3GPP TSG-RAN Meeting #15
Jeju, Korea, 5 – 8, March, 2002

RP-020115

Title: "Proposed CR 195r2 (R'99), CR 196r2 (Rel-4) and CR 197r2(Rel-5) to TS 25.141 on TBDs on test tolerances"

Source: Ericsson, Nokia, Nortel Networks

Agenda: 7.4.2

No.	Spec	CR	Rev	Subject	Release	Cat	Workitem	V_old	V_new
1	25.141	195	2	TBDs on test tolerances	R99	F	TEI	3.8.0	3.9.0
2	25.141	196	2	TBDs on test tolerances	Rel-4	A	TEI	4.3.0	4.4.0
3	25.141	197	2	TBDs on test tolerances	Rel-5	A	TEI	5.1.0	5.2.0

CR-Form-v6.1

CHANGE REQUEST

| ⌘ | **25.141** CR **195** | ⌘**rev** **2** | ⌘ | Current version: | **3.8.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network **X**   Core Network ☐

Title: ⌘	TBDs on test tolerances	
Source: ⌘	Agilent Technologies, Ericsson, Nokia, Nortel Networks, Rohde & Schwarz	
Work item code: ⌘		***Date:*** ⌘ 2002-02-20

Category: ⌘	**F**	***Release:*** ⌘	R99

Use <u>one</u> of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use <u>one</u> of the following releases:
2   *(GSM Phase 2)*
R96   *(Release 1996)*
R97   *(Release 1997)*
R98   *(Release 1998)*
R99   *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘	There are still TBDs on test tolerances in 25.141 for Clause 8 and the corresponding test requirements are without test tolerances
Summary of change: ⌘	TBDs are replaced by agreed test tolerances and the correct tests requirement are introduced by applying the test tolerance to the minimum requirement (from the core specification) <u>Isolated Impact Analysis:</u> A Base Station fulfilling the existing requirements in Clause 8 will also fulfil the updated requirements.
Consequences if not approved: ⌘	The core specification values have been derived without consideration of test tolerance. If it is not applied, the tests will be incorrect.

Clauses affected: ⌘	4.1.4, 4.2.3, 8.2, 8.3, 8.4, 8.5, Annex F

Other specs affected:	⌘ ☐	Other core specifications	⌘
	☐	Test specifications	
	☐	O&M Specifications	

Other comments: ⌘	

4.1.4 Measurement of performance requirement

Table 4.1B: Maximum Test System Uncertainty for Performance Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
8.2, Demodulation in static propagation condtion	~~TBD~~ ± 0.4dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_b/N_0) (AWGN: ±1dB)
8.3, Demodulation of DCH in multiplath fading conditons	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.4 Demodulation of DCH in moving propagation conditions	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
~~8.6 Verification of the internal BLER calculation~~	~~TBD~~	
8.7 Site Selection Diversity Transmission (SSDT) Mode	TBD	
Note 1: Only the overall stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.		

4.2 Test Tolerances (informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification 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.)

4.2.1 Transmitter

Table 4.1C: Test Tolerances for transmitter tests.

Subclause	Test Tolerance[1]
6.2.1 Maximum Output Power	0.7 dB
6.2.2 CPICH Power accuracy	0.8 dB
6.3.4 Frequency error	12 Hz
6.4.2 Power control steps	0.1 dB
6.4.3 Power dynamic range	0.2 dB
6.4.4 Total power dynamic range	0.3 dB
6.5.1 Occupied Bandwidth	0 kHz
6.5.2.1 Spectrum emission mask	1.5 dB
6.5.2.2 ACLR	0.8 dB
6.5.3 Spurious emissions	0 dB
6.6 Transmit intermodulation (interferer requirements)	0 dB[2]
6.7.1 Frequency error	12 Hz
6.7.12 EVM	0 %
6.7.23 Peak code Domain error	1.0dB
Note 1: Unless otherwise stated, The Test Tolerances are applied to the DUT Minimum Requirement. See Annex F.	
Note 2: The Test Tolerance is applied to the stimulus signal(s). See Annex F.	

4.2.2 Receiver

Table 4.1D: Test Tolerances for receiver tests.

Subclause	Test Tolerance[1]
7.2 Reference sensitivity level	0.7 dB
7.3 Dynamic range	1.2 dB
7.4 Adjacent channel selectivity	0 dB
7.5 Blocking characteristics	0 dB
7.6 Intermod Characteristics	0 dB
7.7 Spurious Emissions	0 dB[2]
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	
Note 2: The Test Tolerance is applied to the DUT Minimum Requirement. See Annex F.	

4.2.3 Performance requirement

Table 4.1E: Test Tolerances for Performance Requirements.

Subclause	Test Tolerance[1]
8.2 Demodulation in static propagation condtion	~~TBD~~0.4dB
8.3 Demodulation of DCH in multiplath fading conditons	~~TBD~~0.6dB
8.4 Demodulation of DCH in moving propagation conditions	~~TBD~~0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	~~TBD~~0.6dB
~~8.6 Verification of the internal BLER calculation~~	~~TBD~~
8.7 Site Selection Diversity Transmission (SSDT) Mode	TBD
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.2.1.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.1.

Table 8.1: Performance requirements in AWGN channel.

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.1 dB
64 kbps	1.5 dB	1.7 dB
144 kbps	0.8 dB	0.9 dB
384 kbps	0.9 dB	1.0 dB

The reference for this requirement is TS 25.104 subclause 8.2.1.1.

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.2.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.2~~8.1~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b/3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.1 is found in table 8.2~~

~~**Table 8.2: Wanted signal levels in AWGN channels.**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-103.9 dBm~~
~~64 kbps~~	~~-100.3 dBm~~	~~-100.1 dBm~~
~~144 kbps~~	~~-97.5 dBm~~	~~-97.4 dBm~~
~~384 kbps~~	~~-93.1 dBm~~	~~-93 dBm~~

4) For each of the data rates in table 8.2~~8.1~~ applicable for the base station, measure the BLER.

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.28.1.

Table 8.2: Test requirements in AWGN channel.

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.5 dB
64 kbps	1.9 dB	2.1 dB
144 kbps	1.2 dB	1.3 dB
384 kbps	1.3 dB	1.4 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.3.1.2 Conformance Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	11.9 dB
64 kbps	6.2 dB	9.2 dB
144 kbps	5.4 dB	8.4 dB
384 kbps	5.8 dB	8.8 dB

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.48.3 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.3 is found in table 8.4

Table 8.4: Wanted signal levels in multipath Case 1 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-97,1 dBm
64 kbps	-95.6 dBm	-92.6 dBm
144 kbps	-92.9 dBm	-89.9 dBm
384 kbps	-88.2 dBm	-85.2 dBm

5) For each of the data rates in table 8.48.3 applicable for the base station, measure the BLER.

8.3.1.5   Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.48.3.

Table 8.4: Test requirements in multipath Case 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	12.5 dB
64 kbps	6.8 dB	9.8 dB
144 kbps	6.0 dB	9.0 dB
384 kbps	6.4 dB	9.4 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.2   Multipath fading Case 2

8.3.2.1   Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.2.2   Conformance Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.5.

Table 8.5: Performance requirements in multipath Case 2 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	9.0 dB
64 kbps	4.3 dB	6.4 dB
144 kbps	3.7 dB	5.6 dB
384 kbps	4.1 dB	6.1 dB

The reference for this requirement is TS 25.104 subclause 8.3.2.1.

8.3.2.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding a specified limit.

8.3.2.4 Method of test

8.3.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.68.5 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.5 is found in table 8.6.

Table 8.6: Wanted signal levels in multipath Case 2 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-100 dBm
64 kbps	-97.5 dBm	-95.4 dBm
144 kbps	-94.6 dBm	-92.7 dBm
384 kbps	-89.9 dBm	-87.9 dBm

5) For each of the data rates in table 8.68.5 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.2.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.68.5.

Table 8.6: Test requirements in multipath Case 2 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	9.6 dB
64 kbps	4.9 dB	7.0 dB
144 kbps	4.3 dB	6.2 dB
384 kbps	4.7 dB	6.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.3   Multipath fading Case 3

8.3.3.1   Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.3.2   ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	7.2 dB	8.0 dB
64 kbps	3.4 dB	3.8 dB	4.1 dB
144 kbps	2.8 dB	3.2 dB	3.6 dB
384 kbps	3.2 dB	3.6 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.3.1.

8.3.3.3   Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4   Method of test

8.3.3.4.1   Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.3.4.2   Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8~~8.7~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.7 is found in table 8.8.~~

Table 8.8: Wanted signal levels in multipath Case 3 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}	Wanted signal level for required BLER < 10^{-3}
12.2 kbps	n.a	-101.8 dBm	-101.0 dBm
64 kbps	-98.4 dBm	-98.0 dBm	-97.7 dBm
144 kbps	-95.5 dBm	-95.1 dBm	-94.7 dBm
384 kbps	-90.8 dBm	-90.4 dBm	-89.8 dBm

~~6~~5) For each of the data rates in table 8.8~~8.7~~ applicable for the base station, measure the BLER

8.3.3.5 Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the BLER limits for E_b/N_0 levels specified in table 8.8~~8.7~~.

Table 8.8: Test requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	7.8 dB	8.6 dB
64 kbps	4.0 dB	4.4 dB	4.7 dB
144 kbps	3.4 dB	3.8 dB	4.2 dB
384 kbps	3.8 dB	4.2 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.4.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.2 dB	11.0 dB
64 kbps	6.4 dB	6.8 dB	7.1 dB
144 kbps	5.8 dB	6.2 dB	6.6 dB
384 kbps	6.2 dB	6.6 dB	7.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B8.8A is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b/3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.8A is found in table 8.8B.

Table 8.8B: Wanted signal levels in multipath Case 4 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}	Wanted signal level for required BLER < 10^{-3}
12.2 kbps	n.a	-98.8 dBm	-98.0 dBm
64 kbps	-95.4 dBm	-95.0 dBm	-94.7 dBm
144 kbps	-92.5 dBm	-92.1 dBm	-91.7 dBm
384 kbps	-87.8 dBm	-87.4 dBm	-86.8 dBm

65) For each of the data rates in table 8.8B8.8A applicable for the base station, measure the BLER

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B8.8A.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.8 dB	11.6 dB
64 kbps	7.0 dB	7.4 dB	7.7 dB
144 kbps	6.4 dB	6.8 dB	7.2 dB
384 kbps	6.8 dB	7.2 dB	7.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.4.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.7 dB
64 kbps	2.1 dB	2.2 dB

The reference for this requirement is TS 25.104 subclause 8.4.1.

8.4.3 Test purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.4 Method of test

8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex D.

8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.10~~8.9~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.9 is found in table 8.10~~

~~**Table 8.10: Wanted signal levels in moving channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-103.3 dBm~~
~~64 kbps~~	~~-99.7 dBm~~	~~-99.6 dBm~~

5) For each of the data rates in table 8.10~~8.9~~ applicable for the base station, measure the BLER.

8.4.5 Test requirements

The BLER measured according to subclause 8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.10~~8.9~~.

Table 8.10: Test requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	6.3 dB
64 kbps	2.7 dB	2.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.5.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	7.7 dB
64 kbps	4.1 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.5.1.

8.5.3 Test purpose

The test shall verify the receiver's ability to receive the test signal to find new multi path components with a BLER not exceeding the specified limit.

8.5.4 Method of test

8.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.5.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.12~~8.11~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.11 is found in table 8.12~~

~~**Table 8.12: Wanted signal levels in birth/death channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-101.3 dBm~~
~~64 kbps~~	~~-97.7 dBm~~	~~-97.6 dBm~~

5) For each of the data rates in table 8.12~~8.11~~ applicable for the base station, measure the BLER.

8.5.5 Test requirements

The BLER measured according to subclause 8.5.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.12~~8.11~~.

Table 8.12: Test requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	8.3 dB
64 kbps	4.7 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

Annex F (informative):
Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 4.2. 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 tables F.1, F.2 and F.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 4.1. In this event, the excess error shall be subtracted from the defined test tolerance in order to generate the correct tightened Test Requirements as defined in subclause 4.3.

For example, a Test System having 0.9 dB accuracy for test 6.2.1 Base Station maximum output power (which is 0.2 dB above the limit specified in subclause 4.) would subtract 0.2 dB from the Test Tolerance of 0.7 dB defined in subclause 4.2. This new test tolerance of 0.5 dB would then be applied to the Minimum Requirement using the formula defined in Table F.1 to give a new range of ±2.5 dB of the manufacturer's rated output power. Using this same approach for the case where a test had a test tolerance of 0 dB, an excess error of 0.2 dB would result in a modified test tolerance of –0.2 dB.

Table F.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
6.2.1 Base station maximum output power	In normal conditions … within +2 dB and -2 dB of the manufacturer's rated output power In extreme conditions… within +2.5 dB and −2.5 dB of the manufacturer's rated output power	0.7 dB	Formula: Upper limit + TT Lower limit − TT In normal conditions … within +2.7 dB and −2.7 dB of the manufacturer's rated output power In extreme conditions… within +3.2 dB and −3.2 dB of the manufacturer's rated output power
6.2.2 CPICH Power accuracy	CPICH power shall be within ±2.1dB	0.8 dB	Formula: Upper limit + TT Lower limit − TT CPICH power shall be within ±2.9dB
6.3.4 Frequency error	Frequency error limit = 0.05 ppm	12 Hz	Formula: Frequency Error limit + TT Frequency Error limit = 0.05 ppm + 12 Hz
6.4.2 Power control steps	Lower and upper limits as specified in tables 6.9 and 6.10a	0.1 dB	Formula: Upper limits + TT Lower limits − TT 0.1 dB applied as above to tables 6.9 and 6.10a
6.4.3 Power dynamic range	maximum power limit = BS maximum output power -3 dB minimum power limit = BS maximum output power −28 dB	0.2 dB	Formula: maximum power limit − TT minimum power limit + TT maximum power limit = BS maximum output power −3.2 dB minimum power limit = BS maximum output power −27.8 dB
6.4.4 Total power dynamic range	total power dynamic range limit = 18 dB	0.3 dB	Formula: total power dynamic range limit − TT total power dynamic range limit = 17.7 dB
6.5.1 Occupied Bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz
6.5.2.1 Spectrum emission mask	Maximum level defined in tables 6.11, 6.12, 6.13 and 6.14:	1.5 dB	Formula: Maximum level + TT Add 1.5 to Maximum level entries in tables 6.11, 6.12, 6.13 and 6.14.
6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)	ACLR limit = 45 dB at 5 MHz ACLR limit = 50 dB at 10 MHz	0.8 dB	Formula: ACLR limit − TT ACLR limit = 44.2 dB at 5 MHz ACLR limit = 49.2 dB at 10 MHz
6.5.3 Spurious emissions	Maximum level defined in tables 6.16 to 6.26	0 dB	Formula: Maximum limit + TT Add 0 to Maximum level in tables 6.16 to 6.26
6.6 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.5.2.1, 6.5.2.2 and 6.5.3.	Wanted signal level − interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level − interferer level = 30 + 0 dB
6.7.1 EVM	EVM limit =17.5 %	0 %	Formula: EVM limit + TT EVM limit = 17.5%
6.7.2 Peak code Domain error	Peak code domain error limit = -33 dB	1.0 dB	Formula: Peak code domain error limit + TT Peak code domain error limit = -32 dB

Table F.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
7.2 Reference sensitivity	Reference sensitivity level = -121 dBm FER/BER limit = 0.001	0.7 dB	Formula: Reference sensitivity level + TT Reference sensitivity level = -120.3 dBm FER/BER limit is not changed
7.3 Dynamic range	Wanted signal level = -91 dBm AWGN level = -73 dBm/3.84 MHz	1.2 dB	Formula: Wanted signal level + TT AWGN level unchanged Wanted signal level = -89.8 dBm
7.4 Adjacent channel selectivity	Wanted signal level = -115 dBm W-CDMA interferer level = -52 dBm	0 dB	Formula: Wanted signal level + TT W-CDMA interferer level unchanged Wanted signal level = -115 dBm
7.5 Blocking characteristics	Wanted signal level = -115 dBm Interferer level See table 7.4a / 7.4b	0 dB	Formula: Wanted signal level + TT Interferer level unchanged Wanted signal level = -115 dBm
7.6 Intermod Characteristics	Wanted signal level = -115 dBm Interferer1 level (10 MHz offset CW) = -48 dBm Interferer2 level (20 MHz offset W-CDMA Modulated) = -48 dBm	0 dB	Formula: Wanted signal level + TT Interferer1 level unchanged Interferer2 level unchanged Wanted signal level = -115 dBm
7.7 Spurious Emissions	Maximum level defined in Table 7.7	0 dB	Formula: Maximum level + TT Add TT to Maximum level in table 7.7

Table F.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
8.2, Demodulation in static propagation condtion	Received E_b/N_0 values	~~TBD~~ 0.4 dB	Minimum requirement + TT
8.3, Demodulation of DCH in multiplath fading conditons	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
8.4 Demodulation of DCH in moving propagation conditions	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
8.5 Demodulation of DCH in birth/death propagation conditions	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
~~8.6 Verification of the internal BLER calculation~~		~~TBD~~	
8.7 Site Selection Diversity Transmission (SSDT) Mode		TBD	

CR-Form-v6.1

CHANGE REQUEST

⌘	**25.141** CR **197**	⌘**rev** **2** ⌘	Current version:	**5.1.0** ⌘

For **HELP** *on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title: ⌘	TBDs on test tolerances	
Source: ⌘	Agilent Technologies, Ericsson, Nokia, Nortel Networks, Rohde & Schwarz	
Work item code: ⌘		*Date:* ⌘ 2002-02-26

Category: ⌘ **A**	*Release:* ⌘ Rel-5

Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:	
F (correction)	2	(GSM Phase 2)
A (corresponds to a correction in an earlier release)	R96	(Release 1996)
B (addition of feature),	R97	(Release 1997)
C (functional modification of feature)	R98	(Release 1998)
D (editorial modification)	R99	(Release 1999)
Detailed explanations of the above categories can	REL-4	(Release 4)
be found in 3GPP TR 21.900.	REL-5	(Release 5)

Reason for change: ⌘	There are still TBDs on test tolerances in 25.141 for Clause 8 and the corresponding test requirements are without test tolerances
Summary of change: ⌘	TBDs are replaced by agreed test tolerances and the correct tests requirement are introduced by applying the test tolerance to the minimum requirement (from the core specification)
Consequences if not approved: ⌘	The core specification values have been derived without consideration of test tolerance. If it is not applied, the tests will be incorrect.

Clauses affected: ⌘	4.1.4, 4.2.3, 8.2, 8.3, 8.4, 8.5, Annex F

Other specs affected: ⌘	☐ Other core specifications ⌘	
	☐ Test specifications	
	☐ O&M Specifications	

Other comments: ⌘	

4.1.4 Measurement of performance requirement

Table 4.1B: Maximum Test System Uncertainty for Performance Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
8.2, Demodulation in static propagation condtion	~~TBD~~ ± 0.4dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_b/N_0) (AWGN: ±1dB)
8.3, Demodulation of DCH in multiplath fading conditons	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.4 Demodulation of DCH in moving propagation conditions	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
~~8.6 Verification of the internal BLER calculation~~	~~TBD~~	
8.7 Site Selection Diversity Transmission (SSDT) Mode	TBD	
Note 1: Only the overall stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.		

4.2 Test Tolerances (informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification 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.)

4.2.1 Transmitter

Table 4.1C: Test Tolerances for transmitter tests.

Subclause	Test Tolerance[1]
6.2.1 Maximum Output Power	0.7 dB
6.2.2 CPICH Power accuracy	0.8 dB
6.3.4 Frequency error	12 Hz
6.4.2 Power control steps	0.1 dB
6.4.3 Power dynamic range	0.2 dB
6.4.4 Total power dynamic range	0.3 dB
6.5.1 Occupied Bandwidth	0 kHz
6.5.2.1 Spectrum emission mask	1.5 dB
6.5.2.2 ACLR	0.8 dB
6.5.3 Spurious emissions	0 dB
6.6 Transmit intermodulation (interferer requirements)	0 dB[2]
6.7.1 Frequency error	12 Hz
6.7.12 EVM	0 %
6.7.23 Peak code Domain error	1.0dB
Note 1: Unless otherwise stated, The Test Tolerances are applied to the DUT Minimum Requirement. See Annex F. Note 2: The Test Tolerance is applied to the stimulus signal(s). See Annex F.	

4.2.2 Receiver

Table 4.1D: Test Tolerances for receiver tests.

Subclause	Test Tolerance[1]
7.2 Reference sensitivity level	0.7 dB
7.3 Dynamic range	1.2 dB
7.4 Adjacent channel selectivity	0 dB
7.5 Blocking characteristics	0 dB
7.6 Intermod Characteristics	0 dB
7.7 Spurious Emissions	0 dB[2]
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	
Note 2: The Test Tolerance is applied to the DUT Minimum Requirement. See Annex F.	

4.2.3 Performance requirement

Table 4.1E: Test Tolerances for Performance Requirements.

Subclause	Test Tolerance[1]
8.2, Demodulation in static propagation condtion	~~TBD~~0.4dB
8.3, Demodulation of DCH in multiplath fading conditons	~~TBD~~0.6dB
8.4 Demodulation of DCH in moving propagation conditions	~~TBD~~0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	~~TBD~~0.6dB
~~8.6 Verification of the internal BLER calculation~~	~~TBD~~
8.7 Site Selection Diversity Transmission (SSDT) Mode	TBD
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.2.1.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.1.

Table 8.1: Performance requirements in AWGN channel.

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.1 dB
64 kbps	1.5 dB	1.7 dB
144 kbps	0.8 dB	0.9 dB
384 kbps	0.9 dB	1.0 dB

The reference for this requirement is TS 25.104 subclause 8.2.1.1.

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.2.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.2~~8.1~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $-84+10*Log10(R_b/3.84*10^6)+E_b/N_0$ [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.1 is found in table 8.2~~

Table 8.2: Wanted signal levels in AWGN channels.

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-103.9 dBm
64 kbps	-100.3 dBm	-100.1 dBm
144 kbps	-97.5 dBm	-97.4 dBm
384 kbps	-93.1 dBm	-93 dBm

4) For each of the data rates in table 8.2 ~~8.1~~ applicable for the base station, measure the BLER.

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.2 ~~8.1~~.

Table 8.2: Test requirements in AWGN channel.

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.5 dB
64 kbps	1.9 dB	2.1 dB
144 kbps	1.2 dB	1.3 dB
384 kbps	1.3 dB	1.4 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.3.1.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	11.9 dB
64 kbps	6.2 dB	9.2 dB
144 kbps	5.4 dB	8.4 dB
384 kbps	5.8 dB	8.8 dB

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.48.3 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.3 is found in table 8.4

Table 8.4: Wanted signal levels in multipath Case 1 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-97,1 dBm
64 kbps	-95.6 dBm	-92.6 dBm
144 kbps	-92.9 dBm	-89.9 dBm
384 kbps	-88.2 dBm	-85.2 dBm

5) For each of the data rates in table 8.48.3 applicable for the base station, measure the BLER.

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.48.3.

Table 8.4: Test requirements in multipath Case 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	12.5 dB
64 kbps	6.8 dB	9.8 dB
144 kbps	6.0 dB	9.0 dB
384 kbps	6.4 dB	9.4 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.2 Multipath fading Case 2

8.3.2.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.2.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.5.

Table 8.5: Performance requirements in multipath Case 2 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	9.0 dB
64 kbps	4.3 dB	6.4 dB
144 kbps	3.7 dB	5.6 dB
384 kbps	4.1 dB	6.1 dB

The reference for this requirement is TS 25.104 subclause 8.3.2.1.

8.3.2.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding a specified limit.

8.3.2.4 Method of test

8.3.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.6~~8.5~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-~~ ~~84+~~$10*Log10(R_b/3.84*10^6)+E_b/N_0$ [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.5 is found in table 8.6.~~

Table 8.6: Wanted signal levels in multipath Case 2 channel

Measurement channel data rate (Rb)	Wanted signal level for required BLER < 10⁻¹	Wanted signal level for required BLER < 10⁻²
12.2 kbps	n.a.	-100 dBm
64 kbps	-97.5 dBm	-95.4 dBm
144 kbps	-94.6 dBm	-92.7 dBm
384 kbps	-89.9 dBm	-87.9 dBm

5) For each of the data rates in table 8.68.5 applicable for the base station, measure the BLER.

8.3.2.5   Test requirements

The BLER measured according to subclause 8.3.2.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.68.5.

Table 8.6: Test requirements in multipath Case 2 channel

Measurement channel data rate (Rb)	E_b/N_0 for required BLER < 10⁻¹	E_b/N_0 for required BLER < 10⁻²
12.2 kbps	n.a.	9.6 dB
64 kbps	4.9 dB	7.0 dB
144 kbps	4.3 dB	6.2 dB
384 kbps	4.7 dB	6.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.3   Multipath fading Case 3

8.3.3.1   Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.3.2   Conformance Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel data rate (Rb)	E_b/N_0 for required BLER < 10⁻¹	E_b/N_0 for required BLER < 10⁻²	E_b/N_0 for required BLER < 10⁻³
12.2 kbps	n.a	7.2 dB	8.0 dB
64 kbps	3.4 dB	3.8 dB	4.1 dB
144 kbps	2.8 dB	3.2 dB	3.6 dB
384 kbps	3.2 dB	3.6 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.3.1.

8.3.3.3   Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4   Method of test

8.3.3.4.1   Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.3.4.2   Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.88.7 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.7 is found in table 8.8.

Table 8.8: Wanted signal levels in multipath Case 3 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}	Wanted signal level for required BLER < 10^{-3}
12.2 kbps	n.a	-101.8 dBm	-101.0 dBm
64 kbps	-98.4 dBm	-98.0 dBm	-97.7 dBm
144 kbps	-95.5 dBm	-95.1 dBm	-94.7 dBm
384 kbps	-90.8 dBm	-90.4 dBm	-89.8 dBm

6) For each of the data rates in table 8.88.7 applicable for the base station, measure the BLER

8.3.3.5   Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the BLER limits for E_b/N_0 levels specified in table 8.88.7.

Table 8.8: Test requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	7.8 dB	8.6 dB
64 kbps	4.0 dB	4.4 dB	4.7 dB
144 kbps	3.4 dB	3.8 dB	4.2 dB
384 kbps	3.8 dB	4.2 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.4.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.2 dB	11.0 dB
64 kbps	6.4 dB	6.8 dB	7.1 dB
144 kbps	5.8 dB	6.2 dB	6.6 dB
384 kbps	6.2 dB	6.6 dB	7.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B~~8.8A~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b/3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.8A is found in table 8.8B.~~

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}	Wanted signal level for required BLER < 10^{-3}
12.2 kbps	n.a	-98.8 dBm	-98.0 dBm
64 kbps	-95.4 dBm	-95.0 dBm	-94.7 dBm
144 kbps	-92.5 dBm	-92.1 dBm	-91.7 dBm
384 kbps	-87.8 dBm	-87.4 dBm	-86.8 dBm

6) For each of the data rates in table 8.8B8.8A applicable for the base station, measure the BLER

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B8.8A.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.8 dB	11.6 dB
64 kbps	7.0 dB	7.4 dB	7.7 dB
144 kbps	6.4 dB	6.8 dB	7.2 dB
384 kbps	6.8 dB	7.2 dB	7.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.4.2 Conformance Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.7 dB
64 kbps	2.1 dB	2.2 dB

The reference for this requirement is TS 25.104 subclause 8.4.1.

8.4.3 Test purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.4 Method of test

8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex D.

8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.10~~8.9~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -~~84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.9 is found in table 8.10~~

Table 8.10: Wanted signal levels in moving channel

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-103.3 dBm~~
~~64 kbps~~	~~-99.7 dBm~~	~~-99.6 dBm~~

5) For each of the data rates in table 8.10~~8.9~~ applicable for the base station, measure the BLER.

8.4.5 Test requirements

The BLER measured according to subclause 8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.10~~8.9~~.

Table 8.10: Test requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	6.3 dB
64 kbps	2.7 dB	2.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.5.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	7.7 dB
64 kbps	4.1 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.5.1.

8.5.3 Test purpose

The test shall verify the receiver's ability to receive the test signal to find new multi path components with a BLER not exceeding the specified limit.

8.5.4 Method of test

8.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.5.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.12~~8.11~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b/3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.11 is found in table 8.12~~

~~**Table 8.12: Wanted signal levels in birth/death channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-101.3 dBm~~
~~64 kbps~~	~~-97.7 dBm~~	~~-97.6 dBm~~

5) For each of the data rates in table 8.12~~8.11~~ applicable for the base station, measure the BLER.

8.5.5 Test requirements

The BLER measured according to subclause 8.5.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.12~~8.11~~.

Table 8.12: Test requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	8.3 dB
64 kbps	4.7 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

Annex F (informative):
Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 4.2. 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 tables F.1, F.2 and F.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 4.1. In this event, the excess error shall be subtracted from the defined test tolerance in order to generate the correct tightened Test Requirements as defined in subclause 4.3.

For example, a Test System having 0.9 dB accuracy for test 6.2.1 Base Station maximum output power (which is 0.2 dB above the limit specified in subclause 4.) would subtract 0.2 dB from the Test Tolerance of 0.7 dB defined in subclause 4.2. This new test tolerance of 0.5 dB would then be applied to the Minimum Requirement using the formula defined in Table F.1 to give a new range of ±2.5 dB of the manufacturer's rated output power.

Using this same approach for the case where a test had a test tolerance of 0 dB, an excess error of 0.2 dB would result in a modified test tolerance of –0.2 dB.

Table F.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
6.2.1 Base station maximum output power	In normal conditions … within +2 dB and -2 dB of the manufacturer's rated output power In extreme conditions… within +2.5 dB and –2.5 dB of the manufacturer's rated output power	0.7 dB	Formula: Upper limit + TT Lower limit – TT In normal conditions … within +2.7 dB and –2.7 dB of the manufacturer's rated output power In extreme conditions… within +3.2 dB and –3.2 dB of the manufacturer's rated output power
6.2.2 CPICH Power accuracy	CPICH power shall be within ±2.1dB	0.8 dB	Formula: Upper limit + TT Lower limit – TT CPICH power shall be within ±2.9dB
6.3.4 Frequency error	Frequency error limit = 0.05 ppm	12 Hz	Formula: Frequency Error limit + TT Frequency Error limit = 0.05 ppm + 12 Hz
6.4.2 Power control steps	Lower and upper limits as specified in tables 6.9 and 6.10a	0.1 dB	Formula: Upper limits + TT Lower limits – TT 0.1 dB applied as above to tables 6.9 and 6.10a
6.4.3 Power dynamic range	maximum power limit = BS maximum output power -3 dB minimum power limit = BS maximum output power –28 dB	0.2 dB	Formula: maximum power limit – TT minimum power limit + TT maximum power limit = BS maximum output power –3.2 dB minimum power limit = BS maximum output power –27.8 dB
6.4.4 Total power dynamic range	total power dynamic range limit = 18 dB	0.3 dB	Formula: total power dynamic range limit – TT total power dynamic range limit = 17.7 dB
6.5.1 Occupied Bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz
6.5.2.1 Spectrum emission mask	Maximum level defined in tables 6.11, 6.12, 6.13 and 6.14:	1.5 dB	Formula: Maximum level + TT Add 1.5 to Maximum level entries in tables 6.11, 6.12, 6.13 and 6.14.
6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)	ACLR limit = 45 dB at 5 MHz ACLR limit = 50 dB at 10 MHz	0.8 dB	Formula: ACLR limit – TT ACLR limit = 44.2 dB at 5 MHz ACLR limit = 49.2 dB at 10 MHz
6.5.3 Spurious emissions	Maximum level defined in tables 6.16 to 6.26	0 dB	Formula: Maximum limit + TT Add 0 to Maximum level in tables 6.16 to 6.26
6.6 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.5.2.1, 6.5.2.2 and 6.5.3.	Wanted signal level – interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level – interferer level = 30 + 0 dB
6.7.1 EVM	EVM limit =17.5 %	0 %	Formula: EVM limit + TT EVM limit = 17.5%
6.7.2 Peak code Domain error	Peak code domain error limit = -33 dB	1.0 dB	Formula: Peak code domain error limit + TT Peak code domain error limit = -32 dB

Table F.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
7.2 Reference sensitivity	Reference sensitivity level = -121 dBm FER/BER limit = 0.001	0.7 dB	Formula: Reference sensitivity level + TT Reference sensitivity level = -120.3 dBm FER/BER limit is not changed
7.3 Dynamic range	Wanted signal level = -91 dBm AWGN level = -73 dBm/3.84 MHz	1.2 dB	Formula: Wanted signal level + TT AWGN level unchanged Wanted signal level = -89.8 dBm
7.4 Adjacent channel selectivity	Wanted signal level = -115 dBm W-CDMA interferer level = -52 dBm	0 dB	Formula: Wanted signal level + TT W-CDMA interferer level unchanged Wanted signal level = -115 dBm
7.5 Blocking characteristics	Wanted signal level = -115 dBm Interferer level See table 7.4a / 7.4b	0 dB	Formula: Wanted signal level + TT Interferer level unchanged Wanted signal level = -115 dBm
7.6 Intermod Characteristics	Wanted signal level = -115 dBm Interferer1 level (10 MHz offset CW) = -48 dBm Interferer2 level (20 MHz offset W-CDMA Modulated) = -48 dBm	0 dB	Formula: Wanted signal level + TT Interferer1 level unchanged Interferer2 level unchanged Wanted signal level = -115 dBm
7.7 Spurious Emissions	Maximum level defined in Table 7.7	0 dB	Formula: Maximum level + TT Add TT to Maximum level in table 7.7

Table F.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
8.2, Demodulation in static propagation condtion	Received E_b/N_0 values	~~TBD~~ 0.4 dB	Minimum requirement + TT
8.3, Demodulation of DCH in multiplath fading conditons	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
8.4 Demodulation of DCH in moving propagation conditions	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
8.5 Demodulation of DCH in birth/death propagation conditions	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
~~8.6 Verification of the internal BLER calculation~~		~~TBD~~	
8.7 Site Selection Diversity Transmission (SSDT) Mode		TBD	

CR-Form-v6.1

CHANGE REQUEST

⌘	**25.141** CR **196**	⌘**rev** **2** ⌘	Current version:	**4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘　(U)SIM ☐　ME/UE ☐　Radio Access Network **X**　Core Network ☐

Title: ⌘	TBDs on test tolerances	
Source: ⌘	Agilent Technologies, Ericsson, Nokia, Nortel Networks, Rohde & Schwarz	
Work item code: ⌘		***Date:*** ⌘　2002-02-26

Category: ⌘ **A**	***Release:*** ⌘　Rel-4
Use one of the following categories: ***F*** *(correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*Use one of the following releases:* *2　(GSM Phase 2)* *R96　(Release 1996)* *R97　(Release 1997)* *R98　(Release 1998)* *R99　(Release 1999)* *REL-4　(Release 4)* *REL-5　(Release 5)*

Reason for change: ⌘	There are still TBDs on test tolerances in 25.141 for Clause 8 and the corresponding test requirements are without test tolerances
Summary of change: ⌘	TBDs are replaced by agreed test tolerances and the correct tests requirement are introduced by applying the test tolerance to the minimum requirement (from the core specification) Isolated Impact Analysis: A Base Station fulfilling the existing requirements in Clause 8 will also fulfil the updated requirements.
Consequences if not approved: ⌘	The core specification values have been derived without consideration of test tolerance. If it is not applied, the tests will be incorrect.

Clauses affected: ⌘	4.1.4, 4.2.3, 8.2, 8.3, 8.4, 8.5, Annex F
Other specs affected: ⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments: ⌘	

4.1.4 Measurement of performance requirement

Table 4.1B: Maximum Test System Uncertainty for Performance Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
8.2, Demodulation in static propagation condtion	~~TBD~~ ± 0.4dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_b/N_0) (AWGN: ±1dB)
8.3, Demodulation of DCH in multiplath fading conditons	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.4 Demodulation of DCH in moving propagation conditions	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	~~TBD~~ ± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
~~8.6 Verification of the internal BLER calculation~~	~~TBD~~	
8.7 Site Selection Diversity Transmission (SSDT) Mode	TBD	
Note 1: Only the overall stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.		

4.2 Test Tolerances (informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification 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.)

4.2.1 Transmitter

Table 4.1C: Test Tolerances for transmitter tests.

Subclause	Test Tolerance[1]
6.2.1 Maximum Output Power	0.7 dB
6.2.2 CPICH Power accuracy	0.8 dB
6.3.4 Frequency error	12 Hz
6.4.2 Power control steps	0.1 dB
6.4.3 Power dynamic range	0.2 dB
6.4.4 Total power dynamic range	0.3 dB
6.5.1 Occupied Bandwidth	0 kHz
6.5.2.1 Spectrum emission mask	1.5 dB
6.5.2.2 ACLR	0.8 dB
6.5.3 Spurious emissions	0 dB
6.6 Transmit intermodulation (interferer requirements)	0 dB[2]
6.7.1 Frequency error	12 Hz
6.7.12 EVM	0 %
6.7.23 Peak code Domain error	1.0dB
Note 1: Unless otherwise stated, The Test Tolerances are applied to the DUT Minimum Requirement. See Annex F.	
Note 2: The Test Tolerance is applied to the stimulus signal(s). See Annex F.	

4.2.2   Receiver

Table 4.1D: Test Tolerances for receiver tests.

Subclause	Test Tolerance[1]
7.2 Reference sensitivity level	0.7 dB
7.3 Dynamic range	1.2 dB
7.4 Adjacent channel selectivity	0 dB
7.5 Blocking characteristics	0 dB
7.6 Intermod Characteristics	0 dB
7.7 Spurious Emissions	0 dB[2]
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	
Note 2: The Test Tolerance is applied to the DUT Minimum Requirement. See Annex F.	

4.2.3   Performance requirement

Table 4.1E: Test Tolerances for Performance Requirements.

Subclause	Test Tolerance[1]
8.2, Demodulation in static propagation condtion	~~TBD~~0.4dB
8.3, Demodulation of DCH in multiplath fading conditons	~~TBD~~0.6dB
8.4 Demodulation of DCH in moving propagation conditions	~~TBD~~0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	~~TBD~~0.6dB
~~8.6 Verification of the internal BLER calculation~~	~~TBD~~
8.7 Site Selection Diversity Transmission (SSDT) Mode	TBD
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.2.1.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.1.

Table 8.1: Performance requirements in AWGN channel.

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.1 dB
64 kbps	1.5 dB	1.7 dB
144 kbps	0.8 dB	0.9 dB
384 kbps	0.9 dB	1.0 dB

The reference for this requirement is TS 25.104 subclause 8.2.1.1.

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.2.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.2~~8.1~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.1 is found in table 8.2~~

~~**Table 8.2: Wanted signal levels in AWGN channels.**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-103.9 dBm~~
~~64 kbps~~	~~-100.3 dBm~~	~~-100.1 dBm~~
~~144 kbps~~	~~-97.5 dBm~~	~~-97.4 dBm~~
~~384 kbps~~	~~-93.1 dBm~~	~~-93 dBm~~

4) For each of the data rates in table 8.2~~8.1~~ applicable for the base station, measure the BLER.

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.2~~8.1~~.

Table 8.2: Test requirements in AWGN channel.

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.5 dB
64 kbps	1.9 dB	2.1 dB
144 kbps	1.2 dB	1.3 dB
384 kbps	1.3 dB	1.4 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.3.1.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	11.9 dB
64 kbps	6.2 dB	9.2 dB
144 kbps	5.4 dB	8.4 dB
384 kbps	5.8 dB	8.8 dB

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.4~~8.3~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.3 is found in table 8.4~~

~~**Table 8.4: Wanted signal levels in multipath Case 1 channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-97,1 dBm~~
~~64 kbps~~	~~-95.6 dBm~~	~~-92.6 dBm~~
~~144 kbps~~	~~-92.9 dBm~~	~~-89.9 dBm~~
~~384 kbps~~	~~-88.2 dBm~~	~~-85.2 dBm~~

5) For each of the data rates in table 8.4~~8.3~~ applicable for the base station, measure the BLER.

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.4~~8.3~~.

Table 8.4: Test requirements in multipath Case 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	12.5 dB
64 kbps	6.8 dB	9.8 dB
144 kbps	6.0 dB	9.0 dB
384 kbps	6.4 dB	9.4 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.2   Multipath fading Case 2

8.3.2.1   Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.2.2   ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.5.

Table 8.5: Performance requirements in multipath Case 2 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	9.0 dB
64 kbps	4.3 dB	6.4 dB
144 kbps	3.7 dB	5.6 dB
384 kbps	4.1 dB	6.1 dB

The reference for this requirement is TS 25.104 subclause 8.3.2.1.

8.3.2.3   Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding a specified limit.

8.3.2.4   Method of test

8.3.2.4.1   Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

   1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.2.4.2   Procedure

   1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

   2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

   3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

   4) Adjust the equipment so that required E_b/N_0 specified in table 8.6~~8.5~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -84+10*Log10(R_b/3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.5 is found in table 8.6.~~

~~**Table 8.6: Wanted signal levels in multipath Case 2 channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-100 dBm~~
~~64 kbps~~	~~-97.5 dBm~~	~~-95.4 dBm~~
~~144 kbps~~	~~-94.6 dBm~~	~~-92.7 dBm~~
~~384 kbps~~	~~-89.9 dBm~~	~~-87.9 dBm~~

5) For each of the data rates in table 8.6~~8.5~~ applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.2.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.6~~8.5~~.

Table 8.6: Test requirements in multipath Case 2 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	9.6 dB
64 kbps	4.9 dB	7.0 dB
144 kbps	4.3 dB	6.2 dB
384 kbps	4.7 dB	6.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.3 Multipath fading Case 3

8.3.3.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.3.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	7.2 dB	8.0 dB
64 kbps	3.4 dB	3.8 dB	4.1 dB
144 kbps	2.8 dB	3.2 dB	3.6 dB
384 kbps	3.2 dB	3.6 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.3.1.

8.3.3.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4 Method of test

8.3.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8~~8.7~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.7 is found in table 8.8.~~

~~**Table 8.8: Wanted signal levels in multipath Case 3 channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~	~~Wanted signal level for required BLER < 10^{-3}~~
~~12.2 kbps~~	~~n.a~~	~~-101.8 dBm~~	~~-101.0 dBm~~
~~64 kbps~~	~~-98.4 dBm~~	~~-98.0 dBm~~	~~-97.7 dBm~~
~~144 kbps~~	~~-95.5 dBm~~	~~-95.1 dBm~~	~~-94.7 dBm~~
~~384 kbps~~	~~-90.8 dBm~~	~~-90.4 dBm~~	~~-89.8 dBm~~

6) For each of the data rates in table 8.8~~8.7~~ applicable for the base station, measure the BLER

8.3.3.5 Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the BLER limits for E_b/N_0 levels specified in table 8.8~~8.7~~.

Table 8.8: Test requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	7.8 dB	8.6 dB
64 kbps	4.0 dB	4.4 dB	4.7 dB
144 kbps	3.4 dB	3.8 dB	4.2 dB
384 kbps	3.8 dB	4.2 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.3.4.2 ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.2 dB	11.0 dB
64 kbps	6.4 dB	6.8 dB	7.1 dB
144 kbps	5.8 dB	6.2 dB	6.6 dB
384 kbps	6.2 dB	6.6 dB	7.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B~~8.8A~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $-84+10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.8A is found in table 8.8B.~~

Table 8.8B: Wanted signal levels in multipath Case 4 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}	Wanted signal level for required BLER < 10^{-3}
12.2 kbps	n.a	-98.8 dBm	-98.0 dBm
64 kbps	-95.4 dBm	-95.0 dBm	-94.7 dBm
144 kbps	-92.5 dBm	-92.1 dBm	-91.7 dBm
384 kbps	-87.8 dBm	-87.4 dBm	-86.8 dBm

6) For each of the data rates in table 8.8B8.8A applicable for the base station, measure the BLER

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B8.8A.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.8 dB	11.6 dB
64 kbps	7.0 dB	7.4 dB	7.7 dB
144 kbps	6.4 dB	6.8 dB	7.2 dB
384 kbps	6.8 dB	7.2 dB	7.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.4.2 Conformance Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.7 dB
64 kbps	2.1 dB	2.2 dB

The reference for this requirement is TS 25.104 subclause 8.4.1.

8.4.3 Test purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.4 Method of test

8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex D.

8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.10~~8.9~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: -~~84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.9 is found in table 8.10~~

~~**Table 8.10: Wanted signal levels in moving channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-103.3 dBm~~
~~64 kbps~~	~~-99.7 dBm~~	~~-99.6 dBm~~

5) For each of the data rates in table 8.10~~8.9~~ applicable for the base station, measure the BLER.

8.4.5 Test requirements

The BLER measured according to subclause 8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.10~~8.9~~.

Table 8.10: Test requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	6.3 dB
64 kbps	2.7 dB	2.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications.

8.5.2   ~~Conformance~~ Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	7.7 dB
64 kbps	4.1 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.5.1.

8.5.3   Test purpose

The test shall verify the receiver's ability to receive the test signal to find new multi path components with a BLER not exceeding the specified limit.

8.5.4   Method of test

8.5.4.1   Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.5.4.2   Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.12~~8.11~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: ~~-84+~~10*Log10(R_b /3.84*10^6)+E_b/N_0 [dB~~m~~]. ~~The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.11 is found in table 8.12~~

~~**Table 8.12: Wanted signal levels in birth/death channel**~~

~~Measurement channel data rate (R_b)~~	~~Wanted signal level for required BLER < 10^{-1}~~	~~Wanted signal level for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~-101.3 dBm~~
~~64 kbps~~	~~-97.7 dBm~~	~~-97.6 dBm~~

5) For each of the data rates in table 8.12~~8.11~~ applicable for the base station, measure the BLER.

8.5.5   Test requirements

The BLER measured according to subclause 8.5.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.12~~8.11~~.

Table 8.12: Test requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER $< 10^{-1}$	E_b/N_0 for required BLER $< 10^{-2}$
12.2 kbps	n.a.	8.3 dB
64 kbps	4.7 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

Annex F (informative):
Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 4.2. 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 tables F.1, F.2 and F.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 4.1. In this event, the excess error shall be subtracted from the defined test tolerance in order to generate the correct tightened Test Requirements as defined in subclause 4.3.

For example, a Test System having 0.9 dB accuracy for test 6.2.1 Base Station maximum output power (which is 0.2 dB above the limit specified in subclause 4.) would subtract 0.2 dB from the Test Tolerance of 0.7 dB defined in subclause 4.2. This new test tolerance of 0.5 dB would then be applied to the Minimum Requirement using the formula defined in Table F.1 to give a new range of ±2.5 dB of the manufacturer's rated output power.

Using this same approach for the case where a test had a test tolerance of 0 dB, an excess error of 0.2 dB would result in a modified test tolerance of –0.2 dB.

Table F.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
6.2.1 Base station maximum output power	In normal conditions … within +2 dB and -2 dB of the manufacturer's rated output power In extreme conditions… within +2.5 dB and –2.5 dB of the manufacturer's rated output power	0.7 dB	Formula: Upper limit + TT Lower limit – TT In normal conditions … within +2.7 dB and –2.7 dB of the manufacturer's rated output power In extreme conditions… within +3.2 dB and –3.2 dB of the manufacturer's rated output power
6.2.2 CPICH Power accuracy	CPICH power shall be within ±2.1dB	0.8 dB	Formula: Upper limit + TT Lower limit – TT CPICH power shall be within ±2.9dB
6.3.4 Frequency error	Frequency error limit = 0.05 ppm	12 Hz	Formula: Frequency Error limit + TT Frequency Error limit = 0.05 ppm + 12 Hz
6.4.2 Power control steps	Lower and upper limits as specified in tables 6.9 and 6.10a	0.1 dB	Formula: Upper limits + TT Lower limits – TT 0.1 dB applied as above to tables 6.9 and 6.10a
6.4.3 Power dynamic range	maximum power limit = BS maximum output power -3 dB minimum power limit = BS maximum output power –28 dB	0.2 dB	Formula: maximum power limit – TT minimum power limit + TT maximum power limit = BS maximum output power –3.2 dB minimum power limit = BS maximum output power –27.8 dB
6.4.4 Total power dynamic range	total power dynamic range limit = 18 dB	0.3 dB	Formula: total power dynamic range limit – TT total power dynamic range limit = 17.7 dB
6.5.1 Occupied Bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz
6.5.2.1 Spectrum emission mask	Maximum level defined in tables 6.11, 6.12, 6.13 and 6.14:	1.5 dB	Formula: Maximum level + TT Add 1.5 to Maximum level entries in tables 6.11, 6.12, 6.13 and 6.14.
6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)	ACLR limit = 45 dB at 5 MHz ACLR limit = 50 dB at 10 MHz	0.8 dB	Formula: ACLR limit – TT ACLR limit = 44.2 dB at 5 MHz ACLR limit = 49.2 dB at 10 MHz
6.5.3 Spurious emissions	Maximum level defined in tables 6.16 to 6.26	0 dB	Formula: Maximum limit + TT Add 0 to Maximum level in tables 6.16 to 6.26
6.6 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.5.2.1, 6.5.2.2 and 6.5.3.	Wanted signal level – interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level – interferer level = 30 + 0 dB
6.7.1 EVM	EVM limit =17.5 %	0 %	Formula: EVM limit + TT EVM limit = 17.5%
6.7.2 Peak code Domain error	Peak code domain error limit = -33 dB	1.0 dB	Formula: Peak code domain error limit + TT Peak code domain error limit = -32 dB

Table F.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
7.2 Reference sensitivity	Reference sensitivity level = -121 dBm FER/BER limit = 0.001	0.7 dB	Formula: Reference sensitivity level + TT Reference sensitivity level = -120.3 dBm FER/BER limit is not changed
7.3 Dynamic range	Wanted signal level = -91 dBm AWGN level = -73 dBm/3.84 MHz	1.2 dB	Formula: Wanted signal level + TT AWGN level unchanged Wanted signal level = -89.8 dBm
7.4 Adjacent channel selectivity	Wanted signal level = -115 dBm W-CDMA interferer level = -52 dBm	0 dB	Formula: Wanted signal level + TT W-CDMA interferer level unchanged Wanted signal level = -115 dBm
7.5 Blocking characteristics	Wanted signal level = -115 dBm Interferer level See table 7.4a / 7.4b	0 dB	Formula: Wanted signal level + TT Interferer level unchanged Wanted signal level = -115 dBm

7.6 Intermod Characteristics	Wanted signal level = -115 dBm
	Interferer1 level (10 MHz offset CW) = -48 dBm
	Interferer2 level (20 MHz offset W-CDMA Modulated) = -48 dBm
		0 dB	Formula: Wanted signal level + TT
			   Interferer1 level unchanged
			   Interferer2 level unchanged
			
			Wanted signal level = -115 dBm

7.7 Spurious Emissions	Maximum level defined in Table 7.7	0 dB	Formula: Maximum level + TT Add TT to Maximum level in table 7.7

Table F.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
8.2, Demodulation in static propagation condtion	Received E_b/N_0 values	~~TBD~~ 0.4 dB	Minimum requirement + TT
8.3, Demodulation of DCH in multiplath fading conditons	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
8.4 Demodulation of DCH in moving propagation conditions	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
8.5 Demodulation of DCH in birth/death propagation conditions	Received E_b/N_0 values	~~TBD~~ 0.6 dB	Minimum requirement + TT
~~8.6 Verification of the internal BLER calculation~~		~~TBD~~	
8.7 Site Selection Diversity Transmission (SSDT) Mode		TBD	