

INTERNATIONAL STANDARD



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



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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This third edition cancels and replaces the second edition published in 2017 and constitutes a technical revision.

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

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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.

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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 Power Delivery Specification Revision 3.0 V.1.1 and ECNs through 12 June 2017.

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Editors

Bob Dunstan Renesas Electronics Corp.
Richard Petrie DisplayLink

Contributors

Charles Wang ACON, Advanced-Connectek, Inc.
Conrad Choy ACON, Advanced-Connectek, Inc.
Steve Sedio ACON, Advanced-Connectek, Inc.
Vicky Chuang ACON, Advanced-Connectek, Inc.
Joseph Scanlon Advanced Micro Devices
Casper Lin Allion Labs, Inc.
Casper Lee Allion Labs, Inc.
Howard Chang Allion Labs, Inc.
Greg Stewart Analogix Semiconductor, Inc.
Mehran Badii Analogix Semiconductor, Inc.
Bill Cornelius Apple
Colin Whitby-Strevens Apple
Corey Axelowitz Apple
Corey Lange Apple
Dave Conroy Apple
David Sekowski Apple
Girault Jones Apple
James Orr Apple
Jason Chung Apple
Jennifer Tsai Apple
Karl Bowers Apple
Keith Porthouse Apple
Matt Mora Apple
Paul Baker Apple
Reese Schreiber Apple
Sameer Kelkar Apple
Sasha Tietz Apple
Scott Jackson Apple
Sree Raman Apple
William Ferry Apple
Zaki Moussaoui Apple
Bernard Snyders Bizlink Technology, Inc.
Eric Wang Bizlink Technology, Inc.
Mehmet N. D. Bizlink Technology, Inc.
Shawn Meng Bizlink Technology Inc.
Tiffany Hsiao Bizlink Technology, Inc.
Weichung Ooi Bizlink Technology, Inc.
Michal Staworko Cadence Design Systems, Inc.

Alessandro Ingrassia	Canova Tech
Andrea Cognese	Canova Tech
Davide Ghedin	Canova Tech
Matteo Casalin	Canova Tech
Nicola Scantamburlo	Canova Tech
Yi-Feng Lin	Canyon Semiconductor
YuHung Lin	Canyon Semiconductor
Anup Nayak	Cypress Semiconductor
Jagadeesan Raj	Cypress Semiconductor
Pradeep Bajpai	Cypress Semiconductor
Rushil Kadakia	Cypress Semiconductor
Steven Wong	Cypress Semiconductor
Subu Sankaran	Cypress Semiconductor
Sumeet Gupta	Cypress Semiconductor
Venkat Mandagulathar	Cypress Semiconductor
Adolfo Montero	Dell Inc.
Bruce Montag	Dell Inc.
Gary Verdun	Dell Inc.
Merle Wood	Dell Inc.
Mohammed Hijazi	Dell Inc.
Siddhartha Reddy	Dell Inc.
Dan Ellis	DisplayLink
Jason Young	DisplayLink
Kevin Jacobs	DisplayLink
Peter Burgers	DisplayLink
Richard Petrie	DisplayLink
Abel Astley	Ellisys
Chuck Trefts	Ellisys
Emmanuel Durin	Ellisys
Mario Pasquali	Ellisys
Tim Wei	Ellisys
Chien-Cheng Kuo	Etron Technology, Inc.
Jack Yang	Etron Technology, Inc.
Richard Crisp	Etron Technology, Inc.
Shyanjia Chen	Etron Technology, Inc.
TsungTa Lu	Etron Technology, Inc.
Christian Klein	Fairchild Semiconductor
Oscar Freitas	Fairchild Semiconductor
Souhib Harb	Fairchild Semiconductor
AJ Yan	Foxconn / Hon Hai
Fred Jones	Foxconn / Hon Hai
Steve Sedio	Foxconn / Hon Hai
Terry Little	Foxconn / Hon Hai
Bob McVay	Fresco Logic Inc.
Christopher Meyers	Fresco Logic Inc.

PD Chair/Device Policy Lead

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Jim Guerin	Google Inc.
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Rahul Lakdawala	Hewlett Packard
Robin Castell	Hewlett Packard
Roger Benson	Hewlett Packard
Ron Schooley	Hewlett Packard
Suketu Partiwala	Hewlett Packard
Vaibhav Malik	Hewlett Packard
Walter Fry	Hewlett Packard
Bob Dunstan	Intel Corporation
Brad Saunders	Intel Corporation
Chee Lim Nge	Intel Corporation
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David Thompson	Intel Corporation
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Henrik Leegaard	Intel Corporation
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John Howard	Intel Corporation
Karthi Vadivelu	Intel Corporation
Leo Heiland	Intel Corporation
Maarit Hakonen	Intel Corporation
Nge Chee Lim	Intel Corporation
Paul Dorley	Intel Corporation
Rahman Ismail	Intel Corporation
Donald Swartz	Intel Corporation
Sarah Sharp	Intel Corporation
Scott Brenden	Intel Corporation

PD Chair/Protocol WG Lead

System Policy Lead

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Steve McGowan	Intel Corporation	
Tim McKee	Intel Corporation	PD Chair/Compliance Lead
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Jia Wei	Intersil Corporation	
Kenta Minejima	Japan Aviation Electronics Industry Ltd. (JAE)	
Mark Saubert	Japan Aviation Electronics Industry Ltd. (JAE)	
Toshio Shimoyama	Japan Aviation Electronics Industry Ltd. (JAE)	
Brian Fetz	Keysight Technologies Inc.	
Babu Mailachalam	Lattice Semiconductor Corp	
Gianluca Mariani	Lattice Semiconductor Corp	
Joel Coplen	Lattice Semiconductor Corp	
Thomas Watza	Lattice Semiconductor Corp	
Vesa Lauri	Lattice Semiconductor Corp	
Daniel H Jacobs	LeCroy Corporation	
Jake Jacobs	LeCroy Corporation	
Kimberley McKay	LeCroy Corporation	
Mike Micheletti	LeCroy Corporation	
Roy Chestnut	LeCroy Corporation	
Tyler Joe	LeCroy Corporation	
Phil Jakes	Lenovo	
Dave Thompson	LSI Corporation	
Alan Kinningham	Luxshare-ICT	
Daniel Chen	Luxshare-ICT	
Josue Castillo	Luxshare-ICT	
Scott Shuey	Luxshare-ICT	
Chris Yokum	MCCI Corporation	
Geert Knapen	MCCI Corporation	
Terry Moore	MCCI Corporation	
Velmurugan Selvaraj	MCCI Corporation	
Brian Marley	Microchip Technology Inc.	
Dave Perchlik	Microchip Technology Inc.	
Don Perkins	Microchip Technology Inc.	
John Sisto	Microchip Technology Inc.	
Josh Averyt	Microchip Technology Inc.	
Kiet Tran	Microchip Technology Inc.	
Mark Bohm	Microchip Technology Inc.	
Matthew Kalibat	Microchip Technology Inc.	
Mick Davis	Microchip Technology Inc.	
Rich Wahler	Microchip Technology Inc.	
Ronald Kunin	Microchip Technology Inc.	
Shannon Cash	Microchip Technology Inc.	
Anthony Chen	Microsoft Corporation	
Dave Perchlik	Microsoft Corporation	
David Voth	Microsoft Corporation	

Geoff Shew	Microsoft Corporation	
Jayson Kastens	Microsoft Corporation	
Kai Inha	Microsoft Corporation	
Marwan Kadado	Microsoft Corporation	
Michelle Bergeron	Microsoft Corporation	
Rahul Ramadas	Microsoft Corporation	
Randy Aull	Microsoft Corporation	
Shiu Ng	Microsoft Corporation	
Timo Toivola	Microsoft Corporation	
Toby Nixon	Microsoft Corporation	
Vivek Gupta	Microsoft Corporation	
Yang You	Microsoft Corporation	
Dan Wagner	Motorola Mobility Inc.	
Ben Crowe	MQP Electronics Ltd.	
Pat Crowe	MQP Electronics Ltd.	
Sten Carlsen	MQP Electronics Ltd.	
Frank Borngläber	Nokia Corporation	
Kai Inha	Nokia Corporation	
Pekka Leinonen	Nokia Corporation	
Richard Petrie	Nokia Corporation	PD Vice-Chair/Device Policy Lead
Sten Carlsen	Nokia Corporation	Physical Layer WG Lead
Abhijeet Kulkarni	NXP Semiconductors	
Ahmad Yazdi	NXP Semiconductors	
Bart Vertenten	NXP Semiconductors	
Dong Nguyen	NXP Semiconductors	
Guru Prasad	NXP Semiconductors	
Ken Jaramillo	NXP Semiconductors	
Krishnan TN	NXP Semiconductors	
Michael Joehren	NXP Semiconductors	
Robert de Nie	NXP Semiconductors	
Rod Whitby	NXP Semiconductors	
Vijendra Kuroodi	NXP Semiconductors	
Robert Heaton	Obsidian Technology	
Bryan McCoy	ON Semiconductor	
Christian Klein	ON Semiconductor	
Cor Voorwinden	ON Semiconductor	
Edward Berrios	ON Semiconductor	Power Supply WG Lead
Oscar Freitas	ON Semiconductor	
Tom Duffy	ON Semiconductor	
Craig Wiley	Parade Technologies Inc.	
Aditya Kulkarni	Power Integrations	
Rahul Joshi	Power Integrations	
Ricardo Pregiteer	Power Integrations	
Chris Sporck	Qualcomm, Inc.	
Craig Aiken	Qualcomm, Inc.	

George Paparrizos	Qualcomm, Inc	
Giovanni Garcea	Qualcomm, Inc	
James Goel	Qualcomm, Inc	
Joshua Warner	Qualcomm, Inc	
Narendra Mehta	Qualcomm, Inc.	
Terry Remple	Qualcomm, Inc.	
Will Kun	Qualcomm, Inc.	
Yoram Rimoni	Qualcomm, Inc.	
Atsushi Mitamura	Renesas Electronics Corp.	
Bob Dunstan	Renesas Electronics Corp.	
Dan Aoki	Renesas Electronics Corp.	
Kiichi Muto	Renesas Electronics Corp.	
Masami Katagiri	Renesas Electronics Corp.	
Nobuo Furuya	Renesas Electronics Corp.	
Patrick Yu	Renesas Electronics Corp.	
Peter Teng	Renesas Electronics Corp.	
Philip Leung	Renesas Electronics Corp.	
Steve Roux	Renesas Electronics Corp.	
Tetsu Sato	Renesas Electronics Corp.	
Toshifumi Yamaoka	Renesas Electronics Corp.	
Chunan Kuo	Richtek Technology Corporation	
Heinz Wei	Richtek Technology Corporation	
Tatsuya Irisawa	Ricoh Company Ltd.	
Akihiro Ono	Rohm Co. Ltd.	
Chris Lin	Rohm Co. Ltd.	
Hidenori Nishimoto	Rohm Co. Ltd.	
Kris Bahar	Rohm Co. Ltd.	
Manabu Miyata	Rohm Co. Ltd.	
Ruben Balbuena	Rohm Co. Ltd.	
Takashi Sato	Rohm Co. Ltd.	
Vijendra Kuroodi	Rohm Co. Ltd.	
Yusuke Kondo	Rohm Co. Ltd.	
Matti Kulmala	Salcomp Plc	
Toni Lehimo	Salcomp Plc	
Tong Kim	Samsung Electronics Co. Ltd.	
Alvin Cox	Seagate Technology LLC	Cab Con WG Lead
John Hein	Seagate Technology LLC	
Marc Noblitt	Seagate Technology LLC	
Ronald Rueckert	Seagate Technology LLC	
Tony Priborsky	Seagate Technology LLC	
Chin Chang	Semtech Corporation	
Kafai Leung	Silicon Laboratories, Inc.	
Abhishek Sardeshpande	SiliConch Systems Private Limited	
Jaswanth Ammineni	SiliConch Systems Private Limited	
Kaustubh Kumar	SiliConch Systems Private Limited	

Pavitra Balasubramanian	SiliConch Systems Private Limited
Rakesh Polasa	SiliConch Systems Private Limited
Vishnu Pusuluri	SiliConch Systems Private Limited
John Sisto	SMSC
Ken Gay	SMSC
Mark Bohm	SMSC
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Fabien Friess	ST-Ericsson
Giuseppe Platania	ST-Ericsson
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Nathalie Ballot	ST-Microelectronics
Pascal Legrand	ST-Microelectronics
Patrizia Milazzo	ST-Microelectronics
Richard O'Connor	ST-Microelectronics
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
Ingolf Frank	Texas Instruments
Ivo Huber	Texas Instruments
Javed Ahmad	Texas Instruments
Jean Picard	Texas Instruments
Martin Patoka	Texas Instruments
Mike Campbell	Texas Instruments
Scott Jackson	Texas Instruments
Srinath Hosur	Texas Instruments
Steven Tom	Texas Instruments
Chris Yokum	Total Phase

Physical Layer WG Lead

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.
Jeng Cheng Liu	Weltrend Semiconductor
Wayne Lo	Weltrend Semiconductor
Charles Neumann	Western Digital Technologies, Inc.
Curtis Stevens	Western Digital Technologies, Inc.
John Maroney	Western Digital Technologies, Inc.

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1 Introduction

USB has evolved from a data interface capable of supplying limited power to a primary provider of power with a data interface. Today many devices charge or get their power from USB ports contained in laptops, cars, aircraft or even wall sockets. USB has become a ubiquitous power socket for many small devices such as cell phones, MP3 players and other hand-held devices. Users need USB to fulfill their requirements not only in terms of data but also to provide power to, or charge, their devices simply, often without the need to load a driver, in order to carry out “traditional” USB functions.

There are however, still many devices which either require an additional power connection to the wall, or exceed the USB rated current in order to operate. Increasingly, international regulations require better energy management due to ecological and practical concerns relating to the availability of power. Regulations limit the amount of power available from the wall which has led to a pressing need to optimize power usage. The USB Power Delivery Specification has the potential to minimize waste as it becomes a standard for charging devices that are not satisfied by [\[USBBC 1.2\]](#).

Wider usage of wireless solutions is an attempt to remove data cabling but the need for “tethered” charging remains. In addition, industrial design requirements drive wired connectivity to do much more over the same connector.

USB Power Delivery is designed to enable the maximum functionality of USB by providing more flexible power delivery along with data over a single cable. Its aim is to operate with and build on the existing USB ecosystem; increasing power levels from existing USB standards, for example Battery Charging, enabling new higher power use cases such as USB powered Hard Disk Drives (HDDs) and printers.

With USB Power Delivery the power direction is no longer fixed. This enables the product with the power (Host or Peripheral) to provide the power. For example, a display with a supply from the wall can power, or charge, a laptop. Alternatively, USB power bricks or chargers are able to supply power to laptops and other battery powered devices through their, traditionally power providing, USB ports.

USB Power Delivery enables hubs to become the means to optimize power management across multiple peripherals by allowing each device to take only the power it requires, and to get more power when required for a given application. For example battery powered devices can get increased charging current and then give it back temporarily when the user’s HDD requires spinning up. **Optionally** the hubs can communicate with the PC to enable even more intelligent and flexible management of power either automatically or with some level of user intervention.

USB Power Delivery allows Low Power cases such as headsets to negotiate for only the power they require. This provides a simple solution that enables USB devices to operate at their optimal power levels.

The Power Delivery Specification, in addition to providing mechanisms to negotiate power also can be used as a side-band channel for standard and vendor defined messaging. Power Delivery enables alternative modes of operation by providing the mechanisms to discover, enter and exit Alternate Modes. The specification also enables discovery of cable capabilities such as supported speeds and current levels.

1.1 Overview

This specification defines how USB Devices can negotiate for more current and/or higher or lower voltages over the USB cable (using the USB Type-C CC wire as the communications channel) than are defined in the [\[USB 2.0\]](#), [\[USB 3.1\]](#), [\[USB Type-C 1.2\]](#) or [\[USBBC 1.2\]](#) specifications. It allows Devices with greater power requirements than can be met with today’s specification to get the power they require to operate from V_{BUS} and negotiate with external power sources (e.g. Wall Warts). In addition, it allows a Source and Sink to swap power roles such that a Device could supply power to the Host. For example, a display could supply power to a notebook to charge its battery.