SLOVENSKI STANDARD
SIST EN 50083-2-4:2020

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Kabelska omrežja za televizijske in zvokovne signale ter interaktivne storitve - 2-4. del: Filtri za dušenje motenj, ki delujejo v pasovih 700 MHz in 800 MHz, za sprejem DTT

Cable networks for television signals, sound signals and interactive services - Part 2-4: Interference Mitigation Filters operating in the 700 MHz and 800 MHz bands for DTT reception

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 2-4: Filter zur Vermeidung von Störungen in den 700 MHz- und 800 MHz-Bändern für DTT-Empfang

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 2-4: Filtres d'atténuation de brouillage fonctionnant dans les bandes 700 MHz et 800 MHz pour la réception TNT

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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European Foreword

This document (EN 50083-2-4:2019) has been prepared by CLC/TC 209 “Cable networks for television signals, sound signals and interactive services”.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2020-11-25
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2022-11-25

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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:

a) regional and local broadband cable networks;

b) extended satellite and terrestrial television distribution systems;

c) 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.

This document introduces the requirements for DTT filters[1] with stop-bands for the 700 MHz and 800 MHz bands. These filters are for use in individual and MATV antenna installations for reception of DTT signals when the 700 MHz band will be used by telecommunication services in addition to the 800 MHz band.

These requirements extend those of CLC/TS 50083-2-3 for mitigation filters for LTE services operating in the 800 MHz band only and ETSI EN 303 354 V 1.1.1 (2017-03), that deals with “Amplifiers and active antennas for TV broadcast reception in domestic premises; Harmonized standard covering the essential requirements of article 3.2 of Directive 2014/53/EU”. The ETSI document is mainly applicable to new equipment available on the market, while this document has the purpose to allow the existing individual and MATV antenna installations as well as amplifiers designed for the full spectrum of band 4 and 5 for reception of DTT signals to avoid or mitigate the interference due to the new telecommunication services when the 700 MHz band is added to the 800 MHz band already used.

[1] These DTT filters are not designed to be used for CATV networks.

1 Scope

This document provides requirements for passive filters intended to reduce RF interference from mobile Base Stations (BS) and User Equipment (UE) to receiving equipment and master antenna cable distribution systems of broadcast DVB-T and DVB-T2 signals in the VHF and UHF bands. While primarily intended to be used with VHF/UHF DVB-T and DVB-T2 receivers and signal distribution systems, filters can also be useful for mitigation of interference to VHF FM or DAB radio.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 50083-2, *Cable networks for television signals, sound signals and interactive services - Part 2: Electromagnetic compatibility for equipment*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)(IEC 60529:1989)*

EN 60728-11, *Cable networks for television signals, sound signals and interactive services — Part 11: Safety (IEC 60728-11)*

EN 61169-2, *Radio-frequency connectors - Part 2: Sectional specification - Radio frequency coaxial connectors of type 9,52 (IEC 61169 2)*

EN 61169-24, *Radio-frequency connectors - Part 24: Sectional specification - Radio frequency coaxial connectors with screw coupling, typically for use in 75 ohm cable networks (type F) (IEC 61169 24)*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
bandwidth
width of a frequency band over which a given characteristic of an equipment or transmission channel does not differ from its reference value by more than a specified amount or ratio

3.1.2
pass-band
frequency band throughout which the attenuation is less than a specified value

3.1.3
stop-band
frequency band throughout which the attenuation is greater than a specified value

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

BS	base station
DC	direct current
DTT	Digital Terrestrial Television
EMC	electromagnetic compatibility
LTE	long term evolution
MATV	master antenna television
RF	radio frequency
TV	television
UE	user equipment
UHF	ultra-high frequency
VHF	very high frequency

4 Filter characteristics

4.1 General

To comply with this specification a filter shall pass a range of frequencies (the pass-band) which includes a number of VHF and UHF TV channels and shall attenuate a range of frequencies (the stop-band). In all cases the stop-band lies above the pass-band.

4.2 Pass-band and stop-band

Pass-band (terrestrial broadcasting service):

a) the lower boundary of the pass-band shall lie between 0 Hz (DC) and 174 MHz;

b) the upper boundary of the pass-band shall lie on the upper edge of a TV channel, UHF channel N, such that the pass-band upper bound frequency is (8*N+310) MHz. The value of N shall be in the range 47 to 48.

It should be noted that a filter of the band-stop (or band-reject) type can be used to meet this specification. Where this type of filter is used, the range of frequencies lying above the defined stop-band is not considered to be part of the pass-band for the purpose of this specification.

Stop-band: shall be from 703 MHz to 960 MHz, divided in four parts:

1) **Stop-band 1**: 703 MHz to 733 MHz (User Equipment (UE))

2) **Stop-band 2**: 738 MHz to 821 MHz (Base Station (BS))

3) **Stop-band 3**: 832 MHz to 862 MHz (User Equipment (UE))

4) **Stop-band 4**: 862 MHz to 960 MHz (other services, e.g TETRA)

4.3 Types of standard filter

Three types of standard filter are defined, considering the stop-band attenuation performance, as defined below.

a) Standard 1 filter

“Professional” filter for use in large cable systems incorporating distribution amplifiers and/or where greater attenuation of interference is required in the case that channel 48 is not distributed.

b) Standard 2 filter

"Consumer" filter intended for use with a single receiver or a number of receivers fed via a passive distribution network.

c) Standard 3 filter

"Typical" filter for use in MATV systems incorporating distribution amplifiers and/or where a typical attenuation for interference mitigation is required.

4.4 Filter specifications

The nominal characteristic impedance for the filters is 75 Ω, to be used also in measurements. The main filter characteristics are specified in Table 1.

Table 1 — Filter specifications

Parameter	Requirement			Note
	Standard 1 filter	Standard 2 filter	Standard 3 filter	
Pass-band (excluding any band edge relaxation)				1
UHF channel *N*	**47**	**48**	**48**	
Insertion loss from 174 MHz to channel *N* UHF	≤ 1,5 dB	≤ 2,0 dB	≤ 1,5 dB	2a
Input/output return loss from 174 MHz to channel *N* UHF	≥ 16 dB	≥ 14 dB	≥ 16 dB	3
Maximum amplitude response variation within channel *N* UHF	4 dB	6 dB	4 dB	4
Maximum group delay variation within channel *N* UHF	250 ns	250 ns	250 ns	4
Pass-band (upper band edge [a] or other parameters optional relaxation)				
UHF channel *N*	**48**	**48**	**48**	
Insertion loss in channel *N* UHF	≤ 3,0 dB	≤ 4,0 dB	≤ 3,0 dB	2b
Input/output return loss from 174 MHz to channel *N* UHF	≥ 12 dB	≥ 10 dB	≥ 12 dB	3
Maximum amplitude response variation within channel *N* UHF	6 dB	8 dB	6 dB	4
Stop-band1 (703 MHz to 733 MHz)(UE uplink)				
Insertion loss	≥ 30 dB	≥ 15 dB	≥ 15 dB	2c
Stop-band 2 (738 MHz to 821 MHz)(BS downlink)				
Insertion loss	≥ 55 dB	≥ 25 dB	≥ 30 dB	2c
Stop-band 3 (832 MHz to 862 MHz)(LTE-UE)				
Insertion loss	≥ 30 dB	≥ 25 dB	≥ 25 dB	2c
Stop-band 4 (862 MHz to 960 MHz)(other services)				
Insertion loss above 862 MHz	≥ 30 dB	≥ 25 dB	≥ 25 dB	2c