# PRODUCT SPECIFICATION

## .093 SERIES PLUG AND RECEPTACLE POWER CONNECTORS

### 1.0 SCOPE

This Product Specification covers the 5.03 mm (.198 inch) centerline connector series using pin and socket terminals terminated with 14 to 24 AWG wire using crimp technology with tin plating.

### 2.0 PRODUCT DESCRIPTION

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

| PRODUCT NAME | SERIES NUMBER |
|---|---|
| Plug Housing, 1-circuit | 1619-1P |
| Receptacle Housing, 1-circuit | 1619-1R |
| Plug Housing, 2-circuit | 1545-P* |
| Receptacle Housing, 2-circuit | 1545-R* |
| Plug Housing, 3-circuit | 1396-P* |
| Receptacle Housing, 3-circuit | 1396-R* |
| Plug Housing, 4-circuit (in-line) | 1490-P* |
| Receptacle Housing, 4-circuit (in-line) | 1490-R* |
| Plug Housing, 4-circuit (2 x 2) | 2163-P* |
| Receptacle Housing, 4-circuit (2 x 2) | 2163-R* |
| Plug Housing, 5-circuit | 1653-P* |
| Receptacle Housing, 5-circuit | 1653-R* |
| Plug Housing, 6-circuit | 1261-P* |
| Receptacle Housing, 6-circuit | 1261-R* |
| Plug Housing, 9-circuit | 1292-P* |
| Receptacle Housing, 9-circuit | 1292-R* |
| Plug Housing, 12-circuit | 1360-P* |
| Receptacle Housing, 12-circuit | 1360-R* |
| | |
| Socket Terminal, 14-18 AWG | 1189 |
| Pin Terminal, 14-18 AWG | 1190 |
| Socket Terminal, 18-22 AWG | 1380 |
| Pin Terminal, 18-22 AWG | 1381 |
| Socket Terminal, 22-24 AWG | 2870 |
| Pin Terminal, 22-24 AWG | 2871 |
| Socket Terminal, 14-18 AWG, (P-B) | 4550 |
| Socket Terminal, 18-22 AWG, (P-B) | 2151 |

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

Housings are molded of UL 94V-2 rated PA66.
Terminals are tin-plated brass or phosphor-bronze.
See appropriate sales drawings for additional information on dimensions, materials, platings and markings.

### 2.3 SAFETY AGENCY APPROVALS

UL File #E29179
CSA File #E29179
TUV License #R75107

## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See the appropriate sales drawings for necessary referenced documents and specifications.

## 4.0 RATINGS

### 4.1 VOLTAGE

250 Volts AC (RMS)

### 4.2 CURRENT AND APPLICABLE WIRES

| AWG | Circuit Size | Amps |
|---|---|---|
| 14 | 3 | 14 |
| 14 | 9 | 11 |
| 18 | 3 | 10 |
| 18 | 9 | 7 |
| 22 | 3 | 7 |
| 22 | 9 | 5 |

### 4.3 TEMPERATURE

Operating: - 55°C to + 105°C

## 5.0 PERFORMANCE

### 5.1 ELECTRICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 1 | **Contact Resistance (Low Level)** | Mate connectors: apply a maximum voltage of **20** mV and a current of **20** mA. (Measurement locations in Section 7.0) | **10** milliohms MAXIMUM [initial] |
| 2 | **Dielectric Withstanding Voltage** | Mate connectors: apply a voltage of **2000** VAC for **1** minute between adjacent terminals and between terminals to ground. | No breakdown; current leakage < **500** mA |
| 3 | **Temperature Rise (via Current Cycling)** | Mate connectors, measuring the temperature rise at 60 minute intervals during **96** hours of steady state at rated current; followed by **240** hours of current cycling (**45** minutes ON and **15** minutes OFF per hour) with measurements made during last 5 minute period of each ON cycle; followed by **96** hours of steady state at rated current with measurements taken at 60 minute intervals. | Temperature rise: **+30**°C MAXIMUM |

### 5.2 MECHANICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 4 | **Connector Mate and Unmate Forces** | Mate and unmate connector (male to female) at a rate of **25 ± 6** mm (**1 ± ¼** inch) per minute for a total of 25 cycles. Initial mate forces to be measured. Unmate forces to be measured after 25 cycles. | **15.6** N (**3.5** lbf) MAXIMUM insertion force<br>**4.4** N (**1** lbf) MINIMUM withdrawal force |
| 5 | **Terminal Retention Force (in Housing)** | Axial pullout force on the terminal in the housing at a rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | **89** N (**20** lbf) MINIMUM retention force |
| 6 | **Wire Pullout Force (Axial)** | Apply an axial pullout force on the wire at a rate of **25 ± 6** mm (**1 ± ¼** inch). | MINIMUM pullout forces:<br>14 AWG **178** N (**40** lbf)<br>16 AWG **156** N (**35** lbf)<br>18 AWG **133** N (**30** lbf)<br>20 AWG **89** N (**20** lbf)<br>22 AWG **62** N (**14** lbf)<br>24 AWG **36** N (**8** lbf) |
| 7 | **Terminal Insertion Force (into Housing)** | Apply an axial insertion force on the terminal at a rate of **25 ± 6** mm (**1 ± ¼** inch). | **22**N (**5** lbf) MAXIMUM insertion force |

### 5.3 ENVIRONMENTAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 8 | **Thermal Cycling** | Mate connectors; expose to temperature cycling between **–25**°C and **70**°C for 500 cycles with a dwell time of 30 minutes at each extreme. Measurements to be taken initially and after every 100 cycles. | **10** milliohms MAXIMUM (change from initial)<br>&<br>Visual: No Damage |

### 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. See the appropriate sales drawings for additional information on packaging requirements.