

Product Data Sheet

**3M™ Pak 100 Shunt,
Series 92995**

929957-08

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1.0 Scope

This data sheet summarizes test methods, test conditions and product performance for the 3M Pak 100 Shunt Series 929957-08 with 30 μ” gold plating.

2.0 Product Tested

Product: 2 Position Shunt
Product Number: 929957-08
Related Specification Sheet: TS-0200
Mating Product: 3M™ Header, Straight Low Profile, 30 μ”
Gold
Mating Product Number: 3597-6002EB

3.0 General Conditions

3.1 Test Specimens

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

Tests shall be done under the following conditions:

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

92995X-0X

4.0 Test Results Summary

Items		Specification	Test Method	Results May 93
General	Visual	No defects such as deformation, blister, damage, crack, etc.	EIA-364-18A	Pass
	Low Level Contact Resistance	Max. ΔR : <10 m Ω	EIA-364-23A	Pass
Environmenta I	Solvent Resistance (Class I, II, III)	No Physical abnormalities after test	EIA-364-11	Pass
	Temperature Life (Thermal Aging)	<ul style="list-style-type: none"> No Physical abnormalities after test Max. ΔR: <10 mΩ 	EIA-364-17A	Pass
	Salt Spray	<ul style="list-style-type: none"> No Physical abnormalities after test Max. ΔR: <10 mΩ 	EIA-364-26A	Pass
	Sine Vibration (Low Frequency)	<ul style="list-style-type: none"> No Physical abnormalities after test Max. ΔR: <10 mΩ No electrical discontinuity > 1 μ sec 	EIA-364-28A Test Condition I	Pass
	Sine Vibration (High Frequency)	<ul style="list-style-type: none"> No Physical abnormalities after test Max. ΔR: <10 mΩ No electrical discontinuity > 1 μ sec 	EIA-364-28A Test Condition III	Pass
	Vibration	<ul style="list-style-type: none"> No Physical abnormalities after test Max. ΔR: <10 mΩ No electrical discontinuity > 1 μ sec 	EIA-364-28A Test Condition V Table II A	Pass
	Humidity	Max. ΔR : <10 m Ω	EIA-364-31A	Pass
	Thermal Shock	<ul style="list-style-type: none"> No Physical abnormalities after test Max. ΔR: <10 mΩ 	EIA-364-32B	Pass
	Resistance to Solder Heat	No Physical abnormalities after test	EIA-364-56A	Pass
Mechanical	Contact Wiper Normal Force	150g min.	EIA-364-04	Pass
	Durability	<ul style="list-style-type: none"> 50 Insertions/Withdrawals Max. ΔR: <10 mΩ 	EIA-364-09B	Pass
	Contact Retention	900g min.	EIA-364-29A	Pass
Electrical	Dielectric Withstanding Voltage	1000 V _{rms} @ Sea Level	EIA-364-20A	Pass
	Insulation Resistance	1 X 10 ⁹ @ 500 V _{dc}	EIA-364-21A	Pass
	Current Rating	1A	EIA-364-70	Pass
Plating	Gold Thickness	30 μ "	EIA-364-48, C	Pass
	Nitric Acid Vapor Test (Gold)	1 Spot per Sample Lot	EIA-364-53	Pass
	Adhesion	Required	MIL-G-45204, 4.5.2	Pass

5.0 Testing

Test methods are based upon EIA Standard 364.

5.1 General

Visual (Appearance) — EIA-364-18A

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 EIA-364-18A. 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 — EIA-364-23A

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 EIA-364-23A with circuit current of 100 mA maximum and open circuit voltage of 20 mV maximum. The termination resistance includes contact to wire interface resistance, bulk resistance of contact, and resistance of solder joints of connectors to circuit boards.

The initial readings are in milli-ohms. All other readings are the change in resistance from the initial reading in milli-ohms.

5.2 Environmental

Solvent Resistance — EIA-364-11

Purpose

The purpose of this test is to simulate the ability of connector materials to withstand solvents which may be used to clean components as well as to determine marking and color code integrity.

Test Method

The solvent resistance of the connector materials shall be tested in accordance with EIA-364-11.

Temperature Life — EIA-364-17A

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 to an elevated ambient temperature for a specified length of time.

Test Methods

Mated connectors shall be tested in accordance with EIA-364 17A, Method A, Test Condition 4.

Temperature: 105°C
Current: Without current load
Duration: 500 hours
Reading Taken at Hours: Initial, 48, 120, 240, 500

Salt Spray — EIA-364-26A

Purpose

The purpose of this test is to determine the effects of a controlled salt laden atmosphere on the electrical connector.

Test Methods

Mated connectors shall be tested in accordance with EIA-364-26A, Test Condition B.

Salt Solution: 5%
Temperature: 35°
Duration: 48 Hours
Readings: Initial, final

Sine Vibration (Low Frequency) — EIA-364-28A

Purpose

The purpose of this test is to determine the effects of vibration within the predominant or random vibration frequency ranges and magnitudes that may be encountered during the life of the connector.

Test Methods

Mated connectors shall be tested in accordance with EIA-364-28A, Test Condition I.

Frequency: 10 Hz to 55 Hz to 10 Hz
Time and Direction: 2 hours each in X, Y & Z
Current: 100 mA, all contacts
Amplitude: .03"
Reading: Initial, final

Sine Vibration (High Frequency) — EIA-364-28A

Purpose

The purpose of this test is to determine the effects of vibration within the predominant or random vibration frequency ranges and magnitudes that may be encountered during the life of the connector.

Test Methods

Mated connectors shall be tested in accordance with EIA-364 28A Test Condition III.

Frequency: 10 Hz to 2000 Hz to 10 Hz
Maximum Force: 15g
Time and Direction: 20 minutes each in X, Y & Z, 12 times
Current: 100 mA, all contacts
Reading: Initial, final

Vibration — EIA-364-28A

Purpose

The purpose of this test is to determine the effects of vibration within the predominant or random vibration frequency ranges and magnitudes that may be encountered during the life of the connector.

Test Methods

Mated connectors shall be tested in accordance with EIA-364-28A, Test Condition V, Table II A

Frequency: 50 Hz to 2000 Hz
6 dB/octave - 50 Hz to 100 Hz,
6 dB/octave - 100 Hz to 1000 Hz
6 dB/octave - 1000 Hz to 2000 Hz
Upper and Lower Tolerance Limits: ± 1.5 dB
Power Spectral Density: .02
 G_{rms} Min.: 5.2
Duration: 6 hours
Readings: Initial, final

Humidity — EIA-364-31A

Purpose

The purpose of this test is to permit evaluation of the properties of materials used in connectors as they are influenced or deteriorated by the effects of high humidity and heat condition.

Test Methods

Mated connectors shall be tested in accordance with EIA-364-31A, Test Condition A, Method II, steady state humidity.

Temperature Range: 40°C
Relative Humidity: 95%
Duration: 96 Hours
Readings Taken at Day: Initial, final

Thermal Shock — EIA-364-32B

Purpose

The purpose of this test is to determine the resistance of a given electrical connector to exposure at extremes of high and low temperatures and to the shock of alternate exposures to these extremes, simulating the worst probable conditions of storage, transportation and application.

Test Methods

Mated connectors shall be tested in accordance with EIA-364-32B, Test Condition II.

Temperature: -55°C & +105°C
Cycle Time: 30 minutes each temperature
Transition Time: 5 minute maximum
(using 2 chambers)
Cycles: 5
Reading: Initial, final

Resistance to Solder Heat — EIA-364-56A

Purpose

This test is performed for the purpose of determining whether the connector can withstand the effects of the heat to which it will be subjected during the soldering of its' terminations by solder dip, soldering iron, solder wave, or reflow soldering techniques.

Test Method

The resistance to solder heat shall be determined in accordance with EIA-364-56: Procedure 1 — Solder Cup Terminations; Procedure 2 — Solder Eyelet Terminations; Procedure 3 — Wave Solder Terminations;

Procedure 4 — Reflow Soldering (Vapor Phase).

5.3 Mechanical

Contact Wiper Normal Force — EIA-364-04

Purpose

The purpose of this test is to determine the magnitude of the normal force being generated by a contact system at any given deflection within its normal operating levels.

Test Method

The normal force/deflection characteristics for the contacts shall be determined in accordance with EIA-364-04.

Durability — EIA-364-09B

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 EIA-364-09B.

Mating and Unmating Forces — EIA-364-13A

Purpose

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

Test Methods

The mechanical forces required to mate and unmate these electrical connectors shall be determined in accordance with EIA-364-13A.

Contact Retention — EIA-364-29A

Purpose

The purpose of this test is to impose axial forces on the connector contacts to determine the ability of the connector to withstand forces that tend to displace contacts from their proper location within the connector body and resist contact pullout and pushout.

Test Methods

Contact Retention shall be tested in accordance with EIA-364-29A.

5.4 Electrical

Dielectric Withstanding Voltage — EIA-364-20A

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 Methods

Withstanding voltage shall be tested in accordance with EIA-364-20A. All contacts wired to test opposing and adjacent pairs of contacts.

Applied Voltage: 1000 VAC
Duration: 1 minute
Measurement: check for an evidence of a breakdown

Insulation Resistance — EIA-364-21A

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 Methods

Insulation resistance shall be tested in accordance with EIA-364-21A. All contacts wired to evaluate opposing and adjacent pairs of contacts.

Applied Voltage: 500 VDC
Duration: 2 minutes
Measurement: Insulation resistance

Current Rating — EIA-364-70

Purpose

The purpose of this test is to establish the current rating of the connector.

Test Methods

The temperature rise vs. current relationship shall be determined in accordance with EIA-364-70, Method A.

5.5 Plating

Metallic Coating Thickness — EIA-364-48

Purpose

The purpose of this test is to determine the metallic coating thickness on the contact surfaces.

Test Method

Metallic coating thickness shall be tested in accordance with EIA-364-48, Method C — X-Ray Fluorescence.

Nitric Acid Vapor Test, Gold Finish — EIA-364-53

Purpose

The purpose of this test is to determine the magnitude of porosity as well as other surface defects inherent in the application of the gold finish on the contacts.

Test Method

The porosity of the gold plated contacts shall be determined in accordance with EIA-364-53.

Metallic Coating Adhesion — MIL-G-45204, Section 4.5.2

Purpose

The purpose of this test is to determine if the metallic coating adhere to the base metal and to each other.

Test Method

The adhesion of the metallic coatings shall be determined using the bend test in accordance with MIL-G-45204C, Section 4.5.2.1.

Appendix A — Test Method Cross Reference

Section	EPD Product Evaluation Test Methods And Cross-Reference	EIA RS-364	IEC 512	MIL 1344	MIL 202
m	Contact Wiping Tab Normal Force	4			
m	Durability	9B	7-9a	2016	
m	Mating/Unmating Force	13A	7-13b	2013.1	
e	Temperature Life (Thermal Aging)	17A	5-9b	1005.1	108A
g	Visual	18A	2-1a		
l	Dielectric Withstanding Voltage	20A	2-4a	3001.1	105, 301
l	Insulation Resistance	21A	2-3a	3003.1	302
g	Low Level Contact Resistance	23A	2-2a	3002.1	307
e	Salt Spray	26A	6-11f	1001.1,A	101D
e	Sine Vibration (Low Frequency)	28A		2005.1, I	
e	Sine Vibration (High Frequency)	28A		2005.1, III	
e	Vibration	28A*	4-6d	2005.1, V, IIA	204D, 201A, 214A
m	Contact Retention	29A	8-15d	2007.1	
e	Humidity (Damp Heat Steady State)	31A*	6-11c	1002.2	106F
e	Thermal Shock (Temperature Cycling)	32B*	6-11d	1003.1	107G
p	Metallic Coatings Thickness	48			
p	Nitric Acid Vapor Test (gold)	53			
e	Resistance To Soldering Heat	56A	6-12d		210B,B
l	Current/Temperature Rating	70	3-5b		

Section:

e = environmental
 l = electrical
 p = plating

g = general
 m = mechanical

* = Testing performed to a modification of the standard.

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