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**Connector, FPC, 1 mm**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the TE 1 mm FPC connector. This connector ranges in size from 4 to 30 positions. A single contact is produced with tails to provide right angle surface mount connections to a printed circuit board. An actuator provides ZIF action and the socket accepts FEC, FFC, or FPC. The 2 right angle versions of the socket mate with the exposed traces of the cable facing up or down. Housing can be equipped with solder hold down tabs for both right angle versions.

## 1.2. Qualification

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

**2. APPLICABLE DOCUMENTS**

The following TE Connectivity (TE) documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. 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.

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 114-1072: Application Specification
- 501-278: 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

- Actuator: Glass reinforced nylon (PPA), UL94V-0 or glass reinforced PPS UL94V-0
- Board mount: Phosphor bronze, tin plating
- Contact: Phosphor bronze, tin-lead over nickel plating
- Housing: Glass reinforced polyester (LCP), UL94V-0

## 3.3. Ratings

- Voltage: 200 volts AC (rms)
- Current: Signal application only, 1 ampere maximum for single circuit
- Temperature: -40 to 85°C

## 3.4. Performance and Test Description

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

## 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Spec 114-1072.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination resistance.	$\Delta R$ 10 milliohms maximum.	TE 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Insulation resistance.	1000 megohms minimum.	TE Spec 109-28-4. Test between adjacent contacts of unmated and unmounted samples.
Dielectric withstanding voltage.	500 volts AC at sea level.	TE Spec 109-29-1. Test between adjacent contacts of unmated and unmounted samples.
<b>MECHANICAL</b>		
Solderability.	Immerse contact tails to within .005 inch of housing. Dipped area shall have minimum of 95% solder coverage.	TE Spec 109-11-5, Test Method B. Subject contacts to solderability.
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-21-5. Subject mated samples to 23.91 G's rms. 15 minutes in each of 3 mutually perpendicular planes. See Figure 4.
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-26-9. Subject mated samples to 100 G's sawtooth shock pulses of 6 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.
Durability.	See Note.	TE Spec 109-27. Manually mate and unmate samples for 30 cycles.

Figure 1 (continued)

Test Description	Requirement	Procedure
Contact retention.	Contacts shall not dislodge.	TE Spec 109-30. Apply axial load off 100 grams to contacts in vertical direction and hold for 30 seconds minimum.
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	TE Spec 109-22. Subject mated samples to 5 cycles between -40 and 85°C.
Humidity-temperature cycling.	See Note.	TE Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH. Final measurements shall be taken during recovery period.
Temperature life.	See Note.	TE Spec 109-43. Subject mated samples to temperature life at 85°C for 500 hours.

**NOTE** *Shall meet visual requirements, show no physical damage and shall meet the requirements of additional tests as specified in the 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
	Test Sequence (b)			
Examination of product	1,7	1,7	1,8	1,3
Termination resistance	2,6	2,6		
Insulation resistance			2,6	
Dielectric withstanding voltage			3,7	
Solderability				2
Vibration	4			
Physical shock	5			
Durability	3	3		
Contact retention			9	
Thermal shock			4	
Humidity-temperature cycling		4	5	
Temperature life		5		

**NOTE** (a) See paragraph 4.1.A.  
(b) Numbers indicate sequence in which tests are performed.

Figure 2

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#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Selection

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall consist of a minimum of 5 connectors. Test groups 1 and 2 shall be soldered to printed circuit boards. A minimum of 30 contacts from these test groups shall be randomly selected and tested. If available, test group 1 shall contain both minimum and maximum size connectors. Test groups 3 and 4 shall consist of a minimum of 5 unmated and unmounted connectors. A minimum of 24 contacts from test group 3 shall be randomly selected and tested.

###### 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 the 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 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.

##### 4.4. Quality Conformance Inspection

The applicable 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.

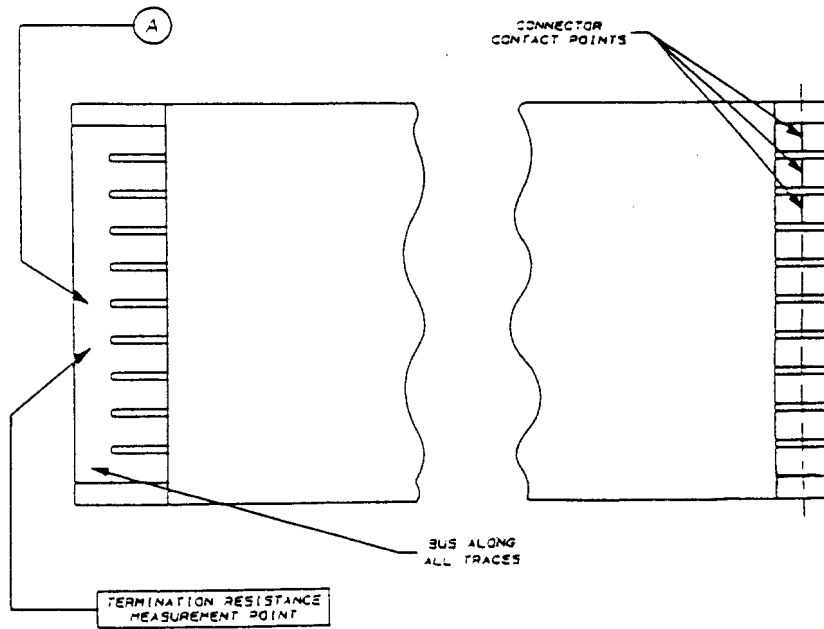
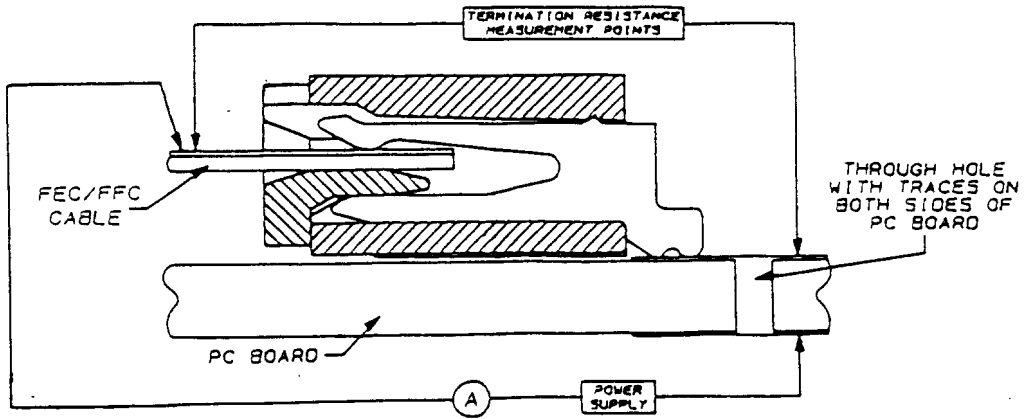


Figure 3  
Termination Resistance Measurement Points

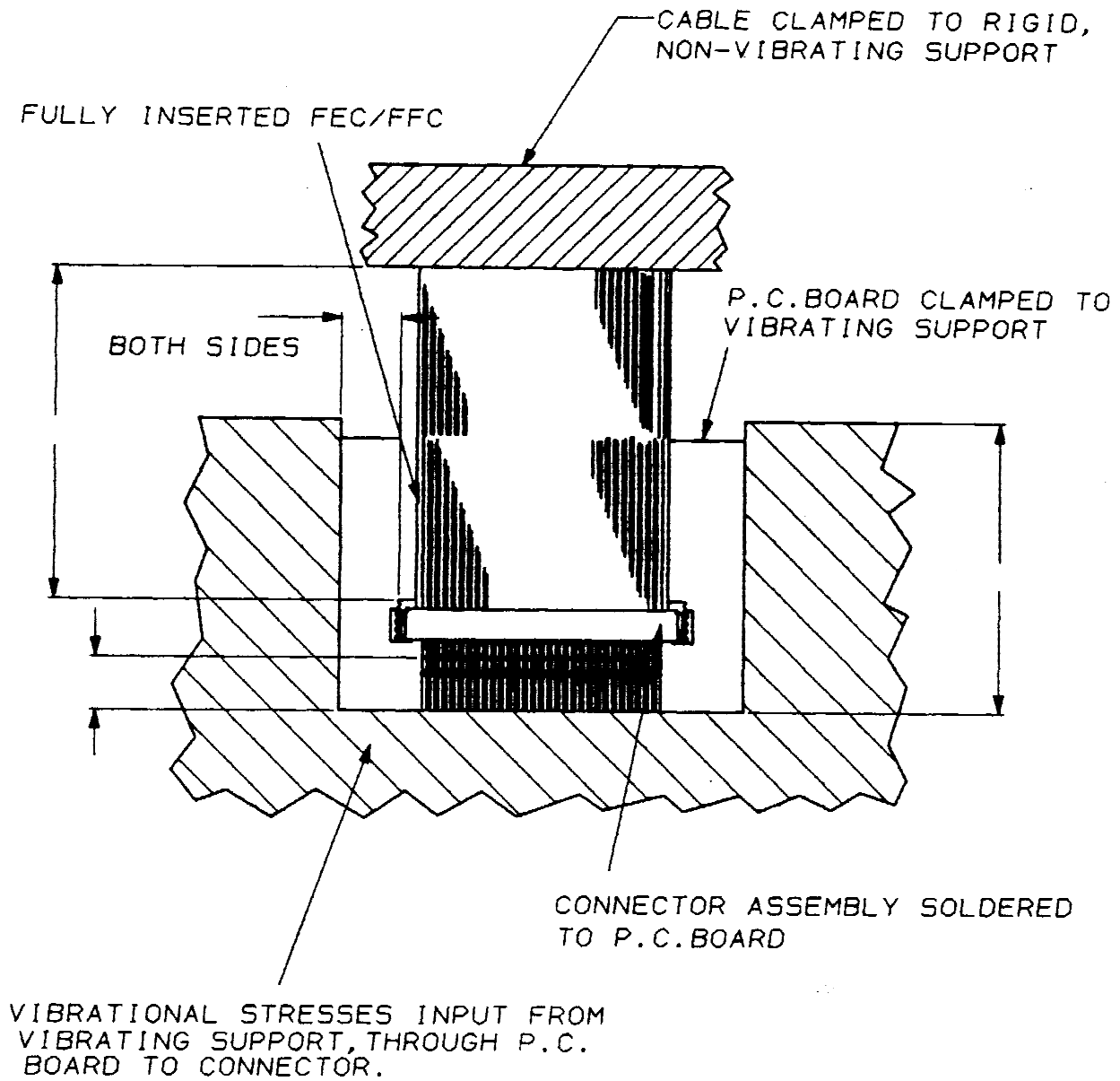


Figure 4  
Vibration & Mechanical Shock Mounting Fixture