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INTERNATIONAL STANDARD



**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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CONTENTS

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.6	Hints for actual operation	65
A.6.1	Optimum operation	65
A.6.2	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 rd 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 rd order interference signal (ISDB-C 64 QAM)	54
Figure 25 – Signal level difference with 3 rd 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 calculation.....	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 μ 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.

A bilingual version of this publication may be issued at a later date.

The contents of the corrigendum of November 2018 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

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*