TSG RAN Meeting #15 **RP-020033**

Cheju, Korea, 5 - 8 March 2002

Title: **CRs (Rel-5) for WI "UTRA FDD Repeater Specification"**

Source: **TSG RAN WG4**

Agenda Item: **9.1.1**

RAN4 Tdoc	Spec	CR	Rev	Phase	Title	Cat	Curr Ver	New Ver
R4-020463	25.143	7		Rel-5	Correction to units in Spectrum emission mask	F	4.2.0	5.0.0
R4-020462	25.106	4		Rel-5	Correction to units in Spectrum emission mask	F	4.1.0	5.0.0

3GPP TSG RAN WG4 Meeting #21 **R4-020462**

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

CR-Form-v4

CHANGE REQUEST

⌘ **25.106** **CR** **4** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

Title:	⌘	Correction to units in Spectrum emission mask
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	1/2/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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 formula for calculating the spectrum emission mask minimum requirement makes incorrect use of units, some units defining the range of Δf are missing and the upper limit for Δf is missing.
Summary of change:	⌘	The usage of units is corrected. The upper limit for Δf is added (Δf_{max}).
Consequences if not approved:	⌘	The requirement is incorrectly specified leading to potential problems with Spectrum Emission Mask interpretation.

Clauses affected:	⌘	9.1.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

9.1.1 Spectrum emission mask

The mask defined in tables 9.1 to 9.4 below may be mandatory in certain regions. In other regions this mask may not be applied.

For regions where this clause applies, the requirement shall be met by a repeater's RF-signal output at maximum gain with WCDMA signals in the operating band of the repeater, at levels that produce the maximum rated output power per channel. The requirements shall also apply at maximum gain without WCDMA signals in the operating band.

Emissions shall not exceed the maximum level specified in tables 9.1 to 9.4 for the appropriate repeater maximum output power, in the frequency range from Δf = 2,5 MHz to Δf_{max} from the 5 MHz channel, where:

- Δf is the separation between the centre frequency of first or last 5 MHz channel used in the operating band and the nominal –3 dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the centre frequency of first or last 5 MHz channel in the operating band and the centre of the measuring filter.
- f_offset_{max} is either 12,5 MHz or the offset to the UTRA band edge at both up- and down-link as defined in section 5.1, whichever is the greater.
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measurement filter.

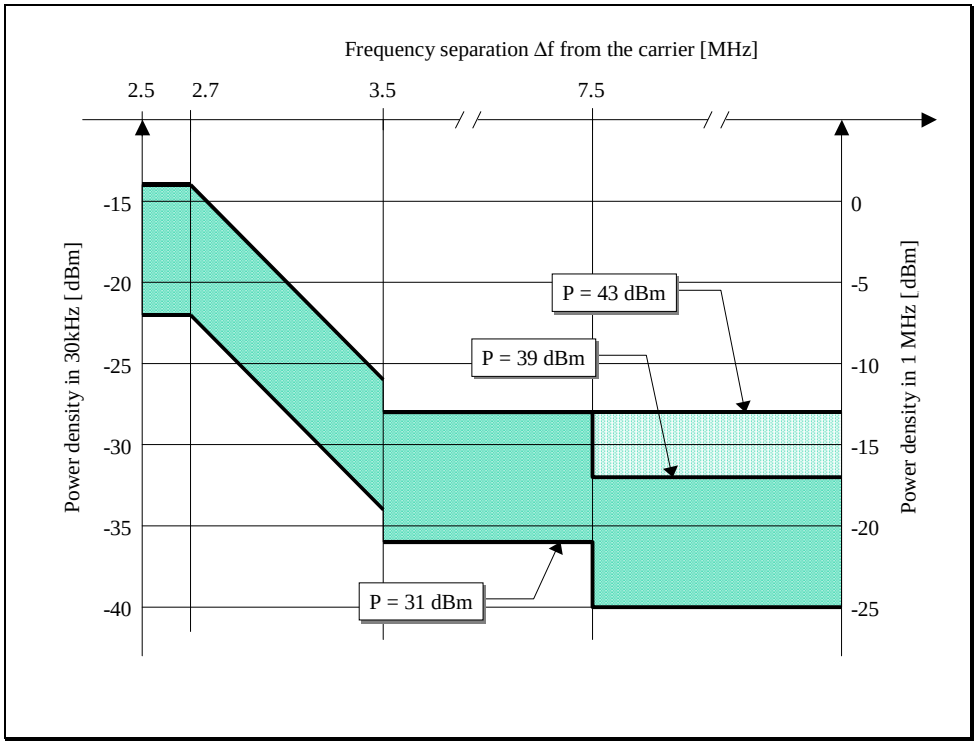

Figure 9.1: Illustrative diagram of spectrum emission mask

Table 9.1: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-14 - 15 (f_offset - 2.715) dBm~~ $-14\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	4,0MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 9.2: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-14 - 15 (f_offset - 2,715) dBm~~ $-14\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
(see note)	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dB~~m~~	1 MHz

Table 9.3: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	P - 53 dB~~m~~	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~P - 53 - 15 (f_offset - 2,715) dBm~~ $P - 53\text{dB} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
(see note)	3,515MHz ≤ f_offset < 4,0MHz	P-65 dB~~m~~	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0MHz ≤ f_offset < 8,0MHz	P - 52 dB~~m~~	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dB~~m~~	1 MHz

Table 9.4: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-22 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-22 - 15 (f_offset - 2,715) dBm~~ $-22\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
(see note)	3,515MHz ≤ f_offset < 4,0MHz	-34 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0MHz ≤ f_offset < 8,0MHz	-21 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of f_offset is continuous.

3GPP TSG RAN WG4 Meeting #21 **R4-020463**

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

CR-Form-v4

CHANGE REQUEST

⌘ **25.143** **CR** **7** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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

Title:	⌘	Correction to units in Spectrum emission mask
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	1/2/2002
Category:	⌘	**F**
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Use one of the following releases:

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R96	*(Release 1996)*
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R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The formula for calculating the spectrum emission mask minimum requirement makes incorrect use of units, some units defining the range of Δf are missing and the upper limit for Δf is missing.
Summary of change:	⌘	The usage of units is corrected. The upper limit for Δf is added (Δf_{max}).
Consequences if not approved:	⌘	The requirement is incorrectly specified leading to potential problems with Spectrum Emission Mask interpretation.

Clauses affected:	⌘	9.1.2 and 9.1.5
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.

9.1.2 Minimum Requirements

For regions where this clause applies, the requirement shall be met by a repeater's RF-signal output at maximum gain with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel. In normal conditions as specified in section 5.4.1 emissions shall not exceed the maximum level specified in Table 9.1, Table 9.2, Table 9.3, and Table 9.4 for the appropriate Repeater maximum output power, in the frequency range from Δf = 2,5 MHz to Δf_{max} from the 5 MHz channel, where:

- Δf is the separation between the centre frequency of first or last 5 MHz channel used in the operating band and the nominal –3 dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the centre frequency of first or last 5 MHz channel in the operating band and the centre of the measuring filter.
- f_offset_{max} is either 12,5 MHz or the offset to the UTRA band edge at both up- and down-link as defined in section 4.1, whichever is the greater.
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measurement filter.

If the operating band corresponds to three or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals in the repeaters operating band.

Table 9.1: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-14 – 15·(f_offset- 2,715) dBm~~ $-14\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 9.2: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-14 – 15·(f_offset - 2,715) dBm~~ $-14\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 d~~B~~m	1 MHz

Table 9.3: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	P - 53 dB~~m~~	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~P – 53 – 15 (f_offset – 2,715) dBm~~ $P - 53dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2,715 \right) dB$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	P - 65 dB~~m~~	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	P - 52 dB~~m~~	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dB~~m~~	1 MHz

Table 9.4: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-22 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-22 – 15 (f_offset - 2,715) dBm~~ $-22dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2,715 \right) dB$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-34 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-21 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

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==========next changed segment ==========

9.1.5 Test requirements

The measurement result of step 3 and 5 of 9.1.4.2 shall not exceed the maximum level specified in tables 9.5 to 9.8 for the appropriate Repeater maximum output power.

Table 9.5: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-12,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-12,5 – 15 (f_offset- 2,715) dBm~~ $-12{,}5\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right)\text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-24,5 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-11,5 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0 MHz ≤ f_offset < f_offset_{max}	-11,5 dBm	1 MHz

Table 9.6: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-12,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-12,5 – 15·(f_offset – 2,715) dBm~~ $-12{,}5\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right)\text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-24,5 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-11,5 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	P – 54,5 d~~Bm~~	1 MHz

Table 9.7: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	P – 51,5 dB~~m~~	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~P – 51,5 – 15 (f_offset – 2,715) dBm~~ $P - 51{,}5\,\text{dB} - 15 \cdot \left(\frac{f\_offset}{MHz} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	P – 63,5 dB~~m~~	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	P – 50,5 dB~~m~~	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	P – 54,5 dB~~m~~	1 MHz

Table 9.8: Spectrum emission mask values, 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 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-20,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	~~-20,5 – 15 (f_offset - 2,715) dBm~~ $-20{,}5\,\text{dBm} - 15 \cdot \left(\frac{f\_offset}{MHz} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-32,5 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-19,5 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max} ~~MHz~~	8,0MHz ≤ f_offset < f_offset_{max}	-23,5 dBm	1 MHz

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex B.