Product Data Sheet

78-5102-0040-1

PD-0040

3M™ Boardmount Plug and Receptacle Connectors 96X Series, 2.54 mm (.100 inch)

1.0 Scope

This data sheet summarizes test methods, test conditions and product performance for the 3M 2.54 mm PC-Boardmount Product family. Both plug and receptacle, plated with 10μ" gold at the mating area.
Testing has been conducted in accordance to IEC Std 60603-13 Perfomance Level 3

2.0 Product Tested

Product:	3M 96X Boardmount Plug and Receptacle Connectors Series, 2.54 mm (.100 inch)
Product Number:	961218-6804-AR; 961226-6804-AR; 961220-6804-AR; 961116-6804-AR; 961108-6804-AR; 960116-6202-AR; 960220-6202-AR; 963116-2000-AR; 960108-8100-AR; 960218-8100-AR
Related Specification Sheet:	TS-2181; TS-2187; TS-2189; TS-2190
Qualification also representative for products related to Spec Sheets:	TS-2182; TS-2183, TS-2184, TS-2185, TS-2186, TS-2188, TS-2191, TS-2192, TS-2193

3.0 General Conditions

3.1 Test Specimens

The test specimens shall be strictly in compliance with the design, construction details and physical properties detailed in the relevant Technical Specification Sheet (See Section 2).

3.2 Standard Test Conditions

The test shall be done under the following conditions:

Temperature:	15°C to 35°C
Relative Humidity:	45% to 75%
Atmospheric pressure:	650 to 800 mmHg

4.0 Test Results Summary

	Items	Specification	Test Method	Results
General	Visual	No defects such as deformation, blister, damage, crack, etc.	IEC-512-2-1a	Pass
	Low Level Contact Resistance	Max. R: (Initial) <20 mΩ	IEC-512-2-2a	Pass
Environmental	Durability	Insertions/Withdrawals -50 cycles Max. R: <20 mΩ	IEC-512-7-9a	Pass
	Dry Heat	No physical abnormalities after test 100 ^{o}C for 12 Hours Max. R: <20 mΩ	IEC-512-6-11i	Pass
	Cold	No physical abnormalities after test ----25^{o}C for 16 Hours Max. R: <20 mΩ	IEC-512-6-11j	Pass
	Solderability	Solder Coverage > 95%	IEC-512-1-12a	Pass
Mechanical	Mating Forces	Max force: 3N/ Contact	IEC-512-7-13b	Pass
Electrical	Dielectric Withstanding Voltage	1000 V_{dc} 1 min	IEC-512-2-4a	Pass
	Insulation Resistance	> 5 X 10^{8} Ω @ 100 V_{dc}	IEC-512-2-3a	Pass
Heat Resistance	Compliance to solder profile	MSL 1	JEDEC-020c	Pass

5.0 Testing

Test methods are in accordance with IEC -512.

5.1 General

Visual (Appearance) — IEC-512-2-1a

Purpose

The purpose of this test is to visually examine and dimensionally inspect the connector in order to determine whether the connector conforms to the applicable specification and detail documents not covered by performance requirements.

Test Method

The examination shall be made in accordance with IEC-512-2-1a. The visual examination shall include inspection of the following features as a minimum: workmanship, marking, materials, finish, standards, design and construction. The dimensional inspection shall be a check for compliance with the outline drawings of the detail specification.

Low Level Contact Resistance — IEC-512-2-2a

Purpose

The purpose of this test is to evaluate contact resistance characteristics of electrical contacts under conditions where applied voltages and currents do not alter the physical contact interface or modify the conductive oxide films which may be present.

Test Method

The low-signal level contact resistance shall be tested in accordance with IEC-512-2-2a with circuit current of 100 mA maximum and open circuit voltage of 20 mV maximum.
All readings are in milli-ohms.

5.2 Environmental

Durability — IEC-512-7-9a

Purpose

The purpose of this test is to determine the effects of subjecting electrical connectors to a conditioning action of mating and unmating of connector simulating operations approximating the life of the connector.

Test Method

Connector durability shall be tested in accordance with IEC-512-7-9a

Condition:	50 Cycles
Max speed:	10 mm/s
Max. R:	< 20 mΩ

Dry Heat — IEC-512-6-11i

Purpose

The purpose of this test is to determine the effects on the electrical and mechanical characteristics of the connector resulting from exposure of the connector under specified condition of dry heat.

Test Method

Mated connectors shall be tested in accordance with IEC-512-6-11i.

Temperature:	100°C
Duration:	12 hours
Max. R:	< 20 mΩ

Cold — IEC-512-11j

Purpose

The purpose of this test is to determine the effects on the electrical and mechanical characteristics of the connector resulting from exposure under specified condition of cold.

Test Method

Mated connectors shall be tested in accordance with IEC-512-6-11j.

Temperature:	-25°C
Duration:	16 hours
Max. R:	< 20 mΩ

Solderability — IEC-512-1-12a

Purpose

This test is conducted to determine the suitability of connectors solder tails being adequate covered by solder after dipping process.

Test Method

Mated connectors shall be tested in accordance with IEC-512-1-12a.

Solder:	96.5Sn/3.0Ag/0.5Cu
Solder bath temperature:	260°C
Flux:	R type
Solder Coverage:	> 95 %

5.3 Mechanical

Mating Forces — IEC-512-7-13b

Purpose

The purpose of this test is to determine the mechanical forces required to mate the electrical connectors.

Test Method

The mechanical forces required to mate these electrical connectors shell be determined in accordance with IEC-512-7-13b.

Max speed:	100 mm / min
Maximum force per contact:	3 N

5.4 Electrical

Dielectric Withstanding Voltage — IEC-512-2-4a

Purpose

The purpose of this test is to prove that a given electrical connector can operate safely at its rated voltage and withstand momentary overpotentials due to switching, surges, and other similar phenomena.

Test Method

Withstanding voltage shall be tested in accordance with IEC-512-2-4a.

Applied Voltage:	1000 V_{dc}
Duration:	1 minute
Measurement:	Check for evidence of a breakdown

Insulation Resistance — IEC-512-2-3a

Purpose

The purpose of this test is to establish the methods and procedures to be followed in determining the resistance offered by the insulation materials and the various seals of a connector to a direct current potential tending to produce a leakage of current through or on the surface of these members.

Test Method

Insulation resistance shall be tested in accordance with IEC-512-2-3a.

Applied Voltage:	100 V_{dc}
Duration:	1 minutes
Measurement:	Insulation Resistance
	>5 X 10^8 Ω @ 100 V_{dc}

6.0 Heat Resistance

Heat Resistance Compliance — JEDEC-020C

Purpose

Purpose of this test is to assure that the part does not deform, crack, craze, blister or split under the heat environment needed for Pb-Free Assemblies and soldering with non leaded solder.

Test Method

Avg Ramp –Up Rate (Ts_{max} to Tp)	3°C / sec max (200° - 260°C)
Preheat Ts_{min} Ts_{max} Time (ts_{min} to ts_{max})	 150°C 200°C 60 - 180 sec
Time t_L maintained above Temp T_L T_L t_L	 217°C 60 - 150 sec
Peak Tp/ Classification	260°C +3°C / MSL1
Time t_p within 5°C of Tp	20 – 40 sec
Ramp – Down Rate Time 25°C to Tp	6°C / sec max 8 minutes max.

Results

The 2.54 mm PC-Boardmount family of parts is JEDEC-20C compliant.

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