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BSI Standards Publication

Cable networks for television signals, sound signals and interactive services

Part 3-3: Active wideband equipment for cable networks — Methods of measurement of the maximum operating output level in the return path

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National foreword

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The UK participation in its preparation was entrusted by Technical Committee EPL/100, Audio, video and multimedia systems and equipment, to Subcommittee EPL/100/4, Cable distribution equipment and systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Cable networks for television signals, sound signals and interactive services - Part 3-3: Active wideband equipment for cable networks - Methods of measurement of the maximum operating output level in the return path

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 3-3: Matériel actifs à large bande utilisés dans les réseaux de distribution - Méthodes de mesure du niveau de sortie maximal de fonctionnement dans la voie de retour

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 3-3: Aktive Breitbandgeräte für Kabelnetze - Messverfahren für den maximalen Betriebs-Ausgangspegel im Rückweg

This Technical Specification was approved by CENELEC on 2014-09-30.

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Foreword

This document (CLC/TS 50083-3-3:2014) has been prepared by CLC/TC 209 “Cable networks for television signals, sound signals and interactive services”.

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Introduction

Standards and deliverables of EN 60728 series and EN 50083 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.

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1 Scope

This Technical Specification is applicable to the method of nonlinearity measurement for active cable network equipment which carry a digital channel load in the return path. The digital channel load is represented by standard DVB-C signals. The method of measurement of the maximum operating output level takes account of a full channel load in the return path frequency range although different applications of return path amplifiers with partial channel load or single channel load are also in practical use. The maximum operating output level for applications with reduced channel loads could be derived from the result with a full channel load by applying a given calculation formula.

The method considers the specific signal form and behaviour of digitally modulated signals and can be applied in the return path frequency range (5 MHz to 65 MHz) as well as in the extended return path frequency range (5 MHz to 85 MHz) according to EN 60728-10.

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.

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

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

3 Terms, definitions, symbols and abbreviations

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

3.1 Terms and definitions

3.1.1
attenuation
ratio of the input power to the output power of an equipment or system, usually expressed in decibels

3.1.2
bit error ratio
BER
ratio between erroneous bits and the total number of transmitted bits

3.1.3
gain
ratio of the output power to the input power, usually expressed in decibels

3.1.4
level
decibel ratio of any power P_1 to the standard reference power P_0, i.e

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

decibel ratio of any voltage U_1 to the standard reference voltage U_0, i.e

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

Note 1 to entry: The power level may be expressed in decibels relative to $P_0 = (U_0^2/R) = (1/75)$ pW, i.e. in dB(P_0), taking into account that the level of P_0 corresponds to 0 dB(P_0) or, as more usually, in dB(pW), taking into account that the level of P_0 corresponds to –18,75 dB(pW). The voltage level is expressed in decibels relative to 1 µV (across 75 Ω), i.e. in dB(µV).

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