



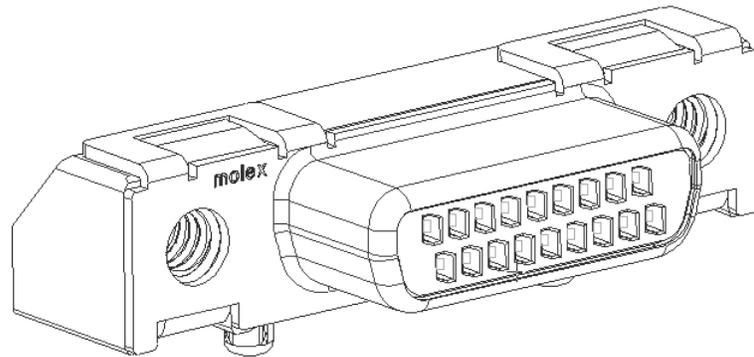
# PRODUCT SPECIFICATION

## TRIAD DIFFERENTIAL PAIR (TDP) /PCIE

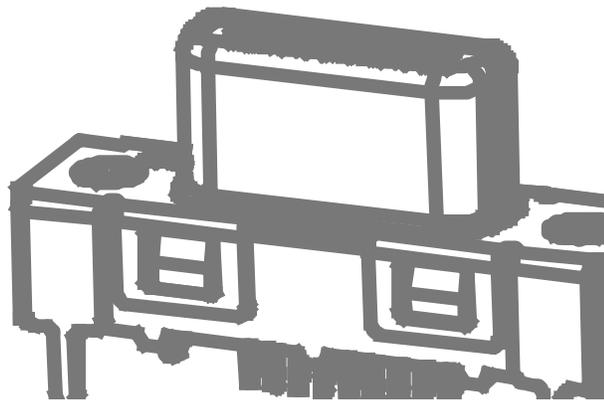
### 1.0 SCOPE

This Product Specification covers the TDP 18, 28, & 48 circuit, 1.27mm/.050" pitch, shielded dual row connector system, which includes the 74960 & 76641 series Receptacle Assembly, the mating 79925 series Cable Assembly and 75000 series Plug Connector Assembly.

### 2.0 PRODUCT DESCRIPTION



18 Circuit Right Angle Receptacle Assembly



18 Ckt Vertical Receptacle Assembly

### 2.1 RECEPTACLE ASSEMBLY

18 Ckt Vertical Receptacle	76641-0001
18 Ckt Right Angle Receptacle	74960-3018
28 Ckt Right Angle Receptacle	74960-3028
48 Ckt Right Angle Receptacle	74960-3048

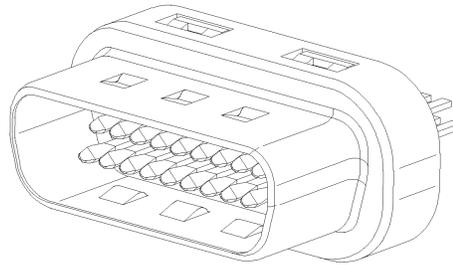
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DOCUMENT NUMBER: <b>PS-74960-000</b>	CREATED / REVISED BY: <b>T. Ibarra</b>	CHECKED BY: <b>M. Cain</b>	APPROVED BY: <b>S. Miller</b>



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## 2.2 RECEPTACLE ASSEMBLY DIMENSIONS

For dimensional details, recommended Printed Circuit Board layout and panel cut-out refer to Sales Drawing SD-74960-010



18 Circuit Plug Connector Assembly

## 2.3 PLUG CONNECTOR ASSEMBLY

The plug cable connector consists of, (1) housing, (1) shield, (2) overmolded sticks with trimmed solder tails. Refer to Application Specification AS-75000-001 for conductor termination details.

Assembled Plug Connector

- 18 Ckt Plug Connector 75000-1018 (First Mate Last Break)
- 28 Ckt Plug Connector 75000-1028
- 48 Ckt Plug Connector 75000-1048

## 2.4 PLUG CONNECTOR ASSEMBLY DIMENSIONS

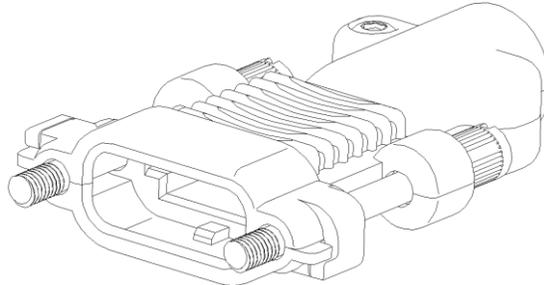
For dimensional details refer to Sales Drawing

- 18 Ckt Plug Connector SD-75000-000
- 28 Ckt Plug Connector SD-75000-001
- 48 Ckt Plug Connector SD-75000-001

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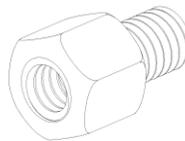


18 Circuit Plug Cable Kit

## 2.5 PLUG CABLE KIT

Consists of (2) Backshells, (2) Jackscrews & (2) Mounting Screws, refer to Sales Drawing for part numbers, circuit sizes, jackscrew thread types and recommended cable diameters;

Plug Cable Kit SD-75115-001 (black finish)



Jack Post

## 2.6 MOUNTING HARDWARE FOR JACKSCREWS

The jack post has an internal 4-40 or M3 thread to mate with the Plug Cable Kit jack screws. This provides a rigid mechanical connection and is suitable for applications that do not require frequent mating and unmating. The Molex jack post is recommended for this application to ensure proper mating of the contact interface when used with a 0.51-2.03 mm (.020"-.080") thick mounting panel.

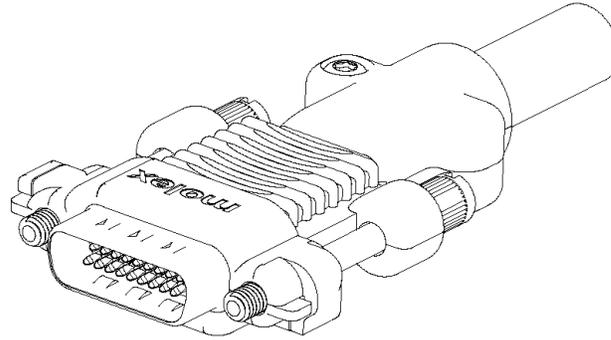
Refer to Sales Drawing for dimensional details and part numbers;

Jack Post SD-74962-000

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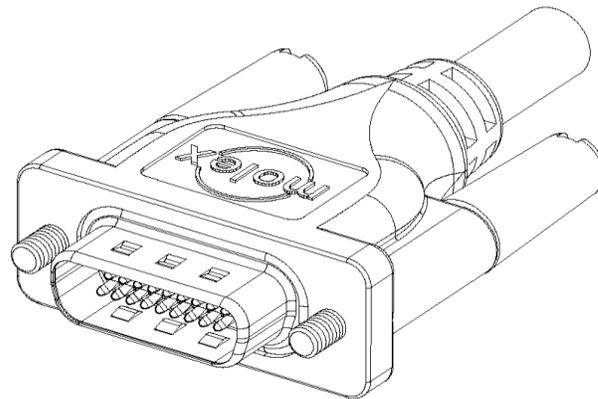


18 Circuit Cable Assembly

## 2.7 DIFFERENTIAL CABLE ASSEMBLY

Available in 1 & 3 meter lengths with either 4-40 (Standard) or M3 (Special) Jack Screws, refer to Sales Drawings for part numbers, electrical specifications and pin wiring details;

- 18 Ckt Cable assembly SD-79925-001
- 28 Ckt Cable Assembly SD-79925-006
- 48 Ckt Cable Assembly SD-79925-0014



PCIe 1x Cable Assembly

## 2.8 PCIE 1X CABLE ASSEMBLY

Available in multiple cable lengths with 4-40 Jack Screws, refer to Sales Drawings for part numbers, electrical specifications and pin wiring details;

- PCIe 1x Cable assembly SD-74576-000

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## 2.9 MATERIALS

### Receptacle Assembly

Housings: High temp glass filled thermoplastic, Black, UL94 V-0 rated  
 Terminals: Copper Alloy  
 Shield: Mild Carbon Steel  
 Threaded Inserts: Stainless Steel

### Plug Connector Assembly

Housing: High temp glass filled thermoplastic, Black, UL94 V-0 rated  
 Terminals: Phosphor Bronze Alloy  
 Shield: Mild Carbon Steel

### Plug Cable Kit

Backshells: Zinc Alloy  
 Jackscrews: Stainless Steel  
 Mounting screw: Steel

## 2.10 PLATINGS

Terminals: Selective Gold (Au) thickness in contact area;  
 15 microinches/0.38 micrometer minimum.  
 Selective matte Tin (Sn) thickness in pc tail area;  
 100 microinches/2.54 micrometer minimum over  
 50 microinches/1.27 micrometer minimum Nickel (Ni) overall.

Shields: For Series 74960 and 75000:  
 100 microinches/2.54 micrometer minimum bright Tin (Sn) over  
 50 microinches/1.27 micrometer minimum Nickel (Ni) over  
 100 microinches/2.54 micrometer minimum Copper (Cu).

For Series 76641:  
 100 microinches/2.54 micrometer minimum matte Tin (Sn) over  
 50 microinches/1.27 micrometer minimum Nickel (Ni) over  
 100 microinches/2.54 micrometer minimum Copper (Cu).

## 2.11 MARKINGS

The Molex name is stamped on the front of each receptacle shield as an identifier.  
 Refer to Sales Drawings for additional information.

## 2.12 SAFETY AGENCY APPROVALS

UL File Number..... E29179  
 CSA File Number.....TBD

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# PRODUCT SPECIFICATION

## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

### 3.1 SPECIFICATIONS

All documents referenced shall be of the latest revision. The order of precedence detailing requirements of this specification is as follows :

1. Product drawings
2. This specification

### 3.2 REFERENCE DOCUMENTS

ANSI/EIA-364-1000.01 Environmental Test Methodology for Assessing the Performance of Electrical Connectors and Sockets Used in Business Office Applications.

IEC-801-2 International Electrotechnical Commission, Electro Discharge Requirements.

MIL STD-202 : Test methods for electronics and electrical component parts.

UL 94 : Tests for flammability of plastic materials.

Molex LFH .050 pitch interface durability testing, 5000 cycles (Test Report #4698).

Molex AS-75000-001 Application Specification, Plug Assembly Cable Termination.

## 4.0 RATINGS

### 4.1 VOLTAGE

40 Volts AC (RMS)

### 4.2 CURRENT

1.5 Amps per circuit at 30°C temperature rise.

30°C maximum temperature rise and 55°C maximum ambient per EIA-364-70.

### 4.3 TEMPERATURE

Operating: - 20°C to +85°C

Non-Operating: - 20°C to +85°C

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# PRODUCT SPECIFICATION

## 5.0 PERFORMANCE

### 5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Contact Resistance (Low Level)</b>	Mate connectors: apply a maximum voltage of <b>20 mV</b> and a current of <b>100 mA</b> . (Measurement locations in Section 7.0)	<b>10 milliohms</b> MAXIMUM [initial]
2	<b>Contact Resistance @ Rated Current</b>	Mate connectors: apply a maximum voltage of <b>20 mV</b> at rated current. (Measurement locations in Section 7.0)	<b>10 milliohms</b> MAXIMUM [initial]
3	<b>Contact Resistance of Wire Termination (Low Level)</b>	Terminate the applicable wire to the terminal and measure wire using a voltage of <b>20 mV</b> and a current of <b>100 mA</b> . (Measurement locations in Section 7.0)	<b>2 milliohms</b> MAXIMUM [initial]
4	<b>Shell Resistance</b>	Bulk resistance measured between ground tab leg on receptacle shield and the plug cable braid. Test current=100 mA; Test voltage=5 Volts DC open circuit maximum per ANSI/EIA-364-06A-83	<b>50 milliohm</b> maximum initial <b>50 milliohm</b> maximum change from initial reading
5	<b>Insulation Resistance</b>	Unmate & unmount connectors: apply a voltage of <b>500 VDC</b> between adjacent terminals and between terminals to ground.	<b>100 Megohms</b> MINIMUM
6	<b>Dielectric Withstanding Voltage</b>	Unmated connectors: apply a voltage of 500 Volts DC +/- 50 V for <b>1</b> minute between adjacent terminals and between terminals to ground.	No breakdown; current leakage < <b>5 mA</b>
7	<b>Electrostatic Discharge</b>	Test unmated from 1kV to 8kV in 1kV steps using 8mm ball probe per IEC 801-2. Contact discharge to shell, air discharge perpendicular to shell, air discharge at angle to shell.	No evidence of discharge to contacts at 8kV. Discharge to the shell is acceptable.
8	<b>Capacitance</b>	Measure between adjacent terminals at <b>1 MHz</b> .	<b>2 picofarads</b> MAXIMUM
9	<b>Temperature Rise (via Current Cycling)</b>	Mate connectors: measure the temperature rise at the rated current after: <b>96</b> hours ( <b>45</b> minutes ON and <b>15</b> minutes OFF per hour).	Temperature rise: <b>+30°C</b> MAXIMUM

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## 5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
10	<b>Terminal Insertion and Withdrawal Forces</b>	Insert and withdraw terminal (male to female) at a rate of $25 \pm 6$ mm ( $1 \pm \frac{1}{4}$ inch) per minute.	0.59 N (0.13 lbf) MAXIMUM insertion force & 0.15 N (0.03 lbf) MINIMUM withdrawal force
11	<b>Connector Mate and Unmate Forces</b>	Mate and unmate shielded connector (male to female) at a rate of $25 \pm 6$ mm ( $1 \pm \frac{1}{4}$ inch) per minute.	0.88 N (0.20 lbf) per Ckt MAXIMUM insertion force & 0.39 N (0.09 lbf) per Ckt MINIMUM withdrawal force
12	<b>Receptacle Terminal Retention Force (in Housing)</b>	Axial pullout force on the terminal in the housing at a rate of $25 \pm 6$ mm ( $1 \pm \frac{1}{4}$ inch) per minute.	4.4 N (1.0 lbf) MINIMUM retention force
13	<b>Durability</b>	Mate connectors <b>500</b> cycles minimum for a maximum rate of <b>10</b> cycles per minute prior to Environmental Tests.	Contact Resistance: <b>10</b> milliohms MAXIMUM Shell Resistance: <b>50</b> milliohms MAXIMUM (change from initial)
14	<b>Vibration (Random)</b>	Mate connectors and vibrate per EIA 364-28, test condition VII.	Contact Resistance: <b>10</b> milliohms MAXIMUM Shell Resistance: <b>50</b> milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
15	<b>Shock (Mechanical)</b>	Mate connectors and shock at <b>50</b> g's with $\frac{1}{2}$ sine wave (11 milliseconds) shocks in the $\pm X$ , $\pm Y$ , $\pm Z$ axes ( <b>18</b> shocks total).	Contact Resistance: <b>10</b> milliohms MAXIMUM Shell Resistance: <b>50</b> milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
16	<b>Fretting Corrosion (Thermal Shock)</b>	Mate connectors; expose for <b>1,000</b> cycles between temperatures <b>25</b> and <b>85°C</b> ; dwell 0.5 hours at each temperature.  {Note: Remove surface moisture and air dry for 1 hour prior to measurements; monitor low level contact resistance every <b>250</b> cycles.}	<b>10</b> milliohms MAXIMUM (change from initial) & Visual: No Damage

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17	<b>Cable Flex</b>	Flex cable <b>180°</b> for <b>100</b> cycles.	<b>10</b> milliohms <b>MAXIMUM</b> (change from initial) & Visual: No Damage
18	<b>Cable Pullout Force (Axial)</b>	Apply an axial pullout force on the cable at a rate of <b>25 ± 6 mm (1 ± ¼ inch)</b> .	<b>89.0 N (20 lbf)</b> <b>MINIMUM</b> pullout force
19	<b>Normal Force</b>	For reference only	<b>0.74 N (75 grams)</b> <b>MINIMUM</b>
20	<b>Thread Torque</b>	Mounted to panel; Test to failure; Tighten jackposts with torque gage until threads are stripped and jackpost turns freely	<b>0.56 N m (5.0 lbf in)</b> minimum

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## 5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT										
21	Shock (Thermal)	Mate connectors; expose to <b>10</b> cycles of: <table border="1"> <thead> <tr> <th>Temperature °C</th> <th>Duration (Minutes)</th> </tr> </thead> <tbody> <tr> <td>-40 +0/-3</td> <td>30</td> </tr> <tr> <td>+25 ±10</td> <td>5 MAXIMUM</td> </tr> <tr> <td>+105 +3/-0</td> <td>30</td> </tr> <tr> <td>+25 ±10</td> <td>5 MAXIMUM</td> </tr> </tbody> </table>	Temperature °C	Duration (Minutes)	-40 +0/-3	30	+25 ±10	5 MAXIMUM	+105 +3/-0	30	+25 ±10	5 MAXIMUM	<b>10</b> milliohms MAXIMUM (change from initial) & Visual: No Damage
Temperature °C	Duration (Minutes)												
-40 +0/-3	30												
+25 ±10	5 MAXIMUM												
+105 +3/-0	30												
+25 ±10	5 MAXIMUM												
22	Thermal Aging	Mate connectors; expose to: <b>240</b> hours at <b>105 ± 2°C</b>	<b>10</b> milliohms MAXIMUM (change from initial) & Visual: No Damage										
23	Humidity (Steady State)	Mate connectors: expose to a temperature of <b>40 ± 2°C</b> with a relative humidity of <b>90-95%</b> for <b>96</b> hours.  Note: Remove surface moisture and air dry for <b>1</b> hour prior to measurements.	<b>10</b> milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at <b>500</b> VAC & Insulation Resistance: <b>1000</b> Megohms MINIMUM & Visual: No Damage										
24	Humidity (Cyclic)	Mate connectors: cycle per EIA-364-31: <b>24</b> cycles at temperature <b>25 ± 3°C</b> at <b>80 ± 5%</b> relative humidity and <b>65 ± 3°C</b> at <b>50 ± 5%</b> relative humidity; dwell time of <b>1.0</b> hour; ramp time of <b>0.5</b> hours.  Note: Remove surface moisture and air dry for <b>1</b> hour prior to measurements.	<b>10</b> milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at <b>500</b> VAC & Insulation Resistance: <b>1000</b> Megohms MINIMUM & Visual: No Damage										
25	Cold Resistance	Mate connectors: Duration: <b>96</b> hours; Temperature: <b>-40 ± 3°C</b>	<b>10</b> milliohms MAXIMUM (change from initial) & Visual: No Damage										
26	Solderability	Per <b>SMES-152</b>	Solder coverage: <b>95%</b> MINIMUM (per <b>SMES-152</b> )										

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27	<b>Solder Resistance</b>	Dip connector terminal tails in solder: Solder Duration: <b>5 ± 0.5</b> seconds; Solder Temperature: <b>245 ± 5°C</b>  Recommend same parameters as <b>SMES-152.</b>	Visual: No Damage to insulator material
28	<b>IR Process Soldering</b>	Molex IR Profile	Dimensional: Conformance to Sales Drawing requirements & Visual: No Damage

## 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage.  
 18 Ckt Vertical Receptacle Assembly packaged in tube per PK-76641-1000  
 18 & 28 Ckt Right Angle Receptacle Assembly packaged in embossed tape & reel per PK-74960-995.  
 48 Ckt Right Angle Receptacle Assembly packaged in embossed tape & reel per PK-74960-996.  
 Assembled Plug Connector tube packed per PK-75000-991.  
 Plug Cable Kit bulk packed per PK-75115-990.

## 7.0 GAGES AND FIXTURES

## 8.0 OTHER INFORMATION

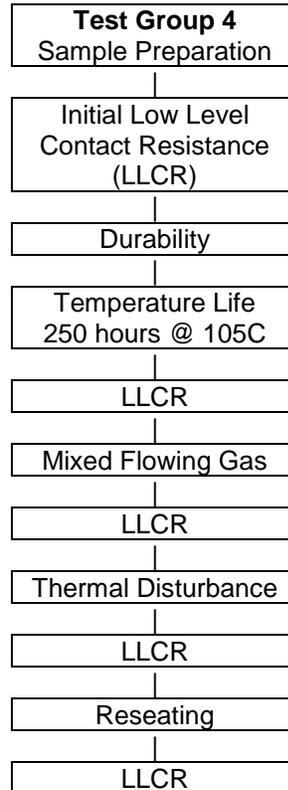
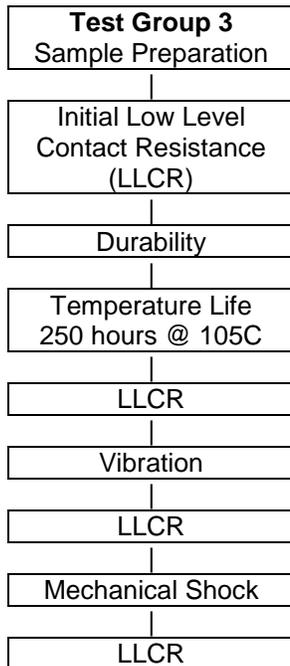
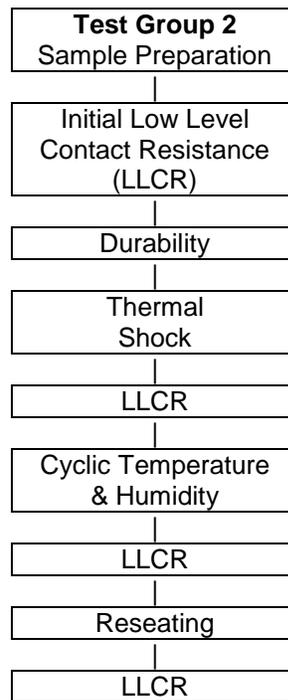
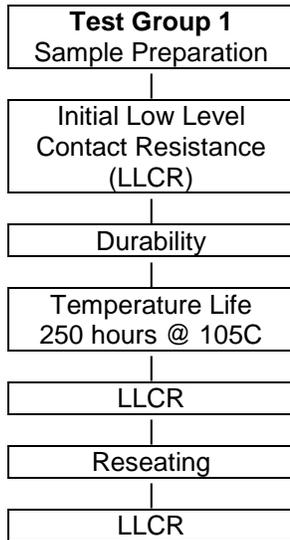
## 9.0 TEST SEQUENCES:

Reliability Test Sequences (per EIA-364-1000 Test Groups 1, 2, 3 & 4):

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