BS EN IEC 60728-101-1:2023

BSI Standards Publication

Cable networks for television signals, sound signals and interactive services

Part 101-1: RF cabling for two-way home networks with all-digital channels load

bsi.

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

National foreword

This British Standard is the UK implementation of EN IEC 60728-101-1:2023. It is identical to IEC 60728-101-1:2023.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio-visual equipment.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 15082 7

ICS 33.040.20; 33.160.01

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 July 2023.

Amendments/corrigenda issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60728-101-1

July 2023

ICS 33.040.20; 33.160.01

English Version

Cable networks for television signals, sound signals and interactive services - Part 101-1: RF cabling for two-way home networks with all-digital channels load (IEC 60728-101-1:2023)

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 101-1: Câblage RF pour réseaux domestiques bidirectionnels soumis à une charge de porteuses exclusivement numériques (IEC 60728-101-1:2023)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 101-1: HF-Verkabelung für bidirektionale Heimnetze mit rein digitaler Kanallast (IEC 60728-101-1:2023)

This European Standard was approved by CENELEC on 2023-07-12. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2023 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN IEC 60728-101-1:2023 E

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

European foreword

The text of document 100/3904/FDIS, future edition 1 of IEC 60728-101-1, prepared by IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60728-101-1:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-04-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-07-12

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

This document is read in conjunction with EN 60728-101:2017.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60728-101-1:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60728-101-2	NOTE	Approved as EN IEC 60728-101-2
IEC 61169-2	NOTE	Approved as EN 61169-2
IEC 61169-24	NOTE	Approved as EN IEC 61169-24

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where 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.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
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 60728-101	2016	Cable networks for television signals, sound signals and interactive services - Part 101: System performance of forward paths loaded with digital channels only	EN 60728-101	2017
IEC 60728-3	2017	Cable networks for television signals sound signals and interactive services - Part 3: Active wideband equipment for coaxial cable networks	EN IEC 60728-3	2018
IEC 60728-10	-	Cable networks for television signals, sound signals and interactive services - Part 10: System performance of return paths	EN 60728-10	-
-	-		+ AC	2017-07
IEC 60966	series	Radio frequency and coaxial cable assemblies	EN IEC 60966	series
ISO/IEC/IEEE 8802-11	-	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN medium access control (MAC) and physical layer (PHY) specifications	-	-

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

This page deliberately left blank

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

CONTENTS

FOREWORD 5
INTRODUCTION 7
1 Scope 9
2 Normative references 10
3 Terms, definitions, symbols and abbreviated terms 10
3.1 Terms and definitions 10
3.2 Symbols 19
3.3 Abbreviated terms 20
4 Methods of measurement for the home network 21
5 Performance requirements of the home network 21
5.1 General 21
5.2 Impedance 22
5.3 Performance requirements at the terminal input 22
5.3.1 General 22
5.3.2 Signal level 22
5.3.3 Other parameters 22
5.4 Performance requirements at system outlets 22
5.4.1 Minimum and maximum RF signal levels 22
5.4.2 Mutual isolation between system outlets 22
5.4.3 Isolation between individual outlets in one household 22
5.4.4 Isolation between forward and return path 23
5.4.5 Long-term frequency stability of distributed signals at any system outlet 23
5.5 Performance requirements at the HNI 23
5.5.1 Minimum and maximum signal levels at HNI1 23
5.5.2 Minimum and maximum RF signal levels at HNI2 and HNI3 23
5.6 RF signal level differences in the home network from HNI to system outlet 23
5.7 Frequency response within a television channel in the home network 23
5.7.1 General 23
5.7.2 Amplitude response 23
5.7.3 Group delay 24
5.8 Random noise produced in the home network 25
5.8.1 General 25
5.8.2 Maximum amplifier noise figure 25
5.9 Interference produced into downstream channels within a home network 25
5.9.1 General 25
5.9.2 Multiple frequency intermodulation interference 25
5.9.3 Intermodulation noise 26
6 Home network design and examples 26
6.1 General 26
6.2 Basic design considerations 26
6.2.1 General 26
6.2.2 System outlet (SO) or terminal input (TI) specifications 26
6.2.3 Home network interface (HNI) specifications 26
6.2.4 Requirements for the home network 27
6.3 Implementation considerations 27
6.4 Home networks with coaxial and balanced cables 28

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

6.4.1 General 28
6.4.2 Network examples 28
6.4.3 Calculation examples 29
6.4.4 General considerations 40
6.4.5 Home network design in a MATV system 41
6.4.6 Return path examples 41
6.5 Different home network type (HNI3 case C) (glass or plastic fibre optic network) 41
6.6 Different home network type (HNI3 case D) 42
6.6.1 General 42
6.6.2 Wireless links inside the home network 42
6.6.3 Applications of ISO/IEC/IEEE 8802-11 (WLAN) 43
6.6.4 Available bands in the 2 GHz to 6 GHz frequency range 44
6.6.5 Main characteristics of a WLAN signal 44
6.6.6 Main characteristics of coaxial cables 45
6.6.7 Characteristics of WLAN signals at system outlet 46
6.6.8 Characteristics of signals at the TV system outlet 46
6.6.9 Example of diplexers and power splitters near the HNI 46
6.6.10 Example of system outlet for coaxial TV connector and WLAN antenna 47
6.6.11 Examples of WLAN connection into home networks 47
Annex A (informative) Wireless links versus cable links 53
A.1 General 53
A.2 Wireless links 53
A.3 Cable links 55
Annex B (informative) Isolation between radiating element and system outlet 56
Annex C (informative) MIMO techniques of IEEE 802.11n 58
C.1 General 58
C.2 MIMO techniques 58
Annex D (informative) MU-MIMO Protocol for IEEE 802.11ax (Wi-Fi 6) 60
Annex E (informative) CMU-MIMO Protocol for IEEE 802.11be (Wi-Fi 7) 61
E.1 CMU-MIMO protocol 61
E.2 Contention algorithm 61
E.3 Antennas' communication with members' algorithm 62
E.4 Transmission algorithm 63
Annex F (informative) Frequency and maximum EIRP of Radio LAN (in Japan) 64
Bibliography 68

Figure 1 – Examples of RF home network types 8
Figure 2 – Examples of location of HNI for various home network types 14
Figure 3 – Examples of home network implementation using coaxial or balanced cables 29
Figure 4 – Signal levels at HNI1 (flat splitter response) 31
Figure 5 – Signal levels at HNI1 (+6 dB compensating splitter slope) 32
Figure 6 – Signal levels at HNI2 (L_1) (flat splitter/amplifier response) 33
Figure 7 – Signal levels at HNI2 (+6 dB compensating splitter/amplifier slope) 33
Figure 8 – Signal levels at HNI3 (flat splitter/amplifier response) 37
Figure 9 – Signal levels at HNI3 (+6 dB compensating splitter/amplifier slope) 37
Figure 10 – Example of a home network using optical fibres 41

AVA Documents Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

Figure 11 – Example of a home network using cable connection and cable/wireless connection 43
Figure 12 – Example of a coupler (two cascaded symmetric couplers) to insert WLAN signals into the home distribution network 47
Figure 13 – Example of system outlet for coaxial TV connector and WLAN antenna 47
Figure 14 – Assumed properties of the filters in the system outlet 48
Figure 15 – Reference points for the examples of calculation of link loss or link budget 48
Figure B.1 – Required isolation and attenuation of a cut-off waveguide, with cut-off frequency of 2 275 MHz and a length (L) of 25 cm or 15 cm 57
Figure C.1 – Principle of MIMO techniques according to IEEE 802.11n 58
Figure E.1 – Flow diagram of CMU-MIMO algorithm 62
Figure E.2 – Antennas communication with members algorithm 63
Figure E.3 – Transmission algorithm 63
Figure F.1 – Wi-Fi channel layout (IEEE 802.11b) 65
Figure F.2 – Wi-Fi channel layout (IEEE 802.11g) 65
Figure F.3 – Wi-Fi channel layout (IEEE 802.11n) 66
Figure F.4 – Wi-Fi channel layout (5 GHz: W52, W53) 66
Figure F.5 – Wi-Fi channel layout (5 GHz: W56) 66
Figure F.6 – 60 GHz band frequency allocation and ISO/IEC/IEEE 8802-11 (IEEE 802.11ad) / WiGig channel allocation in major countries 67

Table 1 – Methods of measurement of IEC 60728-101 applicable to the home network 21
Table 2 – Amplitude response variation in the home network 24
Table 3 – Group delay variation in the home network 24
Table 4 – Example of home network implementation with coaxial cabling (passive) from HNI1 to system outlet 34
Table 5 – Example of home network implementation with coaxial cabling (active) from HNI2 to system outlet 34
Table 6 – Example of home network implementation with balanced pair cables (active) from HNI3 to coaxial terminal input (case A) 38
Table 7 – Example of home network implementation with balanced pair cables (active) from HNI3 to coaxial system outlet (case B) 39
Table 8 – Maximum EIRP according to CEPT ERC Recommendation 70-03 (2021) 44
Table 9 – Available throughput of the WLAN signal 45
Table 10 – Minimum signal level at system outlet (WLAN antenna) 46
Table 11 – Loss from the system outlet to WLAN base station 49
Table 12 – Direct connection between two system outlets (TV outlets) 49
Table 13 – Link budget between WLAN equipment and the WLAN base station 50
Table 14 – Wireless connection between two pieces of WLAN equipment 51
Table 15 – Connection from a SO to a WLAN equipment 52
Table A.1 – Maximum distance for a wireless link (WLAN) in free space or inside a home 55
Table A.2 – Maximum length of the cable 55
Table C.1 – MCSs that are mandatory in IEEE 802.11n 59
Table F.1 – Frequency and maximum EIRP of Radio LAN (Japan) 64

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 101-1: RF cabling for two-way home networks with all-digital channels load

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60728-101-1 has been prepared by technical area 5: Cable networks for television signals, sound signals and interactive services, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This International Standard is to be used in conjunction with IEC 60728-101:2016.

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

Draft	Report on voting
100/3904/FDIS	100/3945/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60728 series, under the general title *Cable networks for television signals, sound signals and interactive services*, can be found on the IEC website.

The reader's attention is drawn to the fact that Annex F lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this document.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

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.

This part of the IEC 60728 deals with the requirements and implementation guidelines for a home network that can be realised with different techniques. The following types of home networks (HN) are possible:

- passive coaxial home network;
- active coaxial home network;
- different home network types (cases A to D shown in Figure 1).

Figure 1 shows typical situations that are possible when considering RF home networks.

The RF home network can be realised using coaxial cables, balanced cables, optical cables or radio links.

This document considers digital signals only and is based on IEC 60728-101 dealing with system performance of forward paths loaded with digital channels only. For RF cable systems loaded with analogue and digital signals, refer to IEC 60728-1-1 ED2.

Figure 4 to Figure 9 have been amended to take into account the level requirement for digital signals only.

Although the upper frequency range of terrestrial broadcast signals depends on the allocation frequency plan of each region (e.g. in Europe it is 694 MHz, the 700 MHz and 800 MHz bands being assigned to telecommunication services), the upper frequency range into the cable networks can be maintained at 862 MHz in order to maximise the number of channels to be distributed in the cable networks, assuming that sufficient immunity (screening efficiency) to signals radiated in the 700 MHz and 800 MHz bands is provided.

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

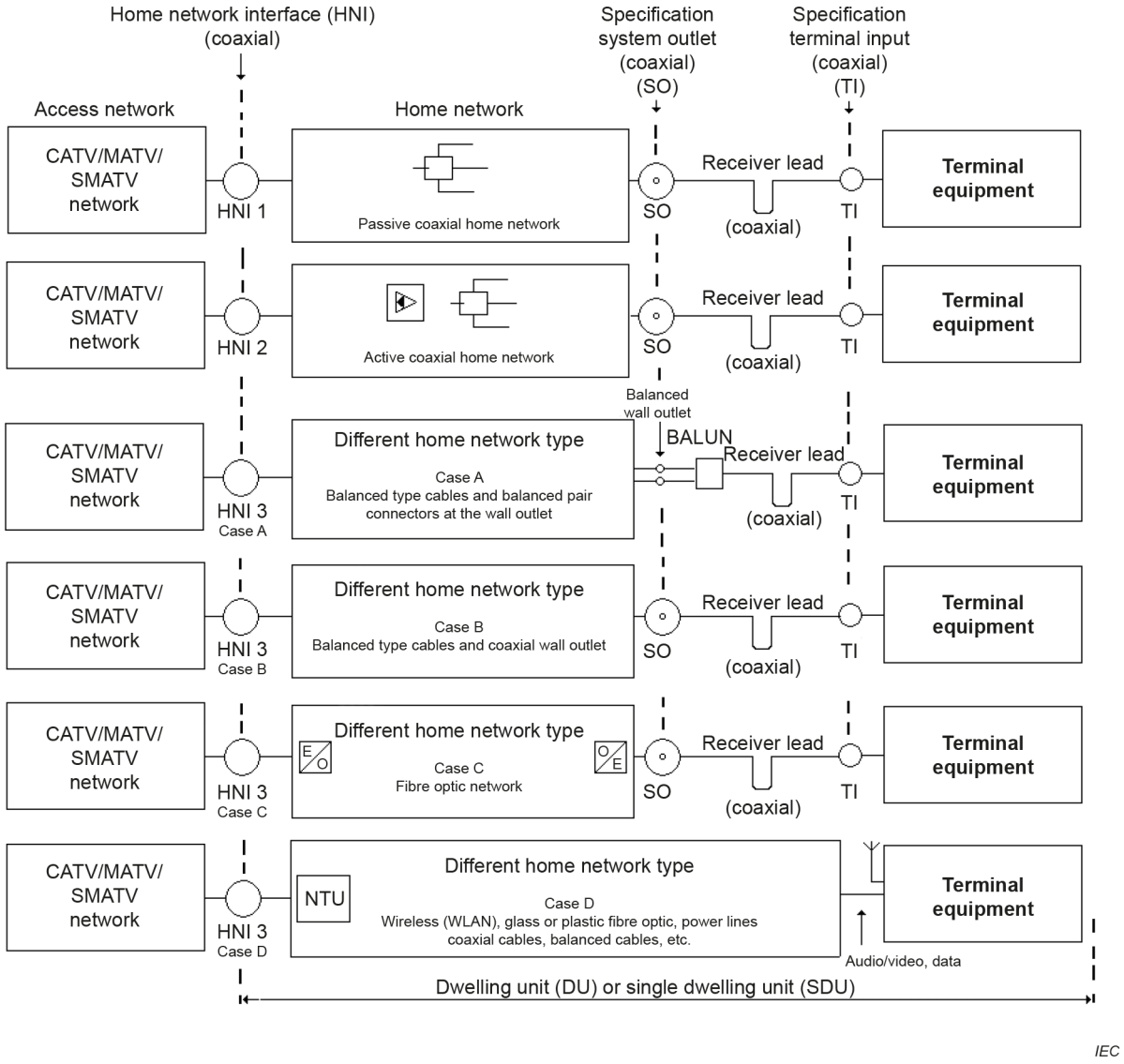

Figure 1 – Examples of RF home network types

Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 101-1: RF cabling for two-way home networks with all-digital channels load

1 Scope

This part of IEC 60728-101 provides the requirements and describes the implementation guidelines of RF cabling for two-way home networks; it is applicable to any home network that distributes signals provided by CATV/MATV/SMATV cable networks (including individual receiving systems) having a coaxial cable output. It is also applicable to home networks where some part of the distribution network uses wireless links, for example in place of the receiver cord.

This part of IEC 60728 is therefore applicable to RF cabling for two-way home networks with wired cords or wireless links inside a room and primarily intended for television and sound signals operating between about 5 MHz and 3 300 MHz. The frequency range is extended to 6 000 MHz for distribution techniques that replace wired cords with a wireless two-way communication inside a room (or a small number of adjacent rooms) that uses the 5 GHz to 6 GHz band.

In a building divided into apartment blocks, the distribution of the signals inside the home starts from the home network interface (HNI) up to the system outlet or terminal input. The requirements at the system outlet are given in IEC 60728-101:2016, Clause 5 and the requirements at the HNI are given in IEC 60728-101:2016, Clause 7. In Clause 5 of this document, additional requirements are given.

This document deals with various possibilities to distribute signals in a home network, using 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.

This document gives references to basic methods of measurement of the operational characteristics of the home cable network in order to assess its performance.

All requirements refer to the performance limits, which are obtained between the input(s) at the home network interface (HNI) and the output 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.

The present document also provides limits for the accumulation of degradations 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).

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.

Clause 5 defines the performance limits measured at system outlet or terminal input for an unimpaired (ideal) test signal applied at the HNI. Under normal operating conditions for any digital channel and meeting these limits, the cumulative effect of the impairment of any single parameter at the HNI and that due to the home network produces signals not worse than the requirements given in IEC 60728-101-2. For digitally modulated signals, the quality requirement is a QEF (quasi error-free) reception.

AVA Documents Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

This document describes the physical layer connection for home networks. Description of protocols required for layer 2 and higher layers is out of the scope of this document. Logical connections between devices within the home network are therefore not always guaranteed.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60728-1:2014, *Cable networks for television signals, sound signals and interactive services – Part 1: System performance of forward paths*

IEC 60728-101:2016, *Cable networks for television signals sound signals and interactive services – Part 101: System performance of forward paths loaded with digital channels only*

IEC 60728-3:2017, *Cable networks for television signals sound signals and interactive services – Part 3: Active wideband equipment for coaxial cable networks*

IEC 60728-10, *Cable networks for television signals, sound signals and interactive services – Part 10: System performance of return paths*

IEC 60966 (all parts), *Radio frequency and coaxial cable assemblies*

ISO/IEC/IEEE 8802-11, *Information technology – Telecommunications and exchange between information technology systems – Requirements for local and metropolitan area networks – Part 11: Wireless LAN medium access control (MAC) and physical layer (PHY) specifications*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
active home network
home network that uses active equipment (for example, amplifiers) in addition to passive equipment like splitters, taps, system outlets, cables and connectors up to the coaxial RF interface (input and/or output) of the terminal equipment for distributing and combining RF signals

[SOURCE: IEC 60728-1:2014, 3.1.2]

Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

3.1.2
antenna
part of a radio transmitting or receiving system which is designed to provide the required coupling between a transmitter or a receiver and the medium in which the radio wave propagates

Note 1 to entry: In practice, the terminals of the antenna or the points to be considered as the interface between the antenna and the transmitter or receiver are specified.

Note 2 to entry: If the transmitter or receiver is connected to its antenna by a feeder line, the antenna is considered to be a transducer between the guided radio waves of the feeder line and the radiated waves in space.

Note 3 to entry: See also IEC 60728-1:2014, 3.1.3, IEC 60728-1-1:2014, 3.1.2 and IEC 60728-1-2:2014, 3.1.2.

[SOURCE: IEC 60050-712:1992, 712-01-01, modified – The deprecated term "aerial" has been deleted, in Note 1 "should be specified" has been replaced by "are specified", Note 2 has been clarified and a Note 3 giving additional references has been added.]

3.1.3
attenuation
ratio of the input power to the output power of a piece of equipment or a system

Note 1 to entry: The ratio is expressed in decibels.

[SOURCE: IEC 60728-1:2014, 3.1.5]

3.1.4
balun
device for transforming an unbalanced voltage to a balanced voltage or vice-versa

Note 1 to entry: The term is derived from "balanced to unbalanced transformer".

3.1.5
bit error ratio
BER
ratio between erroneous bits and the total number of transmitted bits

[SOURCE: IEC 60728-1:2014, 3.1.9]

3.1.6
broadcast and communication technologies
BCT
group of applications including RF distribution of sound signals and video signals

Note 1 to entry: For this document, this is a group of applications using the HF band (3 MHz to 30 MHz), the VHF band (30 MHz to 300 MHz) and the UHF band (300 MHz to 3 000 MHz) for transmission of television signals, sound signals and interactive services, as well as for in-home inter-networking.

[SOURCE: IEC 60728-1:2014, 3.1.13]

3.1.7
CATV network
regional and local broadband cable networks designed to provide sound and television signals as well as signals for interactive services to a regional or local area

Note 1 to entry: Originally defined as Community Antenna Television network.

[SOURCE: IEC 60728-1-1:2014, 3.1.9]

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

3.1.8
decibel ratio
ten times the logarithm to the base 10 of the ratio of two quantities of power P_1 and P_2, i.e.

$$10 \lg \frac{P_1}{P_2} \quad \text{in dB}$$

Note 1 to entry: This ratio may also be expressed in terms of voltages, on the condition that the impedances of U_1 and U_2 are the same (e.g. 75 Ω).

$$20 \lg \frac{U_1}{U_2} \quad \text{in dB}$$

[SOURCE: IEC 60728-1:2014, 3.1.24, modified – Note 1 to entry clarified.]

3.1.9
directivity
attenuation between output port and interface or tap port minus the attenuation between input port and interface or tap port, of any equipment or system

[SOURCE: IEC 60728-1:2014, 3.1.27]

3.1.10
dwelling unit
DU
home or office where television and sound signals are distributed and that provides access to interactive services

[SOURCE: IEC 60728-1:2014, 3.1.31]

3.1.11
extended satellite television distribution network or system
distribution network or system designed to provide sound and television signals received by a satellite-receiving antenna to households in one or more buildings

Note 1 to entry: This kind of network or system can be combined with terrestrial antennas for the additional reception of TV and/or radio signals via terrestrial networks.

Note 2 to entry: This kind of network or system can also carry control signals for satellite switched systems or other signals for special transmission systems (e.g. MoCA or Wi-Fi) in the return path direction.

[SOURCE: IEC 60728-1:2014, 3.1.35]

3.1.12
extended terrestrial television distribution network or system
distribution network or system designed to provide sound and television signals received by terrestrial receiving antenna to households in one or more buildings

Note 1 to entry: This kind of network or system can be combined with a satellite antenna for the additional reception of TV and/or radio signals via satellite networks.

Note 2 to entry: This kind of network or system can also carry other signals for special transmission systems (e.g. MoCA or Wi-Fi) in the return path direction.

[SOURCE: IEC 60728-1:2014, 3.1.36]

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

3.1.13
feeder
transmission path forming part of a cable network

Note 1 to entry: Such a path can consist of a metallic cable, optical fibre, waveguide, or any combination of them.

Note 2 to entry: By extension, the term is also applied to paths containing one or more radio links.

[SOURCE: IEC 60728-1:2014, 3.1.38]

3.1.14
gain
ratio of the output power to the input power of any equipment or system

Note 1 to entry: Gain is expressed in decibels.

[SOURCE: IEC 60728-1:2014, 3.1.42]

3.1.15
headend
equipment which is connected between receiving antennas or other signal sources and the remainder of the cable networks, to process the signals to be distributed

Note 1 to entry: The headend can, for example, comprise antenna amplifiers, frequency converters, combiners, separators and generators.

[SOURCE: IEC 60728-1:2014, 3.1.43]

3.1.16
home cable link
HCL
physical link (cable) between the home distributor (HD) and the system outlet or the terminal input

3.1.17
home distributor
HD
distributor within a home where cables terminate

3.1.18
home network
HN
RF cable network inside a single dwelling (one-family house or one unit of a multi-dwelling building) in the SOHO (Small Offices Home Offices) environments or in the rooms of hotels, hospitals

Note 1 to entry: The preferred topology of this network is a star.

Note 2 to entry: This network carries television signals, sound signals and interactive services up to the coaxial RF interface (input and/or output) of the terminal equipment. It can comprise active equipment, passive equipment, cables, and connectors.

[SOURCE: IEC 60728-1:2014, 3.1.48]

Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

3.1.19
home network interface
HNI
interface for access to the network for transmission of television signal, sound signals and interactive services inside a home (single dwelling)

Note 1 to entry: It is the first accessible point after the entrance of the network into an individual home (see Figure 2).

Note 2 to entry: In some cases, the home network interface can coincide with the system outlet. In this case, the performance requirements for a system outlet apply.

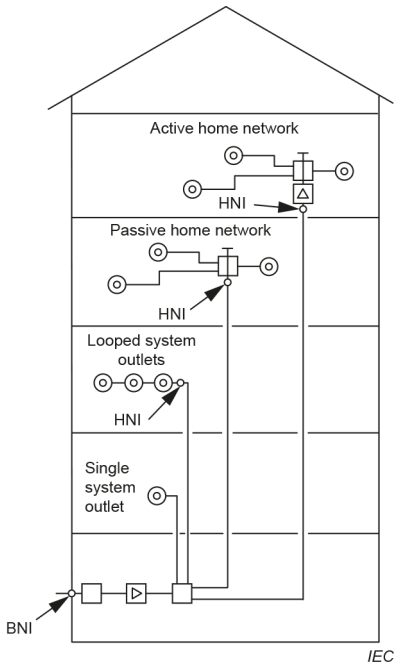

Figure 2 – Examples of location of HNI for various home network types

[SOURCE: IEC 60728-1:2014, 3.1.49, modified – Notes to entry and Figure 2 added.]

3.1.20
individual satellite television receiving system
system designed to provide sound and television signals received from satellite(s) to an individual household

Note 1 to entry: This kind of system could also carry control signals for satellite switched systems or other signals for special transmission systems (e.g. MoCA or Wi-Fi) in the return path direction.

[SOURCE: IEC 60728-1:2014, 3.1.51]

3.1.21
individual terrestrial television receiving system
system designed to provide sound and television signals received via terrestrial broadcast networks to an individual household

Note 1 to entry: This kind of system could also carry other signals for special transmission systems (e.g. MoCA or Wi-Fi) in the return path direction.

[SOURCE: IEC 60728-1:2014, 3.1.52]

Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

3.1.22
intermodulation
process whereby non-linearity of equipment in a system produces output signals (called intermodulation products) at frequencies which are linear combinations of those of the input signals

[SOURCE: IEC 60728-1:2014, 3.1.53]

3.1.23
isolation
attenuation between two output, tap or interface ports of any equipment or system

[SOURCE: IEC 60728-1:2014, 3.1.54]

3.1.24
level
<power> decibel ratio of any power P_1 to the standard reference power P_0, i.e.

$$10 \lg \frac{P_1}{P_0} \quad \text{in dB}$$

[SOURCE: IEC 60728-1:2014, 3.1.55.1, modified – Notes 1 and 2 have been deleted.]

3.1.25
level
<voltage> decibel ratio of any voltage U_1 to the standard reference voltage U_0, i.e.

$$20 \lg \frac{U_1}{U_0} \quad \text{in dB}$$

Note 1 to entry: This can be expressed in decibels (relative to 1 µV in 75 Ω) or more simply in dB(µV) if there is no risk of ambiguity.

[SOURCE: IEC 60728-1:2014, 3.1.55.2, modified – Note 1 to entry has been deleted and former Note 2 to entry has become Note 1 to entry.]

3.1.26
local broadband cable network
network designed to provide sound and television signals as well as signals for interactive services to a local area (e.g. one town or one village)

[SOURCE: IEC 60728-1:2014, 3.1.56]

3.1.27
looped system outlet
device through which the spur feeder passes and to which is connected a receiver lead, without the use of a subscriber feeder

[SOURCE: IEC 60728-1:2014, 3.1.58]

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

3.1.28
MATV network
extended terrestrial television distribution networks or systems designed to provide sound and television signals received by terrestrial receiving antenna to households in one or more buildings

Note 1 to entry: Originally defined as master antenna television network.

Note 2 to entry: This kind of network or system can be combined with a satellite antenna for the additional reception of TV and/or radio signals via satellite networks.

Note 3 to entry: This kind of network or system can also carry other signals for special transmission systems (e.g. MoCA or Wi-Fi) in the return path direction.

[SOURCE: IEC 60728-1:2014, 3.1.60]

3.1.29
multi-dwelling unit
MDU
building with many homes or offices used by single owners where television signals, sound signals are distributed and where is access to interactive services

[SOURCE: IEC 60728-1:2014, 3.1.64]

3.1.30
multiplex
signals from several separate sources assembled into a single composite signal for transmission over a common transmission channel

Note 1 to entry: See also IEC 60728-1:2014, 3.1.65.

[SOURCE: IEC 60050-701:2016, 701-03-09, modified – The term and the definition have been changed to describe the result of the multiplexing process, and Note 1 to entry has been added.]

3.1.31
mutual isolation
attenuation between two specified system outlets at any frequency within the range of the system under investigation which is always specified, for any particular installation, as the minimum value obtained within specified frequency limits

[SOURCE: IEC 60728-1:2014, 3.1.66]

3.1.32
network interface
NI
interface to the network for transmission of television signal, sound signals and interactive services

[SOURCE: IEC 60728-1:2014, 3.1.67]

3.1.33
network termination unit
NTU
equipment for access to the cable network for television signal, sound signals and interactive services

[SOURCE: IEC 60728-1:2014, 3.1.68]

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 60728-101-1:2023

3.1.34
permanent link
transmission path between any two test interfaces within a cabling subsystem link, including the connecting hardware at each end

3.1.35
receiver lead
lead which connects the system outlet to the subscriber's equipment

Note 1 to entry: The definition of a receiver lead includes any filters and/or balun transformers in addition to the cable.

[SOURCE: IEC 60728-1:2014, 3.1.74, modified – Note 1 to entry has been refined.]

3.1.36
regional broadband cable network
network designed to provide sound and television signals as well as signals for interactive services to a regional area covering several towns and/or villages

[SOURCE: IEC 60728-1:2014, 3.1.75]

3.1.37
satellite master antenna television system
SMATV
system which is designed to provide sound and television signals to the outlets of a building or a group of buildings

Note 1 to entry: Two system configurations are defined in ETSI EN 300 473 as follows:

- SMATV system A, based on transparent transmodulation of QPSK satellite signals into QAM signals to be distributed to the user;
- SMATV system B, based on direct distribution of QPSK signals to the user, with two options:
  - SMATV-IF distribution in the satellite IF band (above 950 MHz);
  - SMATV-S distribution in the VHF/UHF band, for example in the extended S band (230 MHz to 470 MHz).

[SOURCE: IEC 60728-1:2014, 3.1.77]

3.1.38
S/IN
signal-to-intermodulation and noise ratio for a digitally modulated signal in the RF band

[SOURCE: IEC 60728-101:2016, 3.1.67]

3.1.39
single dwelling unit
SDU
home, office or one-family house used by a single owner where television signals and sound signals are distributed and there is access to interactive services

[SOURCE: IEC 60728-1:2014, 3.1.81]

3.1.40
slope
difference in gain or attenuation at two specified frequencies between any two points in a system

[SOURCE: IEC 60728-1:2014, 3.1.85]

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023

3.1.41
SMATV network
extended distribution networks or systems designed to provide sound and television signals received by satellite receiving antenna to households in one or more buildings

Note 1 to entry: Originally defined as satellite master antenna television network.

Note 2 to entry: This kind of network or system can be combined with terrestrial antennas for the additional reception of TV and/or radio signals via terrestrial networks.

Note 3 to entry: This kind of network or system can also carry control signals for satellite switched systems or other signals for special transmission systems (e.g. MoCA or Wi-Fi) in the return path direction.

[SOURCE: IEC 60728-1:2014, 3.1.87]

3.1.42
splitter
spur unit
device in which the signal power at the (input) port is divided equally or unequally between two or more (output) ports

Note 1 to entry: Some forms of this device can be used in the reverse direction for combining signal energy.

[SOURCE: IEC 60728-1:2014, 3.1.88]

3.1.43
spur feeder
feeder to which splitters, subscriber taps, or looped system outlets are connected

[SOURCE: IEC 60728-1:2014, 3.1.90]

3.1.44
standard reference power
P_0
<in cable networks> 1/75 pW

Note 1 to entry: This is the power dissipated in a 75 Ω resistor with a voltage drop of 1 μV RMS across it.

[SOURCE: IEC 60728-1:2014, 3.1.92]

3.1.45
subscriber feeder
feeder connecting a subscriber tap to a system outlet or, where the latter is not used, directly to the subscriber equipment

Note 1 to entry: A subscriber feeder can include filters and balun transformers.

[SOURCE: IEC 60728-1:2014, 3.1.93]

3.1.46
subscriber equipment
equipment at the subscriber premises such as receivers, tuners, decoders, video recorders

[SOURCE: IEC 60728-1:2014, 3.1.94]

3.1.47
subscriber tap
device for connecting a subscriber feeder to a spur feeder

[SOURCE: IEC 60728-1:2014, 3.1.95]

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 60728-101-1:2023