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## Mini PCI Express & mSATA Connector

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### 1 Scope:

#### 1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of MINI PCI Express Connector. Applicable product description and part numbers are as shown in Appendix 1.

### 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 TYCO Specifications:

- A. 109-5000 Test Specification, General Requirements for Test Methods
- B. 501-99107 Test Report

#### 2.2 Commercial Standards and Specifications:

- A. MIL-STD-202
- B. Mini PCI Express Card Electromechanical Specification Revision 1.0
- C. EIA-364

### 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

Finish:

Contact area: Gold Flash

Tine area: Gold Flash

Underplate: Nickel Plated

##### B. Housing:

Thermo plastic UL94V-0

##### C. Solder Peg:

Copper Alloy, Tin Plated over Ni plate.

##### D. Latch:

Steel, Tin Plated over Ni plate

#### 3.3 Ratings:

A. Voltage Rating: 50 VAC

B. Current Rating: 0.5 A

C. Temperature Rating:  $-55^{\circ}\text{C}$  to  $85^{\circ}\text{C}$

D. Reflow Peak Temperature:  $250^{\circ}\text{C}$  MAX.

#### 3.4 Performance Requirements and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig. 1. 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	Meets requirements of product drawing	Visual inspection No physical damage
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	55 mΩ Max. (Initial) ΔR=20 mΩ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10 mA Max. at open circuit voltage of 20mV Max. obtain resistance value by dividing the measured reading into two. Fig. 3-1. EIA-364-23
3.5.3	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur. Current leakage: 0.5 mA Max.	0.3 kVAC for 1 minute. Test between adjacent circuits of unmated connectors. EIA-364-20
3.5.4	Insulation Resistance	500MΩ Min.(Initial) 500MΩ Min.(Final)	Impressed voltage 500 V DC. Test between adjacent circuits of unmated connectors. EIA-364-21
3.5.5	Temperature Rising	30 °C Max. under loaded specified current (0.5 A)	Measure temperature rising by energized current. EIA-364-70 Test method 2

Fig.1 (CONT.)

Mechanical Requirements			
Para.	Test Items	Requirements	Procedures
3.5.6	Vibration (Random)	No electrical discontinuity greater than 1 $\mu$ sec. shall occur. $\Delta R=20 \text{ m}\Omega$ Max. (Final)	Subject mated connectors Vibration Frequency: 10 to 55 Hz Accelerated Velocity: $30.38 \text{ m/s}^2$ (3.1G), rms. Vibration Direction: In each of 3 mutually perpendicular planes. Duration: 15 minutes each 100 mA applied. Module board should be fixed on the connector mount board or test jig. EIA-364-28 Method VII condition D
3.5.7	Physical Shock (Normal test)	No electrical discontinuity greater than 1 $\mu$ sec. shall occur. $\Delta R=20 \text{ m}\Omega$ Max. (Final)	Accelerated Velocity: $490 \text{ m/s}^2$ (50 G) Waveform: Half sine Duration: 11 m sec. Number of Drops: 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. EIA-364-27 Condition A
3.5.8	Connector Mating Force	22.5N (2.3kgf) Max.	Operation Speed: 100 mm/min. Measure the force required to mate connectors (In this test, the force required to turn PCB before it engages on lacking, is excluded). EIA-364-13
3.5.9	Durability (Repeated Mating/Unmating)	$\Delta R=20 \text{ m}\Omega$ Max. (Final)	Repeated insertion and extraction of P.C.B to and from the connector with the turns to lock it and then unlock it for 50 cycles. EIA-364-9
3.5.10	Durability (Preconditioning)	No physical damage	No. of cycles: 20 cycles
3.5.11	Reseating	No physical damage	No. of cycles: 3 cycles
3.5.12	Solderability	Wet Solder Coverage:  95 % Min.	Solder Temperature: $245 \pm 5 \text{ }^\circ\text{C}$ Immersion Duration: $3 \pm 0.5$ seconds Flux: Alpha 100

Fig.1 (CONT.)

Environmental Requirements			
Para.	Test Items	Requirements	Procedures
3.5.13	Resistance to Reflow Soldering Heat	No physical damage shall occur	Test connector on P.C.Board Temperature is measured on a soldering pad. Fig.3 Pre-Heat 150~200°C: 60~180sec. Heat 217°C Min.: 60~150sec. Heat Peak 260 +0/-5°C The number of reflow: Once
3.5.14	Thermal Shock	$\Delta R=20 \text{ m}\Omega$ Max. (Final)	Mated connector -55 +0/-3°C / 30 min., 85 +3/-0°C / 30 min. Making this a cycle, repeat 10 cycles. EIA-364-32, Condition A
3.5.15	Temperature - Humidity Cycling	Insulation resistance 500 M $\Omega$ Min. (final) $\Delta R=20 \text{ m}\Omega$ Max. (Final)	Mated connector, 25±3~65±3°C, 50±3~80±3% R.H. 24 cycles Cold shock -10°C performed EIA-364-31
3.5.16	Thermal Cycling	$\Delta R=20 \text{ m}\Omega$ Max. (Final)	Mated connector, 15±3~85±3°C Ramps: 2°C/min. Dwell time: 5min. Min. 10 Cycle
3.5.17	Temperature Life (Heat Aging)	$\Delta R=20 \text{ m}\Omega$ Max. (Final)	Mated connector 115°C, Duration: 240 hours EIA-364-17, Method A
3.5.18	Temperature Life (Preconditioning)	No physical damage	Mated connector 115°C, Duration: 96 hours EIA-364-17, Method A

Fig. 1 (End)

4. Product Qualification Test Sequence

Test Examination	Test Group										
	1	2	3(b)	4(b)	5	6	7	8	9	10	11
	Test Sequence (a)										
Examination of Product	1, 5	1, 3	1, 5, 8	1, 4	1, 3	1, 4	1, 3	1, 3	1, 5, 8, 11	1, 5, 8	1, 5, 8, 11
Termination Resistance (Low Level)			2, 6, 9	2, 5		2, 5			2, 6, 9, 12	2, 6, 9	2, 6, 9, 12
Dielectric withstanding Voltage	2, 6										
Insulation Resistance	3, 7										
Temperature rising		2									
Vibration (Random)			7								
Physical Shock				3							
Connector Mating Force					2						
Durability (Repeated mate/unmate)						3					
Durability (Proconditioning)			3						3	3	3
Reseating									10	7	10
Solderability							2				
Resistance to Reflow Soldering Heat								2			
Temperature Humidity Cycling	4								7		
Thermal Shock									4		
Thermal Cycling											7
Temperature Life (Heat Aging)										4	
Temperature Life (Proconditioning)			4								4

FIG.2

- a) Numbers indicate sequence in which the tests are performed.
- b) In these test groups, no electrical discontinuity shall occur.

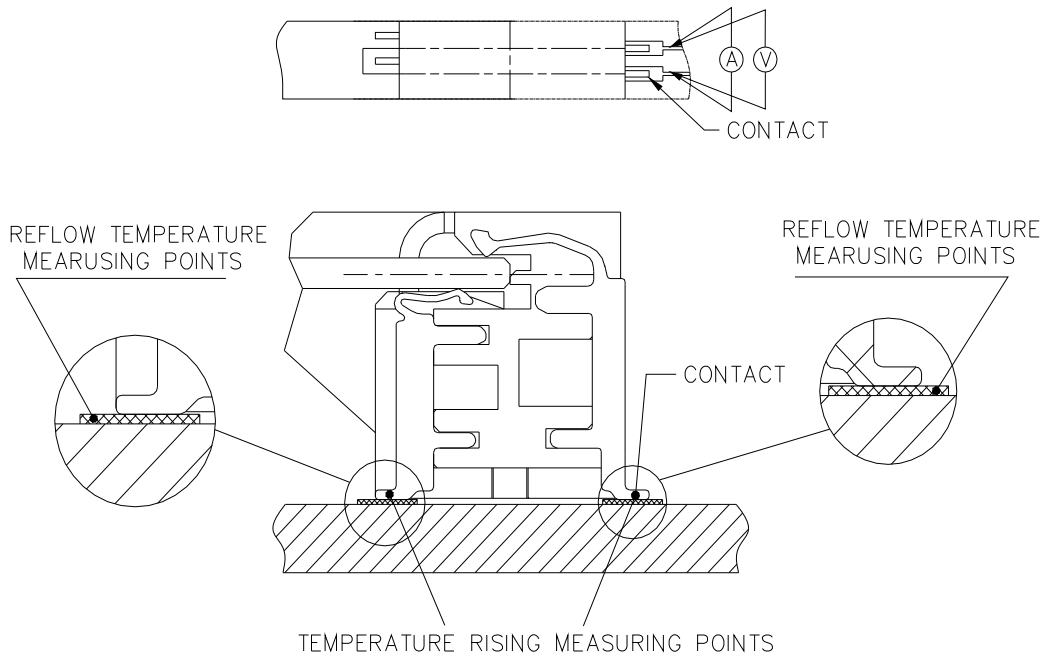
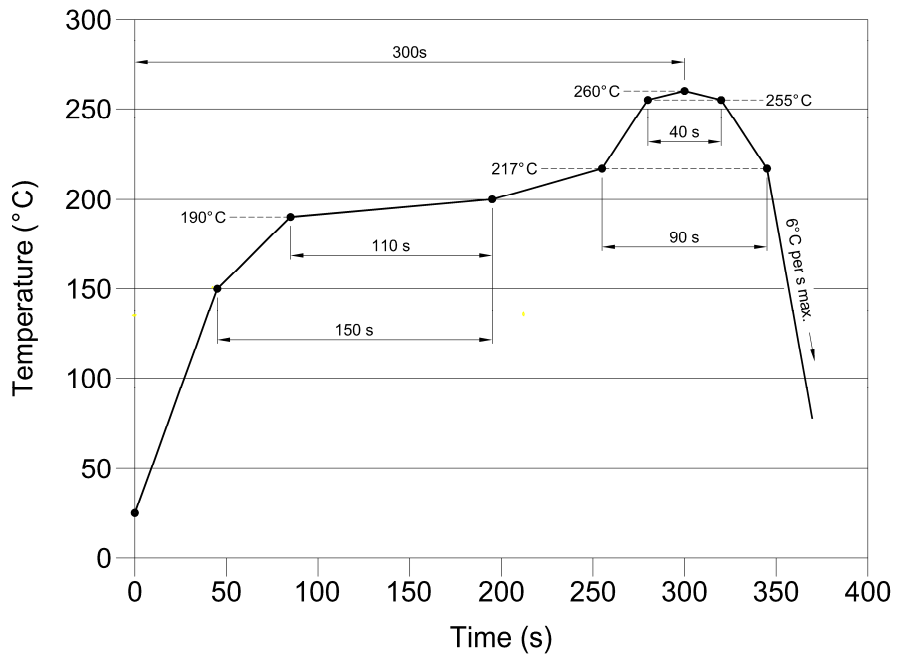


Fig. 3-1 Termination Resistance Measuring points, Temperature Rising Measuring points, and Reflow Temperature Measuring points.



Temperature Profile of Reflow Soldering

Figure 4