

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

Information technology equipment – Immunity characteristics – Limits and methods of measurement

Appareils de traitement de l'information – Caractéristiques d'immunité – Limites et méthodes de mesure

CISPR 24:2010

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INFORMATION TECHNOLOGY EQUIPMENT –
IMMUNITY CHARACTERISTICS –
LIMITS AND METHODS OF MEASUREMENT**

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

CISPR 24 edition 2.1 contains the second edition (2010-08) [documents CIS//331/FDIS and CIS//334/RVD] and its amendment 1 (2015-04) [documents CIS//500/FDIS and CIS//504/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.

International Standard CISPR 24 has been prepared by CISPR subcommittee I: Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers.

This edition includes the following significant technical changes with respect to the previous edition:

- dated references updated;
- option of using a 4 % step size for continuous conducted immunity test deleted;
- revision of Annex A for telephony equipment including methodology for measuring the demodulation from a speaker / hands free device;
- inclusion of new annex related to DSL equipment.

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

The committee has decided that the contents of the base publication and its amendment 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- withdrawn,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
- amended.

The contents of the corrigendum of June 2011 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This CISPR publication establishes uniform requirements for the electromagnetic immunity of information technology equipment. The test methods are given in the referenced Basic EMC Immunity Standards. This publication specifies applicable tests, test levels, product operating conditions and assessment criteria.

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INFORMATION TECHNOLOGY EQUIPMENT – IMMUNITY CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT

1 Scope and object

This CISPR publication applies to information technology equipment (ITE) as defined in CISPR 22.

The object of this publication is to establish requirements that will provide an adequate level of intrinsic immunity so that the equipment will operate as intended in its environment. The publication defines the immunity test requirements for equipment within its scope in relation to continuous and transient conducted and radiated disturbances, including electrostatic discharges (ESD).

Procedures are defined for the measurement of ITE and limits are specified which are developed for ITE within the frequency range from 0 Hz to 400 GHz.

For exceptional environmental conditions, special mitigation measures may be required.

Owing to testing and performance assessment considerations, some tests are specified in defined frequency bands or at selected frequencies. Equipment which fulfils the requirements at these frequencies is deemed to fulfil the requirements in the entire frequency range from 0 Hz to 400 GHz for electromagnetic phenomena.

The test requirements are specified for each port considered.

NOTE 1 Safety considerations are not covered in this publication.

NOTE 2 In special cases, situations will arise where the level of disturbance may exceed the levels specified in this publication, for example where a hand-held transmitter is used in proximity to equipment. In these instances, special mitigation measures may have to be employed.

2 Normative references

The following referenced documents are indispensable for the application 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.

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

IEC 60318-1:2009, *Electroacoustics – Simulators of human head and ear – Part 1: Ear simulator for the measurement of supra-aural and circumaural earphones*

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*
Amendment 1(2007)
Amendment 2(2010)

IEC 61000-4-4:2004, *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*

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

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*

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 20:2006, *Sound and television broadcast receivers and associated equipment – Immunity characteristics – Limits and methods of measurement*

CISPR 22:2008, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-161, and the following apply.

3.1

degradation

unwanted change in operational performance of an EUT due to electromagnetic disturbances. This does not necessarily mean malfunction or catastrophic failure

3.2

equipment under test

EUT

representative device or functionally interactive group of devices (that is a system) which includes one or more host units that is subjected to test procedures specified in this publication

3.3

information technology equipment

ITE

any equipment:

- a) which has a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control, of data and of telecommunication messages and which may be equipped with one or more terminal ports typically operated for information transfer;
- b) with a rated supply voltage not exceeding 600 V.

It includes, for example, data processing equipment, office machines, electronic business equipment and telecommunication equipment.

Any equipment (or part of the ITE equipment) which has a primary function of radio transmission and/or reception according to the ITU Radio Regulations are excluded from the scope of this publication.

NOTE Any equipment which has a function of radio transmission and/or reception according to the definitions of the ITU Radio Regulations should fulfil the national radio regulations, whether or not this publication is also valid.

Equipment, for which all disturbance requirements in the frequency range are explicitly formulated in other IEC or CISPR publications, are excluded from the scope of this publication.

[3.1 of CISPR 22:2008]

3.4 jitter (of a cathode ray tube (CRT) monitor)

peak-to-peak variation in the geometric location of picture elements on the viewing surface of the CRT monitor

3.5 port

particular interface of the specified EUT with the external electromagnetic environment (see Figure 1)

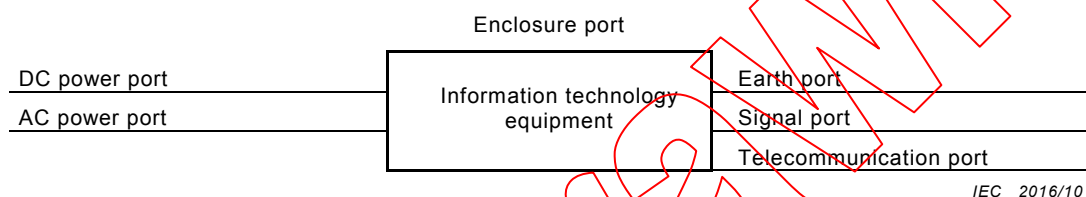


Figure 1 – Description of ports

3.6 enclosure port

physical boundary of the EUT through which electromagnetic fields may radiate or impinge. For plug-in units, the physical boundary will be defined by the host unit

3.7 telephony call

process exercised in the network and the telecommunication terminal equipment (TTE) to allow interchange of information (speech, video or data) with another TTE through the network

NOTE The call should be operated in the way specified by the manufacturer. For circuit switched services, the exchange of data should be considered to be possible when a 64 kbit/s channel or equivalent is available for both parties. For packet service, the exchange of information should be considered to be possible when a virtual path is established to the called TTE.

3.8 establishment of a telephony call

the operating procedure for a user or an automatic process in conjunction with the network to reach the capability to exchange information with another TTE

NOTE See Note of 3.7.

3.9 reception of a telephony call

the operating procedure for a user or an automatic process initiated by, and in conjunction with, the network to reach the capability to exchange information with another TTE

NOTE See Note of 3.7.

3.10 maintenance of a telephony call

the capability of exchanging information without having to clear and re-establish a call

NOTE See Note of 3.7.

3.11

clearing of a telephony call

the operating procedure for a user or an automatic process in conjunction with the network (either at the initiative of the local party or the distant party) to stop the capability of exchanging information by an orderly return to a state where the establishment of a new call is possible

NOTE See Note of 3.7.

3.12

network terminator

NT

associated equipment representing the termination of the telecommunication network

3.13

telephony service

a service providing users with the ability for real-time two-way speech conversation via a network

[see ITU-T, I.241.1]

3.14

telecommunications terminal equipment

TTE

equipment intended to be connected to a public or private telecommunications network, that is:

- a) to be connected directly to the termination of a telecommunications network in order to send, process or receive information; or
- b) to inter-work with a telecommunications network being connected directly or indirectly to the termination of a telecommunications network in order to send, process or receive information

3.15

multifunction equipment

information technology equipment in which two or more functions subject to this standard and/or to other standards are provided in the same unit

NOTE Examples of multifunction equipment include

- a personal computer provided with a telecommunication function and/or broadcast reception function;
- a personal computer provided with a measuring function, etc.

3.16

telecommunication network port

point of connection for voice, data and signaling transfers intended to interconnect widely dispersed systems via such means as direct connection to multi-user telecommunications networks (e.g. public switched telecommunications networks (PSTN), integrated services digital networks (ISDN), x-type digital subscriber lines (xDSL), etc.), local area networks (e.g. Ethernet, Token Ring, etc.) and similar networks

NOTE A port generally intended for interconnection of components of an ITE system under test (e.g. RS-232, IEEE Standard 1284 (parallel printer), Universal Serial Bus (USB), IEEE Standard 1394 ("Fire Wire"), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a telecommunications/network port under this definition.

3.17

analogue interface

an interface that transmits and receives signals whose characteristic quantities follow continuously the variations of another physical quantity representing information