

### Modular Jacks

#### 1. SCOPE

##### 1.1. CONTENT

This specification covers performance, tests and quality requirements for Modular Jack Connector.

##### 1.2. QUALIFICATION

When tests are performed on the subject product line, 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 the referenced documents, this specification shall take precedence.

##### 2.1 SPECIFICATIONS

###### XMULTIPLE Documents

- A. PS-2000 Test specifications as indicated in Figure 1.
- B. TR-2000 Test report.

###### Federal

- A. QQ-B-626 Brass; bar, plate, rod, strip, flat wire and special shaped sections
- B. QQ-B-750 Bronze, phosphor; bar, plate, rod, sheet, strip, flat, wire, and structural and Special shaped sections
- C. QQ-N-290 Plating, nickel (electrodeposited )

###### Military

- A. MIL-STD-1344A Test methods for electrical connectors
- B. MIL-C-39012C General specification for connectors, coaxial, radio frequency
- C. MIL-G-45204 Gold plating ( electrodeposited )

###### Underwriters' Laboratories, Inc.

- A. UL- STD -94 Tests for flammability of plastic material for parts in devices and appliances.

###### Others

- A. ISO 2859 Sampling procedures for inspection by attributes.
- B. FCC Rules for Registration of Telephone Equipment Part 68, Subpart F, connectors.
- C. EIA-364 : Electrical Connector/Socket Test Procedures Including Environmental Classifications.
- D. JESD22-B102D: Solderability Test Method.

### 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 : Phosphor Bronze

Contact area Gold plating

Solder tails Gold (or Tin) plating, Nickel under plated all over.

B. Housing: High temp. Thermoplastic, UL94V-0, Black.

#### 3.3 RATINGS

A. Relative Humidity: 70%±10%RH

B. Operating Temperature: -40°C to 85°C

C. Current Rating: 1.5A Max

D. Voltage Rating: 150 VAC 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

NO.	TEST DESCRIPTION	REQUIREMENT
1	Visual & Mechanical Examination	Mechanical Structure & Appearance & Cosmetics Specs and Drawing.
		<b>ELECTRICAL</b>
2	Contact Resistance.	Open circuit at 20mV Max, 100mA Max. Requirement : 20mΩ max initial. 30mΩ max final. EIA-364-23B (Figure 3)
3	Dielectric Withstanding Voltage.	Test between adjacent circuits of unmated connector. 1KVrms at 60Hz , 1 minute between adjacent contacts. 1.5KVrms at 60Hz , 1 minute between shield and contacts. Requirement: No creeping discharge or flashover shall occur. Current leakage: 0.5 mA Max. EIA-364-20B
4	Insulation Resistance	Test between adjacent contacts of unmated connector for 1 minute. Impressed voltage 500 VDC. Requirement: 500 MΩ Min. Initial. 200 MΩ Min. Final. EIA-364-21C.

Figure 1 ( Continue )

		<b>MECHANICAL</b>
<b>5</b>	Contact Normal Force	Individually pin of contact area Requirement: 0.1kgf Min. EIA-364-04A (Figure 4)
<b>6</b>	Durability	Mate and unmated for 750 cycles Operation Speed: 25mm/min. Requirement: Note 1 EIA-364-09C
<b>7</b>	Mating Force	Measure the force required to mate connector. Operation speed: 25 mm/min. Requirement: 2 contacts -----1.6Kgf Max. 4 contacts -----1.8Kgf Max. 6 contacts -----2.1Kgf Max. 8 contacts -----2.3Kgf Max. 10 contacts -----2.5Kgf Max. EIA-364-13B
		<b>ENVIRONMENTAL</b>
<b>8</b>	Humidity test	At a temperature of $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and relative humidity of 90% to 95% for 96 hours. Requirement: Note 1 EIA-364-31B
<b>9</b>	Temperature Life	Exposing in a heat chamber at a temperature of $65^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 96 hours. Requirement: Note 1 EIA-364-17B
<b>10</b>	Salt Spray	Subject mated connectors to $35\pm 2^{\circ}\text{C}$ and 5+/-1% salt condition for 48hours. After test, rinse the sample with water and recondition the room temperature for 1 hour. Requirement: No detrimental corrosion allowed in contact area and base metal exposed. EIA-364-26B
<b>11</b>	Solderability	Solder pot temperature: $245\pm 5^{\circ}\text{C}$ Solder immersion time: $5\pm 0.5\text{sec}$ . Requirement: The inspected area of each lead must have 95% solder coverage minimum. JESD22-B102D

Figure 1 ( End )

Note 1 : Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the test sequence in Figure 2

### 3.6 CONNECTOR TESTS AND SEQUENCES

Items	Test Group				
	A	B	C	D	E
1 Visual&Mechanical Examination	1, 7	1, 5	1, 7	1, 7	1, 4
2 Contact Resistance.	2, 6	2, 4	2, 6	2, 6	
3 Dielectric Withstanding Voltage.			3, 5		
4 Insulation Resistance				3, 5	
5 Contact Normal Force					2
6 Durability	4				
7 Mating Force	3, 5				
8 Humidity test		3			
9 Temperature Life			4		
10 Salt Spray				4	
11 Solderability					3

Figure 2

### 3.7 TEST SAMPLES

The test samples consisted of 25 pcs which were divided into 5 groups (A,B,C,D and E) with 5 pcs

In each group for each corresponding test group defined in section 3.6 CONNECTOR TESTS AND SEQUENCES.

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1 SAMPLE SELECTION

Modular jack test samples shall be selected at random from current production lots. They shall be prepared for testing in accordance with current application specifications and instruction sheets.

### 4.2 ACCEPTANCE

Acceptance is based on verification that the product meets the requirements 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 resubmittal.

### 4.3 QUALITY CONFORMANCE INSPECTION

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

Figure 3. Low Level Contact Resistance :

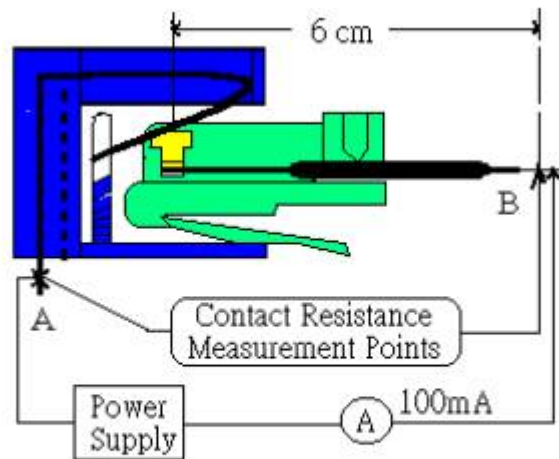
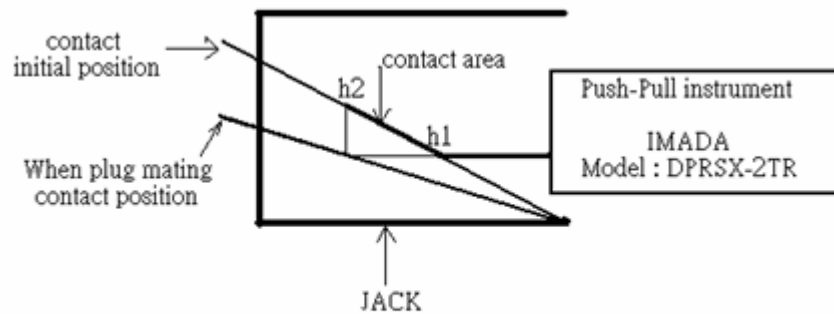


Figure: Contact Resistance Test.

Note: Resistance of 6 cm wire length and contact pin shall be subtracted from all readings.

Figure 4. Contact Normal Force :



Contact area (from  $h_1$  to  $h_2$ ) is the trace of attrition , when plug mating

## 5. VALIDATION

Approved by: Michael Chang