1.0 GENERAL

This specification defines the performance, tests and quality requirements for the USB Mini B connector.

This document is composed of the following sections.
General
Scope
Applicable Documents
Requirements
- ✧ Design and Construction
- ✧ Material
- ✧ Finish

Test Methods and Requirements
Test Plan
Applicable Part Number and Product Drawing

2.0 SCOPE

This specification is applicable to the termination characteristics of the USB Mini B family of products which provides interconnection of computer peripherals.

3.0 APPLICABLE DOCUMENTS

3.1 Military Standards:
- 3.1.1 MIL-STD-202F: Test methods for electronic and electrical component parts.
- 3.1.2 MIL-STD-1344A: Test methods for electrical connectors.

3.2 Industry Specification/Other Standards:
- 3.2.1 UL-94: Tests for flammability of plastic materials.
- 3.2.2 EIA 364: Electrical connector/socket test procedures including environmental classifications.
- 3.2.3 USB: Universal Serial Bus Specification.

4.0 REQUIREMENT

4.1 Design and Construction:
Connectors shall be of the design construction and physical dimensions specified on the applicable product drawing and shall be capable of meeting the qualification test requirements specified herein.

4.2 Materials
- 4.2.1 Housing:
  - ✧ The insulators shall be rated flame retardant 94V-O in accordance with UL-94.
- 4.2.2 Terminal:
  - ✧ Copper Alloy.
- 4.2.3 Shell:
  - ✧ Copper Alloy.

4.3 Finish:
The finish for applicable components shall be specified on the applicable product drawing
- 4.3.1 Contact Area: Gold plating with Nickel under-plate.
- 4.3.2 Solder Tail Area: Tin/Lead or Pure Tin plating with Nickel under-plated.
- 4.3.3 Shell: Tin/Lead or Nickel plating.

5.0 TEST METHODS AND REQUIREMENTS:

5.1 Examination of product:

Item	Test Description	Test Methods	Requirement
5.1.1	Examination of product (Outward Appearance Structure)	**EIA 364-18** Shall be confirmed with eyes in accordance with each drawing. Shall be confirmed by using proper measuring instruments.	1).Outward appearance shall be good without such injurious problem. 2).Structure shall be meet the design and dimensional requirements of drawing.

5.2 Electrical Performance:

Item	Test Description	Test Methods	Requirement
5.2.1	Low Level Contact Resistance	**EIA 364-23** (or MIL-STD-1344A, Method 3002.1, Test Condition B) Subject mated contacts assembled in housing to 20mV maximum open circuit at 100 mA maximum	1).Initial: 50 mΩ Maximum 2).After test: 50 mΩ Maximum
5.2.2	Insulation Resistance	**EIA 364-21** (or MIL-STD-202F, Method 302, Test Condition B) Test between adjacent contacts of mated and unmated connector assemblies.	1).Initial: 100 MΩ Minimum 2).After test: 100 MΩ Minimum
5.2.3	Dielectric Withstanding Voltage	**EIA 364-20** (or MIL-STD-202F, Method 301, Test Condition B) Test between adjacent contacts of mated and unmated connector assemblies.	100 V AC for one minute at sea level 1).No flashover or insulation breakdown 2).Leakage current: 0.5mA Maximum.
5.2.4	Contact Capacitance	**EIA 364-30** Test between adjacent circuits of unmated connector at 1 KHz.	2 pF Maximum per contact
5.2.5	Contact Current Rating	**EIA 364-70 Method 1** When measured at an ambient temperature of 25□. With Power applied to the contacts, the ΔT shall not exceed 30℃ at any point in the USB connector under test.	1.0A per contact.

5.3 Mechanical Performance:

Item	Test Description	Test Methods	Requirement
5.3.1	Random Vibration	**EIA 364-28 Test Condition V Test Letter A**, (or MIL-STD-202F, Method 214, Test Condition 1, Test Letter A) Subject mated connectors to 5.35 G's rms. Fifteen minutes in each of three mutually perpendicular planes.	1).No discontinuities of 1micro sec or longer duration 2).Shall meet visual requirement, show no physical damage. 3).Shall meet requirements of additional tests as specified in TEST SEQUENCE in Section 6
5.3.2	Physical Shock	**EIA 364-27 Test Condition H** (or MIL-STD-202F, Method 214B) Subject mated connectors to 30G's half-sine shock pulses of 11ms duration. Three shocks in each direction applied along three mutually perpendicular planes, 18 total shock.	1).No discontinuities of 1μ sec or longer duration 2).Shall meet visual requirement, show no physical damage. 3).Shall meet requirements of additional tests as specified in TEST SEQUENCE in Section 6
5.3.3	Durability	**EIA 364-09** Mate and unmate Connector assemblies for 5000cycles at maximum rated of 200 cycles per hour.	1).Shall meet visual requirement, show no physical damage. 2).Shall meet requirements of additional tests as specified in TEST SEQUENCE in Section 6
5.3.4	Connector Insertion Force	**EIA 364-13** Shall be measured with TENSION GAUGE or TENSION TESTER. Measure force necessary to mate assemblies at maximum rate of 12.5mm (or 0.492") per minute.	1).Initial : 35 Newtons (or 3.57Kgf) Maximum 2).After test: 35 Newtons (or 3.57Kgf) Maximum
5.3.5	Connector Extraction Force	**EIA 364-13** Shall be measured with TENSION GAUGE or TENSION TESTER. Measure force necessary to mate assemblies at maximum rate of 12.5mm (or 0.492") per minute.	1).Initial : 7 Newtons (or 0.71Kgf) Minimum 2).After test: 3 Newtons (or 0.31Kgf) Minimum
5.3.6	Cable Pull-Out Force	**EIA 364-38** Apply axial load of 40 Newtons to the cable for 1 minute.	1).Cable or connector shall be not dislodge from cable crimp.

		Shall be measured with TENSION GAUGE or TENSION TESTER.	

5.4 Environmental Performance:

Item	Test Description	Test Methods	Requirement
5.4.1	Thermal Shock	**EIA 364-32, Test Condition I,** (or MIL-202F, Method 107G Condition A.) Subject mated connectors to five cycles between –55℃ to +85℃.	1).Shall meet visual requirement, show no physical damage. 2).Shall meet requirements of additional tests as specified in TEST SEQUENCE in Section 6
5.4.2	Humidity	**EIA 364-31, Test Condition A Method III**, (or MIL-202F, Method 103B Test Condition B.) Subject mated connectors to 168 Hours (seven complete cycles)	1).Shall meet visual requirement, show no physical damage. 2).Shall meet requirements of additional tests as specified in TEST SEQUENCE in Section 6
5.4.3	Temperature Life	**EIA 364-17 Test Condition 3 Method B,** Subject mated connectors to temperature life at 85℃ for 250hours	1).Shall meet visual requirement, show no physical damage. 2).Shall meet requirements of additional tests as specified in TEST SEQUENCE in Section 6
5.4.4	Solderability	**EIA 364-52** After one hour steam aging. Or **MIL-STD-202F, Method 208G.** 220degC for 5 seconds.(Tin/Lead Plating for Shell) 245degC for 5 seconds.(Nickel Plating for Shell)	The surface of the portion to be soldered shall at least 95% covered with new solder coating, as specified in Category 2.

6.0 TEST PLAN:

TEST ITEM	PARA.	TEST GROUP					
		A	B	C	D	E	F
		TEST SEQUENCE					
Examination of Product	5.1.1	1,11	1,5	1,9	1,4	1,3	
L/L Contact Resistance	5.2.1	4,8	2,4				
Insulation Resistance	5.2.2			3,7			
Dielectric Withstand Voltage	5.2.3			4,8			
Contact Capacitance	5.2.4			2			
Contact Current Rating	5.2.5				2		
Random Vibration	5.3.1	6					
Physical Shock	5.3.2	7					
Durability	5.3.3	5					
Insertion Force	5.3.4	2,9					
Extraction Force	5.3.5	3,10					
Cable Pull-Out Force	5.3.6					2	
Thermal Shock	5.4.1			5			
Humidity	5.4.2			6			
Temperature Life	5.4.3		3				
Solderability	5.4.4				3		
Sample Size		5	5	5	5	5	

Note:

a. Samples shall be prepare in accordance with applicable manufacture's instructions and shall be selected at random from current production.

b. The numbers in the table indicate sequence in which tests are performed.

c. Precondition samples with 10 cycles durability.

d. All the tests shall be performed in the sequence, indicated by the number in the columns.

7.0 APPLICABLE PART NUMBER & PRODUCT DRAWING:

Part Number	Product Description	Drawing Number	Remark
55671-XXXX	Mini B Receptacle 5pos, R/A, SMT Type	55671	
10033526-XXXX	Mini B Receptacle 5pos, R/A, SMT Type	10033526	
10033527-XXXX	Mini AB Receptacle 5pos, R/A, SMT Type	10033527	
10056678	Mini USB B Plug Kit	10056678	
10054776-XXXXX	Mini USB B Receptacle 5 pos.	10054776	
10119313-XXXXLF	Mini USB Vertical B Receptacle 5 pos	10119313	

Revision Record

Revision	Page	Description	ECR no	Date
A	All	New released	T10083	3/26/2001
B	All	Added P/N 10033526, 10033527	T03-0371	9/02/2003
C	All	Revise the 5.4.4.	T04-0379	10/13/2004
D	All	Added the pure tin plating in 4.3.2,	T05-0037	2/21/2005
E	All	Added P/N 10056678, 10054776 in 7.0. Added the SPEC in 4.2.3	T05-0113	5/25/2005
F	6	Add family 10119313 series	ECR-ELX-N-011614	05/03/2012
G	All	Correct the classification to UNCONFIDENTIAL	ECR-ELX-N-011823	06/04/2012