

Molex 39-00-0074 PDF

深圳创唯电子有限公司

<http://www.molex-connect.com>



PRODUCT SPECIFICATION

MINI-FIT BMI

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 <u>Scope</u>	2
2.0 <u>Product Description</u>	2
2.1 Names and Series Numbers	2
Table 1 – Wire-To-Wire	2
Table 2 – Wire-To-Board	2
Table 3 – Board-To-Board	3
2.2 Dimensions, Materials, Platings, and Markings	3
2.3 Safety Agency Approvals	3
3.0 <u>Applicable Documents and Specifications</u>	3
4.0 <u>Ratings</u>	4
4.1 Voltage	4
4.2 Applicable Wires	4
4.3 Maximum Current Rating (Amperes)	4
Table 4 – Wire-To-Wire	4
Table 5 – Wire-To-Board	5
Table 6 – Board-To-Board	5
4.4 Temperature	5
4.5 Wave Solder Process Temperature	5
5.0 <u>Wire-To-Wire Performance</u>	6
5.1 Electrical Requirements	6
5.2 Mechanical Requirements	6
5.3 Environmental Requirements	8
6.0 <u>Wire-To-Board Performance</u>	9
6.1 Electrical Requirements	9
6.2 Mechanical Requirements	10
6.3 Environmental Requirements	12
7.0 <u>Board-To-Board Performance</u>	13
7.1 Electrical Requirements	13
7.2 Mechanical Requirements	14
7.3 Environmental Requirements	15
8.0 <u>Test Sequences</u>	15
9.0 <u>Packaging</u>	15
10.0 <u>Other Information</u>	16
11.0 <u>Polarization</u>	17

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 1 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

1.0 SCOPE

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

2.0 PRODUCT DESCRIPTION

2.1 NAMES AND SERIES NUMBER(S)

Table 1 – WIRE-TO-WIRE				
Description	Series Number	UL	CSA	TUV
Female Crimp Terminal	5556	N/A	N/A	N/A
Receptacle Housing	5557	Yes	Yes	Yes
Male Crimp Terminal	5558	N/A	N/A	N/A
Receptacle Housing, BMI	42474	Yes	Yes	Yes
Plug Housing, BMI	42475	Yes	Yes	Yes
Plug Housing, BMI	43558	Yes	Yes	No
Plug Housing, BMI	43770	Yes	Yes	Yes

Table 2 – WIRE-TO-BOARD				
Description	Series Number	UL	CSA	TUV
Female Crimp Terminal	5556	N/A	N/A	N/A
Receptacle Housing	5557	Yes	Yes	Yes
Male Crimp Terminal	5558	N/A	N/A	N/A
Receptacle Header, BMI	42385	Yes	Yes	No
Right Angle Header, BMI	42404	Yes	Yes	No
Receptacle Header, BMI	42416	Yes	Yes	No
Right Angle Header, BMI	42417	Yes	Yes	No
Vertical Header, BMI	42440	Yes	Yes	No
Receptacle Housing, BMI	42474	Yes	Yes	Yes
Plug Housing, BMI	42475	Yes	Yes	Yes
Vertical Header, BMI	42786	Yes	Yes	Yes
Vertical Header, BMI	43176	No	No	No
Vertical Header, BMI	43459	Yes	Yes	No
Plug Housing, BMI	43558	Yes	Yes	No
Right Angle Header, BMI	43644	Yes	Yes	No
Vertical Header, BMI	43693	Yes	Yes	No
Right Angle Header, BMI	44151	Yes	Yes	No
Right Angle Header, BMI	44499	Yes	Yes	No

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 2 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

Table 3 – BOARD-TO-BOARD				
Description	Series Number	UL	CSA	TUV
Vertical Receptacle Header, BMI	42385	Yes	Yes	No
Vertical Receptacle Header, BMI	42416	Yes	Yes	No
Vertical Header, BMI	42440	Yes	Yes	No
Vertical Header, BMI	42786	Yes	Yes	Yes
Vertical Header, BMI	43459	Yes	Yes	No
Vertical Header, BMI	43693	Yes	Yes	No
Right Angle Header, BMI	42404	Yes	Yes	No
Right Angle Header, BMI	42417	Yes	Yes	No
Right Angle Header, BMI	43644	Yes	Yes	No
Right Angle Header, BMI	44151	Yes	Yes	No
Right Angle Header, BMI	44499	Yes	Yes	No

Other products conforming to this specification 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: LR19980
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

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 3 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

4.0 RATINGS

4.1 VOLTAGE

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

4.2 APPLICABLE WIRES

Applicable Wire Gauges and Maximum Insulation Diameter	16 AWG: 3.10 / .122 MAXIMUM
	18-20 AWG: 3.10 / .122 MAXIMUM
	22-28 AWG: 1.80 / .071 MAXIMUM

4.3 MAXIMUM CURRENT RATING (Amperes)**

Table 4 – WIRE-TO-WIRE									
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

REVISION:	ER INFORMATION:	TITLE:	SHEET No.
G4	ER No: 607614 DATE: 2018/11/14	PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	4 of 18
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-5556-002	SALHAMY	DSTEIER	FSMITH



PRODUCT SPECIFICATION

4.3 MAXIMUM CURRENT RATING (Amperes) (continued)

Table 5 – 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.

Table 6 – BOARD-TO-BOARD									
Brass					Phosphor Bronze				
Ckt. Size	2-3	4 - 6	7 - 10	12 - 24	Ckt. Size	2-3	4 - 6	7 - 10	12 - 24
	9	8	7	6		8	7	6	5

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

** 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 rise at rated current*

4.5 WAVE SOLDER PROCESS TEMPERATURE

Headers with pegs: 240°C MAX.

Headers without pegs: 260°C MAX.

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 5 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

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 & 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)

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 6 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

5.2 MECHANICAL REQUIREMENTS (continued)

4	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) & 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) & 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.	0.49 N (50 grams) MINIMUM [Gold (noble) plating] OR 1.47 N (150 grams) MINIMUM [Tin (non-noble) plating]	
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)	Standard	49.0 N (11.0 lbf) MAXIMUM insertion force & 10.0 N (2.24 lbf) MINIMUM withdrawal force
			Press-Fit	T.B.D.
			Metal Clip	T.B.D.
10	Thumb Latch Operation Force	Depress latch at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	16.67 N (3.75 lbf) MAXIMUM	
11	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) MINIMUM	

REVISION:	ER INFORMATION:	TITLE:	SHEET No.
G4	ER No: 607614 DATE: 2018/11/14	PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	7 of 18
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-5556-002	SALHAMY	DSTEIER	FSMITH



PRODUCT SPECIFICATION

5.2 MECHANICAL REQUIREMENTS (continued)

12	Panel Insertion and Withdrawal Forces (for 42474)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	225 N (50.7 lbf) MAXIMUM insertion force & 157 N (35.3 lbf) MINIMUM withdrawal force
13	Panel Insertion and Withdrawal Forces (for 44516)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	0.0 MAXIMUM insertion force & 157 N (35.3 lbf) MINIMUM withdrawal force
14	Panel Insertion and Withdrawal Forces (for 42475)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	225 N (50.7 lbf) MAXIMUM insertion force & 157 N (35.3 lbf) MINIMUM withdrawal force

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) & 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) Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4 Visual: No Damage
4	Mixed Flowing Gas	EIA-364-65 with Class IIa Gas concentrations (Gold plated only)	20 milliohms MAXIMUM (change from initial) Visual: No Damage

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 8 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

6.0 WIRE-TO-BOARD PERFORMANCE

6.1 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

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 9 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

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 & 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	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.	9.81 N (2.20 lbf) MINIMUM retention force
4	Stamped PC Tail 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
5	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	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
7	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) & Discontinuity < 1 microsecond
8	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.
9	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

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 10 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

6.2 MECHANICAL REQUIREMENTS (continued)

10	Normal Force	Apply a perpendicular force.	0.49 N (50 grams) MINIMUM [Gold (noble) plating] OR 1.47 N (150 grams) MINIMUM [Tin (non-noble) plating]
11	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)	Standard 49.0 N (11.0 lbf) MAXIMUM insertion force & 10.0 N (2.24 lbf) MINIMUM withdrawal force
			Press-Fit T.B.D.
			Metal Clip T.B.D.
12	Thumb Latch Operation Force	Depress latch at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	16.67 N (3.75 lbf) MAXIMUM
13	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) MINIMUM
14	Panel Insertion and Withdrawal Forces (for 42474)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	225 N (50.7 lbf) MAXIMUM insertion force & 157 N (35.3 lbf) MINIMUM withdrawal force
15	Panel Insertion and Withdrawal Forces (for 44516)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	0.0 MAXIMUM insertion force & 157 N (35.3 lbf) MINIMUM withdrawal force
16	Panel Insertion and Withdrawal Forces (for 42475)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	225 N (50.7 lbf) MAXIMUM insertion force & 157 N (35.3 lbf) MINIMUM withdrawal force

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 11 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

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 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) & 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) 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)
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 (change from initial) Visual: No Damage

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 12 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

7.0 BOARD-TO-BOARD PERFORMANCE

7.1 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

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 13 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

7.2 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 ($1 \pm \frac{1}{4}$ inch) per minute.	14.7 N (3.30 lbf) MAXIMUM insertion force & 0.5 N (0.11 lbf) MINIMUM withdrawal force	
2	Stamped PC Tail Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ 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 ($1 \pm \frac{1}{4}$ inch) per minute.	9.81 N (2.20 lbf) MINIMUM retention force	
4	Durability	Mate connectors up to 75 (Sn) or 100 (Au) cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	20 milliohms MAXIMUM (change from initial)	
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 $\frac{1}{2}$ sine wave (11 milliseconds) shocks in the $\pm X$, $\pm Y$, $\pm Z$ axes, (18 shocks total).	20 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond	
7	Normal Force	Apply a perpendicular force.	1.96 N (200 grams) MINIMUM	
8	PCB Peg Engagement and Separation Forces	Engage and separate a connector at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch) per minute. (Applies to parts with PCB retention features only with PCB holes at nominal diameter)	Standard	98.0 N (22.0 lbf) MAXIMUM insertion force & 10.0 N (2.24 lbf) MINIMUM withdrawal force
			Press-Fit	T.B.D.
			Metal Clip	T.B.D.

REVISION:	ER INFORMATION:	TITLE:	SHEET No.
G4	ER No: 607614 DATE: 2018/11/14	PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	14 of 18
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-5556-002	SALHAMY	DSTEIER	FSMITH



PRODUCT SPECIFICATION

7.3 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) & 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) 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)
5	Solder Temperature Heat Transfer	Dip connector terminals tail in solder: Solder Duration: 5 ± 0.5 seconds; Solder Temperature: 260 ± 5°C	Visual: No Damage to the insulator 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 (change from initial) Visual: No Damage

8.0 TEST SEQUENCES

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

9.0 PACKAGING

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

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 15 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

10.0 OTHER INFORMATION

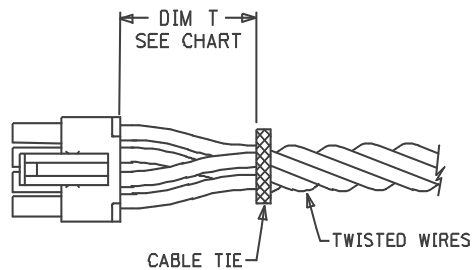
10.1 GAGES AND FIXTURES

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.

10.2 CABLE TIE AND OR WIRE TWIST LOCATION

CKT Sizes	Dim T Min.
2-6	.50" (12.7 mm)
8	.75" (19.1 mm)
10-12	1.00" (25.40 mm)
14-16	1.25" (31.75 mm)
18-20	1.50" (38.09 mm)
22-24	1.75" (44.45 mm)



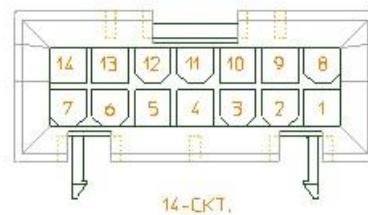
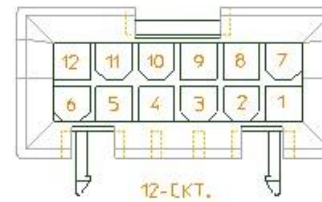
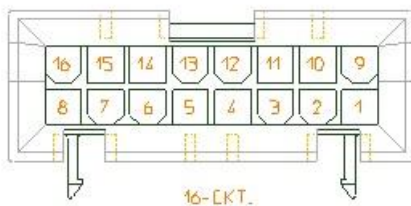
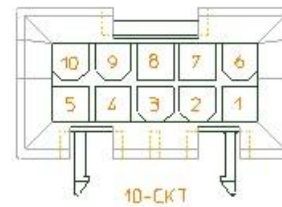
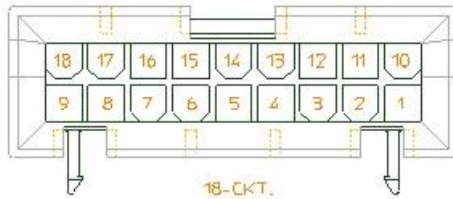
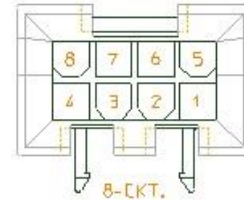
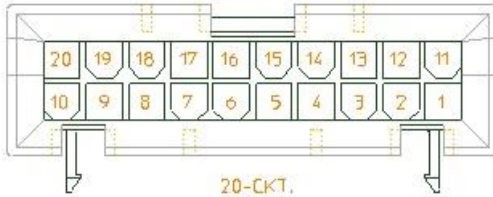
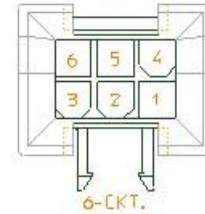
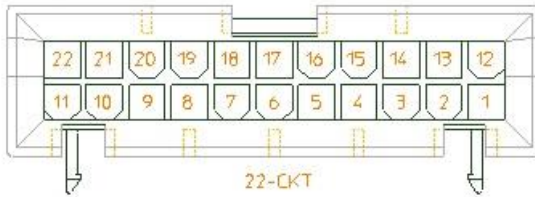
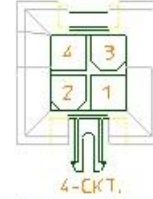
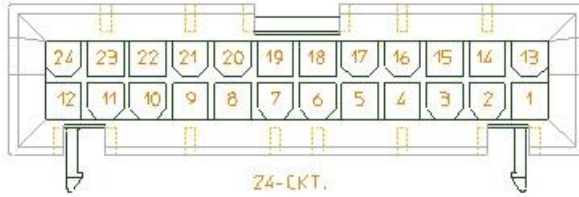
The "T" dimension defines a "free" length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter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

REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 16 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

11.0 STANDARD POLARIZATION FOR HEADERS AND PLUGS (HEADERS ARE SHOWN)



REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 17 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

12.0 STANDARD POLARIZATION FOR RECEPTACLES



REVISION: G4	ER INFORMATION: ER No: 607614 DATE: 2018/11/14	TITLE: PRODUCT SPECIFICATION MINI-FIT BMI CONNECTOR SYSTEM	SHEET No. 18 of 18
DOCUMENT NUMBER: PS-5556-002	CREATED / REVISED BY: SALHAMY	CHECKED BY: DSTEIER	APPROVED BY: FSMITH



TEST SUMMARY

MINI-FIT JR. CONNECTOR SYSTEM STANDARD AND BLIND MATE INTERFACE (BMI) (WIRE TO PCB AND WIRE TO WIRE)

1.0 SCOPE

This specification covers the 4.20 mm (.165 inch) centerline connector series terminated with 16 to 24 Awg wire using crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBERS:

Description	Series Number
BMI Right Angle Header	43810
BMI Vertical Header	44068
BMI Right Angle Header	42404
BMI Vertical Header	42440
BMI Plug Housing	42475
BMI Receptacle Header	42385
BMI Receptacle	44516
BMI Receptacle	42474
Mini-Fit Jr. Receptacle Housing	5557
Mini-Fit Jr Plug Housing	5559
Mini-Fit Jr Terminal-Male	5558
Mini-Fit Jr Terminal-Female	5556
Mini-Fit Jr Vertical Header	5566
Mini-Fit Jr Right Angle Header	5569

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

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

2.3 PRODUCT SPECIFICATION TITLE AND DOCUMENT NUMBERS

Product Specification Title: Mini-Fit Jr BMI	Document Number: PS-5556-002
Product Specification Title: Mini-Fit Jr	Document Number: PS-5556-001
Product Specification Title: Mini-Fit BMI	Document Number: PS-44516-001
Product Specification Title: Mini-Fit BMI	Document Number: PS-43810-001

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 TESTING PROCEDURES AND SEQUENCES

None

3.2 OTHER DOCUMENTS

None

4.0 QUALIFICATIONS

Laboratory conditions and sample selection are in accordance with EIA 364.

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 1 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

5.0 PERFORMANCE

5.1.1 ELECTRICAL PERFORMANCE RESULTS (with Brass material and Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Contact Resistance (Low Level)	After Durability (Mated/Unmated Cycling)	20 Maximum (change from initial)	milliohm	3.09	2.85	3.39
	After Vibration	20 Maximum (change from initial)	milliohm	2.79	2.60	2.95
		Discontinuity	No Opens			
	After Thermal Shock	20 Maximum (change from initial)	milliohm	2.61	2.43	2.79
		Discontinuity	No Opens			
	After Mechanical Shock	20 Maximum (change from initial)	milliohm	2.70	2.54	2.89
		Appearance	No Damage			
	After Humidity (Steady State) 96 hours	20 Maximum (change from initial)	milliohm	2.54	2.44	2.67
		Appearance	No Damage			
	After Flowers of Sulfur	20 Maximum (change from initial)	milliohm	2.50	2.37	2.66
		Appearance	No Damage			
	After Ammonia Gas	20 Maximum (change from initial)	milliohm	2.56	2.44	2.66
		Appearance	No Damage			
	After Salt Spray	20 Maximum (change from initial)	milliohm	2.63	2.47	2.73
Appearance		No Damage				

5.1.2 ELECTRICAL PERFORMANCE RESULTS (with Phos Bronze material and Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Contact Resistance (Low Level)	After Durability (Mated/Unmated Cycling)	20 Maximum (change from initial)	milliohm	2.45	2.36	2.56
	After Vibration	20 Maximum (change from initial)	milliohm	2.32	2.04	2.58
		Discontinuity	No Opens			
	After Mechanical Shock	20 Maximum (change from initial)	milliohm	2.38	2.11	2.69
		Discontinuity	No Opens			
	After Temperature Cycling	20 Maximum (change from initial)	milliohm	2.21	2.01	2.49
Appearance		No Damage				

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 2 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

	After Humidity (Steady State)	20 Maximum (change from initial)	milliohm	2.26	2.05	2.42
		Appearance	No Damage			
	After Flowers of Sulfur	20 Maximum (change from initial)	milliohm	2.22	2.01	2.40
		Appearance	No Damage			
	After Ammonia Gas	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Salt Spray	20 Maximum (change from initial)	milliohm	2.32	2.07	2.55
		Appearance	No Damage			

5.1.3 ELECTRICAL PERFORMANCE RESULTS (with Brass material and Gold plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Contact Resistance (Low Level)	After Durability (Mated/Unmated Cycling)	20 Maximum (change from initial)	milliohm	2.62	2.24	3.35
	After Vibration	20 Maximum (change from initial)	milliohm	3.26	2.59	5.36
		Discontinuity	No Opens			
	After Mechanical Shock	20 Maximum (change from initial)	milliohm	2.98	2.47	3.69
		Discontinuity	No Opens			
	After Temperature Cycling	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Humidity (Steady State)	20 Maximum (change from initial)	milliohm	3.05	2.32	4.69
		Appearance	No Damage			
	After Flowers of Sulfur	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Ammonia Gas	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Salt Spray	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 3 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

5.2.1 MECHANICAL PERFORMANCE (Brass material with Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Connector Mate and Unmate Forces (per 2 cks) Values listed include 2 Circuits	Initial Mating	3.0 Maximum	Kgf	0.85	0.78	0.88
		(6.6) Maximum	(lbf)	(1.9)	(1.7)	(1.9)
	Final Mating (30 th)	3.0 Maximum	Kgf	0.39	0.38	0.41
		(6.6) Maximum	(lbf)	(0.86)	(0.84)	(0.90)
	Initial Unmating	0.1 Minimum	Kgf	0.44	0.41	0.47
		(0.22) Minimum	(lbf)	(0.97)	(0.90)	(1.04)
Final Unmating (30 th)	0.1 Minimum	Kgf	0.16	0.13	0.18	
	(0.22) Minimum	(lbf)	(0.35)	(0.29)	(0.40)	
Terminal Retention Force (to housing)	Initial-Male	3 (6.6)Minimum	Kgf (lbf)	11.5 (25)	10.5 (23)	12.5 (27)
	Initial-Female	3 (6.6) Minimum	Kgf (lbf)	13.8 (30)	12.0 (26)	15.7 (35)
Terminal Insertion Force (into housing)	Initial-Male	1.5(3.3) Maximum	Kgf (lbf)	0.38 (0.8)	0.23 (0.5)	0.54 (1.2)
	Initial-Female	1.5(3.3) Maximum	Kgf (lbf)	0.68 (1.5)	0.61 (1.3)	0.78 (1.7)
Wire Pullout Force (Wire to Terminal Retention)	18 Awg	9.0 Minimum	Kgf	11.70	10.40	12.60
		(19.9) Minimum	(lbf)	(25.80)	(22.90)	(27.80)
	20 Awg	6.0 Minimum	Kgf	12.60	10.30	13.40
		(13.2) Minimum	(lbf)	(27.80)	(22.70)	(29.50)
	22 Awg	4.0 Minimum	Kgf	7.80	6.00	8.70
		(8.8) Minimum	(lbf)	(17.20)	(13.20)	(19.20)
24 Awg	3.0 Minimum	Kgf	4.90	4.00	5.80	
	(6.6) Minimum	(lbf)	(10.80)	(8.80)	(12.80)	

5.2.2 MECHANICAL PERFORMANCE (Phos Bronze material with Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Connector Mate and Unmate Forces (per 2 cks) Values listed include 2 Circuits	Initial Mating	3.0 Maximum	Kgf	1.15	1.00	1.26
		(6.6) Maximum	(lbf)	(2.5)	(2.2)	(2.8)
	Final Mating (30 th)	3.0 Maximum	Kgf	2.03	1.88	2.24
		(6.6) Maximum	(lbf)	(4.5)	(4.1)	(4.9)
	Initial Unmating	0.1 Minimum	Kgf	0.68	0.65	0.71
		(0.22) Minimum	(lbf)	(1.5)	(1.4)	(1.6)
Final Unmating (30 th)	0.1 Minimum	Kgf	1.00	0.84	1.14	
	(0.22) Minimum	(lbf)	(2.2)	(1.85)	(2.5)	
Terminal Retention Force (to housing)	Initial-Male	3 (6.6)Minimum	Kgf (lbf)	- (-)	- (-)	- (-)
	Initial-Female	3 (6.6) Minimum	Kgf (lbf)	11.43 (25.2)	10.3 (22.7)	13.80 (30.4)
Terminal Insertion Force (into housing)	Initial-Male	1.5(3.3) Maximum	Kgf (lbf)	- (-)	- (-)	- (-)

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 4 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

	Initial-Female	1.5(3.3) Maximum	Kgf (lbf)	0.81 (1.8)	0.67 (1.5)	1.06 (2.3)
Wire Pullout Force (Wire to Terminal Retention)	18 Awg	9.0 Minimum	Kgf	16.8	15.7	18.4
		(19.9) Minimum	(lbf)	(37.0)	(34.6)	(40.6)
	20 Awg	6.0 Minimum	Kgf	13.4	12.7	14.3
		(13.2) Minimum	(lbf)	(26.5)	(28.0)	(31.5)
	22 Awg	4.0 Minimum	Kgf	8.3	7.7	8.6
		(8.8) Minimum	(lbf)	(18.3)	(17.0)	(19.0)
24 Awg	3.0 Minimum	Kgf	4.9	4.2	5.9	
	(6.6) Minimum	(lbf)	(10.8)	(9.3)	(13.0)	

5.3.1 ENVIRONMENTAL PERFORMANCE (with Brass Material and Tin plating)

TEST CONDITION	Wire Awg	Amps	REQUIREMENT	Max Temp Rise Degrees C
Temperature Rise & Current Cycling	18	2A	30 Deg C max temp rise	2.6
	18	4A	30 Deg C max temp rise	9.7
	18	6A	30 Deg C max temp rise	21.1
	18	7.5A	30 Deg C max temp rise	32.2
	20	1A	30 Deg C max temp rise	1.1
	20	3A	30 Deg C max temp rise	9.2
	20	5A	30 Deg C max temp rise	23.6
	20	6A	30 Deg C max temp rise	33
	22	2A	30 Deg C max temp rise	5.2
	22	3A	30 Deg C max temp rise	11.4
	22	4A	30 Deg C max temp rise	19.5
	22	5A	30 Deg C max temp rise	30.4
	24	1A	30 Deg C max temp rise	2.2
	24	2A	30 Deg C max temp rise	8.1
	24	3A	30 Deg C max temp rise	17.6
24	4A	30 Deg C max temp rise	30.2	

5.3.2 ENVIRONMENTAL PERFORMANCE (with Phos Bronze Material and Tin plating)

TEST CONDITION	Wire Awg	Amps	REQUIREMENT	Max Temp Rise Degrees C
Temperature Rise & Current Cycling	22	1A	30 Deg C max temp rise	1.6
	22	2A	30 Deg C max temp rise	6.7
	22	3A	30 Deg C max temp rise	13.4
	22	4A	30 Deg C max temp rise	21.4
	22	5A	30 Deg C max temp rise	31.8
	24	1A	30 Deg C max temp rise	2.3
	24	2A	30 Deg C max temp rise	8.5
	24	3A	30 Deg C max temp rise	18.2
	24	4A	30 Deg C max temp rise	30.2

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 5 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH