

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Universal serial bus interfaces for data and power –  
Part 1-3: Common components – USB Type-C® Cable and Connector  
Specification**

**Interfaces de bus universel en série pour les données et l'alimentation  
électrique –  
Partie 1-3: Composants communs – Spécification des câbles et connecteurs  
USB Type-C®**





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

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
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## UNIVERSAL SERIAL BUS INTERFACES FOR DATA AND POWER

**Part 1-3: Common components – USB Type-C® Cable and Connector Specification**

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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
100/3439/CDV	100/3501/RVC

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This standard is the USB-IF publication Universal Serial Bus Type-C Cable and Connector Specification Revision 2.0.

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# Universal Serial Bus Type-C® Cable and Connector Specification

Release 2.0  
August 2019

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**Specification Work Group Chairs / Specification Editors**

Intel Corporation (USB Promoter company)	Yun Ling – Mechanical WG co-chair, Mechanical Chapter Co-editor Brad Saunders – Plenary/Functional WG chair, Specification Co-author
Renesas Electronics Corp. (USB Promoter company)	Bob Dunstan – Functional WG co-chair, Specification Co-author
Seagate	Alvin Cox, Mechanical WG co-chair, Mechanical Chapter Co-editor

**Specification Work Group Contributors**

Note: For historical reasons, the following list also includes individual contributors that were members of the work group and associated with their company affiliations at the time of the original Release 1.0 and Release 2.0.

Advanced-Connectek, Inc. (ACON)	Victory Chen Glen Chandler Dennis Cheung Jeff Chien Lee (Dick Lee) Ching	Conrad Choy Vicky Chuang Jessica Feng Aven Kao Danny Liao	Alan Tsai Wayne Wang Stephen Yang Sunney Yang
Advanced Micro Devices	Steve Capezza Walter Fry Will Harris	Jason Hawken Tim Perley	Joseph Scanlon Peter Teng
Allion Labs, Inc.	Howard Chang Minoru Ohara	Brian Shih	Chester Tsai
Amphenol AssembleTech (Xiamen) Co., Ltd.	Louis Chan Jesse Jaramillo Terry Ke	Martin Li Lino Liu Shawn Wei	Alan Yang
Amphenol Corporation	Zhinenng Fan		
Agilent Technologies, Inc.	James Choate		
Analogix Semiconductor, Inc.	Mehran Badii Greg Stewart	Haijian Sui	Yueke Tang
Apple Inc. (USB Promoter company)	Colin Abraham Mahmoud Amini Sree Anantharaman Brian Baek Paul Baker Michael Bonham Carlos Calderon Jason Chung David Conroy Bill Cornelius Christophe Daniel William Ferry Brian Follis	Zheng Gao Derek Iwamoto Scott Jackson Girault Jones Keong Kam Kevin Keeler Min Kim Woopoung Kim Alexei Kosut Christine Krause Chris Ligtenberg Matthew Mora Nathan Ng	James Orr Keith Porthouse Breton Saunders Reese Schreiber Sascha Tietz Jennifer Tsai Colin Whitby-Strevens Jeff Wilcox Eric Wiles Dan Wilson Dennis Yarak
Bizlink Technology, Inc.	Alex Chou	Morphy Hsieh	

Cadence Design Systems, Inc.	Marcin Behrendt Huzaifa Dalal Pawel Eichler Sathish Kumar Ganesan	Dariusz Kaczmarczyk Tomasz Klimek Jie Min Asila Nahas Uyen Nguyen	Neelabh Singh Michal Staworko Fred Stivers Mark Summers Claire Ying
Canova Tech	Piergiorgio Beruto Andrea Maniero	Michael Marioli Antonio Orzelli	Paola Pilla Nicola Scantamburlo
Cirrus Logic Inc.	Sean Davis	Darren Holding	Brad Lambert
Corning Optical Communication LLC	Wojciech Giziewicz	Ian McKay	Jamie Silva
Cosemi Technologies Inc.	Samir Desai	Devang Parekh	
Cypress Semiconductor	Mark Fu Naman Jain Rushil Kadakia	Benjamin Kropf Venkat Mandagulathur Anup Nayak	Jagadeesan Raj Sanjay Sancheti Subu Sankaran
Dell	Mohammed Hijazi David Meyers Sean O'Neal	Ernesto Ramirez Siddhartha Reddy	Thomas Voor Merle Wood
Dialog Semiconductor (UK) Ltd.	Yimin Chen		
Diodes Incorporated	Kay Annamalai Justin Lee Paul Li	Bob Lo Jaya Shukla	Qun Song Ada Yip
DisplayLink (UK) Ltd.	Pete Burgers		
DJI Technology Co., Ltd.	Steve Huang		
Electronics Testing Center, Taiwan	Sophia Liu		
Elka International Ltd.	Roy Ting		
Ellisys	Abel Astley Rick Bogart	Mario Pasquali Chuck Trefts	Tim Wei
Etron Technology, Inc.	Chien-Cheng Kuo		
Feature Integration Technologies Inc.	Jacky Chan Chen Kris Yulin Lan	KungAn Lin Yuchi Tsao	Paul Yang Amanda Ying
Foxconn / Hon Hai	Patrick Casher Asroc Chen Joe Chen Allen Cheng Jason Chou Edmond Choy Fred Fons	Bob Hall Chien-Ping Kao Ji Li Ann Liu Terry Little Steve Sedio Christine Tran	Pei Tsao AJ Yang Yuan Zhang Jessica Zheng Jie Zheng Andy Yao
Foxlink/Cheng Uei Precision Industry Co., Ltd.	Robert Chen Sunny Chou Carrie Chuang Wen-Chuan Hsu Alex Hsue	Armando Lee Dennis Lee Justin Lin Robert Lu Tse Wu Ting	Steve Tsai Wen Yang Wiley Yang Junjie Yu
Fresco Logic Inc.	Bob McVay	Christopher Meyers	

Google	Alec Berg Joshua Boilard Alec Berg Todd Broch Jim Guerin Jeffrey Hayashida Mark Hayter	Nithya Jagannathan Lawrence Lam Adam Langley Ingrid Lin Richard Palatin Vincent Palatin Dylan Reid	Adam Rodriguez David Schneider Stephan Schooley Toshak Singhal Ken Wu
Granite River Labs	Yung Han Ang Sandy Chang Allen Chen Swee Guan Chua	Alan Chuang Mike Engbretson Caspar Lin	Krishna Murthy Johnson Tan Chin Hun Yaep
Hewlett Packard Inc. (USB Promoter company)	Lee Atkinson Srinath Balaraman Roger Benson Alan Berkema	Robin Castell Steve Chen Michael Krause Rahul Lakdawala	Jim Mann Linden McClure Mike Pescetto Asjad Shamim
Hirose Electric Co., Ltd.	Jeremy Buan William Kysiak Sang-Muk Lim	William MacKillop Gourgen Oganessyan	Eungsoo Shin Sid Tono
Hosiden Corporation	Takahisa Otsuji	Fumitake Tamaki	
I-PEX (Dai-ichi Seiko)	Alan Kinningham	Ro Richard	Tetsuya Tagawa
Infineon Technologies	Tue Fatt David Wee		
Intel Corporation (USB Promoter company)	Dave Ackelson Mike Bell Brad Berlin Pierre Bossart Kuan-Yu Chen Hengju Cheng Jhuda Dayan Paul Durley Saranya Gopal Howard Heck Hao-Han Hsu Seppo Ingalsuo Abdul (Rahman) Ismail James Jaussi	Ziv Kabiry Vijaykumar Kadgi Luke Johnson Jerzy Kolinski Rolf Kuhnus Henrik Leegaard Edmond Lau Xiang Li Yun Ling Guobin Liu Steve McGowan Sankaran Menon Chee Lim Nge Sagar Pawar	Sridharan Ranganathan Rajaram Regupathy Brad Saunders Ehud Shoor Amit Srivastava Einat Surjan Ron Swartz David Thompson Karthi Vadivelu Tsion Vidal Stephanie Wallick Rafal Wielicki Devon Worrell Li Yuan
Japan Aviation Electronics Industry Ltd. (JAE)	Kenji Hagiwara Hiroaki Ikeda Masaki Kimura Toshio Masumoto Kenta Minejima Toshiyuki Moritake Joe Motojima Ron Muir	Tadashi Okubo Kazuhiro Saito Kimiaki Saito Yuichi Saito Mark Saubert Toshio Shimoyama Tatsuya Shiota Atsuo Tago	Masaaki Takaku Jussi Takaneva Tomohiko Tamada Kentaro Toda Kouhei Ueda Takakazu Usami Masahide Watanabe Youhei Yokoyama
JPC/Main Super Inc.	Sam Tseng	Ray Yang	
LeCroy Corporation	Daniel H. Jacobs	Tyler Joe	
Lenovo	Rob Bowser Tomoki Harada	Jianye Li Wei Liu	Howard Locker

LG Electronics Inc.	Do Kyun Kim		
Lintes Technology Co., Ltd.	Tammy Huang	Max Lo	JinYi Tu
	Charles Kaun	CT Pien	Jason Yang
	RD Lintes		
Lotes Co., Ltd.	Ariel Delos Reyes	Charles Kaun	John Lynch
	Ernest Han	Chi-Chang Lin	JinYi Tu
	Mark Ho	Max Lo	Jason Yang
	Regina Liu-Hwang		
LSI Corporation	Dave Thompson		
Luxshare-ICT	Josue Castillo	Alan Kinningham	Sean O'Neal
	Daniel Chen	Gorden Lin	Scott Shuey
	Lisen Chen	John Lin	James Stevens
	Sally Chiu	Stone Lin	Pat Young
	CY Hsu	Alan Liu	
Maxim Integrated Products	Forrest Christo	Sang Kim	Michael Miskho
	Ken Helfrich	Jeff Lo	Jacob Scott
MCCI Corporation	Terry Moore		
MediaTek Inc.	Alex YC Lin		
MegaChips Corporation	Alan Kobayashi	Satoru Kumashiro	
Microchip (SMSC)	Josh Averyt	Matthew Kalibat	John Sisto
	Mark Bohm	Donald Perkins	Anthony Tarascio
	Shannon Cash	Richard Petrie	Kiet Tran
	Thomas Farkas	Mohammed Rahman	Christopher Twigg
	Fernando Gonzalez	Andrew Rogers	Prasanna Vengateshan
Microsoft Corporation (USB Promoter company)	Randy Aull	Teemu Helenius	Toby Nixon
	Jim Belesiu	Dan Iatco	Rahul Ramadas
	Michelle Bergeron	Kai Inha	Srivatsan Ravindran
	Fred Bhesania	Jayson Kastens	Nathan Sherman
	Anthony Chen	Andrea Keating	Bala Sivakumar
	Philip Froese	Shoaib Khan	Timo Toivola
	Vivek Gupta	Eric Lee	David Voth
	David Hargrove	Ivan McCracken	Andrew Yang
	Robbie Harris	Arvind Murching	Panu Ylihaavisto
	Robert Hollyer	Gene Obie	
Molex LLC	Adib Al Abaji	Alan MacDougall	
Monolithic Power Systems	Di Han	Chris Sporck	
MQP Electronics Ltd.	Sten Carlsen	Pat Crowe	
NEC Corporation	Kenji Oguma		
Newnex Technology Corp.	Sam Liu	Nimrod Peled	
Nokia Corporation	Daniel Gratiot	Samuli Makinen	Timo Toivola
	Pekka Leinonen	Pekka Talmola	Panu Ylihaavisto
NXP Semiconductors	Mahmoud EL Sabbagh	Ken Jaramillo	Guru Prasad
	Dennis Ha	Vijendra Kuroodi	Krishnan TN
Oculus VR LLC	Amish Babu	Marty Evans	Joaquin Fierro
ON Semiconductor	Eduardo De Reza	Christian Klein	Michael Smith
	Oscar Freitas	Amir Lahooti	

Parade Technologies, Inc.	Jian Chen Craig Wiley	Paul Xu	Alan Yuen
Power Integrations	Shruti Anand Rahul Joshi	Aditya Kulkarni Akshay Nayaknur	Amruta Patra
Qualcomm, Inc.	Lior Amarilio Aris Balatsos Tomer Ben Chen Richard Burrows Amit Gil James Goel Amit Gupta	Philip Hardy Will Kun Jonathan Luty Lalan Mishra George Paparrizos Vatsal Patel	Jack Pham Vamsi Samavedam Matthew Sienko Dmitrii Vasilchenko Joshua Warner Chris Wiesner
Realtek Semiconductor Corp.	Marco Chiu Tsung-Peng Chuang Charlie Hsu Fan-Hau Hsu	Ty Kingsmore Ray Lee Jay Lin Ryan Lin	Terry Lin Chuting Su Changhung Wu
Renesas Electronics Corp. (USB Promoter company)	Kai Bao Bob Dunstan Nobuo Furuya	Philip Leung Kiichi Muto Ziba Nami	Hajime Nozaki Yosuke Sasaki Toshifumi Yamaoka
Richtek Technology Corp.	Roger Lo		
Rohm Co., Ltd.	Mark Aaldering Kris Bahar Ruben Balbuena Nobutaka Itakura	Yusuke Kondo Arun Kumar Chris Lin Kazuomi Nagai	Yoshinori Ohwaki Takashi Sato Hiroshi Yoshimura
Samsung Electronics Co., Ltd.	Jaedeok Cha KangSeok Cho WooIn Choi Yeongbok Choi Cheolyoon Chung JaeRyong Han Jaehyeok Jang Wonseok Jang	Sangju Kim Soondo Kim Woonki Kim Jagoun Koo Termi Kwon Cheolho Lee Edward Lee	Jun Bum Lee Jinyoung Oh Chahoob Park Chulwoo Park Youngjin Park Jung Waneui Sunggeun Yoon
Seagate	Alvin Cox Emmanuel Lemay	Tony Priborsky Tom Skaar	Dan Smith
Shenzhen Deren Electronic Co., Ltd.	Smark (Zhudong) Huo Wen Fa Lei	Yang Lirong	Lucy Zhang
Silicon Line GmbH	Ian Jackson		
SiliConch Systems Private Limited	Jaswanth Ammineni Pavitra Balasubramanian Kaustubh Kumar Aniket Mathad	Shubham Paliwal Jinisha Patel Vinay Patel Rakesh Polasa	Vishnu Pusuluri Abhishek Sardeshpande Satish Anand Verkila
Simula Technology Inc.	John Chang Voss Cheng Thomas Li	Jung Lin Jyunming Lin Doris Liu	CK Wang Alice Yu
Softnautics LLP	Bhavesh Desai Hetal Jariwala	Dipakkumar Modi Ishita Shah	Ujjwal Talati
Sony Corporation	Shinichi Hirata	Shigenori Tagami	
Spectra7 Microsystems Corp.	Andrew Kim	James McGrath	John Mitchell
Specwerkz	Amanda Hosler	Diane Lenox	

STMicroelectronics (USB Promoter company)	Jerome Bach Nathalie Ballot Filippo Bonaccorso Christophe Cochard Nicolas Florenchie Cedric Force	Gregory Cosciniak Chekib Hammami Joel Huloux Christophe Lorin Patrizia Milazzo Federico Musarra	Pascal Legrand Richard O'Connor Massimo Panzica Legrand Pascal Nicolas Perrin
Sumitomo Electric Ind., Ltd.	Takeshi Inoue Yasuhiro Maeda	Wataru Sakurai Sainer Siagian	Masaki Suzuki Mitsuaki Tamura
Synaptics Inc.	Daniel Bogard	Jeff Lukanc	Prashant Shamarao
Synopsys, Inc.	Subramaniam Aravindhan	Morten Christiansen Nivin George	Satya Patnala
Tektronix, Inc.	Randy White		
Texas Instruments (USB Promoter company)	Jawaid Ahmad Mike Campbell Greg Collins Gary Cooper GP Gopalakrishnan Craig Greenberg Richard Hubbard Nate Johnson Michael Koltun IV Yoon Lee Grant Ley	Win Maung Shafiuddin Mohammed Lauren Moore Brian Parten Martin Patoka Jason Peck John Perry Louis Peryea Brian Quach	Sai Karthik Rajaraman Wes Ray Dafydd Roche Anwar Sadat Cory Stewart Sue Vining Bill Waters Deric Waters Gregory Watkins Roy Wojciechowski
Total Phase	Chris Yokum		
Tyco Electronics Corp. (TE Connectivity Ltd.)	Max Chao Robert E. Cid Calvin Feng Kengo Ijiro Eiji Ikematsu Joan Leu Clark Li	Mike Lockyer Jeff Mason Takeshi Nakashima Luis A. Navarro Masako Saito Yoshiaki Sakuma Gavin Shih	Hiroshi Shirai Hidenori Taguchi Nathan Tracy Bernard Vetten Ryan Yu Noah Zhang Sjoerd Zwartkruis
UL LLC	Michael Hu		
Varjo Technologies	Kai Inha		
Ventev Mobile	Brad Cox	Colin Vose	
VIA Technologies Inc.	Terrance Shih	Jay Tseng	Fong-Jim Wang
Weltrend Semiconductor	Hung Chiang Jeng Cheng	Wayne Lo Ho Wen Tsai	Eric Wu
Xiaomi Communications Co., Ltd.	Xiaoxing Yang	Juejia Zhou	

### Pre-Release Draft Industry Reviewing Companies That Provided Feedback

Aces	JST Mfg. Co., Ltd.	Pericom
Fairchild Semiconductor	Korea Electric Terminal	Semtech Corporation
Fujitsu Ltd.	Marvell Semiconductor	Silicon Image
Industrial Technology Research Institute (ITRI)	Motorola Mobility LLC PalCONN/PalNova (Palpilot International Corp.)	SMK Corporation Toshiba Corporation

Joinsoon Electronics Mfg. Co.  
Ltd.**Revision History**

Revision	Date	Description
1.0	August 11, 2014	Initial Release
1.1	April 3, 2015	Reprint release including incorporation of all approved ECNs as of the revision date plus editorial clean-up.
1.2	March 25, 2016	Reprint release including incorporation of all approved ECNs as of the revision date plus editorial clean-up.
1.3	July 14, 2017	Reprint release including incorporation of all approved ECNs as of the revision date plus editorial clean-up.
1.4	March 29, 2019	Reprint release including incorporation of all approved ECNs as of the revision date plus editorial clean-up.
2.0	August 2019	New release primarily for enabling USB4 over USB Type-C connectors and cables. Also includes incorporation of all approved ECNs as of the revision date plus editorial clean-up.

## 1 Introduction

With the continued success of the USB interface, there exists a need to adapt USB technology to serve newer computing platforms and devices as they trend toward smaller, thinner and lighter form-factors. Many of these newer platforms and devices are reaching a point where existing USB receptacles and plugs are inhibiting innovation, especially given the relatively large size and internal volume constraints of the Standard-A and Standard-B versions of USB connectors. Additionally, as platform usage models have evolved, usability and robustness requirements have advanced and the existing set of USB connectors were not originally designed for some of these newer requirements. This specification is to establish a new USB connector ecosystem that addresses the evolving needs of platforms and devices while retaining all of the functional benefits of USB that form the basis for this most popular of computing device interconnects.

### 1.1 Purpose

This specification defines the USB Type-C® receptacles, plug and cables.

The USB Type-C Cable and Connector Specification is guided by the following principles:

- Enable new and exciting host and device form-factors where size, industrial design and style are important parameters
- Work seamlessly with existing USB host and device silicon solutions
- Enhance ease of use for connecting USB devices with a focus on minimizing user confusion for plug and cable orientation

The USB Type-C Cable and Connector Specification defines a new receptacle, plug, cable and detection mechanisms that are compatible with existing USB interface electrical and functional specifications. This specification covers the following aspects that are needed to produce and use this new USB cable/connector solution in newer platforms and devices, and that interoperate with existing platforms and devices:

- USB Type-C receptacles, including electro-mechanical definition and performance requirements
- USB Type-C plugs and cable assemblies, including electro-mechanical definition and performance requirements
- USB Type-C to legacy cable assemblies and adapters
- USB Type-C-based device detection and interface configuration, including support for legacy connections
- USB Power Delivery optimized for the USB Type-C connector

The USB Type-C Cable and Connector Specification defines a standardized mechanism that supports Alternate Modes, such as repurposing the connector for docking-specific applications.

### 1.2 Scope

This specification is intended as a supplement to the existing USB 2.0, USB 3.2, USB4™ and USB Power Delivery specifications. It addresses only the elements required to implement and support the USB Type-C receptacles, plugs and cables.

Normative information is provided to allow interoperability of components designed to this specification. Informative information, when provided, may illustrate possible design implementations.

### 1.3 Related Documents

**USB 2.0** *Universal Serial Bus Revision 2.0 Specification*

This includes the entire document release package.

**USB 3.2** *Universal Serial Bus Revision 3.2 Specification*

This includes the entire document release package.

*USB 3.1 Legacy Cable and Connector Specification, Revision 1.0*

**USB4** *USB4™ Specification, Version 1.0, August 2019*  
*(including posted errata and ECNs)*

**TBT3** Chapter 13 of *USB4 Specification, Version 1.0, August 2019*

**USB PD** *USB Power Delivery Specification, Revision 2.0, Version 1.3, January 12, 2017*  
*USB Power Delivery Specification, Revision 3.0, Version 2.0, August 2019*  
*(including posted errata and ECNs)*

**USB BB** *USB Billboard Device Class Specification, Revision 1.21, September 8, 2016*

**USB BC** *Battery Charging Specification, Revision 1.2 (including errata and ECNs through March 15, 2012), March 15, 2012*

**DP AM** *DisplayPort™ Alt Mode on USB Type-C Standard, Version 1.0b, 03 November 2017*

All USB-specific documents are available for download at <http://www.usb.org/documents>. The DisplayPort Alt Mode specification is available from VESA (<http://www.vesa.org>).

### 1.4 Conventions

#### 1.4.1 Precedence

If there is a conflict between text, figures, and tables, the precedence shall be tables, figures, and then text.

#### 1.4.2 Keywords

The following keywords differentiate between the levels of requirements and options.

##### 1.4.2.1 Informative

Informative is a keyword that describes information with this specification that intends to discuss and clarify requirements and features as opposed to mandating them.

##### 1.4.2.2 May

May is a keyword that indicates a choice with no implied preference.

##### 1.4.2.3 N/A

N/A is a keyword that indicates that a field or value is not applicable and has no defined value and shall not be checked or used by the recipient.

##### 1.4.2.4 Normative

Normative is a keyword that describes features that are mandated by this specification.

##### 1.4.2.5 Optional

Optional is a keyword that describes features not mandated by this specification. However, if an optional feature is implemented, the feature shall be implemented as defined by this specification (optional normative).