Modular Jack with USB Connector

1. SCOPE

1.1. CONTENTS

This specification covers the performance, tests and quality requirements for the **Modular Jack with USB Connector**.

1.2. QUALIFICATION

When tests are performed on the subject product line, the procedures specified in Tyco 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENT

The following Tyco 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 SPECIFICATIONS

A. 109-1：General Requirements for Test Specifications

B. 109-197：Tyco Specification vs EIA and IEC Test Methods

C. 501-57805：Test Report

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

A. Housing：Thermoplastic UL94V-0

B. Contact：Copper Alloy, Gold plated on contact area, Matte Tin Plated on solder tail and Nickel underplated overall.

C. Shield：Copper Alloy, Nickel plating entire and tin hot dipped on solder tail area.

3.3. RATINGS

3.3.1 MODULAR JACK

A. Voltage：125 VAC rms.

B. Current：1.5 A Max

C. Temperature：- 40 to 85℃

3.3.2 USB

A. Voltage：30 VAC rms.

B. Current：1.0 A Max

C. Temperature：- 55 to 85℃

3.4. PERFORMANCE REQUEIREMENT AND TEST DESCRIPTION

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions per AMP Specification 109-1TEST REQUIREMENTS AND PROCEDURES SUMMARY.

3.5. TEST REQUIREMENTS AND PROCEDURES SUMMARY

Test Item		Requirement	Procedure
1	Examination of Product	Meets requirements of product drawing. No physical damage.	Visual inspection.
ELECTRICAL REQUIREMENT			
2	Contact Resistance	USB 4P： 30 m Ohm Max. RJ45： 80 m Ohm Max.(Initial) 100 m Ohm Max.(Final)	Subject mated contacts assembled in housing to 20mV Max open circuit at 100mA Max. EIA-364-23B.
3	Dielectric withstanding Voltage	No creeping discharge or flashover shall occur. Current leakage: 0.5 mA Max.	750VAC for 1minute（USB 4P） 500VAC for 1minute（RJ45） Test between adjacent circuits of unmated connector. EIA-364-20B
4	Insulation Resistance	500 M Ohm Min.（USB 4P） 1000 M Ohm Min.（RJ45）	Impressed voltage 500 VDC. Test between adjacent circuits of unmated connector. EIA-364-21C.
5	Capacitance（USB 4P）	2 pF Max.	Test between adjacent circuits of unmated connectors at1 Khz. EIA-364-30

Figure 1（Cont.）

Test Item		Requirement	Procedure
MECHANICAL REQUIREMENT			
6	Connector Mating Force	3.57 Kgf Max.（USB 4P） 2.55 Kgf Max.（RJ45）	Operation Speed：12.5mm/min.（USB 4P） Operation Speed：25.4mm/min.（RJ45） Measure force required mating connector.（USB 4P）. Measure force required mating plug and jack with latch depress（RJ45）. EIA-364-13B
7	Connector Unmating Force	1.02 Kgf Max.（USB 4P） 2.55 Kgf Max.（RJ45）	Operation Speed：12.5mm/min.（USB 4P） Operation Speed：25.4mm/min.（RJ45） Measure force required unmating connector.（USB 4P）. Measure force required unmating plug and jack with latch depress（RJ45）. EIA-364-13B
8	Durability	See Note	USB 4P： Operation Speed：12.5mm/min. Durability Cycles：1500 Cycles
			RJ45： Operation Speed：25.4mm/min. Durability Cycles：750 Cycles EIA-364-9C
9	Vibration	No electrical discontinuity greater than 1 μ sec shall occur. See Note.	Subject mated connectors to 10-55-10 Hz traversed in 1minutes at 1.52mm amplitude 2 hours in each of 3 mutually perpendicular planes. 100mA Max. Applied. EIA-364-28D
10	Mechanical Shock	No electrical discontinuity greater than 1 μ sec shall occur. See Note.	Accelerate Velocity：490m/s^2 （50G） Waveform：Half-sine shock plus Duration：10msec No. of Drops：3 drops each to normal and reversed directions of X,Y and Z axes, totally 18 drops, passing DC 1mA current during the test. EIA-364-27B
11	Solder ability	Wet solder coverage：95% Min.	Steam Aging Preconditioning： 93+3/-5℃、100%H_R、8hrs. <J-STD-002 category 3 aging> Solder pot temperature: 245±5℃, 5sec

Figure 1（Cont.）

Test Item		Requirement	Procedure
ENVIRONMENTAL REQUIREMENTS			
12	Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp.：265±5℃, 10±0.5sec. Tyco spec. 109-202, Condition B
13	Thermal Shock	See Note	Mated Connector -55+/-3℃(30 minutes), +85+/-2℃(30 minutes) Perform this a cycle, repeat 5 cycles EIA-364-32C
14	Humidity-Temperature Cycle	See Note	Mated Connector 25~65℃, 90~95% RH, 10 Cycles EIA-364-31B.
15	Temperature Life (Heat Aging)	See Note	Mated Connector 85℃, 250 hours, EIA-364-17B.
16	Salt Spray	No detrimental corrosion allowed in contact area and base metal exposed.	Subject mated connectors to 35+/-2℃ and 5+/-1% salt condition for 48hours. After test, rinse the sample with water and recondition the room temperature for 1 hour. EIA-364-26B.

Figure 1（End）

NOTE：Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the test sequence in Figures 2

3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST

Test or Examination	Test Group								
	A	B	C	D	E	F	G	H	I
	Test Sequence（a）								
Examination of Product	1, 8	1, 9	1, 6	1, 5	1, 5	1, 5	1, 5	1, 3	1, 3
Contact Resistance		2, 8	2, 5	2, 4	2, 4	2, 4	2, 4		
Dielectric withstanding Voltage	4, 7								
Insulation Resistance	3, 6								
Capacitance（USB）	2								
Mating Force		3, 7							
Unmating Force		4, 6							
Durability		5							
Vibration			3						
Mechanical Shock			4						
Solder ability									2
Resistance to Soldering Heat								2	
Thermal Shock				3					
Humidity Temperature Cycling	5				3				
Temperature Life						3			
Salt Spray							3		

Figure 2

NOTE：（a）Numbers indicate sequence in which tests are performed.

（b）Discontinuities shall not take place in this test group, during tests.