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Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/19

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English Version

**Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus (CISPR 16-1-1:2019)**

Spécification des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Partie 1-1: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Appareils de mesure (CISPR 16-1-1:2019)

Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Teil 1-1: Geräte und Einrichtungen zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Messgeräte (CISPR 16-1-1:2019)

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Europäisches Komitee für Elektrotechnische Normung

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

**EN IEC 55016-1-1:2019 (E)****European foreword**

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

CISPR 15:2018	NOTE	Harmonized as EN 55015:2018 <sup>1</sup> (not modified)
CISPR 25:2016	NOTE	Harmonized as EN 55025:2017 (not modified)
CISPR 32:2015	NOTE	Harmonized as EN 55032:2015 (not modified)
CISPR 16-2 (series)	NOTE	Harmonized as EN 55016-2-4 (series)

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<sup>1</sup> Under preparation. Stage at the time of publication: FprEN 55015:2018

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
+ A1	2016		+ A1	2017
+ A2	2019		-	-
CISPR 14-1	2016	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	EN 55014-1	2017
CISPR 16-2-1	2014	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements	EN 55016-2-1	2014
CISPR 16-2-2	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-2: Methods of measurement of disturbances and immunity - Measurement of disturbance power	EN 55016-2-2	2011
CISPR 16-2-3	-	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements	EN 55016-2-3	-
CISPR/TR 16-3:2010	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 3: CISPR technical reports	-	-
+ A1	2012		-	-
+ A2	2015		-	-
IEC 60050-161	1990	International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility	-	-



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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE  
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

BASIC EMC PUBLICATION  
PUBLICATION FONDAMENTALE EN CEM

**Specification for radio disturbance and immunity measuring apparatus and methods –  
Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus**

**Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques –  
Partie 1-1: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Appareils de mesure**



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## CONTENTS

FOREWORD.....	7
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references .....	11
3 Terms and definitions .....	12
4 Fundamental characteristics of a measuring receiver.....	16
4.1 General.....	16
4.2 Input impedance .....	17
4.3 Sine-wave voltage-tolerance .....	17
4.4 Overall pass-band selectivity .....	17
4.5 Bandwidth.....	19
4.6 Frequency tuning-tolerance.....	20
4.7 Intermediate frequency rejection ratio .....	20
4.8 Image frequency rejection ratio .....	20
4.9 Other spurious responses .....	20
4.10 Limitation of intermodulation effects.....	21
4.11 Limitations of receiver noise and internally-generated spurious signals.....	22
4.11.1 Random noise .....	22
4.11.2 Continuous wave .....	22
4.12 Limitation of radio-frequency emissions from the measuring receiver .....	22
4.12.1 Conducted emissions.....	22
4.12.2 Radiated emissions .....	22
4.13 Facilities for connection to a discontinuous disturbance analyzer .....	23
5 Quasi-peak measuring receivers for the frequency range 9 kHz to 1 000 MHz .....	23
5.1 General.....	23
5.2 Response to pulses .....	23
5.2.1 Amplitude relationship (absolute calibration).....	23
5.2.2 Variation with repetition frequency (relative calibration) .....	23
6 Measuring receivers with peak detector for the frequency range 9 kHz to 18 GHz .....	27
6.1 General.....	27
6.2 Charge and discharge time constants ratio .....	27
6.3 Overload factor .....	28
6.4 Response to pulses .....	28
7 Measuring receivers with average detector for the frequency range 9 kHz to 18 GHz .....	28
7.1 General.....	28
7.2 Overload factor .....	29
7.3 Response to pulses .....	29
7.3.1 Amplitude relationship .....	29
7.3.2 Variation with repetition frequency.....	30
7.3.3 Response to intermittent, unsteady and drifting narrowband disturbances .....	30
8 Measuring receivers with RMS-average detector for the frequency range 9 kHz to 18 GHz .....	32
8.1 General.....	32
8.2 Overload factor .....	32



8.3	Response to pulses .....	32
8.3.1	Construction details .....	32
8.3.2	Amplitude relationship .....	33
8.3.3	Variation with repetition frequency .....	33
8.3.4	Response to intermittent, unsteady and drifting narrowband disturbances .....	34
9	Measuring receivers for the frequency range 1 GHz to 18 GHz with amplitude probability distribution (APD) measuring function .....	34
10	Discontinuous disturbance analyzers .....	35
10.1	General .....	35
10.2	Fundamental characteristics .....	36
10.3	Test method for the validation of the performance check for the click analyzer .....	43
10.3.1	Basic requirements .....	43
10.3.2	Additional requirements .....	44
Annex A (normative) Determination of response to repeated pulses of quasi-peak and RMS-average measuring receivers (see 3.6, 5.2.2, 8.2 and 8.3) .....		45
A.1	General .....	45
A.2	Response of the pre-detector stages .....	45
A.3	Response of the quasi-peak detector to the output of preceding stages .....	47
A.3.1	General .....	47
A.3.2	Response of the indicating instrument to the signal from the detector .....	48
A.4	Response of the RMS detector to the output voltage of preceding stages .....	49
A.4.1	Output voltage and amplitude relationship .....	49
A.4.2	Calculation of overload factor .....	50
A.5	Relationship between the indication of the RMS meter and the quasi-peak meter .....	50
Annex B (normative) Determination of pulse generator spectrum (See 5.2, 6.4, 7.2, 8.3) .....		52
B.1	Pulse generator .....	52
B.1.1	General .....	52
B.1.2	The spectrum of the generated pulses .....	52
B.2	General method of measurement .....	52
Annex C (normative) Accurate measurements of the output of nanosecond pulse generators (see 5.2, 6.4, 7.2, 8.3) .....		54
C.1	Measurement of impulse area ( $A_{imp}$ ) .....	54
C.1.1	General .....	54
C.1.2	Area method .....	54
C.1.3	Standard transmission line method .....	54
C.1.4	Harmonic measurement .....	55
C.1.5	Energy method .....	55
C.2	Pulse generator spectrum .....	55
Annex D (normative) Influence of the quasi-peak measuring receiver characteristics on its pulse response (see 5.2.2) .....		56
Annex E (normative) Response of average and peak measuring receivers (see 4.5) .....		57
E.1	Response of pre-detector stages .....	57
E.2	Overload factor .....	57
E.3	Relationship between the indication of an average and a quasi-peak measuring receiver .....	58
E.4	Peak measuring receivers .....	59

E.5	Relationship between indication of a peak and a quasi-peak measuring receiver .....	59
E.6	Test of measuring receiver response above 1 GHz to pulses .....	60
E.7	Measurement of the impulse bandwidth of a measuring receiver .....	62
E.7.1	General .....	62
E.7.2	Method 1: Measurement by comparison of the responses of $B_{imp}$ to two pulses with identical amplitude and width with low and high pulse repetition frequencies (PRF) .....	62
E.7.3	Method 2: Measurement by comparison of the response of $B_{imp}$ to an impulsive signal with the response of a narrow bandwidth to the same signal .....	64
E.7.4	Method 3: Integration of the normalized linear selectivity function .....	64
Annex F (normative)	Performance check of the exceptions from the definitions of a click according to 5.4.3 of CISPR 14-1:2016 .....	66
Annex G (informative)	Rationale for the specifications of the APD measuring function .....	73
Annex H (informative)	Characteristics of a quasi-peak measuring receiver .....	76
Annex I (informative)	Example of EMI receiver and swept spectrum analyzer architecture .....	77
Annex J (normative)	Requirements when using an external preamplifier with a measuring receiver .....	79
J.1	General .....	79
J.2	Considerations for optimum emission measurement system design .....	79
J.3	Linearity specifications and precautions in measurement .....	82
J.4	Detecting the overload of an external preamplifier in a wideband FFT-based measuring system .....	89
Annex K (normative)	Calibration requirements for measuring receivers .....	90
K.1	General .....	90
K.2	Calibration and verification .....	90
K.3	Calibration and verification specifics .....	90
K.4	Measuring receiver specifics .....	91
K.4.1	General .....	91
K.4.2	Demonstration of compliance with CISPR 16-1-1 .....	92
K.5	Partial calibration of measuring receivers .....	92
K.6	Determination of compliance of a measuring receiver with applicable specifications .....	93
Annex L (normative)	Verification of the RF pulse amplitude (See 7.3.1, 8.3.2) .....	94
Bibliography	.....	95
Figure 1	– Limits of overall selectivity – Pass-band (Band A) .....	18
Figure 2	– Limits of overall selectivity – Pass-band (Band B) .....	18
Figure 3	– Limits of overall selectivity – Pass-band (Bands C and D) .....	19
Figure 4	– Limits for the overall selectivity – Pass-band (Band E) .....	19
Figure 5	– Arrangement for testing intermodulation effects .....	22
Figure 6	– Pulse response curve (Band A) .....	24
Figure 7	– Pulse response curve (Band B) .....	25
Figure 8	– Pulse response curve (Bands C and D) .....	25
Figure 9	– Theoretical pulse response curve of quasi-peak detector receivers and average detector receiver .....	26
Figure 10	– Block diagram of an average detector .....	31

Figure 11 – Screenshot showing the response of the meter-simulating network to an intermittent narrowband signal .....	31
Figure 12 – Example of a disturbance analyzer .....	38
Figure 13 – Graphical presentation of test signals used in the test of the analyzer for the performance checks against the definition of a click according to Table 14 .....	39
Figure E.1 – Correction factor for estimating the ratio $B_{imp}/B_6$ for other tuned circuits.....	58
Figure E.2 – Pulse rectification coefficient $P$ .....	60
Figure E.3 – Example (spectrum screenshot) of a pulse-modulated signal with a pulse width of 200 ns .....	61
Figure E.4 – Pulse-modulated RF signal applied to a measuring receiver .....	63
Figure E.5 – Filtering with a $B_{imp}$ much smaller than the PRF .....	63
Figure E.6 – Filtering with a $B_{imp}$ much wider than the PRF .....	63
Figure E.7 – Calculation of the impulse bandwidth .....	64
Figure E.8 – Example of a normalized linear selectivity function .....	65
Figure F.1 – Graphical presentation of the test signals used for the performance checks of the analyzer with the additional requirements according to Table F.1 .....	72
Figure G.1 – Block diagram of APD measurement circuit without A/D converter .....	74
Figure G.2 – Block diagram of APD measurement circuit with A/D converter.....	74
Figure G.3 – Example of display of APD measurement results versus equipment-under-test (EUT) state .....	75
Figure I.1 – Example of block diagram of an EMI receiver consisting of a swept spectrum analyzer with added preselector, preamplifier and quasi-peak/average detector .....	77
Figure J.1 – Receiver with preamplifier .....	81
Figure J.2 – Example of the transfer function of an amplifier .....	83
Figure J.3 – Response of the amplifier of Figure J.2 for a sinusoidal signal .....	83
Figure J.4 – Response of the amplifier of Figure J.2 for an impulse .....	83
Figure J.5 – Deviation from linear gain for an unmodulated sine-wave (example).....	84
Figure J.6 – Deviation from linear gain for a broadband impulsive signal as measured with the quasi-peak detector (example).....	85
Figure J.7 – Screenshot of a band-stop filter test for a preamplifier at around 818 MHz .....	86
Figure J.8 – Band-stop filter test result with the measuring receiver at 818 MHz .....	86
Figure J.9 – Band-stop filter test results for the same 10 dB preamplifier but a different receiver with preselection (black) and without preselection (blue) .....	87
Figure J.10 – Band-stop filter test results for the same 10 dB preamplifier but with the receiver of Figure J.9 with preselection (black) and without preselection (green) .....	87
Figure J.11 – Weighting functions of the various CISPR detectors with a noise curve to illustrate the remaining operating ranges for broadband impulsive signals (example).....	88
Figure K.1 – Compliance determination process with application of measurement uncertainty.....	93
Table 1 – VSWR requirements for receiver input impedance .....	17
Table 2 – Combined selectivity of CISPR measuring receiver and high-pass filter.....	17
Table 3 – Bandwidth requirements for measuring receivers .....	20
Table 4 – Bandwidth characteristics for intermodulation test of quasi-peak measuring receivers.....	21
Table 5 – Test pulse characteristics for quasi-peak measuring receivers .....	23

Table 6 – Pulse response of quasi-peak measuring receivers .....	27
Table 7 – Relative pulse response of peak and quasi-peak measuring receivers for the same bandwidth (frequency range 9 kHz to 1 000 MHz).....	28
Table 8 – Specification of pulse-modulated carrier (e.m.f.).....	30
Table 9 – Maximum reading of average measuring receivers for a pulse-modulated sine-wave input in comparison with the response to a continuous sine-wave having the same amplitude.....	31
Table 10 – Minimum pulse repetition rate without overload .....	32
Table 11 – Specification of pulse-modulated carrier (e.m.f.) for testing RMS-average detectors .....	33
Table 12 – Pulse response of the RMS-average measuring receiver .....	34
Table 13 – Maximum reading of RMS-average measuring receivers for a pulse-modulated sine-wave input in comparison with the response to a continuous sine-wave having the same amplitude .....	34
Table 14 – Disturbance analyzer performance test – Test signals used for the check against the definition of a click.....	40
Table E.1 – $B_{imp}$ and $A_{imp}$ values for a peak measuring receiver .....	60
Table E.2 – Carrier level for pulse-modulated signal of 1,4 nVs .....	61
Table F.1 – Disturbance analyzer test signals.....	67
Table H.1 – Characteristics of quasi-peak measuring receivers .....	76
Table J.1 – Examples of preamplifier and measuring receiver data and resulting system noise figures .....	82
Table K.1 – Verification parameter summary.....	92

INTERNATIONAL ELECTROTECHNICAL COMMISSION  
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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**SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY  
MEASURING APPARATUS AND METHODS –**

**Part 1-1: Radio disturbance and immunity measuring apparatus –  
Measuring apparatus**

FOREWORD

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International Standard CISPR 16-1-1 has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods.

This fifth edition cancels and replaces the fourth edition published in 2015. This edition constitutes a technical revision.

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

- a) Reorganization of the document structure to remove common elements of receiver performance from Clauses 4, 5, 6, and 7 and create a new clause that applies across all of these clauses. Key common parameters include:

- 1) Input impedance
  - 2) CW amplitude accuracy
  - 3) Limitations of intermodulation effects
  - 4) Limitation of receiver noise and internally generated spurious signals
- b) Rewording of Subclause B.1.1 for the purpose of correcting existing errors
  - c) Amendments to Subclause 7.5.2 to modify the definition of the test signal to be used for calibrating and verifying the required RMS-average detector response to pulses of the receiver. This section will include a note requiring that the amplitude of the pulsed signal be verified prior to the calibration, and will include several verification methods.
  - d) Amendments to Subclause 6.5.2 to modify the definition of the test signal to be used for calibrating and verifying the required average detector response to pulses. The purpose of this proposed change is the alignment of the test signal type with that of the newly proposed signal used to verify the RMS-average detector, allowing the use of a pulsed RF signal. This section will include a note requiring that the amplitude of the pulsed signal be verified prior to the calibration and will include several verification methods.
  - e) Implementation and use of Gaussian filters
  - f) Amendments to Clause 9 on discontinuous disturbance analyzers (DDAs) to allow the use of measuring receivers with built-in DDAs, to clarify which signal is used for click time parameter determination and to allow the use of FFT-based measuring instruments with internal DDAs.
  - g) Amendments to Subclauses 4.2, 5.2, 6.2 and 7.2 to remove the mention of a symmetric input for measuring receivers.
  - h) Deletion of Subclause 4.8.1 “Screening Effectiveness”.
  - i) add a frequency accuracy specification to the proposed reorganized clause mentioned in a) above.
  - j) Amend Subclause 6.5.3 to adjust the allowable tolerance for the variation with repetition frequency for the linear average detector.
  - k) Add interpretation information to Clause K.4 based on CISPR-A-1188-INF.
  - l) Indicate that the 31,6 Hz pulse repetition frequency for the RMS-Average test requirement for Bands C and D in Table 15 is optional. For the RMS-Average overload requirement in Table 13, change the minimum pulse repetition frequency to 100 Hz and the associated Peak to RMS-Average ratio to 30,6 dB.
  - m) Improve the phrasing used for the tolerance statements in Subclauses 4.4.1, 5.5, 6.5.2, 6.5.3, 6.5.4 and 7.5.2.
  - n) Remove a note from Clause E1.
  - o) Add a reference for FFT-based discontinuous disturbance analyzers

It has the status of a basic EMC publication in accordance with IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*.

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

FDIS	Report on voting
CIS/A/1290/FDIS	CIS/A/1295/RVD

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.

A list of all parts in the CISPR 16 series, published under the general title *Specification for radio disturbance and immunity measuring apparatus and methods*, can be found on the IEC website.

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.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

The CISPR 16 series, published under the general title *Specification for radio disturbance and immunity measuring apparatus and methods*, is comprised of the following sets of documents:

- CISPR 16-1 – six parts covering measurement instrumentation specifications;
- CISPR 16-2 – five parts covering methods of measurement;
- CISPR TR 16-3 – a single publication containing various technical reports (TRs) with further information and background on CISPR and radio disturbances in general;
- CISPR 16-4 – five parts covering uncertainties, statistics and limit modelling.

CISPR 16-1 consists of the following parts, under the general title *Specification for radio disturbance and immunity measuring apparatus and methods – Radio disturbance and immunity measuring apparatus*:

- Part 1-1: Measuring apparatus
- Part 1-2: Coupling devices for conducted disturbance measurements
- Part 1-3: Ancillary equipment – Disturbance power
- Part 1-4: Antennas and test sites for radiated disturbance measurements
- Part 1-5: Antenna calibration sites and reference test sites for 5 MHz to 18 GHz
- Part 1-6: EMC antenna calibration

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the measuring receiver with RMS-average detector (patent no DE 10126830) given in Clause 7.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

Rohde & Schwarz GmbH & Co. KG  
Muehldorfstrasse 15  
81671 Muenchen  
Germany

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

ISO ([www.iso.org/patents](http://www.iso.org/patents)) and IEC (<http://patents.iec.ch>) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.



## **SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –**

### **Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus**

#### **1 Scope**

This part of CISPR 16 specifies the characteristics and performance of equipment for the measurement of radio disturbance in the frequency range 9 kHz to 18 GHz. In addition, requirements are provided for specialized equipment for discontinuous disturbance measurements.

NOTE In accordance with IEC Guide 107, CISPR 16-1-1 is a basic electromagnetic compatibility (EMC) standard for use by product committees of the IEC. As stated in Guide 107, product committees are responsible for determining the applicability of a basic EMC standard. CISPR and its subcommittee are prepared to co-operate with product committees in the evaluation of the value of particular EMC tests for specific products.

The specifications in this document apply to electromagnetic interference (EMI) receivers and spectrum analyzers. The term “measuring receiver” used in this document refers to both EMI receivers and spectrum analyzers (see also 3.7). The calibration requirements for measuring receivers are detailed in Annex J.

Further guidance on the use of spectrum analyzers can be found in Annex B of any one of the following documents: CISPR 16-2-1:2014, CISPR 16-2-2:2010, or CISPR 16-2-3:-2016.

#### **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.

CISPR 11:2015, *Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement*

CISPR 11:2015/AMD1:2016

CISPR 11:2015/AMD2:2019

CISPR 14-1:2016, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*

CISPR 16-2-1:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements*

CISPR 16-2-1:2014/AMD1:2017

CISPR 16-2-2:2010, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-2: Methods of measurement of disturbances and immunity - Measurement of disturbance power*

CISPR 16-2-3:2016, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements*

CISPR TR 16-3:2010, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 3: CISPR technical reports*  
CISPR TR 16-3:2010/AMD1:2012  
CISPR TR 16-3:2010/AMD2:2015

IEC 60050-161:1990, *International Electrotechnical Vocabulary (IEV) – Part 161: Electromagnetic compatibility* (available at [www.electropedia.org](http://www.electropedia.org))

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**