



PRODUCT SPECIFICATION

Mini-Fit® PCI Express®*

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*Note: PCI Express is a registered trademark of the Peripheral Component Interchange Special Interest Group (PCI-SIG).

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1.0 SCOPE

This Product Specification covers performance requirements for the MINI-FIT PCI Express 4.20 mm (.165 inch) centerline (pitch) printed circuit board (PCB) connector series with Tin or Gold plating in Wire-to-Board and terminated with 16 to 24 AWG wire using Crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 NAMES AND SERIES NUMBER(S)

Table 1 – WIRE-TO-BOARD					
Description	Series Number	RoHS	UL	CSA	TUV
Female Crimp Terminal	5556	Yes	n/a	n/a	n/a
Receptacle Housing	45559	Yes	No	No	No
Right Angle Header	45558	Yes	No	No	No
Right Angle Header	45732	Yes	No	No	No
Vertical Header	45718	Yes	No	No	No

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.

2.3 SAFETY AGENCY APPROVALS

None

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and the other sections of this specification for the necessary referenced documents and specifications.

4.0 RATINGS

4.1 VOLTAGE

600 Volts AC (RMS) (or 600 Volts DC)

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4.2 APPLICABLE WIRES

Applicable Wire Gauges and Maximum Insulation Diameter	16 AWG: 3.15 / .124 MAXIMUM
	18-20 AWG: 2.95 / .116 MAXIMUM
	22-24 AWG: 1.80 / .071 MAXIMUM

4.3 MAXIMUM CURRENT RATING (Amperes)

Table 2 – WIRE-TO-BOARD (Dual Row)										
Brass					Phosphor Bronze					
Wire \ Ckt. Size	2	3 - 6	7 - 10	11 - 24	Wire \ Ckt. Size	2	3 - 6	7 - 10	11 - 24	
AWG #16	9	8	7	6	AWG #16	8	7	6	5	
AWG #18	9	8	7	6	AWG #18	8	7	6	5	
AWG #20	7	6	5	5	AWG #20	6	5	4	4	
AWG #22	5	4	4	4	AWG #22	4	3	3	3	
AWG #24	4	3	3	3	AWG #24	3	2	2	2	

Note: PCB trace design may greatly affect temperature rise results.

4.4 TEMPERATURE

Operating: * - 40°C to + 105°C

Nonoperating: - 40°C to + 105°C

**Including 30°C terminal temperature rise at rated current*

4.5 WAVE SOLDER PROCESS TEMPERATURE

45558 Series Headers with pegs: 235°C MAX.

45732 Series Headers with pegs: 260°C MAX.

4.6 REFLOW SOLDER PROCESS TEMPERATURE

45558 Series Headers: Not Rated for Reflow Processing

45732 Series Headers: 235°C MAX.

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5.0 WIRE-TO-BOARD PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. Wire resistance shall be removed from the measured value.	10 milliohms MAXIMUM [initial]
2	Contact Resistance @ Rated Current	Mate connectors: apply a maximum voltage of 20 mV at rated current.	10 milliohms MAXIMUM [initial]
3	Contact Resistance of Wire Termination (Low Level)	Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100 mA.	5 milliohms MAXIMUM [initial]
4	Insulation Resistance	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
5	Dielectric Withstanding Voltage	Mate connectors: apply a voltage of 1500 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown. Current leakage < 5 mA
6	Temperature Rise (via Current Cycling)	Mate connectors. Measure the temperature rise at the rated current after 96 hours, during current cycling (45 minutes ON and 15 minutes OFF per hour) for 240 hours, and after final 96-hour steady state.	Temperature rise: +30°C MAXIMUM

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5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Terminal Mate and Unmate Forces Per Circuit	Insert and withdraw terminal (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	Sn 14.7 N (3.30 lbf) MAXIMUM insertion force & 1.0 N (0.20 lbf) MINIMUM withdrawal force
			Au 14.7 N (3.30 lbf) MAXIMUM insertion force & 1.0 N (0.20 lbf) MINIMUM withdrawal force
2	Crimp Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	30 N (6.74 lbf) MINIMUM retention force
3	Solid PC Tail Header Pin Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	Sn 4.45 N (1.00 lbf) MINIMUM retention force
			Au 4.45 N (1.00 lbf) MINIMUM retention force
4	Durability	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	20 milliohms MAXIMUM
5	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
6	Shock (Mechanical)	Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±X, ±Y, ±Z axes, (18 shocks total).	20 milliohms MAXIMUM & Discontinuity < 1 microsecond
7	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch).	16 Awg = 88.0 N (19.8 lbf) Min. 18 Awg = 88.0 N (19.8 lbf) Min. 20 Awg = 59.0 N (13.3 lbf) Min. 22 Awg = 39.0 N (8.78 lbf) Min. 24 Awg = 29.0 N (6.52 lbf) Min.

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5.2 MECHANICAL REQUIREMENTS (continued)

8	Crimp Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch).	15.0 N (3.37 lbf) MAXIMUM insertion force
9	Normal Force	Apply a perpendicular force.	0.49 N (50 grams) MINIMUM [Gold (noble) plating] 1.47 N (150 grams) MINIMUM [Tin (non-noble) plating]
10	PCB Peg Engagement and Separation Forces	Engage and separate a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (Applies to parts with PCB retention features only)	49.0 N (11.0 lbf) MAXIMUM insertion force [2 peg header] 111 N (25 lbf) MAXIMUM insertion force [4 peg header] 10.0 N (2.24 lbf) MINIMUM withdrawal force
11	Thumb latch Operation Force	Depress latch at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	16.67 N (3.75 lbf) MAX.
12	Thumb latch Yield Strength	Mate loaded connectors fully. Pull connectors apart at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	68 N (15.29 lbf) MIN.

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Thermal Shock	Mate connectors: expose for 5 cycles Between temperatures -55 and 105°C; Dwell 0.5 hours at each temperature.	20 milliohms MAXIMUM Visual: No Damage Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4
2	Thermal Aging	Mate connectors; expose to: 96 hours at 105 ± 2°C	20 milliohms MAXIMUM & Visual: No Damage
3	Humidity (Steady State)	Mate connectors: expose to a temperature of 60 ± 2°C with a relative humidity of 90-95% for 96 hours.	20 milliohms MAXIMUM Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4 Visual: No Damage
4	Solderability	Per SMES-152	Solder coverage: 95% MINIMUM (per SMES-152)

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5.3 ENVIRONMENTAL REQUIREMENTS (continued)

5	Solder Temperature Heat Transfer Resistance	Dip connector terminals tail in solder: Solder Duration: 5 ± 0.5 seconds; Solder Temperature: 260 ± 5°C	Visual: No Damage to the insulator where the terminal or pin locks to the connector housing
6	Mixed Flowing Gas	EIA-364-65 with Class IIa Gas concentrations (Gold plated only)	20 milliohms MAXIMUM Visual: No Damage

6.0 TEST SEQUENCES

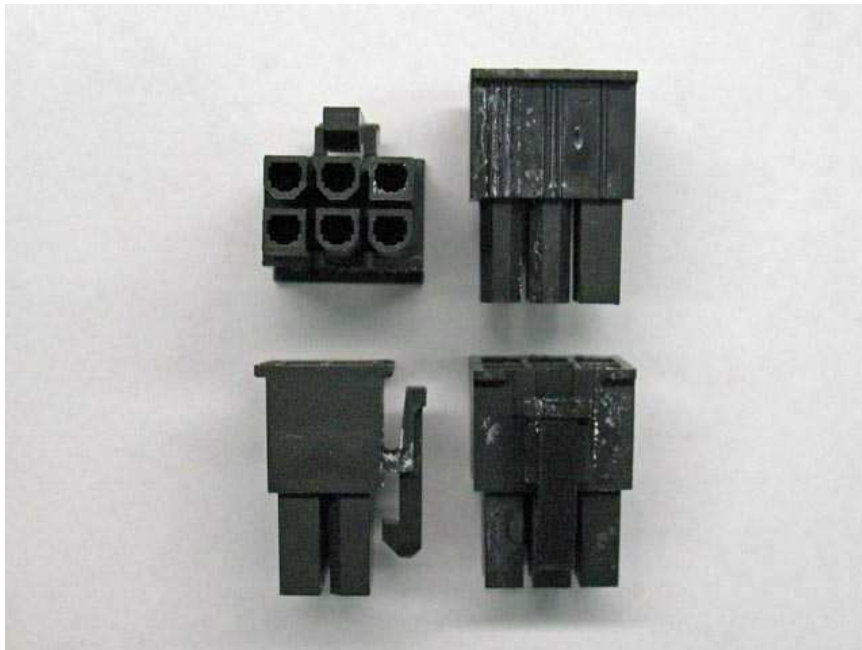
Testing sequences to be performed in accordance with EIA-364-1000.01

7.0 PACKAGING

Parts shall be packaged to protect against damage during normal handling, transit and storage.

8.0 SPECIAL COSMETIC REQUIREMENTS

Due to moisturization, white residue may form on the surface of the 45559 series receptacle housing. This white residue does not effect the performance of the part and is acceptable. Refer to the following photograph for examples of acceptable residue.



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