BS EN 55013:2013



BSI Standards Publication

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

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 55013:2013. It is derived from CISPR 13:2009. It supersedes BS EN 55013:2001+A2:2006, which will be withdrawn on 22 April 2016.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags ▌C〉 〈C▐.

The UK participation in its preparation was entrusted by Technical Committee GEL/210, EMC — Policy committee, to Subcommittee GEL/210/11, EMC product standards.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013.
Published by BSI Standards Limited 2013

ISBN 978 0 580 62539 8
ICS 33.100.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2013.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 55013

June 2013

ICS 33.100.10

English version

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

(CISPR 13:2009, modified)

Récepteurs de radiodiffusion et de télévision et équipements associés - Caractéristiques des perturbations radioélectriques - Limites et méthodes de mesure (CISPR 13:2009, modifiée)

Ton- und Fernseh-Rundfunkempfänger und verwandte Geräte der Unterhaltungselektronik - Funkstöreigenschaften - Grenzwerte und Messverfahren (CISPR 13:2009, modifiziert)

This European Standard was approved by CENELEC on 2013-04-22. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

© 2013 CENELEC - All rights of exploitation in any form and by any means reserved worldwide for CENELEC members.

Ref. No. EN 55013:2013 E

Foreword

The text of document CISPR/I/296/FDIS, future edition 5 of CISPR 13, prepared by CISPR SC I "Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 55013:2013.

A draft amendment, which covers common modifications to CISPR 13:2009, was prepared by CLC/TC 210 "Electromagnetic Compatibility (EMC)" and approved by CENELEC.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-04-22
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2016-04-22

This document supersedes EN 55013:2001 + IS1:2009 + A1:2003 + A2:2006.

EN 55013:2013 includes the following significant technical changes with respect to EN 55013:2001:

EN 55013:2013 constitutes the introduction of the RMS-average detector as an alternative to quasi-peak and average detector for conducted and radiated emission measurements.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard CISPR 13:2009 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
CISPR 16-1-1 + A1 + A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	EN 55016-1-1 + A1 + A2	2007 2007 2008
CISPR 16-1-2 + corr. January + A1 + A2	2003 2009 2004 2006	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	EN 55016-1-2 + A1 + A2	2004 2005 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	EN 55016-1-3	2006
CISPR 16-1-4 + A1 + A2	2007 2007 2008	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances	EN 55016-1-4 + A1 + A2	2007 2008 2009
CISPR 16-2-2 + A1 + A2	2003 2004 2005	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-2: Methods of measurement of disturbances and immunity - Measurement of disturbance power	EN 55016-2-2 + A1 + A2	2004 2005 2005
CISPR 22 (mod)	2008	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55022 + AC:2011	2010 2011
IEC 60050-161 + A1 + A2	1990 1997 1998	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC 60728-2	2002	Cabled distribution systems for television and sound signals - Part 2: Electromagnetic compatibility for equipment	-	-
ITU-R BT.471-1	-	Nomenclature and description of colour bar signals	-	-

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers protection requirements of Annex I Article 1(a) of the EU Directive 2004/108/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directives concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

CONTENTS

INTRODUCTION 7
1 Scope and object 8
2 Normative references 8
3 Terms, definitions and abbreviations 9
3.1 Terms and definitions 9
3.2 Abbreviations 10
4 Limits of disturbance 10
4.1 General 10
4.2 Disturbance voltage at the mains terminals 11
4.3 Disturbance voltage at the antenna terminals 12
4.4 Wanted signal and disturbance voltage at the RF output of equipment with incorporated or with add-on RF video modulator 13
4.5 Disturbance power 13
4.6 Radiated disturbances 13
4.7 Radiated power 14
5 Measurement procedures 15
5.1 General 15
5.2 Test signals 15
5.3 Disturbance voltage at the mains terminals in the frequency range 150 kHz to 30 MHz 16
5.3.1 General 16
5.3.2 Television receivers 16
5.3.3 Sound receivers 17
5.3.4 Associated equipment 17
5.3.5 Audio amplifiers 18
5.3.6 Measurement of the disturbance voltage at the mains terminals 18
5.4 Measurement of disturbance voltage at the antenna terminals of a receiver and associated equipment with an RF input in the frequency range 30 MHz to 2,15 GHz 18
5.4.1 General 18
5.4.2 Measurement on receivers or associated equipment with coaxial antenna connections 19
5.4.3 Measurement on receivers or associated equipment with balanced antenna connectors 19
5.4.4 Presentation of the results 19
5.5 Measurement of the wanted signal and disturbance voltage at the RF output terminals of associated equipment with an RF video modulator, in the frequency range 30 MHz to 2,15 GHz 20
5.5.1 General 20
5.5.2 Method of measurement 20
5.6 Measurement of disturbance power of associated equipment (video recorders excluded) in the frequency range 30 MHz to 1 GHz 20
5.6.1 General 20
5.6.2 Method of measurement 20
5.6.3 Measuring procedure 21
5.6.4 Presentation of the results 21
5.7 Measurement of radiation in the frequency range 30 MHz to 1 GHz at 3 m distance 21

5.7.1 General 21
5.7.2 Measuring site requirements 22
5.7.3 Disposition of the equipment under test 23
5.7.4 Disposition of the field-strength meter 24
5.7.5 Measurement procedure 24
5.8 Measurement of radiation in the frequency range 1 GHz to 18 GHz 24
5.8.1 Measuring set-up 24
5.8.2 Test site validation 25
5.8.3 Measuring procedure 26
5.8.4 Presentation of the results 26
5.9 Measurement of the local oscillator power at the input terminal of the outdoor unit 26
6 Interpretation of CISPR radio disturbance limits 26
6.1 Compliance with this standard 26
6.2 Significance of a CISPR limit 26
6.3 Compliance with limits on a statistical basis 27
Annex A (normative) Broadcast receivers for digital signals 34
Annex B (informative) Specification of the wanted signal 38
Bibliography 43

Figure 1 – Colour bar signal levels according to ITU-R Recommendation BT 471-1 (see 5.2) (“red” signal) 28
Figure 2 – Teletext picture (see 5.2) 28
Figure 3 – Example of an artificial mains network 50 Ω-50 μH (see 5.3.1) 29
Figure 4 – Example of artificial mains network 50 Ω-50 μH-5 Ω (see 5.3.1) 29
Figure 5 – Measurement of the radiofrequency disturbance voltage injected into the mains (see 5.3.1) 30
Figure 6 – Measurement of the radiofrequency disturbance voltage injected into the mains (top view) (see 5.3.1) 30
Figure 7 – Circuit arrangement for the measurement of disturbance voltages at the coaxial antenna terminals (see 5.4.2) 31
Figure 8 – Circuit arrangement for receivers with balanced antenna connections (see 5.4.3) 31
Figure 9 – Circuit arrangement for the measurement of the wanted signal and disturbance voltage at the RF output of video recorders (see 5.5.2) 31
Figure 10 – Circuit arrangement for the measurement of disturbance power of associated equipment (video recorders excluded) (see 5.6.3) 32
Figure 11 – Measuring site (see 5.7.2) 32
Figure 12 – Check of the site suitability (see 5.7.2) 32
Figure 13 – Theoretical site attenuation curve for the range 80 MHz to 1 GHz (see 5.7.2) 33
Figure 14 – Open-field measurement at 3 m distance (see 5.7.3) 33
Figure A.1 – Measurement of the radiofrequency disturbance voltage injected into the mains in the frequency range 150 kHz to 30 MHz (side view) 36
Figure A.2 – Example of isolation transformer for 46 MHz to 1,5 GHz 36
Figure A.3 – Typical size of isolation transformer for 46 MHz to 1,5 GHz 37
Figure A.4 – Typical characteristic of insertion loss of isolation transformer for 46 MHz to 1,5 GHz 37

Table 1 – Limits of disturbance voltage at the mains terminals 11
Table 2 – Limits of disturbance voltage at the antenna terminals 12
Table 3 – Limits of the wanted signal and disturbance voltage at RF output terminals of equipment with RF video modulator 13
Table 4 – Limits of disturbance power 13
Table 5 – Limits of radiated disturbances at 3 m distance 14
Table 6 – Limits of radiated power of tuner units of direct to home satellite receivers 14
Table 7 – Limits of radiated power of outdoor units of direct to home satellite receivers 15

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.