Annex A (informative): Connection Diagrams

Definition of Terms

System Simulator or SS – A device or system, that is capable of generating simulated Node B signalling and analysing UE signalling responses on one or more RF channels, in order to create the required test environment for the UE under test. It will also include the following capabilities:

1. Measurement and control of the UE Tx output power through TPC commands
2. Measurement of Rx BLER and BER
3. Measurement of signalling timing and delays
4. Ability to simulate UTRAN and/or GERAN signalling

Test System – A combination of devices brought together into a system for the purpose of making one or more measurements on a UE in accordance with the test case requirements. A test system may include one or more System Simulators if additional signalling is required for the test case. The following diagrams are all examples of Test Systems.

NOTE: The above terms are logical definitions to be used to describe the test methods used in this document (TS34.121), in practice, real devices called 'System Simulators' may also include additional measurement capabilities or may only support those features required for the test cases they are designed to perform.

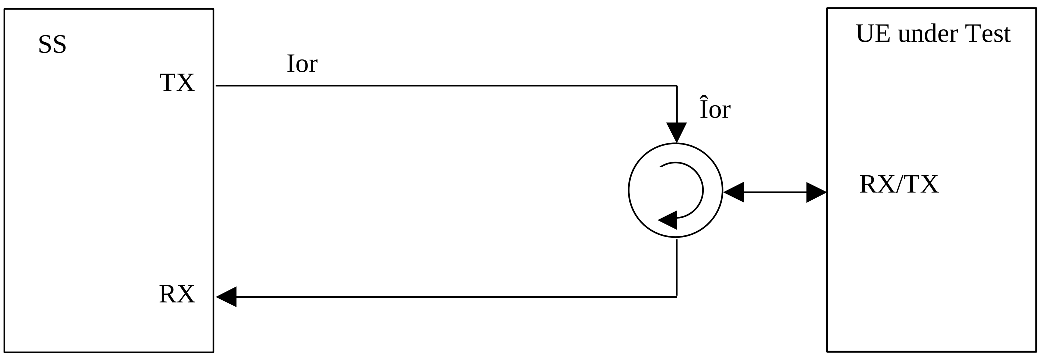


Figure A.1: Connection for basic single cell tests

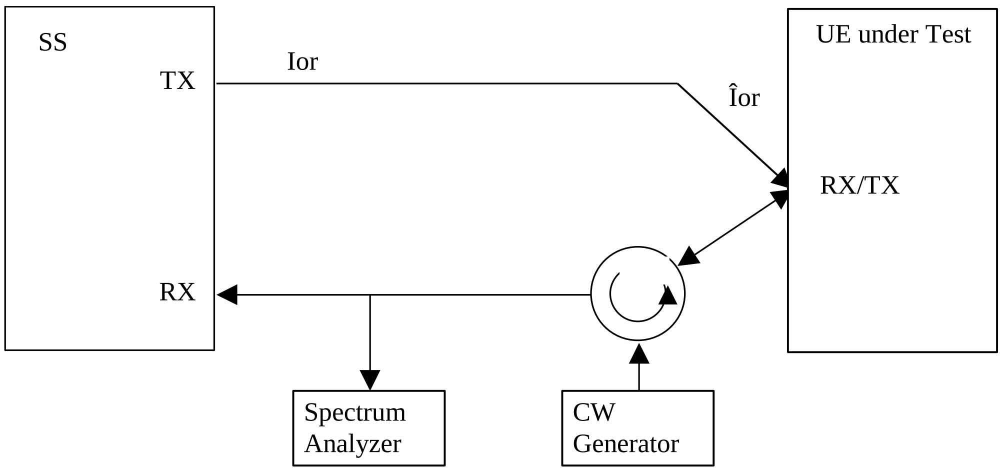


Figure A.2: Connection for Transmitter Intermodulation tests

Figure A.3: Void

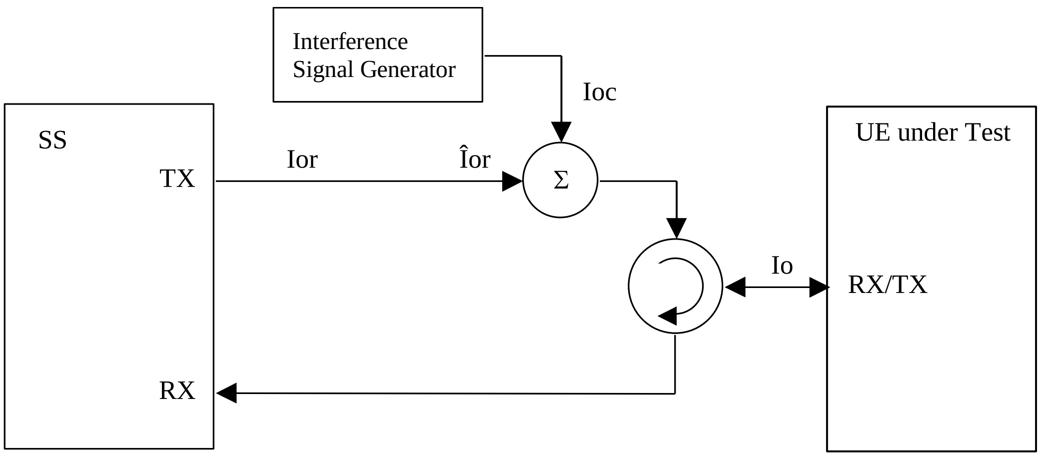


Figure A.4: Connection for Receiver tests with Interference

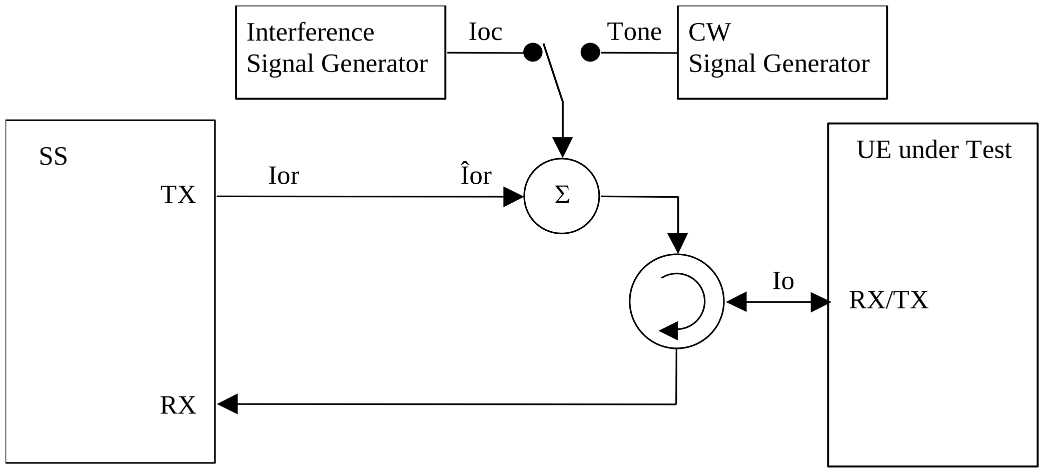


Figure A.5: Connection for Receiver tests with Interference or additional CW signal

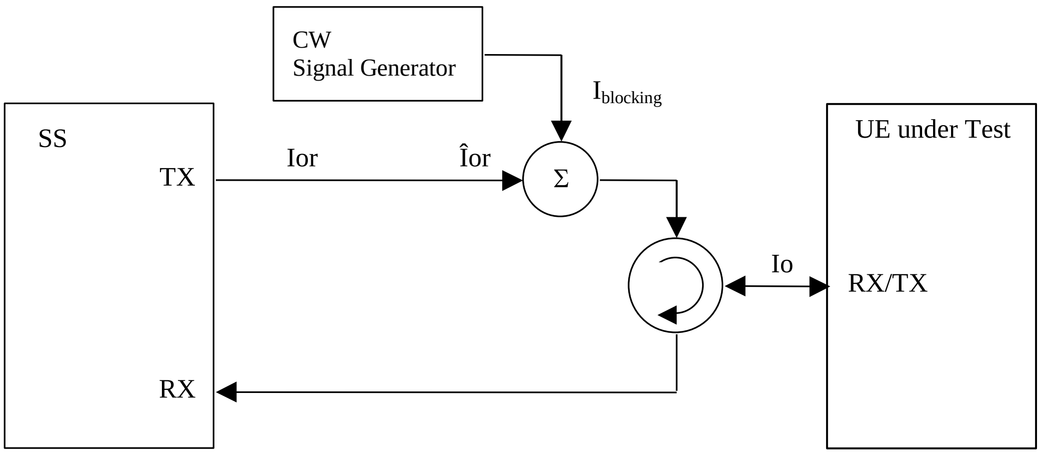


Figure A.6: Connection for Receiver tests with additional CW signal

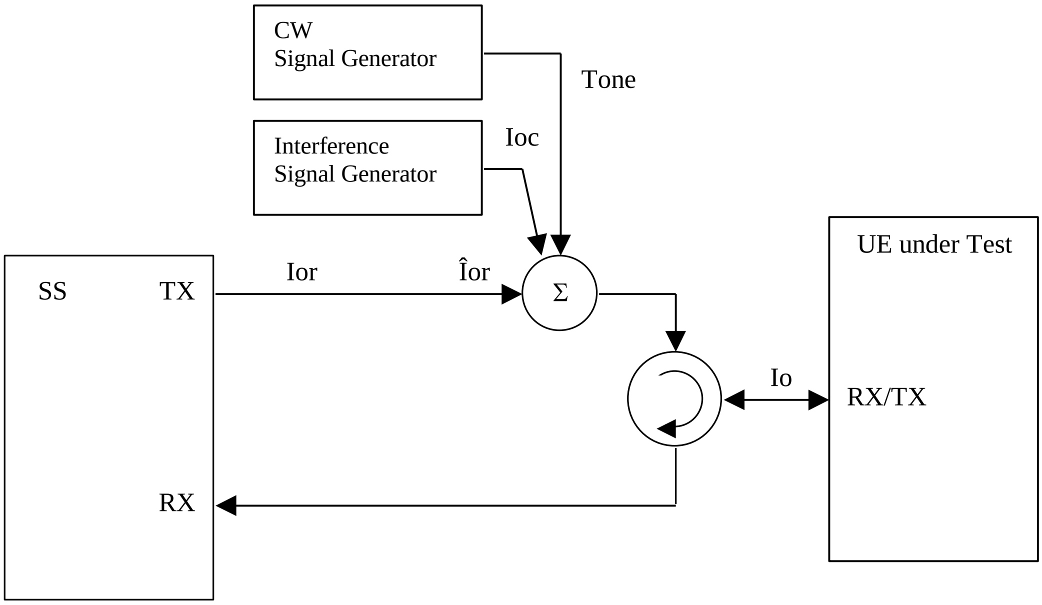


Figure A.7: Connection for Receiver tests with both Interference and additional CW signal

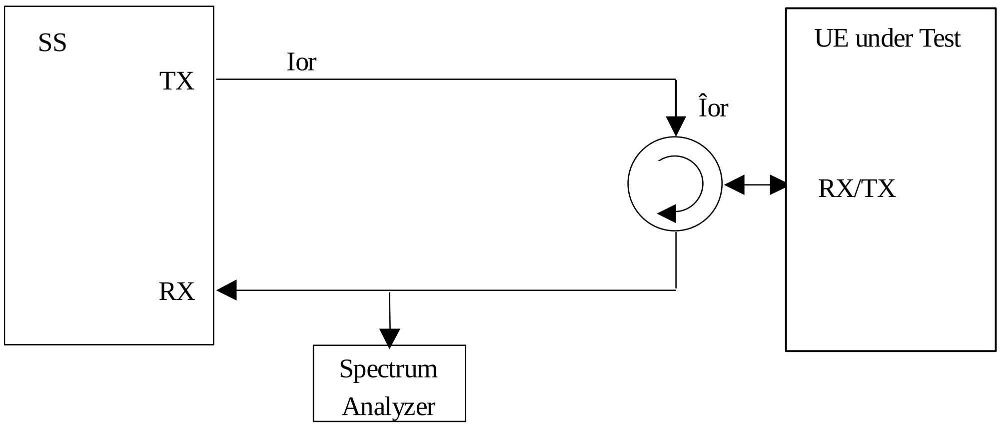


Figure A.8: Connection for tests with additional Spectrum Analyzer

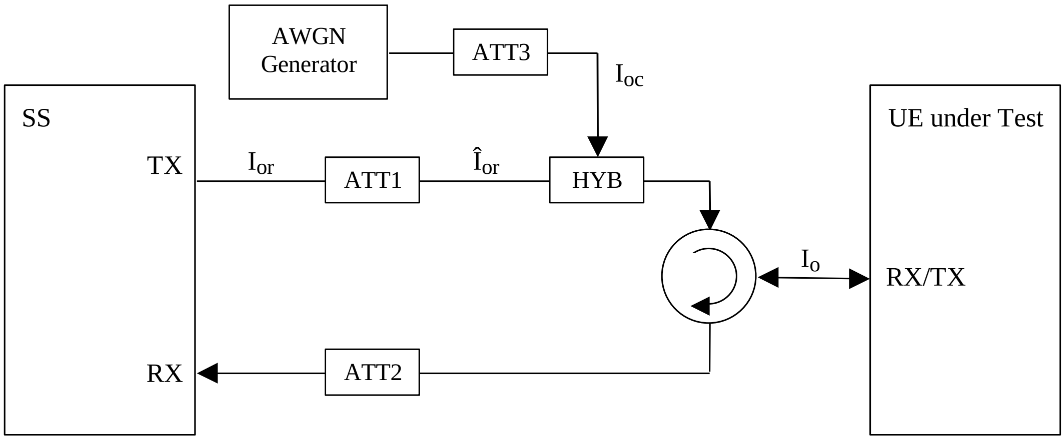


Figure A.9: Connection for single cell tests with static propagation

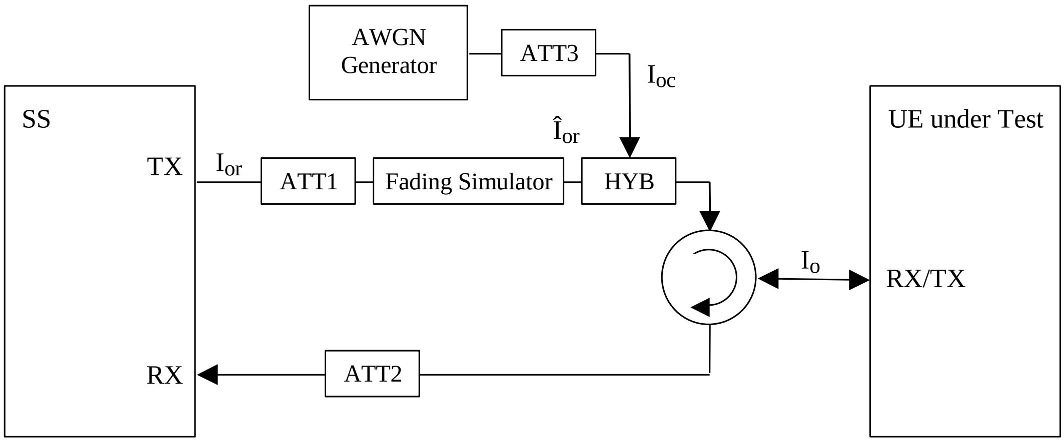


Figure A.10: Connection for single cell tests with Multi-path Fading propagation

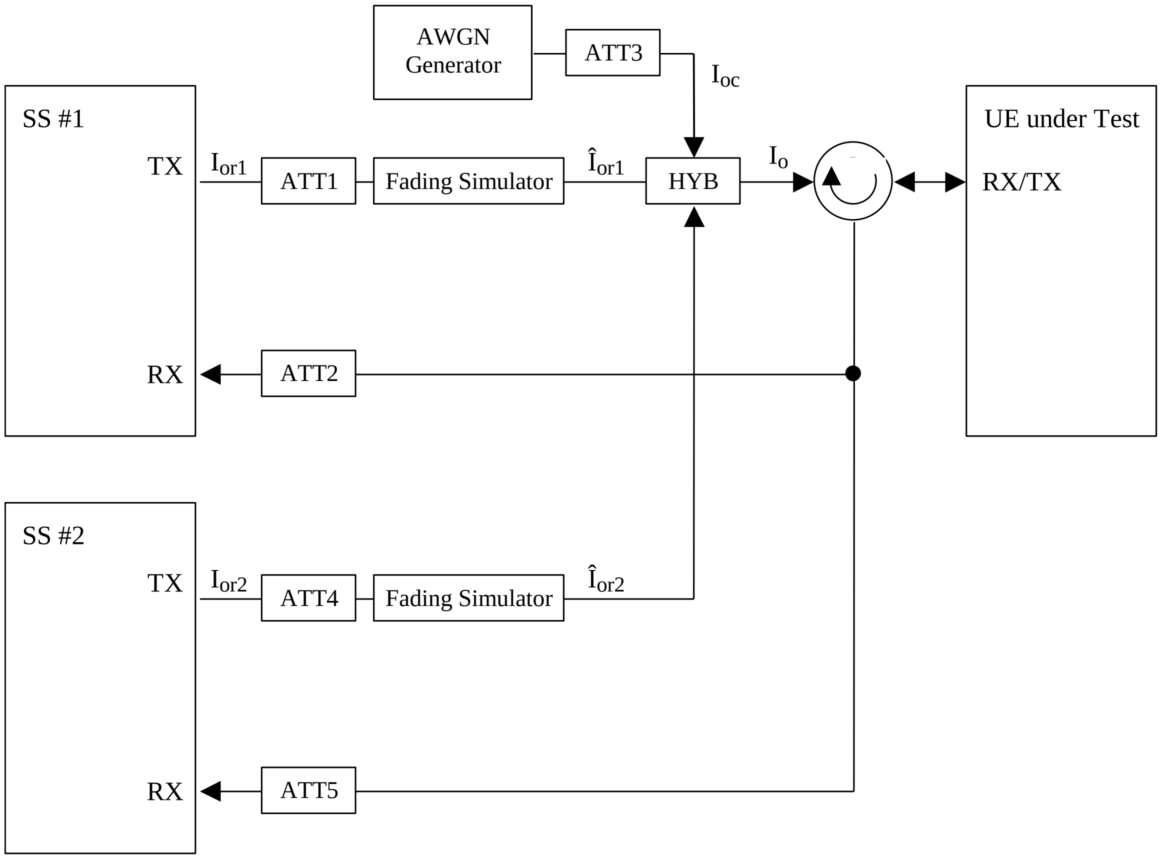


Figure A.11: Connection for two cell tests with Multi-path Fading propagation

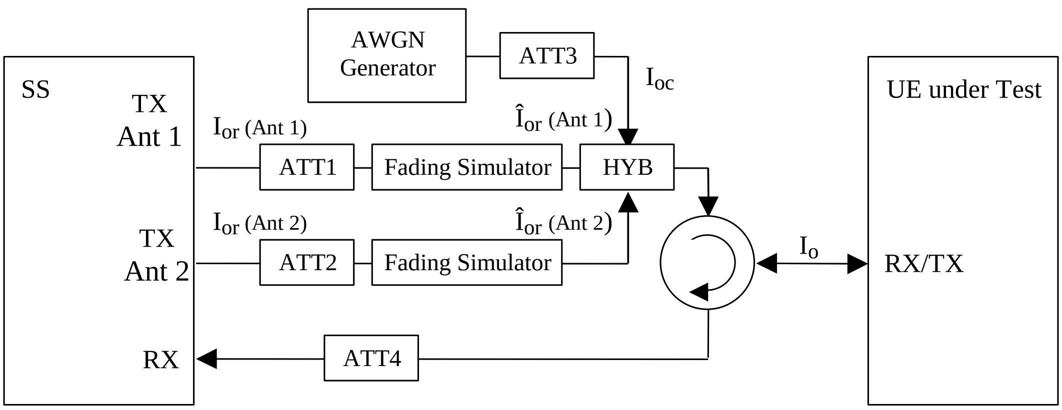


Figure A.12: Connection for single cell tests with Multi-path Fading propagation and transmit diversity

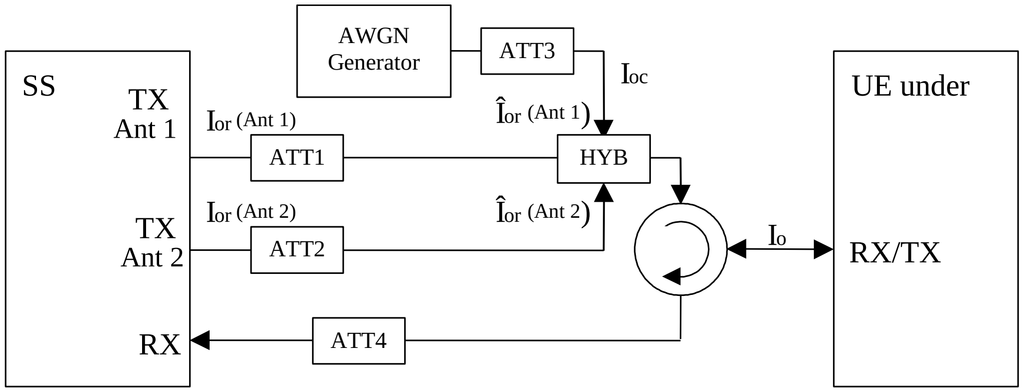


Figure A.12a: Connection for single cell tests with static propagation and transmit diversity

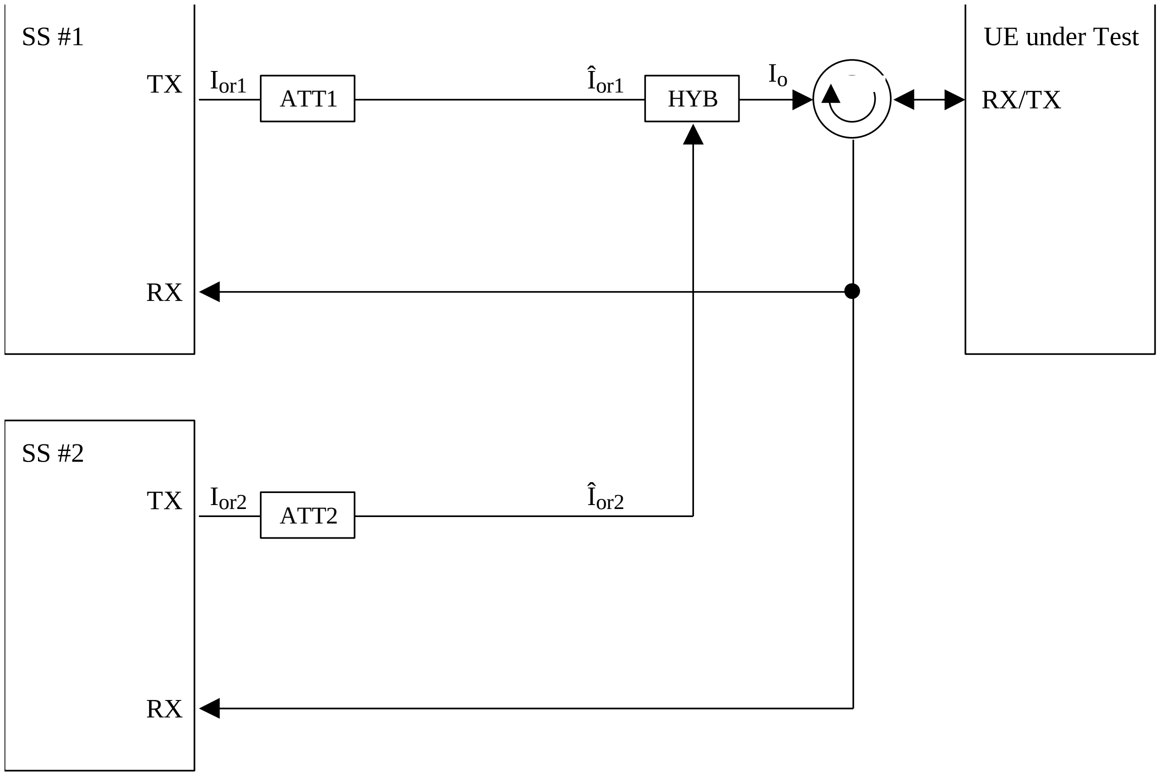


Figure A.13: Connection for basic two cell tests

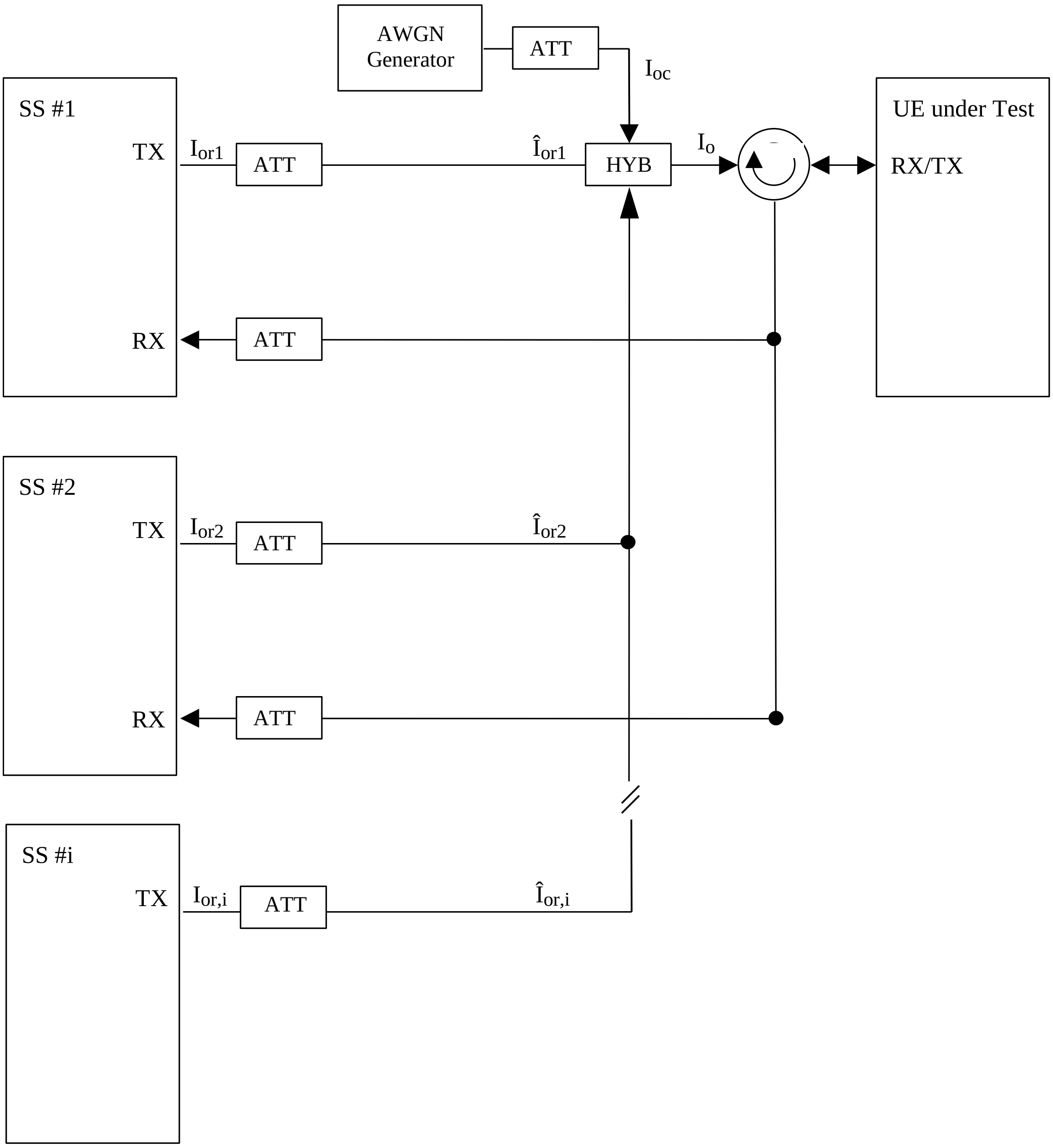


Figure A.14: Connection for multi-cell tests with static propagation

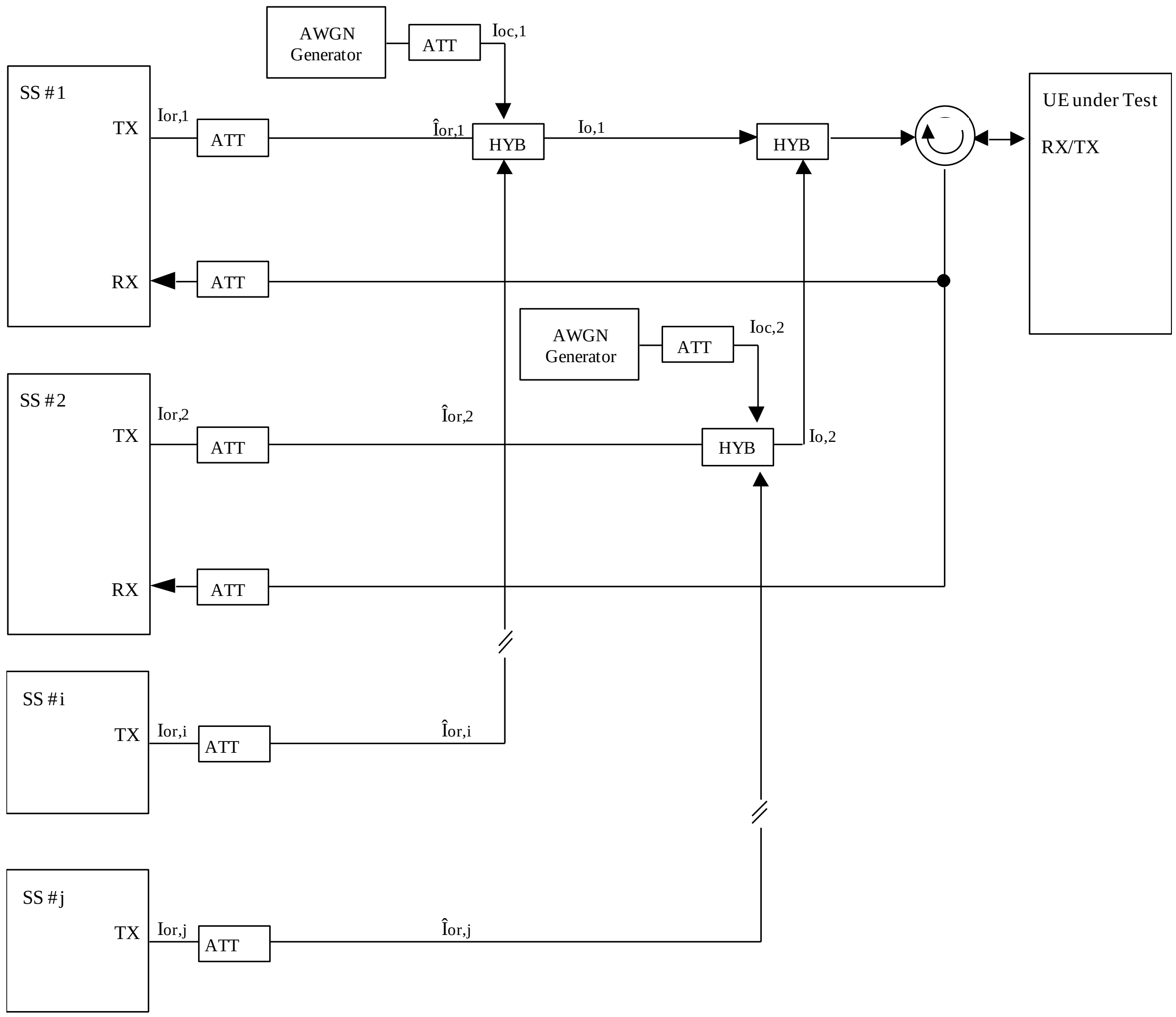


Figure A.15: Connection for multi-carrier, multi-cell tests with static propagation

Figure A.16: Void

Figure A.17: Void

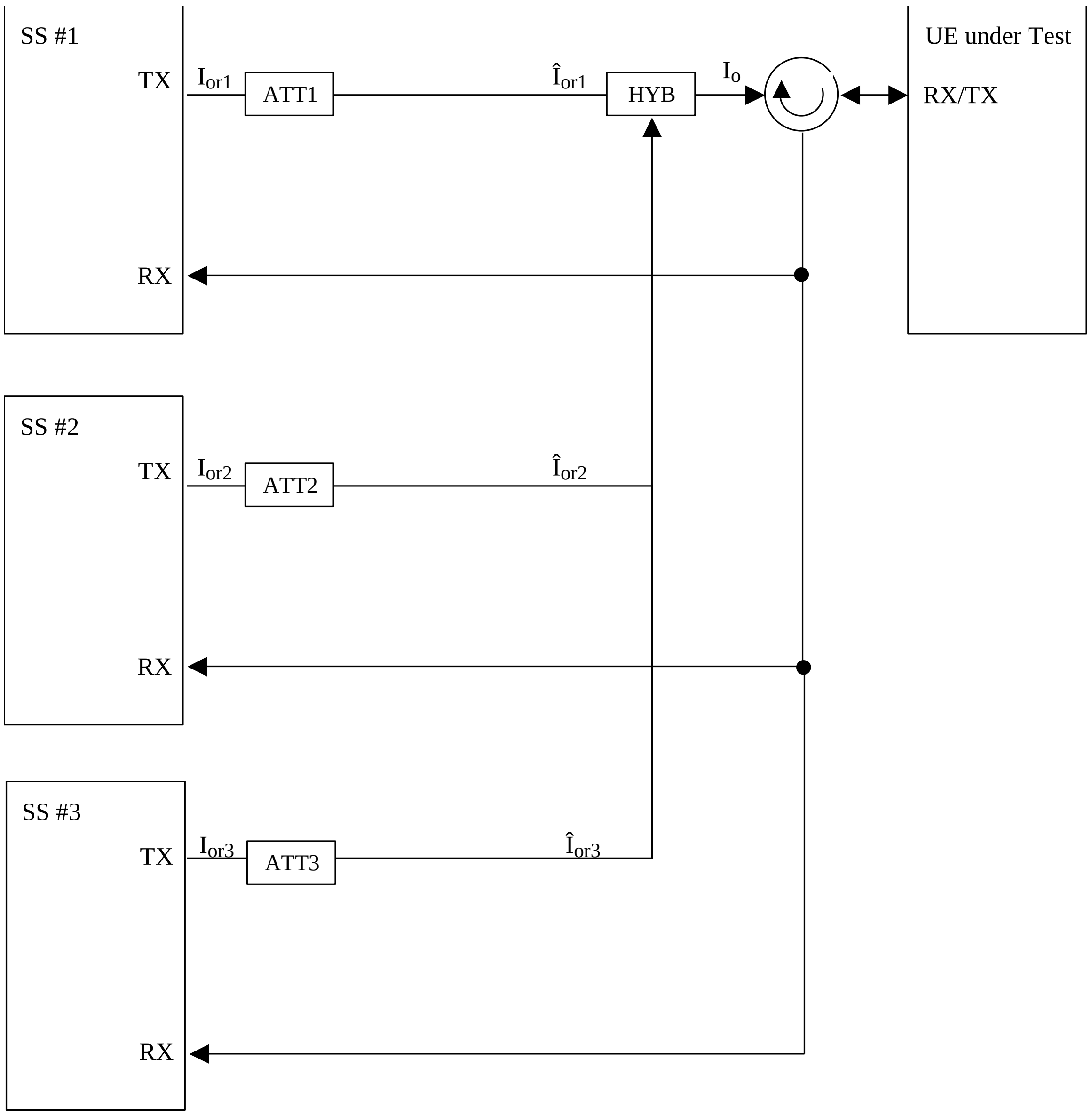


Figure A.18: Connection for basic three cell tests

Figure A.19: Void

Figure A.20: Void

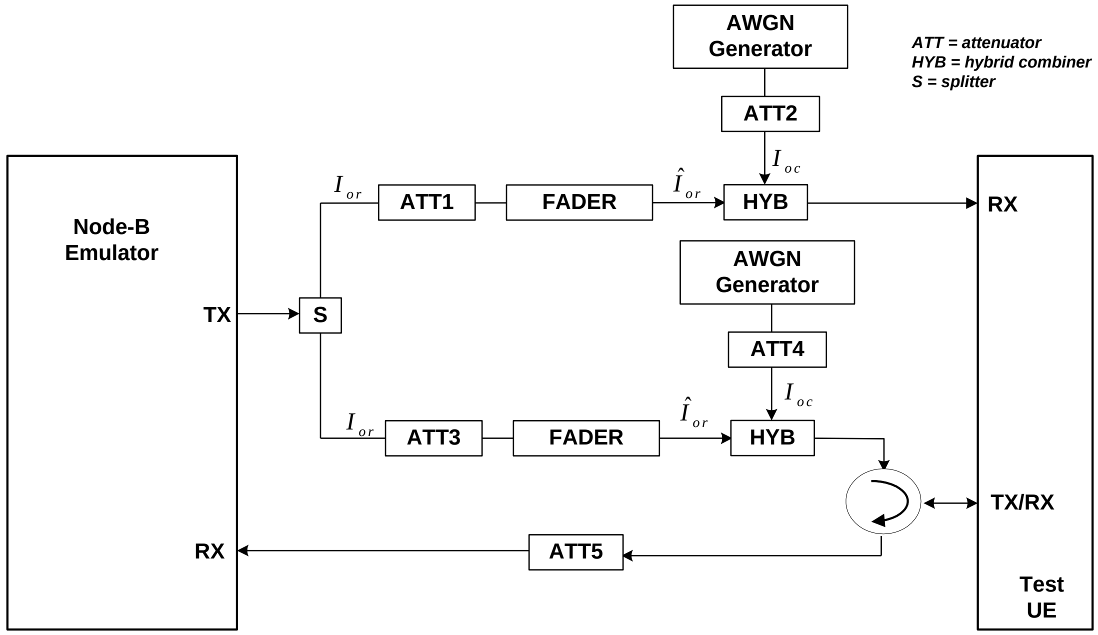


Figure A.21: Connection for single cell tests with Multi-path Fading propagation and UE receive diversity

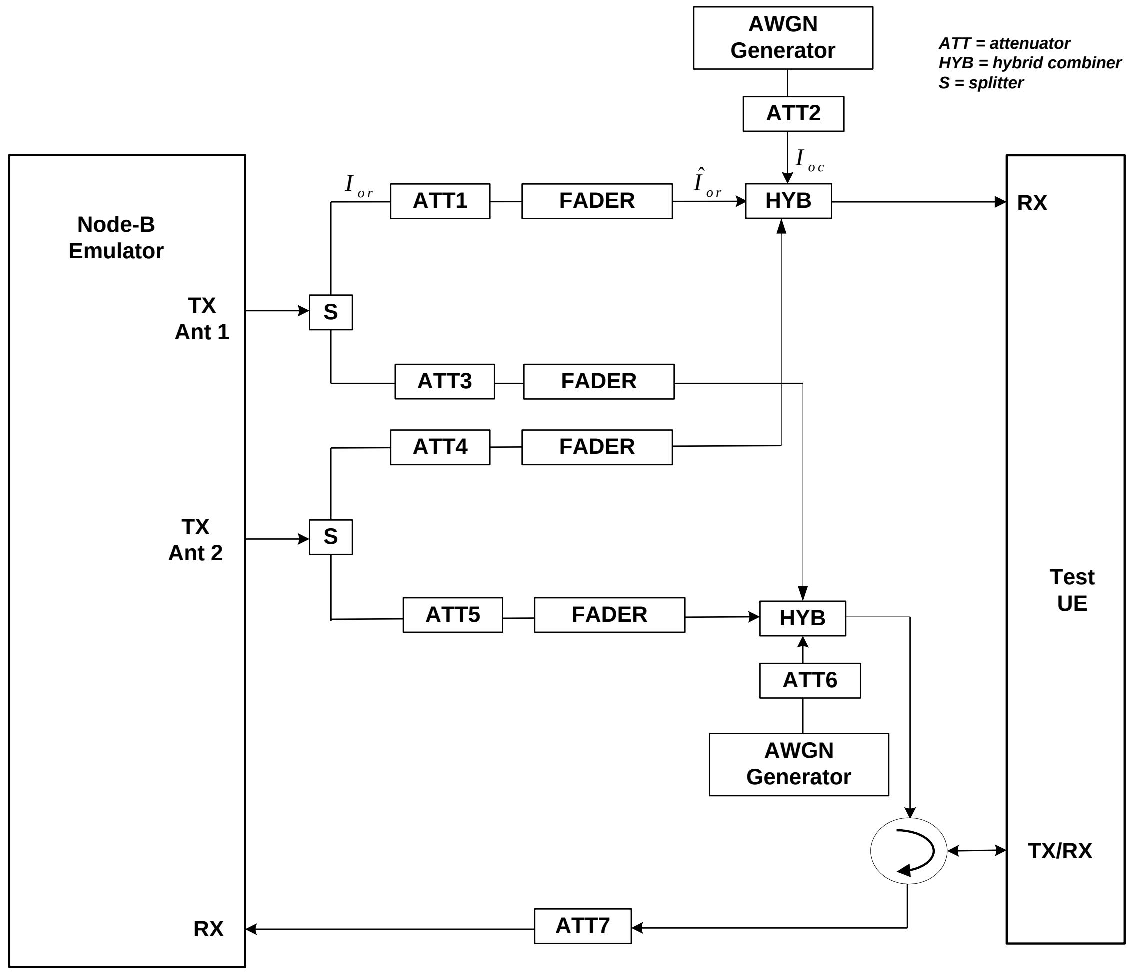


Figure A.22: Connection for single cell tests with Multi-path Fading propagation, transmit diversity UE receive diversity and MIMO.

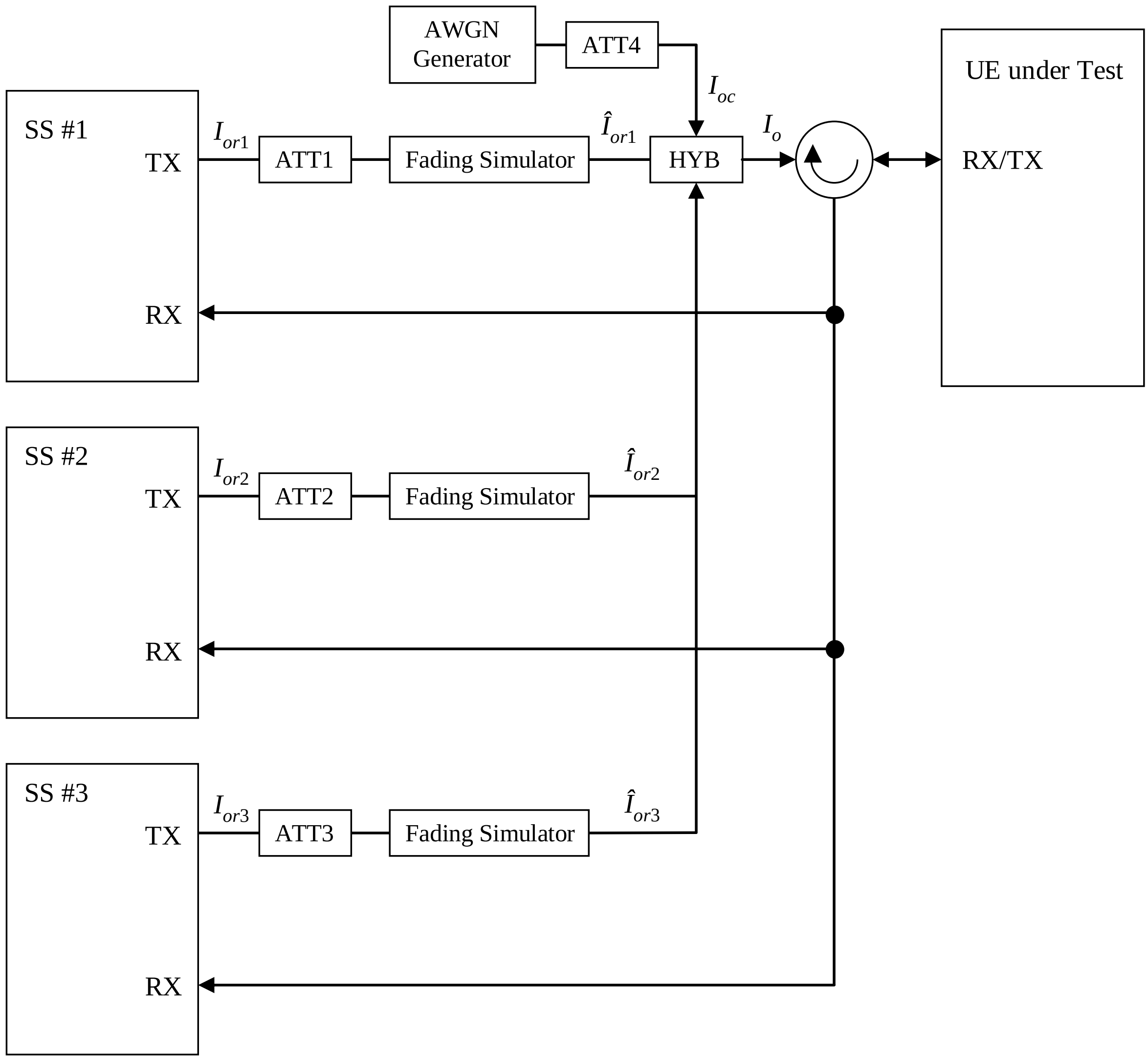


Figure A.23: Connection for three cell tests with Multi-path fading propagation

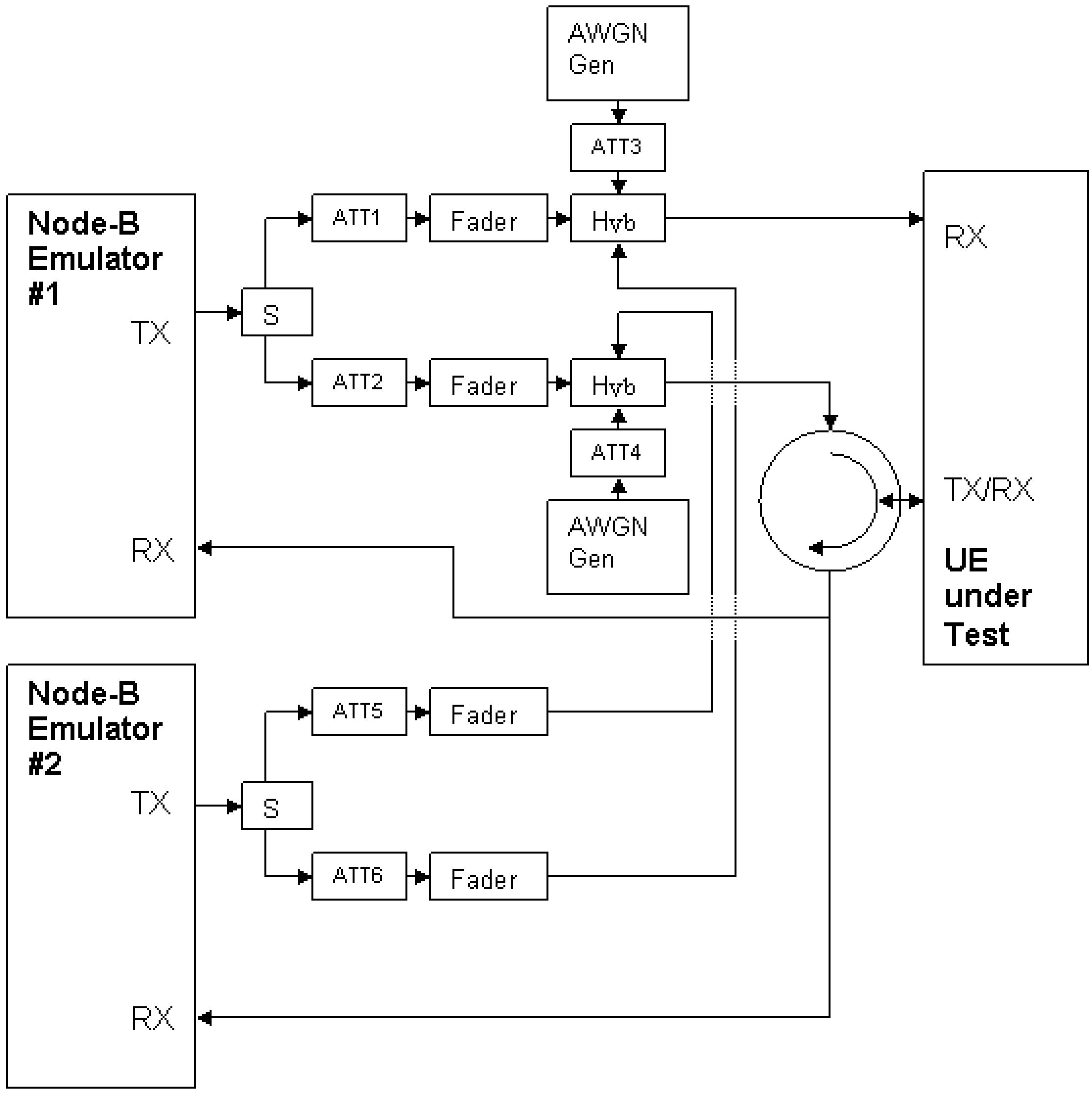


Figure A.24: Connection for two cell tests with Multi-path Fading propagation and UE receive diversity

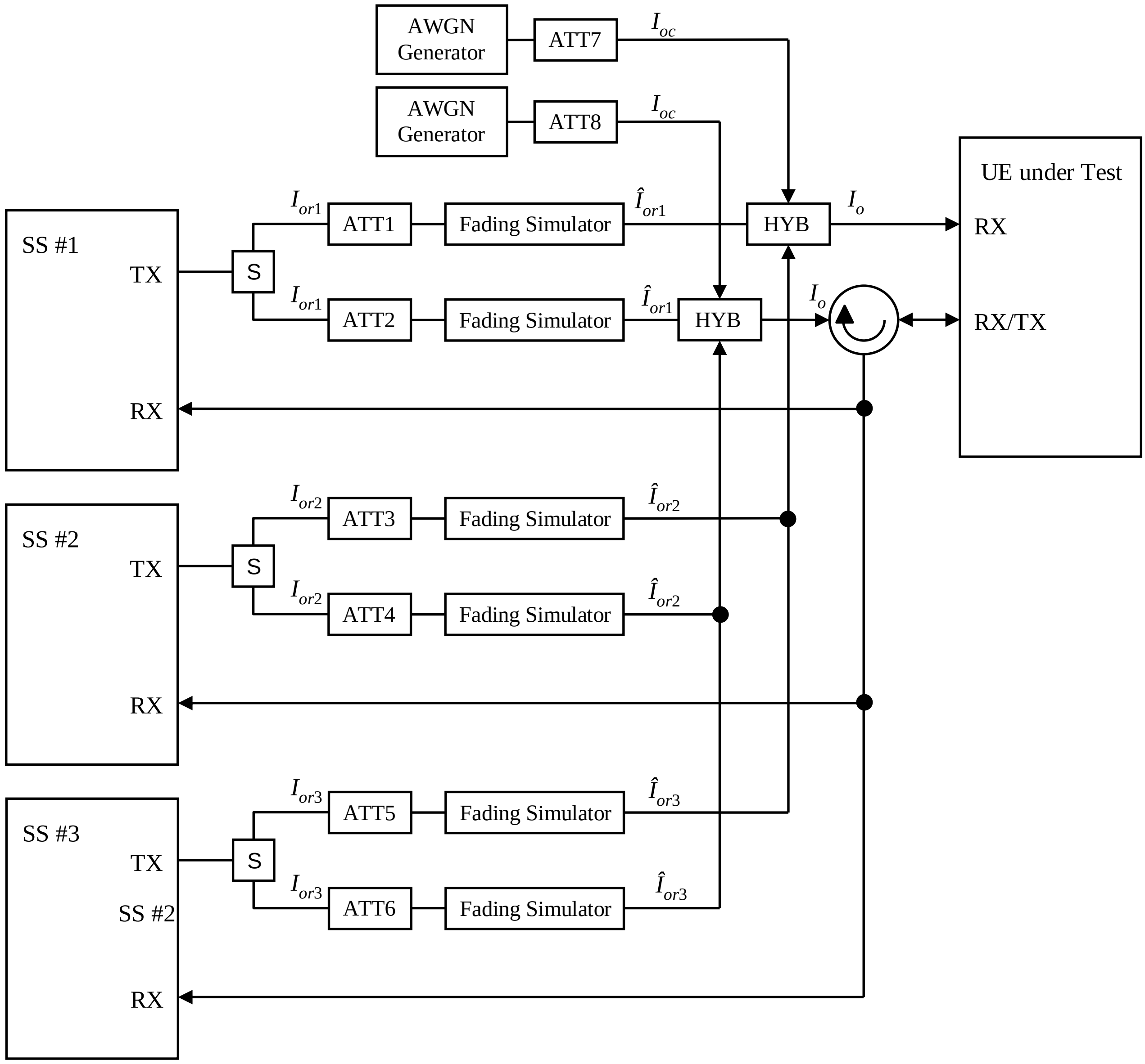


Figure A.25: Connection for three cell tests with Multi-path Fading propagation and UE receive diversity

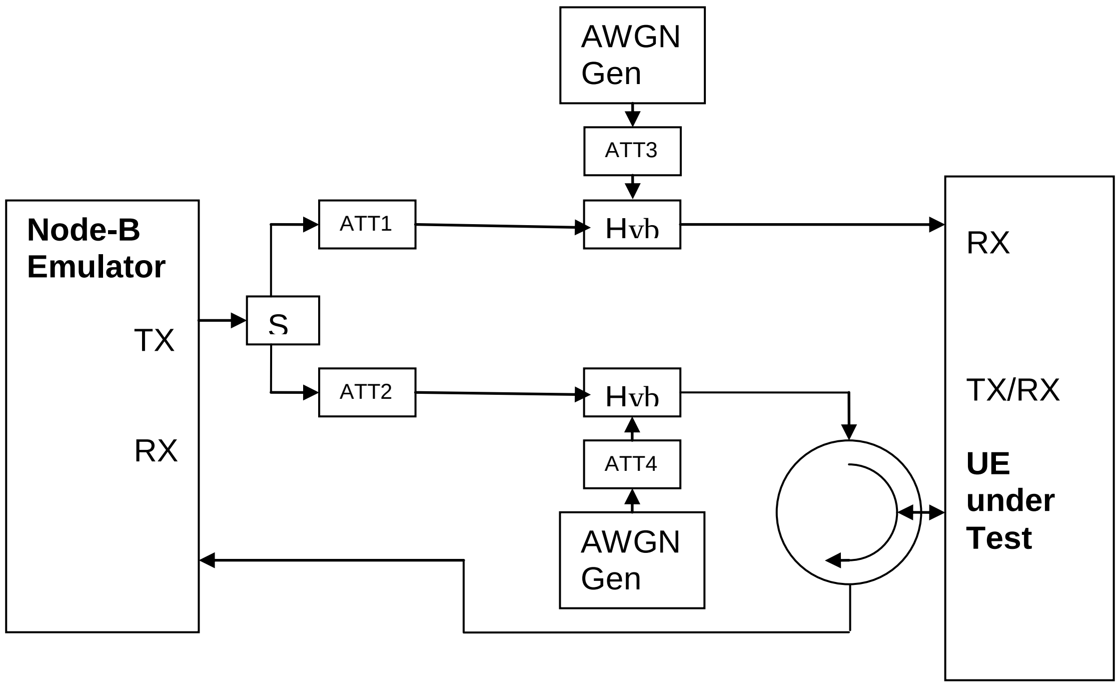


Figure A.26: Connection for single cell tests with static propagation and UE receive diversity

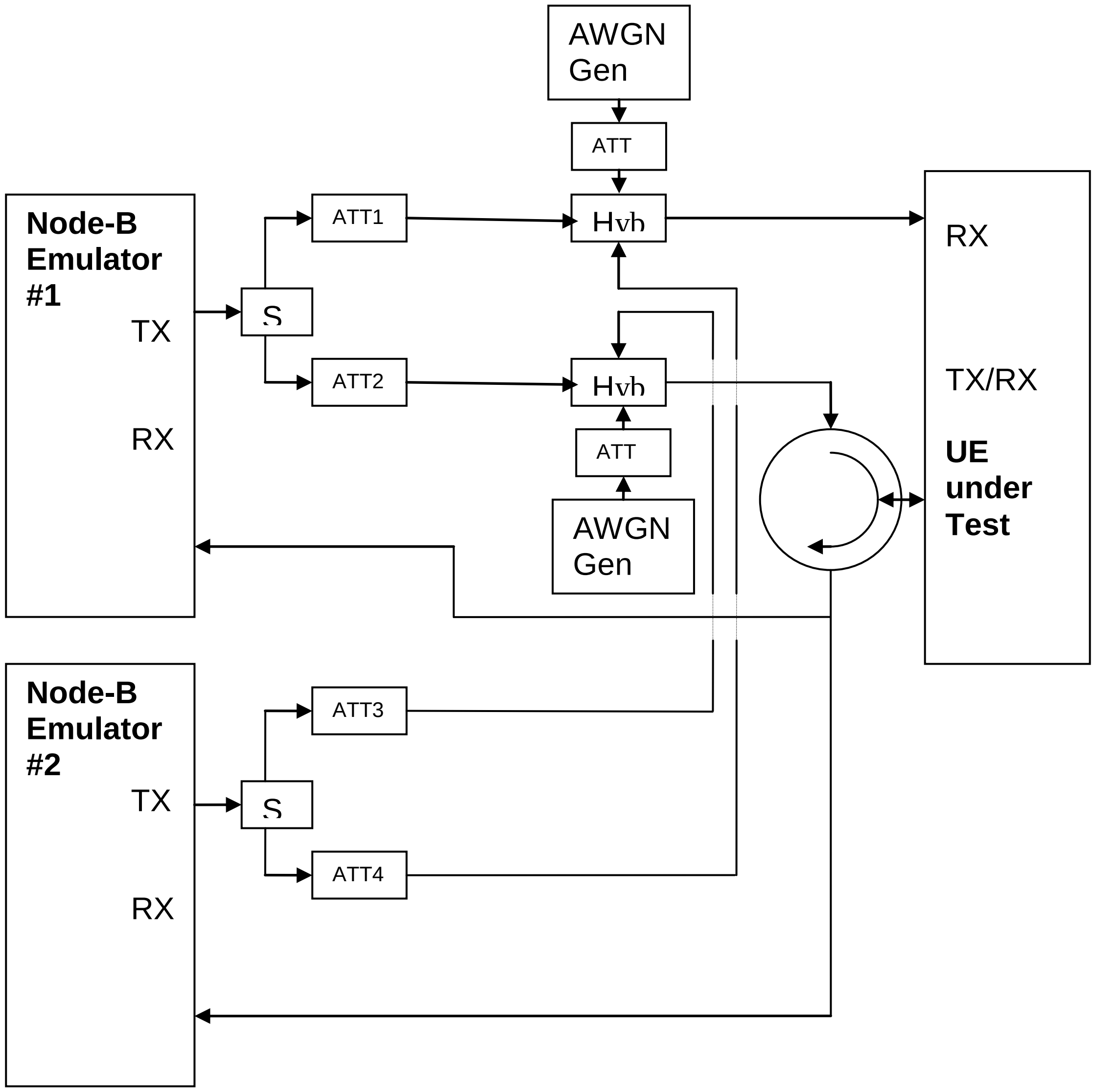


Figure A.27: Connection for two cell tests with static propagation and UE receive diversity

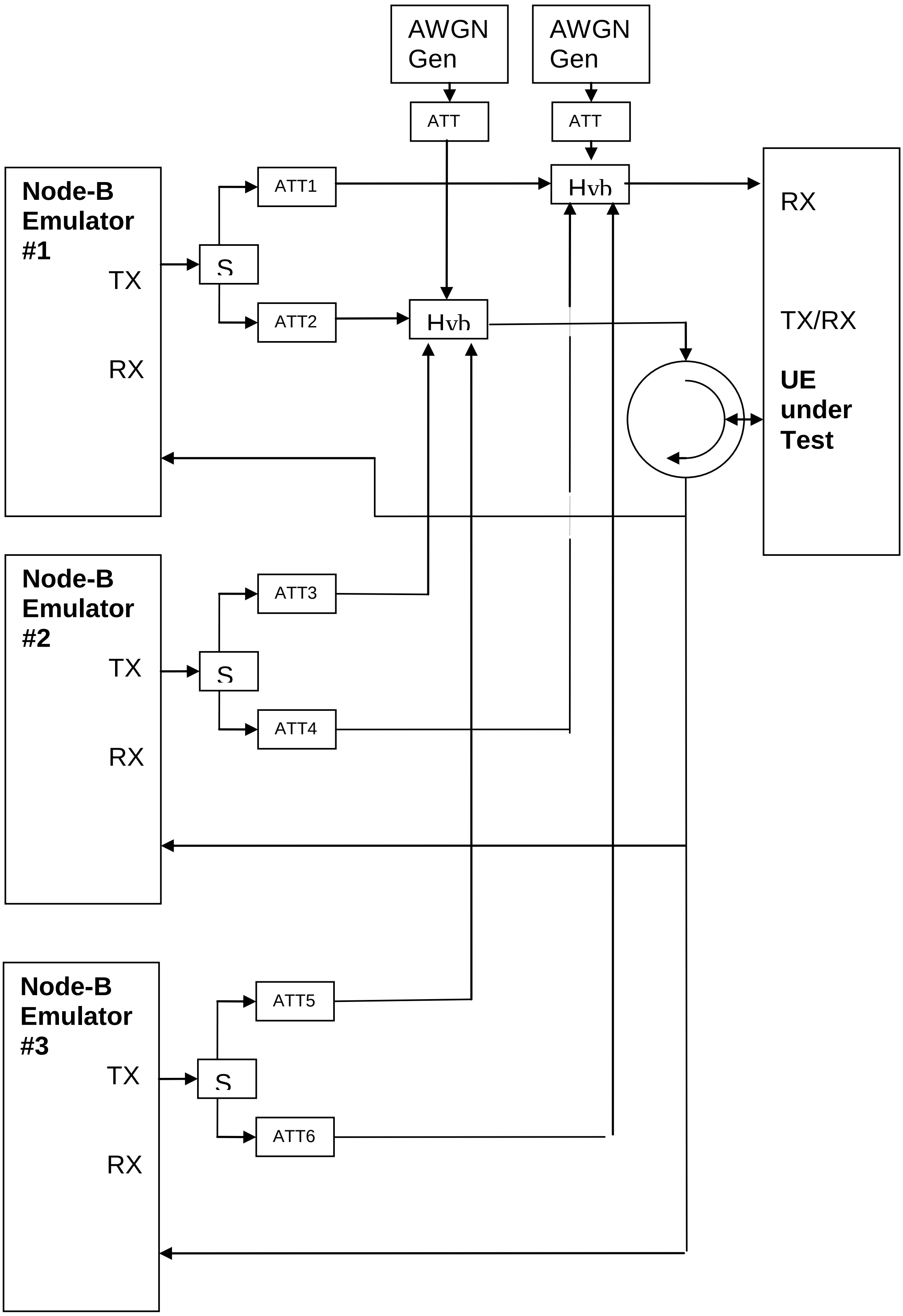


Figure A.28: Connection for 3 cell tests with static propagation and UE receive diversity

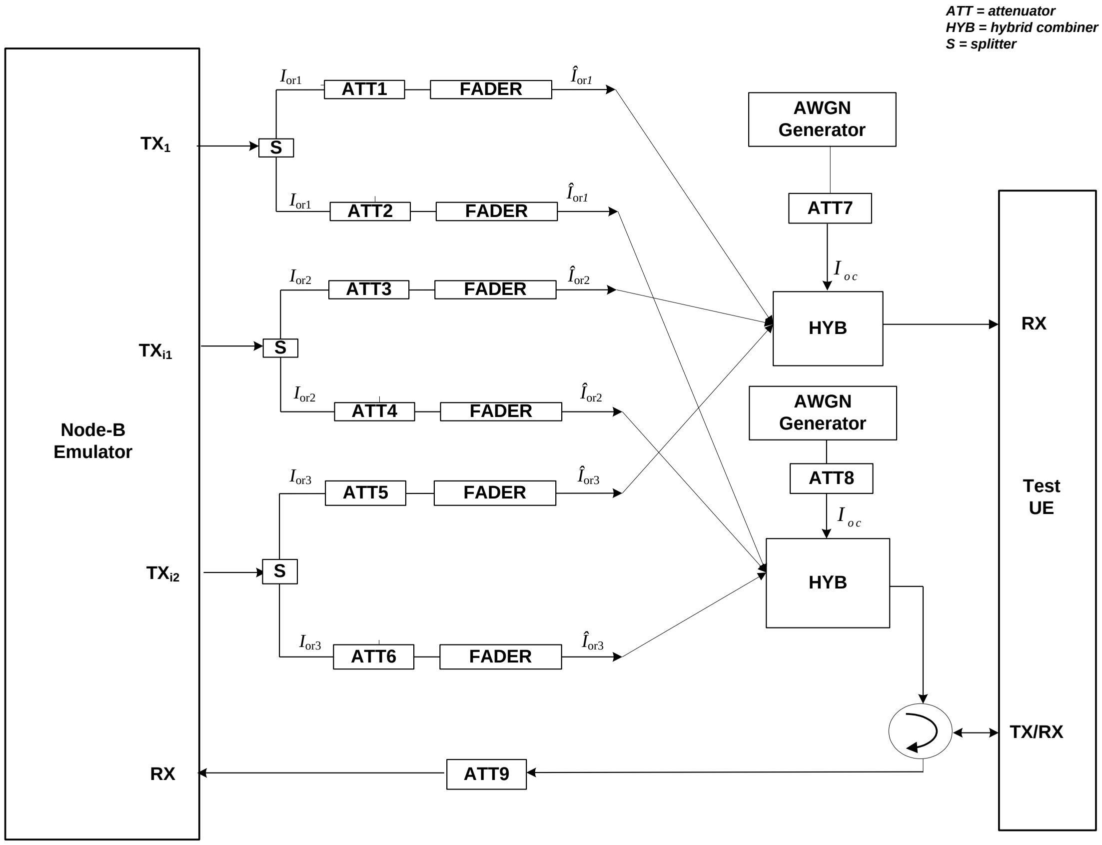


Figure A.29: Connection for single cell tests with Multi-path Fading propagation and UE receive diversity for Type 3i tests

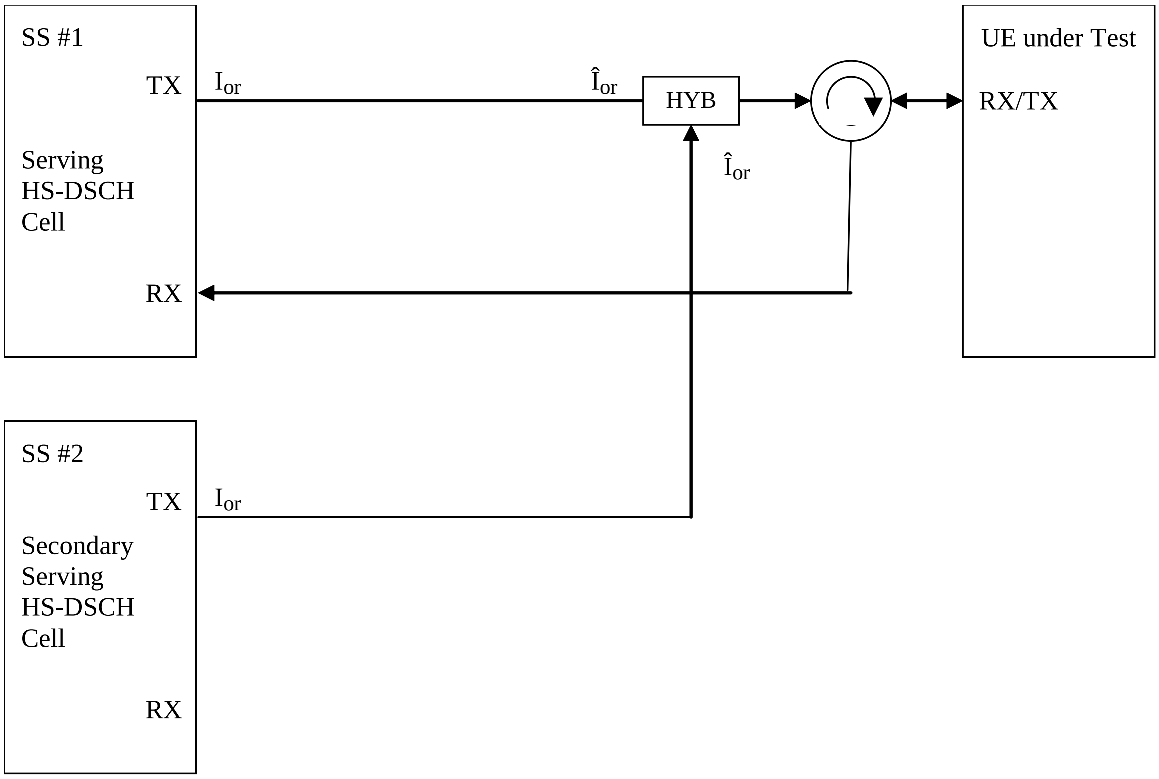


Figure A.30: Connection for basic DC-HSDPA and DB-DC-HSDPA receiver tests

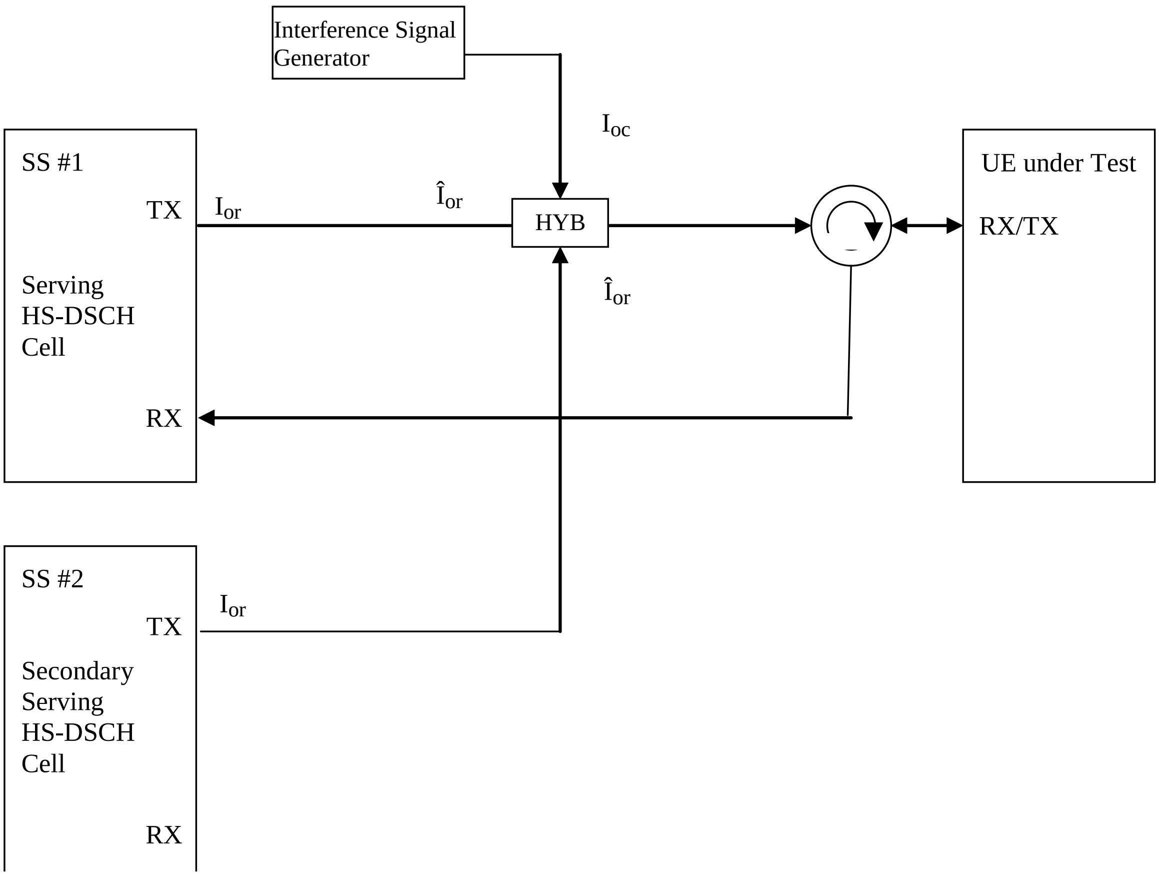


Figure A.31: Connection for DC-HSDPA and DB-DC-HSDPA receiver tests with interferer

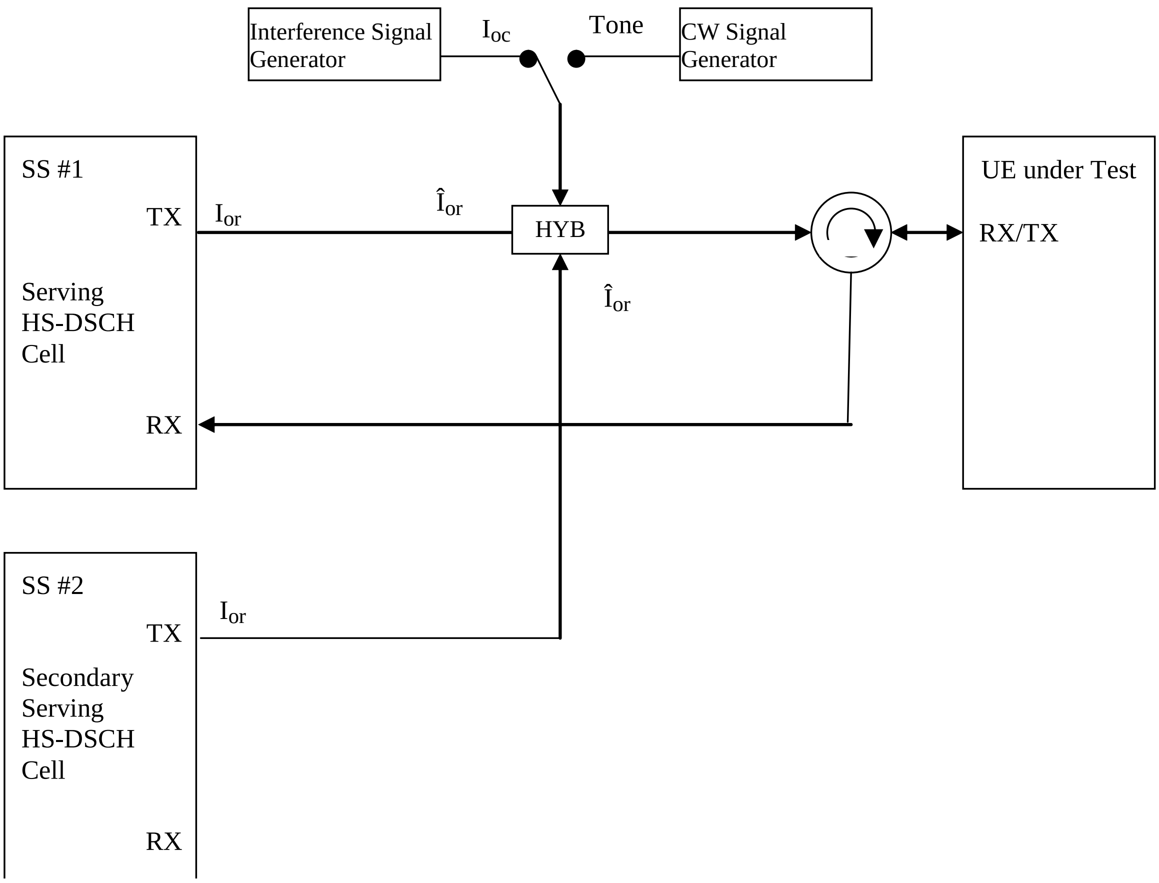


Figure A.32: Connection for DC-HSDPA and DB-DC-HSDPA receiver tests with interferer or additional CW signal

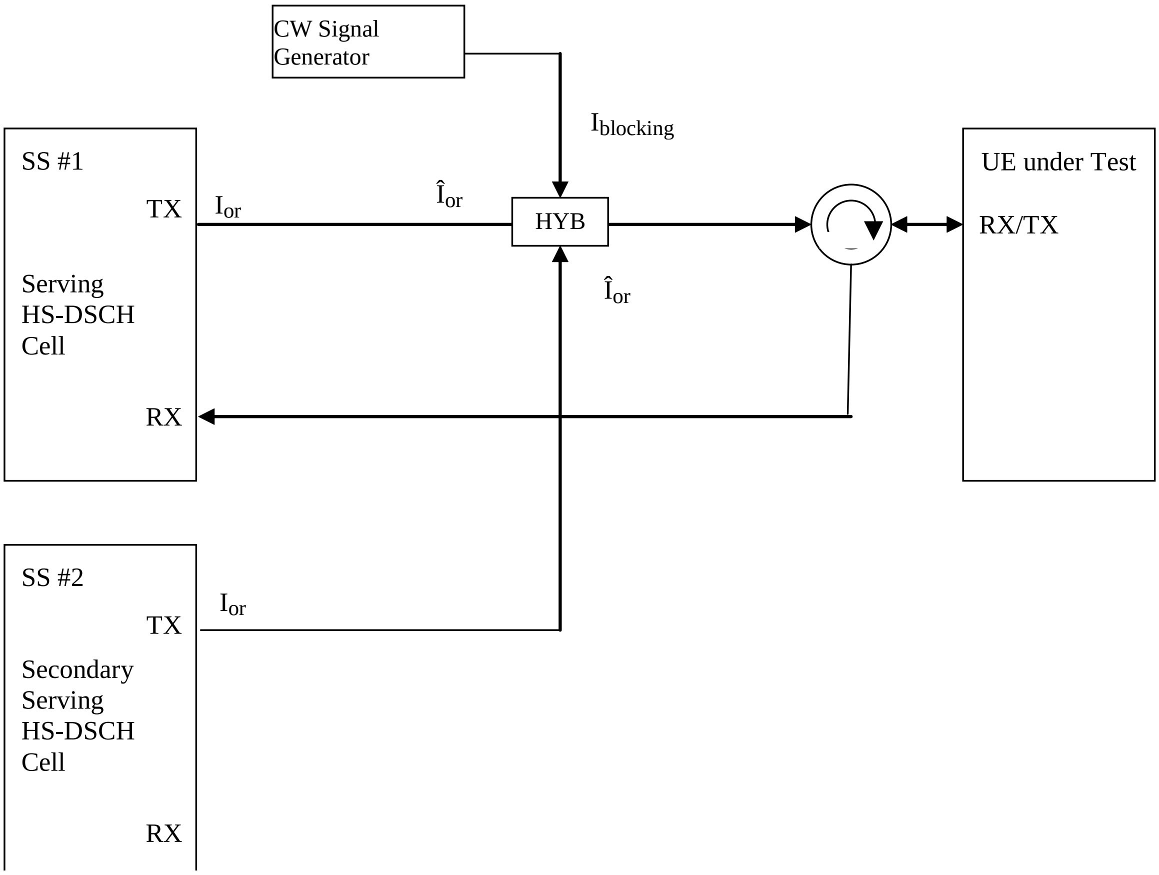


Figure A.33: Connection for DC-HSDPA and DB-DC-HSDPA receiver tests with additional CW signal

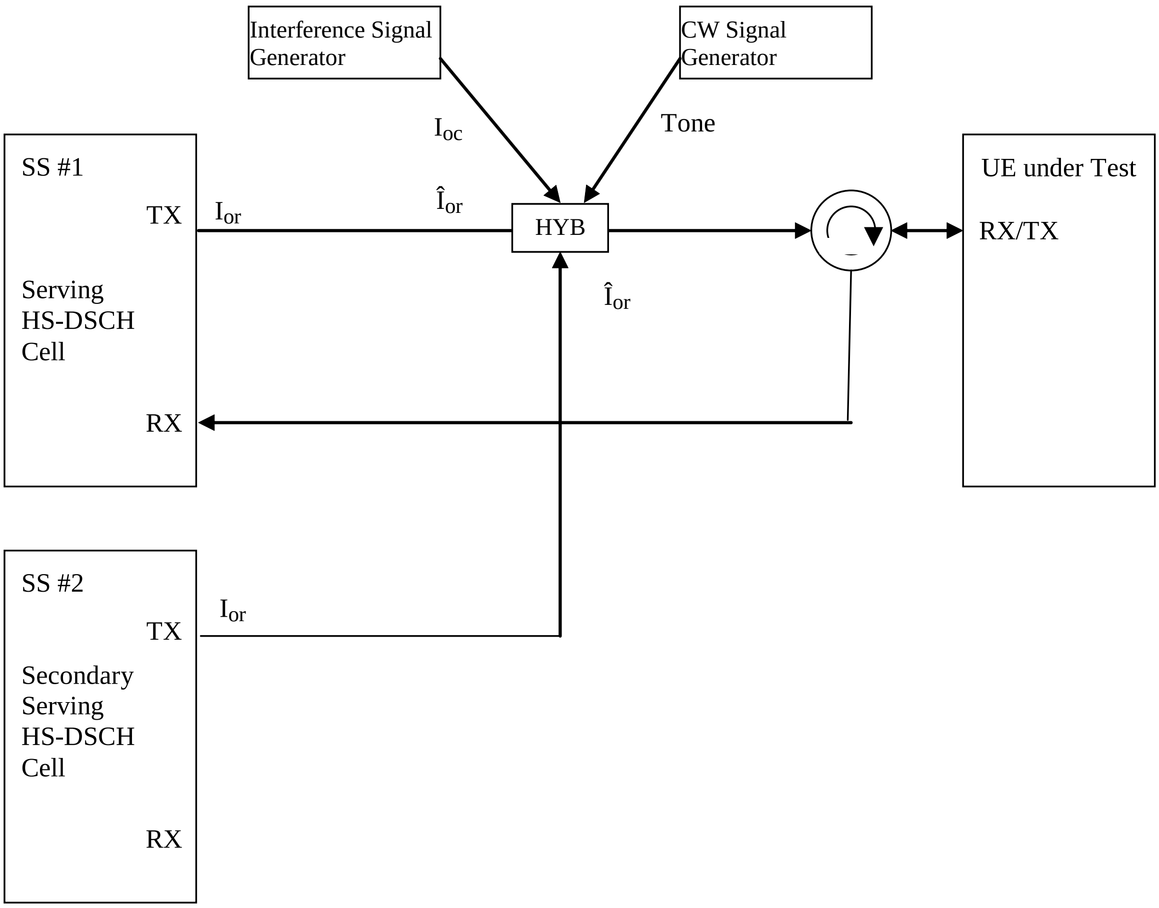


Figure A.34: Connection for DC-HSDPA and DB-DC-HSDPA receiver tests with both interferer and additional CW signal

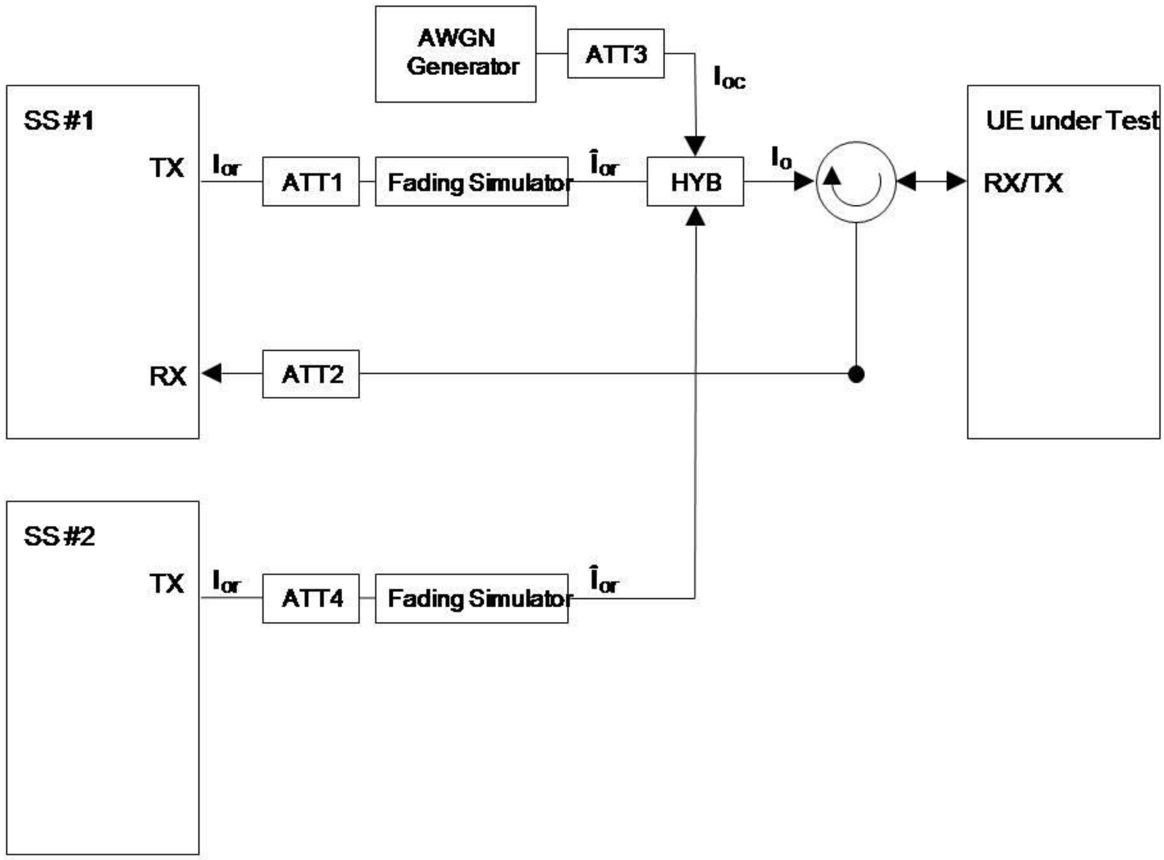


Figure A.35: Connection for Dual cell tests with Multi-path Fading propagation for DC-HSDPA and DB-DC-HSDPA type 2 performance requirements

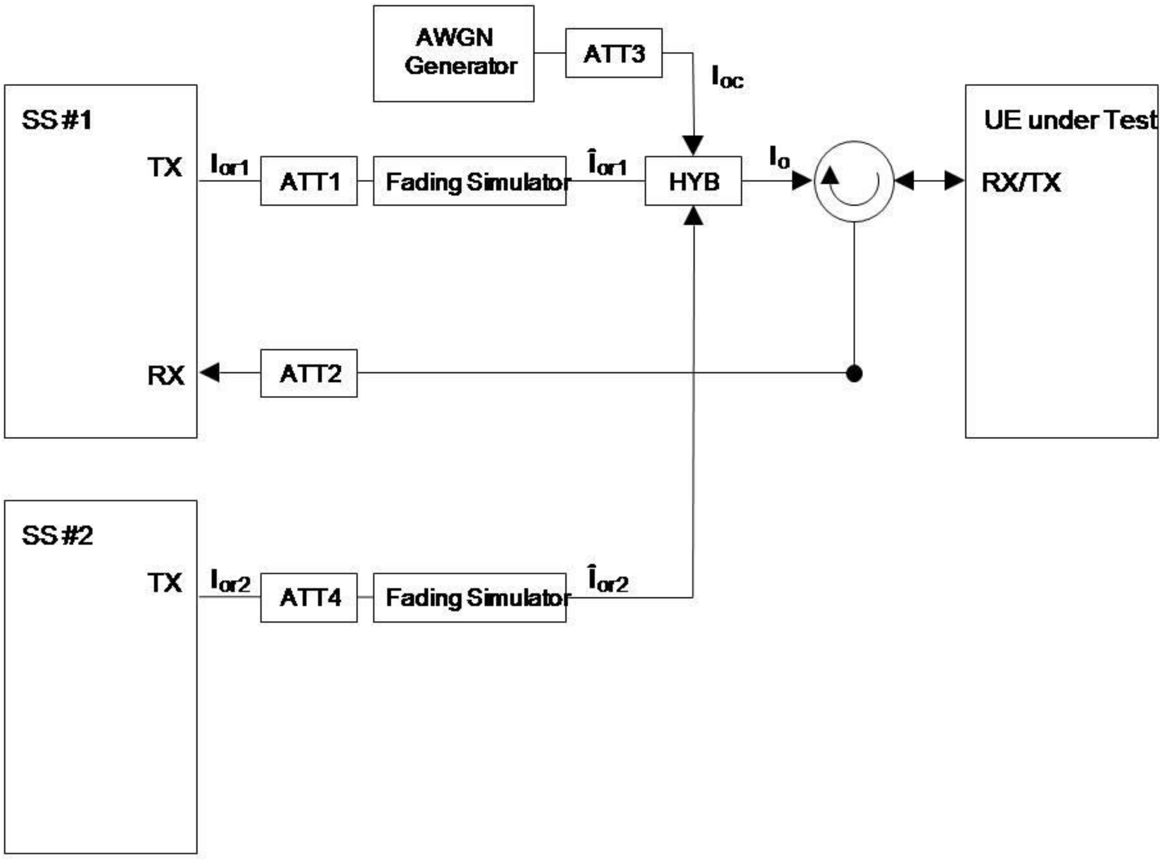


Figure A.36: Connection for Dual cell tests with Multi-path Fading propagation for DC-HSDPA and DB-DC-HSDPA CQI reporting test cases

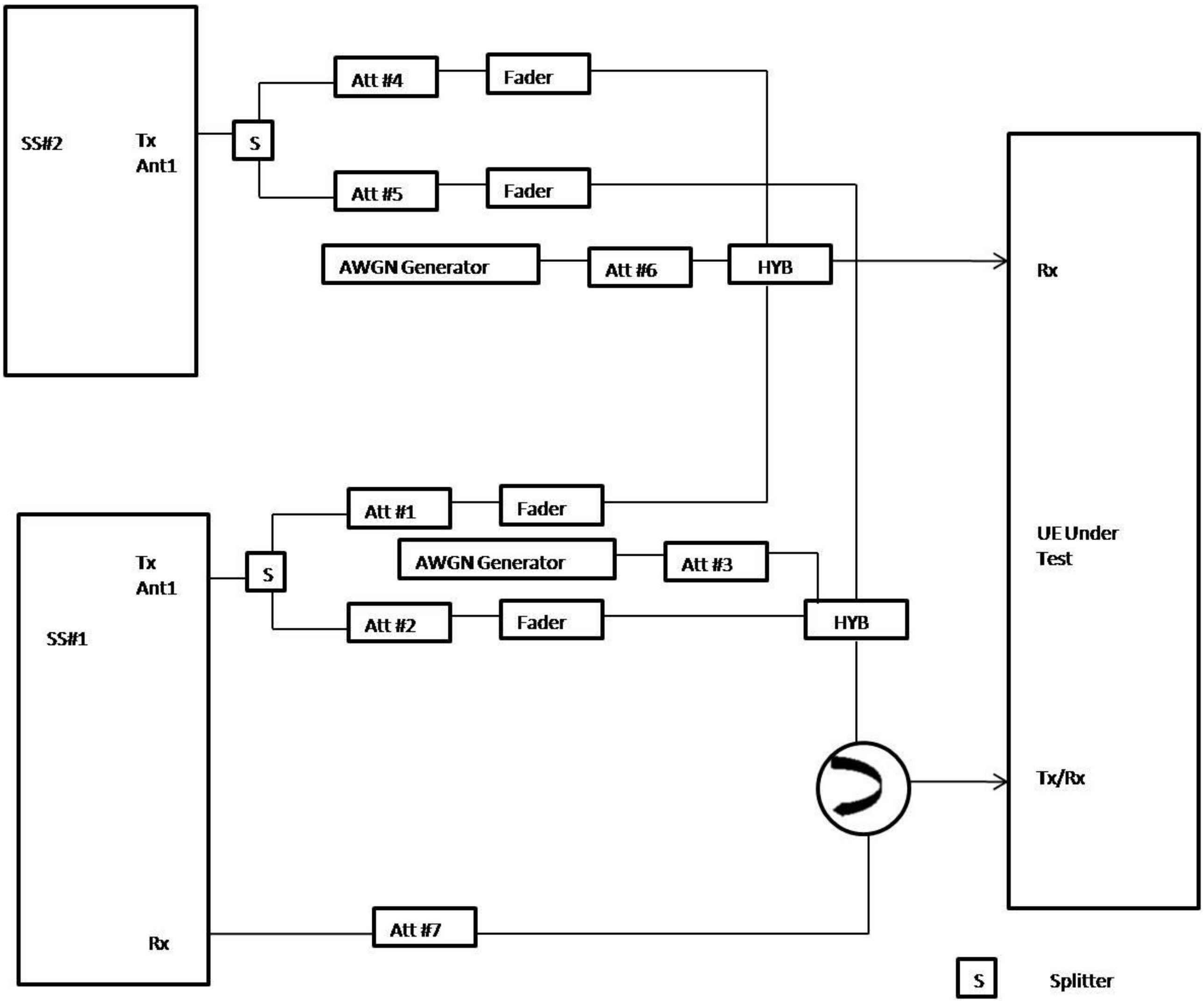


Figure A.37: Connection for Dual cell tests with Multi-path Fading propagation for DC-HSDPA and DB-DC-HSDPA Type 3 Performance test cases

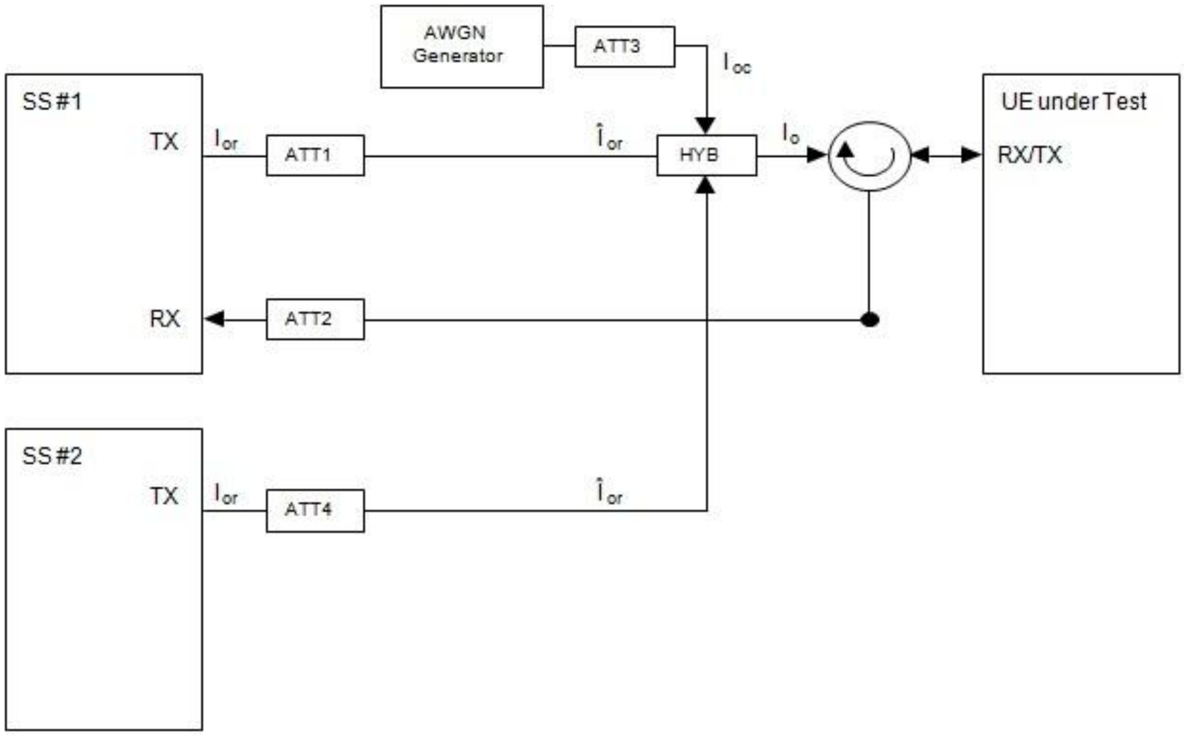


Figure A.38: Connection for Dual cell tests with Static propagation for DC-HSDPA and DB-DC-HSDPA CQI reporting test cases

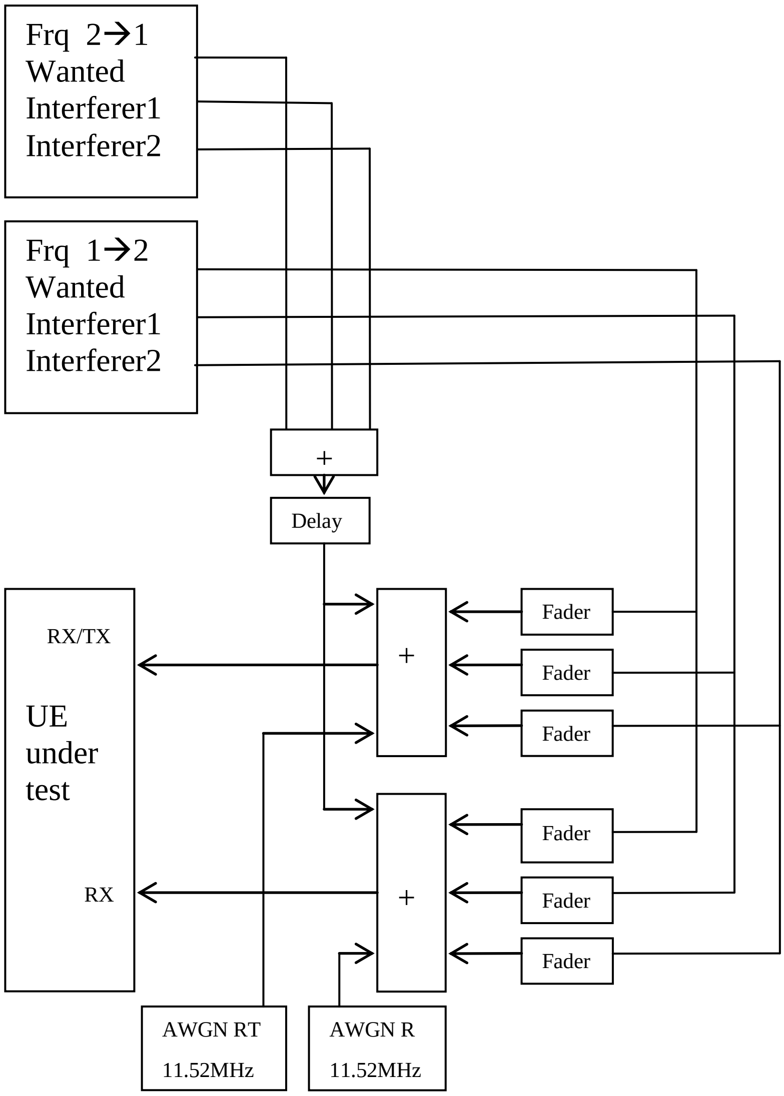


Figure A.39: Connection for DC-HSDPA, Type 3i. 6 faders. 1 delay, to compensate for the basic delay of the faders. 2 part test illustrated by "Freq. 1→2 and Freq. 2→1" Uplink not displayed

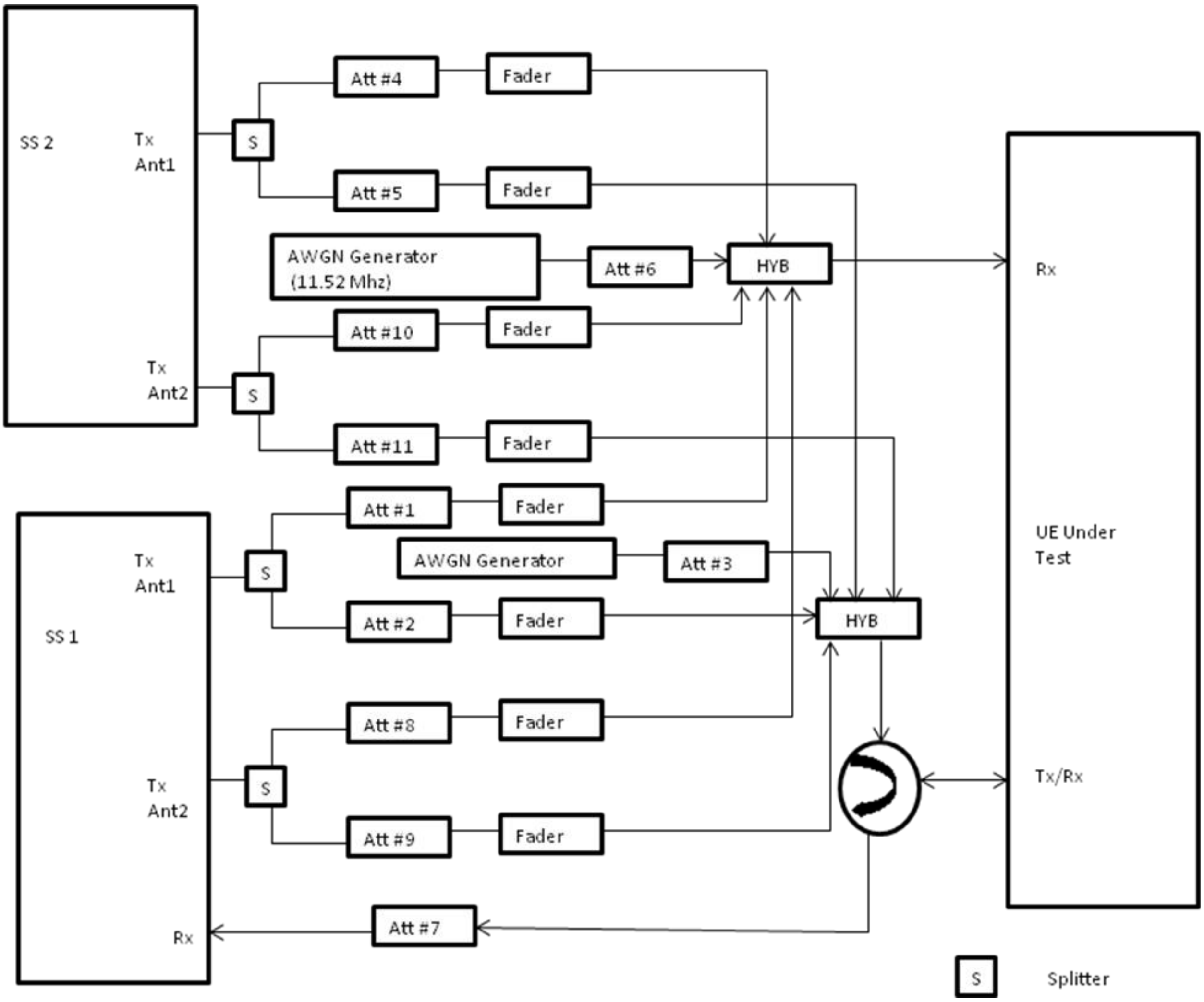


Figure A.40: Connection for Dual cell tests with Multi-path Fading propagation for DC-HSDPA MIMO Performance test cases

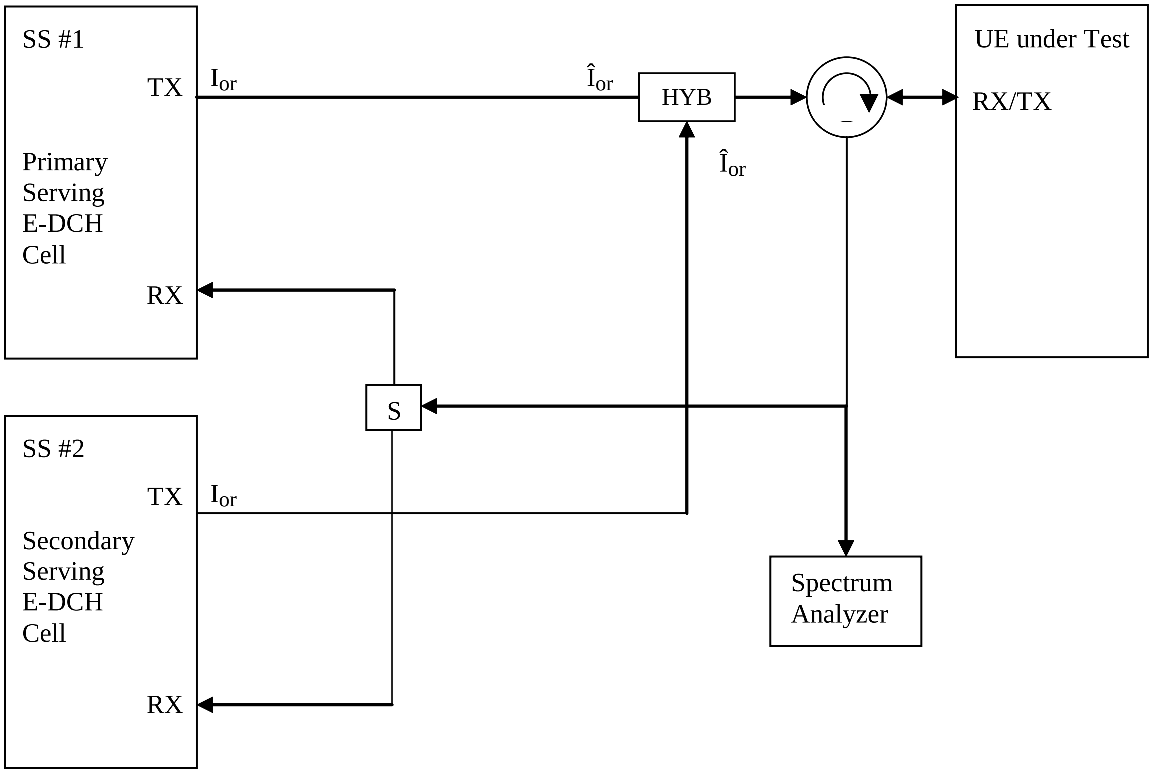


Figure A.41: Connection for basic DC-HSUPA transmitter tests

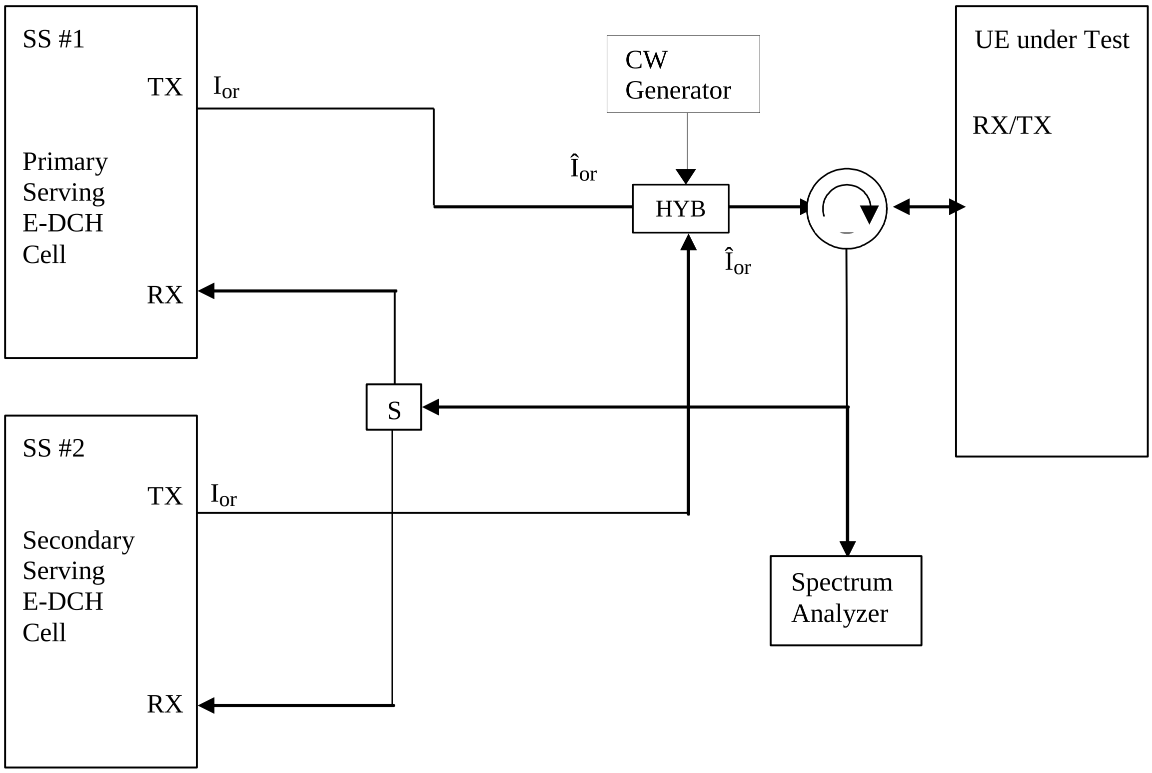


Figure A.42: Connection for DC-HSUPA Transmitter intermodulation tests

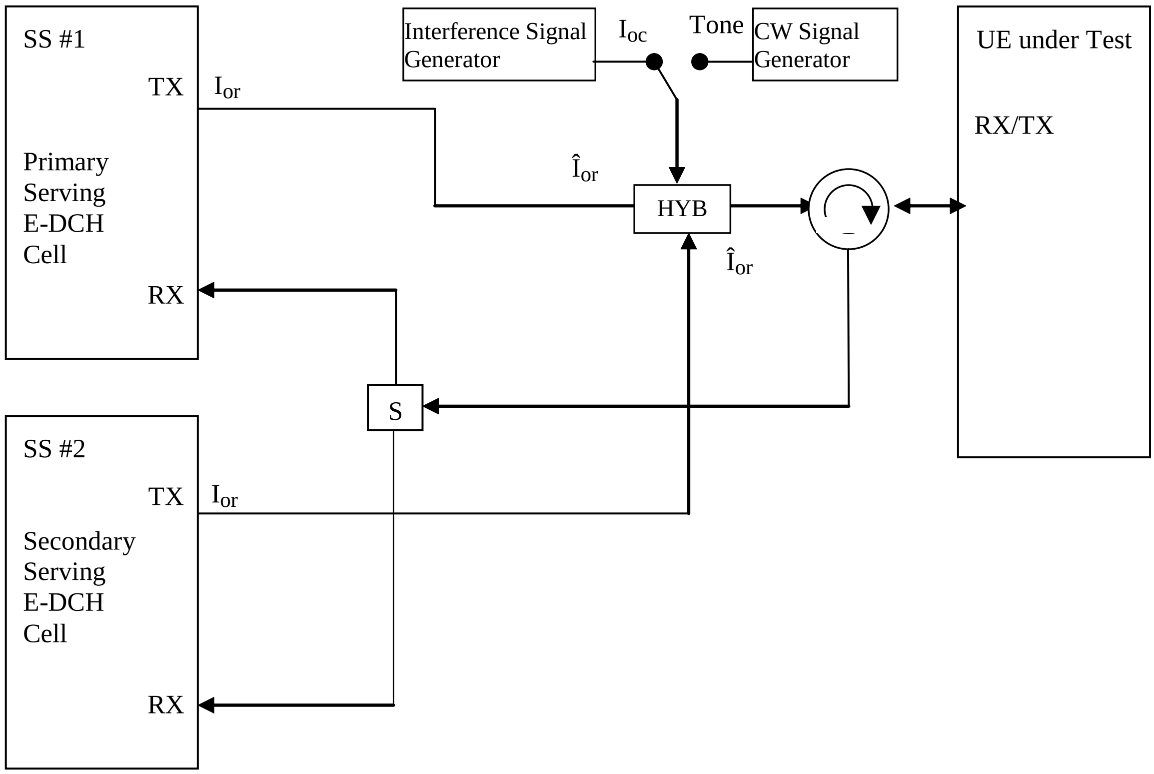


Figure A.43: Connection for DC-HSUPA receiver tests with interferer or additional CW signal

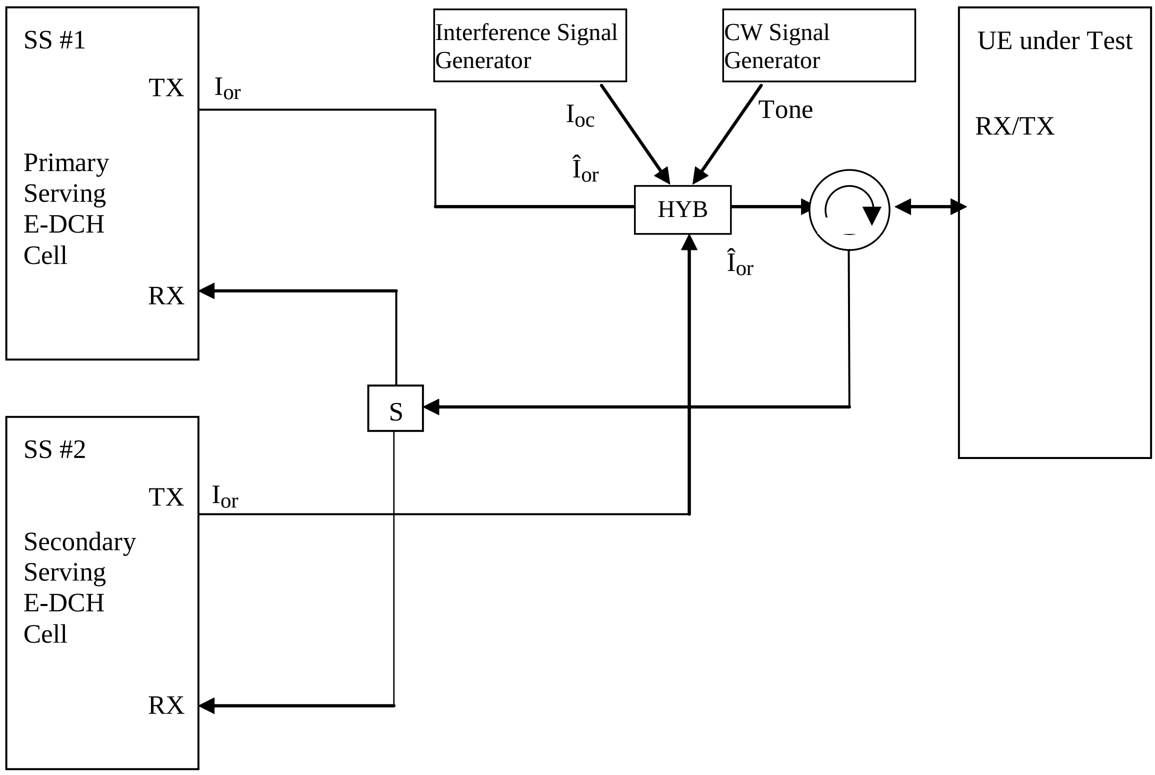


Figure A.44: Connection for DC-HSUPA receiver tests with both interferer and additional CW signal

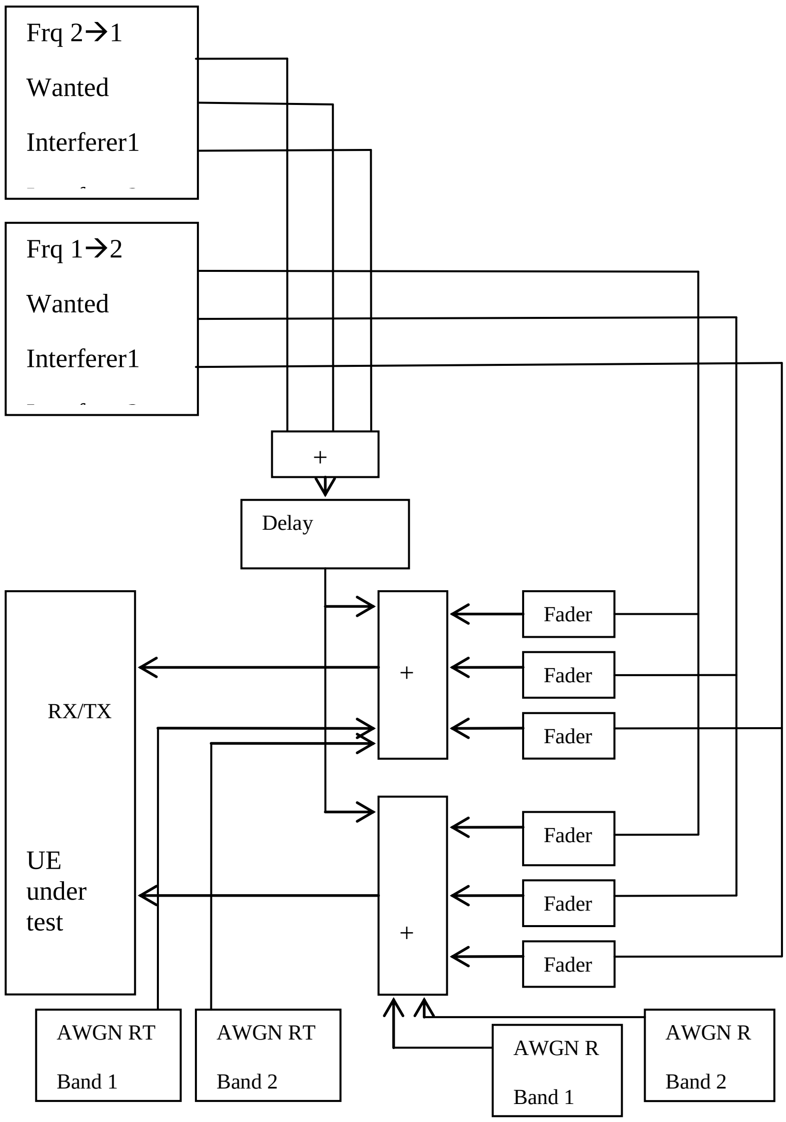


Figure A.45: Connection for DB-DC-HSDPA, Type 3i. 6 faders. 1 delay, to compensate for the basic delay of the faders. 2 part test illustrated by "Freq. 1→2 and Freq. 2→1". Uplink not displayed

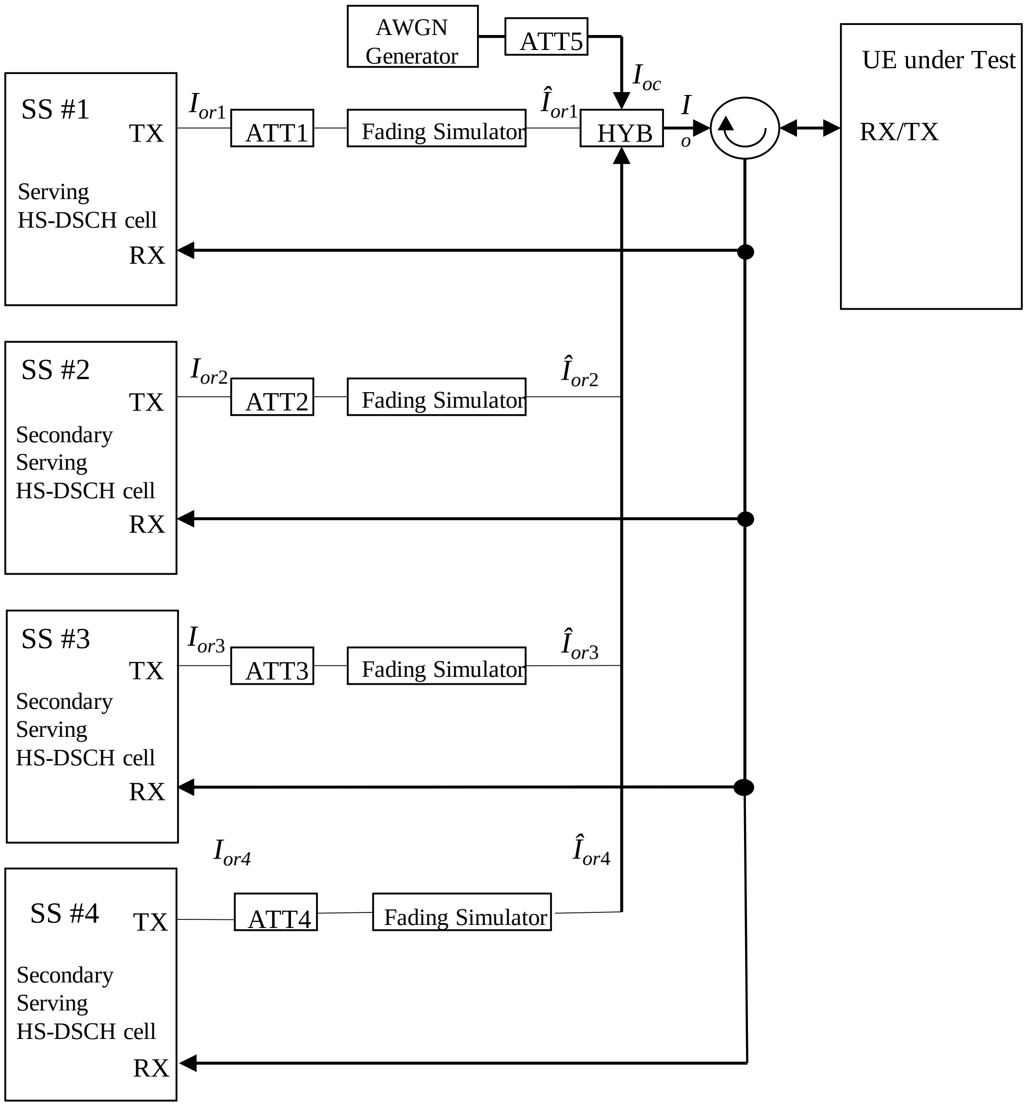


Figure A.46: Connection for 4C-HSDPA tests with multi-path fading propagation. Depending on 4C-HSDPA configuration SS#4 may not be needed

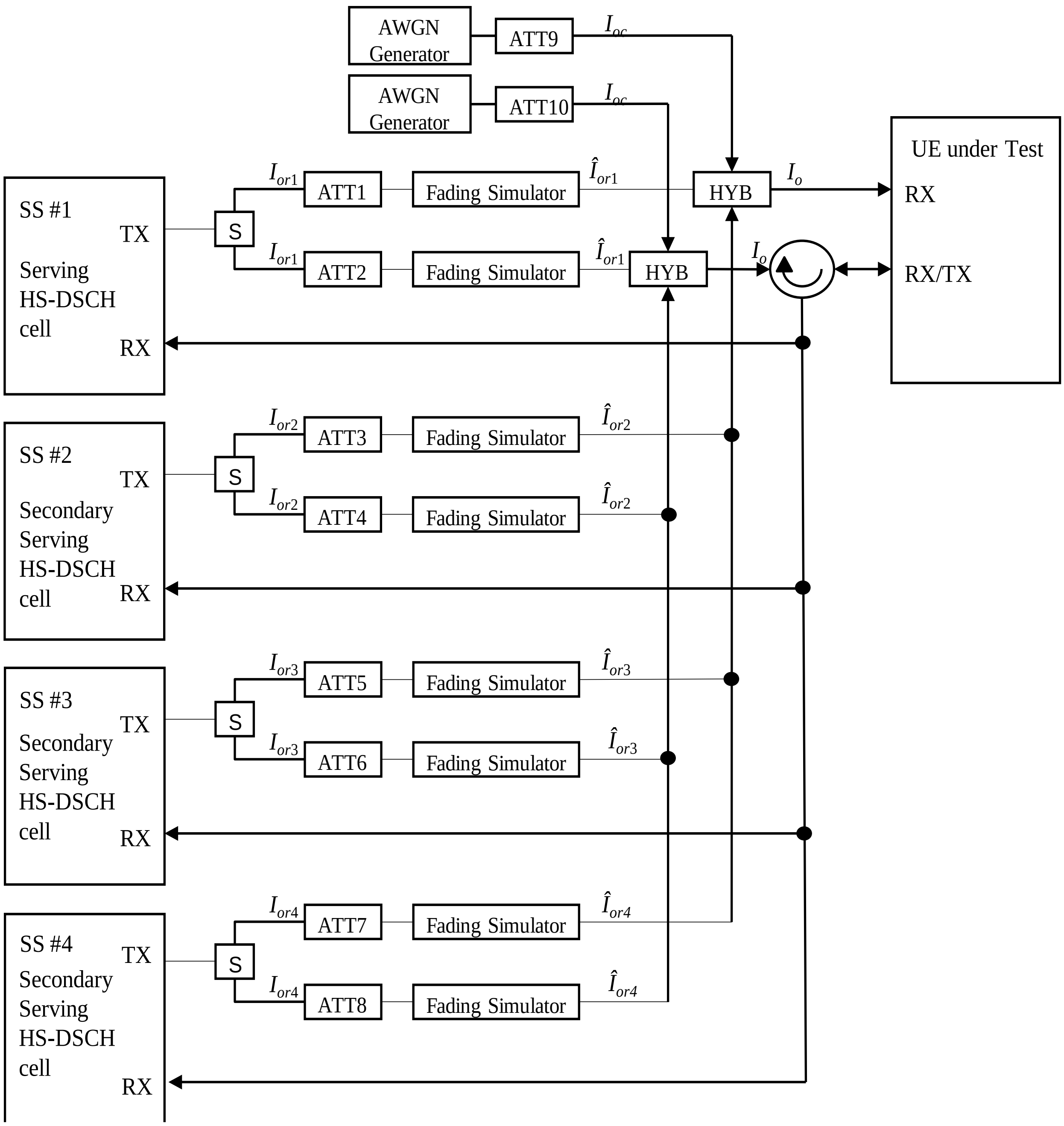


Figure A.47: Connection for 4C-HSDPA with multi-path fading propagation and UE receive diversity. Depending on 4C-HSDPA configuration SS#4 may not be needed

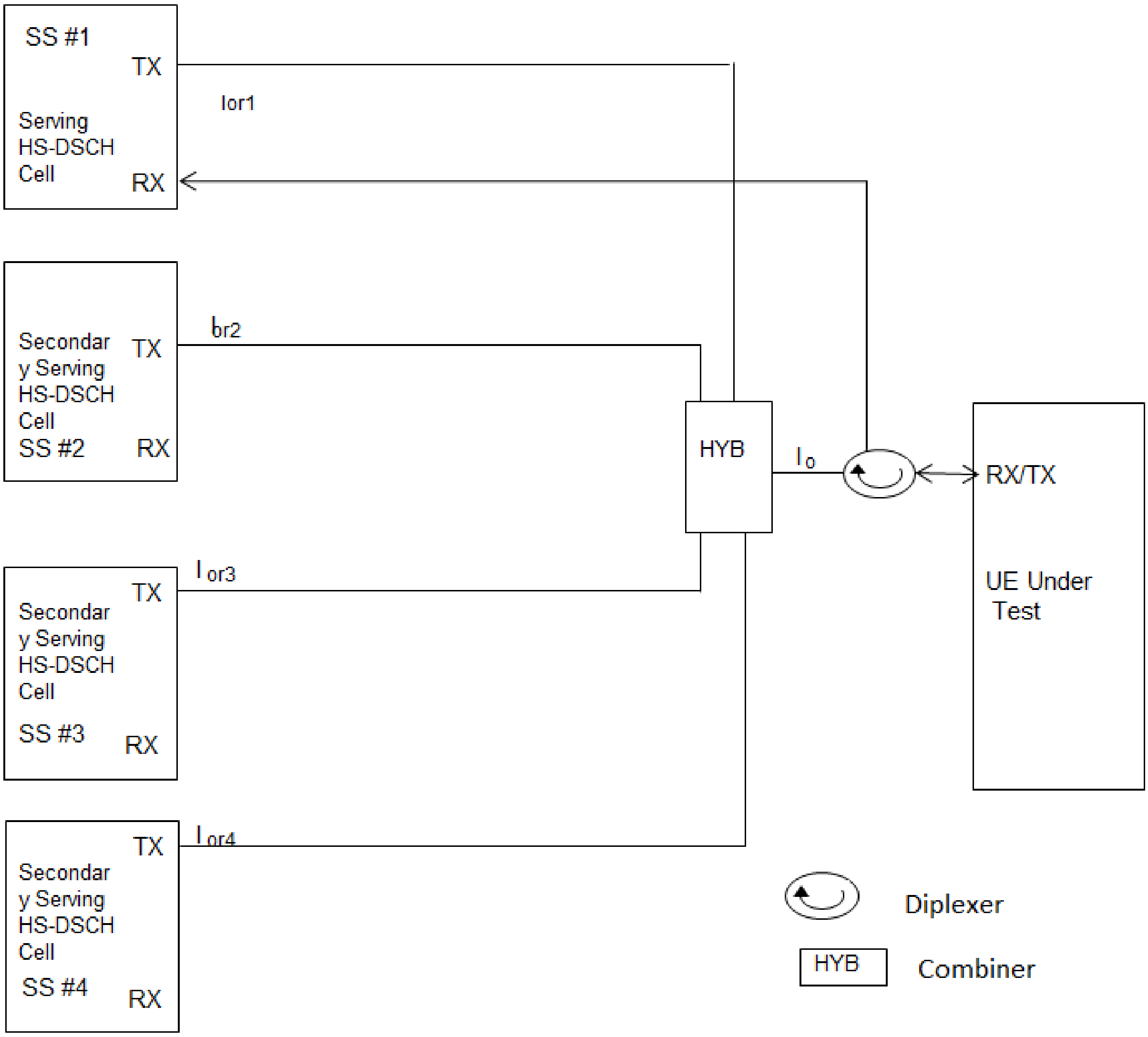


Figure A.48: Connection for basic 4C-HSDPA tests. Depending on 4C-HSDPA configuration SS#4 may not be needed

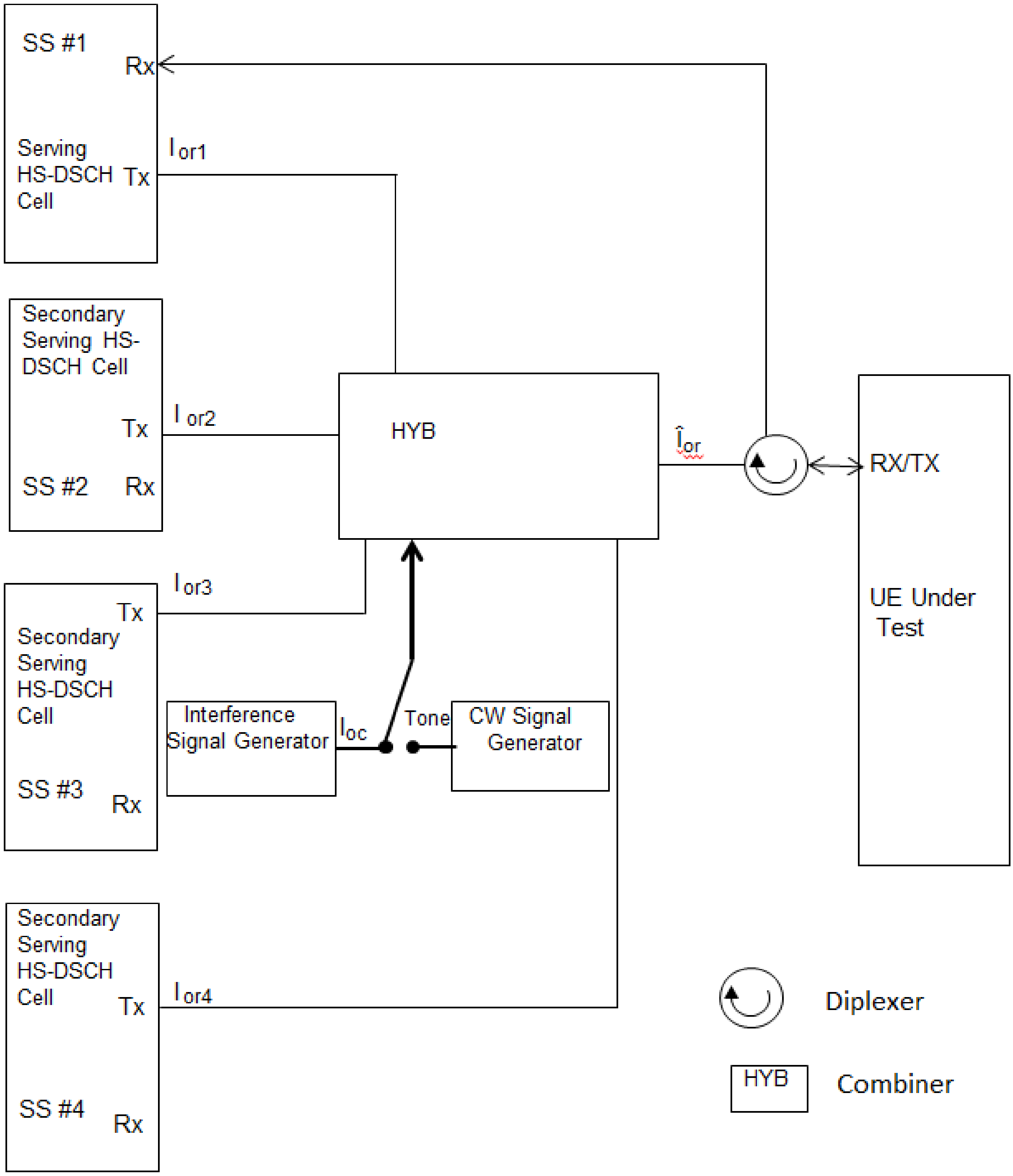


Figure A.49: Connection for 4C-HSDPA Receiver tests with Interference or additional CW signal. Depending on 4C-HSDPA configuration SS#4 may not be needed

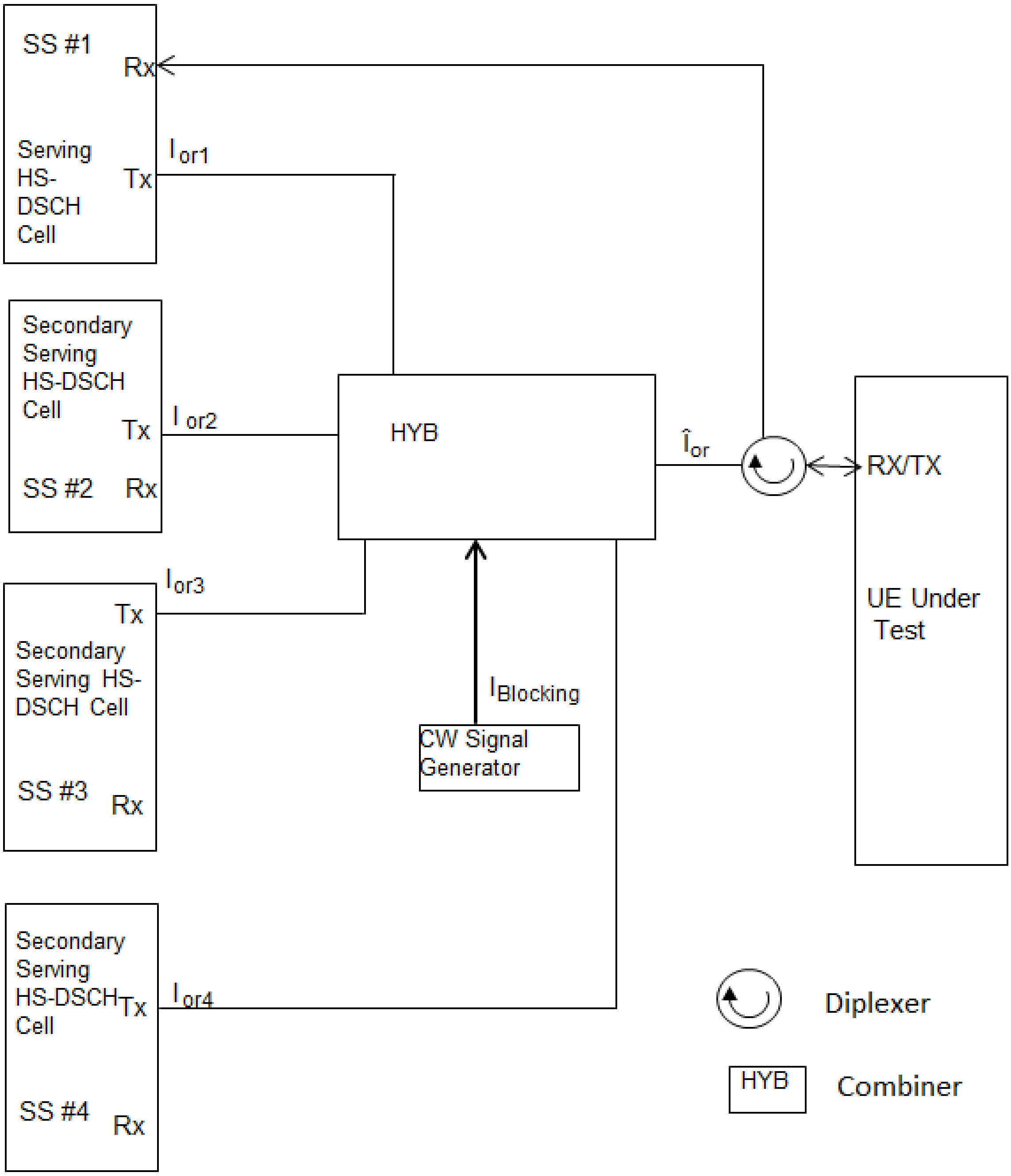


Figure A.50: Connection for 4C-HSDPA Receiver tests with additional CW signal. Depending on 4C-HSDPA configuration SS#4 may not be needed

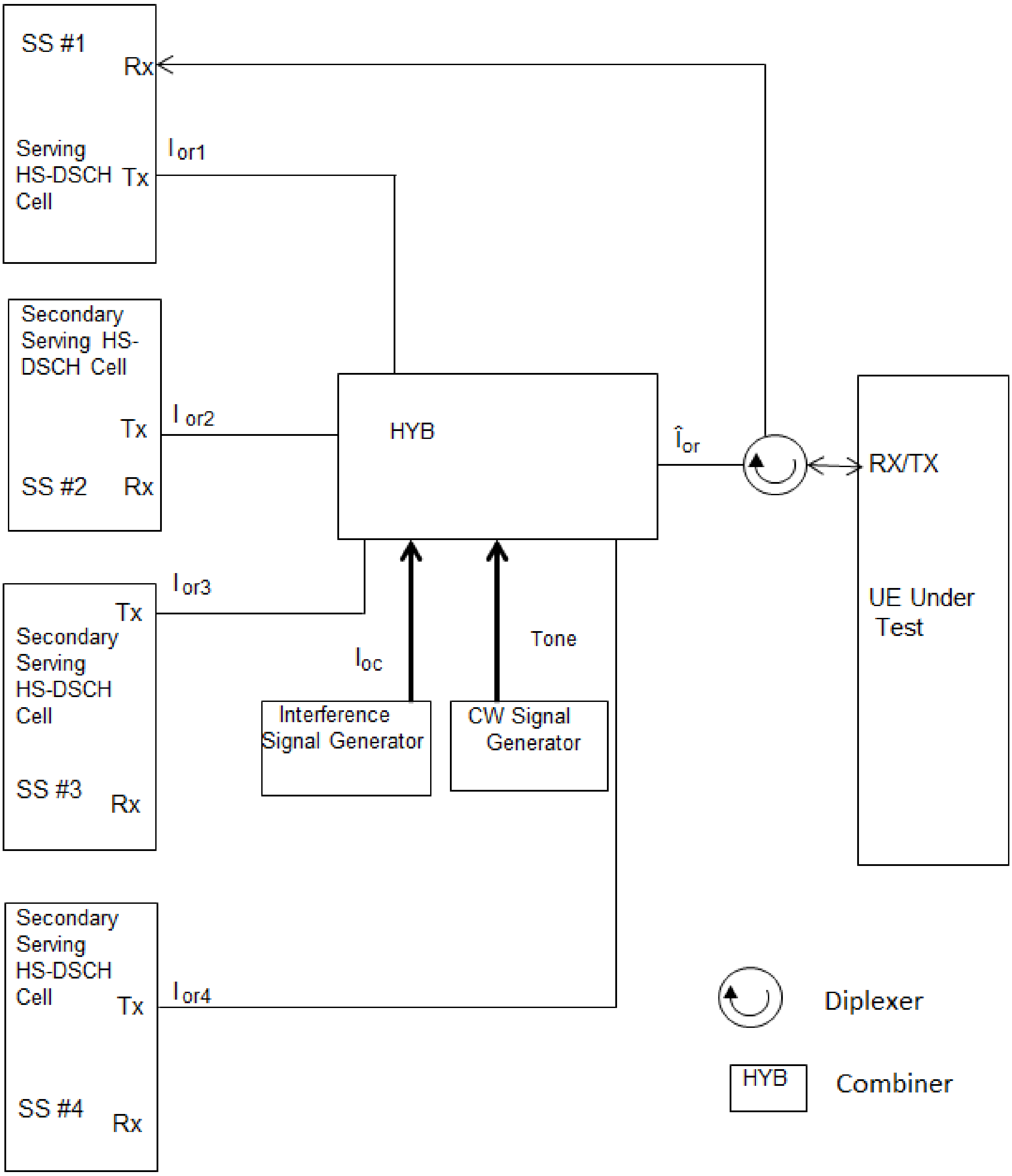


Figure A.51: Connection for 4C-HSDPA Receiver tests with both Interference and additional CW signal. Depending on 4C-HSDPA configuration SS#4 may not be needed

Annex B (normative): Global In-Channel TX-Test

B.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process.

The parameters describing the in-channel quality of a transmitter, however, are not necessarily independent. The algorithm chosen for description inside this annex places particular emphasis on the exclusion of all interdependencies among the parameters. Any other algorithm (e.g. having better computational efficiency) may be applied, as long as the results are the same within the acceptable uncertainty of the test system as defined in annex F.

The global in-channel Tx test is bipartite depending whether the signal under test contains a 16QAM modulation on any of the uplink code channels. Further details are in Note: Residual(16 QAM).

All notes referred in the various clauses of B.2 are put together in B.3.

B.2 Definition of the process

B.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. The reference signal shall be composed of the same number of codes at the correct spreading factors as contained in the test signal. Note, for simplification, the notation below assumes only codes of one spreading factor although the algorithm is valid for signals containing multiple spreading factors. All signals are represented as equivalent (generally complex) baseband signals.

B.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored for further processing.

The following form represents the physical signal in the entire measurement interval:

one vector **Z**, containing N = ns x sf complex samples;

with

ns: number of symbols in the measurement interval;

sf: number of chips per symbol. (sf: spreading factor) (see Note: Symbol length)

B.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications.

It is filtered by the same matched filter, mentioned in clause B.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:

- one vector **R**, containing N = ns x sf complex samples;
- ns, sf: see clause B.2.2.

B.2.4 void

B.2.5 Classification of measurement results

The measurement results achieved by the global in-channel TX test can be classified into two types:

- Results of type "deviation", where the error-free parameter has a non-zero magnitude. (These are the parameters that quantify the integral physical characteristic of the signal).These parameters are:

  RF Frequency;

  Power (in case of single code);

  Code Domain Power (in case of multi code);

  Timing

  (Additional parameters: see Note: Deviation).

- Results of type "residual", where the error-free parameter has value zero. (These are the parameters that quantify the error values of the measured signal, whose ideal magnitude is zero). These parameters are:

  Error Vector Magnitude (EVM);

  Peak Code Domain Error (PCDE).

  Relative Code Domain Error (RCDE).

  Origin Offset (O) See Note : Residual(16 QAM)

B.2.6 Process definition to achieve results f, t, φ, g_1, g_2, and O

The reference signal (**R**; see clause B.2.3) and the signal under Test (**Z**; see subclause B.2.2) are varied with respect to the parameters RF Frequency, absolute Amplitude or Code Domain Amplitude, Phase, Timing and Origin Offset in order to achieve best fit. Best fit is achieved when the RMS difference value between the varied signal under test and the varied reference signal is an absolute minimum.

Overview:

$$FCT\left[\ Z(\tilde{f},\tilde{t},\tilde{\varphi},g_1,g_2,...,\tilde{O}) - R(f,t,\varphi,\tilde{g}_1,\tilde{g}_2,...,O)\ \right] = Minimum!$$

Z: Signal under test.

R: Reference signal,

with

- frequency f,
- the timing t,
- the phase φ,
- amplitude of code1 (g_1), amplitude of code2 (g_2) etc
- Origin Offset O See Note: Residual(16 QAM).

The parameters marked with a tilde in Z and R are varied in order to achieve a best fit.

Detailed formula: see Note: Formula for the minimum process.

The varied reference signal, after the best fit process, will be called **R'.**

The varied signal under test, after the best fit process, will be called **Z'.**

Hence

The samples **R** are constructed, using the nominal values of the parameters f, t, φ, $g_{1,} g_{2,...}$ and O from the TX specifications

Vice versa, values for the parameters f, t, φ, $g_{1,} g_{2,...}$ and O can be assigned to the measured samples **Z**

The values in **R'**: f, t, φ and O are the same as in **R,** g_1, g_2, … are fit towards **Z**

The values in **Z'**: f, t, φ and O are fit towards **R** g_1, g_2, … are same as in **Z**

The varying parameters, leading to **R' and Z'** represent directly the wanted results f, t, φ, $g_{1,}$ $g_{2,}$ etc, and O. . These measurement parameters are expressed as deviation from the reference value with units same as the reference value.

In case of multi code, the f, t, φ, $g_{1,}$ $g_{2,}$ etc, and O. parameters (frequency, timing, origin offset and (RF-phase)) are varied commonly for all codes such that the process returns one frequency-deviation, one timing deviation, (one RF-phase –deviation) one origin offset.

(These parameters are <u>not</u> varied on the individual codes signals such that the process would return kr frequency errors. (kr: number of codes in the reference signal)).

The only parameters varied individually are the code domain amplitudes (g1, g2, …) where (g_1, g_2, …) comprise the active codes only. In general the measured signal Z contains residual power on the unused codes. The amplitudes of the unused codes in R remain 0 and are not fit towards Z.

R' will be used for normalisation frequently in the subsequent clauses. Hence the physical meaning of R' is explained here:

R' is the modified reference signal, modified by fitting the code amplitudes of the active codes towards the measured signal. Hence the power of these samples is the power of the active codes in the measured signal. For a signal, not containing 16 QAM, this is true although f, t, φ in the measured signal are different from the equivalent values in R', however differences in these parameters do not contribute to the power in R'. For a signal, containing 16 QAM modulation on any of the uplink codes, the meaning is different: f, t, φ and O in the measured signal are different to the equivalent values in R', but O contribute to the power in R'. Hence the power in the samples of R' is the power of the active codes in the measured signal excluding the power in the IQ offset.

B.2.6.1 Decision Point Power

The mean-square value of the signal-under-test, sampled at the best estimate of the of Intersymbol-Interference-free points using the process defined in subclause 2.6, is referred to the *Decision Point Power* (DPP):

$$DPP = mean\left(|Z'|^2\right)$$

B.2.6.2 Measured total power of all active codes

The mean-square value of the modified reference signal R' defined in subclause 2.6, is referred to the *measured total power of all active codes*:

measured total power of all active codes = $\text{mean}(|R'|^2)$

B.2.6.3 Code-Domain Power

The samples, **Z'**, are separated into symbol intervals to create ns time-sequential vectors **z** with sf complex samples comprising one symbol interval. The *Code Domain Power* is calculated according to the following steps:

1) Take the vectors **z** defined above.

2) To achieve meaningful results it is necessary to descramble **z,** leading to **z'** (see Note1: Scrambling code)

3) Take the orthogonal vectors of the channelization code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1), and normalize by the norm of the vectors to produce **C**norm=**C**/sqrt(sf). (see Note: Symbol length)

4) Calculate the inner product of **z'** with **C**norm**.**. Do this for all symbols of the measurement interval and for all codes in the code space.
   This gives an array of format k x ns, each value representing a specific symbol and a specific code, which can be exploited in a variety of ways.

   k: total number of codes in the code space (active and unused)

   ns: number of symbols in the measurement interval

5) Calculate k mean-square values, each mean-square value unifying ns symbols within one code.
   (These values can be called "*Absolute CodeDomainPower* (CDP)".) Unused codes may carry CDP. The sum of the k values of CDP is equal to DPP.

6) Normalize by the decision point power to obtain

$$Relative\ CodeDomain\ Power = \frac{Absolute\ CodeDomainPower}{DecisionPointPower}$$

B.2.6.4 Code-Domain Power of the varied reference signal

1) The samples **R'**, as defined in B.2.6, are separated into symbol intervals to create ns time-sequential vectors **r** with sf complex samples comprising one symbol interval. The code domain power of the varied reference signal is calculated according to the following steps:

2) To achieve meaningful results it is necessary to descramble **r,** leading to **r'** (see Note1: Scrambling code)

3) Take the orthogonal vectors of the channelization code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1), and normalize by the norm of the vectors to produce **C**norm=**C**/sqrt(sf).

4) Calculate the inner product of **r'** with **C**norm**.**. Do this for all symbols of the measurement interval but only for used codes in the code space. This gives an array of format uk x ns, each value representing a specific symbol and a specific code

   uk: number of codes (only active (used) codes)

   ns: number of symbols in the measurement interval

5) Calculate uk mean-square values, each mean-square value unifying ns symbols within one code.
   These are called "Absolute *Code Domain Power of the varied reference signal*"

6) Normalize by measured total power of all active codes (B.2.6.2) to obtain:

Absolute Code Domain Power of the varied reference signal

Measured code domain power ratio = --

measured total power of all active codes

B.2.7 Process definition to achieve results EVM, PCDE, RCDE

The difference between the varied reference signal (**R'**; see clause B.2.6.) and the varied TX signal under test (**Z'**; see clauseB.2.6) is the error vector **E** versus time:

- **E** = **Z'** – **R'.**

E gives results of type "residual" applying the three algorithms defined in clauses B 2.7.1, B 2.7.2.1 and B.2.7.3.

B.2.7.1 Error Vector Magnitude (EVM)

The Error Vector Magnitude EVM is calculated according to the following steps:

1) Take the error vector **E** defined in clause B.2.7 and calculate the RMS value of **E**; the result will be called RMS(**E**).

2) Take the varied reference vector **R'** defined in clause B.2.6 and calculate the RMS value of **R'**; the result will be called RMS(**R'**).

3) Calculate EVM according to:

$$EVM = \frac{RMS(\mathbf{E})}{RMS(\mathbf{R}')} x100\% \qquad \text{(here, EVM is relative and expressed in \%)}$$

(see Note: Formula for EVM)

B.2.7.2 Code Domain Error Power

The Code Domain Error Power is calculated according to the following steps:

1) The samples **E**, as defined in B.2.7, are separated into symbol intervals to create ns time-sequential vectors **e** with sf complex samples comprising one symbol interval.

2) To achieve meaningful results it is necessary to descramble **e,** leading to **e'** (see Note1: Scrambling code)

3) Take the orthogonal vectors of the channelisation code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1). (see Note: Symbol length) and normalize by the norm of the vectors to produce **C**norm= **C**/sqrt(sf). (see Note: Symbol length)

4) Calculate the inner product of **e'** with **Cnorm**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing an error-vector representing a specific symbol and a specific code, which can be exploited in a variety of ways.

   k: total number of codes in the code space

   ns: number of symbols in the measurement interval

5) Calculate k values $mean(|e'|^2)$, each value unifying ns symbols within one code.
(These values can be called "*Absolute Code Domain Error Power*"B.2.7.2.1 Peak Code Domain Error Power (PCDE)

Find the peak value among the k "*Absolute Code Domain Error Powers*".
(This value can be called "*Absolute PeakCode Domain Error Powers*" This peak may hit an unused or an active code.)

Normalise by the *measured total power of all active codes* (clause B.2.6.2) to achieve PCDE

$$PCDE = 10*\lg \frac{\textit{Absolute Peak Code Domain Error Power}}{\textit{measured total power of all active codes } (RMS(\mathbf{R}'))^2} \; dB \qquad \text{(a relative value in dB).}$$

(see Note 2: Scrambling code)

(see Note IQ)

B.2.7.3 Relative Code Domain Error (RCDE)

The Relative Code Domain Error is calculated according to the following steps:

Re-use step 1 to 3 from clause B.2.7.2.

4) Calculate the inner product of **e'** with **Cnorm**. Do this for all symbols of the measurement interval but only for the used codes in the code space.
This gives an array of format uk x ns, each value representing an error-vector representing a specific symbol and a specific code.

   uk: used (active) codes in the code space

   ns: number of symbols in the measurement interval

5) Calculate uk values $mean(|e'|^2)$, each value unifying ns symbols within one code.
(These values can be called "*Absolute Code Domain Error Powers*")

6) The uk absolute code domain error powers are normalized by the equivalent uk code domain powers of the varied reference signal (B.2.6.4 step 5)

$$\text{RCDE} = \frac{\textit{Absolute CodeDomain Error Power}}{\textit{Code domain power of the varied reference signal}}$$

B.3 Notes

Note: Symbol length)

A general code multiplexed signal is multicode and multirate. In order to avoid unnecessary complexity, the measurement applications use a unique symbol-length, corresponding to a spreading factor, regardless of the really intended spreading factor. Nevertheless the complexity with a multicode / multirate signal can be mastered by introducing appropriate definitions.

Note: Deviation)

It is conceivable to regard more parameters as type „deviation" e.g. Chip frequency and RF-phase.

As chip-frequency and RF-frequency are linked together by a statement in the core specifications [1] it is sufficient to process RF frequency only.

A parameter RF-phase must be varied within the best fit process (B 2.6.). Although necessary, this parameter-variation doesn't describe any error, as the modulation schemes used in the system don't depend on an absolute RF-phase.

Note: Residual (non 16 QAM))

It is conceivable to regard more parameters as type „residual" e.g. IQ origin offset. As it is not the intention of the test to separate for different error sources, but to quantify the quality of the signal, all such parameters are not extracted by the best fit process, instead remain part of EVM and PCDE.

Note: Residual(16 QAM)

When a UE uses 16QAM modulation on any of the uplink code channels, the best fit process, described in B.2.6, includes the Origin Offset as an additional parameter for minimisation. Otherwise Origin Offset is not part of the best fit process and remains part of EVM, PCDE and RCDE, This bipartite handling of the minimisation process will influence the results for EVM, PCDE and RCDE by definition. It will influence the results for amplitude and the code amplitudes and it may influence, as an effect of higher order, the results for RF frequency, absolute phase and phase discontinuity.

Note 1: Scrambling Code)

In general a TX signal under test can use more than one scrambling code. Note that PCDE is processed regarding the unused channelisation - codes as well. In order to know which scrambling code shall be applied on unused channelisation -codes, it is necessary to restrict the test conditions: TX signal under test shall use exactly one scrambling code.

Note 2: Scrambling Code)

To interpret the measurement results in practice it should be kept in mind that erroneous code power on unused codes is generally de-scrambled differently under test conditions and under real life conditions, whereas erroneous code power on used codes is generally de-scrambled equally under test conditions and under real life conditions. It might be indicated if a used or unused code hits PCDE.

Note IQ)

As in FDD/uplink each code can be used twice, on the I and on the Q channel, the measurement result may indicate separate values of CDP or PCDE for I and Q on which channel (I or Q) they occur.

NOTE: Formula for the minimum process

$$L(\Delta\tilde{f}, \Delta\tilde{t}, \Delta\tilde{\varphi}, \Delta\tilde{g}_c, ..., \tilde{O}) = \sum_{\nu=0}^{N-1} \left| Z(\nu) - R(\nu) \right|^2$$

Legend:

L : the function to be minimised.

The parameters to be varied in order to minimize are:

$\Delta\tilde{f}$: the RF frequency offset

$\Delta\tilde{t}$: the timing offset

$\Delta\tilde{\varphi}$: the phase offset

$\Delta\tilde{g}_c$... code amplitude offsets (one offset for each code)

$\tilde{O}$: Origin Offset

Z(ν): Samples of the signal under Test

R(ν): Samples of the reference signal

$\sum_{\nu=0}^{N-1}$: counting index ν starting at the beginning of the measurement interval and ending at its end.

N = No of chips during the measurement interval.

Z(ν): Samples of the signal under Test. It is modelled as a sequence of complex baseband samples Z(ν) with a n Origin offset, time-shift Δt, a frequency offset Δf, a phase offset Δφ, the latter three with respect to the reference signal.

$$Z(\nu) = Z(\nu - \Delta\tilde{t}) * e^{-j2\pi\Delta\tilde{f}\nu} * e^{-j\Delta\tilde{\varphi}}$$

$$Z(\nu) = Z(\nu - \Delta\tilde{t}) * e^{-j2\pi\Delta\tilde{f}\nu} * e^{-j\Delta\tilde{\varphi}} - \tilde{O}$$

$$Z(\nu) = Z(\nu - \Delta\tilde{t}) * e^{-j2\pi\Delta\tilde{f}\nu} * e^{-j\Delta\tilde{\varphi}}$$

R(ν): Samples of the reference signal:

$$R(\nu) = \sum_{c=1}^{\text{No.of codes}} (g_c + \Delta\tilde{g}_c) * \text{Chip}_c(\nu)$$

g: nominal amplitude of the code channel

$\Delta\tilde{g}$: The offset to be varied in the minimum process

Chip(ν) is the chipsequence of the code channel

Indices at g, Δg and Chip:

The index indicates the code channel: c = 1,2,... No of code channels

Range for $Chip_c$: +1,-1

NOTE: Formula for EVM

$$EVM = \sqrt{\frac{\sum_{\nu=0}^{N-1} \left| Z'(\nu) - R'(\nu) \right|^2}{\sum_{\nu=0}^{N-1} \left| R'(\nu) \right|^2}} * 100\%$$

Z'(ν), R'(ν) are the varied measured and reference signals.

Annex C (normative): Measurement channels

C.1 General

The measurement channels in this annex are defined to derive the requirements in clauses 5, 6 and 7. The measurement channels represent example configuration of radio access bearers for different data rates.

The measurement channel for 12,2 kbps shall be supported by any UE both in up- and downlink. Support for other measurement channels is depending on the UE Radio Access capabilities.

C.2 UL reference measurement channel

C.2.1 UL reference measurement channel (12,2 kbps)

The parameters for the 12,2 kbps UL reference measurement channel are specified in table C.2.1.1, table C 2.1.2, table C 2.1.3 and table C.2.1.4. The channel coding for information is shown in figure C.2.1.

Table C.2.1.1: UL reference measurement channel physical parameters (12,2 kbps)

Parameter	Level	Unit
Information bit rate	12,2	kbps
DPDCH	60	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	−5,46	dB
TFCI	On	-
Repetition	23	%
NOTE: Slot Format #2 is used for closed loop tests in clause 7.6.2. Slot Format #2 and #5 are used for site selection diversity transmission tests in subclause 7.6.3.		

Table C.2.1.2: UL reference measurement channel using RLC-TM for DTCH, transport channel parameters (12.2 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		244	88/80
	Max data rate, bps		12200	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		244	100
	TFS	TF0, bits	0*244	0*100
		TF1, bits	1*244	1*100
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		804	360
	Uplink: Max number of bits/radio frame before rate matching		402	90
	RM attribute		256	256

Table C.2.1.3: UL reference measurement channel, TFCS (12.2 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

NOTE: The TFCs except for (TF1, TF1) are belonging to minimum set of TFCs.

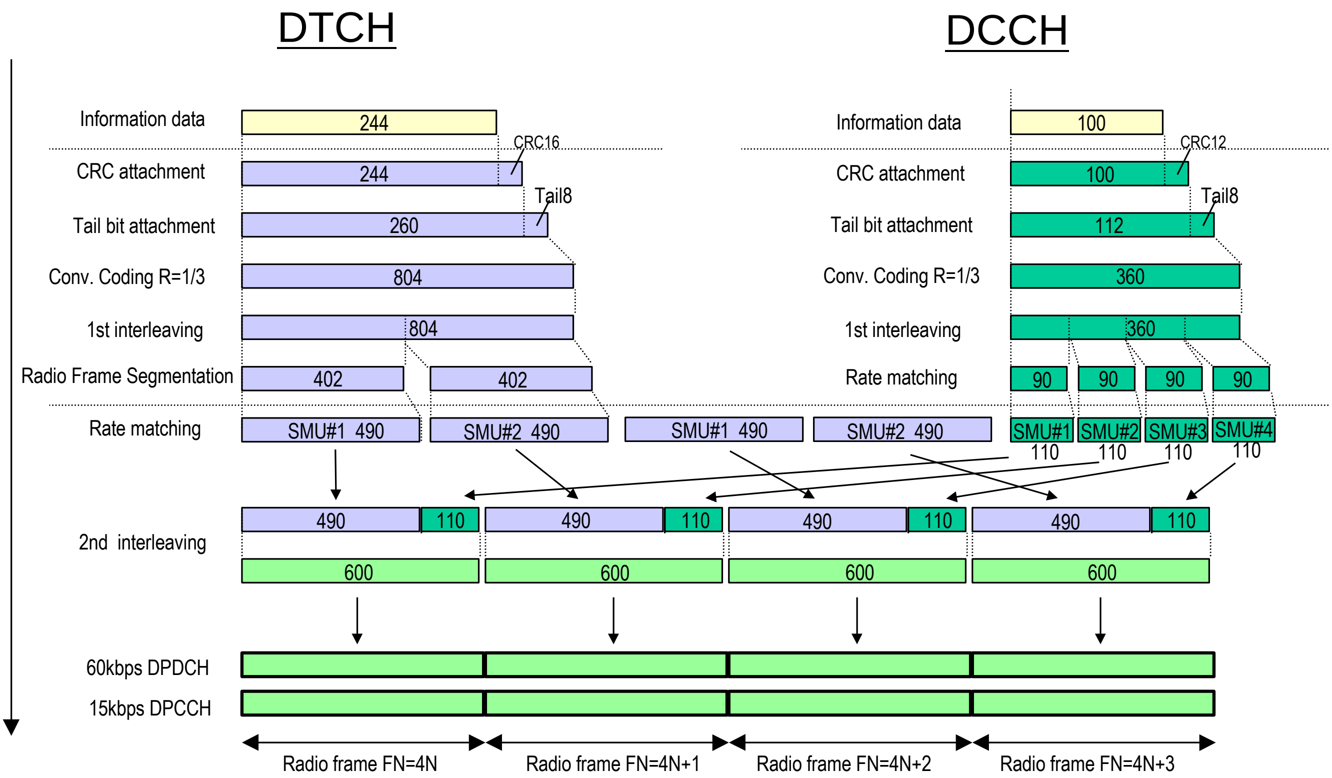


Figure C.2.1 (Informative): Channel coding of UL reference measurement channel (12,2 kbps)

C.2.2 UL reference measurement channel (64 kbps)

The parameters for the 64 kbps UL reference measurement channel are specified in table C.2.2.1, table C.2.2.2, table C.2.2.3 and table C.2.2.4. The channel coding for information is shown in figure C.2.2.

Table C.2.2.1: UL reference measurement channel (64 kbps)

Parameter	Level	Unit
Information bit rate	64	kbps
DPDCH	240	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH	−9,54	dB
TFCI	On	-
Repetition	18	%

Table C.2.2.2: UL reference measurement channel using RLC-TM for DTCH, transport channel parameters (64 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		1280	88/80
	Max data rate, bps		64000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		1280	100
	TFS	TF0, bits	0*1280	0*100
		TF1, bits	1*1280	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		3900	360
	Uplink: Max number of bits/radio frame before rate matching		1950	90
	RM attribute		256	256

Table C.2.2.3: UL reference measurement channel using RLC-AM for DTCH, transport channel parameters (64 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		1264	88/80
	Max data rate, bps		63200	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		1280	100
	TFS	TF0, bits	0*1280	0*100
		TF1, bits	1*1280	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		3900	360
	Uplink: Max number of bits/radio frame before rate matching		1950	90
	RM attribute		256	256

Table C.2.2.4: UL reference measurement channel, TFCS (64 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

NOTE: The TFCs except for (TF1, TF1) are belonging to minimum set of TFCs.

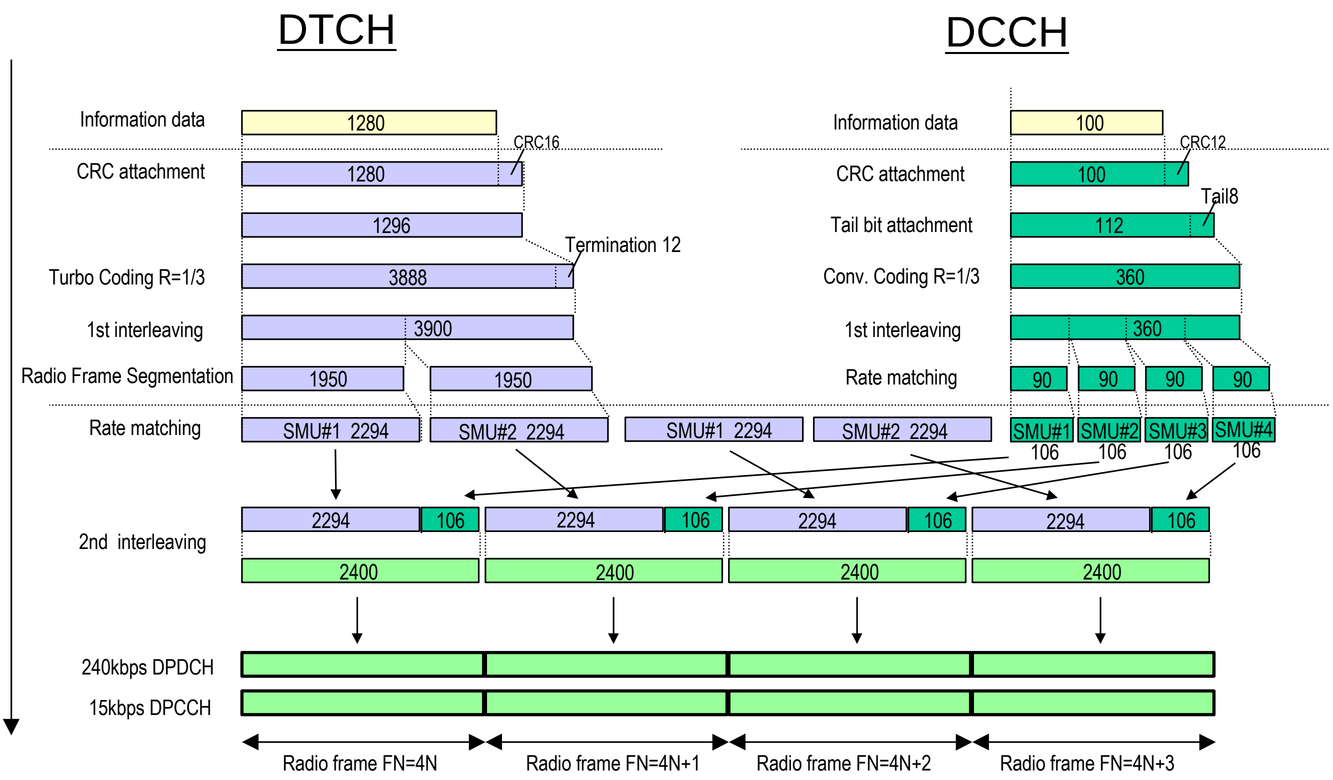


Figure C.2.2 (Informative): Channel coding of UL reference measurement channel (64 kbps)

C.2.3 UL reference measurement channel (144 kbps)

The parameters for the 144 kbps UL reference measurement channel are specified in table C.2.3.1, table C.2.3.2, table C.2.3.3 and table C.2.3.4. The channel coding for information is shown in figure C.2.3.

Table C.2.3.1: UL reference measurement channel (144 kbps)

Parameter	Level	Unit
Information bit rate	144	kbps
DPDCH	480	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	–11,48	dB
TFCI	On	-
Repetition	8	%

Table C.2.3.2: UL reference measurement channel using RLC-TM for DTCH, transport channel parameters (144 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		2880	88/80
	Max data rate, bps		144000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		2880	100
	TFS	TF0, bits	0*2880	0*100
		TF1, bits	1*2880	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		8700	360
	Uplink: Max number of bits/radio frame before rate matching		4350	90
	RM attribute		256	256

Table C.2.3.3: UL reference measurement channel using RLC-AM for DTCH, transport channel parameters (144 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		2864	88/80
	Max data rate, bps		143200	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		2880	100
	TFS	TF0, bits	0*2880	0*100
		TF1, bits	1*2880	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		8700	360
	Uplink: Max number of bits/radio frame before rate matching		4350	90
	RM attribute		256	256

Table C.2.3.4: UL reference measurement channel, TFCS (144 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

NOTE: The TFCs except for (TF1, TF1) are belonging to minimum set of TFCs.

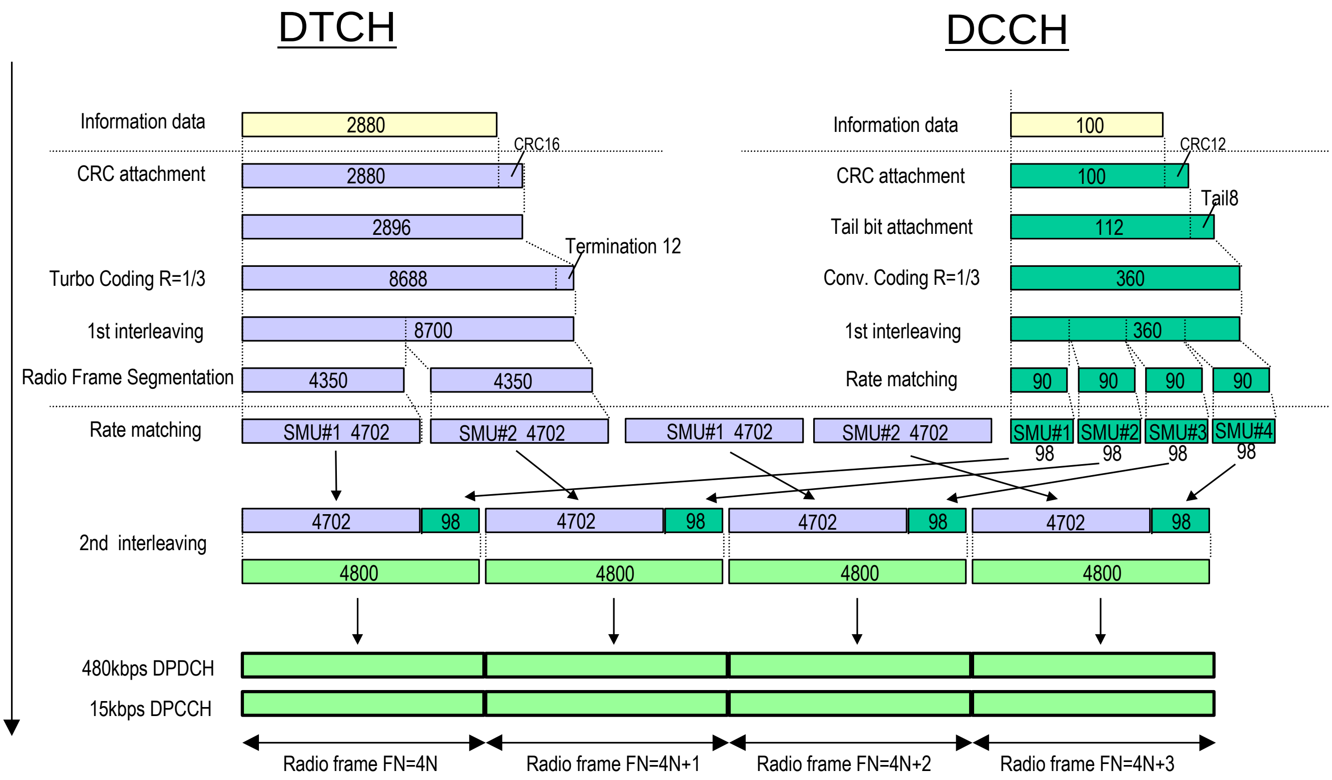


Figure C.2.3 (Informative): Channel coding of UL reference measurement channel (144 kbps)

C.2.4 UL reference measurement channel (384 kbps)

The parameters for the 384 kbps UL reference measurement channel are specified in table C.2.4.1, table C.2.4.2, table C.2.4.3 and table C.2.4.4. The channel coding for information is shown in figure C.2.4.

Table C.2.4.1: UL reference measurement channel (384 kbps)

Parameter	Level	Unit
Information bit rate	384	kbps
DPDCH	960	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	-11,48	dB
TFCI	On	-
Puncturing	18	%

Table C.2.4.2: UL reference measurement channel using RLC-TM for DTCH, transport channel parameters (384 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		3840	88/80
	Max data rate, bps		384000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		3840	100
	TFS	TF0, bits	0*3840	0*100
		TF1, bits	1*3840	1*100
	TTI, ms		10	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		11580	360
	Uplink: Max number of bits/radio frame before rate matching		11580	90
	RM attribute		256	256

Table C.2.4.3: UL reference measurement channel using RLC-AM for DTCH, transport channel parameters (384 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		3824	88/80
	Max data rate, bps		382400	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		3840	100
	TFS	TF0, bits	0*3840	0*100
		TF1, bits	1*3840	1*100
	TTI, ms		10	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		11580	360
	Uplink: Max number of bits/radio frame before rate matching		11580	90
	RM attribute		256	256

Table C.2.4.4: UL reference measurement channel, TFCS (384 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

NOTE: The TFCs except for (TF1, TF1) are belonging to minimum set of TFCs.

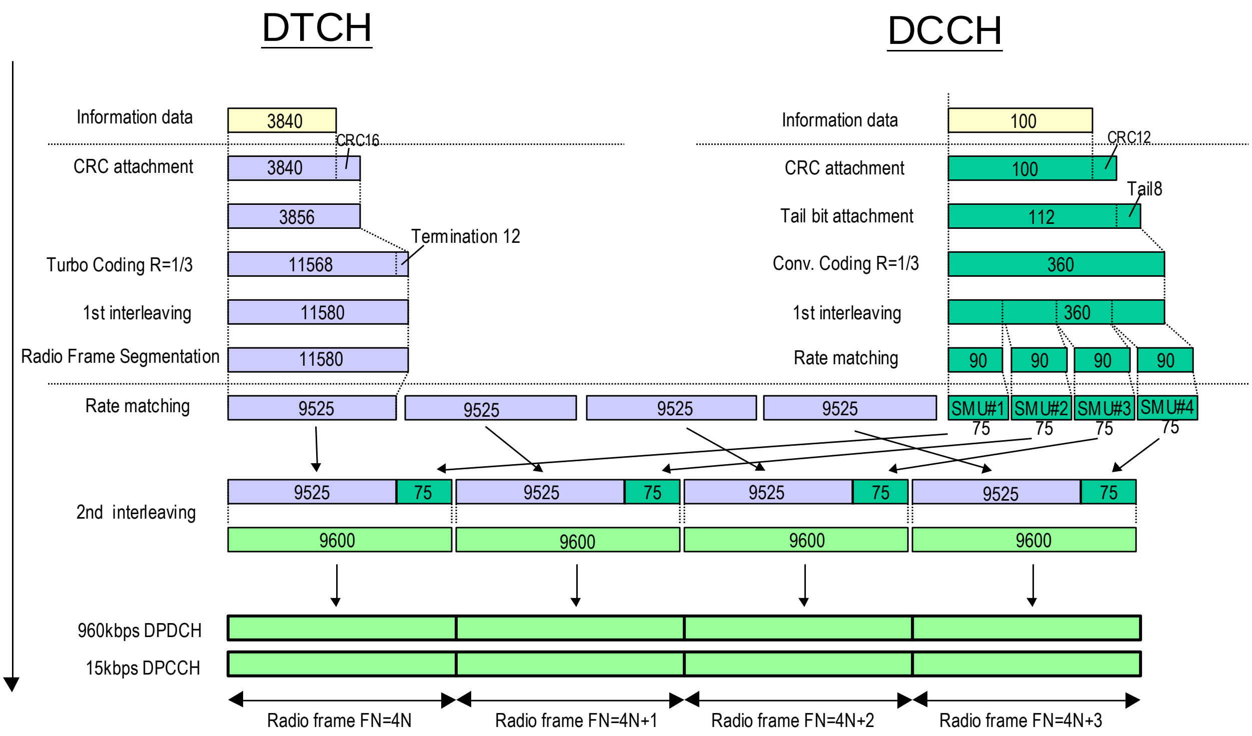


Figure C.2.4 (informative): Channel coding of UL reference measurement channel (384 kbps)

C.2.5 UL reference measurement channel (768 kbps)

The parameters for the UL measurement channel for 768 kbps are specified in table C.2.5.1, table C.2.5.2, table C.2.5.3 and table C.2.5.4.

Table C.2.5.1: UL reference measurement channel, physical parameters (768 kbps)

Parameter	Level	Unit
Information bit rate	2*384	kbps
$DPDCH_1$	960	kbps
$DPDCH_2$	960	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	-11.48	dB
TFCI	On	-
Puncturing	18	%

Table C.2.5.2: UL reference measurement channel using RLC-TM for DTCH, transport channel parameters (768 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		7680	88/80
	Max data rate, bps		768000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		3840	100
	TFS	TF0, bits	0*3840	0*100
		TF1, bits	2*3840	1*100
	TTI, ms		10	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		23160	360
	Uplink: Max number of bits/radio frame before rate matching		23160	90
	RM attribute		256	256

Table C.2.5.3: UL reference measurement channel using RLC-AM for DTCH, transport channel parameters (768 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		7664	88/80
	Max data rate, bps		766400	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		3840	100
	TFS	TF0, bits	0*3840	0*100
		TF1, bits	2*3840	1*100
	TTI, ms		10	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		23160	360
	Uplink: Max number of bits/radio frame before rate matching		23160	90
	RM attribute		256	256

Table C.2.5.4: UL reference measurement channel, TFCS (768 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

NOTE: The TFCs except for (TF1, TF1) are belonging to minimum set of TFCs.

C.2.6 UL E-DCH reference measurement channel for DC-HSUPA using BPSK modulation

The parameters for the UL measurement channel for UE transmitter characteristics for DC-HSUPA are specified in Table C.2.6.1 and Figure C.2.6. The power imbalance in Table C.2.6.1 refers to the ratio of the DPCCH power of the primary uplink frequency to the DPCCH power of the secondary uplink frequency, expressed in dB.

Table C.2.6.1: Settings for DC-HSUPA reference measurement channel using BPSK modulation

Parameter	Unit	Value
Modulation		BPSK
Maximum. Inf. Bit Rate	kbps	60
TTI	ms	2
Number of HARQ Processes	Processes	8
Information Bit Payload (N_{INF})	Bits	120
Binary Channel Bits per TTI (N_{BIN}) (3840 / SF x TTI sum for all channels)	Bits	480
Coding Rate (N_{INF}/ N_{BIN})		0.25
Physical Channel Codes	SF for each physical channel	{16}
E-DPDCH/DPCCH power ratio E-DPCCH/DPCCH power ratio HS-PDCCH/DPCCH power ratio	dB dB dB	4.08 -9.54 -9.54
Power imbalance	dB	0
Note: HS-DPCCH is applicable only for the primary uplink frequency.		

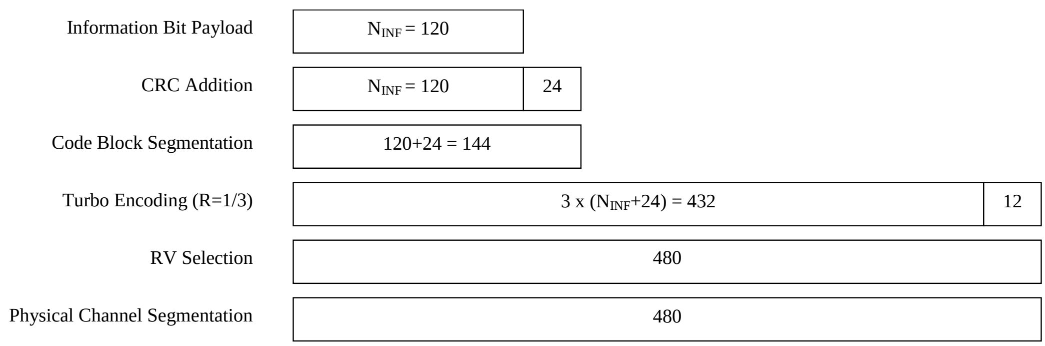


Figure C.2.6: Coding rate for DC-HSUPA reference measurement channel using BPSK modulation

C.2.7 UL E-DCH reference measurement channel for DC-HSUPA using 16QAM modulation

The parameters for the UL measurement channel for UE transmitter characteristics for DC-HSUPA using 16QAM modulation are specified in Table C.2.7.1 and Figure C.2.7. The power imbalance in Table C.2.7.1 refers to the ratio of the DPCCH power of the primary uplink frequency to the DPCCH power of the secondary uplink frequency, expressed in dB.

Table C.2.7.1: Settings for DC-HSUPA reference measurement channel using 16QAM modulation

Parameter	Unit	Value
Modulation		16QAM
Maximum. Inf. Bit Rate	kbps	4227
TTI	ms	2
Number of HARQ Processes	Processes	8
Information Bit Payload (NINF)	Bits	8454
Binary Channel Bits per TTI (NBIN) (3840 / SF x TTI sum for all channels)	Bits	23040
Coding Rate (NINF/ NBIN)		0.367
Physical Channel Codes	SF for each physical channel	{2,2,4,4}
E-DPDCH/DPCCH power ratio SF4 codes E-DPCCH/DPCCH power ratio SF2 codes E-DPCCH/DPCCH power ratio HS-PDCCH/DPCCH power ratio	dB dB dB dB	16.03 19.02 8.07 2.05
Power imbalance	dB	0
Note: HS-DPCCH is applicable only for the primary uplink frequency.		

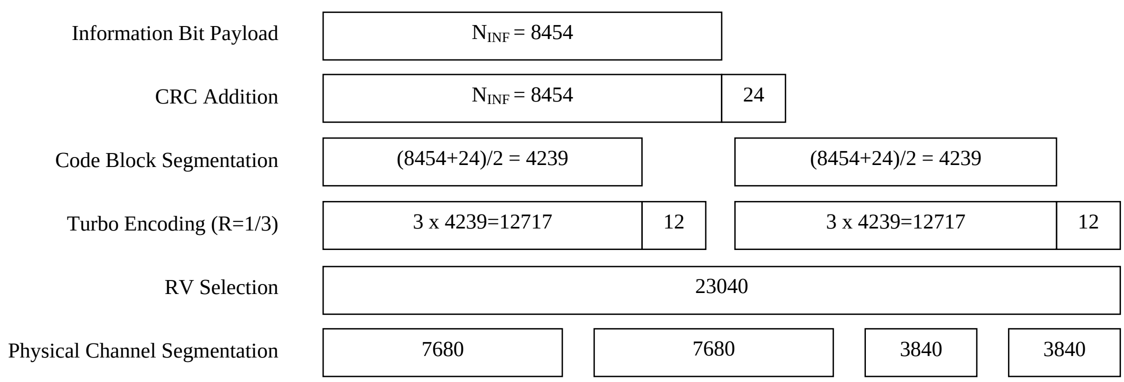


Figure C.2.7: Coding rate for DC-HSUPA reference measurement channel using 16QAM modulation

C.2.8 Combinations of UL E-DCH reference measurement channel for DC-HSUPA tests

The combinations of BPSK and 16QAM reference measurement channels in Table C.2.8.1 shall be used for verifying the UE maximum output power for DC-HSUPA, additional Spectrum emission mask for DC-HSUPA, and additional ACLR requirement for DC-HSUPA. The entry BPSK in Table C.2.8.1 refers to the UL E-DCH reference measurement channel for DC-HSUPA using BPSK modulation, specified in subclause C.2.6, and the entry 16QAM refers to the UL E-DCH reference measurement channel for DC-HSUPA using 16QAM modulation, specified in subclause C.2.7. The power imbalance in subclause C.2.6 and C.2.7 have been adjusted as shown in Table C.2.8.1.

Table C.2.8.1: E-DPDCH settings for DC-HSUPA reference measurement channel

Config #	Primary carrier	Secondary carrier	Power imbalance [dB]	Allowed MPR [dB]
1	BPSK	BPSK	-10	[0.5]
2	BPSK	BPSK	8	[1.0]
3	BPSK	BPSK	0	[1.5]
4	16QAM	16QAM	0	[TBD]

C.3 DL reference measurement channel

C.3.1 DL reference measurement channel (12.2 kbps)

The parameters for the 12,2 kbps DL reference measurement channel are specified in table C.3.1.1, table C.3.1.2 and table C.3.1.3. The channel coding is detailed in figure C.3.1. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in test procedure for RF test as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to sure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.3.1.1: DL reference measurement channel (12.2 kbps)

Parameter	Level	Unit
Information bit rate	12.2	kbps
DPCH	30	ksps
Slot Format #I	11	-
TFCI	On	
Power offsets PO1, PO2 and PO3	0	dB
DTX position	Fixed	-

Table C.3.1.2: DL reference measurement channel using RLC-TM for DTCH, transport channel parameters (12.2 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		244	88/80
	Max data rate, bps		12200	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		244	100
	TFS	TF0, bits	0*244	0*100
		TF1, bits	1*244	1*100
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		804	360
	RM attribute		256	256

Table C.3.1.3: DL reference measurement channel, TFCS (12.2 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

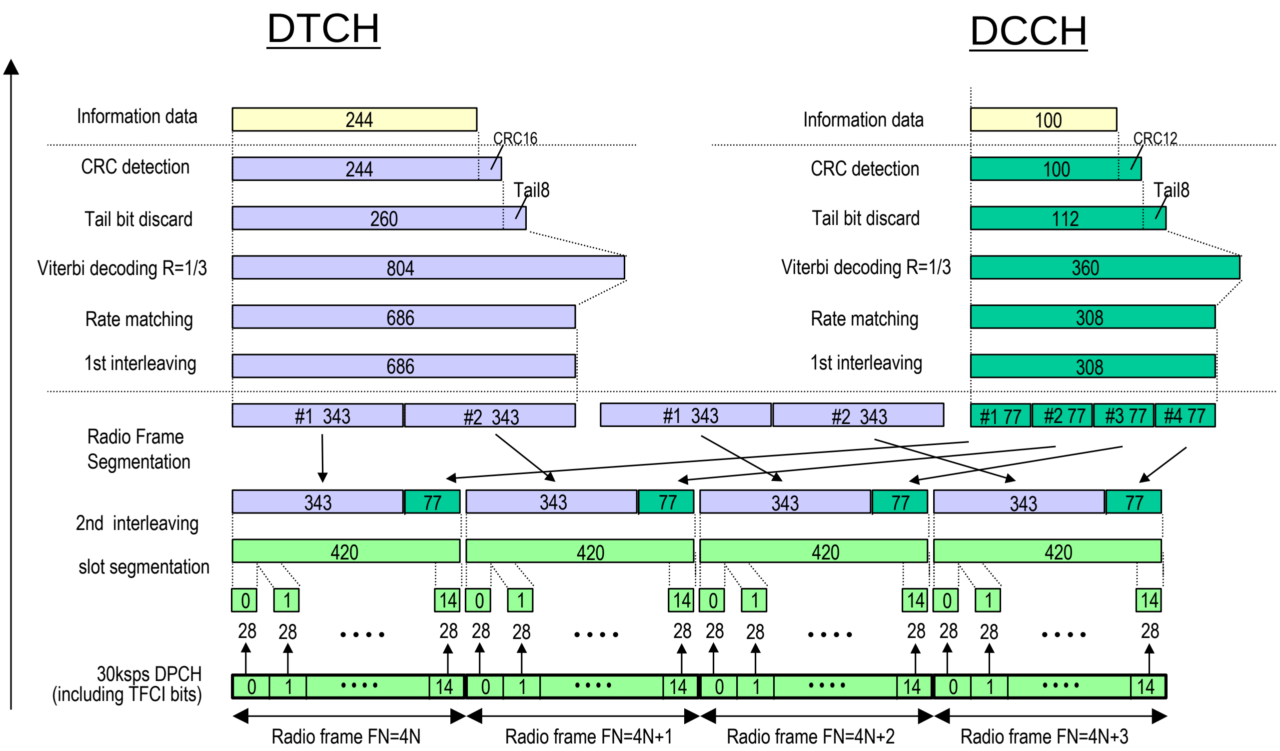


Figure C.3.1 (informative): Channel coding of DL reference measurement channel (12.2 kbps)

C.3.1A DL reference measurement channel (0 kbps and 12.2 kbps)

The parameters for the 0 kbps and 12.2 kbps DL reference measurement channel are specified in table C.3.1A.1, table C.3.1A.2 and table C.3.1A.3. The channel coding is detailed in figures C.3.1A and C.3.1B. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in the test procedure for RF testing as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to make sure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.3.1A.1: DL reference measurement channel (0 kbps and 12.2 kbps)

Parameter	Level	Unit
Information bit rate	12.2	kbps
DPCH	30	ksps
Slot Format #I	11	-
TFCI	On	-
Power offsets PO1, PO2 and PO3	0	dB
DTX position	Fixed	-

Table C.3.1A.2: DL reference measurement channel using RLC-TM for DTCH, transport channel parameters (0 kbps and 12.2 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		244	88/80
	Max data rate, bps		12200	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		244	100
	TFS	TF0, bits	1*0	0*100
		TF1, bits	1*244	1*100
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		804	360
	RM attribute		256	256

Table C.3.1A.3: DL reference measurement channel, TFCS (0 kbps and 12.2 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

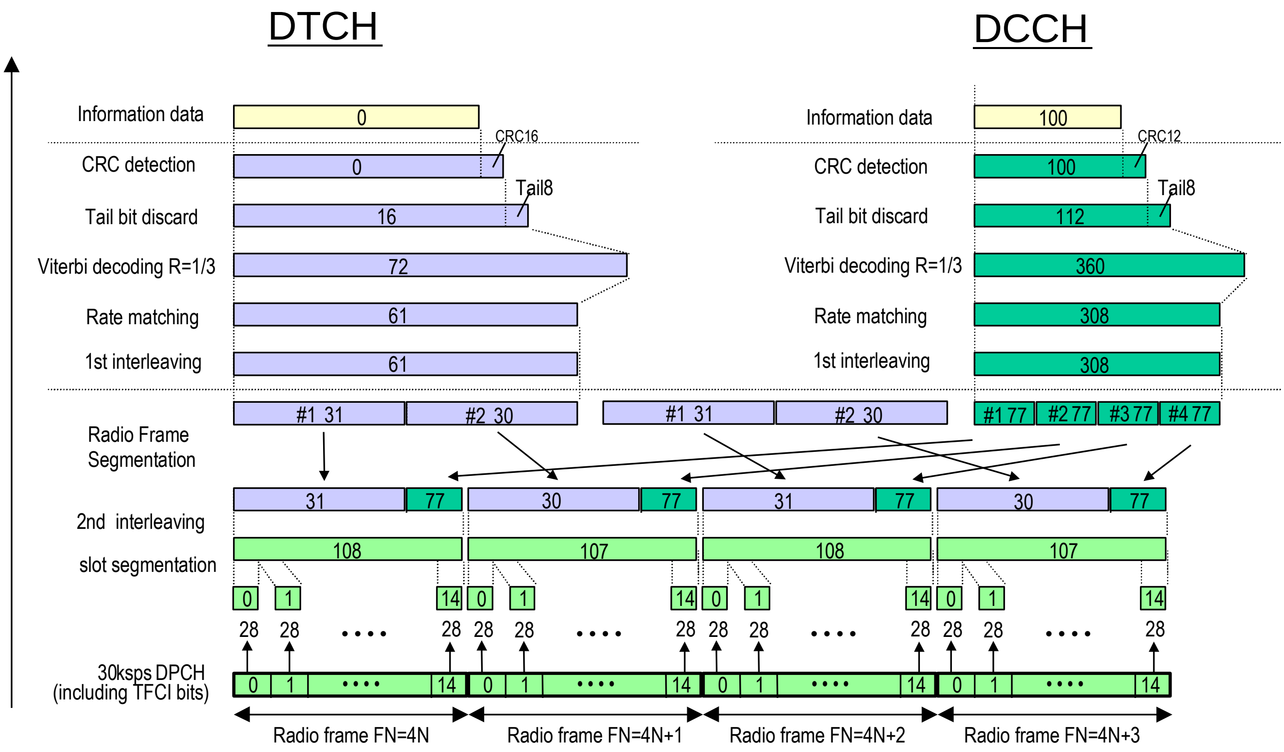


Figure C.3.1A (Informative): Channel coding of DL reference measurement channel (0 kbps)

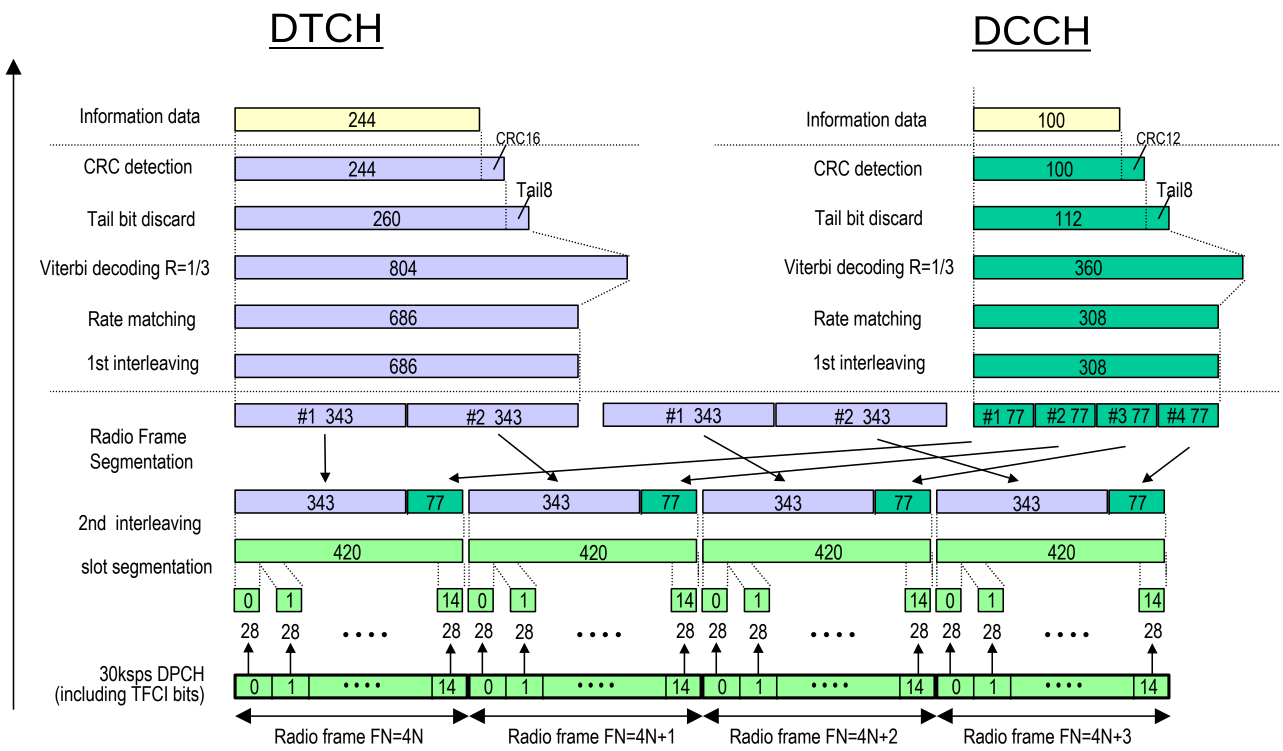


Figure C.3.1B (informative): Channel coding of DL reference measurement channel (12.2 kbps)

C.3.2 DL reference measurement channel (64 kbps)

The parameters for the DL reference measurement channel for 64 kbps are specified in table C.3.2.1, table C.3.2.2, table C.3.2.3 and table C.3.2.4. The channel coding is detailed in figure C.3.2. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in test procedure for RF test as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to sure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.3.2.1: DL reference measurement channel (64 kbps)

Parameter	Level	Unit
Information bit rate	64	kbps
DPCH	120	ksps
Slot Format #i	13	-
TFCI	On	-
Power offsets PO1, PO2 and PO3	0	dB
DTX position	Fixed	-

Table C.3.2.2: DL reference measurement channel using RLC-TM for DTCH, transport channel parameters (64 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		1280	88/80
	Max data rate, bps		64000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		1280	100
	TFS	TF0, bits	0*1280	0*100
		TF1, bits	1*1280	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		3900	360
	RM attribute		256	256

Table C.3.2.3: DL reference measurement channel using RLC-AM for DTCH, transport channel parameters (64 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		1264	88/80
	Max data rate, bps		63200	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		1280	100
	TFS	TF0, bits	0*1280	0*100
		TF1, bits	1*1280	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		3900	360
	RM attribute		256	256

Table C.3.2.4: DL reference measurement channel, TFCS (64 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

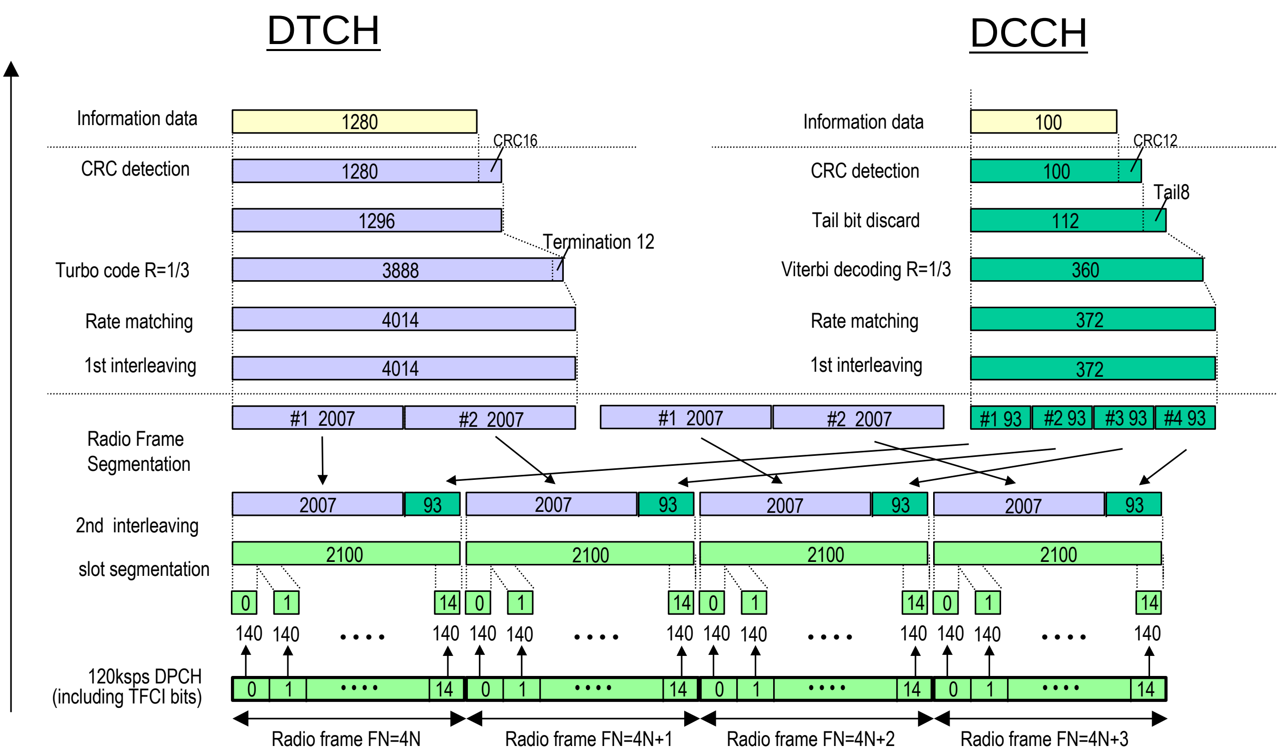


Figure C.3.2 (informative): Channel coding of DL reference measurement channel (64 kbps)

C.3.3 DL reference measurement channel (144 kbps)

The parameters for the DL reference measurement channel for 144 kbps are specified in table C.3.3.1, table C.3.3.2, table C.3.3.3 and table C.3.3.4. The channel coding is detailed in figure C.3.3. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in test procedure for RF test as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to sure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.3.3.1: DL reference measurement channel (144kbps)

Parameter	Level	Unit
Information bit rate	144	kbps
DPCH	240	ksps
Slot Format #i	14	-
TFCI	On	
Power offsets PO1, PO2 and PO3	0	dB
DTX position	Fixed	-

Table C.3.3.2: DL reference measurement channel using RLC-TM for DTCH, transport channel parameters (144 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		2880	88/80
	Max data rate, bps		144000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		2880	100
	TFS	TF0, bits	0*2880	0*100
		TF1, bits	1*2880	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		8700	360
	RM attribute		256	256

Table C.3.3.3: DL reference measurement channel using RLC-AM for DTCH, transport channel parameters (144 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		2864	88/80
	Max data rate, bps		143200	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		2880	100
	TFS	TF0, bits	0*2880	0*100
		TF1, bits	1*2880	1*100
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		8700	360
	RM attribute		256	256

Table C.3.3.4: DL reference measurement channel, TFCS (144 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

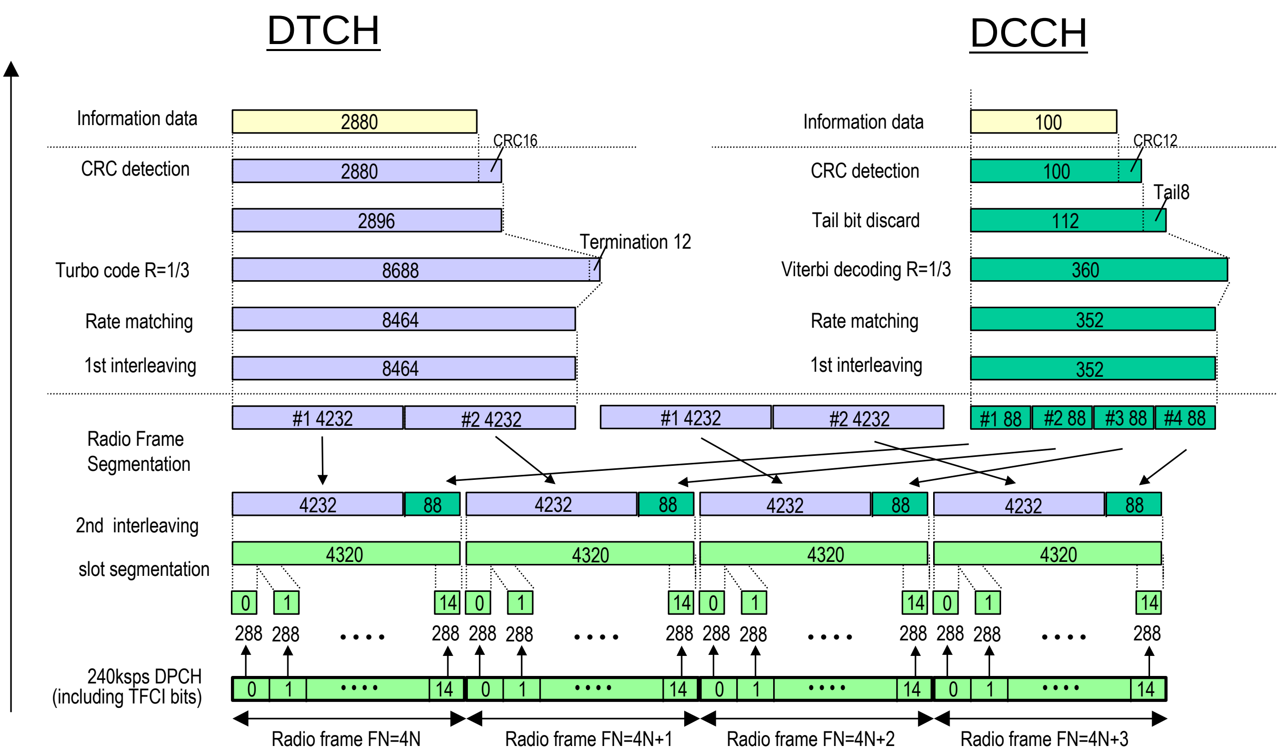


Figure C.3.3 (informative): Channel coding of DL reference measurement channel (144 kbps)

C.3.4 DL reference measurement channel (384 kbps)

The parameters for the DL reference measurement channel for 384 kbps are specified in table C.3.4.1, table C.3.4.2, table C.3.4.3 and table C.3.4.4. The channel coding is shown for information in figure C3.4. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in test procedure for RF test as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to sure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.3.4.1: DL reference measurement channel, physical parameters (384 kbps)

Parameter	Level	Unit
Information bit rate	384	kbps
DPCH	480	ksps
Slot Format #i	15	-
TFCI	On	-
Power offsets PO1, PO2 and PO3	0	dB
DTX position	Fixed	-

Table C.3.4.2: DL reference measurement channel using RLC-TM for DTCH, transport channel parameters (384 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		3840	88/80
	Max data rate, bps		384000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		3840	100
	TFS	TF0, bits	0*3840	0*100
		TF1, bits	1*3840	1*100
	TTI, ms		10	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		11580	360
	RM attribute		256	256

Table C.3.4.3: DL reference measurement channel using RLC-AM for DTCH, transport channel parameters (384 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		3824	88/80
	Max data rate, bps		382400	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		3840	100
	TFS	TF0, bits	0*3840	0*100
		TF1, bits	1*3840	1*100
	TTI, ms		10	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		N/A	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		11580	360
	RM attribute		256	256

Table C.3.4.4: DL reference measurement channel, TFCS (384 kbps)

TFCS size	4
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF0, TF1), (TF1, TF1)

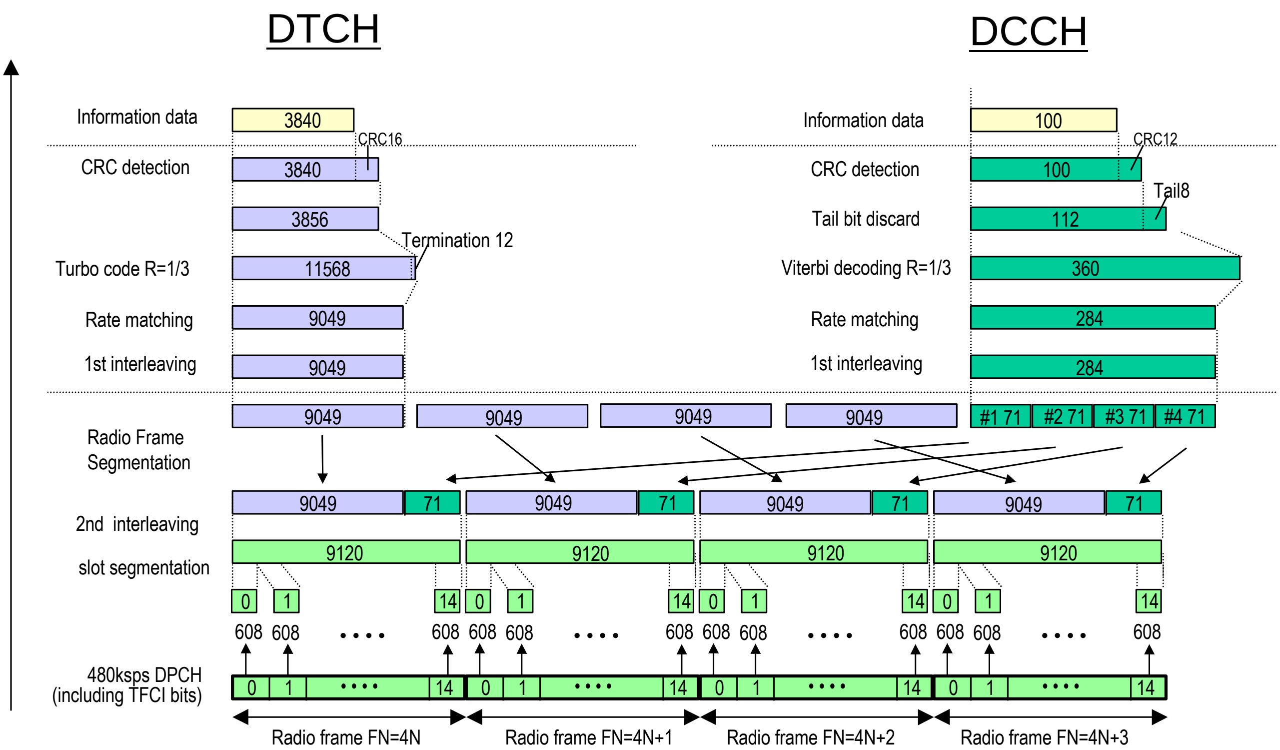


Figure C.3.4 (informative): Channel coding of DL reference measurement channel (384 kbps)

C.3.5 DL reference measurement channel 2 (64 kbps)

The parameters for the DL reference measurement channel 2 for 64 kbps are specified in table C.3.5.1, table C.3.5.2 and table C.3.5.3. The channel coding is detailed in figure C.3.5. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in test procedure for RF test as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to sure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.3.5.1: DL reference measurement channel physical parameters (64 kbps)

Parameter	Unit	Level
Information bit rate (DTCH)	kbps	64
Information bit rate (DCCH)	kbps	3.4
DPCH	ksps	120
Slot Format #i	-	13
TFCI	-	On
Puncturing (DTCH)	%	8.6
Repetition (DCCH)	%	27.9

Table C.3.5.2: DL reference measurement channel 2 using RLC-AM for DTCH, transport channel parameters (64 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		320	136/128
	Max data rate, bps		64000	3400/3200
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		6	10
	TB sizes, bit		336	148
	TB set size, bit		1344	148
	TB per TTI		4	1
	TFS	TF0, bits	0*336	0*148
		TF1, bits	1*336	1*148
		TF2, bits	4*336	
	TTI, ms		20	40
	Coding type		Turbo Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		16	16
	Max number of bits/TTI after channel coding		1068*4	516
	RM attribute		143	256

Table C.3.5.3: DL reference measurement channel 2, TFCS (64 kbps)

TFCS size	6
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF2, TF0), (TF0, TF1), (TF1, TF1)

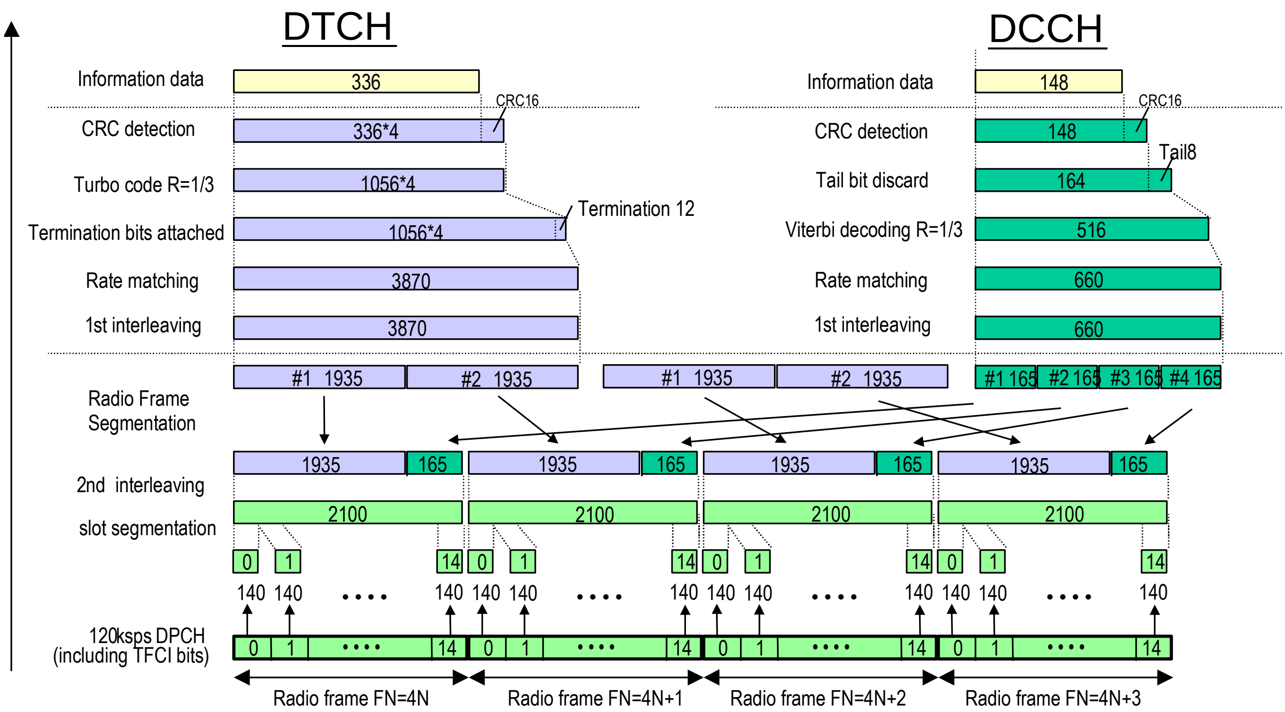


Figure C.3.5 (informative): Channel coding of DL reference measurement channel 2 (64 kbps)

C.4 Reference measurement channel for BTFD performance requirements

C.4.1 UL reference measurement channel for BTFD performance requirements

The parameters for UL reference measurement channel for BTFD are specified in table C.4.1.1, table C.4.1.2, table C.4.1.3 and table C.4.1.4.

Table C.4.1.1: UL reference measurement channel physical parameters for BTFD

Parameter	Level	Unit
Information bit rate	12.8k, 10.8k, 8.55k, 8.0k, 7.3k, 6.5k, 5.75k, 5.35k, 2.55k	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	-5.46 (12.8k - 7.3k)	dB
	-2.69 (6.5k – 2.55k)	
TFCI	On	-
Puncturing Limit	100	%

Table C.4.1.2: UL reference measurement channel, transport channel parameters for SRB

Higher Layer	RAB/Signalling RB		SRB
RLC	Logical channel type		DCCH
	RLC mode		UM/AM
	Payload sizes, bit		88/80
	Max data rate, bps		2200/2000
	PDU header, bit		8/16
	TrD PDU header, bit		N/A
MAC	MAC header, bit		4
	MAC multiplexing		Yes
Layer 1	TrCH type		DCH
	Transport Channel Identity		10
	TB sizes, bit		100
	TFS	TF0, bits	0*100
		TF1, bits	1*100
	TTI, ms		40
	Coding type		Convolution Coding
	Coding Rate		1/3
	CRC, bit		12
	Max number of bits/TTI after channel coding		360
	Uplink: Max number of bits/radio frame before rate matching		90
	RM attribute		256

Table C.4.1.3: UL reference measurement channel using RLC-TM for DTCH, transport channel parameters

Higher Layer	RAB/Signalling RB		12.8k /10.8k/8.55k/8.0k/7.3k/6.5k/5.75k/5.35k/2.55k
RLC	Logical channel type		DTCH
	RLC mode		TM
	Payload sizes, bit		256, 216, 171, 160, 146, 130, 115, 107, 51, 12
	Max data rate, bps		12200
	PDU header, bit		N/A
	TrD PDU header, bit		0
MAC	MAC header, bit		0
	MAC multiplexing		N/A
Layer 1	TrCH type		DCH
	Transport Channel Identity		1
	TB sizes, bit		256, 216, 171, 160, 146, 130, 115, 107, 51,12
	TFS	TF0 bit	0x256
		TF1 bit	1x256
		TF2 bit	1x216
		TF3 bit	1x171
		TF4 bit	1x160
		TF5 bit	1x146
		TF6 bit	1x130
		TF7 bit	1x115
		TF8 bit	1x107
		TF9 bit	1x51
		TF10 bit	1x12
	TTI, ms		20
	Coding type		CC
	Coding Rate		1/3
	CRC, bit		0
	RM attribute		256

Table C.4.1.4: UL reference measurement channel, TFCS

TFCS size	22
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF2, TF0), (TF3, TF0), (TF4, TF0), (TF5, TF0), (TF6, TF0), (TF7, TF0), (TF8, TF0), (TF9, TF0), (TF10, TF0), (TF0, TF1), (TF1, TF1), (TF2, TF1), (TF3, TF1), (TF4, TF1), (TF5, TF1), (TF6, TF1), (TF7, TF1), (TF8, TF1), (TF9, TF1), (TF10, TF1)

NOTE: The TFCs (TF0, TF0), (TF10, TF0) and (TF0, TF1)are belonging to minimum set of TFCs.

C.4.2 DL reference measurement channel for BTFD performance requirements

The parameters for DL reference measurement channel for BTFD are specified in table C.4.2.1, table C.4.2.2, table C.4.2.3 and table C.4.2.4. The channel coding for information is shown in figures C.4.1, C.4.2, and C.4.3. For the RLC configuration of AM DCCHs Timer_STATUS_Periodic shall not be set in RRC CONNECTION SETUP message used in test procedure for RF test as defined in TS 34.108 [3] clause 7.3. This is to prevent unexpected DCHs from being transmitted through such RLC entities when the timer has expired in order to ensure that the required TFC from the minimum set of TFCs can continuously convey a DCH for DTCH during the test.

Table C.4.2.1: DL reference measurement channel physical parameters for BTFD

Parameter	Rate 1	Rate 2	Rate 3	Unit
Information bit rate	12,2	7,95	1,95	kbps
DPCH	30			ksps
Slot Format #I	8			-
TFCI	Off			-
Power offsets PO1, PO2 and PO3	0			dB
DTX position	Fixed			-

Table C.4.2.2: DL reference measurement channel, transport channel parameters for SRB

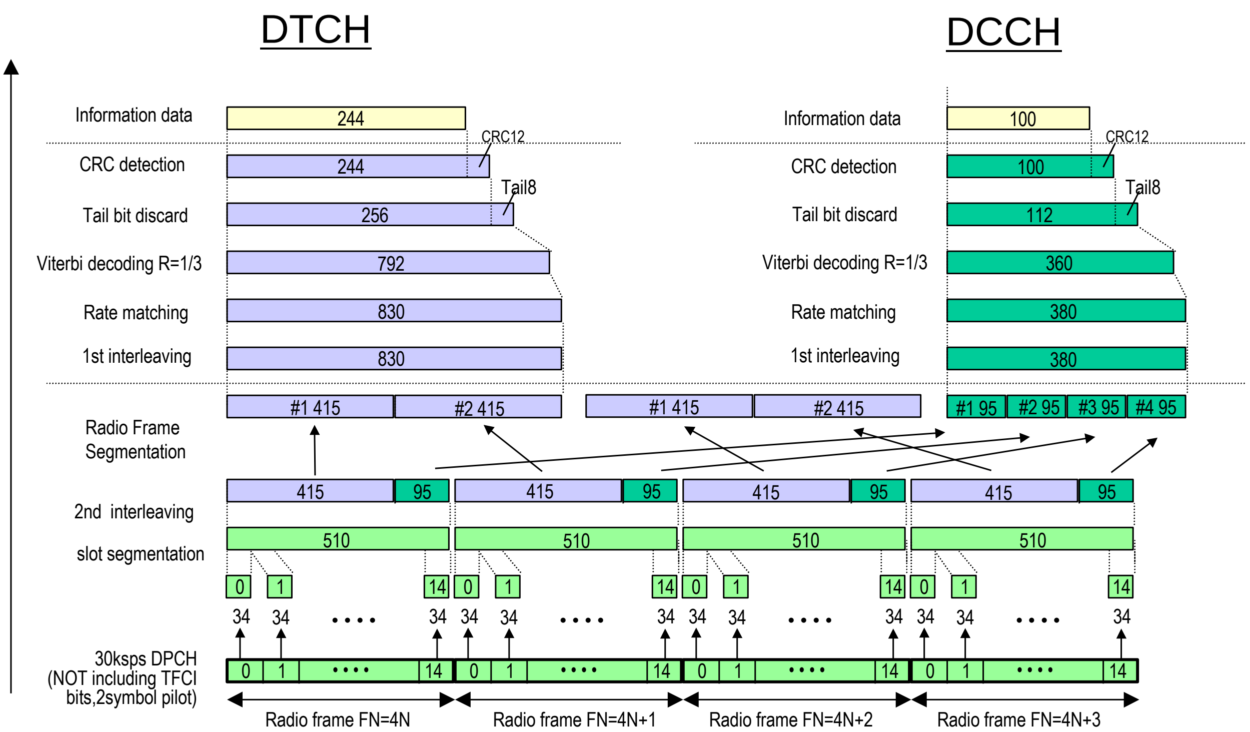
Higher Layer	RAB/Signalling RB		SRB
RLC	Logical channel type		DCCH
	RLC mode		UM/AM
	Payload sizes, bit		88/80
	Max data rate, bps		2200/2000
	PDU header, bit		8/16
	TrD PDU header, bit		N/A
MAC	MAC header, bit		4
	MAC multiplexing		Yes
Layer 1	TrCH type		DCH
	Transport Channel Identity		20
	TB sizes, bit		100
	TFS	TF0, bits	0*100
		TF1, bits	1*100
	TTI, ms		40
	Coding type		Convolution Coding
	Coding Rate		1/3
	CRC, bit		12
	Max number of bits/TTI after channel coding		360
	Uplink: Max number of bits/radio frame before rate matching		90
	RM attribute		256

Table C.4.2.3: DL reference measurement channel using RLC-TM for DTCH, transport channel parameters

Higher Layer	RAB/Signalling RB		12.2k/10.2k/7.95k/7.4k/6.7k/5.9k/5.15k/4.75k/1.95k
RLC	Logical channel type		DTCH
	RLC mode		TM
	Payload sizes, bit		244, 204, 159, 148, 134, 118, 103, 95, 39
	Max data rate, bps		12200
	PDU header, bit		N/A
	TrD PDU header, bit		0
MAC	MAC header, bit		0
	MAC multiplexing		N/A
Layer 1	TrCH type		DCH
	Transport Channel Identity		1
	TB sizes, bit		244, 204, 159, 148, 134, 118, 103, 95, 39
	TFS		
		TF0 bit	1x244
		TF1 bit	1x204
		TF2 bit	1x159
		TF3 bit	1x148
		TF4 bit	1x134
		TF5 bit	1x118
		TF6 bit	1x103
		TF7 bit	1x95
		TF8 bit	1x39
	TTI, ms		20
	Coding type		CC
	Coding Rate		1/3
	CRC, bit		12
	RM attribute		256

Table C.4.2.4: DL reference measurement channel, TFCS

TFCS size	18
TFCS	(DTCH, DCCH)= (TF0, TF0), (TF1, TF0), (TF2, TF0), (TF3, TF0), (TF4, TF0), (TF5, TF0), (TF6, TF0), (TF7, TF0), (TF8, TF0), (TF0, TF1), (TF1, TF1), (TF2, TF1), (TF3, TF1), (TF4, TF1), (TF5, TF1), (TF6, TF1), (TF7, TF1), (TF8, TF1)



FigureC.4.1 (informative): Channel coding of DL reference measurement channel for BTFD (Rate 1)

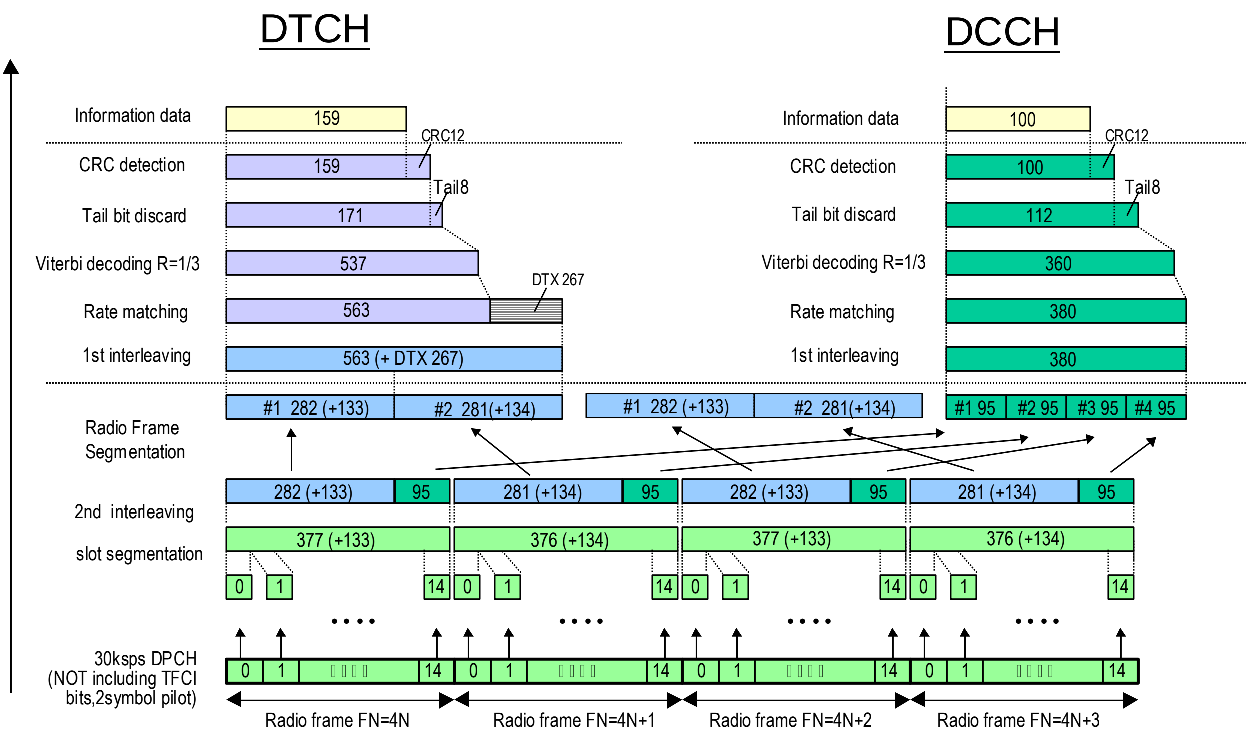


Figure C.4.2 (informative): Channel coding of DL reference measurement channel for BTFD (Rate 2)

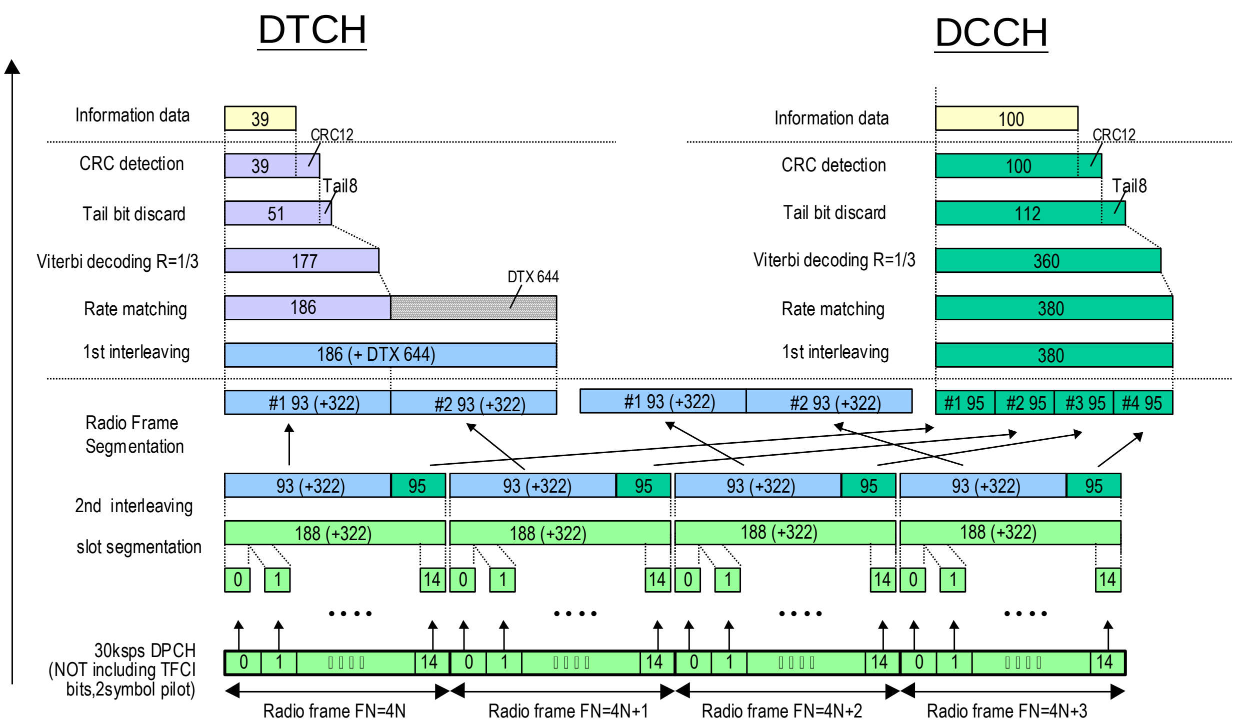


Figure C.4.3 (informative): Channel coding of DL reference measurement channel for BTFD (Rate 3)

C.4.3 Reference parameters for discontinuous UL DPCCH transmission

The parameters for the UE UL power control operation with discontinuous UL DPCCH transmission test is specified in Table C.4.3.1. Same parameter values are used for 2ms and 10ms E-DCH TTI.

Table C.4.3.1: Parameters for the discontinuous UL DPCCH transmission

Parameter	Unit	Level
Enabling_Delay	Radio frames	0
UE_DTX_cycle_1	Subframes	10
UE_DTX_cycle_2	Subframes	10
UE_DTX_DRX_offset	Subframes	0
Inactivity_threshold_for_UE_DTX_cycle2	E-DCH TTI	1
UE_DPCCH_burst_1	Subframes	1
UE_DPCCH_burst_2	Subframes	1
UE_DTX_long_preamble_length	Slots	2
CQI Feedback cycle, k	Milliseconds	0
CQI_DTX_TIMER	Subframes	0

C.5 DL reference compressed mode parameters

Parameters described in table C.5.1 are used in some test specified in TS 25.101 while parameters described in table C.5.2 are used in some tests specified in TS 25.133 [2].

Set 1 parameters in table C.5.1 are applicable when compressed mode by spreading factor reduction is used in downlink. Set 2 parameters in table C.5.1 are applicable when compressed mode by puncturing is used in downlink. Set 2 is applicable for Release 99 and Release 4 only.

Table C.5.1: Compressed mode reference pattern 1 parameters

Parameter	Set 1	Set 2	Set 2A	Note
TGSN (Transmission Gap Starting Slot Number)	11	11	4	
TGL1 (Transmission Gap Length 1)	7	7	7	
TGL2 (Transmission Gap Length 2)	-	-	7	For Set 1 and Set 2 only one gap in use.
TGD (Transmission Gap Distance)	0	0	15	Only one gap in use. For Set 1 and Set 2 UNDEFINED is used for TGD.
TGPL1 (Transmission Gap Pattern Length)	4	4	4	
TGPL2 (Transmission Gap Pattern Length)	-	-	-	R99 and Rel-4: Only one pattern in use. Rel-5 and later releases: Not applicable
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	NA	NA	0	Defined by higher layers
UL/DL compressed mode selection	DL & UL	DL & UL	DL & UL	2 configurations possible DL &UL / DL
UL compressed mode method	SF/2	SF/2	SF/2	
DL compressed mode method	SF/2	Puncturin g	SF/2	Compressed mode by puncturing is applicable for R99 and Rel-4 only.
Downlink Slot format	11B	11A	11B	Downlink frame type is specified per individual test. If it is not specified either downlink frame type A or B can be used
Scrambling code change	No	No	No	
RPP (Recovery period power control mode)	0	0	0	
ITP (Initial transmission power control mode)	0	0	0	

Table C.5.2: Compressed mode reference pattern 2 parameters

Parameter	Set 1	Set 2	Set 3	Set 4	Set 5	Note
TGSN (Transmission Gap Starting Slot Number)	4	4	10	8	10	
TGL1 (Transmission Gap Length 1)	7	7	10	14	10	
TGL2 (Transmission Gap Length 2)	-	-	-	-	-	Only one gap in use.
TGD (Transmission Gap Distance)	0	0	0	0	0	UNDEFINED is used for TGD.
TGPL1 (Transmission Gap Pattern Length)	3	12	11	4	8	
TGPL2 (Transmission Gap Pattern Length)	-	-	-	-	-	R99 and Rel-4: Only one pattern in use. Rel-5 and later releases: Not applicable
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	NA	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	NA	NA	NA	NA	NA	Defined by higher layers
UL/DL compressed mode selection	DL & UL	DL & UL	DL & UL	DL & UL	DL & UL	2 configurations possible. DL & UL / DL
UL compressed mode method	SF/2	SF/2	SF/2	SF/2	SF/2	
DL compressed mode method	SF/2	SF/2	Puncturing	SF/2	SF/2	Compressed mode by puncturing is applicable for R99 and Rel-4 only.
Downlink and Slot format	11B	11B	11A	11B	11B	Downlink frame type is specified per individual test. If it is not specified either downlink frame type A or B can be used
Scrambling code change	No	No	No	No	No	
RPP (Recovery period power control mode)	0	0	0	0	0	
ITP (Initial transmission power control mode)	0	0	0	0	0	

Table C.5.3: Compressed mode reference pattern 3 parameters

Parameter	Set 1	Set 2	Set 3	Set 4	Note
TGSN (Transmission Gap Starting Slot Number)	8	8	8	8	
TGL1 (Transmission Gap Length 1)	14	14	14	14	
TGL2 (Transmission Gap Length 2)	-	-	-	-	Only one gap in use.
TGD (Transmission Gap Distance)	0	0	0	0	UNDEFINED is used for TGD.
TGPL1 (Transmission Gap Pattern Length)	8	24	24	24	
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	0	4	12	20	
UL/DL compressed mode selection	DL & UL	DL & UL	DL & UL	DL & UL	2 configurations possible. DL & UL / DL
UL compressed mode method	SF/2	SF/2	SF/2	SF/2	
DL compressed mode method	SF/2	SF/2	SF/2	SF/2	
Downlink and Slot format	11B	11B	11B	11B	Downlink frame type is specified per individual test. If it is not specified either downlink frame type A or B can be used
Scrambling code change	No	No	No	No	
RPP (Recovery period power control mode)	0	0	0	0	
ITP (Initial transmission power control mode)	0	0	0	0	

C.6 Auxiliary measurement channels

C.6.1 Introduction

BLER measurements for test cases where the UL data rate is less or equal to the DL data rate require that special auxiliary measurement channels (AUXMC) are used. This annex specifies the alternative auxiliary measurement channels and the UE test loop mode parameters to be used for the different UL and DL data rate combinations.

C.6.2 Channel combinations for BLER measurements

Table C.6.2: BLER test method and measurement channels for BLER tests for UL DL data rate combinations

DL rate [kbps]	UE UL RMC rate capability [kbps]	BLER Test method	DL RMC	UL RMC	UE test loop mode (Note 1)	Comments
12.2	RMC 12.2	Loopback Data+CRC	DL TM RMC 12.2 kbps See C.3.1	UL TM AUXMC 12.2 kbps, no CRC See C.6.3	2	Perform test in CS domain.
64	RMC 12.2	AM ACK/NACK	DL AM RMC 64 kbps See C.3.2	UL AM AUXMC 12.2 kbps See C.6.7	1	DL RLC SDU size=1248 UL RLC SDU size=0 See Note 2 Perform test in PS domain.
64	RMC 12.2	AM ACK/NACK	DL AM RMC 64 kbps See C.3.5	UL AM AUXMC 12.2 kbps See C.6.8	1	DL RLC SDU size=304 UL RLC SDU size=0 See Note 5 Perform test in PS domain.
144	RMC 12.2	AM ACK/NACK	DL AM RMC 144 kbps See C.3.3	UL AM AUXMC 12.2 kbps See C.6.7	1	DL RLC SDU size=2848 UL RLC SDU size=0 See Note 3 Perform test in PS domain.
384	RMC 12.2	AM ACK/NACK	DL AM RMC 384 kbps See C.3.4	UL AM AUXMC 12.2 kbps See C.6.7	1	DL RLC SDU size=3808 UL RLC SDU size=0 See Note 4 Perform test in PS domain.

Note 1 See TS 34.109 [4] for details regarding UE test loop modes. See TS 34.109 [4] Annex A.3 for description of the BLER test method using TM reference measurement channel and UE test loop mode 2 (Loopback Data+CRC). See TS 34.109 [4] Annex A.2 for BLER test method using AM reference measurement channels and UE test loop mode 1 (AM ACK/NACK).

Note 2 The DL AM RMC for 64 kbps according to clause C.3.2 table C.3.2.3 has payload size = 1264 bits and TTI = 20 ms. The SS sends one RLC SDU of size 1248 bits (payload size of 1264 bits – 16 bits for length indicator and extension bit) every downlink TTI (20 ms). The UE test loop parameter “UL RLC SDU size” is set to 0 (no data will be returned) in order to avoid UE buffer overflows.

Note 3 The DL AM RMC for 144 kbps according to clause C.3.3 table C.3.3.3 has payload size = 2864 bits and TTI = 20 ms. The SS sends one RLC SDU of size 2848 bits (payload size of 2864 bits – 16 bits for length indicator and extension bit) every downlink TTI (20 ms). The UE test loop parameter “UL RLC SDU size” is set to 0 (no data will be returned) in order to avoid UE buffer overflows.

Note 4 The DL AM RMC for 384 kbps according to clause C.3.4 table C.3.4.3 has a payload size of 3824 bits and a TTI of 10 ms. The SS sends one RLC SDU of size 3808 bits (=payload size of 3824 bits – 16 bits for length indicator and extension bit) every downlink TTI (10 ms). The UE test loop parameter “UL RLC SDU size” set to 0 (no data will be returned) in order to avoid UE buffer overflows.

Note 5 The DL AM RMC for 64 kbps according to clause C.3.5 table C.3.5.2 has a payload size of 320 bits and a TTI of 20 ms. The SS sends one RLC SDU of size 304 bits (=payload size of 320bits – 16 bits for length indicator and extension bit) every downlink TTI (20 ms). The UE test loop parameter “UL RLC SDU size” set to 0 (no data will be returned) in order to avoid UE buffer overflows.

C.6.3 UL auxiliary reference measurement channel (TM, 12.2 kbps, no CRC)

Table C.6.3: UL AUXMC TM 12.2 kbps (13 kbps), no CRC

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		260	88/80
	Max data rate, bps		13000	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		260	100
	TFS	TF0, bits	0*260	0*100
		TF1, bits	1*260	1*100
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		0	12
	Max number of bits/TTI after channel coding		804	360
	Uplink: Max number of bits/radio frame before rate matching		402	90
	RM attribute		256	256

C.6.3A UL auxiliary reference measurement channel (TM, 0 kbps and 12.2 kbps, no CRC)

Table C.6.3A: UL AUXMC TM 0 kbps (400 bps) and 12.2 kbps (13 kbps), no CRC

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		TM	UM/AM
	Payload sizes, bit		260/16	88/80
	Max data rate, bps		13000/400	2200/2000
	PDU header, bit		N/A	8/16
	TrD PDU header, bit		0	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		260	100
	TFS	TF0, bits	0*260	0*100
		TF1, bits	1*260	1*100
		TF2, bits	1*16	-
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		0	12
	Max number of bits/TTI after channel coding		804	360
	Uplink: Max number of bits/radio frame before rate matching		402	90
	RM attribute		256	256

C.6.4 Void

Table C.6.4: Void

C.6.5 Void

Table C.6.5: Void

C.6.6 Void

Table C.6.6: Void

C.6.7 UL AUXMC AM 12.2 kbps

Table C.6.7: UL AUXMC AM 12.2 kbps (11.2 kbps)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		224	88/80
	Max data rate, bps		11200	2200/2000
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		240	100
	TFS	TF0, bits	0*240	0*100
		TF1, bits	1*240	1*100
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		16	12
	Max number of bits/TTI after channel coding		792	360
	Uplink: Max number of bits/radio frame before rate matching		396	90
	RM attribute		256	256

C.6.8 UL AUXMC AM 12.2 kbps(DCCH with TB size of 148bit)

Table C.6.8: UL AUXMC AM 12.2 kbps (11.2 kbps) (DCCH with TB size of 148bit)

Higher Layer	RAB/Signalling RB		RAB	SRB
RLC	Logical channel type		DTCH	DCCH
	RLC mode		AM	UM/AM
	Payload sizes, bit		224	136/128
	Max data rate, bps		11200	3400/3200
	PDU header, bit		16	8/16
	TrD PDU header, bit		N/A	N/A
MAC	MAC header, bit		0	4
	MAC multiplexing		N/A	Yes
Layer 1	TrCH type		DCH	DCH
	Transport Channel Identity		1	5
	TB sizes, bit		240	148
	TFS	TF0, bits	0*240	0*148
		TF1, bits	1*240	1*148
	TTI, ms		20	40
	Coding type		Convolution Coding	Convolution Coding
	Coding Rate		1/3	1/3
	CRC, bit		16	16
	Max number of bits/TTI after channel coding		792	516
	Uplink: Max number of bits/radio frame before rate matching		396	129
	RM attribute		256	256

C.7 DL reference parameters for PCH tests

The parameters for the PCH demodulation tests are specified in table C.7.1 and table C.7.2.

Table C.7.1: Physical channel parameters for S-CCPCH

Parameter	Unit	Level
Channel bit rate	Kbps	60
Channel symbol rate	Ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table C.7.2: Transport channel parameters for S-CCPCH

Parameter	PCH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	fixed

C.8 DL reference channel parameters for HSDPA tests

C.8.1 Fixed Reference Channel (FRC)

C.8.1.1 Fixed Reference Channel Definition H-Set 1/1A/1B/1C

Table C.8.1.1: Fixed Reference Channel H-Set 1/1A/1B/1C

Parameter	Unit	Value	
Nominal Avg. Inf. Bit Rate	kbps	534	777
Inter-TTI Distance	TTI's	3	3
Number of HARQ Processes	Processes	2	2
Information Bit Payload (N_{INF})	Bits	3202	4664
Number Code Blocks	Blocks	1	1
Binary Channel Bits Per TTI	Bits	4800	7680
Total Available SML's in UE	SML's	19200	19200
Number of SML's per HARQ Proc.	SML's	9600	9600
Coding Rate		0.67	0.61
Number of Physical Channel Codes	Codes	5	4
Modulation		QPSK	16QAM
Note: The HS-DSCH shall be transmitted continuously with constant power but only every third TTI shall be allocated to the UE under test. The values in the table defines H-Set 1. H-Set 1A for DC-HSDPA and DB-DC-HSDPA is formed by applying H-Set 1 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 1B and H-Set 1C for 4C-HSDPA are formed by applying H-Set 1 to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 1B and 4 carriers for H-Set 1C).			

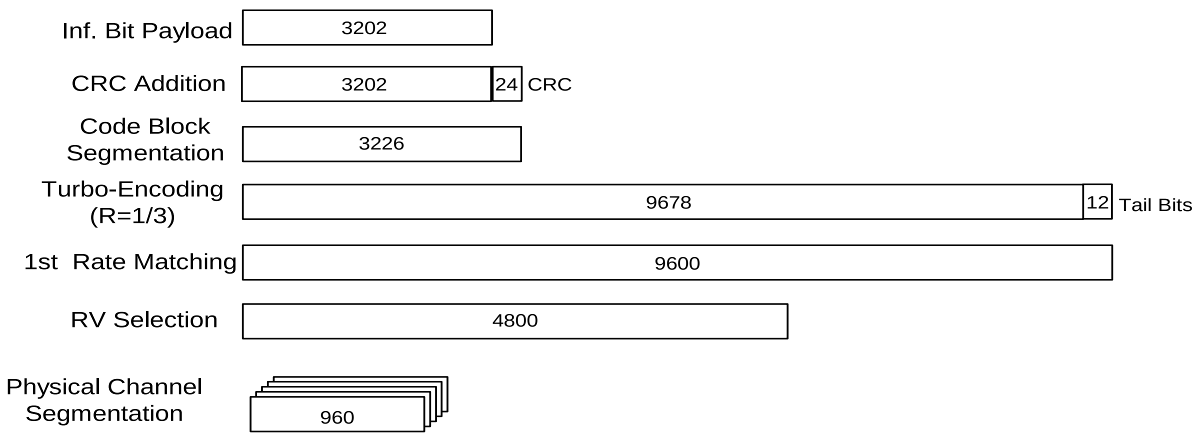


Figure C.8.1: Coding rate for Fixed reference Channel H-Set 1 (QPSK)

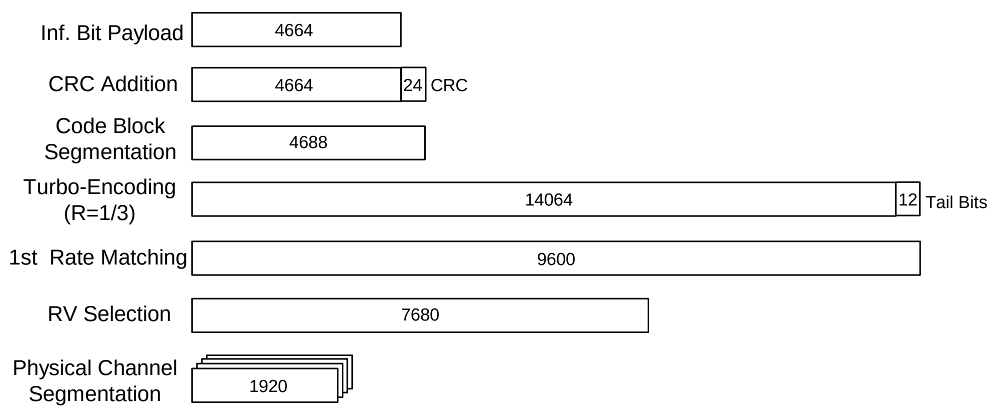


Figure C.8.2: Coding rate for Fixed reference Channel H-Set 1 (16 QAM)

C.8.1.2 Fixed Reference Channel Definition H-Set 2

Table C.8.1.2: Fixed Reference Channel H-Set 2

Parameter	Unit	Value	
Nominal Avg. Inf. Bit Rate	kbps	801	1166
Inter-TTI Distance	TTI's	2	2
Number of HARQ Processes	Processes	3	3
Information Bit Payload (N_{INF})	Bits	3202	4664
MAC-d PDU size	Bits	336	336
Number Code Blocks	Blocks	1	1
Binary Channel Bits Per TTI	Bits	4800	7680
Total Available SML's in UE	SML's	28800	28800
Number of SML's per HARQ Proc.	SML's	9600	9600
Coding Rate		0.67	0.61
Number of Physical Channel Codes	Codes	5	4
Modulation		QPSK	16QAM
Note: The HS-DSCH shall be transmitted continuously with constant power but only every second TTI shall be allocated to the UE under test			

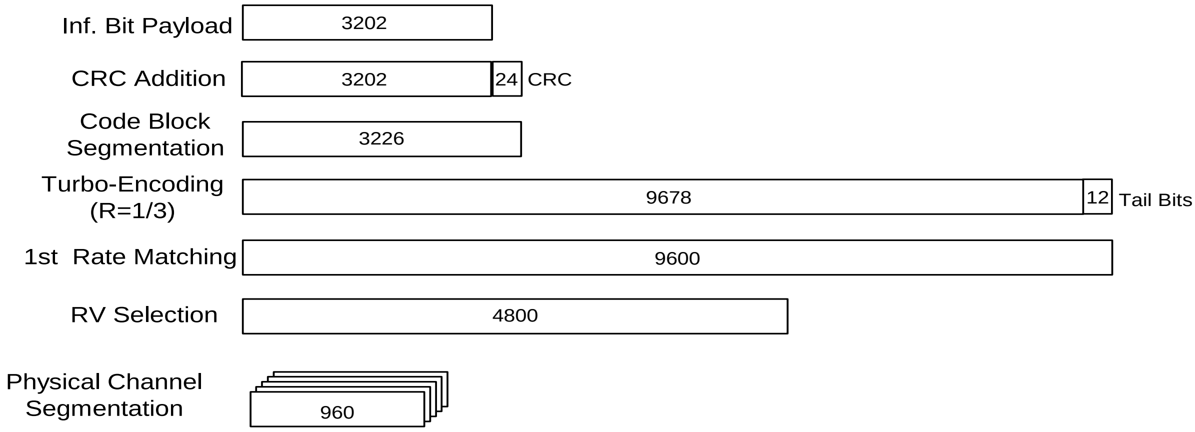


Figure C.8.3: Coding rate for Fixed Reference Channel H-Set 2 (QPSK)

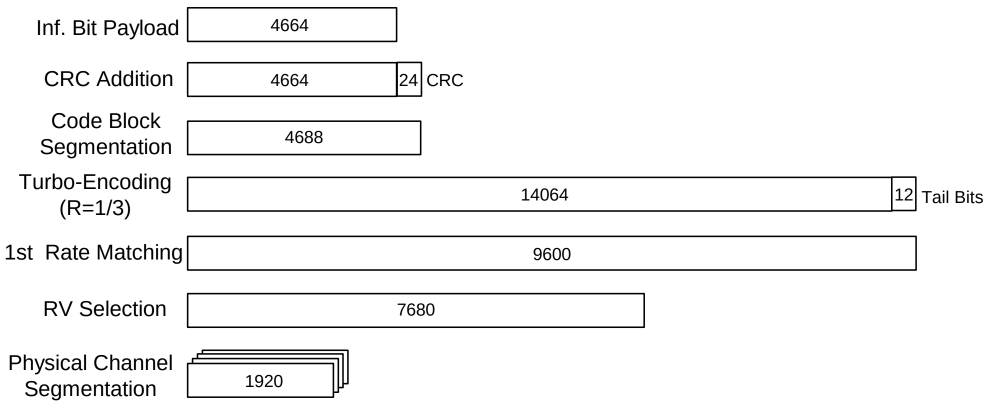


Figure C.8.4: Coding rate for Fixed Reference Channel H-Set 2 (16QAM)

C.8.1.3 Fixed Reference Channel Definition H-Set 3/3A/3B/3C

Table C.8.1.3: Fixed Reference Channel H-Set 3/3A/3B/3C

Parameter	Unit	Value	
Nominal Avg. Inf. Bit Rate	kbps	1601	2332
Inter-TTI Distance	TTI's	1	1
Number of HARQ Processes	Processes	6	6
Information Bit Payload (N_{INF})	Bits	3202	4664
Number Code Blocks	Blocks	1	1
Binary Channel Bits Per TTI	Bits	4800	7680
Total Available SML's,in UE	SML's	57600	57600
Number of SML's per HARQ Proc.	SML's	9600	9600
Coding Rate		0.67	0.61
Number of Physical Channel Codes	Codes	5	4
Modulation		QPSK	16QAM
Note: The values in the table defines H-Set 3. H-Set 3A for DC-HSDPA and DB-DC-HSDPA is formed by applying H-Set 3 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 3B and H-Set 3C for4C-HSDPA are formed by applying H-Set 3 to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 3B and 4 carriers for H-Set 3C).			

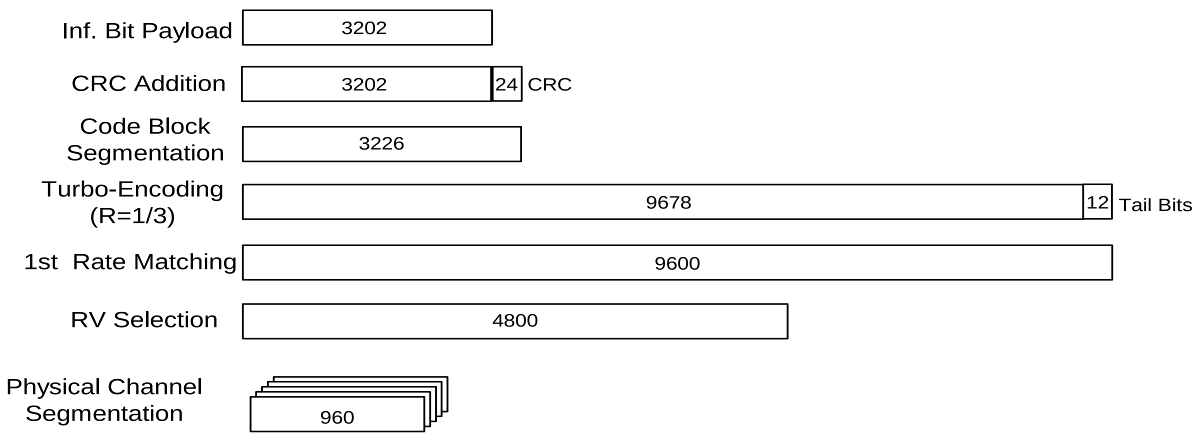


Figure C.8.5: Coding rate for Fixed reference Channel H-Set 3 (QPSK)

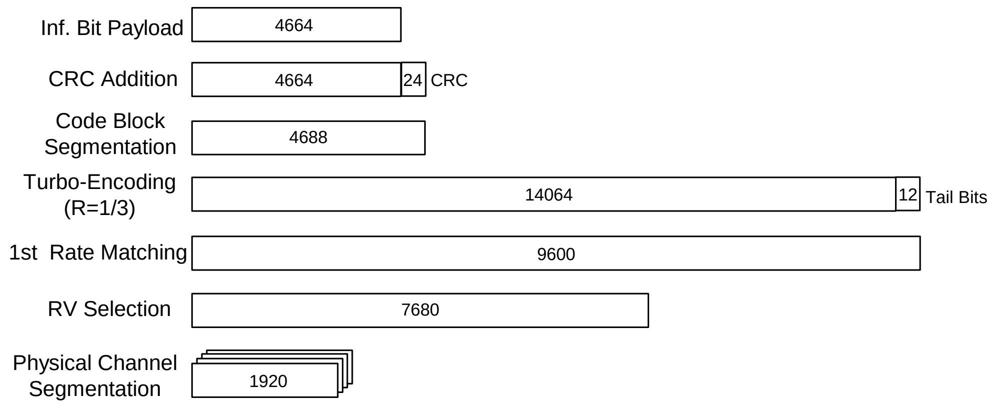


Figure C.8.6: Coding rate for Fixed reference Channel H-Set 3 (16QAM)

C.8.1.4 Fixed Reference Channel Definition H-Set 4

Table C.8.1.4: Fixed Reference Channel H-Set 4

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	534
Inter-TTI Distance	TTI's	2
Number of HARQ Processes	Processes	2
Information Bit Payload (N_{INF})	Bits	3202
MAC-d PDU Size	Bits	336
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	4800
Total Available SML's in UE	SML's	14400
Number of SML's per HARQ Proc.	SML's	7200
Coding Rate		0.67
Number of Physical Channel Codes	Codes	5
Modulation		QPSK
Note: This FRC is used to verify the minimum inter-TTI distance for UE category 11. The HS-PDSCH shall be transmitted continuously with constant power. The six sub-frame HS-SCCH signalling pattern shall repeat as follows: …OOXOXOOOXOXO…, where 'X' marks TTI in which HS-SCCH uses the identity of the UE under test and 'O' marks TTI in which HS-SCCH uses a different identity.		

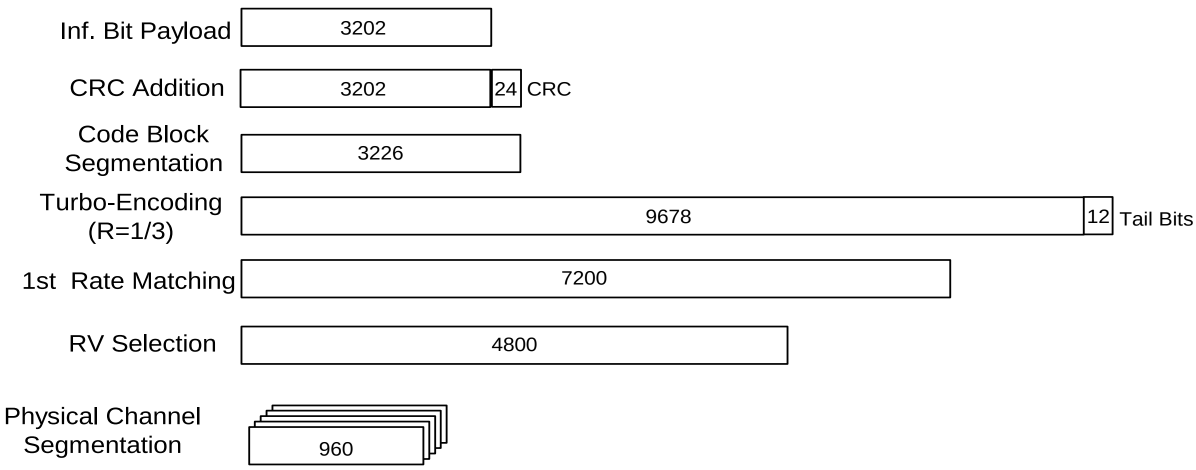


Figure C.8.7: Coding rate for Fixed Reference Channel H-Set 4

C.8.1.5 Fixed Reference Channel Definition H-Set 5

Table C.8.1.5: Fixed Reference Channel H-Set 5

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	801
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	3
Information Bit Payload (N_{INF})	Bits	3202
MAC-d PDU Size	Bits	336
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	4800
Total Available SML's in UE	SML's	28800
Number of SML's per HARQ Proc.	SML's	9600
Coding Rate		0.67
Number of Physical Channel Codes	Codes	5
Modulation		QPSK
Note: This FRC is used to verify the minimum inter-TTI distance for UE category 12. The HS-PDSCH shall be transmitted continuously with constant power. The six sub-frame HS-SCCH signalling pattern shall repeat as follows: …OOXXXOOOXXXO…, where 'X' marks TTI in which HS-SCCH uses the identity of the UE under test and 'O' marks TTI in which HS-SCCH uses a different identity.		

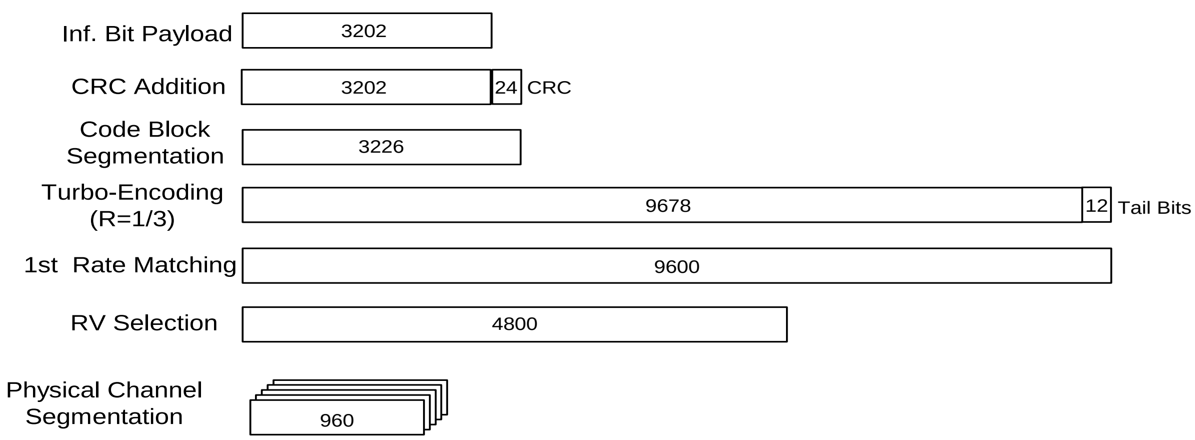


Figure C.8.8: Coding rate for Fixed Reference Channel H-Set 5

C.8.1.6 Fixed Reference Channel Definition H-Set 6/6A/6B/6C

Table C.8.1.6: Fixed Reference Channel H-Set 6/6A/6B/6C

Parameter	Unit	Value	
Nominal Avg. Inf. Bit Rate	kbps	3219	4689
Inter-TTI Distance	TTI's	1	1
Number of HARQ Processes	Processes	6	6
Information Bit Payload (N_{INF})	Bits	6438	9377
Number Code Blocks	Blocks	2	2
Binary Channel Bits Per TTI	Bits	9600	15360
Total Available SML's in UE	SML's	115200	115200
Number of SML's per HARQ Proc.	SML's	19200	19200
Coding Rate		0.67	0.61
Number of Physical Channel Codes	Codes	10	8
Modulation		QPSK	16QAM
Note: The values in the table defines H-Set 6. H-Set 6A for DC-HSDPA and DB-DC-HSDPA is formed by applying H-Set 6 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 6B and H-Set 6C for 4C-HSDPA are formed by applying H-Set 6 to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 6B and 4 carriers for H-Set 6C).			

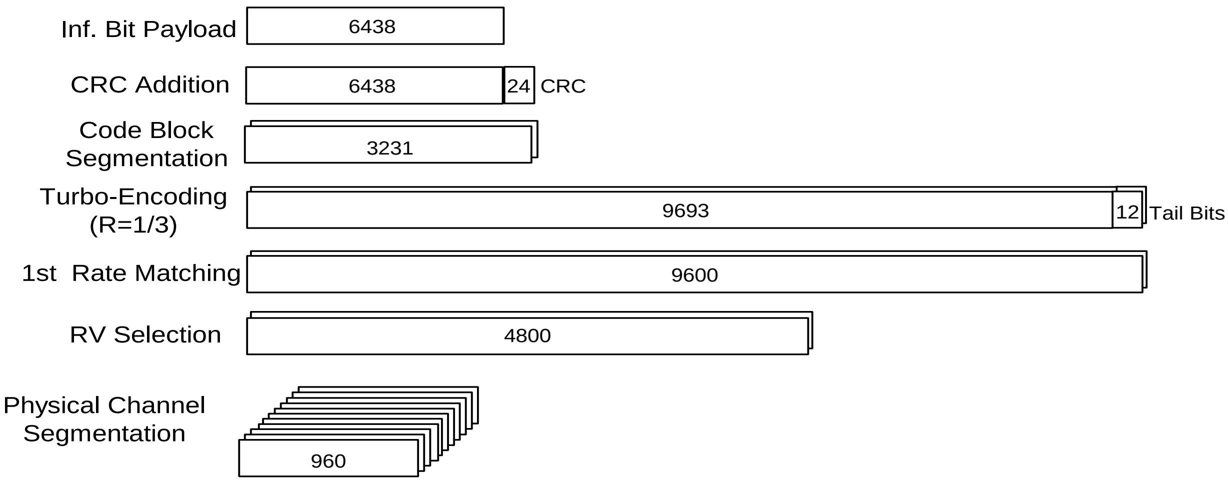


Figure C.8.9: Coding rate for Fixed reference Channel H-Set 6 (QPSK)

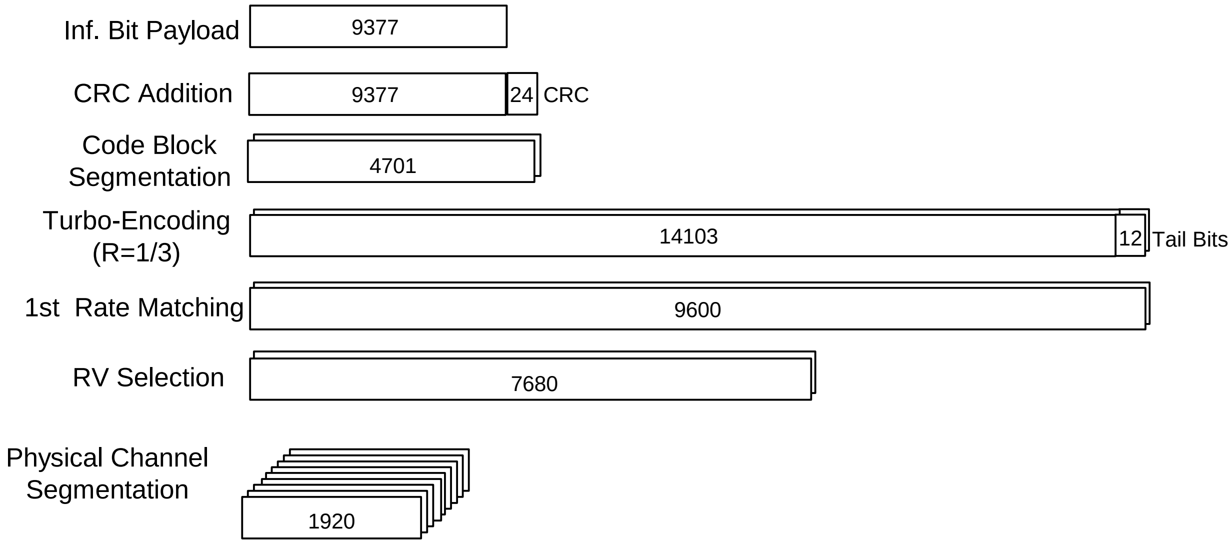


Figure C.8.10: Coding rate for Fixed reference Channel H-Set 6 (16 QAM)

C.8.1.7 Fixed Reference Channel Definition H-Set 7

Table C.8.1.7: Fixed Reference Channel H-Set 7

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	37.8
Inter-TTI Distance	TTI's	8
Information Bit Payload (N_{INF})	Bits	605
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Coding Rate		0.66
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note: This FRC is used to verify CPC operation. The HS-DSCH shall be transmitted continuously with constant power but only every 8th TTI shall be allocated to the UE under test.		

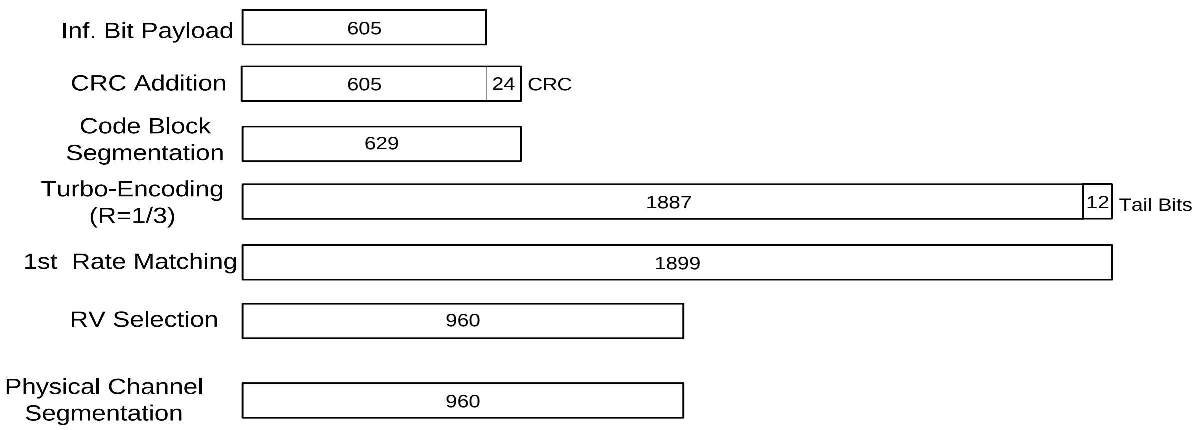


Figure C.8.11: Coding rate for Fixed Reference Channel H-Set 7 (QPSK)

C.8.1.8 Fixed Reference Channel Definition H-Set 8/8A/8B/8C

Table C.8.1.8: Fixed Reference Channel H-Set 8/8A/8B/8C

Parameter	Unit	Value	
Nominal Avg. Inf. Bit Rate	kbps	13252	
Inter-TTI Distance	TTI's	1	
Number of HARQ Processes	Processes	6	
Information Bit Payload (N_{INF})	Bits	26504	
Number Code Blocks	Blocks	6	
Binary Channel Bits Per TTI	Bits	43200	
Total Available SML's in UE	SML's	259200	264000
Number of SML's per HARQ Proc.	SML's	43200	44000
Coding Rate		0.61	0.60
Number of Physical Channel Codes	Codes	15	
Modulation		64QAM	
Note 1: The values in the table define H-Set 8. H-Set 8A for DC-HSDPA and DB-DC-HSDPA is formed by applying H-Set 8 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 8B and H-Set 8C for 4C-HSDPA are formed by applying H-Set 8 to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 8B and 4 carriers for H-Set 8C). Note 2: If "Total number of soft channel bits" as per HS-DSCH categories is equal to 259200, set "Number of SML's per HARQ Proc." As 43200 using an implicit UE IR Buffer Size Allocation. If "Total number of soft channel bits" is larger than or equal to 264000, set "Number of SML's per HARQ Proc." As 44000 using an explicit UE IR Buffer Size Allocation.			

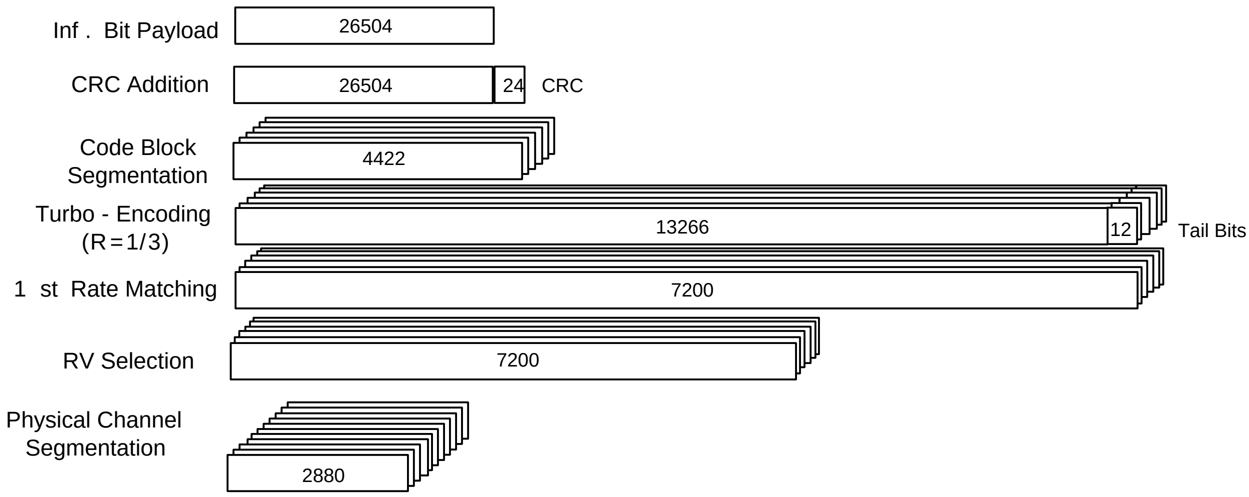


Figure C.8.12: Coding rate for Fixed reference Channel H-Set 8 (64 QAM)

C.8.1.9 Fixed Reference Channel Definition H-Set 9/9A/9B/9C

Table C.8.1.9: Fixed Reference Channel H-Set 9/9A

Parameter	Unit	Value	
Transport block		Primary	Secondary
Combined Nominal Avg. Inf. Bit Rate		13652	
Nominal Avg. Inf. Bit Rate	kbps	8784	4868
Inter-TTI Distance	TTI's	1	1
Number of HARQ Processes	Processes	6	6
Information Bit Payload (N_{INF})	Bits	17568	9736
Number Code Blocks	Blocks	4	2
Binary Channel Bits Per TTI	Bits	28800	14400
Total available SML's in UE	Bits	345600	
Number of SML's per HARQ Proc.	SML's	28800	28800
Coding Rate		0.61	0.68
Number of Physical Channel Codes	Codes	15	15
Modulation		16QAM	QPSK
Note: The values in the table defines H-Set 9. H-Set 9A for DC-HSDPA is formed by applying H-Set 9 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 9B and H-Set 9C for 4C-HSDPA are formed by applying H-Set 9 to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 9B and 4 carriers for H-Set 9C).			

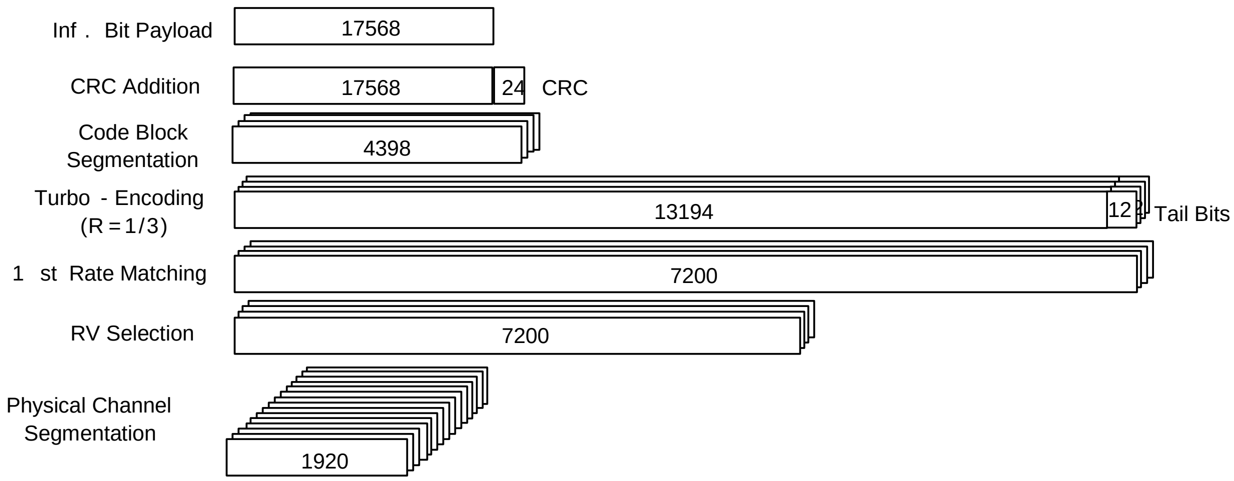


Figure C.8.13: Coding rate for Fixed Reference Channel H-Set 9/9A Primary Transport Block

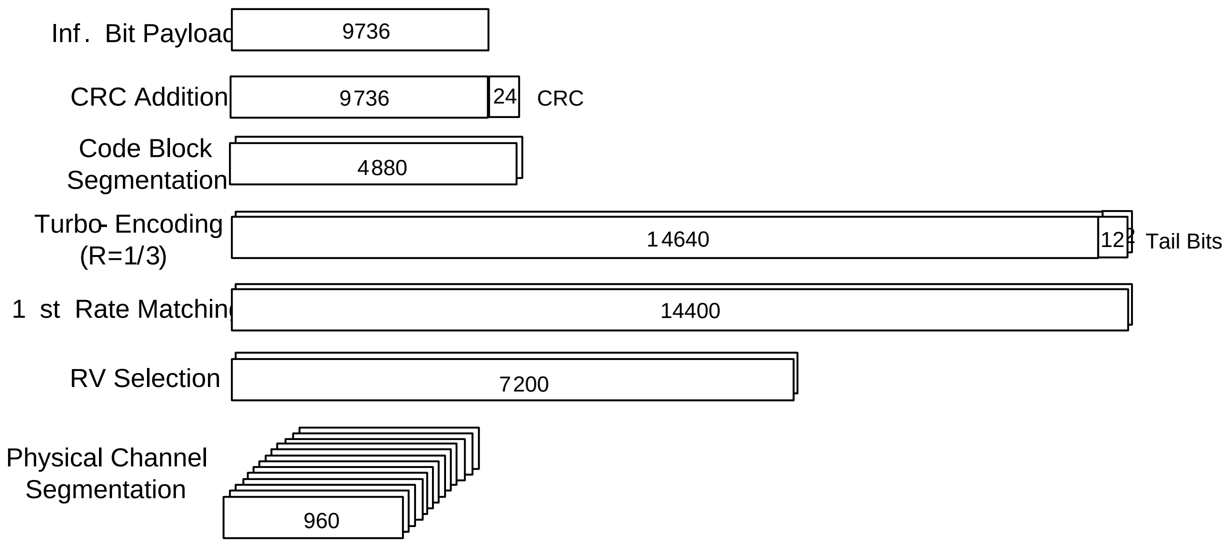


Figure C.8.14: Coding rate for Fixed Reference Channel H-Set 9/9A Secondary Transport Block

C.8.1.10 Fixed Reference Channel Definition H-Set 10/10A/10B/10C

Table C.8.1.10: Fixed Reference Channel H-Set 10/10A/10B/10C

Parameter	Unit	Value	
Nominal Avg. Inf. Bit Rate	Kbps	8774	4860
Inter-TTI Distance	TTI's	1	1
Number of HARQ Processes	Processes	6	6
Information Bit Payload	Bits	17548	9719
Number Code Blocks	Blocks	4	2
Binary Channel Bits Per TTI	Bits	28800	14400
Number of SML's per HARQ Proc.	SML's	28800	28800
Coding Rate		0.6	0.67
Number of Physical Channel Codes	Codes	15	15
Modulation		16QAM	QPSK
Note: The values in the table defines H-Set 10. H-Set 10A for DC-HSDPA and DB-DC-HSDPA is formed by applying H-Set 10 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 10B and H-Set 10C for 4C-HSDPA are formed by applying H-Set 10 to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 10B and 4 carriers for H-Set 10C).			

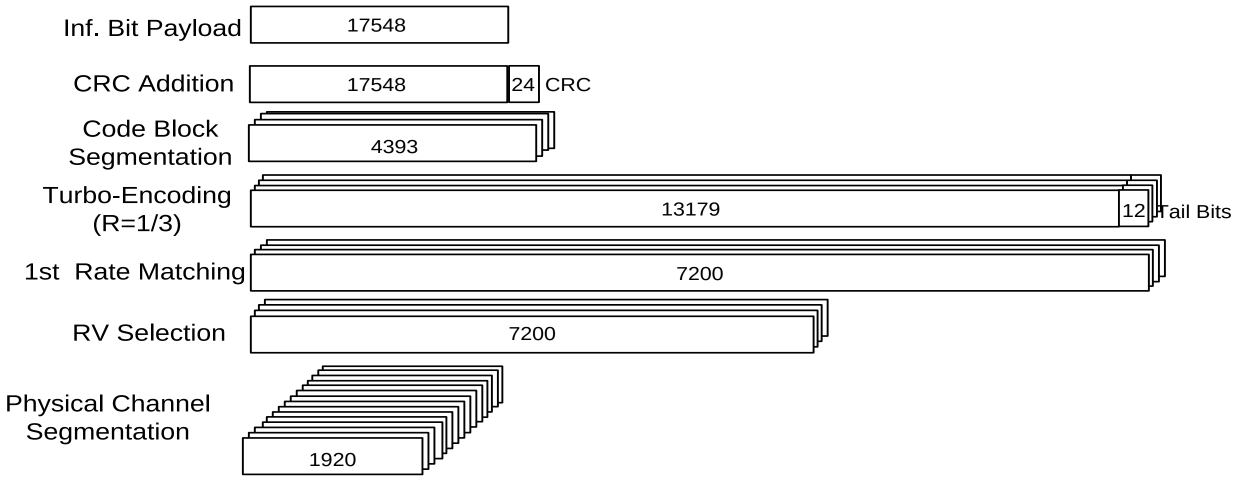


Figure C.8.15: Coding rate for Fixed Reference Channel H-Set 10 (16QAM)

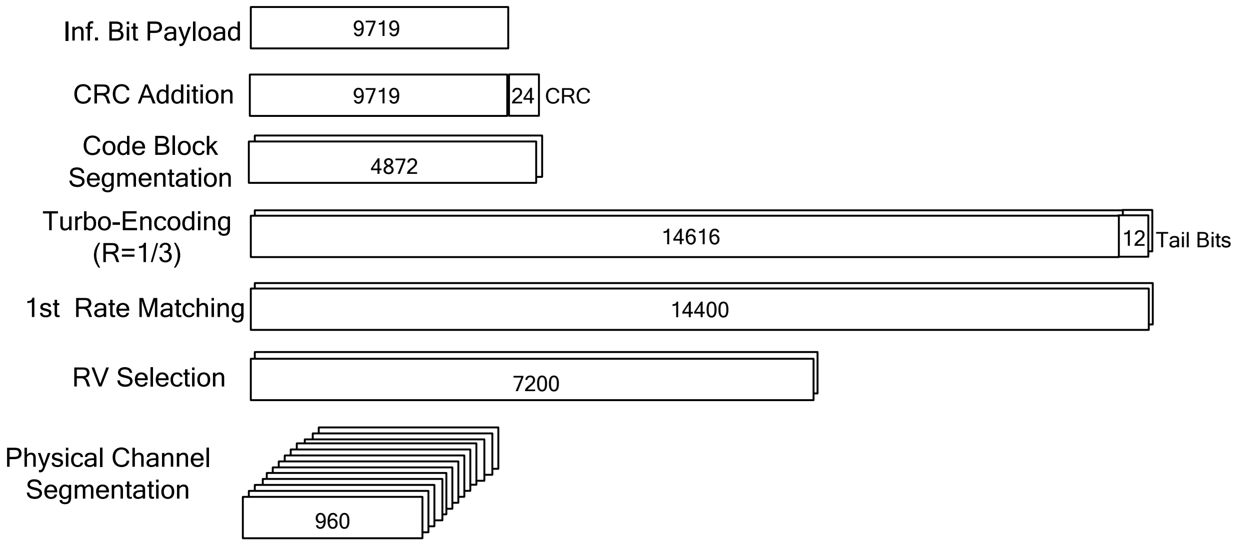


Figure C.8.16: Coding rate for Fixed Reference Channel H-Set 10 (QPSK)

C.8.1.11 Fixed Reference Channel Definition H-Set 11/11A/11B/11C

Table C.8.1.11: Fixed Reference Channel H-Set 11/11A

Parameter	Unit	Value	
Transport block		Primary	Secondary
Combined Nominal Avg. Inf. Bit Rate		22074	
Nominal Avg. Inf. Bit Rate	kbps	13300	8774
Inter-TTI Distance	TTI's	1	1
Number of HARQ Processes	Processes	6	6
Information Bit Payload (N_{INF})	Bits	26504	17568
Number Code Blocks	Blocks	6	4
Binary Channel Bits Per TTI	Bits	43200	28800
Total available SML's in UE	Bits	518400	
Number of SML's per HARQ Proc.	SML's	43200	43200
Coding Rate		0.61	0.6
Number of Physical Channel Codes	Codes	15	15
Modulation		64QAM	16QAM
Note: The values in the table defines H-Set 11. H-Set 11A for DC-HSDPA is formed by applying H-Set 11 to each of the carriers available in DC-HSDPA and DB-DC-HSDPA mode. H-Set 11B and H-Set 11C for 4C-HSDPA are formed by applying H-Set 11 and H-Set 11C to each of the carriers available in 4C-HSDPA mode (3 carriers for H-Set 11B and 4 carriers for H-Set 11C).			

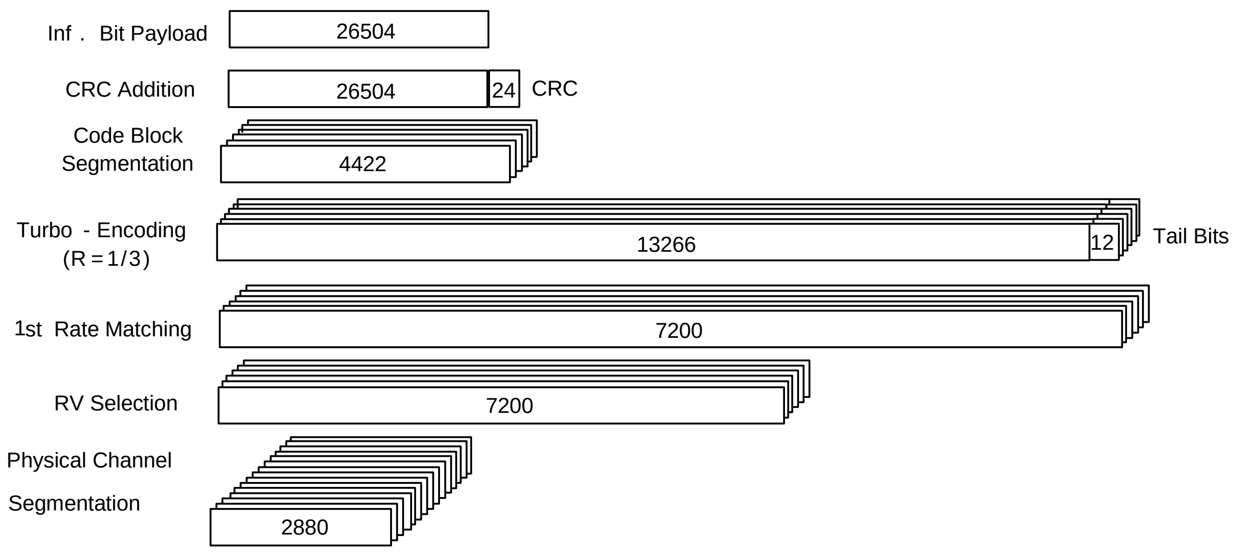


Figure C.8.17: Coding rate for Fixed Reference Channel H-Set 11/11A Primary Transport Block

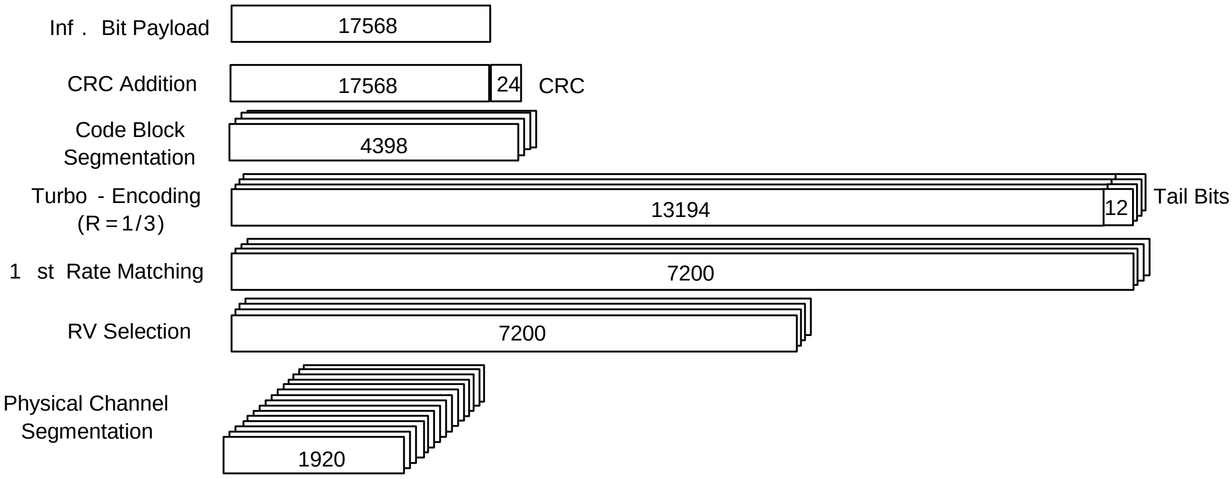


Figure C.8.18: Coding rate for Fixed Reference Channel H-Set 11/11A Secondary Transport Block

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

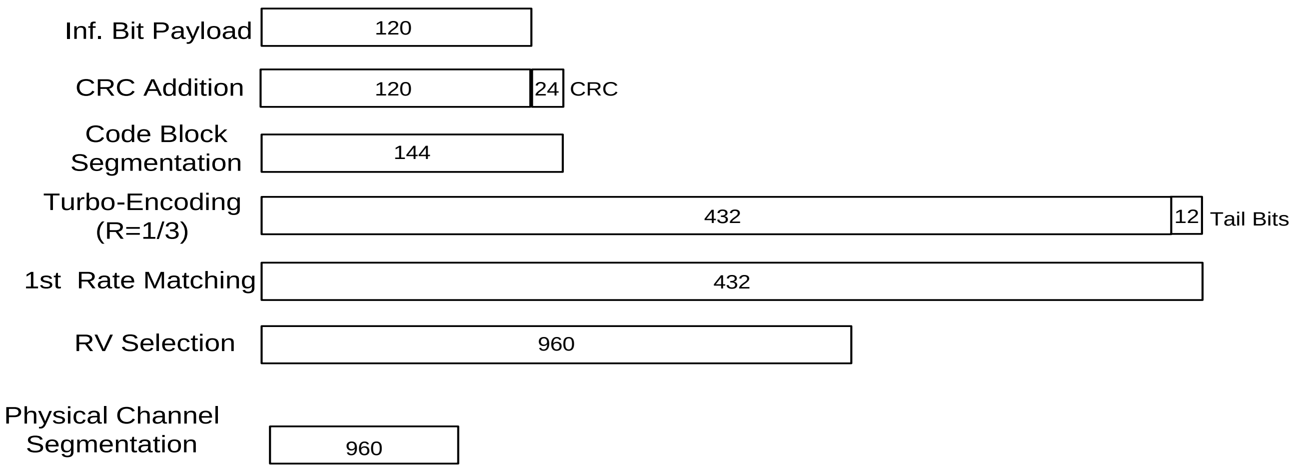


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

C.9 Downlink reference channel dummy DCCH transmission on DCH

Many test cases have been designed to have continuous downlink DCCH transmission on DCH. The DCCH is carrying SRBs. When there are no signalling messages to be transmitted on downlink DCCH then dummy DCCH messages shall be transmitted on the downlink.

For all test cases with continuous downlink DCCH transmission on DCH the format of the dummy DCCH message is using an invalid MAC header with the value "1111" for the C/T field. The UE shall discard PDU's with this invalid MAC header according to TS 25.321. This applies for cases where a MAC header is used to distinguish between several logical channels. In the case of the reference measurement channels the SRBs on DCH use a 4 bit MAC header.

C.9A MAC header transmission on HS-DSCH

For all test cases with HS-DSCH transmission either a correct MAC-hs header consistent with the actual HSDPA transmission is used or an inconsistent MAC-hs header with the value "111" for the SID field is used. If an inconsistent MAC-hs header is used, then the UE shall discard PDU's according to TS 25.321[13] section 10. For other fields the MAC-hs header shall be set according to the HS-DSCH configuration configured by RRC and the actual HS-DSCH transmission in order to avoid unspecified UE behaviour.

C.10 UL reference channel parameters for HSDPA tests

This annex specifies the UL reference channels in for HSDPA test cases and the UE test loop mode parameters to be used when the UL reference measurement channel (12.2 kbps) from C.2.1 does not support the required test conditions. Transmitter characteristics tests with HS-DPCCH require continuous transmission and test loop operation on UL DPCH.

C.10.1 UL reference measurement channel for HSDPA tests

Table C.10.1.1 to C.10.1.4 are applicable for tests on Transmitter Characteristics with HSDPA in clauses 5.2A, 5.2C, 5.2AA, 5.7A, 5.9A, 5.10A, 5.13.1A and 5.13.1AA.

Table C.10.1.1: UL reference measurement channel physical parameters (12.2 kbps) for HSDPA tests

Parameter	Level	Unit
DPCCH/DPDCH power ratio	−5.46 (Note 1)	dB
Note 1: The power ratio for transmitter characteristics testing with HS-DPCCH depends on the beta values given in table C.10.1.4. Note 2: With the exception of the DPCCH/DPDCH power ratio parameter in this table all other parameters are defined in UL reference measurement channel in clause C.2.1, table C.2.1.1.		

Table C.10.1.2: UL reference measurement channel, transport channel parameters (12.2 kbps) for HSDPA

Higher Layer	RAB/Signalling RB	RAB	SRB
Note: As defined in UL reference measurement channel in clause C.2.1, table C.2.1.2.			

Table C.10.1.3: UL reference measurement channel, TFCS (12.2 kbps) for HSDPA

Note: As defined in UL reference measurement channel in clause C.2.1, table C.2.1.3.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} (*Note1, Note 2*)	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

C.11 Reference channel parameters for E-DCH tests

This annex specifies the reference channel parameters for E-DCH test cases.

C.11.1 UL reference measurement channel for E-DCH tests

On uplink E-DCH the MAC-d flow parameters and the physical channel parameters according to default Radio Bearer Setup message of section 9.2.1 of TS 34.108 are used. On uplink DCH the reference measurement channel according to section C.2.1 is used with the exception that for transmitter characteristics tests the DPCCH/DPDCH power ratio depends on the beta values given in table C.11.1.3. For transmitter characteristics tests the beta values on all uplink channels according to table C.11.1.3. are used.

Table C.11.1.1: Void

Table C.11.1.2: Void

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c . For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Table C.11.1.4**: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

C.11.2 DL reference measurement channel for E-DCH tests

On downlink DCH the reference measurement channel according to section C.3.1 is used. On downlink HS-DSCH the fixed reference channel H-Set 1 according to section C.8.1.1 is used.

C.11.3 RLC SDU size for E-DCH tests

Table C.11.3.1 defines the number of DL RLC SDUs per TTI and the sizes of the DL and UL RLC SDUs to achieve the required asymmetrical DL/UL data rates for the E-DCH test cases.

Table C.11.3.1: UL RLC SDU size for E-DCH tests

TC Clause	TS 34.121-1 E-DCH Test Cases	Inter-TTI (Note 1)	DL SDU size [bits] (Note 2)	Number of DL SDUs per DL transmission (Note 1)	UL RLC SDU Size [bits] (Note 1)
5.2B	Maximum Output Power with HS-DPCCH and E-DCH	3 (H-Set 1)	2936	1	For sub-test 1-4: 2936 For sub-test 5: 11744
5.2D	UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH	3 (H-Set 1)	2936	1	2936
5.2E	UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM	3 (H-Set 1)	312	9	8808
5.9B	Spectrum Emission Mask with E-DCH	3 (H-Set 1)	2936	1	For sub-test 1-4: 2936 For sub-test 5: 11744
5.10B	ACLR with E-DCH	3 (H-Set 1)	2936	1	For sub-test 1-4: 2936 For sub-test 5: 11744
5.13.1AAA	EVM and IQ origin offset for HS-DPCCH and E-DCH with 16QAM	3 (H-Set 1)	312	9	8808
5.13.2B	Relative Code Domain Error with HS-DPCCH and E-DCH	3 (H-Set 1)	2936	1	2936
5.13.2C	Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM	3 (H-Set 1)	312	9	8808
8.4.4.1	10 ms TTI E-DCH E-TFC Restriction	3 (H-Set 1)	2936	1	11744
8.4.4.2	2ms TTI E-DCH E-TFC Restriction	3 (H-Set 1)	968	3	11744
8.7.9	UE Transmission Power Headroom	3 (H-Set 1)	-	-	No E-DCH payload data transmitted
10.2.1.1	Detection of E-HICH - Single Link Performance (10ms)	3 (H-Set 1)	2936	1	2936
10.2.1.2	Detection of E-HICH - Single Link Performance (2ms)	3 (H-Set 1)	2936	1	5872
10.2.2.1.1	Detection in Inter-Cell Handover conditions - RLS not containing the Serving E-DCH cell (10ms)	3 (H-Set 1)	2936	1	11744
10.2.2.1.2	Detection in Inter-Cell Handover conditions - RLS not containing the Serving E-DCH cell (2ms)	3 (H-Set 1)	968	3	5872
10.2.2.2.1	Detection in Inter-Cell Handover conditions - RLS containing the Serving E-DCH cell (10ms)	3 (H-Set 1)	968	3	5872
10.2.2.2.2	Detection in Inter-Cell Handover conditions - RLS containing the Serving E-DCH cell (2ms)	3 (H-Set 1)	968	3	9784
10.3.1.1	Detection of E-RGCH - Single Link Performance (10ms)	3 (H-Set 1)	2936	1	2936
10.3.1.2	Detection of E-RGCH - Single Link Performance	3 (H-Set 1)	2936	1	5872

TC Clause	TS 34.121-1 E-DCH Test Cases	Inter-TTI (Note 1)	DL SDU size [bits] (Note 2)	Number of DL SDUs per DL transmission (Note 1)	UL RLC SDU Size [bits] (Note 1)
	(2ms)				
10.3.2	Detection of E-RGCH - Detection in Inter-Cell Handover conditions	3 (H-Set 1)	2936	1	11744
10.4.1	Demodulation of E-AGCH (Single Link Performance)	3 (H-Set 1)	2936	1	8808
Note 1: The achieved UL rate will depend on the number of DL SDUs sent at every inter-TTI interval. For each received DL RLC SDU one UL RLC SDU of the configured UL RLC SDU size is transmitted in UL. Generated UL bit rate by the UE test loop function = Number of DL SDUs per Inter-TTI reception * UL RLC SDU size / DL TTI * Inter-TTI. The UE test loop function bit rate shall be equal or larger than the UL rate required by the test to avoid that Tx buffer becomes empty during the test phase. The SS configured UL SDU size for UE test loop mode 1 shall be limited to maximum 1520 octets (12160 bits) to not restrict the applicability of test cases to UEs supporting optional UL RLC SDU sizes larger than 1520 octets (TS 34.109 clause 6.2). Note 2: The DL RLC SDU size for all E-DCH tests is set to fit into a transport block size of 3202 bits (the transport block size used for H-Set 1). For the case of one, three or nine DL SDUs are used per DL transmission then DL SDU size of 2936, 968 and 312 bits are used. These DL SDU sizes take into account the required fixed and flexible MAC and RLC header size to enable the SS to concatenate and transmit the DL RLC SDUs in one and the same TTI.					

C.11A Reference channel parameters for DC-HSUPA tests

This annex specifies the reference channel parameters for DC-HSUPA test cases.

C.11A.1 UL reference measurement channel for DC-HSUPA tests

On uplink E-DCH the MAC-d flow parameters and the physical channel parameters according to default Radio Bearer Setup message of section 9.2.1 of TS 34.108 are used. On uplink DCH the reference measurement channel according to section C.2.6 (BPSK configuration) or C.2.7 (16QAM configuration) is used. Table C.11A.1.1 and Table C.11.A.1.2 show the beta values on all uplink channels on both carriers that are used for transmitter characteristics tests.

Table C.11A.1.1: β values for transmitter characteristics tests for DC-HSUPA with QPSK

β_c (Note2)	β_d	β_{HS} (Note1)	β_{ec} (Note2)	β_{ed} (1xSF16) (Note2)	AG Index (Note 2 and 3)	E-TFCI (Note 2 and 4)
15/15	-	5/15	5/15	24/15	6	1
Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} =5/15 * β_c . This channel is present only in primary carrier. Note 2: This value is used for both primary and secondary carriers. Note 3: β_{ed} can not be set directly; it is set by Absolute Grant Value. Note 4: 2ms TTI E-DCH Transport Block Size Table 0 is used.						

Table C.11A.1.2: β values for transmitter characteristics tests for DC-HSUPA with 16QAM

β_c (Note2)	β_d	β_{HS} (Note1)	β_{ec} (Note2)	β_{ed} (2xSF2) (Note 2)	β_{ed} (2xSF4) (Note 2)	AG Index (Note 2 and 3)	E-TFCI (Note 2 and 4)	E-TFCI (Boost)
15/15	-	19/15	38/15	β_{ed}1: 134/15 β_{ed}2: 134/15	β_{ed}3: 95/15 β_{ed}4: 95/15	24	68	67
Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 19/15 with β_{hs} =19/15 * β_c . This channel is present only in primary carrier. Note 2: This value is used for both primary and secondary carriers. Note 3: β_{ed} can not be set directly; it is set by Absolute Grant Value. Note 4: 2ms TTI E-DCH Transport Block Size Table 3 is used.								

C.11A.2 DL reference measurement channel for DC-HSUPA tests

On downlink DCH the reference measurement channel according to section C.3.1 is used. On downlink HS-DSCH the fixed reference channel H-Set 3A with QPSK according to section C.8.1.1 is used.

C.11A.3 RLC SDU size for DC-HSUPA tests

Table C.11A.3.1 defines the number of DL RLC SDUs per TTI and the sizes of the DL and UL RLC SDUs to achieve the required asymmetrical DL/UL data rates for the E-DCH test cases.

Table C.11A.3.1: UL RLC SDU size for E-DCH tests

TC Clause	TS 34.121-1 E-DCH Test Cases	Inter-TTI (Note 1)	DL SDU size [bits] (Note 2)	Number of DL SDUs per DL transmission (Note 1)	UL RLC SDU Size [bits] (Note 1)
5.2BA	Maximum Output Power for DC-HSUPA	1 (H-Set 3A)	2936	1	72 (BPSK) 8406 (16QAM)
5.2DA	UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK	1 (H-Set 3A)	2936	1	72
5.3A	Frequency Error for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.4.1A	Open Loop Power Control in the Uplink for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.4.2A	Inner Loop Power Control in the Uplink for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.8A	Occupied Bandwidth (OBW) for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.9C	Additional Spectrum Emission Mask for DC-HSUPA	1 (H-SET 3A)	2936	1	72 (BPSK) 8406 (16QAM)
5.10C	Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for DC-HSUPA	1 (H-SET 3A)	2936	1	72 (BPSK) 8406 (16QAM)
5.11A	Spurious Emissions for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.12A	Transmit Intermodulation for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.13.2BA	Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA	1 (H-SET 3A)	2936	1	72
5.13.2CA	Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM for DC-HSUPA	1 (H-SET 3A)	2936	1	8406
5.13.5	In-band emission for DC-HSUPA	1 (H-SET 3A)	2936	1	72
Note 1: The achieved UL rate will depend on the number of DL SDUs sent at every inter-TTI interval. For each received DL RLC SDU one UL RLC SDU of the configured UL RLC SDU size is transmitted in UL. Generated UL bit rate by the UE test loop function = Number of DL SDUs per Inter-TTI reception * UL RLC SDU size / DL TTI * Inter-TTI. The UE test loop function bit rate shall be equal or larger than the UL rate required by the test to avoid that Tx buffer becomes empty during the test phase. The SS configured UL SDU size for UE test loop mode 1 shall be limited to maximum 1520 octets (12160 bits) to not restrict the applicability of test cases to UEs supporting optional UL RLC SDU sizes larger than 1520 octets (TS 34.109 clause 6.2). Note 2: The DL RLC SDU size for all E-DCH tests is set to fit into a transport block size of 3202 bits (the transport block size used for H-Set 3A).					

C.12 DL reference parameters for MBMS tests

This annex specifies the reference channel parameters for MBMS test cases.

C.12.1 MTCH

The parameters for the MTCH demodulation tests are specified in Table C.12.1.1 and Table C.12.1.2.

Table C.12.1.1: Physical channel parameters for S-CCPCH

Parameter	Unit	Level	Level
User Data Rate	**kpbs**	**256**	**128**
Channel bit rate	kbps	960	480
Channel symbol rate	ksps	480	240
Slot Format #i	-	14	12
TFCI	-	ON	ON
Power offsets of TFCI and Pilot fields relative to data field	dB	0	0

Table C.12.1.2: Transport channel parameters for S-CCPCH

Parameter	MTCH		
User Data Rate	**256 kbps**	**128 kbps 40 ms TTI**	**128 kbps, 80 ms TTI**
Transport Channel Number	1	1	1
Transport Block Size	2536	2536	2536
Transport Block Set Size	10144	5072	10144
Nr of transport blocks/TTI	4	2	4
RLC SDU block size	10080	5024	10080
Transmission Time Interval	40 ms	40 ms	80 ms
Type of Error Protection	Turbo	Turbo	Turbo
Rate Matching attribute	256	256	256
Size of CRC	16	16	16
Position of TrCH in radio frame	Flexible	Flexible	Flexible

C.12.2 Combined MTCH demodulation and cell identification

The parameters for combined MTCH demodulation and cell identification test are defined in Table C.12.2.1.

Table C.12.2.1: Cell reselection parameters

Parameter	Unit	Value
Serving cell in the initial condition		Cell1
Neighbour cells		32 intra-frequency neighbour cells are indicated including Cell2 and Cell3
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0
Qqualmin	dB	-20
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dB	21
Qhyst2	dB	20 dB
Treselection	seconds	4
Sintrasearch	dB	not sent
IE "FACH Measurement occasion info"		not sent

Annex D (normative): Propagation Conditions

D.1 General

D.1.1 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.

For DC-HSDPA tests the minimum bandwidth of the AWGN interferer shall be 11.52 MHz for a chip rate of 3,84 Mcps. The flatness across this minimum bandwidth shall be less than ±1,0 dB and the peak to average ratio at a probability of 0,001 % shall exceed 10 dB.

D.2 Propagation Conditions

D.2.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multi-paths exist for this propagation model.

D.2.2 Multi-path fading propagation conditions

Table D.2.2.1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table D.2.2.1: Propagation conditions for multi-path fading environments

Case 1		**Case 2**		**Case 3**		**Case 4**		**Case 5 (Note 1)**		**Case 6**	
Speed for Band I, II, III, IV, IX, X and XXV: 3 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 3 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 120 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 3 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 50 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 250 km/h	
Speed for Band V, VI, VIII, XIX, XX and XXVI: 7 km/h		Speed for Band V, VI,VIII, XIX, XX and XXVI: 7 km/h		Speed for Band V, VI,VIII, XIX, XX and XXVI: 282 km/h (Note 2)		Speed for Band V, VI,VIII, XIX, XX and XXVI: 7 km/h		Speed for Band V, VI, VIII, XIX, XX and XXVI: 118 km/h		Speed for Band V, VI,VIII, XIX, XX and XXVI: 583 km/h (Note 2)	
Speed for Band VII: 2.3 km/h		Speed for Band VII: 2.3 km/h		Speed for Band VII: 92 km/h		Speed for Band VII: 2.3 km/h		Speed for Band VII: 38 km/h		Speed for Band VII: 192 km/h	
Speed for Band XI, XXI: 4.1 km/h		Speed for Band XI, XXI: 4.1 km/h		Speed for Band XI, XXI: 166 km/h		Speed for Band XI, XXI: 4.1 km/h		Speed for Band XI, XXI: 69 km/h		Speed for Band XI, XXI: 345 km/h (Note 2)	
Speed for Band XII, XIII and XIV: 8 km/h		Speed for Band XII, XIII and XIV: 8 km/h		Speed for Band XII, XIII and XIV: 320 km/h		Speed for Band XII, XIII and XIV: 8 km/h		Speed for Band XII, XIII and XIV: 133 km/h		Speed for Band XII, XIII and XIV: 668 km/h	
Relative Delay [ns]	**Relative mean Power [dB]**	**Relative Delay [ns]**	**Relative mean Power [dB]**	**Relative Delay [ns]**	**Relative mean Power [dB]**	**Relative Delay [ns]**	**Relative mean Power [dB]**	**Relative Delay [ns]**	**Relative mean Power [dB]**	**Relative Delay [ns]**	**Relative mean Power [dB]**
0	0	0	0	0	0	0	0	0	0	0	0
976	-10	976	0	260	-3	976	0	976	-10	260	-3
		20000	0	521	-6					521	-6
				781	-9					781	-9

NOTE 1: Case 5 is only used in Requirements for support of RRM.

NOTE 2: Speed above 250km/h is applicable to demodulation performance requirements only.

Table D.2.2.1A shows propagation conditions that are used for HSDPA performance measurements in multi-path fading environment. For HSDPA and DCH enhanced performance requirements, the fading of the signals and the AWGN signals provided in each receiver antenna port shall be independent. For DC-HSDPA requirements, the fading of the signals for each cell shall be independent.

Table D.2.2.1A: Propagation Conditions for multi-path fading environments for HSDPA

ITU Pedestrian A Speed 3km/h (PA3)		ITU Pedestrian B Speed 3km/h (PB3)		ITU vehicular A Speed 30km/h (VA30)		ITU vehicular A Speed 120km/h (VA120)	
Speed for Band I, II, III, IV, IX, X and XXV: 3 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 3 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 30 km/h		Speed for Band I, II, III, IV, IX, X and XXV: 120 km/h	
Speed for Band V, VI, VIII, XIX, XX and XXVI: 7 km/h		Speed for Band V, VI, VIII, XIX, XX and XXVI: 7 km/h		Speed for Band V, VI, VIII, XIX, XX and XXVI: 71 km/h		Speed for Band V, VI, VIII, XIX, XX and XXVI: 282 km/h (Note 1)	
Speed for Band VII: 2.3 km/h		Speed for Band VII: 2.3 km/h		Speed for Band VII: 23 km/h		Speed for Band VII: 92 km/h	
Speed for Band XI, XXI: 4.1 km/h		Speed for Band XI, XXI: 4.1 km/h		Speed for Band XI, XXI: 41 km/h		Speed for Band XI, XXI: 166 km/h (Note 1)	
Speed for Band XII, XIII and XIV: 8 km/h		Speed for Band XII, XIII and XIV: 8 km/h		Speed for Band XII, XIII and XIV: 80 km/h		Speed for Band XII, XIII and XIV: 320 km/h	
Relative Delay [ns]	**Relative Mean Power [dB]**	**Relative Delay [ns]**	**Relative Mean Power [dB]**	**Relative Delay [ns]**	**Relative Mean Power [dB]**	**Relative Delay [ns]**	**Relative Mean Power [dB]**
0	0	0	0	0	0	0	0
110	-9.7	200	-0.9	310	-1.0	310	-1.0
190	-19.2	800	-4.9	710	-9.0	710	-9.0
410	-22.8	1200	-8.0	1090	-10.0	1090	-10.0
		2300	-7.8	1730	-15.0	1730	-15.0
		3700	-23.9	2510	-20.0	2510	-20.0

NOTE 1: Speed above 120km/h is applicable to demodulation performance requirements only.

Table D.2.2.1B shows propagation conditions that are used for CQI test in multi-path fading and HS-SCCH-less demodulation of HS-DSCH. For HSDPA enhanced performance requirements, the fading of the signals and the AWGN signals provided in each receiver antenna port shall be independent. For DC-HSDPA requirements, the fading of the signals for each cell shall be independent.

Table D.2.2.1B: Propagation Conditions for CQI test in multi-path fading and HS-SCCH-less demodulation of HS-DSCH

Case 8 Speed for Band I, II, III, IV, IX, X and XXV: 30km/h Speed for Band V, VI, VIII, XIX, XX and XXVI: 71km/h Speed for Band VII: 23km/h Speed for Band XI, XXI: 41km/h Speed for Band XII, XIII and XIV: 80 km/h	
Relative Delay [ns]	Relative mean Power [dB]
0	0
976	-10

Table D.2.2.1C shows propagation conditions that are used for MBMS demodulation performance measurements in multi-path fading environment.

Table D.2.2.1C: Propagation Conditions for Multi-Path Fading Environments for MBMS Performance Requirements, Demodulation of HS-DSCH H-Set9 and H-Set10, HS-SCCH Type 3 Performance

ITU vehicular A Speed 3km/h (VA 3)	
Speed for Band I, II, III, IV, IX, X and XXV: 3 km/h	
Speed for Band V, VI, VIII, XIX, XX and XXVI: 7 km/h	
Speed for Band VII: 2.3 km/h	
Speed for Band XI, XXI: 4.1 km/h	
Speed for Band XII, XIII and XIV: 8 km/h	
Relative Delay [ns]	**Relative Mean Power [dB]**
0	0
310	-1.0
710	-9.0
1090	-10.0
1730	-15.0
2510	-20.0

D.2.3 Moving propagation conditions

The dynamic propagation conditions for the test of the baseband performance are non fading channel models with two taps. The moving propagation condition has two taps, one static, Path0, and one moving, Path1. The time difference between the two paths is according Equation D.2.3.1. The taps have equal strengths and equal phases.

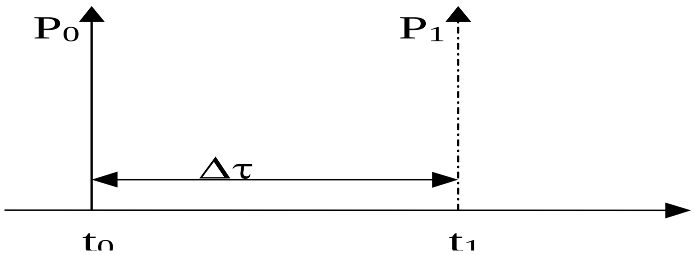


Figure D.2.3.1: The moving propagation conditions

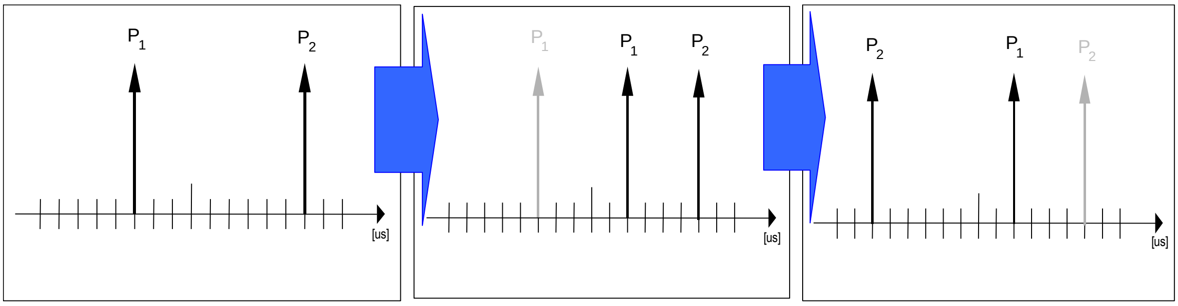
$$\Delta\tau = B + \frac{A}{2}\left(1 + \sin(\Delta\omega \cdot t)\right)$$ Equation D.2.3.1

The parameters in the equation are shown in.

A	5 μs
B	1 μs
Δω	$40 \cdot 10^{-3}\ s^{-1}$

D.2.4 Birth-Death propagation conditions

The dynamic propagation conditions for the test of the baseband performance is a non fading propagation channel with two taps. The moving propagation condition has two taps, Path1 and Path2 while alternate between 'birth' and 'death'. The positions the paths appear are randomly selected with an equal probability rate and are shown in figure D.2.4.1.



NOTE1: Two paths, Path1 and Path2 are randomly selected from the group [-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5] µs. The paths have equal strengths and equal phases.

NOTE 2: After 191 ms, Path1 vanishes and reappears immediately at a new location randomly selected from the group [-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5] µs but excludes the point Path2.

NOTE 3: After additional 191 ms, Path2 vanishes and reappears immediately at a new location randomly selected from the group [-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5] µs but excludes the point Path1.

NOTE 4: The sequence in 2) and 3) is repeated.

D.2.4A High speed train conditions

The high speed train condition for the test of the baseband performance is a non fading propagation channel with one tap. Doppler shift is given by

$$f_s(t) = f_d \cos\theta(t) \qquad \text{(D.2.4A.1)}$$

where $f_s(t)$ is the Doppler shift and f_d is the maximum Doppler frequency. The cosine of angle $\theta(t)$ is given by

$$\cos\theta(t) = \frac{D_s/2 - vt}{\sqrt{D_{\min}{}^2 + (D_s/2 - vt)^2}}\ ,\ 0 \le t \le D_s/v \qquad \text{(D.2.4A.2)}$$

where $D_s/2$ is the initial distance of the train from BS, and $D_{\min}$ is BS-Railway track distance, both in meters; v is the velocity of the train in m/s, t is time in seconds. The parameters in the equation are shown in table D.2.4A.1. Accordingly, Doppler shift changes to the following figure D.2.4A.1.

Table D.2.4A.1

Parameter	Value
D_s	300 m
$D_{\min}$	2 m
v	300 km/h
f_d	600 Hz

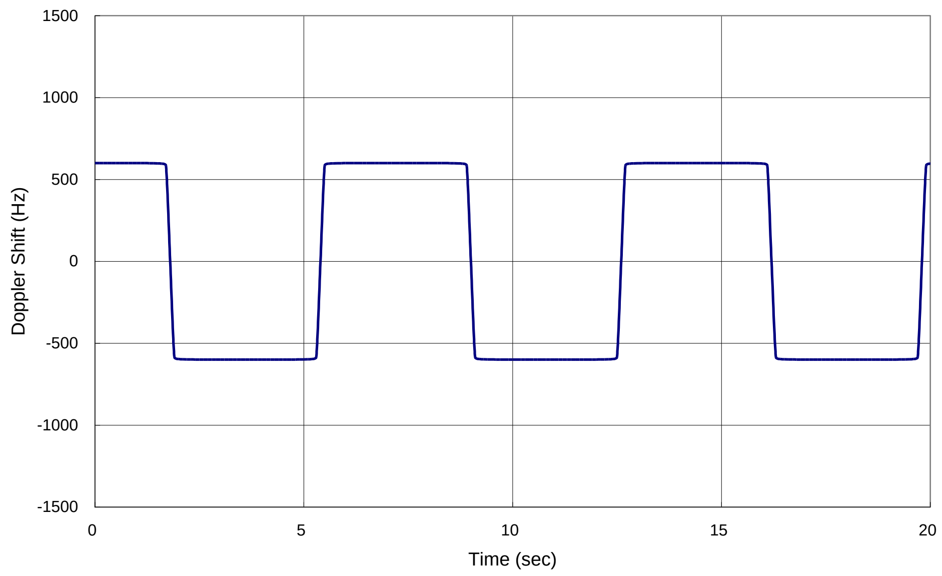


Figure D.2.4A.1: Doppler shift trajectory

D.2.5 Conditions for HSDPA enhanced performance requirements type 1 with UE receiver diversity

The fading profiles used in the two or four faders for testing enhanced performance requirements type 1 with UE receiver diversity shall be uncorrelated to each other.

The two AWGN signals used for testing enhanced performance requirements type 1 with UE receiver diversity shall be uncorrelated to each other.

D.2.6 Conditions for HSDPA enhanced performance requirements type 3 with UE receiver diversity

The fading profiles used in the two faders for testing enhanced performance requirements type 3 with UE receiver diversity shall be uncorrelated to each other.

The two AWGN signals used for testing enhanced performance requirements type 3 with UE receiver diversity shall be uncorrelated to each other.

D.2.7 Conditions for open and closed loop diversity performance

The fading profiles used in the two or four faders for testing open and closed loop diversity performance shall be uncorrelated to each other.

D.2.8 Conditions for MBMS enhanced performance requirements type 1 with UE receiver diversity

The fading profiles used in the six faders for testing enhanced performance requirements type 1 with UE receiver diversity shall be uncorrelated to each other.

The two AWGN signals used for testing enhanced performance requirements type 1 with UE receiver diversity shall be uncorrelated to each other.

D.2.9 MIMO propagation conditions

MIMO propagation conditions are defined for a 2x2 antenna configuration. The resulting propagation channel shall be characterized by a complex 2x2 matrix termed

$$\mathbf{H} = \begin{pmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{pmatrix}.$$

The channel coefficients of **H** shall be defined as a function of the possible precoding vectors or matrices. The possible precoding vectors for MIMO operation according to [5] shall be termed

$$\mathbf{w}^{(1)} = \begin{pmatrix} \frac{1}{\sqrt{2}} \\ \frac{1+\mathrm{j}}{2} \end{pmatrix}, \quad \mathbf{w}^{(2)} = \begin{pmatrix} \frac{1}{\sqrt{2}} \\ \frac{1-\mathrm{j}}{2} \end{pmatrix}, \quad \mathbf{w}^{(3)} = \begin{pmatrix} \frac{1}{\sqrt{2}} \\ \frac{-1+\mathrm{j}}{2} \end{pmatrix}, \quad \mathbf{w}^{(4)} = \begin{pmatrix} \frac{1}{\sqrt{2}} \\ \frac{-1-\mathrm{j}}{2} \end{pmatrix} \qquad \text{(EQ. D.2.9.1)}$$

Furthermore the following possible precoding matrices shall be defined:

$$\mathbf{W}^{(1)} = \begin{pmatrix} \mathbf{w}^{(1)} & \mathbf{w}^{(4)} \end{pmatrix}, \quad \mathbf{W}^{(2)} = \begin{pmatrix} \mathbf{w}^{(2)} & \mathbf{w}^{(3)} \end{pmatrix}, \quad \mathbf{W}^{(3)} = \begin{pmatrix} \mathbf{w}^{(3)} & \mathbf{w}^{(2)} \end{pmatrix}, \quad \mathbf{W}^{(4)} = \begin{pmatrix} \mathbf{w}^{(4)} & \mathbf{w}^{(1)} \end{pmatrix} \qquad \text{(EQ. D.2.9.2)}$$

D.2.9.1 MIMO Single Stream Fading Conditions

For MIMO single stream conditions, the resulting propagation channel shall be generated using two independent fading processes with classical Doppler and one randomly picked but fixed precoding vector $\mathbf{w}$ out of the set defined in equation EQ. D.2.9.1. The two fading processes shall be generated according to the parameters in Table D.2.9.1

Table D.2.9.1

MIMO Single Stream Conditions, Speed for Band I, II, III, IV, IX and X: 3km/h Speed for Band V, VI, VIII, XIX, XX and XXVI: 7.1km/h Speed for Band VII: 2.3km/h Speed for Band XI, XXI: 4.1km/h Speed for Band XII, XIII and XIV: 8 km/h		
Relative Delay [ns]	Relative Mean Power [dB]	(Amplitude, phase) symbols
0	0	(a_1, φ_1)
0	0	(a_2, φ_2)

NOTE: The amplitude a_2 is not used in tests under MIMO single stream conditions, only the phase φ_2 will be used.

The channel coefficients of the resulting propagation channel under MIMO single stream conditions shall be given by

$$\mathbf{H} = \begin{pmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{pmatrix} = a_1 \cdot \begin{pmatrix} \exp(\mathrm{j}\cdot\varphi_1) \\ \exp(-\mathrm{j}\cdot\varphi_2) \end{pmatrix} \cdot \mathbf{w}^{\mathrm{H}}$$

The generation of the resulting channel coefficients for MIMO single stream conditions and the association with the transmitter and receiver ports are depicted Figure D.2.9.1. Figure D.2.9.1 does not restrict test system implementation.

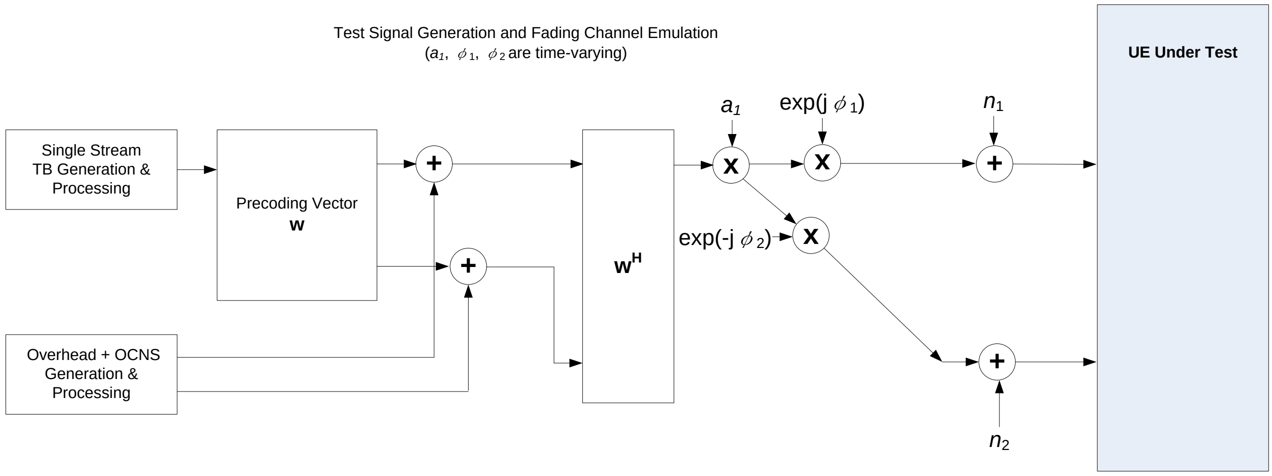


Figure D.2.9.1: Test setup under MIMO Single Stream Fading Conditions

D.2.9.2 MIMO Dual Stream Fading Conditions

For MIMO dual stream conditions, the resulting propagation channel shall be generated using two independent fading processes with classical Doppler and one randomly picked but fixed precoding matrix $\mathbf{W}$ out of the set defined in equation EQ. D.2.9.2. The two fading processes shall be generated according to the parameters in Table D.2.9.2

Table D.2.9.2

MIMO Dual Stream Conditions, Speed for Band I, II, III, IV, IX, X and XXV: 3km/h Speed for Band V, VI, VIII, XIX, XX and XXVI: 7.1km/h Speed for Band VII: 2.3km/h Speed for Band XI, XXI: 4.1km/h Speed for Band XII, XIII and XIV: 8 km/h		
Relative Delay [ns]	Relative Mean Power [dB]	(Amplitude, phase) symbols
0	0	(a_1, φ_1)
0	-3	(a_2, φ_2)

The channel coefficients of the resulting propagation channel under MIMO dual stream conditions shall be given by

$$\mathbf{H} = \begin{pmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{pmatrix} = \sqrt{\frac{2}{3}} \begin{pmatrix} \exp(\mathrm{j}\cdot\varphi_1) & \exp(\mathrm{j}\cdot\varphi_2) \\ \exp(-\mathrm{j}\cdot\varphi_2) & -\exp(-\mathrm{j}\cdot\varphi_1) \end{pmatrix} \cdot \begin{pmatrix} a_1 & 0 \\ 0 & a_2 \end{pmatrix} \cdot \mathbf{W}^{\mathrm{H}}$$

The generation of the resulting channel coefficients for MIMO dual stream conditions and the association with the transmitter and receiver ports are depicted Figure D.2.9.2. Figure D.2.9.2 does not restrict test system implementation.

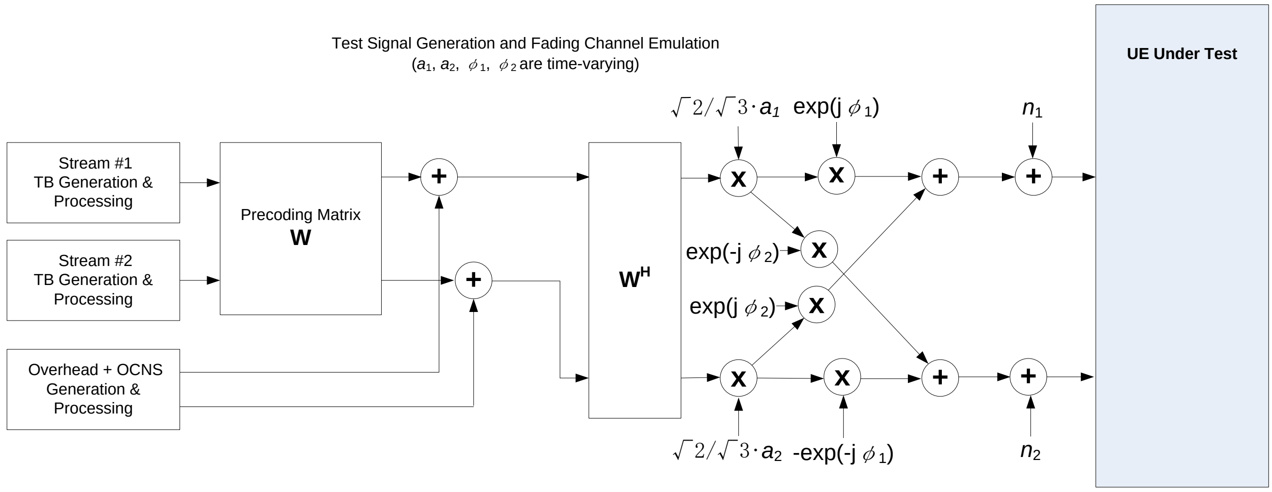


Figure D.2.9.2: Test setup under MIMO Dual Stream Fading Conditions

D.2.9.3 MIMO Dual Stream Static Orthogonal Conditions

The channel coefficients of the resulting propagation channel under MIMO dual stream conditions shall be given by

$$\mathbf{H} = \begin{pmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}$$

The generation of the resulting channel coefficients for MIMO dual stream conditions and the association with the transmitter and receiver ports are depicted Figure D.2.9.3. Figure D.2.9.3 does not restrict test system implementation.

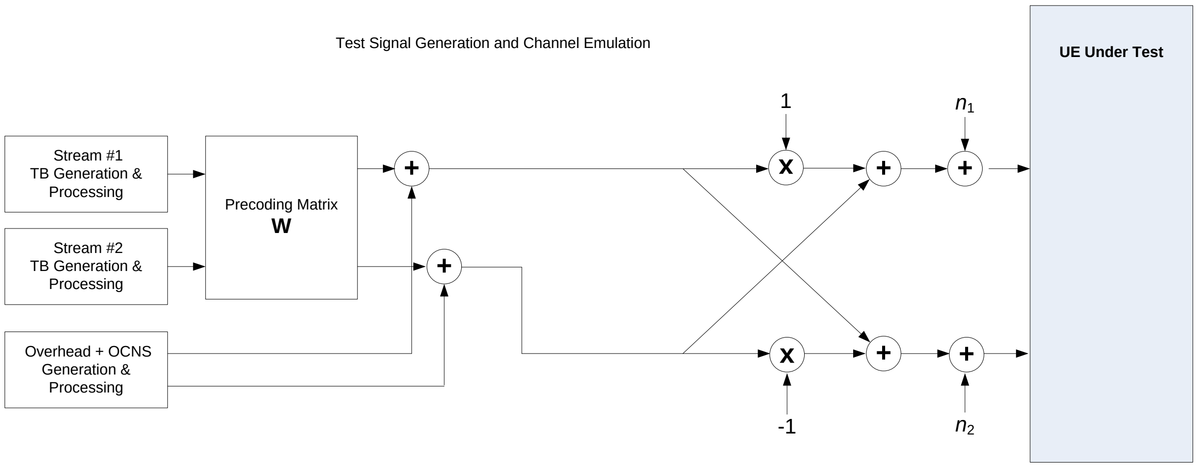


Figure D.2.9.3: Test setup under MIMO Dual Stream Static Orthogonal Conditions

Annex E (normative): Downlink Physical Channels

E.1 General

This normative annex specifies the downlink physical channels that are needed for setting a connection and channels that are needed during a connection. For the definition of OCNS, the power of OCNS shall be controlled so as to keep the total transmit power spectral density Ior constant. The Ior shall be measured as the mean power defined in 3.1 Definitions. The mean power shall be kept constant from one slot to the next.

In test cases where the Ior should be kept constant, it shall be acceptable to continuously send logical channel DCCH data which is allowed to be dummy DCCH data, so that it is not necessary to count the number of power off symbols and calculate OCNS power every symbol or slot period to keep the Ior constant.

NOTE: The power level specified for each physical channel in this annex is an average power, as measured during periods when the physical channel transmission is ON (see [19] for definitions), and no DTX symbols are being transmitted on that physical channel.

E.2 Connection Set-up for non-HSDPA test cases

Table E.2.1 describes the downlink Physical Channels that are required for connection set up.

Table E.2.1: Downlink Physical Channels required for connection set-up

Physical Channel
CPICH
P-CCPCH
SCH
S-CCPCH
PICH
AICH
DPCH

E.2.1 Measurement without dedicated connection

Table E.2.2 describes the downlink Physical Channels that are required for measurement before connection. This is applicable for the clauses 5.4.1 , 5.5.2 and 5.13.4and 5.5.2.

Table E.2.2: Downlink Physical Channels transmitted without dedicated connection

Physical Channel	Power
Îor	Test dependent power
CPICH	CPICH_Ec / Ior = –3.9 dB
P-CCPCH	P-CCPCH_Ec / Ior = –8.3 dB
SCH	SCH_Ec / Ior = –8.3 dB
PICH	PICH_Ec / Ior = –8.3 dB
S-CCPCH	S-CCPCH_Ec / Ior = –5.3 dB

E.3 During connection for non-HSDPA test cases

The following clauses describe the downlink Physical Channels that are transmitted during a connection i.e., when measurements are done. For these measurements the offset between DPCH and SCH shall be zero chips at base station meaning that SCH is overlapping with the first symbols in DPCH in the beginning of DPCH slot structure.

E.3.1 Measurement of Tx Characteristics

Table E.3.1 is applicable for measurements on the Transmitter Characteristics (clause 5) with the exception of clauses 5.3, 5.4.1, 5.4.4 and 5.4.4A.

NOTE: Applicability to clause 5.7 (Power setting in uplink compressed mode) is FFS.

Table E.3.1: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
Îor	–93 dBm / 3,84MHz
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
P-CCPCH	P-CCPCH_Ec / DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec = 2 dB
DPCH	–103,3 dBm / 3,84MHz

E.3.2 Measurement of Rx Characteristics

Table E.3.2.1 is applicable for measurements on the Receiver Characteristics (clause 6) including clauses 5.3, excluding clauses 6.3 and 6.8.

Table E.3.2.1: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
P-CCPCH	P-CCPCH_Ec/ DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec = 2 dB
DPCH	Test dependent power

Table E.3.2.2 describes the downlink Physical Channels that are required for the test of Spurious Emissions (clause 6.8). The UE is in the CELL_FACH state during the measurement.

Table E.3.2.2: Downlink Physical Channels transmitted during the Rx Spurious Emissions test

Physical Channel	Power
CPICH	–86dBm / 3,84MHz
P-CCPCH	P-CCPCH_Ec/ CPICH_Ec = -2 dB
SCH	SCH_Ec / CPICH_Ec = -2 dB
PICH	PICH_Ec / CPICH_Ec = -5 dB
S-CCPCH	S-CCPCH_Ec / CPICH_Ec = -2 dB

E.3.3 Measurement of Performance requirements

Table E.3.3 is applicable for measurements on the Performance requirements (clause 7), including clauses 6.3, 5.4.4 and 5.4.4A, excluding clauses 7.6.1,7.6.2, 7.11 and 7.12.

Table E.3.3.1 is applicable for measurements on the Performance requirements (clause 7) that are done without a dedicated connection (i.e. clauses 7.11 and 7.12).

Table E.3.3: Downlink Physical Channels transmitted during a connection

Physical Channel	Power[2]	Note
P-CPICH	P-CPICH_Ec/Ior = –10 dB	Use of P-CPICH or S-CPICH as phase reference is specified for each requirement and is also set by higher layer signalling.
S-CPICH	S-CPICH_Ec/Ior = –10 dB	When S-CPICH is the phase reference in a test condition, the phase of S-CPICH shall be 180 degrees offset from the phase of P-CPICH. When S-CPICH is not the phase reference, it is not transmitted.
P-CCPCH	P-CCPCH_Ec/Ior = –12 dB	
SCH	SCH_Ec/Ior = –12 dB	This power shall be divided equally between Primary and Secondary Synchronous channels
PICH	PICH_Ec/Ior = –15 dB	
DPCH	Test dependent power	When S-CPICH is the phase reference in a test condition, the phase of DPCH shall be 180 degrees offset from the phase of P-CPICH.
OCNS	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one[1]	OCNS interference consists of 16 dedicated data channels as specified in table E.3.6.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call-set-up phase.		

Table E.3.3.1: Downlink Physical Channels transmitted without a dedicated connection

Physical Channel	Power[2]	Note
P-CPICH	P-CPICH_Ec/Ior = –10 dB	
P-CCPCH	P-CCPCH_Ec/Ior = –12 dB	
S-CCPCH	S-CCPCH_Ec/Ior = –12 dB	This value is set in case the SCCPCH is not a test dependent power
SCH	SCH_Ec/Ior = –12 dB	This power shall be divided equally between Primary and Secondary Synchronous channels
PICH	PICH_Ec/Ior = –15 dB	This value is set in case the PICH is not a test dependent power
AICH	AICH_Ec/Ior = –10 dB	This value is set in case the AICH is not a test dependent power
OCNS	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one[1]	OCNS interference consists of 16 dedicated data channels as specified in table E.3.6.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call-set-up phase.		

E.3.4 Connection with open-loop transmit diversity mode

Table E.3.4 is applicable for measurements for clause 7.6.1.

Table E.3.4: Downlink Physical Channels transmitted during a connection

Physical Channel	Power[2]	Note
P-CPICH (antenna 1)	$P\text{-}CPICH\_E_{c1}/I_{or}$ = –13 dB	1. Total $P\text{-}CPICH\_E_c/I_{or}$ = –10 dB
P-CPICH (antenna 2)	$P\text{-}CPICH\_E_{c2}/I_{or}$ = –13 dB	
P-CCPCH (antenna 1)	$P\text{-}CCPCH\_Ec_1/I_{or}$ = –15 dB	1. STTD applied 2. Total $P\text{-}CCPCH\_Ec/I_{or}$ = –12 dB
P-CCPCH (antenna 2)	$P\text{-}CCPCH\_Ec_2/I_{or}$ = –15 dB	
SCH (antenna 1 / 2)	SCH_E_c/I_{or} = –12 dB	1. TSTD applied. 2. This power shall be divided equally between Primary and Secondary Synchronous channels
PICH (antenna 1)	$PICH\_E_{c1}/I_{or}$ = –18 dB	1. STTD applied 2. Total $PICH\_E_c/I_{or}$ = –15 dB
PICH (antenna 2)	$PICH\_E_{c2}/I_{or}$ = –18 dB	
DPCH	Test dependent power	1. STTD applied 2. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of Node B (I_{or}) adds to one[1]	1. This power shall be divided equally between antennas 2. OCNS interference consists of 16 dedicated data channels as specified in Table E.3.6.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call-set-up phase. NOTE 3: The time alignment of the P-CPICH from Antenna 1 and Antenna 2 as measured at the UE antenna connection shall be within 1/4 chip.		

E.3.5 Connection with closed loop transmit diversity mode

table E.3.5 is applicable for measurements for clause 7.6.2.

Table E.3.5: Downlink Physical Channels transmitted during a connection

Physical Channel	Power[2]	Note
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior = –13 dB	1. Total P-CPICH_Ec/Ior = –10 dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior = –13 dB	
P-CCPCH (antenna 1)	P-CCPCH_Ec1/Ior = –15 dB	1. STTD applied
P-CCPCH (antenna 2)	P-CCPCH_Ec2/Ior = –15 dB	1. STTD applied, total P-CCPCH_Ec/Ior = –12 dB
SCH (antenna 1 / 2)	SCH_Ec/Ior = –12 dB	1. TSTD applied
PICH (antenna 1)	PICH_Ec1/Ior = –18 dB	1. STTD applied 2. STTD applied, total PICH_Ec/Ior = –15 dB
PICH (antenna 2)	PICH_Ec2/Ior = –18 dB	
DPCH	Test dependent power	1. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one[1,3]	1. This power shall be divided equally between antennas 2. OCNS interference consists of 16 dedicated data channels as specified in Table E.3.6.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call-set-up phase. NOTE 3: For the case of DPCH with transmit diversity, the OCNS power calculation shall be based on the addition of the power from Antenna 1 and Antenna 2, i.e. disregarding any phase relationship between the antennas. NOTE 4: The time alignment of the P-CPICH from Antenna 1 and Antenna 2 as measured at the UE antenna connection shall be within 1/4 chip.		

E.3.6 OCNS Definition

Table E.3.6: DPCH Channelization Code and relative level settings for OCNS signal.

• Channelization Code at SF=128[1]	• Relative Level setting (dB)[1,2]	• DPCH Data
• 2	• -1	• The DPCH data for each channelization code shall be uncorrelated with each other and with any wanted signal over the period of any measurement. For OCNS with transmit diversity the DPCH data sent to each antenna shall be either STTD encoded or generated from uncorrelated sources.
• 11	• -3	
• 17	• -3	
• 23	• -5	
• 31	• -2	
• 38	• -4	
• 47	• -8	
• 55	• -7	
• 62	• -4	
• 69	• -6	
• 78	• -5	
• 85	• -9	
• 94	• -10	
• 125	• -8	
• 113	• -6	
• 119	• 0	

NOTE 1: The DPCH Channelization Codes and relative level settings are chosen to simulate a signal with realistic Peak to Average Ratio.

NOTE 2: The relative level setting specified in dB refers only to the relationship between the OCNS channels. The level of the OCNS channels relative to the Ior of the complete signal is a function of the power of the other channels in the signal with the intention that the power of the group of OCNS channels is used to make the total signal add up to 1.

E.4 W-CDMA Modulated Interferer for non-HSDPA test cases

The W-CDMA modulated interferer consists of the downlink channels defined in table E.4.1 plus the OCNS channels defined in Table E.3.6. The relative power of the OCNS channels shall be such that the power of the total signal adds up to one. In this subclause Ior refers to the power of the interferer.

Table E.4.1: Spreading Code, Timing offsets and relative level settings for W-CDMA Modulated Interferer signal channels.

Channel Type	Spreading Factor	Channelization Code	Timing offset (x256T_{chip})	Power	NOTE
P-CCPCH	256	1	0	P-CCPCH_Ec/Ior = -10 dB	
SCH	256	-	0	SCH_Ec/Ior = -10 dB	The SCH power shall be divided equally between Primary and Secondary Synchronous channels
P-CPICH	256	0	0	P-CPICH_Ec/Ior = *10 dB	
PICH	256	16	16	PICH_Ec/Ior = -15 dB	
OCNS	See table E.3.6			Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of the dedicated data channels. as specified in Table E.3.6.

E.5 HSDPA DL Physical channels

E.5.0 Downlink Physical Channels for connection set-up

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

E.5.1 Downlink Physical Channels for measurement

Table E.5.1 is applicable for the measurements for tests in subclauses 5.2A, 5.2AA, 5.2C, 5.7A, 5.9A, 5.10A, 5.13.1A, 5.13.1AA, 5.13.2A, 6.3A, 9.2.1A to 9.2.1GD, 9.3.1, 9.3.1C (HSDPA categories 1-8, 11 and 12), 9.3.2, 9.5.1 and 9.5.1A.

Table E.5.1A is applicable for the measurements for tests in subclauses 6.3B, 9.2.1H, 9.2.1HA, 9.2.1HB, 9.2.1HC, 9.2.1HD, 9.2.1I, 9.3.1, 9.3.1C (HSDPA categories 9,10 and 13-20), 9.3.1A and 9.3.2B.

Table E.5.2 is applicable for the measurements for tests in subclauses 9.2.2A to 9.2.2E, 9.3.3, 9.3.4, 9.2.4A, 9.2.4B, 9.3.7A to 9.3.7E.

Table E.5.3 is applicable for the measurements for tests in subclauses 9.2.3A to 9.2.3E, 9.3.5 and 9.3.6.

Table E.5.4 is applicable for the measurements for tests in subclauses 9.4.1, 9.4.1A.

Table E.5.4A is applicable for the measurements for tests in subclauses 9.4.2, 9.4.2A, 9.4.3, 9.4.4 and 9.4.4A.

Table E.5.4B is applicable for the measurements for DC-HSDPA, DB-DC-HSDPA and 4C-HSDPA tests in sections 5 and 6.

Table E.5.4C is applicable for the measurements for tests in subclauses 9.6.1 and 9.6.2.

Table E.5.4D is applicable for the measurements for tests in subclauses 9.2.4E, 9.2.4F, 9.2.4G. 9.2.4H, 9.3.7F, 9.3.7G, 9.3.7H, 9.3.7I and 9.3.7J

Table E.5.4E is applicable for the measurements for tests in subclauses 9.4.4B, 9.4.4C, 9.4.4D and 9.4.4E.

Table E.5.1: Downlink physical channels for HSDPA/DC-HSDPA/4C-HSDPA receiver testing for Single Link performance

Physical Channel	Parameter	Value	NOTE
P-CPICH	P-CPICH_Ec/Ior	-10dB	
P-CCPCH	P-CCPCH_Ec/Ior	-12dB	Mean power level is shared with SCH.
SCH	SCH_Ec/Ior	-12dB	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per [14] S-SCH pattern is scrambling code group 0
PICH	PICH_Ec/Ior	-15dB	
DPCH	DPCH_Ec/Ior	Test-specific only for serving HS-DSCH cell, omitted otherwise	12.2 kbps DL reference measurement channel as defined in Annex C.3.1
HS-SCCH-1	HS-SCCH_Ec/Ior	Test-specific	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-SCCH-3	HS-SCCH_Ec/Ior	DTX'd	As HS-SCCH-2.
HS-SCCH-4	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present only in HSDPA configuration and not in multi cell configurations e.g. DC-HSDPA.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	.
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one[1]	OCNS interference consists of a number of dedicated data channels as specified in table E.5.5. Table E.5.5 is the definition of OCNS for the test case which uses a maximum of ten HS-PDSCH.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used.			

Table E.5.1A: Downlink physical channels for HSDPA/DC-HSDPA/4C-HSDPA receiver testing for Single Link performance, FRC H-Set 8 to H-Set 10

Physical Channel	Parameter	Value	Note
P-CPICH	P-CPICH_Ec/Ior	-10dB	
P-CCPCH	P-CCPCH_Ec/Ior	-12dB	Mean power level is shared with SCH.
SCH	SCH_Ec/Ior	-12dB	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per [14] S-SCH pattern is scrambling code group 0
PICH	PICH_Ec/Ior	-15dB	
DPCH	DPCH_Ec/Ior	Test-specific only for serving HS-DSCH cell, omitted otherwise	12.2 kbps DL reference measurement channel as defined in Annex C.3.1
HS-SCCH-1	HS-SCCH_Ec/Ior	Test-specific	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	.
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of a number of dedicated data channels as specified in table E.5.5A. Table E.5.5A is the definition of OCNS for the test case which uses a maximum of 11 to 15 HS-PDSCH.

Table E.5.2: Downlink physical channels for HSDPA/DC-HSDPA receiver testing for Open Loop Transmit Diversity performance and MIMO performance

Physical Channel	Parameter	Value	Note
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior	-13dB	1. Total P-CPICH_Ec/Ior = -10dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior	-13dB	
P-CCPCH (antenna 1)	P-CCPCH_Ec1/Ior	-15dB	1. STTD applied. 2. Total P-CCPCH Ec/Ior is –12dB.
P-CCPCH (antenna 2)	P-CCPCH_Ec2/Ior	-15dB	
SCH (antenna 1/2)	SCH_Ec/Ior	-12dB	1. TSTD applied. 2. Power divided equally between primary and secondary SCH.
PICH (antenna 1)	PICH_Ec1/Ior	-18dB	1. STTD applied. 2. Total PICH Ec/Ior is –15dB.
PICH (antenna 2)	PICH_Ec2/Ior	-18dB	
DPCH	DPCH_Ec/Ior	Test-specific only for serving HS-DSCH cell, omitted otherwise	1. STTD applied. 2. Total power from both antennas
HS-SCCH-1	HS-SCCH_Ec/Ior	Test-specific	1. STTD applied. 2. Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-SCCH_1 is not allocated to the UE, the HS-SCCH_1 shall be transmitted continuously with constant power.
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	1. UE assumes STTD applied. 2. No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	1. STTD applied. 2. Total power from both antennas
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one[1,2]	1. Balance of power I_{or} of the Node-B is assigned to OCNS. 2. Power divided equally between antennas. 3. OCNS interference consists of a number of dedicated data channels as specified in table E.5.5 and E.5.5A. Table E.5.5 is the definition of OCNS for the test case which uses a maximum of ten HS-PDSCH. Table E.5.5A is the definition of OCNS for the test case which uses a maximum of 11 to 15 HS-PDSCH.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: For the case of DPCH with transmit diversity, the OCNS power calculation shall be based on the addition of the power from Antenna 1 and Antenna 2, i.e. disregarding any phase relationship between the antennas.			

Table E.5.3: Downlink physical channels for HSDPA receiver testing for Closed Loop Transmit Diversity (Mode-1) performance.

Physical Channel	Parameter	Value	Note
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior	-13dB	1. Total P-CPICH_Ec/Ior = -10dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior	-13dB	
P-CCPCH (antenna 1)	P-CCPCH_Ec1/Ior	-15dB	1. STTD applied. 2. Total P-CCPCH Ec/Ior is –12dB.
P-CCPCH (antenna 2)	P-CCPCH_Ec2/Ior	-15dB	
SCH (antenna 1/2)	SCH_Ec/Ior	-12dB	1. TSTD applied. 2. Power divided equally between primary and secondary SCH.
PICH (antenna 1)	PICH_Ec1/Ior	-18dB	1. STTD applied. 2. Total PICH Ec/Ior is –15dB.
PICH (antenna 2)	PICH_Ec2/Ior	-18dB	
DPCH	DPCH_Ec/Ior	Test-specific	1. CL1 applied. 2. Total power from both antennas
HS-SCCH-1	HS-SCCH_Ec/Ior	Test-specific	1. STTD applied. 2. Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-SCCH_1 is not allocated to the UE, the HS-SCCH_1 shall be transmitted continuously with constant power.
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	1. UE assumes STTD applied. 2. No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-SCCH-3	HS-SCCH_Ec/Ior	DTX'd	1. As HS-SCCH-2.
HS-SCCH-4	HS-SCCH_Ec/Ior	DTX'd	2. As HS-SCCH-2.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	1. CL1 applied. 2. Total power from both antennas
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one[1,2]	1. Balance of power I_{or} of the Node-B is assigned to OCNS. 2. Power divided equally between antennas. 3. OCNS interference consists of 6 dedicated data channels as specified in table E.5.5. Table E.5.5 is the definition of OCNS for the test case which uses a maximum of ten HS-PDSCH. Table E.5.5A is the definition of OCNS for the test case which uses a maximum of 11 to 15 HS-PDSCH.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: For the case of DPCH with transmit diversity, the OCNS power calculation shall be based on the addition of the power from Antenna 1 and Antenna 2, i.e. disregarding any phase relationship between the antennas.			

Table E.5.4: Downlink physical channels for HSDPA receiver testing for HS-SCCH detection performance

Parameter	Units	Value	Comment
CPICH E_c/I_{or}	dB	-10	
CCPCH E_c/I_{or}	dB	-12	Mean power level is shared with SCH.
SCH E_c/I_{or}	dB	-12	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per [14] S-SCH pattern is scrambling code group 0
PICH E_c/I_{or}	dB	-15	
HS-PDSCH-1 E_c/I_{or}	dB	-10	HS-PDSCH associated with HS-SCCH-1. The HS-PDSCH shall be transmitted continuously with constant power.
HS-PDSCH-2 E_c/I_{or}	dB	DTX	HS-PDSCH associated with HS-SCCH-2
HS-PDSCH-3 E_c/I_{or}	dB	DTX	HS-PDSCH associated with HS-SCCH-3
HS-PDSCH-4 E_c/I_{or}	dB	DTX	HS-PDSCH associated with HS-SCCH-4
DPCH E_c/I_{or}	dB	-8	12.2 kbps DL reference measurement channel as defined in Annex C.3.1
HS-SCCH-1 E_c/I_{or}	dB	Test Specific	All HS-SCCH's allocated equal E_c/I_{or}. Specifies E_c/I_{or} when TTI is active. During TTIs, in which the HS-SCCH's are not allocated to the UE, the HS-SCCH's shall be transmitted continuously with constant power.
HS-SCCH-2 E_c/I_{or}	dB		
HS-SCCH-3 E_c/I_{or}	dB		
HS-SCCH-4 E_c/I_{or}	dB		
OCNS E_c/I_{or}	dB	Remaining power at Node-B (including HS-SCCH power allocation when HS-SCCH's inactive).[1,2]	OCNS interference consists of 6 dedicated data channels as specified in table E.5.5. Table E.5.5 is the definition of OCNS for the test case which uses a maximum of ten HS-PDSCH. Table E.5.5A is the definition of OCNS for the test case which uses a maximum of 11 to 15 HS-PDSCH.

NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used.
NOTE 2: For the case of DPCH with transmit diversity, the OCNS power calculation shall be based on the addition of the power from Antenna 1 and Antenna 2, i.e. disregarding any phase relationship between the antennas.

Table E.5.4A: Downlink physical channels for HSDPA receiver testing for HS-SCCH detection with Open Loop Transmit Diversity performance and MIMO performance

Parameter	Units	Value	Comment
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior	-13dB	1. Total P-CPICH_Ec/Ior = -10dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior	-13dB	
P-CCPCH (antenna 1)	P-CCPCH_Ec1/Ior	-15dB	1. STTD applied. 2. Total P-CCPCH Ec/Ior is –12dB.
P-CCPCH (antenna 2)	P-CCPCH_Ec2/Ior	-15dB	
SCH (antenna 1/2)	SCH_Ec/Ior	-12dB	1. TSTD applied. 2. Power divided equally between primary and secondary SCH.
PICH (antenna 1)	PICH_Ec1/Ior	-18dB	1. STTD applied. 2. Total PICH Ec/Ior is –15dB.
PICH (antenna 2)	PICH_Ec2/Ior	-18dB	
HS-PDSCH-1 E_c/I_{or}	dB	-10 dB	1. STTD applied. 2. HS-PDSCH associated with HS-SCCH-1. The HS-PDSCH shall be transmitted continuously with constant power. 3. Total power from both antennas
HS-PDSCH-2 E_c/I_{or}	dB	DTX	HS-PDSCH associated with HS-SCCH-2
HS-PDSCH-3 E_c/I_{or}	dB	DTX	HS-PDSCH associated with HS-SCCH-3
HS-PDSCH-4 E_c/I_{or}	dB	DTX	HS-PDSCH associated with HS-SCCH-4
DPCH E_c/I_{or}	dB	-8	1. STTD applied. 2. Total power from both antennas
HS-SCCH-1 E_c/I_{or}	dB	Test Specific	1. UE assumes STTD applied. 2. All HS-SCCH's allocated equal E_c/I_{or}. Specifies E_c/I_{or} when TTI is active. During TTIs, in which the HS-SCCH's are not allocated to the UE, the HS-SCCH's shall be transmitted continuously with constant power.
HS-SCCH-2 E_c/I_{or}	dB		
HS-SCCH-3 E_c/I_{or}	dB		
HS-SCCH-4 E_c/I_{or}	dB		
OCNS E_c/I_{or}	dB	Remaining power at Node-B (including HS-SCCH power allocation when HS-SCCH's inactive).[1,2]	OCNS interference consists of a number of dedicated data channels as specified in table E.5.5 and E.5.5A. Table E.5.5 is the definition of OCNS for the test case which uses a maximum of ten HS-PDSCH. Table E.5.5A is the definition of OCNS for the test case which uses a maximum of 11 to 15 HS-PDSCH.
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: For the case of DPCH with transmit diversity, the OCNS power calculation shall be based on the addition of the power from Antenna 1 and Antenna 2, i.e. disregarding any phase relationship between the antennas.			

Table E.5.4B: Downlink physical channels for DC-HSDPA/4C-HSDPA Receiver testing

Physical Channel	Parameter	Value	Note
P-CPICH	P-CPICH_Ec/Ior	-10 dB	
P-CCPCH	P-CCPCH_Ec/Ior	-12 dB	Mean power level is shared with SCH.
SCH	SCH_Ec/Ior	-12 dB	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per TS25.213 S-SCH pattern is scrambling code group 0
PICH	PICH_Ec/Ior	-15 dB	
DPCH	DPCH_Ec/Ior	Test-specific only for serving HS-DSCH cell, omitted otherwise	12.2 kbps DL reference measurement channel as defined in Annex C.3.1
HS-SCCH-1	HS-SCCH_Ec/Ior	-9 dB	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval).
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-SCCH-3	HS-SCCH_Ec/Ior	DTX'd	As HS-SCCH-2.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of a number of dedicated data channels as specified in table E.5.5 and E.5.5A. Table E.5.5 specifies the OCNS setup for H-Set 1 to H-Set 6 and H-Set 12. Table E.5.5A specifies the OCNS setup for H-Set 8 and H-set 10.

Table E.5.4C: Downlink physical channels for HS-DSCH and HS-SCCH reception in CELL-FACH state

Physical Channel	Parameter	Value	Note
P-CPICH	P-CPICH_Ec/Ior	-10 dB	
P-CCPCH	P-CCPCH_Ec/Ior	-12 dB	Mean power level is shared with SCH.
SCH	SCH_Ec/Ior	-12 dB	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per TS25.213 S-SCH pattern is scrambling code group 0
PICH	PICH_Ec/Ior	-15 dB	
AICH	AICH Ec/Ior	-10 dB	
HS-SCCH-1	HS-SCCH_Ec/Ior	-10 dB	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval).
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-SCCH-3	HS-SCCH_Ec/Ior	DTX'd	As HS-SCCH-2.
HS-SCCH-4	HS-SCCH_Ec/Ior	DTX'd	As HS-SCCH-2.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of a number of dedicated data channels as specified in table E.5.5. Table E.5.5 is the definition of OCNS for the test case which uses a maximum of ten HS-PDSCH.

Table E.5.4D: Downlink physical channels for HSDPA/DC-HSDPA receiver testing for MIMO performance with asymmetric P-CPICH/S-CPICH power settings

Physical Channel	Parameter	Value	Note
P-CPICH (antenna 1)	P-CPICH_Ec/Ior	-10dB	Phase reference
S-CPICH (antenna 2)	S-CPICH Ec/Ior	-13dB	Phase reference
P-CCPCH	P-CCPCH_Ec/Ior	-12dB	
SCH	SCH_Ec/Ior	-12dB	
PICH	PICH_Ec/Ior	-15dB	
DPCH	DPCH_Ec/Ior	Test-specific	
HS-SCCH-1	HS-SCCH_Ec/Ior	Test-specific	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval).
HS-SCCH-2	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present.
HS-SCCH-3	HS-SCCH_Ec/Ior	DTX'd	As HS-SCCH-2.
HS-SCCH-4	HS-SCCH_Ec/Ior	DTX'd	No signalling scheduled, or power radiated, on this HS-SCCH, but signalled to the UE as present only in HSDPA configuration and not in multi cell configurations e.g. DC-HSDPA.
HS-PDSCH	HS-PDSCH_Ec/Ior	Test-specific	Precoding used.
OCNS		Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	1. Balance of power I_{or} of the Node-B is assigned to OCNS. 2. OCNS interference consists of a number of dedicated data channels as specified in Table E.5.5and E.5.5A.Table E.5.5 specifies the OCNS setup for H-Set 1 to H-set 6. Table E.5.5A specifies the OCNS setup for H-Set 9 and H-Set 11. 3. OCNS transmitted only on antenna 1.
NOTE: Transmit diversity (STTD or TSTD) is disabled on the associated physical channels (P-CPICH, PICH, SCH, HS-SCCH, DPCH).			

Table E.5.4E: Downlink physical channels for HSDPA receiver testing for HS-SCCH detection performance with asymmetric P-CPICH/S-CPICH power settings

Physical Channel	Parameter	Value	Note
P-CPICH (antenna 1)	P-CPICH_Ec/Ior	-10dB	Phase reference
S-CPICH (antenna 2)	S-CPICH Ec/Ior	-13dB	Phase reference
P-CCPCH	P-CCPCH_Ec/Ior	-12dB	
SCH	SCH_Ec/Ior	-12dB	
PICH	PICH_Ec/Ior	-15dB	
DPCH	DPCH_Ec/Ior	-8dB	1. STTD applicability is test-specific. 2. 12.2 kbps DL reference measurement channel as defined in Annex C.3.1
HS-SCCH-1	HS-SCCH_Ec/Ior	Test-specific	1. STTD applicability is test specific. 2. Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). 2. All HS-SCCH's allocated equal E_c/I_{or}. 3. Specifies E_c/I_{or} when TTI is active.
HS-SCCH-2	HS-SCCH_Ec/Ior		
HS-SCCH-3	HS-SCCH_Ec/Ior		
HS-SCCH-4	HS-SCCH_Ec/Ior		
HS-PDSCH-1 E_c/I_{or}	HS-PDSCH_Ec/Ior	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	1. Precoding used. 2. Balance of power I_{or} of the Node-B is assigned to HS-PDSCH.
HS-PDSCH-2 E_c/I_{or}	HS-PDSCH_Ec/Ior	DTX	
HS-PDSCH-3 E_c/I_{or}	HS-PDSCH_Ec/Ior	DTX	
HS-PDSCH-4 E_c/I_{or}	HS-PDSCH_Ec/Ior	DTX	
OCNS		DTX	
NOTE1: Transmit diversity (STTD or TSTD) is disabled on P-CCPCH, PICH and SCH. NOTE2: OCNS is not present for this test. HS-PDSCH is used in order to model other UE MIMO traffic.			

E.5.2 HSDPA OCNS Definition

The selected channelization codes and relative power levels for OCNS transmission for HSDPA performance assessment for receiver types other than enhanced performance type 3i are defined in Table E.5.5 and E.5.5A. The selected codes are designed to have a single length-16 parent code. The test definition for the enhanced performance type 3i is defined in section E.5E.

Table E.5.5: OCNS definition for HSDPA receiver testing

Channelization Code at SF=128	Relative Level setting (dB) (Note 1)	DPCH Data
122	0	The DPCH data for each channelization code shall be uncorrelated with each other and with any wanted signal over the period of any measurement. For OCNS with transmit diversity the DPCH data sent to each antenna shall be either STTD encoded or generated from uncorrelated sources.
123	-2	
124	-2	
125	-4	
126	-1	
127	-3	

NOTE 1: The relative level setting specified in dB refers only to the relationship between the OCNS channels. The level of the OCNS channels relative to the Ior of the complete signal is a function of the power of the other channels in the signal with the intention that the power of the group of OCNS channels is used to make the total signal add up to 1.

Table E.5.5A: OCNS definition for HSDPA receiver testing, FRC H-Set 8, H-Set 9, H-Set 10, H-Set 11

Channelization Code at SF=128	DPCH Data
6	For OCNS with transmit diversity the DPCH data sent to each antenna shall be either STTD encoded or generated from uncorrelated sources.
Note: The core requirements are based on OCNS with 4 codes. However when taking into account the necessary physical channels for call setup, only one code fit the code tree. See table E.6.2.4.	

E.5.3 Downlink Physical Channels for measurement including test tolerances

Table E.5.6 to E.5.8D are applicable for tests in subclause 9.2. Table E.5.9 indicates which levels are applied, when the primary level settings (Ec/Ior and Ior/Ioc) and propagation conditions (PA3, PB3, VA 3, VA30, VA 120) vary. Table E.5.6 is also applicable for tests in subclause 9.5.1 and 9.5.1A. For the downlink physical channels of other than serving cell, OCNS is necessary power so that total transmit power spectral density of Node B (Ior) adds to one.

Table E.5.6: Level set 1 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-5,9
HS-SCCH_1	dB	-7.4
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-13.3
Measurement conditions	PA3 & Case 8:HS-PDSCH = -6dB, Ior/Ioc = 0 dB Case 8: HS-PDSCH = -9 dB, Ior/Ioc = 0 dB	

Table E.5.7: Level set 2 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-5.9
HS-SCCH_1	dB	-8.4
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-10.75
Measurement conditions	HS-PDSCH = -6dB, Ior/Ioc = 10dB, 5dB and 0dB	

Table E.5.8: Level set 3 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-2,9
HS-SCCH_1	dB	-8.4
DPCH_Ec/Ior	dB	-8.4
OCNS_Ec/Ior	dB	off
Measurement conditions	HS-PDSCH = -3dB, Ior/Ioc = 10dB, 5dB and 0 dB	

Table E.5.8A: Level set 4 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-8,9
HS-SCCH_1	dB	-8.4
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-6.75
Measurement conditions	HS-PDSCH = -9dB, Ior/Ioc = 10dB	

Table E.5.8B: Level set 5 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-11,9
HS-SCCH_1	dB	-8.4
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-5.6
Measurement conditions	HS-PDSCH = -12dB, Ior/Ioc = 10dB	

Table E.5.8C: Level set 6 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-1,9
HS-SCCH_1	dB	-11.1
DPCH_Ec/Ior	dB	-11.1
OCNS_Ec/Ior	dB	Off
Measurement conditions	HS-PDSCH = -2dB, Ior/Ioc = 4 dB, 6 dB, 8 dB, 10 dB, 15 dB and 18 dB	

Table E.5.8D: Level set 7 for HSDPA measurements including test tolerances

Parameter During Measurement	Unit	Value
P-CPICH_Ec/Ior	dB	-9.9
P-CCPCH and SCH_Ec/Ior	dB	-11.9
PICH _Ec/Ior	dB	-14.9
HS-PDSCH	dB	-1,4
HS-SCCH_1	dB	-14.2
DPCH_Ec/Ior	dB	-14.2
OCNS_Ec/Ior	dB	Off
Measurement conditions	HS-PDSCH = -1.5 dB, Ior/Ioc = 18 dB	

Table E.5.9: Application of level sets for measurement

Propagation Conditions	Reference value							
	HS-PDSCH E_c / I_{or} (dB)	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 0 dB	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 10 dB	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 6 dB	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 15 dB and 18 dB	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 5 dB	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 4 dB and 8 dB	T-put R (kbps) $\hat{I}_{or} / I_{oc}$ = 18 dB
PA3	-12	Not tested	Level set 5	Not tested	Not tested	Not tested	Not tested	Not tested
	-9	Not tested	Level set 4	Not tested	Not tested	Not tested	Not tested	Not tested
	-6	Level set 1	Level set 2	Not tested	Not tested	Not tested	Not tested	Not tested
	-3	Level set 3	Level set 3	Not tested	Not tested	Not tested	Not tested	Not tested
	-2	Not tested	Level set 6	Level set 6	Level set 6	Not tested	Not tested	Not tested
	-1.5	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Level set 7
PB3	-9	Not tested	Level set 4	Not tested	Not tested	Not tested	Not tested	Not tested
	-6	Level set 2	Level set 2	Not tested	Not tested	Level set 2	Not tested	Not tested
	-3	Level set 3	Level set 3	Not tested	Not tested	Level set 3	Not tested	Not tested
VA30	-9	Not tested	Level set 4	Not tested	Not tested	Not tested	Not tested	Not tested
	-6	Level set 2	Level set 2	Not tested	Not tested	Not tested	Not tested	Not tested
	-3	Level set 3	Level set 3	Not tested	Not tested	Not tested	Not tested	Not tested
VA120	-9	Not tested	Level set 4	Not tested	Not tested	Not tested	Not tested	Not tested
	-6	Level set 2	Level set 2	Not tested	Not tested	Not tested	Not tested	Not tested
	-3	Level set 3	Level set 3	Not tested	Not tested	Not tested	Not tested	Not tested
VA3	-2	Not tested	Level set 6	Level set 6	Not tested	Not tested	Level set 6	Not tested

E.5.4 Downlink Physical Channels for Transmitter Characteristics with HS-DPCCH

Table E.5.10 is applicable for measurements on the Transmitter Characteristics with HSDPA in clauses 5.2A, 5.2AA, 5.2C, 5.7A, 5.9A, 5.10A, 5.13.1A, 5.13.1AA and 5.13.2A.

Table E.5.10: Test specific downlink physical channels

Parameter	Unit	Test
DPCH	DPCH_Ec/Ior (dB)	-9
HS-SCCH_1	HS-SCCH_Ec/Ior (dB)	-8
HS-PDSCH	HS-PDSCH_Ec/Ior (dB)	-3
Note: The power levels are selected high enough to keep the DTX reporting ratio very small and to ensure that the radio link is maintained during the test.		

E.5A E-DCH with HSDPA DL Physical channels

E.5A.0 Downlink Physical Channels for connection set-up

Table E.5A.0: Levels for connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
E-HICH	dB	off
E-AGCH	dB	off
E-RGCH	dB	off
OCNS_Ec/Ior	dB	-3.1

E.5A.1 Downlink Physical Channels for measurement

Table E.5A.1 is applicable for tests in subclause 5.2B, 5.2D, 5.2E, 5.9B, 5.10B, 5.13.1AAA, 5.13.2B, and 5.13.2C. Table E.5A.2 is applicable for tests in subclause 10.2.1, 10.3.1, 10.4.1. and 10.4.1A. Table E.5A.3 is applicable for tests in subclause 10.2.2, 10.3.2 and 10.3.2A.

Table E.5A.1A is applicable for the measurements for DC-HSUPA in sections 5 and 6, and is valid for both DC-HSDPA cells (DC-HSDPA is configured).

Table E.5A.1: Downlink Physical Channel parameters for E-DCH the Transmitter Characteristics tests

Parameter During Measurement	Unit	Value	Remark
P-CPICH_Ec/Ior	dB	-10	
P-CCPCH and SCH_Ec/Ior	dB	-12	
PICH _Ec/Ior	dB	-15	
HS-PDSCH	dB	-3	During TTIs, in which the HS-PDSCH is not allocated to the UE via HS-SCCH signalling, the HS-PDSCH shall be transmitted continuously with constant power
HS-SCCH_1	dB	-8	During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
DPCH_Ec/Ior	dB	-10	
E-AGCH	dB	-20	
E-HICH	dB	-20	
E-RGCH	dB	DTX'd	
OCNS_Ec/Ior	dB	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of 6 dedicated data channels as specified in table E.5A.4
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: For 5.2B, 5.9B, 5.10B, the power levels are selected high enough to keep the DTX reporting ratio very small and to ensure that the radio link is maintained during the test.			

Table E.5A.1A: Downlink Physical Channel parameters for DC-HSUPA Transmitter and Receiver Characteristics tests

Parameter During Measurement	Unit	Value	Remark
P-CPICH_Ec/Ior	dB	-10	
P-CCPCH and SCH_Ec/Ior	dB	-12	
PICH _Ec/Ior	dB	-15	
HS-PDSCH	dB	-3	During TTIs, in which the HS-PDSCH is not allocated to the UE via HS-SCCH signalling, the HS-PDSCH shall be transmitted continuously with constant power
HS-SCCH_1	dB	-8	During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
DPCH_Ec/Ior	dB	-10	
E-AGCH	dB	-20	
E-HICH	dB	-20	
E-RGCH	dB	DTX'd	
OCNS_Ec/Ior	dB	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of 6 dedicated data channels as specified in table E.5A.4
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used. NOTE 2: For 5.2BA, 5.9C, 5.10C, the power levels are selected high enough to keep the DTX reporting ratio very small and to ensure that the radio link is maintained during the test. NOTE 3: DC-HSDPA shall be configured when testing DC-HSUPA.			

Table E.5A.2: Downlink Physical Channel parameters for E-DCH single link performance tests

Parameter During Measurement	Unit	Value	Remark
P-CPICH_Ec/Ior	dB	-10	
P-CCPCH and SCH_Ec/Ior	dB	-12	
PICH _Ec/Ior	dB	-15	
HS-PDSCH	dB	-3	During TTIs, in which the HS-PDSCH is not allocated to the UE via HS-SCCH signalling, the HS-PDSCH shall be transmitted continuously with constant power
HS-SCCH_1	dB	-7.5	During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
DPCH_Ec/Ior	dB	-10	
E-AGCH	dB	Test specific	Test-specific value or –20dB is used
E-HICH	dB	Test specific	Test-specific value or DTX'd is used
E-RGCH	dB	Test specific	Test-specific value or DTX'd is used
OCNS_Ec/Ior	dB	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of 6 dedicated data channels as specified in table E.5A.4
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used.			

Table E.5A.3: Downlink Physical Channel parameters for E-DCH in Inter-cell SHO tests

Parameter During Measurement (Note 1)	Unit	Value	Remark
P-CPICH_Ec/Ior $_{1\ and\ 2}$	dB	-10	
P-CCPCH and SCH_Ec/Ior $_{1\ and\ 2}$	dB	-12	
PICH _Ec/Ior $_{1\ and\ 2}$	dB	-15	
HS-PDSCH $_1$	dB	Test specific	During TTIs, in which the HS-PDSCH is not allocated to the UE via HS-SCCH signalling, the HS-PDSCH shall be transmitted continuously with constant power
HS-SCCH_1 $_1$	dB	-7.5	During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
DPCH_Ec/Ior $_{1\ and\ 2}$	dB	-10	
E-AGCH $_1$	dB	Test specific	Test-specific value or –20dB is used
E-HICH $_1$	dB	Test specific	Test-specific value or DTX'd is used
E-RGCH $_1$	dB	Test specific	Test-specific value or DTX'd is used
OCNS_Ec/Ior $_{1\ and\ 2}$	dB	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one).	OCNS interference consists of 6 dedicated data channels as specified in table E.5A.4
NOTE1: Index 1: cell belonging to RLS containing the Serving E-DCH cell, Index 2: cell belonging to RLS not containing the Serving E-DCH cell			

E.5A.2 E-DCH OCNS Definition

The selected channelization codes and relative power levels for OCNS transmission for E-DCH tests assessment are defined in Table E.5A.4. The selected codes are designed to have a single length-16 parent code.

Table E.5A.4: OCNS definition for HSDPA receiver testing

Channelization Code at SF=128	Relative Level setting (dB)	DPCH Data
122	0	The DPCH data for each channelization code shall be uncorrelated with each other and with any wanted signal over the period of any measurement. For OCNS with transmit diversity the DPCH data sent to each antenna shall be either STTD encoded or generated from uncorrelated sources.
123	-2	
124	-2	
125	-4	
126	-1	
127	-3	

NOTE 1: The relative level setting specified in dB refers only to the relationship between the OCNS channels. The level of the OCNS channels relative to the Ior of the complete signal is a function of the power of the other channels in the signal with the intention that the power of the group of OCNS channels is used to make the total signal add up to 1.

E.5B MBMS DL Physical channels

E.5B.1 Downlink Physical Channels for connection set-up

Table E.5B.1 is applicable for measurements on the Performance requirements in Clause 11.

Table E.5B.1: Downlink Physical Channels on each radio link

Physical Channel	Power ratio	NOTE
P-CPICH	P-CPICH_Ec/Ior = -10 dB	Only P-CPICH is used as phase reference for S-CCPCH carrying MCCH or MTCH.
P-CCPCH	P-CCPCH_Ec/Ior = -12 dB	
SCH	SCH_Ec/Ior = -12 dB	This power shall be divided equally between Primary and Secondary Synchronous channels
PICH	PICH_Ec/Ior = -12 dB	This power shall be high enough such that UE can transition to CELL_PCH state reliably
S-CCPCH_1	S-CCPCH_Ec/Ior = -7 dB	Specifies the power of the S-CCPCH carrying the FACH/PCH/MCCH
S-CCPCH_2	S-CCPCH_Ec/Ior = test dependent	Specifies the power of the S-CCPCH carrying the MTCH
MICH	MICH_Ec/Ior = -10 dB	
OCNS	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of 16 dedicated data channels as specified in table E.3.6

E.5C F-DPCH with HSDPA DL Physical channels

E.5C.0 Downlink Physical Channels for connection set-up

Table E.5C.0: Levels for connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
F-DPCH_Ec/Ior	dB	off
OCNS_Ec/Ior	dB	-3.1

E.5C.1 Downlink Physical Channels for measurement

Table E.5C.1 is applicable for tests in subclause 7.8.5.

Table E.5C.1: Downlink Physical Channel parameters for F-DPCH performance tests

Parameter During Measurement	Unit	Value	Remark
P-CPICH_Ec/Ior	dB	-10	
P-CCPCH Ec/Ior	dB	-12	Mean power level is shared with SCH.
SCH Ec/Ior	dB	-12	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per [14] S-SCH pattern is scrambling code group 0
PICH _Ec/Ior	dB	-15	
HS-PDSCH_Ec/Ior	dB	-7	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-PDSCH is not allocated to the UE via HS-SCCH signalling, the HS-PDSCH shall be transmitted continuously with constant power
HS-SCCH_1_Ec/Ior	dB	-10	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
HS-SCCH-2_Ec/Ior	dB	DTX'd	Not present
HS-SCCH-3_Ec/Ior	dB	DTX'd	Not present
HS-SCCH-4_Ec/Ior	dB	DTX'd	Not present
DPCH_Ec/Ior	dB	off	Not present
F-DPCH_Ec/Ior	dB	Test specific	DL power control is ON so this power varies according to TPC commands received from UE.
OCNS_Ec/Ior	dB	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of 6 dedicated data channels as specified in table E.5.5
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used.			

E.5D HSDPA and E-DCH DL Physical channels with discontinuous UL DPCCH transmission

E.5D.0 Downlink Physical Channels for connection set-up

Table E.5D.0: Levels for connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
F-DPCH_Ec/Ior	dB	off
OCNS_Ec/Ior	dB	-3.1
E-HICH	dB	off
E-AGCH	dB	off
E-RGCH	dB	off

E.5D.1 Downlink Physical Channels for measurement

Table E.5D.1 is applicable for the test in subclause 7.13.

Table E.5D.1: Downlink Physical Channel parameters for UE UL power control operation with discontinuous UL DPCCH transmission test

Parameter During Measurement	Unit	Value	Remark
P-CPICH_Ec/Ior	dB	-10	
P-CCPCH Ec/Ior	dB	-12	Mean power level is shared with SCH.
SCH Ec/Ior	dB	-12	Mean power level is shared with P-CCPCH – SCH includes P- and S-SCH, with power split between both. P-SCH code is S_dl,0 as per [14] S-SCH pattern is scrambling code group 0
PICH _Ec/Ior	dB	-15	
HS-PDSCH_Ec/Ior	dB	-3	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-PDSCH is not allocated to the UE via HS-SCCH signalling, the HS-PDSCH shall be transmitted continuously with constant power
HS-SCCH_1_Ec/Ior	dB	-10	Specifies fraction of Node-B radiated power transmitted when TTI is active (i.e. due to minimum inter-TTI interval). During TTIs, in which the HS-SCCH is not allocated to the UE the HS-SCCH shall be transmitted continuously with constant power.
HS-SCCH-2_Ec/Ior	dB	DTX'd	Not present
HS-SCCH-3_Ec/Ior	dB	DTX'd	Not present
HS-SCCH-4_Ec/Ior	dB	DTX'd	Not present
DPCH_Ec/Ior	dB	off	Not present
F-DPCH_Ec/Ior	dB	-10	DL power control is OFF so this power does not vary according to TPC commands received from UE.
E-AGCH	dB	-20 dB	
E-HICH	dB	-20 dB	
E-RGCH	dB	off	E-RGCH is not configured
OCNS_Ec/Ior	dB	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	OCNS interference consists of 6 dedicated data channels as specified in table E.5.5
NOTE 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the OCNS DPCH channels may be used.			

E.5E Test Definition for Enhanced Performance Type 3i

This section defines additional test definition for enhanced performance type 3i including: number of interfering cells and their respective powers; transmitted code and power characteristics (OCNS) for serving and interfering cells; and frame offsets for interfering cells. For DC-HSDPA, DB-DC-HSDPA and 4C-HSDPA requirements, the number of interfering cells and their respective powers; transmitted code and power characteristics (OCNS) for serving and interfering cells; and frame offsets for interfering cells shall be the same for each carrier frequency. The transmitted OCNS and data signals shall be independent for each cell.

DIPi = $\hat{I}_{or(i+1)} / I_{oc}'$ where $\hat{I}_{orj}$ is the average received power spectral density from the *j*-th strongest interfering cell ($\hat{I}_{or1}$ is assumed to be the power spectral density associated with the serving cell), and I_{oc}' is given by $I_{oc}' = \sum_{j=2}^{3} \hat{I}_{orj} + I_{oc}$ where Ioc is the average power spectral density of a band limited white noise source consistent with the definition provided in section 3.4.

Annex K specifies how the serving cell and interfering cells are mapped to TS 34.108 cells.

E.5E.1 Transmitted code and power characteristics for serving cell

The downlink physical channel code allocations for the serving cell are specified in Table E.5E.1.1. Ten HS-PDSCH codes have been reserved for the user of interest, based upon the use of QPSK with FRC H-Set 6. The other user codes are selected from 46 possible SF = 128 codes. Note not all 46 of these codes are used, and in addition only 16 codes are used at a given instance in time. Table E.5E.1.2 summarizes the power allocations of different channels for the serving cell for 50% and 25% HS-PDSCH power allocation. Note the power allocations in the last row of Table E.5E.1.2 are to be split between the HS-SCCH and the other users' channels in order to ensure proper operation of the HS-SCCH during testing.

Table E.5E.1.3 summarizes the channelisation codes to be used for the other users channels (OCNS) along with their respective relative power allocations in dB when HS-PDSCH is allocated 25% or 50% of the total power. As shown in Table E.5E.1.3, there are two groups of 16 codes, which are randomly selected with equal probability on a symbol-by-symbol basis. This random selection is done per code pair, where a code pair occupies the same row, as opposed to selecting all of the codes within group 1 or group 2. This random selection between these two groups is for purposes of modelling a simplified form of DTX. Note that the switching time for the symbols with SF = 64 would be the symbol timing associated with an SF 64 channel, and the switching time for the symbols with SF = 128 would be the symbol timing for SF = 128 channel. Thus, there would be two different symbol times dependent upon the SF. For SF = 64, symbol time ~ 16.67 microseconds, and for SF = 128, symbol time ~ 33.33 microseconds. Each of these users is also power controlled as described in section E.5E.3.

The scrambling code of the serving cell is set to 0.

Table E.5E.1.1: Downlink physical channel code allocation

Channelization Code at SF=128	Note
0	P-CPICH, P-CCPCH and PICH on SF=256
1	
2…6	5 SF=128 codes free for OCNS
7	HS-SCCH on SF=128
8…87	10 HS-PDSCH codes at SF=16
88…96	9 SF=128 codes free for OCNS
97	DPCH on SF=128
98…127	30 SF=128 codes free for OCNS

Table E.5E.1.2: Summary of modelling approach for the serving cell

	Serving cell	
Common channels	0.195 (-7.1dB) As specified in Table E.5.1	
HS-PDSCH transport format	H-Set 6	
HS-PDSCH power allocation [E_c/I_{or}]	0.5 (-3 dB)	0.25 (-6 dB)
HS-SCCH + DPCH + Other users' channels (OCNS)	0.3049 (-5.16 dB) Other users' channels set according to Table E.5E.1.3	0.5551 (-2.56 dB) Other users' channels set according to Table E.5E.1.3
Note 1: The repetition cycle length of the pre-generated other users channels should be at least 50ms. The pre-generated pattern should be different for each cell and the cycle length should not be the same.		

Table E.5E.1.3: Channelization codes and relative power levels for 25% and 50% HS-PDSCH power allocations

Group 1 Channelization Code, Cch, SF,k	Group 2 Channelization Code, Cch, SF, k	Relative level setting for 25% and 50% allocation
$C_{ch,128,2}$	$C_{ch,128,108}$	-1.7
$C_{ch,128,3}$	$C_{ch,128,103}$	-2.7
$C_{ch,128,5}$	$C_{ch,128,109}$	-3.5
$C_{ch,128,6}$	$C_{ch,128,118}$	-0.8
$C_{ch,128,90}$	$C_{ch,128,4}$	-6.2
$C_{ch,128,94}$	$C_{ch,128,123}$	-4.6
$C_{ch,128,96}$	$C_{ch,128,111}$	-2.3
$C_{ch,128,98}$	$C_{ch,128,106}$	-4.1
$C_{ch,128,99}$	$C_{ch,128,100}$	-3.1
$C_{ch,128,101}$	$C_{ch,128,113}$	-5.1
$C_{ch,64,52}$	$C_{ch,64,44}$	0.0
$C_{ch,128,110}$	$C_{ch,128,124}$	-4.6
$C_{ch,128,114}$	$C_{ch,128,115}$	-4.8
$C_{ch,128,116}$	$C_{ch,128,126}$	-4.8
$C_{ch,64,60}$	$C_{ch,64,46}$	-1.1
$C_{ch,128,125}$	$C_{ch,128,95}$	-4.1

NOTE: The relative level settings specified in dB refer only to the relationship between the OCNS channels. For the serving cell, the sum of the powers of the OCNS channels plus the power allocated to the HS-SCCH must add up to the values specified in the last row of Table E.5E.1.2. For the interfering cells, the sum of the powers of the OCNS channels must add up to the value shown in the last row of E.5E.2-1.

E.5E.2 Transmitted code and power characteristics for interfering cells

The downlink physical channel code allocations for the interfering cells are same as for the serving cell as given in Table E.5E.1.1. The modelling approach for the interfering cells is summarized in Table E.5E.2.1. The modelling of the other users' dedicated channels is done in the same way as in the case of the serving cell except that the HSDPA power allocation is fixed at 50% and the total power allocated is not shared with the HS-SCCH. Thus, the two groups of channelisation codes defined in Table E.5E.1.3 apply, along with the specified relative power levels.

Table E.5E.2.1: Summary of modelling approach for the interfering cells

	Interfering cell(s)
Common channels	0.195 (-7.1dB) As specified in Table E.5.1
HS-PDSCH transport format	Selected randomly from Table E.5E.2.2 Independent for each interferer.
HS-PDSCH power allocation [Ec/Ior]	0.5 (-3 dB)
Other users' channels	0.3049 (-5.16 dB) Set according to Table E.5E.1.3 for 50% HS-PDSCH power allocation
Note 1: The repetition cycle length of the pre-generated HS-PDSCH and other users channels should be at least 50ms. The pre-generated pattern should be different for each cell and the cycle length should not be the same.	

NOTE: The values given in decibel are only for information.

The HS-PDSCH transmission for interfering cells is modelled to have randomly varying modulation and number of codes. The predefined modulation and number of codes are given in Table E.5E.2.2, with the actual codes selected per the code allocation given in Table E.5E.1.1. The transmission from each interfering cell is randomly and independently selected every HSDPA TTI among the four options given in Table E.5E.2.2.

The scrambling codes of the interfering cells are set to 16 and 32, respectively. The frame offsets for the interfering cells are set to 1296 and 2576 chips relative to the serving cell. The scrambling code value of 16 and the frame offset value of 2576 correspond to the first interfering cell.

Table E.5E.2.2: Predefined interferer transmission

#	**Used modulation and number of HS-PDSCH codes**
1	QPSK with 5 codes
2	16QAM with 5 codes
3	QPSK with 10 codes
4	16QAM, with 10 codes

E.5E.3 Model for power control sequence generation

In this section the modelling of power control for the other users' channels is described. There are two powers that are calculated for each user, i at each slot, n. The first is an interim power calculation, which develops a power P_n^i in dB. The second is the actual applied transmit power, $\hat{P}_n^i$ in the linear domain, which is normalized such that the total power for all users remains the same as that originally allocated. The interim power calculation is described first followed by the applied, normalized power calculation.

The interim power is varied randomly, either by increasing or decreasing it by 1 dB steps in each slot, i.e.

$P_n^i = P_{n-1}^i + \Delta$, where $\Delta \in \{-1,+1\}$ (EQ.E.5E.3.1)

The probability of Δ having a value of +1 for the i^{th} user at time instant n can be determined as

$$\Pr_n^i(\Delta = +1) = 0.5 - (P_{n-1}^i - P_0^i)\frac{0.5}{L}$$

(EQ.E.5E.3.2)

where, P_{n-1}^i is the interim power at time instant n-1 and P_0^i is the initial value given in Table E.5E.1.3 after conversion to dB for each of the two possible HS-PDSCH power allocations. L is a scaling factor which can be used to determine the range to which the variation of power is confined. The value of L is set to 10, leading to a variance of ~5 dB.

The applied, normalized power is given by

$$\hat{P}_n^i = \frac{P_{lin,n}^i}{\sum_i P_{lin,n}^i} \sum_i P_{lin,0}^i$$

(EQ.E.5E.3.3)

where $P_{lin,n}^i$ is the interim power of the user i at time instant n in the linear domain, and $P_{lin,0}^i$ is the initial value of the ith user's power also in the linear domain. Each summation is over all 16 possible values for $P_{lin,n}^i$ and $P_{lin,0}^i$ where the latter summation is equal to either 0.5551 or 0.3049 for HS-PDSCH allocations of 25% and 50%, respectively, see Table E.5E.1.3. The total instantaneous output power of the OCNS is now always equal to its allocated power. One other subtle point to note is that at each iteration of interim power generation using (EQ.E.5E.3.1) that the value of P_{n-1}^i is set to P_n^i of the previous iteration as opposed to $\hat{P}_n^i$ of the previous iteration. In summary, two sets of power control sequences are developed using (EQ.E.5E.3.1) and (EQ.E.5E.3.3), respectively, where the interim outputs developed by (E.1) are used to develop the applied, normalized values described by (EQ.E.5E.3.3) and to which the actual channel powers are set.

E.6 Downlink Physical Channels Code Allocation (This clause is informative)

E.6.1 Downlink Physical Channels Code Allocation for non-HSDPA test cases

Table E.6.1.1 shows the downlink code allocation for non-HSDPA test cases. The numbers in the code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined. Only the system configuration according to TS 34.108 [3] section 6.10b is used for RF testing. The codes used for the WCDMA interferer as defined in Table E.4.1 are not included in the table below because the WCDMA interferer is on another carrier. The S-CCPCH has been moved from code 1 to code 2 (SF=64) in order to resolve the code conflict with OCNS DPCH.

Table E.6.1.1: Downlink Physical Channels Code Allocation for RF testing (non-HSDPA)

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213; TS 34.108 [3]: 6.1.4
1: P-CCPCH			TS 25.213
2: PICH	1: -		TS 34.108 [3]: 6.1.0b (SIB5)
3: AICH			TS 34.108 [3]: 6.1.0b (SIB5)
4: -	2: OCNS DPCH	1: -	OCNS: TS34.121: Table E.3.6
5: -			
6: -	3: S-CCPCH		3: TS 34.121: TC 7.11 (PCH) only
7: -			
8: -	4: -	2: S-CCPCH	S-CCPCH for RF testing TS 34.108 [3]: 7.3 (SIB5), TS 34.121: TC 7.11 (FACH)
9: -			
10: -	5: -		5: TS 34.108 [3]: 6.1.2 (CTCH)
11: -			
12: -	6: -	3: -	
13: -			
14: -	7: -		
15: -			
16:	8: -	4: -	
17: -			
18: -	9: -		
19: -			
20: -	10: -	5: -	
21: -			
22: -	11: OCNS DPCH		OCNS: TS 34.121: E.3.6
23: -			
24-31: -	12-15: -	6-7: -	
32: -	16: -	8: -	
33: -			
34: -	17: OCNS DPCH		OCNS: TS 34.121: E.3.6
35: -			
36-43: -	18-21: -	9-10: -	
44: -	22: -	11: -	
45: -			
46: -	23: OCNS DPCH		OCNS: TS 34.121: E.3.6
47: -			
48-59: -	24-29: -	12-14: -	
60: -	30: -	15: -	
61: -			
62: -	31: OCNS DPCH		OCNS: TS 34.121: E.3.6
63: -			
64-75: -	32-37: -	16-18: -	
76: -	38: OCNS DPCH	19: -	OCNS: TS 34.121: E.3.6
77: -			
78: -	39: -		
79: -			

Code with SF=256	Code with SF=128	Code with SF=64	Note
80-91: -	40-45: -	20-22: -	
92: -	46: -	23: -	
93: -			
94: -	47: OCNS DPCH		OCNS: TS 34.121: E.3.6
95: -			
96-107: -	48-53: -	24-26: -	
108: -	54: -	27: -	
109: -			
110: -	55: OCNS DPCH		OCNS: TS 34.121: E.3.6
111: -			
112-123: -	56-61: -	28-30: -	
124: -	62: OCNS DPCH	31: -	OCNS: TS 34.121: E.3.6
125: -			
126: -	63: -		
127: -			
128-135: -	64-67: -	32-33: -	
136: -	68: -	34: -	
137: -			
138: -	69: OCNS DPCH		OCNS: TS 34.121: E.3.6
139: -			
140-155: -	70-77: -	35-38: -	
156: -	78: OCNS DPCH	39: -	OCNS: TS 34.121: E.3.6
157: -			
158: -	79: -		
159: -			
160-167: -	80-83: -	40-41: -	
168: -	84: -	42: -	
169: -			
170: -	85: OCNS DPCH		OCNS: TS 34.121: E.3.6
171: -			
172-187: -	86-93: -	43-46: -	
188: -	94: OCNS DPCH	47: -	OCNS: TS 34.121: E.3.6
189: -			
190: -	95: -		
191: -			
192: DCH SRB	96: DCH 12.2	48: -	TS 34.108 [3]: 9.2.1 (DCH SRB and 12.2); DCH 64: SF32-Code24, DCH 144: SF16-Code12, DCH 384: SF8-Code6
193: -			
194: -	97: -		
195: -			
196-223: -	98-111: -	49-55: -	
224: -	112: -	56: -	
225: -			
226: -	113: OCNS DPCH		OCNS: TS 34.121: E.3.6
227: -			
228-235: -	114-117: -	57-58: -	
236: -	118: -	59: -	
237: -			
238: -	119: OCNS DPCH		OCNS: TS 34.121: E.3.6
239: -			
240-59: -	120-123: -	60-61: -	
248: -	124: -	62: -	
249: -			
250: -	125: OCNS DPCH		OCNS: TS 34.121: E.3.6
251: -			
252-255: -	126-127: -	63: -	

E.6.2 Downlink Physical Channels Code Allocation for HSDPA test cases

Tables E.6.2.1, E.6.2.2, E.6.2.3 and E.6.2.4 show the downlink code allocation for HSDPA test cases. Table E.6.2.1 shows the complete downlink code tree for spreading factors 16, 32 and 64. Table E.6.2.2 shows details of the downlink code tree for SF=16 code=0 with spreading factors 64, 128 and 256. Tables E.6.1.1 and E.6.1.2 should be used for HSDPA test cases for UE categories 1-8 and 11-12. Tables E.6.2.3 and E.6.2.4 show the complete downlink code trees to be used for HSDPA test case for UE categories 9-10 and 13-20, with the exception of test cases testing the control channel performance, for which Tables E.6.2.1 and E.6.2.2 should be used. The numbers in the code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table E.6.2.1: HSDPA Downlink Physical Channels Code Allocation for RF testing

Code with SF=64	Code with SF=32	Code with SF=16	Note
0: -	0: -	0: -	P-CPICH, P-CCPCH, PICH, AICH on SF256
1: -			HS-SCCH1 and HS-SCCH2 on SF128
2: S-CCPCH	1: -		S-CCPCH: TS 34.108 [3]: 6.1.0b
3: -			HS-SCCH3 and HS-SCCH4 on SF128
4: -	2: -	1: HS-PDSCH	1st HS-PDSCH code
5: -			
6: -	3: -		
7: -			
8: -	4: -	2: HS-PDSCH	2nd HS-PDSCH code
9: -			
10: -	5: -		
11: -			
12: -	6: -	3: HS-PDSCH	3rd HS-PDSCH code
13: -			
14: -	7: -		
15: -			
16: -	8: -	4: HS-PDSCH	4th HS-PDSCH code
17: -			
18: -	9: -		
19: -			
20: -	10: -	5: HS-PDSCH	5th HS-PDSCH code
21: -			
22: -	11: -		
23: -			
24: -	12: -	6: HS-PDSCH	6th HS-PDSCH code
25: -			
26: -	13: -		
27: -			
28: -	14: -	7: HS-PDSCH	7th HS-PDSCH code
29: -			
30: -	15: -		
31: -			
32: -	16: -	8: HS-PDSCH	8th HS-PDSCH code
33: -			
34: -	17: -		
35: -			
36: -	18: -	9: HS-PDSCH	9th HS-PDSCH code
37: -			
38: -	19: -		
39: -			
40: -	20: -	10: HS-PDSCH	10th HS-PDSCH code
41: -			
42: -	21: -		
43: -			
44: -	22: -	11: -	
45: -			
46: -	23: -		

Code with SF=64	Code with SF=32	Code with SF=16	Note
47: -			
48: -	24: -	12: -	RMC12.2 on code 96 (SF128), the SRB standalone used during call setup on code 192 (SF256) (TS 34.108 [3]: 9.2.1)
49: -			
50: -	25: -		
51: -			
52: -	26: -	13: -	
53: -			
54: -	27: -		
55: -			
56: -	28: -	14: -	
57: -			
58: -	29: -		
59: -			
60: -	30: -	15: -	OCNS DPCH on codes 122-127 (SF128) (Table E.5.5)
61: -			
62: -	31: -		
63: -			

Table E.6.2.2: HSDPA Downlink Physical Channels Code Allocation for SF=16 code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213; 34.108 [3]: 6.1.4; 34.121: E.4.2
1: P-CCPCH			TS 25.213; 34.121: E.4.2
2: PICH	1: -		TS 34.108 [3]: 6.1.0b (SIB5)
3: AICH			TS 34.108 [3]: 6.1.0b (SIB5)
4: -	2: HS-SCCH1	1: -	TS 34.108 [3]: 9.2.1 RB Setup message
5: -			
6: -	3: HS-SCCH2		TS 34.108 [3]: 9.2.1 RB Setup message
7: -			
8: -	4: -	2: S-CCPCH	S-CCPCH: TS 34.108 [3]: 6.1.0b (SIB5)
9: -			
10: -	5: -		
11: -			
12: -	6: HS-SCCH3	3: -	TS 34.108 [3]: 9.2.1 RB Setup message
13: -			
14: -	7: HS-SCCH4		TS 34.108 [3]: 9.2.1 RB Setup message
15: -			

Table E.6.2.3: HSDPA Downlink Physical Channels Code Allocation for RF testing for UE categories 9-10 and 13-20 test cases, except control channel performance test cases

Code with SF=64	Code with SF=32	Code with SF=16	Note
0: -	0: -	0: -	P-CPICH, P-CCPCH, PICH, AICH on SF256
1: -			HS-SCCH1 and HS-SCCH2 on SF128
2: S-CCPCH	1: -		S-CCPCH: TS 34.108 [3]: 6.1.0b
3: -			OCNS DPCH on code 6 (SF128) (Table E.5.5A), RMC12.2 on code 7 (SF128) (TS 34.108 [3]: 9.2.1 RRC Connection Setup message (Transition to CELL_DCH) with exceptions in Annex I), the SRB standalone used during call setup on code 14 (SF256) (TS 34.108 [3]: 9.2.1 RB Setup message (HSDPA) with exceptions in Annex I)
4: -	2: -	1: HS-PDSCH	1st HS-PDSCH code
5: -			
6: -	3: -		
7: -			
8: -	4: -	2: HS-PDSCH	2nd HS-PDSCH code
9: -			
10: -	5: -		
11: -			
12: -	6: -	3: HS-PDSCH	3rd HS-PDSCH code
13: -			
14: -	7: -		
15: -			
16: -	8: -	4: HS-PDSCH	4th HS-PDSCH code
17: -			
18: -	9: -		
19: -			
20: -	10: -	5: HS-PDSCH	5th HS-PDSCH code
21: -			
22: -	11: -		
23: -			
24: -	12: -	6: HS-PDSCH	6th HS-PDSCH code
25: -			
26: -	13: -		
27: -			
28: -	14: -	7: HS-PDSCH	7th HS-PDSCH code
29: -			
30: -	15: -		
31: -			
32: -	16: -	8: HS-PDSCH	8th HS-PDSCH code
33: -			
34: -	17: -		
35: -			
36: -	18: -	9: HS-PDSCH	9th HS-PDSCH code
37: -			
38: -	19: -		
39: -			
40: -	20: -	10: HS-PDSCH	10th HS-PDSCH code
41: -			
42: -	21: -		
43: -			
44: -	22: -	11: HS-PDSCH	11th HS-PDSCH code
45: -			
46: -	23: -		
47: -			
48: -	24: -	12: HS-PDSCH	12th HS-PDSCH code
49: -			
50: -	25: -		
51: -			

Code with SF=64	Code with SF=32	Code with SF=16	Note
52: -	26: -	13: HS-PDSCH	13th HS-PDSCH code
53: -			
54: -	27: -		
55: -			
56: -	28: -	14: HS-PDSCH	14th HS-PDSCH code
57: -			
58: -	29: -		
59: -			
60: -	30: -	15: HS-PDSCH	15th HS-PDSCH code
61: -			
62: -	31: -		
63: -			

Table E.6.2.4: HSDPA Downlink Physical Channels Code Allocation for SF=16 code=0 for UE categories 9-10 and 13-20 test cases, except control channel performance test cases

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213; 34.108 [3]: 6.1.4; 34.121: E.4.2
1: P-CCPCH			TS 25.213; 34.121: E.4.2
2: PICH	1: -		TS 34.108 [3]: 6.1.0b (SIB5)
3: AICH			TS 34.108 [3]: 6.1.0b (SIB5)
4: -	2: HS-SCCH1	1: -	TS 34.108 [3]: 9.2.1 RB Setup message (HSDPA) with exceptions in Annex I
5: -			
6: -	3: HS-SCCH2		TS 34.108 [3]: 9.2.1 RB Setup message (HSDPA) with exceptions in Annex I
7: -			
8: -	4: -	2: S-CCPCH	S-CCPCH: TS 34.108 [3]: 6.1.0b (SIB5)
9: -			
10: -	5: -		
11: -			
12: -	6: OCNS DPCH	3: -	OCNS DPCH on code 6 (SF128) (Table E.5.5A)
13: -			
14: SRB during call setup	7: RMC 12.2		RMC12.2 on code 7 (SF128) (TS 34.108 [3]: 9.2.1 RRC Connection Setup message (Transition to CELL_DCH) with exceptions in Annex I), the SRB standalone used during call setup on code 14 (SF256) (TS 34.108 [3]: 9.2.1 RB Setup message (HSDPA) with exceptions in Annex I)
15: -			

E.6.3 Downlink Physical Channels Code Allocation for E-DCH test cases

Tables E.6.3.1 and E.6.3.2 show the downlink code allocation for E-DCH test cases. Table E.6.3.1 shows the complete downlink code tree for spreading factors 16, 32 and 64. Table E.6.3.2 shows details of the downlink code tree for SF=16 code=0 with spreading factors 64, 128 and 256. The numbers in the code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table E.6.3.1: E-DCH Downlink Physical Channels Code Allocation for RF testing

Code with SF=64	Code with SF=32	Code with SF=16	Note
0: -	0: -	0: -	P-CPICH, P-CCPCH, PICH, AICH on SF256
1: -			HS-SCCH1 and HS-SCCH2 on SF128
2: S-CCPCH	1: -		S-CCPCH: TS 34.108 [3]: 6.1.0b
3: -			E-HICH/E-RGCH on SF128, E-AGCH on SF256
4: -	2: -	1: HS-PDSCH	1st HS-PDSCH code
5: -			
6: -	3: -		
7: -			
8: -	4: -	2: HS-PDSCH	2nd HS-PDSCH code
9: -			
10: -	5: -		
11: -			
12: -	6: -	3: HS-PDSCH	3rd HS-PDSCH code
13: -			
14: -	7: -		
15: -			
16: -	8: -	4: HS-PDSCH	4th HS-PDSCH code
17: -			
18: -	9: -		
19: -			
20: -	10: -	5: HS-PDSCH	5th HS-PDSCH code
21: -			
22: -	11: -		
23: -			
24: -	12: -	6: -	
25: -			
26: -	13: -		
27: -			
28: -	14: -	7: -	
29: -			
30: -	15: -		
31: -			
32: -	16: -	8: -	
33: -			
34: -	17: -		
35: -			
36: -	18: -	9: -	
37: -			
38: -	19: -		
39: -			
40: -	20: -	10: -	
41: -			
42: -	21: -		
43: -			
44: -	22: -	11: -	
45: -			
46: -	23: -		
47: -			
48: -	24: -	12: -	RMC12.2 on code 96 (SF128), the SRB standalone used during call setup on code 192
49: -			

Code with SF=64	Code with SF=32	Code with SF=16	Note
50: -	25: -		(SF256) (TS 34.108 [3]: 9.2.1)
51: -			
52: -	26: -	13: -	
53: -			
54: -	27: -		
55: -			
56: -	28: -	14: -	
57: -			
58: -	29: -		
59: -			
60: -	30: -	15: -	OCNS DPCH on codes 122-127 (SF128)
61: -			
62: -	31: -		
63: -			

Table E.6.2.2: E-DCH Downlink Physical Channels Code Allocation for SF=16 code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213; 34.108 [3]: 6.1.4; 34.121: E.4.2
1: P-CCPCH			TS 25.213; 34.121: E.4.2
2: PICH	1: -		TS 34.108 [3]: 6.1.0b (SIB5)
3: AICH			TS 34.108 [3]: 6.1.0b (SIB5)
4: -	2: HS-SCCH1	1: -	TS 34.108 [3]: 9.2.1 RB Setup message
5: -			
6: -	3: HS-SCCH2		TS 34.108 [3]: 9.2.1 RB Setup message
7: -			
8: -	4: -	2: S-CCPCH	S-CCPCH: TS 34.108 [3]: 6.1.0b (SIB5)
9: -			
10: -	5: -		
11: -			
12: -	6: E-HICH/E-RGCH	3: -	TS 34.108 [3]: 9.2.1 RB Setup message
13: -			
14: E-AGCH	7: -		TS 34.108 [3]: 9.2.1 RB Setup message
15: -			

E.6.4 Downlink Physical Channels Code Allocation for MBMS test cases

Table E.6.4.1 show the details of downlink code allocation for MBMS test cases. The numbers in the Code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table E.6.4.1: MBMS Downlink Physical Channels Code Allocation for RF testing

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213; TS 34.108 [3]: 6.1.4
1: P-CCPCH			TS 25.213
2: PICH	1: -		TS 34.108 [3]: 6.1.0b (SIB5)
3: AICH			TS 34.108 [3]: 6.1.0b (SIB5)
4: -	2: OCNS DPCH	1: -	OCNS: TS34.121: Table E.3.6
5: -			
6: -	3: -		
7: MICH			
8: -	4: -	2: S-CCPCH	2: TS 34.108 [3]: 6.1.0b (SIB5)
9: -			
10: -	5: -		
11: -			
12: -	6: S-CCPCH	3: -	6: TS 34.121: TC 8.3.5.4
13: -			
14: -	7: -		
15: -			
16:	8: -	4: -	
17: -			
18: -	9: -		
19: -			
20: -	10: -	5: -	
21: -			
22: -	11: OCNS DPCH		OCNS: TS 34.121: E.3.6
23: -			
24-31: -	12-15: -	6-7: -	
32: -	16: -	8: -	
33: -			
34: -	17: OCNS DPCH		OCNS: TS 34.121: E.3.6
35: -			
36-43: -	18-21: -	9-10: -	
44: -	22: -	11: -	
45: -			
46: -	23: OCNS DPCH		OCNS: TS 34.121: E.3.6
47: -			
48-59: -	24-29: -	12-14: -	
60: -	30: -	15: -	
61: -			
62: -	31: OCNS DPCH		OCNS: TS 34.121: E.3.6
63: -			
64-75: -	32-37: -	16-18: -	
76: -	38: OCNS DPCH	19: -	OCNS: TS 34.121: E.3.6
77: -			
78: -	39: -		
79: -			
80-91: -	40-45: -	20-22: -	
92: -	46: -	23: -	
93: -			
94: -	47: OCNS DPCH		OCNS: TS 34.121: E.3.6
95: -			
96-107: -	48-53: -	24-26: -	
108: -	54: -	27: -	
109: -			

Code with SF=256	Code with SF=128	Code with SF=64	Note
110: -	55: OCNS DPCH		OCNS: TS 34.121: E.3.6
111: -			
112-123: -	56-61: -	28-30: -	
124: -	62: OCNS DPCH	31: -	OCNS: TS 34.121: E.3.6
125: -			
126: -	63: -		
127: -			
128-135: -	64-67: -	32-33: -	
136: -	68: -	34: -	
137: -			
138: -	69: OCNS DPCH		OCNS: TS 34.121: E.3.6
139: -			
140-155: -	70-77: -	35-38: -	
156: -	78: OCNS DPCH	39: -	OCNS: TS 34.121: E.3.6
157: -			
158: -	79: -		
159: -			
160-167: -	80-83: -	40-41: -	
168: -	84: -	42: -	
169: -			
170: -	85: OCNS DPCH		OCNS: TS 34.121: E.3.6
171: -			
172-187: -	86-93: -	43-46: -	
188: -	94: OCNS DPCH	47: -	OCNS: TS 34.121: E.3.6
189: -			
190: -	95: -		
191: -			
192: -	96: -	48: -	TS 34.121: TC 8.3.5.4, 8.3.6.3,11.2(Test 2) MTCH 256kbps: SF8-Code6 TS 34.121: TC 11.2(Test 1 and 3), 11.3 MTCH 128kbps: SF16-Code12
193: -			
194: -	97: -		
195: -			
196-223: -	98-111: -	49-55: -	
224: -	112: -	56: -	
225: -			
226: -	113: OCNS DPCH		OCNS: TS 34.121: E.3.6
227: -			
228-235: -	114-117: -	57-58: -	
236: -	118: -	59: -	
237: -			
238: -	119: OCNS DPCH		OCNS: TS 34.121: E.3.6
239: -			
240-59: -	120-123: -	60-61: -	
248: -	124: -	62: -	
249: -			
250: -	125: OCNS DPCH		OCNS: TS 34.121: E.3.6
251: -			
252-255: -	126-127: -	63: -	

Annex F (normative): General test conditions and declarations

The requirements of this clause apply to all applicable tests in the present document.

Many of the tests in the present document measure a parameter relative to a value that is not fully specified in the UE specifications. For these tests, the Minimum Requirement is determined relative to a nominal value specified by the manufacturer.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

In all the relevant clauses in this clause all Bit Error Ratio (BER), Block Error Ratio (BLER), False transmit format Detection Ratio (FDR) measurements shall be carried out according to the general rules for statistical testing in clause F.6.

For operating band XXII, the Test Tolerances may not be valid since some Test System uncertainties are changed for frequencies above 3000MHz. The Test Tolerances for those specific bands are therefore For Further Study [FFS].

F.1 Acceptable uncertainty of Test System

The maximum acceptable uncertainty of the Test System is specified below for each test, where appropriate. The Test System shall enable the stimulus signals in the test case to be adjusted to within the specified range, and the equipment under test to be measured with an uncertainty not exceeding the specified values. All ranges and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

A confidence level of 95 % is the measurement uncertainty tolerance interval for a specific measurement that contains 95 % of the performance of a population of test equipment.

For RF tests it should be noted that the uncertainties in clause F.1 apply to the Test System operating into a nominal 50 ohm load and do not include system effects due to mismatch between the DUT and the Test System.

F.1.1 Measurement of test environments

The measurement accuracy of the UE test environments defined in annex G, Test environments shall be.

- Pressure ±5 kPa.
- Temperature ±2 degrees.
- Relative Humidity ±5 %.
- DC Voltage ±1,0 %.
- AC Voltage ±1,5 %.
- Vibration 10 %.
- Vibration frequency 0,1 Hz.

The above values shall apply unless the test environment is otherwise controlled and the specification for the control of the test environment specifies the uncertainty for the parameter.

F.1.2 Measurement of transmitter

Table F.1.2: Maximum Test System Uncertainty for transmitter tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.2 Maximum Output Power	±0,7 dB	
5.2A Maximum Output Power with HS-DPCCH (Release 5 only)	±0,7 dB	
5.2AA Maximum Output Power with HS-DPCCH (Release 6 and later)	±0,7 dB	
5.2B Maximum Output Power with HS-DPCCH and E-DCH	±0,7 dB	
5.2BA UE Maximum Output Power for DC-HSUPA (QPSK)	±0,7 dB	The accuracy over two carriers is the same as over one carrier
5.2BB UE Maximum Output Power for DC-HSUPA (16QAM)	±0,7 dB	The accuracy over two carriers is the same as over one carrier
5.2C UE relative code domain power accuracy	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB	This accuracy is based on the linearity of the code domain power measurement of the test equipment.
5.2D UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB	This accuracy is based on the linearity of the code domain power measurement of the test equipment.
5.2DA UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB	This accuracy is based on the linearity of the code domain power measurement of the test equipment.
5.2E UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB For -20 dB ≥ -30 dB CDP ± 0.5 dB	This accuracy is based on the linearity of the code domain power measurement of the test equipment.
5.2 EA UE relative code domain power accuracy for DC-HSUPA using HS-DPCCH and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB For -20 dB ≥ -30 dB CDP ± 0.5 dB	This accuracy is based on the linearity of the code domain power measurement of the test equipment.
5.3 Frequency Error	±10 Hz	
5.3A Frequency Error for DC-HSUPA	±10 Hz per carrier	
5.3C Frequency error for UL CLTD Activation state 1	±10 Hz	
5.3D Frequency error for UL CLTD Activation state 2 and 3	10 Hz	
5.4.1 Open loop power control in uplink	±1,0 dB	The uncertainty of this test is a combination of the downlink level setting error and the uplink power measurement that are uncorrelated. Formula = SQRT(source_level_error^2 + power_meas_error^2)
5.4.1A Open Loop Power Control in the Uplink for DC-HSUPA	±1,0 dB per carrier	The uncertainty of this test is a combination of the downlink level setting error and the uplink power measurement that are uncorrelated. Formula = SQRT(source_level_error^2 + power_meas_error^2)

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.4.2 Inner loop power control in the uplink	The test system uncertainty is the function of the UE transmitter power control range for each combination of the step size and number of steps. For 0 dB and 1 dB range ±0,1 dB For a nominal 2 dB range ±0,15 dB For a nominal 3 dB range ±0,2 dB For a greater than 3 dB range ±0,3 dB	This accuracy is based on the linearity of the absolute power measurement of the test equipment.
5.4.2A Inner Loop Power Control in the Uplink for DC-HSUPA	The test system uncertainty is the function of the UE transmitter power control range for each combination of the step size and number of steps. For 0 dB and 1 dB range ±0,1 dB per carrier For a nominal 2 dB range ±0,15 dB per carrier For a nominal 3 dB range ±0,2 dB per carrier For a greater than 3 dB range ±0,3 dB per carrier	This accuracy is based on the linearity of the absolute power measurement of the test equipment.
5.4.3 Minimum Output Power	±1,0 dB	Measured on a static signal
5.4.3A Minimum Output Power for DC-HSUPA	±1,0 dB	Measured on a static signal
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH\_E_c}{I_{or}}$	±0,4 dB	0.1 dB uncertainty in DPCCH ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCCH_Ec/Ior ratio. The absolute error of the AWGN Ioc is not important but is specified as 1.0 dB
5.4.4A Out-of-synchronisation handling of output power for UE which supports type 1 for DCH: $\frac{DPCCH\_E_c}{I_{or}}$	±0,4 dB	0.1 dB uncertainty in DPCCH ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCCH_Ec/Ior ratio. The absolute error of the AWGN Ioc is not important but is specified as 1.0 dB
5.5.1 Transmit OFF Power: (static case)	±1,0 dB	Measured on a static signal
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0,7 dB / -1,0 dB Off power (dynamic case) TBD	Assume asymmetric meas error -1.0 dB / 0.7 dB comprising RSS of: -0.7 dB downlink error plus -0.7 dB meas error, and +0.7 dB for upper limit (assume UE won't go above 24 nominal). For the off power, the accuracy of a two-pass measurement needs to be analysed.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.6 Change of TFC: power control step size (7 dB step)	±0,3 dB relative over a 9 dB range	
5.7 Power setting in uplink compressed mode:-UE output power	A subset of 5.4.2.	
5.7A HS-DPCCH	The test system uncertainty is the function of the UE transmitter power range for each step size on the HS-DPCCH channel. For 0 dB and 1 dB range ±0,1 dB For a nominal 2 dB range ±0,15 dB For a nominal 3 dB range ±0,2 dB For a greater than 3 dB range ±0,3 dB	This accuracy is based on the linearity of the absolute power measurement of the test equipment.
5.8 Occupied Bandwidth	±100 kHz	Accuracy = ±3*RBW. Assume 30 kHz bandwidth.
5.8A Occupied Bandwidth for DC-HSUPA	±100 kHz	Accuracy = ±3*RBW. Assume 30 kHz bandwidth.
5.9 Spectrum emission mask	±1,5 dB	
5.9A Spectrum emission mask with HS-DPCCH	±1,5 dB	
5.9B Spectrum emission mask with E-DCH	±1,5 dB	
5.9C Additional Spectrum Emission Mask for DC-HSUPA (QPSK)	±1,5 dB	
5.9D Additional Spectrum Emission Mask for DC-HSUPA (16QAM)	±1,5 dB	
5.10 ACLR	5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB	
5.10A ACLR with HS-DPCCH	5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB	
5.10B ACLR with E-DCH	5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB	
5.10C ACLR with E-DCH for DC-HSUPA (QPSK)	7.5 MHz offset: ± 0,8 dB 12.5 MHz offset: ± 0,8 dB	
5.10D ACLR with E-DCH for DC-HSUPA (16QAM)	7.5 MHz offset: ± 0,8 dB 12.5 MHz offset: ± 0,8 dB	
5.11 Spurious emissions	± 2,0 dB for UE and coexistence bands for results ≥ -60 dBm ± 3,0 dB for results < -60 dBm Outside above: f≤2.2GHz: ± 1.5 dB 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB f > 4 GHz: ±4.0 dB	
5.11A Spurious emissions for DC-HSUPA	± 2,0 dB for UE and coexistence bands for results ≥ -60 dBm ± 3,0 dB for results < -60 dBm Outside above: f≤2.2GHz: ± 1.5 dB 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB f > 4 GHz: ±4.0 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.12 Transmit Intermodulation	± 2.2 dB	CW Interferer error is 0.7 dB for the UE power RSS with 0.7 dB for CW setting = 1.0 dB Measurement error of intermod product is 0.7 dB for UE power RSS with 0.7 dB for relative = 1.0 dB Interferer has an effect of 2 times on the intermod product so overall test uncertainty is 2*1.0 RSS with 1.0 = 2.2 dB. Apply half any excess test system uncertainty to increase the interferer level
5.12A Transmit Intermodulation for DC-HSUPA	± 2.2 dB	
5.13.1 Transmit modulation: EVM	±2.5 % (for single code)	
5.13.1A Transmit modulation: EVM with HS-DPCCH	±2.5 % (for single code)	
5.13.1AA Transmit modulation: EVM and phase discontinuity with HS-DPCCH	±2.5 % (for single code)	
	±6 degree for Phase discontinuity	
5.13.1AAA EVM and IQ origin offset for HS-DPCCH with E-DCH with 16 QAM	±0.5 dB (for IQ origin offset)	
5.13.2 Transmit modulation: peak code domain error	±1.0dB	
5.13.2A Relative Code Domain Error	±0.5 dB	
5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH	±0.5 dB	
5.13.2BA Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA	±0.5 dB	
5.13.2C Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM	±0.5 dB	
5.13.2CA Relative Code Domain error with HS-DPCCH and E-DCH with 16QAM for DC-HSUPA	±0.5 dB	
5.13.3 UE phase discontinuity	±2.5 % for EVM (for single code)	
	±10 Hz for Frequency error	
	±6 degree for Phase discontinuity	
5.13.4 PRACH quality (EVM)	±2.5 %	
5.13.4 PRACH quality (Frequency error)	±10 Hz	
5.13.5 In-band emission for DC-HSUPA	±0,8 dB	

F.1.3 Measurement of receiver

Table F.1.3: Maximum Test System Uncertainty for receiver tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.2 Reference sensitivity level	± 0.7 dB for Ior ± 0.7 dB for Ec	
6.2A Reference sensitivity level for DC-HSDPA	± 0.7 dB for Ior ± 0.7 dB for Ec	This applies for both DC-HSDPA cells
6.2B Reference sensitivity level for DB-DC-HSDPA	± 0.7 dB for Ior ± 0.7 dB for Ec	This applies for both DB-DC-HSDPA cells
6.2C Reference sensitivity level for single band 4C-HSDPA	± 0.7 dB for Ior ± 0.7 dB for Ec	This applies for all 3CHSDPA cells
6.2D Reference sensitivity level for Dual band 4C-HSDPA	± 0.7 dB for Ior ± 0.7 dB for Ec	This applies for all /4C-HSDPA cells
6.2DA Reference sensitivity level for Dual band 4C-HSDPA (3 carrier)	± 0.7 dB for Ior ± 0.7 dB for Ec	This applies for all 3C-HSDPA cells
6.3 maximum input level:	± 0.7 dB for Ior	The critical parameter is the overall signal level and not the –19 dB DPCH_Ec/Ior ratio. 0.7 dB absolute error due to signal measurement DPCH_Ec/Ior ratio error is <0.1 dB but is not important so is ignored
6.3A Maximum Input Level for HS-PDSCH Reception (16QAM)	± 0.7 dB for Ior	The critical parameter is the overall signal level and not the –3 dB HS-PDSCH_Ec/Ior ratio. 0.7 dB absolute error due to signal measurement HS-PDSCH/Ior ratio error is <0.1 dB but is not important so is ignored
6.3B Maximum Input Level for HS-PDSCH Reception (64QAM)	± 0.7 dB for Ior	The critical parameter is the overall signal level and not the –2 dB HS-PDSCH_Ec/Ior ratio. 0.7 dB absolute error due to signal measurement HS-PDSCH/Ior ratio error is <0.1 dB but is not important so is ignored
6.3C Maximum Input Level for DC-HSDPA Reception (16QAM)	± 0.7 dB for Ior	Same as 6.3A This applies for both DC-HSDPA cells
6.3D Maximum Input Level for DC-HSDPA Reception (64QAM)	± 0.7 dB for Ior	Same as 6.3B This applies for both DC-HSDPA cells
6.3E Maximum Input Level for DB-DC-HSDPA Reception (16QAM)	± 0.7 dB for Ior	Same as 6.3A This applies for both DB-DC-HSDPA cells
6.3F Maximum Input Level for DB-DC-HSDPA Reception (64QAM)	± 0.7 dB for Ior	Same as 6.3B This applies for both DB-DC-HSDPA cells
6.3G Maximum Input Level for 4C-HSDPA Reception (16QAM)	± 0.7 dB for Ior	Same as 6.3A This applies for all 4C-HSDPA cells

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.3GA Maximum Input Level for 4C-HSDPA Reception (16QAM) (3 carrier)	± 0.7 dB for Ior	Same as 6.3A This applies for all 3C-HSDPA cells
6.3H Maximum Input Level for 4C-HSDPA Reception (64QAM)	± 0.7 dB for Ior	Same as 6.3B This applies for all /4C-HSDPA cells
6.3HA Maximum Input Level for 4C-HSDPA Reception (64QAM)(3 carrier)	± 0.7 dB for Ior	Same as 6.3B This applies for all 3C-HSDPA cells
6.4 Adjacent channel selectivity (Rel-99 and Rel-4)	± 1.1 dB	Overall system uncertainty comprises three quantities: 1. Wanted signal level error 2. Interferer signal level error 3. Additional impact of interferer ACLR Items 1 and 2 are assumed to be uncorrelated so can be root sum squared to provide the ratio error of the two signals. Assume for simplicity this ratio error is linearly added to the interferer ACLR. Test System uncertainty = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect. The ACLR effect is calculated by:(Formula to follow) (E.g. ACLR at 5 MHz of 51 dB gives additional error of .0765 dB. ACLR of 48 gives error of –0.15 dB.)
6.4A Adjacent channel selectivity (Rel-5 and later releases)	± 1.1 dB	Same as above
6.4B Adjacent channel selectivity (ACS) for DC-HSDPA	± 0.7 dB for Îor ± 0.7 dB for Ioac ± 1.1 dB for overall uncertainty	Overall system uncertainty comprises three quantities: 1. Wanted signal level error 2. Interferer signal level error 3. Additional impact of interferer ACLR Items 1 and 2 are assumed to be uncorrelated so can be root sum squared to provide the ratio error of the two signals. Assume for simplicity this ratio error is linearly added to the interferer ACLR. Assume also for simplicity this interferer ACLR impacts equally on both DC-HSDPA cells. Test System uncertainty = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect. The ACLR effect is calculated by:(Formula to follow) (E.g. ACLR at 5 MHz of 51 dB gives additional error of .0765 dB. ACLR of 48 gives error of –0.15 dB.)

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.4C Adjacent channel selectivity (ACS) for DB-DC-HSDPA	± 0.7 dB for Ior ± 0.7 dB for Ioac ± 1.1 dB for overall uncertainty	Same as 6.4B
6.5 Blocking characteristics	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Using ± 0.7 dB for signal and interferer as currently defined and 68 dB ACLR @ 10 MHz.
6.5A Blocking characteristics for DC-HSDPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Using ± 0.7 dB for signal and interferer as currently defined and 68 dB ACLR @ 10 MHz. Assume for simplicity this system error applies for both DC-HSDPA cells.
6.5B Blocking characteristics for DB-DC-HSDPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.5C Blocking characteristics for DC-HSUPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.5D Blocking Characteristics for single Uplink Single band 4C-HSDPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.5E Blocking Characteristics for dual Uplink Single band 4C-HSDPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.5F Blocking Characteristics for single Uplink Dual band 4C-HSDPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.5FA Blocking Characteristics for single Uplink Dual band 4C-HSDPA (3 carrier)	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and fb □ 2.2 GHz: ± 1.0 dB 2.2 GHz < f □□4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.5G Blocking Characteristics for dual Uplink Dual band 4C-HSDPA	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and f_b ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.5GA Blocking Characteristics for dual Uplink Dual band 4C-HSDPA (3 carrier)	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and fb □ 2.2 GHz: ± 1.0 dB 2.2 GHz < f □□4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	Same as 6.5A
6.6 Spurious Response	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	
6.6A Spurious Response for DC-HSDPA	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	This applies for both DC-HSDPA cells.
6.6B Spurious Response for DB-DC-HSDPA	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	This applies for both DB-DC-HSDPA cells.
6.6C Spurious Response for single band 4C-HSDPA	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	This applies for all 3C-HSDPA cells.
6.6D Spurious Response for dual band 4C-HSDPA	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	This applies for all 4C-HSDPA cells.
6.6DA Spurious Response for dual band 4C-HSDPA (3 carrier)	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	This applies for all 3C-HSDPA cells.
6.7 Intermodulation Characteristics	±1.3 dB	Similar issues to 7.4 ACS test. ETR028 says impact f the closer signal is twice that of the far signal. If both signals drop 1 dB, intermod product drops 2 dB. Formula = $\sqrt{(2 \cdot CW\_level\_error)^2 + (mod\_level\_error)^2}$ (Using CW interferer ±0.5 dB, modulated interferer ±0.5 dB, wanted signal ±0.7 dB) 1.3 dB! Broadband noise/ACLR not considered but may have impact.
6.7A Intermodulation Characteristics for DC-HSDPA	± 1.3 dB	Same as 6.7. This applies for both DC-HSDPA cells.
6.7B Intermodulation Characteristics for DB-DC-HSDPA	± 1.3 dB	Same as 6.7. This applies for both DB-DC-HSDPA cells.
6.7C Intermodulation Characteristics for DC-HSUPA	± 1.3 dB	Same as 6.7. This applies for both DC-HSUPA cells.
6.7D Intermodulation Characteristics for single uplink single band 4C-HSDPA	± 1.3 dB	Same as 6.7. This applies for all 3CHSDPA cells.
6.7E Intermodulation Characteristics for single uplink dual band 4C-HSDPA	± 1.3 dB	Same as 6.7. This applies for all 4C-HSDPA cells.
6.7EA Intermodulation Characteristics for single uplink dual band 4C-HSDPA (3 carrier)	± 1.3 dB	Same as 6.7. This applies for all 3C-HSDPA cells.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.8 Spurious emissions	± 3.0 dB for UE receive band and UE transmit band (-60 dBm) Outside above: f≤2.2GHz: ± 2.0 dB (-57 dBm) 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB (-47 dBm) f > 4 GHz: ±4.0 dB (-47 dBm) Downlink signal Îor ± 2.0 dB	

F.1.4 Performance requirement

Table F.1.4: Maximum Test System Uncertainty for Performance Requirements

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.2 Demodulation in Static Propagation Condition	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is not important for any tests in clause 7 but is specified as 1.0 dB.
7.3 Demodulation of DCH in multipath Fading Propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.56 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB
7.4 Demodulation of DCH in Moving Propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.5 Demodulation of DCH in Birth-Death Propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.5A Demodulation of DCH in high speed train conditions	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB. Round up to 0.8 dB
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.6.1
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.6.1
7.7.1 Demodulation in inter-cell soft Handover (Release 5 and earlier)	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB, but per output $\hat{I}_{or1}/I_{oc}$ or $\hat{I}_{or2}/I_{oc}$ the error is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB.
7.7.1A Demodulation in inter-cell soft Handover (Release 6 and later)	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB, but per output $\hat{I}_{or1}/I_{oc}$ or $\hat{I}_{or2}/I_{oc}$ the error is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.7.2 Combining of TPC commands Test 1	Ior1,Ior2 ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Test is looking for changes in power – need to allow for relaxation in criteria for power step of probably 0.1 dB to 0.4 dB
7.7.2 Combining of TPC commands Test 2	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.7.1
7.7.3 Combining of reliable TPC commands from radio links of different radio link sets	$\hat{I}_{or1}/I_{oc}$ ±0.3 dB $\hat{I}_{or2}/I_{oc}$ ±0.3 dB $\hat{I}_{or3}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_{c1}}{I_{or1}}$ ±0.1 dB $\frac{DPCH\_E_{c2}}{I_{or2}}$ ±0.1 dB $\frac{DPCH\_E_{c3}}{I_{or3}}$ ±0.1 dB Offset of $\frac{DPCH\_E_{c2}}{I_{or1}}$ relative to $\frac{DPCH\_E_{c1}}{I_{or1}}$ ±0.4 dB Offset of $\frac{DPCH\_E_{c3}}{I_{or1}}$ relative to $\frac{DPCH\_E_{c1}}{I_{or1}}$ ±0.4 dB	Same as 7.2. Offsets calculated as RMS of: Ior1/Ioc, DPCH_Ec1/Ior1 and DPCH_Ec2/Ior2 and Ior1/Ioc, DPCH_Ec1/Ior1 and DPCH_Ec3/Ior3 respectively.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.8.1 Power control in downlink constant BLER target (Release 5 and earlier)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3 For test cases wherein the SS response time to DL power control commands is delayed by one timeslot from the immediate response then additional test system uncertainty in $\frac{DPCH\_E_c}{I_{or}}$ is applied: For test 1 an additional 0.3 dB is allowed. This value is based on a rounded 0.24 dB delta value from simulations. For test 2 an additional 0.2 dB is allowed. This value is based on a rounded 0.14 dB delta value from simulations.
7.8.1A Power control in downlink constant BLER target (Release 6 and later)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.8.2, Power control in downlink initial convergence	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3. When the SS response time to DL power control commands is delayed by one timeslot from the immediate response, then additional test system uncertainty in $\frac{DPCH\_E_c}{I_{or}}$ of 0.2 db is applied. This value is based on a rounded 0.15 dB delta value from simulations.
7.8.3, Power control in downlink: wind up effects (Release 5 and earlier)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3. For test cases wherein the SS response time to DL power control commands is delayed by one timeslot from the immediate response, then additional test system uncertainty in $\frac{DPCH\_E_c}{I_{or}}$ is applied: For test 1 an additional 0.3 dB is allowed. This value is based on a rounded 0.26 dB delta value from simulations.
7.8.3A, Power control in downlink: wind up effects (Release 6 and later)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.8.4, Power control in the downlink, different transport formats	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3 For test cases where the SS response time to DL power control commands is delayed by one timeslot from the immediate response, then additional test system uncertainty in $\frac{DPCH\_E_c}{I_{or}}$ is applied: For test 1 stage 1, an additional 0.2 dB is allowed. This value is based on a rounded 0.24 dB delta value from simulations. For test 1 stage 2, an additional 0.1 dB is allowed. This value is based on a rounded 0.16 dB delta value from simulations.
7.8.5, Power control in the downlink for F-DPCH	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{F-DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.9.1 Downlink compressed mode (Release 5 and earlier)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.9.1A Downlink compressed mode (Release 6 and later)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.10 Blind transport format detection Tests 1, 2, 3	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.2
7.10 Blind transport format detection Tests 4, 5, 6	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.11 Demodulation of paging channel (PCH)	Test 1: $\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB S-CCPCH_Ec/Ior ±0.1 dB PICH_Ec/Ior ±0.1 dB	Test 1: Values for Îor/Ioc and Ioc are the same as 7.2 Uncertainties for S-CCPCH_Ec/Ior and PICH_Ec/Ior are the same as for DPCH_Ec/Ior

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
	Test 2: $\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB S-CCPCH_Ec/Ior ±0.1 dB PICH_Ec/Ior ±0.1 dB	Test 2: Values for Ior/Ioc and Ioc are the same as 7.3 Uncertainties for S-CCPCH_Ec/Ior and PICH_Ec/Ior are the same as for DPCH_Ec/Ior
7.12 Detection of acquisition indicator (AI)	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB AICH_Ec/Ior ±0.1 dB S-CCPCH_Ec/Ior ±0.1 dB	Values for Îor/Ioc and Ioc are the same as 7.2 Uncertainty for AICH_Ec/Ior and S-CCPCH_Ec/Ior is the same as for DPCH_Ec/Ior
7.12A Detection of E-DCH Acquisition Indicator (E-AI)	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB AICH_Ec/Ior ±0.1 dB E-AICH_Ec/Ior ±0.1 dB S-CCPCH_Ec/Ior ±0.1 dB	Values for Ior/Ioc and Ioc are the same as 7.2 Uncertainty for AICH_Ec/Ior, E-AICH and S-CCPCH_Ec/Ior is the same as for DPCH_Ec/Ior
7.13 UE UL power control operation with discontinuous UL DPCCH transmission operation	DL: Ior ±[1.0] dB $\frac{F-DPCH\_E_c}{I_{or}}$ ±[0.1] dB UL: For a greater than 3 dB range ±[0,3]dB	DL: Value for Ior is same as for TC 7.7.2 test 1. Value for F-DPCh is same as TC for TC 7.8.5 UL: This accuracy is based on the linearity of the absolute power measurement of the test equipment.

F.1.5 Requirements for support of RRM

Table F.1.5: Maximum Test System Uncertainty for Radio Resource Management Tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.2 Idle Mode Tasks		
8.2.2 Cell Re-Selection		
8.2.2.1 Scenario 1: Single carrier case	During T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{oc} ±1.0 dB During T1: $I_{or}(2)$ ±0.7 dB $I_{or}(1, 3, 4, 5, 6)$ relative to $I_{or}(2)$ ±0.3 dB During T2: $I_{or}(1)$ ±0.7 dB $I_{or}(2, 3, 4, 5, 6)$ relative to $I_{or}(1)$ ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) The relative uncertainties for Ior(n) across different cells may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainty of Ior(2) at T1 and the relative uncertainty of Ior(1, 3, 4, 5, 6), are uncorrelated to each other. Similarly, the absolute uncertainty of Ior(1) at T2 and the relative uncertainty of Ior(2, 3, 4, 5, 6), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.2.2.2 Scenario 2: Multi carrier case	Channel 1 during T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{oc}(1)$ ±1.0 dB Channel 1 during T1: $I_{or}(1)$ ±0.7 dB $I_{or}(3, 4)$ relative to $I_{or}(1)$ ±0.3 dB Channel 1 during T2: $I_{or}(1)$ ±0.7 dB $I_{or}(3, 4)$ relative to $I_{or}(1)$ ±0.3 dB Channel 2 during T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{oc}(2)$ ±1.0 dB Channel 2 during T1: $I_{or}(2)$ ±0.7 dB $I_{or}(5, 6)$ relative to $I_{or}(2)$ ±0.3 dB Channel 2 during T2: $I_{or}(2)$ ±0.7 dB $I_{or}(5, 6)$ relative to $I_{or}(2)$ ±0.3 dB	
	Assumptions: a) to e): Same as for the one-frequency test 8.2.2.1. f) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(3, 4), are uncorrelated to each other. Similarly, the absolute uncertainty of Ior(2) and the relative uncertainty of Ior(5, 6), are uncorrelated to each other. g) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). h) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.2.3 UTRAN to GSM Cell Re-Selection		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.2.3.1 Scenario 1: Both UTRA and GSM level changed	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.
8.2.3.2 Scenario 2: Only UTRA level changed	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.3.1
8.2.3.3 Scenario 3: HCS with only UTRA level changed	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.3.1
8.2.4 FDD/TDD cell re-selection	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB For multi-band UE with Band I and VI I_{oc1}/I_{oc2} ±0.5 dB	Same as 8.2.2.2
8.2.5 UTRA to E-UTRA Cell Re-Selection		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.2.5.1 E-UTRA is of higher priority	UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config}	Notes: I_{oc} is the AWGN on cell 1 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 1 signal / AWGN CPICH Ec / Ior is the fraction of cell 1 power assigned to the CPICH Physical channel N_{oc} is the AWGN on cell 2 (E-UTRA)frequency Ês / N_{oc} is the ratio of cell 12signal / AWGN
8.2.5.2 E-UTRA is of lower priority	Same as 8.2.5.1	
8.3 UTRAN Connected Mode Mobility		
8.3.1 FDD/FDD Soft Handover	During T0/T1 and T2/T3/T4/T5/T6: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB Relative delay of paths received from cell 2 with respect to cell 1: ±0.5 chips During T0/T1: Already covered above During T2/T3/T4/T5/T6: I_{or}(2) relative to I_{or}(1) ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.3.2 FDD/FDD Hard Handover		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.3.2.1 Handover to intra-frequency cell	During T1 and T2 / T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB I_{oc} ±1.0 dB During T1: Already covered above During T2 / T3: $I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.3.2.2 Handover to inter-frequency cell	Channel 1 during T1 and T2 / T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB $I_{oc}(1)$ ±1.0 dB Channel 2 during T1 and T2 / T3: $I_{oc}(2)$ ±1.0 dB Channel 2 during T1: Already covered above Channel 2 during T2 / T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(2)$ ±0.7 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.3.3 FDD/TDD Handover	TBD	
8.3.4 Inter-system Handover from UTRAN FDD to GSM	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.
8.3.4a Inter-system Handover from UTRAN FDD to E-UTRAN FDD	UTRA Cell: I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB EUTRA Cell: N_{oc} ±0.7 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config}	Notes: I_{oc} is the AWGN on cell 1 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 1 signal / AWGN CPICH Ec / Ior is the fraction of cell 1 power assigned to the CPICH Physical channel N_{oc} is the AWGN on cell 2 frequency Ês / N_{oc} is the ratio of cell 2 signal / AWGN
8.3.4b Inter-system Handover from UTRAN FDD to E-UTRAN TDD	Same as 8.3.4a	Same as 8.3.4a
8.3.4c Inter-system Handover from UTRAN FDD to E-UTRAN FDD: Unknown Target Cell	Same as 8.3.4a	Same as 8.3.4a
8.3.4d Inter-system Handover from UTRAN FDD to E-UTRAN TDD; Unknown Target Cell	Same as 8.3.4a	Same as 8.3.4a
8.3.5 Cell Re-selection in CELL_FACH		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.3.5.1 One frequency present in the neighbour list	During T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{oc} ±1.0 dB During T1: I_{or}(2) ±0.7 dB I_{or}(1, 3, 4, 5, 6) relative to I_{or}(2) ±0.3 dB During T2: I_{or}(1) ±0.7 dB I_{or}(2, 3, 4, 5, 6) relative to I_{or}(1) ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) The relative uncertainties for Ior(n) across different cells may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainty of Ior(2) at T1 and the relative uncertainty of Ior(1, 3, 4, 5, 6), are uncorrelated to each other. Similarly, the absolute uncertainty of Ior(1) at T2 and the relative uncertainty of Ior(2, 3, 4, 5, 6), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.3.5.2 Two frequencies present in the neighbour list	Channel 1 during T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{oc}(1)$ ±1.0 dB Channel 1 during T1: $I_{or}(1)$ ±0.7 dB $I_{or}(3, 4)$ relative to $I_{or}(1)$ ±0.3 dB Channel 1 during T2: $I_{or}(1)$ ±0.7 dB $I_{or}(3, 4)$ relative to $I_{or}(1)$ ±0.3 dB Channel 2 during T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{oc}(2)$ ±1.0 dB Channel 2 during T1: $I_{or}(2)$ ±0.7 dB $I_{or}(5, 6)$ relative to $I_{or}(2)$ ±0.3 dB Channel 2 during T2: $I_{or}(2)$ ±0.7 dB $I_{or}(5, 6)$ relative to $I_{or}(2)$ ±0.3 dB	
	Assumptions: a) to e): Same as for the one-frequency test 8.3.5.1. f) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(3, 4), are uncorrelated to each other. Similarly, the absolute uncertainty of Ior(2) and the relative uncertainty of Ior(5, 6), are uncorrelated to each other. g) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). h) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions is recorded in 3GPP TR 34 902 [24].	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.3.5.3 Cell Re-selection to GSM	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.
8.3.5.4 Cell Reselection during an MBMS session, two frequencies present in neighbour list	Channel 1 during T2 and T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB Channel 1 during T1, T2 and T3: I_{oc}(1) ±1.0 dB Channel 2 during T1, T2 and T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{oc}(2) ±1.0 dB I_{or}(2) ±0.7 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.3.6 Cell Re-selection in CELL_PCH		
8.3.6.1 One frequency present in the neighbour list	Same as 8.2.2.1	Same as 8.2.2.1
8.3.6.2 Two frequencies present in the neighbour list	Same as 8.2.2.2	Same as 8.2.2.2

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.3.6.3 Cell re-selection during an MBMS session, one UTRAN inter-frequency and 2 GSM cells present in the neighbour list	Channel 1 during T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or} (1) ±0.7 dB Channel 1 during T1, T2 and T3: I_{oc} (1) ±1.0 dB Channel 2 during T1, T2 and T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{oc} (2) ±1.0 dB I_{or} (2) ±0.7 dB $\hat{I}_{or}/I_{oc}$ ±0.3 dB GSM during T2: $I_{oc}(2)/RXLEV$ 1 ±0.5 dB RXLEV1 ±1.0 dB $I_{oc}(2)/RXLEV$ 2 ±0.5 dB RXLEV2 ±1.0 dB GSM during T3: $I_{oc}(2)/RXLEV$ 2 ±0.5 dB RXLEV2 ±1.0 dB	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.3.7 Cell Re-selection in URA_PCH		
8.3.7.1 One frequency present in the neighbour list	Same as 8.2.2.1	Same as 8.2.2.1
8.3.7.2 Two frequencies present in the neighbour list	Same as 8.2.2.2	Same as 8.2.2.2

<table>
<tr><th>Clause</th><th>Maximum Test System Uncertainty</th><th>Derivation of Test System Uncertainty</th></tr>
<tr><td rowspan="2">8.3.8 Serving HS-DSCH cell change</td><td>During T0 and T1/T2/T3/T4:
$\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB
$I_{or}(1)$ ±0.7 dB
I_{oc} ±1.0 dB
Relative delay of paths received from cell 2 with respect to cell 1: ±0.5 chips

During T0:
Already covered above

During T1/T2/T3/T4:
$I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB</td><td></td></tr>
<tr><td colspan="2">Assumptions:
a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2.
b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other.
c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other.
An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td rowspan="2">8.3.9 Enhanced Serving HS-DSCH cell change</td><td>During T1/T2/T3/T4:
$\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB
$I_{or}(1)$ ±0.7 dB
$I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB
I_{oc} ±1.0 dB
Relative delay of paths received from cell 2 with respect to cell 1: ±0.5 chips</td><td></td></tr>
<tr><td colspan="2">Assumptions:
a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2.
b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other.
c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other.
An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td>8.3.10 System information acquisition for CSG cell</td><td colspan="2"></td></tr>
</table>

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.3.10.1 Intrafrequency System information acquisition for CSG cell	<u>During T1 / T2:</u> $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB <u>During T1:</u> Already covered above <u>During T2:</u> I_{or}(2) relative to I_{or}(1) ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.3.10.2 Inter frequency System information acquisition for CSG cell	<u>Channel 1 during T1 and T2 / T3:</u> $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc}(1) ±1.0 dB <u>Channel 2 during T1 and T2 / T3:</u> I_{oc}(2) ±1.0 dB <u>Channel 2 during T1:</u> Already covered above <u>Channel 2 during T2 / T3:</u> $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(2) ±0.7 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.4 RRC Connection Control		
8.4.1 RRC Re-establishment delay	Settings. $\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the CPICH_Ec/Ior ratio. The absolute error of the AWGN is specified as 1.0 dB

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.4.2 Random Access	Settings. $\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{AICH\_E_c}{I_{or}}$ ±0.1 dB Measurements: Power difference. ± 1dB Maximum Power: same as 5.5.2	0.1 dB uncertainty in AICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the AICH_Ec/Ior ratio. The absolute error of the AWGN is specified as 1.0 dB Power difference: Assume symmetric meas error ±1.0 dB comprising RSS of: -0.7 dB downlink error plus -0.7 dB meas error. Maximum Power: Assume asymmetric meas error -1.0 dB / 0.7 dB comprising RSS of: -0.7 dB downlink error plus -0.7 dB meas error, and +0.7 dB for upper limit
	PRACH timing error ±0.5 chips	
8.4.3 Transport format combination selection in UE	$\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio
8.4.4 E-TFC restriction in UE		
8.4.4.1 10ms TTI E-DCH E-TFC restriction	$\frac{E_c}{I_{or}}$ ±0.1 dB I_{or} ±0.7 dB DPCCH code domain absolute power measurement uncertainty ±0.9 dB	0.1 dB uncertainty in Ec/Ior ratio Absolute power uncertainty (all codes together) ±0.7dB, relative code domain power uncertainty ±0.5dB, These are uncorrelated so can be combined RSS. Overall error is $(0.5^2 + 0.7^2)^{0.5}$ = 0.9 dB,
8.4.4.2 2ms TTI E-DCH E-TFC restriction	$\frac{E_c}{I_{or}}$ ±0.1 dB I_{or} ±0.7 dB DPCCH code domain absolute power measurement uncertainty ±0.9 dB	0.1 dB uncertainty in Ec/Ior ratio Same as 8.4.4.1
8.5 Timing and Signalling Characteristics		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.5.1 UE Transmit Timing	I_{or} ±1.0 dB I_{or1}/I_{or2} ±0.3 dB $\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB Rx-Tx Timing Accuracy ±0.5 chips Tx-Tx Timing Accuracy ±0.25 chips	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in Ior1/Ior2 based on power meter measurement after the combiner The absolute error of the Ior is specified as 1.0 dB.
8.6 UE Measurements Procedures		
8.6.1 FDD intra frequency measurements		
8.6.1.1 Event triggered reporting in AWGN propagation conditions (R99)	During T1/T4 and T2/T3: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB I_{oc} ±1.0 dB During T1/T4 only: Already covered above During T2/T3 only: $I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB	
8.6.1.1A Event triggered reporting in AWGN propagation conditions (Rel-4 and later)	During T1/T3 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB I_{oc} ±1.0 dB During T1/T3 only: Already covered above During T2 only: $I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB	
8.6.1.1 and 8.6.1.1A	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition (R99)	During T0 to T6: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB During T1/T2, T3 and T6: I_{or}(3) relative to I_{or}(1) ±0.3 dB During T3, T4/T5 and T6: I_{or}(2) relative to I_{or}(1) ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [4], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) The relative uncertainties for Ior(n) across different cells may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The uncertainty for Ioc and Ior(1) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2, 3), are uncorrelated to each other.	
8.6.1.2A Event triggered reporting of multiple neighbours in AWGN propagation condition (Rel-4 and later)	During T0 to T4: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB During T1, T2 and T4: I_{or}(3) relative to I_{or}(1) ±0.3 dB During T2, T3 and T4: I_{or}(2) relative to I_{or}(1) ±0.3 dB	
	Assumptions: Same as 8.6.1.2	
8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition (R99)	During T0 to T5: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB During T1, T2/T3, T4 and T5: I_{or}(3) relative to I_{or}(1) ±0.3 dB During T2/T3, T4 and T5: I_{or}(2) relative to I_{or}(1) ±0.3 dB	

<table>
<tr><th>Clause</th><th>Maximum Test System Uncertainty</th><th>Derivation of Test System Uncertainty</th></tr>
<tr><td>8.6.1.3A Event triggered reporting of two detectable neighbours in AWGN propagation condition (Rel-4 and later)</td><td>During T0 to T4:
$\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB
$I_{or}(1)$ ±0.7 dB
I_{oc} ±1.0 dB

During T1, T2, T3 and T4:
$I_{or}(3)$ relative to $I_{or}(1)$ ±0.3 dB

During T2, T3 and T4:
$I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB</td><td></td></tr>
<tr><td></td><td colspan="2">Assumptions:
a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [4], with a coverage factor of k=2.
b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other.
c) The relative uncertainties for Ior(n) across different cells may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
d) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
e) The uncertainty for Ioc and Ior(1) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
f) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2, 3), are uncorrelated to each other.
An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td>8.6.1.4A Correct reporting of neighbours in fading propagation condition (Rel-4 and later)</td><td>During T1 and T2:
$\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB
$I_{or}(1)$ ±0.7 dB
I_{oc} ±1.0 dB

During T1 and T2:
$I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB</td><td></td></tr>
<tr><td>8.6.1.4A</td><td colspan="2">Assumptions:
a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2.
b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other.
c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).
e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other.
An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].</td></tr>
</table>

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.6.1.5 Event triggered reporting of multiple neighbour cells in Case 1 fading condition	During T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB During T1 and T2: I_{or}(2) relative to I_{or}(1) ±0.3 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [4], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) The relative uncertainties for Ior(n) across different cells may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The uncertainty for Ioc and Ior(1) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.6.1.6 Event triggered reporting of multiple neighbour cells in Case 3 fading condition	During T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{or}(1) ±0.7 dB I_{oc} ±1.0 dB During T1 and T2: I_{or}(2) relative to I_{or}(1) ±0.3 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [4], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) The relative uncertainties for Ior(n) across different cells may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The uncertainty for Ioc and Ior(1) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.6.2 FDD inter frequency measurements		
8.6.2.1 Correct reporting of neighbours in AWGN propagation condition (Release 5 and earlier)	Channel 1 <u>during T0, T1 and T2:</u> $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB I_{oc} ±1.0 dB $I_{or}(1)$ ±0.7 dB <u>Channel 1 during T2:</u> $I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB Channel 2 <u>during T0, T1 and T2:</u> I_{oc} ±1.0 dB Channel 2 <u>during T1 and T2:</u> $I_{or}(3)$ ±0.7 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated) d) The uncertainty for Ioc and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainty of Ior(1) and the relative uncertainty of Ior(2), are uncorrelated to each other. f) The absolute uncertainties for Ior(1) and Ior(3) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). g) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.6.2.1A Correct reporting of neighbours in AWGN propagation condition (Release 6 and later)	Same as 8.6.2.1	Same as 8.6.2.1
8.6.2.2 Correct reporting of neighbours in Fading propagation condition (Release 5 only)	Channel 1 during T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB $I_{oc}(1)$ ±1.0 dB Channel 2 during T1 and T2: $I_{oc}(2)$ ±1.0 dB Channel 2 during T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(2)$ ±0.7 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	
8.6.2.2A Correct reporting of neighbours in Fading propagation condition (Release 6 and later)	Same as 8.6.2.2	Same as 8.6.2.2

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.6.2.3 Correct reporting of neighbours in Fading propagation condition using TGL1=14	Channel 1 during T1 and T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB $I_{oc}(1)$ ±1.0 dB Channel 2 during T1 and T2: $I_{oc}(2)$ ±1.0 dB Channel 2 during T2: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(2)$ ±0.7 dB	
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated).	
8.6.3 TDD measurements		
8.6.3.1Correct reporting of TDD neighbours in AWGN propagation condition	TBD	
8.6.4 GSM Measurement		
8.6.4.1 Correct reporting of GSM neighbours in AWGN propagation condition	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.
8.6.5 Combined Inter frequency and GSM measurements		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.6.5.1 Correct reporting of neighbours in AWGN propagation condition	Channel 1 during T0 to T5: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(1)$ ±0.7 dB $I_{oc}(1)$ ±1.0 dB $\hat{I}_{or}/I_{oc}$ ±0.3 dB Channel 1 during T2 to T5: $I_{or}(2)$ relative to $I_{or}(1)$ ±0.3 dB For multi-band UE with Band I and VI $I_{or}(2)$ relative to $I_{or}(1)$ ±0.5 dB Channel 2 during T0 to T5: $I_{oc}(2)$ ±1.0 dB Channel 2 during T2 to T5: $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB $I_{or}(2)$ ±0.7 dB $\hat{I}_{or}/I_{oc}$ ±0.3 dB GSM during T4/T5 $I_{oc}/RXLEV$ ±0.5 dB RXLEV ±1.0 dB	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.
	Assumptions: a) The contributing uncertainties for Ior(n), channel power ratio, and Ioc are derived according to ETR 273-1-2 [16], with a coverage factor of k=2. b) Within each cell, the uncertainty for Ior(n), and channel power ratio are uncorrelated to each other. c) Across different cells, the channel power ratio uncertainties may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). d) The uncertainty for Ioc(n) and Ior(n) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). e) The absolute uncertainties for Ior(1) and Ior(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). f) The absolute uncertainties for Ioc(1) and Ioc(2) may have any amount of positive correlation from zero (uncorrelated) to one (fully correlated). An explanation of correlation between uncertainties, and of the rationale behind the assumptions, is recorded in 3GPP TR 34 902 [24].	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.6.6.1 Correct reporting of E-UTRAN FDD neighbour in fading propagation condition	UTRA Cell: I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.6 dB CPICH E_c / I_{or} ±0.1 dB EUTRA Cell: N_{oc} ±0.7 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config}	Notes: I_{oc} is the AWGN on cell 1 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 1 signal / AWGN CPICH Ec / Ior is the fraction of cell 1 power assigned to the CPICH Physical channel N_{oc} is the AWGN on cell 2 frequency Ês / N_{oc} is the ratio of cell 2 signal / AWGN
8.6.6.2 Correct reporting of E-UTRAN TDD neighbour in fading propagation condition	Same as 8.6.6.1	Same as 8.6.6.1
8.6.7.1 Correct reporting of E-UTRA FDD neighbours in fading propagation condition	UTRA Cell1 : I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB UTRA Cell2 : I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.6 dB CPICH E_c / I_{or} ±0.1 dB EUTRA Cell 3: N_{oc} ±0.7 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config}	Notes: I_{oc} is the AWGN on cell 1 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 1 signal / AWGN CPICH Ec / Ior is the fraction of cell 1 power assigned to the CPICH Physical channel I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH Ec / Ior is the fraction of cell 2 power assigned to the CPICH Physical channel N_{oc} is the AWGN on cell 3 frequency Ês / N_{oc} is the ratio of cell 3 signal / AWGN For Cell 2 and Cell 3: I_{or} / I_{oc} uncertainty or Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty or I_{or} / I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.6.7.2 Correct reporting of E-UTRA TDD neighbours in fading propagation condition	Same as 8.6.7.1	Same as 8.6.7.1
8.7 Measurements Performance Requirements		
8.7.1 CPICH RSCP		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.7.1.1 Intra frequency measurements accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.1
8.7.1.2 Inter frequency measurement accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB For multi-band UE with Band I and VI I_{oc1}/I_{oc2} ±0.5 dB for	Same as 8.2.2.2
8.7.2 CPICH Ec/Io		
8.7.2.1 Intra frequency measurements accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.1
8.7.2.2 Inter frequency measurement accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB For multi-band UE with Band I and VI I_{oc1}/I_{oc2} ±0.5 dB for	Same as 8.2.2.2
8.7.3.1 UTRA Carrier RSSI, absolute measurement accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB For multi-band UE with Band I and VI I_{oc1}/I_{oc2} ±0.5 dB	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.3 dB or 0.5dB uncertainty in Ioc1/Ioc2 based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB
8.7.3.2 UTRA Carrier RSSI, relative measurement accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc2}/I_{oc3} ±0.3 dB For multi-band UE with Band I and VI I_{oc2}/I_{oc3} ±0.5 dB	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.3 dB uncertainty in Ioc2/Ioc3 based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.7.3A GSM Carrier RSSI	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.5 dB I_{oc} ±1.0 dB $\frac{CPICH\_E_c}{I_{or}}$ ±0.1 dB RXLEV ±1.0 dB RXLEV1/RXLEV2 ±1.4 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.5 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB. The relative accuracy of RXLEV1 to RXLEV2 is specified to be 1.4 dB (RMS of individual uncertainties) when BCCHs are on the same or on different RF channel within the same frequency band The relative accuracy of RXLEV1 to RXLEV2 is specified to be 1.4 dB (RMS of individual uncertainties) when BCCHs are on different frequency band
8.7.3C UE Transmitted power (R99 and Rel-4 only)	Mean power measurement ±0,7 dB	Downlink parameters are unimportant.
8.7.3D UE Transmitted power (Rel-5 and later)	Mean power measurement ±0,7 dB	Downlink parameters are unimportant.
8.7.4 SFN-CFN observed time difference		
8.7.4.1 Intra frequency measurements accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB Actual SFN-CFN observed time difference: ±0.5 chips	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB
8.7.4.2 Inter frequency measurements accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB Actual SFN-CFN observed time difference: ±0.5 chips	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB
8.7.5.1 SFN-SFN observed time difference type 1	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB Actual SFN-SFN observed time difference type 1: ±0.5 chips	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.7.6.1 UE Rx-Tx time difference (Release 5 and earlier)	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB Rx-Tx Timing Accuracy ±0.5 chip	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB.
8.7.6.1A UE Rx-Tx time difference (Release 6 and later)	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB Rx-Tx Timing Accuracy ±0.5 chip	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB.
8.7.8 P-CCPCH RSCP	TBD	
8.7.9 UE Transmission Power Headroom	$\frac{E_c}{I_{or}}$ ±0.1 dB Overall UL absolute power measurement uncertainty ±0.7 dB DPCCH code domain absolute power measurement uncertainty ±0.8 dB	0.1 dB uncertainty in Ec/Ior ratio Absolute power uncertainty (all codes together) ±0.7dB, relative code domain power uncertainty ±0.3dB, These are uncorrelated so can be combined RSS. Overall error is $(0.3^2 + 0.7^2)^{0.5}$ = 0.8 dB,
8.7.10 E-UTRAN FDD RSRP absolute accuracy	<u>UTRA cell</u> I_{oc} ±0.7 dB $\hat{I}_{or}$ / I_{oc} ±0.3 dB CPICH E_C/I_{or} ±0.1 dB <u>E-UTRA cell</u> N_{oc} ±0.7 dB averaged over BW_{Config} N_{oc} ±1.0 dB for PRBs #22-27 $\hat{E}_S$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.8 dB for PRBs #22-27	Note: I_{oc} is the AWGN on cell 1 frequency $\hat{I}_{or}$ / I_{oc} is the ratio of cell 1 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 1 power assigned to the CPICH Physical channel N_{oc} is the AWGN on cell 2 frequency $\hat{E}_S$ / N_{oc} is the ratio of cell 2 signal / AWGN
8.7.11 E-UTRAN TDD RSRP absolute accuracy	Same as 8.7.10	Same as 8.7.10
8.7.12 E-UTRAN FDD RSRQ absolute accuracy	Same as 8.7.10	Same as 8.7.10
8.7.13 E-UTRAN TDD RSRQ absolute accuracy	Same as 8.7.10	Same as 8.7.10

F.1.6 Performance requirement (HSDPA)

Table F.1.6: Maximum Test System Uncertainty for Performance Requirements (HSDPA)

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.2.1A to 9.2.1KD Single Link Performance	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB For multi-carrier, uncertainties apply for each carrier	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB For multi-carrier, uncertainties apply for each carrier
9.2.1L to 9.2.1LD Single Link Enhanced Performance Type 3i	Wanted signal $\hat{I}_{or1}/I_{oc}$ ±0.6 dB First interferer $\hat{I}_{or2}/I_{oc}$ ±0.6 dB Second interferer $\hat{I}_{or3}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB For multi-carrier, uncertainties apply for each carrier	0.1 dB uncertainty in Ec/Ior ratio For wanted signal and each interferer, worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ uncertainty as 7.2. These are uncorrelated so can be combined RSS. Overall uncertainty in $\hat{I}_{or}/I_{oc}$,for each signal: $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB. For multi-carrier, uncertainties apply for each carrier
9.2.2A to 9.2.2E Open loop diversity performance	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB. Round up to 0.8 dB
9.2.3A to 9.2.3E Closed loop diversity performance	Same as 9.2.2A	Same as 9.2.2A
9.2.4A to 9.2.4H MIMO performance	Same as 9.2.2A	Same as 9.2.2A

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.3.1 Single Link Performance - AWGN propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is not important for any tests in clause 7 but is specified as 1.0 dB.
9.3.1A Single Link Performance - AWGN propagation conditions, 64QAM	Same as 9.3.1	Same as 9.3.1
9.3.1B Single Link Performance - AWGN Propagation Conditions, DC-HSDPA requirements	$\hat{I}_{or1}/I_{oc}$ ±0.3 dB $\hat{I}_{or2}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is not important for any tests in clause 7 but is specified as 1.0 dB.
9.3.1BA Single Link Performance - AWGN Propagation Conditions, DB-DC-HSDPA requirements	$\hat{I}_{or1}/I_{oc}$ ±0.3 dB $\hat{I}_{or2}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is not important for any tests in clause 7 but is specified as 1.0 dB.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.3.1C Single Link Performance - AWGN Propagation Conditions, Periodically Varying Radio Conditions	$\hat{I}_{or}/I_{oc1}, \hat{I}_{or}/I_{oc2}$ ±0.3 dB I_{oc1}, I_{oc2} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB I_{oc} Linearity within the applicable range of 10dB 1.0 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is specified as 1.0 dB. The linearity of the AWGN Ioc is specified as 1.0 dB (±0.5dB)
9.3.2 Single Link Performance - Fading propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5} = 0.6$ dB
9.3.2A Single Link Performance - Fading Propagation Conditions, DC-HSDPA requirements	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is (0.52 + 0.32) 0.5 = 0.6 dB
9.3.2AA Single Link Performance - Fading Propagation Conditions, DB-DC-HSDPA requirements	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is (0.52 + 0.32) 0.5 = 0.6 dB
9.3.2B Single Link Performance - Fading propagation conditions, 64QAM	Same as 9.3.2	Same as 9.3.2

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.3.3 Open Loop Diversity Performance - AWGN propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.5 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ for each antenna output based on power meter measurement after the combiner In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.3^2 + 0.3^2)^{0.5}$ = 0.424 dB. Round up to 0.5 dB
9.3.4 Open Loop Diversity Performance - Fading propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB. Round up to 0.8 dB
9.3.5 Closed Loop Diversity Performance - AWGN propagation conditions	Same as 9.3.3	
9.3.6 Closed Loop Diversity Performance - Fading propagation conditions	Same as 9.3.4	
9.3.7A, MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions	Same as 9.3.4	
9.3.7B MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions	Same as 9.3.4	
9.3.7C MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20	Same as 9.3.4	
9.3.7D MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20	Same as 9.3.4	
9.3.7E MIMO performance –Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20	Same as 9.3.4	
9.3.7F MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions – Asymmetric CPICHs	Same as 9.3.4	
9.3.7G MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions –Asymmetric CPICHs	Same as 9.3.4	
9.3.7H MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20	Same as 9.3.4	
9.3.7I MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20 -Asymmetric CPICHs	Same as 9.3.4	
9.3.7J MIMO performance –Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20 –Asymmetric CPICHs	Same as 9.3.4	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.4.1 Single link Performance	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB
9.4.1A Single link Performance – Enhanced Performance Requirements Type 1	Same as 9.4.1	Same as 9.4.1
9.4.2 Open loop diversity performance	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is (0.52 + 0.52 + 0.32) 0.5 = 0.768 dB. Round up to 0.8 dB
9.4.2A Open loop diversity performance – Enhanced Performance Requirements Type 1	Same as 9.4.2	Same as 9.4.2
9.4.3 HS-SCCH Type 3 performance	Same as 9.4.2	Same as 9.4.2
9.4.3A HS-SCCH Type 3 Performance - STTD disabled- Asymmetric CPICHs	Same as 9.4.2	Same as 9.4.2
9.4.3B HS-SCCH Type 3 Performance - STTD enabled- Asymmetric CPICHs	Same as 9.4.2	Same as 9.4.2
9.4.4 HS-SCCH Type 3 performance for MIMO only with single-stream restriction	Same as 9.4.2	Same as 9.4.2
9.4.4A HS-SCCH Type 3 performance for MIMO only with single-stream restriction-Enhanced Performance Requirements Type 1	Same as 9.4.2	Same as 9.4.2
9.4.4B HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD disabled-asymmetric CPICHs	Same as 9.4.2	Same as 9.4.2
9.4.4C HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD disabled-asymmetric CPICHs-Enhanced Performance Requirements Type 1	Same as 9.4.2	Same as 9.4.2
9.4.4D HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD enabled-asymmetric CPICHs	Same as 9.4.2	Same as 9.4.2
9.4.4E HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD enabled-asymmetric CPICHs-Enhanced Performance Requirements Type 1	Same as 9.4.2	Same as 9.4.2
9.5.1 HS-SCCH-less demodulation of HS-DSCH	Same as 9.2.1A	Same as 9.2.1A

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.5.1A HS-SCCH-less demodulation of HS-DSCH, Enhanced Performance Requirements Type 1	Same as 9.2.1A	Same as 9.2.1A
9.6.1 Single link HS-DSCH Demodulation performance in CELL_FACH state	Same as 9.2.1A	Same as 9.2.1A
9.6.2 Single link HS-SCCH Detection performance in CELL_FACH state	Same as 9.2.1A	Same as 9.2.1A

F.1.7 Performance requirement (E-DCH)

Table F.1.7: Maximum Test System Uncertainty for Performance Requirements (E-DCH)

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.2.1L Single Link Enhanced Performance Type 3i	0.76 dB for $\hat{I}_{or}/I_{oc}$' 0.17 dB for DIP1, DIP2 0.1 dB for Ec/Ior	
10.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms TTI)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-HICH_Ec/Ior ±0.1 dB	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB
10.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms TTI, Type 1)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-HICH_Ec/Ior ±0.1 dB	0.1 dB uncertainty in Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB
10.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI)	Same as in 10.2.1.1	Same as 10.2.1.1
10.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI, Type 1)	Same as in 10.2.1.1	Same as 10.2.1.1
10.2.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI)	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-HICH_Ec/Ior ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error per $\hat{I}_{or1}/I_{oc}$ or $\hat{I}_{or2}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5} = 0.6$ dB.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.2.1L Single Link Enhanced Performance Type 3i	0.76 dB for $\hat{I}_{or}/I_{oc}$' 0.17 dB for DIP1, DIP2 0.1 dB for Ec/Ior	
10.2.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI, Type 1)	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-HICH_Ec/Ior ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error per $\hat{I}_{or1}/I_{oc}$ or $\hat{I}_{or2}/I_{oc}$ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB.
10.2.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI)	Same as 10.2.2.1.1	Same as 10.2.2.1.1
10.2.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI, Type 1)	Same as 10.2.2.1.1	Same as 10.2.2.1.1
10.2.2.2.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI)	Same as 10.2.2.1.1	Same as 10.2.2.1.1
10.2.2.2.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI, Type 1)	Same as 10.2.2.1.1	Same as 10.2.2.1.1
10.2.2.2.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI)	Same as 10.2.2.1.1	Same as 10.2.2.1.1
10.2.2.2.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI, Type 1)	Same as 10.2.2.1.1	Same as 10.2.2.1.1
10.3.1.1 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-RGCH_Ec/Ior ±0.1 dB	Same as 10.2.1.1
10.3.1.1A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI, Type 1)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-RGCH_Ec/Ior ±0.1 dB	Same as 10.2.1.1
10.3.1.2 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI)	Same as 10.3.1.1	Same as in 10.2.1.1
10.3.1.2A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI, Type 1)	Same as 10.3.1.1	Same as in 10.2.1.1

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
9.2.1L Single Link Enhanced Performance Type 3i	0.76 dB for $\hat{I}_{or}/I_{oc}$' 0.17 dB for DIP1, DIP2 0.1 dB for Ec/Ior	
10.3.2 Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-RGCH_Ec/Ior ±0.1 dB	Same as 10.2.2.1.1
10.3.2A Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions (Type 1)	$\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-RGCH_Ec/Ior ±0.1 dB	Same as 10.2.2.1.1
10.4.1 Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-AGCH_Ec/Ior ±0.1 dB	Same as 10.2.1.1
10.4.1A Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance (Type 1)	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB E-AGCH_Ec/Ior ±0.1 dB	Same as 10.2.1.1

F.1.8 Performance requirement (MBMS)

Table F.1.8: Maximum Test System Uncertainty for Performance Requirements (MBMS)

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
11.2 Demodulation of MTCH	S-CCPCH_Ec/Ior ±0.1 dB I_{oc} ±1.0 dB $\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB $\hat{I}_{or3}/I_{oc}$ ±0.6 dB	0.1 dB uncertainty in S-CCPCH_Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output. In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 1.0 dB, but per output $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ or $\hat{I}_{or3}/I_{oc}$ the error is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB.
11.2A Demodulation of MTCH - Enhanced Performance Requirements Type 1	S-CCPCH_Ec/Ior ±0.1 dB I_{oc} ±1.0 dB $\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB $\hat{I}_{or3}/I_{oc}$ ±0.6 dB	0.1 dB uncertainty in S-CCPCH_Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output. In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 1.0 dB, but per output $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ or $\hat{I}_{or3}/I_{oc}$ the error is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB.
11.3 Demodulation of MTCH and cell identification	S-CCPCH_Ec/Ior ±0.1 dB I_{oc} ±1.0 dB $\hat{I}_{or1}/I_{oc}$ ±0.6 dB $\hat{I}_{or2}/I_{oc}$ ±0.6 dB $\hat{I}_{or3}/I_{oc}$ ±0.6 dB	0.1 dB uncertainty in S-CCPCH_Ec/Ior ratio Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output. In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ is $(0.5^2 + 0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 1.0 dB, but per output $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ or $\hat{I}_{or3}/I_{oc}$ the error is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB.

F.2 Test Tolerances (This clause is informative)

The Test Tolerances defined in this clause have been used to relax the Minimum Requirements in the present document to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.).

F.2.1 Transmitter

Table F.2.1: Test Tolerances for transmitter tests

Clause	Test Tolerance
5.2 Maximum Output Power	0.7 dB
5.2A Maximum Output Power with HS-DPCCH (Release 5 only)	0.7 dB
5.2AA Maximum Output Power with HS-DPCCH (Release 6 and later)	0.7 dB
5.2B Maximum Output Power with HS-DPCCH and E-DCH	0.7 dB
5.2BA UE Maximum Output Power for DC-HSUPA (QPSK)	0.7 dB
5.2BB UE Maximum Output Power for DC-HSUPA (16QAM)	0.7 dB
5.2C UE relative code domain power accuracy	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB
5.2D UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB
5.2DA UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB
5.2E UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB For -20 dB ≥ -30 dB CDP 0.5 dB
5.2 EA UE relative code domain power accuracy for DC-HSUPA using HS-DPCCH and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB For -20 dB ≥ -30 dB CDP 0.5 dB
5.3 Frequency error	10 Hz
5.3A Frequency Error for DC-HSUPA	10 Hz per carrier
5.3C Frequency error for UL CLTD Activation state 1	10 Hz
5.3D Frequency error for UL CLTD Activation state 2 and 3	10 Hz
5.4.1 Open loop power control in uplink	1.0 dB
5.4.1A Open Loop Power Control in the Uplink for DC-HSUPA	1.0 dB per carrier
5.4.2 Inner loop power control in the uplink	0.1 dB (1 dB and 0 dB range) 0.15 dB (2 dB range) 0.2 dB (3 dB range 0.3 dB (> 3 dB range))
5.4.2A Inner Loop Power Control in the Uplink for DC-HSUPA	0.1 dB per carrier (1 dB and 0 dB range) 0.15 dB per carrier (2 dB range) 0.2 dB per carrier (3 dB range 0.3 dB per carrier (> 3 dB range))
5.4.3 Minimum Output Power	1.0 dB
5.4.3A Minimum Output Power for DC-HSUPA	1.0 dB

Clause	Test Tolerance
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH\_E_c}{I_{or}}$	0.4 dB
5.4.4 Out-of-synchronisation handling of output power: transmit ON/OFF time	0 ms
5.4.4A Out-of-synchronisation handling of output power for a UE which supports type 1 for DCH: $\frac{DPCCH\_E_c}{I_{or}}$	0.4 dB
5.4.4 A Out-of-synchronisation handling of output power for a UE which supports type 1 for DCH: transmit ON/OFF time	0 ms
5.5.1 Transmit OFF power	1.0 dB
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0.7 dB / -1.0 dB Off power TT 1.0 dB
5.6 Change of TFC: power control step size	0.3 dB
5.7 Power setting in uplink compressed mode:-UE output power	See subset of 5.4.2
5.7A HS-DPCCH	0.1 dB (1 dB and 0 dB range) 0.15 dB (2 dB range) 0.2 dB (3 dB range) 0.3 dB (> 3 dB range)
5.8 Occupied Bandwidth	0 kHz
5.8A Occupied Bandwidth for DC-HSUPA	0 kHz
5.9 Spectrum emission mask	1.5 dB (0 dB for additional requirements for Band II, Band IV, Band V and Band X only)
5.9A Spectrum emission mask with HS-DPCCH	1.5 dB (0 dB for additional requirements for Band II, Band IV, Band V and Band X only)
5.9B Spectrum emission mask with E-DCH	1.5 dB (0 dB for additional requirements for Band II, Band IV and Band V only)
5.9C Additional Spectrum Emission Mask for DC-HSUPA (QPSK)	1.5 dB (0 dB for additional requirements for band II, IV, V and X only)
5.9D Additional Spectrum Emission Mask for DC-HSUPA (16QAM)	1.5 dB (0 dB for additional requirements for band II, IV, V and X only)
5.10 ACLR	0.8 dB for ratio 0.0 dB for absolute power
5.10A ACLR with HS-DPCCH	0.8 dB for ratio 0.0 dB for absolute power
5.10B ACLR with E-DCH	0.8 dB for ratio 0.0 dB for absolute power
5.10C ACLR with E-DCH for DC-HSUPA (QPSK)	0.8 dB for ratio 0.0 dB for absolute power
5.10D ACLR with E-DCH for DC-HSUPA (16QAM)	0.8 dB for ratio 0.0 dB for absolute power
5.11 Spurious emissions	0 dB
5.11A Spurious emissions for DC-HSUPA	0 dB
5.12 Transmit Intermodulation	0 dB
5.12A Transmit Intermodulation for DC-HSUPA	0 dB
5.13.1 Transmit modulation: EVM	0%
5.13.1A Transmit modulation: EVM with HS-DPCCH	0%
5.13.1AA Transmit modulation: EVM and phase discontinuity with HS-DPCCH	0% EVM 6 degress phase discontinuity
5.13.1AAA EVM and IQ origin offset for HS-DPCCH with E-DCH with 16 QAM	±0.5 dB (for IQ origin offset)
5.13.2 Transmit modulation: peak code domain error	1.0 dB
5.13.2A Relative Code Domain Error	±0.5 dB
5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH	±0.5 dB

Clause	Test Tolerance
5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA	±0.5 dB
5.13.2C Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM	±0.5 dB
5.13.3 UE phase discontinuity	0% for EVM
	10 Hz for Frequency error
	6 degree for Phase discontinuity
5.13.4 PRACH preamble quality (EVM)	0%
5.13.4 PRACH preamble quality (Frequency error)	10 Hz
5.13.5 In-band emission for DC-HSUPA	0.8 dB

F.2.2 Receiver

Table F.2.2: Test Tolerances for receiver tests

Clause	Test Tolerance
6.2 Reference sensitivity level	0.7 dB for Ior and Ec
6.2A Reference sensitivity level for DC-HSDPA	0.7 dB for Ior and Ec (for both DC-HSDPA cells)
6.2B Reference sensitivity level for DB-DC-HSDPA	0.7 dB for Ior and Ec (for both DB-DC-HSDPA cells)
6.2C Reference sensitivity level for single band 4C-HSDPA	0.7 dB for Ior and Ec (for all 3C-HSDPA cells)
6.2D Reference sensitivity level for Dual band 4C-HSDPA	0.7 dB for Ior and Ec (for all 4C-HSDPA cells)
6.2DA Reference sensitivity level for Dual band 4C-HSDPA (3 carrier)	0.7 dB for Ior and Ec (for all 3C-HSDPA cells)
6.3 Maximum input level:	0.7 dB for Ior
6.3A Maximum Input Level for HS-PDSCH Reception (16QAM)	0.7 dB for Ior
6.3B Maximum Input Level for HS-PDSCH Reception (64QAM)	0.7 dB for Ior
6.3C Maximum Input Level for DC-HSDPA Reception (16QAM)	0.7 dB for Ior (for both DC-HSDPA cells)
6.3D Maximum Input Level for DC-HSDPA Reception (64QAM)	0.7 dB for Ior (for both DC-HSDPA cells)
6.3E Maximum Input Level for DB-DC-HSDPA Reception (16QAM)	0.7 dB for Ior (for both DB-DC-HSDPA cells)
6.3F Maximum Input Level for DB-DC-HSDPA Reception (64QAM)	0.7 dB for Ior (for both DB-DC-HSDPA cells)
6.3G Maximum Input Level for 4C-HSDPA Reception (16QAM)	0.7 dB for Ior and Ec (for all 4C-HSDPA cells)
6.3GA Maximum Input Level for 4C-HSDPA Reception (16QAM) (3 carrier)	0.7 dB for Ior and Ec (for all 3C-HSDPA cells)
6.3H Maximum Input Level for 4C-HSDPA Reception (64QAM)	0.7 dB for Ior and Ec (for all 4C-HSDPA cells)
6.3HA Maximum Input Level for 4C-HSDPA Reception (64QAM) (3 carrier)	0.7 dB for Ior and Ec (for all 3C-HSDPA cells)
6.4 Adjacent channel selectivity (Rel-99 and Rel-4)	0 dB
6.4A Adjacent channel selectivity (Rel-5 and later releases)	0 dB
6.4B Adjacent channel selectivity (ACS) for DC-HSDPA	0 dB
6.4C Adjacent channel selectivity (ACS) for DB-DC-HSDPA	0 dB
6.5 Blocking characteristics	0 dB
6.5A Blocking characteristics for DC-HSDPA	0 dB
6.5B Blocking characteristics for DB-DC-HSDPA	0 dB
6.5C Blocking characteristics for DC-HSUPA	0 dB
6.5D Blocking Characteristics for single Uplink Single band 4C-HSDPA	0 dB
6.5E Blocking Characteristics for dual Uplink Single band 4C-HSDPA	0 dB
6.5F Blocking Characteristics for single Uplink Dual band 4C-HSDPA	0 dB
6.5FA Blocking Characteristics for single Uplink Dual band 4C-HSDPA (3 carrier)	0 dB
6.5G Blocking Characteristics for dual Uplink Dual band 4C-HSDPA	0 dB
6.5GA Blocking Characteristics for dual Uplink Dual band 4C-HSDPA (3 carrier)	0 dB
6.6 Spurious Response	0 dB
6.6A Spurious Response for DC-HSDPA	0 dB

Clause	Test Tolerance
6.6B Spurious Response for DB-DC-HSDPA	0 dB
6.6C Spurious Response for single band 4C-HSDPA	0 dB
6.6D Spurious Response for dual band 4C-HSDPA	0 dB
6.6DA Spurious Response for dual band 4C-HSDPA (3 carrier)	0 dB
6.7 Intermodulation Characteristics	0 dB
6.7A Intermodulation Characteristics for DC-HSDPA	0 dB
6.7B Intermodulation Characteristics for DB-DC-HSDPA	0 dB
6.7C Intermodulation Characteristics for DC-HSUPA	0 dB
6.7D Intermodulation Characteristics for single uplink single band 4C-HSDPA	0 dB
6.7E Intermodulation Characteristics for single uplink dual band 4C-HSDPA	0 dB
6.7EA Intermodulation Characteristics for single uplink dual band 4C-HSDPA (3 carrier)	0 dB
6.8 Spurious emissions	0 dB

F.2.3 Performance requirements

Table F.2.3: Test Tolerances for Performance Requirements

Clause	Test Tolerance
7.2 Demodulation in Static Propagation Condition	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.3 Demodulation of DCH in multipath Fading Propagation conditions	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.4 Demodulation of DCH in Moving Propagation conditions	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.5 Demodulation of DCH in Birth-Death Propagation conditions	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.5A Demodulation of DCH in high speed train conditions	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	0.8 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	0.8 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	0.8 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.1 Demodulation in inter-cell soft Handover conditions (Release 5 and earlier)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.1A Demodulation in inter-cell soft Handover conditions (Release 6 and later)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.2 Combining of TPC commands Test 1	0 dB for Ior1, Ior2 0.1 dB for DPCH_Ec/Ior
7.7.2 Combining of TPC commands Test 2	0.8 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.3 Combining of reliable TPC commands from radio links of different radio link sets	Test parameters: 0 dB for $\hat{I}_{or1}/I_{oc}$ 0 dB for $\hat{I}_{or2}/I_{oc}$ 0 dB for $\hat{I}_{or3}/I_{oc}$ 0 dB for DPCH_Ec1/Ior1 0 dB for DPCH_Ec2/Ior2 0 dB for DPCH_Ec3/Ior3 Test requirements: 0 dB for Test 1 0 dB for Test 2
7.8.1 Power control in downlink constant BLER target (Release 5 and earlier)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior For test cases wherein the SS response time to DL power control commands is delayed by one timeslot from the immediate response the following $\frac{DPCH\_E_c}{I_{or}}$ test tolerances apply: Test 1: 0.4 dB for $\frac{DPCH\_E_c}{I_{or}}$ Test 2: 0.3 dB for $\frac{DPCH\_E_c}{I_{or}}$

Clause	Test Tolerance
7.8.1A Power control in downlink constant BLER target (Release 6 and later)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.8.2, Power control in downlink initial convergence (Release 5 and earlier)	0.6 dB for measured DPCH_Ec/Ior power ratio values during T1 and T2. When the SS response time to DL power control commands is delayed by one timeslot from the immediate response the following measured DPCH_Ec/Ior power ratio value test tolerance applies: Test 1, 2, 3 and 4: 0.8 dB (= rounded 0.75 dB)
7.8.3A, Power control in downlink: wind up effects (Release 6 and later)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.8.3, Power control in downlink: wind up effects	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior For test cases wherein the SS response time to DL power control commands is delayed by one timeslot from the immediate response the following $\frac{DPCH\_E_c}{I_{or}}$ test tolerance applies: Test 1: 0.4 dB for $\frac{DPCH\_E_c}{I_{or}}$
7.8.4, Power control in the downlink, different transport formats	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior For test cases where the SS response time to DL power control commands is delayed by one timeslot from the immediate response the following $\frac{DPCH\_E_c}{I_{or}}$ test tolerances apply: Test 1 stage 1: 0.3 dB for $\frac{DPCH\_E_c}{I_{or}}$ Test 1 stage 2: 0.2 dB for $\frac{DPCH\_E_c}{I_{or}}$
7.8.5, Power control in the downlink for F-DPCH	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for F-DPCH_Ec/Ior
7.9.1 Downlink compressed mode (Release 5 and earlier)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.9.1A Downlink compressed mode (Release 6 and later)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.10 Blind transport format detection Tests 1, 2, 3	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.10 Blind transport format detection Tests 4, 5, 6	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.11 Demodulation of paging channel (PCH)	Test 1: 0.4 dB for $\hat{I}_{or}/I_{oc}$
	Test 2: 0.7 dB for $\hat{I}_{or}/I_{oc}$
7.12 Detection of acquisition indicator (AI)	0.4 dB for $\hat{I}_{or}/I_{oc}$
7.12A Detection of E-DCH Acquisition Indicator (E-AI)	0.4 dB for $\hat{I}_{or}/I_{oc}$
7.13 UE UL power control operation with discontinuous UL DPCCH transmission operation	DL: No test tolerances applied UL: [0.3[dB for the measured UL power step

F.2.4 Requirements for support of RRM

Table F.2.4: Test Tolerances for Radio Resource Management Tests

Clause	Test Tolerance
8.2 Idle Mode Tasks	
8.2.2 Cell Re-Selection	
8.2.2.1 Scenario 1: Single carrier case	During T1 and T2: +0.60 dB for all Cell 1 and 2 Ec/Ior ratios -0.50 dB for all Cell 3, 4 ,5, 6 Ec/Ior ratios +0.03 dB for Ior(3, 4, 5, 6) During T1: -0.27 dB for Ior(1) +0.13 dB for Ior(2) During T2: +0.13 dB for Ior(1) -0.27 dB for Ior(2)
8.2.2.2 Scenario 2: Multi carrier case	Channel 1 during T1 and T2: +0.70 dB for all Cell 1 Ec/Ior ratios -0.80 dB for all Cell 3 and 4 Ec/Ior ratios Channel 1 during T1: -0.01 dB for Ior(1) -0.01 dB for Ior(3, 4) No change for Ioc(1) Channel 1 during T2: +0.75 dB for Ior(1) -0.05 dB for Ior(3, 4) -1.80 dB for Ioc(1) Channel 2 during T1 and T2: +0.70 dB for all Cell 2 Ec/Ior ratios -0.80 dB for all Cell 5 and 6 Ec/Ior ratios Channel 2 during T1: +0.75 dB for Ior(2) -0.05 dB for Ior(5, 6) -1.80 dB for Ioc(2) Channel 2 during T2: -0.01 dB for Ior(2) -0.01 dB for Ior(5, 6) No change for Ioc(2)
8.2.3 UTRAN to GSM Cell Re-Selection	
8.2.3.1 Scenario 1: Both UTRA and GSM level changed	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 1.0 dB for RXLEV
8.2.3.2 Scenario 2: Only UTRA level changed	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 1.0 dB for RXLEV
8.2.3.3 Scenario 3: HCS with only UTRA level changed	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 1.0 dB for RXLEV
8.2.4 FDD/TDD cell re-selection	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc1/Ioc2 For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2
8.2.5 UTRA to E-UTRA Cell Re-Selection	

Clause	Test Tolerance
8.2.5.1 E-UTRA is of higher priority	UTRA cell during T1: 0dB for Ioc +0.80dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T1: -1.10dB for Noc 0dB for Ês / N_{oc} UTRA cell during T2: 0dB for Ioc +0.80dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T2: -1.10dB for Noc +1.90dB for Ês / N_{oc} UTRA cell during T3: 0dB for Ioc +0.80dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T3: -1.10dB for Noc +0.30dB for Ês / N_{oc}
8.2.5.2 E-UTRA is of lower priority	UTRA cell during T1: -0.10dB for Ioc +0.90dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T1: 0dB for Noc +0.80dB for Ês / N_{oc} UTRA cell during T2: -0.10dB for Ioc -0.70dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T2: 0dB for Noc +0.80dB for Ês / N_{oc}
8.3 UTRAN Connected Mode Mobility	
8.3.1 FDD/FDD Soft Handover	During T0/T1 and T2/T3/T4/T5/T6: +0.70 dB for all Cell 1 Ec/Ior ratios Relative delay: {–147.5 … +147.5} chips During T0/T1: Already covered above During T2/T3/T4/T5/T6: +0.70 dB for all Cell 2 Ec/Ior ratios
8.3.2 FDD/FDD Hard Handover	
8.3.2.1 Handover to intra-frequency cell	During T1 and T2 / T3: +0.70 dB for all Cell 1 Ec/Ior ratios During T1: Already covered above During T2 / T3: +0.70 dB for all Cell 2 Ec/Ior ratios

Clause	Test Tolerance
8.3.2.2 Handover to inter-frequency cell	Channel 1 during T1 and T2 / T3: +0.80 dB for all Cell 1 Ec/Ior ratios Channel 2 during T1: Not applicable Channel 2 during T2 / T3: +0.80 dB for all Cell 2 Ec/Ior ratios
8.3.3 FDD/TDD Handover	TBD
8.3.4 Inter-system Handover form UTRAN FDD to GSM	During T2 and T3: + 1 dB for RXLEV
8.3.4a Inter-system Handover from UTRAN FDD to E-UTRAN FDD	UTRA cell during T1: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T1: 0dB for Noc 0dB for Ês / Noc UTRA cell during T2: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T2: 0dB for Noc +0.80dB for Ês / Noc UTRA cell during T3: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell during T3: 0dB for Noc **+0.8**0dB for Ês / Noc
8.3.4b Inter-system Handover from UTRAN FDD to E-UTRAN TDD	Same as 8.3.4a
8.3.4c Inter-system Handover from UTRAN FDD to E-UTRAN FDD: Unknown Target Cell	Zero TT is applied,
8.3.4d Inter-system Handover from UTRAN FDD to E-UTRAN TDD; Unknown Target Cell	Same as 8.3.4c
8.3.5 Cell Re-selection in CELL_FACH	
8.3.5.1 One frequency present in the neighbour list	During T1 and T2: +0.60 dB for all Cell 1 and 2 Ec/Ior ratios -0.50 dB for all Cell 3, 4 ,5, 6 Ec/Ior ratios +0.03 dB for Ior(3, 4, 5, 6) During T1: -0.27 dB for Ior(1) +0.13 dB for Ior(2) During T2: +0.13 dB for Ior(1) -0.27 dB for Ior(2)

Clause	Test Tolerance
8.3.5.2 Two frequencies present in the neighbour list	Channel 1 during T1 and T2: +0.60 dB for all Cell 1 Ec/Ior ratios -0.70 dB for all Cell 3 and 4 Ec/Ior ratios Channel 1 during T1: +0.05 dB for Ior(1) +0.05 dB for Ior(3, 4) No change for Ioc(1) Channel 1 during T2: +0.75 dB for Ior(1) -0.05 dB for Ior(3, 4) -1.60 dB for Ioc(1) Channel 2 during T1 and T2: +0.60 dB for all Cell 2 Ec/Ior ratios -0.70 dB for all Cell 5 and 6 Ec/Ior ratios Channel 2 during T1: +0.75 dB for Ior(2) -0.05 dB for Ior(5, 6) -1.60 dB for Ioc(2) Channel 2 during T2: +0.05 dB for Ior(2) +0.05 dB for Ior(5, 6) No change for Ioc(2)
8.3.5.3 Cell Re-selection to GSM	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 1.0 dB for RXLEV
8.3.5.4 Cell Reselection during an MBMS session, two frequencies present in neighbour list	Channel 1 during T2 and T3: +1.00 dB for all Cell 1 Ec/Ior ratios Channel 1 during T3: -1.52 dB for Ioc(1) Channel 2 during T1, T2 and T3: +1.00 dB for all Cell 2 Ec/Ior ratios Channel 2 during T2: -1.38 dB for Ioc(2)
8.3.6 Cell Re-selection in CELL_PCH	
8.3.6.1 One frequency present in the neighbour list	Same as 8.2.2.1
8.3.6.2 Two frequencies present in the neighbour list	Same as 8.2.2.2
8.3.6.3 Cell re-selection during an MBMS session, one UTRAN inter-frequency and 2 GSM cells present in the neighbour list	Channel 1 during T2: +1.00 dB for all Cell 1 Ec/Ior ratios Channel 2 during T1 and T2: +1.00 dB for all Cell 2 Ec/Ior ratios Channel 2 during T2: -1.50 dB for Ioc(2) Channel 2 during T3: -0.1 dB for CPICH_Ec/Ior -0.3 dB for $\hat{I}_{or}/I_{oc}$ GSM during T2: -1.0 dB for RXLEV1 -1.0 dB for RXLEV2 GSM during T3: +1.0 dB for RXLEV2

Clause	Test Tolerance
8.3.7 Cell Re-selection in URA_PCH	
8.3.7.1 One frequency present in the neighbour list	Same as 8.2.2.1
8.3.7.2 Two frequencies present in the neighbour list	Same as 8.2.2.2
8.3.8 Serving HS-DSCH cell change	During T0/T1/T2/T3/T4: +0.70 dB for all Cell 1 Ec/Ior ratios Relative delay: {–147.5 … +147.5} chips During T0 Already covered above During T1/T2/T3/T4 +0.70 dB for all Cell 2 Ec/Ior ratios
8.3.9 Enhanced Serving HS-DSCH cell change	During /T1/T2/T3/T4: +0.70 dB for all Cell 1 Ec/Ior ratios +0.70 dB for all Cell 2 Ec/Ior ratios + 0.5 chips for relative delay
8.3.10 System information acquisition for CSG cell	
8.3.10.1 Intrafrequency System information acquisition for CSG cell	During T1 / T2: +0.70 dB for all Cell 1 Ec/Ior ratios During T1: Already covered above During T2: +0.70 dB for all Cell 2 Ec/Ior ratios
8.3.10.2 Inter frequency System information acquisition for CSG cell	Channel 1 during T1 and T2 / T3: +0.80 dB for all Cell 1 Ec/Ior ratios Channel 2 during T1: Not applicable Channel 2 during T2 / T3: +0.80 dB for all Cell 2 Ec/Ior ratios
8.4 RRC Connection Control	
8.4.1 RRC Re-establishment delay	Settings: 0 dB for $\hat{I}_{or}/I_{oc}$ 0 dB for any_Ec/Ior Zero TT is applied, as level settings are not critical with respect to the outcome of the test.
8.4.2 Random Access	Settings: 0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for AICH_Ec/Ior Measurements: Power difference: ± 1dB Maximum Power: -1dB / +0.7dB PRACH timing error 0.5 chips
8.4.3 Transport format combination selection in UE	0 dB for DPCH_Ec/Ior
8.4.4 E-TFC restriction in UE	
8.4.4.1 10ms TTI E-DCH E-TFC restriction	0.1 dB for Ec/Ior 0.7 dB for Îor
8.4.4.2 2ms TTI E-DCH E-TFC restriction	0.1 dB for Ec/Ior 0.7 dB for Îor
8.5 Timing and Signalling Characteristics	
8.5.1 UE Transmit Timing	0.1 dB for CPICH_Ec/Ior 0.1 dB for DPCH_Ec/Ior 1 dB for Îor1 1.3 dB for Îor2 0.5 chips for Rx-Tx timing accuracy 0.25 chips for Tx-Tx Timing Accuracy
8.6 UE Measurements Procedures	
8.6.1 FDD intra frequency measurements	

Clause	Test Tolerance
8.6.1.1 Event triggered reporting in AWGN propagation conditions (R99)	During T1/T4 and T2/T3: +0.70 dB for all Cell 1 Ec/Ior ratios During T1/T4 only: Already covered above During T2/T3 only: +0.70 dB for all Cell 2 Ec/Ior ratios
8.6.1.1A Event triggered reporting in AWGN propagation conditions (Rel-4 and later)	During T1/T3 and T2: +0.70 dB for all Cell 1 Ec/Ior ratios During T1/T3 only: Already covered above During T2 only: +0.70 dB for all Cell 2 Ec/Ior ratios
8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition (R99)	During T0 to T6: +0.70 dB for all Cell 1 Ec/Ior ratios +0.70 dB for all Cell 2 Ec/Ior ratios +0.70 dB for all Cell 3 Ec/Ior ratios
8.6.1.2A Event triggered reporting of multiple neighbours in AWGN propagation condition (Rel-4 and later)	During T0 to T4: +0.70 dB for all Cell 1 Ec/Ior ratios +0.70 dB for all Cell 2 Ec/Ior ratios +0.70 dB for all Cell 3 Ec/Ior ratios
8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition (R99)	During T0 to T5: +0.40 dB for all Cell 1 Ec/Ior ratios +0.40 dB for all Cell 2 Ec/Ior ratios +0.40 dB for all Cell 3 Ec/Ior ratios
8.6.1.3A Event triggered reporting of two detectable neighbours in AWGN propagation condition (Rel-4 and later)	During T0 to T4: +0.40 dB for all Cell 1 Ec/Ior ratios +0.40 dB for all Cell 2 Ec/Ior ratios +0.40 dB for all Cell 3 Ec/Ior ratios
8.6.1.4A Correct reporting of neighbours in fading propagation condition (Rel-4 and later)	During T1: +0.70 dB for all Cell 1 Ec/Ior ratios +0.30 dB for all Cell 2 Ec/Ior ratios During T2: +0.30 dB for all Cell 1 Ec/Ior ratios +0.70 dB for all Cell 2 Ec/Ior ratios
8.6.1.5 Event triggered reporting of multiple neighbour cells in Case 1 fading condition	During T1 and T2: +0.70 dB for all Cell 1 Ec/Ior ratios +0.70 dB for all Cell 2 Ec/Ior ratios +0.70 dB for all Cell 3 Ec/Ior ratios
8.6.1.6 Event triggered reporting of multiple neighbour cells in Case 3 fading condition	During T1 and T2: +0.70 dB for all Cell 1 Ec/Ior ratios +0.70 dB for all Cell 2 Ec/Ior ratios +0.70 dB for all Cell 3 Ec/Ior ratios
8.6.2 FDD inter frequency measurements	
8.6.2.1 Correct reporting of neighbours in AWGN propagation condition (Release 5 and earlier)	During T0 to T2: +0.80 dB for all Cell 1 Ec/Ior ratios +0.80 dB for all Cell 2 Ec/Ior ratios +0.80 dB for all Cell 3 Ec/Ior ratios
8.6.2.1A Correct reporting of neighbours in AWGN propagation condition (Release 6 and later)	During T0 to T2: +0.80 dB for all Cell 1 Ec/Ior ratios +0.80 dB for all Cell 2 Ec/Ior ratios +0.80 dB for all Cell 3 Ec/Ior ratios
8.6.2.2 Correct reporting of neighbours in Fading propagation condition (Release 5 only)	During T1 and T2: +0.80 dB for all Cell 1 Ec/Ior ratios +0.80 dB for all Cell 2 Ec/Ior ratios
8.6.2.2A Correct reporting of neighbours in Fading propagation condition (Release 6 and later)	During T1 and T2: +0.80 dB for all Cell 1 Ec/Ior ratios +0.80 dB for all Cell 2 Ec/Ior ratios
8.6.2.3 Correct reporting of neighbours in Fading propagation condition using TGL1=14	During T1 and T2: +0.80 dB for all Cell 1 Ec/Ior ratios +0.80 dB for all Cell 2 Ec/Ior ratios
8.6.3 TDD measurements	

Clause	Test Tolerance
8.6.3.1Correct reporting of TDD neighbours in AWGN propagation condition	TBD
8.6.4 GSM measurements	
8.6.4.1 Correct reporting of GSM neighbours in AWGN propagation condition	During T2: + 1 dB for RXLEV During T3: -1 dB for RXLEV
8.6.5 Combined Inter frequency and GSM measurements	
8.6.5.1 Correct reporting of neighbours in AWGN propagation condition	During T0 to T5: +0.80 dB for all Cell 1 Ec/Ior ratios +0.80 dB for all Cell 2 Ec/Ior ratios During T4 to T5: + 1 dB for RXLEV
8.6.6.1 Correct reporting of E-UTRAN FDD neighbour in fading propagation condition	During T1: -0.6 dB for Cell 2 Noc During T2: -0.6 dB for Cell 2 Noc 0.6dB for Cell 2 Es/Noc During T3: -0.6 dB for Cell 2 Noc 0.6dB for Cell 2 Es/Noc
8.6.6.2 Correct reporting of E-UTRAN TDD neighbour in fading propagation condition	Same as 8.6.6.1
8.6.7.1 Correct reporting of E-UTRA FDD neighbours in fading propagation condition	During T2: 0.7dB for Cell 2 Ior/Ioc
8.6.7.2 Correct reporting of E-UTRA TDD neighbours in fading propagation condition	Same as 8.6.7.1
8.7 Measurements Performance Requirements	
8.7.1 CPICH RSCP	
8.7.1.1 Intra frequency measurements accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 1.0 dB for Ioc
8.7.1.2 Inter frequency measurement accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc1/Ioc2 1.0 dB for Ioc For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2
8.7.2 CPICH Ec/Io	
8.7.2.1 Intra frequency measurements accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior
8.7.2.2 Inter frequency measurement accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc1/Ioc2 1.0 dB for Ioc For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2
8.7.3.1 UTRA Carrier RSSI, absolute measurement accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.3 dB for Ioc1/Ioc2 1.0 dB for Ioc For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2
8.7.3.2 UTRA Carrier RSSI, relative measurement accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 1.0 dB for Ioc

Clause	Test Tolerance
8.7.3A GSM Carrier RSSI	TT for test parameters GSM cell levels: Step 1: -1 dB Step 2: -1 dB Step 3: -1 dB Step 4:+1 dB Relative accuracy requirements: a, b, c and d values in minimum requirements are increased by 2 dB i.e., For x1 ≥ s+14, x2< -48 dBm: a=4, b=4, c=6, d=6 For s+14 > x1 ≥ s+1 a=5, b=4, c=7, d=6 For s+1 > x1 a=6, b=4, c=8, d=6 Absolute accuracy requirements: original minimum requirements are increased by ±1 dB
8.7.3B Transport channel BLER	TBD
8.7.3C UE Transmitted power (R99 and Rel-4 only)	0.7 dB for mean power measurement by test system
8.7.3D UE Transmitted power (Rel-5 and later)	0.7 dB for mean power measurement by test system
8.7.4 SFN-CFN observed time difference	0.3 dB for $\hat{I}_{or}/I_{oc}$ 1.0 dB for Ioc ±0.5 chips for the actual SFN-CFN observed time difference
8.7.5.1 SFN-SFN observed time difference type 1	0.3 dB for $\hat{I}_{or}/I_{oc}$ 1.0 dB for Ioc ±0.5 chips for the actual SFN-SFN observed time difference type 1
8.7.6.1 UE Rx-Tx time difference (Release 5 and earlier)	0.3 dB for $\hat{I}_{or}/I_{oc}$ 1.0 dB for Ioc 0.5 chip for Rx-Tx Timing Accuracy
8.7.6.1A UE Rx-Tx time difference (Release 6 and later)	0.3 dB for $\hat{I}_{or}/I_{oc}$ 1.0 dB for Ioc 0.5 chip for Rx-Tx Timing Accuracy
8.7.7 Observed time difference to GSM cell	TBD
8.7.8 P-CCPCH RSCP	TBD
8.7.9 UE Transmission Power Headroom	0.8 dB for UPH reporting accuracy

Clause	Test Tolerance
8.7.10 E-UTRAN FDD RSRP absolute accuracy	UTRA cell in Test 1: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell in Test 1: -0.30dB for Noc 0dB for Ês/Noc UTRA cell in Test 2: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell in Test 2: 0dB for Noc +0.80dB for Ês/Noc
8.7.11 E-UTRAN TDD RSRP absolute accuracy	Same as 8.7.10
8.7.12 E-UTRAN FDD RSRQ absolute accuracy	UTRA cell in Test 1: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell in Test 1: -0.80dB for Noc 0dB for Ês/Noc UTRA cell in Test 2: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell in Test 2: 0dB for Noc +0.80dB for Ês/Noc UTRA cell in Test 3: 0dB for Ioc 0dB for Ior/Ioc 0dB for CPICH_Ec/Ior E-UTRA cell in Test 3: 0dB for Noc +0.80dB for Ês/Noc
8.7.13 E-UTRAN TDD RSRQ absolute accuracy	Same as 8.7.12

F.2.5 Performance requirements (HSDPA)

Table F.2.5: Test Tolerances for Performance Requirements (HSDPA)

Clause	Test Tolerance
9.2.1A to 9.2.1KD Single Link Performance	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for Ec/Ior Test Tolerances apply for each carrier
9.2.1L to 9.2.1LD Single Link Enhanced Performance Type 3i	0.76 dB for $\hat{I}_{or}/I_{oc}$' 0.17 dB for DIP1, DIP2 0.1 dB for Ec/Ior Test Tolerances apply for each carrier
9.2.2A to 9.2.2E Open loop diversity performance	0.8 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for Ec/Ior
9.2.3A to 9.2.3E Closed loop diversity performance	Same as 9.2.2A
9.2.4A to 9.2.4H MIMO performance	Same as 9.2.2A
9.3.1 Single Link Performance - AWGN propagation conditions	No test tolerances applied
9.3.1A Single Link Performance - AWGN propagation conditions, 64QAM	No test tolerances applied
9.3.1B Single Link Performance - AWGN Propagation Conditions, DC-HSDPA requirements	No test tolerances applied
9.3.1BA Single Link Performance - AWGN Propagation Conditions, DB-DC-HSDPA requirements	No test tolerances applied
9.3.1C Single Link Performance - AWGN Propagation Conditions, Periodically Varying Radio Conditions	No test tolerances applied for test step 7 and 8 TT for M-difference is 1 for test step 9 (difference in medians M_1 and M_2)
9.3.2 Single Link Performance - Fading propagation conditions	No test tolerances applied
9.3.2A Single Link Performance - Fading Propagation Conditions, DC-HSDPA requirements	No test tolerances applied
9.3.2AA Single Link Performance - Fading Propagation Conditions, DB-DC-HSDPA requirements	No test tolerances applied
9.3.2B Single Link Performance - Fading propagation conditions, 64QAM	No test tolerances applied
9.3.3 Open Loop Diversity Performance - AWGN propagation conditions	No test tolerances applied
9.3.4 Open Loop Diversity Performance - Fading propagation conditions	No test tolerances applied
9.3.5 Closed Loop Diversity Performance - AWGN propagation conditions	No test tolerances applied
9.3.6 Closed Loop Diversity Performance - Fading propagation conditions	No test tolerances applied
9.3.7A, MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions	No test tolerances applied
9.3.7B MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions	No test tolerances applied
9.3.7C MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20	No test tolerances applied
9.3.7D MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20	No test tolerances applied

Clause	Test Tolerance
9.3.7E MIMO performance –Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20	No test tolerances applied
9.3.7A MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions - Asymmetric CPICHs	No test tolerances applied
9.3.7B MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions –Asymmetric CPICHs	No test tolerances applied
9.3.7C MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20 – Asymmetric CPICHs	No test tolerances applied
9.3.7D MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20 - Asymmetric CPICHs	No test tolerances applied
9.3.7E MIMO performance –Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20 - Asymmetric CPICHs	No test tolerances applied
9.4.1 Single Link Performance	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for P-CPICH_Ec/Ior and HS-SCCH_Ec/Ior
9.4.1A Single Link Performance - Enhanced Performance Requirements Type 1	Same as 9.4.1
9.4.2 Open loop diversity performance	0.8 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for P-CPICH_Ec/Ior and HS-SCCH_Ec/Ior
9.4.2A Open loop diversity performance – Enhanced Performance Requirements Type 1	Same as 9.4.2
9.4.3 HS-SCCH Type 3 performance	Same as 9.4.2
9.4.3A HS-SCCH Type 3 Performance - STTD disabled- Asymmetric CPICHs	Same as 9.4.2
9.4.3B HS-SCCH Type 3 Performance - STTD enabled- Asymmetric CPICHs	Same as 9.4.2
9.4.4 HS-SCCH Type 3 performance for MIMO only with single-stream restriction	Same as 9.4.2
9.4.4A HS-SCCH Type 3 performance for MIMO only with single-stream restriction- Enhanced Performance Requirements Type1	Same as 9.4.2
9.4.4B HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD disabled-asymmetric CPICHs	Same as 9.4.2
9.4.4C HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD disabled-asymmetric CPICHs-Enhanced Performance Requirements Type 1	Same as 9.4.2
9.4.4D HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD enabled-asymmetric CPICHs	Same as 9.4.2
9.4.4E HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD enabled-asymmetric CPICHs-Enhanced Performance Requirements Type 1	Same as 9.4.2
9.5.1 HS-SCCH-less demodulation of HS-DSCH	Same as 9.2.1A
9.5.1A HS-SCCH-less demodulation of HS-DSCH, Enhanced Performance Requirements Type 1	Same as 9.2.1A

Clause	Test Tolerance
9.6.1 Single link HS-DSCH Demodulation performance in CELL_FACH state	Same as 9.2.1A
9.6.2 Single link HS-SCCH Detection performance in CELL_FACH state	Same as 9.2.1A

F.2.6 Performance requirements (E-DCH)

Table F.2.6: Test Tolerances for Performance Requirements (E-DCH)

Clause	Test Tolerance
10.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms, Type 1)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.2.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.2.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.2.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.2.2.2.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-HICH_Ec/Ior
10.3.1.1 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-RGCH_Ec/Ior
10.3.1.1A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-RGCH_Ec/Ior
10.3.1.2 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-RGCH_Ec/Ior
10.3.1.2A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI, Type 1)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-RGCH_Ec/Ior
10.3.2 Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-RGCH_Ec/Ior
10.3.2A Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions (Type 1)	0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$ 0.1 dB for E-RGCH_Ec/Ior
10.4.1 Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-AGCH_Ec/Ior
10.4.1A Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance (Type 1)	0.6 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for E-AGCH_Ec/Ior

F.2.7 Performance requirements (MBMS)

Table F.2.7: Test Tolerances for Performance Requirements (MBMS).

Clause	Test Tolerance
11.2 Demodulation of MTCH	0.1 dB for S-CCPCH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ and $\hat{I}_{or3}/I_{oc}$.
11.2A Demodulation of MTCH - Enhanced Performance Requirements Type 1	0.1 dB for S-CCPCH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ and $\hat{I}_{or3}/I_{oc}$.
11.3 Demodulation of MTCH and cell identification	0.1 dB for S-CCPCH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ and $\hat{I}_{or3}/I_{oc}$

F.3 Interpretation of measurement results

The measurement results returned by the Test System are compared – without any modification – against the Test Requirements as defined by the shared risk principle.

The Shared Risk principle is defined in ETR 273-1-2 clause 6.5.

The actual measurement uncertainty of the Test System for the measurement of each parameter shall be included in the test report.

The recorded value for the Test System uncertainty shall be, for each measurement, equal to or lower than the appropriate figure in clause F.1 of the present document.

If the Test System for a test is known to have a measurement uncertainty greater than that specified in clause F.1, it is still permitted to use this apparatus provided that an adjustment is made value as follows.

Any additional uncertainty in the Test System over and above that specified in clause F.1 shall be used to tighten the Test Requirement – making the test harder to pass. (For some tests e.g. receiver tests, this may require modification of stimulus signals). This procedure will ensure that a Test System not compliant with clause F.1does not increase the chance of passing a device under test where that device would otherwise have failed the test if a Test System compliant with clause F.1 had been used.

For some of the more complex tests e.g. RRM, deriving the overall test system uncertainty is not straightforward. In such cases the derivation is given in TR 34.902 [24] rather than in subclause F.1. If it is deemed necessary to apply the additional test system uncertainty rules to these tests, the formula for deriving the new overall uncertainty from any excess fundamental test system uncertainties, shall use the formulas provided in 34.902.

F.4 Derivation of Test Requirements (This clause is informative)

The Test Requirements in the present document have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in clause F.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table F.4.

F.4.1 Transmitter

Table F.4.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2 Maximum Output Power	Power class 1 (33 dBm) Tolerance = +1/-3 dB Power class 2 (27 dBm) Tolerance = +1/-3 dB Power class 3 (24 dBm) Tolerance = +1/-3 dB Power class 4 (21 dBm) Tolerance = ±2 dB	0.7 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For power classes 1-3: Upper Tolerance limit = +1.7 dB Lower Tolerance limit = -3.7 dB For power class 4: Upper Tolerance limit = +2.7 dB Lower Tolerance limit= -2.7 dB
5.2A Maximum Output Power with HS-DPCCH (Release 5 only)	For Power class 3: Power class 3 (24 dBm) Tolerance = +1/-3 dB Power class 3 (23 dBm) Tolerance = +2/-3 dB Power class 3 (22 dBm) Tolerance = +3/-3 dB For Power class 4: Power class 4 (21 dBm) Tolerance = ±2 dB Power class 4 (20 dBm) Tolerance = +3/-2 dB Power class 4 (19 dBm) Tolerance = +4/-2 dB	0.7 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For power classes 3: Upper Tolerance limit = +1.7 dB (24 dBm) Upper Tolerance limit = +2.7 dB (23 dBm) Upper Tolerance limit = +1.7 dB (22 dBm) Lower Tolerance limit = -3.7 dB For power class 4: Upper Tolerance limit = +2.7 dB (24 dBm) Upper Tolerance limit = +3.7 dB (23 dBm) Upper Tolerance limit = +4.7 dB (22 dBm) Lower Tolerance limit = -2.7 dB

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2AA Maximum Output Power with HS-DPCCH (Release 6 and later)	For Power class 3: Sub-test 1: Power class 3 (24 dBm) Tolerance = +1/-3 dB Sub-test 2: Power class 3 (24 dBm) Tolerance = +1/-3 dB Sub-test 3: Power class 3 (23.5 dBm) Tolerance = +1.5/-3 dB Sub-test 4: Power class 3 (23.5 dBm) Tolerance = +1.5/-3 dB For Power class 4: Sub-test 1: Power class 4 (21 dBm) Tolerance = ±2 dB Sub-test 2: Power class 4 (21 dBm) Tolerance = ±2 dB Sub-test 3: Power class 4 (20.5 dBm) Tolerance = +2.5/-2 dB Sub-test 4: Power class 4 (20.5 dBm) Tolerance = +2.5/-2 dB	0.7 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For power classes 3: Sub-test 1: Upper Tolerance limit = +1.7 dB (24 dBm) Sub-test 1: Lower Tolerance limit = -3.7 dB Sub-test 2: Upper Tolerance limit = +1.7 dB (24 dBm) Sub-test 2: Lower Tolerance limit = -3.7 dB Sub-test 3: Upper Tolerance limit = +2.2 dB (23.5 dBm) Sub-test 3: Lower Tolerance limit = -3.7 dB Sub-test 4: Upper Tolerance limit = +2.2 dB (23.5 dBm) Sub-test 4: Lower Tolerance limit = -3.7 dB For power class 4: Sub-test 1: Upper Tolerance limit = +2.7 dB (21 dBm) Sub-test 1: Lower Tolerance limit = -2.7 dB Sub-test 2: Upper Tolerance limit = +2.7 dB (21 dBm) Sub-test 2: Lower Tolerance limit = -2.7 dB Sub-test 3: Upper Tolerance limit = +3.2 dB (20.5 dBm) Sub-test 3: Lower Tolerance limit = -2.7 dB Sub-test 4: Upper Tolerance limit = +3.2 dB (20.5 dBm) Sub-test 4: Lower Tolerance limit = -2.7 dB

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2B Maximum Output Power with HS-DPCCH and E-DCH	For Power class 3: Sub-test 1: Power class 3 (24 dBm) Tolerance = +1/-3 Sub-test 2: Power class 3 (22 dBm) Tolerance = +3/-3 Sub-test 3: Power class 3 (23 dBm) Tolerance = +2/-3 Sub-test 4: Power class 3 (22 dBm) Tolerance = +1/-3 Sub-test 5: Power class 3 (24 dBm) Tolerance = +1/-3 For Power class 4: Sub-test 1: Power class 4 (21 dBm) Tolerance = ±2 dB Sub-test 2: Power class 4 (19 dBm) Tolerance = +4/-2 dB Sub-test 3: Power class 4 (20 dBm) Tolerance = +3/-2 dB Sub-test 4: Power class 4 (19 dBm) Tolerance = +4/-2 dB Sub-test 5: Power class 4 (21 dBm) Tolerance = ±2 dB	0.7 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For power classes 3: Sub-test 1: Upper Tolerance limit = +1.7 dB (24 dBm) Sub-test 1: Lower Tolerance limit = -3.7 dB (24 dBm) Sub-test 2: Upper Tolerance limit = +3.7 dB (22 dBm) Sub-test 2: Lower Tolerance limit = -3.7 dB (22 dBm) Sub-test 3: Upper Tolerance limit = +2.7 dB (23 dBm) Sub-test 3: Lower Tolerance limit = -3.7 dB (23 dBm) Sub-test 4: Upper Tolerance limit = +3.7 dB (22 dBm) Sub-test 4: Lower Tolerance limit = -3.7 dB (22 dBm) Sub-test 5: Upper Tolerance limit = +1.7 dB (24 dBm) Sub-test 5: Lower Tolerance limit = -3.7 dB (24 dBm) For power class 4: Sub-test 1: Upper Tolerance limit = +2.7 dB (21 dBm) Sub-test 1: Lower Tolerance limit = -2.7 dB (21 dBm) Sub-test 2: Upper Tolerance limit = +4.7 dB (19 dBm) Sub-test 2: Lower Tolerance limit = -2.7 dB (19 dBm) Sub-test 3: Upper Tolerance limit = +3.7 dB (20 dBm) Sub-test 3: Lower Tolerance limit = -2.7 dB (20 dBm) Sub-test 4: Upper Tolerance limit = +4.7 dB (19 dBm) Sub-test 4: Lower Tolerance limit = -2.7 dB (19 dBm) Sub-test 5: Upper Tolerance limit = +2.7 dB (21 dBm) Sub-test 5: Lower Tolerance limit = -2.7 dB (21 dBm)
5.2BA UE Maximum Output Power for DC-HSUPA (QPSK)	For Power class 3: Sub-test 1: Power class 3 (22.5 dBm) Tolerance = +1/-3 For Power class 4: Sub-test 1: Power class 4 (19.5 dBm) Tolerance = ±2 dB	0.7 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For power classes 3: Sub-test 1: Upper Tolerance limit = +3.2 dB (22.5 dBm) Sub-test 1: Lower Tolerance limit = -3.7 dB (22.5 dBm) For power class 4: Sub-test 1: Upper Tolerance limit = +4.2 dB (19.5 dBm) Sub-test 1: Lower Tolerance limit = -2.7 dB (19.5 dBm)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2BB UE Maximum Output Power for DC-HSUPA (16QAM)	For Power class 3: Sub-test 1: Power class 3 (22.5 dBm) Tolerance = +1/-3 For Power class 4: Sub-test 1: Power class 4 (19.5 dBm) Tolerance = ±2 dB	0.7 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For power classes 3: Sub-test 1: Upper Tolerance limit = +3.2 dB (22.5 dBm) Sub-test 1: Lower Tolerance limit = -3.7 dB (22.5 dBm) For power class 4: Sub-test 1: Upper Tolerance limit = +4.2 dB (19.5 dBm) Sub-test 1: Lower Tolerance limit = -2.7 dB (19.5 dBm)
5.2C UE relative code domain power accuracy	For 0 dB ≥ -10 dB CDP ± 1.5 dB For -10 dB ≥ -15 dB CDP ± 2.0 dB For -15 dB ≥ -20 dB CDP ± 2.5 dB	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB	Formula: UE relative CDP accuracy + TT For 0 dB ≥ -10 dB CDP ± 1.7 dB For -10 dB ≥ -15 dB CDP ± 2.3 dB For -15 dB ≥ -20 dB CDP ± 2.9 dB
5.2D UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH	For 0 dB ≥ -10 dB CDP ±1.5 dB For -10 dB ≥ -15 dB CDP ± 2.0 dB For -15 dB ≥ -20 dB CDP ± 2.5 dB	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB	Formula: UE relative CDP accuracy + TT For 0 dB ≥ -10 dB CDP ± 1.7 dB For -10 dB ≥ -15 dB CDP ± 2.3 dB For -15 dB ≥ -20 dB CDP ± 2.9 dB
5.2DA UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK	For 0 dB ≥ -10 dB CDP ±1.5 dB For -10 dB ≥ -15 dB CDP ± 2.0 dB For -15 dB ≥ -20 dB CDP ± 2.5 dB	For 0 dB ≥ -10 dB CDP 0.2 dB For -10 dB ≥ -15 dB CDP 0.3 dB For -15 dB ≥ -20 dB CDP 0.4 dB	Formula: UE relative CDP accuracy + TT For 0 dB ≥ -10 dB CDP ± 1.7 dB For -10 dB ≥ -15 dB CDP ± 2.3 dB For -15 dB ≥ -20 dB CDP ± 2.9 dB
5.2E UE Relative Code Domain Power Accuracy for HS-DPCCh and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP ±1.5 dB For -10 dB ≥ -15 dB CDP ± 2.0 dB For -15 dB ≥ -20 dB CDP ± 2.5 dB For -20 dB ≥ -30 dB CDP ± 3.0 dB	For 0 dB ≥ -10 dB CDP [0.2 dB] For -10 dB ≥ -15 dB CDP [0.3 dB] For -15 dB ≥ -20 dB CDP [0.4 dB] For -20 dB ≥ -30 dB CDP [0.5 dB]	Formula: UE relative CDP accuracy + TT For 0 dB ≥ -10 dB CDP [± 1.7 dB] For -10 dB ≥ -15 dB CDP [± 2.3 dB] For -15 dB ≥ -20 dB CDP [± 2.9 dB] For -20 dB ≥ -30 dB CDP [± 3.5 dB]

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2 EA UE relative code domain power accuracy for DC-HSUPA using HS-DPCCH and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP ±1.5 dB For -10 dB ≥ -15 dB CDP ± 2.0 dB For -15 dB ≥ -20 dB CDP ± 2.5 dB For -20 dB ≥ -30 dB CDP ± 3.0 dB	For 0 dB ≥ -10 dB CDP [0.2 dB] For -10 dB ≥ -15 dB CDP [0.3 dB] For -15 dB ≥ -20 dB CDP [0.4 dB] For -20 dB ≥ -30 dB CDP [0.5 dB]	Formula: UE relative CDP accuracy + TT For 0 dB ≥ -10 dB CDP [± 1.7 dB] For -10 dB ≥ -15 dB CDP [± 2.3 dB] For -15 dB ≥ -20 dB CDP [± 2.9 dB] For -20 dB ≥ -30 dB CDP [± 3.5 dB]
5.3 Frequency Error	The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = ±(0.1 ppm + 10 Hz).
5.3C Frequency error for UL CLTD Activation state 1	The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = ±(0.1 ppm + 10 Hz).
5.3D Frequency error for UL CLTD Activation state 2 and 3	The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = ±(0.1 ppm + 10 Hz).
5.4.1 Open loop power control in the uplink	Open loop power control tolerance ±9 dB (Normal) Open loop power control tolerance ±12 dB (Extreme)	1.0 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For Normal conditions: Upper Tolerance limit = +10 dB Lower Tolerance limit = -10 dB For Extreme conditions: Upper Tolerance limit = +13 dB Lower Tolerance limit = -13 dB
5.4.1A Open loop power control in the uplink for DC-HSUPA	Open loop power control tolerance ±9 dB (Normal) Open loop power control tolerance ±12 dB (Extreme)	1.0 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT For Normal conditions: Upper Tolerance limit = +10 dB Lower Tolerance limit = -10 dB For Extreme conditions: Upper Tolerance limit = +13 dB Lower Tolerance limit = -13 dB
5.4.2 Inner loop power control in uplink	See table 5.4.2.1 and 5.4.2.2	0.1dB 0.15 dB 0.2 dB 0.3 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT
5.4.2A Inner loop power control in uplink for DC-HSUPA	See table 5.4.2.1 and 5.4.2.2	0.1dB 0.15 dB 0.2 dB 0.3 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT
5.4.3 Minimum Output Power	UE minimum transmit power shall be less than –50 dBm	1.0 dB	Formula: Minimum Requirement + TT UE minimum transmit power = –49 dBm

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.4.3A Minimum Output Power for DC-HSUPA	UE minimum transmit power shall be less than –50 dBm	1.0 dB	Formula: Minimum Requirement + TT UE minimum transmit power = –49 dBm
5.4.4 Out-of-synchronisation handling of output power:	$\frac{DPCCH\_E_c}{I_{or}}$ levels AB: -22 dB BD: -28 dB DE: -24 dB EF: -18 dB transmit ON/OFF time 200ms $\frac{DPDCH\_E_c}{I_{or}}$ = -16.6 dB I_{OC} - 60 dBm $\hat{I}_{or}/I_{oc}$ = - 1 dB	0.4 dB for $\frac{DPCCH\_E_c}{I_{or}}$ 0 ms for timing measurement	Formulas: Minimum Requirement between A and B + TT Minimum Requirement between B and D – TT Minimum Requirement between D and E – TT Minimum Requirement between E and F + TT transmit ON/OFF time Minimum Requirement + TT timing $\frac{DPDCH\_E_c}{I_{or}}$ = -16.6 dB I_{OC} - 60 dBm $\hat{I}_{or}/I_{oc}$ = - 1 dB $\frac{DPCCH\_E_c}{I_{or}}$ levels: AB: -21.6 dB BD: -28.4 dB DE: -24.4 dB EF: -17.6 dB transmit ON/OFF time 200ms timing Uncertainty of OFF power measurement is handled by Transmit OFF power test and uncertainty of ON power measurement is handled by Minimum output power test.

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.4.4A Out-of-synchronisation handling of output power for a UE which supports type 1 for DCH:	$\frac{DPCCH\_E_c}{I_{or}}$ levels AB: -25 dB BD: -31 dB DE: -27 dB EF: -21 dB transmit ON/OFF time 200ms $\frac{DPDCH\_E_c}{I_{or}}$ = -19.6 dB I_{oc} - 60 dBm $\hat{I}_{or}/I_{oc}$ = - 1 dB	0.4 dB for $\frac{DPCCH\_E_c}{I_{or}}$ 0 ms for timing measurement	Formulas: Minimum Requirement between A and B + TT Minimum Requirement between B and D – TT Minimum Requirement between D and E – TT Minimum Requirement between E and F + TT transmit ON/OFF time Minimum Requirement + TT timing $\frac{DPDCH\_E_c}{I_{or}}$ = -19.6 dB I_{oc} - 60 dBm $\hat{I}_{or}/I_{oc}$ = - 1 dB $\frac{DPCCH\_E_c}{I_{or}}$ levels: AB: -24.6 dB BD: -31.4 dB DE: -27.4 dB EF: -20.6 dB transmit ON/OFF time 200ms timing Uncertainty of OFF power measurement is handled by Transmit OFF power test and uncertainty of ON power measurement is handled by Minimum output power test.
5.5.1 Transmit OFF power (static case)	Transmit OFF power shall be less than -56 dBm	1.0 dB	Formula: Transmit OFF power Minimum Requirement + TT Transmit OFF power = –55dBm.
5.5.2 Transmit ON/OFF time mask (dynamic case)	Transmit ON power shall be the target value as defined in clause 5.5.2.2 Transmit OFF power shall be less than -56 dBm	On power upper TT = 0.7 dB On power lower TT = 1.0 dB Off power TT = 1.0 dB	Formula for transmit ON power: (Upper) Minimum Requirement (Transmit ON power) + On power upper TT (Lower) Minimum Requirement (Transmit ON power) - On power lower TT To calculate Transmit ON power target value range take the nominal TX power range from Table 5.5.2.3 then apply table 5.4.1.1 open limits then apply table 5.7.1 (only if there has been a transmission gap) then cap the upper value using table 5.2.1. Formula for transmit OFF power: Transmit OFF power Minimum Requirement + Off power TT Transmit OFF power = -55 dBm

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.6 Change of TFC: power control step size	TFC step size = 7dB (Up or Down) Tolerance=±2dB	0.3 dB	For the nominal -7dB step: (Upper) Minimum Requirement + TT = -4.7 dB (Lower) Minimum Requirement - TT = -9.3 dB For the nominal +7dB step: (Upper) Minimum Requirement + TT = +9.3 dB (Lower) Minimum Requirement - TT = +4.7 dB
5.7 Power setting in uplink compressed mode	See tables 5.7.2 and 5.7.3	Subset of 5.4.2	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT
5.7A HS-DPCCH	See table 5.7A.1 and 5.7A.2	0.1 dB 0.15 dB 0.2 dB 0.3 dB	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT
5.8 Occupied Bandwidth	The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3.84 Mcps.	0 kHz	Formula: occupied channel bandwidth Minimum Requirement + TT occupied channel bandwidth = 5.0 MHz
5.8A Occupied Bandwidth for DC-HSUPA	The occupied channel bandwidth shall be less than 10 MHz based on a chip rate of 3.84 Mcps.	0 kHz	Formula: occupied channel bandwidth Minimum Requirement + TT occupied channel bandwidth = 10.0 MHz
5.9 Spectrum emission mask	Minimum requirement defined in TS25.101 Table 6.10. The lower limit shall be −50 dBm / 3.84 MHz or which ever is higher. This is expressed as the equivalent power in the measurement band-width used at each offset.	1.5 dB	Formula: Minimum requirement + TT Lower limit Minimum Requirement + TT Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10. Zero test tolerance is applied for Additional requirements for Band II, Band IV Band V and Band X due to FCC regulatory requirements. The lower limit shall be −48.5 dBm / 3.84 MHz or which ever is higher.
5.9A Spectrum emission mask with HS-DPCCH	Minimum requirement defined in TS25.101 Table 6.10. The lower limit shall be −50 dBm / 3.84 MHz or which ever is higher.	1.5 dB	Formula: Minimum requirement + TT Lower limit Minimum Requirement + TT Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10. Zero test tolerance is applied for Additional requirements for Band II, Band IV, Band V and Band X due to FCC regulatory requirements. The lower limit shall be −48.5 dBm / 3.84 MHz or which ever is higher.
5.9B Spectrum emission mask with E-DCH	Minimum requirement defined in TS25.101 Table 6.10. The lower limit shall be −50 dBm / 3.84 MHz or which ever is higher.	1.5 dB	Formula: Lower limit Minimum Requirement + TT Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10. Zero test tolerance is applied for Additional requirements for Band II, Band IV, Band V and Band X due to FCC regulatory requirements. The lower limit shall be −48.5 dBm / 3.84 MHz or which ever is higher.

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.9C Additional Spectrum Emission Mask for DC-HSUPA (QPSK)	Minimum requirement defined in TS25.101 Table 6.10D	1.5 dB	Formula: Lower limit Minimum Requirement + TT Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10D. Zero test tolerance is applied for Additional requirements for Band II, IV, V , X and XXV due to FCC regulatory requirements.
5.9D Additional Spectrum Emission Mask for DC-HSUPA (16QAM)	Minimum requirement defined in TS25.101 Table 6.10D	1.5 dB	Formula: Lower limit Minimum Requirement + TT Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10D. Zero test tolerance is applied for Additional requirements for Band II, IV, V , X and XXV due to FCC regulatory requirements.
5.10 Adjacent Channel Leakage Power Ratio (ACLR)	If the adjacent channel power is greater than –50 dBm then the ACLR shall be higher than the values specified below.	0.0 dB	Formula: Absolute power threshold + TT
	Power Classes 3 and 4: UE channel +5 MHz or -5 MHz, ACLR limit: 33 dB UE channel +10 MHz or -10 MHz, ACLR limit: 43 dB	0.8 dB	Formula: ACLR Minimum Requirement - TT Power Classes 3 and 4: UE channel +5 MHz or -5 MHz, ACLR limit = 32.2 dB UE channel +10 MHz or -10 MHz, ACLR limit = 42.2 dB
5.10A Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH	If the adjacent channel power is greater than –50 dBm then the ACLR shall be higher than the values specified below.	0.0 dB	Formula: Absolute power threshold + TT
	Power Classes 3 and 4: UE channel +5 MHz or -5MHz, ACLR limit: 33 dB UE channel +10 MHz or -10MHz, ACLR limit: 43 dB	0.8 dB	Formula: ACLR Minimum Requirement – TT Power Classes 3 and 4: UE channel +5 MHz or -5MHz, ACLR Limit : 32.2 dB UE channel +10 MHz or -10MHz, ACLR Limit: 42.2 dB
5.10B Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH	If the adjacent channel power is greater than –50 dBm then the ACLR shall be higher than the values specified below.	0.0 dB	Formula: Absolute power threshold Minimum Requirement + TT
	Power Classes 3 and 4: UE channel +5 MHz or -5MHz, ACLR limit: 33 dB UE channel +10 MHz or -10MHz, ACLR limit: 43 dB	0.8 dB	Formula: ACLR Minimum Requirement– TT Power Classes 3 and 4: UE channel +5 MHz or -5MHz, ACLR Limit: 32.2 dB UE channel +10 MHz or -10MHz, ACLR Limit:42.2 dB
5.10C ACLR with E-DCH for DC-HSUPA (QPSK)	If the adjacent channel power is greater than –50 dBm then the ACLR shall be higher than the values specified below.	0.0 dB	Formula: Absolute power threshold Minimum Requirement + TT
	Power Classes 3 and 4: UE channel +7.5 MHz or -7.5 MHz: ACLR limit: 33 dB UE channel +12.5 MHz or -12.5 MHz, ACLR limit: 36 dB	0.8 dB	Formula: ACLR Minimum Requirement– TT Power Classes 3 and 4: UE channel +7.5 MHz or -7.5MHz, ACLR Limit: 32.2 dB UE channel +12.5 MHz or -12.5 MHz, ACLR Limit: 35.2 dB

Test	Minimum Requirement in TS 25.101		Test Tolerance (TT)	Test Requirement in TS 34.121	
5.10D ACLR with E-DCH for DC-HSUPA (16QAM)	If the adjacent channel power is greater than –50 dBm then the ACLR shall be higher than the values specified below		0.0 dB	Formula: Absolute power threshold Minimum Requirement + TT	
	Power Classes 3 and 4: UE channel +7.5 MHz or -7.5 MHz: ACLR limit: 33 dB UE channel +12.5 MHz or -12.5 MHz, ACLR limit: 36 dB		0.8 dB	Formula: ACLR Minimum Requirement– TT Power Classes 3 and 4: UE channel +7.5 MHz or -7.5MHz, ACLR Limit: 32.2 dB UE channel +12.5 MHz or -12.5 MHz, ACLR Limit: 35.2 dB	
5.11 Spurious Emissions				Formula: Minimum Requirement+ TT Add zero to all the values of Minimum Requirements in table 5.11.1a and 5.11.1b.	
	Frequency Band	Minimum Requirement		Frequency Band	Minimum Requirement
	9 kHz ≤ f < 150 kHz	−36dBm /1kHz	0 dB	9kHz ≤ f < 1GHz	−36dBm /1kHz
	150 kHz ≤ f < 30 MHz	−36dBm /10kHz	0 dB	150 kHz ≤ f < 30 MHz	−36dBm /10kHz
	30 MHz ≤ f < 1000 MHz	−36dBm /100kHz	0 dB	30 MHz ≤ f < 1000 MHz	−36dBm /100kHz
	1 GHz ≤ f < 12.75 GHz	−30dBm /1MHz	0 dB	1 GHz ≤ f < 2.2 GHz	−30dBm /1MHz
			0 dB	2.2 GHz ≤ f < 4 GHz	−30dBm /1MHz
			0 dB	4 GHz ≤ f < 12.75 GHz	−30dBm /1MHz
	1893.5 MHz < f < 1915.7 MHz	−41dBm /300kHz	0 dB	1893.5 MHz < f < 1915.7 MHz	−41dBm /300kHz
	925 MHz ≤ f ≤ 935 MHz	−67dBm /100kHz	0 dB	925 MHz ≤ f ≤ 935 MHz	−67dBm /100kHz
	935 MHz < f ≤ 960 MHz	−79dBm /100kHz	0 dB	935 MHz < f ≤ 960 MHz	−79dBm /100kHz
	1805 MHz ≤ f ≤ 1880 MHz	−71dBm /100kHz	0 dB	1805 MHz ≤ f ≤ 1880 MHz	−71dBm /100kHz
5.11A Spurious Emissions for DC-HSUPA 5.12 Transmit Intermodulation	Intermodulation Product 5MHz -31 dBc 10MHz -41 dBc CW Interferer level = -40 dBc		0 dB	Formula: CW interferer Minimum Requirement– TT/2 Intermod Products limits remain unchanged. CW interferer level = -40 dBc	
5.12A Transmit Intermodulation for DC-HSUPA	Intermodulation Product 10MHz -31 dBc 20MHz -41 dBc CW Interferer level = -40 dBc		0 dB	Formula: CW interferer Minimum Requirement– TT/2 Intermod Products limits remain unchanged. CW interferer level = -40 dBc	
5.13.1 Transmit modulation: EVM	The measured EVM shall not exceed 17.5%		0%	Formula: EVM Minimum Requirement + TT EVM limit = 17.5 %	
5.13.1A Transmit modulation: EVM with HS-DPCCH	The measured EVM shall not exceed 17.5%		0%	Formula: EVM Minimum Requirement + TT EVM limit = 17.5 %	
5.13.1AA Transmit modulation: EVM with HS-DPCCH	The measured EVM shall not exceed 17.5%		0%	Formula: EVM Minimum Requirement + TT EVM limit = 17.5 %	

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
	Phase discontinuity:	[6] degree	Formula: Phase discontinuity + TT
5.13.1AAA EVM and IQ origin offset for HS-DPCCH with E-DCH with 16 QAM	The Relative Carrier Leakage Power shall not exceed -17 dB	±0.5 dB (for IQ origin offset)	Formula: Relative Carrier Leakage Power + TT Relative Carrier Leakage Power = -16.5 dB
5.13.2 Transmit modulation: peak code domain error	The measured Peak code domain error shall not exceed -15 dB	1.0 dB	Formula: Peak code domain Minimum Requirement + TT Peak code domain error = -14 dB
5.13.2A Relative Code Domain Error	The measured RCDE shall not exceed table 5.13.2A.1	0.5 dB	Formula: UE RCDE requirement +TT
5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH	The measured RCDE shall not exceed table 5.13.2B.1	0.5 dB	Formula: UE RCDE requirement + TT
5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA	The measured RCDE shall not exceed table 5.13.2BA.1	0.5 dB	Formula: UE RCDE requirement + TT
5.13.2C Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM	The measured RCDE shall not exceed tables 5.13.2C.1.and 5.13.2C.2	0.5 dB	Formula: UE RCDE requirement + TT
5.13.3 UE phase discontinuity	EVM: The measured EVM shall not exceed 17.5%	0%	Formula: EVM Minimum Requirement + TT EVM limit = 17.5 %
	Frequency error: The UE modulated carrier frequency shall be accurate to within +/-0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = +/-(0.1 ppm + 10 Hz).
	Phase discontinuity:	6 degree	Formula: Phase discontinuity + TT
5.13.4 PRACH preamble quality (EVM)	The measured EVM shall not exceed 17.5%.	0%	Formula: EVM Minimum Requirement + TT EVM limit = 17.5 %
5.13.4 PRACH preamble quality (Frequency error)	The UE modulated carrier frequency shall be accurate to within +/-0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error Minimum Requirement + TT modulated carrier frequency error = +/-(0.1 ppm + 10 Hz).
5.13.5 In-band emission for DC-HSUPA	The measured in-band emission shall not exceed table 5.13.5.1	0.8 dB	Formula: in-band emission minimum requirement + TT

F.4.2 Receiver

Table F.4.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
6.2 Reference sensitivity level	Îor = -106.7 dBm / 3.84 MHz DPCH_Ec = –117 dBm / 3.84 MHz BER limit = 0.001	0.7 dB	Formula: Îor Minimum Requirement + TT DPCH_Ec + TT BER limit unchanged Îor = -106 dBm / 3.84 MHz DPCH_Ec = -116.3 dBm / 3.84 MHz
6.2A Reference sensitivity level for DC-HSDPA	Îor = -102.7 dBm / 3.84 MHz HS-PDSCH_Ec = –113 dBm / 3.84 MHz BLER limit = 0.1	0.7 dB	Formula: Îor: Minimum Requirement + TT HS-PDSCH_Ec Minimum Requirement +TT BLER limit unchanged Îor = -102 dBm / 3.84 MHz HS-PDSCH_Ec = -112.3 dBm / 3.84 MHz
6.2B Reference sensitivity level for DB-DC-HSDPA	Ior = -102.7 dBm / 3.84 MHz HS-PDSCH_Ec = –113 dBm / 3.84 MHz BLER limit = 0.1	0.7 dB	Formula: Îor: Minimum Requirement + TT HS-PDSCH_Ec Minimum Requirement +TT BLER limit unchanged Îor = -102 dBm / 3.84 MHz HS-PDSCH_Ec = -112.3 dBm / 3.84 MHz
6.2C Reference Sensitivity Level for Single band 4C-HSDPA	Ior = -102.7 dBm / 3.84 MHz HS-PDSCH_Ec = –113 dBm / 3.84 MHz BLER limit = 0.1	0.7 dB	Formula: Îor: Minimum Requirement + TT HS-PDSCH_Ec Minimum Requirement +TT BLER limit unchanged Îor = -102 dBm / 3.84 MHz HS-PDSCH_Ec = -112.3 dBm / 3.84 MHz
6.2D Reference Sensitivity Level for Dual band 4C-HSDPA	Îor = -102.7 dBm / 3.84 MHz HS-PDSCH_Ec = –113 dBm / 3.84 MHz BLER limit = 0.1	0.7 dB	Formula: Îor: Minimum Requirement + TT HS-PDSCH_Ec Minimum Requirement +TT BLER limit unchanged Îor = -102 dBm / 3.84 MHz HS-PDSCH_Ec = -112.3 dBm / 3.84 MHz
6.2DA Reference Sensitivity Level for Dual band 4C-HSDPA (3 carrier)	Îor = -102.7 dBm / 3.84 MHz HS-PDSCH_Ec = –113 dBm / 3.84 MHz BLER limit = 0.1	0.7 dB	Formula: Îor: Minimum Requirement + TT HS-PDSCH_Ec Minimum Requirement +TT BLER limit unchanged Îor = -102 dBm / 3.84 MHz HS-PDSCH_Ec = -112.3 dBm / 3.84 MHz
6.3 Maximum input level	-25 dBm Ior -19 dBc DPCH_Ec/Ior	0.7 dB	Formula: Ior Minimum Requirement -TT Ior = -25.7 dBm
6.3A Maximum Input Level for HS-PDSCH Reception (16QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3B Maximum Input Level for HS-PDSCH Reception (64QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
6.3C Maximum Input Level for DC-HSDPA Reception (16QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3D Maximum Input Level for DC-HSDPA Reception (64QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3E Maximum Input Level for DB-DC-HSDPA Reception (16QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3F Maximum Input Level for DB-DC-HSDPA Reception (64QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3G Maximum Input Level for 4C-HSDPA Reception (16QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3GA Maximum Input Level for 4C-HSDPA Reception (16QAM) (3 carrier)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3H Maximum Input Level for 4C-HSDPA Reception (64QAM)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.3HA Maximum Input Level for 4C-HSDPA Reception (64QAM) (3 carrier)	-25 dBm Ior	0.7 dB	Formula: Minimum Requirement -TT Ior = -25.7 dBm
6.4 Adjacent Channel Selectivity (Rel-99 and Rel-4)	Îor = -92.7 dBm / 3.84 MHz DPCH_Ec = −103 dBm / 3.84 MHz Ioac (modulated) = -52 dBm/3.84 MHz BER limit = 0.001	0 dB	Formula: Îor unchanged DPCH_Ec unchanged Ioac Minimum Requirement – TT BER limit unchanged Ioac = -52 dBm/3.84 MHz
6.4A Adjacent Channel Selectivity (Rel-5 and later releases)	Case 1: Îor = <REFÎ$_{or}$> + 14 dB / 3.84 MHz DPCH_Ec = <REFSENS> + 14 dB / 3.84 MHz Ioac (modulated) = -52 dBm/3.84 MHz BER limit = 0.001 Case 2: Îor = <REFÎ$_{or}$> + 41 dB / 3.84 MHz DPCH_Ec = <REFSENS> + 41 dB / 3.84 MHz Ioac (modulated) = -25 dBm/3.84 MHz BER limit = 0.001	0 dB	Formula: Ior unchanged DPCH_Ec unchanged Ioac Minimum Requirement – TT BER limit unchanged Case1: Ioac = -52 dBm/3.84 MHz Case2: Ioac = -25 dBm/3.84 MHz

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
6.4B Adjacent channel selectivity (ACS) for DC-HSDPA	Case 1: Îor = <REFÎ$_{or}$> + 14 dB / 3.84 MHz HS-PDSCH_Ec = <REFSENS> + 14 dB / 3.84 MHz Ioac (modulated) = -52 dBm/3.84 MHz BLER limit = 0.1 Case 2: Îor = <REFÎ$_{or}$> + 41 dB / 3.84 MHz HS-PDSCH_Ec = <REFSENS> + 41 dB / 3.84 MHz Ioac (modulated) = -25 dBm/3.84 MHz BLER limit = 0.1	0 dB	Formula: Ior unchanged DPCH_Ec unchanged Ioac Minimum Requirement – TT BLER limit unchanged Case1: Ioac = -52 dBm/3.84 MHz Case2: Ioac = -25 dBm/3.84 MHz
6.5 Blocking Characteristics	See Table 6.5.1, 6.5.2 and 6.5.3. in TS34.121 BER limit = 0.001	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BER limit unchanged
6.5A Blocking characteristics for DC-HSDPA	See Table 6.5A.1, 6.5A.2 and 6.5A.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5B Blocking characteristics for DB-DC-HSDPA	See Table 6.5B.1, 6.5B.2 and 6.5B.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5C Blocking characteristics for DC-HSUPA	See Table 6.5C.1 and 6.5C.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5D Blocking Characteristics for single Uplink Single band 4C-HSDPA	See Table 6.5D.1, 6.5D.2 and 6.5D.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5E Blocking Characteristics for dual Uplink Single band 4C-HSDPA	See Table 6.5E.1 and 6.5E.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5F Blocking Characteristics for single Uplink Dual band 4C-HSDPA	See Table 6.5F.1, 6.5F.2 and 6.5F.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5FA Blocking Characteristics for single Uplink Dual band 4C-HSDPA (3 carrier)	See Table 6.5F.1, 6.5F.2 and 6.5F.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
6.5G Blocking Characteristics for dual Uplink Dual band 4C-HSDPA	See Table 6.5G.1 and 6.5G.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.5GA Blocking Characteristics for dual Uplink Dual band 4C-HSDPA (3 carrier)	See Table 6.5G.1 and 6.5G.3 in TS34.121 BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (modulated) Minimum Requirement - TT (dBm/3.84MHz) $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) BLER limit unchanged
6.6 Spurious Response	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BER limit = 0.001	0 dB	Formula: $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) Fuw unchanged BER limit unchanged $I_{blocking}$(CW) = -44 dBm
6.6A Spurious Response for DC-HSDPA	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) Fuw unchanged BLER limit unchanged $I_{blocking}$(CW) = -44 dBm
6.6B Spurious Response for DB-DC-HSDPA	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) Fuw unchanged BLER limit unchanged $I_{blocking}$(CW) = -44 dBm
6.6C Spurious Response for single band 4C-HSDPA	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) Fuw unchanged BLER limit unchanged $I_{blocking}$(CW) = -44 dBm
6.6D Spurious Response for dual band 4C-HSDPA	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) Fuw unchanged BLER limit unchanged $I_{blocking}$(CW) = -44 dBm
6.6DA Spurious Response for dual band 4C-HSDPA (3 carrier)	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BLER limit = 0.1	0 dB	Formula: $I_{blocking}$ (CW) Minimum Requirement - TT (dBm) Fuw unchanged BLER limit unchanged $I_{blocking}$(CW) = -44 dBm
6.7 Intermodulation Characteristics	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -103.7 dBm/3.84 MHz DPCH_Ec = -114 dBm/3.84 MHz BER limit = 0.001	0 dB	Formula: Ior Minimum Requirement + TT DPCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BER limit unchanged.

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
6.7A Intermodulation Characteristics for DC-HSDPA	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -99.7 dBm/3.84 MHz HS-PDSCH_Ec = -110 dBm/3.84 MHz BER limit = 0.1	0 dB	Formula: Ior Minimum Requirement + TT HS-PDSCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BLER limit unchanged.
6.7B Intermodulation Characteristics for DB-DC-HSDPA	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -99.7 dBm/3.84 MHz HS-PDSCH_Ec = -110 dBm/3.84 MHz BER limit = 0.1	0 dB	Formula: Ior Minimum Requirement + TT HS-PDSCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BLER limit unchanged.
6.7C Intermodulation Characteristics for DC-HSUPA	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -99.7 dBm/3.84 MHz HS-PDSCH_Ec = -110 dBm/3.84 MHz BER limit = 0.1	0 dB	Formula: Ior Minimum Requirement + TT HS-PDSCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BLER limit unchanged.
6.7D Intermodulation Characteristics for single uplink single band 4C-HSDPA	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -99.7 dBm/3.84 MHz HS-PDSCH_Ec = -110 dBm/3.84 MHz BER limit = 0.1	0 dB	Formula: Ior Minimum Requirement + TT HS-PDSCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BLER limit unchanged.
6.7E Intermodulation Characteristics for single uplink dual band 4C-HSDPA	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -99.7 dBm/3.84 MHz HS-PDSCH_Ec = -110 dBm/3.84 MHz BER limit = 0.1	0 dB	Formula: Ior Minimum Requirement + TT HS-PDSCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BLER limit unchanged.
6.7EA Intermodulation Characteristics for single uplink dual band 4C-HSDPA (3 carrier)	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -99.7 dBm/3.84 MHz HS-PDSCH_Ec = -110 dBm/3.84 MHz BER limit = 0.1	0 dB	Formula: Ior Minimum Requirement + TT HS-PDSCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BLER limit unchanged.

Test	Minimum Requirement in TS 25.101		Test Tolerance (TT)	Test Requirement in TS 34.121	
6.8 Spurious Emissions				Formula: Maximum level + TT Add zero to all the values of Maximum Level in table 6.8.1.	
	Frequency Band	Maximum level		Frequency Band	Maximum level
	9kHz ≤ f < 1GHz	-57dBm /100kHz	0 dB	9kHz ≤ f < 1GHz	-57dBm /100kHz
	1GHz ≤ f ≤ 12.75GHz	-47dBm /1MHz	0 dB	1GHz ≤ f ≤ 2.2GHz	-47dBm /1MHz
			0 dB	2.2GHz < f ≤ 4GHz	-47dBm /1MHz
			0 dB	4GHz < f ≤ 12.75GHz	-47dBm /1MHz
	1920MHz ≤ f ≤ 1980MHz	-60dBm /3.84MHz	0 dB	1920MHz ≤ f ≤ 1980MHz	-60dBm /3.84MHz
	2110MHz ≤ f ≤ 2170MHz	-60dBm /3.84MHz	0 dB	2110MHz ≤ f ≤ 2170MHz	-60dBm /3.84MHz

F.4.3 Performance requirements

Table F.4.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.2 Demodulation of DPCH in static conditions	$\frac{DPCH\_E_c}{I_{or}}$ -5.5 to -16.6 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = - 1 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.3 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -0.7 dB $\frac{DPCH\_E_c}{I_{or}}$ = -5.4 to -16.5 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 1-4	$\frac{DPCH\_E_c}{I_{or}}$ -2.2 to -15.0 I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB to -3 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 to –2.4 dB $\frac{DPCH\_E_c}{I_{or}}$ = -2.1 to -14.9 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 5-8	$\frac{DPCH\_E_c}{I_{or}}$ -3.2 to -7.7 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 6 dB to -3 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.6 to -2.4 dB $\frac{DPCH\_E_c}{I_{or}}$ = -3.1 to -7.6 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 9-12	$\frac{DPCH\_E_c}{I_{or}}$ -4.4 to -11.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 dB to -3 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.6 to –2.4 dB $\frac{DPCH\_E_c}{I_{or}}$ =-4.3 to –11.7 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 13-16	$\frac{DPCH\_E_c}{I_{or}}$ -2.2 to -15.0 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 $\frac{DPCH\_E_c}{I_{or}}$ = -2.1 to -14.9 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 17-20	$\frac{DPCH\_E_c}{I_{or}}$ -1.4 to -8.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 to -3 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.6 to –2.4 dB $\frac{DPCH\_E_c}{I_{or}}$ = -1.3 to -8.7 dB:
7.4 Demodulation of DPCH in moving propagation conditions	$\frac{DPCH\_E_c}{I_{or}}$ -10.9 to -14.5 I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -1 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -0.4 dB $\frac{DPCH\_E_c}{I_{or}}$ = -10.8 to –14.4 dB:
7.5 Demodulation of DPCH birth-death propagation conditions	$\frac{DPCH\_E_c}{I_{or}}$ -8.7 to -12.6 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -1 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -0.4 dB $\frac{DPCH\_E_c}{I_{or}}$ =-18.6 to -12.5 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.5A Demodulation of DCH in high speed train conditions	$\frac{DPCH\_E_c}{I_{or}}$ -21.8 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 5 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 5.6 dB $\frac{DPCH\_E_c}{I_{or}}$ =-21.7 dB:
7.6.1 Demodulation of DPCH in transmit diversity propagation conditions	$\frac{DPCH\_E_c}{I_{or}}$ -16.8 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.8 dB $\frac{DPCH\_E_c}{I_{or}}$ = -16.7 dB:
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	$\frac{DPCH\_E_c}{I_{or}}$ -18 to -18.3 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.8 dB $\frac{DPCH\_E_c}{I_{or}}$ = -17.9 to -18.2 dB:
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	$\frac{DPCH\_E_c}{I_{or}}$ -5.0 to -10.5 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 0 to -3 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 0.8 to -2.2 dB $\frac{DPCH\_E_c}{I_{or}}$ = -4.9 to -10.4 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.7.1 Demodulation in inter-cell soft Handover (Release 5 and earlier)	$\frac{DPCH\_E_c}{I_{or}}$ -5.5 to –15.2 dB I_{oc} = - 60 dBm $\hat{I}_{or1}/I_{oc}$ = $\hat{I}_{or2}/I_{oc}$ = 6 to 0 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or1}/I_{oc}$ = Minimum Requirement + TT $\hat{I}_{or2}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or1}/I_{oc}=\hat{I}_{or2}/I_{oc}$ = 6.6 to 0.6 dB $\frac{DPCH\_E_c}{I_{or}}$ =-5.4 to –15.4 dB:
7.7.1A Demodulation in inter-cell soft Handover (Release 6 and later)	$\frac{DPCH\_E_c}{I_{or}}$ -5.8 to -15.2 dB I_{oc} = - 60 dBm $\hat{I}_{or1}/I_{oc}$ = $\hat{I}_{or2}/I_{oc}$ = 6 to 0 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or1}/I_{oc}$ = Minimum Requirement + TT $\hat{I}_{or2}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or1}/I_{oc}=\hat{I}_{or2}/I_{oc}$ = 6.6 to 0.6 dB $\frac{DPCH\_E_c}{I_{or}}$ = -5.7 to -15.1 dB:
7.7.2 Combining of TPC commands Test 1	$\frac{DPCH\_E_c}{I_{or}}$ -12 dB Ior1 and Ior2 -60dBm	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0dB for Ior1 and Ior2	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\frac{DPCH\_E_c}{I_{or}}$ = -11,9 dB: Ior1 = –60dBm Ior2 = –60dBm The absolute levels of Ior1 and Ior2 are not important to this test.

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.7.2 Combining of TPC commands Test 2	$\frac{DPCH\_E_c}{I_{or}}$ -12 dB I_{oc} = - 60 dBm $\hat{I}_{or1}/I_{oc}$ = $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or1}/I_{oc}$ = Minimum Requirement + TT $\hat{I}_{or2}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or1}/I_{oc}$ = $\hat{I}_{or2}/I_{oc}$ = 0.6 dB $\frac{DPCH\_E_c}{I_{or}}$ =-11,9 dB:
7.7.3 Combining of reliable TPC commands from radio links of different radio link sets	Test parameters: $\frac{DPCH\_E_{c1}}{I_{or1}}$ = set at the level corresponding to 5% TPC error rate. Test 1: $\frac{DPCH\_E_{c2}}{I_{or2}}$ = $\frac{DPCH\_E_{c1}}{I_{or1}}$ -10 dB $\frac{DPCH\_E_{c3}}{I_{or3}}$ = $\frac{DPCH\_E_{c1}}{I_{or1}}$ -10 dB Test 2: $\frac{DPCH\_E_{c2}}{I_{or2}}$ = $\frac{DPCH\_E_{c1}}{I_{or1}}$ +6 dB Test requirements: Test 1: UE output power = -15 dBm ± 5 dB Test 2: UE output power = -15 dBm ± 3 dB	0 dB for all test parameters 0 dB for all test requirements	Test parameters: $\frac{DPCH\_E_{c1}}{I_{or1}}$ = Minimum Requirement + TT $\frac{DPCH\_E_{c2}}{I_{or2}}$ = Minimum Requirement + TT $\frac{DPCH\_E_{c3}}{I_{or3}}$ = Minimum Requirement + TT Test requirements: Test 1: UE output power = -15 dBm ± (5 dB + TT) Test 2: UE output power = -15 dBm ± (3 dB + TT)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.8.1 Power control in downlink constant BLER target (Release 5 and earlier)	$\frac{DPCH\_E_c}{I_{or}}$ -9 to -16 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 to -1 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$ Alternative $\frac{DPCH\_E_c}{I_{or}}$ tolerances also apply for test cases using an SS with delayed DL power control response time.	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 to -0.4 dB $\frac{DPCH\_E_c}{I_{or}}$ = -8.9 to –15.9 dB:
7.8.1A Power control in downlink constant BLER target (Release 6 and later)	$\frac{DPCH\_E_c}{I_{or}}$ -9 to -16 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 to -1 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 to -0.4 dB $\frac{DPCH\_E_c}{I_{or}}$ = -8.9 to –15.9 dB:
7.8.2, Power control in downlink initial convergence (Release 5 and earlier)	$\frac{DPCH\_E_c}{I_{or}}$ -8.1 to –18.9 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -1 dB	0.6 dB for $\frac{DPCH\_E_c}{I_{or}}$ power ratio values during T1 and T2. Alternative $\frac{DPCH\_E_c}{I_{or}}$ tolerance of 0.8 dB applies when using an SS with delayed DL power control response time.	Formulas: DPCH_Ec/Ior during T1 and T2: Minimum Requirement –TT ≤ DPCH_Ec/Ior ≤ Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = unchanged I_{oc} unchanged

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.8.3A, Power control in downlink: wind up effects (Release 6 and later)	$\frac{DPCH\_E_c}{I_{or}}$ -13.3 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 5 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 5.6 dB $\frac{DPCH\_E_c}{I_{or}}$ = -13.2 dB:
7.8.3, Power control in downlink: wind up effects	$\frac{DPCH\_E_c}{I_{or}}$ -13.3 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 5 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$ Alternative $\frac{DPCH\_E_c}{I_{or}}$ tolerances also apply for test cases using an SS with delayed DL power control response time.	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 5.6 dB $\frac{DPCH\_E_c}{I_{or}}$ = -13.2 dB:
7.8.4, Power control in the downlink, different transport formats	$\frac{DPCH\_E_c}{I_{or}}$ -16 to –18 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$ Alternative $\frac{DPCH\_E_c}{I_{or}}$ tolerances also apply for test cases using an SS with delayed DL power control response time.	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 dB $\frac{DPCH\_E_c}{I_{or}}$ =-15.9 to -17.9 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.8.5, Power control in the downlink for F-DPCH	$\frac{F-DPCH\_E_c}{I_{or}}$ -15.9 to -12 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 to -1 dB	0.1 dB for $\frac{F-DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	
7.9.1 Downlink compressed mode / single link performance (Release 5 and earlier)	$\frac{DPCH\_E_c}{I_{or}}$ Test 1 -14.6 dB Test 3 -15.2 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 dB $\frac{DPCH\_E_c}{I_{or}}$ = Test 1 -14.5 dB Test 3 -15.1 dB:
7.9.1A Downlink compressed mode / single link performance (Release 6 and later)	$\frac{DPCH\_E_c}{I_{or}}$ Test 1 -13.7 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 dB $\frac{DPCH\_E_c}{I_{or}}$ = Test 1 -13.6 dB
7.10 Blind transport format detection Tests 1, 2, 3	$\frac{DPCH\_E_c}{I_{or}}$ -17.7 to -18.4 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -1 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.3 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -0.7 dB $\frac{DPCH\_E_c}{I_{or}}$ =-17.6 to –18.3 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.10 Blind transport format detection Tests 4, 5, 6	$\frac{DPCH\_E_c}{I_{or}}$ -13.0 to -13.8 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -3 dB	0.1 dB for $\frac{DPCH\_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH\_E_c}{I_{or}}$ = Minimum Requirement + TT $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -2.4 dB $\frac{DPCH\_E_c}{I_{or}}$ =-12.9 to -13.7 dB:
7.11 Demodulation of paging channel (PCH)	Test 1: Ioc=-60 dBm Îor/Ioc = -1 dB S-CCPCH_Ec/Ior = -14.8 dB PICH_Ec/Ior = -19 dB	Test 1: 0.4 dB for Îor/Ioc	Ioc, S-CCPCH_Ec/Ior and PICH_Ec/Ior are unchanged Since PICH Power Offset has to be an integer value TT for PICH_Ec/Ior is zero. But TT of Îor/Ioc has been increased by 0.1 dB from its normal value (0.3 dB / 0.6 dB) due to test system uncertainty of PICH_Ec/Ior. Formulas: $\hat{I}_{or}/I_{oc}$ = Minimum Requirement + TT
	Test 2: Ioc=-60 dBm Îor/Ioc = -3 dB S-CCPCH_Ec/Ior = -9.8 dB PICH_Ec/Ior = -12 dB	Test 2: 0.7 dB for Îor/Ioc	
7.12 Detection of acquisition indicator (AI)	Ioc=-60 dBm Îor/Ioc = -1 dB AICH_Ec/Ior = -22.0 dB S-CCPCH_Ec/Ior = -12.0 dB	0.4 dB for Îor/Ioc	Ioc and AICH_Ec/Ior are unchanged. Since AICH Power Offset has to be an integer value TT for AICH_Ec/Ior is zero. But TT of Îor/Ioc has been increased by 0.1 dB from its normal value (0.3 dB) due to test system uncertainty of AICH_Ec/Ior. No need to add test tolerance to S-CCPCH_Ec/Ior since it is not critical parameter Formula: Îor/Ioc = Minimum Requirement + TT
7.12A Detection of E-DCH Acquisition Indicator (E-AI)	Ioc=-60 dBm Îor/Ioc = -1 dB AICH_Ec/Ior = -22.0 dB E-AICH_Ec/Ior = -22.0 dB S-CCPCH_Ec/Ior = -12.0 dB	0.4 dB for Îor/Ioc	Ioc, AICH_Ec/Ior and E-AICH_Ec/Ior are unchanged. Since AICH Power Offset has to be an integer value TT for AICH_Ec/Ior and E-AICH_Ec/Ior are zero. But TT of Îor/Ioc has been increased by 0.1 dB from its normal value (0.3 dB) due to test system uncertainty of AICH_Ec/Ior and E-AICH_Ec/Ior. No need to add test tolerance to S-CCPCH_Ec/Ior since it is not critical parameter Formula: Îor/Ioc = Minimum Requirement + TT
7.13 UE UL power control operation with discontinuous UL DPCCH transmission operation	UE Output power difference: Lower: -2 dB Upper: 4 dB	[0.3] dB	DL: No test tolerances applied: UL: Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT

F.4.4 Requirements for support of RRM

Table F.4.4: Derivation of Test Requirements (RRM tests)

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.2 Idle Mode Tasks			
8.2.2 Cell Re-Selection			
8.2.2.1 Scenario 1: Single carrier case	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T1 and T2: Cells 1 and 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cells 3, 4, 5, 6: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Ior(3, 4, 5, 6) = -69.73 dBm	During T1 and T2: +0.60 dB +0.60 dB +0.60 dB +0.60 dB -0.50 dB -0.50 dB -0.50 dB -0.50 dB +0.03 dB for Ior(3, 4, 5, 6)	During T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ior(3, 4, 5, 6) Minimum Requirement + TT
	During T1: Ior(1) = -62.73 dBm Ior(2) = -59.73 dBm	During T1: -0.27 dB for Ior(1) +0.13 dB for Ior(2)	During T1: Ior(1) Minimum Requirement + TT Ior(2) Minimum Requirement + TT
	During T2: Ior(1) = -59.73 dBm Ior(2) = -62.73 dBm	During T2: +0.13 dB for Ior(1) -0.27 dB for Ior(2)	During T2: Ior(1) Minimum Requirement + TT Ior(2) Minimum Requirement + TT
8.2.2.2 Scenario 2: Multi carrier case	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	Channel 1 during T1 and T2: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cells 3 and 4: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	Channel 1 during T1 and T2: +0.70 dB +0.70 dB +0.70 dB +0.70 dB -0.80 dB -0.80 dB -0.80 dB -0.80 dB	Channel 1 during T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 1 during T1: Ior(1) = -73.39 dBm Ior(3, 4) = -77.39 dBm Ioc(1) = -70.00 dBm	Channel 1 during T1: -0.01 dB for Ior(1) -0.01 dB for Ior(3,4) 0.00 dB for Ioc(1)	Channel 1 during T1: Ior(1) Minimum Requirement + TT Ior(3, 4) Minimum Requirement + TT oc(1) Minimum Requirement + TT
	Channel 1 during T2: Ior(1) = -67.75 dBm Ior(3, 4) = -74.75 dBm Ioc(1) = -70.00 dBm	Channel 1 during T2: +0.75 dB for Ior(1) -0.05 dB for Ior(3, 4) -1.80 dB for Ioc(1)	Channel 1 during T2: Ior(1) Minimum Requirement + TT Ior(3, 4) Minimum Requirement + TT Ioc(1) Minimum Requirement + TT
	Channel 2 during T1 and T2: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cells 5 and 6: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	Channel 2 during T1 and T2: +0.70 dB +0.70 dB +0.70 dB +0.70 dB -0.80 dB -0.80 dB -0.80 dB -0.80 dB	Channel 2 during T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	Channel 2 during T1: Ior(2) = -67.75 dBm Ior(5, 6) = -74.75 dBm Ioc(2) = -70.00 dBm	Channel 2 during T1: +0.75 dB for Ior(2) -0.05 dB for Ior(5, 6) -1.80 dB for Ioc(2)	Channel 2 during T1: Minimum Requirement (Ior(2)) + TT Minimum Requirement (Ior(5, 6)) + TT Minimum Requirement (Ioc(2)) + TT
	Channel 2 during T2: Ior(2) = -73.39 dBm Ior(5, 6) = -77.39 dBm Ioc(2) = -70.00 dBm	Channel 2 during T2: -0.01 dB for Ior(2) -0.01 dB for Ior(5,6) 0.00 dB for Ioc(2)	Channel 2 during T2: Ior(2) Minimum Requirement + TT Ior(5, 6) Minimum Requirement + TT Ioc(2) Minimum Requirement + TT
8.2.3 UTRAN to GSM Cell Re-Selection			
8.2.3.1 Scenario 1: Both UTRA and GSM level changed	During T1: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = 0 dB RXLEV=-90 dBm	During T1: 0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	During T1: Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT RXLEV - TT Ior/Ioc = 0.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -9.9 dB: Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be below –90 dBm (Threshold for GSM).
	During T2: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = - 5 dB RXLEV=-75 dBm	During T2: 0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	During T2: Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement - TT Ior/Ioc = Minimum Requirement - TT RXLEV + TT Ior/Ioc = -5.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -10.1 dB: Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be above –75 dBm (Threshold for GSM).

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.2.3.2 Scenario 2: Only UTRA level changed	During T1: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = 20 dB RXLEV=-80 dBm	During T1: 0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	During T1: Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT RXLEV - TT Ior/Ioc = 20.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -9.9 dB: Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be below –80 dBm (Threshold for GSM).
	During T2: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = -9 dB RXLEV=-80 dBm	During T2: 0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	During T2: Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement - TT Ior/Ioc = Minimum Requirement - TT RXLEV + TT Ior/Ioc = -9.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -10.1 dB: Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be above –80 dBm (Threshold for GSM).
8.2.3.3 Scenario 3: HCS with only UTRA level changed	$\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = 40 dB	0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT RXLEV + TT Ior/Ioc = 40.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -9.9 dB:

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	$\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = 10 dB	0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = ratio - TT Ior/Ioc = ratio - TT RXLEV + TT Ior/Ioc = 9.7 dB $\frac{CPICH\_E_c}{I_{or}}$ = -10.1 dB:
8.2.4 FDD/TDD cell re-selection	TBD		
8.2.5 UTRA to E-UTRA Cell Re-Selection			
8.2.5.1 E-UTRA is of higher priority	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +12.00dB UTRA cell during T3: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T3: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB	UTRA cell during T1: 0dB +0.80dB 0dB E-UTRA cell during T1: -1.10dB 0dB UTRA cell during T2: 0dB +0.80dB 0dB E-UTRA cell during T2: -1.10dB +1.90dB UTRA cell during T3: 0dB +0.80dB 0dB E-UTRA cell during T3: -1.10dB +0.30dB	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: +13.90dB UTRA cell during T3: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T3: N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: -3.70dB
8.2.5.2 E-UTRA is of lower priority	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB	UTRA cell during T1: -0.10dB +0.90dB 0dB E-UTRA cell during T1: 0dB +0.80dB UTRA cell during T2: -0.10dB -0.70dB 0dB E-UTRA cell during T2: 0dB +0.80dB	UTRA cell during T1: I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: +11.90dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.80dB UTRA cell during T2: I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -5.70dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.80dB

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.3 UTRAN Connected Mode Mobility	TBD		
8.3.1 FDD/FDD Soft Handover	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T0/T1 and T2/T3/T4/T5/T6: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Relative delay of paths received from cell 2 with respect to cell 1 = {-148 … 148} chips	During T0/T1 and T2/T3/T4/T5/T6: +0.70 dB +0.70 dB +0.70 dB +0.70 dB 0.5 chips	During T0/T1 and T2/T3/T4/T5/T6: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT {-148+TT … 148-TT} chips
	During T0/T1: Already covered above	During T0/T1: Covered above	During T0/T1: Already covered above
	During T2/T3/T4/T5/T6: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T2/T3/T4/T5/T6: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T2/T3/T4/T5/T6: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
8.3.2 FDD/FDD Hard Handover			
8.3.2.1 Handover to intra-frequency cell	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T1 and T2 / T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T1 / T2 / T3: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T1 and T2 / T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	During T1: Already covered above	During T1: Covered above	During T1: Already covered above
	During T2 / T3: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T2 / T3: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T2 / T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.3.2.2 Handover to inter-frequency cell	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	Channel 1 during T1 and T2 / T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	Channel 1 during T1 and T2 / T3: +0.80 dB +0.80 dB +0.80 dB +0.80 dB	Channel 1 during T1 and T2 / T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 2 during T1: Not applicable	Channel 2 during T1: Not applicable	Channel 2 during T1: Not applicable
	Channel 2 during T2 / T3: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	Channel 2 during T2 / T3: +0.80 dB +0.80 dB +0.80 dB +0.80 dB	Channel 2 during T2 / T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
8.3.3 FDD/TDD Handover	TBD		
8.3.4 Inter-system Handover form UTRAN FDD to GSM	During T2 and T3 RXLEV=-75 dBm	During T2 and T3: + 1 dB for RXLEV	During T2 and T3 Minimum Requirement + TT Only RXLEV during T2 and T3 is a critical parameter. UE measurement accuracy for GSM Carrier RSSI is ±4 dB in this test. During T2 and T3 : measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be above –80 dBm (Threshold for GSM). => TT=+1 dB for RXLEV

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.3.4a Inter-system Handover from UTRAN FDD to E-UTRAN FDD	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +7.00dB UTRA cell during T3: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T3: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +7.00dB	UTRA cell during T1: 0dB 0dB 0dB E-UTRA cell during T1: 0dB 0dB UTRA cell during T2: 0dB 0dB 0dB E-UTRA cell during T2: 0dB +0.80dB UTRA cell during T3: 0dB 0dB 0dB E-UTRA cell during T3: 0dB +0.80dB	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +7.80dB UTRA cell during T3: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T3: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +7.80dB
8.3.4b Inter-system Handover from UTRAN FDD to E-UTRAN TDD	Same as 8.3.4a	Same as 8.3.4a	Same as 8.3.4a
8.3.4c Inter-system Handover from UTRAN FDD to E-UTRAN FDD: Unknown Target Cell	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: 0dB	UTRA cell during T1: 0dB 0dB 0dB E-UTRA cell during T1: 0dB 0dB UTRA cell during T2: 0dB 0dB 0dB E-UTRA cell during T2: 0dB 0dB	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: 0dB
8.3.4d Inter-system Handover from UTRAN FDD to E-UTRAN TDD; Unknown Target Cell	Same as 8.3.4c	Same as 8.3.4c	Same as 8.3.4c
8.3.5 Cell Re-selection in CELL_FACH			
8.3.5.1 One frequency present in the neighbour list	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	During T1 and T2: Cells 1 and 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB Cells 3, 4, 5, 6: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB Ior(3, 4, 5, 6) = -69.73 dBm	During T1 and T2: +0.60 dB +0.60 dB +0.60 dB +0.60 dB +0.60 dB -0.50 dB -0.50 dB -0.50 dB -0.50 dB -0.50 dB +0.03 dB for Ior(3, 4, 5, 6)	During T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ior(3, 4, 5, 6) Minimum Requirement + TT
	During T1: Ior(1) = -62.73 dBm Ior(2) = -59.73 dBm	During T1: -0.27 dB for Ior(1) +0.13 dB for Ior(2)	During T1: Minimum Requirement (Ior(1)) + TT Minimum Requirement (Ior(2)) + TT
	During T2: Ior(1) = -59.73 dBm Ior(2) = -62.73 dBm	During T2: +0.13 dB for Ior(1) -0.27 dB for Ior(2)	During T2: Ior(1) Minimum Requirement + TT or(2) Minimum Requirement + TT
8.3.5.2 Two frequencies present in the neighbour list	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	Channel 1 during T1 and T2: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB Cells 3 and 4: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB	Channel 1 during T1 and T2: +0.60 dB +0.60 dB +0.60 dB +0.60 dB +0.60 dB -0.70 dB -0.70 dB -0.70 dB -0.70 dB -0.70 dB	Channel 1 during T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 1 during T1: Ior(1) = -71.85 dBm Ior(3, 4) = -76.85 dBm Ioc(1) = -70.00 dBm	Channel 1 during T1: +0.05 dB for Ior(1) +0.05 dB for Ior(3,4) 0.00 dB for Ioc(1)	Channel 1 during T1: Ior(1) Minimum Requirement + TT Ior(3, 4) Minimum Requirement + TT Ioc(1) Minimum Requirement + TT
	Channel 1 during T2: Ior(1) = -67.75 dBm Ior(3, 4) = -74.75 dBm Ioc(1) = -70.00 dBm	Channel 1 during T2: +0.75 dB for Ior(1) -0.05 dB for Ior(3, 4) -1.60 dB for Ioc(1)	Channel 1 during T2: Ior(1) Minimum Requirement + TT Ior(3, 4) Minimum Requirement + TT Ioc(1) Minimum Requirement + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	Channel 2 during T1 and T2: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB Cells 5 and 6: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB	Channel 2 during T1 and T2: +0.60 dB +0.60 dB +0.60 dB +0.60 dB +0.60 dB -0.70 dB -0.70 dB -0.70 dB -0.70 dB -0.70 dB	Channel 2 during T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 2 during T1: Ior(2) = -67.75 dBm Ior(5, 6) = -74.75 dBm Ioc(2) = -70.00 dBm	Channel 2 during T1: +0.75 dB for Ior(2) -0.05 dB for Ior(5, 6) -1.60 dB for Ioc(2)	Channel 2 during T1: Ior(2) Minimum Requirement + TT Ior(5, 6) Minimum Requirement + TT Ioc(2) Minimum Requirement + TT
	Channel 2 during T2: Ior(2) = -71.85 dBm Ior(5, 6) = -76.85 dBm Ioc(2) = -70.00 dBm	Channel 2 during T2: +0.05 dB for Ior(2) +0.05 dB for Ior(5,6) 0.00 dB for Ioc(2)	Channel 2 during T2: Ior(2) Minimum Requirement + TT Ior(5, 6) Minimum Requirement + TT Ioc(2) Minimum Requirement + TT
8.3.5.3 Cell Re-selection to GSM	During T1: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = 0 dB RXLEV=-90 dBm Ioc/RXLEV = 20	During T1: 0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	During T1: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT RXLEV - TT Ior/Ioc = 0.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -9.9 dB: Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be below –90 dBm (Threshold for GSM).

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	During T2: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = - 5 dB RXLEV=-75 dBm Ioc/RXLEV = 5	During T2: 0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc 1.0 dB for RXLEV	During T2: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement - TT Ior/Ioc = Minimum Requirement - TT RXLEV + TT Ior/Ioc = -5.3 dB $\frac{CPICH\_E_c}{I_{or}}$ = -10.1 dB: Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be above –75 dBm (Threshold for GSM).
8.3.5.4 Cell Reselection during an MBMS session, two frequencies present in neighbour list	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	Channel 1 during T2 and T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB	Channel 1 during T2 and T3: +1.00 dB +1.00 dB +1.00 dB +1.00 dB +1.00 dB	Channel 1 during T2 and T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 1 during T3: Ioc(1) = -70.00 dBm	Channel 1 during T3: -1.52 dB for Ioc(1)	Channel 1 during T3: Ioc(1) Minimum Requirement + TT
	Channel 2 during T1, T2 and T3: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH1_Ec/Ior = -12 dB S-CCPCH2_Ec/Ior = -6 dB	Channel 2 during T1, T2 and T3: +1.00 dB +1.00 dB +1.00 dB +1.00 dB +1.00 dB +1.00 dB	Channel 2 during T1, T2 and T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 2 during T2: Ioc(2) = -70.00 dBm	Channel 2 during T2: -1.38 dB for Ioc(2)	Channel 2 during T2: Ioc(2) Minimum Requirement + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.3.6 Cell Re-selection in CELL_PCH			
8.3.6.1 One frequency present in the neighbour list	Same as 8.2.2.1	Same as 8.2.2.1	Same as 8.2.2.1
	$\frac{CPICH\_E_c}{I_{or}}$ = -10 dB I_{oc} = - 70 dBm Ior/Ioc = 10.27 dB Note: Parameters are valid for cell 1 at time T2 and cell 2 at time T1	0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc	Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT Ioc unchanged Ior/Ioc = 10.57 dB $\frac{CPICH\_E_c}{I_{or}}$ =-9.9 dB:
8.3.6.2 Two frequencies present in the neighbour list	Same as 8.2.2.2	Same as 8.2.2.2	Same as 8.2.2.2
	$\frac{CPICH\_E_c}{I_{or}}$ = -10 dB I_{oc} = - 70 dBm Ior/Ioc = 2.2 dB Note: Parameters are valid for cell 1 at time T2 and cell 2 at time T1	0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc	Formulas: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT Ioc unchanged Ioc ratio unchanged Ior/Ioc = 2.5 dB $\frac{CPICH\_E_c}{I_{or}}$ = -9.9 dB:
8.3.6.3 Cell re-selection during an MBMS session, one UTRAN inter-frequency and 2 GSM cells present in the neighbour list	Same way as 8.3.5.4 for Channel 1 and 2 during T1 and T2.	Same way as 8.3.5.4 for Channel 1 and 2 during T1 and T2.	Same way as 8.3.5.4 for Channel 1 and 2 during T1 and T2.
	<u>Channel 1 during T2:</u> Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH_Ec/Ior = -12 dB	<u>Channel 1 during T2:</u> +1.00 dB +1.00 dB +1.00 dB +1.00 dB +1.00 dB	<u>Channel 1 during T2:</u> Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	Channel 2 during T1 and T2: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB S-CCPCH1_Ec/Ior = -12 dB S-CCPCH2_Ec/Ior = -6.8 dB	Channel 2 during T1 and T2: +1.00 dB +1.00 dB +1.00 dB +1.00 dB +1.00 dB +1.00 dB	Channel 2 during T1 and T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 2 during T2: Ioc(2) = -70.00 dBm	Channel 2 during T2: -1.50 dB for Ioc(2)	Channel 2 during T2: Ioc(2) Minimum Requirement + TT
	Channel 2 during T3: $\frac{CPICH\_E_c}{I_{or}}$ = -10 dB Ior/Ioc = -15 dB	Channel 2 during T3: -0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ -0.3 dB for Ior/Ioc	Channel 2 during T3: $\frac{CPICH\_E_c}{I_{or}}$ = Minimum Requirement + TT Ior/Ioc = Minimum Requirement + TT
	GSM During T2: RXLEV1=-85 dBm RXLEV2=-85 dBm	GSM During T2: -1.0 dB for RXLEV1 -1.0 dB for RXLEV2	GSM During T2: RXLEV + TT RXLEV + TT Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be below –85 dBm (Threshold for GSM).
	GSM During T3: RXLEV2=-85 dBm	GSM During T3: +1.0 dB for RXLEV2	GSM During T3: RXLEV + TT Measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be above –85 dBm (Threshold for GSM).

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.3.7 Cell Re-selection in URA_PCH			
8.3.7.1 One frequency present in the neighbour list	Same as 8.2.2.1	Same as 8.2.2.1	Same as 8.2.2.1
8.3.7.2 Two frequencies present in the neighbour list	Same as 8.2.2.2	Same as 8.2.2.2	Same as 8.2.2.2
8.3.8 Serving HS-DSCH cell change	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T0/T1/T2/T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB HS-PDSCH_Ec/Ior = -10 dB HS-SCCH_Ec/Ior = -13 dB Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Relative delay of paths received from cell 2 with respect to cell 1 = {-148 … 148} chips	During T0/T1/T2/T3: +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB 0.5 chips	During T0/T1/T2/T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT {-148+TT … 148-TT} chips
	During T0 Already covered above	During T0 Covered above	During T0 Already covered above
	During T1/T2/T3 Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T1/T2/T3 +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T1/T2/T3 Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	During T4: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB HS-PDSCH_Ec/Ior = -10 dB HS-SCCH_Ec/Ior = -13 dB Relative delay of paths received from cell 2 with respect to cell 1 = {-148 … 148} chips	During T4: +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB 0.5 chips	During T4: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT {-148+TT … 148-TT} chips
8.3.9 Enhanced Serving HS-DSCH cell change	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis of TC 8.3.9 is not recorded in 3GPP TR 34 902 [24] but it would be very similar to TC 8.3.8 analysis, and therefore it is safe to assume to apply the same principle in TC 8.3.9 tolerances as in TC 8.3.8 tolerances.		
	During T1/T2: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB HS-PDSCH_Ec/Ior = -10 dB HS-SCCH-1_Ec/Ior = -13 dB Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Relative delay of paths received from cell 2 with respect to cell 1 = {-148 … 148} chips	During T1/T2: +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB 0.5 chips	During T1/T2: Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT {-148+TT … 148-TT} chips

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	During T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB HS-SCCH-1_Ec/Ior = -13 dB Relative delay of paths received from cell 2 with respect to cell 1 = {-148 … 148} chips	During T3: +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB 0.5 chips	During T3: Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT {-148+TT … 148-TT} chips
	During T4: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB HS-PDSCH_Ec/Ior = -10 dB HS-SCCH-2_Ec/Ior = -13 dB Relative delay of paths received from cell 2 with respect to cell 1 = {-148 … 148} chips	During T4: +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB +0.70 dB 0.5 chips	During T4: Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT Ec/Ior Min Requirement + TT {-148+TT … 148-TT} chips
8.3.10 System information acquisition for CSG cell			
8.3.10.1 Intrafrequency System information acquisition for CSG cell	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T1/T2: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T1 / T2: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T1 / T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	During T1: Already covered above	During T1: Covered above	During T1: Already covered above

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	During T2: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T2: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T2: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
8.3.10.2 Inter frequency System information acquisition for CSG cell	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	Channel 1 during T1 and T2 / T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	Channel 1 during T1 and T2 / T3: +0.80 dB +0.80 dB +0.80 dB +0.80 dB	Channel 1 during T1 and T2 / T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
	Channel 2 during T1: Not applicable	Channel 2 during T1: Not applicable	Channel 2 during T1: Not applicable
	Channel 2 during T2 / T3: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	Channel 2 during T2 / T3: +0.80 dB +0.80 dB +0.80 dB +0.80 dB	Channel 2 during T2 / T3: Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT Ec/Ior Minimum Requirement + TT
8.4 RRC Connection Control			
8.4.1 RRC Re-establishment delay	TBD		

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.4.1.1 Test 1	Cell 1, T1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB DCH_Ec/Ior = -17 dB Ior/Ioc = 2.39 dB Cell 1, T2: Ior/Ioc = -infinity Cell 2, T1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Ior/Ioc = 4.39 dB Cell 2, T2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Ior/Ioc = 0.02 dB	0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc	Level settings in either direction are not critical with respect to the outcome of the test.
8.4.1.2 Test 2	Cell 1, T1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB DCH_Ec/Ior = -17 dB Ior/Ioc = -3.35 dB Cell 1, T2: Ior/Ioc = -infinity Cell 2, T1: Ior/Ioc = -infinity Cell 2, T2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Ior/Ioc = 0.02 dB	0.1 dB for $\frac{CPICH\_E_c}{I_{or}}$ 0.3 dB for Ior/Ioc	Level settings in either direction are not critical with respect to the outcome of the test.
8.4.2 Random Access	PRACH power difference nominal 3dB ± 2dB UE setting uncertainty	Measurement TT: Power difference ± 1dBMaximum Power-1dB / +0.7dB	Test parameter settings unchanged. Power measurement: Upper limit +TT Lower limit -TT
8.4.2.1A Correct behaviour when receiving an ACK (Release 6 and later)	PRACH timing error ±3.5 chips	0.5 chips	Formula: Upper limit + TT Lower limit – TT
8.4.2.4 Random Access correct behaviour when reaching maximum transmit power	Maximum preamble power=0dBm±9dB (Normal) Maximum preamble power=0dBm±12dB (Extreme)	1.0 dB	Formula: Upper limit + TT Lower limit – TT For Normal conditions: Upper Tolerance limit = +10 dB Lower Tolerance limit = -10 dB For Extreme conditions: Upper Tolerance limit = +13 dB Lower Tolerance limit = -13 dB

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.4.3 Transport format combination selection in UE	DL Power control is ON so DPCH_Ec/Ior depends on TPC commands sent by UE	0 dB for DPCH_Ec/Ior	No test requirements for DPCH_Ec/Ior
8.4.4 E-TFC restriction in UE			
8.4.4.1 10ms TTI E-DCH E-TFC restriction	$\frac{E_c}{I_{or}}$ -3.47, -10, -31dB Îor = -70 dBm	0.1 dB for $\frac{E_c}{I_{or}}$ 0.7 dB for Îor	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT Îor = Minimum Requirement + TT
8.4.4.2 2ms TTI E-DCH E-TFC restriction	$\frac{E_c}{I_{or}}$ -3.5, -10, -24.4dB Îor = -70 dBm	0.1 dB for $\frac{E_c}{I_{or}}$ 0.7 dB for Îor	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT Îor = Minimum Requirement + TT
8.5 Timing and Signalling Characteristics			
8.5.1 UE Transmit Timing	DPCH_Ec/Ior = -13.5 dB CPICH_Ec/Ior = -10 dB Îor1=-96 dB Îor2=-99 dB Rx-Tx Timing accuracy ±1.5 chips ¼ chip / 200ms maximum rate 233ns / s minimum rate	0.1 dB for CPICH_Ec/Ior 0.1 dB for DPCH_Ec/Ior 0.1 dB for DPCH_Ec/Ior 1 dB for Îor1 1.3 dB for Îor2 0.5 chips for Rx-Tx timing accuracy 0.25 chips for Tx-Tx Timing Accuracy	Since the test is performed close to sensitivity level any TT applied to the nominal setting shall fulfil: Îor1 shall not go below –96 dBm Îor2 shall not go below –99 dBm Îor1/Îor2 shall not go above 3 dB DPCH_Ec/Ior shall not go below –13.5 dB CPICH_Ec/Ior shall not go below –10 dB Formulas for test parameters DPCH_Ec/Ior +TT CPICH_Ec/Ior + TT Îor1 + TT Îor2 + TT Rx-Tx Timing accuracy ±2.0 chip Formulas for test requirements: Upper limit +TT Lower limit –TT Tx-Tx Timing accuracies Formulas for test requirements: Upper limit +TT Lower limit –TT
8.6 UE Measurements Procedures			
8.6.1 FDD intra frequency measurements			
8.6.1.1 Event triggered reporting in AWGN propagation conditions (R99)	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	<u>During T1 to T4:</u> Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	<u>During T1 to T4:</u> +0.70 dB +0.70 dB +0.70 dB +0.70 dB	<u>During T1 to T4:</u> Ec/Ior ratio + TT Ec/Ior ratio + TT Ec/Ior ratio + TT Ec/Ior ratio + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	During T1/T4 only : Already covered above	During T1/T4 only: Covered above	During T1/T4 only: Already covered above
	During T2/T3 only: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T2/T3 only: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T2/T3 only: Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT
8.6.1.1A Event triggered reporting in AWGN propagation conditions (Rel-4 and later)	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T1 / T2 / T3: Cell 1: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T1 / T2 / T3: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T1 / T2 / T3: Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT
	During T1/T3 only : Already covered above	During T1/T3 only: Covered above	During T1/T3 only: Already covered above
	During T2 only: Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T2 only: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T2 only: Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT
8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition (R99)	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T0 to T6: Cell 1, Cell 2 and Cell 3: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T0 to T6: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T0 to T6: Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT
8.6.1.2A Event triggered reporting of multiple neighbours in AWGN propagation condition (Rel-4 and later)	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].		
	During T0 to T4: Cell 1, Cell 2 and Cell 3: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB	During T0 to T4: +0.70 dB +0.70 dB +0.70 dB +0.70 dB	During T0 to T4: Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT
8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition (R99)	Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].TBD		
	During T0 to T5: Cell 1, Cell 2 and Cell 3: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB Cell 1: DPCH_Ec/Ior = -17 dB	During T0 to T5: +0.40 dB +0.40 dB +0.40 dB +0.40 dB +0.40 dB	During T0 to T5: Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT Ec/lor ratio + TT

<table>
<tr><th>Test</th><th>Test Parameters in TS 25.133 [2]</th><th>Test Tolerance (TT)</th><th>Test Requirement in TS 34.121</th></tr>
<tr><td rowspan="2">8.6.1.3A Event triggered reporting of two detectable neighbours in AWGN propagation condition (Rel-4 and later)</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td>During T0 to T4:

Cell 1, Cell 2 and Cell 3:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB

Cell 1:
DPCH_Ec/Ior = -17 dB</td><td>During T0 to T4:

+0.40 dB
+0.40 dB
+0.40 dB
+0.40 dB

+0.40 dB</td><td>During T0 to T4:

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT

Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="3">8.6.1.4A Correct reporting of neighbours in fading propagation condition (Rel-4 and later)</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td>During T1 only:

Cell 1:
CPICH_Ec/Ior = -10dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB
DPCH_Ec/Ior = -17 dB

Cell 2:
CPICH_Ec/Ior = -10dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td>During T1:

+0.70 dB
+0.70 dB
+0.70 dB
+0.70 dB
+0.70 dB

+0.30 dB
+0.30 dB
+0.30 dB
+0.30 dB</td><td>During T1:

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
<tr><td>During T2 only:

Cell 1:
CPICH_Ec/Ior = -10dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB
DPCH_Ec/Ior = -17 dB

Cell 2:
CPICH_Ec/Ior = -10dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td>During T2:

+0.30 dB
+0.30 dB
+0.30 dB
+0.30 dB
+0.30 dB

+0.70 dB
+0.70 dB
+0.70 dB
+0.70 dB</td><td>During T2:

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="2">8.6.1.5 Event triggered reporting of multiple neighbour cells in Case 1 fading condition</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td>During T1 and T2:

Cell 1, 2, 3 and Cell 4:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td>During T1 and T2:

+0.70 dB
+0.70 dB
+0.70 dB
+0.70 dB</td><td>During T1 and T2:

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="2">8.6.1.6 Event triggered reporting of multiple neighbour cells in Case 3 fading conditions</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td>During T1 and T2:

Cell 1, 2, 3 and Cell 4:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td>During T1 and T2:

+0.70 dB
+0.70 dB
+0.70 dB
+0.70 dB</td><td>During T1 and T2:

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
</table>

<table>
<tr><th>Test</th><th>Test Parameters in TS 25.133 [2]</th><th>Test Tolerance (TT)</th><th>Test Requirement in TS 34.121</th></tr>
<tr><td>8.6.2 FDD inter frequency measurements</td><td>TBD</td><td></td><td></td></tr>
<tr><td rowspan="2">8.6.2.1 Correct reporting of neighbours in AWGN propagation condition (Release 5 and earlier)</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td><u>During T0 to T2:</u>

Cell 1, Cell 2 and Cell 3:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB

Cell 1:
DPCH_Ec/Ior = -17 dB</td><td><u>During T0 to T2:</u>

+0.80 dB
+0.80 dB
+0.80 dB
+0.80 dB

+0.80 dB</td><td><u>During T0 to T2:</u>

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT

Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="2">8.6.2.1A Correct reporting of neighbours in AWGN propagation condition (Release 6 and later)</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td><u>During T0 to T2:</u>

Cell 1, Cell 2 and Cell 3:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB

Cell 1:
DPCH_Ec/Ior = -17 dB</td><td><u>During T0 to T2:</u>

+0.80 dB
+0.80 dB
+0.80 dB
+0.80 dB

+0.80 dB</td><td><u>During T0 to T2:</u>

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT

Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="2">8.6.2.2 Correct reporting of neighbours in Fading propagation condition (Release 5 only)</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td><u>During T1 and T2:</u>

Cell 1 and Cell 2:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td><u>During T1 and T2:</u>

+0.80 dB
+0.80 dB
+0.80 dB
+0.80 dB</td><td><u>During T1 and T2:</u>

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="2">8.6.2.2A Correct reporting of neighbours in Fading propagation condition (Release 6 and later)</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 34 902 [24].</td></tr>
<tr><td><u>During T1 and T2:</u>

Cell 1 and Cell 2:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td><u>During T1 and T2:</u>

+0.80 dB
+0.80 dB
+0.80 dB
+0.80 dB</td><td><u>During T1 and T2:</u>

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
<tr><td rowspan="2">8.6.2.3 Correct reporting of neighbours in Fading propagation condition using TGL1=14</td><td colspan="3">Because the relationships between the Test system uncertainties and the Test Tolerances are complex, it is not possible to give a simple derivation of the Test Requirement in this document.</td></tr>
<tr><td><u>During T1 and T2:</u>

Cell 1 and Cell 2:
CPICH_Ec/Ior = -10 dB
PCCPCH_Ec/Ior = -12 dB
SCH_Ec/Ior = -12 dB
PICH_Ec/Ior = -15 dB</td><td><u>During T1 and T2:</u>

+0.80 dB
+0.80 dB
+0.80 dB
+0.80 dB</td><td><u>During T1 and T2:</u>

Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT
Ec/Ior ratio + TT</td></tr>
<tr><td>8.6.3 TDD measurements</td><td>TBD</td><td></td><td></td></tr>
</table>

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.6.3.1Correct reporting of TDD neighbours in AWGN propagation condition	TBD		
8.6.4 GSM measurements			
8.6.4.1 Correct reporting of GSM neighbours in AWGN propagation condition	During T2 RXLEV=-75 dBm During T3 RXLEV=-85 dBm	During T2: + 1 dB for RXLEV During T3: -1 dB for RXLEV	During T2 and T3 RXLEV + TT Only RXLEV is a critical parameter. UE measurement accuracy for GSM Carrier RSSI is ±4 dB in this test. During T2: measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be above –80 dBm (Threshold for GSM). => TT=+1 dB for RXLEV During T3: measured GSM Carrier RSSI ± uncertainty of RXLEV setting shall be below –80 dBm (Threshold for GSM). => TT=-1 dB for RXLEV
8.6.5 Combined Inter frequency and GSM measurements			
8.6.5.1 Correct reporting of neighbours in AWGN propagation condition	During T0 to T5: Cell 1 and Cell 2: CPICH_Ec/Ior = -10 dB PCCPCH_Ec/Ior = -12 dB SCH_Ec/Ior = -12 dB PICH_Ec/Ior = -15 dB During T4 to T5: RXLEV=-75 dBm	During T0 to T5: +0.80 dB +0.80 dB +0.80 dB +0.80 dB During T4 and T5: + 1 dB for RXLEV	During T0 to T5: Ec/Ior ratio + TT Ec/Ior ratio + TT Ec/Ior ratio + TT Ec/Ior ratio + TT During T4 and T5 RXLEV + TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.6.6.1 Correct reporting of E-UTRAN FDD neighbour in fading propagation condition	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -13.00dB E-UTRA cell during T1: N_{oc}: -100.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -13.00dB E-UTRA cell during T2: N_{oc}: -100.00dBm/15kHz Ês / N_{oc}: 16.00 dB UTRA cell during T3: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -13.00dB E-UTRA cell during T3: N_{oc}: -100.00dBm/15kHz Ês / N_{oc}: -4.00 dB	UTRA cell during T1: 0dB 0dB 0dB E-UTRA cell during T1: -0.6dB 0dB UTRA cell during T2: 0dB 0dB 0dB E-UTRA cell during T2: -0.6dB 0.6dB UTRA cell during T3: 0dB 0dB 0dB E-UTRA cell during T3: -0.6dB 0.6dB	UTRA cell during T1: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -13.00dB E-UTRA cell during T1: N_{oc}: -100.60dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -13.00dB E-UTRA cell during T2: N_{oc}: -100.60dBm/15kHz Ês / N_{oc}: 16.6dB UTRA cell during T3: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -13.00dB E-UTRA cell during T3: N_{oc}: -100.60dBm/15kHz Ês / N_{oc}: -3.4dB
8.6.6.2 Correct reporting of E-UTRAN TDD neighbour in fading propagation condition	Same as 8.6.6.1	Same as 8.6.6.1	Same as 8.6.6.1
8.6.7.1 Correct reporting of E-UTRA FDD neighbours in fading propagation condition	UTRA cell 1 during T1 and T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB UTRA cell 2 during T1 : I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -Infinity dB CPICH_E_c/I_{or}: --Infinity dB E-UTRA cell 3 during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell 2 during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -1.8dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell 3 during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: 13.00 dB	UTRA cell 1 during T1 and T2: 0dB 0dB 0dB UTRA cell 2 during T1: 0dB 0dB 0dB E-UTRA cell 3 during T1: 0dB 0dB UTRA cell 2 during T2: 0dB 0.7dB 0dB E-UTRA cell 3 during T2: 0dB 0dB	UTRA cell 1 during T1 and T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: 0dB CPICH_E_c/I_{or}: -10.00dB UTRA cell 2 during T1 : I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -Infinity dB CPICH_E_c/I_{or}: --Infinity dB E-UTRA cell 3 during T1: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -infinity dB UTRA cell 2 during T2: I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -1.1dB CPICH_E_c/I_{or}: -10.00dB E-UTRA cell 3 during T2: N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: 13.00 dB

8.6.7.2 Correct reporting of E-UTRA TDD neighbours in fading propagation condition	Same as 8.6.7.1	Same as 8.6.7.1	Same as 8.6.7.1
8.7 Measurements Performance Requirements			
8.7.1 CPICH RSCP			
8.7.1.1 Intra frequency measurements accuracy	see table 8.7.1.1.1.1 and table 8.7.1.1.1.2	±1 dB for Ioc±0.3 dB for Ior/Ioc±0.1dB for….._Ec/Ior	Any TT applied to the nominal setting shall fulfil: Test 1 (absolute and relative): Io shall not go above -70dBm Test 2(absolute and relative): Io shall not go above -50 dBm Test 3 (absolute and relative): Io shall not go below -94 dBm Ior/Ioc + TTTT on top of UE measurement accuracy:Absolute±1.0 dB for Ioc±0.3 dB for Ior/Ioc ±0.1dB for CPICH_Ec/Ior ∑ 1.4dBRelative±0.3 dB for Ior/Ioc (cell1)±0.3 dB for Ior/Ioc (cell2)±0.1dB for CPICH_Ec/Ior (cell1)±0.1dB for CPICH_Ec/Ior (cell2)∑ 0.8dB
8.7.1.2 Inter frequency measurement accuracy	See table 8.7.1.2.1.1 and table 8.7.1.2.1.2	±1 dB for Ioc±0.3 dB for Ioc1/Ioc2±0.3 dB for Ior/Ioc±0.1dB for ….._Ec/Ior For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2	Any TT applied to the nominal setting shall fulfil: Test 1: Io shall not go above -50 dBm Test 2: Io shall not go below -94 dBm Ior/Ioc + TT TT on top of UE measurement accuracy: ±0.3 dB for Ioc1/Ioc2 ±0.3 dB for Ior/Ioc (cell1) ±0.3 dB for Ior/Ioc (cell2) ±0.1dB for CPICH_Ec/Ior (cell1) ±0.1dB for CPICH_Ec/Ior (cell2) ∑ 1.1 dB
8.7.2 CPICH Ec/Io			

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.7.2.1 Intra frequency measurements accuracy	table 8.7.2.1.1.1 and table 8.7.2.1.1.2	±1 dB for Ioc ±0.3 dB for Ior/Ioc ±0.1dB for ….._Ec/Ior	Any TT applied to the nominal setting shall fulfil: Test 1(absolute and relative): Io shall not go above -50 dBm Test 2 (absolute and relative): Io shall not go below -87dBm Test 3 (absolute and relative): Io shall not go below -94 dBm CPICH Ec/Io shall stay in the UE accuracy ranges Ior/Ioc + TT TT on top of UE measurement accuracy: Absolute ±0.3 dB for Ior/Ioc ±0.1dB for CPICH_Ec/Ior ∑ 0.4dB Relative Ioc1=Ioc2 ±0.3 dB for Ior/Ioc (cell1) ±0.3 dB for Ior/Ioc (cell2) ±0.1dB for CPICH_Ec/Ior (cell1) ±0.1dB for CPICH_Ec/Ior (cell2) ∑ 0.8dB
8.7.2.2 Inter frequency measurement accuracy	table 8.7.2.2.2.1 and table 8.7.2.2.2.2	±1 dB for Ioc ±0.3 dB for Ioc1/Ioc2 ±0.3 dB for Ior/Ioc ±0.1dB for ….._Ec/Ior For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2	Any TT applied to the nominal setting shall fulfil: Test 1: Io shall not go above -50 dBm Test 2: Io shall not go below -87 dBm Test 3: Io shall not go below -94 dBm Ior/Ioc + TT TT on top of UE measurement accuracy: Ioc1=Ioc2. ±0.3 dB for Ior/Ioc (cell1) ±0.3 dB for Ior/Ioc (cell2) ±0.1dB for CPICH_Ec/Ior (cell1) ±0.1dB for CPICH_Ec/Ior (cell2) ∑ 0.8 dB

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.7.3.1 UTRA Carrier RSSI, absolute measurement accuracy	Table 8.7.3.1.2	±1 dB for Ioc ±0.3 dB for Ioc1/Ioc2 ±0.3 dB for Îor/Ioc For multi-band UE with Band I and VI 0.5 dB for Ioc1/Ioc2	Any TT applied to the nominal setting shall fulfil: Test 1: Io shall not go above -50 dBm Test 2: Io shall not go below -69 dBm Test 3: Io shall not go below -94 dBm Ior/Ioc + TT TT on top of UE measurement accuracy: Test 1: Max TT= Io_{max} – $Io_{nominal}$ $Io_{nominal}$ = -51.15 dBm Io_{max} = Ioc_{max} + Ior_{max} = (-53.5 dBm + 1dB) + (-52.5 dBm – 1.45 dB + 0.3 dB) = -50.0 dBm => Max TT = 1.15 dB Min TT = Io_{min} - Io Io_{min} = Ioc_{min} + Ior_{min} = (-53.5 dBm –1 dB) + (-54.5 dBm – 1.45 dB – 0.3 dB) = - 52.3 dBm => Min TT = -1.15 dB Test 2: Max TT= Io_{max} – $Io_{nominal}$ $Io_{nominal}$ = - 67.9 dBm Io_{max} = Ioc_{max} + Ior_{max} = (-69.27 dBm + 1dB) + (-68.27 dBm – 4.4 dB + 0.3 dB) = -66.8 dBm => Max TT = 1.1 dB Min TT = Io_{min} - Io Io_{min} = Ioc_{min} + Ior_{min} = (-69.27 dBm – 1 dB) + (-70.27 dBm – 4.4 dB – 0.3 dB) = -69.0 dBm => Min TT = -1.1 dB Test 3 (Band I): Max TT= Io_{max} – $Io_{nominal}$ $Io_{nominal}$ = -93 dBm Io_{max} = Ioc_{max} + Ior_{max} + No = (-93.46 dBm + 1dB) + (-92.46 dBm – 9.24 dB +0.3 dB) + -99 dBm = -91.2 => Max TT = 1.8 dB Min TT = Io_{min} - Io Io_{min} = Ioc_{min} + Ior_{min} = (-93.46 dBm – 1 dB) + (-94.46 dBm – 9.24 dB – 0.3 dB) = -94.0 dBm => Min TT = -1.0 dB The same TT for all bands

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.7.3.2 UTRA Carrier RSSI, relative measurement accuracy	Table 8.7.3.2.1A	±1 dB for Ioc ±0.3 dB for Ioc2/Ioc3 ±0.3 dB for Îor/Ioc	Any TT applied to the nominal setting shall fulfil: Test 1: Io shall not go above -50 dBm. Io3-Io2 shall not go below -20 dB. Test 2: Io shall not go below -91 dBm. Io3-Io2 shall not go above 20 dB Test 3: Io shall not go below -94 dBm (Band I). Io3-Io2 shall not go above 20 dB. Ior/Ioc + TT TT on top of UE measurement accuracy: Test 1: ±0.3 dB for Ioc3/Ioc2 ratio ±0.3 dB for Ior2/Ioc2 ratio ±0.3 dB for Ior3/Ioc3 ratio ∑±0.9 dB (This is the worst case since G factor makes the actual tolerance lower. No impact from Noise Floor. The same TT for all bands. Test 2: ±0.3 dB for Ioc3/Ioc2 ratio ±0.3 dB for Ior2/Ioc2 ratio ±0.3 dB for Ior3/Ioc3 ratio ∑±0.9 dB (This is the worst case since G factor makes the actual tolerance lower). Noise floor impact: Noise floor = -96 dB for Band III, VIII, and VIII, XII, XIII, XIV and XX (worst case). => Io2 increases by 1.0 dB, Io3 increases by 0.1 dB. Thus noise floor increases the test tolerance by 0.9 dB => TT = ±1.8 dB The same TT for all bands. Test 3: ±0.3 dB for Ioc3/Ioc2 ratio ±0.3 dB for Ior2/Ioc2 ratio ±0.3 dB for Ior3/Ioc3 ratio ∑±0.9 dB (This is the worst case since G factor makes the actual tolerance lower). Noise floor impact (Band I): Noise floor = -99 dB. => Io2 increases by 1.0 dB. No impact to Io3. Thus noise floor increases the test tolerance by 1.0 dB => TT = ±1.9 dB The same TT for all bands.

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.7.3A GSM Carrier RSSI	WCDMA cell parameters: See table 8.7.3A.2 GSM cell parameters: See table 8.7.3A.3	TT for test parameters GSM cell levels: Step 1: -1 dB Step 2: -1 dB Step 3: -1 dB Step 4:+1 dB TT for test requirements: Relative accuracy requirements: a, b, c and d values in minimum requirements are increased by 2 dB i.e., For x1 ≥ s+14, x2< -48 dBm: a=4, b=4, c=6, d=6 For s+14 > x1 ≥ s+1 a=5, b=4, c=7, d=6 For s+1 > x1 a=6, b=4, c=8, d=6 Absolute accuracy requirements: original minimum requirements are increased by ±1 dB	WCDMA: Test parameter settings are unchanged since level settings in either direction are not critical with respect to the outcome of the test GSM: Test parameter settings are changed in steps 1,2,3 and 4 as follows: BCCH levels are increased by test tolerance so that during Step 1, level ≤ 38 dBm, Step 2, level ≤ 48 dBm, Step 3, level ≤ 70 dBm, Step 4, level ≥ -110 dBm. Hence during steps 1,2,3 and 4: New levels=Original levels + TT For other steps 5 to 12 GSM test parameter settings are unchanged since level settings in either direction are not critical with respect to the outcome of the test TT on top of UE measurement accuracy: Relative accuracy: Test system uncertainty ±1.4 dB. Rounded to ±2 dB due to granularity of GSM Carrier RSSI report mapping of 1 dB. Absolute accuracy: Test system uncertainty ±1.0 dB. No need to increase due to granularity of GSM Carrier RSSI report mapping of 1 dB.
8.7.3B Transport channel BLER	TBD		
8.7.3C UE Transmitted power (R99 and Rel-4 only)	Accuracy upper limit Accuracy lower limit Depends on PUEMAX see table 8.7.3C.2.1	0.7 dB	Formula: Upper accuracy limit + TT Lower accuracy limit – TT Add and subtract TT to all the values in table 8.7.3C.2.1.
8.7.3D UE Transmitted power (Rel-5 and later)	Accuracy upper limit Accuracy lower limit	0.7 dB	Formula: Upper accuracy limit + TT Lower accuracy limit – TT Add and subtract TT to all the accuracy values in table 8.7.3D.4.3.

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.7.4 SFN-CFN observed time difference	Table 8.7.4.1.2 and Table 8.7.4.2.2	±1.0 dB for Ioc ±0.3 dB for Ior/Ioc ±0.5 chips for the actual SFN-CFN observed time difference	Intra and inter frequency case: Test 1: Io shall not go above -50 dBm Test 2: No restrictions on Io value Test 3: Io shall not go below -94 dBm (Band 1, IV, VI, X), or below -93 dBm (Band IX), or below –92 dBm (Band II, V, VII, XI) or below –91 dBm (Band III, VIII, XII, XIII, XIV, XX) Îor/Ioc + TT TT on top of UE measurements accuracy: SFN-CFN observed time difference: 1.0 chips + TT
8.7.5.1 SFN-SFN observed time difference type 1	Table 8.7.5.1.2	±1.0 dB for Ioc ±0.3 dB for Ior/Ioc ±0.5 chips for the actual SFN-SFN observed time difference	Test 1: Io shall not go above -50 dBm Test 2: No restrictions on Io value Test 3: Io shall not go below -94 dBm (Band 1, IV, VI, X), or below -93 dBm (Band IX), or below –92 dBm (Band II, V, VII, XI) or below –91 dBm (Band III, VIII, XII, XIII, XIV, XX) Îor/Ioc + TT TT on top of UE measurements accuracy: SFN-SFN observed time difference: 1.0 chips + TT
8.7.6.1 UE Rx-Tx time difference (Release 5 and earlier)	*Io –10.9 dB = Ioc,* Test 1: Io = -94 dBm Test2 : Io = -72dBm Test3 : Io = -50dBm Timing Accuracy ± 1.5 chip	1 dB for Ioc 0.3 dB for Ior/Ioc 0.5 chip for timing accuracy	Test 1: Io = -92.7 dBm, Ioc = -103.6 dBm Formula: $Ioc*(1-TT_{Ioc}+(Ior/Ioc-TT_{Ior/Ioc})) \geq -94$ Test 2: unchanged (no critical RF parameters) Test 3: Io = -51.3 dBm, Ioc = -62.2 dBm Formula: $Ioc*(1+TT_{Ioc}+(Ior/Ioc+TT_{Ior/Ioc})) \leq -50$ Timing accuracy ±2.0 chip Formulas: Upper limit +TT Lower limit –TT

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
8.7.6.1A UE Rx-Tx time difference (Release 6 and later)	Table 8.6.7.1A.2 and Table 8.6.7.1A.4	±1.0 dB for Ioc ±0.3 dB for Ior/Ioc ±0.5 chip for timing accuracy	Test 1: Io shall not go below -94 dBm (Band I, IV, VI, X), or below -93 dBm (Band IX), or below –92 dBm (Band II, V, VII, XI) or below –91 dBm (Band III, VIII, XII, XIII, XIV, XX) Formula: $Ioc*(1-TT_{Ioc}+ (Ior/Ioc-TT_{Ior/Ioc})) \geq -94$ Test 2: No restrictions on Io value Test 3: Io shall not go above -50 dBm Formula: $Ioc*(1+TT_{Ioc}+ (Ior/Ioc+TT_{Ior/Ioc})) \leq -50$ Timing accuracy ±2.0 chip Formulas: Upper limit +TT Lower limit –TT
8.7.7 Observed time difference to GSM cell	TBD		
8.7.8 P-CCPCH RSCP	TBD		
8.7.9 UE Transmission Power Headroom	UPH reporting accuracy from ±2 dB to ±6 dB, depending on UE power class and total UE output power.	0.8 dB for UPH reporting accuracy	Formula: (Upper) Minimum Requirement + TT (Lower) Minimum Requirement – TT UPH reporting accuracy from ±2.8 dB to ±6.8 dB, depending on UE power class and total UE output power.
8.7.10 E-UTRAN FDD RSRP absolute accuracy	Test 1: UTRA Cell 1 I_{oc}: -70.00dBm/3.84MHz $\hat{I}_{or}$ / I_{oc}: -1.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA Cell 2 N_{oc}: -88.65dBm /15kHz $\hat{E}_S$ / N_{oc}: +10dB Reported RSRP values: ±8dB Test 2: UTRA Cell 1 I_{oc}: -70dBm/3.84MHz $\hat{I}_{or}$ / I_{oc}: -1.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA Cell 2 N_{oc}: -117dBm or -115dBm or -113.5 or -114dBm or -116dBm /15kHz depending on operating band $\hat{E}s$ / N_{oc}: -4.00dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB -0.30dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0dB +0.80dB Via mapping	Test 1: UTRA Cell 1 I_{oc}: -70dBm/3.84MHz $\hat{I}_{or}$ / I_{oc}: -1.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA Cell 2 N_{oc}: -88.95dBm /15kHz $\hat{E}_S$ / N_{oc}: +10dB RSRP_52 to RSRP_71 Test 2: UTRA Cell 1 I_{oc}: -70dBm/3.84MHz $\hat{I}_{or}$ / I_{oc}: -1.00dB CPICH_E_c/I_{or}: -10.00dB E-UTRA Cell 2 N_{oc}: -117dBm or -115dBm or -113.5 or -114dBm or -116dBm /15kHz depending on operating band $\hat{E}s$ / N_{oc}: -3.20dB RSRP_13 to RSRP_28 RSRP_15 to RSRP_30 RSRP_17 to RSRP_31 RSRP_16 to RSRP_31 RSRP_14 to RSRP_29 depending on operating band

Test	Test Parameters in TS 25.133 [2]	Test Tolerance (TT)	Test Requirement in TS 34.121
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and Ês / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
8.7.11 E-UTRAN TDD RSRP absolute accuracy	Same as 8.7.10	Same as 8.7.10	Same as 8.7.10
8.7.12 E-UTRAN FDD RSRQ absolute accuracy	Test 1: UTRA Cell 1 Ioc: -70dBm/3.84MHz Îor /Ioc: -1.00dB CPICH_Ec/Ior: -10.00dB E-UTRA Cell 2 Noc: -80.00dBm /15kHz ÊS/Noc: -1.75dB Reported RSRQ values: ±2.5dB Test 2: UTRA Cell 1 Ioc: -70dBm/3.84MHz Îor/Ioc: -1.00dB CPICH_Ec/Ior: -10.00dB E-UTRA Cell 2 Noc: -104.70dBm /15kHz Ês / Noc: -4.00dB Reported RSRQ values: ±3.5dB Test 3: UTRA Cell 1 Ioc: -70dBm/3.84MHz Îor/Ioc: -1.00dB CPICH_Ec/Ior: -10.00dB E-UTRA Cell 2 Noc: -119.5dBm or -118.5dBm or -117.5 or -116.5dBm or -116dBm /15kHz depending on operating band Ês/Noc: -4.00dB Reported RSRP values: ±3.5dB	Test 1: 0dB 0dB 0dB -0.80dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0dB +0.80dB Via mapping Test 3: 0dB 0dB 0dB 0dB +0.80dB Via mapping	Test 1: UTRA Cell 1 Ioc: -70dBm/3.84MHz Îor/Ioc: -1.00dB CPICH_Ec/Ior: -10.00dB E-UTRA Cell 2 Noc: -80.80dBm /15kHz ÊS/Noc: -1.75dB RSRQ_04 to RSRQ_16 Test 2: UTRA Cell 1 Ioc: -70dBm/3.84MHz Îor/Ioc: -1.00dB CPICH_Ec/Ior: -10.00dB E-UTRA Cell 2 Noc: -104.70dBm /15kHz Ês / Noc: -3.20dB RSRQ_00 to RSRQ_16 Test 3: UTRA Cell 1 Ioc: -70dBm/3.84MHz Îor/Ioc: -1.00dB CPICH_Ec/Ior: -10.00dB E-UTRA Cell 2 Noc: -119.5dBm or -118.5dBm or -117.5 or -116.5dBm or -116dBm /15kHz depending on operating band Ês/Noc: -3.20dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and Ês / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. In Test 1 the RSRQ values are 1.5dB wider at each end and in Test 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
8.7.13 E-UTRAN TDD RSRQ absolute accuracy	Same as 8.7.12	Same as 8.7.12	Same as 8.7.12

F.4.5 Performance requirements (HSDPA)

Table F.4.5: Derivation of Test Requirements (Performance tests HSDPA)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.2.1A to 9.2.1KD Single Link Performance	$\frac{E_c}{I_{or}}$ -12, -9, -6, -3 and -2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0, 5, 10, 15 and 18 dB Minimum requirements apply for each carrier	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$ Test Tolerances apply for each carrier	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged Test requirements apply for each carrier
9.2.1L to 9.2.1LD Single Link Enhanced Performance Type 3i	$\frac{E_c}{I_{or}}$ -6 and -3 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}'$ = 0 dB DIP1 = -2.75 dB DIP2 = -7.64 dB Minimum requirements apply for each carrier	0.1 dB for $\frac{E_c}{I_{or}}$ 0.76 dB for $\hat{I}_{or}/I_{oc}'$ 0.17 dB for DIP1, DIP2 Test Tolerances apply for each carrier	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or1}/I_{oc}$ = ratio + 1.2dB $\hat{I}_{or2}/I_{oc}$ = ratio + 0.6dB $\hat{I}_{or3}/I_{oc}$ = ratio + 0.6dB This has the effect of increasing $\hat{I}_{or}/I_{oc}'$ by 0.76dB and increasing DIP1 and DIP2 by 0.17dB. $\hat{I}_{or2}/I_{oc}$ and $\hat{I}_{or3}/I_{oc}$ TT is derived by increasing ratio by uncertainty to ensure DIP values are maintained. $\hat{I}_{or1}/I_{oc}$ TT is derived by combined effect of $\hat{I}_{or1}/I_{oc}$, $\hat{I}_{or2}/I_{oc}$ and $\hat{I}_{or3}/I_{oc}$ uncertainties in wanted signal, interferer 1 and interferer 2 respectively, after applying TT to $\hat{I}_{or2}/I_{oc}$ and $\hat{I}_{or3}/I_{oc}$. The interferer uncertainties are scaled according to their effect on $\hat{I}_{or}/I_{oc}'$, which is determined from the DIP values. I_{oc} unchanged Test requirements apply for each carrier

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.2.2A to 9.2.2E Open loop diversity performance	$\frac{E_c}{I_{or}}$ -6 and -3 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 and 10 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.2.3A to 9.2.3E Closed loop diversity performance	Same as 9.2.2A	Same as 9.2.2A	Same as 9.2.2A
9.2.4A MIMO performance	$\frac{E_c}{I_{or}}$ -2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 and 10 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.2.4B MIMO and 64QAM performance	$\frac{E_c}{I_{or}}$ -1.5 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 18 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.2.4C MIMO Performance - Fixed Reference Channel (FRC) H-Set 9A	$\frac{E_c}{I_{or}}$ -2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 and 10 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged Test requirements should be applied for both the cells
9.2.4CA MIMO Performance - Fixed Reference Channel (FRC) H-Set 9A for DB DC-HSDPA	Same as 9.2.4C	Same as 9.2.4C	Same as 9.2.4C
9.2.4D MIMO Performance - Fixed Reference Channel (FRC) H-Set 11A	$\frac{E_c}{I_{or}}$ -1.5 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 18 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged Test requirements should be applied for both the cells
9.2.4DA MIMO Performance - Fixed Reference Channel (FRC) H-Set 11A for DB DC-HSDPA	Same as 9.2.4D	Same as 9.2.4D	Same as 9.2.4D
9.2.4E MIMO performance - Fixed Reference Channel (FRC) H-Set 9 Asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 and 10 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.2.4F MIMO performance- Fixed Reference Channel (FRC) H-Set 11 Asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -1.5 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 18 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.2.4G MIMO Performance - Fixed Reference Channel (FRC) H-set 9A Asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 and 10 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged Test requirements should be applied for both the cells
9.2.4H MIMO Performance - Fixed Reference Channel (FRC) H-set 11A Asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -1.5 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 18 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged Test requirements should be applied for both the cells
9.3.1 Single Link Performance - AWGN propagation conditions		No test tolerances applied	
9.3.1A Single Link Performance - AWGN propagation conditions, 64QAM		No test tolerances applied	
9.3.1B Single Link Performance - AWGN Propagation Conditions, DC-HSDPA requirements		No test tolerances applied	
9.3.1BA Single Link Performance - AWGN Propagation Conditions, DB-DC-HSDPA requirements		No test tolerances applied	
9.3.1C Single Link Performance - AWGN Propagation Conditions, Periodically Varying Radio Conditions		No test tolerances applied for test step 7 and 8. TT for the M-difference is 1 for test step 9.	10 dB between I_{oc1} and I_{oc2} maps to 6 between medians M_1 and M_2 hence 0.6M per dB. 1dB linearity uncertainty maps to 0.6 M. Since M is integer, the M uncertainty is 1: TT for M is defined to 1 Formula: difference in medians M_1 and M_2 = 6-TT
9.3.2 Single Link Performance - Fading propagation conditions		No test tolerances applied	
9.3.2A Single Link Performance - Fading propagation conditions, DC-HSDPA requirements		No test tolerances applied	

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.3.2AA Single Link Performance - Fading propagation conditions, DB-DC-HSDPA requirements		No test tolerances applied	
9.3.2B Single Link Performance - Fading propagation conditions, 64QAM		No test tolerances applied	
9.3.3 Open Loop Diversity Performance - AWGN propagation conditions		No test tolerances applied	
9.3.4 Open Loop Diversity Performance - Fading propagation conditions		No test tolerances applied	
9.3.5 Closed Loop Diversity Performance - AWGN propagation conditions		No test tolerances applied	
9.3.6 Closed Loop Diversity Performance - Fading propagation conditions		No test tolerances applied	
9.3.7A, MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions		No test tolerances applied	
9.3.7B MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions		No test tolerances applied	
9.3.7C MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20		No test tolerances applied	
9.3.7D MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20		No test tolerances applied	
9.3.7E MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20		No test tolerances applied	

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.3.7F MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions – Asymmetric CPICHs		No test tolerances applied	
9.3.7G MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions – Asymmetric CPICHs		No test tolerances applied	
9.3.7H MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20 – Asymmetric CPICHs		No test tolerances applied	
9.3.7I MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20 – Asymmetric CPICHs		No test tolerances applied	
9.3.7J MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20 – Asymmetric CPICHs		No test tolerances applied	
9.4.1 Single Link Performance	$\frac{E_c}{I_{or}}$ -9, -9.9 and -10 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 and 5 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.1A Single Link Performance - Enhanced Performance Requirements Type 1	$\frac{E_c}{I_{or}}$ -12 and -15.6 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.2 Open loop diversity performance	$\frac{E_c}{I_{or}}$ -11.6, -13.4 and -11.5 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 and 5 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.4.2A Open loop diversity performance – Enhanced Performance Requirements Type 1	$\frac{E_c}{I_{or}}$ -15.2 and -16.4 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.3 HS-SCCH Type 3 performance	$\frac{E_c}{I_{or}}$ -14.7, -15.6, -16 and -16.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.3A HS-SCCH Type 3 Performance -STTD disabled- Asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -12.3, -14.9, -11.4 and -14.2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.3B HS-SCCH Type 3 Performance -STTD enabled- Asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -15.3, -16.7, -14.4 and -15.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.4 HS-SCCH Type 3 performance for MIMO only with single-stream restriction	$\frac{E_c}{I_{or}}$ -8.9, -11.0, -15.6 and -16.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.4A HS-SCCH Type 3 performance for MIMO only with single-stream restriction-Enhanced Performance Requirements Type1	$\frac{E_c}{I_{or}}$ -15.6 and -16.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
9.4.4B HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD disabled-asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -11.0, -8.7, -12.3 and -14.9 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.4C HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD disabled-asymmetric CPICHs-Enhanced Performance Requirements Type 1	$\frac{E_c}{I_{or}}$ -12.3 and -14.9 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.4D HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD enabled-asymmetric CPICHs	$\frac{E_c}{I_{or}}$ -8.4, -11.1, -15.3 and -16.7 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.4.4E HS-SCCH Type 3 Performance for MIMO only with single-stream restriction-STTD enabled-asymmetric CPICHs-Enhanced Performance Requirements Type 1	$\frac{E_c}{I_{or}}$ -15.3 and -16.7 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.5.1 HS-SCCH-less demodulation of HS-DSCH	$\frac{E_c}{I_{or}}$ -6 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.5.1A HS-SCCH-less demodulation of HS-DSCH, Enhanced Performance Requirements Type 1	$\frac{E_c}{I_{or}}$ -9 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.6.1 Single link HS-DSCH Demodulation performance in CELL_FACH state	$\frac{E_c}{I_{or}}$ -6 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
9.6.2 Single link HS-SCCH Detection performance in CELL_FACH state	$\frac{E_c}{I_{or}}$ -10 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for $\frac{E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged

F.4.6 Performance requirements (E-DCH)

Table F.4.6: Derivation of Test Requirements (Performance tests E-DCH)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
10.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms TTI)	E-HICH_Ec/Ior = -35.1 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: E-HICH_Ec/Ior = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms TTI, Type 1)	E-HICH_Ec/Ior = -38.1 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: E-HICH_Ec/Ior = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI)	E-HICH_Ec/Ior = -28.3 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Same as in 10.2.1.1
10.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI, Type 1)	E-HICH_Ec/Ior = -31.7 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Same as in 10.2.1.1
10.2.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI)	E-HICH_Ec/Ior = -23.6 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: E-HICH_Ec/Ior = ratio + TT $\hat{I}_{or1}/I_{oc}$ = ratio + TT $\hat{I}_{or2}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.2.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI, Type 1)	E-HICH_Ec/Ior = -27.8 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: E-HICH_Ec/Ior = ratio + TT $\hat{I}_{or1}/I_{oc}$ = ratio + TT $\hat{I}_{or2}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.2.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI)	E-HICH_Ec/Ior = -16.3 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Same as 10.2.2.1.1
10.2.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI, Type 1)	E-HICH_Ec/Ior = -20.6 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Same as 10.2.2.1.1

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
10.2.2.2.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI)	E-HICH_Ec/Ior = -29.7 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Same as 10.2.2.1.1
10.2.2.2.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI, Type 1)	E-HICH_Ec/Ior = -33.4 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Same as 10.2.2.1.1
10.2.2.2.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI)	E-HICH_Ec/Ior = -23.2 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Same as 10.2.2.1.1
10.2.2.2.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI, Type 1)	E-HICH_Ec/Ior = -27.1 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-HICH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Same as 10.2.2.1.1
10.3.1.1 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI)	E-RGCH_Ec/Ior = -31 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-RGCH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: E-RGCH_Ec/Ior = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.3.1.1A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI, Type 1)	E-RGCH_Ec/Ior = -35 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-RGCH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: E-RGCH_Ec/Ior = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.3.1.2 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI)	E-RGCH_Ec/Ior = -24.4 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-RGCH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Same as 10.3.1.1
10.3.1.2A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI, Type 1)	E-RGCH_Ec/Ior = -28.6 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-RGCH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Same as 10.3.1.1
10.3.2 Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions	E-RGCH_Ec/Ior = -27.3 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-RGCH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: E-RGCH_Ec/Ior = ratio + TT $\hat{I}_{or1}/I_{oc}$ = ratio + TT $\hat{I}_{or2}/I_{oc}$ = ratio + TT I_{oc} unchanged

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
10.3.2A Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions (Type 1)	E-RGCH_Ec/Ior = -31.2 dB I_{oc} = -60 dBm $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB	0.1 dB for E-RGCH_Ec/Ior 0.6 dB for $\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	Formulas: E-RGCH_Ec/Ior = ratio + TT $\hat{I}_{or1}/I_{oc}$ = ratio + TT $\hat{I}_{or2}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.4.1 Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance	E-AGCH_Ec/Ior = -23.2 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-AGCH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: E-AGCH_Ec/Ior = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged
10.4.1A Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance (Type 1)	E-AGCH_Ec/Ior = -26.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 0 dB	0.1 dB for E-AGCH_Ec/Ior 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: E-AGCH_Ec/Ior = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged

F.4.7 Performance requirements (MBMS)

Table F.4.7: Derivation of Test Requirements (Performance tests MBMS)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
11.2 Demodulation of MTCH	S-CCPCH_Ec/Ior = -4.9, -5.6, -8.5 dB	0.1 dB for S-CCPCH_Ec/Ior ratio 0.6 dB for $\hat{I}_{or1}/I_{oc}$ 0.6 dB for $\hat{I}_{or2}/I_{oc}$ 0.6 dB for $\hat{I}_{or3}/I_{oc}$	Formulas: S-CCPCH_Ec/Ior = ratio + TT I_{oc} unchanged $\hat{I}_{or1}/I_{oc}$ = ratio +TT $\hat{I}_{or2}/I_{oc}$ = ratio +TT $\hat{I}_{or3}/I_{oc}$ = ratio +TT
11.2A Demodulation of MTCH - Enhanced Performance Requirements Type 1	S-CCPCH_Ec/Ior = -7.7, -8.7, -11.5 dB	0.1 dB for S-CCPCH_Ec/Ior ratio 0.6 dB for $\hat{I}_{or1}/I_{oc}$ 0.6 dB for $\hat{I}_{or2}/I_{oc}$ 0.6 dB for $\hat{I}_{or3}/I_{oc}$	Formulas: S-CCPCH_Ec/Ior = ratio + TT I_{oc} unchanged $\hat{I}_{or1}/I_{oc}$ = ratio +TT $\hat{I}_{or2}/I_{oc}$ = ratio +TT $\hat{I}_{or3}/I_{oc}$ = ratio +TT
11.3 Demodulation of MTCH and cell identification	S-CCPCH_Ec/Ior = –5.6 dB Stage 1: I_{oc} = –70 dB $\hat{I}_{or1}/I_{oc}$ = –3 dB $\hat{I}_{or2}/I_{oc}$ = –3 dB $\hat{I}_{or3}/I_{oc}$ = –infinity Stage 2: I_{oc} = –73 dB $\hat{I}_{or1}/I_{oc}$ = 0 dB $\hat{I}_{or2}/I_{oc}$ = 0 dB $\hat{I}_{or3}/I_{oc}$ = 0 dB Stage 3: I_{oc} = –70 dB $\hat{I}_{or1}/I_{oc}$ = –3 dB $\hat{I}_{or2}/I_{oc}$ = –infinity $\hat{I}_{or3}/I_{oc}$ = –3 dB	0.1 dB for S-CCPCH_Ec/Ior ratio 0.6 dB for $\hat{I}_{or1}/I_{oc}$ 0.6 dB for $\hat{I}_{or2}/I_{oc}$ 0.6 dB for $\hat{I}_{or3}/I_{oc}$	Formulas: S-CCPCH_Ec/Ior = ratio + TT I_{oc} unchanged $\hat{I}_{or1}/I_{oc}$ = ratio +TT $\hat{I}_{or2}/I_{oc}$ = ratio +TT $\hat{I}_{or3}/I_{oc}$ = ratio +TT

F.5 Acceptable uncertainty of Test Equipment (This clause is informative)

This informative clause specifies the critical parameters of the components of an overall Test System (e.g. Signal generators, Signal Analysers etc.) which are necessary when assembling a Test System that complies with clause F.1 Acceptable Uncertainty of Test System. These Test Equipment parameters are fundamental to the accuracy of the overall Test System and are unlikely to be improved upon through System Calibration.

F.5.1 Transmitter measurements

Table F.5.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Test conditions
5.2 Maximum Output Power	Not critical	19 to 25 dBm
5.2A Maximum Output Power with HS-DPCCH (Release 5 only)	Not critical	19 to 25 dBm
5.2AA Maximum Output Power with HS-DPCCH (Release 6 and later)	Not critical	19 to 25 dBm
5.2B Maximum Output Power with HS-DPCCH and E-DCH	Not critical	19 to 25 dBm
5.2C UE relative code domain power accuracy	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB	-10 to 10 dBm
5.2D UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH	For 0 dB ≥ -10 dB CDP ± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB	-10 to 10 dBm
5.2E UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM	For 0 dB ≥ -10 dB CDP± 0.2 dB For -10 dB ≥ -15 dB CDP ± 0.3 dB For -15 dB ≥ -20 dB CDP ± 0.4 dB For -20 dB ≥ -30 dB CDP ± 0.5 dB	-10 to 10 dBm
5.3 Frequency error	± 10 Hz	0 to 500 Hz.
5.4.1 Open loop power control in uplink	Not critical	-43.7 dBm to 25 dBm
5.4.2 Inner loop power control in the uplink	±0.1 dB relative over a 1.5 dB range ±0.15 dB relative over a 3.0 dB range ±0.2 dB relative over a 4.5 dB range ±0.3 dB relative over a 26 dB range	+25 dBm to -50 dBm
5.4.3 Minimum Output Power	Not critical	
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH\_E_c}{I_{or}}$	±0.1 dB uncertainty in DPCCH_Ec/Ior ratio	Ratio from –16.6 dB to –28 dB
5.4.4A Out-of-synchronisation handling of output power for a UE which supports type 1 for DCH: $\frac{DPCCH\_E_c}{I_{or}}$	±0.1 dB uncertainty in DPCCH_Ec/Ior ratio	Ratio from –19.6 dB to –31 dB
5.5.1 Transmit ON/OFF Power: UE transmit OFF power	Not critical	-56 dBm (static power)
5.5.2 Transmit ON/OFF Power: transmit ON/OFF time mask	TBD	-56 dBm (dynamic power over approx. 70 dB range)
5.6 Change of TFC: power control step size	±0.3 dB relative over a 9 dB range	+25 dBm to –50 dBm
5.7 Power setting in uplink compressed mode:-UE output power	Subset of 5.4.2	+25 dBm to –50 dBm
5.7A HS-DPCCH	±0.1 dB relative over a 1.5 dB range ±0.15 dB relative over a 3.0 dB range ±0.2 dB relative over a 4.5 dB range ±0.3 dB relative over a 26 dB range	+25 dBm to -50 dBm
5.8 Occupied Bandwidth	±100 kHz	For results between 4 and 6 MHz?
5.9 Spectrum emission mask	Not critical	P_Max Accuracy applies ± 5 dB either side of UE requirements
5.9A Spectrum emission mask with HS-DPCCH	Not critical	P_Max Accuracy applies ± 5 dB either side of UE requirements
5.9B Spectrum emission mask with E-DCH	Not critical	P_Max Accuracy applies ± 5 dB either side of UE requirements

5.10 ACLR	5 MHz offset ± 0.8 dB 10 MHz offset ± 0.8 dB	19 to 25 dBm at 5 MHz offset for results between 40 dB and 50 dB. 25 dBm at 10 MHz offset for results between 45 dB and 55 dB.
5.10A ACLR with HS-DPCCH	5 MHz offset ± 0.8 dB 10 MHz offset ± 0.8 dB	19 to 25 dBm at 5 MHz offset for results between 40 dB and 50 dB. 25 dBm at 10 MHz offset for results between 45 dB and 55 dB.
5.10B ACLR with E-DCH	5 MHz offset ± 0.8 dB 10 MHz offset ± 0.8 dB	19 to 25 dBm at 5 MHz offset for results between 40 dB and 50 dB. 25 dBm at 10 MHz offset for results between 45 dB and 55 dB.
5.10C ACLR with E-DCH for DC-HSUPA	7.5 MHz offset ± 0.8 dB 12.5 MHz offset ± 0.8 dB	19 to 25 dBm at 7.5 MHz offset for results between 40 dB and 50 dB. 25 dBm at 12.5 MHz offset for results between 45 dB and 55 dB.
5.11 Spurious emissions	Not critical	19 to 25 dBm
5.11A Spurious emissions for DC-HSUPA	Not critical	19 to 25 dBm
5.12 Transmit Intermodulation	Not critical	19 to 25 dBm
5.12A Transmit Intermodulation for DC-HSUPA	Not critical	19 to 25 dBm
5.13.1 Transmit modulation: EVM	±2.5 % (for single code)	25 dBm to –21 dBm
5.13.1A Transmit modulation: EVM with HS-DPCCH	±2.5 % (for single code)	25 dBm to –21 dBm
5.13.1AAA EVM and IQ origin offset for HS-DPCCH with E-DCH with 16 QAM	±0.5 dB (for IQ origin offset)	UE transmitted power = -28 dB ± 2dB
5.13.2 Transmit modulation: peak code domain error	±1.0dB	For readings between -10 dB to –20 dB.
5.13.2A Relative Code Domain Error	±0.5 dB	Effective Code Domain Power > -30 dB Nominal Code Domain Power > -20 dB
5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH	±0.5 dB	Effective Code Domain Power > -30 dB Nominal Code Domain Power > -20 dB
5.13.2C Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM	±0.5 dB	Effective Code Domain Power > -30 dB Nominal Code Domain Power > -30 dB
5.13.3 UE phase discontinuity	±10 Hz for Frequency error	+25 dBm to –50 dBm
	±2.5 % for EVM (for single code)	+25 dBm to –20 dBm
	6 degree for Phase discontinuity	+25 dBm to –50 dBm
5.13.4 PRACH preamble quality (EVM)	±2.5 %	25 dBm to –21 dBm
5.13.4 PRACH preamble quality (Frequency error)	± 10 Hz	0 to 500 Hz.

F.5.2 Receiver measurements

Table F.5.2: Equipment accuracy for receiver measurements

Clause	Equipment accuracy	Test conditions
6.2 Reference sensitivity level	Not critical	
6.2A Reference sensitivity level for DC-HSDPA	Not critical	
6.2B Reference sensitivity level for DB-DC-HSDPA	Not critical	
6.2C Reference sensitivity level for single band 4C-HSDPA	Not critical	
6.2D Reference sensitivity level for Dual band 4C-HSDPA	Not critical	
6.3 Maximum input level:	Not critical	
6.3A Maximum Input Level for HS-PDSCH Reception (16QAM)	Not critical	
6.3B Maximum Input Level for HS-PDSCH Reception (64QAM)	Not critical	
6.3C Maximum Input Level for DC-HSDPA Reception (16QAM)	Not critical	
6.3D Maximum Input Level for DC-HSDPA Reception (64QAM)	Not critical	
6.3E Maximum Input Level for DB-DC-HSDPA Reception (16QAM)	Not critical	
6.3F Maximum Input Level for DB-DC-HSDPA Reception (64QAM)	Not critical	
6.3G Maximum Input Level for 4C-HSDPA Reception (16QAM)	Not critical	
6.3H Maximum Input Level for 4C-HSDPA Reception (64QAM)	Not critical	
6.4 Adjacent channel selectivity (Rel-99 and Rel-4)	Not critical	
6.4A Adjacent channel selectivity (Rel-5 and later releases)	Not critical	
6.4B Adjacent channel selectivity (ACS) for DC-HSDPA	Not critical	
6.4C Adjacent channel selectivity (ACS) for DB-DC-HSDPA	Not critical	
6.5 Blocking characteristics	Not critical	
6.5A Blocking characteristics for DC-HSDPA	Not critical	
6.5B Blocking characteristics for DB-DC-HSDPA	Not critical	
6.5D Blocking Characteristics for single Uplink Single band 4C-HSDPA	Not critical	
6.5E Blocking Characteristics for dual Uplink Single band 4C-HSDPA	Not critical	
6.5F Blocking Characteristics for single Uplink Dual band 4C-HSDPA	Not critical	
6.5G Blocking Characteristics for dual Uplink Dual band 4C-HSDPA	Not critical	
6.6 Spurious Response	Not critical	
6.6A Spurious Response for DC-HSDPA	Not critical	
6.6B Spurious Response for DB-DC-HSDPA	Not critical	
6.6C Spurious Response for single band 4C-HSDPA	Not critical	
6.6D Spurious Response for dual band 4C-HSDPA	Not critical	
6.7 Intermod Characteristics	Not critical	
6.7A Intermodulation Characteristics for DC-HSDPA	Not critical	
6.7B Intermodulation Characteristics for DB-DC-HSDPA	Not critical	

6.7D Intermodulation Characteristics for single uplink single band 4C-HSDPA	Not critical	
6.7E Intermodulation Characteristics for single uplink dual band 4C-HSDPA	Not critical	
6.8 Spurious emissions	Not critical	

F.5.3 Performance measurements

Table F.5.3: Equipment accuracy for performance measurements

Clause	Equipment accuracy	Test conditions
7.2 to 7.10	$\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	-2.2 to –21.8 dB
7.13	±[0.3] dB relative over 4 dB range	+25 dBm to -50 dBm

F.5.4 Requirements for support of RRM

Table F.5.4: Equipment accuracy for RRM

Clause	Equipment accuracy	Test conditions
8.2.2 to 8.7.8	any_Ec/Ior ±0.1 dB Ior//Ioc ±0.3 dB Ioc1/Ioc2 ±0.3 dB Ioc ±1.0 dB RXLEV ±1.0 dB Ioc/ RXLEV ±0.5 dB	
8.4.2.1A Correct behaviour when receiving an ACK (Release 6 and later)	PRACH timing error ±0.5 chips	±10 chips

F.5.5 Performance measurements (HSDPA)

Table F.5.5: Equipment accuracy for performance measurements (HSDPA)

Clause	Equipment accuracy	Test conditions
9.2.1A to 9.2.1DB Single Link Performance	$\frac{E_c}{I_{or}}$ ±0.1 dB	-12, -9, -6 and -3 dB
9.2.1LA Enhanced Performance Requirements Type 3i - QPSK, Fixed Reference Channel (FRC) H-Set 6A	Time alignment between DC-HSDPA cells: ±½ chip The (0 ns / 0 dB)-tap in the faded signal shall be (equally timed ±½ chip) compared to the delayed signal. Critical!	
9.2.2A to 9.2.2E Open loop diversity performance	Same as 9.2.1A	Same as 9.2.1A
9.2.3A to 9.2.3E Closed loop diversity performance	Same as 9.2.1A	Same as 9.2.1A
9.2.4A to 9.2.4H MIMO performance	Same as 9.2.1A	-1.5, -2 dB
9.3.1 Single Link Performance - AWGN propagation conditions	Same as 9.2.1A	
9.3.1A Single Link Performance - AWGN propagation conditions, 64QAM	Same as 9.2.1A	
9.3.1B Single Link Performance - AWGN propagation conditions, DC HSDPA requirements	Same as 9.2.1A	
9.3.1C Single Link Performance - AWGN Propagation Conditions, Periodically Varying Radio Conditions	Same as 9.2.1A Additionally Ioc linearity 1dB	-60dBm ≤ Ioc ≤ -50dBm
9.3.2 Single Link Performance - Fading propagation conditions	Same as 9.2.1A	
9.3.2A Single Link Performance - Fading propagation conditions, DC HSDPA requirements	Same as 9.2.1A	
9.3.2B Single Link Performance - Fading propagation conditions, 64QAM	Same as 9.2.1A	
9.3.3 Open Loop Diversity Performance - AWGN propagation conditions	Same as 9.2.1A	
9.3.4 Open Loop Diversity Performance - Fading propagation conditions	Same as 9.2.1A	
9.3.5 Closed Loop Diversity Performance - AWGN propagation conditions	Same as 9.2.1A	
9.3.6 Closed Loop Diversity Performance - Fading propagation conditions	Same as 9.2.1A	
9.3.7A, MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions	Same as 9.2.1A	
9.3.7B MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions	Same as 9.2.1A	
9.3.7C MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20	Same as 9.2.1A	
9.3.7D MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20	Same as 9.2.1A	
9.3.7E MIMO performance –Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20	Same as 9.2.1A	
9.3.7F MIMO performance – Reporting of Channel Quality indicator - Single stream fading conditions – Asymmetric CPICHs	Same as 9.2.1A	

9.3.7G MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions – Asymmetric CPICHs	Same as 9.2.1A	
9.3.7H MIMO performance – Reporting of Channel Quality indicator - Dual stream fading conditions– UE categories 19-20 – Asymmetric CPICHs	Same as 9.2.1A	
9.3.7I MIMO performance – Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 15-20 – Asymmetric CPICHs	Same as 9.2.1A	
9.3.7J MIMO performance –Reporting of Channel Quality indicator - Dual stream static orthogonal conditions – UE categories 19-20 – Asymmetric CPICHs	Same as 9.2.1A	
9.5.1 HS-SCCH-less demodulation of HS-DSCH	Same as 9.2.1A	-6 dB
9.5.1A HS-SCCH-less demodulation of HS-DSCH, Enhanced Performance Requirements Type 1	Same as 9.2.1A	-9 dB
9.6.1 Single link HS-DSCH Demodulation performance in CELL_FACH state	Same as 9.2.1A	
9.6.2 Single link HS-SCCH Detection performance in CELL_FACH state	Same as 9.2.1A	

F.5.6 Performance measurements (E-DCH)

Table F.5.6: Equipment accuracy for performance measurements (E-DCH)

Clause	Equipment accuracy		Test conditions
10.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms TTI)	E-HICH_Ec/Ior	±0.1 dB	-35.1 dB
10.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (10 ms TTI, Type 1)	E-HICH_Ec/Ior	±0.1 dB	-38.3 dB
10.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI)	E-HICH_Ec/Ior	±0.1 dB	-28.3 dB
10.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) Single Link Performance (2 ms TTI, Type 1)	E-HICH_Ec/Ior	±0.1 dB	-31.7 dB
10.2.2.1.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI)	E-HICH_Ec/Ior	±0.1 dB	-23.6 dB
10.2.2.1.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (10 ms TTI, Type 1)	E-HICH_Ec/Ior	±0.1 dB	-27.8 dB
10.2.2.1.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI)	E-HICH_Ec/Ior	±0.1 dB	-16.3 dB
10.2.2.1.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS not containing the serving E-DCH cell (2 ms TTI, Type 1)	E-HICH_Ec/Ior	±0.1 dB	-20.7 dB
10.2.2.2.1 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI)	E-HICH_Ec/Ior	±0.1 dB	-29.7 dB
10.2.2.2.1A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (10 ms TTI, Type 1)	E-HICH_Ec/Ior	±0.1 dB	-33.4 dB
10.2.2.2.2 Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI)	E-HICH_Ec/Ior	±0.1 dB	-23.2 dB
10.2.2.2.2A Detection of E-DCH HARQ ACK Indicator Channel (E-HICH) in Inter-Cell handover conditions – RLS containing the serving E-DCH cell (2 ms TTI, Type 1)	E-HICH_Ec/Ior	±0.1 dB	-27.1 dB
10.3.1.1 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI)	E-RGCH_Ec/Ior	±0.1 dB	-31 dB
10.3.1.1A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (10 ms TTI, Type 1)	E-RGCH_Ec/Ior	±0.1 dB	-35 dB
10.3.1.2 Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI)	E-RGCH_Ec/Ior	±0.1 dB	-24.4 dB

10.3.1.2A Detection of E-DCH Relative Grant Channel (E-RGCH) Single Link Performance (2 ms TTI, Type 1)	E-RGCH_Ec/Ior ±0.1 dB	-28.6 dB
10.3.2 Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions	E-RGCH_Ec/Ior ±0.1 dB	-27.3 dB
10.3.2A Detection of E-DCH Relative Grant Channel (E-RGCH) in Inter-Cell Handover conditions (Type 1)	E-RGCH_Ec/Ior ±0.1 dB	-31.2 dB
10.4.1 Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance	E-AGCH_Ec/Ior ±0.1 dB	-23.2 dB
10.4.1A Demodulation of E-DCH Absolute Grant Channel (E-AGCH) Single Link Performance (Type 1)	E-AGCH_Ec/Ior ±0.1 dB	-26.8 dB

F.5.7 Performance measurements (MBMS)

Table F.5.7.1: Equipment accuracy for performance measurements (MBMS)

Clause	Equipment accuracy	Test conditions
11.2 Demodulation of MTCH	S-CCPCH_Ec/Ior ±0.1 dB	-4.9dB, -5.6dB, -8.5dB
11.2A Demodulation of MTCH - Enhanced Performance Requirements Type 1	S-CCPCH_Ec/Ior ±0.1 dB	-7.7dB, -8.7dB, -11.5dB
11.3 Demodulation of MTCH and cell identification	S-CCPCH_Ec/Ior ±0.1 dB	-5.6dB

F.6 General rules for statistical testing

F.6.1 Statistical testing of receiver BER/BLER performance

F.6.1.1 Error Definition

1) Bit Error Ratio (BER)

    The Bit Error Ratio is defined as the ratio of the bits wrongly received to all data bits sent. The bits are the information bits above the convolutional/turbo decoder

2) Block Error Ratio (BLER)

    A Block Error Ratio is defined as the ratio of the number of erroneous blocks received to the total number of blocks sent. An erroneous block is defined as a Transport Block, the cyclic redundancy check (CRC) of which is wrong.

F.6.1.2 Test Method

Each test is performed in the following manner:

a) Setup the required test conditions.

b) Record the number of samples tested and the number of occurred events (bit error or block error)

c) Stop the test at a stop criterion which is minimum test time or an early pass or an early fail event.

d) Once the test is stopped decide according to the pass fail decision rules (subclause F.6.1.7)

F.6.1.3 Test Criteria

The test shall fulfil the following requirements:

a) good pass fail decision

1) to keep reasonably low the probability (risk) of passing a bad unit for each individual test;

2) to have high probability of passing a good unit for each individual test;

b) good balance between test time and statistical significance

3) to perform measurements with a high degree of statistical significance;

4) to keep the test time as low as possible.

F.6.1.4 Calculation assumptions

F.6.1.4.1 Statistical independence

(a) It is assumed, that error events are rare (lim BER BLER → 0) independent statistical events. However the memory of the convolutional /turbo coder is terminated after one TTI. Samples and errors are summed up every TTI. So the assumption of independent error events is justified.

(b) In the BLER test with fading there is the memory of the multipath fading channel which interferes the statistical independence. A minimum test time is introduced to average fluctuations of the multipath fading channel. So the assumption of independent error events is justified approximately.

F.6.1.4.2 Applied formulas

The formulas, applied to describe the BER BLER test, are based on the following experiments:

(1) After having observed a certain number of errors (**ne**) the number of samples are counted to calculate BER BLER. Provisions are made (note 1) such that the complementary experiment is valid as well:

(2) After a certain number of samples (**ns**) the number of errors, occurred, are counted to calculate BER BLER.

Experiment (1) stipulates to use the following Chi Square Distribution with degree of freedom ne: 2*dchisq(2*NE,2*ne).

Experiment (2) stipulates to use the Poisson Distribution: dpois(ne,NE)

(NE: mean of the distribution)

To determine the early stop conditions, the following inverse cumulative operation is applied:

0.5 * qchisq(D,2*ne). This is applicable for experiment (1) and (2).

D: wrong decision risk per test step

Note: other inverse cumulative operations are available, however only this is suited for experiment (1) and (2).

F.6.1.4.3 Approximation of the distribution

The test procedure is as follows:

During a running measurement for a UE ns (number of samples) and ne (number of errors) are accumulated and from this the preliminary BER BLER is calculated. Then new samples up to the next error are taken. The entire past and the new samples are basis for the next preliminary BER BLER. Depending on the result at every step, the UE can pass, can fail or must continue the test.

As early pass- and early fail-UEs leave the statistical totality under consideration, the experimental conditions are changed every step resulting in a distribution that is truncated more and more towards the end of the entire test. Such a distribution can not any more be handled analytically. The unchanged distribution is used as an approximation to calculate the early fail and early pass bounds.

F.6.1.5 Definition of good pass fail decision.

This is defined by the probability of wrong decision F at the end of the test. The probability of a correct decision is 1-F.

The probability (risk) to fail a good DUT shall be ≤ F according to the following definition: A DUT is failed, accepting a probability of ≤ F that the DUT is still better than the specified error ratio (Test requirement).

The probability to pass a bad DUT shall be ≤ F according to the following definition: A DUT is passed, accepting a probability of ≤ F that the DUT is still worse than M times the specified error ratio. (M>1 is the bad DUT factor).

This definitions lead to an early pass and an early fail limit:

Early fail: ber≥ $berlim_{fail}$

$$ber\lim_{fail}(D,ne) = \frac{2*ne}{qchisq(D,2*ne)} \qquad (1)$$

For ne≥ 7

Early pass: ber ≤$berlimbad_{pass}$

$$ber\lim bad_{pass}(D,ne) = \frac{2*ne*M}{qchisq(1-D,2*ne)} \qquad (2)$$

For ne ≥1

With

ber (normalized BER,BLER): BER,BLER according to F.6.1.1 divided by Test requirement

D: wrong decision probability for a test step . This is a numerically evaluated fraction of F, the wrong decision probability at the end of the test. See table F.6.1.6.1.

ne: Number of error events

M: bad DUT factor see table F.6.1.6.1.

qchisq: inverse cumulative chi squared distribution

F.6.1.6 Good balance between test time and statistical significance

Three independent test parameters are introduced into the test and shown in Table F.6.1.6.1. These are the obvious basis of test time and statistical significance. From the first two of them four dependent test parameters are derived. The third independent test parameter is justified separately.

Table F.6.1.6.1 independent and dependent test parameters

Independent test parameters			Dependent test parameters		
Test Parameter	Value	Reference	Test parameter	Value	Reference
Bad DUT factor M	1.5	Table F.6.1.8	Early pass/fail condition	Curves	Subclause F.6.1.5 Figure 6.1.9
Final probability of wrong pass/fail decision F	0.2% 0.02%, note 2	Subclause F.6.1.5	Target number of error events	345	Table 6.1.8
			Probability of wrong pass/fail decision per test step D	0.0085% 0.0008% and 0.008%, note 2	
			Test limit factor TL	1.234]	Table 6.1.8
Minimum test time		Table F.6.1.6.2			

The minimum test time is derived from the following justification:

1) For no propagation conditions and static propagation condition

   No early fail calculated from fractional number of errors <1 (see note 1)

2) For multipath fading condition

   No stop of the test until 990 wavelengths are crossed with the speed given in the fading profile.

3) For birth death propagation conditions

   No stop of the test until 200 birth death transitions occur

4) For moving propagation conditions: 628 sec

   This is necessary in order to pass all potential critical points in the moving propagation profile 4 times:

   Maximum rake window

   Maximum adjustment speed

   Intersection of moving taps

5) For high speed train conditions

   This corresponds 4 complete cycles of approach and leave to and from a BS antenna.

Table F.6.1.6.2 : minimum Test time

Fading profile	Minimum test time
Multipath propagation 3 km/h	164 sec
Multipath propagation 50 km/h	9.8 sec
Multipath propagation 120 km/h	4.1 sec
Multipath propagation 250 km/h	2 sec
Birth Death propagation	38.2 sec
Moving propagation	628 sec
High speed train conditions	28.8 sec

In table F.6.1.8 the minimum test time is converted in minimum number of samples.

F.6.1.7 Pass fail decision rules

No decision is allowed before the minimum test time is elapsed.

1) If minimum Test time < time for target number of error events then the following applies: The required confidence level 1-F (= correct decision probability) shall be achieved. This is fulfilled at an early pass or early fail event.

   For BER:

   For every TTI (Transmit Time Interval) sum up the number of bits (ns) and the number if errors (ne) from the beginning of the test and calculate

   BER_1 (including the artificial error at the beginning of the test (Note 1))and

   BER_0 (excluding the artificial error at the beginning of the test (Note 1)).

   If BER_0 is above the early fail limit, fail the DUT.

   If BER_1 is below the early pass limit, pass the DUT.

   Otherwise continue the test

   For BLER:

   For every block sum up the number of blocks (ns) and the number of erroneous blocks (ne) from the beginning of the test and calculate

   $BLER_1$ (including the artificial error at the beginning of the test (Note 1))and

   $BLER_0$ (excluding the artificial error at the beginning of the test (Note 1)).

   If $BLER_1$ is below the early pass limit, pass the DUT.

   If $BLER_0$ is above the early fail limit, fail the DUT.

Otherwise continue the test

2) If the minimum test time ≥ time for target error events, then the test runs for the minimum test time and the decision is done by comparing the result with the test limit.

For BER:

For every TTI (Transmit Time Interval) sum up the number of bits (ns) and the number if errors (ne) from the beginning of the test and calculate BER_0

For BLER:

For every block sum up the number of blocks (ns) and the number of erroneous blocks (ne) from the beginning of the test and calculate $BLER_0$

If BER_0/$BLER_0$ is above the test limit, fail the DUT.

If BER_0/$BLER_0$ is on or below the test limit, pass the DUT.

F.6.1.8 Test conditions for BER, BLER, RLC SDU Error Rate tests

Table F.6.1.8: Test conditions for a single BER/BLER tests

Type of test (BER)	Test requirement (BER/BLER)	Test limit (BER/BLER) = Test requirement (BER/BLER) x TL TL	Target number of error events (time)	Minimum number of samples	Prob that good unit will fail = Prob that bad unit will pass [%]	Bad unit BER/BLER factor M
Reference Sensitivity Level	0.001	1.234	345 (22.9s)	Note 1	0.2	1.5
Maximum Input Level	0.001	1.234	345 (22.9s)	Note 1	0.2	1.5
Adjacent Channel Selectivity	0.001	1.234	345 (22.9s)	Note 1	0.2	1.5
Blocking Characteristics Pass condition Note 2	0.001	1.251	403 (26.4s)	Note 1	0.2	1.5
Blocking Characteristics Fail condition Note 2	0.001	1.251	403 (26.4s)	Note 1	0.02	1.5
Spurious Response	0.001	1.234	345 (22.9s)	Note 1	0.2	1.5
Intermodulation Characteristics	0.001	1.234	345 (22.9s)	Note 1	0.2	1.5
HS-SCCH Detection Performance	0.05	1.234	345 (34s)	Note 1	0.2	1.5
	0.01	1.234	345 (168s)	Note 1	0.2	1.5

Table F.6.1.8-2: Test conditions for BLER tests

Type of test (BLER)	Information Bit rate	Test requirement (BER/BLER)	Test limit (BER/BLER)= Test requirement (BER/BLER)x TL TL	Target number of error events (time)	Minimum number of samples	Prob that bad unit will pass = Prob that good unit will fail [%]	Bad unit BER/BLER factor M
Demodulation in Static Propagation conditions	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01 0.1 0.01	1.234	345 (559.16s) (55.92s) (559.16s) (55.92s) (559.16s) (27.96s) (279.58s)	Note1	0.2	1.5
Demodulation of DCH in Multi-path Fading Propagation conditions							
3km/h (Case 1, Case 2, Case 4)	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01 0.1 0.01	1.234	345 (559.16s) (55.92s) (559.16s) (55.92s) (559.16s) (27.96s) (279.58s)	 8200 8200 8200 8200 8200 16400 16400	0.2	1.5
120 km/h (Case3)	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01 0.1 0.01	1.234	345 (559.16s) (55.92s) (559.16s) (55.92s) (559.16s) (27.96s) (279.58s)	205 205 205 205 205 410 410	0.2	1.5
250 km/h (Case 6)	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01 0.1 0.01	1.234	345 (559.16s) (55.92s) (559.16s) (55.92s) (559.16s) (27.96s) (279.58s)	100 100 100 100 100 200 200	0.2	1.5
Demodulation of DCH in Moving Propagation conditions	12.2 64	0.01 0.01	1.234	345 (559.16)	31400 31400	0.2	1.5
Demodulation of DCH in Birth-Death Propagation conditions	12.2 64	0.01 0.01	1.234	345 (559.16s) (559.16s)	1910 1910	0.2	1.5
Demodulation of DCH in high speed train conditions	12.2	0.01	1.234	345 (559.16s)	1440	0.2	1.5

Demodulation of DCH in Base Station Transmit diversity modes (3 km/h, case1)	12.2	0.01	1.234	345 (559.16s)	8200	0.2	1.5
Demodulation of DCH in closed loop transmit diversity mode (3 km/h, case1) Mode 1 Mode 2	 12.2 12.2	 0.01 0.01	1.234	345 (559.16s) (559.16s)	 8200 8200	0.2	1.5
Demodulation of DCH in Site Selection Diversity Transmission Power Control mode	12.2	0.01	1.234	345 (559.16)	8200	0.2	1.5
Demodulation of DCH in Inter-Cell Soft Handover (120 km/h, case3)	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01 0.1 0.01	1.234	345 (559.16s) (55.92s) (559.16s) (55.92s) (559.16s) (27.96s) (279.58s)	205 205 205 205 205 410 410	0.2	1.5
Combining of TPC commands from radio links of different radio link sets				Not applicable			
Power control in the downlink, constant BLER target				Not applicable			
Power control in the downlink, initial convergence				Not applicable			
Power control in the downlink, wind up effects				Not applicable			
Power control in the downlink, different transport formats				Not applicable			
Downlink compressed mode				Not applicable			

Blind transport format detection	Static 12.2 7.95 1.95 Multipath 12.2 7.95 1.98	BLER FDR 10^{-2} 10^{-4} 10^{-2} 10^{-4} 10^{-2} 10^{-4} 10^{-2} 10^{-4} 10^{-2} 10^{-4} 10^{-2} 10^{-4}	1.234	345 BLER FDR 559.16s 932min 559.16s 932min 559.16s 932min 559.16s 932min 559.16s 932min 559.16s 932min	Note 1 Note 1 Note 1 205 205 205	0.2	1.5

Table F.6.1.8-3: Test conditions for RLC SDU Error Rate (SDU ER) tests

Type of test (SDU ER)	Test requirement (SDU ER)	Test limit (SDU ER)= Test requirement (SDU ER)x TL TL	Target number of error events	Minimum number of samples	Prob that good unit will fail = Prob that bad unit will pass [%]	Bad unit SDU ER factor M
Cell re-selection during an MBMS session, one UTRAN inter-frequency and 2 GSM cells present in the neighbour list	0.04	1.236	NA	NA	5%	1.5
			The SDU ER test is embedded in the Cell reselection delay test and its test duration depends on the test duration of the delay test. During the cell reselection delay test more samples than necessary for statistical significance are generated in the SDU ER test. (approx factor 50). Hence, after finalisation of the delay test, the SDU ER test is decided against the test limit: 0.04*1.236=0.0495			

F.6.1.9 Practical Use (informative)

See figure F.6.1.9:

The early fail limit represents formula (1) in F.6.1.5. The range of validity is ne≥7, ≥8 in case of blocking test to ne =345

The early pass limit represents the formula (2) in F.6.1.5. The range of validity is ne=1 to ne =345. See note 1

The intersection co-ordinates of both curves are : number of errors ne = 345 and test limit TL = 1.234.

The range of validity for TL is ne>345.

A typical BER BLER test, calculated form the number of samples and errors (F.6.1.2.(b)) using experimental method (1) or (2) (see F.6.1.4. calculation assumptions) runs along the yellow trajectory. With an errorless sample the trajectory goes down vertically. With an erroneous sample it jumps up right. The tester checks if the BER BLER test intersects the early fail or early pass limits. The real time processing can be reduced by the following actions:

> $BLER_0$ (excluding the artificial error at the beginning of the test (Note 1)). is calculated only in case of an error event.

> BER_0 (excluding the artificial error at the beginning of the test (Note 1)). is calculated only in case of an error event within a TTI.

So the early fail limit cannot be missed by errorless samples.

The check against the early pass limit may be done by transforming formula (2) in F.6.1.5 such that the tester checks against a Limit-Number-of-samples (NL(ne)) depending on the current number of errors (including the artificial error at the beginning of the test (Note 1)).

Early pass if

$$NL(ne) \geq \frac{qchisq(1-D,2*ne)}{2*TR*M}$$

TR: test requirement (0.001)

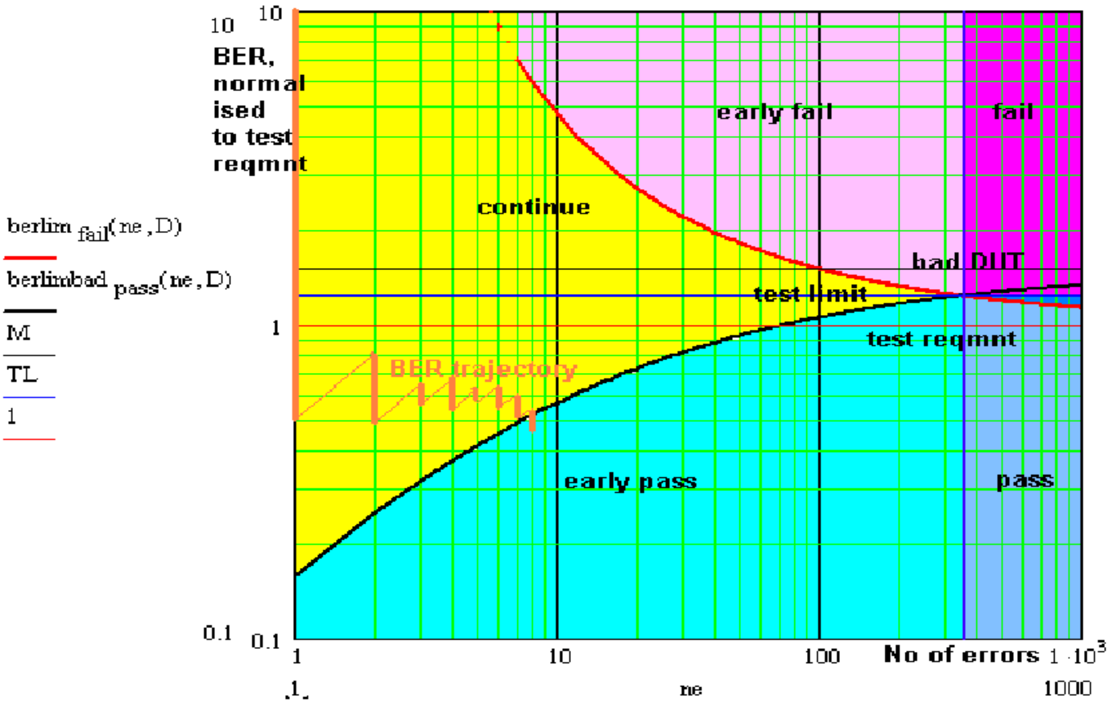


Figure F.6.1.9

NOTE 1: At the beginning of the test, an artificial error is introduced. This ensures that an ideal DUT meets the valid range of the early pass limit. In addition this ensures that the complementary experiment (F.6.1.4. bullet point (2)) is applicable as well.

For the check against the early fail limit the artificial erroneous sample, introduced at the beginning of the test , is disregarded.

Due to the nature of the test, namely discrete error events, the early fail condition shall not be valid, when fractional errors <1 are used to calculate the early fail limit: Any early fail decision is postponed until number of errors ne ≥ 7. In the blocking test any early fail decision is postponed until number of errors ne ≥ 8.

NOTE 2: F= 0.2% is intended to be used for a test containing a few BER/BLER tests (e.g. receiver sensitivity is repeated 12 times). For a test containing many BER/BLER tests (e.g. blocking test) this value is not appropriate for a single BER/BLER test.

The blocking test contains approx. 12750 single BER tests. A DUT on the limit will fail approx. 25 to 26 times due to statistical reasons (wrong decision probability at the end of the test F= 0.2 %). 24 fails are allowed in the blocking test but they are reserved for spurious responses. This shall be solved by the following rule:

All passes (based on F=0.2%) are accepted, including the wrong decisions due to statistical reasons.

An early fail limit based on F=0.02% instead of 0.2% is established, that ensures that wrong decisions due to statistical reasons are reduced to 2 to 3.

These asymmetric test conditions ensure that a DUT on the test limit consumes hardly more test time for a blocking test than in the symmetric case and on the other hand discriminates sufficiently between statistical fails and spurious response cases.

F.6.1.10 Dual limit BLER tests

This annex is applicable for subclause 7.8.1 and 7.8.1A Power control in the downlink constant BLER target, subclause 7.8.4 Power control in the downlink, different transport formats and subclause 7.9 Downlink compressed mode. In this tests the BLER shall stay between two limits.

Table F.6.1.10. Parameters for single and dual limit BLER

Parameters for single limit	**Parameters for dual limits**
Specified BER BLER	Specified BLER * 1.3 (upper test requirement) Specified BLER * 0.7 (lower test requirement)
Bad DUT BER BLER	Bad DUT BLER *1.3 Bad DUT BLER *0.7
Test limit	Upper Test limit Lower Test limit
Early fail and Early pass	Fail_high Pass_high Pass_low Fail_low

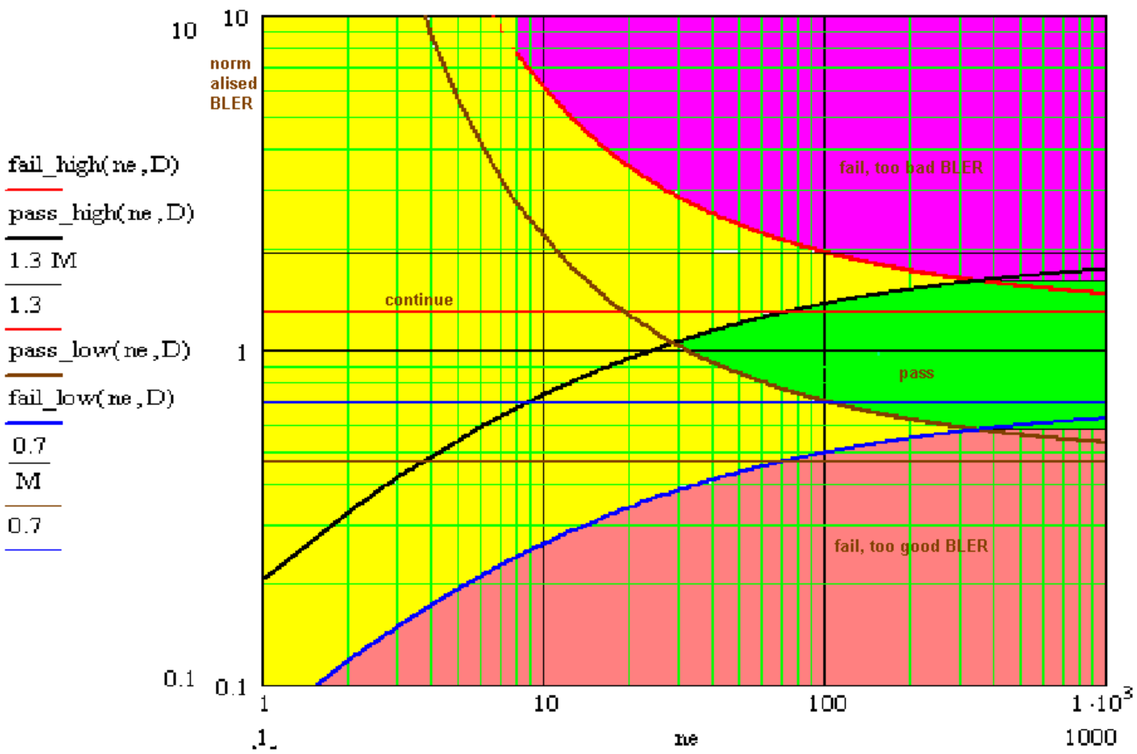


Figure F.6.1.10: Dual limit BLER

F.6.1.10.1 Description of the parameters for dual limit BLER tests

(refer figure F.6.1.10)

The origin

1 (black horizontal line in the centre): this is the normalised origin BLER

The asymptotes

1.3 (red horizontal line): this is the specified upper limit of the range (BLER +30%) (upper test requirement)

0.7(blue horizontal line): this is the specified lower limit of the range (BLER-30%)(lower test requirement)

1.3*M (black horizontal line): this is M times the specified upper limit of the range (Bad DUT BLER)

0.7/M (brown horizontal line): this is 1/M times the specified lower limit. (Bad DUT BLER)

The pass/fail limits

Fail_high (bold red curve):

Definition: A momentary BLER value above this curve is with high probability above the specified upper limit: BLER +30%.

Verdict: Above: Fail due to bad BLER

Below: continue

It approaches towards 1.3(red).

Validity range 7< errors <345.

Formula:

$$\text{fail\_high}(ne, D) := 2\cdot\frac{ne\cdot 1.3}{\text{qchisq}(D, 2\cdot ne)}$$

Fail_low (bold blue curve):

Definition: A momentary BLER value below this curve is with high probability below the specified lower limit: BLER -30%).

Verdict: Above: continue

Below: Fail due to too good BLER

It approaches towards 0.7(blue).

Validity range 1≤ errors <343.

Formula:

$$\text{fail\_low}(ne, D) := 2\cdot\frac{ne\cdot 0.7}{\text{qchisq}(1 - D, 2\cdot ne)}$$

Pass_high (bold black curve):

Definition: a momentary BLER value on and below this curve is with high probability below M times the specified upper limit.

Verdict: Above: continue

Below: pass for ne ≥ 29

continue for ne < 29

It approaches 1.3*M(black).

Validity range 1≤ errors <345.

Formula:

$$\text{pass\_high}(ne, D) := 2\cdot\frac{ne}{\text{qchisq}(1 - D, 2\cdot ne)}\cdot M\cdot 1.3$$

Pass_low (bold brown curve):

Definition: a momentary BLER value on and above this curve is with high probability above 1/M times the specified lower limit of the range.

Verdict: Above: pass for ne ≥ 29,

continue for ne < 29

Below: continue

It approaches 0.7/M(brown).

Validity range 7< errors <343.

$$\text{pass\_low}(ne, D) := 2\cdot\frac{ne\cdot\frac{0.7}{M}}{\text{qchisq}(D, 2\cdot ne)}$$

Legend formulas:

D: wrong decision risk per test step: 0.000085

M: bad DUT factor: 1.5

ne: number of errors

qchisq: inverse cumulative chi square function

Upper test limit (boarder between pink and green) 1.3*1.234 = 1.6

Validity range: 345 ≤ errors.

Verdict: Above: fail due to bad BLER

Below: pass

Lower test limit (boarder between green and orange) 0.7/1.234 = 0.567

Validity range: 343 ≤ errors

Verdict: Above: pass

Below: fail due to too good BLER

The intersection co-ordinates:

Fail_high (bold red curve) and Pass_high (bold black curve):

Upper target number of errors (345) and upper test limit: 1.3* 1.234

Fail_low (bold blue curve) and Pass_high (bold black curve):

Lower target number of errors (343) and lower test limit: 0.7 / 1.234

Pass_high (bold black curve) and Pass_low (bold brown curve)

Minimum number of errors (29) and optimum normalised BLER (1.049)

The ranges:

Range(pink): in this range the measurement can be stopped and the DUT is failed due to too high BLER.

Range (orange): in this range the measurement can be stopped and the DUT is failed due to too low BLER.

Range (yellow): in this range the measurement is undecided and must be continued.

Range (green): in this range the measurement can be stopped and the DUT is passed. No final BLER result is achieved.

F.6.1.10.2 Pass fail decision rules

No decision is allowed before the minimum test time (Table F.6.1.6.2) has elapsed

1) If minimum Test time < time for target number of error events then the following applies: The required confidence level 1-F (= correct decision probability, Table F.6.1.6.2) shall be achieved. This is fulfilled at

   fail_high

   pass_high

   pass_low

   fail_low

   For every block sum up the number of blocks (ns) and the number of erroneous blocks (ne) from the beginning of the test and calculate

   $BLER_1$ (including the artificial error at the beginning of the test (Note 1, F.6.1.9))and

   $BLER_0$ (excluding the artificial error at the beginning of the test (Note 1, F.6.1.9)).

   If $BLER_0$ is above *fail_high*, fail the test due to too bad BLER

If $BLER_1$ is below *fail_low*, fail the test due to too good BLER

If $BLER_0$ is on or below *fail_high* and if $BLER_1$ is above *pass_high*, continue the test

If $BLER_0$ is below *pass_low* and if $BLER_1$ is above or on *fail low*, continue the test

If $BLER_1$ is below or on *pass_high* and if $BLER_0$ is on or above *pass_low*, pass the test

2) If the minimum test time ≥ time for target error events, then the test runs for the minimum test time and the decision is done by comparing the result with the upper and lower test limit.

If $BLER_0$ is above the upper test limit, fail the DUT due to too bad BLER

If $BLER_1$ is below the lower test limit, fail the DUT due to too good BLER

If $BLER_0$ is on or below the upper test limit and if $BLER_1$ is on or above the lower test limit, pass the DUT

F.6.1.10.3 Test conditions for dual limit BLER tests

Table F.6.1.10.3: Test conditions for dual limit BLER tests

Type of test (BLER)	Data rate, Propagation condition	Test requirement (BLER)	Test limit = Test requirement * TL TL	Target number of error events (time)	Minimum number of samples	Prob that a good unit will fail = prob that a bad unit will pass: F[%]	Bad unit factor M
Power control in the downlink, constant BLER target	12.2 kbit/s, 3km/h (case4)	0.01±30% 0.1±30% 0.001±30%	Upper TL: 1.3*1.234 Lower TL 0.7/1.234	Upper: 345 (431.25s) (43s) (4311s) Lower 343 (1191s) (119s) (11946s)	8200	0.2	Upper: 1.5 Lower 1/1.5
Power control in the downlink, constant BLER target	64 kbit/s, 3km/h (case4)	0.01±30% 0.1±30% 0.001±30%	Upper TL: 1.3*1.234 Lower TL 0.7/1.234	Upper: 345 (431.25s) (43s) (4311s) Lower 343 (1191s) (119s) (11946s)	32800	0.2	Upper: 1.5 Lower 1/1.5
Downlink compressed mode	12.2kbit/s, 3km/h (case 2)	0.01±30%	Upper TL: 1.3*1.234 Lower TL 0.7/1.234	Upper: 345 (431.25s) Lower 343 (1191s)	8200	0.2	Upper: 1.5 Lower 1/1.5
Power control in the downlink, different transport formats	12.2 kbit/s, 3km/h 0 kbit/s, 3km/h (case 4)	0.01±30%	Upper TL: 1.3*1.234 Lower TL 0.7/1.234	Upper: 345 (431.25s) Lower 343 (1191s)	8200	0.2	Upper: 1.5 Lower 1/1.5

F.6.1.10.4 Test conditions for dual limit TPC Command Error Rate tests

Table F.6.1.10.4: Test conditions for dual limit TPC Command Error Rate tests

Type of test (TPC Command Error Rate)	TPC Command Error Rate, Propagation condition	Test requirement (TPC Command Error Rate)	Test limit = Test requirement * TL TL	Target number of error events (time)	Minimum number of samples	Prob that a good unit will fail = prob that a bad unit will pass: F[%]	Bad unit factor M
Power control in the downlink for F-DPCH	1500TPC's/s ,3km/h (case4)	0.01±50% 0.05±30%	Upper TL: 1.5*1.234 6.5*1.234 Lower TL 0.5/1.234 3.5/1.234	Upper: 345 (12.425s) (2.485s) Lower: 343 (37.06s) (7.412s)	246000 (164*1500)	0.2	Upper: 1.5 Lower 1/1.5

F.6.2 Statistical testing of RRM delay performance

F.6.2.1 Test Method

Each test is performed in the following manner:

a) Setup the required test conditions.

b) Measure the delay repeated times. Start each repetition after sufficient time, such that each delay test is independent from the previous one. The delay-times, measured, are simplified to:

   a good delay, if the measured delay is ≤ limit.

   a bad delay, if the measured delay is > limit

c) Record the number of delays (ns), tested, and the number of bad delays (ne)

d) Stop the test at an early pass or an early fail event.

e) Once the test is stopped, decide according to the pass fail decision rules (subclause F.6.2.7)

F.6.2.2 Bad Delay Ratio (ER)

The Bad Delay Ratio (ER) is defined as the ratio of bad delays (ne) to all delays (ns).
(1-ER is the success ratio)

F.6.2.3 Test Criteria

The test shall fulfil the following requirements:

a) good pass fail decision

   1) to keep reasonably low the probability (risk) of passing a bad unit for each individual test;

   2) to have high probability of passing a good unit for each individual test;

b) good balance between test-time and statistical significance

   3) to perform measurements with a high degree of statistical significance;

   4) to keep the test time as low as possible.

F.6.2.4 Calculation assumptions

F.6.2.4.1 Statistical independence

It is arranged by test conditions, that bad delays are independent statistical events.

F.6.2.4.2 Applied formulas

The specified ER is 10% in most of the cases. This stipulates to use the binomial distribution to describe the RRM delay statistics. With the binomial distribution optimal results can be achieved. However the inverse cumulative operation for the binomial distribution is not supported by standard mathematical tools. The use of the Poisson or Chi Square Distribution requires ER→0. Using one of this distributions instead of the binomial distribution gives sub-optimal results in the conservative sense: a pass fail decision is done later than optimal and with a lower wrong decision risk than predefined.

The formulas, applied to describe the RRM delay statistics test, are based on the following experiment:

(1) After having observed a certain number of bad delays (**ne**) the number of all delays (**ns**) are counted to calculate ER. Provisions are made (note 1) such that the complementary experiment is valid as well:

(2) After a certain number of delays (**ns**) the number of bad delays (**ne**), occurred, are counted to calculate ER.

Experiment (1) stipulates to use the Chi Square Distribution with degree of freedom ne: 2*dchisq(2*NE,2*ne).

Experiment (2) stipulates to use the Poisson Distribution: dpois(ne,NE)

(NE: mean value of the distribution)

To determine the early stop conditions, the following inverse cumulative operation is applied:

0.5 * qchisq(D,2*ne) for experiment (1) and (2)

D: wrong decision risk per test step

NOTE: Other inverse cumulative operations are available, however only this is suited for experiment (1) and (2).

F.6.2.4.3 Approximation of the distribution

The test procedure is as follows:

During a running measurement for a UE ns (Number of Delays) and ne (Number of bad delays) are accumulated and from this the preliminary ER is calculated. Then new samples up to the next bad delay are taken. The entire past and the new samples are basis for the next preliminary ER. Depending on the result at every step, the UE can pass, can fail or must continue the test.

As early pass- and early fail-UEs leave the statistical totality under consideration, the experimental conditions are changed every step resulting in a distribution that is truncated more and more towards the end of the entire test. Such a distribution can not any more be handled analytically. The unchanged distribution is used as an approximation to calculate the early fail and early pass bounds.

F.6.2.5 Definition of good pass fail decision

This is defined by the probability of wrong decision F at the end of the test. The probability of a correct decision is 1- F.

The probability (risk) to fail a good DUT shall be ≤ F according to the following definition: A DUT is failed, accepting a probability of ≤ F that the DUT is still better than the specified bad delay ratio (Test requirement).

The probability (risk) to pass a bad DUT shall be ≤ F according to the following definition: A DUT is passed, accepting a probability of ≤ F that the DUT is still worse than M times the specified bad delay ratio. (M>=1 is the bad DUT factor).

This definitions lead to an early pass and an early fail limit:

Early fail: $er \geq er\mathbf{lim}_{fail}$

$$er\lim_{fail}(D,ne) = \frac{2*ne}{qchisq(D,2*ne)} \qquad (1)$$

For ne ≥ 5

Early pass: $er \leq er\mathbf{lim}bad_{pass}$

$$er\lim bad_{pass}(D,ne) = \frac{2*ne*M}{qchisq(1-D,2*ne)} \qquad (2)$$

For ne ≥1

With

er (normalized ER): ER according to F.6.2.2 divided by specified ER

D: wrong decision probability for a test step . This is a numerically evaluated fraction of F, the wrong decision probability at the end of the test. see table F.6.2.6.1

ne: Number of bad delays

M: bad DUT factor see table F.6.2.6.1

qchisq: inverse cumulative chi squared distribution

F.6.2.6 Good balance between test-time and statistical significance

Two independent test parameters are introduced into the test and shown in Table F.6.2.6.1. These are the obvious basis of test time and statistical significance. From them four dependent test parameters are derived.

Table F.6.2.6 independent and dependent test parameters

Independent test parameters			**Dependent test parameters**		
Test Parameter	Value	Reference	Test parameter	Value	Reference
Bad DUT factor M	1.5	Table F.6.1.8	Early pass/fail condition	Curves	Subclause F.6.2.5 Figure 6.2.9
Final probability of wrong pass/fail decision F	5%	Table F.6.2.8	Target number of bad delays	154	Table 6.2.8
			Probability of wrong pass/fail decision per test step D	0.6 %	
			Test limit factor TL	1.236]	Table 6.2.8

F.6.2.7 Pass fail decision rules

The required confidence level 1-F (= correct decision probability) shall be achieved. This is fulfilled at an early pass or early fail event. Sum up the number of all delays (ns) and the number of bad delays from the beginning of the test and calculate:

ER_1 (including the artificial error at the beginning of the test (Note 1))and

ER_0 (excluding the artificial error at the beginning of the test (Note 1)).

If ER_0 is on or above the early fail limit, fail the DUT.

If ER_1 is on or below the early pass limit, pass the DUT.

Otherwise continue the test

F.6.2.8 Test conditions for RRM delay tests, Combining of TPC commands test 1, Demodulation of Paging channel and Detection of acquisition indicator tests and UE measurement performance tests.

NOTE: Statistical independence of the tests below need to be considered:

In test 7.7.2 the statistical independency of the samples is given: Power control algorithm 1 is used. Hence the TPC commands represent directly the TPC reception. The TPC bit patterns are independent.

In test 7.7.3 the statistical independency of the samples is FFS

Test 7.11 the statistical independency of the samples is given: A paging message is an independent sample, since channel-coding, introducing dependency, is terminated after one message.

The same holds for Test 7.12

The delay tests in clause 8 up to clause 8.6 use independent samples. This is ensured by changing the scenario or reset the UE in between the samples.

In clause 8.7 the UE reports measurements. In between the reports the scenario keeps constant and the UE continues its measurement. It is unknown, whether the UE re-uses knowledge from the previous reports for the next report (intentionally or unintentionally). Hence it is unknown, whether the samples in the test are independent or not. Independent samples allow the usage of the theory in clause F.6.2.1 to F.6.2.7. Dependent samples could result in a distribution which is wider or narrower, compared to the equivalent independent distribution. In this situation statistical independency of the samples is **assumed** and the theory described in clause F.6.2.1 to F.6.2.7 is re-used.

Table F.6.2.8: Test conditions for a single RRM delay tests, Combining of TPC commands test 1, Demodulation of Paging channel and Detection of Acquisition indicator tests and UE measurement performance tests.

Type of test	Test requirement	Test requirement (ER= 1-success ratio)	Test limit(ER)= Test requirement (ER)x TL TL	Target number of bad results	Prob that good unit will fail = Prob that bad unit will pass [%]	Bad unit factor M
7.7.2 Combining of TPC commands Test 1	99% success ratio for power control sequence	0.01	1.236	154	5	1.5
7.7.3 Combining of reliable TPC commands from radio links of different radio link sets	90% success ratio for power control sequence	0.1	1.236	154	5	1.5
7.11 Demodulation of Paging Channel (PCH)	1% missed paging	0.01	1.236	154	5	1.5
7.12 Detection of Acquisition indicator (AI).	1% false alarm 99% correct detection	0.01	1.236	154	5	1.5
7.12A Detection of E-DCH Acquisition Indicator (E-AI)	99.5% correct detection	0.005	1.236	154	5	1.5
8.2.2 Cell reselection	8s delay	0.1	1.236	154	5	1.5
8.2.3.1 UTRAN to GSM cell reselection, scenario 1	27.9s delay	0.1	1.236	154	5	1.5
8.2.3.2 UTRAN to GSM cell reselection, scenario 2	9.6s delay	0.1	1.236	154	5	1.5
8.2.3.3 UTRAN to GSM cell reselection, scenario 3	39.6s delay	0.1	1.236	154	5	1.5
8.2.4 FDD/TDD Cell reselection	8s delay	0.1	1.236	154	5	1.5
8.3.1 FDD/FDD Soft handover	NA					
8.3.2 FDD/FDD Hard Handover						
8.3.2.1 Handover to intra frequency cell	110 ms delay	0.1	1.236	154	5	1.5
8.3.2.2 FDD/FDD Hard Handover to inter frequency cell	140ms delay	0.1	1.236	154	5	1.5
8.3.4 Inter-system Handover from UTRAN to GSM r	100 ms delay	0.1	1.236	154	5	1.5
8.3.6.3 Cell re-selection during an MBMS session, one UTRAN inter-frequency and 2 GSM cells present in the neighbour list	4.65 s delay	0.1	1.236	154	5	1.5
8.3.8 Serving HS-DSCH cell change	75 ms, 85 ms delay	0.1	1.236	154	5	1.5
8.3.9 Enhanced Serving HS-DSCH cell change	50 ms	0.1	1.236	154	5	1.5
8.3.10 System information acquisition for CSG cell						
8.3.10.1 Intrafrequency System information acquisition for CSG cell	2.71 s delay	0.1	1.236	154	5	1.5
8.3.10.2 Inter frequency System information acquisition for CSG cell	1.96 s delay	0.1	1.236	154	5	1.5

8.4.3. Transport format combination selection in UE.	140ms delay (see 8.4.3.1.4.2 and 8.4.3.1A.4.2 step 7)	0.1	1.236	154	5	1.5
8.4.4.1: 10 ms TTI E-DCH E-TFC restriction	50ms delay	0.1	1.236	154	5	1.5
8.4.4.2: 2 ms TTI E-DCH E-TFC restriction	31ms delay	0.1	1.236	154	5	1.5
8.6.2.2 correct reporting of neighbours in fading propagation condition.	[13.9 s delay] (see procedure 8.6.2.2.4.2 step 8.)	0.1	1.236	154	5	1.5
8.6.2.3 correct reporting of neighbours in fading propagation condition using TGL1=14.	[1.78 s delay] (see procedure 8.6.2.3.4.2 step 8.)	0.1	1.236	154	5	1.5
CPICH RSCP Intra frequency measurements accuracy 8.7.1.1.1 Absolute accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
8.7.1.1.2 Relative accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
Inter frequency measurement accuracy 8.7.1.2.1 Relative accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
CPICH Ec/Io Intra frequency measurements accuracy 8.7.2.1.1 Absolute accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
8.7.2.1.2 Relative accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
Inter frequency measurement accuracy 8.7.2.2.2 Relative accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
UTRA Carrier RSSI 8.7.3.1 Absolute measurement accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
8.7.3.2 Relative measurement accuracy requirement	90% correct reports	0.1	1.236	154	5	1.5
8.7.3 AGSM Carrier SSI	90% correct reports	0.1	1.236	154	5	1.5
8.7.3C UE transmitted power (R99 and Rel-4 only)	90% consistency between reported power and transmitted power	0.1	1.236	154	5	1.5

8.7.3D UE transmitted power (Rel-5 and later)	90% consistency between reported power and transmitted power	0.1	1.236	154	5	1.5
SFN-CFN observed time difference 8.7.4.1 Intra frequency measurement requirement	90% correct reports	0.1	1.236	154	5	1.5
8.7.4.2 Inter frequency measurement requirement	90% correct reports	0.1	1.236	154	5	1.5
SFN-SFN observed time difference 8.7.5.1 SFN-SFN observed time difference type 1	90% correct reports	0.1	1.236	154	5	1.5
8.7.5.2 SFN-SFN observed time difference type 2 without IPDL period active Note: This test case is not complete and there are currently no plans to complete it.						
8.7.5.3 SFN-SFN observed time difference type 2 with IPDL period active Note: This test case is not complete and there are currently no plans to complete it.	90% correct reports	0.1	1.236	154	5	1.5
UE Rx-Tx time difference 8.7.6.1 UE Rx-Tx time difference type 1 (Rel-5 and earlier)	90% correct reports	0.1	1.236	154	5	1.5
8.7.6.1A UE Rx-Tx time difference type 1 (Rel-6 and later)	90% correct reports	0.1	1.236	154	5	1.5
8.7.6.2 UE Rx-Tx time difference type 2 Note: This test case is not complete and there are currently no plans to complete it.						
P-CCPCH RSCP 8.7.8.1 Absolute measurement accuracy	90% correct reports	0.1	1.236	154	5	1.5
8.7.9 UE Transmission Power Headroom.	90% correct reports	0.1	1.236	154	5	1.5

F.6.2.9 Practical Use (informative)

See figure F.6.2.9:

The early fail limit represents formula (1) in F.6.2.5. The range of validity is ne≥ 5 to ne = 154

The early pass limit represents the formula (2) in F.6.2.5. The range of validity is ne=1 to ne =154. See note 1. The intersection co-ordinates of both curves are: target number of bad delays ne = 154 and test limit TL = 1.236 .

A typical delay test, calculated form the number of samples and errors (F.6.2.2) using experimental method (1) or (2) (see F.6.2.4.2. calculation assumptions) runs along the yellow trajectory. With an good delay the trajectory goes down vertically. With a bad delay it jumps up right. The tester checks if the ER test intersects the early fail or early pass limits.

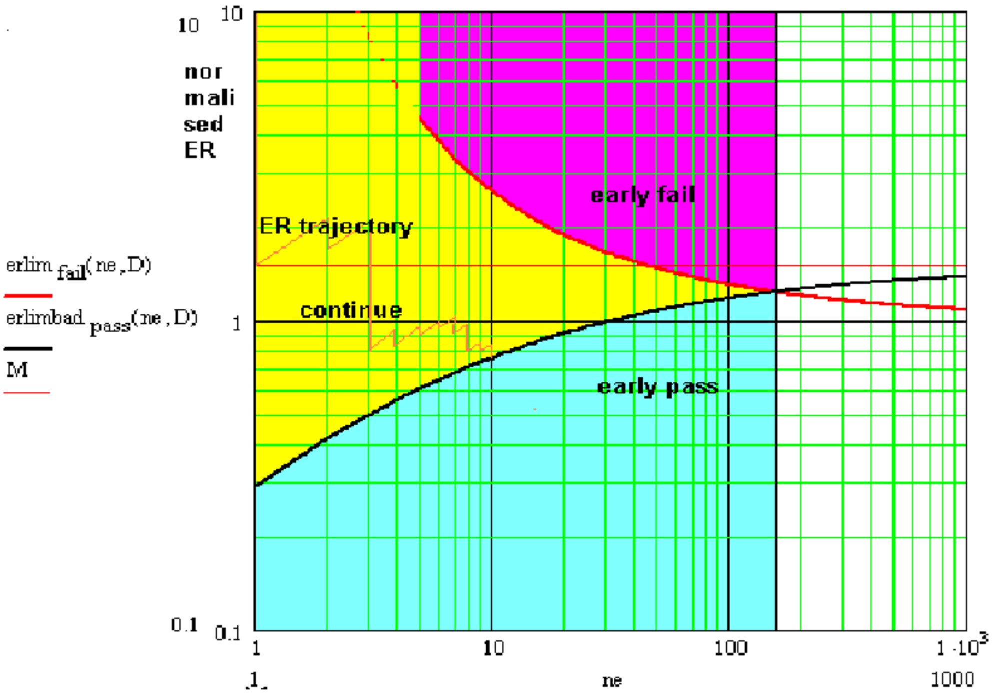


Figure F.6.2.9

NOTE 1: At the beginning of the test, an artificial bad delay is introduced. This ensures that an ideal DUT meets the valid range of the early pass limit. In addition this ensures that the complementary experiment (F.6.2.4.2. bullet point (2)) is applicable as well. For the check against the early fail limit the artificial bad delay sample, introduced at the beginning of the test , is disregarded.
Due to the nature of the test, namely discrete bad delay events, the early fail condition shall not be valid, when fractional bad delays <1 are used to calculate the early fail limit: Any early fail decision is postponed until number of errors ne $\geq$ 5.

F.6.3 Statistical Testing of HSDPA Receiver Performance

F.6.3.1 Definition

Information Bit Throughput R:

The measured information bit throughput R is defined as the sum (in kilobits) of the information bit payloads (excluding the 24-bit HS-DSCH CRC) successfully received during the test interval, divided by the duration of the test interval (in seconds).

F.6.3.2 Mapping throughput to block error ratio

a) In measurement practice the UE indicates successfully received information bit payload by signalling an ACK to the SS.
If payload is received, but damaged and cannot be decoded, the UE signals a NACK.

b) Only the ACK and NACK signals, not the data bits received, are accessible to the SS.
The number of bits is known in the SS from knowledge of what payload was sent.

c) For fixed reference channel the number of bits in a TTI is fixed during one test.

d) The time in the measurement interval is composed of successful TTIs (ACK), unsuccessful TTIs (NACK) and DTX-TTIs.

e) DTX-TTIs occur regularly according to the H-set. (regDTX).
In real live this is the time when other UEs are served.
regDTX vary from test to test but are fixed within the test.

f) Additional DTX-TTIs occur statistically when the UE is not responding ACK or NACK where it should. (statDTX)
This may happen when the UE was not expecting data or decided that the data were not intended for it.

The pass / fail decision is done by observing the:

- number of NACKs
- number of ACKs and
- number of statDTXs (regDTX is implicitly known to the SS)

The ratio `(NACK + statDTX)/(NACK+ statDTX +ACK)` is the Bock Error Ratio BLER. Taking into account the time consumed by the ACK-, NACK-, and DTX-TTIs (regular and statistical), BLER can be mapped unambiguously to throughput for any single FRC test.

F.6.3.3 Bad DUT factor

NOTE: Data throughput in a communication system is of statistical nature and must be measured and decided pass or fail. The specified limit of throughput related to the ideal throughput in different throughput tests is in the range of a few % to near 100%. To make it comparable with BER, we define the complement of the relative throughput: BLER as defined above. Complementary this is in the range of near 100% down to a few % For e.g. BLER = 1%, the currently in BER BLER used Bad DUT factor M=1.5 is highly meaningful. For e.g. BLER = 99%, the currently used M=1.5 obviously meaningless.

An appropriate definition of the bad DUT factor is illustrated in figure F.6.3.3: constant and variable Bad DUT factor.

It illustrates how to find the Bad BLER when the nominal BLER is given.

1) In the range 0%< nominal BLER>10% the Bad DUT factor is constant 1.5

2) In the range 90%< bad BLER>100% it decreases to 1. (symmetrical to (1))

3) The range in between is interpolated by an arc section.

The example shows: nominal BLER=35,6% → bad BLER=47.67.5% → M=1.34

(blue mapping)

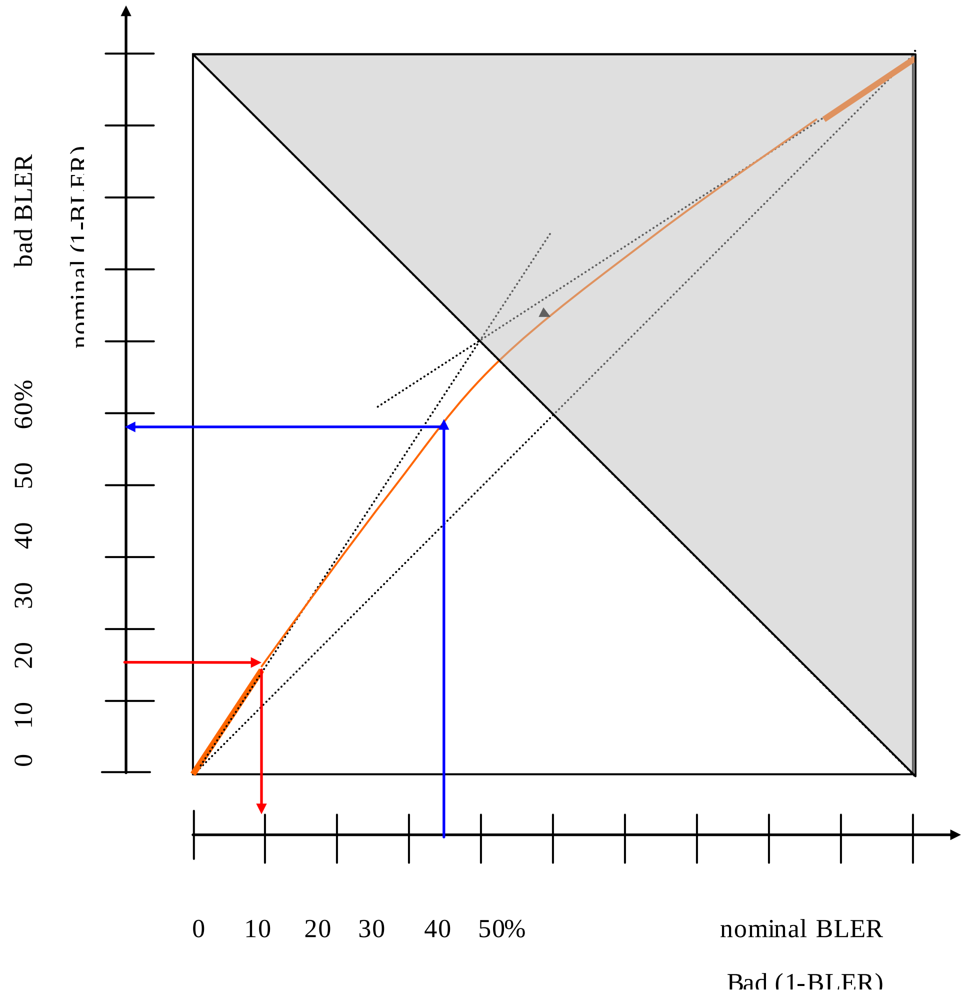


Figure F.6.3.3: constant and variable Bad DUT factor

Formula:

For 0 < BLER<= 0.1 M = 1.5

For 0.1 <BLER <.9

$$M(BLER) := \frac{\sqrt{r^2 - (BLER - 2.35)^2}}{BLER} - \frac{1.35}{BLER}$$

For 0.9 <= BLER < 1 M(BLER)= 2/3BLER + 1/3

With BLER: nominal Block Error Ratio (0<BLER<1)

With r = 2.70415 (Radius of the arc)

F.6.3.3.1 Bad DUT factor, range of applicability

Inaccuracy is one practical reason to avoid the grey shaded area of figure F.6.3.3: constant and variable Bad DUT factor. For BLER near 1 the Bad DUT factor M is near 1. For M=1,exactly, the pass and fail criteria do not intersect. The test never is finalised.

For M near 1 the pass and fail criteria exhibit a very smooth intersection. In addition the binomial distribution and its inverse are of discrete nature. Therefore the test limit and the number of samples is calculable only very ambiguous.

It is proposed to apply the bad DUT factor only in the not shaded area of figure F.6.3.3.

This is done by the following:

BLER mode:

Use BLER as defined above in the range of 0 to 50%, use M >1 as defined above.

The Test Limit will be > the Test Requirement in the table F.6.3.5. below.

Relative Throughput mode:

If BLER is in the range 50 to 100%, use 1-BLER instead. Use m<1 instead of M.

1-BLER is the relative throughput with respect to the ideal throughput.

As a consequence, the Test Limit < Test Requirement

Formula for m:

For 0 < (1-BLER) <= 0.15 m = 1/1.5

For 0.15 <(1-BLER) <.85 $m := \frac{2.35 - \sqrt{r^2 - [(1 - BLER) + 1.35]^2}}{(1 - BLER)}$

In figure F.6.3.3 this is represented by the red mapping.

The tables F.6.3.5... below distinguish between m and M.

F.6.3.4 Minimum Test time

Same as with BER BLER there is a minimum test time is necessary for multipath fading profiles with the same justification:

Table F.6.3.4 Applicability and characteristics of the Tables F.6.3.5. 0 to F.6.3.5.4. 10

profile	Minimum Test time
PA3, PB3	164s
VA30, Case 8	16.4s
VA 120	4.1s

The purpose of tables F.6.3.5.0 to F.6.3.5.4.10 is to decide throughput pass or fail.

(the Ior/Ioc levels are only for reference)

Meaning of a decision:

- A passed DUT is not worse than a Bad DUT with 95% confidence level.
- A failed DUT is not better than a Limit DUT with 95% confidence level.

The minimum Test Time is

1) the minimum test time due to statistical reasons

   (To ensure the confidence level, the test must be continued until a certain number of samples (NACK+ statDTX +ACK) is reached.)

2) the minimum test time due to multipath fading.

The longer test time applies. It is marked in table F.6.3.5. which one applies.

Statistical independence:

If a process works within an incremental redundancy sequence, the samples are not independent. The incremental redundancy sequence for every process must be finalised, successfully or unsuccessfully, on or beyond the minimum test time.

Then the BLER (or 1-BLER) is compared with the Test Limit to decide pass or fail.

Note: It is FFS, if correlation within groups of retransmissions may influence the confidence level of the test.

Formula:

The theory, to derive the minimum number of samples and the Test Limit, takes into consideration that BLER is in the range of near 0% to near 100%. Hence it is based on the binomial distribution and its inverse cumulative function: qbinom:

For the BLER test mode:

ne_{low}=qbinom(D,ns,M*$BLER_{limit}$) (1)

ne_{high}=qbinom(1-D,ns,$BLER_{limit}$) (2)

given: 1-D: confidence level= 95%

$BLER_{limit}$=Block error ratio at the limit

M: Bad DUT factor >1

Input: ns: number of samples (NACK+ statDTX + ACK)

Output ne: number of events (NACK+ statDTX)

The intersection of (1) and (2) is the Test Limit with the coordinates: ns and ne

For the Relative Throughput test mode:

ne_{low}=qbinom(D,ns,1-$BLER_{limit}$) (3)

ne_{high}=qbinom(1-D,ns,m*(1-$BLER_{limit}$)) (4)

given: 1-D: confidence level= 95%

1-$BLER_{limit}$= Relative Throughput at the limit

m: Bad DUT factor <1

Input: ns: number of samples (NACK+ statDTX + ACK)

Output ne: number of events (ACK)

The intersection of (3) and (4) is the Test Limit with the coordinates: ns and ne

Note 1: In contrast to BER BLER test, this approach does not contain any test time optimisation. (early pass, early fail)

Note 2: The intersection of (3) and (4) above is a multipoint intersection due to the discrete nature of those curves. Thus, the specific intersection point used for the test limit is a subjective decision about the intersection point. In all cases, the intersection point was chosen such that it fell in the middle of the set of intersections of curves (3) and (4) above.

Nomenclature used in the tables F.6.3.5… below:

- NACK+ statDTX + ACK is summarised as No of samples
- NACK+ statDTX is summarised as No of errors
- ACK is summarised as No of successes

- In the BLER (BL) test mode the ratio: No of errors/ No of samples is recorded. In this mode a pass is below the test limit
- In the Relative Throughput (RT) test mode (1-BLER) the ratio: No of successes/ No of samples is recorded. In this mode a pass is above the test limit
- The test mode, used, is indicated in the rightmost column with BL or RT
- The transition from the BL to the RT test mode can also be seen in the column relative test requirement: BLER%→ (1-BLER%)
- The generic term for No of errors (BLER mode) or No of successes (Relative Throughput mode) is No of events. This is used in the table column Test Limit.

F.6.3.5 Test conditions for HSDPA Receiver Performance

Table F.6.3.5.0: DC-HSDPA/4C-HSDPA receiver test case 6.2A, 6.2C, 6.2D, 6.4B, 6.5A, 6.5D, 6.2DA, 6.5E, 6.5F, 6.5FA 6.5G, 6.5GA, 6.6A, 6.6C, 6.6D, 6.6DA, 6.7A, 6.7D, 6.7E and 6.7EA

DC-HSDPA Reception QPSK H-Set 12	Absolute Test requirement (kbps)	Relative test requirement (normalized to ideal=60 kbps) No of events/No of samples in %	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
	54	10%	58/467 (M=1.5)	467 (≤58)	0.934s (stat)	BL

Table F.6.3.5.1: Maximum Input Level test cases 6.3A, 6.3C, 6.3G and 6.3GA

Maximum Input Level for HS-PDSCH Reception (16QAM) 16 QAM H-Set 1	Absolute Test requirement (kbps)	Relative test requirement (normalized to ideal=777 kbps) No of events/No of samples in %	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
	700	10%	58/467 (M=1.5)	467 (≤58)	2.8s (stat)	BL

Table F.6.3.5.1A: Maximum Input Level test cases 6.3B, 6.3D, 6.3H and 6.3HA

Maximum Input Level for HS-PDSCH Reception (64QAM) 64 QAM H-Set 8	Absolute Test requirement (kbps)	Relative test requirement (normalized to ideal=13252 kbps) No of events/No of samples in %	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
	11800	10.96%	57/422 (M=1.499)	422 (≤57)	0.844s (stat)	BL

Table F.6.3.5.2.1: Single link performance for test case 9.2.1A, 9.2.1C 9.2.1F, 9.2.1FA to 9.2.1FD demodulation of HS-DSCH (QPSK, H-Set 1, 2, 3/3A/3B/3C)

Single link Performance QPSK H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc} = 0$ dB)	PA3	65	87,82%→ (12.18%)	60/595 (m = 1 / 1.5)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc} = 0$ dB)	PB3	23	95.69% → (4.31%)	64/1796 (m = 1/1.5)	N.A	164s (fading)	RT
		138	74.14%→ (25.86%)	58/268 (m = 0.682)	N.A.	164s(fading)	RT
3 ($\hat{I}_{or}/I_{oc} = 0$ dB)	VA30	22	95.9%→ (4.1%)	64/1888 (m=1/1.5)	N.A.	16.4s(fading)	RT
		142	73.4%→ (26.6%)	59/264 (m = 0.684)	N.A.	16.4s(fading)	RT
4 ($\hat{I}_{or}/I_{oc} = 0$ dB)	VA120	13	97.564%→ (2.436%)	63/3224 (m = 1/1.5)	3224 (≥63)	H-set 1: 19.5s(stat) H-set 2: 13s (stat) H-set 3: 6.5s (stat)	RT
		140	73.77%→ (26.23%)	59/268 (m = 0.683)	N.A.	4.1s(fading)	RT
1 ($\hat{I}_{or}/I_{oc} = 10$ dB)	PA3	309	42.1%	83/171 (M= 1.295)	N.A.	164s (fading)	BL
		423	20.74%	60/237 (M= 1.445)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc} = 10$ dB)	PB3	181	66.1%→ (33.9%)	62/215 (m = 0.703)	N.A	164s (fading)	RT
		287	46.22%→ (53,78%)	84/176 (m = 0.77)	N.A.	164s(fading)	RT
3 ($\hat{I}_{or}/I_{oc} = 10$ dB)	VA30	190	64.4%→ (35.6%)	64/211 (m = 0.708)	N.A.	16.4s(fading)	RT
		295	44.72% → (55.28%)	85/173 (m = 0.775)	N.A.	16.4s(fading)	RT
4 ($\hat{I}_{or}/I_{oc} = 10$ dB)	VA120	181	66.1%→ (33.9%)	62/215 (m = 0.703)	N.A.	4.1s(fading)	RT
		275	48.5%→ (51.5%)	79/174 (m = 0.761)	N.A.	4.1s(fading)	RT

Table F.6.3.5.2.1A: Single link Performance for test case 9.2.1D, 9.2.1E demodulation of HS-DSCH (enhanced requirement type 1, QPSK, H-Set 1, 2, 3) and 9.2.1G, 9.2.1GA, 9.2.1GB, 9.2.1GC, 9.2.1GD demodulation of HS-DSCH (enhanced requirement type 3, QPSK, H-Set 3)

Single link enhanced requirement type 1 Performance / QPSK H-Set 1/2/3 / Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	195	63.46% → (36.54%)	64/205 (m = 0.710)	N.A.	164s (fading)	RT
		329	38.35% →(61.65%)	78/175 (M = 1.320)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	156	70.77% → (29.23%)	59/239 (m = 0.690)	N.A.	164s (fading)	RT
		263	50.72% → (49.28%)	76/176 (m = 0.753)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	171	67.96% → (32.04%)	61/225 (m = 0.697)	N.A.	16.4s(fading)	RT
		273	48.84% → (51.16%)	96/174 (M=1.252)	N.A.	16.4s(fading)	BL
4 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA120	168	68.52% → (34.48%)	60/228 (m = 0.696)	N.A.	4.1s(fading)	RT
		263	50.72% → (49.28%)	76/176 (m = 0.753)	N.A.	4.1s(fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	247	53.72% → (46.28%)	72/180 (m = 0.742)	N.A.	164s (fading)	RT
		379	28.95% → (71.02%)	66/193 (M = 1.386)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	195	63.46% → (36.54%)	63/204 (m = 0.710)	N.A.	164s (fading)	RT
		316	40.79% → (59.21%)	81/172 (M = 1.303)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	212	60.27% → (39.73%)	66/194 (m = 0.720)	N.A.	16.4s(fading)	RT
		329	38.35% → (61.65%)	78/175 (M = 1.320)	N.A.	16.4s(fading)	BL
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA120	191	64.21% → (35.79%)	63/208 (m = 0.708)	N.A.	4.1s(fading)	RT
		293	45.10% → (54.90%)	89/173 (M = 1.275)	N.A.	4.1s(fading)	BL

Table F.6.3.5.2.2: Single link performance for test case 9.2.1A and 9.2.1C demodulation of HS-DSCH (16 QAM, H-Set 1, 2, 3)

Single link Performance 16 QAM H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=777 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	198	74.53%→ (25.47%)	58/272 (m=0.681)	N.A.	164s (fading)	RT
		368	52.66%→ (47.34%)	74/179 m=0.746	N.A.	164s(fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	34	95.626%→ (4.374%)	64/1770 (m=1/1.5)	N.A.	164s (fading)	RT
		219	71.83% → (28,17%)	58/240 (m=0.687)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	47	93.95% → (6.05%)	63/1259 (m=1/1.5)	N.A.	16.4s (fading)	RT
		214	72.47% → (27.53%)	59/255 (m=0.686)	N.A.	16.4s (fading)	RT
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA120	28	96.4% → (3.6%)	64/2150 (m=1/1.5)	2150 (≥64)	12.9s H-set1 8.6s H-set2 4.3s Hset3 (stat)	RT
		167	78.51% → (21.49%)	57/319 (m=0.673)	N.A.	4.1s (fading)	RT

Table F.6.3.5.2.2A: Single link Performance for test case 9.2.1D and 9.2.1E demodulation of HS-DSCH (enhanced requirement type 1, 16 QAM, H-Set 1, 2, 3)

Single link enhanced requirement type 1 Performance 16 QAM H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=777 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	312	59.86% → (40.14%)	66/193 (m = 0.722)	N.A.	164s (fading)	RT
		487	37.35% → (62.65)	76/176 (M = 1.327)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	275	64.62% → (35.38%)	63/209 (m = 0.707)	N.A.	164s (fading)	RT
		408	47.51% → (52.49)	94/174 (M = 1.260)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	296	61.92% → (38.08%)	65/199 (m = 0.715)	N.A.	16.4s (fading)	RT
		430	44.68% → (55.32%)	88/173 (M = 1.278)	N.A.	16.4s (fading)	BL
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA120	271	65.14% → (34.86%)	62/211 (m = 0.705)	N.A.	4.1s (fading)	RT
		392	49.57% → (50.43%)	97/175	N.A.	4.1s (fading)	BL

Table F.6.3.5.2.3: Single link performance for test case 9.2.1B demodulation of HS-DSCH (QPSK H-Set 4)

Single link Performance QPSK H-Set 4 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}=0$ dB)	PA3	72	86.5% → (13.5%)	59/528 (m=1/1.5)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}=0$ dB)	PB3	24	95.5% → (4.5%)	63/1695 (m=1/1.5)	N.A.	164s (fading)	RT
		142	73.4% → (26.6%)	59/264 (m=0.684)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}=0$ dB)	VA30	19	96.44% → (3.56%)	64/2176 (m=1/1.5)	N.A.	16.4s (fading)	RT
		148	72.27% → (27.73%)	59/253 (m=0.686)	N.A.	16.4s (fading)	RT
4 ($\hat{I}_{or}/I_{oc}=0$ dB)	VA120	11	98% → (2%)	65/3746 (m=1/1.5)	3746 (≥65)	22.5s (stat)	RT
		144	73% → (27%)	58/256 (m=0.684)	N.A.	4.1s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}=10$ dB)	PA3	340	36.29%	75/177 (M=1.334)	N.A.	164s (fading)	BL
		439	17.74%	58/266 (M=1.468)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}=10$ dB)	PB3	186	65.15% → (34.85%)	62/209 (m=0.705)	N.A.	164s (fading)	RT
		299	44% → (56%)	87/174 (m=0.778)	N.A.	164s(fading)	RT
3 ($\hat{I}_{or}/I_{oc}=10$ dB)	VA30	183	65.7% →(34.3%)	63/216 (m=0.704)	N.A.	16.4s (fading)	RT
		306	42.66%	86/176 (M=1.291)	N.A.	16.4s (fading)	BL
4 ($\hat{I}_{or}/I_{oc}=10$ dB)	VA120	170	68,14% → (31.86%)	61/226 (m=697)	N.A.	4.1s (fading)	RT
		284	46.78%→ (53.22%)	81/172 (m = 0.767)	N.A.	4.1s (fading)	RT

Table F.6.3.5.2.4: Single link performance for test case 9.2.1B demodulation of HS-DSCH (QPSK H-Set 5)

Single link Performance QPSK H-Set 5 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=801 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}=0$ dB)	PA3	98	87.76% → (12.24%)	59/583 (m=1/1.5)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}=0$ dB)	PB3	35	95.63% → (4.37%)	63/1746 (m=1/1.5)	N.A.	164s (fading)	RT
		207	74.14% → (25.86%)	58/268 (m=0.682)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}=0$ dB)	VA30	33	95.88% → (4.12%)	64/1879 (m=1/1.5)	N.A.	16.4s (fading)	RT
		213	73.4% → (26.6%)	59/264% (m=0.684)	N.A.	16.2s (fading)	RT
4 ($\hat{I}_{or}/I_{oc}=0$ dB)	VA12 0	20	97.5% → (2.5%)	64/3101 (m=1/1.5)	3101 (≥64)	12.4s (stat)	RT
		210	73.77% → (26.23%)	59/268 (m=0.683)	N.A.	4.1s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}=10$ dB)	PA3	464	42%	84/174 (M=1.295)	N.A.	164s (fading)	BL
		635	20.67%	59/234 (M=1.446)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}=10$ dB)	PB3	272	66.02% → (33.98%)	63/218 (m=0.703)	N.A.	164s (fading)	RT
		431	46.16% → (53.84)	84/176 (m=0.77)	N.A.	164s(fading)	RT
3 ($\hat{I}_{or}/I_{oc}=10$ dB)	VA30	285	64.4% → (35.6%)	64/211 (m=0.708)	N.A.	16.4s (fading)	RT
		443	44.7% → (55.3%)	85/173 (m=0.775)	N.A.	16.4s(fading)	RT
4 ($\hat{I}_{or}/I_{oc}=10$ dB)	VA12 0	272	66.02% → (33.98%)	63/218 (m=0.703)	N.A.	4.1s (fading)	RT
		413	48.4% → (51.6%)	81/176 (m=0.761)	N.A.	4.1s(fading)	RT

Table F.6.3.5.2.5: Single link Performance for test case 9.2.1C demodulation of HS-DSCH (QPSK H-Set 6)

Single link Performance QPSK H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=3219 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}=10$ dB)	PA3	1407	56.29% → (43.71%)	70/185	N.A.	164s (fading)	RT
		2090	35.07% → (64.93%)	73/179	N.A.	164s (fading)	BL

Table F.6.3.5.2.5A: Single link Performance for test case 9.2.1E demodulation of HS-DSCH (enhanced requirement type 1, QPSK H-Set 6)

Single link enhanced requirement type 1 Performance QPSK H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=3219 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	672	79.12% → (20.88%)	57/328 (m = 0.672)	N.A.	164s (fading)	RT
		1305	59.46% → (40.54%)	67/193 (m = 0.723)	N.A.	164s (fading)	RT

Table F.6.3.5.2.5B: Single link Performance for test case 9.2.1F, 9.2.1FA to9.2.1FD demodulation of HS-DSCH (enhanced requirement type 2, QPSK H-Set 6/6A/6B/6C)

Single link enhanced requirement type 2 Performance QPSK H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=3219 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	1494	53.59% → (46.41%)	72/179 (m = 0.743)	N.A.	164s (fading)	RT
		2153	33.12% → (66.88%)	71/182 (M = 1.356)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	1038	67.75% → (32.25%)	61/224 (m = 0.698)	N.A.	164s (fading)	RT
		1744	45.82% → (54.18%)	90/172 (M = 1.271)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	1142	64.52% → (35.48%)	63/209 (m = 0.707)	N.A.	16.4s(fading)	RT
		1782	44.64% → (55.36%)	88/172 (M = 1.278)	N.A.	16.4s(fading)	BL
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA12 0	909	71.76% → (28.24%)	59/248 (m = 0.687)	N.A.	4.1s(fading)	RT
		1467	54.43% → (45.57%)	72/181 (m = 0.740)	N.A.	4.1s(fading)	RT

Table F.6.3.5.2.5C: Single link Performance for test case 9.2.1G, 9.2.1GA, 9.2.1GB, 9.2.1GC, 9.2.1GD demodulation of HS-DSCH (enhanced requirement type 3, QPSK H-Set 6/6A)

Single link enhanced requirement type 3 Performance QPSK H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=3219 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	1554	51.72% → (48.28%)	75/178 (m = 0.749)	N.A.	164s (fading)	RT
		2495	22.49% → (77.51%)	61/226 (M = 1.433)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	1190	63.03% → (36.94%)	64/205 (m = 0.712)	N.A.	164s (fading)	RT
		2098	34.82% → (65.18%)	73/180 (M = 1.344)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	1299	59.65% → (40.35%)	66/192 (m = 0.722)	N.A.	16.4s(fading)	RT
		2013	37.46% → (62.54%)	77/176 (M = 1.326)	N.A.	16.4s(fading)	BL
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA120	1060	67.07% → (39.93%)	61/221 (m = 0.700)	N.A.	4.1s(fading)	RT
		1674	48.00% → (52.00%)	96/174 (M = 1.252)	N.A.	4.1s(fading)	BL
5 ($\hat{I}_{or}/I_{oc}$ = 5 dB)	PB3	1248	61.23% → (38.77%)	66/198 (m = 0.717)	N.A.	164s (fading)	RT
		2044	36.50% → (63.50%)	75/176 (M = 1.332)	N.A.	164s (fading)	BL

Table F.6.3.5.2.6: Single link Performance for test case 9.2.1C demodulation of HS-DSCH (16 QAM H-Set 6)

Single link Performance 16 QAM H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4689 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	887	81.08% → (18.92%)	56/362 (m = 0.669)	N.A.	164s (fading)	RT
		1664	64.51% → (35.49%)	63/209 (m = 0.707)	N.A.	164s (fading)	RT

Table F.6.3.5.2.6A: Single link Performance for test case 9.2.1E demodulation of HS-DSCH (enhanced requirement type 1, 16 QAM H-Set 6)

Single link enhanced requirement type 1 Performance 16 QAM H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4689 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	912	80.55% → (19.45%)	56/352 (m = 0.670)	N.A.	164s (fading)	RT
		1730	63.10% → (36.90%)	64/203 (m = 0.712)	N.A.	164s (fading)	RT

Table F.6.3.5.2.6B: Single link Performance for test case 9.2.1F, 9.2.1FA to9.2.1FD demodulation of HS-DSCH (enhanced requirement type 2, 16 QAM H-Set 6/6A/6B/6C)

Single link enhanced requirement type 2 Performance / 16 QAM H-Set 6 / Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4689 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	991	78.86% → (21.14%)	57/324 (m = 0.673)	N.A.	164s (fading)	RT
		1808	61.44% → (38.56%)	65/197 (m = 0.717)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	465	90.08% → (9.92%)	60/740 (m = 1/1.5)	N.A.	164s (fading)	RT
		1370	70.78% → (29.22%)	59/242 (m = 0.690)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	587	87.48% → (12.52%)	59/573 (m = 1/1.5)	N.A.	16.4s(fading)	RT
		1488	68.26% → (31.74%)	60/226 (m = 0.697)	N.A.	16.4s(fading)	RT
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA120	386	91.77% → (8.23%)	61/905 (m = 1/1.5)	N.A.	4.1s(fading)	RT
		1291	72.46% → (27.54%)	58/254	N.A.	4.1s(fading)	RT

Table F.6.3.5.2.6C: Single link Performance for test case 9.2.1G, 9.2.1GA, 9.2.1GB, 9.2.1GC, 9.2.1GD demodulation of HS-DSCH (enhanced requirement type 3, 16 QAM H-Set 6/6A)

Single link enhanced requirement type 3 Performance / 16 QAM H-Set 6 / Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4689 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	1979	57.79% → (42.21%)	69/190 (m = 0.728)	N.A.	164s (fading)	RT
		3032	35.34% → (64.66%)	73/178 (M = 1.340)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	1619	65.47% → (34.53%)	62/211 (m = 0.704)	N.A.	164s (fading)	RT
		2464	47.45% → (52.55%)	92/171 (M = 1.260)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	1710	63.53% → (36.47%)	63/204 (m = 0.710)	N.A.	16.4s(fading)	RT
		2490	46.90% → (53.10%)	91/171 (M = 1.264)	N.A.	16.4s(fading)	BL
4 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA120	1437	69.35% → (30.65%)	59/231 (m = 0.694)	N.A.	4.1s(fading)	RT
		2148	54.19% → (45.81%)	72/182 (m = 0.740)	N.A.	4.1s(fading)	RT
5 ($\hat{I}_{or}/I_{oc}$ = 5 dB)	PB3	779	83.39% → (16.61%)	57/414 (m = 0.667)	N.A.	164s (fading)	RT
		1688	64.00% → (36.00%)	63/207 (m = 0.709)	N.A.	164s (fading)	RT

Table F.6.3.5.2.7: Single link Performance for test case 9.2.1H, 9.2.1HA to- 9.2.1HD demodulation of HS-DSCH (enhanced requirement type 2, 64QAM H-Set 8/8A/8B/8C)

Single link enhanced requirement type 2 Performance 64 QAM H-Set 8 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=13245 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 15 and 18 dB)	PA3	4507	65.97% → (34.03%)	57/324 (m = 0.703)	N.A.	164s (fading)	RT
		5736	56.69% → (43.31%)	70/188 (m = 0.732)	N.A.	164s (fading)	RT

Table F.6.3.5.2.7A: Single link Performance for test case 9.2.1I, 9.2.1IA to 9.2.1ID demodulation of HS-DSCH (enhanced requirement type 3, 64QAM H-Set 8/8A/8B/8C)

Single link enhanced requirement type 3 Performance 64 QAM H-Set 8 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=13245 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 15 and 18 dB)	PA3	6412	51.59% → (48.41%)	78/184 (m = 0.750)	N.A.	164s (fading)	RT
		7638	42.33% → (57.67%)	85/175 (M= 1.293)	N.A.	164s (fading)	BL

Table F.6.3.5.2.7B: Single link Performance for test case 9.2.1J, 9.2.1JA to 9.2.1JD -Enhanced requirement type 2, QPSK / 16QAM, FRC H-Set 10/10A/10B/10C)

Single link enhanced requirement Type2 QPSK/16QAM H-Set 10 Test	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4860(QPSK) ideal=8774 (16QAM) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
QPSK,($\hat{I}_{or}/I_{oc}$ = 4.6 dB)	VA3	1397	71.255%→ (28.745%)	63/259 (m=0.698)	N.A.	164s (fading)	RT
16 QAM, ($\hat{I}_{or}/I_{oc}$ = 8.6 dB)	VA3	1726	80.33%→ (19.67%)	56/343 (m=0.67)	N.A.	164s (fading)	RT

Table F.6.3.5.2.7C: Single link Performance for test case 9.2.1K, 9.2.1KA to 9.2.1KD Enhanced requirement type 3, QPSK / 16 QAM FRC H-Set 10/10A/10B/10C)

Single link enhanced Type 3 QPSK/16QAM H-Set 10 Test	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4860 (QPSK) ideal=8774 (16QAM) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
QPSK ($\hat{I}_{or}/I_{oc}$ = 4.6 dB)	VA3	2621	46.07% → (53.93%)	90/172 (M=1.269)	N.A.	164s (fading)	BL
16QAM ($\hat{I}_{or}/I_{oc}$ = 8.6 dB)	VA3	3396	61.29% → (38.71%)	65/196 (m=0.717)	N.A.	164s (fading)	RT

Table F.6.3.5.2.7D: Single link Performance for test case 9.2.1L, 9.2.1LA to 9.2.1LD Enhanced requirement type 3i, QPSK, FRC H-Set 6/6A/6B/6C)

Single link enhanced Type 3i QPSK H-Set 6/6A Test	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=3219 No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
QPSK ($\hat{I}_{or}/I_{oc}$ = 0dB DIP1=-2.75 dB DIP2=-7.64 dB	PB3	691	78.534% → (21.466%)	57/319 (m=0.673)	N.A.	164s (fading)	RT
		1359	57.782% → (42.218%)	69/189 (m=0.728)	N.A.	164s (fading)	RT
	VA30	661	79.466% → (20.534%)	57/334 (m=0.672)	N.A.	16.4s (fading)	RT
		1327	58.776% → (41.224%)	68/191 (m=0.725)	N.A.	16.4s (fading)	RT

Table F.6.3.5.3.1: Open Loop Diversity Performance for test case 9.2.2A and 9.2.2D demodulation of HS-DSCH (QPSK, H-Set 1, 2, 3)

Open Loop Diversity Performance QPSK H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	77	85.57%→(14.43%)	58/486 (m=1/1.5)	N.A.	164s (fading)	RT
		180	66.27%→(33.73%)	62/216 (m=0.702)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	20	96.25%→ (3.75%)	64/2065 (m=1/1.5)	N.A.	164s (fading)	RT
		154	71.14%→ (28,86%)	59/243 (m=0.689)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	15	97.19% → (2.81%)	64/2758 (m=1/1.5)	H-Set 1: 2758 (≥64)	H-Set 2,3: 16.4s (fading) H-Set 1: 16.6s(stat.)	RT
		162	69.64%→ (30.36%)	60/235 (m=0.693)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	375	29.7%	68/192 (M=1.38)	N.A.	164s (fading)	BL
		475	11%	58/425 (M=1.499)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	183	65.7% → (34.3%)	63/216 (m=0.704)	N.A.	164s (fading)	RT
		274	48.7% →(51.3%)	80/177 (m=0.76)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	187	65% → (35%)	62/208 (m=0.706)	N.A.	16.4s (fading)	RT
		284	46.8% →(53.2%)	82/174 (m=0.767)	N.A.	16.4s (fading)	RT

Table F.6.3.5.3.2: Open Loop Diversity Performance for test case 9.2.2A and 9.2.2D demodulation of HS-DSCH (16 QAM, H-Set 1, 2, 3)

Open Loop Diversity Performance 16 QAM H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=777 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	295	62% →(38%)	66/203 (m=0.715)	N.A.	164s (fading)	RT
		463	40.4%	82/176 (M=1.306)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	24	96.9% →(3.1%)	64/2500 (m=1/1.5)	N.A.	164s (fading)	RT
		243	68.7% →(31.3%)	60/227 (m=0.695)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	35	95.5% →(4.5%)	63/1695 (m=1/1.5)	N.A.	16.4s (fading)	RT
		251	67.7% →(32.3%)	61/223 (m=0.698)	N.A.	16.4s (fading)	RT

Table F.6.3.5.3.3: Open Loop Diversity Performance for test case 9.2.2B demodulation of HS-DSCH (QPSK, H-Set 4)

Open Loop Diversity Performance QPSK H-Set 4 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	70	86.9% →(13.1%)	59/544 (m=1/1.5)	N.A.	164s (fading)	RT
		171	68% →(32%)	61/225 (m=0.697)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	14	97.4% →(2.6%)	64/2982 (m=1/1.5)	N.A.	164s (fading)	RT
		150	71.9% →(28.1%)	59/250 (m=0.687)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	11	97.04% →(2.06%)	65/3819 (m=1/1.5)	3819 (≥65)	23s (stat)	RT
		156	70.8% →(29.2%)	60/243 (m=0.69)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	369	30.9%	69/188 (M=1.372)	N.A.	164s (fading)	BL
		471	11.7%	58/400 (M=1.497)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	180	66.3% →(33.7%)	63/220 (m=0.702)	N.A.	164s (fading)	RT
		276	48.3% →(51.7%)	79/173 (m=0.762)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	184	65.5% →(34.5%)	62/211 (m=0.704)	N.A.	16.4s (fading)	RT
		285	46.6% →(53.4%)	81/171 (m=0.768)	N.A.	16.4s (fading)	RT

Table F.6.3.5.3.4: Open Loop Diversity Performance for test case 9.2.2B demodulation of HS-DSCH (QPSK, H-Set 5)

Open Loop Diversity Performance QPSK H-Set 5 Test number	Absolute Test requirement (kbps)		Relative test requirement, normalized to ideal=801 kbps No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	116	85.5% → (14.5%)	59/492 (m=0.667)	N.A.	164s (fading)	RT
		270	66.27% → (33.73%)	62/216 (m=0.702)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	30	96.25% → (3.75%)	65/2100 (m=1/1.5)	N.A.	164s (fading)	RT
		231	71.14% → (28.86%)	58/243 (m=0.689)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	23	97.13% → (2.87%)	64/2741 (m=1/1.5)	N.A.	16.4s (fading)	RT
		243	69.64% → (30.36%)	60/234 (m=0.693)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	563	29.67%	68/194 (M=1.381)	N.A.	164s (fading)	BL
		713	10.93%	58/428 (M=1.499)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	275	65.65% → (34.35%)	64/212 (m=0.704)	N.A.	164s (fading)	RT
		411	48.66% → (51.34%)	77/170 (m=0.76)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	281	64.9% → (35.1%)	63/211 (m=0.706)	N.A.	16.4s (fading)	RT
		426	46.78% → (53.22%)	81/172 (m=0.767)	N.A.	16.4s (fading)	RT

Table F.6.3.5.3.5: Open Loop Diversity Performance for test case 9.2.2C demodulation of HS-DSCH (QPSK, H-Set 1, 2, 3) and test case 9.2.2E

Open Loop Diversity Performance QPSK H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	197	63.09% → (36.91%)	64/203 (m = 0.712)	N.A.	164s (fading)	RT
		330	38.16% → (61.84%)	80/181 (M = 1.321)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	152	71.52% → (28.48%)	59/247 (m = 0.688)	N.A.	164s (fading)	RT
		251	52.97% → (47.03%)	73/179 (m = 0.745	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	164	69.27% → (30.73%)	60/232 (m = 0.694)	N.A.	16.4s (fading)	RT
		261	51.09% → (48.91%)	75/176 (m = 0.751)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	268	49.78% → (50.22%)	101/181 (M = 1.246)	N.A.	164s (fading)	BL
		407	23.74% → (76.26%)	62/217 (M = 1.424)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	183	65.71% → (34.29%)	62/213 (m = 0.704)	N.A.	164s (fading)	RT
		288	46.03% → (53.97%)	93/178 (M = 1.269)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	197	63.09% → (36.91%)	64/203 (m = 0.712)	N.A.	16.4s (fading)	RT
		307	42.47% → (57.53%)	87/178 (M = 1.292)	N.A.	16.4s (fading)	BL

Table F.6.3.5.3.6: Open Loop Diversity Performance for test case 9.2.2C demodulation of HS-DSCH (16QAM, H-Set 1, 2, 3) and test case 9.2.2E

Open Loop Diversity Performance 16 QAM H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=777 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	340	56.26% → (43.74%)	70/184 (m = 0.733)	N.A.	16.4s (fading)	RT
		513	34.01% → (65.99%)	72/180 (M = 1.350)	N.A.	16.4s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	251	67.71% → (32.29%)	60/222 (m = 0.698)	N.A.	16.4s (fading)	RT
		374	51.89% → (48.11%)	74/177 (m = 0.749)	N.A.	16.4s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	280	63.98% → (36.02%)	63/206 (m = 0.709)	N.A.	16.4s (fading)	RT
		398	48.80% → (51.20%)	96/174 (M = 1.252)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.1: Closed Loop Diversity Performance for test case 9.2.3A and 9.2.3D demodulation of HS-DSCH (QPSK, H-Set 1, 2, 3)

Closed Loop Diversity Performance QPSK H-Set 1/2/3 Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	118	77.89% → (22.11%)	58/315 (m=0.674)	N.A.	164s (fading)	RT
		225	57.84% → (42.16%)	69/189(m=0.728)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	50	90.63% → (9.37%)	61/787 (m=1/1.5)	N.A.	164s (fading)	RT
		173	67.58% → (32.42%)	61/222 (m=0.698)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	47	91.2% → (8.8%)	62/852 (m=1/1.5)	N.A.	16.4s (fading)	RT
		172	67.77% → (32.23%)	61/223 (m=0.698)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	399	25.23%	63/207 (M=1.413)	N.A.	164s (fading)	BL
		458	14.18%	57/325 (M=1.487)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	199	62.71% → (37.29%)	65/204 (m=0.713)	N.A.	164s (fading)	RT
		301	43.6%	88/180 (M=1.285)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	204	61.77% → (38.23%)	65/198 (m=0.716)	N.A.	16.4s (fading)	RT
		305	42.85%	85/173 (M=1.29)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.1A: Closed Loop Diversity Performance for test case 9.2.3C demodulation of HS-DSCH (QPSK, H-Set 1, 2, 3), type 1 and test case 9.2.3E

Closed Loop Diversity Performance / QPSK H-Set 1/2/3 / Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	242	54.7% →(45.3%)	71/180 (m=0.739)	N.A.	164s (fading)	RT
		369	30.9%	86/239(M=1.327)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	170	68.2% →(31.8%)	53/199 (m=0.679)	N.A.	164s (fading)	RT
		272	49.1% →(50.9%)	78/174 (m=0.759)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	172	67.8% →(32.2%)	62/227 (m=0.698)	N.A.	16.4s (fading)	RT
		270	49.4% →(50.6%)	78/175 (m=0.758)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	297	44.4.%	88/173 (M=1.28)	N.A.	164s (fading)	BL
		410	23.2%	60/213 (M=1.434)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	194	63.7% →(36.3%)	63/203 (m=0.71)	N.A.	164s (fading)	RT
		308	42.3%	84/173 (M=1.293)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	204	61.77% →(38.23%)	65/198 (m=0.716)	N.A.	16.4s (fading)	RT
		315	41.0%	80/169 (M=1.302)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.2: Closed Loop Diversity Performance for test case 9.2.3A and 9.2.3D demodulation of HS-DSCH (16 QAM, H-Set 1, 2, 3)

Closed Loop Diversity Performance / 16 QAM H-Set 1/2/3 / Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=777 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	361	53.56% →(46.44%)	73/180 (m=0.743)	N.A.	164s (fading)	RT
		500	35.68%	74/177 (M=1.338)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	74	90.48% →(9.52%)	62/788 (m=1/1.5	N.A.	164s (fading)	RT
		255	67.2% →(32.8%)	61/219 (m=0.7)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	84	89.2% →(10.8%)	61/683 (m=1/1.5)	N.A.	16.4s (fading)	RT
		254	67.32% →(32.68%)	61/220 (m=0.699)	N.A.	16.4s (fading)	RT

Table F.6.3.5.4.2A: Closed Loop Diversity Performance for test case 9.2.3C demodulation of HS-DSCH (16 QAM, H-Set 1, 2, 3), type 1 and test case 9.2.3E

Closed Loop Diversity Performance / 16 QAM H-Set 1/2/3 / Test number	H-SET 1 Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=777 kbps for H-SET 1) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples for H-SET 1, 2, 3 (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}=10$ dB)	PA3	376	51.6% → (48.4%)	75/177 (m=0.75)	N.A.	164s (fading)	RT
		532	31.5%	72/193 (M=1.368)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}=10$ dB)	PB3	267	65.6% → (34.4%)	62/212 (m=0.704	N.A.	164s (fading)	RT
		393	49.4% → (50.6%)	78/175 (m=0.758)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}=10$ dB)	VA30	279	64.1% → (35.9%)	63/206 (m=0.708)	N.A.	16.4s (fading)	RT
		404	48% → (52%)	79/172 (m=0.763)	N.A.	16.4s (fading)	RT

Table F.6.3.5.4.3: Closed Loop Diversity Performance for test case 9.2.3B demodulation of HS-DSCH (QPSK, H-Set 4)

Closed Loop Diversity Performance / QPSK H-Set 4 / Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=534 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}=0$ dB)	PA3	114	78.64% → (21.36%)	58/327 (m=0.673)	N.A.	164s (fading)	RT
		223	58.21% → (41.79%)	69/191 (m=0.727)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}=0$ dB)	PB3	43	91.94% → (8.06%)	62/930 (m=1/1.5)	N.A.	164s (fading)	RT
		167	68.71% → (31.29%)	60/227 (m=0.695)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}=0$ dB)	VA30	40	92.5% → (7.5%)	63/1017 (m=1/1.5)	N.A.	16.4s (fading)	RT
		170	68.14% → (31.86%)	61/226 (m=0.697)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}=10$ dB)	PA3	398	25.42%	63/206 (M=1.412)	N.A.	164s (fading)	BL
		457	14.37%	57/321 (M=1.486)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}=10$ dB)	PB3	196	63.27 → (36.73%)	64/204 (m=0.711)	N.A.	164s (fading)	RT
		292	45.28% → (54.72%)	85/175 (m=0.773)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}=10$ dB)	VA30	199	62.71% → (37.29%)	65/204 (m=0.713)	N.A.	16.4s (fading)	RT
		305	42.85%	85/173 (M=1.29)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.4: Closed Loop Diversity Performance for test case 9.2.3B demodulation of HS-DSCH (QPSK, H-Set 5)

Closed Loop Diversity Performance QPSK H-Set 5 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=801 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PA3	177	77.89% → (22.11%)	58/315 (m=0.674)	N.A.	164s (fading)	RT
		338	57.78% → (42.22%)	68/186 (m=0.728)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	PB3	75	90.63% → (9.37%)	61/787 (m=1/1.5)	N.A.	164s (fading)	RT
		260	67.52% → (32.48%)	62/225 (m=0.699)	N.A.	164s (fading)	RT
3 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	71	91.13% → (8.87%)	62/846 (m=1/1.5)	N.A.	16.4s (fading)	RT
		258	67.77% → (32.23%)	61/223 (m=0.698)	N.A.	16.4s (fading)	RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	599	25.17%	64/211 (M=1.413)	N.A.	164s (fading)	BL
		687	14.18%	57/325 (M=1.487)	N.A.	164s (fading)	BL
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	299	62.65% → (37.35%)	64/200 (m=0.713)	N.A.	164s (fading)	RT
		452	43.54%	87/174 (M=1.285)	N.A.	164s (fading)	BL
3 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA30	306	61.77% → (38.23%)	65/198 (m=0.716)	N.A.	16.4s (fading)	RT
		458	42.79%	86/175 (M=1.29)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.5: Closed Loop Diversity Performance for test case 9.2.3D demodulation of HS-DSCH (QPSK, H-Set 6)

Closed Loop Diversity Performance QPSK H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=3219 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	1536	52.28% → (47.72%)	74/178 (m = 0.747)	N.A.	164s (fading)	RT

Table F.6.3.5.4.6: Closed Loop Diversity Performance for test case 9.2.3D demodulation of HS-DSCH (16QAM, H-Set 6)

Closed Loop Diversity Performance 16QAM H-Set 6 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=4689 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PB3	1154	75.39% → (24.61%)	57/280 (m = 0.679)	N.A.	164s (fading)	RT

Table F.6.3.5.4.7: HS-SCCH-less demodulation of HS-DSCH for test case 9.5.1 (QPSK, H-Set 7))

HS-SCCH-less demodulation of HS-DSCH QPSK H-Set 7 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=TBD kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	Case 8	19.9	47.35% → (52.65%)	91/170 (M = 1.26)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.8: HS-SCCH-less demodulation of HS-DSCH for test case 9.5.1A (Enhanced requirement type 1, QPSK, H-Set 7))

HS-SCCH-less demodulation of HS-DSCH QPSK H-Set 7 Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=TBD kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 0 dB)	Case 8	23.5	37.83% → (62.17%)	76/173 (M = 1.32)	N.A.	16.4s (fading)	BL

Table F.6.3.5.4.9: HS-DSCH and HS-SCCH reception in CELL-FACH state

9.6.1 Single link HS-DSCH demodulation performance in CELL-FACK QPSK H-Set 3	Absolute Test requirement SDU ER		No of events/No of samples in % Error Ratio(ER) → (Success Ratio(SR))	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	ER / SR
($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	0.82	82% → (18%)	57/382 (m = 0.668)	382 (>=57)	30.5s	SR
9.6.2 (HS-DCCH) ($\hat{I}_{or}/I_{oc}$ = 0 dB)	VA30	0.01	1% → (99%)	65/5247 (M = 1.5)	5247 (<=65)	420s	ER

Table F.6.3.5.4.10: MIMO Performance for test case 9.2.4A, 9.2.4C, 9.2.4CA, 9.2.4E, 9.2.4G (FRC , H-Set 9/9A)

MIMO Performance H-Set 9/9A Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=13510 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	PA3	5563	55.8% → (41.2%)	68/192* (m = 0.725)	N.A.	164s (fading)	RT
2 ($\hat{I}_{or}/I_{oc}$ = 10 dB)	VA3	4347	67.8% → (32.2%)	61/225* (m = 0.679)	N.A.	164s (fading)	RT
*)nominator and denominator by its own are irrelevant, only the ratio is relevant.							
MIMO Performance H-Set 9/9A Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=8650 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
3 ($\hat{I}_{or}/I_{oc}$ = 6 dB)	PA3	3933	54.5% → (45.5%)	71/180 (m = 0.739)	N.A.	164s (fading)	RT
4 ($\hat{I}_{or}/I_{oc}$ = 6 dB)	VA3	3011	65.2% → (34.8%)	62/210 (m = 0.705)	N.A.	164s (fading)	RT

Table F.6.3.5.2.11: MIMO Performance for test case 9.2.4B, 9.2.4D, 9.2.4DA, 9.2.4F, 9.2.4H (FRC H-Set 11/11A)

Single link Performance HSET-11/11A 64 QAM Test number	Absolute Test requirement (kbps)		Relative test requirement (normalized to ideal=22074 kbps) No of events/No of samples in % BL → (RT)	Test limit expressed as No of events/min No of samples (Bad DUT factor)	Min No of samples (number of events to pass) Mandatory if applicable	Test time in s Mandatory if fading Informative and approx. if statistical	BL / RT
1 ($\hat{I}_{or}/I_{oc}$ = 18 dB)	PA3	9980	54.79% → (45.21%)	71/180 (m = 0.739)	N.A.	164s (fading)	RT

F.6.4 Statistical testing of performance requirement (E-DCH and MBMS)

F.6.4.1 Test Method

Each test is performed in the following manner:

a) Setup the required test conditions.

b) Measure the E-HICH, the E-RGCH and the E-AGCH repeated times. The results, measured, are summarized to:

   a bad result, if the measured E-HICH returns a missed ACK or a false ACK or
   if the E_RGCH test returns a missed HOLD or a missed UP/DOWN or a missed DOWN or
   if the E-AGCH test returns a missed detection in the relevant test.

   a good result, otherwise.

c) Record the number of valid results (ns), tested, and the number of bad results (ne)

d) Stop the test at an early pass or an early fail event.

e) Once the test is stopped, decide according to the pass fail decision rules

F.6.4.2 Bad Result Ratio (ER)

The Bad Result Ratio (ER) is defined as the ratio of bad results (ne) to all valid results (ns).

(1-ER is the success ratio)

F.6.4.3 Mapping of E-DCH and MBMS tests to RRM tests (F.6.2) and HSDPA tests (F.6.3)

The test design and the explanations for the RRM tests in F.6.2.4 to F.6.2.7 are valid also for the E-DCH and MBMS test as long as the error ratio for minimum requirements is <= 0.1.

The test design and the explanations for the HSDPA tests in F.6.3.3 to F.6.3.4 are partly valid also for the E-DCH test as long as the error ratio for minimum requirements is > 0.1.

F.6.4.4 Test conditions for E-DCH tests and MBMS

Table F.6.4.4: Test conditions for a E-DCH and MBMS tests

Type of test	Minimum requirement (ER)	Test limit TL (ER)= Minimum requirement (ER)x TL TL	Target number of bad results	Prob that good unit will fail = Prob that bad unit will pass [%]	Bad unit factor M	Minimum Test time [s] Note 1
Detection of E-DCH HARQ ACK Indicator Channel (E-HICH)						
10.2.1.1 Single link performance (10ms TTI)						
Missed ACK probability (VA30, Test 1)	0.01	1.236	154	5	1.5	16.4
False ACK probability (VA30, Test 2)Note 2)	0.5	1.127	NA	5	1.245	16.4
10.2.1.2 Single link performance (2ms TTI)						
Missed ACK probability (VA30, Test 1)	0.01	1.236	154	5	1.5	16.4
False ACK probability (VA30, Test 2)Note 2)	0.5	1.127	NA	5	1.245	16.4
Detection in Inter-Cell Handover conditions						
10.2.2.1.1 RLS not containing the Serving E-DCH cell (10ms TTI).						
Missed ACK probability (VA30, Test1)	0.05	1.236	154	5	1.5	16.4
False ACK probability (VA30,Test 2)	2E-4	1.236	154	5	1.5	NA
10.2.2.1.2 RLS not containing the Serving E-DCH cell (2ms TTI)						
Missed ACK probability (VA30, Test 1)	0.05	1.236	154	5	1.5	16.4
False ACK probability (VA30, Test 2)	2E-4	1.236	154	5	1.5	NA
10.2.2.2.1 RLS containing the Serving E-DCH cell (10ms TTI)						
Missed ACK probability (Test 1, VA30)	0.05	1.236	154	5	1.5	16.4
False ACK probability (Test 2,PA3)	0.1	1.236	154	5	1.5	164s
False ACK probability (Test 3, VA120)	0.1	1.236	154	5	1.5	4.1
10.2.2.2.2 RLS containing the Serving E-DCH cell (2ms TTI)						
Missed ACK probability (Test 1, VA30)	0.05	1.236	154	5	1.5	16.4
False ACK probability (Test 2, PA3)	0.1	1.236	154	5	1.5	164
False ACK probability (Test 3, VA120)	0.1	1.236	154	5	1.5	4.1
Detection of E-DCH Relative Grant Channel (E-RGCH)						
10.3.1.1 Single link performance (10ms TTI)						
Missed UP/DOWN (VA30, Test 1)	0.05	1.236	154	5	1.5	16.4
Missed HOLD (VA30,Test 2)	0.1	1.236	154	5	1.5	16.4
10.3.1.2 Single link performance (2ms TTI)						
Missed UP/DOWN (VA30, Test 1)	0.05	1.236	154	5	1.5	16.4
Missed HOLD (VA30, Test 2)	0.1	1.236	154	5	1.5	16.4
10.3.2 Detection in Inter-Cell Handover conditions						
Missed HOLD probability (Test 1)	0.005	1.236	154	5	1.5	16.4
Missed DOWN probability (Test 2)	0.05	1.236	154	5	1.5	16.4
10.4 Demodulation of E-DCH Absolute Grant Channel (E-AGCH						
Missed detection probability (Test 1)	0.01	1.236	154	5	1.5	16.4
11.2 Demodulation of MTCH	0.1	1.236	154	5	1.5	164
11.2A Demodulation of MTCH - Enhanced Performance Requirements Type 1	0.1	1.236	154	5	1.5	164
11.3 Demodulation of MTCH and cell identification	0.05	1.236	154	5	1.5	164
Note 1) The minimum test time due to propagation conditions is constant and overrides the test time due to statistical reasons. The test time due to statistical reasons is variable and depends on the quality of the DUT. Justification is given in clause F.6.1.6.						
Note 2) No early decision is designed in this test. Sample for 16.4 s. Then decide the ER against the TL. The limit ratio is 102/181=0.563536						