TSG RAN Meeting #13 **RP-010623**
Beijing, China, 18-21 September 2001

Title: **CRs (R'99 and Rel-4 Category A) to TS 25.142**

Source **TSG RAN WG4**

Agenda item: **8.4.3**

RAN4 Tdoc	Spec	CR	Title	Cat	Phase	Curr Ver	New Ver
R4-010828	25.142	65	Clarification of AWGN interferer definition	F	Rel99	3.6.0	3.7.0
R4-011082	25.142	66	Clarification of AWGN interferer definition	A	Rel-4	4.1.0	4.2.0
R4-010831	25.142	67	Measurement uncertainty	F	Rel99	3.6.0	3.7.0
R4-011083	25.142	68	Measurement uncertainty	A	Rel-4	4.1.0	4.2.0
R4-010946	25.142	69	Receiver spurious emissions for co-located base stations	F	Rel99	3.6.0	3.7.0
R4-011084	25.142	70	Receiver spurious emissions for co-located base stations	A	Rel-4	4.1.0	4.2.0
R4-011120	25.142	71	CR to TS 25.142 Measurement uncertainty issues	F	Rel99	3.6.0	3.7.0
R4-011121	25.142	72	CR to TS 25.142 Measurement uncertainty issues	A	Rel-4	4.1.0	4.2.0
R4-011135	25.142	73	Power and ACLR definition corrections	F	Rel99	3.6.0	3.7.0
R4-011085	25.142	74	Power and ACLR definition corrections	A	Rel-4	4.1.0	4.2.0
R4-011182	25.142	75	Minimum transmit power test condition alignment with PC dynamic range test conditions.	F	Rel99	3.6.0	3.7.0
R4-011283	25.142	76	Minimum transmit power test condition alignment with PC dynamic range test conditions.	A	Rel-4	4.1.0	4.2.0
R4-011280	25.142	77	Correction of frequency range for receiver spurious emissions	F	Rel99	3.6.0	3.7.0
R4-011281	25.142	78	Correction of frequency range for receiver spurious emissions	A	Rel-4	4.1.0	4.2.0
R4-011292	25.142	79	Definition of "classical Doppler spectrum"	F	Rel99	3.6.0	3.7.0
R4-011296	25.142	80	Definition of "classical Doppler spectrum"	A	Rel-4	4.1.0	4.2.0

3GPP TSG RAN WG4 Meeting #19 R4-010828

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 65 ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Clarification of AWGN interferer definition
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 9 July 2001
Category:	⌘	**F** ***Release:*** ⌘ Rel99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The existing AWGN interferer definition is incomplete.
Summary of change:	⌘	The flatness across the minimum bandwidth and the peak to average ratio of the AWGN interferer are specified.
Consequences if not approved:	⌘	An AWGN signal with insufficient randomness may be used which will artificially improve test results.

Clauses affected:	⌘	3; 5.18 (new); 7.3.4.1; 8.1
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.

3 Definitions, symbols, and abbreviations

For the purposes of the present document, the following definitions, symbols and abbreviations apply:

3GPP	3rd Generation Partnership Project
α	Roll-off factor
AWGN	Additive White Gaussian Noise
dB	decibel
dBm	decibel relative to 1 milliWatt
DPCHo	Mechanism used to simulate an individual intracell interferer in the cell with one code and a spreading factor of 16
$\frac{DPCH_o\_E_c}{I_{or}}$	Ratio of the average transmit energy per PN chip for the $DPCH_o$ to the total transmit power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
EVM	Error Vector Magnitude
F	Frequency (of the assigned channel frequency of the wanted signal)
Fuw	Frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal
IMT-2000	International Mobile Telecommunications 2000
Ioc	Power spectral density of a band limited white noise source (simulating interference form other cells) as measured at the BS antenna connector.
Îor	Received power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	Transmit power
Pout	Output power of the base station; defined as the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter during one slot
Pmax	Maximum output power of the base station; defined as the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station; defined as the mean power level per carrier over an active timeslot that the manufacturer has declared to be available at the antenna connector
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

5.18 Definition of Additive White Gaussian Noise (AWGN) Interferer

The minimum bandwidth of the AWGN interferer shall be 1,5 times chip rate of the radio access mode (e.g. 5,76 MHz for a chip rate of 3,84 Mcps). The flatness across this minimum bandwidth shall be within ± 0,5 dB, and the peak to average ratio at a probability of 0,001% shall exceed 10 dB.

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.

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

7.3.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 7.3.

Table 7.3: Dynamic Range

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	<REFSENS> + 30 dB	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 7.3.

7.3.3 Test purpose

The test purpose is to verify the ability of the BS to receive a prescribed single-code test signal of maximum input power under defined conditions (specified interference, no multipath) with a BER not exceeding a specified limit.

7.3.4 Method of test

7.3.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester (UE simulator), generating the wanted signal, and a band-limited white noise source, generating the interfering AWGN signal, to the antenna connector of one BS Rx port.

(2) Terminate or disable any other BS Rx port not under test.

(3) Start transmission from the BS tester to the BS using the UL reference measurement channel (12,2 kbps) defined in Annex A.2.1.

(4) The level of the BS tester output signal measured at the BS antenna connector shall be adjusted as specified in table 7.4.

(5) The power spectral density of the band-limited white noise source measured at the BS antenna connector shall be adjusted as specified in table 7.4. The characteristics of the white noise source shall comply with the AWGN interferer definition in subclause 5.18.~~The minimum bandwidth of the white noise source shall be 1,5 times the chip rate (5,76 MHz for a chip rate of 3,84 MHz).~~

8 Performance requirements

8.1 General

Performance requirements for the BS are specified for the measurement channels defined in Annex A and the propagation conditions in Annex B. The requirements only apply to those measurement channels that are supported by the base station.

The characteristics ~~minimum bandwidth~~ of the white noise source, simulating interference from other cells (I_{oc}), shall comply with the AWGN interferer definition in subclause 5.18.~~be 1,5 times the chip rate (5,76 MHz for a chip rate of 3,84 MHz).~~

The requirements only apply to a base station with dual receiver antenna diversity. The required $\hat{I}_{or}/I_{oc}$ shall be applied separately at each antenna port.

3GPP TSG RAN WG4 Meeting #19 **R4-011082**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 66 ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	Clarification of AWGN interferer definition
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 September 2001
Category:	⌘ **A**	***Release:*** ⌘ Rel-4

Use one of the following categories:
F *(correction)*
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2	*(GSM Phase 2)*
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R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The existing AWGN interferer definition is incomplete.
Summary of change:	⌘	The flatness across the minimum bandwidth and the peak to average ratio of the AWGN interferer are specified.
Consequences if not approved:	⌘	An AWGN signal with insufficient randomness may be used which will artificially improve test results.

Clauses affected:	⌘	3; 5.18 (new); 7.3.4.1.1; 7.3.4.1.2; 8.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This CR corresponds to R99 Cat F CR in tdoc R4-010828.

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For the purposes of the present document, the following definitions, symbols and abbreviations apply:

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EVM	Error Vector Magnitude
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IMT-2000	International Mobile Telecommunications 2000
Ioc	Power spectral density of a band limited white noise source (simulating interference form other cells) as measured at the BS antenna connector.
Îor	Received power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	Transmit power
Pout	Output power of the base station; defined as the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter during one slot
Pmax	Maximum output power of the base station; defined as the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station; defined as the mean power level per carrier over an active timeslot that the manufacturer has declared to be available at the antenna connector
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

5.18 Definition of Additive White Gaussian Noise (AWGN) Interferer

The minimum bandwidth of the AWGN interferer shall be 1,5 times chip rate of the radio access mode (e.g. 5,76 MHz for a chip rate of 3,84 Mcps and 1,92 MHz for a chip rate of 1,28 Mcps). The flatness across this minimum bandwidth shall be within ± 0,5 dB, and the peak to average ratio at a probability of 0,001% shall exceed 10 dB.

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.

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

7.3.2 Minimum Requirements

7.3.2.1 3,84 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 7.3.

Table 7.3: Dynamic Range

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	<REFSENS> + 30 dB	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

7.3.2.2 1,28 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 7.3A.

Table 7.3A: Dynamic Range for 1,28 Mcps TDD

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	<REFSENS> + 30 dB	dBm
Interfering AWGN signal	-76	dBm/1,28 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 7.3.

7.3.3 Test purpose

The test purpose is to verify the ability of the BS to receive a prescribed single-code test signal of maximum input power under defined conditions (specified interference, no multipath) with a BER not exceeding a specified limit.

7.3.4 Method of test

7.3.4.1 Initial conditions

7.3.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester (UE simulator), generating the wanted signal, and a band-limited white noise source, generating the interfering AWGN signal, to the antenna connector of one BS Rx port.

(2) Terminate or disable any other BS Rx port not under test.

(3) Start transmission from the BS tester to the BS using the UL reference measurement channel (12,2 kbps) defined in Annex A.2.1.

(4) The level of the BS tester output signal measured at the BS antenna connector shall be adjusted as specified in table 7.4.

(5) The power spectral density of the band-limited white noise source measured at the BS antenna connector shall be adjusted as specified in table 7.4. The characteristics of the white noise source shall compy with the AWGN interferer definition in subclause 5.18.~~minimum bandwidth of the white noise source shall be 1,5 times the chip rate (5,76 MHz for a chip rate of 3,84 MHz).~~

7.3.4.1.2 1,28 Mcps TDD option

(1) Connect the BS tester (UE simulator), generating the wanted signal, and a band-limited white noise source, generating the interfering AWGN signal, to the antenna connector of one BS Rx port.

(2) Terminate or disable any other BS Rx port not under test.

(3) Start transmission from the BS tester to the BS using the UL reference measurement channel (12.2 kbps) defined in Annex A.2.1.

(4) The level of the BS tester output signal measured at the BS antenna connector shall be adjusted as specified in table 7.3A.

(5) The power spectral density of the band-limited white noise source measured at the BS antenna connector shall be adjusted as specified in table 7.3A. The characteristics of the white noise source shall compy with the AWGN interferer definition in subclause 5.18.~~minimum bandwidth of the white noise source shall be 1,5 times the chip rate (2,4 MHz for a chip rate of 1,28 MHz).~~

8 Performance requirements

8.1 General

Performance requirements for the BS are specified for the measurement channels defined in Annex A and the propagation conditions in Annex B. The requirements only apply to those measurement channels that are supported by the base station.

The characteristics~~minimum bandwidth~~ of the white noise source, simulating interference from other cells (I_{oc}), shall comply with the AWGN interferer definition in subclause 5.18.~~be 1,5 times the chip rate.~~

The requirements only apply to a base station with dual receiver antenna diversity. The required $\hat{I}_{or}/I_{oc}$ shall be applied separately at each antenna port.

3GPP TSG RAN WG4 Meeting #19 **R4-010831**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 67 ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Measurement uncertainty
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 9 July 2001
Category:	⌘	**F** ***Release:*** ⌘ Rel99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Alignment with recent changes in TS 25.141 based on additional work on measurement uncertainty at TEM Meeting #04.
Summary of change:	⌘	Various updates
Consequences if not approved:	⌘	Incorrect setting of test limits for conformance testing.

Clauses affected:	⌘	5.10.2; 5.10.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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5.10.2 Measurement of transmitter

Table 5.3: Maximum Test System Uncertainty for transmitter tests

Subclause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty ~~Measurement range (see NOTE)~~
6.2 Maximum Output Power	± 0,7 dB	
6.3 Frequency stability	± 12 Hz	~~± 500 Hz~~
6.4.2 Power control steps	single step: ± 0,1 dB ten steps: ± 0,3 dB	Result is difference between two absolute Code Domain Power measurements on the power controlled DPCH.
6.4.3 Power control dynamic range	± 0,3 dB	
6.4.4 Minimum transmit power	± 0,7 dB	
6.4.5 Primary CCPCH power	± 0,8 dB	
6.5.1 Transmit OFF power	± 2,0 dB	
6.5.2 Transmit ON/OFF time mask	Tx power limit = -79 dBm: ± 2,0 dB Tx power limit = -33 dBm: ± 0,7 dB	
6.6.1 Occupied Bandwidth	± 100 kHz	Accuray = ± 3*RBW. Assume 30 kHz bandwidth.~~± 1,0 MHz~~
6.6.2.1 Spectrum emission mask	± 1,5 dB	
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: 5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: ± 4 dB 10 MHz offset: ± 4 dB requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: TBD 10 MHz offset: TBD Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied.	~~Signal power = PRAT~~
6.6.3 Spurious emissions	± 2,0 dB for BS and coexistence bands for results > -60 dBm ± 3,0 dB for results < -60 dBm Outside above range: f ≤ 2,2 GHz: ± 1,5 dB 2,2 GHz < f ≤ 4 GHz: ± 2,0 dB f > 4 GHz: ± 4,0 dB	
6.7 Transmit intermodulation	The value below applies to the setting of the interference signal level only and is unrelated to the measurement uncertainty of the tests (6.6.2.1, 6.6.2.2 and 6.6.3) which have to be carried out in the presence of the interference signal. ~~Need to add formula for uncertainty of the ratio.~~ ± 1 dB	The uncertainty of the interferer has double the effect on the result due to the frequency offset.~~Not applicable~~
6.8.1 Modulation accuracy	± 2,5 % (for single code)	~~± 5,0 %~~ ~~Signal power = PRAT to (PRAT - 30 dB)~~

6.8.2 Peak code domain error	± 1 dB	~~Signal power = PRAT~~
~~NOTE: The Test System uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.~~		

5.10.3 Measurement of receiver

Table 5.4: Maximum Test System Uncertainty for receiver tests

Subclause	Maximum Test System Uncertainty (see NOTE 1)	Derivation of Test System Uncertainty ~~Measurement range (see NOTE 2)~~
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)~~	Formula = SQRT(signal level error^2 and AWGN level error^2) ~~Not applicable~~
7.4 Adjacent Channel Selectivity (ACS)	± 1,1 dB ~~Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect~~ ~~The ACLR effect is calculated by: (Formula to follow)~~	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~~ Maximum Test System Accuracy with Frequency offset of interfering signal < 15MHz: ± 1,4dB ~~(assuming ACLR of interfering signal = 68 dB, measurement uncertainty of wanted signal = 0,7 dB)~~ Frequency offset of interfering signal ≥ 15MHz: f < 2,2 GHz: ± 1,1 dB 2,2 GHz < f ≤ 4 GHz: ± 1,8 dB f > 4 GHz: ± 3,2 dB ~~(assuming –130 dBc broadband noise from interfering signal)~~ ~~Harmonics and spurs of the interfering signal need to be carefully considered.~~ ~~For the –15 dBm CW interfering signal, filtering of the interfering signal (at least 25 dB) is necessary to elimininate problems with broadband noise falling into the bandwidth of the wanted signal.~~	~~Not applicable~~ Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect + Broadband noise (Frequency offset < 15 MHz: assuming ACLR of interfering signal = 68 dB, measurement uncertainty of wanted signal = 0,7 dB) (Frequency offset ≥ 15 MHz: assuming –130 dBc broadband noise from interfering signal) Harmonics and spurs of the interfering signal need to be carefully considered. Perhaps need to avoid harmonics of the interferer that fall on top of the receive channel. For the –15 dBm CW interfering signal, filtering of the interfering signal (at least 25 dB) is necessary to elimininate problems with broadband noise falling into the bandwidth of the wanted signal.
7.6 Intermodulation characteristics	± 1,3 dB ~~(assuming: CW_level_error: 0,5 dB mo_level_error: 0,5 dB wanted_signal_level_error: 0,7 dB)~~ ~~Formula: *Test system uncertainty=*~~ $\sqrt{\quad\quad^2\quad\quad^2}$	~~Not applicable~~ Formula = SQRT ((2∗CW_level_error)² + (mod_level_error)² + (wanted_signal_level_error)²) (assuming: CW_level_error: 0,5 dB mod_level_error: 0,5 dB wanted_signal_level_error: 0,7 dB)

7.7 Spurious emissions ~~(see NOTE 3)~~	± 3,0 dB for BS receive band (-78 dBm) Outside above range: f ≤ 2,2 GHz: ± 2,0 dB (-57 dBm) 2,2 GHz < f ≤ 4 GHz: ± 2,0 dB (-47 dBm) f > 4 GHz : ± 4,0 dB (-47 dBm) (see Note 2)	
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. ~~NOTE 2: The Test System uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.~~ NOTE 2~~3~~: The Test System uncertainty figures for Spurious emissions apply to the measurement of the DUT and not to any stimulus signals.		

3GPP TSG RAN WG4 Meeting #19 R4-011083

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 68 ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

Title:	⌘	Measurement uncertainty
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 September 2001
Category:	⌘	**A** ***Release:*** ⌘ Rel-4

Use one of the following categories:
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R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Alignment with recent changes in TS 25.141 based on additional work on measurement uncertainty at TEM Meeting #04.
Summary of change:	⌘	Various updates
Consequences if not approved:	⌘	Incorrect setting of test limits for conformance testing.

Clauses affected:	⌘	5.10.2; 5.10.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This CR corresponds to a Rel99 Cat F CR in R4-010831.

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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.

5.10.2 Measurement of transmitter

Table 5.3: Maximum Test System Uncertainty for transmitter tests

Subclause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty ~~Measurement range (see NOTE)~~
6.2 Maximum Output Power	± 0,7 dB	
6.3 Frequency stability	± 12 Hz	~~± 500 Hz~~
6.4.2 Power control steps	single step: ± 0,1 dB ten steps: ± 0,3 dB	Result is difference between two absolute Code Domain Power measurements on the power controlled DPCH.
6.4.3 Power control dynamic range	± 0,3 dB	
6.4.4 Minimum transmit power	± 0,7 dB	
6.4.5 Primary CCPCH power	± 0,8 dB	
6.5.1 Transmit OFF power	± 2,0 dB	
6.5.2 Transmit ON/OFF time mask	Tx power limit = -79 dBm: ± 2,0 dB Tx power limit = -33 dBm: ± 0,7 dB	
6.6.1 Occupied Bandwidth	± 100 kHz	Accuray = ± 3*RBW. Assume 30 kHz bandwidth.~~± 1,0 MHz~~
6.6.2.1 Spectrum emission mask	± 1,5 dB	
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: 5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: ± 4 dB 10 MHz offset: ± 4 dB requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: TBD 10 MHz offset: TBD Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied.	~~Signal power = PRAT~~
6.6.3 Spurious emissions	± 2,0 dB for BS and coexistence bands for results > -60 dBm ± 3,0 dB for results < -60 dBm Outside above range: f ≤ 2,2 GHz: ± 1,5 dB 2,2 GHz < f ≤ 4 GHz: ± 2,0 dB f > 4 GHz: ± 4,0 dB	
6.7 Transmit intermodulation	The value below applies to the setting of the interference signal level only and is unrelated to the measurement uncertainty of the tests (6.6.2.1, 6.6.2.2 and 6.6.3) which have to be carried out in the presence of the interference signal. ~~Need to add formula for uncertainty of the ratio.~~ ± 1 dB	The uncertainty of the interferer has double the effect on the result due to the frequency offset.~~Not applicable~~
6.8.1 Modulation accuracy	± 2,5 % (for single code)	~~± 5,0 %~~ ~~Signal power = PRAT to (PRAT - 30 dB)~~

6.8.2 Peak code domain error	± 1 dB	~~Signal power = PRAT~~
~~NOTE: The Test System uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.~~		

5.10.3 Measurement of receiver

Table 5.4: Maximum Test System Uncertainty for receiver tests

Subclause	Maximum Test System Uncertainty (see NOTE 1)	Derivation of Test System Uncertainty ~~Measurement range (see NOTE 2)~~
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)~~	Formula = SQRT(signal level error^2 and AWGN level error^2) ~~Not applicable~~
7.4 Adjacent Channel Selectivity (ACS)	± 1,1 dB ~~Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect~~ ~~The ACLR effect is calculated by: (Formula to follow)~~	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~~ Maximum Test System Accuracy with Frequency offset of interfering signal < 15MHz: ± 1,4dB ~~(assuming ACLR of interfering signal = 68 dB, measurement uncertainty of wanted signal = 0,7 dB)~~ Frequency offset of interfering signal ≥ 15MHz: f < 2,2 GHz: ± 1,1 dB 2,2 GHz < f ≤ 4 GHz: ± 1,8 dB f > 4 GHz: ± 3,2 dB ~~(assuming –130 dBc broadband noise from interfering signal)~~ ~~Harmonics and spurs of the interfering signal need to be carefully considered.~~ ~~For the –15 dBm CW interfering signal, filtering of the interfering signal (at least 25 dB) is necessary to elimininate problems with broadband noise falling into the bandwidth of the wanted signal.~~	~~Not applicable~~ Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect + Broadband noise (Frequency offset < 15 MHz: assuming ACLR of interfering signal = 68 dB, measurement uncertainty of wanted signal = 0,7 dB) (Frequency offset ≥ 15 MHz: assuming –130 dBc broadband noise from interfering signal) Harmonics and spurs of the interfering signal need to be carefully considered. Perhaps need to avoid harmonics of the interferer that fall on top of the receive channel. For the –15 dBm CW interfering signal, filtering of the interfering signal (at least 25 dB) is necessary to elimininate problems with broadband noise falling into the bandwidth of the wanted signal.
7.6 Intermodulation characteristics	± 1,3 dB ~~(assuming: CW_level_error: 0,5 dB mo_level_error: 0,5 dB wanted_signal_level_error: 0,7 dB)~~ ~~Formula: *Test system uncertainty=*~~ $\sqrt{\quad\quad^2\quad\quad^2}$	~~Not applicable~~ Formula = SQRT ((2∗CW_level_error)² + (mod_level_error)² + (wanted_signal_level_error)²) (assuming: CW_level_error: 0,5 dB mod_level_error: 0,5 dB wanted_signal_level_error: 0,7 dB)

7.7 Spurious emissions ~~(see NOTE 3)~~	± 3,0 dB for BS receive band (-78 dBm) Outside above range: f ≤ 2,2 GHz: ± 2,0 dB (-57 dBm) 2,2 GHz < f ≤ 4 GHz: ± 2,0 dB (-47 dBm) f > 4 GHz : ± 4,0 dB (-47 dBm) (see Note 2)	
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. ~~NOTE 2: The Test System uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.~~ NOTE 2~~3~~: The Test System uncertainty figures for Spurious emissions apply to the measurement of the DUT and not to any stimulus signals.		

3GPP TSG RAN WG4 Meeting #19 **R4-010946**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.142** **CR** **69** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘	Receiver spurious emission for co-located base stations
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2001-07-03
Category:	⌘	**F** ***Release:*** ⌘ Rel99

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:	⌘	In case of separate RX and TX antenna port the receiver is currently allowed to have more spurious emission than the transmitter in case of co-located base stations.
Summary of change:	⌘	Adding requirements for receiver spurious emission in case of separate RX and TX antenna port. The requirements are in line with the current transmitter requirements for co-located base stations.
Consequences if not approved:	⌘	Reduced performance of the co-located base station caused by receiver spurious emission.

Clauses affected:	⌘	7.7.2
Other specs Affected:	⌘	☒ Other core specifications ⌘ 3GPP TS 25.105 ☐ 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.

7.7 Spurious emissions

7.7.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS antenna connector. The requirements apply to all BS with separate Rx and Tx antenna connectors. For BS equipped with only a single antenna connector for both transmitter and receiver, the requirements of subclause 6.6.3 shall apply to this port, and this test need not be performed.

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

7.7.2 Minimum Requirements

The power of any spurious emission shall not exceed the values given in table 7.12.

Table 7.12: Receiver spurious emission requirements

Band	Maximum level	Measurement Bandwidth	Note
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 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
1,900 – 1,980 GHz	-78 dBm	3,84 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
1,980 – 2,010 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
2,010 – 2,025 GHz	-78 dBm	3,84 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
2,025 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

In addition to the requirements in table 7.12, the co-existence requirements for co-located base stations in subclauses 6.6.3.2.2.2, 6.6.3.2.3.2 and 6.6.3.2.4.2 may also be applied.

The normative reference for this requirement is TS 25.105 [1] subclause 7.7.1.

3GPP TSG RAN WG4 Meeting #19 **R4-011084**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.142** **CR** **70** ⌘ rev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	Receiver spurious emission for co-located base stations
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2001-08-16
Category:	⌘	**A** ***Release:*** ⌘ Rel-4

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:	⌘	In case of separate RX and TX antenna port the receiver is currently allowed to have more spurious emission than the transmitter in case of co-located base stations.
Summary of change:	⌘	Adding requirements for receiver spurious emission in case of separate RX and TX antenna port. The requirements are in line with the current transmitter requirements for co-located base stations.
Consequences if not approved:	⌘	Reduced performance of the co-located base station caused by receiver spurious emission.

Clauses affected:	⌘	7.7.2
Other specs Affected:	⌘	☒ Other core specifications ⌘ 3GPP TS 25.105 ☐ 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.

7.7 Spurious emissions

7.7.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS antenna connector. The requirements apply to all BS with separate Rx and Tx antenna connectors. For BS equipped with only a single antenna connector for both transmitter and receiver, the requirements of subclause 6.6.3 shall apply to this port, and this test need not be performed.

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

7.7.2 Minimum Requirements

The power of any spurious emission shall not exceed the values given in table 7.12.

Table 7.12: Receiver spurious emission requirements

Band	Maximum level	Measurement Bandwidth	Note
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 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
1,900 – 1,980 GHz	-78 dBm	3,84 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
1,980 – 2,010 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
2,010 – 2,025 GHz	-78 dBm	3,84 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
2,025 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

In addition to the requirements in table 7.12, the co-existence requirements for co-located base stations in subclauses 6.6.3.2.2.2, 6.6.3.2.3.2 and 6.6.3.2.4.2 may also be applied.

3GPP TSG RAN WG4 Meeting #19 **R4-011120**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 71 ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘	CR to TS 25.142 Measurement uncertainty issues
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 September 2001
Category:	⌘	**F** ***Release:*** ⌘ Rel99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Measurement uncertainty aspects are still not fully specified.
Summary of change:	⌘	Various updates in Annex E with respect to measurement ranges etc. based on work of TEM ad hoc, in alignment with an endorsed CR to TS 25.141 in R4-010944
Consequences if not approved:	⌘	Possible misinterpretation of conformance test results if measurements are outside the range over which equipment accuracy applies

Clauses affected:	⌘	Annex G
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Corresponding REL-4 Cat A CR in R4-011121

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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.

Annex E (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 Analysers etc.) which are necessary when assembling a Test System which complies with subclause 5.10 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.

Table E.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Range ~~(see NOTE)~~ over which equipment accuracy applies
6.2 Maximum output power	Not critical	Not critical
6.3 Frequency stability	± 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	single step: ± 0,1 dB ten steps: ± 0,3 dB	Pmax to Pmax - 30 dB
6.4.3 Power control dynamic range	± 0,3 dB	Pmax to Pmax - 30 dB
6.4.4 Minimum transmit power	Not critical	Pmax to Pmax - 30 dB~~Not critical~~
6.4.5 Primary CCPCH power	Not critical	Not critical
6.5.1 Transmit OFF power	Not critical	Not critical
6.5.2 Transmit ON/OFF time mask	Not critical	Not critical
6.6.1 Occupied bandwidth	± 100 kHz	± 1 MHz of the minimum requirement
6.6.2.1 Spectrum emission mask	Not critical	Not critical
6.6.2.2 ACLR	minimum requirement: ± 0,8 dB requirement in case of operation in proximity: ± 4,0 dB requirement in case of co-siting: TBD	Measurements in the range ±3 dB of the minimum requirement at signal power = Pmax
6.6.3 Spurious emissions	Not critical	Not critical
6.7 Transmit intermodulation (interferer requirements)	Not critical	Not critical
6.8.1 Modulation accuracy	± 2,5 % (for single code)	~~Signal power = PRAT to (PRAT – 30 dB)~~ Specified accuracy applies to measurement results between ± 7,5% and 17,5% at signal power = Pmax to Pmax - 30 dB
6.8.2 Peak code domain error	± 1 dB	Measurements in the range -25 dB to -30 dB at signal power = Pmax
~~NOTE: The Test Equipment uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.~~		

Table E.2: Equipment accuracy for receiver measurements

Subclause	Equipment accuracy	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 Intermodulation characteristics	Not critical	Not critical
7.7 Spurious Emissions	Not critical	Not critical

Table E.3: Equipment accuracy for performance measurements

Subclause		Equipment accuracy	Range over which equipment accuracy applies
8.2	Demodulation in static propagation conditions	Not critical	Not critical
8.3	Demodulation of DCH in multipath fading conditions	Not critical	Not critical

3GPP TSG RAN WG4 Meeting #19 **R4-011121**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 72 ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	CR to TS 25.142 Measurement uncertainty issues
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 September 2001
Category:	⌘	**A** ***Release:*** ⌘ Rel-4

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Measurement uncertainty aspects are still not fully specified.
Summary of change:	⌘	Various updates in Annex E with respect to measurement ranges etc. based on work of TEM ad hoc, in alignment with an endorsed CR to TS 25.141
Consequences if not approved:	⌘	Possible misinterpretation of conformance test results if measurements are outside the range over which equipment accuracy applies

Clauses affected:	⌘	Annex G
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Corresponds to a R99 Cat F CR in R4-011120

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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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

Annex E (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 Analysers etc.) which are necessary when assembling a Test System which complies with subclause 5.10 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.

Table E.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Range ~~(see NOTE)~~ over which equipment accuracy applies
6.2 Maximum output power	Not critical	Not critical
6.3 Frequency stability	± 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	single step: ± 0,1 dB ten steps: ± 0,3 dB	Pmax to Pmax - 30 dB
6.4.3 Power control dynamic range	± 0,3 dB	Pmax to Pmax - 30 dB
6.4.4 Minimum transmit power	Not critical	Pmax to Pmax - 30 dB~~Not critical~~
6.4.5 Primary CCPCH power	Not critical	Not critical
6.5.1 Transmit OFF power	Not critical	Not critical
6.5.2 Transmit ON/OFF time mask	Not critical	Not critical
6.6.1 Occupied bandwidth	± 100 kHz	± 1 MHz of the minimum requirement
6.6.2.1 Spectrum emission mask	Not critical	Not critical
6.6.2.2 ACLR	minimum requirement: ± 0,8 dB requirement in case of operation in proximity: ± 4,0 dB requirement in case of co-siting: TBD	Measurements in the range ±3 dB of the minimum requirement at signal power = Pmax
6.6.3 Spurious emissions	Not critical	Not critical
6.7 Transmit intermodulation (interferer requirements)	Not critical	Not critical
6.8.1 Modulation accuracy	± 2,5 % (for single code)	~~Signal power = PRAT to (PRAT – 30 dB)~~ Specified accuracy applies to measurement results between ± 7,5% and 17,5% at signal power = Pmax to Pmax - 30 dB
6.8.2 Peak code domain error	± 1 dB	Measurements in the range -25 dB to -30 dB at signal power = Pmax
~~NOTE: The Test Equipment uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.~~		

Table E.2: Equipment accuracy for receiver measurements

Subclause	Equipment accuracy	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 Intermodulation characteristics	Not critical	Not critical
7.7 Spurious Emissions	Not critical	Not critical

Table E.3: Equipment accuracy for performance measurements

Subclause		Equipment accuracy	Range over which equipment accuracy applies
8.2	Demodulation in static propagation conditions	Not critical	Not critical
8.3	Demodulation of DCH in multipath fading conditions	Not critical	Not critical

3GPP TSG RAN WG4 Meeting #19 **R4-011135**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 73 ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Power and ACLR definition corrections
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3-7/09/01
Category:	⌘ **F**	***Release:*** ⌘ Rel99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Corrections of power related entities; in alignment with a corresponding CR to the relevant core specification TS 25.105.
Summary of change:	⌘	Clarification of the definitions for average power, output power, maximum output power and rated output power. Alignment of the conformance test procedure for maximum output power with the new definition. Correction of Power Control Dynamic Range definition. Renaming of the minimum transmit power into minimum output power. Correction of ACLR definition.
Consequences if not approved:	⌘	Possible misunderstanding of several power and ACLR definitions may result in non-consistent conformance measurements.

Clauses affected:	⌘	3.1 (new); 3.2 (new); 3.3 (new); 5.2; 5.10.2; 5.11.1; 5.15; 6.2.1; 6.2.4.2; 6.4.3.1; 6.4.3.4.2; 6.4.4;, 6.4.4.1; 6.4.4.2; 6.4.4.5; 6.4.5.3; 6.5.1.1; 6.6.1.4.2; 6.6.2.2.1; 6.6.2.2.2.3; 6.6.2.2.4.2; Annex C; Annex D; Annex E
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.

3 Definitions, symbols, and abbreviations

3.1 Definitions

Average power: The thermal power as measured through a root raised cosine filter with roll-off α = 0,22 and a bandwidth equal to the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period, unless otherwise stated.

Maximum output power, Pmax: The maximum output power of the base station per carrier measured at the antenna connector (i.e. the actual broadband power as would be measured assuming no measurement error) for a specified reference condition. The period of measurement shall be a transmit timeslot excluding the guard period.

Rated output power, PRAT: The output power that the manufacturer has declared to be available.

3.2 Symbols

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

α	Roll-off factor

3.3 Abbreviations

For the purposes of the present document, the following ~~definitions, symbols and~~ abbreviations apply:

3GPP	3rd Generation Partnership Project
~~α~~	~~Roll-off factor~~
dB	decibel
dBm	decibel relative to 1 milliWatt
DPCHo	Mechanism used to simulate an individual intracell interferer in the cell with one code and a spreading factor of 16
$\frac{DPCH_o\_E_c}{I_{or}}$	Ratio of the average transmit energy per PN chip for the $DPCH_o$ to the total transmit power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
EVM	Error Vector Magnitude
F	Frequency (of the assigned channel frequency of the wanted signal)
Fuw	Frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal
IMT-2000	International Mobile Telecommunications 2000
Ioc	Power spectral density of a band limited white noise source (simulating interference form other cells) as measured at the BS antenna connector.
Îor	Received power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	~~Transmit~~ Output power
Pout	Output power of the base station~~; defined as the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter during one slot~~
Pmax	Maximum output power of the base station~~; defined as the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition~~
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station~~; defined as the mean power level per carrier over an active timeslot that the manufacturer has declared to be available at the antenna connector~~
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

5.2 Output power

The manufacturer shall declare the rated output power, PRAT, of the base station. ~~which is~~ PRAT is defined in subclause 3.1. ~~as the mean power level per carrier over an active timeslot available at the antenna connector; see subclause 6.2.~~

5.10.2 Measurement of transmitter

Table 5.3: Maximum Test System Uncertainty for transmitter tests

Subclause	Maximum Test System Uncertainty	Measurement range (see NOTE)
6.2 Maximum ~~O~~output ~~P~~power	± 0,7 dB	
6.3 Frequency stability	± 12 Hz	± 500 Hz
6.4.2 Power control steps	single step: ± 0,1 dB ten steps: ± 0,3 dB	
6.4.3 Power control dynamic range	± 0,3 dB	
6.4.4 Minimum output~~transmit~~ power	± 0,7 dB	
6.4.5 Primary CCPCH power	± 0,8 dB	
6.5.1 Transmit OFF power	± 2,0 dB	
6.5.2 Transmit ON/OFF time mask	Tx power limit = -79 dBm: ± 2,0 dB Tx power limit = -33 dBm: ± 0,7 dB	
6.6.1 Occupied Bandwidth	± 100 kHz	± 1,0 MHz
6.6.2.1 Spectrum emission mask	± 1,5 dB	
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: 5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: ± 4 dB 10 MHz offset: ± 4 dB requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: TBD 10 MHz offset: TBD Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied.	Signal power = PRAT
6.6.3 Spurious emissions	± 2,0 dB for BS and coexistence bands for results > -60 dBm ± 3,0 dB for results < -60 dBm Outside above range: f ≤ 2,2 GHz: ± 1,5 dB 2,2 GHz < f ≤ 4 GHz: ± 2,0 dB f > 4 GHz: ± 4,0 dB	
6.7 Transmit intermodulation	The value below applies to the setting of the interference signal level only and is unrelated to the measurement uncertainty ~~of the~~of the tests (6.6.2.1, 6.6.2.2 and 6.6.3) which have to be carried out in the presence of the interference signal. Need to add formula for uncertainty of the ratio. 1 dB	Not applicable
6.8.1 Modulation accuracy	± 2,5 % (for single code)	± 5,0 % Signal power = PRAT to (PRAT –30 dB)
6.8.2 Peak code domain error	± 1 dB	Signal power = PRAT
NOTE: The Test System uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.		

5.11.1 Transmitter

Table 5.6: Test Tolerance for transmitter tests

Subclause	Test Tolerance (see NOTE)
6.2 Maximum ~~O~~output ~~P~~power	0,7 dB
6.3 Frequency stability	12 Hz
6.4.2 Power control steps	single step: 0,1 dB ten steps: 0,3 dB
6.4.3 Power control dynamic range	0,3 dB
6.4.4 Minimum ~~transmit~~output power	0,7 dB
6.4.5 Primary CCPCH power	0,8 dB
6.5.1 Transmit OFF power	2,0 dB
6.5.2 Transmit ON/OFF time mask	Tx power limit = -79 dBm: 2,0 dB Tx power limit = -33 dBm: 0,7 dB
6.6.1 Occupied Bandwidth	0 kHz
6.6.2.1 Spectrum emission mask	1,5 dB
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: 0,8 dB operation in proximity: 4 dB co-siting: TBD
6.6.3 Spurious emissions	0 dB
6.7 Transmit intermodulation	Testing of transmit intermodulation consists of 3 parts: - testing of spectrum emission mask, see 6.6.2.1 - testing of ACLR, see 6.6.2.2 - testing of spurious emissions, see 6.6.3 For each of these parts, the respective Test Tolerances as specified in this table shall apply. Test Tolerance for setting of the interferer power level: 0 dB
6.8.1 Modulation accuracy	0 %
6.8.2 Peak code domain error	1 dB
NOTE: Unless otherwise stated, the Test Tolerances are applied to the DUT Minimum Requirement. See Annex D.	

5.15 Overview of the conformance test requirements

Tables 5.9, 5.10 and 5.11 give an overview of the conformance test requirements for the transmitter, the receiver and system performance, respectively.

Table 5.9: Overview of the conformance tests requirements for the transmitter

Parameter	Subclause	Note
Maximum output power	6.2	manufacturer's declaration required
Frequency stability	6.3	manufacturer's declaration required
Output power dynamics	6.4	
Inner loop power control	6.4.1	
Power control steps	6.4.2	
Power control dynamic range	6.4.3	
Minimum ~~transmit~~output power	6.4.4	
Primary CCPCH power	6.4.5.	
Transmit OFF power	6.5.1	
Transmit ON/OFF time mask	6.5.2	
Output RF spectrum emissions	6.6	
Occupied bandwidth	6.6.1	
Out-of-band emission	6.6.2	
Spectrum emission mask	6.6.2.1	manufacturer's declaration required
Adjacent Channel Leakage power Ratio (ACLR)	6.6.2.2	manufacturer's declaration required
Spurious emissions	6.6.3	
Mandatory requirements	6.6.3.2.1	manufacturer's declaration required
Co-existence with GSM 900	6.6.3.2.2	manufacturer's declaration required
Co-existence with DCS 1800	6.6.3.2.3	manufacturer's declaration required
Co-existence with UTRA FDD	6.6.3.2.4	manufacturer's declaration required
Transmit intermodulation	6.7	
Transmit modulation	6.8	
Modulation accuracy	6.8.1	
Peak code domain error	6.8.2	

6.2 Maximum output power

6.2.1 Definition and applicability

~~**Output power**, Pout, of the base station is the power of one carrier delivered to a load with resistance equal to the nominal load impedance, when averaged (in the sense of thermal power) over the useful part of the burst (time slot).~~

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

~~**Maximum output power**, Pmax, of the base station is the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition.~~

~~m~~Maximum output power (Pmax) and rated output power (PRAT) are defined in subclause 3.1.

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

6.2.2 Minimum Requirements

In normal conditions, the base station maximum output power shall remain within +2 dB and –2 dB of the manufacturer's rated output power.

In extreme conditions, the base station maximum output power shall remain within +2,5 dB and –2,5 dB of the manufacturer's rated 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 5.9.1.

The normative reference for this requirement is TS 25.105 [1] subclause 6.2.1.1.

6.2.3 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.

6.2.4 Method of test

6.2.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

In addition, on one UARFCN only, the test shall be performed under extreme power supply as defined in subclause 5.9.4.

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

(1) The transmitter under test and all other transmitters of the base station (if any) are switched on.

(2) The power of the transmitters not under test (if any) are controlled down.

(3) Connect the power measuring equipment to the BS antenna connector.

(4) Set the parameters of the transmitted signal according to table 6.1.

Table 6.1: Parameters of the transmitted signal for maximum output power test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.2.4.2 Procedure

(1) Measure thermal power of the BS output signal over the 2464 active chips of an even time slot TS i (this excludes the guard periods), and with a measurement bandwidth of at least 5 MHz.

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

6.2.5 Test Requirements

In normal conditions, the measured output power, derived according to subclause 6.2.4.2, shall remain within +2,7 dB and –2,7 dB of the manufacturer's rated output power.

In extreme conditions, the measured output power, derived according to subclause 6.2.4.2, 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.4.3 Power control dynamic range

6.4.3.1 Definition and applicability

The power control dynamic range is the difference between the maximum and the minimum ~~transmit~~ output power~~-~~ of one code channel for a specified reference condition.

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

6.4.3.2 Minimum Requirements

The DL power control dynamic range shall be greater than or equal to 30 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.3.1.

6.4.3.3 Test purpose

The test purpose is to verify the ability of the BS to control the power of a single code signal over the specified dynamic range.

6.4.3.4 Method of test

6.4.3.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.6.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to code domain power, by applying the global in-channel Tx test method described in Annex C;
- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.6: Parameters of the BS transmitted signal for power control dynamic range test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	1
Data content of DPCH	real life (sufficient irregular)

6.4.3.4.2 Procedure

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

(2) Set the BS tester to produce a sequence of TPC commands related to the active DPCH, with content "Increase Tx power". This sequence shall be sufficiently long so that the ~~transmit~~ output power of the active DPCH is controlled to reach its maximum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(3) Measure the power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Set the BS tester to produce a sequence of TPC commands related to the active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the ~~transmit~~ output power of the active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(5) Measure the power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(6) Determine the power control dynamic range by calculating the difference between the maximum ~~transmit~~ output power measured in step (3) and the minimum ~~transmit~~ output power measured in step (5).

(7) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) to (6).

6.4.3.5 Test Requirements

The power control dynamic range derived according to subclause 6.4.3.4.2 shall be greater than or equal to 29,7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.4.4 Minimum outputtransmit power

6.4.4.1 Definition and applicability

The minimum controlled output power of the BS is when the power ~~control setting~~ is set to a minimum value. ~~This is when the power control indicates a minimum transmit output power is required.~~

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

6.4.4.2 Minimum Requirements

The DL minimum ~~transmit~~output power shall be less~~ower~~ than or equal to:

Maximum output power - 30 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.4.1.

6.4.4.3 Test purpose

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

6.4.4.4 Method of test

6.4.4.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.7.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to thermal power;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.7: Parameters of the BS transmitted signal for minimum output ~~transmit~~ power test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.4.4.4.2 Procedure

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

(2) Set the BS tester to produce a sequence of TPC commands related to all active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the ~~transmit~~ output power of all active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(3) Measure the power of the BS output signal over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) and (3).

6.4.4.5 Test Requirements

For all measurements, the minimum ~~transmit~~output power derived in step (4) of subclause 6.4.4.4.2 shall be at least 29,3 dB below the maximum output power as declared by the manufacturer; see 6.2.

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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.4.5 Primary CCPCH power

6.4.5.1 Definition and applicability

Primary CCPCH power is the transmission power of the Primary Common Control Physical Channel averaged over the transmit timeslot. Primary CCPCH power is signaled on the BCH.

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

6.4.5.2 Minimum Requirements

The error between the BCH-broadcast value of the Primary CCPCH power and the Primary CCPCH power averaged over the timeslot shall not exceed the values in table 6.8. The error is a function of the total power averaged over the timeslot, Pout, and the manufacturer's rated output power, PRAT.

Table 6.8: Errors between Primary CCPCH power and the broadcast value

Total power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 2,5 dB
PRAT - 6 < P ≤ PRAT - 3	+/- 3,5 dB
PRAT - 13 < P ≤ PRAT - 6	+/- 5 dB

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.5.

6.4.5.3 Test purpose

The power of the Primary CCPCH received by the UE, together with the information on the Primary CCPCH nominal transmit power signaled on the BCH, are used by the UE for path loss estimation and adjustment of its own output ~~transmit~~ power. Therefore, deviations of the Primary CCPCH power from its nominal value are transposed by the UE into deviations from the wanted output ~~transmit~~ power of the UE.

The test purpose is to verify that the Primary CCPCH power remains within its specified tolerances under normal and extreme conditions.

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

6.5.1.1 Definition and applicability

The transmit OFF power is ~~the maximum residual output power within the channel bandwidth when the BS does not transmit.~~defined as the average power measured over one chip when the transmitter is off. The transmit OFF power state is when the BS does not transmit.

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

6.6 Output RF spectrum emissions

6.6.1 Occupied bandwidth

6.6.1.1 Definition and applicability

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

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

6.6.1.2 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 25.105 [1] subclause 6.6.1.

6.6.1.3 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 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.

6.6.1.4 Method of test

6.6.1.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.12.

Table 6.12: Parameters of the BS transmitted signal for occupied bandwidth testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	Real life (sufficient irregular)

6.6.1.4.2 Procedure

(1) Measure the power of the transmitted signal with a measurement filter of bandwidth 30 kHz. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous 30 kHz steps from a minimum frequency, which shall be (7,5 – 0,015) MHz below the assigned channel frequency of the transmitted signal, up to a maximum frequency, which shall be (7,5 – 0,015) MHz above the assigned channel frequency of the transmitted signal. The time duration of each step shall be sufficiently long to capture one active time slot. The measured power shall be recorded for each step.

(2) Determine the total ~~transmitted~~output-power by accumulating the recorded power measurement results of all steps.

(3) Sum up the recorded power measurement results, starting from the step at the minimum frequency defined in (1) up to the step at a lower limit frequency by which this sum is equal to or greater than 0.5 % of the total output power determined in (2). This limit frequency is recorded as "Lower Frequency".

(4) Sum up the recorded power measurement results, starting from the step at the maximum frequency defined in (1) down to the step at an upper limit frequency by which this sum is equal to or greater than 0.5 % of the total output power determined in (2). This limit frequency is recorded as "Upper Frequency".

(5) Calculate the occupied bandwidth as the difference between the "Upper Frequency" obtained in (3) and the "Lower Frequency" obtained in (4).

6.6.1.5 Test Requirements

The occupied bandwidth calculated in step (5) of subclause 6.6.1.4.2 shall be less than 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.6.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the ~~transmitted~~average power centered on the assigned channel frequency to the average power centered on ~~measured in~~ an adjacent channel frequency. In ~~B~~both cases, the ~~transmitted and the adjacent channel~~ power is~~are~~ measured with~~through a matched~~ a filter that has a~~(~~ R~~r~~oot R~~r~~aised C~~e~~osine (RRC) filter response with~~and~~ roll-off α = 0,22~~) with a noise power~~ and a bandwidth equal to the chip rate. The requirements shall apply for all configurations of BS (single carrier or multi-carrier), and for all operating modes foreseen by the manufacturer's specification.

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

6.6.2.2.2 Minimum Requirements

6.6.2.2.2.1 Minimum requirement

The ACLR shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset	ACLR limit
± 5 MHz	45 dB
± 10 MHz	55 dB

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.

6.6.2.2.2.2 Requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency

In case the equipment is operated in proximity to another TDD BS or FDD BS on an adjacent frequency, the ACLR shall be equal to or greater than the value specified in table 6.23.

Table 6.23: BS ACLR limits in case of operation in proximity

BS adjacent channel offset	ACLR limit
± 5 MHz	70 dB
± 10 MHz	70 dB

The requirement is based on the assumption that the coupling loss between the base stations is at least 84dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.

NOTE: The necessary dynamic range to very the conformance requirements specified in table 6.23 is at the limits of the capability of state-of-art measuring equipment.

6.6.2.2.2.3 Requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency

In case the equipment is co-sited to another TDD BS or FDD BS operating on an adjacent frequency, the ACLR is specified in terms of the absolute ~~transmit~~ average power level of the BS measured in the adjacent channel. The maximum power level shall not exceed the limit in table 6.24.

Table 6.24: BS ACLR limits in case of co-siting

BS adjacent channel offset	Maximum Level	Measurement Bandwidth
± 5 MHz	-80 dBm	3.84 MHz
± 10 MHz	-80 dBm	3.84 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.

NOTE: The necessary dynamic range of the measuring equipment to verify the conformance requirements specified in table 6.24 is dependent on the BS output power. If the BS output power is larger than –10 dBm, the necessary dynamic range is beyond the capability of state-of-the-art measuring equipment; direct verification of the conformance requirements is not feasible. Alternatively, indirect measurement methods need to be defined.

6.6.2.2.3 Test purpose

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

6.6.2.2.4 Method of test

6.6.2.2.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.25.

Table 6.25: Parameters of the BS transmitted signal for ACLR testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	Real life (sufficient irregular)

6.6.2.2.4.2 Procedure

(1) Measure ~~transmitted output~~the average power centered on the assigned channel frequency over the 2464 active chips of the even time slots TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate. ~~The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points. (The global in-channel Tx test described in Annex C may be applied.)~~

(2) Average over TBD time slots.

(3) Measure ~~interference~~the average power at the first lower adjacent RF channel (center frequency 5 MHz below the assigned channel frequency of the transmitted signal) over the useful part of the burst within the even time slots TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken with adherence to the sampling theorem.

(4) Average over TBD time slots.

(5) Calculate the ACLR by the ratio

ACLR = ~~output transmitted~~average power acc. to (2) / average~~interference~~ power acc. to (4)

(6) Repeat steps (3), (4) and (5) for the second lower adjacent RF channel (center frequency 10 MHz below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (center frequency 5 MHz and 10 MHz above the assigned channel frequency of the transmitted signal, respectively).

6.6.2.2.5 Test Requirements

The ACLR calculated in step (5) of subclause 6.6.2.2.4.2 shall be equal or greater than the limits given in table 6.26 or table 6.272, respectively. In case the equipment is co-sited to another TDD BS or FDD BS operating on an adjacent frequency, the interference power at the first and second adjacent channel measured according to steps (3) and (4) of subclause 6.6.2.2.4.2 shall not exceed the maximum level specified in table 6.28

Table 6.26: BS ACLR Test Requirements

BS adjacent channel offset	ACLR limit
± 5 MHz	44,2 dB
± 10 MHz	54,2 dB

Table 6.27: BS ACLR Test Requirements in case of operation in proximity

BS adjacent channel offset	ACLR limit
± 5 MHz	66 dB
± 10 MHz	66 dB

Table 6.28: BS ACLR Test Requirements in case of co-sitting

BS adjacent channel offset	Maximum Level	Measurement Bandwidth
± 5 MHz	-[80 dBm - TT]	3.84 MHz
± 10 MHz	-[80 dBm - TT]	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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

C.3 Applications

This process may be applied in the measurements defined in the following subclauses:

6.3 Frequency Stability

6.4 Output Power Dynamics

6.4.2 Power control steps

6.4.3 Power control dynamic range

6.4.4 Minimum ~~transmit~~ output power

6.4.5 Primary CCPCH power

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.8 Transmit Modulation

6.8.1 Modulation accuracy

6.8.2 Peak Code Domain Error

Annex D (informative): Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 5.11. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in tables D.1 to D.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 5.10. 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 5.12.

For example, a Test System having 0,9 dB accuracy for test 6.2 Maximum output power (which is 0,2 dB above the limit specified in subclause 5.10.2) would subtract 0,2 dB from the Test Tolerance of 0,7 dB defined in subclause 5.11.1. This new test tolerance of 0,5 dB would then be applied to the Minimum Requirement using the formula defined in Table D.1 to give a new range of ±2,5 dB of the manufacturer's rated output power.

For the case where an excess error of 0.2 dB exists, when applied to a test with a test tolerance of zero, the test tolerance used in the formula would be –0.2 dB.

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

Test	Minimum Requirement in TS 25.105 (numbering of tables in the column below refers to TS 25.142)	Test Tolerance (TT)	Test Requirement in TS 25.142
6.2 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
6.3 Frequency stability	Frequency stability = ± 0,05 ppm	12 Hz	Formula: ± (frequency stability +TT) ± (0,05 ppm + 12 Hz)
6.4.2 Power control steps	single step: step size tolerance specified in table 6.3 ten steps: minimum and maximum average rate of change in mean power specified in table 6.3	single step: 0,1 dB ten steps: 0,3 dB	Formula: single step: ± (step size tolerance + TT) ten steps: maximum average rate + TT minimum average rate – TT 0,1 dB and 0,3 dB, respectively, applied as above to table 6.3
6.4.3 Power control dynamic range	range ≥ 30 dB	0,3 dB	Formula: Range – TT range ≥ 29,7 dB
6.4.4 Minimum ~~transmit~~output power	PRAT – 30 dB	0,7 dB	Formula : PRAT – 30 dB +TT PRAT – 29,3 dB
6.4.5 Primary CCPCH power	PCCPCH power tolerance defined in table 6.8	0,8 dB	Formula: ± (power tolerance + TT) 0,8 dB applied as above to table 6.8
6.5.1 Transmit OFF power	Tx OFF power limit < -79 dBm	2,0 dB	Formula: < Tx OFF power limit + TT < - 77 dBm
6.5.2 Transmit ON/OFF time mask	Tx power limit < -33 dBm or –79 dBm, resp.	< -33 dBm: 0,7 dB < -79 dBm: 2,0 dB	Formula: < Tx power limit + TT < -32,3 dBm or < - 77 dBm
6.6.1 Occupied bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz

6.6.2.1 Spectrum emission mask	Maximum level defined in tables 6.13 to 6.16	1,5 dB	Formula: Maximum level + TT Add 1,5 dB to Maximum level entries in tables 6.13 to 6.16
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: ACLR limit = 45 dB at 5 MHz ACLR limit = 55 dB at 10 MHz requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency: ACLR limit = 70 dB at 5 MHz ACLR limit = 70 dB at 10 MHz requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency ACLR limit = - 80 dBm at 5 MHz ACLR limit = - 80 dBm at 10 MHz	min. req. : 0,8 dB operation in proxim.: 4 dB co-siting: TBD	Formula: ACLR limit – TT min. requirement: ACLR limit = 44,2 dB at 5 MHz ACLR limit = 54,2 dB at 10 MHz operation in proximity: ACLR limit = 66 dB at 5 MHz ACLR limit = 66 dB at 10 MHz co-siting: TBD
6.6.3 Spurious emissions	maximum level defined in tables 6.29 to 6.37	0 dB	Formula: Maximum limit + TT add 0 dB to maximum levels in tables 6.29 to 6.37
6.7 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.6.2.1, 6.6.2.2 and 6.6.3.	Wanted signal level – interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level – interferer level = 30 + 0 dB
6.8.1 Modulation accuracy	EVM limit = 12,5 %	0 %	Formula: EVM limit + TT EVM limit = 12,5 %
6.8.2 Peak code domain error	PCDE limit = - 28 dB	1 dB	Formula: PCDE limit + TT PCDE limit = - 27 dB

Annex E (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 Analysers etc.) which are necessary when assembling a Test System which complies with subclause 5.10 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.

Table E.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Range (see NOTE)
6.2 Maximum output power	Not critical	Not critical
6.3 Frequency stability	± 10 Hz + timebase = 12 Hz	± 500 Hz. (This is to allow for UE range that at 0,1 PPM is larger than BTS.)
6.4.2 Power control steps	single step: ± 0,1 dB ten steps: ± 0,3 dB	
6.4.3 Power control dynamic range	± 0,3 dB	
6.4.4 Minimum ~~transmit~~output power	Not critical	Not critical
6.4.5 Primary CCPCH power	Not critical	Not critical
6.5.1 Transmit OFF power	Not critical	Not critical
6.5.2 Transmit ON/OFF time mask	Not critical	Not critical
6.6.1 Occupied bandwidth	± 100 kHz	± 1 MHz
6.6.2.1 Spectrum emission mask	Not critical	Not critical
6.6.2.2 ACLR	minimum requirement: ± 0,8 dB requirement in case of operation in proximity: ± 4,0 dB requirement in case of co-siting: TBD	
6.6.3 Spurious emissions	Not critical	Not critical
6.7 Transmit intermodulation (interferer requirements)	Not critical	Not critical
6.8.1 Modulation accuracy	± 2,5 % (for single code)	Signal power = PRAT to (PRAT – 30 dB) Specified accuracy applies to measurement results between ± 7,5% and 17,5%
6.8.2 Peak code domain error	± 1 dB	
NOTE: The Test Equipment uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.		

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CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 74 ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	Power and ACLR definition corrections
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 September 2001
Category:	⌘ **A**	***Release:*** ⌘ Rel-4

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

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

Reason for change:	⌘	Corrections of power related entities; in alignment with a corresponding CR to the relevant core specification TS 25.105.
Summary of change:	⌘	Clarification of the definitions for average power, output power, maximum output power and rated output power. Alignment of the conformance test procedure for maximum output power with the new definition. Renaming of the minimum transmit power into minimum output power. Correction of ACLR definition. Correction of Power Control dynamic range definition.
Consequences if not approved:	⌘	Possible misunderstanding of several power and ACLR definitions may result in non-consistent conformance measurements.

Clauses affected:	⌘	3.1(new); 3.2 (new); 3.3(new); 5.2; 5.10.2; 5.11.1; 5.15; 6.2.1; 6.2.4.2.1; 6.4.2.4.2.1, 6.4.3.1, 6.4.3.4.2.1, 6.4.4; 6.4.4.1;6.4.4.2; 6.4.4.4.1.1, 6.4.4.4.2.1, 6.4.4.5; 6.4.5.3; 6.5.1.1; 6.6.1.4.2.1; 6.6.2.2.1; 6.6.2.2.2.3.1; 6.6.2.2.4.2.1; Annex C Annex D; Annex E
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This CR corresponds to R99 Cat F CR in tdoc R4-011135.

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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.

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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.

3 Definitions, symbols, and abbreviations

3.1 Definitions

Average power: The thermal power as measured through a root raised cosine filter with roll-off α = 0,22 and a bandwidth equal to the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period, unless otherwise stated.

Maximum output power, Pmax: The maximum output power of the base station per carrier measured at the antenna connector (i.e. the actual broadband power as would be measured assuming no measurement error) for a specified reference condition. The period of measurement shall be a transmit timeslot excluding the guard period.

Rated output power, PRAT: The output power that the manufacturer has declared to be available.

3.2 Symbols

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

α	Roll-off factor

3.3 Abbreviations

For the purposes of the present document, the following ~~definitions, symbols and~~ abbreviations apply:

3GPP	3rd Generation Partnership Project
~~α~~	~~Roll-off factor~~
dB	decibel
dBm	decibel relative to 1 milliWatt
DPCHo	Mechanism used to simulate an individual intracell interferer in the cell with one code and a spreading factor of 16
$\frac{DPCH_o\_E_c}{I_{or}}$	Ratio of the average transmit energy per PN chip for the $DPCH_o$ to the total transmit power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
EVM	Error Vector Magnitude
F	Frequency (of the assigned channel frequency of the wanted signal)
Fuw	Frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal
IMT-2000	International Mobile Telecommunications 2000
Ioc	Power spectral density of a band limited white noise source (simulating interference form other cells) as measured at the BS antenna connector.
Îor	Received power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	~~Transmi~~t Output power
Pout	Output power of the base station~~; defined as the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter during one slot~~
Pmax	Maximum output power of the base station~~; defined as the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition~~
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station~~; defined as the mean power level per carrier over an active timeslot that the manufacturer has declared to be available at the antenna connector~~
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

5.2 Output power

The manufacturer shall declare the rated output power, PRAT, of the base station. ~~which~~PRAT is defined in subclause 3.1.~~as the mean power level per carrier over an active timeslot available at the antenna connector; see subclause 6.2.~~

5.10.2 Measurement of transmitter

Table 5.3: Maximum Test System Uncertainty for transmitter tests

Subclause	Maximum Test System Uncertainty	Measurement range (see NOTE)
6.2 Maximum ~~O~~output ~~P~~power	± 0,7 dB	
6.3 Frequency stability	± 12 Hz	± 500 Hz
6.4.2 Power control steps	single step: ± 0,1 dB ten steps: ± 0,3 dB	
6.4.3 Power control dynamic range	± 0,3 dB	
6.4.4 Minimum output~~transmit~~ power	± 0,7 dB	
6.4.5 Primary CCPCH power	± 0,8 dB	
6.5.1 Transmit OFF power	± 2,0 dB	
6.5.2 Transmit ON/OFF time mask	Tx power limit = -79 dBm: ± 2,0 dB Tx power limit = -33 dBm: ± 0,7 dB	
6.6.1 Occupied Bandwidth	± 100 kHz	± 1,0 MHz
6.6.2.1 Spectrum emission mask	± 1,5 dB	
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: 5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: ± 4 dB 10 MHz offset: ± 4 dB requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency: 5 MHz offset: TBD 10 MHz offset: TBD Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied.	Signal power = PRAT
6.6.3 Spurious emissions	± 2,0 dB for BS and coexistence bands for results > -60 dBm ± 3,0 dB for results < -60 dBm Outside above range: f ≤ 2,2 GHz: ± 1,5 dB 2,2 GHz < f ≤ 4 GHz: ± 2,0 dB f > 4 GHz: ± 4,0 dB	
6.7 Transmit intermodulation	The value below applies to the setting of the interference signal level only and is unrelated to the measurement uncertainty of ~~-~~the tests (6.6.2.1, 6.6.2.2 and 6.6.3) which have to be carried out in the presence of the interference signal. Need to add formula for uncertainty of the ratio. 1 dB	Not applicable
6.8.1 Modulation accuracy	± 2,5 % (for single code)	± 5,0 % Signal power = PRAT to (PRAT –30 dB)
6.8.2 Peak code domain error	± 1 dB	Signal power = PRAT
NOTE: The Test System uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.		

5.11.1 Transmitter

Table 5.6: Test Tolerance for transmitter tests

Subclause	Test Tolerance (see NOTE)
6.2 Maximum ~~O~~output ~~P~~power	0,7 dB
6.3 Frequency stability	12 Hz
6.4.2 Power control steps	single step: 0,1 dB ten steps: 0,3 dB
6.4.3 Power control dynamic range	0,3 dB
6.4.4 Minimum ~~transmit~~output power	0,7 dB
6.4.5 Primary CCPCH power	0,8 dB
6.5.1 Transmit OFF power	2,0 dB
6.5.2 Transmit ON/OFF time mask	Tx power limit = -79 dBm: 2,0 dB Tx power limit = -33 dBm: 0,7 dB
6.6.1 Occupied Bandwidth	0 kHz
6.6.2.1 Spectrum emission mask	1,5 dB
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: 0,8 dB operation in proximity: 4 dB co-siting: TBD
6.6.3 Spurious emissions	0 dB
6.7 Transmit intermodulation	Testing of transmit intermodulation consists of 3 parts: - testing of spectrum emission mask, see 6.6.2.1 - testing of ACLR, see 6.6.2.2 - testing of spurious emissions, see 6.6.3 For each of these parts, the respective Test Tolerances as specified in this table shall apply. Test Tolerance for setting of the interferer power level: 0 dB
6.8.1 Modulation accuracy	0 %
6.8.2 Peak code domain error	1 dB
NOTE: Unless otherwise stated, the Test Tolerances are applied to the DUT Minimum Requirement. See Annex D.	

5.15 Overview of the conformance test requirements

Tables 5.9, 5.10 and 5.11 give an overview of the conformance test requirements for the transmitter, the receiver and system performance, respectively.

Table 5.9: Overview of the conformance tests requirements for the transmitter

Parameter	Subclause	Note
Maximum output power	6.2	manufacturer's declaration required
Frequency stability	6.3	manufacturer's declaration required
Output power dynamics	6.4	
Inner loop power control	6.4.1	
Power control steps	6.4.2	
Power control dynamic range	6.4.3	
Minimum ~~transmit~~output power	6.4.4	
Primary CCPCH power	6.4.5.	
Transmit OFF power	6.5.1	
Transmit ON/OFF time mask	6.5.2	
Output RF spectrum emissions	6.6	
Occupied bandwidth	6.6.1	
Out-of-band emission	6.6.2	
Spectrum emission mask	6.6.2.1	manufacturer's declaration required
Adjacent Channel Leakage power Ratio (ACLR)	6.6.2.2	manufacturer's declaration required
Spurious emissions	6.6.3	
Mandatory requirements	6.6.3.2.1	manufacturer's declaration required
Co-existence with GSM 900	6.6.3.2.2	manufacturer's declaration required
Co-existence with DCS 1800	6.6.3.2.3	manufacturer's declaration required
Co-existence with UTRA FDD	6.6.3.2.4	manufacturer's declaration required
Transmit intermodulation	6.7	
Transmit modulation	6.8	
Modulation accuracy	6.8.1	
Peak code domain error	6.8.2	

6.2 Maximum output power

6.2.1 Definition and applicability

~~**Output power**, Pout, of the base station is the power of one carrier delivered to a load with resistance equal to the nominal load impedance, when averaged (in the sense of thermal power) over the useful part of the burst (time slot).~~

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

~~**Maximum output power**, Pmax, of the base station is the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition.~~

M~~m~~aximum output power (Pmax) and rated output power (PRAT) are defined in subclause 3.1.

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

6.2.2 Minimum Requirements

In normal conditions, the base station maximum output power shall remain within +2 dB and –2 dB of the manufacturer's rated output power.

In extreme conditions, the base station maximum output power shall remain within +2,5 dB and –2,5 dB of the manufacturer's rated 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 5.9.1.

The normative reference for this requirement is TS 25.105 [1] subclause 6.2.1.1.

6.2.3 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.

6.2.4 Method of test

6.2.4.1 Initial conditions

6.2.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

In addition, on one UARFCN only, the test shall be performed under extreme power supply as defined in subclause 5.9.4.

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

(1) The transmitter under test and all other transmitters of the base station (if any) are switched on.

(2) The power of the transmitters not under test (if any) are controlled down.

(3) Connect the power measuring equipment to the BS antenna connector.

(4) Set the parameters of the transmitted signal according to table 6.1.

Table 6.1: Parameters of the transmitted signal for maximum output power test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.2.4.1.2 1,28 Mcps TDD option

(1) The transmitter under test and all other transmitters of the base station (if any) are switched on.

(2) The power of the transmitters not under test (if any) are controlled down.

(3) Connect the power measuring equipment to the BS antenna connector.

(4) Set the parameters of the transmitted signal according to table 6.1A.

Table 6.1A: Parameters of the transmitted signal for maximum output power test for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
BS output power setting	PRAT
Number of DPCH in each active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.2.4.2 Procedure

6.2.4.2.1 3,84 Mcps TDD option

(1) Measure thermal power of the BS output signal over the 2464 active chips of an even time slot TS i (this excludes the guard periods), and with a measurement bandwidth of at least 5 MHz.

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

6.2.4.2.2 1,28 Mcps TDD option

(1) Measure thermal power over the 848 active chips of an even time slot (this excludes the guard periods), and with a measurement bandwidth of at least 1,6 MHz.

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

6.2.5 Test Requirements

NOTE: If the Test Requirement below 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

In normal conditions, the measured output power, derived according to subclause 6.2.4.2, shall remain within +2,7 dB and –2,7 dB of the manufacturer's rated output power.

In extreme conditions, the measured output power, derived according to subclause 6.2.4.2, shall remain within +3,2 dB and –3,2 dB of the manufacturer's rated output power.

6.4.2 Power control steps

6.4.2.1 Definition and applicability

The power control step is the step change in the DL transmitter output power in response to a TPC message from the UE.

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

6.4.2.2 Minimum Requirements

The power control step sizes in the DL shall be 1 dB, 2 dB and 3 dB.

The tolerance of the transmitter output power and the greatest average rate of change in mean power due to the power control step shall be within the range shown in Table 6.3.

Table 6.3: Power control step size tolerance

Step size	Tolerance	Range of average rate of change in mean power per 10 steps	
		Minimum	maximum
1dB	± 0,5 dB	± 8 dB	± 12 dB
2dB	± 0,75 dB	± 16 dB	± 24 dB
3dB	± 1 dB	± 24 dB	± 36 dB

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.2.1.

6.4.2.3 Test purpose

The DL power control is applied to adjust the BS output power to a value that is sufficiently high to generate a SIR at the UE receiver equal to the target SIR, while limiting the intercell interference.

The test purpose is to verify the ability of the BS to interpret received TPC commands in a correct way and to adjust its output power according to these commands with the specified accuracy.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

6.4.2.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Disable closed loop power control in the BS under test.

(3) Set the initial parameters of the BS transmitted signal according to table 6.4.

(4) Operate the BS in such a mode that it is able to interpret received TPC commands.

(5) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to code domain power, by applying the global in-channel Tx test method described in Annex C;
- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.4: Initial parameters of the BS transmitted signal for power control steps test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	1
DPCH power	Minimum
Data content of DPCH	real life (sufficient irregular)

6.4.2.4.1.2 1,28 Mcps TDD option

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Disable closed loop power control in the BS under test.

(3) Set the initial parameters of the BS transmitted signal according to table 6.4A.

(4) Operate the BS in such a mode that it is able to interpret received TPC commands.

(5) Start BS transmission.

NOTE: The BS tester used for this test must have the ability

- to analyze the output signal of the BS under test with respect to code domain power, by applying the global in-channel Tx test method described in Annex C;
- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.4A: Initial parameters of the BS transmitted signal for power control steps test for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 6: transmit, if i is 0, 4,5,6; receive, if i is 1,2,3.
Number of DPCH in each active TS	1
DPCH power	Minimun
Data content of DPCH	real life (sufficient irregular)

6.4.2.4.2 Procedure

6.4.2.4.2.1 3,84 Mcps TDD option

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

(2) Set the BS tester to produce a sequence of TPC commands related to the active DPCH. This sequence shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS) and shall consist of a series of TPC commands with content "Increase Tx power", followed by a series of TPC commands with content "Decrease Tx power". Each of these series should be sufficiently long so that the transmit ~~output~~ power of the active DPCH is controlled to reach its maximum and its minimum, respectively.

(3) Measure the power of the active DPCH over the 2464 active chips of each even time slot TS i (this excludes the guard period) , and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Based on the measurement made in step (3), calculate the power control step sizes and the average rate of change per 10 steps.

(5) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) to (4).

6.4.2.4.2.2 1,28 Mcps TDD option

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

(2) Set the BS tester to produce a sequence of TPC commands related to the active DPCH. This sequence shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS) and shall consist of a series of TPC commands with content "Increase Tx power", followed by a series of TPC commands with content "Decrease Tx power". Each of these series should be sufficiently long so that the transmit output power of the active DPCH is controlled to reach its maximum and its minimum, respectively.

(3) Measure the power of the active DPCH over the 848 active chips of each even time slot TS i (this excludes the guard period) , and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Based on the measurement made in step (3), calculate the power control step sizes and the average rate of change per 10 steps.

(5) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) to (4).

6.4.2.5 Test Requirements

NOTE: If the Test Requirements below differ 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.4.2.5.1 3,84 Mcps TDD option

For all measurements, the tolerance of the power control step sizes and the average rate of change per 10 steps shall be within the limits given in Table 6.5.

Table 6.5: Test Requirements for power control step size tolerance

Step size	Single step tolerance	Range of average rate of change in mean power per 10 steps	
		Minimum	maximum
1dB	± 0,6 dB	± 7,7 dB	± 12,3 dB
2dB	± 0,85 dB	± 15,7 dB	± 24,3 dB
3dB	± 1,1 dB	± 23,7 dB	± 36,3 dB

In case, the power control step size is set to 3 dB, the number of power control steps feasible within the power control dynamic range of the BS under test may be less than 10. In this case, the evaluation of the average rate of change in mean power shall be based on the number of power control steps actually feasible, and the permitted range of average rate of change shall be reduced compared to the values given in table 6.51 in proportion to the ratio (number of power control steps actually feasible /10).

EXAMPLE: If the number of power control steps actually feasible is 9, the minimum and maximum value of the range of average rate of change in mean power are given by ±21,3 dB and ±32,7 dB, respectively.

6.4.2.5.2 1,28 Mcps TDD option

For all measurements, the tolerance of the power control step sizes and the average rate of change per 10 steps shall be within the limits given in Table 6.3.

In case, the power control step size is set to 3 dB, the number of power control steps feasible within the power control dynamic range of the BS under test may be less than 10. In this case, the evaluation of the average rate of change in

mean power shall be based on the number of power control steps actually feasible, and the permitted range of average rate of change shall be reduced compared to the values given in table 6.4A in proportion to the ratio (number of power control steps actually feasible /10).

EXAMPLE: If the number of power control steps actually feasible is 9, the minimum and maximum value of the range of average rate of change in mean power are given by 21,6 dB and 32,4 dB, respectively.

6.4.3 Power control dynamic range

6.4.3.1 Definition and applicability

The power control dynamic range is the difference between the maximum and the minimum ~~transmit~~ output power of one code channel for a specified reference condition.

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

6.4.3.2 Minimum Requirements

The DL power control dynamic range shall be greater than or equal to 30 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.3.1.

6.4.3.3 Test purpose

The test purpose is to verify the ability of the BS to control the power of a single code signal over the specified dynamic range.

6.4.3.4 Method of test

6.4.3.4.1 Initial conditions

6.4.3.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.6.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to code domain power, by applying the global in-channel Tx test method described in Annex C;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.6: Parameters of the BS transmitted signal for power control dynamic range test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	1
Data content of DPCH	real life (sufficient irregular)

6.4.3.4.1.2 1,28 Mcps TDD option

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.6A.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability

- to analyze the output signal of the BS under test with respect to code domain power, by applying the global in-channel Tx test method described in Annex C;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.6A: Parameters of the BS transmitted signal for power control dynamic range test for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 6: transmit, if i is 0, 4,5,6; receive, if i is 1,2,3.
Number of DPCH in each active TS	1
Data content of DPCH	real life (sufficient irregular)

6.4.3.4.2 Procedure

6.4.3.4.2.1 3,84 Mcps TDD option

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

(2) Set the BS tester to produce a sequence of TPC commands related to the active DPCH, with content "Increase Tx power". This sequence shall be sufficiently long so that the ~~transmit~~ output power of the active DPCH is controlled to reach its maximum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(3) Measure the power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Set the BS tester to produce a sequence of TPC commands related to the active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the ~~transmit~~ output power of the active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(5) Measure the power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(6) Determine the power control dynamic range by calculating the difference between the maximum ~~transmit~~ output power measured in step (3) and the minimum ~~transmit~~ output power measured in step (5).

(7) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) to (6).

6.4.3.4.2.2 1,28 Mcps TDD option

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

(2) Set the BS tester to produce a sequence of TPC commands related to the active DPCH, with content "Increase Tx power". This sequence shall be sufficiently long so that the transmit output power of the active DPCH is controlled to reach its maximum, and shall be transmitted to the BS within the receive time slots TS i of the BS.

(3) Measure the power of the active DPCH over the 848 active chips of an receive time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Set the BS tester to produce a sequence of TPC commands related to the active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the transmit output power of the active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the receive time slots TS i of the BS.

(5) Measure the power of the active DPCH over the 848 active chips of a receive time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(6) Determine the power control dynamic range by calculating the difference between the maximum transmit output power measured in step (3) and the minimum transmit output power measured in step (5).

(7) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) to (6).

6.4.3.5 Test Requirements

NOTE: If the Test Requirement below 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

The power control dynamic range derived according to subclause 6.4.3.4.2 shall be greater than or equal to 29,7 dB

6.4.4 Minimum outputtransmit power

6.4.4.1 Definition and applicability

The minimum controlled output power of the BS is when the power control setting is set to a minimum value. This is when the power control indicates a minimum transmit output power is required.

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

6.4.4.2 Minimum Requirements

The DL minimum transmitoutput power shall be lessower than or equal to:

Maximum output power - 30 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.4.1.

6.4.4.3 Test purpose

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

6.4.4.4 Method of test

6.4.4.4.1 Initial conditions

6.4.4.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.7.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to thermal power;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.7: Parameters of the BS transmitted signal for minimum ~~transmit~~ power test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.4.4.4.1.2 1,28 Mcps TDD option

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.7A.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability

- to analyze the output signal of the BS under test with respect to thermal power;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.7A: Parameters of the BS transmitted signal for minimum transmit power test for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
BS output power setting	PRAT
Number of DPCH in each active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.4.4.4.2 Procedure

6.4.4.4.2.1 3,84 Mcps TDD option

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

(2) Set the BS tester to produce a sequence of TPC commands related to all active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the ~~transmit~~ output power of all active DPCH is

controlled to reach its minimum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(3) Measure the power of the BS output signal over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) and (3).

6.4.4.4.2.2 1,28 Mcps TDD option

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

(2) Set the BS tester to produce a sequence of TPC commands related to all active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the transmit output power of all active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the receive time slots TS i of the BS.

(3) Measure the power of the BS output signal over the 848 active chips of a receive time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) and (3).

6.4.4.5 Test Requirements

NOTE: If the Test Requirement below 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

For all measurements, the minimum ~~transmit~~output power derived in step (4) of subclause 6.4.4.4.2 shall be at least 29,3 dB below the maximum output power as declared by the manufacturer; see 6.2.

6.4.5 Primary CCPCH power

6.4.5.1 Definition and applicability

Primary CCPCH power is the transmission power of the Primary Common Control Physical Channel averaged over the transmit timeslot. Primary CCPCH power is signaled on the BCH.

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

6.4.5.2 Minimum Requirements

The error between the BCH-broadcast value of the Primary CCPCH power and the Primary CCPCH power averaged over the timeslot shall not exceed the values in table 6.8. The error is a function of the total power averaged over the timeslot, Pout, and the manufacturer's rated output power, PRAT.

Table 6.8: Errors between Primary CCPCH power and the broadcast value

Total power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 2,5 dB
PRAT - 6 < P ≤ PRAT - 3	+/- 3,5 dB
PRAT - 13 < P ≤ PRAT - 6	+/- 5 dB

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.5.

6.4.5.3 Test purpose

The power of the Primary CCPCH received by the UE, together with the information on the Primary CCPCH nominal transmit power signaled on the BCH, are used by the UE for path loss estimation and adjustment of its own ~~transmit~~output-power. Therefore, deviations of the Primary CCPCH power from its nominal value are transposed by the UE into deviations from the wanted ~~transmit~~output -power of the UE.

The test purpose is to verify that the Primary CCPCH power remains within its specified tolerances under normal and extreme conditions.

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

6.5.1.1 Definition and applicability

The transmit OFF power is ~~the maximum residual output power within the channel bandwidth when the BS does not transmit.~~defined as the average power measured over one chip when the transmitter is off. The transmit OFF power state is when the BS does not transmit.

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

6.6 Output RF spectrum emissions

6.6.1 Occupied bandwidth

6.6.1.1 Definition and applicability

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

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

6.6.1.2 Minimum Requirements

6.6.1.2.1 3,84 Mcps TDD option

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

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.1.

6.6.1.2.2 1,28 Mcps TDD option

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

The reference for this requirement is TS 25.105 [1] subclause 6.6.1.

6.6.1.3 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 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.

6.6.1.4 Method of test

6.6.1.4.1 Initial conditions

6.6.1.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.12.

Table 6.12: Parameters of the BS transmitted signal for occupied bandwidth testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	Real life (sufficient irregular)

6.6.1.4.1.2 1,28 Mcps TDD option

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.12A.

Table 6.12A: Parameters of the BS transmitted signal for occupied bandwidth testing for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
BS output power setting	PRAT
Number of DPCH in each active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.1.4.2 Procedure

6.6.1.4.2.1 3,84 Mcps TDD option

(1) Measure the power of the transmitted signal with a measurement filter of bandwidth 30 kHz. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous 30 kHz steps from a minimum frequency, which shall be (7,5 – 0,015) MHz below the assigned channel frequency of the transmitted signal, up to a maximum frequency, which shall be (7,5 – 0,015) MHz above the assigned channel frequency of the transmitted signal. The time duration of each step shall be sufficiently long to capture one active time slot. The measured power shall be recorded for each step.

(2) Determine the total ~~transmitted~~output-power by accumulating the recorded power measurement results of all steps.

(3) Sum up the recorded power measurement results, starting from the step at the minimum frequency defined in (1) up to the step at a lower limit frequency by which this sum is equal to or greater than 0.5 % of the total output power determined in (2). This limit frequency is recorded as "Lower Frequency".

(4) Sum up the recorded power measurement results, starting from the step at the maximum frequency defined in (1) down to the step at an upper limit frequency by which this sum is equal to or greater than 0.5 % of the total output-power determined in (2). This limit frequency is recorded as "Upper Frequency".

(5) Calculate the occupied bandwidth as the difference between the "Upper Frequency" obtained in (3) and the "Lower Frequency" obtained in (4).

6.6.1.4.2.2 1,28 Mcps TDD option

(1) Measure the power of the transmitted signal with a measurement filter of bandwidth 30 kHz. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyser filter). The centre frequency of the filter shall be stepped in contiguous 30 kHz steps from a minimum frequency, which shall be (2,4 – 0,015) MHz below the assigned channel frequency of the transmitted signal, up to a maximum frequency, which shall be (2,4 – 0,015) MHz above the assigned channel frequency of the transmitted signal. The time duration of each step shall be sufficiently long to capture one active time slot. The measured power shall be recorded for each step.

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

(3) Sum up the recorded power measurement results, starting from the step at the minimum frequency defined in (1) up to the step at a lower limit frequency by which this sum is equal to or greater than 0,5 % of the total power determined in (2). This limit frequency is recorded as "Lower Frequency".

(4) Sum up the recorded power measurement results, starting from the step at the maximum frequency defined in (1) down to the step at an upper limit frequency by which this sum is equal to or greater than 0,5 % of the total power determined in (2). This limit frequency is recorded as "Upper Frequency".

(5) Calculate the occupied bandwidth as the difference between the "Upper Frequency" obtained in (3) and the "Lower Frequency" obtained in (4).

6.6.1.5 Test Requirements

NOTE: If the Test Requirement below differ from the Minimum Requirements, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.6.1.5.1 3,84 Mcps TDD option

The occupied bandwidth calculated in step (5) of subclause 6.6.1.4.2.1 shall be less than 5 MHz.

6.6.1.5.2 1,28 Mcps TDD option

The occupied bandwidth calculated in step (5) of subclause 6.6.1.4.2.2 shall be less than 1,6 MHz.

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.6.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the ~~transmitted~~average power centered on the assigned channel frequency to the average power centered on~~measured in~~ an adjacent channel frequency. In ~~B~~both cases, the ~~transmitted and the adjacent channel~~ power is~~are~~ measured with a ~~through a matched~~ filter that has a (~~r~~Root ~~r~~Raised ~~c~~Cosine (RRC) filter response with~~and~~ roll-off α = 0,22~~) with a noise power~~ and a bandwidth equal to the chip rate. The requirements shall apply for all configurations of BS (single carrier or multi-carrier), and for all operating modes foreseen by the manufacturer's specification.

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

6.6.2.2.2 Minimum Requirements

6.6.2.2.2.1 Minimum requirement

6.6.2.2.2.1.1 3,84 Mcps TDD option

The ACLR shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset	ACLR limit
± 5 MHz	45 dB
± 10 MHz	55 dB

6.6.2.2.2.1.2 1,28 Mcps TDD option

The ACLR shall be equal to or greater than the limits given in Table 6.22A.

Table 6.22A: BS ACLR limits for 1,28 Mcps TDD

BS adjacent channel offset	ACLR limit
± 1.6 MHz	40 dB
± 3.2 MHz	50 dB

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.

6.6.2.2.2.2 Requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency

6.6.2.2.2.2.1 3,84 Mcps TDD option

In case the equipment is operated in proximity to another TDD BS or FDD BS on an adjacent frequency, the ACLR shall be equal to or greater than the value specified in table 6.23.

Table 6.23: BS ACLR limits in case of operation in proximity

BS adjacent channel offset	ACLR limit
± 5 MHz	70 dB
± 10 MHz	70 dB

The requirement is based on the assumption that the coupling loss between the base stations is at least 84dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.

NOTE: The necessary dynamic range to very the conformance requirements specified in table 6.23 is at the limits of the capability of state-of-art measuring equipment.

6.6.2.2.2.2 1,28 Mcps TDD option

In case the equipment is operated in proximity to another TDD BS or FDD BS and both BSs operating on an adjacent frequency band , the requirement is specified in terms of power level of the transmitting BS. This requirement is valid for co-existence with non-frame and non-switching point synchronised systems operating on the closest used carrier. The interference power level shall not exceed the limit in Table 6.23A.

Table 6.23A: BS ACLR in case of operation in proximity for 1,28 Mcps TDD

Center Frequency for Measurement	Maximum Level of the interference power (in case of multiple antennas the interference powers shall be summed at all antenna connectors)	Measurement Bandwidth
Closest used carrier of the victim receiver: Either FDD carrier Or 3.84 Mcps TDD carrier Or 1.28 Mcps TDD carrier	-36 dBm	chip rate of the victim receiver: In case of FDD: 3.84 MHz In case of 3.84 Mcps TDD: 3.84 MHz In case of 1.28 Mcps TDD: 1.28 MHz

The closest used carrier with respect to the regarded carrier of one system is defined by

a minimum difference in centre frequency between the regarded carrier and the carriers used in the other system and the chip rate of the other system.

If the actual allowed interference level $P_{int, allowed, actual}$ at the victim receiver is higher than –106dBm, this requirement may be relaxed by the amount $P_{int, allowed, actual} - (-106dBm)$.

6.6.2.2.3 Requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency

6.6.2.2.3.1 3,84 Mcps TDD option

In case the equipment is co-sited to another TDD BS or FDD BS operating on an adjacent frequency, the ACLR is specified in terms of the absolute ~~transmit~~output-power level of the BS measured in the adjacent channel. The maximum power level shall not exceed the limit in table 6.24.

Table 6.24: BS ACLR limits in case of co-siting

BS adjacent channel offset	Maximum Level	Measurement Bandwidth
± 5 MHz	-80 dBm	3.84 MHz
± 10 MHz	-80 dBm	3.84 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.

NOTE: The necessary dynamic range of the measuring equipment to verify the conformance requirements specified in table 6.24 is dependent on the BS output power. If the BS output power is larger than –10 dBm, the necessary dynamic range is beyond the capability of state-of-the-art measuring equipment; direct verification of the conformance requirements is not feasible. Alternatively, indirect measurement methods need to be defined.

6.6.2.2.3.2 1,28 Mcps TDD option

In case the equipment is co-sited to another TDD BS or FDD BS and both BSs operating on an adjacent frequency band, the requirement is specified in terms of power level of the transmitting BS. This requirement is valid for co-

existence with a non-frame and non-switching point synchronised systems operating on closest used carrier. The interference power level shall not exceed the limit in Table 6.24A.

Table 6.24A : BS ACLR in case of co-siting for 1,28 Mcps TDD

Center Frequency for Measurement	Maximum Level of the interference power (in case of multiple antennas the interference powers shall be summed at all antenna connectors)	Measurement Bandwidth
Closest used carrier of the victim receiver: Either FDD carrier Or 3.84 Mcps TDD carrier Or 1.28 Mcps TDD carrier	-76 dBm	chip rate of the victim receiver: In case of FDD: 3.84 MHz In case of 3.84 Mcps TDD: 3.84 MHz In case of 1.28 Mcps TDD: 1.28 MHz

The closest used carrier with respect to the regarded carrier of one system is defined by:

a minimum difference in centre frequency between the regarded carrier and the carriers used in the other system and the chip rate of the other system.

If the actual MCL_{actual} is higher than 30dB, this requirement may be relaxed by the amount MCL_{actual} − 30dB.

If the actual allowed interference level $P_{int, allowed, actual}$ at the victim receiver is higher than –106dBm, this requirement may be relaxed by the amount $P_{int, allowed, actual}$ − (-106dBm).

6.6.2.2.3 Test purpose

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

6.6.2.2.4 Method of test

6.6.2.2.4.1 Initial conditions

6.6.2.2.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.25.

Table 6.25: Parameters of the BS transmitted signal for ACLR testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	Real life (sufficient irregular)

6.6.2.2.4.1.2 1,28 Mcps TDD option

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.25A.

Table 6.25A: Parameters of the BS transmitted signal for ACLR testing for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
BS output power setting	PRAT
Number of DPCH in each active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.2.2.4.2 Procedure

6.6.2.2.4.2.1 3,84 Mcps TDD option

(1) Measure ~~transmitted~~~~output~~ the average power centered on the assigned channel frequency over the 2464 active chips of the even time slots TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate. ~~The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points. (The global in-channel Tx test described in Annex C may be applied.)~~

(2) Average over TBD time slots.

(3) Measure ~~interference~~the average power at the first lower adjacent RF channel (center frequency 5 MHz below the assigned channel frequency of the transmitted signal) over the useful part of the burst within the even time slots TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken with adherence to the sampling theorem.

(4) Average over TBD time slots.

(5) Calculate the ACLR by the ratio

ACLR = ~~transmitted output~~ average power acc. to (2) / average interference power acc. to (4).

(6) Repeat steps (3), (4) and (5) for the second lower adjacent RF channel (center frequency 10 MHz below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (center frequency 5 MHz and 10 MHz above the assigned channel frequency of the transmitted signal, respectively).

6.6.2.2.4.2.2 1,28 Mcps TDD option

(1) Measure transmitted power over the 848 active chips of the transmit time slots TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points. (The global in-channel Tx test described in Annex C may be applied.)

(2) Average over TBD time slots.

(3) Measure interference power at the first lower adjacent RF channel (center frequency 1,6 MHz below the assigned channel frequency of the transmitted signal) over the useful part of the burst within the transmit time slots TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken with adherence to the sampling theorem.

(4) Average over TBD time slots.

(5) Calculate the ACLR by the ratio:

ACLR = transmitted power acc. to (2) / interference power acc. to (4).

(6) Repeat steps (3), (4) and (5) for the second lower adjacent RF channel (center frequency 3,2 MHz below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (center frequency 1,6 MHz and 3,2 MHz above the assigned channel frequency of the transmitted signal, respectively).

6.6.2.2.5 Test Requirements

NOTE: If the Test Requirements below differ from the Minimum Requirements, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.6.2.2.5.1 3,84 Mcps TDD option

The ACLR calculated in step (5) of subclause 6.6.2.2.4.2.1 shall be equal or greater than the limits given in table 6.26 or table 6.272, respectively. In case the equipment is co-sited to another TDD BS or FDD BS operating on an adjacent frequency, the interference power at the first and second adjacent channel measured according to steps (3) and (4) of subclause 6.6.2.2.4.2.1 shall not exceed the maximum level specified in table 6.28

Table 6.26: BS ACLR Test Requirements

BS adjacent channel offset	ACLR limit
± 5 MHz	44,2 dB
± 10 MHz	54,2 dB

Table 6.27: BS ACLR Test Requirements in case of operation in proximity

BS adjacent channel offset	ACLR limit
± 5 MHz	66 dB
± 10 MHz	66 dB

Table 6.28: BS ACLR Test Requirements in case of co-sitting

BS adjacent channel offset	Maximum Level	Measurement Bandwidth
± 5 MHz	-[80 dBm - TT]	3.84 MHz
± 10 MHz	-[80 dBm - TT]	3.84 MHz

6.6.2.2.5.2 1,28 Mcps TDD option

The ACLR calculated in step (5) of subclause 6.6.2.2.4.2.2 shall be equal or greater than the limits given in table 6.26A. In case the equipment is in proximity or co-sited to another TDD BS or FDD BS operating on an adjacent frequency, the interference power at the adjacent channel measured according to steps (3) and (4) of subclause 6.6.2.2.4.2.2 shall not exceed the maximum level specified in table 6.27A or 6.28A respectively.

Table 6.26A: BS ACLR Test Requirements (1,28 Mcps option)

BS adjacent channel offset	ACLR limit
± 1.6 MHz	39.2 dB
± 3.2 MHz	49 dB

Table 6.27A: BS ACLR Test Requirements in case of operation in proximity (1,28 Mcps option)

Center Frequency for Measurement	Maximum Level (sum of emitted interference power of all node B antennas at the antenna connector)	Measurement Bandwidth
Closest used frequency of victim receiver	[-36 dBm-TT]	chip rate of victim receiver

Table 6.28A: BS ACLR Test Requirements in case of co-siting (1,28 Mcps option)

Center Frequency for Measurement	Maximum Level (sum of emitted interference power of all node B antennas at the antenna connector)	Measurement Bandwidth
Closest used frequency of victim receiver	[-76 dBm-TT]	Chip rate of victim receiver

C.3 Applications

This process may be applied in the measurements defined in the following subclauses:

6.3	Frequency Stability
6.4	Output Power Dynamics
6.4.2	Power control steps
6.4.3	Power control dynamic range
6.4.4	Minimum ~~transmit~~ output power
6.4.5	Primary CCPCH power
6.6.2.2	Adjacent Channel Leakage power Ratio (ACLR)
6.8	Transmit Modulation
6.8.1	Modulation accuracy
6.8.2	Peak Code Domain Error

Annex D (informative): Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 5.11. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in tables D.1 to D.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 5.10. 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 5.12.

For example, a Test System having 0,9 dB accuracy for test 6.2 Maximum output power (which is 0,2 dB above the limit specified in subclause 5.10.2) would subtract 0,2 dB from the Test Tolerance of 0,7 dB defined in subclause 5.11.1. This new test tolerance of 0,5 dB would then be applied to the Minimum Requirement using the formula defined in Table D.1 to give a new range of ±2,5 dB of the manufacturer's rated output power.

For the case where an excess error of 0.2 dB exists, when applied to a test with a test tolerance of zero, the test tolerance used in the formula would be –0.2 dB.

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

Test	Minimum Requirement in TS 25.105 (numbering of tables in the column below refers to TS 25.142)	Test Tolerance (TT)	Test Requirement in TS 25.142
6.2 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
6.3 Frequency stability	Frequency stability = ± 0,05 ppm	12 Hz	Formula: ± (frequency stability +TT) ± (0,05 ppm + 12 Hz)
6.4.2 Power control steps	single step: step size tolerance specified in table 6.3 ten steps: minimum and maximum average rate of change in mean power specified in table 6.3	single step: 0,1 dB ten steps: 0,3 dB	Formula: single step: ± (step size tolerance + TT) ten steps: maximum average rate + TT minimum average rate – TT 0,1 dB and 0,3 dB, respectively, applied as above to table 6.3
6.4.3 Power control dynamic range	range ≥ 30 dB	0,3 dB	Formula: Range – TT range ≥ 29,7 dB
6.4.4 Minimum ~~transmit~~output power	PRAT – 30 dB	0,7 dB	Formula : PRAT – 30 dB +TT PRAT – 29,3 dB
6.4.5 Primary CCPCH power	PCCPCH power tolerance defined in table 6.8	0,8 dB	Formula: ± (power tolerance + TT) 0,8 dB applied as above to table 6.8
6.5.1 Transmit OFF power	Tx OFF power limit < -79 dBm	2,0 dB	Formula: < Tx OFF power limit + TT < - 77 dBm
6.5.2 Transmit ON/OFF time mask	Tx power limit < -33 dBm or –79 dBm, resp.	< -33 dBm: 0,7 dB < -79 dBm: 2,0 dB	Formula: < Tx power limit + TT < -32,3 dBm or < - 77 dBm
6.6.1 Occupied bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz

6.6.2.1 Spectrum emission mask	Maximum level defined in tables 6.13 to 6.16	1,5 dB	Formula: Maximum level + TT Add 1,5 dB to Maximum level entries in tables 6.13 to 6.16
6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	minimum requirement: ACLR limit = 45 dB at 5 MHz ACLR limit = 55 dB at 10 MHz requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency: ACLR limit = 70 dB at 5 MHz ACLR limit = 70 dB at 10 MHz requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency ACLR limit = - 80 dBm at 5 MHz ACLR limit = - 80 dBm at 10 MHz	min. req. : 0,8 dB operation in proxim.: 4 dB co-siting: TBD	Formula: ACLR limit – TT min. requirement: ACLR limit = 44,2 dB at 5 MHz ACLR limit = 54,2 dB at 10 MHz operation in proximity: ACLR limit = 66 dB at 5 MHz ACLR limit = 66 dB at 10 MHz co-siting: TBD
6.6.3 Spurious emissions	maximum level defined in tables 6.29 to 6.37	0 dB	Formula: Maximum limit + TT add 0 dB to maximum levels in tables 6.29 to 6.37
6.7 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.6.2.1, 6.6.2.2 and 6.6.3.	Wanted signal level – interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level – interferer level = 30 + 0 dB
6.8.1 Modulation accuracy	EVM limit = 12,5 %	0 %	Formula: EVM limit + TT EVM limit = 12,5 %
6.8.2 Peak code domain error	PCDE limit = - 28 dB	1 dB	Formula: PCDE limit + TT PCDE limit = - 27 dB

Annex E (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 Analysers etc.) which are necessary when assembling a Test System which complies with subclause 5.10 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.

Table E.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Range (see NOTE)
6.2 Maximum output power	Not critical	Not critical
6.3 Frequency stability	± 10 Hz + timebase = 12 Hz	± 500 Hz. (This is to allow for UE range that at 0,1 PPM is larger than BTS.)
6.4.2 Power control steps	single step: ± 0,1 dB ten steps: ± 0,3 dB	
6.4.3 Power control dynamic range	± 0,3 dB	
6.4.4 Minimum ~~transmit~~output power	Not critical	Not critical
6.4.5 Primary CCPCH power	Not critical	Not critical
6.5.1 Transmit OFF power	Not critical	Not critical
6.5.2 Transmit ON/OFF time mask	Not critical	Not critical
6.6.1 Occupied bandwidth	± 100 kHz	± 1 MHz
6.6.2.1 Spectrum emission mask	Not critical	Not critical
6.6.2.2 ACLR	minimum requirement: ± 0,8 dB requirement in case of operation in proximity: ± 4,0 dB requirement in case of co-siting: TBD	
6.6.3 Spurious emissions	Not critical	Not critical
6.7 Transmit intermodulation (interferer requirements)	Not critical	Not critical
6.8.1 Modulation accuracy	± 2,5 % (for single code)	Signal power = PRAT to (PRAT – 30 dB) Specified accuracy applies to measurement results between ± 7,5% and 17,5%
6.8.2 Peak code domain error	± 1 dB	
NOTE: The Test Equipment uncertainty applies for measurement results in a range equal to the DUT Test Requirement (not the Minimum Requirement) extended by the range specified.		

3GPP TSG RAN WG4 Meeting #19 **R4-011182**

Edinburgh, Great Britain, 3rd - 7th September 2001

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CHANGE REQUEST

⌘ **25.142** **CR** **75** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Minimum transmit power test condition alignment with PC dynamic range test conditions.
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 – 9 – 01
Category:	⌘	**F** ***Release:*** ⌘ Rel99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
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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:	⌘	Minimum transmit power test conditions should be in agreement with the PC dynamic range test conditions to maximize testing efficiency.
Summary of change:	⌘	Align Minimum transmit power test conditions to be the same as PC dynamic range test conditions with 1 active DPCH in each active TS.
Consequences if not approved:	⌘	The current requirement requires unnecessary testing complexity.

Clauses affected:	⌘	6.4.4.4		
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)Determine the power control dynamic range by calculating the difference between the maximum transmit output power measured in step (3) and the minimum transmit output power measured in step (5).

(7) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) to (6).

6.4.3.5 Test Requirements

The power control dynamic range derived according to subclause 6.4.3.4.2 shall be greater than or equal to 29,7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.4.4 Minimum transmit power

6.4.4.1 Definition and applicability

The minimum controlled output power of the BS is when the power control setting is set to a minimum value. This is when the power control indicates a minimum transmit output power is required.

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

6.4.4.2 Minimum Requirements

The DL minimum transmit power shall be lower than or equal to:

Maximum output power - 30 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.4.1.

6.4.4.3 Test purpose

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

6.4.4.4 Method of test

6.4.4.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.7.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to thermal power;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.7: Parameters of the BS transmitted signal for minimum transmit power test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	~~9~~1
~~Power of each DPCH~~	~~1/9 of Base Station output power~~
Data content of DPCH	real life (sufficient irregular)

6.4.4.4.2 Procedure

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

(2) Set the BS tester to produce a sequence of TPC commands related to ~~all~~ the active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the transmit output power of all active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).

(3) Measure the power of the BS output signal over the 2464 active chips of an even time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.

(4) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) and (3).

6.4.4.5 Test Requirements

For all measurements, the minimum transmit power derived in step (4) of subclause 6.4.4.4.2 shall be at least 29,3 dB below the maximum output power as declared by the manufacturer; see 6.2.

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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

6.4.5 Primary CCPCH power

6.4.5.1 Definition and applicability

Primary CCPCH power is the transmission power of the Primary Common Control Physical Channel averaged over the transmit timeslot. Primary CCPCH power is signaled on the BCH.

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

6.4.5.2 Minimum Requirements

The error between the BCH-broadcast value of the Primary CCPCH power and the Primary CCPCH power averaged over the timeslot shall not exceed the values in table 6.8. The error is a function of the total power averaged over the timeslot, Pout, and the manufacturer's rated output power, PRAT.

Table 6.8: Errors between Primary CCPCH power and the broadcast value

Total power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 2,5 dB
PRAT - 6 < P ≤ PRAT - 3	+/- 3,5 dB
PRAT - 13 < P ≤ PRAT - 6	+/- 5 dB

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.5.

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CHANGE REQUEST

⌘ **25.142** **CR** **76** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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Category:	⌘	**A** ***Release:*** ⌘ Rel-4

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REL-5	*(Release 5)*

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Clauses affected:	⌘	6.4.4.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
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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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

6.4.4 Minimum transmit power

6.4.4.1 Definition and applicability

The minimum controlled output power of the BS is when the power control setting is set to a minimum value. This is when the power control indicates a minimum transmit output power is required.

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

6.4.4.2 Minimum Requirements

The DL minimum transmit power shall be lower than or equal to:

Maximum output power - 30 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.4.1.

6.4.4.3 Test purpose

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

6.4.4.4 Method of test

6.4.4.4.1 Initial conditions

6.4.4.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T; see subclause 5.3.

(1) Connect the BS tester to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.7.

(3) Operate the BS in such a mode that it is able to interpret received TPC commands

(4) Start BS transmission.

NOTE: The BS tester used for this test must have the ability:

- to analyze the output signal of the BS under test with respect to thermal power;

- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

Table 6.7: Parameters of the BS transmitted signal for minimum transmit power test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Number of DPCH in each active TS	~~0~~1
~~Power of each DPCH~~	~~1/9 of Base Station output power~~
Data content of DPCH	real life (sufficient irregular)

3GPP TSG RAN WG4 Meeting #19 **R4-011280**

Edinburgh, Great Britain, 3rd - 7th September 2001

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CHANGE REQUEST

⌘ **25.142** **CR** 77 ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘	Correction of frequency range for receiver spurious emissions
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 3 September 2001
Category:	⌘ **F**	***Release:*** ⌘ Rel99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The current frequency range for receiver spurious emission requirements is inconsistent with the value proposed in ITU-R M.[UNWANT-MS].
Summary of change:	⌘	The starting frequency for receiver spurious emission requirements is changed from 9 kHz to 30 MHz as proposed in ITU-R M.[UNWANT-MS].
Consequences if not approved:	⌘	There will be an inconsistency with ITU-R recommendation M.[UNWANT]. It will cause further inconsistencies with future regional or national regulations that will follow the ITU-R recommendation.

Clauses affected:	⌘	
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Corresponding REL-4 Cat A CR in R4-011281

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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

7.7 Spurious emissions

7.7.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS antenna connector. The requirements apply to all BS with separate Rx and Tx antenna connectors. For BS equipped with only a single antenna connector for both transmitter and receiver, the requirements of subclause 6.6.3 shall apply to this port, and this test need not be performed.

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

7.7.2 Minimum Requirements

The power of any spurious emission shall not exceed the values given in table 7.12.

Table 7.12: Receiver spurious emission requirements

Band	Maximum level	Measurement Bandwidth	Note
30 MHz~~9 kHz~~ – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 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
1,900 – 1,980 GHz	-78 dBm	3,84 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
1,980 – 2,010 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
2,010 – 2,025 GHz	-78 dBm	3,84 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
2,025 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 TS 25.105 [1] subclause 7.7.1.

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 5.9.1.

RF channels to be tested: M; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of one BS Rx port.

(2) Terminate or disable any other BS Rx port not under test.

(3) Set the BS receiver to operational mode.

(4) Set the BS to transmit a signal with parameters according to table 7.13.

(5) Terminate the Tx port(s).

Table 7.13: Parameters of the transmitted signal for Rx spurious emissions test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

7.7.4.2 Procedure

(1) Measure the power of the spurious emissions by applying the measuring equipment with the settings as specified in table 7.14. The characteristics of the measurement filter with the bandwidth 3,84 MHz shall be RRC with roll-off α = 0,22. The characteristics of the measurement filters with bandwidths 100 kHz and 1 MHz shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filters shall be stepped in contiguous steps over the frequency bands as specified in table 7.14. The time duration of each step shall be sufficiently long to capture one even (transmit) time slot.

(2) If the BS is equipped with more than one Rx port, interchange the connections of the BS Rx ports and repeat the measurement according to (1).

Table 7.14: Measurement equipment settings

Stepped frequency range	Measurement bandwidth	Step width	Note	Detection mode
30 MHz~~9 kHz~~ – 1 GHz	100 kHz	100 kHz		true RMS
1 GHz – 1,900 GHz	1 MHz	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	
1,900 GHz – 1,980 GHz	3,84 MHz	200 kHz		
1,980 GHz – 2,010 GHz	1 MHz	1 MHz		
2,010 GHz – 2,025 GHz	3,84 MHz	200 kHz		
2,025 GHz – 12,75 GHz	1 MHz	1 MHz		

7.7.5 Test Requirements

The spurious emissions measured according to subclause 7.7.4.2 shall not exceed the limits specified in subclause 7.7.2.

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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

3GPP TSG RAN WG4 Meeting #19 **R4-011281**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** 78 ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	Correction of frequency range for receiver spurious emissions
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 4 September 2001
Category:	⌘ **A**	***Release:*** ⌘ Rel-4

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The current frequency range for receiver spurious emission requirements is inconsistent with the value proposed in ITU-R M.[UNWANT-MS].
Summary of change:	⌘	The starting frequency for receiver spurious emission requirements is changed from 9 kHz to 30 MHz as proposed in ITU-R M.[UNWANT-MS].
Consequences if not approved:	⌘	There will be an inconsistency with ITU-R recommendation M.[UNWANT]. It will cause further inconsistencies with future regional or national regulations that will follow the ITU-R recommendation.

Clauses affected:	⌘	
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Corresponds to a R99 Cat F CR in R4-011280

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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

7.7 Spurious emissions

7.7.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS antenna connector. The requirements apply to all BS with separate Rx and Tx antenna connectors. For BS equipped with only a single antenna connector for both transmitter and receiver, the requirements of subclause 6.6.3 shall apply to this port, and this test need not be performed.

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

7.7.2 Minimum Requirements

7.7.2.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the values given in table 7.12.

Table 7.12: Receiver spurious emission requirements

Band	Maximum level	Measurement Bandwidth	Note
30 MHz~~9 kHz~~ – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 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
1,900 – 1,980 GHz	-78 dBm	3,84 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
1,980 – 2,010 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
2,010 – 2,025 GHz	-78 dBm	3,84 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
2,025 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

7.7.2.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the values given in table 7.12A.

Table 7.12A: Receiver spurious emission requirements for 1,28 Mcps TDD

Band	Maximum level	Measurement Bandwidth	Note
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1.9 GHz and 1.98 GHz – 2.01 GHz	-47 dBm	1 MHz	With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS.
1.9 GHz – 1.98 GHz and 2.01 GHz – 2.025 GHz	-83 dBm	1.28 MHz	With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS.
2.025 GHz – 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS.

The normative reference for this requirement is TS 25.105 [1] subclause 7.7.1.

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

7.7.4.1.1 3,84 Mcps TDD option

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: M; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of one BS Rx port.

(2) Terminate or disable any other BS Rx port not under test.

(3) Set the BS receiver to operational mode.

(4) Set the BS to transmit a signal with parameters according to table 7.13.

(5) Terminate the Tx port(s).

Table 7.13: Parameters of the transmitted signal for Rx spurious emissions test

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

7.7.4.1.2 1,28 Mcps TDD option

(1) Connect the measuring equipment to the antenna connector of one BS Rx port.

(2) Terminate or disable any other BS Rx port not under test.

(3) Set the BS receiver to operational mode.

(4) Set the BS to transmit a signal with parameters according to table 7.13A.

(5) Terminate the Tx port(s).

Table 7.13A: Parameters of the transmitted signal for Rx spurious emissions test for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
BS output power setting	PRAT
Number of DPCH in each active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

7.7.4.2 Procedure

7.7.4.2.1 3,84 Mcps TDD option

(1) Measure the power of the spurious emissions by applying the measuring equipment with the settings as specified in table 7.14. The characteristics of the measurement filter with the bandwidth 3,84 MHz shall be RRC with roll-off α = 0,22. The characteristics of the measurement filters with bandwidths 100 kHz and 1 MHz shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filters shall be stepped in contiguous steps over the frequency bands as specified in table 7.14. The time duration of each step shall be sufficiently long to capture one even (transmit) time slot.

(2) If the BS is equipped with more than one Rx port, interchange the connections of the BS Rx ports and repeat the measurement according to (1).

Table 7.14: Measurement equipment settings

Stepped frequency range	Measurement bandwidth	Step width	Note	Detection mode
30 MHz~~9 kHz~~ – 1 GHz	100 kHz	100 kHz		true RMS
1 GHz – 1,900 GHz	1 MHz	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	
1,900 GHz – 1,980 GHz	3,84 MHz	200 kHz		
1,980 GHz – 2,010 GHz	1 MHz	1 MHz		
2,010 GHz – 2,025 GHz	3,84 MHz	200 kHz		
2,025 GHz – 12,75 GHz	1 MHz	1 MHz		

7.7.4.2.2 1,28 Mcps TDD option

(1) Measure the power of the spurious emissions by applying the measuring equipment with the settings as specified in table 7.14A. The characteristics of the measurement filter with the bandwidth 1,28 MHz shall be RRC with roll-off α = 0,22. The characteristics of the measurement filters with bandwidths 100 kHz and 1 MHz shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filters shall be stepped in contiguous steps over the frequency bands as specified in table 7.14A. The time duration of each step shall be sufficiently long to capture one even (transmit) time slot.

(2) If the BS is equipped with more than one Rx port, interchange the connections of the BS Rx ports and repeat the measurement according to (1).

Table 7.14A: Measurement equipment settings

Stepped frequency range	Measurement bandwidth	Step width	Note	Detection mode
9 kHz – 1 GHz	100 kHz	100 kHz		true RMS
1 GHz – 1,900 GHz	1 MHz	1 MHz	With the exception of frequencies between 4 MHz below the first carrier frequency and 4 MHz above the last carrier frequency used by the BS	
1,900 GHz – 1,980 GHz	1,28 MHz	200 kHz		
1,980 GHz – 2,010 GHz	1 MHz	1 MHz		
2,010 GHz – 2,025 GHz	1,28 MHz	200 kHz		
2,025 GHz – 12,75 GHz	1 MHz	1 MHz		

7.7.5 Test Requirements

NOTE: If the Test Requirement below 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 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

The spurious emissions measured according to subclause 7.7.4.2 shall not exceed the limits specified in subclause 7.7.2.

3GPP TSG RAN WG4 Meeting #19 **R4-011292**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** **79** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘	Definition of "classical Doppler spectrum" in TS 25.142
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 04 September 2001
Category:	⌘	**F** ***Release:*** ⌘ Rel99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Clarification of how the "classical Doppler spectrum" is defined
Summary of change:	⌘	A formula of the classical Doppler spectrum with Rayleigh fading is introduced, as taken by GSM specs
Consequences if not approved:	⌘	There is not a unique definition of "classical Doppler spectrum"

Clauses affected:	⌘	B.2		
Other specs affected:	⌘	**X** Other core specifications	⌘	25.104, 25.105
		X Test specifications		25.141
		☐ O&M Specifications		
Other comments:	⌘			

How to create CRs using this form:

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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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

B.2 Multi-path fading propagation conditions

Table B1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum, defined as:

(CLASS) $$S(f) \propto 1/(1-(f/f_D)^2)^{0.5}$$ for $f \in -f_d, f_d$.

Table B.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
		12000	0	521	-6
				781	-9

3GPP TSG RAN WG4 Meeting #19 **R4-011296**

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** **80** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	Definition of "classical Doppler spectrum" in TS 25.142
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 04 September 2001
Category:	⌘	**A** ***Release:*** ⌘ Rel-4

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Clarification of how the "classical Doppler spectrum" is defined
Summary of change:	⌘	A formula of the classical Doppler spectrum with Rayleigh fading is introduced, as taken by GSM specs
Consequences if not approved:	⌘	There is not a unique definition of "classical Doppler spectrum"

Clauses affected:	⌘	B.2		
Other specs affected:	⌘	**X** Other core specifications	⌘	25.104, 25.105
		X Test specifications		25.141
		☐ 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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

B.2 Multi-path fading propagation conditions

Table B1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum~~.~~, defined as:

(CLASS) $S(f) \propto 1/(1-(f/f_D)^2)^{0.5}$ for f ∈ -f_d, f_d.

B.2.1 3,84 Mcps TDD option

Table B.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
		12000	0	521	-6
				781	-9

B.2.2 1,28 Mcps TDD option

Table B2.2 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum~~.~~, defined as:

(CLASS) $S(f) \propto 1/(1-(f/f_D)^2)^{0.5}$ for f ∈ -f_d, f_d.

Table B2: Propagation Conditions for Multi path Fading Environments for 1,28 Mcps TDD

Case 1, speed 3km/h		Case 2, speed 3km/h		Case 3, speed 120km/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
2928	-10	2928	0	781	-3
		12000	0	1563	-6
				2344	-9