CISPR 13

Edition 5.0 2009-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Sound and television broadcast receivers and associated equipment – Radio disturbance characteristics – Limits and methods of measurement

Récepteurs de radiodiffusion et de télévision et équipements associés – Caractéristiques des perturbations radioélectriques – Limites et méthodes de mesure

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SOUND AND TELEVISION BROADCAST RECEIVERS AND ASSOCIATED EQUIPMENT – RADIO DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard CISPR 13 has been prepared by CISPR subcommittee I: Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers.

This fifth edition of CISPR 13 cancels and replaces the fourth edition published in 2001, its Amendment 1 (2003) and Amendment 2 (2006).This edition constitutes the introduction of the RMS-average detector as an alternative to quasi-peak and average detector for conducted and radiated emission measurements.

The document CISPR/I/296/FDIS, circulated to the National Committees as Amendment 3, led to the publication of the new edition.

The text of this standard is based on the fourth edition, Amendment 1, Amendment 2 and the following documents:

FDIS	Report on voting
CISPR/I/296/FDIS	CISPR/I/297/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 maintenance result 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.

INTRODUCTION

The CISPR recommends that the limits and methods of measurement of radio disturbance characteristics of sound and television receivers contained in the latest edition of CISPR 13, including amendments, be used, without regional or national addenda or modifications. The requirements are considered sufficient to reach adequate emission levels to protect radio broadcast and telecommunication services and to allow other apparatus to operate as intended at a reasonable distance.

SOUND AND TELEVISION BROADCAST RECEIVERS AND ASSOCIATED EQUIPMENT – RADIO DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT

1 Scope and object

This International Standard applies to the generation of electromagnetic energy from sound and television receivers for the reception of broadcast and similar transmissions and from associated equipment. The frequency range covered extends from 9 kHz to 400 GHz.

No measurements need be performed at frequencies where no limits are specified.

Receiving systems for collective reception, in particular:

– cable distribution head ends (Community Antenna Television, CATV);
– community reception systems (Master Antenna Television, MATV)

are covered by IEC 60728-2.

Broadcast receivers for digital signals are covered by Annex A and Annex B.

Information technology equipment (ITE) is excluded, even if intended to be connected to a television broadcast receiver.

The telecommunication port of broadcast receivers, intended to be connected to a telecommunication network, is covered by CISPR 22.

In addition, measurements at the telecommunication port are performed with the broadcast reception functions, which are independent from the telecommunication function, disabled during the measurement.

PC tuner cards are measured according to the relevant clauses of this standard.

This standard describes the methods of measurement applicable to sound and television receivers or associated equipment and specifies limits for the control of disturbance from such equipment.

For multifunction equipment which is subjected simultaneously to different clauses of this standard and/or other standards, details are given in 4.1.

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.

CISPR 16-1-1:2006, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus* [1]
Amendment 1 (2006)
Amendment 2 (2007)

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* [2]
Amendment 1 (2004)
Amendment 2 (2006)

CISPR 16-1-3:2004, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-3: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Disturbance power*

CISPR 16-1-4:2007, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances* [3]
Amendment 1 (2007)
Amendment 2 (2008)

CISPR 16-2-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-2: Methods of measurement of disturbances and immunity – Measurement of disturbance power* [4]
Amendment 1 (2004)
Amendment 2 (2005)

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

IEC 60050-161:1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*
Amendment 1 (1997)
Amendment 2 (1998)

IEC 60728-2:2002, *Cabled distribution systems for television and sound signals – Part 2: Electromagnetic compatibility for equipment* (only available in English)

ITU-R BT 471-1, *Nomenclature and description of colour bar signals*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
sound broadcast receivers
appliances intended for the reception of sound broadcast and similar services for terrestrial, cable and satellite transmission, regardless whether the input signals are digital or analog

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1 There exists a consolidated edition 2.2 (2007) including edition 2.0, its Amendment 1 (2006) and its Amendment 2 (2007).

2 There exists a consolidated edition 1.2 (2006) including edition 1.0, its Amendment 1 (2004) and its Amendment 2 (2006).

3 There exists a consolidated edition 2.1 (2008) including edition 2.0 and its Amendment 1 (2007).

4 There exists a consolidated edition 1.2 (2005) including edition 1.0, its Amendment 1 (2004) and its Amendment 2 (2005).

3.1.2
television receivers
appliances intended for the reception of television broadcast and similar services for terrestrial, cable and satellite transmissions, regardless whether the input signals are digital or analog

3.1.3
associated equipment
equipment either intended to be connected directly to sound or television broadcast receivers, or to generate or reproduce audio or visual information

NOTE 1 Tuners may be provided with a broadcast-satellite-receiving stage and with demodulators, decoders, demultiplexers, D/A converters, encoders (e.g. NTSC, PAL or SECAM encoders), etc.

NOTE 2 Frequency converters may be provided with a broadcast-satellite-receiving stage and with devices which convert the signals to other frequency bands.

NOTE 3 Receivers, tuners, or frequency converters may be tuneable or may only be able to receive a fixed frequency.

3.1.4
PC tuner cards
sound broadcast receiver cards and television broadcast receiver cards, either to be inserted in personal computers or permanently integrated therein

3.1.5
outdoor unit of direct to home satellite receiving systems for individual reception
unit consisting of the antenna, the feeding network and the low-noise amplifier with its associated down-converter. The intermediate frequency amplifier and the demodulator are not included

3.1.6
multifunction equipment
appliances in which two or more functions are provided in the same unit, for instance television reception, radio reception, digital clock, tape-recorder or disc player, etc.

3.2 Abbreviations

AM	Amplitude Modulation
CATV	Community Antenna Television
CD	Compact Disc
EUT	Equipment Under Test
FM	Frequency Modulation
ITE	Information Technology Equipment
ITU-R	International Telecommunication Union – Radio
LW, MW and SW	Long-, Medium- and Short-Waves
MATV	Master Antenna Television
PC	Personal Computer
RF	Radio Frequency

4 Limits of disturbance

4.1 General

For RF disturbances the level shall not exceed the limits specified in 4.2 to 4.7 when measured using the methods given in Clause 5. Where there is frequency duplication at the boundary of

two ranges, the lower limit shall apply. For equipment in large-scale production, it is required that, with 80 % confidence, at least 80 % of production complies with the limits (see Clause 6).

Multifunction equipment which is subjected simultaneously to different clauses of this standard and/or other standards shall be tested with each function operated in isolation, if this can be achieved without modifying the equipment internally. The equipment thus tested shall be deemed to have complied with the requirements of all clauses/standards when each function has satisfied the requirements of the relevant clause/standard.

For equipment for which it is not practical to test with each function operated in isolation, or where the isolation of a particular function would result in the equipment being unable to fulfil its primary function, the equipment shall be deemed to have complied if it meets the provisions of the relevant clause/standard with the necessary functions operative.

4.2 Disturbance voltage at the mains terminals

Measurements shall be made in accordance with 5.3.

Table 1 – Limits of disturbance voltage at the mains terminals

Equipment type	Frequency MHz	Limit dB(μV)		
		Quasi-peak	Average	RMS-average [a]
Television and sound receivers and associated equipment	0,15 to 0,5	66 to 56 [b]	56 to 46 [b]	60 to 50 [b]
	0,5 to 5	56	46	50
	5 to 30	60	50	54

[a] The r.m.s average limits can be applied as an alternative to quasi-peak and average limits.

[b] Decreasing linearly with the logarithm of the frequency.

NOTE 1 If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurements with the average detector are considered to be met.

NOTE 2 The higher value measured with and without the outer conductor screen of the antenna terminal connected to earth is considered.

NOTE 3 Television receivers with teletext facilities should be tested in teletext mode with teletext picture.

4.3 Disturbance voltage at the antenna terminals

Measurements of the antenna terminal voltage shall be made in accordance with 5.4.

The limit values specified correspond to a nominal impedance of 75 Ω.

The limit values for receivers with nominal impedance other than 75 Ω are calculated according to the following formula:

$$L_Z = L_{75} + 10 \log (Z/75) \text{ dB}(\mu\text{V})$$

Table 2 – Limits of disturbance voltage at the antenna terminals

Equipment type	Source	Frequency MHz	Limit dB(μV) 75 Ω Quasi-peak [a]	Limit dB(μV) 75 Ω RMS-average [b]
Television receivers, video recorders and PC tuner cards working in channels between 30 MHz and 1 GHz	Local oscillator	≤1 000	Fundamental 46	Fundamental 46
		30 to 950	Harmonics 46	Harmonics 46
		950 to 2 150	Harmonics 54	Harmonics 54
	Other	30 to 2 150	46	46
Television receivers for broadcast satellite transmissions and tuner units [c]	Local oscillator	950 to 2 150	Fundamental 54	Fundamental 54
		950 to 2 150	Harmonics 54	Harmonics 54
	Other	30 to 2 150	46	46
Frequency modulation sound receivers and PC tuner cards	Local oscillator	≤1 000	Fundamental 54	Fundamental 54
		30 to 300	Harmonics 50	Harmonics 50
		300 to 1 000	Harmonics 52	Harmonics 52
	Other	30 to 1 000	46	46
Frequency modulation car radios	Local oscillator	≤1 000	Fundamental 66	Fundamental 66
		30 to 300	Harmonics 59	Harmonics 59
		300 to 1 000	Harmonics 52	Harmonics 52
	Other	30 to 1 000	46	46
Associated equipment with an RF input, e.g. video tape player, laser disc player	Other	30 to 2 150	46	46

[a] At frequencies above 1 GHz, the peak detector is used.

[b] The RMS-average limits can be applied as an alternative to quasi-peak limits in the entire frequency range.

[c] For tuner units, "antenna terminal" means "first intermediate frequency input terminal".

NOTE For AM broadcast receivers for LW, MW and SW, no limits apply.