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INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

Electromagnetic compatibility of multimedia equipment – Immunity requirements

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Compatibilité électromagnétique des équipements multimédia – Exigences d'immunité

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COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references.....	9
3 Terms, definitions and abbreviations	10
3.1 Terms and definitions	10
3.2 Abbreviations	15
4 Requirements	18
4.1 General requirements.....	18
4.2 Particular requirements	19
4.2.1 Electrostatic discharges (ESD)	19
4.2.2 Continuous RF disturbances.....	19
4.2.3 Power frequency magnetic field.....	21
4.2.4 Electrical fast transients/burst (EFT/B).....	21
4.2.5 Surges.....	21
4.2.6 Voltage dips and interruptions	21
4.2.7 Broadband impulsive conducted disturbances.....	21
5 Immunity requirements	23
6 Documentation	28
6.1 Test report	28
6.2 Advice to end-users	28
7 Test configuration	28
8 General performance criteria.....	29
8.1 General.....	29
8.2 Performance criterion A.....	29
8.3 Performance criterion B.....	30
8.4 Performance criterion C.....	30
9 Compliance with this document.....	30
10 Test uncertainty.....	30
Annex A (normative) Broadcast reception function.....	31
A.1 General.....	31
A.2 Applicability	31
A.3 Mode of operation	31
A.4 Modified test levels and performance criteria	33
Annex B (normative) Print function	35
B.1 Applicability	35
B.2 Mode of operation	35
B.3 Performance criteria.....	35
B.3.1 Performance criterion A.....	35
B.3.2 Performance criterion B.....	36
B.3.3 Performance criterion C	36
Annex C (normative) Scan function	37
C.1 Applicability	37
C.2 Mode of operation	37
C.3 Performance criteria.....	37

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C.3.1	Performance criterion A.....	37
C.3.2	Performance criterion B.....	37
C.3.3	Performance criterion C	38
Annex D (normative)	Display and display output functions	39
D.1	Applicability	39
D.2	Mode of operation	39
D.2.1	Test signals and conditions	39
D.2.2	Display evaluation, for continuous disturbances.....	41
D.2.3	Display evaluation for power frequency magnetic field testing	43
D.3	Performance criteria.....	44
D.3.1	Performance criterion A for continuous radiated and conducted disturbances tests.....	44
D.3.2	Performance criterion A for the power frequency magnetic field tests	44
D.3.3	Performance criterion B.....	44
D.3.4	Performance criterion C	44
Annex E (normative)	Musical tone generating function.....	45
E.1	Applicability	45
E.2	Mode of operation	45
E.3	Performance criteria.....	45
E.3.1	General	45
E.3.2	Performance criterion A.....	45
E.3.3	Performance criterion B.....	46
E.3.4	Performance criterion C	46
Annex F (normative)	Networking functions.....	47
F.1	Applicability.....	47
F.1.1	General	47
F.1.2	Switching and routing function.....	47
F.1.3	Data transmission function	47
F.1.4	Supervisory function	47
F.2	Specific terminology for use within Annex F	47
F.3	General requirements for network functions	48
F.3.1	General	48
F.3.2	Configuration	48
F.3.3	Performance criteria.....	48
F.4	Requirements for CPE containing xDSL ports	50
F.4.1	Configuration and mode of operation	50
F.4.2	Performance criterion A.....	51
F.4.3	Performance criterion B.....	52
F.4.4	Performance criterion C	53
Annex G (normative)	Audio output function.....	54
G.1	Applicability	54
G.2	Specific terminology for use within this annex	54
G.2.1	acoustic interference ratio	54
G.2.2	acoustic reference level	54
G.2.3	audio output port.....	54
G.2.4	dBm0.....	54
G.2.5	demodulated audio level.....	54
G.2.6	electrical interference ratio	55
G.2.7	electrical reference level	55

G.2.8	loudspeaker	55
G.2.9	on-ear device	55
G.3	Overview	55
G.3.1	General	55
G.3.2	Ports to be tested	55
G.4	Reference level	56
G.5	Mode of operation	57
G.5.1	General	57
G.5.2	Gain setting	57
G.5.3	Audio frequency-response adjustments	57
G.5.4	Non-linear processing	57
G.6	Method of measurement	57
G.6.1	General	57
G.6.2	Electrical measurements	58
G.6.3	Acoustic measurements	58
G.6.4	Processes (not applicable to direct measurements).....	59
G.7	Performance criteria	60
G.7.1	Performance criterion A.....	60
G.7.2	Performance criterion B.....	60
G.7.3	Performance criterion C	61
G.8	Test setup examples	61
Annex H (normative)	Telephony function	65
H.1	Applicability	65
H.2	General.....	65
H.3	Mode of operation	65
H.4	Performance criteria	66
Annex I (informative)	Immunity to specific radio technologies operating at frequencies of 800 MHz and above	67
Annex J (informative)	Examples of how to apply this document.....	69
J.1	Purpose	69
J.2	Developing the test plan	69
J.3	Specific examples	70
J.3.1	General	70
J.3.2	Example 1: A multifunction printer	70
J.3.3	Example 2: Flat panel television	72
J.3.4	Example 3: Notebook computer	74
J.3.5	Example 4: Small key telephone systems or PABXs.....	76
Bibliography	79
Figure 1	– Examples of ports.....	14
Figure 2	– Example schematic of the broadband impulsive conducted disturbances test setup.....	21
Figure 3	– Graphical representation of the continuous induced RF disturbances levels defined in table clause 2.1	23
Figure D.1	– Example colour bar image	41
Figure D.2	– Example test setup with a video camera system for use with a display	42
Figure D.3	– Example test setup for capturing the image directly from a display port	43
Figure F.1	– xDSL access system configuration.....	50

Figure G.1 – Example basic test setup for electrical measurements (direct connection to EUT).....	61
Figure G.2 – Example basic test setup for acoustic measurements	61
Figure G.3 – Example test setup for acoustic measurements on loudspeakers	61
Figure G.4 – Example test setup for on-ear acoustic measurements.....	62
Figure G.5 – Example test setup for on-ear acoustic measurements, microphone located away from earpiece transducer	62
Figure G.6 – Example test setup for measuring the sound pressure level from the acoustic output device of a telephone handset.....	63
Figure G.7 – Example test setups for measuring the demodulation on analogue wired network lines	64
Figure J.1 – Examples of different types of functions	70
Figure J.2 – Example of a typical small key telephone system or PABX.....	77
Table 1 – Immunity requirements for enclosure ports	24
Table 2 – Immunity requirements for analogue/digital data ports	25
Table 3 – Immunity requirements for DC network power ports	26
Table 4 – Immunity requirements for AC mains power ports	27
Table 5 – Test arrangements of EUT	29
Table A.1 – Examples of specifications of digital broadcast signals	32
Table A.2 – Modified test levels for performance criterion A for the broadcast reception function	34
Table D.1 – Prioritised list of display images	40
Table D.2 – Characteristics of a measurement video camera monitor system	43
Table E.1 – Subgroups and performance criteria A for the musical tone generating function	45
Table E.2 – Performance criteria for different subgroups given in Table E.1	46
Table F.1 – ITU-T recommendations for xDSL systems.....	51
Table F.2 – Attenuation values representing cable lengths.....	51
Table F.3 – Performance criteria against impulse duration	52
Table G.1 – Test requirements for various MME	56
Table G.2 – Measurement method and reference level setting	56
Table G.3 – Performance criterion A – Limits for devices supporting telephony	60
Table H.1 – Telephony functions, performance criteria.....	66
Table I.1 – Guidance on the selection of immunity levels to common wireless communication devices	68
Table J.1 – Test requirements for example 1: a multifunction printer	71
Table J.2 – Test details for example 1: a multifunction printer	72
Table J.3 – Test requirements for example 2: flat panel television.....	73
Table J.4 – Test details for example 2: flat panel television.....	74
Table J.5 – Test requirements for example 3: notebook computer	75
Table J.6 – Test details for example 3: notebook computer	76
Table J.7 – Example test configurations and performance assessment methods applicable to a PABX and associated terminals for continuous induced RF disturbance tests	78

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**ELECTROMAGNETIC COMPATIBILITY OF MULTIMEDIA EQUIPMENT –
IMMUNITY REQUIREMENTS**

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The text of this standard is based on the following documents:

FDIS	Report on voting
CISPR/II/522/FDIS	CISPR/II/527/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

This CISPR document establishes uniform requirements for the electromagnetic immunity of multimedia equipment. The test methods are given within this document or in referenced basic EMC immunity standards. This document specifies applicable tests, test levels, product operating conditions and assessment criteria.

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ELECTROMAGNETIC COMPATIBILITY OF MULTIMEDIA EQUIPMENT – IMMUNITY REQUIREMENTS

1 Scope

NOTE Blue coloured text within this document indicates text aligned with CISPR 32. CISPR 32 contains the appropriate emission requirements above 150 kHz for the equipment within the scope of this document.

This document applies to multimedia equipment (MME) as defined in 3.1.24 and having a rated AC or DC supply voltage not exceeding 600 V.

MME within the scope of CISPR 20 or CISPR 24 is within the scope of this document.

MME with a broadcast reception function is within the scope of this document, see Annex A. MME with non-broadcast wireless interfaces is also within the scope of this document, however, compliance with this document does not require the assessment of the performance of these interfaces.

MME intended primarily for professional use is within the scope of this document.

MME for which immunity requirements in the frequency range covered by this document are explicitly formulated in other CISPR documents (except CISPR 20 and CISPR 24) are excluded from the scope of this document.

The objectives of this document are:

- to establish requirements which provide an adequate level of intrinsic immunity so that the MME will operate as intended in its environment in the frequency range 0 kHz to 400 GHz;
- to specify procedures to ensure the reproducibility of tests and the repeatability of results.

Due to technology convergence of the functions of MME, the performance criteria have been determined on a function-orientated basis rather than on an equipment-orientated basis.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CISPR 16-1-2:2014, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-3:2006/AMD 1:2007

IEC 61000-4-3:2006/AMD 2:2010

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*¹

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*²

IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61000-4-20: 2010, *Electromagnetic compatibility (EMC) – Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides*

IEC 61000-4-21:2011, *Electromagnetic compatibility (EMC) – Part 4-21: Testing and measurement techniques – Reverberation chamber test methods*

ISO 9241-3:1992, *Ergonomic requirements for office work with visual display terminals (VDTs) – Part 3: Visual display requirements*

IEEE Standard 802.3, *IEEE Standard for Ethernet, Section Three*

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3 Terms, definitions and abbreviations

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3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

NOTE Terms and definitions related to EMC and to relevant phenomena are given in IEC 60050-161. Attention is drawn to the fact that a common set of definitions has been written for both CISPR 32 and CISPR 35. It is noted that some terms and definitions will only be used in one of these two documents but for purposes of consistency they are intentionally included in both.

3.1.1

AC mains power port

port used to connect to the mains supply network

Note 1 to entry: Equipment with a DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment.

¹ 2nd edition (2005). This 2nd edition has been replaced in 2014 by a 3rd Edition IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*.

² 3rd edition (2008). This 3rd edition has been replaced in 2013 by a 4th Edition IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*.

3.1.2

analogue/digital data port

signal/control port (3.1.32), antenna port (3.1.3), wired network port (3.1.34), broadcast receiver tuner port (3.1.8), or optical fibre port (3.1.25) with metallic shielding and/or metallic strain relief member(s)

3.1.3

antenna port

port, other than a broadcast receiver tuner port (3.1.8), for connection of an antenna used for intentional transmission and/or reception of radiated RF energy

3.1.4

arrangement

physical layout and orientation of all the parts of the EUT, AE and any associated cabling, located within the test area

3.1.5

associated equipment

AE

equipment needed to exercise and/or monitor the operation of the EUT

Note 1 to entry: The AE may be either local (within the measurement or test area) or remote.

3.1.6

audio equipment

equipment which has a primary function of either (or a combination of) generation, input, storage, play, retrieval, transmission, reception, amplification, processing, switching or control of audio signals

3.1.7

broadcast receiver equipment

equipment containing a tuner that is intended for the reception of broadcast services

Note 1 to entry: These broadcast services are typically television and radio services, including terrestrial broadcast, satellite broadcast and/or cable transmission.

3.1.8

broadcast receiver tuner port

port intended for the reception of a modulated RF signal carrying terrestrial, satellite and/or cable transmissions of audio and/or video broadcast and similar services

Note 1 to entry: This port may be connected to an antenna, a cable distribution system, an RF modulator output port (3.1.31) or similar device.

3.1.9

common mode impedance

asymmetrical mode (see CISPR 16-2-1:2014) impedance between a cable attached to a port and the Reference Ground Plane (RGP)

Note 1 to entry: The complete cable is seen as one wire of the circuit, and the RGP is seen as the other wire of the circuit. The common mode current flowing around this circuit can lead to the emission of radiated energy from the EUT.

3.1.10

configuration

operational conditions of the EUT and AE, consisting of the set of hardware elements selected to comprise the EUT and AE, the mode of operation (3.1.23) used to exercise the EUT and arrangement (3.1.4) of the EUT and AE

3.1.11**converted common mode current**

asymmetrical mode current converted from differential mode current by the unbalance of an attached cable and/or network

3.1.12**DC network power port**

port, not powered by a dedicated AC/DC power converter and not supporting communication, that connects to a DC supply network

Note 1 to entry: Equipment with a DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment.

Note 2 to entry: DC power ports supporting communication are considered to be wired network ports (3.1.34), for example Ethernet ports which include power over Ethernet (POE).

3.1.13**enclosure port**

physical boundary of the EUT through which electromagnetic fields may radiate or may enter

3.1.14**entertainment lighting control equipment**

equipment generating or processing electrical signals for controlling the intensity, colour, nature or direction of the light from a luminaire, where the intention is to create artistic effects in theatrical, televisual or musical productions and visual presentations

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3.1.15**Equipment Under Test****EUT**

multimedia equipment (MME) being evaluated for compliance with the requirements of this document

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3.1.16**formal measurement**

measurement used to determine compliance

Note 1 to entry: This is often the final measurement performed. It may be carried out following a prescan measurement. It is the measurement recorded in the test report.

3.1.17**function**

operation carried out by an MME

Note 1 to entry: Functions are related to basic technologies incorporated in the MME such as: displaying, recording, processing, controlling (including control of lighting operations, see 3.1.14), reproducing, transmitting, or receiving single medium or multimedia content. Where relevant the content may be data, audio or video, either individually or in combination.

3.1.18**highest internal frequency**

F_x

highest fundamental frequency generated or used within the EUT, or highest frequency at which it operates

Note 1 to entry: This includes frequencies which are solely used within an integrated circuit.

3.1.19**information technology equipment****ITE**

equipment having a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control of data and/or telecommunication

messages and which may be equipped with one or more ports typically for information transfer

Note 1 to entry: Examples include data processing equipment, office machines, electronic business equipment and telecommunication equipment.

3.1.20

launched common mode current

asymmetric mode current produced by internal circuitry and appearing at a wired network port of the EUT

Note 1 to entry: Measurement of the launched common mode current requires the EUT port to be loaded by a perfectly balanced termination.

3.1.21

LNB

low noise block converter which amplifies and converts broadcast satellite frequencies to frequencies usable by a satellite receiver

3.1.22

local AE

AE located within the measurement or test area

3.1.23

mode of operation

set of operational states of all functions of an EUT during a test or measurement

3.1.24

multimedia equipment

MME

equipment that is information technology equipment (3.1.19), audio equipment (3.1.6), video equipment (3.1.33), broadcast receiver equipment (3.1.7), entertainment lighting control equipment (3.1.14) or a combinations of these

3.1.25

optical fibre port

port at which an optical fibre is connected to an equipment

3.1.26

outdoor unit of home satellite receiving systems

outdoor unit which typically consists of a reflecting surface (or antenna) and an LNB

Note 1 to entry: This excludes the intermediate frequency amplifier and the demodulator included in the indoor receiver.

3.1.27

port

physical interface through which electromagnetic energy enters or leaves the EUT

Note 1 to entry: See Figure 1.