1 SCOPE

1.1 Introduction

This specification covers performance, tests and quality requirements for Tyco Electronics Series SMP 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 40 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 subject product line, procedures specified in this Design Objective 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, latest edition of the document applies. In the event of conflict between the 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

- 619301 SMP Jack 90° PCB SMD
- 619302 SMP Jack Panel Press Fit
- 619303 SMP Plug 90° RG 405
- 619304 SMP Jack – SMC Jack Panel
- 619305 SMP Plug – SMP Plug 9.5mm
- 619306 SMP Plug – SMP Plug 6.65 mm
- 619335 SMP Plug Straight RG 405
- 501-19127 Test report

2.2 Commercial Standards

- IEC 61169: Radio-frequency connectors.
- IEC 60068 Environmental Testing
- IEC 60512: Basic testing procedure and measuring methods
- MIL-STD-348A : Military international standard, fig. 326 SMP
- MIL-STD-202 : Test Methods for electronic and electrical component parts

3 REQUIREMENTS

3.1 Design and Construction

Products shall be of design, construction and physical dimensions specified on the applicable customer and 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

- Working Voltage: 335 Vrms
- Temperature: -65°C to 165°C
- Characteristic Impedance: 50 ohms
- Frequency: 0 to 40 GHz
- VSWR (straight version) ≤ 1.5 typ.
- Current: 1.2 Amp max
- Climatic category: -65/165/4

3.4 Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Table 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

Electrical

Test Description	Requirement	Procedure
Current temperature	1.2 A @ 30°C max over ambient	IEC 60512-3-1
Insulation resistance	5GΩ min	IEC 61169-1 Clause 9.2.5
Voltage proof	500V rms	IEC 61169-1 Clause 9.2.6

Table 1 (cont)

Test Description	Requirement	Procedure
Center contact resistance	≤6 mΩ initial ≤18 mΩ after conditioning	MIL-STD-202 Meth. 307
Outer contact resistance	≤2 mΩ initial ≤6 mΩ after conditioning	MIL-STD-202 Meth. 307
Insertion Loss VSWR : Smd pcb Straight Angled Adapter SMP-SMC Adapter SMP-SMP	0.1dB max @ 1GHz ≤ 1.15, DC to 6 GHz ≤ 1.25, 6GHz to 12GHz ≤ 1.1+0.01xf[GHz] DC to 20GHz ≤ 1.1+0.01xf[GHz] DC to 20GHz ≤ 1.15, DC to 6 GHz ≤ 1.3, 6GHz to 12GHz ≤ 1.1, DC to 6 GHz ≤ 1.15, 6GHz to 12GHz ≤ 1.25, 6GHz to 20GHz	IEC 61169-1-1 Clause 9.2.1
Shielding effectiveness	≤-80 dB up to 3GHz ≤-65 dB from 3 to 26.5GHz	IEC 61169-1 Clause 9.2.8

Mechanical

Test Description	Requirement	Procedure
SMP connector Engagement force: - Full Detent - Limited Detent - Smooth Detent SMPA connector: -Engagement force:	 68 Nmax 45 Nmax 9 Nmax 25 Nmax	IEC 61169-1 Clause 9.3.6
SMP connector Disengagement force: - Full Detent - Limited Detent - Smooth Detent SMPA connector: -Disengagement force:	 22 Nmin 9 Nmin 2.2 Nmin 2 Nmin	IEC 61169-1 Clause 9.3.6
Center Contact captivation	7 Nmin	IEC 61169-1 Clause 9.3.5
Mating Cycles: - SMP conn. Limited Detent - SMPA conn.	 500 500	IEC 61169-1 Clause 9.5
Solderability	No dewetting spots > 5%, total dewetting < 10% of the soldering area	IEC 6068-2-20, Test Ta, meth. 1 (IEC 61169-1 Clause 9.3.2)

Table 1 (cont)

Environmental

Test Description	Requirement	Procedure
Humidity	Damp Heat, Steady State.+65°C, 90-98%RH, 24h 10 cycles Method 106	MIL-STD-202
Vibration	Sweep 10-500-10 Hz, Amplitude: 0.75mm, Acceleration: 10g, No discontinuity > 1µsec. Method 204 Cond.A	MIL-STD-202
Shock	Half sine wave pulls, 11msec, Acceleration: 50g, No discontinuity > 1µsec. Method 213 Cond.A	MIL-STD-202
Salt mist	Duration: 48 hours, Temperature: 95±2°C, Salt solution: 5±1% Method 101 Cond.B	MIL-STD-202
Thermal shock	-65/+25/+125/+25°C Minimum time for T° 1/2h 5 cycle Method 107 Cond.B	MIL-STD-202
Industrial atmosphere	10 days; four gas test method 4	IEC 60068-2-60
Temperature life	Duration: 96 hours, Temperature: 100±2°C, Method 108 Cond A	MIL-STD-202

Table 1 (end)

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 Table 2.

3.6 Product Qualification and Requalification Test Sequence

Table 2

Test or Examination	Test group							
	1	2	3	4	5	6	7	8
	Test sequence (*)							
Initial examination of product	1	1	1	1	1	1	1	1
Insulation resistance	2,7							
Dielectric withstanding voltage	3,8							
Center contact resistance	4,9		2,5	2,5,8, 11	2,6	2,5	2,5	
Outer contact resistance	5,10		3,6	3,6,9, 12	3,7	3,6	3,6	
VSWR		2						
Insertion Loss		3						
Shielding effectiveness		4**						
Current rating		5						
Mating/Unmating force***					4,8			
Center Contact captivation		6						
Humidity	6							
Vibration				4				
Shock				7				
Salt mist				10				
Mechanical endurance					5			
Thermal shock						4		
Industrial atmosphere			4					
Temperature Life							4	
Solderability test								2
Final examination of product	11	7	7	13	9	7	7	3

NOTE: (*) Numbers indicate sequence in which tests are performed.
(**) This test must be performed only for 619302,619303 (both version) and 619335 (both version).
(***) Applicable to the plug connectors only.

Table 3

Test Group	Number of samples – mating letter*								
	619301	619302	619303	619303 No ring	619304	619305	619306	619335	619335 No ring
1	-	10a	10a	-	10b	10b	-	-	-
2	5-a	5-c	5-c	5d	5-a	5-a	5-b	5-e	5-f
		5-d							
	5-b	5-e			5-b				
		5-f							
3	10-a	-	-	-	10-a	-	10-a	-	-
	10-b	-	-	-	-	-	-	10-b	-
4	-	10-a	10-a	-	10-b	10-b	-	-	-
5	10-a	-	-	-	10-a	-	10-a	-	-
	10-b	-	-	-	-	-	-	10-b	-
6	-	10-a	10-a	-	10-b	10-b	-	-	-
7	10-a	-	-	-	10-a	-	10-a	-	-
	10-b	-	-	-	-	-	-	10-b	-
8	5	-	5	-	-	-	-	5	-

NOTE: (*) The samples with the same letter must be mated together during the test. The samples without letter must be tested alone.

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.