

# INTERNATIONAL STANDARD



**Cable networks for television signals, sound signals and interactive services –  
Part 13-1: Bandwidth expansion for broadcast signal over FTTH system**



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## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references .....	8
3 Terms, definitions, symbols and abbreviations.....	8
3.1 Terms and definitions .....	8
3.2 Symbols .....	16
3.3 Abbreviations .....	17
4 Optical system reference model.....	18
5 Preparation of measurement .....	19
5.1 Environmental conditions .....	19
5.1.1 Standard measurement conditions.....	19
5.1.2 Standard operating condition.....	19
5.1.3 Standard signal and measuring equipment .....	19
5.2 Accuracy of measuring equipment.....	20
5.3 Source power .....	20
6 Methods of measurement .....	20
6.1 Measuring points and parameters.....	20
6.1.1 General .....	20
6.1.2 Measuring points .....	20
6.1.3 Measuring parameters .....	21
6.2 Optical power .....	22
6.3 Optical wavelength .....	22
6.4 Carrier level and carrier-to-noise ratio .....	22
6.4.1 General .....	22
6.4.2 Measurement setup .....	22
6.4.3 Measurement conditions.....	23
6.4.4 Measurement method for xPSK signals .....	23
6.4.5 Presentation of the results.....	23
6.5 Carrier-to-noise ratio defined by optical signal.....	23
6.5.1 General .....	23
6.5.2 Measuring points and measurement setup.....	23
6.5.3 Measurement conditions.....	24
6.5.4 System <i>RIN</i> measurement method .....	24
6.5.5 <i>CIN</i> calculation based on <i>RIN</i> value .....	26
6.5.6 Calculation of component <i>RIN</i> .....	27
6.6 Optical modulation index .....	27
6.7 Carrier-to-crosstalk ratio ( <i>CCR</i> ).....	28
7 Specification of optical system for broadcast signal transmission .....	28
7.1 Analogue and digital broadcast system over optical network .....	28
7.2 International TV systems .....	28
7.3 Relationship between <i>RIN</i> and <i>CIN</i> .....	29
7.4 Optical wavelength .....	31
7.5 Frequency of source signal .....	32

7.6	Optical system specification for satellite signal transmission .....	32
7.7	<i>C/N</i> ratio specification for in-house and in-building wirings .....	32
7.8	Crosstalk due to optical fibre non-linearity .....	33
7.9	Single frequency interference level due to fibre non-linearity .....	33
7.10	Environment condition .....	33
Annex A (informative)	Actual service systems and design considerations .....	34
Annex B (informative)	Wavelength division multiplexing.....	46
Annex C (informative)	Minimum wavelength separation .....	53
Annex D (informative)	Relation between <i>C/N</i> degradation and rain attenuation .....	57
Bibliography	.....	59
Figure 1	– FTTH Cable TV system using one-wavelength .....	18
Figure 2	– FTTH Cable TV system using two wavelengths .....	18
Figure 3	– Performance specified points of the optical system .....	19
Figure 4	– Measuring points in a typical video distribution system.....	21
Figure 5	– Measurement of optical wavelength using WDM coupler .....	22
Figure 6	– Measurement of carrier level and carrier-to-noise ratio.....	22
Figure 7	– Measuring points in a typical FTTH system .....	23
Figure 8	– <i>RIN</i> measurement setup .....	24
Figure 9	– Performance allocation and measuring points .....	28
Figure 10	– Section of <i>C/N</i> ratio specification (38 dB) for in-house wiring.....	33
Figure 11	– Section of <i>C/N</i> ratio specification (24 dB) for in-building wiring (in case of coaxial cable distribution after V-ONU) .....	33
Figure A.1	– Example of a multi-channel service system of one million terminals .....	34
Figure A.2	– Example of a multi-channel service system of 2 000 terminals .....	35
Figure A.3	– Example of a multi-channel with CS supplementary service system of 2 000 terminals .....	35
Figure A.4	– Example of retransmission service system with 144 terminals.....	36
Figure A.5	– Example of retransmission service system with 72 terminals.....	36
Figure A.6	– System performance calculation Model No.1.....	39
Figure A.7	– System performance calculation Model No.2.....	40
Figure A.8	– System performance calculation Model No.3.....	41
Figure A.9	– System performance calculation Model No.4.....	42
Figure A.10	– System performance calculation Model No.5.....	43
Figure A.11	– System performance calculation model No.6.....	44
Figure B.1	– Linear crosstalk between two wavelengths.....	49
Figure B.2	– Wavelength dependency of Raman crosstalk .....	50
Figure B.3	– Nonlinear crosstalk between two wavelengths .....	50
Figure B.4	– Frequency dependency of cross phase modulation .....	51
Figure B.5	– <i>C/N</i> degradation (two wavelengths into one V-ONU case) .....	52
Figure C.1	– Experimental results of <i>RIN</i> degradation due to optical beat .....	54
Figure C.2	– Wavelength variation of DWDM transmitter against ambient temperature .....	54
Figure C.3	– Wavelength variation of CWDM transmitter against ambient temperature .....	55
Figure C.4	– Example of wavelength division multiplexing using WDM filter .....	55

Figure C.5 – Example of CWDM filter design .....	56
Figure C.6 – Example of wavelength division multiplexing using optical coupler.....	56
Table 1 – Level of RF signals.....	13
Table 2 – Measuring instruments .....	20
Table 3 – Measuring points and measured parameters .....	21
Table 4 – Parameters used to calculate the $C/N$ when signals of multiple wavelengths are received by a single V-ONU.....	27
Table 5 – Minimum RF signal-to-noise ratio requirements in operation.....	28
Table 6 – Types of broadcast services .....	30
Table 7 – Type of service and minimum operational $RIN$ values for Satellite services .....	31
Table 8 – Performance of optical wavelength and power.....	31
Table 9 – Optical system specification .....	32
Table 10 – Section of $C/N$ ratio specification for in-house/in-building wiring .....	32
Table 11 – Interference level due to fibre non-linearity.....	33
Table A.1 – Basic system parameters .....	37
Table B.1 – Example nominal central frequencies of the DWDM grid .....	47
Table B.2 – Nominal central wavelength for spacing of 20 nm (ITU-T G.694.2).....	49

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

## **Part 13-1: Bandwidth expansion for broadcast signal over FTTH system**

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International Standard IEC 60728-13-1 has been prepared by technical area 5: Cable networks for television signals, sound signal 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:

CDV	Report on voting
100/1801/CDV	100/1931/RVC

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

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

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

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



## INTRODUCTION

Standards of the IEC 60728 series deal with cable networks including equipment and associated methods of measurement for headend reception, processing and distribution of television signals, sound signals and their associated data signals and for processing, interfacing and transmitting all kinds of signals for interactive services using all applicable transmission media.

This includes

- CATV networks,
- MATV networks and SMATV networks,
- individual receiving networks

and all kinds of equipment, systems and installations installed in such networks.

NOTE CATV encompasses the Hybrid Fibre Coaxial (HFC) networks used nowadays to provide telecommunications services, voice, data, audio and video both broadcast and narrowcast.

The extent of this standardization work is from the antennas, special signal source inputs to the headend or other interface points to the network up to the terminal input.

The standardization of any user terminals (i.e. tuners, receivers, decoders, terminals, etc.) as well as of any coaxial and optical cables and accessories thereof is excluded.

In this standard, informative Annex A describes the system composition and model system based on this standard, and Annex B describes basic concepts for optical wavelength division multiplexing and adds notes for system configuration. Annex C gives the minimum wavelength separation, and Annex D explains the relationship between *CIN* degradation and rain attenuation.

This standard describes the pass-through method of satellite broadcast signals over the FTTH system which uses AM-FDM (SCM) transmission. For an FTTH system below 1 GHz refer to IEC 60728-13. This standard contains descriptions of the measurement methods and specifications for optical wavelength division multiplex and for PSK modulation systems. It specifies the downstream video signal transmission and thus the two-way optical transmission system is out of the scope of this standard. This standard applies to the FTTH system of broadband broadcast signal transmission which conveys satellite broadcast signals using one or multiple optical wavelengths. It is provided for cable/satellite operators to extend their broadband services in order to avoid interference between optical wavelengths based on the technologies described in IEC 60728-13.

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

## **Part 13-1: Bandwidth expansion for broadcast signal over FTTH system**

### **1 Scope**

The purpose of this part of IEC 60728 is the precise description of the fibre to the home (FTTH) system for expanding broadband broadcast signal transmission from CATV services only, towards CATV plus broadcast satellite (BS) plus communication satellite (CS) services, additionally to other various signals such as data services.

The scope is limited to the RF signal transmission over the FTTH (fibre to the home) system. Thus, this part of IEC 60728 does not include IP transport technologies.

### **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 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60728-1:2007, *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 60728-13:2010, *Cable networks for television signals, sound signals and interactive services – Part 13: Optical systems for broadcast signal transmissions*

IEC 61280-1-3, *Fibre optic communication subsystem test procedures – Part 1-3 General communication subsystems – Central wavelength and spectral width measurement*

ITU-T Recommendation G.694.1, *Spectral grids for WDM applications: CWDM wavelength grid*

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

### **3 Terms, definitions, symbols and abbreviations**

#### **3.1 Terms and definitions**

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