

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Electromagnetic compatibility of multimedia equipment –
Emission requirements**

**Compatibilité électromagnétique des équipements multimédia –
Exigences d'émission**

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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTROMAGNETIC COMPATIBILITY
OF MULTIMEDIA EQUIPMENT –****Emission requirements**

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International Standard CISPR 32 has been prepared by CISPR subcommittee 1: Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers.

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

FDIS	Report on voting
CIS/1/391/FDIS	CIS/1/398/RVD

Full information on the voting for the approval of this publication 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 web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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The contents of the corrigenda of March 2012 and August 2012 have been included in this copy.

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Withd~~rawn~~

ELECTROMAGNETIC COMPATIBILITY OF MULTIMEDIA EQUIPMENT –

Emission requirements

1 Scope

NOTE Blue coloured text within this document indicates text aligned with CISPR 35.

This International Standard applies to multimedia equipment (MME) as defined in 3.1.23 and having a rated r.m.s. AC or DC supply voltage not exceeding 600 V.

Equipment within the scope of CISPR 13 or CISPR 22 is within the scope of this publication.

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

The radiated emission requirements in this standard are not intended to be applicable to the intentional transmissions from a radio transmitter as defined by the ITU, nor to any spurious emissions related to these intentional transmissions.

Equipment, for which emission requirements in the frequency range covered by this publication are explicitly formulated in other CISPR publications (except CISPR 13 and CISPR 22), are excluded from the scope of this publication.

This document does not contain requirements for in-situ assessment. Such testing is outside the scope of this publication and may not be used to demonstrate compliance with it.

This publication covers two classes of MME (Class A and Class B). The MME classes are specified in Clause 4.

The objectives of this publication are:

- 1) to establish requirements which provide an adequate level of protection of the radio spectrum, allowing radio services to operate as intended in the frequency range 9 kHz to 400 GHz;
- 2) to specify procedures to ensure the reproducibility of measurement and the repeatability of results.

2 Normative references

The following reference documents are indispensable for the application of this publication. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CISPR 16-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*
Amendment 1 (2010)

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*
Amendment 1 (2004)
Amendment 2 (2006)

CISPR 16-1-4:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*

CISPR 16-2-1:2008, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements*
Amendment 1 (2010)

CISPR 16-2-3:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*
Amendment 1 (2010)

CISPR 16-4-2:2011, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty*

CISPR/TR 16-4-3:2004, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-3: Uncertainties, statistics and limit modelling – Statistical considerations in the determination of EMC compliance of mass-produced products*
Amendment 1 (2006)

IEC 60050-161:1990, *International Electrotechnical Vocabulary – Chapter 161: Electromagnetic compatibility*

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

ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

IEEE Std 802.3, *IEEE Standard for Information technology – Specific requirements – Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications*

ANSI C63.5-2006, *American National Standard (for) Electromagnetic Compatibility - Radiated Emission Measurements in Electromagnetic Interference (EMI) Control - Calibration of Antennas (9 kHz to 40 GHz)*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

NOTE Terms and definitions related to EMC and to relevant phenomena are given in IEC 60050-161. It should be noted that a common set of definitions has been written for both CISPR 32 and CISPR 35 (to be published). It is noted that some terms and definitions will only be used in one of these two publications 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 Equipment with a DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment.

3.1.2

analogue/digital data port

signal/control port (3.1.28), antenna port (3.1.3), wired network port (3.1.30), broadcast receiver tuner port (3.1.8), or optical fibre port (3.1.24) 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 of all the parts of the EUT, local AE and any associated cabling within the measurement or test area

3.1.5

associated equipment

AE

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

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

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NOTE 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 This port may be connected to an antenna, a cable distribution system, a VCR or similar device.

3.1.9

broadcast satellite outdoor system

antenna and the low-noise amplifier with its associated down-converter, forming part of a satellite reception system

NOTE The indoor receiver's intermediate frequency amplifier and demodulator are excluded.

3.1.10

common mode impedance

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

NOTE 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 of EUT.

3.1.11

configuration

operational conditions of the EUT and AE, consisting of the set of hardware elements selected to comprise the EUT and AE, mode of operation (3.1.22) used to exercise the EUT and arrangement (3.1.4) of the EUT and AE

3.1.12

converted common mode current

asymmetrical mode current converted from differential mode current by the unbalance of a cable or network not forming part of an EUT

3.1.13

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 Equipment with a DC power port which is powered by a dedicated AC/DC power converter is considered to be AC mains powered equipment.

NOTE 2 DC power ports supporting communications are considered to be wired networks ports, for example Ethernet ports which include Power Over Ethernet (POE).

3.1.14

enclosure port

physical boundary of the EUT through which electromagnetic fields may radiate

3.1.15

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

3.1.16

Equipment Under Test

EUT

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

3.1.17

formal measurement

measurement used to determine compliance

NOTE 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.

3.1.18

function

operation carried out by a MME

NOTE Functions are related to basic technologies incorporated in the MME such as: displaying, recording, processing, controlling, reproducing, transmitting, or receiving single medium or multimedia content. The content may be data, audio or video, either individually or in combination.

3.1.19

highest internal frequency

F_x

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

NOTE This includes frequencies which are solely used within an integrated circuit.

3.1.20

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 Examples include data processing equipment, office machines, electronic business equipment and telecommunication equipment.

3.1.21

launched common mode current

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

NOTE Measurement of the launched common mode current requires the EUT port to be loaded by a perfectly balanced termination.

3.1.22

mode of operation

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

3.1.23

MultiMedia Equipment

MME

equipment that is information technology equipment (3.1.20), audio equipment (3.1.6), video equipment (3.1.29), broadcast receiver equipment (3.1.7), entertainment lighting control equipment (3.1.15) or combinations of these

3.1.24

optical fibre port

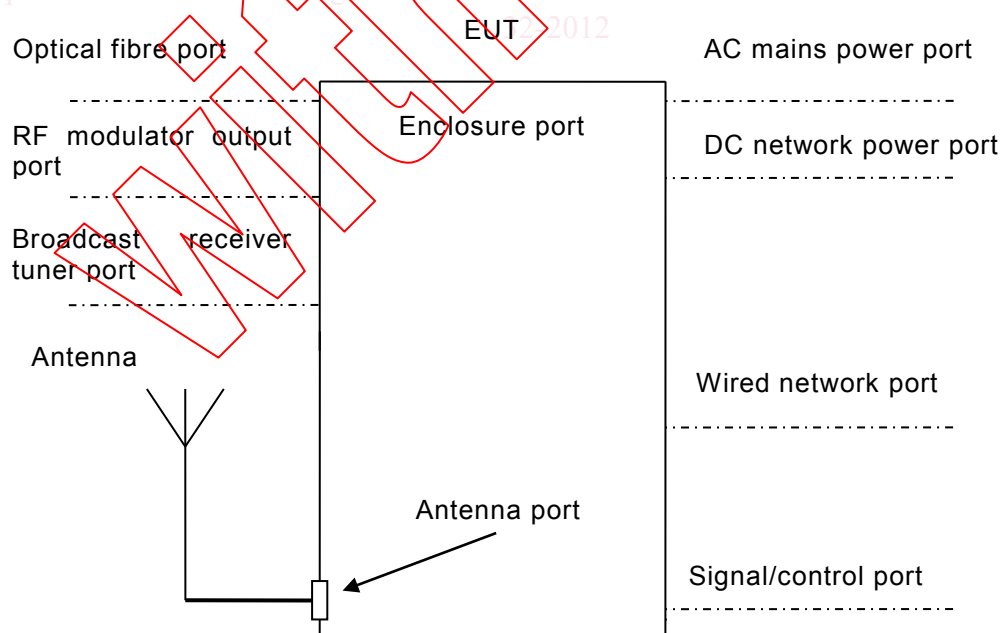
port at which an optical fibre is connected to an equipment

3.1.25

port

physical interface through which electromagnetic energy enters or leaves the EUT

NOTE See Figure 1.



IEC 004/12

Figure 1 – Examples of ports

3.1.26

primary function

any function of an MME considered essential for the user or for the majority of users that needs to be monitored directly or indirectly during immunity testing

NOTE MME may have more than one primary function. For example the primary functions of a basic television set include broadcast reception, audio reproduction and display.

3.1.27

RF modulator output port

port intended to be connected to a broadcast receiver tuner port in order to transmit a signal to the broadcast receiver

3.1.28

signal/control port

port intended for the interconnection of components of an EUT, or between an EUT and local AE and used in accordance with relevant functional specifications (for example for the maximum length of cable connected to it)

NOTE Examples include RS-232, Universal Serial Bus (USB), High-Definition Multimedia Interface (HDMI), IEEE Standard 1394 ("Fire Wire").

3.1.29

video equipment

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

3.1.30

wired network port

point of connection for voice, data and signalling transfers intended to interconnect widely-dispersed systems by direct connection to a single-user or multi-user communication network (for example CATV, PSTN, ISDN, xDSL, LAN and similar networks)

NOTE These ports may support screened or unshielded cables and may also carry AC or DC power where this is an integral part of the telecommunication specification.

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

AAN	Asymmetric Artificial Network
AC	Alternating Current
AC-3	ATSC standard: digital Audio Compression (AC-3)
AE	Associated Equipment, see 3.1.5.
AM	Amplitude Modulation
AMN	Artificial Mains Network
ATSC	Advanced Television Systems Committee
AV	Audio Visual
BPSK	Binary Phase Shift Keying
CATV	Cable TV network
CISPR	International special committee on radio interference
CM	Common Mode
CMAD	Common Mode Absorbing Device
CVP	Capacitive Voltage Probe
DC	Direct Current
DMB-T	Digital Multimedia Broadcast – Terrestrial
DQPSK	Differential Quadrature Phase Shift Keying
DSL	Digital Subscriber Line

DVB-C	Digital Video Broadcast – Cable
DVB-S	Digital Video Broadcast – Satellite
DVB-T	Digital Video Broadcast – Terrestrial
DVD	Digital Versatile Disc (an optical disc format also known as a Digital Video Disc)
DVB	Digital Video Broadcast
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test, see 3.1.16
FAR	Fully Anechoic Room
FM	Frequency Modulation
FSOATS	Free Space Open Area Test Site
HDMI	High-Definition Multimedia Interface
HID	Human Interface Device
IEC	International Electrotechnical Commission
IF	Intermediate Frequency
ISDB	Integrated Services Digital Broadcasting
ISDB-S	Integrated Services Digital Broadcasting – Satellite
ISDN	Integrated Services Digital Network
ISO	International Standardisation Organisation
ITE	Information Technology Equipment, see 3.1.20
ITU	International Telecommunication Union
ITU-R	International Telecommunication Union – Radio Communication Sector
ITU-T	International Telecommunication Union – Telecommunication Sector
LAN	Local Area Network
LCL	Longitudinal Conversion Loss
LNB	Low-Noise Block converter
MME	Multimedia Equipment, see 3.1.23
MPEG	Moving Picture Experts Group
NSA	Normalized Site Attenuation
OATS	Open Area Test Site
OFDM	Orthogonal Frequency Division Multiplexing
PC	Personal Computer
POE	Power Over Ethernet
POS	Point Of Sale
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit (including a AC/DC power converter)
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
RGP	Reference Ground Plane
SAC	Semi Anechoic Chamber
TV	Television
UHF	Ultra High Frequency