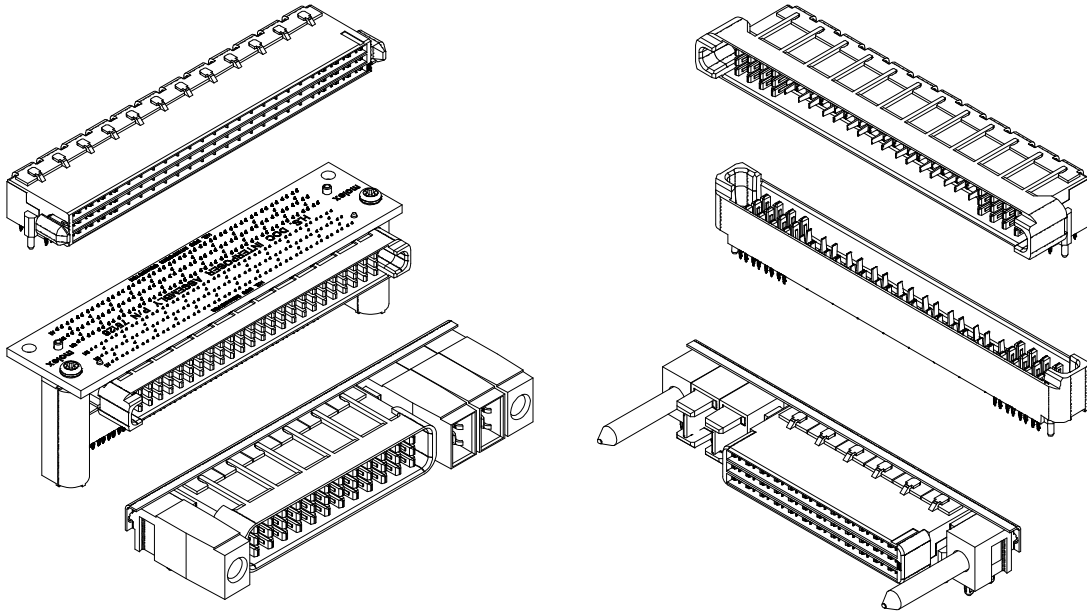




# PRODUCT SPECIFICATION

## PLATEAU™ HIGH SPEED DOCK CONNECTOR



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# PRODUCT SPECIFICATION

## PLATEAU™ HIGH SPEED DOCK CONNECTOR

### 1.0 SCOPE

This Product Specification is intended to define the mechanical, electrical and environmental requirements for the High Speed Docking connector system. The interface consists of differential pair signal lines over-molded in plastic and surrounded by a plated plastic housing. The signal contact pairs are on a column-to-column pitch of 3.50 mm pitch and a row-to-row pitch of 2.46mm. There are also dedicated lines for power, power return and detect.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBERS

High Speed Docking Connector

75018 – Fixed Connector (mates with 75019)

75019 – Floating Connector (mates with 75018, 75126 & 75140)

75126 – Interposer (mates with 75019)

75140 – Vertical Fixed Connector (mates with 75019)

75475 – Fixed Connector with external power & guide modules (mates with 75476)

75476 – Floating Connector with external power & guide modules (mates with 75475)

#### 2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

(see appropriate sales drawings for information)

#### 2.3 SAFETY AGENCY APPROVALS

UL: E29179

CSA: 1373502

### 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See the Sales Drawing and other sections of this Specification for the necessary referenced Documents and Specifications.

|   |   |   |                                 |
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## 4.0 RATINGS

### 4.1 VOLTAGE

12 Volts DC

### 4.2 CURRENT

Signal Connector

2.7 Amps – one pair

2.4 Amps – two adjacent pairs

2.0 Amps – three or more adjacent pairs

Power Module (externally mounted with guide module)

20 Amps

### 4.3 TEMPERATURE

Operating: - 20°C to + 85°C

Non-operating: - 40°C to + 85°

### 4.4 CHARACTERISTIC IMPEDANCE

100 Ohms – differential pair signals

50 Ohms – single ended signals

### 4.5 DIGITAL BANDWIDTH

0 to 10 Gbps – differential pair

|  |  |  |  |
|--|--|--|--|
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# PRODUCT SPECIFICATION

## 5.0 PERFORMANCE

### 5.1 ELECTRICAL CHARACTERIZATION

| ITEM | DESCRIPTION                            | TEST CONDITION  | REQUIREMENT  |
|------|--|---|--|
| 1    | Contact Resistance (Low Level)         | Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. (Measurement locations in Section 7.0)               | Signal - 30 milliohms<br>Power - 20 milliohms<br>MAXIMUM [initial] |
| 2    | Dielectric Withstanding Voltage        | Unmate connectors: apply a voltage of 500 VAC for 1 minute between adjacent terminals and between terminals to ground.          | No breakdown;<br>current leakage < 5 mA                            |
| 3    | Temperature Rise (via Current Cycling) | Mate connectors: measure the temperature rise at the rated current after: 96 hours (45 minutes ON and 15 minutes OFF per hour). | Temperature rise:<br>+30°C MAXIMUM                                 |
| 4    | Impedance (differential pair)          | Mate connectors: rise time of 150 ps (10/90)  | 100 ± 10% ohms   |
| 5    | Bandwidth (differential pair)          | Mate connectors: including launches   | Average: 10 Gbps   |
| 6    | Cross-talk (NEXT) (differential pair)  | Mate connectors: rise time of 50/100/150 ps (10/90), all adjacent pairs driven  | 50ps - <0.8%<br>100ps - <0.7%<br>150ps - <0.6%                     |
| 7    | Cross-talk (FEXT) (differential pair)  | Mate connectors: rise time of 100 ps (10/90), all adjacent pairs driven   | <0.5%  |
| 8    | Impedance (single ended)               | Mate connectors: rise time of 1 ns  | 50 ± 10% ohms  |
| 9    | Bandwidth (single ended)               | Mate connectors: including launches   | <3.125 Gbps  |
| 10   | Cross-talk (NEXT) (single ended)       | Mate connectors: rise time of 1 ns, within a pair   | <4%  |
| 11   | Cross-talk (FEXT) (single ended)       | Mate connectors: rise time of 1 ns, within a pair   | <1%  |
| 12   | Differential Skew (within pair)        | Mate connectors:  | <1 ps  |
| 13   | Propagation Delay                      | Mate connectors: calculated using group delay   | A to A' <130 ps<br>B to B' <185 ps<br>C to C' <240 ps              |
| 14   | Plated Housing Resistivity             |   | < 2 milliohms / cm   |
| 15   | Differential Insertion Loss (DP)       | Mate connectors: -3db   | Average: 5GHz  |
| 16   | Differential Insertion Loss (SE)       | Mate connectors: -3db   | Average: 4GHz  |

Note: High-speed electrical characterization is for 4.74mm centerline right angle product mated in an in-line orientation. Contact your Molex Representative for additional information.

|   |   |   |                                |                                 |
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## 5.2 MECHANICAL CHARACTERIZATION

| ITEM | DESCRIPTION                             | TEST CONDITION  | REQUIREMENT  |
|------|---|---|--|
| 1    | <b>Connector Mate and Unmate Forces</b> | Mate and unmate connector (male to female) at a rate of $25 \pm 6$ mm ( $1 \pm \frac{1}{4}$ inch) per minute. (144 circuit) | <b>80 N (18 lbf)</b><br>MAXIMUM insertion force &<br><b>20 N (4.5 lbf)</b><br>MINIMUM withdrawal force           |
| 2    | <b>Durability</b>                       | Mate connectors up 100 cycles, at a maximum rate of <b>10</b> cycles per minute. Test per EIA-364-09.                       | <b>10</b> milliohms MAXIMUM (change from initial)  |
| 3    | <b>Durability (pre-conditioning)</b>    | Mate connectors 5 cycles, at a maximum rate of <b>10</b> cycles per minute. Test per EIA-364-09.                            | no physical damage   |
| 4    | <b>Vibration (Random)</b>               | Mate connectors and vibrate per EIA 364-28, test condition VII.   | <b>10</b> milliohms MAXIMUM (change from initial) &<br>Discontinuity < <b>1</b> microsecond                      |
| 5    | <b>Normal Force</b>                     | Apply a perpendicular force.  | <b>0.49 N (50 grams)</b> MINIMUM   |
| 6    | <b>Compliant Pin Insertion into PCB</b> | Apply an axial insertion force on the terminal at a rate of $25 \pm 6$ mm ( $1 \pm \frac{1}{4}$ inch).                      | <b>Signal - 35 N (7.9 lbf)</b><br><b>Power - 53 N (12.0 lbf)</b><br>MAXIMUM insertion force<br>Per compliant pin |
| 7    | <b>Compliant Pin Retention into PCB</b> | Apply an axial extraction force on the terminal at a rate of $25 \pm 6$ mm ( $1 \pm \frac{1}{4}$ inch).                     | <b>Signal - 9 N (2 lbf)</b><br><b>Power - 9 N (2 lbf)</b><br>MINIMUM retention force<br>Per compliant pin        |
| 8    | <b>Reseating</b>                        | Mate connectors 5 cycles, at a maximum rate of <b>10</b> cycles per minute. Test per EIA-364-09.                            | no physical damage   |

|   |   |   |                                 |
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## 5.3 ENVIRONMENTAL REQUIREMENTS

| ITEM | DESCRIPTION                                | TEST CONDITION   | REQUIREMENT  |
|------|--|--|--|
| 1    | <b>Fretting Corrosion (Thermal Shock)</b>  | Mate connectors: expose for 10 cycles between -55°C and 85°C; dwell 0.5 hours at each temperature.<br>Test per EIA-364-32, Condition 1 | <b>10 milliohms MAXIMUM</b><br>(change from initial)   |
| 2    | <b>Temperature Life (Thermal Aging)</b>    | Mate connectors: expose to 1500 hours at 90°C ± 2°C.<br>Test per EIA-364-17, Method A, Test Condition 4.                               | <b>10 milliohms MAXIMUM</b><br>(change from initial)   |
| 3    | <b>Temperature Life (pre-conditioning)</b> | Mate connectors: expose to 500 hours at 90°C ± 2°C.<br>Test per EIA-364-17, Method A, Test Condition 4.                                | <b>10 milliohms MAXIMUM</b><br>(change from initial)   |
| 4    | <b>Cyclic Humidity</b>                     | Mate connectors: 10 cycles (10 days) between 25°C at 80%RH and 65°C at 50%RH.<br>Test per EIA-364-31, Method III, Test Condition B.    | <b>10 milliohms MAXIMUM</b><br>(change from initial)   |
| 5    | <b>Thermal Disturbance</b>                 | Mate connectors: 10 cycles between 15°C and 85°C. Temperature ramp should be 2°C per minute with 5-minute dwell minimum.               | <b>10 milliohms MAXIMUM</b><br>(change from initial)   |
| 6    | <b>Mixed Flowing Gas</b>                   | Mate connectors: expose to Class II environment for 14 days.<br>Test per EIA-364-65.   | <b>10 milliohms MAXIMUM</b><br>(change from initial, 2% allowed above 10 milliohms but below 50 milliohms) |

|   |   |   |                                 |
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## 6.0 TEST SEQUENCES AND CONFORMANCE REQUIREMENTS

| Test Description                            | Eia-364-1000.01 Test Sequences |            |       |            |     |
|---|--------------------------------|------------|-------|------------|-----|
|   | 1                              | 2          | 3     | 4          | 7   |
| LLCR or Contact Resistance (5.1.1)          | 1, 4, 6                        | 1, 4, 6, 8 | 1,4,6 | 1,4,6,8,10 | 2,4 |
| Dielectric Withstanding Voltage (5.1.2)     |                                |            |       |            | 1,5 |
| Durability (5.2.2)                          |                                |            |       |            | 3   |
| Durability (pre-conditioning) (5.2.3)       | 2                              | 2          | 2     | 2          |     |
| Mechanical Vibration (5.2.4)                |                                |            | 5     |            |     |
| Thermal Shock (5.3.1)                       |                                | 3          |       |            |     |
| Temperature Life (5.3.2)                    | 3                              |            |       |            |     |
| Temperature Life (pre-conditioning) (5.3.3) |                                |            | 3     | 3          |     |
| Cyclic Humidity (5.3.4)                     |                                | 5          |       |            |     |
| Thermal Disturbance (5.3.5)                 |                                |            |       | 7          |     |
| Mixed Flowing Gas (5.3.6)                   |                                |            |       | 5          |     |
| Reseating (5.2.8)                           | 5                              | 7          |       | 9          |     |

| Test Description                      | Additional Test Sequences |   |   |   |
|---------------------------------------|---------------------------|---|---|---|
|                                       | 1                         | 2 | 3 | 4 |
| Temperature Rise (5.1.4)              | 1                         |   |   |   |
| Mating Force (5.2.1)                  |                           | 1 |   |   |
| Un-mating Force (5.2.1)               |                           | 2 |   |   |
| Normal Force (5.2.5)                  |                           |   |   | 1 |
| Compliant Pin Insertion Force (5.2.6) |                           |   | 1 |   |
| Compliant Pin Retention Force (5.2.7) |                           |   | 2 |   |

| Test Description                              | High Speed Test Sequences |   |   |   |   |
|---|---------------------------|---|---|---|---|
|   | 1                         | 2 | 3 | 4 | 5 |
| Impedance – differential pair (5.1.4)         | 1                         |   |   |   |   |
| Bandwidth – differential pair (5.1.5)         | 2                         |   |   |   |   |
| Cross-talk – differential pair (5.1.6, 5.1.7) |                           | 1 |   |   |   |
| Impedance – single ended (5.1.8)              |                           |   | 1 |   |   |
| Bandwidth – single ended (5.1.9)              |                           |   | 2 |   |   |
| Cross-talk – single ended (5.1.10, 5.1.11)    |                           |   |   | 1 |   |
| Skew – within pair (5.1.12)                   |                           |   |   |   | 1 |
| Propagation Delay (5.1.13)                    |                           |   |   |   | 2 |
| Insertion Loss / Return Loss (5.1.15,5.1.16)  |                           | 2 |   | 2 |   |

|   |   |   |                                 |
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## 6.1 QUALIFICATION TESTING

### 6.1.1 SPECIMEN SELECTION

Samples for testing shall be representative of normal production lots.

### 6.1.2 DATA

Sample groups shall consist of a minimum of 5 mated connectors.

## 6.2 RE-QUALIFICATION TESTING

If changes significantly affecting the form, fit, or function are made to the product or to the manufacturing process, the product shall go through re-qualification testing as determined by product engineering, quality engineering and reliability engineering.

## 6.3 ACCEPTANCE

Acceptance is based on verification that the product meets the requirements listed in Section 5.0, Performance Requirements. Failures attributed to equipment, test setup, or operator error shall not disqualify the product. If a product failure occurs, corrective action shall be taken and specimens re-submitted for qualification.

## 7.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. Refer to PK-75020-010 for tray packaging information for 75018, 75019 and 75140 series. Refer to PK-75126-001 for tray packaging for 75126 series.

## 8.0 GAGES AND FIXTURES

## 9.0 APPLICATION NOTES

### A. APPLICATION OF CONNECTOR TO PCB

Connector is to be applied with Molex application tool or equivalent.  
See document AS-75018-001 for application instructions and application tool requirements.  
Connector is to be pressed into PCB within  $\pm 0.10$ mm of the PCB surface.  
Connector is to be pressed only in the designated areas when applying to the PCB.

### B. REPAIR OF CONNECTOR ON PCB

Connector is to be removed with Molex removal or equivalent.  
See document AS-75018-001 for removal instructions and removal tool requirements.  
Connector may be repaired a maximum of three times.

### C. MATING OF CONNECTORS

Connector is designed for use in a rack/card cage environment.  
Connector is designed to be able to mate within 1.27mm of misalignment.  
Connector is designed to be able to handle a maximum of  $\frac{1}{2}^\circ$  rotation.  
Excess zippering of connectors during mating or un-mating operation could damage contact interface.

|   |   |   |                                 |
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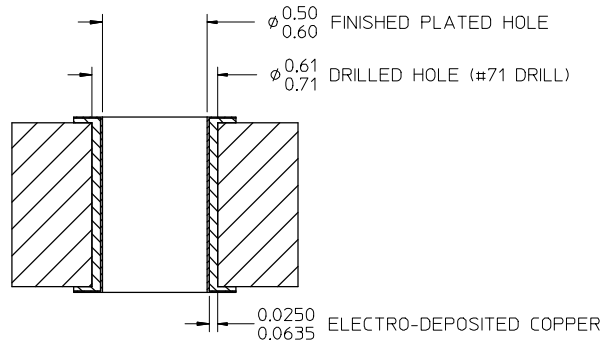
## 10. OTHER INFORMATION

### 10.1. PCB REQUIREMENTS

The compliant pin shall be capable of being inserted one time.

The PCB hole shall be capable of retaining the compliant pin for a maximum of three insertions. The removal of the compliant pin from the PCB shall not damage the PCB hole beyond the point to be able to retain a compliant pin (that has not been inserted into a PCB).

The minimum thickness of PCB for use with the compliant pin is 1.80.



HOLE PLATING DETAIL

### 10.2. MULTIPLE CONNECTORS IN PARALLEL

Multiple connectors may be used in parallel. When using multiple connectors in parallel the PCB holes must be drilled as a single pattern. The positional requirement of the pattern is to be:



|   |   |   |                                 |
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