Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document is part 1 of a multi-parts TS:

3GPP TS 34.121-1: User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification.

3GPP TS 34.121-2 [32]: User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 2: Implementation Conformance Statement (ICS).

NOTE: TS 34.121 has been converted to multipart TS with version 7.0.0. Previous versions are a single part standard 34.121.

1 Scope

The present document specifies the UTRA measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in addition to requirements for support of RRM (Radio Resource Management) in FDD mode. In addition it specifies conformance testing of RRM requirements for support of E-UTRA when the UE operates in UTRA mode.

NOTE: Conformance testing of RRM requirements for support of UTRA when the UE operates in E-UTRA mode are specified in TS 36.521-3 [38].

The requirements are listed in different clauses only if the corresponding parameters deviate. More generally, tests are only applicable to those mobiles that are intended to support the appropriate functionality. To indicate the circumstances in which tests apply, this is noted in the "*definition and applicability*" part of the test.

For example only Release 5 and later UE declared to support HSDPA shall be tested for this functionality. In the event that for some tests different conditions apply for different releases, this is indicated within the text of the test itself.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document.
  - For a Release 1999 UE, references to 3GPP documents are to version 3.x.y.
  - For a Release 4 UE, references to 3GPP documents are to version 4.x.y.
  - For a Release 5 UE, references to 3GPP documents are to version 5.x.y.
  - For a Release 6 UE, references to 3GPP documents are to version 6.x.y.
  - For a Release 7 UE, references to 3GPP documents are to version 7.x.y.
  - For a Release 8 UE, references to 3GPP documents are to version 8.x.y.
  - For a Release 9 UE, references to 3GPP documents are to version 9.x.y.

[1] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[5] 3GPP TS 25.214: "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990: "Vocabulary".

[8] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".

[9] 3GPP TS 25.433: "UTRAN Iub Interface NBAP Signalling".

[10] ITU-R Recommendation SM.329: "Spurious emissions".

[11] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[12] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[13] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[14] 3GPP TS 25.213: "Spreading and modulation (FDD)".

[15] 3GPP TS 25.223: "Spreading and modulation (TDD)".

[16] ETSI ETR 273-1-2: "Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[17] 3GPP TR 25.926: "UE Radio Access Capabilities".

[18] 3GPP TR 21.904: "UE capability requirements".

[19] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[20] 3GPP TS 05.08 (R99): "Technical Specification Group GSM/EDGE Radio Access Network; Radio subsystem link control".

[21] 3GPP TS 34.123-1: "User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance Specification".

[22] 3GPP TS 25.215: "Physical Layer - Measurements (FDD)".

[23] Void

[24] 3GPP TR 34.902: "Derivation of test tolerances for multi-cell Radio Resource Management (RRM) conformance tests ".

[25] 3GPP TS 51.010-1: "Mobile Station (MS) conformance specification; Part 1: Conformance specification ".

[26] 3GPP TS 25.307 "Requirements on UEs supporting a release independent frequency band".

[27] ITU-T recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[28] 3GPP TS 05.05 (R99): "Technical Specification Group GSM/EDGE Radio Access Network; Radio transmission and reception".

[29] 3GPP TS 45.005 (Rel-4 and later releases): "Technical Specification Group GSM/EDGE Radio Access Network; Radio transmission and reception".

[30] 3GPP TS 45.008 (Rel-4 and later releases): "Technical Specification Group GSM/EDGE Radio Access Network; Radio subsystem link control".

[31] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[32] 3GPP TS 34.121-2: "User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 2: Implementation Conformance Statement (ICS)".

[33] 3GPP TS 36.508: "Technical Specification Group Radio Access Network; E-UTRA and EPC; Common test environments for User Equipment (UE)".3 Definitions, symbols, abbreviations and equations

[34] 3GPP TS 36.133: "E-UTRA requirements for support of radio resource management".

[35] 3GPP TS 36.211: "Physical Channels and Modulation".

[36] 3GPP TS 36.331: "E-UTRA Radio Resource Control (RRC): protocol specification".

[37] 3GPP TS 36.101: "E-UTRA UE radio transmission and reception".

[38] 3GPP TS 36.521-3: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management (RRM) conformance testing".

3 Definitions, symbolds, abbreviations and equations

3.1 Definitions

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

For the purpose of the present document, the following terms and definitions apply:

Maximum Output Power: This is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

For DC-HSUPA the maximum output power is defined by the sum of the broadband transmit power of each carrier in the UE.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class.

Mean power: When applied to a W-CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot unless otherwise stated.

RRC filtered mean power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

NOTE 1: The RRC filtered mean power of a perfectly modulated W-CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in 3GPP TS 25.101 clause 6.8.1.

RegDTX: Regular DTX. These are the times when the HS-DPCCH ACK/NACK is not expected to be transmitted due to an Inter-TTI period greater than 1.

statDTX: Statistical DTX. These are the times when the HS-DPCCH is expected to transmit an ACK or NACK but none is transmitted due to the UE not being able to decode consistent control information from the HS_SCCH.

Throughput: Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.

Enhanced performance requirements type 1: This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise receiver diversity.

Enhanced performance requirements type 2: This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise a chip equaliser receiver structure.

Enhanced performance requirements type 3: This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise a chip equaliser receiver structure with receiver diversity.

Enhanced performance requirements type 3i: This defines performance requirements which are optional for the UE, The requirements are based on UEs which utilise an interference-aware chip equaliser receiver structure with receiver diversity.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…] Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken

3.3 Abbreviations

For the purpose of the present document, the following abbreviations apply:

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
AFC	Automatic Frequency Control
AICH	Acquisition Indication Channel
ASD	Acceleration Spectral Density
ATT	Attenuator
BER	Bit Error Ratio
BLER	Block Error Ratio
BTFD	Blind Transport Format Detection
CQI	Channel Quality Indicator
CW	Continuous Wave (un-modulated signal)
DB-DC-HSDPA	Dual Band Dual Cell HSDPA
DC-HSDPA	Dual Cell HSDPA
DCH	Dedicated Channel, which is mapped into Dedicated Physical Channel
DIP	Dominant Interferer Proportion ratio
DL	Down Link (forward link)
DTX	Discontinuous Transmission
DPCCH	Dedicated Physical Control Channel
DPCH	Dedicated Physical Channel
DPDCH	Dedicated Physical Data Channel
E-DCH	Enhanced Dedicated Channel
E-AGCH	E-DCH Absolute Grant Channel
E-HICH	E-DCH HARQ ACK Indicator Channel
E-RGCH	E-DCH Relative Grant Channel
EIRP	Effective Isotropic Radiated Power
EVM	Error Vector Magnitude
FACH	Forward Access Channel
FDD	Frequency Division Duplex
FDR	False transmit format Detection Ratio. A false Transport Format detection occurs when the receiver detects a different TF to that which was transmitted, and the decoded transport block(s) for this incorrect TF passes the CRC check(s)
HARQ	Hybrid Automatic Repeat Request
HSDPA	High Speed Downlink Packet Access
HS-DSCH	High Speed Downlink Shared Channel
HS-PDSCH	High Speed Physical Downlink Shared Channel
HS-SCCH	High Speed Shared Control Channel
HYB	Hybrid
Information Data Rate	Rate of the user information, which must be transmitted over the Air Interface. For example, output rate of the voice codec
IM	Intermodulation
ITP	Initial Transmission Power control mode
MBSFN	MBMS over a Single Frequency Network
MER	Message Error Ratio
MIMO	Multiple Input Multiple Output
Node B	A logical node responsible for radio transmission / reception in one or more cells to/from the User Equipment. Terminates the Iub interface towards the RNC
OBW	Occupied Bandwidth
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink
PAR	Peak to Average Ratio

P-CCPCH	Primary Common Control Physical Channel
PCH	Paging Channel
P-CPICH	Primary Common Pilot ChannelPCDE Peak Code Domain Error
PICH	Paging Indicator Channel
PPM	Parts Per Million
R	Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.RACH Random Access Channel
RBW	Resolution Bandwidth
PRBS	Pseudo Random Bit Sequence
regDTX	Regular DTX
RRC	Root-Raised Cosine
S-CCPCH	Secondary Common Control Physical Channel
S-CPICH	Secondary Common Pilot Channel
SCH	Synchronisation Channel consisting of Primary and Secondary synchronisation channels
SG	Serving Grant
SIR	Signal to Interference ratio
SML	Soft Metric Location (Soft channel bit)
SS	System Simulator; see Annex A for description
statDTX	Statistical DTX
STTD	Space Time Transmit Diversity
TDD	Time Division Duplexing
TFC	Transport Format Combination
TFCI	Transport Format Combination Indicator
TGCFN	Transmission Gap Connection Frame Number
TGD	Transmission Gap Distance
TGL	Transmission Gap Length
TGPL	Transmission Gap Pattern Length
TGPRC	Transmission Gap Pattern Repetition Count
TGSN	Transmission Gap Starting Slot Number
TPC	Transmit Power Control
TSTD	Time Switched Transmit Diversity
UE	User Equipment
UL	Up Link (reverse link)
UTRA	UMTS Terrestrial Radio Access

3.4 Equations

For the purpose of the present document, the following additional equations apply:

$\frac{CPICH\_E_c}{I_{or}}$	The ratio of the received energy per PN chip of the CPICH to the total transmit power spectral density at the Node B (SS) antenna connector.
$\mathrm{DPCH\_E_c}$	Average energy per PN chip for DPCH.
$\frac{DPCH\_E_c}{I_{or}}$	The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B (SS) antenna connector.
$\frac{DPCCH\_E_c}{I_{or}}$	The ratio of the transmit energy per PN chip of the DPCCH to the total transmit power spectral density at the Node B (SS) antenna connector.
$\frac{DPDCH\_E_c}{I_{or}}$	The ratio of the transmit energy per PN chip of the DPDCH to the total transmit power spectral density at the Node B (SS) antenna connector
$\mathrm{E_c}$	Average energy per PN chip.

$\frac{E_c}{I_{or}}$ The ratio of the average transmit energy per PN chip for different fields or physical channels to the total transmit power spectral density.

F_{uw} Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or a frequency offset from the assigned channel frequency. For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

I_{Node_B} Interference signal power level at Node B in dBm, which is broadcasted on BCH.

I_o The total received power spectral density, including signal and interference, as measured at the UE antenna connector.

I_{oac} The power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the adjacent frequency channel as measured at the UE antenna connector.

I_{oc} The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector. For DC-HSDPA and DB-DC-HSDPA, I_{oc} is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell.

I_{oc}' The received power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of the summation of the received power spectral densities of the two strongest interfering cells plus Ioc as measured at the UE antenna connector. The respective power spectral density of each interfering cell relative to Ioc' is defined by its associated DIP value.

I_{or} The total transmit power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal at the Node B antenna connect. For DC-HSDPA and DB-DC-HSDPA, I_{or} is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell. Or

$\hat{I}_{or}$ The received power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector For DC-HSDPA and DB-DC-HSDPA, $\hat{I}_{or}$ is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell.

I_{otx} The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating Node B transmitter impairments) as measured at the Node B transmit antenna connector(s). For DC-HSDPA and DB-DC-HSDPA, I_{otx} is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell.).

I_{ouw} Unwanted signal power level.

$OCNS\_E_c$ Average energy per PN chip for the OCNS.

$\frac{OCNS\_E_c}{I_{or}}$ The ratio of the average transmit energy per PN chip for the OCNS to the total transmit power spectral density.

P-CCPCH_E_c Average (note) energy per PN chip for P-CCPCH.

$P-CCPCH\frac{E_c}{I_o}$ The ratio of the received P-CCPCH energy per chip to the total received power spectral density at the UE antenna connector.

$\frac{P-CCPCH\_E_c}{I_{or}}$ The ratio of the average (note) transmit energy per PN chip for the P-CCPCH to the total transmit power spectral density.

$P\text{-}CPICH\_E_c$ Average (note) energy per PN chip for P-CPICH.

$PICH\_E_c$ Average (note) energy per PN chip for PICH.

$\frac{PICH\_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the PICH to the total transmit power spectral density at the Node B (SS) antenna connector.

R Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.

<REFSENS> Reference sensitivity

<REF $\hat{I}_{or}$> Reference $\hat{I}_{or}$

$S-CCPCH$ Secondary Common Control Physical Channel.

$S-CCPCH\_E_c$ Average energy per PN chip for S-CCPCH.

SCH_E_c Average (note) energy per PN chip for SCH.

$S\text{-}CPICH\_E_c$ Average (note) energy per PN chip for S-CPICH.

NOTE: Averaging period for energy/power of discontinuously transmitted channels should be defined.

NOTE: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, ($DPCH\_E_c$ and $P\text{-}CPICH\_E_c$) and others defined in terms of PSD (I_{oac}, I_{oc}, and $\hat{I}_{or}$). There also exist quantities that are a ratio of energy per chip to PSD ($DPCH\_E_c/I_{or}$, E_c/I_{or} etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

4 Frequency bands and channel arrangement

4.1 General

The information presented in this clause is based on a chip rate of 3,84 Mcps. The normative reference for the frequency bands and channel arrangement are defined is TS 25.101 [1], clause 5 and TS 25.307 [26].

NOTE: Other chip rates may be considered in future releases.

4.2 Frequency bands

a) UTRA/FDD is designed to operate in either of the following paired bands:

Operating Band	UL Frequencies UE transmit, Node B receive	DL frequencies UE receive, Node B transmit
I	1920 - 1980 MHz	2110 - 2170 MHz
II	1850 -1910 MHz	1930 - 1990 MHz
III	1710 -1785 MHz	1805 - 1880 MHz
IV	1710 -1755MHz	2110 - 2155MHz
V	824 - 849MHz	869 - 894MHz
VI	830 - 840 MHz	875 - 885 MHz
VII	2500 - 2570 MHz	2620 - 2690 MHz
VIII	880 - 915 MHz	925 - 960 MHz
IX	1749.9 - 1784.9 MHz	1844.9 - 1879.9 MHz
X	1710 - 1770 MHz	2110 - 2170 MHz
XI	1427.9 - 1447.9 MHz	1475.9 - 1495.9 MHz
XII	699 - 716 MHz	729 - 746 MHz
XIII	777 - 787 MHz	746 - 756 MHz
XIV	788 - 798 MHz	758 - 768 MHz
XV	Reserved	Reserved
XVI	Reserved	Reserved
XVII	Reserved	Reserved
XVIII	Reserved	Reserved
XIX	830 - 845 MHz	875 - 890 MHz
XX	832 - 862 MHz	791 - 821 MHz
XXI	1447.9 - 1462.9 MHz	1495.9 - 1510.9 MHz
XXII	3410 - 3490 MHz	3510 - 3590 MHz
XXV	1850 - 1915 MHz	1930 - 1995 MHz
XXVI	814 - 849 MHz	859 - 894 MHz

b) Deployment in other frequency bands is not precluded.

c) DB-DC-HSDPA is designed to operate in the following configurations:

DB-DC-HSDPA Configuration	UL Band	DL Bands
1	I or VIII	I and VIII
2	II or IV	II and IV
3	I or V	I and V
4	I or XI	I and XI
5	II or V	II and V

d) Single band 4C-HSDPA is designed to operate in the following configurations:

Table 4.0A Single band 4C-HSDPA configurations

Single band 4C-HSDPA Configuration	Operating Band	Number of DL carriers
I-3	I	3
NOTE: Single band 4C-HSDPA configuration is numbered as (X-M) where X denotes the operating band and M denotes the number of DL carriers.		

e) Dual band 4C-HSDPA is designed to operate in the following configurations:

Table 4.0B Dual band 4C-HSDPA configurations

Dual band 4C-HSDPA Configuration	UL Band	DL Band A	Number of DL carriers in Band A	DL Band B	Number of DL carriers in Band B
I-2-VIII-1	I or VIII	I	2	VIII	1
I-3-VIII-1	I or VIII	I	3	VIII	1
II-1-IV-2	II or IV	II	1	IV	2
II-2-IV-1	II or IV	II	2	IV	1
II-2-IV-2	II or IV	II	2	IV	2
I-1-V-2	I or V	I	1	V	2
I-2-V-1	I or V	I	2	V	1
I-2-V-2	I or V	I	2	V	2
NOTE: Dual band 4C-HSDPA configuration is numbered as (X-M-Y-N) where X denotes the DL Band A, M denotes the number DL carriers in the DL Band A, Y denotes the DL Band B, and N denotes the number of DL carriers in the DL Band B.					

4.3 TX-RX frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation.

Operating Band	TX-RX frequency separation
I	190 MHz
II	80 MHz
III	95 MHz
IV	400 MHz
V	45 MHz
VI	45 MHz
VII	120 MHz
VIII	45 MHz
IX	95 MHz
X	400 MHz
XI	48 MHz
XII	30 MHz
XIII	31 MHz
XIV	30 MHz
XIX	45 MHz
XX	41 MHz
XXI	48 MHz
XXII	100 MHz
XXV	80 MHz
XXVI	45 MHz

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

d) When configured to operate on dual cells, the TX-RX frequency separation shall be applied to UL and DL with the serving HS-DSCH cell. For band XII, XIII and XIV, the TX-RX frequency separation shall be the minimum spacing between UL and any of DL carriers.

4.4 Channel arrangement

4.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario. In DC-HSDPA and DB-DC-HSDPA mode, the UE receives two cells simultaneously. In context of DC-HSDPA and DB-DC-HSDPA, a cell is characterized by a combination of scrambling code and a carrier frequency; see TR 21.905 [5].

4.4.2 Channel raster

The channel raster is 200 kHz, for all bands which means that the centre frequency must be an integer multiple of 200 kHz. In addition a number of additional centre frequencies are specified according to table 4.1a, which means that the centre frequencies for these channels are shifted 100 kHz relative to the general raster.

4.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). For each operating Band, the values of the UARFCN are defined as follows.

Uplink: $N_U = 5 * (F_{UL} - F_{UL\_Offset})$, for the carrier frequency range $F_{UL\_low} \le F_{UL} \le F_{UL\_high}$

Downlink: $N_D = 5 * (F_{DL} - F_{DL\_Offset})$, for the carrier frequency range $F_{DL\_low} \le F_{DL} \le F_{DL\_high}$

For each operating Band, F_{UL_Offset}, F_{UL_low}, F_{UL_high}, F_{DL_Offset}, F_{DL_low} and F_{DL_high} are defined in Table 4.1 for the general UARFCN. For the additional UARFCN, F_{UL_Offset}, F_{DL_Offset} and the specific F_{UL} and F_{DL} are defined in Table 4.1A.

Table 4.1: UARFCN definition (general)

Band	UPLINK (UL) UE transmit, Node B receive			DOWNLINK (DL) UE receive, Node B transmit		
	UARFCN formula offset	Carrier frequency (F_{UL}) range [MHz]		UARFCN formula offset	Carrier frequency (F_{DL}) range [MHz]	
	F_{UL_Offset} [MHz]	F_{UL_low}	F_{UL_high}	F_{DL_Offset} [MHz]	F_{DL_low}	F_{DL_high}
I	0	1922.4	1977.6	0	2112.4	2167.6
II	0	1852.4	1907.6	0	1932.4	1987.6
III	1525	1712.4	1782.6	1575	1807.4	1877.6
IV	1450	1712.4	1752.6	1805	2112.4	2152.6
V	0	826.4	846.6	0	871.4	891.6
VI	0	832.4	837.6	0	877.4	882.6
VII	2100	2502.4	2567.6	2175	2622.4	2687.6
VIII	340	882.4	912.6	340	927.4	957.6
IX	0	1752.4	1782.4	0	1847.4	1877.4
X	1135	1712.4	1767.6	1490	2112.4	2167.6
XI	733	1430.4	1445.4	736	1478.4	1493.4
XII	-22	701.4	713.6	-37	731.4	743.6
XIII	21	779.4	784.6	-55	748.4	753.6
XIV	12	790.4	795.6	-63	760.4	765.6
XIX	770	832.4	842.6	735	877.4	887.6
XX	-23	834.4	859.6	-109	793.4	818.6
XXI	1358	1450.4	1460.4	1326	1498.4	1508.4
XXII	2525	3412.4	3487.6	2580	3512.4	3587.6
XXV	875	1852.4	1912.6	910	1932.4	1992.6
XXVI	-291	816.4	846.6	-291	861.4	891.6

Table 4.1a: UARFCN definition (additional channels)

Band	UPLINK (UL) UE transmit, Node B receive		DOWNLINK (DL) UE receive, Node B transmit	
	UARFCN formula offset F_{UL_Offset} [MHz]	Carrier frequency [MHz] (F_{UL})	UARFCN formula offset F_{DL_Offset} [MHz]	Carrier frequency [MHz] (F_{DL})
I	-	-	-	-
II	1850.1	1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5	1850.1	1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5
III	-	-	-	-
IV	1380.1	1712.5, 1717.5, 1722.5, 1727.5, 1732.5, 1737.5 1742.5, 1747.5, 1752.5	1735.1	2112.5, 2117.5, 2122.5, 2127.5, 2132.5, 2137.5, 2142.5, 2147.5, 2152.5
V	670.1	826.5, 827.5, 831.5, 832.5, 837.5, 842.5	670.1	871.5, 872.5, 876.5, 877.5, 882.5, 887.5
VI	670.1	832.5, 837.5	670.1	877.5, 882.5
VII	2030.1	2502.5, 2507.5, 2512.5, 2517.5, 2522.5, 2527.5, 2532.5, 2537.5, 2542.5, 2547.5, 2552.5, 2557.5, 2562.5, 2567.5	2105.1	2622.5, 2627.5, 2632.5, 2637.5, 2642.5, 2647.5, 2652.5, 2657.5, 2662.5, 2667.5, 2672.5, 2677.5, 2682.5, 2687.5
VIII	-	-	-	-
IX	-	-	-	-
X	1075.1	1712.5, 1717.5, 1722.5, 1727.5, 1732.5, 1737.5, 1742.5, 1747.5, 1752.5, 1757.5, 1762.5, 1767.5	1430.1	2112.5, 2117.5, 2122.5, 2127.5, 2132.5, 2137.5, 2142.5, 2147.5, 2152.5, 2157.5, 2162.5, 2167.5
XI	-	-	-	-
XII	-39.9	701.5, 706.5, 707.5, 712.5, 713.5	-54.9	731.5, 736.5, 737.5, 742.5, 743.5
XIII	11.1	779.5, 784.5	-64.9	748.5, 753.5
XIV	2.1	790.5, 795.5	-72.9	760.5, 765.5
XIX	755.1	832.5, 837.5, 842.5	720.1	877.5, 882.5, 887.5
XX	-	-	-	-
XXI	-	-	-	-
XXII	-	-	-	-
XXV	639.1	1852.5, 1857.5, 1862.5,1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5, 1912.5	674.1	1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5, 1992.5
XXVI	-325.9	816.5, 821.5, 826.5, 827.5, 831.5, 832.5, 836.5, 837.5, 841.5, 842.5, 846.5	-325.9	861.5, 866.5, 871.5, 872.5, 876.5, 877.5, 881.5, 882.5, 886,5, 887.5, 891.5

4.4.4 UARFCN

The following UARFCN range shall be supported for each paired band.

Table 4.2: UTRA Absolute Radio Frequency Channel Number

Band	Uplink (UL) UE transmit, Node B receive		Downlink (DL) UE receive, Node B transmit	
	General	Additional	General	Additional
I	9612 to 9888	-	10562 to 10838	
II	9262 to 9538	12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287	9662 to 9938	412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662, 687
III	937 to 1288	-	1162 to 1513	-
IV	1312 to 1513	1662, 1687, 1712, 1737, 1762, 1787, 1812, 1837, 1862	1537 to 1738	1887, 1912, 1937, 1962, 1987, 2012, 2037, 2062, 2087
V	4132 to 4233	782, 787, 807, 812, 837, 862	4357 to 4458	1007, 1012, 1032, 1037, 1062, 1087
VI	4162 to 4188	812, 837	4387 to 4413	1037, 1062
VII	2012 to 2338	2362, 2387, 2412, 2437, 2462, 2487, 2512, 2537, 2562, 2587, 2612, 2637, 2662, 2687	2237 to 2563	2587, 2612, 2637, 2662, 2687, 2712, 2737, 2762, 2787, 2812, 2837, 2862, 2887, 2912
VIII	2712 to 2863	-	2937 to 3088	-
IX	8762 to 8912	-	9237 to 9387	-
X	2887 to 3163	3187, 3212, 3237, 3262, 3287, 3312, 3337, 3362, 3387, 3412, 3437, 3462	3112 to 3388	3412, 3437, 3462, 3487, 3512, 3537, 3562, 3587, 3612, 3637, 3662, 3687
XI	3487 to 3562	-	3712 to 3787	-
XII	3617 to 3678	3707, 3732, 3737, 3762, 3767	3842 to 3903	3932, 3957, 3962, 3987, 3992
XIII	3792 to 3818	3842, 3867	4017 to 4043	4067, 4092
XIV	3892 to 3918	3942, 3967	4117 to 4143	4167, 4192
XIX	312 to 363	387, 412, 437	712 to 763	787, 812, 837
XX	4287 to 4413	-	4512 to 4638	-
XXI	462 to 512	-	862 to 912	-
XXII	4437 to 4813	-	4662 to 5038	-
XXV	4887 to 5188	6067, 6092, 6117, 6142, 6167, 6192, 6217, 6242, 6267, 6292, 6317, 6342, 6367	5112 to 5413	6292, 6317, 6342, 6367, 6392, 6417, 6442, 6467, 6492, 6517, 6542, 6567, 6592
XXVI	5537 to 5688	5712, 5737, 5762, 5767, 5787, 5792, 5812, 5817, 5837, 5842, 5862	5762 to 5913	5937, 5962, 5987, 5992, 6012, 6017, 6037, 6042, 6062, 6067, 6087

NOTE: If the UE is on a network with Mobile Country Code set to Japan then it may assume that any DL UARFCN sent by the network from the overlapping region of Band V and Band VI is from Band VI. If the UE is on a network with a Mobile Country Code other than Japan then it may assume that any DL UARFCN sent by the network from the overlapping region of Band V and Band VI is from Band V.

4A Reference Conditions

The reference environment used by all test cases in this document is specified in TS 34.108 [3] and TS 36.508 [33]. Where a test requires an environment that is different, this will be specified in the test itself.

4A.1 Generic setup procedures

Test procedures for RF test are defined in TS 34.108 [3] clause 7.3. The initial conditions of this clause also refer to the generic setup procedures defined in TS 34.108 [3] clause 7.2.

4A.2 System information

The reference system information used for test cases specified in this document is defined in TS 34.108 [3] clauses 6.1.0a (Default Master Information Block and Scheduling Block messages) and 6.1.0b (Default System Information Block Messages). For cells other than cell 1 the difference in information elements is defined in TS 34.108 [3] clause 6.1.4. For the generic setup procedures defined in TS 34.108 [3] clause 7.3 some SIB elements override those specific SIB elements from TS 34.108 [3] clause 6.1.0b. Annex I in the present document overwrites specific elements in the Master Information Block and Scheduling Block messages compared to TS 34.108 [3] clause 6.1.0a and specific SIB elements compared to TS 34.108 [3] clauses 6.1.0b and 7.3. In the test description itself specific SIB elements can be overwritten again. This leads to the following places defining Master Information Block, Scheduling Block messages and System Information Block Messages:

1. TS 34.108 [3] clauses 6.1.0a, 6.1.0b and 6.1.4
2. TS 34.108 [3] clause 7.3
3. TS 34.121 Annex I
4. TS 34.121 test case description

When the same Information Element is defined in several places then the place with the higher number according to the above list will override the other definition(s).

The reference system information for E-UTRAN is specified in TS 36.508 [33]

4A.3 Message contents

Default message contents for test cases specified in this document are defined in TS 34.108 [3] clause 9. Most default message contents are specified in TS 34.108 [3] clause 9.2.1, but some default message contents originally defined for signalling test cases are re-used for RF testing and specified in TS 34.108 [3] clause 9.1.1. TS 34.108 [3] clause 7.3 contains additional information regarding the default messages. Annex I in the present document overwrites specific message contents for some test cases. In the test description itself specific information elements can be overwritten again. This leads to the following places defining message contents:

1a. TS 34.108 [3] clause 9.1.1 (only if indicated by TS 34.108 [3] clause 7.3 or the test description in TS 34.121)

1b. TS 34.108 [3] clause 9.2.1 (as indicated by TS 34.108 [3] clause 7.3 or the test description in TS 34.121)

2. TS 34.108 [3] clause 7.3
3. TS 34.121 Annex I
4. TS 34.121 test case description

When the same Information Element is defined in several places then the place with the higher number according to the above list will override the other definition(s). Default message contents from TS 34.108 [3] clause 9 will be used either from clause 9.1.1 (1a in the list above) or from clause 9.2.1 (1b in the list above). Some messages are not defined in all places, but all messages have to be defined at least in the test description.

Default message contents for E-UTRAN is specified in TS 36.508 [33].

4A.4 Measurement configurations

Measurement configurations defined by system information are specified in TS 34.108 [3]. System Information Block type 11 (SIB 11) configures measurements for cell 1 according to TS 34.108 [3], clause 6.1.0b. See TS 34.108 [3], clause 6.1.4 for the difference in message contents of SIB 11 (FDD) for other cells used in the test. SIB 12 is specified in TS 34.108 [3] clause 6.1.0b, but is currently not used to configure measurements.

Some modifications to specific information elements in SIB 11 are defined in TS 34.121 Annex I or in the test description itself. In this case the priority defined in clause 4A.2 shall be applied.

Note: Currently SIB 11 in TS 34.108 [3] configures Intra-frequency measurement system information to use "Intra-frequency measurement identity=1" (default value), "Intra-frequency measurement identity =CPICH RSCP" with events 1a, 1b and 1c. The Inter-frequency measurement system information and the Inter-RAT measurement system information do not configure measurement identities. Traffic volume measurement system information is not present.

In many test cases the measurement identity as configured by SIB 11 is reused and the Measurement Control message will "Modify" the Measurement Identity configured in SIB 11.

In some test cases additional measurements are used. Then the Measurement Control message will "Setup" a new Measurement Identity with the default value for that measurement quantity as specified in TS 25.331 [8]. If the Measurement Control message uses "Setup" then the new Measurement Identity shall be different to already configured ones. All Inter-frequency measurements and Inter-RAT measurements are first configured by Measurement Control message using "Setup".

All UE measurements are referenced to the UE antenna connector.

Measurement configurations defined by system information for E-UTRAN is specified in TS 36.508 [33].

5 Transmitter Characteristics

5.1 General

Transmitting performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 5.1.

Table 5.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate	Remarks
12,2 kbps reference measurement channel	12,2 kbps	30 ksps	60 kbps	Standard Test

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 5 are defined using the UL reference measurement channel (12,2 kbps) specified in clause C.2.1 and unless stated otherwise, with the UL power control ON.

The common RF test conditions of Tx Characteristics are defined in clause E.3.1, and each test conditions in this clause (clause 5) should refer clause E.3.1. Individual test conditions are defined in the paragraph of each test.

When DCCH has been configured on downlink DCH then DCCH Data shall be continuously transmitted on downlink DCH during the measurement period. When there is no signalling to transmit on downlink DCCH then dummy DCCH transmission as described in Annex C.9 shall be used.

For HSDPA test cases and E-DCH test cases, when DTCH has been configured on downlink DCH then DTCH Data shall be continuously transmitted on downlink DCH during the measurement period.

The MAC header transmission on HS-DSCH for all E-DCH test cases shall use a correct MAC-hs header consistent with the actual HSDPA transmission.

The DL and UL RLC SDU size for all E-DCH tests in clause 5 shall be set according to Annex C.11.3.

For HSDPA test cases without E-DCH, the MAC headers on HS-DSCH shall be according to Annex C.9A.

UEs supporting DC-HSUPA shall support both minimum requirements, as well as additional requirements for DC-HSUPA.

For the additional requirements for DC-HSUPA, all the parameters in clause 6 are defined using the UL E-DCH reference measurement channel, specified in subclause C.2.6. For the additional requirements for DC-HSUPA, the spacing of the carrier frequencies of the two cells shall be 5 MHz.

5.2 Maximum Output Power

5.2.1 Definition and applicability

The nominal maximum output power and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.2.2 Minimum Requirements

The UE maximum output power shall be within the nominal value and tolerance specified in table 5.2.1 even for the multi-code transmission mode.

Table 5.2.1: Nominal Maximum Output Power

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1/-3	+27	+1/-3	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band II	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band III	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band IV	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band V	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band VI	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band VII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band VIII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band IX	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band X	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XI	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XIII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XIV	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XIX	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XX	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XXI	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XXII	-	-	-	-	+24	+1/-4.5	+23	+2/-3.5	+21	+2/-3.5
Band XXV					+24	+1/-4	+23	+2/-3	+21	+2/-3
Band XXVI (Note 1)	-	-	-	-	+24	+1/-4	+23	+2/-3	+21	+2/-3
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.										

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2.1 is allowed to be decreased by the amount given in Table 6.2.5A-3 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5A-3 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5A-3 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1.

5.2.3 Test purpose

To verify that the error of the UE maximum output power does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

5.2.4 Method of test

5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.
2) Measure the mean power of the UE in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot.

5.2.5 Test requirements

The maximum output power, derived in step 2), shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.2.

Table 5.2.2: Nominal Maximum Output Power

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1,7/-3,7	+27	+1,7/-3,7	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band II	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band III	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band IV	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band V	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band VI	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band VII	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band VIII	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band IX	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band X	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XI	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XII	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XIII	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XIV	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XIX	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XX	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XXI	-	-	-	-	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XXII	-	-	-	-	+24	+1,7/-5.2	+23	+2,7/-4.2	+21	+2.7/-4.2
Band XXV	-	-	-	-	+24	+1,7/-4,7	+23	+2,7/-3,7	+21	+2,7/-3,7
Band XXVI (Note 1)	-	-	-	-	+24	+1.7/-4.7	+23	+2.7/-3.7	+21	+2.7/-3.7
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.										

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2A Maximum Output Power with HS-DPCCH (Release 5 only)

5.2A.1 Definition and applicability

The maximum output power with HS-DPCCH and its tolerance are defined according to the Power Class of the UE.

The maximum output power with HS-DPCCH is a measure of the maximum power the UE can transmit when HS-DPCCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply to all types of UTRA for the FDD UE that support HSDPA for Release 5.

5.2A.2 Minimum Requirements

The UE maximum output power with HS-DPCCH shall be within the value and tolerance specified in table 5.2A.1 when HS-DPCCH is fully or partially transmitted during a DPCCH timeslot. The maximum output power where HS-DPCCH is not transmitted shall be within the values and tolerance specified in table 5.2.1.

Table 5.2A.1: Maximum Output Powers with HS-DPCCH

Ratio of β_c to β_d for all values of β_{hs}	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
$1/15 \le \beta_c/\beta_d \le 12/15$	+24	+1/-3	+21	+2/-2
$13/15 \le \beta_c/\beta_d \le 15/8$	+23	+2/-3	+20	+3/-2
$15/7 \le \beta_c/\beta_d \le 15/0$	+22	+3/-3	+19	+4/-2

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2.

5.2A.3 Test purpose

To verify that the error of the UE maximum output power with HS-DPCCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2A.1.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2A.4 Method of test

5.2A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1 with the beta values set according to table C.10.1.4.
3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2A.1A.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.2A.1A: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.
2) Set and send continuously Up power control commands to the UE.
3) Start transmitting HSDPA Data.
4) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.
5) Repeat the measurement for the different combinations of beta values as given in table C.10.1.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

5.2A.5 Test requirements

The maximum output power with HS-DPCCH, derived in step 4), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2A.2. The maximum output power where HS-DPCCH is not transmitted shall not exceed the range prescribed in table 5.2.2.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4.

Table 5.2A.2: Maximum Output Powers with HS-DPCCH for test

Ratio of β_c to β_d for all values of β_{hs}	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
β_c/β_d = 2/15, 12/15	+24	+1.7/-3.7	+21	+2.7/-2.7
β_c/β_d = 15/8	+23	+2.7/-3.7	+20	+3.7/-2.7
β_c/β_d = 15/4	+22	+3.7/-3.7	+19	+4.7/-2.7
NOTE: For the purpose of the test Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .				

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2AA Maximum Output Power with HS-DPCCH (Release 6 and later)

5.2AA.1 Definition and applicability

The maximum output power with HS-DPCCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH is a measure of the maximum power the UE can transmit when HS-DPCCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA without E-DCH.

5.2AA.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2AA.1 for when the values of $\beta_{c,}$ $\beta_{d,}$ $\beta_{hs,}$ β_{ec} and β_{ed} is fully or partially transmitted during a DPCCH timeslot.

Table 5.2AA.1: Maximum Output Power with HS-DPCCH and E-DCH

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	MAX (CM-1, 0)
NOTE 1: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by:

$$CM = CEIL \{ [20 * \log10 ((v\_norm^3)_{rms}) - 20 * \log10 ((v\_norm\_ref^3)_{rms})] / k, 0.5 \}$$

Where:

- CEIL{ x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM $\in$ [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]
- k is 1.85 for signals where all channelisations codes meet the following criteria $C_{SF,N}$ where N< SF/2
- k is 1.56 for signals were any channelisations codes meet the following criteria $C_{SF,N}$ where $N \geq SF/2$
- v_norm is the normalized voltage waveform of the input signal

- v_norm_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and 20 * log10 ((v_norm_ref^3)$_{rms}$) = 1.52 dB

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2.

5.2AA.3 Test purpose

To verify that the error of the UE maximum output power with HS-DPCCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2AA.2.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2AA.4 Method of test

5.2AA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.1 and C.8.1.1.
3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2AA.1A.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.2AA.1A: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2AA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2AA.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according to the HS-DPCCH slot offset required for measurements.
2) Set and send continuously Up power control commands to the UE.
3) Start transmitting HSDPA Data.
4) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.
5) Repeat the measurement for the different combinations of beta values as given in table C.10.1.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

5.2AA.5 Test requirements

The maximum output power with HS-DPCCH, derived in step 4), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2AA.2 or 5.2AA.3 depending on tested band. The maximum output power where HS-DPCCH is not transmitted shall not exceed the range prescribed in table 5.2.2.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4.

Table 5.2AA.2: Maximum Output Powers with HS-DPCCH for test

Sub-test in table C.10.1.4	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-3.7	+21	+2.7/-2.7
2	+24	+1.7/-3.7	+21	+2.7/-2.7
3	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7
4	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7

Table 5.2AA.3: Maximum Output Powers with HS-DPCCH for test in bands XXV and XXVI

Sub-test in table C.10.1.4	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-4.7	+21	+2.7/-3.7
2	+24	+1.7/-4.7	+21	+2.7/-3.7
3	+23.5	+2.2/-4.7	+20.5	+3.2/-3.7
4	+23.5	+2.2/-4.7	+20.5	+3.2/-3.7
NOTE: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2AB Maximum Output Power for OLTD

FFS

5.2AC Maximum Output Power for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2AC.1 Definition and applicability

The nominal maximum output power with UL CLTD and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2AC.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the nominal maximum output power is specified in Table 5.2AC.1. The nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

Table 5.2AC.1: Nominal Maximum Output Power for UL CLTD

Operating Band	Power Class 3		Power Class 3bis	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+24	+1/-4	23	+2/-3
Band II	+24	+1/-4	23	+2/-3
Band III	+24	+1/-4	23	+2/-3
Band IV	+24	+1/-4	23	+2/-3
Band V	+24	+1/-4	23	+2/-3
Band VI	+24	+1/-4	23	+2/-3
Band VII	+24	+1/-4	23	+2/-3
Band VIII	+24	+1/-4	23	+2/-3
Band IX	+24	+1/-4	23	+2/-3
Band X	+24	+1/-4	23	+2/-3
Band XI	+24	+1/-4	23	+2/-3
Band XII	+24	+1/-4	23	+2/-3
Band XIII	+24	+1/-4	23	+2/-3
Band IV	+24	+1/-4	23	+2/-3
Band XIX	+24	+1/-4	23	+2/-3
Band XX	+24	+1/-4	23	+2/-3
Band XXI	+24	+1/-4	23	+2/-3
Band XXII	+24	+1/-5.5	23	+2/-4.5
Band XXV	+24	+1/-5	23	+2/-4
Band XXVI (Note 1)	+24	+1/-5	23	+2/-4
Note 1 For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1B.

5.2AC.3 Test purpose

To verify that the error of the UE maximum output power for UL CLTD activation state 1 does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.AC.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

5.2AC.4 Method of test

5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses FFS.

3) An HSDPA call is set up according to TS 34.108 [3] clause FFS. RF parameters are set up according to table E.5.1 and table E.5.10.

4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.

5) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Start transmitting HSDPA Data.

3) Measure the mean power of the UE in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector.

5.2AC.5 Test requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the nominal maximum output power is specified in Table 5.2AC.2. The nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

The maximum output power, derived in step 3), shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2AC.2.

Table 5.2AC.2: Nominal Maximum Output Power for UL CLTD

Operating Band	Power Class 3		Power Class 3bis	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+24	+/-TT	23	+/-TT
Band II	+24	+/-TT	23	+/-TT
Band III	+24	+/-TT	23	+/-TT
Band IV	+24	+/-TT	23	+/-TT
Band V	+24	+/-TT	23	+/-TT
Band VI	+24	+/-TT	23	+/-TT
Band VII	+24	+/-TT	23	+/-TT
Band VIII	+24	+/-TT	23	+/-TT
Band IX	+24	+/-TT	23	+/-TT
Band X	+24	+/-TT	23	+/-TT
Band XI	+24	+/-TT	23	+/-TT
Band XII	+24	+/-TT	23	+/-TT
Band XIII	+24	+/-TT	23	+/-TT
Band IV	+24	+/-TT	23	+/-TT
Band XIX	+24	+/-TT	23	+/-TT
Band XX	+24	+/-TT	23	+/-TT
Band XXI	+24	+/-TT	23	+/-TT
Band XXII	+24	+/-TT	23	+/-TT
Band XXV	+24	+/-TT	23	+/-TT
Band XXVI (Note 1)	+24	+/-TT	23	+/-TT
Note 1 For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.2AD Maximum Output Power for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2AD.1 Definition and applicability

The nominal maximum output power with UL CLTD and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2AD.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the nominal maximum output power specified in table 5.2AD.1 applies at the active transmit antenna connector.

Table 5.2AD.1: Nominal Maximum Output Power

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1/-3	+27	+1/-3	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band II	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band III	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band IV	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band V	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band VI	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band VII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band VIII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band IX	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band X	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XI	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XIII	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XIV	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XIX	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XX	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XXI	-	-	-	-	+24	+1/-3	+23	+2/-2	+21	+2/-2
Band XXII	-	-	-	-	+24	+1/-4.5	+23	+2/-3.5	+21	+2/-3.5
Band XXV					+24	+1/-4	+23	+2/-3	+21	+2/-3
Band XXVI (Note 1)	-	-	-	-	+24	+1/-4	+23	+2/-3	+21	+2/-3
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.										

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1B.

5.2AD.3 Test purpose

To verify that the error of the UE maximum output power with UL CLTD activation state 2 and 3 does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.AD.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

5.2AD.4 Method of test

5.2AD.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses FFS.
3) An HSDPA call is set up according to TS 34.108 [3] clause FFS. RF parameters are set up according to table E.5.1 and table E.5.10.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 2
5) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.2AD.4.2 Procedure

1) Set and send continuously up power control commands to the UE.
2) Start transmitting HSDPA Data.
3) Measure the mean power of the UE in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot and is measured at the active transmit antenna connector.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 3
5) Repeat step 1 to 3 for activation state 3.

5.2AD.5 Test requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the nominal maximum output power specified in table 5.2AD.2 applies at the active transmit antenna connector.

The maximum output power, derived in step 3) for activation 2 and 3, shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2AD.2.

Table 5.2AD.2: Nominal Maximum Output Power

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+/-TT	+27	+/-TT	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band II	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band III	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band IV	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band V	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band VI	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band VII	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band VIII	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band IX	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band X	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XI	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XII	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XIII	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XIV	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XIX	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XX	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XXI	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XXII	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XXV	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
Band XXVI (Note 1)	-	-	-	-	+24	+/-TT	+23	+/-TT	+21	+/-TT
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.										

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.2B Maximum Output Power with HS-DPCCH and E-DCH

5.2B.1 Definition and applicability

The maximum output power with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

5.2B.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2B.1 for when the values of of β_c, β_d, β_{hs}, β_{ec} and β_{ed} is fully or partially transmitted during a DPCCH timeslot.

Table 5.2B.1: Maximum Output Power with HS-DPCCH and E-DCH

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	MAX (CM-1, 0)
NOTE 1: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by:

$$CM = CEIL \{ [20 * \log10 ((v\_norm^3)_{rms}) - 20 * \log10 ((v\_norm\_ref^3)_{rms})] / k, 0.5 \}$$

Where

- CEIL{ x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM $\in$ [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]
- k is 1.85 for signals where all channelisations codes meet the following criteria $C_{SF,N}$ where N< SF/2
- k is 1.56 for signals were any channelisations codes meet the following criteria $C_{SF,N}$ where $N \geq SF/2$
- v_norm is the normalized voltage waveform of the input signal
- v_norm_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and 20 * log10 $((v\_norm\_ref^3)_{rms})$ = 1.52 dB

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2.

5.2B.3 Test purpose

To verify that the error of the UE maximum output power with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2B.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2B.4 Method of test

5.2B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2B.4A.
4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test. For sub-test 5, enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.9.3.2 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2B.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels - 2bit CTFC - Power offset Information - CHOICE Gain Factors - CHOICE mode - Gain factor ßc - Gain factor ßd	 3 Signalled Gain Factors FDD Value used in test: see Table C.11.1.3 Value used in test: see Table C.11.1.3
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message.	

Table 5.2B.2: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.2B.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

Table 5.2B.3A: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- E-DCH minimum set of E-TFCI	67
- Reference E-TFCIs	1 E-TFCI
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Maximum channelisation codes	Sf4

Table 5.2B.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info For sub-test 1 to 4: Algorithm2 For sub-test 5: Algorithm 1 Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.2B.4A: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2B.4.2 Procedure

5.2B.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.

4) Send power control bits to give one TPC_cmd = +1 command to the UE.

5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).

6) Send power control bits to give one TPC_cmd = -1 command to the UE and wait 150ms.

7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC_cmd = -1 command to the UE and wait 150ms.

8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1.3.

5.2B.4.2.2 Procedure for sub-test 5

1) Set the Absolute Grant according to sub-test 5 in Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150ms.

4) Set and send continuously Up power control commands to the UE. Wait 150ms.

5) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

5.2B.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2B.5 or 5.2B.6 depending on tested band. Note:

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1.3.

Table 5.2B.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-6.7	+21	+2.7/-5.7
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-3.7	+21	+2.7/-2.7

Table 5.2B.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-7.7	+21	+2.7/-6.7
2	+22	+3.7/-6.2	+19	+4.7/-5.2
3	+23	+2.7/-6.2	+20	+3.7/-5.2
4	+22	+3.7/-6.2	+19	+4.7/-5.2
5	+24	+1.7/-4.7	+21	+2.7/-3.7
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2B.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2B.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

5.2BA UE Maximum Output Power for DC-HSUPA (QPSK)

5.2BA.1 Definition and applicability

The maximum output power with DC-HSUPA and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with DC-HSUPA is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. For DC-HSUPA, the nominal transmit power is defined by the sum of the broadband transmit power of each carrier in the UE. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.2BA.2 Minimum Requirements

The Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} is fully or partially transmitted during a DPCCH timeslot and defined through calculation of the Raw Cubic Metric (Raw CM) which is based on the UE transmit channel configuration and is given by:

$$\text{Raw CM} = 20 * \log10 ((\text{v\_norm}^3)_{rms}) - 20 * \log10 ((\text{v\_norm\_ref}^3)_{rms})$$

Where:

- v_norm is the normalized voltage waveform of the input signal
- v_norm_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and
- $20 * \log10 ((\text{v\_norm\_ref}^3)_{rms}) = 1.52$ dB

For any DC-HSUPA signal not employing 16QAM modulation on any of the carriers, and for any DC-HSUPA signal having Raw CM < [2.5], the MPR is specified in Table 5.2BA.1.

Table 5.2BA.1: UE maximum output power for DC-HSUPA signals not employing 16QAM modulation, and DC-HSUPA signals having Raw CM < [2.5]

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0.22 \leq CM \leq 3.72$	MAX (CM-0.72, 0)

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by

$$CM = CEIL \{ \text{Raw CM} / k, 0.22 \}$$

Where:

- CEIL { x, 0.22 } means rounding upwards to closest 0.22dB with 0.5 dB granularity, i.e. CM [0.22, 0.72, 1.22, 1.72, 2.22, 2.72, 3.22, 3.72]
- k is 1.66

For any DC-HSUPA signal employing 16QAM modulation on any of the carriers and having Raw CM ≥ [2.5], the MPR is specified in Table 5.2BA.2.

Table 5.2BA.2: UE maximum output power for DC-HSUPA signals employing 16QAM modulation and having RAW CM ≥ [2.5]

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$[2.24] \leq CM \leq [5.24]$	MAX (CM-[1.24], 0)

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by:

CM = CEIL { Raw CM / k, [0.24] }

Where:

- CEIL { x, 0.24 } means rounding upwards to closest 0.24dB with 0.5 dB granularity, i.e. CM = [2.24, 2.74, 3.24, 3.74, 4.24, 4.74, 5.24]
- k is [1.23] for DC-HSUPA signals employing 16QAM modulation and having Raw CM ≥ [2.5]

It is necessary to verify this requirement only for the DC-HSUPA configurations specified in clause C.2.8.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2A.

5.2BA.3 Test purpose

To verify that the error of the UE maximum output power with DC-HSUPA does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BA.6.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2BA.4 Method of test

5.2BA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and parameters are specified in clauses C.2.6, C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.2BA.5.
4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.
5) Repeat for configuration 1, 2 and 3 in table C.2.8.1.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BA.3: Void

Table 5.2BA.4: Void

Table 5.2BA.5: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2BA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2BA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.
2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.
3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within ± 1.7 dB and the total output power of the UE to be at least 7.5dB lower than the maximum output power. Wait 150ms.
4) Set and send continuously Up power control commands to both carriers to the UE and wait 150ms.
5) Measure the mean power of each carrier of the UE. The mean power shall be averaged over at least one timeslot. The maximum output power is the sum of the broadband transmit power of each carrier in the UE.
6) The SS shall verify that UE is still in a DC-HSUPA call by verifying that UE transmits signal on each carrier. If UE is not transmitting signal on each carrier the SS shall fail the UE in this test.
7) Repeat steps 1-6 for all the different combinations of beta values as given in tables C.11A.1.1.

5.2BA.5 Test requirements

The maximum output power with DC-HSUPA, derived in step 6), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BA.6 or 5.2BA.7 depending on tested band.

The UL reference measurement channel for TX test will be set as defined in C.2.6 and C.2.7 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in tables C.11A.1.1.

Table 5.2BA.6: Maximum Output Power for DC-HSUPA test

Sub-test in table C.11A.1.1	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+22.5	+3.2/-3.7	+19.5	+4.2/-2.7

Table 5.2BA.7: Maximum Output Power for DC-HSUPA test in bands XXV and XXVI

Sub-test in table C.11A.1.1	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+22.5	+3.2/-4.7	+19.5	+4.2/-3.7
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2BB UE Maximum Output Power for DC-HSUPA (16QAM)

5.2BB.1 Definition and applicability

The maximum output power with DC-HSUPA and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with DC-HSUPA is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. For DC-HSUPA, the nominal transmit power is defined by the sum of the broadband transmit power of each carrier in the UE. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH 16QAM UE capability category 9.

5.2BB.2 Minimum Requirements

The Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} is fully or partially transmitted during a DPCCH timeslot and defined through calculation of the Raw Cubic Metric (Raw CM) which is based on the UE transmit channel configuration and is given by:

$$\text{Raw CM} = 20 * \log10 ((v\_norm^3)_{rms}) - 20 * \log10 ((v\_norm\_ref^3)_{rms})$$

Where:

- v_norm is the normalized voltage waveform of the input signal
- v_norm_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and
- $20 * \log10 ((v\_norm\_ref^3)_{rms}) = 1.52$ dB

For any DC-HSUPA signal not employing 16QAM modulation on any of the carriers, and for any DC-HSUPA signal having Raw CM < [2.5], the MPR is specified in Table 5.2BB.1.

Table 5.2BB.1: UE maximum output power for DC-HSUPA signals not employing 16QAM modulation, and DC-HSUPA signals having Raw CM < [2.5]

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0.22 \le CM \le 3.72$	MAX (CM-0.72, 0)

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by

$$CM = CEIL \{ \text{Raw CM} / k, 0.22 \}$$

Where:

- CEIL { x, 0.22 } means rounding upwards to closest 0.22dB with 0.5 dB granularity, i.e. CM [0.22, 0.72, 1.22, 1.72, 2.22, 2.72, 3.22, 3.72]
- k is 1.66

For any DC-HSUPA signal employing 16QAM modulation on any of the carriers and having Raw CM ≥ [2.5], the MPR is specified in Table 5.2BB.2.

Table 5.2BB.2: UE maximum output power for DC-HSUPA signals employing 16QAM modulation and having RAW CM ≥ [2.5]

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$[2.24] \le CM \le [5.24]$	MAX (CM-[1.24], 0)

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by:

CM = CEIL { Raw CM / k, [0.24] }

Where:

- CEIL { x, 0.24 } means rounding upwards to closest 0.24dB with 0.5 dB granularity, i.e. CM = [2.24, 2.74, 3.24, 3.74, 4.24, 4.74, 5.24]
- k is [1.23] for DC-HSUPA signals employing 16QAM modulation and having Raw CM ≥ [2.5]

It is necessary to verify this requirement only for the DC-HSUPA configurations specified in clause C.2.8.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2A.

5.2BB.3 Test purpose

To verify that the error of the UE maximum output power with DC-HSUPA does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BB.6.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2BB.4 Method of test

5.2BB.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and parameters are specified in clauses C.2.6, C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.2BB.5. E-DPDCH settings according to configuration 4 in Table C.2.8.1.
4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BB.3: Void

Table 5.2BB.4: Void

Table 5.2BB.5: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2BB.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2BB.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.
2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.
3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within ± 1.7 dB and the total output power of the UE to be at least 7.5dB lower than the maximum output power. Wait 150ms.
4) Set and send continuously Up power control commands to both carriers to the UE and wait 150ms.
5) Measure the mean power of each carrier of the UE. The mean power shall be averaged over at least one timeslot. The maximum output power is the sum of the broadband transmit power of each carrier in the UE..
6) The SS shall verify that UE is still in a DC-HSUPA call by verifying that UE transmits signal on each carrier. If UE is not transmitting signal on each carrier the SS shall fail the UE in this test.
7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.11A.1.2.

5.2BB.5 Test requirements

The maximum output power with DC-HSUPA, derived in step 6), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BB.6 or 5.2BB.7 depending on tested band.

The UL reference measurement channel for TX test will be set as defined in C.2.6 and C.2.7 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11A.1.2.

Table 5.2BB.6: Maximum Output Power for DC-HSUPA test

Sub-test in table C.11A.1.1	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+22.5	+3.2/-3.7	+19.5	+4.2/-2.7

Table 5.2BB.7: Maximum Output Power for DC-HSUPA test in bands XXV and XXVI

Sub-test in table C.11A.1.1	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+22.5	+3.2/-4.7	+19.5	+4.2/-3.7
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2BC Maximum Output Power with HS-DPCCH and E-DCH for OLTD

FFS

5.2BD Maximum Output Power with HS-DPCCH and E-DCH for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.

- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2BD.1 Definition and applicability

The maximum output power for UL CLTD with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2BD.2 Minimum Requirements

The Maximum Power Reduction (MPR) for the nominal maximum output power is specified in table 5.2BD.1 for the values of β_{c}, β_{d}, β_{hs}, β_{ec}, β_{ed} and β_{sc} defined in [8] fully or partially transmitted during a DPCCH timeslot.

Table 5.2BD.1: Maximum Output Power with HS-DPCCH and E-DCH for UL CLTD

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH, E-DPCCH and S-DPCCH	$0 \leq CM \leq 4$	MAX (CM-1, 0)

T Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by

$$CM = CEIL \{ [20 * \log10 ((v\_norm^{3})_{rms}) - 20 * \log10 ((v\_norm\_ref^{3})_{rms})] / k, 0.5 \}$$

Where:

- CEIL { x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM = [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]
- k is 1.85 for signals where all channelisations codes meet the following criteria $C_{SF, N}$ where N< SF/2
- k is 1.56 for signals were any channelisations codes meet the following criteria $C_{SF, N}$ where $N \geq SF/2$
- v_norm is the normalized voltage waveform of the input signal
- v_norm_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and
- $20 * \log10 ((v\_norm\_ref^{3})_{rms}) = 1.52$ dB

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the allowed Maximum Power Reduction (MPR) for the nominal maximum output power of each antenna is specified in Table 5.2BA.1 The amount of applied power reduction on each antenna shall be the same.

NOTE: CM is measured at each transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2C.

5.2BD.3 Test purpose

To verify that the error of the UE maximum output power for UL CLTD activation state 1 with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BD.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2BD.4 Method of test

5.2BD.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex FFS.
3) An E-DCH call is set up according to TS 34.108 [3] FFS with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2BD.4A.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
5) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BD.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels	
- 2bit CTFC	3
- Power offset Information	
- CHOICE Gain Factors	Signalled Gain Factors
- CHOICE mode	FDD
- Gain factor ßc	Value used in test: see Table C.11.1.3
- Gain factor ßd	Value used in test: see Table C.11.1.3
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm2
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message.	

Table 5.2BD.2: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.2BD.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

Table 5.2BD.3A: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- E-DCH minimum set of E-TFCI	67
- Reference E-TFCIs	1 E-TFCI
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Maximum channelisation codes	Sf4

Table 5.2BD.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	For sub-test 1 to 4: Algorithm2 For sub-test 5: Algorithm 1
- Δ_{ACK}	Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.2BDs.4A: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2BD.4.2 Procedure

5.2BD.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.

4) Send power control bits to give one TPC_cmd = +1 command to the UE.

5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).

6) Send power control bits to give one TPC_cmd = -1 command to the UE and wait 150ms.

7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC_cmd = -1 command to the UE and wait 150ms.

8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector.

10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1.3.

5.2BD.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BD.5 or 5.2BD.6 depending on tested band. Note:

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1.3.

Table 5.2BD.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+/-TT	+21	+/-TT
2	+22	+/-TT	+19	+/-TT
3	+23	+/-TT	+20	+/-TT
4	+22	+/-TT	+19	+/-TT

Table 5.2BD.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+/-TT	+21	+/-TT
2	+22	+/-TT	+19	+/-TT
3	+23	+/-TT	+20	+/-TT
4	+22	+/-TT	+19	+/-TT
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2BD.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2BD.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

5.2BE Maximum Output Power with HS-DPCCH and E-DCH for UL CLTD activation state 2 and 3.

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2BE.1 Definition and applicability

The maximum output power for UL CLTD with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2BE.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2BE.1 for when the values of of $\beta_{c,}$ $\beta_{d,}$ $\beta_{hs,}$ β_{ec} and β_{ed} is fully or partially transmitted during a DPCCH timeslot.

Table 5.2BE.1: Maximum Output Power with HS-DPCCH and E-DCH

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	MAX (CM-1, 0)
NOTE 1: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by:

$$CM = CEIL \{ [20 * \log10 ((v\_norm^3)_{rms}) - 20 * \log10 ((v\_norm\_ref^3)_{rms})] / k, 0.5 \}$$

Where:

- CEIL{ x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM $\in$ [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]
- k is 1.85 for signals where all channelisations codes meet the following criteria $C_{SF, N}$ where N< SF/2
- k is 1.56 for signals were any channelisations codes meet the following criteria $C_{SF, N}$ where $N \geq SF/2$
- v_norm is the normalized voltage waveform of the input signal

- v_norm_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and 20 * log10 ((v_norm_ref^3)$_{rms}$) = 1.52 dB

For UE configured in UL CLTD activation state 2 or activation state 3, the allowed Maximum Power Reduction (MPR) for the nominal maximum output power applies at the active transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2C.

5.2BE.3 Test purpose

To verify that the error of the UE maximum output power for UL CLTD activation state 2 and 3 with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BD.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2BE.4 Method of test

5.2BE.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex FFS.
3) An E-DCH call is set up according to TS 34.108 [3] FFS with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2BE.4A.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 2.
5) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BE.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels	
- 2bit CTFC	3
- Power offset Information	
- CHOICE Gain Factors	Signalled Gain Factors
- CHOICE mode	FDD
- Gain factor ßc	Value used in test: see Table C.11.1.3
- Gain factor ßd	Value used in test: see Table C.11.1.3
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm2
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message.	

Table 5.2BE.2: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.2BE.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

Table 5.2BE.3A: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- E-DCH minimum set of E-TFCI	67
- Reference E-TFCIs	1 E-TFCI
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Maximum channelisation codes	Sf4

Table 5.2BE.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info For sub-test 1 to 4: Algorithm2 For sub-test 5: Algorithm 1 Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.2BE.4A: Settings for the serving cell during the measurement of Maximum Output Power with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2BE.4.2 Procedure

5.2BE.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1.3.
2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.
3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.
4) Send power control bits to give one TPC_cmd = +1 command to the UE.
5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).
6) Send power control bits to give one TPC_cmd = -1 command to the UE and wait 150ms.
7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC_cmd = -1 command to the UE and wait 150ms.
8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.
9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot and is measured at the active transmit antenna connector.
10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1.3.
11) SS sends a HS-SCCH order activating UL_CLTD activation state 3.
12) Repeat step 1 to 10 for activation state 3.

5.2BE.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9) for activation 2 and 3, shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BE.5 or 5.2BE.6 depending on tested band. Note:

For UE configured in UL CLTD activation state 2 or activation state 3, the nominal maximum output power applies at the active transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1.3.

Table 5.2BE.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+/-TT	+21	+/-TT
2	+22	+/-TT	+19	+/-TT
3	+23	+/-TT	+20	+/-TT
4	+22	+/-TT	+19	+/-TT

Table 5.2BE.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+/-TT	+21	+/-TT
2	+22	+/-TT	+19	+/-TT
3	+23	+/-TT	+20	+/-TT
4	+22	+/-TT	+19	+/-TT
NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz.				

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2BE.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2BE.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

5.2C UE relative code domain power accuracy

5.2C.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA but not E-DCH.

5.2C.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2C.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2C.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3.

5.2C.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2C.4.

5.2C.4 Method of test

5.2C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2C.2.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2C.2: Settings for the serving cell during the measurement of HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.2C.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

4) Start transmitting HSDPA Data.

5) Figure 5.2C.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2C.1. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2C.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2C.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

Information Element	Value/remark
- Ack-Nack repetition factor - CQI repetition factor	1 1

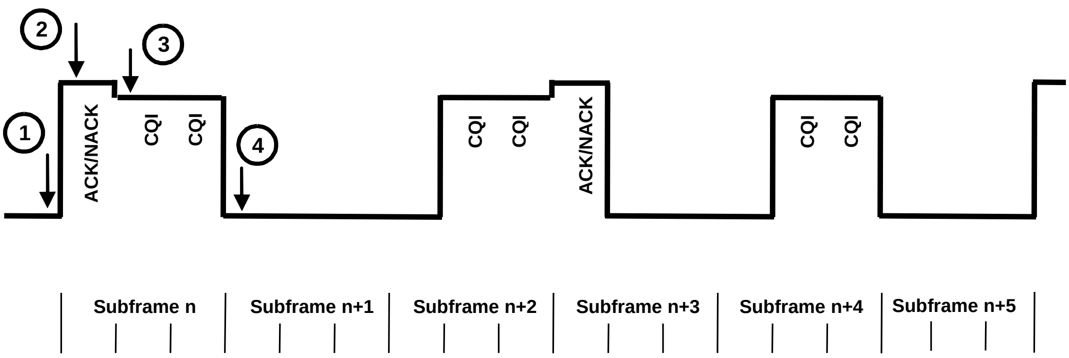


Figure 5.2C.1: Transmit power profile showing measurement points

5.2C.5 Test requirements

For the expected relative code domain power ratios given in table 5.2C.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2C.4.

Table 5.2C.3: UE relative code domain power nominal ratios

Sub-test in table C.10.1.4	Measurement point	Expected relative code domain power in dB		
		DPCCH	DPDCH	HS-DPCCH
1	1	-17.6	-0.08	OFF
	2	-17.9	-0.4	-11.8
	3	-17.8	-0.3	-13.7
	4	-17.6	-0.08	OFF
2	1	-4.1	-2.1	OFF
	2	-8.2	-6.2	-2.1
	3	-7.1	-5.2	-3
	4	-4.1	-2.1	OFF
3	1	-1.1	-6.5	OFF
	2	-7.2	-12.7	-1.2
	3	-5.8	-11.3	-1.8
	4	-1.1	-6.5	OFF
4	1	-0.3	-11.8	OFF
	2	-7.1	-18.5	-1
	3	-5.6	-17.1	-1.5
	4	-0.3	-11.8	OFF

Table 5.2C.4: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.7
-10 dB to ≥ -15 dB	±2.3
-15 dB to ≥ -20 dB	±2.9

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2CA UE relative code domain power accuracy for OLTD

FFS

5.2CB UE relative code domain power accuracy for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2CB.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2+ A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2CB.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2CB.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2CB.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

5.2CB.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 1 meets the requirements given in table 5.2CB.4.

5.2CB.4 Method of test

5.2CB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex FFS.
3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6.RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2CB.2.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2CB.2: Settings for the serving cell during the measurement of HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.2CB.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

4) Start transmitting HSDPA Data.

5) Figure 5.2CB.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2CB.1 at each transmit antenna connector. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2CB.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2CB.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

Information Element	Value/remark
- Ack-Nack repetition factor	1
- CQI repetition factor	1

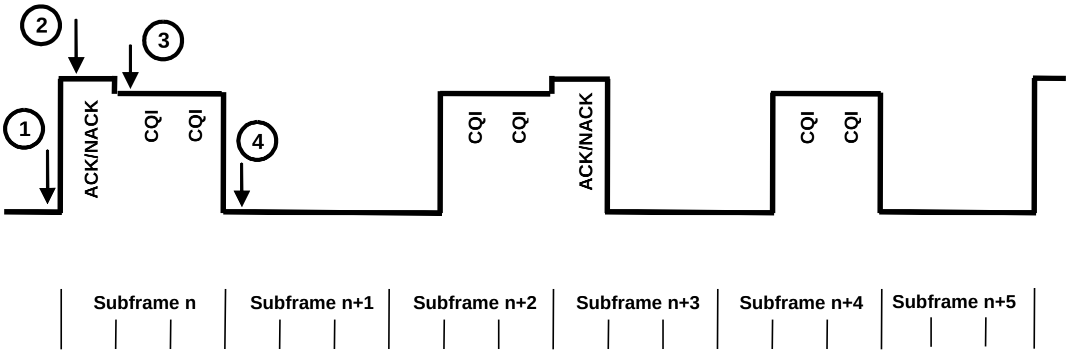


Figure 5.2CB.1: Transmit power profile showing measurement points

5.2CB.5 Test requirements

For the expected relative code domain power ratios given in table 5.2CB.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2CB.4.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2CB.3: UE relative code domain power nominal ratios

Sub-test in table C.10.1.4	Measurement point	Expected relative code domain power in dB		
		DPCCH	DPDCH	HS-DPCCH
1	1	-17.6	-0.08	OFF
	2	-17.9	-0.4	-11.8
	3	-17.8	-0.3	-13.7
	4	-17.6	-0.08	OFF
2	1	-4.1	-2.1	OFF
	2	-8.2	-6.2	-2.1
	3	-7.1	-5.2	-3
	4	-4.1	-2.1	OFF
3	1	-1.1	-6.5	OFF
	2	-7.2	-12.7	-1.2
	3	-5.8	-11.3	-1.8
	4	-1.1	-6.5	OFF
4	1	-0.3	-11.8	OFF
	2	-7.1	-18.5	-1
	3	-5.6	-17.1	-1.5
	4	-0.3	-11.8	OFF

Table 5.2CB.4: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5 ± TT
-10 dB to ≥ -15 dB	±2.0 ± TT
-15 dB to ≥ -20 dB	±2.5 ± TT

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.2CC UE relative code domain power accuracy for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2CC.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2CC.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2CC.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy specified in table 5.2CC.1 applies at the active transmit antenna connector.

Table 5.2CC.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

5.2CC.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 2 and 3 meets the requirements given in table 5.2CC.4.

5.2CC.4 Method of test

5.2CC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex FFS.
3) An HSDPA call is set up according to TS 34.108 [3] clause FFS. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2CC.2.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 2.
5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2CC.2: Settings for the serving cell during the measurement of HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.2CC.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.
3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.
4) Start transmitting HSDPA Data.
5) Figure 5.2CC.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2CC.1 at the active transmit antenna connector. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2CC.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2CC.4.
6) S sends a HS-SCCH order activating UL_CLTD activation state 3.
7) Repeat step 1 to 5 for activation state 3.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

Information Element	Value/remark
- Ack-Nack repetition factor - CQI repetition factor	1 1

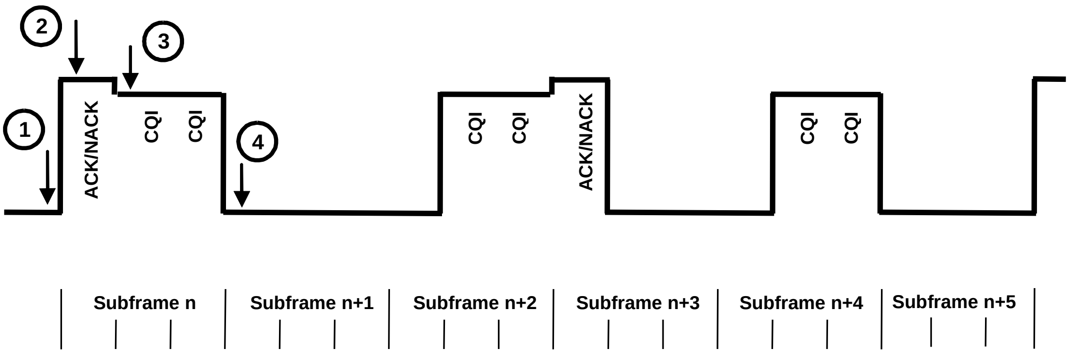


Figure 5.2CC.1: Transmit power profile showing measurement points

5.2CC.5 Test requirements

For the expected relative code domain power ratios given in table 5.2CC.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2CC.4.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy applies at the active transmit antenna connector.

Table 5.2CC.3: UE relative code domain power nominal ratios

Sub-test in table C.10.1.4	Measurement point	Expected relative code domain power in dB		
		DPCCH	DPDCH	HS-DPCCH
1	1	-17.6	-0.08	OFF
	2	-17.9	-0.4	-11.8
	3	-17.8	-0.3	-13.7
	4	-17.6	-0.08	OFF
2	1	-4.1	-2.1	OFF
	2	-8.2	-6.2	-2.1
	3	-7.1	-5.2	-3
	4	-4.1	-2.1	OFF
3	1	-1.1	-6.5	OFF
	2	-7.2	-12.7	-1.2
	3	-5.8	-11.3	-1.8
	4	-1.1	-6.5	OFF
4	1	-0.3	-11.8	OFF
	2	-7.1	-18.5	-1
	3	-5.6	-17.1	-1.5
	4	-0.3	-11.8	OFF

Table 5.2CC.4: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5 ± TT
-10 dB to ≥ -15 dB	±2.0 ± TT
-15 dB to ≥ -20 dB	±2.5 ± TT

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.2D UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH

5.2D.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

5.2D.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2D.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2D.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3.

5.2D.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2D.8.

5.2D.4 Method of test

5.2D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.11.1 and C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2D.6.
4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2D.2 Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels	
- 2bit CTFC	3
- Power offset Information	
- CHOICE Gain Factors	Signalled Gain Factors
- CHOICE mode	FDD
- Gain factor ßc	Value used in test: see Table C.11.1.3
- Gain factor ßd	Value used in test: see Table C.11.1.3
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message	

Table 5.2D.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.2D.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info - E-DPDCH info - Reference E-TFCIs - Reference E-TFCI - Reference E-TFCI PO - Reference E-TFCI - Reference E-TFCI PO	Uplink DPCH info 2 E-TFCIs 11 4 92 18

Table 5.2D.5 Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.2D.6: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2D.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.3 and alternating between this value and an Absolute Grant Index of Zero_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2D.1.

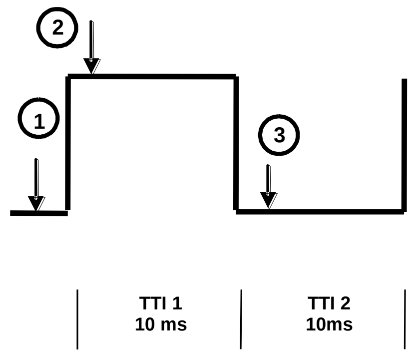


Figure 5.2D.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2D.1. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2D.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2D.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1.3.

5.2D.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2D.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2D.8.

Table 5.2D.7: UE relative code domain power nominal ratios

Sub-Test in Table C.11.1.3	Measure-ment Point	Expected Relative Code Domain Power in dB					
		DPCCH	DPDCH	HS-DPCCH	E-DPCCH	E-DPDCH1	E-DPDCH2
1	1	-9.3	-6.6	-3.3	-7.3	-18.9	OFF
	2	-18.5	-15.8	-12.5	-16.5	-0.5	OFF
	3	-9.3	-6.6	-3.3	-7.3	-18.9	OFF
2	1	-11.9	-3.9	-5.8	-5.8	-21.4	OFF
	2	-14.0	-6.0	-8.0	-8.0	-4.1	OFF
	3	-11.9	-3.9	-5.8	-5.8	-21.4	OFF
3	1	-9.8	-14.2	-3.7	-3.7	-19.3	OFF
	2	-14.6	-19.1	-8.6	-8.6	-4.7	-4.7
	3	-9.8	-14.2	-3.7	-3.7	-19.3	OFF
4	1	-17.9	-0.4	-11.9	-17.9	-27.5	OFF
	2	-19.7	-2.2	-13.7	-19.7	-4.7	OFF
	3	-17.9	-0.4	-11.9	-17.9	-27.5	OFF

Table 5.2D.8: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.7
-10 dB to ≥ -15 dB	±2.3
-15 dB to ≥ -20 dB	±2.9

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2DA UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK

5.2DA.1 Definition and applicability

The requirement and corresponding measurements apply to each individual carrier when the total power in each of the assigned carriers is equal to each other. Furthermore, it is necessary to verify this requirement only for β values as specified in Table C.11A.1.1.

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers in a carrier relative to the total power of all active codes in that carrier. The measure of accuracy is the difference between two dB ratios measured per carrier configured on the uplink:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes in each carrier and is derived from beta factors. The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal in each carrier and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.2DA.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DA.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2DA.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5
-20 dB to ≥ -30 dB	±3.0

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3A.

5.2DA.3 Test purpose

To verify that the UE relative code domain power accuracy for DC-HSUPA meets the requirements given in table 5.2DA.7.

5.2DA.4 Method of test

5.2DA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14. RF parameters are set up according to table E. 5A.1A. Settings for the serving cell are defined in table 5.2DA.5.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DA.2: Void

Table 5.2DA.3: Void

Table 5.2DA.4: Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

Table 5.2DA.5: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2BA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.2DA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within ± 1.7 dB and the total output power of the UE to be in the range 15dBm ± 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.1. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0. This test step is expected to keep the total power in each of the assigned carriers to be equal to

each other within ± 1.7 dB and the total output power of the UE to be in the range 15dBm ± 2dB during the relative code domain power measurements performed at next step.

6) Measure the relative code domain power of each active code on each uplink frequency. Each measurement is made over one timeslot. The nominal UE relative code domain power for each active code is defined in table 5.2DA.6. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DA.7.

5.2DA.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DA.6 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DA.7.

Table 5.2DA.6: UE relative code domain power nominal ratios

Sub-Test in Table C.11A.1.3	Expected Relative Code Domain Power in dB						
	Primary Uplink Frequency				Secondary Uplink Frequency		
	DPCCH	HS-DPCCH	E-DPCCH	E-DPDCH	DPCCH	E-DPCCH	E-DPDCH
1	-5.8	-15.3	-15.3	-1.7	-5.6	-15.2	-1.6

Table 5.2DA.7: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.7
-10 dB to ≥ -15 dB	±2.3
-15 dB to ≥ -20 dB	±2.9

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.2DB UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH for OLTD

FFS

5.2DC UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2DC.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2+ A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2DC.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DC.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2DC.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

5.2DC.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 1 meets the requirements given in table 5.2DC.8.

5.2DC.4 Method of test

5.2DC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex FFS.
3) An E-DCH call is set up according to TS 34.108 [3] FFS with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2DC.6.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
5) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DC.2 Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels	
- 2bit CTFC	3
- Power offset Information	
- CHOICE Gain Factors	Signalled Gain Factors
- CHOICE mode	FDD
- Gain factor ßc	Value used in test: see Table C.11.1.3
- Gain factor ßd	Value used in test: see Table C.11.1.3
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message	

Table 5.2DC.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.2DC.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

Table 5.2DC.5 Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.2DC.6: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2DC.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.3 and alternating between this value and an Absolute Grant Index of Zero_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2DC.1.

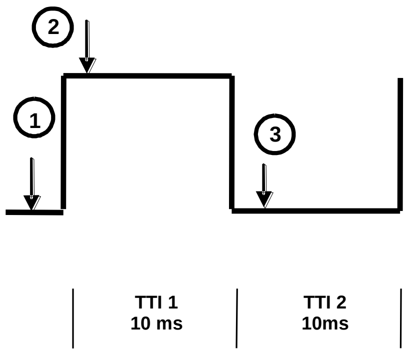


Figure 5.2DC.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2DC.1 at each transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2DC.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DC.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1.3.

5.2DC.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DC.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DC.8.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2DC.7: UE relative code domain power nominal ratios

Sub-Test in Table C.11.1.3	Measure-ment Point	Expected Relative Code Domain Power in dB					
		DPCCH	DPDCH	HS-DPCCH	E-DPCCH	E-DPDCH1	E-DPDCH2
1	1	-9.3	-6.6	-3.3	-7.3	-18.9	OFF
	2	-18.5	-15.8	-12.5	-16.5	-0.5	OFF
	3	-9.3	-6.6	-3.3	-7.3	-18.9	OFF
2	1	-11.9	-3.9	-5.8	-5.8	-21.4	OFF
	2	-14.0	-6.0	-8.0	-8.0	-4.1	OFF
	3	-11.9	-3.9	-5.8	-5.8	-21.4	OFF
3	1	-9.8	-14.2	-3.7	-3.7	-19.3	OFF
	2	-14.6	-19.1	-8.6	-8.6	-4.7	-4.7
	3	-9.8	-14.2	-3.7	-3.7	-19.3	OFF
4	1	-17.9	-0.4	-11.9	-17.9	-27.5	OFF
	2	-19.7	-2.2	-13.7	-19.7	-4.7	OFF
	3	-17.9	-0.4	-11.9	-17.9	-27.5	OFF

Table 5.2DC.8: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5 ± TT
-10 dB to ≥ -15 dB	±2.0 ± TT
-15 dB to ≥ -20 dB	±2.5 ± TT

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.2DD UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Update to 34.121-2 is FFS

5.2DD.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.2DD.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DD.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy specified in table 5.2CC.1 applies at the active transmit antenna connector.

Table 5.2D.1: UE Relative CDP accuracy

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

5.2DD.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 2 and 3 meets the requirements given in table 5.2DD.8.

5.2DD.4 Method of test

5.2DD.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex FFS.

3) An E-DCH call is set up according to TS 34.108 [3] FFS with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2DD.6.

4) SS sends a HS-SCCH order activating UL_CLTD activation state 2

5) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DD.2 Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels	
- 2bit CTFC	3
- Power offset Information	
- CHOICE Gain Factors	Signalled Gain Factors
- CHOICE mode	FDD
- Gain factor ßc	Value used in test: see Table C.11.1.3
- Gain factor ßd	Value used in test: see Table C.11.1.3
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message	

Table 5.2DD.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.2DD.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

Table 5.2DD.5 Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.2DD.6: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2DD.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.3 and alternating between this value and an Absolute Grant Index of Zero_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2DD.1.

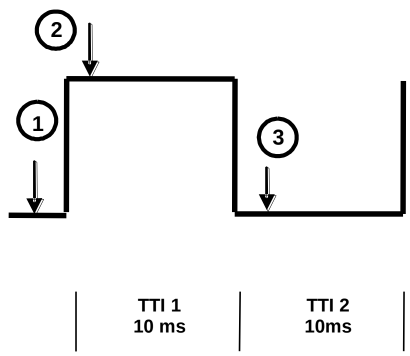


Figure 5.2DD.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2DD.1 at the active transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2DD.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DD.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1.3.

9) SS sends a HS-SCCH order activating UL_CLTD activation state 3

10) Repeat step 1 to 8 for activation state 3.

5.2DD.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DD.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DD.8.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy applies at the active transmit antenna connector.

Table 5.2DD.7: UE relative code domain power nominal ratios

Sub-Test in Table C.11.1.3	Measure-ment Point	Expected Relative Code Domain Power in dB					
		DPCCH	DPDCH	HS-DPCCH	E-DPCCH	E-DPDCH1	E-DPDCH2
1	1	-9.3	-6.6	-3.3	-7.3	-18.9	OFF
	2	-18.5	-15.8	-12.5	-16.5	-0.5	OFF
	3	-9.3	-6.6	-3.3	-7.3	-18.9	OFF
2	1	-11.9	-3.9	-5.8	-5.8	-21.4	OFF
	2	-14.0	-6.0	-8.0	-8.0	-4.1	OFF
	3	-11.9	-3.9	-5.8	-5.8	-21.4	OFF
3	1	-9.8	-14.2	-3.7	-3.7	-19.3	OFF
	2	-14.6	-19.1	-8.6	-8.6	-4.7	-4.7
	3	-9.8	-14.2	-3.7	-3.7	-19.3	OFF
4	1	-17.9	-0.4	-11.9	-17.9	-27.5	OFF
	2	-19.7	-2.2	-13.7	-19.7	-4.7	OFF
	3	-17.9	-0.4	-11.9	-17.9	-27.5	OFF

Table 5.2DD.8: UE relative code domain power accuracy test requirements

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5 ± TT
-10 dB to ≥ -15 dB	±2.0 ± TT
-15 dB to ≥ -20 dB	±2.5 ± TT

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.2E UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM

5.2E.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2+ A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 7 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7. This test applies only to UE that support HSDPA and E-DCH.

5.2E.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2E.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2E.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5
-20 dB to ≥ -30 dB	±3.0

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3.

5.2E.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2E.6.

5.2E.4 Method of test

5.2E.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C.11.1 and C.8.1.1. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2E.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2E.2: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 1

Information Element	Value/Remark
E-DCH info - E-DPCCH info - E-DPDCH power interpolation - E-DPDCH info - E-TFCI Table Index - Reference E-TFCIs - Reference E-TFCI - Reference E-TFCI PO - Reference E-TFCI - Reference E-TFCI PO - Reference E-TFCI - Reference E-TFCI PO - Max Channelisation Codes	Uplink DPCH info FALSE 2 3 E-TFCIs 105 12 116 14 127 16 SF4x2 and SF2x2

Table 5.2E.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.4
- Δ_{NACK}	Value used in test: see Table C.11.1.4
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.4
- E-TFC Boost Info	
- E-TFCI boost	Value used in test: see Table C.11.1.4
- Delta T2TP	12 dB
- UL 16QAM settings	
- BetaEd gain E-AGCH table selection	0
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.4

Table 5.2E.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2E.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2E.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.4 and alternating between this value and an Absolute Grant Index of Zero_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2E.1.

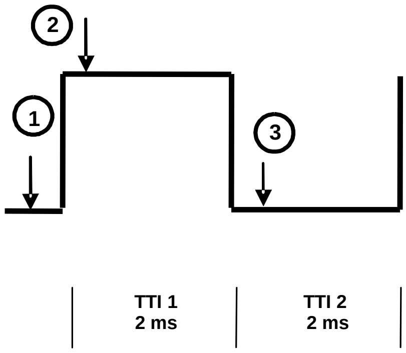


Figure 5.2E.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2E.1. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2E.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2E.6.

5.2E.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2E.5 ≥ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2E.6.

Table 5.2E.5: UE relative code domain power nominal ratios

Sub-Test in Table C.11.1.4	Meas Point	Expected Relative Code Domain Power in dB					
		DPCCH	HS-DPCCH	E-DPCCH	E-DPDCH 1	E-DPDCH 2	E-DPDCH 3,4
1	1	-9.6	-3.6	-3.6	-19.1	OFF	OFF
	2	-13.4	-7.4	-7.4	-7.4	-7.4	-9.4
	3	-9.6	-3.6	-3.6	-19.1	OFF	OFF

Table 5.2E.6: UE relative code domain power accuracy test requirements, HSDPA and E-DCH with 16QAM

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.7
-10 dB to ≥ -15 dB	±2.3
-15 dB to ≥ -20 dB	±2.9
-20 dB to ≥ -30 dB	[±3.5]

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^\wedge 2 + A_2*(1.3416)^\wedge 2+ A_3*(-0.4472)^\wedge 2 + A_4*(-1.3416)^\wedge 2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

5.2EA UE Relative Code Domain Power Accuracy for DC-HSUPA with 16QAM

5.2EA.1 Definition and applicability

The requirement and corresponding measurements apply to each individual carrier when the total power in each of the assigned carriers is equal to each other.

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers in a carrier relative to the total power of all active codes in that carrier. When the UE uses 16QAM modulation on any of the uplink code channels in a carrier the IQ origin offset power measured in that carrier shall be removed from the Measured CDP ratio in that carrier; however, the removed relative IQ origin offset power (relative carrier leakage power) measured in that carrier also has to satisfy the applicable requirement in that carrier. The measure of accuracy is the difference between two dB ratios measured per carrier configured on the uplink:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes in each carrier and is derived from beta factors. The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal in each carrier and of noise in the signal that falls on inactive codes.

The reference measurement channels for the requirements in this subclause are provided in subclause C.2.7 with additional parameters as specified in Table C.11A.1.2.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support Dual Cell E-DCH 16QAM UE capability category 9.

5.2EA.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2EA.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2EA.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5
-20 dB to ≥ -30 dB	±3.0

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3A.

5.2EA.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2EA.4.

5.2EA.4 Method of test

5.2EA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.7 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14 with the exceptions in the RADIO BEARER SETUP message as specified in Table 5.2EA.2. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.2EA.3.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2EA.2: Contents of RADIO BEARER SETUP message: AM or UM (DC-HSUPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

Table 5.2EA.3: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy for DC-HSUPA with 16QAM

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2BA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.2EA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.2.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within ± 1.7 dB and the total output power of the UE to be in the range 15dBm ± 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.2. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0. This test step is expected to keep the total power in each of the assigned carriers to be equal to each other within ± 1.7 dB and the total output power of the UE to be in the range 15dBm ± 2dB during the relative code domain power measurements performed at next step.

6) Measure the relative code domain power of each active code on each uplink frequency. Each measurement is made over one timeslot.

5.2EA.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2EA.4 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2EA.5.

Table 5.2EA.4: UE relative code domain power nominal ratios

Expected Relative Code Domain Power in dB								
Primary Uplink Frequency					Secondary Uplink Frequency			
DPCCH	HS-DPCCH	E-DPCCH	E-DPDCH codes 1 and 2 (2xSF2)	E-DPDCH codes 3 and 4 (2xSF4)	DPCCH	E-DPCCH	E-DPDCH codes 1 and 2 (2xSF2)	E-DPDCH codes 3 and 4 (2xSF4)
-24.0	-21.9	-15.9	-4.9	-7.9	-23.9	-15.9	-4.9	-7.9

Table 5.2EA.5: UE relative code domain power accuracy test requirements, HSDPA and E-DCH with 16QAM

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.7
-10 dB to ≥ -15 dB	±2.3
-15 dB to ≥ -20 dB	±2.9
-20 dB to ≥ -30 dB	±3.5

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

5.2EB FFS

5.2EC UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message contents are FFS
- Test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Code domain power calculation is FFS.

5.2EC.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2+ A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 11 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7 and UL CLTD.

5.2EC.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2EC.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2EC.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5
-20 dB to ≥ -30 dB	±3.0

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

5.2EC.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 1 meets the requirements given in table 5.2EC.6.

5.2EC.4 Method of test

5.2EC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex FFS. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.17 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table FFS and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to FFS. Settings for the serving cell are defined in table 5.2E.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.

5) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2EC.2: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 1

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPCCH info	
- E-DPDCH power interpolation	FALSE
- E-DPDCH info	
- E-TFCI Table Index	2
- Reference E-TFCIs	3 E-TFCIs
- Reference E-TFCI	105
- Reference E-TFCI PO	12
- Reference E-TFCI	116
- Reference E-TFCI PO	14
- Reference E-TFCI	127
- Reference E-TFCI PO	16
- Max Channelisation Codes	SF4x2 and SF2x2

Table 5.2EC.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.4
- Δ_{NACK}	Value used in test: see Table C.11.1.4
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.4
- E-TFC Boost Info	
- E-TFCI boost	Value used in test: see Table C.11.1.4
- Delta T2TP	12 dB
- UL 16QAM settings	
- BetaEd gain E-AGCH table selection	0
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.4

Table 5.2EC.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2E.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2EC.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.4 and alternating between this value and an Absolute Grant Index of Zero_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2EC.1.

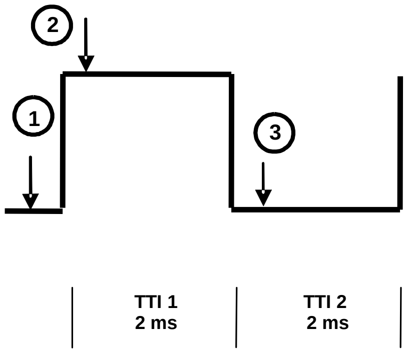


Figure 5.2EC.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2EC.1 at each transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2EC.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2EC.6.

5.2EC.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2EC.5 ≥ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2EC.6.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2EC.5: UE relative code domain power nominal ratios

FFS

Table 5.2EC.6: UE relative code domain power accuracy test requirements, HSDPA and E-DCH with 16QAM

FFS

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2+ A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

5.2ED UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message contents are FFS
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Code domain power calculation is FFS.

5.2ED.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2+ A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 11 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7 and UL CLTD.

5.2ED.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2ED.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy specified in table 5.2ED.1 applies at the active transmit antenna connector.

Table 5.2ED.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

Nominal CDP ratio	Accuracy (dB)
≥ -10 dB	±1.5
-10 dB to ≥ -15 dB	±2.0
-15 dB to ≥ -20 dB	±2.5
-20 dB to ≥ -30 dB	±3.0

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

5.2ED.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 2 and 3 meets the requirements given in table 5.2ED.6.

5.2ED.4 Method of test

5.2ED.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex FFS. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.17 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table FFS and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table FFS. Settings for the serving cell are defined in table 5.2ED.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 2.
5) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2ED.2: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 1

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPCCH info	
- E-DPDCH power interpolation	FALSE
- E-DPDCH info	
- E-TFCI Table Index	2
- Reference E-TFCIs	3 E-TFCIs
- Reference E-TFCI	105
- Reference E-TFCI PO	12
- Reference E-TFCI	116
- Reference E-TFCI PO	14
- Reference E-TFCI	127
- Reference E-TFCI PO	16
- Max Channelisation Codes	SF4x2 and SF2x2

Table 5.2ED.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.4
- Δ_{NACK}	Value used in test: see Table C.11.1.4
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.4
- E-TFC Boost Info	
- E-TFCI boost	Value used in test: see Table C.11.1.4
- Delta T2TP	12 dB
- UL 16QAM settings	
- BetaEd gain E-AGCH table selection	0
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.4

Table 5.2ED.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2E.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.2ED.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.4 and alternating between this value and an Absolute Grant Index of Zero_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2ED.1.

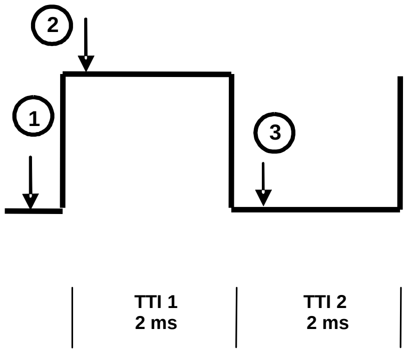


Figure 5.2ED.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2ED.1 at the active transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2ED.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2ED.6.

8) SS sends a HS-SCCH order activating UL_CLTD activation state 3

9) Repeat step 1 to 7 for activation state 3.

5.2ED.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2ED.5 $\geq$ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2ED.6.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy applies at the active transmit antenna connector.

Table 5.2ED.5: UE relative code domain power nominal ratios

FFS

Table 5.2ED.6: UE relative code domain power accuracy test requirements, HSDPA and E-DCH with 16QAM

FFS

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

5.3 Frequency Error

5.3.1 Definition and applicability

The frequency error is the difference between the RF modulated carrier frequency transmitted from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.3.2 Minimum Requirements

The UE modulated carrier frequency shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3.

5.3.3 Test purpose

To verify that the UE carrier frequency error does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

5.3.4 Method of test

5.3.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2, and RF parameters (DPCH_Ec and Îor) are set up according to table 6.2.2. The relative power level of other downlink physical channels to the DPCH_Ec are set up according to clause E.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.3.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.

2) Measure the frequency error delta f, using the Global In-Channel-Tx-test (annex B).

5.3.5 Test Requirements

For all measurements, the frequency error, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.3A Frequency Error for DC-HSUPA

5.3A.1 Definition and applicability

The frequency error for DC-HSUPA is the difference, for each carrier, between the RF modulated carrier frequency transmitted from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequencies received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in clause 5.3A.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.3A.2 Minimum Requirements

The UE modulated carrier frequency per carrier shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequencies received from the Node B. If the signal from one Node B cell is out-of-sync, the UE modulated carrier frequency shall be compared to the remaining carrier frequency received from the other Node B cell.

The normative reference for this requirement is TS 25.101 [1] clause 6.3A.

5.3A.3 Test purpose

To verify that the UE carrier frequency error, on each carrier, does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequencies.

5.3A.4 Method of test

5.3A.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.
3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, and RF parameters (HS-PDSCH_Ec and Îor) are set up according to table 6.2A.1. The other RF parameters are set up according to table E.5A.1A.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.3A.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4.
2) Measure the frequency error delta f on each of the two assigned channel frequencies, using the Global In-Channel-Tx-test (annex B).

5.3A.5 Test Requirements

For all measurements, the frequency error, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.3C Frequency Error for UL CLTD Activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure and test procedure may need an update.
- Update to 34.121-2 is FFS

5.3C.1 Definition and applicability

The frequency error for UL CLTD is the difference, between the RF modulated carrier frequency transmitted at each antenna connector from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3C.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support UL CLTD.

5.3C.2 Minimum Requirements

The UE modulated carrier frequency at each antenna connector shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3C.

5.3C.3 Test purpose

To verify that the UE carrier frequency error at each antenna connector does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

5.3C.4 Method of test

5.3C.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) The UL Reference Measurement Channel and parameters are specified in Annex TBD. The DL Fixed Reference Channels (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.
3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17. RF parameters are set up according to table TBD and table TBD.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.3C.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.
2) Measure the frequency error delta f at each antenna connector, using the Global In-Channel-Tx-test (annex B).

5.3C.5 Test Requirements

For all measurements, the frequency error at each antenna connector, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.3D Frequency Error for UL CLTD Activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure and test procedure may need an update.
- Update to 34.121-2 is FFS

5.3D.1 Definition and applicability

The frequency error for UL CLTD is the difference, between the RF modulated carrier frequency transmitted at each antenna connector from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3D.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support UL CLTD.

5.3D.2 Minimum Requirements

The UE modulated carrier frequency at each antenna connector shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3C.

5.3D.3 Test purpose

To verify that the UE carrier frequency error at each antenna connector does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

5.3D.4 Method of test

5.3D.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.

2) The UL Reference Measurement Channel and parameters are specified in Annex TBD. The DL Fixed Reference Channels (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.

3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17. RF parameters are set up according to table TBD and table TBD.

4) SS sends a HS-SCCH order activating UL_CLTD activation state 2.

5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test for state 2.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.3D.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.

2) Measure the frequency error delta f at each antenna connector, using the Global In-Channel-Tx-test (annex B).

3) SS sends a HS-SCCH order activating UL_CLTD activation state 3.

4) Repeat step 1 to 2 for activation state 3.

5.3D.5 Test Requirements

For all measurements, the frequency error at each antenna connector, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4 Output Power Dynamics in the Uplink

Power control is used to limit the interference level.

5.4.1 Open Loop Power Control in the Uplink

5.4.1.1 Definition and applicability

Open loop power control in the uplink is the ability of the UE transmitter to set its output power to a specific value. This function is used for PRACH transmission and based on the information from Node B using BCCH and the downlink received signal power level of the CPICH. The information from Node B includes transmission power of CPICH and uplink interference power level.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.1.2 Minimum requirements

The UE open loop power is defined as the mean power in a timeslot or ON power duration, whichever is available.

The UE open loop power control tolerance is given in table 5.4.1.1.

Table 5.4.1.1: Open loop power control tolerance

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.101 [1] clause 6.4.1.

5.4.1.3 Test purpose

The power measured by the UE of the received signal and the signalled BCCH information are used by the UE to control the power of the UE transmitted signal with the target to transmit at the lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in table 5.4.1.1.

An excess error of the open loop power control decreases the system capacity.

5.4.1.4 Method of test

5.4.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1. The parameter settings of the cell are set up according to Table 5.4.1.1a.

3) Switch on the phone.

4) After the UE has performed registration and entered idle mode, $\hat{I}_{or}$ is set up according to table 5.4.1.2. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1

5) A call is set up according to the Generic call setup procedure in [3] clause 7.3.1 with channel conditions according the test parameters in table 5.4.1.3, The RACH procedure within the call setup is used for the test.

Table 5.4.1.1a: Settings for the serving cell

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		Channel 1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	21
Preamble Retrans Max		1

Table 5.4.1.2: Test parameters for Open Loop Power Control (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.4.1.3	dBm / 3,84 MHz

Table 5.4.1.3: Test parameters for Open Loop Power Control (SS)

Parameter		RX Upper dynamic end	RX-middle	RX-Sensitivity level
$\hat{I}_{or}$ (note 3)		-25,0 dBm / 3,84 MHz	-65,7 dBm / 3,84 MHz	<REF$\hat{I}_{or}$> dBm / 3,84 MHz
CPICH_RSCP (notes 3 and 4)		-28,9 dBm	-69,6 dBm	<REF$\hat{I}_{or}$> +CPICH_Ec / Ior
Primary CPICH DL TX power		+19 dBm	+28 dBm	+19 dBm
Simulated path loss = Primary CPICH DL TX power - CPICH_RSCP		+47.9 dB	+97.6 dB	Band I, IV, VI, X, XIX, XI, XXI: +128.9 dB Band II, V, VII, XI: +126.9 dB Band III, VIII, XII, XIII, XIV, XX, XXII: +125.9 dB Band IX: +127.9 dB Band XXV, XXVI: +125.4 dB
UL interference	Band I, IV, VI, X, XIX, XI, XXI	-75 dBm	-101 dBm	-110 dBm
	Band II, V, VII			-108 dBm
	Band III, VIII, XII, XIII, XIV, XX, XXII			-107 dBm
	Band IX			-109 dBm
	Band XXV, XXVI			-106.5 dBm
Constant Value		-10 dB	-10 dB	-10 dB
Expected nominal UE TX power (note 5)		-37.1 dBm	-13.4 dBm	+8.9 dBm (note 2)

NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: Primary CPICH DL TX power, UL interference, Constant Value are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.
NOTE 2: Nominal TX output power <9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4).
NOTE 3: <REF$\hat{I}_{or}$> is specified in Table 6.2.2, and CPICH_Ec / Ior is specified in Table E.2.2. The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is set to -5.3 dB relative to I_{or}.
NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.
NOTE 5: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8].

5.4.1.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 5.4.1.3 (-25 dBm / 3,84 MHz).
2) Measure the first RACH preamble mean power of the UE.
3) Repeat the above measurement for all SS levels in table 5.4.1.3.

5.4.1.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.4.1.3), derived in step 2) shall not exceed the prescribed tolerance in table 5.4.1.4.

Table 5.4.1.4: Open loop power control tolerance

Normal conditions	±10 dB
Extreme conditions	±13 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.1A Open Loop Power Control in the Uplink for DC-HSUPA

5.4.1A.1 Definition and applicability

Open loop power control in the uplink for DC-HSUPA is the ability of the UE transmitter to set its output power, for each carrier, to a specific value. This function is used for initial Dual Cell transmission in CELL_DCH and based on the information from Node B using RADIO BEARER SETUP message and the downlink received signal power level of the CPICH.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.4.1A.2 Minimum requirements

The UE open loop power is defined as the mean power in a timeslot or ON power duration, whichever is available.

The UE open loop power control tolerance per carrier is given in table 5.4.1A.1.

Table 5.4.1A.1: Open loop power control tolerance

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.101 [1] clause 6.4.1.1A

5.4.1A.3 Test purpose

The power measured by the UE of the received signal and information in RADIO BEARER SETUP message are used by the UE to control the power of the UE transmitted signal with the target to transmit at the lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in table 5.4.1A.1 during Dual Cell E-DCH.

An excess error of the open loop power control decreases the system capacity.

5.4.1A.4 Method of test

5.4.1A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range, see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.
2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.5.0. The parameter settings of the cell are set up according to Table 5.4.1A.1a.
3) Switch on the phone.
4) After the UE has performed registration and entered idle mode, Îor for primary and secondary serving cells are set up according to table 5.4.1A.2.
5) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.14 with channel conditions, for primary and secondary serving cells, according to the test parameters in table 5.4.1A.3 and exception for information elements in RADIO BEARER SETUP message as specified in table 5.4.1A.4. The uplink DPCCH power control preambles related to the call setup is used for the test.

Table 5.4.1A.1a: Settings for the serving cell

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		Channel 1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	21
Preamble Retrans Max		1

Table 5.4.1A.2: Test parameters for Open Loop Power Control (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.4.1A.3	dBm / 3,84 MHz

Table 5.4.1A.3: Test parameters for Open Loop Power Control (SS)

Parameter	RX Upper dynamic end	RX-middle	RX-Sensitivity level
$\hat{I}_{or}$ (note 3)	-25,0 dBm / 3,84 MHz	-65,7 dBm / 3,84 MHz	<REF$\hat{I}_{or}$> dBm / 3,84 MHz
CPICH_RSCP (notes 3 and 4)	-28,9 dBm	-69,6 dBm	<REF$\hat{I}_{or}$> +CPICH_Ec / Ior
DPCCH Power offset	-66 dB	-84 dB	Band I, IV, VI, IX, X, XI, XIX, XXI: -108 dB Band II, III, V, VII, VIII, XII, XIII, XIV, XX, XXII: -106 dB
Expected nominal UE TX power (note 5)	-37.1 dBm	-14.4 dBm	Band I, II, IV, V, VI, VII, X, XI, XIX, XXI:+8.7 dBm (note 2) Band III, VIII, IX, XII, XIII, XIV, XX, XXII: +7.7 dBm

NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameter DPCCH Power offset is chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.
NOTE 2: Nominal TX output power <9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4).
NOTE 3: <REF$\hat{I}_{or}$> is specified in Table 6.2.2, and CPICH_Ec / Ior is specified in Table E.5.0.
NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.
NOTE 5: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.3 Open Loop Power Control of TS 25.331 [8].

Table 5.4.1A.4: Contents of RADIO BEARER SETUP message: AM or UM

Uplink radio resources	
- Uplink DPCH info	
- PC Preamble	1
- SRB Delay	7
- Uplink secondary Cell info FDD	
- PC Preamble	1

5.4.1A.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 5.4.1A.3 (-25 dBm / 3,84 MHz).

2) Measure the Dual Cell transmission mean power from the first slot of uplink DPCCH PC preamble for each carrier.

3) Repeat the above measurement for all SS levels in table 5.4.1A.3.

5.4.1A.5 Test requirements

The deviation at any carrier with respect to the Expected nominal UE TX power (table 5.4.1A.3), derived in step 2) shall not exceed the prescribed tolerance in table 5.4.1A.5.

Table 5.4.1A.5: Open loop power control tolerance per carrier

Normal conditions	±10 dB
Extreme conditions	±13 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.2 Inner Loop Power Control in the Uplink

5.4.2.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.2.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2.2. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5	+1,5	+1	+3	+1,5	+4,5
0	-0,5	+0,5	-0,5	+0,5	-0,5	+0,5
-1	-0,5	-1,5	-1	-3	-1,5	-4,5

Table 5.4.2.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8	+12	+16	+24	+16	+26
0	-1	+1	-1	+1	-1	+1
-1	-8	-12	-16	-24	-16	-26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,-1	-6	-14	N/A	N/A	N/A	N/A

The UE shall meet the above requirements for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2.3 Test purpose

- To verify that the UE inner loop power control size and response is meet to the described value shown in clause 5.4.2.2.

- To verify that TPC_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

5.4.2.4 Method of test

5.4.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2.4.1: Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm 2

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2.4.2 Procedure

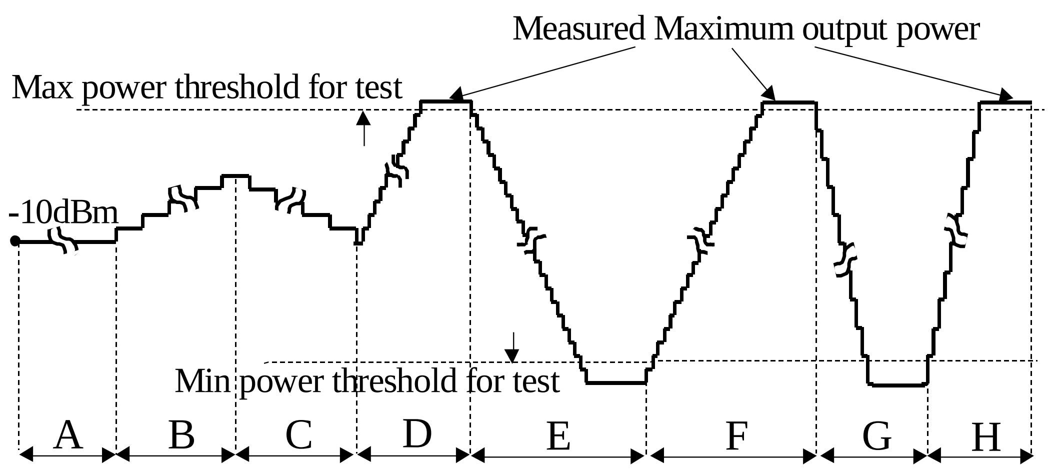


Figure 5.4.2.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101011111010000010101010111110100000101010101111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION

COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10^{th} slot after the mean power has exceeded the maximum power threshold;
- In steps E and G, measurement of the mean power is not required in slots after the 10^{th} slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 1dB FDD Long 0 1 64 TRUE Not Present(0) 1	
Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL	 FDD Not Present Not Present Not Present	 R99 and Rel-4 only

Table 5.4.2.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 2dB FDD Long 0 1 64 TRUE Not Present(0) 1	
Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL	 FDD Not Present Not Present Not Present	 R99 and Rel-4 only

5.4.2.5 Test requirements

Table 5.4.2.5.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,4	+1,6	+0,85	+3,15	+1,3	+4,7
0	-0,6	+0,6	-0,6	+0,6	-0,6	+0,6
-1	-0,4	-1,6	-0,85	-3,15	-1,3	-4,7

Table 5.4.2.5.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+7,7	+12,3	+15,7	+24,3	+15,7	+26,3
0	–1,1	+1,1	–1,1	+1,1	–1,1	+1,1
–1	–7,7	–12,3	–15,7	–24,3	–15,7	–26,3
0,0,0,0,+1	+5,7	+14,3	N/A	N/A	N/A	N/A
0,0,0,0,–1	–5,7	–14,3	N/A	N/A	N/A	N/A

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC_cmd of 0, as given in table 5.4.2.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of 0, as given in table 5.4.2.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1, given that every 5^{th} TPC_cmd should have the value +1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,+1}, as given in table 5.4.2.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1, given that every 5^{th} TPC_cmd should have the value –1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,-1}, as given in table 5.4.2.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC_cmd of –1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 1 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC_cmd of +1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 1 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC_cmd of –1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 2 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC_cmd of +1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 2 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.2A Inner Loop Power Control in the Uplink for DC-HSUPA

5.4.2A.1 Definition and applicability

Inner loop power control in the uplink for DC-HSUPA is the ability of the UE transmitter to adjust its output power, on each uplink carrier, in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 9 and later releases for the FDD UE that supports HSDPA and Dual Cell E-DCH.

5.4.2A.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power in each assigned carrier in the uplink with a step size of 1, 2 and 3 dB according to the value of Δ_{TPC} or Δ_{RP-TPC}, in the slot immediately after the TPC_cmd for the corresponding carrier as follows

a) The transmitter output power step due to inner loop power control in each assigned carrier in the uplink shall be within the range shown in Table 5.4.2A.1, when the total transmit power in each of the assigned carriers is equal to each other.

b) The transmitter average output power step due to inner loop power control in each assigned carrier in the uplink shall be within the range shown in Table 5.4.2A.2, when the total transmit power in each of the assigned carriers is equal to each other. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

c) The requirements can be tested by sending the same TPC commands for each of the assigned carriers, assuming that the signal powers for the carriers (in terms of DPCCH code power and total power) have been aligned prior to the beginning of the test procedure.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot in each carrier, not including the transient duration. The transient duration is from 25μs before the slot boundary to 25μs after the slot boundary.

Table 5.4.2A.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5	+1,5	+1	+3	+1,5	+4,5
0	–0,5	+0,5	–0,5	+0,5	–0,5	+0,5
–1	–0,5	–1,5	–1	–3	–1,5	–4,5

Table 5.4.2A.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8	+12	+16	+24	+16	+26
0	–1	+1	–1	+1	–1	+1
–1	–8	–12	–16	–24	–16	–26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,–1	–6	–14	N/A	N/A	N/A	N/A

The UE shall meet the above requirements for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1A.

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2A.3 Test purpose

- To verify that the UE inner loop power control size and response, on each carrier, is met to the described value shown in clause 5.4.2A.2.

- To verify that TPC_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control for DC-HSUPA over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement for DC-HSUPA (clause 5.4.3A.5).

The Max power threshold for test is defined as the Measured Maximum output power for DC-HSUPA of the UE in the relevant Step of the test (using the same method as in clause 5.2BA.4.2) minus the Test Tolerance specified for test 5.2BA Maximum Output Power for DC-HSUPA in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

5.4.2A.4 Method of test

5.4.2A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A.1.1. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for each carrier in the Uplink is set to algorithm 2.

Table 5.4.2A.4.1: Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm 2

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2A.4.2 Procedure

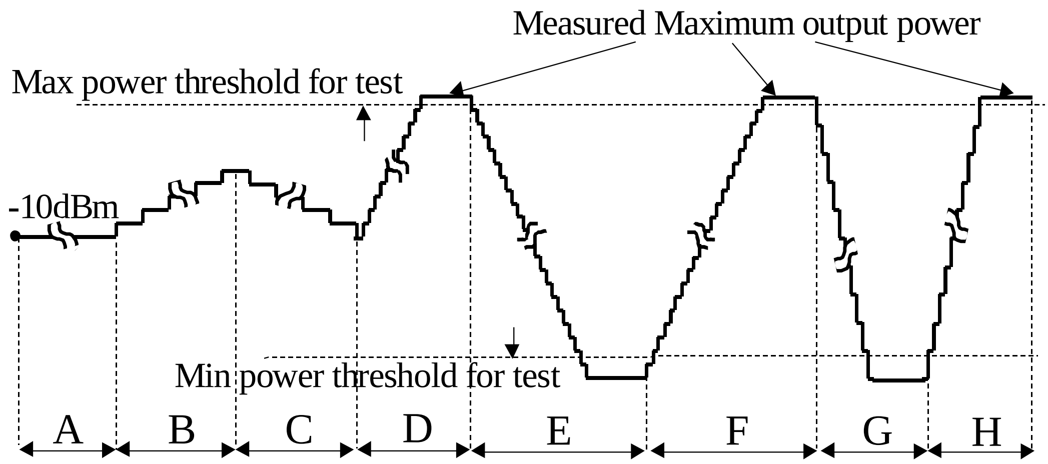


Figure 5.4.2A.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the assigned carriers equal to each other within ± 1.7 dB and in the range -10 ± 9 dBm. This may be achieved by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands on both cells, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel, in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the information elements are as specified in TS34.108 [3] sub clause 7.3.14.4.2 with the exception as specified in the table 5.4.2A.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel, in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the information elements are as specified in TS34.108 [3] sub clause 7.3.14.4.2 with the exception as specified in the table 5.4.2A.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot on each carrier shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that each carrier reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2A.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2A.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm 1
- TPC step size	1 dB

Table 5.4.2A.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- TPC step size	2 dB

5.4.2A.5 Test requirements

Table 5.4.2A.5.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,4	+1,6	+0,85	+3,15	+1,3	+4,7
0	–0,6	+0,6	–0,6	+0,6	–0,6	+0,6
–1	–0,4	–1,6	–0,85	–3,15	–1,3	–4,7

Table 5.4.2A.5.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+7,7	+12,3	+15,7	+24,3	+15,7	+26,3
0	–1,1	+1,1	–1,1	+1,1	–1,1	+1,1
–1	–7,7	–12,3	–15,7	–24,3	–15,7	–26,3
0,0,0,0,+1	+5,7	+14,3	N/A	N/A	N/A	N/A
0,0,0,0,–1	–5,7	–14,3	N/A	N/A	N/A	N/A

a) During Step A, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range for a TPC_cmd of 0, as given in table 5.4.2A.5.1.

b) During Step A, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of 0, as given in table 5.4.2A.5.2.

c) During Step B, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1, given that every 5th TPC_cmd should have the value +1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,+1}, as given in table 5.4.2A.5.2.

e) During Step C, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1, given that every 5th TPC_cmd should have the value –1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,-1}, as given in table 5.4.2A.5.2.

g) During Step E, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC_cmd of –1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of –1, and step size of 1 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC_cmd of +1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of +1, and step size of 1 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC_cmd of –1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of –1, and step size of 2 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC_cmd of +1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC_cmd group of +1, and step size of 2 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.2B FFS

5.4.2C Inner Loop Power Control in the Uplink for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Test procedure, test tolerances may need an update.

- Update of Annexure is FFS

5.4.2C.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.4.2C.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2C.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2C.2. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the inner loop power control in the uplink specified in this clause applies at each transmit antenna connector.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2C.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5	+1,5	+1	+3	+1,5	+4,5
0	-0,5	+0,5	-0,5	+0,5	-0,5	+0,5
-1	-0,5	-1,5	-1	-3	-1,5	-4,5

Table 5.4.2C.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8	+12	+16	+24	+16	+26
0	-1	+1	-1	+1	-1	+1
-1	-8	-12	-16	-24	-16	-26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,-1	-6	-14	N/A	N/A	N/A	N/A

The UE shall meet the above requirements for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1C.

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2C.3 Test purpose

- To verify that the UE inner loop power control size and response with UL CLTD activation state 1 is meet to the described value shown in clause 5.4.2C.2.
- To verify that TPC_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

5.4.2C.4 Method of test

5.4.2C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.17, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2C.4.1: Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm 2

3) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2C.4.2 Procedure

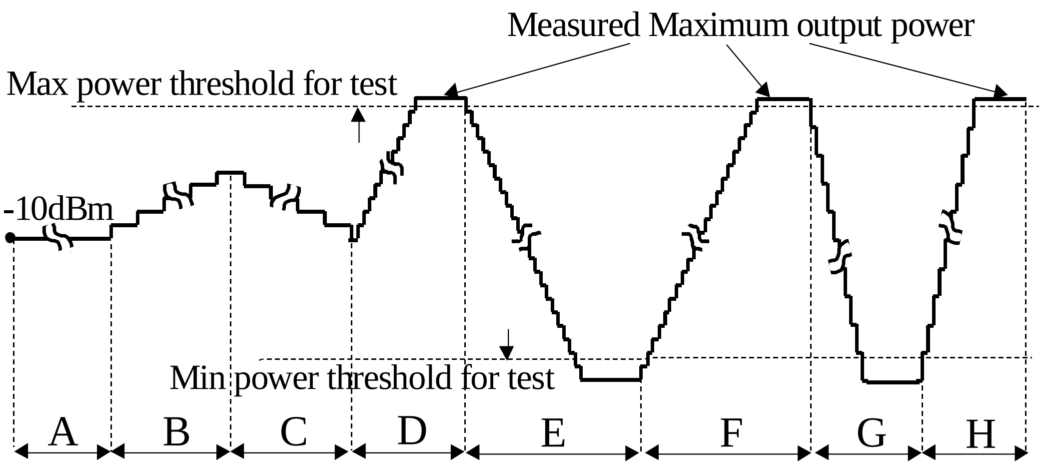


Figure 5.4.2C.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

   - no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;
   - at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;
   - at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

   The following is an example of a suitable sequence of TPC commands:

   100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2C.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2C.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;
- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2C.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2C.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 1dB FDD Long 0 1 64 TRUE Not Present(0) 1	
Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL	 FDD Not Present Not Present Not Present	 R99 and Rel-4 only

Table 5.4.2C.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 2dB FDD Long 0 1 64 TRUE Not Present(0) 1	
Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL	 FDD Not Present Not Present Not Present	 R99 and Rel-4 only

5.4.2C.5 Test requirements

Table 5.4.2C.5.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5± TT	+1,5± TT	+1± TT	+3± TT	+1,5± TT	+4,5± TT
0	-0,5± TT	+0,5± TT	-0,5± TT	+0,5± TT	-0,5± TT	+0,5± TT
-1	-0,5± TT	-1,5± TT	-1± TT	-3± TT	-1,5± TT	-4,5± TT

Table 5.4.2C.5.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8±TT	+12±TT	+16±TT	+24±TT	+16±TT	+26±TT
0	−1±TT	+1±TT	−1±TT	+1±TT	−1±TT	+1±TT
−1	−8±TT	−12±TT	−16±TT	−24±TT	−16±TT	−26±TT
0,0,0,0,+1	+6±TT	+14±TT	N/A	N/A	N/A	N/A
0,0,0,0,−1	−6±TT	−14±TT	N/A	N/A	N/A	N/A

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC_cmd of 0, as given in table 5.4.2C.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of 0, as given in table 5.4.2C.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1, given that every 5th TPC_cmd should have the value +1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,+1}, as given in table 5.4.2C.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1, given that every 5th TPC_cmd should have the value −1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,-1}, as given in table 5.4.2C.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC_cmd of −1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of −1, and step size of 1 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC_cmd of +1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 1 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC_cmd of –1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 2 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC_cmd of +1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 2 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.4.2D Inner Loop Power Control in the Uplink for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS

5.4.2D.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

5.4.2D.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2D.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2D.2. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

For UE configured in UL CLTD activation state 2 or 3, the inner loop power control in the uplink specified in this clause applies at the active transmit antenna connector.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2D.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5	+1,5	+1	+3	+1,5	+4,5
0	-0,5	+0,5	-0,5	+0,5	-0,5	+0,5
-1	-0,5	-1,5	-1	-3	-1,5	-4,5

Table 5.4.2D.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8	+12	+16	+24	+16	+26
0	-1	+1	-1	+1	-1	+1
-1	-8	-12	-16	-24	-16	-26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,-1	-6	-14	N/A	N/A	N/A	N/A

The UE shall meet the above requirements for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1C.

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2D.3 Test purpose

- To verify that the UE inner loop power control size and response with UL CLTD activation state 2 and 3 is meet to the described value shown in clause 5.4.2D.2.
- To verify that TPC_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

5.4.2D.4 Method of test

5.4.2D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.

2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.17, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2D.4.1: Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm 2

3) SS sends a HS-SCCH order activating UL_CLTD activation state 2.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2D.4.2 Procedure

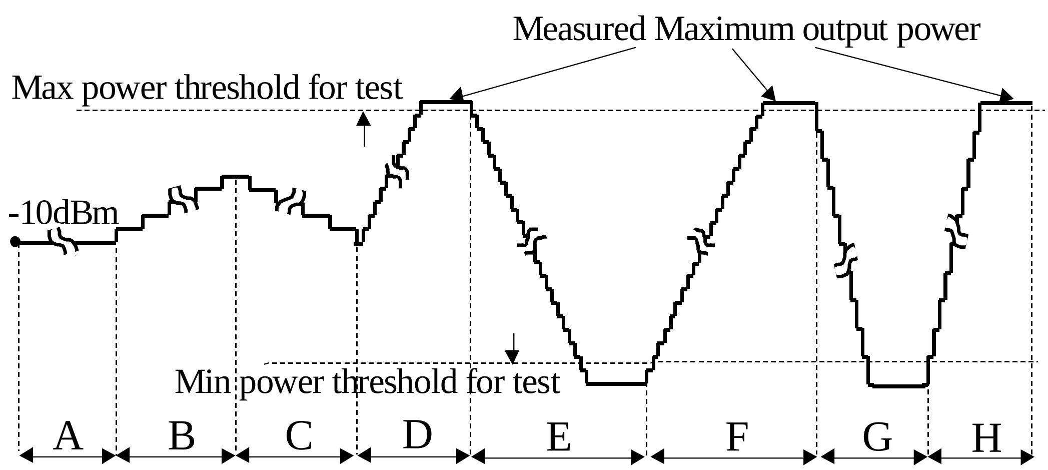


Figure 5.4.2D.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2D.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2D.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

11) SS sends a HS-SCCH order activating UL_CLTD activation state 3

12) Repeat step 1 to 10 for activation state 3.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2D.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2D.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 1dB FDD Long 0 1 64 TRUE Not Present(0) 1	
Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL	 FDD Not Present Not Present Not Present	 R99 and Rel-4 only

Table 5.4.2D.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 2dB FDD Long 0 1 64 TRUE Not Present(0) 1	
Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL	 FDD Not Present Not Present Not Present	 R99 and Rel-4 only

5.4.2D.5 Test requirements

Table 5.4.2D.5.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5± TT	+1,5± TT	+1± TT	+3± TT	+1,5± TT	+4,5± TT
0	-0,5± TT	+0,5± TT	-0,5± TT	+0,5± TT	-0,5± TT	+0,5± TT
-1	-0,5± TT	-1,5± TT	-1± TT	-3± TT	-1,5± TT	-4,5± TT

Table 5.4.2D.5.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8±TT	+12±TT	+16±TT	+24±TT	+16±TT	+26±TT
0	−1±TT	+1±TT	−1±TT	+1±TT	−1±TT	+1±TT
−1	−8±TT	−12±TT	−16±TT	−24±TT	−16±TT	−26±TT
0,0,0,0,+1	+6±TT	+14±TT	N/A	N/A	N/A	N/A
0,0,0,0,−1	−6±TT	−14±TT	N/A	N/A	N/A	N/A

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC_cmd of 0, as given in table 5.4.2D.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of 0, as given in table 5.4.2D.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1, given that every 5th TPC_cmd should have the value +1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,+1}, as given in table 5.4.2D.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1, given that every 5th TPC_cmd should have the value –1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,-1}, as given in table 5.4.2D.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC_cmd of –1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 1 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC_cmd of +1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 1 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC_cmd of –1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 2 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC_cmd of +1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 2 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.4.3 Minimum Output Power

5.4.3.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.3.2 Minimum Requirements

The minimum output power is defined as the mean power in one timeslot. The minimum transmit power shall be less than –50 dBm.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1.

5.4.3.3 Test purpose

To verify that the UE minimum transmit power is less than –50 dBm.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

5.4.3.4 Method of test

5.4.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.3.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power of the UE.

5.4.3.5 Test requirements

The measured power, derived in step 2), shall be less than –49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.3A Minimum Output Power for DC-HSUPA

5.4.3A.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.4.3A.2 Minimum Requirements

The minimum output power is defined as the mean power in one time slot in each carrier. The minimum output power in each carrier shall be less than -50 dBm, when both carriers are set to minimum output power.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1A.

5.4.3A.3 Test purpose

To verify that the UE minimum transmit power in each carrier is less than –50 dBm when both carriers are set to minimum output power.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

5.4.3A.4 Method of test

5.4.3A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14 with the exceptions in the RADIO BEARER SETUP message given in Tables 5.2BA.2, 5.2BA.3 and 5.2BA4. These exceptions allow the beta values to be set according to table C.11A.1. and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.4.3A.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.4.3A: Settings for the serving cell during the measurement of Minimum Output Power with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.4.3A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$.		
NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.4.3A.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power in each carrier of the UE.

5.4.3A.5 Test requirements

The measured power in each carrier, derived in step 2), shall be less than –49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.3B Minimum Output Power for OLTD

FFS

5.4.3C Minimum Output Power for UL CLTD Activation state 1

Editor's Note: : This clause is incomplete. The following aspects are either missing or not yet determined

- Method of Test contains many TBDs.
- Test Tolerances are FFS.
- Call Setup procedure is FFS.
- Update of Annexure is FFS
- Corresponding CR to TS 34.121-2 is missing

5.4.3C.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink CLTD.

5.4.3C.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the minimum output power specified in sub-clause 5.4.3.2 applies at each transmit antenna connector, when the UE power is set to a minimum value.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1C.

5.4.3C.3 Test purpose

To verify that the UE minimum transmit power at each carrier is less than –50 dBm when the UE power is set to a minimum value.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

5.4.3C.4 Method of test

5.4.3C.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure TBD.
2) The UL Reference Measurement Channel and parameters are specified in Annex TBD. The DL Reference Measurement Channel (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.
3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17.. RF parameters are set up according to table TBD. Settings for the serving cell are defined in table 5.4.3C.1.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.4.3C.1: Settings for the serving cell

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.4.3C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$.		
NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

See TS 34.109 [4] for details regarding loopback test mode for HSDPA .

5.4.3C.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.
2) Measure the mean power at each carrier of the UE.

5.4.3C.5 Test requirements

The measured power at each carrier, derived in step 2), shall be less than –50 + TBD dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.3D Minimum Output Power for UL CLTD Activation state 2 and 3

Editor's Note: : This clause is incomplete. The following aspects are either missing or not yet determined

- Method of Test contains many TBDs.
- Test Tolerances are FFS.
- Call Setup procedure is FFS.

- Update of Annexure is FFS
- Corresponding CR to TS 34.121-2 is missing

5.4.3D.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink CLTD.

5.4.3D.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the minimum output power specified in sub-clause 5.4.3.2 applies at the active transmit antenna connector, when the UE power is set to a minimum value.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1C.

5.4.3D.3 Test purpose

To verify that the UE minimum transmit power at the active carrier is less than –50 dBm when the UE power is set to a minimum value.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

5.4.3D.4 Method of test

5.4.3D.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure TBD.
2) The UL Reference Measurement Channel and parameters are specified in Annex TBD. The DL Reference Measurement Channel (F-H-Set 1) is specified in Annex C.8.1.1.
3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17. RF parameters are set up according to table TBD. Settings for the serving cell are defined in table 5.4.3D.1.
4) SS sends a HS-SCCH order activating UL_CLTD activation state 2.5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.4.3D.1: Settings for the serving cell.

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.4.3D.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$.		
NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

See TS 34.109 [4] for details regarding loopback test mode for HSDPA.

5.4.3D.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.
2) Measure the mean power at active carrier of the UE.
3) SS sends a HS-SCCH order activating UL_CLTD activation state 3.

4) Repeat step 1 to 2 for activation state 3.

5.4.3D.5 Test requirements

The measured power at active carrier in activation state 2 or 3, derived in step 2), shall be less than –50 + TBD dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.4 Out-of-synchronisation handling of output power

5.4.4.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Q_{out} and Q_{in} specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Q_{out} and Q_{in} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Q_{in} should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Q_{out}. This can be at a TPC command error ratio level of e.g. 20%.

The requirements of this test apply to all types of UTRA for the FDD UE and not supporting type 1 for DCH.

5.4.4.2 Minimum Requirements

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1.

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4.1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_Ec/Ior ratio of -25 dB, and a signal with Q_{in} by a DPCCH_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4.1: DCH parameters for test of Out-of-synch handling test case

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	−1	dB
I_{oc}	−60	dBm / 3,84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See Figure 5.4.4.1: Before point A −16,6 After point A Not defined See note in clause 5.4.4.3	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See table 5.4.4.2	dB
Information Data Rate	12,2	kbps

Table 5.4.4.2: Minimum Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4.1	DPCCH_Ec/Ior	Unit
Before A	-16,6	dB
A to B	-22,0	dB
B to D	-28,0	dB
D to E	-24,0	dB
After E	-18,0	dB

Figure 5.4.4.1 shows an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

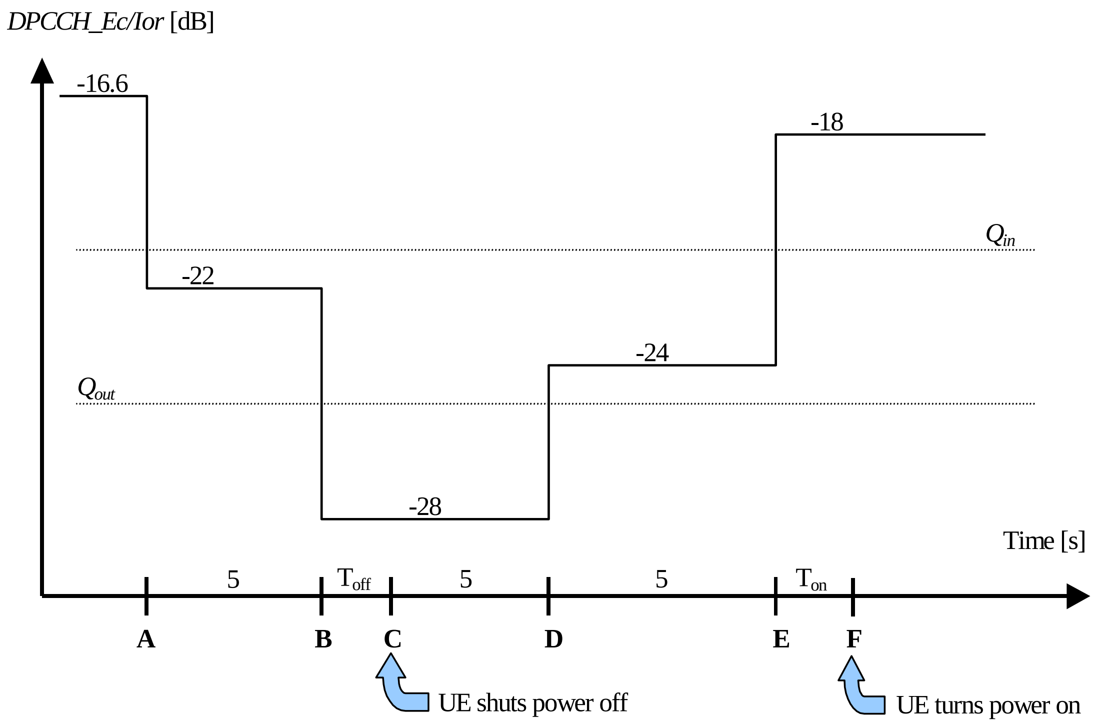


Figure 5.4.4.1: Test case for out-of-synch handling in the UE.

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.
2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.
3. The UE shall not turn its transmitter on between points C and E.
4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The reference for this test case is TS 25.101 [1] clause 6.4.4.2.

5.4.4.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4.1.

NOTE 1: DPDCH_Ec/I_{or} after point A is not defined in table 5.4.4.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

5.4.4.4 Method of test

5.4.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.9.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.2, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4.2A: System Information Block type 1 message

Information Element	Value/Remark
UE Timers and constants in connected mode - T313 - N313	 15 seconds 200

3) DCH parameters are set up according to table 5.4.4.1 with DPCCH_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause E.3.3.
4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4.4.2 Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reach maximum level.
2) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'A to B' as defined in table 5.4.4.3. The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched off during this time.
3) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'B to D' as defined in table 5.4.4.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.
4) The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched on during this time.
5) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'D to E' as defined in table 5.4.4.3. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.
6) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'After E' as defined in table 5.4.4.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched on.

5.4.4.5 Test requirements

Table 5.4.4.3: Test Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4.1	DPCCH_Ec/Ior	Unit
Before A	-16,6	dB
A to B	-21,6	dB
B to D	-28,4	dB
D to E	-24,4	dB
After E	-17,6	dB

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.4A Out-of-synchronization handling of output power for a UE which supports type1 for DCH

5.4.4A.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4A.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Q_{out} and Q_{in} specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Q_{out} and Q_{in} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Q_{in} should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Q_{out}. This can be at a TPC command error ratio level of e.g. 20%.

The requirements of this test apply to UEs, which support the enhanced receiver performance of type1 for DCH of UTRA for the FDD from Release 7 onwards.

5.4.4A.2 Minimum requirement

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1.

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in Table 5.4.4A.1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_Ec/Ior ratio of -28 dB, and a signal with Q_{in} by a DPCCH_Ec/Ior ratio of -24 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in Table 5.4.4A.1, are as specified in Table E.3.3 of Annex E.

Table 5.4.4A.1: DCH parameters for the Out-of-synch handling test case

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	-1
I_{oc}	dBm/3.84 MHz	-60
$\frac{DPDCH\_E_c}{I_{or}}$	dB	See figure 5.4.4A.1: Before point A -19.6 After point A Not defined
$\frac{DPCCH\_E_c}{I_{or}}$		See table 5.4.4A.2
Information Data Rate	kbps	12.2

Table 5.4.4A.2: Minimum Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4A.1	DPCCH_Ec/Ior (UE, supporting enhanced performance requirements type 1 for DCH)	Unit
Before A	-19.6	dB
A to B	-25.0	dB
B to D	-31.0	dB
D to E	-27.0	dB
After E	-21.0	dB

Figure 5.4.4A.1 shows an example scenario for a UE which supports the optional enhanced performance requirements type1 for DCH, where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

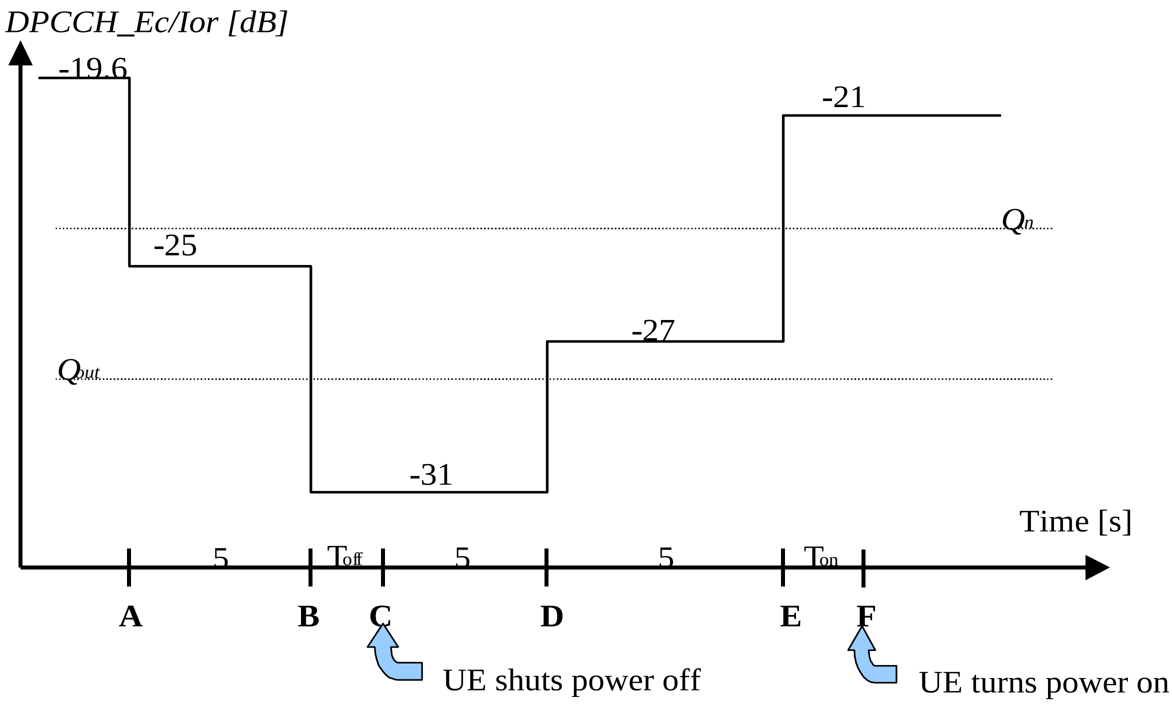


Figure 5.4.4A.1: Test case for out-of-synch handling in the UE supporting the enhanced performance requirements type1 for DCH

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.
2. The UE shall shut its transmitter off before point C, which is T_{off} = 200 ms after point B.
3. The UE shall not turn its transmitter on between points C and E.
4. The UE shall turn its transmitter on before point F, which is T_{on} = 200 ms after point E.

5.4.4A.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4A.1.

NOTE 1: DPDCH_Ec/I_{or} after point A is not defined in table 5.4.4A.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

5.4.4A.4 Method of test

5.4.4A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.9 or figure A.26 in case of a UE, supporting enhanced performance requirements type 1 for DCH, equipped with RX-diversity.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.2, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4A.2A: System Information Block type 1 message

Information Element	Value/Remark
UE Timers and constants in connected mode - T313 - N313	 15 seconds 200

3) DCH parameters are set up according to table 5.4.4A.1 with DPCCH_Ec/Ior ratio level at -19,6 dB. The other RF parameters are set up according to clause E.3.3.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4A.4.2 Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reach maximum level.

2) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'A to B' as defined in table 5.4.4A.3. The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched off during this time.

3) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'B to D' as defined in table 5.4.4A.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.

4) The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched on during this time.

5) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'D to E' as defined in table 5.4.4A.3. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

6) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'After E' as defined in table 5.4.4A.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched on.

5.4.4A.5 Test requirements

Table 5.4.4A.3: Test Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4A.1	DPCCH_Ec/Ior (UE, supporting enhanced performance requirements type 1)	Unit
Before A	-19.6	dB
A to B	-24.6	dB
B to D	-31.4	dB
D to E	-27.4	dB
After E	-20.6	dB

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4A.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.4B FFS

5.4.4C Out-of-synchronisation handling of output power for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Test procedure is FFS

5.4.4C.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4C.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Q_{out} and Q_{in} specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Q_{out} and Q_{in} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Q_{in} should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Q_{out}. This can be at a TPC command error ratio level of e.g. 20%.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and not supporting type 1 for DCH.

5.4.4C.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the minimum requirements specified below apply at each transmit antenna connector.

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4C.1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_Ec/Ior ratio of -25 dB, and a signal with Q_{in} by a DPCCH_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4C.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4C.1: DCH parameters for test of Out-of-synch handling test case

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	−1	dB
I_{oc}	−60	dBm / 3,84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See Figure 5.4.4C.1: Before point A −16,6 After point A Not defined See note in clause 5.4.4C.3	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See table 5.4.4C.2	dB
Information Data Rate	12,2	kbps

Table 5.4.4C.2: Minimum Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4C.1	DPCCH_Ec/Ior	Unit
Before A	-16,6	dB
A to B	-22,0	dB
B to D	-28,0	dB
D to E	-24,0	dB
After E	-18,0	dB

Figure 5.4.4C.1 shows an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

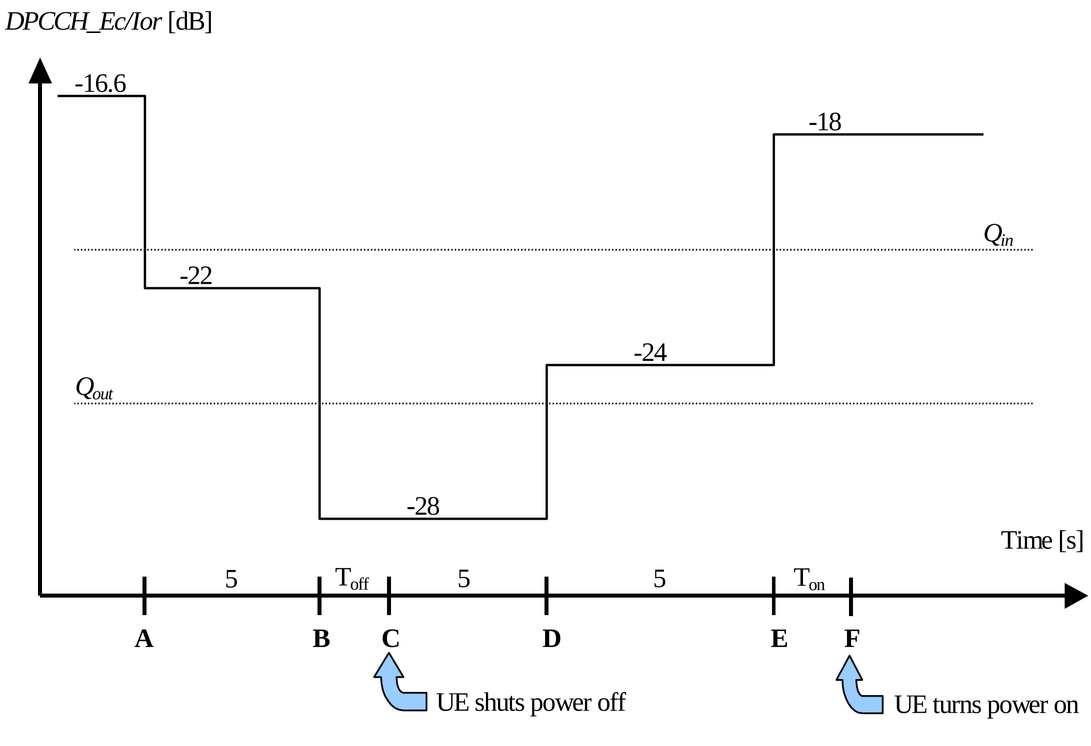


Figure 5.4.4C.1: Test case for out-of-synch handling in the UE

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.
2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.
3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1B.

5.4.4C.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4C.1.

NOTE 1: DPDCH_Ec/I_{or} after point A is not defined in table 5.4.4C.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

5.4.4C.4 Method of test

5.4.4C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause FFS, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.
3) SS activates UL_CLTD activation state 1.

Table 5.4.4C.2A: System Information Block type 1 message

Information Element	Value/Remark
UE Timers and constants in connected mode - T313 - N313	 15 seconds 200

4) DCH parameters are set up according to table 5.4.4C.1 with DPCCH_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause E.3.3.
5) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4C.4.2 Procedure

1FFS

5.4.4C.5 Test requirements

Table 5.4.4C.3: Test Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4C.1	DPCCH_Ec/Ior	Unit
Before A	-16,6+TT	dB
A to B	-21,6+TT	dB
B to D	-28,4+TT	dB
D to E	-24,4+TT	dB
After E	-17,6+TT	dB

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4C.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.4.4D Out-of-synchronisation handling of output power for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS
- Test Procedure is FFS

5.4.4D.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4D.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Q_{out} and Q_{in} specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Q_{out} and Q_{in} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Q_{in} should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Q_{out}. This can be at a TPC command error ratio level of e.g. 20%.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and not supporting type 1 for DCH.

5.4.4D.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the minimum requirements specified below apply at the active transmit antenna connector.

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4D.1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_Ec/Ior ratio of -25 dB, and a signal with Q_{in} by a DPCCH_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4D.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4D.1: DCH parameters for test of Out-of-synch handling test case

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	−1	dB
I_{oc}	−60	dBm / 3,84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See Figure 5.4.4D.1: Before point A −16,6 After point A Not defined See note in clause 5.4.4D.3	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See table 5.4.4D.2	dB
Information Data Rate	12,2	kbps

Table 5.4.4D.2: Minimum Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4D.1	DPCCH_Ec/Ior	Unit
Before A	-16,6	dB
A to B	-22,0	dB
B to D	-28,0	dB
D to E	-24,0	dB
After E	-18,0	dB

Figure 5.4.4D.1 shows an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

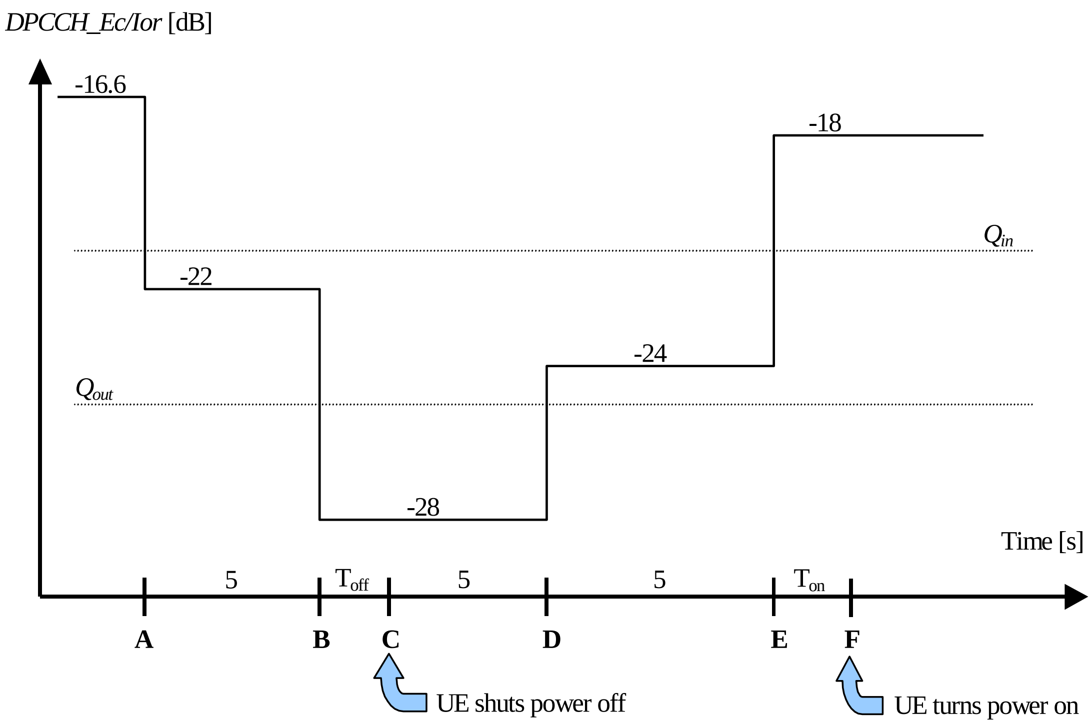


Figure 5.4.4D.1: Test case for out-of-synch handling in the UE.

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.

2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.

3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1B.

5.4.4D.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4D.1.

NOTE 1: DPDCH_Ec/I_{or} after point A is not defined in table 5.4.4D.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

5.4.4D.4 Method of test

5.4.4D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause FFS, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4D.2A: System Information Block type 1 message

Information Element	Value/Remark
UE Timers and constants in connected mode - T313 - N313	 15 seconds 200

3) SS sends a HS-SCCH order activating UL_CLTD activation state 2.

4) DCH parameters are set up according to table 5.4.4D.1 with DPCCH_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause E.3.3.

5) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4D.4.2 Procedure

FFS

5.4.4D.5 Test requirements

Table 5.4.4D.3: Test Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4D.1	DPCCH_Ec/Ior	Unit
Before A	-16,6+TT	dB
A to B	-21,6+TT	dB
B to D	-28,4+TT	dB
D to E	-24,4+TT	dB
After E	-17,6+TT	dB

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4D.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.5 Transmit ON/OFF Power

5.5.1 Transmit OFF Power

5.5.1.1 Definition and applicability

Transmit OFF power is defined as the RRC filtered mean power when the transmitter is off. The transmit OFF power state is when the UE does not transmit or during periods when the UE is not transmitting DPCCH due to discontinuous uplink DPCCH transmission During transmission gaps in UL compressed mode, the UE is not considered to be in the OFF state.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.1.2 Minimum Requirements

The requirement for the transmit OFF power shall be less than –56 dBm.

The normative reference for this requirement is TS 25.101 [1] clause 6.5.1.1.

5.5.1.3 Test purpose

To verify that the UE transmit OFF power is less than –56 dBm.

An excess transmit OFF power increases the interference to other channels, and decreases the system capacity.

5.5.1.4 Method of test

This test is covered by clause 5.5.2 Transmit ON/OFF Time mask.

5.5.1.5 Test requirements

The measured RRC filtered mean power shall be less than –55 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.5.2 Transmit ON/OFF Time mask

5.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the UE between transmit OFF power and transmit ON power. Possible ON/OFF scenarios for release 99 and release 4 only are PRACH, CPCH or uplink compressed mode. For release 5 and later the possible ON/OFF scenarios are PRACH, discontinuous uplink DPCCH transmission or uplink compressed mode.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.2.2 Minimum requirements

The mean power of successive slots shall be calculated according to figure 5.5.1 for PRACH preambles, figure 5.5.1A for discontinuous uplink DPCCH transmission and figure 5.5.2 for all other cases. The off signal is defined as the RRC filtered mean power.

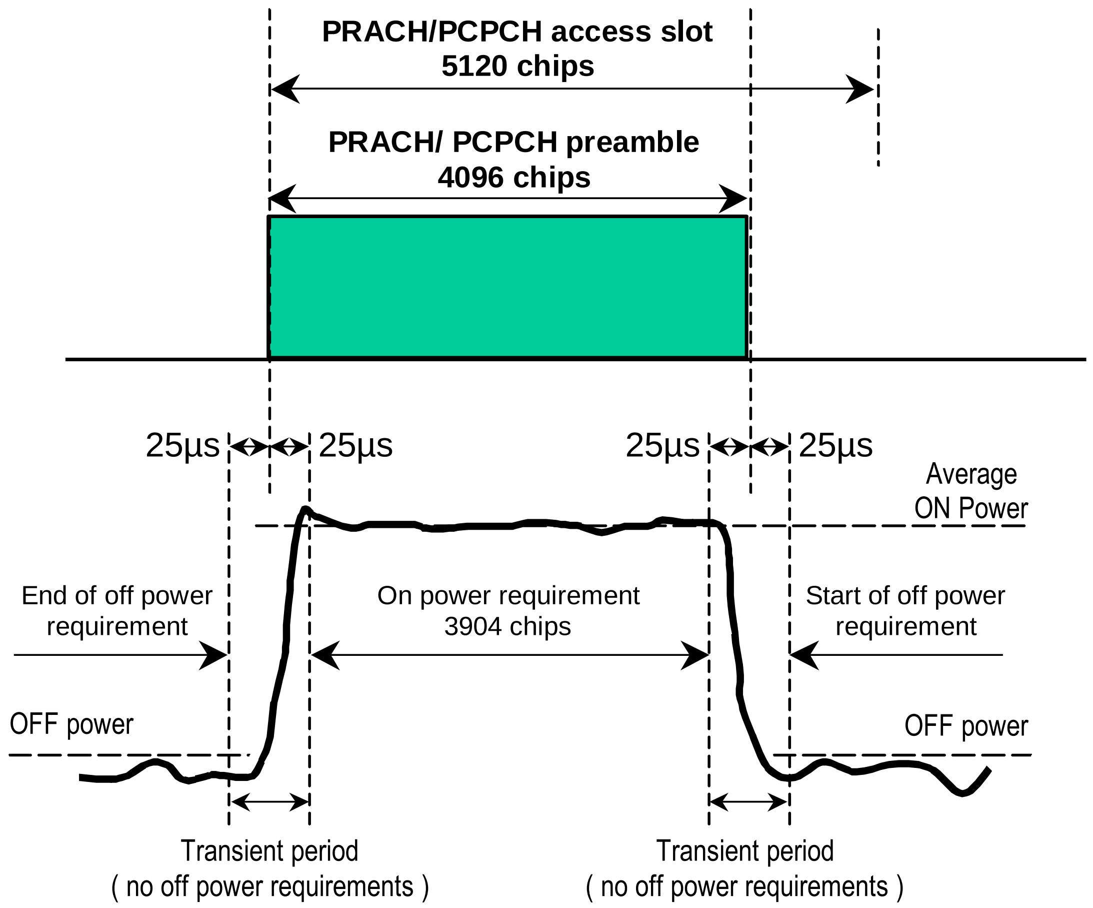


Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

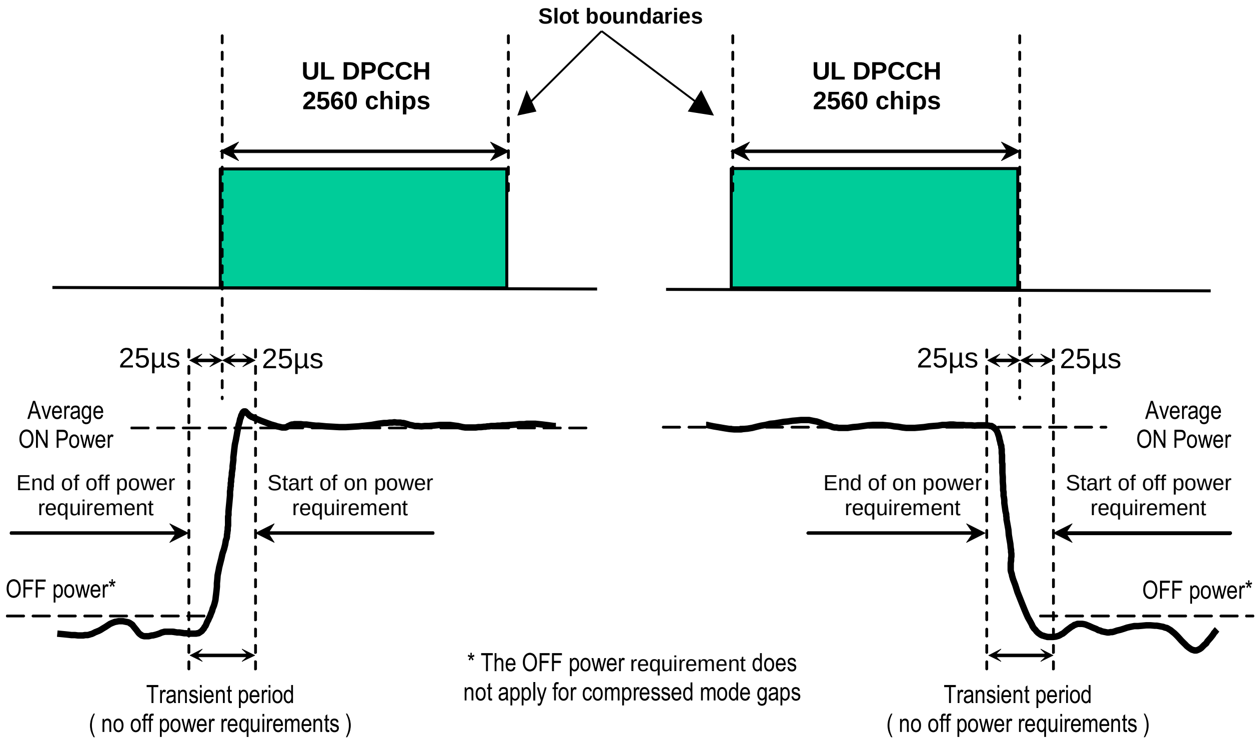


Figure 5.5.1A: Transmit ON/OFF template for discontinuous uplink DPCCH transmission

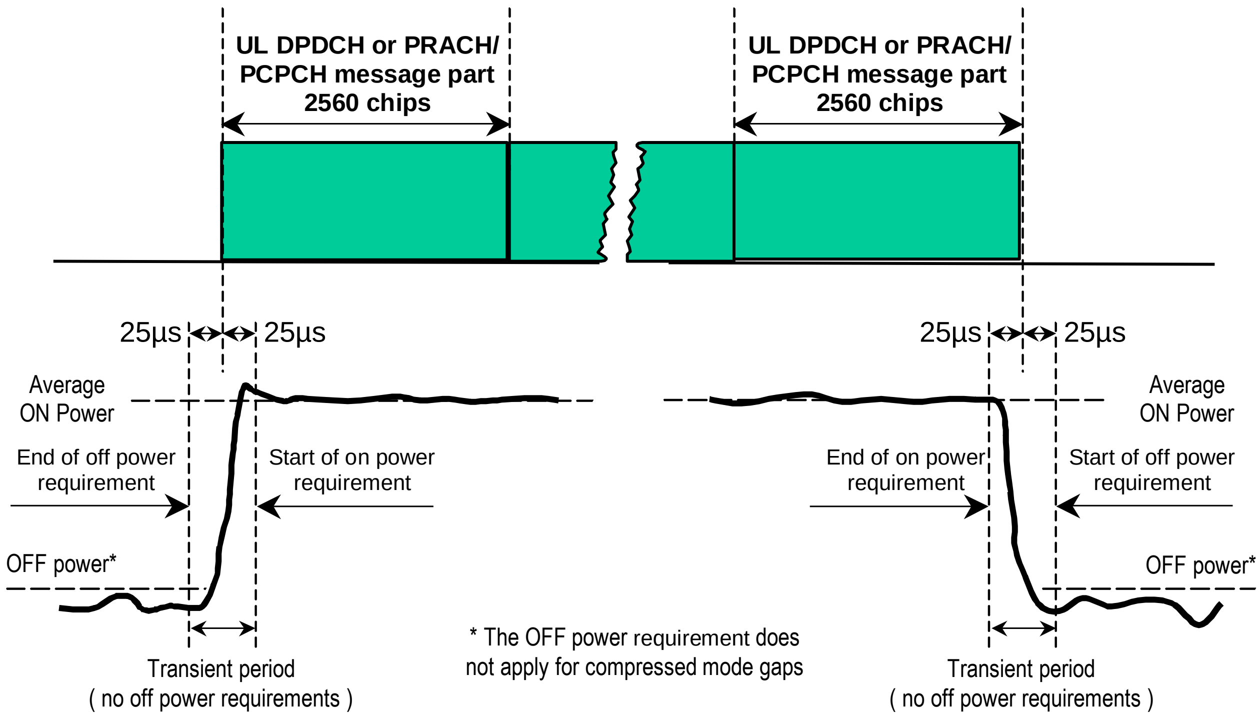


Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in clause 5.5.1.2.

ON power is defined as the mean power. The specification depends on each possible case.

- First preamble of PRACH: Open loop accuracy (table 5.4.1.1).
- During preamble ramping of the RACH and between final RACH preamble and RACH message part: Accuracy depending on size of the required power difference (table 5.5.2.1).
- After transmission gap due to discontinuous uplink DPCCH transmission: Accuracy as in table 5.5.2.1A.
- After transmission gaps in compressed mode: Accuracy as in table 5.7.1.
- Power step to Maximum Power: Maximum power accuracy (table 5.2.1).

Table 5.5.2.1: Transmitter power difference tolerance for RACH preamble ramping, and between final RACH preamble and RACH message part

Power difference size ΔP [dB]	Transmitter power difference tolerance [dB]
0	±1
1	±1
2	±1,5
3	±2
$4 \le \Delta P \le 10$	±2,5
$11 \le \Delta P \le 15$	±3,5
$16 \le \Delta P \le 20$	±4,5
$21 \le \Delta P$	±6,5

Table 5.5.2.1A: Transmitter power difference tolerance after a gap of up to 10 sub-frames due to discontinuous uplink DPCCH transmission

Last TPC_cmd	Transmitter power step tolerance after discontinuous UL DPCCH transmission gap					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	-2 dB	+4 dB	-1 dB	+5 dB	0 dB	+6 dB
0	-3 dB	+3 dB	-3 dB	+3 dB	-3 dB	+3 dB
-1	-4 dB	+2 dB	-5 dB	+1 dB	-6 dB	0 dB

The reference for this requirement is TS 25.101 [1] clause 6.5.2.1.

This is tested using PRACH operation.

5.5.2.3 Test purpose

To verify that the power ON/OFF ratio of the PRACH shown in figure 5.5.1 meets the requirements given in 5.5.2.2.

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink's own channel.

NOTE: The test case covers only the PRACH scenario.

5.5.2.4 Method of test

5.5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of downlink physical channels to I_{or} are set up according to clause E.2.1. The parameter settings of the cell are set up according to table 5.5.2.1A.
3) Switch on the phone.
4) After the UE has performed registration and entered idle mode, $\hat{I}_{or}$ is set up according to table 5.5.2.2. The relative power level of downlink physical channels to I_{or} are set up according to clause E.2.1
5) A call is set up according to the Generic call setup procedure, in [3] clause 7.3.1 with channel conditions according the test parameters in table 5.5.2.3.

The RACH procedure within the call setup is used for the test. The number of the available subchannels should be limited to one. This ensures that the preamble sequence is known to the SS. The preamble retransmission shall be at least 3. The power ramping step size shall be 1 dB. Note that the maximum number of preamble retransmissions is limited to 5 due to the fact that the commanded uplink power exceeds the allowed uplink power of more than 6 dB. The SS shall not send either an ACK or a NACK.

Table 5.5.2.1A: Settings for the serving cell

Parameter	Unit	Cell 1			
		Power class 1	Power class 2	Power class 3	Power class 4
Cell type		Serving cell			
UTRA RF Channel Number		Channel 1			
Qqualmin	dB	-24			
Qrxlevmin	dBm	-115			
UE_TXPWR_MAX_RACH	dBm	33	27	24	21

Table 5.5.2.2: Test parameters for Transmit ON/OFF Time mask (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.5.2.3	dBm / 3,84 MHz

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

Parameter		Power Class 1	Power Class 2	Power Class 3	Power Class 4	Unit
$\hat{I}_{or}$ (note 1)		<REF$\hat{I}_{or}$>	<REF$\hat{I}_{or}$>	<REF$\hat{I}_{or}$>	<REF$\hat{I}_{or}$>	dBm / 3,84 MHz
CPICH_RSCP (notes 1 and 2)		<REF$\hat{I}_{or}$> + CPICH_Ec / Ior	<REF$\hat{I}_{or}$> + CPICH_Ec / Ior	<REF$\hat{I}_{or}$> + CPICH_Ec / Ior	<REF$\hat{I}_{or}$> + CPICH_Ec / Ior	dBm
Primary CPICH DL TX power		+19	+19	+19	+19	dBm
Simulated path loss = Primary CPICH DL TX power - CPICH_RSCP	Band I, IV, VI, X, XIX, XI, XXI	128.9	128.9	128.9	128.9	dB
	Band II, V, VII	126.9	126.9	126.9	126.9	
	Band III, VIII, XII, XIII, XIV, XX, XXII	125.9	125.9	125.9	125.9	
	Band IX	127.9	127.9	127.9	127.9	
	Band XXV, XXVI	125.4	125.4	125.4	125.4	
UL interference	Band I, IV, VI, X, XIX, XI, XXI	–86	–92	–95	–98	dBm
	Band II, V, VII	–84	–90	–93	–96	
	Band III, VIII, XII, XIII, XIV, XX, XXII	–83	–89	–92	–95	
	Band IX	-85	-91	-94	-97	
	Band XXV, XXVI	-83	-89	-92	-95	
Constant Value		–10	–10	–10	–10	dB
Expected nominal UE TX power for all bands except bands XXV and XXVI (note 3)		+32.9	+26.9	+23.9	+20.9	dBm
Expected nominal UE TX power for bands XXV and XXVI (note 3)		+32.4	+26.4	+23.4	+20.4	

NOTE 1: <REF$\hat{I}_{or}$> is specified in Table 6.2.2, and CPICH_Ec / Ior is specified in Table E.2.2. The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is set to –5.3 dB relative to I_{or}.
NOTE 2: The purpose of this parameter is to calculate the Expected nominal UE TX power.
NOTE 3: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8].

5.5.2.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector and select the test parameters of table 5.5.2.3 according to the power class. $\hat{I}_{or}$ shall be according to table 5.5.2.3.

2) Measure the mean power (ON power) of the UE on the first PRACH preamble according to the timing in figure 5.5.1.

3) Measure the RRC filtered mean power (OFF power) in a 2368 chip time interval before a transient period of 25 µs (96 chips) prior to a RACH preamble (ON power). Measure the RRC filtered mean power (OFF power) in a 2368 chip time interval after a transient period of 25 µs (96 chips) after a RACH preamble (ON power). Due to the dynamic range between the ON and OFF power measurements, the OFF power measurements can be made on subsequent PRACH preambles rather than adjacent to the first PRACH preamble.

5.5.2.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.5.2.3), derived in step 2), shall not exceed the prescribed upper tolerance in table 5.2.2 (clause 5.2.5) and lower tolerance in table 5.4.1.4. (clause 5.4.1.5) for the first PRACH preamble.

The measured RRC filtered mean power, derived in step 3), shall be less than –55 dBm. (clause 5.5.1.5).

5.6 Change of TFC

5.6.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPDCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.6.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size is specified in table 5.6.1. The power change due to a change in TFC is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.6.1: Transmitter power step tolerance

Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
0	±0,5
1	±0,5
2	±1,0
3	±1,5
$4 \le \Delta P \le 10$	±2,0
$11 \le \Delta P \le 15$	±3,0
$16 \le \Delta P \le 20$	±4,0
$21 \le \Delta P$	±6,0

Clause C.2.1 defines the UL reference measurement channels (12,2 kbps) for TX test and the power ratio between DPCCH and DPDCH as –5,46 dB. Therefore, only one power control step size is selected as minimum requirement from table 5.6.1. The accuracy of the power step, given the step size is specified in table 5.6.2.

Table 5.6.2: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2

The mean power of successive slots shall be calculated according to figure 5.6.1.

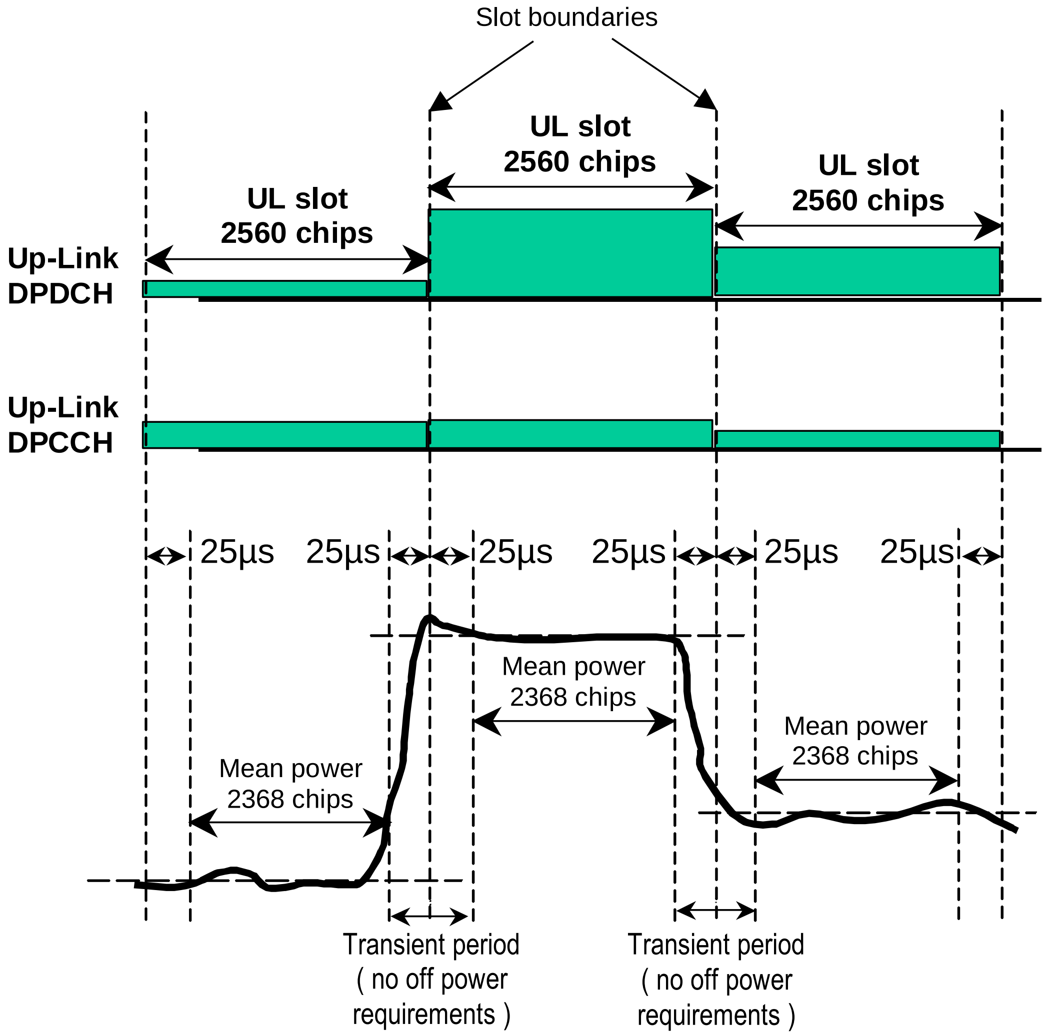


Figure 5.6.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6.2.

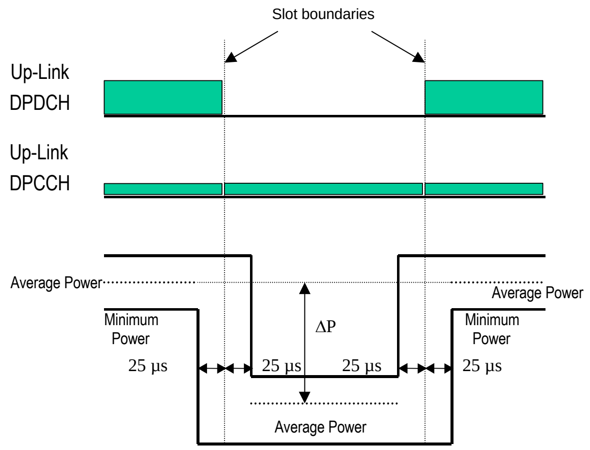


Figure 5.6.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1.

5.6.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6.2.

5.6.4 Method of test

5.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.6.4.2 Procedure

1) Set the power level of the UE to , 0 dBm ± 1 dB.

2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

3) Measure the mean output power of the UE in two cases, both DPDCH and DPCCH are ON and only DPCCH is ON. The measurements shall not include the transient periods.

5.6.5 Test requirements

The difference in mean power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6.3.

Table 5.6.3: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2.3

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.6AA FFS

5.6AB Change of TFC for UL CLTD activation state 1

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Test procedure, test tolerances may need an update.
- Update of Annexure is FFS

5.6AB.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPDCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink CLTD.

5.6AB.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + S-DPCCH + DPDCH for UE configured in UL CLTD activation state 1) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size, is specified in Table 5.6AB.1 at each transmit antenna connector. The power change at each transmit antenna connector due to a change in TFC is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25μs before the slot boundary to 25μs after the slot boundary.

Table 5.6AB.1: Transmitter power step tolerance

Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
0	±0,5
1	±0,5
2	±1,0
3	±1,5
4 ≤ ΔP ≤ 10	±2,0
11 ≤ ΔP ≤ 15	±3,0
16 ≤ ΔP ≤ 20	±4,0
21 ≤ ΔP	±6,0

Clause FFS defines the UL reference measurement channels for TX test and the power ratio between DPCCH and DPDCH as FFS. Therefore, only one power control step size is selected as minimum requirement from table 5.6AB.1. The accuracy of the power step, given the step size is specified in table 5.6AB.2.

Table 5.6AB.2: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2

The mean power of successive slots shall be calculated according to figure 5.6AB.1.

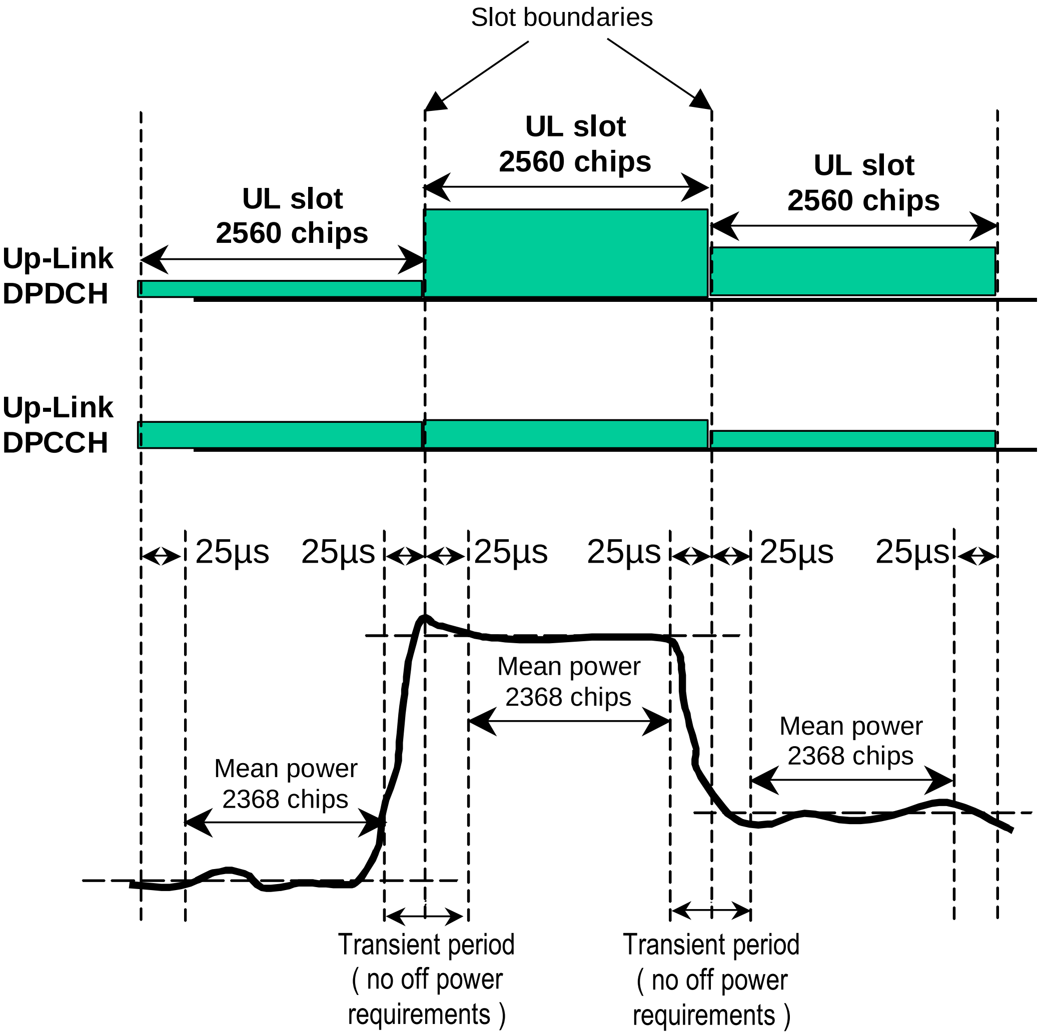


Figure 5.6AB.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6AB.2.

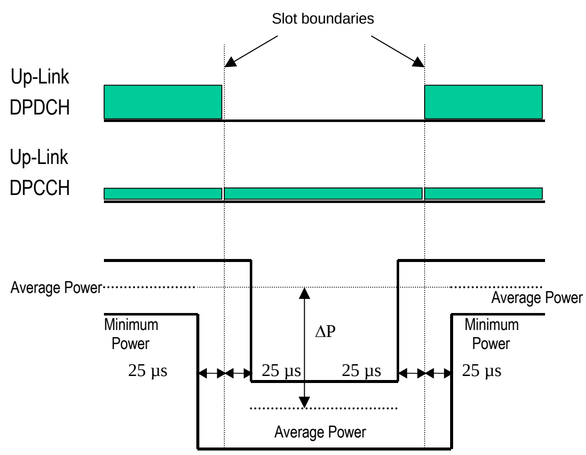


Figure 5.6AB.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1B.

5.6AB.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6AB.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6AB.2.

5.6AB.4 Method of test

5.6AB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.17. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
3) SS sends a HS-SCCH order activating UL_CLTD activation state 1.
4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.6AB.4.2 Procedure

1) Set the power level of the UE to , 0 dBm ± 1 dB.
2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.
3) Measure the mean output power of the UE in two cases, when all DPDCH, S-DPCCH and DPCCH are ON and when only DPCCH is ON. The measurements shall not include the transient periods.

5.6AB.5 Test requirements

The difference in mean power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6AB.3.

Table 5.6AB.3: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2.3+TT

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.6AC Change of TFC for UL CLTD activation state 2 and 3

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Message Contents are FFS.
- Call Setup procedure, test procedure, test tolerances may need an update.
- Update of Annexure is FFS

5.6AC.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPDCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink CLTD.

5.6AC.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + S-DPCCH + DPDCH for UE configured in UL CLTD activation state 1, and DPCCH + DPDCH for UE configured in UL CLTD activation state 2 or activation state 3) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size, is specified in Table 5.6AC.1 at each transmit antenna connector. The power change at each transmit antenna connector due to a change in TFC is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25μs before the slot boundary to 25μs after the slot boundary.

Table 5.6AC.1: Transmitter power step tolerance

Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
0	±0,5
1	±0,5
2	±1,0
3	±1,5
4 ≤ ΔP ≤ 10	±2,0
11 ≤ ΔP ≤ 15	±3,0
16 ≤ ΔP ≤ 20	±4,0
21 ≤ ΔP	±6,0

Clause FFS defines the UL reference measurement channels for TX test and the power ratio between DPCCH and DPDCH as FFS. Therefore, only one power control step size is selected as minimum requirement from table 5.6AC.1. The accuracy of the power step, given the step size is specified in table 5.6AC.2.

Table 5.6AC.2: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2

The mean power of successive slots shall be calculated according to figure 5.6AC.1.

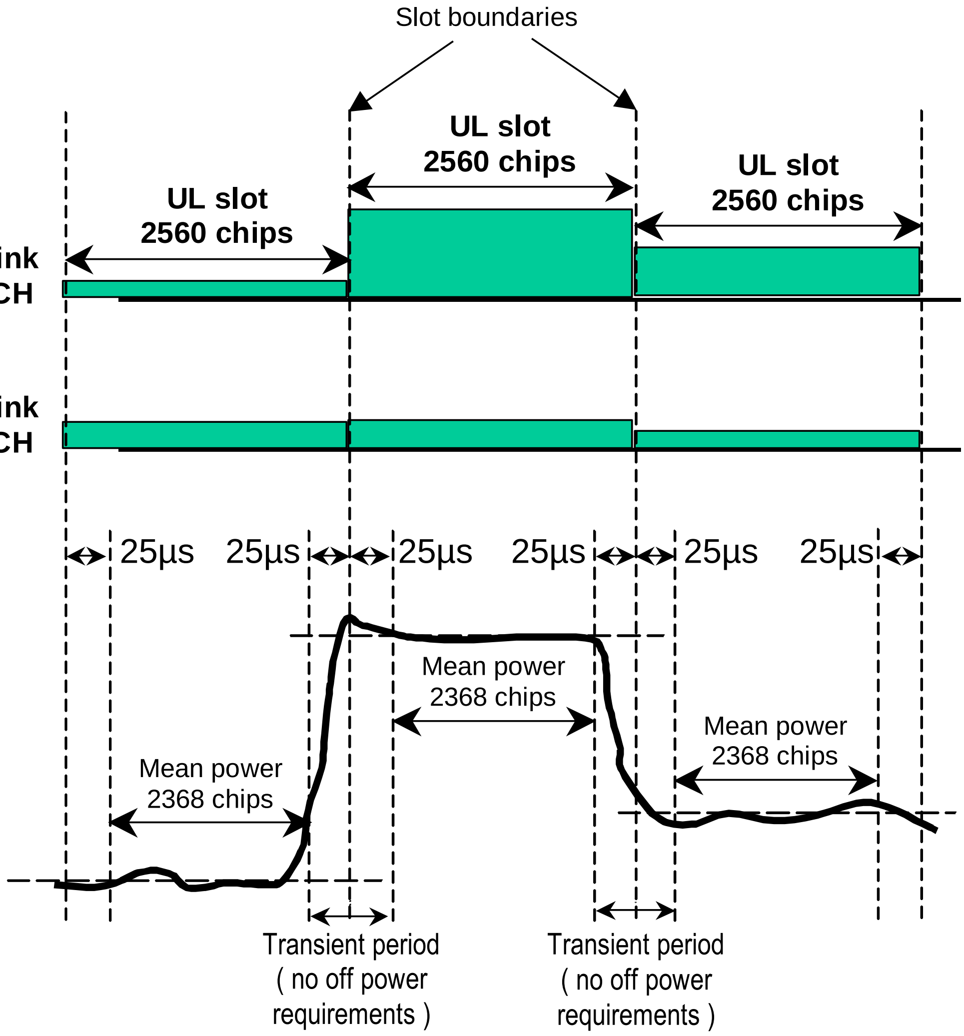


Figure 5.6AC.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6AC.2.

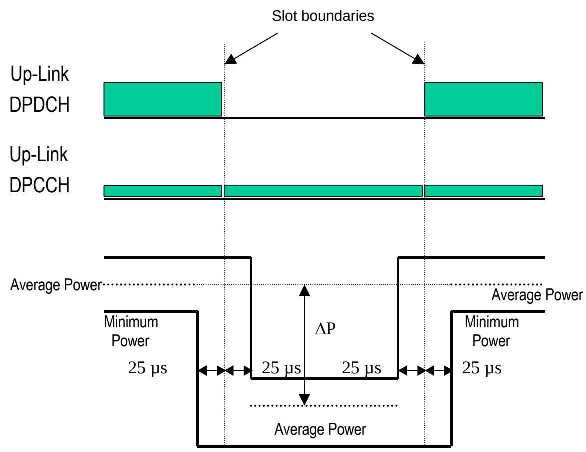


Figure 5.6AC.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1B.

5.6AC.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6AC.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6AC.2.

5.6AC.4 Method of test

5.6AC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.17. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
3) SS sends a HS-SCCH order activating UL_CLTD activation state 2.
4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.6AC.4.2 Procedure

1) Set the power level of the UE to , 0 dBm ± 1 dB.
2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.
3) Measure the mean output power of the UE in two cases, both DPDCH and DPCCH of the active transmit antenna are ON and only DPCCH is ON. The measurements shall not include the transient periods.

5.6AC.5 Test requirements

The difference in mean power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6AC.3.

Table 5.6AC.3: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2.3+TT

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

5.7 Power setting in uplink compressed mode

5.7.1 Definition and applicability

Compressed mode in uplink means that the power in uplink is changed.

The requirements and this test apply to all types of UTRA for the FDD UE that support UL or combined UL/DL compressed modes.

5.7.2 Minimum requirements

A change of output power is required during uplink compressed frames since the transmission of data is performed in a shorter interval. The ratio of the amplitude between the DPDCH codes and the DPCCH code will also vary. The power step due to compressed mode shall be calculated in the UE so that the energy transmitted on the pilot bits during each transmitted slot shall follow the inner loop power control.

Thereby, the power during compressed mode, and immediately afterwards, shall be such that the mean power of the DPCCH follows the steps due to inner loop power control combined with additional steps of $10\text{Log}_{10}(N_{pilot.prev} / N_{pilot.curr})$ dB where $N_{pilot.prev}$ is the number of pilot bits in the previously transmitted slot, and $N_{pilot.curr}$ is the current number of pilot bits per slot.

The resulting step in total transmitted power (DPCCH +DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the power step, given the step size, is specified in table 5.6.1 in clause 5.6.2. The power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, when neither the original timeslot nor the reference timeslot are in a transmission gap. The transient duration is not included, and is from 25 µs before the slot boundary to 25µs after the slot boundary.

In addition to any power change due to the ratio $N_{pilot.prev} / N_{pilot.curr}$, the mean power of the DPCCH in the first slot after a compressed mode transmission gap shall differ from the mean power of the DPCCH in the last slot before the transmission gap by an amount Δ_{RESUME}, where Δ_{RESUME} is calculated as described in clause 5.1.2.3 of TS 25.214 [5].

The resulting difference in the total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power difference exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the resulting difference in the total transmitted power (DPCCH + DPDCH) after a transmission gap of up to 14 slots shall be as specified in table 5.7.1.

Table 5.7.1: Transmitter power difference tolerance after a transmission gap of up to 14 slots

Power difference (Up or down) ΔP [dB]	Transmitter power step tolerance after a transmission gap [dB]
$\Delta P \le 2$	±3
3	±3
$4 \le \Delta P \le 10$	±3.5
$11 \le \Delta P \le 15$	±4
$16 \le \Delta P \le 20$	±4.5
$21 \le \Delta P$	±6.5

The power difference is defined as the difference between the mean power of the original (reference) timeslot before the transmission gap and the mean power of the target timeslot after the transmission gap, not including the transient durations. The transient durations at the start and end of the transmission gaps are each from 25 µs before the slot boundary to 25 µs after the slot boundary.

The mean power of successive slots shall be calculated according to figure 5.7.1.

The reference for this requirement is TS 25.101 [1], clause 6.5.4.1.

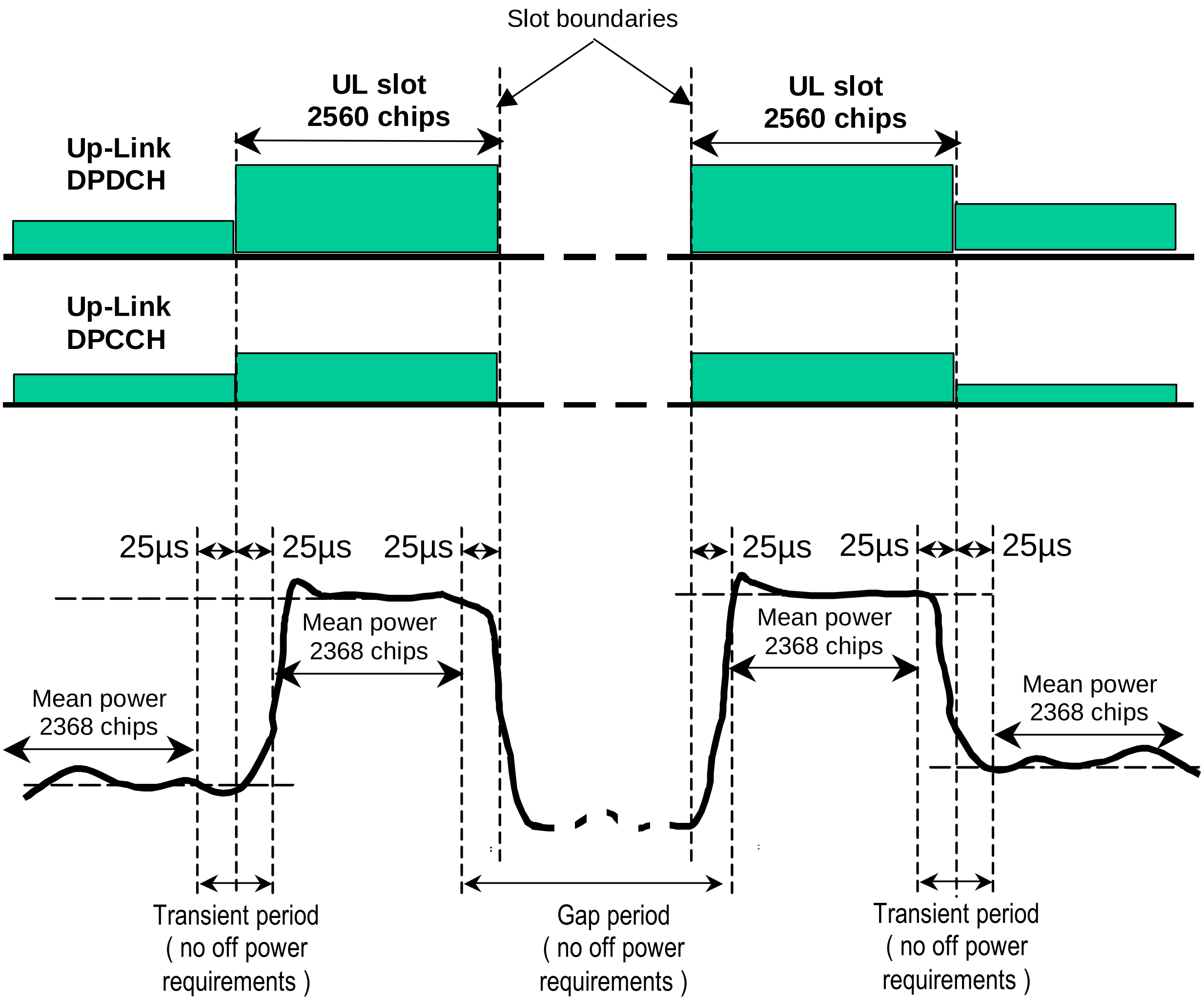


Figure 5.7.1: Transmit template during Compressed mode

For RPL (Recovery Period Length) slots after the transmission gap, where RPL is the minimum out of the transmission gap length and 7 slots, the UE shall use the power control algorithm and step size specified by the signalled Recovery Period Power Control Mode (RPP), as detailed in TS 25.214 [5] clause 5.1.2.3.

When nominal 3 dB power control steps are used in the recovery period, the transmitter mean power steps due to inner loop power control shall be within the range shown in table 5.7.2, and the transmitter aggregate mean power step due to inner loop power control shall be within the range shown in table 5.7.3, excluding any other power changes due, for example, to changes in spreading factor or number of pilot bits.

Table 5.7.2: Transmitter power control range for 3dB step size

TPC_cmd	Transmitter power control range for 3dB step size	
	Lower	Upper
+1	+1,5 dB	+4,5 dB
0	−0,5 dB	+0,5 dB
−1	−1,5 dB	−4,5 dB

Table 5.7.3: Transmitter aggregate power control range for 3dB step size

TPC_cmd group	Transmitter power control range after 7 equal TPC_cmd groups	
	Lower	Upper
+1	+16 dB	+26 dB
0	–1 dB	+1 dB
–1	–16 dB	–26 dB

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

5.7.3 Test purpose

To verify that the changes in uplink transmit power in compressed mode are within the prescribed tolerances.

Excess error in transmit power setting in compressed mode increases the interference to other channels, or increases transmission errors in the uplink.

5.7.4 Method of test

5.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2. The 12,2 kbps UL reference measurement channel is used, with gain factors β_c = 0,5333 and β_d = 1,0 in non-compressed frames. Slot formats 0 and 0B are used on the uplink DPCCH.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.7.4.2 Procedure

NOTE: CFNs are given in this procedure for reference as examples only. A fixed offset may be applied to the CFNs.

1) Before proceeding with step (3) below, set the output power of the UE to be in the range -36 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.
2) Transmit the PHYSICAL CHANNEL RECONFIGURATION message to set the uplink power control parameters to use Algorithm 1 and a step size of 2 dB, and to set the compressed mode parameters shown in table 5.7.5. The contents of the message are specified in table 5.7.9. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of:
    a) in steps (3) and (4), upward 3 dB output power steps and the implementation of a downward power change when resuming transmission after a compressed mode gap, and
    b) in steps (7) and (8), downward 3dB output power steps and the implementation of an upward power change when resuming transmission after a compressed mode gap.

Table 5.7.5: Parameters for pattern A for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	0
TGSN	Slot number of the first transmission gap slot within the TGCFN	2
TGL1	Length of first transmission gap within the transmission gap pattern	7 slots
TGL2	Length of second transmission gap within the transmission gap pattern	7 slots
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	15 slots
TGPL1	Duration of transmission gap pattern 1	3 frames
TGPL2	Duration of transmission gap pattern 2	R99 and Rel-4: Omit Rel-5 and later releases: Not applicable
RPP	Recovery Period Power Control Mode	Mode 1
ITP	Initial Transmit Power Mode	Mode 1
UL/DL Mode	Defines whether UL only or combined UL/DL compressed mode is used	UL only or UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in figure 5.7.2.

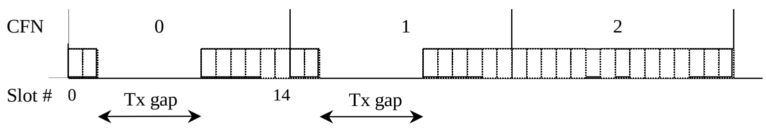


Figure 5.7.2: Pattern A for compressed mode test

3) After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit TPC commands on the downlink as shown in table 5.7.6.

Table 5.7.6: TPC commands transmitted in downlink

CFN	TPC commands in downlink
0	0 1 - - - - - - - 1 1 1 1 1 1
1	1 1 - - - - - - - 1 0 1 0 1 0
2	1 0 1 0 1 0 1 0 1 0 1 0 1 0 1

4) Measure the mean power in the following slots, not including the 25 μs transient periods at the start and end of each slot:

CFN 0: Slots # 9,10,11,12,13,14
CFN 1: Slots # 0,1,9

5) Re-start the test. Before proceeding with step (7) below, set the output power of the UE to be in the range 2 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

6) Repeat step (2) above, with the exception that TGCFN = 3 in table 5.7.5 and table 5.7.9.

7) After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit TPC commands on the downlink as shown in table 5.7.7.

Table 5.7.7: TPC commands transmitted in downlink

CFN	TPC commands in downlink
3	0 1 - - - - - - - 0 0 0 0 0 0
4	0 0 - - - - - - - 0 1 0 1 0 1
5	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0

8) Measure the mean power in the following slots, not including the 25 μs transient periods at the start and end of each slot:

CFN 3: Slots # 9,10,11,12,13,14
CFN 4: Slots # 0,1,9

9) Re-start the test. Before proceeding with step (11) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

10) Transmit the PHYSICAL CHANNEL RECONFIGURATION message to set the uplink power control parameters to use Algorithm 1 and a step size of 1 dB, and to set the compressed mode parameters shown in table 5.7.8. The contents of the message are specified in table 5.7.10. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of power steps at the start and end of compressed frames, and the implementation of a zero power change when resuming transmission after a compressed mode gap.

Table 5.7.8: Parameters for pattern B for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	7
TGSN	Slot number of the first transmission gap slot within the TGCFN	8
TGL1	Length of first transmission gap within the transmission gap pattern	14 slots
TGL2	Length of second transmission gap within the transmission gap pattern	omit
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	UNDEFINED
TGPL1	Duration of transmission gap pattern 1	4 frames
TGPL2	Duration of transmission gap pattern 2	R99 and Rel-4: Omit Rel-5 and later releases: Not applicable
RPP	Recovery Period Power Control Mode	Mode 0
ITP	Initial Transmit Power Mode	Mode 0
UL/DL Mode	Defines whether UL only or combined UL/DL compressed mode is used	UL only or UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in figure 5.7.3.

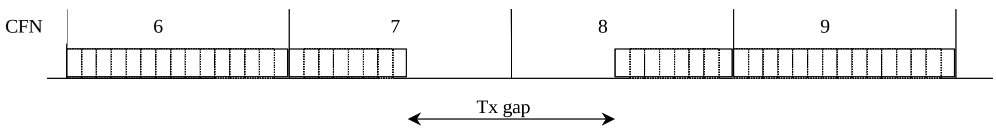


Figure 5.7.3: Pattern B for compressed mode test

11) After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit TPC commands on the downlink as shown in table 5.7.8.

Table 5.7.8: TPC commands transmitted in downlink

CFN	TPC commands in downlink
6	0 0 0 0 0 0 0 0 0 0 0 0 1 1 1
7	1 1 1 1 1 1 1 1 - - - - - - -
8	- - - - - - - 0 0 0 0 0 0 0 0
9	0 0 0 1 1 1 1 1 1 1 1 1 1 1 1

12) Measure the mean power in the following slots, not including the 25 μs transient periods at the start and end of each slot:

CFN 6: Slot # 14
CFN 7: Slots # 0 and 7
CFN 8: Slots # 7 and 14
CFN 9: Slot # 0

Table 5.7.9: PHYSICAL CHANNEL RECONFIGURATION message (step 2)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 2dB FDD Long 0 1 64 TRUE Not Present(0) 1	

Information Element	Value/Remark	Version
Downlink radio resources		
-CHOICE mode	FDD	
-Downlink PDSCH information	Not Present	R99 and Rel-4 only
-Downlink information common for all radio links		
-Downlink DPCH info common for all RL	Not Present	
-CHOICE mode	FDD	
-DPCH compressed mode info		
-Transmission gap pattern sequence		
-TGPSI	1	
-TGPS Status Flag	Activate	
-TGCFN	0	
-Transmission gap pattern sequence configuration parameters		
-TGMP	FDD measurement	
-TGPRC	1	
-TGSN	2	
-TGL1	7	
-TGL2	7	
-TGD	15	
-TGPL1	3	
-TGPL2	Not Present	R99 and Rel-4 only
-RPP	Mode 1	
-ITP	Mode 1	
-CHOICE UL/DL mode	UL only or UL and DL, depending on UE capability	
-Downlink compressed mode method	SF/2 or Not present depending on UE capability	
-Uplink compressed mode method	SF/2	
-Downlink frame type	A	
-DeltaSIR1	0	
-DeltaSIRafter1	0	
-DeltaSIR2	Not Present	
-DeltaSIRafter2	Not Present	
-N Identify abort	Not Present	
-T Reconfirm abort	Not Present	
-TX Diversity Mode	Not Present	
-SSDT information	Not Present	R99 and Rel-4 only
-Default DPCH Offset Value	Not Present	
-Downlink information per radio link list		
- Downlink information for each radio link		
-Choice mode	FDD	
-Primary CPICH info		
-Primary scrambling code	100	
-PDSCH with SHO DCH Info	Not Present	R99 and Rel-4 only
-PDSCH code mapping	Not Present	R99 and Rel-4 only
-Downlink DPCH info for each RL		
-CHOICE mode	FDD	
-Primary CPICH usage for channel estimation	Primary CPICH may be used	
-DPCH frame offset	Set to value Default DPCH Offset Value (as currently stored in SS) mod 38400	
-Secondary CPICH info	Not Present	
-DL channelisation code		
-Secondary scrambling code	Not Present	
-Spreading factor	128	
-Code number	96	
-Scrambling code change	No code change	
-TPC combination index	0	
-SSDT Cell Identity	Not Present	R99 and Rel-4 only
-Closed loop timing adjustment mode	Not Present	
-SCCPCH Information for FACH	Not Present	

Table 5.7.10: PHYSICAL CHANNEL RECONFIGURATION message (step 10)

Information Element	Value/Remark	Version
Message Type		
UE Information Elements -RRC transaction identifier -Integrity check info - message authentication code - RRC message sequence number -Integrity protection mode info -Ciphering mode info -Activation time -New U-RNTI -New C-RNTI -RRC State Indicator -UTRAN DRX cycle length coefficient	 0 SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. SS provides the value of this IE, from its internal counter. Not Present Not Present Not Present Not Present Not Present CELL_DCH Not Present	
CN Information Elements -CN Information info	 Not Present	
UTRAN mobility information elements -URA identity	 Not Present	
RB information elements -Downlink counter synchronisation info	 Not Present	
PhyCH information elements -Frequency info	 Not Present	
Uplink radio resources -Maximum allowed UL TX power -CHOICE channel requirement -Uplink DPCH power control info -CHOICE mode -DPCCH Power offset -PC Preamble -SRB delay -Power Control Algorithm -TPC step size -CHOICE mode -Scrambling code type -Scrambling code number -Number of DPDCH -spreading factor -TFCI existence -Number of FBI bits -Puncturing Limit Downlink radio resources -CHOICE mode -Downlink PDSCH information -Downlink information common for all radio links -Downlink DPCH info common for all RL -CHOICE mode -DPCH compressed mode info -Transmission gap pattern sequence -TGPSI -TGPS Status Flag -TGCFN -Transmission gap pattern sequence configuration parameters	 Not Present Uplink DPCH info FDD -40 (-80dB) 1 frame 7 frames Algorithm 1 1dB FDD Long 0 1 64 TRUE Not Present(0) 1 FDD Not Present Not Present FDD 1 Activate 7 	 R99 and Rel-4 only

Information Element	Value/Remark	Version
-TGMP	FDD measurement	
-TGPRC	1	
-TGSN	8	
-TGL1	14	
-TGL2	Not Present	
-TGD	UNDEFINED	
-TGPL1	4	
-TGPL2	Not Present	R99 and Rel-4 only
-RPP	Mode 0	
-ITP	Mode 0	
-CHOICE UL/DL mode	UL only or UL and DL, depending on UE capability	
-Downlink compressed mode method	SF/2 or Not present depending on UE capability	
-Uplink compressed mode method	SF/2	
-Downlink frame type	A	
-DeltaSIR1	0	
-DeltaSIRafter1	0	
-DeltaSIR2	Not Present	
-DeltaSIRafter2	Not Present	
-N Identify abort	Not Present	
-T Reconfirm abort	Not Present	
-TX Diversity Mode	Not Present	
-SSDT information	Not Present	R99 and Rel-4 only
-Default DPCH Offset Value	Not Present	
-Downlink information per radio link list		
- Downlink information for each radio link		
-Choice mode	FDD	
-Primary CPICH info		
-Primary scrambling code	100	
-PDSCH with SHO DCH Info	Not Present	R99 and Rel-4 only
-PDSCH code mapping	Not Present	R99 and Rel-4 only
-Downlink DPCH info for each RL		
-CHOICE mode	FDD	
-Primary CPICH usage for channel estimation	Primary CPICH may be used	
-DPCH frame offset	Set to value Default DPCH Offset Value (as currently stored in SS) mod 38400	
-Secondary CPICH info	Not Present	
-DL channelisation code		
-Secondary scrambling code	Not Present	
-Spreading factor	128	
-Code number	96	
-Scrambling code change	No code change	
-TPC combination index	0	
-SSDT Cell Identity	Not Present	R99 and Rel-4 only
-Closed loop timing adjustment mode	Not Present	
-SCCPCH Information for FACH	Not Present	

5.7.5 Test requirements

For ease of reference, the following uplink output power measurements are defined in figure 5.7.4. In this figure:

- P_g is the RRC filtered mean power in an uplink transmission gap, excluding the 25 μs transient periods.
- P_a is the mean power in the last slot before a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.
- P_b is the mean power in the first slot of a compressed frame, excluding the 25 μs transient periods.
- P_c is the mean power in the last slot before a transmission gap, excluding the 25 μs transient periods.

- P_d is the mean power in the first slot after a transmission gap, excluding the 25 µs transient periods.
- P_e is the mean power in the last slot of a compressed frame, excluding the 25 µs transient periods.
- P_f is the mean power in the first slot after a compressed frame (or pair of compressed frames), excluding the 25 µs transient periods.

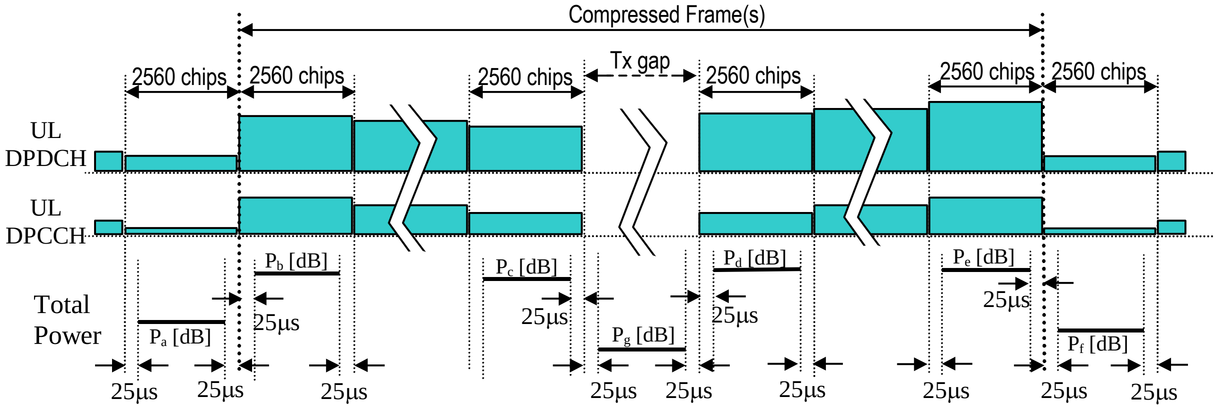


Figure 5.7.4: Uplink transmit power in uplink compressed mode

1. At the boundary between CFN 6 and CFN 7, $P_b - P_a$ shall be within the range +4 ± 2.3 dB.
2. In slot #9 of CFN 1, the power difference $P_d - P_c$ from the power in slot #1 of CFN 1 shall be within the range -11 ± 4.3 dB.
3. In slot #9 of CFN 4, the power difference $P_d - P_c$ from the power in slot #1 of CFN 4 shall be within the range +11 ± 4.3 dB.
4. In slot #7 of CFN 8, the power difference $P_d - P_c$ from the power in slot #7 of CFN 7 shall be within the range 0 ± 3.2 dB.
5. (void)
6. At the boundary between CFN 8 and CFN 9, $P_f - P_e$ shall be within the range -4 ± 2.3 dB.
7. In the slots between slot #10 of CFN 0 and slot #1 of CFN 1 inclusive, the change in mean power from the previous slot shall be within the range given in table 5.7. 11 for TPC_cmd = +1.
8. The aggregate change in mean power from slot #9 of CFN 0 to slot #1 of CFN 1 shall be within the range given in table 5.7. 12 for TPC_cmd = +1.
9. In the slots between slot #10 of CFN 3 and slot #1 of CFN 4 inclusive, the change in mean power from the previous slot shall be within the range given in table 5.7. 11 for TPC_cmd = -1.
10. The aggregate change in mean power from slot #9 of CFN 3 to slot #1 of CFN 4 shall be within the range given in table 5.7. 12 for TPC_cmd = -1.

Table 5.7.11: Transmitter power control range for 3dB step size

TPC_cmd	Transmitter power control range for 3dB step size	
	Lower	Upper
+1	+1,3 dB	+4,7 dB
0	–0,6 dB	+0,6 dB
–1	–1,3 dB	–4,7 dB

Table 5.7.12: Transmitter aggregate power control range for 3dB step size

TPC_cmd group	Transmitter power control range after 7 equal TPC_cmd groups	
	Lower	Upper
+1	+15,7dB	+26,3dB
0	−1,1dB	+1,1dB
−1	−15,7dB	−26,3dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.7A HS-DPCCH power control

5.7A.1 Definition and applicability

The transmission of Ack/Nack or CQI over the HS-DPCCH may cause the transmission power in the uplink to vary. The ratio of the amplitude between the DPCCH and the Ack/Nack and CQI respectively is signalled by higher layers.

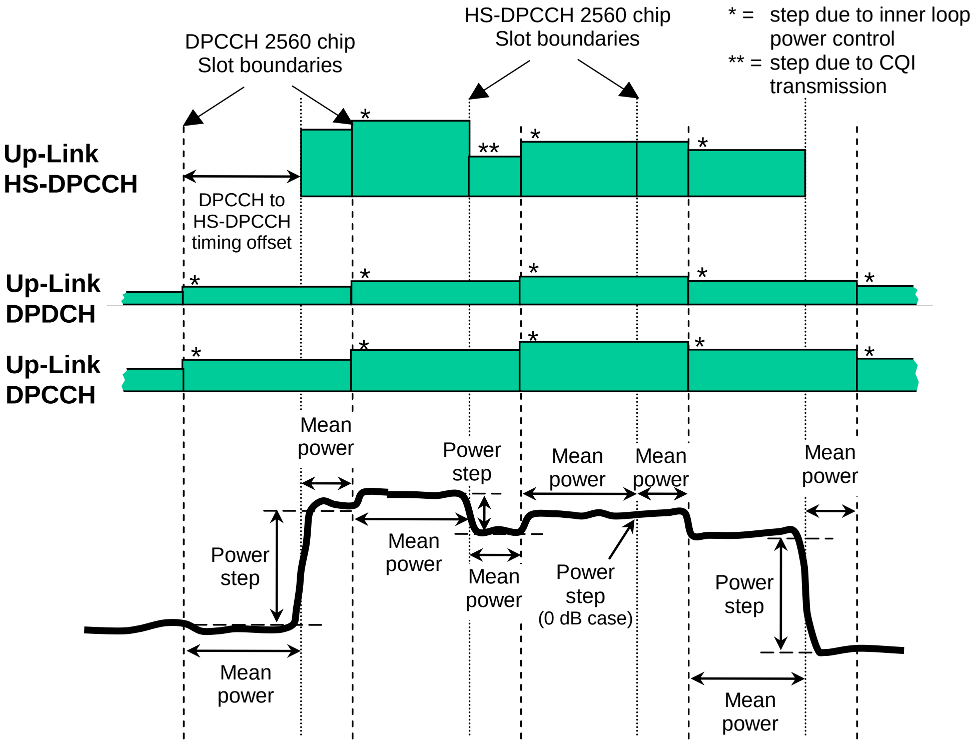
The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support HSDPA.

5.7A.2 Minimum requirement

The nominal sum power on DPCCH+DPDCH is independent of the transmission of Ack/Nack and CQI unless the UE output power when Ack/Nack or CQI is transmitted would exceed the maximum value specified in Table 5.2A.1 or fall below the value specified in 5.4.3.2, whereupon the UE may then also apply additional scaling to the total transmit power as defined in section 5.1.2.6 of TS.25.214 [5].

The composite transmitted power (DPCCH + DPDCH+HS-DPCCH) may then also be rounded to the closest integer dB value. If rounding is done a power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude.

The nominal power step due to transmission of Ack/Nack or CQI is defined as the difference between the nominal mean powers of two power evaluation periods either side of an HS-DPCCH boundary. The first evaluation period starts 25 μs after a DPCCH slot boundary and ends 25μs before the following HS-DPCCH slot boundary. The second evaluation period starts 25 μs after the same HS-DPCCH slot boundary and ends 25 μs before the following DPCCH slot boundary. This is described in figure 5.7A.1.



The power step due to HS-DPCCH transmission is the difference between the mean powers transmitted before and after an HS-DPCCH slot boundary. The mean power evaluation period excludes a 25µs period before and after any DPCCH or HS-DPCCH slot boundary.

Figure 5.7A.1: Transmit power template during HS-DPCCH transmission

The tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements in table 5.7A.1.

Table 5.7A.1: Transmitter power step tolerance

Power step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
0	±0.5
1	±0.5
2	±1.0
3	±1.5
4 ≤ ΔP ≤ 7	±2.0

The normative reference for this requirement is TS 25.101 [1], clause 6.5.5.1.

5.7A.3 Test purpose

To verify that the changes in uplink transmit power when transmitting the HS-DPCCH (Ack/Nack and CQI) and the power between HS-DPCCH transmissions are within the allowed power step tolerances as shown in table 5.7A.2 and 5.7A.3. The test is carried out at max power with TPC_cmd=1 and at a nominal power of 0 dBm at the minimum point of the 12ms transmit pattern (HS-DPCCH off).

5.7A.4 Method of test

5.7A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.7A.1A.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.7A.1A: Settings for the serving cell during the measurement of HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.7A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.7A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall initially specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, measured at the UE antenna connector when the HS-DPCCH is not transmitted, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

5) Figure 5.7A.2 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC_cmd=0. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7A.2. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 4, 8 and 11 are at the DPCCH slot boundaries just after and just before the HS-DPCCH transmission. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7A.2. The power steps shall meet the test requirements in table 5.7A.2.

6) Reconfigure the uplink DPCH power control Info to use Algorithm 1 with 1 dB step size. Set and send continuously Up power control commands to the UE until the UE output power during HS-DPCCH ACK/NACK transmission reaches the maximum as defined in table 5.2A.1.

7) Figure 5.7A.3 shows the 12ms cycle created when using TPC_cmd=1. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7A.3. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 5, 10 and 13 are at the DPCCH slot boundaries in between the HS-DPCCH transmissions. The last downward step prior to the HS-DPCCH transmission is not tested due to the accumulation of tolerances making the test requirement very wide. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7A.3. The transmitter power steps shall meet the test requirements in table 5.7A.3.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

Information Element	Value/remark
- Ack-Nack repetition factor	1
- CQI repetition factor	1

5.7A.5 Test requirements

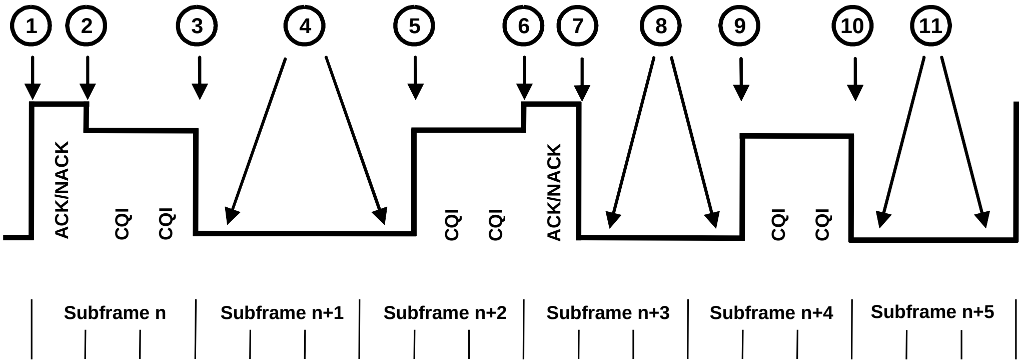


Figure 5.7A.2: Transmit power template below max power with TPC_cmd = 0

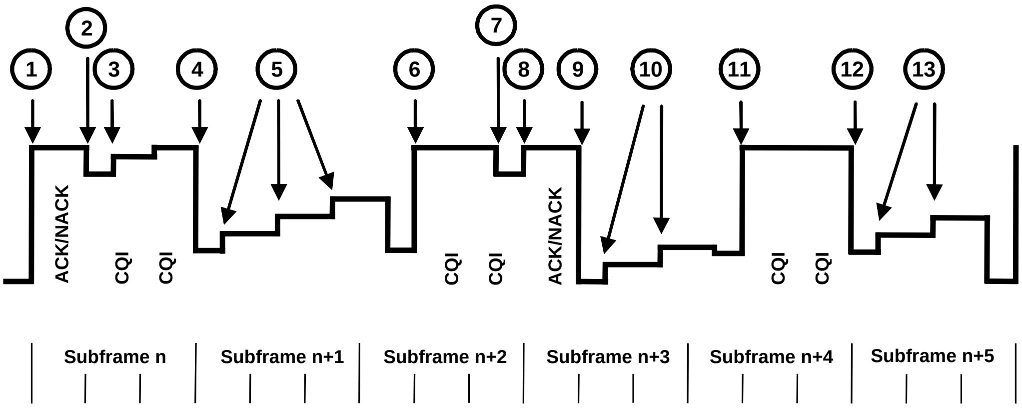


Figure 5.7A.3: Transmit power template at max power with TPC_cmd = 1

The difference in mean power derived in steps 5) and 7), shall not exceed the allowed transmitter power step range in table 5.7A.2 and 5.7A.3 respectively.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4 sub-test 3.

Table 5.7A.2: Transmitter power test requirements for TPC_cmd=0

Sub-test in table C.10.1.4	Power step	Nominal Power step size, ΔP [dB]	Rounded Power step size, ΔP [dB]	Transmitter power step Tolerance [dB]	Allowed Transmitter power step range [dB]
3	1	6.14	6	+/- 2.3	3.7 to 8.44
	2	-1.38	-1	+/- 0.6	-1.98 to -0.4
	3	-4.76	-5	+/- 2.3	-7.3 to -2.46
	4[1]	0	0	+/- 0.6	-0.6 to 0.6
	5	4.76	5	+/- 2.3	2.46 to 7.3
	6	1.38	1	+/- 0.6	0.4 to 1.98
	7	-6.14	-6	+/- 2.3	-8.44 to -3.7
	8[1]	0	0	+/- 0.6	-0.6 to 0.6
	9	4.76	5	+/- 2.3	2.46 to 7.3
	10	-4.76	-5	+/- 2.3	-7.3 to -2.46
	11[1]	0	0	+/- 0.6	-0.6 to 0.6
NOTE 1: Two test points.					

Table 5.7A.3: Transmitter power test requirements for TPC_cmd=1

Sub-test in table C.10.1.4	Power step	Nominal Power step size, ΔP [dB]	Rounded Power step size, ΔP [dB]	Transmitter power step Tolerance [dB]	Allowed Transmitter power step range [dB]
3	1	6.14	6	+/- 2.3	3.7 to 8.44
	2	-1.38	-1	+/- 0.6	-1.98 to -0.4
	3[3]	No requirements	No requirements	NA	No requirements
	4	-4.76	-5	+/- 2.3	-7.3 to -2.46
	5[1]	1	1	+/- 0.6	0.4 to 1.6
	6	4.76	5	+/- 2.3	2.46 to 7.3
	7[3]	No Requirements	No requirements	NA	No requirements
	8	1.38	1	+/- 0.6	0.40 to 1.98
	9	-6.14	-6	+/- 2.3	-8.44 to -3.7
	10[2]	1	1	+/- 0.6	0.4 to 1.6
	11	4.76	5	+/- 2.3	2.46 to 7.3
	12	-4.76	-5	+/- 2.3	-7.3 to -2.46
	13[2]	1	1	+/- 0.6	0.4 to 1.6
NOTE 1: Three test points. NOTE 2: Two test points. NOTE 3: In these test points rel-6 UE performs additional power scaling due to changes in allowed MPR, and therefore there are no requirements specified for transmitter power steps.					

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.8 Occupied Bandwidth (OBW)

5.8.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred on the assigned channel frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.8.2 Minimum Requirements

The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1.

5.8.3 Test purpose

To verify that the UE occupied channel bandwidth is less than 5 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

5.8.4 Method of test

5.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.8.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring on the current carrier frequency with 30 kHz or less RBW. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).

3) Calculate the total power within the range of all frequencies measured in '2)' and save this value as "Total Power".

4) Sum up the power upward from the lower boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Lower Frequency".

5) Sum up the power downward from the upper boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".

6) Calculate the difference ("Upper Frequency" - "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

5.8.5 Test Requirements

The measured Occupied Bandwidth, derived in step 6), shall not exceed 5 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.8A Occupied Bandwidth (OBW) for DC-HSUPA

5.8A.1 Definition and applicability

In the case dual adjacent carriers are assigned in the uplink, occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred at the centre of the assigned channel frequencies.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.8A.2 Minimum Requirements

The occupied channel bandwidth shall be less than 10 MHz on a chip rate of 3.84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1A.

5.8A.3 Test purpose

To verify that the DC-HSUPA UE occupied channel bandwidth is less than 10 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

5.8A.4 Method of test

5.8A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14 with the exceptions in the RADIO BEARER SETUP message given in Tables 5.2BA.2, 5.2BA.3, 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1. and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.8A.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.8A: Settings for the serving cell during the measurement of Occupied Bandwidth for with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.8A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.8A.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within ± 1.7 dB and the total output power of the UE to be at least 7.5dB lower than the maximum output power. Wait 150ms.

4) Set and send continuously Up power control commands to both carriers to the UE and wait 150ms.

5) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring between the two carrier frequencies with 30 kHz or less RBW. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).

6) Calculate the total power of the two carriers within the range of all frequencies measured in '2)' and save this value as "Total Power".

7) Sum up the power upward from the lower boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" of the two carriers and save this point as "Lower Frequency".

8) Sum up the power downward from the upper boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".

9) Calculate the difference ("Upper Frequency" – "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

5.8A.5 Test Requirements

The measured Occupied Bandwidth, derived in step 6), shall not exceed 10 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.9 Spectrum emission mask

5.9.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.9.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of β_c, β_d as specified in [5].

Table 5.9.1: Spectrum Emission Mask Requirement

Δf in MHz (Note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-71.1 dBm	30 kHz (note 3)
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-55.8 dBm	1 MHz (note 4)
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-55.8 dBm	1 MHz (note 4)
8.5 - 12.5 MHz	-49 dBc	-55.8 dBm	1 MHz (note 4)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth. NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power. NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.			

For operation in band II, IV, V, X, XII, XIII,XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9.1 or the applicable additional requirement in Tables 5.9.1A, 5.9.1B or 5.9.1C, whichever is the tighter requirement.

Table 5.9.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	4.0MHz ≤ f_offset < 12.0 MHz	-13 dBm	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9.1B: Additional spectrum emission limits for Band V and XXVI

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	3.55MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band XII, XIII, XIV	Measurement bandwidth
2.5 MHz ≤ Δf < 2.6 MHz	2.515MHz ≤ f_offset < 2.585MHz	-13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9.1, 5.9.1A, 5.9.1B and 5.9.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1.1.

5.9.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9.1.

Excess emission increases the interference to other channels or to other systems.

5.9.4 Method of test

5.9.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.9.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9.2 and 5.9.2A, 5.9.2B, 5.9.2C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9.2. The measured power shall be recorded for each step.
3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5.9.5 Test requirements

The result of clause 5.9.4.2 step 4) shall fulfil the requirements of table 5.9.2.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9.2 and the applicable additional requirement in Tables 5.9.2A, 5.9.2B, or 5.9.2C need to be satisfied.

Table 5.9.2: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2.5 - 3.5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-69.6 dBm	30 kHz (note 3)
3.5 - 7.5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-54.3 dBm	1 MHz (note 4)
7.5 - 8.5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-54.3 dBm	1 MHz (note 4)
8.5 - 12.5 MHz	-47.5 dBc	-54.3 dBm	1 MHz (note 4)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth. NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power. NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.			

Table 5.9.2A: Additional spectrum emission limits for Bands II, IV, X, XXV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	4.0MHz ≤ f_offset < 12.0 MHz	-13 dBm	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9.2B: Additional spectrum emission limits for Band V and XXVI

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	3.55MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9.2C: Additional spectrum emission limits for Bands XII, XIII and XIV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band XII, XIII, XIV	Measurement bandwidth
2.5 MHz ≤ Δf < 2.6 MHz	2.515MHz ≤ f_offset < 2.585MHz	-13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.9A Spectrum Emission Mask with HS-DPCCH

5.9A.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support HSDPA.

5.9A.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9A.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of β_c, β_d, β_{hs} as specified in [5].

Table 5.9A.1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-71.1 dBm	30 kHz (note 3)
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-55.8 dBm	1 MHz (note 4)
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-55.8 dBm	1 MHz (note 4)
8.5 - 12.5 MHz	-49 dBc	-55.8 dBm	1 MHz (note 4)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth. NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power. NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.			

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9A.1 or the applicable additional requirement in Tables 5.9A.1A, 5.9A.1B or 5.9A.1C, whichever is the tighter requirement.

Table 5.9A.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	4.0MHz ≤ f_offset < 12.0 MHz	-13 dBm	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9A.1B: Additional spectrum emission limits for Bands V and XXVI

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	3.55MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9A.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band XII, XIII, XIV	Measurement bandwidth
2.5 MHz ≤ Δf < 2.6 MHz	2.515MHz ≤ f_offset < 2.585MHz	-13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9A.1, 5.9A.1A, 5.9A.1B and 5.9A.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1.1.

5.9A.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9A.1. even in the presence of the HS-DPCCH. (see note). This is applicable for all values of β_c , β_d and β_{hs} as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9A.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

5.9A.4 Method of test

5.9A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.
3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.9A.2.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.9A.2: Settings for the serving cell during the measurement of Spectrum Emission Mask with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.9A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.		

5.9A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9A.3 and 5.9A.3A, 5.9A.3B, 5.9A.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9A.3 and 5.9A.3A, 5.9A.3B, 5.9A.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency.

6) Calculate the ratio of the power 4) with respect to 5) in dBc.

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

5.9A.5 Test requirements

The result of clause 5.9A.4.2 step 6) shall fulfil the requirements of table 5.9A.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9A.3 and the applicable additional requirement in Tables 5.9A.3A, 5.9A.3B, or 5.9A.3C need to be satisfied.

Table 5.9A.3: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2.5 - 3.5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-69.6 dBm	30 kHz (note 3)
3.5 - 7.5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-54.3 dBm	1 MHz (note 4)
7.5 - 8.5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-54.3 dBm	1 MHz (note 4)
8.5 - 12.5 MHz	-47.5 dBc	-54.3 dBm	1 MHz (note 4)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth. NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power. NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.			

Table 5.9A.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	4.0MHz ≤ f_offset < 12.0 MHz	-13 dBm	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9A.3B: Additional spectrum emission limits for Bands V and XXVI

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	3.55MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9A.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band XII, XIII, XIV	Measurement bandwidth
2.5 MHz ≤ Δf < 2.6 MHz	2.515MHz ≤ f_offset < 2.585MHz	-13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.9B Spectrum Emission Mask with E-DCH

5.9B.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

5.9B.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9B.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. This is applicable for all values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} as specified in [5].

Table 5.9B.1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-71.1 dBm	30 kHz (note 3)
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-55.8 dBm	1 MHz (note 4)
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-55.8 dBm	1 MHz (note 4)
8.5 - 12.5 MHz	-49 dBc	-55.8 dBm	1 MHz (note 4)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth. NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power. NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.			

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9B.1 or the applicable additional requirement in Tables 5.9B.1A, 5.9B.1B or 5.9B.1C, whichever is the tighter requirement.

Table 5.9B.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	4.0MHz ≤ f_offset < 12.0 MHz	-13 dBm	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9B.1B: Additional spectrum emission limits for Bands V and XXVI

Δf in MHz (note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	3.55MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9B.1C: Additional spectrum emission limits for Bands XII, XIII, XIV

Δf in MHz (Note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band XII, XIII, XIV	Measurement bandwidth
2.5 MHz ≤ Δf < 2.6 MHz	2.515MHz ≤ f_offset < 2.585MHz	-13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9B.1, 5.9B.1A, 5.9B.1B and 5.9B.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1.1.

5.9B.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9B.1. even in the presence of the E-DCH. (see note). This is applicable for all values of β_c, β_d , β_{hs}, β_{ec} and β_{ed} as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9B.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

5.9B.4 Method of test

5.9B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.9B.2.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test. For sub-test 5, enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.9.3.2 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.9B.2: Settings for the serving cell during the measurement of Spectrum Emission Mask with E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.9B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.9B.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8. For sub-test 5, set UE to maximum output power according to 5.2B.4.2.2 step 1 to 4.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9B.3 and 5.9B.3A, 5.9B.3B, 5.9B.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9B.3 and 5.9B.3A, 5.9B.3B 5.9B.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1.3.

5.9B.5 Test requirements

The result of clause 5.9B.4.2 step 4) shall fulfil the requirements of table 5.9B.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9B.3 and the applicable additional requirement in Tables 5.9B.3A, 5.9B.3B or 5.9B.3C need to be satisfied.

Table 5.9B.3: Spectrum Emission Mask Requirement

Δf in MHz (Note 1)	Minimum requirement (Note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2.5 - 3.5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-69.6 dBm	30 kHz (Note 3)
3.5 - 7.5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-54.3 dBm	1 MHz (Note 4)
7.5 - 8.5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-54.3 dBm	1 MHz (Note 4)
8.5 - 12.5 MHz	-47.5 dBc	-54.3 dBm	1 MHz (Note 4)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth. NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power. NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.			

Table 5.9B.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

Δf in MHz (Note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	4.0MHz ≤ f_offset < 12.0 MHz	-13 dBm	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9B.3B: Additional spectrum emission limits for Bands V and XXVI

Δf in MHz (Note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δf < 3.5 MHz	2.515MHz ≤ f_offset < 3.485MHz	-15 dBm	30 kHz
3.5 MHz ≤ Δf ≤ 12.5 MHz	3.55MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

Table 5.9B.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

Δf in MHz (Note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band XII, XIII, XIV	Measurement bandwidth
2.5 MHz ≤ Δf < 2.6 MHz	2.515MHz ≤ f_offset < 2.585MHz	-13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65MHz ≤ f_offset < 12.45 MHz	-13 dBm	100 kHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.9C Additional Spectrum Emission Mask for DC-HSUPA (QPSK)

5.9C.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 5 MHz and 20 MHz away from the UE centre frequency of the two assigned channel frequencies. The requirements assume that the UE output power shall be maximum level.

It is necessary to verify the requirements only for the DC-HSUPA configurations specified in subclause C.2.8.The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.9C.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9C.1 for the specified channel bandwidth.

Table 5.9C.1: Spectrum emission mask for DC-HSUPA

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-18	30 kHz
± 6-10	6.5MHz ≤ f_offset < 10.0MHz	-10	1 MHz
± 10-19	10.0MHz ≤ f_offset < 19.0MHz	-13	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-25	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

The UE shall meet an additional requirement specified in Table 5.9C.1A for band II, IV, V and X.

Table 5.9C.1A: Additional spectrum emission mask for DC-HSUPA in band II, IV, V, X, XXV and XXVI

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-18	30 kHz
± 6-19	6.5MHz ≤ f_offset < 19.0MHz	-13	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-25	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1A

5.9C.3 Test purpose

To verify that the power of UE emission, during DC-HSUPA transmission, does not exceed the prescribed limits shown in table 5.9C.1 or 5.9C.1A. This is applicable for all values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BA.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

5.9C.4 Method of test

5.9C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.
3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with exceptions for information elements in RADIO BEARER SETUP message as given in Table 5.2BA.2, 5.2BA.3 and 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to E.5 A.1A. Settings for the serving cell are defined in table 5.9C.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.9C.2: Settings for the serving cell during the measurement of Spectrum Emission Mask for DC-HSUPA

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.9C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.9C.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4.
2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9C.1 and 5.9C.1A. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9C.1 and 5.9C.1A. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.
3) Repeat steps 1-2 for all the different combinations of UL E-DCH reference measusrement channels and of beta values as given in clause C.2.8 and table C.11A.1.1.

5.9C.5 Test requirements

The result of clause 5.9C.4.2 step 2) shall fulfil the requirements of table 5.9C.3.

For operation in band II, IV, V and X both minimum requirement in table 5.9C.3 and the applicable additional requirement in Tables 5.9C.3A need to be satisfied.

Table 5.9C.3: Spectrum Emission Mask Requirement

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-16.5	30 kHz
± 6-10	6.5MHz ≤ f_offset < 10.0MHz	-8.5	1 MHz
± 10-19	10.0MHz ≤ f_offset < 19.0MHz	-11.5	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-23.5	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

Table 5.9C.3A: Additional spectrum emission limits for Bands II, IV, V, X, XXV and XXVI

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-18	30 kHz
± 6-19	6.5MHz ≤ f_offset < 19.0MHz	-13	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-25	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.9D Additional Spectrum Emission Mask for DC-HSUPA (16QAM)

5.9D.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 5 MHz and 20 MHz away from the UE centre frequency of the two assigned channel frequencies. The requirements assume that the UE output power shall be maximum level.

It is necessary to verify the requirements only for the DC-HSUPA configurations specified in subclause C.2.8.The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH 16QAM UE capability category 9.

5.9D.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9D.1 for the specified channel bandwidth.

Table 5.9D.1: Spectrum emission mask for DC-HSUPA

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-18	30 kHz
± 6-10	6.5MHz ≤ f_offset < 10.0MHz	-10	1 MHz
± 10-19	10.0MHz ≤ f_offset < 19.0MHz	-13	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-25	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

The UE shall meet an additional requirement specified in Table 5.9D.1A for band II, IV, V and X.

Table 5.9D.1A: Additional spectrum emission mask for DC-HSUPA in band II, IV, V, X, XXV and XXVI

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-18	30 kHz
± 6-19	6.5MHz ≤ f_offset < 19.0MHz	-13	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-25	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1A

5.9D.3 Test purpose

To verify that the power of UE emission, during DC-HSUPA transmission, does not exceed the prescribed limits shown in table 5.9D.1 or 5.9D.1A. This is applicable for all values of β_c, β_d , β_{hs}, β_{ec} and β_{ed} as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BA.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

5.9D.4 Method of test

5.9D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with exceptions for information elements in RADIO BEARER SETUP message as given in Table 5.2BA.2, 5. 2BA.3 and 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to E.5 A.1A. Settings for the serving cell are defined in table 5.9D.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.9D.2: Settings for the serving cell during the measurement of Spectrum Emission Mask for DC-HSUPA

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.9D.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.9D.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9D.1 and 5.9D.1A. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9D.1 and 5.9D.1A. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Repeat steps 1-2 for all the different combinations of UL E-DCH reference measurement channels and of beta values as given in clause C.2.8 and table C.11A.1.2.

5.9D.5 Test requirements

The result of clause 5.9D.4.2 step 2) shall fulfil the requirements of table 5.9D.3.

For operation in band II, IV, V and X both minimum requirement in table 5.9D.3 and the applicable additional requirement in Tables 5.9D.3A need to be satisfied.

Table 5.9D.3: Spectrum Emission Mask Requirement

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-16.5	30 kHz
± 6-10	6.5MHz ≤ f_offset < 10.0MHz	-8.5	1 MHz
± 10-19	10.0MHz ≤ f_offset < 19.0MHz	-11.5	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-23.5	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

Table 5.9D.3A: Additional spectrum emission limits for Bands II, IV, V, X, XXV and XXVI

Δf (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Spectrum emission limit (dBm)	Measurement bandwidth
± 5-6	5.015MHz ≤ f_offset < 5.985MHz	-18	30 kHz
± 6-19	6.5MHz ≤ f_offset < 19.0MHz	-13	1 MHz
± 19-20	19.0MHz ≤ f_offset < 19.5MHz	-25	1 MHz
Note: Δf is the separation between the the center of two assigned channel frequencies and the centre of the measurement bandwidth			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.10 Adjacent Channel Leakage Power Ratio (ACLR)

5.10.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.10.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in table 5.10.1.

Table 5.10.1: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	33 dB
3	+10 MHz or –10 MHz	43 dB
4	+5 MHz or –5 MHz	33 dB
4	+10 MHz or –10 MHz	43 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

5.10.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10.1.

Excess ACLR increases the interference to other channels or to other systems.

5.10.4 Method of test

5.10.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.10.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the RRC filtered mean power.
3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
4) Calculate the ratio of the power between the values measured in '2)'and '3)'.

5.10.5 Test requirements

If the measured adjacent channel RRC filtered mean power, derived in step 3), is greater than –50,0 dBm then the measured ACLR, derived in step 4), shall be higher than the limit in table 5.10.2.

Table 5.10.2: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	32,2 dB
3	+10 MHz or –10 MHz	42,2 dB
4	+5 MHz or –5 MHz	32,2 dB
4	+10 MHz or –10 MHz	42,2 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.10A Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

5.10A.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support HSDPA.

5.10A.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in table 5.10A.1. This is applicable for all values of β_c, β_d and β_{hs} as specified in [5].

Table 5.10A.1: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	33 dB
3	+10 MHz or –10 MHz	43 dB
4	+5 MHz or –5 MHz	33 dB
4	+10 MHz or –10 MHz	43 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

5.10A.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10A.1. This is applicable for all values of β_c, β_d and β_{hs} as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess ACLR increases the interference to other channels or to other systems.

5.10A.4 Method of test

5.10A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.
3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.10A.2.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.10A.2: Settings for the serving cell during the measurement of Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.10A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.10A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.
2) Set and send continuously Up power control commands to the UE.
3) Start transmitting HSDPA Data.
4) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.
5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
6) Calculate the ratio of the power between the values measured in step 4) and step 5).
7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

5.10A.5 Test requirements

The measured ACLR, derived in step 6), shall be higher than the limit in table 5.10A.3.

Table 5.10A.3: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	32.2 dB
3	+10 MHz or –10 MHz	42.2 dB
4	+5 MHz or –5 MHz	32.2 dB
4	+10 MHz or –10 MHz	42.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.10B Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

5.10B.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

5.10B.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in table 5.10B.1. This is applicable for all values of β_c, β_d , β_{hs}, β_{ec} and β_{ed} as specified in [5].

Table 5.10B.1: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	33 dB
3	+10 MHz or –10 MHz	43 dB
4	+5 MHz or –5 MHz	33 dB
4	+10 MHz or –10 MHz	43 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

5.10B.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10B.1. This is applicable for all values of β_c, β_d , β_{hs}, β_{ec} and β_{ed} as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess ACLR increases the interference to other channels or to other systems.

5.10B.4 Method of test

5.10B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.10B.1A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test. For sub-test 5, enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.9.3.2 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10B.1A: Settings for the serving cell during the measurement of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.10B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.10B.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8. For sub-test 5, set UE to maximum output power according to 5.2B.4.2.2 step 1 to 4.

2) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1.3.

5.10B.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10B.2.

Table 5.10B.2: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	32.2 dB
3	+10 MHz or –10 MHz	42.2 dB
4	+5 MHz or –5 MHz	32.2 dB
4	+10 MHz or –10 MHz	42.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause

5.10C Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for DC-HSUPA (QPSK)

5.10C.1 Definition and applicability

In the case dual adjacent carriers are assigned on the uplink, ACLR is the ratio of the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.10C.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in table 5.10C.1. This is applicable for all values of β_c, β_{hs}, β_{ec} and β_{ed} as specified in [5]. However, it is necessary to verify the requirements only for the DC-HSUPA configurations in subclause C.2.8.

Table 5.10C.1: UE ACLR for DC-HSUPA

Power Class	Adjacent channel frequency relative to the centre of two assigned channel frequencies	ACLR limit
3	+ 7.5 MHz or - 7.5 MHz	33 dB
3	+ 12.5 MHz or - 12.5 MHz	36 dB
4	+ 7.5 MHz or - 7.5 MHz	33 dB
4	+ 12.5 MHz or -12.5 MHz	36 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1A.

5.10C.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10C.1. This is applicable for all values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} as specified in [5].

Excess ACLR increases the interference to other channels or to other systems.

5.10C.4 Method of test

5.10C.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BA.2, 5.2BA.3, 5.2BA4 and 5.2BA.5. These exceptions allow the beta values to be set according to table C.11A.1.1, table C.11A.1.2 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.10C.2.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10C.2: Settings for the serving cell during the measurement of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.10C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.10C.4.2 Procedure

1) Set UE to maximum output power according to 5.2BA.4.2 step 1 to 4.

2) Measure the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11A.1.1.

5.10C.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10C.3.

Table 5.10C.3: UE ACLR for DC-HSUPA

Power Class	Adjacent channel frequency relative to the centre of two assigned channel frequencies	ACLR limit
3	+ 7.5 MHz or - 7.5 MHz	32.2 dB
3	+ 12.5 MHz or - 12.5 MHz	35.2 dB
4	+ 7.5 MHz or - 7.5 MHz	32.2 dB
4	+ 12.5 MHz or -12.5 MHz	35.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause

5.10D Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for DC-HSUPA (16QAM)

5.10D.1 Definition and applicability

In the case dual adjacent carriers are assigned on the uplink, ACLR is the ratio of the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH 16QAM UE capability category 9.

5.10D.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in table 5.10D.1. This is applicable for all values of β_c, β_{hs}, β_{ec} and β_{ed} as specified in [5]. However, it is necessary to verify the requirements only for the DC-HSUPA configurations in subclause C.2.8.

Table 5.10D.1: UE ACLR for DC-HSUPA

Power Class	Adjacent channel frequency relative to the centre of two assigned channel frequencies	ACLR limit
3	+ 7.5 MHz or - 7.5 MHz	33 dB
3	+ 12.5 MHz or - 12.5 MHz	36 dB
4	+ 7.5 MHz or - 7.5 MHz	33 dB
4	+ 12.5 MHz or -12.5 MHz	36 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1A.

5.10D.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10D.1. This is applicable for all values of β_c, β_d , β_{hs}, β_{ec} and β_{ed} as specified in [5].

Excess ACLR increases the interference to other channels or to other systems.

5.10D.4 Method of test

5.10D.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BA.2, 5.2BA.3, 5.2BA4 and 5.2BA.5. These exceptions allow the beta values to

be set according to table C.11A.1.1, table C.11A.1.2 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.10D.2.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10D.2: Settings for the serving cell during the measurement of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.10D.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.10D.4.2 Procedure

1) Set UE to maximum output power according to 5.2BA.4.2 step 1 to 4.

2) Measure the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11A.1.2.

5.10D.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10D.3.

Table 5.10D.3: UE ACLR for DC-HSUPA

Power Class	Adjacent channel frequency relative to the centre of two assigned channel frequencies	ACLR limit
3	+ 7.5 MHz or - 7.5 MHz	32.2 dB
3	+ 12.5 MHz or - 12.5 MHz	35.2 dB
4	+ 7.5 MHz or - 7.5 MHz	32.2 dB
4	+ 12.5 MHz or -12.5 MHz	35.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause.

5.11 Spurious Emissions

5.11.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.11.2 Minimum Requirements

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 5.11.1a: General spurious emissions requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement	Note
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm	
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm	
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm	
1 GHz ≤ f < 12,75 GHz	1 MHz	–30 dBm	
12.75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	–30 dBm	Note 1
NOTE 1: Applies only for Band XXII.			

Table 5.11.1b: Additional spurious emissions requirements

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz < f <1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
II	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 758 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
III	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
IV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
V	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	859 MHz ≤ f ≤ 869 MHz	1 MHz	-27 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VI	860 MHz ≤ f < 875 MHz	1 MHz	-37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤ 1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3.84 MHz	-79 dBm (see note 1) -60 dBm
	1805 MHz < f ≤ 1830 MHz	100 kHz 3.84 MHz	-71 dBm (see notes 1 and 2) -60 dBm (see note 2)
	1830 MHz < f ≤ 1880 MHz	100 kHz 3.84 MHz	-71 dBm (see note 1) -60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2585 MHz ≤ f ≤ 2640 MHz	3.84 MHz	-60 dBm
	2640 MHz < f ≤ 2690 MHz	3.84 MHz	-60 dBm (see note 2)
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
X	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤ 1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	763 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 3)
	793 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 3)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	759 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 3)
	799 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 3)
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIX	860 MHz ≤ f < 875 MHz	1 MHz	-37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
XX	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
XXI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	1 MHz	-35 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XXII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1880 MHz ≤ f ≤ 1920 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2300 MHz ≤ f ≤ 2400 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
	3510 MHz ≤ f ≤ 3525 MHz	1 MHz	-40 dBm
	3525 MHz ≤ f ≤ 3590 MHz	1 MHz	-50 dBm
	3600 MHz ≤ f ≤ 3800 MHz	3.84 MHz	-50 dBm
XXV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm
	3510 MHz ≤ f ≤ 3590 MHz	3.84 MHz	-60 dBm
	3400 MHz ≤ f ≤ 3800 MHz	1 MHz	-50 dBm (see note 2)
XXVI	703 MHz ≤ f ≤ 729 MHz	1 MHz	-50 dBm
	729 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	768 MHz ≤ f ≤ 799 MHz	1 MHz	-50 dBm
	799 MHz ≤ f ≤ 803 MHz	1 MHz	-40 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	1 MHz	-50 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤f ≤1919.6 MHz	300 kHz	-41 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-50 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2300 MHz ≤ f ≤ 2400 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm(see note 2)
	3400 MHz ≤ f ≤3800 MHz	1 MHz	-50 dBm

<table>
<tr><th>Operating Band</th><th>Frequency Bandwidth</th><th>Measurement Bandwidth</th><th>Minimum requirement</th></tr>
<tr><td colspan="4">NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement.
NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement due to 2nd or 3rd harmonic spurious emissions.
NOTE 3: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.
NOTE 4: The frequency bandwidth protection 2585-2690 MHz test requirement for Bands I, III, and VIII deviates from the requirement in TS 25.101 [1] Rel-8 and earlier releases. The present document reflects the frequency bandwidth specified in the EN 301 908-2 [Ref.] which became a mandatory requirement after these earlier TS 25.101 releases were frozen.</td></tr>
</table>

NOTE: The applicability of each line in Table 5.11.1b for UEs of different releases is defined in TS 25.101 [1].

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1.

5.11.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11.1a and table 5.11.1b.

Excess spurious emissions increase the interference to other systems.

5.11.4 Method of test

5.11.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.8.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.11.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11.2a and 5.11.2b.

These requirements are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 5.11.2a: General spurious emissions test requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement	Note
9 kHz ≤ f < 150 kHz	1 kHz	−36 dBm	
150 kHz ≤ f < 30 MHz	10 kHz	−36 dBm	
30 MHz ≤ f < 1 000 MHz	100 kHz	−36 dBm	
1 GHz ≤ f < 12,75 GHz	1 MHz	−30 dBm	
12.75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	−30 dBm	Note 1
NOTE 1: Applies only for Band XXII.			

Table 5.11.2b: Additional spurious emissions test requirements

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz < f < 1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
II	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 758 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2155 MHz	3.84 MHz	-60 dBm (see note 3)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm (see note 4)
III	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
IV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	2110 MHz ≤ f ≤ 2155 MHz	3.84 MHz	-60 dBm (see note 3)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm (see note 4)
V	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	859 MHz ≤ f ≤ 869 MHz	1 MHz	-27 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2155 MHz	3.84 MHz	-60 dBm (see note 3)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm (see note 4)
VI	860 MHz ≤ f < 875 MHz	1 MHz	-37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤ 1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3.84 MHz	-79 dBm (see note 1) -60 dBm
	1805 MHz < f ≤ 1830 MHz	100 kHz 3.84 MHz	-71 dBm (see notes 1 and 2) -60 dBm (see note 2)
	1830 MHz < f ≤ 1880 MHz	100 kHz 3.84 MHz	-71 dBm (see note1) -60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2585 MHz ≤ f ≤ 2640 MHz	3.84 MHz	-60 dBm
	2640 MHz < f ≤ 2690 MHz	3.84 MHz	-60 dBm (see note 2)
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
X	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤ 1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	763 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 6)
	793 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 6)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	769 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 6)
	799 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 6)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIX	860 MHz ≤ f < 875 MHz	1 MHz	-37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XX	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
XXI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	1 MHz	-35 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XXII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1880 MHz ≤ f ≤ 1920 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2300 MHz ≤ f ≤ 2400 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
	3510 MHz ≤ f ≤ 3525 MHz	1 MHz	-40 dBm
	3525 MHz ≤ f ≤ 3590 MHz	1 MHz	-50 dBm
	3600 MHz ≤ f ≤ 3800 MHz	3.84 MHz	-50 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
XXV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm
	3510 MHz ≤ f ≤ 3590 MHz	3.84 MHz	-60 dBm
	3400 MHz ≤ f ≤ 3800 MHz	1 MHz	-50 dBm (see note 2)
XXVI	703 MHz ≤ f ≤ 729 MHz	1 MHz	-50 dBm
	729 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	768 MHz ≤ f ≤ 799 MHz	1 MHz	-50 dBm
	799 MHz ≤ f ≤ 803 MHz	1 MHz	-40 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	1 MHz	-50 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1919.6 MHz	300 kHz	-41 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-50 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2300 MHz ≤ f ≤ 2400 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm (see note 2)
	3400 MHz ≤ f ≤3800 MHz	1 MHz	-50 dBm

NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.2a are permitted for each UARFCN used in the measurement.

NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.2a are permitted for each UARFCN used in the measurement due to 2nd or 3rd harmonic spurious emissions. Exception is allowed if bandwidth of the harmonic signal and measurement bandwidth are totally or partially overlapping.
- Bandwidth for 2nd harmonic = 2 x 5 MHz.
- Bandwidth for 3rd harmonic = 3 x 5 MHz.

NOTE 3: For UEs that conform to Release 6 and support Band II, IV or V shall support the defined frequency bandwidth.

NOTE 4: For UEs that conform to Release 7 and later releases and support Band II, IV or V shall support the defined frequency bandwidth.

NOTE 5: The applicability of each line in Table 5.11.2b for UEs of different releases is defined in TS 25.101 [1].

NOTE 6: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.

NOTE 7: The frequency bandwidth protection 2585-2690 MHz test requirement for Bands I, III, and VIII deviates from the requirement in TS 25.101 [1] Rel-8 and earlier releases. The present document reflects the frequency bandwidth specified in the European Harmonized Standard EN 301 908-2 [Ref.] which became a mandatory requirement after these earlier TS 25.101 releases were frozen.

NOTE: The applicability of each line in Table 5.11.2b for UEs of different releases is defined in TS 25.101 [1].

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.2a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.11A Spurious Emissions for DC-HSUPA

5.11A.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.11A.2 Minimum Requirements

These requirements are only applicable for frequencies, which are greater than 20 MHz away from the centre of the assigned carrier frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.1: General spurious emissions requirements for DC-HSUPA

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement	Note
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm	
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm	
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm	
1 GHz ≤ f < 12,75 GHz	1 MHz	–30 dBm	
12.75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	–30 dBm	Note 1
NOTE 1: Applies only for Band XXII.			

The requirements in Table 5.11A.2 are only applicable for frequencies, which are greater than 25 MHz away from the centre of the assigned frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.2: Additional spurious emissions requirements for DC-HSUPA

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-55 dBm
	1884.5 MHz <f <1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
II	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 758 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
III	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) - 60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
IV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
V	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	859 MHz ≤ f ≤ 869 MHz	1 MHz	-27 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VI	860 MHz ≤ f < 875 MHz	1 MHz	-37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	1 MHz	-37 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-57 dBm (see notes 1 and 3) -50 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3.84 MHz	-79 dBm (see note 1) -60 dBm
	1805 MHz < f ≤ 1830 MHz	100 kHz 3.84 MHz	-71 dBm (see notes 1 and 2) -60 dBm (see note 2)
	1830 MHz < f ≤ 1880 MHz	100 kHz 3.84 MHz	-71 dBm (see note 1) -60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2640 MHz	3.84 MHz	-60 dBm
	2640 MHz < f ≤ 2690 MHz	3.84 MHz	-60 dBm (see note 2)
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
X	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-55 dBm (see note 3)
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-44 dBm (see note 3)
	763 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 3)
	793 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 3)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	769 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 3)
	799 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 3)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIX	860 MHz ≤ f < 875 MHz	1 MHz	-30 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XX	811 MHz ≤ f ≤ 821 MHz	3.84 MHz	-50 dBm (see note 3)
	791 MHz ≤ f ≤ 811 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	1 MHz	-37 dBm
XXII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1880 MHz ≤ f ≤ 1920 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	2300 MHz ≤ f ≤ 2400 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
	3510 MHz ≤ f ≤ 3525 MHz	1 MHz	-40 dBm
	3525 MHz ≤ f ≤ 3590 MHz	1 MHz	-50 dBm
	3600 MHz ≤ f ≤ 3800 MHz	3.84 MHz	-50 dBm
XXV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm
	3400 MHz ≤ f ≤ 3800 MHz	1 MHz	-50 dBm
XXVI	703 MHz ≤ f ≤ 729 MHz	1 MHz	-50 dBm
	729 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	768 MHz ≤ f ≤ 799 MHz	1 MHz	-50 dBm
	799 MHz ≤ f ≤ 803 MHz	1 MHz	-40 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	1 MHz	-50 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤f ≤1919.6 MHz	300 kHz	-41 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-50 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2300 MHz ≤ f ≤ 2400 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm (see note 2)
	3400 MHz ≤ f ≤3800 MHz	1 MHz	-50 dBm
NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 5.11A.1 are permitted for each UARFCN used in the measurement. NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11A.1 are permitted for each UARFCN used in the measurement due to 2nd or 3rd harmonic spurious emissions. NOTE 3: This requirement is applicable also for frequencies, which are between 5 MHz and 25 MHz away from the UE centre carrier frequency.			

NOTE: The applicability of each line in Table 5.11A.2 for UEs of different releases is defined in TS 25.101 [1].

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11A.1 are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1A.

5.11A.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11A.1 and table 5.11A.2.

Excess spurious emissions increase the interference to other systems.

5.11A.4 Method of test

5.11A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BA.2, 5.2BA.3, 5.2BA4 and 5.2BA.5. These exceptions allow the beta values to be set according to table C.11A.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A.
4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11A.4.2 Procedure

1) Set UE to maximum output power according to 5.2BA.4.2 step 1 to 4.
2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.11A.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11A.3 and 5.11A.4.

These requirements are only applicable for frequencies, which are greater than 20 MHz away from the centre of the assigned carrier frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.3: General spurious emissions test requirements for DC-HSUPA

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement	Note
9 kHz ≤ f < 150 kHz	1 kHz	−36 dBm	
150 kHz ≤ f < 30 MHz	10 kHz	−36 dBm	
30 MHz ≤ f < 1 000 MHz	100 kHz	−36 dBm	
1 GHz ≤ f < 12,75 GHz	1 MHz	−30 dBm	
12.75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	−30 dBm	Note 1
NOTE 1: Applies only for Band XXII.			

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	−36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	−36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	−36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	−30 dBm

The requirements in Table 5.11A.4 are only applicable for frequencies, which are greater than 25 MHz away from the centre of the assigned frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.4: Additional spurious emissions test requirements for DC-HSUPA

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-55 dBm
	1884.5 MHz <f<1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
II	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 758 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
III	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) - 60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
IV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
V	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	859 MHz ≤ f ≤ 869 MHz	1 MHz	-27 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VI	860 MHz ≤ f < 875 MHz	1 MHz	-37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
VII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 869 MHz	1 MHz	-50 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	1 MHz	-37 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-57 dBm (see notes 1 and 3) -50 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3.84 MHz	-79 dBm (see note 1) -60 dBm
	1805 MHz < f ≤ 1830 MHz	100 kHz 3.84 MHz	-71 dBm (see notes 1 and 2) -60 dBm (see note 2)
	1830 MHz < f ≤ 1880 MHz	100 kHz 3.84 MHz	-71 dBm (see note 1) -60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2640 MHz	3.84 MHz	-60 dBm
	2640 MHz < f ≤ 2690 MHz	3.84 MHz	-60 dBm (see note 2)
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
X	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-55 dBm (see note 3)
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-44 dBm (see note 3)
	763 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 3)
	793 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 3)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	769 MHz ≤ f ≤ 775 MHz	6.25 kHz	[TBD] dBm (see note 3)
	799 MHz ≤ f ≤ 805 MHz	6.25 kHz	[TBD] dBm (see note 3)
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XIX	860 MHz ≤ f < 875 MHz	1 MHz	-30 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1500.9 MHz	3.84 MHz	-60 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤ f ≤1915.7 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
XX	811 MHz ≤ f ≤ 821 MHz	3.84 MHz	-50 dBm (see note 3)
	791 MHz ≤ f ≤ 811 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	1 MHz	-37 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
XXII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)
	1880 MHz ≤ f ≤ 1920 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2300 MHz ≤ f ≤ 2400 MHz	3.84 MHz	-60 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm
	3510 MHz ≤ f ≤ 3525 MHz	1 MHz	-40 dBm
	3525 MHz ≤ f ≤ 3590 MHz	1 MHz	-50 dBm
	3600 MHz ≤ f ≤ 3800 MHz	3.84 MHz	-50 dBm
XXV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	852 MHz ≤ f ≤ 859 MHz	1 MHz	-50 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm
	3400 MHz ≤ f ≤ 3800 MHz	1 MHz	-50 dBm
XXVI	703 MHz ≤ f ≤ 729 MHz	1 MHz	-50 dBm
	729 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm
	768 MHz ≤ f ≤ 799 MHz	1 MHz	-50 dBm
	799 MHz ≤ f ≤ 803 MHz	1 MHz	-40 dBm
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm
	1525 MHz ≤ f ≤ 1559 MHz	1 MHz	-50 dBm
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm
	1884.5 MHz ≤f ≤1919.6 MHz	300 kHz	-41 dBm
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-50 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm
	2300 MHz ≤ f ≤ 2400 MHz	1 MHz	-50 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm (see note 1)
	3400 MHz ≤ f ≤3800 MHz	1 MHz	-50 dBm

NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 5.11A.3 are permitted for each UARFCN used in the measurement.
NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11A.3 are permitted for each UARFCN used in the measurement due to 2nd or 3rd harmonic spurious emissions.
NOTE 3: This requirement is applicable also for frequencies, which are between 5 MHz and 25 MHz away from the UE centre carrier frequency.
NOTE 4: The applicability of each line in Table 5.11A.4 for UEs of different releases is defined in TS 25.101 [1].

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11A.3 are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.12 Transmit Intermodulation

5.12.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

UE(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or Node B receive band as an unwanted interfering signal. The UE transmit intermodulation attenuation is defined by the ratio of the RRC filtered mean power of the wanted signal to the RRC filtered mean power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.12.2 Minimum Requirements

The UE transmit intermodulation shall not exceed the described value in table 5.12.1.

Table 5.12.1: Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Interference CW Signal Level	–40 dBc	
Intermodulation Product	–31 dBc	–41 dBc

The normative reference for this requirement is TS 25.101 [1] clause 6.7.1.

5.12.3 Test purpose

To verify that the UE transmit intermodulation does not exceed the described value in table 5.12.1.

An excess transmit intermodulation increases transmission errors in the up link own channel when other transmitter exists nearby.

5.12.4 Method of test

5.12.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.2.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.12.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Set the frequency of the CW generator to the offset 1 or offset 2 as shown in table 5.12.2.

3) Measure the RRC filtered mean power of the UE.

4) Search the intermodulation product signal, then measure the RRC filtered mean power of transmitting intermodulation, and calculate the ratio with the power measured in step 3).

5) Repeat the measurement with another tone offset.

5.12.5 Test requirements

The ratio derived in step 4), shall not exceed the described value in table 5.12.2.

Table 5.12.2: Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Interference CW Signal Level	–40 dBc	
Intermodulation Product	-31 dBc	-41 dBc

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.12A Transmit Intermodulation for DC-HSUPA

5.12A.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

The UE intermodulation attenuation is defined by the ratio of the sum of the RRC filtered mean powers of the wanted signal on the assigned carriers to the sum of the RRC filtered mean powers of the intermodulation product on two adjacent carriers when an interfering CW signal is added at a level below the wanted signal.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that supports HSDPA and Dual Cell E-DCH.

5.12A.2 Minimum Requirements for DC-HSUPA

The requirement of transmitting intermodulation for a carrier spacing of 5 MHz is prescribed in Table 5.12A.1.

Table 5.12A.1: Transmit Intermodulation requirement for DC-HSUPA

Interference Signal Frequency Offset	10MHz	20MHz
Interference CW Signal Level	-40dBc	
Intermodulation Product	-31dBc	-41dBc

The normative reference for this requirement is TS 25.101 [1] clause 6.7.1A.

5.12A.3 Test purpose

To verify that the UE transmit intermodulation does not exceed the described value in table 5.12A.2.

An excess transmit intermodulation increases transmission errors in the up link when other transmitter exists nearby.

5.12A.4 Method of test

5.12A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.42.
2) The UL Reference Measurement Channel and parameters are specified in Annex C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14.
4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

5.12A.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4.
2) Set the frequency of the CW generator to the first offset as shown in table 5.12A.2.
3) Measure the sum of the RRC filtered mean powers centred on each of the two assigned channels.
4) Search the intermodulation product signal and measure the RRC filtered mean power of transmitting intermodulation.
5) Calculate the ratio of the intermodulation product signal power (step 4) with the wanted power (step 3).
6) Repeat the measurement to both sides of the two assigned channels and using the second tone offset.

5.12A.5 Test requirements

The ratio derived in step 4), shall not exceed the described value in table 5.12A.2.

Table 5.12A.2: Transmit Intermodulation

Interference Signal Frequency Offset	10MHz	20MHz
Interference CW Signal Level	-40dBc	
Intermodulation Product	-31dBc	-41dBc

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13 Transmit Modulation

Transmit modulation defines the modulation quality for expected in-channel RF transmissions from the UE. The requirements apply to all transmissions including the PRACH/PCPCH pre-amble and message parts and all other expected transmissions for release 99 and release 4 only. For release 5 and later the requirements apply to all transmissions including the PRACH pre-amble and message parts and all other expected transmissions. In cases where the mean power of the RF signal is allowed to change versus time e.g. PRACH, DPCH in compressed mode, change of TFC, inner loop power control and for HSDPA transmissions with non-constant HS-DPCCH code power, the EVM and Peak Code Domain Error requirements do not apply during the 25 us period before and after the nominal time when the mean power is expected to change.

5.13.1 Error Vector Magnitude (EVM)

5.13.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off α =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

For Release 99 and Release 4 the measurement interval is one timeslot.

For Release 5 and later releases where tests may include power changes, the measurement interval is further clarified as being one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot. The requirements and this test apply to all types of UTRA for the FDD UE.

5.13.1.2 Minimum Requirements

The EVM shall not exceed 17,5 % for the parameters specified in table 5.13.1.

Table 5.13.1: Parameters for EVM

Parameter	Level / Status	Unit
Output power	≥ –20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.0.

5.13.1.3 Test purpose

To verify that the EVM does not exceed 17,5 % for the specified parameters in table 5.13.1.

An excess EVM increases transmission errors in the up link own channel.

5.13.1.4 Method of test

5.13.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.13.1.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the EVM using Global In-Channel Tx-Test (annex B).
3) Set the power level of UE to -18dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be -18dBm with ±2dB tolerance.
4) Repeat step 2).

5.13.1.5 Test requirements

The measured EVM, derived in step 2) and 4), shall not exceed 17,5 %. for parameters specified in table 5.13.1 Parameters for EVM.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.1A Error Vector Magnitude (EVM) with HS-DPCCH

5.13.1A.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off α =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 µs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25µs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

The requirements and this test apply for Release 5 only to all types of UTRA for the FDD UE that support HSDPA.

5.13.1A.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1A.1. This is applicable for all values of β_c, β_d and β_{hs} as specified in [5].

Table 5.13.1A.1: Parameters for EVM

Parameter		Level / Status	Unit
Output power		≥ –20	dBm
Operating conditions		Normal conditions	
Power control step size		1	dB
Measurement period[1]	PRACH	3904	Chips
	Any DPCH	From 1280 to 2560[2]	
NOTE 1: Less any 25µs transient periods NOTE 2: The longest period over which the nominal power remains constant			

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.0.

5.13.1A.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1A.1 using the values of β_c, β_d and β_{hs} specified in table C.10.1.4 for subtest 3.

5.13.1A.4 Method of test

5.13.1A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1A.2. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1A.2: Settings for the serving cell during the measurement of Error Vector Magnitude (EVM) with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.1A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$.		
NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.1A.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1A.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2A.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1A.1 measure the EVM using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off (measurement point 4) and the UE is at its minimum power in the cycle. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with ±2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Repeat step 4).

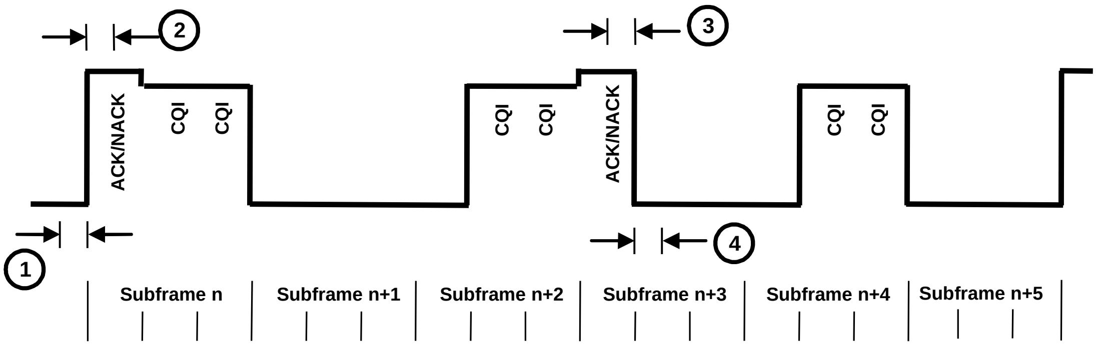


Figure 5.13.1A.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

Information Element	Value/remark
- Ack-Nack repetition factor	1
- CQI repetition factor	1

5.13.1A.5 Test requirements

The measured EVM, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1A.1 parameters for EVM.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.1AA Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH

5.13.1AA.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off α =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 µs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25µs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

Phase discontinuity for HS-DPCCH is the change in phase due to the transmission of the HS-DPCCH. In the case where the HS-DPCCH timeslot is offset from the DPCCH timeslot, the period of evaluation of the phase discontinuity shall be the DPCCH timeslot that contains the HS-DPCCH slot boundary. The phase discontinuity for HS-DPCCH result is defined as the difference between the absolute phase used to calculate the EVM for that part of the DPCCH timeslot prior to the HS-DPCCH slot boundary, and the absolute phase used to calculate the EVM for remaining part of the DPCCH timeslot following the HS-DPCCH slot boundary. In all cases the subslot EVM is measured excluding the transient periods of 25 μs.

Since subslot EVM is only defined for intervals of at least one half timeslot, the phase discontinuity for HS-DPCCH is only defined for non-aligned timeslots when the offset is 0.5 slots.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA.

5.13.1AA.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1AA. This is applicable for all values of β_c, β_d and β_{hs} as specified in [5].

Table 5.13.1AA.1: Parameters for EVM

Parameter		Level / Status	Unit
Output power		≥ –20	dBm
Operating conditions		Normal conditions	
Power control step size		1	dB
Measurement period[1]	PRACH	3904	Chips
	Any DPCH	From 1280 to 2560[2]	
NOTE 1: Less any 25μs transient periods NOTE 2: The longest period over which the nominal power remains constant			

The phase discontinuity for HS-DPCCH shall not exceed the value specified in table 5.13.1AA.2 90% of the time. When calculating the phase discontinuity, the requirements for frequency error and EVM in sub clauses 6.3 and 6.8.2, of TS 25.101 [1] respectively shall be met.

Table 5.13.1AA.2: Phase discontinuity minimum requirement for HS-DPCCH at HS-DPCCH slot boundary

Phase discontinuity for HS-DPCCH Δθ in degrees	Δθ ≤ 30

The normative reference for these requirements is TS 25.101 [1] clause 6.8.3.0 and 6.8.5.1.

5.13.1AA.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1AA using the values of β_c, β_d and β_{hs} specified in table C.10.1.4 for subtest 3.

To verify that HSDPA phase discontinuity does not exceed the values in table 5.13.1AA.2.

NOTE: The statistical aspect (90% pass rate) of this minimum requirement is not currently tested.

5.13.1AA.4 Method of test

5.13.1AA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1AA.3. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1AA.3: Settings for the serving cell during the measurement of Error Vector Magnitude (EVM) with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.1AA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of I_{or} instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.1AA.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1AA.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2AA.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1AA.1 measure the EVM using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off and the UE is at its minimum power in the cycle (measurement point 4). Compute from these two EVM results the phase discontinuity between the two half slot periods. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). Compute from these two EVM results the phase discontinuity between the two half slot periods. All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with ±2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Repeat step 4).

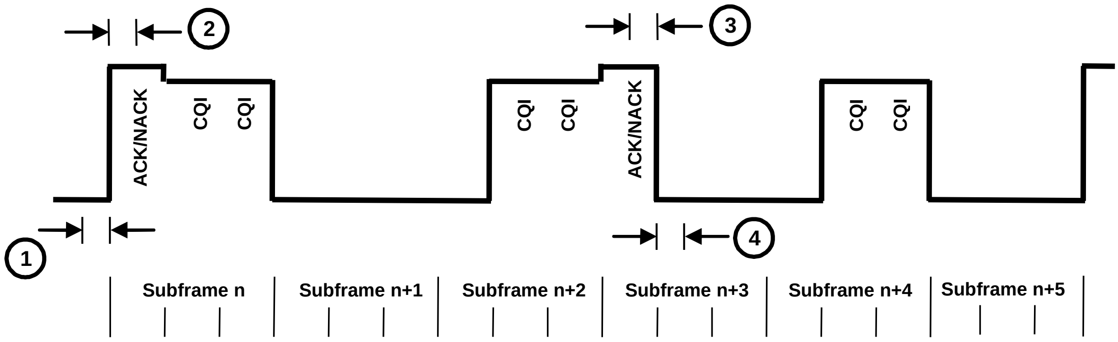


Figure 5.13.1AA.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

Information Element	Value/remark
- Ack-Nack repetition factor	1
- CQI repetition factor	1

5.13.1AA.5 Test requirements

Table 5.13.1AA.4: Phase discontinuity test requirement for HS-DPCCH at HS-DPCCH slot boundary

Phase discontinuity for HS-DPCCH $\Delta\theta$ in degrees	$\Delta\theta \leq 36$

The measured EVM, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1AA.1 parameters for EVM.

The measured phase discontinuity, derived in steps 4) and 6), shall not exceed the value specified in table 5.13.1AA.4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.1AAA EVM and IQ origin offset for HS-DPCCH and E-DCH with 16 QAM

5.13.1AAA.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off α =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 µs at each end of the slot. For the PRACH preamble the measurement interval is 4096 chips less 25 µs at each end of the burst (3904 chips).

When the UE uses 16QAM modulation on any of the uplink code channels, the error minimization step also includes selecting an IQ origin offset besides selecting the frequency, absolute phase, absolute amplitude and chip clock timing to minimise the error vector. The IQ origin offset shall be removed from the evaluated signal before calculating the EVM; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25µs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

The requirements apply for Release 7 and later releases to all types of UTRA for the FDD UE that support E-DCH 16 QAM UE capability category 7. This test applies only to UE that support HSDPA and E-DCH.

5.13.1AAA.2 Minimum requirement

When 16QAM modulation is not used on any of the uplink code channels, the Error Vector Magnitude shall not exceed 17.5 %. This is tested in 5.13.1A.

When 16QAM modulation is used on any of the uplink code channels, the modulation accuracy requirement shall meet one or both of the following requirements:

1. The Error Vector Magnitude does not exceed 14 %. This is not tested
2. The Relative Code Domain Error requirements are met. This is tested in 5.13.2C

When 16QAM modulation is used on any of the uplink code channels, the relative carrier leakage power (IQ origin offset power) shall not exceed the values specified in Table 5.13.1AAA.2

The requirements are applicable for all values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} as specified in [8].

Table 5.13.1AAA.1: Parameters for IQ origin offset

Parameter		Unit	Level
UE Output Power, 16QAM		dBm	≥ -30
Operating conditions			Normal conditions
Power control step size		dB	1
Measurement period (Note 1)	PRACH	Chips	3904
	Any DPCH		From 1280 to 2560 (Note 2)
NOTE 1: Less any 25µs transient periods NOTE 2: The longest period over which the nominal power remains constant			

Table 5.13.1AAA.2: Relative Carrier Leakage Power

UE Transmitted Mean Power	Relative Carrier Leakage Power (dB)
P ≥ -30 dBm	< -17

5.13.1AAA.3 Test purpose

To verify that the IQ offset does not exceed the values in table 5.13.1AAA.6 for the specified parameters in Table 5.13.1AAA.1 and for the beta values defined in table C.11.1.4.

5.13.1AAA.4 Method of test

5.13.1AAA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels-are specified in Annex C.11.1 and C. 11.2

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.13.1AAA.5. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.1AAA.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 1

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPCCH info	
- E-DPDCH power interpolation	FALSE
- E-DPDCH info	
- E-TFCI Table index	2
- Reference E-TFCIs	3 E-TFCIs
- Reference E-TFCI	105
- Reference E-TFCI PO	12
- Reference E-TFCI	116
- Reference E-TFCI PO	14
- Reference E-TFCI	127
- Reference E-TFCI PO	16
- Max Channelisation Codes	SF4x2 and SF2x2

Table 5.13.1AAA.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.4
- Δ_{NACK}	Value used in test: see Table C.11.1.4
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.4
- E-TFC Boost Info	
- E-TFCI boost	Value used in test: see Table C.11.1.4
- Delta T2TP	12 dB
- UL 16QAM settings	
- BetaEd gain E-AGCH table selection	0
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.4

Table 5.13.1AAA.5: Settings for the serving cell during the measurement of IQ origin offset

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.1AAA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.1AAA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range -28 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Measure Relative Carrier Leakage Power (IQ origin offset) according Annex B of the composite signal.

5.13.1AAA.5 Test requirements

The Relative Carrier Leakage Power shall not exceed the value given in table 5.13.1AAA.6.

Table 5.13.1AAA.6: Relative Carrier Leakage Power

UE Transmitted Mean Power	Relative Carrier Leakage Power (dB)
-28 dBm	<-16.5

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.2 Peak code domain error

5.13.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting power of the error vector (as defined in clause 5.13.1.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes.

For Release 99 and Release 4 the measurement interval is one timeslot.

For Release 5 and later releases where tests may include power changes, the measurement interval is further clarified as being one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 µs at each end of the slot.

The requirements and this test apply only to the UE in which the multi-code DPDCH transmission is provided and therefore does not apply for the PRACH and PCPCH preamble and message parts for R99 and Release 4 only or the PRACH preamble and message parts for Release 5 and later.

5.13.2.2 Minimum Requirements

The peak code domain error shall not exceed -15 dB at spreading factor 4 for the parameters specified in table 5.13.3.The requirements are defined using the UL reference measurement channel (768 kbps) specified in clause C.2.5.

Table 5.13.3: Parameters for Peak code domain error

Parameter	Level / Status	Unit
Output power	≥ –20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.1.

5.13.2.3 Test purpose

To verify that the UE peak code domain error does not exceed -15 dB for the specified parameters in table 5.13.3.

An excess peak code domain error increases transmission errors in the up link own channel.

5.13.2.4 Method of test

5.13.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2, and RF parameters are set up according to table 5.13.4.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.13.4: Test parameters for Peak code domain error

Parameter	Level / Status	Unit
Operating conditions	Normal conditions	
Uplink signal	multi-code	
Information bit rate	2*384	kbps
Power control step size	1	dB

5.13.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the Peak code Domain error using Global In-Channel Tx-Test (annex B).
3) Set the power level of UE to -18dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be-18dBm with ±2dB tolerance.
4) Repeat step 2).

5.13.2.5 Test requirements

The measured Peak code domain error, derived in step 2) and 4), shall not exceed -14 dB.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4

5.13.2A Relative Code Domain Error with HS-DPCCH

5.13.2A.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 µs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

$ECDP_k$ = (Nominal CDP ratio)$_k$ + 10*log10(SF_k/256)

The requirements for Relative Code Domain Error are not applicable when either or both the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.
- when the nominal code domain power of any code channel is < -20 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA but not E-DCH.

5.13.2A.2 Minimum Requirements

The Relative Code Domain Error shall meet the requirements in Table 5.13.2A.1 for the parameters specified in table 5.13.2A.2.

Table 5.13.2A.1: Relative Code Domain Error minimum requirement

ECDP dB	Relative Code Domain Error dB
-21 < ECDP	≤ -16
-30 ≤ ECDP ≤ -21	≤ -37 - ECDP
ECDP < -30	No requirement

Table 5.13.2A.2: Parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter		Unit	Level
UE Output Power		dBm	≥ -20
Operating conditions			Normal conditions
Power control step size		dB	1
Measurement period (Note 1)	PRACH	Chips	3904
	Any DPCH		From 1280 to 2560 (Note 2)
NOTE 1: Less any 25µs transient periods NOTE 2: The longest period over which the nominal power remains constant			

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

5.13.2A.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2A.5 for the beta values defined in table 5.13.2A.4.

5.13.2A.4 Method of test

5.13.2A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1 with the beta values set according to table C.10.1.4.
3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.2A.3.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.2A.3: Settings for the serving cell during the measurement of Relative Code Domain Error with HS-DPCCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.2A.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
I_{or} (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.2A.4.2 Procedure

1) Set and send continuously Up power control commands to the UE and wait until the UE has reached maximum power.
2) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 sub test 1 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.
3) Start transmitting HSDPA Data.
4) Measure the Relative Code Domain Error of the DPCCH, DPDCH and HS-DPCCH.
5) Repeat step 4 for the other combinations of beta values as given in table 5.13.2A.4.
6) Set the power level of UE to -18dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be -18dBm with ±2dB tolerance.
7) Repeat step 4 for all the combinations of beta values as given in table 5.13.2A.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

5.13.2A.5 Test requirements

For the ECDP of each code measured in step 4 the Relative Code Domain Error shall not exceed the value given in table 5.13.2A.5.

Table 5.13.2A.4: Nominal ECDP ratios

Sub-test in table C.10.1.4	Code	Nominal Code Domain Power	Spreading factor	Nominal ECDP
1	DPCCH	-17.9	256	-17.9
	DPDCH	-0.4	64	-6.4
	HS-DPCCH	-11.8	256	-11.8
3	DPCCH	-7.2	256	-7.2
	DPDCH	-12.7	64	-18.7
	HS-DPCCH	-1.2	256	-1.2
4	DPCCH	-7.1	256	-7.1
	DPDCH	-18.5	64	-24.5
	HS-DPCCH	-1	256	-1

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2C.

Table 5.13.2A.5: Relative Code Domain Error test requirement

ECDP dB	Relative Code Domain Error dB
-21 < ECDP	≤ -15.5
-30 ≤ ECDP ≤ -21	≤ -36.5 - ECDP
ECDP < -30	No requirement

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH

5.13.2B.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

$ECDP_k = (\text{Nominal CDP ratio})_k + 10*\log10(SF_k/256)$

The requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.
- when the nominal code domain power of any code channel is < -20 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

5.13.2B.2 Minimum Requirements

The Relative Code Domain Error shall meet the requirements in Table 5.13.2B.1 for the parameters specified in Table 5.13.2B.2.

Table 5.13.2B.1: Relative Code Domain Error minimum requirement

ECDP dB	Relative Code Domain Error dB
-21 < ECDP	≤ -16
-30 ≤ ECDP ≤ -21	≤ -37 - ECDP
ECDP < -30	No requirement

Table 5.13.2B.2: Parameters for Relative Code Domain Error with HS-DPCCH and E-DCH

Parameter		Unit	Level
UE Output Power		dBm	≥ -20
Operating conditions			Normal conditions
Power control step size		dB	1
Measurement period (Note 1)	PRACH	Chips	3904
	Any DPCH		From 1280 to 2560 (Note 2)
NOTE 1: Less any 25 μs transient periods NOTE 2: The longest period over which the nominal power remains constant			

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

5.13.2B.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2B.9 for the beta values defined in table 5.13.2B.8.

5.13.2B.4 Method of test

5.13.2B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.13.2B.7.

4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2B.3: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark
UL Transport channel information for all transport channels	
- 2bit CTFC	3
- Power offset Information	
- CHOICE Gain Factors	Signalled Gain Factors
- CHOICE mode	FDD
- Gain factor ßc	Value used in test: see Table C.11.1.3
- Gain factor ßd	Value used in test: see Table C.11.1.3
NOTE: All other 2 bit CTFC values use computed gain factors as in the default message.	

Table 5.13.2B.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

Table 5.13.2B.5: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 3

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

Table 5.13.2B.6: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.3
- Δ_{NACK}	Value used in test: see Table C.11.1.3
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.3
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.3

Table 5.13.2B.7: Settings for the serving cell during the measurement of Relative Code Domain Error with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.2B.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.2B.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15dBm ± 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.5) Measure the Relative Code Domain Error of the DPCCH, DPDCH, HS-DPCCH, E-DPCCH and E-DPDCH(s).

6) Repeat steps 1 through 5 for the other combinations of beta values as given in Table C.11.1.3.

7) Set the power level of UE to -18 dBm or send down power control commands (1 dB step size should be used) to the UE until UE output power shall be -18 dBm with ± 2 dB tolerance.

8) Measure the Relative Code Domain Error of the DPCCH, DPDCH, HS-DPCCH, E-DPCCH and E-DPDCH(s).

9) Repeat steps 7 and 8 for all the combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1.3.

5.13.2B.5 Test requirements

For the ECDP of each code measured in steps 5 and 8 the Relative Code Domain Error shall not exceed the value given in table 5.13.2B.9.

Table 5.13.2B.8: Nominal ECDP ratios

Sub-Test in Table C.11.1.3	Code	Nominal Code Domain Power	Spreading Factor	Nominal ECDP
1	DPCCH	-18.5	256	-18.5
	DPDCH	-15.8	64	-21.8
	HS-DPCCH	-12.5	256	-12.5
	E-DPCCH	-16.5	256	-16.5
	E-DPDCH	-0.5	4	-18.6
2	DPCCH	-14.0	256	-14.0
	DPDCH	-6.0	64	-12.0
	HS-DPCCH	-8.0	256	-8.0
	E-DPCCH	-8.0	256	-8.0
	E-DPDCH	-4.1	4	-22.2
3	DPCCH	-14.6	256	-14.6
	DPDCH	-19.1	64	-25.1
	HS-DPCCH	-8.6	256	-8.6
	E-DPCCH	-8.6	256	-8.6
	E-DPDCH1	-4.7	4	-22.8
	E-DPDCH2	-4.7	4	-22.8
4	DPCCH	-19.7	256	-19.7
	DPDCH	-2.2	64	-8.2
	HS-DPCCH	-13.7	256	-13.7
	E-DPCCH	-19.7	256	-19.7
	E-DPDCH	-4.7	4	-22.8

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2D.

Table 5.13.2B.9: Relative Code Domain Error test requirement

ECDP dB	Relative Code Domain Error dB
-21 < ECDP	≤ -15.5
-30 ≤ ECDP ≤ -21	≤ -36.5 - ECDP
ECDP < -30	No requirement

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.2BA Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA

5.13.2BA.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain for each of the two assigned channel frequencies. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

In the mode of DC-HSUPA, the requirement and corresponding measurements apply to each individual carrier when the total power in each of the assigned carriers is equal to each other. Furthermore, it is necessary to verify the requirements when each carrier is configured according to either of the UL E-DCH reference measurement channel for DC-HSUPA using BPSK or 16QAM modulation, specified in subclause C.2.6, C.2.7 and C.11A.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

$ECDP_k$ = (Nominal CDP ratio)$_k$ + 10*log10(SF_k/256)

The requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.
- when the nominal code domain power of any code channel is < -20 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.13.2BA.2 Minimum Requirements

The Relative Code Domain Error shall meet the requirements in Table 5.13.2BA.1 for the parameters specified in Table 5.13.2BA.2.

Table 5.13.2BA.1: Relative Code Domain Error minimum requirement

ECDP dB	Relative Code Domain Error dB
-21 < ECDP	≤ -16
-30 ≤ ECDP ≤ -21	≤ -37 - ECDP
ECDP < -30	No requirement

Table 5.13.2BA.2: Parameters for Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA

Parameter	Unit	Level
UE Output Power, no 16QAM	dBm	≥ -20
Operating conditions		Normal conditions
Power control step size	dB	1

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

5.13.2BA.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2BA.9 for the beta values defined in table 5.13.2BA.8.

5.13.2BA.4 Method of test

5.13.2BA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 3A, QPSK) and parameters are specified in Annex C.2.6 and C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11A.1 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.13.2BA.7.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2BA.3: Void

Table 5.13.2BA.4: Void

Table 5.13.2BA.5: Void

Table 5.13.2BA.6: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

Table 5.13.2BA.7: Settings for the serving cell during the measurement of Relative Code Domain Error with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.2BA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.2BA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of each of the two carriers to be in the range 15dBm ± 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.1. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

6) Set the power level of each of the two carriers to -18 dBm or send down power control commands (1 dB step size should be used) to the UE until the power level of each of the two carriers is -18 dBm with ± 2 dB tolerance.

7) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

5.13.2BA.5 Test requirements

For the ECDP of each code measured in steps 5 and 8 the Relative Code Domain Error shall not exceed the value given in table 5.13.2BA.9.

Table 5.13.2BA.8: Nominal ECDP ratios

Sub-Test in Table C.11A.1.1	UL frequency	Code	Nominal Code Domain Power	Spreading Factor	Nominal ECDP
1	Primary	DPCCH	-5.8	256	-5.8
		DPDCH	-	-	-
		HS-DPCCH	-15.3	256	-15.3
		E-DPCCH	-15.3	256	-15.3
		E-DPDCH	-1.7	16	-13.7
	Secondary	DPCCH	-5.6	256	-5.6
		DPDCH	-	-	-
		HS-DPCCH	-	-	-
		E-DPCCH	-15.2	256	-15.2
		E-DPDCH	-1.6	16	-13.6

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2DA.

Table 5.13.2BA.9: Relative Code Domain Error test requirement

ECDP dB	Relative Code Domain Error dB
-21 < ECDP	≤ -15.5
-30 ≤ ECDP ≤ -21	≤ -36.5 - ECDP
ECDP < -30	No requirement

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.2C Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM

5.13.2C.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 µs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

$ECDP_k = (\text{Nominal CDP ratio})_k + 10*\log10(SF_k/256)$

When 16QAM is used on any of the UL code channels, the requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.

- when the nominal code domain power of any code channel is < -30 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements apply for Release 7 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7. This test applies only to UE that support HSDPA and E-DCH.

5.13.2C.2 Minimum Requirements

When 16QAM is used on any of the UL code channels, the Relative Code Domain Error of the codes not using 16QAM shall meet the requirements in Table 5.13.2C.1 for the parameters specified in Table 5.13.2C.3.

Table 5.13.2C.1: Relative Code Domain Error minimum requirement, codes not using 16QAM

ECDP dB	Relative Code Domain Error dB
-22 < ECDP	≤ -18
-30 ≤ ECDP ≤ -22	≤ -40 - ECDP
ECDP < -30	No requirement

When 16QAM is used on any of the UL code channels; the Nominal CDP-Ratio-weighted average of the Relative Code Domain Errors measured individually on each of the codes using 16QAM shall meet the requirements in Table 5.13.2C.2 for the parameters specified in Table 5.13.2C.3. The Nominal CDP Ratio-weighted average of the Relative Code Domain Errors means the sum $\sum_k 10^{(\text{NominalCDP ratio})_k/10} \cdot 10^{(\text{Relative Code DomainError})_k/10}$ over all code k that uses 16QAM.

For the purposes of evaluating the requirements specified in Table 5.13.2C.2, the ECDP value is determined as the minimum of the individual ECDP values corresponding to the codes using 16QAM.

Table 5.13.2C.2: Relative Code Domain Error minimum requirement, with 16QAM used

ECDP dB	Average Relative Code Domain Error dB
-25.5 < ECDP	≤ -18
-30 ≤ ECDP ≤ -25.5	≤ -43.5 - ECDP
ECDP < -30	No requirement

Table 5.13.2C.3: Parameters for Relative Code Domain Error, with 16QAM used

Parameter		Unit	Level
UE Output Power, 16QAM		dBm	≥ -30
Operating conditions			Normal conditions
Power control step size		dB	1
Measurement period (Note 1)	PRACH	Chips	3904
	Any DPCH		From 1280 to 2560 (Note 2)
NOTE 1: Less any 25 μs transient periods NOTE 2: The longest period over which the nominal power remains constant			

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

5.13.2C.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2C.7for the beta values defined in table 5.13.2C.6.

5.13.2C.4 Method of test

5.13.2C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.
2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.13.2C.5. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2C.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA) for Sub-test 1

Information Element	Value/Remark
E-DCH info - E-DPCCH info - E-TFCI Table Index - E-DPDCH power interpolation - E-DPDCH info - Reference E-TFCIs - Reference E-TFCI - Reference E-TFCI PO - Reference E-TFCI - Reference E-TFCI PO - Reference E-TFCI - Reference E-TFCI PO - Max Channelisation Codes	Uplink DPCH info 2 FALSE 3 E-TFCIs 105 12 116 14 127 16 SF4x2 and SF2x2

Table 5.13.2C.5: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm - Δ_{ACK}	Uplink DPCH info Algorithm2 Value used in test: see Table C.11.1.4
- Δ_{NACK}	Value used in test: see Table C.11.1.4
- Ack-Nack repetition factor	3 (required for continuous HS-DPCCH signal)
E-DCH info	
- E-DPCCH info	
- E-DPCCH/DPCCH power offset	Value used in test: see Table C.11.1.4
- E-TFC Boost Info	
- E-TFCI boost	Value used in test: see Table C.11.1.4
- Delta T2TP	12 dB
- UL 16QAM settings	
- BetaEd gain E-AGCH table selection	0
Downlink HS-PDSCH Information	
- Measurement Feedback Info	
- CQI Feedback cycle, k	4 ms
- CQI repetition factor	2 (required for continuous HS-DPCCH signal)
- Δ_{CQI}	Value used in test: see Table C.11.1.4

Table 5.13.2C.6: Settings for the serving cell during the measurement of Relative Code Domain Error with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.2C.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.2C.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.

6) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s).

7) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range -18 dBm ± 2 dB and repeat steps 4 to 6.5.13.2C.5 Test requirements

For the ECDP of each code measured in step 6) the Relative Code Domain Error shall not exceed the value given in table 5.13.2C.8 and table 5.13.2C.9.

Table 5.13.2C.7: Nominal ECDP ratios

Sub-Test in Table C.11.1.4	Code	Nominal Code Domain Power	Spreading Factor	Nominal ECDP
1	DPCCH	-13.4	256	-13.4
	HS-DPCCH	-7.4	256	-7.4
	E-DPCCH	-7.4	256	-7.4
	E-DPDCH1	-7.4	2	-28.5
	E-DPDCH2	-7.4	2	-28.5
	E-DPDCH3	-9.4	4	-27.5
	E-DPDCH4	-9.4	4	-27.5

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2E.

Table 5.13.2C.8: Relative Code Domain Error test requirement, codes not using 16QAM

ECDP dB	Average Relative Code Domain Error dB
-22 < ECDP	≤ -17.5
-30 ≤ ECDP ≤ -22	≤ -39.5 - ECDP
ECDP < -30	No requirement

Table 5.13.2C.9: Relative Code Domain Error test requirement, with 16QAM used

ECDP dB	Average Relative Code Domain Error dB
-25.5 < ECDP	≤ -17.5
-30 ≤ ECDP ≤ -25.5	≤ -43.0 - ECDP
ECDP < -30	No requirement

NOTE 1: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^2 + A_2*(1.3416)^2 + A_3*(-0.4472)^2 + A_4*(-1.3416)^2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.2CA Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM for DC-HSUPA

5.13.2CA.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain for each of the two assigned channel frequences. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

$$ECDP_k = (\text{Nominal CDP ratio})_k + 10*\log10(SF_k/256)$$

The requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.
- when the nominal code domain power of any code channel is < -30 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.13.2CA.2 Minimum Requirements

When 16QAM is used on any of the UL code channels, the Relative Code Domain Error of the codes not using 16QAM shall meet the requirements in Table 5.13.2CA.1 for the parameters specified in Table 5.13.2CA.3.

Table 5.13.2CA.1: Relative Code Domain Error minimum requirement, codes not using 16QAM

ECDP dB	Relative Code Domain Error dB
-22 < ECDP	≤ -18
-30 ≤ ECDP ≤ -22	≤ -40 - ECDP
ECDP < -30	No requirement

When 16QAM is used on any of the UL code channels; the Nominal CDP-Ratio-weighted average of the Relative Code Domain Errors measured individually on each of the codes using 16QAM in that carrier shall meet the requirements in Table 5.13.2CA.2 for the parameters specified in Table 5.13.2CA.3. The Nominal CDP Ratio-weighted average of the

Relative Code Domain Errors means the sum $\sum_k 10^{(\text{NominalCDP ratio})_k/10} \cdot 10^{(\text{Relative Code DomainError})_k/10}$ over all code k that uses 16QAM.

For the purposes of evaluating the requirements specified in Table 5.13.2CA.2, the ECDP value is determined as the minimum of the individual ECDP values corresponding to the codes using 16QAM.

Table 5.13.2CA.2: Relative Code Domain Error minimum requirement, with 16QAM used

ECDP dB	Average Relative Code Domain Error dB
-25.5 < ECDP	≤ -18
-30 ≤ ECDP ≤ -25.5	≤ -43.5 - ECDP
ECDP < -30	No requirement

Table 5.13.2CA.3: Parameters for Relative Code Domain Error, with 16QAM used

Parameter		Unit	Level
UE Output Power, 16QAM		dBm	≥ -30
Operating conditions			Normal conditions
Power control step size		dB	1
Measurement period (Note 1)	PRACH	Chips	3904
	Any DPCH		From 1280 to 2560 (Note 2)
NOTE 1: Less any 25 μs transient periods NOTE 2: The longest period over which the nominal power remains constant			

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

5.13.2CA.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2CA.6 for the beta values defined in table 5.13.2CA.5.

5.13.2CA.4 Method of test

5.13.2CA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.
2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 3A,16QAM) are specified in Annex C.2.6 and C.8.1.1.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.A.1 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.13.2CA.5. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.
4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2CA.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

Table 5.13.2CA.5: Settings for the serving cell during the measurement of Relative Code Domain Error with HS-DPCCH and E-DCH

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.13.2CA.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

5.13.2CA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.2.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of each of the two carriers to be in the range 15dBm ± 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.2. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

6) Set the power level of each of the two carriers to -18 dBm or send down power control commands (1 dB step size should be used) to the UE until the power level of each of the two carriers is -18 dBm with ± 2 dB tolerance.

7) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

5.13.2CA.5 Test requirements

For the ECDP of each code measured in steps 5) and 7) the Relative Code Domain Error shall not exceed the value given in table 5.13.2CA.7 and table 5.13.2CA.8.

Table 5.13.2CA.6: Nominal ECDP ratios

Sub-Test in Table C.11A.1.2	UL frequency	Code	Nominal Code Domain Power	Spreading Factor	Nominal ECDP
1	Primary	DPCCH	-24,0	256	-24,0
		DPDCH	-	-	-
		HS-DPCCH	-21,9	256	-21,9
		E-DPCCH	-15,9	256	-15,9
		E-DPDCH (SF/2)	-4,9	2	-26,0
		E-DPDCH (SF/4)	-7,9	4	-26,0
	Secondary	DPCCH	-23,9	256	-23,9
		DPDCH	-	-	-
		HS-DPCCH	-	-	-
		E-DPCCH	-15,9	256	-15,9
		E-DPDCH (SF/2)	-4,9	2	-26,0
		E-DPDCH (SF/4)	-7,9	4	-26,0

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2E.

Table 5.13.2CA.7: Relative Code Domain Error test requirement, codes not using 16QAM

ECDP dB	Average Relative Code Domain Error dB
-22 < ECDP	≤ -17.5
-30 ≤ ECDP ≤ -22	≤ -39.5 - ECDP
ECDP < -30	No requirement

Table 5.13.2CA.8: Relative Code Domain Error test requirement, with 16QAM used

ECDP dB	Average Relative Code Domain Error dB
-25.5 < ECDP	≤ -17.5
-30 ≤ ECDP ≤ -25.5	≤ -43.0 - ECDP
ECDP < -30	No requirement

NOTE 1: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the β_{ed} value used to compute the Nominal CDP equal to $\{A_1*(0.4472)^\wedge 2 + A_2*(1.3416)^\wedge 2+ A_3*(-0.4472)^\wedge 2 + A_4*(-1.3416)^\wedge 2\}^{1/2}$ where A_1, A_2, A_3 and A_4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.3 UE phase discontinuity

5.13.3.1 Definition and applicability

Phase discontinuity is the change in phase between any two adjacent timeslots. The EVM for each timeslot (excluding the transient periods of 25 μs on either side of the nominal timeslot boundaries) shall be measured according to subclause 5.13.1. The frequency, absolute phase, absolute amplitude and chip clock timing used to minimise the error vector are chosen independently for each timeslot. The phase discontinuity result is defined as the difference between the absolute phase used to calculate EVM for the preceding timeslot, and the absolute phase used to calculate EVM for the succeeding timeslot.

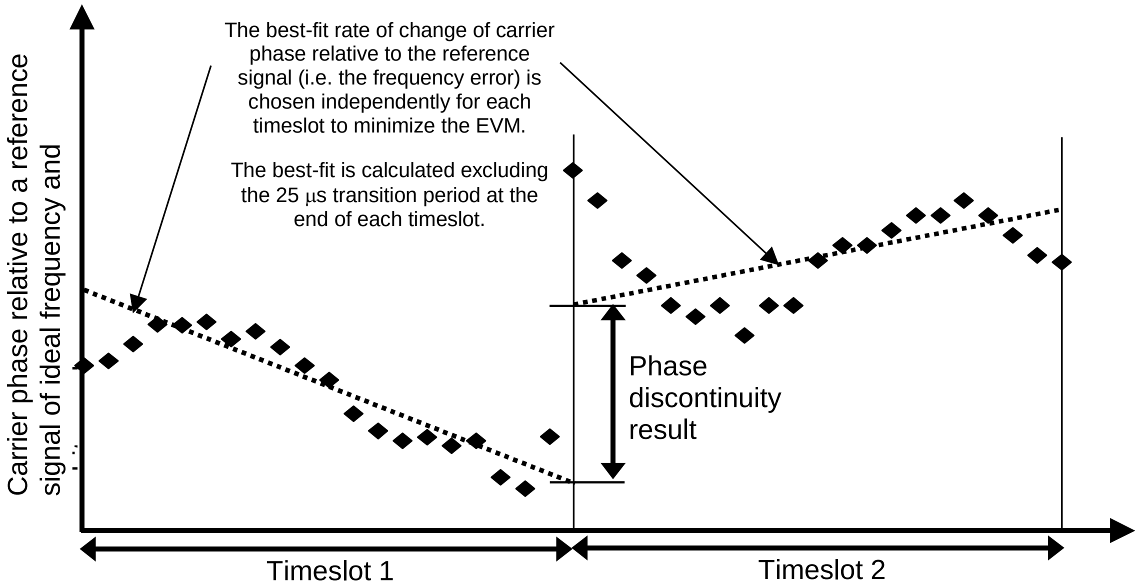


Figure 5.13.3.1 Graphical description of phase discontinuity

The best-fit rate of change of phase for each timeslot is calculated using the same process as used to minimize the EVM. This best-fit rate of change of phase is by definition the frequency error result for the timeslot. Due to the presence of power steps in the test, the data used for the best-fit calculation shall exclude the 25µs transition period at the beginning and end of each timeslot. The best-fit rate of change of phase for each timeslot is then extrapolated in both directions onto the timeslot boundaries. The phase discontinuity result at any one slot boundary is the difference between the extrapolated phase at the end of the timeslot preceding the slot boundary and the extrapolated phase at the start of the timeslot following the slot boundary.

The requirements and this test apply to all types of UTRA for the FDD UE for Release 5 and later releases.

5.13.3.2 Minimum requirements

The rate of occurrence of any phase discontinuity on an uplink DPCH for the parameters specified in table 5.13.3.1 shall not exceed the values specified in table 5.13.3.2. Phase shifts that are caused by changes of the UL transport format combination (TFC) and compressed mode are not included. When calculating the phase discontinuity, the requirements for frequency error and EVM in subclauses TS 25.101 [1] 6.3 and TS 25.101 [1] 6.8.2 for each timeslot shall be met.

Table 5.13.3.1: Parameters for Phase discontinuity

Parameter	Unit	Level
Power control step size	dB	1

Table 5.13.3.2: Phase discontinuity minimum requirement

Phase discontinuity $\Delta\theta$ in degrees	Maximum allowed rate of occurrence in Hz
$\Delta\theta \leq 30$	1500
$30 < \Delta\theta \leq 60$	300
$\Delta\theta > 60$	0

The normative reference for this requirement is TS 25.101 [1] clause 6.8.4.

5.13.3.3 Test purpose

To verify that the UE phase discontinuity is within the limits shown in clause 5.13.3.2.

To verify that any timeslot used in the calculation of a phase discontinuity result also passes the frequency error and EVM requirements referenced in clause 5.3 2 and 5.13.3.2.

5.13.3.4 Method of test

5.13.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure using power control algorithm 1 as specified in TS34.108 [3] sub clause 7.3.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Procedure

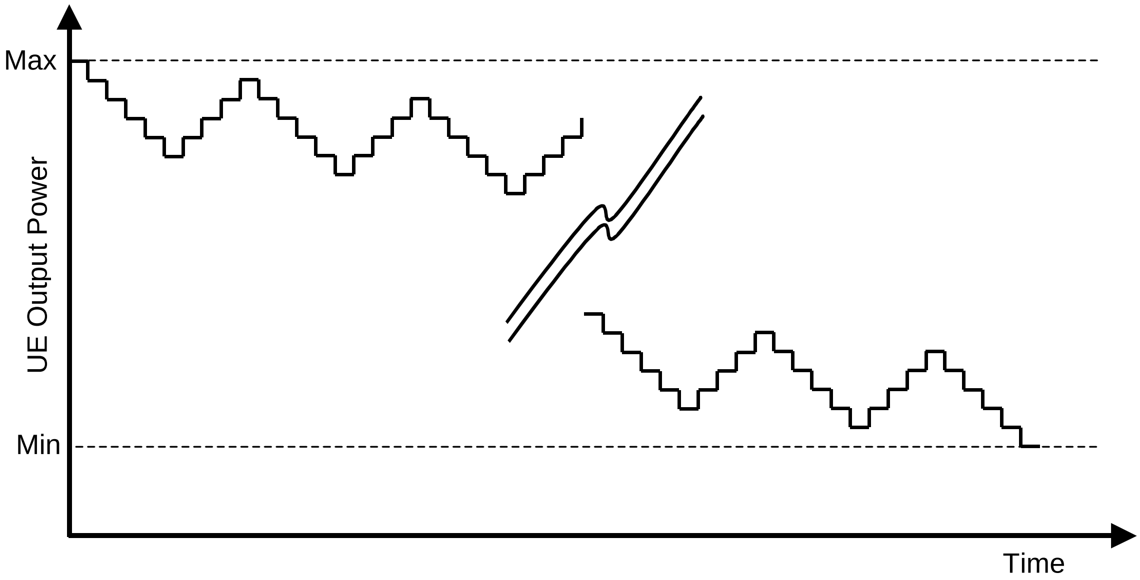


Figure 5.13.3.2: Five down four up hysteresis test pattern

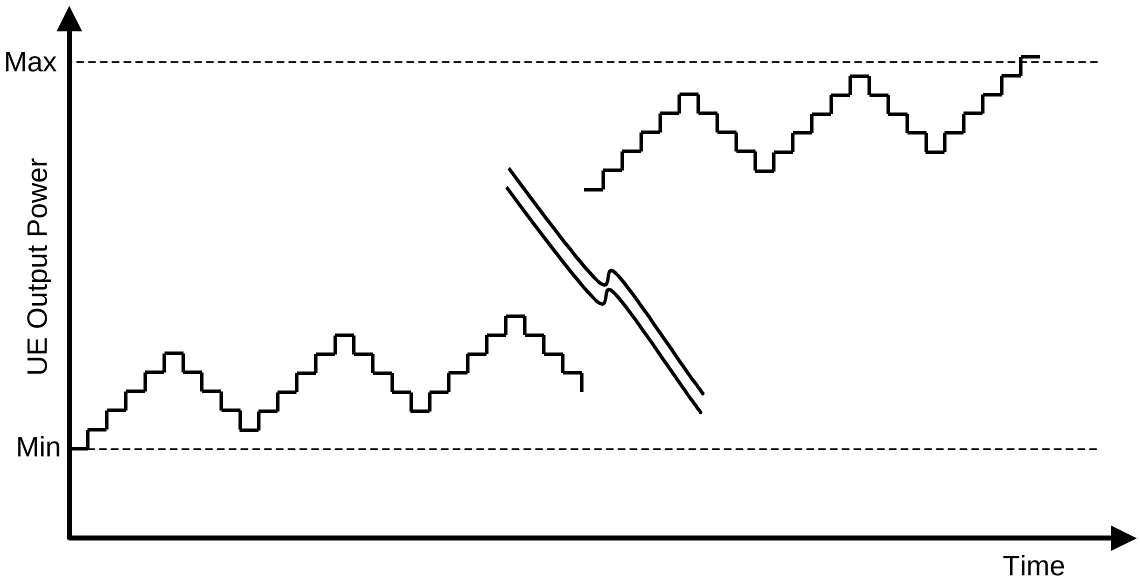


Figure 5.13.3.3: Five up four down hysteresis test pattern

1) Set the power of the UE to max power using continuous up TPC commands.

2) Transmit a sequence of five down four up TPC commands as shown in figure 5.13.3.2 until the UE has reached the minimum power defined in 5.4.3 with ±2dB tolerance.

3) During step 2 starting with the slot before the first down power step, measure the EVM of each slot and the phase discontinuity to the next slot.

4) Transmit a sequence of five up four down TPC commands as shown in figure 5.13.3.3 until the UE has reached its maximum power defined in 5.2 with ±2dB tolerance.

5) During step 4 starting with the slot before the first up power step, measure the EVM of each slot and the phase discontinuity to the next slot.

NOTE: In order to make it practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequences. Except when within 5 dB of the upper or lower thresholds, segmentation will require sufficient overlap such that every power step in one direction is followed by four steps in the other direction.

5.13.3.5 Test requirements

a) During 5.13.3.4.2 step 3, and step 5, the EVM of every measured slot which is greater than or equal to -20 dBm shall not exceed 17.5%

b) During 5.13.3.4.2 step 3, and step 5, the Frequency error of every measured slot shall not exceed ±(0,1 ppm + 10 Hz).

c) During 5.13.3.4.2 step 3, and step 5; the phase discontinuity measurements made between any two adjacent slots shall be less than or equal to 36 degrees. If a phase discontinuity measurement is greater than 36 degrees and less than or equal to 66 degrees then the next four measurements shall be less than or equal to 36 degrees. No measurement shall exceed 66 degrees.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.4 PRACH preamble quality

5.13.4.1 Definition and applicability

PRACH preamble quality is a measure of the ability of the UE to transmit the PRACH preamble in accordance with the core requirements so that the Node B can reliably decode the PRACH.

This test applies to all types of UTRA for the FDD UE from Release 5 onwards.

5.13.4.2 Minimum requirements

The EVM of the PRACH preamble observed over the interval of 3904 chips (i.e. excluding the transient periods) shall not exceed 17.5%.

The reference for this requirement is TS 25.101 [1] clause 6.8.2.

The UE modulated carrier frequency used to transmit the PRACH preamble observed over the interval of 3904 chips (i.e. excluding the transient periods) shall be within ± 0.1 PPM compared to the carrier frequency received from the Node B.

The reference for this requirement is TS 25.101 [1] clause 6.3.

The PRACH preamble shall be transmitted in the correct access slot using the correct signature as defined by the parameters signalled to the UE.

The reference for this requirement is TS 25.214 [5] clause 6.1 physical random access procedure.

5.13.4.3 Test purpose

The test purpose is to verify that the transmission quality of the first PRACH preamble meets the minimum requirements for modulation quality, carrier frequency, access slot and signature as defined in 5.13.4.2. The UE is tested at nominal maximum output power and nominally 5.6 dB to 8.6 dB above reference sensitivity, which simulates operation towards the cell boundary. The access slot and signature are chosen randomly from the allowed possibilities for each execution of the RACH procedure. There are 384 possible configurations that could be chosen, but only 10 of these are randomly selected for test in order to minimize the test time.

5.13.4.4 Method of test

5.13.4.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure, using the modified parameters according to table 5.13.4.1 and table 5.13.4.2. The relative power levels of the downlink physical channels to I_{or} are set up according to clause E.2.1. The physical random access procedure within the call setup is used for the test.

See TS 34.108 [3] for details regarding generic call setup procedure and 25.214 [5] for details of the physical random access procedure.

Table 5.13.4.1: Static test parameters for PRACH quality

Static Parameters	Power Class 1	Power Class 2	Power Class 3	Power Class 4	Unit
$\hat{I}_{or}$	–98.1	–98.1	–98.1	–98.1	dBm / 3,84 MHz
Nominal CPICH_RSCP	–102	–102	–102	–102	dBm
Primary CPICH TX power	+24	+24	+24	+24	dBm
Simulated path loss = Primary CPICH TX power - CPICH_RSCP	+126	+126	+126	+126	dB
UL interference	–83	–89	–92	–95	dBm
Constant Value	–10	–10	–10	–10	dB
Expected nominal UE TX power[1]	+33	+27	+24	+21	dBm
Preamble Retrans Max	1				
NOTE 1: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8].					

Table 5.13.4.2: Random test parameters for PRACH quality

Random Parameters[1]	Value
Available RACH Sub Channels	One sub-channel chosen at random from the 12-bit Available sub channel number
Available PRACH Signatures	One signature chosen at random from the 16-bit Available signature number
ASC Setting	Both Available signature Start Index and Available signature End Index are 0
AICH transmission timing	Chosen at random from the range 0 to1
NOTE 1: In order to avoid a static test configuration, each time the RACH procedure is executed, the parameters in this table are to be chosen at random from the defined range. The random function used shall be such that each of the allowed selections is chosen with equal probability.	

Table 5.13.4.3: PAGING TYPE 1 Message content

Information Element	Value/remark
BCCH modification info	
MIB Value Tag	Set to the same value as the value tag of the MIB after the BCCH modification
BCCH Modification time	Not present

5.13.4.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 5.13.4.1 depending on the power class of the UE.

2) The SS shall initiate a call by sending PAGING TYPE 1 message and measure the first RF transmission from the UE.

3) The SS shall determine the access slot used, the received signature, the EVM and the frequency error.

4) Choose a new set of parameters from table 5.13.4.2

5) Send PAGING TYPE 1 message with BCCH modification info as per table 5.13.4.3.

6) Wait 5seconds to allow the UE to read the new SIB 5.

7) Repeat from step number 2) ten times.

5.13.4.5 Test requirements

For all the transmitted PRACH preambles measured in 5.13.4.4.2 step 3:

1) The EVM shall not exceed 17,5 %.
2) The frequency error shall not exceed ±(0,1 ppm + 10 Hz).
3) The detected access slot and signature shall be correct according to the physical random access procedure defined in [5].

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.5 In-band emission for DC-HSUPA

5.13.5.1 Definition and applicability

The in-band emission is measured as the ratio of the UE output power in one carrier in dual cells to the UE output power in the other carrier, where the power in the former carrier shall be set to the minimum output power and the power in the latter carrier to the maximum output power. It is necessary to verify the requirements when the both carriers are configured according to the UL E-DCH reference measurement channel for DC-HSUPA using BPSK modulation, specified in subclause C.11A. The basic in-band emission measurement interval is defined over one slot in the time domain.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

5.13.5.2 Minimum Requirements

The in-band emission shall not exceed the value specified in Table 5.13.5.1.

Table 5.13.5.1: In-band emission minimum requirements for DC-HSUPA

Parameter Description	Unit	Limit
In-band emission	dBc	-24
NOTE: The measurement bandwidth is 3.84 MHz centred on each carrier frequency and the limit is expressed as a ratio of RRC filtered mean power in one carrier, transmitting at minimum output power, to the RRC filtered mean power in the other carrier, transmitting at maximum output power.		

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3b.1.

5.13.5.3 Test purpose

To verify that the in-band emission, during DC-HSUPA transmission, does not exceed the prescribed limits shown in table 5.13.5.1. This is applicable for all values of β_c, β_d , β_{hs}, β_{ec} and β_{ed} as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BA.1.

Excess in-band emission decreases the uplink stability and throughput in DC-HSUPA operation.

NOTE: For a static signal, the measurement with a 3.84 MHz filter can be replaced by a narrower filter and integration over the bandwidth. For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

5.13.5.4 Method of test

5.13.5.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with exceptions for information elements in RADIO BEARER SETUP message as given in Table 5.2BA.2, 5.2BA.3 and 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to E.5 A.1A. Settings for the serving cell are defined in table 5.13.5.2

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.5.2: Settings for the serving cell during the measurement of in-band emission for DC-HSUPA

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 5.145.13.5.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
$\hat{I}_{or}$ (see notes 1 and 2)	dBm/3.84 MHz	-86
NOTE 1: The power level is specified in terms of $\hat{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\hat{I}_{or}$. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

Table 5.13.5.3: Power Settings of Uplink Carriers for the measurement of in-band emission for DC-HSUPA

Sub-test	Power of First Carrier	Power of Second Carrier
1	Maximum	Minimum
2	Minimum	Maximum

5.13.5.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set and send continuously Up power control commands to one carrier and Down power control commands to the other carrier to reach the power levels as given in table 5.13.5.3. Wait for 150ms.

4) Measure the power of each carrier with a measurement filter of bandwidths according to table 5.13.5.1 and record the power difference. The power may be calculated by integrating multiple narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Repeat steps 1-4 for sub-tests as given in table 5.13.5.3.

5.13.5.5 Test requirements

The result of clause 5.13.5.4.2 step 4) shall fulfil the requirements of table 5.13.5.4.

Table 5.13.5.4: In-band Emission Requirement for DC-HSUPA

Parameter Description	Unit	Limit
In-band emission	dBc	-23.2
NOTE: The measurement bandwidth is 3.84 MHz centred on each carrier frequency and the limit is expressed as a ratio of RRC filtered mean power in one carrier, transmitting at minimum output power, to the RRC filtered mean power in the other carrier, transmitting at maximum output power.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6 Receiver Characteristics

6.1 General

Receiving performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 6.1.

Table 6.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate	Remarks
12,2 kbps reference measurement channel	12,2 kbps	30 ksps	60 kbps	Standard Test

Unless otherwise stated the receiver characteristics are specified at the antenna connector of the UE. For UE(s) with an integral antenna only, a reference antenna with a gain of 0 dBi is assumed. UE with an integral antenna may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signals applied to each of the antenna connectors shall be as defined in the respective sections below. The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

With the exception of clause 6.8, all the parameters in clause 6 are defined using the DL reference measurement channel (12,2 kbps) specified in clause C.3.1 and unless stated otherwise, with DL power control OFF.

The common RF test conditions of Rx Characteristics are defined in clause E.3.2, and each test conditions in this clause (clause 6) should refer clause E.3.2. Individual test conditions are defined in the paragraph of each test.

When DCCH has been configured on downlink DCH then DCCH Data shall be continuously transmitted on downlink DCH during the measurement period. When there is no signalling to transmit on downlink DCCH then dummy DCCH transmission as described in Annex C.9 shall be used.

For HSDPA test cases, when DTCH has been configured on downlink DCH then DTCH Data shall be continuously transmitted on downlink DCH during the measurement period.

All Bit Error ratio (BER) measurements in clause 6 shall be performed according to the general rules for statistical testing in Annex F.6.

For HSDPA test cases without E-DCH, the MAC headers on HS-DSCH shall be according to Annex C.9A.

UEs supporting DC-HSDPA shall support both minimum requirements, as well as additional requirements for DC-HSDPA.

UEs supporting DB-DC-HSDPA shall support both minimum requirements as well as additional requirements for DB-DC-HSDPA.

For the additional requirements for DC-HSDPA or DB-DC-HSDPA, all the parameters in clause 6 are defined using the DL reference measurement channel H-Set 12 unless otherwise stated, specified in subclause C.8.1.12 and the downlink physical channel setup according to table E.5.4B. For the additional requirements for DC-HSDPA, the spacing of the carrier frequencies of the two cells shall be 5 MHz.

6.1A Reference input power adjustment for a dual band device

For the UE which supports DB-DC-HSDPA configuration in clause 4.2, the reference input powers (HS-PDSCH_Ec and $\hat{I}_{or}$) of core requirements specified in test cases 6.5C and 6.7C are allowed to be increased by the amount given in Table 6.1A for the applicable bands.

Table 6.1A: Allowed increase of HS-PDSCH Ec and $\hat{I}_{or}$ for UE which supports DB-DC-HSDPA.

DB-DC-HSDPA Configuration	Allowed increase of HS-PDSCH Ec and $\hat{I}_{or}$ (dB)	Applicable bands
1	0.5	I, VIII
2	1	II, IV
3	0.5	I, V

For the UE which supports dual band 4C-HSDPA configuration in Table 4.0B, the reference input powers (HS-PDSCH_Ec and Îor) of core requirements specified in clause 6.5C, 6.5E and 6.7C are allowed to be increased by the amount given in Table 6.1B for the applicable bands.

Table 6.1B: Allowed increase of HS-PDSCH Ec and $\hat{I}_{or}$ for UE which supports dual band 4C-HSDPA

Dual Band 4C-HSDPA Configuration	Allowed increase of HS-PDSCH Ec and $\hat{I}_{or}$ (dB)	Applicable bands
I-2-VIII-1 I-3-VIII-1	0.5	I, VIII
II-1-IV-2 II-2-IV-1 II-2-IV-2	1	II, IV
I-1-V-2 I-2-V-1 I-2-V-2	0.5	I, V

6.2 Reference Sensitivity Level

6.2.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value

The requirements and this test apply to all types of UTRA for the FDD UE.

6.2.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.2.1.

Table 6.2.1: Test parameters for Reference Sensitivity Level

Operating Band	Unit	DPCH_Ec <REFSENS>	<REFÎor>
I	dBm/3.84 MHz	-117	-106.7
II	dBm/3.84 MHz	-115	-104.7
III	dBm/3.84 MHz	-114	-103.7
IV	dBm/3.84 MHz	-117	-106.7
V	dBm/3.84 MHz	-115	-104.7
VI	dBm/3.84 MHz	-117	-106.7
VII	dBm/3.84 MHz	-115	-104.7
VIII	dBm/3.84 MHz	-114	-103.7
IX	dBm/3.84 MHz	-116	-105.7
X	dBm/3.84 MHz	-117	-106.7
XI	dBm/3.84 MHz	-117	-106.7
XII	dBm/3.84 MHz	-114	-103.7
XIII	dBm/3.84 MHz	-114	-103.7
XIV	dBm/3.84 MHz	-114	-103.7
XIX	dBm/3.84 MHz	-117	-106.7
XX	dBm/3.84 MHz	-114	-103.7
XXI	dBm/3.84 MHz	-117	-106.7
XXII	dBm/3.84 MHz	-114	-103.7
XXV	dBm/3.84 MHz	-113.5	-103.2
XXVI	dBm/3.84 MHz	-113.5	-103.2
NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power. NOTE 2: For Power class 4 this shall be at the maximum output power. NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -114.5 dBm DPCH_Ec <REFSENS> shall apply for Band IX. The corresponding <REFÎor> is -104.2 dBm. NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS.			

For the UE which supports DB-DC-HSDPA configuration in Table 6.2.1A, the reference sensitivity level DPCH_Ec <REFSENS> and corresponding <REFÎ$_{or}$> in Table 6.2.1 are allowed to be increased by the amount given in Table 6.2.1A for the applicable bands.

Table 6.2.1A: Allowed de-sensitization relative to reference sensitivity for UE which supports DB-DC-HSDPA.

DB-DC-HSDPA Configuration	Allowed de-sensitization (dB)	Applicable bands
2	1	II, IV

The normative reference for this requirement is TS 25.101 [1] clause 7.3.1.

6.2.3 Test purpose

To verify that the UE BER shall not exceed 0,001 for the parameters specified in table 6.2.2.

The lack of the reception sensitivity decreases the coverage area at the far side from Node B.

6.2.4 Method of test

6.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1. The parameter settings of the cell are set up according to TS 34.108 [3], clause 6.1.5 for "Default settings for a serving cell in a single cell environment".

3) Switch on the phone.

4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

5) The RF parameters are set up according to table 6.2.2.

6) Enter the UE into loopback test mode and start the loopback test.

See TS 34.109 [4] for details regarding loopback test.

6.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0,001.

Table 6.2.2: Test parameters for Reference Sensitivity Level

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I	dBm/3.84 MHz	-116.3	-106
II	dBm/3.84 MHz	-114.3	-104
III	dBm/3.84 MHz	-113.3	-103
IV	dBm/3.84 MHz	-116.3	-106
V	dBm/3.84 MHz	-114.3	-104
VI	dBm/3.84 MHz	-116.3	-106
VII	dBm/3.84 MHz	-114.3	-104
VIII	dBm/3.84 MHz	-113.3	-103
IX	dBm/3.84 MHz	-115.3	-105
X	dBm/3.84 MHz	-116.3	-106
XI	dBm/3.84 MHz	-116.3	-106
XII	dBm/3.84 MHz	-113.3	-103
XIII	dBm/3.84 MHz	-113.3	-103
XIV	dBm/3.84 MHz	-113.3	-103
XIX	dBm/3.84 MHz	-116.3	-106
XX	dBm/3.84 MHz	-113.3	-103
XXI	dBm/3.84 MHz	-116.3	-106
XXII	dBm/3.84 MHz	-113.3	-103
XXV	dBm/3.84 MHz	-112.8	-102.5
XXVI	dBm/3.84 MHz	-112.8	-102.5

NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.
NOTE 2: For Power class 4 this shall be at the maximum output power.
NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -113.8 dBm DPCH_Ec <REFSENS> shall apply for Band IX. The corresponding <REF$\hat{I}_{or}$> is -103.5 dBm.
NOTE 4: For the UE which supports DB-DC-HSDPA configuration 2, the reference sensitivity level of -113.3 dBm/3.84 MHz DPCH_Ec <REFSENS> shall apply for Band II. The corresponding <REF$\hat{I}_{or}$> is -103 dBm/3.84 MHz.
NOTE 5: For the UE which supports DB-DC-HSDPA configuration 2, the reference sensitivity level of -115.3 dBm/3.84 MHz DPCH_Ec <REFSENS> shall apply for Band IV. The corresponding <REF$\hat{I}_{or}$> is -105 dBm/3.84 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.2A Reference Sensitivity Level for DC-HSDPA

6.2A.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

6.2A.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.2A.1.

Table 6.2A.1: Test parameters for reference sensitivity, additional requirement for DC-HSDPA

Operating Band	Unit	HS-PDSCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I	dBm/3.84 MHz	-113	-102.7
II	dBm/3.84 MHz	-111	-100.7
III	dBm/3.84 MHz	-110	-99.7
IV	dBm/3.84 MHz	-113	-102.7
V	dBm/3.84 MHz	-111	-100.7
VI	dBm/3.84 MHz	-113	-102.7
VII	dBm/3.84 MHz	-111	-100.7
VIII	dBm/3.84 MHz	-110	-99.7
IX	dBm/3.84 MHz	-112	-101.7
X	dBm/3.84 MHz	-113	-102.7
XI	dBm/3.84 MHz	-113	-102.7
XII	dBm/3.84 MHz	-110	-99.7
XIII	dBm/3.84 MHz	-110	-99.7
XIV	dBm/3.84 MHz	-110	-99.7
XIX	dBm/3.84 MHz	-113	-102.7
XX	dBm/3.84 MHz	-110	-99.7
XXI	dBm/3.84 MHz	-113	-102.7
XXII	dBm/3.84 MHz	-110	-99.7
XXV	dBm/3.84 MHz	-109.5	-99.2
XXVI	dBm/3.84 MHz	-109.5	-99.2
NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power			
NOTE 2: For Power class 4 this shall be at the maximum output power			
NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -110.5 dBm HS-PDSCH_Ec <REFSENS> shall apply for Band IX. The corresponding <REF$\hat{I}_{or}$> is -100.2 dBm			
NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS.			

The normative reference for this requirement is TS 25.101 [1] clause 7.3.2.

6.2A.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2A.3 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

6.2A.4 Method of test

6.2A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.30.

2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.

3) Switch on the phone.

4) A call is set up according to the Generic DC-HSDPA setup procedure in TS34.108 [3] sub clause 7.3.13 with exceptions for information elements listed in table 6.2A.2.

5) The RF parameters are set up according to table 6.2A.3 for both primary and secondary serving cells.

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Table 6.2A.2: Specific Message Contents for reference sensitivity, additional requirement for DC-HSDPA

Information Element	Value/remark	Version
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.109 [4] for details regarding loopback test.

6.2A.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.2A.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2A.3: Test parameters for reference sensitivity, additional requirement for DC-HSDPA

Operating Band	Unit	HS-PDSCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I	dBm/3.84 MHz	-112.3	-102
II	dBm/3.84 MHz	-110.3	-100
III	dBm/3.84 MHz	-109.3	-99
IV	dBm/3.84 MHz	-112.3	-102
V	dBm/3.84 MHz	-110.3	-100
VI	dBm/3.84 MHz	-112.3	-102
VII	dBm/3.84 MHz	-110.3	-100
VIII	dBm/3.84 MHz	-109.3	-99
IX	dBm/3.84 MHz	-111.3	-101
X	dBm/3.84 MHz	-112.3	-102
XI	dBm/3.84 MHz	-112.3	-102
XII	dBm/3.84 MHz	-109.3	-99
XIII	dBm/3.84 MHz	-109.3	-99
XIV	dBm/3.84 MHz	-109.3	-99
XIX	dBm/3.84 MHz	-112.3	-102
XX	dBm/3.84 MHz	-109.3	-99
XXI	dBm/3.84 MHz	-112.3	-102
XXII	dBm/3.84 MHz	-119.3	-99
XXV	dBm/3.84 MHz	-108.8	-98.5
XXVI	dBm/3.84 MHz	-108.8	-98.5

NOTE 1 For Power class 3 and 3bis this shall be at the maximum output power.
NOTE 2 For Power class 4 this shall be at the maximum output power.
NOTE 3 For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -109.8 dBm HS-PDSCH_Ec <REFSENS> shall apply for Band IX. The corresponding <REF$\hat{I}_{or}$> is -99.5 dBm.
NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.2B Reference Sensitivity Level for DB-DC-HSDPA

6.2B.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

6.2B.2 Minimum Requirements

For all requirements listed in Table 6.2B.1, corresponding to the specific DB-DC-HSDPA configuration(s) supported by the UE, (see clause 4.2), the BLER measured on each individual cell shall not exceed 0.1.

Table 6.2B.1: Test parameters for reference sensitivity, additional requirement for DB-DC-HSDPA.

DB-DC-HSDPA configuration	DL Band	UL Band	Unit	HS-PDSCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
1	I	I	dBm/3.84 MHz	-113	-102.7
	VIII		dBm/3.84 MHz	-110	-99.7
	I	VIII	dBm/3.84 MHz	-113	-102.7
	VIII		dBm/3.84 MHz	-110	-99.7
2	II	II	dBm/3.84 MHz	-110	-99.7
	IV		dBm/3.84 MHz	-112	-101.7
	II	IV	dBm/3.84 MHz	-110	-99.7
	IV		dBm/3.84 MHz	-112	-101.7
3	I	I	dBm/3.84 MHz	-113	-102.7
	V		dBm/3.84 MHz	-111	-100.7
	I	V	dBm/3.84 MHz	-113	-102.7
	V		dBm/3.84 MHz	-111	-100.7
NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.					
NOTE 2: For Power class 4 this shall be at the maximum output power.					

The normative reference for this requirement is TS 25.101 [1] clause 7.3.3.

6.2B.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2B.2 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

6.2B.4 Method of test

6.2B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.30.
2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.
3) Switch on the phone.
4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.13 with exceptions for information elements listed in table 6.2B.2.
5) The RF parameters are set up according to table 6.2B.3 for both primary and secondary serving cells.

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Table 6.2B.2: Specific Message Contents for reference sensitivity, additional requirement for DB-DC-HSDPA

Information Element	Value/remark	Version
Downlink HS-PDSCH Information		
- CHOICE mode	FDD	
- Downlink 64QAM configured	Not Present	Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.109 [4] for details regarding loopback test.

6.2B.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

6.2B.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2B.3: Test parameters for reference sensitivity, additional requirement for DB-DC-HSDPA

DB-DC-HSDPA configuration	DL Band	UL Band	Unit	HS-PDSCH_Ec <REFSENS>	$\langle REF\hat{I}_{or} \rangle$
1	I	I	dBm/3.84 MHz	-112.3	-102
	VIII		dBm/3.84 MHz	-109.3	-99
	I	VIII	dBm/3.84 MHz	-112.3	-102
	VIII		dBm/3.84 MHz	-109.3	-99
2	II	II	dBm/3.84 MHz	-109.3	-99
	IV		dBm/3.84 MHz	-111.3	-101
	II	IV	dBm/3.84 MHz	-109.3	-99
	IV		dBm/3.84 MHz	-111.3	-101
3	I	I	dBm/3.84 MHz	-112.3	-102
	V		dBm/3.84 MHz	-110.3	-100
	I	V	dBm/3.84 MHz	-112.3	-102
	V		dBm/3.84 MHz	-110.3	-100
NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power. NOTE 2: For Power class 4 this shall be at the maximum output power.					

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.2C Reference Sensitivity Level for Single band 4C-HSDPA

6.2C.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band 4C-HSDPA and HS-DSCH categories 29 to 32.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.2C.2 Minimum Requirements

For all requirements listed in Table 6.2C.1, corresponding to the specific single band 4C-HSDPA configuration(s) supported by the UE, (see Table 4.0A), the BLER measured on each individual cell shall not exceed 0.1.

NOTE: The reference sensitivity level <REFSENS> requirement for single band 4C-HSDPA is not applicable for dual uplink operation. However, there might be a substantial Rx de-sensitization for the UE operating in bands which have less than 80 MHz Tx-Rx frequency separation, transmitting on more than one uplink frequency, at maximum power.

Table 6.2C.1: Test parameters for reference sensitivity, additional requirement for single band 4C-HSDPA

Single band 4C-HSDPA configuration	DL Band	Unit	HS-PDSCH_Ec <REFSENS>	<REFÎor>	UL-DL carrier separation
I-3	I	dBm/3.84 MHz	-113	-102.7	Minimum
NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power					

For the UE which supports DB-DC-HSDPA configuration in Table 6.2C.2, the reference sensitivity level HS-PDSCH_Ec <REFSENS> and corresponding <REFÎ$_{or}$> in Table 6.2C.1 are allowed to be increased by the amount given in Table 6.2C.2 for the applicable bands.

Table 6.2C.2: Allowed de-sensitization relative to reference sensitivity for UE which supports DB-DC-HSDPA

DB-DC-HSDPA Configuration	Allowed de-sensitization (dB)	Applicable bands
4	1	I

The normative reference for this requirement is TS 25.101 [1] clause 7.3.4.

6.2C.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2C.4 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

This test case tests only 3 carrier configurations.

6.2C.4 Method of test

6.2C.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.48.
2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.
3) Switch on the phone.
4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.16.
5) The RF parameters are set up according to table 6.2C.3 for each individual cells.

See TS 34.109 [4] for details regarding loopback test.

6.2C.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

6.2C.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2C.3: Test parameters for reference sensitivity, additional requirement for single band 4C-HSDPA.

Single band 4C-HSDPA configuration	DL Band	Unit	HS-PDSCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>	UL-DL carrier separation
I-3	I	dBm/3.84 MHz	-112.3	-102	Minimum
NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power					

For the UE which supports DB-DC-HSDPA configuration in Table 6.2C.3, the reference sensitivity level HS-PDSCH_Ec <REFSENS> and corresponding <REF$\hat{I}_{or}$> in Table 6.2C.3 are allowed to be increased by the amount given in Table 6.2C.4 for the applicable bands.

Table 6.2C.4: Allowed de-sensitization relative to reference sensitivity for UE which supports DB-DC-HSDPA

DB-DC-HSDPA Configuration	Allowed de-sensitization (dB)	Applicable bands
4	1	I

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.2D Reference Sensitivity Level for Dual band 4C-HSDPA

6.2D.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.2D.2 Minimum Requirements

For all requirements listed in Table 6.2D.1, corresponding to the specific dual band 4C-HSDPA configuration(s) supported by the UE, (see Table 4.0B), the BLER measured on each individual cell shall not exceed 0.1.

Note: The reference sensitivity level <REFSENS> requirement for dual band 4C-HSDPA is not applicable for dual uplink operation. However, there might be a substantial Rx de-sensitization for the UE operating in bands which have less than 80 MHz Tx-Rx frequency separation, transmitting on more than one uplink frequency, at maximum power.

Table 6.2D.1: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

Dual band 4C-HSDPA configuration	DL Band	UL Band	Unit	HS-PDSCH_Ec <REFSENS>	<$REF\hat{I}_{or}$>	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	dBm/3.84 MHz	-113	-102.7	Minimum
	VIII		dBm/3.84 MHz	-110	-99.7	Minimum
	I	VIII	dBm/3.84 MHz	-113	-102.7	Minimum
	VIII		dBm/3.84 MHz	-110	-99.7	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	dBm/3.84 MHz	-110	-99.7	Minimum
	IV		dBm/3.84 MHz	-112	-101.7	Minimum
	II	IV	dBm/3.84 MHz	-110	-99.7	Minimum
	IV		dBm/3.84 MHz	-112	-101.7	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	dBm/3.84 MHz	-113	-102.7	Minimum
	V		dBm/3.84 MHz	-111	-100.7	Minimum
	I	V	dBm/3.84 MHz	-113	-102.7	Minimum
	V		dBm/3.84 MHz	-111	-100.7	Minimum
NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power						

The normative reference for this requirement is TS 25.101 [1] clause 7.3.5.

6.2D.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2D.3 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

This test case tests only 4 carrier configurations.

6.2D.4 Method of test

6.2D.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.48.
2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.
3) Switch on the phone.
4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause7.3.16.
5) The RF parameters are set up according to table 6.2D.2 for each individual cells.

See TS 34.109 [4] for details regarding loopback test.

6.2D.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

6.2D.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2D.2: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

Dual band 4C-HSDPA configuration	DL Band	UL Band	Unit	HS-PDSCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	dBm/3.84 MHz	-112.3	-102	Minimum
	VIII		dBm/3.84 MHz	-109.3	-99	Minimum
	I	VIII	dBm/3.84 MHz	-112.3	-102	Minimum
	VIII		dBm/3.84 MHz	-109.3	-99	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	dBm/3.84 MHz	-109.3	-99	Minimum
	IV		dBm/3.84 MHz	-111.3	-101	Minimum
	II	IV	dBm/3.84 MHz	-109.3	-99	Minimum
	IV		dBm/3.84 MHz	-111.3	-101	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	dBm/3.84 MHz	-112.3	-102	Minimum
	V		dBm/3.84 MHz	-110.3	-100	Minimum
	I	V	dBm/3.84 MHz	-112.3	-102	Minimum
	V		dBm/3.84 MHz	-110.3	-100	Minimum
NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power						

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.2DA Reference Sensitivity Level for Dual band 4C-HSDPA (3 carrier)

6.2DA.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.2DA.2 Minimum Requirements

For all requirements listed in Table 6.2DA.1, corresponding to the specific dual band 4C-HSDPA configuration(s) supported by the UE, (see Table 4.0B), the BLER measured on each individual cell shall not exceed 0.1.

Note: The reference sensitivity level <REFSENS> requirement for dual band 4C-HSDPA is not applicable for dual uplink operation. However, there might be a substantial Rx de-sensitization for the UE operating in bands which have less than 80 MHz Tx-Rx frequency separation, transmitting on more than one uplink frequency, at maximum power.

Table 6.2DA.1: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

Dual band 4C-HSDPA configuration	DL Band	UL Band	Unit	HS-PDSCH_Ec <REFSENS>	$\langle REF\hat{I}_{or}\rangle$	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	dBm/3.84 MHz	-113	-102.7	Minimum
	VIII		dBm/3.84 MHz	-110	-99.7	Minimum
	I	VIII	dBm/3.84 MHz	-113	-102.7	Minimum
	VIII		dBm/3.84 MHz	-110	-99.7	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	dBm/3.84 MHz	-110	-99.7	Minimum
	IV		dBm/3.84 MHz	-112	-101.7	Minimum
	II	IV	dBm/3.84 MHz	-110	-99.7	Minimum
	IV		dBm/3.84 MHz	-112	-101.7	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	dBm/3.84 MHz	-113	-102.7	Minimum
	V		dBm/3.84 MHz	-111	-100.7	Minimum
	I	V	dBm/3.84 MHz	-113	-102.7	Minimum
	V		dBm/3.84 MHz	-111	-100.7	Minimum
NOTE 1: For Power class 3, 3bis and 4, this shall be at the maximum output power						

The normative reference for this requirement is TS 25.101 [1] clause 7.3.5.

6.2DA.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2DA.3 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

This test case tests only 3 carrier configurations.

6.2DA.4 Method of test

6.2DA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.48.
2) Channel conditions are initially set up with received CPICH_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.
3) Switch on the phone.
4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause7.3.16.
5) The RF parameters are set up according to table 6.2DA.2 for each individual cells.

See TS 34.109 [4] for details regarding loopback test.

6.2DA.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

6.2DA.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2DA.2: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

Dual band 4C-HSDPA configuration	DL Band	UL Band	Unit	HS-PDSCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	dBm/3.84 MHz	-112.3	-102	Minimum
	VIII		dBm/3.84 MHz	-109.3	-99	Minimum
	I	VIII	dBm/3.84 MHz	-112.3	-102	Minimum
	VIII		dBm/3.84 MHz	-109.3	-99	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	dBm/3.84 MHz	-109.3	-99	Minimum
	IV		dBm/3.84 MHz	-111.3	-101	Minimum
	II	IV	dBm/3.84 MHz	-109.3	-99	Minimum
	IV		dBm/3.84 MHz	-111.3	-101	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	dBm/3.84 MHz	-112.3	-102	Minimum
	V		dBm/3.84 MHz	-110.3	-100	Minimum
	I	V	dBm/3.84 MHz	-112.3	-102	Minimum
	V		dBm/3.84 MHz	-110.3	-100	Minimum
NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power						

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3 Maximum Input Level

6.3.1 Definition and applicability

This is defined as the maximum mean power received at the UE antenna port, which shall not degrade the specified BER performance.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.3.2 Minimum requirements

The BER shall not exceed 0.001 for the parameters specified in table 6.3.2.

The reference for this requirement is TS 25.101 [1] clause 7.4.1.

NOTE: Since the spreading factor is large (10log(SF)=21dB), the majority of the total input signal consists of the OCNS interference. The structure of OCNS signal is defined in clause E.3.3.

6.3.3 Test purpose

To verify that the UE BER shall not exceed 0,001 for the parameters specified in table 6.3.3.

An inadequate maximum input level causes loss of coverage near the Node B

6.3.4 Method of test

6.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) RF parameters are set up according to table 6.3.3 and table E.3.3.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.3.1 Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 6.3.2: Test parameters for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	−25	dBm / 3,84MHz
$\frac{DPCH\_E_c}{I_{or}}$	−19	dB
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

6.3.4.2 Procedure

1) Set the power level of UE according to the table 6.3.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

2) Measure the BER of DCH received from the UE at the SS.

6.3.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.3.3: Test requirements for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	−25.7	dBm / 3,84MHz
$\frac{DPCH\_E_c}{I_{or}}$	−19	dB
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3A Maximum Input Level for HS-PDSCH Reception (16QAM)

6.3A.1 Definition and applicability

Maximum input level for HS-PDSCH reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified HSDPA throughput performance. The requirements and this test apply to all types of UTRA FDD UE that support HSDPA (16QAM).

6.3A.2 Minimum requirements

The requirements are specified in terms of a minimum information bit throughput R for the DL reference channel H-Set 1 (16QAM version) specified in Annex C.8.1.1 with the addition of the parameters in Table 6.3A.1 and the downlink physical channel setup according to table E.5.1.

Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3A.2.

The reference for this requirement is TS 25.101 [1] clause 7.4.2.

Table 6.3A.1 Minimum requirement parameters for 16QAM Maximum Input Level

Parameter	Unit	Value
Phase reference		P-CPICH
$\hat{I}_{or}$	dBm/3.84 MHz	-25 *
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

Table 6.3A.2 Minimum throughput requirement

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-3	700

6.3A.3 Test purpose

To verify that the UE HSDPA throughput meets the minimum requirements specified in table 6.3A.2 for the DL reference channel H-Set 1 specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3A.4.

An inadequate maximum input level causes loss of coverage near the Node B.

6.3A.4 Method of test

6.3A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3A.4 and table E.5.1.

Table 6.3A.3 Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

6.3A.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.1.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure with looping back 12.2kbps RMC specified in TS 34.108 [3] clause 7.3.6. Additional radio bearer message definition is in table 6.3A.3

3) Set the power level of UE according to the table 6.3A.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3A.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3A.4: Test requirement parameters for 16QAM Maximum Input Level

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25.7
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3B Maximum Input Level for HS-PDSCH Reception (64QAM)

6.3B.1 Definition and applicability

Maximum input level for HS-PDSCH reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified HSDPA throughput performance. The requirements and this test apply for Release 7 and later releases to all types of UTRA FDD UE that support HSDPA (64QAM).

6.3B.2 Minimum requirements

The requirements are specified in terms of a minimum information bit throughput R for the DL reference channel H-Set 8 (64QAM version) specified in Annex C.8.1.8 with the addition of the parameters in Table 6.3B.1 and the downlink physical channel setup according to table E.5.1A.

Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3B.2.

The reference for this requirement is TS 25.101 [1] clause 7.4.2.

Table 6.3B.1 Minimum requirement parameters for 64QAM Maximum Input Level

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

Table 6.3B.2 Minimum throughput requirement

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-2	11800

6.3B.3 Test purpose

To verify that the UE HSDPA throughput meets the minimum requirements specified in table 6.3B.2 for the DL reference channel H-Set 8 specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3B.4.

An inadequate maximum input level causes loss of coverage near the Node B.

6.3B.4 Method of test

6.3B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3B.4 and table E.5.1A.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL_DCH)

Table 6.3B.3 Specific Message Contents for 64QAM Maximum Input Level

Information Element	Value/remark	Version
Downlink information for per radio links list - Downlink information for each radio links - Downlink DPCH info for each RL - DL channelisation code - Code number	 14	

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark	Version
Uplink DPCH info - Power Control Algorithm	 Algorithm2	Rel-6
Downlink information per radio link list - Downlink information for each radio link - Downlink DPCH info for each RL - DL channelisation code - Code number	 7	

Contents of RADIO BEARER SETUP message: AM or UM (HSDPA)

Information Element	Value/remark	Version
RAB information for setup list - RAB information for setup - RB mapping info - Downlink RLC logical channel info - Downlink transport channel type - CHOICE DL MAC header type - DL HS-DSCH MAC-ehs Queue Id - Logical channel identity	 HS-DSCH MAC-ehs 0 1	 Rel-7 Rel-7
Added or Reconfigured DL TrCH information list - Added or Reconfigured DL TrCH information - CHOICE DL parameters - CHOICE DL MAC header type - Added or reconfigured MAC-ehs reordering queue - MAC-ehs queue to add or reconfigure list - MAC-ehs queue Id - T1 - Treset - MAC-ehs window size	1 TrCHs added HS-DSCH MAC-ehs (one queue) 0 50 Not Present 16	 Rel-7 Rel-7 Rel-7 Rel-7 Rel-7 Rel-7 Rel-7
Uplink DPCH info - Power Control Algorithm	 Algorithm2	Rel-6
Downlink HS-PDSCH Information - HS-SCCH Info - CHOICE mode - DL Scrambling Code - HS-SCCH Channelisation Code Information - HS-SCCH Channelisation Code - HS-SCCH Channelisation Code - CHOICE mode - Downlink 64QAM configured	 FDD 2 3 FDD TRUE	 Rel-7
Downlink information per radio link list - Downlink information for each radio link - Downlink DPCH info for each RL - DL channelisation code - Code number	 7	

6.3B.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.1.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure with looping back 12.2kbps RMC specified in TS 34.108 [3] clause 7.3.6, with the exceptions for information elements listed in table 6.3B.3

3) Set the power level of UE according to the table 6.3B.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3B.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800Kbit/second. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3B.4: Test requirement parameters for 64QAM Maximum Input Level

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25.7
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3C Maximum Input Level for DC-HSDPA Reception (16QAM)

6.3C.1 Definition and applicability

Maximum input level for DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DC-HSDPA throughput performance.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA with 16QAM.

6.3C.2 Minimum requirements

The additional DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1 (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3C.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3C.2.

Table 6.3C.1 Minimum requirement parameters for 16QAM Maximum Input Level (DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
$\hat{I}_{or}$	dBm/3.84 MHz	-25 *
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

Table 6.3C.2 Minimum throughput requirement (DC-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-3	700

The reference for this requirement is TS 25.101 [1] clause 7.4.3.1

6.3C.3 Test purpose

To verify that the UE DC-HSDPA throughput meets the minimum requirements specified in table 6.3C.2 for the DL reference channel H-Set 1 specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3C.4.

An inadequate maximum input level causes loss of DC-HSDPA coverage near the Node B.

6.3C.4 Method of test

6.3C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3C.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3C.3: Specific Message Contents for 16QAM Maximum Input Level (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.3C.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13 with exceptions for information elements listed in table 6.3C.3

3) Set the power level of UE according to the table 6.3C.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3C.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3C.4: Test requirement parameters for 16QAM Maximum Input Level (DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
$\hat{I}_{or}$	dBm/3.84 MHz	-25.7
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3D Maximum Input Level for DC-HSDPA Reception (64QAM)

6.3D.1 Definition and applicability

Maximum input level for DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DC-HSDPA throughput performance.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA with 64QAM.

6.3D.2 Minimum requirements

The additional DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8A specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3D.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3D.2.

Table 6.3D.1: Minimum requirement parameters for 64QAM Maximum Input Level (DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
$\hat{I}_{or}$	dBm/3.84 MHz	-25 *
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

Table 6.3D.2: Minimum throughput requirement (DC-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-2	11800

The reference for this requirement is TS 25.101 [1] clause 7.4.3.2.

6.3D.3 Test purpose

To verify that the UE DC-HSDPA throughput meets the minimum requirements specified in table 6.3D.2 for the DL reference channel H-Set 8A specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3D.4.

An inadequate maximum input level causes loss of DC-HSDPA coverage near the Node B.

6.3D.4 Method of test

6.3D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3D.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL_DCH)

Table 6.3D.3: Specific Message Contents for 64QAM Maximum Input Level (DC-HSDPA)

Information Element	Value/remark	Version
Downlink information for per radio links list -Downlink information for each radio links - Downlink DPCH info for each RL - DL channelisation code - Code number	 14	

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink information per radio link list		
- Downlink information for each radio link		
- Downlink DPCH info for each RL		
- DL channelisation code		
- Code number	7	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD TRUE (for H-Set 8A)	 Rel-7
- HS-DSCH TB size table	Not Present	Rel-7
Downlink information per radio link list - Downlink information for each radio link - Downlink DPCH info for each RL - DL channelisation code - Code number	 7	
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	TRUE (for H-Set 8A)	
- HS-DSCH TB size table	Not Present	

6.3D.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.
2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13with exceptions for information elements listed in table 6.3D.3
3) Set the power level of UE according to the table 6.3D.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).
5) The UE is switched off.

6.3D.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3D.4: Test requirement parameters for 64QAM Maximum Input Level (DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25.7
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3E Maximum Input Level for DB-DC-HSDPA Reception (16QAM)

6.3E.1 Definition and applicability

Maximum input level for DB-DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DB-DC-HSDPA throughput performance.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA with 16QAM.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

6.3E.2 Minimum requirements

The additional DB-DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1 (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3E.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3E.2.

Table 6.3E.1: Minimum requirement parameters for 16QAM Maximum Input Level (DB-DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

Table 6.3E.2: Minimum throughput requirement (DB-DC-HSDPA)

HS-PDSCH E_c/I_{or} (dB)	T-put R (kbps)
-3	700

The reference for this requirement is TS 25.101 [1] clause 7.4.3.1

6.3E.3 Test purpose

To verify that the UE DB-DC-HSDPA throughput meets the minimum requirements specified in table 6.3E.2 for the DL reference channel H-Set 1 specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3E.4.

An inadequate maximum input level causes loss of DB-DC-HSDPA coverage near the Node B.

6.3E.4 Method of test

6.3E.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3E.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3E.3: Specific Message Contents for 16QAM Maximum Input Level (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.3E.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13 with exceptions for information elements listed in table 6.3E.3

3) Set the power level of UE according to the table 6.3E.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3E.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3E.4: Test requirement parameters for 16QAM Maximum Input Level (DB-DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25.7
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3F Maximum Input Level for DB-DC-HSDPA Reception (64QAM)

6.3F.1 Definition and applicability

Maximum input level for DB-DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DB-DC-HSDPA throughput performance.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA with 64QAM.

DB-DC-HSDPA is designed to operate in configurations, specified in clause 4.2

6.3F.2 Minimum requirements

The additional DB-DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8A specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3F.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3F.2.

Table 6.3F.1: Minimum requirement parameters for 64QAM Maximum Input Level (DB-DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

Table 6.3F.2: Minimum throughput requirement (DB-DC-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-2	11800

The reference for this requirement is TS 25.101 [1] clause 7.4.3.2.

6.3F.3 Test purpose

To verify that the UE DB-DC-HSDPA throughput meets the minimum requirements specified in table 6.3F.2 for the DL reference channel H-Set 8A specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3F.4.

An inadequate maximum input level causes loss of DB-DC-HSDPA coverage near the Node B.

6.3F.4 Method of test

6.3F.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3F.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL_DCH)

Table 6.3F.3: Specific Message Contents for 64QAM Maximum Input Level (DB-DC-HSDPA)

Information Element	Value/remark	Version
Downlink information for per radio links list -Downlink information for each radio links - Downlink DPCH info for each RL - DL channelisation code - Code number	14	

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink information per radio link list		
- Downlink information for each radio link		
- Downlink DPCH info for each RL		
- DL channelisation code		
- Code number	7	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD TRUE (for H-Set 8A)	 Rel-7
- HS-DSCH TB size table	Not Present	Rel-7
Downlink information per radio link list - Downlink information for each radio link - Downlink DPCH info for each RL - DL channelisation code - Code number	 7	
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	TRUE (for H-Set 8A)	
- HS-DSCH TB size table	Not Present	

6.3F.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13 with exceptions for information elements listed in table 6.3F.3

3) Set the power level of UE according to the table 6.3F.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3F.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3F.4: Test requirement parameters for 64QAM Maximum Input Level (DB-DC-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
I_{or}	dBm/3.84 MHz	-25.7
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3G Maximum Input Level for 4C-HSDPA Reception (16QAM)

6.3G.1 Definition and applicability

Maximum input level for 4C-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified 4C-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 16QAM and HS-DSCH categories 31 or 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.3G.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1C (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3G.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3G.2.

Table 6.3G.1: Minimum requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

Table 6.3G.2: Minimum throughput requirement (4C-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-3	700

The reference for this requirement is TS 25.101 [1] clause 7.4.4.1

6.3G.3 Test purpose

To verify that the UE DC-HSDPA throughput meets the minimum requirements specified in table 6.3G.2 for the DL reference channel H-Set 1C specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3G.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 4 carrier configurations.

6.3G.4 Method of test

6.3G.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3G.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3G.3: Specific Message Contents for 16QAM Maximum Input Level (4C-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.3G.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.
2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 with exceptions for information elements listed in table 6.3G.3
3) Set the power level of UE according to the table 6.3G.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).
5) The UE is switched off.

6.3G.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3G.4: Test requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22.7
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3GA Maximum Input Level for 4C-HSDPA Reception (16QAM) (3 carrier)

6.3GA.1 Definition and applicability

Maximum input level for 4C-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified 4C-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 16QAM and HS-DSCH UE categories 29 to 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.3GA.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1B (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3GA.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3GA.2.

Table 6.3GA.1 Minimum requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

Table 6.3GA.2: Minimum throughput requirement (4C-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-3	700

The reference for this requirement is TS 25.101 [1] clause 7.4.4.1

6.3GA.3 Test purpose

To verify that the UE 4C-HSDPA throughput meets the minimum requirements specified in table 6.3GA.2 for the DL reference channel H-Set 1B specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3GA.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 3 carrier configurations.

6.3GA.4 Method of test

6.3GA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3GA.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3GA.3: Specific Message Contents for 16QAM Maximum Input Level (4C-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.3GA.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 with exceptions for information elements listed in table 6.3GA.3

3) Set the power level of UE according to the table 6.3GA.4 and send power control commands to the UE.The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3GA.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3GA.4: Test requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22.7
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3H Maximum Input Level for 4C-HSDPA Reception (64QAM)

6.3H.1 Definition and applicability

Maximum input level for DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DC-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 64QAM and HS-DSCH categories 31 or 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.3H.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8C specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3H.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3H.2.

Table 6.3H.1: Minimum requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

Table 6.3H.2: Minimum throughput requirement (4C-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-2	11800

The reference for this requirement is TS 25.101 [1] clause 7.4.4.2.

6.3H.3 Test purpose

To verify that the UE 4C-HSDPA throughput meets the minimum requirements specified in table 6.3H.2 for the DL reference channel H-Set 8C specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3H.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 4 carrier configurations.

6.3H.4 Method of test

6.3H.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3H.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL_DCH)

Table 6.3H.3: Specific Message Contents for 64QAM Maximum Input Level (4C-HSDPA)

Information Element	Value/remark	Version
Downlink information for per radio links list -Downlink information for each radio links - Downlink DPCH info for each RL - DL channelisation code - Code number	 14	

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink information per radio link list		
- Downlink information for each radio link		
- Downlink DPCH info for each RL		
- DL channelisation code		
- Code number	7	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD TRUE	 Rel-7
Downlink information per radio link list - Downlink information for each radio link - Downlink DPCH info for each RL - DL channelisation code - Code number	 7	
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	TRUE	

6.3H.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 exceptions for information elements listed in table 6.3H.3

3) Set the power level of UE according to the table 6.3H.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).

5) The UE is switched off.

6.3H.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3H.4: Test requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22.7
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3HA Maximum Input Level for 4C-HSDPA Reception (64QAM) (3 carrier)

6.3HA.1 Definition and applicability

Maximum input level for 4C-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified 4C-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 64QAM and HSDPA UE capability categories 29 to 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.3HA.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8B specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3HA.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3HA.2.

Table 6.3HA.1: Minimum requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

Table 6.3HA.2: Minimum throughput requirement (4C-HSDPA)

HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps)
-2	11800

The reference for this requirement is TS 25.101 [1] clause 7.4.4.2.

6.3HA.3 Test purpose

To verify that the UE 4C-HSDPA throughput meets the minimum requirements specified in table 6.3HA.2 for the DL reference channel H-Set 8B specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3HA.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 3 carrier configurations.

6.3HA.4 Method of test

6.3HA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3HA.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL_DCH)

Table 6.3HA.3: Specific Message Contents for 64QAM Maximum Input Level (4C-HSDPA)

Information Element	Value/remark	Version
Downlink information for per radio links list -Downlink information for each radio links - Downlink DPCH info for each RL - DL channelisation code - Code number	 14	

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink information per radio link list		
- Downlink information for each radio link		
- Downlink DPCH info for each RL		
- DL channelisation code		
- Code number	7	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD TRUE	 Rel-7
Downlink information per radio link list - Downlink information for each radio link - Downlink DPCH info for each RL - DL channelisation code - Code number	 7	
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	TRUE	

6.3HA.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.
2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 exceptions for information elements listed in table 6.3HA.3
3) Set the power level of UE according to the table 6.3HA.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize*number of blocks acknowledged/time).
5) The UE is switched off.

6.3HA.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3HA.4: Test requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

Parameter	Unit	Value
Phase reference		P-CPICH
Wanted signal mean power per band (dBm)	dBm/band	-22.7
UE transmitted mean power	dBm	0
DPCH_Ec/Ior	dB	-13
HS-SCCH_1_Ec/Ior	dB	-13
Redundancy and constellation version		6
Maximum number of HARQ transmissions		1
Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.4 Adjacent Channel Selectivity (ACS) (Rel-99 and Rel-4)

6.4.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the FDD UE for Release 99 and Release 4.

6.4.2 Minimum Requirements

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 6.4.1. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.1: Test parameters for Adjacent Channel Selectivity for Release 99 and Release 4.

Parameter	Level / Status	Unit
DPCH_Ec	–103	dBm / 3,84 MHz
$\hat{I}_{or}$	–92,7	dBm / 3,84 MHz
I_{oac} mean power (modulated)	–52	dBm
F_{uw} (offset)	–5 or +5	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm

The normative reference for these requirements is TS 25.101 [1] clause 7.5.1.

NOTE: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

6.4.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the test parameters specified in table 6.4.2.

The lack of the ACS decreases the coverage area when other transmitter exists in the adjacent channel.

6.4.4 Method of test

6.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.4.
2) RF parameters are set up according to table 6.4.2.
3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.
4) Enter the UE into loopback test mode and start the loopback test.

Table 6.4.1A Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4.2.
2) Set the power level of UE according to the table 6.4.2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.

6.4.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.4.2: Test parameters for Adjacent Channel Selectivity for Release 99 and Release 4.

Parameter	Level / Status	Unit
DPCH_Ec	–103	dBm / 3,84 MHz
$\hat{I}_{or}$	–92,7	dBm / 3,84 MHz
I_{oac} mean power (modulated)	–52	dBm
F_{uw} (offset)	–5 or +5	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.4A Adjacent Channel Selectivity (ACS) (Rel-5 and later releases)

6.4A.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the FDD UE for Release 5 and later releases.

6.4A.2 Minimum Requirements

For the UE of power class 3, 3bis and 4, the BER shall not exceed 0,001 for the parameters specified in table 6.4A.1. This test condition is equivalent to the ACS value 33 dB.

Table 6.4A.1: Test parameters for Adjacent Channel Selectivity for release 5 and later releases

Parameter	Unit	Case 1	Case 2
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REFÎ$_{or}$> + 14 dB	<REFÎ$_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	20 (for Power class 3 and 3bis) 18 (for Power class 4)

The normative reference for these requirements is TS 25.101 [1] clause 7.5.1.

NOTE 1: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REFÎ$_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REFÎ$_{or}$> as specified in Table 6.2.1.

6.4A.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the test parameters specified in table 6.4A.2.

The lack of the ACS decreases the coverage area when other transmitter exists in the adjacent channel.

6.4A.4 Method of test

6.4A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.4.

2) RF parameters are set up according to table 6.4A.2.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.4A.1A: Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement - Power Control Algorithm	Uplink DPCH info Algorithm2

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4A.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4A.2 case 1.
2) Set the power level of UE according to the table 6.4A.2 case 1 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.
4) Set the parameters of the interference signal generator as shown in table 6.4A.2 case 2.
5) Set the power level of UE according to the table 6.4A.2 case 2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
6) Measure the BER of DCH received from the UE at the SS.

6.4A.5 Test requirements

The measured BER, derived in step 1) and step 6), shall not exceed 0,001.

Table 6.4A.2: Test parameters for Adjacent Channel Selectivity for Release 5 and later releases

Parameter	Unit	Case 1	Case 2
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
I_{or}	dBm/3.84 MHz	<REFI_{or}> + 14 dB	<REFI_{or}> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE: 1 The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

NOTE 3: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.4B Adjacent Channel Selectivity (ACS) for DC-HSDPA

6.4B.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

6.4B.2 Minimum Requirements

The UE shall fulfil the additional requirement specified in Table 6.4B.1 for all values of an adjacent channel interferer up to -25 dBm.

However it is not possible to directly measure the ACS, instead the lower and upper range of test parameters are chosen in Table 6.4.B.2, where the HS-PDSCH BLER shall not exceed 0.1.

Table 6.4B.1: Adjacent Channel Selectivity

Power Class	Unit	ACS
3	dB	33
4	dB	33

Table 6.4B.2: Test parameters for Adjacent Channel Selectivity (DC-HSDPA)

Parameter	Unit	Case 1	Case 2
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 14 dB	<REF$\hat{I}_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset) (note 2)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE 1: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

The normative reference for these requirements is TS 25.101 [1] clause 7.5.2.

6.4B.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the test parameters specified in table 6.4B.4 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the ACS decreases the DC-HSDPA coverage area when other transmitter exists in the adjacent channel.

6.4B.4 Method of test

6.4B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.31.

2) RF parameters are set up according to table 6.4B.2.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.4B.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.4B.3: Specific Message Contents for Adjacent Channel Selectivity (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4B.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4B.4 case 1.

2) Set the power level of UE according to the table 6.4B.4 case 1 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) Set the parameters of the interference signal generator as shown in table 6.4B.4 case 2.

5) Set the power level of UE according to the table 6.4B.4 case 2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

6) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.4B.5 Test requirements

The measured BLER, derived in step 1) and step 6), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F. 6.3.5.0.

Table 6.4B.4: Test parameters for Adjacent Channel Selectivity (DC-HSDPA)

Parameter	Unit	Case 1	Case 2
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 14 dB	<REF$\hat{I}_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE 1: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2A.1.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.4C Adjacent Channel Selectivity (ACS) for DB-DC-HSDPA

6.4C.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

6.4C.2 Minimum Requirements

The UE shall fulfil the additional requirement specified in Table 6.4C.1 for all values of an adjacent channel interferer up to -25 dBm.

However it is not possible to directly measure the ACS, instead the lower and upper range of test parameters are chosen in Table 6.4.B.2, where the HS-PDSCH BLER shall not exceed 0.1.

Table 6.4C.1: Adjacent Channel Selectivity

Power Class	Unit	ACS
3	dB	33
4	dB	33

Table 6.4C.2: Test parameters for Adjacent Channel Selectivity (DB-DC-HSDPA)

Parameter	Unit	Case 1	Case 2
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
Î$_{or}$	dBm/3.84 MHz	<REFÎ$_{or}$> + 14 dB	<REFÎ$_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset) (note 2)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE 1: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2B.1.

The normative reference for these requirements is TS 25.101 [1] clause 7.5.2.

6.4C.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the test parameters specified in table 6.4C.4 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the ACS decreases the DB-DC-HSDPA coverage area when other transmitter exists in the adjacent channel.

6.4C.4 Method of test

6.4C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.31.
2) RF parameters are set up according to table 6.4C.2.
3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.4C.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.4C.3: Specific Message Contents for Adjacent Channel Selectivity (DB-DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4C.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4C.4 case 1.
2) Set the power level of UE according to the table 6.4C.4 case 1 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).
4) Set the parameters of the interference signal generator as shown in table 6.4C.4 case 2.

5) Set the power level of UE according to the table 6.4C.4 case 2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

6) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.4C.5 Test requirements

The measured BLER, derived in step 1) and step 6), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.4C.4: Test parameters for Adjacent Channel Selectivity (DB-DC-HSDPA)

Parameter	Unit	Case 1	Case 2
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 14 dB	<REF$\hat{I}_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE 1: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

NOTE 5: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5 Blocking Characteristics

6.5.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5.2.1 and 6.5.2.2 and this test apply to all types of UTRA for the FDD UE.

The requirements in clause 6.5.2.3 and this test apply to the FDD UE supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

The frequency range 4 requirements do not apply to Release 5 or earlier releases, but only to Release 6 and onwards.

6.5.2 Minimum Requirements

6.5.2.1 Minimum Requirements (In-band blocking)

The BER shall not exceed 0,001 for the parameters specified in table 6.5.1. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1.

Table 6.5.1: Test parameters for In-band blocking characteristics

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
I_{or}	dBm/3.84 MHz	<REFI_{or}> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note 2 and 3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6 (Note 2)	2605 ≤ f ≤ 2705
F_{uw} (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4 (Note 2)	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6 (Note 2)	2095 ≤ f ≤ 2185
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4 (Note 2)	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6 (Note 2)	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6 (Note 2)	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6 (Note 2)	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6 (Note 2)	860≤ f ≤905 (Note 3)
F_{uw} (Band XX operation)	MHz	783.4≤ f ≤828.6 (Note 2)	776≤ f ≤836
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4 (Note 2)	1480.9≤ f ≤1525.9 (Note 3)
F_{uw} (Band XXII operation)	MHz	3502.4≤ f ≤3597.6	3495≤ f ≤3605
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6	1915≤ f ≤2010
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

6.5.2.2 Minimum requirements (Out of-band blocking)

The BER shall not exceed 0.001 for the parameters specified in table 6.5.2. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band. For table 6.5.2 in frequency range 1, 2 and 3, up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

For Table 6.5.2 in frequency range 4, up to 8 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using 1 MHz step size.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2.

Table 6.5.2: Test parameters for Out of band blocking characteristics

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f ≤2050 2230 ≤f <2255	1< f ≤2025 2255≤f<12750	-
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f ≤1870 2050 ≤f <2075	1< f ≤1845 2075≤f<12750	1850 ≤ f ≤ 1910
F_{uw} (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f ≤ 1745 1940≤f < 1965	1< f ≤1720 1965≤f<12750	-
F_{uw} (Band IV operation)	MHz	2050< f <2095 2170< f <2215	2025< f ≤2050 2215≤ f < 2240	1< f ≤2025 2240≤f<12750	-
F_{uw} (Band V operation)	MHz	809< f <854 909< f <954	784< f ≤809 954≤ f < 979	1< f ≤784 979≤f<12750	824 ≤ f ≤ 849
F_{uw} (Band VI operation)	MHz	815 < f < 860 900 < f < 945	790 < f ≤ 815 945 ≤ f < 970	1 < f ≤ 790 970 ≤ f < 12750	-
F_{uw} (Band VII operation)	MHz	2570 < f < 2605 2705 < f < 2750	na 2750 ≤ f < 2775	1 < f ≤ 2570 2775 ≤ f < 12750	-
F_{uw} (Band VIII operation)	MHz	865 < f < 910 975 < f < 1020	840 < f ≤ 865 1020 ≤ f < 1045	1 < f ≤ 840 1045 ≤ f < 12750	-
F_{uw} (Band IX operation)	MHz	1784.9 < f < 1829.9 1894.9 < f < 1939.9	1759.9 < f ≤ 1784.9 1939.9 ≤ f < 1964.9	1 < f ≤ 1759.9 1964.9 ≤ f < 12750	-
F_{uw} (Band X operation)	MHz	2050 < f < 2095 2185 < f < 2230	2025 < f ≤ 2050 2230 ≤ f < 2255	1 < f ≤ 2025 2255 ≤ f < 12750	-
F_{uw} (Band XI operation)	MHz	1415.9 < f < 1460.9 1510.9 < f < 1555.9	1390.9 < f ≤ 1415.9 1555.9 ≤ f < 1580.9	1 < f ≤ 1390.9 1580.9 ≤ f< 12750	-
F_{uw} (Band XII operation)	MHz	669 < f < 714 761 < f < 806	644 < f ≤ 669 806 < f < 831	1 < f ≤ 644 831 ≤ f < 12750	699 ≤ f ≤ 716
F_{uw} (Band XIII operation)	MHz	686 < f < 731 771 < f < 816	661 < f ≤ 686 816 ≤ f < 841	1 < f ≤ 661 841 ≤ f < 12750	776 ≤ f ≤ 788
F_{uw} (Band XIV operation)	MHz	698 < f < 743 783 < f < 828	673 < f ≤ 698 828 ≤ f < 853	1 < f ≤ 673 853 ≤ f <≤ 12750	788 ≤ f ≤ 798
F_{uw} Band XIX operation)	MHz	815 < f < 860 905 < f < 950	790 < f ≤ 815 950 ≤ f < 975	1 < f ≤ 790 975 ≤ f < 12750	-

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
F_{uw} (Band XX operation)	MHz	731< f <776 836< f <881	706 < f ≤ 731 881 ≤ f < 906	1 < f ≤ 706 906 ≤ f < 12750	-
F_{uw} (Band XXI operation)	MHz	1435.9 < f < 1480.9 1525.9 < f < 1570.9	1410.9 < f ≤ 1435.9 1570.9 ≤ f < 1595.9	1 < f ≤ 1410.9 1595.9 ≤ f < 12750	-
Fuw (Band XXII operation)	MHz	3450 < f <3495 3605< f <3650	3425 < f ≤ 3450 3650≤ f < 3675	1< f ≤3425 3675≤ f<12750	-
Fuw (Band XXV operation)	MHz	1870<f <1915 2010<f <2055	1845 <f ≤1870 2055 ≤f <2080	1< f ≤1845 2080≤f<12750	1850 ≤ f ≤ 1915
F_{uw} (Band XXVI operation)	MHz	799< f <844 909< f <954	774 < f ≤799 954 ≤ f < 979	1< f ≤774 979 ≤ f < 12750	814 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Band I operation	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band II operation	For 1915≤f ≤2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied				
Band III operation	For 1790≤f ≤1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band IV operation	For 2095≤f ≤2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band V operation	For 854≤<f ≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band VI operation	For 860≤f ≤900 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band VII operation	For 2605 ≤ f ≤ 2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band VIII operation	For 910 ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band IX operation	For 1829.9≤f≤ 1894.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band X operation	For 2095 ≤ f ≤ 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XI operation	For 1460.9 ≤ f ≤ 1510.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XII operation	For 714 ≤ f ≤ 761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XIII operation	For 731 ≤ f ≤ 771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XIV operation	For 743 ≤ f ≤ 783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XIX operation	For 860≤f≤905 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XX operation	For 776≤f≤836 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XXI operation	For 1480.9≤f ≤1525.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XXII operation	For 3495≤ f ≤3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XXV operation	For 1915≤f ≤2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied				
Band XXVI operation	For 844≤<f ≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
NOTE: For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS.					

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

6.5.2.3 Minimum requirements (Narrow band blocking)

The BER shall not exceed 0.001 for the parameters specified in table 6.5.3. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing. The requirements and this test apply to UTRA for the FDD UE supporting band II, band III, band IV, band V, band VIII, band X, band XII, band XIII or band XIV.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3

Table 6.5.3: Test parameters for narrow band blocking

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
I_{or}	dBm/3.84 MHz	<REFI_{or}> + 10 dB	<REFI_{or}> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset)	MHz	2.7	2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

6.5.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.5.4, table 6.5.5 and table 6.5.6. For Table 6.5.5 in frequency range 1, 2 and 3, up to (24) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

For Table 6.5.5 in frequency range 4, up to 8 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

The lack of the blocking ability decreases the coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.5.

2) RF parameters are set up according to table 6.5.4, table 6.5.5 and table 6.5.6.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.5.3A Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm2

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5.4, 6.5.5 and table 6.5.6. For table 6.5.5, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5.4, table 6.5.5, and table 6.5.6, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

4) For table 6.5.5, record the frequencies for which BER exceed the test requirements.

6.5.5 Test requirements

For table 6.5.4, the measured BER, derived in step 2), shall not exceed 0.001. For table 6.5.5, the measured BER, derived in step 2) shall not exceed 0,001 except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4 . For table 6.5.6, the measured BER, derived in step 2), shall not exceed 0.001.

Table 6.5.4: Test parameters for In-band blocking characteristics

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note 2 and 3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6 (Note 2)	2605 ≤ f ≤ 2705
F_{uw} (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4 (Note 2)	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6 (Note 2)	2095 ≤ f ≤ 2185

Parameter	Unit	Level	
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4 (Note 2)	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6 (Note 2)	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6 (Note 2)	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6 (Note 2)	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6 (Note 2)	860≤ f ≤905 (Note 3)
F_{uw} (Band XX operation)	MHz	783.4≤ f ≤828.6 (Note 2)	776≤ f ≤836
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4 (Note 2)	1480.9≤ f ≤1525.9 (Note 3)
F_{uw} (Band XXII operation)	MHz	3502.4≤ f ≤3597.6	3495≤ f ≤3605
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6	1915≤ f ≤2010
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI and Band XIX, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

Table 6.5.5: Test parameters for Out of band blocking characteristics

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f ≤2050 2230 ≤f <2255	1< f ≤2025 2255≤f<12750	-
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f ≤1870 2050 ≤f <2075	1< f ≤1845 2075≤f<12750	1850 ≤ f ≤ 1910
F_{uw} (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f ≤ 1745 1940≤f < 1965	1< f ≤1720 1965≤f<12750	-
F_{uw} (Band IV operation)	MHz	2050< f <2095 2170< f <2215	2025< f ≤2050 2215≤ f < 2240	1< f ≤2025 2240≤f<12750	-
F_{uw} (Band V operation)	MHz	809< f <854 909< f <954	784< f ≤809 954≤ f < 979	1< f ≤784 979≤f<12750	824 ≤ f ≤ 849
F_{uw} (Band VI operation)	MHz	815 < f < 860 900 < f < 945	790 < f ≤ 815 945 ≤ f < 970	1 < f ≤ 790 970 ≤ f < 12750	-
F_{uw} (Band VII operation)	MHz	2570 < f < 2605 2705 < f < 2750	na 2750 ≤ f < 2775	1 < f ≤ 2570 2775 ≤ f < 12750	-

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
F_{uw} (Band VIII operation)	MHz	865 < f < 910 975 < f < 1020	840 < f ≤ 865 1020 ≤ f < 1045	1 < f ≤ 840 1045 ≤ f < 12750	-
F_{uw} (Band IX operation)	MHz	1785 < f < 1830 1895 < f < 1940	1760 < f ≤ 1785 1940 ≤ f < 1965	1 < f ≤ 1760 1965 ≤ f < 12750	-
F_{uw} (Band X operation)	MHz	2050 < f < 2095 2185 < f < 2230	2025 < f ≤ 2050 2230 ≤ f < 2255	1 < f ≤ 2025 2255 ≤ f < 12750	-
F_{uw} (Band XI operation)	MHz	1416 < f < 1461 1511 < f < 1556	1391 < f ≤ 1416 1556 ≤ f < 1581	1 < f ≤ 1391 1581 ≤ f< 12750	-
F_{uw} (Band XII operation)	MHz	669 < f < 714 761 < f < 806	644 < f < 669 806 < f < 831	1 < f ≤ 644 831 ≤ f < 12750	699 ≤ f ≤ 716
F_{uw} (Band XIII operation)	MHz	686 < f < 731 771 < f < 816	661 < f < 686 816 < f < 841	1 < f ≤ 661 841 ≤ f < 12750	776 ≤ f ≤ 788
F_{uw} (Band XIV operation)	MHz	698 < f < 743 783 < f < 828	673 < f < 698 828 < f < 853	1 < f ≤ 673 853 ≤ f < 12750	788 ≤ f ≤ 798
F_{uw} (Band XIX operation)	MHz	815 < f < 860 905 < f < 950	790 < f ≤ 815 950 ≤ f < 975	1 < f ≤ 790 975 ≤ f < 12750	-
F_{uw} (Band XX operation)	MHz	731< f <776 836< f <881	706 < f ≤ 731 881 ≤ f < 906	1 < f ≤ 706 906 ≤ f < 12750	-
F_{uw} (Band XXI operation)	MHz	1436 < f < 1481 1526 < f < 1571	1411 < f ≤ 1436 1571 ≤ f < 1596	1 < f ≤ 1411 1596 ≤ f< 12750	-
Fuw (Band XXII operation)	MHz	3450 < f <3495 3605< f <3650	3425 < f ≤ 3450 3650≤ f < 3675	1< f ≤3425 3675≤ f<12750	-
F_{uw} (Band XXV operation)	MHz	1870<f <1915 2010<f <2055	1845 <f ≤1870 2055 ≤f <2080	1< f ≤1845 2080≤f<12750	1850 ≤ f ≤ 1915
F_{uw} (Band XXVI operation)	MHz	799< f <844 909< f <954	774 < f ≤799 954 ≤ f < 979	1< f ≤774 979 ≤ f < 12750	814 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Band I operation	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band II operation	For 1915≤f ≤2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied				
Band III operation	For 1790≤f ≤1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band IV operation	For 2095≤f ≤2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band V operation	For 854≤<f ≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band VI operation	For 860<f<875 MHz and 885<f<900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied				
Band VII operation	For 2605 ≤ f ≤ 2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band VIII operation	For 910 ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band IX operation	For 1830≤f ≤1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band X operation	For 2095 ≤ f ≤ 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XI operation	For 1461 ≤ f ≤ 1511 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XII operation	For 714 ≤ f ≤ 761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XIII	For 731 ≤ f ≤ 771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause				

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
operation	6.5.2 and subclause 6.4.2 shall be applied.				
Band XIV operation	For 743 ≤ f ≤ 783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XIX operation	For 860≤f≤905 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XX operation	For 776≤f≤836 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied.				
Band XXI operation	For 1480.9≤f ≤1525.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XXII operation	For 3495≤ f ≤3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied.				
Band XXV operation	For 1915≤f ≤2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied				
Band XXVI operation	For 844≤f ≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied				
NOTE: For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS.					

NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

Table 6.5.6: Test parameters for narrow band blocking

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset)	MHz	2.7	2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 2: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5A Blocking Characteristics for DC-HSDPA

6.5A.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5A.2.1 and 6.5A.2.2 and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

The requirements in clause 6.5A.2.3 and this test apply for Release 8 and later releases to the FDD UE that support DC-HSDPA and are supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

6.5A.2 Minimum Requirements

6.5A.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5A.1. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5A.1: In-band blocking for DC-HSDPA

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
I_{or}	dBm/3.84 MHz	<REFI$_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (note 4)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note 2 and 3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6 (Note 2)	2605 ≤ f ≤ 2705
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4 (Note 2)	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6 (Note 2)	2095 ≤ f ≤ 2185
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4 (Note 2)	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6 (Note 2)	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6 (Note 2)	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6 (Note 2)	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6 (Note 2)	860≤ f ≤905 (Note 3)
F_{uw} (Band XX operation)	MHz	783.4≤ f ≤828.6 (Note 2)	776≤ f ≤836
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4 (Note 2)	1480.9≤ f ≤1525.9 (Note 3)
Fuw (Band XXII operation)	MHz	3502.4≤ f ≤3597.6 (Note 2)	3495≤ f ≤3605
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6	1915≤ f ≤2010
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 5: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1A.

6.5A.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5A.2. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5A.2 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6A spurious response are applicable.

For Table 6.5.A.2 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6A spurious response are applicable.

Table 6.5A.2: Out of band blocking for DC-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
HS-PDSCH_Ec	dBm / 3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS> +3 dB
I_{or}	dBm / 3.84 MHz	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f ≤2050 2230 ≤f <2255	1< f ≤2025 2255≤f<12750	-
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f ≤1870 2050 ≤f <2075	1< f ≤1845 2075≤f<12750	1850 ≤ f ≤ 1910
F_{uw} (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f ≤ 1745 1940≤f < 1965	1< f ≤1720 1965≤f<12750	-
F_{uw} (Band IV operation)	MHz	2050< f <2095 2170< f <2215	2025< f ≤2050 2215≤ f < 2240	1< f ≤2025 2240≤f<12750	-
F_{uw} (Band V operation)	MHz	809< f <854 909< f <954	784< f ≤809 954≤ f < 979	1< f ≤784 979≤f<12750	824 ≤ f ≤ 849
F_{uw} (Band VI operation)	MHz	815 < f < 860 900 < f < 945	790 < f ≤ 815 945 ≤ f < 970	1 < f ≤ 790 970 ≤ f < 12750	-
F_{uw} (Band VII operation)	MHz	2570 < f < 2605 2705 < f < 2750	na 2750 ≤ f < 2775	1 < f ≤ 2570 2775 ≤ f < 12750	-
F_{uw} (Band VIII operation)	MHz	865 < f < 910 975 < f < 1020	840 < f ≤ 865 1020 ≤ f < 1045	1 < f ≤ 840 1045 ≤ f < 12750	-
F_{uw} (Band IX operation)	MHz	1784.9 < f < 1829.9 1894.9 < f < 1939.9	1759.9 < f ≤ 1784.9 1939.9 ≤ f < 1964.9	1 < f ≤ 1759.9 1964.9 ≤ f < 12750	-
F_{uw} (Band X operation)	MHz	2050 < f < 2095 2185 < f < 2230	2025 < f ≤ 2050 2230 ≤ f < 2255	1 < f ≤ 2025 2255 ≤f< 12750	-

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
F_{uw} (Band XI operation)	MHz	1415.9 < f < 1460.9 1510.9 < f < 1555.9	1390.9 < f ≤ 1415.9 1555.9 ≤ f < 1580.9	1 < f ≤ 1390.9 1580.9 ≤ f < 12750	-
F_{uw} (Band XII operation)	MHz	669 < f < 714 761 < f < 806	644 < f ≤ 669 806 ≤ f < 831	1 < f ≤ 644 831 ≤f< 12750	699 ≤ f ≤ 716
F_{uw} (Band XIII operation)	MHz	686 < f < 731 771 < f < 816	661 < f ≤ 686 816 ≤ f < 841	1 < f ≤ 661 841 ≤f< 12750	776 ≤ f ≤ 788
F_{uw} (Band XIV operation)	MHz	698 < f < 743 783 < f < 828	673 < f ≤ 698 828 ≤ f < 853	1 < f ≤ 673 853 ≤f< 12750	788 ≤ f ≤ 798
F_{uw} (Band XIX operation)	MHz	815 < f < 860 905 < f < 950	790 < f ≤ 815 950 ≤ f < 975	1 < f ≤ 790 975 ≤ f < 12750	-
F_{uw} (Band XX operation)	MHz	731< f <776 836< f <881	706 < f ≤ 731 881 ≤ f < 906	1 < f ≤ 706 906 ≤ f < 12750	-
F_{uw} (Band XXI operation)	MHz	1435.9 < f < 1480.9 1525.9 < f < 1570.9	1410.9 < f ≤ 1435.9 1570.9 ≤ f < 1595.9	1 < f ≤ 1410.9 1595.9 ≤ f < 12750	-
F_{uw} (Band XXII operation)	MHz	3450 <f <3495 3605<f <3650	3425 <f ≤ 3450 3650≤f < 3675	1< f ≤3425 3675≤f<12750	-
F_{uw} (Band XXV operation)	MHz	1870<f <1915 2010<f <2055	1845 <f ≤1870 2055 ≤f <2080	1< f ≤1845 2080≤f<12750	1850 ≤ f ≤ 1915
F_{uw} (Band XXVI operation)	MHz	799< f <844 909< f <954	774 < f ≤799 954 ≤ f < 979	1< f ≤774 979 ≤ f < 12750	814 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Band I operation	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band II operation	For 1915≤f ≤2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band III operation	For 1790≤f ≤1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band IV operation	For 2095≤f≤2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band V operation	For 854≤f≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band VI operation	For 860≤f≤900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band VII operation	For 2605 ≤ f ≤ 2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band VIII operation	For 910 ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band IX operation	For 1829.9≤f≤ 1894.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band X operation	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XI operation	For 1460.9≤f≤ 1510.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XII operation	For 714 ≤ f ≤ 761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XIII operation	For 731 ≤ f ≤ 771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XIV operation	For 743 ≤ f ≤ 783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XX operation	For 776≤f≤836 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XIX operation	For 860≤f≤905 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
Band XXI operation	For 1480.9≤f ≤1525.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XXII operation	For 3495≤ f ≤3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XXV operation	For 1915≤f ≤2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied				
Band XXVI operation	For 844≤f≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
NOTE: For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS.					

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2A.

6.5A.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5A.3. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5A.3: Narrow band blocking characteristics for DC-HSDPA

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3A.

6.5A.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5A.5, table 6.5A.6 and table 6.5A.7 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the blocking ability decreases the DC-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5A.4 Method of test

6.5A.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.32.

2) RF parameters are set up according to table 6.5A.5, table 6.5A.6 and table 6.5A.7.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.5A.4. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5A.: Specific Message Contents for In-band blocking characteristics for DC-HSDPA

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5A.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5A.5, table 6.5A.6 and table 6.5A.6. For table 6.5A.6, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5A.5, table 6.5A.6, and table 6.5A.7, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5A.6, record the frequencies for which BLER exceed the test requirements.

6.5A.5 Test requirements

For table 6.5A.5, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5A.6, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4 . For table 6.5A.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5A.5: Test parameters for In-band blocking characteristics for DC-HSDPA

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 4)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note 2 and 3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6 (Note 2)	2605 ≤ f ≤ 2705
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4 (Note 2)	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6 (Note 2)	2095 ≤ f ≤ 2185
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4 (Note 2)	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6 (Note 2)	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6 (Note 2)	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6 (Note 2)	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6 (Note 2)	860≤ f ≤905 (Note 3)
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4 (Note 2)	1480.9≤ f ≤1525.9 (Note 3)
Fuw (Band XXII operation)	MHz	3502.4≤ f ≤3597.6 (Note 2)	3495≤ f ≤3605
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6	1915≤ f ≤2010
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 5: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2A.1.

Table 6.5A.6: Test parameters for Out of band blocking characteristics for DC-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
HS-PDSCH_Ec	dBm / 3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS> +3 dB
I_{or}	dBm / 3.84 MHz	<REFI$_{or}$> + 3 dB	<REFI$_{or}$> + 3 dB	<REFI$_{or}$> + 3 dB	<REFI$_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f ≤2050 2230 ≤f <2255	1< f ≤2025 2255≤f<12750	-
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f ≤1870 2050 ≤f <2075	1< f ≤1845 2075≤f<12750	1850 ≤ f ≤ 1910
F_{uw} (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f ≤ 1745 1940≤f < 1965	1< f ≤1720 1965≤f<12750	-
F_{uw} (Band IV operation)	MHz	2050< f <2095 2170< f <2215	2025< f ≤2050 2215≤ f < 2240	1< f ≤2025 2240≤f<12750	-
F_{uw} (Band V operation)	MHz	809< f <854 909< f <954	784< f ≤809 954≤ f < 979	1< f ≤784 979≤f<12750	824 ≤ f ≤ 849
F_{uw} (Band VI operation)	MHz	815 < f < 860 900 < f < 945	790 < f ≤ 815 945 ≤ f < 970	1 < f ≤ 790 970 ≤ f < 12750	-
F_{uw} (Band VII operation)	MHz	2570 < f < 2605 2705 < f < 2750	na 2750 ≤ f < 2775	1 < f ≤ 2570 2775 ≤ f < 12750	-
F_{uw} (Band VIII operation)	MHz	865 < f < 910 975 < f < 1020	840 < f ≤ 865 1020 ≤ f < 1045	1 < f ≤ 840 1045 ≤ f < 12750	-
F_{uw} (Band IX operation)	MHz	1785 < f < 1830 1895 < f < 1940	1760 < f ≤ 1785 1940 ≤ f < 1965	1 < f ≤ 1760 1965 ≤ f < 12750	-
F_{uw} (Band X operation)	MHz	2050 < f < 2095 2185 < f < 2230	2025 < f ≤ 2050 2230 ≤ f < 2255	1 < f ≤ 2025 2255 ≤f< 12750	-
F_{uw} (Band XI operation)	MHz	1416 < f < 1461 1511 < f < 1556	1391 < f ≤ 1416 1556 ≤ f < 1581	1 < f ≤ 1391 1581 ≤ f < 12750	-
F_{uw} (Band XII operation)	MHz	669 < f < 714 761 < f < 806	644 < f ≤ 669 806 ≤ f < 831	1 < f ≤ 644 831 ≤f< 12750	699 ≤ f ≤ 716
F_{uw} (Band XIII operation)	MHz	686 < f < 731 771 < f < 816	661 < f ≤ 686 816 ≤ f < 841	1 < f ≤ 661 841 ≤f< 12750	776 ≤ f ≤ 788
F_{uw} (Band XIV operation)	MHz	698 < f < 743 783 < f < 828	673 < f ≤ 698 828 ≤ f < 853	1 < f ≤ 673 853 ≤f< 12750	788 ≤ f ≤ 798
F_{uw} (Band XIX operation)	MHz	815 < f < 860 905 < f < 950	790 < f ≤ 815 950 ≤ f < 975	1 < f ≤ 790 975 ≤ f < 12750	-
F_{uw} (Band XX operation)	MHz	731< f <776 836< f <881	706 < f ≤ 731 881 ≤ f < 906	1 < f ≤ 706 906 ≤ f < 12750	-

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
F_{uw} (Band XXI operation)	MHz	1436 < f < 1481 1526 < f < 1571	1411 < f ≤ 1436 1571 ≤ f < 1596	1 < f ≤ 1411 1596 ≤ f < 12750	-
F_{uw} (Band XXV operation)	MHz	1870<f <1915 2010<f <2055	1845 <f ≤1870 2055 ≤f <2080	1< f ≤1845 2080≤f<12750	1850 ≤ f ≤ 1915
F_{uw} (Band XXVI operation)	MHz	799< f <844 909< f <954	774 < f ≤799 954 ≤ f < 979	1< f ≤774 979 ≤ f < 12750	814 ≤ f ≤ 849
F_{uw} (Band XXII operation)	MHz	3450 < f <3495 3605< f <3650	3425 < f ≤ 3450 3650≤ f < 3675	1< f ≤3425 3675≤ f <12750	-
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Band I operation	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band II operation	For 1915≤f ≤2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band III operation	For 1790≤f ≤1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band IV operation	For 2095≤f≤2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band V operation	For 854≤f≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band VI operation	For 860≤f≤900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band VII operation	For 2605 ≤ f ≤ 2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band VIII operation	For 910 ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band IX operation	For 1830≤f≤ 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band X operation	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XI operation	For 1461≤f≤ 1516 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XII operation	For 714 ≤ f ≤ 761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XIII operation	For 731 ≤ f ≤ 771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XIV operation	For 743 ≤ f ≤ 783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XIX operation	For 860≤f≤905 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XXI operation	For 1481≤f ≤1526 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XXII operation	For 3495≤ f ≤3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
Band XXV operation	For 1915≤f ≤2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied				
Band XXVI operation	For 844≤f≤909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied.				
NOTE	For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS.				

NOTE 6: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1

Table 6.5A.7: Test parameters for narrow band blocking for DC-HSDPA

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 7: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 8: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 9: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

NOTE 10: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5B Blocking Characteristics for DB-DC-HSDPA

6.5B.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5B.2 Minimum Requirements

6.5B.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5B.1. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5B.1: In-band blocking for DB-DC-HSDPA

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
I_{or}	dBm/3.84 MHz	<REFI$_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 4)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6	2605 ≤ f ≤ 2705
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6	2095 ≤ f ≤ 2185
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6	860≤ f ≤905 (Note 3)
F_{uw} (Band XX operation)	MHz	783.4 ≤ f ≤ 828.6	776 ≤ f ≤ 836
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4	1480.9≤ f ≤1525.9 (Note 3)
F_{uw} (Band XXII operation)	MHz	3502.4≤ f ≤3597.6	3495≤ f ≤3605
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6	1915≤ f ≤2010
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 5: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1A.

6.5B.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5B.2. Out-of-band blocking is defined for an unwanted interfering signal falling at frequencies outside of frequency regions defined as the UE receive bands extended by 15 MHz at their lower and upper ends. For Table 6.5B.2 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6B Spurious response are applicable.

For Table 6.5B.2 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6B Spurious response for DB-DC-HSDPA are applicable.

Table 6.5B.2: Out of band blocking for DB-DC-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
HS-PDSCH_Ec	dBm / 3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS> +3 dB
Î$_{or}$	dBm / 3.84 MHz	<REFÎ$_{or}$> + 3 dB	<REFÎ$_{or}$> + 3 dB	<REFÎ$_{or}$> + 3 dB	<REFÎ$_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (DB-DC-HSDPA Configuration 1)	MHz	865< f <910 975< f <1020 2050< f <2095 2185< f <2230	840< f ≤865 1020≤ f <1045 2025< f ≤2050 2230≤ f <2255	1< f ≤840 1045≤ f <2025 2255< f ≤ 12750	-
F_{uw} (DB-DC-HSDPA Configuration 2)	MHz	1870< f <1915 2005< f <2095 2170< f <2215	1845< f ≤1870 2215≤ f <2240	1< f ≤1845 2240≤ f <12750	1850≤ f ≤1910
F_{uw} (DB-DC-HSDPA Configuration 3)	MHz	809< f <854 909< f <954 2050< f <2095 2185< f <2230	784< f ≤809 954≤ f < 979 2025< f ≤2050 2230≤ f <2255	1< f ≤784 979≤ f <2025 2255< f ≤12750	824 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
DB-DC-HSDPA Configuration 1	For 910≤f ≤975 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5.B2.1 shall be applied.				
DB-DC-HSDPA Configuration 2	For 1915≤f ≤2005 MHz and 2095≤f ≤2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5.B2.1 shall be applied.				
DB-DC-HSDPA Configuration 3	For 854≤f≤909 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5.B2.1 shall be applied.				

NOTE: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2B.1

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2B.

6.5B.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5B.3. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5B.3: Narrow band blocking characteristics for DB-DC-HSDPA

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3A.

6.5B.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5B.5, table 6.5B.6 and table 6.5B.7 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the blocking ability decreases the DB-DC-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5B.4 Method of test

6.5B.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.32.
2) RF parameters are set up according to table 6.5B.5, table 6.5B.6 and table 6.5B.7.
3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.5B.4. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5B.4 Specific Message Contents for In-band blocking characteristics for DB-DC-HSDPA

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5B.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5B.5, table 6.5B.6 and table 6.5B.6. For table 6.5B.6, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5B.5, table 6.5B.6, and table 6.5B.7, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5B.6, record the frequencies for which BLER exceed the test requirements.

6.5B.5 Test requirements

For table 6.5B.5, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5B.6, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4 . For table 6.5B.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5B.5: Test parameters for In-band blocking characteristics for DB-DC-HSDPA

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 3)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

Table 6.5B.6: Test parameters for Out of band blocking characteristics for DB-DC-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
HS-PDSCH_Ec	dBm / 3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm / 3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (DB-DC-HSDPA Configuration 1)	MHz	865< f <910 975< f <1020 2050< f <2095 2185< f <2230	840< f ≤865 1020≤ f <1045 2025< f ≤2050 2230≤ f <2255	1< f ≤840 1045≤ f <2025 2255< f ≤ 12750	-
F_{uw} (DB-DC-HSDPA Configuration 2)	MHz	1870< f <1915 2005< f <2095 2170< f <2215	1845< f ≤1870 2215≤ f <2240	1< f ≤1845 2240≤ f <12750	1850≤ f ≤1910
F_{uw} (DB-DC-HSDPA Configuration 3)	MHz	809< f <854 909< f <954 2050< f <2095 2185< f <2230	784< f ≤809 954≤ f < 979 2025< f ≤2050 2230≤ f <2255	1< f ≤784 979≤ f <2025 2255< f ≤12750	824 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
DB-DC-HSDPA Configuration 1	For 910≤f ≤975 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5B.2.1 shall be applied.				
DB-DC-HSDPA Configuration 2	For 1915≤f ≤2005 MHz and 2095≤f ≤2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause6.4C.2 and subclause 6.5B.2.1 shall be applied.				
DB-DC-HSDPA Configuration 3	For 854≤f≤909 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5B.2.1 shall be applied.				

NOTE 5: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1

Table 6.5B.7: Test parameters for narrow band blocking for DB-DC-HSDPA

Parameter	Unit	Band II, IV, V	Band VIII
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
I_{or}	dBm/3.84 MHz	<REFI$_{or}$> + 10 dB	<REFI$_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 6: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 7: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 8: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2B.1.

NOTE 9: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5C Blocking Characteristics for DC-HSUPA

6.5C.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements and this test apply for Release 9 and later releases for the FDD UE that supports HSDPA and Dual Cell E-DCH.

6.5C.2 Minimum Requirements

6.5C.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5C.1 and Table 6.5C.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5C.1: In-band blocking for DC-HSUPA

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 4)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6 (Note 2)	2605 ≤ f ≤ 2705
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4 (Note 2)	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6 (Note 2)	2095 ≤ f ≤ 2185
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4 (Note 2)	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6 (Note 2)	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6 (Note 2)	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6 (Note 2)	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6 (Note 2)	860≤ f ≤905 (Note 3)
F_{uw} (Band XX operation)	MHz	783.4≤ f ≤828.6 (Note 2)	776≤ f ≤836 (Note 3)
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4 (Note 2)	1480.9≤ f ≤1525.9 (Note 3)
F_{uw} (Band XXII operation)	MHz	3502.4≤ f ≤3597.6 (Note 2)	3495≤ f ≤3605 (Note 3)
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6 (Note 2)	1915≤ f ≤2010 (Note 3)
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.5C.2: Reference input powers for in-band blocking, DC-HSUPA

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
I	dBm/3.84 MHz	-110	-99.7
II	dBm/3.84 MHz	-108	-97.7
III	dBm/3.84 MHz	-107	-96.7
IV	dBm/3.84 MHz	-110	-99.7
V	dBm/3.84 MHz	-104.3	-94
VI	dBm/3.84 MHz	-104.7	-94.4
VII	dBm/3.84 MHz	-108	-97.7
VIII	dBm/3.84 MHz	-101.1	-90.8
IX	dBm/3.84 MHz	-109	-98.7
X	dBm/3.84 MHz	-110	-99.7
XI	dBm/3.84 MHz	-101.4	-91.1
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XIX	dBm/3.84 MHz	-104.7	-94.4
XX	dBm/3.84 MHz	TBD	TBD
XXI	dBm/3.84 MHz	-101.4	-91.1
XXII	dBm/3.84 MHz	TBD	TBD
XXV	dBm/3.84 MHz	-106.5	-96.2
XXVI	dBm/3.84 MHz	-101.1	-90.8
NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF_Ec$_{,in-band}$> shall apply for Band IX. The corresponding <REF$\hat{I}_{or,in-band}$> is TBD dBm NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS. NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A			

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1B.

6.5C.2.2 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5C.3 and Table 6.5C.4. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5C.3: Narrow band blocking characteristics for DC-HSUPA

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.5C.4: Reference input powers for narrow-band blocking, DC-HSUPA

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
II	dBm/3.84 MHz	-101	-90.7
III	dBm/3.84 MHz	-100	-89.7
IV	dBm/3.84 MHz	-102.8	-92.5
V	dBm/3.84 MHz	-100.9	-90.6
VIII	dBm/3.84 MHz	-98.5	-88.2
X	dBm/3.84 MHz	-102.8	-92.5
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XXV	dBm/3.84 MHz	-99.5	-89.2
XXVI	dBm/3.84 MHz	-98.5	-88.2
NOTE 1: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A			

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3B.

6.5C.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5C.6, table 6.5C.7, table 6.5C.8 and table 6.5C.9 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the blocking ability decreases the DC-HSUPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5C.4 Method of test

6.5C.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.43.

2) RF parameters are set up according to table 6.5C.6, table 6.5C.7, table 6.5C.8 and table 6.5C.9.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.14, with exceptions for information elements listed in Table 6.5C.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5C.5 Specific Message Contents for In-band blocking characteristics for DC-HSUPA

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5C.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5C.6 and table 6.5C.8.

2) Set the power level of UE according to the table 6.5C.6, table 6.5C.7, table 6.5C.8 and table 6.5C.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.5C.5 Test requirements

For table 6.5C.6, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5C.8, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5C.6: Test parameters for In-band blocking characteristics for DC-HSUPA

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 4)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note 3)	860≤ f ≤900 (Note 3)
F_{uw} (Band VII operation)	MHz	2612.4≤ f ≤2697.6 (Note 2)	2605 ≤ f ≤ 2705
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6 (Note 2)	910 ≤ f ≤ 975
F_{uw} (Band IX operation)	MHz	1837.4 ≤ f ≤ 1887.4 (Note 2)	1829.9 ≤ f ≤ 1894.9
F_{uw} (Band X operation)	MHz	2102.4 ≤ f ≤ 2177.6 (Note 2)	2095 ≤ f ≤ 2185
F_{uw} (Band XI operation)	MHz	1468.4 ≤ f ≤ 1503.4 (Note 2)	1460.9 ≤ f ≤ 1510.9
F_{uw} (Band XII operation)	MHz	721.4 ≤ f ≤ 753.6 (Note 2)	714 ≤ f ≤ 761
F_{uw} (Band XIII operation)	MHz	738.4 ≤ f ≤ 763.6 (Note 2)	731 ≤ f ≤ 771
F_{uw} (Band XIV operation)	MHz	750.4 ≤ f ≤ 775.6 (Note 2)	743 ≤ f ≤ 783
F_{uw} (Band XIX operation)	MHz	867.4≤ f ≤897.6 (Note 2)	860≤ f ≤905 (Note 3)
F_{uw} (Band XX operation)	MHz	783.4≤ f ≤828.6 (Note 2)	776≤ f ≤836 (Note 3)
F_{uw} (Band XXI operation)	MHz	1488.4≤ f ≤1518.4 (Note 2)	1480.9≤ f ≤1525.9 (Note 3)
F_{uw} (Band XXII operation)	MHz	3502.4≤ f ≤3597.6 (Note 2)	3495≤ f ≤3605 (Note 3)
F_{uw} (Band XXV operation)	MHz	1922.4≤ f ≤2002.6 (Note 2)	1915≤ f ≤2010 (Note 3)
F_{uw} (Band XXVI operation)	MHz	851.4≤ f ≤901.6	844≤ f ≤909
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.5C.7: Test parameters for reference input powers for in-band blocking characteristics, DC-HSUPA

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
I	dBm/3.84 MHz	-110	-99.7
II	dBm/3.84 MHz	-108	-97.7
III	dBm/3.84 MHz	-107	-96.7
IV	dBm/3.84 MHz	-110	-99.7
V	dBm/3.84 MHz	-104.3	-94
VI	dBm/3.84 MHz	-104.7	-94.4
VII	dBm/3.84 MHz	-108	-97.7
VIII	dBm/3.84 MHz	-101.1	-90.8
IX	dBm/3.84 MHz	-109	-98.7
X	dBm/3.84 MHz	-110	-99.7
XI	dBm/3.84 MHz	-101.4	-91.1
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XIX	dBm/3.84 MHz	-104.7	-94.4
XX	dBm/3.84 MHz	TBD	TBD
XXI	dBm/3.84 MHz	-101.4	-91.1
XXII	dBm/3.84 MHz	TBD	TBD
XXV	dBm/3.84 MHz	-106.5	-96.2
XXVI	dBm/3.84 MHz	-101.1	-90.8
NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF_Ec$_{,in-band}$> shall apply for Band IX. The corresponding <REF$\hat{I}_{or,in-band}$> is TBD dBm NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS. NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A			

Table 6.5C.8: Test parameters for narrow band blocking for DC-HSUPA

Parameter	Unit	Band II, IV, V, X, XXV, XXVI	Band III, VIII, XII, XIII, XIV
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 5: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 6: Offset refers to the assigned channel frequencies of the individual cells.

Table 6.5C.9: Test parameters for reference input powers for narrow-band blocking, DC-HSUPA

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
II	dBm/3.84 MHz	-101	-90.7
III	dBm/3.84 MHz	-100	-89.7
IV	dBm/3.84 MHz	-102.8	-92.5
V	dBm/3.84 MHz	-100.9	-90.6
VIII	dBm/3.84 MHz	-98.5	-88.2
X	dBm/3.84 MHz	-102.8	-92.5
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XXV	dBm/3.84 MHz	-99.5	-89.2
XXVI	dBm/3.84 MHz	-98.5	-88.2
NOTE: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A			

NOTE 7: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5D Blocking Characteristics for single Uplink Single band 4C-HSDPA

6.5D.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5D.2.1 and 6.5D.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band single uplink 4C-HSDPA.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5D.2 Minimum Requirements

6.5D.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5D.1 and 6.5D.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5D.1: Test parameters for in-band blocking, single band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5D.2: In-band blocking requirements, single band 4C-HSDPA, single uplink operation

Single band 4C-HSDPA Configuration	DL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-3	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2C.1 for single band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1C.1.

6.5D.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5D.3 and 6.5D.4. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5D.3 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6C spurious response are applicable.

For Table 6.5D.4 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6C spurious response are applicable.

Table 6.5D.3: Test parameters for out of band blocking, single band 4C-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Single band 4C-HSDPA Configuration I-3)	MHz	2050<f <2095 2185<f <2230	2025 <f ≤2050 2230 ≤f <2255	1< f ≤2025 2255≤f<12750	-
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Single band 4C-HSDPA Configuration I-3	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5D.2.1 shall be applied.				

Table 6.5D.4: Out of band blocking requirements, single band 4C-HSDPA

Singe band 4C-HSDPA Configuration	Parameter	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4	UL-DL carrier separation
I-3	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	I_{or} (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2C.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2C.

6.5D.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5D.6, table 6.5D.7, table 6.5D.8 and table 6.5D.10 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5D.4 Method of test

6.5D.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.
2) RF parameters are set up according to table 6.5D.6, table 6.5D.7, table 6.5D.8 and table 6.5D.9.
3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5D.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5D.5: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.5D.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5D.6 and table 6.5D.7, for inblocking measurements and table 6.5D.8 and table 6.5D.9 for out of band measurements. For table 6.5D.8 and 6.5D.9, the frequency step size is 1 MHz.
2) Set the power level of UE according to the table 6.5D.6, table 6.5D.7, table 6.5D.8 and table 6.5D.9, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).
4) For table 6.5D.8 and 6.5D.9, record the frequencies for which BLER exceed the test requirements.

6.5D.5 Test requirements

For table 6.5D.6 and 6.5D.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5D.8 and 6.5D.9, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5D.6: Test parameters for in-band blocking, single band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5D.7: In-band blocking requirements, single band 4C-HSDPA, single uplink operation

Single band 4C-HSDPA Configuration	DL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-3	I	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REFÎ$_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2C.1 for single band 4C-HSDPA.

Table 6.5D.8: Test parameters for out of band blocking, single band 4C-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Single band 4C-HSDPA Configuration I-3)	MHz	2050<f <2095 2185<f <2230	2025 <f ≤2050 2230 ≤f <2255	1< f ≤2025 2255≤f<12750	-
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Single band 4C-HSDPA Configuration I-3	For 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5D.2.1 shall be applied.				

Table 6.5D.9: Out of band blocking requirements, single band 4C-HSDPA

Singe band 4C-HSDPA Configuration	Parameter	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4	UL-DL carrier separation
I-3	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	$\hat{I}_{or}$ (dBm/3.84MHz)	<REFÎ$_{or}$> + 3 dB	<REFÎ$_{or}$> + 3 dB	<REFÎ$_{or}$> + 3 dB	<REFÎ$_{or}$> + 3 dB	

NOTE 4: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2C.1.

NOTE 5: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5E Blocking Characteristics for dual uplink single band 4C-HSDPA

6.5E.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5E.2.1 and 6.5E.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band dual uplink 4C-HSDPA.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5E.2 Minimum Requirements

6.5E.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5E.1 and 6.5E.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5E.1: Test parameters for in-band blocking, single band 4C-HSDPA, dual uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5E.2: In-band blocking requirements, single band 4C-HSDPA, dual uplink operation

Single band 4C-HSDPA Configuration	DL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-3	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
NOTE 1: For the UE which supports DB-DC-HSDPA configuration in section 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A. NOTE 2: For the UE which supports dual band 4C-HSDPA configuration in Table 4.0B the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1B.					

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1C.2.

6.5E.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5E.4 and table 6.5E.5 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5E.4 Method of test

6.5E.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.
2) RF parameters are set up according to table 6.5E.4 and table 6.5E.5.
3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5E.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5E.3: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.5E.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5E.4 and table 6.5E.5, for inblocking measurements.
2) Set the power level of UE according to the table 6.5E.4 and table 6.5E.5, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).
4) For table 6.5E.5, record the frequencies for which BLER exceed the test requirements.

6.5E.5 Test requirements

For table 6.5E.4 and 6.5E.5, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5E.4: Test parameters for in-band blocking, single band 4C-HSDPA, dual uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5E.5: In-band blocking requirements, single band 4C-HSDPA, dual uplink operation

Single band 4C-HSDPA Configuration	DL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-3	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
NOTE 1: For the UE which supports DB-DC-HSDPA configuration in section 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A. NOTE 2: For the UE which supports dual band 4C-HSDPA configuration in Table 4.0B the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1B.					

NOTE 3: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5F Blocking Characteristics for single Uplink dual band 4C-HSDPA

6.5F.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5F.2.1 and 6.5F.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band single uplink 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5F.2 Minimum Requirements

6.5F.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5F.1 and 6.5F.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5F.1: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5F.2: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.1.

6.5F.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5F. 3 and 6.5F.4. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5F.3 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6D spurious response are applicable.

For Table 6.5F.4 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6D spurious response are applicable.

Table 6.5F.3: Test parameters for out of band blocking, dual band 4C-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1)	MHz	865< f <910 975< f <1020 2050< f <2095 2185< f <2230	840< f ≤865 1020≤ f <1045 2025< f ≤2050 2230≤ f <2255	1< f ≤840 1045≤ f <2025 2255< f ≤ 12750	-
F_{uw} (Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2)	MHz	1870< f <1915 2005< f <2095 2170< f <2215	1845< f ≤1870 2215≤ f <2240	1< f ≤1845 2240≤ f <12750	1850≤ f ≤1910
F_{uw} (Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2)	MHz	809< f <854 909< f <954 2050< f <2095 2185< f <2230	784< f ≤809 954≤ f < 979 2025< f ≤2050 2230≤ f <2255	1< f ≤784 979≤ f <2025 2255< f ≤12750	824 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1	For 910≤f ≤975 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2	For 1915≤f ≤2005 MHz and 2095≤f ≤2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2	For 854≤f≤909 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied.				

Table 6.5F.4: Out of band blocking requirements, dual band 4C-HSDPA

Dual band 4C-HSDPA Configuration	DL Band	UL Band	Parameter	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum
	I	VIII	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	II	IV	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	I	V	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2D.

6.5F.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5F.5 and 6.5F.6. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5F.5: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5F.6: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	VIII	VIII	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	II	IV	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	V	V	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1 for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.1.

6.5F.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5F.8, table 6.5F.9, table 6.5F.10, table 6.5F.11, table 6.5F.12 and table 6.5F.13 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 4 carrier configurations.

6.5F.4 Method of test

6.5F.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.
2) RF parameters are set up according to table 6.5F.8 through table 6.5F.13.
3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5F.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5F.7: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.5F.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5F.8 and table 6.5F.9, for inblocking measurements, Table 6.5F.10 and table 6.5F.11 for out of band measurements and Table 6.5F.12 and table 6.5F.13 for narrow band blocking. For table 6.5F.8 and 6.5F.9, the frequency step size is 1 MHz.
2) Set the power level of UE according to the table 6.5F.8 through table 6.5F.13, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).
4) For table 6.5F.9, table 6.5F.11 and table 6.5F.13, record the frequencies for which BLER exceed the test requirements.

6.5F.5 Test requirements

For table 6.5F.8 and 6.5F.9, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5F.10 and 6.5F.11, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. For table 6.5F.12 and 6.5F.13, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5F.8: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5F.9: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REFI$_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REFI$_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFI$_{or}$>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFI$_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1.

Table 6.5F.10: Test parameters for out of band blocking, dual band 4C-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1)	MHz	865< f <910 975< f <1020 2050< f <2095 2185< f <2230	840< f ≤865 1020≤ f <1045 2025< f ≤2050 2230≤ f <2255	1< f ≤840 1045≤ f <2025 2255< f ≤ 12750	-
F_{uw} (Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2)	MHz	1870< f <1915 2005< f <2095 2170< f <2215	1845< f ≤1870 2215≤ f <2240	1< f ≤1845 2240≤ f <12750	1850≤ f ≤1910
F_{uw} (Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2)	MHz	809< f <854 909< f <954 2050< f <2095 2185< f <2230	784< f ≤809 954≤ f < 979 2025< f ≤2050 2230≤ f <2255	1< f ≤784 979≤ f <2025 2255< f ≤12750	824 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1	For 910≤f ≤975 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2	For 1915≤f ≤2005 MHz and 2095≤f ≤2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2	For 854≤f≤909 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied.				

Table 6.5F.11: Out of band blocking requirements, dual band 4C-HSDPA

Dual band 4C-HSDPA Configuration	DL Band	UL Band	Parameter	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum
	I	VIII	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	II	IV	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	I	V	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1

Table 6.5F.12: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 5: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004

NOTE 6: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5F.13: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	VIII	VIII	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	II	IV	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	V	V	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum

NOTE 7: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1 for dual band 4C-HSDPA.

NOTE 8: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5FA Blocking Characteristics for single Uplink dual band 4C-HSDPA (3 carrier)

6.5FA.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5FA.2.1 and 6.5FA.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band single uplink 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5FA.2 Minimum Requirements

6.5FA.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5FA.1 and 6.5FA.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5FA.1: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5FA.2: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.1.

6.5FA.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5FA.3 and 6.5FA.4. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5FA.3 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6DA spurious response are applicable.

For Table 6.5FA.4 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6DA spurious response are applicable.

Table 6.5FA.3: Test parameters for out of band blocking, dual band 4C-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1)	MHz	865< f <910 975< f <1020 2050< f <2095 2185< f <2230	840< f ≤865 1020≤ f <1045 2025< f ≤2050 2230≤ f <2255	1< f ≤840 1045≤ f <2025 2255< f ≤ 12750	-
F_{uw} (Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2)	MHz	1870< f <1915 2005< f <2095 2170< f <2215	1845< f ≤1870 2215≤ f <2240	1< f ≤1845 2240≤ f <12750	1850≤ f ≤1910
F_{uw} (Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2)	MHz	809< f <854 909< f <954 2050< f <2095 2185< f <2230	784< f ≤809 954≤ f < 979 2025< f ≤2050 2230≤ f <2255	1< f ≤784 979≤ f <2025 2255< f ≤12750	824 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1	For 910≤f ≤975 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2	For 1915≤f ≤2005 MHz and 2095≤f ≤2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2	For 854≤f≤909 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied.				

Table 6.5FA.4: Out of band blocking requirements, dual band 4C-HSDPA

Dual band 4C-HSDPA Configuration	DL Band	UL Band	Parameter	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	I	VIII	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	II	IV	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	I	V	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2DA.

6.5FA.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5FA.5 and 6.5FA.6. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5FA.5: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5FA.6: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	VIII	VIII	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	II	IV	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	V	V	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1 for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.1.

6.5FA.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5FA.8, table 6.5FA.9, table 6.5FA.10, table 6.5FA.11, table 6.5FA.12 and table 6.5FA.13 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 3 carrier configurations.

6.5FA.4 Method of test

6.5FA.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figureA.49.

2) RF parameters are set up according to table 6.5FA.8 through table 6.5FA.13.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5FA.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5FA.7: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.5FA.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5FA.8 and table 6.5FA.9, for inblocking measurements, Table 6.5FA.10 and table 6.5FA.11 for out of band measurements and Table 6.5FA.12 and table 6.5FA.13 for narrow band blocking. For table 6.5FA.8 and 6.5FA.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5FA.8 through table 6.5FA.13, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5FA.9, table 6.5FA.11 and table 6.5FA.13, record the frequencies for which BLER exceed the test requirements.

6.5FA.5 Test requirements

For table 6.5FA.8 and 6.5FA.9, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5FA.10 and 6.5FA.11, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. For table 6.5FA.12 and 6.5FA.13, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5FA.8: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5FA.9: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1.

Table 6.5FA.10: Test parameters for out of band blocking, dual band 4C-HSDPA

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4
$I_{blocking}$ (CW)	dBm	-44	-30	-15	-15
F_{uw} (Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1)	MHz	865< f <910 975< f <1020 2050< f <2095 2185< f <2230	840< f ≤865 1020≤ f <1045 2025< f ≤2050 2230≤ f <2255	1< f ≤840 1045≤ f <2025 2255< f ≤ 12750	-
F_{uw} (Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2)	MHz	1870< f <1915 2005< f <2095 2170< f <2215	1845< f ≤1870 2215≤ f <2240	1< f ≤1845 2240≤ f <12750	1850≤ f ≤1910
F_{uw} (Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2)	MHz	809< f <854 909< f <954 2050< f <2095 2185< f <2230	784< f ≤809 954≤ f < 979 2025< f ≤2050 2230≤ f <2255	1< f ≤784 979≤ f <2025 2255< f ≤12750	824 ≤ f ≤ 849
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			
Dual band 4C-HSDPA Configuration I-2-VIII-1, I-3-VIII-1	For 910≤f ≤975 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration II-1-IV-2, II-2-IV-1, II-2-IV-2	For 1915≤f ≤2005 MHz and 2095≤f ≤2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied.				
Dual band 4C-HSDPA Configuration I-1-V-2, I-2-V-1, I-2-V-2	For 854≤f≤909 MHz and 2095≤f ≤2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied.				

Table 6.5FA.11: Out of band blocking requirements, dual band 4C-HSDPA

Dual band 4C-HSDPA Configuration	DL Band	UL Band	Parameter	Frequency range 1	Frequency range 2	Frequency range 3	Frequency range 4	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	I	VIII	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	VIII		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	II	IV	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	IV		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		$\hat{I}_{or}$ (dBm/3.84MHz)	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	Minimum
	I	V	HS-PDSCH_Ec (dBm/3.84MHz)	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	<REFSENS> +3 dB	Minimum
	V		I_{or} (dBm/3.84MHz)	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	<REFI_{or}> + 3 dB	Minimum

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1

Table 6.5FA.12: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 5: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004

NOTE 6: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5FA.13: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	VIII	VIII	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	II	IV	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	IV		<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum
	V	V	<REFSENS>+10 dB	<REF$\hat{I}_{or}$>+10 dB	Minimum

NOTE 7: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1 for dual band 4C-HSDPA.

NOTE 8: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5G Blocking Characteristics for dual uplink dual band 4C-HSDPA

6.5G.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5G.2.1 and 6.5G.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band dual uplink 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5G.2 Minimum Requirements

6.5G.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5G.1 and 6.5G.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5G.1: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5G.2: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	VIII		-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1 for single band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.2.

6.5G.2.2 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5G.3 and Table 6.5G.4. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5G.3: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5G.4: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.2.

6.5G.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5G.6, table 6.5G.7, table 6.5G.8 and table 6.5G.9 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 4 carrier configurations.

6.5G.4 Method of test

6.5G.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.

2) RF parameters are set up according to table 6.5G.6, table 6.5G.7, table 6.5G.8 and table 6.5G.9.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5G.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5G.5: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.5G.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5G.6 and table 6.5G.7, for inblocking measurements and table 6.5G.8 and table 6.5G.9 for narrow band measurements. For table 6.5G.8 and 6.5G.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5G.6, table 6.5G.7, table 6.5G.8 and table 6.5G.9, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5G.8 and 6.5G.9, record the frequencies for which BLER exceed the test requirements.

6.5G.5 Test requirements

For table 6.5G.6 and 6.5G.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5G.8 and 6.5G.9, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5G.6: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5G.7: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	VIII		-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1 for single band 4C-HSDPA.

Table 6.5G.8: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8

NOTE 4: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 5: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5G.9: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

NOTE 6: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5GA Blocking Characteristics for dual uplink dual band 4C-HSDPA (3 carrier)

6.5GA.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5GA.2.1 and 6.5GA.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band dual uplink 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.5GA.2 Minimum Requirements

6.5GA.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5GA.1 and 6.5GA.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5GA.1: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5GA.2: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	VIII		-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1 for single band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.2.

6.5GA.2.2 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5GA.3 and Table 6.5GA.4. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5GA.3: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8

NOTE 1: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5GA.4: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.2.

6.5GA.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5GA.6, table 6.5GA.7, table 6.5GA.8 and table 6.5GA.9 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 3 carrier configurations.

6.5GA.4 Method of test

6.5GA.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.

2) RF parameters are set up according to table 6.5GA.6, table 6.5GA.7, table 6.5GA.8 and table 6.5GA.9.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5GA.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5GA.5: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

Information Element	Value/Remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

6.5GA.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5GA.6 and table 6.5GA.7, for inblocking measurements and table 6.5GA.8 and table 6.5GA.9 for narrow band measurements. For table 6.5GA.8 and 6.5GA.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5GA.6, table 6.5GA.7, table 6.5GA.8 and table 6.5GA.9, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5GA.8 and 6.5GA.9, record the frequencies for which BLER exceed the test requirements.

6.5GA.5 Test requirements

For table 6.5GA.6 and 6.5GA.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5GA.8 and 6.5GA.9, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5GA.6: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Level	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset (NOTE 2)		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6	1915≤ f ≤2005
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6	854≤ f ≤909
Fuw (Band VIII operation)	MHz	917.4≤ f ≤967.6	910 ≤ f ≤ 975

NOTE 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5GA.7: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	VIII		-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-107	-96.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-109	-98.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	I	I	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-108	-97.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	I	V	-110	-99.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V		-103.2	-92.9	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refer to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1 for single band 4C-HSDPA.

Table 6.5GA.8: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

Parameter	Unit	Band II, IV, V	Band VIII
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset) (NOTE 2)	MHz	±2.7	±2.8

NOTE 4: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 5: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5GA.9: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UE transmitted mean power (dBm)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-1-IV-2	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-1	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
II-2-IV-2	II	II	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	II	IV	-100	-89.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	IV		-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-1-V-2	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-1	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
I-2-V-2	V	I	-101	-90.7	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum
	V	V	-99.8	-89.5	20 (for Power class 3 and 3bis) 18 (for Power class 4)	Minimum

NOTE 6: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6 Spurious Response

6.6.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit is not met.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.6.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.6.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.1.

Table 6.6.1: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

6.6.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.6.2.

The lack of the spurious response ability decreases the coverage area when other unwanted interfering signal exists at any other frequency.

6.6.4 Method of test

6.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.6.

2) RF parameters are set up according to table 6.6.2.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.6.1A Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm2

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6.2. The spurious response frequencies are determined in step 3) of clause 6.5.4.2.

2) Set the power level of UE according to the table 6.6.2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

6.6.5 Test requirements

The measured BER, derived in step 3), shall not exceed 0,001.

Table 6.6.2: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6A Spurious Response for DC-HSDPA

6.6A.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5A.2.2 is not met.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

6.6A.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6A.1.

Table 6.6A.1: Test Parameters for Spurious Response (DC-HSDPA)

Parameter	Unit	Level
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB
$I_{blocking}$ (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 7.2A.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

6.6A.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6A.3 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the spurious response ability decreases the DC-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

6.6A.4 Method of test

6.6A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5A.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.33.
2) RF parameters are set up according to table 6.6A.3.
3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.6A.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6A.2: Specific Message Contents for Spurious Response (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6A.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6A.3. The spurious response frequencies are determined in step 3) of clause 6.5A.4.2.

2) Set the power level of UE according to the table 6.6A.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.6A.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6A.3: Test parameters for Spurious Response (DC-HSDPA)

Parameter	Level	Unit
HS-PDSCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	−44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6B Spurious Response for DB-DC-HSDPA

6.6B.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5B.2.2 is not met.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

6.6B.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6B.1.

Table 6.6B.1: Test Parameters for Spurious Response (DB-DC-HSDPA)

Parameter	Unit	Level
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB
I_{or}	dBm/3.84 MHz	<REFI_{or}> +3 dB
$I_{blocking}$ (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

6.6B.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6B.3 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the spurious response ability decreases the DB-DC-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

6.6B.4 Method of test

6.6B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5B.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.33.
2) RF parameters are set up according to table 6.6B.3.
3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.6B.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6B.2: Specific Message Contents for Spurious Response (DB-DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6B.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6B.3. The spurious response frequencies are determined in step 3) of clause 6.5B.4.2.

2) Set the power level of UE according to the table 6.6B.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.6B.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6B.3: Test parameters for Spurious Response (DB-DC-HSDPA)

Parameter	Level	Unit
HS-PDSCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	−44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6C Spurious Response for single band 4C-HSDPA

6.6C.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5D.2.2 is not met.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band 4C-HSDPA.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.6C.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6C.1.

Table 6.6C.1: Test Parameters for Spurious Response single band 4C-HSDPA

Parameter	Unit	Level
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB
I_{or}	dBm/3.84 MHz	<REFI$_{or}$> +3 dB
$I_{blocking}$ (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2C.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

6.6C.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6C.3 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the spurious response ability decreases the 4C-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

6.6C.4 Method of test

6.6C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5D.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.50.
2) RF parameters are set up according to table 6.6C.3.
3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.6C.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6C.2: Specific Message Contents for Spurious Response (single band 4C-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6C.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6C.3. The spurious response frequencies are determined in step 3) of clause 6.5D.4.2.

2) Set the power level of UE according to the table 6.6C.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.6C.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6C.3: Test parameters for Spurious Response (single band 4C-HSDPA)

Parameter	Level	Unit
HS-PDSCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6D Spurious Response for dual band 4C-HSDPA

6.6D.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5B.2.2 is not met.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.6D.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6D.1.

Table 6.6D.1: Test Parameters for Spurious Response (Dual band 4C-HSDPA)

Parameter	Unit	Level
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB
$I_{blocking}$ (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

6.6D.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6D.3 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the spurious response ability decreases the 4C-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

This test case tests only 4 carrier configurations.

6.6D.4 Method of test

6.6D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5F.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.50.
2) RF parameters are set up according to table 6.6D.3.
3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.6D.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6D.2: Specific Message Contents for Spurious Response (Dual band 4C-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6D.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6D.3. The spurious response frequencies are determined in step 3) of clause 6.5F.4.2.

2) Set the power level of UE according to the table 6.6D.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.6D.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6D.3: Test parameters for Spurious Response (Dual band 4C-HSDPA)

Parameter	Level	Unit
HS-PDSCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6DA Spurious Response for dual band 4C-HSDPA (3 carrier)

6.6DA.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5B.2.2 is not met.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.6DA.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6DA.1.

Table 6.6DA.1: Test Parameters for Spurious Response (Dual band 4C-HSDPA)

Parameter	Unit	Level
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB
$I_{blocking}$ (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)

NOTE: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

6.6DA.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6DA.3 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the spurious response ability decreases the 4C-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

This test case tests only 3 carrier configurations.

6.6DA.4 Method of test

6.6DA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5FA.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.50.
2) RF parameters are set up according to table 6.6DA.3.
3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.6DA.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6DA.2: Specific Message Contents for Spurious Response (Dual band 4C-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6DA.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6DA.3. The spurious response frequencies are determined in step 3) of clause 6.5FA.4.2.
2) Set the power level of UE according to the table 6.6DA.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.6DA.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6DA.3: Test parameters for Spurious Response (Dual band 4C-HSDPA)

Parameter	Level	Unit
HS-PDSCH_Ec	<REFSENS> +3 dB	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7 Intermodulation Characteristics

6.7.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply to all types of UTRA for the FDD UE. The test parameters in tables 6.7.2 and 6.7.4 applies to the FDD UE supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

6.7.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.7.1 and in table 6.7.2.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1 and clause 7.8.2.

Table 6.7.1: Test parameters for Intermodulation Characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> +3 dB		dBm / 3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB		dBm / 3,84 MHz
$I_{ouw\,1}$ (CW)	–46		dBm
$I_{ouw\,2}$ mean power (modulated)	–46		dBm
$F_{uw\,1}$ (offset)	10	-10	MHz
$F_{uw\,2}$ (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)		dBm

NOTE 1: I_{ouw2} (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

Table 6.7.2: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band II, IV, V, X		Band III, VIII, XII, XIII, XIV	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 3: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1A.

6.7.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.7.3 and in table 6.7.4.

The lack of the intermodulation response rejection ability decreases the coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7.4 Method of test

6.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.7.

2) RF parameters are set up according to table 6.7.3 and table 6.7.4.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.7.2A Contents of RADIO BEARER SETUP message: AM or UM

Information Element	Value/Remark
CHOICE channel requirement	Uplink DPCH info
- Power Control Algorithm	Algorithm2

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7.3 and in table 6.7.4.

2) Set the power level of UE according to the tables 6.7.3, and table 6.7.4 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

6.7.5 Test requirements

The measured BER, derived in step 3), shall not exceed 0,001.

Table 6.7.3: Test parameters for Intermodulation Characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> +3 dB		dBm / 3.84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB		dBm / 3.84 MHz
$I_{ouw\,1}$ (CW)	–46		dBm
$I_{ouw\,2}$ mean power (modulated)	–46		dBm
$F_{uw\,1}$ (offset)	10	-10	MHz
$F_{uw\,2}$ (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3 and 3bis) 18 (for Power class 4)		dBm

NOTE 1: I_{ouw2} (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

Table 6.7.4: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band II, IV, V, X		Band III, VIII, XII, XIII, XIV	
DPCH_Ec	DdBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	DdBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 3: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 4: <REFSENS> and <REF$\hat{I}_{or}$> refers to the DPCH_Ec<REFSENS> and the DPCH<REF$\hat{I}_{or}$> as specified in Table 6.2.1A.

NOTE 5: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7A Intermodulation Characteristics for DC-HSDPA

6.7A.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7A.1 and 6.7.A.4 apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

The test parameters in Tables 6.7A.2 and 6.7A.5 apply to all types of UTRA for the FDD UE that support DC-HSDPA and are supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

6.7A.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7A.1.

Table 6.7A.1: Test Parameters for Receive intermodulation characteristics (DC-HSDPA)

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7A.2.

Table 6.7A.2: Test Parameters for narrow band intermodulation characteristics (DC-HSDPA)

Parameter	Unit	Band II, IV, V, X, XXV, XXVI		Band III, VIII, XII, XIII, XIV	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 4: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 6: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1A and clause 7.8.2A.

6.7A.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7A.4 and in table 6.7A.5 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the intermodulation response rejection ability decreases the DC-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7A.4 Method of test

6.7A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.34.

2) RF parameters are set up according to table 6.7A.4 and table 6.7A.5.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.7A.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7A.3: Specific Message Contents for Intermodulation Characteristics (DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7A.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7A. 4 and in table 6.7A.5.

2) Set the power level of UE according to the tables 6.7A.4, and table 6.7A.5 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.7A.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7A.4: Test parameters for Intermodulation Characteristics (DC-HSDPA)

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

Table 6.7A.5: Test parameters for narrow band intermodulation characteristics (DC-HSDPA)

Parameter	Unit	Band II, IV, V, X, XXV, XXVI		Band III, VIII, XII, XIII, XIV	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 4: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 6: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2A.1.

NOTE 7: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7B Intermodulation Characteristics for DB-DC-HSDPA

6.7B.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

6.7B.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7B.1.

Table 6.7B.1: Test Parameters for Receive intermodulation characteristics (DB-DC-HSDPA)

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7B.2.

Table 6.7B.2: Test Parameters for narrow band intermodulation characteristics (DB-DC-HSDPA)

Parameter	Unit	Band II, IV, V, X		Band III, VIII, XII, XIII, XIV	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 4: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 6: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1A and clause 7.8.2A.

6.7B.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7B.4 and in table 6.7B.5 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the intermodulation response rejection ability decreases the DB-DC-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7B.4 Method of test

6.7B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.34.

2) RF parameters are set up according to table 6.7B.4 and table 6.7B.5.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.7B.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7B.3: Specific Message Contents for Intermodulation Characteristics (DB-DC-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7B.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7B.4 and in table 6.7B.5.

2) Set the power level of UE according to the tables 6.7B.4, and table 6.7B.5 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.7B.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7B.4: Test parameters for Intermodulation Characteristics (DB-DC-HSDPA)

Parameter	Unit	Level	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB	
I_{or}	dBm/3.84 MHz	<REFI_{or}> +3 dB	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

Table 6.7B.5: Test parameters for narrow band intermodulation characteristics (DB-DC-HSDPA)

Parameter	Unit	Band II, IV, V		Band VIII	
HS-PDSCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
I_{or}	dBm/3.84 MHz	<REFI_{or}> + 10 dB		[<REFI_{or}> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 4: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 6: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2B.1.

NOTE 7: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 8: Band II and band IV correspond to DB-DC-HSDPA configuration 2, band V corresponds to DB-DC-HSDPA configuration 3 and band VIII corresponds to DB-DC-HSDPA configuration 1 as given in clause 4.2.

6.7C Intermodulation Characteristics for DC-HSUPA

6.7C.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply for Release 9 and later releases for the FDD UE that supports HSDPA and Dual Cell E-DCH.

6.7C.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7C.1 and Table 6.7C.2.

Table 6.7C.1: Receive intermodulation characteristics (DC-HSUPA)

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7C.2: Reference input powers for intermodulation (DC-HSUPA)

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
I	dBm/3.84 MHz	-104.7	-94.4
II	dBm/3.84 MHz	-104.4	-94.1
III	dBm/3.84 MHz	-104.1	-93.8
IV	dBm/3.84 MHz	-104.7	-94.4
V	dBm/3.84 MHz	-102	-91.7
VI	dBm/3.84 MHz	-102.2	-91.9
VII	dBm/3.84 MHz	-104.4	-94.1
VIII	dBm/3.84 MHz	-99.8	-89.5
IX	dBm/3.84 MHz	-104.6	-94.3
X	dBm/3.84 MHz	-104.7	-94.4
XI	dBm/3.84 MHz	-100	-89.7
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XIX	dBm/3.84 MHz	-102.2	-91.9
XX	dBm/3.84 MHz	TBD	TBD
XXI	dBm/3.84 MHz	-100	-89.7
XXII	dBm/3.84 MHz	TBD	TBD
XXV	dBm/3.84 MHz	-103.5	-93.2
XXVI	dBm/3.84 MHz	-99.8	-89.5
NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF_Ec$_{,intermod}$> shall apply for Band IX. The corresponding <REF$\hat{I}_{or,intermod}$> is TBD dBm. NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS. NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 7.12 of TS 25.101[1] clause 7.10.			

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7C.3 and Table 6.7C.4.

Table 6.7C.3: Receive intermodulation for narrow band (DC-HSUPA)

Parameter	Unit	Band II, IV, V, X, XXV, XXVI		Band III, VIII, XII, XIII, XIV	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 1: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7C.4: Reference input powers for intermodulation, narrow band, (DC-HSUPA)

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
II	dBm/3.84 MHz	-86.7	-76.4
III	dBm/3.84 MHz	-85.7	-75.4
IV	dBm/3.84 MHz	-86.7	-76.4
V	dBm/3.84 MHz	-86.7	-76.4
VIII	dBm/3.84 MHz	-85.6	-75.3
X	dBm/3.84 MHz	-86.7	-76.4
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XXV	dBm/3.84 MHz	-84.7	-74.4
XXVI	dBm/3.84 MHz	-85.6	-75.3
NOTE 1: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A.			

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1B and clause 7.8.2B.

6.7C.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7C.6, table 6.7C.7 table 6.7C.8 and in table 6.7C.9 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the intermodulation response rejection ability decreases the DC-HSUPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7C.4 Method of test

6.7C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.44.

2) RF parameters are set up according to table 6.7C.6, table 6.7C.7 table 6.7C.8 and table 6.7C.9.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.14, with exceptions for information elements listed in Table 6.7C.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7C.5: Specific Message Contents for Intermodulation Characteristics (DC-HSUPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Information Element	Value/remark	Version
Uplink DPCH info - Uplink DPCH power control info		Rel-6
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	
Downlink HS-PDSCH Information - CHOICE mode - Downlink 64QAM configured	 FDD Not Present	 Rel-7
- HS-DSCH TB size table	octet aligned (for H-Set 12)	Rel-7
Downlink secondary cell info FDD		Rel-8
- CHOICE Configuration info	New configuration	
- Downlink 64QAM configured	Not Present	
- HS-DSCH TB size table	octet aligned (for H-Set 12)	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7C.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7C.6 and in table 6.7C.8.

2) Set the power level of UE according to the table 6.7C.6, table 6.7C.7 table 6.7C.8 and table 6.7C.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.7C.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7C.6: Test parameters for Intermodulation Characteristics (DC-HSUPA)

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Offset refers to the assigned channel frequencies of individual cells.

Table 6.7C.7: Test Parameters for reference input powers for intermodulation characteristics (DC-HSUPA)

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
I	dBm/3.84 MHz	-104.7	-94.4
II	dBm/3.84 MHz	-104.4	-94.1
III	dBm/3.84 MHz	-104.1	-93.8
IV	dBm/3.84 MHz	-104.7	-94.4
V	dBm/3.84 MHz	-102	-91.7
VI	dBm/3.84 MHz	-102.2	-91.9
VII	dBm/3.84 MHz	-104.4	-94.1
VIII	dBm/3.84 MHz	-99.8	-89.5
IX	dBm/3.84 MHz	-104.6	-94.3
X	dBm/3.84 MHz	-104.7	-94.4
XI	dBm/3.84 MHz	-100	-89.7
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XIX	dBm/3.84 MHz	-102.2	-91.9
XX	dBm/3.84 MHz	TBD	TBD
XXI	dBm/3.84 MHz	-100	-89.7
XXII	dBm/3.84 MHz	TBD	TBD
XXV	dBm/3.84 MHz	-103.5	-93.2

NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF_Ec$_{,intermod}$> shall apply for Band IX. The corresponding <REF$\hat{I}_{or,intermod}$> is TBD dBm

NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS.

NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause4.2 the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table 6.1A

Table 6.7C.8: Test Parameters for narrow band intermodulation characteristics (DC-HSUPA)

Parameter	Unit	Band II, IV, V, X		Band III, VIII, XII, XIII, XIV	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 1: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 2: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

Table 6.7C.9: Test Parameters for reference input powers for narrow band intermodulation characteristics (DC-HSUPA)

Operating Band	Unit	HS-PDSCH_Ec	$\hat{I}_{or}$
II	dBm/3.84 MHz	-86.7	-76.4
III	dBm/3.84 MHz	-85.7	-75.4
IV	dBm/3.84 MHz	-86.7	-76.4
V	dBm/3.84 MHz	-86.7	-76.4
VIII	dBm/3.84 MHz	-85.6	-75.3
X	dBm/3.84 MHz	-86.7	-76.4
XII	dBm/3.84 MHz	N/A	N/A
XIII	dBm/3.84 MHz	N/A	N/A
XIV	dBm/3.84 MHz	N/A	N/A
XXV	dBm/3.84 MHz	-84.7	-74.4
NOTE 1: For the UE which supports DB-DC-HSDPA configuration in clause 4.2the < HS-PDSCH_Ec > and < $\hat{I}_{or}$ > are allowed to be increased by an amount defined in Table6.1A.			

6.7D Intermodulation Characteristics for single uplink single band 4C-HSDPA

6.7D.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7D.1 and 6.7D.4 apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band 4C-HSDPA, single uplink operation.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.7D.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7D.1 and 6.7D.2.

Table 6.7D.1: Test parameters for receive intermodulation characteristics, single band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7D.2: Intermodulation requirements, single band 4C-HSDPA, single uplink operation

Single band 4C-HSDPA Configuration	DL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-3	I	<REFSENS>+3 dB	<REFI$_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2C.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1C.1.

6.7D.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7D.4 and in table 6.7D.5 for the DL reference channel H-Set 1B/1C specified in Annex C.8.1.1.

The lack of the intermodulation response rejection ability decreases the 4C-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7D.4 Method of test

6.7D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.51.
2) RF parameters are set up according to table 6.7D.4 and table 6.7D.5.
3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.7D.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7D.3: Specific Message Contents for Intermodulation Characteristics (Single Uplink Single band 4C-HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7D.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7D.4 and in table 6.7D.5.
2) Set the power level of UE according to the tables 6.7D.4, and table 6.7D.5 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.7D.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7D.4: Test parameters for receive intermodulation characteristics, single band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7D.5: Intermodulation requirements, single band 4C-HSDPA, single uplink operation

Single band 4C-HSDPA Configuration	DL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-3	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2C.1.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7E Intermodulation Characteristics for single uplink dual band 4C-HSDPA

6.7E.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7E.1 and 6.7E.4 apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA, single uplink operation and HSDPA UE capability categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.7E.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7E.1 and 6.7E.2.

Table 6.7E.1: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7E.2: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1.

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7E.3 and Table 6.7E.4.

Table 6.7E.3: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V		Band VIII	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 1: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7E.4: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+16.6 dB	<REF$\hat{I}_{or}$>+16.6 dB	Minimum
	VIII	VIII	<REFSENS>+16.6 dB	<REF$\hat{I}_{or}$>+16.6 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+17 dB	<REF$\hat{I}_{or}$>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REFI_{or}>+18.9 dB	Minimum
	II	IV	<REFSENS>+17 dB	<REFI_{or}>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REF$\hat{I}_{or}$>+18.9 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+17 dB	<REF$\hat{I}_{or}$>+17 dB	Minimum
	V	V	<REFSENS>+17 dB	<REF$\hat{I}_{or}$>+17 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2D.1for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1D.1and clause 7.8.2D.1.

6.7E.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7E.6 through 6.7E.9 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the intermodulation response rejection ability decreases the 4C-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

This test case tests only 4 carrier configurations.

6.7E.4 Method of test

6.7E.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.51.

2) RF parameters are set up according to table 6.7E.6 and table 6.7E.8.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.7E.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7E.5: Specific Message Contents for Intermodulation Characteristics (Single Uplink Single band 4C--HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7E.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7E.4 and in table 6.7E.5.
2) Set the power level of UE according to the tables 6.7E.6, 6.7E.7, 6.7E.8 and table 6.7E.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.
3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.7E.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7E.6: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7E.7: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation

I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REFÎ$_{or}$>+3 dB	Minimum

Table 6.7E.8: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V		Band VIII	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 1: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7E.8: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+16.6 dB	<REFÎ$_{or}$>+16.6 dB	Minimum
	VIII	VIII	<REFSENS>+16.6 dB	<REFÎ$_{or}$>+16.6 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REFÎ$_{or}$>+18.9 dB	Minimum
	II	IV	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REFÎ$_{or}$>+18.9 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum
	V	V	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum

NOTE 3: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2D.1for dual band 4C-HSDPA.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7EA Intermodulation Characteristics for single uplink dual band 4C-HSDPA (3 carrier)

6.7EA.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7EA.1 and 6.7EA.4 apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA, single uplink operation and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

6.7EA.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7EA.1 and 6.7EA.2.

Table 6.7EA.1: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7EA.2: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1.

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7EA.3 and Table 6.7EA.4.

Table 6.7EA.3: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V		Band VIII	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 1: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7EA.4: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+16.6 dB	<REF$\hat{I}_{or}$>+16.6 dB	Minimum
	VIII	VIII	<REFSENS>+16.6 dB	<REF$\hat{I}_{or}$>+16.6 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+17 dB	<REF$\hat{I}_{or}$>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REF$\hat{I}_{or}$>+18.9 dB	Minimum
	II	IV	<REFSENS>+17 dB	<REFI_{or}>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REF$\hat{I}_{or}$>+18.9 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+17 dB	<REF$\hat{I}_{or}$>+17 dB	Minimum
	V	V	<REFSENS>+17 dB	<REF$\hat{I}_{or}$>+17 dB	Minimum

NOTE 3: <REFSENS> and <REF$\hat{I}_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REF$\hat{I}_{or}$> as specified in Table 6.2DA.1for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1D.1and clause 7.8.2D.1.

6.7EA.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7EA.6 through 6.7EA.9 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the intermodulation response rejection ability decreases the 4C-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

This test case tests only 4 carrier configurations.

6.7EA.4 Method of test

6.7EA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.51.

2) RF parameters are set up according to table 6.7EA.6 and table 6.7EA.8.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.7EA.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7EA.5: Specific Message Contents for Intermodulation Characteristics (Single Uplink Single band 4C--HSDPA)

Information Element	Value/Remark	Version
Uplink DPCH info		Rel-6
- Uplink DPCH power control info		
- CHOICE mode	FDD	
- Power Control Algorithm	Algorithm2	

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7EA.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7EA.4 and in table 6.7EA.5.

2) Set the power level of UE according to the tables 6.7EA.6, 6.7EA.7, 6.7EA.8 and table 6.7EA.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with ±1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

6.7EA.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F. 6.3.5.0.

Table 6.7EA.6: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Level	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset) (NOTE 2)	MHz	10	-10
F_{uw2} (offset) (NOTE 2)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)	

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7EA.7: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation
I-2-VIII-1 I-3-VIII-1	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	I	VIII	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	VIII		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
	II	IV	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	IV		<REFSENS>+3 dB	<REFI_{or}>+3 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	I	I	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	I	V	<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum
	V		<REFSENS>+3 dB	<REF$\hat{I}_{or}$>+3 dB	Minimum

Table 6.7EA.8: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

Parameter	Unit	Band II, IV, V		Band VIII	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset) (NOTE 2)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset) (NOTE 2)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3 and 3bis) 18 (for Power class 4)			

NOTE 1: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7EA.8: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

Dual band 4C-HSDPA Configuration	DL Band	UL Band	HS-PDSCH_Ec (dBm/3.84MHz)	$\hat{I}_{or}$ (dBm/3.84MHz)	UL-DL carrier separation

I-2-VIII-1 I-3-VIII-1	VIII	I	<REFSENS>+16.6 dB	<REFÎ$_{or}$>+16.6 dB	Minimum
	VIII	VIII	<REFSENS>+16.6 dB	<REFÎ$_{or}$>+16.6 dB	Minimum
II-1-IV-2 II-2-IV-1 II-2-IV-2	II	II	<REFSENS>+17 dB	<REFI$_{or}$>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REFÎ$_{or}$>+18.9 dB	Minimum
	II	IV	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum
	IV		<REFSENS>+18.9 dB	<REFI$_{or}$>+18.9 dB	Minimum
I-1-V-2 I-2-V-1 I-2-V-2	V	I	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum
	V	V	<REFSENS>+17 dB	<REFÎ$_{or}$>+17 dB	Minimum

NOTE 3: <REFSENS> and <REFÎ$_{or}$> refers to the HS-PDSCH_Ec<REFSENS> and the HS-PDSCH<REFÎ$_{or}$> as specified in Table 6.2DA.1for dual band 4C-HSDPA.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.8 Spurious Emissions

6.8.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector. The spurious emission is verified per antenna connector with the other(s) terminated.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.8.2 Minimum Requirements

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in table 6.8.1 and table 6.8.2.

Table 6.8.1: General receiver spurious emission requirements

Frequency Band	Measurement Bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm	
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm	

Table 6.8.2: Additional receiver spurious emission requirements

Operating band	Frequency Band	Measurement Bandwidth	Maximum level	Note
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm	UE receive band
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
II	1850 MHz ≤ f ≤ 1910 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	UE receive band
III	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	1710 MHz ≤ f ≤ 1785 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	UE receive band
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
IV	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	
	1710 MHz ≤ f < 1755 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	UE receive band
V	824 MHz ≤ f ≤ 849 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	UE receive band
VI	815 MHz ≤ f ≤ 850 MHz	3.84 MHz	-60 dBm	UE in URA_PCH, Cell_PCH and idle state
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	UE in URA_PCH, Cell_PCH and idle state
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
VII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz -3.84 MHz	-67 dBm (see note 1) -60 dBm	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)	
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2500 MHz ≤ f ≤ 2570 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	UE receive band
VIII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	880 MHz ≤ f ≤ 915 MHz	3.84 MHz	-60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm	UE receive band
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)	UE receive band
	1805 MHz < f ≤ 1880 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	

Operating band	Frequency Band	Measurement Bandwidth	Maximum level	Note
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1749.9 MHz ≤ f ≤ 1784.9 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	UE receive band
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
X	869 MHz ≤ f < 894 MHz	3.84 MHz	- 60 dBm	
	1710 MHz ≤ f < 1770 MHz	3.84 MHz	- 60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	- 60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	UE receive band
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1427.9 MHz ≤ f ≤ 1462.9 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	UE receive band
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XII	699 MHz ≤ f ≤ 716 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm	UE receive band
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XIII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	UE receive band
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	
	776 MHz ≤ f ≤ 788 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XIV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	UE receive band
	788 MHz ≤ f ≤ 798 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XIX	815 MHz ≤ f ≤ 850 MHz	3.84 MHz	-60 dBm	UE in URA_PCH, Cell_PCH and idle state
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	UE in URA_PCH, Cell_PCH and idle state
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	

Operating band	Frequency Band	Measurement Bandwidth	Maximum level	Note
XX	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	UE receive band
	832 MHz ≤ f ≤ 862 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm *	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm * -60 dBm	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *	
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
XXI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1427.9 MHz ≤ f ≤ 1462.9 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	UE receive band
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XXII	791 MHz ≤ f < 821 MHz	3.84 MHz	-60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)	
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	
	1880 MHz ≤ f ≤ 1920 MHz	3.84 MHz	-60 dBm	
	2010 MHz ≤ f ≤ 2025 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2300 MHz ≤ f ≤ 2400 MHz	3.84 MHz	-60 dBm	
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm	
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
	3410 MHz ≤ f ≤ 3490 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	3510 MHz ≤ f ≤ 3590 MHz	3.84 MHz	-60 dBm	UE receive band
	3600 MHz ≤ f ≤ 3800 MHz	3.84 MHz	-50 dBm	
XXV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	[-60] dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	[-60] dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	[-60] dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	[-60] dBm	
	1850 MHz ≤ f ≤ 1915 MHz	3.84 MHz	[-60] dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	[-60] dBm	UE receive band
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	[-60] dBm	
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	[-50] dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	[-50] dBm	
	3400 MHz ≤ f ≤ 3800 MHz	1 MHz	[-50] dBm	

Operating band	Frequency Band	Measurement Bandwidth	Maximum level	Note
XXVI	703 MHz ≤ f ≤ 799 MHz	1 MHz	-50 dBm	
	799 MHz ≤ f ≤ 803 MHz	1 MHz	-40 dBm	
	729 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1525 MHz ≤ f ≤ 1559 MHz	1 MHz	-50 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	1884.5 MHz ≤ f ≤1919.6 MHz	300 kHz	-41 dBm	
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm	
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-50 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm	
	2300 MHz ≤ f ≤ 2400 MHz	1 MHz	-50 dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm (see note 2)	
	3400 MHz ≤ f ≤3800 MHz	1 MHz	-50 dBm	
NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 6.8.1 are permitted for each UARFCN used in the measurement. NOTE 2: The frequency bandwidth protection 2585-2690 MHz test requirement for Bands I, III, and VIII deviates from the requirement in TS 25.101 [1] Rel-8 and earlier releases. The present document reflects the frequency bandwidth specified in the European Harmonized Standard EN 301 908-2 [Ref.] which became a mandatory requirement after these earlier TS 25.101 releases were frozen.				

The reference for this requirement is TS 25.101 [1] clause 7.9.1.

6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in clause 6.8.5.

Excess spurious emissions increase the interference to other systems.

6.8.4 Method of test

6.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect a spectrum analyzer (or other suitable test equipment) to the UE antenna connector as shown in figure A.8.

2) RF parameters are setup according to table E.3.2.2. Settings for the serving cell are defined in table 6.8.2A.

3) A call is set up according to the setup procedure specified in TS34.108 [3] sub clause 7.3.5, with the following exceptions for information elements in System Information Block type3.

SIB 3 Information Element	Value/Remark
- Cell selection and re-selection info	
- CHOICE mode	FDD
- Sintrasearch	0 dB
- Sintersearch	0 dB
- RAT List	This parameter is not present
- Maximum allowed UL TX power	Power level where Pcompensation=0

The exceptions for SIB1 are defined in TS 34.108 [3] clause 7.3.5.2.

NOTE: The setup procedure (3) sets the UE into the CELL_FACH state. With this state and the SS level (2) it is ensured that UE continuously monitors the S-CCPCH and no cell reselections are performed [see 3GPP TS 25.304, clauses 5.2.3.and 5.2.6]. The UE will not be transmitting, and therefore will not interfere with the measurement.

Table 6.8.2A: Settings for the serving cell during the measurement of Rx Spurious Emissions

Parameter	Unit	Cell 1
Cell type		Serving cell
UTRA RF Channel Number		As defined in clause 6.8.4.1
Qqualmin	dB	-24
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	+21
CPICH Ec (see notes 1 and 2)	dBm/3.84 MHz	As defined in table E.3.2.2
NOTE 1: The power level is specified in terms of CPICH_Ec instead of CPICH_RSCP as RSCP is a receiver measurement and only CPICH_Ec can be directly controlled by the SS. NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2.		

6.8.4.2 Procedure

1) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

6.8.5 Test requirements

It shall be verified that the RRC connection release at the end of the procedure described in 34.108 [3] clause 7.3.5.3 shall be completed successfully indicating that the UE has stayed in CELL_FACH state during the measurement of the spurious emissions.

The measured spurious emissions, derived in step 1), shall not exceed the maximum level specified in table 6.8.3 and table 6.8.4.

Table 6.8.3: General receiver spurious emission requirements

Frequency Band	Measurement Bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm	
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm	

Table 6.8.4: Additional receiver spurious emission requirements

Operating Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm	UE transmit band
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm	UE receive band
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
II	1850 MHz ≤ f ≤ 1910 MHz	3.84 MHz	-60 dBm	UE transmit band
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	UE receive band
III	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	1710 MHz ≤ f ≤ 1785 MHz	3.84 MHz	-60 dBm	UE transmit band
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	UE receive band
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
IV	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	
	1710 MHz ≤ f < 1755 MHz	3.84 MHz	-60 dBm	UE transmit band
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz≤ f ≤ 2155 MHz	3.84 MHz	-60 dBm	UE receive band (see note 2)
	2110 MHz ≤ f ≤ 2170 MHz	3.8.4 MHz	-60 dBm	UE receive band (see note 3)

Operating Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
V	824 MHz ≤ f ≤ 849 MHz	3.84 MHz	-60 dBm	UE transmit band
	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	UE receive band
VI	815 MHz ≤ f ≤ 850 MHz	3.84 MHz	-60 dBm	
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
VII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz -3.84 MHz	-67 dBm (see note 1) -60 dBm	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)	
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (see note 1)	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2500 MHz ≤ f ≤ 2570 MHz	3.84 MHz	-60 dBm	UE transmit band
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	UE receive band
VIII	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	
	880 MHz ≤ f ≤ 915 MHz	3.84 MHz	-60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm	UE receive band
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)	UE receive band
	1805 MHz < f ≤ 1880 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2585 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1749.9 MHz ≤ f ≤ 1784.9 MHz	3.84 MHz	-60 dBm	UE transmit band
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	UE receive band
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
X	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	
	1710 MHz ≤ f < 1770 MHz	3.84 MHz	-60 dBm	UE transmit band
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	UE transmit band
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1427.9 MHz ≤ f ≤ 1462.9 MHz	3.84 MHz	-60 dBm	UE transmit band
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	UE receive band
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XII	699 MHz ≤ f ≤ 716 MHz	3.84 MHz	-60 dBm	UE transmit band
	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm	UE receive band
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XIII	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	UE receive band
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	
	776 MHz ≤ f ≤ 788 MHz	3.84 MHz	-60 dBm	UE transmit band
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XIV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	-60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	UE receive band
	788 MHz ≤ f ≤ 798 MHz	3.84 MHz	-60 dBm	UE transmit band
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	

Operating Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
XIX	815 MHz ≤ f ≤ 850 MHz	3.84 MHz	-60 dBm	UE in URA_PCH, Cell_PCH and idle state
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	UE in URA_PCH, Cell_PCH and idle state
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XX	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	-60 dBm	UE receive band
	832 MHz ≤ f ≤ 862 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm *	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm * -60 dBm	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *	
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
XXIs	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	-60 dBm	
	1427.9 MHz ≤ f ≤ 1462.9 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	UE receive band
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
XXII	791 MHz ≤ f < 821 MHz	3.84 MHz	-60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note 1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	-67 dBm (see note 1) -60 dBm	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note 1)	
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	
	1880 MHz ≤ f ≤ 1920 MHz	3.84 MHz	-60 dBm	
	2010 MHz ≤ f ≤ 2025 MHz	3.84 MHz	-60 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2300 MHz ≤ f ≤ 2400 MHz	3.84 MHz	-60 dBm	
	2590 MHz ≤ f ≤ 2620 MHz	3.84 MHz	-50 dBm	
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-60 dBm	
	3410 MHz ≤ f ≤ 3490 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	3510 MHz ≤ f ≤ 3590 MHz	3.84 MHz	-60 dBm	UE receive band
	3600 MHz ≤ f ≤ 3800 MHz	3.84 MHz	-50 dBm	
XXV	729 MHz ≤ f ≤ 746 MHz	3.84 MHz	[-60] dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	[-60] dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	[-60] dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	[-60] dBm	
	1850 MHz ≤ f ≤ 1915 MHz	3.84 MHz	[-60] dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	[-60] dBm	UE receive band
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	[-60] dBm	
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	[-50] dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	[-50] dBm	
	3400 MHz ≤ f ≤ 3800 MHz	1 MHz	[-50] dBm	

Operating Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
XXVI	703 MHz ≤ f ≤ 799 MHz	1 MHz	-50 dBm	
	799 MHz ≤ f ≤ 803 MHz	1 MHz	-40 dBm	
	729 MHz ≤ f ≤ 756 MHz	3.84 MHz	-60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	-60 dBm	
	859 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm	
	1475.9 MHz ≤ f ≤ 1510.9 MHz	3.84 MHz	-60 dBm	
	1525 MHz ≤ f ≤ 1559 MHz	1 MHz	-50 dBm	
	1844.9 MHz ≤ f ≤ 1879.9 MHz	3.84 MHz	-60 dBm	
	1884.5 MHz ≤ f ≤1919.6 MHz	300 kHz	-41 dBm	
	1930 MHz ≤ f ≤ 1995 MHz	3.84 MHz	-60 dBm	
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-50 dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
	2180 MHz ≤ f ≤ 2200 MHz	1 MHz	-50 dBm	
	2300 MHz ≤ f ≤ 2400 MHz	1 MHz	-50 dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1 MHz	-50 dBm (see note 2)	
	3400 MHz ≤ f ≤3800 MHz	1 MHz	-50 dBm	

NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 6.8.3 are permitted for each UARFCN used in the measurement.
NOTE 2: For UEs that conform to Release 6 and support Band IV shall support the defined frequency bandwidth.
NOTE 3: For UEs that conform to Release 7 and later releases and support Band IV shall support the defined frequency bandwidth.
NOTE 4: The frequency bandwidth protection 2585-2690 MHz test requirement for Bands I, III, and VIII deviates from the requirement in TS 25.101 [1] Rel-8 and earlier releases. The present document reflects the frequency bandwidth specified in the European Harmonized Standard EN 301 908-2 [Ref.] which became a mandatory requirement after these earlier TS 25.101 releases were frozen.
NOTE 5: The applicability of each line in Table 6.8.4 for UEs of different releases is defined in TS 25.101, Clause 7.9, Table 7.11.

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The Test Requirements are measured in the CELL_FACH state instead of in the UE states defined in the Minimum Requirement because the CELL_FACH state ensures that the UE receiver is continuously on and the UE transmitter is off whilst the spectrum analyser searches for spurious emissions. The UE states defined in the Minimum Requirement allow the UE receiver to be in discontinuous reception, and using those UE states during the measurement would have resulted in a complicated and significantly lengthened test procedure since the UE receiver would be allowed to be switched off part of the time.