3M™ Pak 10 Plug, PK10 series
PK10-XXXPX-X-DA

3M™ Pak 10 Socket, PK10 series
PK10-XXXSX-X-DA

Product Specification 78-5102-0153-2

Revised 08-30-12

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Table of Contents

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1.0 Scope

This document summarizes test methods, test conditions, and product performance requirements for 3M™ Pak 10 Socket PK10 Series mated to 3M™ Pak 10 Plug PK10 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

78-5100-1077-6 Technical data sheet for Pak 10 Plug PK10 Series
78-5100-1078-4 Techical data sheet for Pak 10 Socket PK10 Series

3.0 Performance Testing

Unless otherwise specified, all tests shall be performed on PK10-XXXSX-X-DA sockets mated to PK10-XXXPX-X-DA 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: 315 VACrms at sea level for 1 minute
Current (AC or DC): 0.5 A
Temperature: -55°C to +85°C
Insulation resistance: >1 $x10^9$ Ω at 500 VDC

4.2 Materials

Socket:
- Material: Glass filled LCP
- Flammability: UL 94V-0
- Color: White
- Contact Material: Copper Alloy

Plug:
- Material: Glass Filled LCP
- Flammability: UL 94V-0
- Color: White
- Contact Material: Copper Alloy

4.3 Finishes

Plating:
- Underplating: 120µ"[3.0 µm]Nickel
- Wiping Area: 2 µ" [0.05 µm] min. Gold
- Solder Tails: Gold Flash
- Retaining Clips: Gold Flash over 120µ"[3.0 µm] Nickel

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 315 VAC_{RMS} Voltage for 1 minute betweeen 2 adjacent contacts.	Pass
Current Rating: All Contacts in Series	Temperature Rise: < 40^{0}C Results: 0.5 A =15^{0}C Temp. Rise	Ambient: 23^{0}C	Pass
Low Level Contact Resistance (LLCR)	Max R: <50 mΩ	4 Wire Measurement Current: 1mA DC	Pass
Insulation Resistance (IR)	1000 MΩ min.	Apply 500V DC for 1 minute between 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: 50G 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

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
Peel-Off Test	No damage to connector. No cracking or peeling at the leads.	Reflow Soldering Conditions: Temperature: < 250°C Duration: 1 min. Thickness of cream solder: 0.15 mm Post Reflow Requirements: Force to peel-off leads at 10 mm/min must be > 150g/pin	Pass
Insertion Force	Insertion Force: < 7.8 kg (100 pins)	Measure with mating connectors	Pass
Withdrawal Force (Contact Retention)	Withdrawal Force: < 1.0 kg (100 pins)	Measure with mating connectors	Pass
Durability (100 times)	No damage or deformation. LLCR: 50 mΩ Max	100 cycles at 400-600 cycles per hour	Pass
Durability (500 times)	No damage or deformation. LLCR: 50 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: 50 mΩ Max No Damage or Deformation	Temperature: +85°C Duration: 500 hours	Pass
Salt Spray	No serious corrosion LLCR: 50mΩ Max	Temperature: +35°C Duration: 96 hours Concentration: 5%	Pass
Thermal Shock	No damage or deformation. (5 cycles, -55°C to +85°C)	1. -55°C for 30 min 2. +25°C for 5 min 3. +85°C for 30 min 4. +25°C for 5 min Repeat 1-4, 5 cycles	Pass
Humidity	No damage or deformation. DWV: No breakdown or arcing IR: 1000 MΩ Min	Humidity: 90-95% RH Temperature: 40°C Duration: 96 hrs	Pass

H_2S Exposure	**No serious corrosion.** **LLLCR: 50 mΩ Max**	**Temperature: 40°C** **Concentration: 3 ppm** **RH: 80%** **Duration: 96 hours**	**Pass**
SO_2 Exposure	**No serious corrosion.** **LLLCR: 50 mΩ Max**	**Temperature: 40°C** **Concentration: 10 ppm** **RH: 80%** **Duration: 96 hours**	**Pass**
Moisture	**No damage.** **LLLCR: 50 mΩ Max**	**Conditions:** **hrs.** ◊ **(1) 25°C to 65°C 2.5** ◊ **(2) 65°C 3.0** P **(3) 65°C to 25°C 2.5** ◊ **(4) 25°C to 65°C 2.5** ◊ **(5) 65°C 3.0** P **(6) 65°C to 25°C 2.5** ◊ **(7a) 25°C 8.0** **(7b) -10°C 3.0** ◊ **Humidity 90-98%** P **Humidity 80-98%** 10 cycles of steps 1-7	**Pass**
Resistance to Soldering Heat	**No damage or deformation.**	**Reflow Conditions:** **250°C Peak** **200°C 1 min.**	**Pass**

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9.0 Qualification Test Groups and Sequences

9.1 Sequenced Tests

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

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