TECHNICAL REPORT

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English Version

Cable networks for television signals, sound signals and interactive services - Part 2-2: Interference issues for DVB-T reception in the presence of LTE base station signals

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 2-2: Problèmes de perturbations concernant la réception de signaux DVB-T en présence de signaux émis par les stations de base LTE

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 2-2: Störaspekte für den DVB-T-Empfang unter Einwirkung von LTE-Basisstations-Signalen

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

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Foreword

This document (CLC/TR 50083-2-2:2014) has been prepared by CLC/TC 209 “Cable networks for television signals, sound signals and interactive services”.

This document is currently submitted to voting in accordance with the Internal Regulations, Part 2, Subclause 11.4.3.3 (simple majority) for acceptance as a CENELEC Technical Report.

1 Scope

1.1 General

Standards and deliverables of EN 50083 (all parts) and EN 60728 (all parts) 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.

For instance, this includes

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.

1.2 Specific scope of CLC/TR 50083-2-2

The radiated fields produced by LTE Base Stations (LTE-BS) need special and careful attention when received by individual or community antenna television systems because of high level signals injected at the input port of wideband amplifiers placed on the antenna mast or in the headend. These high level disturbing signals in the 800 MHz band are able to cause interference problems by producing overload and/or strong intermodulation products in wide band amplifiers and to disturb or even prevent the reception of digital television signals (DVB-T) broadcast in VHF/UHF bands.

This interference problem, in a frequency band previously assigned to terrestrial television broadcasting and now to broadband telecommunication services, can be avoided or reduced both with an appropriate suitable screening efficiency of cable network and equipment and by using an appropriate and suitable filter (LTE filter) to attenuate the 800 MHz band signals received by the television antenna system and injected (conducted interference) at the input port of wideband amplifiers.

Some examples of EMC requirements relating to LTE-BS disturbing signals are described (see Clause 7) and the main characteristics of a typical LTE filter (see Clause 8) are indicated.

These additional EMC requirements for cable networks and equipment, resulting from the assignment of the 800 MHz band to LTE services, are based on:

a) the expected field strengths in the 800 MHz band due to both LTE User Equipment (LTE-UE) and LTE Base Station (LTE-BS), considered as disturbing signals;

b) the field strengths planned for terrestrial television broadcasting in the UHF band, up to 790 MHz (e.g. ch. 60),

c) the required protection of television signals with respect to both LTE-UE and LTE-BS disturbing fields.

Both LTE-BS disturbing effects and LTE-UE disturbance effects and protection requirements are therefore considered in this technical report.

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

IEC 60050-161, *International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility*

CEPT Report 30:2009, *The identification of common and minimal (least restrictive) technical conditions for 790 - 862 MHz for the digital dividend in the European Union*

3 Term, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-161 and the following apply.

3.1.1
CATV network
originally defined as Community Antenna Television network; now covering regional and local broadband cable networks, designed to provide sound and television signals as well as signals for interactive services to a regional or local area

3.1.2
electromagnetic-active equipment
all passive and active equipment carrying RF signals is considered as electromagnetic-active equipment because it is liable to cause electromagnetic disturbances or the performance of them and is liable to be affected by such disturbances

3.1.3
extended satellite television distribution networks or systems
distribution networks or systems designed to provide sound and television signals received by satellite receiving antenna to households in one or more buildings

Note 1 to entry: This kind of network or system could eventually be combined with terrestrial antennas for the additional reception of TV and/or radio signals via terrestrial networks.

Note 2 to entry: This kind of network or system could also carry control signals for satellite switched systems or other signals for special transmission systems (e.g. MoCA or WiFi) in the return path direction.

3.1.4
extended terrestrial television distribution networks or systems
distribution networks or systems designed to provide sound and television signals received by terrestrial receiving antenna to households in one or more buildings

Note 1 to entry: This kind of network or system could eventually be combined with a satellite antenna for the additional reception of TV and/or radio signals via satellite networks.

Note 2 to entry: This kind of network or system could also carry other signals for special transmission systems (e.g. MoCA or WiFi) in the return path direction.