TSG RAN Meeting #15 **RP-020030**

Cheju, Korea, 5 - 8 March 2002

Title: **CRs (Rel-4) to TS 25.142**

Source: **TSG RAN WG4**

Agenda Item: **7.4.4**

RAN4 Tdoc	Spec	CR	Rev	Phase	Title	Cat	Curr Ver	New Ver
R4-020395	25.142	94	1	Rel-4	Amendment for BS ACLR2 test of 1.28 Mcps TDD option	F	4.3.0	4.4.0
R4-020396	25.142	95	1	Rel-4	Amendment for BS Spectrum Emission Mask Test of 1.28Mcps TDD Option	F	4.3.0	4.4.0
R4-020414	25.142	98	1	Rel-4	Consideration of multi-carrier operation in ACLR conformance testing for 1.28 Mcps TDD option	F	4.3.0	4.4.0
R4-020254	25.142	101		Rel-4	Single and multi carrier in spurious emissions conformance testing for 1.28 Mcps TDD option	F	4.3.0	4.4.0
R4-020444	25.142	104	1	Rel-4	Correction of transmit intermodulation conformance testing for 1.28 Mcps TDD option	F	4.3.0	4.4.0

3GPP TSG RAN WG4 Meeting #21 **R4-020254**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** **101** ⌘ ev **-** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘	Single and multi carrier in spurious emissions conformance testing for 1.28 Mcps TDD option
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	1/2/2002
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:	⌘	The current spurious emissions requirement for 1.28 Mcps TDD option covers single and multicarrier BS for Category A and B requirements, but not for the co-existence and co-location requirements. This is in conflict with the ITU-R M.[IMT.UNWANT-BS], where all spurious emission requirements are for both single and multicarrier. The application of the limits, as stated in ITU-R SM.329-8 and ITU-R M.[IMT.UNWANT-BS] for the additional requirements is missing.
Summary of change:	⌘	Section 5.3 is extended to cover tests with multicarrier configuration also. The provision for single and multicarrier and for application of limits are moved to section 6.6.3.1, which is the general section for spurious emissions. The general test conditions in section 6.6.3.4.1.0 are extended to test at multiple carriers if supported.
Consequences if not approved:	⌘	There would be a conflict between the spurious emission requirements in the test specification and the one in ITU-R M.[IMT.UNWANT-BS]. Isolated Impact Analysis: Correction of a requirement where the specification was ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.

Clauses affected:	⌘	6.6.3.1, 6.6.3.2.1.1.2, 6.6.3.2.1.2.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

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

6.6.3 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 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.

--- next changed section ---

6.6.3.2.1.1.2 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.~~

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.

--- next changed section ---

6.6.3.2.1.2.2 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.~~

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30A.

3GPP TSG RAN WG4 Meeting #21 **R4-020414**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.142** **CR** **98** ⌘ ev **1** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘	Consideration of multi-carrier operation in ACLR conformance testing for 1.28 Mcps TDD option
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	1/2/2002
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:	⌘	The ACLR requirement shall apply for all configurations of BS (single carrier or multi-carrier). Currently, ACLR is tested at single carrier only.
Summary of change:	⌘	- Section 5.3 extended to cover tests with multicarrier configuration. - ACLR test procedure modified to support multiple carriers under test. - BS adjacent channel offsets clarified in line with TS 25.105
Consequences if not approved:	⌘	The ACLR test will be incomplete. Isolated Impact Analysis: Correction of a requirement where the specification was ambiguous or not sufficiently explicit. This CR would affect conformance testing only, would not affect implementations, BS–UE interoperability or system performance.

Clauses affected:	⌘	6.6.2.2.2.1.2; 6.6.2.2.4.2.2; 6.6.2.2.5.2
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

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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 $\alpha = 0,22$ 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 shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

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

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

6.6.2.2.2.1.2 1,28 Mcps TDD option

The ACLR <u>of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies</u> 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 <u>below the first or above the last carrier frequency used</u>	ACLR limit
~~±~~1.6 MHz	40 dB
~~±~~3.2 MHz	50 dB

<u>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.</u>

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

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 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 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 assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (center frequency 5 MHz and 10 MHz above the assigned channel frequency of the transmitted signal, respectively).

6.6.2.2.4.2.2 1,28 Mcps TDD option

(1) Measure 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 lowest 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).

(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) ~~and also~~ for the ~~first and~~ second upper adjacent RF channel (center frequency ~~1,6 MHz and~~ 3,2 MHz above the highest assigned channel frequency of the transmitted signal~~, respectively~~).

6.6.2.2.5 Test Requirements

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

6.6.2.2.5.1 3,84 Mcps TDD option

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

Table 6.26: BS ACLR Test Requirements

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

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

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

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

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

6.6.2.2.5.2 1,28 Mcps TDD option

The ACLR calculated in 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	49 dB

3GPP TSG RAN WG4 Meeting #21 **R4-020396**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** **95** ⌘ **rev** **1** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘	Amendment for BS Spectrum Emission Mask Test of 1.28Mcps TDD Option
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	1/2/2002
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)*
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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:	⌘	Align the spectrum emission mask test with the spectrum emission mask change in TS25.105.
Summary of change:	⌘	Spectrum emission mask test(1.28Mcps TDD) is changed.
Consequences if not approved:	⌘	Not align with the spectrum mask in TS25.105. Isolated Impact Analysis: Correction of a requirement where the specification was ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.

Clauses affected:	⌘	6.6.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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6.6.2 Out of band emission

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

6.6.2.1 Spectrum emission mask

6.6.2.1.1 Definition and applicability

6.6.2.1.1.1 3,84 Mcps TDD option

The spectrum emission mask specifies the limit of the transmitter out of band emissions at frequency offsets from the assigned channel frequency of the wanted signal between 2,5 MHz and 12,5 MHz.

The mask defined in subclause 6.6.2.1.2.1 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.6.2.1.1.2 1,28 Mcps TDD option

The spectrum emission mask specifies the limit of the transmitter out of band emissions at frequency offsets from the assigned channel frequency of the wanted signal between 0,8 MHz and 4 MHz.

The mask defined in subclause 6.6.2.1.2.2 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.6.2.1.2 Minimum Requirements

6.6.2.1.2.1 3,84 Mcps TDD option

For regions where this subclause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.13 to 6.16 in the frequency range of f_offset from 2,515 MHz to f_offset_{max} from the carrier frequency, where:

f_offset is the separation between the carrier frequency and the centre of the measurement filter

f_offset_{max} is either 12,5 MHz or the offset to the UMTS Tx band edge as defined in subclause 4.2, whichever is the greater.

Table 6.13: Spectrum emission mask values, BS rated output power PRAT ≥ 43 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	-14 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	- 14 - 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	-26 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	-13 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 6.14: Spectrum emission mask values, BS rated output power 39 ≤ PRAT < 43 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	-14 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	-14 - 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	-26 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	-13 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	P – 56 dBm	1 MHz

Table 6.15: Spectrum emission mask values, BS rated output power 31 ≤ PRAT < 39 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	P – 53 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	P – 53 - 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	P – 65 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	P – 52 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	P – 56 dBm	1 MHz

Table 6.16: Spectrum emission mask values, BS rated output power PRAT < 31 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	-22 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	-22 – 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	-34 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	-21 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.1.1

6.6.2.1.2.2 1,28 Mcps TDD option

For regions where this subclause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.13A to 16A in the frequency range of f_offset from 0.815 MHz to f_offset_{max} from the carrier frequency, where:

- f_offset is the separation between the carrier frequency and the centre of the measurement filter
- f_offset_{max} is either 4 MHz or the offset to the UMTS Tx band edge as defined in subclause 4.2, whichever is the greater.

Table 6.13A: Spectrum emission mask values, BS maximum output power P ≥ ~~43~~ 34 dBm for 1,28 Mcps TDD

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
0.815MHz ≤ f_offset < 1.015MHz	~~14~~ 20 dBm	30 kHz
1.015MHz ≤ f_offset < 1.815MHz	~~- 14 - 15 (f_offset – 1.015) dBm~~ $-20dBm-10\cdot\left(\frac{f\_offset}{MHz}-1{,}015\right)dB$	30 kHz
1.815MHz ≤ f_offset < 2.3MHz	-28 dBm	30 kHz
2.3MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 6.14A: Spectrum emission mask values, BS maximum output power ~~39~~ 26 ≤ P < ~~43~~ 34 dBm for 1,28 Mcps TDD

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
0.815MHz ≤ f_offset < 1.015MHz	~~-14~~P-54 dB~~m~~	30 kHz
1.015MHz ≤ f_offset < 1.815MHz	~~-14 - 15 (f_offset – 1.015) dBm~~ $P-54dB-10\cdot\left(\frac{f\_offset}{MHz}-1{,}015\right)dB$	30 kHz
~~1.815MHz ≤ f_offset < 2.415MHz~~	~~-28 dBm~~	~~30 kHz~~
~~2.415~~1.815MHz ≤ f_offset < ~~2.9~~2.3MHz	P-~~71~~ 62 dB~~m~~	30 kHz
~~2.9~~2.3MHz ≤ f_offset < f_offset_{max}	P - ~~56~~ 47 dB~~m~~	1 MHz

~~**Table 6.15A: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm for 1,28 Mcps TDD**~~

~~Frequency offset of measurement filter centre frequency, f_offset~~	~~Maximum level~~	~~Measurement bandwidth~~
~~0.815MHz ≤ f_offset < 1.015MHz~~	~~P - 53 dBm~~	~~30 kHz~~
~~1.015MHz ≤ f_offset < 1.815MHz~~	~~P - 53 - 15 (f_offset – 1.015) dBm~~	~~30 kHz~~
~~1.815MHz ≤ f_offset < 2.415MHz~~	~~P - 67 dBm~~	~~30 kHz~~
~~2.415MHz ≤ f_offset < 2.9MHz~~	~~P - 71 dBm~~	~~30 kHz~~
~~2.9MHz ≤ f_offset < f_offset$_{max}$~~	~~P - 56 dBm~~	~~1 MHz~~

Table 6.~~16A~~15A: Spectrum emission mask values, BS maximum output power P < ~~31~~ 26 dBm for 1,28 Mcps TDD

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
0.815MHz ≤ f_offset < 1.015MHz	~~-22~~ 28 dBm	30 kHz
1.015MHz ≤ f_offset < 1.815MHz	~~-22 - 15 (f_offset – 1.015) dBm~~ $-28dBm-10\cdot\left(\frac{f\_offset}{MHz}-1{,}015\right)dB$	30 kHz
~~1.815MHz ≤ f_offset < 2.415MHz~~	~~-36 dBm~~	~~30 kHz~~
~~2.415~~1.815MHz ≤ f_offset < ~~2.9~~2.3MHz	-~~40~~ 36 dBm	30 kHz
~~2.9~~2.3MHz ≤ f_offset < f_offset_{max}	-~~25~~ 21 dBm	1 MHz

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.2.1.2.

6.6.2.1.3 Test purpose

The test purpose is to verify that the BS out of band emissions do not result in undue interference to any other system (wideband, narrowband) operating at frequencies close to the assigned channel bandwidth of the wanted signal.

This test is independent of the characteristics of possible victim systems and, therefore, complements the tests on occupied bandwidth in 6.6.1 (verifying the spectral concentration of the BS Tx emissions) and on ACLR in 6.6.2.2 (simulating the perception of other UTRA receivers).

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, ..., 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)

6.6.2.1.4.1.2 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~~16A: 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.
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)

6.6.2.1.4.2 Procedure

6.6.2.1.4.2.1 3,84 Mcps TDD option

Measure the power of the BS spectrum emissions by applying measurement filters with bandwidths as specified in the relevant table in subclause 6.6.2.1.2.1. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The centre frequency of the filter shall be stepped in contiguous steps over the ranges of frequency offsets f_offset as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

For frequency offsets of the measurement filter centre frequency in the range 4,0 MHz ≤ f_offset < f_offset_{max}, the measurement shall be performed by applying filters with measurement bandwidth of 50 kHz or less and integrating the measured results over the nominal measurement bandwidth 1 MHz specified in the tables in subclause 6.6.2.1.2.1.

6.6.2.1.4.2.2 1,28 Mcps TDD option

Measure the power of the BS spectrum emissions by applying measurement filters with bandwidths as specified in the relevant table in subclause 6.6.2.1.2.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The centre frequency of the filter shall be stepped in contiguous steps over the ranges of frequency offsets f_offset as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

The measurement shall be performed by applying filters with measurement bandwidth of 50 kHz or less and integrating the measured results over the nominal measurement bandwidth 1 MHz specified in the tables in subclause 6.6.2.1.2.2 when the measurement bandwidth is 1MHz.

6.6.2.1.5 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.

6.6.2.1.5.1 3,84 Mcps TDD option

The spectrum emissions measured according to subclause 6.6.2.1.4.2.1 shall not exceed the maximum level specified in tables 6.18 to 6.21 for the appropriate BS rated output power

Table 6.18: Test Requirements for spectrum emission mask values, BS rated output power PRAT ≥ 43 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	-12,5 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	- 12,5 – 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	-24,5 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	-11,5 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	-11,5 dBm	1 MHz

Table 6.19: Test Requirements for spectrum emission mask values, BS rated output power 39 ≤ PRAT < 43 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	-12,5 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	-12,5 – 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	-24,5 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	-11,5 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	P – 54,5 dBm	1 MHz

Table 6.20: Test Requirements for spectrum emission mask values, BS rated output power 31 ≤ PRAT < 39 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	P – 51,5 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	P – 51,5 - 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	P – 63,5 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	P – 50,5 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	P – 54,5 dBm	1 MHz

Table 6.21: Test Requirements for spectrum emission mask values, BS rated output power PRAT < 31 dBm

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,515 MHz ≤ f_offset < 2,715 MHz	-20,5 dBm	30 kHz
2,715 MHz ≤ f_offset < 3,515 MHz	-20,5 – 15·(f_offset – 2,715) dBm	30 kHz
3,515 MHz ≤ f_offset < 4,0 MHz	-32,5 dBm	30 kHz
4,0 MHz ≤ f_offset < 8,0 MHz	-19,5 dBm	1 MHz
8,0 MHz ≤ f_offset < f_offset_{max}	-23,5 dBm	1 MHz

6.6.2.1.5.2 1,28 Mcps TDD option

The spectrum emissions measured according to subclause 6.6.2.1.4.2.2 shall be within the mask defined in the table 6.18A to 6.21A.

Table 6.~~18A~~17A: Test requirements for spectrum emission mask values, BS maximum output power P ≥ ~~43~~ 34 dBm for 1,28 Mcps TDD

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
0.815MHz ≤ f_offset < 1.015MHz	~~-12.5~~-18.5 dBm	30 kHz
1.015MHz ≤ f_offset < 1.815MHz	~~- 12.5 - 15 (f_offset – 1.015) dBm~~ $-18.5dBm - 10 \cdot \left(\frac{f\_offset}{MHz} - 1{,}015 \right) dB$	30 kHz
1.815MHz ≤ f_offset < 2.3MHz	-26.5 dBm	30 kHz
2.3MHz ≤ f_offset < f_offset$_{max}$	-11.5 dBm	1 MHz

Table 6.~~19A~~18A: Test requirements for spectrum emission mask values, BS maximum output power ~~39~~ 26 ≤ P < ~~43~~ 34 dBm for 1,28 Mcps TDD

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
0.815MHz ≤ f_offset < 1.015MHz	~~-12.5~~P-52.5 dB~~m~~	30 kHz
1.015MHz ≤ f_offset < 1.815MHz	~~-12.5 - 15 (f_offset – 1.015) dBm~~ $P - 52.5dB - 10 \cdot \left(\frac{f\_offset}{MHz} - 1{,}015 \right) dB$	30 kHz
~~1.815MHz ≤ f_offset < 2.415MHz~~	~~-26.5 dBm~~	~~30 kHz~~
~~2.415~~1.815MHz ≤ f_offset < ~~2.9~~2.3MHz	P-~~69.5~~60.5 dB~~m~~	30 kHz
~~2.9~~2.3MHz ≤ f_offset < f_offset$_{max}$	P – ~~54.5~~45.5 dB~~m~~	1 MHz

~~**Table 6.20A: Test requirements for spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm for 1,28 Mcps TDD**~~

~~Frequency offset of measurement filter centre frequency, f_offset~~	~~Maximum level~~	~~Measurement bandwidth~~
~~0.815MHz ≤ f_offset < 1.015MHz~~	~~P – 51.5 dBm~~	~~30 kHz~~
~~1.015MHz ≤ f_offset < 1.815MHz~~	~~P – 51.5 - 15 (f_offset – 1.015) dBm~~	~~30 kHz~~
~~1.815MHz ≤ f_offset < 2.415MHz~~	~~P – 65.5 dBm~~	~~30 kHz~~
~~2.415MHz ≤ f_offset < 2.9MHz~~	~~P – 69.5 dBm~~	~~30 kHz~~
~~2.9MHz ≤ f_offset < f_offset$_{max}$~~	~~P – 54.5 dBm~~	~~1 MHz~~

Table 6.~~21A~~19A: Test requirements for spectrum emission mask values, BS maximum output power P < ~~31~~ 26 dBm for 1,28 Mcps TDD

Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
0.815MHz ≤ f_offset < 1.015MHz	~~-20.5~~-26.5 dBm	30 kHz
1.015MHz ≤ f_offset < 1.815MHz	~~-20.5 - 15 (f_offset – 1.015) dBm~~ $-26.5dBm - 10 \cdot \left(\frac{f\_offset}{MHz} - 1{,}015 \right) dB$	30 kHz
~~1.815MHz ≤ f_offset < 2.415MHz~~	~~-34.5 dBm~~	~~30 kHz~~
~~2.415~~1.815MHz ≤ f_offset < ~~2.9~~2.3MHz	~~-38.5~~-34.5 dBm	30 kHz
~~2.9~~2.3MHz ≤ f_offset < f_offset$_{max}$	~~-23.5~~-19.5 dBm	1 MHz

3GPP TSG RAN WG4 Meeting #21 **R4-020395**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.142** **CR** **94** ⌘ **rev** **1** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘	Amendment for BS ACLR2 test of 1.28 Mcps TDD option
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	1/2/2002
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:	⌘	BS ACLR requirements are stringent to 1.28Mcps TDD
Summary of change:	⌘	BS ACLR for bi-adjacent carrier (1.28 Mcps TDD option) is changed from 50dB to 45dB.
Consequences if not approved:	⌘	Unnecessary hard requirement for the ACLR requirement which can cause difficulities in implementation. Isolated Impact Analysis: Correction of a requirement where the specification was ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.

Clauses affected:	⌘	6.6.2.2.2.1.2; 6.6.2.2.5.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

6.6.2.2 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 $\alpha = 0,22$ 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 shall be equal to or greater than the limits given in table 6.22.

Table 6.22: BS ACLR limits

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

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

6.6.2.2.2.1.2 1,28 Mcps TDD option

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

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

BS adjacent channel offset	ACLR limit
± 1.6 MHz	40 dB
± 3.2 MHz	45~~-50~~ dB

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

6.6.2.2.5 Test Requirements

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

6.6.2.2.5.1 3,84 Mcps TDD option

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

Table 6.26: BS ACLR Test Requirements

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

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

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

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

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

6.6.2.2.5.2 1,28 Mcps TDD option

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

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

BS adjacent channel offset	ACLR limit
± 1.6 MHz	39.2 dB
± 3.2 MHz	44.2~~49~~ dB

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

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

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

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

3GPP TSG RAN WG4 Meeting #21 **R4-020444**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.142** **CR** **104** ⌘ ev **1** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘	Correction of transmit intermodulation conformance testing for 1.28 Mcps TDD option
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	1/2/2002
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:	⌘	The frequency range for measurement of spurious emissions during the transmit intermodulation test is very large, leading to an unnecessary long testing time.
Summary of change:	⌘	Frequency range for measurement of spurious emissions during the transmit intermodulation test limited to cover the relevant frequency range.
Consequences if not approved:	⌘	The test requirement will be ambiguous. Test time will be unnecessary long. Isolated Impact Analysis: Correction of a requirement where the specification was ambiguous or not sufficiently explicit. The CR would allow to reduce the time required for transmit intermodulation conformance testing, but would not affect BS implementations, BS-UE interoperability or system performance.
Clauses affected:	⌘	6.7.1.2; 6.7.4.1.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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 CDMA 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 CDMA signal generator to produce an interference signal with a level of 30 dB lower than that of the BS transmitted signal. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the BS transmitted signal.

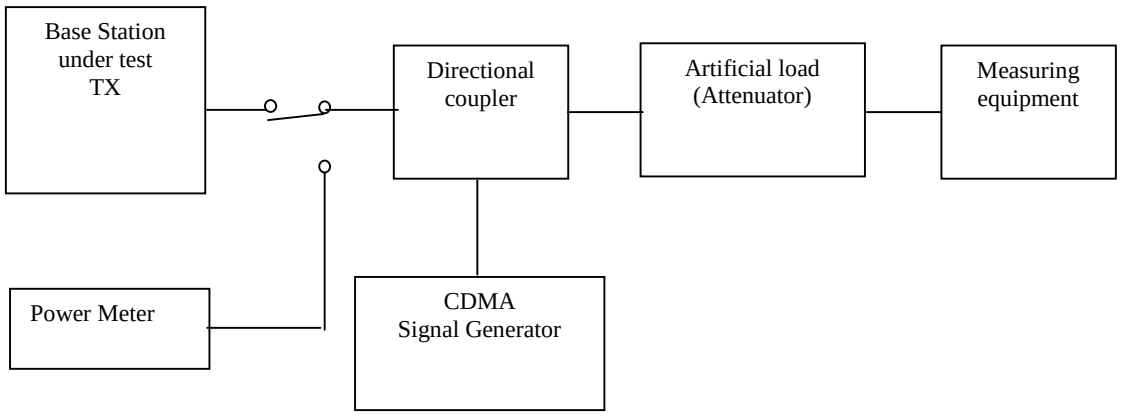

Figure 6.2: Measuring setup for Base Station transmit intermodulation testing

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~~of 30 dB lower than that of the BS transmitted signal~~. 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~~BS transmitted~~ signal, but excluding interference frequencies outside of the UTRA frequency bands specified in 4.2a, 4.2b or 4.2c, respectively.