3M™ Pak 50 Boardmount Socket, P50 series
P50-XXXS-XXX-EA

3M™ Pak 50 Boardmount Plug, P50 series
P50-XXXP-XXX-EA

Product Specification 78-5102-0141-7

Revised 08-09-12

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1.0 Scope

This document summarizes test methods, test conditions, and product performance requirements for 3M™ Pak 50 Boardmount Socket P50 Series mated to 3M™ Pak 50 Boardmount Plug P50 Series. In the event of performance data conflicts between this specification and any documents listed below, this specification supersedes those documents. Materials and finishes listed in the documents below apply and are included in this specification for reference only.

2.0 3M Customer Documents

78-5100-2049-4 Technical data sheet for Pak 50 Boardmount Plug P50 Series
78-5100-2050-2 Techical data sheet for Pak 50 Boardmount Socket P50 Series

3.0 Performance Testing

Unless otherwise specified, all tests shall be performed on P50-XXXS-XXX-EA sockets mated to P50-XXXP-XXX-EA plugs at ambient environmental conditions per EIA-364. Unless otherwise specified, all values and limits are typical of those obtained by qualification testing of the subject product. All specifications are subject to revision and change without notice from 3M.

4.0 Performance and Characteristics Overview

4.1 Ratings

Dielectric Withstanding Voltage: 500 VACrms at sea level
Current (AC or DC): 1 A
Temperature: -55°C to +85°C
Insulation resistance: >1 $x10^9$ Ω at 500 VDC

4.2 Materials

Socket:
- Material: Glass Filled Nylon
- Flammability: UL 94V-0
- Color: Black
- Contact Material: Phosphor Bronze

Header:
- Material: Glass Filled Nylon
- Flammability: UL 94V-0
- Color: Black
- Contact Material: Phosphor Bronze

4.3 Finishes

Plating:
- Underplating: Nickel
- Wiping Area: 10 µ" [.25 µm] Gold
- Solder Tails: Gold Flash
- Retaining Clips: Tin-Copper

4.4 Regulatory Compliance

See Regulatory Information Appendix (RIA) in the "RoHS compliance" section of **www.3Mconnector.com** for compliance information. See customer drawings for regulatory specifics on each connector.

5.0 Electrical

Description or Parameter	Specification	Test Method	Results
Dielectric Withstanding Voltage (DWV)	No dielectric breakdown or arcing.	Apply 650 VAC_{RMS} Voltage for 1 minute betweeen 2 adjacent contacts.	Pass
Current Rating: All Contacts in Series	Temperature Rise: < 40°C Results: 0.5 A = 6°C Temp. Rise 0.8 A = 17°C Temp. Rise 0.9 A = 22°C Temp. Rise 1.0 A = 25°C Temp. Rise	Ambient: 22°C	Pass
Current Rating: 5 Contacts in Series	Temperature Rise: < 40°C Results: 1.0 A = 4°C Temp. Rise 1.5 A = 7°C Temp. Rise 1.8 A = 9°C Temp. Rise 2.0 A = 12°C Temp. Rise	Ambient: 22°C	Pass
Current Rating: 1 Contacts in Series	Temperature Rise: < 40°C Results: 1.0 A = 4°C Temp. Rise 1.5 A = 5°C Temp. Rise 2.0 A = 7°C Temp. Rise	Ambient: 22°C	Pass
Low Level Contact Resistance (LLCR)	Max R: <25 mΩ	4 Wire Measurement Current: 100mA DC	Pass
Insulation Resistance (IR)	1000 MΩ min.	Apply 500V DC for 1 minutebetween two adjacent contacts.	Pass

6.0 Mechanical

Description or Parameter	Specification	Test Method	Test Standard or Method
Physical Shock	No damage or deformation. No electrical discontinuity >1 μ sec	Acceleration: 490 m/sec^2 Shock Mode: half sine wave Duration: 11 ms 3x in each X,Y,Z opposite direction 100mA DC applied to all contacts in series	Pass

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Vibration	**No damage or deformation.** **No electrical discontinuity >1 μ sec**	**Frequency: 10-55 Hz** **Amplitude: 1.52 mm** **Sweep time: 1 min** **2 hours in each X,Y,Z opposite direction** **100 mA applied to all contacts in series**	**Pass**
Insertion Force	**Insertion Force: < 186.2 N (200 position)**	**Measure with mating connectors**	**Pass**
Withdrawal Force (Contact Retention)	**Withdrawal Force: < 39.2 N (200 position)**	**Measure with mating connectors**	**Pass**
Durability (100 times)	**No damage or deformation.** **LLCR: 25 mΩ Max**	**100 cycles at 400-600 cycles per hour**	**Pass**
Durability (500 times)	**No damage or deformation.** **LLCR: 25 mΩ Max**	**500 cycles at 1000 cycles per hour**	**Pass**

7.0 Physical

Description or Parameter	Specification	Test Method	Result
Visual	**Conforms to the design drawings**	**Visual Inspection**	**Pass**

8.0 Environmental

Description or Parameter	Specification	Requirement or Conditions	Test Standard or Method
Temperature Life (Thermal Aging)	**LLCR: 40 mΩ Max** **No Damage or Deformation**	**Temperature: +85°C** **Duration: 240 hours**	**Pass**
Salt Spray	**No serious corrosion** **LLCR: 25mΩ Max**	**Temperature: +35°C** **Duration: 48 hours** **Concentration: 5%**	**Pass**
Thermal Shock	**No damage or deformation.** **LLCR: 25 mΩ Max** **(5 cycles, -55°C to +85°C)**	**1. -55°C for 30 min** **2. +25°C for 5 min Repeat 1-4, 5 cycles** **3. +85°C for 30 min** **4. +25°C for 5 min**	**Pass**
Humidity	**No damage or deformation.** **DWV: No breakdown or arcing** **LLLCR: 25 mΩ Max**	**Humidity: 90-95% RH** **Temperature: 40°C** **Duration: 96 hrs**	**Pass**

H_2S Exposure	**No serious corrosion. LLLCR: 25 mΩ Max**	**Temperature: 40°C Concentration: 3 ppm RH: 80% Duration: 48 hours**	**Pass**
SO_2 Exposure	**No serious corrosion. LLLCR: 25 mΩ Max**	**Temperature: 40°C Concentration: 10 ppm RH: 80% Duration: 48 hours**	**Pass**

9.0 Qualification Test Groups and Sequences

9.1 Sequenced Tests

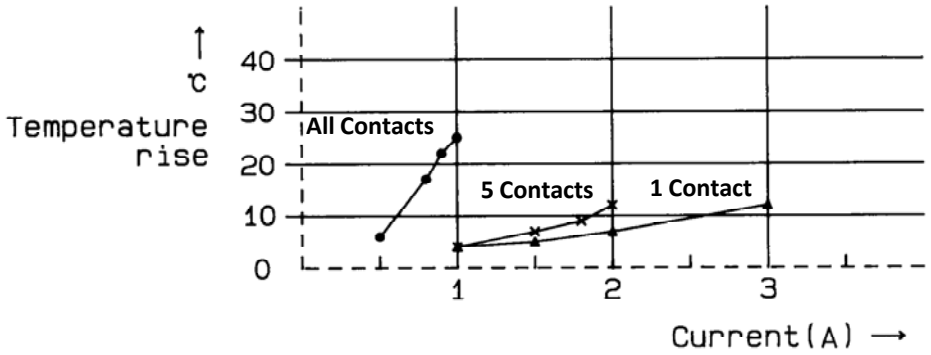
Test or Examination	Test Group					
	A	B	C	D	E	F
Visual	1	1	1	1	1	1
Insulation Resistance	2	2				
Dielectric Withstanding Volatge	3	3				
Low Level Contact Resistance	4	4, 8	3, 6	3, 5	3, 5	3, 5
Total Insertion Force	5					
Total Withdrawal Force	6					
Thermal Shock	7		4			
Vibration	8					
Shock	9					
Humidity		5	5			
Durability (100)		6	2	2	2	2
Salt Spray		7				
S02 Exposure				4		
H2S Exposure					4	
Temperature Life						4

9.2 Independent Tests

1. **Durability (500)**
2. **Dielectric Withstanding Voltage**
3. **Current Rating**
4. **Insulation Resistance**
5. **Mating Force / Contact**
6. **Unmating Force / Contact**

10. Figures

10.1 Temperature Rise Plot



11.0 Agency Listings

11.1 Underwriters Laboratories (UL)

Agency	File No.
UL	E68080

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