

Cable networks for television signals, sound signals and interactive services - Part 1-2: Performance requirements for signals delivered at the system outlet in Operation

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**Cable networks for television signals, sound signals and
interactive services - Part 1-2: Performance requirements for
signals delivered at the system outlet in Operation
(IEC 60728-1-2:2014)**

Réseaux de distribution par câbles pour signaux de
télévision, signaux de radiodiffusion sonore et services
interactifs - Partie 1-2: Exigences de performance relatives
aux signaux délivrés à la prise terminale en fonctionnement
(CEI 60728-1-2:2014)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive
Dienste - Teil 1-2: Leistungsanforderungen an Signale der
Teilnehmeranschlussdose im realen Betrieb
(IEC 60728-1-2:2014)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 100/2246/FDIS, future edition 2 of IEC 60728-1-2, prepared by Technical Area 5 "Cable networks for television signals, sound signals and interactive services" of IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60728-1-2:2014.

The following dates are fixed:

- latest date by which the document has to be (dop) 2015-02-28
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2017-04-11
standards conflicting with the
document have to be withdrawn

This document supersedes EN 60728-1-2:2009.

EN 60728-1-2:2014 includes the following significant technical changes with respect to EN 60728 1-2:2009:

- update of performance requirements in Clause 7 to include those for DVB-T2 signals.

This standard is to be used in conjunction with EN 60728-1:2014.

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Endorsement notice

The text of the International Standard IEC 60728-1-2:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60728-10	NOTE	Harmonized as EN 60728-10.
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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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-705	-	International Electrotechnical Vocabulary (IEV) - Chapter 705: Radio wave propagation	-	-
IEC 60050-712	-	International Electrotechnical Vocabulary (IEV) - Chapter 712: Antennas	-	-
IEC 60050-725	-	International Electrotechnical Vocabulary (IEV) - Chapter 725: Space radiocommunications	-	-
IEC 60728-1	2014	Cable networks for television signals, sound signals and interactive services - Part 1: System performance of forward paths	EN 60728-1	2014
IEC 60728-1-1	2014	Cable networks for television signals sound signals and interactive services - Part 1-1: RF cabling for two way home networks	EN 60728-1-1	2014
IEC 60728-3	2010	Cable networks for television signals, sound signals and interactive services - Part 3: Active wideband equipment for cable networks	EN 60728-3	2011
IEC 60966-2-4	-	Radio frequency and coaxial cable assemblies - Part 2-4: Detail specification for cable assemblies for radio and TV receivers - Frequency range 0 MHz to 3 000 MHz, IEC 61169-2 connectors	EN 60966-2-4	-
IEC 60966-2-5	-	Radio frequency and coaxial cable assemblies - Part 2-5: Detail specification for cable assemblies for radio and TV receivers - Frequency range 0 MHz to 1 000 MHz, IEC 61169-2 connectors	EN 60966-2-5	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60966-2-6	-	Radio frequency and coaxial cable assemblies - Part 2-6: Detail specification for cable assemblies for radio and TV receivers - Frequency range 0 MHz to 3 000 MHz, IEC 61169-24 connectors	EN 60966-2-6	-
ITU-R Recommendation BT.500	-	Methodology for the subjective assessment- of the quality of television pictures		-
ITU-R Recommendation BT.654	-	Subjective quality of television pictures in relation to the main impairments of the analogue composite television signal	-	-
ITU-R Recommendation BT.655	-	Radio-frequency protection ratios for AM vestigial sideband terrestrial television systems interfered with by unwanted analogue vision signals and their associated sound signals	-	-
ITU-T Recommendation J.61	-	Transmission performance of television circuits designed for use in international connections	-	-
ITU-T Recommendation J.63	-	Insertion of test signals in the field-blanking- interval of monochrome and colour television signals		-
ETSI EN 300 421	-	Digital Video Broadcasting (DVB): Framing - structure, channel coding and modulation for 11/12 GHz satellite services		-
ETSI EN 300 429	-	Digital Video Broadcasting (DVB): Framing - structure, channel coding and modulation for cable systems		-
ETSI EN 300 473	-	Digital Video Broadcasting (DVB): Satellite - Master Antenna Television (SMATV) distribution systems		-
ETSI EN 300 744	-	Digital Video Broadcasting (DVB): Framing - structure, channel coding and modulation for digital terrestrial television		-
ETSI EN 302 307	-	Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications (DVB-S2)	-	-
ETSI EN 302 755	-	Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)	-	-

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	9
2 Normative references	9
3 Terms, definitions, symbols and abbreviations.....	10
3.1 Terms and definitions.....	10
3.2 Abbreviations.....	17
4 Methods of measurement	18
5 Subjective quality of television pictures in relation to the main impairments of the analogue composite television signal.....	19
5.1 Subjective quality scale.....	19
5.2 Subjective quality and objective parameters.....	20
6 Summation of the impairments	23
6.1 Impairments to be summed	23
6.2 Summation laws.....	23
6.2.1 General	23
6.2.2 Voltage addition.....	23
6.2.3 Power addition.....	24
6.3 Examples.....	24
7 Performance requirements in operation	24
7.1 General.....	24
7.2 Impedance	25
7.3 Performance requirements at the terminal input	25
7.3.1 Definition	25
7.3.2 Signal level.....	25
7.3.3 Other parameters	25
7.4 Performance requirements at system outlets.....	25
7.4.1 Minimum and maximum carrier levels	25
7.4.2 Mutual isolation between system outlets	26
7.4.3 Isolation between individual outlets in one household	26
7.4.4 Isolation between forward and return path	26
7.4.5 Long-term frequency stability of distributed carrier signals at any system outlet.....	26
7.4.6 Carrier level differences at system outlet	26
7.4.7 Frequency response within a television channel	26
7.4.8 Random noise at system outlet.....	26
7.4.9 Interference to television channels.....	29
Annex A (normative) RF carrier to noise ratio	31
A.1 AM-VSB modulated signals.....	31
A.1.1 General	31
A.1.2 Definition	31
A.1.3 TV receiver IF filtering process	31
A.1.4 Equivalent noise bandwidth	31
A.1.5 AM demodulation process.....	32
A.2 FM modulated signals	33

Annex B (informative) Examples of summation of impairments.....	34
B.1 Voltage addition	34
B.2 Power addition	34
Bibliography.....	36
Figure 1 – CATV/MATV/SMATV cable network – Performance requirements	7
Figure 2 – Examples of location of HNI for various home network types.....	14
Figure 3 – Signal to echo ratio (dB) versus echo delay (μ s)	22
Figure A.1 – Example of a TV receiver IF filter (systems B and G)	31
Figure A.2 – Example of a demodulated TV signal (systems B and G)	32
Table 1 – Methods of measurement of IEC 60728-1 applicable in operation.....	19
Table 2 – Impairment units versus subjective quality.....	20
Table 3 – Impairment grade versus un-weighted white noise	21
Table 4 – Impairment grade versus differential gain	21
Table 5 – Impairment grade versus differential phase	21
Table 6 – Impairment grade versus short time linear distortion ($2T$ pulse).....	21
Table 7 – Impairment grade versus chrominance-luminance gain inequality.....	21
Table 8 – Impairment grade versus chrominance-luminance delay inequality	22
Table 9 – Impairment grade versus echo rating (1μ s echo delay).....	22
Table 10 – Correction factors to be applied for delays different from 1μ s	22
Table 11 – Carrier-to-noise ratios at system outlet (analogue television) in operation	27
Table 12 – RF signal-to-noise ratios at system outlet (digital television) in operation	27
Table 13 – Carrier-to-noise ratios at system outlet (sound radio) in operation	29
Table B.1 – Examples of voltage addition	34
Table B.2 – Examples of power addition	35

INTRODUCTION

Standards and deliverables of the IEC 60728 series deal with cable networks including equipment and associated methods of measurement for headend reception, processing and distribution of television and sound signals, and for processing, interfacing and transmitting all kinds of data signals for interactive services using all applicable transmission media. These signals are typically transmitted in networks by frequency-multiplexing techniques.

This includes for instance

- regional and local broadband cable networks,
- extended satellite and terrestrial television distribution systems,
- individual satellite and terrestrial television receiving systems,

and all kinds of equipment, systems and installations used in such cable networks, distribution and receiving systems.

The extent of this standardization work is from the antennas and/or special signal source inputs to the headend or other interface points to the network up to the terminal input of the customer premises equipment.

The standardization work will consider coexistence with users of the RF spectrum in wired and wireless transmission systems.

The standardization of any user terminals (i.e. tuners, receivers, decoders, multimedia terminals, etc.) as well as of any coaxial, balanced and optical cables and accessories thereof is excluded.

The reception of television signals inside a building requires an outdoor antenna and a distribution network to convey the signal to the TV receivers. In a building divided into apartment blocks, the signals received by the antennas are distributed by the MATV/SMATV cable network up to the home network interface (HNI). The television signals are then distributed (inside the home) by home networks (HN) of various types up to the system outlet or terminal input. The cable network can support two way operation, from the system outlet (or terminal input) towards the headend.

The home network can use coaxial cables, balanced pair cables, fibre optic cables (glass or plastic) and also wireless links inside a room (or a small number of adjacent rooms) to replace wired cords.

IEC 60728-1-2 (this standard) deals with the requirements to be fulfilled at the system outlet or terminal input, when the CATV/MATV/SMATV system is in operation.

These performance requirements for signals at the system outlet or terminal input in operation are derived from considerations of the characteristics of the received signals at the input of the headend (see Clause 6 of IEC 60728-1:2014) and the summation of the impairments produced by the headend, the CATV/MATV/SMATV network and the home network, when the requirements given in IEC 60728-1:2014 and IEC 60728-1-1 are fulfilled.

This standard gives the guidelines for calculation of the operational characteristics at system outlet, taking into account the performance requirements of the CATV/MATV/SMATV network, of the home networks and of the received signals, given in the International Standards IEC 60728-1:2014 and 60728-1-1.

Figure 1 shows the main sections of a general CATV/MATV/SMATV system, indicating the parts of the IEC 60728-1 series where the relevant performance requirements are indicated.

- The requirements for the signals received at the headend are given in Clause 6 of IEC 60728-1:2014.
- The requirements for the CATV/MATV/SMATV cable network, assuming an unimpaired input signal at the input of the headend, up to the system outlet are given in IEC 60728-1:2014, Clause 5.
- The requirements for the CATV/MATV/SMATV cable network up to the home network interface (HNI) are given in IEC 60728-1:2014, Clause 7, assuming an unimpaired input signal at the input of the headend.
- The specific requirements from HNI to the system outlet or terminal input are given in IEC 60728-1-1:2014, Clause 5, assuming an unimpaired input signal at the HNI.
- The requirements at the system outlet in operation are given in Clause 7 of this standard.

The expression in operation means that the received signals, with their impairments, are applied to the headend input of the CATV/MATV/SMATV cable network. The requirements at the system outlet in operation are derived, therefore, by summing the impairments of the various cascaded parts of the system and of the input signal.

When a change of signal format from analogue to analogue (e.g. from FM to AM-VSB) or from digital to digital (e.g. from QPSK to QAM) or from digital to analogue (e.g. from DVB-S/S2 to AM-VSB or DVB-T to AM-VSB) is made at the headend, the summation of the impairments that produce a relaxation of requirements at system outlet does not apply. Such a case will be the equivalence of unimpaired signals applied at the headend input. Therefore, the requirements at system outlet given in IEC 60728-1:2014 apply.

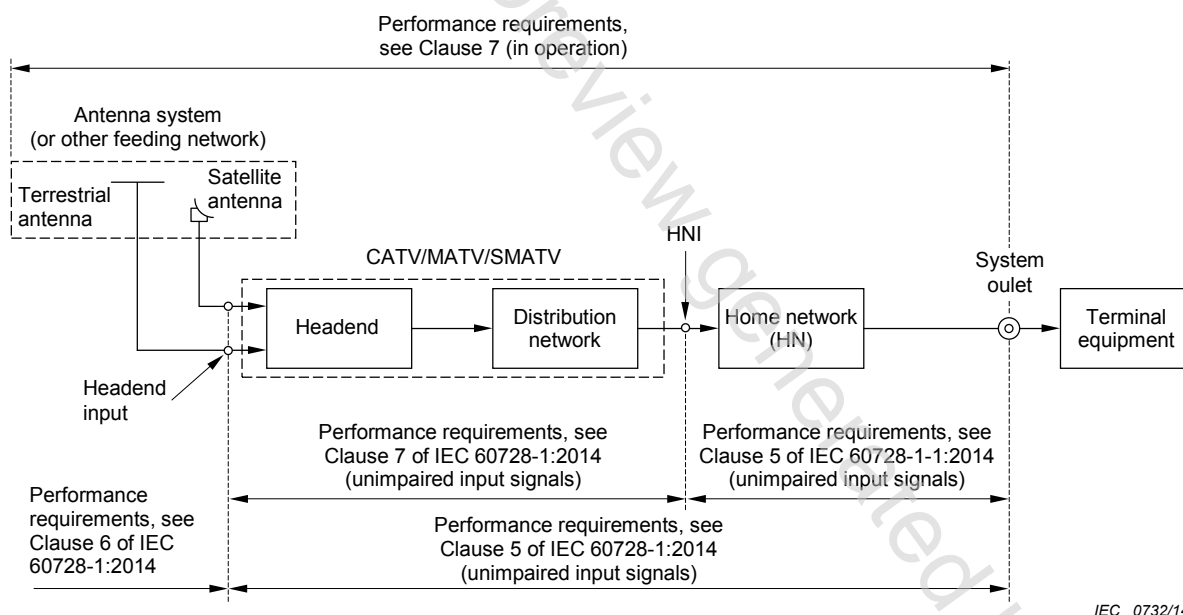


Diagram of the main sections of a CATV/MATV/SMATV cable network and the relevant parts of the IEC 60728-1 series where the requirements are indicated.

Figure 1 – CATV/MATV/SMATV cable network – Performance requirements

This standard also provides references for the basic methods of measurement of the operational characteristics of the downstream cable network in order to assess its performance.

All requirements refer to the performance limits to be achieved in operation at any system outlet when terminated in a resistance equal to the nominal load impedance of the system,

unless otherwise specified. Where system outlets are not used, the above applies to the terminal input.

If the home network is subdivided into a number of parts, using different transmission media (e.g. coaxial cabling, balanced cabling, optical cabling, wireless links) the accumulation of degradations should not exceed the figures given below.

NOTE Performance requirements of return paths as well as special methods of measurement for the use of the return paths in cable networks are described in IEC 60728-10.

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