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IEC 60728-113

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# INTERNATIONAL STANDARD



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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**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

CONTENTS .....	2
FOREWORD .....	7
INTRODUCTION .....	9
1 Scope .....	10
2 Normative references .....	10
3 Terms, definitions, graphical symbols and abbreviated terms .....	11
3.1 Terms and definitions .....	11
3.2 Graphical symbols .....	16
3.3 Abbreviated terms .....	17
4 Optical system reference model .....	19
5 Preparation of measurement .....	22
5.1 Environmental conditions .....	22
5.1.1 Standard measurement conditions .....	22
5.1.2 Temperature and humidity .....	22
5.1.3 Setting up the measuring setup and system under test .....	22
5.1.4 AGC/ALC operation .....	22
5.1.5 Impedance matching between pieces of equipment .....	22
5.1.6 Standard operating condition .....	22
5.1.7 Standard signal and measuring equipment .....	23
5.2 Accuracy of measuring equipment .....	23
5.3 Source power .....	23
6 Methods of measurement .....	23
6.1 Measuring points and items .....	23
6.1.1 General .....	23
6.1.2 Measuring points .....	23
6.1.3 Measured parameters .....	23
6.2 Optical power .....	25
6.2.1 Introduction .....	25
6.2.2 Measuring setup .....	25
6.2.3 Measuring method .....	25
6.2.4 Precautions for measurement .....	26
6.2.5 Presentation of the results .....	26
6.3 Signal level and RF signal to intermodulation and noise ratio S/IN .....	26
6.3.1 General .....	26
6.3.2 Measuring setup .....	26
6.3.3 Measuring conditions .....	27
6.3.4 Precautions for measurement .....	27
6.3.5 Presentation of the results .....	28
6.4 Signal-to-noise ratio of optical signals .....	28
6.4.1 General .....	28
6.4.2 Measuring setup .....	28
6.4.3 Measurement conditions .....	29
6.4.4 System RIN measuring method .....	29
6.4.5 S/N calculation based on RIN value .....	30
6.4.6 Component RIN calculation .....	31
6.4.7 Example for calculating signal-to-noise ratio S/N .....	32

6.5	Optical modulation index.....	33
6.6	Signal-to-crosstalk ratio (SCR).....	33
6.6.1	General .....	33
6.6.2	Equipment required .....	33
6.6.3	General measurement requirements .....	34
6.6.4	Procedure.....	34
6.6.5	Potential sources of error .....	35
6.6.6	Presentation of the results .....	35
6.7	RF signal-to-intermodulation and noise ratio S/IN .....	35
6.7.1	General .....	35
6.7.2	Equipment required .....	35
6.7.3	Connection of the equipment .....	36
6.7.4	Measurement procedure .....	36
6.7.5	Presentation of the results .....	37
6.8	Bit error ratio (BER).....	37
6.8.1	General .....	37
6.8.2	Connection of the equipment .....	37
6.8.3	Measurement procedure .....	38
6.8.4	Presentation of the results .....	38
6.9	BER versus S/N .....	38
6.9.1	General .....	38
6.9.2	Connection of the equipment .....	38
6.9.3	Measurement procedure .....	39
6.9.4	Presentation of the results .....	39
6.10	System noise margins .....	40
6.10.1	General .....	40
6.10.2	Connection of the equipment .....	40
6.10.3	Measurement procedure .....	41
6.10.4	Presentation of the results .....	41
6.11	Modulation error ratio (MER).....	42
6.11.1	General .....	42
6.11.2	Connection of the equipment .....	42
6.11.3	Measurement procedure .....	43
6.11.4	Presentation of the results .....	43
7	Specification of the optical system for broadcast signal transmission.....	43
7.1	Digital broadcast system over optical network.....	43
7.2	Relationship between RIN and S/N .....	47
7.3	Optical wavelength .....	49
7.4	Frequency of source signal .....	49
7.5	Level difference between adjacent channels .....	49
7.6	BER at headend input.....	51
7.7	MER .....	51
7.8	S/N specification for in-house and in-building wirings.....	51
7.9	Electrical signal interference .....	52
7.10	Crosstalk due to optical fibre non-linearity .....	56
7.11	Interference due to intermodulation noise caused by fibre non-linearity.....	56
7.12	Environmental conditions .....	57
Annex A (informative)	Actual service systems and design considerations .....	58
A.1	General.....	58

A.2	Multi-channel service system .....	58
A.2.1	General .....	58
A.2.2	Operating conditions .....	59
A.2.3	Operating environment .....	59
A.3	Re-transmission service system .....	60
A.3.1	General .....	60
A.3.2	Operating conditions .....	60
A.3.3	Operating environment .....	61
A.4	S/N ratio calculation of optical network .....	61
A.5	System reference model .....	62
A.5.1	Optimum operation .....	65
A.5.2	Key issues to be specified .....	66
Annex B (informative) BER extrapolation method .....		67
Annex C (informative) Optical system degradations .....		69
C.1	System degradation factors .....	69
C.2	Non-linear degradation .....	70
C.2.1	Degradation factors .....	70
C.2.2	Stimulated Brillouin scattering (SBS) .....	70
C.2.3	Stimulated Raman scattering (SRS) .....	71
C.2.4	Self-phase modulation (SPM) .....	74
C.2.5	Cross-phase modulation (XPM) .....	74
Annex D (informative) Measurement of parameters ( $R$ , $I_{d0}$ , $I_{eq}$ and $G$ ) required for $RIN$ calculation .....		75
D.1	Measurement of the responsivity ( $R$ ) .....	75
D.2	Measurement of dark current ( $I_{d0}$ ) .....	75
D.3	Measurement of equivalent noise current density ( $I_{eq}$ ) .....	75
D.4	Measurement of gain ( $G$ ) .....	76
Annex E (informative) Measurement of peak and average signal levels of digitally modulated signals .....		77
E.1	General .....	77
E.2	Peak and average power measurement using CCDF .....	77
E.3	Measurement method of CCDF .....	79
E.3.1	General .....	79
E.3.2	Measurement procedure .....	79
E.3.3	Estimation of BER from the CCDF measurement result .....	79
E.3.4	Examples of CCDF measurements .....	81
E.4	Performance evaluation of the FTTH system .....	82
E.4.1	General .....	82
E.4.2	Evaluation procedure .....	82
E.5	Potential sources of error .....	83
Annex F (informative) Clipping noise .....		84
Bibliography .....		85
Figure 1 – Example of FTTH system for television and sound signal .....		21
Figure 2 – Points of performance specification of the FTTH system .....		22
Figure 3 – Typical optical video distribution system .....		24
Figure 4 – Test set-up for optical power measurement using a wavelength filter .....		25
Figure 5 – Test set-up for optical power measurement using a WDM coupler .....		25

Figure 6 – Test setup for RF signal to intermodulation and noise ratio measurement .....	27
Figure 7 – Measuring points in the optical cable TV network .....	28
Figure 8 – Test setup for RIN measurement.....	29
Figure 9 – Test setup for signal to crosstalk measurement.....	34
Figure 10 – Test setup for BER measurement.....	38
Figure 11 – Test setup for BER versus S/N measurement.....	38
Figure 12 – Extrapolation method of BER measurement .....	39
Figure 13 – Example of BER versus S/N characteristics .....	40
Figure 14 – Test setup for system noise margin measurement.....	41
Figure 15 – Example of system noise margin characteristics.....	42
Figure 16 – Test setup for MER measurement .....	42
Figure 17 – Example of result of MER measurement (64 QAM modulation format).....	43
Figure 18 – Performance specified points .....	44
Figure 19 – Permissible signal level of adjacent channels (in the case of Japan) .....	50
Figure 20 – Section S/N for MDU wiring (specified by electrical signal).....	52
Figure 21 – Section S/N for MDU wiring (specified by optical signal).....	52
Figure 22 – Signal level difference with 3 <sup>rd</sup> order interference signal (ISDB-T).....	53
Figure 23 – Level difference between signal and reflected (echo) signal (ISDB-T) .....	54
Figure 24 – Signal level difference with 3 <sup>rd</sup> order interference signal (ISDB-C 64 QAM) .....	54
Figure 25 – Signal level difference with 3 <sup>rd</sup> order interference signal (ISDB-C 256 QAM) .....	55
Figure 26 – Level difference between signal and reflected (echo) signal (ISDB-C 64 QAM, ISDB-C2 256 QAM to 4 096 QAM).....	55
Figure 27 – Level difference between signal and reflected (echo) signal (ISDB-C 256 QAM).....	56
Figure A.1 – Example of a multi-channel service system of one million terminals .....	58
Figure A.2 – Example of a multi-channel service system of 2 000 terminals .....	59
Figure A.3 – Example of re-transmission service system of 72 terminals.....	60
Figure A.4 – Example of re-transmission service system of 144 terminals.....	60
Figure A.5 – Model 1 system performance calculation.....	64
Figure A.6 – Model 4 system performance calculationHints for actual operation.....	65
Figure B.1 – Extrapolation method of BER measurement .....	67
Figure B.2 – BER characteristics for 256 QAM, 1 024 QAM and 4 096 QAM (Extrapolation method).....	68
Figure C.1 – Reflection model.....	69
Figure C.2 – Degradation factors of optical transmission system.....	70
Figure C.3 – SBS generation image .....	70
Figure C.4 – Interference between two wavelengths .....	72
Figure C.5 – Simulation of SRS (OLT transmission power versus D/U) .....	72
Figure C.6 – Simulation of SRS (D/U in arbitrary unit versus fibre length).....	73
Figure C.7 – Fibre length of the first peak of SRS D/U versus frequency.....	73
Figure C.8 – GE-PON idle pattern spectrum (ISO/IEC/IEEE 8802-3:2017 1 000 Base-PX) (62,5 MHz = 1 250 Mbps/20 bit) .....	74
Figure D.1 – Measurement of gain ( <i>G</i> ) .....	76
Figure E.1 – Typical CCDF curves for OFDM and M-QAM signals.....	78

Figure E.2 – CCDF measurement setup.....	79
Figure E.3 – CCDF measurement example .....	80
Figure E.4 – SER vs S/N performance in an AWGN channel.....	81
Figure E.5 – Example of CCDF measurements .....	81
Figure E.6 – Performance evaluation of digital optical signals in the FTTH system .....	82
Figure E.7 – CCDF measurement bandwidth.....	82
Figure F.1 – Clipping effects in laser diode static curve (IL curve).....	84
Figure F.2 – Clipping noise, zero span, sweeping time is 100 $\mu$ s.....	84
Table 1 – Level of RF signals.....	14
Table 2 – Optical wavelength for FTTH system .....	19
Table 3 – Frequency range .....	20
Table 4 – Measuring instruments .....	23
Table 5 – Measuring points and measured parameters .....	24
Table 6 – Parameters used for the calculation of signal-to-noise ratio (S/N).....	32
Table 7 – RF signal noise bandwidth .....	37
Table 8 – Minimum S/N ratio (SDU case).....	44
Table 9 – Minimum S/N ratio (MDU case) .....	45
Table 10 – Minimum RF signal to noise ratio requirements in operation .....	46
Table 11 – Types of broadcast services and relative carrier level.....	48
Table 12 – Type of service and minimum operational RIN values.....	48
Table 13 – Section S/N ratio for in-house/in-building wiring (Japan).....	51
Table 14 – Limits for in-channel electrical signal interference .....	53
Table 15 – Interference level due to fibre non-linearity.....	57
Table 16 – Environmental conditions .....	57
Table A.1 – Operating conditions of a multi-channel service system .....	59
Table A.2 – Operating conditions of re-transmission service system .....	61
Table A.3 – Basic system parameters for multi-channel and re-transmission service systems .....	63
Table C.1 – Disturbance parameter of Raman crosstalk.....	71

## 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**

#### FOREWORD

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International Standard IEC 60728-13 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.

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

FDIS	Report on voting
100/3103/FDIS	100/3125/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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.

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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 at about 1 000 MHz. For systems requiring more bandwidth, refer to IEC 60728-13-1.

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 optical portion of this document. This document describes RF transmission for fully digitalized broadcast and narrowcast (limited area distribution of broadcast) signals over FTTH, and introduces xPON system as a physical layer media. The detailed description of the physical layer is out of the scope of this document. The scope is limited to RF signal transmission over FTTH, thus, it does not include IP transport technologies, such as IP Multicast and associate protocols.

Some interference descriptions 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 (OFCS)*

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

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.382, *Advanced digital downstream transmission systems for television, sound and data services for cable distribution*