

1 Scope :**1.1 Contents**

This specification covers the requirements for product performance, test methods and quality assurance provisions of AMP USB CONNECTOR.

Applicable product description and part numbers are as shown in Appendix 1.

2. Applicable Documents:

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.

2.1 AMP Specification

- A. 501-5583 : Qualification Test Report

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**

Material : Phosphor Bronze
Au plate on contact area and Tin plate on solder
Tine all over Ni plate.

B. Housing

Thermoplastic, UL 94 V-0

C. Shell**Front Shell:**

Material : Brass
Tin plated all over Nickel plated

Back Shell:

Material : Brass
All over Nickel plated

3.3 Ratings :

- A. Voltage Rating : 30 VAC
- B. Current Rating : 1A Max. per contact
- C. Temperature Rating : - 40 °C to 80 °C

3.4 Performance Requirements and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.1. All tests shall be performed in the room temperature, unless otherwise specified.

3.5 Test Requirements and Procedures Summary

Para.	Test Items	Requirements	Procedures
3.5.1	Examination of Product	Meets requirements of product drawing.	Visual inspection No physical damage
3.5.2	Examination of Plating	Meets plating specification of product drawing.	Surface Plating: Checked through X-rays. Under Plating:,Checked through X-rays, after surface plating is removed.
Electrical Requirements			
3.5.3	Termination Resistance	30 mΩ Max.	Subject mated contacts assembled in housing to 20 mV Max open circuit at 10 mA Max. Refer Fig.3
3.5.4	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur. Current leakage:1 mA Max.	750 VAC for 1 minute. Test between adjacent circuits of mated and unmated connectors.
3.5.5	Insulation Resistance	1000 MΩ Min.	Impressed voltage 500 VDC for 1 minute. Test between adjacent circuits of mated and unmated connectors.
3.5.6	Capacitance	2pF Max.	Test between the adjacent circuits of unmated connector. Frequency : 1kHz
Mechanical Requirements			
3.5.7	Vibration (Random)	No electrical discontinuity greater than 1 μ sec. Shall occur. See Note(a).	Vibration Frequency : 50 to 2000 Hz (Random) Accelerated Velocity : 52.43 m/s ² (5.35 G) Vibration Direction : In each of 3 Mutually perpendicular planes. Duration : 15 minute each
3.5.8	Physical Shock	No electrical discontinuity greater than 1 μ sec. Shall occur. See Note(a).	Accelerated Velocity:294m/s ² (30G) Waveform :Half-sine shock Duration :11 msec. Velocity Change :3.4 m/s Number of Drops :3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops.
3.5.9	Connector Mating Force	4Pos:35N(3.57 kgf) Max.	Operation Speed : 12.5 mm/min. Measure the force required to mate connectors.
3.5.10	Connector Unmating Force	4Pos:10N(1 kgf) Min.	Operation Speed : 12.5 mm/min. Measure the force required to unmate connectors.
3.5.11	Contact Retention Force	3N (0.31 kgf) Min.	Apply an axial pull-off load to contact. (at least 5 seconds)
3.5.12	Durability(Repeated Mate / Unmating)	See Note (a)	Operation Speed : 200cycles/hr. No.of Cycles:1500 cycles

Para.	Test Items	Requirements	Procedures
3.5.13	Resistance to Soldering Heat	No physical damage shall occur.	Test connector on PCB. <u>Flow Soldering</u> Solder Temperature :260±5°C Immersion Duration :10±0.5 sec. <u>Manual Soldering</u> Temperature:350±10 °C for 3(+1/-0) Seconds.
3.5.14	Solderability	Wet Solder Coverage : 95 % Min.	Except preconditioning Solder temperature : 245±3°C Immersion Duration in Flux : 5 ~ 10sec Solder sample : Sn-3Ag-0.5Cu Flux sample:Tamura Chemical Ind. NA-200 (Suitable) Immersion point : 1.6±0.5mm from the tip of contact tine. Immersion Duration in solder : 3(+1/-0)sec. Manual Solering Temperature : 350±10°C for 3(+1/-0)sec.
Environmental Requirements			
3.5.15	Thermal Shock	See Note(a)	Mated connector - 55°C / 30 min., 85 °C / 30 min. Making this a cycle, repeat 5 cycles.
3.5.16	Humidity, Steady State	See Note(a)	Mated connector 90 ~ 95%, R.H. 40°C 96 hours
3.5.17	Temperature Life (Heat Aging)	See Note(a)	Mated connector 85 °C, 250 hours
3.5.18	Examination of Whisker-1 (Thermal Shock)	No whisker on surface of contact and shell.	- 35±5°C/30 min.,+125±5°C/30min. Making this a cycle, repeat 500 cycles.
3.5.19	Examination of Whisker-2 (Humidity, Steady State)	No whisker on surface of contact and shell.	85 %R.H., 85 °C, 500 hours

(a)Shall meet requirements of additional test as specified in Test Sequence in Figure 2.

Fig. 1 (End)

3.6 Product Qualification Test Sequence

Test Items	Test Group								
	1	2	3	4	5	6	7	8	9
	Test Sequence(b)								
Examination of Product	1,9	1,6	1,9	1,3	1,3	1	1,3	1,3	1,3
Examination of Plating						2			
Termination Resistance	3,7	2,5							
Dielectric Withstanding Voltage			4,8						
Insulation Resistance			3,7						
Capacitance			2						
Vibration(Random)	5								
Physical Shock	6								
Connector Mating Force	2								
Connector Unmating Force	8								
Contact Retention Force					2				
Durability (Repeated Mate/Unmating)	4	3(c)							
Resistance to Soldering Heat							2		
Solderability				2					
Thermal Shock			5						
Humidity(Steady State)			6						
Temperature Life(Heat Aging)		4							
Examination of Whisker-1 (Thermal Shock)								2	
Examination of Whisker-2 (Humidity,Steady State)									2

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

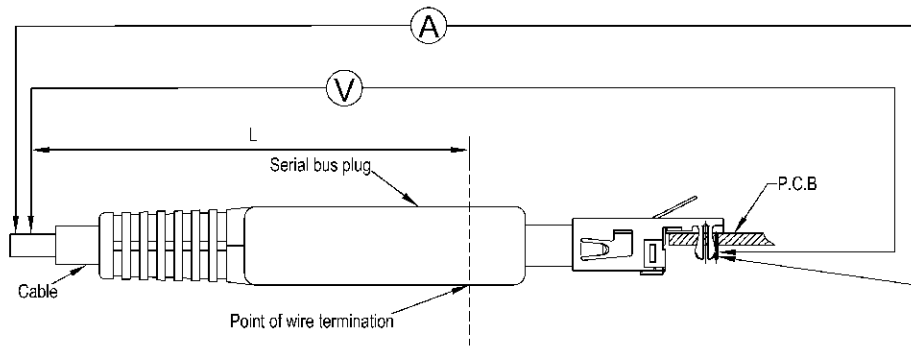
(c) Just 10 cycles durability

Fig.2

The applicable product descriptions and part numbers are as shown in Appendix.1.

Product Part No.	Description
1746311-x	USB CONNECTOR
974325-x	Standard Cable Ass'y, USB Plug ,4Pos.-4Pos.

Appendix.1



Note: Resistance due to L millimeter of wire shall be removed from all readings.

Fig.3 Termination Resistance Measurement Points

(Prepared by) S.Chien

Date
05JUL'04

(Checked by) T.Futatsugi

Date
05JUL'04

(Approved by) W.Kodama

Date
05JUL'04

LTR	REVISION RECORD	ECN	DR	CHK	APP	DATE
O	RELEASED	FJ00-0693-04	S.C	T.F	H.K	05JUL04
A	REVISED	FJB0-0888-04	S.C	T.F	H.K	30AUG04