

# INTERNATIONAL STANDARD

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





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Part 2: Electromagnetic compatibility for equipment**

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## CONTENTS

CONTENTS .....	2
FOREWORD .....	5
INTRODUCTION .....	7
1 Scope .....	8
2 Normative references .....	10
3 Terms, definitions, symbols and abbreviated terms .....	10
3.1 Terms and definitions .....	10
3.2 Symbols .....	16
3.3 Abbreviated terms .....	17
4 Methods of measurements .....	17
4.1 General operating conditions .....	17
4.2 Disturbance voltages from equipment .....	18
4.2.1 Disturbance voltages from equipment in the frequency range from 150 kHz to 30 MHz .....	18
4.2.2 Disturbance voltages from equipment at the AC mains frequency and its harmonics .....	18
4.2.3 Measurement of input terminal disturbance voltage .....	19
4.3 Radiation from active equipment .....	19
4.3.1 General .....	19
4.3.2 General measurement requirements .....	19
4.3.3 Methods of measurements .....	20
4.4 Immunity of active equipment .....	29
4.4.1 General .....	29
4.4.2 Performance criterion .....	29
4.4.3 Measurement of the external immunity to ambient fields .....	30
4.4.4 Internal immunity (immunity to unwanted signals) .....	36
4.5 Screening effectiveness of passive equipment .....	42
4.5.1 General .....	42
4.5.2 General measurement requirements .....	42
4.5.3 Methods of measurements .....	42
4.6 Electrostatic discharge immunity test for active equipment .....	44
4.6.1 General .....	44
4.6.2 Performance criterion B (according to IEC 61000-6-1:2016) .....	44
4.7 Electrical fast transient/burst immunity test for AC power ports .....	44
4.8 Methods of measurement for telecom signal ports of multimedia network equipment .....	44
4.9 Measurement of indoor receiving antennas for broadcast signals .....	44
4.9.1 Indoor antennas with additional RF network input port .....	44
4.9.2 Indoor antennas without additional RF network input port .....	45
5 Performance requirements .....	45
5.1 General .....	45
5.1.1 Emission performance requirements .....	45
5.1.2 Immunity performance requirements .....	45
5.2 Disturbance voltages from equipment .....	45
5.2.1 Limits of mains terminal disturbance voltage .....	45
5.2.2 Limits of input terminal disturbance voltages .....	45
5.3 Radiation .....	46

5.3.1	Radiation from active equipment .....	46
5.3.2	Local oscillator power at the outdoor unit input .....	46
5.4	Immunity of active equipment .....	47
5.4.1	External immunity to electromagnetic fields .....	47
5.4.2	Internal immunity .....	47
5.4.3	Immunity of outdoor units to image frequency signals .....	51
5.5	Screening effectiveness of passive equipment.....	52
5.6	Electrostatic discharge immunity test for active equipment.....	52
5.7	Electrical fast transient/burst immunity test for AC power ports .....	52
5.8	Performance requirements for telecom signal ports of multimedia network equipment .....	53
5.9	Applicability of EMC performance requirements and methods of measurement to different types of equipment .....	53
	Bibliography .....	56
	Figure 1 – Measurement set-up for radiation measurements in the frequency range 5 MHz to 30 MHz using the "coupling unit" method .....	21
	Figure 2 – Absorbing clamp method (30 MHz to 1 000 MHz) .....	23
	Figure 3 – Example of general measurement set-up .....	24
	Figure 4 – Example of measurement set-up for measurements on the input port of active equipment.....	25
	Figure 5 – Measurement set-up for the "substitution" radiation method – First measurement step .....	27
	Figure 6 – Measurement set-up for the "substitution" radiation method – Second measurement step .....	28
	Figure 7 – Frequency allocation for out-of-band immunity measurement of active equipment in the frequency range $\leq 1\,000$ MHz .....	31
	Figure 8 – Frequency allocation for out-of-band immunity measurement of active equipment in the frequency range $\geq 950$ MHz .....	31
	Figure 9 – Frequency allocation for in-band immunity measurement of active equipment in the frequency range $\leq 1\,000$ MHz .....	34
	Figure 10 – Frequency allocation for in-band immunity measurement of active equipment in the frequency range $\geq 950$ MHz .....	35
	Figure 11 – Measurement set-up for internal immunity test .....	37
	Figure 12 – Levels of wanted and unwanted signals for the internal immunity of FSS receiving outdoor units .....	40
	Figure 13 – Levels of wanted and unwanted signals for the internal immunity of BSS receiving outdoor units .....	41
	Figure 14 – Levels of unwanted signals for the internal immunity of active equipment in Band I (47 MHz to 68 MHz) .....	48
	Figure 15 – Levels of unwanted signals for the internal immunity of active equipment in Band II (87,5 MHz to 108 MHz).....	49
	Figure 16 – Levels of unwanted signals for the internal immunity of active equipment in Band III (174 MHz to 230 MHz).....	50
	Figure 17 – Levels of unwanted signals for the internal immunity of active equipment in Band IV/V (470 MHz to 862 MHz) .....	51
	Table 1 – Port structure of different network equipment .....	9
	Table 2 – Limits of mains terminal disturbance voltage .....	45

Table 3 – Limits of input terminal disturbance voltages for equipment directly connected to receiving antennas .....	46
Table 4 – Limits of input terminal disturbance voltages for equipment directly connected to satellite outdoor units .....	46
Table 5 – Limits of radiated disturbance power .....	46
Table 6 – Limit of local oscillator terminal power .....	47
Table 7 – Limits of out-of-band immunity .....	47
Table 8 – Limits of in-band immunity .....	47
Table 9 – Test specification for internal immunity.....	48
Table 10 – Limits of immunity to image frequency signals in terms of image suppression ratio.....	51
Table 11 – Limits of screening effectiveness of passive equipment within the nominal frequency ranges .....	52
Table 12 – Test specifications for electrostatic discharge immunity test for active equipment.....	52
Table 13 – Test specifications for electrical fast transient/burst immunity test .....	53
Table 14 – Port types and environmental conditions for EMC performance requirements and methods of measurement .....	53
Table 15– Emission parameters .....	54
Table 16 – Immunity and screening effectiveness parameters.....	55

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS  
AND INTERACTIVE SERVICES –****Part 2: Electromagnetic compatibility for equipment**

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This International Standard IEC 60728-2 has been prepared by technical area 5: Cable networks for television signals, sound signals and interactive services, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Frequency extensions
  - 1) The upper frequency limit of conventional cable network equipment was extended from 862 MHz to 1 000 MHz due to market demands.
  - 2) The first intermediate frequency range (1st IF range) for satellite signal transmission was extended to cover now frequencies from 950 MHz up to 3 500 MHz.

- 3) The methods of measurement and the EMC requirements in the overlapping frequency range from 950 MHz to 1 000 MHz were allocated in relation to the upper frequency limit, 1 000 MHz, and the lower frequency limit, 950 MHz, of the relevant equipment under test.

b) New EMC environment in the 800 MHz band

- 1) The European Commission has requested CENELEC and ETSI to draft immunity requirements for equipment, to protect against disturbance from the new wireless service in the 790 MHz to 862 MHz band.

NOTE The lower frequency has been reconsidered in this document, as new frequency bands are allocated for wireless services starting from 694 MHz.

- 2) A CENELEC/ETSI Joint Working Group “Digital Dividend” was formed to describe the new EMC environment and to advise on appropriate test methods and limits.
- 3) IEC 60728-2 is the document specifying immunity requirements for active and passive cable network equipment.
- 4) The method of measurement and the requirements for in-band immunity were extended taking into account this new EMC environment due to the allocation of broadband wireless services in the frequency band 694 MHz to 862 MHz. As a consequence, the limits of in-band immunity were specified for analogue and additionally for digital signals in this frequency range.
- 5) Consequently it is recommended, that, where cable networks and wireless networks coexist, only the transmission of digitally modulated signals should be used in the frequency range 694 MHz to 862 MHz.
- 6) For passive equipment, Class A and Class B specifications were kept in the standard but a note was added recommending that only Class A equipment should be used in the planning and implementation of new networks.

c) Indoor antennas

- 1) The methods of measurement for all kinds of indoor antennas were combined in the new 4.9.

d) Bibliography

- 1) A Bibliography has been added at the end of the document referencing, for example, CEPT Report 30 on “The identification of common and minimal (least restrictive) technical conditions for 790-862 MHz for the digital dividend in the European Union”.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2715/CDV	100/2859A/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.



## INTRODUCTION

Standards and deliverables of the IEC 60728 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 interfaces to the headend or other interface points to the network up to any terminal interface 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.

# CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

## Part 2: Electromagnetic compatibility for equipment

### 1 Scope

This part of IEC 60728:

- applies to the radiation characteristics and immunity to electromagnetic disturbance of EM-active equipment (active and passive equipment) for the reception, processing and distribution of television, sound and interactive multimedia signals as dealt with in the following parts of IEC 60728 series:
  - IEC 60728-3, *Active wideband equipment for cable networks*;
  - IEC 60728-4, *Passive wideband equipment for coaxial cable networks*;
  - IEC 60728-5, *Headend equipment*;
  - IEC 60728-6, *Optical equipment*;
- covers the following frequency ranges:
 

disturbance voltage injected into the mains	150 kHz to 30 MHz;
radiation from active equipment	5 MHz to 25 GHz;
immunity of active equipment	150 kHz to 25 GHz <sup>1)</sup> ;
screening effectiveness of passive equipment	5 MHz to 3,5 GHz (25 GHz) <sup>2)</sup> ;
- specifies requirements for maximum allowed radiation, minimum immunity and minimum screening effectiveness;
- describes test methods for conformance testing.

No measurement needs to be performed at frequencies where no requirement is specified.

Due to the fact that cable networks, the former cabled distribution systems for television and sound signals, are more and more used for interactive services, these networks also incorporate equipment that carries, besides the cable network equipment ports, also one or more telecom signal port(s). This equipment is called "multimedia network equipment".

The EMC behaviour of cable network equipment, telecommunication network equipment and multimedia network equipment can be described by the port structure given in Table 1:

1) For "inband immunity of active equipment" and "out-of-band immunity of active equipment", no requirements apply at present for the frequency range 3,5 GHz to 25 GHz. Methods of measurement and limits are investigated for inclusion in a future amendment or revised edition.

2) For "screening effectiveness of passive equipment", no requirements apply at present for the frequency range 3,5 GHz to 25 GHz. Methods of measurement and limits are being investigated for inclusion in a future amendment or revised edition.