



SLOVENSKI STANDARD
SIST EN 61606:1999

01-april-1999

Audio and audiovisual equipment - Digital audio parts – Basic methods of measurement of audio characteristics (IEC 61606:1997)

Audio and audiovisual equipment - Digital audio parts - Basic methods of measurement of audio characteristics

Audio- und Audiovisuelle-Geräte - Digitale Tonteile - Grundlegende Meßverfahren der Audio-Eigenschaften

Equipements audio et audiovisuels - Parties audionumériques - Méthodes fondamentales pour la mesure des caractéristiques audio

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Ta slovenski standard je istoveten z: EN 61606:1997

ICS:

33.160.30 Avdio sistemi Audio systems

SIST EN 61606:1999 **en**

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EUROPEAN STANDARD
 NORME EUROPÉENNE
 EUROPÄISCHE NORM

EN 61606

April 1997

ICS 33.160.30

Descriptors: Video recording, sound recording, digital technics, recording apparatus, television systems, audiovisual materials, radio equipment, characteristics, measurements

English version

**Audio and audiovisual equipment - Digital audio parts
 Basic methods of measurement of audio characteristics
 (IEC 61606:1997)**

Equipements audio et audiovisuels
 Parties audionumériques
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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 100/16/FDIS, future edition 1 of IEC 61606, 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 on 1997-03-11.

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) 1997-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-12-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A and B are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61606:1997 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 38 (mod)	1983	IEC standard voltages ¹⁾	HD 472 S1	1989
IEC 107-5	1992	Recommended methods of measurement on receivers for television broadcast transmissions Part 5: Electrical measurements on multichannel sound television receivers using the NICAM two-channel digital sound-system	EN 60107-5	1992
IEC 268-1	1985	Sound system equipment Part 1: General	HD 483.1 S2 ²⁾	1989
IEC 268-2	1987	Part 2: Explanation of general terms and calculation methods	HD 483.2 S2 ³⁾	1993
IEC 268-3	1988	Part 3: Amplifiers	HD 483.3 S2 ⁴⁾	1992
IEC 268-15	1987	Part 15: Preferred matching values for the interconnection of sound system components	HD 483.15 S4 ⁵⁾	1992
IEC 651	1979	Sound level meters	EN 60651	1994
IEC 958	1989	Digital audio interface	EN 60958	1990

1) The title of HD 472 S1 is: Nominal voltages for low-voltage public electricity supply systems.

2) HD 483.1 S2 includes A1: 1988 to IEC 268-1.

3) HD 483.2 S2 includes A1:1991 to IEC 268-2.

4) HD 483.3 S2 includes A1:1990 + A2:1991 to IEC 268-3.

5) HD 483.15 S4 includes A1:1989 + A2:1990 + A3:1991 to IEC 268-15.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 1079-4	1993	Methods of measurements on receivers for satellite broadcast transmissions in the 12 GHz band Part 4: Electrical measurements on sound/data decoder units for the Digital Sub-carrier/NTSC system	-	-
IEC 1079-5	1993	Part 5: Electrical measurements on decoder units for MAC/Packet systems	EN 61079-5	1993
ISO 266	1975	Acoustics - Preferred frequencies for measurements	-	-

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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

61606

Première édition
First edition
1997-02

Equipements audio et audiovisuels –
Parties audionumériques –
Méthodes fondamentales pour la mesure
des caractéristiques audio

iTeh STANDARD PREVIEW

(standardsiteh.ai)
Audio and audiovisual equipment –

Digital audio parts –

Basic methods of measurement
of audio characteristics

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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CONTENTS

	Page
FOREWORD	7
Clause	7
1 General	9
1.1 Scope	9
1.2 Normative references	9
2 Definitions, explanation of terms and abbreviations	11
2.1 Definitions	11
2.2 Explanation of terms	11
2.3 Abbreviation	13
3 Measuring conditions	13
3.1 Environmental conditions	13
3.2 Power supply	15
3.3 Test signal	15
3.4 Test signal source	17
3.5 Standard input conditions for the EUT	19
3.6 Standard output conditions for the EUT	21
3.7 Standard settings of controls	21
3.8 Pre-conditioning	21
3.9 Test instruments	21
4 Methods of measurement (digital in/analogue out)	25
4.1 Output source impedance	27
4.2 Output voltage and power	27
4.3 Frequency response	29
4.4 Gain difference between channels	31
4.5 Phase difference between two channels	33
4.6 Phase linearity	35
4.7 Total delay through the EUT	35
4.8 Polarity	37
4.9 Level non-linearity	39
4.10 Distortion and noise	41
4.11 Dynamic range	43
4.12 Idle channel noise level (signal-to-noise ratio)	45
4.13 Intermodulation distortion	47
4.14 Out-of-band noise ratio	47
4.15 Stereophonic separation	49
5 Classification of the characteristics to be specified	51

	Page
Tables	
1 Frequencies used for measurements.....	53
2 Pass band of typical $\frac{1}{2} f_s$ filters unless otherwise specified.....	55
3 Pass band of out-of-band filters.....	55
4 Measurement frequencies for band pass filters (Hz).....	55
5 Example of the presentation of the measured values.....	57
6 Classification of the characteristics to be specified.....	59
Figures	
1 Waveform.....	19
2 Circuit arrangement for measuring output source impedance.....	27
3 Circuit arrangement for measuring output voltage and power.....	29
4 Circuit arrangement for measuring frequency response.....	31
5 Circuit arrangement for measuring phase difference.....	33
6 Circuit arrangement for measuring total delay.....	37
7 Circuit arrangement for measuring polarity.....	39
8 Circuit arrangement for measuring non-linearity.....	39
9 Circuit arrangement for measuring distortion and noise.....	41
10 Circuit arrangement for measuring dynamic range.....	43
11 Circuit arrangement for measuring idle channel noise level.....	45
12 Circuit arrangement for measuring out of band noise.....	47
13 Circuit arrangement for measuring stereophonic separation.....	51
Annexes	
A Compact disc test discs.....	61
B Bibliography.....	63

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61606 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
100/16/FDIS	100/37/RVD

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

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

1 General

1.1 Scope

This International Standard is applicable to the basic methods of measurement of the audio characteristics of the digital audio part of audio and audiovisual equipment (for both consumer and professional uses).

The common measuring conditions and methods are described, which are used in the measurement of performance characteristics of equipment having an audio bandwidth approximately one-half of the sampling frequency of a system, where the audio information is processed in the form of digital data. CD players, DAT recorders, digital amplifiers, digital sound broadcast receivers and television broadcast receivers with digital sound are some of the examples. Methods specified in this standard are not applicable to systems incorporating bit-rate reduced digital audio signals.

This standard only describes tests for equipment with analogue output and digital input.

Future revision of this standard will cover digital in/digital out, analogue in/digital out and analogue in/analogue out tests.

NOTES

1 A digital audio system having an analogue input and an analogue output may have different characteristics from those of a pure analogue audio system due to sampling of the audio signal and performance of A/D and D/A converters incorporated. Measurement methods described in IEC 268-3 may not give correct results when applied to a digital audio system.

2 The methods described are mostly based on sampling frequencies of 32 kHz and higher.

3 For tests of these systems of digital in – digital out, analogue in – digital out and analogue in – analogue out test, refer to AES 17 (AES standard method for digital audio engineering – Measurement of digital audio equipment. *J. Audio Eng. Soc.*, Vol. 39, No. 12, 1991 December, pp 961-975).

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions in this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties having agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 38: 1983, *IEC standard voltages*

IEC 107-5: 1992, *Recommended methods of measurement on receivers for television broadcast transmissions, Part 5: Electrical measurements on multichannel sound television receivers using the NICAM two-channel digital sound system*

IEC 268-1: 1985, *Sound system equipment – Part 1: General*

IEC 268-2: 1987, *Sound system equipment – Part 2: Explanation of general terms and calculation methods*

IEC 268-3: 1988, *Sound system equipment – Part 3: Amplifiers*

IEC 268-15: 1987, *Sound system equipment – Part 15: Preferred matching values for the interconnection of sound system components*

IEC 651: 1979, *Sound level meters*

IEC 958: 1989, *Digital audio interface*

IEC 1079-4: 1993, *Methods of measurement on receivers for satellite broadcast transmissions in the 12 GHz band – Part 4: Electrical measurements on sound/data decoder units for the digital subcarrier NTSC system*

IEC 1079-5: 1993, *Methods of measurement on receivers for satellite broadcast transmissions in the 12 GHz band – Part 5: Electrical measurements on decoder units for MAC/packet systems*

ISO 266: 1975, *Acoustics – Preferred frequencies for measurements*

2 Definitions, explanation of terms and abbreviations

2.1 Definitions

For the purpose of this International Standard the following definitions apply.

2.1.1 digital audio signal: Audio signal expressed as a series of digital data by sampling.

2.1.2 digital input word length: Maximum word length of audio data that can be applied to the EUT for which the least significant bit is not ignored.

2.1.3 sampling frequency (f_s): Sampling frequency of a digital audio signal is the rate at which the successive data samples corresponding to that channel are repeated (see IEC 958).

2.1.4 full-scale amplitude (FS): Largest positive and the largest negative digital coding values corresponding respectively to the largest positive and the largest negative values of a signal.

NOTES

1 For example a full-scale amplitude sine wave coded using 16 bit 2's complement has a negative peak at 8001_H and positive peak of 7FFF_H.

2 Depending on the relation between the sampling instants, and the signal frequency and phase, these peaks may not necessarily coincide with sampling instants and so may not correspond to any encoded data in the signal. The peak value of the signal needs to be determined by interpolation.

2.1.5 out of band: Frequency range from half the sampling frequency to 500 kHz.

2.2 Explanation of terms

2.2.1 Emphasis

Emphasis is a technique used to reduce the effects of noise and distortion in an audio system and is composed of two processes, pre-emphasis and de-emphasis. In pre-emphasis the frequency response of an analogue signal is changed before digital conversion by increasing the magnitudes of higher frequency components. De-emphasis is the reverse process restoring the original frequency characteristics of the system resulting in a reduction in the effect of quantization noise and distortion.