



PRODUCT SPECIFICATION

MINI-FIT SR. SERIES

1.0 SCOPE

This specification covers the 10.00 mm / (.394 in.) centerline tin and gold plated connector series, single and dual row versions in wire to wire and wire to printed circuit board applications. This product performance is optimized for stranded tinned wire termination.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND PART NUMBER

| <u>Product Name</u> | <u>Part Number</u> |
|---------------------------------|--------------------|
| Female Terminal | 42815-**** |
| Male Terminal | 42817-**** |
| Receptacle (single row) | 42816-**** |
| Plug (single row) | 42818-**** |
| Vertical Header (single row) | 42819-**** |
| Right Angle Header (single row) | 42820-**** |
| Receptacle (dual row) | 43914-**** |
| TPA (dual row) | 43980-**** |
| Vertical Header (dual row) | 43915-**** |
| Panel Mount Plug (dual row) | 43938-**** |

2.2 DIMENSIONS, MATERIALS PLATINGS & MARKINGS.

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and the other sections of this specification for the necessary referenced documents and specifications.

3.1 Agency Approvals

UL File #E29179
CSA Certificate #LR 19980-555
TUV Certificate #R 9751144, #R 9950481

4.0 RATINGS

4.1 VOLTAGE RATINGS

IEC 950 250 Volts AC (RMS) / DC
UL / CSA 600 Volts AC (RMS) / DC

4.2 CURRENT RATINGS

(Based on tin plated terminals)

| | | | |
|--|--|---|-----------------------------------|
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| <u>DOCUMENT NUMBER:</u> PS-42815-001 | <u>CREATED / REVISED BY:</u> COMERCI | <u>CHECKED BY:</u> COMERCI | <u>APPROVED BY:</u> FRY |



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Single Row Product (tested to 30degC max. rise)

| | 2ckt. W to W | 2ckt. W to PCB** | 6ckt W to W | 6ckt. W to PCB** |
|-----------------------|-----------------------|-----------------------|-------------|------------------|
| 12 AWG | 23A | 23A | 23A | 23A |
| 10 AWG | 33A | 33A | 33A | 33A |
| 8 AWG | 50A | 48A | 45A | 37A |
| 12AWG Double Crimp | 40A (20A per wire) | 40A (20A per wire) | | |

Note: CSA ratings are as follows; 12AWG = 23A max., 10AWG = 30A max.

TUV ratings are as follows; 12AWG = 23A max., 10AWG = 33A max.

**PCB trace design may greatly effect temperature rise results.

Dual Row Product (tested to 30degC max. rise)

| | 6ckt. W to W | 6ckt. W to PCB** | 14ckt W to W | 14ckt. W to PCB** |
|--------|--------------|------------------|--------------|-------------------|
| 12 AWG | 23A | 23A | 23A | 22A |
| 10 AWG | 32A | 31A | 29A | 28A |
| 8 AWG | 43A | 37A | 38A | 36A |

**PCB trace design may greatly effect temperature rise results.

4.3 TEMPERATURES

Operating: -40 Degrees C to +105 Degrees C

Nonoperating: -40 Degrees C to +105 Degrees C

(Including 30 degrees C terminal temperature at full current)

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5.0 PERFORMANCE

5.1 ELECTRICAL PERFORMANCE

| Section | Item | Test Condition | Requirement |
|---------|--|--|---|
| 5.1.1 | Initial Contact Resistance (low level) | Mate connectors, measure by dry circuit, 20mV max., 100mA. Wire resistance shall be removed from the measured value. | 1.5 mOhm max. (tin) 1.0 mOhm max. (gold) |
| 5.1.2 | Insulation Resistance | Mate connectors, apply 500V DC between adjacent terminal or ground. | 1000 M Ohm min. |
| 5.1.3 | Dielectric Strength | Mate connectors, apply 2200V AC for 1 minute between adjacent terminal or ground. | No breakdown |
| 5.1.4 | Contact Resistance (rated) | Measure contact resistance at rated current. | 1.5 mOhm max. (tin) 1.0 mOhm max. (gold) |
| 5.1.5 | Contact Resistance on Crimp | Crimp the wire to the terminal, measure crimp resistance by dry circuit, 20mV max., 100mA | 1.0 mOhm max. |

5.2 MECHANICAL PERFORMANCE

| Section | Item | Test Condition | Requirement |
|---------|------------------------------------|--|---|
| 5.2.1 | Contact Insertion and Withdrawal | Insert and withdraw a contact at a speed rate of 25 +/- 6mm / minute | Max. Insertion = 3Kg Min. Withdrawal = 0.5Kg |
| 5.2.2 | Connector Insertion and Withdrawal | Insert and withdraw a connector at a rate of 25 +/- 6mm / minute | Max. Insertion = 3.0Kg/ckt. Min. Withdrawal = 0.5Kg/ckt. |

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| 5.2.3 | Terminal Insertion Force | Insert the crimped terminal into the housing. | Max. Insertion = 7.0Kg |
| 5.2.4 | Crimp Terminal Retention Force | Apply axial pull out force at a speed rate of 25 +/- 6mm / minute on the terminal assembled in the housing and with the TPA cover installed. | Min. Retention = 10Kg |
| 5.2.5 | Header Terminal Retention Force | Apply axial pull out force at a speed rate of 25 +/- 6mm / minute on the terminal assembled in the housing. | Min. Retention = 2.0Kg |
| 5.2.6 | Wire Pull Out Force | Mount the crimped terminal, apply an axial pull out force on the wire at a speed rate of 25 +/- 6mm / minute. | 12AWG = 31Kg 10AWG = 36Kg 8AWG = 40Kg |
| 5.2.7 | Normal Force | Apply a perpendicular force at a speed rate of 25 +/- 6mm / minute. | 200 g min. |

5.2 Mechanical performance (continued)

| Section | Item | Test Condition | Requirement |
|---------|------------------------------------|---|--|
| 5.2.8 | PCB Insertion and Withdrawal Force | Apply force perpendicular to the housing at a speed rate of 25 +/- 6mm minute as shown. | Insertion = 2Kg max. Withdrawal = 1Kg min. |
| 5.2.9 | Panel Insertion & Withdrawal | Insert and withdraw a connector at a speed rate of 25 +/- 6mm / minute | Insertion = 5Kg max. Withdrawal = 10Kg min. |
| 5.2.10 | Latch Yield Strength | Insert and withdraw connector housings (30 times) and pull apart at a speed rate of 25 +/- 6mm / minute | Yield = 10.0Kg min. |
| 5.2.11 | Durability (tin) | Insert and withdraw connectors (30 times) at a maximum rate of 10 cycles per minute prior to environmental tests. | Contact Res. change = 1.0mOhm max. |

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| 5.2.11A | Durability (gold) | Insert and withdraw connectors (100 times) at a maximum rate of 10 cycles per minute prior to environmental tests. | Contact Res. change = 1.0mOhm max. |
| 5.2.12 | Vibration without lubrication (tin) Not Recommended | (30 times) at a maximum rate of 10 cycles per minute prior to environmental tests. | Contact Res change =. 4.0mOhm max Discontinuity not greater than 1 microsecond |
| 5.2.12A | Vibration with lubrication (tin) (Nyogel 760G) | Amplitude: 1.50 mm peak to peak Sweep: 10-50-10 Hz in one minute Duration: 2 hours in each X-Y-Z axis. | Contact Res change =. 1.0mOhm max Discontinuity not greater than 1 microsecond |
| 5.2.12B | Vibration without lubrication (gold) | Amplitude: 1.50 mm peak to peak Sweep: 10-55-10 Hz in one minute Duration: 2 hours in each X-Y-Z axis. | Contact Res change =. 1.0mOhm max Discontinuity not greater than 1 microsecond |
| 5.2.13 | Mechanical Shock | Sweep: 10-50-10 Hz in one minute Duration: 2 hours in each X-Y-Z axis. | Contact Res. change = 1.0mOhm max. Discontinuity not greater than 1 microsecond |

5.3 ENVIRONMENTAL PERFORMANCE

| Section | Item | Test Condition | Requirement |
|---------|-----------------|---------------------------------|---|
| 5.3.1 | Cold Resistance | -40 +/- 3 degrees C for 96 hrs. | Appearance: No damage Contact Res. change = 1.0mOhm max. |

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| 5.3.2 | Thermal Shock | Mate connectors, expose to 25 cycles of: -40 +0/-3 deg. C for 30 minutes +25 +/- 10 deg. C for 5 minutes max. +105 +3/-0 deg. C for 30 minutes +25 +/- 10 deg. C for 5 minutes max. | Appearance: No damage Contact Res. change = 1.0mOhm max. |
| 5.3.3 | Thermal Aging | Mate connectors, expose to 240 hours at 105 +/- 2 deg. C | Appearance: No damage Contact Res. change = 1.0mOhm max |
| 5.3.4 | Humidity (Steady State) | Mate connectors, expose to a temperature of 85 +/- 2 deg. C with a relative humidity of 90% to 95% for 96 hours. | Appearance: No damage Contact Res. change = 1.0mOhm max Dielectric withstanding voltage: No breakdown Insul. res: 1000M Ohm min. |
| 5.3.5 | Humidity (cyclic) without lubrication Not Recommended | Mate connectors, expose to 25 cycles at 90% to 95% relative humidity with a transition time of 2.5 hrs. between extremes. +25 +/- 10 deg. C for 5 minutes max. +65 +3/-0 deg. C for 30 minutes | Appearance: No damage Contact Res. change = 2.0mOhm max Dielectric withstanding voltage: No breakdown Insul. res: 1000M Ohm min. |

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5.3 ENVIRONMENTAL PERFORMANCE (cont.)

| Section | Item | Test Condition | Requirement |
|---------|---|--|--|
| 5.3.6 | Immunity to Fretting Corrosion without lubrication. (tin) Not Recommended | Mate connectors, expose to 500 cycles with a max. transition time of 5 minutes between extremes. +25 +/- 10 deg. C for 30 minutes +70 +3/-0 deg. C for 30 minutes | Appearance: No damage Contact Res. change = 4.0mOhm max |
| 5.3.6A | Immunity to Fretting Corrosion with lubrication. (tin) (Nyogel 760G) | Mate connectors, expose to 500 cycles with a max. transition time of 5 minutes between extremes. +25 +/- 10 deg. C for 30 minutes +70 +3/-0 deg. C for 30 minutes | Appearance: No damage Contact Res. change = 1.0mOhm max |
| 5.3.7 | Temp. Rise & Current Cycling | Mate the connectors and measure the temperature rise at the rated current for 96 hrs., 45 minutes ON and 15 minutes OFF for 240 hrs., and an additional 96 hrs. of steady-state current. | Max. Temp. Rise = 30deg. C |
| 5.3.8 | Solderability | Solder time: 3 +/- 5 seconds Solder temp.: 230 +/- 5 deg. C | 95% of the immersed area must show no voids or pin holes. |
| 5.3.9 | IR Process Resistance | 245 +/- 3 deg. C for 4 minutes, allow to cool to room temperature, repeat for 3 cycles. | Appearance: No damage Dimensional: Conformance to sales drawing requirements. |
| 5.3.10 | Resistance to Solder | Solder time: 3 +/- 0.5 seconds Solder temp.: 230 +/- deg. C | Appearance: No damage |

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5.3 ENVIRONMENTAL PERFORMANCE (cont.)

| Section | Item | Test Condition | Requirement |
|---------|------------------------|--|--------------------------|
| 5.3.11 | Resistance to Solvents | Solvent: flourinert FC-70 (3M Corp.) Solvent temp: Boiling temp. Immersion time: 120 +/- 5 seconds Solvent: Alpha 1003 (Alpha Metal) Solvent: Isopropyl Alcohol Solvent Temp.: Boiling temp. Immersion time: 240 +/- 5 seconds Repeat in solvent 5 times. Rinse with deionized water between cycles. | Appearance: No damage |

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