
0.5 Pitch FM Board-To-Board

1. SCOPE

1.1. CONTENTS

This specification covers the performance, tests and quality requirements for the 0.5 Pitch FM (Fine Mate) Board-To-Board 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. 501-57669 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, 94V-0 rated.
- B. Contact: Copper Alloy, plating: (see drawing)
- C. Tab: Copper Alloy, plating: (see drawing)

3.3. RATINGS

- A. Voltage: 50 VAC r.m.s.
- B. Current: 0.5 A max.
- C. Temperature: - 45 °C to 125 °C

3.4. PERFORMANCE REQUIREMENT 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.

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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	50 mΩ Max (Initial) ΔR 20 mΩ 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	150VAC for 1 minute Test between adjacent circuits of unmated connector. EIA-364-20B
4	Insulation Resistance	500 MΩ Min. (Initial) 100 MΩ Min. (Final)	Impressed voltage 500 VDC. Test between adjacent circuits of unmated connector. EIA-364-21C.
5	Temperature Rising	30°C Max. Under loaded rating current	Contact series-wired, apply test current of loaded rating current to the circuit, and measure the temperature rising by probing on soldered areas of contacts, after the temperature becomes stabilized deduct ambient temperature from the measured value.
MECHANICAL REQUIREMENT			
6	Connector Mating Force	150 gf/Pin Max.	Operation Speed: 10 mm/min. Measure the force required to mate connector. EIA-364-13B
7	Connector Unmating Force	10 gf/Pin Min.	Operation Speed: 10 mm/min. Measure the force required to unmate connector. EIA-364-13B
8	Durability	See Note	Operation Speed: cycle/min. Durability Cycles: 50 Cycles EIA-364-9C
9	Vibration	No electrical discontinuity greater than 1μ sec shall occur. See Note.	Subject mated connectors to 10-55-10 Hz traversed in 1minutes at 1.52mm amplitude 2 Hours each of 3 mutually perpendicular planes. 100mA Max. Applied. EIA-364-28D
10	Mechanical Shock	No electrical discontinuity greater than 1μsec shall occur. See Note.	Accelerate Velocity: 490m/s ² (50G) Waveform: Half-sine shock plus Duration: 11 msec 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
MECHANICAL REQUIREMENT			
11	Contact Retention Force	30 gf Min.	Measure the contact retention force with Tensile strength tester.
ENVIRONMENTAL REQUIREMENTS			
12	Solderability	The inspected area of each lead must have 95% solder coverage minimum.	Steam Aging Preconditioning: 93 +3/-5 °C, 100% H.R., 8 hrs. <J-STD-002 category 3 aging> Solder pot temperature: 245±5 °C, 5 sec.

Figure 1 (cont.)

TEST ITEM		REQUIREMENT	PROCEDURE
ENVIRONMENTAL REQUIREMENTS			
13	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C/85% R.H. for 168 hours. Pre Heat: 150 ~ 180°C, 90±30 sec. Heat: 230°C Min., 30±10 sec. Peak Temp.: 260+0/-5°C, 20 ~ 40 sec. Duration: 3 cycles Tyco spec. 109-201, Condition B
14	Thermal Shock	See Note	Mated Connector -55+/-3°C (30 minutes), +85+/-2°C (30 minutes) Perform this a cycle, repeat 5 cycles EIA-364-32C
15	Humidity-Temperature Cycle	See Note	Mated Connector 25~65°C, 90~95% RH, 10 Cycles EIA-364-31B.
16	Temperature Life	See Note	Mated Connector 85°C, 250 hours, EIA-364-17B.
17	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 48 hours. 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 Figure 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, 7	1, 9	1, 6	1, 5	1, 5	1, 5	1, 5	1, 3	1, 4
Contact Resistance		2, 8	2, 5	2, 4	2, 4	2, 4	2, 4		
Dielectric withstanding Voltage	3, 5								
Insulation Resistance	2, 6								
Temperature Rising									
Connector Mating Force		3, 6							
Connector Unmating Force		4, 7							
Durability		5							
Vibration			3						
Mechanical Shock			4						
Contact Retention Force									3
Solderability								2	
Resistance to Reflow Soldering Heat									2
Thermal Shock					3				
Humidity Temperature Cycling	4					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.