

Molex 39-29-1027 PDF

深圳创唯电子有限公司











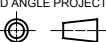
<http://www.molex-connect.com>

1. 5569-NA1, -NA1-210, -NA1-BLM, -NA1-REM 梱包仕様

1-1. 製品名称: NEW MINI FIT CONN. RIGHT ANGLE HEADER HS' G ASS' Y
 製品番号: 5569-NA1
 // -NA1-210
 // -NA1-BLM
 // -NA1-REM

1-2. 標準梱包数

種数	ポリ袋		[96707-0003]		[96708-0005]
	ポリ袋型番	<SPQ> 1袋中の製品数	ポリ袋の数	製品数	製品数 (内装カートン×4)
2	96713-0003	1,000	1	1,000	4,000
4	96713-0002	500	2	1,000	4,000
6	96713-0003	500	1	500	2,000
8	96713-0003	500	1	500	2,000
10	96713-0002	200	2	400	1,600
12	96713-0002	200	2	400	1,600
14	96713-0002	100	3	300	1,200
16	96713-0002	100	3	300	1,200
18	96713-0002	100	2	200	800
20	96713-0002	100	2	200	800
22	96713-0002	100	2	200	800
24	96713-0002	100	2	200	800

SYMBOLS  = 0  = 0  = 0  = 0  = 0  = 0  = 0  = 0  = 0	THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION DIMENSION UNITS: MM ONLY SCALE: 1:1		CURRENT REV DESC: MIGRATE TO ECTR EC NO: 172489 DRWN: AZAHIROVIC 2018/01/12 CHK'D: JBELL 2018/02/20 APPR: FSMITH 2018/02/22		 PACKAGING SPEC FOR MINIFIT JR 5569 R/A DUAL ROW SCREW MOUNT HDR											
	GENERAL TOLERANCES (UNLESS SPECIFIED) ANGULAR TOL ± 0.5°		INITIAL REVISION: DRWN: T.HARUYAMA 1998/02/17 APPR: FSMITH 2010/04/09						PACKAGING DESIGN DRAWING							
	4 PLACES ± 3 PLACES ± 2 PLACES ± 1 PLACE ± 0 PLACES ±		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		THIRD ANGLE PROJECTION 		DRAWING: A-SIZE		SERIES: 5569		MATERIAL NUMBER: SEE CHART		CUSTOMER: GENERAL MARKET		SHEET NUMBER: 1 OF 2	
	DOCUMENT STATUS: P1 RELEASE DATE: 2018/02/22 21:31:09		THIS DRAWING REPLACES DRAWING PK-5569-NA*		DOCUMENT NUMBER: 55690001-PK DOC TYPE: PDD DOC PART: 000 REVISION: A											

2. 5569-NAG1, -NAG1-210 梱包仕様 (金メッキ品)

2-1. 製品名称: NEW MINI FIT CONN. RIGHT ANGLE HEADER HS° G ASS° Y
 製品番号: 5569-NAG1
 // -NAG1-210

2-2. 標準梱包数

極数	ポリ袋		[96707-0003]		[96708-0005]
	ポリ袋型番	<SPQ> 1袋中の製品数	ポリ袋の数	製品数	製品数 (内装カートン×4)
2	96713-0002	500	2	1,000	4,000
4	96713-0001	100	10	1,000	4,000
6	96713-0002	100	5	500	2,000
8	96713-0002	100	5	500	2,000
10	96713-0002	100	4	400	1,600
12	96713-0002	100	4	400	1,600
14	96713-0002	100	3	300	1,200
16	96713-0002	100	3	300	1,200
18	96713-0002	100	2	200	800
20	96713-0002	100	2	200	800
22	96713-0002	100	2	200	800
24	96713-0002	100	2	200	800

SYMBOLS										THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION									
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▽ = 0		GENERAL TOLERANCES (UNLESS SPECIFIED)																	
▽ = 0		ANGULAR TOL ± 0.5°				INITIAL REVISION: DRWN: T.HARUYAMA 1998/02/17 APPR: FSMITH 2010/04/09													
▽ = 0		4 PLACES ±		3 PLACES ±															
▽ = 0		2 PLACES ±		1 PLACE ±		DOCUMENT NUMBER				DOC TYPE		DOC PART		REVISION					
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■ = 0						A-SIZE		5569		SEE CHART		GENERAL MARKET		2 OF 2					
▽ = 0																			

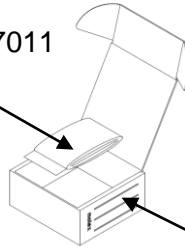
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DOCUMENT STATUS	P1	RELEASE DATE	2018/02/22	21:31:09
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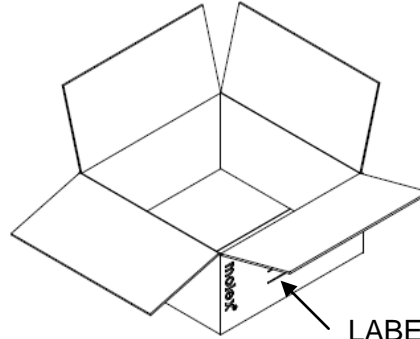
PACKAGING SPECIFICATION

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: C	ECR/ECN INFORMATION: EC No: 109269 DATE: 2016/10/13	TITLE: BULK PACKAGING SPECIFICATION FOR: 5569, 45558 & 172648 HEADER ASS'YS	SHEET No. 1 of 2
DOCUMENT NUMBER: PK-5569-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: 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: C	ECR/ECN INFORMATION: EC No: 109269 DATE: 2016/10/13	TITLE: BULK PACKAGING SPECIFICATION FOR: 5569, 45558 & 172648 HEADER ASS'YS	SHEET No. 2 of 2
DOCUMENT NUMBER: PK-5569-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



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

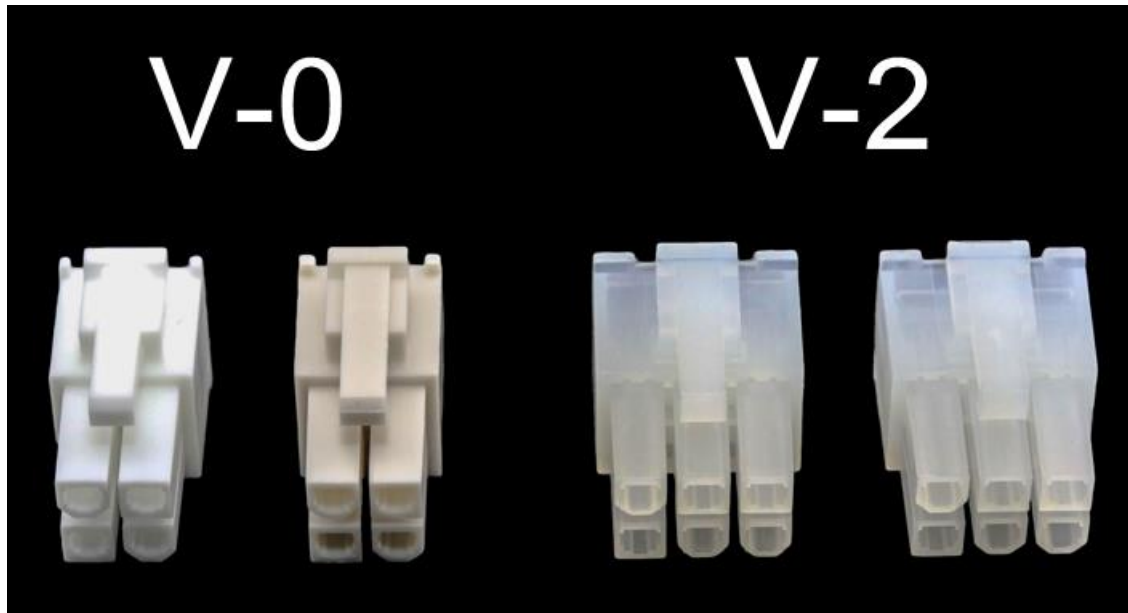
3.0 REFERENCE DOCUMENTS

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

MINI-FIT JR.

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E9	ER No: 600132 DATE: 2019/04/05	PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM	1 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-5556-001	AZAHIROVIC	DSTEIER	FSMITH

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.

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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 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.

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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	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

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PS-5556-001	AZAHIROVIC	DSTEIER	FSMITH

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

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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 st mate)	68 N (15.3 lbf) MINIMUM	

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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 $105 \pm 2^{\circ}\text{C}$	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
3	Humidity (Steady State)	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	Cold Resistance	Mate connectors: Duration: 96 hours; Temperature: $-40 \pm 3^{\circ}\text{C}$	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 (30 μ " 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 $25^{\circ}\text{C} / 80\% \text{RH}$ 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

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6.0 WIRE-TO-BOARD PERFORMANCE

6.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. Wire resistance shall be removed from the measured value.	10 milliohms MAXIMUM [initial]
2	Insulation Resistance	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	Dielectric Withstanding Voltage	Mate connectors: apply a voltage of 2200 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown. Current leakage < 5 mA
4	Temperature Rise (via Current Cycling)	Mate connectors. Measure the temperature rise at the rated current after 96 hours, during current cycling (45 minutes ON and 15 minutes OFF per hour) for 240 hours, and after final 96-hour steady state.	Temperature rise: +30°C MAXIMUM

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

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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 1 st mate)	68 N (15.3 lbf) MINIMUM

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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 °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

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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

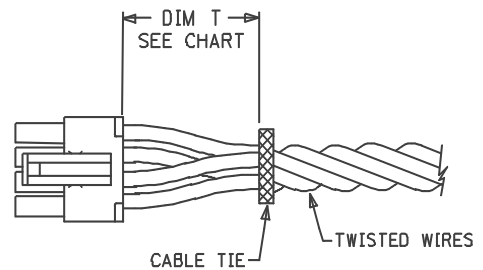
9.1 GAGES AND FIXTURES

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.

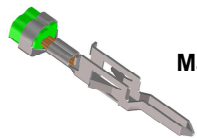
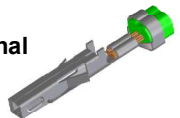
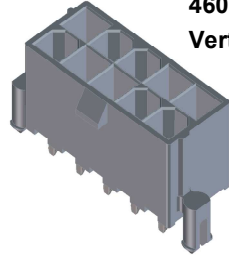
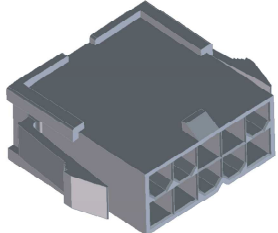
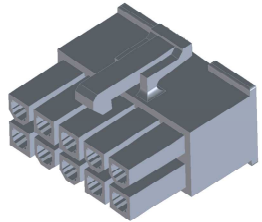
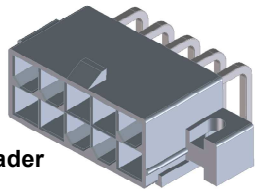
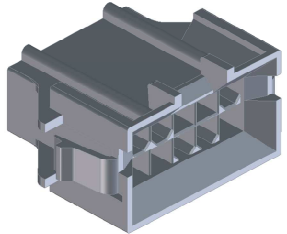
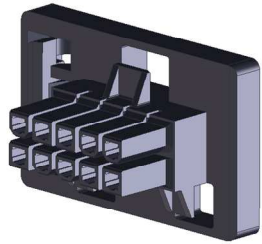
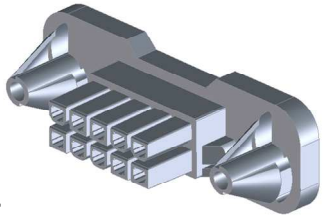
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PRODUCT SPECIFICATION

PRODUCT SPECIFICATION FOR Mini-Fit Plus HCS™

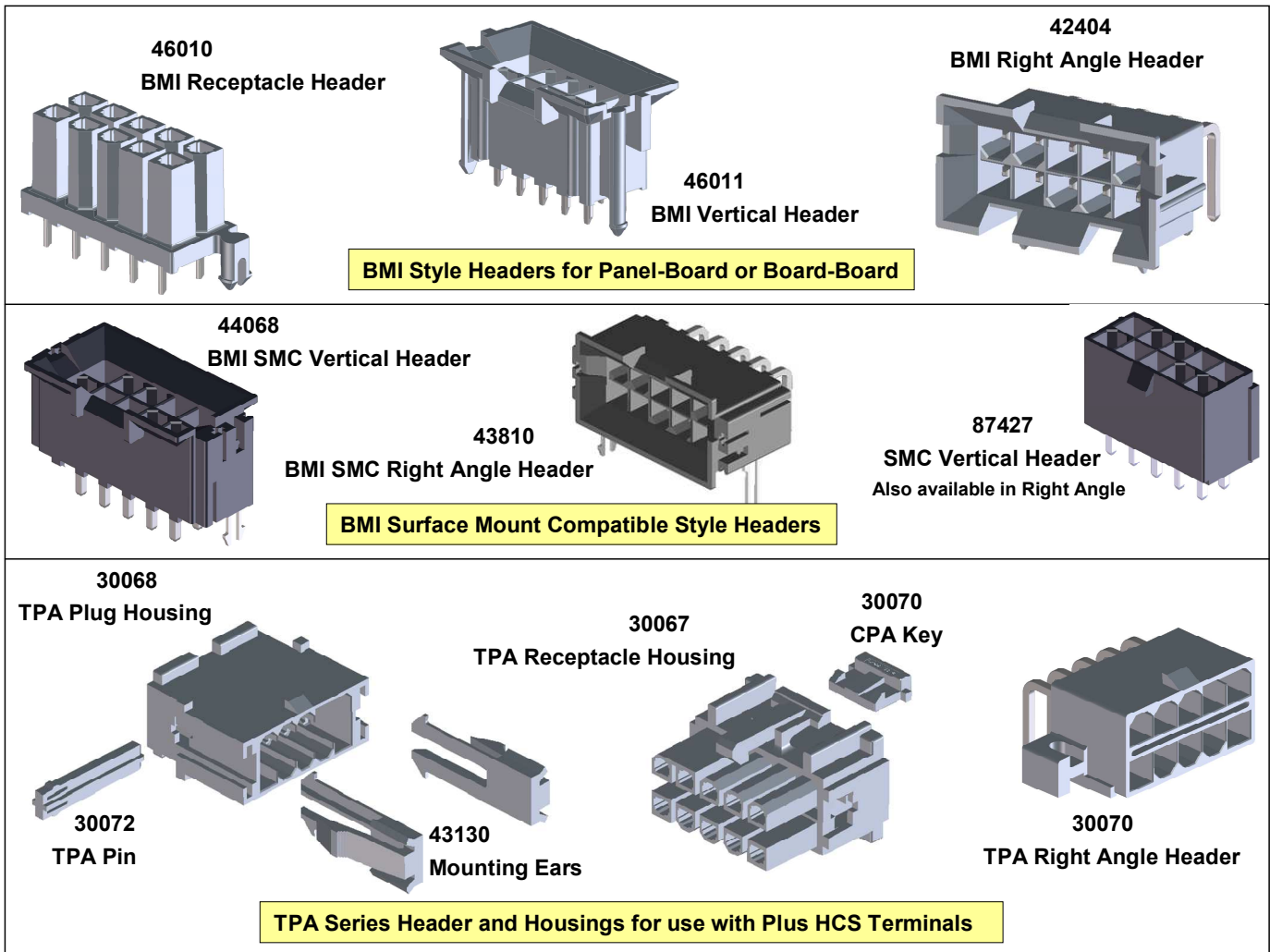
INTERCONNECT SYSTEMS

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

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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.

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PRODUCT SPECIFICATION

MINI-FIT PLUS HCS

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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
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	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-UJ C-CSA T-TUV

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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.

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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.

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PRODUCT SPECIFICATION

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.

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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 th 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.

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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

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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.

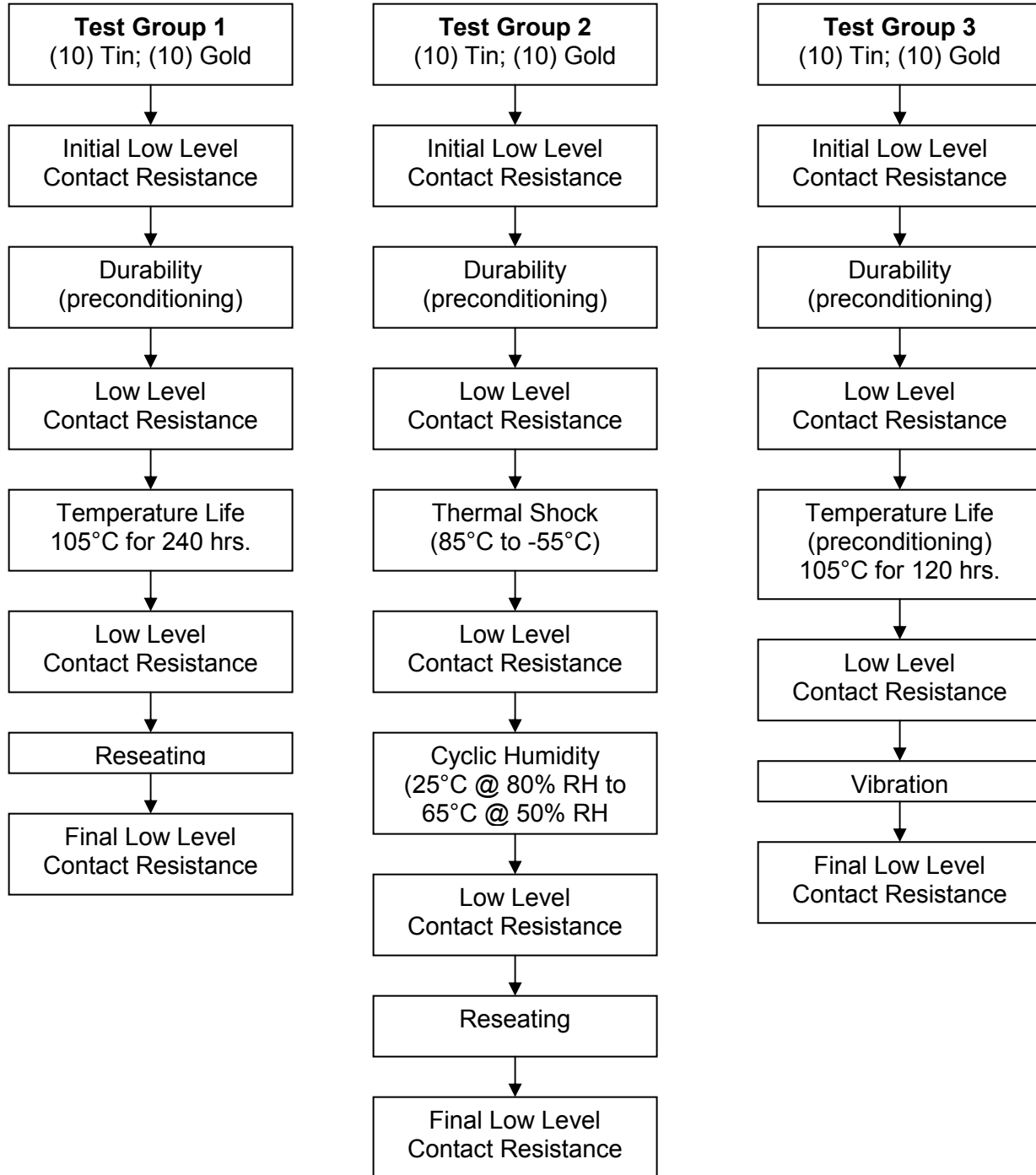
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7.0 TEST SEQUENCES

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.

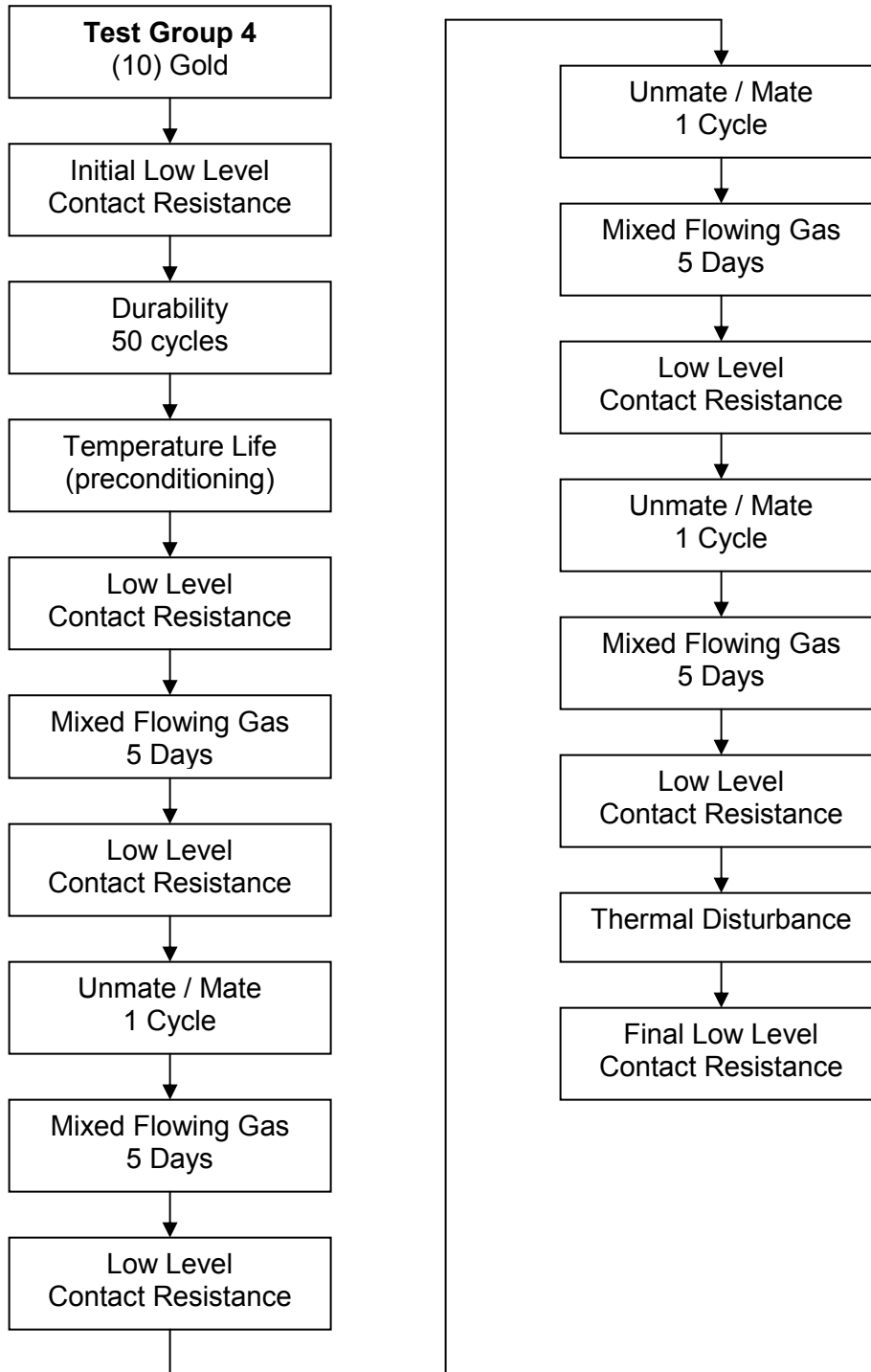


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7.0 TEST SEQUENCES (CON'D)

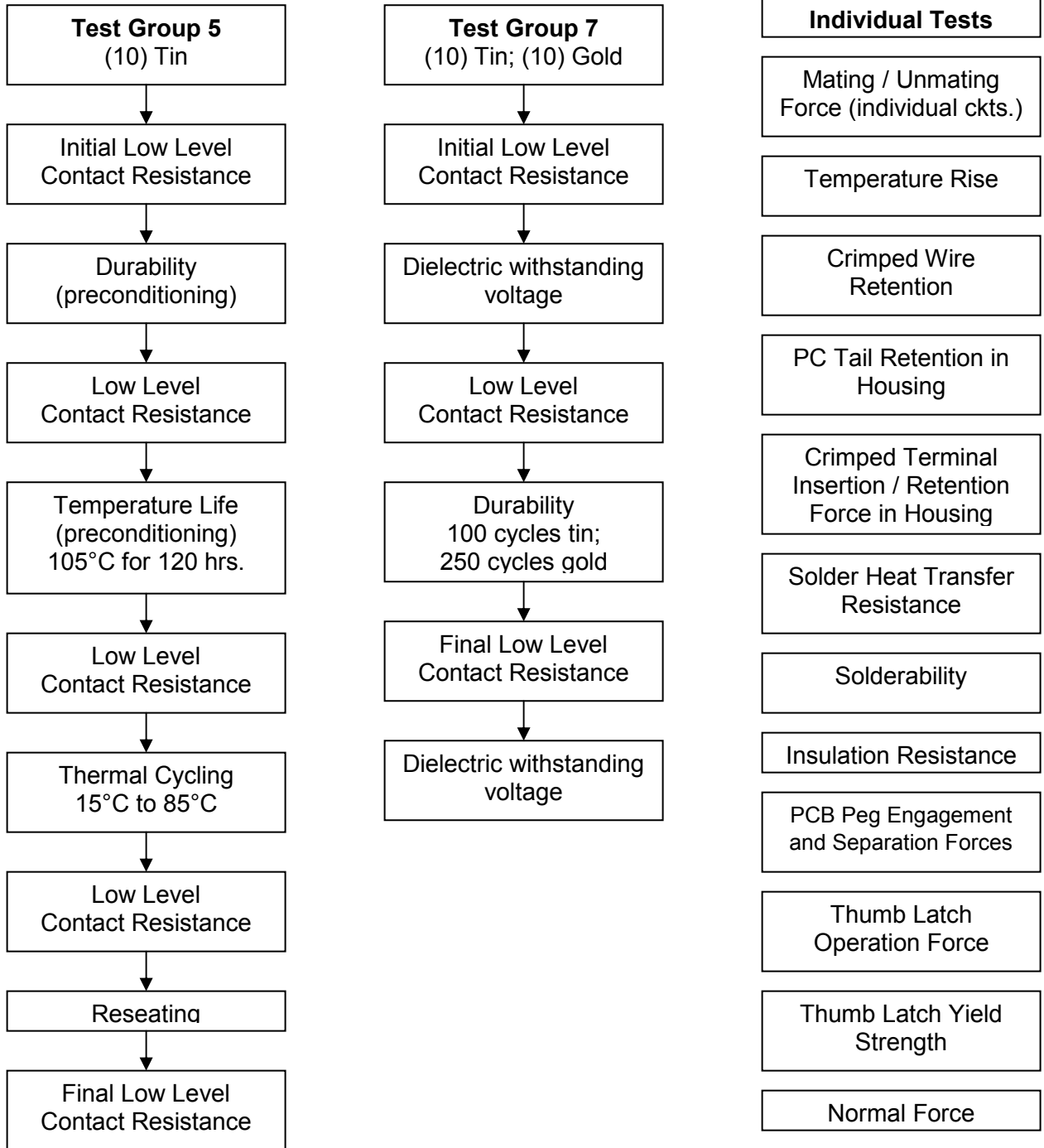


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7.0 TEST SEQUENCES (CON'D)



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