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**PCI Express® Mini Card Connector**

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**1. SCOPE**

## 1.1. Contents

This specification covers the performance, tests and quality requirements for the Tyco Electronics PCI Express® Mini Card connector.

## 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 DOCUMENT**

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. Tyco Electronics Documents

- TEC-109-201: Component Heat Resistance to Lead-Free Reflow Soldering.
- 501-57883: Qualification Test Report.

## 2.2. Commercial Standard

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications.
- JESD22-B102D: Solderability Test Method.

**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

Materials used in the construction of this product shall be as specified on the applicable product drawing.

## 3.3. Ratings

- A. Voltage: 50 volts AC.
- B. Current: 0.5 amperes.
- C. Temperature: -55 to 80°C.

## 3.4. Performance Requirement and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

## 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
ELECTRICAL		
Low level contact resistance.	55 mΩ maximum initial. ΔR20 mΩ maximum increase.	EIA-364-23. Subject mated contact assembled in housing to 20 mV maximum open circuit at 100 mA maximum.
Dielectric withstanding voltage.	1 minute hold with no breakdown, flashover, or 0.5 mA maximum leakage.	EIA-364-20, Condition I. 300 volts AC at sea level. Test between adjacent contacts of unmated specimens.
Insulation resistance.	500 MΩ minimum.	EIA-364-21. Test between adjacent contacts of unmated specimens.
Temperature rising.	30°C maximum under loaded rating current.	EIA-364-70, Method 2. 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		
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See <b>NOTE</b>	EIA-364-28, Condition I. Subject mated specimens to 10-55-10 Hz traversed in 1 minute with 1.52 mm maximum total excursion. 2 hours in each of 3 mutually perpendicular planes.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See <b>NOTE</b>	EIA-364-27, Condition A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Module board mating force.	22.5 N maximum.	EIA-364-13. Measure force necessary to mate specimens with test boards at a maximum rate of 25.4 mm per minute.
Durability.	See <b>NOTE</b>	EIA-364-9. Mate and unmate specimens with test boards for 50 cycles at a maximum rate of 200 cycles per hour.
Reseating.	See <b>NOTE</b>	Manually unplug/plug the connector. Perform 3 such cycles.
ENVIRONMENTAL		
Solderability.	The inspected area of each lead must have 95% solder coverage minimum.	JESD22-B102D, Condition C. Steam Aging Preconditioning: 93 ±3/-5°C, 8 hours ±15 min. Reflow Temperature: 230-245°C Reflow Time: 50-70 s.

Figure 1 (continued)

ENVIRONMENTAL		
Test Description	Requirement	Procedure
Resistance to reflow soldering heat.	See <b>NOTE</b>	TEC-109-201, Condition B. Moisture Soak Preconditioning: 85°C and 85% R.H. for 168 hours. Preheat Temp.: 150-200°C, 60-180 s. Time over liquidus (217°C): 60-150 s. Peak Temp.: 260 +0/-5°C, 20-40 s. Duration: 3 cycles.
Thermal shock.	See <b>NOTE</b>	EIA-364-32, Condition I. Subject mated specimens to 10 cycles between -55 and 85°C
Humidity-temperature cycling.	See <b>NOTE</b>	EIA-364-31, Method II, Condition A. Subject mated specimens to 4 cycles (4 days) between 25 and 65°C at 90 to 95% R.H.
Temperature life.	See <b>NOTE</b>	EIA-364-17, Method A, Temperature condition 4, Time condition A. Subject mated specimens to 105°C for 96 hours.

**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.

Figure 1 (end)

### 3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)									
	A	B	C	D	E	F	G	H	I	J
	Test Sequence (b)									
Examination of product.	1, 7	1, 3	1, 5	1, 4	1, 3	1, 5	1, 3	1, 3	1, 9	1, 7
Low level contact resistance.			2, 4	2, 5		2, 4			2, 4, 6, 8	2, 4, 6
Dielectric withstanding voltage.	2, 5									
Insulation resistance.	3, 6									
Temperature rising.		2								
Vibration, sinusoidal.			3 (c) (d)							
Mechanical shock.				3						
Module board mating force.					2					
Durability.						3				
Reseating.									7	5
Solderability.							2			
Resistance to reflow soldering heat.								2		
Thermal shock.									3 (c)	
Humidity-temperature cycling.	4								5	
Temperature life.										3 (c)

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which test are performed.
- (c) Durability preconditioning only 3 cycles required.
- (d) Temperature life preconditioning only 72 hours.

Figure 2

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1. Qualification Testing

#### A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall each consist of a minimum of 5 specimens.

#### B. Test Sequence

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

### 4.2. Requalification Testing

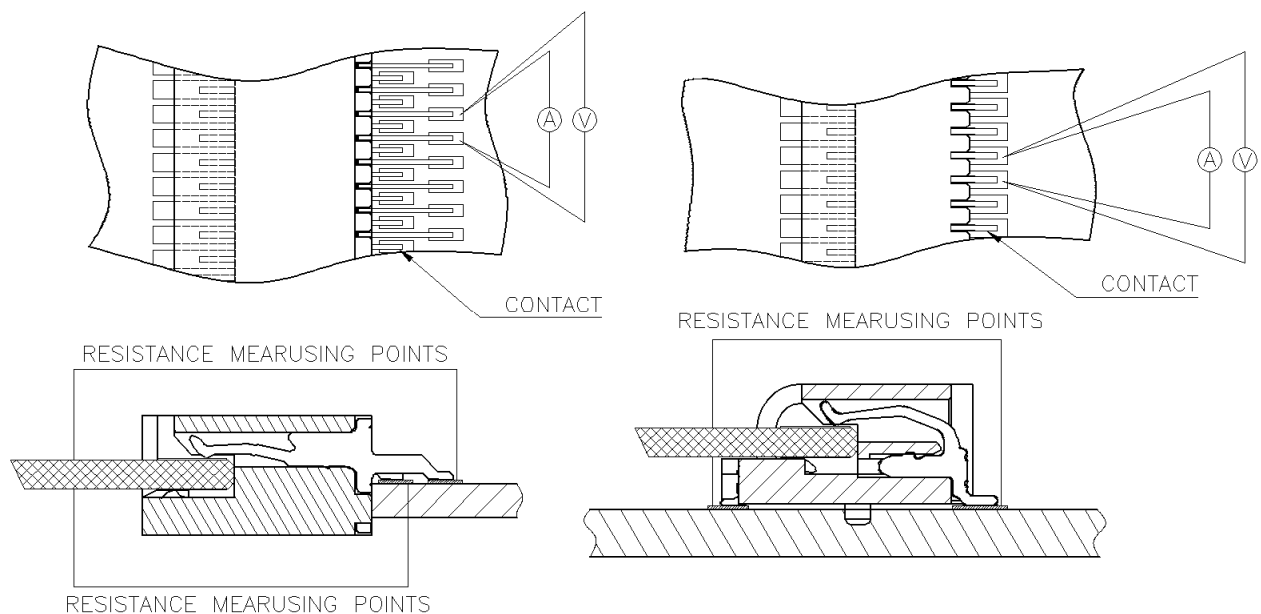
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

### 4.3. Acceptance

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

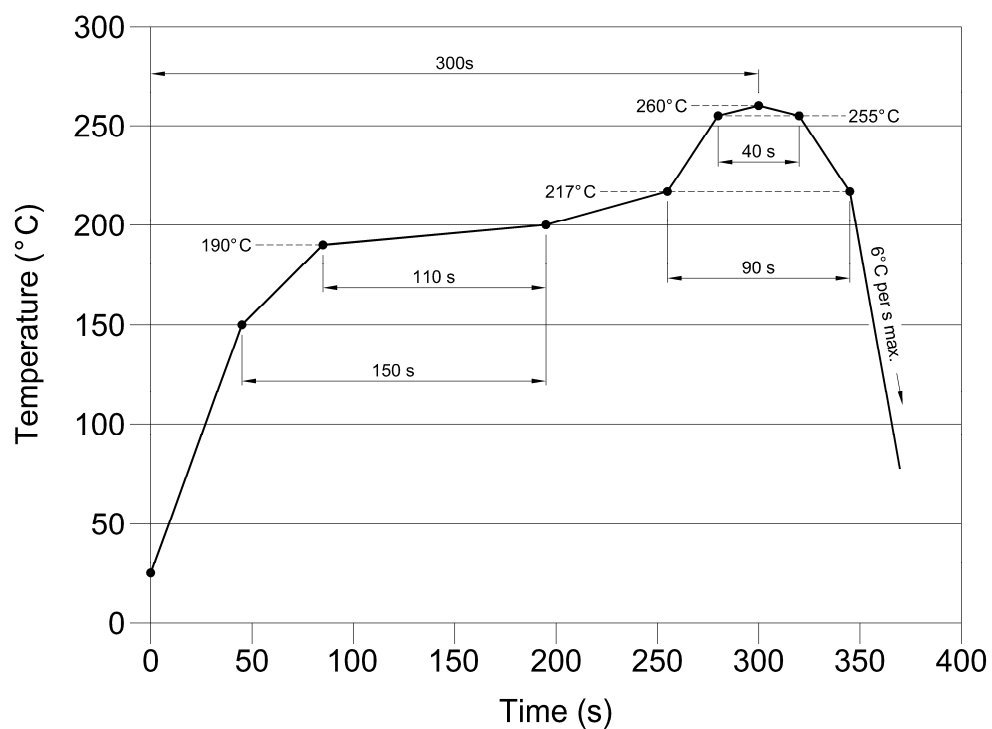
### 4.4. Quality Conformance Inspection

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.



Low Level Contact Resistance Measurement Points

Figure 3



Temperature Profile of Reflow Soldering

Figure 4