

**Universal serial bus interfaces for data and power -- Part
4: Universal Serial Bus Cables and Connectors Class
Document, Revision 2.0**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 62680-4:2014 sisaldab Euroopa standardi EN 62680-4:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 62680-4:2014 consists of the English text of the European standard EN 62680-4:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 11.04.2014.	Date of Availability of the European standard is 11.04.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 33.120, 35.200

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Aru 10, 10317 Tallinn, Eesti; www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:
Aru 10, 10317 Tallinn, Estonia; www.evs.ee; phone 605 5050; e-mail info@evs.ee

**Universal serial bus interfaces for data and power -
Part 4: Universal Serial Bus Cables and Connectors
Class Document, Revision 2.0
(IEC 62680-4:2013)**

Interfaces de bus universel en série pour
les données et l'alimentation électrique -
Partie 4: Document des classes des
câbles et des connecteurs de bus
universel en série, Révision 2.0
(CEI 62680-4:2013)

Schnittstellen des Universellen Seriellen
Busses für Daten und Energie -
Teil 4: Klasse für Kabel und
Steckverbinder des Universellen Seriellen
Busses, Überarbeitung 2.0
(IEC 62680-4:2013)

This European Standard was approved by CENELEC on 2013-07-24. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 100/1984/CDV, future edition 1 of IEC 62680-4, prepared by Technical Area 14 "Interfaces and methods of measurement for personal computing equipment" of IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62680-4:2014.

The following dates are fixed:

- latest date by which the document has to be (dop) 2014-10-11
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2016-07-24
standards conflicting with the
document have to be withdrawn

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62680-4:2013 was approved by CENELEC as a European Standard without any modification.

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.

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, royalty-free licensing arrangement for compliant products. For more information, please see:

<http://www.usb.org/developers/docs/>

http://www.usb.org/developers/devclass_docs#approved

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."

This series covers the Universal Serial Bus interfaces for data and power and consists of the following parts:

IEC 62680-1, *Universal Serial Bus interfaces for data and power – Part 1: Universal Serial Bus Specification, Revision 2.0*

IEC 62680-2, *Universal Serial Bus interfaces for data and power – Part 2: USB Micro-USB Cables and Connectors Specification, Revision 1.01*

IEC 62680-3, *Universal Serial Bus interfaces for data and power – Part 3: USB Battery Charging Specification, Revision 1.2*

IEC 62680-4, *Universal Serial Bus interfaces for data and power – Part 4: Universal Serial Bus Cables and Connectors Class Document Revision. 2.0*

This part of the IEC 62680 series consists of several distinct parts:

- the main body of the text, which consists of the original specification developed by the USB-IF.

CONTENTS

1	Introduction	10
1.1	Purpose	10
1.2	Scope	10
1.3	Related Documents	10
1.4	Terms and Abbreviations	11
2	Management Overview	12
3	USB Electrical, Mechanical and Environmental Compliance Standards	12
4	Acceptance Criteria, Test Methods and Test Procedures	15
4.1	Integrators List (IL)	15
4.2	USB Logo Usage	16
4.3	Compliance Test Report	16
4.4	Connector and Cable Assembly Physical Certification	16
4.5	General Information	16
4.5.1	Mated Pairs	16
4.5.2	Before Testing	16
4.5.3	Test Sequences	16
4.6	Sample Selection	17
4.7	USB Compliance Testing Interval	17
4.8	Primary Qualification Approval Testing	17
4.9	Sustaining Qualification Approval Testing	17
4.10	Compliance Test Sequences	17
4.10.1	Inspection EIA 364-18	17
4.10.2	Test Group '1'	19
4.10.3	Test Group '2'	20
4.10.4	Test Group '3'	21
4.10.5	Test Group '4'	21
4.10.6	Test Group '5'	23
4.10.7	Test Group '6'	23
4.10.8	Test Group '7'	24
4.10.9	Test Group '8'	24
5	Certification Acceptance and Submission	25
5.1	Compliance Test Report	25
5.2	Listing, Authorization and Notification	25
5.2.1	Listing	25
5.2.2	Authorization to use Certified USB Logo	25
5.2.3	Notification	26
	Appendices	27
	A Testing by Similarity – General Guidelines	27
	B Critical Dimensions	30

Universal Serial Bus Cables and Connectors Specification

**Revision 2.0
August, 2007**

Revision History

Revision	Date	Filename	Comment
2.0 RC6	August 10, 2007	CabConnRC6_Aug10.doc	Added Go/No-go & latch measurement for Micro series Added Drain wire inspection process Added pin contact visual inspection Added clarifying text to 4-axis test description
2.0 RC5	June 5, 2007	CabConn20RC5_June5	Removed Shielding Effectiveness Replace Rotational Continuity with 4-Axis continuity Other miscellaneous minor changes
2.0 RC4	May, 2007	CabConn20RC4_May07	Cable Construction inspection added
2.0	April 4, 2007	CabConn20	Removed Shielding Effectiveness, Added power line resistance test Added cable rotation test
2.0	February 14, 2007	CabConn Rev 2.0	Edits from Tsuyoshi YAMANE of Matsushita
2.0	February 13, 2007	CabConn Rev 2.0	Edited by Jim Koser new chart from Hirose
2.0	February 7, 2007	CabConn Rev 2.0	Edited draft
2.02RC2	February 6, 2007	CabConnRC2_02-06-07	Work group editorials
2.01RC2	December 6, 2006	CabConnRC2_12-06-06	Work group editorials
2.0RC2	July 11, 2006	CabConnRC2_7-11-06	Added durability requirements for Ruggedized Standard "A" receptacle and durability requirements for Micro series
2.0RC2	June 7, 2006	CabConnRC2_6-7-06	Added new critical dimensions drawings for standard "A" and "B" plugs and receptacles and changed the criteria for "mini" products to the use of go – no go gages in Appendix B
2.0RC2	March 24, 2006	CabConnRC2_3-23-06.doc	Added new IP agreement
2.0RC2	December 03, 2003	CabConnRC2.doc	Final edit during USB DWG meeting in Austin prior to posting the document to Web site
2.0RC1	October 29, 2002	CabConnRC1.doc	Adjust formatting in technical edit pass
2.0RC	August 13, 2002		Rewrite of test program to reflect current practice and general updates to reflect changes in the USB Specification.
1.1	September 1, 1999		Editorial Update for improved use. Add Appendices 'A' and 'B.'
1.0	May 22, 1999		Accepted unanimously by USB-IF DWG after 30-day posting without negative comment.
1.0RC	March 27, 1999		Release for industry comment

Revision	Date	Filename	Comment
0.9a	January 19, 1999		Moved to Revision 0.9 by consensus of the Cable & Connector Work Group. Pending final editorial cleanup RRs to be voted on at a special Cable & Connector Work Group meeting February 21, 1999.
0.9RC	December 18, 1998		Moves Document to 0.9RC by consensus of the Cable & Connector Group to Version 0.9 without Appendices Drawings and Lab Listings. Special dispensation by the DWG to move to Revision 1.0 for use at the January 1999 Plug Fest.
0.8	October 20, 1998		Release for industry comment

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.

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

USB Cables and Connectors Class Document
© Copyright 2007 USB Implementers Forum
All rights reserved.

Contributors

Name	Company	E-mail Address
James R. Koser	Foxconn Electronics – CCWG Chair	jim.koser@foxconn.com
Tsuneki Watanabe	Foxconn Electronics	t.watanabe@foxconn.com
Jim Zhao	Foxconn Electronics	Jim.zhao@foxconn.com
George G. Olear II	Contech Research – Co-Editor	ggo@contechresearch.com
Jaremy Flake	ATL Technology – CCWG Scribe	jaremyf@atlconnect.com
Glen Chandler	Acon	glenc@acon.com
George Yee	Acon	George.Yee@acon.com
Roy Ting	ELKA International Ltd.	roy@elka.com.tw
Sophia Liu	ETC (Electronic Test Center, Taiwan)	scl@etc.org.tw
Bill Northey	FCI	William.northey@fciconnect.com
Jack Lu	Foxlink International, Inc.	Jack_lu@foxlink.com
Wen Yang	Foxlink International, Inc.	wen@foxlink.com
Yasuhiro Ishii	Fujikura Ltd	Yishii@fujikura.co.jp
Shigreu Ashida	Fujikura Ltd	Ashidas@fujikura.co.jp
Marksuk Piyavit	Fujikura Ltd	MPiyavit @fujikura.com
Hiromichi Kato	Fujikura Ltd	paki@fujikura.com
Sathid Inthon	Fujikura Ltd	isathid @fujikura.com
Makoto Kikuchi	Fujikura Ltd	mkikuchi@fujikura.co.jp
Hiroshi Nakazawa	Hirose Electric Co. Ltd Hiroshi	Nakazawa@hirose.co.jp
Yousuke Takeuchi	Hirose Electric Co. Ltd	Yousuke_Takeuchi@hirose.co.jp
Shinya Tono	Hirose Electric Co. Ltd	Shinya_tohno@hirose.co.jp
Karl Kwiat	Hirose Electric Co. Ltd	kkwiat@hirose.com
Kazunori Ichikawa	Hirose Electric Co. Ltd	Kazunori_Ichikawa@hirose.co.jp
Toshi Sasaki	Honda Connectors	t.sasaki@honda-connectors.co.jp
Jim Eilers	Hosiden	eilersjm@hoaco.com
Tsuyoshi Kitagawa	Hosiden	kitagawat@hoaco.com
David Suryoutomo	Japan Aviation Electronics, Inc	suryoutomod@jae.com
Ron Muir	Japan Aviation Electronics, Inc	muirr@jae.com
Kazuhiro Saito	Japan Aviation Electronics, Inc	saitouk@jae.co.jp
Takahiro Deguchi	JST Mfg. Co. Ltd	tdeguchi@jst-mfg.com
Yasuhira Miya	JST Mfg. Co. Ltd	ymiya@jst-mfg.com
Yoichi Nakazawa	JST Mfg. Co. Ltd	ynakazawa@jst-mfg.com
Hironori Handa	JST Mfg. Co. Ltd	hhanda@jst-mfg.com
Vincent Chen	Longwell	vince@longwell.com
Ron Ward	Matsushita Electronics	rward@us.pewg.panasonic.com
Hitoshi Kawamura	Mitsumi	h_kawamura@sales.mitsumi.co.jp
Atsushi Nishio	Mitsumi	a_nishio@eeb.mitsumi.co.jp
Yasuhiko Shinohara	Mitsumi	y_shinohara@eeb.mitsumi.co.jp

Name	Company	E-mail Address
Scott Sommers	Molex	Scott.sommers@molex.com
E. Mark Rodda	Motorola PCS	markrodda@motorola.com
Sheldon Singleton	National Technical Systems	sheldons@ntscorp.com
Sam Liu	Newnex	saml@newnex.com
Jan Fahlund	Nokia Corporation	Jan.h.fahlund@nokia.com
Kai Silvennoine	Nokia Corporation	Kai.silvennoine@nokia.com
Richard Petrie	Nokia Corporation	Richard.petrie@nokia.com
Jussi Takaneva	Nokia Corporation	Jussi.Takaneva@nokia.com
Panu Ylihaavisto	Nokia Corporation	Panu.Ylihaavisto@nokia.com
Arthur Zarnowitz	Palm	arthur.zarnowitz@palm.com
Dave Peters	Palm	dave.peters@palm.com
Tetsuji Kawaguchi	Panasonic (Matsushita)	t.Kawaguchi@us.pewg.panasonic.com
Satoshi Yamamoto	Panasonic (Matsushita)	koteyamd@sei.mew.co.jp
Tsuyoshi Yamane	Panasonic (Matsushita)	Yamane.tsuyoshi@mail.mew.co.jp
Naoyuki Ono	SMK	Naoyuki@smk.co.jp
Eric Yagi	SMK	s-yagi@smkusa.com
Scott Shuey	Tyco Electronics	scott.shuey@tycoelectronics.com
Masaru Ueno	Tyco Electronics	Ueno.masaru@tycoelectronics.com
Mark Paxson	USB-IF	mpaxson@vtm-inc.com
Ed Beeman	2010 Tech for USB-IF	ed.beeman@2010tech.com

1 Introduction

1.1 Purpose

This document describes the mechanical, electrical, environmental, design and performance criteria and voluntary supplier compliance requirements for USB connectors, cable and fabricated cable assemblies. In addition, this document provides detailed requirements for the design, approval and implementation of application specific USB connectors and fabricated cable assemblies.

1.2 Scope

The information provided in this document serves as a guideline for design, development and voluntary compliance testing of USB connectors and fabricated cables assemblies, as well as defining mechanical, electrical, environmental and performance characteristics. As such, it defines how USB connectors, cable and fabricated cables assemblies are to be implemented and how manufacturers and/or fabricators will interact with the voluntary compliance requirements.

1.3 Related Documents

American Society for Testing and Materials

ASTM-D-4565 *Standard Test Methods for Physical and Environmental Performance Properties of Insulations and Jackets for Telecommunications Wire and Cable.* This specification is available through the World Wide Web site <http://www.astm.org/>

ASTM-D-4566 *Standard Test Methods for Electrical Performance Properties of Insulations and Jackets for Telecommunications Wire and Cable.* This specification is available through the World Wide Web site <http://www.astm.org/>

ANSI/EIA 364-C *Electrical Connector/Socket Test Procedures Including Environmental Classifications*, approved 1994. Available in hard copy – reference search site <http://www.nssn.org/information.html>

Underwriters Laboratories

UL STD-94 *Test procedures used to classify polymeric materials 94HB, 94V-1, 94V-2, 94-5VA, 94-5VB, 94VTM-0, 94VTM-1, 94VTM-2, 94HBF, 94HF-1, and 94HF-2.* This specification is available through the World Wide Web site <http://www.comm-2000.com/>

UL Subject-444 *Type CMP (plenum cable), Type CMR (riser cable), Type CM (commercial cable), and Type CMX (cable for restricted use.* This specification is available through the World Wide Web site <http://www.comm-2000.com/>

[USB2.0] *Universal Serial Bus Specification*, revision 2.0 (also referred to as the *USB Specification*). This specification is available on the World Wide Web site <http://www.usb.org>.

USB On-The-Go *On-The-Go Supplement to the USB 2.0 Specification* (also referred to as the *USB On-The-Go Specification*). This specification is available on the World Wide Web site <http://www.usb.org>.