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INTERNATIONAL STANDARD

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	10
INTRODUCTION.....	12
1 Scope.....	13
2 Normative references	13
3 Terms, definitions, symbols and abbreviations.....	15
3.1 Terms and definitions.....	15
3.2 Symbols.....	27
3.3 Abbreviations.....	29
4 Methods of measurement at system outlet.....	31
4.1 Performance limits	31
4.2 Mutual isolation between system outlets	33
4.2.1 Overview	33
4.2.2 Equipment required	33
4.2.3 Connection of the equipment	34
4.2.4 Measurement procedure	34
4.2.5 Presentation of the results	35
4.3 Amplitude response within a channel	35
4.3.1 Overview	35
4.3.2 Equipment required	35
4.3.3 Connection of the equipment	35
4.3.4 Measurement procedure	36
4.3.5 Presentation of the results	37
4.4 Chrominance-luminance gain and delay inequalities	38
4.4.1 Overview	38
4.4.2 Equipment required	39
4.4.3 Connection of the equipment	39
4.4.4 Measurement procedure	39
4.4.5 Presentation of the results	40
4.5 Non-linear distortion.....	41
4.5.1 General	41
4.5.2 Intermodulation.....	41
4.5.3 Composite beat	41
4.5.4 Composite crossmodulation	45
4.5.5 Intermodulation noise	46
4.5.6 Hum modulation of carriers.....	46
4.5.7 Differential gain and phase	51
4.6 Carrier-to-noise ratio.....	56
4.6.1 Overview	56
4.6.2 Equipment required	56
4.6.3 Connection of the equipment	56
4.6.4 Measurement set-up.....	57
4.6.5 Measurement procedure	57
4.6.6 Presentation of the results	58
4.7 Echoes	58
4.7.1 Overview	58
4.7.2 Equipment required	59

4.7.3	Connection of the equipment	59
4.7.4	Measurement procedure	59
4.7.5	Presentation of the results	60
4.8	AM-VSB television, FM radio and FM television signal level	60
4.8.1	General	60
4.8.2	Definitions for NTSC, PAL and SECAM systems	60
4.8.3	Equipment required	60
4.8.4	Measurement procedure	60
4.8.5	Presentation of the results	61
4.9	Data echo rating and data delay inequality	61
4.10	Interference in FM sound radio channels	61
4.11	Methods of measurement for digitally modulated signals	61
4.11.1	Overview	61
4.11.2	Basic assumptions and measurement interfaces	62
4.11.3	Signal level for digitally modulated signals	65
4.11.4	RF signal-to-noise ratio $S_{D,RF}/N$ for digitally modulated signals	66
4.11.5	Bit error ratio (BER)	68
4.11.6	BER versus E_b/N_0 or C/N	69
4.11.7	Noise margin	73
4.11.8	Modulation error ratio (MER)	74
4.11.9	Phase jitter	76
4.11.10	Phase noise of an RF carrier	79
5	Performance requirements at system outlet	82
5.1	General	82
5.2	Impedance	82
5.3	Requirements at the terminal input	82
5.3.1	General	82
5.3.2	Signal level	83
5.3.3	Other parameters	83
5.4	Carrier levels at system outlets	83
5.4.1	Minimum and maximum carrier levels	83
5.4.2	Carrier level differences	85
5.5	Mutual isolation between system outlets	86
5.5.1	Isolation between two subscribers	86
5.5.2	Isolation between individual outlets in one household	86
5.5.3	Isolation between forward and return path	86
5.6	Frequency response within a television channel at any system outlet	87
5.6.1	Amplitude response	87
5.6.2	Group delay	87
5.7	Long-term frequency stability of distributed carrier signals at any system outlet	88
5.8	Random noise	89
5.9	Interference to television channels	91
5.9.1	Single-frequency interference	91
5.9.2	Single-channel intermodulation interference	92
5.9.3	Multiple frequency intermodulation interference	92
5.9.4	Intermodulation noise	92
5.9.5	Cross-modulation	93

5.10	Video baseband requirements.....	93
5.10.1	Differential gain and phase in any television channel.....	93
5.10.2	Echoes.....	93
5.11	Hum modulation of carriers in television channels.....	93
5.12	Requirements for data signal transmission.....	94
5.12.1	Data signals carried in the structure of a television signal.....	94
5.12.2	Data signals other than those carried within the structure of a television signal.....	94
5.13	Digitally modulated signals – Additional performance requirements.....	94
5.13.1	DVB (PSK, QAM, OFDM) performance.....	94
5.13.2	NICAM performance.....	96
5.13.3	DAB performance.....	96
5.14	FM sound radio – Additional performance requirements.....	97
5.14.1	Amplitude response within an FM channel.....	97
5.14.2	Phase response within an FM channel.....	97
5.14.3	Interference within an FM channel.....	97
5.14.4	AM hum modulation on FM sound carriers.....	97
5.14.5	Echoes within an FM channel.....	97
6	Performance requirements at receiving antennas.....	97
6.1	General.....	97
6.2	Method of measurement of field strength.....	98
6.2.1	Overview.....	98
6.2.2	Equipment required.....	98
6.2.3	Connection of the equipment.....	98
6.2.4	Measurement procedure.....	98
6.2.5	Presentation of the results.....	100
6.3	Requirements.....	100
6.3.1	General.....	100
6.3.2	Field strength requirements.....	100
6.3.3	Quality of received signals.....	102
6.3.4	Safety.....	106
6.3.5	Electromagnetic compatibility (EMC).....	107
6.4	Interference reduction.....	107
6.4.1	General.....	107
6.4.2	Active antennas.....	107
7	Performance requirements at home network interfaces of cable networks.....	107
7.1	General.....	107
7.2	Requirements at HNI1 for passive coaxial home networks.....	108
7.2.1	General.....	108
7.2.2	Carrier levels at the HNI1.....	109
7.2.3	Mutual isolation between two HNI1.....	112
7.2.4	Frequency response within any television channel at HNI1.....	112
7.2.5	Long-term frequency stability of distributed carrier signals at HNI1.....	113
7.2.6	Random noise at the HNI1.....	113
7.2.7	Interference to television channels at HNI1.....	113
7.2.8	Return path requirements at HNI1.....	114
7.3	Requirements at HNI2 for active coaxial home networks.....	114
7.3.1	General.....	114

7.3.2	Carrier levels at the HNI2	114
7.3.3	Mutual isolation between two HNI2	117
7.3.4	Frequency response within any television channel at HNI2	117
7.3.5	Long-term frequency stability of distributed carrier signals at HNI2	117
7.3.6	Random noise at HNI2	118
7.3.7	Interference to television channels at the HNI2	121
7.3.8	Return path requirements at HNI2	122
7.4	Requirements at HNI3 and at system outlet or terminal input when the home network is mainly of balanced type	122
7.4.1	Overview	122
7.4.2	Requirements at HNI3	122
7.4.3	Requirements at system output	123
7.4.4	Additional requirements at HNI3 for upstream transmission	123
7.5	Requirements at HNI3 (Case C)	124
7.6	Requirements at HNI3 (Case D)	124
Annex A (informative) Reception of television signals		125
Annex B (normative) Calibration of modulation depth		130
B.1	Equipment required	130
B.2	Connection of the equipment	130
B.3	Calibration procedure	130
Annex C (normative) Equipment required – Additional items		131
C.1	Measuring receiver preamplifier	131
C.2	Measuring receiver input filter	131
Annex D (normative) Preliminary checks on the measuring equipment for carrier-to-noise ratio		132
D.1	Noise	132
D.2	Intermodulation	132
D.3	Overload	132
Annex E (normative) Correction factors		133
E.1	Level correction factor C_m	133
E.2	Bandwidth correction factor C_b	133
Annex F (normative) Calibration of the measuring receiver		134
Annex G (normative) Correction factors for noise		135
G.1	Signal level measurement	135
G.2	Noise level measurement	135
Annex H (normative) Null packet and PRBS definitions		137
H.1	Null packet definition	137
H.2	PRBS definition	138
Annex I (normative) Digital signal level and bandwidth		139
I.1	RF/IF power (carrier)	139
I.2	Bandwidth of a digital signal	139
I.2.1	Occupied bandwidth	139
I.2.2	Noise bandwidth	140
I.2.3	Equivalent signal bandwidth	140
I.3	Examples	141
Annex J (normative) Correction factor for a spectrum analyser		142
Annex K (informative) Differences in some countries		143

K.1	Subclause 3.1.58, Norway	143
K.2	Subclause 5.4.1, Japan, Netherlands	143
	K.2.1 Japan	143
	K.2.2 Netherlands	143
K.3	Subclause 5.4.2, Japan	143
K.4	Subclause 5.5.1, Japan	144
K.5	Subclause 5.6.1, Japan	145
K.6	Subclause 5.6.2, Netherlands	145
K.7	Subclause 5.7, Japan	146
K.8	Subclause 5.8, Japan	146
K.9	Subclause 5.9.1, Japan, Netherlands	147
	K.9.1 Japan	147
	K.9.2 Netherlands	148
K.10	Subclause 5.9.5, Japan	149
K.11	Subclause 5.10.2, Netherlands, Japan	149
	K.11.1 Netherlands	149
	K.11.2 Japan	149
K.12	Subclause 5.11, Japan	150
K.13	Subclause 5.12.1, Denmark	151
K.14	Subclause 5.13.1.5, Japan	151
K.15	Subclause 5.14.3, Netherlands	151
K.16	Clause 7, Japan	151
	Bibliography	152
	Figure 1 – Arrangement of test equipment for measurement of mutual isolation between system outlets	34
	Figure 2 – Arrangement of test equipment for measurement of frequency response within a channel	36
	Figure 3 – Interpretation of displays for measurement of frequency response within a channel	37
	Figure 4 – Test signal (signal <i>F</i> for 625-line systems) employed for chrominance/luminance gain and delay inequality	38
	Figure 5 – Test signal (signal B2 for 625-line systems) employed for chrominance/luminance gain and delay inequality	38
	Figure 6 – Arrangement of test equipment for measurement of chrominance/luminance gain and delay inequality	39
	Figure 7 – Displayed pulses: chrominance low and lagging	40
	Figure 8 – Displayed pulses: chrominance high and leading	40
	Figure 9 – Connection of test equipment for the measurement of non-linear distortion by composite beat	42
	Figure 10 – Weighting curve for 625-line system B, G and D1 (PAL): CW interference with no special (frequency offset) control	44
	Figure 11 – Weighting curve for 625-line system I (PAL): CW interference with no special (frequency offset) control	44
	Figure 12 – Weighting curve for 625-line systems D and K (PAL): CW interference with no special (frequency offset) control	45
	Figure 13 – Weighting curve for 625-line system L (SECAM): CW interference with no special (frequency offset) control	45
	Figure 14 – Hum modulation envelope	46

Figure 15 – Calibrated potential divider.....	47
Figure 16 – Stable variable DC source.....	47
Figure 17 – Connection of equipment for measurement of hum modulation (DC method).....	48
Figure 18 – Oscilloscope display.....	49
Figure 19 – Connection of equipment for hum modulation measurement (AC method).....	50
Figure 20 – Signal D2.....	52
Figure 21 – Example of the modified staircase waveform.....	53
Figure 22 – Arrangement of test equipment for measurement of differential gain and phase.....	54
Figure 23 – Arrangement of test equipment for carrier-to-noise ratio measurement.....	56
Figure 24 – Echo rating graticule.....	58
Figure 25 – Arrangement of test equipment for measurement of echo rating.....	59
Figure 26 – PSK modulation (QPSK, BPSK or TC8PSK).....	62
Figure 27 – DVB-S2 modulation (QPSK, 8PSK, 16APSK, 32APSK).....	62
Figure 28 – DVB-C QAM modulation.....	62
Figure 29 – DVB-T OFDM modulation.....	63
Figure 30 – DVB-T2 OFDM modulation.....	63
Figure 31 – Reference receiver for PSK demodulation (QPSK, BPSK or TC8PSK).....	63
Figure 32 – Reference receiver for DVB-S2 demodulation (QPSK, 8PSK, 16APSK, 32APSK).....	64
Figure 33 – Reference receiver for QAM demodulation.....	64
Figure 34 – Reference receiver for DVB-T OFDM demodulation.....	64
Figure 35 – Reference receiver (buffer model) for DVB-T2 OFDM demodulation.....	64
Figure 36 – Test set-up for BER measurement.....	69
Figure 37 – Test set-up for BER measurement versus E_b/N_0 or C/N and noise margin measurement.....	70
Figure 38 – Example of <i>BER</i> measurement versus E_b/N_0	72
Figure 39 – Example of <i>BER</i> measurement versus C/N	72
Figure 40 – Test set-up for modulation error ratio (MER) measurement and phase jitter measurement.....	75
Figure 41 – Example of constellation diagram for a 64 QAM modulation format.....	76
Figure 42 – Example of constellation diagram for a 64 QAM modulation format with arc sections due to phase jitter.....	78
Figure 43 – Test set-up for phase noise measurement.....	79
Figure 44 – Example of mask for phase noise measurements: PSK, APSK and QAM formats.....	81
Figure 45 – Example of mask for phase noise measurements: OFDM format.....	81
Figure 46 – Home network types used to define the requirements at HNI1 (coaxial).....	108
Figure A.1 – Example of a master antenna television system (MATV) for terrestrial reception.....	126
Figure A.2 – Example of the headend of a master antenna television system for satellite (SMATV) reception.....	127
Figure A.3 – Example of a master antenna television system for terrestrial and satellite (SMATV) reception.....	127
Figure A.4 – Example of a cabled distribution system for television and sound signals.....	128

Figure A.5 – System model for downstream direction of a cable network for television and sound signals (CATV)	129
Figure B.1 – Calibration of modulation depth	130
Figure G.1 – Noise correction factor CF versus measured level difference D	136
Figure K.1 – Mask group delay characteristic for PAL signals with FM-FM sound (Netherlands).....	145
Figure K.2 – Single-frequency interference (VSB-AM NTSC) (Japan).....	147
Figure K.3 – Single-frequency interference (64 QAM digital) (Japan)	148
Figure K.4 – Single-frequency interference (256 QAM digital) (Japan)	148
Figure K.5 – Requirement for echo loss in relation to the time delay of the reflected signal (Netherlands).....	149
Figure K.6 – Echoes (VSB-AM NTSC) (Japan).....	150
Figure K.7 – Echoes (FM NTSC) (Japan).....	150
Table 1 – Application of the methods of measurement	32
Table 2 – Residual carrier reduction factors	49
Table 3 – Frequency distance f_m	81
Table 4 – Carrier signal levels at any system outlet (analogue signals).....	83
Table 5 – RF signal levels at any system outlet (digital signals).....	84
Table 6 – Maximum level differences at any system outlet between distributed television channels	85
Table 7 – Mutual isolation	86
Table 8 – Residual carrier level at television or FM radio output within the same outlet or between two different outlets	87
Table 9 – Amplitude response variation	87
Table 10 – Group delay variation	88
Table 11 – Maximum deviation of the conversion frequency for digitally modulated DVB signals	89
Table 12 – Carrier-to-noise ratios at system outlet (analogue television).....	89
Table 13 – RF signal-to noise ratio at system outlet (digital television)	90
Table 14 – Carrier-to-noise ratios at the system outlet (sound radio)	91
Table 15 – Differential gain and phase in television channels	93
Table 16 – Modulation error ratio MER of DVB signals.....	95
Table 17 – Phase jitter of a DVB signal.....	95
Table 18 – Phase noise of a DVB signal (PSK, APSK and QAM)	96
Table 19 – Phase noise of a DVB-T signal (COFDM)	96
Table 20 – Minimum field strength levels recommended by ITU-R.....	101
Table 21 – Minimum field strength levels recommended by CEPT:1997	101
Table 22 – Minimum signal level at the headend input for the reception of analogue sound broadcasting.....	102
Table 23 – Minimum signal level at the headend input for the reception of analogue television broadcasting	102
Table 24 – Minimum signal level at the headend input for the reception of DAB signals at an error ratio of 1×10^{-4} and code rate 1/2	103
Table 25 – Minimum signal level and RF signal-to-noise ratio at the headend input for stationary reception of DVB-T signals	103

Table 26 – Minimum signal-to-noise ratio $S_{D,RF}/N$ at the headend input for DVB-T2 signals (LDPC block length 64 800 bit)	104
Table 27 – Minimum signal level and carrier-to-noise ratio at the headend input for the reception of FM modulated satellite signals.....	104
Table 28 – Minimum RF signal-to-noise ratio at the headend input for the reception of DVB-S or DVB-S2 satellite signals (AWGN channel and FECFRAME length of 64 800)	105
Table 29 – Minimum values for signal-to-disturbance ratio	105
Table 30 – Minimum values for signal-to-echo ratio	106
Table 31 – Signal level at HNI1 (analogue signals)	109
Table 32 – Signal level at HNI1 (digital signals)	110
Table 33 – Maximum level differences at HNI1	111
Table 34 – Mutual isolation between two HNI1	112
Table 35 – Amplitude response variation at HNI1	112
Table 36 – Group delay variation at HNI1	113
Table 37 – Signal level at HNI2 (analogue signals)	114
Table 38 – Signal level at HNI2 (digital signals)	115
Table 39 – Maximum level differences at HNI2	116
Table 40 – Amplitude response variation at HNI2.....	117
Table 41 – Group delay variation at HNI2	117
Table 42 – Carrier-to-noise ratios at HNI2 (analogue television)	118
Table 43 – RF signal-to-noise ratios at HNI2 (digital television)	119
Table 44 – Carrier-to-noise ratios at HNI2 (sound radio)	120
Table 45 – Minimum signal level at coaxial terminal input (case A) or at coaxial system outlet (case B)	123
Table G.1 – Noise correction factor.....	135
Table H.1 – Null transport stream packet definition	138
Table I.1 – Examples of bandwidths for digital modulation techniques	141
Table K.1 – Carrier signal levels at any system outlet (Japan)	143
Table K.2 – Carrier signal levels at any system outlet (Netherlands).....	143
Table K.3 – Maximum level differences at any system outlet between distributed television channels (Japan)	144
Table K.4 – Mutual isolation (Japan).....	144
Table K.5 – Amplitude response variation (Japan)	145
Table K.6 – Frequency stability requirements (Japan).....	146
Table K.7 – Carrier-to-noise ratios at system outlet (Japan).....	146
Table K.8 – Single-frequency interference (Japan).....	147
Table K.9 – Single-frequency interference (Netherlands)	148
Table K.10 – Cross-modulation (Japan)	149
Table K.11 – Echoes requirements (Japan).....	149
Table K.12 – Hum modulation of carriers in television channels (Japan)	150
Table K.13 – Phase noise of an RF carrier (Japan).....	151

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 1: System performance of forward paths

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60728-1 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 fifth edition cancels and replaces the fourth edition published in 2007 and constitutes a technical revision.

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

- redrafting of measurement procedure to include DVB-T2 signals;
- updating of performance requirements in Clause 5 to include those for DVB-T2 signals;
- updating of performance requirements in Clause 6 to include those for DVB-T2 signals;
- updating of performance requirements in Clause 7 to include those for DVB-T2 signals;

- reference to IEC 60728-1-1 for home networks;
- reference to IEC 60728-1-2 for performance requirements at system outlet in operation.

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

FDIS	Report on voting
100/2269/FDIS	100/2335/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.

For the differences in some countries, see Annex K.

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.

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

INTRODUCTION

Standards and 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 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.

IEC 60728-1 includes the following clauses:

Clause 5 defines the system performance limits which will, with an unimpaired input, (headend input signal), produce picture and sound signals (at system outlets) where the impairment to any single parameter will not be worse, in normal operating conditions for any analogue channel, than grade four on the five-grade impairment scale contained in ITU- R Recommendation BT.500-10. For digitally modulated signals, the quality requirement is a quasi-error-free (QEF) reception.

Appropriate performance requirements for the signals at the receiving antennas site are given in Clause 6 in order to provide at the input of the headend of the cable network both analogue and digital television signals with suitable quality.

Clause 7 is applicable to home networks (including those of individual receiving systems) using coaxial cables, balanced cables or optical cables and primarily intended for television signals, sound signals and interactive services, operating between about 30 MHz and 3 000 MHz.

This clause (Clause 7), considering the basic operational characteristics of a home network, specifies the requirements with respect to the home network interface (HNI) taking into account the performance requirements given at the system outlet or at the terminal input.

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

Part 1: System performance of forward paths

1 Scope

This part of IEC 60728 is applicable to any cable network (including individual receiving systems) having in the forward path a coaxial cable output and primarily intended for television and sound signals operating between about 30 MHz and 3 000 MHz.

This part of IEC 60728 specifies the basic methods of measurement of the operational characteristics of cable network having coaxial cable outputs in order to assess the performance of these systems and their performance limits.

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 60050-705, *International Electrotechnical Vocabulary – Chapter 705: Radio wave propagation*

IEC 60050-712:1992, *International Electrotechnical Vocabulary – Chapter 712: Antennas*

IEC 60050-725, *International Electrotechnical Vocabulary (IEV) – Chapter 725: Space radiocommunications*

IEC 60728-1-1, *Cable networks for television signals, sound signals and interactive services – Part 1-1: RF cabling for two way home networks*

IEC 60728-1-2, *Cable networks for television signals sound signals and interactive services – Part 1-2: Performance requirements for signals delivered at the system outlet in operation*

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

IEC 60728-3:2010, *Cable networks for television signals, sound signals and interactive services – Part 3: Active wideband equipment for cable networks*

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

IEC 60728-10, *Cable networks for television signals, sound signals and interactive services – Part 10: System performance of return paths*

IEC 60728-11, *Cable networks for television signals, sound signals and interactive services – Part 11: Safety*

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

IEC 60966-2-4, *Radio frequency and coaxial cable assemblies – Part 2-4: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 MHz to 3 000 MHz, IEC 61169-2 connectors*

IEC 60966-2-5, *Radio frequency and coaxial cable assemblies – Part 2-5: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 MHz to 1 000 MHz, IEC 61169-2 connectors*

IEC 60966-2-6, *Radio frequency and coaxial cable assemblies – Part 2-6: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 MHz to 3 000 MHz, IEC 61169-24 connectors*

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

ISO/IEC 13818-4, *Information technology – Generic coding of moving pictures and associated audio information – Part 4: Conformance testing*

ISO/IEC 14496-1, *Information technology – Coding of audio-visual objects – Part 1: Systems*

ITU-R Recommendation BS.412-9, *Planning standards for terrestrial FM sound broadcasting at VHF*

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