Presentation of Specification to TSG or WG

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3rd Generation Partnership Project; Technical Specification Group (TSG) Terminals; Electromagnetic compatibility (EMC) Table of International requirements for Mobile terminals and ancillary equipment (Release 4)

Presented for: **Approval**

Abstract of document:

This Technical Report is a compilation of regional and or national requirements for Electromagnetic Compatibility and will continuously be upgraded as standards and regulations change. Sections will be added for new regions or nations, which enter the 3GPP and have different requirements. It is the intention to reference global standards but where it is known that none exist then alternative standards mandated by the regional and or national requirements will be quoted.

The sole purpose of the document is as a reference to the current status at time of publication. When new versions are published they will supersede the previous ones.

Changes since last presentation to Meeting #9

Additional material: Updates to the reference section with the full titles of the missing FCC and ARIB documents. This completes the document and it is now ready for approval.

Outstanding Issues:

None

Contentious Issues:

None

3GPP TR 34.926 V2.0.0 (2000-11)

Technical Report

3rd Generation Partnership Project; Technical Specification Group (TSG) Terminals; Electromagnetic compatibility (EMC) Table of International requirements for Mobile terminals and ancillary equipment (Release 4)

Keywords
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Contents

Foreword

This Technical Report 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 TR, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.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 document.

Introduction

This Technical Report is a living document and will continuously be upgraded as standards and regulations change. Sections will be added for new regions or nations, which enter the 3GPP and have different requirements. It is the intention to reference global standards but where it is known that none exist then alternative standards mandated by the regional and or national requirements will be quoted.

The sole purpose of the document is as a reference to the current status at time of publication. When new versions are published they will supersede the previous ones.

1 Scope

The present document shows in tabular form most of the current regulatory and voluntary requirements by region or nation, and is for information purposes only.

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.

[1] IEC 61000-6-1 (1997): "Electromagnetic compatibility (EMC) – Part 6: Generic standards - Section 1: Immunity standard for residential, commercial and light-industrial environments".

[2] IEC 61000-6-3 (1996): "Electromagnetic compatibility (EMC) – Part 6: Generic standards - Section 3: Emission standard for residential, commercial and light-industrial environments.

[3] ISO 7637-1 (1990): "Road vehicles - Electrical disturbance by conduction and coupling - Part 1: Passenger cars and light commercial vehicles with nominal 12 V supply voltage - Electrical transient conduction along supply lines only".

[4] ISO 7637-2 (1990): "Road vehicles - Electrical disturbance by conduction and coupling - Part 2: Commercial vehicles with nominal 24 V supply voltage - Electrical transient conduction along supply lines only".

[5] RECOMMENDATION ITU-R SM.329-8 (2000); "SPURIOUS EMISSIONS"

[6] IEC CISPR publication 22; 3rd edition (1997-11); "Information technology equipment; Radio disturbance characteristics – Limits and methods of measurement"

[7] IEC CISPR publication 16-1; (1993); Radio disturbance and immunity measuring apparatus"; Am.1 (1997); "Specification for radio disturbance and immunity measuring apparatus and methods"

[8] IEC 61000-3-2; (1995-03); "Electromagnetic compatibility; Part 3 - Limits; section 2 – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)"; Am.1 (1997-09)

[9] IEC 61000-3-3; (1994-12); "Electromagnetic compatibility; Part 3 - Limits; section 2 – Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A"

[10] IEC 61000-4-2; "Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – section 2: Electrostatic discharge immunity test – Basic EMC publication"

[11] IEC 61000-4-3; "Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – section 3: Radiated, radio-frequency electromagnetic field immunity test"

[12] IEC 61000-4-4; "Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – section 4: Electrical fast transient/burst immunity test – Basic EMC publication"

[13] IEC 61000-4-5; "Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – section 5: Surge immunity test"

[14] IEC 61000-4-6; "Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – section 6: immunity to conducted disturbances induced by radio frequency fields"

[15] IEC 61000-4-11; "Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – section 11:Voltage dips, short interruptions, and voltage variations immunity test"

[16] EN 300 607 - 1; Digital cellular telecommunications system (Phase 2); Mobile Station (MS) conformance specification; Part 1: Conformance specification (GSM 11.10-1 version 4.24.0)

[17] EN 55022; "Information technology equipment; Radio disturbance characteristics – Limits and methods of measurement"

[18] ARIB STD-T57 ; "ELECTROMAGNETIC COMPATIBILITY (EMC) FOR RADIO EQUIPMENT Edition 2.0 " ARIB STANDARD

[19] RCR STD-27 ; "PERSONAL DIGITAL CELLULAR TELECOMMUNICATION SYSTEM Edition H " ARIB STANDARD

[20] FCC CFR 47 part 15; RADIO FREQUENCY DEVICES, Code of Federal Regulations Title 47, Volume 1, Parts 0 to 19

[21] CWTS TS C404; China Wireless Telecommunication Standard (CWTS); Working Group 1 (WG1); UE and BTS EMC

[22] ETSI EN 301 489; Electromagnetic compatibility and Radio Spectrum Matters /ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services;
Part 1: "Common technical requirements";
Part 7: "Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)";.
Part 8: "Specific conditions for GSM base stations";
Part 18: "Specific conditions for Terrestrial Trunked Radio (TETRA)"
Part 23: " Specific conditions for 3rd Generation Partnership project (UMTS) Base station radio and ancillary equipment
Part 24: " Specific conditions for 3rd Generation Partnership project (UMTS) for Mobile and potable (UE) radio and ancillary equipment

3 Definitions and abbreviations

3.1 Definitions

Ancillary equipment: Equipment (apparatus), used in connection with a user equipment (UE) is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a UE to provide additional operational and/or control features to the UE, (e.g. to extend control to another position or location); and
- the equipment cannot be used on a stand alone basis to provide user functions independently of a UE; and
- the UE to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

Idle mode: Idle mode is the state of User Equipment (UE) when switched on but with no Radio Resource Control (RRC) connection.

Port: particular interface, of the specified equipment (apparatus), with the electromagnetic environment. For example, any connection point on an equipment intended for connection of cables to or from that equipment is considered as a port (see figure 1).

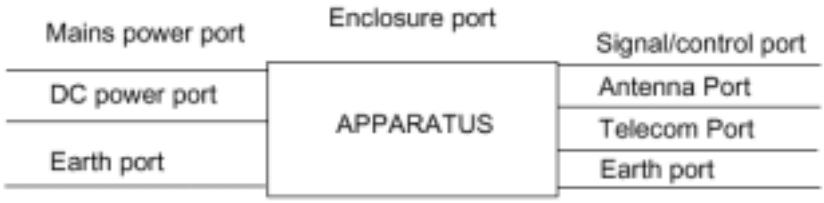

Figure 1: Examples of ports

Spurious emission from ITU-R SM 329-8

Emission on a frequency, or frequencies, which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products but exclude out-of-band emissions.

NOTE 1 – For the purpose of this Recommendation all emissions, including intermodulation products, conversion products and parasitic emissions, which fall at frequencies separated from the centre frequency of the emission by 250% or more of the necessary bandwidth of the emission will generally be considered spurious emissions. For multi-channel or multi-carrier transmitters/transponders, where several carriers may be transmitted simultaneously from a final output amplifier or an active antenna, the centre frequency of the emission is taken to be the centre of the –3dB bandwidth of the transmitter or transponder.

Telecommunication port

ports which are intended to be connected to telecommunication networks (e.g. public switched telecommunication networks, integrated services digital networks), local area networks (e.g. Ethernet, Token Ring) and similar networks (see CISPR 22).

Transient phenomena

Pertaining to or designating a phenomena or a quantity which varies between two consecutive steady states during a time interval short compared with the time-scale of interest (IEC 60050-161).

4 Table of International EMC Requirements for Mobile terminals and ancillary equipment

SPEC ITEM AREA	APPLIC.	China		3GPP SPECS		JAPAN		EUROPE		USA		KOREA	
		REQMENT	REF. DOC	REQMENT	REF. DOC	REQMENT	REF. DOC	REQMENT	REF. DOC	REQMENT	REF. DOC	REQMENT	REF. DOC
RADIATED EMISSIONS													
Limits on Radiated Emission	Vehicular, Portable, Ancillary,	TS C404	TS 34.124 TS 25.113		TS 34.124	**classA(Q-peak)** 30MHz-230 MHz : 40dBuV/m 230MHz-1GHz : 47 dBuV/m **classB(Q-peak)** 30 MHz -230 MHz : 30 dBuV/m 230MHz-1GHz : 37 dBuV/m	ARIB T-57 2.2 reference from CISPR22 *(measurement is under receiving condition)		EN 300 607-1 Version 6 release 1997			**class A (Q-peak)** 30 MHz-230 MHz : 40dBuV/m 230MHz-1GHz : 47 dBuV/m **classB (Q-peak)** 30 MHz -230 MHz : 30 dBuV/m 230MHz-1GHz : 37 dBuV/m	CISPR22
Transmit OFF power (idle m ode)			TS 34.124 TS 25.113		TS 34.124	-60 dBm for PDC terminal	RCR 27 (Standard for PDC)		EN 300 607-1 Version 6 release 1997				

Limits on Radiated Emissions	Ancillary AC eqpt only				TS 34.124		CISPR 22		EN 55022	Not Req for Part 24 devices. 500uV/m >960 MHz or CISPR 22	CFR 47 Part 15.109(a),(e) needs further investigation		
CONDUCTED EMISSIONS													
A. Limits on Conducted Emission	Ancillary equipment		TS 34.124 TS 25.113		TS 34.124					Not Reqd for Part 24 devices.			
DC Power in/out	Vehicular, Portable, Ancillary		TS 34.124 TS 25.113		TS 34.124	0.15 - 0.5 MHz : Q-Peak 79dBuV Average 66dBuV 0.5 - 30 MHz : Q-Peak 73dBuV Average 60dBuV	ARIB T-57 2.3 reference from CISPR 16-1 / 22		CISPR 16-1, EN55022			0.15 - 0.5 MHz : Q-Peak 79dBuV Average 66dBuV 0.5 - 30 MHz : Q-Peak 73dBuV Average 60dBuV	CISPR22
AC Mains	Portable, Ancillary		TS 34.124 TS 25.113		TS 34.124	Class A 0.15 - 0.5 MHz : Q-Peak 79dBuV Average 66dBuV 0.5 - 30 MHz : Q-Peak 73dBuV Average 60dBuV Class B 0.15 - 0.5 MHz : Q-Peak 66-56 dBuV / Average 56-46 dBuV 0.5 - 5 MHz : Q-Peak 56 dBuV	ARIB T-57 2.4 reference from CISPR 16-1 / 22		CISPR 22, EN55022	250 uV <30 MHz or CISPR 22	CFR part 15.107(a), (e)	Class A 0.15 - 0.5 MHz : Q-Peak 79dBuV Average 66dBuV 0.5 - 30 MHz : Q-Peak 73dBuV Average 60dBuV Class B 0.15 - 0.5 MHz : Q-Peak 66-56 dBuV / Average 56-46 dBuV 0.5 - 5 MHz : Q-Peak 56 dBuV	CISPR22

						Average 46dBuV 5 -30 MHz : Q-Peak 60 dBuV Average 50dBuV						Average 46dBuV 5 -30 MHz : Q-Peak 60 dBuV Average 50dBuV	
Harmonic Current Emissions, AC Mains	Portable, Ancillary		TS 34.124 TS 25.113		TS 34.124	Not Applicable			EN 61000-3-2			Not Applicable	
Voltage Fluctuations/ Flicker	Portable, Ancillary		TS 34.124 TS 25.113		TS 34.124	Not Applicable			EN 61000-3-3			Not Applicable	
Immunity to RF EM Fields, 80-1000 MHz	Vehicular, Portable, Ancillary eqpt,		RF EM Fields, 80-2000 MHz		TS 34.124	3 V/m	ARIB T-57 3.6 reference from JIS 1000-4-3 (IEC 61000-4-3)	3 V/m	EN 61000-4-3			3 V/m (80MHz~1GHz: No modulation)	IEC 61000-4-3
AC Mains - Voltage Dips and interruption	Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	Not applicable			EN 61000-4-11			Under Consideration	IEC 61000-4-11

AC Mains - Surges, Common Mode and Differental mode	Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	Not applicable			EN 61000-4-5			1 kV	IEC 61000-4-5
DC Mains-Surges	Vehicular, Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	Not applicable						Under Consideration	IEC 61000-4-5
Signal ports and Comm-unication ports-Surges	Vehicular, Portable, Ancillary eqpt,		TS 34.124 TS 25.113			Not applicable							
DC Mains-Surges	Vehicular,		TS 34.124 TS 25.113		TS 34.124	50 V / -50 V and -5 V / -2.5 V / 0 V	ARIB T-57 3.10 reference from ISO 7637-1/2		ISO 7637-1/2			Under Consideration	
Fast Transients - AC/DC Power	Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	Not applicable		2/1 Kv	EN 61000-4-4			1kV	IEC 61000-4-4
Fast Transients - Signal/control ports	Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	Not applicable		0.5 Kv	EN 61000-4-4			0.5kV	IEC 61000-4-4
RF Conducted 0.15-80MHz	Vehicular, Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	3 Vrms	ARIB T-57 3.7 v. 2.0 reference from IEC 61000-4-6 (only Vehicular)	3 V rms	EN 61000-4-6			Under Consideration	IEC 61000-4-6
ELECTRO-STATIC DISCHARGE	Vehicular, Portable, Ancillary eqpt,		TS 34.124 TS 25.113		TS 34.124	±8 kV (Air) / ± 4 kV (Contact)	ARIB T-57 3.4 v.2.0 reference	±8 kV (Air) / ± 4 kV (Contact)	EN 61000-4-2			±8 kV (Air) / ± 4 kV (Contact)	IEC 61000-4-2

							from IEC 61000-4-2						
			TS 34.124 TS 25.113		TS 34.124	1 A/m (60 Hz or 50 Hz)	ARIB T-57 3.8 v.2.0 reference from IEC 61000-4-8						

Annex A (informative): Change history

Change history					
TSG SA#	Version	CR	Tdoc SA	New Version	Subject/Comment
	34.926 version 1.0.0				April 2000

Document history		
34.12xx	November 1999	Preliminary draft
34.926	April 2000	34.926 version 1.0.0
34.926	Nov 2000	34.926 version 2.0.0