PRODUCT SPECIFICATION

MINI-FIT JR.

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1.0 SCOPE

This Product Specification covers performance requirements for the MINI-FIT JR. 4.20 mm (.165 inch) centerline (pitch) printed circuit board (PCB) connector series with Tin or Gold plating, and
The MINI-FIT JR. connector series terminated with 16 to 28 AWG wire using Crimp technology with Tin or Gold plating.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Table 1 – WIRE-TO-WIRE					
Description	Series Number	RoHS	UL	CSA	TUV
Female Crimp Terminal	5556	Yes	n/a	n/a	n/a
Receptacle Housing	5557	Yes	Yes	Yes	Yes
Male Crimp Terminal	5558	Yes	n/a	n/a	n/a
Plug Housing	5559	Yes	Yes	Yes	Yes

Table 2 – WIRE-TO-BOARD					
Description	Series Number	RoHS	UL	CSA	TUV
Female Crimp Terminal	5556	Yes	n/a	n/a	n/a
Receptacle Housing	5557	Yes	Yes	Yes	Yes
Vertical Header	5566	Yes	Yes	Yes	Yes
Right Angle Header	5569	Yes	Yes	Yes	Yes

Other products conforming to this specification are noted on the individual drawings.

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

UL File: E29179
CSA Certificate: LR 19980
TUV Certificate: R72081037

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and the other sections of this specification for the necessary referenced documents and specifications.
Test Summary: TS-5556-002

4.0 RATINGS

4.1 VOLTAGE

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

4.2 APPLICABLE WIRES

Maximum Insulation Diameter and Applicable Wire Gauges	16 AWG: 3.10 mm / .122 inches MAXIMUM
	18-24 AWG: 3.10 mm / .122 inches MAXIMUM
	22-28 AWG: 1.80 mm / .071 inches MAXIMUM

4.3 MAXIMUM CURRENT RATING (Amperes)**

Table 3 - MAXIMUM CURRENT RATING (Amperes)
Wire-to-Wire and Wire-to-Board

Brass					Phosphor Bronze				
Wire \ Ckt. Size	2 & 3	4 - 6	7 - 10	12 - 24	Wire \ Ckt. Size	2 & 3	4 - 6	7 - 10	12 - 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
AWG #26	3	2	2	2	AWG #26	2	1	1	1
AWG #28	2	1	1	1	AWG #28	1	1	1	1

Note: PCB trace design may greatly affect temperature rise results in Wire-to-Board Applications.

** Ratings shown represent *MAXIMUM* current carrying capacity of a fully loaded connector with all circuits powered. Ratings are based on a 30°C maximum temperature rise limit over ambient (room temperature). Above charts are intended as a guideline. Current rating is application dependent. Appropriate de-rating is required depending on factors such as higher ambient temperature, smaller copper weight of PCB traces, gross heating from adjacent modules or components and other factors that influence connector performance.

4.4 TEMPERATURE

Operating: * - 40°C to + 105°C
Nonoperating: - 40°C to + 105°C
**Including 30°C terminal temperature at rated current*

4.5 WAVE SOLDER PROCESS TEMPERATURE

Headers with pegs: 240°C Maximum
Headers without pegs: 260°C Maximum

5.0 WIRE-TO-WIRE 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	**Insulation Resistance**	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	**Dielectric Withstanding Voltage**	Mate connectors: apply a voltage of 2200 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown. Current leakage < 5 mA
4	**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

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.	14.7 N (3.30 lbf) MAXIMUM insertion force and 0.5 N (0.11 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	**Durability**	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	20 milliohms maximum (change from initial)

5.2 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
4	**Vibration (Random)**	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) and Discontinuity < 1 microsecond	
5	**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 (change from initial) and Discontinuity < 1 microsecond	
6	**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. 26 Awg = 19.0 N (4.27 lbf) Min. 28 Awg = 9.80 N (2.20 lbf) Min.	
7	**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	
8	**Normal Force**	Apply a perpendicular force.	Sn	1.47 N (150 grams) MINIMUM
			Au	0.49 N (50 grams) MINIMUM
9	**Panel Insertion and Withdrawl Forces**	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (Applies only to plugs with panel retention feature)	225 N (50.7 lbf) MAXIMUM insertion force and 157 N (35.3 lbf) MINIMUM withdrawl force	
10	**Thumblatch Operation Force**	Depress latch at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	16.67 N (3.75 lbf) MAXIMUM	
11	**Thumblatch Yield Strength**	Mate loaded connectors fully. Pull connectors apart at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	68 N (15.3 lbf) MINIMUM	

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 (change from initial) 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 (change from initial) and 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 Visual: No Damage Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4
4	**Cold Resistance**	Mate connectors: Duration: 96 hours; Temperature: -40 ± 3°C	10 milliohms MAXIMUM (change from initial) and Visual: No Damage
5	**Mixed Flowing Gas**	EIA-364-65 with Class IIa Gas concentrations (Gold plated only)	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

5.0 WIRE-TO-BOARD PERFORMANCE

6.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQURIEMENT
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	**Insulation Resistance**	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	**Dielectric Withstanding Voltage**	Mate connectors: apply a voltage of 2200 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown. Current leakage < 5 mA
4	**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

6.2 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.	14.7 N (3.30 lbf) MAXIMUM insertion force and 0.5 N (0.11 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	**Durability**	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	20 milliohms maximum (change from initial)

6.2 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
4	**Vibration (Random)**	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) and Discontinuity < 1 microsecond	
5	**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 (change from initial) and Discontinuity < 1 microsecond	
6	**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. 26 Awg = 19.0 N (4.27 lbf) Min. 28 Awg = 9.80 N (2.20 lbf) Min.	
7	**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	
8	**Normal Force**	Apply a perpendicular force.	Sn	1.47 N (150 grams) MINIMUM
			Au	0.49 N (50 grams) MINIMUM
9	**PCB 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 with PCB holes at nominal diameter)	49.0 N (11.0 lbf) MAXIMUM insertion force and 10.0 N (2.24 lbf) MINIMUM withdrawal force	
10	**Pin Retention Force**	Apply axial push force at the speed rate of 25 ± 3mm/minute.	9.81 N (2.20 lbf) MINIMUM RETENTION FORCE	
11	**Thumblatch Operation Force**	Depress latch at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	16.67 N (3.75 lbf) MAXIMUM	
12	**Thumblatch Yield Strength**	Mate loaded connectors fully. Pull connectors apart at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	68 N (15.3 lbf) MINIMUM	

6.3 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 (change from initial) Visual: No Damage Dielectric Strength per 6.1.5 Insulation Resistance per 6.1.4
2	**Thermal Aging**	Mate connectors; expose to: 96 hours at 105 ± 2°C	20 milliohms MAXIMUM (change from initial) and 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 (change from initial) Visual: No Damage Dielectric Strength per 6.1.5 Insulation Resistance per 6.1.4
4	**Solderability**	Per SMES-152	Solder coverage: 95% MINIMUM (per SMES-152)
5	**Solder Resistance**	Dip connector terminals tail in solder: Solder Duration: 5 ± 0.5 seconds; Solder Temperature: 260 ± 5°C	Visual: No Damage to insulator material
6	**Cold Resistance**	Mate connectors: Duration; 96 hours; Temperature: -40 ± 3°C	10 milliohms MAXIMUM (change from initial) and Visual: No Damage
7	**Mixed Flowing Gas**	EIA-364-65 with Class IIa Gas concentrations (Gold plated only)	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

7.0 TEST SEQUENCES

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

8.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage.
Nylon parts should remain in there original packaging until ready for use to prevent moisture loss or gain.

9.0 OTHER INFORMATION

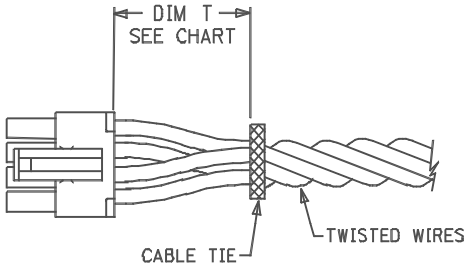
9.1 GAGES AND FIXTURES

It is recommended that test plugs (Series 44281) be used for continuity testing of receptacles. Standard mating parts should not be used for harness testing.

NOTE: The use of unauthorized testing devices and/or probes with a Molex product may cause damage to and affect functionality of the Molex product, and such use may void any and all warranties, expressed or implied.

9.2 CABLE TIE AND OR WIRE TWIST LOCATION

CKT Sizes		Dim T Min.
Dual Row	Single Row	
2-6	3	.50” (12.7 mm)
8	4	.75” (19.1 mm)
10-12	5-6	1.00” (25.4 mm)
14-16	7-8	1.25” (31.75 mm)
18-20	9-10	1.50”(38.09 mm)
22-24	11-12	1.75” (44.45 mm)



The “T” dimension defines a “free” length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter the housing. Wires are to be dressed in such a manner to allow the terminals to float freely in the pocket. This dimension is a general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

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