



SLOVENSKI STANDARD
oSIST prEN IEC 60728-11:2019
01-maj-2019

**Kabelska omrežja za televizijske in zvokovne signale ter interaktivne storitve - 11.
del: Varnost**

Cable networks for television signals, sound signals and interactive services - Part 11:
Safety (TA 5)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 11:
Sicherheitsanforderungen

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion
sonore et services interactifs - Partie 11: Sécurité

<https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pr-en-iec-60728-11-2019>

Ta slovenski standard je istoveten z: prEN IEC 60728-11:2019

ICS:

33.060.40 Kabelski razdelilni sistemi Cabled distribution systems

oSIST prEN IEC 60728-11:2019 **en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN IEC 60728-11:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019>



100/3208/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 60728-11 ED5	
DATE OF CIRCULATION: 2019-03-15	CLOSING DATE FOR VOTING: 2019-06-07
SUPERSEDES DOCUMENTS: 100/3140/CD,100/3176A/CC	

IEC TA 5 : CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES	
SECRETARIAT: Japan	SECRETARY: Mr Hiroo Tamura
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING	
<p>Attention IEC-CENELEC parallel voting oSIST prEN IEC 60728-11:2019</p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Cable networks for television signals, sound signals and interactive services - Part 11: Safety (TA 5)

PROPOSED STABILITY DATE: 2024

NOTE FROM TC/SC OFFICERS:

Copyright © 2019 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

1 CONTENTS

2	CONTENTS	2
3	FOREWORD	6
4	INTRODUCTION	8
5	1 Scope	9
6	2 Normative references	9
7	3 Terms, definitions, symbols and abbreviations	11
8	3.1 Terms and definitions	11
9	3.2 Symbols	19
10	3.3 Abbreviations	19
11	4 Fundamental requirements	20
12	4.1 General	20
13	4.2 Mechanical requirements	21
14	4.3 Accessible parts	21
15	4.4 Radiation	21
16	4.5 Electromagnetic Radiation	21
17	4.6 Thermal protection	22
18	4.7 Safety in case of Fire and Fire Reaction	22
19	5 Protection against environmental influences	22
20	6 Equipotential bonding and earthing	22
21	6.1 General requirements	22
22	6.2 Equipotential bonding mechanisms	22
23	6.3 Equipotential bonding in meshed systems	33
24	6.3.1 References to other standards	33
25	6.3.2 General on AC mains	33
26	6.3.3 AC power distribution and connection of the protective conductor	33
27	6.3.4 Dangers and malfunction	33
28	6.3.5 Measures	34
29	7 Mains-supplied equipment	34
30	8 Remote power feeding in cable networks	35
31	8.1 Remote power feeding	35
32	8.1.1 Maximum allowed voltages	35
33	8.1.2 General requirements for equipment	35
34	8.1.3 Current-carrying capacity and dielectric strength of the components	35
35	8.2 Remote powering from subscriber premises	36
36	9 Segregation distances and protection against indirect contact to electric power	
37	distribution systems	36
38	9.1 General	36
39	9.2 Overhead lines	36
40	9.2.1 Overhead lines up to 1 000 V	36
41	9.2.2 Overhead lines above 1 000 V	37
42	9.3 House installations up to 1 000 V	37
43	10 System outlets and transfer points	37
44	10.1 General	37
45	10.2 System outlet	38
46	10.2.1 Types of system outlets	38

47	10.2.2	Fully isolated system outlet.....	38
48	10.2.3	Semi-isolated system outlet.....	38
49	10.2.4	Non-isolated system outlet with protective element.....	38
50	10.2.5	Non-isolated system outlet without protective element.....	39
51	10.2.6	Fully-isolated system outlet provided by means of a FTTH system.....	39
52	10.3	Transfer point	40
53	11	Protection against atmospheric over voltages and elimination of potential differences	41
54			
55	11.1	General.....	41
56	11.2	Protection of the antenna system	42
57	11.2.1	Selection of appropriate methods for protection of antenna systems	42
58	11.2.2	Building equipped with a lightning protection system (LPS).....	43
59	11.2.3	Building not equipped with an LPS.....	50
60	11.3	Earthing and bonding of the antenna system.....	54
61	11.3.1	Internal protection system.....	54
62	11.3.2	Earthing conductors.....	54
63	11.3.3	Earth termination system	56
64	11.4	Overvoltage protection	59
65	12	Mechanical stability	60
66	12.1	General requirements	60
67	12.2	Bending moment	61
68	12.3	Wind-pressure values	62
69	12.4	Mast construction.....	62
70	12.5	Data to be published	62
71	Annex A (informative)	Earth loop impedance.....	64
72	A.1	General.....	64
73	A.2	Earthing for fault conditions	64
74	A.3	Earthing to protect against hazardous touch voltage	65
75	A.4	Temporary safety measures.....	66
76	Annex B (informative)	Use of shield wires to protect installations with coaxial cables.....	68
77	B.1	General.....	68
78	B.2	Soil quality determines shield-wiring necessity.....	68
79	B.3	Protective measures against direct lightning strikes on underground cables.....	68
80	Annex C (informative)	Differences in some countries	71
81	C.1	Subclause 6.1	71
82	C.1.1	France	71
83	C.1.2	Japan	71
84	C.2	Subclause 6.2.....	71
85	C.2.1	France	71
86	C.2.2	Norway	71
87	C.2.3	Japan and Poland.....	71
88	C.3	Subclause 6.3 – Norway	71
89	C.3.1	Justification	71
90	C.3.2	Equipotential bonding mechanism for cable networks	72
91	C.3.3	Use of galvanic isolation in a cable network with remote power-feeding.....	77
92	C.3.4	Use of voltage dependent protective device in a cable network.....	77
93	C.4	Subclause 8.1.1 – Japan.....	79
94	C.5	Subclause 9.1 – France	79

95	C.6	Subclause 9.2 – Japan.....	79
96	C.7	Subclause 10.1.....	79
97	C.7.1	Sweden.....	79
98	C.7.2	UK.....	79
99	C.8	Subclause 10.2 – Japan.....	79
100	C.9	Subclause 11.1 – Japan.....	80
101	C.10	Subclause 11.2.....	80
102	C.10.1	Germany.....	80
103	C.10.2	Japan.....	80
104	C.11	Subclause 11.3.2 – Japan.....	81
105	C.12	Subclause 11.3.3 – Japan.....	81
106	C.13	Subclause 12.2 – Japan.....	81
107	C.14	Subclause 12.3 – Finland.....	82
108		Bibliography.....	82
109			
110		Figure 1 – Example of equipotential bonding and earthing of a metal enclosure inside	
111		a non-conductive cabinet for outdoor-use.....	24
112		Figure 2 – Example of equipotential bonding of a building installation.....	25
113		Figure 3 – Example of equipotential bonding and indirect earthing of a metal enclosure	
114		inside a non-conductive cabinet for outdoor-use.....	26
115		Figure 4 – Example of equipotential bonding and earthing of a building installation	
116		(underground connection).....	28
117		Figure 5 – Example of equipotential bonding and earthing of a building installation	
118		(above ground connection).....	29
119		Figure 6 – Example of equipotential bonding with a galvanic isolated cable entering a	
120		building (underground connection).....	30
121		Figure 7 – Example of maintaining equipotential bonding whilst a unit is removed.....	32
122		Figure 8a – MDU building installed with FTTH technology to the home.....	39
123		Figure 8b – MDU building installed with FTTH technology to the headend.....	40
124		Figure 9 0 – Areas of antenna-mounting in or on buildings, where earthing is not	
125		mandatory.....	42
126		Figure 10 – Flow chart for selection of the appropriate method for protecting the	
127		antenna system against atmospheric over voltages.....	45
128		Figure 11 – Example of equipotential bonded headends and antennas in a protected	
129		volume of the building LPS.....	46
130		Figure 12 – Example of equipotential bonded headends and antennas in a protected	
131		volume of the building LPS.....	47
132		Figure 13 – Example of equipotential bonded headends and antennas in a protected	
133		volume of an external isolated ATS.....	48
134		Figure 14 – Example of equipotential bonded antennas (not installed in a protected	
135		volume) and headend with direct connection to building LPS.....	49
136		Figure 15 – Example of equipotential bonded headend and earthed antennas (building	
137		without LPS).....	52
138		Figure 16 – Example of bonding for antennas and headend (building without LPS and	
139		lightning risk lower than or equal to the tolerable risk).....	53
140		Figure 17 – Example of protecting an antenna system (not installed in a protected	
141		volume) by additional bonding conductors (R □.RT).....	56
142		Figure 18a – Examples of earthing mechanisms Conductor in building foundations.....	57

143	Figure 18b – Examples of earthing mechanisms (minimum dimensions Steel rod earth electrodes).....	58
144		
145	Figure 18c – Examples of earthing mechanisms (minimum dimensions Steel strip).....	58
146	Figure 18d – Examples of earthing mechanisms Structural steel work.....	59
147	Figure 19 – Example of an overvoltage protective device for single dwelling unit.....	60
148	Figure 20 – Example of bending moment of an antenna mast.....	61
149	Figure A.1 – Systematic of earth loop resistance.....	65
150	Figure B.1 – Principle of single shield wire.....	69
151	Figure B.2 – Principle of two shield wires.....	70
152	Figure C.1 – IT power distribution system in Norway.....	72
153	Figure C.2 – Example of installations located farther than 20 m away from a transforming station.....	73
154		
155	Figure C.3 – Example of installations located closer than 20m from a transforming station.....	74
156		
157	Figure C.4 – Example of cabinets for cable network with locally fed equipment and mains placed less than 2 m apart.....	75
158		
159	Figure C.5 – Example of cabinets for cable network with remotely fed equipment and mains placed less than 2 m apart.....	75
160		
161	Figure C.6 – Example of cabinets for cable network with locally fed equipment and mains placed more than 2 m apart.....	76
162		
163	Figure C.7 – Example of cabinets for cable network with remotely fed equipment and mains placed more than 2m apart.....	76
164		
165	Figure C.8 – Example of an installation placing the amplifier in front of the galvanic isolator.....	77
166		
167	Figure C.9 – Example of protection using a voltage depending device on network installations on poles.....	78
168		
169	Figure C.10 – Example of the installation of a safety terminal in Japan.....	80
170	Figure C.11 – Examples of installation of a lightning protection system in Japan.....	81
171		
172	Table 1 – Maximum allowed operation voltages and maximum recommended currents for coaxial cables in the EN 50117 series.....	36
173		
174	Table 2 – Solutions for protection of antenna systems against atmospheric overvoltages.....	43
175		
176	Table B.1 – Conductivity of different types of soil.....	68
177	Table B.2 – Protection factors (K_p) of protection measures against direct lightning strokes for buried cables.....	69
178		
179		
180		

181 INTERNATIONAL ELECTROTECHNICAL COMMISSION

182

183

184

185

186

187

188

189

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

Part 11: Safety

FOREWORD

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

200 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international
201 consensus of opinion on the relevant subjects since each technical committee has representation from all
202 interested IEC National Committees.

203 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National
204 Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC
205 Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any
206 misinterpretation by any end user.

207 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications
208 transparently to the maximum extent possible in their national and regional publications. Any divergence
209 between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in
210 the latter.

211 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity
212 assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any
213 services carried out by independent certification bodies.

214 6) All users should ensure that they have the latest edition of this publication.

215 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and
216 members of its technical committees and IEC National Committees for any personal injury, property damage or
217 other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and
218 expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC
219 Publications.

220 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is
221 indispensable for the correct application of this publication.

222 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of
223 patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

224 International Standard IEC 60728-11 has been prepared by technical area 5: Cable networks
225 for television signals, sound signals and interactive services, of IEC technical committee 100:
226 Audio, video and multimedia systems and equipment.

227 This fifth edition cancels and replaces the fourth edition published in 2016. This edition
228 constitutes a technical revision.

229 This edition includes the following significant technical changes with respect to the previous
230 edition.

- 231 • Replacement of IEC 60065 and IEC 609501 with IEC 62368-1:2018
- 232 • Re-wording of much of the standard in order to comply with the new low voltage
233 directive
- 234 • Revised definition of class I equipment, class II equipment, main earthing terminal

- 235 • Addition of definitions for harm, hazard, Ordinary person, Instructed person, Skilled
236 person
- 237 • Additional requirement to provide details on the equipment installed
- 238 • Additional mechanical, design and construction requirements
- 239 • Changes to the accessible part requirements
- 240 • The introduction of radiation requirements
- 241 • The current carrying capacity and dielectric strength of components is now obligatory
- 242 • The assessment of the risk of lightning strike is now obligatory
- 243 • Extension of remote feeding voltage on subscriber feeder.
- 244 • Consideration of the Electro-Magnetic Field Directive (EMF)
- 245 • Consideration of the Construction Product Regulation (CPR)
- 246 • Addition of Annex ZZ

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

FDIS	Report on voting
100/XXX/FDIS	100/XXXX/RVD

248 Full information on the voting for the approval of this standard can be found in the report on
249 voting indicated in the above table.
250

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

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

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

- 257 • reconfirmed;
- 258 • withdrawn;
- 259 • replaced by a revised edition, or
- 260 • amended.
- 261
- 262

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.

263

264

265

INTRODUCTION

266 Standards and other deliverables of the IEC 60728 series deal with cable networks including
267 equipment and associated methods of measurement for headend reception, processing and
268 distribution of television and sound signals and for processing, interfacing and transmitting all
269 kinds of data signals for interactive services using all applicable transmission media. These
270 signals are typically transmitted in networks by frequency-multiplexing techniques.

271 This includes for instance

- 272 • regional and local broadband cable networks,
- 273 • extended satellite and terrestrial television distribution networks and systems
- 274 • individual satellite and terrestrial television receiving systems,

275 and all kinds of equipment, systems and installations used in such cable networks, distribution
276 and receiving systems.

277 The extent of this standardization work is from the antennas and/or special signal source
278 inputs to the headend or other interface points to the network up to the terminal input of the
279 customer premises equipment.

280 The standardization work will consider coexistence with users of the RF spectrum in wired
281 and wireless transmission systems.

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

[oSIST prEN IEC 60728-11:2019](https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019)

285 [https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-](https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019)
286 [010d284a4cb3/osist-pren-iec-60728-11-2019](https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019)

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

289
 290 **Part 11: Safety**

291
 292
 293
 294 **1 Scope**

295 This part of IEC 60728 deals with the safety requirements applicable to fixed sited systems
 296 and equipment. As far as applicable, it is also valid for mobile and temporarily installed
 297 systems, for example, caravans.

298 Additional requirements may be applied, for example, referring to

- 299 • electrical installations of buildings and overhead lines,
- 300 • other telecommunication services distribution systems,
- 301 • water distribution systems,
- 302 • gas distribution systems,
- 303 • lightning systems.

304 This standard is intended to provide requirements specifically for the safety of the system,
 305 personnel working on it, subscribers and subscriber equipment. It deals only with safety
 306 aspects and is not intended to define a standard for the protection of the equipment used in
 307 the system.

[oSIST prEN IEC 60728-11:2019](https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019)

[https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-](https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019)

308 **2 Normative references** [010d284a4cb3/osist-pren-iec-60728-11-2019](https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pren-iec-60728-11-2019)

309 The following documents, in whole or in part, are normatively referenced in this document and
 310 are indispensable for its application. For dated references, only the edition cited applies. For
 311 undated references, the latest edition of the referenced document (including any
 312 amendments) applies.

313 EN 50117-2-2:2004+A2:2013, *Coaxial cables. Sectional specification for cables used in*
 314 *cabled distribution networks. Outdoor drop cables for systems operating at 5 MHz-1000 MHz*

315 EN 50117-2-5:2004+A2:2013, *Coaxial cables. Sectional specification for cables used in*
 316 *cabled distribution networks. Outdoor drop cables for systems operating at 5 MHz-3000 MHz*

317 EN 50117-2-3:2004+A2:2013, *Coaxial cables. Sectional specification for cables used in*
 318 *cabled distribution networks. Distribution and trunk cables for systems operating at 5 MHz -*
 319 *1000 MHz*

320 EN 50117-3:1996, *Coaxial cables used in cabled distribution networks. Sectional specification*
 321 *for outdoor drop cables*

322 EN 50117-4-1:2008+A1:2013, *Coaxial cables. Sectional specification for cables for BCT*
 323 *cabling in accordance with EN 50173. Indoor drop cables for systems operating at 5 MHz –*
 324 *3 000 MHz*

325 EN 50117-4-2:2015, *Coaxial cables. Sectional specification for CATV cables up to 6 GHz*
 326 *used in cabled distribution networks*

- 327 EN 50117-5:1997, *Coaxial cables used in cabled distribution networks. Sectional specification*
 328 *for indoor drop cables for use in networks operating at frequencies between 5 MHz and 2150*
 329 *MHz*
- 330 EN 50117-6:1997, *Coaxial cables used in cabled distribution networks. Sectional specification*
 331 *for outdoor drop cables for use in networks operating at frequencies between 5 MHz and 2150*
 332 *MHz*
- 333 EN 50174-2:2018, *Information technology – Cabling installation – Part 2: Installation*
 334 *planning and practices inside buildings*
- 335 EN 50310:2016, *Telecommunications bonding networks for buildings and other structures*
- 336 EN 50575:2014, *Power, control and communication cables - Cables for general applications in*
 337 *construction works subject to reaction to fire requirements*
- 338 IEC 62368-1- *Audio/video, information and communication technology equipment - Part 1:*
 339 *Safety requirements*
- 340 IEC 60364-1:2005, *Low-voltage electrical installations – Part 1: Fundamental principles,*
 341 *assessment of general characteristics, definitions*
- 342 IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety –*
 343 *Protection against voltage disturbances and electromagnetic disturbances*
- 344 IEC 60364-4-44:2007/AMD1:2015, *Low-voltage electrical installations – Part 4-44:*
 345 *Protection for safety – Protection against voltage disturbances and electromagnetic*
 346 *disturbances*
<https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-oSIST-prEN-IEC-60728-11-2019>
- 347 IEC 60364-5-52:2009, *Low-voltage electrical installations – Part 5-52: Selection and erection*
 348 *of electrical equipment – Wiring systems*
- 349 IEC 60364-5-54:2011, *Low-voltage electrical installations – Part 5-54: Selection and erection*
 350 *of electrical equipment – Earthing arrangements and protective conductors*
- 351 IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
- 352 IEC 60529:1989/AMD1:1999, *Degrees of protection provided by enclosures (IP Code)*
- 353 IEC 60529:1989/AMD2:2013, *Degrees of protection provided by enclosures (IP Code)*
- 354 IEC 60728-2:2014, *Cable networks for television signals, sound signals and interactive*
 355 *services – Part 2: Electromagnetic compatibility for equipment*
- 356 IEC 60825-1:2014, *Safety of laser products – Part 1: Equipment classification and*
 357 *requirements*
- 358 IEC 60825-2:2004+AMD1:2006+AMD2:2010, *Safety of laser products – Part 2: Safety of*
 359 *optical fibre communication systems (OFCS)*
- 360 IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*
- 361 IEC 61140:2001, *Protection against electric shock – Common aspects for installation and*
 362 *equipment*
 363 IEC 61140:2001/AMD1:2004

- 364 IEC 62305:2013 (all parts), *Protection against lightning*
- 365 IEC 62305-2:2010, *Protection against lightning – Part 2: Risk management*
- 366 IEC 62305-3:2010, *Protection against lightning – Part 3: Physical damage to structures and*
367 *life hazard*
- 368 IEC 62305-4:2010, *Protection against lightning – Part 4: Electrical and electronic systems*
369 *within structures*
- 370 IEC 62561-1:2017, *Lightning Protection System Components (LPSC) – Part 1: Requirements*
371 *for connection components*
- 372 IEC 62561-2:2018, *Lightning Protection System Components (LPSC) – Part 2: Requirements*
373 *for conductors and earth electrodes*
- 374 ISO 3864-1:2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design*
375 *principles for safety signs in workplaces and public areas*

376 **3 Terms, definitions, symbols and abbreviations**

377 **3.1 Terms and definitions**

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

379 NOTE Some terms have been taken from IEC 60050-195, IEC 60050-826 and IEC 60050-851, with the reference
380 number in square brackets, and from other IEC standards, also referenced to in square brackets.

<https://standards.iteh.ai/catalog/standards/sist/0cb805ee-92de-486e-8d1d-010d284a4cb3/osist-pr-en-iec-60728-11-2019>

381 **3.1.1**

382 **air-termination system**

383 part of an external LPS using metallic elements such as rods, mesh conductors or catenary
384 wires intended to intercept lightning flashes

385 [SOURCE: IEC 62305-3:2010, 3.6]

386 **3.1.2**

387 **amplifier**

388 device to compensate for attenuation

389 **3.1.3**

390 **attenuation**

391 ratio of the input power to the output power

392 Note 1 to entry: The ratio is expressed in decibel.

393 **3.1.4**

394 **cable networks**

395 television signals, sound signals and interactive services> regional and local broadband cable
396 networks, extended satellite and terrestrial television distribution networks or systems and
397 individual satellite and terrestrial television receiving systems

398 Note 1 to entry: These networks and systems can be used in downstream and upstream directions.

399 **3.1.5**400 **CATV network**

401 regional and local broadband cable networks designed to provide sound and television signals
402 as well as signals for interactive services to a regional or local area

403 Note 1 to entry: Originally defined as Community Antenna Television network.

404 **3.1.6**405 **class I equipment**

406 equipment in which protection against electric shock does not rely on basic insulation only,
407 but that includes a supplementary safeguard in such a way that means are provided for the
408 connection of accessible conductive parts to the protective earthing conductor in the fixed
409 wiring of the installation

410 Note 1 to entry: For equipment intended for use with a flexible cord or cable, this provision includes a protective
411 conductor as part of the flexible cord or cable.

412 Note 2 to entry: Class I equipment may be provided with class II construction.

413 [SOURCE: IEC 62368-1]

414 **3.1.7**415 **class II construction**

416 part of an equipment for which protection against electric shock relies upon double
417 insulation or reinforced insulation

418 **3.1.8**419 **class II equipment**

420 equipment in which protection against electric shock does not rely on basic insulation only,
421 but in which a supplementary safeguard is provided, there being no provision for protective
422 earthing or reliance upon installation conditions

423 [SOURCE: IEC 62368-1]

424 **3.1.9**425 **earthing arrangement**

426 all the electric connections and devices involved in the earthing of a system, an installation
427 and equipment

428 [SOURCE: IEC 60050-195:1998, 195-02-20, modified – The preferred term "grounding
429 arrangement (US), and the deprecated term "earthing system" have been deleted.]

430 **3.1.10**431 **earthing conductor**

432 conductor which provides a conductive path, or part of the conductive path, between a given
433 point in a system or in an installation or in equipment and an earth electrode or an earth-
434 electrode network

435 Note 1 to entry: In the electrical installation of a building, the given point is usually the main earthing terminal,
436 and the earthing conductor connects this point to the earth electrode or the earth-electrode network.

437 [SOURCE: IEC 60050-826:2004, 826-13-12, modified – The preferred term "grounding
438 conductor (US)", and the deprecated term "earth conductor" have been deleted.]

439 **3.1.11**440 **earth electrode**

441 conductive part, which may be embedded in the soil or in a specific conductive medium, e.g.
442 concrete or coke, in electric contact with the Earth

443 [SOURCE: IEC 60050-826:2004, 826-13-05, modified – The preferred term "ground electrode
444 (US)" has been deleted.]

445 **3.1.12**

446 **earthing terminal**

447 terminal provided on equipment or on a device and intended for the electric connection with
448 the earthing arrangement

449 [SOURCE: IEC 60050-195:1998, 195-02-31, modified – The preferred term "grounding
450 terminal (US), and the deprecated term "earth terminal" have been deleted.]

451 **3.1.13**

452 **electric shock**

453 physiological effect resulting from an electric current through a human or animal body

454 [SOURCE: IEC 60050-826:2004, 826-12-01]

455 **3.1.14**

456 **equipotential bonding**

457 provision of electric connections between conductive parts, intended to achieve
458 equipotentiality

459 [SOURCE: IEC 60050-826:2004, 826-13-19]

460 **3.1.15**

461 **equipotential bonding bar**

462 bar which is part of an equipotential bonding system and enables the electric connection of a
463 number of conductors for equipotential bonding purposes

464 [SOURCE: IEC 60050-826:2004, 826-13-35]

465 **3.1.16**

466 **protective bonding conductor**

467 protective conductor provided for protective-equipotential-bonding

468 [SOURCE: IEC 60050-826:2004, 826-13-24, modified – The deprecated term "equipotential
469 bonding conductor" has been deleted.]

470 **3.1.17**

471 **exposed conductive part**

472 conductive part of equipment which can be touched and which is not normally live, but which
473 can become live when basic insulation fails

474 [SOURCE: IEC 60050-195:1998, 195-06-10]

475 **3.1.18**

476 **extended terrestrial television distribution network or system**

477 distribution network or system designed to provide sound and television signals received by
478 terrestrial receiving antenna to households in one or more buildings

479 Note 1 to entry: This kind of network or system can possibly be combined with a satellite antenna for the
480 additional reception of TV and/or radio signals via satellite networks.

481 Note 2 to entry: This kind of network or system can also carry other signals for special transmission systems (e.g.
482 MoCA or WiFi) in the return path direction.