SLOVENSKI STANDARD
SIST EN 50083-4:1995

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Kabelski distribucijski sistemi za televizijsko in zvokovno radiofuzijo - 4. del: Pasivna koaksialna širokopasovna distribucijska oprema

Cabled distribution systems for television and sound signals -- Part 4: Passive coaxial wideband distribution equipment

Kabelverteilsysteme für Ton- und Fernsehrundfunk-Signale -- Teil 4: Passive Breitbandbandgeräte für koaxiale Verteilnetze

Systèmes de distribution par câble destinés aux signaux de radiodiffusion sonore et de télévision -- Partie 4: Matériels passifs utilisés dans les systèmes de distribution coaxiale à large bande

Ta slovenski standard je istoveten z: **EN 50083-4:1994**

ICS:

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

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EUROPEAN STANDARD

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EN 50083-4

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

English version

Cabled distribution systems for television and sound signals
Part 4: Passive coaxial wideband distribution equipment

Systèmes de distribution par câble destinés aux signaux de radiodiffusion sonore et de télévision
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Kabelverteilsysteme für Ton- und Fernsehrundfunk-Signale
Teil 4: Passive Breitbandgeräte für koaxiale Verteilnetze

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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

Foreword

This European Standard was prepared by CENELEC Technical Committee TC 109, Cabled distribution systems for television and sound signals. The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50083-4 on 1993-09-22.

The following dates were fixed :

- latest date of publication of an identical national standard (dop) 1994-12-01
- latest date of withdrawal of conflicting national standards (dow) 1994-12-01

For products which have complied with the relevant national standard before 1994-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 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, annexes A and B are normative and annex C is informative.

Contents

1 Scope

This standard applies to receiver leads, system outlets, splitters and subscriber taps, passive one and two port devices 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 1 750 MHz;
- identifies performance requirements for certain parameters;
- lays down data publication requirements for certain parameters;
- stipulates methods of measurement;
- 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 devices.

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 Terms and definitions

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

2.1 feeder

A transmission path forming part of a cabled distribution system. 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.

2.2 **spur feeder**

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

2.3 **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.

2.4 **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.

2.5 **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.

2.6 **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.

2.7 **subscriber tap**

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

2.8 **system outlet**

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

2.9 **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.

2.10 **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.

2.11 decibel ratio

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

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

2.12 standard reference power and voltage

In cabled systems the standard reference power, P_o, is 1/75 pW.

NOTE : This is the power dissipated in a 75 ohm resistor with a voltage drop of 1μV rms across it.

The standard reference voltage, U_o, is 1μV.

2.13 level

The level of any power P_1 is the decibel ratio of that power to the standard reference power P_o, 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_o, 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.

2.14 attenuation

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

2.15 **amplitude frequency response**

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

2.16 **isolation**

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

2.17 **directivity**

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

2.18 **chrominance/luminance delay inequality**

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

2.19 **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.

2.20 **well-matched**

The matching condition when the error introduced by the mismatch of the equipment connected to the DUT and that of the device under test (DUT) is acceptable. To calculate the maximum error, use the following formula :

$$\textit{max. measurement error of the return loss} = -20 \cdot \lg \left| 1 \pm 10^{\frac{a_r - a_m}{20}} \right|$$

NOTE : The worst case condition occurs when the return loss of the DUT and of the test equipment are equal but have opposite phase, i.e. resonance occurs.

Ripple due to mismatch

$$a_{ripple\ max.} = 40 \cdot lg\left(\frac{\left(1+10^{-\frac{a_m+a_r}{20}}\right)}{\left(1-10^{-\frac{a_m+a_r}{20}}\right)}\right) + 20 \cdot lg\left(\frac{\left(1+10^{-\frac{a_m}{20}}\right)}{\left(1-10^{-\frac{a_m}{20}}\right)}\right)$$

The first term describes the ripple due to the mismatch of the DUT at input and output, the second term gives the ripple due to mismatch between source and load with reference to Z_o.
For simplicity this formula assumes that the test object has the same return loss value, a_r, at the input and the output.
It is also assumed that the test units connected to the input and the output have the same return loss value, a_m.

a_r = DUT return loss in dB
a_m = return loss of test equipment in dB

General information :

The return loss of the test equipment should be at least 10 dB better than the expected DUT value.

3 Methods of measurement

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

3.2 Return loss measurements shall be carried out as laid down in EN50083-3. Unused ports shall be well-matched in 75 ohms.

4 Performance requirements and recommendations

4.1 Safety

The relevant safety requirements as laid down in EN 50083-1 shall be met.

4.2 Electromagnetic compatibility (EMC)

The relevant EMC requirements as laid down in EN 50083-2 shall be met.

4.3 Environmental

Manufacturers shall publish relevant environmental information on their products in accordance with the requirements of the following publications :

4.3.1 **Storage** (simulated effects of)	HD 323.2.48 S1
4.3.2 **Transportation**	
Air freight (combined cold and low pressure)	HD 323.2.40 S1
Road transport (bump test)	EN 60068-2-29
Road transport (shock test)	EN 60068-2-27
4.3.3 **Installation or maintenance**	
Topple or drop test	EN 60068-2-31
Free fall test	EN 60068-2-32
4.3.4 **Operation**	
IP Class. Protection provided by enclosures	EN 60529
Climatic category of component or equipment for storage and operation as defined in Appendix A of	HD 323.1.S2
Cold	EN 60068-2-1
Dry heat	EN 60068-2-2+A1
Damp heat	HD 323.2.30 S3
Change of temperature (test Nb)	HD 323.2.14 S2
Vibration (sinusoidal) Appendix B of	HD 323.2.6 S2

This will enable users to judge the product's suitability with regard to four main requirements: storage, transportation, installation and operation.

4.4 Marking

It is recommended that symbols in accordance with HD 571 S1 and HD 243 S10 be used when marking ports.

4.5 Impedance

The nominal impedance of all passive equipment shall be 75 ohms.