

**TSG RAN Meeting #14****RP-010779****Kyoto, Japan, 11 - 14 December 2001****Title: CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.104****Source: TSG RAN WG4****Agenda Item: 8.4.3**

<b>RAN4 Tdoc</b>	<b>Spec</b>	<b>CR</b>	<b>Title</b>	<b>Cat</b>	<b>Phase</b>	<b>Curr Ver</b>	<b>New Ver</b>
R4-011518	25.104	88	Multi and single carrier for spurious emissions	F	Rel99	3.8.0	3.9.0
R4-011585	25.104	89	Multi and single carrier for spurious emissions	A	Rel-4	4.2.0	4.3.0
R4-011586	25.104	90	Multi and single carrier for spurious emissions	A	Rel-5	5.0.0	5.1.0
R4-011556	25.104	91	Correction to units in Spectrum emission mask	F	Rel99	3.8.0	3.9.0
R4-011557	25.104	92	Correction to units in Spectrum emission mask	A	Rel-4	4.2.0	4.3.0
R4-011558	25.104	93	Correction to units in Spectrum emission mask	A	Rel-5	5.0.0	5.1.0
R4-011594	25.104	94	Co location with UTRA TDD	F	Rel99	3.8.0	3.9.0
R4-011621	25.104	95	Co location with UTRA TDD	A	Rel-5	5.0.0	5.1.0
R4-011620	25.104	96	Co location with UTRA TDD	A	Rel-4	4.2.0	4.3.0
R4-011595	25.104	97	Correction for FCC emission mask and frequency raster for Band B (UMTS1900)	F	Rel99	3.8.0	3.9.0
R4-011649	25.104	98	Correction for FCC emission mask and frequency raster for Band B (UMTS1900)	A	Rel-4	4.2.0	4.3.0

CR-Form-v4

## CHANGE REQUEST

⌘ **25.104 CR 88** ⌘ ev **-** ⌘ Current version: **3.8.0** ⌘

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

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

<b>Title:</b>	⌘ Single and Multi carrier in Spurious Emissions Requirements		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘		<b>Date:</b> ⌘ 2001-11-13
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b> ⌘ Rel99	
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> 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)

<b>Reason for change:</b>	⌘ The current spurious emissions requirement 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 requirement as stated in TS 25.141, EN 301 908-3 (European Harmonised Standard) and ITU-R M.[IMT.UNWANT-BS], where all spurious emission requirements are for both single and multicarrier.
<b>Summary of change:</b>	⌘ The provision for single and multicarrier is moved from section 6.6.3.1 to section 6.6.3, which is the general section for spurious emissions.
<b>Consequences if not approved:</b>	⌘ There would be a conflict between the spurious emission requirements in the core specification and the one in the test specification, as well as with the ones in the European harmonised standard and in ITU-R M.[IMT.UNWANT-BS].  <u>Isolated Impact Analysis:</u> Correction of a requirement. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.

<b>Clauses affected:</b>	⌘ 6.6.3, 6.6.3.1	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘ The test specification TS 25.141 is already drafted in the way of the CR.	

## 6.6.3 Spurious emissions

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.

Unless otherwise stated, all requirements are measured as mean power.

### 6.6.3.1 Mandatory Requirements

The requirements of either subclause 6.6.3.1.1 or subclause 6.6.3.1.2 shall apply ~~whatever the type of transmitter considered (single carrier or multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.~~

Either requirement applies at frequencies within the specified frequency ranges that are more than 12.5MHz below the first carrier frequency used or more than 12.5MHz above the last carrier frequency used.

CR-Form-v4	
<b>CHANGE REQUEST</b>	
⌘ <b>25.104 CR 89</b> ⌘ ev <b>-</b> ⌘ Current version: <b>4.2.0</b> ⌘	

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

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

<b>Title:</b>	⌘ Single and Multi carrier in Spurious Emissions Requirements	
<b>Source:</b>	⌘ RAN WG4	
<b>Work item code:</b>	⌘	<b>Date:</b> ⌘ 2001-11-14
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b> ⌘ Rel-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Use <u>one</u> 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)

<b>Reason for change:</b>	⌘ The current spurious emissions requirement 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 requirement as stated in TS 25.141, EN 301 908-3 (European Harmonised Standard) and ITU-R M.[IMT.UNWANT-BS], where all spurious emission requirements are for both single and multicarrier.
<b>Summary of change:</b>	⌘ The provision for single and multicarrier is moved from section 6.6.3.1 to section 6.6.3, which is the general section for spurious emissions.
<b>Consequences if not approved:</b>	⌘ There would be a conflict between the spurious emission requirements in the core specification and the one in the test specification, as well as with the ones in the European harmonised standard and in ITU-R M.[IMT.UNWANT-BS].  <u>Isolated Impact Analysis:</u> Correction of a requirement. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.

<b>Clauses affected:</b>	⌘ 6.6.3, 6.6.3.1	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘ The test specification TS 25.141 is already drafted in the way of the CR.	

## 6.6.3 Spurious emissions

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.

Unless otherwise stated, all requirements are measured as mean power.

### 6.6.3.1 Mandatory Requirements

The requirements of either subclause 6.6.3.1.1 or subclause 6.6.3.1.2 shall apply, ~~whatever the type of transmitter considered (single carrier or multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.~~

Either requirement applies at frequencies within the specified frequency ranges that are more than 12.5MHz below the first carrier frequency used or more than 12.5MHz above the last carrier frequency used.

**CHANGE REQUEST**

⌘ **25.104 CR 90** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

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

<b>Title:</b>	⌘ Single and Multi carrier in Spurious Emissions Requirements		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 2001-11-14
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>R96</b>	(GSM Phase 2) (Release 1996)
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R97</b>	(Release 1997)
	<b>B</b> (addition of feature),	<b>R98</b>	(Release 1998)
	<b>C</b> (functional modification of feature)	<b>R99</b>	(Release 1999)
	<b>D</b> (editorial modification)	<b>REL-4</b>	(Release 4)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	<b>REL-5</b>	(Release 5)

<b>Reason for change:</b>	⌘ The current spurious emissions requirement 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 requirement as stated in TS 25.141, EN 301 908-3 (European Harmonised Standard) and ITU-R M.[IMT.UNWANT-BS], where all spurious emission requirements are for both single and multicarrier.
<b>Summary of change:</b>	⌘ The provision for single and multicarrier is moved from section 6.6.3.1 to section 6.6.3, which is the general section for spurious emissions.
<b>Consequences if not approved:</b>	⌘ There would be a conflict between the spurious emission requirements in the core specification and the one in the test specification, as well as with the ones in the European harmonised standard and in ITU-R M.[IMT.UNWANT-BS].

<b>Clauses affected:</b>	⌘ 6.6.3, 6.6.3.1		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘ The test specification TS 25.141 is already drafted in the way of the CR.		

## 6.6.3 Spurious emissions

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.

Unless otherwise stated, all requirements are measured as mean power.

### 6.6.3.1 Mandatory Requirements

The requirements of either subclause 6.6.3.1.1 or subclause 6.6.3.1.2 shall apply, ~~whatever the type of transmitter considered (single carrier or multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.~~

Either requirement applies at frequencies within the specified frequency ranges that are more than 12.5MHz below the first carrier frequency used or more than 12.5MHz above the last carrier frequency used.

East Brunswick, NJ, USA 12th - 16th November 2001

CR-Form-v4

**CHANGE REQUEST**
 ⌘ **25.104 CR 91** ⌘ ev **-** ⌘ Current version: **3.8.0** ⌘

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

<b>Title:</b>	⌘ Correction to units in Spectrum emission mask		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 2001-11-16
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>2</b> (GSM Phase 2)	
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R96</b> (Release 1996)	
	<b>B</b> (addition of feature),	<b>R97</b> (Release 1997)	
	<b>C</b> (functional modification of feature)	<b>R98</b> (Release 1998)	
	<b>D</b> (editorial modification)	<b>R99</b> (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	<b>REL-4</b> (Release 4)	<b>REL-5</b> (Release 5)

<b>Reason for change:</b>	⌘ The formula for calculating the power results in a negative answer
<b>Summary of change:</b>	⌘ The correct units are used
<b>Consequences if not approved:</b>	⌘ The requirement is incorrectly specified leading to potential problems with Spectrum Emission Mask performance and subsequent harm to the network.  <u>Isolated impact statement:</u> Correction to a function where the specification was containing some contradictions. Would not affect implementations behaving like indicated in the CR.

<b>Clauses affected:</b>	⌘ 6.6.2
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications
	25.141
<b>Other comments:</b>	⌘

**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](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.

## 6.6.2 Out of band emission

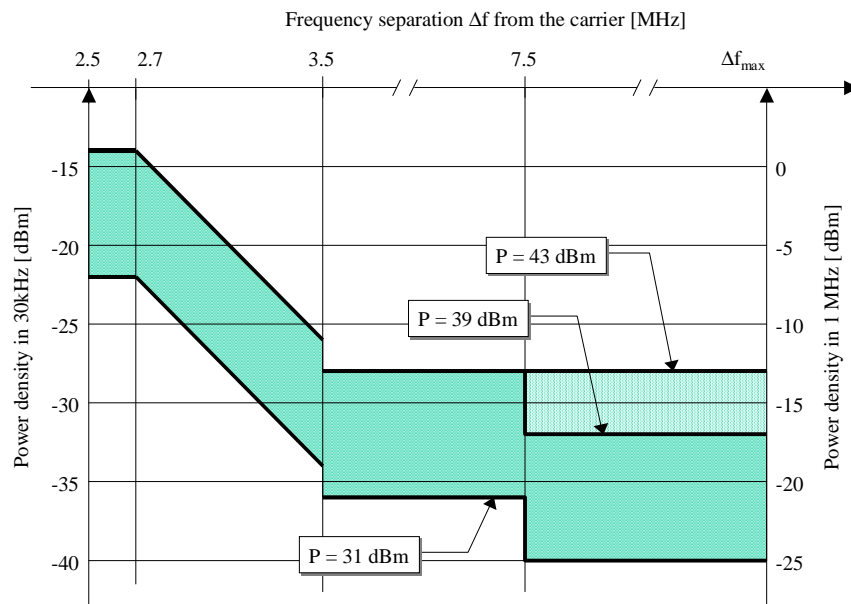
Out of band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission requirement is specified both in terms of a spectrum emission mask and adjacent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

### 6.6.2.1 Spectrum emission mask

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.

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 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range from  $\Delta f = 2.5$  MHz to  $\Delta f_{\max}$  from the carrier frequency, where:

- $\Delta f$  is the separation between the carrier frequency and the nominal -3dB point of the measuring filter closest to the carrier frequency.
- $F_{\text{offset}}$  is the separation between the carrier frequency and the centre of the measuring filter.
- $f_{\text{offset}_{\max}}$  is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.
- $\Delta f_{\max}$  is equal to  $f_{\text{offset}_{\max}}$  minus half of the bandwidth of the measuring filter.



**Illustrative diagram of spectrum emission mask**

**Figure 6.2: Spectrum emission mask**

**Table 6.3: Spectrum emission mask values, BS maximum output power  $P \geq 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-14 dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	30 kHz
$3.5 \leq \Delta f$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

**Table 6.4: Spectrum emission mask values, BS maximum output power  $39 \leq P < 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-14 dBm - 15·(f_offset - 2.715) dBm	30 kHz
V (see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-13 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	1 MHz

**Table 6.5: Spectrum emission mask values, BS maximum output power  $31 \leq P < 39$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	$P - 53$ dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$P - 53$ dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	$P - 65$ dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	$P - 52$ dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	1 MHz

**Table 6.6: Spectrum emission mask values, BS maximum output power  $P < 31$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-22 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-22 dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-34 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-21 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.

### 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

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 average power is measured with a filter that has Root Raised Cosine (RRC) filter response with roll-off  $\alpha = 0.22$  and a bandwidth equal to the chip rate.

#### 6.6.2.2.1 Minimum requirement

The ACLR shall be higher than the value specified in Table 6.7.

**Table 6.7: BS ACLR**

<b>BS adjacent channel offset below the first or above the last carrier frequency used</b>	<b>ACLR limit</b>
5 MHz	45 dB
10 MHz	50 dB

## CHANGE REQUEST

⌘ **25.104 CR 92** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

For [HELP](#) on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

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

<b>Title:</b>	⌘ Correction to units in Spectrum emission mask												
<b>Source:</b>	⌘ RAN WG4												
<b>Work item code:</b>	⌘ <b>Date:</b> ⌘ 2001-11-16												
<b>Category:</b>	⌘ <b>A</b>												
Use <u>one</u> of the following categories:													
<table border="0"> <tr> <td><b>F</b> (correction)</td> <td><b>R96</b> (Release 1996)</td> </tr> <tr> <td><b>A</b> (corresponds to a correction in an earlier release)</td> <td><b>R97</b> (Release 1997)</td> </tr> <tr> <td><b>B</b> (addition of feature),</td> <td><b>R98</b> (Release 1998)</td> </tr> <tr> <td><b>C</b> (functional modification of feature)</td> <td><b>R99</b> (Release 1999)</td> </tr> <tr> <td><b>D</b> (editorial modification)</td> <td><b>REL-4</b> (Release 4)</td> </tr> <tr> <td></td> <td><b>REL-5</b> (Release 5)</td> </tr> </table>		<b>F</b> (correction)	<b>R96</b> (Release 1996)	<b>A</b> (corresponds to a correction in an earlier release)	<b>R97</b> (Release 1997)	<b>B</b> (addition of feature),	<b>R98</b> (Release 1998)	<b>C</b> (functional modification of feature)	<b>R99</b> (Release 1999)	<b>D</b> (editorial modification)	<b>REL-4</b> (Release 4)		<b>REL-5</b> (Release 5)
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<b>D</b> (editorial modification)	<b>REL-4</b> (Release 4)												
	<b>REL-5</b> (Release 5)												
Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .													
<b>Release:</b>	⌘ Rel-4												
Use <u>one</u> of the following releases:													

<b>Reason for change:</b>	⌘ The formula for calculating the power results in a negative answer
<b>Summary of change:</b>	⌘ The correct units are used
<b>Consequences if not approved:</b>	⌘ The requirement is incorrectly specified leading to potential problems with Spectrum Emission Mask performance and subsequent harm to the network.  <u>Isolated impact statement:</u> Correction to a function where the specification was containing some contradictions. Would not affect implementations behaving like indicated in the CR.

<b>Clauses affected:</b>	⌘ 6.6.2
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications
	25.141
<b>Other comments:</b>	⌘

**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](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.

## 6.6.2 Out of band emission

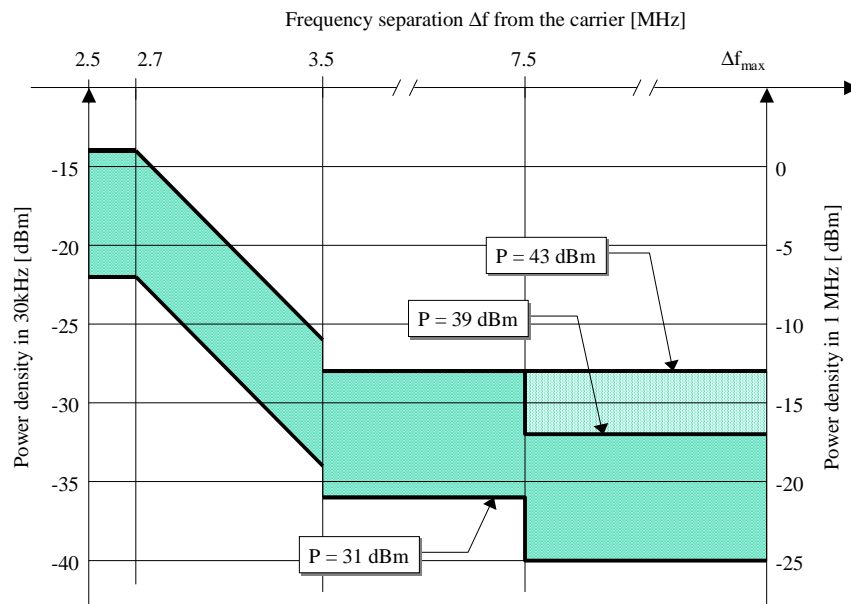
Out of band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission requirement is specified both in terms of a spectrum emission mask and adjacent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

### 6.6.2.1 Spectrum emission mask

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.

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 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range from  $\Delta f = 2.5$  MHz to  $\Delta f_{\max}$  from the carrier frequency, where:

- $\Delta f$  is the separation between the carrier frequency and the nominal -3dB point of the measuring filter closest to the carrier frequency.
- $F_{\text{offset}}$  is the separation between the carrier frequency and the centre of the measuring filter.
- $f_{\text{offset}_{\max}}$  is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.
- $\Delta f_{\max}$  is equal to  $f_{\text{offset}_{\max}}$  minus half of the bandwidth of the measuring filter.



**Illustrative diagram of spectrum emission mask**

**Figure 6.2: Spectrum emission mask**

**Table 6.3: Spectrum emission mask values, BS maximum output power  $P \geq 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-14 dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	30 kHz
$3.5 \leq \Delta f$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

**Table 6.4: Spectrum emission mask values, BS maximum output power  $39 \leq P < 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-14 dBm - 15·(f_offset - 2.715) dBm	30 kHz
V (see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-13 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	1 MHz

**Table 6.5: Spectrum emission mask values, BS maximum output power  $31 \leq P < 39$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	$P - 53$ dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$P - 53$ dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	$P - 65$ dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	$P - 52$ dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	1 MHz

**Table 6.6: Spectrum emission mask values, BS maximum output power  $P < 31$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-22 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-22 dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-34 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-21 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.

### 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

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 average power is measured with a filter that has Root Raised Cosine (RRC) filter response with roll-off  $\alpha = 0.22$  and a bandwidth equal to the chip rate.

#### 6.6.2.2.1 Minimum requirement

The ACLR shall be higher than the value specified in Table 6.7.



**Table 6.7: BS ACLR**

<b>BS adjacent channel offset below the first or above the last carrier frequency used</b>	<b>ACLR limit</b>
5 MHz	45 dB
10 MHz	50 dB

## CHANGE REQUEST

⌘ **25.104 CR 93** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

For [HELP](#) on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

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

<b>Title:</b>	⌘ Correction to units in Spectrum emission mask		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 2001-11-16
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>2</b>	(GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R96</b>	(Release 1996)
	<b>B</b> (addition of feature),	<b>R97</b>	(Release 1997)
	<b>C</b> (functional modification of feature)	<b>R98</b>	(Release 1998)
	<b>D</b> (editorial modification)	<b>R99</b>	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	<b>REL-4</b>	(Release 4)
		<b>REL-5</b>	(Release 5)

<b>Reason for change:</b>	⌘ The formula for calculating the power results in a negative answer
<b>Summary of change:</b>	⌘ The correct units are used
<b>Consequences if not approved:</b>	⌘ The requirement is incorrectly specified leading to potential problems with Spectrum Emission Mask performance and subsequent harm to the network.  <u>Isolated impact statement:</u> Correction to a function where the specification was containing some contradictions. Would not affect implementations behaving like indicated in the CR.

<b>Clauses affected:</b>	⌘ 6.6.2
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications
	25.141
<b>Other comments:</b>	⌘

**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](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.

## 6.6.2 Out of band emission

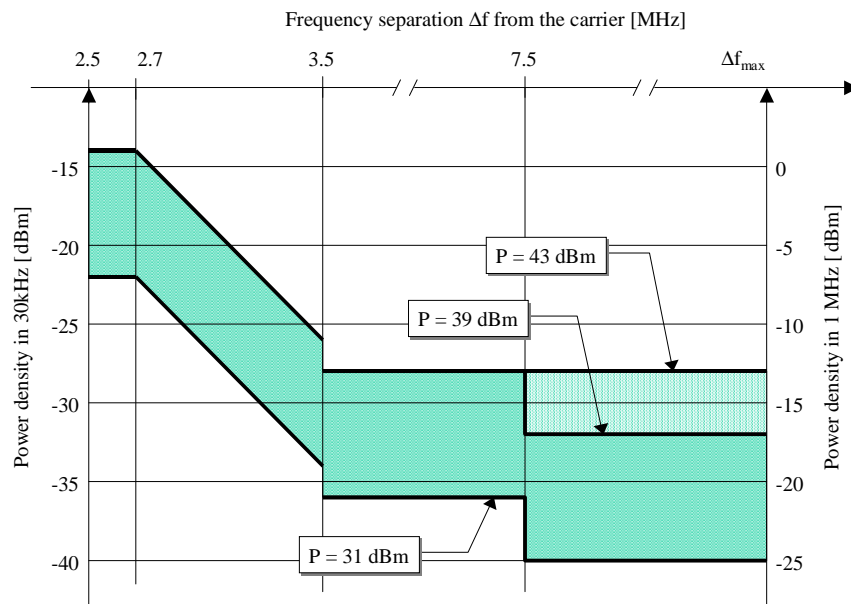
Out of band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission requirement is specified both in terms of a spectrum emission mask and adjacent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

### 6.6.2.1 Spectrum emission mask

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.

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 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range from  $\Delta f = 2.5$  MHz to  $\Delta f_{\max}$  from the carrier frequency, where:

- $\Delta f$  is the separation between the carrier frequency and the nominal -3dB point of the measuring filter closest to the carrier frequency.
- $F_{\text{offset}}$  is the separation between the carrier frequency and the centre of the measuring filter.
- $f_{\text{offset}_{\max}}$  is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.
- $\Delta f_{\max}$  is equal to  $f_{\text{offset}_{\max}}$  minus half of the bandwidth of the measuring filter.



**Illustrative diagram of spectrum emission mask**

**Figure 6.2: Spectrum emission mask**

**Table 6.3: Spectrum emission mask values, BS maximum output power  $P \geq 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-14 dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	30 kHz
$3.5 \leq \Delta f$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

**Table 6.4: Spectrum emission mask values, BS maximum output power  $39 \leq P < 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-14 dBm - 15·(f_offset - 2.715) dBm	30 kHz
V (see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-13 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	1 MHz

**Table 6.5: Spectrum emission mask values, BS maximum output power  $31 \leq P < 39$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	$P - 53$ dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$P - 53$ dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	$P - 65$ dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	$P - 52$ dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	1 MHz

**Table 6.6: Spectrum emission mask values, BS maximum output power  $P < 31$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-22 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	-22 dBm - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-34 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-21 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.

### 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

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 average power is measured with a filter that has Root Raised Cosine (RRC) filter response with roll-off  $\alpha = 0.22$  and a bandwidth equal to the chip rate.

#### 6.6.2.2.1 Minimum requirement

The ACLR shall be higher than the value specified in Table 6.7.

**Table 6.7: BS ACLR**

<b>BS adjacent channel offset below the first or above the last carrier frequency used</b>	<b>ACLR limit</b>
5 MHz	45 dB
10 MHz	50 dB

## CHANGE REQUEST

⌘ **25.104 CR 94** ⌘ ev **-** ⌘ Current version: **3.8.0** ⌘

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

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

<b>Title:</b>	⌘ Co-location with UTRA-TDD		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 2001-11-15
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel99
	<i>Use one of the following categories:</i> <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		<i>Use one of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)

<b>Reason for change:</b>	⌘ Certain site-engineering solutions are addressed in TR 25.942. The reference in 25.104 to 25.942 is missing.
<b>Summary of change:</b>	⌘ Reference added.  <b>Isolated Impact Analysis:</b> Modification is correction of an informative reference and does not change any requirement.
<b>Consequences if not approved:</b>	⌘ No information available where site-engineering solutions can be found.

<b>Clauses affected:</b>	⌘ 2, 4.3, 7.4.2, 7.5.3	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘
	<input type="checkbox"/> Test specifications	
	<input type="checkbox"/> O&M Specifications	
<b>Other comments:</b>	⌘	

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## 2 References

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

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

[1] ITU-R Recommendation SM.329-8, "Spurious emissions".

[2] (void)

[3] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[4] 3GPP TR 25.942 "RF System Scenarios"



## 4.3 Regional requirements

Some requirements in TS 25.104 may only apply in certain regions. Table 4.1 lists all requirements that may be applied differently in different regions.

**Table 4.1: List of regional requirements.**

Clause number	Requirement	Comments
5.2	Frequency bands	Some bands may be applied regionally.
5.3	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1	Base station maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.
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.
6.6.2.3	Protection outside a licensee's frequency block	This requirement is applicable if protection is required outside a licensee's frequency block.
6.6.3.1.1	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.329-8 [1], are applied.
6.6.3.1.2	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.329-8 [1], are applied.
6.6.3.3.1	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.
6.6.3.3.2	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.
6.6.3.4.1	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.
6.6.3.4.2	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.
6.6.3.5	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.6.3.6	Co-existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 5.2(a) and 1930-1990 MHz, as defined in sub-clause 5.2(b) in geographic areas in which both an adjacent band service and UTRA are deployed.
6.6.3.7.1	Co-existence with UTRA TDD - Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.7.2	Co-existence with UTRA TDD - Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
7.4.2	<u>Adjacent Channel Selectivity Co-location with UTRA-TDD</u>	<u>This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-FDD BS and UTRA-TDD BS are co-located.</u>
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.5.2	Blocking characteristics Co-location with GSM900 and/or DCS 1800	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900/DCS1800 BS are co-located.

7.5.3	Blocking characteristics Co-location with UTRA TDD	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and UTRA TDD BS are co-located.
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## 7.4 Adjacent Channel Selectivity (ACS)

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel(s).

### 7.4.1 Minimum requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.3.

**Table 7.3 : Adjacent channel selectivity**

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	-115	dBm
Interfering signal	-52	dBm
Fuw (Modulated)	5	MHz

### 7.4.2 Minimum requirement – Co-location with UTRA-TDD

The current state-of-the-art technology does not allow a single generic solution for co-location with UTRA-TDD on adjacent frequencies for 30dB BS-BS minimum coupling loss.

Further information and analysis for this scenario can be found in TR 25.942 [4].

### 7.5.3 Minimum Requirement - Co-location with UTRA-TDD

The current state-of-the-art technology does not allow a single generic solution for co-location with UTRA-TDD on adjacent frequencies for the same 30dB BS-BS minimum coupling loss used to calculate the requirements in 7.5.1 and 7.5.2.

However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR ~~TBD~~ 25.942 [4].

CR-Form-v4

## CHANGE REQUEST

⌘ **25.104 CR 95** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

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

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

<b>Title:</b>	⌘ Co-location with UTRA-TDD		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 2001-11-15
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	<i>Use one of the following categories:</i> <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		<i>Use one of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)

<b>Reason for change:</b>	⌘ Certain site-engineering solutions are addressed in TR 25.942. The reference in 25.104 to 25.942 is missing.
<b>Summary of change:</b>	⌘ Reference added.
<b>Consequences if not approved:</b>	⌘ No information available where site-engineering solutions can be found.

<b>Clauses affected:</b>	⌘ 2, 4.3, 7.4.2, 7.5.3	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘	

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## 2 References

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

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

[1] ITU-R Recommendation SM.329-8, "Spurious emissions".

[2] (void)

[3] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[4] 3GPP TR 25.942 "RF System Scenarios"

## 4.3 Regional requirements

Some requirements in TS 25.104 may only apply in certain regions. Table 4.1 lists all requirements that may be applied differently in different regions.

**Table 4.1: List of regional requirements.**

Clause number	Requirement	Comments
5.2	Frequency bands	Some bands may be applied regionally.
5.3	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1	Base station maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.
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.
6.6.2.3	Protection outside a licensee's frequency block	This requirement is applicable if protection is required outside a licensee's frequency block.
6.6.3.1.1	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.329-8 [1], are applied.
6.6.3.1.2	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.329-8 [1], are applied.
6.6.3.3.1	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.
6.6.3.3.2	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.
6.6.3.4.1	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.
6.6.3.4.2	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.
6.6.3.5	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.6.3.6	Co-existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 5.2(a) and 1930-1990 MHz, as defined in sub-clause 5.2(b) in geographic areas in which both an adjacent band service and UTRA are deployed.
6.6.3.7.1	Co-existence with UTRA TDD - Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.7.2	Co-existence with UTRA TDD - Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
7.4.2	<u>Adjacent Channel Selectivity Co-location with UTRA-TDD</u>	<u>This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-FDD BS and UTRA-TDD BS are co-located.</u>
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.5.2	Blocking characteristics Co-location with GSM900 and/or DCS 1800	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900/DCS1800 BS are co-located.

7.5.3	Blocking characteristics Co-location with UTRA TDD	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and UTRA TDD BS are co-located.
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## 7.4 Adjacent Channel Selectivity (ACS)

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel(s).

### 7.4.1 Minimum requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.3.

**Table 7.3 : Adjacent channel selectivity**

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	-115	dBm
Interfering signal	-52	dBm
F <sub>w</sub> (Modulated)	5	MHz

### 7.4.2 Minimum requirement – Co-location with UTRA-TDD

The current state-of-the-art technology does not allow a single generic solution for co-location with UTRA-TDD on adjacent frequencies for 30dB BS-BS minimum coupling loss.

Further information and analysis for this scenario can be found in TR 25.942 [4].

### 7.5.3 Minimum Requirement - Co-location with UTRA-TDD

The current state-of-the-art technology does not allow a single generic solution for co-location with UTRA-TDD on adjacent frequencies for the same 30dB BS-BS minimum coupling loss used to calculate the requirements in 7.5.1 and 7.5.2.

However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR ~~TBD~~ 25.942 [4].

CR-Form-v4

## CHANGE REQUEST

⌘ **25.104 CR 96** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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

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

<b>Title:</b>	⌘ Co-location with UTRA-TDD		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 2001-11-15
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)

<b>Reason for change:</b>	⌘ Certain site-engineering solutions are addressed in TR 25.942. The reference in 25.104 to 25.942 is missing.
<b>Summary of change:</b>	⌘ Reference added.  <u>Isolated Impact Analysis:</u> Modification is correction of an informative reference and does not change any requirement.
<b>Consequences if not approved:</b>	⌘ No information available where site-engineering solutions can be found.

<b>Clauses affected:</b>	⌘ 2, 4.3, 7.4.2, 7.5.3	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘	

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## 2 References

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

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

[1] ITU-R Recommendation SM.329-8, "Spurious emissions".

[2] (void)

[3] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[4] 3GPP TR 25.942 "RF System Scenarios"

## 4.3 Regional requirements

Some requirements in TS 25.104 may only apply in certain regions. Table 4.1 lists all requirements that may be applied differently in different regions.

**Table 4.1: List of regional requirements.**

Clause number	Requirement	Comments
5.2	Frequency bands	Some bands may be applied regionally.
5.3	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1	Base station maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.
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.
6.6.2.3	Protection outside a licensee's frequency block	This requirement is applicable if protection is required outside a licensee's frequency block.
6.6.3.1.1	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.329-8 [1], are applied.
6.6.3.1.2	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.329-8 [1], are applied.
6.6.3.3.1	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.
6.6.3.3.2	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.
6.6.3.4.1	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.
6.6.3.4.2	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.
6.6.3.5	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.6.3.6	Co-existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 5.2(a) and 1930-1990 MHz, as defined in sub-clause 5.2(b) in geographic areas in which both an adjacent band service and UTRA are deployed.
6.6.3.7.1	Co-existence with UTRA TDD - Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.7.2	Co-existence with UTRA TDD - Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
7.4.2	<u>Adjacent Channel Selectivity Co-location with UTRA-TDD</u>	<u>This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-FDD BS and UTRA-TDD BS are co-located.</u>
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.5.2	Blocking characteristics Co-location with GSM900 and/or DCS 1800	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900/DCS1800 BS are co-located.

7.5.3	Blocking characteristics Co-location with UTRA TDD	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and UTRA TDD BS are co-located.
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## 7.4 Adjacent Channel Selectivity (ACS)

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel(s).

### 7.4.1 Minimum requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.3.

**Table 7.3 : Adjacent channel selectivity**

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	-115	dBm
Interfering signal	-52	dBm
F <sub>w</sub> (Modulated)	5	MHz

### 7.4.2 Minimum requirement – Co-location with UTRA-TDD

The current state-of-the-art technology does not allow a single generic solution for co-location with UTRA-TDD on adjacent frequencies for 30dB BS-BS minimum coupling loss.

Further information and analysis for this scenario can be found in TR 25.942 [4].

### 7.5.3 Minimum Requirement - Co-location with UTRA-TDD

The current state-of-the-art technology does not allow a single generic solution for co-location with UTRA-TDD on adjacent frequencies for the same 30dB BS-BS minimum coupling loss used to calculate the requirements in 7.5.1 and 7.5.2.

However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR ~~TBD~~ 25.942 [4].



**CHANGE REQUEST**

⌘ **25.104 CR 97** ⌘ ev **-** ⌘ Current version: **3.8.0** ⌘

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

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

**Title:** ⌘ Correction for FCC emission mask and frequency raster for Band b (UMTS1900)

**Source:** ⌘ RAN WG4

**Work item code:** ⌘ **Date:** ⌘ 2001-11-15

**Category:** ⌘ **F** **Release:** ⌘ Rel99

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:** ⌘ During the UMTS1900/1800 WI for release 5 it has been identified issues that need to be corrected also in earlier releases to avoid discontinuities between different releases (Between Rel-5 and R99/Rel-4). These topics have been identified: FCC emission mask clarification and channel raster corrections for band b.

**Summary of change:** ⌘

- Channel raster  
12 new carriers have been added to support FCC band allocation and single 5 MHz deployment. Mapping table of UARFCN table updated accordingly.
- FCC mask correction  
Mask includes also an absolute emission limit -13 dBm adjusted with different measurement BW.  
Isolated Impact Analysis: Correction of a requirement. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.

**Consequences if not approved:** ⌘ Channel raster description and Spectrum mask would be inconsistent with the Release independent UMTS1900 requirements in Rel-5.

**Clauses affected:** ⌘ 5.4.3, 6.6.2.1

**Other specs affected:** ⌘  Other core specifications ⌘  Test specifications ⌘ TS 25.141  
 O&M Specifications

**Other comments:** ⌘

### 5.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows:

**Table 5.1: UTRA Absolute Radio Frequency Channel Number**

Uplink	$N_u = 5 * F_{\text{uplink}}$	$0.0 \text{ MHz} \leq F_{\text{uplink}} \leq 3276.6 \text{ MHz}$ where $F_{\text{uplink}}$ is the uplink frequency in MHz
Downlink	$N_d = 5 * F_{\text{downlink}}$	$0.0 \text{ MHz} \leq F_{\text{downlink}} \leq 3276.6 \text{ MHz}$ where $F_{\text{downlink}}$ is the downlink frequency in MHz

**Table 5.1b: UARFCN definition (Band b, region 2, Additional Channels)**

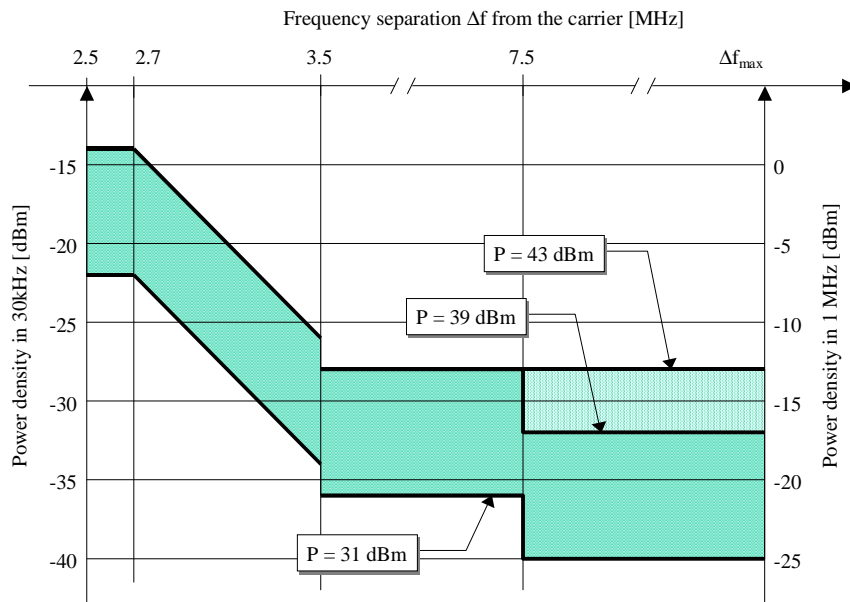
<u>Uplink</u>	<u><math>N_u = 5 * ((F_{\text{uplink}} - 100\text{kHz}) - 1850)</math></u>	<u>1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5</u>
<u>Downlink</u>	<u><math>N_d = 5 * ((F_{\text{downlink}} - 100\text{kHz}) - 1850)</math></u>	<u>1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5</u>

### 6.6.2.1 Spectrum emission mask

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.

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 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range from  $\Delta f = 2.5$  MHz to  $\Delta f_{max}$  from the carrier frequency, where:

- $\Delta f$  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 measuring filter.
- $f_{offset_{max}}$  is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.
- $\Delta f_{max}$  is equal to  $f_{offset_{max}}$  minus half of the bandwidth of the measuring filter.



**Illustrative diagram of spectrum emission mask**

**Figure 6.2: Spectrum emission mask**

**Table 6.3: Spectrum emission mask values, BS maximum output power  $P \geq 43$  dBm**

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{offset}$	Minimum requirement Maximum-level	Additional Minimum Requirement for Band b	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{offset} < 2.715\text{MHz}$	-14 dBm	-15 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{offset} < 3.515\text{MHz}$	$-14 - 15 \cdot (f_{offset} - 2.715)$ dBm	-15 dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{offset} < 4.0\text{MHz}$	-26 dBm	NA	30 kHz
$3.5 \leq \Delta f$ MHz	$4.0\text{MHz} \leq f_{offset} < f_{offset_{max}}$	-13 dBm	NA	1 MHz

Table 6.4: Spectrum emission mask values, BS maximum output power  $39 \leq P < 43$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	<u>Minimum requirement</u> <u>Maximum level</u>	<u>Additional</u> <u>Minimum</u> <u>Requirement</u> <u>for Band b</u>	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	<u>-15 dBm</u>	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$-14 - 15 \cdot (f_{\text{offset}} - 2.715)$ dBm	<u>-15 dBm</u>	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	<u>NA</u>	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-13 dBm	<u>NA</u>	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	<u>NA</u>	1 MHz

Table 6.5: Spectrum emission mask values, BS maximum output power  $31 \leq P < 39$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	<u>Minimum requirement</u> <u>Maximum level</u>	<u>Additional</u> <u>Minimum</u> <u>Requirement</u> <u>for Band b</u>	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	$P - 53$ dBm	<u>-15 dBm</u>	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$P - 53 - 15 \cdot (f_{\text{offset}} - 2.715)$ dBm	<u>-15 dBm</u>	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	$P - 65$ dBm	<u>NA</u>	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	$P - 52$ dBm	<u>NA</u>	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	<u>NA</u>	1 MHz

Table 6.6: Spectrum emission mask values, BS maximum output power  $P < 31$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	<u>Minimum requirement</u> <u>Maximum level</u>	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-22 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$-22 - 15 \cdot (f_{\text{offset}} - 2.715)$ dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-34 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-21 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.

**CHANGE REQUEST**

⌘ **25.104 CR 98** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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

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

<b>Title:</b>	⌘ Correction for FCC emission mask and frequency raster for Band b (UMTS1900 band).
<b>Source:</b>	⌘ RAN WG4
<b>Work item code:</b>	⌘ <b>Date:</b> ⌘ 2001-11-15
<b>Category:</b>	⌘ <b>A</b> <b>Release:</b> ⌘ Rel-4
	Use <u>one</u> of the following categories:
	<b>F</b> (correction)
	<b>A</b> (corresponds to a correction in an earlier release)
	<b>B</b> (addition of feature),
	<b>C</b> (functional modification of feature)
	<b>D</b> (editorial modification)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .
	Use <u>one</u> 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)

<b>Reason for change:</b>	⌘ During the UMTS1900/1800 WI for release 5 it has been identified issues that need to be corrected also in earlier releases to avoid discontinuities between different releases (Between Rel-5 and R99/Rel-4). These topics have been identified: FCC emission mask clarification and channel raster corrections for band b.
<b>Summary of change:</b>	⌘ 1. Channel raster 12 new carriers have been added to support FCC band allocation and single 5 MHz deployment. Mapping table of UARFCN table updated accordingly. 2. FCC mask correction Mask includes also an absolute emission limit -13 dBm adjusted with different measurement BW. <u>Isolated Impact Analysis:</u> Correction of a requirement. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.
<b>Consequences if not approved:</b>	⌘ Channel raster description and Spectrum mask would be inconsistent with the Release independent UMTS1900 requirements in Rel-5.

<b>Clauses affected:</b>	⌘ 5.4.3, 6.6.2.1
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input checked="" type="checkbox"/> Test specifications ⌘ TS 25.141 <input type="checkbox"/> O&M Specifications
<b>Other comments:</b>	⌘



### 5.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows:

**Table 5.1: UTRA Absolute Radio Frequency Channel Number**

Uplink	$N_u = 5 * F_{\text{uplink}}$	$0.0 \text{ MHz} \leq F_{\text{uplink}} \leq 3276.6 \text{ MHz}$ where $F_{\text{uplink}}$ is the uplink frequency in MHz
Downlink	$N_d = 5 * F_{\text{downlink}}$	$0.0 \text{ MHz} \leq F_{\text{downlink}} \leq 3276.6 \text{ MHz}$ where $F_{\text{downlink}}$ is the downlink frequency in MHz

**Table 5.1b: UARFCN definition (Band b, region 2, Additional Channels)**

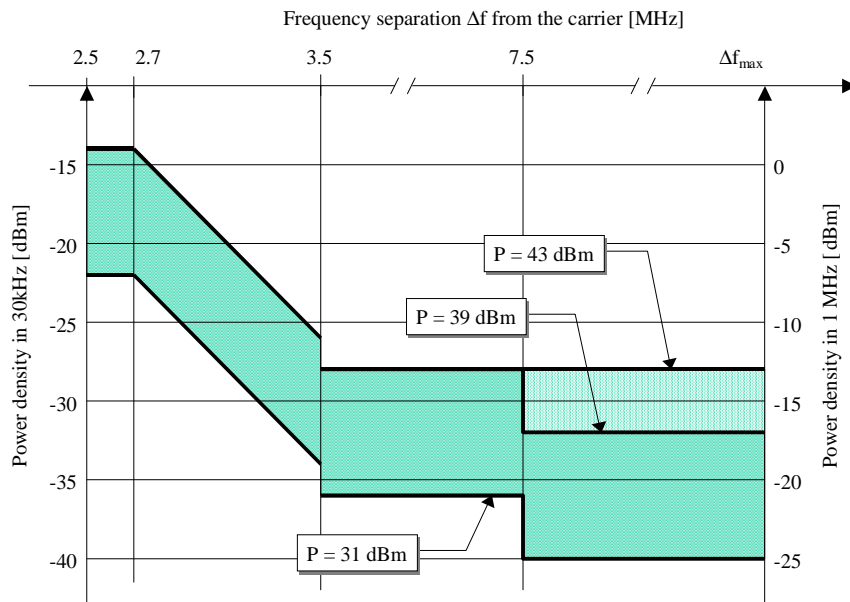
<u>Uplink</u>	<u><math>N_u = 5 * ((F_{\text{uplink}} - 100\text{kHz}) - 1850)</math></u>	<u>1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5</u>
<u>Downlink</u>	<u><math>N_d = 5 * ((F_{\text{downlink}} - 100\text{kHz}) - 1850)</math></u>	<u>1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5</u>

### 6.6.2.1 Spectrum emission mask

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.

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 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range from  $\Delta f = 2.5$  MHz to  $\Delta f_{max}$  from the carrier frequency, where:

- $\Delta f$  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 measuring filter.
- $f_{offset_{max}}$  is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.
- $\Delta f_{max}$  is equal to  $f_{offset_{max}}$  minus half of the bandwidth of the measuring filter.



Illustrative diagram of spectrum emission mask

Figure 6.2: Spectrum emission mask

Table 6.3: Spectrum emission mask values, BS maximum output power  $P \geq 43$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{offset}$	Minimum requirement Maximum-level	Additional Minimum Requirement for Band b	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{offset} < 2.715\text{MHz}$	-14 dBm	-15 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{offset} < 3.515\text{MHz}$	$-14 - 15 \cdot (f_{offset} - 2.715)$ dBm	-15 dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{offset} < 4.0\text{MHz}$	-26 dBm	NA	30 kHz
$3.5 \leq \Delta f$ MHz	$4.0\text{MHz} \leq f_{offset} < f_{offset_{max}}$	-13 dBm	NA	1 MHz



Table 6.4: Spectrum emission mask values, BS maximum output power  $39 \leq P < 43$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	<u>Minimum requirement</u> <u>Maximum-level</u>	<u>Additional</u> <u>Minimum</u> <u>Requirement</u> <u>for Band b</u>	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-14 dBm	<u>-15 dBm</u>	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$-14 - 15 \cdot (f_{\text{offset}} - 2.715)$ dBm	<u>-15 dBm</u>	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-26 dBm	<u>NA</u>	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-13 dBm	<u>NA</u>	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	<u>NA</u>	1 MHz

Table 6.5: Spectrum emission mask values, BS maximum output power  $31 \leq P < 39$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	<u>Minimum requirement</u> <u>Maximum-level</u>	<u>Additional</u> <u>Minimum</u> <u>Requirement</u> <u>for Band b</u>	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	$P - 53$ dBm	<u>-15 dBm</u>	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$P - 53 - 15 \cdot (f_{\text{offset}} - 2.715)$ dBm	<u>-1.5 dBm</u>	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	$P - 65$ dBm	<u>NA</u>	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	$P - 52$ dBm	<u>NA</u>	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 56$ dBm	<u>NA</u>	1 MHz

Table 6.6: Spectrum emission mask values, BS maximum output power  $P < 31$  dBm

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	<u>Minimum requirement</u> <u>Maximum-level</u>	Measurement bandwidth
$2.5 \leq \Delta f < 2.7$ MHz	$2.515\text{MHz} \leq f_{\text{offset}} < 2.715\text{MHz}$	-22 dBm	30 kHz
$2.7 \leq \Delta f < 3.5$ MHz	$2.715\text{MHz} \leq f_{\text{offset}} < 3.515\text{MHz}$	$-22 - 15 \cdot (f_{\text{offset}} - 2.715)$ dBm	30 kHz
(see note)	$3.515\text{MHz} \leq f_{\text{offset}} < 4.0\text{MHz}$	-34 dBm	30 kHz
$3.5 \leq \Delta f < 7.5$ MHz	$4.0\text{MHz} \leq f_{\text{offset}} < 8.0\text{MHz}$	-21 dBm	1 MHz
$7.5 \leq \Delta f$ MHz	$8.0\text{MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.