

STN	Elektroakustické zariadenia Časť 4: Mikrofóny	STN EN IEC 60268-4 36 8305
------------	--	--

Sound system equipment - Part 4: Microphones

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. 02/19

Obsahuje: EN IEC 60268-4:2018, IEC 60268-4:2018

Oznámením tejto normy sa od 17.10.2021 ruší
STN EN 60268-4 (36 8305) z februára 2015

127986

EUROPEAN STANDARD

EN IEC 60268-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2018

ICS 33.160.50

Supersedes EN 60268-4:2014

English Version

**Sound system equipment - Part 4: Microphones
(IEC 60268-4:2018)**

Equipements pour systèmes électroacoustiques - Partie 4:
Microphones
(IEC 60268-4:2018)

Elektroakustische Geräte - Teil 4: Mikrofone
(IEC 60268-4:2018)

This European Standard was approved by CENELEC on 2018-10-17. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

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

EN IEC 60268-4:2018 (E)**European foreword**

The text of document 100/2992/CDV, future edition 6 of IEC 60268-4, prepared by IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60268-4:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-07-17
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-10-17

This document supersedes EN 60268-4:2014.

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

Endorsement notice

The text of the International Standard IEC 60268-4:2018 was approved by CENELEC as a European Standard without any modification.

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

CISPR 22:2008	NOTE	Harmonized as EN 55022:2010 (modified)
IEC 60065:2014	NOTE	Harmonized as EN 60065:2014 (modified)
IEC 60958-4:2016 (series)	NOTE	Harmonized as EN 60958-4:2016 (series)
IEC 61000-3-2:2014	NOTE	Harmonized as EN 61000-3-2:2014 (not modified)
IEC 61000-3-3:2013	NOTE	Harmonized as EN 61000-3-3:2013 (not modified)
IEC 61606 (series)	NOTE	Harmonized as EN 61606 (series)
IEC 61672-1:2013	NOTE	Harmonized as EN 61672-1:2013 (not modified)

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 35 (mod)	2016	Electromagnetic compatibility of multimedia equipment - Immunity requirements	EN 55035	2017
IEC 60268-1	1985	Sound system equipment. Part 1: General	HD 483.1 S2	1989
+ A1	1988		-	-
+ A2	1988		-	-
IEC 60268-2	1987	Sound system equipment. Part 2: Explanation of general terms and calculation methods	HD 483.2 S2	1993
+ A1	1991		-	-
IEC 60268-3	2013	Sound system equipment - Part 3: Amplifiers	EN 60268-3	2013
IEC 60268-5	2003	Sound system equipment - Part 5: Loudspeakers	EN 60268-5	2003
+ A1	2007		+ A1	2009
IEC 60268-11	1987	Sound system equipment. Part 11: Application of connectors for the interconnection of sound system components	HD 483.11 S3	1993
+ A1	1989		-	-
+ A2	1991		-	-
IEC 60268-12	1987	Sound system equipment. Part 12: Application of connectors for broadcast and similar use	EN 60268-12	1995
+ A1	1991		-	-
+ A2	1994		+ A2	1995
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	2009

EN IEC 60268-4:2018 (E)

IEC 61000-4-3	2006	Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	2006
+ A1	2007		+ A1	2008
+ A2	2010		+ A2	2010
IEC 61000-4-4	2012	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	2012
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2014
IEC 61000-4-8	2009	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	2010
IEC 61000-4-16	2015	Electromagnetic compatibility (EMC) - Part 4-16: Testing and measurement techniques - Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	EN 61000-4-16	2016
IEC 61000-4-17	1999	Electromagnetic compatibility (EMC) - Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test	EN 61000-4-17	1999
+ A1	2001		+ A1	2004
+ A2	2008		+ A2	2009
IEC 61260-1	2014	Electroacoustics - Octave-band and fractional-octave-band filters - Part 1: Specifications	EN 61260-1	2014
IEC 61938	2013	Multimedia systems - Guide to the recommended characteristics of analogue interfaces to achieve interoperability	-	-
ITU-T Recommendation P.51	-	Artificial mouth	-	-
EN 55103-2	2009	Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 2: Immunity	EN 55103-2	2009
EN 300 422-2 V1.3.1	2011	Electromagnetic compatibility and radio spectrum matters (ERM) - Wireless microphones in the 25 MHz to 3 GHz frequency range - Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	EN 300 422-2 V1.3.1	2011



IEC 60268-4

Edition 6.0 2018-09

INTERNATIONAL STANDARD

**Sound system equipment –
Part 4: Microphones**





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2018 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.

IEC Central Office
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 corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

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 also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 21 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

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 60268-4

Edition 6.0 2018-09

INTERNATIONAL STANDARD

**Sound system equipment –
Part 4: Microphones**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.160.50

ISBN 978-2-8322-5955-9

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions	9
4 General conditions.....	10
4.1 General.....	10
4.2 Measurement conditions.....	10
4.2.1 General	10
4.2.2 Rated conditions	11
5 Particular conditions	12
5.1 Pre-conditioning.....	12
5.2 Sound source.....	12
5.3 Measurement of sound pressure.....	12
5.4 Voltage measuring system.....	12
5.5 Acoustical environment	12
5.5.1 General	12
5.5.2 Free-field conditions.....	13
5.5.3 Diffuse field conditions	14
5.5.4 Microphone coupled to a sound source by means of a small cavity coupler	15
5.6 Methods of measuring frequency response	15
5.6.1 Point-by-point and continuous sweep frequency methods.....	15
5.6.2 Calibration methods	16
5.7 Overall accuracy	16
5.8 Graphical presentation of results	16
6 Type description (acoustical behaviour)	17
6.1 Principle of the transducer.....	17
6.2 Type of microphone.....	17
6.3 Type of directional response characteristics.....	17
6.4 Application	17
7 Terminals and controls.....	17
7.1 Marking.....	17
7.2 Connectors and electrical interface values	17
8 Reference point and axis	18
8.1 Reference point.....	18
8.2 Reference axis	18
9 Rated power supply	18
9.1 Characteristics to be specified	18
9.2 Method of measurement.....	18
10 Electrical impedance.....	18
10.1 Internal impedance.....	18
10.1.1 Characteristic to be specified	18
10.1.2 Methods of measurement	18
10.2 Rated impedance	19
10.3 Rated minimum permitted load impedance.....	19

11	Sensitivity.....	19
11.1	General.....	19
11.2	Sensitivities with respect to acoustical environment	20
11.2.1	Free-field sensitivity	20
11.2.2	Diffuse-field sensitivity	21
11.2.3	Close-talking and near-field sensitivity.....	21
11.2.4	Pressure sensitivity.....	22
11.3	Rated sensitivity.....	22
12	Response.....	22
12.1	Frequency response.....	22
12.1.1	Characteristic to be specified	22
12.1.2	Method of measurement.....	23
12.1.3	Graphical presentation of results	23
12.2	Effective frequency range.....	23
12.2.1	Characteristic to be specified	23
12.2.2	Method of measurement.....	23
13	Directional characteristics	23
13.1	Directional pattern.....	23
13.1.1	Characteristic to be specified	23
13.1.2	Methods of measurement	24
13.1.3	Graphical presentation of results	25
13.2	Directivity index	25
13.2.1	Characteristic to be specified	25
13.2.2	Method of measurement.....	25
14	Amplitude non-linearity	25
14.1	General.....	25
14.2	Total harmonic distortion	25
14.2.1	Characteristic to be specified	25
14.2.2	Method of measurement.....	26
14.3	Harmonic distortion of the n^{th} order ($n = 2, 3, \dots$)	26
14.3.1	Characteristic to be specified	26
14.3.2	Method of measurement.....	26
14.4	Difference frequency distortion of second order	27
14.4.1	Characteristic to be specified	27
14.4.2	Method of measurement.....	27
15	Limiting characteristics	28
15.1	Rated maximum permissible peak sound pressure	28
15.2	Overload sound pressure	28
15.2.1	Characteristic to be specified	28
15.2.2	Method of measurement.....	28
16	Balance.....	28
16.1	Balance of the microphone output.....	28
16.2	Balance under working conditions.....	29
17	Equivalent sound pressure level due to inherent noise.....	29
17.1	Characteristic to be specified	29
17.2	Method of measurement.....	29
18	Ambient conditions	30
18.1	General.....	30

18.2	Pressure range	30
18.3	Temperature range.....	30
18.4	Relative humidity range	30
19	External influences	30
19.1	General.....	30
19.1.1	Specification and methods of measurement	30
19.1.2	Other external interferences	31
19.2	Equivalent sound pressure due to mechanical vibration.....	31
19.2.1	Characteristic to be specified	31
19.2.2	Method of measurement.....	31
19.3	Equivalent sound pressure due to wind	31
19.3.1	Characteristic to be specified	31
19.3.2	Method of measurement.....	32
19.4	Transient equivalent sound pressure due to "pop" effect	35
19.4.1	General	35
19.4.2	Characteristic to be specified	35
19.4.3	Method of measurement.....	36
20	Electromagnetic compatibility (EMC)	37
20.1	Regulatory requirements	37
20.2	Requirements for preserving programme quality	37
20.3	Performance criteria.....	38
20.3.1	Criterion A	38
20.3.2	Criterion B	38
20.4	Testing for immunity to disturbances in the presence of acoustical noise	39
20.5	Immunity to frequency-modulated radiated disturbances	39
20.6	Immunity to magnetic fields	39
20.7	Immunity to ripple on d.c. power supply	39
20.8	Permanent magnetic field	40
20.9	Evaluation and reporting of the test results	40
21	Physical characteristics	40
21.1	Dimensions	40
21.2	Weight.....	40
21.3	Cables and connectors.....	40
22	Classification of the characteristics to be specified	40
Annex A	(normative) Additional characteristics	43
A.1	Characteristic sensitivity for speech.....	43
A.1.1	Characteristic to be specified	43
A.1.2	Method of measurement.....	43
A.2	Front-to-rear sensitivity index (0° – 180°).....	44
A.2.1	Characteristic to be specified	44
A.2.2	Method of measurement.....	44
A.3	Noise-cancelling index	44
A.3.1	Characteristic to be specified	44
A.3.2	Method of measurement.....	44
A.4	Special characteristics for stereo microphones.....	45
A.4.1	General	45
A.4.2	Included angle of an XY (left-right) microphone.....	45
A.4.3	Acceptance angle	45

Annex B (informative) Sound insulation device	46
Annex C (informative) Recommendations for professional digital microphones	47
C.1 General.....	47
C.2 Data sheets for digital microphones.....	47
Annex D (informative) Recommended method for measuring noise levels according to ITU-R BS.468-4 in the digital domain	50
D.1 General.....	50
D.2 Recommended method.....	50
D.3 Matlab code	51
Bibliography	54
Figure 1 – Balance of the output	28
Figure 2 – Balance under working conditions.....	29
Figure 3 – Measurement set-up for wind influence	32
Figure 4 – Wind generators, type 1 (Figure 4a) and type 2 (Figure 4b).....	34
Figure 5 – Electrical and mechanical setup for the measuring of the "pop" effect.....	36
Figure B.1 – Sound insulation device	46
Figure D.1 – ITU weighting filter for weighted and unweighted measurements.....	50
Figure D.2 – Peak value rectifier scheme	51
Table 1 – Reverberation time of the empty room.....	15
Table 2 – Examples of EMC regulations and standards.....	37
Table 3 – Basic EMC standards and their application to microphones	38
Table 4 – Classification of characteristics	41
Table A.1 – Speech power weighting factor at octave-band centre frequencies	43
Table C.1 – Classification of the characteristics recommended to be specified	47
Table C.2 – Additional digital characteristics to be specified	49
Table D.1 – Time constants for the two PVRs.....	51

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SOUND SYSTEM EQUIPMENT –

Part 4: Microphones

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.

International Standard IEC 60268-4 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This sixth edition cancels and replaces the fifth edition published in 2014. This edition constitutes a technical revision.

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

- a) Subclause 19.4 on "pop" measurement replaces Annex C;
- b) new Annex D for noise measurements in the digital domain.

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

CDV	Report on voting
100/2992/CDV	100/3109/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.

A list of all parts of the IEC 60268 series, under the general title *Sound system equipment*, 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.

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

SOUND SYSTEM EQUIPMENT –

Part 4: Microphones

1 Scope

This part of IEC 60268 specifies methods of measurement for the electrical impedance, sensitivity, directional response pattern, dynamic range and external influences of sound system microphones, and also details the characteristics to be specified by the manufacturer.

It applies to sound system microphones for all applications for speech and music. It does not apply to measurement microphones, but it does apply to each audio channel of microphones having more than one channel, for example for stereo or similar use. It is also applicable to flush-mounted microphones and to the analogue characteristics of microphones with digital audio output.

For the purposes of this International Standard, a microphone includes all such devices as transformers, pre-amplifiers, or other elements that form an integral part of the microphone, up to the output terminals specified by the manufacturer.

The major characteristics of a microphone are considered in Clauses 6 to 21. Additional characteristics are considered in Annex A and Annex C.

NOTE The characteristics specified in this document do not describe the subjective response of the microphone. Further work is necessary to find new definitions and measurement procedures for a later introduction of objective characteristics for at least some of the subjective descriptions used to describe microphone performance.

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 35:2016, *Electromagnetic compatibility of multimedia equipment – Immunity requirements*

IEC 60268-1:1985, *Sound system equipment – Part 1: General*
IEC 60268-1:1985/AMD1:1988
IEC 60268-1:1985/AMD2:1988

IEC 60268-2:1987, *Sound system equipment – Part 2: Explanation of general terms and calculation methods*
IEC 60268-2:1987/AMD1:1991

IEC 60268-3:2013, *Sound system equipment – Part 3: Amplifiers*

IEC 60268-5:2003, *Sound system equipment – Part 5: Loudspeakers*
IEC 60268-5:2003/AMD1:2007

IEC 60268-11:1987, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*
IEC 60268-11:1987/AMD1:1989
IEC 60268-11:1987/AMD2:1991

IEC 60268-12:1987, *Sound system equipment – Part 12: Application of connectors for broadcast and similar use*

IEC 60268-12:1987/AMD1:1991

IEC 60268-12:1987/AMD2:1994

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-3:2006/AMD1:2007

IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-16:2015, *Electromagnetic compatibility (EMC) – Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz*

IEC 61000-4-17:1999, *Electromagnetic compatibility (EMC) – Part 4-17: Testing and measurement techniques – Ripple on d.c. input power port immunity test*

61000-4-17:1999/AMD1:2001

61000-4-17:1999/AMD2:2008

IEC 61260-1:2014, *Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications*

IEC 61938:2013, *Multimedia systems – Guide to the recommended characteristics of analogue interfaces to achieve interoperability*

ITU-T Recommendation P.51:1996, *Artificial mouth*

EN 55103-2:2009, *Electromagnetic compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use – Part 2: Immunity*

EN 300 422-2 V1.3.1:2011, *Electromagnetic compatibility and radio spectrum matters (ERM) – Wireless microphones in the 25 MHz to 3 GHz frequency range – Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN