

**Rrestricted To Matsushita Electronic Industrial Co., Ltd**

**Product Specification**

**108-60053**

**High Durability R/A Dip Type USB Connector**

1. Scope:

1.1 Contents:

This specification covers the requirements for product performance, test methods and quality requirements of AMP\* Universal Serial Bus(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

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D	CHANGE THE SHELL MATERIAL FROM COPPER ALLOY TO STAINLESS STEEL REVISED	T.Z	17JUL18	DR		tyco			
				Wenke He 15DEC2005		Tyco Electronics			
				CHK Gavin Zhang 15DEC2005		Electronics			
				APP Steven Yao 15DEC2005		NO 108-60053		REV D	LOC ES
C	D20060321221734_472309	W.H	22MAR06	PAGE 1 of 9	TITLE High Durability R/A Dip Type USB Connector				
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D. 114-40054: Application Specification.

E. 501-60028: 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:

- (1) Receptacle: Copper alloy: gold over nickel plating on contact area 0.76um, tin plating on solder area 2um , all over nickel plating 1.3um

##### B. Housing:

- (1) Receptacle: Thermoplastic, white, 130 °C, UL94V-0

#### ① C. Shell:

- (1) Receptacle: Stainless Steel, Tin over Ni plate

#### 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	30 mΩ Max.	AMP Spec 109-5311-2 Subject mated contact assembled in housing to 20 mv maximum open circuit at 100 ma maximum See figure 3
3.5.3	Dielectric Withstanding voltage	750 vac at sea level 1 minute hold with no breakdown or flashover	AMP Spec 109-5301 Test between the adjacent contacts of mating and unmating samples
3.5.4	Insulation Resistance	1000 MΩ Min.	AMP Spec 109-5302 Test between the adjacent contacts of mating and unmating samples
3.5.5	Capacitance	2 picofarads maximum	AMP Spec 109-5307-3 Test between the adjacent contacts of unmating samples
3.5.6	Temperature Rising	30 °C Max under loaded specified current	Measure temperature rising by energized current AMP Spec. 109-5310
Mechanical Requirements			
3.5.7	Contact Retention Force	6.8 N min	Apply an axial pull-off load to contact (at least 5 seconds)
3.5.8	Mating Force	35 N maximum (initial)	AMP Spec 109-42 Condition A Measure force necessary to mate samples at maximum rate of 12.5 mm per minute.
3.5.9	Unmating Force	10 N minimum (initial)	AMP Spec 109-42 Condition A Measure force necessary to unmate samples at maximum rate of 12.5 mm per minute.
3.5.10	Durability	30 mΩ Max.	AMP Spec 109-27 Mate and unmate samples for 30000 cycles at maximum rate of 200 cycles per hour by hand operation

Para.	Test Items	Requirements	Procedures
3.5.11	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
3.5.12	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
3.5.13	Solderability	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			
3.5.14	Thermal Shock	See Note	AMP Spec 109-22 Subject mated samples to 10 cycles between -55 °C and +85 °C.
3.5.15	Humidity, Steady State	See Note	AMP Spec 109-5105 Mated connector 90~95%, R.H. 40 °C 96 hours
3.5.16	Temperature life	See Note	AMP Spec 109-5104 Subject mated samples to temperature life at 85 °C for 250 hours
3.5.17	Resistance to cold	30 mΩ Max.	Mated connector -25 °C ±3 °C 96 Hours AMP Spec. 109-5108

Para.	Test Items	Requirements	Procedures
3.5.18	Sulfurous Acid Gas (SO <sub>2</sub> )	30 mΩ Max.	Mated connector SO <sub>2</sub> Gas: 25ppm, 95% R.H. 25 °C, 96 hours AMP Spec. 109-5107
3.5.19	Salt Spray	30 mΩ Max.	Mated connector with 5 %, 30 °C Concentration for 48 hours AMP Spec. 109-5101
3.5.20	Resistance to soldering heat	No physical damage shall occur.	Test connector on PCB. Solder temperature: 260±5 °C Immersion Duration: 10±1 sec. AMP Spec. 109-5204  Manual soldering 2 times. Temperature: 360±2 °C Duration: 3±0.5 sec. No pressurize a time.

**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	6	7	8	9	10	11
	Test Sequence (b)										
Examination of Product	1, 7	1, 6	1, 9	1, 3	1, 3	1	1,3	1	1	1	1,3
Termination Resistance	2,6	2.5				3,6		2,4	2,4	2,4	
Dielectric Withstanding Voltage			4, 8								
Insulation Resistance			3, 7								
Capacitance			2								
Vibration (Random)	4										
Physical Shock	5										
Mating Force						2					
Unmating force						4					
Contact Retention Force					2						
Durability	3(d)	3 (c)				5					
Solderability				2							
Thermal Shock			5								
Humidity (Steady State)			6								
Temperature Life		4									
Temperature Rising							2				
Resistance to cold								3			
Sulfurous Acid Gas (SO <sub>2</sub> )									3		
Salt Spray										3	
Resistance to soldering heat											2

(a) See Para 4.1.A.

#### NOTE

(b) Numbers indicate sequence in which tests are performed

(c) Precondition samples with 10 cycles durability

(d) Precondition samples with 1500 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.

Used mated plug for test: 1827510-1 (Tyco)

#### B. Test Sequence

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

### 4.2 Requalification Testing

If a change 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.

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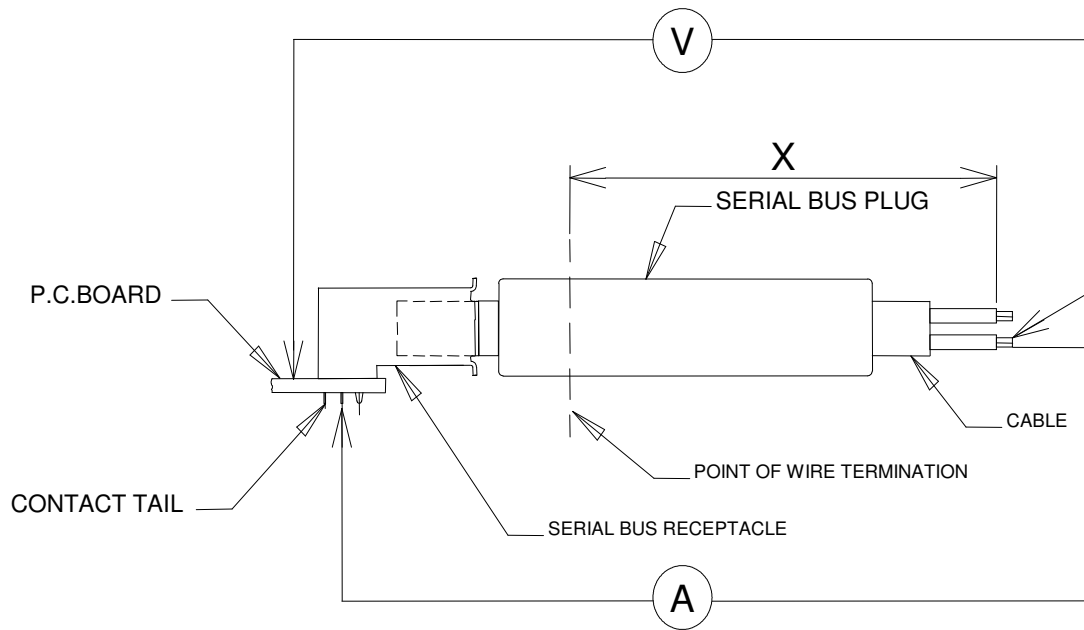


Figure 3  
Termination Resistance Measurement Point

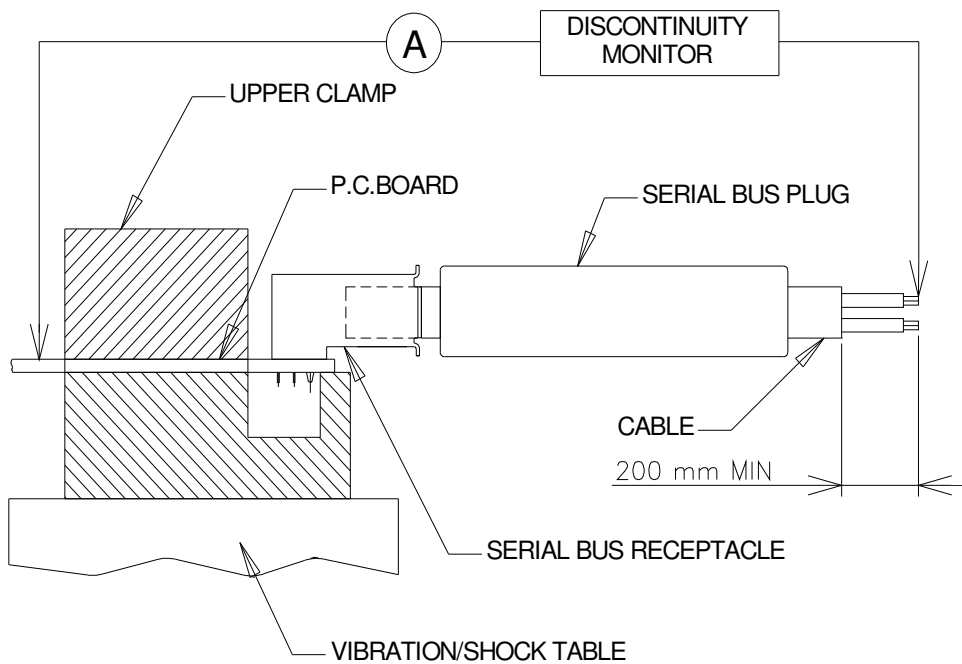


Figure 4  
Vibration & Physical Shock Mounting Fixture



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

Product Part No.	Description
1674459-2	High Durability R/A Dip Type USB Connector

Appendix. 1