# PRODUCT SPECIFICATION

## MINIFIT JR CONNECTOR SYSTEM / 87427 SERIES

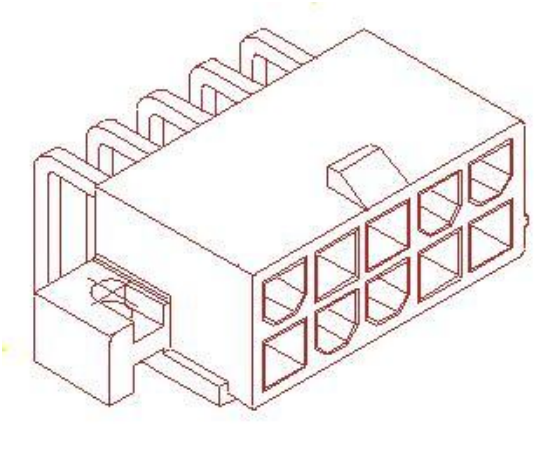
### 1.0 SCOPE

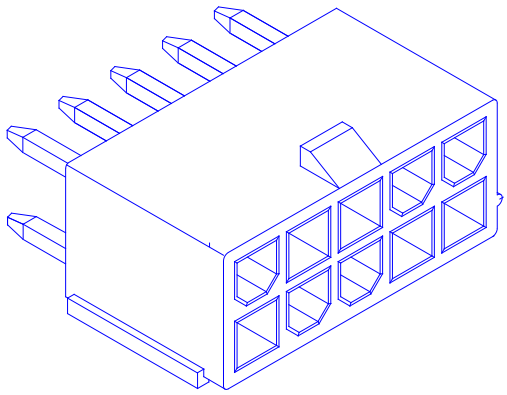
This specification covers the 4.2mm centerline tin plated Mini-Fit Jr connector series terminated with 16 to 28 AWG wire using crimp technology.

### 2.0 PRODUCT DESCRIPTION

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

| Part Number | Product Description |
|---|---|
| 87427-**0* | Mini-Fit Jr. Right Angle Header without Mounting Flanges |
| 87427-**1* | Mini-Fit Jr. Right Angle Header with Mounting Flanges |
| 87427-**4* | Mini-Fit Jr. Vertical Header |
| 5557 SERIES | Receptacle, Mini-Fit Jr. Series |
| 5556 SERIES | Female Crimp Terminal |





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

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

#### 2.3 SAFETY AGENCY APPROVALS

UL File: E29179
CSA Certificate: LR19980

### 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See the Sales Drawings and the other sections of this specification for the necessary referenced documents and specifications.

## 4.0 RATINGS

### 4.1 VOLTAGE

600 Volts AC (RMS)(or 600 Volts DC)

### 4.2 MAXIMUM CURRENT RATING AND APPLICABLE WIRES

| | Current (Amperes) | | | | Max insulation Diameter |
|---|---|---|---|---|---|
| CKT / AWG | 2&3 | 4&6 | 7-10 | 12-24 | |
| AWG #16 | 9A | 8A | 7A | 6A | 3.10 MAX |
| AWG #18 | 9A | 8A | 7A | 6A | |
| AWG #20 | 7A | 6A | 5A | 5A | |
| AWG #22 | 5A | 4A | 4A | 4A | |
| AWG #24 | 4A | 3A | 3A | 3A | |
| AWG #26 | 3A | 2A | 2A | 2A | 1.80 MAX |
| AWG #28 | 2A | 1A | 1A | 1A | |

Ratings shown represent MAXIMUM current carrying capacity of a fully loaded connector with all circuits powered. Ratings are based on a 30°C maximum temperature rise limit over ambient (room temperature). Above charts are intended as a guideline. Current rating is application dependent. Appropriate de-rating is required depending on factors such as circuit size, ambient temperature, smaller copper weight of PCB traces, gross heating from adjacent modules or components and other factors that influence connector performance. Wire size and stranding, tin coated or bare copper, wire length and crimp quality are other factors that influence current rating. Current ratings apply to Brass 5556 crimp terminals only.

### 4.3 TEMPERATURE

Operating*: - 40 °C to + 105 °C

*Including 30 °C terminal temperature at rated current.

## 5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 1 | **Contact Resistance** | Mate connectors: apply a maximum voltage of **20** mV and a current of **100** mA. Wire resistance shall be removed from the measured value. | 10 mΩ Max (Initial) |
| 2 | **Insulation Resistance** | Mate connectors: apply a voltage of **500** VDC between adjacent terminals and between terminals to ground. | 1000 MΩ Min |
| 3 | **Dielectric Withstanding Voltage** | Mate connectors: apply a voltage of **2200** VAC for **1** minute between adjacent terminals and between terminals to ground. | No breakdown; current leakage < **5** mA |

### 5.2 MECHANICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 4 | **Connector Mate and Unmating Forces** | Mate and unmate connector at a rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | See chart in Section 8.0 |
| 5 | **Wire Pullout Force (Axial)** | Mount the crimped terminal apply an axial pullout force on the wire at a rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | AWG # 16: 9.0 kgf Min<br>AWG # 18: 9.0 kgf Min<br>AWG # 20: 6.0 kgf Min<br>AWG # 22: 4.0 kgf Min<br>AWG # 24: 3.0 kgf Min<br>AWG # 26: 2.0 kgf Min<br>AWG # 28: 1.0 kgf Min<br>Wire pull out force is applicator dependent. Reference relevant Molex application tooling specification |
| 6 | **Terminal Insertion Forces** | Insert crimped terminal into the housing | 1.5 kgf Min. |
| 7 | **Terminal Retention Force (in Housing)** | Axial pullout force on the crimp terminal in the housing at a rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | 3.0 kgf Min MINIMUM retention force |
| 8 | **Pin Retention Force (in Housing)** | Axial push force at the speed rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | 1.0 kgf Min MINIMUM retention force |
| 9 | **Thumblatch Operation Force in Housing** | Depress latch at a speed rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | 1.7 kgf Max. |
| 10 | **Thumblatch Yield Strength** | Mate loaded connector fully. Pull apart via wires at a speed rate of **25 ± 6** mm (**1 ± ¼** inch) per minute. | 7.0 kgf Min. |
| 11 | **Normal Force** | Insert split test fixture into female terminal. Apply force perpendicular to terminal sides at a speed rate of **2.54** mm (.**1** inch) per minute. | 375.0 gf Max. |
| 12 | **Durability** | When mated up to 30 cycles repeatedly by the rate of 10 cycles per minute. | Contact Resistance: **20** mΩ MAXIMUM * |

*Change from initial

### 5.3 ENVIRONMENTAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| **13** | **Shock (Mechanical)** | Mate connectors and shock at **50** g's with three saw tooth wave form shocks in the X,Y,Z axes. | Appearance: No Damage<br>Contact Resistance: **20** mΩ MAXIMUM *<br>Discontinuity: < **1** microsecond |
| **14** | **Vibration** | Amplitute: 1.5mm peak to peak<br>Sweep: 10-55-10 Hz in one minute<br>Duration: 2 hours in each X-Y-Z axis | Appearance: No Damage<br>Contact Resistance: **20** mΩ MAXIMUM *<br>Discontinuity: 1 usec Max. |
| **15** | **Thermal Aging** | Mate connectors:<br>Duration: **96** hours;<br>Temperature: **105 ± 2**°C | Appearance: No Damage<br>Contact Resistance: **20** mΩ MAXIMUM * |
| **16** | **Cold Resistance** | Mate connectors:<br>Duration: **96** hours;<br>Temperature: **-40 ± 3**°C | Appearance: No Damage<br>Contact Resistance: **20** mΩ MAXIMUM * |
| **17** | **Temperature Cycling** | 5 Cycles:<br>a) -55 C, 30 minutes<br>b) +105 C, 30 minutes | Appearance: No Damage<br>Contact Resistance: **20** mΩ MAXIMUM * |
| **18** | **Humidity (Steady State)** | Mate connectors: expose to a temperature of **60 ± 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. | **20** mΩ MAXIMUM * (change from initial)<br>&<br>Dielectric Withstanding Voltage:<br>No Breakdown at **1500** VAC<br>&<br>Insulation Resistance:<br>**1000** MΩ MINIMUM<br>&<br>Visual: No Damage |

*Change from initial

### 5.3 ENVIRONMENTAL REQUIREMENTS (continued)

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| **20** | **Mixed Flowing Gas** | EIA-364-65 with class IIa gas concentrations (30µ" gold plated only) | Appearance: No Damage<br>Contact Resistance: **20** mΩ MAXIMUM * |
| **21** | **Solderability** | Per **SMES-152** | Solder coverage: **95**% MINIMUM (per **SMES-152**) |
| **22** | **Temperature Rise** | Carrying rated current load | **30 °C rise Max** |
| **23** | **Wave Solder Resistance** | Dip connector terminal tails in solder:<br>Solder Duration: **5 ± 0.5** seconds;<br>Solder Temperature: **260 ± 5°**C<br>Per ES-40000-5013 | Visual:<br>No Damage to insulator material |
| **24** | **Reflow Solder Resistance** | Convection reflow solder process 235°C Max per ES-40000-5013 (see note 1 below) | Visual: No Damage |

*Change from Initial

Notes:

1. The 87427 products covered in this specification are molded from a hydroscopic thermoplastic resin. In high-humidity environments, parts will absorb moisture, possibly causing outgassing and blistering when exposed to temperatures higher than specified above. High reflow temperatures (typical for lead-free soldering) may be used if special precautions to remove moisture are taken. Parts exposed to high humidity conditions should be dried or "baked" before the soldering process.
   Guidelines for drying are:
   - 3-5 hours at 120 ° - 125°C
   - Note that the customer should determine the optimum drying parameters based on their own conditions and experience.

## 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. Nylon parts should remain in their original packaging until ready for use to prevent moisture loss or gain.

## 7.0 GAGES AND FIXTURES

## 8.0 MATE AND UNMATE FORCE

Receptacle and Right Angle Header Assemblies with Tin-plated Brass Terminals.

| CKT SIZE | MATE (kg. Max) | | | UNMATE (kg Min) | | |
|---|---|---|---|---|---|---|
| | Initial | 6 th | 30 th | Initial | 6 th | 30 th |
| 10 | 14.50 | 13.50 | 13.50 | 0.50 | 0.40 | 0.40 |
| 22 | 31.90 | 29.70 | 29.70 | 1.10 | 0.88 | 0.88 |

## 9.0 OTHER INFORMATION

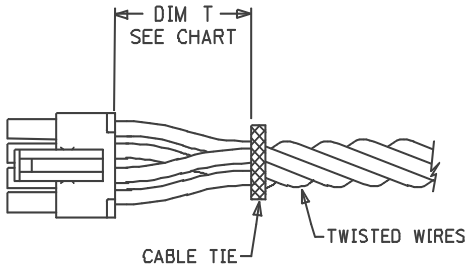
### 9.1 GAGES AND FIXTURES

It is recommended that test plugs (Series 44281) be used for continuity testing of receptacles. Standard mating parts should not be used for harness testing.

NOTE: The use of unauthorized testing devices and/or probes with a Molex product may cause damage to and affect functionality of the Molex product, and such use may void any and all warranties, expressed or implied.

### 9.2 CABLE TIE AND OR WIRE TWIST LOCATION

| Circuit Sizes | | Dim T Min. |
|---|---|---|
| Dual Row | Single Row | |
| 2-6 | 3 | .50” (12.7 mm) |
| 8 | 4 | .75” (19.1 mm) |
| 10-12 | 5-6 | 1.00” (25.4 mm) |
| 14-16 | 7-8 | 1.25” (31.75 mm) |
| 18-20 | 9-10 | 1.50”(38.09 mm) |
| 22-24 | 11-12 | 1.75” (44.45 mm) |




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