TSG RAN Meeting #16 **RP-020287**
Marco Island, FL, USA, 4 - 7 June 2002

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.142**
Source **TSG RAN WG4**
Agenda Item **7.4.3**

RAN4 Tdoc	Spec	Curr Ver	New Ver	CR	R	Cat	Ph	Title	Acronym
R4-020708	25.142	3.9.0	3.10.0	119		F	R99	Correction of power terms and definitions	TEI
R4-020709	25.142	4.4.0	4.5.0	120		A	Rel-4	Correction of power terms and definitions	TEI
R4-020710	25.142	5.0.0	5.1.0	121		A	Rel-5	Correction of power terms and definitions	TEI
R4-020969	25.142	3.9.0	3.10.0	128		F	R99	BS conformance testing of revised ACLR and spurious emissions requirements in case of coexistence	TEI
R4-020970	25.142	4.4.0	4.5.0	129		F	Rel-4	BS conformance testing of revised ACLR and spurious emissions requirements for 3,84 Mcps and 1,28 Mcps TDD option in case of coexistence	TEI, LCRTDD-RF

3GPP TSG RAN WG4 Meeting #23 **R4-020708**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘	**25.142**	**CR**	**119**	⌘ ev	**-**	⌘	Current version:	**3.9.0** ⌘

*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: ⌘	Correction of power terms and definitions			
Source: ⌘	RAN WG4			
Work item code: ⌘	TEI		***Date:*** ⌘	17/5/2002
Category: ⌘	**F**		***Release:*** ⌘	R99
	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 requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.
Summary of change: ⌘	3.1 Definitions - Average Power deleted, Clarification of power spectral density added. Mean power (consistant with ITU radio regulation), RRC filtered mean power, Code domain power, and Output power added; Maximum output power and Rated output power are now related to mean power 3.3. Abbreviations – definition of I_{oc} and $\hat{I}_{or}$ corrected. 6.4.1 Inner loop power control - output power and mean output power replaced by code domain power 6.4.2 Power control steps - transmitter output power and mean power replaced by code domain power 6.4.3 Power control dynamic range - output power replaced by code domain power 6.4.5 Primary CCPCH power – defined as code domain power, total power replaced by output power 6.5.1 Transmit OFF power - average power replaced by RRC filtered mean power 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR) – changed to RRC filtered mean power terminology 6.7 Transmit intermodulation - subject and interferer signals defined as mean

		power 7.2. Reference sensitivity level - defined as mean power, FER removed 7.3. Receiver dynamic range - Wanted signal defined as mean power, wanted signal level given as –79 dBm (according formula: REFSENS + 30 dB : -109dBm+30 dB) 7.4 Adjacent Channel Selectivity (ACS) - Wanted and interfering signals defined as mean power, interferer defined as single code to match existing test. Missing “offset” added to Fuw definition. wanted signal level given as –103 dBm (according formula: REFSENS + 6 dB : -109dBm+6 dB) 7.5 Blocking characteristics - Wanted and interfering signals defined as mean power, wanted signal level given as –103 dBm (according formula: REFSENS + 6 dB : -109dBm+6 dB) 7.6 Intermodulation characteristics - Wanted and interfering signals defined as mean power Annex B.2: Average power replaced by relative mean power
Consequences if not approved:	⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. ACLR, P-CCPCH power, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of requirements. Correct interpretation of the existing specification will not affect implementations or system performance. However, incorrect interpretation may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3.1, 3.3, 6.4.1, 6.4.2.1, 6.4.2.2, 6.4.2.3, 6.4.2.4.2, 6.4.2.5, 6.4.3.1, 6.4.3.3, 6.4.3.4.2, 6.4.5.1, 6.4.5.2, 6.4.5.3, 6.4.5.4.2, 6.4.5.5, 6.5.1.1, 6.5.1.2, 6.5.2.4.2, 6.6.2.2.1, 6.6.2.2.4.2, 6.7.1, 7.2.1, 7.2.2, 7.2.5, 7.3.2, 7.3.5, 7.4.1, 7.4.4.1, 7.4.2, 7.5.2.1, 7.5.2.2, 7.6.2, Annex B2		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘	Equivalent CRs in other Releases: CR120 cat. A to 25.142 v4.4.0, CR121 cat. A to 25.142 v5.0.0		

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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.

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3 Definitions, symbols, and abbreviations

3.1 Definitions

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

~~**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.~~

Mean power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

NOTE: The roll-off factor α is defined in section 6.8.1.

RRC filtered mean power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

NOTE: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

Code domain power: That part of the mean power which correlates with a particular (OVSF) code channel. The sum of all powers in the code domain equals the mean power in a bandwidth of (1+ α) times the chip rate of the radio access mode.

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

Maximum output power~~, Pmax~~: The mean power level per carrier ~~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~~ in a specified reference condition. The period of measurement shall be a transmit timeslot excluding the guard period.

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

--- next changed section ---

3.3 Abbreviations

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

3GPP	3rd Generation Partnership Project
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
I_{oc}	Power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference ~~fo~~r<u>o</u>m other cells) as measured at the BS antenna connector.
$\hat{I}_{or}$	Received power spectral density (integrated in a bandwidth (1+a) times the chip rate and normalized to the chip rate) of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	Output power
Pout	Output power of the base station
Pmax	Maximum output power of the base station
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

--- next changed section ---

6.4 Output power dynamics

6.4.1 Inner loop power control

Inner loop power control is the ability of the BS transmitter to adjust its ~~output~~ <u>code domain</u> power in response to the UL received signal.

For inner loop correction on the Downlink Channel, the base station adjusts the ~~mean output~~ <u>code domain</u> power ~~level~~ of a <u>power controlled</u> CCTrCH in response to each valid power control bit received from the UE on the Uplink Traffic Channel based on the mapping of the TPC bits in uplink CCTrCH to downlink CCTrCH. Inner loop control is based on SIR measurements at the UE receiver~~,~~ and the corresponding TPC commands are generated by the UE.

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~~ <u>code domain</u> 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~~ code domain power and the greatest average rate of change in ~~mean~~ code domain 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~~ code domain 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~~ code domain 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~~ code domain power according to these commands with the specified accuracy.

6.4.2.4 Method of test

6.4.2.4.1 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 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)

6.4.2.4.2 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. 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~~ code domain power of the active DPCH is controlled to reach its maximum and its minimum, respectively.

(3) Measure the code domain power of the active DPCH over the 2464 active chips of each even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C. ~~, 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.~~

(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

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~~ code domain 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~~ code domain 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 6.5~~1~~ 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~~ code domain power are given by ±21,3 dB and ±32,7 dB, respectively.

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 ~~output~~ code domain power of one power controlled 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 code domain 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 ~~output~~ code domain 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 code domain power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

(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 ~~output~~ code domain 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 code domain power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

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

--- next changed section ---

6.4.5 Primary CCPCH power

6.4.5.1 Definition and applicability

Primary CCPCH power is the ~~transmission~~ code domain power of the Primary Common Control Physical Channel averaged over the transmit timeslot. Primary CCPCH power is signalled 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 code domain power averaged over the timeslot shall not exceed the values in table 6.8. The error is a function of the ~~total~~ output 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~~ Output power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 2,5 dB
PRAT - 6 < Pout ≤ PRAT - 3	+/- 3,5 dB
PRAT - 13 < Pout ≤ 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 code domain 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 power. Therefore, deviations of the Primary CCPCH code domain power from its nominal value are transposed by the UE into deviations from the wanted output power of the UE.

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

6.4.5.4 Method of test

6.4.5.4.1 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. The BS tester 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.

(2) Set the parameters of the BS transmitted signal according to table 6.9.

Table 6.9: Parameters of the BS transmitted signal for Primary CCPCH power testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slots carrying PCCPCH	TS 0 and TS 8
Number of additional DPCH in TS 0 and TS 8	3
BS output power setting	PRAT
Relative power of PCCPCH	¼ of BS output power
Relative power of each DPCH in TS 0 and TS 8	¼ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.5.4.2 Procedure

(1) Measure the PCCPCH code domain power in TS 0 and TS 8 by applying the global in-channel Tx test method described in Annex C.

(2) Reduce the base station output power by 2 dB, 5 dB and 13 dB, without changing the relative powers of the PCCPCH and the DPCHs, and repeat step (1) for each output power setting.

6.4.5.5 Test Requirements

The Primary CCPCH power, measured according to subclause 6.4.5.4.2, shall be within the limits defined in table 6.10

Table 6.10: Test Requirements for errors between Primary CCPCH power and the broadcast value

~~Total~~ Output power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 3,3 dB
PRAT - 6 < Pout ≤ PRAT - 3	+/- 4,3 dB
PRAT - 13 < Pout ≤ PRAT - 6	+/- 5,8 dB

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

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

6.5.1.1 Definition and applicability

The transmit OFF power is defined as the ~~average~~ RRC filtered mean 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.

6.5.1.2 Minimum Requirements

The transmit OFF power shall be less than –79 dBm~~ measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate~~.

The normative reference for this requirement is TS 25.105 [1] subclause 6.5.1.

6.5.1.3 Test purpose

This test verifies the ability of the BS to reduce its transmit OFF power to a value below the specified limit. This ability is needed to minimize the interference for other users receiving on the same frequency.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.4.1 for initial conditions.

6.5.1.4.2 Procedure

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.4.2 for procedure.

6.5.1.5 Test Requirements

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.5 for test requirements.

6.5.2 Transmit ON/OFF time mask

6.5.2.1 Definition and applicability

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

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

6.5.2.2 Minimum Requirements

The transmit power level versus time should meet the mask specified in figure 6.1.

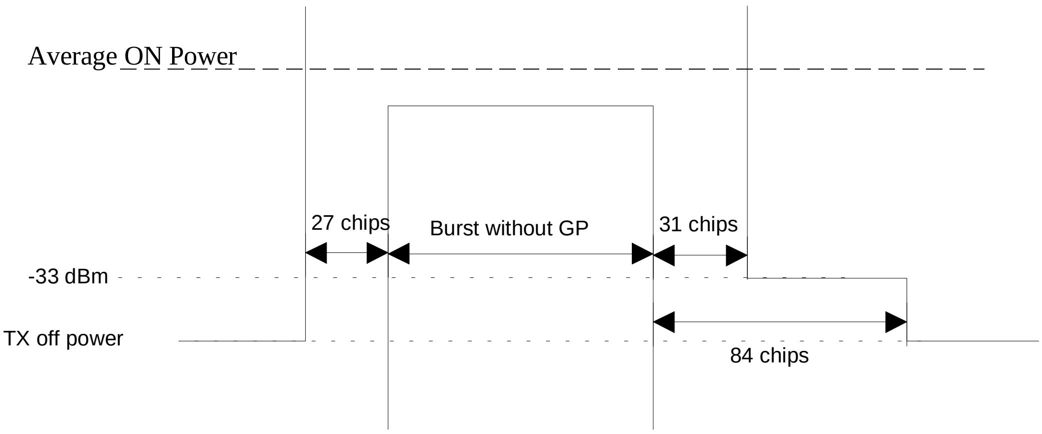

Figure 6.1: Transmit ON/OFF template

The normative reference for this requirement is TS 25.105 [1] subclause 6.5.2.

6.5.2.3 Test purpose

This test verifies the ability of the BS to reduce its transmit power outside of the active part of the Tx time slot (burst without guard period) to values below specified limits. This ability is needed to minimize the interference for other users receiving on the same frequency.

6.5.2.4 Method of test

6.5.2.4.1 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 power measuring equipment to the BS antenna connector.

(2) Set the parameters of the transmitted signal according to table 6.11.

Table 6.11: Parameters of the transmitted signal for transmit ON/OFF time mask 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)

6.5.2.4.2 Procedure

(1) Measure the RRC filtered mean power of the BS output signal chipwise (i.e. averaged over time intervals of one chip duration) over the period starting 65 chips before the start of the odd time slots TS i (receive time slots of the BS), and ending 27 chips before the next even time slot (transmit time slot of the BS) starts. ~~, 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. If the power measuring equipment is based on signal sampling, the sampling theorem shall be met. In this case, the power is determined by calculating the RMS value of the signal samples taken at the measurement filter output over one chip duration.~~

6.5.2.5 Test Requirements

Each value of the power measured according to subclause 6.5.4.2 shall be below – 32,3 dBm in the period from 32 chips to 84 chips after the burst and – 77 dBm in the period where the Tx OFF power specification is applicable

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.

--- next changed section ---

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 ~~average~~ RRC filtered mean power centered on the assigned channel frequency to the ~~average~~ RRC filtered mean power centered on an adjacent channel frequency. ~~In both~~

~~cases, the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	55 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies 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 below the first or above the last carrier frequency used	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.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the TDD BS or FDD BS in proximity.

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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies is specified in terms of the absolute 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 below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-80 dBm	3.84 MHz
10 MHz	-80 dBm	3.84 MHz

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited TDD BS or FDD BS.

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 with multiple carriers if supported; 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 the <u>RRC filtered mean</u> ~~average~~ power centered on the lowest 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 a = 0,22 and a bandwidth equal to the chip rate~~.

2) Average over TBD time slots.

3) Measure the <u>RRC filtered mean</u> ~~average~~ power at the first lower adjacent RF channel (center frequency 5 MHz below the lowest 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 = 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 lowest assigned channel frequency of the transmitted signal)

7) In case of a multi-carrier BS, repeat steps (1) and (2) for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the RRC filtered mean ~~average~~ power at the first higher adjacent RF channel (center frequency 5 MHz above the highest 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~~.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 10 MHz above the highest assigned channel frequency of the transmitted signal).

6.6.2.2.5 Test Requirements

The ACLR calculated in steps 5) and 10)of subclause 6.6.2.2.4.2 shall be equal or greater than the limits given in table 6.26 or table 6.27, 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 (4) and (9) 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 below the first or above the last carrier frequency used	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 below the first or above the last carrier frequency used	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 below the first or above the last carrier frequency used	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.

--- next changed section ---

6.7 Transmit intermodulation

6.7.1 Definition and applicability

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

The transmit intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into the antenna connector at a mean power level of 30 dB lower than that of the mean power of the subject signal. The carrier frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the subject signal carrier frequency, but excluding interference carrier frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

The requirements are applicable for a single carrier.

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

6.7.2 Minimum Requirements

The transmit intermodulation level shall not exceed the out of band or the spurious emission requirements of subclause 6.6.2 and 6.6.3, respectively.

The normative reference for this requirement is TS 25.105 [1] subclause 6.7.1.

6.7.3 Test purpose

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

6.7.4 Method of test

6.7.4.1 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, the BS under test and the WCDMA signal generator as shown in figure 6.2.

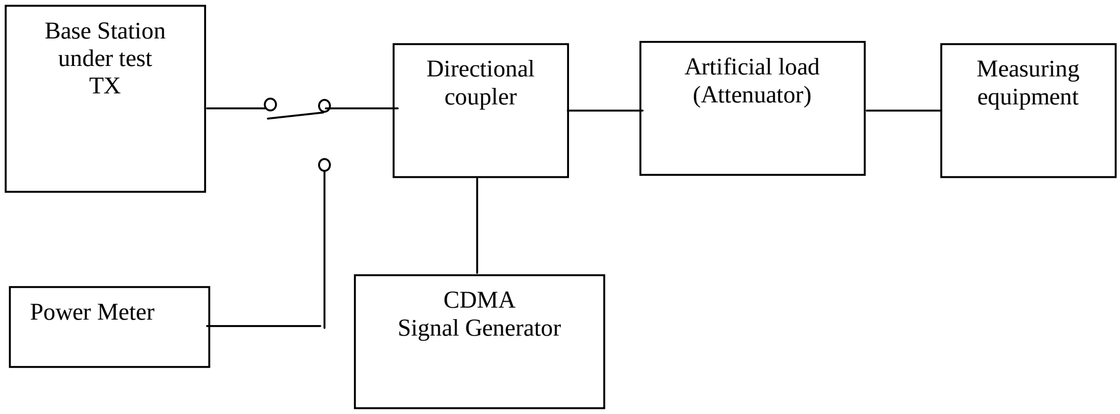

Figure 6.2: Measuring setup for Base Station transmit intermodulation testing

(2) Set the parameters of the BS transmitted signal according to table 6.38.

Table 6.38: Parameters of the BS transmitted signal for transmit intermodulation testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is odd; receive, if i is even.
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)

(3) Configure the WCDMA signal generator to produce an interference signal with a mean power level according to subclause 6.7.5. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The carrier frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the carrier frequency of the wanted signal, but excluding interference frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

6.7.4.2 Procedure

Apply the test procedures for out of band and spurious emissions as described in 6.6.2 and 6.6.3, respectively , at the frequencies of all third and fifth order intermodulation products. The frequency band occupied by the interference signal shall be excluded from the measurements.

NOTE: The third order intermodulation products are at frequencies (F1 ± 2F2) and (2F1 ± F2), the fifth order intermodulation products are at frequencies (2F1 ± 3F2), (3F1 ± 2F2), (4F1 ± F2) and (F1 ± 4F2), where F1 represents the frequencies within the bandwidth of the wanted signal and F2 represents the frequencies within the bandwidth of the WCDMA modulated interference signal.

6.7.5 Test Requirements

The mean power level of the WCDMA modulated interference signal shall be 30 dB below the mean power level of the wanted signal.

At the frequencies of all third and fifth order intermodulation products, the Test Requirements for out of band and spurious emissions as specified in subclauses 6.6.2.1.5 (Spectrum emission mask), 6.6.2.2.5 (ACLR) and 6.6.3.5 (Spurious emissions) shall be met.

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.

--- next changed section ---

7.2 Reference sensitivity level

7.2.1 Definition and applicability

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the antenna connector at which the BER ~~does~~ shall not exceed the specific value.

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

7.2.2 Minimum Requirements

~~For~~ Using the reference measurement channel specified in Annex A.2.1, the reference sensitivity level and performance of the BS shall be as specified in table 7.1 ~~below~~.

Table 7.1: BS reference sensitivity level

Reference measurement channel ~~D~~data rate	BS reference sensitivity level ~~(dBm)~~	BER
12,2 kbps	-109 dBm	BER shall not exceed 0,001

The normative reference for this requirement is TS 25.105 [1] subclause 7.2.1.

7.2.3 Test purpose

The test purpose is to verify the ability of the BS to receive a prescribed single-code test signal of minimum input power under defined conditions (no interference, no multipath propagation) with a BER not exceeding a specified limit. This test is also used as a reference case for other tests to allow the assessment of degradations due to various sources of interference.

7.2.4 Method of test

7.2.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

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

The following additional test shall be performed:

On each of B, M and T, 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) Connect the BS tester (UE simulator) 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 to the Test Requirement for the BS reference sensitivity level specified in table 7.2.5.1.

7.2.4.2 Procedure

(1) Measure the BER by comparing the bit sequence of the information data transmitted by the BS tester with the bit sequence obtained from the BS receiver.

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

7.2.5 Test Requirements

For any BS Rx port tested, the measured BER at the Test Requirement of the BS reference sensitivity level specified in table 7.2 shall not exceed 0,001.

Table 7.2: Test Requirement for BS reference sensitivity level

Reference measurement channel ~~D~~data rate	BS reference sensitivity level ~~(dBm)~~	BER
12,2 kbps	-108,3 dBm	BER shall not exceed 0,001

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.

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
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~<REFSENS> + 30 dB~~ –79	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.

7.3.4.2 Procedure

(1) Measure the BER by comparing the bit sequence of the information data transmitted by the BS tester with the bit sequence obtained from the BS receiver.

(2) Interchange the connections of the BS Rx ports and repeat the measurement according to (1)

7.3.5 Test Requirements

For any BS Rx port tested, the measured BER shall not exceed 0,001 for the parameters specified in table 7.4.

Table 7.4: Test Requirements for Dynamic Range

Parameter	Level	Unit
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~<REFSENS> + 31,2 dB~~ –77,8	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

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

7.4 Adjacent Channel Selectivity (ACS)

7.4.1 Definition and applicability

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of a~~n~~ single code CDMA modulated adjacent channel signal at a given frequency offset from the center frequency of the assigned channel.

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

7.4.2 Minimum Requirements

The BER, measured on the wanted signal in the presence of an interfering signal, shall not exceed 0,001 for the parameters specified in table 7.5.

Table 7.5: Parameters of the wanted signal and the interfering signal for ACS testing

Parameter	Level	Unit
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~Reference sensitivity level + 6 dB~~ –103	dBm
Interfering signal mean power	-52	dBm
Fuw (modulated)	5	MHz
NOTE: Fuw is the frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal.		

The normative reference for this requirement is TS 25.105 [1] subclause 7.4.1.

7.4.3 Test purpose

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

7.4.4 Method of test

7.4.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

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

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator used to produce the interfering signal in the adjacent channel to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5.

(4) Set the signal generator to produce an interfering signal that is equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0{,}22$. The mean power level of the interfering signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5.

7.4.4.2 Procedure

(1) Set the center frequency of the interfering signal to 5 MHz above the assigned channel frequency of the wanted signal.

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

(3) Set the center frequency of the interfering signal to 5 MHz below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.4.5 Test Requirements

The BER measured according to subclause 7.4.4.2 shall not exceed 0,001.

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.

7.5 Blocking characteristics

7.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in tables 7.6, 7.7, 7.8, 7.9 or 7.10 respectively, using a 1 MHz step size.

The requirements in table 7.6, 7.7 or 7.8 apply to base stations intended for general-purpose applications, depending on which frequency band is used. The additional requirements in Tables 7.9 and 7.10 may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS

7.5.2 Minimum Requirements

7.5.2.1 General requirements

The static reference performance as specified in clause 7.2 shall be met with a wanted and an interfering signal coupled to the BS antenna input using the parameters specified in tables 7.6, 7.7 or 7.8 respectively.

Table 7.6: Blocking requirements for operating bands defined in subclause 4.2 a)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1900 – 1920 MHz, 2010 – 2025 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1880 – 1900 MHz, 1990 – 2010 MHz, 2025 – 2045 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1920 – 1980 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 - 1880 MHz, 1980 – 1990 MHz, 2045 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.7: Blocking requirements for operating bands defined in subclause 4.2 b)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1850 – 1990 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1830 – 1850 MHz, 1990 – 2010 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 – 1830 MHz, 2010 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.8: Blocking requirements for operating bands defined in subclause 4.2 c)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1910 – 1930 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1890 – 1910 MHz, 1930 – 1950 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 – 1890 MHz, 1950 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

7.5.2.2 Co-location with GSM900 and/or DCS 1800

This additional blocking requirement may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in the tables below, using a 1MHz step size.

In case this additional blocking requirement is applied, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Table 7.9: Additional blocking requirements for operating bands defined in subclause 4.2 a) when co-located with GSM900

Center Frequency of Interfering Signal	Interfering Signal ~~Level~~ mean power	Wanted Signal ~~Level~~ mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
921 – 960 MHz	+16 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.10: Additional blocking requirements for operating bands defined in subclause 4.2 a) when co-located with DCS1800

Center Frequency of Interfering Signal	Interfering Signal ~~Level~~ mean power	Wanted Signal ~~Level~~ mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
1805 ~~-~~– 1880 MHz	+16 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.

7.5.3 Test purpose

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

7.5.4 Method of test

7.5.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: M; see subclause 5.3.
The BS shall be configured to operate as close to the centre of the operating band as possible.

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

(2) Terminate or disable any other 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.The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level specified in subclause 7.2.2.

7.5.4.2 Procedure

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

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

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in tables 7.6, 7.7, or 7.8 respectively. The type of the interfering signal is either equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see tables 7.6, 7.7 or 7.8 respectively.

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

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

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

7.5.5 Test Requirements

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

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.

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

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

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

7.6.2 Minimum Requirements

The static reference performance as specified in clause 7.2 should be met when the following signals are coupled to the BS antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above the static reference level.
- Two interfering signals with the parameters specified in table 7.11.

Table 7.11: Parameters of the interfering signals for intermodulation characteristics testing

Interfering Signal ~~Level~~ mean power	Offset	Type of Interfering Signal
- 48 dBm	10 MHz	CW signal
- 48 dBm	20 MHz	WCDMA signal with one code

The normative reference for this requirement is TS 25.105 [1] subclause 7.6.

7.6.3 Test purpose

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

7.6.4 Method of test

7.6.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

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

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and two signal generators to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level specified in subclause 7.2.2.

(4) Set the first signal generator to produce a CW signal with a level measured at the BS antenna connector of - 48 dBm.

(5) Set the second signal generator to produce an interfering signal equivalent to a wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0{,}22$. The level of the signal measured at the BS antenna connector shall be set to - 48 dBm.

7.6.4.2 Procedure

(1) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, above the assigned channel frequency of the wanted signal.

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

(3) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.6.5 Test Requirements

The BER measured according subclause 7.6.4.2 to shall not exceed 0,001.

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.

--- next changed section ---

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 ∈ $-f_d, f_d$

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~~ Ralative Mean Power [dB]**	**Relative Delay [ns]**	**~~Average~~ Relative Mean Power [dB]**	**Relative Delay [ns]**	**~~Average~~ Relative Mean 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 #23 **R4-020709**

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CR-Form-v4

CHANGE REQUEST

⌘ **25.142 CR 120** ⌘ ev **-** ⌘ Current version: **4.4.0** ⌘

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: ⌘	Correction of power terms and definitions		
Source: ⌘	RAN WG4		
Work item code: ⌘	TEI	***Date:*** ⌘	17/5/2002
Category: ⌘	**A** *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.	***Release:*** ⌘	Rel-4 *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 requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.
Summary of change: ⌘	3.1 Definitions - Average Power deleted, Clarification of power spectral density added. Mean power (consistant with ITU radio regulation), RRC filtered mean power, Code domain power, and Output power added; Maximum output power and Rated output power are now related to mean power 3.3. Abbreviations – definition of I_{oc} and $\hat{I}_{or}$ corrected. 6.4.1 Inner loop power control - output power and mean output power replaced by code domain power 6.4.2 Power control steps - transmitter output power and mean power replaced by code domain power 6.4.3 Power control dynamic range - output power replaced by code domain power 6.4.5 Primary CCPCH power – defined as code domain power, total power replaced by output power 6.5.1 Transmit OFF power - average power replaced by RRC filtered mean power 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR) – changed to RRC filtered mean power terminology 6.7 Transmit intermodulation - subject and interferer signals defined as mean

		power 7.2. Reference sensitivity level - defined as mean power, FER removed 7.3. Receiver dynamic range - Wanted signal defined as mean power, wanted signal level given as –79 dBm (according formula: REFSENS + 30 dB : -109dBm+30 dB) 7.4 Adjacent Channel Selectivity (ACS) - Wanted and interfering signals defined as mean power, interferer defined as single code to match existing test. Missing “offset” added to Fuw definition. wanted signal level given as –103 dBm (according formula: REFSENS + 6 dB : -109dBm+6 dB) 7.5 Blocking characteristics - Wanted and interfering signals defined as mean power, wanted signal level given as –103 dBm (according formula: REFSENS + 6 dB : -109dBm+6 dB) 7.6 Intermodulation characteristics - Wanted and interfering signals defined as mean power Annex B.2: Average power replaced by relative mean power
Consequences if not approved:	⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. ACLR, P-CCPCH power, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of requirements. Correct interpretation of the existing specification will not affect implementations or system performance. However, incorrect interpretation may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3.1, 3.3, 6.4.1, 6.4.2.1, 6.4.2.2, 6.4.2.3, 6.4.2.4.2.1, 6.4.2.5.1, 6.4.3.1, 6.4.3.3, 6.4.3.4.2.1, 6.4.5.1, 6.4.5.2, 6.4.5.3, 6.4.5.4.2.1, 6.4.5.5, 6.4.6.4.2.1, 6.5.1.1, 6.5.1.2.1, 6.5.2.4.2.1, 6.6.2.2.1, 6.6.2.2.4.2.1, 6.7.1, 7.2.1, 7.2.2.1, 7.2.5.1, 7.3.2.1, 7.3.5.1, 7.4.1, 7.4.2.1, 7.4.4.1.1, 7.5.2.1.1, 7.5.2.1.2, 7.6.2.1, Annex B2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Equivalent CRs in other Releases: CR119 cat. F to 25.142 v3.9.0, CR121 cat. A to 25.142 v5.0.0

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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

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

~~**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.~~

Mean power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

NOTE: The roll-off factor α is defined in section 6.8.1.

RRC filtered mean power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

NOTE: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

Code domain power: That part of the mean power which correlates with a particular (OVSF) code channel. The sum of all powers in the code domain equals the mean power in a bandwidth of (1+ α) times the chip rate of the radio access mode.

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

Maximum output power~~, Pmax~~: The mean power level per carrier ~~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~~ in a specified reference condition. The period of measurement shall be a transmit timeslot excluding the guard period.

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

--- next changed section ---

3.3 Abbreviations

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

3GPP	3rd Generation Partnership Project
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 (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference f~~o~~rom other cells) as measured at the BS antenna connector.
Îor	Received power spectral density (integrated in a bandwidth (1+a) times the chip rate and normalized to the chip rate) of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	Output power
Pout	Output power of the base station
Pmax	Maximum output power of the base station
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

--- next changed section ---

6.4 Output power dynamics

6.4.1 Inner loop power control

Inner loop power control is the ability of the BS transmitter to adjust its ~~output~~ code domain power in response to the UL received signal.

For inner loop correction on the Downlink Channel, the base station adjusts the ~~mean output~~ code domain power ~~level~~ of a power controlled CCTrCH in response to each valid power control bit received from the UE on the Uplink Traffic Channel based on the mapping of the TPC bits in uplink CCTrCH to downlink CCTrCH. Inner loop control is based on SIR measurements at the UE receiver, and the corresponding TPC commands are generated by the UE.

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~~ code domain 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~~ code domain power and the greatest average rate of change in ~~mean~~ code domain 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~~ code domain 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~~ code domain 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~~ code domain power according to these commands with the specified accuracy.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

6.4.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.2.4.1.1 3,84 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 6.4.

(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 ~~output~~ code domain power of the active DPCH is controlled to reach its maximum and its minimum, respectively.

(3) Measure the code domain power of the active DPCH over the 2464 active chips of each even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

(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 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~~ code domain 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~~ code domain 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 6.5~~1~~ 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~~ code domain 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 ~~output~~ code domain power of one power controlled 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 code domain 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

6.4.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.3.4.1.1 3,84 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 6.6.

(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 ~~output~~ code domain 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 code domain power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

(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 ~~output~~ code domain 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 code domain power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

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

--- next changed section ---

6.4.5 Primary CCPCH power

6.4.5.1 Definition and applicability

Primary CCPCH power is the ~~transmission~~ code domain power of the Primary Common Control Physical Channel averaged over the transmit timeslot. Primary CCPCH power is signalled 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 code domain power averaged over the timeslot shall not exceed the values in table 6.8. The error is a function of the ~~total~~ output 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~~ Output power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 2,5 dB
PRAT - 6 < Pout ≤ PRAT - 3	+/- 3,5 dB
PRAT - 13 < Pout ≤ 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 code domain power of the Primary CCPCH received by the UE, together with the information on the Primary CCPCH nominal output power signaled on the BCH, are used by the UE for path loss estimation and adjustment of its own transmit power. Therefore, deviations of the Primary CCPCH code domain power from its nominal value are transposed by the UE into deviations from the wanted output power of the UE.

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

6.4.5.4 Method of test

6.4.5.4.1 Initial conditions

6.4.5.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.5.4.1.1 3,84 Mcps TDD option

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

(2) Set the parameters of the BS transmitted signal according to table 6.9.

Table 6.9: Parameters of the BS transmitted signal for Primary CCPCH power testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slots carrying PCCPCH	TS 0 and TS 8
Number of additional DPCH in TS 0 and TS 8	3
BS output power setting	PRAT
Relative power of PCCPCH	¼ of BS output power
Relative power of each DPCH in TS 0 and TS 8	¼ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.5.4.1.2 1,28 Mcps TDD option

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

(2) Set the parameters of the BS transmitted signal according to table 6.9A.

Table 6.9A: Parameters of the BS transmitted signal for Primary CCPCH power testing 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.
Time slots carrying PCCPCH	TS 0
BS output power setting	PRAT
Relative power of PCCPCH	½ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.5.4.2 Procedure

6.4.5.4.2.1 3,84 Mcps TDD option

(1) Measure the PCCPCH code domain power in TS 0 and TS 8 by applying the global in-channel Tx test method described in Annex C.

(2) Reduce the base station output power by 2 dB, 5 dB and 13 dB, without changing the relative powers of the PCCPCH and the DPCHs, and repeat step (1) for each output power setting.

6.4.5.4.2.2 1,28 Mcps TDD option

(1) Measure the PCCPCH power in TS 0 by applying the global in-channel Tx test method described in Annex C.

(2) Reduce the base station output power by 2 dB, 5 dB and 13 dB, without changing the relative powers of the PCCPCH and the DPCHs, and repeat step (1) for each output power setting.

6.4.5.5 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 Primary CCPCH power, measured according to subclause 6.4.5.4.2, shall be within the limits defined in table 6.10

Table 6.10: Test Requirements for errors between Primary CCPCH power and the broadcast value

~~Total~~ Output power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 3,3 dB
PRAT - 6 < Pout ≤ PRAT - 3	+/- 4,3 dB
PRAT - 13 < Pout ≤ PRAT - 6	+/- 5,8 dB

6.4.6 Differential accuracy of Primary CCPCH power

6.4.6.1 Definition and applicability

The differential accuracy of the Primary CCPCH power is the relative transmitted power accuracy of PCCPCH in consecutive frames when the nominal PCCPCH power is not changed.

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

6.4.6.2 Minimum Requirements

The differential accuracy of PCCPCH power shall be within ± 0,5 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.6.

6.4.6.3 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 power. Therefore, a lack of accuracy of the Primary CCPCH power over time will result in unwanted fluctuations of the transmit power of the UE which may degrade system performance.

The test purpose is to verify that the differential accuracy of the Primary CCPCH power remains within its specified tolerances.

6.4.6.4 Method of test

6.4.6.4.1 Initial conditions

6.4.6.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.6.4.1.1 3,84 Mcps TDD option

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

2) Set the parameters of the BS transmitted signal according to table 6.10A.

Table 6.10A: Parameters of the BS transmitted signal for testing of differential accuracy of the Primary CCPCH power

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slots carrying PCCPCH	TS 0 and TS 8
Number of additional DPCH in TS 0 and TS 8	3
BS output power setting	PRAT
Relative power of PCCPCH	¼ of BS output power
Relative power of each DPCH in TS 0 and TS 8	¼ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.6.4.1.2 1,28 Mcps TDD option

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

2) Set the parameters of the BS transmitted signal according to table 6.9A.

Table 6.10B: Parameters of the BS transmitted signal for testing of differential accuracy of the Primary CCPCH power 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.
Time slots carrying PCCPCH	TS 0
BS output power setting	PRAT
Relative power of PCCPCH	½ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.6.4.2 Procedure

6.4.6.4.2.1 3,84 Mcps TDD option

1) Measure the PCCPCH code domain power in TS 0 and TS 8 of consecutive frames by applying the global in-channel Tx test method described in Annex C.

2) Calculate the differential accuracy of the Primary CCPCH power by taking the the difference between the PCCPCH power measurement results of consecutive frames.

6.4.6.4.2.2 1,28 Mcps TDD option

1) Measure the PCCPCH power in TS 0 of consecutive frames by applying the global in-channel Tx test method described in Annex C.

2) Calculate the differential accuracy of the Primary CCPCH power by taking the the difference between the PCCPCH power measurement results of consecutive frames.

6.4.6.5 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 differential accuracy of the Primary CCPCH power, measured according to subclause 6.4.6.4.2, shall be within ± 0,6 dB.

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

6.5.1.1 Definition and applicability

The transmit OFF power is defined as the ~~average~~ RRC filtered mean 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.

6.5.1.2 Minimum Requirements

6.5.1.2.1 3,84 Mcps TDD option

The transmit OFF power shall be less than –79 dBm ~~measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate~~.

6.5.1.2.2 1,28 Mcps TDD option

The transmit OFF power shall be less than –82 dBm measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate.

The normative reference for this requirement is TS 25.105 [1] subclause 6.5.1.

6.5.1.3 Test purpose

This test verifies the ability of the BS to reduce its transmit OFF power to a value below the specified limit. This ability is needed to minimize the interference for other users receiving on the same frequency.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.4.1 for initial conditions.

6.5.1.4.2 Procedure

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.4.2 for procedure.

6.5.1.5 Test Requirements

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.5 for test requirements.

6.5.2 Transmit ON/OFF time mask

6.5.2.1 Definition and applicability

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

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

6.5.2.2 Minimum Requirements

6.5.2.2.1 3,84 Mcps TDD option

The transmit power level versus time should meet the mask specified in figure 6.1.

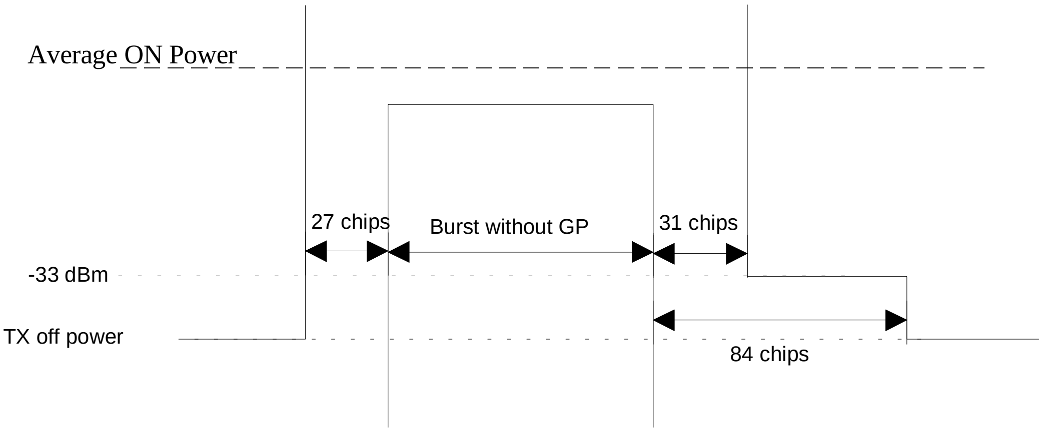

Figure 6.1: Transmit ON/OFF template

6.5.2.2.2 1,28 Mcps TDD option

The transmit power level versus time should meet the mask specified in figure 6.1A.

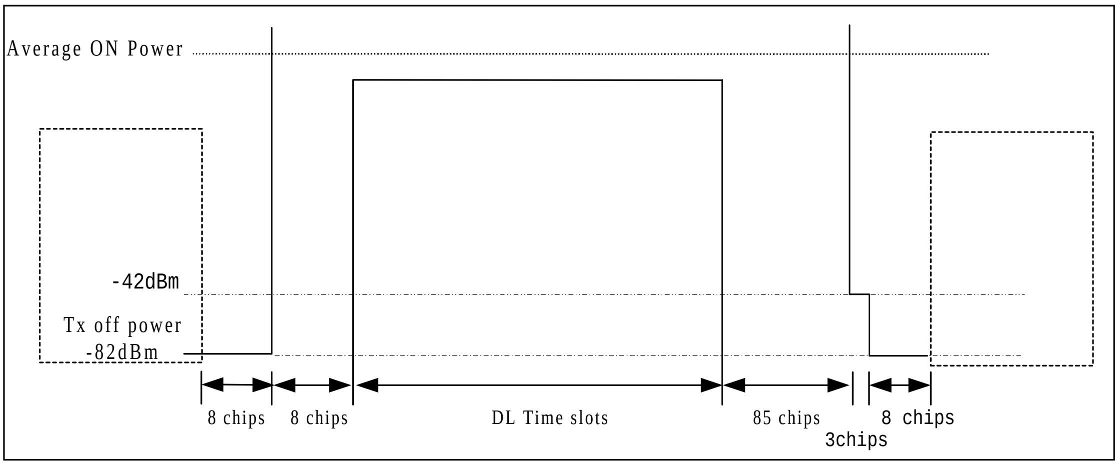

Figure 6.1A: Transmit ON/OFF template for 1,28 Mcps TDD option

The normative reference for this requirement is TS 25.105 [1] subclause 6.5.2.

6.5.2.3 Test purpose

This test verifies the ability of the BS to reduce its transmit power outside of the active part of the Tx time slot (burst without guard period) to values below specified limits. This ability is needed to minimize the interference for other users receiving on the same frequency.

6.5.2.4 Method of test

6.5.2.4.1 Initial conditions

6.5.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.5.2.4.1.1 3,84 Mcps TDD option

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

(2) Set the parameters of the transmitted signal according to table 6.11.

Table 6.11: Parameters of the transmitted signal for transmit ON/OFF time mask 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)

6.5.2.4.1.2 1,28 Mcps TDD option

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

(2) Set the parameters of the transmitted signal according to table 6.11A.

Table 6.11A: Parameters of the transmitted signal for transmit ON/OFF time mask 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 UpPCH,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)

6.5.2.4.2 Procedure

6.5.2.4.2.1 3,84 Mcps TDD option

(1) Measure the RRC filtered mean power of the BS output signal chipwise (i.e. averaged over time intervals of one chip duration) over the period starting 65 chips before the start of the odd time slots TS i (receive time slots of the BS), and ending 27 chips before the next even time slot (transmit time slot of the BS) starts.~~, 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. If the power measuring equipment is based on signal sampling, the sampling theorem shall be met. In this case, the power is determined by calculating the RMS value of the signal samples taken at the measurement filter output over one chip duration.~~

6.5.2.4.2.2 1,28 Mcps TDD option

(1) Measure the power of the BS output signal chipwise (i.e. averaged over time intervals of one chip duration) over the transmit off power period starting 11 chips before the start of the receive time slot TS i = UpPCH, and ending 8 chips before the next transmit time slot TS i=4 starts, 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. If the power measuring equipment is based on signal sampling, the sampling theorem shall be met. In this case, the power is determined by calculating the RMS value of the signal samples taken at the measurement filter output over one chip duration.

6.5.2.5 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.

6.5.2.5.1 3,84 Mcps TDD option

Each value of the power measured according to subclause 6.5.4.2 shall be below – 32,3 dBm in the period from 32 chips to 84 chips after the burst and – 77 dBm in the period where the Tx OFF power specification is applicable

6.5.2.5.2 1,28 Mcps TDD option

Each value of the power measured according to subclause 6.5.4.2 shall be below the limits defined in figure 6.1A of subclause 6.5.2.2.

--- next changed section ---

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 ~~average~~ RRC filtered mean power centered on the assigned channel frequency to the ~~average~~ RRC filtered mean power centered on an adjacent channel frequency. ~~In both cases, the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	55 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.1.

6.6.2.2.2.1.2 1,28 Mcps TDD option

The ACLR of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies 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 below the first or above the last carrier frequency used	ACLR limit
1.6 MHz	40 dB
3.2 MHz	45 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.2

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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies 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 below the first or above the last carrier frequency used	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.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the TDD BS or FDD BS in proximity.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.1.

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.

6.6.2.2.2.2.2 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).

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.2.

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

6.6.2.2.2.3.1 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 average power level of the BS measured in the adjacent channel. The maximum power level of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall not exceed the limit in table 6.24.

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

BS adjacent channel offset below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-80 dBm	3.84 MHz
10 MHz	-80 dBm	3.84 MHz

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited TDD BS or FDD BS.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.1.

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.

6.6.2.2.2.3.2 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 the average 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).

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.2.

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

6.6.2.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T with multiple carriers if supported; see subclause 5.3.

6.6.2.2.4.1.1 3,84 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 6.25.

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 the ~~average~~ RRC filtered mean power centered on the lowest 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~~.

2) Average over TBD time slots.

3) Measure the ~~average~~ RRC filtered mean power at the first lower adjacent RF channel (center frequency 5 MHz below the lowest 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 = average 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 lowest assigned channel frequency of the transmitted signal).

7) In case of a multi-carrier Bs, repeat steps (1) and (2) for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the ~~average~~ RRC filtered mean power at the first higher adjacent RF channel (center frequency 5 MHz above the highest 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~~.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 10 MHz above the highest assigned channel frequency of the transmitted signal).

6.6.2.2.4.2.2 1,28 Mcps TDD option

1) Measure the average power centered on the lowest assigned channel frequency 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.

2) Average over TBD time slots.

3) Measure the average 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 = 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 3,2 MHz below the lowest 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).

7) In case of a multi-carrier BS, repeat steps (1) and 2 for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the average power at the first higher adjacent RF channel (center frequency 1,6 MHz above the highest 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.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 3,2 MHz above the highest assigned channel frequency of the transmitted signal).

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 steps (5) and (10) 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 (4) and (9) 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 below the first or above the last carrier frequency used	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 below the first or above the last carrier frequency used	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 below the first or above the last carrier frequency used	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 steps (5) and (10) 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 below the first or above the last carrier frequency used	ACLR limit
1.6 MHz	39.2 dB
3.2 MHz	44.2 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

--- next changed section ---

6.7 Transmit intermodulation

6.7.1 Definition and applicability

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

The transmit intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into the antenna connector at a mean power level of 30 dB lower than that of the mean power of the subject signal.

The requirements are applicable for a single carrier.

6.7.1.1 3,84 Mcps TDD option

The carrier frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the subject signal carrier frequency, but excluding interference carrier frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

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

6.7.1.2 1,28 Mcps TDD option

The carrier frequency of the interference signal shall be ±1,6 MHz, ±3,2 MHz and ±4,8 MHz offset from the subject signal carrier frequency, but excluding interference carrier frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

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

6.7.2 Minimum Requirements

The transmit intermodulation level shall not exceed the out of band or the spurious emission requirements of subclause 6.6.2 and 6.6.3, respectively.

The normative reference for this requirement is TS 25.105 [1] subclause 6.7.1.

6.7.3 Test purpose

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

6.7.4 Method of test

6.7.4.1 Initial conditions

6.7.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.7.4.1.1 3,84 Mcps TDD option

(1) Connect the measuring equipment, the BS under test and the WCDMA signal generator as shown in figure 6.2.

(2) Set the parameters of the BS transmitted signal according to table 6.38.

(3) Configure the WCDMA signal generator to produce an interference signal with a mean power level according to subclause 6.7.5. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The carrier frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the carrier frequency of the wanted signal, but excluding interference frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

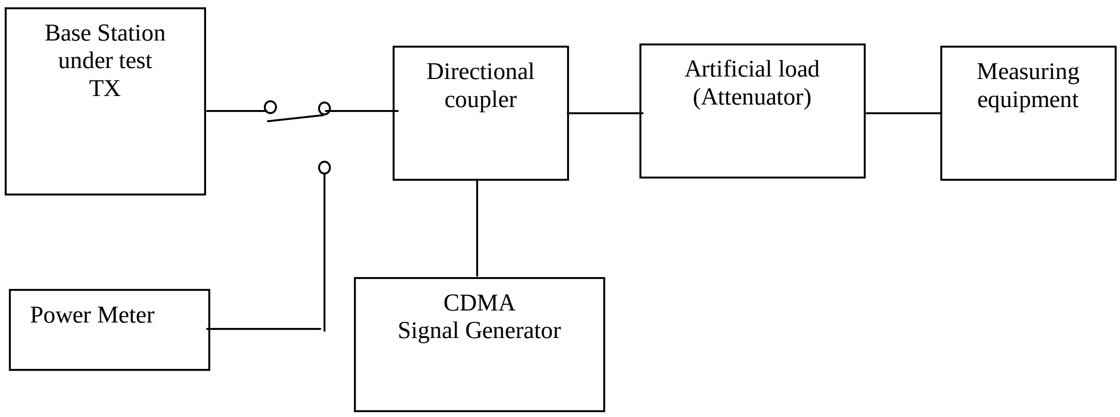

Figure 6.2: Measuring setup for Base Station transmit intermodulation testing

Table 6.38: Parameters of the BS transmitted signal for transmit intermodulation testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is odd; receive, if i is even.
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)

6.7.4.1.2 1,28 Mcps TDD option

(1) Connect the measuring equipment, the BS under test and the WCDMA signal generator as shown in figure 6.2A.

(2) Set the parameters of the BS transmitted signal according to table 6.38A.

(3) Configure the WCDMA signal generator to produce an interference signal with a mean power level according to subclause 6.7.5. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The carrier frequency of the interference signal shall be ±1,6 MHz, ±3,2 MHz and ±4,8 MHz offset from the carrier frequency of the wanted signal, but excluding interference frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

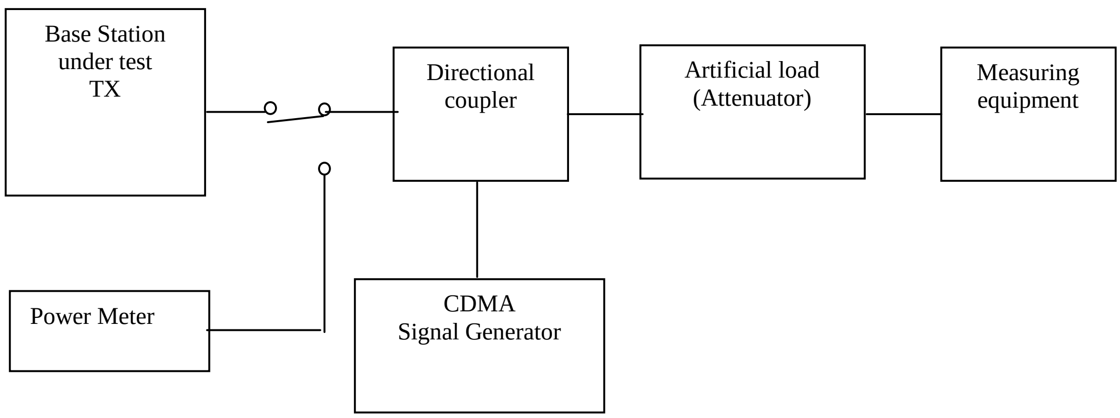

Figure 6.2A: Measuring setup for Base Station transmit intermodulation testing

Table 6.38A: Parameters of the BS transmitted signal for transmit intermodulation 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)

6.7.4.2 Procedure

Apply the test procedures for out of band and spurious emissions as described in 6.6.2 and 6.6.3, respectively, at the frequencies of all third and fifth order intermodulation products. The frequency band occupied by the interference signal are excluded from the measurements.

NOTE: The third order intermodulation products are at frequencies (F1 ± 2F2) and (2F1 ± F2), the fifth order intermodulation products are at frequencies (2F1 ± 3F2), (3F1 ± 2F2), (4F1 ± F2) and (F1 ± 4F2), where F1 represents the frequencies within the bandwidth of the wanted signal and F2 represents the frequencies within the bandwidth of the WCDMA modulated interference signal.

6.7.5 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 mean power level of the WCDMA modulated interference signal shall be 30 dB below the mean power level of the wanted signal.

At the frequencies of all third and fifth order intermodulation products, the Test Requirements for out of band and spurious emissions as specified in subclauses 6.6.2.1.5 (Spectrum emission mask), 6.6.2.2.5 (ACLR) and 6.6.3.5 (Spurious emissions) shall be met.

--- next changed section ---

7.2 Reference sensitivity level

7.2.1 Definition and applicability

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the antenna connector at which the BER ~~does~~ shall not exceed the specific value.

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

7.2.2 Minimum Requirements

7.2.2.1 3,84 Mcps TDD option

~~For~~ Using the reference measurement channel specified in Annex A.2.1, the reference sensitivity level and performance of the BS shall be as specified in table 7.1 ~~below~~.

Table 7.1: BS reference sensitivity level

Reference measurement channel ~~D~~data rate	BS reference sensitivity level ~~(dBm)~~	BER
12,2 kbps	-109 dBm	BER shall not exceed 0,001

The normative reference for this requirement is TS 25.105 [1] subclause 7.2.1.1.

7.2.2.2 1,28 Mcps option

For the measurement channel specified in Annex A.2.1.2, the reference sensitivity level and performance of the BS shall be as specified in table 7.1A below.

Table 7.1A: BS reference sensitivity levels (1,28 Mcps option)

Data rate	BS reference sensitivity level (dBm)	BER
12,2 kbps	-110 dBm	BER shall not exceed 0,001

The normative reference for this requirement is TS 25.105 [1] subclause 7.2.1.2.

7.2.3 Test purpose

The test purpose is to verify the ability of the BS to receive a prescribed single-code test signal of minimum input power under defined conditions (no interference, no multipath propagation) with a BER not exceeding a specified limit. This test is also used as a reference case for other tests to allow the assessment of degradations due to various sources of interference.

7.2.4 Method of test

7.2.4.1 Initial conditions

7.2.4.1.0 General test requirements

Test environment: normal; see subclause 5.9.1.

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

The following additional test shall be performed:

On each of B, M and T, 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.

7.2.4.1.1 3,84 Mcps TDD option

(1) Connect the BS tester (UE simulator) 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 to the Test Requirement for the BS reference sensitivity level specified in table 7.2.

7.2.4.1.2 1,28 Mcps TDD option

(1) Connect the BS tester (UE simulator) 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 BS tester output signal measured at the BS antenna connector shall be adjusted to –110 dBm.

7.2.4.2 Procedure

(1) Measure the BER by comparing the bit sequence of the information data transmitted by the BS tester with the bit sequence obtained from the BS receiver.

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

7.2.5 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.

7.2.5.1 3,84 Mcps TDD option

For any BS Rx port tested, the measured BER at the Test Requirement of the BS reference sensitivity level specified in table 7.2 shall not exceed 0,001.

Table 7.2: Test Requirement for BS reference sensitivity level

Reference measurement channel ~~D~~data rate	BS reference sensitivity level ~~(dBm)~~	BER
12,2 kbps	-108,3 dBm	BER shall not exceed 0,001

7.2.5.2 1,28 Mcps TDD option

For any BS Rx port tested, the measured BER at the Test Requirement of the BS reference sensitivity level specified in table 7.2A shall not exceed 0,001.

Table 7.2A: Test Requirement for BS reference sensitivity level for 1,28 Mcps option

Data rate	BS reference sensitivity level (dBm)	BER
12,2 kbps	-109,3 dBm	BER shall not exceed 0,001

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
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~<REFSENS> + 30 dB~~ –79	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 7.3.1.1.

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 7.3.1.2.

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

7.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

7.3.4.1.1 3,84 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 7.4.

(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

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.

7.3.4.2 Procedure

(1) Measure the BER by comparing the bit sequence of the information data transmitted by the BS tester with the bit sequence obtained from the BS receiver.

(2) Interchange the connections of the BS Rx ports and repeat the measurement according to (1)

7.3.5 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.

7.3.5.1 3,84 Mcps TDD option

For any BS Rx port tested, the measured BER shall not exceed 0,001 for the parameters specified in table 7.4.

Table 7.4: Test Requirements for Dynamic Range

Parameter	Level	Unit
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~<REFSENS> + 31,2 dB~~ –77,8	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

7.3.5.2 1,28 Mcps TDD option

For any BS Rx port tested, the measured BER shall not exceed 0,001 for the parameters specified in table 7.4A.

Table 7.4A: Test Requirements for Dynamic Range for 1,28 Mcps TDD option

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	<REFSENS> + 31,2 dB	dBm
Interfering AWGN signal	-76	dBm/1,28 MHz

7.4 Adjacent Channel Selectivity (ACS)

7.4.1 Definition and applicability

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of ~~an~~ single code CDMA modulated adjacent channel signal at a given frequency offset from the center frequency of the assigned channel.

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

7.4.2 Minimum Requirements

7.4.2.1 3,84 Mcps TDD option

The BER, measured on the wanted signal in the presence of an interfering signal, shall not exceed 0,001 for the parameters specified in table 7.5.

Table 7.5: Parameters of the wanted signal and the interfering signal for ACS testing

Parameter	Level	Unit
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~Reference sensitivity level + 6 dB~~ –103	dBm
Interfering signal mean power	-52	dBm
Fuw (modulated)	5	MHz
NOTE: Fuw is the frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal.		

The normative reference for this requirement is TS 25.105 [1] subclause 7.4.1.1.

7.4.2.2 1,28 Mcps TDD option

The BER, measured on the wanted signal in the presence of an interfering signal, shall not exceed 0,001 for the parameters specified in table 7.5A.

Table 7.5A: Parameters of the wanted signal and the interfering signal for ACS testing for 1,28 Mcps TDD

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	Reference sensitivity level + 6 dB	dBm
Interfering signal	-55	dBm
Fuw (modulated)	1,6	MHz
NOTE: Fuw is the frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal.		

The normative reference for this requirement is TS 25.105 [1] subclause 7.4.1.2.

7.4.3 Test purpose

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

7.4.4 Method of test

7.4.4.1 Initial conditions

7.4.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

7.4.4.1.1 3,84 Mcps TDD option

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator used to produce the interfering signal in the adjacent channel to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5.

(4) Set the signal generator to produce an interfering signal that is equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$. The mean power level of the interfering signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5.

7.4.4.1.2 1,28 Mcps TDD option

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator used to produce the interfering signal in the adjacent channel to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5A.

(4) Set the signal generator to produce an interfering signal that is equivalent to a continuous wideband CDMA signal with one code of chip frequency 1,28 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$. The level of the interfering signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5A.

7.4.4.2 Procedure

7.4.4.2.1 3,84 Mcps TDD option

(1) Set the center frequency of the interfering signal to 5 MHz above the assigned channel frequency of the wanted signal.

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

(3) Set the center frequency of the interfering signal to 5 MHz below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.4.4.2.2 1,28 Mcps TDD option

(1) Set the center frequency of the interfering signal to 1,6 MHz above the assigned channel frequency of the wanted signal.

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

(3) Set the center frequency of the interfering signal to 1,6 MHz below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.4.5 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.

The BER measured according to subclause 7.4.4.2 shall not exceed 0,001.

7.5 Blocking characteristics

7.5.1 Definition and applicability

7.5.1.1 3,84 Mcps TDD option

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirements applies to interfering signals with center frequency within the ranges specified in tables 7.6, 7.7, 7.8, 7.9 and 7.10 respectively, using a 1 MHz step size.

The requirements in tables 7.6, 7.7 or 7.8 apply to base stations intended for general-purpose applications, depending on which frequency band is used. The additional requirements in Tables 7.9 and 7.10 may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

7.5.1.2 1,28 Mcps TDD option

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in tables 7.6A, 7.7A, 7.8A, 7.9A and 7.10A respectively, using a 1 MHz step size.

The requirements in Table 7.6A, 7.7A or 7.8A apply to base stations intended for general-purpose applications, depending on which frequency band is used. The additional requirements in Tables 7.9A and 7.10A may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

7.5.2 Minimum Requirements

7.5.2.1 3,84 Mcps TDD option

7.5.2.1.1 General requirements

The static reference performance as specified in clause 7.2 shall be met with a wanted and an interfering signal coupled to the BS antenna input using the parameters specified in tables 7.6, 7.7 and or 7.8 respectively.

Table 7.6: Blocking requirements for operating bands defined in subclause 4.2 a)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1900 – 1920 MHz, 2010 – 2025 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1880 – 1900 MHz, 1990 – 2010 MHz, 2025 – 2045 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1920 – 1980 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 - 1880 MHz, 1980 – 1990 MHz, 2045 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.7: Blocking requirements for operating bands defined in subclause 4.2 b)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1850 – 1990 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1830 – 1850 MHz, 1990 – 2010 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 – 1830 MHz, 2010 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.8: Blocking requirements for operating bands defined in subclause 4.2 c)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1910 – 1930 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1890 – 1910 MHz, 1930 – 1950 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 – 1890 MHz, 1950 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.0.1.

7.5.2.1.2 Co-location with GSM900 and/or DCS 1800

This additional blocking requirement may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in the tables below, using a 1MHz step size.

In case this additional blocking requirement is applied, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Table 7.9: Additional blocking requirements for operating bands defined in subclause 4.2 a) when co-located with GSM900

Center Frequency of Interfering Signal	Interfering Signal ~~Level~~ mean power	Wanted Signal ~~Level~~ mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
921 – 960 MHz	+16 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.10: Additional blocking requirements for operating bands defined in subclause 4.2 a) when co-located with DCS1800

Center Frequency of Interfering Signal	Interfering Signal ~~Level~~ mean power	Wanted Signal ~~Level~~ mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
1805 ~~-~~– 1880 MHz	+16 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.1.1.

7.5.2.2 1,28 Mcps TDD option

7.5.2.2.1 General requirements

The static reference performance as specified in clause 7.2 shall be met with a wanted and an interfering signal coupled to the BS antenna input using the parameters specified in tables 7.6A,7.7A or 7.8A, respectively.

Table 7.6A: Blocking requirements for operating bands defined in subclause 4.2 a) for 1,28 Mcps TDD

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1900 – 1920 MHz, 2010 – 2025 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1880 – 1900 MHz, 1990 – 2010 MHz, 2025 – 2045 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1920 – 1980 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1 - 1880 MHz, 1980 – 1990 MHz, 2045 – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.7A: Blocking requirements for operating bands defined in subclause 4.2 b)for 1,28 Mcps TDD

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1850 – 1990 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1830 – 1850 MHz, 1990 – 2010 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1 – 1830 MHz, 2010 – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.8A: Blocking requirements for operating bands defined in subclause 4.2 c)for 1,28 Mcps TDD

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1910 – 1930 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1890 – 1910 MHz, 1930 – 1950 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1 – 1890 MHz, 1950 – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.0.2.

7.5.2.2.2 Co-location with GSM900 and/or DCS 1800

This additional blocking requirement may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in the tables below, using a 1MHz step size.

In case this additional blocking requirement is applied, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Table 7.9A: Additional blocking requirements for operating bands defined in 4.2(a) when co-located with GSM900

Centre Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
921 – 960 MHz	+16 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.10A: Additional blocking requirements for operating bands defined in 4.2(a) when co-located with DCS1800

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1805 – 1880	+16 dBm	<REFSENS> + 6 dB	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.1.2.

7.5.3 Test purpose

7.5.3.1 3,84 Mcps TDD option

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

7.5.3.2 1,28 Mcps TDD option

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 3,2 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: M; see subclause 5.3. The BS shall be configured to operate as close to the centre of the operating band as possible.

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

(2) Terminate or disable any other 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.The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level specified in subclause 7.2.2.

7.5.4.2 Procedure

7.5.4.2.1 3,84 Mcps TDD option

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

$$\text{Fuw} = \pm (\text{n x 1 MHz}),$$

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in tables 7.6, 7.7, or 7.8 respectively. The type of the interfering signal is either equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see tables 7.6, 7.7 or 7.8 respectively.

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

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

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

7.5.4.2.2 1,28 Mcps TDD option

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

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

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in tables 7.6A, 7.7A, or 7.8A respectively. The type of the interfering signal is either equivalent to a continuous wideband CDMA signal with one code of chip frequency 1,28 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0,22$, or a CW signal; see tables 7.6A, 7.7A, or 7.8A respectively.

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

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

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

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

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

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

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

7.6.2 Minimum Requirements

7.6.2.1 3,84 Mcps TDD option

The static reference performance as specified in clause 7.2 should be met when the following signals are coupled to the BS antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above the static reference level.
- Two interfering signals with the parameters specified in table 7.11.

Table 7.11: Parameters of the interfering signals for intermodulation characteristics testing

Interfering Signal ~~Level~~ mean power	Offset	Type of Interfering Signal
- 48 dBm	10 MHz	CW signal
- 48 dBm	20 MHz	WCDMA signal with one code

The normative reference for this requirement is TS 25.105 [1] subclause 7.6.1.1.

7.6.2.2 1,28 Mcps TDD option

The static reference performance as specified in clause 7.2 should be met when the following signals are coupled to the BS antenna input.

- A wanted signal at the assigned channel frequency, 6 dB above the static reference level.
- Two interfering signals with the parameters specified in table 7.11A.

Table 7.11A: Parameters of the interfering signals for intermodulation characteristics testing for 1,28 Mcps TDD

Interfering Signal Level	Offset	Type of Interfering Signal
- 48 dBm	3,2 MHz	CW signal
- 48 dBm	6,4 MHz	1,28 Mcps TDD signal with one code

The normative reference for this requirement is TS 25.105 [1] subclause 7.6.1.2.

7.6.3 Test purpose

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

7.6.4 Method of test

7.6.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

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

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and two signal generators to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level specified in subclause 7.2.2.

(4) Set the first signal generator to produce a CW signal with a level measured at the BS antenna connector of - 48 dBm.

(5) Set the second signal generator to produce an interfering signal equivalent to a wideband CDMA signal with one code of chip frequency, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0{,}22$. The level of the signal measured at the BS antenna connector shall be set to - 48 dBm.

7.6.4.2 Procedure

7.6.4.2.1 3,84 Mcps TDD option

(1) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, above the assigned channel frequency of the wanted signal.

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

(3) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.6.4.2.2 1,28 Mcps TDD option

(1) The frequency of the first and the second signal generator shall be set to 3,2 MHz and 6,4 MHz, respectively, above the assigned channel frequency of the wanted signal.

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

(3) The frequency of the first and the second signal generator shall be set to 3,2 MHz and 6,4 MHz, respectively, below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.6.5 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 BER measured according subclause 7.6.4.2 to shall not exceed 0,001.

--- next changed section ---

B.2 Multi-path fading propagation conditions

B.2.1 3,84 Mcps TDD option

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 for 3,84 Mcps TDD option

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h	
Relative Delay [ns]	~~Average~~ Relative Mean Power [dB]	Relative Delay [ns]	~~Average~~ Relative Mean Power [dB]	Relative Delay [ns]	~~Average~~ Relative Mean 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 $f \in -f_d, f_d$.

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

3GPP TSG RAN WG4 Meeting #23 **R4-020710**

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CR-Form-v4

CHANGE REQUEST

⌘ **25.142 CR 121** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

*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: ⌘	Correction of power terms and definitions		
Source: ⌘	RAN WG4		
Work item code: ⌘	TEI	***Date:*** ⌘	17/5/2002
Category: ⌘	**A** *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.	***Release:*** ⌘	Rel-5 *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 requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.
Summary of change: ⌘	3.1 Definitions - Average Power deleted, Clarification of power spectral density added. Mean power (consistant with ITU radio regulation), RRC filtered mean power, Code domain power, and Output power added; Maximum output power and Rated output power are now related to mean power 3.3. Abbreviations – definition of I_{oc} and $\hat{I}_{or}$ corrected. 6.4.1 Inner loop power control - output power and mean output power replaced by code domain power 6.4.2 Power control steps - transmitter output power and mean power replaced by code domain power 6.4.3 Power control dynamic range - output power replaced by code domain power 6.4.5 Primary CCPCH power – defined as code domain power, total power replaced by output power 6.5.1 Transmit OFF power - average power replaced by RRC filtered mean power 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR) – changed to RRC filtered mean power terminology 6.7 Transmit intermodulation - subject and interferer signals defined as mean

	power 7.2. Reference sensitivity level - defined as mean power, FER removed 7.3. Receiver dynamic range - Wanted signal defined as mean power, wanted signal level given as –79 dBm (according formula: REFSENS + 30 dB : -109dBm+30 dB) 7.4 Adjacent Channel Selectivity (ACS) - Wanted and interfering signals defined as mean power, interferer defined as single code to match existing test. Missing “offset” added to Fuw definition. wanted signal level given as –103 dBm (according formula: REFSENS + 6 dB : -109dBm+6 dB) 7.5 Blocking characteristics - Wanted and interfering signals defined as mean power, wanted signal level given as –103 dBm (according formula: REFSENS + 6 dB : -109dBm+6 dB) 7.6 Intermodulation characteristics - Wanted and interfering signals defined as mean power Annex B.2: Average power replaced by relative mean power
Consequences if not approved: ⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. ACLR, P-CCPCH power, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of requirements. Correct interpretation of the existing specification will not affect implementations or system performance. However, incorrect interpretation may impact conformance test implementation and conformance test results.

Clauses affected: ⌘	3.1, 3.3, 6.4.1, 6.4.2.1, 6.4.2.2, 6.4.2.3, 6.4.2.4.2.1, 6.4.2.5.1, 6.4.3.1, 6.4.3.3, 6.4.3.4.2.1, 6.4.5.1, 6.4.5.2, 6.4.5.3, 6.4.5.4.2.1, 6.4.5.5, 6.4.6.4.2.1, 6.5.1.1, 6.5.1.2.1, 6.5.2.4.2.1, 6.6.2.2.1, 6.6.2.2.4.2.1, 6.7.1, 7.2.1, 7.2.2.1, 7.2.5.1, 7.3.2.1, 7.3.5.1, 7.4.1, 7.4.2.1, 7.4.4.1.1, 7.5.2.1.1, 7.5.2.1.2, 7.6.2.1, Annex B2.1	
Other specs affected: ⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications	
Other comments: ⌘	Equivalent CRs in other Releases: CR119 cat. F to 25.142 v3.9.0, CR120 cat. A to 25.142 v4.4.0	

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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

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

~~**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.~~

Mean power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

NOTE: The roll-off factor α is defined in section 6.8.1.

RRC filtered mean power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

NOTE: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

Code domain power: That part of the mean power which correlates with a particular (OVSF) code channel. The sum of all powers in the code domain equals the mean power in a bandwidth of (1+ α) times the chip rate of the radio access mode.

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

Maximum output power~~, Pmax~~: The mean power level per carrier ~~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~~ in a specified reference condition. The period of measurement shall be a transmit timeslot excluding the guard period.

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

--- next changed section ---

3.3 Abbreviations

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

3GPP	3rd Generation Partnership Project
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 (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference ~~for~~om other cells) as measured at the BS antenna connector.
Îor	Received power spectral density (integrated in a bandwidth (1+a) times the chip rate and normalized to the chip rate) of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
P	Output power
Pout	Output power of the base station
Pmax	Maximum output power of the base station
RBER	Residual BER
REFSENS	Reference Sensitivity Level
RMS	Root-Mean Square
PRAT	Rated output power of the base station
RRC	Root-Raised Cosine
T_C	Chip duration
TS	Time Slot

--- next changed section ---

6.4 Output power dynamics

6.4.1 Inner loop power control

Inner loop power control is the ability of the BS transmitter to adjust its ~~output~~ code domain power in response to the UL received signal.

For inner loop correction on the Downlink Channel, the base station adjusts the ~~mean output~~ code domain power ~~level~~ of a power controlled CCTrCH in response to each valid power control bit received from the UE on the Uplink Traffic Channel based on the mapping of the TPC bits in uplink CCTrCH to downlink CCTrCH. Inner loop control is based on SIR measurements at the UE receiver, and the corresponding TPC commands are generated by the UE.

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~~ code domain 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~~ code domain power and the greatest average rate of change in ~~mean~~ code domain 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~~ code domain 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~~ code domain 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~~ code domain power according to these commands with the specified accuracy.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

6.4.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.2.4.1.1 3,84 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 6.4.

(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 ~~output~~ code domain power of the active DPCH is controlled to reach its maximum and its minimum, respectively.

(3) Measure the code domain power of the active DPCH over the 2464 active chips of each even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C. ~~, 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.~~

(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 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~~ code domain 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~~ code domain 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 6.5~~1~~ 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~~ code domain 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 ~~output~~ code domain power of one power controlled 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 code domain 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

6.4.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.3.4.1.1 3,84 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 6.6.

(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 ~~output~~ code domain 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 code domain power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

(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 ~~output~~ code domain 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 code domain power of the active DPCH over the 2464 active chips of an even time slot TS i (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.~~, 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.~~

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

--- next changed section ---

6.4.5 Primary CCPCH power

6.4.5.1 Definition and applicability

Primary CCPCH power is the ~~transmission~~ code domain power of the Primary Common Control Physical Channel averaged over the transmit timeslot. Primary CCPCH power is signalled 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 code domain power averaged over the timeslot shall not exceed the values in table 6.8. The error is a function of the ~~total~~ output 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~~ Output power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 2,5 dB
PRAT - 6 < Pout ≤ PRAT - 3	+/- 3,5 dB
PRAT - 13 < Pout ≤ 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 code domain power of the Primary CCPCH received by the UE, together with the information on the Primary CCPCH nominal output power signaled on the BCH, are used by the UE for path loss estimation and adjustment of its own transmit power. Therefore, deviations of the Primary CCPCH code domain power from its nominal value are transposed by the UE into deviations from the wanted output power of the UE.

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

6.4.5.4 Method of test

6.4.5.4.1 Initial conditions

6.4.5.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.5.4.1.1 3,84 Mcps TDD option

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

(2) Set the parameters of the BS transmitted signal according to table 6.9.

Table 6.9: Parameters of the BS transmitted signal for Primary CCPCH power testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slots carrying PCCPCH	TS 0 and TS 8
Number of additional DPCH in TS 0 and TS 8	3
BS output power setting	PRAT
Relative power of PCCPCH	¼ of BS output power
Relative power of each DPCH in TS 0 and TS 8	¼ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.5.4.1.2 1,28 Mcps TDD option

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

(2) Set the parameters of the BS transmitted signal according to table 6.9A.

Table 6.9A: Parameters of the BS transmitted signal for Primary CCPCH power testing 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.
Time slots carrying PCCPCH	TS 0
BS output power setting	PRAT
Relative power of PCCPCH	½ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.5.4.2 Procedure

6.4.5.4.2.1 3,84 Mcps TDD option

(1) Measure the PCCPCH code domain power in TS 0 and TS 8 by applying the global in-channel Tx test method described in Annex C.

(2) Reduce the base station output power by 2 dB, 5 dB and 13 dB, without changing the relative powers of the PCCPCH and the DPCHs, and repeat step (1) for each output power setting.

6.4.5.4.2.2 1,28 Mcps TDD option

(1) Measure the PCCPCH power in TS 0 by applying the global in-channel Tx test method described in Annex C.

(2) Reduce the base station output power by 2 dB, 5 dB and 13 dB, without changing the relative powers of the PCCPCH and the DPCHs, and repeat step (1) for each output power setting.

6.4.5.5 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 Primary CCPCH power, measured according to subclause 6.4.5.4.2, shall be within the limits defined in table 6.10

Table 6.10: Test Requirements for errors between Primary CCPCH power and the broadcast value

~~Total~~ Output power in slot, dB	PCCPCH power tolerance
PRAT - 3 < Pout ≤ PRAT + 2	+/- 3,3 dB
PRAT - 6 < Pout ≤ PRAT - 3	+/- 4,3 dB
PRAT - 13 < Pout ≤ PRAT - 6	+/- 5,8 dB

6.4.6 Differential accuracy of Primary CCPCH power

6.4.6.1 Definition and applicability

The differential accuracy of the Primary CCPCH power is the relative transmitted power accuracy of PCCPCH in consecutive frames when the nominal PCCPCH power is not changed.

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

6.4.6.2 Minimum Requirements

The differential accuracy of PCCPCH power shall be within ± 0,5 dB.

The normative reference for this requirement is TS 25.105 [1] subclause 6.4.6.

6.4.6.3 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 power. Therefore, a lack of accuracy of the Primary CCPCH power over time will result in unwanted fluctuations of the transmit power of the UE which may degrade system performance.

The test purpose is to verify that the differential accuracy of the Primary CCPCH power remains within its specified tolerances.

6.4.6.4 Method of test

6.4.6.4.1 Initial conditions

6.4.6.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.4.6.4.1.1 3,84 Mcps TDD option

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

2) Set the parameters of the BS transmitted signal according to table 6.10A.

Table 6.10A: Parameters of the BS transmitted signal for testing of differential accuracy of the Primary CCPCH power

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slots carrying PCCPCH	TS 0 and TS 8
Number of additional DPCH in TS 0 and TS 8	3
BS output power setting	PRAT
Relative power of PCCPCH	¼ of BS output power
Relative power of each DPCH in TS 0 and TS 8	¼ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.6.4.1.2 1,28 Mcps TDD option

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

2) Set the parameters of the BS transmitted signal according to table 6.9A.

Table 6.10B: Parameters of the BS transmitted signal for testing of differential accuracy of the Primary CCPCH power 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.
Time slots carrying PCCPCH	TS 0
BS output power setting	PRAT
Relative power of PCCPCH	½ of BS output power
Data content of DPCH	real life (sufficient irregular)

6.4.6.4.2 Procedure

6.4.6.4.2.1 3,84 Mcps TDD option

1) Measure the PCCPCH code domain power in TS 0 and TS 8 of consecutive frames by applying the global in-channel Tx test method described in Annex C.

2) Calculate the differential accuracy of the Primary CCPCH power by taking the the difference between the PCCPCH power measurement results of consecutive frames.

6.4.6.4.2.2 1,28 Mcps TDD option

1) Measure the PCCPCH power in TS 0 of consecutive frames by applying the global in-channel Tx test method described in Annex C.

2) Calculate the differential accuracy of the Primary CCPCH power by taking the the difference between the PCCPCH power measurement results of consecutive frames.

6.4.6.5 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 differential accuracy of the Primary CCPCH power, measured according to subclause 6.4.6.4.2, shall be within ± 0,6 dB.

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

6.5.1.1 Definition and applicability

The transmit OFF power is defined as the ~~average~~ RRC filtered mean 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.

6.5.1.2 Minimum Requirements

6.5.1.2.1 3,84 Mcps TDD option

The transmit OFF power shall be less than –79 dBm ~~measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate~~.

6.5.1.2.2 1,28 Mcps TDD option

The transmit OFF power shall be less than –82 dBm measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate.

The normative reference for this requirement is TS 25.105 [1] subclause 6.5.1.

6.5.1.3 Test purpose

This test verifies the ability of the BS to reduce its transmit OFF power to a value below the specified limit. This ability is needed to minimize the interference for other users receiving on the same frequency.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.4.1 for initial conditions.

6.5.1.4.2 Procedure

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.4.2 for procedure.

6.5.1.5 Test Requirements

The conformance testing of transmit OFF power is included in the conformance testing of transmit ON/OFF time mask; therefore, see subclause 6.5.2.5 for test requirements.

6.5.2 Transmit ON/OFF time mask

6.5.2.1 Definition and applicability

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

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

6.5.2.2 Minimum Requirements

6.5.2.2.1 3,84 Mcps TDD option

The transmit power level versus time should meet the mask specified in figure 6.1.

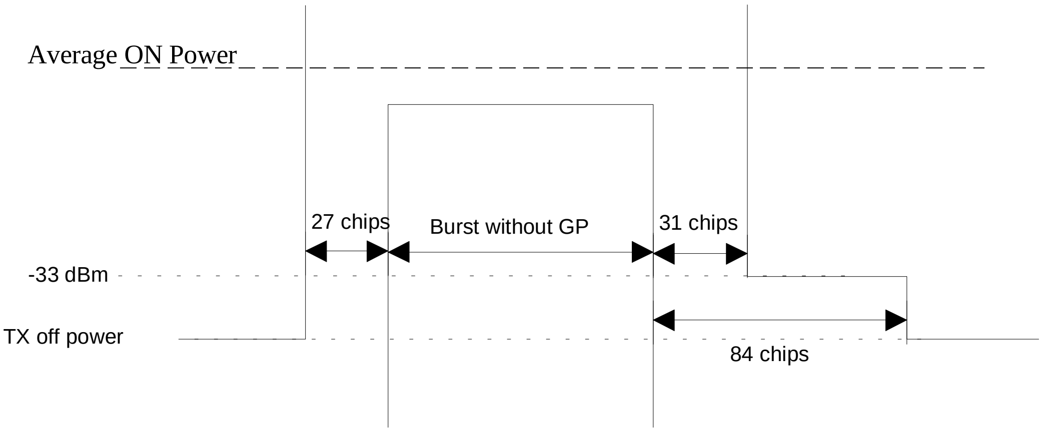

Figure 6.1: Transmit ON/OFF template

6.5.2.2.2 1,28 Mcps TDD option

The transmit power level versus time should meet the mask specified in figure 6.1A.

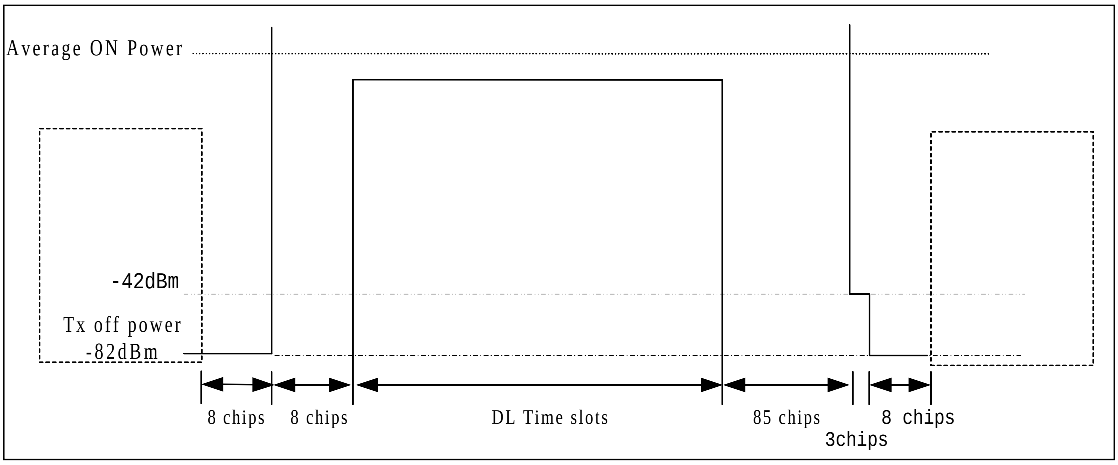

Figure 6.1A: Transmit ON/OFF template for 1,28 Mcps TDD option

The normative reference for this requirement is TS 25.105 [1] subclause 6.5.2.

6.5.2.3 Test purpose

This test verifies the ability of the BS to reduce its transmit power outside of the active part of the Tx time slot (burst without guard period) to values below specified limits. This ability is needed to minimize the interference for other users receiving on the same frequency.

6.5.2.4 Method of test

6.5.2.4.1 Initial conditions

6.5.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.5.2.4.1.1 3,84 Mcps TDD option

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

(2) Set the parameters of the transmitted signal according to table 6.11.

Table 6.11: Parameters of the transmitted signal for transmit ON/OFF time mask 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)

6.5.2.4.1.2 1,28 Mcps TDD option

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

(2) Set the parameters of the transmitted signal according to table 6.11A.

Table 6.11A: Parameters of the transmitted signal for transmit ON/OFF time mask 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 UpPCH,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)

6.5.2.4.2 Procedure

6.5.2.4.2.1 3,84 Mcps TDD option

(1) Measure the RRC filtered mean power of the BS output signal chipwise (i.e. averaged over time intervals of one chip duration) over the period starting 65 chips before the start of the odd time slots TS i (receive time slots of the BS), and ending 27 chips before the next even time slot (transmit time slot of the BS) starts.~~, 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. If the power measuring equipment is based on signal sampling, the sampling theorem shall be met. In this case, the power is determined by calculating the RMS value of the signal samples taken at the measurement filter output over one chip duration.~~

6.5.2.4.2.2 1,28 Mcps TDD option

(1) Measure the power of the BS output signal chipwise (i.e. averaged over time intervals of one chip duration) over the transmit off power period starting 11 chips before the start of the receive time slot TS i = UpPCH, and ending 8 chips before the next transmit time slot TS i=4 starts, 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. If the power measuring equipment is based on signal sampling, the sampling theorem shall be met. In this case, the power is determined by calculating the RMS value of the signal samples taken at the measurement filter output over one chip duration.

6.5.2.5 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.

6.5.2.5.1 3,84 Mcps TDD option

Each value of the power measured according to subclause 6.5.4.2 shall be below – 32,3 dBm in the period from 32 chips to 84 chips after the burst and – 77 dBm in the period where the Tx OFF power specification is applicable

6.5.2.5.2 1,28 Mcps TDD option

Each value of the power measured according to subclause 6.5.4.2 shall be below the limits defined in figure 6.1A of subclause 6.5.2.2.

--- next changed section ---

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 ~~average~~ RRC filtered mean power centered on the assigned channel frequency to the ~~average~~ RRC filtered mean power centered on an adjacent channel frequency. ~~In both cases, the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	55 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.1.

6.6.2.2.2.1.2 1,28 Mcps TDD option

The ACLR of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies 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 below the first or above the last carrier frequency used	ACLR limit
1.6 MHz	40 dB
3.2 MHz	45 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.2

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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies 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 below the first or above the last carrier frequency used	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.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the TDD BS or FDD BS in proximity.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.1.

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.

6.6.2.2.2.2.2 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).

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.2.

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

6.6.2.2.2.3.1 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 average power level of the BS measured in the adjacent channel. The maximum power level of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall not exceed the limit in table 6.24.

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

BS adjacent channel offset below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-80 dBm	3.84 MHz
10 MHz	-80 dBm	3.84 MHz

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited TDD BS or FDD BS.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.1.

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.

6.6.2.2.2.3.2 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 the average 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).

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.2.

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

6.6.2.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T with multiple carriers if supported; see subclause 5.3.

6.6.2.2.4.1.1 3,84 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 6.25.

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 the ~~average~~ RRC filtered mean power centered on the lowest 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~~.

2) Average over TBD time slots.

3) Measure the ~~average~~ RRC filtered mean power at the first lower adjacent RF channel (center frequency 5 MHz below the lowest 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 = average 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 lowest assigned channel frequency of the transmitted signal).

7) In case of a multi-carrier Bs, repeat steps (1) and (2) for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the ~~average~~ RRC filtered mean power at the first higher adjacent RF channel (center frequency 5 MHz above the highest 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~~.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 10 MHz above the highest assigned channel frequency of the transmitted signal).

6.6.2.2.4.2.2 1,28 Mcps TDD option

1) Measure the average power centered on the lowest assigned channel frequency 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.

2) Average over TBD time slots.

3) Measure the average 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 = 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 3,2 MHz below the lowest 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).

7) In case of a multi-carrier BS, repeat steps (1) and 2 for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the average power at the first higher adjacent RF channel (center frequency 1,6 MHz above the highest 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.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 3,2 MHz above the highest assigned channel frequency of the transmitted signal).

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 steps (5) and (10) 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 (4) and (9) 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 below the first or above the last carrier frequency used	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 below the first or above the last carrier frequency used	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 below the first or above the last carrier frequency used	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 steps (5) and (10) 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 below the first or above the last carrier frequency used	ACLR limit
1.6 MHz	39.2 dB
3.2 MHz	44.2 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

--- next changed section ---

6.7 Transmit intermodulation

6.7.1 Definition and applicability

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

The transmit intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into the antenna connector at a mean power level of 30 dB lower than that of the mean power of the subject signal.

The requirements are applicable for a single carrier.

6.7.1.1 3,84 Mcps TDD option

The carrier frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the subject signal carrier frequency, but excluding interference carrier frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

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

6.7.1.2 1,28 Mcps TDD option

The carrier frequency of the interference signal shall be ±1,6 MHz, ±3,2 MHz and ±4,8 MHz offset from the subject signal carrier frequency, but excluding interference carrier frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

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

6.7.2 Minimum Requirements

The transmit intermodulation level shall not exceed the out of band or the spurious emission requirements of subclause 6.6.2 and 6.6.3, respectively.

The normative reference for this requirement is TS 25.105 [1] subclause 6.7.1.

6.7.3 Test purpose

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

6.7.4 Method of test

6.7.4.1 Initial conditions

6.7.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.7.4.1.1 3,84 Mcps TDD option

(1) Connect the measuring equipment, the BS under test and the WCDMA signal generator as shown in figure 6.2.

(2) Set the parameters of the BS transmitted signal according to table 6.38.

(3) Configure the WCDMA signal generator to produce an interference signal with a mean power level according to subclause 6.7.5. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The carrier frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the carrier frequency of the wanted signal, but excluding interference frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

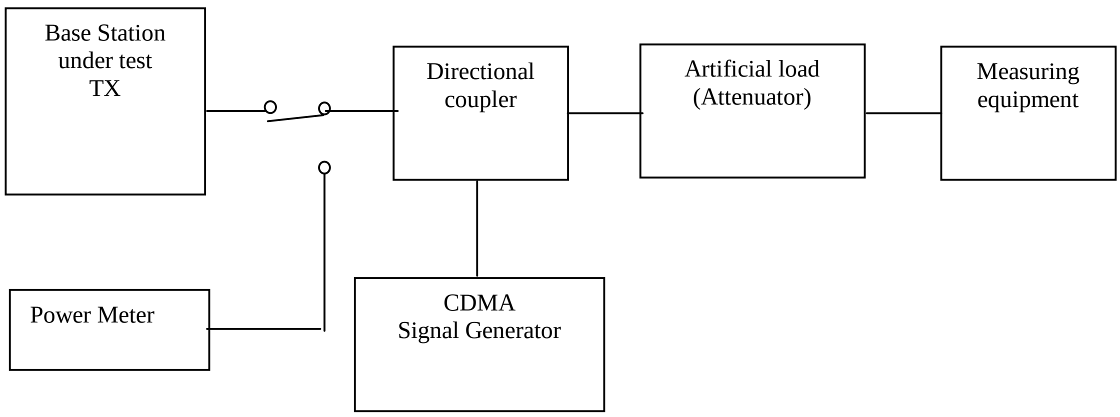

Figure 6.2: Measuring setup for Base Station transmit intermodulation testing

Table 6.38: Parameters of the BS transmitted signal for transmit intermodulation testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is odd; receive, if i is even.
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)

6.7.4.1.2 1,28 Mcps TDD option

(1) Connect the measuring equipment, the BS under test and the WCDMA signal generator as shown in figure 6.2A.

(2) Set the parameters of the BS transmitted signal according to table 6.38A.

(3) Configure the WCDMA signal generator to produce an interference signal with a mean power level according to subclause 6.7.5. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The carrier frequency of the interference signal shall be ±1,6 MHz, ±3,2 MHz and ±4,8 MHz offset from the carrier frequency of the wanted signal, but excluding interference frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.

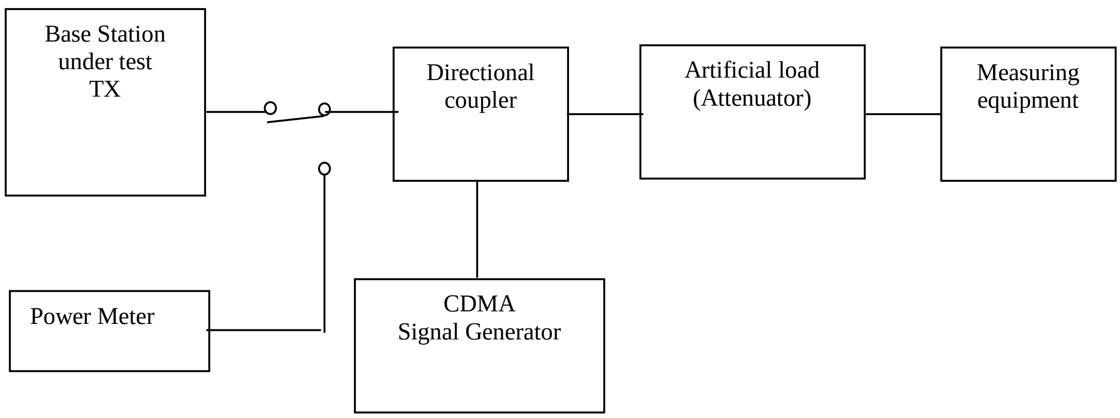

Figure 6.2A: Measuring setup for Base Station transmit intermodulation testing

Table 6.38A: Parameters of the BS transmitted signal for transmit intermodulation 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)

6.7.4.2 Procedure

Apply the test procedures for out of band and spurious emissions as described in 6.6.2 and 6.6.3, respectively, at the frequencies of all third and fifth order intermodulation products. The frequency band occupied by the interference signal are excluded from the measurements.

NOTE: The third order intermodulation products are at frequencies (F1 ± 2F2) and (2F1 ± F2), the fifth order intermodulation products are at frequencies (2F1 ± 3F2), (3F1 ± 2F2), (4F1 ± F2) and (F1 ± 4F2), where F1 represents the frequencies within the bandwidth of the wanted signal and F2 represents the frequencies within the bandwidth of the WCDMA modulated interference signal.

6.7.5 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 mean power level of the WCDMA modulated interference signal shall be 30 dB below the mean power level of the wanted signal.

At the frequencies of all third and fifth order intermodulation products, the Test Requirements for out of band and spurious emissions as specified in subclauses 6.6.2.1.5 (Spectrum emission mask), 6.6.2.2.5 (ACLR) and 6.6.3.5 (Spurious emissions) shall be met.

--- next changed section ---

7.2 Reference sensitivity level

7.2.1 Definition and applicability

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the antenna connector at which the BER ~~does~~ shall not exceed the specific value.

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

7.2.2 Minimum Requirements

7.2.2.1 3,84 Mcps TDD option

~~For~~ Using the reference measurement channel specified in Annex A.2.1, the reference sensitivity level and performance of the BS shall be as specified in table 7.1 ~~below~~.

Table 7.1: BS reference sensitivity level

Reference measurement channel ~~D~~data rate	BS reference sensitivity level ~~(dBm)~~	BER
12,2 kbps	-109 dBm	BER shall not exceed 0,001

The normative reference for this requirement is TS 25.105 [1] subclause 7.2.1.1.

7.2.2.2 1,28 Mcps option

For the measurement channel specified in Annex A.2.1.2, the reference sensitivity level and performance of the BS shall be as specified in table 7.1A below.

Table 7.1A: BS reference sensitivity levels (1,28 Mcps option)

Data rate	BS reference sensitivity level (dBm)	BER
12,2 kbps	-110 dBm	BER shall not exceed 0,001

The normative reference for this requirement is TS 25.105 [1] subclause 7.2.1.2.

7.2.3 Test purpose

The test purpose is to verify the ability of the BS to receive a prescribed single-code test signal of minimum input power under defined conditions (no interference, no multipath propagation) with a BER not exceeding a specified limit. This test is also used as a reference case for other tests to allow the assessment of degradations due to various sources of interference.

7.2.4 Method of test

7.2.4.1 Initial conditions

7.2.4.1.0 General test requirements

Test environment: normal; see subclause 5.9.1.

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

The following additional test shall be performed:

On each of B, M and T, 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.

7.2.4.1.1 3,84 Mcps TDD option

(1) Connect the BS tester (UE simulator) 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 to the Test Requirement for the BS reference sensitivity level specified in table 7.2.

7.2.4.1.2 1,28 Mcps TDD option

(1) Connect the BS tester (UE simulator) 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 BS tester output signal measured at the BS antenna connector shall be adjusted to –110 dBm.

7.2.4.2 Procedure

(1) Measure the BER by comparing the bit sequence of the information data transmitted by the BS tester with the bit sequence obtained from the BS receiver.

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

7.2.5 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.

7.2.5.1 3,84 Mcps TDD option

For any BS Rx port tested, the measured BER at the Test Requirement of the BS reference sensitivity level specified in table 7.2 shall not exceed 0,001.

Table 7.2: Test Requirement for BS reference sensitivity level

Reference measurement channel ~~D~~data rate	BS reference sensitivity level ~~(dBm)~~	BER
12,2 kbps	-108,3 dBm	BER shall not exceed 0,001

7.2.5.2 1,28 Mcps TDD option

For any BS Rx port tested, the measured BER at the Test Requirement of the BS reference sensitivity level specified in table 7.2A shall not exceed 0,001.

Table 7.2A: Test Requirement for BS reference sensitivity level for 1,28 Mcps option

Data rate	BS reference sensitivity level (dBm)	BER
12,2 kbps	-109,3 dBm	BER shall not exceed 0,001

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
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~<REFSENS> + 30 dB~~ –79	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 7.3.1.1.

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 7.3.1.2.

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

7.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

7.3.4.1.1 3,84 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 7.4.

(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

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.

7.3.4.2 Procedure

(1) Measure the BER by comparing the bit sequence of the information data transmitted by the BS tester with the bit sequence obtained from the BS receiver.

(2) Interchange the connections of the BS Rx ports and repeat the measurement according to (1)

7.3.5 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.

7.3.5.1 3,84 Mcps TDD option

For any BS Rx port tested, the measured BER shall not exceed 0,001 for the parameters specified in table 7.4.

Table 7.4: Test Requirements for Dynamic Range

Parameter	Level	Unit
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~<REFSENS> + 31,2 dB~~ –77,8	dBm
Interfering AWGN signal	-73	dBm/3,84 MHz

7.3.5.2 1,28 Mcps TDD option

For any BS Rx port tested, the measured BER shall not exceed 0,001 for the parameters specified in table 7.4A.

Table 7.4A: Test Requirements for Dynamic Range for 1,28 Mcps TDD option

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	<REFSENS> + 31,2 dB	dBm
Interfering AWGN signal	-76	dBm/1,28 MHz

7.4 Adjacent Channel Selectivity (ACS)

7.4.1 Definition and applicability

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of a~~n~~ single code CDMA modulated adjacent channel signal at a given frequency offset from the center frequency of the assigned channel.

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

7.4.2 Minimum Requirements

7.4.2.1 3,84 Mcps TDD option

The BER, measured on the wanted signal in the presence of an interfering signal, shall not exceed 0,001 for the parameters specified in table 7.5.

Table 7.5: Parameters of the wanted signal and the interfering signal for ACS testing

Parameter	**Level**	**Unit**
Reference measurement channel ~~D~~data rate	12,2	kbit/s
Wanted signal mean power	~~Reference sensitivity level + 6 dB~~ –103	dBm
Interfering signal mean power	-52	dBm
Fuw (modulated)	5	MHz
NOTE: Fuw is the frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal.		

The normative reference for this requirement is TS 25.105 [1] subclause 7.4.1.1.

7.4.2.2 1,28 Mcps TDD option

The BER, measured on the wanted signal in the presence of an interfering signal, shall not exceed 0,001 for the parameters specified in table 7.5A.

Table 7.5A: Parameters of the wanted signal and the interfering signal for ACS testing for 1,28 Mcps TDD

Parameter	**Level**	**Unit**
Data rate	12,2	kbit/s
Wanted signal	Reference sensitivity level + 6 dB	dBm
Interfering signal	-55	dBm
Fuw (modulated)	1,6	MHz
NOTE: Fuw is the frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal.		

The normative reference for this requirement is TS 25.105 [1] subclause 7.4.1.2.

7.4.3 Test purpose

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

7.4.4 Method of test

7.4.4.1 Initial conditions

7.4.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

7.4.4.1.1 3,84 Mcps TDD option

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator used to produce the interfering signal in the adjacent channel to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5.

(4) Set the signal generator to produce an interfering signal that is equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0{,}22$. The mean power level of the interfering signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5.

7.4.4.1.2 1,28 Mcps TDD option

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator used to produce the interfering signal in the adjacent channel to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5A.

(4) Set the signal generator to produce an interfering signal that is equivalent to a continuous wideband CDMA signal with one code of chip frequency 1,28 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0{,}22$. The level of the interfering signal measured at the BS antenna connector shall be adjusted to the value specified in table 7.5A.

7.4.4.2 Procedure

7.4.4.2.1 3,84 Mcps TDD option

(1) Set the center frequency of the interfering signal to 5 MHz above the assigned channel frequency of the wanted signal.

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

(3) Set the center frequency of the interfering signal to 5 MHz below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.4.4.2.2 1,28 Mcps TDD option

(1) Set the center frequency of the interfering signal to 1,6 MHz above the assigned channel frequency of the wanted signal.

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

(3) Set the center frequency of the interfering signal to 1,6 MHz below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.4.5 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.

The BER measured according to subclause 7.4.4.2 shall not exceed 0,001.

7.5 Blocking characteristics

7.5.1 Definition and applicability

7.5.1.1 3,84 Mcps TDD option

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirements applies to interfering signals with center frequency within the ranges specified in tables 7.6, 7.7, 7.8, 7.9 and 7.10 respectively, using a 1 MHz step size.

The requirements in tables 7.6, 7.7 or 7.8 apply to base stations intended for general-purpose applications, depending on which frequency band is used. The additional requirements in Tables 7.9 and 7.10 may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

7.5.1.2 1,28 Mcps TDD option

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in tables 7.6A, 7.7A, 7.8A, 7.9A and 7.10A respectively, using a 1 MHz step size.

The requirements in Table 7.6A, 7.7A or 7.8A apply to base stations intended for general-purpose applications, depending on which frequency band is used. The additional requirements in Tables 7.9A and 7.10A may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

7.5.2 Minimum Requirements

7.5.2.1 3,84 Mcps TDD option

7.5.2.1.1 General requirements

The static reference performance as specified in clause 7.2 shall be met with a wanted and an interfering signal coupled to the BS antenna input using the parameters specified in tables 7.6, 7.7 and or 7.8 respectively.

Table 7.6: Blocking requirements for operating bands defined in subclause 4.2 a)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1900 – 1920 MHz, 2010 – 2025 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1880 – 1900 MHz, 1990 – 2010 MHz, 2025 – 2045 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1920 – 1980 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 - 1880 MHz, 1980 – 1990 MHz, 2045 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.7: Blocking requirements for operating bands defined in subclause 4.2 b)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1850 – 1990 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1830 – 1850 MHz, 1990 – 2010 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 – 1830 MHz, 2010 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.8: Blocking requirements for operating bands defined in subclause 4.2 c)

Center frequency of interfering signal	Interfering signal ~~level~~ mean power	Wanted signal ~~level~~ mean power	Minimum offset of interfering signal	Type of interfering signal
1910 – 1930 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1890 – 1910 MHz, 1930 – 1950 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	10 MHz	WCDMA signal with one code
1 – 1890 MHz, 1950 – 12750 MHz	-15 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.0.1.

7.5.2.1.2 Co-location with GSM900 and/or DCS 1800

This additional blocking requirement may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in the tables below, using a 1MHz step size.

In case this additional blocking requirement is applied, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Table 7.9: Additional blocking requirements for operating bands defined in subclause 4.2 a) when co-located with GSM900

Center Frequency of Interfering Signal	Interfering Signal ~~Level~~ mean power	Wanted Signal ~~Level~~ mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
921 – 960 MHz	+16 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

Table 7.10: Additional blocking requirements for operating bands defined in subclause 4.2 a) when co-located with DCS1800

Center Frequency of Interfering Signal	Interfering Signal ~~Level~~ mean power	Wanted Signal ~~Level~~ mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
1805 ~~-~~– 1880 MHz	+16 dBm	~~<REFSENS> + 6 dB~~ –103 dBm	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.1.1.

7.5.2.2 1,28 Mcps TDD option

7.5.2.2.1 General requirements

The static reference performance as specified in clause 7.2 shall be met with a wanted and an interfering signal coupled to the BS antenna input using the parameters specified in tables 7.6A,7.7A or 7.8A, respectively.

Table 7.6A: Blocking requirements for operating bands defined in subclause 4.2 a) for 1,28 Mcps TDD

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1900 – 1920 MHz, 2010 – 2025 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1880 – 1900 MHz, 1990 – 2010 MHz, 2025 – 2045 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1920 – 1980 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1 - 1880 MHz, 1980 – 1990 MHz, 2045 – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.7A: Blocking requirements for operating bands defined in subclause 4.2 b)for 1,28 Mcps TDD

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1850 – 1990 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1830 – 1850 MHz, 1990 – 2010 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1 – 1830 MHz, 2010 – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.8A: Blocking requirements for operating bands defined in subclause 4.2 c)for 1,28 Mcps TDD

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1910 – 1930 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1890 – 1910 MHz, 1930 – 1950 MHz	-40 dBm	<REFSENS> + 6 dB	3.2 MHz	1,28 Mcps TDD signal with one code
1 – 1890 MHz, 1950 – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.0.2.

7.5.2.2.2 Co-location with GSM900 and/or DCS 1800

This additional blocking requirement may be applied for the protection of TDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA TDD BS.

The blocking performance requirement applies to interfering signals with center frequency within the ranges specified in the tables below, using a 1MHz step size.

In case this additional blocking requirement is applied, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Table 7.9A: Additional blocking requirements for operating bands defined in 4.2(a) when co-located with GSM900

Centre Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
921 – 960 MHz	+16 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.10A: Additional blocking requirements for operating bands defined in 4.2(a) when co-located with DCS1800

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1805 – 1880	+16 dBm	<REFSENS> + 6 dB	—	CW carrier

The normative reference for this requirement is TS 25.105 [1] subclause 7.5.1.2.

7.5.3 Test purpose

7.5.3.1 3,84 Mcps TDD option

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

7.5.3.2 1,28 Mcps TDD option

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 3,2 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: M; see subclause 5.3. The BS shall be configured to operate as close to the centre of the operating band as possible.

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

(2) Terminate or disable any other 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.The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level specified in subclause 7.2.2.

7.5.4.2 Procedure

7.5.4.2.1 3,84 Mcps TDD option

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

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

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in tables 7.6, 7.7, or 7.8 respectively. The type of the interfering signal is either equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off α = 0,22, or a CW signal; see tables 7.6, 7.7 or 7.8 respectively.

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

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

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

7.5.4.2.2 1,28 Mcps TDD option

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

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

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in tables 7.6A, 7.7A, or 7.8A respectively. The type of the interfering signal is either equivalent to a continuous wideband CDMA signal with one code of chip frequency 1,28 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off α = 0,22, or a CW signal; see tables 7.6A, 7.7A, or 7.8A respectively.

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

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

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

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

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

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

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

7.6.2 Minimum Requirements

7.6.2.1 3,84 Mcps TDD option

The static reference performance as specified in clause 7.2 should be met when the following signals are coupled to the BS antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above the static reference level.
- Two interfering signals with the parameters specified in table 7.11.

Table 7.11: Parameters of the interfering signals for intermodulation characteristics testing

Interfering Signal ~~Level~~ mean power	Offset	Type of Interfering Signal
- 48 dBm	10 MHz	CW signal
- 48 dBm	20 MHz	WCDMA signal with one code

The normative reference for this requirement is TS 25.105 [1] subclause 7.6.1.1.

7.6.2.2 1,28 Mcps TDD option

The static reference performance as specified in clause 7.2 should be met when the following signals are coupled to the BS antenna input.

- A wanted signal at the assigned channel frequency, 6 dB above the static reference level.
- Two interfering signals with the parameters specified in table 7.11A.

Table 7.11A: Parameters of the interfering signals for intermodulation characteristics testing for 1,28 Mcps TDD

Interfering Signal Level	Offset	Type of Interfering Signal
- 48 dBm	3,2 MHz	CW signal
- 48 dBm	6,4 MHz	1,28 Mcps TDD signal with one code

The normative reference for this requirement is TS 25.105 [1] subclause 7.6.1.2.

7.6.3 Test purpose

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

7.6.4 Method of test

7.6.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

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

(1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and two signal generators to the antenna connector of one Rx port.

(2) Terminate or disable any other 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. The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level specified in subclause 7.2.2.

(4) Set the first signal generator to produce a CW signal with a level measured at the BS antenna connector of - 48 dBm.

(5) Set the second signal generator to produce an interfering signal equivalent to a wideband CDMA signal with one code of chip frequency, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0{,}22$. The level of the signal measured at the BS antenna connector shall be set to - 48 dBm.

7.6.4.2 Procedure

7.6.4.2.1 3,84 Mcps TDD option

(1) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, above the assigned channel frequency of the wanted signal.

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

(3) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.6.4.2.2 1,28 Mcps TDD option

(1) The frequency of the first and the second signal generator shall be set to 3,2 MHz and 6,4 MHz, respectively, above the assigned channel frequency of the wanted signal.

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

(3) The frequency of the first and the second signal generator shall be set to 3,2 MHz and 6,4 MHz, respectively, below the assigned channel frequency of the wanted signal.

(4) Measure the BER of the wanted signal at the BS receiver.

(5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

7.6.5 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 BER measured according subclause 7.6.4.2 to shall not exceed 0,001.

--- next changed section ---

B.2 Multi-path fading propagation conditions

B.2.1 3,84 Mcps TDD option

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 for 3,84 Mcps TDD option

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h	
Relative Delay [ns]	**~~Average~~ Relative Mean Power [dB]**	**Relative Delay [ns]**	**~~Average~~ Relative Mean Power [dB]**	**Relative Delay [ns]**	**~~Average~~ Relative Mean 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 $f \in -f_d, f_d$.

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

3GPP TSG RAN WG4 Meeting #23 **R4-020969**

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CR-Form-v5.1

CHANGE REQUEST

⌘	**25.142**	**CR 128**	⌘ **rev**	**-**	⌘ Current version:	**3.9.0** ⌘

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: ⌘	BS conformance testing of revised ACLR and spurious emissions requirements in case of coexistence			
Source: ⌘	RAN WG4			
Work item code: ⌘	TEI		***Date:*** ⌘	17/5/2002
Category: ⌘	**F**		***Release:*** ⌘	R99
	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: ⌘	Introduction of revised ACLR and spurious emissions requirements for co-existence into the core specification TS 25.105.
Summary of change: ⌘	Correction of Minimum Requirements and Test Requirements (taking due account of appropriate Test Tolerances) for ACLR and spurious emissions in case of co-existence.
Consequences if not approved: ⌘	Misalignment between TS 25.142 and the relevant core specification TS 25.105, because conformance testing for the revised ACLR and spurious emission requirements would not be covered by TS 25.142. Isolated Impact Analysis: Does affect BS conformance testing only, does not affect BS-UE interworking.

Clauses affected: ⌘		
Other specs affected: ⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications	
Other comments: ⌘	Equivalent CRs in other Releases: CR129 cat. F to 25.142 v4.4.0	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

2 References

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

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

[1] 3GPP TS 25.105: " UTRA (BS) TDD; Radio transmission and reception ".

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

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

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

[5] ETR 028: "Uncertainties in the measurement of mobile radio equipment characteristics".

[6] Recommendation ITU-R SM.329-8: "Spurious emissions".

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

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

[9] 3GPP TR 25.942: "RF System Scenarios".

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
6.2 Maximum output 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	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 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	± 100 kHz	Accuracy = ± 3∗RBW. Assume 30 kHz bandwidth.
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~~for operation in the same geographic area ~~proximity to~~with unsynchronised TDD BS~~ or FDD BS~~ ~~operating~~ on ~~an~~ adjacent channels~~frequency~~: 5 MHz offset: ± 4 dB 10 MHz offset: ± 4 dB requirement for operation in the same geographic area with FDD BS on adjacent channels: 5 MHz offset: TBD 10 MHz offset: ± 4 dB requirement in case of co-siting with unsynchronised TDD BS or FDD BS operating on ~~an~~ adjacent channels~~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.	
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. ± 1 dB	The uncertainty of the interferer has double the effect on the result due to the frequency offset.

6.8.1 Modulation accuracy	± 2,5 % (for single code)	
6.8.2 Peak code domain error	± 1 dB	

5.11 Test Tolerances (informative)

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

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

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

5.11.1 Transmitter

Table 5.6: Test Tolerance for transmitter tests

Subclause	Test Tolerance (see NOTE)
6.2 Maximum output 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 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 the same geographic area~~proximity~~: 4 dB for TDD BS on adjacent channels TBD/4 dB for FDD BS on adjacent channels 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.	

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 average power centered on the assigned channel frequency to the average power centered on an adjacent channel frequency. In both cases, the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 and a bandwidth equal to the chip rate.

In some cases the requirement is expressed as adjacent channel leakage power, which is the maximum absolute emission level on the adjacent channel frequency measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α=0,22 and a bandwidth equal to the chip rate of the victim system.

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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	55 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

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

6.6.2.2.2.2 Additional r~~R~~equirement ~~in case of~~for operation in the same geographic area with ~~proximity to~~FDD or unsynchronised TDD ~~BS or FDD BS operating~~ on ~~an~~ adjacent channels~~frequency~~

6.6.2.2.2.2.1 Additional requirement for operation in the same geographic area with unsynchronised TDD on adjacent channels

In case the equipment is operated in the same geographic area with an unsynchronised ~~proximity to another~~ TDD BS ~~or FDD BS~~ operating on the first or second ~~an~~ adjacent frequency, the ~~ACLR~~adjacent channel leakage power of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall not exceed~~be equal to or greater than~~ the limits~~value~~ specified in table 6.23.

Table 6.23: ~~BS ACLR~~ Adjacent channel leakage power limits ~~in case of~~for operation in the same geographic area with unsynchronised TDD on adjacent channels~~proximity~~

BS adjacent channel offset below the first or above the last carrier frequency used	~~ACLR limit~~Maximum Level	Measurement Bandwidth
5 MHz	~~70 dB~~-29 dBm	3,84 MHz
10 MHz	~~70 dB~~-29 dBm	3,84 MHz

NOTE: The requirements in table 6.23 are~~is~~ based on ~~the assumption that the~~ a coupling loss of 74 dB between the unsynchronised TDD base stations.~~ is at least 84dB.~~ The scenario leading to this requirement is addressed in TR 25.942 [9].

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the TDD BS ~~or FDD BS~~ in ~~proximity~~the same geographic area.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.1.

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.

6.6.2.2.2.2.2 Additional requirement for operation in the same geographic area with FDD on adjacent channels

In case the equipment is operated in the same geographic area with a FDD BS operating on the first or second adjacent channel, the adjacent channel leakage power shall not exceed the limits specified in table 6.23A.

Table 6.23A: Adjacent channel leakage power limits for operation in the same geographic area with FDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
+/- 5 MHz	-36 dBm	3,84 MHz
+/- 10 MHz	-36 dBm	3,84 MHz

NOTE: The requirements in table 6.23A are based on a coupling loss of 74 dB between the FDD and TDD base stations. The scenario leading to this requirement is addressed in TR 25.942 [9].

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the FDD BS in the same geographic area.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.2.

6.6.2.2.2.3 Additional r~~R~~equirement in case of co-siting with unsynchronised TDD BS or FDD BS operating on an adjacent channel~~frequency~~

6.6.2.2.2.3.1 Additional requirement in case of co-siting with unsynchronised TDD BS operating on an adjacent channel

In case the equipment is co-sited to ~~another~~an unsynchronised TDD BS ~~or FDD BS~~ operating on ~~an~~the first or second adjacent frequency, the adjacent channel leakage power ~~ACLR~~ of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies ~~is specified in terms of the absolute average power level of the BS measured in the adjacent channel. The maximum power level~~ shall not exceed the limits in table 6.24.

Table 6.24: ~~BS ACLR~~Adjacent channel leakage power limits in case of co-siting with unsynchronised TDD on adjacent channels

BS adjacent channel offset below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-73~~80~~ dBm	3,~~.~~84 MHz
10 MHz	-73~~80~~ dBm	3,~~.~~84 MHz

NOTE: The requirements in table 6.24 are based on a coupling loss of 30 dB between the unsynchronised TDD base stations.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited TDD BS ~~or FDD BS~~.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.1.

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.

6.6.2.2.2.3.2 Additional requirement in case of co-siting with FDD BS operating on an adjacent channel

In case the equipment is co-sited to a FDD BS operating on the first or second adjacent channel, the adjacent channel leakage power shall not exceed the limits specified in table 6.24A.

Table 6.24A: Adjacent channel leakage power limits in case of co-siting with FDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
+/- 5 MHz	-80 dBm	3,84 MHz
+/- 10 MHz	-80 dBm	3,84 MHz

NOTE: The requirements in table 6.24A are based on a coupling loss of 30 dB between the FDD and TDD base stations.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited FDD BS.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.2.

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 with multiple carriers if supported; 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 the average power centered on the lowest 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 a = 0,22 and a bandwidth equal to the chip rate.

2) Average over TBD time slots.

3) Measure the average power at the first lower adjacent RF channel (center frequency 5 MHz below the lowest 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 = 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 lowest assigned channel frequency of the transmitted signal)

7) In case of a multi-carrier BS, repeat steps (1) and (2) for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the average power at the first higher adjacent RF channel (center frequency 5 MHz above the highest 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.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

   ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 10 MHz above the highest assigned channel frequency of the transmitted signal).

6.6.2.2.5 Test Requirements

The ACLR calculated in steps 5) and 10) of subclause 6.6.2.2.4.2 shall be equal or greater than the limits given in table 6.26~~ or table 6.27, respectively~~. In case the equipment is tested against the requirements defined for operation in the same geographic area or co-sited with unsynchronised TDD or FDD on adjacent channels,~~co-sited to another TDD BS or FDD BS operating on an adjacent frequency~~, the ~~interference~~adjacent channel leakage power ~~at the first and second adjacent channel~~ measured according to steps (4) and (9) of subclause 6.6.2.2.4.2 shall not exceed the maximum levels specified in tables 6.27, 6.27A, 6.28 or 6.28, respectively.

Table 6.26: BS ACLR Test Requirements

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	44,2 dB
10 MHz	54,2 dB

Table 6.27: ~~BS ACLR~~Adjacent channel leakage power Test Requirements ~~in case of~~for operation in the same geographic area with unsynchronised TDD on adjacent channels ~~proximity~~

BS adjacent channel offset below the first or above the last carrier frequency used	~~ACLR limit~~Maximum Level	Measurement Bandwidth
5 MHz	~~66 dB~~-25 dBm	3,84 MHz
10 MHz	~~66 dB~~-25 dBm	3,84 MHz

Table 6.27A: Adjacent channel leakage power Test Requirements for operation in the same geographic area with FDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
+/- 5 MHz	-[36 dBm –TT]	3,84 MHz
+/- 10 MHz	-32 dBm	3,84 MHz

Table 6.28: ~~BS ACLR~~ Adjacent channel leakage power Test Requirements in case of co-sit~~t~~ing with unsynchronised TDD on adjacent channels

BS adjacent channel offset below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-[73~~80~~ dBm - TT]	3,~~.~~84 MHz
10 MHz	-[73~~80~~ dBm - TT]	3,~~.~~84 MHz

Table 6.28A: Adjacent channel leakage power Test Requirements in case of co-siting with FDD on adjacent channels

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.

6.6.3 Spurious emissions

6.6.3.1 Definition and applicability

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

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

Either requirement applies at frequencies within the specified frequency ranges which are more than 12,5 MHz under the first carrier frequency used or more than 12,5 MHz above the last carrier frequency used.

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

6.6.3.2 Minimum Requirements

6.6.3.2.1 Mandatory requirements

The requirements of either subclause 6.6.3.2.1.1 or subclause 6.6.3.2.1.2 shall apply.

6.6.3.2.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.

The power of any spurious emission shall not exceed the maximum level given in Table 6.29.

Table 6.29: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.

6.6.3.2.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30.

Table 6.30: BS Mandatory spurious emissions limits, Category B

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1
Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher* – Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher* – Fc2 + 50 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc2 + 50 MHz or Fu + 10 MHz *whichever is the lower* – Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower* – 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1. Upper frequency as in ITU-R SM.329-8, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.2.1.

6.6.3.2.2 Co-existence with GSM

6.6.3.2.2.1 Operation in the same geographic area

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

The power of any spurious emission shall not exceed the maximum level given in Table 6.31.

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of GSM 900 MS receiver

Band	Maximum level	Measurement bandwidth	Note
921 MHz – 960 MHz	-57 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.1.1.

6.6.3.2.2.2 Co-located base stations

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

The power of any spurious emission shall not exceed the maximum level given in table 6.32.

Table 6.32: BS Spurious emissions limits for protection of the GSM 900 BTS receiver

Band	Maximum level	Measurement bandwidth	Note
876 MHz – 915 MHz	–98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.2.1.

6.6.3.2.3 Co-existence with DCS 1800

6.6.3.2.3.1 Operation in the same geographic area

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

The power of any spurious emission shall not exceed the maximum level given in table 6.33.

Table 6.33: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800 MS receiver

Band	Maximum level	Measurement bandwidth	Note
1805 MHz – 1880 MHz	-47 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.1.1.

6.6.3.2.3.2 Co-located base stations

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

The power of any spurious emission shall not exceed the maximum level given in table 6.34.

Table 6.34: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1710 MHz – 1785 MHz	-98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.3.1.

6.6.3.2.4 Co-existence with UTRA FDD

6.6.3.2.4.1 Operation in the same geographic area

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

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.35. For TDD base stations which use a carrier frequency within the band 1900 – 1920 MHz the requirements applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900 – 1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.35.

Table 6.35: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-43~~32~~ dBm (*)	~~1~~3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	

(*) The requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used whichever is higher.

NOTE: The requirements in table 6.35 are based on a coupling loss of 67 dB between the TDD and FDD base stations. The scenarios leading to these requirements are addressed in TR 25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.1.1.

6.6.3.2.4.2 Co-located base stations

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

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.36. For TDD base stations which use a carrier frequency within the band 1900 – 1920 MHz the requirements applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900 – 1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.36.

Table 6.36: BS Spurious emissions limits for BS co-located with UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-80~~6~~ dBm (*)	~~1~~3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	

(*) The requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used whichever is higher.

NOTE: The requirements in table 6.36 are based on a coupling loss of 30 dB between the TDD and FDD base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.2.1.

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 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~~for operation in the same geographic area~~proximity to~~ with unsynchronised TDD BS or FDD BS ~~operating~~ on ~~an~~ adjacent channels ~~frequency~~: Maximum Level defined in tables 6.23 and 6.23A ~~ACLR limit = 70 dB at 5 MHz~~ ~~ACLR limit = 70 dB at 10 MHz~~ requirement in case of co-siting with unsynchronised TDD BS or FDD BS operating on ~~an~~ adjacent channels:~~frequency~~ Maximum Level defined in tables 6.24 and 6.24A ~~ACLR limit = - 80 dBm at 5 MHz~~ ~~ACLR limit = - 80 dBm at 10 MHz~~	min. req. : 0,8 dB operation in the same geographic area~~proxim~~ ~~.~~: 4 dB (TBD in table 6.23A, 5 MHz offset, resp.) 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 the same geographic area~~proximity~~: Add 4 dB (TBD in table 6.23A, 5 MHz offset, resp.) to the Maximum Level entries in tables 6.23 and 6.23A ~~ACLR limit = 66 dB at 5 MHz~~ ~~ACLR limit = 66 dB at 10 MHz~~ co-siting: Add TBD to the Maximum Level entries in tables 6.24 and 6.24A
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

Table D.2: Derivation of Test Requirements (Receiver 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
7.2 Reference sensitivity	Reference sensitivity level = -109 dBm BER limit = 0,001	0,7 dB	Formula: Reference sensitivity level + TT Reference sensitivity level = -108,3 dBm BER limit is not changed
7.3 Dynamic range	Wanted signal level = <REFSENS> + 30 dB Interfering AWGN level = -73 dBm/3,84 MHz	1,2 dB	Formula: Wanted signal level + TT AWGN level unchanged Wanted signal level = <REFSENS> + 31,2 dB
7.4 Adjacent Channel Selectivity (ACS)	Wanted signal level = Ref. sensitivity level + 6 dB Interfering signal level = -52 dBm/3,84 MHz	0 dB	Formula: Wanted signal level + TT Interfering signal level unchanged Wanted signal level = Ref. sensitivity level + 6 dB
7.5 Blocking characteristics	Wanted signal level = <REFSENS> + 6 dB Interfering signal level see tables 7.6 to 7.8	0 dB	Formula: Wanted signal level + TT Interfering signal level unchanged Wanted signal level = <REFSENS> + 6 dB
7.6 Intermodulation characteristics	Wanted signal level = <REFSENS> + 6 dB Interferer1 level (10 MHz offset CW) = -48 dBm Interferer2 level (20 MHz offset W-CDMA Modulated) = -48 dBm	0 dB	Formula: Wanted signal level + TT Interferer 1 level: unchanged Interferer 2 level: unchanged Wanted signal level = <REFSENS> + 6 dB
7.7 Spurious emissions	Maximum level defined in table 7.12	0 dB	Formula: Maximum level + TT Add TT to maximum level in table 7.12

Table D.3: Derivation of Test Requirements (Performance requirements)

Test	Minimum Requirement in TS 25.105	Test Tolerance (TT)	Test Requirement in TS 25.142
8.2 Demodulation in static propagation conditions		TBD	
8.3 Demodulation of DCH in multipath fading conditions		TBD	

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Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘	**25.142**	**CR**	**129**	⌘ **rev**	**-**	⌘ Current version: **4.4.0** ⌘

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: ⌘	BS conformance testing of revised ACLR and spurious emissions requirements for 3,84 Mcps and 1,28 Mcps TDD option in case of coexistence			
Source: ⌘	RAN WG4			
Work item code: ⌘	TEI, LCRTDD-RF		***Date:*** ⌘	17/5/2002
Category: ⌘	**F**		***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: ⌘	Introduction of revised ACLR and spurious emissions requirements in case of co-existence for both 3,84 Mcps and 1,28 Mcps TDD options into the core specification TS 25.105.
Summary of change: ⌘	Correction of Minimum Requirements and Test Requirements (taking due account of appropriate Test Tolerances) for ACLR and spurious emissions.
Consequences if not approved: ⌘	Misalignment between TS 25.142 and the relevant core specification TS 25.105, because conformance testing for the revised ACLR and spurious emissions requirements would not be covered by TS 25.142. Isolated Impact Analysis: Does affect BS conformance testing only, does not affect BS-UE interworking.

Clauses affected: ⌘		
Other specs affected: ⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications	
Other comments: ⌘	Equivalent CRs in other Releases: CR128 cat. F to 25.142 v3.9.0	

How to create CRs using this form:

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

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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.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 3GPP TS 25.105: "UTRA (BS) TDD: Radio transmission and reception".

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

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

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

[5] ETR 028: "Uncertainties in the measurement of mobile radio equipment characteristics".

[6] Recommendation ITU-R SM.329-8: "Spurious emissions".

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

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

[9] 3GPP TR 25.942: "RF System Scenarios".

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
6.2 Maximum output 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	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 output power	± 0,7 dB	
6.4.5 Primary CCPCH power	± 0,8 dB	
6.4.6 Differential accuracy of Primary CCPCH power	± 0,1 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	Accuracy = ± 3∗RBW. Assume 30 kHz bandwidth
6.6.2.1 Spectrum emission mask	± 1,5 dB	

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)	3,84 Mcps TDD option: minimum requirement: 5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB requirement ~~in case of~~for operation in the same geographic area ~~proximity to~~with unsynchronised TDD BS ~~or FDD BS operating~~ on ~~an~~ adjacent channels~~frequency~~: 5 MHz offset: ± 4 dB 10 MHz offset: ± 4 dB requirement for operation in the same geographic area with FDD BS on adjacent channels: 5 MHz offset: TBD 10 MHz offset: ± 4 dB requirement in case of co-siting with unsynchronised TDD BS or FDD BS operating on ~~an~~ adjacent channels~~frequency~~: 5 MHz offset: TBD 10 MHz offset: TBD 1,28 Mcps TDD option: minimum requirement: 1,6 MHz offset: ± 0,8 dB 3,2 MHz offset: ± 0,8 dB requirement for operation in the same geographic area with unsynchronised 1,28 Mcps TDD BS on adjacent channels: 1,6 MHz offset: ± 1 dB 3,2 MHz offset: ± 1 dB requirement for operation in the same geographic area with unsynchronised TDD BS on adjacent channels: 3,4 MHz offset: ± 1 dB requirement for operation in the same geographic area with FDD BS on adjacent channels: ± 4 dB requirement in case of co-siting with unsynchronised 1,28 Mcps TDD BS on an adjacent channel: 1,6 MHz offset: TBD 3,2 MHz offset: TBD requirement in case of co-siting with unsynchronised TDD BS on an adjacent channel: 3,4 MHz offset: TBD requirement in case of co-siting with FDD BS on an adjacent channel: TBD Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied.	

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. ± 1 dB	The uncertainty of the interferer has double the effect on the result due to the frequency offset.
6.8.1 Modulation accuracy	± 2,5 % (for single code)	
6.8.2 Peak code domain error	± 1 dB	

5.11 Test Tolerances (informative)

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

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

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

5.11.1 Transmitter

Table 5.6: Test Tolerance for transmitter tests

Subclause	Test Tolerance (see NOTE)
6.2 Maximum output 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 output power	0,7 dB
6.4.5 Primary CCPCH power	0,8 dB
6.4.6 Differential accuracy of Primary CCPCH power	± 0,1 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)	3,84 Mcps TDD option: minimum requirement: 0,8 dB operation in the same geographic area~~proximity~~: 4 dB for TDD BS on adjacent channels TBD/4 dB for FDD BS on adjacent channels co-siting: TBD 1,28 Mcps TDD option: minimum requirement: 0,8 dB operation in the same geographic area: 1 dB for TDD BS on adjacent channels 4 dB for FDD BS on adjacent channels 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.	

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 average power centered on the assigned channel frequency to the average power centered on an adjacent channel frequency. In both cases, the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 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.

In some cases the requirement is expressed as adjacent channel leakage power, which is the maximum absolute emission level on the adjacent channel frequency measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α=0,22 and a bandwidth equal to the chip rate of the victim system.

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 of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	55 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.1.

6.6.2.2.2.1.2 1,28 Mcps TDD option

The ACLR of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies 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 below the first or above the last carrier frequency used	ACLR limit
1,6 MHz	40 dB
3,2 MHz	45 dB

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied individually to the single carriers or group of single carriers.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.1.2

6.6.2.2.2.2 Additional ~~R~~requirement ~~in case of~~for operation in the same geographic area with FDD or ~~proximity to~~unsynchronised TDD ~~BS or FDD BS operating~~ on ~~an~~ adjacent channels ~~frequency~~

6.6.2.2.2.2.1 3,84 Mcps TDD option

6.6.2.2.2.2.1.1 Additional requirement for operation in the same geographic area with unsynchronised TDD on adjacent channels

In case the equipment is operated in the same geographic area with an unsynchronised ~~proximity to another~~ TDD BS ~~or FDD BS~~ operating on the first or second adjacent frequency ~~on an adjacent frequency~~, the ~~ACLR~~adjacent channel leakage power of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall not exceed~~be equal to or greater than~~ the limits~~value~~ specified in table 6.23.

Table 6.23: ~~BS ACLR~~Adjacent channel leakage power limits ~~in case of~~for operation in the same geographic area with unsynchronised TDD on adjacent channels~~proximity~~

BS adjacent channel offset below the first or above the last carrier frequency used	~~ACLR limit~~Maximum Level	Measurement Bandwidth
5 MHz	~~70 dB~~-29 dBm	-3,84 MHz
10 MHz	~~70 dB~~-29 dBm	-3,84 MHz

NOTE: The requirements in table 6.23 ~~is~~are based on ~~the assumption that the~~a coupling loss of 74 dB between the unsynchronised TDD base stations. ~~is at least 84dB.~~ The scenario leading to this requirement is addressed in TR 25.942 [9].

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the TDD BS ~~or FDD BS~~ in the same geographic area~~proximity~~.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.1.1.

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.

6.6.2.2.2.2.1.2 Additional requirement for operation in the same geographic area with FDD on adjacent channels

In case the equipment is operated in the same geographic area with a FDD BS operating on the first or second adjacent channel, the adjacent channel leakage power shall not exceed the limits specified in table 6.23AA.

Table 6.23AA: Adjacent channel leakage power limits for operation in the same geographic area with FDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
+/- 5 MHz	-36 dBm	3,84 MHz
+/- 10 MHz	-36 dBm	3,84 MHz

NOTE: The requirements in table 6.23AA are based on a coupling loss of 74 dB between the FDD and TDD base stations. The scenario leading to this requirement is addressed in TR 25.942 [9].

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the FDD BS in the same geographic area.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.1.2.

6.6.2.2.2.2.2 1,28 Mcps TDD option

6.6.2.2.2.2.2.1 Additional requirement for operation in the same geographic area with unsynchronised TDD on adjacent channels

In case the equipment is operated in the same geographic area with an ~~proximity to another~~unsynchronised TDD BS ~~or FDD BS and both BSs~~ operating on an adjacent channel~~frequency band~~, the requirement is specified in terms of adjacent channel leakage power. ~~level of the transmitting BS.~~ In geographic areas where only UTRA 1,28 Mcps TDD option is deployed, the adjacent channel leakage power limits shall not exceed the limits specified in table 6.23A, otherwise the limits in table 6.23B shall apply ~~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~~Adjacent channel leakage power limits for~~in case of~~ operation in the same geographic area with unsynchronised 1,28 Mcps TDD on adjacent channels~~proximity for 1,28 Mcps TDD~~

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 1,6 MHz	-29 dBm	1,28 MHz
± 3,2 MHz	-29 dBm	1,28 MHz

Table 6.23B: Adjacent channel leakage power limits for operation in the same geographic area with unsynchronised TDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 3,4 MHz	-29 dBm	3,84 MHz

NOTE: The requirements in table 6.23A and 6.23B are based on a coupling loss of 74 dB between the unsynchronised TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [9].

~~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).~~

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.2.1.

6.6.2.2.2.2.2.2 Additional requirement for operation in the same geographic area with FDD on adjacent channels

In case the equipment is operated in the same geographic area with a FDD BS operating on an adjacent channel, the adjacent channel leakage power shall not exceed the limits specified in table 6.23C. This requirement is only applicable if the equipment is intended to operate in frequency bands specified in 4.2 a) and the highest carrier frequency used is in the range 1916,2 – 1920 MHz.

Table 6.23C: Adjacent channel leakage power limits for operation in the same geographic area with FDD on adjacent channels

Center Frequency for Measurement	Maximum Level	Measurement Bandwidth
1922,6 MHz	-36 dBm	3,84 MHz

NOTE: The requirement in table 6.23C is based on a relaxed coupling loss of 74 dB between the TDD and FDD base stations. The scenarios leading to these requirements are addressed in TR 25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.2.2.2.

6.6.2.2.2.3 Additional ~~R~~requirement in case of co-si~~t~~ting with unsynchronised TDD BS or FDD BS operating on an adjacent channel~~frequency~~

6.6.2.2.2.3.1 3,84 Mcps TDD option

6.6.2.2.2.3.1.1 Additional requirement in case of co-siting with unsynchronised TDD BS operating on an adjacent channel

In case the equipment is co-sited to ~~another~~an unsynchronised TDD BS ~~or FDD BS~~ operating on ~~an~~ the first or second adjacent frequency, the adjacent channel leakage power~~ACLR is specified in terms of the absolute average power level of the BS measured in the adjacent channel. The maximum power level~~ of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies shall not exceed the limits specified in table 6.24.

Table 6.24: ~~BS ACLR~~Adjacent channel leakage power limits in case of co-siting with unsynchronised TDD on adjacent channels

BS adjacent channel offset below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-73~~80~~ dBm	3,~~.~~84 MHz
10 MHz	-73~~80~~ dBm	3,~~.~~84 MHz

NOTE: The requirements in table 6.24 are based on a coupling loss of 30 dB between the unsynchronised TDD base stations.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited TDD BS~~ or FDD BS~~.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.1.1.

NOTE: The necessary dynamic range of the measuring equipment to verify the conformance requirements specified in table 6.24 for the Wide Area BS 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.

6.6.2.2.2.3.1.2 Additional requirement in case of co-siting with FDD BS operating on an adjacent channel

In case the equipment is co-sited to a FDD BS operating on the first or second adjacent channel, the adjacent channel leakage power shall not exceed the limits specified in table 6.24A.

Table 6.24A: Adjacent channel leakage power limits in case of co-siting with FDD on an adjacent channel

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 5 MHz	-80 dBm	3,84 MHz
± 10 MHz	-80 dBm	3,84 MHz

NOTE: The requirements in table 6.24A are based on a minimum coupling loss of 30 dB between base stations.

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements shall be applied to those adjacent channels of the single carriers or group of single channels which are used by the co-sited FDD BS.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.1.2.

6.6.2.2.2.3.2 1,28 Mcps TDD option

6.6.2.2.2.3.2.1 Additional requirement in case of co-siting with unsynchronised TDD BS operating on an adjacent channel

In case the equipment is co-sited to ~~another~~an unsynchronised TDD BS~~ or FDD BS and both BSs~~ operating on an adjacent channel~~frequency band~~, the requirement is specified in terms of adjacent channel leakage ~~the average~~ power. ~~level of the transmitting BS.~~ In geographic areas where only UTRA 1,28 Mcps TDD option is deployed, the adjacent channel leakage power shall not exceed the limits specified in table 6.24B, otherwise the limits in table 6.24C shall apply. ~~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 6.24B~~A~~: ~~BS ACLR~~Adjacent channel leakage power limits in case of co-siting ~~for 1,28 Mcps TDD~~with unsynchronised 1.28 Mcps TDD on an adjacent channel

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 1,6 MHz	-73 dBm	1,28 MHz
± 3,2 MHz	-73 dBm	1,28 MHz

Table 6.24C: Adjacent channel leakage power limits in case of co-siting with unsynchronised TDD on an adjacent channel

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 3,4 MHz	-73 dBm	3,84 MHz

NOTE: The requirements in table 6.24B and 6.24C are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations.

~~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).~~

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.2.1.

6.6.2.2.2.3.2.2 Additional requirement in case of co-siting with FDD BS operating on an adjacent channel

In case the equipment is co-sited to a FDD BS operating on an adjacent channel, the adjacent channel leakage power shall not exceed the limits specified in table 6.24D. This requirement is only applicable if the equipment is intended to operate in frequency bands specified in 4.2 a) and the highest carrier frequency used is in the range 1916,2 – 1920 MHz.

Table 6.24D: Adjacent channel leakage power in case of co-siting with UTRA FDD on an adjacent channel

Center Frequency for Measurement	Maximum Level	Measurement Bandwidth
1922,6 MHz	-80 dBm	3,84 MHz

NOTE: The requirements in table 6.24D are based on a minimum coupling loss of 30 dB between base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.2.3.2.2.

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

6.6.2.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T with multiple carriers if supported; see subclause 5.3.

6.6.2.2.4.1.1 3,84 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 6.25.

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 the average power centered on the lowest 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 $\alpha = 0{,}22$ and a bandwidth equal to the chip rate.

2) Average over TBD time slots.

3) Measure the average power at the first lower adjacent RF channel (center frequency 5 MHz below the lowest 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 $\alpha = 0{,}22$ 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 with adherence to the sampling theorem.

4) Average over TBD time slots.

5) Calculate the ACLR by the ratio

ACLR = average 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 lowest assigned channel frequency of the transmitted signal).

7) In case of a multi-carrier Bs, repeat steps (1) and (2) for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the average power at the first higher adjacent RF channel (center frequency 5 MHz above the highest 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 $\alpha = 0{,}22$ 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 with adherence to the sampling theorem.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 10 MHz above the highest assigned channel frequency of the transmitted signal).

6.6.2.2.4.2.2 1,28 Mcps TDD option

1) Measure the average power centered on the lowest assigned channel frequency 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 $\alpha = 0{,}22$ and a bandwidth equal to the chip rate.

2) Average over TBD time slots.

3) Measure the average 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 $\alpha =$ 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 with adherence to the sampling theorem.

4) Average over TBD time slots.

5) Calculate the ACLR by the ratio:

   ACLR = 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 3,2 MHz below the lowest 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).

7) In case of a multi-carrier BS, repeat steps (1) and 2 for the highest assigned channel frequency. Otherwise, use the result obtained in step (2) above for further calculation in step (10).

8) Measure the average power at the first higher adjacent RF channel (center frequency 1,6 MHz above the highest 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 $\alpha = 0{,}22$ 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 with adherence to the sampling theorem.

9) Average over TBD time slots.

10) Calculate the ACLR by the ratio

    ACLR = average power acc. to (7) / average interference power acc. to (9).

11) Repeat steps (8) to (10) for the second upper adjacent RF channel (center frequency 3,2 MHz above the highest assigned channel frequency of the transmitted signal).

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 steps (5) and (10) 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 tested against the requirements defined for operation in the same geographic area or co-sited with unsynchronised TDD or FDD on adjacent channels~~co-sited to another TDD BS or FDD BS operating on an adjacent frequency~~, the ~~interference~~adjacent channel leakage power ~~at the first and second adjacent channel~~ measured according to steps (4) and (9) of subclause 6.6.2.2.4.2.1 shall not exceed the maximum levels specified in table 6.27, 6.27A, 6.28 or 6.28A, respectively.

Table 6.26: BS ACLR Test Requirements

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	44,2 dB
10 MHz	54,2 dB

Table 6.27: ~~BS ACLR~~Adjacent channel leakage power Test Requirements ~~in case of~~for operation in the same geographic area with unsynchronised TDD on adjacent channels~~ proximity~~

BS adjacent channel offset below the first or above the last carrier frequency used	~~ACLR limit~~Maximum Level	Measurement Bandwidth
5 MHz	~~66 dB~~-25 dBm	3,84 MHz
10 MHz	~~66 dB~~-25 dBm	3,84 MHz

Table 6.27A: Adjacent channel leakage power Test Requirements for operation in the same geographic area with FDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
+/- 5 MHz	-[36 dBm – TT]	3,84 MHz
+/- 10 MHz	-32 dBm	3,84 MHz

Table 6.28: ~~BS ACLR~~Adjacent channel leakage power Test Requirements in case of co-sit~~t~~ing with unsynchronised TDD on adjacent channels

BS adjacent channel offset below the first or above the last carrier frequency used	Maximum Level	Measurement Bandwidth
5 MHz	-[73~~80~~ dBm - TT]	3,~~.~~84 MHz
10 MHz	-[73~~80~~ dBm - TT]	3,~~.~~84 MHz

Table 6.28A: Adjacent channel leakage power Test Requirements in case of co-siting with FDD on adjacent channels

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 steps (5) and (10) 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 tested against the requirements defined for operation in the same geographic area or co-sited with unsynchronised TDD or FDD on adjacent channels~~in proximity or co-sited to another TDD BS or FDD BS operating on an adjacent frequency~~, the ~~interference~~adjacent channel leakage 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 levels specified in tables 6.27B~~A~~, 6.27C, 6.27D, 6.28B, 6.28C or 6.28~~A~~D, respectively.

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

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
1,~~.~~6 MHz	~~-~~39,~~.~~2 dB
3,~~.~~2 MHz	44,~~.~~2 dB

Table 6.27BA: ~~BS ACLR~~ Adjacent channel leakage power Test Requirements ~~in case of~~for operation in the same geographic area with unsynchronised 1,28 Mcps TDD on adjacent channels~~proximity (1,28 Mcps option)~~

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 1,6 MHz	-28 dBm	1,28 MHz
± 3,2 MHz	-28 dBm	1,28 MHz

Table 6.27C: Adjacent channel leakage power limits for operation in the same geographic area with unsynchronised TDD on adjacent channels

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 3,4 MHz	-28 dBm	3,84 MHz

Table 6.27D: Adjacent channel leakage power limits for operation in the same geographic area with FDD on adjacent channels

Center Frequency for Measurement	Maximum Level	Measurement Bandwidth
1922,6 MHz	-32 dBm	3,84 MHz

Table 6.28B: Adjacent channel leakage power limits in case of co-siting with unsynchronised 1.28 Mcps TDD on an adjacent channel

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 1,6 MHz	-[73 dBm – TT]	1,28 MHz
± 3,2 MHz	-[73 dBm – TT]	1,28 MHz

Table 6.28C: Adjacent channel leakage power limits in case of co-siting with unsynchronised TDD on an adjacent channel

BS Adjacent Channel Offset	Maximum Level	Measurement Bandwidth
± 3,4 MHz	-[73 dBm – TT]	3,84 MHz

Table 6.28D: Adjacent channel leakage power in case of co-siting with UTRA FDD on an adjacent channel

Center Frequency for Measurement	Maximum Level	Measurement Bandwidth
1922,6 MHz	-[80 dBm – TT]	3,84 MHz

~~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~~

6.6.3 Spurious emissions

6.6.3.1 Definition and applicability

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

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

For 3.84 Mcps TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 12,5 MHz under the first carrier frequency used or more than 12,5 MHz above the last carrier frequency used.

For 1,28 Mcps TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 4 MHz under the first carrier frequency used or more than 4 MHz above the last carrier frequency used.

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

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

6.6.3.2 Minimum Requirements

6.6.3.2.1 Mandatory requirements

The requirements of either subclause 6.6.3.2.1.1 or subclause 6.6.3.2.1.2 shall apply.

6.6.3.2.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.

6.6.3.2.1.1.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in Table 6.29.

Table 6.29: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.1.

6.6.3.2.1.1.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in Table 6.29A.

Table 6.29A: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.2.

6.6.3.2.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.

6.6.3.2.1.2.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30.

Table 6.30: BS Mandatory spurious emissions limits, Category B

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1
Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher* – Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher* – Fc2 + 50 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc2 + 50 MHz or Fu + 10 MHz *whichever is the lower* – Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower* – 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1. Upper frequency as in ITU-R SM.329-8, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.2.1.1.

6.6.3.2.1.2.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30A.

Table 6.30A: BS Mandatory spurious emissions limits, Category B for 1,28 Mcps TDD

Band	Maximum Level	Measurement Bandwidth	Note
9kHz – 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU SM.329-8, s4.1
150kHz – 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU SM.329-8, s4.1
30MHz – 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU SM.329-8, s4.1
1GHz ↔ Fc1-19,2 MHz or Fl –3,2 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU SM.329-8, s4.1
Fc1 – 19,2 MHz or Fl - 3,2MHz *whichever is the higher* ↔ Fc1 - 16 MHz or Fl –3,2 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.1
Fc1 - 16 MHz or Fl –3,2 MHz *whichever is the higher* ↔ Fc2 + 16 MHz or Fu +3,2 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.1
Fc2 + 16 MHz or Fu + 3,2MHz *whichever is the lower* ↔ Fc2 +19,2 MHz or Fu + 3,2MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.1
Fc2 + 19,2 MHz or Fu +3,2 MHz *whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1. Upper frequency as in ITU-R SM.329-8, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The reference for this requirement is TS 25.105 subclause 6.6.3.1.2.1.2.

6.6.3.2.2 Co-existence with GSM

6.6.3.2.2.1 Operation in the same geographic area

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

The power of any spurious emission shall not exceed the maximum level given in Table 6.31.

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of GSM 900 MS receiver

Band	Maximum level	Measurement bandwidth	Note
921 MHz – 960 MHz	-57 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.1.1.

6.6.3.2.2.2 Co-located base stations

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

The power of any spurious emission shall not exceed the maximum level given in table 6.32.

Table 6.32: BS Spurious emissions limits for protection of the GSM 900 BTS receiver

Band	Maximum level	Measurement bandwidth	Note
876 MHz – 915 MHz	–98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.2.1.

6.6.3.2.3 Co-existence with DCS 1800

6.6.3.2.3.1 Operation in the same geographic area

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

The power of any spurious emission shall not exceed the maximum level given in table 6.33.

Table 6.33: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800 MS receiver

Band	Maximum level	Measurement bandwidth	Note
1805 MHz – 1880 MHz	-47 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.1.1.

6.6.3.2.3.2 Co-located base stations

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

The power of any spurious emission shall not exceed the maximum level given in table 6.34.

Table 6.34: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1710 MHz – 1785 MHz	-98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.2.1.

6.6.3.2.4 Co-existence with UTRA FDD

6.6.3.2.4.1 Operation in the same geographic area

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

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.35. For 3,84 Mcps TDD option base stations which use a carrier frequency within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900-1920 MHz. For 1,28 Mcps TDD option base stations which use carrier frequencies within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1900-1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.35.

Table 6.35: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-43~~32~~ dBm (*)	~~1~~3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	

(*) For 3,84 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used, whichever is higher. For 1,28 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 6,6 MHz above the last TDD carrier used, whichever is higher.

NOTE: The requirements in table 6.35 are based on a coupling loss of 67dB between the TDD and FDD base stations. The scenarios leading to these requirements are addressed in TR 25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.1.1.

6.6.3.2.4.2 Co-located base stations

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

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.36. For 3,84 Mcps TDD option base stations which use a carrier frequency within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900-1920 MHz. For 1,28 Mcps TDD option base stations which use carrier frequencies within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1900-1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.36.

Table 6.36: BS Spurious emissions limits for BS co-located with UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-80~~6~~ dBm	~~1~~3,84 MHz (*)	
2110 – 2170 MHz	-52 dBm	1 MHz	

(*) For 3,84 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used, whichever is higher. For 1,28 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 6,6 MHz above the last TDD carrier used, whichever is higher.

NOTE: The requirements in table 6.36 are based on a minimum coupling loss of 30 dB between base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.2.1.

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 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
6.4.6 Differential accuracy of Primary CCPCH power	Differential accuracy of PCCPCH power: ≤ ± 0,5 dB	0,1 dB	Formula: ± (PCCPCH tolerance + TT) ± 0,6 dB
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)	3,84 Mcps TDD option: minimum requirement: ACLR limit = 45 dB at 5 MHz ACLR limit = 55 dB at 10 MHz requirement ~~in case of~~for operation in the same geographic area~~proximity to~~ with unsynchronised TDD BS or FDD BS ~~operating~~ on ~~an~~ adjacent channels ~~frequency~~: Maximum Level defined in tables 6.23 and 6.23AA ~~ACLR limit = 70 dB at 5 MHz~~ ~~ACLR limit = 70 dB at 10 MHz~~ requirement in case of co-siting with unsynchronised TDD BS or FDD BS operating on ~~an~~ adjacent channels~~frequency~~: Maximum Level defined in tables 6.24 and 6.24A ~~ACLR limit = - 80 dBm at 5 MHz~~ ~~ACLR limit = - 80 dBm at 10 MHz~~ 1,28 Mcps TDD option: minimum requirement: ACLR limit = 40 dB at 1,6 MHz ACLR limit = 45 dB at 3,2 MHz requirement for operation in the same geographic area with unsynchronised TDD or FDD on adjacent channels: Maximum Level defined in tables 6.23A, 6.23B and 6.23C requirement in case of co-siting with unsynchronised TDD or FDD on an adjacent channel: Maximum Level defined in tables 6.24B, 6.24C and 6.24D	3,84 Mcps TDD option: min. req. : 0,8 dB operation in the same geographic area~~proxim~~~~.~~: 4 dB (TBD in table 6.23A, 5 MHz offset, resp.) co-siting: TBD 1,28 Mcps TDD option: min. req. : 0,8 dB operation in the same geographic area: 1 dB or 4 dB co-siting: TBD	Formula: ACLR limit – TT 3,84 Mcps TDD option: min. requirement: ACLR limit = 44,2 dB at 5 MHz ACLR limit = 54,2 dB at 10 MHz operation in the same geographic area~~proximity~~: Add 4 dB (TBD in table 6.23A, 5 MHz offset, resp.) to the Maximum Level entries in tables 6.23 and 6.23AA. ~~ACLR limit = 66 dB at 5 MHz~~ ~~ACLR limit = 66 dB at 10 MHz~~ co-siting: Add TBD to the Maximum Level entries in tables 6.24 and 6.24A. 1,28 Mcps TDD option: min. requirement: ACLR limit = 39,2 dB at 1,6 MHz ACLR limit = 44,2 dB at 3,2 MHz operation in the same geographic area: Add 1 dB to the Maximum Level entries in tables 6.23A and 6.23B, and 4 dB to the Maximum Level entry in table 6.23C. co-siting: Add TBD to the Maximum Level entries in tables 6.24B, 6.24C and 6.24D.
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