

# Molex 39-01-2046 PDF

深圳创唯电子有限公司

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



# APPLICATION SPECIFICATION

## ACCEPTABLE COLORS OF MINI-FIT JR® CONNECTORS

### 1.0 SCOPE

The purpose of this document is to address the acceptable color variation of molded Mini-Fit Jr® connectors.

### 2.0 PRODUCT NAME AND SERIES NUMBERS

Mini-Fit Jr® Receptacle Housing	5557
Mini-Fit Jr® Plug Housing	5559
Mini-Fit Jr® Vertical Header	5566
Mini-Fit Jr® Right Angle Header	5569

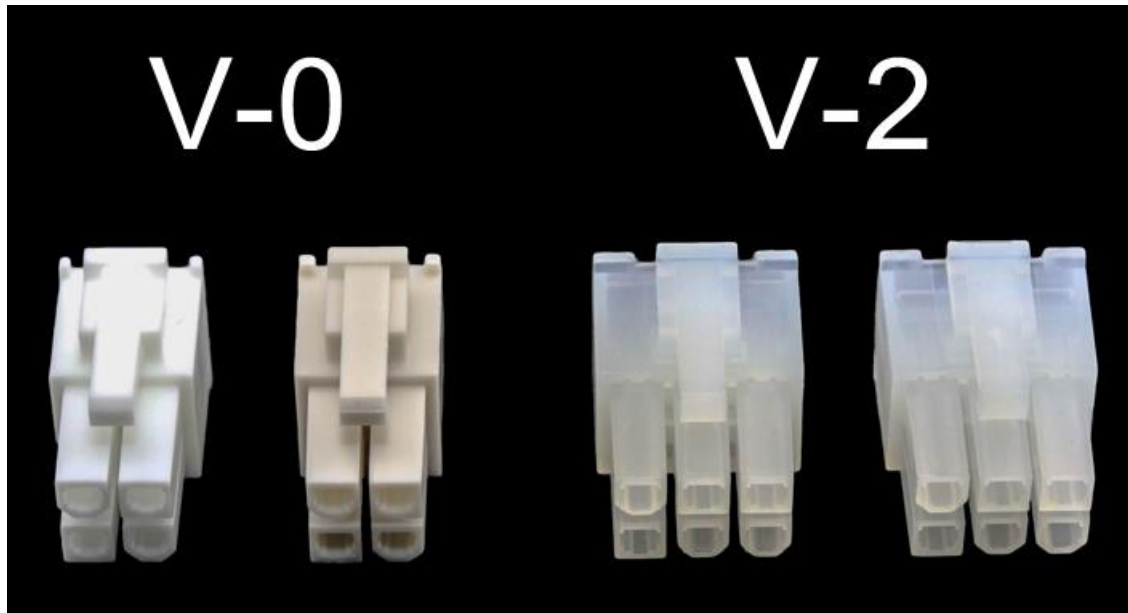
### 3.0 REFERENCE DOCUMENTS

See the appropriate sales drawings for information on specific part numbers and materials.

### 4.0 GENERAL REQUIREMENTS

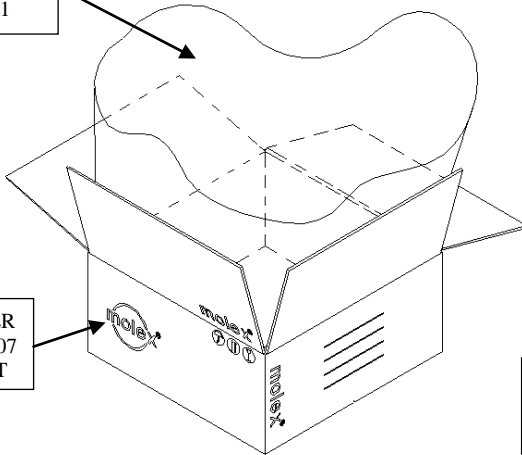
Mini-Fit JR® offers a broad product line with a world wide manufacturing footprint. To provide cost effective connector solutions, Molex utilizes several different plastic material grades to mold these connectors through-out the world. These materials must pass stringent performance requirements before they are approved for use. These approved materials have slight variations in colors as shown in the figures below and all are considered acceptable. It is possible to receive the same part in more than one color variation.

Examples of acceptable colors of Mini Fit Jr® materials:



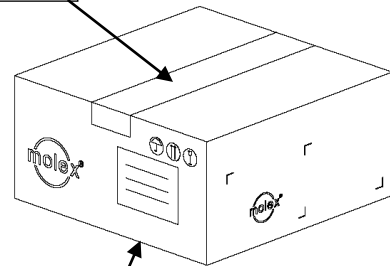
REVISION: <b>A1</b>	ECR/ECN INFORMATION: EC No: 118438 DATE: 2017/06/21	TITLE: <b>APPLICATION SPECIFICATION FOR MINI-FIT JR® CONNECTOR SYSTEM</b>	SHEET No. <b>1 of 1</b>
DOCUMENT NUMBER: <b>AS-5557-001</b>	CREATED / REVISED BY: <b>J.QUILES</b>	CHECKED BY: <b>J.BELL</b>	APPROVED BY: <b>F.SMITHROEMER</b>

BAG PER  
ES-40000-7011



CARTON PER  
ES-40000-7007  
SEE CHART

ADHESIVE TAPE PER  
ES-40000-7013



PRODUCT I.D. AND SAFETY  
AGENCY LABEL PER  
ES-40000-7012

- 1) CARTON TOPS AND BOTTOMS TO BE SEALED WITH A 2" WIDE ADHESIVE TAPE. STAPLING OF THE BOTTOM OF THE CARTON IS ACCEPTABLE.
- 2) USE PRESCRIBED BOX AND LINER BAG PER CHART BELOW. BAG MUST BE SEALED WITH TWIST LOCK 313017300, TWIST TIE OR EQUIVALENT.
- 3) PARTS TO BE MOISTURIZED PER AS-45499-001 IF REQUIRED PER CHART. FOR 5559-\*P-400, 5559-\*P-225 & 46993-\*\*10 USE PAD AND BAG METHOD.
- 4) THIS PACKAGING SPECIFICATION ALSO APPLIES TO 46993-\*\*\*0 PARTS.

REVISION: <b>B2</b>	ECR/ECN INFORMATION: EC No: <b>172304</b> DATE: <b>2018/02/13</b>	TITLE: <b>BULK PACKAGING SPECIFICATION FOR 5559 SERIES DUAL ROW WITH EARS</b>	SHEET No. <b>1 of 2</b>
DOCUMENT NUMBER: <b>PK-5559-001</b>	CREATED / REVISED BY: <b>ANESSER</b>	CHECKED BY: <b>JBELL</b>	APPROVED BY: <b>FSMITH</b>

**molex****PACKAGING SPECIFICATION**

			MALAYSIA		USA	
		MOISTURIZE (SEE NOTE 3)	YES		YES, EXCEPT 24 CKT	
			CARTON PART # 59411-0002		CARTON PART # 96707-0014	
CKT	ENG. NO.	PARTS PER CARTON (SPQ)	BAG PART # 8000044732		BAG PART # 31300-8790	
	(SEE NOTE 4)		PARTS PER BAG	BAGS PER CARTON	PARTS PER BAG	BAGS PER CARTON
2	5559-02P-*	5000	5000	1	5000	1
4	5559-04P-*	4000	4000	1	4000	1
6	5559-06P-*	2500	2500	1	2500	1
8	5559-08P-*	2000	2000	1	2000	1
10	5559-10P-*	2000	2000	1	2000	1
12	5559-12P-*	1600	1600	1	1600	1
14	5559-14P-*	1400	1400	1	1400	1
16	5559-16P-*	1200	1200	1	1200	1
18	5559-18P-*	1000	1000	1	1000	1
20	5559-20P-*	1000	1000	1	1000	1
22	5559-22P-*	800	800	1	800	1
24	5559-24P-*	800	800	1	800	1

			SHANGHAI		INDIA	
		MOISTURIZE (SEE NOTE 3)	NO		YES	
			CARTON PART # 96708-0005 (885960512)		CARTON PART # 96708-0005	
CKT	ENG. NO.	PARTS PER CARTON (SPQ)	BAG PART # 96713-0003		BAG PART # 96713-0003	
	(SEE NOTE 4)		PARTS PER BAG	BAGS PER CARTON	PARTS PER BAG	BAGS PER CARTON
2	5559-02P-*	5000	1000	5	1000	5
4	5559-04P-*	4000	500	8	1000	4
6	5559-06P-*	2500	500	5	500	5
8	5559-08P-*	2000	500	4	500	4
10	5559-10P-*	2000	200	10	500	4
12	5559-12P-*	1600	200	8	400	4
14	5559-14P-*	1400	200	7	200	7
16	5559-16P-*	1200	200	6	200	6
18	5559-18P-*	1000	200	5	N/A	N/A
20	5559-20P-*	1000	200	5	200	5
22	5559-22P-*	800	200	4	N/A	N/A
24	5559-24P-*	800	200	4	N/A	N/A

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.	
<b>B2</b>	EC No: <b>172304</b> DATE: <b>2018/02/13</b>	<b>BULK PACKAGING SPECIFICATION FOR 5559 SERIES DUAL ROW WITH EARS</b>	<b>2 of 2</b>	
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:	
<b>PK-5559-001</b>	<b>ANESSER</b>	<b>JBELL</b>	<b>FSMITH</b>	

**MINI-FIT JR.**

**Table of Contents**

<b>Section</b>	<b>Page</b>
1.0 <u>Scope</u>	<b>2</b>
2.0 <u>Product Description</u>	<b>2</b>
2.1 Names and Series Number(s)	2
Table 1 – Wire-To-Wire	2
Table 2 – Wire-To-Board	2
2.2 Dimensions, Materials, Platings, and Markings	2
2.3 Safety Agency Approvals	2
3.0 <u>Applicable Documents and Specifications</u>	<b>3</b>
4.0 <u>Ratings</u>	<b>3</b>
4.1 Voltage	3
4.2 Applicable Wires	3
4.3 Maximum Current Rating (Amperes)	3
Table 3 – Maximum Current Rating (Amperes)	
Wire-To-Wire and Wire-To-Board	3
4.4 Temperature	4
4.5 Wave Solder Process Temperature	4
4.6 Glow Wire	4
5.0 <u>Wire-To-Wire Performance</u>	<b>4</b>
5.1 Electrical Requirements	4
5.2 Mechanical Requirements	5
5.3 Environmental Requirements	7
6.0 <u>Wire-To-Board Performance</u>	<b>8</b>
6.1 Electrical Requirements	8
6.2 Mechanical Requirements	8
6.3 Environmental Requirements	10
7.0 <u>Test Sequences</u>	<b>11</b>
8.0 <u>Packaging</u>	<b>11</b>
9.0 <u>Other Information</u>	<b>11</b>
9.1 Gages and Fixtures	11
9.2 Cable tie and/or twist location	11

REVISION: <b>E9</b>	ECR/ECN INFORMATION: ER No: <b>600132</b> DATE: <b>2019/04/05</b>	TITLE: <b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	SHEET No. <b>1 of 11</b>
DOCUMENT NUMBER: <b>PS-5556-001</b>	CREATED / REVISED BY: <b>AZAHIROVIC</b>	CHECKED BY: <b>DSTEIER</b>	APPROVED BY: <b>FSMITH</b>

**1.0 SCOPE**

This Product Specification covers performance requirements for the MINI-FIT JR. 4.20 mm (.165 inch) centerline (pitch) wire to board and wire to wire connector system terminated with 16 to 28 AWG standard, copper wire using Crimp technology with Tin or 30µ” Gold plating.

**2.0 PRODUCT DESCRIPTION**

**2.1 PRODUCT NAME AND SERIES NUMBER (S)**

<b>Table 1 – WIRE-TO-WIRE</b>				
Description	Series Number	UL(600V)	CSA(600V)	IEC(250V)
Female Crimp Terminal	5556	n/a	n/a	Yes
Receptacle Housing	5557	Yes	Yes	Yes
Male Crimp Terminal	5558	n/a	n/a	Yes
Plug Housing	5559	Yes	Yes	Yes
Plug Housing	45776	Yes	Yes	Yes
Receptacle Housing	46992/46994	Yes	Yes	Yes
Plug housing	46993/172646	Yes	Yes	Yes

<b>Table 2 – WIRE-TO-BOARD</b>				
Description	Series Number	UL(600V)	CSA(600V)	IEC(250V)
Female Crimp Terminal	5556	n/a	n/a	Yes
Receptacle Housing	5557	Yes	Yes	Yes
Vertical Header	5566	Yes	Yes	Yes
Right Angle Header	5569	Yes	Yes	Yes
Receptacle Housing	46992/46994	Yes	Yes	Yes
Vertical Header	172447/172647	Yes	Yes	Yes
Right Angle Header	172448/172648	Yes	Yes	Yes

Other products conforming to this specification are noted on the individual drawing

**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

IEC 61984 Certification : Tested to and found in compliance with IEC 61984. NRTL type examination certificate available upon request. Contact Molex Safety team for questions regarding certification on specific part numbers.

REVISION: <b>E9</b>	ECR/ECN INFORMATION: ER No: 600132 DATE: 2019/04/05	TITLE: <b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	SHEET No. <b>2 of 11</b>
DOCUMENT NUMBER: <b>PS-5556-001</b>	CREATED / REVISED BY: <b>AZAHIROVIC</b>	CHECKED BY: <b>DSTEIER</b>	APPROVED BY: <b>FSMITH</b>

**3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS**

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

Application Specification: AS-45499-001 (moisturizing nylon parts)

Test Summary: TS-5556-002

Molex Solderability Specification: SMES-152

EIA-364-1000.01

**4.0 RATINGS**

**4.1 VOLTAGE**

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

\*Voltage rating based on UL 1977. Maximum voltage allowed may vary dependent upon "End Use Application". Refer to the applicable end use standard for additional information on Voltage, Creepage and Clearance requirements.

**4.2 APPLICABLE WIRES**

<b>Maximum Insulation Diameter and Applicable Wire Gauges</b>	16 AWG Stranded, Copper: 3.15 mm / .124 inches MAXIMUM
	18-24 AWG Stranded, Copper: 3.10 mm / .122 inches MAXIMUM
	22-28 AWG Stranded, Copper: 1.80 mm / .071 inches MAXIMUM

**4.3 MAXIMUM CURRENT RATING (Amperes)\*\***

<b>Table 3 - MAXIMUM CURRENT RATING (Amperes) Wire-to-Wire and Wire-to-Board</b>										
<b>Brass</b>					<b>Phosphor Bronze</b>					
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.

\*\* Current rating is application dependent and may be affected by the wire rating such as listed in UL-60950-1. Each application should be evaluated by the end user for compliance to specific safety agency requirements. The ratings listed in the chart above represents the MAXIMUM current carrying capacity of a fully loaded connector with all circuits powered using tinned copper conductor stranded wire per Molex test method based on a 30° C maximum temperature rise over ambient temperature and are provided as a guideline. Appropriate de-rating is required based on circuit size, ambient temperature, copper trace size on the PCB, gross heating from adjacent modules/components and other factors that influence connector performance. Wire size & stranding, tin coated or bare copper wire, wire length & crimp quality are other factors that influence current rating.

<b>REVISION:</b>	<b>ECR/ECN INFORMATION:</b>	<b>TITLE:</b>			<b>SHEET No.</b>
<b>E9</b>	ER No: <b>600132</b> DATE: <b>2019/04/05</b>	<b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>			<b>3 of 11</b>
<b>DOCUMENT NUMBER:</b>		<b>CREATED / REVISED BY:</b>	<b>CHECKED BY:</b>	<b>APPROVED BY:</b>	
<b>PS-5556-001</b>		<b>AZAHIROVIC</b>	<b>DSTEIER</b>	<b>FSMITH</b>	

**4.4 TEMPERATURE**

	Terminal Type		
	Formed Brass	Solid Brass	Phos Bronze
Operating: *	- 40°C to + 80°C	- 40°C to + 105°C	- 40°C to + 105°C
Nonoperating:	- 40°C to + 80°C	- 40°C to + 105°C	- 40°C to + 105°C

\*Including 30°C terminal temperature at rated current

**4.5 MAXIMUM WAVE SOLDER PROCESS TEMPERATURE**

Header Type	Plating Type		
	Matte Tin over Nickel	Bright Tin over Nickel	Tin over Copper
Pegs	240°C	240°C	240°C
No Pegs	260°C	240°C	240°C
Glow Wire with Pegs Series: 172447, 172447, 172448, 172648	220°C	N/A	N/A

For Headers: Matte tin over Nickel plating is recommended for new applications.

**4.6 Glow Wire**

The following series are glow capable: 46992, 46993, 46994, 172646, 172447, 172448, 172648, 45776. Representative samples were tested and found compliant with EN 60695-2-11-2001 / IEC 60695-2-11-2000 Glow Wire Test Methods for End-Products. These were additionally investigated for compliance with EN 60335-1 / IEC 60335-1 750C / 2 sec with no flaming. VDE Test report available upon request.

**5.0 WIRE-TO-WIRE PERFORMANCE**

**5.1 ELECTRICAL REQUIREMENTS**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Contact Resistance (Low Level)</b>	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	<b>Insulation Resistance</b>	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	<b>Dielectric Withstanding Voltage</b>	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	<b>Temperature Rise (via Current Cycling)</b>	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:	ECR/ECN INFORMATION:	TITLE:		SHEET No.
<b>E9</b>	ER No: 600132 DATE: 2019/04/05	<b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>		<b>4 of 11</b>
DOCUMENT NUMBER:		CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>PS-5556-001</b>		<b>AZAHIROVIC</b>	<b>DSTEIER</b>	<b>FSMITH</b>



**5.2 MECHANICAL REQUIREMENTS**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Terminal Mate and Unmate Forces Per Circuit</b>	Insert and withdraw terminal (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute with latch disabled.	14.7 N (3.30 lbf) MAXIMUM insertion force and 0.5 N (0.11 lbf) MINIMUM withdrawal force
2	<b>Crimp Terminal Retention Force (in Housing)</b>	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	<b>Durability</b>	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute Based on mated pairs of 30µ" Au or 100µ" tin at the contact interface.	20 milliohms maximum (change from initial)
4	<b>Vibration (Random)</b>	Mate connectors and vibrate per EIA 364-28, test condition VII, letter D. Test Duration: 15 minutes in each axis.	20 milliohms MAXIMUM (change from initial) and Discontinuity < 1 microsecond
5	<b>Shock (Mechanical)</b>	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	<b>Wire Pullout Force (Axial)</b>	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute without influence from the insulation crimp. Wire pullout force is applicator dependent. Refer to relevant Molex Applicator Tooling specification.	16 Awg = 68.4 N (15.4 lbf) Min. 18 Awg = 88.0 N (19.8 lbf) Min. 20 Awg = 58.7 N (13.2 lbf) Min. 22 Awg = 39.1 N (8.8 lbf) Min. 24 Awg = 29.3 N (6.6 lbf) Min. 26 Awg = 19.6 N (4.4 lbf) Min. 28 Awg = 9.8 N (2.2 lbf) Min.
7	<b>Crimp Terminal Insertion Force (into Housing)</b>	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	15.0 N (3.37 lbf) MAXIMUM insertion force

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>E9</b>	ER No: 600132 DATE: 2019/04/05	<b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	<b>5 of 11</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>PS-5556-001</b>	<b>AZAHIROVIC</b>	<b>DSTEIER</b>	<b>FSMITH</b>

**5.2 MECHANICAL REQUIREMENTS (continued)**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
8	Normal Force	Apply a perpendicular force to contacts.	Sn	1.47 N (150 grams) MINIMUM
			Au	0.49 N (50 grams) MINIMUM
9	Panel Insertion and Withdrawl Forces (5559, 46993, 172646 Series)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. Applies only to plugs with panel retention features.	225 N (50.7 lbf) MAXIMUM insertion force and Dual Row: 157 N (35.3 lbf) Single Row: 133 N (29.9 lbf) MINIMUM withdrawl force	
10	Panel Insertion and Withdrawl Forces (45776 Series)	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 and 133 N (29.9 lbf) MINIMUM withdrawl force	
11	Thumb latch Operation Force	Depress latch at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	22.2 N (5.0 lbf) MAXIMUM	
12	Thumb latch Yield Strength	Mate loaded connectors fully. Pull connectors apart at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (after 1 <sup>st</sup> mate)	68 N (15.3 lbf) MINIMUM	

REVISION:	ECR/ECN INFORMATION:	TITLE:		SHEET No.
<b>E9</b>	ER No: 600132 DATE: 2019/04/05	<b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>		<b>6 of 11</b>
DOCUMENT NUMBER:		CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>PS-5556-001</b>		<b>AZAHIROVIC</b>	<b>DSTEIER</b>	<b>FSMITH</b>

**5.3 ENVIRONMENTAL REQUIREMENTS**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Thermal Shock</b>	Mate connectors: expose for 5 cycles Between temperatures $-55$ and $105^{\circ}\text{C}$ ; Dwell 0.5 hours at each temperature.	20 milliohms MAXIMUM (change from initial) Visual: No Damage Dielectric Strength per 5.1.3 except 1500VAC test voltage Insulation Resistance per 5.1.2
2	<b>Thermal Aging</b>	Mate connectors; expose to: 96 hours at $105 \pm 2^{\circ}\text{C}$	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
3	<b>Humidity (Steady State)</b>	Mate connectors: expose to a temperature of $60 \pm 2^{\circ}\text{C}$ with a relative humidity of 90-95% for 96 hours. Remove surface moisture and air dry for 1 hour prior to measurements.	20 milliohms MAXIMUM Visual: No Damage Dielectric Strength per 5.1.3 except 1500VAC test voltage Insulation Resistance per 5.1.2
4	<b>Cold Resistance</b>	Mate connectors: Duration: 96 hours; Temperature: $-40 \pm 3^{\circ}\text{C}$	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
5	<b>Mixed Flowing Gas</b>	EIA-364-65 with Class IIa Gas concentrations 10 days mated (30 $\mu$ " Gold plated only)	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
6	<b>Cyclic Temperature And Humidity</b>	Mate connectors: expose to 24 cycles from $25^{\circ}\text{C} / 80\% \text{RH}$ to $65^{\circ}\text{C} / 50\% \text{RH}$ ramp time: 0.5hr dwell time: 1hr Per EIA-364-1000.01	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

REVISION: <b>E9</b>	ECR/ECN INFORMATION: ER No: 600132 DATE: 2019/04/05	TITLE: <b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	SHEET No. <b>7 of 11</b>
DOCUMENT NUMBER: <b>PS-5556-001</b>	CREATED / REVISED BY: <b>AZAHIROVIC</b>	CHECKED BY: <b>DSTEIER</b>	APPROVED BY: <b>FSMITH</b>

**6.0 WIRE-TO-BOARD PERFORMANCE**

**6.1 ELECTRICAL REQUIREMENTS**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Contact Resistance (Low Level)</b>	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	<b>Insulation Resistance</b>	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	<b>Dielectric Withstanding Voltage</b>	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	<b>Temperature Rise (via Current Cycling)</b>	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	<b>Terminal Mate and Unmate Forces Per Circuit</b>	Insert and withdraw terminal (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute with latch disabled.	14.7 N (3.30 lbf) MAXIMUM insertion force and 0.5 N (0.11 lbf) MINIMUM withdrawal force
2	<b>Crimp Terminal Retention Force (in Housing)</b>	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	<b>Durability</b>	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute Based on mated pairs of 30µ" Au or 50µ" tin at the contact interface	20 milliohms maximum (change from initial)
4	<b>Vibration (Random)</b>	Mate connectors and vibrate per EIA 364-28, test condition VII, letter D. Test Duration: 15 minutes in each axis.	20 milliohms MAXIMUM (change from initial) and Discontinuity < 1 microsecond

REVISION:	ECR/ECN INFORMATION:	TITLE:		SHEET No.
<b>E9</b>	ER No: 600132 DATE: 2019/04/05	<b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>		<b>8 of 11</b>
DOCUMENT NUMBER:		CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>PS-5556-001</b>		<b>AZAHIROVIC</b>	<b>DSTEIER</b>	<b>FSMITH</b>

**6.2 MECHANICAL REQUIREMENTS (continued)**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5	<b>Shock (Mechanical)</b>	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	<b>Wire Pullout Force (Axial)</b>	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute without influence from the insulation crimp. Wire pullout force is applicator dependent. Refer to relevant Molex Applicator Tooling specification.	16 Awg = 68.4 N (15.4 lbf) Min. 18 Awg = 88.0 N (19.8 lbf) Min. 20 Awg = 58.7 N (13.2 lbf) Min. 22 Awg = 39.1 N (8.8 lbf) Min. 24 Awg = 29.3 N (6.6 lbf) Min. 26 Awg = 19.6 N (4.4 lbf) Min. 28 Awg = 9.8 N (2.2 lbf) Min.
7	<b>Crimp Terminal Insertion Force (into Housing)</b>	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	15.0 N (3.37 lbf) MAXIMUM insertion force
8	<b>Normal Force</b>	Apply a perpendicular force to contacts.	Sn   1.47 N (150 grams) MINIMUM
			Au   0.49 N (50 grams) MINIMUM
9	<b>PCB Engagement Forces</b>	Engage 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 and location. Values will vary with PCB material & PCB fabrication and peg type.	For 5569, 172448, 172648: 26.7 to 66.7 N (6.0 to 15.0 lbf) For 5566, 172447, 172647: 4.4 to 44.5 N (1.0 TO 10.0 lbf) Typical insertion force per peg. For Reference ONLY
10	<b>Solid PC Tail Header Pin Retention Force (in housing) (5569, 172448, 172648 Series)</b>	Apply axial push force on the terminal in the housing at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	9.81 N (2.20 lbf) MINIMUM RETENTION FORCE
11	<b>Stamped PC Tail Terminal Retention Force (in housing) (5566, 172447, 172647 Series)</b>	Apply axial push force on the terminal in the housing at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	9.81 N (2.20 lbf) MINIMUM RETENTION FORCE
12	<b>Thumb latch Operation Force</b>	Depress latch at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	22.2 N (5.0 lbf) MAXIMUM
13	<b>Thumb latch Yield Strength</b>	Mate loaded connectors fully. Pull connectors apart at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (after 1 <sup>st</sup> mate)	68 N (15.3 lbf) MINIMUM

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>E9</b>	ER No: 600132 DATE: 2019/04/05	<b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	<b>9 of 11</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>PS-5556-001</b>	<b>AZAHIROVIC</b>	<b>DSTEIER</b>	<b>FSMITH</b>

**6.3 ENVIRONMENTAL REQUIREMENTS**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Thermal Shock</b>	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 6.1.3 except 1500VAC test voltage Insulation Resistance per 6.1.2
2	<b>Thermal Aging</b>	Mate connectors; expose to: 96 hours at 105 ± 2°C	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
3	<b>Humidity (Steady State)</b>	Mate connectors: expose to a temperature of 60 ± 2°C with a relative humidity of 90-95% for 96 hours. Remove surface moisture and air dry for 1 hour prior to measurements.	20 milliohms MAXIMUM (change from initial) Visual: No Damage Dielectric Strength per 6.1.3 except 1500VAC test voltage Insulation Resistance per 6.1.2
4	<b>Solderability Dip Test</b>	Per Molex Test Method: SMES-152	Solder area shall have minimum of 95% solder coverage
5	<b>Wave Solder Resistance</b>	Dip connector terminals tail in solder: Solder Duration: 5 ± 0.5 seconds; Solder Temperature: Use maximum solder temperature from Section 4.5	Visual: No Damage to insulator housing material
6	<b>Cold Resistance</b>	Mate connectors: Duration; 96 hours; Temperature: -40 ± 3°C	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
7	<b>Mixed Flowing Gas</b>	EIA-364-65 with Class IIa Gas concentrations 10 days mated (30µ" Gold plated only)	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
8	<b>Cyclic Temperature and Humidity</b>	Mate connectors: expose to 24 cycles from 25 °C / 80% RH to 65 °C / 50% RH ramp time: 0.5hr dwell time: 1hr Per EIA-364-1000.01	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

REVISION: <b>E9</b>	ECR/ECN INFORMATION: ER No: 600132 DATE: 2019/04/05	TITLE: <b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	SHEET No. <b>10 of 11</b>
DOCUMENT NUMBER: <b>PS-5556-001</b>	CREATED / REVISED BY: <b>AZAHIROVIC</b>	CHECKED BY: <b>DSTEIER</b>	APPROVED BY: <b>FSMITH</b>

**7.0 TEST SEQUENCES**

Testing sequences are based on 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 their original packaging until ready for use to prevent moisture loss or gain. Nylon will absorb moisture which causes dimensions to increase. Excess moisture gain can result in dimensions exceeding specification. For details, refer to the packaging specification called out on the applicable product sales drawing.

**9.0 OTHER INFORMATION**

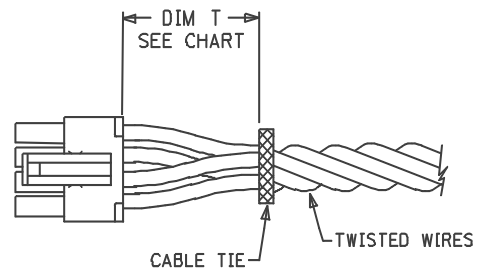
**9.1 GAGES AND FIXTURES**

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**

Circuit Sizes		Dim T Min.
Dual Row	Single Row	
2-6	2-3	.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.

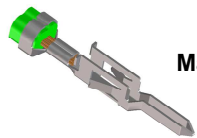
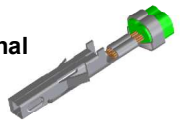
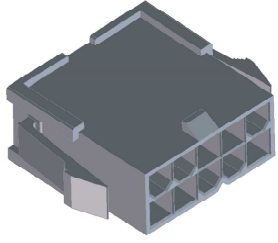
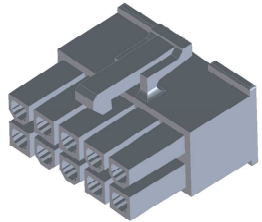
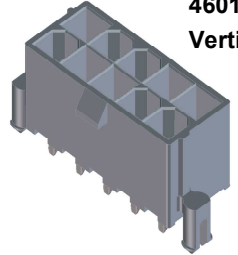
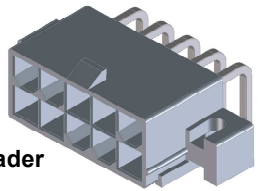
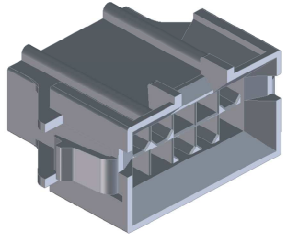
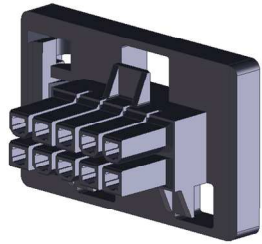
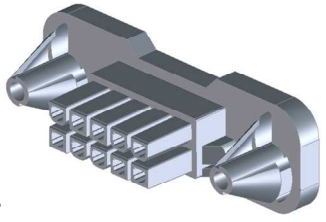
REVISION: <b>E9</b>	ECR/ECN INFORMATION: ER No: 600132 DATE: 2019/04/05	TITLE: <b>PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM</b>	SHEET No. <b>11 of 11</b>
DOCUMENT NUMBER: <b>PS-5556-001</b>	CREATED / REVISED BY: <b>AZAHIROVIC</b>	CHECKED BY: <b>DSTEIER</b>	APPROVED BY: <b>FSMITH</b>



# PRODUCT SPECIFICATION

## PRODUCT SPECIFICATION FOR Mini-Fit Plus HCS™

### INTERCONNECT SYSTEMS

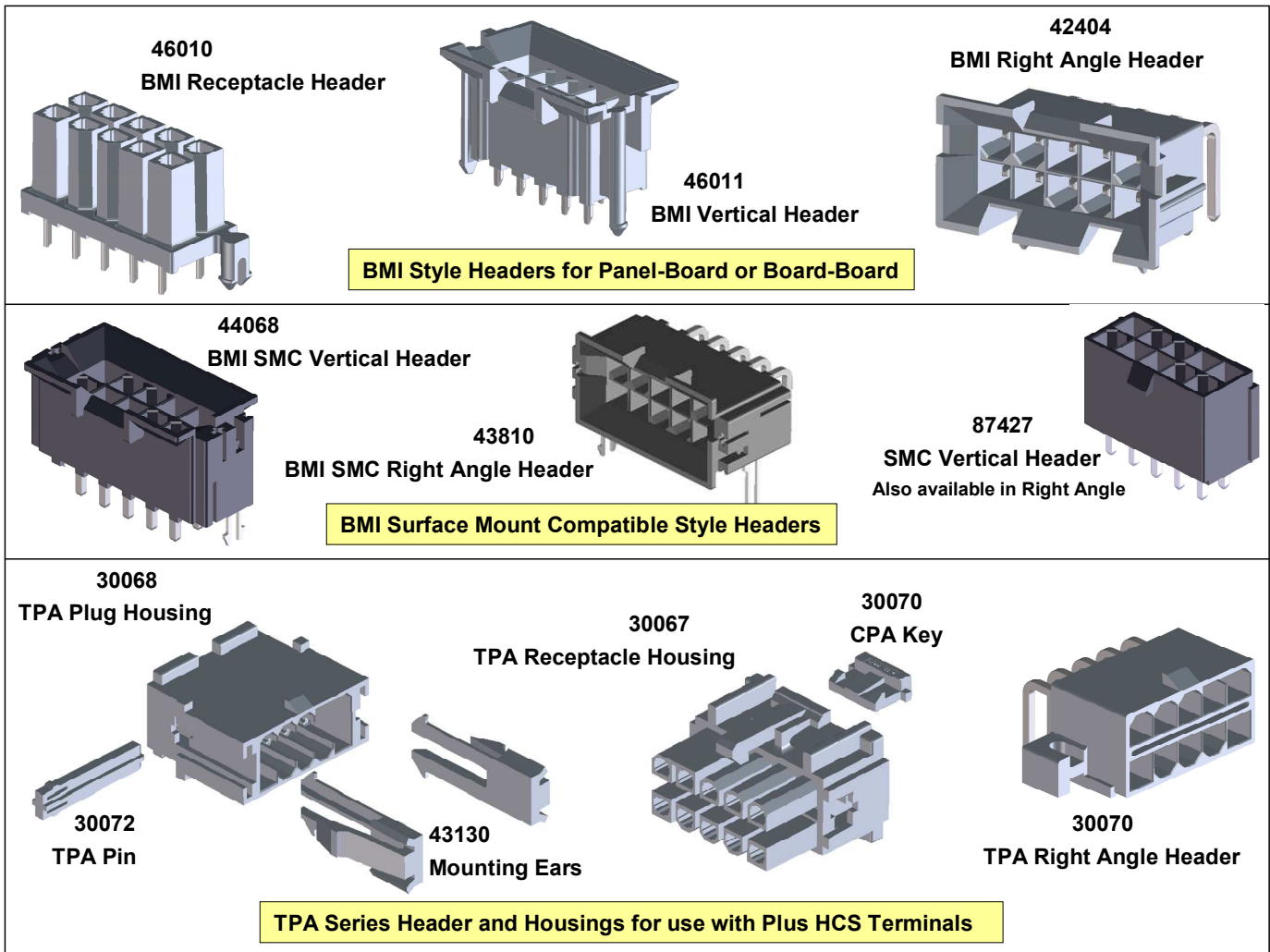
 <p><b>46012</b> Male Terminal</p>  <p><b>45750</b> Female Terminal</p>  <p><b>5559</b> Plug Housing</p>  <p><b>5557</b> Receptacle Housing</p> <p><b>Crimp Terminals and Housing for Wire-Wire</b></p>	 <p><b>46015</b> Vertical Header</p>  <p><b>5569</b> Right Angle Header</p> <p><b>Headers for Wire-Board</b></p>
 <p><b>42475</b> BMI Plug Housing</p>  <p><b>44516</b> BMI Slide and Lock Receptacle</p>  <p><b>42474</b> BMI Receptacle w/ Spirals</p> <p><b>BMI Style Panel Mount Housings for Wire-Panel, Panel-Panel and Panel-Board</b></p>	

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>1 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>





# PRODUCT SPECIFICATION



**Product feature designations:**

- BMI Blind Mate Interface – features allowing easier alignment in panel-board and board to board applications.
- SMC Surface Mount Compatible - reflow solder temperatures up to 245°C.
- TPA Terminal Position Assurance – helps ensure crimp terminals are fully engaged and prevents terminals from backing out in high vibration applications.
- CPA Connector Position Assurance – assures housing cannot be inadvertently disengaged.

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>2 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## MINI-FIT PLUS HCS

### TABLE OF CONTENTS

SECTION	PAGE
<b>1.0 <u>Scope</u></b>	<b>4</b>
<b>2.0 <u>Product Description</u></b>	<b>4-5</b>
2.1 Names and Series Numbers	4
2.2 Dimensions, Materials, Platings, and Markings	5
2.3 Safety Agency Approvals	5
<b>3.0 <u>Applicable Documents and Specifications</u></b>	<b>5</b>
<b>4.0 <u>Packaging</u></b>	<b>5</b>
<b>5.0 <u>Ratings</u></b>	<b>5-6</b>
5.1 Voltage	5
5.2 Applicable Wires	5
5.3 Temperature	5
5.4 Wave Solder Process Temperature	5
5.5 Durability (Mating Cycles)	5
5.6 Maximum Current Carrying Capacities	6
Wire-To-Wire	
Wire-To-Board	
Board-To-Board	
<b>6.0 <u>Product Performance Tests and Requirements</u></b>	<b>7-9</b>
5.1 Electrical Requirements	7
5.2 Mechanical Requirements	7
5.3 Environmental Requirements	9
<b>7.0 <u>Test Sequences</u></b>	<b>11-13</b>

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>3 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 1.0 SCOPE

This Product Specification covers the electrical, mechanical and environmental performance requirements for the **Mini-Fit Plus HCS™** (High Current System) in 4.20 mm (.165 inch) pitch. The **Mini-Fit Plus HCS™** uses contacts stamped in High Performance Alloy for increased current carrying capacity, while maintaining properties at elevated operating temperatures. Wire-Wire, Wire-Panel, Wire-Board, Panel-Panel, Panel-Board, and Board-Board configurations in Tin and Gold plated systems. Crimp terminals accept 16 to 20 AWG stranded wire.

## 2.0 PRODUCT DESCRIPTION

### 2.1 SERIES NUMBERS, DESCRIPTION, SALES DRAWING NUMBERS

SERIES	DESCRIPTION	SALES DRAWING	TPA	BMI	SMC	AGENCY APP'L
<b>CRIMP TERMINALS</b>						
45750	Female Crimp Terminal	SD-46012-001				NA
46012	Male Crimp Terminal	SD-45750-001				NA
<b>HOUSINGS</b>						
5557	Receptacle Housing	SD-5557-003				U,C,T
5559	Plug Housing	SD-5559-NP				U,C,T
42475	Panel Mount BMI Plug Housing	SD-42475-***1		X		U,C,T
43770	Panel Mount Plug Housing, 36 Ckt	SD-43770-001		X		U,C,T
42474	Panel Mount Receptacle Housing	SD-42474-****		X		U,C,T
43974	Panel Mount Receptacle Hsg 40 Ckt	SD-43974-005			X	U,C,T
44516	Panel Mount Receptacle Housing, Slide-and-Lock	SD-44516-00*		X		U,C
30067	TPA Receptacle Housing	SD-30067-*	X			U,C,T
30068	Panel Mount TPA Plug Housing	SD-30068-*	X	X		U,C,T
<b>VERTICAL HEADERS</b>						
44068	Vertical BMI SMC Header, solid pin	SD-44068-031		X	X	U,C,T
46010	Vertical PCB Receptacle Header	SD-46010-001		X		U,C
46011	Vertical BMI Header	SD-46011-001		X		U,C
46014	Vertical Header, single row	SD-46014-001				U,C
46015	Vertical Header, dual row	SD-46015-001				U,C
87427	Vertical SMC Header	SD-87427-***4*			X	U,C
<b>RIGHT ANGLE HEADERS</b>						
5569	Right Angle Header	SD-5569-002				U,C,T
30070	Right Angle TPA Header with mounting flanges	SD-30070-001	X			U,C,T
		SDA-30070-****				
42404	Right Angle BMI Header	SDA-42404-****		X		U,C,T
43810	Right Angle BMI SMC Header	SD-43810-0**		X	X	U,C,T
43973	Right Angle Header, 40 Ckt	SD-43973-00*		X	X	U,C,T
45567	Right Angle Header, 36 Ckt	SD-45567-001		X		U,C
87427	Right Angle SMC Header	SD-87427-***0*, -***1*, -***2*			X	U,C

#### Agency Approval designations:

U-UJL C-CSA T-TUV

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>4 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

For details regarding dimensions, materials and terminal platings, refer to the appropriate sales drawings for further information.

## 2.3 SAFETY AGENCY APPROVALS

UL File: E29179  
CSA Certificate: LR19980  
TUV Certificate: R72081037

## 3.0 APPLICABLE STANDARDS AND SPECIFICATIONS

- EIA-364-1000
- Molex solderability specification SMES-152

## 4.0 PACKAGING

Parts shall be packaged to protect against damage during normal handling, transit and storage. For details refer to the Packaging Specification as called out on the applicable product Sales Drawing.

## 5.0 RATINGS

### 5.1 VOLTAGE

600 Volts AC RMS or 600 Volts DC

### 5.2 APPLICABLE WIRES

WIRE GAUGE	INSULATION DIAMETER
16 AWG	1.80-3.10 millimeters / .071-.122 inches
18-20 AWG	1.65-2.95 millimeters / .065-.116 inches

### 5.3 TEMPERATURE RATING

Mini-Fit Plus HCS has a field temperature of 65°C and field life rating for 10 years based on testing per EIA-364-17B, Method A.

### 5.4 WAVE SOLDER PROCESS TEMPERATURE

Headers with molded pegs: 240°C MAX.  
Headers without pegs: 265°C MAX

### 5.5 DURABILITY (MATING CYCLES)

Tin: 100 cycles  
Gold: 250 cycles

Durability ratings established as tested per Durability Test Procedures described by EIA-364-09C and meet requirements for low level contact resistance and DWV as prescribed per EIA-364-1000 Test Sequence Group 7.

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>5 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 5.6 MAXIMUM CURRENT RATING (AMPERES)\*\*

WIRE-TO-WIRE									
Wire Size	Single Row Circuit Sizes			Dual Row Circuit Sizes					
	3	4	5	2	4	6, 8	10, 12	14, 16, 18	20, 22, 24
16 AWG	13A	12.5A	12A	13A	12A	11A	10.5A	10A	9.5A
18 AWG	11A	10.5A	10A	11A	10A	9A	8.5A	8A	7.5A
20 AWG	9.5A	9A	9A	9.5A	8.5A	8A	7.5A	7A	6.5A

WIRE-TO-BOARD									
Wire Size	Single Row Circuit Sizes			Dual Row Circuit Sizes					
	3	4	5	2	4	6, 8	10, 12	14, 16, 18	20, 22, 24
16 AWG	12.5A	12A	11.5A	12.5A	11.5A	10A	9A	8.5A	8.0A
18 AWG	10.5A	10A	9.5A	10.5A	9.5A	8.5A	8A	7.5A	7A
20 AWG	9A	8.5A	8.5A	9A	8A	7A	6.5A	6A	5.5A

BOARD-TO-BOARD						
Dual Row Circuit Sizes						
2	4	6, 8	10, 12	14, 16, 18	20, 22, 24	
11.5A	11A	9.5A	8A	6.5A	5A	

\*\* 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). Testing conducted with tinned copper conductor stranded wire. 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.

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: UCP2011-0141 DATE: 2010 /07/15	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>6 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 6.0 PRODUCT PERFORMANCE TESTS & REQUIREMENTS

### 6.1 ELECTRICAL REQUIREMENTS

ITEM	TEST	TEST PROCEDURE	REQUIREMENT
1	<b>Contact Resistance (Low Level)</b>	EIA-364-23: 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 mΩ Maximum Initial resistance for each test sequence. Resistance measurements for subsequent tests are the Maximum change from Initial as specified.
2	<b>Insulation Resistance</b>	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	<b>Dielectric Withstanding Voltage</b>	EIA-364-20: Apply a voltage of 1500 VAC for 1 minute between adjacent contacts.	No breakdown. Current leakage < 5 mA
4	<b>Temperature Rise (via Current Cycling)</b>	EIA-364-70 (Temperature Rise) & EIA-364-55 (Current Cycling): Apply current to mated connectors & incrementally increase until specified T-Rise is reached to establish rated current. Measure the T-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	TEST	TEST PROCEDURE	REQUIREMENT
1	<b>Terminal Mate / Unmate Forces Per Circuit for:</b>  <b>Wire – Wire;</b> <b>Wire – Board (formed pin header);</b> <b>and</b> <b>Wire – Board (solid pin header)</b>	Mate and unmate female to male crimp terminal or female terminal to header at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. Testing to be conducted with individual (single) circuit. Measure and record the maximum mate and unmate forces across 5 mating cycles.	<b>Tin, W-W &amp; W-B (formed pin):</b> Mate: 15.6 N (3.50 lbf) MAX. Unmate: 13.8N (3.10 lbf) MAX.  <b>Gold, W-W &amp; W-B (formed pin):</b> Mate: 4.9 N (1.10 lbf) MAX. Unmate: 4.0 N (0.91 lbf) MAX.  <b>Tin, W-B (solid pin):</b> Mate: 10.5 N (2.36 lbf) MAX. Unmate: 11.0N (2.47 lbf) MAX.  <b>Gold, W-B (solid pin):</b> Mate: 3.4 N (0.77 lbf) MAX. Unmate: 2.8 N (0.63 lbf) MAX.

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>7 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 6.2 MECHANICAL REQUIREMENTS (CON'D)

ITEM	TEST	TEST PROCEDURE	REQUIREMENT
2	Normal Force	Apply a perpendicular force simultaneously to each beam until the desired total deflection is achieved. Return to original size, then deflect beams a second time and measure normal force.	3.5 N (360 g) MINIMUM
3	Durability	Per EIA-364-09C, mate connectors 100 cycles for tin plated product, 250 cycles for gold plated product at a maximum rate of 500 cycles per minute.	10 mΩ Max. chg. from Initial; Visual: No Damage
4	Durability (preconditioning)	Mate connectors by hand, 20 cycles for tin plated product, 50 cycles for gold as required prior to environmental test sequence as indicated.	Visual: no damage
5	Reseating	Unmate / mate connectors by hand three cycles.	Visual: no damage
6	Vibration (Random)	EIA 364-28: Mate connectors and vibrate per, test condition VII.	10 mΩ Max. chg. from Initial; Discontinuity < 1 microsecond
7	Crimp Terminal Insertion Force (into housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inches).	15.0 N (3.37 lbf) MAXIMUM insertion force
8	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
9	Wire Crimp Retention	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inches) per minute.	16 Awg = 68.4 N (15.4 lbf) Min. 18 Awg = 68.4 N (15.4 lbf) Min. 20 Awg = 58.7 N (13.2 lbf) Min.
10	Thumb Latch Operation Force	Depress latch at a rate of 25 ± 6mm (1 ± ¼ inches) per minute.	16.7 N (3.75 LBF) MAX.
11	Thumb Latch Yield Strength	Manually mate and unmate unloaded housings for 30 cycles. Following the 30 <sup>th</sup> mate, pull apart housings in an axial direction at a rate of 25 ± 6mm (1 ± ¼ inches) per minute.	75.2 N (16.9 LBF) MIN.

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>8 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 6.2 MECHANICAL REQUIREMENTS (CON'D)

ITEM	TEST	TEST PROCEDURE	REQUIREMENT	
12	Header Solid 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.	Tin	4.45 N (1.00 lbf) MINIMUM
			Gold	4.45 N (1.00 lbf) MINIMUM
13	Header Stamped Pin Retention Force in Housing	Axial pullout force on terminal from housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	30 N (6.74 lbf) MINIMUM retention force	
14	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)	98.0 N (22.0 lbf) MAX. insertion force; 10.0 N (2.24 lbf) MIN. withdrawal force	

## 6.3 ENVIRONMENTAL REQUIREMENTS

ITEM	TEST	TEST PROCEDURE	REQUIREMENT
1a	Temperature Life Group 1	Per EIA-364-17, method A: mate connectors and expose to 240 hours at 105 ± 2°C.	10 mΩ Max. chg. from Initial; Visual: No Damage
1b	Temperature Life (preconditioning) Groups 3 & 5	Per EIA-364-17, method A: mate connectors and expose to 120 hours at 105 ± 2°C.	10 mΩ Max. chg. from Initial; Visual: No Damage
1c	Temperature Life (preconditioning) Group 4	Per EIA-364-17, method A: mate connectors and expose to 300 hours at 105 ± 2°C.	10 mΩ Max. chg. from Initial; Visual: No Damage
2	Thermal Shock	Per EIA-364-32, method A, test condition I, test duration A-4: mate connectors and expose for 10 cycles between -55°C and 105° C; dwell 0.5 hours at each temperature.	10 mΩ Max. chg. from Initial; Visual: No Damage Dielectric Strength per 5.1.3 Insulation Resistance per 5.1.2
3	Cyclic Temperature & Humidity	Per EIA-364-31, method III w/o conditioning, initial measurements, cold shock and vibration. Cycle mated connectors between 25°C ±3°C @ 80% ±3% RH and 65°C ±3°C @ 50% ±3RH. Ramp time: 0.5 hr.; dwell time: 1 hr. Perform 24 cycles.	10 mΩ Max. chg. from Initial; Visual: No Damage

REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>9 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>





# PRODUCT SPECIFICATION

## 6.3 ENVIRONMENTAL REQUIREMENTS (CON'D)

4	<b>Mixed Flowing Gas</b>	Per EIA-364-65 with Class IIA gas concentrations following Telcordia Specification GR1217.	10 mΩ Max. chg. from Initial; Visual: No Damage
5	<b>Thermal Cycling</b>	Per EIA-364-1000 Test Group 5: Cycle mated connector between 15°C±3°C and 85°C±3°C as measured on the part. Ramps should be a minimum of 2°C per minute, and dwell times should insure contacts reach the temperature extremes (minimum of 5 minutes). Humidity is not controlled. Perform 500 cycles.	10 mΩ Max. chg. from Initial; Visual: No Damage
6	<b>Solderability</b>	Per SMES-152	Solder coverage: 95% MINIMUM (per SMES-152)
7	<b>Solder Temperature Heat Transfer Resistance</b>	Expose connector terminals tails to wave solder process. Dwell time duration: 5 ± 0.5 seconds; Solder Temperature: 260 ± 5°C	Visual: No Damage to the insulator where terminal or pin locks to the connector housing.

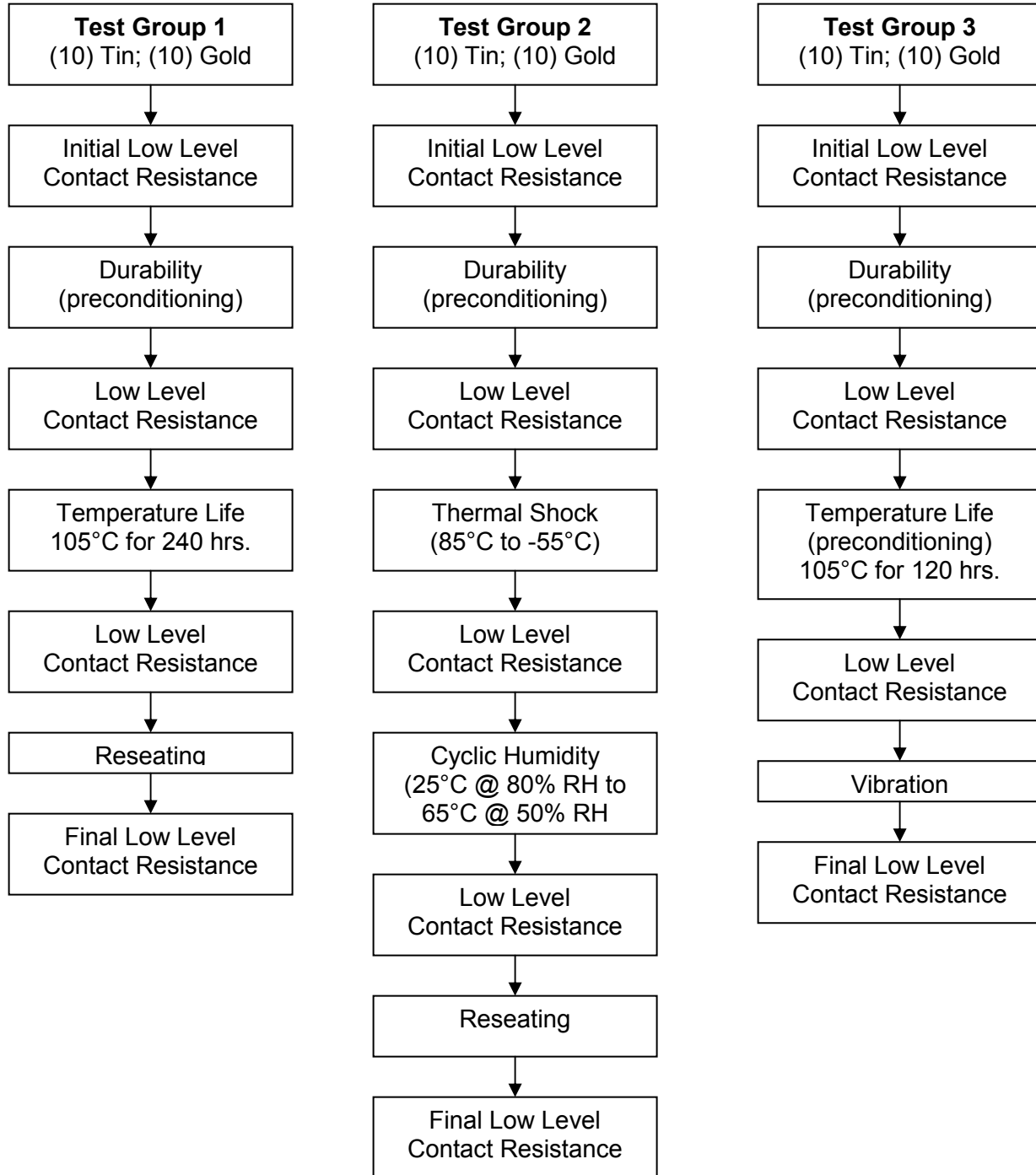
REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>10 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 7.0 TEST SEQUENCES

Environmental test sequences for Groups 1, 2, 3, 5 and 7 performed in accordance with EIA-364-1000. Sequence for Group 4 per Nortel Optical Networks specification test plan.

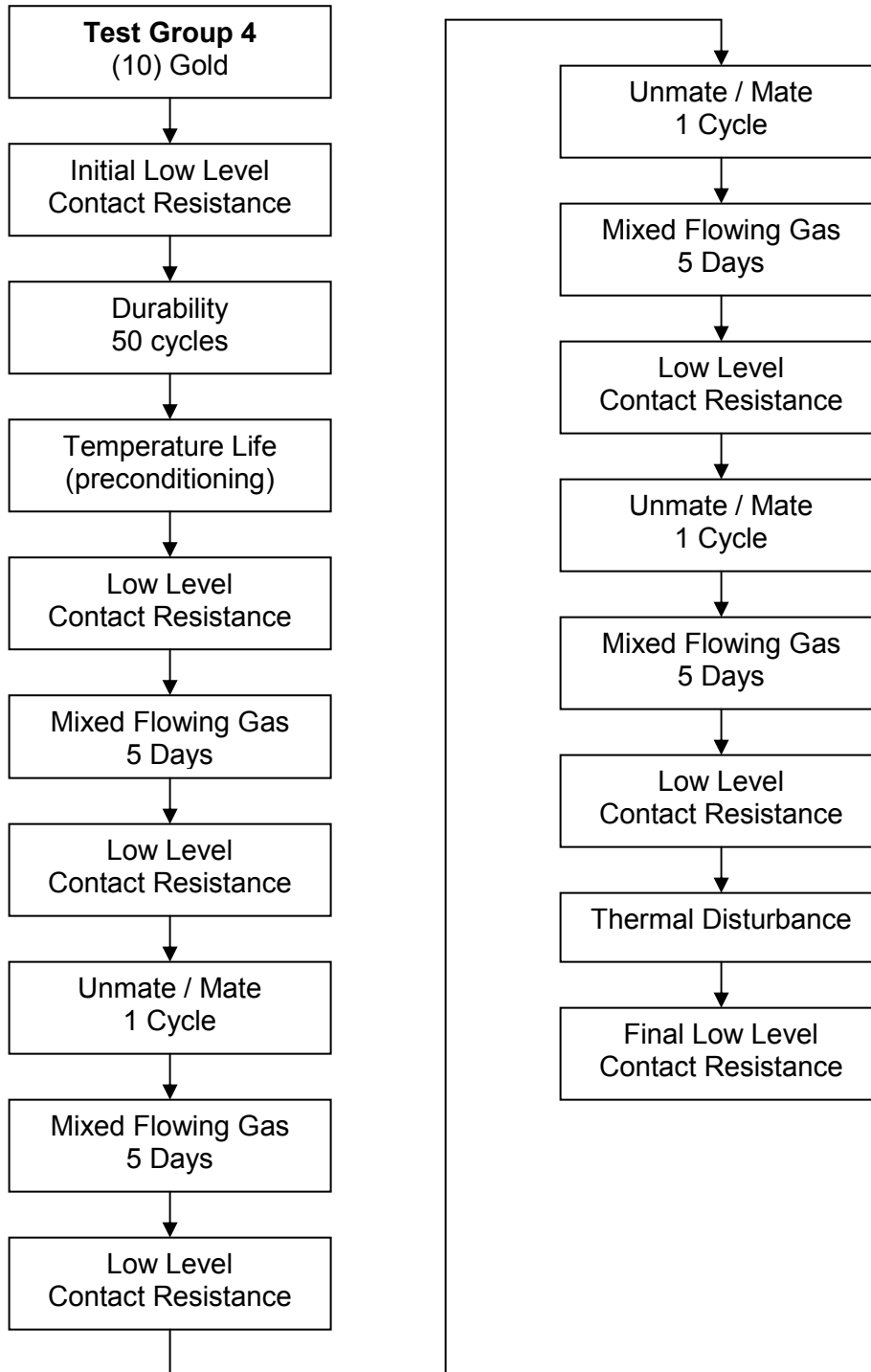


REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>11 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 7.0 TEST SEQUENCES (CON'D)

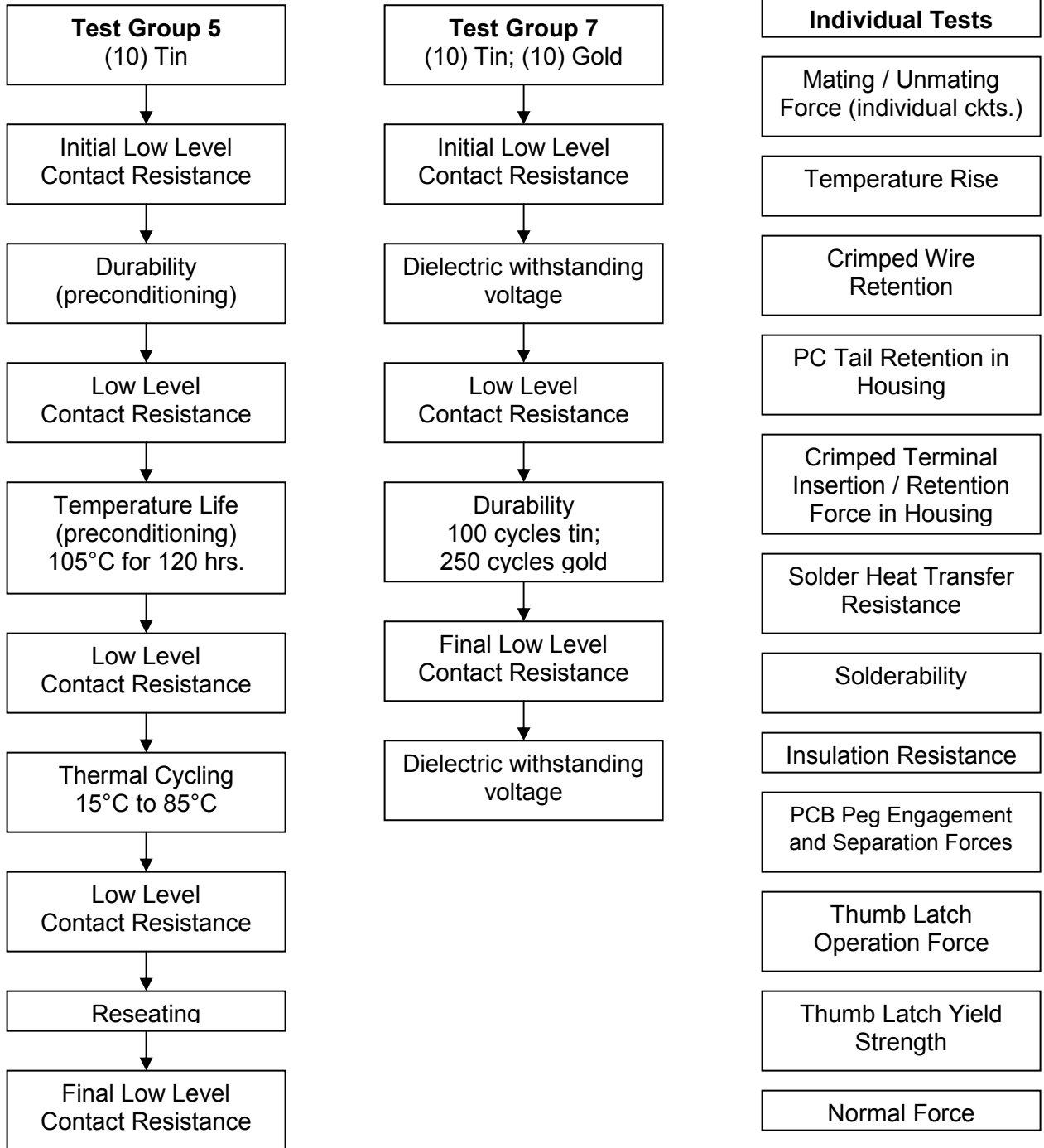


REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>12 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>



# PRODUCT SPECIFICATION

## 7.0 TEST SEQUENCES (CON'D)



REVISION: <b>C1</b>	ECR/ECN INFORMATION: EC No: <b>UCP2011-0141</b> DATE: <b>2010 /07/15</b>	TITLE: <b>PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM</b>	SHEET No. <b>13 of 13</b>
DOCUMENT NUMBER: <b>PS-45750-001</b>	CREATED / REVISED BY: <b>BWIRKUS</b>	CHECKED BY: <b>BWIRKUS</b>	APPROVED BY: <b>APATEL</b>