Molex 39-30-1022 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

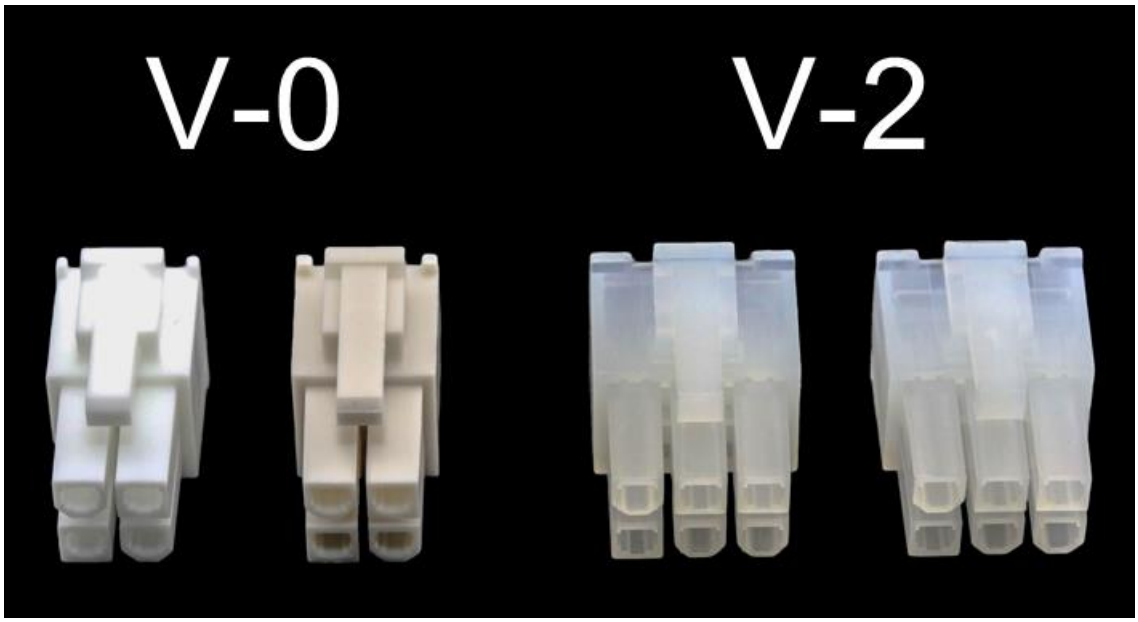
3.0 REFERENCE DOCUMENTS

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:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A1	EC No: **118438** DATE: **2017/06/21**	**APPLICATION SPECIFICATION FOR MINI-FIT JR® CONNECTOR SYSTEM**	**1** of **1**

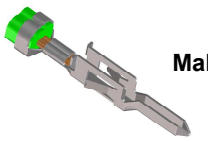
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
AS-5557-001	**J.QUILES**	**J.BELL**	**F.SMITHROEMER**

PRODUCT SPECIFICATION

PRODUCT SPECIFICATION FOR

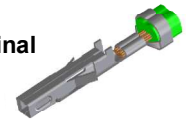
Mini-Fit Plus HCS™

INTERCONNECT SYSTEMS



46012
Male Terminal

45750
Female Terminal



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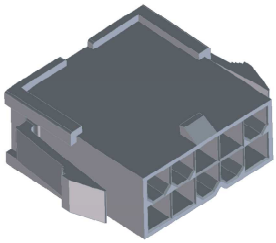
Plug Housing



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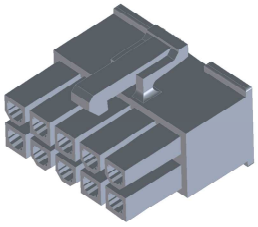
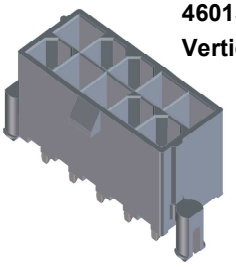
Receptacle Housing

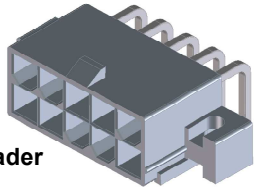


Crimp Terminals and Housing for Wire-Wire

46015
Vertical Header

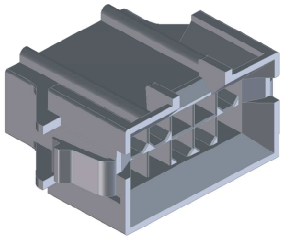


5569
Right Angle Header

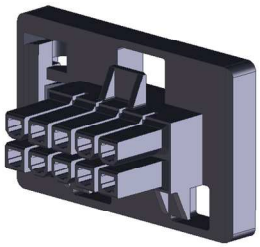


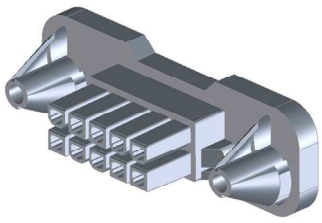
Headers for Wire-Board

42475
BMI Plug Housing



44516
BMI Slide and Lock Receptacle



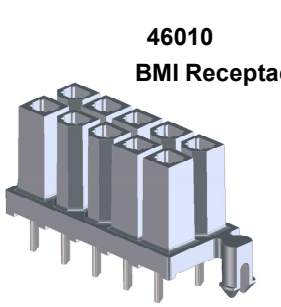


42474
BMI Receptacle w/ Spirals

BMI Style Panel Mount Housings for Wire-Panel, Panel-Panel and Panel-Board

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
C1	EC No: UCP2011-0141 DATE: 2010 /07/15	PRODUCT SPECIFICATION FOR MINI-FIT PLUS HCS CONNECTOR SYSTEM	1 of 13

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-45750-001	BWIRKUS	BWIRKUS	APATEL



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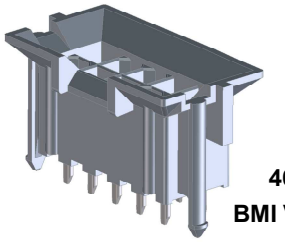
BMI Receptacle Header



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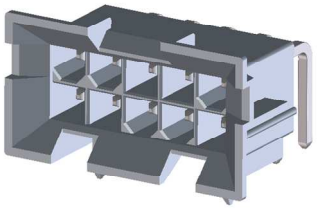
BMI Vertical Header



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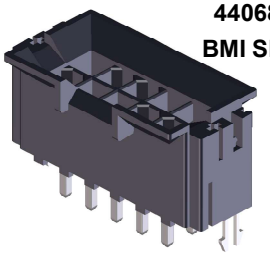
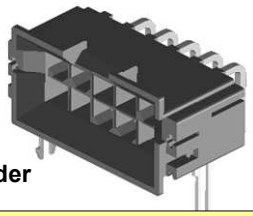
BMI Right Angle Header

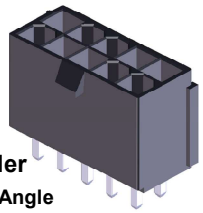
BMI Style Headers for Panel-Board or Board-Board



44068
BMI SMC Vertical Header



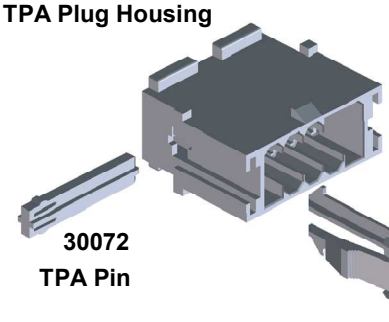
43810
BMI SMC Right Angle Header



87427
SMC Vertical Header
Also available in Right Angle

BMI Surface Mount Compatible Style Headers

30068
TPA Plug Housing



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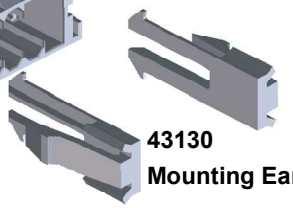
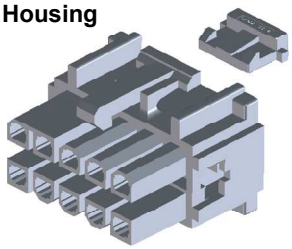
TPA Pin

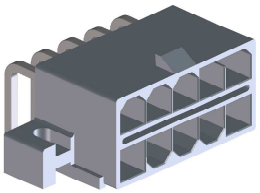


43130
Mounting Ears

30067
TPA Receptacle Housing

30070
CPA Key





30070
TPA Right Angle Header

TPA Series Header and Housings for use with Plus HCS Terminals

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.

MINI-FIT PLUS HCS

TABLE OF CONTENTS

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
CRIMP TERMINALS						
45750	Female Crimp Terminal	SD-46012-001				NA
46012	Male Crimp Terminal	SD-45750-001				NA
HOUSINGS						
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
VERTICAL HEADERS						
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
RIGHT ANGLE HEADERS						
5569	Right Angle Header	SD-5569-002				U,C,T
30070	Right Angle TPA Header with mounting flanges	SD-30070-001 SDA-30070-****	X			U,C,T
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-UL C-CSA T-TUV

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.

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.

6.0 PRODUCT PERFORMANCE TESTS & REQUIREMENTS

6.1 ELECTRICAL REQUIREMENTS

ITEM	TEST	TEST PROCEDURE	REQUIREMENT
1	**Contact Resistance (Low Level)**	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	**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**	EIA-364-20: Apply a voltage of 1500 VAC for 1 minute between adjacent contacts.	No breakdown. Current leakage < 5 mA
4	**Temperature Rise (via Current Cycling)**	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	**Terminal Mate / Unmate Forces Per Circuit for:** **Wire – Wire; Wire – Board (formed pin header); and Wire – Board (solid pin header)**	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.	**Tin, W-W & W-B (formed pin):** Mate: 15.6 N (3.50 lbf) MAX. Unmate: 13.8N (3.10 lbf) MAX.
			Gold, W-W & W-B (formed pin): Mate: 4.9 N (1.10 lbf) MAX. Unmate: 4.0 N (0.91 lbf) MAX.
			Tin, W-B (solid pin): Mate: 10.5 N (2.36 lbf) MAX. Unmate: 11.0N (2.47 lbf) MAX.
			Gold, W-B (solid pin): Mate: 3.4 N (0.77 lbf) MAX. Unmate: 2.8 N (0.63 lbf) MAX.

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 30th 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.

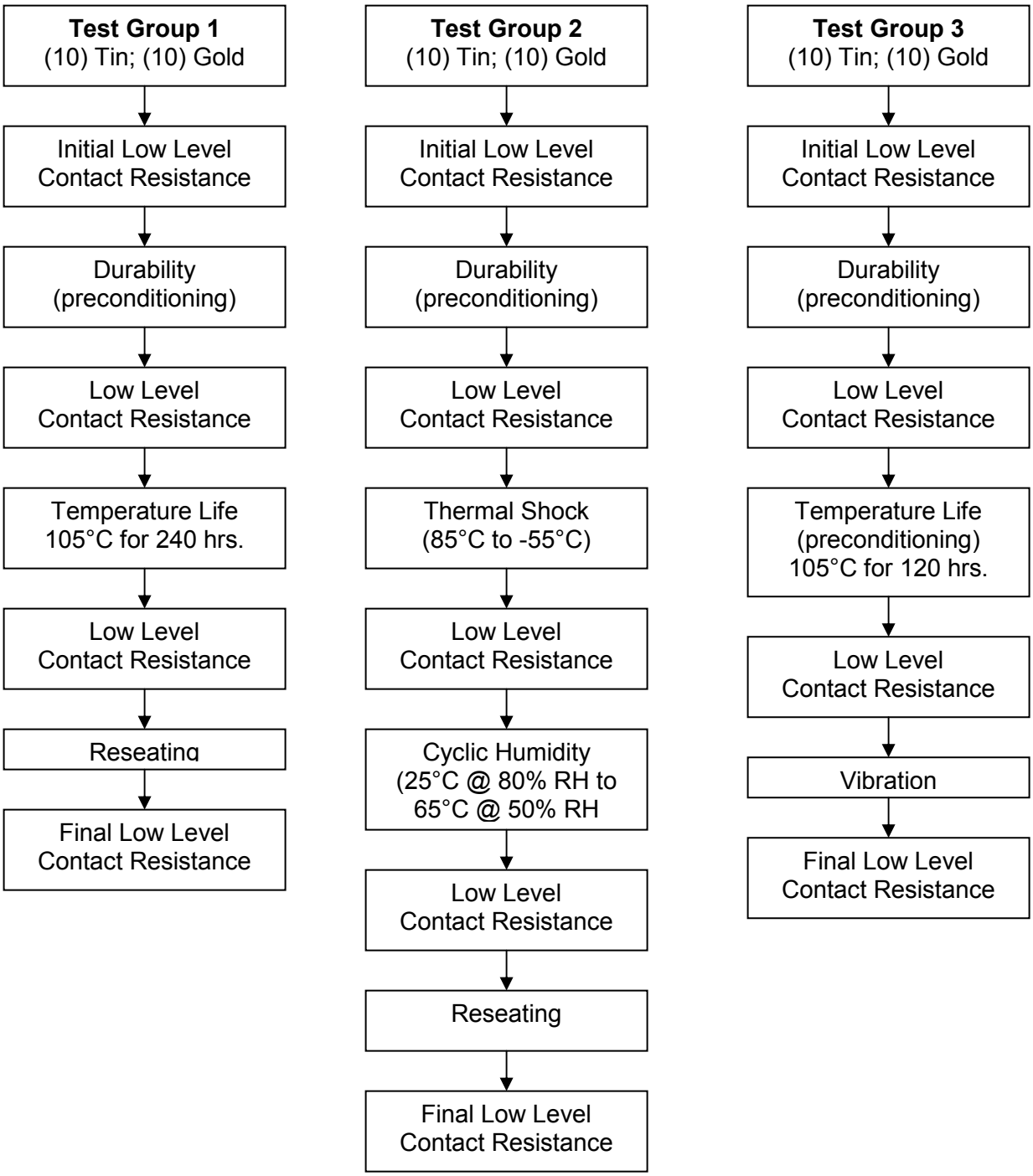
6.2 MECHANICAL REQUIREMENTS (CON'D)				
ITEM	**TEST**	**TEST PROCEDURE**	**REQUIREMENT**	
12	**Header Solid Pin Retention Force in Housing**	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	Tin	4.45 N (1.00 lbf) MINIMUM
			Gold	4.45 N (1.00 lbf) MINIMUM
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

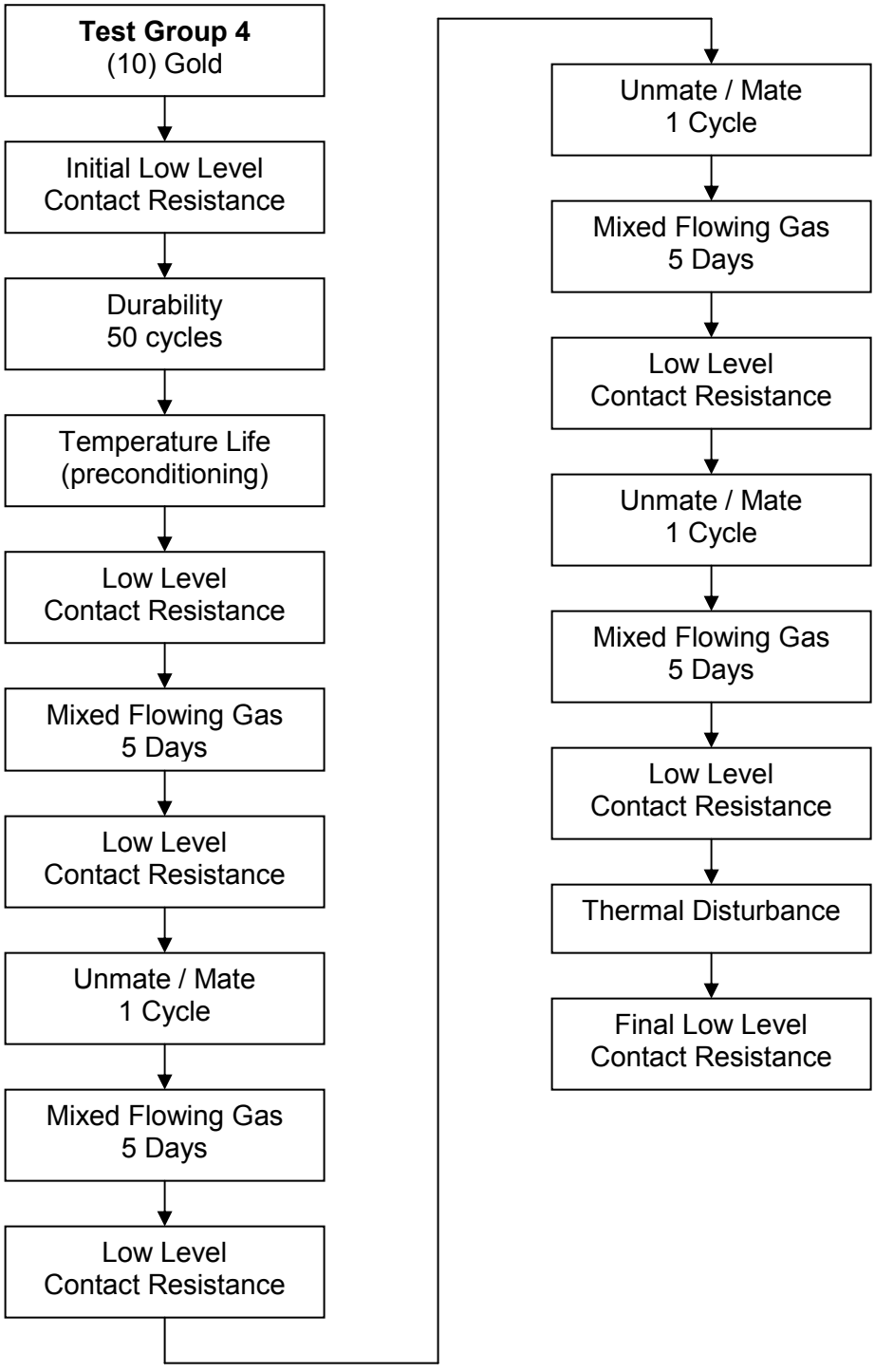
6.3 ENVIRONMENTAL REQUIREMENTS (CON'D)			
4	**Mixed Flowing Gas**	Per EIA-364-65 with Class IIA gas concentrations following Telcordia Specification GR1217.	10 mΩ Max. chg. from Initial; Visual: No Damage
5	**Thermal Cycling**	Per EIA-364-1000 Test Group 5: Cycle mated connector between 15°C±3°C and 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	**Solderability**	Per SMES-152	Solder coverage: 95% MINIMUM (per SMES-152)
7	**Solder Temperature Heat Transfer Resistance**	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.

7.0 TEST SEQUENCES

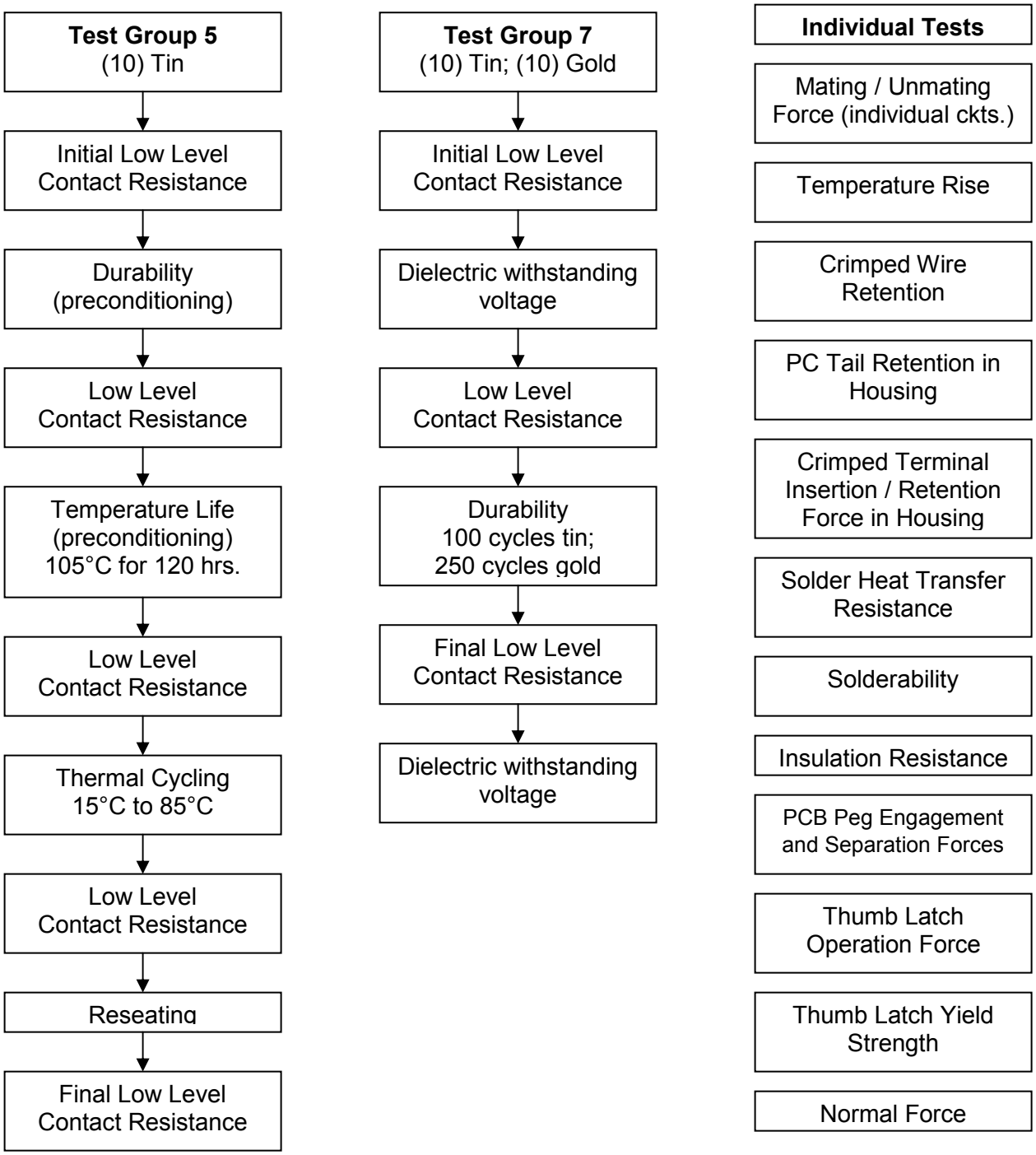
Environmental test sequences for Groups 1, 2, 3, 5 and 7 performed in accordance with EIA-364-1000. Sequence for Group 4 per Nortel Optical Networks specification test plan.



7.0 TEST SEQUENCES (CON'D)



7.0 TEST SEQUENCES (CON'D)



molex

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) 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)

Table 1 – WIRE-TO-WIRE

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

Table 2 – WIRE-TO-BOARD

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.

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

Maximum Insulation Diameter and Applicable Wire Gauges	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)**

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.
** 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 30º 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.

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

	Plating Type		
Header 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	**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 with latch disabled.	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 Based on mated pairs of 30µ" Au or 100µ" tin at the contact interface.	20 milliohms maximum (change from initial)
4	**Vibration (Random)**	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	**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) 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	**Crimp Terminal Insertion Force (into Housing)**	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

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 1st mate)	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 5.1.3 except 1500VAC test voltage Insulation Resistance per 5.1.2
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. 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	**Cold Resistance**	Mate connectors: Duration: 96 hours; Temperature: -40 ± 3°C	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
5	**Mixed Flowing Gas**	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
6	**Cyclic Temperature And Humidity**	Mate connectors: expose to 24 cycles from 25 ºC / 80% RH to 65 ºC / 50% RH ramp time: 0.5hr dwell time: 1hr Per EIA-364-1000.01	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

6.0 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 with latch disabled.	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 Based on mated pairs of 30µ" Au or 50µ" tin at the contact interface	20 milliohms maximum (change from initial)
4	**Vibration (Random)**	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

6.2 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
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) 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	**Crimp Terminal Insertion Force (into Housing)**	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	**Normal Force**	Apply a perpendicular force to contacts.	Sn	1.47 N (150 grams) MINIMUM
			Au	0.49 N (50 grams) MINIMUM
9	**PCB Engagement Forces**	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	**Solid PC Tail Header Pin Retention Force (in housing) (5569, 172448, 172648 Series)**	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	**Stamped PC Tail Terminal Retention Force (in housing) (5566, 172447, 172647 Series)**	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	**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	
13	**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 1st mate)	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 6.1.3 except 1500VAC test voltage Insulation Resistance per 6.1.2
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. 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	**Solderability Dip Test**	Per Molex Test Method: SMES-152	Solder area shall have minimum of 95% solder coverage
5	**Wave Solder Resistance**	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	**Cold Resistance**	Mate connectors: Duration; 96 hours; Temperature: -40 ± 3°C	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
7	**Mixed Flowing Gas**	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	**Cyclic Temperature and Humidity**	Mate connectors: expose to 24 cycles from 25 ºC / 80% RH to 65 ºC / 50% RH ramp time: 0.5hr dwell time: 1hr Per EIA-364-1000.01	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

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

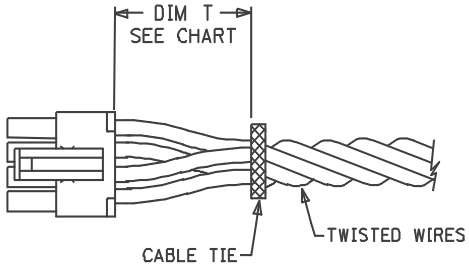
9.1 GAGES AND FIXTURES

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

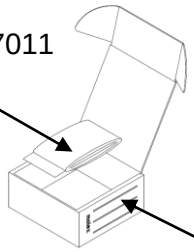
Circuit Sizes		Dim T Min.
Dual Row	Single Row	
2-6	2-3	.50” (12.7 mm)
8	4	.75” (19.1 mm)
10-12	5-6	1.00” (25.4 mm)
14-16	7-8	1.25” (31.75 mm)
18-20	9-10	1.50”(38.09 mm)
22-24	11-12	1.75” (44.45 mm)



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.

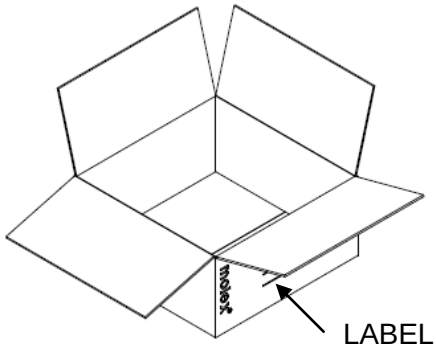
PACKAGING SPECIFICATION

ANTISTAT BAG:
PER ES-40000-7011



LABEL: PER
ES-40000-7012

OPTION A:
CARTON
96707-0012



LABEL: PER
ES-40000-7012

OPTION B:
CARTON 96708-0007
LOADED WITH 96707-0012

CKTS	PART DESCRIPTION		ENG. NO. SUFFIX (REF)	BAG MATERIAL NUMBER	QTY PER 96707-0012	BAGS PER 96707-0012	96707-0012 PER 96708-0007
	ROW	MOUNT					
02	DUAL	FLANGE	-02A1*	85091016 (70180-1423) or Equivalent	600	1	8
02	DUAL	PEG	-02A2*		1000	1	8
03	SINGLE	PEG	-03A4*		800	1	8
03	SINGLE	PEG	-03A5*		800	1	8
04	DUAL	FLANGE	-04A1*		400	1	8
04	DUAL	PEG	-04A2*		500	1	8
04	SINGLE	FLANGE	-04A3*		400	1	8
04	SINGLE	PEG	-04A4*		600	1	8
05	SINGLE	PEG	-05A4*		400	1	8
05	SINGLE	PEG	-05A5*		400	1	8
06	DUAL	FLANGE	-06A1*		250	1	8
06	DUAL	PEG	-06A2*		300	1	8

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
C	EC No: **109269** DATE: **2016/10/13**	**BULK PACKAGING SPECIFICATION FOR: 5569, 45558 & 172648 HEADER ASS'YS**	**1** of **2**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PK-5569-002	**GES**	**JBELL**	**FSMITH**

PACKAGING SPECIFICATION

CKTS	PART DESCRIPTION		ENG. NO. SUFFIX (REF)	BAG MATERIAL NUMBER	QTY PER 96707-0012	BAGS PER 96707-0012	96707-0012 PER 96708-0007
	ROW	MOUNT					
08	DUAL	FLANGE	-08A1*	85091016 (70180-1423) or Equivalent	225	1	8
08	DUAL	PEG	-08A2*		225	1	8
10	DUAL	FLANGE	10A1*		150	1	8
10	DUAL	PEG	10A2*		150	1	8
12	DUAL	FLANGE	12A1*		150	1	8
12	DUAL	PEG	12A2*		150	1	8
14	DUAL	FLANGE	14A1*		100	1	8
14	DUAL	PEG	14A2*		100	1	8
16	DUAL	FLANGE	16A1*		100	1	8
16	DUAL	PEG	16A2*		100	1	8
18	DUAL	FLANGE	18A1*		75	1	8
18	DUAL	PEG	18A2*		75	1	8
20	DUAL	FLANGE	20A1*		75	1	8
20	DUAL	PEG	20A2*		75	1	8
22	DUAL	FLANGE	22A1*		75	1	8
22	DUAL	PEG	22A2*		75	1	8
24	DUAL	FLANGE	24A1*		75	1	8
24	DUAL	PEG	24A2*		75	1	8

NOTES:

1. THIS PACKAGING SPECIFICATION IS ALSO FOR USE WITH PART NO. 455580003, 6 CIRCUIT DUAL ROW WITH PEGS.
2. THIS PACKAGING SPECIFICATION IS ALSO FOR USE WITH 172648 SERIES PART NUMBERS BASED ON CIRCUIT SIZE AND MOUNTING OPTION.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
C	EC No: **109269** DATE: **2016/10/13**	**BULK PACKAGING SPECIFICATION FOR: 5569, 45558 & 172648 HEADER ASS'YS**	**2** of **2**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PK-5569-002	**GES**	**JBELL**	**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.

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			

	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			

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 ckts) 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 ckts) 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)	- (-)	- (-)	- (-)

	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