

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Universal serial bus interfaces for data and power
Part 1-2: Common components – USB Power Delivery specification

Interfaces de bus universel en série pour les données et l'alimentation électrique
Partie 1-2: Composants communs – Spécification de l'alimentation électrique
par port USB



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 It also gives information on projects, replaced and withdrawn publications.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.



IEC 62680-1-2

Edition 5.0 2021-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Universal serial bus interfaces for data and power
Part 1-2: Common components – USB Power Delivery specification

Interfaces de bus universel en série pour les données et l'alimentation électrique
Partie 1-2: Composants communs – Spécification de l'alimentation électrique
par port USB

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.220; 33.120; 35.200

ISBN 978-2-8322-9288-4

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 1-2: Common components – USB Power Delivery specification

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 62680-1-2 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
100/3440/CDV	100/3505/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.

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 document 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 62680-1-2:2021](https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021)

<https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021>

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 Universal Serial Bus Power Delivery Specification Revision 3.0, Version 2.0.

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 Power Delivery Specification

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Revision:

3.0

[IEC 62680-1-2:2021](#)

Version:

2.0

<https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021>

Release date:

29 August 2019

LIMITED COPYRIGHT LICENSE

THE USB 3.0 PROMOTERS GRANT A CONDITIONAL COPYRIGHT LICENSE UNDER THE COPYRIGHTS EMBODIED IN THE USB POWER DELIVERY SPECIFICATION TO USE AND REPRODUCE THE SPECIFICATION FOR THE SOLE PURPOSE OF, AND SOLELY TO THE EXTENT NECESSARY FOR, EVALUATING WHETHER TO IMPLEMENT THE SPECIFICATION IN PRODUCTS THAT WOULD COMPLY WITH THE SPECIFICATION. WITHOUT LIMITING THE FOREGOING, USE THE OF SPECIFICATION FOR THE PURPOSE OF FILING OR MODIFYING ANY PATENT APPLICATION TO TARGET THE SPECIFICATION OR USB COMPLIANT PRODUCTS IS NOT AUTHORIZED. EXCEPT FOR THIS EXPRESS COPYRIGHT LICENSE, NO OTHER RIGHTS OR LICENSES ARE GRANTED, INCLUDING WITHOUT LIMITATION ANY PATENT LICENSES. IN ORDER TO OBTAIN ANY ADDITIONAL INTELLECTUAL PROPERTY LICENSES OR LICENSING COMMITMENTS ASSOCIATED WITH THE SPECIFICATION A PARTY MUST EXECUTE THE USB 3.0 ADOPTERS AGREEMENT. NOTE: BY USING THE SPECIFICATION, YOU ACCEPT THESE LICENSE TERMS ON YOUR OWN BEHALF AND, IN THE CASE WHERE YOU ARE DOING THIS AS AN EMPLOYEE, ON BEHALF OF YOUR EMPLOYER.

INTELLECTUAL PROPERTY DISCLAIMER

THIS SPECIFICATION IS PROVIDED TO YOU “AS IS” WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT, OR FITNESS FOR ANY PARTICULAR PURPOSE. THE AUTHORS OF THIS SPECIFICATION DISCLAIM ALL LIABILITY, INCLUDING LIABILITY FOR INFRINGEMENT OF ANY PROPRIETARY RIGHTS, RELATING TO USE OR IMPLEMENTATION OF INFORMATION IN THIS SPECIFICATION. THE PROVISION OF THIS SPECIFICATION TO YOU DOES NOT PROVIDE YOU WITH ANY LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS.

Please send comments via electronic mail to techsup@usb.org

For industry information, refer to the USB Implementers Forum web page at <http://www.usb.org>

USB Type-C® and USB4™ are trademarks of the Universal Serial Bus Implementers Forum (USB-IF).

Thunderbolt™ is a trademark of Intel Corporation.

You may only use the Thunderbolt™ trademark or logo in conjunction with products designed to this specification that complete proper certification and executing a Thunderbolt™ trademark license – see <http://usb.org/compliance> for further information.

All product names are trademarks, registered trademarks, or service marks of their respective owners. Copyright © 2010-2019, USB 3.0 Promoter Group: Apple Inc., Hewlett-Packard Inc., Intel Corporation, Microsoft Corporation, Renesas, STMicroelectronics, and Texas Instruments.

All rights reserved.

Chairs

Alvin Cox	Cabling Sub-Chair
Bob Dunstan	Specification Chair/Protocol Subgroup Chair
Deric Waters	PHY Chair
Ed Berrios	Power Supply Chair
Rahman Ismail	System Policy Chair
Richard Petrie	Specification Chair/Device Policy Chair

Editors

Bob Dunstan
Richard Petrie

Contributors

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 62680-1-2:2021](https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021)
<https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021>

Charles Wang	ACON, Advanced-Connectek, Inc.	Jie min	Cadence Design Systems, Inc.
Conrad Choy	ACON, Advanced-Connectek, Inc.	Mark Summers	Cadence Design Systems, Inc.
Dennis Chuang	ACON, Advanced-Connectek, Inc.	Michal Staworko	Cadence Design Systems, Inc.
Steve Sedio	ACON, Advanced-Connectek, Inc.	Sathish Kumar Ganesan	Cadence Design Systems, Inc.
Sunney Yang	ACON, Advanced-Connectek, Inc.	Alessandro Ingrassia	Canova Tech
Vicky Chuang	ACON, Advanced-Connectek, Inc.	Andrea Colognese	Canova Tech
Joseph Scanlon	Advanced Micro Devices	Antonio Orzelli	Canova Tech
Caspar Lin	Allion Labs, Inc.	Davide Ghedin	Canova Tech
Casper Lee	Allion Labs, Inc.	Matteo Casalin	Canova Tech
Danny Shih	Allion Labs, Inc.	Michael Marioli	Canova Tech
Howard Chang	Allion Labs, Inc.	Nicola Scantamburlo	Canova Tech
Greg Stewart	Analogix Semiconductor, Inc.	Paolo Pilla	Canova Tech
Mehran Badii	Analogix Semiconductor, Inc.	Yi-Feng Lin	Canyon Semiconductor
Alexei Kosut	Apple	YuHung Lin	Canyon Semiconductor
Bill Cornelius	Apple	David Tsai	Chrontel, Inc.
Carlos Colderon	Apple	Anshul Gulati	Cypress Semiconductor
Chris Uiterwijk	Apple	Anup Nayak	Cypress Semiconductor
Colin Whitby-Stevens	Apple	Benjamin Kropf	Cypress Semiconductor
Corey Axelowitz	Apple	Dhanraj Rajput	Cypress Semiconductor
Corey Lange	Apple	Ganesh Subramaniam	Cypress Semiconductor
Dave Conroy	Apple	Jagadeesan Raj	Cypress Semiconductor
David Sekowski	Apple	Junjie cui	Cypress Semiconductor
Girault Jones	Apple	Manu Kumar	Cypress Semiconductor
James Orr	Apple	Muthu M	Cypress Semiconductor
Jason Chung	Apple	Nicholas Bodnaruk	Cypress Semiconductor
Jay Kim	Apple	Pradeep Bajpai	Cypress Semiconductor
Jeff Wilcox	Apple	Rajaram R	Cypress Semiconductor
Jennifer Tsai	Apple	Rama Vakkantula	Cypress Semiconductor
Karl Bowers	Apple	Rushil Kadakia	Cypress Semiconductor
Keith Porthouse	Apple	Simon Nguyen	Cypress Semiconductor
Kevin Hsiue	Apple	Steven Wong	Cypress Semiconductor
Matt Mora	Apple	Subu Sankaran	Cypress Semiconductor
Paul Baker	Apple	Sumeet Gupta	Cypress Semiconductor
Reese Schreiber	Apple	Tejender Sheoran	Cypress Semiconductor
Ruchi Chaturvedi	Apple	Venkat Mandagulathar	Cypress Semiconductor
Sameer Kelkar	Apple	Xiaofeng Shen	Cypress Semiconductor
Sasha Tietz	Apple	Zeng Wei	Cypress Semiconductor
Scott Jackson	Apple	Adie Tan	Dell Inc.
Sree Raman	Apple	Adolfo Montero	Dell Inc.
William Ferry	Apple	Bruce Montag	Dell Inc.
Zaki Moussaoui	Apple	Gary Verdun	Dell Inc.
Jeff Liu	ASMedia Technology Inc.	Marcin Nowak	Dell Inc.
Kuo Lung Li	ASMedia Technology Inc.	Merle Wood	Dell Inc.
Ming-Wei Hsu	ASMedia Technology Inc.	Mohammed Hijazi	Dell Inc.
PS Tseng	ASMedia Technology Inc.	Siddhartha Reddy	Dell Inc.
Sam Tzeng	ASMedia Technology Inc.	Bindhu Vasu	Dialog Semiconductor (UK) Ltd
Thomas Hsu	ASMedia Technology Inc.	Chanchal Gupta	Dialog Semiconductor (UK) Ltd
Weikao Chang	ASMedia Technology Inc.	Dipti Baheti	Dialog Semiconductor (UK) Ltd
Yang Cheng	ASMedia Technology Inc.	Duc Doan	Dialog Semiconductor (UK) Ltd
Shawn Meng	Bizlink Technology Inc.	Holger Petersen	Dialog Semiconductor (UK) Ltd
Bernard Shyu	Bizlink Technology, Inc.	Jianming Yao	Dialog Semiconductor (UK) Ltd
Eric Wu	Bizlink Technology, Inc.	John Shi	Dialog Semiconductor (UK) Ltd
Morphy Hsieh	Bizlink Technology, Inc.	KE Hong	Dialog Semiconductor (UK) Ltd
Sean O'Neal	Bizlink Technology, Inc.	Kevin Mori	Dialog Semiconductor (UK) Ltd
Tiffany Hsiao	Bizlink Technology, Inc.	Larry Ping	Dialog Semiconductor (UK) Ltd
Weichung Ooi	Bizlink Technology, Inc.	Mengfei Liu	Dialog Semiconductor (UK) Ltd
Rahul Bhushan	Broadcom Corp.	Scott Brown	Dialog Semiconductor (UK) Ltd
Asila nahas	Cadence Design Systems, Inc.	Yimin Chen	Dialog Semiconductor (UK) Ltd
Claire Ying	Cadence Design Systems, Inc.	Yong Li	Dialog Semiconductor (UK) Ltd

Dan Ellis	DisplayLink (UK) Ltd.	Alan Berkema	Hewlett Packard
Jason Young	DisplayLink (UK) Ltd.	Lee Atkinson	Hewlett Packard
Kevin Jacobs	DisplayLink (UK) Ltd.	Rahul Lakdawala	Hewlett Packard
Paulo Alcobia	DisplayLink (UK) Ltd.	Robin Castell	Hewlett Packard
Peter Burgers	DisplayLink (UK) Ltd.	Roger Benson	Hewlett Packard
Richard Petrie	DisplayLink (UK) Ltd.	Ron Schooley	Hewlett Packard
Abel Astley	Ellisys	Hideyuki HAYAFUJI	Hosiden Corporation
Chuck Trefts	Ellisys	Keiji Mine	Hosiden Corporation
Emmanuel Durin	Ellisys	Masaki YAMAOKA	Hosiden Corporation
Mario Pasquali	Ellisys	Takashi MUTO	Hosiden Corporation
Tim Wei	Ellisys	Yasunori NISHIKAWA	Hosiden Corporation
Chien-Cheng Kuo	Etron Technology, Inc.	Kenneth Chan	HP Inc.
Jack Yang	Etron Technology, Inc.	Lee Atkinson	HP Inc.
Richard Crisp	Etron Technology, Inc.	Steve Chen	HP Inc.
Shyanjia Chen	Etron Technology, Inc.	Suketu Partiwalla	HP Inc.
TsungTa Lu	Etron Technology, Inc.	Suketu Partiwalla	HP Inc.
Christian Klein	Fairchild Semiconductor	Vaibhav Malik	HP Inc.
Oscar Freitas	Fairchild Semiconductor	Walter Fry	HP Inc.
Souhib Harb	Fairchild Semiconductor	Bai Sean	Huawei Technologies Co., Ltd.
Amanda Ying	Feature Integration Technology Inc.	Chunjiang Zhao	Huawei Technologies Co., Ltd.
Jacky Chan	Feature Integration Technology Inc.	JianQuan Wu	Huawei Technologies Co., Ltd.
Kenny Hsieh	Feature Integration Technology Inc.	Li Zongjian	Huawei Technologies Co., Ltd.
KungAn Lin	Feature Integration Technology Inc.	Lihua Duan	Huawei Technologies Co., Ltd.
Paul Yang	Feature Integration Technology Inc.	Min Chen	Huawei Technologies Co., Ltd.
su Jaden	Feature Integration Technology Inc.	Wang Feng	Huawei Technologies Co., Ltd.
Yu-Lin Chu	Feature Integration Technology Inc.	Wei Hailong	Huawei Technologies Co., Ltd.
Yulin Lan	Feature Integration Technology Inc.	Robert Heaton	Indie Semiconductor
AJ Yang	Foxconn / Hon Hai	Vincent Wang	Indie Semiconductor
Bob Hall	Foxconn / Hon Hai	Sie Boo Chiang	Infineon Technologies
Fred Fons	Foxconn / Hon Hai	Tue Fatt David Wee	Infineon Technologies
Jie zheng	Foxconn / Hon Hai	Wee Tai Richard Ng	Infineon Technologies
Patrick Cashier	Foxconn / Hon Hai	Wolfgang Pürtnier	Infineon Technologies
Steve Sedio	Foxconn / Hon Hai	Bob Dunstan	Intel Corporation
Terry Little	Foxconn / Hon Hai	Brad Saunders	Intel Corporation
Bob McVay	Fresco Logic Inc.	Chee Lim Nge	Intel Corporation
Christopher Meyers	Fresco Logic Inc.	Christine Krause	Intel Corporation
Dian Kurniawan	Fresco Logic Inc.	Dan Froelich	Intel Corporation
Tom Burton	Fresco Logic Inc.	David Harriman	Intel Corporation
Adam Rodriguez	Google Inc.	David Hines	Intel Corporation
Alec Berg	Google Inc.	David Thompson	Intel Corporation
Dave Bernard	Google Inc.	Guobin Liu	Intel Corporation
David Schneider	Google Inc.	Harry Skinner	Intel Corporation
Jim Guerin	Google Inc.	Henrik Leegaard	Intel Corporation
Juan Fantin	Google Inc.	Jenn Chuan Cheng	Intel Corporation
Ken Wu	Google Inc.	Jervis Lin	Intel Corporation
Mark Hayter	Google Inc.	John Howard	Intel Corporation
Nithya Jagannathan	Google Inc.	Karthi Vadivelu	Intel Corporation
Srikanth Lakshmikanthan	Google Inc.	Leo Heiland	Intel Corporation
Todd Broch	Google Inc.	Maarit Harkonen	Intel Corporation
Toshak Singhal	Google Inc.	Nge Chee Lim	Intel Corporation
Vincent Palatin	Google Inc.	Paul Durley	Intel Corporation
Xuelin Wu	Google Inc.	Rahman Ismail	Intel Corporation
Alan Kinningham	Granite River Labs	Rajaram Regupathy	Intel Corporation
Balamurugan Manialagan	Granite River Labs	Ronald Swartz	Intel Corporation
Mike Engbretson	Granite River Labs	Sarah Sharp	Intel Corporation
Mike Wu	Granite River Labs	Scott Brenden	Intel Corporation
Mukesh Tatiya	Granite River Labs	Sridharan Ranganathan	Intel Corporation
Rajaraman V	Granite River Labs	Steve McGowan	Intel Corporation
Tim Lin	Granite River Labs	Tim McKee	Intel Corporation

Toby Opferman	Intel Corporation	Mark Bohm	Microchip Technology Inc.
Ziv Kabiry	Intel Corporation	Matthew Kalibat	Microchip Technology Inc.
Jia Wei	Intersil Corporation	Mick Davis	Microchip Technology Inc.
Al Hsiao	ITE Tech. Inc.	Prasanna Vengateshan	Microchip Technology Inc.
Greg Song	ITE Tech. Inc.	Rich Wahler	Microchip Technology Inc.
Richard Guo	ITE Tech. Inc.	Richard Petrie	Microchip Technology Inc.
Victor Lin	ITE Tech. Inc.	Ronald Kunin	Microchip Technology Inc.
Y.C. Chou	ITE Tech. Inc.	Shannon Cash	Microchip Technology Inc.
Kenta Minejima	Japan Aviation Electronics Industry Ltd. (JAE)	Thomas Farkas	Microchip Technology Inc.
Mark Saubert	Japan Aviation Electronics Industry Ltd. (JAE)	Andrew Yang	Microsoft Corporation
Toshio Shimoyama	Japan Aviation Electronics Industry Ltd. (JAE)	Anthony Chen	Microsoft Corporation
Brian Fetz	Keysight Technologies Inc.	Arvind Murching	Microsoft Corporation
Jit Lim	Keysight Technologies Inc.	Dave Perchlik	Microsoft Corporation
Babu Mailachalam	Lattice Semiconductor Corp	David Voth	Microsoft Corporation
Gianluca Mariani	Lattice Semiconductor Corp	Geoff Shew	Microsoft Corporation
Joel Coplen	Lattice Semiconductor Corp	Jayson Kastens	Microsoft Corporation
Thomas Watza	Lattice Semiconductor Corp	Kai Inha	Microsoft Corporation
Vesa Lauri	Lattice Semiconductor Corp	Marwan Kadado	Microsoft Corporation
Keneth Kim	LG electronics	Michelle Bergeron	Microsoft Corporation
Bruce Chuang	Leadtrend	Rahul Ramadas	Microsoft Corporation
Eilian Liu	Leadtrend	Randy Aull	Microsoft Corporation
Daniel H Jacobs	LeCroy Corporation	Shiu Ng	Microsoft Corporation
Jake Jacobs	LeCroy Corporation	Timo Toivola	Microsoft Corporation
Kimberley McKay	LeCroy Corporation	Toby Nixon	Microsoft Corporation
Mike Micheletti	LeCroy Corporation	Vivek Gupta	Microsoft Corporation
Roy Chestnut	LeCroy Corporation	Yang You	Microsoft Corporation
Tyler Joe	LeCroy Corporation	Adib Al Abaji	Molex LLC
Phil Jakes	Lenovo	Aaron Xu	Monolithic Power Systems Inc.
Aaron Melgar	Lion Semiconductor	Bo Zhou	Monolithic Power Systems Inc.
Chris Zhou	Lion Semiconductor	Christian Sporck	Monolithic Power Systems Inc.
Sehyung Jeon	Lion Semiconductor	Di Han	Monolithic Power Systems Inc.
Wonyoung Kim	Lion Semiconductor	Zhihong Yu	Monolithic Power Systems Inc.
Yongho Kim	Lion Semiconductor	Dan Wagner	Motorola Mobility Inc.
Dave Thompson	LSI Corporation	Ben Crowe	MQP Electronics Ltd.
Alan Kinningham	Luxshare-ICT	Pat Crowe	MQP Electronics Ltd.
Daniel Chen	Luxshare-ICT	Sten Carlsen	MQP Electronics Ltd.
Eric Wen	Luxshare-ICT	Kenji Oguma	NEC Corporation
James Stevens	Luxshare-ICT	Frank Borngräber	Nokia Corporation
Josue Castillo	Luxshare-ICT	Kai Inha	Nokia Corporation
Pat Young	Luxshare-ICT	Pekka Leinonen	Nokia Corporation
Scott Shuey	Luxshare-ICT	Richard Petrie	Nokia Corporation
Chikara Kakizawa	Maxim Integrated Products	Sten Carlsen	Nokia Corporation
Jacob Scott	Maxim Integrated Products	Abhijeet Kulkarni	NXP Semiconductors
Ken Helfrich	Maxim Integrated Products	Ahmad Yazdi	NXP Semiconductors
Michael Miskho	Maxim Integrated Products	Bart Vertenten	NXP Semiconductors
Chris Yokum	MCCI Corporation	Dennis Ha	NXP Semiconductors
Geert Knapen	MCCI Corporation	Dong Nguyen	NXP Semiconductors
Terry Moore	MCCI Corporation	Guru Prasad	NXP Semiconductors
Velmurugan Selvaraj	MCCI Corporation	Ken Jaramillo	NXP Semiconductors
Satoru Kumashiro	MegaChips Corporation	Krishnan TN	NXP Semiconductors
Brian Marley	Microchip Technology Inc.	Michael Joehren	NXP Semiconductors
Dave Perchlik	Microchip Technology Inc.	Robert de Nie	NXP Semiconductors
Don Perkins	Microchip Technology Inc.	Rod Whitby	NXP Semiconductors
Fernando Gonzalez	Microchip Technology Inc.	Vijendra Kuroodi	NXP Semiconductors
John Sisto	Microchip Technology Inc.	Winston Langeslag	NXP Semiconductors
Josh Averyt	Microchip Technology Inc.	Robert Heaton	Obsidian Technology
Kiet Tran	Microchip Technology Inc.	Andrew Yoo	ON Semiconductor
		Brady Maasen	ON Semiconductor
		Bryan McCoy	ON Semiconductor

© USB 3.0 Promoter Group: 2010-2019

Christian Klein	ON Semiconductor	Matti Kulmala	Salcomp Plc
Cor Voorwinden	ON Semiconductor	Toni Lehimo	Salcomp Plc
Edward Berrios	ON Semiconductor	Tong Kim	Samsung Electronics Co. Ltd.
Michael Smith	ON Semiconductor	Alvin Cox	Seagate Technology LLC
Oscar Freitas	ON Semiconductor	Emmanuel Lemay	Seagate Technology LLC
Tom Duffy	ON Semiconductor	John Hein	Seagate Technology LLC
Craig Wiley	Parade Technologies Inc.	Marc Noblitt	Seagate Technology LLC
Aditya Kulkarni	Power Integrations	Michael Morgan	Seagate Technology LLC
Amruta Patra	Power Integrations	Ronald Rueckert	Seagate Technology LLC
Rahul Joshi	Power Integrations	Tony Priborsky	Seagate Technology LLC
Ricardo Pregiteer	Power Integrations	Chin Chang	Semtech Corporation
Shruti Anand	Power Integrations	Tom Farkas	Semtech Corporation
Amit Gupta	Qualcomm, Inc	Ning Dai	Silergy Corp.
George Paparrrizos	Qualcomm, Inc	Wanfeng Zhang	Silergy Corp.
Giovanni Garcea	Qualcomm, Inc	Kafai Leung	Silicon Laboratories, Inc.
Jack Pham	Qualcomm, Inc	Kok Hong Soh	Silicon Laboratories, Inc.
James Goel	Qualcomm, Inc	Sorin Badiu	Silicon Laboratories, Inc.
Joshua Warner	Qualcomm, Inc	Steven Ghang	Silicon Laboratories, Inc.
Karyn Vuong	Qualcomm, Inc	Abhishek Sardeshpande	SiliConch Systems Private Limited
Lalan Mishra	Qualcomm, Inc	Aniket Mathad	SiliConch Systems Private Limited
Vamsi Samavedam	Qualcomm, Inc	Chandana N	SiliConch Systems Private Limited
Vatsal Patel	Qualcomm, Inc	Jaswanth Ammineni	SiliConch Systems Private Limited
Chris Sporck	Qualcomm, Inc.	Jinisha Patel	SiliConch Systems Private Limited
Craig Aiken	Qualcomm, Inc.	Kaustubh Kumar	SiliConch Systems Private Limited
Narendra Mehta	Qualcomm, Inc.	Nitish Nitish	SiliConch Systems Private Limited
Terry Remple	Qualcomm, Inc.	Pavitra Balasubramanian	SiliConch Systems Private Limited
Will Kun	Qualcomm, Inc.	Rakesh Polasa	SiliConch Systems Private Limited
Yoram Rimoni	Qualcomm, Inc.	Satish Anand Verkila	SiliConch Systems Private Limited
Fan-Hau Hsu	Realtek Semiconductor Corp.	Shubham Paliwal	SiliConch Systems Private Limited
Tsung-Peng Chuang	Realtek Semiconductor Corp.	Vishnu Pusuluri	SiliConch Systems Private Limited
Atsushi Mitamura	Renesas Electronics Corp.	John Sisto	SMSC
Bob Dunstan	Renesas Electronics Corp.	Ken Gay	SMSC
Brian Allen	Renesas Electronics Corp.	Mark Bohm	SMSC
Dan Aoki	Renesas Electronics Corp.	Richard Wahler	SMSC
Hajime Nozaki	Renesas Electronics Corp.	Shannon Cash	SMSC
John Carpenter	Renesas Electronics Corp.	Tim Knowlton	SMSC
Kiichi Muto	Renesas Electronics Corp.	William Chiechi	SMSC
Masami Katagiri	Renesas Electronics Corp.	Shigenori Tagami	Sony Corporation
Nobuo Furuya	Renesas Electronics Corp.	Shinichi Hirata	Sony Corporation
Patrick Yu	Renesas Electronics Corp.	Amanda Hosler	Specwerkz
Peter Teng	Renesas Electronics Corp.	Bob Dunstan	Specwerkz
Philip Leung	Renesas Electronics Corp.	Diane Lenox	Specwerkz
Steve Roux	Renesas Electronics Corp.	Michael Munn	StarTech.com Ltd.
Tetsu Sato	Renesas Electronics Corp.	Fabien Friess	ST-Ericsson
Toshifumi Yamaoka	Renesas Electronics Corp.	Giuseppe Platania	ST-Ericsson
Chunan Kuo	Richtek Technology Corporation	Jean-Francois Gatto	ST-Ericsson
Heinz Wei	Richtek Technology Corporation	Milan Stamenkovic	ST-Ericsson
TZUHSIEN CHUANG	Richtek Technology Corporation	Nicolas Florenchie	ST-Ericsson
Tatsuya Irisawa	Ricoh Company Ltd.	Patrizia Milazzo	ST-Ericsson
Akihiro Ono	Rohm Co. Ltd.	Christophe Cochard	STMicroelectronics
Chris Lin	Rohm Co. Ltd.	Christophe Lorin	STMicroelectronics
Hidenori Nishimoto	Rohm Co. Ltd.	Filippo Bonaccorso	STMicroelectronics
Kris Bahar	Rohm Co. Ltd.	Jessy Guilbot	STMicroelectronics
Manabu Miyata	Rohm Co. Ltd.	Joel Huloux	STMicroelectronics
Ruben Balbuena	Rohm Co. Ltd.	John Bloomfield	STMicroelectronics
Takashi Sato	Rohm Co. Ltd.	Massimo Panzica	STMicroelectronics
Vijendra Kuroodi	Rohm Co. Ltd.	Meriem Mersel	STMicroelectronics
Yusuke Kondo	Rohm Co. Ltd.	Nathalie Ballot	STMicroelectronics
Kazuomi Nagai	ROHM Co., Ltd.	Pascal Legrand	STMicroelectronics

Patrizia Milazzo	STMicroelectronics
Richard O'Connor	STMicroelectronics
Morten Christiansen	Synopsys, Inc.
Nivin George	Synopsys, Inc.
Zongyao Wen	Synopsys, Inc.
Joan Marrinan	Tektronix
Kimberley McKay	Teledyne-LeCroy
Matthew Dunn	Teledyne-LeCroy
Tony Minchell	Teledyne-LeCroy
Anand Dabak	Texas Instruments
Bill Waters	Texas Instruments
Bing Lu	Texas Instruments
Deric Waters	Texas Instruments
Grant Ley	Texas Instruments
Gregory Watkins	Texas Instruments
Ingolf Frank	Texas Instruments
Ivo Huber	Texas Instruments
Javed Ahmad	Texas Instruments
Jean Picard	Texas Instruments
John Perry	Texas Instruments
Martin Patoka	Texas Instruments
Mike Campbell	Texas Instruments
Scott Jackson	Texas Instruments
Shafiuddin Mohammed	Texas Instruments
Srinath Hosur	Texas Instruments
Steven Tom	Texas Instruments
Yoon Lee	Texas Instruments
Tim Wilhelm	The Silanna Group Pty. Ltd.
Tod Wolf	The Silanna Group Pty. Ltd.
Chris Yokum	Total Phase
Brad Cox	Ventev Mobile
Colin Vose	Ventev Mobile
Dydron Lin	VIA Technologies, Inc.
Fong-Jim Wang	VIA Technologies, Inc.
Jay Tseng	VIA Technologies, Inc.
Rex Chang	VIA Technologies, Inc.
Terrance Shih	VIA Technologies, Inc.
Ho Wen Tsai	Weltrend Semiconductor
Hung Chiang	Weltrend Semiconductor
Jeng Cheng Liu	Weltrend Semiconductor
Priscilla Lee	Weltrend Semiconductor
Wayne Lo	Weltrend Semiconductor
Charles Neumann	Western Digital Technologies, Inc.
Curtis Stevens	Western Digital Technologies, Inc.
John Maroney	Western Digital Technologies, Inc.
Joe O'Brien	Wilder Technologies
Will Miller	Wilder Technologies
Juejia Zhou	Xiaomi Communications Co., Ltd.
Xiaoxing Yang	Xiaomi Communications Co., Ltd.

IEC STANDARD PREVIEW
 (standards.iteh.ai)
 IEC 62680-1-2:2021
<http://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-92326f1/iec-62680-1-2-2021>

Revision History

Revision	Version	Comments	Issue Date
1.0	1.0	Initial release Revision 1.0	5 July, 2012
1.0	1.1	Including errata through 31-October-2012	31 October 2012
1.0	1.2	Including errata through 26-June-2013	26 June, 2013
1.0	1.3	Including errata through 11-March-2014	11 March 2014
2.0	1.0	Initial release Revision 2.0	11 August 2014
2.0	1.1	Including errata through 7-May 2015	7 May 2015
2.0	1.2	Including errata through 25-March-2016	25 March 2016
2.0	1.3	Including errata through 11-January-2017	11 January 2017
3.0	1.0	Initial release Revision 3.0	11 December 2015
3.0	1.0a	Including errata through 25-March-2016	25 March 2016
3.0	1.1	Including errata through 12-January-2016	12 January 2017
3.0	1.2	Including errata through 21-June-2018	21 June 2018
3.0	2.0	Including errata through 29-August-2019	29 August 2019

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 62680-1-2:2021](https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021)

<https://standards.iteh.ai/catalog/standards/sist/d19fc41c-5ad8-477f-8f4d-672dd92326f1/iec-62680-1-2-2021>