SVENSK STANDARD SS-EN 60728-3

Fastställd	Utgåva	Sida	Ansvarig kommitté
2011-07-06	2	1 (1+65)	SEK TK 100

Kabelnät för television, ljudradio och interaktiva tjänster – Del 3: Aktiva komponenter för bredbandsnät

Cable networks for television signals, sound signals and interactive services – Part 3: Active wideband equipment for cable networks

Som svensk standard gäller europastandarden EN 60728-3:2011. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60728-3:2011.

Nationellt förord

Europastandarden EN 60728-3:2011

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 60728-3, Fourth edition, 2010 - Cable networks for television signals, sound signals and interactive services - Part 3: Active wideband equipment for cable networks**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60728-3, utgåva 1, 2007, SS-EN 50083-3, utgåva 1, 2002 och SS-EN 50083-3 C1, utgåva 1, 2007, gäller ej fr o m 2014-01-13.

ICS 33.060.40; 33.170

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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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Stora delar av arbetet sker internationellt

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Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60728-3

February 2011

ICS 33.060.40; 33.170

Supersedes EN 60728-3:2006

English version

Cable networks for television signals, sound signals and interactive services - Part 3: Active wideband equipment for cable networks

(IEC 60728-3:2010)

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 3: Matériel actif à large bande pour réseaux de distribution par câbles (CEI 60728-3:2010)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 3: Aktive Breitbandgeräte für koaxiale Kabelnetze (IEC 60728-3:2010)

This European Standard was approved by CENELEC on 2011-01-13. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60728-3:2011 E

SEK Svensk Elstandard

Foreword

The text of document 100/1746/FDIS, future edition 4 of IEC 60728-3, prepared by Technical Area 5, Cable networks for television signals, sound signals and interactive services, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60728-3 on 2011-01-13.

This European Standard supersedes EN 60728-3:2006.

EN 60728-3:2011 includes the following significant technical changes with respect to EN 60728-3:2006:

– extension of upper frequency range limit for cable network equipment from 862 MHz to 1 000 MHz;

– method of measurement and requirements for immunity to surge voltages;

– extension of scope to equipment using symmetrical ports;

– additional normative references;

– additional terms and definitions and abbreviations.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-10-13
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-01-13

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60728-3:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60728-6:2003	NOTE	Harmonized as EN 60728-6:2003 (not modified).
IEC 60728-10	NOTE	Harmonized as EN 60728-10.
IEC 61169-2	NOTE	Harmonized as EN 61169-2.
IEC 61169-24	NOTE	Harmonized as EN 61169-24.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60065	-	Audio, video and similar electronic apparatus - Safety requirements	EN 60065	-
IEC 60068-1	1988	Environmental testing - Part 1: General and guidance	EN 60068-1	1994
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-6	-	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	-
IEC 60068-2-27	-	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60068-2-29	-	Environmental testing - Part 2: Tests - Test Eb and guidance: Bump	EN 60068-2-29	-
IEC 60068-2-30	-	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	-
IEC 60068-2-31	-	Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens	EN 60068-2-31	-
IEC 60068-2-32	-	Environmental testing. Part 2-32: Tests. Test Ed: Free fall	EN 60068-2-32	-
IEC 60068-2-40	-	Basic environmental testing procedures - Part 2-40: Tests - Test Z/AM: Combined cold/low air pressure tests	EN 60068-2-40	-
IEC 60068-2-48	-	Environmental testing - Part 2-48: Tests - Guidance on the application of the tests of IEC 60068 to simulate the effects of storage	EN 60068-2-48	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-

Publication	Year	Title	EN/HD	Year
IEC 60728-1	-	Cable networks for television signals, sound signals and interactive services - Part 1: System performance of forward paths	EN 60728-1	-
IEC 60728-2	-	Cabled distribution systems for television and sound signals - Part 2: Electromagnetic compatibility for equipment	EN 50083-2	-
IEC 60728-4	-	Cable networks for television signals, sound signals and interactive services - Part 4: Passive wideband equipment for coaxial cable networks	EN 60728-4	-
IEC 60728-5	-	Cable networks for television signals, sound signals and interactive services - Part 5: Headend equipment	EN 60728-5	-
IEC 60728-11	-	Cable networks for television signals, sound signals and interactive services - Part 11: Safety	EN 60728-11	-
IEC 60950-1	-	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	-
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	-
IEC 61319-1	-	Interconnections of satellite receiving equipment - Part 1: Europe	EN 61319-1	-
IEC 61319-2	-	Interconnections of satellite receiving equipment - Part 2: Japan	-	-
ITU-T Recommendation G.117	-	Transmission aspects of unbalance about earth	-	-
ITU-T Recommendation O.9	-	Measuring arrangements to assess the degree of unbalance about earth	-	-

CONTENTS

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[1]-networks;
- MATV-networks and SMATV-networks;
- individual receiving networks;

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

For active equipment with balanced RF signal ports this standard applies to those ports which carry RF broadband signals for services as described in the scope of this standard.

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.

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.

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1 This word encompasses the HFC (Hybrid Fibre Cable) networks used nowadays to provide telecommunications services, voice, data, audio and video both broadcast and narrowcast.

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

Part 3: Active wideband equipment for cable networks

1 Scope

This part of IEC 60728 lays down the measuring methods, performance requirements and data publication requirements for active wideband equipment of cable networks for television signals, sound signals and interactive services.

This standard

- applies to all broadband amplifiers used in cable networks;
- covers the frequency range 5 MHz to 3 000 MHz;

NOTE The upper limit of 3 000 MHz is an example, but not a strict value. The frequency range, or ranges, over which the equipment is specified, should be published.

- applies to one-way and two-way equipment;
- lays down the basic methods of measurement of the operational characteristics of the active equipment in order to assess the performance of this equipment;
- identifies the performance specifications to be published by the manufacturers;
- states the minimum performance requirements of certain parameters.

Amplifiers are divided into the following two quality levels:

Grade 1: amplifiers typically intended to be cascaded;

Grade 2: amplifiers for use typically within an apartment block, or within a single residence, to feed a few outlets.

Practical experience has shown that these types meet most of the technical requirements necessary for supplying a minimum signal quality to the subscribers. This classification is not a requirement but is provided to users and manufacturers for information about minimum quality criteria of the material required to install networks of different sizes. The system operator has to select appropriate material to meet the minimum signal quality at the subscriber's outlet, and to optimise cost/performance, taking into account the size of the network and local circumstances.

All requirements and published data are understood as guaranteed values within the specified frequency range and in well-matched conditions.

2 Normative references

The following referenced documents are indispensable for the application 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 60065, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-1:1998, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-29, *Basic environmental testing procedures – Part 2-29: Tests – Test Eb and guidance: Bump*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60068-2-32, *Basic environmental testing procedures – Part 2-32: Tests – Test Ed: Free fall*

IEC 60068-2-40, *Basic environmental testing procedures – Part 2-40: Tests – Test Z/AM: Combined cold/low air pressure tests*

IEC 60068-2-48, *Basic environmental testing procedures – Part 2-48: Tests – Guidance on the application of the tests of IEC publication 60068 to simulate the effects of storage*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

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 60728-4, *Cable networks for television signals, sound signals and interactive services – Part 4: Passive wideband equipment for coaxial cable networks*

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

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

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61319-1, *Interconnections of satellite receiving equipment – Part 1: Europe*

IEC 61319-2, *Interconnections of satellite receiving equipment – Part 2: Japan*

ITU-T Recommendation G.117, *Transmission systems and media – Digital systems and networks – International telephone connections and circuits – General recommendations on the transmission quality for an entire international telephone connection – Transmission aspects of unbalance about earth*

ITU-T Recommendation O.9, *Specifications of measuring equipment – General – Measuring arrangements to assess the degree of unbalance about earth*