

TSG RAN Meeting #18
New Orleans, US, 3 - 6 December, 2002

RP-020789

Title CRs (Rel-4 and Rel-5 Category A) to TS 25.142
Source TSG RAN WG4
Agenda Item 7.4.4

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-021646	25.142	147	1	F	Rel-4	4.6.0	Introduction of Rel-5 clarifications and small corrections in Rel-4	TEI4
R4-021582	25.142	148		F	Rel-4	4.6.0	Averaging period in ACLR test for 1.28 Mcps TDD option	LCRTDD-RF
R4-021583	25.142	149		A	Rel-5	5.2.0	Averaging period in ACLR test for 1.28 Mcps TDD option	LCRTDD-RF

CHANGE REQUEST

⌘ **25.142 CR 147** ⌘ rev **1** ⌘ Current version: **4.6.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Introduction of Rel-5 clarifications and small corrections in Rel-4		
Source:	⌘ RAN WG4		
Work item code:	⌘ TEI4	Date:	⌘ 26/11/2002
Category:	⌘ F	Release:	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4	(Release 4)
		Rel-5	(Release 5)
		Rel-6	(Release 6)

Reason for change:	⌘ 1- Before RAN#17, CRs considered as "non-essential" were only agreed for Rel-5 in RAN4. It was agreed that such corrections could be introduced into Rel-4 as well. This CR proposes to apply to Rel-4 all already agreed "non-essential" Rel-5 CRs that are applicable to Rel-4. 2-Adjacent channel leakage power definition is ambiguous in case that different systems are considered for the source and the victim systems (i.e 1,28 Mcps TDD option leaking on 3.84 Mcps TDD option).
Summary of change:	⌘ 1- Corrections presented in the following CR for Rel-5 are proposed for Rel-4. - General corrections to TS25.142. (CR138) - Applicability of requirements in case of RF devices external to the BS (CR139) - Total power dynamic range definition. (CR140) - Update of reference to ITU-R recommendation SM.329-9 (CR144) - Correction of Node B test configurations (CR141) 2- It is clarified that for adjacent channel leakage power the measurement bandwidth and the adjacent channel offset are dependent of the considered scenarios and defined in the respective sections.
Consequences if not approved:	⌘ Rel-4 and Rel-5 specifications are not inlined with respect to issues that are covered in both releases. Adjacent channel leakage power definition remains ambiguous. Isolated Impact Analysis:

This CR has no impact on UE-Node B interworking since the proposed corrections are clarification of the standard.

Clauses affected:	⌘	2, 3, 5.7, 5.13, 5.14.4, 5.17, 6.1, 6.2.4, 6.3.4, 6.4.2.4, 6.4.3.4, 6.4.4.4, 6.4.5.3, 6.5.2.4, 6.6.1.4, 6.6.2.1.4, 6.6.2.2, 6.6.2.2.3, 6.6.3, 6.6.3.4, 6.7.4, 6.8.1, 6.8.2, 7.1, 7.7.4.									
Other specs affected:	⌘	<table border="1"> <thead> <tr> <th>Y</th> <th>N</th> </tr> </thead> <tbody> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </tbody> </table>	Y	N		X		X		X	Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘
Y	N										
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	X										
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Other comments:	⌘										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/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.
- 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.329-98: "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".

3 Definitions, symbols, and abbreviations

3.1 Definitions

Ancillary RF amplifier: a piece of equipment, which when connected by RF coaxial cables to the BS, has the primary function to provide amplification between the transmit and/or receive antenna connector of a BS and an antenna without requiring any control signal to fulfil its amplifying function.

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 \hat{I} or). 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.

Mean power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least $(1 + \alpha)$ 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 $(1 + \alpha)$ 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: The mean power level per carrier of the base station measured at the antenna connector in a specified reference condition. The period of measurement shall be a transmit timeslot excluding the guard period.

Rated output power: Rated 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.

Total power dynamic range: The difference between the maximum and the minimum output power of the base station for a specified reference condition.

---NEXT SECTION---

5.7 Tx spurious emissions

5.7.1 Category of spurious emissions limit

The manufacturer shall declare one of the following:

- a) the BS shall be tested against Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-98 [6].

or

- b) the BS shall be tested against Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-98 [6].

If the manufacturer declares Category A limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.1 is mandatory, and the requirements specified in subclause 6.6.3.2.1.2 need not to be tested.

If the manufacturer declares Category B limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.2 is mandatory, and the requirements specified in subclause 6.6.3.2.1.1 need not to be tested.

---NEXT SECTION---

5.13 Selection of configurations for testing

Measurements shall be performed within the time slots under test as specified individually for each test within the subclause "Initial conditions"

Most tests in this TS are only performed for a subset of the possible combinations of test conditions. For instance:

- Not all TRXs in the configuration may be specified to be tested.
- Only one RF channel may be specified to be tested.
- Only one timeslot may be specified to be tested.

When a test is performed by a test laboratory, the choice of which combinations are to be tested shall be specified by the laboratory. The laboratory may consult with operators, the manufacturer or other bodies.

When a test is performed by a manufacturer, the choice of which combinations are to be tested may be specified by an operator.

---NEXT SECTION---

5.14.4 Ancillary RF amplifiers

~~Ancillary RF amplifier: a piece of equipment, which when connected by RF coaxial cables to the BS, has the primary function to provide amplification between the transmit and/or receive antenna connector of a BS and an antenna without requiring any control signal to fulfil its amplifying function.~~

The requirements of this TS shall be met with the ancillary RF amplifier fitted. At tests according to clause 6 and 7 for TX and RX respectively, the ancillary amplifier is connected to the BS by a connecting network (including any cable(s), attenuator(s), etc.) with applicable loss to make sure the appropriate operating conditions of the ancillary amplifier and the BS. The applicable connecting network loss range is declared by the manufacturer. Other characteristics and the temperature dependence of the attenuation of the connecting network are neglected. The actual attenuation value of the connecting network is chosen for each test as one of the applicable extreme values. The lowest value is used unless otherwise stated.

Sufficient tests should be repeated with the ancillary amplifier fitted and, if it is optional, without the ancillary RF amplifier to verify that the BS meets the requirements of this TS in both cases

---NEXT SECTION---

5.17 Regional requirements

Some requirements in this specification may only apply in certain regions. Table 5.12 lists all requirements that may be applied differently in different regions.

Table 5.12: List of regional requirements

Subclause number	Requirement	Comments
4.2	Frequency bands	Some bands may be applied regionally.
6.2.2	Maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.8.1
6.6.2.1.	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.3.2.1.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9& [6], are applied.
6.6.3.2.1.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9& [6], are applied.
6.6.3.2.2.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.6.3.2.2.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.6.3.2.3.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.6.3.2.3.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.6.3.2.4.1	Co-existence with UTRA FDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.2.4.2	Co-existence with UTRA FDD – 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.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in subclause 4.2 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA TDD BS receivers when UTRA TDD BS and GSM 900/DCS1800 BS are co-located.

---NEXT SECTION---

6 Transmitter characteristics

6.1 General

Unless otherwise stated, all measurements shall be made at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a TX amplifier, a filter or the combination of such devices is used, the tests according to subclauses 5.14.4 shall be performed to ensure that the requirements are met at test port B.

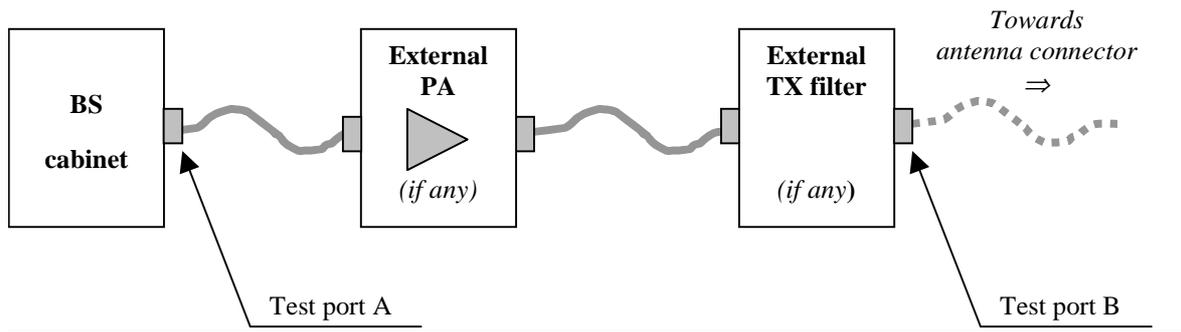


Figure X.X: Transmitter test ports

---NEXT SECTION---

6.2.4 Method of test

6.2.4.1 Initial conditions

6.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

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

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

6.2.4.1.1 3,84 Mcps TDD option

- (1) The transmitter under test and all other transmitters of the base station (if any) are switched on.
- (2) The power of the transmitters not under test (if any) are controlled down.
- (3) Connect the power measuring equipment to the BS antenna connector.
- (4) Set the parameters of the transmitted signal according to table 6.1.

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.2.4.1.2 1,28 Mcps TDD option

- (1) The transmitter under test and all other transmitters of the base station (if any) are switched on.
- (2) The power of the transmitters not under test (if any) are controlled down.
- (3) Connect the power measuring equipment to the BS antenna connector.
- (4) Set the parameters of the transmitted signal according to table 6.1A.

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, 3, 4, 5, 6$: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.2.4.2 Procedure

6.2.4.2.1 3,84 Mcps TDD option

- (1) Measure ~~thermal the output~~ power of the BS output signal, ~~over the 2464 active chips of an even time slot TS i (this excludes the guard periods), and with a measurement bandwidth of at least 5 MHz.~~
- (2) Run step (1) for RF channels Low / Mid / High.

6.2.4.2.2 1,28 Mcps TDD option

- (1) Measure ~~thermal the output~~ power of the BS output signal, ~~over the 848 active chips of an even time slot TS i (this excludes the guard periods), and with a measurement bandwidth of at least 1,6 MHz.~~
- (2) Run step (1) for RF channels Low / Mid / High.

---NEXT SECTION---

6.3.4 Method of test

6.3.4.1 Initial conditions

6.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

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.

6.3.4.1.1 3,84 Mcps TDD option

- (1) The transmitter under test and all other transmitters of the base station (if any) are switched on.
- (2) The power of the transmitters not under test (if any) are controlled down.
- (3) Connect the tester to the BS antenna connector.
- (4) Set the parameters of the transmitted signal according to table 6.2.

Table 6.2: Parameters of the transmitted signal for frequency stability test

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
Number of DPCH in each <u>time slot</u> under test active TS	1
BS output power setting	PRAT
Data content of DPCH	real life (sufficient irregular)

6.3.4.1.2 1,28 Mcps TDD option

- (1) The transmitter under test and all other transmitters of the base station (if any) are switched on.
- (2) The power of the transmitters not under test (if any) are controlled down.
- (3) Connect the tester to the BS antenna connector.
- (4) Set the parameters of the transmitted signal according to table 6.2A.

Table 6.2A: Parameters of the transmitted signal for Frequency stability test for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 6$: transmit, if i is 0, 4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
Number of DPCH in each <u>time slot</u> under test active TS	1
BS output power setting	PRAT
Data content of DPCH	real life (sufficient irregular)

---NEXT SECTION---

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 ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
<u>Time slot carrying SCH</u>	<u>TS0</u>
<u>Time slots under test</u>	<u>TS i, i even and non zero</u>
<u>Number of DPCH in each time slot under test</u> 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 ; $i = 0, 1, 2, \dots, 6$: transmit, if i is 0, 4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
Number of DPCH in each time slot under test	1
DPCH power	Minimum
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 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.
- (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 TS i 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 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 848 active chips of each ~~transmit~~ even time slot TS i of the BS (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.
- (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).

---NEXT SECTION---

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 ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
Number of DPCH in each <u>each time slot under test</u> 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 ; $i = 0, 1, 2, \dots, 6$: transmit, if i is 0, 4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
Number of DPCH in each time slot under test	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 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.
- (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 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.
- (6) Determine the power control dynamic range by calculating the difference between the maximum code domain power measured in step (3) and the minimum 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 code domain 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 code domain power of the active DPCH over the 848 active chips of an ~~receive~~ transmit time slot TS i of the BS (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.
- (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 code domain 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 code domain power of the active DPCH over the 848 active chips of a ~~transmit~~ receive time slot TS i of the BS (this excludes the guard period) by applying the global in-channel Tx test method described in Annex C.
- (6) Determine the power control dynamic range by calculating the difference between the maximum code domain power measured in step (3) and the minimum 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).

---NEXT SECTION---

6.4.4.4.1.1 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 6.7.
- (3) Operate the BS in such a mode that it is able to interpret received TPC commands
- (4) Start BS transmission.

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

- to analyze the output signal of the BS under test with respect to mean thermal power;
- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
Number of DPCH in each time slot under test	1
Data content of DPCH	real life (sufficient irregular)

6.4.4.4.1.2 1,28 Mcps TDD option

- (1) Connect the BS tester to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 6.7A.
- (3) Operate the BS in such a mode that it is able to interpret received TPC commands
- (4) Start BS transmission.

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

- to analyze the output signal of the BS under test with respect to thermal mean power;
- to simulate an UE with respect to the generation of TPC commands embedded in a valid UE signal.

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, 3, 4, 5, 6$: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test	1
Power of each DPCH	PRAT
Data content of DPCH	real life (sufficient irregular)

6.4.4.4.2 Procedure

6.4.4.4.2.1 3,84 Mcps TDD option

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

- (2) Set the BS tester to produce a sequence of TPC commands related to all active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the output power of all active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the odd time slots TS i (receive time slots of the BS).
- (3) Measure the power of the BS output signal over the 2464 active chips of an even and non zero time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.
- (4) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) and (3).

6.4.4.4.2.2 1,28 Mcps TDD option

- (1) Configure the BS transmitter to enable power control steps of size 1 dB.
- (2) Set the BS tester to produce a sequence of TPC commands related to all active DPCH, with content "Decrease Tx power". This sequence shall be sufficiently long so that the output power of all active DPCH is controlled to reach its minimum, and shall be transmitted to the BS within the receive time slots TS i of the BS.
- (3) Measure the power of the BS output signal over the 848 active chips of a ~~receive~~ time slot TS i (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points.
- (4) Configure the BS transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps (2) and (3).

---NEXT SECTION---

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.~~

---NEXT SECTION---

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 ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test 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.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---NEXT SECTION---

6.6.1.4 Method of test

6.6.1.4.1 Initial conditions

6.6.1.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.6.1.4.1.1 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 6.12.

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	Real life (sufficient irregular)

6.6.1.4.1.2 1,28 Mcps TDD option

- (1) Connect the measuring equipment to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 6.12A.

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, 3, 4, 5, 6$: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---NEXT SECTION---

6.6.2.1.4 Method of test

6.6.2.1.4.1 Initial conditions

6.6.2.1.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.6.2.1.4.1.1 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 6.17.

Table 6.17: Parameters of the BS transmitted signal for spectrum emission mask testing

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.2.1.4.1.2 1,28 Mcps TDD option

- (1) Connect the measuring equipment to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 6.17A.

Table 6.17A: Parameters of the BS transmitted signal for spectrum emission mask 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.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---NEXT 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 RRC filtered mean power centered on the assigned channel frequency to the RRC filtered mean power centered on an adjacent channel frequency. 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 RRC filtered mean power for the given bandwidth of the victim system at the defined adjacent channel offset. ~~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 $\alpha=0,22$ 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.

---NEXT SECTION---

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 ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test/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.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test/active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---NEXT SECTION---

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.329-98 [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.329-98, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-98, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-98, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-98, 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.329-98, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-98, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-98, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-98, 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.329-98 [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.329-98, s4.1
150 kHz – 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-98, s4.1
30 MHz – 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-98, s4.1
1 GHz – Fc1 - 60 MHz or FI - 10 MHz <i>whichever is the higher</i>	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-98, s4.1
Fc1 - 60 MHz or FI - 10 MHz <i>whichever is the higher</i> – Fc1 - 50 MHz or FI -10 MHz <i>whichever is the higher</i>	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-98, s4.3 and Annex 7
Fc1 - 50 MHz or FI -10 MHz <i>whichever is the higher</i> – Fc2 + 50 MHz or Fu +10 MHz <i>whichever is the lower</i>	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-98, s4.3 and Annex 7
Fc2 + 50 MHz or Fu + 10 MHz <i>whichever is the lower</i> – Fc2 + 60 MHz or Fu + 10 MHz <i>whichever is the lower</i>	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-98, s4.3 and Annex 7
Fc2 + 60 MHz or Fu + 10 MHz <i>whichever is the lower</i> – 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-98, s4.1. Upper frequency as in ITU-R SM.329-98, 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

FI : 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.329-98, s4.1
150kHz – 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU SM.329-98, s4.1
30MHz – 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU SM.329-98, s4.1
1GHz ↔ Fc1-19,2 MHz or FI –10 MHz <i>whichever is the higher</i>	-30 dBm	1 MHz	Bandwidth as in ITU SM.329-98, s4.1
Fc1 – 19,2 MHz or FI -10 MHz <i>whichever is the higher</i> ↔ Fc1 - 16 MHz or FI –10 MHz <i>whichever is the higher</i>	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-98, s4.1
Fc1 - 16 MHz or FI –10 MHz <i>whichever is the higher</i> ↔ Fc2 + 16 MHz or Fu +10 MHz <i>whichever is the lower</i>	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-98, s4.1
Fc2 + 16 MHz or Fu + 10 MHz <i>whichever is the lower</i> ↔ Fc2 +19,2 MHz or Fu + 10 MHz <i>whichever is the lower</i>	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-98, s4.1
Fc2 + 19,2 MHz or Fu +10 MHz <i>whichever is the lower</i> ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-98, s4.1. Upper frequency as in ITU-R SM.329-98, 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

FI : 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.

---NEXT SECTION---

6.6.3.4 Method of test

6.6.3.4.1 Initial conditions

6.6.3.4.1.0 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.

6.6.3.4.1.1 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 6.37.

Table 6.37: Parameters of the BS transmitted signal for spurious emissions testing

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each <u>time slot</u> <u>under test</u> active <u>TS</u>	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.3.4.1.2 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 6.37A.

Table 6.37A: Parameters of the BS transmitted signal for spurious emissions 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.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each <u>time slot</u> <u>under test</u> active <u>TS</u>	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---NEXT SECTION---

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.

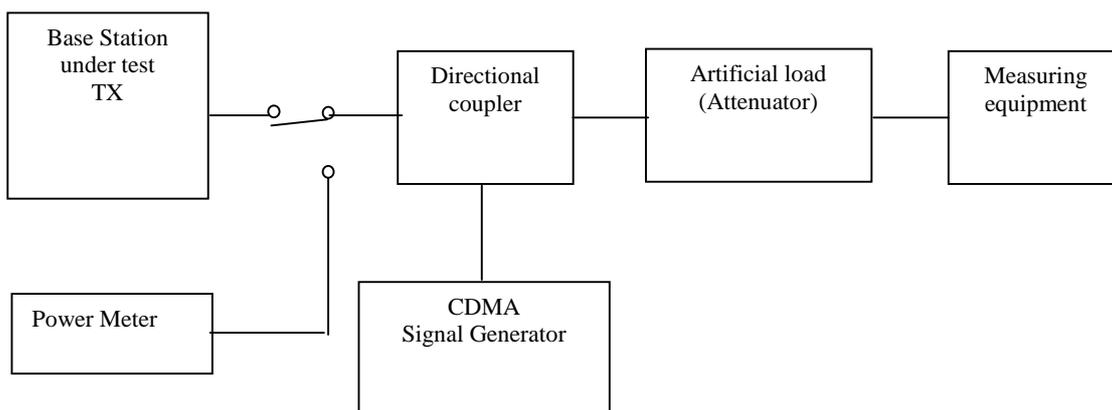


Figure 6.2: Measuring setup for Base Station transmit intermodulation testing

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is odd; receive, if i is even.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test 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 $\pm 1,6$ MHz, $\pm 3,2$ MHz and $\pm 4,8$ 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.

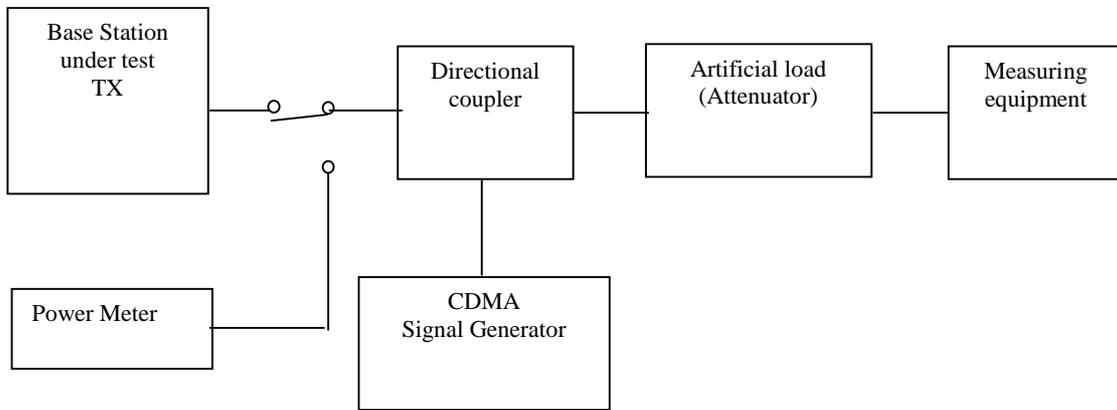


Figure 6.2A: Measuring setup for Base Station transmit intermodulation testing

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.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each <u>each time slot under test</u> active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---NEXT SECTION---

6.8 Transmit Modulation

6.8.1 Modulation accuracy

6.8.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth corresponding to the considered chip rate and roll-off $\alpha = 0,22$. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %. The measurement interval is one timeslot. The requirement is valid over the total power dynamic range as specified in section 3.1.25.105 subclause 6.4.3. See Annex C of this specification for further details.

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

NOTE: The theoretical modulated waveform shall be calculated on the basis that the transmit pulse shaping filter is a root-raised cosine (RRC) with roll-off $\alpha = 0,22$ in the frequency domain. The impulse response of the chip impulse filter $RC_0(t)$ is

$$RC_0(t) = \frac{\sin\left(\pi \frac{t}{T_c}(1-\alpha)\right) + 4\alpha \frac{t}{T_c} \cos\left(\pi \frac{t}{T_c}(1+\alpha)\right)}{\pi \frac{t}{T_c} \left(1 - \left(4\alpha \frac{t}{T_c}\right)^2\right)}$$

Where the roll-off factor $\alpha = 0,22$ and T_c is the chip duration

6.8.1.2 Minimum Requirements

The error vector magnitude (EVM) shall not exceed 12,5 %. The requirement is valid over the total power dynamic range as specified in section 3.1.25.105 subclause 6.4.3 of TS 25.105.

The normative reference for this requirement is TS 25.105 [1] subclause 6.8.2.1.

6.8.1.3 Test purpose

The test purpose is to verify the ability of the BS transmitter to generate a sufficient precise waveform and thus to enable the UE receiver to achieve the specified error performance.

6.8.1.4 Method of test

6.8.1.4.1 Initial conditions

6.8.1.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.8.1.4.1.1 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 6.39.

Table 6.39: Parameters of the BS transmitted signal for modulation accuracy testing

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
Number of DPCH in each- <u>time slot</u> under test active TS	1
BS power setting	PRAT
Data content of DPCH	real life (sufficient irregular)

6.8.1.4.1.2 1,28 Mcps TDD option

- (1) Connect the measuring equipment to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 6.39A.

Table 6.39A: Parameters of the BS transmitted signal for modulation accuracy testing for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 6$: Transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
Number of DPCH in each <u>time slot</u> under test active TS	1
Base station power	PRAT maximum, according to manufacturer's declaration
Data content of DPCH	real life (sufficient irregular)

6.8.1.4.2 Procedure

- (1) Measure the error vector magnitude (EVM) by applying the global in-channel Tx test method described in Annex C.
- (2) Set the BS output power to maximum output power– 30 dB and repeat step (1) above.

6.8.1.5 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 error vector magnitude (EVM) measured according to subclause 6.8.1.4.2 shall not exceed 12,5 %.

6.8.2 Peak code domain error

6.8.2.1 Definition and applicability

The code domain error is computed by projecting the error vector power onto the code domain at a specific spreading factor. The error power for each code is defined as the ratio to the mean power of the reference waveform expressed in

dB. And the Peak Code Domain Error is defined as the maximum value for Code Domain Error. The measurement interval is one timeslot.

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

6.8.2.2 Minimum Requirements

The peak code domain error shall not exceed -28 dB at spreading factor 16.

The normative reference for this requirement is TS 25.105 [1] subclause 6.8.3.1.

6.8.2.3 Test purpose

The test purpose is to verify the ability of the BS transmitter to limit crosstalk among codes and thus to enable the UE receiver to achieve the specified error performance.

6.8.2.4 Method of test

6.8.2.4.1 Initial conditions

6.8.2.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

6.8.2.4.1.1 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 6.40.

Table 6.40: Parameters of the BS transmitted signal

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)
Spreading factor	16

6.8.2.4.1.2 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 6.40A.

Table 6.40A: Parameters of the BS transmitted signal for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 6$: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)
Spreading factor	16

6.8.2.4.2 Procedure

Measure the peak code domain error by applying the global in-channel Tx test method described in Annex C.

6.8.2.5 Test Requirements

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

The peak code domain error measured according to subclause 6.8.2.4.2 shall not exceed -27 dB.

7 Receiver characteristics

7.1 General

All tests unless otherwise stated in this subclause shall be conducted on Base Station Systems fitted with a full complement of Transceivers for the configuration. The manufacturer shall provide appropriate logical or physical test access to perform all tests in this subclause. Measurements shall include any RX multicoupler.

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

~~For receivers with diversity, testing of conformance shall be performed by applying the specified signals to one of the receiver inputs, and terminating or disabling the other(s).~~

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

Unless detailed the receiver characteristic are specified at each antenna connector of the BS.

Unless otherwise stated, all tests in this clause shall be performed at the BS antenna connector (test port A). If any external apparatus such as a RX amplifier, a filter or the combination of such devices is used, the tests according to subclauses 5.14.4 shall be performed to ensure that the requirements are met at test port B.

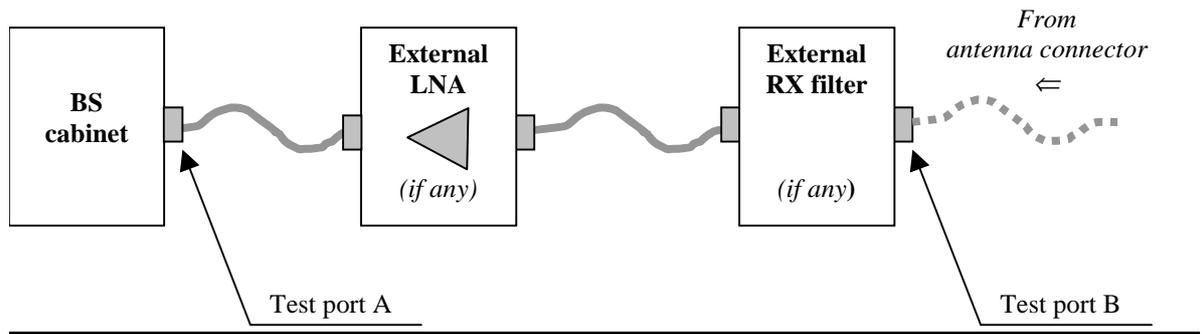


Figure X.X: Receiver test ports

---NEXT SECTION---

7.7.4 Method of test

7.7.4.1 Initial conditions

7.7.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

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

7.7.4.1.1 3,84 Mcps TDD option

- (1) Connect the measuring equipment to the antenna connector of one BS Rx port.
- (2) Terminate or disable any other BS Rx port not under test.
- (3) Set the BS receiver to operational mode.
- (4) Set the BS to transmit a signal with parameters according to table 7.13.
- (5) Terminate the Tx port(s).

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 14$: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i , i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

7.7.4.1.2 1,28 Mcps TDD option

- (1) Connect the measuring equipment to the antenna connector of one BS Rx port.
- (2) Terminate or disable any other BS Rx port not under test.
- (3) Set the BS receiver to operational mode.
- (4) Set the BS to transmit a signal with parameters according to table 7.13A.
- (5) Terminate the Tx port(s).

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

Parameter	Value/description
TDD Duty Cycle	TS i ; $i = 0, 1, 2, \dots, 6$: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test active TS	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

---END OF CORRECTION ---

CHANGE REQUEST

⌘ **25.142 CR 148** ⌘ rev ⌘ Current version: **4.6.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Averaging period in ACLR test for 1.28 Mcps TDD option		
Source:	⌘ RAN WG4		
Work item code:	⌘ LCRTDD-RF	Date:	⌘ 26/11/2002
Category:	⌘ F	Release:	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	R96	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R97	(Release 1996)
	B (addition of feature),	R98	(Release 1997)
	C (functional modification of feature)	R99	(Release 1998)
	D (editorial modification)	Rel-4	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Rel-5	(Release 4)
		Rel-6	(Release 5)
			(Release 6)

Reason for change:	⌘ The averaging period in the ACLR test is not defined.
Summary of change:	⌘ The general measurement period for the RRC filtered mean power is one time slot unless otherwise stated. The noisy nature of adjacent channel power requires an averaging over a longer period for repeatability of the measurement results. The averaging period is defined to be of at least one time slot.
Consequences if not approved:	⌘ The test procedure remains ambiguous. This may lead to inconsistent conformance test results. Isolated impact analysis: The proposed correction has no impact on NodeB implementation or NodeB-UE interworking since it is a correction to a test specification.

Clauses affected:	⌘ 6.6.2.2.4.2.2										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	X	X	X	X	X	X	Other core specifications	⌘
Y	N										
X	X										
X	X										
X	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘ Equivalent CRs in other Releases: CR149 cat. A to 25.142 v5.2.0										

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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.

6.6.2.2.4.2.2 1,28 Mcps TDD option

- 1) Measure the RRC filtered mean 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).
- 2) Average over ~~TBD~~ at least one time slots.
- 3) Measure the RRC filtered mean 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).
- 4) Average over ~~TBD~~ at least one time slots.
- 5) Calculate the ACLR by the ratio:

$$\text{ACLR} = \text{average power acc. to (2)} / \text{average interference power acc. to (4)}.$$

- 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 RRC filtered mean 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).
- 9) Average over ~~TBD~~ at least one time slots.
- 10) Calculate the ACLR by the ratio

$$\text{ACLR} = \text{average power acc. to (7)} / \text{average interference power acc. to (9)}.$$

- 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).

CHANGE REQUEST

⌘ **25.142 CR 149** ⌘ rev ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Averaging period in ACLR test for 1.28 Mcps TDD option		
Source:	⌘ RAN WG4		
Work item code:	⌘ LCRTDD-RF	Date:	⌘ 26/11/2002
Category:	⌘ A	Release:	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
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	C (functional modification of feature)	R98	(Release 1998)
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	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4	(Release 4)
		Rel-5	(Release 5)
		Rel-6	(Release 6)

Reason for change:	⌘ The averaging period in the ACLR test is not defined.
Summary of change:	⌘ The general measurement period for the RRC filtered mean power is one time slot unless otherwise stated. The noisy nature of adjacent channel power requires an averaging over a longer period for repeatability of the measurement results. The averaging period is defined to be of at least one time slot.
Consequences if not approved:	⌘ The test procedure remains ambiguous. This may lead to inconsistent conformance test results. Isolated impact analysis: The proposed correction has no impact on NodeB implementation or NodeB-UE interworking since it is a correction to a test specification.

Clauses affected:	⌘ 6.6.2.2.4.2.2						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
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<input checked="" type="checkbox"/>							
Other comments:	⌘ Equivalent CRs in other Releases: CR148 cat. F to 25.142 v4.6.0						

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6.6.2.2.4.2.2 1,28 Mcps TDD option

- 1) Measure the RRC filtered mean 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).
- 2) Average over ~~TBD~~ at least one time slots.
- 3) Measure the RRC filtered mean 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).
- 4) Average over ~~TBD~~ at least one time slots.
- 5) Calculate the ACLR by the ratio:

$$\text{ACLR} = \text{average power acc. to (2)} / \text{average interference power acc. to (4)}.$$

- 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 RRC filtered mean 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).
- 9) Average over ~~TBD~~ at least one time slots.
- 10) Calculate the ACLR by the ratio

$$\text{ACLR} = \text{average power acc. to (7)} / \text{average interference power acc. to (9)}.$$

- 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).