TSG-RAN Meeting #10 ***RP-000593***
Bangkok, Thailand, 6 - 8 December 2000

Title: Agreed CRs to TS 25.141 [2]

Source: TSG RAN WG4

Agenda Item:5.4.3

Tdoc Num	TS	CR number	Title	Type	Status	Cur Ver	New Ver
R4-001000	25.141	57	Test tolerance for Base station output power	F	agreed	3.3.0	3.4.0
R4-001000	25.141	58	Test tolerance for Adjacent Channel Leakage Ratio	F	agreed	3.3.0	3.4.0
R4-001000	25.141	59	Test tolerance for Spectrum emission mask	F	agreed	3.3.0	3.4.0
R4-001000	25.141	62	Annex explaining implementation of Test tolerance to Tests	F	agreed	3.3.0	3.4.0

3GPP TSG-RAN4 Meeting #14
Sophia Antipolis, France, 13-17 November, 2000

Tdoc R4-001000

CR-Form-v3

CHANGE REQUEST

⌘ **TS 25.141 CR 57** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

Title:	⌘	Test tolerance for Base station output power
Source:	⌘	TSG RAN WG4
Work item code:	⌘	***Date:*** ⌘ 00-11-16
Category:	⌘	**F** ***Release:*** ⌘ R99

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

Use one of the following releases:

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

Reason for change:	⌘	The correct test limit is introduced
Summary of change:	⌘	The test limit is introduced by applying the test tolerance to the core specification value
Consequences if not approved:	⌘	The core specification value has been derived without consideration of test tolerance. If it is not applied, the test will be incorrect.

Clauses affected:	⌘	6.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Is aligned with CR 62 for TS 25.141.

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6.2 Base station output power

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

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

6.2.1 Base station maximum output power

6.2.1.1 Definition and applicability

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

6.2.1.2 Conformance requirement

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

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

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

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

6.2.1.3 Method of test

6.2.1.3.1 Initial conditions

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

6.2.1.3.2 Procedure

1. Set the base station to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model1 in subclause 6.1.1.1.
2. Measure the mean power at the RF output port over a certain slots.

6.2.1.4 Test requirements

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

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CHANGE REQUEST

⌘ **TS 25.141 CR 58** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

Title:	⌘	Test tolerance for Adjacent Channel Leakage Ratio
Source:	⌘	TSG RAN WG4
Work item code:	⌘	***Date:*** ⌘ 00-11-16
Category:	⌘	**F** ***Release:*** ⌘ R99

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R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The correct test limit is introduced.
Summary of change:	⌘	The test limit is introduced by applying the test tolerance to the core specification value.
Consequences if not approved:	⌘	The core specification value has been derived without consideration of test tolerance. If it is not applied, the test will be incorrect.

Clauses affected:	⌘	6.5.2.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Is aligned with CR 62 for TS 25.141.

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6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.5.2.2.1 Definition and applicability

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

6.5.2.2.2 Conformance requirement

Table 6.15: BS ACLR

BS channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	44.2~~45~~ dB
10 MHz	49.2~~50~~ dB

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

6.5.2.2.3 Test purpose

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

6.5.2.2.4 Method of test

6.5.2.2.4.1 Initial conditions

1) Connect measurement device to the base station RF output port as shown in annex B.

2) The measurement device characteristics shall be:

   - measurement filter bandwidth: defined in subclause 6.5.2.2.1;

   - detection mode: true RMS voltage or true average power.

3) Set the base station to transmit a signal modulated in accordance with 6.1.1.1 Test model 1. Total power at the RF output port shall be the maximum output power as specified by the manufacturer.

4) Set carrier frequency within the frequency band supported by BS. Minimum carrier spacing shall be 5 MHz and maximum carrier spacing shall be specified by manufacturer.

6.5.2.2.4.2 Procedure

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

2) All RF channel configurations supported by BS shall be verified.

6.5.2.2.5 Test requirement

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

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CHANGE REQUEST

⌘ **TS 25.141 CR 59** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

Title:	⌘	Test tolerance for Spectrum emission mask
Source:	⌘	TSG RAN WG4
Work item code:	⌘	***Date:*** ⌘ 00-11-16
Category:	⌘	**F** ***Release:*** ⌘ R99

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

Use one of the following releases:

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

Reason for change:	⌘	The correct test limit is introduced
Summary of change:	⌘	The test limit is introduced by applying the test tolerance to the core specification value
Consequences if not approved:	⌘	The core specification value has been derived without consideration of test tolerance. If it is not applied, the test will be incorrect.

Clauses affected:	⌘	6.5.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Is aligned with CR 62 for TS 25.141.

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6.5.2.1 Spectrum emission mask

NOTE: This subclause may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.1 Definitions and applicability

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

6.5.2.1.2 Conformance requirements

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

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

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

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

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.514 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 12.514 – 15·(f_offset-2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.526 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.513 dBm	1 MHz
7.5 ≤ Δf MHz	8.0 MHz ≤ f_offset < f_offset_{max}	-11.513 dBm	1 MHz

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

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.514 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-12.514 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.526 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.513 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.556 dBm	1 MHz

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

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 51.553 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P – 51.553 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 63.565 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 50.552 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.556 dBm	1 MHz

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

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-20.522 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-20.522 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-32.534 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-19.521 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	-23.525 dBm	1 MHz

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

6.5.2.1.3 Test purpose

The purpose of this test is to verify that the BS meet the spectrum emission requirements as specified in TS 25.104, subclause 6.6.2.1.

6.5.2.1.4 Method of test

6.5.2.1.4.1 Initial conditions

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

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

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

4) Detection mode: True RMS.

6.5.2.1.5 Procedures

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

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

6.5.2.1.6 Test requirements

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

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CHANGE REQUEST

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

Title:	⌘	Annex explaining implementation of Test tolerance to Tests
Source:	⌘	TSG RAN WG4
Work item code:	⌘	***Date:*** ⌘ 00-11-16
Category:	⌘	**F** ***Release:*** ⌘ R99

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

Reason for change:	⌘	New test limit have been introduced accounting for test tolerances.
Summary of change:	⌘	An informative Annex explains how the test limit and core specification value relates to each other and what the test tolerance is.
Consequences if not approved:	⌘	When implementing test tolerances, the test limit and the core specification value will differ. If this is not explained, the specification may be open to interpretations.

Clauses affected:	⌘	Annex X
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Is aligned with CRs 57, 58 and 59 for TS 25.141.

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Annex X (informative):
Test Tolerances Applied to the Tests

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

Table X.1. Core requirements, test tolerancas and test limits.

Clause number	Title	Core requirement in TS 25.104	Test tolerance	Test limit in TS 25.141
6.2.1.2	Base station maximum output power	In normal conditions … within +2 dB and -2 dB	0.7 dB	In normal conditions … within +2.7 dB and –2.7 dB
		In extreme conditions… within +2.5 dB and –2.5 dB		In extreme conditions… within +3.2 dB and –3.2 dB
6.5.2.1	Spectrum emission mask	Tables 6.11, 6.12, 6.13 and 6.14: "Maximum level" = X dB	1.5 dB	Tables 6.11, 6.12, 6.13 and 6.14: "Maximum level" = X+1.5 dB
6.5.2.2	Adjacent Channel Leakage power Ratio (ACLR)	45 dB	0.8 dB	44.2 dB
		50 dB		49.2 dB