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**SMPM Female Cabled Connectors**

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**1. SCOPE**

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Subminiature P Miniature (SMPM) Cabled Female Connectors available in straight and right angle designs.

**1.1. Content**

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Subminiature P Miniature (SMPM) Cabled Female Connectors available in straight and right angle designs.

**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.

**1.3. Successful qualification testing on the subject product line was completed on 02Mar11. The Qualification Test Report number for this testing is 501-747. This documentation is on file at and available from Engineering Practices and Standards (EPS).****2. APPLICABLE DOCUMENTS**

The following 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.

**2.1. TE Connectivity Document**

501-747: Qualification Test Report (SMPM Female Cabled Connectors)

**2.2. Industry Document**

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

**2.3. Reference Document**

109-197: AMP (TE Connectivity) Test Specifications vs EIA and IEC Test Methods

**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**

Materials used in the construction of this product shall be as specified on the applicable product drawing.

### 3.3. Ratings

- A. Voltage: 150 volts AC
- B. Current: Signal application only
- C. Temperature -55 to 125°C
- D. Characteristic impedance: 50 ohms
- E. Frequency Range: DC to 40 GHz

### 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.

### 3.5. Test Requirements and Procedures Summary

Test Items	Requirements	Procedures
Initial examination of product	Meets requirements of product drawing	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements	EIA-364-18. Visual inspection.
<b>ELECTRICAL</b>		
Low Level Contact Resistance (LLCR).	$\Delta R$ 2 milliohms final for center and outer contacts.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Voltage Standing Wave Ratio (VSWR).	1.2 maximum for straight product 1.35 maximum for right angle product	EIA-364-108. Measure VSWR between DC and 40 GHz.
Insulation resistance.	5000 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between the center contact and outer shell of mated specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 325 volts AC minimum at sea level. Test between the center contact and outer shell of mated specimens.
Insertion loss.	-0.053 $\sqrt{f}$ (GHz) dB maximum for straight product -0.053 $\sqrt{f}$ (GHz) dB maximum for right angle product	EIA-364-101, Method A. Measure RF insertion loss between 0.1 and 40 GHz.
<b>MECHANICAL</b>		
Solderability, dip test (male product only).	Solderable area shall have a minimum of 95% solder coverage.	EIA-364-52, Category 3, Class 2. Subject contacts to solderability.

**Figure 1 (cont)**

Test Items	Requirements	Procedures
Sinusoidal vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition III. Subject mated specimens to 10 to 2000 Hz traversed in 20 minutes with 1.5 mm maximum total excursion. Four hours in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method G. Subject mated specimens to 100 G's sawtooth shock pulses of 6 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.
Durability.	See Note.	EIA-364-9. Manually mate and unmate full detent specimens for a minimum of 100 cycles; and smooth bore specimens for a minimum of 500 cycles at a maximum rate of 12 cycles per minute.
Mating force.	40 N maximum for product with full detent. 22 N maximum for product with smooth bore detent.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unmating force.	7.0 N minimum for product with full detent. 2.3 N minimum for product with smooth bore detent.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	EIA-364-32. Subject mated specimens to 5 cycles between -55 and 125°C.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 5, Test Time Condition B. Subject mated specimens to 125°C for 250 hours.
Corrosion.	Contacts must mate and unmate after exposure. See Note.	EIA-364-26, Condition B. Subject unmated specimens to a salt-laden atmosphere for 48 hours.


**NOTE**

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown 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	6	7	8
	Test Sequence (b)							
Initial examination of product	1	1	1	1	1	1	1	1
Low level contact resistance	3,5	2,4	2,4					
VSWR					2			
Insulation resistance				2,6				
Withstanding voltage				3,7				
Insertion loss						2		
Solderability, dip test							2	
Sinusoidal vibration								2(c)
Mechanical shock								3
Durability	4							
Mating force	2							
Unmating force	6							
Thermal shock				4				
Humidity/temperature cycling				5				
Temperature life		3(c)						
Corrosion			3(c)					
Final examination of product	7	5	5	8	3	3	3	4



**NOTE**

- (a) See Paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition specimens with 10 durability cycles.

**Figure 2**

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## 4. QUALITY ASSURANCE PROVISIONS

### 4.1. Qualification Testing

#### A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups 1, 2, 3 and 8 shall consist of 4 specimens each. Test groups 4 and 7 shall consist of 5 specimens each. Test groups 5 and 6 shall consist of 10 specimens each.

#### B. Test Sequence

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

### 4.2. Requalification Testing

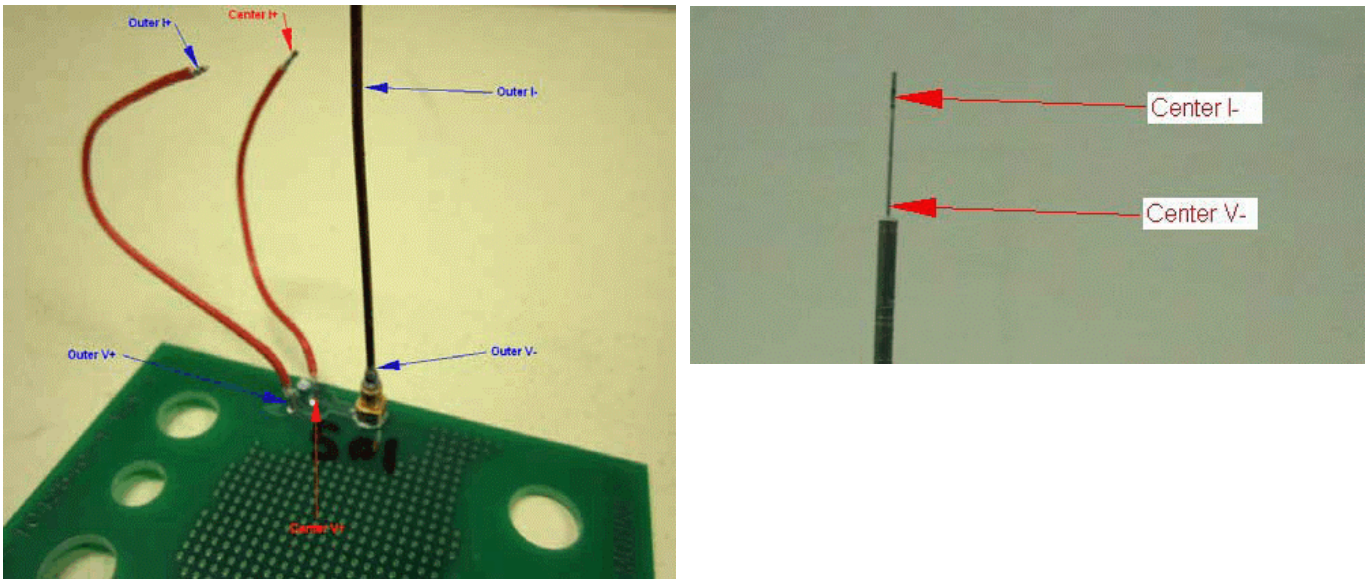
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

### 4.3. Acceptance

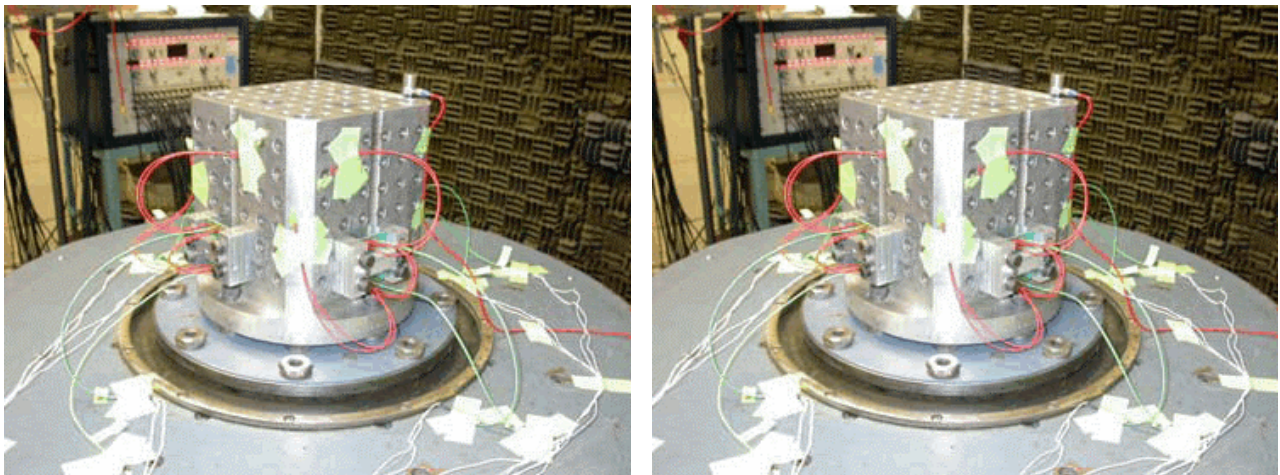
Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing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

### 4.4. Quality Conformance Inspection

The applicable quality inspection plan shall 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**  
LLCR Measurement Points



**Figure 4**  
Vibration and Mechanical Shock Mounting Fixture