



PRODUCT SPECIFICATION

1.0 SCOPE

This specification covers the Molex 60 and 80 circuit LFH .050" pitch vertical and right angle shielded plug and receptacle connectors. This represents a board-to-board I/O and a cable to board I/O connector system specific to the requirements set forth by Molex Inc.

1.1 Reference Documents:

For application tooling and assembly requirements refer to Molex Specification AS-70929 and AS-71691-9999

2.0 PRODUCT DESCRIPTION

2.1 The connectors covered in this specification are:

<u>Description</u>	<u>Applicable Document</u>
<u>Receptacle Connector</u>	
Right Angle	SDA-70928-200*
Vertical	SDA-70928-0001 SDA-70928-0002 SDA-70928-9999 SDA-71478-****
Guide Hardware	SDA-71629-****
<u>Plug Connector</u>	
Right Angle	SDA-70929-0001
Vertical	SDA-70929-1001 SDA-71475-****
Mounting Hardware	SDMS-70982-**** SD-71108-**** SD-70982-****
Guide Hardware	SDA-71628-****
<u>Cable – Plug</u>	
Hsg./Shield Sub-assembly	SDA-70929-20** SDA-71720-****
Inserts (Contact)	SDA-70984-100* SDA-71477-****
Clampshells	SDMS-71245-2000/3000 SDMS-71723-****
<u>Cable – Receptacle</u>	
Hsg./Shield Sub-assembly	SDA-71691-0003
Inserts (Contact)	SDA-70985-100*
Backshells	SDA-71691-0002

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2.0 PRODUCT DESCRIPTION (CONTINUED)

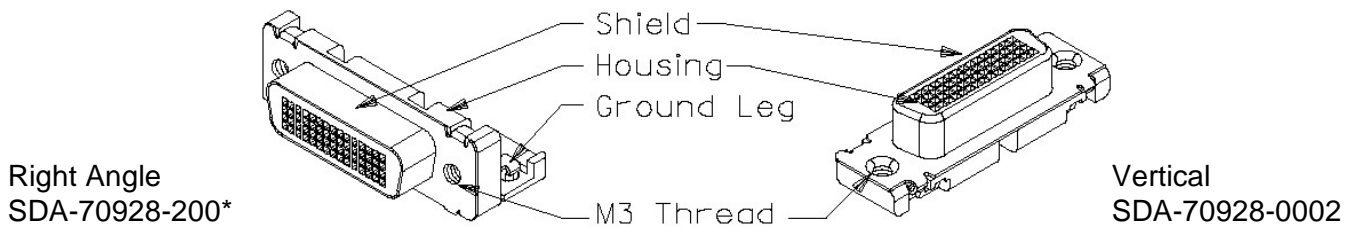
2.2 This LFH (Low Force Helix) connector system is designed to meet the industry's demand for a cost effective, high density, and low insertion force connector. The connectors utilize a gold-to-gold contact system to provide long-term reliability. The operating temperature for these connectors is -20 degrees C to 80 degrees C.

2.3 The receptacle connector is available in vertical, right angle and cable I/O variations. The board connectors are designed to be wave soldered to PCBs using standard industry methods. The receptacle connector tail pattern is on a .050" x .050" grid. In cable applications, this EMI/RFI shielded system is designed to be capable of high speed transmission signal transfer, which is achieved through the cable interconnect and component integration via paddle cards on .050" centerlines or direct wire welding. For further information on cable applications, please contact Molex.

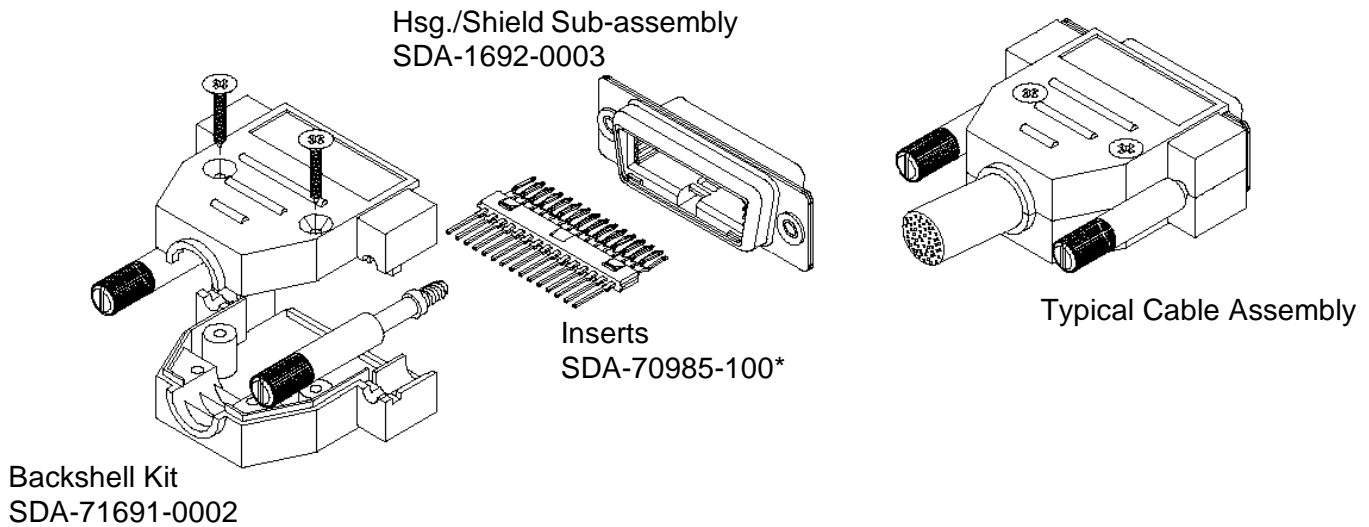
2.4 The plug connector is a right angle, vertical or cable style connector designed to be wave soldered to a standard .062" thick PCB using conventional industry methods. The plug connector tail pattern is on a .050" x .050" grid.

2.5 Nomenclature:

Receptacle Board Level I/O



Receptacle Cable I/O



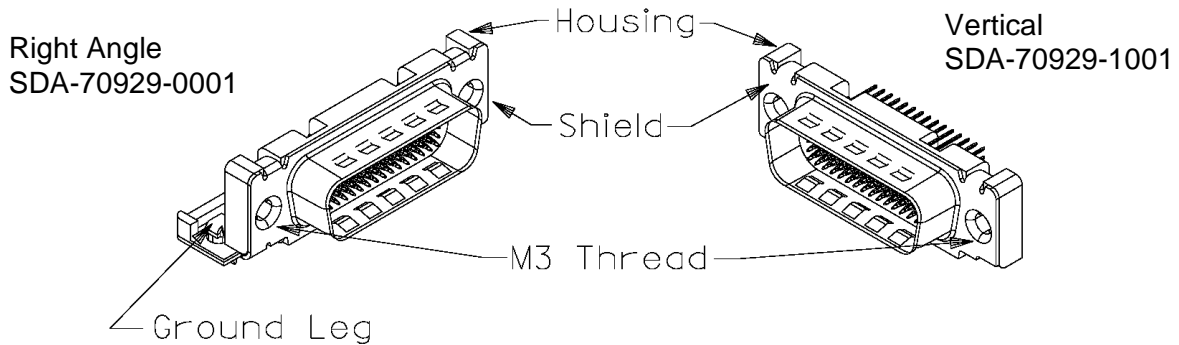
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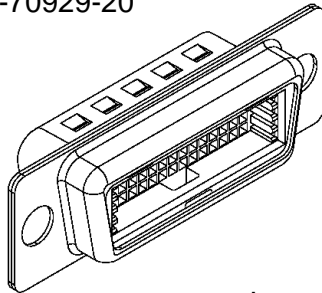
2.0 PRODUCT DESCRIPTION (CONTINUED)

2.5 Nomenclature: (Cont'd)
Plug Board Level I/O

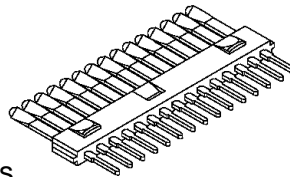


Plug Cable I/O

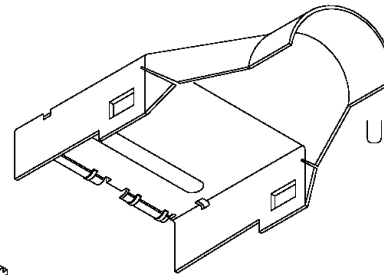
Hsg./Shield Sub-Assembly
 SDA-70929-20**



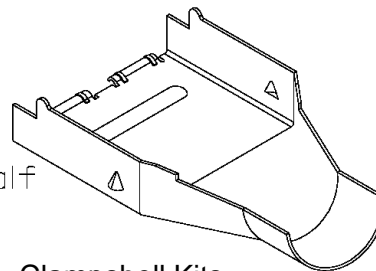
Inserts
 SDA-70984-100*



Upper Half



Lower Half



Clampshell Kits
 SDMS-71245-2000
 SDMS-71245-3000

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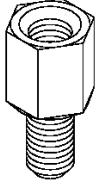


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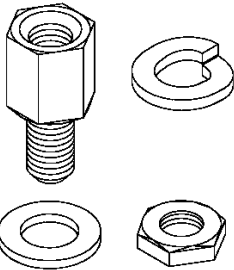
2.0 PRODUCT DESCRIPTION (CONTINUED)

2.5 Nomenclature (Cont'd)

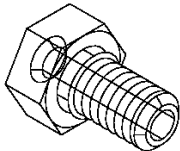
Hardware



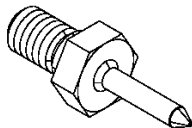
$\frac{3}{16}$ Hexagonal Screwlock - Internal #4-40/External M3
SD-70982-****



$\frac{3}{16}$ Hexagonal Hardware Kit
SDMS-70982-****



Guide Sleeve
SDA-71629-****



Guide Pin
SDA-71628-****

3.0 RECOGNIZED AGENCY APPROVAL

3.1 U.L. Recognition: File E29179, Volume 10, Section 12.

3.2 C.S.A. Certification: LR19980.

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4.0 MECHANICAL SPECIFICATIONS:

4.1 Materials:

- 4.1.1 Housings are molded of liquid crystal polymer (LCP), glass filled, black, and 94V-0 rated.
- 4.1.2 Terminal Sticks are molded of liquid crystal polymer (LCP), glass filled, black, and 94V-0 rated.
- 4.1.3 Receptacle Terminals are beryllium copper alloy.
- 4.1.4 Plug Terminals are phosphor bronze alloy.

4.2 Plating:

- 4.2.1 Terminals are plated with .000030”(0.00076mm) minimum gold plate in contact area over nickel underplate overall.
- 4.2.2 Terminals are plated with .00010”(0.00254mm) minimum tin plate in solder tail area over nickel underplate overall.

4.3 Insertion/Withdrawal forces;

- 4.3.1 Maximum Contact Insertion Force:
60 grams per contact
- 4.3.2 Minimum Contact Withdrawal Force:
40 grams per contact

4.4 Durability: 500 cycles

4.5 Mechanical Durability: 5000 cycles

Contact resistance not to exceed 50 milliohms following this test. Mechanical damage acceptable if it does not interfere with future connector performance.

5.0 ELECTRICAL SPECIFICATIONS

5.1 Voltage: 40 VAC RMS.

5.2 Current: 1.0 Amps at 30°C temperature rise.

5.3 Contact Interface Resistance: 10 milliohms max.

5.4 Dielectric Strength: 500 VRMS for 1 minute

5.5 Insulation Resistance: 100 Mohms minimum after 500 VDC for 1 minute.

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6.0 ENVIRONMENTAL SPECIFICATIONS:

6.1 Group I Sequence: Mated Environment

<u>Test/Specification</u>	<u>Test Severity/Duration</u>
6.1.1 Thermal Shock	-40°C to 105°C, 30 minute dwell at each temp., 10 cycles
6.1.2 Thermal Aging	105°C for 240 hours
6.1.3 Cyclic Humidity	10 Temperature cycles between 25°C to 65°C at 96% R.H. for 240 hrs.
6.1.4 Following Group I test sequence the contact resistance shall not change more than 10 milliohms from initial readings.	

6.2 Group III Sequence: Mated Environment/Mechanical

<u>Test/Specification</u>	<u>Test Severity/Duration</u>
6.2.1 Steady State Humidity Mil-Std-202 Method 103	40°C @ 90-95% R.H. for 240 hours
6.2.2 Vibration Mil-Std-202 Method 201	10-55-10 Hz, 1 minute cycles for 2 hours in each axis. .03 inch excursion, 10 G.
6.2.3 Following Group III test sequence the contact resistance shall not change more than 10 milliohms from initial readings.	

6.3 Group V Sequence: Mechanical – Connector Forces

<u>Test/Specification</u>	<u>Test Severity/Duration</u>
6.3.1 Thermal Aged	½ samples 105°C for 240hours
6.3.2 Mate/Unmate Cycling	500 mate /umate cycles Rate: 1"/min.
6.3.3 Following this test sequence the forces shall be:	
<u>60 Circuit</u>	
Mating Force: 12 pounds maximum.	
Unmating Force: 5 pounds minimum.	
<u>80 Circuit</u>	
Mating Force: 15 pounds maximum.	
Unmating Force: 7 pounds minimum.	

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6.0 ENVIRONMENTAL SPECIFICATION (CONTINUED)

6.4 Group V Sequence: Mechanical – Individual Contact Forces

<u>Test/Specification</u>	<u>Test Severity/Duration</u>
6.4.1 Mate/Unmate Cycling	500 mate/unmate cycles
6.4.2 Following this test sequence the forces shall be: Contact Insertion Force: 60 grams max. Contact Withdrawal force: 15 grams min.	
6.4.3 At the conclusion of the test, the change in contact resistance shall not increase by more than 5 milliohms over their initial values.	

6.5 Group V Sequence: Mechanical – Normal Forces

<u>Test/Specification</u>	<u>Test Severity/Duration</u>
6.5.1 Thermal Aged w/Stress	1/3 of samples 105°C for 240 hours
6.5.2 Mate/Unmate Cycling	1/3 of samples 500 cycles
6.5.3 Following this test sequence the contacts of the three different test groups shall have a minimum normal force of 50 grams.	

7.0 TEST REQUIREMENTS AND SEQUENCE

7.1 Tests shall be performed per the test matrix on page 8 of this specification.

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TEST OR EXAMINATION	TEST SEQUENCE								
	1	2	3	4	5	6	7	8	9
EXAMINATION OF PRODUCT	1,9	1,12	1,7	1,9	1	1	1	1	1
MEASURE CONTACT RESISTANCE	2,4,6,8	2,4,6,8,10	2,4,6	2,4,6,8					
THERMAL SHOCK (105C TO -40C; 10 CYC.)	3	5							
MATE/UNMATE CYCLING (DURABILITY: 500 CYCLES)		3		3					2
THERMAL AGING (105C; 240 HOURS)	5	7				3			
CYCLIC HUMIDITY (MIL-STD-202; METHOD 106)	7	9							
STEADY STATE HUMIDITY (MIL-STD-202; METHOD 103)			3	5					
VIBRATION (MIL-STD-202; METHOD 201)			5	7					
CONNECTOR MATING FORCE					2	2			
CONNECTOR UNMATING FORCE					3	4			
MULTIPLE MATING/ UNMATING FORCES					4	5			
THERMAL AGED W/STRESS (105C; 240 HOURS)							2		
MEASURE TERMINAL NORMAL FORCES		11					3	2	3

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