

1 SCOPE

1.1 Introduction

This specification covers performance, tests and quality requirements for the Tyco Electronics 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 soldered connection and SMD connector for surface mount technology onto printed circuit boards.

1.2 Qualification

When tests are performed on the subject product line, procedures specified in this Design Objective Specification shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

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 requirements in this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements in this specification and referenced documents, this specification shall take precedence.

2.1 Tyco documents

- 619273 MMCX Jack straight PCB
- 619283 MMCX Plug right angle cable crimp RG178
- 619285 MMCX Jack right angle PCB
- 619286 MMCX Plug straight PCB SMD
- 619287 MMCX Jack right angle PCB Pin in Paste
- 619336 MMCX Plug right angle cable solder RG405 (*)
- 501-19118 Test report

2.2 Commercial Standards

- IEC 61169: Radio-frequency connectors.
Part 1: General requirement and measuring methods
- IEC 60068: Environmental Testing.
- IEC 60512: Basic testing procedure and measuring methods
- EN 122340 : Sectional Specification, Radio frequency coaxial
connectors – series MMCX

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 and finish

Materials and finish used in the construction of this product shall be as specified on the applicable customer drawing.
Connector family in accordance to UL94V0.

3.3 Ratings

- Voltage: 170 volts AC
- Temperature: -55°C to 155°C
- Characteristic Impedance: 50 ohms
- Frequency: 0 to 6 GHz
- Current: 1.0 Amp
- Climatic category: -55/155/4

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 IEC 61169.

3.5 Test Requirements and Procedures

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing and customer drawing	IEC 61169-1 Clause 9.1.2, 9.1.3 Visual and dimensional inspection shall comply with product and customer drawing.
Final examination of product.	Meets visual requirements.	IEC 61169-1 Clause 9.1.2 Visual inspection

Figure 1 (cont)

Electrical

Test Description	Requirement	Procedure
Current temperature	1A @ 30°C max over ambient	IEC 60512-5-1
Insulation resistance	500MΩ	IEC 61169-1 Clause 9.2.5
Voltage proof	500V rms	IEC 61169-1 Clause 9.2.6
Center contact resistance	5 mΩ initial 15 mΩ after stress	CECC 22000 Clause 4.4.2
Outer contact resistance	2.5 mΩ initial 7.5 mΩ after stress	CECC 22000 Clause 4.4.3
VSWR ⁽¹⁾ : -Straight styles -Right styles	≤ 1.25 up to 6 GHz ≤ 1.35 up to 6 GHz	IEC 61169-1-1 Clause 9.2.1
Shielding effectiveness	SE ≥ 60dB up to 1GHz	IEC 61169-1 Clause 9.2.8

Mechanical

Test Description	Requirement	Procedure
Engagement force	Max 18 N	IEC 61169-1 Clause 9.3.6
Separation force	Min 6 N	IEC 61169-1 Clause 9.3.6
Contact captivation: -axial force	10 N	IEC 61169-1 Clause 9.3.5
Effectiveness of cable clamping device: -Cable pulling: axial load -Cable torsion	32 N min. during 60 seconds. 0.05 Nm min.	IEC 61169-1 Clause 9.3.7
Bending moment: -Lateral force	5N during 60 seconds on gauge at 10mm distance	IEC 61169-1 Clause 9.3.12

Environmental

Test Description	Requirement	Procedure
Humidity	Damp Heat, Steady State.+40°C, 90-95%RH, 96 hours	IEC 60068-2-3
Vibration	Sweep 10-500-10 Hz, Amplitude: 0.35mm, Acceleration: 10g, Duration: 2 hours per axis, 3 mutually perpendicular axis, No discontinuity > 1μsec.	IEC 61169-1 Clause 9.3.3

Figure 1 (cont)

Test Description	Requirement	Procedure
Shock	Half sine wave pulls of 11msec, Acceleration: 50g, 6 shocks per axis, 3 mutually perpendicular axis, No discontinuity > 1μsec.	IEC 61169-1 Clause 9.3.14
Salt mist	Duration: 48 hours, Temperature: 35±2°C, Salt solution: 5±1%	IEC 61169-1 Clause 9.4.6

Endurance

Test Description	Requirement	Procedure
Mechanical endurance	500 cycles	IEC 61169-1 Clause 9.5
High temperature ⁽²⁾	1000 hours at 155°C	IEC 61169-1 Clause 9.6

Figure 1 (end)

(¹) Use the Tyco connector PN 619286 plug or PN 619287 jack or equivalent. These values apply to the basic connector. In practice these may be influenced by the cable used and reference should always be made to the actual values given in the detail specification.

(²) For certain connectors the upper temperature limit is restricted by the cable characteristics. Reference should be made to the relevant cable specification.

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

3.6 Product Qualification and Requalification Test Sequence.

Table 1

Test or Examination	Test group					
	1	2	3	4	5	6
	Test sequence (c)					
Initial examination of product	1	1	1	1	1	1
Insulation resistance	2,9					
Dielectric withstanding voltage	3,10					
Center contact resistance	4,7			2,5,8, 11	2,5	2,5
Outer contact resistance	5,8			3,6,9, 12	3,6	3,6
Reflection factor		2				
Shielding effectiveness		3				
Temperature rise		4				
Mating/Unmating force (b)			2,4			
Contact captivation			5			
Cable Pulling (d)			6			
Bending moment			3			
Humidity	6					
Vibration				4		
Shock				7		
Salt mist				10		
Mechanical endurance (a)					4	
High temperature						4
Solderability						
Final examination of product	11	5	7	13	7	7

NOTE: (a) Verification at cycles: 50, 100, 250, 500.
(b) Applicable to plug connectors only.
(c) Numbers indicate sequence in which tests are performed.
(d) Applicable to cabled connectors only.

Table 2

Sample description	Number of described samples in test groups					
	1	2	3	4	5	6
619273	10	10	10	10	10	10
619283	-	10	10	-	-	10
619285	-	10	-	-	-	-
619286	10	10	-	10	10	10
619287	-	10	-	10	-	-

*For simile these test are also valid for 619336.

4 QUALITY ASSURANCE PROVISIONS**4.1 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 part of original testing sequence as determined by product, quality and reliability engineering.

4.2 Acceptance

Acceptance is based on verification that product meets requirements of Para 3. Failures attributed to equipment, test set-up, customer supplied components 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.

4.3 Quality Conformance Inspection

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