

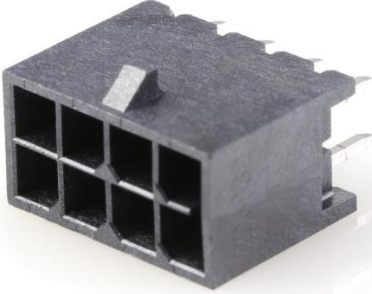
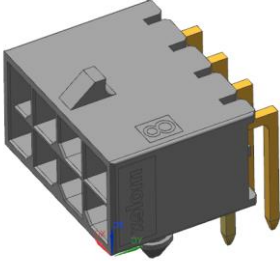


MICRO-FIT + SOLUTION

WIRE TO BOARD CONNECTOR SYSTEM

Female Crimp Terminal	Receptacle Housing
	
Series: 206460	Series: 206461

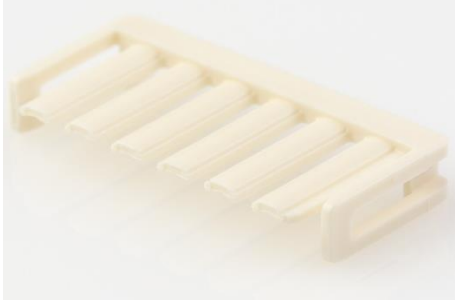
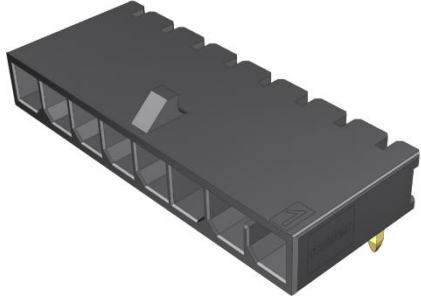
Vertical Header Assembly	Right Angle Header Assembly
	
Series: 206832	Series: 212528

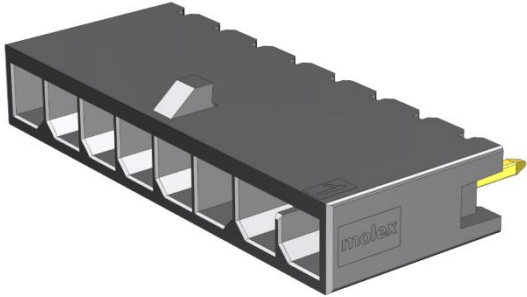
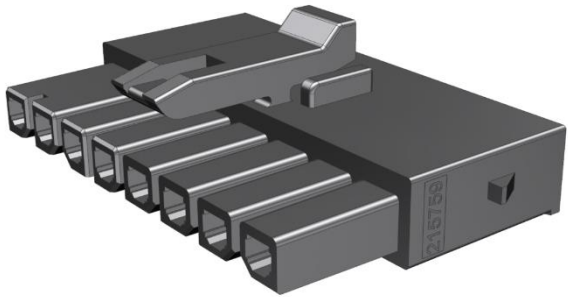
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DOCUMENT NUMBER: 206460000-PS		DOC TYPE: PS	DOC PART: 000	CREATED / REVISED BY: ZIXUAQ	CHECKED BY: NCSR	APPROVED BY: NCSR

TPA	Right Angle Header Single Row Assembly
	
Series: 206462	Series: 215760

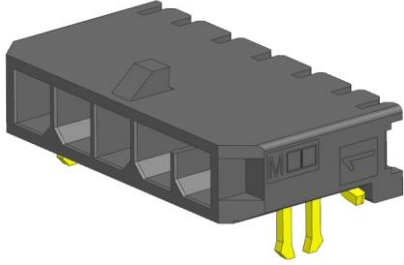
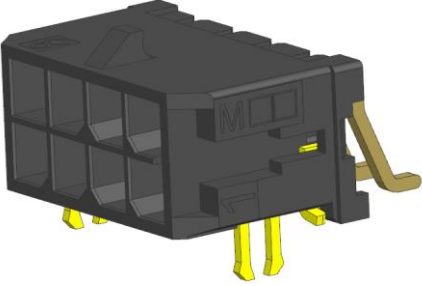
Vertical Header Single Row Assembly	Receptacle Single Row Housing
	
Series: 216571	Series: 215759

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Header Single Row Assembly	Header Single Row Assembly
	
Series: 218989	Series: 218216

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1.0 SCOPE

This Product SPEC covers the Micro-Fit Plus 3.00 mm (.118 inch) centerline (pitch) Wire to Board connector system with gold and tin plating. Receptacle are terminated with 16 to 30 AWG wire using crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

DESCRIPTION	SERIES NUMBER
Female Crimp Terminal	206460
Receptacle Housing, Dual Row	206461
TPA	206462
Vertical Header Assembly, Dual Row	206832
Right Angle Header Assembly, Dual Row	212528
Receptacle Housing, Single Row	215759
Vertical Header Assembly, Single Row	216571
Right Angle Header Assembly, Single Row	215760
Header Assembly, Single Row -Right Angle, Nail, SMT - Right Angle, Clip, SMT -Vertical, Nail, SMT -Vertical, Clip, SMT	218989
Header Assembly, Dual Row -Right Angle, Nail, SMT - Right Angle, Clip, SMT -Vertical, Nail, SMT -Vertical, Clip, SMT - Right Angle, Clip, Through Hole	218216

2.2 DIMENSIONS, MATERIALS, PLATINGS

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

2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:

- [Go to molex.com](#)
- Enter the part number in the search field.
- At the bottom of the page go to "Environmental" to see compliance status.

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

2.4 SAFETY AGENCY LISTINGS

UL File Number: E29179*

*Series 218216 and Series 218989 is in process.

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

[Micro-Fit Plus Connector System Test summary 2064600000-TS](#)

Micro-Fit Plus Connector System Application Summary 2064600000-AS

[Molex Quality Crimping Handbook Order No. 63800-0029](#)

[Molex Solderability Specification SMES-152](#)

[Molex Heat Resistance Specification AS-40000-5013](#)

[Molex Moisture Technical Advisory AS-45499-001](#)

[Molex Package Handling Specification 454990100-PK](#)

[Molex Micro-Fit Plus Connector System Test Summary SR 2157590005-TS](#)

ATS – Application Tooling Specification*

*Application Tooling Specification for terminals is not provided in this document. ATS for terminals can be available from respective terminal part number page in Molex.com

3.2 INDUSTRY DOCUMENTS

EIA-364-1000

UL-60950-1

UL-1977

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

600 Volts AC (RMS) or DC.

* This connector voltage meets the connector level provided by the safety agency. For application voltage requirements per UL-60950 or other standards, the creepage & clearance also needs to be determined based upon pads/traces on the PCB.

4.2 APPLICABLE WIRES

WIRE GAUGE	INSULATION DIAMETER
16 AWG	2.00mm (.079 inch) MAXIMUM
18 AWG	1.85 mm (.073 inch) MAXIMUM
20 AWG	1.85 mm (.073 inch) MAXIMUM
22 AWG	1.85 mm (.073 inch) MAXIMUM
24 AWG	1.85 mm (.073 inch) MAXIMUM
26 AWG	1.27 mm (.050 inch) MAXIMUM
28 AWG	1.27 mm (.050 inch) MAXIMUM
30 AWG	1.27 mm (.050 inch) MAXIMUM

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

4.3 CURRENT RATINGS

Dual Row Wire to Board Current Rating (Amp Max.) <i>As tested with tinned copper wire and Tin plated terminals</i>												
Connector fully loaded with all circuits powered												
AWG Wire Size	Circuit Size (Dual Row)											
	2	4	6	8	10	12	14	16	18	20	22	24
16	12.50	11.60*	10.60*	10.10*	9.50*	9.00	8.6*	8.30*	8.10*	8.00*	8.00*	8.00
18	10.30*	9.30*	8.50*	7.70*	7.00*	6.50*	6.10*	5.70*	5.50*	5.40*	5.40*	5.50*
20	8.50	7.30*	6.20*	5.30*	4.60*	4.00	4.00*	4.00*	3.75*	3.75*	3.75*	3.75*
22	7.50*	6.60*	5.80*	5.10*	4.50*	4.00*	3.60*	3.60*	3.25*	3.25*	3.25	3.25*
24	6.50	5.80*	5.20*	4.60*	4.10*	3.75*	3.40*	3.20*	3.00*	3.00*	3.00*	3.00
26	5.50	4.90*	4.30*	3.80*	3.40*	3.00	2.70*	2.50*	2.30*	2.25*	2.25*	2.25
28	5.00*	4.50*	4.10*	3.70*	3.30*	3.00*	2.70*	2.50*	2.30*	2.20*	2.10*	2.00*
30	3.75	3.60*	3.50*	3.40*	3.20*	3.00*	2.70*	2.50*	2.30*	2.20*	2.10*	2.00

Dual Row Wire to Board Current Rating (Amp Max.) <i>(As tested with tinned copper wire and gold plated terminals)</i>												
Connector fully loaded with all circuits powered												
AWG Wire Size	Circuit Size (Dual Row)											
	2	4	6	8	10	12	14	16	18	20	22	24
16	12.00	11.00*	10.00*	9.50*	9.00*	8.50	8.30*	8.20*	8.10*	8.00*	8.00*	TBD
18	10.50*	9.50*	8.50*	8.00*	7.50*	7.00*	6.50*	6.30*	6.10*	6.00*	6.00*	6.00*
20	9.50	8.50*	8.00*	7.50*	7.00*	6.50*	6.00*	5.50*	5.10*	5.00*	5.00*	TBD
22	8.00*	7.50*	7.00*	6.50*	5.80*	5.00*	4.50*	3.80*	3.60*	3.50*	3.50*	3.50*
24	6.50*	6.00*	5.50*	5.00*	4.50*	4.00*	3.80*	3.20*	3.00*	3.00*	3.00*	3.00*
26	6.00	5.50*	5.00*	4.50*	4.30*	4.00	3.50*	3.20*	3.00*	2.50*	2.50*	TBD
28	5.00*	4.50*	4.10*	3.70*	3.50*	3.30*	3.00*	2.80*	2.50*	2.00*	2.00*	2.00*
30	4.00*	3.80*	3.60*	3.40*	3.20*	3.00*	2.70*	2.50*	2.30*	2.00*	2.00*	2.00*

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		CHECKED BY: NCSR	APPROVED BY: NCSR

Single Row Wire to Board Current Rating (Amp Max.) <i>As tested with tinned copper wire and Tin plated terminals</i>							
Connector fully loaded with all circuits powered							
AWG Wire Size	Circuit Size (Single Row)						
	2	3	4	5	6	7	8
16	13.00	12.60*	12.10*	11.60*	11.20*	10.80*	10.50
18	11.00*	10.50*	10.00*	10.50*	9.10*	8.70*	8.30*
20	9.80	9.20*	8.60*	8.30*	8.00*	7.70*	7.50
22	8.60*	8.10*	7.60*	7.20*	6.80*	6.40*	6.10*
24	7.60*	7.20*	6.80*	6.50*	6.20*	5.90*	5.60*
26	6.60	6.30*	6.10*	5.90*	5.70*	5.30*	5.00
28	6.00*	5.70*	5.50*	5.30*	5.10*	4.70*	4.50*
30	4.75*	4.65*	4.60*	4.55*	4.50*	4.45*	4.40*

Single Row Wire to Board Current Rating (Amp Max.) <i>(As tested with tinned copper wire and gold plated terminals)</i>							
Connector fully loaded with all circuits powered							
AWG Wire Size	Circuit Size (Single Row)						
	2	3	4	5	6	7	8
16	12.50	12.10*	11.70*	11.40*	11.00*	10.60*	10.30
18	11.00*	10.50*	10.00*	9.50*	9.10*	8.60*	8.30*
20	9.80	9.20*	8.80*	8.40*	8.10*	7.80*	7.50
22	8.60*	7.00*	7.50*	7.20*	7.00*	6.70*	6.50*
24	7.60*	7.10*	6.70*	6.40*	6.10*	5.90*	5.80*
26	6.60	6.20*	5.90*	5.70*	5.60*	5.40*	5.30
28	6.00*	6.70*	5.50*	5.20*	5.00*	4.80*	4.70*
30	4.80*	4.75*	4.70*	4.65*	4.60*	4.55*	4.50*

*Interpolated Values

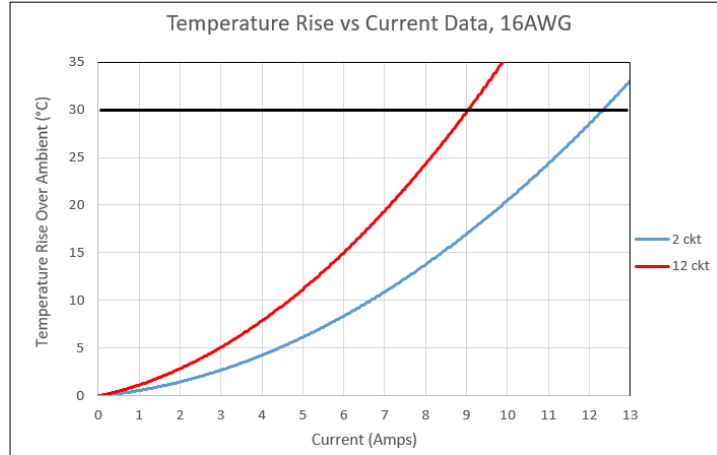
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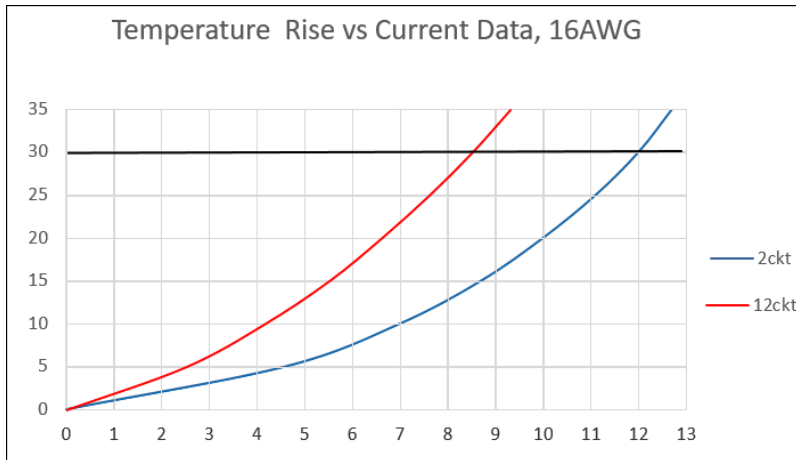


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	CHECKED BY: NCSR	APPROVED BY: NCSR	

Tin Plated Terminals Temperature Rise vs. Current per EIA-364-70
Tested with UL1061 Tinned Wire – Dual Row .



Gold plated terminals Temperature Rise vs. Current per EIA-364-70
Tested with UL1061 Tinned Wire -- Dual Row .



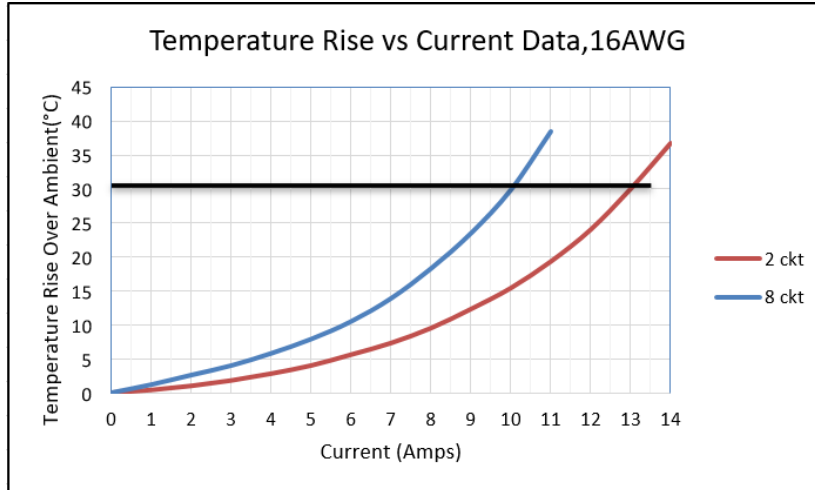
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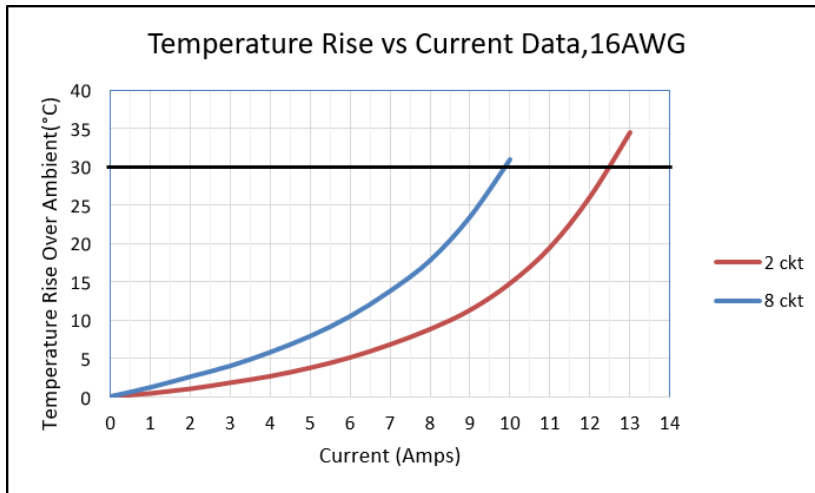


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	CHECKED BY: NCSR	APPROVED BY: NCSR	

Tin Plated Terminals Temperature Rise vs. Current per EIA-364-70
Tested with UL1061 Tinned Wire – Single Row .



Gold plated terminals Temperature Rise vs. Current per EIA-364-70
Tested with UL1061 Tinned Wire -- Single Row .



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

The ratings listed in the chart below are 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

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

size, insulation thickness, stranding, tin coated or bare copper, wire length & crimp quality are other factors that influence current rating.

4.4 TEMPERATURE

Operating Temperature Range* (includes T-Rise from applied current): - 40°C to + 105°C

Field Temperature and Field Life: 65° C for 10 years (based on EIA-364-1000, table 8)

Note: Temperature life test duration (section 6.3 item 1) is based on the assumption that the contact spends its entire life at the rated field maximum temperature (based on EIA-364-1000, table 8)

4.5 DURABILITY

Plating Type	Number of Cycles
Tin Plated	25
Gold Plated	200

As tested in accordance with EIA-364-1000 test method (see section 6.2 item 5 of this specification). Durability per EIA-364-09

4.6 GLOW WIRE SERIES

206461
206462
206832
212528
215760
216571
215759

5.0 QUALIFICATION

Laboratory condition, sample selection and test sequences are in accordance with EIA-364-1000.

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Initial Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. EIA-364-23.	Maximum (Initial): Tin: 10 mΩ Gold: 6 mΩ
6.1.2	Contact Resistance of Wire Termination (Low Level)	Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100 mA. EIA-364-23	Maximum (Initial): Tin: 5 mΩ Gold: 5 mΩ
6.1.3	Insulation Resistance	Unmate & unmount connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground. EIA-364-21	1,000 MΩ minimum
6.1.4	Dielectric Withstanding Voltage	Unmate connectors: apply a voltage of 2200 VAC for 1 minute between adjacent terminals and between terminals to ground. EIA-364-20	No breakdown Current leakage < 5 mA
6.1.5	Temperature Rise (Current Profiling)	Mate connectors, measure T- Rise @ Rated Current Per EIA-364-70, Method 2	Temperature rise: 30°C maximum (see chart) PASS
6.1.6	Temperature Rise (Via Current Cycling)	Mate connectors: measure the temperature rise at the rated current after: 96 hours (steady state) 240 hours (45 minutes ON and 15 minutes OFF per hour) 96 hours (steady state) Steady state per EIA-364-70, Method 2. Current cycling per EIA-364-55, Test Condition A, Test Method 4	Temperature rise: +30°C MAXIMUM [Over ambient]

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Connector Mate and Un-mate Forces [Initial cycle] Latch disabled	Mate and un-mate connector (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. EIA-364-13E, Method A	Tin: 7.0 N (1.57 lbf) MAXIMUM mate force per circuit & 1.4 N (0.31 lbf) MINIMUM un-mate force per circuit; Gold: 1.0 N (0.45 lbf) MAXIMUM mate force per circuit & 0.2 N (0.16 lbf) MINIMUM un-mate force per circuit.
6.2.2	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. EIA-364-29C, Method C	24.5 N (5.5 lbf) MINIMUM retention force
6.2.3	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 EIA-364-05	14.7 N (3.3 lbf) MAXIMUM insertion force
6.2.4	Housing Locking Mechanism Strength	Exert an axial force at a rate of 13 mm per minute (0.5 inch per minute) to separate the housing halves EIA-364-98	58 N MIN.
6.2.5	Durability	Mate connectors up to 25 cycles at a maximum rate of 10 cycles per minute Per EIA-364-09	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial)
6.2.6	Vibration (Random) Shock (Mechanical) EIA-364-1000 Test Group 3 (See section 7.0)	Mate connectors and vibrate per EIA 364-28, test condition VII, Letter D. Test Duration: 15 minutes each axis. Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±X, ±Y, ±Z axes (18 shocks total). EIA-364-27, Test Condition H	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

6.2 MECHANICAL PERFORMANCE (CONT.)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.2.7	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch). Per EIA-364-08	Wire Size	Min. pullout force
			16 AWG	89 N (20.0 lbf)
			18 AWG	89 N (20.0 lbf)
			20 AWG	57.8 N (13.0 lbf)
			22 AWG	35.6 N (8.0 lbf)
			24 AWG	22.2 N (5.0 lbf)
			26 AWG	13.3 N (3.0 lbf)
			28 AWG	8.9 N (2.0 lbf)
30 AWG	6.6 N (1.5 lbf)			
6.2.8	Header Pin Retention Force (From Header Housing)	Apply an axial pullout force to pin at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch).	13.7 N (3.1 lbf) MINIMUM retention force	
6.2.9	Header Retention Force (From PCB)	Apply an axial pullout force to Header at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch).	20.0 N (4.49 lbf) per circuit MINIMUM	

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	CHECKED BY: NCSR	APPROVED BY: NCSR	

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Temperature life EIA-364-1000 Test group 1 (See section 7.0)	Mate connectors; expose to : 240 hours at 105 ± 2 °C. Per EIA-364-17, Method A	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.2	Shock (Thermal) EIA-364-1000 Test group 2A & 2B (See section 7.0)	Mate connectors; expose to 5 cycles of: <u>Temperature °C</u> <u>Duration(Minutes)</u> -4 + 0/-3 30 +25 ± 10 5 MAXIMUM +105 + 3/-0 30 +25 ± 10 5 MAXIMUM EIA-364-32, Test Condition VIII	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.3	Cyclic Temperature & Humidity EIA-364-1000 Test group 2A & 2B (See section 7.0)	Mate connectors: cycle per EIA-364-31: 24 cycles at temperature 25 ± 3 °C at 80 ± 5% relative humidity and 65 ± 3 °C at 50 ± 5% relative humidity; dwell time of 1.0 hour; ramp time of 0.5 hours.	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at 500 VAC & Insulation Resistance: 1000 Megohms MINIMUM & Visual: No Damage
6.3.4	Thermal Cycling EIA-364-1000 Test group 5 (See section 7.0)	Cycle the connector between 15 ± 3 °C and 85 ± 3 °C. Ramps time :14minutes Dwell time:15 minutes, and dwell times should ensure contacts reach the temperature extremes. Humidity is not controlled. 500 cycles.	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.5	Salt Spray	Mate connectors: Duration: 48 hours exposure; Atmosphere: salt spray from a 5% solution; Temperature: 35 +1/-2 °C	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.6	Cold Resistance	Mate connectors: Duration: 96 hours; Temperature: -40 ± 3 °C	Tin: 20 milliohms MAXIMUM Gold: 10 milliohms MAXIMUM (change from initial) & Visual: No Damage

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6.3 ENVIRONMENTAL PERFORMANCE (CONT.)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.7	Solderability	Per SMES-152	Solder coverage: 95% MINIMUM (per SMES-152)
6.3.8	Solder Resistance	A) Wave Solder Process Dip connector terminal tails in solder; Solder Duration: 10 seconds MAX Solder Temperature: 260°C MAX Per AS-40000-5013 B) Convection Reflow Solder Process 260°C MAX Per AS-40000-5013	Visual: No Damage to insulator material

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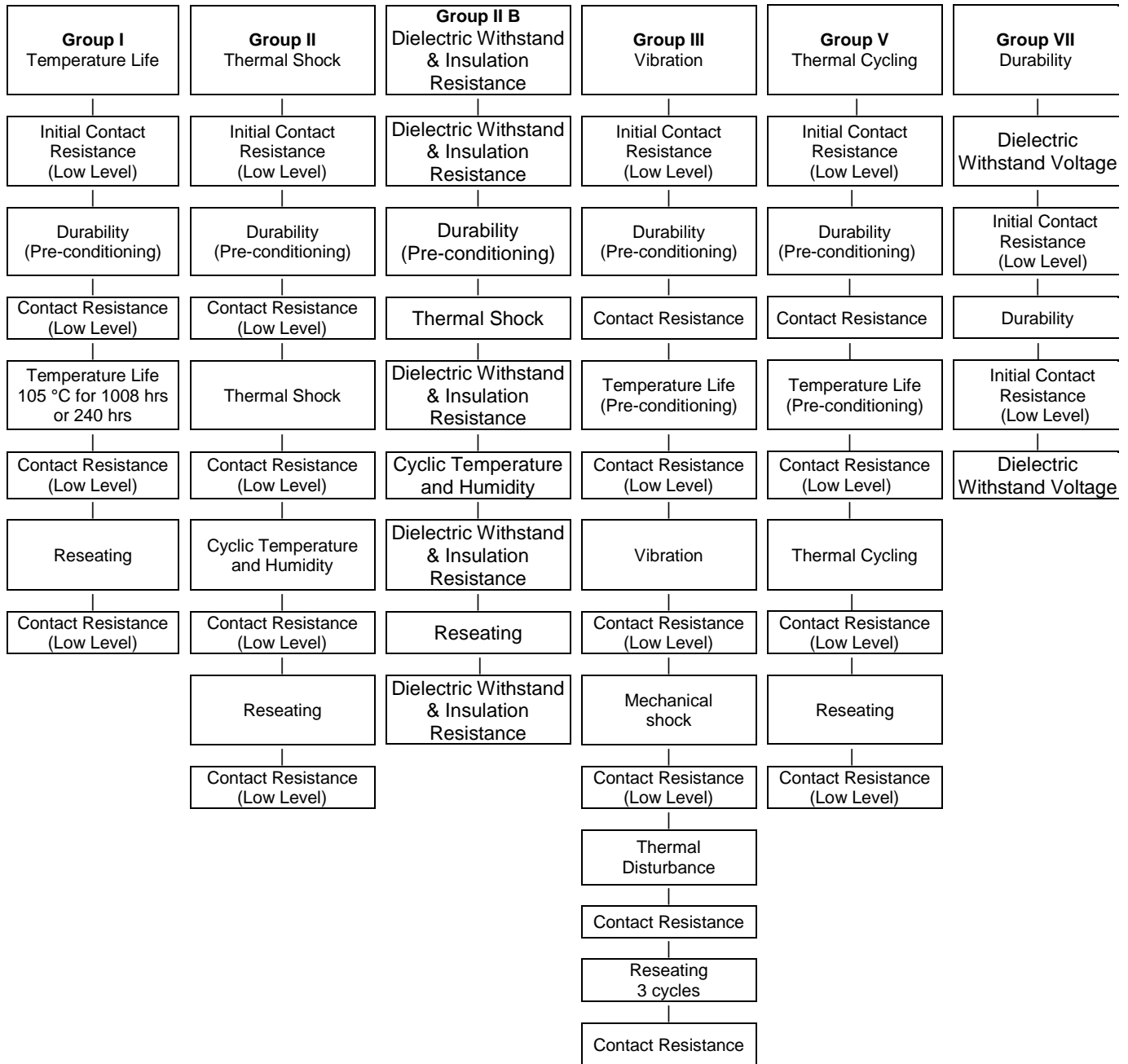
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7.0 TEST SEQUENCE

Reliability Test Sequences Per EIA-364-1000



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Individual Tests

Connector Mate and Un-mate Forces

Crimp Terminal Insertion Force

Crimp Terminal Retention Force

Housing Locking Mechanism Strength

Wire Crimp Pullout Force

Header Pin Retention Force

Temperature Rise

T-Rise Profiling

Steady State Temperature Rise

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8.0 SOLDER INFORMATION

Per SMES-152 and AS-40000-5013

*These specifications establish standard solderability test methods used to evaluate a products ability to accept molten solder. Solder Process Temperatures and Reflow Solder Profiles will vary based on application, equipment, solder paste, PCB thickness, etc.

8.1 SOLDER PROCESS TEMPERATURES *

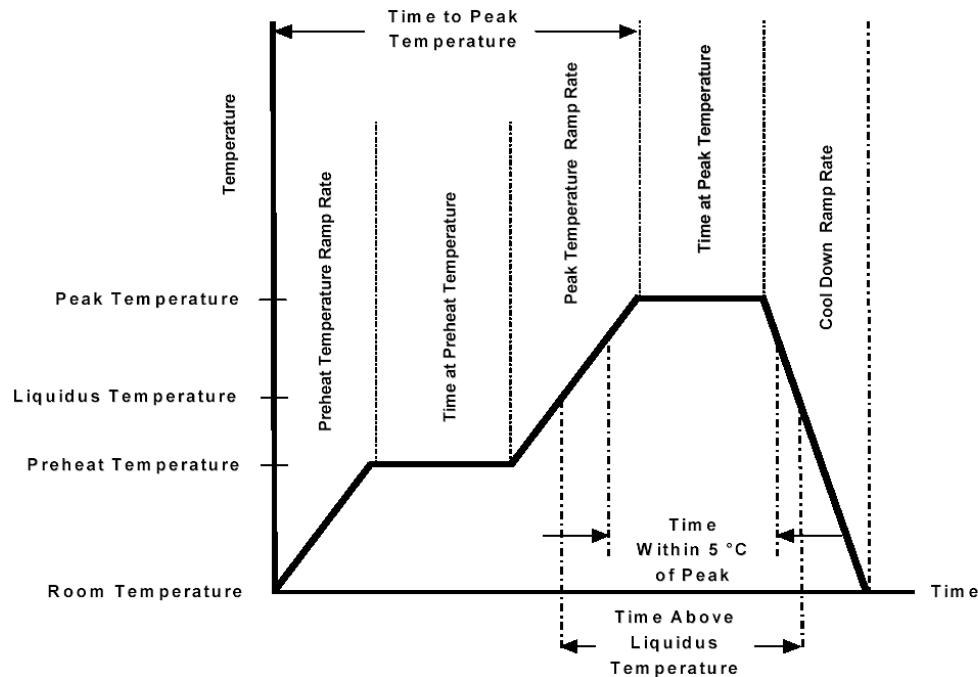
Wave Solder Temperature: 260°C Maximum
 Reflow Solder Temperature: 260°C Maximum

[Molex Solderability Specification SMES-152 \(Click Here\)](#)

8.2 SOLDERING PROFILE

(This profile is per JEDEC J-STD-020D.1 and it is for guideline only; please see notes for additional information)

[Molex Connector Heat Resistance Specification AS-40000-5013 \(Click Here\)](#)



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Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquids (217°C)	60 to 150 sec
Peak Temperature	260 +/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max

9.0 PACKAGING

Parts shall be packaging to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item.

[Micro-Fit + Connector System Web Page](#)

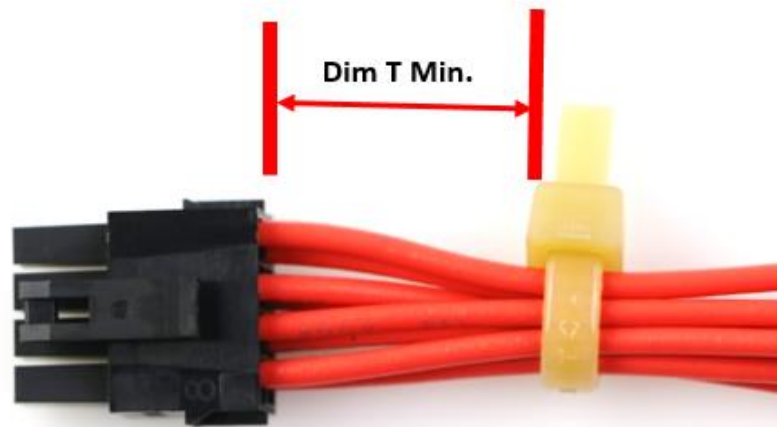
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10.0 CABLE TIE AND / OR TWIST TIE LOCATION

CKT Size			Dim T Min.
2	4	6	0.50" (12.7mm)
8			0.75" (19.1mm)
10	12		1.00" (25.40mm)
14	16		1.25" (31.75mm)
18	20		1.50" (38.09mm)
22	24		1.75" (44.45mm)



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

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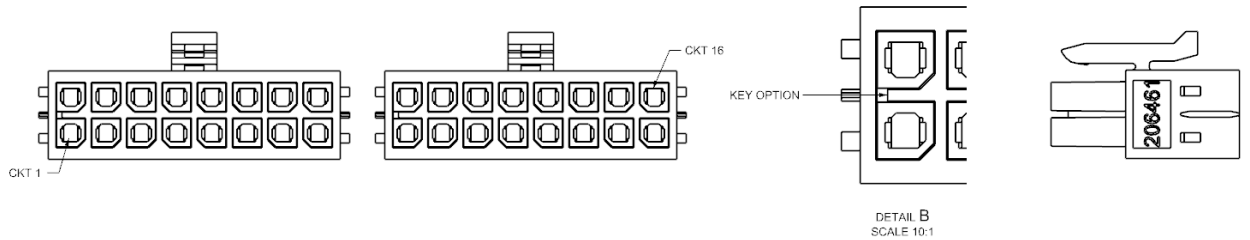
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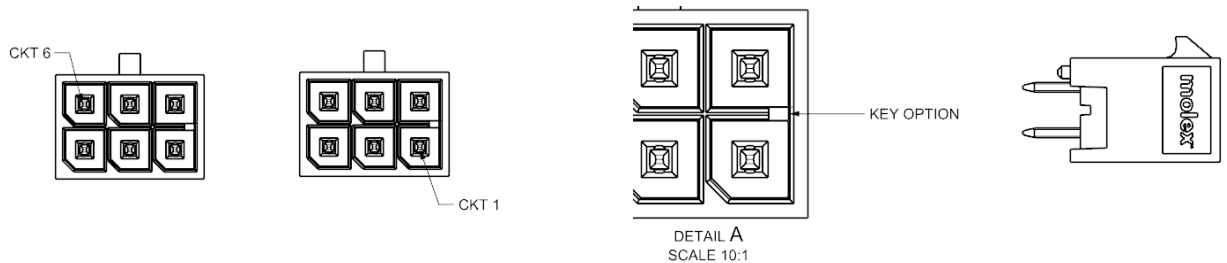
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11.0 POLARIZATION AND KEYING OPTIONS

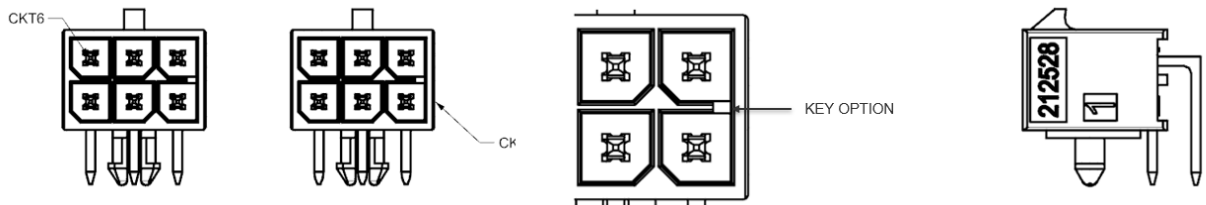
11.1 Dual Row Receptacle (Series: [206461](#))



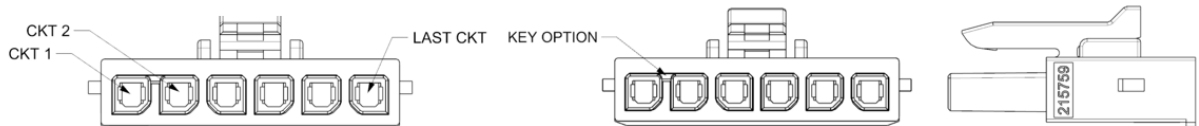
11.2 Vertical Header Assembly (Series: [206832](#))



11.3 Right Angle Header Assembly (Series: [212528](#))



11.4 Single Row Receptacle (Series: [215759](#))



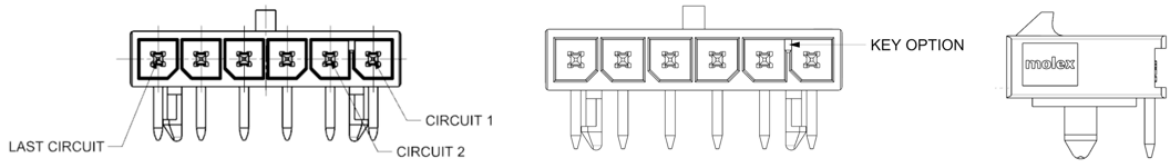
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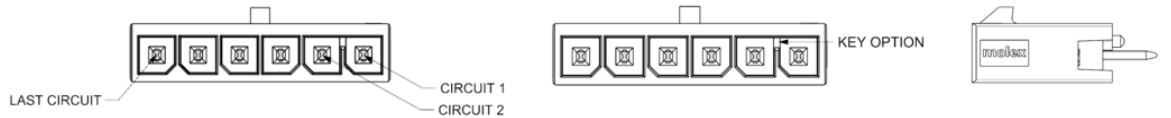


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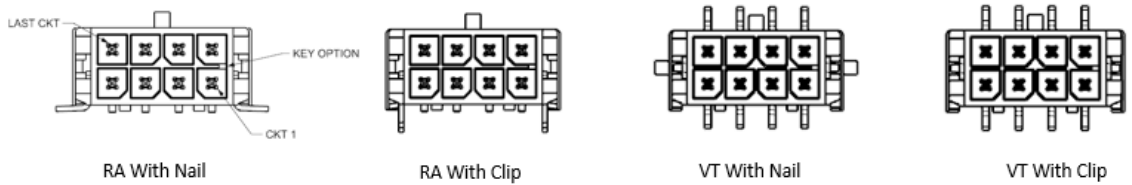
11.5 Right Angle Header Assembly (Series:215760)



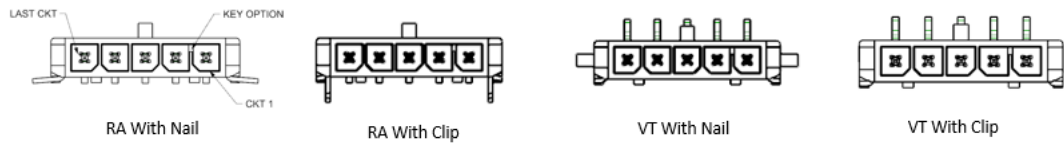
11.6 Right Angle Header Assembly (Series:216571)



11.7 SMT Dual Row Right Angle and Vertical Header Assembly (Series:218216)



11.8 SMT Signal Row Right Angle and Vertical Header Assembly (Series:218989)



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