



# PRODUCT SPECIFICATION

## MX150L PCB HEADER CONNECTOR SYSTEM

### 1.0 SCOPE

This Product Specification covers the 5.84mm (.236 inch) centerline (pitch) right angle, vertical, & low profile vertical through hole printed circuit board (PCB) header connector series with Tin or Tin & Select Gold plated terminals.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBER(S)

|   |       |
|---|-------|
| 2.1.1 Right Angle PCB Header Assembly Series                      | 19427 |
| 2.1.2 Vertical & Low Profile Vertical PCB Header Assembly Series  | 19428 |
| 2.1.3 Vertical & Right Angle PCB Breakaway Header Assembly Series | 19440 |

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

See applicable sales drawings for information on dimensions, materials, plating, and any other specifications.

#### 2.3 SAFETY AGENCY APPROVALS

- 2.3.1 UL File #E152602
- 2.3.2 CSA File #018689, Class #6233-01
- 2.3.3 All molded components flammability rated 94 V-0

#### 2.4 MATING CONNECTORS

- 2.4.1 Series 19418 Receptacle Assemblies, 22–14 AWG
- 2.4.2 Series 19420 Female Terminals, 22–14 AWG
- 2.4.3 Series 19417 Circuit Plugs, Standard & W-T-B

### 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

#### 3.1 Right Angle PCB Header Assemblies

- Sales Drawing SD-19427-\*\*\*
- Packaging Drawing PK-19427-001

#### 3.2 Vertical PCB Header Assemblies

- Sales Drawing SD-19428-\*\*\*
- Packaging Drawing PK-19428-001

#### 3.3 Low Profile Vertical PCB Header Assemblies

- Sales Drawing SD-19428-\*\*\*
- Packaging Drawing PK-19428-002

#### 3.4 Vertical & Right Angle PCB Breakaway Header Assemblies

- Sales Drawing SD-19440-\*\*\*
- Packaging Drawing PK-19440-001

|   |   |  |                                 |
|---|---|--|---------------------------------|
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| DOCUMENT NUMBER:<br><b>PS-19427-001</b> | CREATED / REVISED BY:<br><b>WLEUNG</b>  | CHECKED BY:<br><b>BRUPERT</b>  | APPROVED BY:<br><b>JFMURPHY</b> |



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## 4.0 RATINGS

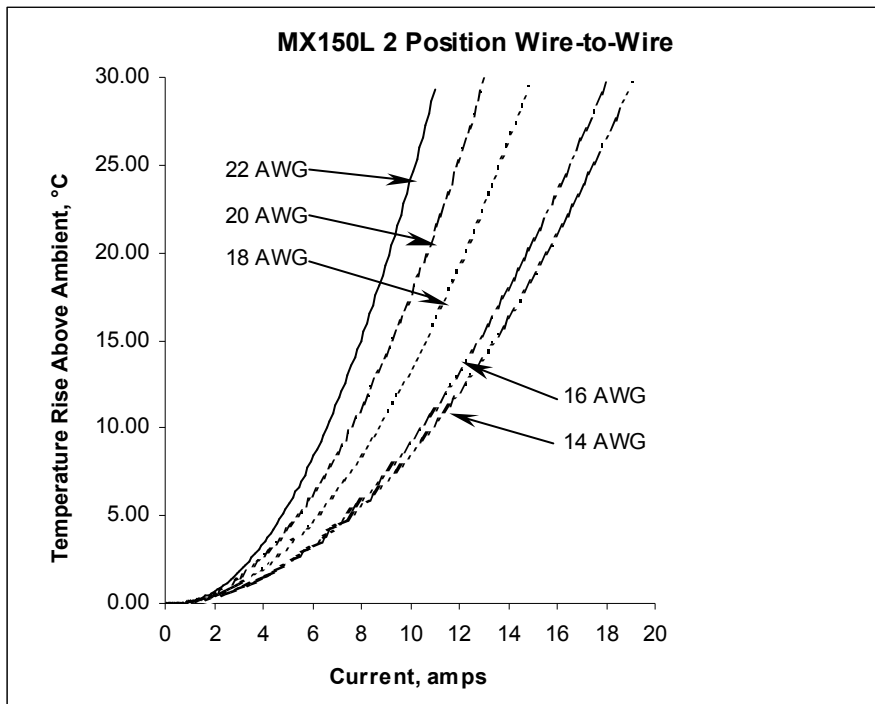
### 4.1 VOLTAGE

600 Volts AC

### 4.2 CURRENT AND APPLICABLE WIRES

| AWG   | Amps      | Insulation Outside Diameter  |
|-------|-----------|------------------------------|
| 22-18 | See chart | 2.36-2.74mm (.093-.108 inch) |
| 16-14 | See chart | 2.87-3.53mm (.113-.139 inch) |

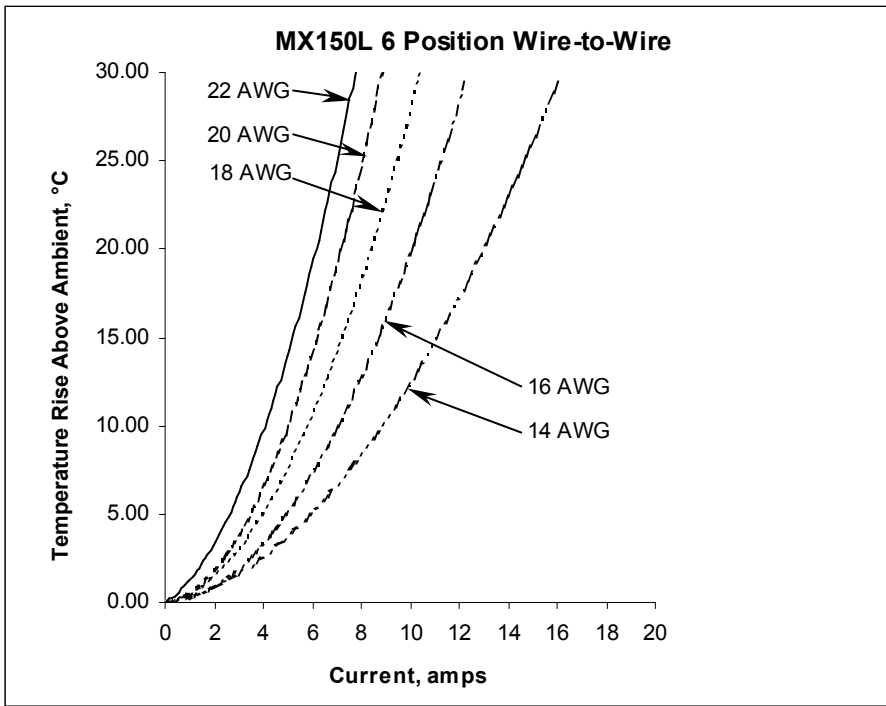
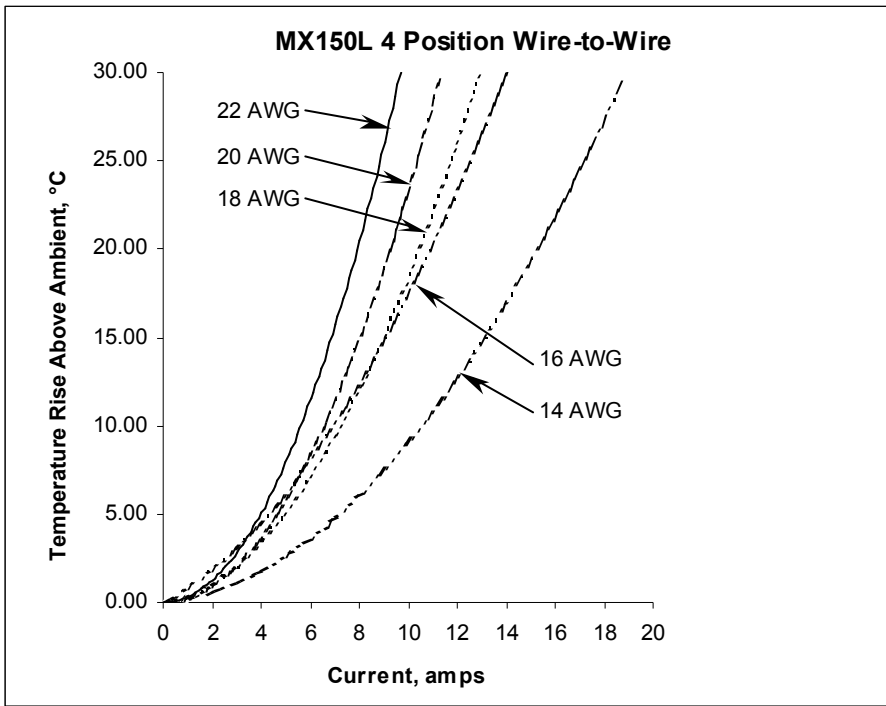
*Note: The below curves were developed using averages of fully loaded connector pairs and are presented as a guideline. The end user must evaluate the performance of the connector pair in actual application to determine the suitability and actual performance.*



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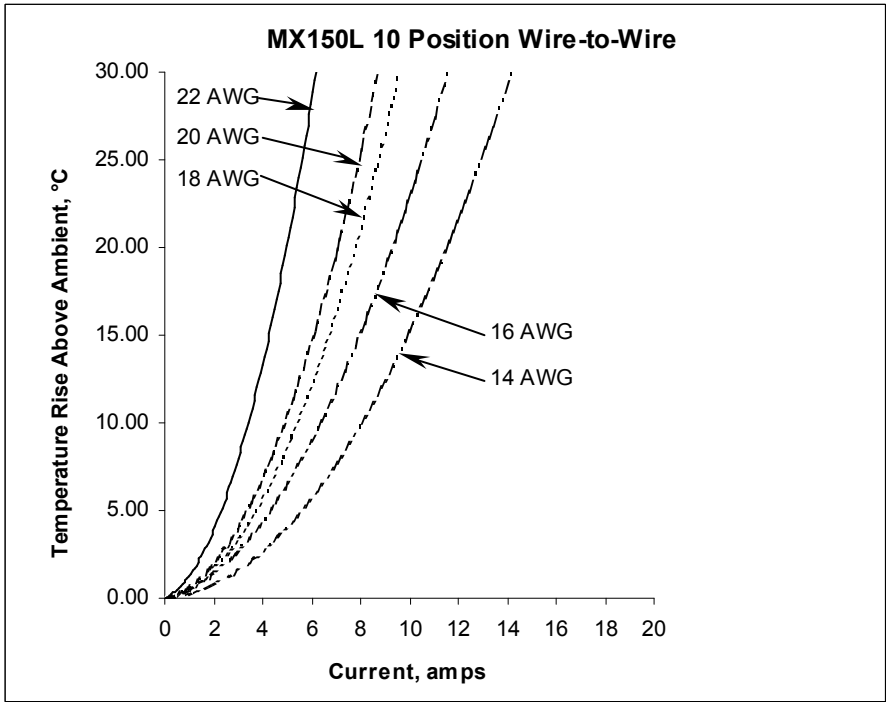
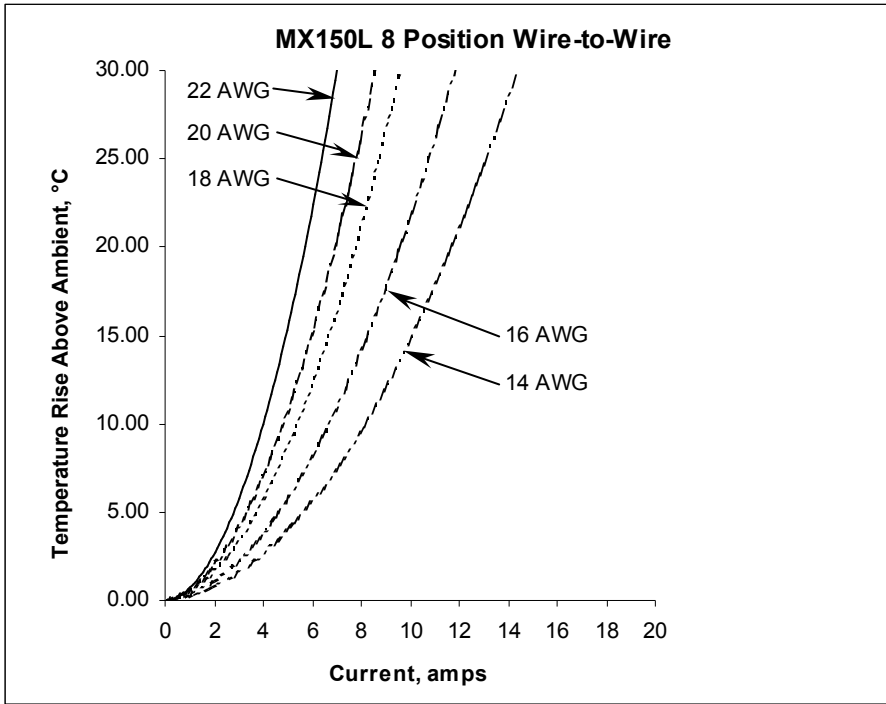
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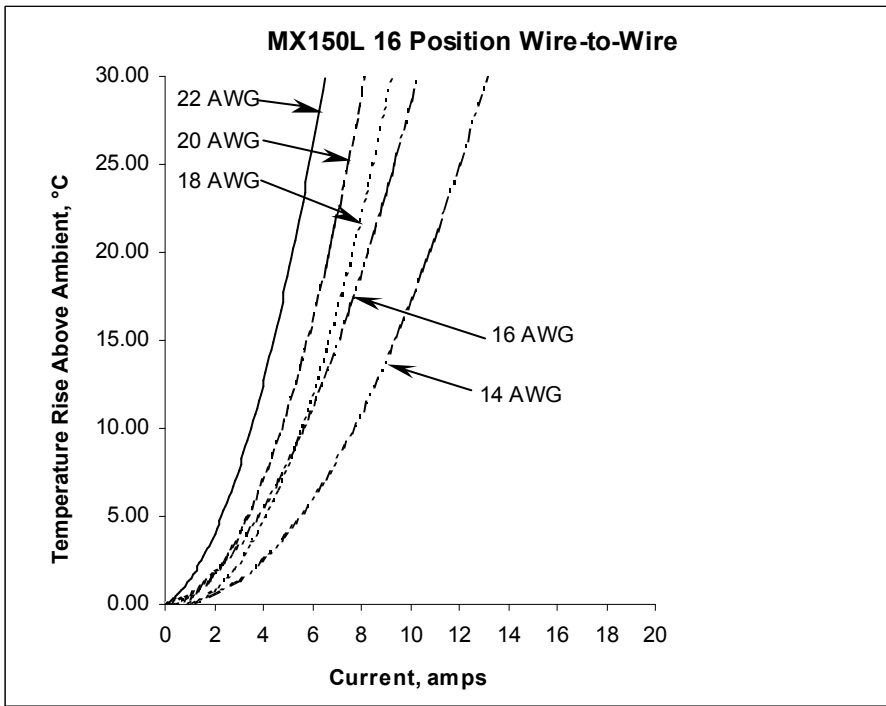
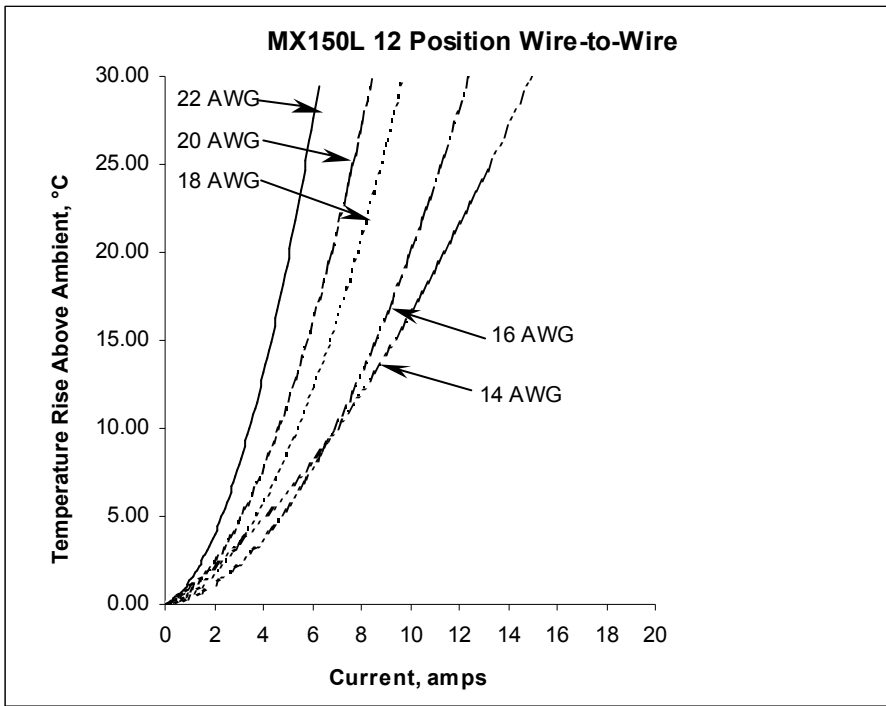
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## 4.3 TEMPERATURE

Operating: - 40°C to + 120°C

Nonoperating: - 40°C to + 120°C

## 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> .   | <b>30 milliohms</b><br>MAXIMUM<br>[initial]    |
| 2    | <b>Insulation Resistance</b>           | Unmate & unmount connectors: apply a voltage of <b>500 VDC</b> between adjacent terminals and between terminals to ground.                                  | <b>20 Megohms</b><br>MINIMUM                   |
| 3    | <b>Dielectric Withstanding Voltage</b> | Apply a voltage of <b>{two times the rated voltage plus 1000 volts}</b> VAC for <b>1 minute</b> between adjacent terminals and between terminals to ground. | No breakdown;<br>current leakage < <b>5 mA</b> |
| 4    | <b>Temperature Rise</b>                | Mate connectors: measure the temperature rise at the rated current after 4 hours and temperature stabilizes   | Temperature rise:<br><b>+30°C</b> MAXIMUM      |

### 5.2 MECHANICAL REQUIREMENTS

| ITEM | DESCRIPTION                             | TEST CONDITION  | REQUIREMENT   |
|------|---|---|---|
| 5    | <b>Connector Mate and Unmate Forces</b> | Mate and unmate connector (male to female) at a rate of <b>25 ± 6 mm (1 ± ¼ inch)</b> per minute.   | <b>75 N (16.9 lbf)</b><br>MAXIMUM insertion force<br>&<br><b>110 N (24.7 lbf)</b><br>MINIMUM withdrawal force |
| 6    | <b>Terminal Retention Force</b>         | Axial pullout force on the terminal in the housing at a rate of <b>25 ± 6 mm (1 ± ¼ inch)</b> per minute for 1 minute minimum.  | <b>22 N (5 lbf)</b><br>MINIMUM retention force  |
| 7    | <b>Durability</b>                       | Mate connectors up to <b>{25 cycles for tin (non-noble) plating OR 100 cycles for gold (noble) plating}</b> at a maximum rate of <b>10 cycles per minute</b> without environmental tests. | <b>10 milliohms</b> MAXIMUM<br>(change from initial)  |

|   |   |  |                                 |
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# PRODUCT SPECIFICATION

## 5.2 MECHANICAL REQUIREMENTS (continued)

| ITEM | DESCRIPTION           | TEST CONDITION  | REQUIREMENT   |
|------|-----------------------|---|---|
| 8    | Vibration<br>(Random) | Mate connectors and vibrate from 10Hz to 1000Hz for 8 hours in each of three mutually perpendicular axes (X, Y, Z). | 10 milliohms MAXIMUM<br>(change from initial)<br>&<br>Discontinuity < 1 microsecond |
| 9    | Shock<br>(Mechanical) | Mate connectors and shock at 35 g's with 10 1/2 sine wave (10 milliseconds) shocks in the ±X,±Y,and ±Z axes.        | 10 milliohms MAXIMUM<br>(change from initial)<br>&<br>Discontinuity < 1 microsecond |

## 5.3 ENVIRONMENTAL REQUIREMENTS

| ITEM           | DESCRIPTION                  | TEST CONDITION  | REQUIREMENT   |                    |           |    |         |                 |            |    |         |                 |   |
|----------------|------------------------------|---|---|--------------------|-----------|----|---------|-----------------|------------|----|---------|-----------------|---|
| 10             | Shock<br>(Thermal)           | Mate connectors; expose to 100 cycles of:<br><table border="1" style="margin-left: 20px;"> <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>30 sec. MAXIMUM</td> </tr> <tr> <td>+125 +3/-0</td> <td>30</td> </tr> <tr> <td>+25 ±10</td> <td>30 sec. MAXIMUM</td> </tr> </tbody> </table> | Temperature °C  | Duration (Minutes) | -40 +0/-3 | 30 | +25 ±10 | 30 sec. MAXIMUM | +125 +3/-0 | 30 | +25 ±10 | 30 sec. MAXIMUM | 10 milliohms MAXIMUM<br>(change from initial)<br>&<br>Visual: No Damage |
| Temperature °C | Duration (Minutes)           |   |   |                    |           |    |         |                 |            |    |         |                 |   |
| -40 +0/-3      | 30                           |   |   |                    |           |    |         |                 |            |    |         |                 |   |
| +25 ±10        | 30 sec. MAXIMUM              |   |   |                    |           |    |         |                 |            |    |         |                 |   |
| +125 +3/-0     | 30                           |   |   |                    |           |    |         |                 |            |    |         |                 |   |
| +25 ±10        | 30 sec. MAXIMUM              |   |   |                    |           |    |         |                 |            |    |         |                 |   |
| 11             | High Temperature<br>Exposure | Mate and un-mate connectors: 10 cycles<br>Duration: 1008 hours exposure<br>Temperature: +125± 3°C   | 10 milliohms MAXIMUM<br>(change from initial)   |                    |           |    |         |                 |            |    |         |                 |   |
| 12             | Salt Spray                   | Mate connectors:<br>Duration: 96 hours exposure;<br>Atmosphere: salt spray from a 5% solution;<br>Temperature: 35 +1/-2°C   | 10 milliohms MAXIMUM<br>(change from initial)<br>&<br>Visual: No Damage                                 |                    |           |    |         |                 |            |    |         |                 |   |
| 13             | Fluid Resistance             | Submerge mated connectors for 30 minutes in each of the following automotive fluids: gasoline, diesel fuel, engine oil, E85 ethanol fuel, power steering fluid, automatic transmission fluid, engine coolant, brake fluid   | Insulation<br>Resistance 20 Megohms<br>MINIMUM<br>&<br>Visual: No damage or loss of mechanical function |                    |           |    |         |                 |            |    |         |                 |   |
| 14             | Solderability                | Per SMES-152  | Solder coverage: 95%<br>MINIMUM (per SMES-152)  |                    |           |    |         |                 |            |    |         |                 |   |
| 15             | Solder Resistance            | Dip connector terminal tails in solder: Solder<br>Duration: 5±0.5 seconds; Solder<br>Temperature: 245±5°C<br>{Recommend same parameters as SMES-152}  | Visual:<br>No Damage to insulator material  |                    |           |    |         |                 |            |    |         |                 |   |

|                                      |   |   |                              |
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|----|------|--|--|
| 16 | IPX7 | IPX7 – Submerge mated connectors for 30 minutes under 1 meter of water | No dielectric breakdown;<br>current leakage < 5 mA |
|----|------|--|--|

## 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage.

## 7.0 OTHER INFORMATION

The MX150L™ Industrial Sealed Connector System is IPX7 rated and conforms to UL 1977, but it is **NOT** suitable for automotive applications with requirements such as USCAR-2, USCAR-25, GMW3191, AK Testing, J2030, Volvo Technology Requirements, and Toyota Connector Spec (TCS)

|   |   |   |                               |                                 |
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