

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 2-3: Methods of measurement of disturbances and immunity – Radiated
disturbance measurements**

**Spécifications des méthodes et des appareils de mesure des perturbations
radioélectriques et de l'immunité aux perturbations radioélectriques –
Partie 2-3: Méthodes de mesure des perturbations et de l'immunité – Mesurages
des perturbations rayonnées**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

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 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements**

**Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques –
Partie 2-3: Méthodes de mesure des perturbations et de l'immunité – Mesurages des perturbations rayonnées**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.100.10; 33.100.20

ISBN 978-2-8322-7143-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

REDLINE VERSION

VERSION REDLINE



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 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements**

**Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques –
Partie 2-3: Méthodes de mesure des perturbations et de l'immunité – Mesurages des perturbations rayonnées**

CONTENTS

FOREWORD.....	9
INTRODUCTION to Amendment 1	11
1 Scope.....	12
2 Normative references	12
3 Terms, definitions and abbreviations	13
3.1 Terms and definitions.....	13
3.2 Abbreviated terms.....	19
4 Types of disturbance to be measured	20
4.1 General.....	20
4.2 Types of disturbance.....	20
4.3 Detector functions.....	21
5 Connection of measuring equipment.....	21
6 General measurement requirements and conditions	21
6.1 General.....	21
6.2 Disturbance not produced by the equipment under test	22
6.2.1 General	22
6.2.2 Compliance (conformity assessment) testing	22
6.3 Measurement of continuous disturbance	22
6.3.1 Narrowband continuous disturbance	22
6.3.2 Broadband continuous disturbance	22
6.3.3 Use of spectrum analyzers and scanning receivers.....	22
6.4 EUT arrangement and measurement conditions	22
6.4.1 General arrangement of the EUT	22
6.4.2 Operation of the EUT	25
6.4.3 EUT time of operation.....	25
6.4.4 EUT running-in time.....	25
6.4.5 EUT supply.....	25
6.4.6 EUT mode of operation.....	25
6.4.7 Operation of multifunction equipment.....	25
6.4.8 Determination of arrangement(s) causing maximum emissions	26
6.4.9 Recording of measurements	26
6.5 Interpretation of measuring results.....	26
6.5.1 Continuous disturbance	26
6.5.2 Discontinuous disturbance.....	27
6.5.3 Measurement of the duration of disturbance	27
6.6 Measurement times and scan rates for continuous disturbance.....	27
6.6.1 General	27
6.6.2 Minimum measurement times	27
6.6.3 Scan rates for scanning receivers and spectrum analyzers	28
6.6.4 Scan times for stepping receivers	29
6.6.5 Strategies for obtaining a spectrum overview using the peak detector	30
6.6.6 Timing considerations using FFT-based instruments.....	33
7 Measurement of radiated disturbances	36
7.1 Introductory remarks General.....	36
7.1.1 General remarks and overview of test methods	37

7.1.2	Overview of maximum EUT volumes depending on measurement method, frequency range, and measurement distance	38
7.2	Loop-antenna system measurements (9 kHz to 30 MHz)	40
7.2.1	General	40
7.2.2	General measurement method	41
7.2.3	Test environment	42
7.2.4	Configuration of the equipment under test	42
7.2.5	Measurement uncertainty for LLAS	43
7.3	Open-area test site or semi-anechoic chamber measurements (30 MHz to 1 GHz)	43
7.3.1	Measurand	43
7.3.2	Test site requirements	46
7.3.3	General measurement method	46
7.3.4	Measurement distance	47
7.3.5	Antenna height variation	48
7.3.6	Product specification details	48
7.3.7	Measurement instrumentation	50
7.3.8	Field-strength measurements on other outdoor sites	50
7.3.9	Measurement uncertainty for OATS and SAC	50
7.4	Fully-anechoic room measurements (30 MHz to 1 GHz)	50
7.4.1	Test set-up and site geometry	50
7.4.2	EUT position	53
7.4.3	Cable layout and termination	54
7.4.4	Measurement uncertainty for FAR	55
7.5	Radiated emission measurement method (30 MHz to 1 GHz) and radiated immunity test method (80 MHz to 1 GHz) with common test set-up in semi-anechoic chamber	55
7.5.1	Applicability	55
7.5.2	EUT perimeter definition and antenna-to-EUT separation distance	55
7.5.3	Uniform test volume	56
7.5.4	Specifications for EUT set-up in common emissions/immunity test set-up	57
7.5.5	Measurement uncertainty for common emission/immunity set-up and method	63
7.6	Fully-anechoic room and absorber-lined OATS/SAC measurements (1 GHz to 18 GHz)	63
7.6.1	Quantity to measure Measurand	63
7.6.2	Measurement distance	64
7.6.3	Set-up and operating conditions of the equipment under test (EUT)	64
7.6.4	Measurement site	65
7.6.5	Measurement instrumentation	65
7.6.6	Measurement procedure	66
7.6.7	Measurement uncertainty for FAR	74
7.7	<i>In situ</i> measurements (9 kHz to 18 GHz)	74
7.7.1	Applicability of and preparation for <i>in situ</i> measurements	74
7.7.2	Field-strength measurements <i>in situ</i> in the frequency range 9 kHz to 30 MHz	75
7.7.3	Field-strength measurements <i>in situ</i> in the frequency range above 30 MHz	76
7.7.4	<i>In situ</i> measurement of the disturbance effective radiated power using the substitution method	77

7.7.5	Documentation of the measurement results	81
7.7.6	Measurement uncertainty for <i>in situ</i> method.....	81
7.8	Substitution measurements (30 MHz to 18 GHz).....	81
7.8.1	General	81
7.8.2	Test site	81
7.8.3	Test antennas.....	82
7.8.4	EUT configuration.....	82
7.8.5	Test procedure	83
7.8.6	Measurement uncertainty for substitution method	83
7.9	Reverberation chamber measurements (80 MHz to 18 GHz)	83
7.10	TEM waveguide measurements (30 MHz to 18 GHz).....	83
7.11	Open-area test site or semi-anechoic chamber measurements (9 kHz to 30 MHz).....	83
7.11.1	Measurand	83
7.11.2	Test site requirements	84
7.11.3	General measurement method.....	84
7.11.4	Measurement distance and EUT dimensions.....	86
7.11.5	Antenna height	86
7.11.6	Product standard specification details.....	87
7.11.7	Measurement uncertainty for OATS and SAC	87
7.11.8	Field strength measurements at other sites	87
8	Automated measurement of emissions	88
8.1	Introduction – Precautions for automated measurements	88
8.2	Generic measurement procedure	88
8.3	Pre-scan measurements	89
8.3.1	General	89
8.3.2	Determination of the required measurement time.....	89
8.3.3	Pre-scan requirements for different types of measurements.....	89
8.4	Data reduction	90
8.5	Emission maximization and final measurement	91
8.6	Post-processing and reporting	92
8.7	Emission measurement strategies with FFT-based measuring instruments	92
Annex A (informative)	Measurement of disturbances in the presence of ambient emissions	93
A.1	General.....	93
A.2	Terms and definitions.....	93
A.3	Problem description	93
A.4	Proposed solution	93
A.4.1	Overview	93
A.4.2	Pre-testing the EUT in a shielded room	96
A.4.3	Method of measurement of EUT disturbances in the presence of narrowband ambient emissions.....	97
A.4.4	Method of measurement of EUT disturbance in the presence of broadband ambient emissions	100
A.5	Determination of the EUT disturbance in case of superposition.....	102
Annex B (informative)	Use of spectrum analyzers and scanning receivers	107
B.1	General.....	107
B.2	Overload.....	107
B.3	Linearity test.....	107

B.4	Selectivity	107
B.5	Normal response to pulses	107
B.6	Peak detection	107
B.7	Frequency scan rate	108
B.8	Signal interception	108
B.9	Average detection	108
B.10	Sensitivity	108
B.11	Amplitude accuracy	109
Annex C (informative)	Scan rates and measurement times for use with the average detector	110
C.1	Purpose	110
C.2	Suppression of disturbances	110
C.2.1	Suppression of impulsive disturbance	110
C.2.2	Suppression of impulsive disturbance by digital averaging	111
C.2.3	Suppression of amplitude modulation	111
C.3	Measurement of slowly intermittent, unsteady or drifting narrowband disturbances	111
C.4	Recommended procedure for automated or semi-automated measurements	113
Annex D (informative)	Explanation of the APD measurement method applying to the compliance test	114
Annex E (normative)	Determination of suitability of spectrum analyzers for compliance tests	116
Annex F (informative)	Background for EUT-volume specifications depending on measurement distance and frequency range	117
F.1	General	117
F.2	Criterion 1 – Limitation of field-strength underestimations due to a large ratio of EUT volume diameter-to-measurement distance for short-distance measurements	117
F.2.1	General	117
F.2.2	9 kHz to 30 MHz	117
F.2.3	30 MHz to 1 000 MHz	118
F.2.4	1 GHz to 18 GHz	118
F.3	Criterion 2 – Limitation due to near-field effects	119
F.3.1	General	119
F.3.2	9 kHz to 30 MHz	119
F.3.3	30 MHz to 1 000 MHz	119
F.3.4	1 GHz to 18 GHz	121
F.4	Criterion 3 – Limitation due to receive antenna beamwidth	122
F.4.1	General	122
F.4.2	9 kHz to 30 MHz	122
F.4.3	30 MHz to 1 000 MHz	122
F.4.4	1 GHz to 18 GHz	124
F.5	Criterion 4 – Limitation due to the results of test site validation	127
F.5.1	General	127
F.5.2	9 kHz to 30 MHz	127
F.5.3	30 MHz to 1 000 MHz	127
F.5.4	1 GHz to 6 GHz or to 18 GHz	127
Bibliography	128

Figure 1 – Measurement of a combination of a CW signal (NB) and an impulsive signal (BB) using multiple sweeps with maximum hold	30
Figure 2 – Example of a timing analysis	31
Figure 3 – A broadband spectrum measured with a stepped receiver	32
Figure 4 – Intermittent narrowband disturbances measured using fast short repetitive sweeps with maximum hold function to obtain an overview of the emission spectrum.....	33
Figure 5 – FFT scan in segments	35
Figure 6 – Frequency resolution enhanced by FFT-based measuring instrument	36
Figure 7 – Concept of magnetic field induced current measurements made with the loop antenna system	42
Figure 8 – Measurement distance	44
Figure 9 – Separation distance relative to the phase centre of an LPDA antenna	46
Figure 10 – Concept of electric field strength measurements made on an open-area test site (OATS) or semi-anechoic chamber (SAC) showing the direct and reflected rays arriving at the receiving antenna	47
Figure 11 – Position of CMAD for table-top equipment on OATS or in SAC	50
Figure 12 – Typical FAR site geometry, where a, b, c, e depend upon the room performance	51
Figure 13 – Typical test set-up for table-top equipment within the test volume of a FAR	52
Figure 14 – Typical test set-up for floor-standing equipment within the test volume of a FAR	53
Figure 15 – Positions of reference planes for uniform field calibration (top-view)	56
Figure 16 – Test set-up for table-top equipment.....	60
Figure 17 – Test set-up for table-top equipment – Top view	61
Figure 18 – Test set-up for floor-standing equipment	62
Figure 19 – Test set-up for floor-standing equipment – Top view	63
Figure 20 – Measurement method above 1 GHz, receive antenna in vertical polarization.....	67
Figure 21 – Illustration of height scan requirements for two different categories of EUTs	67
Figure 22 – Determination of the transition distance	80
Figure 23 – Substitution method set-up geometries for: a) measurement, b) calibration	82
Figure 25 – Concept of magnetic field strength measurement set-up at an OATS or in a SAC for table-top EUT	85
Figure 26 – Concept of magnetic field strength measurement set-up at an OATS or in a SAC for floor-standing EUT.....	85
Figure 27 – Feed point location.....	86
Figure 24 – Process to give reduction of measurement time	88
Figure A.1 – Flow diagram for the selection of bandwidths and detectors and the estimated measurement errors due to that selection	95
Figure A.2 – Relative difference in adjacent emission amplitudes during preliminary testing	97
Figure A.3 – Disturbance by an unmodulated signal (dotted line).....	98
Figure A.4 – Disturbance by an amplitude-modulated signal (dotted line).....	98
Figure A.5 – Indication of an amplitude-modulated signal as a function of modulation frequency with the QP detector in CISPR bands B, C and D	99

Figure A.6 – Indication of a pulse-modulated signal (pulse width 50 μ s) as a function of pulse repetition frequency with peak, QP and average detectors.....	100
Figure A.7 – Disturbance by a broadband signal (dotted line)	100
Figure A.8 – Unmodulated EUT disturbance (dotted line).....	101
Figure A.9 – Amplitude-modulated EUT disturbance (dotted line).....	102
Figure A.10 – Increase of peak value with superposition of two unmodulated signals.....	103
Figure A.11 – Determination of the amplitude of the disturbance signal by means of the amplitude ratio d and the factor i (see Equation (A.3) and Equation (A.6))	104
Figure A.12 – Increase of average indication measured with a real receiver and calculated from Equation (A.8).....	105
Figure C.1 – Weighting function of a 10 ms pulse for peak (PK) and average detections with (CISPR AV) and without (AV) peak reading: meter time constant 160 ms	112
Figure C.2 – Weighting functions of a 10 ms pulse for peak (PK) and average detections with (CISPR AV) and without (AV) peak reading: meter time constant 100 ms.....	112
Figure C.3 – Example of weighting functions (of a 1 Hz pulse) for peak (PK) and average detections as a function of pulse width: meter time constant 160 ms	113
Figure C.4 – Example of weighting functions (of a 1 Hz pulse) for peak (PK) and average detections as a function of pulse width: meter time constant 100 ms	113
Figure D.1 – Example of APD measurement Method 1 for fluctuating disturbances	114
Figure D.2 – Example of APD measurement Method 2 for fluctuating disturbances	115
Figure F.1 – Comparison of field strength given by Equation (C.17) of CISPR 16-1-6:2014 versus near-field region given by Equation (C.31) of CISPR 16-1-6:2014	121
Figure F.2 – Deviation of near-field AFs from free space AFs of a biconical antenna (from Figure C.5.b) of CISPR 16-1-6:2014).....	121
Figure F.3 – Radius r of the test volume for a given distance d and antenna beamwidth of 60°	123
Figure F.4 – Effect of antenna directivity	124
Figure F.5 – HPBW (E-plane/H-plane) of a V-type LPDA antenna	124
Figure F.6 – Measuring receiver with external preamplifier	125
Figure F.7 – Noise level E_{Nlinav} (example for $10\lg F_{tot} = 4$ dB) compared with the disturbance limit E_{LAV} for the linear average detector for 3 m, 5 m, and 10 m distances in the frequency range 1 GHz to 6 GHz	126
Figure F.8 – Noise level E_{Nlogav} (example for $10\lg F_{tot} = 4$ dB) compared with the disturbance limit E_{LAV} for the logarithmic average detector for 3 m, 5 m, and 10 m distances in the frequency range 1 GHz to 18 GHz	127
Table 1 – Minimum measurement times for the four CISPR bands	27
Table 2 – Minimum scan times for the three CISPR bands with peak and quasi-peak detectors	28
Table 3 – Applicable frequency ranges and document references for CISPR radiated emission test sites and test methods.....
Table 4 – Minimum dimension of w (w_{min}).....
Table 8 – Applicable frequency ranges and document references for CISPR radiated disturbance test sites and measurement methods	38
Table 9 – Maximum EUT dimensions for different LLAS diameters, 9 kHz to 30 MHz	39
Table 10 – Recommended maximum EUT-volume diameter D (in m) and height h (in m), OATS/SAC and outdoor site, 9 kHz to 30 MHz.....	39

Table 11 – Maximum EUT-volume diameter D (in m) and height h (in m), OATS/SAC and FAR, 30 MHz to 1 000 MHz.....	40
Table 12 – Recommended maximum EUT-volume diameter D (in m) and height h (in m) – for reduced near-field uncertainty; absorber-lined OATS/SAC and FAR, 1 GHz to 18 GHz	40
Table 5 – Example values of w for three antenna types.....	69
Table 6 – Horizontal polarization correction factors as a function of frequency.....	80
Table 7 – Recommended antenna heights to guarantee signal interception (for pre-scan) in the frequency range 30 MHz to 1 000 MHz	90
Table A.1 – Combinations of EUT disturbance and ambient emissions.....	94
Table A.2 – Measurement error depending on the detector type and on the combination of ambient and disturbing signal spectra	106
Table C.1 – Pulse suppression factors and scan rates for a 100 Hz video bandwidth.....	111
Table C.2 – Meter time constants and the corresponding video bandwidths and minimum scan times	112
Table E.1 – Maximum amplitude difference between peak and quasi-peak detected signals.....	116
Table F.1 – Maximum EUT volume diameters (D_{\max}) and heights (h_{\max}) per Formula (F.1) for various measurement distances (d).....	120

INTERNATIONAL ELECTROTECHNICAL COMMISSION
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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

**Part 2-3: Methods of measurement of disturbances and immunity –
Radiated disturbance measurements**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.

CISPR 16-2-3 edition 4.2 contains the fourth edition (2016-09) [documents CISPR/A/1176A/FDIS and CISPR/A/1182/RVD], its amendment 1 (2019-06) [documents CISPR/A/1278/FDIS and CISPR/A/1283/RVD] and its amendment 2 (2023-06) [documents CIS/A/1391/FDIS and CIS/A/1397/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard CISPR 16-2-3 has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods.

This fourth edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition: addition of content on correction of the electric field strength to account for phase centre of log-periodic dipole array antennas.

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*.

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

A list of all parts of 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 and its amendments will remain unchanged until the stability date indicated on the IEC website under 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 to Amendment 1

Amendment of CISPR 16-2-3 regarding EUT volume specifications for radiated disturbance measurements depending on test method and on measurement distance

SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements

1 Scope

This part of CISPR 16 specifies the methods of measurement of radiated disturbance phenomena in the frequency range of 9 kHz to 18 GHz. The aspects of measurement uncertainty are specified in CISPR 16-4-1 and CISPR 16-4-2.

NOTE In accordance with IEC Guide 107 [13]¹, CISPR 16-2-3 is a basic EMC publication for use by product committees of the IEC. As stated in Guide 107, product committees are responsible for determining the applicability of the EMC standard. CISPR and its subcommittees are prepared to co-operate with product committees in the evaluation of the value of particular EMC tests for specific products.

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.

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

CISPR 16-1-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-1-2:2014, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements*

CISPR 16-1-4:~~2010~~2019, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*

CISPR 16-1-4:2019/AMD1:2020

CISPR 16-1-4:2019/AMD2:2023

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 TR 16-4-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-1: Uncertainties, statistics and limit modelling – Uncertainties in standardized EMC tests*

¹ Numbers in square brackets refer to the Bibliography.