FPC Connector, 0.5mm Pitch, Right angle, Bottom, SMT Type

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for FPC Connector, 0.5mm Pitch, Right angle, Bottom, SMT Type

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.

2. APPLICABLE DOCUMENTS AND FORMS

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 Connectivity Specifications

A. 109-1：General Requirements for the Test Specification

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

C. 501-161807：Test Report

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials 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 TE drawing.

A. Housing ： Thermoplastic, UL94V-0

B. Actuator ： Thermoplastic, UL94V-0

C. Contact: Copper Alloy, Gold plating on contact area over nickel underplating overall.

D. Tab ：Copper Alloy, Tin plating on solder tail over nickel underplating overall.

3.3. Ratings

A. Voltage Rating: 50VAC

B. Current Rating: 0.5 A Max

C. Temperature Rating: –40°C to +85°C

3.4. Performance Requirements and Test Description

The product should meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions otherwise specified.

3.5. Test Requirements and Procedure Summary

Si No	TEST ITEM	REQUIREMENT	PROCEDURE
1	Examination of Product	Visual inspection	Meets requirements of product drawing. No physical damage.
ELECTRICAL REQUIREMENT			
2	Contact Resistance	40 m Ohm Max (Initial) 60 m Ohm Max(Final)	Subject mated contacts assembled in housing to 20mV Max open circuit at 10mA Max. EIA-364-6B.
3	Dielectric withstanding Voltage	No creeping discharge or flashover shall occur. Current leakage: 0.5 mA MAX	250 VAC for 1minute Test between adjacent circuits of unmated connector. EIA-364-20B
4	Insulation Resistance	500 M Ohm Min. (Initial) 100 M Ohm Min.(Final)	Impressed voltage 500 VDC. Test between adjacent circuits of unmated connector. EIA-364-21C.
MECHANICAL REQUIREMENT			
5	FPC Cable Retention Force	0.050 kgf/Pin Min.	Operation Speed：10 mm/min. Measure the force required to mate connector. EIA-364-13B
6	Vibration	No electrical discontinuity greater than 1μsec shall occur. See Note.	Subject mated connectors to 10-55-10 Hz traversed in 1minutes at 1.52mm amplitude 2Hours each of 3 mutually perpendicular planes. 100mA Max. Applied. EIA-364-28D, Condition I
7	Mechanical Shock	No electrical discontinuity greater than 1μsec shall occur. See Note.	Accelerate Velocity：490m/s2（50G）Waveform：Half-sine shock plus Duration：11msec No. of Drops：3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops, passing DC 100mA max. current during the test. EIA-364-27B, Method A
8	Solderability	The inspected area of each lead must have 95% solder coverage minimum.	Steam Aging Preconditioning：1. Intended for nontin and nontin-alloy lead finishes for 93+3/-5°C、1hrs. 2. Intended for tin and tin-alloy lead finishes for 93+3/-5°C、8hrs. <JESD22-B102D, Condition C> Solder pot temperature: 245±5°C, 5sec
ENVIRONMENTAL REQUIREMENTS			
9	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C/85％RH for 168 hrs. Pre Heat：150~180°C, 90±30sec. Heat：230°C Min., 30±10sec. Peak Temp.：260+0/-5°C, 20~40sec. Duration：3 cycles Tyco spec. 109-201, Condition B
10	Thermal Shock	See Note	Mated Connector -55+/-3°C (30 min.), +85+/-2°C (30 min.) Perform this a cycle, repeat 5 cycles EIA-364-32C, Condition I
11	Humidity-Temperature Cycle	See Note	Mated Connector 25~65°C, 90~95% RH, 10 Cycles EIA-364-31B
12	Temperature Life (Heat Aging)	See Note	Mated Connector 85°C, 250 hours, EIA-364-17B.
13	Salt Spray	No detrimental corrosion allowed in contact area and base metal exposed	Subject mated connectors to 35+/-2°C 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, Condition B

Figure 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 Figure 2.

3.6. Product Qualification and Requalification Test Sequence

Item/Test group		A	B	C	D	E	F	G	H
1	Examination of Product	1, 5	1, 6	1, 9	1, 5	1, 9	1, 5	1, 3	1, 3
2	Contact Resistance	2, 4,	2, 5	4, 6	2, 4	4, 6	2, 4		
3	FPC Cable Retention Force	3							
4	Mechanical Shock		3						
5	Vibration		4						
6	Dielectric withstanding Voltage			3, 8		3, 8			
7	Insulation Resistance			2, 7		2, 7			
8	Thermal Shock			5					
9	Temperature Life				3				
10	Humidity Temperature Cycling					5			
11	Salt Spray						3		
12	Solder ability							2	
13	Resistance To Reflow Soldering Heat								2

Figure 2

NOTE
(a) See paragraph 4.2.
(b) Numbers indicate sequence in which tests are performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 3.

Temperature	15°C – 35°C
Relative Humidity	45% – 75%
Atmospheric Pressure	86.6 – 106.6 kPa

Figure 3

4.2. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.3. 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.

4.4. Acceptance

Acceptance is based on verification that the product meets the requirements in 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.

4.5. 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.