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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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# PRODUCT SPECIFICATION

## MICRO-FIT SINGLE ROW CONNECTOR SYSTEM

### 1.0 SCOPE

This Product Specification covers the 3.00 mm (.118 inch) centerline (pitch) square pin headers when mated with either printed circuit board (PCB) connector or connectors terminated with 20 to 30 AWG wire using crimp technology.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBERS

Receptacle: 43645      Female Crimp Terminal: 43030  
Plug: 43640            Male Crimp Terminal: 43031  
Headers: 43650  
Test Plug: 44242 (recommended for continuity testing only)  
Other products conforming to this specification are noted on the individual drawings.

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

Housings: Receptacle and Plug - Polyester, Nylon; Headers - LCP  
Crimp Terminals: Phosphor Bronze  
Pins: Brass

#### 2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179  
CSA: LR19980  
TUV: 72081037

### 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Test Summary: TS-43045-001

### 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 | TUV | UL   | CSA | TUV |
| 43640  | 250                                     | 250 | 250 | 5  | 7   | 5   |
| 43645  | 600                                     | 250 | 250 | 5  | 7   | 5   |
| 43650  | 600                                     | 250 | 250 | 5  | 5   | 5   |

(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.)

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| <u>DOCUMENT NUMBER:</u><br><b>PS-43650</b> | <u>CREATED / REVISED BY:</u><br><b>MMSTROH</b>                                       | <u>CHECKED BY:</u><br><b>SSOUSEK</b>  | <u>APPROVED BY:</u><br><b>FSMITH</b> |



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## 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.

| AWG | Max. Outside Insulation Diameter |
|-----|----------------------------------|
| 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)              |

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

- 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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| DOCUMENT NUMBER:<br><b>PS-43650</b> | CREATED / REVISED BY:<br><b>MMSTROH</b>                                       | CHECKED BY:<br><b>SSOUSEK</b>  | APPROVED BY:<br><b>FSMITH</b> |



# PRODUCT SPECIFICATION

## 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.<br>(Does not include wire resistance)  | 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      |

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## 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>3.7 N (0.8 lbf)<br>MINIMUM withdrawal force   |
| <b>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  |
| <b>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 at a maximum rate of 10 cycles per minute prior to Environmental Tests.               | 20 milliohms MAXIMUM<br>(change from initial)  |
| <b>Vibration (Random)</b>                      | Mate connectors and vibrate per EIA 364-28, test condition VII, Letter D.<br>Test Duration: 15 minutes each axis.     | 20 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). | 20 milliohms MAXIMUM<br>(change from initial])<br>&<br>Discontinuity < 1 microsecond   |
| <b>Wire Pullout Force (Axial)</b>              | Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.                              | MINIMUM pullout force<br>20 awg: 57.8 N (13.0 lbf)<br>22 awg: 35.6 N (8.0 lbf)<br>24 awg: 22.2 N (5.0 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) |
| <b>Normal Force</b>                            | Apply a perpendicular force.  | 2.7 N (0.6 lbf) MINIMUM  |
| <b>Pin to Header Retention</b>                 | Apply axial push force to pin at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.   | 13.7 N (3.1 lbf)<br>MINIMUM pushout force  |
| <b>Thumb Latch to Ramp Yield Strength</b>      | Full mate and then Unmate the connectors at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.                              | 68.4 N (15.4 lbf)<br>MINIMUM Yield Strength  |

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| <u>DOCUMENT NUMBER:</u><br><b>PS-43650</b> | <u>CREATED / REVISED BY:</u><br><b>MMSTROH</b>                                       | <u>CHECKED BY:</u><br><b>SSOUSEK</b>  | <u>APPROVED BY:</u><br><b>FSMITH</b> |



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## 5.3 ENVIRONMENTAL REQUIREMENTS

| DESCRIPTION                        | TEST CONDITION   | REQUIREMENT   |
|------------------------------------|--|---|
| <b>Thermal Aging</b>               | Mate connectors; expose to:<br>240 hours at 105 ± 2°C<br>OR<br>500 hours at 85 ± 2°C   | 20 milliohms MAXIMUM<br>(change from initial)   |
| <b>Humidity<br/>(Steady State)</b> | Mate connectors: expose to a temperature of<br>40 ± 2°C with a relative humidity of 90-95%<br>for 96 hours.<br><br>Note: Remove surface moisture and air dry<br>for 1 hour prior to measurements.  | 20 milliohms MAXIMUM<br>(change from initial)<br>&<br>Dielectric Withstanding<br>Voltage:<br>No Breakdown at 500 VAC<br>&<br>Insulation Resistance:<br>1000 Megohms MINIMUM |
| <b>Solderability</b>               | Per SMES-152   | Solder coverage:<br>95% MINIMUM<br>(per SMES-152)   |
| <b>Solder<br/>Resistance</b>       | <b>A) Wave Solder Process</b><br>Dip connector terminal tails in solder;<br>Solder Duration: 10 seconds MAX<br>Solder Temperature: 260°C MAX<br>Per ES-40000-5013<br><br><b>B) Convection Reflow Solder Process</b><br>235°C MAX Per ES-40000-5013<br><br>Parts identified with a blue dot on the primary<br>shipping carton label and all parts with a<br>manufacturing date after 9/1/2007:<br>260°C MAX Per ES-40000-5013 | Visual:<br>No Damage to insulator<br>material   |
| <b>Cold Resistance</b>             | Mate connectors:<br>Duration: 96 hours;<br>Temperature: -40 ± 3°C  | 20 milliohms MAXIMUM<br>(change from initial)   |

## 6.0 PACKAGING

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

Receptacle and Plug: Bulk Packaged

Headers: PK-70873-0321, PK-70873-0811, PK-70873-07\*\*

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# PRODUCT SPECIFICATION

## 7.0 GAGES AND FIXTURES

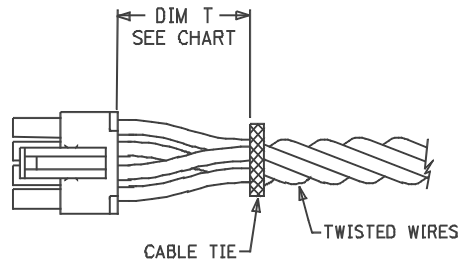
It is recommended that test plugs (Series 44242) be used for continuity testing of receptacles. Standard mating parts should not be used for harness testing.

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.

## 8.0 OTHER INFORMATION

### 8.1 CABLE TIE AND OR WIRE TWIST LOCATION

| 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.

### 8.2 CONTACT ENGAGEMENT FOR FULLY MATED COMPONENTS

| Receptacle                      | Mated to Plug/ Header | Application   | Contact Wipe       |
|---------------------------------|-----------------------|---------------|--------------------|
| 43645 Receptacle <sup>(1)</sup> | 43640 Plug            | Wire-to-Wire  | 0.094 in/(2.39 mm) |
|                                 | 43650 Header          | Wire-to-Board | 0.069 in/(1.75mm)  |

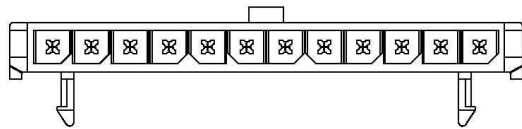
**Note (1):** Contact Wipe is based on 43030 female crimp terminal. If using 46235 female crimp terminal, reduce Contact Wipe by .005 in/(0.13 mm).

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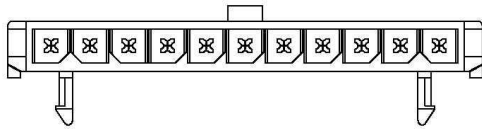


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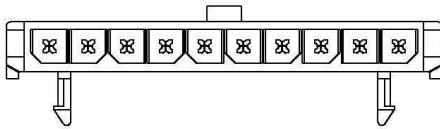
## 8.3 STANDARD POLARIZATION FOR HEADERS AND PLUGS (HEADERS ARE SHOWN)



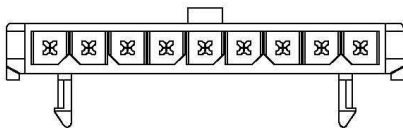
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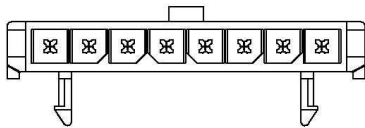
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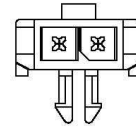
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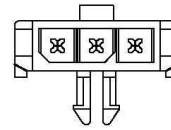
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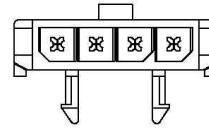
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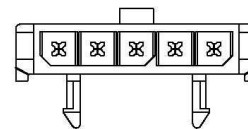
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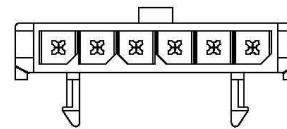
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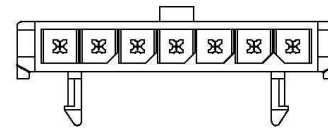
4-CKT.



5-CKT.



6-CKT.



7-CKT.

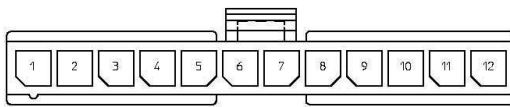
|  |  |   |                                      |                                       |
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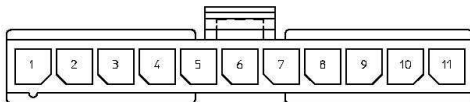


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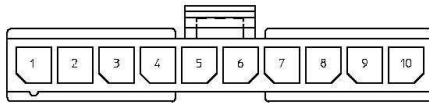
## 8.4 STANDARD POLARIZATION FOR RECEPTACLES



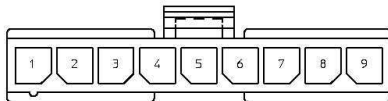
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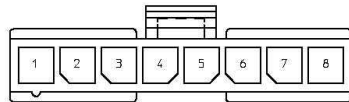
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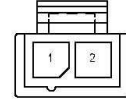
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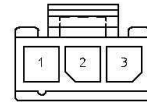
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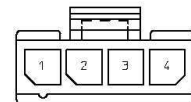
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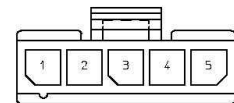
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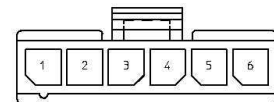
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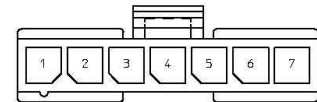
4-CKT.



5-CKT.



6-CKT.



7-CKT.

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