

Agenda Item: 6.2.3
Source: Editor
Title: Latest draft of TS 25.113
Document for: Information

RAN WG4 #7 requested that the latest draft of TS 15.113 should be presented to RAN meeting #5, in order that TSG RAN is aware of the progress on this specification.

This specification is presented to RAN #5 for information. At WG4 #7, the scope of TS 25.113 was revised and broadened. There is not yet any content in (new) sections 4 and 7, and the draft content for section 5 has not yet been reviewed by WG4. WG4 therefore believes that the document is not complete enough to be raised to version 2 or version 3. WG4 was not aware of any reason why this would be necessary at RAN #5.

This version of TS 25.113 is Draft V 1.2.0. This contains a new proposal for content in section 5, which has been circulated by E-mail to WG4 members, but has not been discussed or agreed. This is shown by revision marks.

Version 1.1.1 is the latest version of TS 25.113 to have been approved by WG4 (by correspondence, closing date for comments 30 Sept 99):

- V1.1.0 incorporates the changes to TS 25.113 which were approved at RAN WG4 #7.
- V1.1.1 corrects the titles of two of the references which were agreed to be added during RAN 4 #7.

The differences between TS 25.113 Draft Version 1.2.0 and Version 1.1.1 are as follows:

- 1) All content in section 5.
- 2) Document version number
- 3) Update of Document History.

3G TS 25.113 Draft V1.24.04 (1999-09)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group (TSG) RAN WG4;
Base station EMC
(3G TS 25.113 Draft version 1.24.04)**



The present document has been developed within the 3rd Generation Partnership Project (3GPP™) 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 3GPP™ system should be obtained via the 3GPP Organisational Partners' Publications Offices.

Reference

DTS/TSG<name abbrev>-0<WG no><spec no> U

Keywords

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Contents

Foreword.....	5
1 Scope	6
2 References	6
3 Definitions, symbols and abbreviations	7
3.1 Definitions.....	7
3.2 Symbols.....	7
3.3 Abbreviations	7
4 Test conditions.....	7
5 Performance assessment	7
6 Performance Criteria	8
6.1 Performance criteria for continuous phenomena.....	8
6.2 Performance criteria for transient phenomena	8
7 Applicability overview	9
Annex A (normative): Methods of measurement	10
A.1 Emission.....	10
A.1.1 Methods of measurement and limits for EMC emissions	10
A.1.2 Test configurations	10
A.1.3 Conducted emission DC power input/output port	10
A.1.4 Conducted emissions, AC mains power input/output port.....	11
A.1.5 Harmonic Current emissions (AC mains input port)	12
A.1.6 Voltage fluctuations and flicker (AC mains input port).....	12
A.2 Immunity	12
A.2.1 Test methods and levels for immunity tests.....	12
A.2.2 Test configurations	12
A.2.3 RF electromagnetic field (80 MHz - 2000 MHz)	13
A.2.4 Electrostatic discharge.....	13
A.2.5 Fast transients common mode	14
A.2.6 RF common mode (0,15 MHz - 80 MHz)	14
A.2.7 Voltage dips and interruptions.....	15
A.2.7.2 Test method and level.....	15
A.2.8 Surges, common and differential mode	16
A.3 References.....	16
Annex B (informative): Open items	17
History	18

Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 Indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

The present document covers the assessment of basestations and associated ancilliary equipment in respect of ElectroMagnetic Compatibility (EMC).

The present document specifies the applicable test conditions, performance assessment and performance criteria for basestations and associated ancilliary equipment in one of the following categories:

- basestations for the FDD mode of UTRA meeting the requirements of TS 25.104 [1], with conformance demonstrated by compliance to TS 25.141 [3].
- basestations for the TDD mode of UTRA meeting the requirements of TS 25.105 [2], with conformance demonstrated by compliance to TS 25.142 [4].

Technical requirements related to the antenna port of basestations are not included in the present document. These are found in the relevant product standards [1], [2], [3], [4].

The environment classification used in the present document refers to the environment classification used in IEC 61000-6-1 [5] and IEC 61000-6-3 [6].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus at residential, commercial and light industrial environments. The levels, however, do not cover extreme cases which may occur in any location but with low probability of occurrence.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] TS 25.104; 3rd Generation Partnership Project; TSG RAN WG4; UTRA (BS) FDD; Radio transmission and reception
- [2] TS 25.105; 3rd Generation Partnership Project; TSG RAN WG4; UTRA (BS) TDD; Radio transmission and reception
- [3] TS 25.141; 3rd Generation Partnership Project; TSG RAN WG4; UTRA (BS) FDD; Base station conformance testing (FDD)
- [4] TS 25.142; 3rd Generation Partnership Project; TSG RAN WG4; Base station conformance testing (TDD)
- [5] IEC 61000-6-1: 1997; "Electromagnetic compatibility (EMC) – Part 6: Generic standards – Section 1: Immunity for residential, commercial and light-industrial environments"
- [6] IEC 61000-6-3: 1996; "Electromagnetic compatibility (EMC) – Part 6: Generic standards – Section 3: mission standard for residential, commercial and light industrial environments".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Continuous phenomena:

Loss of service:

Loss of call:

Transient phenomena:

3.2 Symbols

For the purposes of the present document, the following symbols apply:

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

4 Test conditions

5 Performance assessment

The manufacturer shall at the time of submission of the equipment for test, supply the following information to be recorded in the test report:

- the primary functions of the radio equipment to be tested during and after the EMC testing;
- the intended functions of the radio equipment which shall be in accordance with the documentation accompanying the equipment;
- the method to be used to verify that a communications link is established and maintained
- the user-control functions and stored data that are required for normal operation and the method to be used to assess whether these have been lost after EMC stress;
- the ancillary equipment to be combined with the radio equipment for testing (where applicable);
- the information about ancillary equipment intended to be used with the radio equipment;
- an exhaustive list of ports, classified as either power or signal/control. Power ports shall further be classified as AC or DC power.

6 Performance Criteria

6.1 Performance criteria for continuous phenomena

The test should, where possible, be performed using a bearer with the characteristics of data rate and BER defined in Table 1. If the test is not performed using one of these bearers (for, example, of none of them are supported by the BS), the characteristics of the bearer used shall be recorded.

A test signal shall be input to the BS at a level where the performance is not limited by the receiver noise floor or strong signal effects. The wanted signal for the requirement of receiver blocking characteristics for the BS in TS 25.104 (for FDD) [1] or in TS 25.105 (for TDD) [2] is a suitable test signal for this purpose.

The test method for blocking characteristics in TS 25.141 (for FDD) [3] or TS 25.142 (for TDD) [4] is a suitable test configuration for assessment of performance criteria, with the difference that the interfering signal is not applied.

The BS shall meet the performance criteria defined in Table 1 during the test. After each test case BS shall operate as intended with no loss of user control function, stored data and the communication link shall be maintained.

<i>Bearer Information Data Rate</i>	<i>Bearer Reference performance</i>	<i>Performance Criteria</i>
12.2 kbps	BER < 10 ⁻³	BER > 10 ⁻³ temporarily No loss of service
64 kbps	BER < 10 ⁻⁶	BER > 10 ⁻⁶ temporarily No loss of service
144 kbps	BER < 10 ⁻⁶	BER > 10 ⁻⁶ temporarily No loss of service
384 kbps	BER < 10 ⁻⁶	BER > 10 ⁻⁶ temporarily No loss of service
2048 kbps	BER < 10 ⁻⁶	BER > 10 ⁻⁶ temporarily No loss of service

Table 1, BS Performance Criteria for continuous phenomena

6.2 Performance criteria for transient phenomena

The test should be, where possible, be performed using a bearer with the characteristics of data rate and BER defined in Table 2. If the test is not performed using one of these bearers (for, example, of none of them are supported by the BS), the characteristics of the bearer used shall be recorded.

A test signal shall be input to the BS at a level where the performance is not limited by the receiver noise floor or strong signal effects. The wanted signal for the receiver blocking requirement for the BS in TS 25.104 (for FDD) [1] or TS 25.105 (for TDD) [2] meets this requirement.

Temporary losses of functions are allowed during tests, but shall be self-recoverable, i.e. no actions needed by operator in normal operation environment.

<i>Bearer Information Data Rate</i>	<i>Bearer Reference performance</i>	<i>Performance Criteria</i>
12.2 kbps	BER < 10 ⁻³	Loss of call permissible System operation self-recoverable
64 kbps	BER < 10 ⁻⁶	Loss of call permissible System operation self-recoverable
144 kbps	BER < 10 ⁻⁶	Loss of call permissible System operation self-recoverable
384 kbps	BER < 10 ⁻⁶	Loss of call permissible System operation self-recoverable
2048 kbps	BER < 10 ⁻⁶	Loss of call permissible System operation self-recoverable

Table 2, BS Performance Criteria for transient phenomena

7 Applicability overview

Annex A (normative): Methods of measurement

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 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.1.4

This test shall be performed on a representative configuration of the radio equipment.

A.1.3.1 Definition

This test assesses the ability of transmitters, receivers and transceivers to limit internal noise from the DC power input/output ports.

A.1.3.2 Test method

The test method shall be in accordance with CISPR 22 [1] and the Line Impedance Stabilizing Networks (LISN) shall be connected to a DC power source.

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

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

The equipment shall be installed with a ground plane as defined in CISPR 22 [1]. The reference earth point of the LISNs 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 [2].

A.1.3.3 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.1.3.2 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 1 .

Table 1: 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 2 shall be used.

Table 2: 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.1.4 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.

A.1.4.1 Definition

This test assesses the ability of transmitters, receivers and transceivers to limit internal noise from the AC mains power input/output ports.

A.1.4.2 Test method

The test method shall be in accordance with CISPR 22 [1].

Mains connected ancillary equipment which is not part of the EUT shall be connected to the mains via a separate LISN. According to clause 11.9 of CISPR 16-1 [2], the Protective Earth (PE) wire shall also be terminated by a 50 Ω /50 μ H common mode RF impedance.

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.

Table 3: 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 4 shall be used.

Table 4: 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 Harmonic Current emissions (AC mains input port)

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

A.1.6 Voltage fluctuations and flicker (AC mains input port)

The requirements of IEC 61000-3-3 [4] for voltage fluctuations and flicker apply for equipment covered by the scope of the present document.

A.2 Immunity

A.2.1 Test methods and levels for immunity tests

A.2.2 Test configurations

This subclause defines the configurations for immunity 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.
- Immunity tests shall be performed with a communication link established (call mode).

A.2.3 RF electromagnetic field (80 MHz - 2000 MHz)

The test shall be performed on a representative configuration of the equipment.

A.2.3.1 Definition

This test assesses the ability of transmitters, receivers and transceivers to operate as intended in the presence of a radio frequency electromagnetic field disturbance at the enclosure.

A.2.3.2 Test method and level

The test method shall be in accordance with IEC 61000-4-3 [6]:

- for transmitters, receivers and transceivers the following requirements shall apply:
- the test level shall be 3 V/m amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 kHz;
- the stepped frequency increments shall be 1 % of the momentary frequency;
- when using the max hold detector method at each test frequency step initially an unmodulated test signal shall be applied. Then the test modulation shall be applied;
- the test shall be performed over the frequency range 80 MHz - 1 000 MHz and 1,4 GHz – 2 GHz with the exception of an exclusion bands for transmitters and receivers , see subclause x..x and x.x;
- responses in stand alone receivers or receivers which are part of transceivers occurring at discrete frequencies which are narrow band responses, shall be disregarded, see subclause x.x;
- the frequencies selected during the test shall be recorded in the test report.

A.2.3.3 Performance criteria

The performance criteria of subclause 4.1, shall apply.

A.2.4 Electrostatic discharge

The test shall be performed on a representative configuration of the equipment.

A.2.4.1 Definition

This test assesses the ability of transmitters, receivers and transceivers to operate as intended in the event of an electrostatic discharge.

A.2.4.2 Test method and level

The test method shall be in accordance with IEC 61000-4-2 [5]:

- for contact discharge, the equipment shall pass at ± 2 kV and ± 4 kV;
- for air discharge shall pass at ± 2 kV, ± 4 kV and ± 8 kV, see IEC 61000-4-2 [5];
- electrostatic discharge shall be applied to all exposed surfaces of the EUT except where the user documentation specially indicates a requirement for appropriate protective measures.

NOTE: Ensure that the EUT is fully discharged between each ESD exposure.

A.2.4.3 Performance criteria

The performance criteria of subclause 4.2 shall apply.

A.2.5 Fast transients common mode

The test shall be performed on AC mains power input ports.

This test shall be performed on signal ports, control ports and DC power input/output ports if the cables may be longer than 3 m.

Where this test is not carried out on a port or any other ports because the manufacturer declares that it is not intended to be used with cables longer than 3 m, a list of ports which were not tested for this reason shall be included in the test report.

This test shall be performed on a representative configuration of the equipment.

A.2.5.1 Definition

This test assesses the ability of transmitters, receivers, and transceivers to operate as intended in the event of fast transients present on one of the input/output ports.

A.2.5.2 Test method and level

The test method shall be in accordance with IEC 61000-4-4 [7]:

- the test level for signal and control ports shall be 0,5 kV open circuit voltage as given in IEC 61000-4-4 [7];
- the test level for DC power input/output ports shall be 1 kV open circuit voltage as given in IEC 61000-4-4 [7];
- the test level for AC mains power input ports shall be 2 kV open circuit voltage as given in IEC 61000-4-4 [7].

For AC and DC power input ports the transients shall be applied (in parallel) to all the wires in the cable with reference to the cabinet reference ground (true common mode) and the source impedance shall be 50 Ω .

A.2.5.3 Performance criteria

The performance criteria of subclause 4.2 shall apply.

A.2.6 RF common mode (0,15 MHz - 80 MHz)

The test shall be performed on AC mains power input/output ports.

This test shall be performed on signal, control and DC power input/output ports, which may have cables longer than 1 m.

Where this test is not carried out on a port or any other ports because the manufacturer declares that it is not intended to be used with cables longer than stated above, a list of ports which were not tested shall be included in the test report.

This test shall be performed on a representative configuration of the equipment.

NOTE: This test can also be performed using the intrusive method, where appropriate, see IEC 61000-4-6 [9].

A.2.6.1 Definition

This test assesses the ability of transmitters, receivers and transceivers to operate as intended in the presence of a radio frequency electromagnetic disturbance.

A.2.6.2 Test method and level

The test method shall be in accordance with IEC 61000-4-6 [9]:

- the test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 kHz;
- the stepped frequency increments shall be 50 kHz and 1 % frequency increment of the momentary frequency in the frequency range 5 MHz - 80 MHz;
- the test level shall be severity level 2 as given in IEC 61000-4-6 [9] corresponding to 3 V rms, at a transfer impedance of 150 Ω ;
- the test shall be performed over the frequency range 150 kHz - 80 MHz;
- responses of stand alone receivers or receivers which are part of transceivers occurring at discrete frequencies which are narrow band responses, shall be disregarded, see subclause x.x;
- the frequencies selected during the test and the test method used shall be recorded in the test report.

A.2.6.3 Performance criteria

The performance criteria of subclause 4.1 shall apply.

A.2.7 Voltage dips and interruptions

The tests shall be performed on AC mains power input ports.

These tests shall be performed on a representative configuration of the equipment.

A.2.7.1 Definition

These tests assess the ability of transmitters, receivers and transceivers to operate as intended in the event of voltage dips and interruptions present on the AC mains power input ports.

A.2.7.2 Test method and level

The following requirements shall apply.

The test method shall be in accordance with IEC 61000-4-11 [10].

The test levels shall be:

- a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms;
- a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms;
- a voltage interruption corresponding to a reduction of the supply voltage of > 95 % for 5 000 ms.

A.2.7.3 Performance criteria

For a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms the performance criteria of subclause 4.2 shall apply:

For a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms and/or a voltage interruption corresponding to a reduction of the supply voltage of > 95 % for 5 000 ms the performance criteria of subclause 4.2 shall apply:

In the case where the equipment is powered solely from the AC mains supply (without the use of a parallel battery back-up the communications link need not be maintained and may have to be re-established and volatile user data may have been lost.

In the event of loss of the communications link or in the event of loss of user data, this fact shall be recorded in the test report, the product description and the user documentation.

A.2.8 Surges, common and differential mode

The tests shall be performed on AC mains power input ports.

These tests shall be performed on a representative configuration of the equipment.

A.2.8.1 Definition

These tests assess the ability of transmitters, receivers and transceivers to operate as intended in the event of surges being present at the AC mains power input ports.

A.2.8.2 Test method and level

The test method shall be in accordance with IEC 61000-4-5 [8].

The following requirements and evaluation of test results shall apply:

- the test level for ac mains power input ports shall be 1 kV line to ground and 0,5 kV line to line with the output impedance of the surge generator as given in the IEC61000-4-5 [8];
- the test generator shall provide the 1,2/50 µsec pulse as defined in IEC 61000-4-5 [8].

A.2.8.3 Performance criteria

The performance criteria of subclause 4.2 shall apply.

A.3 References

This Annex incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] CISPR 22 (1997): "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".
- [2] CISPR 16-1 (1993): "Specification for radio disturbance and immunity measuring apparatus and methods".
- [3] IEC 61000-3-2: "Electromagnetic compatibility (EMC) - Part 3: Limits – Section 2: Limits for harmonic current emissions (equipment input current 16 A)".
- [4] IEC 61000-3-3: "Electromagnetic compatibility (EMC) - Part 3: Limits – Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current 16 A".
- [5] IEC 61000-4-2 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test".
- [6] IEC 61000-4-3 (1996): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency electromagnetic field immunity test".

- [7] IEC 61000-4-4 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test".
- [8] IEC 61000-4-5 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 5: Surge immunity test".
- [9] IEC 61000-4-6 (1996): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 6: Immunity to contacted disturbances, induced by radio frequency fields".
- [10] IEC 61000-4-11 (1994): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 11: Voltage dips, short interruptions and voltage radiations. Immunity tests".

Annex B (informative): Open items

Section number	Section description	Status
3.1	Definition of: Loss of service Loss of call	Contributions invited.
3.1	Definition of: Transient phenomena Continuous phenomena	Editor to check if any generally accepted definition already exists
4		New text to be proposed by correspondence following WG4#7
5		New text to be proposed by correspondence following WG4#7
6.1, 6.2	Number of tests	The number of different bearers which need to be tested needs to be defined.
6.2	Self recovery	Conditions for "System operation self-recoverable" need to be defined.
7		New text to be approved by correspondence to identify relevant sections of Annex A for phenomena

History

Document history		
V 0.1.0	1999-07-28	First version presented to RAN WG4 #6. Technical content taken from R4-99307
V 0.1.1	1999-07-29	Editorial corrections made. Open issues added to annex B,
V1.0.0	1999-08-03	Revision marks accepted. Re-issued as version 1.0.0 as agreed at RAN WG4 #6.
V1.1.0	1999-09-17	Changes agreed at WG4 #7 incorporated: R4-99547 and R4-99562
V1.1.1	1999-09-21	Editorial correction to references [5] and [6] in sections 1 and 2.
V1.2.0	1999-09-30	Revision marks accepted. New text added in section 5
<p>Editor for TS 25.113 (Base Station EMC) is:</p> <p>Simon Pike</p> <p>Lucent Technologies</p> <p>Tel: +44 1793 883206</p> <p>Fax: +44 1793 883232</p> <p>e-mail: spike2@lucent.com</p>		