



# PRODUCT SPECIFICATION

## MICRO-FIT BMI FLOATING CONNECTOR SYSTEM

### 1.0 SCOPE

This Product Specification covers the 3.00 mm (.118 inch) centerline (pitch) connector system terminated with 20 to 30 AWG wire using crimp technology with tin plating.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBERS

- Micro-Fit Dual Row BMI Floating Panel Receptacle: 44133      Female Crimp Terminal: 43030
- Micro-Fit Dual Row BMI Panel Mount Plug: 44300              Male Crimp Terminal: 43031
- Micro-Fit Dual Row BMI Receptacle Headers: 44764 and 44769
- Micro-Fit Dual Row BMI Headers: 44428 and 44432
- Micro-Fit Dual Row BMI Vertical CPI Header : 45280
- Micro-Fit Single Row BMI Floating Panel Receptacle: 46623
- Micro-Fit Single Row BMI Panel Mount Plug: 46625
- Micro-Fit Single Row BMI Headers: 46622
- Test Plug: 44242 (recommended for continuity testing only)

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

- (See the appropriate Sales Drawings for details)
- Crimp Terminals: Phosphor Bronze
- Panel Receptacle and Plug: Polyester, Nylon
- Headers: High Temp Nylon, LCP
- Header Pins and Terminals: Brass, Modified Tin/Brass, Phosphor Bronze

#### 2.3 SAFETY AGENCY APPROVALS

UL File Number:.... E29179  
 CSA:..... LR19980  
*IEC 61984 Certification: Tested to and found in compliance with IEC 61984. NRTL type examination certificate available from Molex upon request. Contact Molex Safety Agency team for questions regarding certification on specific part numbers."*

### 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Test Summary: TS-43045-001

|   |   |  |                                |
|---|---|--|--------------------------------|
| REVISION:<br><b>L3</b>                  | EC No: <b>UCP2016-3198</b><br>DATE: <b>2016/02/17</b> | TITLE:<br><b>PRODUCT SPECIFICATION<br/>Micro-Fit (3.0)<br/>BMI Floating Connector System</b> | SHEET No.<br><b>1 of 12</b>    |
| DOCUMENT NUMBER:<br><b>PS-44300-001</b> | CREATED / REVISED BY:<br><b>CSLAFTER</b>              | CHECKED BY:<br><b>S.SOUSEK</b>   | APPROVED BY:<br><b>F.SMITH</b> |



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## 4.0 RATINGS

### 4.1 SAFETY AGENCY RATINGS

| Series | Agency Voltage Rating<br>(AC RMS or DC) |     |     | Agency Current Rating (Single Circuit)<br>(Amps) |     |     |
|--------|---|-----|-----|--|-----|-----|
|        | UL                                      | CSA | IEC | UL   | CSA | IEC |
| 44133  | 250                                     | 250 | 250 | N/A  | 7   | 5   |
| 44300  | 250                                     | 250 | 250 | N/A  | 7   | 5   |
| 44428  | 600                                     | 250 | 250 | N/A  | 5   | 5   |
| 44432  | 250                                     | 250 | 250 | N/A  | 5   | 5   |
| 44764  | 600                                     | 250 | 250 | N/A  | 5   | 5   |
| 44769  | 250                                     | 250 | 250 | N/A  | 5   | 5   |
| 45280  | 600                                     | 250 | 250 | N/A  | 5   | 5   |
| 46622  | TBD                                     | TBD | TBD | TBD  | TBD | TBD |
| 46623  | TBD                                     | TBD | TBD | TBD  | TBD | TBD |
| 46625  | TBD                                     | TBD | TBD | TBD  | TBD | TBD |

(Current ratings are maximum and may vary depending on wire size, circuit count, and end-use application. Further testing may be required in the end-use application.)

### 4.2 CURRENT DERATING AND 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.

| <u>AWG</u> | <u>Max. Outside Insulation Diameter</u> |
|------------|---|
| 20         | 1.85 mm (.073 inch)                     |
| 22         | 1.85 mm (.073 inch)                     |
| 24         | 1.85 mm (.073 inch)                     |
| 26         | 1.27 mm (.050 inch)                     |
| 28         | 1.27 mm (.050 inch)                     |
| 30         | 1.27 mm (.050 inch)                     |

|   |   |  |                                |
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## CURRENT DERATING REFERENCE INFORMATION

| AWG | 2-circuit |      | 6-circuit |       | 12-circuit |       | 24-circuit |       |
|-----|-----------|------|-----------|-------|------------|-------|------------|-------|
|     | W-W       | W-B  | W-W       | W-B   | W-W        | W-B   | W-W        | W-B   |
|     | Amps      | Amps | Amps      | Amps  | Amps       | Amps  | Amps       | Amps  |
| 20  | 6.5       | 7    | 5         | * 5.5 | 4.5        | * 5   | * 4        | 4.5   |
| 22  | 5.5       | * 6  | * 4       | * 4.5 | * 3.5      | * 4   | * 3        | * 3.5 |
| 24  | 5         | 5.5  | 4         | * 4.5 | 3          | * 3.5 | * 2        | * 3   |
| 26  | 4         | 4.5  | 3         | * 4   | 2.5        | * 3.5 | * 1.5      | 2.5   |
| 28  | 3         | * 4  | * 2       | * 3   | * 2        | * 3   | * 1        | * 2   |
| 30  | 3         | 3.5  | 2         | * 3   | 2          | * 2.5 | * 1        | 1     |

- 1) Values are for REFERENCE ONLY.
- 2) Current deratings are based on not exceeding 30°C Temperature Rise.
- 3) PCB trace design can greatly affect temperature rise results in Wire-to-Board applications.
- 4) Data is for all circuits powered.
- 5) \* indicates interpolated information.
- 6) **W-W**: Wire-to-Wire    **W-B**: Wire-to-Board

### 4.3 CURRENT FOR TEST PLUG 44242

2.5 Amps Maximum (Pogo pin current capacity)  
 (Test plugs are for testing purposes only and not intended for continuous use.)

### 4.4 TEMPERATURE

Operating: -40°C to +105°C (Including Terminal Temperature Rise)  
 Nonoperating: -40°C to +105°C

|   |   |  |                                |
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## 5.0 PERFORMANCE

### 5.1 ELECTRICAL REQUIREMENTS

| DESCRIPTION   | TEST CONDITION  | REQUIREMENT                             |
|---|---|---|
| <b>Contact Resistance (Low Level)</b>                     | Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA.  | 10 milliohms<br>MAXIMUM<br>[initial]    |
| <b>Contact Resistance of Wire Termination (Low Level)</b> | Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100 mA.  | 5 milliohms<br>MAXIMUM<br>[initial]     |
| <b>Insulation Resistance</b>                              | Unmate & unmount connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.   | 1000 Megohms<br>MINIMUM                 |
| <b>Dielectric Withstanding Voltage</b>                    | 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;<br>current leakage < 5 mA |
| <b>Capacitance</b>  | Measure between adjacent terminals at 1 MHz.  | 2 picofarads<br>MAXIMUM                 |
| <b>Temperature Rise (via Current Cycling)</b>             | Mate connectors: measure the temperature rise at the rated current after:<br>1) 96 hours (steady state)<br>2) 240 hours (45 minutes ON and 15 minutes OFF per hour)<br>3) 96 hours (steady state) | Temperature rise:<br>+30°C MAXIMUM      |

### 5.2 MECHANICAL REQUIREMENTS

| DESCRIPTION  | TEST CONDITION   | REQUIREMENT  |
|--|--|--|
| <b>Connector Mate and Unmate Forces</b>            | Mate and unmate connector (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (per circuit) | 8.0 N (1.8 lbf)<br>MAXIMUM insertion force<br>&<br>2.4 N (0.5 lbf)<br>MINIMUM withdrawal force |
| <b>Crimp Terminal Retention Force (in Housing)</b> | Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.       | 24.5 N (5.5 lbf)<br>MINIMUM retention force  |

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## 5.2 MECHANICAL REQUIREMENTS

| DESCRIPTION   | TEST CONDITION   | REQUIREMENT  |
|---|--|--|
| <b>Pin Retention Force (in Header)</b>                            | Apply axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.                   | 13.3 N (3.0 lbf)<br>MINIMUM retention force  |
| <b>Crimp Terminal Insertion Force (into Housing)</b>              | Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.                             | 14.7 N (3.3 lbf)<br>MAXIMUM insertion force  |
| <b>Durability</b>   | Mate connectors up to 30 cycles for tin or gold at a maximum rate of 10 cycles per minute.                                 | 10 milliohms MAXIMUM<br>(change from initial)  |
| <b>Vibration (Random)</b>   | Mate connectors and vibrate per EIA 364-28, test condition VII.  | 10 milliohms MAXIMUM<br>(change from initial)<br>&<br>Discontinuity < 1 microsecond  |
| <b>Shock (Mechanical)</b>   | 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<br>(change from initial)]<br>&<br>Discontinuity < 1 microsecond   |
| <b>Wire Pullout Force (Axial) Wire to Terminal</b>                | Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch).  | 20 Awg: 57.9 N (13.0 lbf)<br>22 Awg: 35.5 N (8.0 lbf)<br>24 Awg: 26.6 N (6.0 lbf)<br>26 Awg: 13.3 N (3.0 lbf)<br>28 Awg: 8.9 N (2.0 lbf)<br>30 Awg: 6.6 N (1.5 lbf)<br>MINIMUM pullout force |
| <b>Normal Force</b>   | Apply a perpendicular force.   | 2.7 N (0.6 lbf) MINIMUM  |
| <b>Panel Retention Forces</b>                                     | Apply a force perpendicular to the panel on the connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.                  | 200 N (45 lbf)<br>MINIMUM withdrawal force   |
| <b>Fretting Corrosion (Hammer Shock)</b>                          | Mate connectors: strike test platform at a rate of 10 cycles per minute with a 0.98 N (100 gram) hammer for 20,000 cycles. | 10 milliohms MAXIMUM<br>(change from initial)  |
| <b>Compliant Pin Insertion Force into PCB Hole (45280 Series)</b> | Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch).  | 106.7 N (24 lbf)<br>MAXIMUM Insertion force<br>(Per Terminal)  |
| <b>Compliant Pin Retention Force in PCB Hole (45280 Series)</b>   | Apply an axial extraction force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch).                                       | 35.6 N (8 lbf)<br>MINIMUM Retention force<br>(Per Terminal)  |

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## 5.3 ENVIRONMENTAL REQUIREMENTS

| DESCRIPTION                               | TEST CONDITION  | REQUIREMENT                                |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
|---|---|--|--------------------|-----------|----|---------|-----------|------------|----|---------|-----------|----------------|--------------------|----------|----|----------|----|--|
| <b>Fretting Corrosion (Thermal Shock)</b> | <p>Mate connectors. Expose for 500 cycles between temperatures shown below. Dwell 0.5 hours at each temperature.</p> <p>Single Row: Temperatures 15 and 85°C<br/>Dual Row: Temperatures 25 and 85°C</p> <p>{Note: Remove surface moisture and air dry for 1 hour prior to measurements; monitor low level contact resistance every 167 cycles.}</p>   | 10 milliohms MAXIMUM (change from initial) |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| <b>Shock (Thermal)</b>                    | <p>Dual Row: Mate connectors. Expose to 5 cycles of:</p> <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> <p>Single Row: Mate connectors. Expose to 10 cycles of:</p> <table border="1"> <thead> <tr> <th>Temperature °C</th> <th>Duration (Minutes)</th> </tr> </thead> <tbody> <tr> <td>-55 +/-2</td> <td>30</td> </tr> <tr> <td>+85 +/-2</td> <td>30</td> </tr> </tbody> </table> | Temperature °C                             | Duration (Minutes) | -40 +0/-3 | 30 | +25 ±10 | 5 MAXIMUM | +105 +3/-0 | 30 | +25 ±10 | 5 MAXIMUM | Temperature °C | Duration (Minutes) | -55 +/-2 | 30 | +85 +/-2 | 30 | 10 milliohms MAXIMUM (change from initial) |
| Temperature °C                            | Duration (Minutes)  |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| -40 +0/-3                                 | 30  |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| +25 ±10                                   | 5 MAXIMUM   |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| +105 +3/-0                                | 30  |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| +25 ±10                                   | 5 MAXIMUM   |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| Temperature °C                            | Duration (Minutes)  |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| -55 +/-2                                  | 30  |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| +85 +/-2                                  | 30  |  |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |
| <b>Thermal Aging</b>                      | <p>Mate Connectors. Expose to:</p> <p><u>Dual Row</u><br/>96 hours at 105 +/- 2°C or<br/>500 hours at 85 +/- 2°C</p> <p><u>Single Row</u><br/>240 hours at 105 +/- 2°C or<br/>500 hours at 85 +/- 2°C</p>   | 10 milliohms MAXIMUM (change from initial) |                    |           |    |         |           |            |    |         |           |                |                    |          |    |          |    |  |

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## 5.3 ENVIRONMENTAL REQUIREMENTS

|   |  |  |
|---|--|--|
| <p><b>Humidity<br/>(Steady State)</b></p>   | <p>Mate connectors: expose to a temperature of <math>85 \pm 2^{\circ}\text{C}</math> with a relative humidity of 90-95% for 96 hours.</p> <p>Note: Remove surface moisture and air dry for 1 hour prior to measurements.</p>   | <p>10 milliohms MAXIMUM (change from initial) &amp; Dielectric Withstanding Voltage: No Breakdown at 500 VAC &amp; Insulation Resistance: 1000 Megohms MINIMUM</p> |
| <p><b>Humidity<br/>(Cyclic)</b></p>   | <p>Mate connectors: cycle per EIA-364-31: 10 cycles at temperature <math>25 \pm 3^{\circ}\text{C}</math> at <math>80 \pm 5\%</math> relative humidity and <math>65 \pm 3^{\circ}\text{C}</math> at <math>50 \pm 5\%</math> relative humidity; dwell time of 1.0 hour; ramp time of 0.5 hours.</p> <p>{Note: Remove surface moisture and air dry for 1 hour prior to measurements.}</p> | <p>10 milliohms MAXIMUM (change from initial) &amp; Dielectric Withstanding Voltage: No Breakdown at 500 VAC &amp; Insulation Resistance: 1000 Megohms MINIMUM</p> |
| <p><b>Solderability</b></p>   | <p>Per SMES-152</p>  | <p>Solder coverage: 95% MINIMUM (per SMES-152)</p>   |
| <p><b>Solder Resistance</b></p>   | <p><b>Wave Solder Process (Nylon or LCP Headers)</b><br/>Dip connector terminal tails in solder;<br/>Solder Duration: 10 seconds MAX<br/>Solder Temperature: <math>260^{\circ}\text{C}</math> MAX<br/>Per ES-40000-5013</p> <p><b>Convection Reflow Solder Process (LCP Headers Only)</b><br/><math>260^{\circ}\text{C}</math> MAX Per ES-40000-5013</p>                               | <p>Visual:<br/>No Damage to insulator material</p>   |
| <p><b>Cold Resistance</b></p>   | <p>Mate connectors:<br/>Duration: 96 hours;<br/>Temperature: <math>-40 \pm 3^{\circ}\text{C}</math></p>  | <p>10 milliohms MAXIMUM (change from initial)</p>  |
| <p><b>Corrosive Atmosphere:<br/>Flowing Mixed Gas (FMG)<br/>(Dual Row Gold Plated Only)</b></p> | <p>Mate connectors:<br/>Test per EIA-364-65, method 2A</p>   | <p>10 milliohms MAXIMUM (change from initial)</p>  |

|   |   |  |  |
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## 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage per the packaging specifications listed below:

- BMI Floating Panel Receptacle: PK-44133-002, PK-46623-001, PK-46623-002
- BMI Panel Mount Plug: PK-44300-001, PK-44300-002, PK-46625-001
- BMI Receptacle Headers: PK-44764-001, PK-44769-001
- BMI Headers: PK-44428-001, PK-44432-001, PK-46622-001
- BMI Vertical CPI Header: PK-44432-001

## 7.0 GAGES AND FIXTURES

It is recommended that test plugs (Series 44242) be used for continuity testing of receptacles. Standard mating parts should not be used for continuity testing.

NOTE: The use of unauthorized testing devices and/or probes with a Molex product may cause damage to and affect functionality of the Molex product, and such use may void any and all warranties, expressed or implied.

|   |   |  |                                 |                                |
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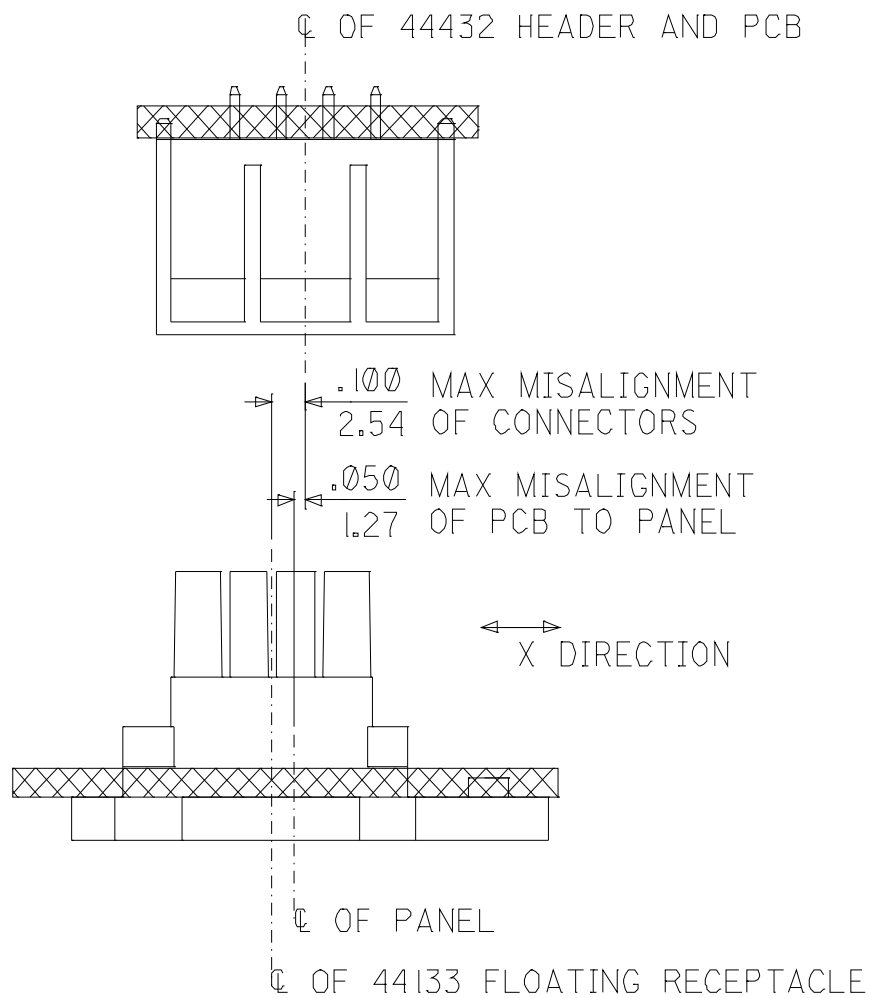


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## 8.0 APPLICATION INFORMATION

### 8.1 CONNECTOR ALIGNMENT

Misalignment applies to "X" and "Y" directions  
(Dual Row Receptacle (44133) is illustrated. Dimensions also apply to Single Row Receptacle (46623) mating to single row plug or header.)

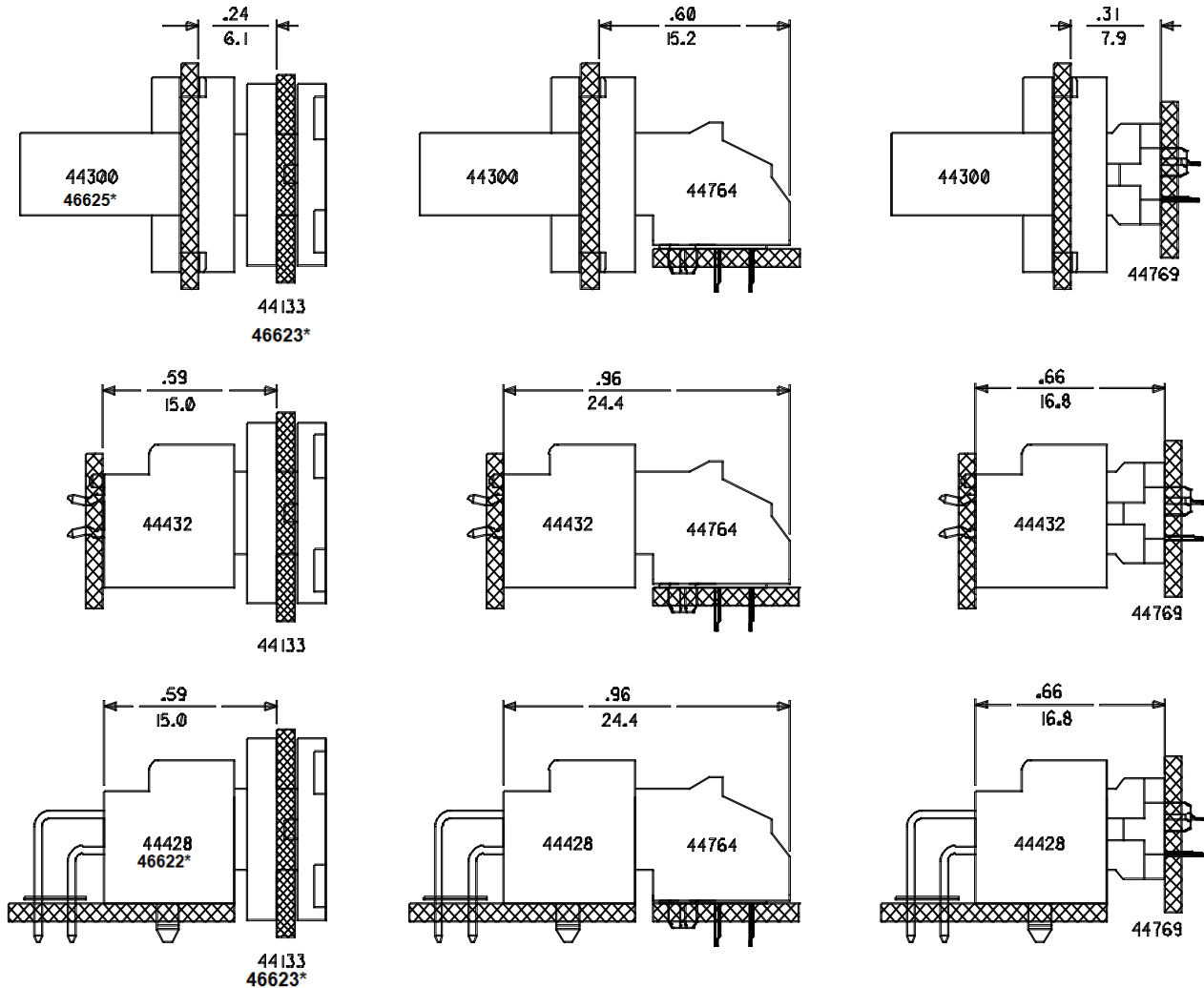


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## 8.2 Mated Dimensions (PARTS SHOWN FULLY MATED)(Dual Row is illustrated)



**\*Note:**

- 46622 – Single Row Right Angle Header
- 46623 – Single Row Panel Mount Receptacle
- 46625 – Single Row Panel Mount Plug

|   |  |  |                                |
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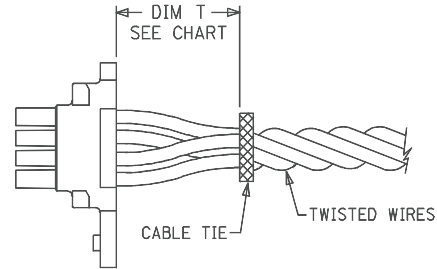
## 8.3 TIE WRAP AND/OR WIRE TWISTING PLACEMENT

Dual Row:

| CKT Sizes | Dim T | Min.    |
|-----------|-------|---------|
| 2-8       | .500  | (12.70) |
| 10-16     | .750  | (19.10) |
| 18-24     | 1.000 | (25.40) |

Single Row:

| CKT Sizes | Dim T | Min.    |
|-----------|-------|---------|
| 2-4       | .500  | (12.70) |
| 5-8       | .750  | (19.10) |
| 9-12      | 1.000 | (25.40) |



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.

## 8.4 CONTACT ENGAGEMENT FOR FULLY MATED COMPONENTS

| Receptacle                                  | Mated to Plug/ Header                                    | Application    | Contact Wipe        |
|---|--|----------------|---------------------|
| 44133 Panel Mount Receptacle <sup>(1)</sup> | 44300 Plug   | Wire-to-Wire   | .094 in/ (2.39 mm ) |
|   | 44428 RA Header<br>44432 Vert Header<br>45280 CPI Header | Wire-to-Board  | .072 in/ (1.82 mm)  |
|   | 44764 Right Angle Receptacle Header                      | Board-to-Wire  | .091 in/ (2.30 mm ) |
| 44769 Vertical Receptacle Header            | 44428 RA Header<br>44432 Vert Header<br>45280 CPI Header | Board-to-Board | .068 in/ (1.73 mm ) |
|   | 44300 Plug   | Board-to-Wire  | .087 in/ (2.20 mm ) |
|   | 44428 RA Header<br>44432 Vert Header<br>45280 CPI Header | Board-to-Board | .064 in/ (1.63 mm ) |
| 46623 Panel Mount Receptacle <sup>(1)</sup> | 46625 Plug   | Wire-to-Wire   | .094 in/(2.39mm)    |
|   | 46623 RA Header  | Wire-to-Board  | .072 in/(1.82mm)    |

**Note (1):** Contact Wipe is based on 43030 female crimp terminal. If using 46235 female crimp terminal, reduce Contact Wipe by .005 in/(0.13 mm).

|   |   |  |                                |
|---|---|--|--------------------------------|
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| DOCUMENT NUMBER:<br><b>PS-44300-001</b> | CREATED / REVISED BY:<br><b>CSLAFTER</b>              | CHECKED BY:<br><b>S.SOUSEK</b>   | APPROVED BY:<br><b>F.SMITH</b> |



# PRODUCT SPECIFICATION

## 8.5 MATING VELOCITY

Blind Mate Interface connectors should not be mated together at excessive velocities. Depending on the specifics of the application, excessive mating speeds may not allow sufficient reaction time for the connectors to properly self align and this can cause damage to connector housings and terminals. Molex recommends mating speeds do not exceed 40 mm/sec (1.6 inch/sec) for proper mating.

|   |   |  |                                |
|---|---|--|--------------------------------|
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