

# **3M™ Four-Wall Header, 3000 Series, Compliant Pin**

**Product Specification 78-5102-0135-9**

**Released: 12-01-2021**



## 1. Scope

This document summarizes test methods, test conditions and product performance requirements for the 3M™ Four-Wall Headers, 3000 Series, Compliant Pin type. Listings of materials, finishes, test conditions, and test standards are included in this specification. In the event of conflict between this specification and any documents listed below, the listed documentation supersedes this specification.

## 2. 3M Documents

78-5100-0478-7	TS-0478, Technical Data Sheet for 3M™ Four-Wall Header, 3000 Series, Compliant Pin
78-9100-7795-3	Instructions for 3M™ Polarizing Key, 3518
34-7038-0818-7	Instructions for Compliant Pin Tool, 3442-00XX

## 3. Performance and Test Description

Unless otherwise specified, all tests shall be performed on the N3433-6X0T02RB or N3372-6X0T02RB headers with 30μ" of gold mated to 3425-XXXX or 3334-XXXX sockets with 30 μ" of gold using 3M™ Cables 3365 or 3801 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.

## 4. Requirements Overview

### 4.1 Ratings

Dielectric Withstanding Voltage: 1000 VAC<sub>RMS</sub> at sea level

Current: All Lines: 1.75 A (All lines powered)

6 Lines: 3.00 A (Adjacent lines powered in 2 x 3 configuration)

EIA-364-070 method 2, 30°C maximum temperature rise.

Temperature: -55°C to +105°C

Insulation Resistance: >1 x10<sup>9</sup>Ω at 500 VDC

UL Rating: 1.0A, 125V, 130C

### 4.2 Materials

Insulation: Glass Filled PCT, High Temperature Option

Contact: Copper Alloy

### 4.3 Finishes

Plating:

TS-0478

Overall, Nickel: 50 - 150 μ inches, ASTM B689-97, SAE AMS-QQ-N-290

Wipe, Gold: 30 μ inches Avg, MIL-G-45204 Type II, Grade C, ASTM B488-01

Tail, Matte Tin: 200-300 μ inches Matte Tin

### 4.4 Regulatory Compliance

For regulatory information about this product, visit [3M.com/regs](http://3M.com/regs) or contact your 3M representative.

**5. Electrical**

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Dielectric Withstanding Voltage	1000	VAC <sub>RMS</sub>	Measured between adjacent and opposing contacts. No disruptive discharge during 1 minute duration. Sea level with 50% relative humidity. Excludes cable.	EIA-364-20F Method A Test Condition I
Dielectric Breakdown Voltage	1000	VAC/sec	Ramp assembled pair at 500V/s until electrical arc. Sea level with 70% relative humidity. Excludes cable.	EIA-364-20F Method A Test Condition I
Insulation Resistance	>1x10 <sup>9</sup>	Ohms	Mated connectors. Measured between adjacent and opposing contacts. 500 VDC for 1 minute duration.	EIA-364-21F
Current Rating		Amperes	Mated to a multi-wipe board mount socket connector.	EIA-364-70A Method 2
	3.00		6 line driven. 30°C temp. rise. 20% derated.	
	1.75		All line driven. 30°C temp. rise. 20% derated.	
Low Level Connection Resistance	<10	Milliohms	Full Contact as mated to PCB and Socket Contact 10 milliohm maximum ΔR contact resistance per mated interface throughout testing.	EIA-364-23C
Low Level Connection Resistance	<10	Milliohms	Compliant pin interface to PCB 1 milliohm max average ΔR per connector, 5 milliohm max ΔR per individual contact	EIA-364-23C

**6. Mechanical**

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Header Pin Retention / Contact	>900	grams	Force / contact required to remove pin from header body.	EIA-364-29B
Insertion Force	<45	lbs	1st and 3rd insertions. Rate 1.0 in/min. No physical abnormalities	EIA-364-29B
Retention Force	≥5	lbs	1st and 3rd withdrawals. Rate 1.0 in/min. No physical abnormalities.	EIA-364-29B
Vibration	20-500 4.9 45 min	Hz g minutes	X, Y, & Z axis. Mated connector shall exhibit no discontinuities greater than 10 ns and 10 milliohm maximum ΔR contact resistance throughout testing.	EIA-364-28F Condition VII, Table 4 Condition E, 45min
Durability (Full)	50	Mating cycles	10 milliohm maximum ΔR contact resistance per mated interface throughout testing.	EIA-364-09C

**7. Physical**

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Visual	NA	NA	No defects such as deformation, blister, damage, crack, etc.	EIA-364-18A
(Metallic Coating) Adhesion	NA	NA	No cracking, flaking.	MIL-G-45204 Section 4.6.2
Header Plating thickness Nickel Gold Wipe Tin Tail	50-150 30 Avg 200-300	μ"	Average of random measurements from any 3 lots.	EIA-364-48 (A)

## 8. Environmental

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Temperature Life	300 105	hours °C	No physical abnormalities. 1 milliohm max average $\Delta R$ connector, 5 milliohm max $\Delta R$ individual, compliant pin to board interface. 10 milliohm maximum $\Delta R$ contact resistance per mated interface throughout testing.	EIA-364-17C Method A Condition 4
Humidity Temperature Cycling	10 +25 to +65 80 to 100 -10	Days °C % RH °C cold shock	-10C sub cycle. No physical abnormalities. 1 milliohm max average $\Delta R$ connector, 5 milliohm max $\Delta R$ individual, compliant pin to board interface. 10 milliohm maximum $\Delta R$ contact resistance per mated interface throughout testing.	EIA-364-31F Method IV Fig 1
Thermal Shock	-55 to +105 5	°C cycles	No physical abnormalities. 1 milliohm max average $\Delta R$ connector, 5 milliohm max $\Delta R$ individual, compliant pin to board interface. 10 milliohm maximum $\Delta R$ contact resistance per mated interface throughout testing.	EIA-364-32G Method A, Test Cond. VII
Salt Spray	5 48	% NaCl hours	10 milliohm maximum $\Delta R$ contact resistance per mated interface throughout testing.	EIA-364-26C Test Cond. B
Plated Through Hole Integrity	3	Conditioning Cycles	Average hole distortion $\leq 0.0015$ in, no distortion $> 0.002$ in Evidence of continuous Cu btwn compliant pin and board material No evidence of physical damage to the board/via (cracks, pad lifting, etc)	EIA-364-96

## 9. Test Sequence

### 9.1 Sequenced Tests

### TEST FLOW

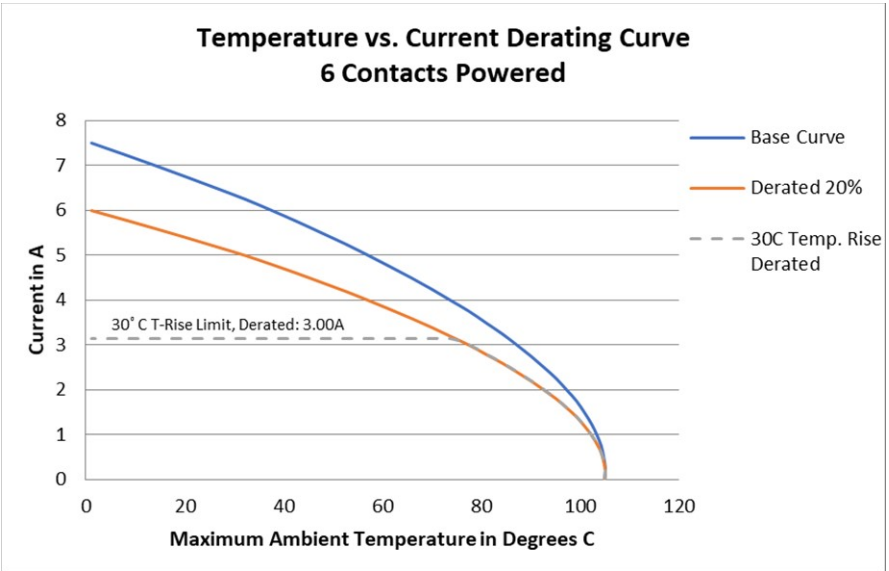
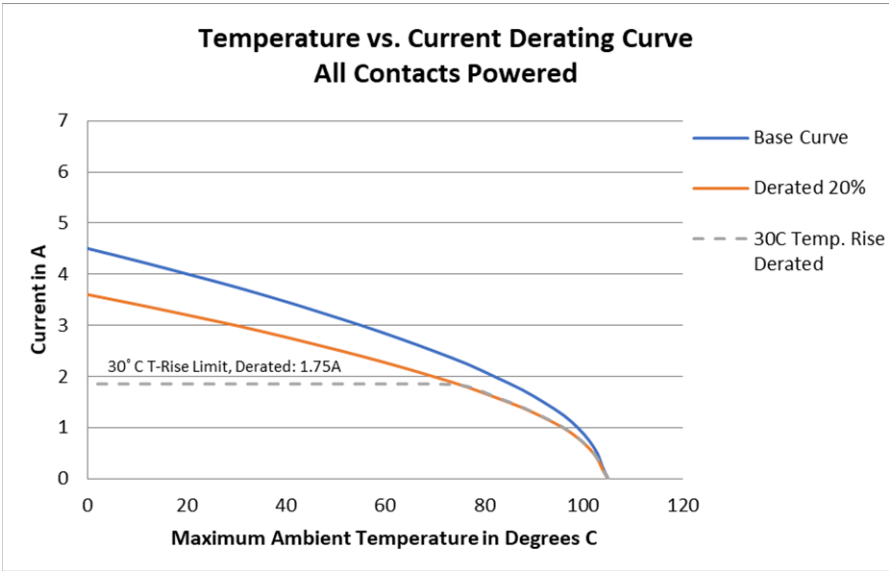
TEST	EIA 364 TP NO.	TEST SEQUENCE						
		A	B	C	D	E	F	G
Visual	18	0	0, 7	0, 9	0, 7	0, 7	0, 2	0, 6
Durability - 50 cycles	13			3		3		3
LLCR - Individual, Hand Probe with Keithly 580	23	2, 6	1, 4	1, 7	1, 4	1, 5		
LLCR - Automated 3M LLCR System #2 or #3	23		2, 5	2, 5, 8	2, 5	2, 6		
Insertion Force 1st contact insertion	29	1						
Retention Force 1st contact insertion	29	3	6	8	6			
Hole Conditioning	-	4						
Insertion Force 3rd contact insertion	29	5						
Retention Force 3rd contact insertion	29	7						
Plated through hole integrity (x-section & measure)	96	8						
Temperature Life (Full)	17				3			
Vibration	28		3					
Thermal Shock	32			4				
Humidity Temperature Cycling	31			6				
Salt Spray	26					4		
Dielectric Withstanding Voltage	20							1, 4
Dielectric Breakdown Voltage	20							7
Insulation Resistance	21							2, 5
Temperature Rise vs. Current	70						1	

### 9.2 Independent Tests

#### 1. Contact Retention

10. Figures

10.1 Current Rating



11. Agency Listings

11.1 Underwriters Laboratories (UL)

Agency	File No.
UL	E68080
CUL	E68080

Unless otherwise noted, references to industry specifications are intended to indicate substantial compliance to the material elements of the specification. Such references should not be construed as a guarantee of compliance to all requirements in a given specification.

Regulatory: For regulatory information about this product, visit [3M.com/regs](https://www.3m.com/regs)

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