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

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

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste -- Teil 4: Passive Breitbandgeräte für koaxiale Kabelnetze

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs -- Partie 4: Matériels passifs à large bande utilisés dans les réseaux de distribution coaxiale

Ta slovenski standard je istoveten z: **EN 50083-4:1998**

ICS:

33.060.40	Kabelski razdelilni sistemi	Cabled distribution systems
33.120.10	Koaksialni kabli. Valovodi	Coaxial cables. Waveguides

SIST EN 50083-4:1999 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50083-4

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Descriptors: Telecasting, cable television, sound broadcasting, community aerial systems, coaxial cables, components, measuring techniques, specifications

English version

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

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs
Partie 4: Matériels passifs à large bande utilisés dans les réseaux de distribution coaxiale

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste
Teil 4: Passive Breitbandgeräte für koaxiale Kabelnetze

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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.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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FOREWORD

This second edition of the European Standard was prepared by CENELEC Technical Committee TC 209, "Cable networks for television signals, sound signals and interactive services" on the basis of EN 50083-4:1994 and the first amendment to EN 50083-4.

The text of this first amendment was approved by CENELEC on 1998-01-01 with the request to prepare a second edition of EN 50083-4, by incorporating this amendment into the European standard EN 50083-4:1994.

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) 1998-12-01

- latest date by which national standards conflicting with the EN have to be withdrawn (dow) 1999-12-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given only for information.
In this standard, annex A is normative, annexes B and C are informative.

CONTENTS

Annexes

1 Scope

1.1 General

Standards of EN 50083 series deal with cable networks for television signals, sound signals and interactive services including equipment, systems and installations

- for headend reception, processing and distribution of television and 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.

All kinds of networks like

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

and all kinds of equipment, systems and installations installed in such networks, are within this scope.

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 system outlet or the terminal input, where no system outlet exists.

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

1.2 Specific scope of this part 4

This standard applies to receiver leads, system outlets, splitters and subscriber taps, passive one and two port equipment comprising filters, attenuators, equalizers, galvanic isolators, power injectors, cable splices, terminating resistors and transfer points, but excluding coaxial cables.

It

- covers the frequency range 5 MHz to 3000 MHz,
- identifies performance requirements for certain parameters,
- lays down data publication requirements for certain parameters,
- stipulates methods of measurements,
- introduces minimum requirements defining quality (Q) grade(s).

There are three Q grades for taps and splitters and two Q grades for passive one and two port equipment.

There is only one Q grade for system outlet and receiver lead. Different networks require the same performance and, when integrating networks, upgrading will be avoided.

Practical experience has shown these types meet most of the technical requirements necessary for supplying a minimum signal quality to the subscribers. This classification shall not be considered as a requirement but as the information for users and manufacturers on the 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 optimize cost/performance, taking into account the size of the network and local circumstances.

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

For passive equipment of quality grades other than mentioned above, manufacturers shall specify minimum values for:

- return loss
- isolation
- directivity

using the relevant measurement methods and the presentation of table 1.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50083		Cable networks for television signals, sound signals and interactive services
EN 50083-1 + A1	1993 1997	Part 1: Safety requirements
EN 50083-2 + A1	1995 1997	Part 2: Electromagnetic compatibility for equipment
EN 50083-3	1998	Part 3: Active wideband equipment for coaxial cable networks
EN 50083-5	1998	Part 5: Headend equipment
EN 50083-7	1996	Part 7: System performance
EN 60068/HD 323	series	Environmental testing/Basic environmental testing procedures
EN 60169-24	1993	Radio frequency connectors - Part 24: Radio-frequency coaxial connectors with screw coupling, typically for use in 75 ohm cable distribution systems (Type F) (IEC 169-24:1991)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) NOTE: Basic Safety Publication (IEC 529:1989)
HD 134.1 S1	1977	Radio frequency connectors - Part 1: General requirements and measuring methods (IEC 169-1:1965)
HD 134.2 S2	1984	Radio frequency connectors - Part 2: Coaxial unmatched connector (IEC 169-2:1965 + A1:1982)
HD 243 S12	1995	Graphical symbols for use on equipment - Index, survey and compilation of the single sheets (IEC 417:1973 + IEC 417A:1974 to IEC 417M:1994)
HD 571 S1	1990	General principles for the creation of graphical symbols for use on equipment (IEC 416:1988)

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purpose of this standard, the following definitions apply.

3.1.1 feeder

A transmission path forming part of a cable network. Such a path may consist of a metallic cable, optical fibre, waveguide or any combination of them. By extension, the term is also applied to paths containing one or more radio links.

3.1.2 spur feeder

A feeder to which splitters, subscriber taps or looped system outlets are connected.

3.1.3 subscriber feeder

A feeder connecting a subscriber tap to a system outlet or, where the latter is not used, directly to the subscriber equipment.

NOTE: A subscriber feeder may include filters and balun transformers.

3.1.4 splitter (spur unit)

A device in which the signal power at the (input) port is divided equally or unequally between two or more (output) ports.

NOTE: Some forms of this device may be used in the reverse direction for combining signal energy.

3.1.5 directional coupler

A splitter in which the attenuation between any two output ports exceeds the sum of the attenuations between the input port and each of those output ports.

3.1.6 equalizer

A device designed to compensate over a certain frequency range for the amplitude/frequency distortion or phase/frequency distortion introduced by feeders or equipment.

NOTE: This device is for the compensation of linear distortions only.

3.1.7 subscriber tap

A device for connecting a subscriber feeder to a spur feeder.

3.1.8 system outlet

A device for interconnecting a subscriber feeder and a receiver lead.

3.1.9 looped system outlet

A device through which the spur feeder passes and to which is connected a receiver lead, without the use of a subscriber feeder.

3.1.10 receiver lead

A lead which connects the system outlet to the subscriber equipment.

NOTE: A receiver lead may include filters and balun transformers in addition to the cable.

3.1.11 decibel ratio

Ten times the logarithm of the ratio of two quantities of power P_1 and P_2, i.e.

$$10 \lg \frac{P_1}{P_2} \quad \text{(dB)}$$

3.1.12 standard reference power and voltage

In cable networks the standard reference power, P_0, is 1/75 pW.

NOTE: This is the power dissipated in a 75 ohm resistor with a voltage drop of $1 \mu V_{rms}$ across it.

The standard reference voltage, U_0, is 1μV.

3.1.13 level

The level of any power P_1 is the decibel ratio of that power to the standard reference power P_0, i.e.

$$10 \lg \frac{P_1}{P_0}$$

The level of any voltage U_1 is the decibel ratio of that voltage to the standard reference voltage U_0, i.e.

$$20 \lg \frac{U_1}{U_0}$$

This may be expressed in decibel (relative to 1μV in 75 ohm) or more simply in dB (μV) if there is no risk of ambiguity.

3.1.14 attenuation

The ratio of the input power to the output power of an equipment or system, usually expressed in decibel.

3.1.15 amplitude frequency response

The gain or loss of an equipment or system plotted against frequency.

3.1.16 isolation

The attenuation between two output, tap or interface ports of any equipment or system.

3.1.17 directivity

The attenuation between output port and interface or tap port minus the attenuation between input and interface or tap port, of any equipment or system.

3.1.18 chrominance/luminance delay inequality

The delay inequality in nanoseconds, between the luminance and chrominance (4,43 MHz) within a single PAL/SECAM television channel. The worst case channels shall be identified by frequency.

3.1.19 transfer point

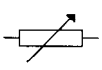
The interface between the cable distribution network and the building's internal network, each of which may be separately owned. The transfer point may contain a voltage dependent device and/or a galvanic isolator.

3.1.20 well-matched

The matching condition when the return loss of the equipment complies with the requirements of table 1.

NOTE: Through mismatching of measurement instruments and the measurement object measurement errors are possible. Comments to the estimation of such errors are given in annex C.

3.2 Symbols

Symbols	Terms	Symbols	Terms
	voltmeter		oscilloscope
	variable Generator		detector with LF-amplifier
	Device under Test		adjustable AC voltage source
	amperemeter		low pass filter
	variable attenuator		high pass filter
	ground		RF choke
	capacitor		variable resistor

3.3 Abbreviation

AC	alternating current
AM	amplitude modulation
CATV	community antenna television (system)
DC	direct current
DUT	device under test
EMC	electromagnetic compatibility
FM	frequency modulation
HP	high pass
IP Class	international protection class
LF	low frequency
LP	low pass
MATV	master antenna television (system)
Q grade(s)	Quality grade(s)
RF	radio frequency
RMS	root mean square
SMATV	satellite master antenna television (system)
TV	television

NOTE: Only the abbreviations used in the English version of this part of EN 50083 are mentioned in this subclause. The German and the French versions of this part may use other abbreviations. Refer to 3.3 of each language version for details.

4 Methods of measurement

4.1 Attenuation, isolation, through loss and amplitude frequency response

Measurement of attenuation, isolation, through loss and amplitude frequency response are well-known and shall not be duplicated here.

4.2 Return loss

Return loss measurements shall be carried out as laid down in EN 50083-3. Unused ports shall be well-matched in 75 ohms.

4.3 Hum modulation of carrier

Definition

The interference ratio for hum modulation is the ratio stated in dB between the peak-to-peak value of the unmodulated carrier and the peak-to-peak value of one of the two envelopes caused by the hum modulated to this carrier.

The hum modulation ratio (carrier/hum ratio) is shown in figure 1.