# MarKK TERMINAL SERIES

## 1.0 SCOPE

This product spec covers the operational performance of the 45570 kk crimp terminal series with tin plating in the single row kk housing at 3.96/.156 center line. This system is for use with (1.14)/.045 square pins for wire to board applications. Product performance is optimized with pre-tinned stranded wire.

## 2.0 PRODUCT DESCRIPTION

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

| Product Name | Part Number Series |
|---|---|
| Female Terminal - MarKK | 45570 |
| Receptacle Housing 3.96/.156 kk (single row) | 41695, 6442 |
| Vertical Header – (square pins) | All .156" Centerline Pin Headers |

### 2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.
Material: RoHS compliant.

### 2.3 SAFETY AGENCY APPROVALS

**U.L. FILE #E29179**
**CSA CERT # LR19980**

| SERIES | Agency Voltage Rating (AC RMS or DC) except as noted | | Agency Current Rating (Single Circuit) (Amps) | | Agency Temperature Rating (°C) |
|---|---|---|---|---|---|
| | UL | CSA | UL | CSA | UL |
| 41695 | 600 | 250VAC | 13* | 13* | 105°C |
| 6442 | 600** | - | 13** | - | 105°C |

* Single pole tested
****** 6442 UL rating: 600V 13A for single circuit, 250V 7A, fully loaded

## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

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

## 4.0 RATINGS

### 4.1 VOLTAGE

600 Volts AC (RMS)/DC

### 4.2 CURRENT AND APPLICABLE WIRES

| | Pre-Tinned Wire | | Bare Copper Wire | |
|---|---|---|---|---|
| | 2 ckt. | 3 to 18 ckt. | 2 ckt. | 3 to 18 ckt. |
| 18 AWG | 13A | 10.5A | 11.5A | 10A |
| 20 AWG | 11A | 8A | | |

**Product tested to 30 degrees C T-Rise with pre-tinned and/or bare copper stranded wire as shown.
** Current rating is application dependent. Above rating is a guideline only. Appropriate de-rating is required per ambient conditions, wire type, wire stranding and gross heating from adjacent modules/components and other factors that influence connector performance.

### 4.3 TEMPERATURE

Operating: - 40°C to + 105°C
No operating: - 40°C to + 85°C
(Including 30 degrees C terminal temperature at full current)

## 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 **100** mA. (Measurement locations in Section 7.0) | **10** milliohms MAXIMUM [initial] |
| 2 | **Contact Resistance @ Rated Current** | Mate connectors: apply a maximum voltage of **20** mV at rated current. (Measurement locations in Section 7.0) | **10** milliohms MAXIMUM [initial] |
| 3 | **Insulation Resistance** | Unmate & unmount connectors: apply a voltage of **500** VDC between adjacent terminals and between terminals to ground. | **1000** Megohms MINIMUM |
| 4 | **Dielectric Withstanding Voltage** | Unmated connectors: apply a voltage of **1500 volts** VAC for **1** minute between adjacent terminals and between terminals to ground. | No breakdown; current leakage < **5** mA |
| 5 | **Capacitance** | Measure between adjacent terminals at **1** MHz. | **2** Pico farads MAXIMUM |
| 6 | **Temperature Rise (via Current Cycling)** | Mate connectors: measure the temperature rise at the rated current after **96** hours, during current cycling (45 minutes ON and 15 minutes OFF per hour) for 240 hours and after final 96 hour steady state. Per EIA-364-70 | Temperature rise: **+30**°C MAXIMUM |

### 5.2 MECHANICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 7 | **Terminal Insertion and Withdrawal Forces (Applies to 1st mating cycle only)** | Insert and withdraw terminal (male to female) at a rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. (Gage dimensions in Section 7.0) | **8.89** N (**2.00** lbf)/CKT. MAXIMUM insertion force & **2.20** N (.49 lbf) MINIMUM withdrawal force Avg insertion force 127.45 N (1.25 lbf)/ckt. |
| 8 | **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. Per EIA-364, TP29 Rev B | **40.0** N (**9.0** lbf) MINIMUM retention force |
| 9 | **Durability** | Mate connectors up to **{25** cycles for tin (non-noble) plating at a maximum rate of **5** cycles per minute prior to Environmental Tests. | **10** milliohms MAXIMUM (change from initial) |
| 10 | **Vibration (Random)** | Mate connectors and vibrate. Per EIA 364-28, test condition VII; Letter D. | **20** milliohms MAXIMUM (change from initial) & Discontinuity < **1** microsecond |
| 11 | **Wire Pullout Force (Axial)** | Apply an axial pullout force on the wire at a rate of **25 ± 6** mm (**1 ± ¼** inch). | 18 Awg = 89.0 N (20.00lbf) Min 20 Awg = 57.0 N (13.00lbf) Min |
| 12 | **Terminal Insertion Force (into Housing)** | Apply an axial insertion force on the terminal at a rate of **25 ± 6** mm (**1 ± ¼** inch). Per EIA-364, TP05 Rev. B | **5.78** N (**1.30** lbf) MAXIMUM insertion force |
| 13 | **Normal Force** | Apply a perpendicular force. Per EIA-364-04 Method A | **0.97** N (**99**grams) MINIMUM [Tin (non-noble) plating] |

### 5.3 ENVIRONMENTAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| **14** | **Fretting Corrosion (Thermal Shock)** | Mate connectors: expose for **500** cycles between temperatures **15** and **85**°C; dwell **0.5** hours at each temperature.<br><br>**{**Note: Remove surface moisture and air dry for 1 hour prior to measurements.**}** | **10** milliohms MAXIMUM (change from initial)<br>&<br>Visual: No Damage |
| **16** | **Temperature Life (Thermal Aging)** | Mate connectors; expose to:<br>**120** hours at **105 ± 2°**C<br>Per EIA-364-17 | **10** milliohms MAXIMUM (change from initial])<br>&<br>Visual: No Damage |
| **17** | **Humidity (Steady State)** | Mate connectors: expose to a temperature of **40 ± 2°**C with a relative humidity of **90-95**% for **96** hours.<br><br>Note: Remove surface moisture and air dry for **1** hour prior to measurements. | **10** milliohms MAXIMUM (change from initial)<br>&<br>Dielectric Withstanding Voltage:<br>No Breakdown at **500** VAC<br>&<br>Insulation Resistance:<br>**1000** Megohms MINIMUM<br>&<br>Visual: No Damage |
| **18** | **Humidity (Cyclic)** | Mate connectors: cycle per EIA-364-31: **24** cycles at temperature **25 ± 3°**C at **80 ± 5**% relative humidity and **65 ± 3°**C at **50 ± 5**% relative humidity; dwell time of **1.0** hour; ramp time of **0.5** hours.<br><br>**{**Note: Remove surface moisture and air dry for **1** hour prior to measurements.**}** | **10** milliohms MAXIMUM (change from initial)<br>&<br>Dielectric Withstanding Voltage:<br>No Breakdown at **500** VAC<br>&<br>Insulation Resistance:<br>**1000** Megohms MINIMUM<br>&<br>Visual: No Damage |

### 6.0 PACKAGING

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

### 7.0 GAGES AND FIXTURES

### 8.0 OTHER INFORMATION