



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

1.0 SCOPE

This specification covers the 2.54mm centerline SL wire to wire and wire to board systems. The termination option range from solder to PCB or terminated using crimp or IDT technology.

2.0 PRODUCT DESCRIPTION: see Appendix A for other series that are covered by this specification.

2.1 SERIES AND DESCRIPTION

2.1.0 Crimp Terminals

- 70021 = Male Crimp Terminal
- 70058 = Female Crimp Terminal
- 71851 = High Force Female Crimp Terminal

2.1.1 Crimp Housing

- 70066 & 70107 = Single Row Crimp Housings
- 70450 & 74130 = Dual Row Crimp Housings

2.1.2 Insulation Displacement Assembly

- 70400 = Female Single Row Insulation Displacement Connector
- 70475 & 71178 = Male Single Row Insulation Displacement Connector

2.1.3 Headers

- 171971 = SL Vertical Hdr Assy Thru Hole no Pegs 3.05 Pocket
- 171972 = SL Vertical Hdr Assy Thru Hole with Pegs 3.05 Pocket
- 171973 = SL Vertical Hdr Assy SMT no Pegs 3.05 Pocket
- 171974 = SL Right Angle Hdr Assy Thru Hole no Pegs 3.05 Pocket
- 171975 = SL Right Angle Hdr Assy Thru Hole with Pegs 3.05 Pocket
- 171976 = SL Right Angle Hdr Assy SMT no Pegs 3.05 Pocket
- 171977 = SL Right Angle Hdr Assy SMT with Pegs 3.05 Pocket
- 70563 and 70564 = SL Vertical Hdr Assy Thru Hole no Pegs 4.57 Pocket
- 70566 = SL Vertical Hdr Assy Thru Hole Tri Peg 4.57 Pocket
- 70571 = SL Right Angle Hdr Assy Thru Hole Lock Peg 4.57 Pocket
- 70575 = SL Right Angle Hdr Assy Thru Hole Tri Peg 4.57 Pocket

See Appendix A or individual sales drawings for other series that conform to this specification.

2.2 DIMENSIONS, MATERIALS AND SPECIFICATIONS:

2.2.1 Wire Sizes and Cable Sizes:

- IDT Terminations: 22 - 28 AWG stranded wire with an insulation diameter 1.35 mm max.
- Crimp Termination: 22 - 36 AWG wire. See individual drawings for insulation diameter.
- Molex Cable: 7307, 7767, 8996, 8997, 24226, 24241, 24369 and 24389.

2.2.2 Available Finishes:

- Overall Matte Tin
- Select Gold

See the appropriate Sales Drawing(s) for additional information on dimensions, materials, platings, and markings.

2.3 AGENCY LISTINGS

- 2.3.1 Underwriters Laboratory: UL E29179
- 2.3.2 Canadian Standards Association: CSA LR19980

REVISION:	ECR/ECN INFORMATION:	TITLE:		SHEET No.
P	EC No: 106074 DATE: 2018/03/05	PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM		1 of 8
DOCUMENT NUMBER:		CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-70400		KSAMIEC	MKIPPER	FSMITH



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS:

- 3.1 See the appropriate Sales Drawing(s) for additional information
- 3.2 See individual Terminals and un-mated Headers Product Specification for more information.
 - PS-70021: Male, crimp terminal
 - PS-70058: Female box, crimp terminal
 - PS-71851: Female box, high force crimp terminal
 - PS-70495: Compliant Header
 - 1719710000-PS: Vertical and Right Angle Headers

4.0 RATINGS:

4.1 VOLTAGE: 250 Volts

4.2 CURRENT: (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.)

WIRE SIZE	CURRENT (Amps Max)
28 awg	1.2 A
26 awg	1.8 A
24 awg	3.0 A
22 awg	3.0 A

Note: Current ratings shown are for a single circuit, based on a 30°C temperature rise.

4.2 TEMPERATURES:

Operating Temperature: - 40°C to +105°C
 Non-Operating Temperature: - 40°C to +105°C

4.4 HEADER PROCESS DATA

- 4.4.1 Peak Temperature: 260°C Max (171971-171977 Hdrs only)
- 4.4.1 Peak Temperature: 245°C Max (all other Hdrs)
- 4.4.2 Time within 5°C of peak temperature: 40 seconds Max
- 4.4.3 Cycles: 3 cycles thru solder process Max.

<u>REVISION:</u> P	<u>ECR/ECN INFORMATION:</u> EC No: 106074 DATE: 2018/03/05	<u>TITLE:</u> PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM	<u>SHEET No.</u> 2 of 8
<u>DOCUMENT NUMBER:</u> PS-70400		<u>CREATED / REVISED BY:</u> KSAMIEC	<u>CHECKED BY:</u> MKIPPER
		<u>APPROVED BY:</u> FSMITH	



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

5.0 PERFORMANCE:

5.1 ELECTRICAL PERFORMANCE:

Item	Test Condition	Requirement
Contact Resistance (Low Level)	Mate Connectors with a maximum voltage of 20mV and a current of 100 mA.	30 milliohm Maximum Initial
Insulation Resistance	Mate Connectors with a voltage of 500 VDC between adjacent terminals and between terminals and ground.	1000 Megohms Minimum
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
Voltage Drop	Mate Connectors with a current of 3 amps and the open circuit voltage set to not exceed 15 VDC. Power is applied for a minimum of 30 seconds before the first measurement	30 millivolt Maximum Initial
Voltage Drop after Vibration	Subject mated connectors to a total of 8 hours of simple harmonic motions. (Apply 4 hours in the Z axis and 2 hours in each of the X and Y axes). Vary the frequency uniformly from 10 Hz to 50 Hz traversed continuously in 8 minutes	30 millivolt Maximum Initial & 60 millivolt Maximum After Endurance Exposure
Voltage Drop after Heat Resistance	Place mated connectors in an air circulating chamber oven exposed to a temperature of 100 degrees for 120 hours.	30 millivolt Maximum Initial & 60 millivolt Maximum After Endurance Exposure
Voltage Drop after Cold Resistance	Place mated connectors in an air circulating chamber exposed to a temperature of -40°C for 120 hours.	30 millivolt Maximum Initial & 60 millivolt Maximum After Endurance Exposure
Voltage Drop after Dust Proofness	Place mated connectors 150mm from the walls of a chamber that measure 1000 mm in length, width, and height. Approximately 1.5kg of Portland cement is to be diffused at a rate of 10 seconds per 15 minutes by blowing air onto it. Expose for 1 hour	30 millivolt Maximum Initial & 60 millivolt Maximum After Endurance Exposure
Leak Current	Apply a potential of 13 volts DC across the adjacent contacts of a mated pair. After 60 seconds, measure the initial leakage current. Place mated pair in a thermostatic chamber at a temperature of 60±5° C and a humidity level of 90-95% for one hour	10 microamps Maximum Initial & 1 milliamp Maximum Post Environmental
Capacitance	Measure between adjacent terminals at 1 MHz. (Loaded: 50 ohms impedance)	Loaded: 2 picofarad maximum Unloaded: 0.5 picofarad maximum

REVISION: P	ECR/ECN INFORMATION: EC No: 106074 DATE: 2018/03/05	TITLE: PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM	SHEET No. 3 of 8
DOCUMENT NUMBER: PS-70400	CREATED / REVISED BY: KSAMIEC	CHECKED BY: MKIPPER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

5.2 MECHANICAL PERFORMANCE:

Item	Test Condition	Requirement
Terminal Insertion and Withdrawal Forces	Insert and withdraw a terminal (male to female) at a rate of 25 ± 6mm (1 ± 1/4 inch) per minute.	70058 - Insertion force shall be 4.45 N (1.0 lb) maximum and withdrawal 0.56 N (0.125 lb) minimum 71851 - Insertion force shall be 13.34 N (3.0 lb) maximum and withdrawal 1.67 N (0.375 lb) minimum
Retention Force (in Housing) for Crimped/IDT Terminals	Axial pullout force on the terminal in the housing at a rate of 25 ± 6mm (1 ± 1/4 inch) per minute.	Contact : 17.79 N (4.0 lbs.) min.
Durability	Mate connectors up to 25 cycles for tin plating and 50 cycles for gold plating at a maximum rate of 10 cycles per minute prior to defined Environmental Tests.	Contact Resistance : 10 milliohms Maximum Change from Initial
Durability – Male Plug (30 Gold Plate Pins)	Male Plug is mated to the receptacle and then unmated at a rate of 500 cycles/hour. The receptacle was replaced every 50 cycles. The male plug was subjected to 500 mate/unmate cycles	Contact Resistance : 10 milliohms Maximum Change from Initial
Vibration Mil-Std-1344 Method 2005.1 Condition I	Amplitude: 1.50mm (.060 inch) peak to peak Sweep: 10-55-10 Hz in one minute Duration: 2 hours in each X-Y-Z axis. (Test module shall be per Section 7.0)	Contact Resistance: 10 milliohms Maximum Change from Initial Discontinuity: not greater than one microsecond
Mechanical Shock Mil-Std-1344 Method 2004.1 Condition A	50 g's with three 1/2 sine wave form shocks in each X-Y-Z axis. (Test module shall be per Section 8.2)	Contact Resistance: 10 milliohms Maximum Change from Initial Discontinuity: not greater than one microsecond
Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6mm (1 ± 1/4 inch) per minute.	Pullout force - 75% tensile strength of wire, minimum.
Wire Pullout Force (Right Angle)	Apply a right angle pullout force on the wire at a rate of 25 ± 6mm (1 ± 1/4 inch) per minute.	Pullout force - 75% tensile strength of wire, minimum. 20 Newton's and below - no plastic deformation / no electrical discontinuity Above 20 and below 60 Newton's - slight non-functional plastic deformation / no electrical discontinuity.

REVISION: P	ECR/ECN INFORMATION: EC No: 106074 DATE: 2018/03/05	TITLE: PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM	SHEET No. 4 of 8
DOCUMENT NUMBER: PS-70400	CREATED / REVISED BY: KSAMIEC	CHECKED BY: MKIPPER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

5.2 MECHANICAL PERFORMANCE:

Item	Test Condition	Requirement
Insertion Force (into Housing) for Female Terminals	Apply an axial insertion force on the terminal at a rate of $25 \pm 6\text{mm}$ ($1 \pm 1/4$ inch) per minute.	13.34 N (3.0 lbs) maximum insertion force.
Wire Flex	Flex cable 180° for 500 cycles.	Contact resistance: 10 milliohms Maximum Change from Initial. Appearance: No Damage
Normal Force of Box Crimp	Apply a perpendicular force at a rate of $25 \pm 6\text{mm}$ ($1 \pm 1/4$ inch) per minute on the contacts in a manner simulating actual use.	0.49 N (50 grams) minimum end of life, for gold plating 0.98 N (100 grams) minimum end of life, for tin plating.
Connector Insertion	Mate connectors at a rate of 1 in/min until latch engagement was achieved	29.4 N Maximum
Connector Retention	Unmate connectors at a rate of 1 in/min until latch defeat occurred & Unmate connectors at a rate of 0.8 in/min with latch disengaged	45 N Minimum with latch engaged & 15 N Minimum with latch disengaged
Connector Retention	Apply a perpendicular force of 45 N to the wire harness using a free hanging weight.	No deformation or Terminal separation

REVISION: P	ECR/ECN INFORMATION: EC No: 106074 DATE: 2018/03/05	TITLE: PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM	SHEET No. 5 of 8
DOCUMENT NUMBER: PS-70400	CREATED / REVISED BY: KSAMIEC	CHECKED BY: MKIPPER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

5.3 ENVIRONMENTAL PERFORMANCE

Item	Test Condition	Requirement												
Thermal Shock Mil-Std-202F Method 107 E	Mate connectors exposed to 10 cycles of: <table border="1" style="margin-left: 20px;"> <tr> <th>Temperature °C</th> <th>Duration (Min)</th> </tr> <tr> <td>-40 +0/-3</td> <td>30</td> </tr> <tr> <td>+25 +/-10</td> <td>5 Max</td> </tr> <tr> <td>+105 +3/-0</td> <td>30</td> </tr> <tr> <td>+25 +/-10</td> <td>5 Max</td> </tr> <tr> <td>-40 +0/-3</td> <td>30</td> </tr> </table>	Temperature °C	Duration (Min)	-40 +0/-3	30	+25 +/-10	5 Max	+105 +3/-0	30	+25 +/-10	5 Max	-40 +0/-3	30	Appearance: No Damage Contact Resistance: 10 milliohms maximum change from initial
Temperature °C	Duration (Min)													
-40 +0/-3	30													
+25 +/-10	5 Max													
+105 +3/-0	30													
+25 +/-10	5 Max													
-40 +0/-3	30													
Thermal Aging Mil-Std-202F Method 108	Mate connectors; expose to 240 hours at 105 ± 3° C	Appearance: No Damage Contact Resistance: 10 milliohms maximum change from initial												
Humidity (Steady State) Mil-Std-202F Method 103	Mate connectors; expose to a temperature of : 85 ± 2°C with a Relative Humidity of 92 ± 3% for 96 hours. Note: Remove surface moisture and air dry for 1 hour prior to measurements.	Appearance: No Damage Contact Resistance: 10 milliohms maximum change from initial. Dielectric Withstanding Voltage: No Breakdown Insulation Resistance: 10000 Megohms Minimum												
Humidity (Cyclic) Mil-Std-202 Method 105	Mate connectors; expose for 10 cycles at 90-98% relative humidity with a transition time of 2.5 hours between extremes: <table border="1" style="margin-left: 20px;"> <tr> <th>Temperature °C</th> <th>Duration (Min)</th> </tr> <tr> <td>+25 ± 10</td> <td>5 maximum</td> </tr> <tr> <td>+65 +3/-0</td> <td>15 maximum</td> </tr> </table> Note: Remove surface moisture and air dry for one hour prior to measurements.	Temperature °C	Duration (Min)	+25 ± 10	5 maximum	+65 +3/-0	15 maximum	Appearance: No Damage Contact Resistance: 10 milliohms maximum change from initial. Dielectric Withstanding Voltage: No Breakdown Insulation Resistance: 10000 Megohms Minimum						
Temperature °C	Duration (Min)													
+25 ± 10	5 maximum													
+65 +3/-0	15 maximum													
Temperature Rise and Current Cycling	Temperature Rise: Mate the connectors; and measure the temperature rise at the rated current after 96 hours. Current Cycling: Mate connectors; measure the temperature rise at the rated current after 500 hours (45 minutes ON and 15 minutes OFF per hour). Measure temperature rise.	Temperature Rise: 30°C above ambient maximum Temperature Rise: 30°C above ambient maximum												

REVISION: P	ECR/ECN INFORMATION: EC No: 106074 DATE: 2018/03/05	TITLE: PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM	SHEET No. 6 of 8
DOCUMENT NUMBER: PS-70400	CREATED / REVISED BY: KSAMIEC	CHECKED BY: MKIPPER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

5.3 ENVIRONMENTAL PERFORMANCE

Item	Test Condition	Requirement
Temperature Rise and Vibration	<p>Temperature Rise: Mate the connectors; and measure the temperature rise at the rated current after 45 minutes.</p> <p>Vibration: Subject mated connectors to a total of 8 hours of simple harmonic motions. (Apply 4 hours in the Z axis and 2 hours in each of the X and Y axes). Vary the frequency uniformly from 10 Hz to 50 Hz traversed continuously in 8 minutes. Measure temperature rise.</p>	<p>Temperature Rise: 30°C above ambient maximum</p> <p>Temperature Rise: 30°C above ambient maximum</p>
Temperature Rise and Heat Resistance	<p>Temperature Rise: Mate the connectors; and measure the temperature rise at the rated current after 45 minutes.</p> <p>Heat Resistance: Place mated connectors in an air circulating chamber oven exposed to a temperature of 100 degrees for 120 hours. Measure temperature rise.</p>	<p>Temperature Rise: 30°C above ambient maximum</p> <p>Temperature Rise: 30°C above ambient maximum</p>
Temperature Rise and Cold Resistance	<p>Temperature Rise: Mate the connectors; and measure the temperature rise at the rated current after 45 minutes.</p> <p>Cold Resistance: Place mated connectors in an air circulating chamber exposed to a temperature of -40°C for 120 hours</p>	<p>Temperature Rise: 30°C above ambient maximum</p> <p>Temperature Rise: 30°C above ambient maximum</p>
Solderability Molex SMES-152	Steam age 1 hr. Solder time 5 ± 0.5 seconds. Solder temperature: 245 ± 5°C Non activated flux.	95% of the immersed area must show no voids, pin holes
Flowing Mixed Gas (FMG)	Battelle Class II, 10 ppm Cl ₂ , 10 ppm H ₂ S, 100 ppm NO ₂ , 70 ± 1% R.H., 25 deg. C. 50-60 CFM. 10 days mated and 7 days unmated exposure.	Contact Resistance: 10 milliohms Maximum change from Initial
Resistance to Solder Heats	Solder Time 3 ± 0.5 seconds Solder Temperature: 260 ± 5°C Immerse leads to a depth of 1.57mm (.062 in.) from connector body.	Appearance: No damage or discoloration of connector materials.

6.0 PACKAGING:

Parts are packaged in trays, tubes or bulk packed, refer to appropriate Sales Drawing for specific information.

REVISION: P	ECR/ECN INFORMATION: EC No: 106074 DATE: 2018/03/05	TITLE: PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM	SHEET No. 7 of 8
DOCUMENT NUMBER: PS-70400	CREATED / REVISED BY: KSAMIEC	CHECKED BY: MKIPPER	APPROVED BY: FSMITH



PRODUCT SPECIFICATION

SL SINGLE ROW LINEAR CONNECTOR SYSTEM

APPENDIX A

Other products that conform to this specification

- 70541, single row, .120" pocket, wire-to-board, shrouded header, vertical, split peg
- 70543, single row, .120" pocket, wire-to-board, shrouded header, vertical
- 70545, single row, .120" pocket, wire-to-board, shrouded header, vertical, tri-peg
- 70546, single row, .120" pocket, wire-to-board, shrouded header, vertical, tri-peg
- 70551, single row, .120" pocket, wire-to-board, shrouded header, right angle, split peg
- 70553, single row, .120" pocket, wire-to-board, shrouded header, right angle
- 70555, single row, .120" pocket, wire-to-board, shrouded header, right angle, tri-peg
- 70556, single row, .120" pocket, wire-to-board, shrouded header, right angle, tri-peg
- 70634, single row, .120" pocket, wire-to-board, shrouded header, right angle, tri-peg, SMT
- 71164, single row, .120" pocket, wire-to-board, shrouded header, voided circuits
- 74095, single row, .120" pocket, wire-to-board, shrouded header, vertical, compliant pin
- 74098, single row, .120" pocket, wire-to-board, shrouded header, right angle, split peg, SMT
- 74099, single row, .120" pocket, wire-to-board, shrouded header, vertical, SMT
- 74105, single row, .120" pocket, wire-to-board, shrouded header, right angle, SMT

<u>REVISION:</u>	<u>ECR/ECN INFORMATION:</u>	<u>TITLE:</u>		<u>SHEET No.</u>
P	<u>EC No:</u> 106074 <u>DATE:</u> 2018/03/05	PRODUCT SPECIFICATION SINGLE ROW – STACKABLE LINEAR (SL) CONNECTOR SYSTEM		8 of 8
<u>DOCUMENT NUMBER:</u>		<u>CREATED / REVISED BY:</u>	<u>CHECKED BY:</u>	<u>APPROVED BY:</u>
PS-70400		KSAMIEC	MKIPPER	FSMITH