

<b>STN</b>	<b>Káblové siete pre televízne signály, rozhlasové signály a interaktívne služby Časť 113: Optické systémy na prenos vysielaného signálu pri zaťažení digitálnych kanálov</b>	<b>STN EN IEC 60728-113</b>  36 7211
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Cable networks for television signals, sound signals and interactive services - Part 113: Optical systems for broadcast signal transmissions loaded with digital channels only

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/23

Obsahuje: EN IEC 60728-113:2023, IEC 60728-113:2023

Oznámením tejto normy sa od 05.07.2026 ruší  
STN EN 60728-13-1 (36 7211) z marca 2018

STN EN IEC 60728-113 (36 7211) z marca 2019

**137365**

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Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2023  
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 60728-113**

July 2023

ICS 33.060.40

Supersedes EN 60728-13-1:2017;  
EN IEC 60728-113:2018;  
EN IEC 60728-113:2018/AC:2018-12

English Version

**Cable networks for television signals, sound signals and  
interactive services - Part 113: Optical systems for broadcast  
signal transmissions loaded with digital channels only  
(IEC 60728-113:2023)**

Réseaux de distribution par câbles pour signaux de  
télévision, signaux de radiodiffusion sonore et services  
interactifs - Partie 113: Systèmes optiques pour la  
transmission de signaux de radiodiffusion soumis à une  
charge de porteuses exclusivement numériques  
(IEC 60728-113:2023)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive  
Dienste - Teil 113: Optische Systeme zur  
Rundfunksignalübertragung bei Vollbelegung mit digitalen  
Kanälen  
(IEC 60728-113:2023)

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

## EN IEC 60728-113:2023 (E)

### European foreword

The text of document 100/3900/FDIS, future edition 2 of IEC 60728-113, 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 60728-113:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2024-04-05 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2026-07-05 document have to be withdrawn

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The text of the International Standard IEC 60728-113:2023 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 60068 (series) NOTE Approved as EN 60068 (series)

IEC 60728-1-2 NOTE Approved as EN 60728-1-2

IEC 60728-3 NOTE Approved as EN IEC 60728-3

IEC 60728-5 NOTE Approved as EN 60728-5

IEC 60728-10 NOTE Approved as EN 60728-10

IEC 60728-11 NOTE Approved as EN 60728-11

IEC 60728-13-1 NOTE Approved as EN 60728-13-1

IEC 60728-14 NOTE Approved as EN 60728-14

IEC 60875-1 NOTE Approved as EN 60875-1

IEC 61280-2-2 NOTE Approved as EN 61280-2-2

IEC 61280-2-9 NOTE Approved as EN 61280-2-9

IEC 61281-1 NOTE Approved as EN IEC 61281-1

IEC 61290-1-2 NOTE Approved as EN 61290-1-2

IEC 61290-1-3 NOTE Approved as EN IEC 61290-1-3

IEC 61754-13 NOTE Approved as EN 61754-13

## 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](http://www.cencenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	2013	Environmental testing - Part 1: General and guidance	EN 60068-1	2014
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 60728-6	2011	Cable networks for television signals, sound signals and interactive services - Part 6: Optical equipment	EN 60728-6	2011
IEC/TR 60728-6-1	2006	Cable networks for television signals, sound signals and interactive services - Part 6-1: System guidelines for analogue optical transmission systems	-	-
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
-	-		/AC	2017-07
IEC 60825-1	-	Safety of laser products - Part 1: Equipment classification and requirements	EN 60825-1	-
IEC 60825-2	-	Safety of laser products - Part 2: Safety of optical fibre communication systems (OFCs)	EN 60825-2	-
IEC 60825-12	-	Safety of laser products - Part 12: Safety of free space optical communication systems used for transmission of information	EN IEC 60825-12	-
IEC 61280-1-1	2013	Fibre optic communication subsystem basic test procedures - Part 1-1: Test procedures for general communication subsystems - Transmitter output optical power measurement for single-mode optical fibre cable	EN 61280-1-1	2013

**EN IEC 60728-113:2023 (E)**

IEC 61280-1-3	-	Fibre optic communication subsystem test procedures - Part 1-3: General communication subsystems - Measurement of central wavelength, spectral width and additional spectral characteristics	EN IEC 61280-1-3	-
IEC 61755-1	2005	Fibre optic connector optical interfaces - Part 1: Optical interfaces for single mode non-dispersion shifted fibres - General and guidance	EN 61755-1	2006
-	-			+ corrigendum Dec. 2006
ITU-T Recommendation G.692	-	Optical interfaces for multichannel systems - with optical amplifiers		-
ITU-T Recommendation G.694.2	-	Spectral grids for WDM applications: CWDM wavelength grid	-	-
ITU-T Recommendation J.183	-	Time-division multiplexing of multiple MPEG-2 transport streams and generic formats of transport streams over cable television systems	-	-
ITU-T Recommendation J.382	-	Advanced digital downstream transmission - systems for television, sound and data services for cable distribution		-
ITU-T Recommendation J.83	-	Digital multi-programme systems for television, sound and data services for cable distribution	-	-



IEC 60728-113

Edition 2.0 2023-05

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



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**Réseaux de distribution par câbles pour signaux de télévision, signaux de  
radiodiffusion sonore et services interactifs –  
Partie 113: Systèmes optiques pour la transmission de signaux de radiodiffusion  
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IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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IEC 60728-113

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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INTERNATIONALE

ICS 33.060.40

ISBN 978-2-8322-7054-7

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CABLE NETWORKS FOR TELEVISION SIGNALS,  
SOUND SIGNALS AND INTERACTIVE SERVICES –****Part 113: Optical systems for broadcast signal  
transmissions loaded with digital channels only**

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IEC 60728-113 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 second edition cancels and replaces the first edition published in 2018 and IEC 60728-13-1:2017. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) IEC 60728-13-1, which deals with the bandwidth expansion for broadcast signal over FTTH systems, has been merged with this document;
- b) a table containing the digital signal level at the system outlet (Table 8) has been added.

The text of this International Standard is based on the following documents:

Draft	Report on voting
100/3900/FDIS	100/3920/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.

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

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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

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## INTRODUCTION

International Standards and other 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 ranges from antennas and/or special interfaces to headends, or other interface points on the network up to any terminal interface of the equipment on the customer's premises.

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) as well as of any coaxial, balanced and optical cables and accessories thereof is excluded.

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

## **Part 113: Optical systems for broadcast signal transmissions loaded with digital channels only**

### **1 Scope**

This part of IEC 60728 is applicable to optical transmission systems for broadcast signal transmission that consist of headend equipment, optical transmission lines, in-house wirings and system outlets. These systems are primarily intended for television and sound signals using digital transmission technology. This document specifies the basic system parameters and methods of measurement for optical distribution systems between headend equipment and system outlets in order to assess the system performance and its performance limits.

In this document, the upper signal frequency is limited to about 3 300 MHz.

The purpose of this part of IEC 60728 is to describe the system specifications of FTTH (fibre to the home) networks for digitally modulated broadcast signal transmission. This document is also applicable to broadcast signal transmission using a telecommunication network if it satisfies the performance of the optical portion of the system defined in this document. This document describes RF transmission for fully digitalized broadcast and narrowcast (limited area distribution of broadcast) signals over FTTH, and introduces the xPON system as a physical layer media. The detailed description of the physical layer is out of scope of this document. The scope is limited to downstream RF video signal transmission over FTTH; IP transport technologies, such as IP Multicast and associate protocols, which require a two-way optical transmission system, are out of scope of this document.

Some interference effects occurring between the telecommunication system and the broadcast system are addressed in Clause 7.

### **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 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60728-1:2014, *Cable networks for television signals, sound signals and interactive services – Part 1: System performance of forward paths*

IEC 60728-6:2011, *Cable networks for television signals, sound signals and interactive services – Part 6: Optical equipment*

IEC TR 60728-6-1:2006, *Cable networks for television signals, sound signals and interactive services – Part 6-1: System guidelines for analogue optical transmission systems*

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 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCSs)*

IEC 60825-12, *Safety of laser products – Part 12: Safety of free space optical communication systems used for transmission of information*

IEC 61280-1-1:2013, *Fibre optic communication subsystem basic test procedures – Part 1-1: Test procedures for general communication subsystems – Transmitter output optical power measurement for single-mode optical fibre cable*

IEC 61280-1-3, *Fibre optic communication subsystem test procedures – Part 1-3: General communication subsystems – Measurement of central wavelength, spectral width and additional spectral characteristics*

IEC 61755-1:2005, *Fibre optic connector optical interfaces – Part 1: Optical interfaces for single mode non-dispersion shifted fibres – General and guidance*

ITU-T Recommendation G.692, *Optical interfaces for multichannel systems with optical amplifiers*

ITU-T Recommendation G.694.2, *Spectral grids for WDM applications: CWDM wavelength grid*

ITU-T Recommendation J.83, *Digital multi-programme systems for television, sound and data services for cable distribution*

ITU-T Recommendation J.183, *Time-division multiplexing of multiple MPEG-2 transport streams and generic formats of transport streams over cable television systems*

ITU-T Recommendation J.382, *Advanced digital downstream transmission systems for television, sound and data services for cable distribution*

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