Molex 39960-0104 PDF

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PRODUCT SPECIFICATION FOR 3998X SERIES PLUGGABLE EUROSTYLE TERMINAL BLOCKS

1.0 SCOPE

This Product Specification covers the 5.08 mm (.200 inch) centerline (pitch) printed circuit board (PCB) plug and header connector series with tin and gold plated terminals.

2.0 PRODUCT DESCRIPTION

2.1 3998X SERIES PLUGGABLE EUROSTYLE TERMINAL BLOCKS

A. PART NUMBERS (WHERE "XX"= QUANTITY OF CIRCUIT POSITIONS):

MATERIAL #	ENG. #	DESCRIPTION
3998003XX	9809XX	TIN PLUG
3998004XX	9815XX	TIN HEADER
3998103XX	9809XX-G30	GOLD PLUG
3998104XX	9815XX-G30	GOLD HEADER
399890008	980903-SP359	TIN PLUG W/ SPCL KEYING AND IMPRINTING
399890014	980903-SP441	TIN PLUG W/ SPCL IMPRINTING AND GRAY HOUSING
399890013	981503-SP361	TIN HEADER W/ SPCL KEYING
399890015	981503-SP442	TIN HEADER W/ SPCL KEYING AND GRAY HOUSING
39989 SERIES	98 SERIES	OTHER PLUG AND HEADER SPECIALS

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

A. ALL OF THESE ITEMS ARE DESCRIBED ON THE INDIVIDUAL SALES DRAWINGS

B. MATERIALS USED

I. PLUG HOUSING: POLYAMIDE 66/6 (PA66/6), UNFILLED, UL94 V-0

1. COLOR: BLACK – STANDARD
   GRAY – SPECIAL
2. CTI: PLC 0 (600V)

II. HEADER HOUSING: POLYAMIDE 46 (PA46), 30% GLASS FILLED, UL94 V-0

1. COLOR: BLACK – STANDARD
   GRAY – SPECIAL
2. CTI: PLC 2 (250-399V)

III. PLUG TERMINAL: PHOSPHOR BRONZE

1. TIN FINISH: HOT TIN DIP, THICKNESS= 3.8 µm (150 µin) MIN.
2. GOLD FINISH: 0.76 µm (30 µin) MIN. SELECT GOLD IN CONTACT AREA, 0.13 µm (5 µin) MIN. SELECT GOLD IN WIRE ENTRY AREA. 1.3 µm (50 µin) MIN. NICKEL UNDERPLATE OVERALL.

IV. PLUG WIRE CLAMP: BRASS

1. FINISH: NICKEL, THICKNESS= 3.8 µm (150 µin) MIN.

V. PLUG SCREW, TIN PLUGS: STEEL

1. FINISH: ZINC, THICKNESS= 5.1 µm (200 µin) MIN. WITH TRIVALENT CLEAR CHROMATE CONVERSION COATING

VI. PLUG SCREW, GOLD PLUGS: PHOSPHOR BRONZE

1. FINISH: TIN, THICKNESS= 3.8 µm (150 µin) MIN.

VII. HEADER PIN: BRASS

1. **TIN FINISH: SEMI-BRIGHT TIN, THICKNESS= 3.8 µm (150 µin) MIN. OVER COPPER, THICKNESS= 1.3 µm (50 µin) MIN.**
2. **GOLD FINISH: 0.76 µm (30 µin) MIN. OVERALL GOLD OVER 1.3 µm (50 µin) MIN. NICKEL UNDERPLATE.**

2.3 SAFETY AGENCY APPROVALS

A. UL FILE# E48521 – RECOGNIZED: USR, CNR

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 UL 1059 Standard for Terminal Blocks

3.2 CSA C22.2 No. 158-1987, The Standard for Terminal Blocks

3.3 UL 486E Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors

3.4 SMES-152 Solderability Specifications

4.0 RATINGS

4.1 VOLTAGE

UL USE GROUP B (Commercial): 300 Volts AC (RMS)
UL USE GROUP D (Industrial Limited): 300 Volts AC (RMS)

4.2 CURRENT

UL USE GROUP B (Commercial): 15 Amps
UL USE GROUP D (Industrial Limited): 10 Amps

4.3 WIRE RANGE:

12 – 26 AWG (3.3 mm² - 0.15 mm²): Single wire termination
14 – 26 AWG (2.1 mm² - 0.15 mm²): Multiple wire termination with matching wire sizes and stranding. 2 wire maximum per circuit.

4.4 TEMPERATURE

Operating: - 40°C to + 85°C
Nonoperating: - 40°C to + 115°C

4.5 WIRE STRIP LENGTH: 6.4 mm (.25”)

4.6 SCREWDRIVER: Snap-On #SSD214 or Apex (Insert Bit #445-00)

4.7 TIGHTENING TORQUE: 0.6 N-m (5 in-lb)

4.8 RECOMMENDED MIN. PTH DIA: 1.47 mm (.058”)

5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Temperature Rise**	Appropriately mount the connectors, apply rated current and measure the temperature rise once it has stabilized per UL 1059.	Temperature rise: **+30**°C MAXIMUM
2	**Static Heating (14 AWG)**	Appropriately mount the connectors, apply a current of **20** A and measure the temperature rise once it has stabilized per UL 486E	Temperature rise: **+50**°C MAXIMUM
3	**Static Heating (12 AWG)**	Appropriately mount the connectors, apply a current of **25** A and measure the temperature rise once it has stabilized per UL 486E	Temperature rise: **+50**°C MAXIMUM
4	**Dielectric Withstanding Voltage (Agency)**	Unmate connectors: apply a voltage of **1600** VAC for **1** minute between adjacent terminals and between terminals to ground per UL 1059.	No breakdown
5	**Insulation Resistance**	Unmate and unmount connectors: apply a voltage of **500** VDC between adjacent terminals and between terminals to ground.	**500** Megohms MINIMUM

5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6	**Secureness Test (14 AWG)**	A **0.68** kg (**1.5** lb) weight is to be held per UL486E, section 12 and CSA C22.2 NO. 158.	Joint between terminal and wire must remain intact for **30** minutes MINIMUM
7	**Secureness Test (12 AWG)**	A **0.9** kg (**2** lb) weight is to be held per UL486E, section 12 and CSA C22.2 NO. 158.	Joint between terminal and wire must remain intact for **30** minutes MINIMUM
8	**Wire Pullout Force (Axial, Min Wire Size, 26 AWG)**	Apply an axial pullout force for **1** minute on the wire per UL 486E, Section 14.	**8.9** N (**2** lbf) MINIMUM pullout force
9	**Wire Pullout Force (Axial, Max Wire Size, 14 AWG)**	Apply an axial pullout force for **1** minute on the wire per UL 486E, Section 14 following secureness test.	**50** N (**11.5** lbf) MINIMUM pullout force

10	**Wire Pullout Force (Axial, Max Wire Size, 12 AWG)**	Apply an axial pullout force for **1** minute on the wire per UL 486E, Section 14 following secureness test.	**60** N (**13.5** lbf) MINIMUM pullout force
11	**Header Pin Retention**	Force required to dislodge terminals from the housing, applied at a rate of **25** ± **6** mm (**1** ± ¼ inch) per minute, in the direction opposite terminal insertion.	**22.2** N (**5** lbf) MINIMUM
12	**Plug Retention in Header**	Force required to dislodge plug assembly from the header assembly, applied at a rate of **25** ± **6** mm (**1** ± ¼ inch) per minute, in the direction parallel with wire insertion.	2 & 3 circuit: **2** lbf MINIMUM 4 - 24 circuit: **10** lbf MINIMUM
13	**Wiring Screw Rated Torque**	Tighten screw to **110**% rated torque [**0.62** N-m (**5.5** in-lb)] with max. and min. wire sizes and loosen **5** times per UL 1059.	No damage to housing, terminal, or screw

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
14	**Solderability**	Applies to header pins only. Per **SMES-152**	Solder coverage: **95**% MINIMUM
15	**Solder Resistance**	Dip connector terminal tails in solder: Solder Duration: **5 ± 0.5** seconds; Solder Temperature: **260 ± 5°**C	Visual: No Damage to insulator material
16	**Accelerated Aging Test**	Subject parts to **105 ± 1°**C for a time of **7** days (168 hours).	No evidence of blistering, cracking, softening, or melting.

6.0 PACKAGING

Parts shall be tray packaged to protect against damage during handling, transit and storage.

7.0 REVISION INFORMATION

LETTER	EC#	DESCRIPTION	DATE
Ø		Original Release	1998/06/04
A		Change PTH to .058”	1998/08/19
B		Add Plug Retention Specification	1998/11/18
C		Format Change	2003/04/16
D		Add CTI specification	2003/12/08
E		Add SAP numbers to Dimensional	2004/01/08
F		Update material to PA 66	2004/02/13
G	WNA2011-0047	Redrawn, Correct Torque Spec	2010/08/02