16Gbps 0.5mm Pitch Board-to-Board Connector (SMT)

1. SCOPE

1.1. Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 16Gbps 0.5 mm Pitch, Board-to-Board Connector (SMT).

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. 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 Documents

    A.   114-115003   Application Specification

    B.   501-32576   Test Report

2.2. Commercial Standard and Specification

    A.   EIA 364   Electrical Connector/Socket Test Procedures Including Environmental Classifications

    B.   MIL-STD-202   Test Methods for Electronic & Electric Parts

    C.   J-STD-002   Surface Mount Solder ability

    D.   IEC 60068-2   International Electrical Commission

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. Contact: Copper Alloy
B. Housing: High temperature resin, UL 94-V0
C. Other: Ground Plate/Solder peg – Copper Alloy

3.3. Ratings

A. Voltage Rating: 50 VAC.
B. Current Rating: 0.5 A
C. Temperature Rating: -40 ^{0}C to +125 ^{0}C.

3.4. Performance and Test Description

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Para 3.5. All tests shall be performed in the room temperature, unless otherwise specified.
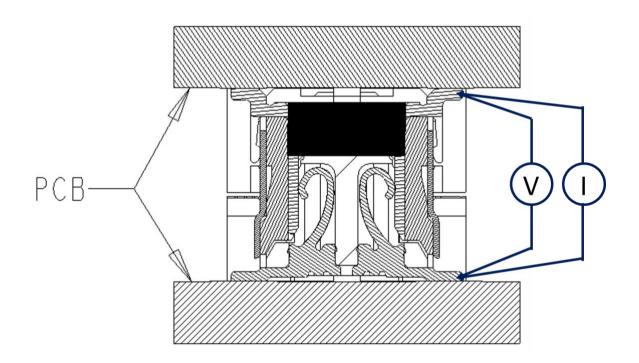
3.5.   Test Requirements and Procedures Summary

Para.	Test Items	Requirements	Procedures
3.5.1	Examination of product	No physical damage nor dirty	Visual inspection
Electrical Requirements **(TR = Termination Resistance)**			
3.5.2	Termination Resistance (Low Level)	50 mΩ Max. (Initial) ΔR = 20 mΩ Max. (Final)	Subject mated contacts assembled in housing to 20 mV Max. Open circuit at 10mA Fig.1 Spec. EIA-364-23
3.5.3	Dielectric withstanding Voltage	Neither creeping discharge nor flashover shall occur. Current leakage: 5 mA Max.	200VAC for 1 minute. Test between adjacent circuits of unmated connectors. Spec. EIA-364-20
3.5.4	Insulation Resistance	500 MΩ Min. (Initial) 100 MΩ Min. (Final)	Impressed Voltage 500 VDC. Test between adjacent circuits of unmated connectors. Spec. EIA-364-21
Physical Requirements			
3.5.5	Connector Mating Force	0.6 N Max. per contact	Operation Speed: 100 mm/min. Measure the force required to mate connectors. Spec. EIA-364-13
3.5.6	Connector Un-mating Force	0.2 N Min. per contact	Operation Speed: 100 mm/min. Measure the force required to un-mate connectors. Spec. EIA-364-13
3.5.7	Durability (Repeated Mating / Un-mating)	ΔR = 20 mΩ Max. (Final)	Operation Speed: 100 mm/min No. of cycles: 30 cycles Spec. EIA-364-09
3.5.8	Vibration (Low Frequency)	No electrical discontinuity greater than 0.1 micro-sec shall occur.	Subject mated connectors to 10-55-10 Hz transverses in 1 minute at 1.52 mm amplitude with 100mA applied. Duration: 2 hours each for 3 mutually perpendicular planes. Spec. EIA-364-28
3.5.9	Physical Shock	No electrical discontinuity greater than 0.1 micro-sec shall occur.	Accelerated Velocity: 490m/s^2 (50G) Waveform: Half sine Wave Duration: 11 m sec Velocity Change: 11.3 m/s Number of Drops: 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 Drops Spec. EIA-364-27
3.5.10	Solderability	Solder Coverage: 95 % Min.	Preheat: 150°C to180°C / 60-120 seconds Reflow: 230°C to 260°C / 30-60 seconds Spec. J-STD-002
Environmental Requirements			
3.5.11	Resistance to Cold	ΔR = 20 mΩ Max. (Final)	Mated connector, -40 ℃ +/-3 ℃, 96 hours Spec. IEC 60068-2-1

3.5.12	Thermal Shock	ΔR = 20 mΩ Max. (Final)	Mated connector, -40 ℃ / 30 min.; +125 ℃ / 30 min. Making this a cycle, repeat 5 cycles. Spec. EIA-364-32
3.5.13	Humidity-Temperature Cycling.	Insulation Resistance (Final) = 100 MΩ Min. Termination resistance ΔR = 20 mΩ Max. (Final)	Mated connector. Temp: 25~65 ℃, R.H.: 95% No. of cycles: 10 Spec. EIA-364-31
3.5.14	Salt Spray	ΔR = 20 mΩ Max. (Final)	Subject mated connectors to 5% salt concentration. Duration: 24 hours. Spec. MIL-STD-202, Method 101.
3.5.15	Resistance to Reflow Soldering Heat	Tested housing shall show no evidence of deformation or fusion of housing or no physical damage	TEC-109-201 Method-A, Condition-B. Subject SMD connector to 3x reflow curve 260°C peak.
3.5.16	Industrial Gas (SO$_2$)	ΔR = 20 mΩ Max. (Final)	Mated connector, SO2 Gas: 10 ppm.95% R.H.25 ℃, 24hours Spec. IEC 60068-2-42
3.5.17	Temperature Life (Heat Aging)	ΔR = 20 mΩ Max. (Final)	Temp.: +125 ℃, Duration: 4 days Spec. EIA-364-17

Fig. 1

3.6. Product Qualification Test Sequence

Test or Examination		Test Group									
		1	2	3	4	5	6	7	8	9	10
Sample Quantity (pcs)	RECEPTACLE	3	3	3	3	3	3	3	3	3	3
	PLUG	3	3	3	3	3	3	3	3	3	3
Test Items		**Test Sequence (a)**									
Examination of product		1,9	1,6	1,9	1,3	1,3	1,5	1,5	1,5	1,5	1,5
Termination Resistance (Low Level)		2,6	2,5	2,8			2,4	2,4	2,4	2,4	2,4
Dielectric withstanding Voltage		3,7									
Insulation Resistance		4,8									
Vibration (Low Frequency)			3								
Physical Shock			4								
Connector Mating Force				3,6							
Connector Un-mating Force				4,7							
Durability (Repeated Mating/Un-mating)				5							
Solderability					2						
Humidity-Temperature Cycling		5									
Resistance to Reflow Soldering Heat						2					
Thermal Shock							3				
Salt Spray								3			
Industrial Gas (SO$_2$)									3		
Temperature Life (Heat Aging)										3	
Resistance to Cold											3

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