
USB CONNECTOR

1. SCOPE

This specification covers performance, tests and quality requirements for USB 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.

Test report : 501-57592

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 plated on soldertails, Nickel underplated all over
- B. Housing : Thermoplastic High Temperature, UL94V-0.
- C. Front Shell : Copper Alloy, Nickel plated over Cu underplated all over.
Rear Shell : Steel, Nickel plated over Cu underplated all over.

3.3. RATINGS

- A. Operation temperature : -20°C to +85°C
- B. Current rating : 2.5 Ampere.
- C. Voltage rating : 30 VAC RMS Max.

3.4. PERFORMANCE AND TEST DESCRIPTION

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

3.5. TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST ITEM	REQUIREMENTS	PROCEDURE
Examination of product	Meets requirements of product drawing and AMP Specification.	Visual inspection No physical damage.
ELECTRICAL TEST		
Termination Resistance (Low Level)	30 mΩ Max. (initial) /till double stacked USB, 50 mΩ Max. (initial) /triple stacked USB	Subject mated contacts assembled in housing to 20 mV Max. open circuit at 100 mA Max. See figure 3. EIA 364-23
Insulation Resistance	1000 MΩ Min.	Test between adjacent contacts of mated and unmated connector assemblies.500±50 VDC EIA 364-21.
Dielectric Withstanding Voltage	No breakdown or flashover.	Test between adjacent contacts of mated and unmated connector assemblies.750 VAC for 1 minute. EIA 364-20
Capacitance	2 pF Max.	Test between adjacent circuits of unmated connectors at 1 KHz. EIA 364-30
MECHANICAL TEST		
Connector Mating Force	35 N Max.	Measure force necessary to mate connector assemblies at Max. rate of 12.5 mm/minute. EIA 364-13
Connector Unmating Force	10 N Min.	Measure force necessary to mate connector assemblies at Max. rate of 12.5 mm/minute. EIA 364-13
Durability	Terminal resistance: 40 mΩ Max. (final) / till double stacked USB, 60 mΩ Max. (final) / triple stacked USB See note (a).	Mate and unmate connector assemblies for 1500 cycles at Max. rate of 200 cycles per hour. EIA 364-09
Vibration, random	No electrical discontinuity of 1 microsecond or longer duration. See note (a).	Subject mated connectors to 5.35 G's rms. 15 minutes in each of three mutually perpendicular planes. See figure 4. EIA 364-28 condition V, Test letter A.
Contact Retention Force	300 gf /pin Min.	Measure the contact retention force with Tensile strength tester.
Physical Shock	No electrical discontinuity of 1 microsecond or longer duration. See note (a).	Subject mated connectors to 30 G's half-sine shock pulses of 11 ms duration. Three shocks in each direction applied along three mutually perpendicular planes, 18 total shocks. See figure 4 for the test setup. EIA 364-27, condition H.

Figure 1 (Cont.)

ENVIRONMENTAL TEST		
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 240±5 °C, 10±0.5sec. TE spec. 109-202, Condition A
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 265±5 °C , 10±0.5sec. TE spec. 109-202, Condition B
Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre Heat : 100~150 °C , 60 sec Max. Heat : 210 °C Min., 30 sec Max. Peak Temp. : 240 °C Max., 10±0.5sec.
Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85 °C / 85% RH for 168 hours. Pre Heat : 150~180 °C , 90±30sec. Heat : 230 °C Min., 30±10sec. Peak Temp. : 260+0/-5 °C , 20~40sec. Duration : 3 cycles TE spec. 109-201, Condition B
Thermal Shock	See Note (a)	Mated connector. -55 °C /30minutes, 85 °C /30minutes, 10cycles. EIA 364-32 test condition I.
Humidity Test	See note (a)	Mated connectors. 40 °C with 90~95% R.H. for 168 hours. EIA 364-31 method II test condition A.
Temperature Life	Terminal resistance: 40 mΩ Max. (final) / till double stacked USB, 60 mΩ Max. (final) / triple stacked USB See note (a)	Mated connectors. 85±5 °C for 250 hours. EIA 364-17, condition 3 method B.
Solderability	Wet Solder Coverage: 95% Min.	Solder Temperature: 245±5 °C Immersion Duration: 5±0.5sec. EIA 364-52

Figure 1 (End)

- (a) Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in the test sequence listed in figure 2.

3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

Test or Examination	Test Group (a)				
	A	B	C	D	E
	Test Sequence (b)				
Examination of Product	1,9	1,5	1,9	1,3	1,3
Termination Resistance (Low Level)	3,7	2,4			
Insulation Resistance			3,7		
Dielectric Withstanding Voltage			4,8		
Connector Mating Force	2				
Connector Unmating Force	8				
Durability	4				
Capacitance			2		
Vibration	5				
Physical Shock	6				
Thermal Shock			5		
Humidity Test			6		
Temperature Life		3 (c)			
Contact Retention Force					4
Resistance to Soldering Heat					2
Solderability				2	

Figure 2(end)

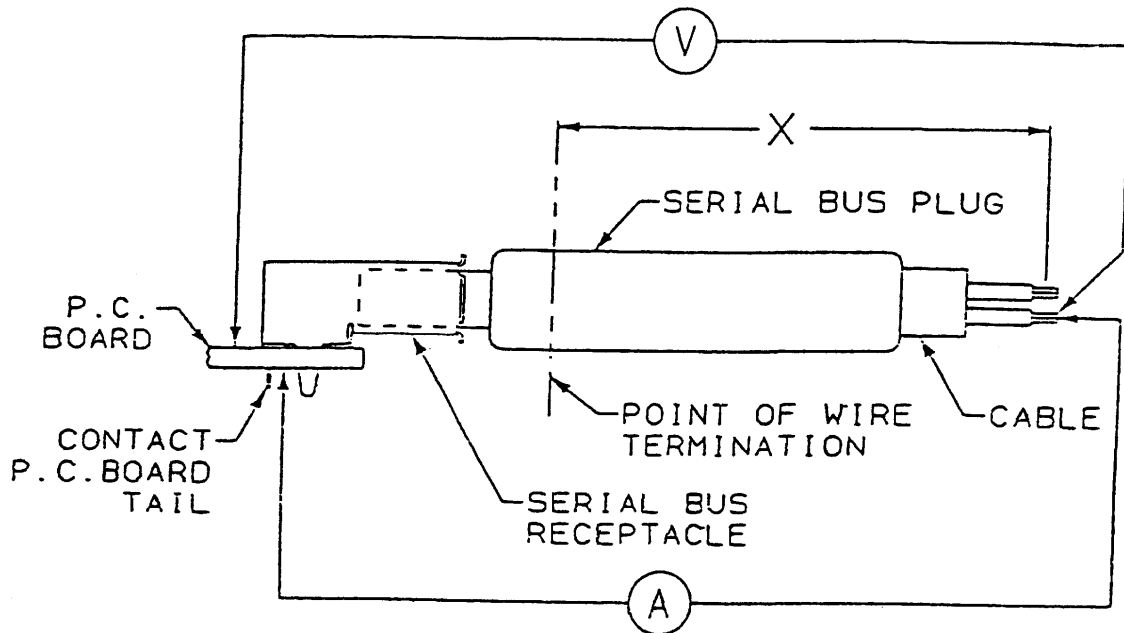
Notes : (a) See Para 4

(b) Numbers indicate sequence in which tests are performed.

(c) Precondition samples with 10 cycles durability.

4. SAMPLE SELECTION

Samples shall be prepared in accordance with applicable manufacturers' instructions and shall be selected at random from current production. Test groups 1,2, and 3 shall consist of a minimum of eight connectors. A minimum of 30 contacts shall be selected and identified. Unless otherwise specified, these contacts shall be used for all measurements.



Note: Resistance due to X inches of wire shall be removed from all readings.

Figure 3
Termination Resistance Measurement Point

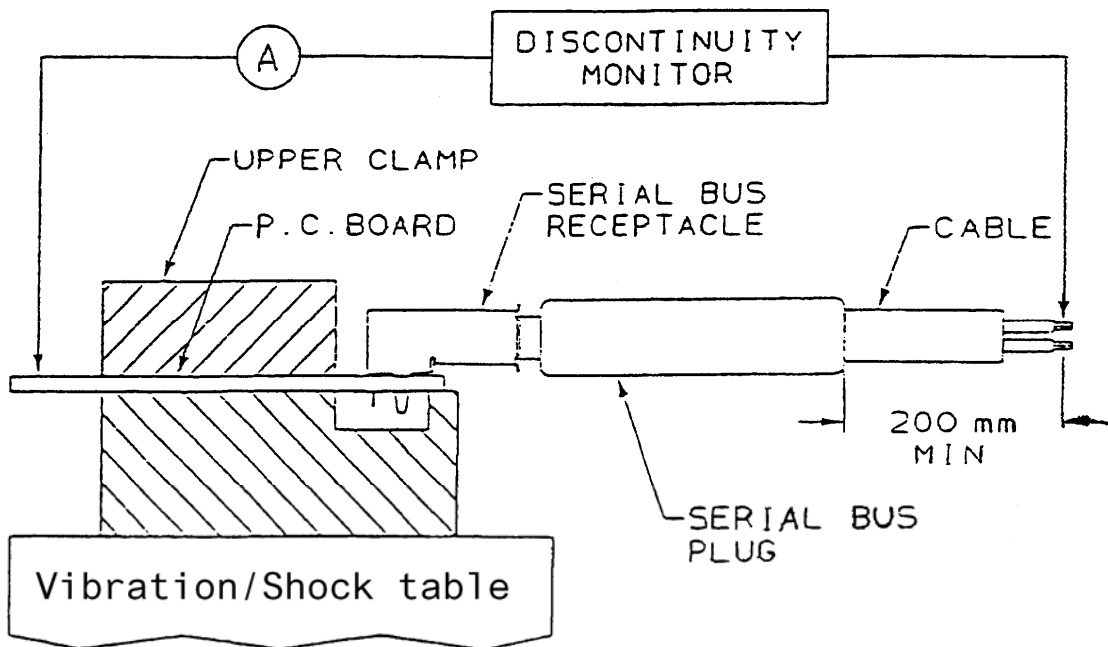


Figure 4
Vibration & Physical Shock Mounting Fixture