

**TSG-RAN Meeting #11
Palm Springs, CA, USA, 13 - 16 March 2001**

RP-010089

Title: Agreed CRs (Release '99) to TS 25.113

Source: TSG-RAN WG4

Agenda item: 5.4.3

Doc-1st-Level	Spec	CR	Subject	Cat	Status-2nd-Level	Version-Current	Version-New
RP-010089	25.113	8	Correction to the description of the radiated spurious emission test method	F	agreed	3.4.0	3.5.0
RP-010089	25.113	9	Alignment of TS25.113 with CISPR 22 standard	F	agreed	3.4.0	3.5.0

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

CHANGE REQUEST
 ⌘ **25.113** **CR 8** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

Title:	⌘ Correction to the description of the radiated spurious emission test method														
Source:	⌘ RAN WG4														
Work item code:	⌘ Date: ⌘ 23.02.2001														
Category:	⌘ F Release: ⌘ R99														
Use <u>one</u> of the following categories: <table border="0"> <tr> <td>F (essential correction)</td> <td>2 (GSM Phase 2)</td> </tr> <tr> <td>A (corresponds to a correction in an earlier release)</td> <td>R96 (Release 1996)</td> </tr> <tr> <td>B (Addition of feature),</td> <td>R97 (Release 1997)</td> </tr> <tr> <td>C (Functional modification of feature)</td> <td>R98 (Release 1998)</td> </tr> <tr> <td>D (Editorial modification)</td> <td>R99 (Release 1999)</td> </tr> <tr> <td></td> <td>REL-4 (Release 4)</td> </tr> <tr> <td></td> <td>REL-5 (Release 5)</td> </tr> </table>		F (essential correction)	2 (GSM Phase 2)	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	B (Addition of feature),	R97 (Release 1997)	C (Functional modification of feature)	R98 (Release 1998)	D (Editorial modification)	R99 (Release 1999)		REL-4 (Release 4)		REL-5 (Release 5)
F (essential correction)	2 (GSM Phase 2)														
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C (Functional modification of feature)	R98 (Release 1998)														
D (Editorial modification)	R99 (Release 1999)														
	REL-4 (Release 4)														
	REL-5 (Release 5)														
Detailed explanations of the above categories can be found in 3GPP TR 21.900.															

Reason for change:	⌘ Correction to the description of the radiated spurious emission test method.
Summary of change:	⌘ Correction to be in line with the UE EMC spec and harmonised EMC specification.
Consequences if not approved:	⌘ Inconsistency with the 3GPP UE EMC spec and the harmonised EMC specification

Clauses affected:	⌘ 7.1 and A1.3
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications
Other comments:	⌘

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- 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://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

3GPP TS 25.113 V3.4.0 (2000-12)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Radio Access Networks; Base station electromagnetic compatibility (EMC) (Release 1999)



The present document has been developed within the 3rd Generation Partnership Project (3GPPTM) and may be further elaborated for the purposes of 3GPP.

The present document has not been subject to any approval process by the 3GPP Organisational Partners and shall not be implemented. This Specification is provided for future development work within 3GPP only. The Organisational Partners accept no liability for any use of this Specification. Specifications and reports for implementation of the 3GPPTM system should be obtained via the 3GPP Organisational Partners' Publications Offices.

7 Applicability overview

7.1 Emission

Phenomenon	Application	Equipment test requirement		Reference subclause in the present document	Reference Standard
		Base station equipment	Ancillary equipment		
Radiated emission	Enclosure	applicable		A.1.3.1	ITU-R SM.329-8 [1]
Radiated emission	Enclosure		applicable	A.1.3.2	CISPR 22 [4]
Conducted emission	DC power input/output port	applicable	applicable	A.1.4	CISPR 22 [4], CISPR 16-1 [5]
Conducted emission	AC mains input/output port	applicable	applicable	A.1.5	CISPR 22 [4]
Harmonic current emissions	AC mains input port	applicable	applicable	A.1.6	IEC 61000-3-2 [6]
Voltage fluctuations and flicker	AC mains input port	applicable	applicable	A.1.7	IEC 61000-3-3 [7]

Table 3, Emission applicability

Note: spurious emissions from antenna connector shall be measured according to TS 25.141 [3] and TS 25.142 [4].

7.2 Immunity

Phenomenon	Application	Equipment test requirement		Reference subclause in the present document	Reference standard
		Base station equipment	Ancillary equipment		
RF electro-magnetic field (80 - 1000 MHz)	Enclosure	applicable	applicable	A.2.3	IEC 61000-4-3 [96]
Electrostatic discharge	Enclosure	applicable	applicable	A.2.4	IEC 61000-4-2 [85]
Fast transients common mode	Signal, telecommunication and control ports, DC and AC power input ports	applicable	applicable	A.2.5	IEC 61000-4-4 [107]
RF common mode 0,15 - 80 MHz	Signal, telecommunication and control ports, DC and AC power input ports	applicable	applicable	A.2.6	IEC 61000-4-6 [129]
Voltage dips and interruptions	AC mains power input ports	applicable	applicable	A.2.7	IEC 61000-4-11 [130]
Surges, common and differential mode	AC power input ports and telecommunication s port	applicable	applicable	A.2.8	IEC 61000-4-5 [118]

Table 4, Immunity applicability

Annex A (normative): Methods of measurement

Note: References cited in this annex relate to those listed in clause A.3 of this annex, and not to the main references given in clause 2 above.

A.1 Emission

A.1.1 Methods of measurement and limits for EMC emissions

A.1.2 Test configurations

This subclause defines the configurations for emission tests as follows:

- the equipment shall be tested under normal test conditions as specified in the functional standards;
- the test configuration shall be as close to normal intended use as possible;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested;
- the test conditions, test configuration and mode of operation shall be recorded in the test report;
- ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the input/output characteristics of the ancillary equipment, Radio Frequency (RF) input/output ports shall be correctly terminated;
- ports which are not connected to cables during normal operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of EMC testing. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables;
- the test arrangements for transmitter and receiver sections of the transceiver are described separately for the sake of clarity. However, where possible the test of the transmitter section and receiver section of the EUT may be carried out simultaneously to reduce test time.

A.1.3 Radiated spurious emission from Base station and ancillary equipment

A.1.3.1 Radiated spurious emission, Base stations

This test is applicable to Base station. This test shall be performed on a representative configuration of the Base station.

A.1.3.1.1 Definition

This test assesses the ability of BS to limit unwanted emission from the enclosure port.

A.1.3.1.2 Test method

- a) A test site fulfilling the requirements of ITU-R SM. 329-8 [1] shall be used. The BS shall be placed on a non-conducting support and shall be operated from a power source via a RF filter to avoid radiation from the power leads.

Average power Radiation of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyzer). At each frequency at which a component is detected, the BS shall be rotated and the height of the test antenna adjusted to obtain maximum response, and the effective radiated power (e.r.p.) of that component determined by a substitution measurement. The measurement shall be repeated with the test antenna in the orthogonal polarization plane.

NOTE: Effective radiated power (e.r.p.) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between e.i.r.p. and e.r.p.

$$e.r.p. (dBm) = e.i.r.p. (dBm) - 2,15$$
 Ref: ITU-R SM.329-8 ANNEX 1 [1].

- b) The BS shall transmit with maximum power declared by the manufacturer with all transmitters active. Set the base station to transmit a signal as stated for measurement of spurious emission in table 6.1 (Test model 1) for FDD in the TS25.141 [2] and table 6.2.4.1.1 for TDD in the TS25.142 [3].
- c) The received power shall be measured over the frequency range 30 MHz to 12.75 GHz, excluding 12.5MHz below the first carrier frequency to 12.5 MHz above the last carrier frequency used. The measurement bandwidth shall be 100 kHz between 30 MHz and 1 GHz and 1 MHz above 1 GHz as given in ITU-R SM.329-8 [1]. The video bandwidth shall be approximately three times the resolution bandwidth. If this video bandwidth is not available on the measuring receiver, it shall be the maximum available and at least 1 MHz. ~~At each frequency at which a component is detected, the maximum effective radiated power of that component shall be determined, as described in step a.~~

A.1.3.1.3 Limits

The BS shall meet the limits below:

Table 5: Limits for radiated emissions from BS

Frequency range	Minimum requirement (e.r.p.)/ Reference Bandwidth Power limit
30 MHz ≤ f < 1000 MHz	-36 dBm / 100 kHz
1 GHz ≤ f ≤ 12,75 GHz	-30 dBm / 1MHz
Fc1 – 12,75 MHz < f < Fc2+12,5 MHz	Not defined

Key:

Fc1: Center frequency of first carrier frequency used by the BS.

Fc2: Center frequency of last carrier frequency used by the BS.

A.1.3.2 Radiated spurious emission, Ancillary equipment

This test is applicable to ancillary equipment. This test shall be performed on a representative configuration of the ancillary equipment.

A.1.3.2.1 Definition

This test assesses the ability of ancillary equipment to limit unwanted emission from the enclosure port.

A.1.3.2.2 Test method

The test method shall be in accordance with CISPR 22 [4]

A.1.3.2.3 Limits

The ancillary equipment shall meet the limits according to CISPR 22 [4] (10 m measuring distance) shown in table 2:

Table 6: Limits for radiated emissions from ancillary equipment, measured on a stand alone basis

Frequency range	Quasi-peak
30 MHz-230 MHz	30 dB μ V/m
230 MHz-1000 MHz	37 dB μ V/m

A.1.4 Conducted emission DC power input/output port

This test is applicable to equipment which may have DC cables longer than 3 m.

If the DC power cable of the radio equipment is intended to be less than 3 m in length, and intended only for direct connection to a dedicated AC to DC power supply, then the measurement shall be performed only on the AC power input of that power supply as specified in subclause A.1.5.

This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

A.1.4.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to limit internal noise from the DC power input/output ports.

A.1.4.2 Test method

The test method shall be in accordance with CISPR 22 [4] and the Artificial Mains Network (AMN) shall be connected to a DC power source.

In the case of DC output ports, the ports shall be connected via a AMN to a load drawing the rated current of the source.

A measuring receiver shall be connected to each AMN measurement port in turn and the conducted emission recorded. The AMN measurement ports not being used for measurement shall be terminated with a 50 Ω /50 μ H load.

The equipment shall be installed with a ground plane as defined in CISPR 22 [4]. The reference earth point of the AMNs shall be connected to the reference ground plane with a conductor as short as possible.

The measurement receiver shall be in accordance with the requirements of section one of CISPR 16-1 [5].

A.1.4.3 Limits

The equipment shall meet the limits below (including the average limit and the quasi-peak limit) when using, respectively, an average detector receiver and a quasi-peak detector receiver and measured in accordance with the method described in subclause A.1.4.2 above. If the average limit is met when using a quasi-peak detector, the equipment shall be deemed to meet both limits and measurement with the average detector receiver is not necessary.

The equipment shall meet the limits given in table 7.

Table 7: Limits for conducted emissions

Frequency range	Quasi-peak	Average
> 0,15-0,5 MHz	66 - 56 dB μ V	56 - 46 dB μ V
> 0,5- 5 MHz	56 dB μ V	46 dB μ V
> 5-30 MHz	60 dB μ V	50 dB μ V
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Alternatively, for equipment intended to be used in telecommunication centres the limits given in table 8 shall be used.

Table 8: Limits for conducted emissions

Frequency range	Quasi-peak	Average
>0,15-0,5MHz	79dB μ V	66dB μ V
>0,5-30 MHz	73dB μ V	60dB μ V

A.1.5 Conducted emissions, AC mains power input/output port

This test is applicable to equipment powered by the AC mains.

This test is not applicable to AC output ports which are connected directly (or via a circuit breaker) to the AC power port of the EUT.

This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

A.1.5.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to limit internal noise from the AC mains power input/output ports.

A.1.5.2 Test method

The test method shall be in accordance with CISPSR 22 [4].

Mains connected ancillary equipment which is not part of the EUT shall be connected to the mains via a separate AMN. According to clause 11.9 of CISPR 16-1 [5], the Protective Earth (PE) conductor shall also be terminated by a 50 Ω /50 μ H common mode RF impedance.

A.1.5.3 Limits

The equipment shall meet the limits below (including the average limit and the quasi-peak limit) when using, respectively, an average detector receiver and a quasi-peak detector receiver and measured in accordance with the method described in subclause A.1.5.2 above. If the average limit is met when using a quasi-peak detector, the equipment shall be deemed to meet both limits and measurement with the average detector receiver is not necessary.

Table 9: Limits for conducted emissions

Frequency range	Quasi-peak	Average
> 0,15-0,5 MHz	66 - 56 dB μ V	56 - 46 dB μ V
> 0,5- 5 MHz	56 dB μ V	46 dB μ V
> 5-30 MHz	60 dB μ V	50 dB μ V
NOTE:	The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.	

Alternatively, for equipment intended to be used in telecommunication centres the limits given in table 10 shall be used.

Table 10: Limits for conducted emissions

Frequency range	Quasi-peak	Average
>0,15-0,5MHz	79dB μ V	66dB μ V
>0,5-30 MHz	73dB μ V	60dB μ V

A.1.6 Harmonic Current emissions (AC mains input port)

The requirements of IEC 61000-3-2 [6] for harmonic current emission apply for equipment covered by the scope of the present document.

A.1.7 Voltage fluctuations and flicker (AC mains input port)

The requirements of IEC 61000-3-3 [7] for voltage fluctuations and flicker apply for equipment covered by the scope of the present document.

CR-Form-v3

CHANGE REQUEST

⌘ **25.113 CR 9** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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:	⌘ Alignment of TS25.113 with CISPR 22 standard		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-02-16
Category:	⌘ F	Release:	⌘ R99
	<i>Use one of the following categories:</i> F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		

Reason for change:	⌘ To be in line with CISPR 22 for Base Station		
Summary of change:	⌘ To replace table 8 with table 7.		
Consequences if not approved:	⌘ Inconsistency with CISPR 22 standard.		

Clauses affected:	⌘ A.1.4		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> 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.

A.1.4 Conducted emission DC power input/output port

This test is applicable to equipment which may have DC cables longer than 3 m.

If the DC power cable of the radio equipment is intended to be less than 3 m in length, and intended only for direct connection to a dedicated AC to DC power supply, then the measurement shall be performed only on the AC power input of that power supply as specified in subclause A.1.5.

This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

A.1.4.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to limit internal noise from the DC power input/output ports.

A.1.4.2 Test method

The test method shall be in accordance with CISPR 22 [4] and the Artificial Mains Network (AMN) shall be connected to a DC power source.

In the case of DC output ports, the ports shall be connected via a AMN to a load drawing the rated current of the source.

A measuring receiver shall be connected to each AMN measurement port in turn and the conducted emission recorded. The AMN measurement ports not being used for measurement shall be terminated with a 50 Ω /50 μ H load.

The equipment shall be installed with a ground plane as defined in CISPR 22 [4]. The reference earth point of the AMNs shall be connected to the reference ground plane with a conductor as short as possible.

The measurement receiver shall be in accordance with the requirements of section one of CISPR 16-1 [5].

A.1.4.3 Limits

The equipment shall meet the limits below (including the average limit and the quasi-peak limit) when using, respectively, an average detector receiver and a quasi-peak detector receiver and measured in accordance with the method described in subclause A.1.4.2 above. If the average limit is met when using a quasi-peak detector, the equipment shall be deemed to meet both limits and measurement with the average detector receiver is not necessary.

The equipment shall meet the limits given in table 7.

Table 7: Limits for conducted emissions

Frequency range	Quasi-peak	Average
> 0,15-0,5 MHz	66-56 dB μ V	56-46 dB μ V
> 0,5-5 MHz	56 dB μ V	46 dB μ V
> 5-30 MHz	60 dB μ V	50 dB μ V
NOTE: — The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

~~Alternatively, for equipment intended to be used in telecommunication centres the limits given in table 8 shall be used.~~

Table 78: Limits for conducted emissions

Frequency range	Quasi-peak	Average
>0,15-0,5MHz	79dB μ V	66dB μ V
>0,5-30 MHz	73dB μ V	60dB μ V

A.1.5 Conducted emissions, AC mains power input/output port

This test is applicable to equipment powered by the AC mains.

This test is not applicable to AC output ports which are connected directly (or via a circuit breaker) to the AC power port of the EUT.

This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

A.1.5.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to limit internal noise from the AC mains power input/output ports.

A.1.5.2 Test method

The test method shall be in accordance with CISPR 22 [4].

Mains connected ancillary equipment which is not part of the EUT shall be connected to the mains via a separate AMN. According to clause 11.9 of CISPR 16-1 [5], the Protective Earth (PE) conductor shall also be terminated by a 50 Ω /50 μ H common mode RF impedance.

A.1.5.3 Limits

The equipment shall meet the limits below (including the average limit and the quasi-peak limit) when using, respectively, an average detector receiver and a quasi-peak detector receiver and measured in accordance with the method described in subclause A.1.5.2 above. If the average limit is met when using a quasi-peak detector, the equipment shall be deemed to meet both limits and measurement with the average detector receiver is not necessary.

Table 89: Limits for conducted emissions

Frequency range	Quasi-peak	Average
> 0,15-0,5 MHz	66 - 56 dB μ V	56 - 46 dB μ V
> 0.5- 5 MHz	56 dB μ V	46 dB μ V
> 5-30 MHz	60 dB μ V	50 dB μ V
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Alternatively, for equipment intended to be used in telecommunication centres the limits given in table 10 shall be used.

Table 940: Limits for conducted emissions

Frequency range	Quasi-peak	Average
>0,15-0,5MHz	79dB μ V	66dB μ V
>0,5-30 MHz	73dB μ V	60dB μ V