BS EN 60728-1-1:2014

BSI Standards Publication

Cable networks for television signals, sound signals and interactive services

Part 1-1: RF cabling for two way home networks

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National foreword

This British Standard is the UK implementation of EN 60728-1-1:2014. It is identical to IEC 60728-1-1:2014. It supersedes BS EN 60728-1-1:2010 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee EPL/100, Audio, video and multimedia systems and equipment, to Subcommittee EPL/100/4, Cable distribution equipment and systems.

A list of organizations represented on this committee 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.

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English Version

Cable networks for television signals, sound signals and interactive services - Part 1-1: RF cabling for two way home networks (IEC 60728-1-1:2014)

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 1-1: Câblage RF pour réseaux domestiques bidirectionnels (CEI 60728-1-1:2014)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 1-1: Zweiwege-HF-Wohnungsvernetzung (IEC 60728-1-1:2014)

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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.

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European Committee for Electrotechnical Standardization
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Foreword

The text of document 100/2249/FDIS, future edition 2 of IEC 60728-1-1, 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 60728-1-1:2014.

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)	2015-02-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-04-11

This document supersedes EN 60728-1-1:2010.

EN 60728-1-1:2014 includes the following significant technical changes with respect to EN 60728-1-1:2010:

- update of performance requirements in Clause 5 to include those for DVB-T2 signals.

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

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.

Endorsement notice

The text of the International Standard IEC 60728-1-1:2014 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 standards indicated:

IEC 61169-2	NOTE	Harmonized as EN 61169-2.
IEC 61169-24	NOTE	Harmonized as EN 61169-24.
IEC 61196-2	NOTE	Harmonized as EN 61196-2.

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
		Coaxial cables - Part 2-4: Sectional specification for cables used in cabled distribution networks - Indoor drop cables for systems operating at 5 MHz - 3 000 MHz	EN 50117-2-4	-
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 60728-1-2	-	Cable networks for television signals, sound signals and interactive services - Part 1-2: Performance requirements or signals delivered at the system outlet in operation	EN 60728-1-2	-
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 60728-10	-	Cable networks for television signals, sound signals and interactive services - Part 10: System performance of return paths	EN 60728-10	-
IEC 60966	series	Radio frequency and coaxial cable assemblies	EN 60966	series
IEC 60966-2	series	Radio frequency and coaxial cable assemblies - Part 2: Sectional specification for flexible coaxial cable assemblies	EN 60966-2	series

Publication	Year	Title	EN/HD	Year
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	-
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	-
IEEE 802.11	-	IEEE Standard for 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	-	-
IEEE 802.11a	-	IEEE Standard for 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 - Amendment 1: High-speed Physical Layer in the 5 GHz band	-	-
IEEE 802.11b	-	Supplement to 802.11-1999, Wireless LAN - MAC and PHY specifications: Higher speed Physical Layer (PHY) extension in the 2.4 GHz band	-	-
IEEE 802.11e	-	IEEE Standard for 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 - Amendment 8: Medium Access Control (MAC) Quality of Service Enhancements	-	-

Publication	Year	Title	EN/HD	Year
IEEE 802.11g	-	IEEE Standard for 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 - Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band	-	-
IEEE 802.11h	-	IEEE Standard for Information technology - Telecommunications and Information Exchange Between Systems - LAN/MAN Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Spectrum and Transmit Power Management Extensions in the 5GHz band in Europe	-	-
IEEE 802.11n	-	IEEE Standard for 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 - Amendment 5: Enhancements for Higher Throughput	-	-
IEEE 802.16	-	IEEE Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems (WiMax)	-	-
ITU-R Recommendation BT.500	-	Methodology for the subjective assessment of the quality of television pictures	-	-
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	-	-

Publication	Year	Title	EN/HD	Year
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

INTRODUCTION

Standards and deliverables of 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.

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.

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 analogue 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, will produce picture and sound signals not worse than grade four on the five-grade impairment scale contained in ITU-R BT.500. These requirements are given in IEC 60728-1-2. For digitally modulated signals the quality requirement is a QEF (Quasi Error Free) reception.

This standard 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 standard. Logical connections between devices within the home network are therefore not always guaranteed.

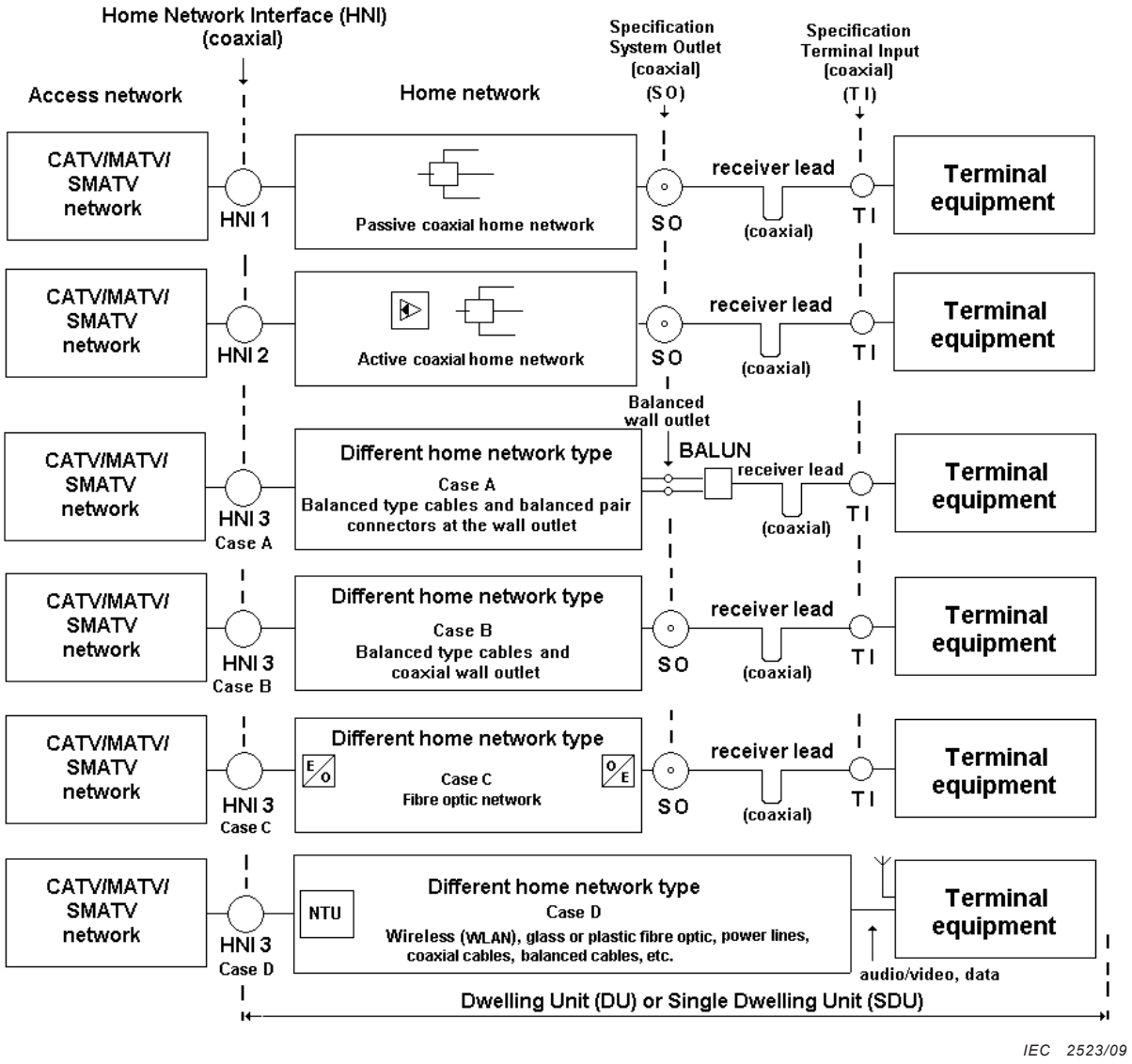

Figure 1 – Examples of RF home network types

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

Part 1-1: RF cabling for two way home networks

1 Scope

This part of IEC 60728 provides the requirements and describes the implementation guidelines of RF cabling for two-way home networks. This standard 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. This standard also applies to home networks where some part of the distribution network uses wireless links, for example instead 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 3 000 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.

2 Normative references

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.

IEC 60050-705, *International Electrotechnical Vocabulary – Chapter 705: Radio wave propagation*

IEC 60050-712, *International Electrotechnical Vocabulary – Chapter 712: Antennas*

IEC 60050-725, *International Electrotechnical Vocabulary – 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*

IEC 60728-1-2, *Cable networks for television signals, sound signals and interactive services – Part 1-2: Performance requirements for signals delivered at system outlet in operation*

IEC 60728-3:2010, *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*

IEC 60966-2 (all parts), *Radio frequency and coaxial cable assemblies – Part 2: Detail specification for cable assemblies for radio and TV receivers*