



SLOVENSKI STANDARD

SIST-TS CLC/TS 50083-2-3:2019

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Kabelska omrežja za televizijske signale, zvokovne signale in interaktivne storitve - 2-3. del: Filter LTE (4G) za preprečevanje motenj

Cable networks for television signals, sound Signals and interactive services - Part 2-3:
LTE (4G) Interference Mitigation Filters

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 2-3: LTE (4G)
Filter zur Vermeidung von Störungen

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion
sonore et services interactifs - Partie 2-3 : Filtres d'atténuation du brouillage pour les
réseaux LTE (4G)

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**Cable networks for television signals, sound Signals and
interactive services - Part 2-3: LTE (4G) Interference Mitigation
Filters**

Réseaux de distribution par câbles pour signaux de
télévision, signaux de radiodiffusion sonore et services
interactifs - Partie 2-3 : Filtres d'atténuation du brouillage
pour les réseaux LTE (4G)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive
Dienste - Teil 2-3: LTE (4G) Filter zur Vermeidung von
Störungen

This Technical Specification was approved by CENELEC on 2017-12-25.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	3
Introduction	4
1 Scope	5
2 Normative references.....	5
3 Terms, definitions and abbreviations	5
3.1 Terms and definitions	5
3.2 Abbreviations	6
4 LTE Filter Characteristics.....	6
4.1 General	6
4.2 Pass-band and stop-band of a LTE filter (800 MHz band).....	6
4.3 Types of standard for a LTE filter	7
4.4 LTE filter specifications	7
4.5 Connections, EMC, environmental and other factors.....	8
4.5.1 Connections	8
4.5.2 EMC – Screening effectiveness.....	8
4.5.3 DC and 50 Hz line power considerations.....	8
4.5.4 Climate and operating temperature range	8
4.5.5 Drop test.....	9
4.5.6 Fixings.....	9
4.6 Information to be supplied by the manufacturer or responsible vendor	9
Annex A (informative) Signal protection from LTE signals	10
A.1 Frequency allocation of LTE signals in the 800 MHz band	10
A.2 LTE-UE field strength in the 800 MHz band	10
A.3 LTE-BS field strength in the 800 MHz band	11

European foreword

This document (CLC/TS 50083-2-3:2018) has been prepared by CLC/TC 209 “Cable networks for television signals, sound signals and interactive services”.

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CLC/TS 50083-2-3:2018 (E)**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.

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1 Scope

This Technical Specification provides requirements to passive filters intended to reduce RF interference from LTE Base Stations (LTE-BS) and LTE User Equipment (LTE-UE) to receiving equipment and 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 50083-2:2012, *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)*

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3 Terms, definitions and abbreviations

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3.1 Terms and definitions [bd40-5146f0560ed1/sist-ts-clc-ts-50083-2-3-2019](https://standards.iteh.ai/catalog/standards/sist/14503570-e973-4839-bd40-5146f0560ed1/sist-ts-clc-ts-50083-2-3-2019)

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

CLC/TS 50083-2-3:2018 (E)

3.2 Abbreviations

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

BS	Base Station
DC	direct current
EMC	electromagnetic compatibility
LTE	long term evolution
RF	radio frequency
MATV	Master Antenna Television
TV	television
UHF	ultra high frequency
UE	user equipment
VHF	very high frequency

4 LTE 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 LTE frequencies (the stop-band). In all cases the stop-band lies above the pass-band.

4.2 Pass-band and stop-band of a LTE filter (800 MHz band)

Pass-band (terrestrial broadcasting service):

- the lower boundary of the pass-band shall lie between 0 Hz (DC) and 174 MHz;
- 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 58 to 60.

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.

NOTE 1 What the filter does above 862 MHz might be advantageous and could offer some roll-off in the 900 MHz mobile spectrum, but this is outside the scope of this specification.

Stop-band: shall be from 791 MHz to 862 MHz, divided in two parts:

- Stop-band 1**: 791 MHz to 821 MHz (LTE Base Station (LTE-BS))
- Stop-band 2**: 832 MHz to 862 MHz (LTE User Equipment (LTE-UE))

NOTE 2 It is intended to add an extended stop-band option in a future revision of this specification, allowing the option to cover the proposed 700 MHz LTE band once the extent of that band is agreed.

4.3 Types of standard for a LTE filter

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

a) Standard 1 LTE filter

“Professional” filter for use in large cable systems incorporating distribution amplifiers and/or where greater attenuation of LTE interference is required in the case that channel 60 is not distributed.

b) Standard 2 LTE filter

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

c) Standard 3 LTE filter

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

4.4 LTE filter specifications

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

Table 1 — LTE filter specifications

Parameter	Requirement			Note
	Standard 1 filter	Standard 2 filter	Standard 3 filter	
Pass-band (excluding any band edge relaxation)				1
UHF channel <i>N</i>	58	59	59	
Insertion loss	≤ 1,5 dB	≤ 2,0 dB	≤ 1,5 dB	2
Input/output return loss	≥ 16 dB	≥ 14 dB	≥ 16 dB	3
Maximum amplitude response variation within channel <i>N</i> UHF	4 dB	6 dB	4 dB	4
Maximum group delay variation within channel <i>N</i> UHF	50 ns	50 ns	50 ns	4
Pass-band (optional band edge relaxation) ^a				
UHF channel <i>N</i>	59	60	60	
Insertion loss	≤ 4,0 dB	≤ 5,0 dB	≤ 4,0 dB	2
Input/output return loss	≥ 12 dB	≥ 10 dB	≥ 12 dB	3
Maximum amplitude response variation within channel <i>N</i> UHF	6 dB	8 dB	6 dB	4
Maximum group delay variation within channel <i>N</i> UHF	250 ns	250 ns	250 ns	4
Stop-band1 (791 MHz to 821 MHz)(LTE-BS)				
Insertion loss	≥ 55 dB	≥ 25 dB	≥ 30 dB	2
Stop-band2 (832 MHz to 862 MHz)(LTE-UE)				
Insertion loss	≥ 30 dB	≥ 15 dB	≥ 15 dB	2