

**MINI USB SERIES CONNECTOR****1. SCOPE**

This specification covers performance, tests and quality requirements for **MINI USB SERIES CONNECTOR**.

**2. APPLICABLE DOCUMENT**

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

**3. REQUIREMENTS****3.1. DESIGN AND CONSTRUCTION**

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

**3.2. MATERIALS**

- A. Contact: Copper Alloy, Gold plating on contact area, Tin-lead or Tin-cu plated on soldertails, Nickel underplated all over
- B. Housing: Thermoplastic High Temperature, UL94V-0.
- C. Shell: Copper Alloy, Tin plated over Nickel underplated all over.

**3.3. RATING**

- A. Temperature range: -20°C to +60°C
- B. Current rating: 1 Ampere.
- C. Voltage rating: 30 VAC RMS Max.

**4. TEST CONDITION:**

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

DR	DATE	APVD	DATE
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## 5. TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Examination of product	Meets requirements of product drawing and AMP Specification.	Visual inspection No physical damage
<b>ELECTRICAL</b>		
Low Level Contact Resistance	50mΩ max.	Subject mated contacts assembled in housing to 20mV maximum open circuit at 100 mA maximum. EIA 364-23 (or MIL-STD-1344A, Method 3002.1, Test Condition B).
Insulation Resistance	100MΩ min	Test between adjacent contacts of mated and unmated connector assemblies. EIA 364-21 (or MIL-STD-202F, Method 302, Test Condition B).
Dielectric Withstanding Resistance	100 V AC for one minute at sea level 1. No flashover or insulation breakdown 2. Leakage current: 0.5mA Max.	Test between adjacent contacts of mated and unmated connector assemblies. EIA 364-20 (or MIL-STD-202F, Method 301, Test Condition B)
Contact Capacitance	2 pF Maximum per Contact	Test between adjacent circuits of unmated connector at 1 KHz. EIA 364-30
Contact Current Rating	1.0A at 250Vac minimum	When measured at an ambient temperature of 25°C. With Power applied to the contacts, the ΔT shall not exceed applied to the contacts, the 30°C at any point in the USB connector under test EIA 364-70 Method B
<b>MECHANICAL</b>		
Random Vibration	No discontinuities of 1 μsec or longer duration	Subject mated connectors to 5.35 G's rms. Fifteen minutes in each of three mutually perpendicular planes. EIA 364-28 Test Condition V Test Letter A, (or MIL-STD-202F, Method 214, Test Condition 1, Test Letter A)
Physical Shock	No discontinuities of 1 μsec or longer duration	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 shocks. EIA 364-27 Test Condition H (or MIL-STD-202F, Method 214B)
Durability	No physical damage	Mate and unmate Connector assemblies for 5000 cycles at maximum rated of 200 cycles per hour. EIA 364-09
Mating Force	35 N (3.57Kgf) Max.	Measure force necessary to mate assemblies at maximum rate of 12.5mm (or 0.492") per minute. EIA 364-13
Unmating Force	7 N (0.71Kgf) Min. (Initial) 3 N (0.31Kgf) Min. (After)	Measure force necessary to mate assemblies at maximum rate of 12.5mm (or 0.492") per minute. EIA 364-13

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
<b>ENVIRONMENTAL</b>		
Thermal Shock	See note.	Subject mated connectors to five cycles between -55°C to +85°C. EIA 364-32, Test Condition I, (or MIL-202F, Method 107G Condition A.)
Humidity	See note.	Subject mated connectors to 168 Hours (seven complete cycles) EIA 364-31, Test Condition A Method III, (or MIL-202F, Method 103B Test Condition B.)
Temperature Life	See note.	Subject mated connectors to temperature life at 85°C for 250hours EIA 364-17 Test Condition 3 Method A.
Mixed flowing gas	See Note	(1) Unmated for 1 day (2) Mated for 10 day EIA 364-65-92 Class II, Exposures
<b>PHYSICAL</b>		
Solderability	The surface of the portion to be soldered shall at least 95% covered with new solder coating as specified	After one hour steam aging. EIA 364-52.
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 240±5°C, 10±0.5sec. Tyco spec. 109-202, Condition A
Resistance to Wave Soldering Heat (Lead-Free)	No physical damage shall occur.	Solder Temp. : 265±5°C, 10±0.5sec. Tyco spec. 109-202, Condition B
Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C/85% RH for 168 hours. Pre Heat : 150~200°C, 60~180sec. Heat : 217°C Min., 60~150sec. Peak Temp. : 245+0/-5°C, 10~30sec. Duration : 3 cycles Tyco spec. 109-201, Condition A
Resistance to Reflow Soldering Heat (Lead-Free)	No physical damage shall occur.	Pre-soak condition, 85°C/85% RH for 168 hours. Pre Heat : 150~200°C, 60~180sec. Heat : 217°C Min., 60~150sec. Peak Temp. : 260+0/-5°C, 20~40sec. Duration : 3 cycles Tyco spec. 109-201, Condition B

Figure 1

NOTE: Shall meet visual requirements, show no physical damages.

**PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE**

Test or Examination	Test Group					
	A	B	C	D	E	F
	Test Sequence (a)					
Examination of product	1,11	1,5	1,7	1,4	1,3	1,3
Low Level Contact Resistance	3,8	2,4				
Insulation Resistance			3			
Dielectric Withstanding Voltage			4			
Contact Capacitance			2			
Contact Current Rating				2		
Random Vibration	6					
Physical Shock	7					
Durability	5					
Connector Mating Force	2,10					
Connector Unmating Force	4,9					
Cable Pull-out Force						2
Thermal Shock			5			
Humidity			6			
Temperature Life (see note c)		3				
Solderability				3		
Resistance to Soldering Heat					2	

Figure 2

NOTE : (a) Numbers indicate sequence in which tests are performed.