

POWERWIZE BMI 2-CKT HIGH CURRENT PANEL-TO-BOARD/BUSBAR INTERCONNECTS – 6mm VERSIONS

POWERWIZE 6mm RA HEADER SOLDER TAIL VERSION	POWERWIZE 6mm RA HEADER SCREW MOUNT VERSION
P/N : 2155106241	P/N : 2155106031
Series: 215510	

POWERWIZE 6mm PANEL MOUNT RECEPTACLE HOUSING	TPA FOR 6mm PANEL MOUNT RECEPTACLE	CRIMP SOCKETS
P/N : 2155116121	P/N : 2155136001	Series: 204608

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1.0 SCOPE

The Product Specification covers the reliability test data of 6mm PowerWize BMI 2-CKT High Current Panel to Board/Busbar mount connector systems which consists of PCB/Busbar Mount Right-Angle Header with both Screw mount and Solder Tail (For Wave / IR / Reflow Soldering Process) mounting option with 2.00mm per side float on Receptacle.

2.0 PRODUCT DESCRIPTION

The PowerWize BMI 2-CKT High Current Panel to Board/Busbar mount connector systems is a 2 ckt single row connector with screw mount and solder tail male pins for high power applications connecting PCB/Busbar mount Header to Panel mount Receptacle by friction. Connector systems are available with 2.0mm of float on Receptacle side to facilitate BMI applications. the Au plated socket contacts mating to Ag plated male pins.

2.1 DESCRIPTION AND SERIES NUMBER

This specification covers the performance requirements and test methods for the following products listed by series and part numbers:

SERIES	PART NUMBER	DESCRIPTION
215510	215510-6241	PowerWize BMI 6mm Right Angle Solder Mount Header
	215510-6031	PowerWize BMI 6mm Right Angle Screw Mount Header
215511	215511-6121	PowerWize BMI 6mm Panel mount Receptacle Assembly
215513	215513-6001	PowerWize BMI 6mm TPA Retainer
204608	204608-0006	PowerWize BMI 6mm Female Crimp Terminal Assembly (2 AWG)
	204608-3006	PowerWize BMI 6mm Female Crimp Terminal Assembly (4 AWG)
	204608-1006	PowerWize BMI 6mm Female Crimp Terminal Assembly (6 AWG)
	204608-4006	PowerWize BMI 6mm Female Crimp Terminal Assembly (8 AWG)
	204608-2006	PowerWize BMI 6mm Female Crimp Terminal Assembly (10 AWG)

2.2 DIMENSIONS, MATERIALS, PLATINGS

1. Dimensions: Refer to sales drawing.
2. Material: RoHS compliant materials:
 - a. Power Male Pins: Copper Alloy.
 - b. Power Female Sockets: Copper Alloy for Components and Terminal Contacts.
3. Plating:
 - a. Power Male Pins: Silver Plating with a Tarnish Inhibitor.
 - b. Power Female Sockets: Gold Plating for Terminal Contact (Mating Interference), Remaining Components are Silver Plated with Tarnish Inhibitor.
4. Refer to [2043131234-TS](#) for effects of tarnish on connector.

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2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:

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

2.4 SAFETY AGENCY APPROVALS



2.4.1 ^C ^{US} File Number*: TDB

CSA approval meets following standards/test procedures:

- CSA STD. C22.2 No. 182.3-M1987
- UL-1977

* - "C" and "US" mark adjacent to CSA signifies that the product has been evaluated to the applicable CSA and ANSI/UL standards, for use in Canada and US respectively.

CSA
NON-current interruption
WIP

2.4.2 UL File Number:

UL
NON-current interruption
WIP

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3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

6.00mm PowerWize 2-CKT P-to-B BMI Connector system			
Sales Drawing	Packaging Drawing	Test summary	Application Specification
2155106031 2155106241	2155106121-PK	2155106000-TS	2155101000-AS
2155116121	2155116121-PK		
2155136001	2155136001-PK		
2046080006	2046080006-PK	2119410000-TS	2119410000-AS

Other General Molex Documents

- [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](#)

3.2 INDUSTRY DOCUMENTS

- EIA-364-1000
- UL-60950-1
- UL – 1977
- CSA STD. C22.2 No. 182.3-M1987

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

600 Volts

Connector Rating per UL-1977

Connector voltage rating meets the connector approval level defined by UL 1977, Sect. 11 for spacing per table 11.1. Example: 1.2 mm for ≤ 250 volt; 3.2 mm for ≥ 250 volt.

Exception taken for spacing less than those specified are permitted, if the device complies with the requirements in the dielectric voltage withstanding test per Sect. 17.

Application Voltage Guideline

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.

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4.2 CURRENT RATING

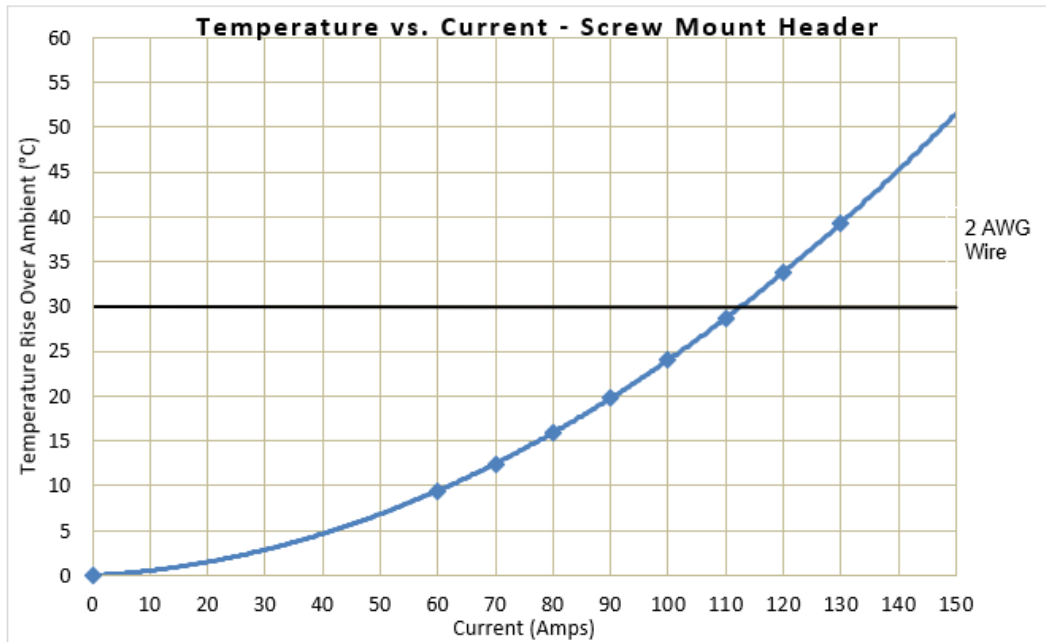
See Temperature vs. Current and Voltage Drop vs. Current charts below for applicable current rating per application. Higher current can be achieved by having larger PCB area to act as heat sink.

- 110 Amps (with 2 AWG cable connection)
- 100 Amps (with 4 AWG cable connection)
- 80 Amps (with 6 AWG cable connection)
- 60 Amps (with 8 AWG cable connection)
- 40 Amps (with 10 AWG cable connection)

** Current rating is application dependent. Above rating is only a guideline. Appropriate de-rating is required per ambient conditions, copper weight of PCB, gross heating from adjacent modules/components, and other factors that influence connector performance.

PCB SPECIFICATIONS FOR TEMPERATURE RISE AND VOLTAGE DROP TESTS:

PCB Thickness – 2.36mm (.093")
 10 Layer PCB with 2oz Cu per layer.

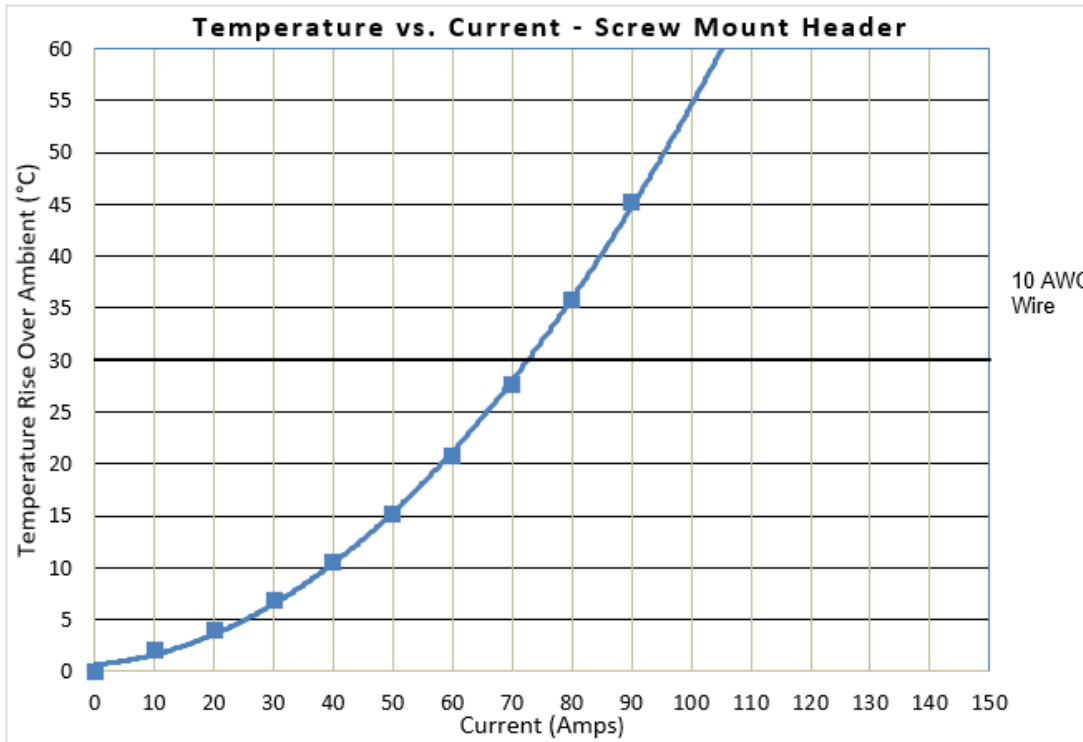
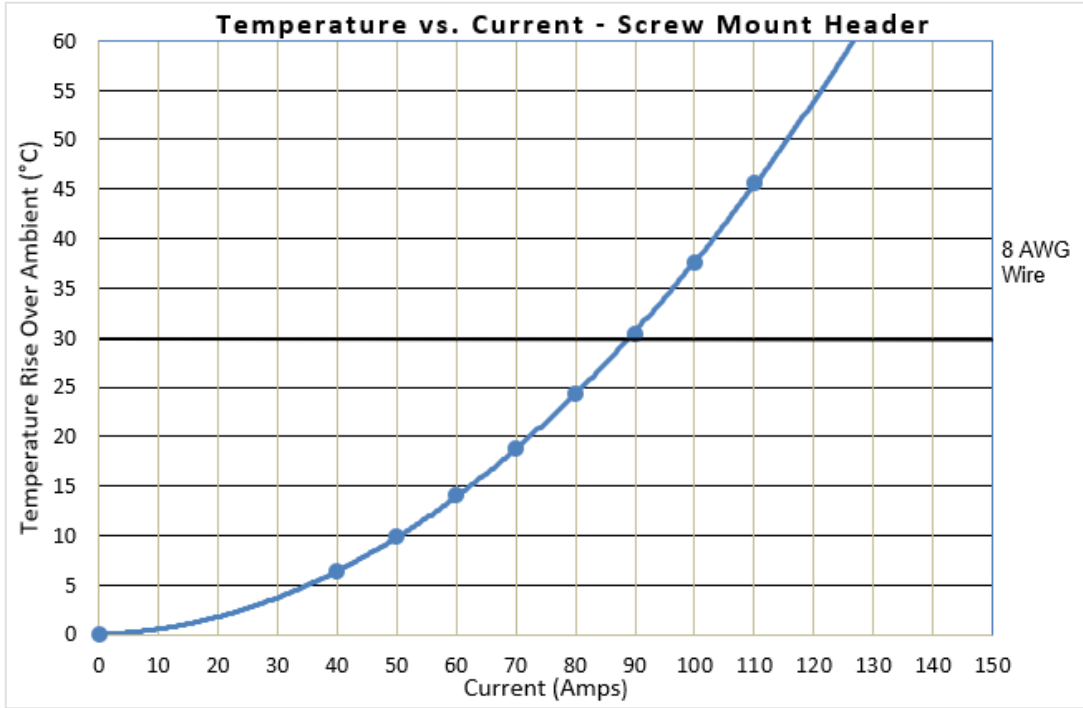


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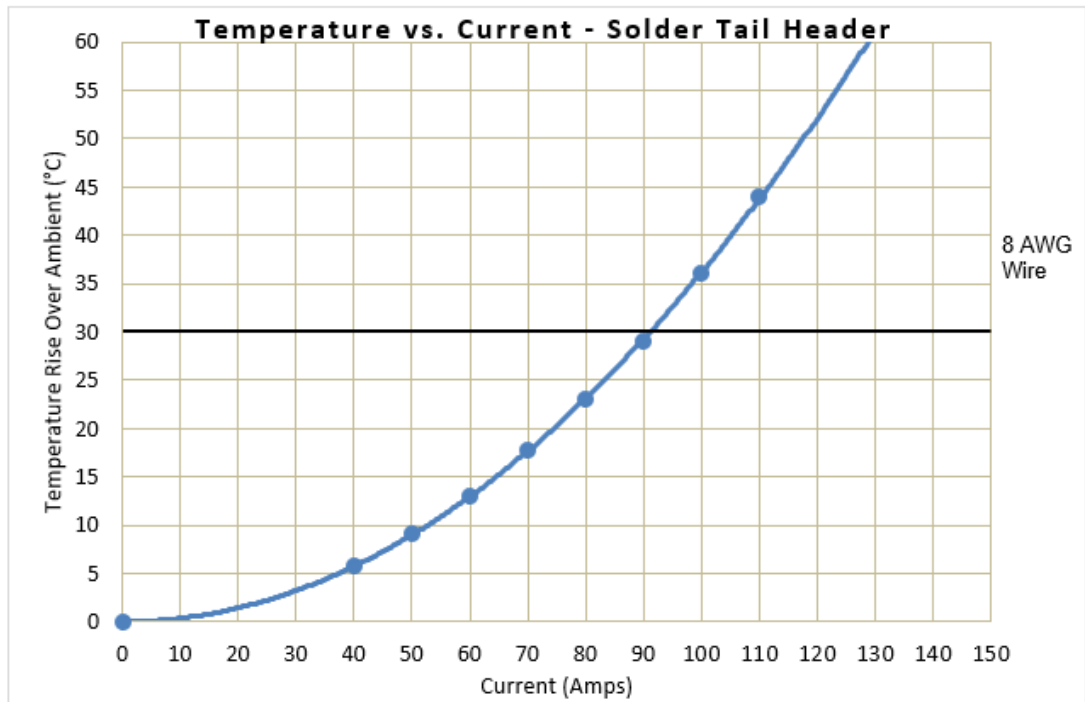
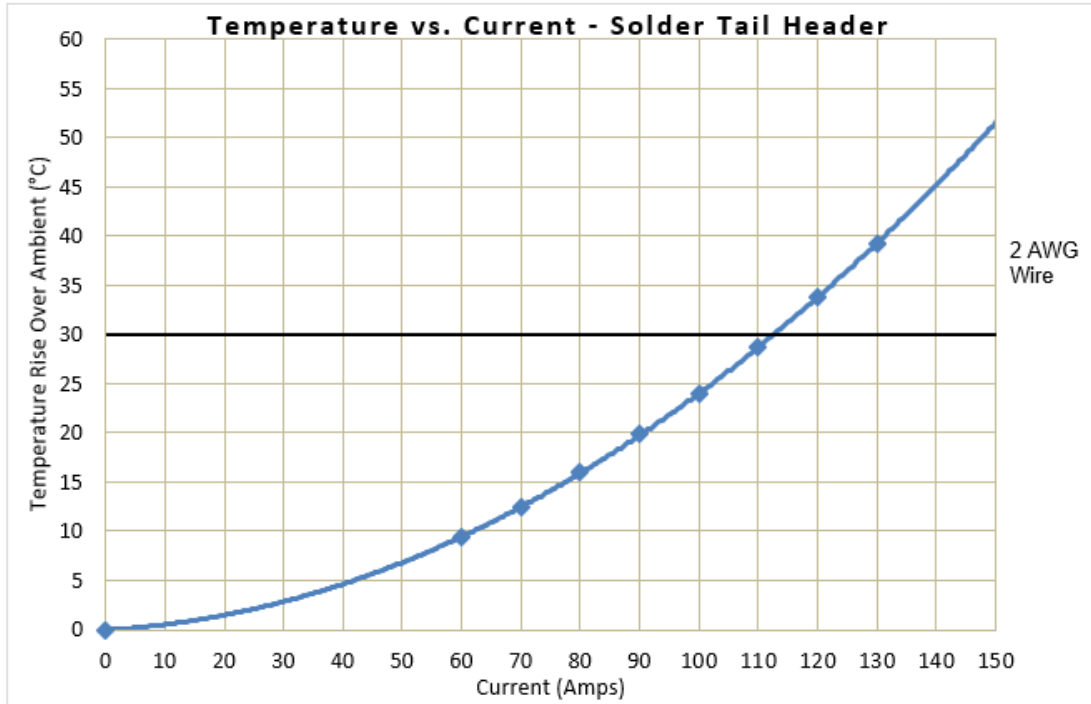


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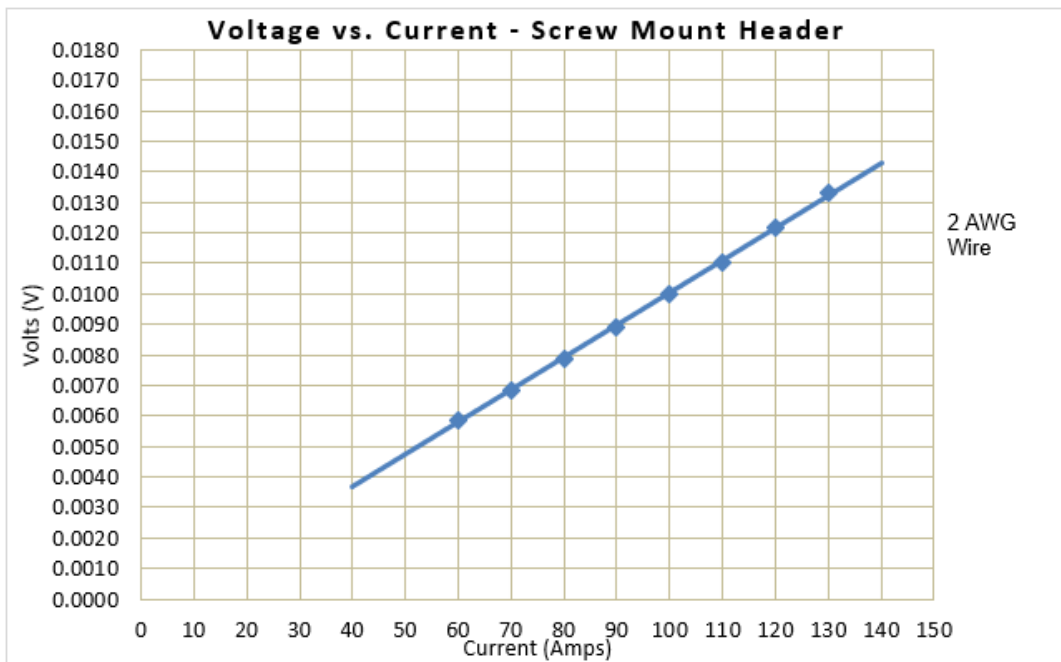
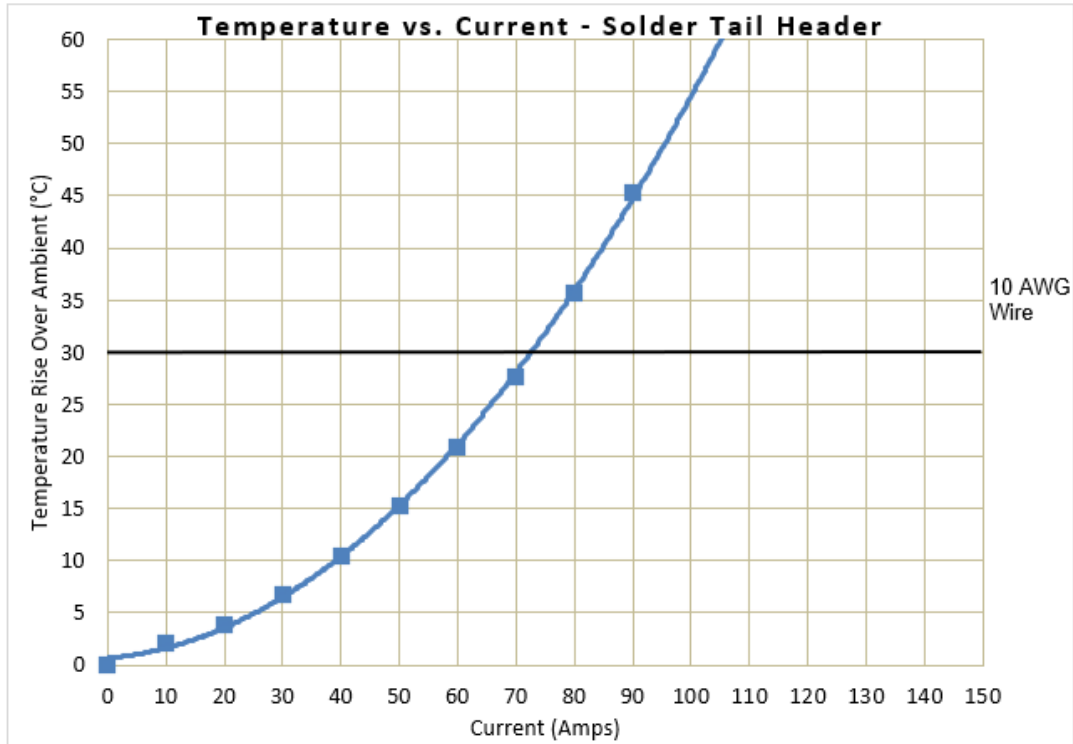


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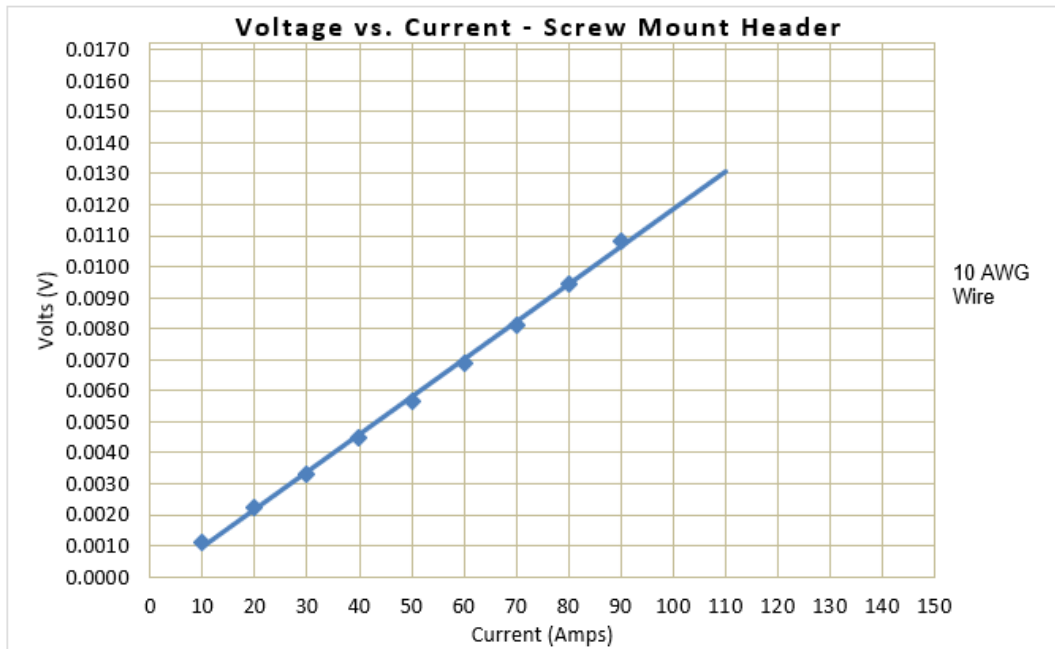
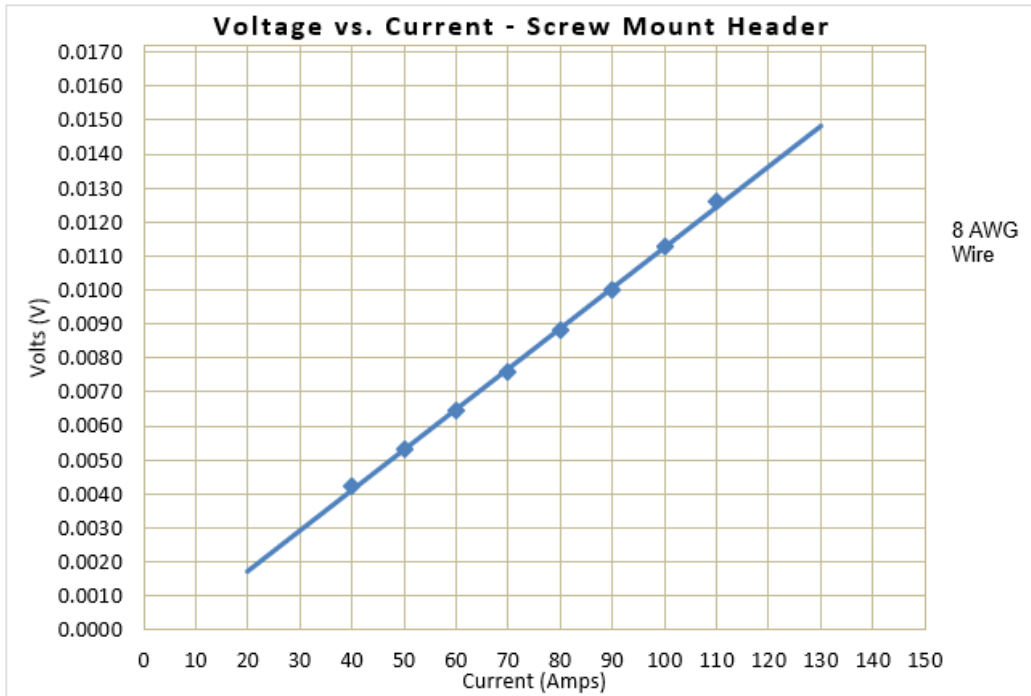


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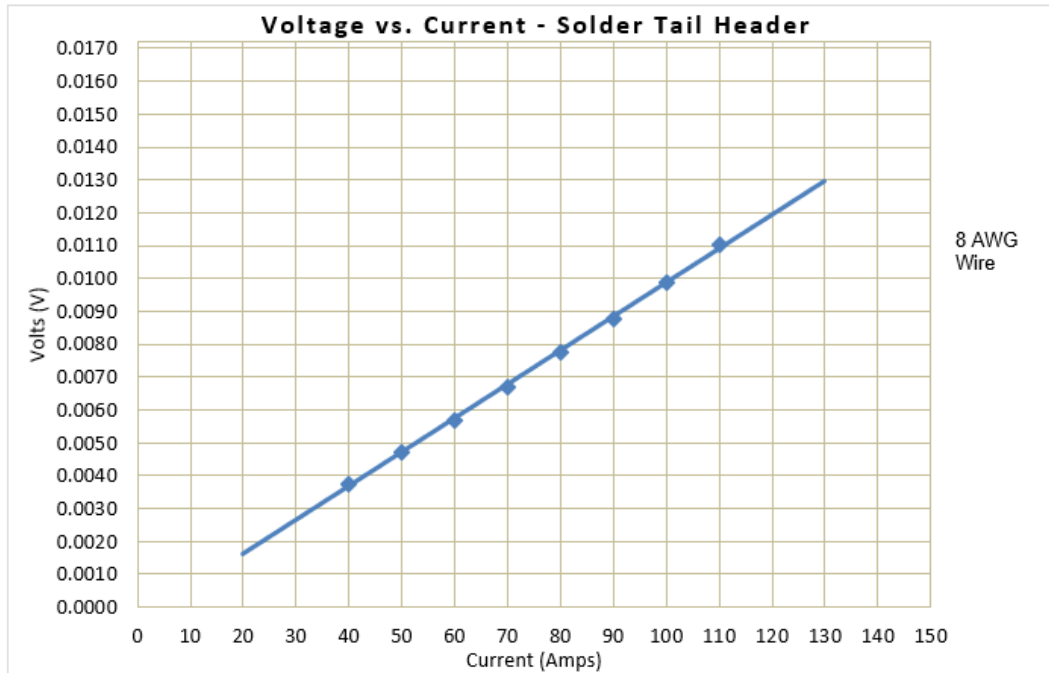
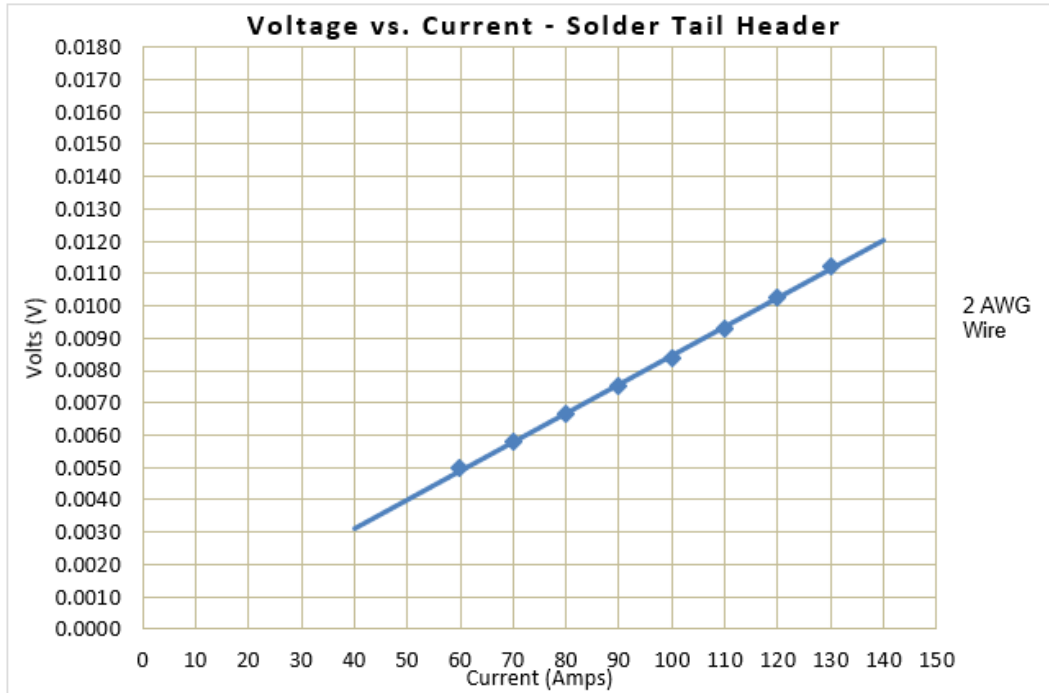


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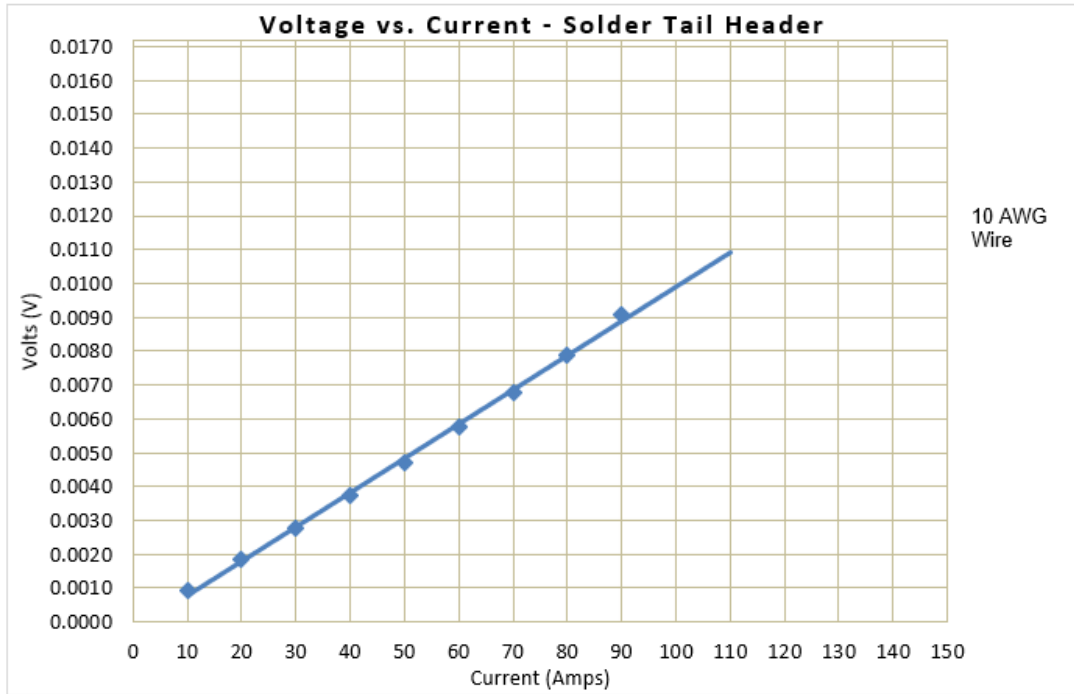


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4.3 TEMPERATURE

Operating Temperature Range (includes T-Rise from applied current): - 40 °C to + 125 °C
 Non-Operating Temperature Range : - 40 °C to + 125 °C

Field Temperature and Field Life: 85 °C for 10 years (based on EIA-364-1000, table 8)

Note:
 Temperature life tested per EIA 364-17 Method A for 114 hrs. @125 °C per table 8

4.4 DURABILITY

Plating Type	Number of Cycles
Gold Plated – Socket Contact Silver Plated – Pin Surface	200

**Mechanical / Non – Environmental Durability.
 *Based on EIA-364-1000.01 test method C section 7 with assembled with PCB
 As tested in accordance with EIA-364-1000 test method (see section 6.2 item 3 of this specification).
 Durability per EIA-364-09*

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5.0 QUALIFICATION

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

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Contact Resistance (Low Level)	Mate connectors, apply maximum voltage of 20 mV and current of 100 mA as per EIA-364-23	Maximum 0.1 mΩ
6.1.2	Insulation Resistance	Un-mate & un-mount connectors: Apply a voltage of 500 VDC between adjacent terminals or ground as per EIA-364-21	Target : Minimum 5,000 MΩ
6.1.3	Temperature Rise	Mate connectors, measure the temperature rise above ambient at the rated current as per EIA-364-70B, method 2 Wire Size – 2//8/10 AWG With PCB	Refer section 4.2
6.1.4	Voltage Drop (@ Rated Current)	Mate connectors apply maximum rated current.	Refer section 4.2
6.1.5	Dielectric Withstanding Voltage	Un-mate connectors: Apply 2200 VDC for 1 minute between adjacent terminals or ground. as per EIA-364-20 or per UL 1977	No Breakdown
6.1.6	Temperature Rise (Current cycling)	Mate connectors: measure the Temperature rise at the rated current after : 96 hours (Steady state), 240hours (Current cycling) 45 minutes ON and 15 minutes OFF per hour, 96 hours(Steady state) Steady state per EIA-364-70B, Method 2. Current cycling per EIA-364-55A, Test Condition A, Wire Size – 2 AWG	30°C T-Rise

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6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Whole Connector Mate Force	Mate connectors (male to female) at a rate of 25.4±6 mm per minute as per EIA-364-37	60 N Maximum
6.2.2	Whole Connector Un-mate Force	Un-mate connectors (male to female) at a rate of 25.4±6 mm per minute. As per EIA-364-37	12 N Minimum
6.2.3	Durability (Without environmental pre-conditioning) (Test Group_7)	Mate connectors up to 200 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests. As per EIA-364-09	0.1 mΩ Maximum (Change from initial)
6.2.4	TPA Insertion force with Receptacle Housing	Insert TPA into receptacle housing at a rate of 25 ± 6 mm per minute.	10 N maximum force For 2/4/6/8/10 AWG wire size
6.2.5	TPA Retention(wire pullout) force with Receptacle Housing	Axially pullout the TPA with wire from the receptacle housing at a rate of 25 ± 6 mm per minute. As per EIA-364-35	90 N minimum force For 2/4/6 AWG wire size
			70 N minimum force For 8/10 AWG wire size
6.2.6	Crush peg insertion force to PCB	Insert the connector to PCB at a rate of 12.7± 6 mm per minute. Until connector is fully seat on PCB	200 N Maximum insertion force
6.2.7	Random Vibration (Test Group 3)	Mate connectors and vibrate per EIA-364-28 test condition VII-D 15 minutes each axis.	0.1 mΩ maximum (Change from initial) & Discontinuity < 1 microsecond
6.2.8	Mechanical Shock	Mate connectors and shock at 50 g with ½ sine wave (11 milliseconds) shocks in the ±X,±Y,±Z axes (18 shocks total). As per EIA-364-27	0.1 mΩ maximum (Change from initial) & Discontinuity < 1 microsecond

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6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Temperature Life (Pre-Conditioning)	Mate Connectors, expose to 56 hours at 125 °C, as per EIA-364-17 & EIA-364-1000	0.1 mΩ maximum (Change from initial) & No Visual Damage
6.3.2	Temperature Life (Test Group_1)	Mate Connectors, expose to 114 hours at 125 °C, as per EIA-364-17 & EIA-364-1000	
6.3.3	Thermal Shock (Test Group_2)	Mate connectors, expose to 10 cycles from -55 deg. C to 85 deg. C, test condition I, test duration A-4 as per EIA-364-32	0.1 mΩ maximum (Change from initial)
6.3.4	Cyclic temperature and humidity (Test Group_2)	Mate connectors: expose to 24 cycles as per EIA-364-31, method VIII,	
6.3.5	Mixed flowing Gas (Test Group_4)	Expose to MFG 224 hours unmated, 112 hours mated, as per EIA-364-65 Class IIA	
6.3.6	Dust Exposure (Test Group_6)	Un-mate connector and expose to dust up to 1 hour duration as per EIA-364-91	
6.3.7	Solderability Dip Test	Molex test method: As, per SMES-152	Solder area shall have minimum of 95% solder coverage
6.3.8	Resistance to soldering heat (Reflow soldering & Wave soldering)	As per EIA-364-61, Test procedure 2 (Test Condition II)	No dimensions change No physical damage

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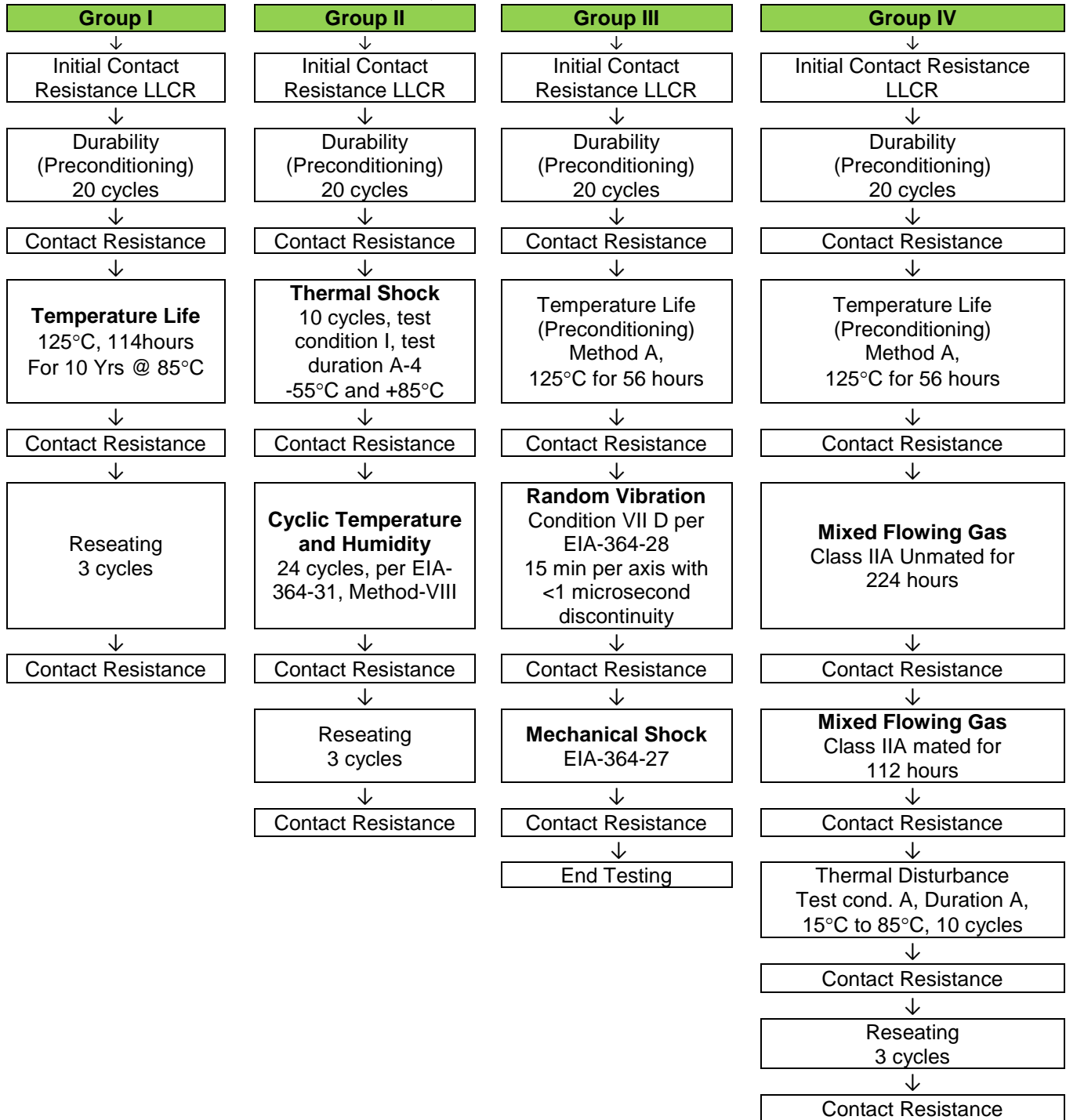
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7.0 TEST SEQUENCE

7.1 RELIABILITY TEST SEQUENCES PER EIA-364-1000

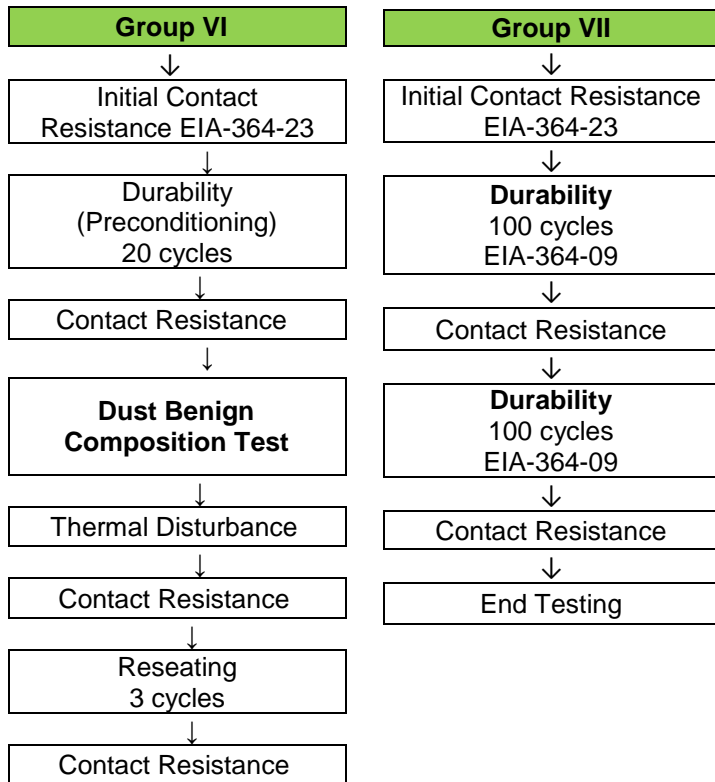


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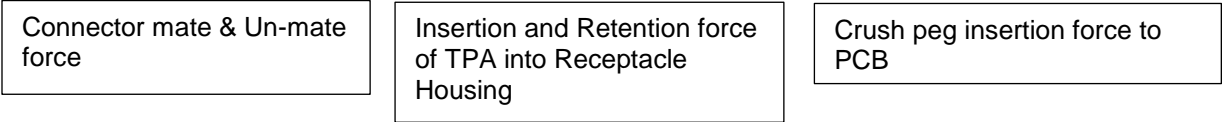
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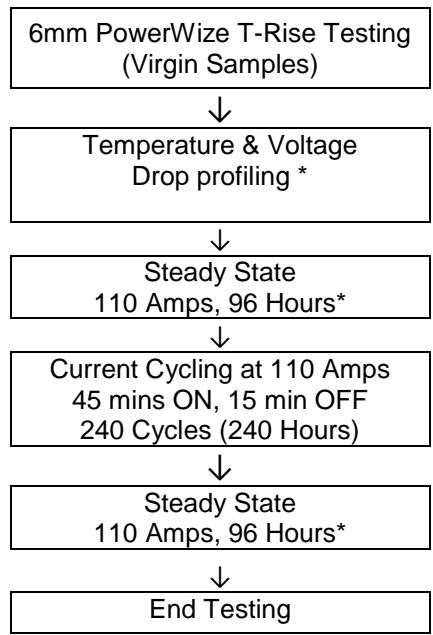


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7.2 MECHANICAL TEST SEQUENCES



7.3 TEMPERATURE RISE TEST SEQUENCES



POWERWIZE BMI 2-CKT HIGH – CURRENT INTERCONNECT SYSTEMS - 6mm

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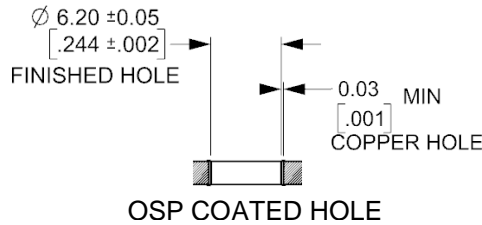


REVISION: A2	ECM INFORMATION: EC No: 731594 DATE: 2022/12/12	TITLE: PRODUCT SPECIFICATION FOR 6MM POWERWIZE BMI_2-CKT HIGH CURRENT PANEL TO BOARD/BUSBAR INTERCONNECTS				SHEET No. 18 of 22
DOCUMENT NUMBER: 2155100006-PS	DOC TYPE: PS	DOC PART: 000	CREATED / REVISED BY: CHETAB	CHECKED BY: CHETAB	APPROVED BY: HTHYAGARAJ	
TEMPLATE FILENAME: 1703070003 REV A						

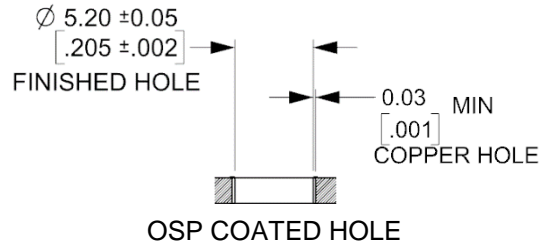
8.0 PRINTED CIRCUIT BOARD SPECIFICATION

8.1 PCB THROUGH HOLE SPECIFICATION

PROFILE FOR SOLDER TAIL_6.20 mm (FINISH) HOLES:
OSP HOLE DIMENSIONS IN MM/IN



PROFILE FOR SCREW MOUNT_5.20 mm (FINISH) HOLES:
OSP HOLE DIMENSIONS IN MM/IN



Note: Silver Coating can also be used for Plated through holes

9.0 POWERWIZE BMI MATING/ALIGNING ASPECTS

9.1 WIPE LENGTH DETAILS

RIGHT ANGLE PCB MOUNT HEADER TO PANEL MOUNT RECEPTACLE		
Pin type	Nominal Wipe(mm)	Minimum Wipe (Statistical)(mm)*
Short Pin	4.1	3.6

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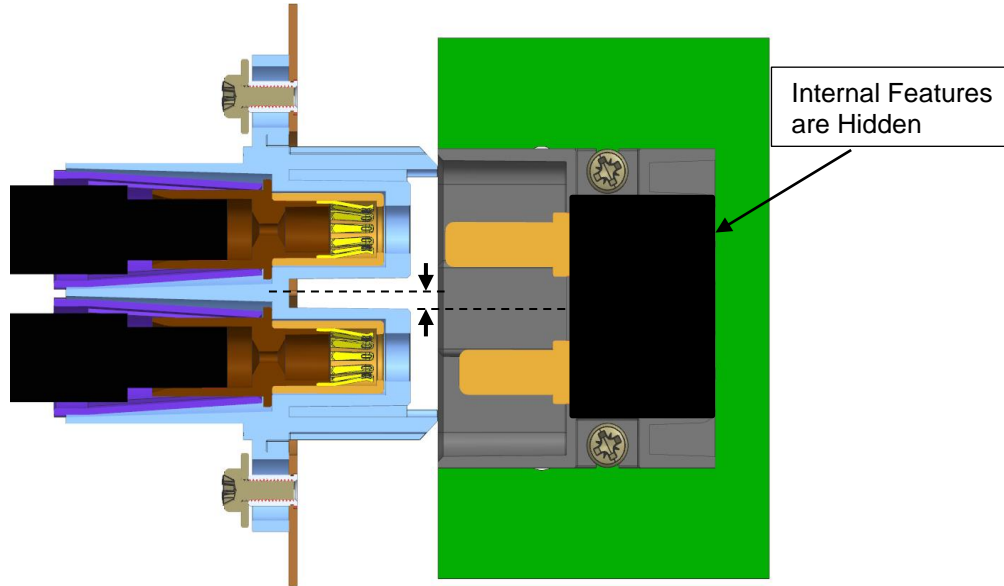
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*Minimum wipe is determined using RSS tolerance analysis for the connector only assuming at mated condition as per reference mating length provided in the illustration above. Mated profile tolerances and system tolerances are not considered into the analysis

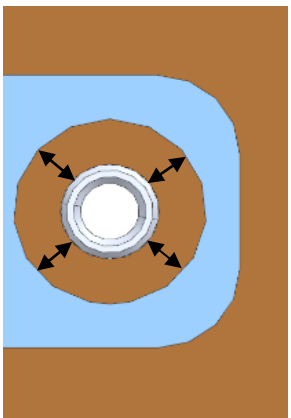
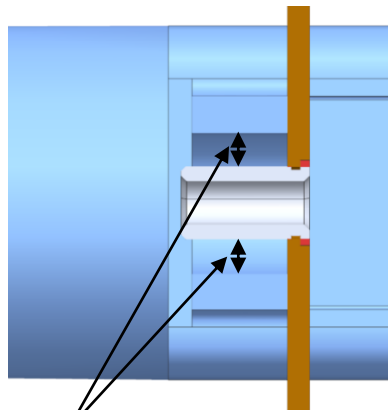
9.2 GATHERABILITY



Maximum Gatherability available for the PowerWize BMI 6mm Connector is 2mm

Side View

Rear View



2mm Radial Float

2mm Radial Float

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10.0 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.

10.1 SOLDER PROCESS TEMPERATURES

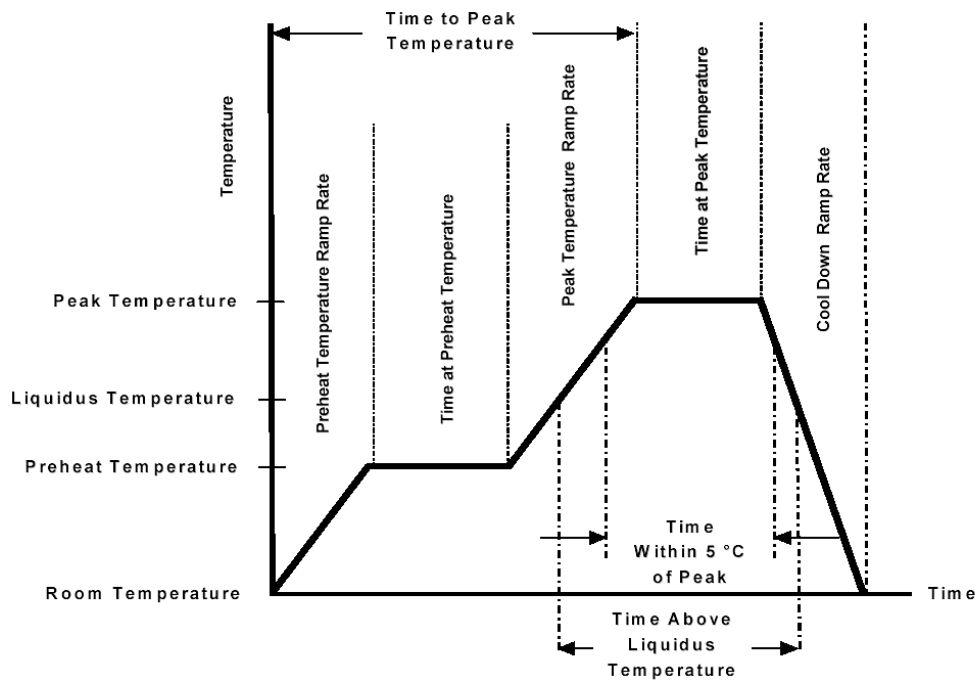
Reflow Solder Temperature: 260°C Maximum

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

10.2 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

11.0 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.

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