

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Audio and audiovisual equipment – Digital audio, part 2 – Basic measurement methods of audio characteristics – Part 2: Consumer use

Équipements audio et audiovisuels – Parties audionumériques – Méthodes fondamentales pour la mesure des caractéristiques audio – Partie 2: Utilisation grand public



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2021 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 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 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 It also gives information on projects, replaced and withdrawn publications.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 online collection - oc.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 22 000 terminological entries in English and French, with equivalent terms in 18 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 online collection - oc.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 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Audio and audiovisual equipment – Digital audio parts – Basic measurement methods of audio characteristics –
Part 2: Consumer use**

**Équipements audio et audiovisuels – Parties audionumériques – Méthodes fondamentales pour la mesure des caractéristiques audio –
Partie 2: Utilisation grand public**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.160.01

ISBN 978-2-8322-1006-3

**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.**

CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Terms, definitions, explanations and rated values	7
3.1 Terms and definitions	7
3.2 Explanation of terms “jitter”	8
3.3 Digital interface for measurement.....	8
3.4 Rated values	8
4 Measuring conditions.....	8
4.1 General	8
4.2 Environmental conditions	8
4.3 Power supply.....	8
4.4 Test signal frequencies	8
4.5 Standard setting	8
4.6 Preconditioning	9
4.7 Measuring instruments	9
4.7.1 General	9
4.7.2 Digital level meter.....	9
4.7.3 Distortion meter.....	9
4.7.4 Analogue weighting filter	10
4.7.5 Digital weighting filter	10
4.7.6 Digital spectrum analyzer	10
5 Methods of measurement (digital-in/analogue-out)	10
5.1 General	10
5.2 Input/output characteristics	10
5.2.1 Maximum output amplitude.....	10
5.2.2 Gain difference between channels.....	11
5.3 Frequency characteristics	11
5.3.1 Frequency response	11
5.3.2 Group delay (phase linearity).....	12
5.4 Noise characteristics	13
5.4.1 Signal-to-noise ratio	13
5.4.2 Dynamic range	13
5.4.3 Out-of-band noise ratio.....	14
5.4.4 Channel separation	15
5.5 Distortion characteristics	16
5.5.1 Level non-linearity	16
5.5.2 Distortion and noise.....	17
5.5.3 Intermodulation.....	17
6 Methods of measurement (analogue-in/digital-out)	18
6.1 General	18
6.2 Input/output characteristics	18
6.2.1 Analogue to digital level calibration	18
6.2.2 Maximum allowable input amplitude.....	20
6.2.3 Gain difference between channel and tracking error	21
6.3 Frequency characteristics.....	23

6.3.1	Frequency response	23
6.3.2	Group delay	24
6.4	Noise characteristics	25
6.4.1	Signal-to-noise ratio (idle channel noise)	25
6.4.2	Dynamic range	27
6.4.3	Folded noise	28
6.4.4	Cross-talk	29
6.4.5	Channel separation	31
6.5	Distortion characteristics	33
6.5.1	Level non-linearity	33
6.5.2	Distortion and noise	34
6.5.3	Intermodulation	35
Figure 1	– Connection diagram of equipment	11
Figure 2	– Connection diagram of equipment	11
Figure 3	– Connection diagram of equipment	12
Figure 4	– Connection diagram of equipment	13
Figure 5	– Connection diagram of equipment	14
Figure 6	– Connection diagram of equipment	14
Figure 7	– Connection diagram of equipment	15
Figure 8	– Connection diagram of equipment	16
Figure 9	– Connection diagram of equipment	17
Figure 10	– Connection diagram of equipment	17
Figure 11	– Connection diagram of equipment	18
Figure 12	– Connection diagram of equipment	19
Figure 13	– Connection diagram of equipment	20
Figure 14	– Connection diagram of equipment	20
Figure 15	– Connection diagram of equipment	21
Figure 16	– Connection diagram of equipment	22
Figure 17	– Connection diagram of equipment	23
Figure 18	– Connection diagram of equipment	23
Figure 19	– Connection diagram of equipment	24
Figure 20	– Connection diagram of equipment	24
Figure 21	– Connection diagram of equipment	25
Figure 22	– Connection diagram of equipment	26
Figure 23	– Connection diagram of equipment	27
Figure 24	– Connection diagram of equipment	27
Figure 25	– Connection diagram of equipment	28
Figure 26	– Connection diagram of equipment	28
Figure 27	– Connection diagram of equipment	30
Figure 28	– Connection diagram of equipment	30
Figure 29	– Connection diagram of equipment	31
Figure 30	– Connection diagram of equipment	32
Figure 31	– Connection diagram of equipment	33
Figure 32	– Connection diagram of equipment	33

Figure 33 – Connection diagram of equipment 34
Figure 34 – Connection diagram of equipment 34
Figure 35 – Connection diagram of equipment 35
Figure 36 – Connection diagram of equipment 36

Table 1 – Levels for measurement 16
Table 2 – Interfering frequency 29

Currently in preview, click buy full version

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUDIO AND AUDIOVISUAL EQUIPMENT –
DIGITAL AUDIO PARTS –
BASIC MEASUREMENT METHODS
OF AUDIO CHARACTERISTICS –****Part 2: Consumer 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 61606-2 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision.

The significant technical changes with respect to the first edition are the following:

- changed the period of preconditioning;
- add A weighting filter in measuring instruments;
- correct the wrong reference number;
- some inappropriate descriptions have been improved.

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

FDIS	Report on voting
100/1548/FDIS	100/1582/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 part is to be used in conjunction with IEC 61606-1, General.

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

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://www.pre.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.

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

Part 2: Consumer use

1 Scope

This part of IEC 61606 is applicable to the basic measurement methods of the audio characteristics of the digital audio part of audio and audiovisual equipment for consumer use.

The common measuring conditions and methods are described in IEC 61606-1. This International Standard specifies conditions and methods of measurement for consumer equipment are given in this standard.

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

IEC 60958 (all parts), *Digital audio interface*

IEC 61606-1:2009, *Audio and audiovisual equipment – Digital audio parts – Basic measurement methods of audio characteristics – Part 1: General*

IEC 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 61883-6, *Consumer audio/video equipment – Digital interface – Part 6: Audio and music data transmission protocols*

IEC 61938, *Audio, video and audiovisual systems – Interconnections and matching values – Preferred matching values of analogue signals*

3 Terms, definitions, explanations and rated values

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61606-1 as well as the following apply.

3.1.1

analogue full-scale amplitude

nominal signal level of an EUT corresponding to the digital full-scale level

NOTE In order to accommodate the EUT in an audio system, it is recommended that the analogue full scale amplitude has the value defined in IEC 61938. In the case of general purpose audio for consumer equipment, the amplitude is 2 V r.m.s.