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**SMPM Male and Female Uncabled Connectors**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Subminiature P Miniature (SMPM) Uncabled Male and Female Connectors. Male product is available in printed circuit board mounted, surface mount, edge mount and thru hole designs with full or limited detent and smooth bore mating options. Female feed thru adapters are available in solid bullet or spring loaded bullet 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 26Aug10. The Qualification Test Report number for this testing is 501-741. 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 Document

501-741: Qualification Test Report (SMPM Male and Female Uncabled Connectors)

## 2.2. Industry Standard

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

## 2.3. Reference Document

109-197: Test Specification (TE 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

- Voltage: 150 volts AC
- Current: Signal application only
- Temperature: -55 to 125°C
- Characteristic Impedance: 50 ohms
- Frequency Range:
  - Male product: DC to 20 GHz
  - Female product: DC to 40 GHz for solid bullet design; DC to 22 GHz for spring loaded bullet design

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 Description	Requirement	Procedure
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).	6 milliohms maximum initial for center contact. 2 milliohms maximum initial for outer contact. $\Delta R$ 2 milliohms final.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Voltage Standing Wave Ratio (VSWR).	1.5 maximum for female product with solid bullet design. 1.35 maximum for female product with spring loaded bullet design.	EIA-364-108. Measure VSWR between DC and 40 GHz for female product with solid bullet design, or DC to 22 GHz for female product with spring loaded bullet design.
Insulation resistance.	5000 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 325 volts rms minimum at sea level. Test between adjacent contacts of mated specimens.
Insertion loss.	$-0.053 \sqrt{f}$ (GHz) dB maximum for female product.	EIA-364-101, Method A. Measure RF insertion loss between 0.1 and 40 GHz for female product with solid bullet design, or between 0.1 and 22 GHz for female product with spring loaded bullet design.

Figure 1 (continued)

Test Description	Requirement	Procedure
<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.
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 specimens using full detent for 100 cycles at a maximum rate of 12 cycles per minute.
Mating force.	36 N maximum for product with full detent. 11 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.	22 N minimum for product with full detent. 2 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 with -10°C cold shock.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 105°C for 500 hours.
Corrosion.	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
	Test Sequence (b)						
Initial examination of product	1	1	1	1	1	1	1
LLCR	3,7	2,4	2,4				
VSWR					2		
Insulation resistance				2,6			
Withstanding voltage				3,7			
Insertion loss						2	
Solderability, dip test							2
Sinusoidal vibration	5						
Mechanical shock	6						
Durability	4						
Mating force	2						
Unmating force	8						
Thermal shock				4			
Humidity/temperature cycling				5			
Temperature life		3(c)					
Corrosion			3(c)				
Final examination of product	9	5	5	8	3	3	3

- 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. All test groups shall each consist of a minimum of 5 specimens.

###### 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.

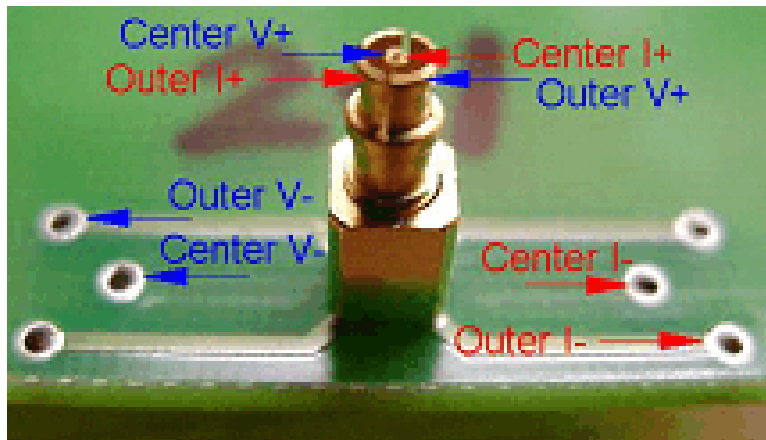


Figure 3  
LLCR Measurement Points

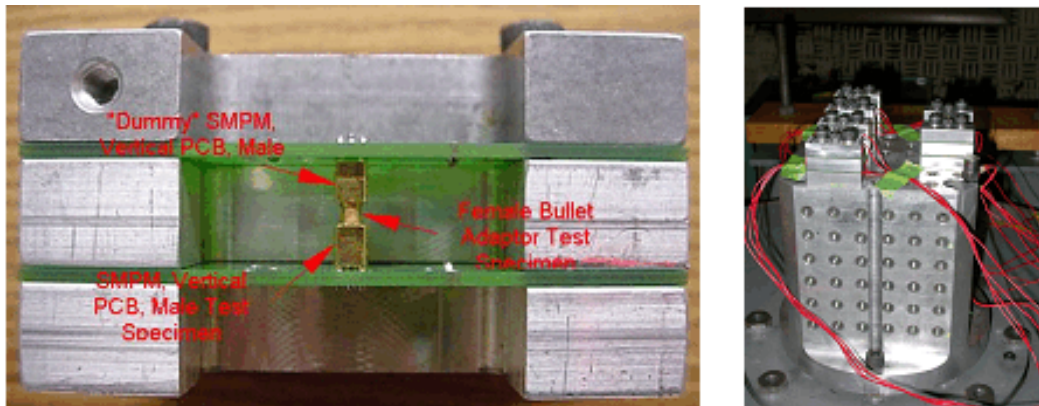


Figure 4  
Vibration & Mechanical Shock Mounting Fixture