

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Cable networks for television signals, sound signals and interactive services –
Part 10: System performance for return paths**

**Réseaux de distribution par câbles pour signaux de télévision, signaux de
radiodiffusion sonore et services interactifs –
Partie 10: Performances des systèmes de voie de retour**



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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms, definitions, symbols and abbreviations.....	10
3.1 Terms and definitions.....	10
3.2 Symbols.....	13
3.3 Abbreviations.....	14
4 Methods of measurement	14
4.1 General.....	14
4.2 Set-up of the network.....	15
4.3 Measurement of channel level.....	15
4.3.1 General	15
4.3.2 Equipment required	15
4.3.3 Connection of the equipment	16
4.3.4 Measurement procedure for digitally modulated carriers	16
4.3.5 Measurement procedure for intermittent digitally modulated carriers.....	17
4.3.6 Presentation of the results	18
4.4 Measurement of amplitude response variation	18
4.4.1 Background	18
4.4.2 Equipment required	18
4.4.3 Connection of the equipment	18
4.4.4 Calibration of equipment.....	18
4.4.5 Method of measurement	19
4.4.6 Presentation of the results	19
4.5 Measurement of signal to noise ratio ($S_{D,RF}/N$).....	19
4.5.1 General	19
4.5.2 Equipment required	19
4.5.3 Connection of the equipment	19
4.5.4 Measurement procedure	19
4.5.5 Presentation of the results	20
4.6 Measurement of multiple interference	20
4.6.1 General	20
4.6.2 Equipment required	21
4.6.3 Connection of the equipment	21
4.6.4 Measurement procedure	21
4.6.5 Processing of the data	21
4.6.6 Presentation of the results	21
4.7 Measurement of impulse noise.....	22
4.7.1 General	22
4.7.2 Equipment required	22
4.7.3 Connection of the equipment	22
4.7.4 Measurement procedure	22
4.7.5 Processing of the data and presentation of the results.....	23

4.8	Measurement of echo ratio.....	23
4.8.1	General	23
4.8.2	Equipment required	24
4.8.3	Connection of the equipment	25
4.8.4	Measurement procedure	25
4.8.5	Presentation of the results	25
4.9	Measurement of group delay variation.....	25
4.10	Measurement of frequency error	26
4.10.1	General	26
4.10.2	Equipment required	26
4.10.3	Connection of the equipment	26
4.10.4	Measurement procedure	26
4.10.5	Presentation of the result.....	27
4.11	Measurement of bit error ratio (BER)	27
4.11.1	General	27
4.11.2	Equipment required	27
4.11.3	Connection of the equipment	28
4.11.4	Measurement procedure	28
4.11.5	Presentation of the results	28
4.12	Noise power ratio (<i>NPR</i>) measurement on return path	28
4.12.1	General	28
4.12.2	Equipment required	29
4.12.3	Connection of the equipment	29
4.12.4	Measurement procedure	30
4.12.5	Presentation of the results	31
4.12.6	Recommended correction factors.....	31
4.12.7	Precautions during measurement.....	32
4.12.8	<i>NPR</i> dynamic range.....	32
4.13	10-Tone measurement.....	33
4.13.1	General	33
4.13.2	Measurement principle.....	34
4.13.3	Measurement procedure	34
4.14	Modulation error ratio (<i>MER</i>) measurement on return path	35
4.14.1	General	35
4.14.2	Equipment required	36
4.14.3	Connection of the equipment	36
4.14.4	Measurement procedure	36
4.14.5	Presentation of the results	37
5	System performance requirements	37
5.1	General.....	37
5.2	Analogue parameters that influence the system performance.....	40
5.3	General requirements	42
5.3.1	Impedance.....	42
5.3.2	Maximum signal level	42
5.4	Specific system performance requirements	42
6	System performance recommendations – Return path bandwidth	45
6.1	Frequency allocation.....	45
6.2	Transmission quality in the return path frequency ranges.....	45
	Annex A (normative) Correction factors for noise	47

A.1	Signal level measurement	47
A.2	Noise level measurement	47
Annex B (normative)	Correction factor for a spectrum analyser	49
Annex C (normative)	Null packet and PRBS definitions	50
C.1	Null packet definition	50
C.2	PRBS definition	51
Bibliography	52
Figure 1	– Reference points of an active return path system (example).....	15
Figure 2	– Time domain representation of an upstream burst with marker on the preamble of the DOCSIS signal	17
Figure 3	– Arrangement of test equipment for measurement of amplitude response variation.....	18
Figure 4	– Echo rating graticule	24
Figure 5	– Arrangement of test equipment for measurement of echo ratio	25
Figure 6	– Test set-up for frequency stability measurement	26
Figure 7	– Principle of BER measurement.....	27
Figure 8	– Band-pass and band-stop filters response.....	29
Figure 9	– <i>NPR</i> test set up.....	30
Figure 10	– <i>NPR</i> versus RF power density applied at input of optical transmitter and determination of <i>OMI</i> 100 %.....	31
Figure 11	– Example of the frequency response of the optional band-pass filter	31
Figure 12	– Example of <i>NPR</i> dynamic range	33
Figure 13	– Dynamic range plotted versus <i>NPR</i>	33
Figure 14	– Alternative <i>NPR</i> measurement principle	34
Figure 15	– Relationship between classical <i>NPR</i> method and multi-tone method	35
Figure 16	– Test set-up for modulation error ratio (<i>MER</i>) measurement	36
Figure 17	– Example of constellation diagram for a 64QAM modulation format	37
Figure 18	– Return path signals affecting forward path signals.....	38
Figure 19	– Forward path signals affecting return path signals.....	39
Figure 20	– Return path signals of service 1 affecting return path signals of a different service (e.g. service 2).....	39
Figure 21	– Return path signals of a specific service (e.g. service 2) affecting return path signals of the same service	39
Figure 22	– Identification of the most common sub-bands within the return path band with limited transmission quality.....	46
Figure 23	– Noise correction factor <i>CF</i> versus measured level difference <i>D</i>	48
Table 1	– Examples of the Nyquist bandwidth of digitally modulated carriers	16
Table 2	– Band-stop filter notch frequencies	29
Table 3	– Summary of the requirements for <i>MER</i> according to ETSI EN 302 878-2, V.1.1.1 (2011-11), (clause 6.2.22.3.2).....	41
Table 4	– System performance requirements for different modulation techniques for <i>BER</i> = 10 ⁻⁴	43
Table 5	– Comparison of system performance parameters given in Table 4 with those given in ETSI EN 302 878-2, V.1.1.1 (2011-11), specifications.....	44

Table 6 – Return path frequency ranges 45

Table 7 – Reasons for quality reduction in sub-bands of the return path 45

Table A.1 – Noise correction factor 47

Table C.1 – Null transport stream packet definition 51

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CABLE NETWORKS FOR TELEVISION SIGNALS,
SOUND SIGNALS AND INTERACTIVE SERVICES –****Part 10: System performance for return paths**

FOREWORD

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International Standard IEC 60728-10 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.

This third edition cancels and replaces the second edition published in 2005 and constitutes a technical revision.

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

- update on the state-of-the-art of return path transmission in cable networks;
- provisions for DOCSIS 3.0 and EuroDOCSIS 3.0 transmission standards;
- revision of subclause 4.3 on measurement of channel level;
- new subclause 4.12 for method of measurement of noise power ratio (NPR) on return paths;

- new subclause 4.13 for 10-tone measurements;
- new subclause 4.14 for method of measurement of modulation error ratio (*MER*);
- revision of subclause 5.2 on analogue parameters influencing system performance.

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

FDIS	Report on voting
100/2247/FDIS	100/2283/RVD

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 be 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://www.store.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.

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.

Specific equipment installed in cable networks for the operation of such return paths is standardised in the relevant equipment standards. See IEC 60728-3, IEC 60728-4, IEC 60728-5, IEC 60728-6.

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

Part 10: System performance for return paths

1 Scope

This part of IEC 60728 specifies the transparent return path of cable networks operated in the frequency range between 5 MHz and 85 MHz or parts thereof. The upper frequency limit of the return path is reduced to 65 MHz where FM radio signals are transmitted in a cable network. Higher frequencies may be used in fibre based networks.

NOTE In addition, it is possible to use the frequency range from 0 MHz to 5 MHz for return path transmissions, for example for NMS or other control, monitoring and signalling purposes. Applications below 5 MHz are not covered by this standard.

Specifications of transmission systems (e.g. DOCSIS) are not within the scope of this standard.

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 60728 (all parts), *Cable networks for television signals, sound signals and interactive services*

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

IEC 60728-2, *Cable networks for television signals, sound signals and interactive services – Part 2: Electromagnetic compatibility for equipment*

IEC 60728-5, *Cable networks for television signals, sound signals and interactive services – Part 5: Headend equipment*

IEC 60728-12, *Cabled distribution systems for television and sound signals – Part 12: Electromagnetic compatibility of systems*

ISO/IEC 13818-1:2007, *Information technology – Generic coding of moving pictures and associated audio information – Part 1: Systems*

ITU-R BT.470, *Conventional analogue television systems*

CLC/TR 50083-10-1:2009, *Guidelines for the implementation of return paths in cable networks*

ETSI ES 200 800, *Digital Video Broadcasting (DVB); DVB interaction channel for Cable TV distribution systems (CATV)*