

3M™ Ribbon Cable Socket 2 mm x 2 mm 158 Series

3M™ Shrouded Board Mount Header 2 mm x 2 mm 159 Series

3M™ Ribbon Cable Socket 2 mm X 2 mm Pitch 158 Series

3M™ Shrouded Board Mount Header 2 mm X 2 mm Pitch 159 Series

Product Specification 78-5102-0078-1

Revised 10-26-2017

3M Electronics Materials Solutions Division

Interconnect Products

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www.3M.com/interconnect



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Steven Neu: Approved 10-26-2017
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1.0 Scope

This document summarizes test methods, test conditions, and product performance requirements for 3M Ribbon Cable Sockets 158 Series mated to 3M Shrouded Board Mount Headers 159 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

78-5100-2358-9 Customer drawing for 3M™ Ribbon Cable Socket 158 Series

78-5100-2359-7 Customer drawing for 3M™ Shrouded Board Mount Header 159 Series

78-9101-2810-3 3M™ Locator Plate Instructions 3443-119

3.0 Performance Testing

Unless otherwise specified, all tests shall be performed on 158150 3M™ Ribbon Cable Sockets mated to 159150-6002 3M™ Shrouded Board Mount Headers using 3M™ Round Conductor Flat Cable, 3625 Series 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: 125 V_{AC}

Current (AC or DC):

2.75 A 1 line energized

2.00 A 6 lines* energized *Lines are adjacent in 2x3 configuration

1.25 A All lines energized

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

Temperature: -55°C to +125°C

Insulation resistance: >1 x10⁹ Ω at 500 VDC

4.2 Materials

Socket:

Housing insulation: Glass filled polyester PBT, gray, 94V-0

Cover insulation: Glass filled polyester PBT, gray, 94V-0

Strain relief insulation: Glass filled polyester PBT, gray, 94V-0

Contact: Copper alloy

Wire recommendation: 3M™ Round Conductor Flat Cable 3625

Wire accommodation: 28 AWG stranded

Header:

Insulation: High temperature glass filled liquid crystal polymer, black, 94V-0

Contact: Copper alloy

4.3 Finishes

Plating:

Nickel: 1.27 - 3.8 μm (50 - 150 μ inches), ASTM B689-97, SAE AMS-QQ-N-290

Gold options: 0.76 μm (30 μ inches), ASTM B488-01 Class C

0.38 μm (15 μ inches), ASTM B488-01 Class C

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4.4 Regulatory Compliance

See Regulatory Information Appendix (RIA) in the “RoHS compliance” section of www.3Mconnectors.com for compliance information. See customer drawings for regulatory specifics on each connector.

5.0 Electrical

Description or Parameter	Values & Limits	Units	Requirement or Conditions	Test Standard or Method
Dielectric Withstanding Voltage	125	V _{AC}	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	2.75	Amperes	1 line energized.	30°C temperature rise, 20% derated.
	2.00		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	4.45 1.78	Newtons average minimum	No reflow After 260°C reflow	Force required to dislodge pin from housing when pushed in mating direction.
Termination Force per Position	27	Newtons	Application tool force required per IDC contact to terminate 3M™ Flat Cable 3625.	
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

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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
Insertion Force	0.8 average	Newtons per contact	Average for connector, based on 50 pin connector. No friction latch.	EIA-364-37B Method B
Withdrawal Force	0.85 average	Newtons per contact	Average for connector, based on 50 pin connector. No friction latch.	EIA-364-37B Method B

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	1.27 - 3.81 (50-150)	Micro-meters (Micro-inches)	Average of random measurements from any 3 lots shall not be less than specified.	EIA-364-48
Gold Thickness	0.38 or 0.76 (15 or 30)	Micro-meters (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)	125	Degrees C	No physical abnormalities. 10 milliohm maximum ΔR contact resistance throughout testing.	EIA-364-17B Method A Condition 4
	1000	Hours		
Durability	100	Mating cycles	10 milliohm maximum ΔR contact resistance throughout testing.	EIA-364-09C
Thermal Shock	-55 & 125	Degrees C	No physical abnormalities. 10 milliohm maximum ΔR contact resistance throughout testing.	EIA-364-32C Condition III
	5	Cycles		
Humidity- Temperature Cycling	65 to -10	Degrees C	No physical abnormalities. 10 milliohm maximum ΔR contact resistance throughout testing.	EIA-364-31B Condition B Method III
	90 to 98	% Relative humidity		
	240	Hours		
Header Solderability, Lead-Free Dip Test	>95	Percent	Coverage of solderable area	EIA-364-52 Category 3

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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		
Mixed Flowing Gas	4	gas	No physical abnormalities. 10 milliohm maximum ΔR contact resistance throughout testing.	EIA-364-1000, MFG with preconditioning
	50	cycles		
	168	Hours		

9.0 Qualification Test Groups and Sequences

9.1 Sequenced Tests

Test or Examination	Test Group				
	1	2	2b	3	4
	Test Sequence				
Visual	1, 9	1, 9	1, 10	1, 7	1, 7
Insulation Resistance			2, 5, 8		
Dielectric Withstanding Voltage			3, 6, 9		
Low Level Contact Resistance	2, 4, 6, 8	2, 4, 6, 8		2, 4, 6	2, 4, 6
Vibration	5				
Physical Shock	7				
Thermal Shock		5	4		
Mixed Flowing Gas				5	
Temperature Life					5
Humidity-Temperature Cycling		7	7		
Durability	3	3		3	3
Sample Size (Connectors per Group)	3	3	3	6	3

9.2 Independent Tests

- 1 Mating Forces
- 2 Unmating Forces
- 3 Axial Cable Pull
- 4 Contact Retention
- 5 Current Rating
- 6 Tin Plating Thickness
- 7 Solderability

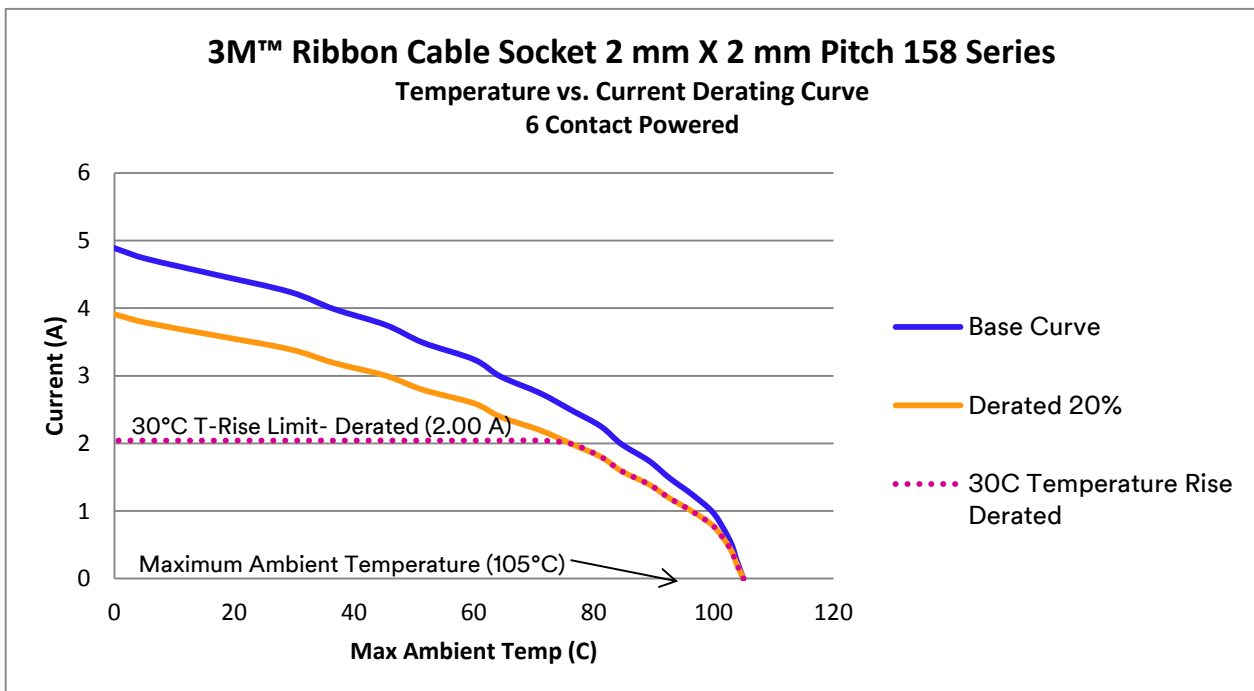
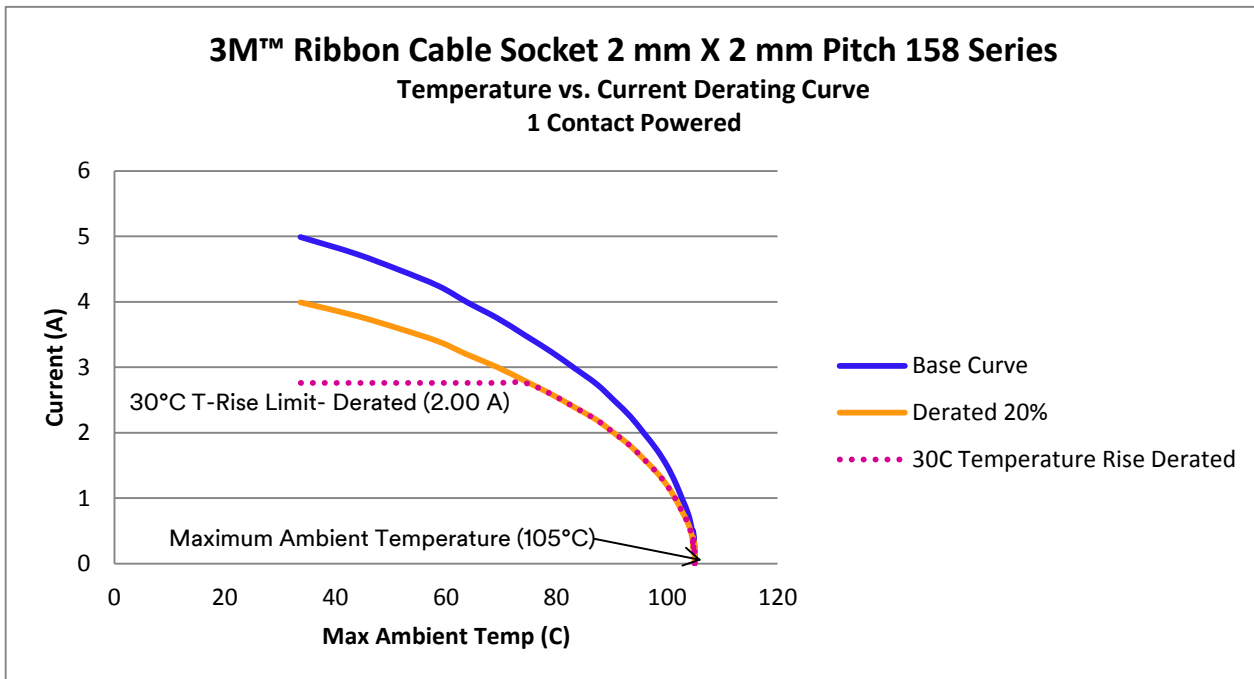
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10. Figures

10.1 Current Rating



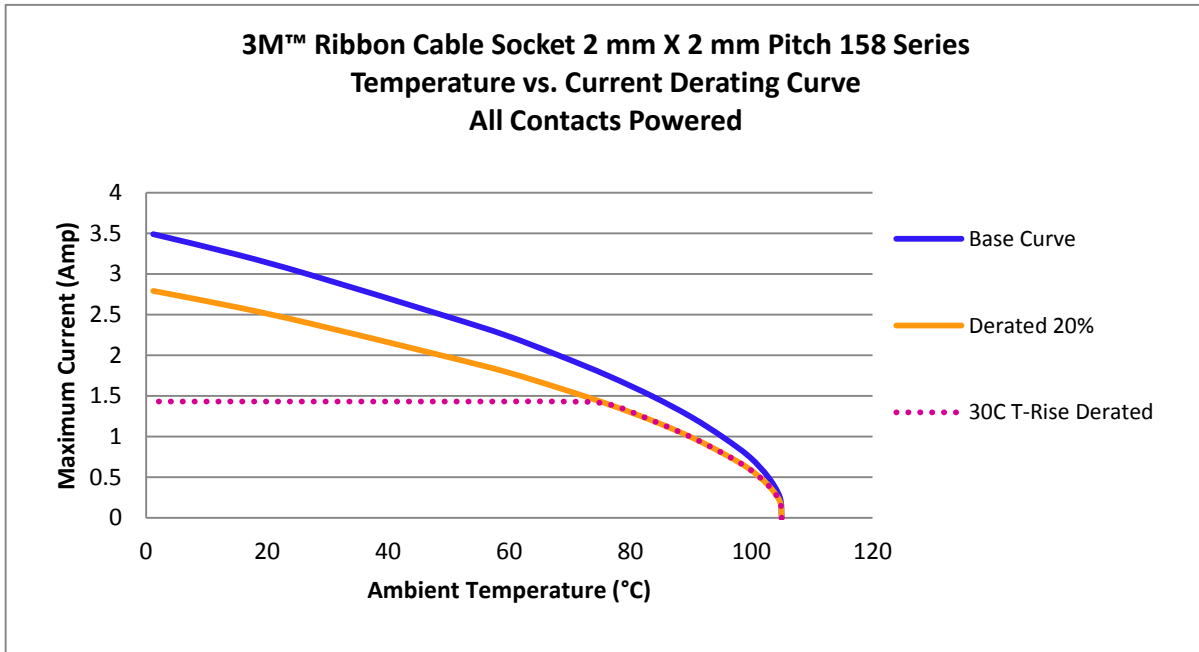
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