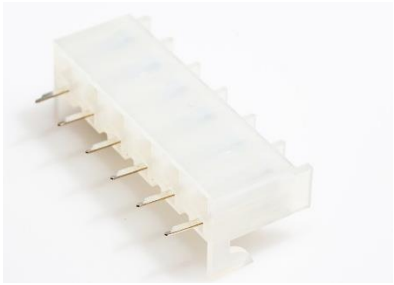
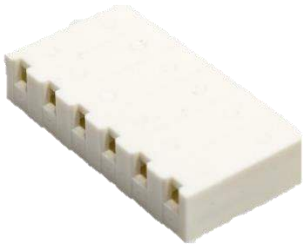
molex

PRODUCT SPECIFICATION

KK 508 / .200

WIRE-TO-BOARD
BOARD-TO-BOARD
CONNECTOR SYSTEM

Crimp Terminal	PCB Receptacle
	
Series: 2478 , 2578	Series: 3002

Crimp Housing	Crimp Housing (Glow Wire)
	
Series: 3001	Series: 91813

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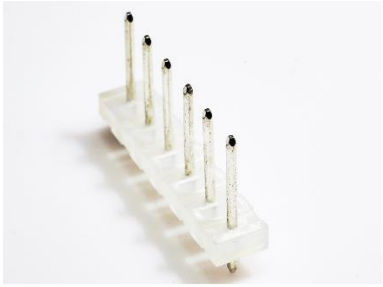
REVISION:	ECM INFORMATION:	TITLE:	SHEET No.
C2	EC No: 622056 DATE: 2019/07/07	PRODUCT SPECIFICATION 5.08mm CENTER KK CONNECTORS	1 of 14

DOCUMENT NUMBER:	DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-99020-0087	PS	001	SS06	SS06	ISHWARG

Header	Header with Polarizing Backwall
	
Series: 3003	Series: 2599

Header with Polarizing Backwall (Glow Wire)

Series: 173083

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1.0 SCOPE

This Product Specification covers 5.08 mm centerline (pitch) 1.14mm round pin headers mated with either printed circuit board (PCB) connectors or connectors terminated with 18 to 26 AWG wire using crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

DESCRIPTION	SERIES NUMBER
Crimp Terminal	2478, 2578, 2878
Crimp Housings	3001, 91813
Headers	2599, 173083, 3003, 3061
PCB Connector	3002

Other products conforming to this specification noted on the individual drawings

2.2 DIMENSIONS, MATERIALS, PLATINGS

Dimensions & Plating: See individual sales drawings.
Terminal Material: Brass or Phos. Bronze (for Max performance use Phos bronze material.)
Housing: Nylon or Polyester.
Pins: Brass.

2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:
a. Go to molex.com
b. Enter the part number in the search field.
c. At the bottom of the page go to “Environmental” to see compliance status.

2.4 SAFETY AGENCY APPROVALS

UL File Number: E29179
CSA File number: LR 19980

SERIES	Agency Voltage Rating (AC RMS or DC)		Agency Current Rating (Amps)		Agency Temperature Rating (°C)
	UL	CSA	UL	CSA	UL
3001	600	250	-	10	105°C
91813	600	250	-	10	105°C
2599	600	250	-	10	105°C
3003	600	250	-	10	105°C
3061	-	-	-	-	105°C
3002	600	250	-	10	105°C

*Single pole tested

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

See series specific sales drawings and the other sections of this specifications for the necessary referenced documents and specifications.

Cosmetic Specification PS-45499-002

Molex Quality Crimping Handbook Order No. 63800-0029
Molex Solderability Specification SMES-152
Molex Heat Resistance Specification AS-40000-5013
Molex Moisture Technical Advisory AS-45499-001
Molex Package Handling Specification 454990100-PK
ATS – Application Tooling Specification*

Application Tooling Specification for terminals is not provided in this document. ATS for terminals can be available from respective terminal part number page in Molex.com

3.2 INDUSTRY DOCUMENTS

EIA-364-1000
UL-60950-1
CSA STD. C22.2 NO. 182.3-M1987

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

600 Volts AC (RMS) (or 600 Volts DC)

4.2 APPLICABLE WIRES

(Current is dependent on connector size, contact material, plating, ambient temperature, printed circuit board characteristics and related factors. Actual current rating is application dependent and should be evaluated for each application.)

a. For Crimp Terminals and Applicable Wires

Wire AWG	Amps (Max) With Brass Terminal	Amps (Max) With Phos Bronze Terminal	Wire Insulation Dia
18	5.00	7.00	See terminal drawings
20	4.75	6.25	See terminal drawings
22	4.50	5.50	See terminal drawings
24	4.25	5.00	See terminal drawings
26	4.00	4.50	See terminal drawings

Note: current ratings are for a single circuit, based on not exceeding 30°C temperature rise.

b. For Printed Circuit Board Connectors

Connector Style	Amps (Max) With Brass Terminal	Amps (Max) With Phos Bronze Terminal
Top Entry	4.50	5.00
Right Angle	4.50	5.00
Bottom Entry	4.00	4.50

Note: current ratings are for a single circuit, based on not exceeding 30°C temperature rise.

4.3 TEMPERATURE
(ambient + 30° C temp rise)

	Brass Terminals	Phos Bronze Terminals
Operating Temperature	-40°C to +80°C*	-40°C to +105°C*
Non-Operating Temperature	-40°C to +105°C**	-40°C to +105°C

*including terminal temperature rise.
**parts not mated.

4.4 DURABILITY

Tin / Gold plated: 25 mating cycles
As tested in accordance with EIA-364-1000 test method (see sec 6.2.4 of this specification).

4.5 GLOW WIRE SERIES

173083, 91813

5.0 QUALIFICATION

Laboratory condition, sample selection and test sequences are in accordance with EIA-364-1000.

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA.	10 milliohms MAXIMUM [initial]
6.1.2	Contact Resistance of Wire Termination (Low Level)	Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100 mA.	2 milliohms MAXIMUM [initial]
6.1.3	Insulation Resistance	Unmate & unmount connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megaohms MINIMUM
6.1.4	Dielectric Withstanding Voltage	Unmate connectors: apply a voltage of {two times the rated voltage plus 1000 volts} VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown
6.1.5	Capacitance	Measure between adjacent terminals at 1 MHz.	1.2 picofarads MAXIMUM
6.1.6	Temperature Rise (via Current Cycling)	Mate connectors: measure the temperature rise at the rated current after: 1) 96 hours (steady state) 2) 240 hours (45 minutes ON and 15 minutes OFF per hour) 3) 96 hours (steady state)	Temperature rise: +30°C MAXIMUM

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Connector Mate and Unmate Forces	Per circuit when mated to a 1.14 mm Sq. pin. Mate and unmate connector (male to female) at a rate of 25 ± 6 mm per minute.	15.6 N MAXIMUM insertion force & 1.8 N MINIMUM withdrawal force
6.2.2	Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm. (Forces will change with platings and materials.)	17.8 N MAXIMUM insertion force
6.2.3	Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm per minute. (Forces will change with platings and materials.)	35.6 N MINIMUM withdrawal force
6.2.4	Durability	Mate connectors up to 25 cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	10 milliohms MAXIMUM (change from initial)
6.2.5	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
6.2.6	Shock (Mechanical)	Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±X,±Y,±Z axes (18 shocks total).	10 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
6.2.7	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm. (For maximum performance use Molex application tooling with stranded tinned copper wire)	Wire pullout force depends on crimp tooling. See relevant Molex Application Tooling Specification for requirements.
6.2.8	Normal Force	Apply a perpendicular force.	7.34 N (748 grams) average

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Shock (Thermal)	Mate connectors; expose to 5 cycles of: Temperature °C — Duration (Minutes) -40 +0/-3 — 30 +25 ±10 — 5 MAXIMUM +105 +3/-0 — 30 +25 ±10 — 5 MAXIMUM	10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.2	Thermal Aging	Mate connectors; expose to: 96 hours at 105 ± 2°C	10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.3	Humidity (Steady State)	Mate connectors: expose to a temperature of 40 ± 2°C with a relative humidity of 90-95% for 96 hours. Note: Remove surface moisture and air dry for 1 hour prior to measurements.	10 milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at 500 VAC & Insulation Resistance: 1000 Megaohms MINIMUM & Visual: No Damage
6.3.4	Humidity (Cyclic)	Mate connectors: cycle per EIA-364-31: 24 cycles at temperature 25 ± 3°C at 80 ± 5% relative humidity and 65 ± 3°C at 50 ± 5% relative humidity; dwell time of 1.0 hour; ramp time of 0.5 hours. {Note: Remove surface moisture and air dry for 1 hour prior to measurements.}	10 milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at 500 VAC & Insulation Resistance: 1000 Megaohms MINIMUM & Visual: No Damage
6.3.5	Solderability	Per SMES-152	Solder coverage: 95% MINIMUM (per SMES-152)

6.3 ENVIRONMENTAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.6	Solder Resistance	Dip connector terminal tails in solder: Solder Duration: 5 ± 0.5 seconds; Solder Temperature: 230 ± 5°C	Visual: No Damage to insulator material
6.3.7	Cold Resistance	Mate connectors: Duration: 96 hours; Temperature: -40 ± 3°C	10 milliohms MAXIMUM (change from initial) & Visual: No Damage

7.0 SOLDER INFORMATION

Per SMES-152
*These specifications establish standard solderability test methods used to evaluate a products ability to accept molten solder. Solder Process Temperatures and Solder Profiles will vary based on application, equipment, solder paste, PCB thickness, etc.

7.1 SOLDER PROCESS TEMPERATURES *

Wave Solder Temperature: 235°C Maximum

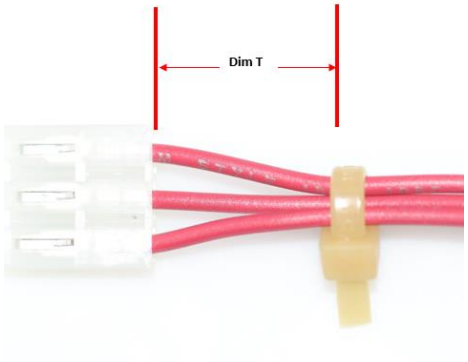
Molex Solderability Specification SMES-152 (Click Here)

8.0 PACKAGING

Parts shall be packaging to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item.

9.0 CABLE TIE AND / OR TWIST TIE LOCATION

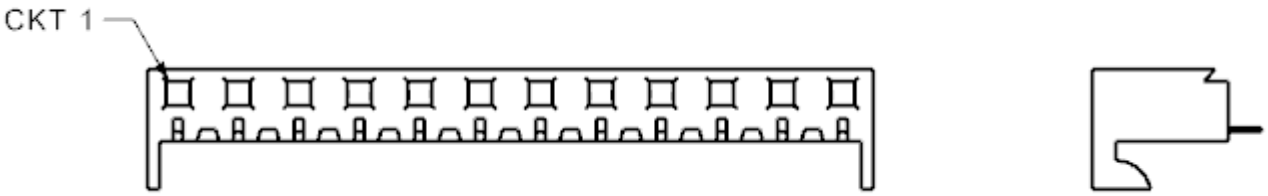
CKT Size	Dim T Min.
2-6	0.50” (12.7mm)
7-9	0.75” (19.1mm)
10-12	1.00” (25.40mm)



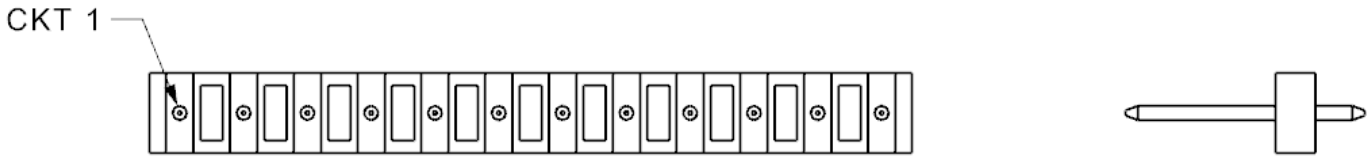
The “T” dimension defines a “free” length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter the housing. Wires are to be dressed in such a manner to allow the terminals to float freely in the pocket. This dimension is general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

10.0 POLARIZATION AND KEYING OPTIONS

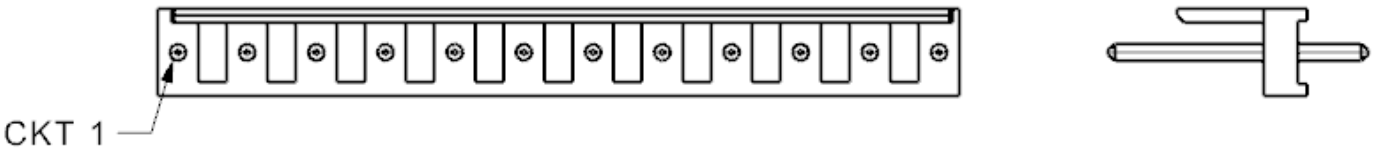
10.1 PCB Receptacles (Series: 3002)



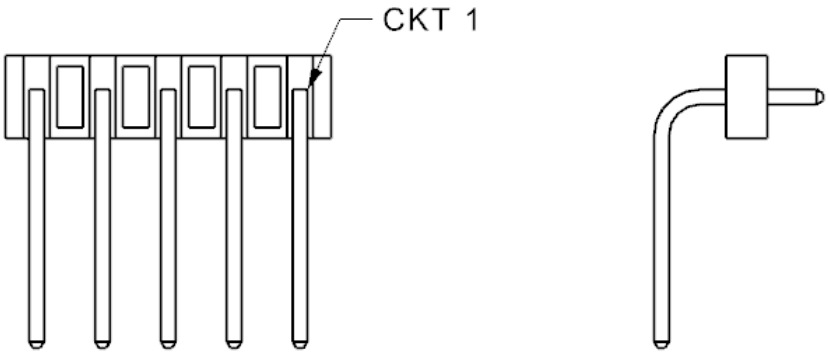
10.2 PCB Headers (Series: 3003)



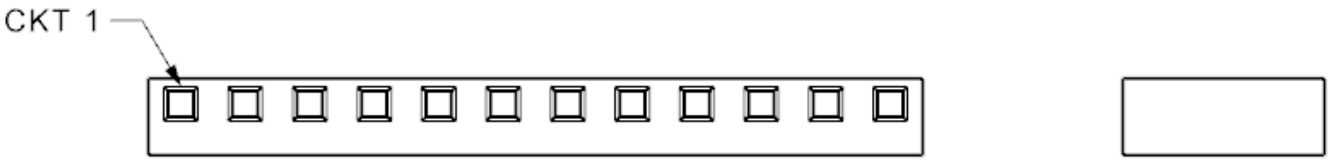
10.3 PCB Headers with Polarizing Backwall (Series: 2599)



10.4 Headers (Series: 3061)



10.5 Crimp Housing (Series: 3001)



10.6 Crimp Housing (Series: 91813)