TSG-RAN Meeting #11 ***RP-010092***
Palm Springs, CA, USA, 13 - 16 March 2001

Title: **Agreed CRs (Release '99) to TS 25.141**

Source: **TSG-RAN WG4**

Agenda item: **5.4.3**

Doc-1st-Level	Spec	CR	Subject	Cat	Status-2nd-Level	Version-Current	Version-New
RP-010092	25.141	66	Correction of blocking test. Alignment with CR to 25.104.	F	agreed	3.4.1	3.5.0
RP-010092	25.141	67	UL Performance requirement in fast fading	F	agreed	3.4.1	3.5.0
RP-010092	25.141	68	Test description for Case 4(250km/h)	F	agreed	3.4.1	3.5.0
RP-010092	25.141	69	Proposed CR to 25.141 on Spectrum Emissions Mask	F	agreed	3.4.1	3.5.0
RP-010092	25.141	70	Correction to PICH frame structure	F	agreed	3.4.1	3.5.0
RP-010092	25.141	71	Addition of S-CCPCH containing PCH into test models	F	agreed	3.4.1	3.5.0
RP-010092	25.141	72	UTRAN Received total wideband power	F	agreed	3.4.1	3.5.0
RP-010092	25.141	73	Correction of reference to SM.329-8 in TS 25.141	F	agreed	3.4.1	3.5.0
RP-010092	25.141	74	Corrections to Blocking and Rx Spurious emissions tests in TS 25.141	F	agreed	3.4.1	3.5.0
RP-010092	25.141	75	Rx spurious emissions measurement bandwidth in 25.141	F	agreed	3.4.1	3.5.0
RP-010092	25.141	76	Conditions for BS conformance testing (FDD)	F	agreed	3.4.1	3.5.0
RP-010092	25.141	77	CR to 25.141 for Test Tolerances	F	agreed	3.4.1	3.5.0
RP-010092	25.141	78	CR to 25.141 for Test Tolerances in TX tests	F	agreed	3.4.1	3.5.0
RP-010092	25.141	79	Definition of EVM	F	agreed	3.4.1	3.5.0
RP-010092	25.141	80	Addition of CPICH to Test Model 4 for EVM measurement	F	agreed	3.4.1	3.5.0
RP-010092	25.141	81	Re-introduction of the SCH period into the EVM / PCDE measurements	F	agreed	3.4.1	3.5.0
RP-010092	25.141	82	Implementation of Test Tolerances (Receiver part)	F	agreed	3.4.1	3.5.0

3GPP TSG RAN WG4 Meeting #16 **R4-010424**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **66** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Correction of blocking test. Alignment with CR to 25.104.
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 19.02.01
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Alignment of blocking test with 25.104.
Summary of change:	⌘	Correction of conformance requirement and table of regional requirements to align with 25.104
Consequences if not approved:	⌘	Test not in line with 25.104.

Clauses affected:	⌘	4.7, 7.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4.7 Regional requirements

Some requirements in TS 25.141 may only apply in certain regions. Table 4.4 lists all requirements that may be applied differently in different regions.

Table 4.4: List of regional requirements

Subclause number	Requirement	Comments
3.4.1	Frequency bands	Some bands may be applied regionally.
3.4.2	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in subclause 3.4.1 that are supported by the BS.
6.2.1.2	Base station output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.
6.5.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.5.3.5	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.
6.5.3.6	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.
6.5.3.8.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.5.3.8.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.5.3.9.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.5.3.9.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.5.3.10	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.5.3.11	Co-.existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in subclause 3.4.1(a) and 1930-1990 MHz, as defined in subclause 3.4.1(b) in geographic areas in which both an adjacent band service and UTRA are deployed.
6.5.3.12.1	Co-existence with UTRA TDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.5.3.12.2	Co-existence with UTRA TDD – Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in subclause 3.4.1 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900/DCS1800 BS are co-located.

7.5 Blocking characteristics

7.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance shall apply at all frequencies as specified in table 7.4.

The requirements in this subclause shall apply to base stations intended for general-purpose applications. The requirements in Tables 7.4 (c) and 7.4 (d) apply when the FDD BS for operation in frequency bands in subclause 3.4.1(a) is colocated with GSM900 or DCS1800 BTS respectively.

7.5.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.4.

Table 7.4(a): Blocking characteristics for operation in frequency bands in subclause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 920 MHz to 1 980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 900 MHz to 1 920 MHz 1 980 MHz to 2 000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 900 MHz and 2 000 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

Table 7.4(b): Blocking performance requirement for operation in frequency bands in subclause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 850 MHz to 1 910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 830 MHz to 1 850 MHz 1 910 MHz to 1 930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 830 MHz 1 930 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

Table 7.4(c) : Blocking performance requirement for operation in frequency bands in sub-clause 3.4.1.(a) when co-located with GSM900

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 – 925 MHz and 960 - 1900 MHz, and 2000 MHz – 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
925 -960 MHz	+~~20~~16 dBm	-115 dBm	—	CW carrier

Table 7.4(d) : Blocking performance requirement for operation in frequency bands in sub-clause 3.4.1(b)) when co-located with DCS1800

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 – 1805 MHz and 1880 - 1900 MHz, and 2000 MHz – 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
1805 – 1880 MHz	+~~20~~16 dBm	-115 dBm	—	CW carrier

The reference for these requirements is in TS 25.104[1] su bclause 7.5

7.5.3 Test purpose

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

1) Connect WCDMA signal generator at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

2) Terminate any other Rx port not under test.

3) Transmit a signal from the WCDMA signal generator to the BS. The characteristics of the signal shall be set according to the UL reference measurement channel (12,2 kbit/s) specified in annex A subclause A.2.1. The level of the WCDMA signal measured at the BS antenna connector shall be set to the level specified in subclause 7.5.2.

7.5.4.2 Procedure

1) Set the signal generator to produce an interfering signal at a frequency offset Fuw from the assigned channel frequency of the wanted signal which is given by:

$$Fuw = \pm (n \times 1\ MHz),$$

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in table 7.4. The type of the interfering signal is either equivalent to a continuous WCDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see table 7.4.

2) Measure the BER of the wanted signal at the BS receiver.

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10 000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

3GPP TSG RAN WG4 Meeting #16 **R4-010385**

Vienna, Austria 19th - 23rd February 2001

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CHANGE REQUEST

⌘ **25.141** **CR** **67** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	UL Performance requirement in fast fading
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2001-02-20
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Correction of implementation margin for the performance requirement with fast fading (Case 3, 120 km/h).
Summary of change:	⌘	Case 3 performance is updated.
Consequences if not approved:	⌘	Performance requirements will not be correct.

Clauses affected:	⌘	8.3.3		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	CR 25.104-xxx
Other comments:	⌘			

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 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	~~6.7~~7.2 dB	~~7.5~~8.0 dB
64 kbps	~~2.9~~3.4 dB	~~3.3~~3.8 dB	~~3.6~~4.1 dB
144 kbps	~~2.3~~2.8 dB	~~2.7~~3.2 dB	~~3.1~~3.6 dB
384 kbps	~~2.7~~3.2 dB	~~3.1~~3.6 dB	~~3.7~~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

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.

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

5) Adjust the equipment so that required E_b/N_0 specified in table 8.7 is achieved. To achieve the specified E_b/N_O, the wanted signal level 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: Performance requirements 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	~~-102.3~~-101.8 dBm	~~-101.5~~-101.0 dBm
64 kbps	~~-98.9~~-98.4 dBm	~~-98.5~~-98.0 dBm	~~-98.2~~-97.7 dBm
144 kbps	~~-96.0~~-95.5 dBm	~~-95.6~~-95.1 dBm	~~-95.2~~-94.7 dBm
384 kbps	~~-91.3~~-90.8 dBm	~~-90.9~~-90.4 dBm	~~-90.3~~-89.8 dBm

6) For each of the data rates in table 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 limits specified in table 8.7.

3GPP TSG RAN WG4 Meeting #16 **R4-010420**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **68** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Test description for Case 4(250km/h)
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 20.2.2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Performance requirement for demodulation of DCH in multipath fading conditions at 250km/h has been added into 25.104
Summary of change:	⌘	Performance requirement for demodulation of DCH in multipath fading conditions at 250km/h has been added into 25.104. This CR adds the corresponding test description to test specification
Consequences if not approved:	⌘	Performance requirement has no test description.

Clauses affected:	⌘	8.3, D.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 8.5 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [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 8.5 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the limits specified in table 8.5.

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 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	6.7 dB	7.5 dB
64 kbps	2.9 dB	3.3 dB	3.6 dB
144 kbps	2.3 dB	2.7 dB	3.1 dB
384 kbps	2.7 dB	3.1 dB	3.7 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

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.

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

5) Adjust the equipment so that required E_b/N_0 specified in table 8.7 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [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: Performance requirements 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	-102.3 dBm	-101.5 dBm
64 kbps	-98.9 dBm	-98.5 dBm	-98.2 dBm
144 kbps	-96.0 dBm	-95.6 dBm	-95.2 dBm
384 kbps	-91.3 dBm	-90.9 dBm	-90.3 dBm

6) For each of the data rates in table 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 limits specified in table 8.7.

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 requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.x.

Table 8.x: 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	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

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.

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

5) Adjust the equipment so that required E_b/N_0 specified in table 8.x is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.x is found in table 8.y.

Table 8.y: Performance requirements 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	-98.8 dBm	-98 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.x 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 limits specified in table 8.x.

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 requirement

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

Annex D (normative): Propagation conditions

D.1 Static propagation condition

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

D.2 Multi-path fading propagation conditions

Table D.1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table D.1: Propagation Conditions for Multi path Fading Environments

~~Case 1, speed 3km/h~~		~~Case 2, speed 3 km/h~~		~~Case 3, 120 km/h~~	
~~Relative Delay [ns]~~	~~Average Power [dB]~~	~~Relative Delay [ns]~~	~~Average Power [dB]~~	~~Relative Delay [ns]~~	~~Average Power [dB]~~
~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~976~~	~~-10~~	~~976~~	~~0~~	~~260~~	~~-3~~
		~~20000~~	~~0~~	~~521~~	~~-6~~
				~~781~~	~~-9~~

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h		Case 4, 250 km/h	
Relative Delay [ns]	Average Power [dB]	Relative Delay [ns]	Average Power [dB]	Relative Delay [ns]	Average Power [dB]	Relative Delay [ns]	Average Power [dB]
0	0	0	0	0	0	0	0
976	-10	976	0	260	-3	260	-3
		20000	0	521	-6	521	-6
				781	-9	781	-9

D.3 Moving propagation conditions

The dynamic propagation conditions for the test of the baseband performance are non fading channel models with two taps. The moving propagation condition has two tap, one static, Path0, and one moving, Path1. The time difference between the two paths is according Equation (D.1). The taps have equal strengths and equal phases.

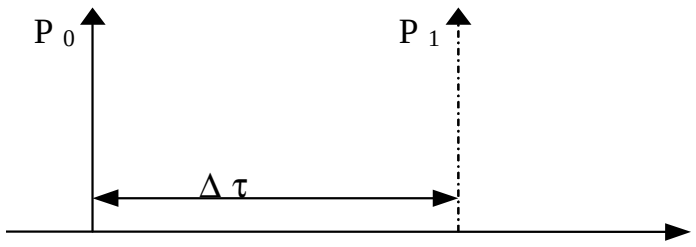

Figure D.1: The moving propagation conditions

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

The parameters in the equation are shown in.

A	5 μs
B	1 μs
Δω	$40*10^{-3}$ s^{-1}

3GPP TSG RAN WG4 Meeting #16 **R4-010215**

Vienna, Austria 19th - 23rd February 2001

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CHANGE REQUEST

⌘ **25.141** **CR** **69** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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 ☒ Core Network ☐

Title:	⌘	Proposed CR to 25.141 on Spectrum Emissions Mask
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2001-01-25
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	The test on Spectrum Emissions Mask contains an erroneous term Δf_{max}, which is not defined. The correct term should f_offset_{max}.
Summary of change:	⌘	The term Δf_{max} is corrected to be f_offset_{max}.
Consequences if not approved:	⌘	The specification may be misinterpreted, since the maximum frequency to measure the mask at is ambiguous.

Clauses affected:	⌘	6.5.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

6.5.2 Out of band emission

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

6.5.2.1 Spectrum emission mask

6.5.2.1.1 Definitions and applicability

The mask defined in Tables 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.2 Conformance requirements

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.11 to 6.14 for the appropriate BS maximum output power, in the frequency range from Δf =2.5 MHz to f_offset_{max} from the carrier frequency, where:~~in~~

- Δf is the separation between the carrier frequency and the nominal –3dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the carrier frequency and the centre of the measurement filter;
- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in subclause 3.4.1, whichever is the greater.

~~f_offset is the separation between the carrier frequency and the centre of the measuring filter.~~

Table 6.11: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 12.5 – 15·(f_offset- 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0 MHz ≤ f_offset < f_offset_{max}	-11.5 dBm	1 MHz

Table 6.12: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-12.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dBm	1 MHz

Table 6.13: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 51.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P – 51.5 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 63.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 50.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dBm	1 MHz

Table 6.14: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-20.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-20.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-32.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-19.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	-23.5 dBm	1 MHz

The reference for this requirement is in TS 25.104 [1] subclause 6.6.2.1

NOTE: The test limits include test tolerances as outlined in Annex F.

6.5.2.1.3 Test purpose

This test measures the emissions of the BS, close to the assigned channel bandwidth of the wanted signal, while the transmitter is in operation.

6.5.2.1.4 Method of test

6.5.2.1.4.1 Initial conditions

1) Set-up the equipment as shown in annex A.

2) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4.0 MHz shall use a 30 kHz measurement bandwidth.

3) Measurements with an offset from the carrier centre frequency between 4.0 MHz and (~~Δf_{max}~~ f_offset_{max} – 500 kHz).shall use a 1 MHz measurement bandwidth. The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements

4) Detection mode: True RMS.

6.5.2.1.4.2~~5~~ Procedures

1) Set the BS to transmit a signal in accordance to test model 1, subclause 6.2.1.1.1 at ~~by~~ the manufacturer's specified maximum output power.

2) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6.5.2.1.6 Test requirements

In all measurements, the requirements according to subclause 6.5.2.1.2 shall be fulfilled.

3GPP TSG RAN WG4 Meeting #16 **R4-010079**

Vienna, Austria 19th - 23rd February 2001

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CHANGE REQUEST

⌘ **25.141** **CR** **70** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Correction to PICH frame structure
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 18.1.2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	According to TS25.211, PICH frame structure is 300 bits.
Summary of change:	⌘	PICH frame structure is changed to define 300 bits.
Consequences if not approved:	⌘	Discrepancy between TS25.211 and TS.25.141.

Clauses affected:	⌘	6.1.1.6.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Table 6.7: DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8
6	30	15	256	150	150	300	20	2	8	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of TS 25.211, which are reproduced in table 6.8.

Table 6.8: Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	**0**	**1**	**2**	**3**
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelization code as the seed for the PN sequence at the start of each frame, according to its timing offset.

The sequence shall be generated in a nine-stage shift register whose 5^{th} and 9^{th} stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The generator shall be seeded so that the sequence begins with the channelization code starting from the LSB, and followed by 2 consecutive ONEs for SF=128 and 1 consecutive ONE for SF=256.

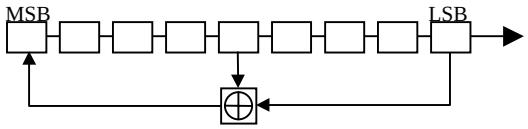

Figure 6.2

6.1.1.6 Common channel Structure of the Downlink Test Models

6.1.1.6.1 P-CCPCH

The aggregate 15 x 18 = 270 P-CCPCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. Channelization code of the P-CCPCH is used as the seed for the PN sequence at the start of each frame.

The generator shall be seeded so that the sequence begins with the 8 bit channelization code starting from the LSB, and followed by a ONE.

6.1.1.6.2 PICH

PICH carries 18 Paging Indicators (PI) sent in the following sequence from left to right [1 0 1 1 0 0 0 1 0 1 1 0 0 0 1 0 1 0]. This defines the 288 first ~~symbols (= ± 1 ± j)~~bits of the PICH. No power is transmitted for the 12 remaining unused ~~symbols (=0)~~bits.

6.1.1.6.3 Primary scrambling code and SCH

The scrambling code should be 0.

Where multiple repetitions of the Test Model signals are being used to simulate a multi-carrier signal the scrambling code for the lower frequency is 0. Carriers added at successively higher frequencies use codes 1, 2,... and their frame structures are time offset by 1/5, 2/5... of a time slot duration.

The scrambling code defines the SSC sequence of the secondary SCH. In their active part, primary and secondary SCH share equally the power level defined for "PCCPCH+SCH".

6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter.

Rated output power, PRAT, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

6.2.1 Base station maximum output power

6.2.1.1 Definition and applicability

Maximum output power, Pmax, of the base station is the mean power level per carrier measured at the antenna connector in specified reference condition.

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.

6.2.1.2 Conformance requirement

In normal conditions, the Base station maximum output power shall remain within +2.7 dB and –2.7 dB of the manufacturer's rated output power.

In extreme conditions, the Base station maximum output power shall remain within +3.2 dB and –3.2 dB of the manufacturer's rated output power.

The reference for this requirement is in TS 25.104 [1] subclause 6.2.1.

NOTE: The test limits include test tolerance as outlined in Annex F.

6.2.1.3 Test purpose

The test purpose is to verify the accuracy of the maximum output power across the frequency range and under normal and extreme conditions for all transmitters in the BS.

6.2.1.4 Method of test

6.2.1.4.1 Initial conditions

1) Connect the power measuring equipment to the base station RF output port.

3GPP TSG RAN WG4 Meeting #16 **R4-010237**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **71** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Addition of S-CCPCH containing PCH into test models
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 12.2.2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	According to TS25.433, PICH can not be set up without PCH or FACH.
Summary of change:	⌘	S-CCPCH containing PCH is included in test models 1, 2 and 3
Consequences if not approved:	⌘	Discrepancy between TS25.433 and TS.25.141.

Clauses affected:	⌘	6.1.1.1, 6.1.1.2, 6.1.1.3, 6.1.1.6
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.1.1 Test Models

The set-up of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test.

A code "level setting" of -X dB is the setting that according to the base station manufacturer will result in a code power of nominally X dB below the maximum output power. The relative accuracy of the level settings shall conform to subclause 6.4.2.

6.1.1.1 Test Model 1

This model shall be used for tests on:

- spectrum emission mask;
- ACLR;
- spurious emissions;
- transmit intermodulation;
- base station maximum output power.

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" is relative to the maximum output power on the TX antenna interface under test.

Table 6.1: Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256T_{chip})
~~PCCPCH+SCH~~ P-CCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	~~3.2~~1.6	~~-15~~-18	16	120
S-CCPCH containing PCH (SF=256)	1	1.6	-18	3	150
DPCH (SF=128)	16/32/64	76.8 in total	see table 6.2	see table 6.2	see table 6.2

Table 6.2: DPCH Spreading Code, Timing offsets and level settings for Test Model 1

Code	Timing offset ($x256T_{chip}$)	Level settings (dB) (16 codes)	Level settings (dB) (32 codes)	Level settings (dB) (64 codes)
2	86	-10	-13	-16
11	134	-12	-13	-16
17	52	-12	-14	-16
23	45	-14	-15	-17
31	143	-11	-17	-18
38	112	-13	-14	-20
47	59	-17	-16	-16
55	23	-16	-18	-17
62	1	-13	-16	-16
69	88	-15	-19	-19
78	30	-14	-17	-22
85	18	-18	-15	-20
94	30	-19	-17	-16
102	61	-17	-22	-17
113	128	-15	-20	-19
119	143	-9	-24	-21
7	83		-20	-19
13	25		-18	-21
20	103		-14	-18
27	97		-14	-20
35	56		-16	-24
41	104		-19	-24
51	51		-18	-22
58	26		-17	-21
64	137		-22	-18
74	65		-19	-20
82	37		-19	-17
88	125		-16	-18
97	149		-18	-19
108	123		-15	-23
117	83		-17	-22
125	5		-12	-21
4	91			-17
9	7			-18
12	32			-20
14	21			-17
19	29			-19
22	59			-21
26	22			-19
28	138			-23
34	31			-22
36	17			-19
40	9			-24
44	69			-23
49	49			-22
53	20			-19
56	57			-22
61	121			-21
63	127			-18
66	114			-19
71	100			-22
76	76			-21
80	141			-19
84	82			-21
87	64			-19
91	149			-21
95	87			-20
99	98			-25
105	46			-25
110	37			-25
116	87			-24

Code	Timing offset (x256T_{chip})	Level settings (dB) (16 codes)	Level settings (dB) (32 codes)	Level settings (dB) (64 codes)
118	149			-22
122	85			-20
126	69			-15

NOTE: The figures for code power are nominal and have tolerance of ±1 dB.

6.1.1.2 Test Model 2

This model shall be used for tests on:

- output power dynamics.

Table 6.3: Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256T_{chip})
~~PCCPCH+SCH~~ P-CCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	~~10~~5	~~-10~~-13	16	120
S-CCPCH containing PCH (SF=256)	1	5	-13	3	150
DPCH (SF=128)	3	2 x 10,1 x 50	2 x –10, 1 x –3	24, 72, 120	1, 7, 2

6.1.1.3 Test Model 3

This model shall be used for tests on:

- peak code domain error.

Table 6.4: Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%) 16/32	Level settings (dB) 16/32	Channelization Code	Timing offset (x256T_{chip})
~~PCCPCH+SCH~~ P-CCPCH+SCH	1	12,6/7,9	-9 / -11	1	0
Primary CPICH	1	12,6/7,9	-9 / -11	0	0
PICH	1	~~10/3,2~~5/1.6	~~-10 / -15~~-13/-18	16	120
S-CCPCH containing PCH (SF=256)	1	5/1.6	-13/-18	3	150
DPCH (SF=256)	16/32	63,7/80,4 in total	see table 6.5	see table 6.5	see table 6.5

As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 6.5: DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Level settings (dB) (16 codes)	Level settings dB) (32 codes)
64	86	-14	-16
69	134	-14	-16
74	52	-14	-16
78	45	-14	-16
83	143	-14	-16
89	112	-14	-16
93	59	-14	-16
96	23	-14	-16
100	1	-14	-16
105	88	-14	-16
109	30	-14	-16
111	18	-14	-16
115	30	-14	-16
118	61	-14	-16
122	128	-14	-16
125	143	-14	-16
67	83		-16
71	25		-16
76	103		-16
81	97		-16
86	56		-16
90	104		-16
95	51		-16
98	26		-16
103	137		-16
108	65		-16
110	37		-16
112	125		-16
117	149		-16
119	123		-16
123	83		-16
126	5		-16

NOTE: The figures for code power are nominal and have tolerance of ±1 dB.

6.1.1.4 Test Model 4

This model shall be used for tests on:

- EVM measurement.

Table 6.6: Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level seting (dB)	Channelization Code	Timing offset
PCCPCH+SCH	1	50 to 1.6	-3 to -18	1	

6.1.1.5 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by TS 25.211-slot format 10 and 6 that are reproduced in table 6.7.

Table 6.7: DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8
6	30	15	256	150	150	300	20	2	8	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of TS 25.211, which are reproduced in table 6.8.

Table 6.8: Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	**0**	**1**	**2**	**3**
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelization code as the seed for the PN sequence at the start of each frame, according to its timing offset.

The sequence shall be generated in a nine-stage shift register whose 5^{th} and 9^{th} stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The generator shall be seeded so that the sequence begins with the channelization code starting from the LSB, and followed by 2 consecutive ONEs for SF=128 and 1 consecutive ONE for SF=256.

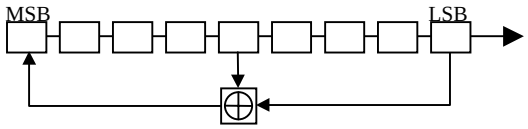

Figure 6.2

6.1.1.6 Common channel Structure of the Downlink Test Models

6.1.1.6.1 P-CCPCH

The aggregate 15 x 18 = 270 P-CCPCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. Channelization code of the P-CCPCH is used as the seed for the PN sequence at the start of each frame.

The generator shall be seeded so that the sequence begins with the 8 bit channelization code starting from the LSB, and followed by a ONE.

6.1.1.6.2 PICH

PICH carries 18 Paging Indicators (PI) sent in the following sequence from left to right [1 0 1 1 0 0 0 1 0 1 1 0 0 0 1 0 1 0]. This defines the 288 first symbols (= ± 1 ± j) of the PICH. No power is transmitted for the 12 remaining unused symbols (=0).

6.1.1.6.3 Primary scrambling code and SCH

The scrambling code should be 0.

Where multiple repetitions of the Test Model signals are being used to simulate a multi-carrier signal the scrambling code for the lower frequency is 0. Carriers added at successively higher frequencies use codes 1, 2,... and their frame structures are time offset by 1/5, 2/5... of a time slot duration.

The scrambling code defines the SSC sequence of the secondary SCH. In their active part, primary and secondary SCH share equally the power level defined for "PCCPCH+SCH".

6.1.1.6.4 S-CCPCH containing PCH

The aggregate 15 x 18 = 270 S-CCPCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. Channelization code of the S-CCPCH is used as the seed for the PN sequence at the start of each frame.

The generator shall be seeded so that the sequence begins with the 8 bit channelization code starting from the LSB, and followed by a ONE.

3GPP TSG RAN WG4 Meeting #16 **R4-010321**

Vienna, Austria 19th - 23rd February 2001

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CHANGE REQUEST

⌘ **25.141** **CR** **72** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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 ☒ Core Network ☐

Title:	⌘	UTRAN Received total wideband power
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2001-01-26
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	The definition of UTRAN Received totoal wideband power may be interpreted differentlyand additional inofrmation is included in an informative Annex to enable a consistent interpretation of the requirement.
Summary of change:	⌘	Inclusion of Annex X , that includes a testlike description.
Consequences if not approved:	⌘	Mfgs may interpret requirements differently, and in a multivendor system the radio network algorithms may not work properly.

Clauses affected:	⌘	New Annex
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

Annex X (Informative): UTRAN Measurement Test Cases

X.1 Purpose of Annex

This Annex specifies test specific parameters for some of the UTRAN requirements in chapter 9.2 TS 25.133. The tests provide additional information to how the requirements should be interpreted. Some requirements may lack a test.

X.2 Received Total Wideband Power

X.2.1 Absolute RTWP measurement

1. Terminate the BS RX inputs, measure the RTWP and record it.
2. Connect a signal generator and increase the signal generator power until the reported RTWP level (Irep) has increased 3dB.
3. Measure the signal level power at the antenna connector port. This signal level is now called the "Internally generated noise" (Ni).
4. Sweep the sum of internally generated noise (Ni) and signal generator power (I) through the defined accuracy range.
5. Check that: |(Ni+I)-Irep| meets the requirements in chapter 9.2.1.

Note that Io= (Ni+I)

X.2.2 Relative RTWP measurement

1. Terminate the BS RX inputs, measure the RTWP and record it.
2. Attach a signal generator to the RX input and increase the power until the by the BS reported RTWP value (Irep) has increased 3 dB.
3. Measure the signal level power at the antenna connector port. This signal level is now called the "Internally generated noise" (Ni).
4. Calculate the required signal levels I such that the sum of the internally generated noise (Ni) and the signal generator power (I)
5. The difference between the reported RTWP values shall meet the requirements specified in chapter 9.2.1.

3GPP TSG RAN WG4 Meeting #16 **R4-010340**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **73** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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 ☒ Core Network ☐

Title:	⌘	Correction of reference to SM.329-8 in TS 25.141
Source:	⌘	RAN WG4
Work item code:	⌘	-
Date:	⌘	2001-02-17
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	The old reference to SM.329-7 was misleading since the current specification of Category B requirements is in accordance with the recently published SM.329-8.
Summary of change:	⌘	Reference is corrected to point at the relevant parts of SM.329-8.
Consequences if not approved:	⌘	Regional bodies may misunderstand the background of the spurious emissions requirement.

Clauses affected:	⌘	2, 4.7, 6.5.3.4.1, 6.5.3.4.2		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	CR for TS 25.104 in Tdoc R4-010339
Other comments:	⌘			

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

[1] 3GPP TS 25.104: "UTRA(BS) FDD; Radio transmission and Reception".

[2] 3GPP TS 25.942: "RF system scenarios".

[3] 3GPP TS 25.113: "Base station EMC".

[4] ITU-R recommendation SM.329-8~~7~~: "Spurious emissions".

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

[6] IEC 60721-3-3 (1994): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weather protected locations".

[7] IEC 60721-3-4 (1995): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations".

[8] IEC 60068-2-1 (1990): "Environmental testing - Part 2: Tests. Tests A: Cold".

[9] IEC 60068-2-2 (1974): "Environmental testing - Part 2: Tests. Tests B: Dry heat".

[10] IEC 60068-2-6 (1995): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)".

4.7 Regional requirements

Some requirements in TS 25.141 may only apply in certain regions. Table 4.4 lists all requirements that may be applied differently in different regions.

Table 4.4: List of regional requirements

Subclause number	Requirement	Comments
3.4.1	Frequency bands	Some bands may be applied regionally.
3.4.2	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in subclause 3.4.1 that are supported by the BS.
6.2.1.2	Base station output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.
6.5.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.5.3.5	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8~~7~~ [1], are applied.
6.5.3.6	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8~~7~~ [1], are applied.
6.5.3.8.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.5.3.8.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.5.3.9.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.5.3.9.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.5.3.10	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.5.3.11	Co-.existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in subclause 3.4.1(a) and 1930-1990 MHz, as defined in subclause 3.4.1(b) in geographic areas in which both an adjacent band service and UTRA are deployed.
6.5.3.12.1	Co-existence with UTRA TDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.5.3.12.2	Co-existence with UTRA TDD – Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in subclause 3.4.1 that are supported by the BS.

6.5.3.4.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation [4], are applied.

6.5.3.4.1.1 Minimum Requirement

The power of any spurious emission shall be attenuated by at least the minimum requirement.

Table 6.16: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9 kHz to 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
150 kHz to 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
30 MHz to 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
1 GHz to 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8~~7~~, subclause 2.5, Table 1~~6~~

6.5.3.4.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation [4], are applied.

6.5.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.17: BS Mandatory spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9 kHz ↔ 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
150 kHz ↔ 30 MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
1 GHz ↔ Fc1 – 60 MHz or 2 100 MHz *Whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1
Fc1 – 60 MHz or 2 100 MHz whichever is the higher ↔ Fc1 – 50 MHz or 2 100 MHz whichever is the higher	-25 dBm	1 MHz	Specification in accordance with ~~more stringent than~~ ITU-R SM.329-8~~7~~, subclause 4.3~~1~~ and Annex 7
Fc1 – 50 MHz or 2100 MHz whichever is the higher ↔ Fc2 + 50 MHz or 2180 MHz whichever is the lower	-15 dBm	1 MHz	Specification in accordance with ~~more stringent than~~ ITU-R SM.329-8~~7~~, subclause 4.3~~1~~ and Annex 7
Fc2 + 50 MHz or 2180 MHz whichever is the lower ↔ Fc2 + 60 MHz or 2 180 MHz Whichever is the lower	-25 dBm	1 MHz	Specification in accordance with ~~more stringent than~~ ITU-R SM.329-8~~7~~, subclause 4.3~~1~~ and Annex 7
Fc2 + 60 MHz or 2 180 MHz *Whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8~~7~~, subclause 4.1. Upper frequency as in ITU-R SM.329-8~~7~~, subclause 2.5, Table 1~~6~~
Fc1: Center frequency of first carrier frequency used. Fc2: Center frequency of last carrier frequency used.			

3GPP TSG RAN WG4 Meeting #16 **R4-010341**

Vienna, Austria 19th - 23rd February 2001

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CHANGE REQUEST

⌘ **25.141** **CR** **74** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Corrections to Blocking and Rx Spurious emissions tests in TS 25.141
Source:	⌘	RAN WG4
Work item code:	⌘	-
Date:	⌘	2001-02-17
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	The Blocking test procedure had an incorrect definition of how to set the frequency offset. The Rx spurious test procedure did not list the 1 MHz measurement bandwidth.
Summary of change:	⌘	These two errors in the tests are now corrected
Consequences if not approved:	⌘	The test procedures would have been inconsistent with the core requirement.

Clauses affected:	⌘	7.5.4, 7.7.4
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

7.5.4 Method of test

7.5.4.1 Initial conditions

1) Connect WCDMA signal generator at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

2) Terminate any other Rx port not under test.

3) Transmit a signal from the WCDMA signal generator to the BS. The characteristics of the signal shall be set according to the UL reference measurement channel (12,2 kbit/s) specified in annex A subclause A.2.1. The level of the WCDMA signal measured at the BS antenna connector shall be set to the level specified in subclause 7.5.2.

7.5.4.2 Procedure

1) Set the signal generator to produce an interfering signal at a frequency offset Fuw from the assigned channel frequency of the wanted signal which is given by:

$$Fuw = \pm (n \times 1\ MHz),$$

where n shall be increased in integer steps from n = 1~~0~~ up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in table 7.4. The type of the interfering signal is either equivalent to a continuous WCDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see table 7.4.

2) Measure the BER of the wanted signal at the BS receiver.

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10 000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

3) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (2).

<Editor's note: The above NOTE is taken from proposal for TDD specification (R4-99789). Precise parameters for this 2-phase measurement shall be specified. >

7.7.4 Method of test

7.7.4.1 Initial conditions

1) Connect a measurement receiver to the BS antenna connector as shown in annex B.
2) Enable the BS receiver.
3) Start BS transmission with channel configuration as specified in the table 6.1 and 6.2 (Test model 1).

7.7.4.2 Procedure

1) Set measurement equipment parameters as specified in table 7.6.
2) Measure the spurious emissions over each frequency range described in subclause 7.7.2.
3) Repeat test using diversity antenna connector if available.

Table 7.6

Measurement Band width	3.84 MHz (Root raised cosine,0.22) / 100 kHz / 1 MHz (note)
Sweep frequency range	9 kHz to 12.75GHz
Detection	True RMS
NOTE: As defined in subclause 7.7.2.	

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CHANGE REQUEST

⌘ **25.141** **CR** **75** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Rx spurious emissions measurement bandwidth in 25.141
Source:	⌘	RAN WG4
Work item code:	⌘	-
Date:	⌘	2001-02-21
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	The Rx spurious test procedure does not list the 1 MHz measurement bandwidth.
Summary of change:	⌘	The 1 MHz bandwidth is added to the Rx spurious tests
Consequences if not approved:	⌘	The test procedure would have been inconsistent with the core requirement.

Clauses affected:	⌘	7.7.4
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications ⌘
Other comments:	⌘	

7.7.4 Method of test

7.7.4.1 Initial conditions

1) Connect a measurement receiver to the BS antenna connector as shown in annex B.
2) Enable the BS receiver.
3) Start BS transmission with channel configuration as specified in the table 6.1 and 6.2 (Test model 1).

7.7.4.2 Procedure

1) Set measurement equipment parameters as specified in table 7.6.
2) Measure the spurious emissions over each frequency range described in subclause 7.7.2.
3) Repeat test using diversity antenna connector if available.

Table 7.6

Measurement Band width	3.84 MHz (Root raised cosine,0.22) / 100 kHz / 1 MHz (note)
Sweep frequency range	9 kHz to 12.75GHz
Detection	True RMS
NOTE: As defined in subclause 7.7.2.	

3GPP TSG RAN WG4 Meeting #16 **R4-010434**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **TS 25.141 CR 76** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Conditions for BS conformance testing (FDD)
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2001-02-17
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential 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:	⌘	Missing specifications for the test conditions (test environment and RF channels to be tested) of each individual test
Summary of change:	⌘	Introduction of specifications for the test conditions into the conformance test description for each parameter
Consequences if not approved:	⌘	Incomplete definition of the test conditions may result in non-consistent conformance measurements

Clauses affected:	⌘	4.8, 5, 6, 7, 8
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This is a revision of the CR in R4-010214

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.8 Specified frequency range

The manufacturer shall declare:

- which of the frequency bands defined in sub-clause 3.4 is supported by the BS.
- the frequency range within the above frequency band(s) supported by the BS.

Many tests in this TS are performed with appropriate frequencies in the bottom, middle and top of the operating frequency band of the BS. These are denoted as RF channels B (bottom), M (middle) and T (top).

When a test is performed by a test laboratory, the UARFCNs to be used for RF channels B, M and T shall be specified by the laboratory. The laboratory may consult with operators, the manufacturer or other bodies.

When a test is performed by a manufacturer, the UARFCNs to be used for RF channels B, M and T may be specified by an operator.

5 Format and interpretation of tests

Each test in the following clauses has a standard format:

X Title

All tests are applicable to all equipment within the scope of the present document, unless otherwise stated.

X.1 Definition and applicability

This subclause gives the general definition of the parameter under consideration and specifies whether the test is applicable to all equipment or only to a certain subset.

X.2 Conformance requirements

This subclause describes the requirement under test has to fulfil to ensure compliance with the relevant specification.

In addition, this subclause contains the reference to the subclause to the 3GPP reference (or core) specification from which the conformance requirements are derived.

X.3 Test purpose

This subclause defines the purpose of the test.

X.4 Method of test

X.4.1 Initial conditions

This subclause defines the initial conditions for each test, including the test environment, the RF channels to be tested and the basic measurement set-up.

X.4.2 Procedure

This subclause describes the steps necessary to perform the test and provides further details of the test definition like point of access (e.g. antenna port), domain (e.g. frequency-span), range, weighting (e.g. bandwidth), and algorithms (e.g. averaging).

X.5 Test requirements

This subclause defines the pass/fail criteria for the equipment under test.

6.2.1 Base station maximum output power

6.2.1.1 Definition and applicability

Maximum output power, Pmax, of the base station is the mean power level per carrier measured at the antenna connector in specified reference condition.

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.

6.2.1.2 Conformance requirement

In normal conditions, the Base station maximum output power shall remain within +2.7 dB and –2.7 dB of the manufacturer's rated output power.

In extreme conditions, the Base station maximum output power shall remain within +3.2 dB and –3.2 dB of the manufacturer's rated output power.

The reference for this requirement is in TS 25.104 [1] subclause 6.2.1.

NOTE: The test limits include test tolerance as outlined in Annex F.

6.2.1.3 Test purpose

The test purpose is to verify the accuracy of the maximum output power across the frequency range and under normal and extreme conditions for all transmitters in the BS.

6.2.1.4 Method of test

6.2.1.4.1 ~~6.2.1.4.1~~ Initial conditions

Test environment: normal; see subclause 4.4.1.

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

In addition, on one UARFCN only, the test shall be performed under extreme power supply as defined in subclause 4.4.2

NOTE: Tests under extreme power supply also test extreme temperature.

1) Connect the power measuring equipment to the base station RF output port.

6.2.1.4.2 Procedure

1) Set the base station to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model1 in subclause 6.1.1.1.

2) Measure the mean power at the RF output port over a certain slots.

6.2.1.5 Test requirements

Maximum output power requirement shall be met as specified in subclause 6.2.1.2.

6.2.2 CPICH power accuracy

6.2.2.1 Definition and applicability

CPICH power accuracy is defined as the maximum deviation between the ordered channel power and the power in that channel measured at the TX antenna interface. The requirement is applicable for all BS types.

6.2.2.2 Conformance Requirement

The measured CPICH power shall be within ±2.1dB of the ordered absolute value. The reference for this requirement is in TS 25.104 [1] subclause 6.4.4

6.2.2.3 Test purpose

The purpose of the test is to verify, that the BS under test delivers CPICH power within margins, thereby allowing reliable cell planning and operation.

6.2.2.4 Method of test

6.2.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

~~1) Establish applicable temperature and supply voltage, as specified in subclause 4.4.~~

1~~2~~) Connect BS to code domain analyser as shown in annex B.

2~~3~~) Disable inner loop power control.

3~~4~~) Set-up BS transmission at maximum total power as specified by the supplier. Channel set-up shall be according to subclause 6.1.1.2.

6.2.2.4.2 Procedure

1) Measure the power in the PCCPCH and PCPICH according to annex E.
2) Repeat the measurement for all other applicable temperatures and supply voltages.

6.2.2.5 Test requirement

The measured CPICH power shall meet the requirements as specified in 6.2.2.2

6.3 Frequency error

6.3.1 Definition and applicability

Frequency error is the measure of the difference between the actual BS transmit frequency and the assigned frequency. The same source shall be used for RF frequency and data clock generation.

It is not possible to verify by testing that the data clock is derived from the same frequency source as used for RF generation. This may be confirmed by a manufacturers declaration

6.3.2 Conformance requirement

The Frequency Error shall be within ± 0.05 PPM.

The reference for this requirement is in TS 25.104 [1] subclause 6.3

6.3.3 Test purpose

To verify that the Frecuency Error is within the limit specified in 6.3.2

6.3.4 Method of test

6.3.4.1. ~~6.3.4.1.~~ Initial Conditions

Test environment: normal; see subclause 4.4.1

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

The following additional tests shall be performed:

a) On each of B, M and T, the test shall be performed under extreme power supply as defined in subclause 4.4.2

NOTE: Tests under extreme power supply also test extreme temperature.

1) Connect the base station RF output port to the test equipment. Refer to annex B.1.2 for a functional block diagram of the test set-up.

2) Set the base station to transmit a signal modulated with PCCPCH. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

6.3.4.2. Procedure

1) Measure the Frequency Error according to annex E.

6.3.5 Test requirement

The Frequency Error shall meet the limit specified in 6.3.2

6.4 Output power dynamics

Power control is used to limit the interference level. The BS transmitter uses a quality-based power control on the downlink. The physical channels for the following test(s) shall be set-up according to subclause 6.1.1.2.

6.4.1 Inner loop power control

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

6.4.2 Power control steps

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.2.1 Definition and applicability

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.2.2 Conformance requirement

The BS transmitter shall have the capability of setting the inner loop output power with a step sizes of 1 dB mandatory and 0,5 dB optional.

a) The tolerance of the power control step due to inner loop power control shall be within the range shown in table 6.9.

b) The tolerance of the combined output power change due to inner loop power control shall be within the range shown in table 6.10a.

Table 6.9: Transmitter power control step tolerance

Power control commands in the down link	Transmitter power control step tolerance			
	1 dB step size		0,5 dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+0,5 dB	+1,5 dB	+0,25 dB	+0,75 dB
Down(TPC command "0")	-0,5 dB	-1,5 dB	-0,25 dB	-0,75 dB

Table 6.10a: Transmitter combined output power tolerance

Power control commands in the down link	Transmitter combined output power change tolerance after 10 consecutive equal commands (up or down)			
	1 dB step size		0.5dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+8 dB	+12 dB	+4 dB	+6 dB
Down(TPC command "0")	-8 dB	-12 dB	-4 dB	-6 dB

The reference for this requirement is TS 25.104 [1] subclause 6.4.1.1.1

6.4.2.3 Test purpose

To verify those requirements for the power control step size and response are met as specified in subclause 6.4.2.2.

6.4.2.4 Method of test

6.4.2.4.1 ~~6.4.2.4.1~~ 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 suitable measurement equipment to the BS antenna connector as shown in annex B.

2) Start BS transmission with channel configuration as specified in table 6.3 Test model 2.

3) Establish downlink power control with parameters as specified in table 6.10b.

Table 6.10b

Parameter	Level/status	Unit
UL signal level	Ref.sens + 10 dB	dBm/3,84 MHz
Data sequence	PN9	

6.4.2.4.2 Procedure

1) Set and send alternating TPC bits from the UE simulator or UL signal generator.

2) Measure mean power level of the code under the test each time TPC command is transmitted. All steps within power control dynamic range declared by manufacturer shall be measured. Use the code power measurement method defined in annex E.

3) Measure the 10 highest and the 10 lowest power step levels within the power control dynamic range declared by manufacturer by sending 10 consecutive equal commands as described table 6.10a.

4) Check that average step size tolerance requirement shall be met.

6.4.2.5 Test requirement

a) BS shall fulfil step size requirement for all power control steps declared by manufacture as specified in subclause 6.4.2.2.

b) For all measured Up/Down cycles, the difference of transmission power between before and after 10 equal commands (Up and Down), derived in step (3), shall not exceed the prescribed range in subclause 6.4.2.2.

6.4.3 Power control dynamic range

6.4.3.1 Definition and applicability

The power control dynamic range is difference between the maximum and the minimum transmit output power of a code channel for a specified reference condition. Transmit modulation shall be maintained within whole dynamic range as specified in TS 25.104 subclause 6.8.

6.4.3.2 Conformance requirement

Down link (DL) power control dynamic range:

- maximum power: BS maximum output power -3 dB or greater;
- minimum power: BS maximum output power -28 dB or less.

The reference for this requirement is TS 25.104 [1] subclause 6.4.2.1.

6.4.3.3 Test purpose

To verify that the minimum power control dynamic range is met as specified in subclause 6.4.3.2.

6.4.3.4 Method of test

6.4.3.4.1 ~~6.4.3.4.1~~ 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 measurement equipment to the BS antenna connector as shown in annex B.

2) Channel configuration defined in table 6.3 Test model 2 shall be used.

3) Set BS frequency.

4) Star BS transmission.

6.4.3.4.2 Procedure

Pmax shall be defined as described in subclause 6.2.1 Base station maximum output power.

1) Set power of the DPCH under test to the Pmax-3 dB level. Power levels for other code channels shall be adjusted as necessary.

2) Measure mean power level of the code channel under test. Use the code power measurement method defined in annex E.

3) Set power of the DPCH under test to the minimum value by means determined by the manufacturer. Power levels for other code channels shall remain unchanged.

4) Measure mean power level of the code channel under test.

6.4.3.5 Test requirement

Power control dynamic range requirement shall be met as specified in subclause 6.4.3.2.

6.4.4 Total power dynamic range

6.4.4.1 Definition and applicability

The total power dynamic range is difference between the maximum and the minimum transmit output power for a specified reference condition.

6.4.4.2 Conformance requirement

The down link (DL) total power dynamic range shall be 18 dB or greater. The reference for this requirement is TS 25.104 [1] subclause 6.4.3.1.

6.4.4.3 Test purpose

To verify that the total power dynamic range is met as specified in TS 25.104 subclause 6.4.3.1. The test is to ensure that the total output power can be reduced while still transmitting a single code. This is to ensure that the interference to neighbouring cells is reduced.

6.4.4.4 Method of test

Requirement is tested together with Error Vector Magnitude test, as described in subclause 6.7.1

6.4.4.5 Test requirement

BS shall achieve total power dynamic range as specified in subclause 6.4.4.2.

6.5 Output RF spectrum emissions

The physical channels for the following test(s) shall be set-up according to subclause 6.1.1.1.

6.5.1 Occupied bandwidth

6.5.1.1 Definition and applicability

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage $\beta/2$ of the total mean transmitted power.

The value of $\beta/2$ should be taken as 0,5%.

6.5.1.2 Conformance requirements

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

The reference for this requirement is TS 25.104 subclause 6.6.1.

6.5.1.3 Test purpose

The occupied bandwidth, defined in the Radio Regulations of the International Telecommunication Union ITU, is a useful concept for specifying the spectral properties of a given emission in the simplest possible manner; see also Recommendation ITU-R Recommendation SM.328-9 [7]. The test purpose is to verify that the emission of the BS does not occupy an excessive bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

6.5.1.4 Method of test

6.5.1.4.1 ~~6.5.1.4.1~~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 Measurement device to the BS antenna connector.

2) Start transmission on a single carrier according to test model defined in subclause 6.1.1.1.

6.5.1.4.2 Procedure

1) Measure the spectrum of the transmitted signal across a span of 10 MHz, based on an occupied bandwidth requirement of 5 MHz. The selected resolution bandwidth (RBW) filter of the analyzer shall be 30 kHz or less. The spectrum shall be measured at 400 or more points across the measurement span.

NOTE: The detection mode of the spectrum analyzer will not have any effect on the result if the statistical properties of the out-of-OBW power are the same as those of the inside-OBW power. Both are expected to have the Rayleigh distribution of the amplitude of Gaussian noise. In any case where the statistics are not the same, though, the detection mode must be power responding. There are at least two ways to be power responding. The spectrum analyzer can be set to "sample" detection, with its video bandwidth setting at least three times its RBW setting. Or the analyzer may be set to respond to the average of the power (root-mean-square of the voltage) across the measurement cell.

2) Compute the total of the power, P0, (in power units, not decibel units) of all the measurement cells in the measurement span. Compute P1, the power outside the occupied bandwidth on each side. P1 is half of the total power outside the bandwidth. P1 is half of (100 % - (occupied percentage)) of P0. For the occupied percentage of 99 %, P1 is 0.005 times P0.

3) Determine the lowest frequency, f1, for which the sum of all power in the measurement cells from the beginning of the span to f1 exceeds P1.

4) Determine the highest frequency, f2, for which the sum of all power in the measurement cells from the end of the span to f2 exceeds P1.

5) Compute the occupied bandwidth as f2 - f1.

6.5.1.5 Test requirements

The bandwidth calculated in step (5) of subclause 6.5.1.4.2 shall be less than 5 MHz.

6.5.2 Out of band emission

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

6.5.2.1 Spectrum emission mask

6.5.2.1.1 Definitions and applicability

The mask defined in Tables 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.2 Conformance requirements

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.11 to 6.14 for the appropriate BS maximum output power, in the frequency range from Δf =2.5 MHz to f_offset_{max} from the carrier frequency, where:m

- Δf is the separation between the carrier frequency and the nominal –3dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the carrier frequency and the centre of the measurement filter;
- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in subclause 3.4.1, whichever is the greater.

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

Table 6.11: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 12.5 – 15·(f_offset- 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0 MHz ≤ f_offset < f_offset_{max}	-11.5 dBm	1 MHz

Table 6.12: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-12.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dBm	1 MHz

Table 6.13: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 51.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P – 51.5 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 63.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 50.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dBm	1 MHz

Table 6.14: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-20.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-20.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-32.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-19.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	-23.5 dBm	1 MHz

The reference for this requirement is in TS 25.104 [1] subclause 6.6.2.1

NOTE: The test limits include test tolerances as outlined in Annex F.

6.5.2.1.3 Test purpose

This test measures the emissions of the BS, close to the assigned channel bandwidth of the wanted signal, while the transmitter is in operation.

6.5.2.1.4 Method of test

6.5.2.1.4.1 ~~6.5.2.1.4.1~~ Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Set-up the equipment as shown in annex A.

2) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4.0 MHz shall use a 30 kHz measurement bandwidth.

3) Measurements with an offset from the carrier centre frequency between 4.0 MHz and (Δf_{max} – 500 kHz).shall use a 1 MHz measurement bandwidth. The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements

4) Detection mode: True RMS.

6.5.2.1.5 Procedures

1) Set the BS to transmit a signal in accordance to test model 1, subclause 6.2.1.1.1 at by the manufacturer specified maximum output power.

2) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6.5.2.1.6 Test requirements

In all measurements, the requirements according to subclause 6.5.2.1.2 shall be fulfilled.

6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.5.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

6.5.2.2.2 Conformance requirement

Table 6.15: BS ACLR

BS channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	44.2 dB
10 MHz	49.2 dB

The reference for this requirement is in TS 25.104 [1] subclause 6.5.2.2

NOTE: The test limits include test tolerances as outlined in Annex F.

6.5.2.2.3 Test purpose

To verify that the adjacent channel leakage power ratio requirement shall be met as specified in subclause 6.5.2.2.2.

6.5.2.2.4 Method of test

6.5.2.2.4.1 ~~6.5.2.2.4.1~~ 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 measurement device to the base station RF output port as shown in annex B.
2) The measurement device characteristics shall be:
   - measurement filter bandwidth: defined in subclause 6.5.2.2.1;
   - detection mode: true RMS voltage or true average power.
3) Set the base station to transmit a signal modulated in accordance with 6.1.1.1 Test model 1. Total power at the RF output port shall be the maximum output power as specified by the manufacturer.
4) Set carrier frequency within the frequency band supported by BS. Minimum carrier spacing shall be 5 MHz and maximum carrier spacing shall be specified by manufacturer.

6.5.2.2.4.2 Procedure

1) Measure Adjacent channel leakage power ratio for 5 MHz and 10 MHz offsets both side of channel frequency. In multiple carrier case only offset frequencies below the lowest and above the highest carrier frequency used shall be measured.
2) All RF channel configurations supported by BS shall be verified.

6.5.2.2.5 Test requirement

Adjacent channel leakage power ratio requirement shall be met as specified in subclause 6.5.2.2.2.

6.5.3 Spurious emissions

6.5.3.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions. This is measured at the base station RF output port.

The requirement applies at frequencies within the specified frequency ranges, which are more than 12.5 MHz under the first carrier frequency used or more than 12.5 MHz above the last carrier frequency used.

The requirements of either subclause 6.5.3.4.1 or subclause 6.5.3.4.2 shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

Unless otherwise stated, all requirements are measured as mean power (RMS).

6.5.3.2 Test purpose

This test measures conducted spurious emission from the BS transmitter antenna connector, while the transmitter is in operation.

6.5.3.3 Test case

Test environment: normal; see subclause 4.4.1.

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

The BS shall be configured with transmitters active at their maximum output power for all transmission modes foreseen by the manufacturer's specification.

Set the base station to transmit a signal as stated in subclause 6.1.1.1. Total power at the RF Output port shall be the nominal power as specified by the manufacturer.

The transmitter antenna connector shall be connected to a measurement receiver with the same characteristic impedance, using an attenuator or directional coupler if necessary.

The detecting device shall be configured with a measurement bandwidth as stated in the tables.

6.5.3.4 Conformance Requirements

6.5.3.4.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation [4], are applied.

6.5.3.4.1.1 Minimum Requirement

The power of any spurious emission shall be attenuated by at least the minimum requirement.

Table 6.16: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9 kHz to 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
150 kHz to 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
30 MHz to 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
1 GHz to 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-7, subclause 2.6

6.5.3.4.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation [4], are applied.

6.5.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.17: BS Mandatory spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9 kHz ↔ 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
150 kHz ↔ 30 MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
1 GHz ↔ Fc1 – 60 MHz or 2 100 MHz *Whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
Fc1 – 60 MHz or 2 100 MHz whichever is the higher ↔ Fc1 – 50 MHz or 2 100 MHz whichever is the higher	-25 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc1 – 50 MHz or 2100 MHz whichever is the higher ↔ Fc2 + 50 MHz or 2180 MHz whichever is the lower	-15 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc2 + 50 MHz or 2180 MHz whichever is the lower ↔ Fc2 + 60 MHz or 2 180 MHz Whichever is the lower	-25 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc2 + 60 MHz or 2 180 MHz *Whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1. Upper frequency as in ITU-R SM.329-7, subclause 2.6
Fc1: Center frequency of first carrier frequency used. Fc2: Center frequency of last carrier frequency used.			

6.5.3.4.3 Protection of the BS receiver

This requirement may be applied in order to prevent the receiver of the BS being desensitised by emissions from the BS transmitter which are coupled between the antennas of the BS.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

This requirement is not applicable to antenna ports which are used for both transmission and reception (e.g. which have an internal duplexer).

NOTE: In this case, the measurement of Reference Sensitivity will directly show any desensitization of the receiver.

6.5.3.4.3.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.18: BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
1 920 MHz to 1 980 MHz For operation in Frequency Bands defined in subclause 3.4.1(a)	-96 dBm	100 kHz	
1 850 MHz to 1 910 MHz For operation in Frequency Bands defined in subclause 3.4.1(b)	-96 dBm	100kHz	

6.5.3.4.4 Co-existence with GSM 900

6.5.3.4.4.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

6.5.3.4.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.19: BS Spurious emissions limits for BS in geographic coverage area of GSM 900

Band	Maximum Level	Measurement Bandwidth	Note
921 MHz to 960 MHz	-57 dBm	100 kHz	

6.5.3.4.4.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.

6.5.3.4.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.20: BS Spurious emissions limits for protection of the BTS receiver

Band	Maximum Level	Measurement Bandwidth	Note
876 MHz to 915 MHz	–98 dBm	100 kHz	

6.5.3.4.5 Co-existence with DCS 1800

6.5.3.4.5.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

6.5.3.4.5.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.21: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800

Band	Maximum Level	Measurement Bandwidth	Note
1 805 MHz to 1 880 MHz	-47 dBm	100 kHz	

6.5.3.4.5.2 Co-located basestations

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

6.5.3.4.5.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.22: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum Level	Measurement Bandwidth	Note
1 710 MHz to 1 785 MHz	-98 dBm	100 kHz	

6.5.3.4.6 Co-existence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.

6.5.3.4.6.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.23: BS Spurious emissions limits for BS in geographic coverage area of PHS

Band	Maximum Level	Measurement Bandwidth	Note
1 893,5 MHz to 1 919,60 MHz	-41 dBm	300 kHz	

6.5.3.4.7 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to 2 110 MHz to 2 170 MHz, as defined in subclause 3.4.1(a) and 1 930 MHz to 1 990 MHz, as defined in subclause 3.4.1(b) in geographic areas in which both an adjacent band service and UTRA are deployed.

6.5.3.4.7.1 Minimum requirement

The power of any spurious emission shall not exceed.

Table 6.24: BS spurious emissions limits for protection of adjacent band services

Band (f)	Maximum Level	Measurement Bandwidth	Note
2 100 MHz to 2 105 MHz For operation in frequency bands as defined in subclause 3.4.1(a)	-30 + 3,4 (f - 2 100 MHz) dBm	1 MHz	
2 175 MHz to 2 180 MHz For operation in frequency bands as defined in subclause 3.4.1(a)	-30 + 3,4 (2 180 MHz - f) dBm	1 MHz	
1 920 MHz to 1 925 MHz For operation in frequency bands as defined in subclause 3.4.1(b)	-30 + 3,4 (f – 1 920 MHz) dBm	1 MHz	
1 995 MHz to 2 000 MHz For operation in frequency bands as defined in subclause 3.4.1(b)	-30 +3,4 (2 000 MHz – f) dBm	1 MHz	

6.5.3.4.8 Co-existence with UTRA-TDD

6.5.3.4.8.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

6.5.3.4.8.1.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.25: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1 900 MHz to 1 920 MHz	-52 dBm	1 MHz	
2 010 MHz to 2 025 MHz	-52 dBm	1 MHz	

6.5.3.4.8.2 Co-located base stations

This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.5.3.4.8.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.26: BS Spurious emissions limits for BS co-located with UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1 900 MHz to 1 920 MHz	–86 dBm	1 MHz	
2 010 MHz to 2 025 MHz	–86 dBm	1 MHz	

6.6 Transmit intermodulation

6.6.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

The transmit intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into an antenna connector at a level of 30 dB lower than that of the wanted signal. The frequency of the interference signal shall be 5 MHz, 10 MHz and 15 MHz offset below the first or above the last carrier frequency used.

The requirements are applicable for single carrier BS.

6.6.2 Conformance requirement

The transmit intermodulation level shall not exceed the out of band emission or the spurious emission requirements of subclauses 6.5.2 and 6.5.3.

The reference for this requirement is in TS 25.104 [1] subclause 6.7

6.6.3 Test purpose

The test purpose is to verify the ability of the BS transmitter to restrict the generation of intermodulation products in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna to below specified levels.

6.6.4 Method of test

6.6.4.1 ~~6.6.4.1~~ Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Test set-up in accordance to annex B.

6.6.4.2 Procedures

1) Generate the wanted signal in accordance to test model 1, subclause 6.1.1.1 at specified maximum BS output power.
2) Generate the interference signal (WCDMA signal as specified in the table 6.1 and 6.2 (Test model 1)) with frequency offset of 5 MHz relative to the wanted signal in accordance to test model 2, subclause 6.1.1.2.
3) Adjust ATT1 so the level of the WCDMA modulated interference signal at BS is 30 dB below the wanted signal.
4) Perform the out of band emission test as specified in subclause 6.5.2.
5) Perform the spurious emission test as specified in subclause 6.5.3.
6) Verify that the emission level does not exceed the required level with the exception of interference signal frequencies.
7) Repeat the test for interference frequency off set of -5 MHz.
8) Repeat the test for interference frequency off set of ±10 MHz and ±15 MHz.

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). Due to difficulties estimating the power of the non-orthogonal SCH, the period of the SCH is excluded.

6.7.1.2 Conformance Requirement

The Error Vector Magnitude shall be less than 17.5%

The reference for this requirement is in TS 25.104 [1] subclause 6.8.2

6.7.1.3 Test Purpose

To verify that the Error Vector Magnitude is within the limit specified in 6.7.1.2

6.7.1.4 ~~6.7.1.4~~ Method of Test

6.7.1.4.1 Initial Conditions

Test environment: normal; see subclause 4.4.1.

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

Refer to annex B for a functional block diagram of the test set-up.

1) ~~1)~~ Connect the base station RF output port to the measurement equipment.

6.7.1.4.2 Procedure

1~~2~~) Set the base station to transmit a signal according to 6.2.1.3.1 (test model 4) on the main path only. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

2~~3~~) Trigger the test equipment from the system time reference signal from the base station.

<Editor's note: Precise definition of "Triggering signal" shall be needed.>

3~~4~~) Measure the Error Vector Magnitude as defined in annex E.

4~~5~~) If the base station supports STTD or TxAA, repeat steps 1 through 4 with the diversity path (antenna connector 2) enabled instead of the main path

6.7.1.5 Test Requirement

The Error Vector Magnitude measured in 6.7.2.4 step 4 shall meet the limit specified in 6.7.2.2

6.7.2 Peak Code Domain Error

6.7.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting the error vector (as defined in 6.7.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. The measurement interval is one power control group (timeslot). Due to the non-orthogonal SCH mapping to all the OVSF codes, the period of the SCH is excluded.

6.7.2.2 Conformance requirement

The peak code domain error shall not exceed -33 dB at spreading factor 256.

The reference for this requirement is in TS 25.104[1] subclause 6.8.3.

6.7.2.3 Test Purpose

It is the purpose of this test to discover and limit inter-code cross-talk.

6.7.2.4 Method of test

6.7.2.4.1 ~~6.7.2.4.1~~ 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 measurement equipment to the BS antenna connector as shown in annex B. For non-transmit diversity modes, connect the antenna connector as shown in Figure B.2. If STTD or TxAA is supported by the BS, connect both antenna connectors as shown in Figure B.6.

2) Channel configuration defined in subclause 6.1.1.3 Test model 3 shall be used.

<Suggested Editor's Note: Changes to Test model 3 for TD tests are ffs>

3) Set BS frequency.

4) Start BS transmission

6.7.2.4.2 Procedure

1) Measure Peak code domain error according to annex E.

6.7.2.5 Test requirement

Peak code domain error shall meet the requirement as specified in subclause 6.7.2.2.

7 Receiver characteristics

7.1 General

Unless otherwise stated, all tests in this clause shall be performed at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a RX amplifier, a diplexer, a filter or the combination of such devices is used, the tests according to subclauses 4.6.2 and/or 4.6.4, depending on the device added, shall be performed to ensure that the requirements are met at test port B.

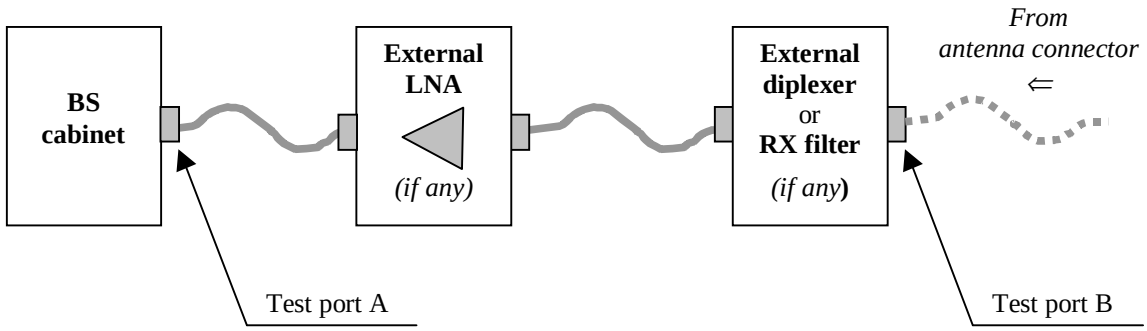

Figure 7.1: Receiver test ports

The tests in clause 7 assume that the receiver is not equipped with diversity. For receivers with diversity, unless otherwise stated, tests shall be performed by applying the specified signals to one of the receiver inputs, and terminating or disabling the other(s). The tests and requirements are otherwise unchanged.

In all the relevant subclauses in this clause all Bit Error Ratio (BER), Residual BER (RBER) and Block Error Ratio (BLER) measurements shall be carried out according to the general rules for statistical testing in annex A.

If external BER measurement is not used then the internal BER calculation shall be used instead. When internal BER calculation is used, the requirements of the verification test according to 7.8 shall be met in advance.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

7.2 Reference sensitivity level

7.2.1 Definition and applicability

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the BER does not exceed the specific value indicated in subclause 7.2.2. This test is performed without interfering signal with power applied to the BS antenna connector according to annex B. In the case duplex operation is supported, the measurement configuration principle is indicated for one duplex branch also in Annex B. In case of internal BER calculation is used example of test connection is as shown in figure B.7 The reference point for signal power is at the input of receiver (antenna connector).

7.2.2 Conformance requirement

The BER shall not exceed 0,001 for the parameters specified in table 7.1.

Table 7.1: BS reference sensitivity levels

Data rate	BS reference sensitivity level (dBm)	FER/BER
12,2 kbps	-121 dBm	BER shall not exceed 0,001
NOTE: Should only be specified for a measurement channel.		

The reference for this requirement is in TS 25.104[1] subclause 7.2.

7.2.3 Test purpose

To verify the minimum receiver input power of a single code at which the BER does not exceed the specified limit.

7.2.4 Method of testing

7.2.4.1 ~~7.2.4.1~~ Initial conditions

Test environment: normal; see subclause 4.4.1

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

The following additional tests shall be performed:

a) On each of B, M and T, the test shall be performed under extreme power supply as defined in subclause 4.4.2

NOTE: Tests under extreme power supply also test extreme temperature.

1) Connect BS to be tested to RF signal source.
2) Set frequency.
3) Start transmit 12,2kbps DPCH with reference measurement channel defined in annex A to the BS under test (PN-9 data sequence or longer).
4) Disable TPC function.

7.2.4.2 Procedure

1) Calculate BER from at least 30000 received data bits.
2) Set test signal power level transmitted for corresponding data rate as specified in table 7.1.
3) Measure BER.

7.2.5 Test requirement

Requirements for RX reference sensitivity specified in subclause 7.2.2 shall be fulfilled.

7.3 Dynamic range

7.3.1 Definition and applicability

Receiver dynamic range is the receiver ability to handle a rise of interference in the reception frequency channel. The receiver shall fulfil a specified BER requirement for a specified sensitivity degradation of the wanted signal in the presence of an interfering AWGN signal in the same reception frequency channel.

Minimum bandwidth of AWGN interferer shall be 1.5 times chip rate –5.76 MHz for a chip rate of 3.84 MHz.

7.3.2 Conformance requirement

The BER shall not exceed 0,001 for the parameters specified in table 7.2.

Table 7.2: Dynamic range

Parameter	Level	Unit
Data rate	12,2	kbps
Wanted signal	-91	dBm
Interfering AWGN signal	-73	dBm/3.84 MHz

The reference for this requirement is in TS 25.104[1] subclause 7.3

7.3.3 Test purpose

The test purpose is to verify the ability of the BS to receive a single-code test signal of maximum with a BER not exceeding a specified limit.

7.3.4 Method of test

7.3.4.1 ~~7.3.4.1~~ 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 test equipment as shown in annex B.

7.3.4.2 Procedure

1) Adjust the signal generator for the wanted signal to -91 dBm.
2) Adjust the AWGN generator level to -73 dBm/3.84 MHz and set the frequency to the same frequency as the tested channel.
3) Measure the BER for the tested service and verify that it is below the specified level.

Repeat the measurement for the other RX port.

7.3.5 Test requirements

Dynamic range requirement shall be met as specified in subclause 7.3.2

7.4 Adjacent Channel Selectivity (ACS)

7.4.1 Definition and applicability

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The interference signal be detuned by F_{uw} MHz and modulated by a pseudo random binary sequence uncorrelated to the wanted signal.

7.4.2 Conformance requirement

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

Table 7.3: Adjacent channel selectivity

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	-115	dBm
Interfering signal	-52	dBm
Fuw (Modulated)	±5	MHz

The interference signal shall be wide band CDMA signal of single code.

The reference for this requirement is in TS 25.104[1] subclause 7.4.

7.4.3 Test purpose

The test purpose is to verify the ability of the BS receiver filter to suppress interfering signals in the channels adjacent to the wanted channel.

7.4.4 Method of test

7.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Set-up the equipment as shown in annex B.

7.4.4.2 Procedure

1) Generate the reference channel and adjust the ATT1 to set the input level to the base station under test to the specified -115 dBm.

2) Set-up the interference signal at the adjacent channel frequency and adjust the ATT2 to obtain the specified level of interference signal at the base station input. Note that the interference signal shall have an ACLR of at least 63 dB in order to eliminate the impact of interference signal adjacent channel leakage power on the ACS measurement.

3) Measure the BER and control that the measured value does not exceed the specified value (BER < 0,001).

4) Repeat the test for the port, which was terminated.

7.4.5 Test requirements

Adjacent channel selectivity requirement shall be met as specified in subclause 7.4.2

7.5 Blocking characteristics

7.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance shall apply at all frequencies as specified in table 7.4.

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

7.5.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.4.

Table 7.4(a): Blocking characteristics for operation in frequency bands in subclause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 920 MHz to 1 980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 900 MHz to 1 920 MHz 1 980 MHz to 2 000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 900 MHz and 2 000 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

Table 7.4(b): Blocking performance requirement for operation in frequency bands in subclause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 850 MHz to 1 910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 830 MHz to 1 850 MHz 1 910 MHz to 1 930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 830 MHz 1 930 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

The reference for these requirements is in TS 25.104[1] su bclause 7.5

7.5.3 Test purpose

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: M see subclause 4.8. The BS shall be configured to operate as close to the centre of the operating band as possible.

1) Connect WCDMA signal generator at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

2) Terminate any other Rx port not under test.

3) Transmit a signal from the WCDMA signal generator to the BS. The characteristics of the signal shall be set according to the UL reference measurement channel (12,2 kbit/s) specified in annex A subclause A.2.1. The level of the WCDMA signal measured at the BS antenna connector shall be set to the level specified in subclause 7.5.2.

7.5.4.2 Procedure

1) Set the signal generator to produce an interfering signal at a frequency offset Fuw from the assigned channel frequency of the wanted signal which is given by:

$$Fuw = \pm (n \times 1\ MHz),$$

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in table 7.4. The type of the interfering signal is either equivalent to a continuous WCDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see table 7.4.

2) Measure the BER of the wanted signal at the BS receiver.

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10 000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

3) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (2).

<Editor's note: The above NOTE is taken from proposal for TDD specification (R4-99789). Precise parameters for this 2-phase measurement shall be specified. >

7.5.5 Test requirements

In all measurements made according to subclause 7.5.4.2, the BER shall not exceed 0,001.

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.6.2 Conformance requirement

The intermodulation performance should be met when the following signals are applied to the receiver.

Table 7.5: Interferer signals for intermodulation performance requirement

Type of Signal	Offset	Signal level
Wanted signal	-	-115 dBm
CW signal	10 MHz	-48 dBm
WCDMA signal with one code	20 MHz	-48 dBm

The BER for wanted signal shall not exceed 0,001 for the parameters specified in table 7.5.

The reference for this requirement is in TS 25.104 [1] subclause 7.6

7.6.3 Test purpose

The test purpose is to verify the ability of the BS receiver to inhibit the generation of intermodulation products in its non-linear elements caused by the presence of two high-level interfering signals at frequencies with a specific relationship to the frequency of the wanted signal.

7.6.4 Method of test

7.6.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Set-up the equipment as shown in annex B.

7.6.4.2 Procedures

1) Generate the wanted signal (reference signal) and adjust ATT1 to set the signal level to the BS under test to the specified -115 dBm.

2) Adjust the signal generators to the frequency offset of +10 MHz (CW tone) and +20 MHz (WCDMA modulated) from the frequency of the wanted signal if possible.

3) Adjust the ATT2 and ATT3 to obtain the specified level of interference signal at the BS input.

4) Measure the BER and control that the measured value does not exceed the specified value.

5) Repeat the test for interference signal frequency offset of –10 MHz and -20 MHz for CW and WCDMA modulated respectively.

6) Repeat the whole test for the port which was terminated.

7.6.5 Test requirements

The BER for wanted signal shall not exceed 0,001.

7.7 Spurious Emissions

7.7.1 Definition and applicability

The spurious emission power is the power of the emissions generated or amplified in a receiver that appears at the BS antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For all BS with common RX and TX antenna port the transmitter spurious emission as specified in subclause 6.6.3 is valid.

7.7.2 Conformance requirements

The power of any spurious emission shall not exceed:

Table 7.7: Spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
1900 – 1980 MHz and 2010 – 2025 MHz	-78 dBm	3.84 MHz	
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

The reference for this requirement is in TS 25.104[1] subclause 7.7

7.7.3 Test purpose

The test purpose is to verify the ability of the BS to limit the interference caused by receiver spurious emissions to other systems.

7.7.4 Method of test

7.7.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: M see subclause 4.8

1) Connect a measurement receiver to the BS antenna connector as shown in annex B.
2) Enable the BS receiver.
3) Start BS transmission with channel configuration as specified in the table 6.1 and 6.2 (Test model 1).

7.7.4.2 Procedure

1) Set measurement equipment parameters as specified in table 7.6.
2) Measure the spurious emissions over each frequency range described in subclause 7.7.2.
3) Repeat test using diversity antenna connector if available.

Table 7.6

Measurement Band width	3.84 MHz (Root raised cosine,0.22) / 100 kHz (note)
Sweep frequency range	9 kHz to 12.75GHz
Detection	True RMS
NOTE: As defined in subclause 7.7.2.	

7.7.5 Test requirements

The all measured spurious emissions, derived in step (2), shall be within requirement limits as specified in subclause 7.7.2.

7.8 Verification of the internal BER calculation

7.8.1 Definition and applicability

Base Station System with internal BER calculation can synchronise it's receiver to known pseudo-random data sequence and calculates bit error ratio from the received data. This test is performed only if Base Station System has this kind of feature. All data rate's which are used in RX conformance testing shall be used in verification test. This test is performed by feeding measurement signal with known BER to the input of the receiver. Locations of the erroneous bits shall be randomly distributed within a frame. Erroneous bits shall be inserted to the data bit stream as shown in figure 7.1.

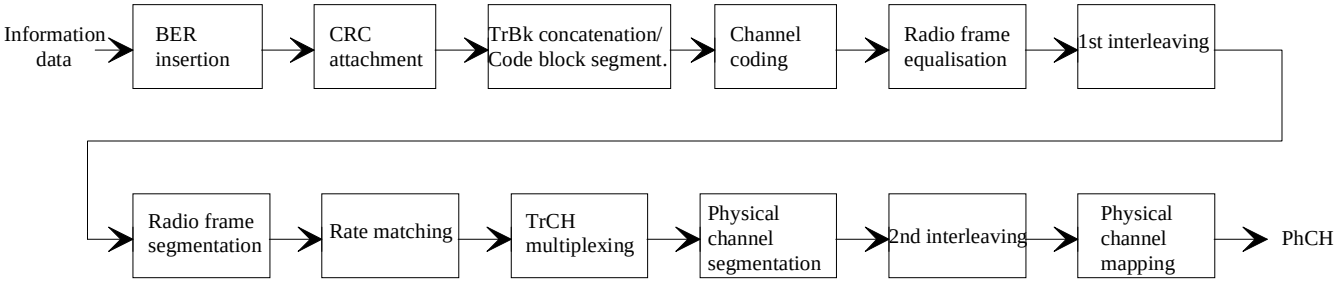

Figure 7.1: BER insertion into the information data

7.8.2 Conformance requirement

BER indicated by the Base Station System shall be within ±[10%] of the BER generated by the RF signal source. Measurement shall be repeated for each measurement signal specified in table 7.7.

Table 7.7

Transport channel combination	Data rate	BER
DPCH	12,2 kbps	BER 0,01
TBD	TBD	TBD
…	…	…
NOTE: 10 times larger BER generator is used to get a good confidence.		

7.8.3 Test purpose

To verify that the internal BER calculation accuracy shall meet requirements for conformance testing.

7.8.4 Method of test

7.8.4.1 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 BS RX antenna connector to the RF signal source or UE simulator as shown in annex B.
2) Set correct signal source parameters as specified in table 7.8.

Table 7.8

Parameter	Level/status	Unit
UL signal level	Ref.sens +10 dB	dBm/3,84 MHz
Data sequence	PN9 or longer	

7.8.4.2 Procedure

1) Measure the BER of received signal from RF signal source or UE simulator to BS antenna connector.
2) BER calculation shall be done at least over 50 000 bits.
3) Repeat test for all required data rates.

7.8.5 Test requirement

BER indicated by the Base Station System shall be within requirement as specified in subclause 7.8.2.

8 Performance requirement

8.1 General

All Bit Error Ratio (BER) and Block Error ratio (BLER) measurements shall be carried out according to the general rules for statistical testing defined in ITU-T Recommendation O.153 [5].

If external BLER measurement is not used then the internal BLER calculation shall be used instead. When internal BLER calculation is used, the requirements of the verification test according to 8.6 shall be met in advance.

Performance requirements are specified for a number of test environments and multi-path channel classes.

The requirements only apply to those measurement channels that are supported by the base station.

The requirements only apply to a base station with dual receiver antenna diversity. The required E_b/N_0 shall be applied separately at each antenna port.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

8.2 Demodulation in static propagation conditions

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 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 8.1 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.1 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 8.1 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 limits specified in table 8.1.

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 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 8.3 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [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 8.3 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 limits specified in table 8.3.

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 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 8.5 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [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 8.5 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the limits specified in table 8.5.

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 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	6.7 dB	7.5 dB
64 kbps	2.9 dB	3.3 dB	3.6 dB
144 kbps	2.3 dB	2.7 dB	3.1 dB
384 kbps	2.7 dB	3.1 dB	3.7 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.

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

5) Adjust the equipment so that required E_b/N_0 specified in table 8.7 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [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: Performance requirements 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	-102.3 dBm	-101.5 dBm
64 kbps	-98.9 dBm	-98.5 dBm	-98.2 dBm
144 kbps	-96.0 dBm	-95.6 dBm	-95.2 dBm
384 kbps	-91.3 dBm	-90.9 dBm	-90.3 dBm

6) For each of the data rates in table 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 limits specified in table 8.7.

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 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.

8.4.3.1 Method of test

8.4.3.1.1 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.

8.4.3.1.2 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 8.9 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.9 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 8.9 applicable for the base station, measure the BLER.

8.4.3.4 Test requirements

The BLER measured according to subclause 8.4.2.3.2 shall not exceed the limits specified in table 8.9.

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 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.

8.5.2.1 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.

8.5.2.2 Method of test

8.5.2.2.1 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.

8.5.2.2.2 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 8.11 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.11 is found in table 8.12

Table 8.12: Performance requirements 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 8.11 applicable for the base station, measure the BLER.

8.5.2.3 Test requirements

The BLER measured according to subclause 8.5.2.2.2 shall not exceed the limits specified in table 8.11.

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in clause 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the erroneous blocks shall be randomly distributed within a frame. Erroneous bits shall be inserted into the UL signal as shown in figure 8.1.

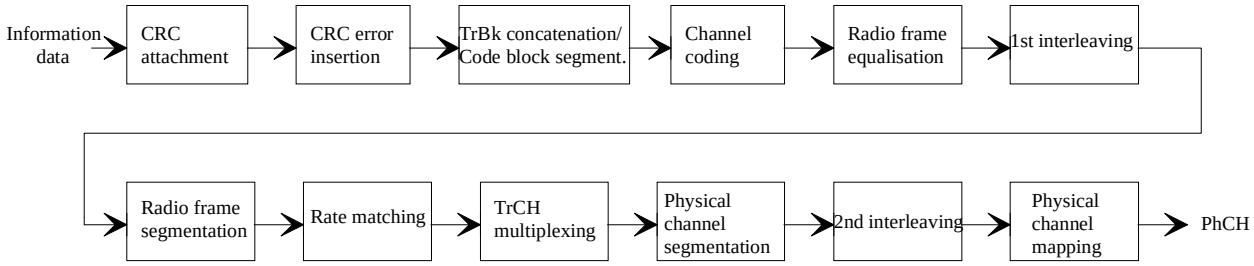

Figure 8.1: BLER insertion to the output data

8.6.2 Conformance requirement

BLER indicated by the Base Station System shall be within ±[10%] of the BLER generated by the RF signal source. Measurement shall be repeated for each signal rate as specified in table 8.13.

Table 8.13

Transport channel combination	Data rate	BLER
DPCH	12,2 kbps	BLER 0.01
DPCH	64 kbps	BLER 0.01
DPCH	144 kbps	BLER 0.01
DPCH	384 kbps	BLER 0.01

NOTE: 10 times larger BLER generator is used to get a good confidence.

8.6.3 Test purpose

To verify that the internal BLER calculation accuracy shall met requirements for conformance testing.

8.6.4 Method of test

8.6.4.1 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 to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

Table 8.14

Parameter	Level/status	Unit
UL signal level	Ref.sens +10 dB	dBm/3.84 MHz
Data sequence	PN9	

8.6.4.2 Procedure

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

2) The BLER insertion to the wanted signal shall be configured according to the corresponding data rate in table 8.7.

3) Adjust the BS tester so that the required UL signal level specified in table 8.14 is achieved.

For each of the data rates in table 8.13 applicable for the base station, measure the BLER at least over 50 000 blocks.

8.6.5 Test requirement

BLER indicated by the Base Station System shall be within requirement as specified in subclause 8.6.2.

8.7 Site Selection Diversity Transmission (SSDT) Mode

8.7.1 Definition and applicability

Site Selection Diversity Transmission (SSDT) mode is an optional feature of BS and is a macro diversity method in soft handover mode. In SSDT mode, the UE selects one of the cells from its active set to be "primary", all other active cells are classed as "non-primary". The non-primary cells switch off the DCH transmission. The primary cell ID code is delivered to active cells using uplink FBI field of DPCCH.

The requirements and this test apply only to Base Station which has a function of SSDT mode.

8.7.1.1 Conformance requirements

According to the conditions specified in Table 8.15, the downlink DPDCH and DPCCH are properly transmitted or stopped.

Table 8.15: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set in BS	dB	-5			
Uplink: $\frac{DPCH\_E_c}{I_o}$	dB	Q_{th} + 10	Q_{th} + 10	Q_{th} - 3	Q_{th} - 3
Cell ID transmitted by UE	-	A	B	A	B
Transmission Of downlink DPCCH	-	Yes	Yes	Yes	yes
Transmission Of downlink DPDCH	-	Yes	No	Yes	yes

The reference for this requirement is in TS 25.104 clause 8.6.

8.7.1.2 Test purpose

To verify that downlink transmission reaction of BS to Layer 1 feedback signalling messages from UE.

8.7.1.3 Method of test

8.7.1.3.1 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 a UE simulator and an AWGN noise source to the BS antenna connector as shown in Figure B.13.

2) Set up a call according to the Generic call setup procedure using parameters as specified in Table 8.15. SSDT Quality threshold Q_{th} should be set to the value specified by the manufacturer.

3) Activate SSDT function.

8.7.1.3.2 Procedure

1) Check downlink DCH, properly transmitted on or off, according to Table 8.15 under conditions of Test1 through Test4 with 3 types of Cell ID sets, “long”, ”medium” and “short”, respectively.

8.7.1.4 Test Requirements

Downlink DCH of the BS under test shall be transmitted or stopped properly according to the conditions specified in Table 8.15

3GPP TSG RAN WG4 Meeting #16 **R4-010437**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **77** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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 ☒ Core Network ☐

Title:	⌘	CR to 25.141 for Test Tolerances
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 23/02/01
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential 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:	⌘	Completion of test System uncertainties and Test Tolerances and formulas for TX an RX tests. Incorporation of new standard terminology and document structure for the handling of test tolerances.
Summary of change:	⌘	Section 4 is filled out along with Annex F test tolerance formulas. The three tests introduced in the previous version are reworded to align with the new approved structure for handling test tolerances.
Consequences if not approved:	⌘	The Test Requirements will be incorrect for many tests. Inconsistent wording could lead to confusion of the correct test requirements.

Clauses affected:	⌘	4, 5, 6.2.1, 6.5.2, Annex F, Annex G
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4 General test conditions and declarations

The requirements of this clause apply to all applicable tests in this specification.~~the present document, when applicable.~~

Many of the tests in this specification ~~e present document~~ measure a parameter relative to a value ~~which~~ that is not fully specified in the UTRA specifications. For these tests, the ~~conformance~~ Minimum ~~r~~Requirement is determined relative to a nominal value specified by the manufacturer.

Certain functions of a BS are optional in the UTRA specifications. Some requirements for the BS may be regional as listed in subclause 4.7.

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

4.1 Acceptable uncertainty of ~~measurement equipment~~Test System

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

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

For RF tests ~~I~~it should be noted that the ~~stated~~ uncertainties in subclause 4.1 apply to the ~~test equipment~~ Test System ~~only~~ operating into a nominal 50 ohm load and do not include system effects due to mismatch between the DUT and the ~~t~~Test ~~equipment~~System.

4.1.1 Measurement of test environments

The measurement accuracy of the BS test environments defined in Subclause 4.4, Test environments shall be.

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

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

4.1.2 Measurement of ~~T~~transmitter

Table 4.1.2 Maximum Test System Uncertainty for transmitter tests

Subclause	Maximum Test System Uncertainty	Range over which test system uncertainty applies
6.2.1 Maximum Output Power	±0.7 dB	
6.2.2 CPICH Power accuracy	± ~~[~~0.8~~]~~ dB	[Range of cpich relative to Ior]
6.3.4 Frequency error	± 12 Hz	Measurement results of ±500 Hz
6.4.2 Power control steps	± ~~[~~0.1~~]~~ dB for one 1 dB step ± ~~[~~0.1~~]~~ dB for ten 1 dB steps	
6.4.3 Power dynamic range	± ~~[~~>0.~~1~~2~~]~~ dB ~~± [>0.1] dB for ten 1 dB steps~~	[Ior range and the minimum code power (-32)]
6.4.4 Total power dynamic range	± ~~[1.0]~~0.3 dB	
6.5.1 Occupied Bandwidth	±100 kHz	Measurement results of ±1 MHz
6.5.2.1 Spectrum emission mask	±1.5 dB Due to carrier leakage, for measurements specified in a 1 MHz bandwidth close to the carrier (4 MHz to 8 MHz), integration of the measurement using several narrower measurements may be necessary in order to achieve the above accuracy.	
6.5.2.2 ACLR	5 MHz offset ± 0.8 dB 10 MHz offset ± 0.8 dB Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied. However, the above limits remain valid.	Signal power = P_Max
6.5.3 Spurious emissions	± 2.0 dB for BS and coexistance bands for results > -60 dBm ± 3.0 dB for results < -60 dBm Outside above range: f≤2.2GHz : ± 1.5 dB 2.2 GHz < f ≤ 4 GHz : ± 2.0 dB f > 4 GHz : ±4.0 dB	

6.6 Transmit intermodulation (interferer requirements)	The value below applies only to the the interference signal and is unrelated to the measurement uncertainty of the tests (6.5.2.1, 6.5.2.2 and 6.5.3) which have to be carried out in the presence of the interfer. Need to add formula for uncertainty of the ratio. ~~For spectrum mask:~~ ± ~~[~~2.5~~]~~1.0 dB ~~For spurious~~ ~~± 2.8 dB for BS and coexistnece bands for results > -60 dBm~~ ~~+4.6/−3.6 dB for results < -60 dBm~~ ~~Outside above:~~ ~~f≤2.2GHz : ± 2.5 dB~~ ~~2.2 GHz < f ≤ 4 GHz :~~ ~~± 2.8 dB~~ ~~f > 4 GHz : ±4.6 dB~~	Not applicable
~~6.7.1 Frequency error~~	~~± 12 Hz~~	
6.7.1~~2~~ EVM	±2.5 % (for single code)	Measurement results from 12.5% to 22.5% at Signal power = P_Max –3 to P_Max – 18 dB
6.7.2~~3~~ Peak code Domain error	±1.0 dB	Measurement results from -36 to –30 dB at signal power = P_Max – 3 to P_Max – 18 dB

~~Subclause 6.2, Base station output power:~~

- ~~base station maximum output power ±[0,5] dB.~~

~~Subclause 6.3, Frequency stability:~~

- ~~carrier frequency ±[10] Hz.~~

~~Subclause 6.4.1, Inner loop power control in the downlink:~~

- ~~transmitter power control step (relative 1 dB step) ±[0,3] dB;~~
- ~~transmitter average power control step (relative 10 × 1 dB steps) ±[0,5] dB.~~

~~NOTE 1: Code domain power.~~

~~Subclause 6.4.3, Power control dynamic range:~~

- ~~maximum and minimum power ±[0,8] dB;~~

- power control dynamic range (at 25 dB relative power) ±[0,5] dB.

NOTE 2: Code domain power.

Subclause 6.4.4, Total power dynamic range:

- total power ±[0,5] dB;
- total power dynamic range (at 18 dB relative power) ±[0,3] dB.

Subclause 6.2.2, CPICH power accuracy:

- CPICH power ±[0,8] dB.

NOTE 3: Code domain power.

Subclause 6.5.1, Occupied bandwidth:

- occupied channel bandwidth ±[] kHz.

Subclause 6.5.2.1, Spectrum emission mask:

- emission power:

Table 4.1: Uncertainty for Spectrum emission mask measurement

Frequency offset Δf		Uncertainty
2,5 ≤ Δf < 2,7 MHz		±[1,5] dB
2,7 ≤ Δf < 3,5 MHz		±[1,5] dB
3,5 ≤ Δf < 7,5 MHz		±[1,5] dB
7,5 ≤ Δf ≤ Δf_{max} MHz		±[1,5] dB

Subclause 6.5.2.2, Adjacent Channel Leakage power Ratio (ACLR):

- ACLR ± 5 MHz (Relative carrier power) ±[0,8] dB;
- ACLR ± 10 MHz (Relative carrier power) ±[0,8] dB.

Subclause 6.5.3.7, Protection of the BS receiver:

- emission power ±[1,5] dB.

Subclause 6.5.3, Spurious emissions:

- conformance requirement in BS and coexistence receive bands:
  - emission power ±[2,0] dB.
- conformance requirements outside BS and coexistence receive bands:
  - emission power:

f ≤ 2.2 GHz ±[1,5] dB;

2.2 GHz < f ≤ 4 GHz ±[2,0] dB;

f > 4 GHz ±[4,0] dB.

Subclause 6.6, Transmit intermodulation:

- interference signal power relative the carrier power ±[1,0] dB;
- intermodulation power ±[1,5] dB.

Subclause 6.7.1, Modulation Accuracy:

~~modulation accuracy (EVM) ±[2,5] % RMS.~~

~~Subclause 6.7.2, Peak code Domain error:~~

~~peak code domain error ±[] dB.~~

4.1.3 Measurement of ~~R~~receiver

Table 4.1.3 Maximum Test System Uncertainty for receiver tests

Subclause	**Maximum Test System Uncertainty**[1]	**Range over which test system uncertainty applies**
7.2 Reference sensitivity level	± 0.7 dB	Not applicable
7.3 Dynamic range	± ~~[~~1.2~~]~~ dB Formula = SQRT(signal level error^2 and AWGN level error^2)	Not applicable
7.4 Adjacent channel selectivity	± 1.1 dB Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect. The ACLR effect is calculated by: (Formula to follow)	Not applicable
7.5 Blocking characteristics	Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect + Broadband noise. System error with blocking signal <15 MHz offset: ± 1.4 dB (using ACLR 68 dB, 0.7 dB for signals) Blocking signal >= 15 MHz offset and f ≤ 2.2 GHz: ± ~~[~~1.1~~0]~~ dB + broadband noise 2.2 GHz < f ≤ 4 GHz : ±~~[~~1.~~7~~8~~]~~ dB f > 4 GHz: ±~~[~~3.2~~1]~~ dB ~~Need to check effect of broadband nose~~Assume--130 dBc broadband noise from blocking signal has 0.1 dB effect. Harmonics and spurs of the interferer need to be carefully considered. Perhaps need to avoid harmonics of the interfere that fall on top of the receive channel. For the –15 dBm CW blocking case, filtering of the slocking signal (at least 25 dB) is necessary to elimininate problems with broadband noise.	Not applicable

7.6 Intermod Characteristics	~~± [0.6] dB~~ ~~Need further analysis on formula for calculating overall uncertainty from the three signals.~~ Formula = $\frac{}{\sqrt{(2 \cdot CW\_level\_error)^2 + (\text{mod}\_level\_error)^2 + (wanted\_signal\_level\_error)^2}}$ (Using CW interferer ±0.5 dB, modulated interfere ±0.5 dB, wanted singal ±0.7 dB) 1.3 dB	Not applicable
7.7 Spurious Emissions	The Test System uncertainty figures for Spurious emissions apply to the the measurement of the DUT ± ~~[~~3.0~~]~~ dB for BS receive band (-78 dBm) Outside above range: f≤2.2GHz : ± ~~[~~2.0~~]~~ dB (-57 dBm) 2.2 GHz < f ≤ 4 GHz : ± ~~[~~2.0~~]~~ dB (-47 dBm) f > 4 GHz : ±~~[~~4.0~~]~~ dB (-47 dBm)	

Note 1: Unless otherwise noted, only the Test System stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.

~~Subclause 7.2, Reference sensitivity level:~~

~~test signal power ±[0,8] dB.~~

~~Subclause 7.3, Dynamic range:~~

~~test signal power ±[0,8] dB;~~

~~AWGN signal power ±[1,0] dB.~~

~~Subclause 7.4, Adjacent Channel Selectivity (ACS):~~

~~test signal power ±[0,8] dB;~~

~~interfering signal power (Relative to the test signal) ±[0,8] dB.~~

~~Subclause 7.5, Blocking characteristics:~~

~~test signal power ±[0,8] dB:~~

~~interfering signal power:~~

~~f ≤ 2,2 GHz ±[0,7] dB;~~

~~2,2 GHz < f ≤ 4 GHz ±[1,5] dB;~~

~~f > 4 GHz ±[3,0] dB.~~

~~Subclause 7.6, Intermodulation characteristics:~~

~~test signal power ±[0,8] dB;~~

~~interfering signals power ±[0,7] dB.~~

~~Subclause 7.7, Spurious emissions:~~

- emission power:

  f ≤ 2,2 GHz ±[1,5] dB;

  2,2 GHz < f ≤ 4 GHz ±[2,0] dB;

  f > 4 GHz ±[4,0] dB.

4.1.4 Measurement of Pperformance requirement

Table 4.1.4 Maximum Test System Uncertainty for Performance Requirements

Subclause	Maximum Test System Uncertainty[1]
8.2, Demodulation in static propagation condtion	TBD
8.3, Demodulation of DCH in multiplath fading conditons	TBD
8.4 Demodulation of DCH in moving propagation conditions	TBD
8.5 Demodulation of DCH in birth/death propagation conditions	TBD
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.

Subclause 8.2, Demodulation in static propagation condtion:

- test signal power ±[] dB;
- Eb/I0 (relative) ±[] dB.

Subclause 8.3, Demodulation of DCH in multiplath fading conditons:

- test signal power ±[] dB;
- Eb/I0 (relative) ±[] dB.

4.2 Test tTolerances (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 following values may be increased only on a test by test basis. The test tolerances should not be increased 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 4.2.1 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~~TBD~~
6.3.4 Frequency error	12 Hz
6.4.2 Power control steps	0.1 dB~~TBD~~
6.4.3 Power dynamic range	0.2 dB~~TBD~~
6.4.4 Total power dynamic range	0.3 dB~~TBD~~
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~~
6.7.1~~2~~ EVM	0 %
6.7.2~~3~~ 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.

~~Subclause 6.2, Base station output power:~~

~~— base station maximum output power ±0,7 dB.~~

~~Subclause 6.3, Frequency stability:~~

~~— carrier frequency ±[10] Hz.~~

~~Subclause 6.4.1, Inner loop power control in the downlink:~~

~~— transmitter power control step (relative 1 dB step) ±[0,3] dB;~~

~~— transmitter average power control step (relative 10 × 1 dB steps) ±[0,5] dB.~~

~~NOTE 1: Code domain power.~~

~~Subclause 6.4.3, Power control dynamic range:~~

~~— maximum and minimum power ±[0,8] dB;~~

~~— power control dynamic range (at 25 dB relative power) ±[0,5] dB.~~

~~NOTE 2: Code domain power.~~

~~Subclause 6.4.4, Total power dynamic range:~~

~~— total power ±[0,5] dB;~~

~~— total power dynamic range (at 18 dB relative power) ±[0,3] dB.~~

~~Subclause 6.2.2, CPICH power accuracy:~~

~~— CPICH power ±[0,8] dB.~~

~~NOTE 3: Code domain power.~~

~~Subclause 6.5.1, Occupied bandwidth:~~

~~— occupied channel bandwidth ±0 kHz.~~

~~Subclause 6.5.2.1, Spectrum emission mask:~~

~~— emission power:~~

~~Table 4.1: Uncertainty for Spectrum emission mask measurement~~

~~Frequency offset Δf~~		~~Uncertainty~~
~~2,5 ≤ Δf < 2,7 MHz~~		~~±1.5 dB~~
~~2,7 ≤ Δf < 3,5 MHz~~		~~±1.5 dB~~
~~3,5 ≤ Δf < 7,5 MHz~~		~~±1.5 dB~~
~~7,5 ≤ Δf ≤ Δf_{max} MHz~~		~~±1.5 dB~~

~~Subclause 6.5.2.2, Adjacent Channel Leakage power Ratio (ACLR):~~

~~— ACLR ± 5 MHz (Relative carrier power) ±0,8 dB;~~

~~— ACLR ± 10 MHz (Relative carrier power) ±0,8 dB.~~

~~Subclause 6.5.3.7, Protection of the BS receiver:~~

~~— emission power ±[1,5] dB.~~

~~Subclause 6.5.3, Spurious emissions:~~

~~— conformance requirement in BS and coexistence receive bands:~~

~~— emission power ±0 dB.~~

~~— conformance requirements outside BS and coexistence receive bands:~~

~~— emission power:~~

~~f ≤ 2.2 GHz ±0 dB;~~

~~2.2 GHz < f ≤ 4 GHz ±0 dB;~~

~~f > 4 GHz ±0 dB.~~

~~Subclause 6.6, Transmit intermodulation:~~

~~— interference signal power relative the carrier power ±0dB;~~

~~— intermodulation power ±0dB.~~

~~Subclause 6.7.1, Modulation Accuracy:~~

~~— modulation accuracy (EVM) ±0% RMS.~~

~~Subclause 6.7.2, Peak code Domain error:~~

~~— peak code domain error ±[] dB.~~

4.2.2 Receiver

Table 4.2.2 Test Tolerances for receiver tests.

Subclause	Test Tolerance[1]
7.2 Reference sensitivity level	0.7 dB
7.3 Dynamic range	~~TBD~~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.

~~Subclause 7.2, Reference sensitivity level:~~

~~- test signal power ±[0,8] dB.~~

~~Subclause 7.3, Dynamic range:~~

~~- test signal power ±[0,8] dB;~~

~~- AWGN signal power ±[1,0] dB.~~

~~Subclause 7.4, Adjacent Channel Selectivity (ACS):~~

~~- test signal power ±0 dB;~~

~~- interfering signal power (Relative to the test signal) ±0 dB.~~

~~Subclause 7.5, Blocking characteristics:~~

~~- test signal power ±0 dB:~~

~~- interfering signal power:~~

~~f ≤ 2,2 GHz ±0 dB;~~

~~2,2 GHz < f ≤ 4 GHz ±0 dB;~~

~~f > 4 GHz ±0 dB.~~

~~Subclause 7.6, Intermodulation characteristics:~~

~~- test signal power ±0 dB;~~

~~- interfering signals power ±0 dB.~~

~~Subclause 7.7, Spurious emissions:~~

~~- emission power:~~

~~f ≤ 2,2 GHz ±0 dB;~~

~~2,2 GHz < f ≤ 4 GHz ±0 dB;~~

~~f > 4 GHz ±0 dB.~~

4.2.3 Performance requirement

Table 4.2.3 Test Tolerances for Performance Requirements.

Subclause	Test Tolerance[1]
8.2, Demodulation in static propagation condtion	TBD
8.3, Demodulation of DCH in multiplath fading conditons	TBD
8.4 Demodulation of DCH in moving propagation conditions	TBD
8.5 Demodulation of DCH in birth/death propagation conditions	TBD
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.

~~Subclause 8.2, Demodulation in static propagation condtion:~~

- ~~test signal power ±[] dB;~~
- ~~Eb/I0 (relative) ±[] dB.~~

~~Subclause 8.3, Demodulation of DCH in multiplath fading conditons:~~

- ~~test signal power ±[] dB;~~
- ~~Eb/I0 (relative) ±[] dB.~~

4.2.4 RRM measurements

The following tolerances refer to the requirements of 25.133.

tbd

4.3 Interpretation of measurement results

~~Compliance with the requirement is determined by comparing the measured value (or derived value from the measured one) with the test limit. The test limit shall be calculated by adding the specified limit in the core requirement using the test toleance as specified in subclause 4.2.~~

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

The Shared Risk principle is defined in ETR 273 Part 1 sub-part 2 section 6.5.

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

The recorded value for the ~~t~~Test ~~equipment~~ System uncertainty shall be, for each measurement, equal to or lower than the appropriate figure in subclause 4.1 of ~~the present document~~this specification.

If the ~~t~~Test ~~equipment~~ System for a test is known to have a measurement uncertainty greater than that specified in subclause 4.1, it is still permitted to use this apparatus provided that an adjustment is made ~~to the measured value~~ as follows.

~~The initial test limit is derived as above.~~ Any additional uncertainty in the ~~t~~Test ~~equipment~~ System over and above that specified in subclause 4.1 shall be used to tighten the T~~t~~est ~~limit~~Requirement – making the test harder to pass. (For some tests e.g. receiver tests, this may require modification of stimulus signals). This procedure (defined in Annex F) will ensure that a ~~t~~Test ~~equipment~~ System not compliant with subclause 4.1does not increase the chance of passing a device under test where that device would otherwise have failed the test if a ~~t~~Test ~~equipment~~ System compliant with subclause 4.1 had been used.

5 Format and interpretation of tests

Each test in the following clauses has a standard format:

X Title

All tests are applicable to all equipment within the scope of the present document, unless otherwise stated.

X.1 Definition and applicability

This subclause gives the general definition of the parameter under consideration and specifies whether the test is applicable to all equipment or only to a certain subset.

X.2 ~~Conformance~~ Minimum ~~r~~Requirement~~s~~

This subclause ~~describes the requirement under test has to fulfil to ensure compliance with the relevant specification.~~ is an informative copy of the Minimum Requirement defined by the core specification.

In addition, this subclause contains the reference to the subclause ~~t~~of the 3GPP reference (or core) specification ~~from which the conformance requirements are derived~~ which defines the Minimum Requirement.

X.3 Test purpose

This subclause defines the purpose of the test.

X.4 Method of test

X.4.1 Initial conditions

This subclause defines the initial conditions for each test, including the basic measurement set-up.

X.4.2 Procedure

This subclause describes the steps necessary to perform the test and provides further details of the test definition like point of access (e.g. antenna port), domain (e.g. frequency-span), range, weighting (e.g. bandwidth), and algorithms (e.g. averaging).

X.5 Test R~~r~~equirement~~s~~

This subclause defines the pass/fail criteria for the equipment under test. See subclause 4.3 Interpretation of measurement results.

6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter.

Rated output power, PRAT, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

6.2.1 Base station maximum output power

6.2.1.1 Definition and applicability

Maximum output power, Pmax, of the base station is the mean power level per carrier measured at the antenna connector in specified reference condition.

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.

6.2.1.2 ~~Conformance~~ Minimum ~~r~~Requirement

In normal conditions, the Base station maximum output power shall remain within +2.0~~7~~ dB and –2.0~~7~~ dB of the manufacturer's rated output power.

In extreme conditions, the Base station maximum output power shall remain within +2.5~~3.2~~ dB and –2.5~~3.2~~ dB of the manufacturer's rated output power.

The normative reference for this requirement is in TS 25.104 [1] subclause 6.2.1.

~~NOTE: The test limits include test tolerance as outlined in Annex F.~~

6.2.1.3 Test purpose

The test purpose is to verify the accuracy of the maximum output power across the frequency range and under normal and extreme conditions for all transmitters in the BS.

6.2.1.4 Method of test

6.2.1.4.1 Initial conditions

1) Connect the power measuring equipment to the base station RF output port.

6.2.1.4.2 Procedure

1) Set the base station to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model1 in subclause 6.1.1.1.

2) Measure the mean power at the RF output port over a certain slots.

6.2.1.5 Test ~~r~~Requirements

~~.Maximum output power requirement shall be met as specified in subclause 6.2.1.2.~~

In normal conditions, the measurement result in step 2 of 6.2.1.4.2 shall remain within +2.7 dB and –2.7 dB of the manufacturer's rated output power.

In extreme conditions, measurement result in step 2 of 6.2.1.4.2 shall remain within +3.2 dB and –3.2 dB of the manufacturer's rated output power.

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

6.5.2 Out of band emission

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

6.5.2.1 Spectrum emission mask

6.5.2.1.1 Definitions and applicability

The mask defined in Tables 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.2 ~~Conformance~~ Minimum ~~r~~Requirements

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.11 to 6.14 for the appropriate BS maximum output power, in the frequency range from Δf =2.5 MHz to f_offset_{max} from the carrier frequency, where:m

- Δf is the separation between the carrier frequency and the nominal –3dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the carrier frequency and the centre of the measurement filter;
- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in subclause 3.4.1, whichever is the greater.

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

Table 6.11: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-1~~4~~2.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 1~~4~~2.5 – 15·(f_offset- 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-2~~6~~4.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-1~~3~~1.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0 MHz ≤ f_offset < f_offset_{max}	-1~~3~~1.5 dBm	1 MHz

Table 6.12: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-1~~4~~2.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-1~~4~~2.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-1~~3~~1.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 5~~6~~4.5 dBm	1 MHz

Table 6.13: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 531.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P – 531.5 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 653.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 520.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 564.5 dBm	1 MHz

Table 6.14: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-220.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-220.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-342.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-2119.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	-253.5 dBm	1 MHz

The normative reference for this requirement is in TS 25.104 [1] subclause 6.6.2.1

NOTE: The test limits include test tolerances as outlined in Annex F.

6.5.2.1.3 Test purpose

This test measures the emissions of the BS, close to the assigned channel bandwidth of the wanted signal, while the transmitter is in operation.

6.5.2.1.4 Method of test

6.5.2.1.4.1 Initial conditions

1) Set-up the equipment as shown in annex A.

2) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4.0 MHz shall use a 30 kHz measurement bandwidth.

3) Measurements with an offset from the carrier centre frequency between 4.0 MHz and (Δf_{max} – 500 kHz).shall use a 1 MHz measurement bandwidth. The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements

4) Detection mode: True RMS.

6.5.2.1.5 Procedures

1) Set the BS to transmit a signal in accordance to test model 1, subclause 6.2.1.1.1 at by the manufacturer specified maximum output power.

2) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6.5.2.1.6 Test requirements

In all measurements, the requirements according to subclause 6.5.2.1.2 shall be fulfilled.

The measurement result in step 2 of 6.5.2.1.5 shall not exceed the maximum level specified in tables 6.15 to 6.18 for the appropriate BS maximum output power.

Table 6.15: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 12.5 – 15·(f_offset- 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0 MHz ≤ f_offset < f_offset$_{max}$	-11.5 dBm	1 MHz

Table 6.16: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-12.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset$_{max}$	P – 54.5 dBm	1 MHz

Table 6.17: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 51.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P – 51.5 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 63.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 50.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset$_{max}$	P – 54.5 dBm	1 MHz

Table 6.18: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-20.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-20.5 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-32.5 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-19.5 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset$_{max}$	-23.5 dBm	1 MHz

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

6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.5.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

6.5.2.2.2 ~~Conformance~~ Minimum ~~r~~Requirement

Table 6.1~~9~~5: BS ACLR

BS channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45~~4.2~~ dB
10 MHz	50~~49.2~~ dB

The normative reference for this requirement is in TS 25.104 [1] subclause 6.5.2.2

~~NOTE: The test limits include test tolerances as outlined in Annex F.~~

6.5.2.2.3 Test purpose

To verify that the adjacent channel leakage power ratio requirement shall be met as specified in subclause 6.5.2.2.2.

6.5.2.2.4 Method of test

6.5.2.2.4.1 Initial conditions

1) Connect measurement device to the base station RF output port as shown in annex B.
2) The measurement device characteristics shall be:
   - measurement filter bandwidth: defined in subclause 6.5.2.2.1;
   - detection mode: true RMS voltage or true average power.
3) Set the base station to transmit a signal modulated in accordance with 6.1.1.1 Test model 1. Total power at the RF output port shall be the maximum output power as specified by the manufacturer.
4) Set carrier frequency within the frequency band supported by BS. Minimum carrier spacing shall be 5 MHz and maximum carrier spacing shall be specified by manufacturer.

6.5.2.2.4.2 Procedure

1) Measure Adjacent channel leakage power ratio for 5 MHz and 10 MHz offsets both side of channel frequency. In multiple carrier case only offset frequencies below the lowest and above the highest carrier frequency used shall be measured.
2) All RF channel configurations supported by BS shall be verified.

6.5.2.2.5 Test R~~r~~equirement

~~Adjacent channel leakage power ratio requirement shall be met as specified in subclause 6.5.2.2.2.~~

The measurement result in step 1 of 6.5.2.2.4.2 shall not be less than the ACLR limit specified in tables 6.19

Table 6.19: BS ACLR

BS channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	44.2 dB
10 MHz	49.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in 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):
~~Test tolerances Applied to the Tests~~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 table F.1.

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.

~~For the tests where a non-zero test tolerance is applied, the test tolerance and its implementation is explained in Table F.1~~

Table F.1. Derivation of Test Requirements~~Core requirements, test tolerances and test limits.~~

Test ~~Clause number~~	**~~Core~~ Minimum ~~r~~Requirement in TS 25.104**	**Test ~~t~~Tolerance (TT)**	**Test ~~limit~~ Requirement in TS 25.141**
Transmitter tests			
6.2.1~~.2~~ 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 ~~T~~tables 6.11, 6.12, 6.13 and 6.14: ~~"Maximum level" − X dB~~	1.5 dB	Formula: Maximum level + TT Add 1.5 to Maximum level entries in t~~T~~ables 6.11, 6.12, 6.13 and 6.14~~:~~. ~~"Maximum level" − X+1.5 dB~~
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
Receiver tests			
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
Performance tests			
8.2, Demodulation in static propagation condtion		TBD	
8.3, Demodulation of DCH in multiplath fading conditons		TBD	
8.4 Demodulation of DCH in moving propagation conditions		TBD	
8.5 Demodulation of DCH in birth/death propagation conditions		TBD	
8.6 Verification of the internal BLER calculation		TBD	
8.7 Site Selection Diversity Transmission (SSDT) Mode		TBD	

Annex G (informative): Acceptable uncertainty of Test Equipment

This informative annex specifies the critical parameters of the components of an overall Test System (e.g. Signal generators, Signal Analyzers etc.) which are necessary when assembling a Test System which complies with subclause 4.1 Acceptable Uncertainty of Test System. These Test Equipment parameters are fundamental to the accuracy of the overall Test System and are unlikely to be improved upon through System Calibration.

G.1 Transmitter measurements

Table G.1 Equipment accuracy for transmitter measurements

Test	**Equipment accuracy**	**~~Test conditions~~Range over which equipment accuracy applies**
6.2.1 Maximum Output Power	Not critical	Not critical
6.2.2 CPICH Power accuracy	Not critical	Not critical
6.3.4 Frequency error	± 10 Hz + timebase = [12] Hz	Measurements in the range ±500 Hz. (This is to allow for UE range that at 0.1 PPM is larger than BTS.)
6.4.2 Power control steps	± ~~[~~0.1~~]~~ dB ± ~~[~~0.1~~]~~ dB for ten 1 dB steps	~~P_Max – 3 dB to below~~ ~~P_Max – 28 dB~~
6.4.3 Power dynamic range	± ~~[~~>0.2~~1]~~ dB ~~± [>0.1] dB for ten 1 dB steps~~	~~>=P_Max – 3 dB to~~ ~~≤P_Max – 28 dB~~
6.4.4 Total power dynamic range	~~[~~±0.3~~]~~ dB relative error over 18 dB	~~P_Max to P_Min~~
6.5.1 Occupied Bandwidth	± 100 kHz	±1 MHz~~For results between 4 and 6 MHz?~~
6.5.2.1 Spectrum emission mask	Not critical	Not critical
6.5.2.2 ACLR	± 0.8 dB	
6.5.3 Spurious emissions	Not critical	Not critical
6.6 Transmit intermodulation (interferer requirements)	Not critical	Not critical
~~6.7.1 Frequency error~~	~~± 10 Hz + timebase = [12] Hz~~	~~Range 0 to 500 Hz. (This is to allow for UE range that at 0.1 PPM is larger than BTS.)~~

6.7.1~~2~~ EVM	± 2.5 % (for single code)	Measurements in the range 12.5% to 22.5% at signal power = P_Max –3 to P_Max – 18 dB~~?~~ ~~Applies for reading from 10% to 25%.~~
6.7.2~~3~~ Peak code Domain error	±1.0dB	~~For readings between -28 dB to -38 dB.~~

G.2 Receiver measurements

Table G.2 Equipment accuracy for receiver measurements

Test	**Equipment accuracy**	**~~Test conditions~~Range over which equipment accuracy applies**
7.2 Reference sensitivity level	Not critical	Not critical
7.3 Dynamic range	Not critical	Not critical
7.4 Adjacent channel selectivity	Not critical	Not critical
7.5 Blocking characteristics	Not critical	Not critical
7.6 Intermod Characteristics	Not critical	Not critical
7.7 Spurious Emissions	Not critical	Not critical

G.3 Performance measurements

Table G.3 Equipment accuracy for performance measurements

Test	**Equipment accuracy**	**~~Test conditions~~Range over which equipment accuracy applies**
8.2, Demodulation in static propagation condtion	Not critical	Not critical
8.3, Demodulation of DCH in multiplath fading conditons	Not critical	Not critical

3GPP TSG RAN WG4 Meeting #16 **R4-010266**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **78** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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 ☒ Core Network ☐

Title:	⌘	CR to 25.141 for Test Tolerances in TX tests
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 23/02/01
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Implementation of new document structure and decisions on Test System uncertainty and test Tolerances for TX tests
Summary of change:	⌘	All TX tests are updated with the new format and tes tlerances aplied to test requirements.
Consequences if not approved:	⌘	Inconsistency of wording between standards, likely misinterpretation of the test limits with impact on regulatory issues. Incorrect Test Requirements.

Clauses affected:	⌘	6		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.2.2 CPICH power accuracy

6.2.2.1 Definition and applicability

CPICH power accuracy is defined as the maximum deviation between the ordered channel power and the power in that channel measured at the TX antenna interface. The requirement is applicable for all BS types.

6.2.2.2 ~~Conformance~~ Minimum Requirement

The measured CPICH power shall be within ±2.1dB of the ordered absolute value. The normative reference for this requirement is in TS 25.104 [1] subclause 6.4.4

6.2.2.3 Test purpose

The purpose of the test is to verify, that the BS under test delivers CPICH power within margins, thereby allowing reliable cell planning and operation.

6.2.2.4 Method of test

6.2.2.4.1 Initial conditions

1) Establish applicable temperature and supply voltage, as specified in subclause 4.4.
2) Connect BS to code domain analyser as shown in annex B.
3) Disable inner loop power control.
4) Set-up BS transmission at maximum total power as specified by the supplier. Channel set-up shall be according to subclause 6.1.1.2.

6.2.2.4.2 Procedure

1) Measure the power in the PCCPCH and PCPICH according to annex E.
2) Repeat the measurement for all other applicable temperatures and supply voltages.

6.2.2.5 Test R~~r~~equirement

The measured CPICH power shall be within ±2.9dB of the ordered absolute value. ~~The measured CPICH power shall meet the requirements as specified in 6.2.2.2~~

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

6.3 Frequency error

6.3.1 Definition and applicability

Frequency error is the measure of the difference between the actual BS transmit frequency and the assigned frequency. The same source shall be used for RF frequency and data clock generation.

It is not possible to verify by testing that the data clock is derived from the same frequency source as used for RF generation. This may be confirmed by a manufacturers declaration

6.3.2 ~~Conformance requirement~~Minimum Requirement

The Frequency Error shall be within ± 0.05 PPM.

The normative reference for this requirement is in TS 25.104 [1] subclause 6.3

6.3.3 Test purpose

To verify that the Frecuency Error is within the limit specified in 6.3.2

6.3.4 Method of test

6.3.4.1. Initial Conditions

1) Connect the base station RF output port to the test equipment. Refer to annex B.1.2 for a functional block diagram of the test set-up.

2) Set the base station to transmit a signal modulated with PCCPCH. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

6.3.4.2. Procedure

1) Measure the Frequency Error according to annex E.

6.3.5 Test requirement

The Frequency Error shall ~~meet the limit specified in 6.3.2~~be within the range (–0.05 PPM – 12 Hz) to (+0.05 PM + 12 Hz).

6.4 Output power dynamics

Power control is used to limit the interference level. The BS transmitter uses a quality-based power control on the downlink. The physical channels for the following test(s) shall be set-up according to subclause 6.1.1.2.

6.4.1 Inner loop power control

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

6.4.2 Power control steps

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.2.1 Definition and applicability

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.2.2 ~~Conformance requirement~~Minimum Requirement

The BS transmitter shall have the capability of setting the inner loop output power with a step sizes of 1 dB mandatory and 0,5 dB optional.

a) The tolerance of the power control step due to inner loop power control shall be within the range shown in table 6.9.

b) The tolerance of the combined output power change due to inner loop power control shall be within the range shown in table 6.10a.

Table 6.9: Transmitter power control step tolerance

Power control commands in the down link	Transmitter power control step tolerance			
	1 dB step size		0,5 dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+0,5 dB	+1,5 dB	+0,25 dB	+0,75 dB
Down(TPC command "0")	-0,5 dB	-1,5 dB	-0,25 dB	-0,75 dB

Table 6.10a: Transmitter combined output power tolerance

Power control commands in the down link	Transmitter combined output power change tolerance after 10 consecutive equal commands (up or down)			
	1 dB step size		0.5dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+8 dB	+12 dB	+4 dB	+6 dB
Down(TPC command "0")	-8 dB	-12 dB	-4 dB	-6 dB

The normative reference for this requirement is TS 25.104 [1] subclause 6.4.1.1.1

6.4.2.3 Test purpose

To verify those requirements for the power control step size and response are met as specified in subclause 6.4.2.2.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

1) Connect the suitable measurement equipment to the BS antenna connector as shown in annex B.

2) Start BS transmission with channel configuration as specified in table 6.3 Test model 2.

3) Establish downlink power control with parameters as specified in table 6.10b.

Table 6.10b

Parameter	Level/status	Unit
UL signal level	Ref.sens + 10 dB	dBm/3,84 MHz
Data sequence	PN9	

6.4.2.4.2 Procedure

1) Set and send alternating TPC bits from the UE simulator or UL signal generator.

2) Measure mean power level of the code under the test each time TPC command is transmitted. All steps within power control dynamic range declared by manufacturer shall be measured. Use the code power measurement method defined in annex E.

3) Measure the 10 highest and the 10 lowest power step levels within the power control dynamic range declared by manufacturer by sending 10 consecutive equal commands as described table 6.10a.

4) Check that average step size tolerance requirement shall be met.

6.4.2.5 Test requirement

a) BS shall fulfil step size requirement shown in Table 6.10c for all power control steps declared by manufacture as specified in subclause 6.4.2.2.

b) For all measured Up/Down cycles, the difference of transmission power between before and after 10 equal commands (Up and Down), derived in step (3), shall not exceed the prescribed range in ~~subclause 6.4.2.2~~table 6.10d.

Table 6.10c: Transmitter power control step tolerance

Power control commands in the down link	Transmitter power control step tolerance			
	1 dB step size		0,5 dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+0,6 dB	+1,6 dB	+0,35 dB	+0,85 dB
Down(TPC command "0")	-0,6 dB	-1,6 dB	-0,35 dB	-0,85 dB

Table 6.10d: Transmitter combined output power tolerance

Power control commands in the down link	Transmitter combined output power change tolerance after 10 consecutive equal commands (up or down)			
	1 dB step size		0.5dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+7.9 dB	+12.1 dB	+3.9 dB	+6.1 dB
Down(TPC command "0")	-7.9 dB	-12.1 dB	-3.9 dB	-6.1 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.

6.4.3 Power control dynamic range

6.4.3.1 Definition and applicability

The power control dynamic range is difference between the maximum and the minimum transmit output power of a code channel for a specified reference condition. Transmit modulation shall be maintained within whole dynamic range as specified in TS 25.104 subclause 6.8.

6.4.3.2 ~~Conformance requirement~~Minimum Requirement

Down link (DL) power control dynamic range:

- maximum power: BS maximum output power -3 dB or greater;
- minimum power: BS maximum output power -28 dB or less.

The normative reference for this requirement is TS 25.104 [1] subclause 6.4.2.1.

6.4.3.3 Test purpose

To verify that the minimum power control dynamic range is met as specified in subclause 6.4.3.2.

6.4.3.4 Method of test

6.4.3.4.1 Initial conditions

1) Connect the measurement equipment to the BS antenna connector as shown in annex B.
2) Channel configuration defined in table 6.3 Test model 2 shall be used.
3) Set BS frequency.
4) Star BS transmission.

6.4.3.4.2 Procedure

Pmax shall be defined as described in subclause 6.2.1 Base station maximum output power.

1) Set power of the DPCH under test to the Pmax-3 dB level. Power levels for other code channels shall be adjusted as necessary.
2) Measure mean power level of the code channel under test. Use the code power measurement method defined in annex E.
3) Set power of the DPCH under test to the minimum value by means determined by the manufacturer. Power levels for other code channels shall remain unchanged.
4) Measure mean power level of the code channel under test.

6.4.3.5 Test requirement

~~Power control dynamic range requirement shall be met as specified in subclause 6.4.3.2.~~Down link (DL) power control dynamic range:

- maximum power: BS maximum output power –3.2 dB or greater;
- minimum power: BS maximum output power –27.8 dB or less.

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.

6.4.4 Total power dynamic range

6.4.4.1 Definition and applicability

The total power dynamic range is difference between the maximum and the minimum transmit output power for a specified reference condition.

6.4.4.2 ~~Conformance requirement~~Minimum Requirement

The down link (DL) total power dynamic range shall be 18 dB or greater. The normative reference for this requirement is TS 25.104 [1] subclause 6.4.3.1.

6.4.4.3 Test purpose

To verify that the total power dynamic range is met as specified in TS 25.104 subclause 6.4.3.1. The test is to ensure that the total output power can be reduced while still transmitting a single code. This is to ensure that the interference to neighbouring cells is reduced.

6.4.4.4 Method of test

Requirement is tested together with Error Vector Magnitude test, as described in subclause 6.7.1

6.4.4.5 Test requirement

~~BS shall achieve total power dynamic range as specified in subclause 6.4.4.2.~~The down link (DL) total power dynamic range shall be 17.7 dB or greater.

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.

6.5 Output RF spectrum emissions

The physical channels for the following test(s) shall be set-up according to subclause 6.1.1.1.

6.5.1 Occupied bandwidth

6.5.1.1 Definition and applicability

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage β/2 of the total mean transmitted power.

The value of β/2 should be taken as 0,5%.

6.5.1.2 ~~Conformance requirement~~Minimum Requirements

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

The normative reference for this requirement is TS 25.104 subclause 6.6.1.

6.5.1.3 Test purpose

The occupied bandwidth, defined in the Radio Regulations of the International Telecommunication Union ITU, is a useful concept for specifying the spectral properties of a given emission in the simplest possible manner; see also Recommendation ITU-R Recommendation SM.328-9 [7]. The test purpose is to verify that the emission of the BS does not occupy an excessive bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

1) Connect the Measurement device to the BS antenna connector.

2) Start transmission on a single carrier according to test model defined in subclause 6.1.1.1.

6.5.1.4.2 Procedure

1) Measure the spectrum of the transmitted signal across a span of 10 MHz, based on an occupied bandwidth requirement of 5 MHz. The selected resolution bandwidth (RBW) filter of the analyzer shall be 30 kHz or less. The spectrum shall be measured at 400 or more points across the measurement span.

NOTE: The detection mode of the spectrum analyzer will not have any effect on the result if the statistical properties of the out-of-OBW power are the same as those of the inside-OBW power. Both are expected to have the Rayleigh distribution of the amplitude of Gaussian noise. In any case where the statistics are not the same, though, the detection mode must be power responding. There are at least two ways to be power responding. The spectrum analyzer can be set to "sample" detection, with its video bandwidth setting at least three times its RBW setting. Or the analyzer may be set to respond to the average of the power (root-mean-square of the voltage) across the measurement cell.

2) Compute the total of the power, P0, (in power units, not decibel units) of all the measurement cells in the measurement span. Compute P1, the power outside the occupied bandwidth on each side. P1 is half of the total power outside the bandwidth. P1 is half of (100 % - (occupied percentage)) of P0. For the occupied percentage of 99 %, P1 is 0.005 times P0.

3) Determine the lowest frequency, f1, for which the sum of all power in the measurement cells from the beginning of the span to f1 exceeds P1.

4) Determine the highest frequency, f2, for which the sum of all power in the measurement cells from the end of the span to f2 exceeds P1.

5) Compute the occupied bandwidth as f2 - f1.

6.5.1.5 Test requirements

~~The bandwidth calculated in step (5) of subclause 6.5.1.4.2 shall be less than 5 MHz.~~The occupied bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

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.

6.5.3 Spurious emissions

6.5.3.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions. This is measured at the base station RF output port.

The requirement applies at frequencies within the specified frequency ranges, which are more than 12.5 MHz under the first carrier frequency used or more than 12.5 MHz above the last carrier frequency used.

The requirements of either subclause 6.5.3.4.1 or subclause 6.5.3.4.2 shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

Unless otherwise stated, all requirements are measured as mean power (RMS).

6.5.3.2 Test purpose

This test measures conducted spurious emission from the BS transmitter antenna connector, while the transmitter is in operation.

6.5.3.3 Test case

The BS shall be configured with transmitters active at their maximum output power for all transmission modes foreseen by the manufacturer's specification.

Set the base station to transmit a signal as stated in subclause 6.1.1.1. Total power at the RF Output port shall be the nominal power as specified by the manufacturer.

The transmitter antenna connector shall be connected to a measurement receiver with the same characteristic impedance, using an attenuator or directional coupler if necessary.

The detecting device shall be configured with a measurement bandwidth as stated in the tables.

6.5.3.4 ~~Conformance~~ Minimum Requirements

6.5.3.4.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation [4], are applied.

6.5.3.4.1.1 Minimum Requirement

The power of any spurious emission shall be attenuated by at least the minimum requirement.

Table 6.16: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9 kHz to 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
150 kHz to 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
30 MHz to 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
1 GHz to 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-7, subclause 2.6

6.5.3.4.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation [4], are applied.

6.5.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.17: BS Mandatory spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9 kHz ↔ 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
150 kHz ↔ 30 MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
1 GHz ↔ Fc1 – 60 MHz or 2 100 MHz *Whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
Fc1 – 60 MHz or 2 100 MHz whichever is the higher ↔ Fc1 – 50 MHz or 2 100 MHz whichever is the higher	-25 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc1 – 50 MHz or 2100 MHz whichever is the higher ↔ Fc2 + 50 MHz or 2180 MHz whichever is the lower	-15 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc2 + 50 MHz or 2180 MHz whichever is the lower ↔ Fc2 + 60 MHz or 2 180 MHz Whichever is the lower	-25 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc2 + 60 MHz or 2 180 MHz *Whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1. Upper frequency as in ITU-R SM.329-7, subclause 2.6
Fc1: Center frequency of first carrier frequency used. Fc2: Center frequency of last carrier frequency used.			

6.5.3.4.3 Protection of the BS receiver

This requirement may be applied in order to prevent the receiver of the BS being desensitised by emissions from the BS transmitter which are coupled between the antennas of the BS.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

This requirement is not applicable to antenna ports which are used for both transmission and reception (e.g. which have an internal duplexer).

NOTE: In this case, the measurement of Reference Sensitivity will directly show any desensitization of the receiver.

6.5.3.4.3.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.18: BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
1 920 MHz to 1 980 MHz For operation in Frequency Bands defined in subclause 3.4.1(a)	-96 dBm	100 kHz	
1 850 MHz to 1 910 MHz For operation in Frequency Bands defined in subclause 3.4.1(b)	-96 dBm	100kHz	

6.5.3.4.4 Co-existence with GSM 900

6.5.3.4.4.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

6.5.3.4.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.19: BS Spurious emissions limits for BS in geographic coverage area of GSM 900

Band	Maximum Level	Measurement Bandwidth	Note
921 MHz to 960 MHz	-57 dBm	100 kHz	

6.5.3.4.4.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.

6.5.3.4.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.20: BS Spurious emissions limits for protection of the BTS receiver

Band	Maximum Level	Measurement Bandwidth	Note
876 MHz to 915 MHz	–98 dBm	100 kHz	

6.5.3.4.5 Co-existence with DCS 1800

6.5.3.4.5.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

6.5.3.4.5.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.21: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800

Band	Maximum Level	Measurement Bandwidth	Note
1 805 MHz to 1 880 MHz	-47 dBm	100 kHz	

6.5.3.4.5.2 Co-located basestations

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

6.5.3.4.5.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.22: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum Level	Measurement Bandwidth	Note
1 710 MHz to 1 785 MHz	-98 dBm	100 kHz	

6.5.3.4.6 Co-existence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.

6.5.3.4.6.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.23: BS Spurious emissions limits for BS in geographic coverage area of PHS

Band	Maximum Level	Measurement Bandwidth	Note
1 893,5 MHz to 1 919,60 MHz	-41 dBm	300 kHz	

6.5.3.4.7 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to 2 110 MHz to 2 170 MHz, as defined in subclause 3.4.1(a) and 1 930 MHz to 1 990 MHz, as defined in subclause 3.4.1(b) in geographic areas in which both an adjacent band service and UTRA are deployed.

6.5.3.4.7.1 Minimum requirement

The power of any spurious emission shall not exceed.

Table 6.24: BS spurious emissions limits for protection of adjacent band services

Band (f)	Maximum Level	Measurement Bandwidth	Note
2 100 MHz to 2 105 MHz For operation in frequency bands as defined in subclause 3.4.1(a)	-30 + 3,4 (f - 2 100 MHz) dBm	1 MHz	
2 175 MHz to 2 180 MHz For operation in frequency bands as defined in subclause 3.4.1(a)	-30 + 3,4 (2 180 MHz - f) dBm	1 MHz	
1 920 MHz to 1 925 MHz For operation in frequency bands as defined in subclause 3.4.1(b)	-30 + 3,4 (f – 1 920 MHz) dBm	1 MHz	
1 995 MHz to 2 000 MHz For operation in frequency bands as defined in subclause 3.4.1(b)	-30 +3,4 (2 000 MHz – f) dBm	1 MHz	

6.5.3.4.8 Co-existence with UTRA-TDD

6.5.3.4.8.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

6.5.3.4.8.1.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.25: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1 900 MHz to 1 920 MHz	-52 dBm	1 MHz	
2 010 MHz to 2 025 MHz	-52 dBm	1 MHz	

6.5.3.4.8.2 Co-located base stations

This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.5.3.4.8.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.26: BS Spurious emissions limits for BS co-located with UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1 900 MHz to 1 920 MHz	–86 dBm	1 MHz	
2 010 MHz to 2 025 MHz	–86 dBm	1 MHz	

6.6 Transmit intermodulation

6.6.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

The transmit intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into an antenna connector at a level of 30 dB lower than that of the wanted signal. The frequency of the interference signal shall be 5 MHz, 10 MHz and 15 MHz offset below the first or above the last carrier frequency used.

The requirements are applicable for single carrier BS.

6.6.2 ~~Conformance requirement~~Minimum Requirement

The transmit intermodulation level shall not exceed the out of band emission or the spurious emission requirements of subclauses 6.5.2 and 6.5.3.

The normative reference for this requirement is in TS 25.104 [1] subclause 6.7

6.6.3 Test purpose

The test purpose is to verify the ability of the BS transmitter to restrict the generation of intermodulation products in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna to below specified levels.

6.6.4 Method of test

6.6.4.1 Initial conditions

1) Test set-up in accordance to annex B.

6.6.4.2 Procedures

1) Generate the wanted signal in accordance to test model 1, subclause 6.1.1.1 at specified maximum BS output power.
2) Generate the interference signal (WCDMA signal as specified in the table 6.1 and 6.2 (Test model 1)) with frequency offset of 5 MHz relative to the wanted signal in accordance to test model 2, subclause 6.1.1.2.
3) Adjust ATT1 so the level of the WCDMA modulated interference signal is as defined in subclause 6.6.~~at BS is 30 dB below the wanted signal~~.
4) Perform the out of band emission test as specified in subclause 6.5.2.
5) Perform the spurious emission test as specified in subclause 6.5.3.
6) Verify that the emission level does not exceed the required level with the exception of interference signal frequencies.
7) Repeat the test for interference frequency off set of -5 MHz.
8) Repeat the test for interference frequency off set of ±10 MHz and ±15 MHz.

6.6.4 Test Requirements

The WCDMA modulated interference signal shall be 30 dB below the wanted signal.

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

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). Due to difficulties estimating the power of the non-orthogonal SCH, the period of the SCH is excluded.

6.7.1.2 ~~Conformance Requirement~~Minimum Requirement

The Error Vector Magnitude shall be less than 17.5%

The normative reference for this requirement is in TS 25.104 [1] subclause 6.8.2

6.7.1.3 Test Purpose

To verify that the Error Vector Magnitude is within the limit specified in 6.7.1.2

6.7.1.4 Method of Test

Refer to annex B for a functional block diagram of the test set-up.

1) Connect the base station RF output port to the measurement equipment.
2) Set the base station to transmit a signal according to 6.2.1.3.1 (test model 4) on the main path only. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.
3) Trigger the test equipment from the system time reference signal from the base station.

<Editor's note: Precise definition of "Triggering signal" shall be needed.>

4) Measure the Error Vector Magnitude as defined in annex E.
5) If the base station supports STTD or TxAA, repeat steps 1 through 4 with the diversity path (antenna connector 2) enabled instead of the main path

6.7.1.5 Test Requirement

~~The Error Vector Magnitude measured in 6.7.2.4 step 4 shall meet the limit specified in 6.7.2.2~~The Error Vector Magnitude shall be less than 17.5%

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

6.7.2 Peak Code Domain Error

6.7.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting the error vector (as defined in 6.7.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. The measurement interval is one power control group (timeslot). Due to the non-orthogonal SCH mapping to all the OVSF codes, the period of the SCH is excluded.

6.7.2.2 ~~Conformance requirement~~Minimum Requirement

The peak code domain error shall not exceed -33 dB at spreading factor 256.

The normative reference for this requirement is in TS 25.104[1] subclause 6.8.3.

6.7.2.3 Test Purpose

It is the purpose of this test to discover and limit inter-code cross-talk.

6.7.2.4 Method of test

6.7.2.4.1 Initial conditions

1) Connect the measurement equipment to the BS antenna connector as shown in annex B. For non-transmit diversity modes, connect the antenna connector as shown in Figure B.2. If STTD or TxAA is supported by the BS, connect both antenna connectors as shown in Figure B.6.

2) Channel configuration defined in subclause 6.1.1.3 Test model 3 shall be used.

<Suggested Editor's Note: Changes to Test model 3 for TD tests are ffs>

3) Set BS frequency.

4) Start BS transmission

6.7.2.4.2 Procedure

1) Measure Peak code domain error according to annex E.

6.7.2.5 Test requirement

~~Peak code domain error shall meet the requirement as specified in subclause 6.7.2.2.~~The peak code domain error shall not exceed -32 dB at spreading factor 256.

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.

3GPP TSG RAN WG4 Meeting #16 **R4-010263**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141 CR 79** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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 ☒ Core Network ☐

Title:	⌘	Definition of EVM
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 19/02/01
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Correction to EVM definition
Summary of change:	⌘	Re-introduction of the SCH period into the EVM measurement.. Alignment of the EVM description with the core spec 25.104 v 3.5.0.
Consequences if not approved:	⌘	The SCH will not be measured.

Clauses affected:	⌘	6.7.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

~~The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). Due to difficulties estimating the power of the non-orthogonal SCH, the period of the SCH is excluded.~~

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. This difference is called the error vector. The measured waveform is modified by first passing it through a matched Root Raised Cosine filter with bandwidth 3.84 MHz and roll-off α =0.22. The waveform is then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). The requirement is valid over the total power dynamic range as specified in 25.104 subclause 6.4.3. See Annex E of this specification for further details.

3GPP TSG RAN WG4 Meeting #16 R4-010438

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ 25.141 CR 80 ⌘ rev - ⌘ Current version: 3.4.1 ⌘

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

Title:	⌘	Addition of CPICH to Test Model 4 for EVM measurement
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 09.02.2001
Category:	⌘	F ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Currently it is not possible to configure test model 4 using the cell setup message.
Summary of change:	⌘	The CPICH is added to test model 4.
Consequences if not approved:	⌘	Test model 4 can not be configured according to the cell setup message.

Clauses affected:	⌘	6.1.1.4
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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6.1.1.4 Test Model 4

This model shall be used for tests on:

- EVM measurement.

Table 6.6: Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level seting (dB)	Channelization Code	Timing offset
PCCPCH+SCH	1	50 to 1.6	-3 to -18	1	0
Primary CPICH[1]	1	10	-10	0	0

Note 1: The CPICH channel is optional.

3GPP TSG RAN WG4 Meeting #16 **R4-010440**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **81** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

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

Title:	⌘	Re-introduction of the SCH period into the EVM / PCDE measurements
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 23/02/01
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential 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:	⌘	Correction to EVM / PCDE definition
Summary of change:	⌘	Re-introduction of the SCH period into the EVM / PCDE measurement.s. Alignment of the EVM description with 25.104.
Consequences if not approved:	⌘	The SCH will not be measured.

Clauses affected:	⌘	6.7.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

~~The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). Due to difficulties estimating the power of the non-orthogonal SCH, the period of the SCH is excluded.~~

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3.84 MHz and roll-off α =0.22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %. The measurement interval is one timeslot as defined by the C-PICH (when present) otherwise the measurement interval is one timeslot starting with the beginning of the SCH. The requirement is valid over the total power dynamic range as specified in 25.104 subclause 6.4.3. See Annex E of this specification for further details.

6.7.1.2 Conformance Requirement

The Error Vector Magnitude shall be less than 17.5%

The reference for this requirement is in TS 25.104 [1] subclause 6.8.2

6.7.1.3 Test Purpose

To verify that the Error Vector Magnitude is within the limit specified in 6.7.1.2

6.7.1.4 Method of Test

Refer to annex B for a functional block diagram of the test set-up.

1) Connect the base station RF output port to the measurement equipment.

2) Set the base station to transmit a signal according to 6.2.1.3.1 (test model 4) on the main path only. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

3) Trigger the test equipment from the system time reference signal from the base station.

<Editor's note: Precise definition of "Triggering signal" shall be needed.>

4) Measure the Error Vector Magnitude as defined in annex E.

5) If the base station supports STTD or TxAA, repeat steps 1 through 4 with the diversity path (antenna connector 2) enabled instead of the main path

6.7.1.5 Test Requirement

The Error Vector Magnitude measured in 6.7.2.4 step 4 shall meet the limit specified in 6.7.2.2

6.7.2 Peak Code Domain Error

6.7.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting the error vector (as defined in 6.7.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. ~~The measurement interval is one power control group (timeslot). Due to the non-orthogonal SCH mapping to all the OVSF codes, the period of the SCH is excluded.~~The measurement interval is one timeslot as defined by the C-PICH (when present), otherwise the measurement interval is one timeslot starting with the beginning of the SCH. The requirement is valid over the total power dynamic range as specified in 25.104 subclause 6.4.3. See Annex E of this specification for further details.

3GPP TSG RAN WG4 Meeting #16 **R4-010470**

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **82** ⌘ rev **-** ⌘ Current version: **3.4.1** ⌘

*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:	⌘	**Implementation of Test Tolerances (Receiver part)**
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 26. Feb. 01
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
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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:	⌘	Implement Test Tolerances for receiver tests
Summary of change:	⌘	Test Requirements sections are introduced so as to implement test tolerances.
Consequences if not approved:	⌘	Test Tolerances are not incorporated into conformance testing.

Clauses affected:	⌘	7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7 Receiver characteristics

7.1 General

Unless otherwise stated, all tests in this clause shall be performed at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a RX amplifier, a diplexer, a filter or the combination of such devices is used, the tests according to subclauses 4.6.2 and/or 4.6.4, depending on the device added, shall be performed to ensure that the requirements are met at test port B.

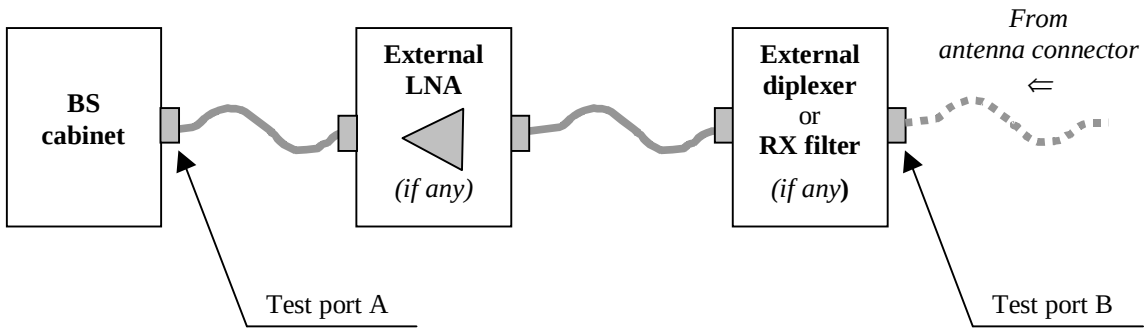

Figure 7.1: Receiver test ports

The tests in clause 7 assume that the receiver is not equipped with diversity. For receivers with diversity, unless otherwise stated, tests shall be performed by applying the specified signals to one of the receiver inputs, and terminating or disabling the other(s). The tests and requirements are otherwise unchanged.

In all the relevant subclauses in this clause all Bit Error Ratio (BER), Residual BER (RBER) and Block Error Ratio (BLER) measurements shall be carried out according to the general rules for statistical testing in annex A.

If external BER measurement is not used then the internal BER calculation shall be used instead. When internal BER calculation is used, the requirements of the verification test according to 7.8 shall be met in advance.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

7.2 Reference sensitivity level

7.2.1 Definition and applicability

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the BER does not exceed the specific value indicated in subclause 7.2.2. This test is performed without interfering signal with power applied to the BS antenna connector according to annex B. In the case duplex operation is supported, the measurement configuration principle is indicated for one duplex branch also in Annex B. In case of internal BER calculation is used example of test connection is as shown in figure B.7 The reference point for signal power is at the input of receiver (antenna connector).

7.2.2 ~~Conformance requirement~~Minimum Requirement

The BER shall not exceed 0,001 for the parameters specified in table 7.1.

Table 7.1: BS reference sensitivity levels

Data rate	BS reference sensitivity level (dBm)	FER/BER
12,2 kbps	-121 dBm	BER shall not exceed 0,001
NOTE: Should only be specified for a measurement channel.		

The normative reference for this requirement is in TS 25.104[1] subclause 7.2.

7.2.3 Test purpose

To verify the minimum receiver input power of a single code at which the BER does not exceed the specified limit.

7.2.4 Method of testing

7.2.4.1 Initial conditions

1) Connect BS to be tested to RF signal source.
2) Set frequency.
3) Start transmit 12,2kbps DPCH with reference measurement channel defined in annex A to the BS under test (PN-9 data sequence or longer).
4) Disable TPC function.

7.2.4.2 Procedure

1) Calculate BER from at least 30000 received data bits.
2) Set test signal power level transmitted for corresponding data rate as specified in table 7.1A.
3) Measure BER.

7.2.5 Test Rrequirement

~~Requirements for RX reference sensitivity specified in subclause 7.2.2 shall be fulfilled.~~

The measurement result in step 3 of 7.2.4.2 shall not be greater than the BER with BS reference sensitivity level both specified in tables 7.1A.

Table 7.1A: BS reference sensitivity levels

Data rate	BS reference sensitivity level (dBm)	FER/BER
12,2 kbps	-120.3 dBm	BER shall not exceed 0,001
NOTE: Should only be specified for a measurement channel.		

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

7.3 Dynamic range

7.3.1 Definition and applicability

Receiver dynamic range is the receiver ability to handle a rise of interference in the reception frequency channel. The receiver shall fulfil a specified BER requirement for a specified sensitivity degradation of the wanted signal in the presence of an interfering AWGN signal in the same reception frequency channel.

Minimum bandwidth of AWGN interferer shall be 1.5 times chip rate –5.76 MHz for a chip rate of 3.84 MHz.

7.3.2 ~~Conformance requirement~~Minimum Requirement

The BER shall not exceed 0,001 for the parameters specified in table 7.2.

Table 7.2: Dynamic range

Parameter	Level	Unit
Data rate	12,2	~~K~~kbps
Wanted signal	-91	~~D~~dBm
Interfering AWGN signal	-73	~~D~~dBm/3.84 MHz

The normative reference for this requirement is in TS 25.104[1] subclause 7.3

7.3.3 Test purpose

The test purpose is to verify the ability of the BS to receive a single-code test signal of maximum with a BER not exceeding a specified limit.

7.3.4 Method of test

7.3.4.1 Initial conditions

1) Connect the test equipment as shown in annex B.

7.3.4.2 Procedure

1) Adjust the signal generator for the wanted signal as specified in Table 7.2A~~to -91 dBm~~.
2) Adjust the AWGN generator level as specified in Table 7.2A~~to -73 dBm/3.84 MHz~~ and set the frequency to the same frequency as the tested channel.
3) Measure the BER for the tested service and verify that it is below the specified level.

Repeat the measurement for the other RX port.

7.3.5 Test R~~r~~equirements

~~Dynamic range requirement shall be met as specified in subclause 7.3.2~~

The measurement result in step 3 of 7.3.4.2 shall not be greater than the BER specified level (BER < 0,001) with the level specified in tables 7.2A.

Table 7.2A: Dynamic range

Parameter	Level	Unit
Data rate	12,2	Kbps
Wanted signal	-89.8	DBm
Interfering AWGN signal	-73	DBm/3.84 MHz

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

7.4 Adjacent Channel Selectivity (ACS)

7.4.1 Definition and applicability

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The interference signal be detuned by F_{uw} MHz and modulated by a pseudo random binary sequence uncorrelated to the wanted signal.

7.4.2 ~~Conformance requirement~~Minimum Requirement

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

Table 7.3: Adjacent channel selectivity

Parameter	Level	Unit
Data rate	12.2	~~K~~kbps
Wanted signal	-115	~~D~~dBm
Interfering signal	-52	~~D~~dBm
Fuw (Modulated)	±5	MHz

The interference signal shall be wide band CDMA signal of single code.

The normative reference for this requirement is in TS 25.104[1] subclause 7.4.

7.4.3 Test purpose

The test purpose is to verify the ability of the BS receiver filter to suppress interfering signals in the channels adjacent to the wanted channel.

7.4.4 Method of test

7.4.4.1 Initial conditions

1) Set-up the equipment as shown in annex B.

7.4.4.2 Procedure

1) Generate the reference channel and adjust the ATT1 to set the input level to the base station under test to the specified -115 dBm.

2) Set-up the interference signal at the adjacent channel frequency and adjust the ATT2 to obtain the specified level of interference signal at the base station input. Note that the interference signal shall have an ACLR of at least 63 dB in order to eliminate the impact of interference signal adjacent channel leakage power on the ACS measurement.

3) Measure the BER and control that the measured value does not exceed the specified value (BER < 0,001).

4) Repeat the test for the port, which was terminated.

7.4.5 Test R~~r~~equirements

The measurement result in step 3 of 7.4.4.2 shall not be greater than the specified level (BER < 0,001) with the level specified in table 7.3A.~~Adjacent channel selectivity requirement shall be met as specified in subclause 7.4.2~~

Table 7.3A: Adjacent channel selectivity

Parameter	Level	Unit
Data rate	12.2	~~K~~kbps
Wanted signal	-115	~~D~~dBm
Interfering signal	-52	~~D~~dBm
Fuw (Modulated)	±5	MHz

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

7.5 Blocking characteristics

7.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance shall apply at all frequencies as specified in table 7.4.

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

7.5.2 ~~Conformance requirement~~Minimum Requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.4.

Table 7.4(a): Blocking characteristics for operation in frequency bands in subclause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 920 MHz to 1 980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 900 MHz to 1 920 MHz 1 980 MHz to 2 000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 900 MHz and 2 000 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

Table 7.4(b): Blocking performance requirement for operation in frequency bands in subclause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 850 MHz to 1 910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 830 MHz to 1 850 MHz 1 910 MHz to 1 930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 830 MHz 1 930 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

The normative reference for these requirements is in TS 25.104[1] su bclause 7.5

7.5.3 Test purpose

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

1) Connect WCDMA signal generator at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

2) Terminate any other Rx port not under test.

3) Transmit a signal from the WCDMA signal generator to the BS. The characteristics of the signal shall be set according to the UL reference measurement channel (12,2 kbit/s) specified in annex A subclause A.2.1. The level of the WCDMA signal measured at the BS antenna connector shall be set to the level specified in subclause 7.5.5~~2~~.

7.5.4.2 Procedure

1) Set the signal generator to produce an interfering signal at a frequency offset Fuw from the assigned channel frequency of the wanted signal which is given by:

$$Fuw = \pm (n \times 1\ MHz),$$

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in table 7.4A. The type of the interfering signal is either equivalent to a continuous WCDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see table 7.4A.

2) Measure the BER of the wanted signal at the BS receiver.

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10 000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

3) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (2).

<Editor's note: The above NOTE is taken from proposal for TDD specification (R4-99789). Precise parameters for this 2-phase measurement shall be specified. >

7.5.5 Test R~~r~~equirements

~~In all measurements made according to subclause 7.5.4.2, the BER shall not exceed 0,001.~~

The BER shall not exceed 0.001 for the parameters specified in table 7.4A.

Table 7.4A(a): Blocking characteristics for operation in frequency bands in subclause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 920 MHz to 1 980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 900 MHz to 1 920 MHz 1 980 MHz to 2 000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 900 MHz and 2 000 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

Table 7.4A(b): Blocking performance requirement for operation in frequency bands in subclause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 850 MHz to 1 910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 830 MHz to 1 850 MHz 1 910 MHz to 1 930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 830 MHz 1 930 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

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.

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.6.2 ~~Conformance requirement~~Minimum Requirement

The intermodulation performance should be met when the following signals are applied to the receiver.

Table 7.5: Interferer signals for intermodulation performance requirement

Type of Signal	Offset	Signal level
Wanted signal	-	-115 dBm
CW signal	10 MHz	-48 dBm
WCDMA signal with one code	20 MHz	-48 dBm

The BER for wanted signal shall not exceed 0,001 for the parameters specified in table 7.5.

The normative reference for this requirement is in TS 25.104 [1] subclause 7.6

7.6.3 Test purpose

The test purpose is to verify the ability of the BS receiver to inhibit the generation of intermodulation products in its non-linear elements caused by the presence of two high-level interfering signals at frequencies with a specific relationship to the frequency of the wanted signal.

7.6.4 Method of test

7.6.4.1 Initial conditions

1) Set-up the equipment as shown in annex B.

7.6.4.2 Procedures

1) Generate the wanted signal (reference signal) and adjust ATT1 to set the signal level to the BS under test to the specified -115 dBm.

2) Adjust the signal generators to the frequency offset of +10 MHz (CW tone) and +20 MHz (WCDMA modulated) from the frequency of the wanted signal if possible.

3) Adjust the ATT2 and ATT3 to obtain the specified level of interference signal at the BS input.

4) Measure the BER and control that the measured value does not exceed the specified value.

5) Repeat the test for interference signal frequency offset of –10 MHz and -20 MHz for CW and WCDMA modulated respectively.

6) Repeat the whole test for the port which was terminated.

7.6.5 Test requirements

~~The BER for wanted signal shall not exceed 0,001.~~

The intermodulation performance should be met when the following signals are applied to the receiver.

Table 7.5A: Interferer signals for intermodulation performance requirement

Type of Signal	Offset	Signal level
Wanted signal	-	-115 dBm
CW signal	10 MHz	-48 dBm
WCDMA signal with one code	20 MHz	-48 dBm

The BER for wanted signal shall not exceed 0,001 for the parameters specified in table 7.5A.

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.

7.7 Spurious Emissions

7.7.1 Definition and applicability

The spurious emission power is the power of the emissions generated or amplified in a receiver that appears at the BS antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For all BS with common RX and TX antenna port the transmitter spurious emission as specified in subclause 6.6.3 is valid.

7.7.2 ~~Conformance requirement~~Minimum Requirements

The power of any spurious emission shall not exceed:

Table 7.~~6~~7: Spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
1900 – 1980 MHz and 2010 – 2025 MHz	-78 dBm	3.84 MHz	
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

The normative reference for this requirement is in TS 25.104[1] subclause 7.7

7.7.3 Test purpose

The test purpose is to verify the ability of the BS to limit the interference caused by receiver spurious emissions to other systems.

7.7.4 Method of test

7.7.4.1 Initial conditions

1) Connect a measurement receiver to the BS antenna connector as shown in annex B.

2) Enable the BS receiver.

3) Start BS transmission with channel configuration as specified in the table 6.1 and 6.2 (Test model 1).

7.7.4.2 Procedure

1) Set measurement equipment parameters as specified in table 7.7~~6~~.

2) Measure the spurious emissions over each frequency range described in subclause 7.7.2.

3) Repeat test using diversity antenna connector if available.

Table 7.7~~6~~

Measurement Band width	3.84 MHz (Root raised cosine,0.22) / 100 kHz (note)
Sweep frequency range	9 kHz to 12.75GHz
Detection	True RMS
NOTE: As defined in subclause 7.7.2.	

7.7.5 Test R~~r~~equirements

The all measured spurious emissions, derived in step (2), shall be within requirement limits as specified in Table 7.7A~~subclause 7.7.2~~.

Table 7.7A: Spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
1900 – 1980 MHz and 2010 – 2025 MHz	-78 dBm	3.84 MHz	
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

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.

7.8 Verification of the internal BER calculation

7.8.1 Definition and applicability

Base Station System with internal BER calculation can synchronise it's receiver to known pseudo-random data sequence and calculates bit error ratio from the received data. This test is performed only if Base Station System has this kind of feature. All data rate's which are used in RX conformance testing shall be used in verification test. This test is performed by feeding measurement signal with known BER to the input of the receiver. Locations of the erroneous bits shall be randomly distributed within a frame. Erroneous bits shall be inserted to the data bit stream as shown in figure 7.1.

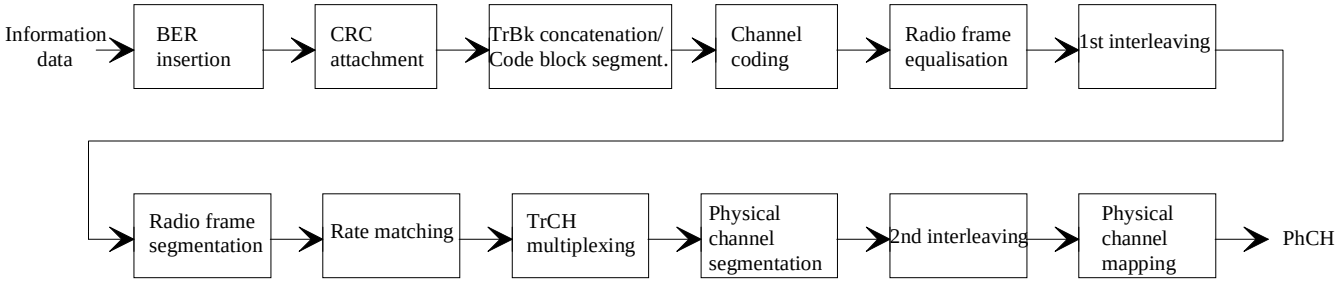

Figure 7.1: BER insertion into the information data

7.8.2 ~~Conformance requirement~~Minimum Requirement

BER indicated by the Base Station System shall be within ±[10%] of the BER generated by the RF signal source. Measurement shall be repeated for each measurement signal specified in table 7.8~~7~~.

Table 7.8~~7~~

Transport channel combination	Data rate	BER
DPCH	12,2 kbps	BER 0,01
TBD	TBD	TBD
…	…	…
NOTE: 10 times larger BER generator is used to get a good confidence.		

7.8.3 Test purpose

To verify that the internal BER calculation accuracy shall meet requirements for conformance testing.

7.8.4 Method of test

7.8.4.1 Initial conditions

1) Connect BS RX antenna connector to the RF signal source or UE simulator as shown in annex B.
2) Set correct signal source parameters as specified in table 7.9~~8~~.

Table 7.9~~8~~

Parameter	Level/status	Unit
UL signal level	Ref.sens +10 dB	dBm/3,84 MHz
Data sequence	PN9 or longer	

7.8.4.2 Procedure

1) Measure the BER of received signal from RF signal source or UE simulator to BS antenna connector.
2) BER calculation shall be done at least over 50 000 bits.
3) Repeat test for all required data rates.

7.8.5 Test R~~r~~equirement

BER indicated by the Base Station System shall be within requirement as specified in subclause 7.8.2.