molex

PRODUCT SPECIFICATION

MICRO-FIT

LOW MATE FORCE SERIES (46235)

Female Crimp Terminal

Series: 46235

Male Crimp Terminal

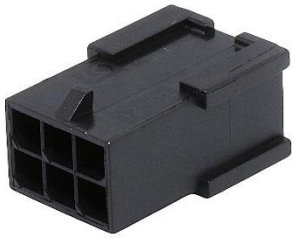
Series: 43031

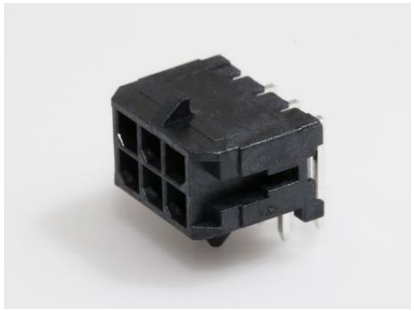
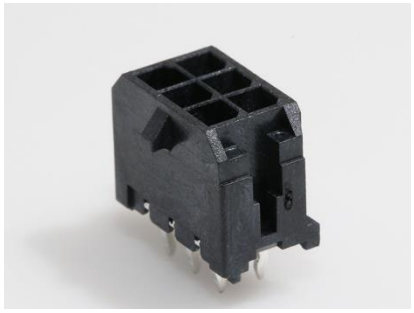
MICRO-FIT WEB LINK

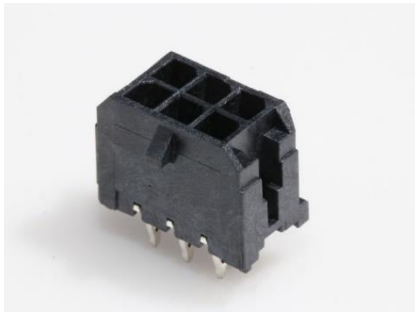
TABLE OF CONTENTSTOC

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
B4	EC No: 642999 DATE: 2020/08/10	PRODUCT SPECIFICATION MICRO-FIT LOW MATE FORCE CONNECTOR SYSTEM	1 of 19

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-46235-001	MKIPPER	SSOUSEK	FSMITH

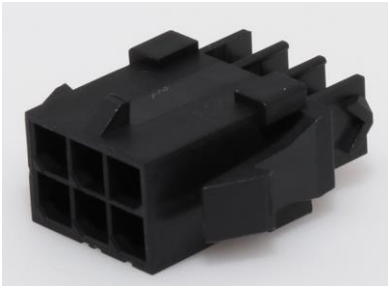
Receptacle, Dual Row	Plug, Dual Row
	
Series: 43025	Series: 43020

Right Angle Header, Dual Row	Vertical Header, Dual Row
	
Series: 43045	Series: 43045, 44067

CPI Header, Dual Row

Series: 44914

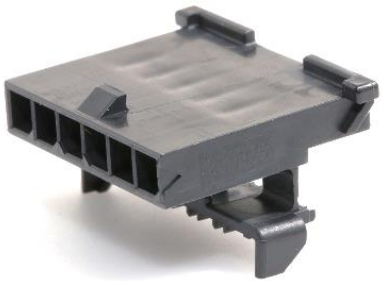
MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

TPA Receptacle Housing, Dual Row	TPA Plug Housing, Dual Row
	
Series: 172952	Series: 203632

TPA (for 172952 and 203632)

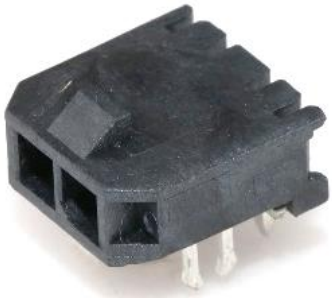
Series: 172953

TPA Receptacle, Single Row	TPA Plug, Single Row
	
Series: 171850	Series: 200875

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

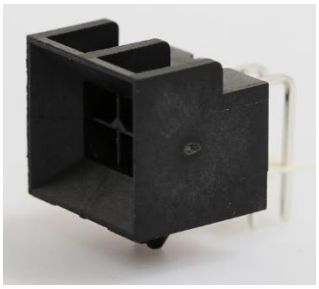
Receptacle, Single Row	Plug, Single Row
	
Series: 43645	Series: 43640

Right Angle Header, Single Row	Vertical Header, Single Row
	
Series: 43650	

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

Micro-Fit Dual Row BMI Floating Panel Receptacle	Micro-Fit Dual Row BMI Panel Mount Plug
	
Series: 44133	Series: 44300

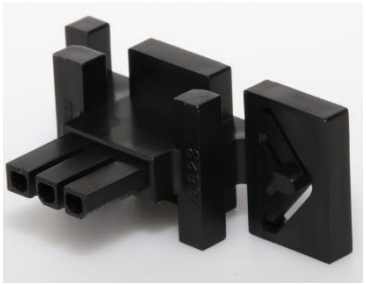
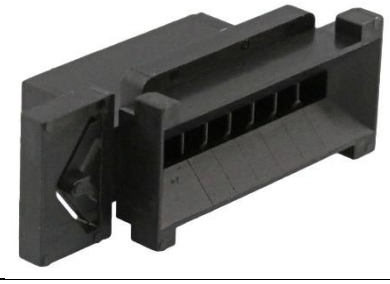
Micro-Fit Dual Row BMI Right Angle Header	Micro-Fit Dual Row BMI Vertical Header
	
Series: 44428	Series: 44432

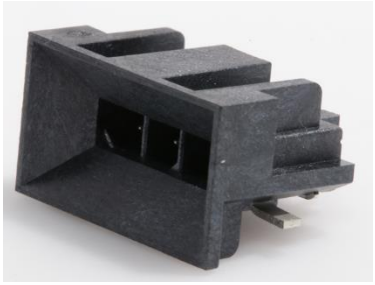
Micro-Fit Dual Row BMI Vertical CPI Header

Series: 45280

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

Micro-Fit Single Row BMI Floating Panel Receptacle	Micro-Fit Single Row BMI Panel Mount Plug
	
Series: 46623	Series: 46625

Micro-Fit Single Row BMI Right Angle Header

Series: 46622

Test Plug

Series: 44242

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

Table of Contents

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

1.0 SCOPE

This Product Specification covers the 3.00 mm (.118 inch) centerline (pitch) square pin headers or plugs when mated with connectors terminated with 46235 series female crimp terminals with 20 to 30 AWG wire using crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTIONS, SERIES NUMBERS, AND LINKS

DESCRIPTION	SERIES	PRIMARY PRODUCT SPECIFICATION
Female Crimp Terminal	46235	PS-46235-001 (This Document)
Male Crimp Terminal	43031	PS-43650, PS-43045 PS-44300-001
Single Row Receptacle Housing	43645	PS-43650 SINGLE ROW FAMILY
Single Row Plug Housing with / without Panel Mount Ears	43640	
Single Row TPA Receptacle Housing	171850	
Single Row TPA Plug Housing with/without Panel Mount Ears	200875	
Single Row Header, Right Angle -SMT or Thru Hole PCB Tail -PCB Snap-in Plastic Retention Peg -PCB Press-fit / Solderable Metal Retention Clip -PCB Solder Tab	43650	
Single Row Header, Vertical -SMT, Thru Hole, or Thru Hole Kinked PCB Tail -PCB Polarizing Peg -PCB Press-fit / Solderable Metal Retention Clip -PCB Solder Tab		
Dual Row Receptacle Housing	43025	PS-43045 DUAL ROW FAMILY
Dual Row Plug Housing, with / without Panel Mount Ears	43020	
Dual Row TPA Receptacle Housing	172952	
Dual Row TPA Plug Housing, with / without Panel Mount Ears	203632	
Dual Row Header, Right Angle -SMT or Thru Hole PCB Tail -PCB Snap-in Plastic Retention Peg -PCB Press-fit / Solderable Metal Retention Clip -PCB Solder Tab	43045 44067	
Dual Row Header, Vertical -SMT, Thru Hole, or Thru Hole Kinked PCB Tail -PCB Polarizing Peg -PCB Press-fit / Solderable Metal Retention Clip		

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

-PCB Solder Tab		
Dual Row CPI Header	44914	

2.1 DESCRIPTIONS, SERIES NUMBERS, AND LINKS CONTINUED

DESCRIPTION	SERIES	PRIMARY PRODUCT SPECIFICATION
Single Row BMI Floating Panel Mount Receptacle Housing	46623	PS-44300-001 Single and Dual Row BMI
Single Row BMI Panel Mount Plug Housing	46625	
Single Row BMI Headers	46622	
Dual Row BMI Floating Panel Mount Receptacle Housing	44133	
Dual Row BMI Panel Mount Plug Housing	44300	
Dual Row BMI Header, Right Angle	44428	
Dual Row BMI Header, Vertical	44432	
Dual Row BMI Vertical CPI Header	45280	
Test Plug (recommended for continuity testing only)	44242	PS-43045

Other products conforming to this specification are noted on the individual drawings.

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

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

2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:
a. Go to molex.com
b. Enter the part number in the search field.
c. At the bottom of the page go to “Environmental” to see compliance status.

2.4 SAFETY AGENCY FILE LISTINGS

UL: E29179
CSA: LR19980
IEC 61984 Certification: Tested to and found in compliance with IEC 61984. NRTL type examination certificate available from Molex upon request. Contact Molex Safety Agency team for questions regarding certification on specific part numbers.

Note: Safety agency approval is granted for the connector assembled with its associated terminals. The approval is documented in the agency file/license by the series number of the housing only. The terminal series number will not appear in the agency file/license as a stand-alone approved product. As a result, only the housings may bear the agency certification mark. Please note that even though the housings are marked as approved product, the safety agency approval does not apply if any terminals are installed other than those used to establish the rating.

3.0 APPLICABLE DOCUMENTS AND TEST STANDARDS

3.1 MOLEX DOCUMENTS

See series specific sales drawings and the other sections of this specification for the necessary referenced documents and specifications. See primary product specifications listed in table 2.1 for receptacle housings and mating components for specifications and requirements not listed in this document.
Micro-Fit Test Summary TS-46235-001
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
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
EIA TS-1000
UL-1977
CSA STD. C22.2 NO. 182.3-M1987
IEC / EN 61984

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 SAFETY AGENCY RATINGS

	Agency Current Rating (Amps)			Agency Voltage Rating
Series	**UL**	**CSA**	**IEC**	
43645	5	7	5	See Primary Product Specification in section 2.1
43640	5	7	5	
171850	5	7	5	
200875	5	7	5	
43650	5	7	5	
43025	5	7	5	
43020	5	7	5	
172952	5	7	-	
203632	5	7	5	
43045	5	7	5	
44914	5	7	5	
46623	5	7	5	

*Current rating for products are based upon use of 46235 series terminal system

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

4.1 SAFETY AGENCY RATINGS (CONT'D)

	Agency Current Rating (Amps)			Agency Voltage Rating
Series	UL	CSA	IEC	
46625	TBD	7	5	See Primary Product Specification in section 2.1
46622	5	7	5	
44133	5	7	5	
44300	TBD	7	5	
44428	5	7	5	
44432	5	7	5	
45280	5	7	5	

*Current rating for products are based upon use of 46235 series terminal system

Current ratings are maximum and may vary depending on wire size, circuit count, and end-use application. Further testing may be required in the end-use application.

4.2 APPLICABLE WIRES

STRANDED COPPER WIRE SIZE	MAX. OUTSIDE INSULATION DIAMETER
20 AWG	1.85 mm (.073 inch)
22 AWG	1.85 mm (.073 inch)
24 AWG	1.85 mm (.073 inch)
26 AWG	1.27 mm (.050 inch)
28 AWG	1.27 mm (.050 inch)
30 AWG	1.27 mm (.050 inch)

4.3 CURRENT DERATING**

AWG Wire Size	2-circuit W-W, W-B Amps
20	5.0
22	5.0
24	4.0
26	3.0
28	2.0
30	1.0

See notes on next page

1) Values are for REFERENCE ONLY.
2) Current de-ratings are based on not exceeding 30°C Temperature Rise.
3) Testing conducted using tinned stranded copper wire.
4) PCB trace design can greatly affect temperature rise results in Wire-to-Board applications.
5) Data is for all circuits powered.
6) * indicates interpolated information.
7) W-W: Wire-to-Wire W-B: Wire-to-Board

***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 are per Molex test method based on a 30°C maximum temperature rise over ambient temperature and are provided as a guideline. Testing conducted with tinned copper conductor stranded wire. 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, insulation thickness, stranding, tin coated or bare copper, wire length & crimp quality are other factors that influence current rating.*

4.4 CURRENT FOR TEST PLUG 44242

2.5 Amps Maximum (Pogo pin current capacity)
Test plugs are for testing purposes only and not intended for continuous use.

4.5 TEMPERATURE

Operating: - 40°C to + 105°C (*Including 30°C terminal average temperature rise at rated current*)
Non-operating: - 40°C to + 105°C

Rated 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 15) is based on assumption that the contact spends its entire life at the rated field maximum temperature (based on EIA-364-1000, table 8)

4.6 DURABILITY

Gold plated: 40 mating cycles for non-lubed (46235-000*) and 250 Cycles for lubricated (46235-500*).

All testing in accordance with EIA-364-1000 test method (see Sec. 6.2 item 10, item 11 of this specification Durability per EIA-364-09

5.0 QUALIFICATION

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

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

6.0 PERFORMANCE

6.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Low Level Contact Resistance** (LLCR)	Per EIA-364-23 (termination of connector to board carrier or cable shall be included in measurements)	LLCR: 20 mΩ MAXIMUM [initial]
2	**Insulation Resistance**	Unmate & unmount connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 MΩ MINIMUM
3	**Dielectric Withstanding Voltage**	Per EIA-364-20 Unmate connectors: apply a voltage of two times the rated voltage plus 1000 volts VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown or flashover; current leakage < 5 mA
4	**Capacitance**	Measure between adjacent terminals at 1 MHz.	2 picofarads MAXIMUM
5	**Temperature Rise** (via Current Cycling)	Mate connectors: measure the temperature rise at the rated current after: 1) 96 hours (steady state) 2) 240 hours (45 minutes ON and 15 minutes OFF per hour) 3) 96 hours (steady state)	Temperature rise: +30°C MAXIMUM

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

6.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6	**Connector Mate and Unmate Forces**	Mate and unmate connector (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	4.0 N (0.9 lbf) per circuit MAXIMUM mate force & 2.0 N (0.5 lbf) per circuit MAXIMUM unmate force
7	**Terminal Retention Force** (from Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	24.5 N (5.5 lbf) MINIMUM retention force
8	**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.	14.7 N (3.3 lbf) MAXIMUM insertion force
9	**Durability** (non-lubed)	Per EIA-364-09 Mate connectors up to 40 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	LLCR: Δ 20 mΩ MAXIMUM
10	**Durability** (lubricated)	Per EIA-364-09 Mate connectors up to 250 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	LLCR: Δ 20 mΩ MAXIMUM
11	**Vibration** (Random)	Per EIA 364-28, test condition VII	LLCR: Δ 20 mΩ MAXIMUM & Discontinuity < 1 microsecond
12	**Shock** (Mechanical)	Per EIA-364-27 Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±X,±Y,±Z axes (18 shocks total).	LLCR: Δ 20 mΩ MAXIMUM & Discontinuity < 1 microsecond
13	**Wire Pullout Force (Axial)** (Wire from Terminal)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	MINIMUM pullout force 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)
14	**Normal Force** (per contact beam)	Apply a perpendicular force.	50 g (0.5 N) MINIMUM

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

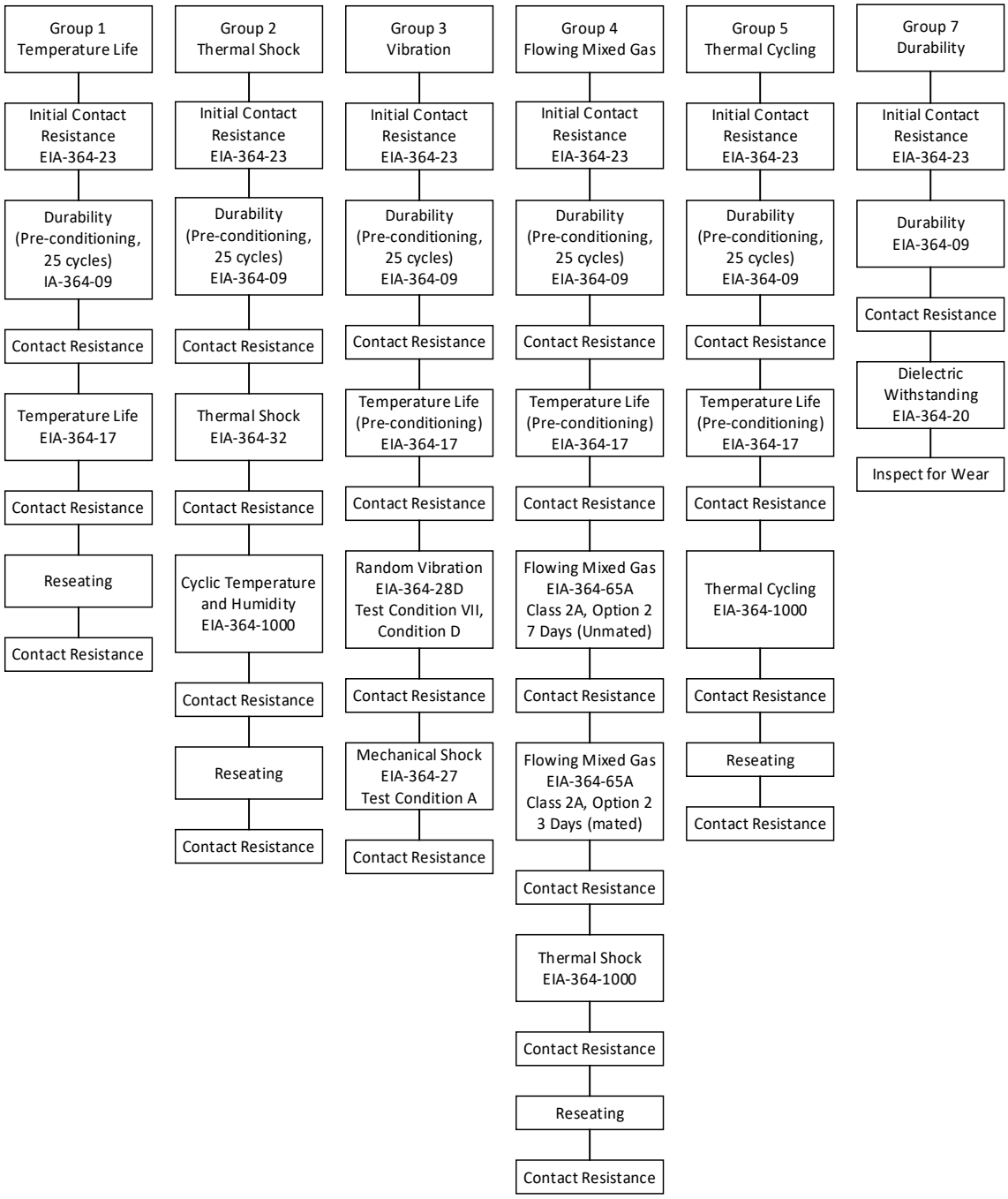
6.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
15	**Temperature Life (Thermal Aging)** Group 1 Only	Per EIA-364-17, method A Mate connectors and expose to: 240 hours at 105 ± 2°C	LLCR: Δ 20 mΩ MAXIMUM
16	**Temperature Life (Thermal Aging)** Groups 3, 4 & 5	Per EIA-364-17, method A Mate connectors and expose to: 120 hours at 105 ± 2°C	LLCR: Δ 20 mΩ MAXIMUM
17	**Cyclic Temp and Humidity** (Steady State)	Per EIA-364-31 Mate connectors: expose to a temperature of 40 ± 2°C with a relative humidity of 90-95% for 96 hours. Note: Remove surface moisture and air dry for 1 hour prior to measurements.	LLCR: Δ 20 mΩ MAXIMUM
18	**Mixed Flowing Gas (MFG)** (30µ" Gold)	Per EIA-364-65, Option 2, Class IIA Total 10-day exposure (7 days unmated / 3 days mated)	LLCR: Δ 20 mΩ MAXIMUM
19	**Mixed Flowing Gas (MFG)** (15µ" Gold)	Per EIA-364-65, Option 2, Class IIA Total 10-day exposure (7 days unmated / 3 days mated)	LLCR: Δ 40 mΩ MAXIMUM

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

7.0 TEST SEQUENCE GROUPS



MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

Temperature Rise	Individual Tests
First Steady State 96 hours	Connector Mate and Un-mate Forces
Current Cycling 240 Cycles 45 minutes On 15 minutes Off	Crimp Terminal Insertion and Retention Forces (in Housing)
2nd Steady State 96 hours	Wire Pullout Force (from Terminal)
	Normal Force

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

8.0 APPLICATION INFORMATION

8.1 CONTACT ENGAGLEMENT (WIPE)

Receptacle	Mated to Plug/ Header	Application	Contact Wipe (nominal)	Family
43645 Receptacle	43640 Plug	Wire-to-Wire	.078 in/(1.98mm)	SINGLE ROW
	43650 Header	Wire-to-Board	.064 in/(1.63mm)	
171850 TPA Receptacle	43650 Header	Wire-to-Board	.058 in/(1.47mm)	
	200875 TPA Plug	Wire-to-Wire	.063 in/(1.60mm)	
43025 Receptacle	43020 Plug	Wire-to-Wire	.078 in/(1.98mm)	DUAL ROW
	43045, 44067 Headers, 44914 CPI Header	Wire-to-Board	.064 in/(1.63mm)	
172952 TPA Receptacle	43045, 44067 Headers, 44914 CPI Header	Wire-to-Board	.058 in/(1.47mm)	
	203632 TPA Plug	Wire-to-Wire	.063 in/(1.60mm)	
44133 Panel Mount Receptacle	44300 Plug	Wire-to -Wire	.089 in/ (2.26 mm)	DUAL ROW BMI
	44428 RA Header 44432 Vert Header 45280 CPI Header	Wire-to-Board	.067 in/ (1.70 mm)	
46623 Panel Mount Receptacle	46625 Plug	Wire-to-Wire	.089 in/(2.26mm)	SINGLE ROW BMI
	46623 RA Header	Wire-to-Board	.067 in/(1.70mm)	

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC

8.2 SOLDER INFORMATION

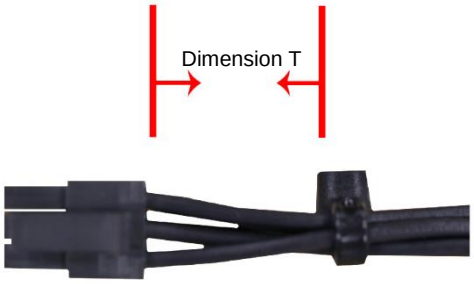
See primary product specification listed in table 2.1

8.3 GAGES AND FIXTURES

It is recommended that test plugs (Series 44242) be used for continuity testing of receptacles. Standard mating parts should not be used for harness testing.

8.4 CABLE TIE AND / OR WIRE TWIST LOCATION

Single Row Circuit Sizes	Dual Row Circuit Sizes	Dimension T Min.
2-4	2-8	.500 (12.70 mm)
5-8	10-16	.750 (19.10 mm)
9-12	18-24	1.000 (25.40 mm)



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

9.0 PACKAGING

Parts shall be packaged to protect against damage during normal handling, transit and storage. Refer to the Molex.com webpage for the specific part number to get the exact packaging document.

46235 Series Crimp Terminals: Available in chain form on reels, PK-46235-001
Receptacles and mating parts: See Primary Product Specification in Section 2.1

10.0 POLARIZATION & KEYING OPTIONS

See primary product specification listed in table 2.1

MICRO-FIT WEB LINK

TABLE OF CONTENTSTOC