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**Jack, Modular, 110 Panel Mount**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for TE Connectivity (TE) Category 3 and Category 5 110 panel mount modular jacks. These assemblies are designed for panel mounting and provide insulation displacing 110 punchdown blocks for terminating both shielded and unshielded twisted pair conductors to the jacks. 110 blocks are designed to terminate 22 to 26 AWG solid or stranded conductors having a maximum overall diameter of .050. Jacks are available in fully shielded, unshielded and grounded styles.

## 1.2. Qualification

When tests are performed on subject product line, procedures specified in 109 Series Test Specifications shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

**2. APPLICABLE DOCUMENTS**

The following documents constitute a part of this specification to the extent specified herein. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

## 2.1. TE Documents

- 109-1: General Requirements For Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 108-1588: Product Specification (110 Connection Block)
- 408-3354: Instruction Sheet (110 Panel Mount Jack)
- 501-202: Qualification Test Report

## 2.2. Commercial Specifications

- EIA/TIA-TSB40-A: Transmission Specifications for Unshielded Twisted Pair Connecting Hardware
- FCC Rules For Registration Of Telephone Equipment, Part 68, Subpart F, Connectors
- UL File E81956 Volume 1, Section 12: Communication Circuit Accessories

**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

- Housings:
  - Modular jack: Polyphenylene oxide, UL94V-0
  - Connector block: Polycarbonate, UL94V-0
- Terminals:
  - Modular jack: Phosphor bronze, gold over nickel plating
  - Connector block: Phosphor bronze, tin-lead over nickel plating
- Shield: Brass, tin-lead plating

3.3. Ratings

- Voltage: 150 volts alternating current
- Current: 1.5 amperes maximum (signal application only)
- Temperature: -40 to 70°C
- Shielding effectiveness: Shielding effectiveness is measured by comparing level of electromagnetic emissions from an unshielded system with that of a shielded system. A system includes active electronic devices and associated cables. Emission levels can be affected by many variables such as cable type, cable length, grounding method and test setup. Contribution of a shielded connector to overall shielding will vary with each application. Typically, a shielded modular plug/jack interface may be expected to improve shielding effectiveness approximately 20 dB as compared to an unshielded interface.
- Frequency range:
  - Category 3: 1 - 16 MHz
  - Category 5: 1 - 100 MHz
- Characteristic impedance: 100 ohms

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions per Test Specification 109-1 unless otherwise specified.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination resistance, specified current.	24 AWG wire size; 1 ampere test current; 100 milliohms resistance.	TE Spec 109-25. Measure potential drop of jack and mated plug assembly. Calculate resistance. See Figure 3.
Termination resistance, dry circuit.	100 milliohms maximum initial. 120 milliohms maximum final.	TE Spec 109-6-1. Subject jack and mated plug assembly to 50 mv open circuit at 100 ma. See Figure 3.

Figure 1 (continued)

Test Description	Requirement	Procedure
Dielectric withstanding voltage.	1 kvac dielectric withstanding voltage. 1 minute hold. 1 milliampere maximum leakage current. No breakdown or flashover.	TE Spec 109-29-1. Test between adjacent contacts of jack and mated plug assembly.
Insulation resistance.	500 megohms minimum final.	TE Spec 109-28-3. Test between adjacent contacts of jack and mated plug assembly.
<b>MECHANICAL</b>		
Sinusoidal vibration.	No discontinuities greater than 1 microsecond. See Note.	TE Spec 109-21-1. Subject jack and mated plug assembly to 10 to 55 Hz traversed in 1 minute at .06 inches total excursion. 15 minutes in each of 3 mutually perpendicular planes.
Plug retention in jack.	Plug shall not dislodge from jack.	TE Spec 109-50. Apply axial load of 20 pounds to plug housing at rate of .5 inch per minute with plug mated in jack and latch engaged.
Mechanical shock.	No discontinuities greater than 1 microsecond. See Note.	TE Spec 109-26-1. Subject mated jack and plug assembly to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks applied along 3 mutually perpendicular planes, 18 total shocks.
Mating force.	5 pounds maximum.	TE Spec 109-42, Condition A. Measure force necessary to mate plug and jack with plug latch depressed at a rate of .5 inch per minute.
Unmating force.	5 pounds maximum.	TE Spec 109-42, Condition A. Measure force necessary to unmate plug and jack with plug latch depressed at a rate of .5 inch per minute.
Durability.	Termination resistance dry circuit final. See Note.	TE Spec 109-27. Mate and unmate plug and jack for 750 cycles at a maximum rate of 500 cycles per hour with latch inoperative.

Figure 1 (continued)

Test Description	Requirement	Procedure
Housing panel retention.	20 pounds minimum.	TE Spec 109-49. Measure panel retention force at a rate of .5 inch per minute using nominal panel cutout dimensions as specified in AMP Customer Drawing.
<b>ENVIRONMENTAL</b>		
Thermal shock.	Insulation resistance. Termination resistance, dry circuit final. See Note.	TE Spec 109-22. Subject mated plug and jack to 25 cycles between -40 and 70°C.
Humidity-temperature cycling.	Insulation resistance within 30 minutes after final cycle. Termination resistance, dry circuit final. 500 vac dielectric withstanding voltage during final cycle. 5 second hold. See Note.	TE Spec 109-76-2. Subject mated plug and jack to 10 humidity-temperature cycles between 4 and 60°C at 95% RH.
Mixed flowing gas.	Termination resistance, dry circuit final. See Note.	TE Spec 109-85-2. Subject mated plug and jack to environmental class II for 20 days.
Temperature life.	See Note.	TE Spec 109-43. Subject mated plug and jack to temperature life at 70°C for 1000 hours duration.

**NOTE**

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

Figure 1 (end)

3.6. Product Qualification And Requalification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Examination of product	1,9	1,5	1,5	1,8	1,4
Termination resistance, dry circuit	3,7	2,4	2,4		
Dielectric withstanding voltage				3,7	
Insulation resistance				2,6	
Vibration	5				
Physical shock	6				
Mating force	2				
Unmating force	8				
Plug retention in jack					2
Durability	4				
Housing panel retention					3
Thermal shock				4	
Humidity-temperature cycling				5	
Mixed flowing gas			3(c)		
Temperature life		3(c)			

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

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample selection.

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall consist of 10, 110 panel mount jacks and 10 terminated plugs.

B. Test sequence.

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

4.2. Requalification Testing

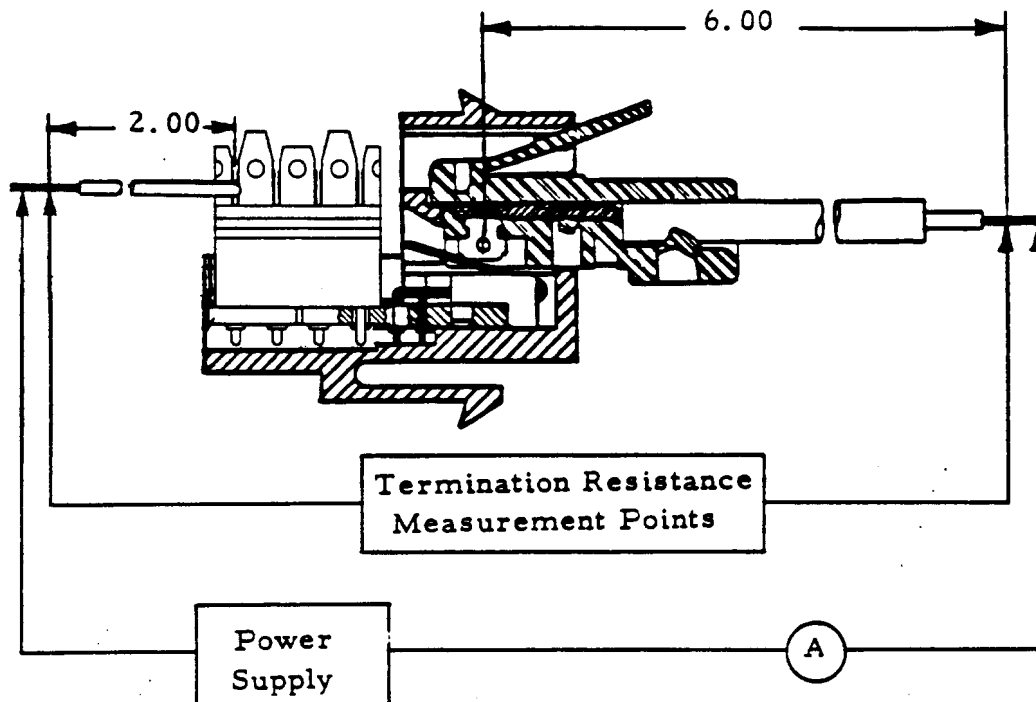
If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

#### 4.3. Acceptance

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

#### 4.4. Quality Conformance Inspection

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



#### NOTE

- (a) Termination resistance of this assembly consists of the following: Plug to jack contact resistance plus printed circuit board trace plus 110 block to discrete wire contact resistance. Printed circuit board trace length varies with each jack position, therefore, significant variations in termination resistance readings can be expected within each jack assembly.
- (b) Millivolt drop (resistance) due to 6 inch and 2 inch wire lengths shall be subtracted from all readings.

Figure 3  
Termination Resistance Measurement Points