

**3M™ Surfacemount Header**  
**N46XX Series**

**Product Specification 78-5102-0179-7**

**Revised Date 07-22-2013**

## Table of Contents

	<b>Title Page and Contents</b> .....	<b>1</b>
<b>1.0</b>	<b>Scope</b> .....	<b>3</b>
<b>2.0</b>	<b>3M Customer Documents</b> .....	<b>3</b>
<b>3.0</b>	<b>Performance Testing</b> .....	<b>3</b>
<b>4.0</b>	<b>Performance and Characteristics Overview</b> .....	<b>3</b>
<b>5.0</b>	<b>Electrical</b> .....	<b>4</b>
<b>6.0</b>	<b>Mechanical</b> .....	<b>4</b>
<b>7.0</b>	<b>Physical</b> .....	<b>5</b>
<b>8.0</b>	<b>Environmental</b> .....	<b>6</b>
<b>9.0</b>	<b>Qualification Test Groups and Sequences</b> .....	<b>7</b>
<b>10.0</b>	<b>Figures</b> .....	<b>8</b>
	<b>Important Notice</b> .....	<b>10</b>
	<b>Warranty Information</b> .....	<b>10</b>

Steven A. Neu: Approved 07-22-13  
Sandra J. Stuckert: Approved 07-22-13  
Jim W. Wessman/Rachel A. Brynsvold: Approved 07-22-13

## 1.0 Scope

This document summarizes test methods, test conditions, and product performance requirements for 3M Surface Mount Headers N4600. 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 supercedes this specification.

## 2.0 3M Customer Documents

78-5100-0168-4 Customer drawing for Surface Mount Header N4600 Series  
78-9100-7795-3 Instruction sheet for 3M™ Polarizing Key 3518

## 3.0 Performance Testing

Unless otherwise specified, all tests shall be performed on 3M™ Wiremount Sockets, 3000 Series mated to 3M™ Round Conductor Flat Cable, 3365 Series at 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: 1000 VACrms at sea level

Current (AC or DC):

4.75 A 1 line energized

2.25 A 6 lines\* energized

1.25 A All lines energized

\*Lines are adjacent in 2x3 configuration

Current rating conditions: 30°C temperature rise, 20% derated

Temperature: -55°C to +105°C

Insulation resistance:  $>1 \times 10^9 \Omega$  at 500 VDC

### 4.2 Materials

Header:

Insulation: High temperature glass filled polyester PCT, black, 94V-0

Contact: Copper alloy

### 4.3 Finishes

Plating:

Nickel: 80 - 150  $\mu$  inches, ASTM B689-97, SAE AMS-QQ-N-290

Gold options: 30  $\mu$  inches, ASTM B488-01 Class C

Sn: 200-300  $\mu$  inches Matte Tin or 100-300  $\mu$  inches Tin-Lead

### 4.4 Regulatory Compliance

See Regulatory Information Appendix (RIA) in the "RoHS compliance" section of [www.3Mconnectors.com](http://www.3Mconnectors.com) for compliance information. See customer drawings for regulatory specifics on each connector.

## 3M Electronic Solutions Division

Interconnect Products  
6801 River Place Blvd.  
Austin, TX 78726-9000  
[www.3Mconnectors.com](http://www.3Mconnectors.com)

### 5.0 Electrical

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Dielectric Withstanding Voltage	1000	VACrms	Measured between adjacent and opposing contacts. No disruptive discharge during 1 minute duration. Sea level with 50% relative humidity.	EIA-364-20B Method B Condition I
Current Rating per Line	4.75	Amperes	1 line energized.	30°C temperature rise, 20% derated.
	2.75		6 lines energized.	
	1.25		All lines energized.	
Low Level Contact Resistance	≤10	Milliohms	10 milliohm maximum ΔR contact resistance per mated interface throughout testing.	EIA-364-23A
Insulation Resistance	>1000	Megohms	Measured between adjacent and opposing contacts with 500 VDC applied for 1 minute.	EIA-364-21C

### 6.0 Mechanical

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Header Pin Retention	5.0 lb Min	Lbs	Force required to dislodge pin from housing when pushed in mating direction.	EIA-364-29B
Vibration	≤10	Nano-seconds	Mated connectors shall exhibit no discontinuities greater than specified. 10 milliohm maximum ΔR contact resistance per mated interface throughout testing.	EIA-364-28A Condition V Letter A, 1.5 hours each plane
Physical Shock	≤10	Nano-seconds	Mated connectors shall exhibit no discontinuities greater than specified. 10 milliohm maximum ΔR contact resistance per mated interface throughout testing.	EIA-364-27B Condition H

**7.0 Physical**

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Visual	N/A	N/A	No defects such as deformation, blisters, cracks or other damage.	EIA-364-18A
Nickel Plating Thickness	(80-150)	(Micro-inches)	Average of random measurements from any 3 lots shall not be less than specified.	EIA-364-48
Gold Plating Thickness	(30)	(Micro-inches)	Average of random measurements from any 3 lots shall not be less than specified.	EIA-364-48
Tin Plating Thickness	(200)	(Micro-inches)	Average of random measurements from any 3 lots shall not be less than specified.	EIA-364-48

**8.0 Environmental**

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Temperature Life (Thermal Aging)	105	Degrees C	No physical abnormalities. 10 milliohm maximum $\Delta R$ contact resistance throughout testing.	EIA-364-17B Method A Condition 4
	1000	Hours		
Durability	50	Mating cycles	10 milliohm maximum $\Delta R$ contact resistance throughout testing.	EIA-364-09C
Thermal Shock	-55 & 105	Degrees C	No physical abnormalities. 10 milliohm maximum $\Delta R$ contact resistance throughout testing.	EIA-364-32C Condition II
	5	Cycles		
Humidity-Temperature Cycling	65 to -10	Degrees C	No physical abnormalities. 10 milliohm maximum $\Delta R$ contact resistance throughout testing.	EIA-364-31B Condition B Method III
	90 to 98	% Relative humidity		
	240	Hours		
Salt Spray	96	Hours	10 milliohm maximum rR contact resistance throughout testing.	EIA-364-26
Header Solderability, Lead-Free Dip Test	>95	Percent	Coverage of solderable area	EIA-364-52 Category 3
Lead-Free Solder Process Capability	260	Degrees C	No defects such as deformation, blisters, cracks or other damage. Must maintain dimensional stability.	J-STD-020C Level 1
	3 Times	Rework capability		

## 9.0 Qualification Test Groups and Sequences

### 9.1 Sequenced Tests

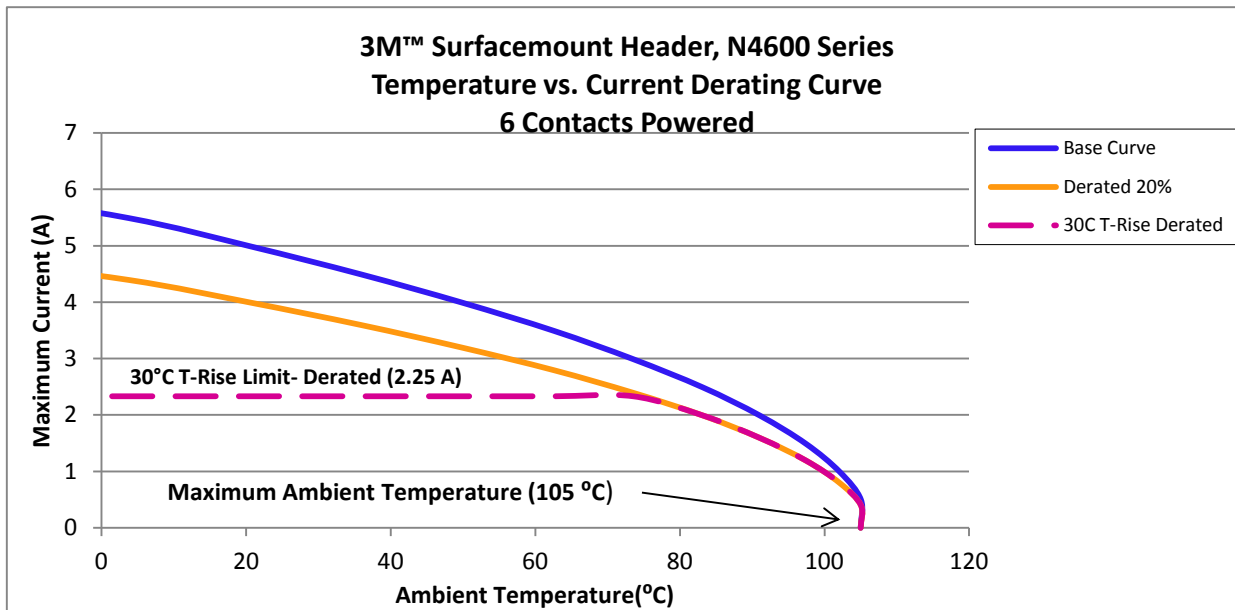
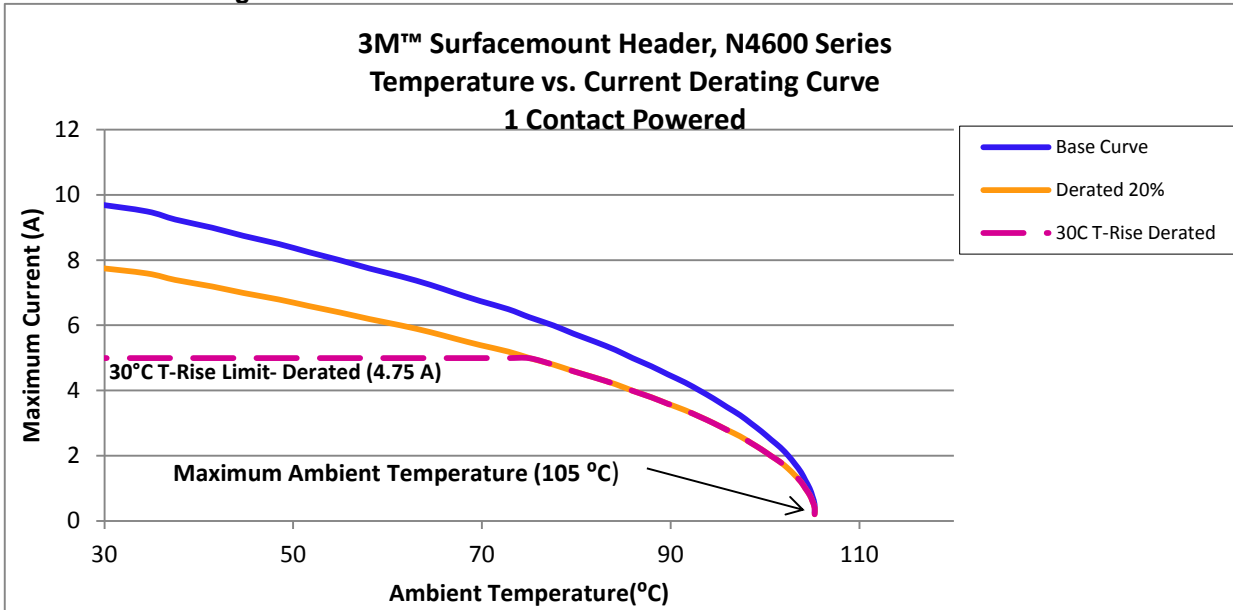
Test	Sequence Numbers for Test Group			
	A	B	C	D
Visual	0	0	0	0
Low Level Connection Resistance (LLCR)	1,3,5	1,3	1,3,5	1,3,5
Vibration			2	
Physical Shock			4	
Durability (with Environmental)				2
Temperature Life (Thermal Aging)		2		
Humidity	4			
Thermal Shock	2			
Salt Spray				4
Number of Samples (Connectors)	5	5	5	5

### 9.2 Independent Tests

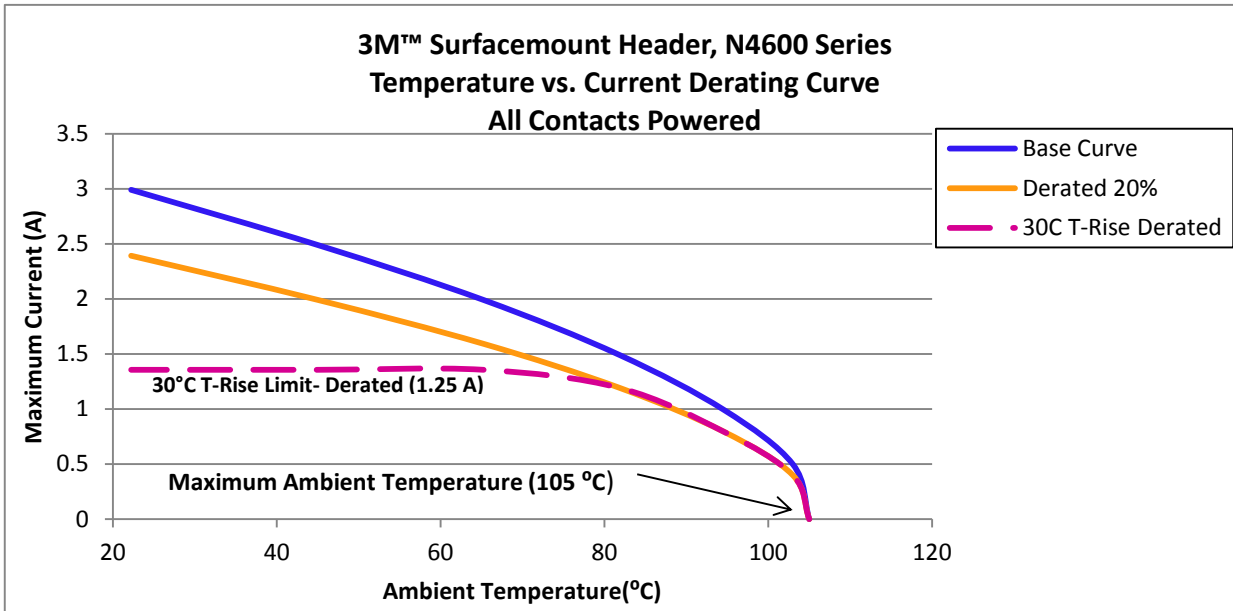
- 1 Pin Retention
- 2 Current Rating
- 3 Plating Thickness
- 4 Solderability

## 10. Figures

### 10.1 Current Rating







---

**3M is a trademark of 3M Company.**

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.

### **Important Notice**

All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.

### **Warranty; Limited Remedy; Limited Liability**

This product will be free from defects in material and manufacture for a period of one (1) year from the time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**