
Series MMCX 50 Ohm Micro-Miniature Connectors

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Series MMCX 50 ohm micro-miniature connectors. These connectors are primarily intended for applications where minimum dimensions and space-saving designs are required. They are suitable for use up to 6 GHz and are provided with a reliable snap-on coupling mechanism. The connector family contains straight and right angle variants for cable or solder connection and SMD connectors for surface mount technology onto printed circuit boards.

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. Qualification Test Results

Successful qualification testing on the subject product line was completed on 18Jan08. The Qualification Test Report number for this testing is 501-672. 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. Tyco Electronics Document

501-672: Qualification Test Report (Series MMCX 50 Ohm Micro-Miniature Connectors)

2.2. Commercial Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- CECC 22 220: Sectional Specification - Radio Frequency Coaxial Connectors; Series MCX

2.3. Reference Documents

- BS EN 122340 (2002): Sectional Specification - Radio Frequency Coaxial Connectors - Series MMCX
- CECC 22 000: Generic Specification - Radio Frequency Coaxial Connectors (Parts I, II and III)

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: 170 volts AC
- Temperature: -55 to 155°C, except when limited by cable characteristics
- Nominal Impedance: 50 ohms
- Frequency Range: Up to 6.0 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 Description	Requirement	Procedure
Visual examination.	Meets requirements of product drawing.	CECC 22 220, 4.2. Visual and dimensional (C of C) inspection per product drawing.
ELECTRICAL		
Contact resistance.	5 milliohms maximum for center contact. 2.5 milliohms maximum for outer contact.	CECC 22 220, 4.4.2. and 4.4.3. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Insulation resistance.	1000 megohms minimum.	CECC 22 220, 4.4.4. 500 volts DC, 1 minute hold. Test between center and outer contacts of unmated specimens.
Voltage proof.	1 minute hold with no breakdown or flashover.	CECC 22 220, 4.4.5. 500 volts AC at sea level. Test between center and outer contacts of mated and unmated specimens.
Reflection factor/Voltage Standing Wave Ratio (VSWR).	≤ 0.15 (1.35 VSWR) up to 2.7 GHz.	EIA-364-108.
Screening effectiveness.	35 dB minimum, 200 MHz to 1 GHz.	EIA-364-66A.
MECHANICAL		
Sinusoidal vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	CECC 22 220, 4.6.3. 10-500 Hz, 98 m/sec ² .

Figure 1 (continued)

Test Description	Requirement	Procedure
Mechanical endurance.	See Note.	CECC 22 220, 4.7.1. Manually mate and unmate specimens for 500 cycles at a maximum rate of 15 cycles per minute.
Engaging and separating forces.	18 N [4.05 lbf] maximum engaging force. 6 N [1.34 lbf] minimum separating force.	CECC 22 220, 4.5.4. Measure force necessary to engage (mate) and separate (unmate) specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Contact captivation.	10 N [2.25 lbf] minimum.	CECC 22 220, 4.5.2. Apply axial force to center contact pin at a maximum rate of 12.7 mm [.5 in] per minute.
Cable clamping device, axial.	32 N [7.2 lbf] minimum.	CECC 22 220, 4.5.5. Apply tensile force to cable at a maximum rate of 12.7 mm [.5 in] per minute.
Cable clamping device, torsion.	0.05 N•m [.04 lbf-ft] minimum.	CECC 22 220, 4.5.5. Apply axial torque to cable.
Bending moment.	0.05 N•m [.04 lbf-ft] minimum.	CECC 22 220, 4.5.9.
ENVIRONMENTAL		
Rapid change of temperature.	See Note.	CECC 22 220, 4.6.7. Subject mated specimens to 5 cycles between -55 and 155°C with 30 minute dwells at temperature extremes and 2 to 3 minute transition between temperature extremes.
High temperature.	See Note.	CECC 22 220, 4.7.2. Subject mated specimens to 155°C for 1000 hours.
Damp heat, steady state.	See Note.	CECC 22 220, 4.6.6. Subject mated specimens to 40°C and 93% RH for 96 hours. Voltage proof shall be performed within 15 minutes after specimens are removed from the chamber.
Salt mist.	See Note.	CECC 22 220, 4.6.10. Subject mated specimens to salt spray for 48 hours.

Figure 1 (continued)

Test Description	Requirement	Procedure
Climatic sequence.	See Note.	CECC 22 220, 4.6.5. Subject mated specimens to the following: 1) Sixteen hours of dry heat at 155°C. Insulation resistance shall be performed during the last hour of this exposure. 2) One, 24 hour damp heat cycle of 20 hours at 55°C and 93% RH followed by a 2 hour recovery at ambient, followed by 2 hours at -55°C. 3) Low pressure (70,000 feet) for 1 hour. Voltage proof at 300 volts AC shall be performed during the final 5 minutes of this exposure. 4) A second 24 damp heat cycle as described above. Voltage proof at 500 volts AC at sea level shall be performed during the final 15 minutes of the damp heat cycle.

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(b)	3(b)	4(b)	5(b)	6(b)	7(b)	8(b)
	Test Sequence (c)							
Visual examination	1,6	1,6	1,13	1,13	1,3	1,3	1,14	1,3
Contact resistance, center contact			2,5	2,5,9			2,8	
Contact resistance, outer contact			3,6	3,6,10			3,9	
Insulation resistance	5		8	11			5,10	
Voltage proof	4		9	7,12			6,11	
Reflection factor/VSWR					2			
Screening effectiveness						2		
Sinusoidal vibration,			4					
Mechanical endurance				4				
Engaging force	2		12				13	
Separating force	3		11				12	
Contact captivation								2
Cable clamping device, axial (d)		4						
Cable clamping device, torsion (d)		3						
Bending moment.		5						
Rapid change of temperature		2					4	
High temperature				8				
Damp heat, steady state			7					
Salt mist			10					
Climatic sequence							7	

- NOTE**
- (a) See paragraph 4.1.A.
 - (b) Test groups 2, 3, 4, 5, 6, 7 and 8 will be conducted on specimens that have successfully completed test group 1.
 - (c) Numbers indicate sequence in which tests are performed.
 - (d) Applicable to cabled connectors only.

Figure 2

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 group 1 shall consist of 21 specimens. Test groups 2, 3, 4, 5, 6, 7 and 8 shall consist of 3 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.