
1.5mm Pitch EMIX Connector

1. TSCOPE**1.1. CONTENTS**

This specification covers the performance, tests and quality requirements for the **1.5mm Pitch EMIX 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. 501-57736 : 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, Tin Plating on soldertail over Nickel underplating overall.

3.3. RATINGS

- A. Voltage: **250** VAC rms.
- B. Current: **3** A Max
- C. Temperature: - **55** °C to **105** °C

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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 per Tyco specification 109-1 test requirements and procedure 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	20 m Ohm Max(Initial) 40 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	[500]VAC for 1minute Test between adjacent circuits of unmated connector. EIA-364-20B
4	Insulation Resistance	1000 M Ohm Min.(Initial) 500 M Ohm 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	Insertion Force	0.50 kgf per pin Max.	Operation Speed : 25 mm/min. Measure the force required to mate connector. EIA-364-13B
7	Withdrawal Force	0.08 kgf per pin Min.	Operation Speed : 25 mm/min. Measure the force required to unmate connector. EIA-364-13B
8	Tensile strength of wire termination	AWG#24-29.4N(3.0kgf)min AWG#26-19.6N(2.0kgf)min AWG#28-9.8N(1.0kgf)min AWG#30-7.8N(0.8kgf)min	Apply an axial pull-off load to terminated wire of contact. At a rate of 100mm a minute the load is applied in the axial and lateral directions.
9	Terminal retention force	1.0kgf min	Measure force to Mounting and pulling at a rate of 25mm a minute
10	Pin Retention force	1.0kgf min	Apply an axial push force at a rate of 25mm a Minute.

Figure 1 (Cont.)

TEST ITEM		REQUIREMENT			PROCEDURE
11	Connector Mating/ Unmating Force	Circuit (Pos)	Mating (Kgf max)	Unmating (Kgf min)	Withdraw connectors at a rate of 12.7mm per minute
		2	2.5KG Max	1.0KG-3.0KG	
		3	3.0KG Max	1.0KG-3.5KG	
		4	3.5KG Max	1.0KG-4.0KG	
		5	4.0KG Max	1.0KG-4.5KG	
		6	4.5KG Max	1.0KG-5.0KG	
		7	5.0KG Max	1.0KG-5.0KG	
		8	5.5KG Max	1.5KG-5.5KG	
		9	5.5KG Max	1.5KG-5.5KG	
		10	6.0KG Max	1.5KG-6.0KG	
		11	6.0KG Max	1.5KG-6.0KG	
		12	6.5KG Max	1.5KG-6.5KG	
		13	6.5KG Max	1.5KG-6.5KG	
		14	7.0KG Max	1.5KG-7.0KG	
		15	7.0KG Max	1.5KG-7.0KG	
12	Durability	See Note			Subject connector assembly to 10 cycles of repeated mating/unmating
13	Vibration	No electrical discontinuity greater than 0.1 or 1 μ 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, Condition I
14	Mechanical Shock	No electrical discontinuity greater than 0.1 or 1 μ sec shall occur. See Note.			Accelerate Velocity: 490m/s ² (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
15	Solder ability	The inspected area of each lead must have 95% solder coverage minimum.			Steam Aging Preconditioning : 1. Intended for nontin and nontin-alloy leadfinishes for 93+3/-5 $^{\circ}$ C \cdot 1hrs. 2. Intended for tin and tin-alloy leadfinishes for 93+3/-5 $^{\circ}$ C \cdot 8hrs. <JESD22-B102D, Condition C> Solder pot temperature: 245 \pm 5 $^{\circ}$ C, 5sec
ENVIRONMENTAL REQUIREMENTS					
16	Resistance to Wave Soldering Heat	No physical damage shall occur.			Solder Temp. : 240 \pm 5 $^{\circ}$ C, 10 \pm 0.5sec. Tyco spec. 109-202, Condition A
16	Resistance to Wave Soldering Heat	No physical damage shall occur.			Solder Temp. : 265 \pm 5 $^{\circ}$ C, 10 \pm 0.5sec. Tyco spec. 109-202, Condition B

Figure 1 (Cont.)

TEST ITEM		REQUIREMENT	PROCEDURE
16	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre Heat : 100~150°C, 60 sec Max. Heat : 210°C Min., 30 sec Max. Peak Temp. : 240°C Max., 10±0.5sec.
16	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C/85% RH for 168 hours. Pre Heat : 150~180°C, 90±30sec. Heat : 230°C Min., 30±10sec. Peak Temp. : 245+0/-5°C, 10~30sec. Duration : 3 cycles Tyco spec. 109-201, Condition A
16	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C/85% RH for 168 hours. 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
17	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
18	Humidity-Temperature Cycle	See Note	Mated Connector 25~85°C, 90~95% RH, 10 Cycles EIA-364-31B.
19	Temperature Life (Heat Aging)	See Note	Mated Connector 85°C, 250 hours, EIA-364-17B.
20	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 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	J
	Test Sequence (a)									
Examination of Product	1,12	1,8	1	1,5	1,5	1,5	1,5	1,3	1,3	1,3
Contact Resistance	4	2,9	2,5	2,4	2,4	2,4	2,4			
Dielectric withstanding Voltage	2,6									
Insulation Resistance	3									
Temperature Rising	5							2		
Insertion force	7									
Withdrawal Force	8									
Tensile Strength of Wire Termination	9									
Contact Retention Force	10									
Pin Retention Force	11									
Connector Mating Force		3,6								
Connector Unmation Force		4,7								
Durability		5								
Vibration			3							
Mechanical Shock			4	3						
Solder ability										2
Resistance to Soldering heat									2	
Thermal Shock										
Humidity-Temperature Cycle					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.