Foreword

This Technical Specification (TS) 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.

1 Scope

This present document specifies the measurement procedure for the conformance test of the mobile station that contain transmitting characteristics, receiving characteristics and performance requirements in addition to requirements for support of RRM (Radio Resource Management) in both UTRATDD modes. The two options are the 3,84 Mcps TDD Option and 1,28 Mcps TDD Option, respectively.

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 *in the same Release as the present document*.

[1] 3GPP TS 25.102 (V4.0.0): "UTRA (UE) TDD; Radio Transmission and Reception (TDD)".

[2] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".

[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 25.224: "Physical Layer Procedures (TDD)".

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

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

[8] ITU-R Recommendation SM.328-9: "Spectra and bandwidth of emissions".

[9] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[10] 3GPP TS 25.433 "UTRAN Iub Interface NBAP Signalling".

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

[12] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[13] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[14] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[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 measuremement 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 25.221: "Physical channels and mapping of transport channels onto physical channels (TDD)".

[20] 3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

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

[22] 3GPP TS 25.225: "Physical Layer – Measurements (TDD)".

[23] 3GPP TS 51.010-1: " Mobile Station (MS) conformance specification; Part 1: Conformance specification".

[24] 3GPP TS 25.306: "UE Radio Access capabilities definition".

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

[26] 3GPP TS 36.133: "Requirements for support of radio resource management"

[27] 3GPP TS 36.101: "User Equipment (UE) radio transmission and reception"

[28] 3GPP TS 36.508: "Technical Specification Group Radio Access Network; E-UTRA and EPC; Common test environments for User Equipment (UE)"

[29] 3GPP TS 36.133: "E-UTRA requirements for support of radio resource management".

[30] 3GPP TS 36.211: "Physical Channels and Modulation".

[31] 3GPP TS 36.331: "E-UTRA Radio Resource Control (RRC): protocol specification".

[32] 3GPP TS 36.101: "E-UTRA UE radio transmission and reception".

[33] 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, abbreviations and equations

For the purposes of the present document, the definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [6] and TR 25.990 [7].

3.1 Definitions

For the purpose of the present document, the following definition applies:

Power Spectral Density: 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_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior 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 (3,84 Mcps TDD option) or X dBm/1,281,28 MHz (1,281,28 Mcps TDD option) can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3,84 MHz (3,84 Mcps TDD option) or Y dBm/1,281,28 MHz (1,281,28 Mcps TDD option) can be expressed as a signal power of Y dBm.

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 a transmit timeslot excluding the guard period.

Mean Power: When applied to a 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 a transmit timeslot excluding the guard period unless otherwise stated.

Output power: The mean power of the UE delivered to a load with resistance equal to the nominal load impedance of the transmitter.

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.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class. The period of measurement shall be a transmit timeslot excluding the guard period.

Received Signal Code Power (RSCP): Given only signal power is received, the RRC filtered mean power of the received signal after despreading and combining.

Interference Signal Code Power (ISCP): Given only interference power is received, the RRC filtered mean power of the received signal after despreading to the code and combining. Equivalent to the RSCP value but now only interference is received instead of signal.

The following two definitions are applicable for LCR TDD multi-frequency operation.

Inter-frequency cell: In idle, CELL-FACH, CELL-PCH and URA-PCH state, inter-frequency cell is defined as the cell of which the primary frequency is different from the user's current frequency. In CELL-DCH state, inter-frequency cell is defined as the cell of which the frequency to be measured in that cell is different from the operating frequency for single carrier operation or is different from the associated DPCH operating frequency for multi-carrier operation.

Intra-frequency cell: In idle, CELL-FACH, CELL-PCH and URA-PCH state, intra-frequency cell is defined as the cell of which the primary frequency is the same as the user's current frequency. In CELL-DCH state, intra-frequency cell is defined as the cell of which the frequency to be measured in that cell is the same as the operating frequency for single carrier operation or is the same as the associated DPCH operating frequency for multi-carrier operation.

NOTE 1: The RRC filtered mean power of a perfectly modulated 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 section 6.8.1 of [1].

3.2 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
ATT	Attenuator
CW	Continuous wave (unmodulated signal)
DPCH	Dedicated physical channel
DPCH_Ec	Average energy per PN chip for DPCH
EVM	Error Vector Magnitude
FFS	For Further Study
Fuw	Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or frequency offset from the assigned channel frequency.
HYB	Hybrid
I_{BTS}	Interference signal power level at BTS in dBm, which is broadcasted on BCH
IMB	Integrated Mobile Broadcast
I_{oac}	The power spectral density of the adjacent frequency channel as measured at the UE antenna connector.
Ioc	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.

Ior	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 BS antenna connector
$\hat{I}_{or}$	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
Iowc	Unwanted signal power level
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.
PCDE	Peak Code Domain Error
PPM	Parts Per Million
PRBS	Pseudo Random Bit Sequence
RRC	Root-Raised Cosine
SCTD	Space Code Transmit Diversity
SIR	Signal to Interference ratio
SS	System Simulator
TBD	To Be Defined
TPC	Transmit Power Control
TS	Time Slot

3.3 Equations

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

$\frac{DPCH\_Ec}{I_{or}}$	The ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the downlink at the BS antenna connector
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	The ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector

4 Frequency bands and channel arrangement

4.1 General

The information presented in this clause is based on the chip rates of 3,84 Mcps TDD Option, 1,28 Mcps TDD Option and 7.68Mcps Option.

4.2 Frequency bands

UTRA/TDD is designed to operate in the following bands;

a) 1 900 – 1 920 MHz: Uplink and downlink transmission
   2 010 – 2 025 MHz Uplink and downlink transmission

b) 1 850 – 1 910 MHz: Uplink and downlink transmission
   1 930 – 1 990 MHz: Uplink and downlink transmission

c) 1 910 – 1 930 MHz: Uplink and downlink transmission

d) 2 570 - 2 620 MHz: Uplink and downlink transmission

e) 2300—2400 MHz: Uplink and downlink transmission

f) 1880 - 1920 MHz: Uplink and downlink transmission

NOTE 1: Deployment in existing or other frequency bands is not precluded.

NOTE 2: In China, Band a only includes 2010 - 2025 MHz for 1.28 Mcps TDD option.

4.3 TX–RX frequency separation

4.3.1 3,84 Mcps TDD Option

No TX-RX frequency separation is required as Time Division Duplex (TDD) is employed. Each TDMA frame consists of 15 timeslots where each timeslot can be allocated to either transmit or receive.

The IMB option is only applicable for dedicated carrier operations in which all TDD slots of the radio frame are configured in the downlink direction

4.3.2 1,28 Mcps TDD Option

No TX-RX frequency separation is required as Time Division Duplex (TDD) is employed. Each subframe consists of 7 main timeslots where all main timeslots (at least the first one) before the single switching point are allocated DL and all main timeslots (at least the last one) after the single switching point are allocated UL.

4.3.3 7,68 Mcps TDD Option

No TX-RX frequency separation is required as Time Division Duplex (TDD) is employed. Each TDMA frame consists of 15 timeslots where each timeslot can be allocated to either transmit or receive.

4.4 Channel arrangement

4.4.1 Channel spacing

4.4.1.1 3,84 Mcps TDD Option

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

4.4.1.2 1,28 Mcps TDD Option

The nominal channel spacing is 1,6 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

4.4.1.3 7,68 Mcps TDD Option

The nominal channel spacing is 10 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

4.4.2 Channel raster

The channel raster is 200 kHz, which means that the carrier frequency must be a multiple of 200 kHz.

4.4.3 Channel number

The carrier frequency is designated by the UTRA absolute radio frequency channel number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows:

$N_t = 5 * F$	0,0 MHz $\leq F \leq$ 3276,6 MHz	where F is the carrier frequency in MHz

4.4.4 UARFCN (3,84 Mcps TDD Option)

The following UARFCN range shall be supported for each band.

Table 4.4.1: UTRA Absolute Radio Frequency Channel Number

Frequency Band	Frequency Range	UARFCN Uplink and Downlink transmission
For operation in frequency band as defined in subclause 4.2 (a)	1900-1920 MHz 2010-2025 MHz	9512 to 9588 10062 to 10113
For operation in frequency band as defined in subclause 4.2 (b)	1850-1910 MHz 1930-1990 MHz	9262 to 9538 9662 to 9938
For operation in frequency band as defined in subclause 4.2 (c)	1910-1930 MHz	9562 to 9638
For operation in frequency band as defined in subclause 4.2 (d)	2570-2620 MHz	12862 to 13088

4.4.4A UARFCN (1.28 Mcps TDD Option)

The following UARFCN range shall be supported for each band.

Table 4.4.1A: UTRA Absolute Radio Frequency Channel Number

Frequency Band	Frequency Range	UARFCN Uplink and Downlink transmission
For operation in frequency band as defined in subclause 4.2 (a)	1900-1920 MHz 2010-2025 MHz	9504 to 9596 10054 to 10121
For operation in frequency band as defined in subclause 4.2 (b)	1850-1910 MHz 1930-1990 MHz	9254 to 9546 9654 to 9946
For operation in frequency band as defined in subclause 4.2 (c)	1910-1930 MHz	9554 to 9646
For operation in frequency band as defined in subclause 4.2 (d)	2570-2620 MHz	12854 to 13096
For operation in frequency band as defined in subclause 4.2 (e)	2300-2400 MHz	11504 to 11996
For operation in frequency band as defined in subclause 4.2 (f)	1880-1920 MHz	9404 to 9596

4.4.5 UARFCN (7,68 Mcps TDD Option)

The following UARFCN range shall be supported for each band.

Table 4.4.2: UTRA Absolute Radio Frequency Channel Number

Frequency Band	Frequency Range	UARFCN Uplink and Downlink transmission	Additional UARFCN Uplink and Downlink transmission
For operation in frequency band as defined in subclause 4.2 (a)	1900-1920 MHz 2010-2025 MHz	9512 to 9588 10062 to 10113	-
For operation in frequency band as defined in subclause 4.2 (b)	1850-1910 MHz 1930-1990 MHz	9262 to 9538 9662 to 9938	-
For operation in frequency band as defined in subclause 4.2 (c)	1910-1930 MHz	9562 to 9638	-
For operation in frequency band as defined in subclause 4.2 (d)	2570-2620 MHz	12874 to 13076	-

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 uses normal call protocol until the UE is communicating on traffic channel basically. (Refer to TS 34.108 [3] Common Test Environments for User Equipment (UE) Conformance Testing) 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] Logical Test Interface; Special conformance testing functions).

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 for further study.

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 recognized that different requirements and test methods are likely to be required for the different types of UE.

The common RF test conditions are defined in annex E, and each test conditions in this Clause should refer annex E. Individual test conditions are defined in the paragraph of each test.

5.2 User Equipment 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 requirements in this test apply to all UTRA – TDD- UEs

Notes copied from TS 25.102 clause 6.2.1:

NOTE 1: For multi-code operation the nominal maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission.

NOTE 2: The tolerance allowed for the nominal maximum power applies even at the multi-code transmission mode

NOTE 3: For UE using directive antennas for transmission, a class dependent limit will be placed on the maximum EIRP (Equivalent Isotropic Radiated Power).

5.2.2 Minimum Requirements

5.2.2.1 3.84 Mcps TDD option

The error of the UE maximum output power shall not exceed the tolerance shown in tables 5.2.2 1.a and b for single and multi-code for 3.84Mcps TDD option.

Table 5.2.2.1.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
1	+30 dBm	+1dB/-3dB
2	+24 dBm	+1dB/-3dB
3	+21 dBm	+2dB/-2dB
4	+10 dBm	+4dB/-4dB

Table 5.2.2.1.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
1	+27 dBm (note)	+1dB/-3dB
2	21 dBm (note)	+1dB/-3dB
3	18 dBm (note)	+2dB/-2dB
4	+7 dBm (note)	+4dB/-4dB
NOTE: These figures are not mentioned in 25.102. Instead there is a note, saying: "For multi-code operation the maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission." The figures are calculated from maximum output power single code (table 5.2.2.1.a) and UL multicode reference measurement channel (12,2 kbit/s) (annex C.2.2.1 for the 3,84 TDD Option) containing two code signals with equal level.		

The normative reference for this requirement is TS 25.102 [1] clause 6.2.1.

5.2.2.2 1.28 Mcps TDD option

The error of the UE maximum output power shall not exceed the tolerance shown in tables 5.2.2 2.a and b for single and multi-code for 1.28Mcps TDD option.

Table 5.2.2.2.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
1	+33 dBm	+1dB/-3dB
2	+24 dBm	+1dB/-3dB
3	+21 dBm	+2dB/-2dB
4	+27 dBm	+1dB/-3dB

Table 5.2.2.2.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
1	+30 dBm (note)	+1dB/-3dB
2	22 dBm (note)	+1dB/-3dB
3	18 dBm (note)	+2dB/-2dB
4	+24 dBm (note)	+1dB/-3dB
NOTE: These figures are not mentioned in 25.102. Instead there is a note, saying: "For multi-code operation the maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission." The figures are calculated from maximum output power single code (table 5.2.2.a) and UL multicode reference measurement channel (12,2 kbit/s) (annex C.2.2.2 for the 1,28 Mcps TDD Option) containing two code signals with equal level.		

The normative reference for this requirement is TS 25.102 [1] clause 6.2.1.

5.2.2.3 7.68 Mcps TDD option

The error of the UE maximum output power shall not exceed the tolerance shown in tables 5.2.2 1.a and b for single and multi-code for 7.68Mcps TDD option.

Table 5.2.2.1.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
1	+30 dBm	+1dB/-3dB
2	+24 dBm	+1dB/-3dB
3	+21 dBm	+2dB/-2dB
4	+10 dBm	+4dB/-4dB

Table 5.2.2.1.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
1	+27 dBm (note)	+1dB/-3dB
2	21 dBm (note)	+1dB/-3dB
3	18 dBm (note)	+2dB/-2dB
4	+7 dBm (note)	+4dB/-4dB
NOTE: These figures are not mentioned in 25.102. Instead there is a note, saying: "For multi-code operation the maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission." The figures are calculated from maximum output power single code (table 5.2.2.1.a) and UL multicode reference measurement channel (12,2 kbit/s) (annex C.2.2.3 for the 7.68 TDD Option) containing two code signals with equal level.		

The normative reference for this requirement is TS 25.102 [1] clause 6.2.1.

5.2.3 Test purpose

For the following reasons:

Limit interference.

Verify that the maximum output power is achievable.

It is the purpose of the test to verify that the UE's maximum output power is within its tolerance limits under all environmental conditions.

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) Calls are set up according to the Generic call setup procedure using parameters as specified in tables 5.2.4.1.1a and b for the 3,84 Mcps TDD Option and in tables 5.2.4.1.2a and b for the 1,28 Mcps TDD Option, respectively.

3) Enter the UE into loopback test mode and start the loopback test.

5.2.4.1.1 3,84 Mcps TDD Option

Table 5.2.4.1.1a: Test parameters for Maximum Output Power single code (3,84 Mcps TDD Option)

Parameter	Value/description
UL Reference measurement channel	12,2 kbps, according to annex C.2.1.1
Uplink Power Control	SS level and signalling values such that UE transmits maximum power.
Data content	real life (sufficient irregular)

Table 5.2.4.1.1b: Test parameters for Maximum Output Power multicode (3,84 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2 kbps, according to annex C.2.2.1
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.2.4.1.2 1,28 Mcps TDD Option

Table 5.2.4.1.2a: Test parameters for Maximum Output Power single code (1,28 Mcps TDD Option)

Parameter	Value/description
UL Reference measurement channel	12,2 kbps, according to annex C.2.1.2.
Uplink Power Control	SS level and signalling values such that UE transmits maximum power.
Data content	real life (sufficient irregular)

Table 5.2.4.1.2b: Test parameters for Maximum Output Power multicode (1,28 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2 kbps, according to annex C.2.2.2
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.2.4.1.3 7,68 Mcps TDD Option

Table 5.2.4.1.3a: Test parameters for Maximum Output Power single code (7,68 Mcps TDD Option)

Parameter	Value/description
UL Reference measurement channel	12,2 kbps, according to annex C.2.1.3
Uplink Power Control	SS level and signalling values such that UE transmits maximum power.
Data content	real life (sufficient irregular)

Table 5.2.4.1.3b: Test parameters for Maximum Output Power multicode (7,68 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2 kbps, according to annex C.2.2.3
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.2.4.2 Procedure

1) Measure the mean power of the UE output signal.

2) Run step 1) for RF channels Low / Mid / High.

5.2.5 Test Requirements

5.2.5.1 3,84 Mcps TDD Option

The output power, measured in step 2) of clause 5.2.4.2, shall not exceed the prescribed tolerance in table 5.2.5 a and b.

Table 5.2.5.1.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
1	+30 dBm	+1,7 dB / -3,7 dB
2	+24 dBm	+1,7 dB / -3,7dB
3	+21 dBm	+2,7 dB / -2,7dB
4	+10 dBm	+4,7 dB /-4,7dB

Table 5.2.5.1.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
1	27 dBm	+1,7 dB / -3,7 dB
2	21 dBm	+1,7dB / -3,7 dB
3	18 dBm	+2,7dB / -2,7 dB
4	7 dBm	+4,7 dB / -4,7 dB

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

NOTE 2: Concerning multicode transmission this test applies only for UE power classes 2 and 3. It is intended, that additional test requirements for UE power classes 1 and 4 in this case are part of a later version of the present document.

5.2.5.2 1.28 Mcps TDD Option

The output power, measured in step 2) of clause 5.2.4.2, shall not exceed the prescribed tolerance in table 5.2.5.2 a and b.

Table 5.2.5.2.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
1	+33dBm	+1,7 dB / -3,7 dB
2	+24 dBm	+1,7 dB / -3,7dB
3	+21 dBm	+2,7 dB / -2,7dB
4	+27 dBm	+1,7 dB / -3,7 dB

Table 5.2.5.2.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
1	30 dBm	+1,7 dB / -3,7 dB
2	22 dBm	+1,7dB / -3,7 dB
3	18 dBm	+2,7dB / -2,7 dB
4	24 dBm	+1,7 dB / -3,7 dB

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

NOTE 2: Concerning multicode transmission this test applies only for UE power classes 2 and 3. It is intended, that additional test requirements for UE power classes 1 and 4 in this case are part of a later version of the present document.

5.2.5.3 7.68 Mcps TDD Option

The output power, measured in step 2) of clause 5.2.4.2, shall not exceed the prescribed tolerance in table 5.2.5.3 a and b.

Table 5.2.5.3.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
1	+33dBm	+1,7 dB / -3,7 dB
2	+24 dBm	+1,7 dB / -3,7dB
3	+21 dBm	+2,7 dB / -2,7dB
4	+27 dBm	+1,7 dB / -3,7 dB

Table 5.2.5.3.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
1	30 dBm	+1,7 dB / -3,7 dB
2	21 dBm	+1,7dB / -3,7 dB
3	18 dBm	+2,7dB / -2,7 dB
4	24 dBm	+1,7 dB / -3,7 dB

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

NOTE 2: Concerning multicode transmission this test applies only for UE power classes 2 and 3. It is intended, that additional test requirements for UE power classes 1 and 4 in this case are part of a later version of the present document.

5.2A User Equipment maximum output power with E-DCH

5.2A.1 Definition and applicability

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

The requirements and this test apply for Release 7 and later releases to all types of UTRA for the TDD UE that support HSUPA.

5.2A.2 Minimum Requirements

5.2A.2.1 3.84 Mcps TDD option

[FFS]

5.2A.2.2 1.28 Mcps TDD option

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2A.2.2.a

Table 5.2A.2.2.a: UE maximum output power with E-DCH

UE transmit channel configuration	CM (dB)	MPR (dB)
E-DCH and E-UCCH	$0 \leq CM \leq 1.5$	CM

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

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

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)
- k is 1.94
- $20 * \log10 ((v\_norm\_ref^3)_{rms}) = 1.22$ dB

The normative reference for this requirement is TS 25.102 clause 6.2.2.

5.2A.2.3 7.68 Mcps TDD option

[FFS]

5.2A.3 Test purpose

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

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 Fixed Reference Channels (FRC 3, 16QAM) are specified C.6.1.2.3.
3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9
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.

5.2A.4.1.1 3,84 Mcps TDD Option

[FFS]

5.2A.4.1.2 1,28 Mcps TDD Option

Table 5.2A.4.1.2a: Test parameters for Maximum Output Power single code (1,28 Mcps TDD Option)

Parameter	Value/description
UL Reference measurement channel	12,2 kbps, according to annex C.2.1.2.
Uplink Power Control	SS level and signalling values such that UE transmits maximum power.
Data content	real life (sufficient irregular)

Table 5.2A.4.1.2b: Test parameters for Maximum Output Power multicode (1,28 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2 kbps, according to annex C.2.2.2
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.2 A.4.1.3 7,68 Mcps TDD Option

[FFS]

5.2A.4.2 Procedure

1) The SS starts transmitting and the UE loops the received data back on E-DCH.
2) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150ms.
3) Send power control bits to give one TPC_cmd = +1 command to the UE.
4) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI within the 150ms then go back to step (3) otherwise proceed to step 5).
5) Send power control bits to give one TPC_cmd = -1 command to the UE and wait 150ms.
6) The SS checks the received E-TFCI for 150 ms. If UE sends any 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.
7) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI = 53. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.
8) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

5.2A.5 Test requirements

5.2A.5.1 3.84 Mcps TDD Option

[FFS]

5.2A.5.2 1.28 Mcps TDD Option

The maximum output power with E-DCH, derived in step 7), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2A.5.2.a.

Table 5.2A.5.2.a: Maximum Output Powers with E-DCH for test

UE transmit channel configuration	Power Class1	
	Nominal maximum output power	Tolerance
E-DCH and E-UCCH	FFS	FFS

UE transmit channel configuration	Power Class2	
	Nominal maximum output power	Tolerance
E-DCH and E-UCCH	22.5dBm	+3.2dB / -5.2dB

UE transmit channel configuration	Power Class3	
	Nominal maximum output power	Tolerance
E-DCH and E-UCCH	FFS	FFS

UE transmit channel configuration	Power Class4	
	Nominal maximum output power	Tolerance
E-DCH and E-UCCH	FFS	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

NOTE2: The test procedure will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2A.5.2.a are made lower by 1.5 dB.

5.2A.5.3 7.68 Mcps TDD Option

[FFS]

5.2B User Equipment maximum output power with HS-SICH and DPCH

5.2B.1 Definition and applicability

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

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

5.2B.2 Minimum Requirements

5.2B.2.1 3.84 Mcps TDD option

[FFS]

5.2B2.2 1.28 Mcps TDD option

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2B.2.2.b

Table 5.2B.2.2.b: UE maximum output power with HS-SICH and DPCH

UE transmit channel configuration	CM (dB)	MPR (dB)
HS-SICH and DPCH	0 ≤ CM ≤ 2.5	CM

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

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

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)
- k is 1.68
- $20 * \log10 ((v\_norm\_ref^3)_{rms}) = 1.22$ dB

The normative reference for this requirement is TS 25.102 clause 6.2.2.

5.2B.2.3 7.68 Mcps TDD option

[FFS]

5.2B.3 Test purpose

To verify that the error of the UE maximum output power with HS-SICH and DPCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2B.2.2b.

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 Reference Measurement Channels are specified C.2.2.2a.
3) An HSDPA call is set up according to TS 34.108 [3] 7.3.6
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

5.2B.4.2 Procedure

1) The SS starts transmitting HSDPA data.
2) Set SS-level and signalling values such that the power level of both DPCH and HS-SICH are between 12.5-14dBm
3) Send power control bits continuously to give TPC_cmd = +1 command to DPCH and HS-SICH simultaneously.
4) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

5.2B.5 Test requirements

5.2B.5.1 3.84 Mcps TDD Option

[FFS]

5.2B.5.2 1.28 Mcps TDD Option

The maximum output power with HS-SICH and DPCH, derived in step 7), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2B.5.2b.

Table 5.2A.5.2b.: Maximum Output Powers with HS-SICH and DPCH for test

UE transmit channel configuration	Power Class1	
	Nominal maximum output power	Tolerance
For some combinations of; HS-SICH and DPCH	FFS	FFS

UE transmit channel configuration	Power Class2	
	Nominal maximum output power	Tolerance
For some combinations of; HS-SICH and DPCH	21.5dBm	+4.2 dB / -3.7dB

UE transmit channel configuration	Power Class3	
	Nominal maximum output power	Tolerance
For some combinations of; HS-SICH and DPCH	FFS	FFS

UE transmit channel configuration	Power Class4	
	Nominal maximum output power	Tolerance
For some combinations of; HS-SICH and DPCH	FFS	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.2B.5.3 7.68 Mcps TDD Option

[FFS]

5.3 UE frequency stability

5.3.1 Definition and applicability

The frequency stability is the difference of the modulated carrier frequency between the RF transmission from the UE and the RF transmission from the BS. The UE shall use the same frequency source for both RF frequency generation and chip clocking.

The requirements of this test apply to all types of UTRA - UE.

5.3.2 Minimum Requirements

The UE frequency stability, observed over a period of one timeslot, shall be within ±0,1 ppm compared to signals received from the BS.

The normative reference for this requirement is TS 25.102 [1] clause 6.3.

5.3.3 Test purpose

Reliable frequency stability of the UE's transmitter in certain tolerance limits is prerequisite for connectivity.

This test stresses the ability of the UE's receiver to derive correct frequency information from the received signal for the transmitter.

5.3.4 Method of test

5.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

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

5.3.4.1.1 3,84 Mcps TDD Option

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 parameters as specified in table 5.3.4.1.1.
3) Enter the UE into loopback test mode and start the loopback test.

Table 5.3.4.1.1: Test parameters for Frequency Stability (3,84 Mcps TDD Option)

Parameter	Value/description
SS level (Ior)	–105 dBm / 3,84 MHz (reference sensitivity)
UL reference measurement channel	12,2 kbps according to annex C.2.1.1.
Data content	real life (sufficient irregular)

5.3.4.1.2 1,28 Mcps TDD Option

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 parameters as specified in table 5.3.4.1.2.
3) Enter the UE into loopback test mode and start the loopback test.

Table 5.3.4.1.2: Test parameters for Frequency Stability (1,28 Mcps TDD Option)

Parameter	Value/description
SS level (Ior)	–108 dBm / 1,28 MHz (reference sensitivity)
UL reference measurement channel	12,2 kbps according to annex C.2.1.2
Data content	real life (sufficient irregular)

5.3.4.1.3 7,68 Mcps TDD Option

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 parameters as specified in table 5.3.4.1.3.
3) Enter the UE into loopback test mode and start the loopback test.

Table 5.3.4.1.3: Test parameters for Frequency Stability (7,68 Mcps TDD Option)

Parameter	Value/description
SS level (Ior)	–102 dBm / 7,68 MHz (reference sensitivity)
UL reference measurement channel	12,2 kbps according to annex C.2.1.3.
Data content	real life (sufficient irregular)

5.3.4.2 Procedure

1) Measure the frequency error delta f across the TS according to annex B.

2) Repeat step 1) for 200 bursts (time slots).

3) Run Step 1) and 2) for RF channels Low /Mid/ High.

5.3.5 Test Requirements

For all measured bursts (time slots), the frequency error, derived in clause 5.3.4.2, 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4

5.4 Output Power Dynamics

Power control is used to limit the interference level.

5.4.1 Uplink power control

Uplink power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, values determined by higher layer signalling and path loss weighting parameter α as defined in TS 25.331 [9]. The output power is defined as the RRC filtered mean power of the transmit timeslot.

5.4.1.1 Initial accuracy (3,84 Mcps TDD Option)

5.4.1.1.1 Definition and applicability

Initial Uplink power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, and signalling values: I_{BTS} and Constant value, received from the BCH and applicable for the PRACH.

The requirements and this test apply to all types of UTRA - UEs.

5.4.1.1.2 Minimum requirements

The UE power control, initial accuracy, is given in table 5.4.1.1.2.

Table 5.4.1.1.2: Initial uplink power control tolerance (3,84 Mcps TDD Option)

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.102 [1] clause 6.4.1.1.1.

5.4.1.1.3 Test purpose

The power of the received signal at the UE and the BCH information control the power of the transmitted UE signal with the target to transmit at lowest power, acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power over the receiver dynamic range and to derive from this correct transmitter-power.

5.4.1.1.4 Method of test

5.4.1.1.4.1 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.

Connect the SS to the MS antenna connector as shown in figure A.1.

A call is set up according to the generic call setup procedure [3] using parameters as specified in table 5.4.1.1.4. The RACH procedure within the call setup is used for the test.

Table 5.4.1.1.4: Test parameters for uplink Power Control (3,84 Mcps TDD Option)

	RX-Upper dynamic end	RX-middle	RX-Sensitivity level
SS transmit power	-25 dBm/3,84 MHz	-65 dBm/3,84 MHz	-105 dBm/3,84 MHz
Broadcasted transmit-power PCCPCH	35 dBm	35 dBm	24 dBm
Simulated path loss = Broadcasted TX – SS TX Power	60 dB	100 dB	129 dB
I BTS (UL interference)	-75 dBm	-100 dBm	-110 dBm
Constant value	-10 dB	-10 dB	-10 dB
Nominal expected UE TX power	-25 dBm	-10 dBm	+9 dBm (note 2)
NOTE 1: While the SS transmit power shall cover the UE receiver input dynamic range, the logical parameters: broadcasted transmit power, I_{BTS}, and RACH constant value are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 3 UE.			
NOTE 2: Nominal TX output power 9 dBm allows to check the uplink power control algorithm within the entire tolerance range (9 dBm +-12 dB: 9 dBm +12 dB =21 dBm = max power class 3).			

5.4.1.1.4.2 Procedure

1) Set the SS transmit power according to table 5.4.1.1.4.

2) Measure the RACH output power of the UE according to annex B.

3) Repeat the test for all SS transmit powers and parameters in table 5.4.1.1.4.

5.4.1.1.5 Test requirements

The deviation with respect to the nominal expected UE TX power (table 5.4.1.1.2), derived in step 2, shall not exceed the prescribed tolerance in table 5.4.1.1.5.

Table 5.4.1.1.5: Test parameters for uplink Power Control

Expected UE TX power, normal conditions	-25 dBm ±10 dB	-10 dBm±10 dB	+9 dBm ±10 dB
Expected UE TX power, extreme conditions	-25 dBm ±13 dB	-10 dBm±13 dB	+9 dBm ±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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.1.2 Differential accuracy, controlled input (3,84 Mcps TDD Option)

5.4.1.2.1 Definition and applicability

Uplink power control, differential accuracy, is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, and the signalling values: I_{BTS}, SIR_{Target}, Constant Value, received from higher layers and applicable for the DPCH.

Specifically, the uplink power control, differential accuracy, controlled input, is defined as the error in the UE transmitter power step as a result of a step in SIR_{TARGET}, I_{BTS} or DPCH Constant Value when the path loss weighting parameter α=0.

The requirements of this test apply to all types of UTRA -UE.

5.4.1.2.2 Minimum requirements

The step in SIR_{TARGET} shall be rounded to the closest integer dB value. The power control error resulting from a change in SIR_{TARGET}, I_{BTS} or DPCH Constant Value shall not exceed the values in table 5.4.1.2.2.

Table 5.4.1.2.2: Transmitter power step tolerance as a result of control power step (3,84 Mcps TDD Option)

ΔSIR_{TARGET} [dB]	Transmitter power step tolerance [dB]
$\Delta SIR_{TARGET} \leq 1$	± 0,5
$1 < \Delta SIR_{TARGET} \leq 2$	± 1
$2 < \Delta SIR_{TARGET} \leq 3$	± 1,5
$3 < \Delta SIR_{TARGET} \leq 10$	± 2
$10 < \Delta SIR_{TARGET} \leq 20$	± 4
$20 < \Delta SIR_{TARGET} \leq 30$	± 6
$30 < \Delta SIR_{TARGET}$	± 9 (note)
NOTE: Value is given for normal conditions. For extreme conditions value is ±12.	

The reference for this requirement is TS 25.102 [1] clause 6.4.1.1.2.

5.4.1.2.3 Test purpose

It is verified if the UE sets correct uplink power steps in response to steps in the signalling value SIR_{Target} and DPCH Constant Value, signalled via the downlink to the UE under the following conditions: keeping the other signalling parameters constant and deactivating any influence due to varying pathloss.

5.4.1.2.4 Method of test

5.4.1.2.4.1 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 MS antenna connector as shown in figure A.1.

2) A call is set up according to the generic call setup procedure using parameters as specified in table 5.4.1.2.4.

Table 5.4.1.2.4 : Test parameters for Uplink Power Control, Differential Accuracy, Controlled Input (3,84 Mcps TDD Option)

Parameter	Value/description
UL reference measurement channel	12,2 kbps according to annex C clause C.2.1.1
BS Transmit to UE Transmit delay	7 TSs--> α=0
SS Transmit power	-65 dBm
Reference transmit power broadcast on BCH	35 dBm
IBTS	-100
Constant value	-10
Data content	real life (sufficient irregular)

5.4.1.2.4.2 Procedure

Using a combination of SIR_{Target} and DPCH constant value signalled in the downlink, cover the UE-transmitter dynamic range by commanding the UEs power with the signalling value SIR_{Target} in a step resolution (positive and negative direction) of:

1 dB approx. 68 steps up and 68 steps down

2 dB approx. 34 steps up and 34 steps down

3 dB approx. 22 steps up and 22 steps down

10 dB approx. 7 steps up and 7 steps down

20 dB approx. 3 steps up and 3 steps down

30 dB approx. 2 step up and 2 step down

maximum step size 1 step up and 1 step down

Measure the power according to annex B.

5.4.1.2.5 Test requirements

For the UE output power laying between

Max Power minus tolerance and Min Power

the step response shall not exceed the prescribed tolerance in table 5.4.1.2.5.

Table 5.4.1.2.5: Transmitter power step tolerance as a result of control power step

ΔSIR_{TARGET} [dB]	Transmitter power step tolerance [dB]
$\Delta SIR_{TARGET} \leq 1$	± 0,6
$1 < \Delta SIR_{TARGET} \leq 2$	± 1,15
$2 < \Delta SIR_{TARGET} \leq 3$	± 1,7
$3 < \Delta SIR_{TARGET} \leq 10$	± 2,5
$10 < \Delta SIR_{TARGET} \leq 20$	± 4,7
$20 < \Delta SIR_{TARGET} \leq 30$	± 6,7
$30 < \Delta SIR_{TARGET}$	± 10

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.1.2A Differential accuracy, controlled input

This is not tested.

5.4.1.3 Open loop power control (1,28 Mcps TDD Option)

5.4.1.3.1 Definition and applicability

Open loop power control is the ability of the UE transmitter to sets its output power to a specific value. The open loop power control tolerance is given in table 5.4.1.3.2.

The requirements and this test apply to all types of 1.28 Mcps TDD UE.

5.4.1.3.2 Minimum requirements

The UE open loop power is defined as the average power in a timeslot or ON power duration, whichever is available, and they are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate of 1,28 Mcps. The open loop power control tolerance is given in table 5.4.1.3.2.

Table 5.4.1.3.2: Open loop power control tolerance (1,28 Mcps TDD Option)

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.102 [1] clause 6.4.1.2.1.1.

5.4.1.3.3 Test purpose

The power of the received signal and the BCCH information control the power of the transmitted signal with the target to transmit at 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 5.4.1.3.2.

An excess error of the open loop power control decreases the system capacity.

5.4.1.3.4 Method of test

5.4.1.3.4.1 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, and RF parameters are set up according to table 5.4.1.3.4a. The transmit power level by a UE on the UpPTS is measured. The network signals on BCH a power increment that is applied only for the access procedure. At each new transmission of a UpPTS burst during the access procedure, the transmit power level can be increased by this power increment. According to the test purpose this power increment is set to zero.

See TS 34.108 [3] for details regarding generic call setup procedure.

Table 5.4.1.3.4a: Test parameters for Open Loop Power Control (UE) (1,28 Mcps TDD Option)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.4.1.3.4b	dBm / 1,28 MHz

Table 5.4.1.3.4b: Test parameters for Open Loop Power Control (SS) (1,28 Mcps TDD Option) [1)]

Parameter	RX Upper dynamic end	RX-middle	RX-Sensitivity level
SS transmit power $\hat{I}_{or}$	–25 dBm / 1,28 MHz	– 66 dBm / 1,28 MHz	– 108 dBm / 1,28 MHz [3)]
broadcasted Primary CCPCH transmit power on BCH	+35 dBm	+24 dBm	+11 dBm
Simulated path loss = broadcasted TX – SS TX power	+60 dB	+90 dB	+119 dB
PRXUpPCHdes	–85 dBm	–100 dBm	–110 dBm
Pwr_{ramp} (Power Ramping Step)	0 dB	0 dB	0 dB
I (Max SYNC_UL Transmissions)	1	1	1
Expected nominal UE TX power [5)]	-25 dBm	-10 dBm	+9 dBm [2)]

Table 5.4.1.3.4c: Settings for the serving cell

Parameter	Unit	Cell 1
Cell type		Serving cell
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	21

NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: broadcasted TX power, Desired UpPCH RX power at the BS receiver and Power Ramp step are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 3 UE.

NOTE 2: Nominal TX output power 9 dBm allows checking the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 3)

NOTE 3: The reference for this requirement is TS 25.102 [1] clause 7.3.1.2.

NOTE 4: This test applies only for max UE power classes 3. It is intended, that additional test requirements for UE power class 4 are part of a later release.

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 [9]

5.4.1.3.4.2 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 5.4.1.3.4b (–25 dBm / 1,28 MHz).

2) Measure the UpPCH TX mean power of UE.

3) Repeat the above measurement for all SS levels in table 5.4.1.3.4b.

5.4.1.3.5 Test requirements

The measured UE TX power in step 2), shall not exceed the prescribed tolerance given in table 5.4.1.3.5.

Table 5.4.1.3.5: Test parameters for open loop power control (1,28 Mcps TDD Option)

Expected UE TX power, normal conditions	-25 dBm ±10 dB	-10 dBm±10 dB	+9 dBm ±10 dB
Expected UE TX power, extreme conditions	-25 dBm ±13 dB	-10 dBm±13 dB	+9 dBm ±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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.1.4 Closed loop power control (1,28 Mcps TDD Option)

5.4.1.4.1 Definition and applicability

Closed 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, arrived at the UE.

The requirements and this test apply to all types of 1.28 Mcps TDD UE.

5.4.1.4.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1, 2 and 3 dB according to the value of Δ_{TPC} in the slot immediately after the TPC_cmd can be arrived.

a) The transmitter output power step due to closed loop power control shall be within the range shown in table 5.4.1.4.2a.

b) The transmitter average output power step due to closed loop power control shall be within the range shown in table 5.4.1.4.2b. 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 closed loop power is defined as the relative power differences between RRC filtered mean power of original (reference) timeslot and RRC filtered mean power of the target timeslot without transient duration.

Table 5.4.1.4.2a: Transmitter power control range

TPC_cmd	Transmitter power control range					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
Up	+0,5 dB	+1,5 dB	+1 dB	+3 dB	+1,5 dB	+4,5 dB
Down	-0,5 dB	-1,5 dB	-1 dB	-3 dB	-1,5 dB	-4,5 dB

Table 5.4.1.4.2b: Transmitter average power control range

TPC_cmd group	Transmitter power control range after 10 equal TPC_ cmd groups					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
Up	+8 dB	+12 dB	+16 dB	+24 dB	+24 dB	+36 dB
Down	-8 dB	-12 dB	-16 dB	-24 dB	-24 dB	-36 dB

5.4.1.4.3 Test purpose

The purpose of this test is

- to verify that the UE inner loop power control size and response is meet to the described value shown in clause 5.4.1.4.2; and

- to verify that the TPC_cmd is correctly derived from received TPC commands.

5.4.1.4.4 Method of test

5.4.1.4.4.1 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.1.

2) A call is set up according to the Generic call setup procedure.

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.

5.4.1.4.4.2 Procedure

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –10± 9dBm. 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: Configure the uplink channel to set the TPC step size to 1 dB. When the Configuration is complete, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

3) Step B: Transmit a sequence of 68 (note) TPC commands with the value 0.

4) Step C: Transmit a sequence of 68 (note) TPC commands with the value 1.

5) Step D: Reconfigure the uplink channel to set the TPC step size to 2dB. When the reconfiguration is complete, 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 34 (note) TPC commands with the value 0.

6) Step E: Transmit a sequence of 34 (note) TPC commands with the value 1.

7) Step F: Reconfigure the uplink channel to set the TPC step size to 3 dB. When the reconfiguration is complete, 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 22 (note) TPC commands with the value 0.

8) Step G: Transmit a sequence of 22 (note) TPC commands with the value 1.

NOTE: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be sufficient to ensure that the UE reaches the relevant maximum or minimum power threshold.

5.4.1.4.5 Test requirements

a) During Step B, the difference in mean output power between adjacent slots shall be within the prescribed range given in table 5.4.1.4.2a for a TPC_cmd of –1 and step size of 1 dB, until the output power reaches (Minimum power threshold +0,5 dB).

b) During Step B, the change in mean output 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 5.4.1.4.2b, until the output power reaches (Minimum power threshold +0,5 dB).

c) During Step C, the difference in mean output power between adjacent slots shall be within the prescribed range given in table 5.4.1.4.2a for a TPC_cmd of +1 and step size of 1 dB, until the output power reaches (Maximum power threshold –0,5 dB).

d) During Step C, the change in mean output 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 5.4.1.4.2b, until the output power reaches (Maximum power threshold –0,5 dB).

e) During Step D, the difference in mean output power between adjacent slots shall be within the prescribed range given in table 5.4.1.4.2a for a TPC_cmd of –1 and step size of 2 dB, until the output power reaches (Minimum power threshold +1 dB).

f) During Step D, the change in mean output 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 5.4.1.4.2b, until the output power reaches (Minimum power threshold +1 dB).

g) During Step E, the difference in mean output power between adjacent slots shall be within the prescribed range given in table 5.4.1.4.2a for a TPC_cmd of +1 and step size of 2 dB, until the output power reaches (Maximum power threshold –1 dB).

h) During Step E, the change in mean output 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 5.4.1.4.2b, until the output power reaches (Maximum power threshold –1 dB).

i) During Step F, the difference in mean output power between adjacent slots shall be within the prescribed range given in table 5.4.1.4.2a for a TPC_cmd of –1 and step size of 3 dB, until the output power reaches (Minimum power threshold +1 dB).

j) During Step F, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 3 dB as given in table 5.4.1.4.2b, until the output power reaches (Minimum power threshold +1 dB).

k) During Step G, the difference in mean output power between adjacent slots shall be within the prescribed range given in table 5.4.1.4.2a for a TPC_cmd of +1 and step size of 3 dB, until the output power reaches (Maximum power threshold –1 dB).

l) During Step G, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 3 dB as given in table 5.4.1.4.2b, until the output power reaches (Maximum power threshold –1 dB).

5.4.1.5 Initial accuracy (7,68 Mcps TDD Option)

5.4.1.5.1 Definition and applicability

Initial Uplink power control is the ability of the UE transmitter to set its output power in accordance with measured downlink path loss, and signalling values: I_{BTS} and Constant value, received from the BCH and applicable for the PRACH.

The requirements and this test apply to all types of UTRA - UEs.

5.4.1.5.2 Minimum requirements

The UE power control, initial accuracy, is given in table 5.4.1.5.2.

Table 5.4.1.5.2: Initial uplink power control tolerance (7,68 Mcps TDD Option)

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.102 [1] clause 6.4.1.3.1.

5.4.1.5.3 Test purpose

The power of the received signal at the UE and the BCH information control the power of the transmitted UE signal with the target to transmit at lowest power, acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power over the receiver dynamic range and to derive from this correct transmitter-power.

5.4.1.5.4 Method of test

5.4.1.5.4.1 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.

Connect the SS to the MS antenna connector as shown in figure A.1.

A call is set up according to the generic call setup procedure [3] using parameters as specified in table 5.4.1.5.4. The RACH procedure within the call setup is used for the test.

Table 5.4.1.5.4: Test parameters for uplink Power Control (7,68 Mcps TDD Option)

	RX-Upper dynamic end	RX-middle	RX-Sensitivity level
SS transmit power	-25 dBm/7,68 MHz	-65 dBm/7,68 MHz	-102 dBm/7,68 MHz
Broadcasted transmit-power PCCPCH	35 dBm	35 dBm	24 dBm
Simulated path loss = Broadcasted TX – SS TX Power	60 dB	100 dB	126 dB
I BTS (UL interference)	-75 dBm	-100 dBm	-107 dBm
Constant value	-10 dB	-10 dB	-10 dB
Nominal expected UE TX power	-25 dBm	-10 dBm	+9 dBm (note 2)
NOTE 1: While the SS transmit power shall cover the UE receiver input dynamic range, the logical parameters: broadcasted transmit power, I_{BTS}, and RACH constant value are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 3 UE.			
NOTE 2: Nominal TX output power 9 dBm allows to check the uplink power control algorithm within the entire tolerance range (9 dBm +-12 dB: 9 dBm +12 dB =21 dBm = max power class 3).			

5.4.1.5.4.2 Procedure

1) Set the SS transmit power according to table 5.4.1.1.4.

2) Measure the RACH output power of the UE according to annex B.

3) Repeat the test for all SS transmit powers and parameters in table 5.4.1.5.4.

5.4.1.5.5 Test requirements

The deviation with respect to the nominal expected UE TX power (table 5.4.1.5.2), derived in step 2, shall not exceed the prescribed tolerance in table 5.4.1.5.5.

Table 5.4.1.5.5: Test parameters for uplink Power Control

Expected UE TX power, normal conditions	-25 dBm ±10 dB	-10 dBm±10 dB	+9 dBm ±10 dB
Expected UE TX power, extreme conditions	-25 dBm ±13 dB	-10 dBm±13 dB	+9 dBm ±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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.2 Minimum output power

5.4.2.1 Definition and applicability

The minimum controlled output power of the UE is when the power is set to a minimum value. The minimum output power is defined as the mean power in one time slot excluding the guard period.

The normative requirements of this test apply to all types of UTRA - UE.

5.4.2.2 Minimum Requirements

5.4.2.2.1 3,84Mcps TDD Option

The minimum output power shall be lower than or equal to –44 dBm.

The normative reference for this requirement is TS 25.102 [1] clause 6.4.2.1.1.

5.4.2.2.2 1,28Mcps TDD Option

The minimum output power shall be better than –49 dBm.

The normative reference for this requirement is TS 25.102 [1] clause 6.4.2.1.2.

5.4.2.2.3 7,68Mcps TDD Option

The minimum output power shall be lower than or equal to –41 dBm.

The normative reference for this requirement is TS 25.102 [1] clause 6.4.2.1.3.

5.4.2.3 Test purpose

The test purpose is to verify the ability of the UE to reduce its output power to a specified value.

5.4.2.4 Method of test

5.4.2.4.1 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 using parameters as specified in table E.3.1.2.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.2.4.2 Procedure

1) Configure the UE transmitter to enable power control steps of size 1 dB.

2) Set and send Down power control commands to the UE. The sequence shall be sufficiently long so that the UE output signal reached its minimum power.

2) Measure the mean power of the UE output signal according to annex B.

NOTE: Annex B returns the power in the decision points (displayed as reference power and power offset). This is equivalent to thermal power at the air-interface. Insofar 5.4.2.2.1 minimum output power for 3,84 Mcps TDD Option and 5.4.2.2.2 minimum output power for 1,28 Mcps TDD Option is consistent with 5.2 maximum output power.

3) Configure the UE transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat step 2).

4) Run step 2) for RF channels Low Mid and High.

5.4.2.5 Test requirements

5.4.2.5.1 3,84 Mcps TDD Option

For all measurements, the minimum output power derived in step 3) and 4) of 5.4.2.4.2 shall be below –43 dBm.

5.4.2.5.2 1,28 Mcps TDD Option

For all measurements, the minimum output power derived in step 3) and 4) of 5.4.2.4.2 shall be below -48 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.2.5.3 7,68 Mcps TDD Option

For all measurements, the minimum output power derived in step 3) and 4) of 5.4.2.4.2 shall be below -40 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.3 Transmit OFF power

5.4.3.1 Definition and applicability

Transmit OFF power is defined as the RRC filtered mean power measured over one chip when the transmitter is off. The transmit OFF power state is when the UE does not transmit.

The requirements of this test apply to all types of UTRA-UE.

5.4.3.2 Minimum Requirements

The transmit OFF power shall be below –65 dBm.

The normative reference for this requirement is TS 25.102 clause 6.5.1.

5.4.3.3 Test purpose

Refer clause 5.4.4.3.

5.4.3.4 Method of test

Refer clause 5.4.4.4.

5.4.3.5 Test requirements

The transmit OFF power shall be below –63.5 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4

5.4.4 Transmit ON/OFF Time mask

5.4.4.1 Definition and applicability

The transmit ON/OFF time mask defines the ramping time allowed for the UE between transmit OFF power and transmit ON power.

This test applies for all UTRA TTD UEs.

5.4.4.2 Minimum requirements

5.4.4.2.1 3,84Mcps TDD Option

The transmit power level versus time shall meet the mask specified in figure 5.4.4.2, where the transmission period refers to the burst without guard-period for a single transmission slot, and to the period from the beginning of the burst in the first transmission slot to the end of the burst without guard period in the last transmission timeslot for consecutive transmission slots.

The reference for this requirement is TS 25.102 [1] clause 6.5.2.1.1.

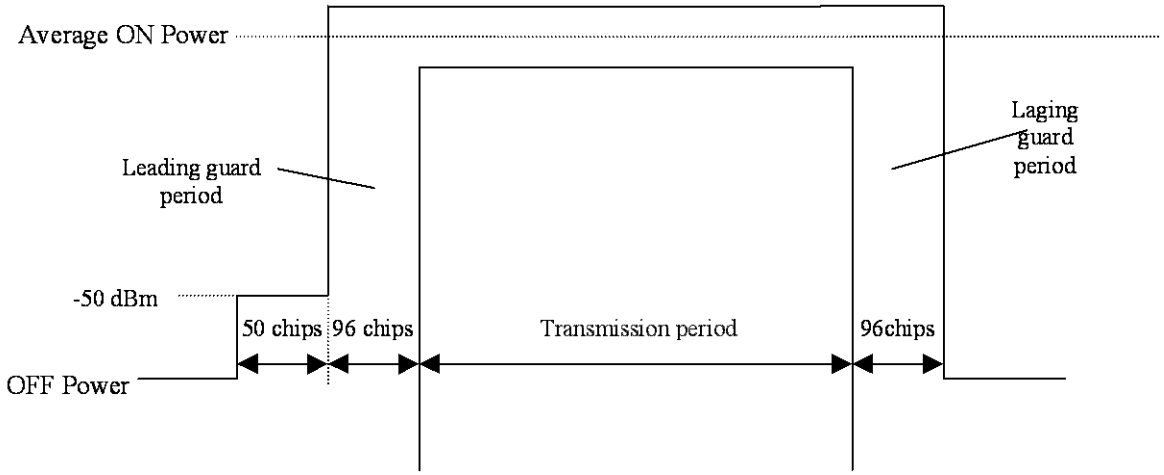

Figure 5.4.4.2.1: Transmit ON/OFF template for 3,84 Mcps TDD Option

5.4.4.2.2 1,28Mcps TDD Option

The transmit power level versus time shall meet the mask specified in figure 5.4.4.2.2, where the transmission period refers to the burst without guard period for a single transmission slot, and to the period from the beginning of the burst in the first transmission slot to the end of the burst without guard period in the last transmission timeslot for consecutive transmission slots.

The reference for this requirement is TS 25.102 [1] clause 6.5.2.1.2.

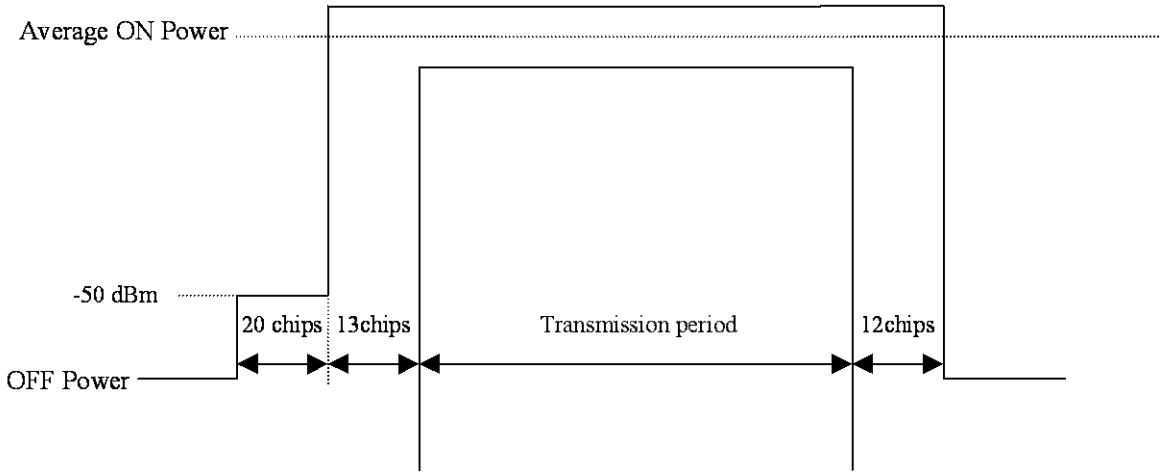

Figure 5.4.4.2.2: Transmit ON/OFF template for 1,28Mcps TDD Option

5.4.4.2.3 7,68Mcps TDD Option

The transmit power level versus time shall meet the mask specified in figure 5.4.4.2.3, where the transmission period refers to the burst without guard-period for a single transmission slot, and to the period from the beginning of the burst in the first transmission slot to the end of the burst without guard period in the last transmission timeslot for consecutive transmission slots.

The reference for this requirement is TS 25.102 [1] clause 6.5.2.1.3.

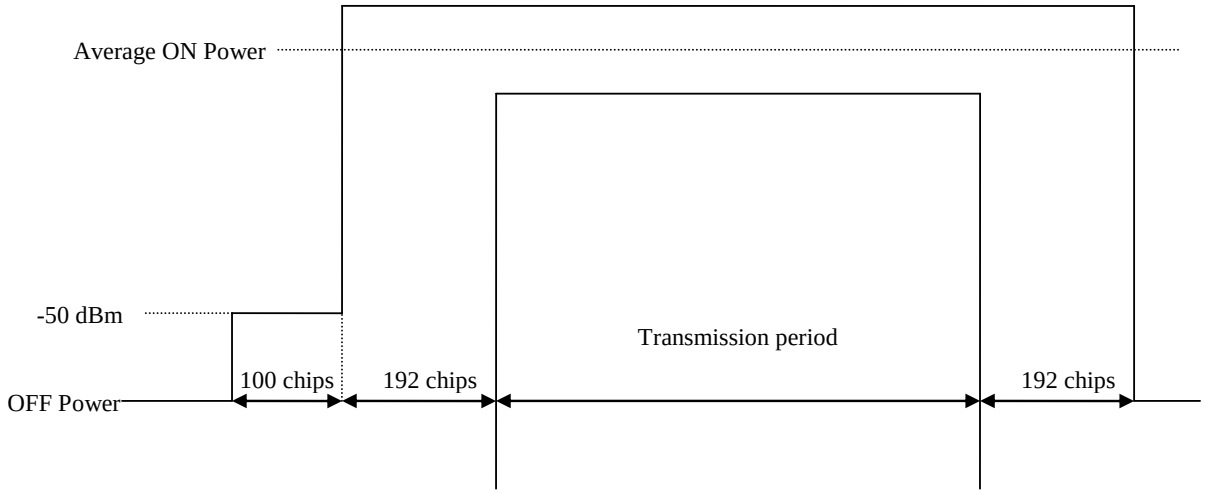

Figure 5.4.4.2.3: Transmit ON/OFF template for 7,68 Mcps TDD Option

5.4.4.3 Test Purpose

It is tested if the UE TX signal uses the guard period for on-to-off and off-to-on transitions, where the time position of guard period is derived from the burst under test itself.

It is further on tested, if the UE TX signal is below certain limits outside transmission period and guard periods where the position in time is derived from the burst under test itself.

With this test interference to other UTRA TDD users are limited

5.4.4.4 Method of test

5.4.4.4.1 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.

Connect the SS to the UE antenna connector as shown in figure A.1.

A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.

Enter the UE into loopback test mode and start the loopback test.

5.4.4.4.2 Procedure

1) The time position of the midamble of the burst under test (TimeSlot s in Frame f) shall be the reference for the time position of the leading and lagging guard-periods of the burst under test and, alternatively, for the equivalent guard periods of the next 2 bursts.

2) Record the following time periods with at least 2 samples /chip through a matched filter (RRC 0.22, BW equal to the chip rate) : TS s-1 and TS s+1 in frame f or f+1 or f+2

3) Calculate power samples by averaging the recorded samples of one chip duration.

5.4.4.5 Test requirements

Each power sample shall be below the limits (off Power (clause 5.4.3) and –50 dBm), indicated in figure 5.4.4.2.1 for 3,84 Mcps TDD Option, figure 5.4.4.2.2 for 1,28 Mcps TDD Option and figure 5.4.4.2.3 for 7,68 Mcps TDD Option, respectively.

NOTE: In this test no power limits apply during guard period.

5.4.5 Out-of-synchronisation handling of output power for continuous transmission

5.4.5.1 Definition and applicability

The UE shall monitor the DPCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.224. [5] The thresholds Q_{out} and Q_{in} specify at what DPCH 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 requirement of this clause shall apply to all types of UTRA-UE.

5.4.5.2 Minimum Requirement

5.4.5.2.1 3,84 Mcps TDD Option

When the UE estimates the DPCH quality over the last 160 ms period 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 DPCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

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 5.4.5.2.1, a signal with the quality at the level Q_{out} is generated by a ΣDPCH_Ec/Ior ratio of -13 dB, and a signal with Q_{in} by a ΣDPCH_Ec/Ior ratio of -9 dB. In this test, the DL reference measurement channel (12,2) kbps specified in clause C.3.1, where the CRC bits are replaced by data bits, and with static propagation conditions is used.

Table 5.4.5.2.1: DCH parameters the of Out-of-synch handling test case test case – 3,84 Mcps TDD option – continuous transmission

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	1.1
I_{oc}	dBm/3,84 MHz	-60
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	See figure 5.4.5.2.1
Information Data Rate	kbps	13
TFCI	-	On

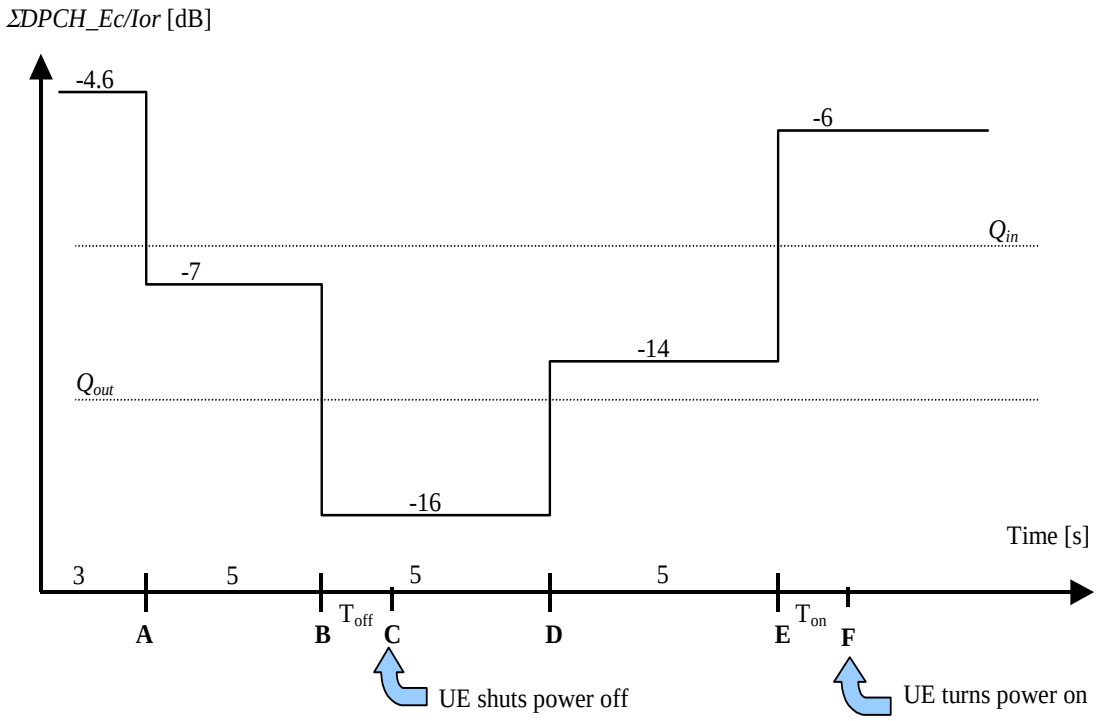

Figure 5.4.5.2.1: Test case for out-of-synch handling in the UE. Conditions apply for 3,84 Mcps TDD Option – continuous transmission

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 Ton = 200 ms after Point E.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.1.

5.4.5.2.2 1,28 Mcps TDD Option

The parameters in table 5.4.5.2.2 are defined using the DL reference measurement channel (12,2) kbps specified in annex C where the CRC bits are replaced by data bits, and with static propagation conditions.

Table 5.4.5.2.2: DCH parameters for test of Out-of-synch handling

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	-1
I_{oc}	dBm/1,28 MHz	-60
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	See figure 5.4.5.2.2
Information Data Rate	kbps	12,2
TFCI	-	On

The conditions for when the UE shall shut its transmitter off and when it shall turn it on are defined by the parameters in table 5.4.5.1.2 together with the DPCH power level as defined in figure 5.4.5.1.

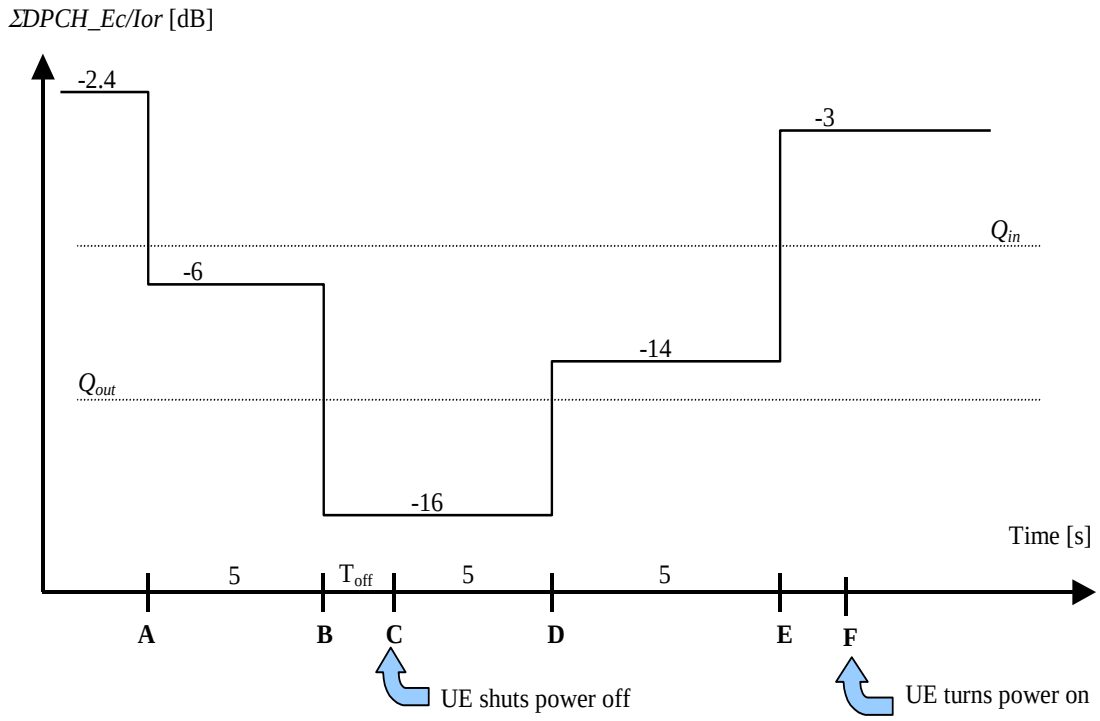

Figure 5.4.5.2.2: Conditions for out-of-synch handling in the UE. The indicated thresholds Q_{out} and Q_{in} are only informative. Conditions apply for 1,28 Mcps TDD Option – continuous transmission

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.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.2.

5.4.5.2.3 7,68 Mcps TDD Option

When the UE estimates the DPCH quality over the last 160 ms period 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 DPCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

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 5.4.5.2.3, a signal with the quality at the level Q_{out} is generated by a ΣDPCH_Ec/Ior ratio of -16 dB, and a signal with Q_{in} by a ΣDPCH_Ec/Ior ratio of -12 dB. In this test, the DL reference measurement channel (12,2) kbps specified in clause C.3.1.3, where the CRC bits are replaced by data bits, and with static propagation conditions is used.

Table 5.4.5.2.3: DCH parameters the of Out-of-synch handling test case test case – 7,68 Mcps TDD option – continuous transmission

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	1.1
I_{oc}	dBm/3,84 MHz	-60
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	See figure 5.4.5.2.3
Information Data Rate	kbps	12,2
TFCI	-	On

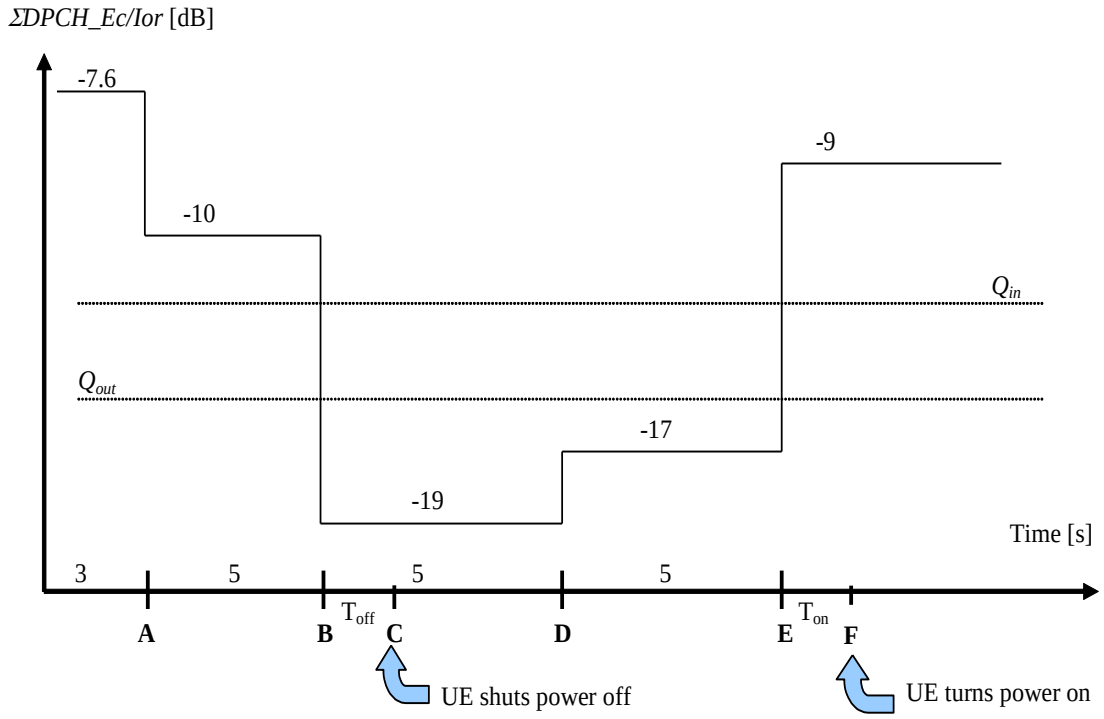

Figure 5.4.5.2.3: Test case for out-of-synch handling in the UE. Conditions apply for 7,68 Mcps TDD Option – continuous transmission

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 Ton = 200 ms after Point E.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.3.

5.4.5.3 Test purpose

To verify that the UE monitors the DPCH quality and turns its transmitter on or off according to DPCH level diagram specified in figure 5.4.5.1

5.4.5.4 Method of test

5.4.5.4.1 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) Calls are set up according to the Generic call setup procedure using parameters as specified in table 5.4.5.1
3) Enter the UE into loopback test mode and start the loopback test.
4) The handover triggering level shall be set very high [TBD] to ensure that the beacon channel power never exceeds the value of 10dB above it. Therefore the averaging time for signal quality will always be 160 milliseconds.

5.4.5.4.2 Procedure

5.4.5.4.2.1 3,84 Mcps TDD Option

1) SS level and signalling values are set that the UE transmits maximum power (see annex E clause E.3.1)
2) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -4.6[+0.4 - 0] dB and verify that the UE TX signal is on.
3) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -7[+0.4 - 0]dB and verify that the UE TX signal remains on continuously for at least 5 seconds.
4) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -16[+0 -0.4] dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.
5) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -14[+0 -0.4] dB and verify that the UE TX signal remains off continuously for at least 5 seconds.
6) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -6[+0.4 - 0]dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.5.4.2.2 1,28 Mcps TDD Option

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reaches maximum level
2) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -2.4 [+0.3 - 0] dB and verify that the UE TX signal is on.
3) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -6[+0.3 - 0] dB and verify that the UE TX signal remains on continuously for at least 5 seconds.
4) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -16[+0 - 0.3] dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

5) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -14[+0 - 0.3] dB and verify that the UE TX signal remains off continuously for at least 5 seconds.

6) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -3[+0.3 - 0] dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.5.4.2.3 7,68 Mcps TDD Option

1) SS level and signalling values are set that the UE transmits maximum power (see annex E clause E.3.1)

2) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -7.6[+0.4 - 0] dB and verify that the UE TX signal is on.

3) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -10[+0.4 - 0]dB and verify that the UE TX signal remains on continuously for at least 5 seconds.

4) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -19[+0 -0.4] dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

5) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -17[+0 -0.4] dB and verify that the UE TX signal remains off continuously for at least 5 seconds.

6) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -9[+0.4 - 0]dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.5.5 Test Requirements

The UE TX on-criterion including tolerance window is derived from the initial conditions and is verified with the method of 5.4.2.4 minimum transmit power related to minimum requirements according to clause 5.4.2.2.1 for 3,84 Mcps TDD Option, 5.4.2.2.2 for 1,28 Mcps TDD Option and 5.4.2.2.3 for 7.68Mcps TDD option, respectively. The UE transmitter is considered to be on if the UE transmitted power is higher than the minimum output power.

The UE TX off criterion including tolerance is verified according to clause 5.4.3 of the present document (Transmit off power). The UE transmitter is considered to be off if the UE transmitted power is lower than the transmit OFF power.

To pass the test, steps 1 through 6 of the procedure must be fulfilled.

5.4.6 Out-of-synchronisation handling of output power for discontinuous transmission

5.4.6.1 Definition and applicability

Normally the UE monitors the DPCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.224. [5] The thresholds Q_{out} and Q_{in} specify at what DPCH 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.

However, during DTX, there are periods when the UE will receive no data from the UTRAN. As specified in TS 25.224, in order to keep synchronization, Special Bursts shall be transmitted by the UTRAN during these periods of no data.

During these periods, the conditions for when the UE shall shut its transmitter on or off are defined by the power level of the received Special Bursts.

When the UE does not detect at least one special burst with a quality above a threshold Q_{sbout} over the last 160 ms period, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the special burst quality exceeds an acceptable level Q_{sbin}. When the UE estimates the special burst quality to be better than a threshold Q_{sbin} over the last 160 ms, the UE shall again turn its transmitter on within 40 ms.

The requirement of this clause shall apply to all types of UTRA-UE.

5.4.6.2 Minimum Requirement

5.4.6.2.1 3,84 Mcps TDD Option

When the UE estimates the DPCH quality over the last 160 ms period 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 DPCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

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 5.4.6.2.1, a signal with the quality at the level Q_{out} is generated by a DPCH_Ec/Ior ratio of -16 dB during special bursts, and a signal with Q_{in} by a DPCH_Ec/Ior ratio of -12 dB.

Table 5.4.6.2.1: DCH parameters the of Out-of-synch handling test case test case – 3,84 Mcps TDD option – discontinuous transmission

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	1.1
I_{oc}	dBm/3,84 MHz	-60
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	See figure 5.4.6.2.1
Bits/burst (including TFCI bits)	bits	244
TFCI	-	On

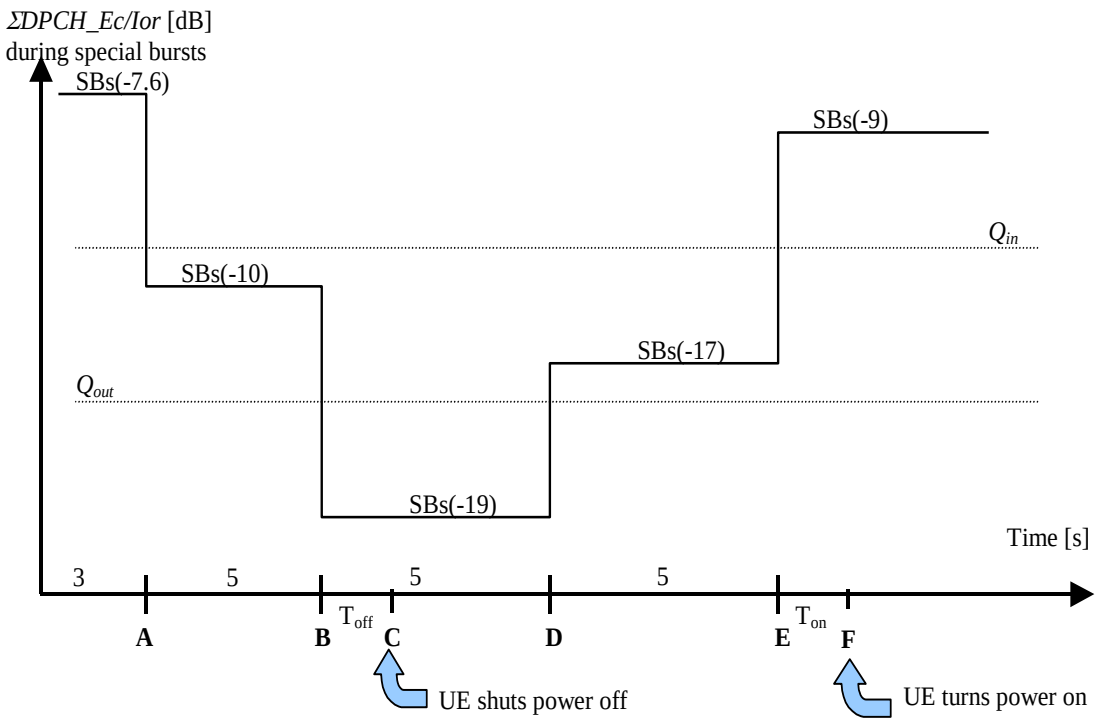

Figure 5.4.6.2.1: Test case for out-of-synch handling in the UE. Conditions apply for 3,84 Mcps TDD Option – discontinuous transmission

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 Ton = 200 ms after Point E.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.1.

5.4.6.2.2 1,28 Mcps TDD Option

When the UE estimates the DPCH quality over the last 160 ms period 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 DPCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

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 5.4.6.2.2, a signal with the quality at the level Q_{out} is generated by a DPCH_Ec/Ior ratio of -16 dB during special bursts, and a signal with Q_{in} by a DPCH_Ec/Ior ratio of -12 dB.

Table 5.4.6.2.2: DCH parameters for test of Out-of-synch handling

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	-1
I_{oc}	dBm/1,28 MHz	-60
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	See figure 5.4.6.2.2
Bits/burst (including TFCI bits)	bits	88 per subframe
TFCI	-	On

The conditions for when the UE shall shut its transmitter off and when it shall turn it on are defined by the parameters in table 5.4.6.2.2 together with the DPCH power level as defined in figure 5.4.6.2.

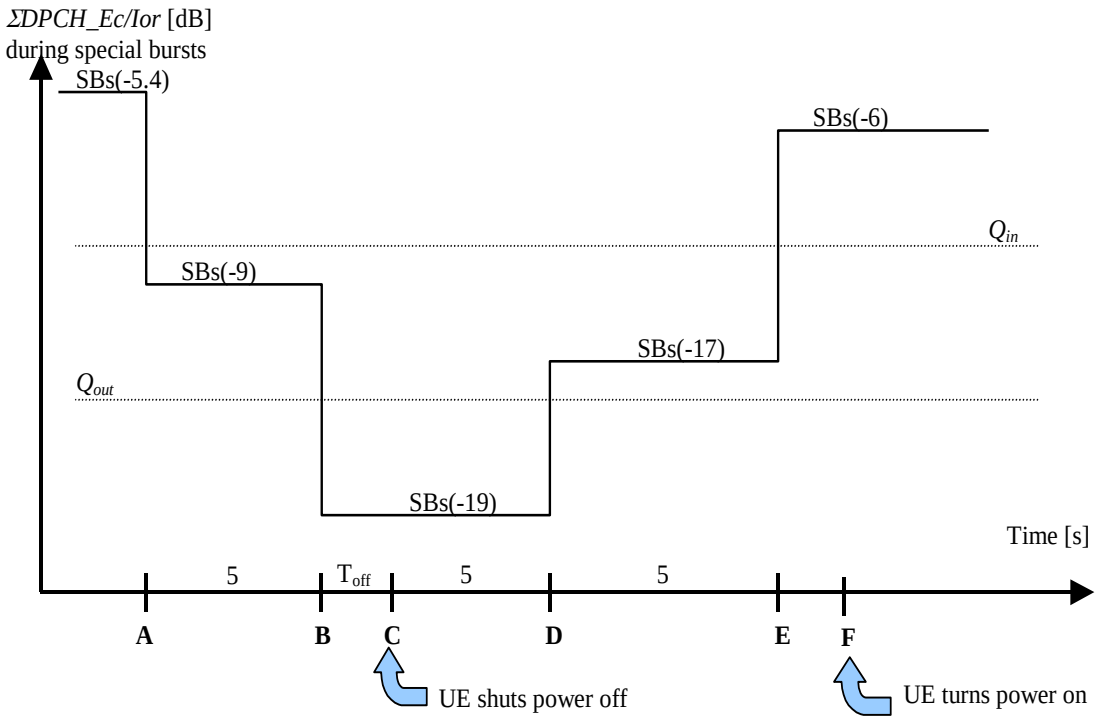

Figure 5.4.6.2.2: Conditions for out-of-synch handling in the UE. The indicated thresholds Q_{out} and Q_{in} are only informative. Conditions apply for 1,28 Mcps TDD Option– discontinuous transmission

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.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.2.

5.4.6.2.3 7,68 Mcps TDD Option

When the UE estimates the DPCH quality over the last 160 ms period 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 DPCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

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 5.4.6.2.3, a signal with the quality at the level Q_{out} is generated by a DPCH_Ec/Ior ratio of -19 dB during special bursts, and a signal with Q_{in} by a DPCH_Ec/Ior ratio of -15 dB.

Table 5.4.6.2.3: DCH parameters the of Out-of-synch handling test case test case – 7,68 Mcps TDD option – discontinuous transmission

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	1.1
I_{oc}	dBm/3,84 MHz	-60
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	See figure 5.4.6.2.3
Bits/burst (including TFCI bits)	bits	244
TFCI	-	On

The conditions for when the UE shall shut its transmitter off and when it shall turn it on are defined by the parameters in table 5.4.6.2.3 together with the DPCH power level as defined in figure 5.4.6.2.3.

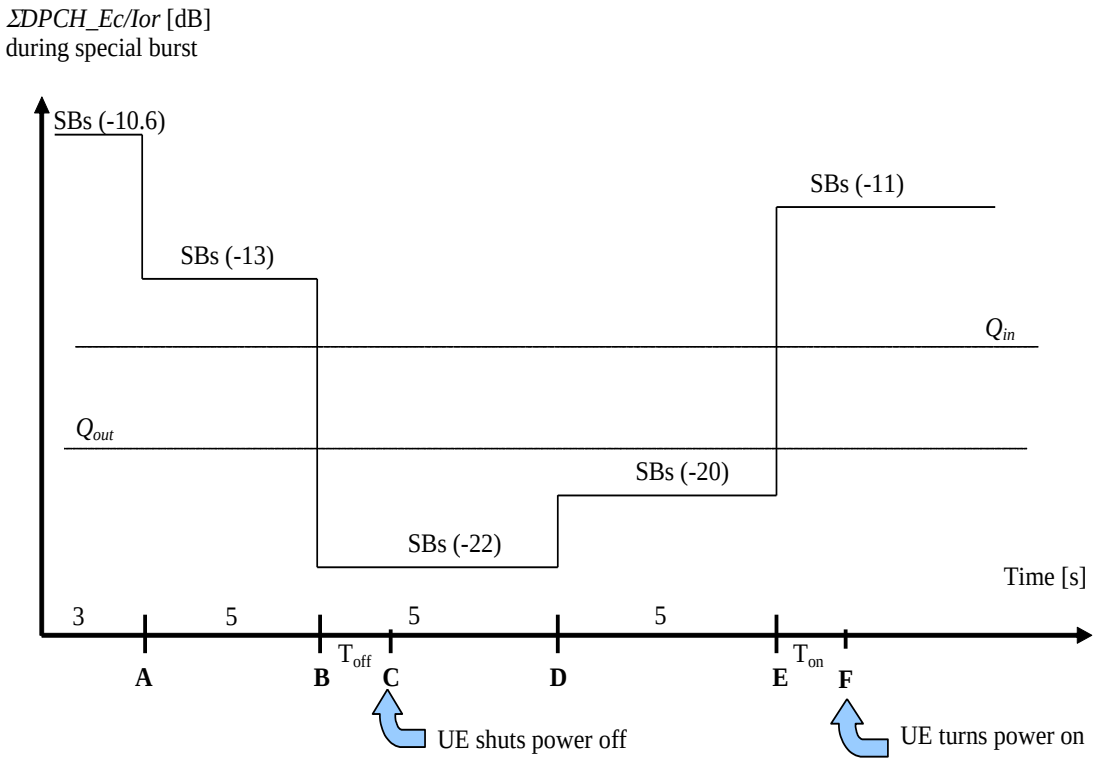

Figure 5.4.6.2.3: Test case for out-of-synch handling in the UE. Conditions apply for 7,68 Mcps TDD Option – discontinuous transmission

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 Ton = 200 ms after Point E.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.3.

5.4.6.3 Test purpose

To verify that the UE monitors the DPCH quality and turns its transmitter on or off according to DPCH level diagram specified in figure 5.4.6.1

5.4.6.4 Method of test

5.4.6.4.1 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) Calls are set up according to the Generic call setup procedure using parameters as specified in table 5.4.6.1
3) Enter the UE into loopback test mode and start the loopback test.
4) The handover triggering level shall be set very high [TBD] to ensure that the beacon channel power never exceeds the value of 10dB above it. Therefore the averaging time for signal quality will always be 160 milliseconds.

5.4.6.4.2 Procedure

5.4.6.4.2.1 3,84 Mcps TDD Option

1) SS level and signalling values are set that the UE transmits maximum power (see annex E clause E.3.1)
2) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -7.6[+0.4 –0] dB and verify that the UE TX signal is on.
3) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -10[+0.4 –0] dB and verify that the UE TX signal remains on continuously for at least 5 seconds.
4) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -19[+0 –0.4] dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.
5) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -17[+0 –0.4] dB and verify that the UE TX signal remains off continuously for at least 5 seconds.
6) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -9[+0.4 –0] dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.6.4.2.2 1,28 Mcps TDD Option

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reaches maximum level
2) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -5.4[+0.3 - 0] dB and verify that the UE TX signal is on.
3) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -9+[+0,3-0] dB and verify that the UE TX signal remains on continuously for at least 5 seconds.
4) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -19-[+0-0,3] dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.
5) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -17-[=0-0,3] dB and verify that the UE TX signal remains off continuously for at least 5 seconds.

6) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -6+[+0,3-0] dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.6.4.2.3 7,68 Mcps TDD Option

1) SS level and signalling values are set that the UE transmits maximum power (see annex E clause E.3.1)

2) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -10.6[+0.4 –0] dB and verify that the UE TX signal is on.

3) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -13[+0.4 –0] dB and verify that the UE TX signal remains on continuously for at least 5 seconds.

4) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -22[+0 –0.4] dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

5) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -20[+0 –0.4] dB and verify that the UE TX signal remains off continuously for at least 5 seconds.

6) Set the SS TX signal quality to $\frac{DPCH\_E_c}{I_{or}}$ = -11[+0.4 –0] dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.6.5 Test Requirements

The UE TX on-criterion including tolerance window is derived from the initial conditions and is verified with the method of 5.4.2.4 minimum transmit power related to minimum requirements according to clause 5.4.2.2.1 for 3,84 Mcps TDD Option, 5.4.2.2.2 for 1,28 Mcps TDD Option and 5.4.2.2.3 for 7.68Mcps TDD option, respectively. The UE transmitter is considered to be on if the UE transmitted power is higher than the minimum output power.

The UE TX off criterion including tolerance is verified according to clause 5.4.3 of the present document (Transmit off power). The UE transmitter is considered to be off if the UE transmitted power is lower than the transmit OFF power.

To pass the test, steps 1 through 6 of the procedure must be fulfilled.

5.5 Output RF spectrum emissions

5.5.1 Occupied bandwidth

5.5.1.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power for transmitted spectrum and is centred on the assigned channel frequency.

The requirements in this clause shall apply to all types of UTRA - UE.

5.5.1.2 Minimum Requirements

5.5.1.2.1 3,84Mcps TDD Option

The occupied bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.1.1.

5.5.1.2.2 1,28Mcps TDD Option

The occupied channel bandwidth shall be less than 1.6 MHz based on a chip rate of 1,28 Mcps.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.1.2.

5.5.1.2.3 7,68Mcps TDD Option

The occupied bandwidth shall be less than 10 MHz based on a chip rate of 7,68 Mcps.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.1.3.

5.5.1.3 Test purpose

The occupied bandwidth, defined in the Radio Regulations of the International Telecommunication Union ITU, is a useful concept for specifying the spectral properties of a given emission in the simplest possible manner; see also ITU-R Recommendation SM.328-9 [8].

The test purpose is to verify that the emission of the UE is sufficiently concentrated in the bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

5.5.1.4 Method of test

5.5.1.4.1 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 using parameters as specified in table E.3.1.2.

3) Enter the UE into loopback test mode and start the loopback test.

5.5.1.4.2 Procedure

1) Measure the power of the transmitted signal with a measurement filter of bandwidth [30 kHz]. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous 30 kHz steps from a minimum frequency, which shall be [7,5 – 0,015] MHz for the 3,84 Mcps TDD Option, [2,4 – 0,015] MHz for the 1,28 Mcps TDD Option and [15 - 0,015] MHz for 7.68 Mcps TDD option, respectively, below the assigned channel frequency of the transmitted signal, up to a maximum frequency, which shall be [7,5 – 0,015] MHz for the 3,84 Mcps TDD Option, [2,4 – 0,015] MHz for the 1,28 Mcps TDD Option and [15 - 0,015] MHz for 7.68 Mcps TDD option, respectively, above the assigned channel frequency of the transmitted signal. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.

2) Determine the total transmitted power by accumulating the recorded power measurements results of all steps.

3) 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".

4) 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".

5) Calculate the difference ("Upper Frequency" – "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '(4)' and '(5)'.

5.5.1.5 Test requirements

5.5.1.5.1 3,84 Mcps TDD Option

The measured Occupied Bandwidth, derived in step 5), shall not exceed 5 MHz for the 3,84 Mcps TDD Option.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.5.1.5.2 1,28 Mcps TDD Option

The measured Occupied Bandwidth, derived in step 5), shall not exceed 1.6 MHz for the 1,28 Mcps TDD Option.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.5.1.5.3 7,68 Mcps TDD Option

The measured Occupied Bandwidth, derived in step 5), shall not exceed 10 MHz for the 7,68 Mcps TDD Option.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.5.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the nominal channel resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and adjacent channel leakage power ratio (ACLR).

5.5.2.1 Spectrum emission mask

5.5.2.1.1 Definition and applicability

5.5.2.1.1.1 3,84 Mcps TDD Option

The spectrum emission mask of the UE is a requirement that applies to frequencies which are between 2,5 MHz and 12,5 MHz on both sides of 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 of this test apply to all types of UTRA-UE.

5.5.2.1.1.2 1,28 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 0,8 MHz and 4,0 MHz on both sides of the 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 1.28 Mcps TDD UE.

5.5.2.1.1.3 7,68 Mcps TDD Option

The spectrum emission mask of the UE is a requirement that applies to frequencies which are between 5 MHz and 25 MHz on both sides of the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

5.5.2.1.2 Minimum Requirements

5.5.2.1.2.1 3,84 Mcps TDD Option

The power of any UE emission shall not exceed the levels specified in table 5.5.2.1.2.1.

The normative reference for this requirement is TS 25.102 clause 6.6.2.1.1.1.

Table 5.5.2.1.2.1: Spectrum Emission Mask Requirement (3,84 Mcps TDD Option)

Δf in MHz (note 1)	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz (note 2)
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz (note 3)
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz (note 3)
8.5 - 12.5	-49 dBc	1 MHz

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –50dBm/3,84 MHz or the minimum requirement presented in this table which ever is the higher.

5.5.2.1.2.2 1,28 Mcps TDD Option

The power of any UE emission shall not exceed the levels specified in table 5.5.2.1.2.2.

The normative reference for this requirement is TS 25.102 clause 6.6.2.1.1.2.

Table 5.5.2.1.2.2: Spectrum Emission Mask Requirement (1,28 Mcps TDD Option)

Δf (note 1) in MHz	Minimum requirement	Measurement bandwidth
0.8-1.8	$\left\{-35-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dBc$	30 kHz (note 2)
1.8-2.4	$\left\{-49-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dBc$	30 kHz (note 2)
2.4 – 4.0	-44 dBc	1MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –55dBm/1,281,28 MHz or the minimum requirement presented in this table which ever is the higher.

5.5.2.1.2.3 7,68 Mcps TDD Option

The power of any UE emission shall not exceed the levels specified in table 5.5.2.1.2.3.

The normative reference for this requirement is TS 25.102 clause 6.6.2.1.3.1.

Table 5.5.2.1.2.3: Spectrum Emission Mask Requirement (7,68 Mcps TDD Option)

Δf* in MHz	Minimum requirement	Measurement bandwidth
5.0 - 5.75	$\left\{-38-10.67\cdot\left(\frac{\Delta f}{MHz}-5.0\right)\right\}dBc$	30 kHz **
5.75 - 7.0	$\left\{-46-5.6\cdot\left(\frac{\Delta f}{MHz}-5.75\right)\right\}dBc$	30 kHz**
7.0 - 15	$\left\{-38-0.5\cdot\left(\frac{\Delta f}{MHz}-7.0\right)\right\}dBc$	1 MHz ***
15.0 - 17.0	$\left\{-42-5.0\cdot\left(\frac{\Delta f}{MHz}-15.0\right)\right\}dBc$	1 MHz ***
17.0 - 25.0	-53 dBc	1 MHz ***

* Δf is the separation between the carrier frequency and the centre of the measuring filter.

** The first and last measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz and 6.985 MHz

*** The first and last measurement position with a 1 MHz filter is at Δf equals to 7.5 MHz and 24.5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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.

NOTE: The lower limit shall be -47dBm/7.68 MHz or the minimum requirement presented in this table which ever is the higher.

5.5.2.1.3 Test purpose

This test supplements Occupied Bandwidth (verifying the spectral concentration of the UE's emissions) and Adjacent Channel Leakage Ratio (simulating the perception of other UTRA receivers) in a system independent way. It is the purpose of this test to limit interferences to other systems (wideband or narrowband).

5.5.2.1.4 Method of test

5.5.2.1.4.1 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 using parameters as specified in table E.3.1.2.

3) Enter the UE into loopback test mode and start the loopback test.

5.5.2.1.4.2 Procedure

1) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.5.2.1.5.1 for the 3,84 Mcps TDD Option, 5.5.2.1.5.2 for the 1,28 Mcps TDD Option and 5.5.2.1.5.3 for the 7,68 Mcps TDD Option, respectively. 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 5.5.2.1.5.1 for the 3,84 Mcps TDD Option, 5.5.2.1.5.2 for the 1,28 Mcps TDD Option and 5.5.2.1.5.3 for the 7,68 Mcps TDD Option, respectively. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.

2) Measure the RRC filtered mean power centred on the assigned channel frequency according to annex B.

3) Display the results of 1) in dBc with respect to 2).

5.5.2.1.5 Test requirements

5.5.2.1.5.1 3,84 Mcps TDD Option

The result 5.5.2.1.4.2. step 3) shall fulfil the requirements of table 5.5.2.1.5.1.

Table 5.5.2.1.5.1: Spectrum Emission Mask Requirement (3,84 Mcps TDD Option)

Δf in MHz (note 1)	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz
3.5 - 7.5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz
7.5 - 8.5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz
8.5 - 12.5	-47.5 dBc	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –48.5dBm/3,84 MHz or the minimum requirement presented in this table which ever is the higher.		

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

5.5.2.1.5.2 1,28 Mcps TDD Option

The result 5.5.2.1.4.2. step 3) shall fulfil the requirements of table 5.5.2.1.5.2.

Table 5.5.2.1.5.2: Spectrum Emission Mask Requirement (1,28 Mcps TDD Option)

Δf (note 1) in MHz	Minimum requirement	Measurement bandwidth
0.8-1.8	$\left\{-33.5-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dB$	30 kHz (note 2)
1.8-2.4	$\left\{-47.5-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dB$	30 kHz (note 2)
2.4 – 4.0	-42.5 dBc	1MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.

NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –53.5 dBm/1,281,28 MHz or the minimum requirement presented in this table which ever is the higher.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

5.5.2.1.5.3 7,68 Mcps TDD Option

The result 5.5.2.1.4.2. step 3) shall fulfil the requirements of table 5.5.2.1.5.3.

Table 5.5.2.1.5.3: Spectrum Emission Mask Requirement (7,68 Mcps TDD Option)

Δf* in MHz	Minimum requirement	Measurement bandwidth
5.0 - 5.75	$\left\{-36.5-10.67\cdot\left(\frac{\Delta f}{MHz}-5.0\right)\right\}dBc$	30 kHz **
5.75 - 7.0	$\left\{-44.5-5.6\cdot\left(\frac{\Delta f}{MHz}-5.75\right)\right\}dBc$	30 kHz**
7.0 - 15	$\left\{-36.5-0.5\cdot\left(\frac{\Delta f}{MHz}-7.0\right)\right\}dBc$	1 MHz ***
15.0 - 17.0	$\left\{-40.5-5.0\cdot\left(\frac{\Delta f}{MHz}-15.0\right)\right\}dBc$	1 MHz ***
17.0 - 25.0	-51.5 dBc	1 MHz ***

* Δf is the separation between the carrier frequency and the centre of the measuring filter.

** The first and last measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz and 6.985 MHz

*** The first and last measurement position with a 1 MHz filter is at Δf equals to 7.5 MHz and 24.5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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.

NOTE: The lower limit shall be -47dBm/7.68 MHz or the minimum requirement presented in this table which ever is the higher.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

5.5.2.1A Spectrum emission mask with E-DCH

5.5.2.1A.1 Definition and applicability

5.5.2.1A.1.1 3,84 Mcps TDD Option

[FFS]

5.5.2.1A.1.2 1,28 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 0,8 MHz and 4,0 MHz on both sides of the 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 7 and later release to all types of UTRA for the TDD UE that support HSUPA.

5.5.2.1A.1.3 7,68 Mcps TDD Option

[FFS]

5.5.2.1A.2 Minimum Requirements

5.5.2.1A.2.1 3,84 Mcps TDD Option

[FFS]

5.5.2.1A.2.2 1,28 Mcps TDD Option

The power of any UE emission shall not exceed the levels specified in table 5.5.2.1A.2.2a.

The normative reference for this requirement is TS 25.102 clause 6.6.2.1.1.2.

Table 5.5.2.1A.2.2a: Spectrum Emission Mask Requirement (1,28 Mcps TDD Option)

Δf (note 1) in MHz	Minimum requirement	Measurement bandwidth
0.8-1.8	$\left\{-35-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dBc$	30 kHz (note 2)
1.8-2.4	$\left\{-49-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dBc$	30 kHz (note 2)
2.4 – 4.0	-44 dBc	1MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –55dBm/1,281,28 MHz or the minimum requirement presented in this table which ever is the higher.

5.5.2.1A.2.3 7,68 Mcps TDD Option

[FFS]

5.5.2.1A.3 Test purpose

This test supplements Occupied Bandwidth (verifying the spectral concentration of the UE's emissions) and Adjacent Channel Leakage Ratio in a system independent way. It is the purpose of this test to limit interferences to other systems (wideband or narrowband).

5.5.2.1A.4 Method of test

5.5.2.1A.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 to the UE antenna connector as shown in figure A.1.

2) The Reference Measurement Channels(FRC3,16QAM) are specified C.6.1.2.3.

3) A HSUPA call is set up according to TS 34.108[3] clause 7.3.9.

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

5.5.2.1A.4.2 Procedure

1) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table5.5.2.1A.5.2a for the 1,28 Mcps TDD Option. 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 table5.5.2.1A.5.2a for the 1,28 Mcps TDD Option. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.

2) Measure the RRC filtered mean power centred on the assigned channel frequency according to annex B.

3) Display the results of 1) in dBc with respect to 2).

5.5.2.1A5 Test requirements

5.5.2.1A5.1 3,84 Mcps TDD Option

[FFS]

5.5.2.1A5.2 1,28 Mcps TDD Option

The result 5.5.2.1B4.2. step 3) shall fulfil the requirements of table 5.5.2.1A.5.2a.

Table 5.5.2.1A.5.2a: Spectrum Emission Mask Requirement (1,28 Mcps TDD Option)

Δf (note 1) in MHz	Minimum requirement	Measurement bandwidth
0.8	-33.5 dBc	30 kHz (note 2)
0.8-1.8	$\left\{-33.5-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dB$	30 kHz (note 2)
1.8-2.4	$\left\{-47.5-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dB$	30 kHz (note 2)
2.4 – 4.0	-42.5 dBc	1MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –53.5 dBm/1,281,28 MHz or the minimum requirement presented in this table which ever is the higher.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

5.5.2.1A5.3 7,68 Mcps TDD Option

[FFS]

5.5.2.1B Spectrum emission mask with HS-SICH and DPCH

5.5.2.1B.1 Definition and applicability

5.5.2.1B.1.1 3,84 Mcps TDD Option

[FFS]

5.5.2.1B.1.2 1,28 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 0,8 MHz and 4,0 MHz on both sides of the 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 release to all types of UTRA for the TDD UE that support HSDPA.

5.5.2.1B.1.3 7,68 Mcps TDD Option

[FFS]

5.5.2.1B.2 Minimum Requirements

5.5.2.1B.2.1 3,84 Mcps TDD Option

[FFS]

5.5.2.1B.2.2 1,28 Mcps TDD Option

The power of any UE emission shall not exceed the levels specified in table 5.5.2.1B.2.2b.

The normative reference for this requirement is TS 25.102 clause 6.6.2.1.1.2.

Table 5.5.2.1B.2.2b: Spectrum Emission Mask Requirement (1,28 Mcps TDD Option)

Δf (note 1) in MHz	Minimum requirement	Measurement bandwidth
0.8-1.8	$\left\{-35-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dBc$	30 kHz (note 2)
1.8-2.4	$\left\{-49-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dBc$	30 kHz (note 2)
2.4 – 4.0	-44 dBc	1MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –55dBm/1,281,28 MHz or the minimum requirement presented in this table which ever is the higher.

5.5.2.1B.2.3 7,68 Mcps TDD Option

[FFS]

5.5.2.1B.3 Test purpose

This test supplements Occupied Bandwidth (verifying the spectral concentration of the UE's emissions) and Adjacent Channel Leakage Ratio in a system independent way. It is the purpose of this test to limit interferences to other systems (wideband or narrowband).

5.5.2.1B.4 Method of test

5.5.2.1B.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.

2) Connect the SS to the UE antenna connector as shown in figure A.1.

2) The Reference Measurement Channels are specified C.2.2.2a.

3) An HSDPA call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.

4) Enter the UE into loopback test mode and start the loopback test.

5.5.2.1B.4.2 Procedure

1) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table5.5.2.1B.5.2b for the 1,28 Mcps TDD Option. 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 table5.5.2.1B.5.2b for the 1,28 Mcps TDD Option. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.

2) Measure the RRC filtered mean power centred on the assigned channel frequency according to annex B.

3) Display the results of 1) in dBc with respect to 2).

5.5.2.1B5 Test requirements

5.5.2.1B5.1 3,84 Mcps TDD Option

[FFS]

5.5.2.1B5.2 1,28 Mcps TDD Option

The result 5.5.2.1B4.2. step 3) shall fulfil the requirements of table 5.5.2.1B.5.2b.

Table 5.5.2.1B.5.2b: Spectrum Emission Mask Requirement (1,28 Mcps TDD Option)

Δf (note 1) in MHz	Minimum requirement	Measurement bandwidth
0.8-1.8	$\left\{-33.5-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dB$	30 kHz (note 2)
1.8-2.4	$\left\{-47.5-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dB$	30 kHz (note 2)
2.4 – 4.0	-42.5 dBc	1MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 lower limit shall be –53.5 dBm/1,281,28 MHz or the minimum requirement presented in this table which ever is the higher.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

5.5.2.1B5.3 7,68 Mcps TDD Option

[FFS]

5.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)

5.5.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (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 in this clause shall apply to all types of UTRA-UE.

5.5.2.2.2 Minimum Requirements

5.5.2.2.2.1 3,84Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than –50 dBm then the ACLR shall be higher than the value specified in table 5.5.2.2.2.1.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.2.2.1.1.

Table 5.5.2.2.2.1: UE ACLR (3,84 Mcps TDD Option)

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel ± 5 MHz	33 dB
2, 3	UE-Channel ± 10 MHz	43 dB

5.5.2.2.2.2 1,28Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than –55 dBm then the ACLR shall be better than the value specified in table 5.5.2.2.2.2.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.2.2.1.2.

Table 5.5.2.2.2.2: UE ACLR (1,28Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 1.6 MHz	33 dB
2, 3	UE channel ± 3.2 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.

5.5.2.2.2.3 7,68Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than -50dBm measured with a 3.84 Mcps RRC filter then the ACLR shall be higher than the value specified in table 5.5.2.2.2.3.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.2.2.1.3.

Table 5.5.2.2.2.3: UE ACLR (7,68 Mcps TDD Option)

Power Class	adjacent channel	Chip Rate for RRC Measurement Filter	ACLR limit
2, 3	UE channel ± 7.5 MHz	3.84 MHz	33 dB
2, 3	UE channel ± 12.5 MHz	3.84 MHz	43 dB
2 ,3	UE channel ± 10.0 MHz	7.68 MHz	33 dB
2 ,3	UE channel ± 20.0 MHz	7.68 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.

5.5.2.2.3 Test purpose

The test purpose is to verify the ability of the UE to limit the interference produced by the transmitted signal to other UTRA receivers operating at the first or second adjacent RF channel.

5.5.2.2.4 Method of test

5.5.2.2.4.1 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 using parameters as specified in table E.3.1.2.
3) Enter the UE into loopback test mode and start the loopback test.

5.5.2.2.4.2 Procedure

1) Measure the RRC filtered mean power centred on the assigned channel frequency.
2) Measure RRC filtered mean power centred on the first lower adjacent channel frequency.
3) Calculate the ACLR by dividing the power measured in 1) by the power measured in 2).
4) Repeat steps 2) and 3) for the second lower adjacent RF channel (centre frequency 10 MHz for the 3,84 Mcps TDD Option, 3,2 MHz for the 1,28 Mcps TDD Option and 20MHz for the 7,68 Mcps TDD option with the 7,68Mcps RRC filter, respectively, below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (centre frequency 5 MHz for the 3,84 Mcps TDD Option, 1,6 MHz for the 1,28 Mcps TDD Option and 10MHz for the 7,68Mcps TDD option with the 7,68Mcps RRC filter, respectively, and 10 MHz, for the 3,84 Mcps TDD Option, 3,2 MHz for the 1,28 Mcps TDD Option and 20MHz for the 7,68Mcps TDD option with the 7,68Mcps RRC filter, respectively).
7) Run step 1) to 4) for RF channels Low/Mid/High.
8) For the 7,68Mcps TDD option repeat steps 1 to 7 except use the adjacent channel frequency of +/- 7.5MHz and 12.5MHz using the 3.84Mcps RRC filter..

5.5.2.2.5 Test requirements

5.5.2.2.5.1 3,84 Mcps TDD Option

The ACLR calculated in steps 3) and 4) of clause 5.5.2.2.4.2 shall be equal or greater than the limits given in table 5.5.2.2.5.1 for the 3,84 Mcps TDD Option.

Table 5.5.2.2.5.1: UE ACLR (3,84 Mcps TDD Option)

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel ± 5 MHz	32.2 dB
2, 3	UE-Channel ± 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F.

5.5.2.2.5.2 1,28 Mcps TDD Option

The ACLR calculated in steps 3) and 4) of clause 5.5.2.2.4.2 shall be equal or greater than the limits given in table 5.5.2.2.5.2 for the 1,28 Mcps TDD Option.

Table 5.5.2.2.5.2: UE ACLR (1,28 Mcps TDD Option)

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel ± 1.6 MHz	32.2 dB
2, 3	UE-Channel ± 3.2 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F.

5.5.2.2.5.3 7,68 Mcps TDD Option

The ACLR calculated in steps 3) and 4) of clause 5.5.2.2.4.2 shall be equal or greater than the limits given in table 5.5.2.2.5.3 for the 7,68 Mcps TDD Option.

Table 5.5.2.2.5.3: UE ACLR (7,68 Mcps TDD Option)

Power Class	adjacent channel	Chip Rate for RRC Measurement Filter	ACLR limit
2, 3	UE channel ± 7.5 MHz	3.84 MHz	32.8 dB
2, 3	UE channel ± 12.5 MHz	3.84 MHz	42.2 dB
2 ,3	UE channel ± 10.0 MHz	7.68 MHz	32.8 dB
2 ,3	UE channel ± 20.0 MHz	7.68 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F.

5.5.2.2A Adjacent Channel Leakage power Ratio (ACLR) with E-DCH

5.5.2.2A.1 Definition and applicability

Adjacent Channel Leakage power Ratio (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 in this clause shall apply for Release 7 and later releases to all types of UTRA-UE that support HSUPA.

5.5.2.2A.2 Minimum Requirements

5.5.2.2A.2.1 3,84Mcps TDD Option

[FFS]

5.5.2.2A.2.2 1,28Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than –55 dBm then the ACLR shall be better than the value specified in table 5.5.2.2A.2.2.a.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.2.2.1.2.

Table 5.5.2.2A.2.2a: UE ACLR (1,28Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 1.6 MHz	33 dB
2, 3	UE channel ± 3.2 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.

5.5.2.2A.2.3 7,68Mcps TDD Option

[FFS]

5.5.2.2A.3 Test purpose

The test purpose is to verify the ability of the UE to limit the interference produced by the transmitted signal to other UTRA receivers operating at the first or second adjacent RF channel.

5.5.2.2A.4 Method of test

5.5.2.2A.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.1.
2) The Reference Measurement Channels(FRC3,16QAM) are specified C.6.1.2.3
3) A HSUPA call is set up according to TS 34.108[3] clause 7.3.9.
4) Enter the UE into loopback test mode in the presence of HSUPA and start the loopback test.

5.5.2.2A.4.2 Procedure

1) Measure the RRC filtered mean power centred on the assigned channel frequency.
2) Measure RRC filtered mean power centred on the first lower adjacent channel frequency.
3) Calculate the ACLR by dividing the power measured in 1) by the power measured in 2).
4) Repeat steps 2) and 3) for the second lower adjacent RF channel.
7) Run step 1) to 4) for RF channels Low/Mid/High.

5.5.2.2A.5 Test requirements

5.5.2.2A.5.1 3,84 Mcps TDD Option

[FFS]

5.5.2.2A.5.2 1,28 Mcps TDD Option

The ACLR calculated in steps 3) and 4) of clause 5.5.2.2A.4.2 shall be equal or greater than the limits given in table 5.5.2.2A.5.2a for the 1,28 Mcps TDD Option.

Table 5.5.2.2A.5.2a: UE ACLR (1,28 Mcps TDD Option)

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel ± 1.6 MHz	32.2 dB
2, 3	UE-Channel ± 3.2 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F.

5.5.2.2A.5.3 7,68 Mcps TDD Option

[FFS]

5.5.2.2B Adjacent Channel Leakage power Ratio (ACLR) with HS-SICH and DPCH

5.5.2.2B.1 Definition and applicability

Adjacent Channel Leakage power Ratio (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 in this clause shall apply for Release 5 and later releases to all types of UTRA-UE that support HSDPA.

5.5.2.2B.2 Minimum Requirements

5.5.2.2B.2.1 3,84Mcps TDD Option

[FFS]

5.5.2.2B.2.2 1,28Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than –55 dBm then the ACLR shall be better than the value specified in table 5.5.2.2B.2.2.b.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.2.2.1.2.

Table 5.5.2.2B.2.2b: UE ACLR (1,28Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 1.6 MHz	33 dB
2, 3	UE channel ± 3.2 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.

5.5.2.2B.2.3 7,68Mcps TDD Option

[FFS]

5.5.2.2B.3 Test purpose

The test purpose is to verify the ability of the UE to limit the interference produced by the transmitted signal to other UTRA receivers operating at the first or second adjacent RF channel.

5.5.2.2B.4 Method of test

5.5.2.2B.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.1.
2) The Reference Measurement Channels are specified C.2.2.2a.
3) A HSDPA call is set up according to TS 34.108[3] clause 7.3.6.3.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

5.5.2.2B.4.2 Procedure

1) Measure the RRC filtered mean power centred on the assigned channel frequency.
2) Measure RRC filtered mean power centred on the first lower adjacent channel frequency.
3) Calculate the ACLR by dividing the power measured in 1) by the power measured in 2).
4) Repeat steps 2) and 3) for the second lower adjacent RF channel.
7) Run step 1) to 4) for RF channels Low/Mid/High.

5.5.2.2B.5 Test requirements

5.5.2.2B.5.1 3,84 Mcps TDD Option

[FFS]

5.5.2.2B.5.2 1,28 Mcps TDD Option

The ACLR calculated in steps 3) and 4) of clause 5.5.2.2B.4.2 shall be equal or greater than the limits given in table 5.5.2.2B.5.2b for the 1,28 Mcps TDD Option.

Table 5.5.2.2B.5.2b: UE ACLR (1,28 Mcps TDD Option)

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel ± 1.6 MHz	32.2 dB
2, 3	UE-Channel ± 3.2 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F.

5.5.2.2B.5.3 7,68 Mcps TDD Option

[FFS]

5.5.3 Spurious emissions

5.5.3.1 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 [8].

The requirements and this test apply to all types of 1.28 Mcps TDD UE.

5.5.3.2 Minimum Requirements

5.5.3.2.1 3,84 Mcps TDD Option

These requirements are only applicable for frequencies which are greater than 12.5 MHz away from the UE centre carrier frequency.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.3.1.1.

Table 5.5.3.2.1a: General Spurious emissions requirements (3,84 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.2.1b: Additional Spurious emissions requirements (3,84 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm*
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm*
1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm*
1884.5 MHz ≤ f ≤ 1915.7 MHz	300kHz	-41 dBm**

NOTE: 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 5.5.3.2.1a are permitted for each UARFCN used in the measurement.

** Applicable for transmission in 2010-2025 MHz as defined in subclause 4.2 (a).

5.5.3.2.2 1,28Mcps TDD Option

These requirements are only applicable for frequencies which are greater than 4 MHz away from the UE centre carrier frequency.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.3.1.2.

Table 5.5.3.2.2a : General Spurious emissions requirements (1,28 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.2.2b : Additional Spurious emissions requirements (1,28 Mcps TDD Option)

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
a	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm (note1)
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (note1)
	2010 MHz ≤ f ≤ 2025 MHz	1MHz	-65 dBm (Note2)
	1880 MHz ≤ f ≤ 1920 MHz	1MHz	-65 dBm (Note 3)
	2300 MHz ≤ f ≤ 2400 MHz	1MHz	-65 dBm (Note 3)
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm (Note 3)
b	1850 MHz ≤ f ≤ 1910 MHz	1 MHz	-65 dBm (Note 4)
	1930 MHz ≤ f ≤ 1990 MHz	1 MHz	-65 dBm (Note 5)
	2010 MHz ≤ f ≤ 2025 MHz	1MHz	-65 dBm
c	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-65 dBm
d	1900 MHz ≤ f ≤ 1920 MHz	1 MHz	-65 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-65 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-37 dBm
e	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm (note1)
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (note1)
	1880 MHz ≤ f ≤ 1920 MHz	1 MHz	-65 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-65 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm
f	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm (note1)
	921 MHz≤ f<925 MHz	100 kHz	-60 dBm (note1)
	925 MHz< f <935 MHz	100 kHz	-67 dBm (note1)
	935 MHz< f <960 MHz	100 kHz	-79 dBm (note1)
	1805 MHz ≤ f ≤ 1850 MHz	100 kHz	-71 dBm (note1)
	2010 MHz ≤ f ≤ 2025 MHz	1MHz	-65 dBm
	2300 MHz ≤ f ≤ 2400 MHz	1MHz	-65 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm

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 6.7c are permitted for each UARFCN used in the measurement.
Note 2: This requirement is only applicable when UE operating in 1900-1920MHz of band a.
Note 3: This requirement is only applicable when UE operating in 2010-2025MHz of band a.
Note 4: This requirement is only applicable when UE operating in 1930-1990MHz of band b.
Note 5:This requirement is only applicable when UE operating in 1850-1910MHz of band b.
Note 6: The frequency bandwidth protection 703-803 MHz and 2496-2690 MHz test requirements for Bands a, e and f deviate from the requirement in TS 25.102 [1] Rel-10 and earlier releases.

5.5.3.2.3 7,68 Mcps TDD Option

These requirements are only applicable for frequencies which are greater than 25 MHz away from the UE centre carrier frequency.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.3.1.3.

Table 5.5.3.2.3a: General Spurious emissions requirements (7,68 Mcps TDD Option)

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 < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.2.3b: Additional Spurious emissions requirements (7,68 Mcps TDD Option)

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (note 1)
2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-37 dBm (note 1)
1884.5 MHz ≤ f ≤ 1915.7 MHz	300 kHz	-41 dBm (note 2)
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 6.7E are permitted for each UARFCN used in the measurement.		
NOTE 2: Applicable for transmission in 2010-2025 MHz as defined in subclause 4.2 (a).		

NOTE: 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 5.5.3.2.3a are permitted for each UARFCN used in the measurement.

5.5.3.3 Test purpose

5.5.3.3.1 3,84 Mcps Option

The test purpose is to verify the ability of the UE to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 12,5 MHz away from of the UE's carrier frequency.

5.5.3.3.2 1,28 Mcps Option

The test purpose is to verify the ability of the UE to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 4 MHz away from of the UE's carrier frequency.

5.5.3.3.3 7,68 Mcps Option

The test purpose is to verify the ability of the UE to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 25 MHz away from of the UE's carrier frequency.

5.5.3.4 Method of test

5.5.3.4.1 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 using parameters as specified in table E.3.1.2.

3) Enter the UE into loopback test mode and start the loopback test.

5.5.3.4.2 Procedure

Measure the power of the spurious emissions applying measurement filters with bandwidths as specified in the relevant tables of 5.5.3.2.1 for 3,84 Mcps TDD Option, tables 5.5.3.2.2 for 1,28 Mcps TDD Option and tables 5.5.3.2.3 for 7,68 Mcps TDD option, respectively. The characteristic of the filters shall be approximately Gaussian (typical spectrum

analyzer filters). The centre frequency of the filter shall be swept over the frequency bands as given in the tables. The sweep time shall be sufficiently low to capture the active time slots.

5.5.3.5 Test requirements

5.5.3.5.1 3,84 Mcps TDD Option

The spurious emissions measured according to clause 5.5.3.4.2 shall not exceed the limits specified in the relevant tables of 5.5.3.5.1a and 5.5.3.5.1b.

Table 5.5.3.5.1a: General Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Test requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1GHz ≤ f < 12.75GHZ	1MHz	-30 dBm

Table 5.5.3.5.1b: Additional Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Test requirement
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm*
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm*
1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm*
1884.5 MHz ≤ f ≤ 1915.7 MHz	300kHz	-41 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 5.5.3.5.1a for the 3,84 Mcps TDD Option are permitted for each UARFCN used in the measurement.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

** Applicable for transmission in 2010-2025 MHz as defined in subclause 4.2 (a).

5.5.3.5.2 1,28 Mcps TDD Option

The spurious emissions measured according to clause 5.5.3.4.2 shall not exceed the limits specified in the relevant tables of 5.5.3.5.2a and 5.5.3.5.2b.

Table 5.5.3.5.2a: General Spurious emissions requirements (1,28 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Test requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.5.2b: Additional Spurious emissions requirements (1,28 Mcps TDD Option)

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
a	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm (note1)
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (note1)
	2010 MHz ≤ f ≤ 2025 MHz	1MHz	-65 dBm (Note2)
	1880 MHz ≤ f ≤ 1920 MHz	1MHz	-65 dBm (Note 3)
	2300 MHz ≤ f ≤ 2400 MHz	1MHz	-65 dBm (Note 3)
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm (Note 3)
b	1850 MHz ≤ f ≤ 1910 MHz	1 MHz	-65 dBm (Note 4)
	1930 MHz ≤ f ≤ 1990 MHz	1 MHz	-65 dBm (Note 5)
	2010 MHz ≤ f ≤ 2025 MHz	1MHz	-65 dBm
c	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-65 dBm
d	1900 MHz ≤ f ≤ 1920 MHz	1 MHz	-65 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-65 dBm
	2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-37 dBm
e	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm (note1)
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note1)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (note1)
	1880 MHz ≤ f ≤ 1920 MHz	1 MHz	-65 dBm
	2010 MHz ≤ f ≤ 2025 MHz	1 MHz	-65 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm
f	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm (note1)
	921 MHz≤ f<925 MHz	100 kHz	-60 dBm (note1)
	925 MHz< f <935 MHz	100 kHz	-67 dBm (note1)
	935 MHz< f <960 MHz	100 kHz	-79 dBm (note1)
	1805 MHz ≤ f ≤ 1850 MHz	100 kHz	-71 dBm (note1)
	2010 MHz ≤ f ≤ 2025 MHz	1MHz	-65 dBm
	2300 MHz ≤ f ≤ 2400 MHz	1MHz	-65 dBm
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm

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 6.7c are permitted for each UARFCN used in the measurement.
Note 2: This requirement is only applicable when UE operating in 1900-1920MHz of band a.
Note 3: This requirement is only applicable when UE operating in 2010-2025MHz of band a.
Note 4: This requirement is only applicable when UE operating in 1930-1990MHz of band b.
Note 5: This requirement is only applicable when UE operating in 1850-1910MHz of band b.
Note 6: The frequency bandwidth protection 703-803 MHz and 2496-2690 MHz test requirements for Bands a, e and f deviate from the requirement in TS 25.102 [1] Rel-10 and earlier releases.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.5.3.5.3 7,68 Mcps TDD Option

The spurious emissions measured according to clause 5.5.3.4.2 shall not exceed the limits specified in the relevant tables of 5.5.3.5.3a and 5.5.3.5.3b.

Table 5.5.3.5.3a: General Spurious emissions requirements

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 < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.5.3b: Additional Spurious emissions requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm (note 1)
2620 MHz ≤ f ≤ 2690 MHz	3.84 MHz	-37 dBm (note 1)
1884.5 MHz ≤ f ≤ 1915.7 MHz	300 kHz	-41 dBm (note 2)
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 6.7E are permitted for each UARFCN used in the measurement. NOTE 2: Applicable for transmission in 2010-2025 MHz as defined in subclause 4.2 (a).		

NOTE: 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 5.5.3.5.3a are permitted for each UARFCN used in the measurement.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.6 Transmit Intermodulation

5.6.1 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 the presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or BS receive band as an unwanted interfering signal. The UE 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 of this test shall apply for all UTRA-UE.

5.6.2 Minimum Requirements

5.6.2.1 3,84 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 5 MHz is prescribed in the table below.

The normative reference for this requirement is TS 25.102 [1] clause 6.7.1.1.

Table 5.6.2.1: Transmit Intermodulation (3,84 Mcps TDD Option)

Interference Signal Frequency Offset	5MHz	10MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum Requirement	-31dBc	-41dBc

5.6.2.2 1,28 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 1,6 MHz is prescribed in table 5.6.2.2.

The normative reference for this requirement is TS 25.102 [1] clause 6.7.1.1.

Table 5.6.2.2: Transmit Intermodulation (1,28 Mcps TDD Option)

Interference Signal Frequency Offset	1.6 MHz	3.2 MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum Requirement	-31dBc	-41dBc

5.6.2.3 7,68 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 10 MHz is prescribed in the table 5.6.2.3.

The normative reference for this requirement is TS 25.102 [1] clause 6.7.1.3.

Table 5.6.2.3: Transmit Intermodulation (7,68 Mcps TDD Option)

Interference Signal Frequency Offset	10MHz	20MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum Requirement	-31dBc	-41dBc

5.6.3 Test purpose

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into other UE, or BS receive band as an unwanted interfering signal.

It is the purpose of this test to limit interferences to the own and other systems due to intermodulation products.

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 and the interferer to the UE antenna connector as shown in figure A.2.

2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.

3) Enter the UE into loopback test mode and start the loopback test.

Configure parameters of the interferer according to table 5.6.2.1 for 3,84 Mcps TDD Option, table 5.6.2.2 for 1,28 Mcps TDD Option and table 5.6.2.3 for 7,68 Mcps TDD Option, respectively.

5.6.4.2 Procedure

5.6.4.2.1 3,84 Mcps TDD Option

1) Measure the unwanted emissions according to 5.6.2. in a carrier offset spacing of 5 MHz using an interferer +5MHz offset.

   The frequency occupied by the interferer is excluded from the measurement.

2) Repeat 1) with the other 3 interferer-configurations (-5Mz. +10 MHz, -10 MHz).

3) Measure the wanted power according to annex B.

4) Display 1) and 2) in dBc with respect to 3).

5.6.4.2.2 1,28 Mcps TDD Option

1) Measure the unwanted emissions according to 5.6.2.2 in a carrier offset spacing of 1.6 MHz using an interferer +1.6MHz offset.

   The frequency occupied by the interferer is excluded from the measurement.

2) Repeat 1) with the other 3 interferer-configurations (-1.6 MHz, +3.2 MHz, -3.2 MHz).

3) Measure the wanted power according to annex B.

4) Display 1) and 2) in dBc with respect to 3).

5.6.4.2.3 7,68 Mcps TDD Option

1) Measure the unwanted emissions according to 5.6.2.3 in a carrier offset spacing of 10 MHz using an interferer +10MHz offset.

   The frequency occupied by the interferer is excluded from the measurement.

2) Repeat 1) with the other 3 interferer-configurations (-10Mz. +20 MHz, -20 MHz).

3) Measure the wanted power according to annex B.

4) Display 1) and 2) in dBc with respect to 3).

5.6.5 Test requirements

5.6.5.1 3,84 Mcps TDD Option

The results in 4) from clause 5.6.4.2.1 shall not exceed the prescribed values in table 5.6.5.1.

Table 5.6.5.1: Transmit Intermodulation (3,84 Mcps TDD Option)

Interference Signal Frequency Offset	5MHz	10MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum Requirement	[-31+TT] dBc	[-41+TT] 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.6.5.2 1,28 Mcps TDD Option

The results in 4) from clause 5.6.4.2.2 shall not exceed the prescribed values in table 5.6.5.2.

Table 5.6.5.2 : Transmit Intermodulation (1,28Mcps TDD Option)

Interference signal frequency offset	1.6MHz	3.2MHz
Interference signal level	-40dBc	
Minimum requirement of intermodulation products	-31dBc	-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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.6.5.3 7,68 Mcps TDD Option

The results in 4) from clause 5.6.4.2.3 shall not exceed the prescribed values in table 5.6.5.3.

Table 5.6.5.3: Transmit Intermodulation (7,68 Mcps TDD Option)

Interference Signal Frequency Offset	10MHz	20MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum Requirement	[-31+TT] dBc	[-41+TT] 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.7 Transmit Modulation

5.7.1 Error Vector Magnitude

5.7.1.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). Both waveforms pass through a matched Root Raised Cosine filter with bandwidth corresponding to the considered chip rate 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 signal power expressed as a %. The measurement interval is one timeslot excluding the guard period.

The requirement of this clause shall apply to all types of UTRA-UE.

5.7.1.2 Minimum Requirements

The Error Vector Magnitude shall not exceed 17,5 % for the parameters specified in table 5.7.1.2.

Table 5.7.1.2.: Test parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter	Level	Unit
UE Output Power	≥-20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.102 [1] clause 6.8.2.1.

5.7.1.3 Test purpose

The transmitter shall generate a sufficient precise waveform, to enable the receiver to achieve the specified receiver performances.

5.7.1.4 Method of test

5.7.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

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 parameters as specified in table E.3.1.2.
3) Enter the UE into loopback test mode and start the loopback test.

5.7.1.4.2 Procedure

1) Starting from the initial conditions, measure EVM (Error Vector Magnitude) of the UE according to annex B.
2) Set SS-level and signalling values such that the power level of the UE is between –20 and –19 dBm.
3) Measure EVM of the UE according to annex B.

5.7.1.5 Test requirements

The results in step 1) and 2) shall not exceed 17.5 % for parameters specified in table 5.7.1.2.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.7.1A Error Vector Magnitude with E-DCH16QAM

5.7.1A.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). Both waveforms pass through a matched Root Raised Cosine filter with bandwidth corresponding to the considered chip rate 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 signal power expressed as a %. The measurement interval is one timeslot excluding the guard period.

The requirement of this clause shall apply to UTRA -UE which supports E-DCH with 16QAM.

5.7.1A.2 Minimum Requirements

The Error Vector Magnitude shall not exceed 14 % for the parameters specified in table 5.7.1.2.

Table 5.7.1.2A.: Test parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter	Level	Unit
UE Output Power	≥-20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.102 [1] clause 6.8.2.1.

5.7.1A.3 Test purpose

The transmitter shall generate a sufficient precise waveform, to enable the receiver to achieve the specified receiver performances.

5.7.1A.4 Method of test

5.7.1A.4.1 Initial conditions

5.7.1A.4.1.1 3.84Mcps TDD option

Void

5.7.1A.4.1.2 1.28Mcps TDD option

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

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) The UL Reference Measurement Channel parameters are defined in Annex C.6.1.2 and DL Reference Measurement Channel parameters are defined in Annex C4.2.1.1
4) The value of TRRI shall be set to '11100' and CRRI on E-AGCH shall be set to 1.
5) The value of PRRI is same. This ensures that the UL data rate remains constant.
6) The UE is switched on.
7) Enter the UE into loopback mode 1, looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test. See TS 34.108 [3] clause 7.3.9 and TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6. To fill the RLC transmit buffer, run the loopback for [3]s before starting the procedure.

5.7.1A.4.1.3 7.68Mcps TDD option

Void

5.7.1A.4.2 Procedure

5.7.1A.4.2.1 3.84Mcps TDD Option

Void

5.7.1A.4.2.2 1.28Mcps TDD Option

1) Starting from the initial conditions, measure EVM (Error Vector Magnitude) of the UE according to annex B.
2) Set SS level and signalling values such that the power level of the UE is between –20 and –19 dBm.
3) Measure EVM of the UE according to annex B.

5.7.1A.4.2.3 7.68Mcps TDD Option

Void

5.7.1A.5 Test requirements

The results in step 1) and 2) shall not exceed 14 % for parameters specified in table 5.7.1.2.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.7.1B Error Vector Magnitude with HS-SICH and DPCH

5.7.1B.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). Both waveforms pass through a matched Root Raised Cosine filter with bandwidth corresponding to the considered chip rate 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 signal power expressed as a %. The measurement interval is one timeslot excluding the guard period.

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

5.7.1B.2 Minimum Requirements

The Error Vector Magnitude shall not exceed 17,5 % for the parameters specified in table 5.7.1B.2b.

Table 5.7.1B.2b.: Test parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter	Level	Unit
UE Output Power	≥-20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.102 [1] clause 6.8.2.1.

5.7.B1.3 Test purpose

The transmitter shall generate a sufficient precise waveform, to enable the receiver to achieve the specified receiver performances.

5.7.1B.4 Method of test

5.7.1B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

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 Reference Measurement Channels are specified C.2.2.2a.
3) An HSDPA call is set up according to TS 34.108 [3] 7.3.6
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

5.7.1B.4.2 Procedure

1) Starting from the initial conditions, measure EVM (Error Vector Magnitude) of the UE according to annex B.
2) Set SS-level and signalling values such that the power level of the UE is between –20 and –19 dBm.
3) Measure EVM of the UE according to annex B.

5.7.1B.5 Test requirements

The results in step 1) and 2) shall not exceed 17.5 % for parameters specified in table 5.7.1B.2b.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.7.2 Peak code domain error

5.7.2.1 Definition and applicability

The code domain error is computed by projecting the error vector power onto the code domain at a specific spreading factor. The error power for each code is defined as the ratio to the mean power of the projection onto the code, to the mean power of the composite reference waveform expressed in dB. And the Peak Code Domain Error is defined as the maximum value for Code Domain Error. The measurement interval is one timeslot.

The present document is applicable for multi-code transmission only.

The requirement of this test applies to all UTRA-UE, applicable for multi-code transmission.

5.7.2.2 Minimum Requirement

The peak code domain error shall not exceed -21dB at spreading factor 16 for 3,84 Mcps TDD Option, and 1,28 Mcps TDD Option . The peak code domain error shall not exceed -24dB at spreading factor 32 for 7,68 Mcps TDD Option.

The normative reference for this requirement is TS 25.102 [1] clause 6.8.3.1.

5.7.2.3 Test purpose

It is the purpose of this test to limit crosstalk among codes.

5.7.2.4 Method of test

5.7.2.4.1 Initial conditions

5.7.2.4.1.1 3,84 Mcps TDD Option

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 parameters as specified in table 5.7.2.4.1.1 for the 3,84 Mcps TDD Option.

3) Enter the UE into loopback test mode and start the loopback test.

Table 5.7.2.4.1.1: Test parameters for Peak code Domain Error (3,84 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2kbps, according to annex C.2.2.1
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.7.2.4.1.2 1,28 Mcps TDD Option

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 parameters as specified in table 5.7.2.4.1.2 for the 1,28 Mcps TDD Option.

3) Enter the UE into loopback test mode and start the loopback test.

Table 5.7.2.4.1.2: Test parameters for Peak code Domain Error (1,28 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2kbps, according to annex C.2.2.2
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.7.2.4.1.3 7,68 Mcps TDD Option

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 parameters as specified in table 5.7.2.4.1.3 for the 7,68 Mcps TDD Option.

3) Enter the UE into loopback test mode and start the loopback test.

Table 5.7.2.4.1.3: Test parameters for Peak code Domain Error (7,68 Mcps TDD Option)

Parameter	Value/description
Reference measurement channel	Multicode 12,2kbps, according to annex C.2.2.3
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.7.2.4.2 Procedure

1) Starting from the initial conditions, measure peak code error(PCDE)of the UE according to annex B.

2) Set SS-level and signalling values such that the power level of the UE is between –20 and –19 dBm.

3) Measure PCDE of the UE according to annex B.

5.7.2.5 Test requirements

The results in step 1) and 2) shall nor exceed -20 dB. for parameters specified in table 5.7.1.2 for 3,84 Mcps TDD Option, and 1,28 Mcps TDD Option.

The results in step 1) and 2) shall nor exceed -23 dB. for parameters specified in table 5.7.1.2 for 7,68 Mcps TDD Option.

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F 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 uses normal call protocol until the UE is communicating on traffic channel basically. (Refer to TS 34.108 [3] Common Test Environments for User Equipment (UE) Conformance Testing.) On the traffic channel, the UE provides

special function for testing that is described in Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [3] Logical Test Interface (FDD/TDD) Special conformance testing functions.)

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. Receiver characteristics for UE(s) with multiple antennas/antenna connectors are for further study.

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 recognized that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 6 are defined using the DL reference measurement channel (12,2 kbps) specified in clause C.3.3. For 3.84 Mcps TDD IMB, the DL reference measurement channel (28 kbps) specified in clause C.3.8 is used..

All Bit Error ratio (BER) measurements in clause 6 shall be performed according to the general rules for statistical testing in Annex F.6.

6.2 Reference sensitivity level

6.2.1 Definition and applicability

The reference sensitivity level is the minimum mean power received at the UE antenna connector at which the BER shall not exceed the specific value.

The requirements in this clause shall apply to all types of UTRA UE.

6.2.2 Minimum Requirements

6.2.2.1 3,84 Mcps TDD Option

For the DL reference measurement channel 12,2 kBit/s specified in annex C, the BER shall not exceed 0.001 for the parameters specified in table 6.2.2.1.

Table 6.2.2.1: Test parameters for reference sensitivity (3,84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/3,84 MHz

The normative reference for this requirement is TS 25.102 [1] clause 7.3.1.1.

6.2.2.2 1,28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 6.2.2.2.

Table 6.2.2.2: Test parameters for reference sensitivity (1,28Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-108	dBm/1,28 MHz

The normative reference for this requirement is TS 25.102 [1] clause 7.3.1.2.

6.2.2.3 7,68 Mcps TDD Option

For the DL reference measurement channel 12,2 kBit/s specified in annex C.3.1.3, the BER shall not exceed 0.001 for the parameters specified in table 6.2.2.3.

Table 6.2.2.3: Test parameters for reference sensitivity (7,68 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/7.68 MHz

The normative reference for this requirement is TS 25.102 [1] clause 7.3.1.3.

6.2.3 Test purpose

The test purpose is to verify the ability of the UE to receive a prescribed test signal at the lower end of the dynamic range under defined conditions (no interference, no multipath propagation) with a BER not exceeding a specified level. This test is also used as a reference case for other tests to allow the assessment of degradations due to various sources of interference.

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.3.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.
4) The level of SS output signal measured at the UE antenna connector shall be –105 dBm for the 3,84 Mcps TDD Option and 7,68 Mcps TDD option and –108 dBm for the 1,28 Mcps TDD Option, respectively.

6.2.4.2 Procedure

1) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

6.2.5.1 3,84 Mcps TDD Option

The measured BER, derived in step 1), shall not exceed 0.001 under conditions described in table 6.2.5.1 for the 3,84 Mcps TDD Option.

Table 6.2.5.1: Test parameters for reference sensitivity (3,84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-104.3	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.2.5.2 1,28 Mcps TDD Option

The measured BER, derived in step 1), shall not exceed 0.001 under conditions described in table 6.2.5.2 for the 1,28 Mcps TDD Option.

Table 6.2.5.2: Test parameters for reference sensitivity (1,28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-107.3	dBm/1,28 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.2.5.3 7,68 Mcps TDD Option

The measured BER, derived in step 1), shall not exceed 0.001 under conditions described in table 6.2.5.3 for the 7,68 Mcps TDD Option.

Table 6.2.5.3: Test parameters for reference sensitivity (7,68 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-104.3	dBm/7,68 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.2A Reference sensitivity level (IMB)

6.2A.1 Definition and applicability

The reference sensitivity level is the minimum mean power received at the UE antenna connector at which the BLER shall not exceed the specific value.

The requirements in this clause shall apply to 3.84 Mcps TDD IMB UE.

6.2A.2 Minimum Requirements

The BLER shall not exceed 0.01 for the parameters specified in table 6.2A.2.1 for the DL reference measurement channel 28 kBit/s specified in annex C.

Table 6.2A.2.1: Test parameters for reference sensitivity (3.84 Mcps TDD IMB)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	dB
$\hat{I}_{or}$	-105	dBm/3,84 MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

The normative reference for this requirement is TS 25.102 [1] clause 7.3.1.1.

6.2A.3 Test purpose

The test purpose is to verify the ability of the UE to receive a prescribed test signal at the lower end of the dynamic range under defined conditions (no interference, no multipath propagation) with a BLER not exceeding a specified level. This test is also used as a reference case for other tests to allow the assessment of degradations due to various sources of interference.

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.3.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback mode 3 and start the loopback test. See TS 34.108 and TS 34.109 for details regarding loopback test mode 3 for MBMS.

4) The level of SS output signal measured at the UE antenna connector shall be –105 dBm.

6.2A.4.2 Procedure

1) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.

2) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.

3) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.

4) The test shall be run until the statistical significance according to Annex to F.6.1.8 is achieved.

6.2A.5 Test requirements

The computed BLER shall not exceed 0.01 under conditions described in table 6.2A.5.1.

Table 6.2A.5.1: Test parameters for reference sensitivity (3,84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	dB
$\hat{I}_{or}$	-104.3	dBm/3,84 MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.3 Maximum Input Level

6.3.1 Definition and applicability

The maximum input level is defined as the maximum mean power received at the UE antenna connector, which does not degrade the specified BER performance.

The requirements in this clause shall apply to all types of UTRA UE.

6.3.2 Minimum requirements

6.3.2.1 3,84 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.3.2.1.

Table 6.3.2.1: Maximum input level (3,84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-7	dB
$\hat{I}_{or}$	-25	dBm/3,84 MHz

The reference for this requirement is TS 25.102 [1] clause 7.4.1.1.

6.3.2.2 1,28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 6.3.2.2.

Table 6.3.2.2: Maximum input level (1,28Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-7	dB
$\hat{I}_{or}$	-25	dBm/1,28 MHz

The reference for this requirement is TS 25.102 [1] clause 7.4.1.2.

6.3.2.3 7,68 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.3.2.3.

Table 6.3.2.3: Maximum input level (7,68 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-10	dB
$\hat{I}_{or}$	-25	dBm/7,68 MHz

The reference for this requirement is TS 25.102 [1] clause 7.4.1.3.

6.3.3 Test purpose

The test purpose is to verify the ability of the UE to receive a prescribed test signal at the upper end of the dynamic range under defined conditions (no interference, no multipath propagation) with BER not exceeding a specified value.

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.3.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.
4) The level of SS output signal measured at the UE antenna connector shall be according to table 6.3.2.1 (3,84 Mcps TDD Option), table 6.3.2.2(1,28 Mcps TDD Option) and table 6.3.2.3 (7,68 Mcps TDD Option), respectively.

6.3.4.2 Procedure

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.

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 1.28Mcps TDD option UE that support HSDPA (16QAM).

6.3A.2 Minimum requirements

The throughput shall be ≥ 90% of the maximum throughput of the reference measurement channels as specified in Table 6.3A.2 for different UE categories with the parameters specified in Table 6.3A.1. Using this configuration the throughput shall meet or exceed 500kbps

The reference for this requirement is TS 25.102 [1] clause 7.4.2.

Table 6.3A.1 Minimum requirement parameters for 16QAM Maximum Input Level

Parameter	Unit	Value
$\frac{\sum HS-PDSCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/1.28 MHz	-25
Redundancy and constellation version	-	6
Maximum number of HARQ transmissions	-	1

Table 6.3A.2 Reference Measurement Channel for different UE Categories (16QAM)

UE Category	Reference Channel
Category 4-6	C.4.2.2.2
Category 7-9	C.4.2.3.2
Category 10-12	C.4.2.4.2
Category 13-15	C.4.2.5.2

6.3A.3 Test purpose

To verify that the UE HSDPA throughput meets the minimum requirements for the DL reference channel specified in Table 6.3A.2 with the addition of the parameters specified in table 6.3A.1.

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.

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 specified in TS 34.108 [3] and SS RF parameters are given in tables 6.3A.1.

3) Measure the HS-PDSCH throughput *R* received by the UE by counting the number of NACK, ACK and statDTX on the UL HS-SICH (Throughput = blocksize*number of blocks acknowledged/time).

4) The UE is switched off.

6.3A.5 Test requirements

The throughput shall be ≥ 90% of the maximum throughput of the reference measurement channels as specified in Table 6.3A.2 for different UE categories with the parameters specified in Table 6.3A.1. 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.

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 to all types of 1.28Mcps TDD option UE that support HSDPA (64QAM).

6.3B.2 Minimum requirements

The throughput shall be ≥ 90% of the maximum throughput of the reference measurement channels as specified in Table 6.3B.2 for different UE categories with the parameters specified in Table 6.3B.1. Using this configuration the throughput shall meet or exceed 1.1Mbps

The reference for this requirement is TS 25.102 [1] clause 7.4.2.

Table 6.3B.1 Minimum requirement parameters for 64QAM Maximum Input Level

Parameter	Unit	Value
$\frac{\sum HS-PDSCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/1.28 MHz	-25
Redundancy and constellation version	-	6
Maximum number of HARQ transmissions	-	1

Table 6.3B.2 Reference Measurement Channel for different UE Categories (64QAM)

UE Category	Reference Channel
Category 16-18	C.4.2.6.1
Category 19-21	C.4.2.6.2
Category 22-24	C.4.2.6.3
Category 25/26/27	Note1
Category 28 (Note2)	C.4.2.10.1
Category 29 (Note2)	C.4.2.11.1
Category 30 (Note2)	C.4.2.12.1
NOTE 1: Category 25/26/27 UEs are configured to non-MIMO mode and the requirements of Category 18/21/24 UEs are applied respectively. NOTE 2: The FRCs for the first stream is used.	

6.3B.3 Test purpose

To verify that the UE HSDPA throughput meets the minimum requirements for the DL reference channel specified in Table 6.3B.2 with the addition of the parameters specified in table 6.3B.1.

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.

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 specified in TS 34.108 [3] and SS RF parameters are given in tables 6.3B.1.

3) Measure the HS-PDSCH throughput *R* received by the UE by counting the number of NACK, ACK and statDTX on the UL HS-SICH (Throughput = blocksize*number of blocks acknowledged/time).

4) The UE is switched off.

6.3B.5 Test requirements

The throughput shall be ≥ 90% of the maximum throughput of the reference measurement channels as specified in Table 6.3B.2 for different UE categories with the parameters specified in Table 6.3B.1. 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.

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 (IMB)

6.3C.1 Definition and applicability

The maximum input level is defined as the maximum mean power received at the UE antenna connector, which does not degrade the specified BLER performance.

The requirements in this clause shall apply to 3.84 Mcps TDD IMB UE.

6.3C.2 Minimum requirements

The BLER shall not exceed 0.01 for the parameters specified in table 6.3C.2.1.

Table 6.3C.2.1: Maximum input level (3,84 Mcps TDD IMB)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-7.77	dB
$\hat{I}_{or}$	-25	dBm/3,84 MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

The reference for this requirement is TS 25.102 [1] clause 7.4.1.1.

6.3C.3 Test purpose

The test purpose is to verify the ability of the UE to receive a prescribed test signal at the upper end of the dynamic range under defined conditions (no interference, no multipath propagation) with BLER not exceeding a specified value.

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.

1) Connect the SS to the UE antenna connector as shown in figure A.3.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback mode 3 and start the loopback test. See TS 34.108 and TS 34.109 for details regarding loopback test mode 3 for MBMS.

4) The level of SS output signal measured at the UE antenna connector shall be according to table 6.3C.2.1

6.3C.4.2 Procedure

1) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.

2) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.

3) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.

4) The test shall be run until the statistical significance according to Annex to F.6.1.8 is achieved.

6.3C.5 Test requirements

For IMB operation, the computed BLER shall not exceed 0.01.

6.4 Adjacent Channel Selectivity (ACS)

6.4.1 Definition and applicability

Adjacent Channel Selectivity is a measure of a receiver's ability to receive a wanted 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 receiver filter attenuation on the adjacent channel(s).

The requirements of this test apply to all UTRA UE.

6.4.2 Minimum Requirements

6.4.2.1 3,84 Mcps TDD Option

For the UE of power class 2 and 3, the BER shall not exceed 0,001 for parameters specified in table 6.4.2.1. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.2.1: Test parameters for Adjacent Channel Selectivity (3,84 Mcps TDD Option)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset	MHz	+5 or -5

Explanatory NOTE:

- Within the reference sensitivity BER= 0.001 corresponds to a test signal = -105 dBm/3,84 MHz and a noise level -99 dBm /3,84 MHz BW (S/I -6 dB).
- Within ACS BER=0.001 is directly verified.
- Known from the reference sensitivity, this corresponds to S/I –6dB in the wanted BW.
- As a wanted signal of –91 dBm applied, an in-channel-interfering-signal of –85 dBm can be assumed.
- Verifying a filter suppression of 33 dB indirectly, an adjacent-channel-interferer of –52 dBm is needed
- The normative reference of this requirement is TS 25.102 [1] clause 7.5.

6.4.2.2 1,28 Mcps TDD Option

For the UE of power class 2 and 3, the BER shall not exceed 0,001 for parameters specified in table 6.4.2.2. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.2.2: Test parameters for Adjacent Channel Selectivity (1,28Mcps TDD Option)

Parameter	Unit	Case 1	Case 2
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0	0
$\hat{I}_{or}$	dBm/1,28MHz	-91	-62
I_{oac} mean power (modulated)	dBm	-54	-25
F_{uw} offset	MHz	+1.6 or –1.6	+1.6 or -1.6

The normative reference of this requirement is TS 25.102 [1] clause 7.5.1.2.

6.4.2.3 7,68 Mcps TDD Option

For the UE of power class 2 and 3, the BER shall not exceed 0,001 for parameters specified in table 6.4.2.3. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.2.3: Test parameters for Adjacent Channel Selectivity (7,68 Mcps TDD Option)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/7.68 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset (3.84 Mcps Modulated)	MHz	+7.5 or -7.5
F_{uw} offset (7.68 Mcps Modulated)	MHz	+10 or -10

Explanatory NOTE:

- Within the reference sensitivity BER= 0.001 corresponds to a test signal = -105 dBm/7,68 MHz and a noise level -99 dBm /7,68 MHz BW (S/I -6 dB).
- Within ACS BER=0.001 is directly verified.
- Known from the reference sensitivity, this corresponds to S/I –6dB in the wanted BW.
- As a wanted signal of –91 dBm applied, an in-channel-interfering-signal of –85 dBm can be assumed.
- Verifying a filter suppression of 33 dB indirectly, an adjacent-channel-interferer of –52 dBm is needed
- The normative reference of this requirement is TS 25.102 [1] clause 7.5.1.3.

6.4.3 Test purpose

The test purpose is to verify the ability of the UE-receiver to sufficiently suppress the interfering signal in the channel adjacent to the wanted 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 and the interferer to the UE antenna connector as shown in figure A.4.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

4) Set the signal generators to produce wanted and interference signals according table 6.4.2.1 for 3,84 Mcps TDD option, table 6.4.2.1.2 for 1,28 Mcps TDD option and table 6.4.2.1.3 for 7,68 Mcps TDD option. The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s for the 3,84 Mcps TDD Option, a 1,28 Mchp/s for the 1,28 Mcps TDD Option and 7,68 Mchip/s for the 7,68 Mcps TDD Option, respectively and rolloff 0.22.

6.4.4.2 Procedure

1) Set the interference signal 5 MHz for the 3,84 Mcps TDD Option,1.6 MHz for the 1,28 Mcps TDD Option and 10 MHz for the 7,68 Mcps TDD Option, respectively above the assigned channel frequency of the wanted signal.

2) Measure the BER of the wanted signal received from the UE at the SS.

3) Set the interference signal 5 MHz for the 3,84 Mcps TDD Option, 1.6 MHz for the 1,28 Mcps TDD Option and 10 MHz for the 7,68 Mcps TDD Option, respectively, below the assigned channel frequency of the wanted signal and repeat 2).

4) For the 7,68Mcps TDD option repeat steps 1 to 3 for an interfering 3.84Mcps signal with offsets 7.5MHz above and below the assigned channel frequency of the wanted signal.

6.4.5 Test Requirements

6.4.5.1 3,84 Mcps TDD Option

The measured BER, derived in step 2), shall not exceed 0,001 under conditions described in table 6.4.5.1 for the 3,84 Mcps TDD Option.

Table 6.4.5.1: Test parameters for Adjacent Channel Selectivity (3,84 Mcps TDD Option)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset	MHz	+5 or -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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

6.4.5.2 1,28 Mcps TDD Option

The measured BER, derived in step 2), shall not exceed 0,001 under conditions described in table 6.4.5.2 for the 1,28 Mcps TDD Option.

Table 6.4.5.2: Test parameters for Adjacent Channel Selectivity (1,28Mcps TDD Option)

Parameter	Unit	Case 1	Case 2
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0	0
$\hat{I}_{or}$	dBm/1,28MHz	-91	-62
I_{oac} mean power (modulated)	dBm	-54	-25
F_{uw} offset	MHz	+1.6 or –1.6	+1.6 or –1.6

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.4.5.3 7,68 Mcps TDD Option

The measured BER, derived in step 2), shall not exceed 0,001 under conditions described in table 6.4.5.3 for the 7,68 Mcps TDD Option.

Table 6.4.5.3: Test parameters for Adjacent Channel Selectivity (7,68 Mcps TDD Option)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset (3.84 Mcps Modulated)	MHz	+7.5 or -7.5
F_{uw} offset (7.68 Mcps Modulated)	MHz	+10 or -10

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

6.4A Adjacent Channel Selectivity (ACS) (IMB)

6.4A.1 Definition and applicability

Adjacent Channel Selectivity is a measure of a receiver's ability to receive a wanted 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 receiver filter attenuation on the adjacent channel(s).

The requirements of this test apply to 3.84 Mcps TDD IMB UE.

6.4A.2 Minimum Requirements

The BLER shall not exceed [0.01 for the parameters specified in table 6.4A.2.1.

Table 6.4A.2.1: Test parameters for Adjacent Channel Selectivity (3,84 Mcps TDD IMB)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	-0.77
$\hat{I}_{or}$	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset	MHz	+5 or -5
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

Explanatory note:

Within the reference sensitivity BLER=0.01 corresponds to a test signal = -105 dBm/3,84 MHz and a noise level -99 dBm/3,84 MHz BW (S/I -6 dB).

Within ACS BLER=0.01 is directly verified.

Known from the reference sensitivity, this corresponds to S/I –6dB in the wanted BW.

As a wanted signal of –91 dBm applied, an in-channel-interfering-signal of –85 dBm can be assumed.

Verifying a filter suppression of 33 dB indirectly, an adjacent-channel-interferer of –52 dBm is needed

The normative reference of this requirement is TS 25.102 [1] clause 7.5.

6.4A.3 Test purpose

The test purpose is to verify the ability of the UE-receiver to sufficiently suppress the interfering signal in the channel adjacent to the wanted 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 and the interferer to the UE antenna connector as shown in figure A.4.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback mode 3 and start the loopback test. See TS 34.108 and TS 34.109 for details regarding loopback test mode 3 for MBMS.
4) Set the signal generators to produce wanted and interference signals according table 6.4A.2.1. The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s and rolloff 0.22.

6.4A.4.2 Procedure

1) Set the interference signal 5 MHz for the 3,84 Mcps TDD Option above the assigned channel frequency of the wanted signal.
2) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.
3) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.
4) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.
5) Set the interference signal 5 MHz for the 3,84 Mcps TDD Option below the assigned channel frequency of the wanted signal and repeat steps 2 to 5.

6.4A.5 Test Requirements

The computed BLER shall not exceed 0.01 under conditions described in table 6.4A.5.1.

Table 6.4A.5.1: Test parameters for Adjacent Channel Selectivity (3,84 Mcps TDD IMB)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	-0.77
$\hat{I}_{or}$	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset	MHz	+5 or -5
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

6.5 Blocking Characteristics

6.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver 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 of this test apply to all UTRA UE.

6.5.2 Minimum Requirements

6.5.2.1 3,84 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.5.2.1a and table 6.5.2.1b. For table 6.5.2.1b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size for the interference signal.

The normative reference for this requirement is TS 25.102 clause 7.6.1.1.

Table 6.5.2.1a: In-band blocking (3,84 Mcps TDD Option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for $F_{uw\ offset}$ ±10 MHz)	-44 (for $F_{uw\ offset}$ ±15 MHz)	dBm

Table 6.5.2.1b: Out of band blocking (3,84 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/3,84 MHz
Iouw	-44	-30	-15	dBm
Fuw For operation in frequency bands as defined in clause 4.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
Fuw For operation in frequency bands as defined in clause 4.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
Fuw For operation in frequency bands as defined in clause 4.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz

NOTE 1: For operation referenced in 4.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

6.5.2.2 1,28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 6.5.2.2a and table 6.5.2.2b. For table 6.5.2.2b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size.

The normative reference for this requirement is 3G TS 25.102 [1] clause 7.6.1.2.

Table 6.5.2.2a: In-band blocking (1,28Mcps TDD Option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-105		dBm/1,28 MHz
I_{ouw} mean power (modulated)	-61 (for F_{uw} offset ±3.2 MHz)	-49 (for F_{uw} offset ±4.8 MHz)	dBm

Table 6.5.2.2b: Out of band blocking (1,28Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	**0**	**0**	**0**	**dB**
$\hat{I}_{or}$	-105	-105	-105	dBm/1,28 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in clause 4.2(a)	1840 <f <1895.2 1924.8 <f <2005.2 2029.8 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(b)	1790 < f < 1845.2 1994.8 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(c)	1850 < f < 1905.2 1934.8 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 5.2(e)	2240 < f < 2295.2 2404.8 < f < 2460	2215 < f ≤ 2240 2460 ≤ f < 2485	1< f ≤ 2215 2485 ≤ f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 5.2(f)	1820 < f <1875.2 1924.8 < f <1980	1795 < f ≤ 1820 1980 ≤ f < 2005	1 < f ≤ 1795 2005 < f <12750	MHz

NOTE 1: For operation referenced in 4.2(a), from 1895.2 <f< 1900 MHz, 1920 <f< 1924.8 MHz, 2005.2 <f< 2010 MHz and 2025<f< 2029.8 MHz , the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1845.2 < f < 1850 MHz and 1990< f < 1994.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1905.2 < f < 1910 MHz and 1930< f < 1934.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

NOTE 4: For operation referenced in 4.2(d), from 2565.2 ≤ f ≤ 2624.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

NOTE 5: For operation referenced in 4.2(e), from 2295.2 ≤ f ≤ 2404.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

NOTE 6: For operation referenced in 4.2(f), from 1875.2 ≤ f ≤ 1924.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

6.5.2.3 7,68 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.5.2.3a and table 6.5.2.3b. For table 6.5.2.3b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size for the interference signal.

The normative reference for this requirement is TS 25.102 clause 7.6.1.3.

Table 6.5.2.3a: In-band blocking (7,68 Mcps TDD Option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/7.68 MHz
I_{ouw} mean power (modulated)	-53 (for F_{uw} offset ±20 MHz)	-41 (for F_{uw} offset ±30 MHz)	dBm

Table 6.5.2.3b: Out of band blocking (7,68 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/7.68 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in subclause 4.2(a)	1840 <f <1870 1950 <f <1980 2055 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 4.2(b)	1790 < f < 1820 2020 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 4.2(c)	1850 < f < 1880 1960 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 4.2(d)	2510 <f< 2540 2650 <f< 2680	2485 <f< 2510 2680 <f< 2705	1 <f< 2485 2705 <f< 12750	MHz
1. For operation referenced in 4.2(a), from 1870 <f< 1900 MHz, 1920 <f< 1950 MHz, 1980 <f< 2010 MHz and 2025<f< 2055 MHz , the appropriate in-band blocking or adjacent channel selectivity in section 6.4.2.3 shall be applied.				
2. For operation referenced in 4.2(b), from 1820 < f < 1850 MHz and 1990< f < 2020 MHz, the appropriate in-band blocking or adjacent channel selectivity in section 6.4.2.3 shall be applied.				
3. For operation referenced in 4.2(c), from 1880 < f < 1910 MHz and 1930< f < 1960 MHz, the appropriate in-band blocking or adjacent channel selectivity in section 6.4.2.3 shall be applied.				
4. For operation referenced in 4.2(d), from 2540 < f < 2570 MHz and 2620< f < 2650 MHz, the appropriate in-band blocking or adjacent channel selectivity in section 6.4.2.3 shall be applied.				

Table 6.5.2.3c: Additional Out of band blocking (7,68 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/7.68 MHz
I_{ouw}(CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands in 2010-2025 MHz as defined in subclause 5.2(a)	1840 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
NOTE 1: Additional requirement is applied for Band a) UE operating on 2010-2025MHz.				

6.5.3 Test purpose

"The test stresses the ability of the UE receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity."

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.

1) Connect the SS and the interfering Signal generator to the UE antenna connector as shown in figure A.5.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

6.5.4.2 Procedure

1) The wanted signal frequency channel is set to mid range frequency. The wanted signal power level shall be set according to Table 6.5.5.1a for the 3,84 Mcps TDD option, Table 6.5.5.2a for the 1,28 Mcps TDD option and Table 6.5.5.3a for the 7,68 Mcps TDD option.

2) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5.2.1a for the 3,84 Mcps TDD Option, table 6.5.2.2a for the 1,28 Mcps TDD Option and table 6.5.2.3a for the 7,68 Mcps TDD Option, respectively with a step size of 1 MHz. The interfering signal level shall be set according to Table 6.5.5.1a for the 3,84 Mcps TDD option, Table 6.5.5.2a for the 1,28 Mcps TDD option and Table 6.5.5.3a for the 7,68 Mcps TDD option.

3) The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s for the 3,84 Mcps TDD Option, 1,28 Mchp/s for the 1,28 Mcps TDD Option and 7,68 Mchip/s for the 7,68 Mcps TDD Option, respectively and rolloff 0.22.

4) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.

5) The wanted signal frequency channel is set to an arbitrary frequency chosen from the low, mid or high range. The level of the wanted signal shall be set according to Table 6.5.5.1b for the 3,84 Mcps TDD option, table 6.5.5.2b for the 1,28 Mcps TDD option and table 6.5.5.3b for the 7,68 Mcps TDD option.

6) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5.2.1b for the 3,84 Mcps TDD Option, table 6.5.2.2b for the 1,28 Mcps TDD Option and table 6.5.2.3b for the 7,68 Mcps TDD Option, respectively with a step size of 1 MHz. The interfering signal level shall be set according to Table 6.5.5.1b for the 3,84 Mcps TDD option, Table 6.5.5.2b for the 1,28 Mcps TDD option and Table 6.5.5.3b for the 7,68 Mcps TDD option.

7) The interference signal is a CW signal.

8) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.

9) Record the frequencies for which BER exceed the test requirements in Table 6.5.5.1b for the 3,84 Mcps TDD option, table 6.5.5.2b for the 1,28 Mcps TDD option and table 6.5.5.3b for the 7,68 Mcps TDD option. These frequencies are further proceeding in subclause 6.6 Spurious Response.

10) For 7,68Mcps TDD option repeat steps 1 to 9 except use the channel power levels defined for the addition test conditions specified in 6.5.5.3c and the frequency ranges specified in 6.5.2.3c.

NOTE: Due to the large amount of time-consuming BER tests it is recommended to speed up a single BER test by reducing the 0.001-BER confidence level [10 000 bits under test or 10 errors] for screening the critical frequencies. Critical frequencies must be identified using standard BER confidence level. [30 000 bits or 30 errors].

6.5.5 Test requirements

6.5.5.1 3,84 Mcps TDD Option

The measured BER, derived in step 4) shall not exceed 0,001 (without exception) under test conditions described in table 6.5.5.1a.

The measured BER, derived in step 8), shall not exceed 0,001 except for up to 24 different frequencies of the interfering signal under test conditions described in table 6.5.5.1b.

These frequencies are further processed in clause 6.6 Spurious response.

Table 6.5.5.1a: Test conditions In-band blocking (3,84 Mcps TDD Option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for $F_{uw\ offset}$ ±10 MHz)	-44 (for $F_{uw\ offset}$ ±15 MHz)	dBm

Table 6.5.5.1b: Test conditions Out of band blocking (3,84 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/3,84 MHz
Iouw (CW)	-44	-30	-15	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.5.5.2 1,28 Mcps TDD Option

The measured BER, derived in step 4), shall not exceed 0,001 (without exception) under test conditions described in table 6.5.5.2a.

The measured BER, derived in step 8), shall not exceed 0,001 except for up to 24 different frequencies of the interfering signal under test conditions described in table 6.5.5.2b.

These frequencies are further processed in clause 6.6 Spurious response.

Table 6.5.5.2a: Test conditions In-band blocking (1,28 Mcps TDD Option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-105		dBm/1,28 MHz
I_{ouw} mean power (modulated)	-61 (for F_{uw} offset ±3.2 MHz)	-49 (for F_{uw} offset ±4.8 MHz)	dBm

Table 6.5.5.2b: Test conditions Out of band blocking (1,28 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-105	-105	-105	dBm/1,28 MHz
Iouw	-44	-30	-15	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4

6.5.5.3 7,68 Mcps TDD Option

The measured BER, derived in step 4) shall not exceed 0,001 (without exception) under test conditions described in table 6.5.5.3a.

The measured BER, derived in step 8), shall not exceed 0,001 except for up to 24 different frequencies of the interfering signal under test conditions described in table 6.5.5.3b and 6.5.5.3c.

These frequencies are further processed in clause 6.6 Spurious response.

Table 6.5.5.3a: Test conditions In-band blocking (7,68 Mcps TDD Option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/7,68 MHz
I_{ouw} mean power (modulated)	-53 (for $F_{uw\ offset}$ ±20 MHz)	-41 (for $F_{uw\ offset}$ ±30 MHz)	dBm

Table 6.5.5.3b: Test conditions Out of band blocking (7,68 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB

$\hat{I}_{or}$	-102	-102	-102	dBm/7,68 MHz
Iouw (CW)	-44	-30	-15	dBm

Table 6.5.5.3c: Test conditions additional Out of band blocking (7,68 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/7.68 MHz
I_{ouw}(CW)	-44	-30	-15	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.5A Blocking Characteristics (IMB)

6.5A.1 Definition and applicability

The blocking characteristics is a measure of the receiver 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 of this test apply to 3.84 Mcps TDD IMB UE.

6.5A.2 Minimum Requirements

The BLER shall not exceed 0.01 for the parameters specified in table 6.5A.2.1a and table 6.5A.2.1b. For table 6.5A.2.1b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size for the interference signal.

The normative reference for this requirement is TS 25.102 clause 7.6.1.1.

Table 6.5A.2.1a: In-band blocking (3,84 Mcps TDD IMB)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77		dB
$\hat{I}_{or}$	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for $F_{uw\ offset}$ ±10 MHz)	-44 (for $F_{uw\ offset}$ ±15 MHz)	dBm
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.			

Table 6.5A.2.1b: Out of band blocking (3,84 Mcps TDD IMB)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	-0.77	-0.77	dB
Îor	-102	-102	-102	dBm/3,84 MHz
Iouw	-44	-30	-15	dBm
Fuw For operation in frequency bands as defined in clause 4.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
Fuw For operation in frequency bands as defined in clause 4.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
Fuw For operation in frequency bands as defined in clause 4.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
NOTE: The term □DPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.				

NOTE 1: For operation referenced in 4.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

6.5A.3 Test purpose

"The test stresses the ability of the UE receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity."

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.

1) Connect the SS and the interfering Signal generator to the UE antenna connector as shown in figure A.5.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback mode 3 and start the loopback test. See TS 34.108 and TS 34.109 for details regarding loopback test mode 3 for MBMS.

6.5A.4.2 Procedure

1) The wanted signal frequency channel is set to mid range frequency. The wanted signal power level shall be set according to Table 6.5A.5.1a.

2) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5A.2.1a with a step size of 1 MHz. The interfering signal level shall be set according to Table 6.5A.5.1a.

3) The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s and rolloff 0.22.

4) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.

5) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.

6) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.

7) The test shall be run for the wanted signal received from the UE at the SS for each step of the interferer.

8) The wanted signal frequency channel is set to an arbitrary frequency chosen from the low, mid or high range. The level of the wanted signal shall be set according to Table 6.5A.5.1b.

9) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5A.2.1b with a step size of 1 MHz. The interfering signal level shall be set according to Table 6.5A.5.1b

10) The interference signal is a CW signal.

11) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.

12) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.

13) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.

14) The test shall be run for the wanted signal received from the UE at the SS for each step of the interferer.

15) Record the frequencies for which BLER exceed the test requirements in Table 6.5A.5.1b. These frequencies are further proceeding in subclause 6.6A Spurious Response.

NOTE: Due to the large amount of time consumed by the BLER test it is recommended to speed up a single BLER test by reducing the 0.01-BLER confidence level [1 000 blocks under test or 10 errors] for screening the critical frequencies. Critical frequencies must be identified using standard BLER confidence level. [3 000 blocks or 30 errors].

6.5A.5 Test requirements

The computed BLER, in step 6) shall not exceed 0.01 (without exception) under test conditions described in table 6.5A.5.1a.

The computed BLER, in step 13), shall not exceed 0.01 except for up to 24 different frequencies of the interfering signal under test conditions described in table 6.5A.5.1b.

These frequencies are further processed in clause 6.6A Spurious response.

Table 6.5A.5.1a: Test conditions In-band blocking (3,84 Mcps TDD IMB)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77		dB
$\hat{I}_{or}$	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for $F_{uw\,offset}$ ±10 MHz)	-44 (for $F_{uw\,offset}$ ±15 MHz)	dBm
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.			

Table 6.5A.5.1b: Test conditions Out of band blocking (3,84 Mcps TDD IMB)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	-0.77	-0.77	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/3,84 MHz
Iouw (CW)	-44	-30	-15	dBm
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.				

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F 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 blocking limit is not met.

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

6.6.2 Minimum Requirements

6.6.2.1 3,84 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.6.2.1.

The normative reference for this requirement is TS 25.102 clause 7.7.1.1.

Table 6.6.2.1: Spurious Response (3,84 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

6.6.2.2 1,28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 6.6.2.2.

Table 6.6.2.2: Spurious Response (1,28Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	**0**	**dB**
$\hat{I}_{or}$	-105	dBm/1,28 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

6.6.2.3 7,68 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.6.2.3.

The normative reference for this requirement is TS 25.102 clause 7.7.1.3.

Table 6.6.2.3: Spurious Response (7,68 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-102	dBm/7.68 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

6.6.3 Test purpose

Spurious response frequencies, identified in the blocking test, are measured against a less stringent test requirement. The test stresses the ability of the receiver to withstand high level interference signals without undue degradation of its sensitivity due to the receiver's frequency conversion concept.

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 subclause 6.5.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS and the unwanted signal to the UE antenna connector as shown in figure A.6.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

6.6.4.2 Procedure

1) Set the wanted signal frequency to the frequency used for the out-of-band blocking test. Set the power level of the wanted signal according to table 6.6.2.1 for the 3,84 Mcps TDD Option, table 6.6.2.2 for the 1,28 Mcps TDD Option and table 6.6.2.3 for the 7,68 Mcps TDD Option, respectively.

2) Set the frequency of the interferer signal according the recorded spurious response frequency values obtained from the out-of-band blocking test as described in 6.5.4.2, at which the blocking test failed. Set the power level of the interferer according to table 6.6.5.1 for the 3,84 Mcps TDD Option, table 6.6.5.2 for the 1,28 Mcps TDD Option and table 6.6.5.3 for the 7,68 Mcps TDD Option, respectively.

3) Measure the BER of DCH received from the UE at the SS.

6.6.5 Test requirements

6.6.5.1 3,84 Mcps TDD

The measured BER, derived in step 3), shall not exceed 0,001 under. test conditions described in table 6.6.5.1 for the 3,84 Mcps TDD Option.

Table 6.6.5.1: Test Parameters Spurious Response (3,84 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
Îor	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.6.5.2 1,28 Mcps TDD

The measured BER, derived in step 3), shall not exceed 0,001 under test conditions described in table 6.6.5.2 for the 1,28 Mcps TDD Option.

Table 6.6.5.2: Test Parameters Spurious Response (1,28 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
Îor	-105	dBm/1,28 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.6.5.3 7,68 Mcps TDD

The measured BER, derived in step 3), shall not exceed 0,001 under. test conditions described in table 6.6.5.3 for the 7,68 Mcps TDD Option.

Table 6.6.5.3: Test Parameters Spurious Response (7,68 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB

Îor	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.6A Spurious Response (IMB)

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 blocking limit is not met.

The requirements of this test apply to 3.84 Mcps TDD IMB UE.

6.6A.2 Minimum Requirements

The BLER shall not exceed 0.01 for the parameters specified in table 6.6A.2.1.

The normative reference for this requirement is TS 25.102 clause 7.7.1.1.

Table 6.6A.2.1: Spurious Response (3,84 Mcps TDD IMB)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	dB
Îor	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

6.6A.3 Test purpose

Spurious response frequencies, identified in the blocking test, are measured against a less stringent test requirement. The test stresses the ability of the receiver to withstand high level interference signals without undue degradation of its sensitivity due to the receiver's frequency conversion concept.

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 subclause 6.5A.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS and the unwanted signal to the UE antenna connector as shown in figure A.6.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback mode 3 and start the loopback test. See TS 34.108 and TS 34.109 for details regarding loopback test mode 3 for MBMS.

6.6A.4.2 Procedure

1) Set the wanted signal frequency to the frequency used for the out-of-band blocking test. Set the power level of the wanted signal according to table 6.6A.2.1.

2) Set the frequency of the interferer signal according the recorded spurious response frequency values obtained from the out-of-band blocking test as described in 6.5A.4.2, at which the blocking test failed. Set the power level of the interferer according to table 6.6A.5.1.

3) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.

2) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.

3) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.

6.6A.5 Test requirements

The computed BLER in step 3), shall not exceed 0.01 under test conditions described in table 6.6A.5.1.

Table 6.6A.5.1: Test Parameters Spurious Response (3,84 Mcps TDD IMB)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	dB
Îor	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F 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 receiver 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 of this test shall apply to all UTRA UE.

6.7.2 Minimum Requirements

6.7.2.1 3,84 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.7.2.1.

The normative reference for this requirement is TS 25.102 clause 7.8.1.1.

Table 6.7.2.1: Receive intermodulation characteristics (3,84 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-102	dBm/3,84 MHz
Iouw1(CW)	-46	dBm
Iouw2 mean power (modulated)	-46	dBm
F_{uw1} (CW)	±10	MHz
F_{uw2} (Modulated)	±20	MHz

6.7.2.2 1,28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 6.7.2.2.

The normative reference for this requirement is TS 25.102 clause 7.8.1.2.

Table 6.7.2.2: Receive intermodulation characteristics (1,28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/1,28 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm
F_{uw1} (CW)	±3.2	MHz
F_{uw2} (Modulated)	±6.4	MHz

6.7.2.3 7,68 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.7.2.3.

The normative reference for this requirement is TS 25.102 clause 7.8.1.3.

Table 6.7.2.3: Receive intermodulation characteristics (7,68 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-102	dBm/7.68 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm
F_{uw1} (CW)	±20	MHz
F_{uw2} (modulated)	±40	MHz

6.7.3 Test purpose

The test stresses the ability of the receiver to withstand two or more high level interference signals without undue degradation of its sensitivity due to the receiver's non-linear elements.

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 and the unwanted signals to the UE antenna connector as shown in figure A.7.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

6.7.4.2 Procedure

1) Set the wanted and interfering signals as indicated in table 6.7.2.1 for the 3,84 Mcps TDD Option, table 6.7.2.2 for the 1,28 Mcps TDD Option and table 6.7.2.3 for the 7,68 Mcps TDD Option with positive offset with respect to the wanted signal.

2) Measure the BER of DCH received from the UE at the SS.

3) Set the interfering signals as indicated in table 6.7.2.1 for the 3,84 Mcps TDD Option, table 6.7.2.2 for the 1,28 Mcps TDD Option and table 6.7.2.3 for the 7,68 Mcps TDD Option with negative offset with respect to the wanted signal and repeat 2).

6.7.5 Test requirements

6.7.5.1 3,84 Mcps TDD Option

The measured BER, derived in step 2) and 3), shall not exceed 0,001 under test conditions described in table 6.7.5.1 for the 3,84 Mcps TDD Option.

Table 6.7.5.1: Test parameters Receive intermodulation characteristics (3,84 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$ Wanted Signal Level	-102	dBm/3,84 MHz
Iouw1(CW)	-46	dBm
Iouw2 mean power (modulated)	-46	dBm
F_{uw1} (CW)	±10	MHz
F_{uw2} (Modulated)	±20	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.7.5.2 1,28 Mcps TDD Option

The measured BER, derived in step 2) and 3), shall not exceed 0,001 under test conditions described in table 6.7.5.2 for the 1,28 Mcps TDD Option.

Table 6.7.5.2: Test parameters Receive intermodulation characteristics (1,28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/1,28 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm
F_{uw1} (CW)	±3.2	MHz
F_{uw2} (Modulated)	±6.4	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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

6.7.5.3 7,68 Mcps TDD Option

The measured BER, derived in step 2) and 3), shall not exceed 0,001 under test conditions described in table 6.7.5.3 for the 7,68 Mcps TDD Option.

Table 6.7.5.3: Test parameters Receive intermodulation characteristics (7,68 Mcps TDD Option)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$ Wanted Signal Level	-102	dBm/3,84 MHz
Iouw1(CW)	-46	dBm
Iouw2 mean power (modulated)	-46	dBm
$F_{uw\ 1}$ (CW)	±20	MHz
$F_{uw\ 2}$ (Modulated)	±40	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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.7A Intermodulation Characteristics (IMB)

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 receiver 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 of this test shall apply to 3.84 Mcps TDD IMB UE.

6.7A.2 Minimum Requirements

The BLER shall not exceed 0.01 for the parameters specified in table 6.7A.2.1.

The normative reference for this requirement is TS 25.102 clause 7.8.1.1.

Table 6.7A.2.1: Receive intermodulation characteristics (3,84 Mcps TDD IMB)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	dB

$\hat{I}_{or}$	-102	dBm/3,84 MHz
Iouw1(CW)	-46	dBm
Iouw2 mean power (modulated)	-46	dBm
$F_{uw\,1}$ (CW)	±10	MHz
$F_{uw\,2}$ (Modulated)	±20	MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

6.7A.3 Test purpose

The test stresses the ability of the receiver to withstand two or more high level interference signals without undue degradation of its sensitivity due to the receiver's non-linear elements.

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 and the unwanted signals to the UE antenna connector as shown in figure A.7.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback mode 3 and start the loopback test. See TS 34.108 and TS 34.109 for details regarding loopback test mode 3 for MBMS.

6.7A.4.2 Procedure

1) Set the wanted and interfering signals as indicated in table 6.7A.2.1 with positive offset with respect to the wanted signal.

2) SS shall start the test by sending data on the MTCH radio bearer and maintain the count of transmitted RLC SDU blocks on the MTCH.

3) SS shall send a "UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST" message and wait for the UE to response with a "UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE" reporting the received RLC SDU counter value.

4) SS shall compute the RLC SDU error rate based on the transmitted RLC SDUs count and received RLC SDU count reported by the UE.

5) Set the interfering signals as indicated in table 6.7A.2.1 with negative offset with respect to the wanted signal and repeat steps 2 to 4).

6.7A.5 Test requirements

The computed BLER in step 4) and 5), shall not exceed 0.01 under test conditions described in table 6.7A.5.1.

Table 6.7A.5.1: Test parameters Receive intermodulation characteristics (3,84 Mcps TDD IMB)

Parameter	Value	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-0.77	dB
$\hat{I}_{or}$ Wanted Signal Level	-102	dBm/3,84 MHz
Iouw1(CW)	-46	dBm
Iouw2 mean power (modulated)	-46	dBm
F_{uw1} (CW)	±10	MHz
F_{uw2} (Modulated)	±20	MHz
NOTE: The term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F 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 requirements of this test are applicable for all UTRA UE.

6.8.2 Minimum Requirements

6.8.2.1 3,84 Mcps TDD Option

The power of any spurious emission shall not exceed:

Table 6.8.2.1: Receiver spurious emission requirements (3,84 Mcps TDD Option)

Band	Maximum level	Measurement Bandwidth	Note
30 MHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 GHz and 1,92 GHz – 2,01 GHz and 2,025 GHz – 2,11 GHz	-47 dBm	1 MHz	
1,9 GHz – 1,92 GHz and 2,01 GHz – 2,025 GHz and 2,11 GHz – 2,170 GHz	-60 dBm	3,84 MHz	
2,170 GHz – 12,75 GHz	-47 dBm	1 MHz	

The normative reference for this requirement is TS 25.102 [1] clause 7.9.1.1.

6.8.2.2 1,28 Mcps TDD Option

The power of any spurious emission shall not exceed the maximum level specified in Table 6.8.2.2 and Table 6.8.2.2A.

Table 6.8.2.2: Receiver spurious emission requirements (1,28Mcps TDD Option)

Frequency Band	Measurement Bandwidth	Maximum level	Note
30MHz ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 6.8.2.2A: Additional receiver spurious emission requirements (1.28 Mcps TDD Option)

Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
a	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm	
	2010 MHz ≤ f ≤ 2025 MHz	1.28MHz	-64dBm	
	2570 MHz ≤ f ≤ 2620 MHz	1.28MHz	-64dBm	
	2300 MHz ≤ f ≤ 2400 MHz	1.28MHz	-64dBm	
	1880 MHz ≤ f ≤ 1920MHz	1.28MHz	-64dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84MHz	-60dBm	
	2620 MHz ≤ f ≤ 2690 MHz	3.84MHz	-60dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm	
b	1850 MHz ≤ f ≤ 1910 MHz	1.28MHz	-64dBm	
	1910 MHz ≤ f ≤ 1990 MHz	1.28MHz	-64dBm	
c	1910 MHz ≤ f ≤ 1930MHz	1.28MHz	-64dBm	
d	2570 MHz ≤ f ≤ 2620MHz	1.28MHz	-64dBm	
	2010 MHz ≤ f ≤ 2025MHz	1.28MHz	-64dBm	
	2110 MHz ≤ f ≤ 2170MHz	3.84MHz	-60dBm	
	2620 MHz ≤ f ≤ 2690MHz	3.84MHz	-60dBm	
e	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm	
	2300 MHz ≤ f ≤ 2400MHz	1.28MHz	-64dBm	
	2010 MHz ≤ f ≤ 2025MHz	1.28MHz	-64dBm	
	1880 MHz ≤ f ≤ 1920MHz	1.28MHz	-64dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm	
f	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm	
	1880 MHz ≤ f ≤ 1920MHz	1.28MHz	-64dBm	
	2010 MHz ≤ f ≤ 2025 MHz	1.28MHz	-64dBm	
	2300 MHz ≤ f ≤ 2400 MHz	1.28MHz	-64dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm	
Note 1: The frequency bandwidth protection 703-803 MHz and 2496-2690 MHz test requirements for Bands a, e and f deviate from the requirements in TS 25.102 [1] Rel-10 and earlier releases.				

The normative reference for this requirement is TS 25.102 [1] clause 7.9.1.2.

6.8.2.3 7,68 Mcps TDD Option

The power of any spurious emission shall not exceed:

Table 6.8.2.3: Receiver spurious emission requirements (7,68 Mcps TDD Option)

Band	Maximum level	Measurement Bandwidth	Note
30 MHz - 1 GHz	-57 dBm	100 kHz	
1 GHz - 1.9 GHz and 1.92 GHz - 2.01 GHz and 2.025 GHz - 2.11 GHz 2.17 GHz - 2.57 GHz	-47 dBm	1 MHz	
1.9 GHz - 1.92 GHz and 2.01 GHz - 2.025 GHz and 2.11 GHz - 2.170 GHz 2.57 Ghz - 2.69 GHz	-57 dBm	7.68 MHz	
2.69 GHz - 12.75 GHz	-47 dBm	1 MHz	

The normative reference for this requirement is TS 25.102 [1] clause 7.9.1.3.

6.8.3 Test purpose

The test purpose is to verify the UE's ability to limit interference caused by receiver spurious emissions to the own and the other systems. The test requirements are tighter than in clause 5.5.3 ((TX) Spurious Emissions) because the time of Receive–Only-Operation is generally much longer than RX-TX-Operation.

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: 1 arbitrary frequency selected between low, mid and high range; see clause G.2.4.

1) Connect the measurement equipment to the UE antenna connector according to figure A.8.

2) RF parameters are setup according to table 6.8.4.1a for 3,84 Mcps TDD option, 6.8.4.1b for 1,28 Mcps TDD and table 6.8.4.1a for 7,68 Mcps TDD option respectively.

3) A call is set up according to the setup procedure specified in TS34.108 [3] sub-clause 7.3.3, with the following exceptions for information elements in System Information Block type3.

Information Element	Value/Remark
- Cell selection and re-selection info	
- CHOICE mode	TDD
- Sintrasearch	0 dB
- Sintersearch	0 dB
- RAT List	This parameter is configurable
- Ssearch,RAT	0 dB
- Maximum allowed UL TX power	Power level where Pcompensation=0

NOTE: The setup procedure (3) sets the UE into 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 25.304, subcl. 5.2.3.and 5.2.6]. No transmission of the UE will interfere with the measurement.

Table 6.8.4.1a: RF parameters for receiver spurious test (3,84Mcps TDD Option and 7.68Mcps TDD option)

Parameter	Unit	Level
PCCPCH_Ec/Ior	dB	-3
SCH_Ec/Ior	dB	-9
$\hat{I}_{or}/I_{oc}$	dB	9
PCCPCH RSCP	dBm	-64

Table 6.8.4.1b: RF parameters for receiver spurious test (1,28Mcps TDD Option)

Parameter	Unit	Level
PCCPCH_Ec/Ior	dB	-3
DwPCH_Ec/Ior	dB	0
$\hat{I}_{or}/I_{oc}$	dB	9
PCCPCH RSCP	dBm	-64

6.8.4.2 Procedure

Measure the average power of spurious emissions by covering the frequency ranges of table 6.8.2.1 for the 3,84 Mcps TDD Option, table 6.8.2.2 for the 1,28 Mcps TDD Option and table 6.8.2.3 for the 7,68 Mcps TDD Option.

6.8.5 Test requirements

6.8.5.1 3,84 Mcps TDD Option

The spurious emissions shall be according to table 6.8.5.1 for the 3,84 Mcps TDD Option.

Table 6.8.5.1: Receiver spurious emission test requirements (3,84 Mcps TDD Option)

Band	Maximum level	Measurement Bandwidth	Note
30 MHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 GHz and 1,92 GHz – 2,01 GHz and 2,025 GHz – 2,11 GHz	-47 dBm	1 MHz	
1,9 GHz – 1,92 GHz and 2,01 GHz – 2,025 GHz and 2,11 GHz – 2,170 GHz	-60 dBm	3,84 MHz	
2,170 GHz – 12,75 GHz	-47 dBm	1MHz	

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.8.5.2 1,28 Mcps TDD Option

The spurious emissions shall be according to table 6.8.5.2 and table 6.8.5.2A for the 1,28 Mcps TDD Option.

Table 6.8.5.2: Receiver spurious emission requirements (1,28Mcps TDD Option)

Frequency Band	Measurement Bandwidth	Maximum level	Note
30MHz ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 6.8.5.2A: Additional receiver spurious emission requirements (1.28 Mcps TDD Option)

Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
a	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm	
	2010 MHz ≤ f ≤ 2025 MHz	1.28MHz	-64dBm	
	2570 MHz ≤ f ≤ 2620 MHz	1.28MHz	-64dBm	
	2300 MHz ≤ f ≤ 2400 MHz	1.28MHz	-64dBm	
	1880 MHz ≤ f ≤ 1920MHz	1.28MHz	-64dBm	
	2110 MHz ≤ f ≤ 2170 MHz	3.84MHz	-60dBm	
	2620 MHz ≤ f ≤ 2690 MHz	3.84MHz	-60dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm	
b	1850 MHz ≤ f ≤ 1910 MHz	1.28MHz	-64dBm	
	1910 MHz ≤ f ≤ 1990 MHz	1.28MHz	-64dBm	
c	1910 MHz ≤ f ≤ 1930MHz	1.28MHz	-64dBm	
d	2570 MHz ≤ f ≤ 2620MHz	1.28MHz	-64dBm	
	2010 MHz ≤ f ≤ 2025MHz	1.28MHz	-64dBm	
	2110 MHz ≤ f ≤ 2170MHz	3.84MHz	-60dBm	
	2620 MHz ≤ f ≤ 2690MHz	3.84MHz	-60dBm	
e	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm	
	2300 MHz ≤ f ≤ 2400MHz	1.28MHz	-64dBm	
	2010 MHz ≤ f ≤ 2025MHz	1.28MHz	-64dBm	
	1880 MHz ≤ f ≤ 1920MHz	1.28MHz	-64dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm	
f	703 MHz ≤ f < 803 MHz	1 MHz	-50 dBm	
	1880 MHz ≤ f ≤ 1920MHz	1.28MHz	-64dBm	
	2010 MHz ≤ f ≤ 2025 MHz	1.28MHz	-64dBm	
	2300 MHz ≤ f ≤ 2400 MHz	1.28MHz	-64dBm	
	2496 MHz ≤ f ≤ 2690 MHz	1MHz	-50dBm	
Note 1: The frequency bandwidth protection 703-803 MHz and 2496-2690 MHz test requirements for Bands a, e and f deviate from the requirements in TS 25.102 [1] Rel-10 and earlier releases.				

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.8.5.3 7,68 Mcps TDD Option

The spurious emissions shall be according to table 6.8.5.3 for the 7,68 Mcps TDD Option.

Table 6.8.5.3: Receiver spurious emission test requirements (7,68 Mcps TDD Option)

Band	Maximum level	Measurement Bandwidth	Note
30 MHz - 1 GHz	-57 dBm	100 kHz	
1 GHz - 1.9 GHz and 1.92 GHz - 2.01 GHz and 2.025 GHz - 2.11 GHz 2.17 GHz - 2.57 GHz	-47 dBm	1 MHz	
1.9 GHz - 1.92 GHz and 2.01 GHz - 2.025 GHz and 2.11 GHz - 2.170 GHz 2.57 Ghz - 2.69 GHz	-57 dBm	7.68 MHz	
2.69 GHz - 12.75 GHz	-47 dBm	1 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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

7 Performance Requirements

7.1 General

The performance requirements for the UE in this clause is specified for the measurement channels specified in annex C and the test environments specified in annex D.

All Block Error ratio (BLER) measurements in clause 7 shall be performed according to the general rules for statistical testing in Annex F.6.

7.1.2 Definition of Additive White Gaussian Noise (AWGN) Interferer

The minimum bandwidth of the AWGN interferer shall be 1.5 times chip rate of the radio access mode. (e.g. 5.76 MHz for a chip rate of 3,84 Mcps). The flatness across this minimum bandwidth shall be less than ±0.5 dB and the peak to average ratio at a probability of 0.001% shall exceed 10 dB.

7.2 Demodulation in static propagation conditions

7.2.1 Demodulation of DCH

7.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rates, supported. The data-rate-corresponding requirements shall apply to the UE.

The requirements and this test apply to all types of UTRA TDD UE.

7.2.1.2 Minimum requirements

7.2.1.2.1 3,84 Mcps TDD Option

For the parameters specified in table 7.2.1.2.1a the BLER shall not exceed the piece-wise linear BLER curve specified in table 7.2.1.2.1b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.2.1.1.1.

Table 7.2.1.2.1a: DCH parameters in static propagation conditions (3,84 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4	Test 5
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	-6	-3	0	0	0
I_{oc}	dBm/3,84 MHz	-60				
Cell Parameter*		0,1				
DPCH Channelization Codes*	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1 . .5	C(i,16) i=1 . .9	C(i,16) i=1 . .8	-
OCNS Channelization Code*	C(k,Q)	C(3,16)	C(6,16)	-	-	-
Information Data Rate	kbps	12,2	64	144	384	2048
Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.						

Table 7.2.1.2.1b: Performance requirements in AWGN channel (3,84 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	1,1	10^{-2}
2	3,5	10^{-1}
	3,8	10^{-2}
3	3,4	10^{-1}
	3,6	10^{-2}
4	2,7	10^{-1}
	3,0	10^{-2}
5	3,5	10^{-1}
	3,6	10^{-2}

7.2.1.2.2 1,28 Mcps TDD Option

For the parameters specified in table 7.2.1.2.2a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.2.1.2.2b. The reference for this requirement is TS 25.102 [1] clause 8.2.1.1.2.

Table 7.2.1.2.2a: DCH parameters in static propagation conditions (1,28Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
Number of $DPCH_o$		8	2	2	0
Scrambling code and basic midamble code number*		0	0	0	0
DPCH Channelization Codes*	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8	C(i,16) i=1…8	C(i,16) i=1…9
$DPCH_o$ Channelization Codes*	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10	C(i,16) 9≤ i ≤10	-
$\frac{DPCH_o\_E_c}{I_{or}}$	dB	-10	-10	-10	0
I_{oc}	dBm/1,28MHz	-60			
Midamble		Common midamble			
Information Data Rate	Kbps	12.2	64	144	384
*Note: Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.					

Table 7.2.1.2.2b: Performance requirements in AWGN channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	3.6	10^{-2}
2	2.4	10^{-1}
	2.7	10^{-2}
3	2.8	10^{-1}
	3.2	10^{-2}
4	4.6	10^{-1}

7.2.1.2.3 7,68 Mcps TDD Option

For the parameters specified in table 7.2.1.2.3a the BLER shall not exceed the piece-wise linear BLER curve specified in table 7.2.1.2.3b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.2.1.1.3.

Table 7.2.1.2.3a: DCH parameters in static propagation conditions (7,68 Mcps TDD Option)

Parameters	Unit	Test 1
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	-9
I_{oc}	dBm/7.68 MHz	-60
Cell Parameter*	-	0,1
DPCH Channelization Codes*	C(k, Q)	C(i, 32), i = 1,2
OCNS Channelization Code*	C(k, Q)	C(3, 32)
Information Data Rate	kbps	12.2
*Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.		

Table 7.2.1.2.3b: Performance requirements in AWGN channel (7,68 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	1.1	10^{-2}

7.2.1.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal ,representing a static propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.2.1.4 Method of test

7.2.1.4.1 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, AWGN Generator and additional components to the UE antenna connector as shown in figure A.9.

2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) (64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C for 3.84 Mcps TDD option and 1.28Mcps TDD option. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) for 7.68 Mcps TDD option.

3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).

4) The levels of the wanted signal and the co-channel signals are set according to table 7.2.1.2.1a and b for the 3,84 Mcps TDD Option, table 7.2.1.2.2a and b for the 1,28 Mcps TDD Option and table 7.2.1.2.3a and b for the 7,68 Mcps TDD Option, respectively.

7.2.1.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all tests specified in table 7.2.1.2.1a for the 3,84 Mcps TDD Option, table 7.2.1.2.2a for the 1,28 Mcps TDD Option and table 7.2.1.2.3a for the 7,68 Mcps TDD Option, respectively.

7.2.1.5 Test requirements

7.2.1.5.1 3.84Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.2.1.2.1b for the 3,84 Mcps TDD Option

7.2.1.5.2 1.28Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.2.1.5.2 for the1.28 Mcps TDD Option

Table 7.2.1.5.2: Performance requirements in AWGN channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	3.9	10^{-2}
2	2.7	10^{-1}
	3.0	10^{-2}
3	3.1	10^{-1}
	3.5	10^{-2}
4	4.9	10^{-1}

7.2.1.5.3 7.68Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.2.1.2.3b for the 7.68 Mcps TDD Option

NOTE: If the 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.

7.3 Demodulation of DCH in multipath fading conditions

7.3.1 Multipath fading Case 1

7.3.1.1 Definition and applicability

The performance requirement of DCH is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data ratio of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data ratios, supported. The data-ratio-corresponding requirements shall apply to the UE.

The requirements and this test apply to all types of UTRA TDD UE.

7.3.1.2 Minimum requirements

7.3.1.2.1 3,84 Mcps TDD Option

For the parameters specified in table 7.3.1.2.1a the BLER shall not exceed the piece-wise linear BLER curve specified in table 7.3.1.2.1b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 clause 8.3.1.1.1.

Table 7.3.1.2.1a: DCH parameters in multipath Case 1 channel (3,84 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4	Test 5
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	DB	-6	-3	0	0	0
I_{oc}	dBm/3,84 MHz	-60				
Cell Parameter (note)		0,1				
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1 . .5	C(i,16) i=1 . .9	C(i,16) i=1 . .8	-
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	C(6,16)	-	-	-
Information Data Rate	kbps	12,2	64	144	384	2048
Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.						

Table 7.3.1.2.1b: Performance requirements in multipath Case 1 channel (3,84 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	13,9	10^{-2}
2	13,7	10^{-1}
	19,8	10^{-2}
3	14,1	10^{-1}
	20,6	10^{-2}
4	13,8	10^{-1}
	20,0	10^{-2}
5	13,2	10^{-1}
	17,8	10^{-2}

7.3.1.2.2 1,28 Mcps TDD Option

For the parameters specified in table 7.3.1.2.2a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.1.2.2b. The reference for this requirement is TS 25.102 [1] clause 8.3.1.1.2.

Table 7.3.1.2.2a: DCH parameters in a multipath Case 1 channel (1,28 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
Number of $DPCH_o$		8	2	2	0
Scrambling code and basic midamble code number (see note)		0	0	0	0
DPCH Channelization Codes (see note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8	C(i,16) i=1…8	C(i,16) i=1…9
$DPCH_o$ Channelization Codes (see note)	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10	C(i,16) 9≤ i ≤10	-
$\frac{DPCH_o\_E_c}{I_{or}}$	DB	-10	-10	-10	0
I_{oc}	dBm/1,28MHz	-60			
Midamble		Common midamble			
Information Data Rate	Kbps	12.2	64	144	384
Note: Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.					

Table 7.3.1.2.2b: Performance requirements in a multipath Case 1 channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	22.4	10^{-2}
2	15.8	10^{-1}
	22.9	10^{-2}
3	16.6	10^{-1}
	23.9	10^{-2}
4	15.5	10^{-1}
	21.4	10^{-2}

7.3.1.2.3 7,68 Mcps TDD Option

For the parameters specified in table 7.3.1.2.3a the BLER shall not exceed the piece-wise linear BLER curve specified in table 7.3.1.2.3b. This requirement is applicable for TFCS size 16.

The reference for this requirement is TS 25.102 clause 8.3.1.1.3.

Table 7.3.1.2.3a: DCH parameters in multipath Case 1 channel (7,68 Mcps TDD Option)

Parameters	Unit	Test 1
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	-9
I_{oc}	dBm/7.68 MHz	-60
Cell Parameter*	-	0,1
DPCH Channelization Codes*	C(k, Q)	C(i, 32), i = 1,2
OCNS Channelization Code*	C(k, Q)	C(3, 32)
Information Data Rate	kbps	12.2
*Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.		

Table 7.3.1.2.3b: Performance requirements in multipath Case 1 channel (7,68 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	13.9	10^{-2}

7.3.1.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal, representing a multipath propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3.1.4 Method of test

7.3.1.4.1 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, , the fading simulator, the AWGN generator and additional components to the UE antenna connector as shown in figure A.10.

2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s), (64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in

annex C for 3.84 Mcps TDD option and 1.28Mcps TDD option. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) for 7.68 Mcps TDD option.

3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).

4) The levels of the wanted signal and the co-channel signals are set according to table 7.3.1.2.1a and b for the 3,84 Mcps TDD Option, table 7.3.1.2.2a and b for the 1,28 Mcps TDD Option and table 7.3.1.2.3a and b for the 7,68 Mcps TDD Option, respectively.

7.3.1.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all tests specified in table 7.3.1.2.1a for the 3,84 Mcps TDD Option, table 7.3.1.2.2a for the 1,28 Mcps TDD Option and table 7.3.1.2.3a for the 7,68 Mcps TDD Option, respectively.

7.3.1.5 Test requirements

7.3.1.5.1 3.84Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.1.2.1b for the 3,84 Mcps TDD Option

7.3.1.5.2 1.28Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.1.5.2b for the1.28 Mcps TDD Option

Table 7.3.1.5.2b: Performance requirements in a multipath Case 1 channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	23.0	10^{-2}
2	16.4	10^{-1}
	23.5	10^{-2}
3	17.2	10^{-1}
	24.5	10^{-2}
4	16.2	10^{-1}
	22.0	10^{-2}

7.3.1.5.3 7.68Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.1.2.3b for the 7.68 Mcps TDD Option

NOTE: If the 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.

7.3.2 Multipath fading Case 2

7.3.2.1 Definition and applicability

The performance requirement of DCH is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rates, supported. The data-rate-corresponding requirements shall apply to the UE.

The requirements and this test apply to all types of UTRA TDD UE.

7.3.2.2 Minimum requirement

7.3.2.2.1 3,84 Mcps TDD Option

For the parameters specified in table 7.3.2.2.1a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.2.2.1b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.3.2.1.

Table 7.3.2.2.1a: DCH parameters in multipath Case 2 channel (3,84 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4	Test 5
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	DB	-3	0	0	0	0
I_{oc}	dBm/3,84 MHz	-60				
Cell Parameter (note)		0,1				
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1 . .5	C(i,16) i=1 . .9	C(i,16) i=1 . .8	-
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	-	-	-	-
Information Data Rate	kbps	12,2	64	144	384	2048
Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.						

Table 7.3.2.2.1b: Performance requirements in multipath Case 2 channel (3,84 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	5,8	10^{-2}
2	5,7	10^{-1}
	9,2	10^{-2}
3	9,3	10^{-1}
	12,7	10^{-2}
4	8,8	10^{-1}
	12,0	10^{-2}
5	10,3	10^{-1}
	12,7	10^{-2}

7.3.2.2.2 1,28 Mcps TDD Option

For the parameters specified in table 7.3.2.2.2a: the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.2.2.2b. The reference for this requirement is TS 25.102 [1] clause 8.3.2.1.2.

Table 7.3.2.2.2a: DCH parameters in multipath Case 2 channel (1,28 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
Number of $DPCH_o$		8	2	2	0
Scrambling code and basic midamble code number (see note)		0	0	0	0
DPCH Channelization Codes (see note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8	C(i,16) i=1…8	C(i,16) i=1…9
$DPCH_o$ Channelization Codes (see note)	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10	C(i,16) 9≤ i ≤10	-
$\frac{DPCH_o\_E_c}{I_{or}}$	dB	-10	-10	-10	0
I_{oc}	dBm/1,28MHz	-60			
Midamble		Common midamble			
Information Data Rate	Kbps	12.2	64	144	384
Note Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.					

Table 7.3.2.2.2b: Performance requirements in multipath Case 2 channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	13.6	10^{-2}
2	9.8	10^{-1}
	13.9	10^{-2}
3	10.3	10^{-1}
	14.4	10^{-2}
4	11.4	10^{-1}
	15.0	10^{-2}

7.3.2.2.3 7,68 Mcps TDD Option

For the parameters specified in table 7.3.2.2.3a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.2.2.3b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.3.2.1.3.

Table 7.3.2.2.3a: DCH parameters in multipath Case 2 channel (7,68 Mcps TDD Option)

Parameters	Unit	Test 1
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	-6
I_{oc}	dBm/7.68 MHz	-60
Cell Parameter (note)	-	0,1
DPCH Channelization Codes (note)	C(k, Q)	C(i, 32), i = 1,2
OCNS Channelization Code (note)	C(k, Q)	C(3, 32)
Information Data Rate	kbps	12.2
NOTE: Refer to TS 25.223 for definition of channelization codes and cell parameter.		

Table 7.3.2.2.3b: Performance requirements in multipath Case 2 channel (7,68 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	5.8	10^{-2}

7.3.2.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal, representing a multipath propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3.2.4 Method of test

7.3.2.4.1 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, the fading simulator, the AWGN generator and additional components to the UE antenna connector as shown in figure A.10.

2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) (64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C for 3.84 Mcps TDD option and 1.28Mcps TDD option. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) for 7.68 Mcps TDD option.

3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).

4) The levels of the wanted signal and the co-channel signals are set according to table 7.3.2.2.1a and b for the 3,84 Mcps TDD Option, table 7.3.2.2.2a and b for the 1,28 Mcps TDD Option and table 7.3.2.2.3a and b for the 7,68 Mcps TDD Option, respectively.

7.3.2.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all tests specified in table 7.3.2.2.1a for the 3,84 Mcps TDD Option, table 7.3.2.2.2a for the 1,28 Mcps TDD Option and table 7.3.2.2.3a for the 7,68 Mcps TDD Option, respectively.

7.3.2.5 Test requirements

7.3.2.5.1 3.84Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.2.2.1b for the 3,84 Mcps TDD Option

7.3.2.5.2 1.28Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.2.5.2b for the1.28 Mcps TDD Option

Table 7.3.2.5.2b: Performance requirements in multipath Case 2 channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	14.2	10^{-2}
2	10.4	10^{-1}
	14.5	10^{-2}
3	10.9	10^{-1}
	15.0	10^{-2}
4	12.0	10^{-1}
	15.6	10^{-2}

7.3.2.5.3 7.68Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.2.2.3b for the 7.68 Mcps TDD Option

NOTE: If the 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.

7.3.3 Multipath fading Case 3

7.3.3.1 Definition and applicability

The performance requirement of DCH is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rates, supported. The data-rate-corresponding requirements shall apply to the UE.

The requirements and this test apply to all types of UTRA TDD UE.

7.3.3.2 Minimum requirements

7.3.3.2.1 3,84 Mcps TDD Option

For the parameters specified in table 7.3.3.2.1a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.3.2.1b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 clause 8.3.3.1.1.

Table 7.3.3.2.1a: DCH parameters in multipath Case 3 channel (3,84 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4	Test 5
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	DB	-3	0	0	0	0
I_{oc}	dBm/3,84 MHz	-60				
Cell Parameter (note)		0,1				
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1 . .5	C(i,16) i=1 . .9	C(i,16) i=1 . .8	-
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	-	-	-	-
Information Data Rate	kbps	12,2	64	144	384	2048
Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.						

Table 7.3.3.2.1b: Performance requirements in multipath Case 3 channel (3,84 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	4,8	10^{-2}
2	5,8	10^{-1}
	8,5	10^{-2}
	10,7	10^{-3}
3	10,3	10^{-1}
	13,3	10^{-2}
	16,0	10^{-3}
4	8,9	10^{-1}
	11,5	10^{-2}
	13,6	10^{-3}
5	9,4	10^{-1}
	11,5	10^{-2}
	13,6	10^{-3}

7.3.3.2.2 1,28 Mcps TDD Option

For the parameters specified in table 7.3.3.2.2a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.3.2.2b. The reference for this requirement is TS 25.102 [1] clause 8.3.3.1.2.

Table 7.3.3.2.2a: DCH parameters in multipath Case 3 channel (1,28 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
Number of $DPCH_o$		8	2	2	0
Scrambling code and basic midamble code number (see note)		0	0	0	0
DPCH Channelization Codes (see note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8	C(i,16) i=1…8	C(i,16) i=1…9
$DPCH_o$ Channelization Codes (see note)	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10	C(i,16) 9≤ i ≤10	-
$\frac{DPCH_o\_E_c}{I_{or}}$	dB	-10	-10	-10	0
I_{oc}	dBm/1,28MHz	-60			
Midamble		Common midamble			
Information Data Rate	Kbps	12.2	64	144	384
Note Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.					

Table 7.3.3.2.2b: Performance requirements in multipath Case 3 channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	11.7	10^{-2}
2	9.0	10^{-1}
	11.7	10^{-2}
	14.3	10^{-3}
3	9.1	10^{-1}
	11.2	10^{-2}
	12.7	10^{-3}
4	9.9	10^{-1}
	11.2	10^{-2}
	12.4	10^{-3}

7.3.3.2.3 7,68 Mcps TDD Option

For the parameters specified in table 7.3.3.2.3a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.3.2.3b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 clause 8.3.3.1.3.

Table 7.3.3.2.3a: DCH parameters in multipath Case 3 channel (7,68 Mcps TDD Option)

Parameters	Unit	Test 1
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	-6
I_{oc}	dBm/7.68 MHz	-60
Cell Parameter*	-	0,1
DPCH Channelization Codes*	C(k, Q)	C(i, 32), i = 1,2
OCNS Channelization Code*	C(k, Q)	C(3, 32)
Information Data Rate	kbps	12.2
*Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.		

Table 7.3.3.2.3b: Performance requirements in multipath Case 3 channel (7,68 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	4.8	10^{-2}

7.3.3.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal ,representing a multipath propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3.3.4 Method of test

7.3.3.4.1 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, the fading simulator, the AWGN generator and additional components to the UE antenna connector as shown in figure A.10.

2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s)(64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C for 3.84 Mcps TDD option and 1.28Mcps TDD option. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) for 7.68 Mcps TDD option.

3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).

4) The levels of the wanted signal and the co-channel signals are set according to table 7.3.3.2.1a and b for the 3,84 Mcps TDD Option, table 7.3.3.2.2a and b for the 1,28 Mcps TDD Option and table 7.3.3.2.3a and b for the 7,68 Mcps TDD Option, respectively.

7.3.3.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all tests specified in table 7.3.3.2.1a for the 3,84 Mcps TDD Option, table 7.3.3.2.2a for the 1,28 Mcps TDD Option and table 7.3.3.2.3a for the 7,68 Mcps TDD Option, respectively.

7.3.3.5 Test requirements

7.3.3.5.1 3.84Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.3.2.1b for the 3,84 Mcps TDD Option

7.3.3.5.2 1.28Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.3.5.2b for the1.28 Mcps TDD Option

Table 7.3.3.5.2b: Performance requirements in multipath Case 3 channel (1,28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	12.3	10^{-2}
2	9.6	10^{-1}
	12.3	10^{-2}
	14.9	10^{-3}
3	10.0	10^{-1}
	11.8	10^{-2}
	13.3	10^{-3}
4	10.5	10^{-1}
	11.8	10^{-2}
	13.0	10^{-3}

7.3.3.5.3 7.68Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3.3.2.3b for the 7.68Mcps TDD Option.

NOTE: If the 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.

7.3A Demodulation of DCH in High speed train conditions

7.3A.1 Definition and applicability

7.3A.1.1 3,84 Mcps TDD Option

<void>

7.3A.1.2 1,28 Mcps TDD Option

The performance requirement of DCH in high speed train conditions is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rates, supported. The data-rate-corresponding requirements shall apply to the UE.

The requirements and this test apply to all types of 1.28 Mcps TDD UE of Release 9 and later.

7.3A.1.3 3,84 Mcps TDD Option

<void>

7.3A.2 Minimum requirements

7.3A.2.1 3,84 Mcps TDD Option

<void>

7.3A.2.2 1,28 Mcps TDD Option

For the parameters specified in table 7.3A.2.2a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3A.2.2b. The reference for this requirement is TS 25.102 [1] clause 8.3A.2.2.

Table 7.3A.2.2a: DCH parameters in high speed train condition

Parameters	Unit	Test 1	Test 2
Number of DPCHo		8	2
Scrambling code and basic midamble code number*		0	0
DPCH Channelization Codes*		C(i,16) i=1,2	C(i,16) i=1…8
$DPCH_o$ Channelization Codes*	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10
$\frac{DPCH_o \_ E_c}{I_{or}}$	C(k,Q)	*-10*	-10
Ioc	dBm/1.28MHz	-60	
Information Data Rate	Kbps	12.2	64
*Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.			

Table 7.3A.2.2b: Performance requirements in high speed train condition

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$	BLER
1	8.5	10^{-2}
2	6.2	10^{-1}
	8.5	10^{-2}

7.3A.2.3 7,68 Mcps TDD Option

<void>

7.3A.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal ,representing a high speed train channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3A.4 Method of test

7.3A.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.

1) Connect the SS, the AWGN noise source and additional components to the UE antenna connector as shown in figure A.10.
2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) and (64 kbit/s) specified in annex C 1.28Mcps TDD option.
3) Enter the UE into loopback test mode and start the loopback test.
4) Setup fading simulation as High speed train conditions, which is described in clause D.2.4A.
5) The levels of the wanted signal and the co-channel signals are set according to table 7.3A.2.2a for the 1,28 Mcps TDD Option.

7.3A.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all tests specified in table 7.3A.2.2a for the 1,28 Mcps TDD Option.

7.3A.5 Test requirements

7.3A.5.1 3.84Mcps TDD Option

<void>

7.3A.5.2 1.28Mcps TDD Option

The measured BLER shall not exceed the values indicated in table 7.3A.3.2a for the1.28 Mcps TDD Option

Table 7.3A.5.2a: Performance requirements in high speed train condition

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$	BLER
1	9.1	10^{-2}
2	6.8	10^{-1}
	9.1	10^{-2}

7.3A.5.3 7.68Mcps TDD Option

<void>

NOTE: If the 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.

7.4 Base station transmit diversity mode for 3,84 Mcps TDD Option

7.4.1 Demodulation of BCH in SCTD mode

This is not tested.

7.5 Power control in downlink

7.5.1 Definition and applicability

Power control in the uplink is the ability of the UE to converge to the required link quality set by the network while using minimum uplink power. The requirements of this test shall apply to the UTRA-TDD UE.

7.5.2 Power control in downlink for 3,84 Mcps TDD option, constant BLER Target

7.5.2.1 Minimum requirements

For the parameters specified in table 7.5.2.1 the downlink $\hat{I}_{or}/I_{oc}$ averaged over one timeslot shall be below the specified value in table 7.5.2 more than 90% of the time. BLER shall be as shown in table 7.5.2.2 Downlink power control is ON during the test.

Table 7.5.2.1: Test parameters for downlink power control - constant BLER Target

Parameter	Unit	Test 1
$\frac{DPCH\_E_c}{I_{or}}$	dB	0
I_{oc}	dBm/3,84 MHz	-60
Information Data Rate	kbps	12,2
Target quality value on DTCH	BLER	0,01
Propagation condition		Case 1
DL Power Control step size, Δ_{TPC}	dB	1
Maximum_DL_power (note)	dB	0
Minimum_DL_power (note)	dB	-27
NOTE: Refer to TS 25.224 for description and definition		

NOTE: DL power is relative to P-CCPCH power.

Table 7.5.2.2: Requirements for downlink power control - constant BLER Target

Parameter	Unit	Test 1
$\hat{I}_{or}/I_{oc}$	dB	8,5
Measured quality on DTCH	BLER	0,01±30%

The reference for this requirement is TS 25.102 [1] clause 8.5.1.

7.5.2.2 Test purpose

To verify that the UE receiver is capable of converging to the required link quality set by the network while using as low power as possible.

7.5.2.3 Method of test

7.5.2.3.1 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 SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.5.2.1

4) Enter the UE into loopback test mode and start the loopback test.

5) SS signals to UE target quality value on DTCH as specified in table 7.5.2.1. SS will vary the physical channel power in downlink according to the TPC commands from UE, and at the same time measure BLER. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

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

7.5.2.3.2 Procedure

1) After the target quality on DTCH is met, BLER is measured. Simultaneously the downlink $\hat{I}_{or}/I_{oc}$ power ratio averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

2) The measured quality on DTCH (BLER) and the measured downlink $\hat{I}_{or}/I_{oc}$ power ratio values averaged over one slot are compared to the limits in table 7.5.2.2.

7.5.2.4 Test Requirements

a) The measured quality on DTCH does not exceed the values in table 7.5.2.2.

b) The downlink $\hat{I}_{or}/I_{oc}$ power ratio values, which are averaged over one slot, shall be below the values in table 7.5.2.2 more than 90 % of the time.

7.5.3 Power control in downlink for 1,28 Mcps TDD option, constant BLER Target(Release 6 and earlier)

7.5.3.1 Definition and applicability

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See clause C.3),

then it has to be such that outer loop is based on DTCH and not on DCCH. The requirements and this test apply to all types of UTRA for the 1,28 Mcps TDD UE Release 6 and earlier releases.

7.5.3.2 Minimum requirements

For the parameters specified in table 7.5.3.1 the downlink $\hat{I}_{or}/I_{oc}$ averaged over one timeslot power shall be below the specified value in table 7.5.3.2 more than 90% of the time. BLER shall be as shown in table 7.5.3.2. Downlink power control is ON during the test.

Table 7.5.3.1: Test parameters for downlink power control – constant BLER Target

Parameter	Unit	Value
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	0
I_{oc}	dBm/1.28 MHz	-60
Information data rate	kbps	12.2
Target quality on DTCH	BLER	0.01
Propagation condition	Case 1	
DL Power Control step size, Δ_{TPC}	dB	1
Maximum_DL_power *	dB	0
Minimum_DL_power *	dB	-27

NOTE: DL power is compared to P-CCPCH power.

Table 7.5.3.2: Requirements for downlink power control – constant BLER Target

Parameter	Unit	Test 1	
$\hat{I}_{or}/I_{oc}$	dB	7.5	
Measured quality on DTCH	BLER	0,01±30%	

The reference for this requirement is TS 25.102 [1] clause 8.5.1.

7.5.3.3 Test purpose

To verify that the UE receiver is capable of converging to the required link quality set by the network while using as low power as possible.

7.5.3.4 Method of test

7.5.3.4.1 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 SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.5.3.1

4) Enter the UE into loopback test mode and start the loopback test.

5) SS signals to UE target quality value on DTCH as specified in table 7.5.3.1. SS will vary the physical channel power in downlink according to the TPC commands from UE, and at the same time measure BLER. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

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

7.5.3.4.2 Procedure

1) After the target quality on DTCH is met, BLER is measured. Simultaneously the downlink $\hat{I}_{or}/I_{oc}$ power ratio averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

2) The measured quality on DTCH (BLER) and the measured downlink $\hat{I}_{or}/I_{oc}$ power ratio values averaged over one slot are compared to the limits in table 7.5.3.2.

7.5.3.5 Test Requirements

a) The measured quality on DTCH does not exceed the values in table 7.5.3.2.

b) The downlink $\hat{I}_{or}/I_{oc}$ power ratio values, which are averaged over one slot, shall be below the values in table 7.5.3.2.

7.5.3A Power control in downlink for 1,28 Mcps TDD option, constant BLER Target(Release 7 and later)

7.5.3A.1 Definition and applicability

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See clause C.3), then it has to be such that outer loop is based on DTCH and not on DCCH. The requirements and this test apply to all types of UTRA for the 1,28 Mcps TDD UE Release 7 and later releases.

7.5.3A.2 Minimum requirements

For the parameters specified in table 7.5.3A.1 the downlink $\hat{I}_{or}/I_{oc}$ averaged over one timeslot power shall be below the specified value in table 7.5.3A.2 more than 90% of the time. BLER shall be as shown in table 7.5.3A.2. Downlink power control is ON during the test.

Table 7.5.3A.1: Test parameters for downlink power control – constant BLER Target

Parameter	Unit	Test 1	Test2	Test3	Test4	Test5	Test6
$\frac{\Sigma DPCH\_E_c}{I_{or}}$	dB	0	0	0	0	0	0
I_{oc}	dBm/1.28 Mhz	-60	-60	-60	-60	-60	-60
Information data rate	kbps	12.2	12.2	64	64	64	64
Target quality on DTCH	BLER	0.01	0.01	0. 1	0.1	0.001	0.001
Propagation condition		Case 1	Case3	Case 1	Case3	Case1	Case3
DL Power Control step size, Δ_{TPC}	dB	1	1	1	1	1	1
Maximum_DL_power *	dB	0	0	0	0	0	0
Minimum_DL_power *	dB	-27	-27	-27	-27	-27	-27

NOTE: DL power is compared to P-CCPCH power.

Table 7.5.3A.2: Requirements for downlink power control – constant BLER Target

Parameter	Unit	Test 1	Test 2	Test 3	Test 4	Test5	Test 6
$\hat{I}_{or}/I_{oc}$	dB	7.5	4.8	9.1	8.9	17.9	13.1
Measured quality on DTCH	BLER	0.01±30%	0.01±30%	0.1±30%	0.1±30%	0.001±30%	0.001±30%

The reference for this requirement is TS 25.102 [1] clause 8.5.1.

7.5.3A.3 Test purpose

To verify that the UE receiver is capable of converging to the required link quality set by the network while using as low power as possible.

7.5.3A.4 Method of test

7.5.3A.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.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.5.3A.1

4) Enter the UE into loopback test mode and start the loopback test.

5) SS signals to UE target quality value on DTCH as specified in table 7.5.3A.1. SS will vary the physical channel power in downlink according to the TPC commands from UE, and at the same time measure BLER. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

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

7.5.3A.4.2 Procedure

1) After the target quality on DTCH is met, BLER is measured. Simultaneously the downlink $\hat{I}_{or}/I_{oc}$ power ratio averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

2) The measured quality on DTCH (BLER) and the measured downlink $\hat{I}_{or}/I_{oc}$ power ratio values averaged over one slot are compared to the limits in table 7.5.3A.2.

7.5.3A.5 Test Requirements

a) The measured quality on DTCH does not exceed the values in table 7.5.3A.2.

b) The downlink $\hat{I}_{or}/I_{oc}$ power ratio values, which are averaged over one slot, shall be below the values in table 7.5.3A.2.7.5.4 Power control in downlink for 7,68 Mcps TDD option, constant BLER Target

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7.5.4 Power control in the downlink for 1,28 Mcps TDD option, wind up effects

7.5.4.1 Definition and applicability

This requirement verifies that, after the downlink maximum power is limited in the UTRAN and it has been released again, the downlink power control in the UE does not have a wind up effect, i.e. the required DL power has increased during time period the DL power was limited.

The requirements and this test apply to all types of 1.28 Mcps TDD UE of Release 7 and later.

7.5.4.2 Minimum requirements

This test is run in three stages where stage 1 is for convergence of the power control loop. In stage two the maximum downlink power for the dedicated channel is limited not to be higher than the parameter specified in table 7.5.4.1. All parameters used in the three stages are specified in table 7.5.4.1. The downlink Ior/Ioc power ratio measured values, which are averaged over one timeslot, during stage 3 shall be lower than the value specified in table 7.5.4.2 more than 90 % of the time. Power control of the UE is ON during the test.

Table 7.5.4.1: Test parameter for downlink power control, wind-up effects

Parameter	Test 1			Unit
	Stage 1	Stage 2	Stage 3	
Time in each stage	5	40	5	S
I_{oc}	-60			dBm/1,28 MHz
Information Data Rate	12,2			Kbps
Quality target on DTCH	0,01			BLER
Propagation condition	Case 1			
Maximum_DL_Power (Note 2)	0	*P* (Note 1)	0	dB
Minimum_DL_Power (Note 2)	-27			dB
DL Power Control step size, Δ_{TPC}	1			dB
Note 1: *P* is the level corresponding to the average Ior/Ioc power ratio - 3 dB compared to the P-CCPCH level. The average Ior/Ioc power ratio is measured during the initialisation stage after the power control loop has converged before the actual test starts. Note 2: Power is compared to P-CCPCH.				

Table 7.5.4.2: Requirements in downlink power control, wind-up effects

Parameter	Test 1, stage 3	Unit
Ior/Ioc	9.1	dB

The reference for this requirement is TS 25.102 [1] clause 8.5.2.

7.5.4.3 Test purpose

To verify that the UE downlink power control does not require too high downlink power during a period after the downlink power is limited by the UTRAN.

7.5.4.4 Method of test

7.5.4.4.1 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 SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test. RF parameters are set up according to table 7.5.4.1. SS waits 15 seconds and then collects the Ior/Ioc power ratio measured values, which are averaged over one timeslot, over 80 second period. The average of these Ior/Ioc values is then calculated and 3dB is subtracted from it to get the power value P, which will then be used during the stage 2 in the test procedure.

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

7.5.4.4.2 Procedure

1) RF parameters are set up according to table 7.5.4.1. Stage 1 is used for the power control to converge and During Stage 2 the maximum downlink power is limited by UTRAN.

2) SS will vary the physical channel power in downlink according to the TPC commands from UE during stages 1, 2, and 3.

3) Measure Ior/Ioc power ratio during stage 3 according to table 7.5.4.1.

4) Repeat steps 1) to 3) 230 times.

NOTE: The number of repetitions (230) is derived from minimum testing time for 3 km/h fading channels (Table F.6.1.6.2; 1168 seconds).

7.5.4.5 Test Requirements

The downlink Ior/Ioc power ratio values, which are averaged over one timeslot during stage 3, shall be lower than the level specified in table 7.5.4.2 during stage 3 more than 90 % of the time.

7.5.5 Power control in the downlink for 1,28 Mcps TDD option, initial convergence

7.5.5.1 Definition and applicability

This requirement verifies that DL power control works properly during the first seconds after DPCH connection is established.

The requirements and this test apply to all types of 1.28 Mcps TDD UE of Release 7 and later.

7.5.5.2 Minimum requirements

For the parameters specified in table 7.5.5.1 the downlink DPCH_ I_{or}/I_{oc} power ratio measured values, which are averaged over 50 ms, shall be within the range specified in table 7.5.5.2 more than 90 % of the time. T1 equals to 5 s and it starts 100 ms after the uplink DPCH physical channel is considered established. T2 equals to 5 s and it starts when T1 has expired. Power control is ON during the test.

The first 100 ms shall not be used for averaging, i.e. the first sample to be input to the averaging filter is at the beginning of T1. The averaging shall be performed with a sliding rectangular window averaging filter. The window size of the averaging filter is linearly increased from 0 up to 50 ms during the first 50 ms of T1, and then kept equal to 50ms .

Table 7.5.5.1: Test parameters for downlink power control, initial convergence

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Target quality value on DTCH	BLER	0.01	0.01	0.1	0.1
Initial I_{or}/I_{oc}	dB	5	-15	9.4	-10.6
Information Data Rate	kbps	12.2	12.2	64	64
I_{oc}	dBm/1.28 MHz	-60			
Propagation condition		Static			
Maximum_DL_Power	dB	0			
Minimum_DL_Power	dB	-27			
DL Power Control step size, Δ_{TPC}	dB	1			

Table 7.5.5.2: Requirements in downlink power control, initial convergence

Parameter	Unit	Test 1 and Test 2	Test 3 and Test 4
I_{or}/I_{oc} during T1	dB	$-8.5 \le I_{or}/I_{oc} \le 0$	$-4.1 \le I_{or}/I_{oc} \le 4.4$
I_{or}/I_{oc} during T2	dB	$-8.5 \le I_{or}/I_{oc} \le -3$	$-4.1 \le I_{or}/I_{oc} \le 1.4$

The reference for this requirement is TS 25.102 [1] clause 8.5.3.2.

NOTE: DTCH shall be transmitted during the whole test.

7.5.5.3 Test purpose

To verify that DL power control works properly during the first seconds after DPCH connection is established.

7.5.5.4 Method of test

7.5.5.4.1 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 SS and an AWGN source to the UE antenna connector as shown in figure A.9.

7.5.5.4.2 Procedure

1) Enter the UE into loopback test mode according to the Generic call setup procedure. System simulator shall activate power control at the activation time of the Radio Bearer Setup message (At RRC connection setup only DCCH is established). The uplink DPCH physical channel is considered established at the activation time of the Radio Bearer Setup message.

2) RF parameters are set up according to table 7.5.5.1 for the test running. After the transmission of Radio Bearer Setup message, initial DPCH I_{or}/I_{oc} is set to the specified level at the activation time.

3) SS will vary the physical channel power in downlink according to the TPC commands from UE.

4) Measure I_{or}/I_{oc} power ratio averaged over 50 ms during T1. T1 starts 100 ms after the uplink DPCH physical channel is considered established and T1 equals to 5 s. The first 100 ms shall not be used for averaging, i.e. the first sample to be input to the averaging filter is at the beginning of T1. The averaging shall be performed with a sliding rectangular window averaging filter. The window size of the averaging filter is linearly increased from 0 up to 50 ms during the first 50 ms of T1, and then kept equal to 50ms. At the first slot where the averaging window crosses the T1 - T2 boundary, the average power level within the window begins to test against the T2 requirements.

5) Measure I_{or}/I_{oc} power ratio averaged over 50 ms during T2. T2 starts, when T1 has expired and T2 equals to 5 s.

The reception of the "RB setup complete" and the "CLOSE UE TEST LOOP COMPLETE" messages is not necessary to pass this test.

7.5.5.5 Test Requirements

a) The downlink I_{or}/I_{oc} power ratio values shall be within the range specified in table 7.5.5.2 during T1 more than 90 % of the time.

b) The downlink I_{or}/I_{oc} power ratio values shall be within the range specified in table 7.5.5.2 during T2 more than 90 % of the time.

7.6 Uplink Power Control

7.6.1 Definition and applicability

Power control in the uplink is the ability of the UE to converge to the required link quality set by the network while using minimum uplink power. The requirements of this test shall apply to all types of the UTRA-TDD UE.

7.6.2 Minimum requirements

During period T1, the PCCPCH and a second Beacon Channel are transmitted in the DL in designated slots within each frame and at the same power level.

The UE transmits, using the channel of TS25.105, Annex A.2.1 UL reference measurement channel (12.2 kbps) in one UL slot. For different parts of the test, different UL slots will be designated.

The values of table 7.6.1, period T1 shall be selected. Then, with the received PCCPCH and Beacon power set at –60 dBm, the value of DPCH constant value shall be adjusted so that the mean UE output power is 5 dBm. These conditions are held steady during period T1.

Periods T1 and T2 are each 5 seconds long.

Table 7.6.1: UL Power Control Test Conditions

		Period T1	Period T2
I_{BTS} all slots	dBm	-60	
PCCPCH Power -Broadcast	dBm	18	
PCCPCH Power - Received	dBm	-60	-70
Mean UE transmit power	dBm	5	According to tables 7.6.2 and 7.6.3
SIR_{TARGET}	dB	6	
I_{oc} in PCCPCH and Beacon Slots	dBm	-60	
IE (information element) Alpha	As defined in 25.331	1.0	
PCCPCH slot position	Integer 0 -14	0	
Beacon slot position	Integer 0 -14	8	

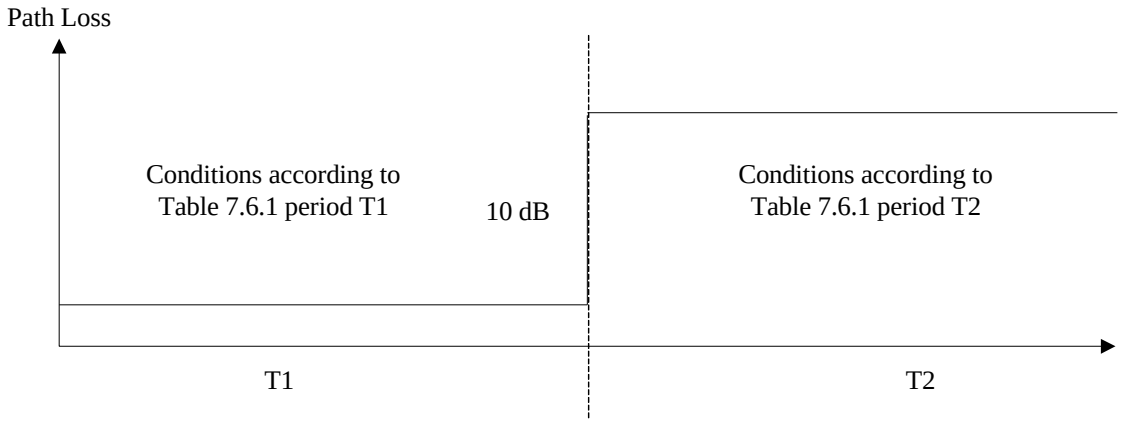

Figure 7.6.1

At the end of period T1, the PCCPCH and Beacon Received power shall be simultaneously decreased by 10 dB. These conditions are summarized in table 7.6.1, period T2.

For the first frame including the change in received power the UE output power shall satisfy the values in table 7.6.2.

For the 20th frame after the change in received power the UE output power shall satisfy the values in table 7.6.3.

Table 7.6.2: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	5 ±0.5

Table 7.6.3: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	15 ±4.0

7.6.3 Test purpose

To verify the ability of the UE to converge to the required link quality set by the network while using minimum uplink power.

7.6.4 Method of test

7.6.4.1 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 SS and an AWGN source to the UE antenna connector as shown in figure A.9.

2) Set up a call according to the Generic call setup procedure using SS levels and signalling values as specified in table 7.6.1 for Period P1 and table 7.6.4 . The UE shall be signalled to transmit in timeslot position 1.

Table 7.6.4: Test parameters for Uplink Power Control Test

Parameter	Value/description
UL Reference measurement channel	12,2kbps, according to annex C.2.1
DPCH constant value	0
Data content	real life (sufficient irregular)

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.

7.6.4.2 Procedure

1) The SS adjusts the DPCH constant value until the UE transmit power is 5 dBm.

2) After the UE output power has been held constant at 5 dBm for at least 5 seconds, the received PCCPCH power shall be decreased by 10 dB to -70 dBm as shown in figure 7.6.1.

3) Measure the transmit power according to annex B for the first frame including the pathloss change and the 20th frame after the pathloss change.

4) Set the received PCCPCH power to -60 dBm.

5) SS signals UE to transmit in timeslot 7. Repeat step 1 - 4.

6) SS signals UE to transmit in timeslot 9. Repeat step 1 - 4.

7) SS signals UE to transmit in timeslot 14. Repeat step 1 - 4.

7.6.5 Test Requirements

The measured transmit power shall not exceed the prescribed tolerance in tables 7.6.5 and 7.6.6.

Table 7.6.5: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	5 ±0.5

Table 7.6.6: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	15 ±5.5

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 annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F clause F.4.

7.7 Demodulation of DCH in moving conditions

7.7.1 Definition and applicability

7.7.1.1 3,84 Mcps TDD Option

<void>

7.7.1.2 1,28 Mcps TDD Option

The receive characteristics of the Dedicated Channel (DCH) in dynamic moving propagation conditions are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of 1.28 Mcps TDD UE of Release 7 and later.

7.7.1.3 7,68 Mcps TDD Option

<void>

7.7.2 Minimum requirements

7.7.2.1 3.84 Mcps TDD Option

Void

7.7.2.2 1.28 Mcps TDD Option

For the parameters specified in Table 7.7.1 the BLER should not exceed the piece-wise linear BLER curve specified in Table 7.7.2.

Table 7.7.1: DCH parameters in moving propagation conditions (1.28 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2
Number of $DPCH_o$		8	2
Scrambling code and basic midamble code number*		0	0
DPCH Channelization Codes*	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8
$DPCH_o$ Channelization Codes*	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10
$\frac{DPCH_o \_ E_c}{I_{or}}$	DB	-10	-10
I_{oc}	dBm/1.28MHz	-60	
Information Data Rate	Kbps	12.2	64
*Note: Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.			

Table 7.7.2: Performance requirements in moving propagation conditions (1.28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	7.1	10^{-2}
2	6.7	10^{-2}

7.7.2.3 7.68 Mcps TDD Option

void

7.7.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a moving propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.7.4 Method of test

7.7.4.1 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 and an AWGN noise source to the UE antenna connector as shown in figure A.10. In case of UE-receive diversity connect according to figure A.17.
2. Set up a call according to the Generic call setup procedure TS34.108 [3] sub clause 7.3.2.
3. Set the test parameters as specified in table 7.7.1.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulator as moving propagation condition, which is described in clause D.2.3.

7.7.4.2 Procedure

1. Measure BLER of DCH.

7.7.5 Test Requirements

7.7.5.1 3.84 Mcps option

Void.

7.7.5.2 1.28 Mcps option

For the parameters specified in table 7.7.3 the average downlink $\frac{\hat{I}_{or}}{I_{oc}}$ power ratio shall be below the specified value for the BLER shown in table 7.7.4.

Table 7.7.3: DCH parameters in moving propagation conditions

Parameters	Unit	Test 1	Test 2
Number of $DPCH_o$		8	2
Scrambling code and basic midamble code number*		0	0
DPCH Channelization Codes*	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8
$DPCH_o$ Channelization Codes*	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10
$\frac{DPCH_o\_E_c}{I_{or}}$	DB	-10	-10
I_{oc}	dBm/1.28MHz	-60	
Information Data Rate	Kbps	12.2	64
*Note: Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.			

Table 7.7.4: DCH requirements in moving propagation conditions

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	7.8	10^{-2}
2	7.4	10^{-2}

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.

7.7.5.3 7.68Mcps option

Void.

7.8 Demodulation of DCH in birth-death conditions

7.8.1 Definition and applicability

7.8.1.1 3,84 Mcps TDD Option

<void>

7.8.1.2 1,28 Mcps TDD Option

The receive characteristics of the Dedicated Channel (DCH) in birth-death propagation conditions are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of 1.28 Mcps TDD UE of Release 7 and later.

7.8.1.3 7,68 Mcps TDD Option

<void>

7.8.2 Minimum requirements

7.8.2.1 3.84 Mcps TDD Option

Void

7.8.2.2 1.28 Mcps TDD Option

For the parameters specified in Table 7.8.1 the BLER should not exceed the piece-wise linear BLER curve specified in Table 7.8.2.

Table 7.8.1: DCH parameters in birth-death propagation conditions (1.28 Mcps TDD Option)

Parameters	Unit	Test 1	Test 2
Number of $DPCH_o$		8	2
Scrambling code and basic midamble code number*		0	0
DPCH Channelization Codes*	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8
$DPCH_o$ Channelization Codes*	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10
$\frac{DPCH_o\_E_c}{I_{or}}$	DB	-10	-10
I_{oc}	dBm/1.28MHz	-60	
Information Data Rate	Kbps	12.2	64
*Note: Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.			

Table 7.8.2: Performance requirements in birth-death propagation conditions (1.28 Mcps TDD Option)

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	7.3	10^{-2}
2	6.5	10^{-2}

7.8.2.3 7.68 Mcps TDD Option

void

7.8.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a moving propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.8.4 Method of test

7.8.4.1 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 and an AWGN noise source to the UE antenna connector as shown in figure A.10. In case of UE-receive diversity connect according to figure A.17.
2. Set up a call according to the Generic call setup procedure TS34.108 [3] sub clause 7.3.2.
3. Set the test parameters as specified in table 7.8.1.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulator as moving propagation condition, which is described in clause D.2.3.

7.8.4.2 Procedure

1. Measure BLER of DCH.

7.8.5 Test Requirements

7.8.5.1 3.84 Mcps option

Void.

7.8.5.2 1.28 Mcps option

For the parameters specified in table 7.8.3 the average downlink $\frac{\hat{I}_{or}}{I_{oc}}$ power ratio shall be below the specified value for the BLER shown in table 7.8.4.

Table 7.8.3: DCH parameters in birth-death propagation conditions

Parameters	Unit	Test 1	Test 2
Number of $DPCH_o$		8	2
Scrambling code and basic midamble code number*		0	0
DPCH Channelization Codes*	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1…8
$DPCH_o$ Channelization Codes*	C(k,Q)	C(i,16) 3≤ i ≤10	C(i,16) 9≤ i ≤10
$\frac{DPCH_o\_E_c}{I_{or}}$	DB	-10	-10
I_{oc}	dBm/1.28MHz	-60	
Information Data Rate	Kbps	12.2	64
*Note: Refer to TS 25.223 for definition of channelization codes, scrambling code and basic midamble code.			

Table 7.8.4: DCH requirements in birth-death propagation conditions

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	8.0	10^{-2}
2	7.2	10^{-2}

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.

7.8.5.3 7.68 Mcps option

Void.