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Edition 1.0 2015-09

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Universal serial bus interfaces for data and power –
Part 2-3: Universal Serial Bus Cables and Connectors Class Document Revision 2.0

Interfaces de bus universel en série pour les données et l'alimentation électrique –
Partie 2-3: Document des classes de câbles et connecteurs USB, révision 2.0

IEC 62680-2-3:2015-09(en-fr)

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UNIVERSAL SERIAL BUS INTERFACES FOR DATA AND POWER –

Part 2-3: Universal Serial Bus Cables and Connectors Class Document Revision 2.0

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International Standard IEC 62680-2-3 has been prepared by technical area 14: Interfaces and methods of measurement for personal computing equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on documents 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.

This first edition cancels and replaces IEC 62680-4 published in 2013. This edition constitutes a technical revision.

This bilingual version (2018-04) corresponds to the English version, published in 2015-09.

The text of this standard is based on the following documents:

CDV	Report on voting
100/2333/CDV	100/2436/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

A list of all the parts in the IEC 62680 series, published under the general title *Universal serial bus interfaces for data and power* can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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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 to 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.

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

IEC 62680-1-1, *Universal Serial Bus interfaces for data and power – Part 1-1: Common components – USB Battery Charging Specification, Revision 1.2*

IEC 62680-2-1, *Universal Serial Bus interfaces for data and power – Part 2-1: Universal Serial Bus Specification, Revision 2.0*

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

IEC 62680-2-3, *Universal Serial Bus interfaces for data and power – Part 2-3: Universal Serial Bus Cables and Connectors Class Document Rev. 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

FOREWORD 2
INTRODUCTION 4
1 Introduction 11
1.1 Purpose 11
1.2 Scope 11
1.3 Related Documents 11
1.4 Terms and Abbreviations 12
2 Management Overview 13
3 USB Electrical, Mechanical and Environmental Compliance Standards 13
4 Acceptance Criteria, Test Methods and Test Procedures 17
4.1 Integrators List (IL) 17
4.2 USB Logo Usage 17
4.3 Compliance Test Report 17
4.4 Connector and Cable Assembly Physical Certification 17
4.5 General Information 18
4.5.1 Mated Pairs 18
4.5.2 Before Testing 18
4.5.3 Test Sequences 18
4.6 Sample Selection 18
4.7 USB Compliance Testing Interval 18
4.8 Primary Qualification Approval Testing 18
4.9 Sustaining Qualification Approval Testing 19
4.10 Compliance Test Sequences 19
4.10.1 Inspection EIA 364-18 19
4.10.2 Test Group ‘1’ 21
4.10.3 Test Group ‘2’ 22
4.10.4 Test Group ‘3’ 23
4.10.5 Test Group ‘4’ 24
4.10.6 Test Group ‘5’ 25
4.10.7 Test Group ‘6’ 25
4.10.8 Test Group ‘7’ 26
4.10.9 Test Group ‘8’ 27
5 Certification Acceptance and Submission 27
5.1 Compliance Test Report 28
5.2 Listing, Authorization and Notification 28
5.2.1 Listing 28
5.2.2 Authorization to use Certified USB Logo 28
5.2.3 Notification 28
Appendices 29

Figure 4-1 – Typical Contact Resistance Measurement 22

Table 3-1 – Electrical, Mechanical and Environmental Compliance Standards 14
Table 4-1 – Test Conditions 17
Table 4-2 – Performance Levels 18

Table 4-3 – Primary Qualification Approval Testing 19
Table 4-4 – Test Group '1' Durability, Vibration, Shock, Cable Retention and Mating/Un-mating Force 21
Table 4-5 – Group '2' Temperature Life 22
Table 4-6 – Test Group '3' Mixed Flowing Gas 23
Table 4-7 – Test Group '4' Insulation Resistance, Dielectric Withstanding Voltage, Thermal Shock & Humidity Temperature Cycling 24
Table 4-8 – Test Group '5' Solderability 25
Table 4-9 – Test Group '6' High Frequency Testing 25
Table 4-10 – Test Group '7' Critical Dimensions 26
Table 4-11 – Test Group '8' Cable 27

Universal Serial Bus
Cables and Connectors
Specification

Revision 2.0
August, 2007

Revision History

Revision	Date	Filename	Comment
2.0 RC 6	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

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USB Cables and Connectors Class Document

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UNIVERSAL SERIAL BUS INTERFACES FOR DATA AND POWER –

Part 2-3: Universal Serial Bus Cables and Connectors Class Document Revision 2.0

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 **h**ttp://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.

1.4 Terms and Abbreviations

Term	Description
A2LA	The American Association for Laboratory Accreditation (A2LA) is a non-profit, professional membership society. A2LA coordinates and manages a broad-spectrum, nationwide laboratory accreditation system and offers training and continuing education in laboratory practices and management. A2LA offers accreditation to private, independent (for hirer), in-house and government testing laboratories in the following fields: acoustics and vibration; biological; chemical; construction materials; electrical; environmental; geotechnical; mechanical; calibration; and, nondestructive and thermal.
ANSI	American National Standards Institute
Approved Integrators List (AIL)	A listing available to USB-IF member companies at http://www.usb.org listing cable and connector products that have successfully completed a Voluntary Compliance Testing program conducted in accordance with the most current version of the USB Specification's Electrical, Mechanical and Environmental Performance Standards as shown in Chapter 6, Chapter 7 and this document.
ASTM	American Society for Testing and Materials.
ASUPS	The acronym for Application Specific USB Product Specification. An ASUPS describes the unique characteristics of a special purpose nonstandard USB connector or cable assembly specification.
C of C	Certificate of Compliance.
Characteristic	A physical, chemical, visual or any other measurable property of a product or material.
Contact Point	One electrical contact of a multi-contact connector.
CTR	Conformance Test Report
Defect	Any nonconformance of the unit of product with specified requirements.
Defective Unit	A unit of product that contains one or more defects.
DWG	USB-IF Device Working Group
EIA	Electronic Industries Association.
EMI/RFI	Electro-magnetic Interference/Radio Frequency Interference.
Full-speed	The USB 'Full-speed' data signaling rate is 12 Mb/s.
High-speed	The USB 'High-speed' data signaling rate is 480 Mb/s.
Low-speed	The USB 'Low-speed' data signaling rate is 1.5 Mb/s.
NIST	National Institute of Standards and Technology.
Power Pair	The non-twisted pair of electrical conductors in a USB cable used to carry power from the 'host controller' and/or a 'selfpowered hub' to the device. Where the 'Red' conductor is Vbus and the 'Black' conductor is Ground.
Signal Pair	The twisted pair of electrical conductors in a USB cable used to carry data from the 'host controller' and/or a 'self-powered hub' to the device. Where the 'Green' conductor is Dplus (D+) and the 'White' conductor is Dminus (D-).
TID	Test Identification Number
Universal Serial Bus	Universal Serial Bus is a serial interconnect bus that supports transfer rates up to 480 M/bs for a maximum of 127 USB devices. (Please see USB 2.0)
USB Devices	USB devices can be: 'Hubs' that provide attachment points for USB; or, 'Functions' that provide capabilities to the system, such as an ISDN connection, a digital joystick, a printer, speakers, et cetera.
CNLA	Chinese National Laboratory Accreditation
USB Host	The USB interface to the host computer system is referred to as the Host Controller. The Host Controller may be implemented in a combination of hardware, firmware or software. A 'root hub' is integrated within the host system to provide one or more attachment points. Additional information concerning the 'USB host' may be found in Section 4.9 and Chapter 10 of the USB Specification USB 2.0.

Term	Description
USB Topology	The USB connects USB devices with the USB host. The USB physical interconnection is a tiered star topology. A 'hub' is at the center of each star. Each wire segment is a point-to-point connection between the 'host' and a 'hub' or 'function,' or a 'hub' connected to another 'hub' or 'function.'
USB	The acronym for Universal Serial Bus. *(*Please see Universal Serial Bus)
USB-IF	USB Implementers Forum is a nonprofit industry organization made up of original equipment manufacturers (**OEMs**), component manufacturers and firmware/software developers who are actively involved in the advancement of USB technology. (Please see http://www.usb.org)

2 Management Overview

This section is an overview of the contents of this document and provides a brief summary of each of the subsequent sections. It does not establish any requirements or guidelines.

Section 3 describes USB Electrical, Mechanical and Environmental Compliance Standards.

Section 4 describes the acceptance testing criteria and test procedures for USB connectors and fabricated cable assemblies.

Section 5 Certification, Acceptance and Submission

Appendices:

3 USB Electrical, Mechanical and Environmental Compliance Standards

USB cable, connectors and fabricated cable assemblies must meet or exceed the requirements specified by the most current version of Chapter 6 of the USB Specification and applicable Supplements (please see Table 3-1, USB Electrical, Mechanical and Environmental Compliance Standards).