Product Specification
108-60034
AMP Connector
USB Consortium, Plug & Receptacle
Lead Free Version

1. Scope:

1.1 Contents:

This specification covers the requirements for product performance, test methods and quality requirements of AMP* **U**niversal **S**erial **B**us(**USB**) consortium plug and receptacle connectors. These connectors are mounted plug and printed circuit board mounted receptacle connectors.

1.2 Qualification:

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

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 referenced documents, this specification shall take precedence.

2.1 AMP Specifications:

A. 109-1: General Requirements for Test Specifications

B. 109 Series : Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)

C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Government or Commercial Documents

D. 114-40054: Application Specification.

E. 501-60007: Qualification Test Report

THIS INFORMATION IS CONFIDENTIAL AND IS DISCLOSED TO YOU ON CONDITION THAT NO FURTHER DISCLOSURE IS MADE BY YOU TO OTHER THAN AMP PERSONNEL WITHOUT WRITTEN AUTHORIZATION FROM AMP SHANGHAI LTD.

LTR	REVISION RECORD	DR	DATE
A	Change the material for the receptacle shell	T.Z	13MAR 17

DIST

DR	C. WANG	tyco Electronics	Tyco Electronics AMP Shanghai Ltd
CHK	S. YAO		
APP	I. ENOMOTO	NO 108-60034	REV A / LOC ES

PAGE 1 of 7

TITLE: **AMP Connector, USB Consortium, Plug & Receptacle Lead Free Version**

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:

(1) Plug: Copper alloy: gold over palladium nickel plating on contact area, tin plating on solder area, all over nickel plating or gold plating on contact area, tin plating on solder area, all over nickel plating

(2) Receptacle: Copper alloy: gold over palladium nickel plating on contact area, tin plating on solder area, all over nickel plating or gold plating on contact area, tin plating on solder area, all over nickel plating

B. Housing:

(1) Plug : Thermoplastic, black, 130 ℃, UL94V-0

(2) Receptacle: Thermoplastic, black, 130 ℃, UL94V-0

C. Shell:

(1) Plug: Steel ,bright tin over copper

(2) Receptacle: Stainless Steel , bright tin

3.3 Ratings:

A. Voltage Rating : 30 vac (rms)

B. Current Rating : Signal application only,1 ampere maximum per contact

C. Temperature Rating: -55°C to +85°C unless limited by cable or overmold

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. Unless otherwise specified all tests shall be performed at ambient environmental conditions per AMP Specification 109-1

3.5 Test Requirements and Procedures Summary:

Para.	Test Items	Requirements	Procedures
3.5.1	Examination of Product	Meets requirements of product drawing and AMP Spec 114-40054.	Visually, dimensionally and functionally inspected per applicable inspection plan
		Electrical Requirements	
3.5.2	Termination Resistance	ΔR=10 mΩ Max.	AMP Spec 109-6-6 Subject mated contact assembled in housing to 20 mv maximum open circuit at 100 ma maximum See figure 3
3.5.3	Insulation Resistance	1000 MΩ Min.	AMP Spec 109-28-4 Test between the adjacent contacts of mating and unmating samples
3.5.4	Dielectric Withstanding voltage	750 vac at sea level 1 minute hold with no breakdown or flashover	AMP Spec 109-29-1 Test between the adjacent contacts of mating and unmating samples
3.5.5	Capacitance	2 picofarads maximum	AMP Spec 109-47 Test between the adjacent contacts of unmating samples at 1KHZ
		Mechanical Requirements	
3.5.6	Vibration Random	No electrical discontinuities greater than 1 microsecond shall occur. See Note	AMP Spec 109-21-5 Subject mated connectors to 5.35 G's rms .15 minutes in each of 3 mutually perpendicular planes See Figure 4
3.5.7	Physical Shock	No electrical discontinuity greater than 1 microsecond shall occur. See Note	AMP Spec 109-26-1 Except 30 G's Subject mated connectors to 30 G's half-sine shock pulses of 11 millisecond duration; 3 shocks in each direction applied along the 3 mutually perpendicular planes, total 18 shocks; See figure 4
3.5.8	Mating Force	35 N maximum	AMP Spec 109-42 Condition A Measure force necessary to mate samples at maximum rate of 12.5 mm a minute.

Para.	Test Items	Requirements	Procedures
3.5.9	Unmating Force	10 N minimum	AMP Spec 109-42 Condition A Measure force necessary to unmate samples at maximum rate of 12.5 mm per minute.
3.5.10	Cable Retention Force	Cable shall not dislodge from crimp	AMP Spec 109-46 Apply axial load 25 N to cable
3.5.11	Durability	See Note	AMP Spec 109-27 Mate and unmate samples for 1500 cycles at maximum rate of 200 cycles per hour
3.5.12	Solder ability	Solderable area shall have minimum of 95%solder coverage	AMP Spec 109-11-1 Subject surface mount samples to Solder ability.
			AMP Spec 109-11-1 Subject through hole samples to Solder ability.
Environmental Requirements			
3.5.13	Thermal Shock	See Note	AMP Spec 109-22 Subject mated samples to 25 cycles between -55 ^{o}C and +85 ^{o}C.
3.5.14	Temperature life	See Note	AMP Spec 109-43 Subject mated samples to temperature life at 85 ^{o}C for 315 hours
3.5.15	Humidity-Temperature Cycling	See Note	AMP Spec 109-23-3 Condition B Subject samples to 10 ,24 hours cycles between 25 ^{o}C and 65 ^{o}C at 95% R.H.
3.5.16	Mixed flowing Gas	See Note	AMP Spec 109-85-2 Subject mated samples to Environmental class Ⅱ for 14 days.

NOTE *Shall meet visual requirement, show no physical damage and shall meet requirement of additional tests as specified in Test Sequence in Figure 2.*

Figure 1 (end)

3.6 Product Qualification and Requalification Test Sequence

Test of Examination	Test Group(a)				
	1	2	3	4	5
	Test Sequence (b)				
Examination of Product	1, 10	1, 5	1, 5	1, 9	1, 3
Termination Resistance	3,7	2.4	2.4		
Insulation Resistance				3, 7	
Dielectric Withstanding Voltage				4, 8	
Capacitance				2	
Solder ability					2
Vibration	5				
Physical Shock	6				
Durability	4				
Mating Force	2				
Unmating force	8				
Cable Retention	9				
Thermal Shock				5	
Humidity-Temperature Cycling				6	
Temperature Life		3(c)			
Mixed flowing gas			3(c)		

NOTE

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed
(b) Precondition samples with 10 cycles durability

Figure 2

4 QUALITY ASSURANCE PROVISIONS

4.1 Qualification Testing

A. Sample Selection

Sample shall be prepared in accordance with applicable Instruction Sheet and shall be selected at random from current production Test group 1,2,3and 4 shall each consist of minimum of 8 connectors. Test group 5 shall consist of a minimum of 8 printed circuit board receptacles

connectors. A minimum of 30 contacts shall be selected and identified for each test group. Unless otherwise specified, these contacts shall be used for all measurements.

B. Test Sequence

Qualification inspection shall be verified testing samples as specified in Figure 2.

4.2 Requalification Testing

If changes significantly affecting form, fit or function is made to be product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3 Acceptance

Acceptance is based on verification that the product meets requirement of Figure 1.Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

4.4 Quality Conformance Inspection

Applicable AMP quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

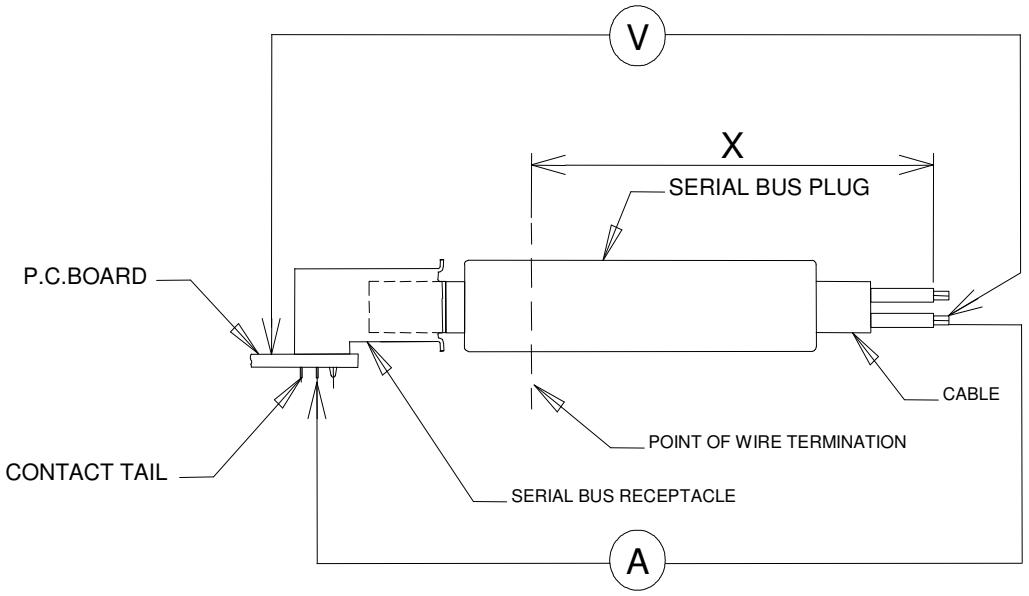


Figure 3

Termination Resistance Measurement Point

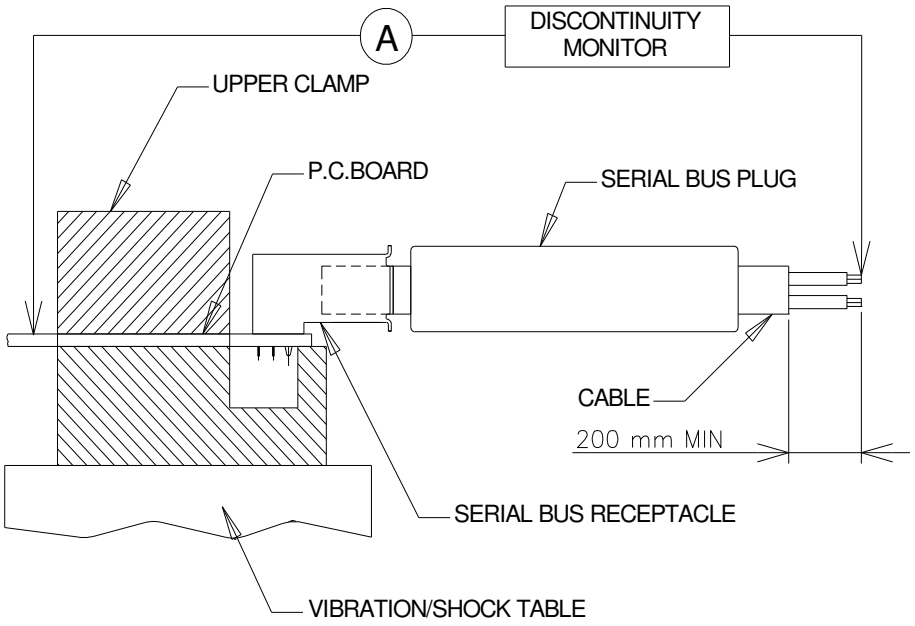


Figure 4

Vibration & Physical Shock Mounting Fixture