

| | | |
|------------|--|--|
| STN | Rozhrania univerzálnej sériovej zbernice pre dáta a napájanie Časť 1-6: Spoločné súčasti Definícia triedy zariadenia USB Audio 3.0 Základné funkcie | STN EN IEC 62680-1-6 36 8365 |
|------------|--|--|

Universal serial bus interfaces for data and power - Part 1-6: Common components - USB Audio 3.0 device class definition basic functions

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. 02/20

Obsahuje: EN IEC 62680-1-6:2019, IEC 62680-1-6:2019

130283

EUROPEAN STANDARD

EN IEC 62680-1-6

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2019

ICS 33.120.20; 35.200; 29.200

English Version

Universal serial bus interfaces for data and power - Part 1-6:
Common components - USB Audio 3.0 device class definition
basic functions
(IEC 62680-1-6:2019)

Interfaces de bus universel en série pour les données et
l'alimentation électrique - Partie 1-6: Composants communs
- Définition de classes de dispositifs USB Audio 3.0 pour
fonctions de base
(IEC 62680-1-6:2019)

Schnittstellen des Universellen Seriellen Busses für Daten
und Energie - Teil 1-6: Gemeinsame Komponenten - USB
Audio 3.0 Geräteklassendefinition Grundfunktionen
(IEC 62680-1-6:2019)

This European Standard was approved by CENELEC on 2019-10-24. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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 62680-1-6:2019 (E)**European foreword**

The text of document 100/3158/CDV, future edition 1 of IEC 62680-1-6, 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 62680-1-6:2019.

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) 2020-07-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-10-24

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 62680-1-6:2019 was approved by CENELEC as a European Standard without any modification.



IEC 62680-1-6

Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Universal serial bus interfaces for data and power –
Part 1-6: Common components – USB Audio 3.0 device class definition basic
functions**

**Interfaces de bus universel en série pour les données et l'alimentation
électrique –
Partie 1-6: Composants communs – Définition de classes de dispositifs USB
Audio 3.0 pour fonctions de base**



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 1997-2016 USB-IF

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 IEC, or USB-IF at the respective address given below. Any questions about USB-IF copyright should be addressed to the USB-IF. Enquiries about obtaining additional rights to this publication and other information requests should be addressed to the IEC or your local IEC member National Committee.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

USB Implementers Forum, Inc.
3855 S.W. 153rd Drive
Beaverton, OR 97003
United States of America
Tel: +1 503-619-0426
admin@usb.org
www.usb.org

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.

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 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 62680-1-6

Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Universal serial bus interfaces for data and power –
Part 1-6: Common components – USB Audio 3.0 device class definition basic
functions**

**Interfaces de bus universel en série pour les données et l'alimentation
électrique –
Partie 1-6: Composants communs – Définition de classes de dispositifs USB
Audio 3.0 pour fonctions de base**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 35.200; 29.200; 33.120.20

ISBN 978-2-8322-7242-8

**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.**

INTERNATIONAL ELECTROTECHNICAL COMMISSION

UNIVERSAL SERIAL BUS INTERFACES FOR DATA AND POWER –

Part 1-6: Common components – USB Audio 3.0 device class definition basic functions

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 62680-1-6 has been prepared by technical area 18: Multimedia home systems and applications for end-user networks, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard was prepared by the USB Implementers Forum (USB-IF). The structure and editorial rules used in this publication reflect the practice of the organization which submitted it.

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

| CDV | Report on voting |
|--------------|------------------|
| 100/3158/CDV | 100/3228/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.

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.

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

The IEC 62680 series is based on a series of specifications that were originally developed by the USB Implementers Forum (USB-IF). These specifications were submitted to the IEC under the auspices of a special agreement between the IEC and the USB-IF.

This standard is the USB-IF publication USB Device Class Definition for Basic Audio Functions Release 3.0.

The USB Implementers Forum, Inc.(USB-IF) is a non-profit corporation founded by the group of companies that developed the Universal Serial Bus specification. The USB-IF was formed to provide a support organization and forum for the advancement and adoption of Universal Serial Bus technology. The Forum facilitates the development of high-quality compatible USB peripherals (devices), and promotes the benefits of USB and the quality of products that have passed compliance testing.

ANY USB SPECIFICATIONS ARE PROVIDED TO YOU "AS IS, "WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT, OR FITNESS FOR ANY PARTICULAR PURPOSE. THE USB IMPLEMENTERS FORUM AND THE AUTHORS OF ANY USB SPECIFICATIONS DISCLAIM ALL LIABILITY, INCLUDING LIABILITY FOR INFRINGEMENT OF ANY PROPRIETARY RIGHTS, RELATING TO USE OR IMPLEMENTATION OR INFORMATION IN THIS SPECIFICATION.

THE PROVISION OF ANY USB SPECIFICATIONS TO YOU DOES NOT PROVIDE YOU WITH ANY LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS.

Entering into USB Adopters Agreements may, however, allow a signing company to participate in a reciprocal, RAND-Z licensing arrangement for compliant products. For more information, please see:

<https://www.usb.org/documents>

IEC DOES NOT TAKE ANY POSITION AS TO WHETHER IT IS ADVISABLE FOR YOU TO ENTER INTO ANY USB ADOPTERS AGREEMENTS OR TO PARTICIPATE IN THE USB IMPLEMENTERS FORUM.”

UNIVERSAL SERIAL BUS DEVICE CLASS DEFINITION FOR BASIC AUDIO FUNCTIONS

Release 3.0

September 22, 2016

SCOPE OF THIS RELEASE

This document is the Release 3.0 of this specification.

CONTRIBUTORS

| | |
|----------------------------------|--|
| Joe Scanlon | Advanced Micro Devices |
| Rhoads Hollowell | Apple Inc. |
| Girault Jones | Apple Inc. |
| Matthew X. Mora | Apple Inc. |
| Tzung-Dar Tsai | C-Media Electronics, Inc. |
| Brad Lambert | Cirrus Logic, Inc. |
| Dan Bogard | Conexant Systems, Inc. |
| Pete Burgers | DisplayLink (UK), Ltd. |
| David Roh | Dolby Laboratories, Inc. |
| Leng Ooi | Google, Inc. |
| Pierre-Louis Bossart | Intel Corporation |
| David Hines | Intel Corporation |
| Abdul Rahman Ismail (Co-Chair) | Intel Corporation |
| Devon Worrell | Intel Corporation |
| Chandrashekar Rao | Logitech, Inc. |
| Terry Moore | MCCI Corporation |
| Alex Lin | MediaTek, Inc. |
| Bala Sivakumar | Microsoft Corporation |
| Geert Knapen (Co-Chair & Editor) | NXP Semiconductors PL Mobile Audio 411 E. Plumeria drive San Jose, CA 95134, USA Phone: +1 (408) 518-5514 E-mail: geert.knapen@nxp.com |
| James Goel | Qualcomm, Inc. |
| Andre Schevciw | Qualcomm, Inc. |
| Jin-Sheng Wang | Qualcomm, Inc. |
| Morten Christiansen | Synopsys |

REVISION HISTORY

| Rev. | Date | Filename | Description |
|------|-------------|-------------------------|-------------|
| 1.0 | Nov. 24, 09 | BasicAudioDevice-10.pdf | Release 1.0 |
| 3.0 | Sep. 22, 16 | BasicAudioDevice30.pdf | Release 3.0 |

**Copyright © 1997-2016 USB Implementers Forum, Inc.
All rights reserved.**

INTELLECTUAL PROPERTY DISCLAIMER

A LICENSE IS HEREBY GRANTED TO REPRODUCE THIS SPECIFICATION FOR INTERNAL USE ONLY. NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, IS GRANTED OR INTENDED HEREBY.

USB-IF AND THE AUTHORS OF THIS SPECIFICATION EXPRESSLY DISCLAIM ALL LIABILITY FOR INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS RELATING TO IMPLEMENTATION OF INFORMATION IN THIS SPECIFICATION. USB-IF AND THE AUTHORS OF THIS SPECIFICATION ALSO DO NOT WARRANT OR REPRESENT THAT SUCH IMPLEMENTATION(S) WILL NOT INFRINGE THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS.

THIS SPECIFICATION IS PROVIDED “AS IS” AND WITH NO WARRANTIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE. ALL WARRANTIES ARE EXPRESSLY DISCLAIMED. USB-IF, ITS MEMBERS AND THE AUTHORS OF THIS SPECIFICATION PROVIDE NO WARRANTY OF MERCHANTABILITY, NO WARRANTY OF NON-INFRINGEMENT, NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, AND NO WARRANTY ARISING OUT OF ANY PROPOSAL, SPECIFICATION, OR SAMPLE.

IN NO EVENT WILL USB-IF, MEMBERS OR THE AUTHORS BE LIABLE TO ANOTHER FOR THE COST OF PROCURING SUBSTITUTE GOODS OR SERVICES, LOST PROFITS, LOSS OF USE, LOSS OF DATA OR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, OR SPECIAL DAMAGES, WHETHER UNDER CONTRACT, TORT, WARRANTY, OR OTHERWISE, ARISING IN ANY WAY OUT OF THE USE OF THIS SPECIFICATION, WHETHER OR NOT SUCH PARTY HAD ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

NOTE: VARIOUS USB-IF MEMBERS PARTICIPATED IN THE DRAFTING OF THIS SPECIFICATION. CERTAIN OF THESE MEMBERS MAY HAVE DECLINED TO ENTER INTO A SPECIFIC AGREEMENT LICENSING INTELLECTUAL PROPERTY RIGHTS THAT MAY BE INFRINGED IN THE IMPLEMENTATION OF THIS SPECIFICATION. PERSONS IMPLEMENT THIS SPECIFICATION AT THEIR OWN RISK.

Dolby™, AC-3™, Pro Logic™ and Dolby Surround™ are trademarks of Dolby Laboratories, Inc.

All other product names are trademarks, registered trademarks, or service marks of their respective owners.

Please send comments via electronic mail to audio-chair@usb.org

TABLE OF CONTENTS

| | |
|--|----|
| Scope of This Release | 6 |
| Contributors | 6 |
| Revision History | 6 |
| Table of Contents | 8 |
| List of Tables | 10 |
| List of Figures | 11 |
| 1 Introduction | 12 |
| 1.1 Scope | 12 |
| 1.2 Purpose | 12 |
| 1.3 Related Documents | 12 |
| 1.4 Terms and Abbreviations | 12 |
| 2 Management Overview | 14 |
| 3 Classification | 15 |
| 4 General Requirements | 16 |
| 4.1 Host and Basic Audio Device Interoperability | 16 |
| 4.2 BADD AudioStreaming Interfaces | 16 |
| 4.2.1 USB Speeds | 16 |
| 4.2.2 Burst Modes | 16 |
| 4.2.3 Synchronization Type | 16 |
| 4.2.4 Sampling Frequency & Bit Depth | 16 |
| 4.2.5 Cluster Descriptors | 16 |
| 4.3 Power Considerations | 18 |
| 4.3.1 Power Domains | 18 |
| 5 Topologies | 19 |
| 5.1 BAOF Topology | 19 |
| 5.2 BAIF Topology | 19 |
| 5.3 BAIOF Topology | 20 |
| 6 Descriptors | 22 |
| 6.1 Standard Descriptors | 22 |
| 6.2 Interface Descriptors | 22 |
| 6.2.1 Interface Association Descriptor | 22 |
| 6.2.2 AudioControl Interface Descriptors | 22 |
| 6.2.3 AudioControl Endpoint Descriptors | 30 |
| 6.2.4 AudioStreaming Interface Descriptors | 30 |
| 6.3 String Descriptors | 34 |
| 7 Requests | 35 |
| 7.1.1 Standard Requests | 35 |
| 7.1.2 Class-specific Requests | 35 |
| 8 BADD Profiles | 37 |

| | | |
|-----|------------------------------|----|
| 8.1 | Generic I/O Profile..... | 37 |
| 8.2 | Headphone Profile | 38 |
| 8.3 | Speaker Profile | 39 |
| 8.4 | Microphone Profile | 40 |
| 8.5 | Headset Profile..... | 40 |
| 8.6 | Headset Adapter Profile..... | 41 |
| 8.7 | Speakerphone Profile..... | 42 |

LIST OF TABLES

| | |
|--|----|
| Table 4-1: Mono Cluster Descriptor | 17 |
| Table 4-2: Stereo Cluster Descriptor | 18 |
| Table 6-3: Interface Association Descriptor | 22 |
| Table 6-4: Standard AC Interface Descriptor | 23 |
| Table 6-5: Class-Specific AC Interface Header Descriptor | 23 |
| Table 6-6: Input Terminal ID1 Descriptor | 24 |
| Table 6-7: Input Terminal ID4 Descriptor | 24 |
| Table 6-8: Output Terminal ID3 Descriptor | 25 |
| Table 6-9: Output Terminal ID6 Descriptor | 25 |
| Table 6-10: Connectors Descriptor | 26 |
| Table 6-11: Connectors Descriptor | 26 |
| Table 6-12: Mixer Unit Descriptor | 27 |
| Table 6-13: Feature Unit ID2 Descriptor | 27 |
| Table 6-14: Feature Unit ID5 Descriptor | 28 |
| Table 6-15: Feature Unit ID7 Descriptor | 28 |
| Table 6-16: Clock Source Descriptor | 29 |
| Table 6-17: Power Domain ID10 Descriptor | 29 |
| Table 6-18: Power Domain ID11 Descriptor | 30 |
| Table 6-19: Standard AC Interrupt Endpoint Descriptor | 30 |
| Table 6-20: Standard AS Interface Descriptor (Alt. Set. 0) | 31 |
| Table 6-21: Standard AS Interface Descriptor | 31 |
| Table 6-22: Class-Specific AS Interface Descriptor | 32 |
| Table 6-23: Standard AS Isochronous Audio Data Endpoint Descriptor | 33 |
| Table 6-24: Class-Specific AS Isochronous Audio Data Endpoint Descriptor | 33 |
| Table 6-25: Standard AS Explicit Feedback Endpoint Descriptor | 33 |
| Table 8-26: Number of Channels | 37 |
| Table 8-27: Generic Profile Descriptor Variables | 38 |
| Table 8-28: Headphone Profile Descriptor Variables | 39 |
| Table 8-29: Speaker Profile Descriptor Variables | 39 |
| Table 8-30: Microphone Profile Descriptor Variables | 40 |
| Table 8-31: Headset Profile Descriptor Variables | 41 |
| Table 8-32: Headset Adapter Profile Descriptor Variables | 42 |
| Table 8-33: Speakerphone Profile Descriptor Variables | 43 |

LIST OF FIGURES

Figure 5-1: BAOF Topology 19
Figure 5-2: BAIF Topology..... 20
Figure 5-3: BAIOf Topology 21

1 INTRODUCTION

1.1 SCOPE

The *USB Audio Device Class Definition for Basic Audio Functions* applies to all USB Audio Functions that are based on the *Universal Serial Bus Device Class Definition for Audio Devices Release 3.0*. It defines baseline audio functionality for all ADC 3.0 compliant Hosts and Devices.

1.2 PURPOSE

The purpose of this specification is to create a higher level of interoperability among Hosts and Audio Devices. By establishing a set of essential audio features, users can expect a consistent experience, Device manufacturers have a solid template to follow, and Host drivers may be simplified.

1.3 RELATED DOCUMENTS

- *Universal Serial Bus Specification, Revision 2.0* (referred to in this document as the *USB Specification*). In particular, see Chapter 5, “USB Data Flow Model” and Chapter 9, “USB Device Framework.”
- *Universal Serial Bus 3.1 Specification, Revision 1.0* (referred to in this document as the *USB 3.1 Specification*). This document covers details specific to SuperSpeed and SuperSpeed+ devices.
- *Universal Serial Bus Device Class Definition for Audio Devices Release 3.0* (referred to in this document as Audio 3.0 Specification or ADC 3.0 in short).
- *Universal Serial Bus Device Class Definition for Audio Data Formats Release 3.0* (referred to in this document as Audio 3.0 Data Formats).
- *Universal Serial Bus Device Class Definition for Terminal Types Release 3.0* (referred to in this document as Audio 3.0 Terminal Types).
- Device Class Definition for Human Interface Devices (HID) Version 1.11. June 27, 2001.
- *HID Usage Tables* Version 1.12. October 28, 2004. Please visit www.usb.org for the latest additions to the HID Usage Tables.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN