



MILLIGRID

Wire to Board

CONNECTOR SYSTEM

| | |
|---|--|
| <p align="center">Crimp Terminal</p> | <p align="center">Crimp Receptacle Housing with Polarization</p> |
|  |  |
| <p align="center">Series: 50394</p> | <p align="center">Series: 51110</p> |

| |
|---|
| <p align="center">Crimp Receptacle Housing w/o Polarization</p> |
|  |
| <p align="center">Series: 51110</p> |

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| <p>DOCUMENT NUMBER: PS-51110-001</p> | <p>DOC TYPE: PS</p> | <p>DOC PART: 001</p> | <p>CREATED / REVISED BY: ABABUPS</p> | <p>CHECKED BY: MRAMAKRISHNA</p> | <p>APPROVED BY: MRAMAKRISHNA</p> | |

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1.0 SCOPE

This Product Specification covers the performance requirement for the Milli-Grid 2 mm Grid Wire to Board Connector terminated with 24 to 30 AWG wire using Crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

| DESCRIPTION | SERIES NUMBER |
|--------------------------|-----------------------|
| Crimp Terminal | 50394 |
| Crimp Receptacle Housing | 51110 |

2.2 DIMENSIONS, MATERIALS, PLATINGS

See sales drawings for details on dimensions, materials and platings.

2.3 ENVIRONMENTAL CONFORMANCE

To fine product compliance information:

- [Go to molex.com](#)
- Enter the part number in the search field.
- At the bottom of the page go to “Environmental” to see compliance status.

2.4 SAFETY AGENCY LISTINGS

UL Number: E29179
 CSA Number: 1585720 (LR19980)



CSA approval meets following standards/test procedures:

- CSA std. C22.2 No. 182.3-M1987
- UL-1977

* “C” and “US” mark adjacent to CSA signifies that the product has been evaluated to the applicable CSA and ANSI/UL standards, for use in Canada and US respectively.

Series 51110, rated 2.0 A (No. 24 AWG), 125 V

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3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

MilliGrid W-T-B Connectors Test Summary TS
[MilliGrid W-T-B Connectors Application Specification 503940001-AS](#)
[Molex Quality Crimping Handbook Order No. 63800-0029](#)
[Molex Moisture Technical Advisory AS-45499-001](#)
[Molex Package Handling Specification 454990100-PK](#)
 ATS-Application Tooling Specification *

**Application tooling Specification differs with Terminals. ATS shall be available in the respective Terminal part number page.*

3.2 INDUSTRY DOCUMENTS

UL-60950-1
 UL-1977
 CSA STD. C22.2 NO. 182.3-M1987

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

125 V AC (rms) / DC

4.2 APPLICABLE WIRES

| | |
|----------------------------|------------------|
| Wire Gage(Stranded copper) | Insulation O.D. |
| AWG#24 – AWG#30 | 1.4 mm dia. Max. |

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4.3 CURRENT RATING (MAXIMUM AMPERES)

| AWG | Single Ckt | Fully Loaded (50 Ckts) |
|-----|------------|------------------------|
| #24 | 6.00 A | 2.40 A |
| #26 | 5.40 A | 2.20 A |
| #28 | 5.00 A | 2.00 A |
| #30 | 4.40 A | 1.80 A |

Current rating is application dependent and each application should be evaluated by the end user for compliance to specific safety agency requirements. The ratings listed in the chart below are per Molex test method based on a 30 °C maximum temperature rise over ambient temperature and are provided as a guideline. Appropriate de-rating is required based on circuit size, ambient temperature, copper trace size on the PCB, gross heating from adjacent modules/components and other factors that influence connector performance. Wire size, insulation thickness, stranding, tin coated or bare copper, wire length & crimp quality are other factors that influence current rating.

4.4 TEMPERATURE

Operating Temperature Range : - 40 °C to + 105 °C
 Non-Operating Temperature Range: : - 55 °C to + 105 °C

Note: Temperature life test duration (section 6.3. item 1) is based on the assumption that the contact spends its entire life at the rated field maximum temperature (based on EIA-364-1000, table 8).

5.0 QUALIFICATION

Laboratory condition, sample selection and test sequences are in accordance with MIL-STD-202.

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6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|-------|---------------------------------------|--|-------------------------|
| 6.1.1 | Contact Resistance | Mate connectors, measure by dry circuit, 20 mV MAX., 10 mA (based upon JIS C5402 5.4). | 40 mohm MAX. |
| 6.1.2 | Insulation Resistance | Mate connectors, apply 500 V (rms) AC for 1 minute between adjacent terminal or ground (based upon JIS C5402 5.1/ MIL-STD-202 Method 301). | 1000 Mohms Min. |
| 6.1.3 | Dielectric Strength | Mate connectors, apply 500 V(rms) AC for 1 minute between adjacent terminal or ground (based upon JIS C5402 5.1/ MIL-STD-202 Method 301). | No breakdown |
| 6.1.4 | Contact Resistance on Crimped Portion | Crimp the applicable wire onto the terminal, measure by dry circuit, 20 mV MAX., 10 mA. | 5 mohm MAX. |
| 6.1.5 | Temperature Rise | Mate connectors and measure the temperature rise of contact when the maximum DC rated current is passed. | Temperature: 30 °C Max. |

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6.2 MECHANICAL PERFORMANCE

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|-------|--|---|--|
| 6.2.1 | Mating and Unmating Force | Mating and Unmating connectors at a rate of 25 +/- 3 mm/min. | Mating force: 1.96 N / CKT MAX. Unmating force: 0.392 N / CKT Min. |
| 6.2.2 | Crimp Terminal Insertion Force | Insertion the crimped terminal into the housing. | 9.8 N MAX. |
| 6.2.3 | Crimp Terminal Housing Retention Force | Apply axial pull out force at a rate of 25 mm/min. on the terminal assembled in the housing. | 9.8 N MIN. |
| 6.2.4 | Crimping Pull Out Force | Fix the crimped terminal, Apply axial pull out force on the Wire at the speed rate of 25 mm/min. (based on JIS C5402 6.8) | AWG#24 = 29.4 MIN. AWG#26 = 19.6 MIN. AWG#28 = 9.8 MIN. AWG#30 = 4.9 MIN. (all in Newtons) |
| 6.2.5 | Repeated Mate / Unmate | When Mate / unmate up to 50 cycles repeatedly at a rate of 10 cycles / min. | Contact Resistance: 60 mohms Max. |
| 6.2.6 | Vibration | Mate connectors and subject to the following vibration conditions, for a period of two hours in each 3 mutually perpendicular axis, passing DC 1 mA current during the test. Amplitude: 1.5 mm p-p Frequency: 10-55-10 Hz. Shall be transversed on 1 minute (based on MIL-STD-202 Method 201A) | Appearance: No damage Contact resistance: 60 mohm Max. Discontinuity: 1.0 µs MAX. |
| 6.2.7 | Shock | Mate connectors and subject to the following shock conditions, 3 shocks shall be applied along 3 mutually perpendicular axis, passing DC 1 mA current during the test. (Total of 18 shocks) Test pulse : Half Sine Peak value: 490 m/s sq. (50G) Duration : 11 ms (based on JIS C0041 MIL-STD-202 Method 213B Cond. A) | Appearance: No damage. Contact Resistance: 60 mohm Max. Discontinuity: 1.0 µs Max. |

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6.3 ENVIRONMENTAL PERFORMANCE

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|-------|---------------------|---|--|
| 6.3.1 | Heat Resistance | Mate connector and expose to 85+/-2 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (based on JIS C0021 / MIL-STD-202 Method 108A Cond. A) | Appearance: No damage. Contact Resistance: 60 mohm Max. |
| 6.3.2 | Cold Resistance | Mate connector and expose to -55+/-3 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed (based on JIS C0020) | Appearance: No damage. Contact Resistance: 60 mohm Max. |
| 6.3.3 | Humidity | Mate connector and expose to 60+/-2 °C, relative humidity 90-95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (based on JIS C0022 / MIL-STD-202 Method 103B Cond. B). | Appearance: No damage. Contact Resistance: 60 mohm Max. Dielectric Strength: Must meet 6.1.3 Insulation Resistance: 100 Mohm Min. |
| 6.3.4 | Temperature Cycling | Mate connectors and subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. 1 cycle: a) -55+/-3 °C 30 min. b) +105+/-2 °C 30 min. (Transit time shall be within 5 minutes; JIS C0025) | Appearance: No damage. Contact Resistance: 60 mohm Max. |

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6.3 ENVIRONMENTAL PERFORMANCE CONTINUED

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|-------|-------------|---|---|
| 6.3.5 | Salt Spray | <p>Mate connectors and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dipped in the running water, after which the specified measurements shall be performed.</p> <p>NaCl solution concentration: 5+/-1% Spray time: 48+/-4 hours Ambient Temperature: 35 +/- 2 °C (based on JIS C5028 / MIL-STD-202 Method 101D Condition B).</p> | <p>Appearance: No damage. Contact Resistance: 60 mohm Max.</p> |
| 6.3.6 | S02 Gas | <p>Mate connectors and expose to 50+/-5 ppm S0₂ gas, ambient temperature 40+/-2 °C for 24 hours.</p> | <p>Appearance: No damage. Contact Resistance: 60 mohms Max.</p> |

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Individual Tests

Mating & Unmating Force

Crimp Terminal Insertion Force

Crimp Terminal Retention Force

Crimping Pull Out Force

Repeated Mate / Unmate

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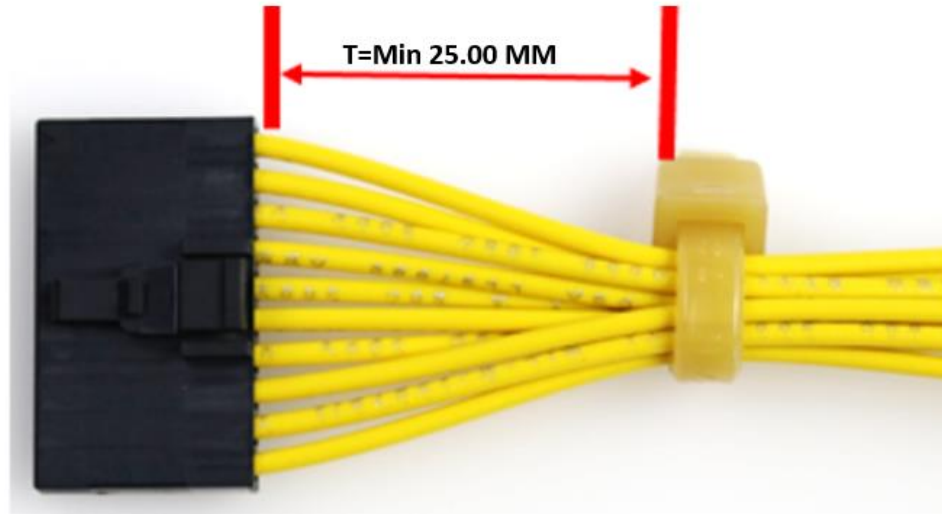


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7.0 PACKAGING

Parts shall be packaging to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item

8.0 CABLE TIE AND / OR TWIST TIE LOCATION



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. This dimension is general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

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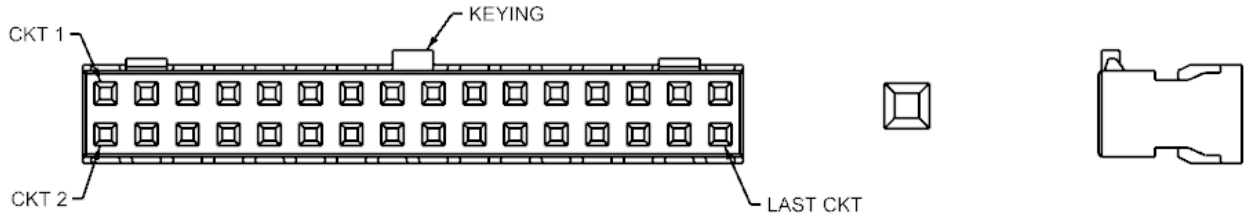
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9.0 POLARIZATION AND KEYING OPTIONS

9.1 RECEPTACLE HOUSING (Series: [51110](#))



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