



SLOVENSKI STANDARD

SIST EN 61606-3:2009

01-januar-2009

Avdio in avdiovizualna oprema - Digitalni avdio deli - Osnovne merilne metode zvokovnih karakteristik - 3. del: Profesionalna uporaba (IEC 61606-3:2008)

Audio and audiovisual equipment - Digital audio parts - Basic measurement methods of audio characteristics - Part 3: Professional use (IEC 61606-3:2008)

Audio- und audiovisuelle Geräte - Digitale Tonteile - Grundlegende Messverfahren der Audio-Eigenschaften - Teil 3: Professioneller Gebrauch (IEC 61606-3:2008)

Equipements audio et audiovisuels - Parties audionumériques - Méthodes fondamentales pour la mesure des caractéristiques audio - Partie 3 : Utilisations professionnelles (CEI 61606-3:2008)

Ta slovenski standard je istoveten z: EN 61606-3:2008

ICS:

33.160.30 Avdio sistemi Audio systems

SIST EN 61606-3:2009 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61606-3:2009

<https://standards.iteh.ai/catalog/standards/sist/1e25bf3a-862a-4b16-9e99-5dec6df66514/sist-en-61606-3-2009>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61606-3

November 2008

ICS 33.160.30

English version

**Audio and audiovisual equipment -
Digital audio parts -
Basic measurement methods of audio characteristics -
Part 3: Professional use
(IEC 61606-3:2008)**

Equipements audio et audiovisuels -
Parties audionumériques -
Méthodes fondamentales pour
la mesure des caractéristiques audio -
Partie 3: Utilisations professionnelles
(CEI 61606-3:2008)

Audio- und audiovisuelle Geräte -
Digitale Tonteile -
Grundlegende Messverfahren
der Audio-Eigenschaften -
Teil 3: Professioneller Gebrauch
(IEC 61606-3:2008)

**ITeh STANDARD PREVIEW
(standards.iteh.ai)**

SIST EN 61606-3:2009

This European Standard was approved by CENELEC on 2008-11-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 100/1428/FDIS, future edition 1 of IEC 61606-3, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61606-3 on 2008-11-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2009-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2011-11-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61606-3:2008 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:

IEC 60268-3	NOTE Harmonized as EN 60268-3:2000 (not modified).
IEC 61938	NOTE Harmonized as EN 61938:1997 (not modified).

SIST EN 61606-3:2009

<https://standards.iteh.ai/catalog/standards/sist/1e25bf3a-862a-4b16-9e99-5dec6df66514/sist-en-61606-3-2009>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60268-1	- ¹⁾	Sound system equipment - Part 1: General	HD 483.1 S2	1989 ²⁾
IEC 60268-2	- ¹⁾	Sound system equipment - Part 2: Explanation of general terms and calculation methods	HD 483.2 S2	1993 ²⁾
IEC 60958-1	- ¹⁾	Digital audio interface - Part 1: General	EN 60958-1	2008 ²⁾
IEC 61260	- ¹⁾	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	1995 ²⁾
IEC 61606-1	- ¹⁾	Audio and audiovisual equipment - Digital audio parts - Basic measurement methods of audio characteristics - Part 1: General	EN 61606-1	2004 ²⁾
AES11	2003	AES recommended practice for digital audio engineering - Synchronization of digital audio equipment in studio operations	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61606-3:2009

<https://standards.iteh.ai/catalog/standards/sist/1e25bf3a-862a-4b16-9e99-5dec6df66514/sist-en-61606-3-2009>



IEC 61606-3

Edition 1.0 2008-10

INTERNATIONAL STANDARD

**Audio and audiovisual equipment – Digital audio parts – Basic measurement
methods of audio characteristics –
Part 3: Professional use**

STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 61606-3:2009
<https://standards.iteh.ai/catalog/standards/sist/1e25bf3a-862a-4b16-9e99-5dec6df66514/sist-en-61606-3-2009>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE



ICS 33.160.30

ISBN 2-8318-1008-6

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
4 Rated values	10
5 Measuring conditions.....	10
5.1 Environmental conditions	10
5.2 Power supply.....	10
5.3 Test signal frequencies	11
5.4 Standard settings	11
5.5 Preconditioning	11
5.6 Measuring instruments	11
5.6.1 General	11
5.6.2 Signal generator	11
5.6.3 Signal analyzer.....	12
6 Measurement methods	16
6.1 Overview	16
6.2 General characteristics	16
6.2.1 Linear response.....	16
6.2.2 Amplitude non-linearity	21
6.2.3 Noise.....	26
6.2.4 Interference products.....	28
6.2.5 Sampling effects.....	30
6.3 Input/output characteristics	32
6.3.1 Analogue input characteristics	32
6.3.2 Analogue output characteristics	34
6.3.3 Digital input characteristics.....	35
6.3.4 Digital output characteristics.....	36
Annex A (normative) Alternative measurement methods	37
Bibliography.....	41
Figure 1 – Signal generator	11
Figure 2 – Wideband amplitude.....	13
Figure 3 – In-band amplitude	13
Figure 4 – Out-of-band amplitude	13
Figure 5 – Selective amplitude.....	13
Figure 6 – Residual amplitude.....	13
Figure 7 – Weighted amplitude	14
Figure 8 – Gain method	16
Figure 9 – Frequency response method	17
Figure 10 – Maximum input and output amplitude method.....	18
Figure 11 – Distortion-and-noise method	21
Figure 12 – Distortion and noise versus frequency method	21
Figure 13 – Distortion and noise versus amplitude method	22

Figure 14 – Individual harmonic distortion method	22
Figure 15 – Total harmonic distortion method	22
Figure 16 – Largest spurious signal method	23
Figure 17 – Intermodulation method	23
Figure 18 – Intermodulation method	24
Figure 19 – Amplitude-dependent gain method	25
Figure 20 – Intrinsic signal modulation products method	25
Figure 21 – Low-amplitude noise modulation method	26
Figure 22 – Idle-channel noise method	26
Figure 23 – Idle-channel noise spectrum method	27
Figure 24 – Dynamic range method	27
Figure 25 – Out-of-band noise ratio method	27
Figure 26 – Channel separation method	28
Figure 27 – Non-linear cross-talk method	29
Figure 28 – Power-line (mains) related products method	30
Figure 29 – Suppression of the aliasing components method	30
Figure 30 – Suppression of imaging components method	31
Figure 31 – Sampling jitter susceptibility method	32
Figure 32 – Analogue full-scale input amplitude method	32
Figure 33 – Overload behaviour method	33
Figure 34 – Common-mode rejection ratio method	33
Figure 35 – Analogue full-scale output amplitude method	34
Figure 36 – Output balance method	35
Table A.1 – Stimulus wavetables	38

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUDIO AND AUDIOVISUAL EQUIPMENT –
DIGITAL AUDIO PARTS –
BASIC MEASUREMENT METHODS
OF AUDIO CHARACTERISTICS –**

Part 3: Professional use

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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 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 61606-3 has been prepared by IEC technical committee 100:Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

FDIS	Report on voting
100/1428/FDIS	100/1453/RVD

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

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

A list of all parts of the IEC 61606 series, under the general title *Audio and audiovisual equipment – Digital audio parts – Basic measurement methods of audio characteristics*, can be found on the IEC website.

This International Standard is to be used in conjunction with IEC 61606-1.

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

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

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61606-3:2009

<https://standards.iteh.ai/catalog/standards/sist/1e25bf3a-862a-4b16-9e99-5dec6df66514/sist-en-61606-3-2009>

AUDIO AND AUDIOVISUAL EQUIPMENT – DIGITAL AUDIO PARTS – BASIC MEASUREMENT METHODS OF AUDIO CHARACTERISTICS –

Part 3: Professional use

1 Scope

This part of IEC 61606 is applicable to the basic measurement methods of audio equipment for professional use.

The definitions, measuring conditions and methods common to both consumer and professional equipment are described in the IEC 61606-1.

This standard contains details of definitions and measuring conditions and methods applicable to professional equipment which differ from those described in IEC 61606-1.

This standard excludes consideration of

- measurement of low-quality audio devices,
- measurement of low-bit-rate audio devices ('sub-band' or 'perceptual' coding devices),
- measurement of devices which significantly modify time or frequency characteristics of the signal, such as pitch shifters or reverberators,
- measurement of signals from analogue input to analogue output, beyond the most general,
- EMC and safety related testing.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60268-1, *Sound system equipment – Part 1: General*

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

IEC 60958-1, *Digital audio interface – Part 1: General*

IEC 61260, *Electroacoustics – Octave-band and fractional-octave-band filters*

IEC 61606-1, *Audio and audiovisual equipment – Digital audio parts – Basic measurement methods of audio characteristics – Part 1: General*

AES11-2003, *AES Recommended Practice for Digital Audio Engineering – Synchronization of digital audio equipment in studio operations*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

aliasing components

see definition in IEC 61606-1

3.2

analogue full-scale input and output amplitude

when applied to an analogue input of the EUT, it produces digital full-scale amplitude within the EUT; conversely, the analogue output full-scale amplitude is that which is produced at an analogue output from the EUT by a digital full-scale amplitude within the EUT

NOTE 1 Sometimes the range of an analogue input or output path may be less than that corresponding to digital full-scale amplitude. For this reason, analogue full-scale input and output amplitudes are usually inferred by driving the converters at a lower amplitude (see 6.3.1.1 and 6.3.2.1).

NOTE 2 The ideal values of these amplitudes cannot be defined within the standard since they are different for different EUTs, and may be modally variable for a single EUT.

NOTE 3 Where these values are unknown for an EUT at the outset of testing, they should generally be established first (using the methods described in 6.3.1.1 and 6.3.2.1 since it may subsequently be necessary, for example, to drive an analogue input at -60 dB_{FS} or to measure an amplitude at an analogue output in dB_{FS} relative to a digital stimulus.

3.3

coding format

a numerical convention used to represent digital audio data at the inputs or outputs of the EUT

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61606-3:2009](https://standards.iteh.ai/catalog/standards/sist/1c25b3a-862e-4b16-9e99-300000000000/iec-61606-3-2009)

NOTE This standard is primarily intended to be applied to EUTs which transact digital audio signals expressed as a stream of LPCM (Linear Pulse Code Modulation) samples; that is, a stream of binary words, directly representing the amplitudes of successive audio samples quantised at the sampling frequency, and rendered as binary 2's complement numbers. Positive analogue voltages correspond to positive digital sample values (that is, 2's complement numbers whose most-significant bit (MSB) is zero). Many of the methods described in the standard are applicable to other coding formats.

3.4

decibels full-scale

dB_{FS}

the r.m.s. amplitude of a sinusoid described in 3.10 is defined as 0 dB_{FS}, where the amplitude of any signal can be defined in dB_{FS} as 20 times the common logarithm of the ratio of the r.m.s. amplitude of the signal to that of the signal defined in 3.10

NOTE Analogue amplitudes at the input or output of an EUT can be expressed in dB_{FS} by referring to the analogue full-scale input or output amplitudes as defined in 3.2.

3.5

digital audio interface

a physical medium upon which digital audio data are transferred into or out of the EUT

NOTE Digital audio interfaces may include packaged media (such as in the case of a CD player) or radio-frequency (RF) carriers (such as in the case of a set-top-box) as well as conventional copper or optical digital interconnections.

3.6

digital audio signal

see definition in IEC 61606-1

3.7

digital zero

see definition in IEC 61606-1