molex **PRODUCT SPECIFICATION**

EXTREME POWERMASS
BOARD TO BOARD
INTERCONNECT SYSTEM

Extreme Power mass R/A Plug Side Assembly on rail – Solder Tail	Extreme Power mass R/A Plug Side Assembly on rail – Press Fit
	
Series: 75555	Series: 171528

Extreme Power mass Vertical Receptacle Side Assembly - Press Fit	Extreme Power mass R/A Receptacle Side Assembly on rail – Press Fit
	
Series: 75541	Series: 171529

EXTreme PowerMass High-Current Connectors Web Page	TABLE OF CONTENTS	

REVISION:	ECM INFORMATION:	TITLE:	SHEET No.
G	EC No: 669659 DATE: 2021/07/14	PRODUCT SPECIFICATION POWER DOCK SR INTERCONNECT SYSTEM	1 of 26

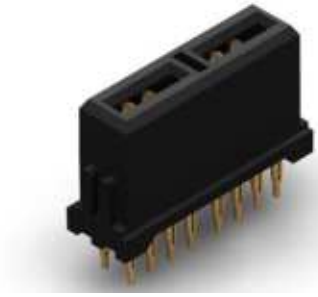
DOCUMENT NUMBER:	DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-75431-999	PS	001	RLOW	BPISZCZOR	BPISZCZOR

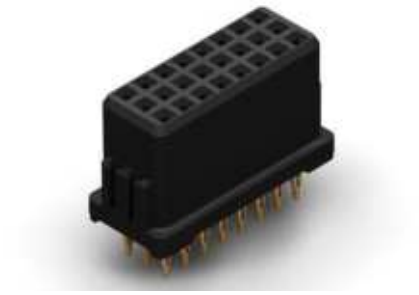
TEMPLATE FILENAME: 1703070003 REV A

Extreme Power mass R/A Receptacle Side Assembly on rail –Solder Tail	Extreme Power mass 150 Amp Plug Module
	
Series: 45840	Series: 75556

Extreme Power mass 80 Amp & 40 Amp Plug Module	Extreme Power mass Multipath Module (160 Amp)
	
Series: 75561	Series: 46081

Extreme Power mass Signal Plug Module (24 – 64 ckt)	Extreme Power mass 150 Amp Receptacle Module – Press Fit
	
Series: 75568	Series: 75542

Extreme Power mass 80 Amp & 40 Amp Receptacle Module	Extreme Power Multipath Module (160 Amp) – Press Fit
	
Series: 75545	Series: 46079

Extreme Power mass Signal Receptacle Module (24-64 ckt) – Press Fit	Extreme Power mass 150 Amp Receptacle Module
	
Series: 75548	Series: 45841

Extreme Power mass Signal Receptacle Module	Extreme Power mass Right Angle Receptacle Aligner
	
Series: 46225	Series: 45839

Extreme Power mass Vertical Receptacle Aligner	Extreme Power mass Plug Side Aligner
	
Series: 75552	Series: 75572

Extreme Power Mass Horizontal Receptacle Plug Side

Series: 75556

EXTreme PowerMass High-Current Connectors Web Page

TABLE OF CONTENTS

NOTE: Refer table in section 2.1 for more variants.

Table of Contents

ITEMS		PAGE
1.0	SCOPE	7
2.0	PRODUCT DESCRIPTION	7
2.1	DESCRIPTION, SERIES NUMBER, AND LINKS	7
2.2	DIMENSIONS, MATERIALS, PLATINGS	9
2.3	ENVIRONMENTAL CONFORMANCE	9
2.4	SAFETY AGENCY LISTINGS	9
3.0	APPLICABLE DOCUMENTS AND SPECIFICATION	10
3.1	MOLEX DOCUMENTS	10
3.2	INDUSTRY DOCUMENTS	10
4.0	ELECTRICAL PERFORMANCE RATINGS	10
4.1	VOLTAGE	10
4.2	CURRENT	11
4.3	RESISTANCE	14
4.4	TEMPERATURE	15
4.5	DURABILITY	15
5.0	QUALIFICATION	15
6.0	PERFORMANCE	16
6.1	ELECTRICAL PERFORMANCE	16
6.2	MECHANICAL PERFORMANCE	17
6.3	ENVIRONMENTAL PERFORMANCE	18
6.4	COMPLIANT PIN PERFORMANCE	19
7.0	TEST SEQUENCE	21
8.0	SOLDER INFORMATION	23
8.1	SOLDER PROCESS TEMPERATURES	23
8.2	SOLDERING PROFILE	23
9.0	PACKAGING	24
10.0	CO-PLANAR MATED DIMENSIONS	25

1.0 SCOPE

The Extreme Power mass interconnect systems consist of right angle plug and vertical and co-planar receptacle modular configurations with 150 Amp modules, 80 Amp modules, signal modules and guidance modules. These connectors are two-piece devices, which connect two printed circuit boards. The right angle plug connectors are through-hole solder and the vertical receptacle connectors are press-fit, with eye-of-the-needle compliant pin terminals.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

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

Assembly On Rails				
Configuration	Plug		Receptacle	
	Series	Tail Termination	Series	Tail Termination
Right Angle to Vertical (Backplane)	75555	Solder-Tail	75541	Press-Fit
	171528	Press-Fit		
Coplanar (Right Angle to Right Angle)	75555	Solder-Tail	171529	Press-Fit
			45840	Solder-Tail
	171528	Press-Fit	171529	Press-Fit
			45840	Solder-Tail

Individual Modules					
Configuration	Module Capacity	Plug		Receptacle	
		Series	Tail Termination	Series	Tail Termination
Right Angle to Vertical (Backplane)	160 Amp (Multipath)	46081	Solder-Tail	46079	Press-Fit
			Press-Fit		
	150 Amp	75556	Solder-Tail	75542	
			Press-Fit		
	80 Amp	75561	Solder-Tail	75545	
			Press-Fit		
	40 Amp		Solder-Tail		
	3 Amp (Signal)	75568	Solder-Tail	75548	
			Press-Fit		
Right Angle to Right Angle (Coplanar)	150 Amp	75556	Solder-Tail	45841	Press-Fit
			Press-Fit		Solder-Tail
	3 Amp	75568	Solder-Tail	46225	Solder-Tail
			Press-Fit		Press-Fit

Note: Refer respective sales drawing for below available variations.
1. Tail Lengths
2. Contact Lengths
3. Peg Option

DESCRIPTION	SERIES
Extreme Power mass Right angle Receptacle Aligner	45839
Extreme Power mass Vertical Receptacle Aligner	75552
Extreme Power mass Plug Side Aligner	75572

2.2 DIMENSIONS, MATERIALS, PLATINGS

See sales drawings for details on dimensions, materials and platings.

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 LISTINGS

UL File Number: E29179

CSA File Number: LR19980 CSA Std. C22.2 No. 182.3

COPLANAR PRODUCT	RIGHT ANGLE TO VERTICAL	VOLTAGE RATING	CURRENT RATING
45840, 45841, 171528, 171529	75555, 75541, 75556, 75542	600 V	150 Amp
	75561, 75545, 46081, 46079 (Single Circuit)	600 V	57 Amp
	75561, 75545, 46081, 46079 (Dual Circuit)	450 V	80 Amp
46225	75548, 75568	50 V	3 Amp

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

Extreme Power mass Connector System Test summary TS-75431-999
Extreme Power mass Connector System Application Specification AS-75541-100
Extreme Power mass Connector System Application Specification AS-171528-001
Extreme Power mass Connector System Application Specification AS-171529-001
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
CSA STD. C22.2 NO. 182.3-M1987

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

Signal Module:	50 Volts
150 Amp Power Module:	600 Volts
40 Amp/Circuit Module (Dual Circuit):	450 Volts
40 Amp Single Circuit Module:	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.

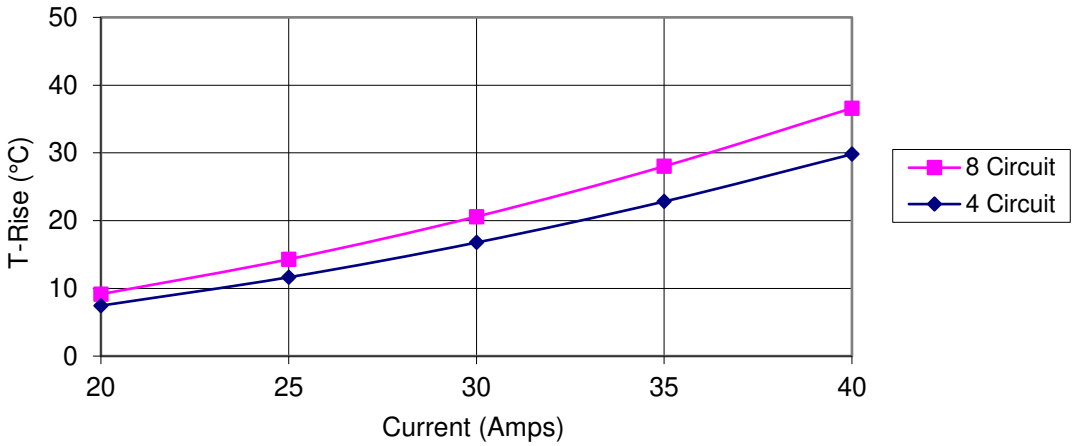
Application Voltage Guideline

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.

4.2 CURRENT

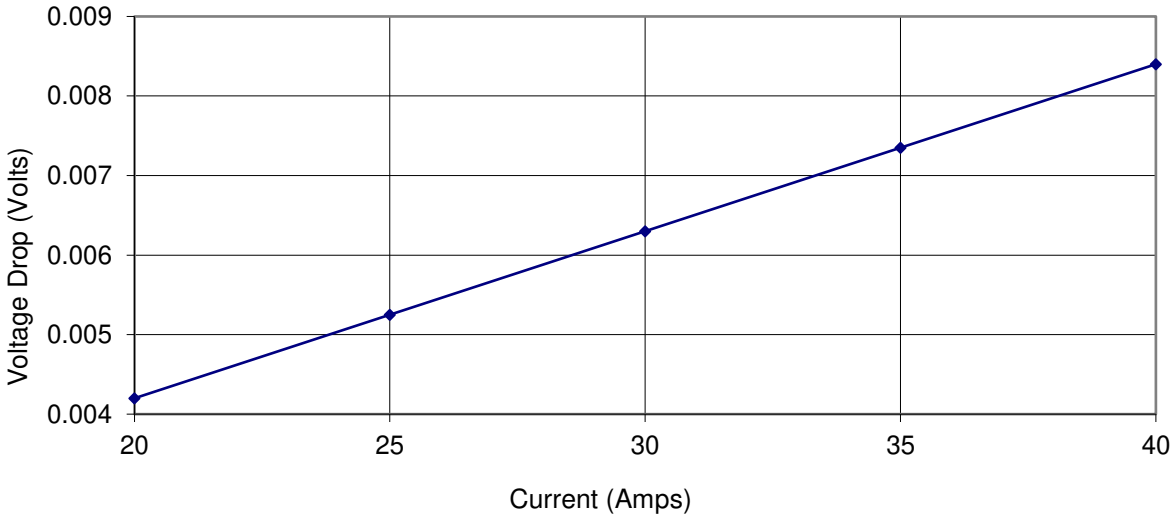
Signal Contact: 3 Amps
150 Amp Power Contact: 150 Amps
80 / 40 Amp Power Contact 40 amps/ circuit
** Current rating is application dependent. Above rating is only a guideline. Appropriate de-rating is required per ambient conditions, copper weight of PCB, gross heating from adjacent modules/components, and other factors that influence connector performance.

Extreme Powermass - 40 Amp Circuit *
Temperature Rise vs. Current - 20 oz Cu



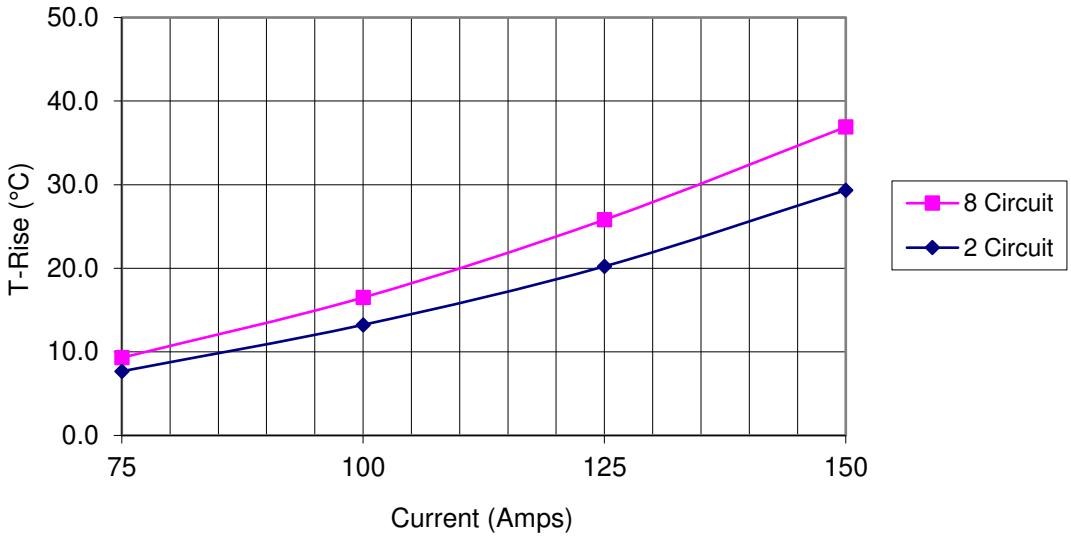
*40 Amp Circuit curves apply to each blade of the 80 Amp Modules (75545,75561),
40 Amp High Voltage Modules (75545, 75561) and the Multi-Path Modules (46079, 46081).

Extreme Powermass - 40 Amp Circuit *
Voltage Drop vs. Current

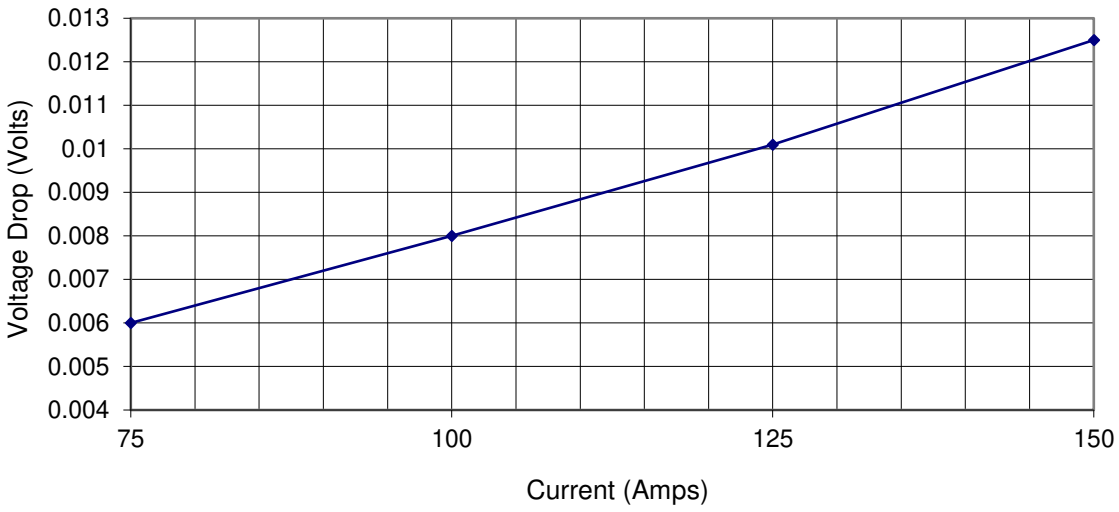


*40 Amp Circuit curves apply to each blade of the 80 Amp Modules (75545, 75561), 40 Amp High Voltage Modules (75545, 75561) and the Multi-Path Modules (46079, 46081).

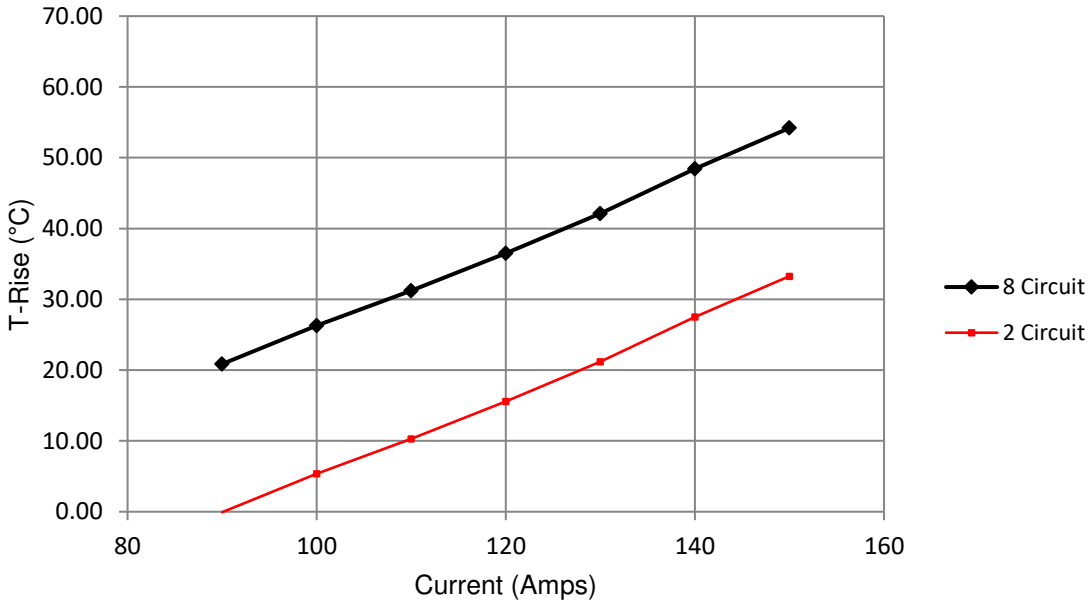
Extreme Powermass - 150 Amp Right Angle to Vertical
Temperature Rise vs. Current - 24 oz Cu



Extreme Powermass - 150 Amp Right Angle to Vertical
Voltage Drop vs. Current

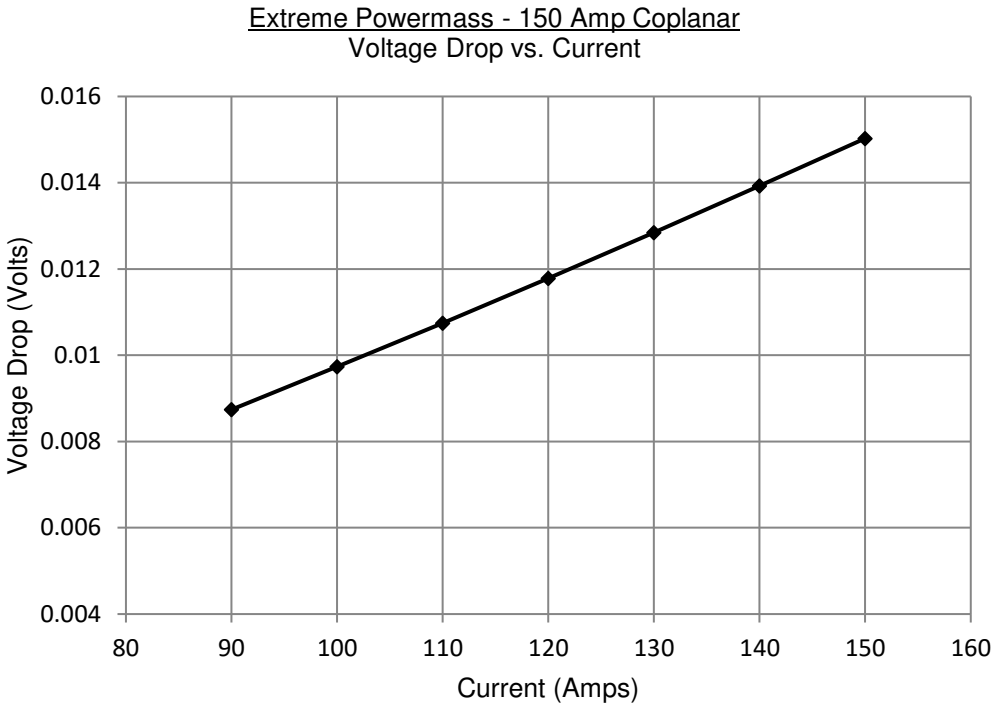


Extreme Powermass - 150 Amp Coplanar
Temperature Rise vs. Current - 22 oz. Cu



EXTreme PowerMass High-Current Connectors Web Page

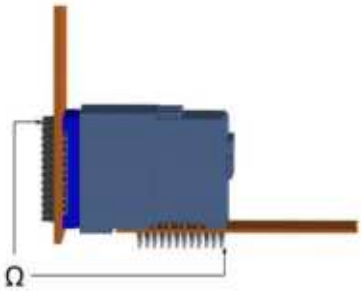
TABLE OF CONTENTS



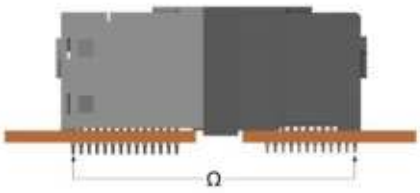
4.3 RESISTANCE

150 Amp Power Contact: 0.10 mohms (nominal)
80 / 40 Amp Power Contact 0.25 mohms (nominal)
All resistance values are nominal, PCB-to-PCB values including connector bulk resistance and contact resistance.

Right Angle to Vertical



Coplanar



4.4 TEMPERATURE

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

Field Temperature and Field Life: 65 °C for 7 years (based on EIA-364-1000, table 8)

Note: Temperature life test duration (section 6.3 item 2) 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

Plated Terminal	**50 Cycles**

As tested in accordance with EIA-364-1000 test method (see section 6.2 item 3 of this specification). Durability per EIA-364-09

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) (EIA-364-23)	Mate connectors, apply maximum voltage of 20 mV and current of 100 mA	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.1.2	Contact Resistance (@ Rated Current)	Mate connectors, apply maximum voltage of 20 mV at the rated current.	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.1.3	Insulation Resistance (EIA-364-21)	Apply 500 VDC between adjacent terminals or ground.	5,000 megaohms minimum
6.1.4	Dielectric Withstanding Voltage (EIA-364-20)	Apply 1500 VDC for 1 minute between adjacent terminals or ground.	No breakdown
6.1.5	Assembly Hi-Pot test	Apply 500 VAC between all module terminals and assembly rails	No breakdown
6.1.6	Temperature Rise	Mate connectors & Measure T-Rise @ Rated Current after 96 Hours per EIA-364-70	30 °C T-Rise

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Mating Force, Single Circuit (EIA-364-37)	Mate connectors at a rate of 25 +/- 6 mm per minute.	130 g per signal pin 2600 g per 150 Amp Contact 1200 g per 40 Amp Contact 2400 g per 80 A Contact (MAX Values) Initial
6.2.2	Unmating Force, Single Circuit (EIA-364-37)	Unmate connectors at a rate of 25 +/- 6 mm per minute.	22 g per signal pin 800 g per 150 Amp Contact 300 g per 40 Amp Contact 600 g per 80 A Contact (MIN Values)
6.2.3	Durability w/o Environment (EIA-364-09)	Mate connectors 50 cycles at a maximum rate of 10 cycles per minute.	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.2.4	Contact retention (EIA-364-29)	Axial pullout force on the terminal in the housing at a rate of 25 +/- 6 mm per minute.	170 g per signal pin 225 g per 150 Amp Contact 200 g per 40 Amp Contact (Minimum Values) **
6.2.5	Vibration (EIA-364-28)	Mate connectors and vibrate per EIA-364-28, test condition D 15 minutes each axis	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.2.6	Mechanical Shock (EIA-364-27)	Mate connectors and shock at 50 g with ½ sine wave (11 milliseconds) shocks in the X, Y, Z axes (18 shocks total)	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm

** Values are for receptacle; plug is insert molded.

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Thermal Shock (EIA-364-1000)	Mate connectors, expose to 10 cycles from 15 deg. C to 85 deg. C per EIA-364 TS-1000	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.3.2	Temperature Life (EIA-364-1000)	Mate Connectors, expose to 180 hours at 105 °C Per EIA-364-17 and EIA-364 TS-1000	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.3.3	Cyclic temperature and humidity (EIA-364-1000)	Mate connectors: expose to 24 cycles from 25 °C / 80% RH to 65 °C / 50% RH	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.3.4	Dust (EIA-364-91)	Unmated 1 hour duration 25 °C / 50% RH dust mass of 9 g/ft^3 at rate of 300 m/min	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.3.5	Mixed flowing Gas (EIA-364-65)	168 hours unmated, 72 hours mated, per EIA-364-65 Class IIA	Maximum Change: Signal Contact: 10 milliohm 150 Amp Contact: 0.25 milliohm 40 Amp Contact: 0.75 milliohm
6.3.6	Resistance to heat from soldering rework (for PCB with OSP vias)	Per EIA-364-61, Test Procedure 4 for compliant pin retention force	Increase in PCB retention force from initial.
6.3.7	Resistance to Soldering Heat	Refer to sec 8.0	No Physical Damage

6.4 COMPLIANT PIN PERFORMANCE

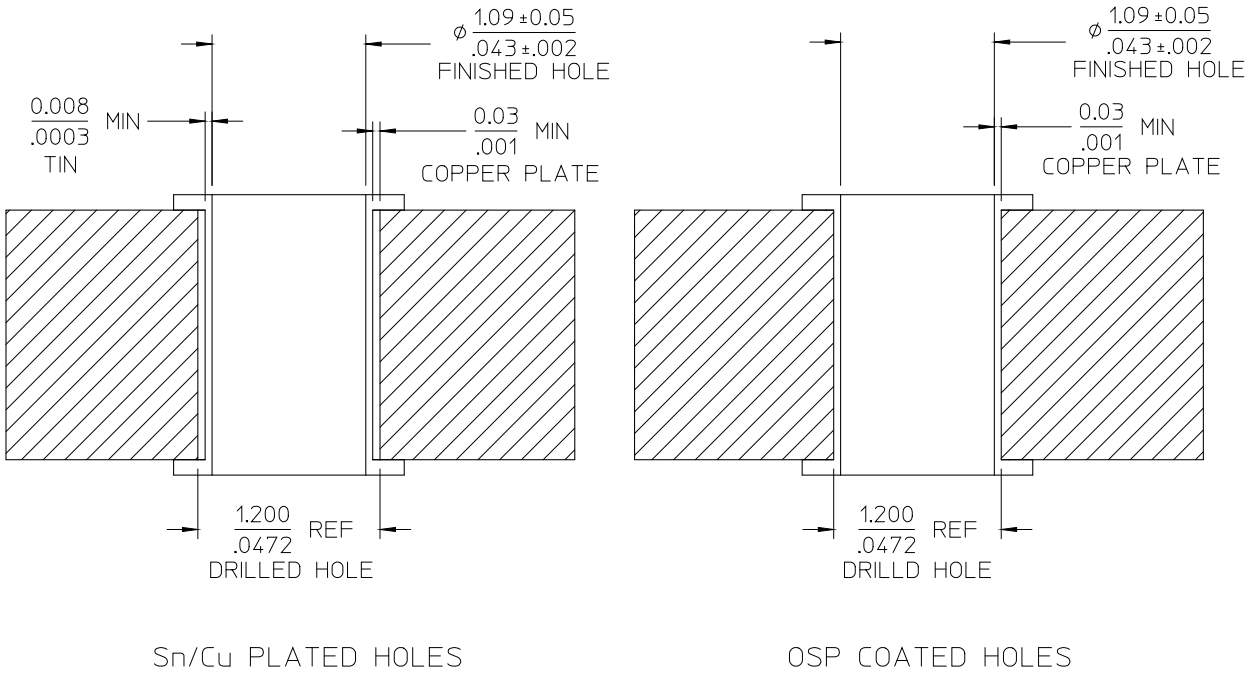
6.4.1 Tin Plated Thru Hole - Insertion and Withdrawal Force (3 times in the same hole) per EIA-364-05 and EIA-364-29.

COMPONENT	TEST CONDITION	REQUIREMENT	
		INSERT.	WITHDR.
Power Socket (Single section)	Insert the single compliant section into the PTH, extract the section from the hole after 12 hrs, repeat 2 times (new part in the same hole)	111 N 25 lb MAX.	28 N 6.5 lb MIN.
Power Blade (Single section)	Insert the single compliant section into the PTH, extract the section from the hole after 12 hrs, repeat 2 times (new part in the same hole)	111 N 25 lb MAX.	28 N 6.5 lb MIN.
Signal Pin (Single pin)	Insert the single compliant pin into the PTH, extract the pin from the hole after 12 hrs, repeat 2 times (new part in the same hole)	111 N 25 lb MAX.	28 N 6.5 lb MIN.
Signal Socket (Single Terminal)	Insert the single terminal into the PTH, extract the terminal from the hole after 12 hrs, repeat 2 times (new part in the same hole)	111 N 25 lb MAX.	28 N 6.5 lb MIN.

6.4.2 OSP Plated Thru Hole - Insertion and Withdrawal Force (3 times in the same hole) per EIA-364-05 and EIA-364-29.

COMPONENT	TEST CONDITION	REQUIREMENT	
		INSERT.	WITHDR.
Power Receptacle (Single section)	Insert the single compliant section into the PTH, extract the section from the hole after 12 hrs, repeat 2 times (new part in the same hole)	98 N 22.0 lb MAX	20.5 N 4.6 lb MIN.
Power Blade (Single section)	Insert the single compliant section into the PTH, extract the section from the hole after 12 hrs, repeat 2 times (new part in the same hole)	98 N 22.0 lb MAX	20.5 N 4.6 lb MIN.
Signal Pin (Single pin)	Insert the single compliant pin into the PTH, extract the pin from the hole after 12 hrs, repeat 2 times (new part in the same hole)	98 N 22.0 lb MAX	16.2 N 3.6 lb MIN
Signal Receptacle (Single Terminal)	Insert the single terminal into the PTH, extract the terminal from the hole after 12 hrs, repeat 2 times (new part in the same hole)	75.6 N 17.0 lb MAX	16.9 N 3.8 lb MIN

6.4.3 PLATED THROUGH HOLE DIMENSIONS

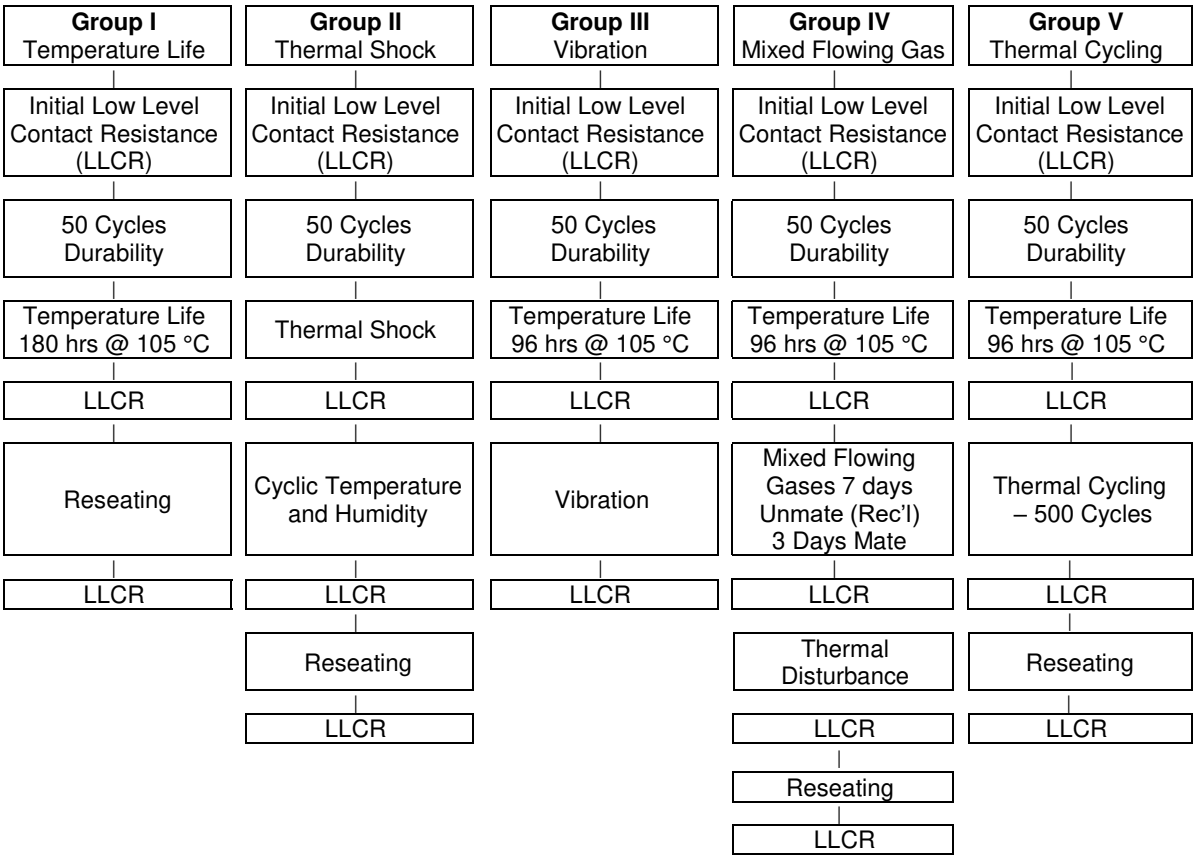


Recommended PCB thickness: 2.38 mm / .093 in. Min. for solder tail.
Recommended PCB thickness: 3.18 mm / .125 in. Min. for press-fit.

PCB Material: FR4

7.0 TEST SEQUENCE

Reliability Test Sequences Per EIA-364-1000



Group VI Thermal Disturbance	Group VII Durability
Initial Low Level Contact Resistance (LLCR)	Dielectric Withstanding Voltage
50 Cycles Durability	LLCR
Dust	50 Cycles Durability
LLCR	LLCR
Thermal Disturbance	200 Cycles Durability
LLCR	LLCR
Reseating	Dielectric Withstanding Voltage
LLCR	LLCR

Individual Tests

- Mating Force Single circuit
- Unmating Force Single circuit
- Contact Retention

Sample Preparation Current Rating
↓
Initial Low Level Contact Resistance (LLCR)
↓
30 °C Temperature Rise (Profile)

Sample Preparation Resistance to Heat from Solder Rework
↓
Initial Insertion & Retention to PCB
↓
Pre-condition 48 hrs @ 125 °C
↓
Solder Profile (Pb free per EIA-364-61 Procedure 4)
↓
Terminal Retention to PCB

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 *

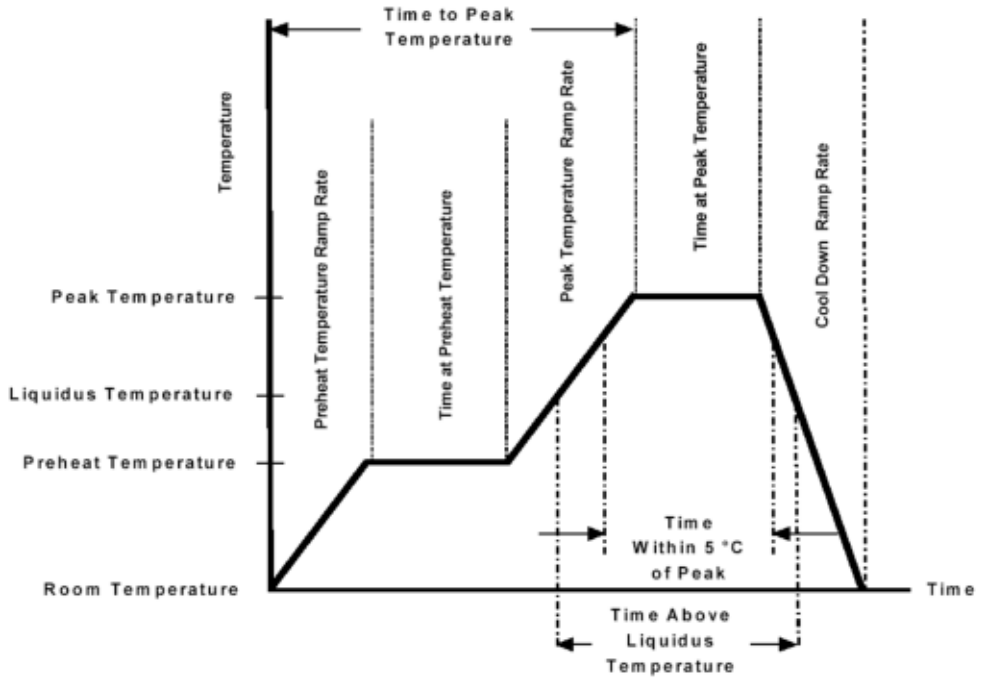
Wave Solder Temperature: 245 °C Maximum
Reflow Solder Temperature: 260 °C Maximum

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)

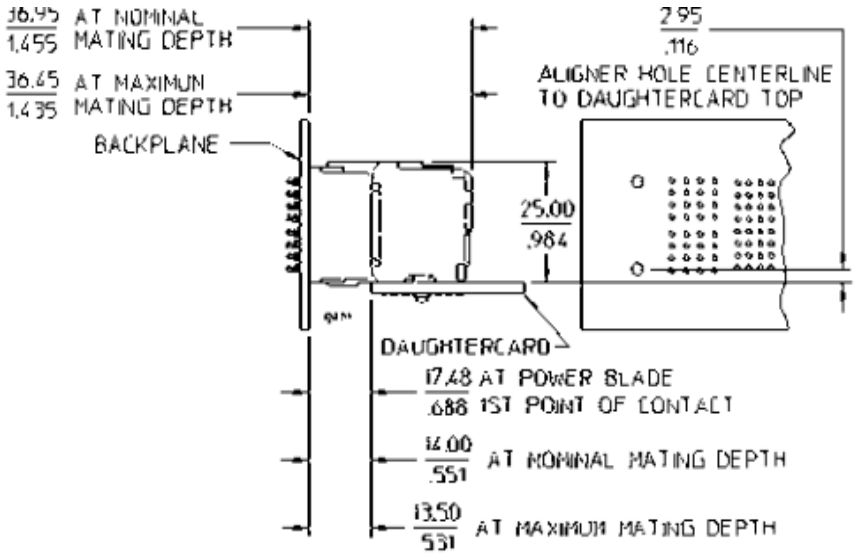


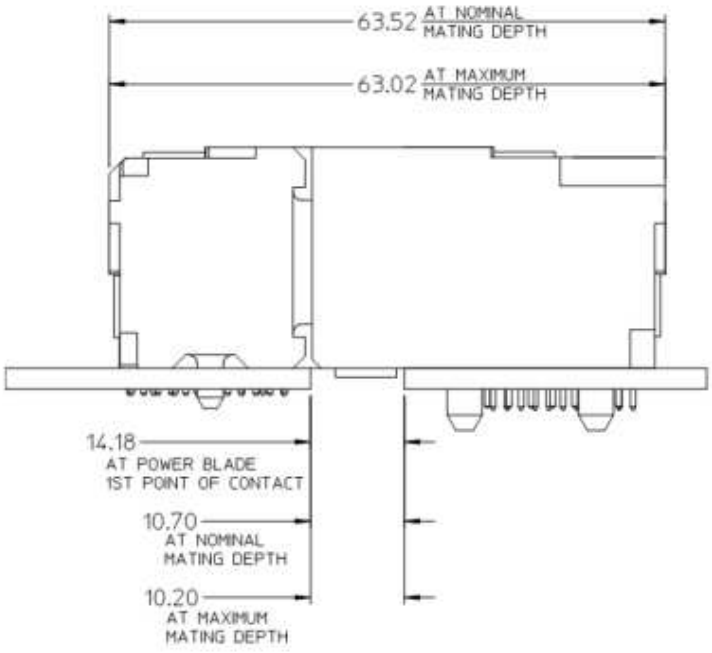
Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquids (217°C)	60 to 150 sec
Peak Temperature	260 +0/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max

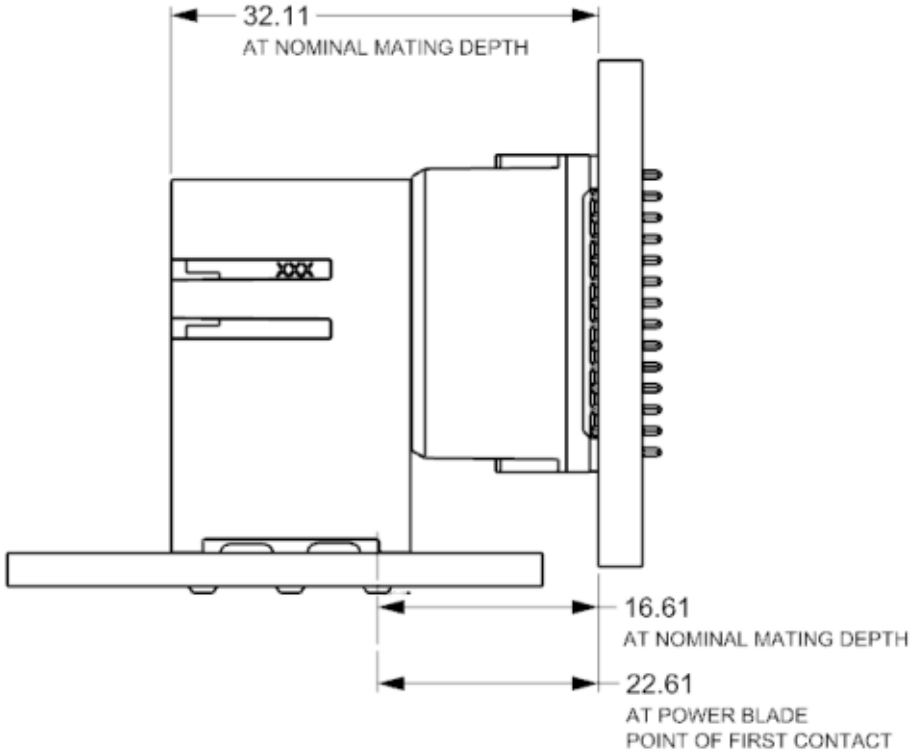
9.0 PACKAGING

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.

10.0 CO-PLANAR MATED DIMENSIONS







EXTreme PowerMass High-Current Connectors Web Page | TABLE OF CONTENTS