Miniature high performance twist pin connectors

Micro-D & Nano-D, Rectangular & Circular

www.axon-cable.com
RECTANGULAR MICRO-D CONNECTORS

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MIL-DTL-83513

Micro-D QPL - CAGE CODE: OKOJ2

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**GLOSSARY OF TERMS**

**METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS**

- **JACKSCREW** - High or low profile, hexagonal socket or slotted head.
- **SHELL** - Connector metal body.
- **JACKPOST** - Mates with jackscrew.
- **TWIST PIN** - Male contact, fitted to plug connector.
- **INSERT** - Moulded insulation housing, separating each connection.
- **INTERFACIAL SEAL** - Fitted to socket connector only.
- **SOCKET** - Female contact, fitted to socket connector (also known as socket).
- **TRAY** - Junction box used for PCB connectors only.

- **Standard connector** - Manufactured to the standard dimensions and specifications.
- **Special connector** - A standard connector modified to meet specific requirements.
- **Custom made connector** - Designed to meet specific customer requirements.
- **Connector saver** - Used to reduce wear and tear on equipment and systems while testing.
- **BR connector** - Board Right Angle connector.
- **CBR connector** - Condensed Board Right Angle connector.
- **BS connector** - Board Straight connector.
- **Strip connector** - Single row plastic connector with 1.27 mm spacing (.050”).
- **Pigtail connector** - Connector with insulated or uninsulated wires.
- **Cord** - Cable harness with 2 connectors only.
- **Jumper/Extension cord** - Cord with 1 plug and 1 receptacle connector of the same number of ways.
- **Harness** - Multi-branched cable assembly.
- **LCP** - Liquid Crystal Polymer.
- **Potting** - Epoxy compound used as an encapsulant.
- **Solder cup connector** - Connector with solder type contacts, usually used for prototyping.
CONNECTOR MATING GUIDE

1. Align both connectors and start to insert the male D-shape into the female one.

2. Screw each jackscrew down alternately by no more than approximately one turn. This is essential to ensure correct mating.

3. Tighten both jackscrews to the recommended torque values set out below.

RECOMMENDED TORQUE VALUES

- MICRO-D 9 to 69 way jackscrew: 0.28 N.m / 2.5 inch-pounds.
- MICRO-D 100 way jackscrew: 0.51 N.m / 4.5 inch-pounds.
- MICRO-D PCB mounting screws (inside threaded inserts):
  9 to 69 way with 2-56 UNC 2A screws: 0.14 N.m / 1.25 inch-pounds
  100 way with 4-40 UNC 2A screws: 0.34 N.m / 3 inch-pounds
- NANO-D 9 to 51 way jackscrew: 0.11 N.m / 1 inch-pounds.
AXON’s range of Micro-D connectors which is covered by the MIL-DTL-83513* standard, is ideally suited to equipment and applications where weight, miniaturisation and long term performance are required. It is available:
- in 10 contact arrangements (9 to 100 contacts) for rectangular Micro-D connectors,
- and 2 to 40 contacts for microstrips.

### Electrical & mechanical characteristics

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SPECIFICATION</th>
<th>TEST METHOD</th>
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</thead>
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<td><strong>CURRENT RATING</strong></td>
<td>3 A max.</td>
<td>EIA-364-70</td>
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<tr>
<td><strong>CONTACT RESISTANCE</strong></td>
<td>8 mΩ max.</td>
<td>EIA-364-08</td>
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<tr>
<td><strong>INSULATION RESISTANCE</strong></td>
<td>5000 MΩ min. @ 500 Vac</td>
<td>EIA-364-21</td>
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<tr>
<td><strong>DIELECTRIC WITHSTANDING VOLTAGE</strong></td>
<td>- Sea Level 0 m</td>
<td>EIA-364-20</td>
</tr>
<tr>
<td></td>
<td>- Altitude 21 km (70,000 ft)</td>
<td></td>
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<tr>
<td><strong>CONTACT ENGAGING AND SEPARATION FORCE</strong></td>
<td>170 g max. (6 oz)</td>
<td>EIA-364-37</td>
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<td></td>
<td>14 g min. (0.5 oz)</td>
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<tr>
<td><strong>CONNECTOR MATING AND DEMATING FORCE</strong></td>
<td>283 g (10 oz) x number of contacts max.</td>
<td>EIA-364-13</td>
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<tr>
<td><strong>CONTACT RETENTION</strong></td>
<td>2.26 kg (5 lbs) for 5 seconds min.</td>
<td>EIA-364-29</td>
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<tr>
<td><strong>DURABILITY</strong></td>
<td>500 mating cycles min.</td>
<td>EIA-364-09</td>
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<td><strong>TEMPERATURE RANGES</strong></td>
<td>- Standard: -55°C / +150°C</td>
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</tr>
<tr>
<td></td>
<td>- High Temp: -55°C / +200°C</td>
<td></td>
</tr>
<tr>
<td><strong>VIBRATION</strong></td>
<td>20 g's - No discontinuity &gt;1μs</td>
<td>EIA-364-28</td>
</tr>
<tr>
<td><strong>SHOCK</strong></td>
<td>50 g's - No discontinuity &gt;1μs</td>
<td>EIA-364-27</td>
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<tr>
<td><strong>SALT SPRAY</strong></td>
<td>48 hours</td>
<td>EIA-364-26</td>
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<tr>
<td><strong>HUMIDITY</strong></td>
<td>Insulation resistance &gt; 1MΩ</td>
<td>EIA-364-31</td>
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### Material & Finish

<table>
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<tr>
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<th>MATERIAL</th>
<th>FINISH</th>
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<tbody>
<tr>
<td><strong>MALE CONTACT (TWIST PIN)</strong></td>
<td>COPPER AND BERYLLIUM COPPER</td>
<td>GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µM (0.00005&quot;) MIN) CODE C</td>
</tr>
<tr>
<td><strong>FEMALE CONTACT</strong></td>
<td>COPPER ALLOY</td>
<td>OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 CLASS 2 (1.27µM (0.00005&quot;) TO 3.81µM (0.00015&quot;))</td>
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<tr>
<td><strong>SOLDER CUP</strong></td>
<td>BRASS</td>
<td>GOLD PLATING OVER NICKEL UNDERPLATING</td>
</tr>
<tr>
<td><strong>METAL SHELL</strong></td>
<td>ALUMINIUM ALLOY, TYPE 6061</td>
<td>YELLOW CHROMATE OVER Cadium IN ACCORDANCE WITH SAE-AMS-QQ-P-416, TYPE II, CLASS 3 ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, .0095 INCH MIN. BLACK ZINC NICKEL OVER NICKEL UNDERPLATE</td>
</tr>
<tr>
<td><strong>PLASTIC SHELL / INSERT / PCB TRAY</strong></td>
<td>LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE</td>
<td>PASSIVATION IN ACCORDANCE WITH SAE-AMS2700</td>
</tr>
<tr>
<td><strong>INTERFACIAL SEAL</strong></td>
<td>FLUOROSILICONE RUBBER</td>
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</tr>
<tr>
<td><strong>HARDWARE</strong></td>
<td>STAINLESS STEEL, 300 SERIES</td>
<td>PASSIVATION IN ACCORDANCE WITH SAE-AMS2700</td>
</tr>
<tr>
<td><strong>ENCAPSULANT</strong></td>
<td>EPOXY RESIN</td>
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<tr>
<td><strong>INSULATED WIRE</strong></td>
<td>PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH NEMA-HP3</td>
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<td>PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/11</td>
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<td>ETPF INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/33</td>
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<td><strong>UNINSULATED WIRE</strong></td>
<td>GOLD PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551</td>
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<tr>
<td></td>
<td>TIN PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551</td>
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</tbody>
</table>

*: ISSUE G AT TIME OF GOING TO PRESS
RoHS compliance

AXON’ CABLE has been pro-actively implementing measures for many years to ensure compliance with the European Directive 2011/65/EU which came into force on 21st July 2011. The Directive prohibits the use of Hazardous Substances such as lead, mercury, hexavalent chromium, cadmium, bromine compounds (PBBS and PBDE) and various phthalates. It relates to all components of products which are used in the manufacture of electronic and electrical equipment.

As a cable and connector manufacturer, AXON’ has taken actions to ensure compliance with directive 2000/53/EC applicable since 21st October 2000.

COMPONENT SPECIFIC RoHS COMPLIANCE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
<th>FINISH</th>
<th>RoHS STATUS</th>
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<tbody>
<tr>
<td>PIN CONTACT (TWIST PIN)</td>
<td>COPPER + BERYLLIUM</td>
<td>COPPER Gold</td>
<td>RoHS Compliant</td>
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<tr>
<td>SOCKET CONTACT</td>
<td>COPPER ALLOY</td>
<td>COPPER Gold</td>
<td>RoHS Compliant</td>
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<td>PLASTIC SHELL</td>
<td>LIQUID CRYSTAL POLYMER</td>
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<td>RoHS Compliant</td>
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<td>METAL SHELL</td>
<td>ALUMINIUM ALLOY TYPE 6061</td>
<td>YELLOW CHROMATE OVER CADMIUM</td>
<td>RoHS Compliant*</td>
</tr>
<tr>
<td>PLASTIC INSERT/PCB TRAY</td>
<td>LIQUID CRYSTAL POLYMER</td>
<td>N/A</td>
<td>RoHS Compliant</td>
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<td>INTERFACIAL SEAL</td>
<td>FLUOROSILICONE RUBBER</td>
<td>N/A</td>
<td>RoHS Compliant</td>
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<td>HARDWARE</td>
<td>STAINLESS STEEL 300 SERIES</td>
<td>PASSIVATION</td>
<td>RoHS Compliant</td>
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<tr>
<td>&quot;STANDARD&quot; SERIES PCB TERMINATION</td>
<td>SOLID COPPER WIRE</td>
<td>GOLD</td>
<td>RoHS Compliant</td>
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<tr>
<td>MIL VERSION PCB TERMINATION</td>
<td>SOLID COPPER WIRE</td>
<td>NOT LEADED TIN 97% MAX TIN</td>
<td>RoHS Compliant</td>
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<tr>
<td>ENCAPSULANT</td>
<td>EPOXY RESIN 150°C VERSION</td>
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<td>RoHS Compliant</td>
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Application of REACH

The new EU regulation on the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) came into force in June 2007. The regulation concerns the authorised use of chemicals. It requires manufacturers and importers to register substances and their use with the European Chemical Agency (ECHA).

AXON’ CABLE is known as a "downstream user" with respect to the REACH regulation, and a manufacturer of "Articles". AXON’ CABLE products are not intended to release any undesired substance under normal and reasonable operations of use.

To this day AXON’ CABLE have not identified any component containing any SVHC in their product range.
CONTACT ARRANGEMENTS

Mating face of male rectangular connector
- 1.27 mm (0.050") contact spacing.
- 1.09 mm (0.043") spacing between rows.

9 CONTACTS

15 CONTACTS

21 CONTACTS

25 CONTACTS

31 CONTACTS

37 CONTACTS

51 CONTACTS

51 CONTACTS DOUBLE ROW (51DR)

69 CONTACTS

100 CONTACTS

120 CONTACTS: SEE PAGE 178 OR 302
OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST
**CONTACT ARRANGEMENTS**

Mating face of female rectangular connector

- 1.27 mm (0.050") contact spacing.
- 1.09 mm (0.043") spacing between rows.

**Micro-D connectors**

**CONTACT ARRANGEMENTS**

- 9 CONTACTS
- 15 CONTACTS
- 21 CONTACTS
- 25 CONTACTS
- 31 CONTACTS
- 37 CONTACTS
- 51 CONTACTS
- 51 CONTACTS DOUBLE ROW (51DR)
- 69 CONTACTS
- 100 CONTACTS

120 CONTACTS: SEE PAGE 178 OR 302
OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

## MICRO-D WEIGHTS

### MICRO-D ALUMINIUM CONNECTOR WEIGHTS IN GRAMS

<table>
<thead>
<tr>
<th>NB OF CONTACT</th>
<th>GENDER</th>
<th>SOLDER CUP</th>
<th>PIGTAIL</th>
<th>PCB CBR .100&quot; pitch</th>
<th>PCB CBR .075&quot; pitch</th>
<th>PCB BR .100&quot; pitch</th>
<th>PCB BS .100&quot; pitch</th>
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### MICRO-D STAINLESS STEEL WEIGHT ADDERS IN GRAMS

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**NOTES**
1. NOMINAL WEIGHT SHOWN. ADD 10% FOR MAXIMUM WEIGHT.
2. SOLDER CUPS: CONNECTOR WEIGHT DOES NOT INCLUDE THE HARDWARE WEIGHT.
3. PIGTAILS: CONNECTOR WEIGHT DOES NOT INCLUDE HARDWARE AND WIRE WEIGHTS. SEE TABLE PAGE 29 FOR WIRE WEIGHT CALCULATION.
4. PCB CONNECTORS: NOMINAL WEIGHT INCLUDES THE HARDWARE WEIGHT.
## WIRE CODES

Nominal dimensions are used throughout this chapter.

### Solid uninsulated wires

<table>
<thead>
<tr>
<th>WIRE CODE</th>
<th>WIRE DESIGNATION</th>
<th>WEIGHT g/m</th>
<th>MATERIAL</th>
<th>CONSTRUCTION (mm)</th>
<th>Ø (mm)</th>
<th>AREA (mm²)</th>
<th>RESISTANCE (Ω/100m)</th>
<th>TEMPERATURE RATING</th>
<th>VOLTAGE RATING</th>
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<td>GPC2501</td>
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<td>GOLD PLATED COPPER</td>
<td>7x0.160 7x0.063</td>
<td>0.480 0.019</td>
<td>0.141 0.000219</td>
<td>12.8 39.0</td>
<td>-90°C +200°C</td>
<td>600 Vdc</td>
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<tr>
<td>2 T 2607</td>
<td>TPC2401</td>
<td>1.81</td>
<td>TIN PLATED COPPER</td>
<td>19x0.102 19x0.040</td>
<td>0.504 0.020</td>
<td>0.154 0.000239</td>
<td>12.6 36.4</td>
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<td>600 Vdc</td>
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<tr>
<td>3 F 2607</td>
<td>GPC2501</td>
<td>1.81</td>
<td>GOLD PLATED COPPER AND TIN LEAD-FREE (97% TIN MAX)</td>
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### Insulated wires

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<th>RESISTANCE (Ω/100m)</th>
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<td>12.6 36.4</td>
<td>-90°C +200°C</td>
<td>600 Vdc</td>
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</table>

Other wire types available on request:

- ***: ONLY FOR COLOUR CODE V
- **: SILVER PLATED COPPER
- ***: SILVER PLATED COPPER ALLOY
COLOUR CODES

Colour codes F and L

All the wires have the same colour.
Available with all wire types.

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<th>COLOUR CODE</th>
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<td>F</td>
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OTHER COLOURS AVAILABLE ON REQUEST.

Colour code W

Also called 10 colour repeat. (10 colours repeated in sequence) as per MIL-DTL-83513. Available with all wire types.

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Colour code V

Only available with 2607 AWG wires (Micro-D wire code F) and 2619 AWG wires (Micro-D wire code 3).

Colours and coloured stripes as per MIL-STD-681 system (except the appropriate colour code is the contact number minus 1).

Only available for Micro-D connectors with 51 contacts or less.

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REAR PANEL MOUNTING GUIDE

- 2 sizes of hardware: one version for all shell sizes for 9 to 69 way and a separate version for the 100 way shell size.
- 1 kit consists of 2 posts, 2 washers and 2 nuts.
- Material: 300 series stainless steel passivated.

Dimensions are given in millimetres (inches).

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<th>P3</th>
<th>P4</th>
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<td>.047</td>
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Micro-D connectors

- 2 sizes of hardware: one version for all shell sizes for 9 to 69 way and a separate version for the 100 way shell size.
- 1 kit consists of 2 posts, 2 washers and 2 nuts.
- Material: 300 series stainless steel passivated.

**FRONT PANEL MOUNTING GUIDE**

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<th>100 way</th>
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**Rectangular Micro-D connectors**
PANEL CUTOUTS

Metal shell & Plastic shell

9 TO 69 CONTACTS

Metal shell

100 CONTACTS
### Dimensions

Dimensions are in millimetres (inches).

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<th>FIGURE N°</th>
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<th>PLASTIC SHELLS</th>
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<td>10.26 (.404)</td>
<td>6.96 (274)</td>
<td>14.48 (570)</td>
</tr>
<tr>
<td></td>
<td>10.36 (.408)</td>
<td>6.55 (258)</td>
<td>14.48 (570)</td>
</tr>
<tr>
<td>15</td>
<td>14.07 (.554)</td>
<td>6.96 (274)</td>
<td>18.29 (.720)</td>
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<td>14.20 (.559)</td>
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<td>21</td>
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<td>22.10 (.870)</td>
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<td></td>
<td>18.00 (.709)</td>
<td>6.55 (258)</td>
<td>22.10 (.870)</td>
</tr>
<tr>
<td>25</td>
<td>20.42 (.804)</td>
<td>6.96 (274)</td>
<td>24.64 (.970)</td>
</tr>
<tr>
<td></td>
<td>20.55 (.809)</td>
<td>6.55 (258)</td>
<td>24.64 (.970)</td>
</tr>
<tr>
<td>31</td>
<td>24.23 (.954)</td>
<td>6.96 (274)</td>
<td>28.45 (1.120)</td>
</tr>
<tr>
<td></td>
<td>24.36 (.959)</td>
<td>6.55 (258)</td>
<td>28.45 (1.120)</td>
</tr>
<tr>
<td>37</td>
<td>28.04 (1.104)</td>
<td>6.96 (274)</td>
<td>32.26 (1.270)</td>
</tr>
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<td></td>
<td>28.17 (1.109)</td>
<td>6.55 (258)</td>
<td>32.26 (1.270)</td>
</tr>
<tr>
<td>51</td>
<td>36.93 (1.454)</td>
<td>6.96 (274)</td>
<td>41.15 (1.620)</td>
</tr>
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<td></td>
<td>37.03 (1.458)</td>
<td>6.55 (258)</td>
<td>41.15 (1.620)</td>
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<td>51</td>
<td>26.77 (.104)</td>
<td>8.00 (.315)</td>
<td>31.00 (1.220)</td>
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<tr>
<td></td>
<td>26.90 (.109)</td>
<td>7.64 (.301)</td>
<td>31.00 (1.220)</td>
</tr>
<tr>
<td>69</td>
<td>34.39 (.135)</td>
<td>8.00 (.315)</td>
<td>38.62 (1.520)</td>
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<tr>
<td></td>
<td>34.49 (.135)</td>
<td>7.64 (.301)</td>
<td>38.62 (1.520)</td>
</tr>
<tr>
<td>100</td>
<td>36.73 (.146)</td>
<td>9.25 (.364)</td>
<td>45.85 (1.805)</td>
</tr>
<tr>
<td></td>
<td>37.06 (.149)</td>
<td>10.31 (.406)</td>
<td>45.85 (1.805)</td>
</tr>
</tbody>
</table>

**Dimensions are in millimetres (inches).**

#### Panel mounting dimensions

Dimensions are in millimetres (inches).

- **Rear mount of male and female connectors.**
- **Front mount of male and female connectors.**
- **Front mount of male connector and rear mount of female connector, or vice versa.**
MIL-DTL-83513 CONNECTORS

Micro-D QPL - CAGE CODE: OKOJ2

M83513 /01 & /02
- Solder cup connector - Metal shell ........................................ 38
M83513 /03 & /04
- Pigtail connector - Metal shell .............................................. 40
M83513 /06 & /07
- Solder cup connector - Plastic shell ................................. 42
M83513 /08 & /09
- Pigtail connector - Plastic shell ................................. 44
M83513 /10 TO /15
- PCB connector - Narrow profile - Right angle
  0.100" pitch - Metal shell .............................................. 46
- PCB layout for QPL narrow profile ....................... 48
M83513 /16 TO /21
- PCB connector - Standard profile - Right angle
  0.100" pitch - Metal shell .............................................. 50
- PCB layout for QPL standard profile ....................... 52
M83513 /22 TO /27
- PCB connector - Straight - 0.100" pitch - Metal shell .............. 54
- PCB layout for QPL Straight - 0.100" pitch ................... 56
M83513 /28 TO /33
- PCB connector - Straight - 0.075" pitch - Metal shell .............. 58
- PCB layout for QPL Straight - 0.075" pitch ................... 60

MILITARY CROSS REFERENCE CHART ................................. 417
**MIL-DTL-83513 /01 & /02**

**SOLDER CUP CONNECTOR**

**METAL SHELL**
- Metal shell recommended for environmental and EMI applications.
- Ideal for prototyping or where pigtail type connectors cannot be used.

**CAGE CODE: 0K0J2**

**IDENTIFICATION CODE**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>M83513/</th>
<th>QPL series.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>01-</td>
<td>Pin connector, metal shell.</td>
</tr>
<tr>
<td></td>
<td>02-</td>
<td>Socket connector, metal shell.</td>
</tr>
</tbody>
</table>

**NUMBER OF CONTACTS**

| A  | 9.
| B  | 15.
| C  | 21.
| D  | 25.
| E  | 31.
| F  | 37.
| G  | 51.
| H  | 100. |

See pages 26 & 27 for contact arrangements.

**SHELL FINISH**

| C  | Cadmium plating. |
| N  | Nickel plating. |
| P  | Passivated stainless steel. |

**METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS**
### Dimensions
Dimensions are in millimetres (inches).

#### Rectangular Micro-D Connectors

### Male Connector

- **Dimensions**
  - 2.79 (.110) MAX
  - 5.08 (.200) MAX

#### Female Connector

- **Dimensions**
  - 2.79 (.110) MAX
  - 5.08 (.200) MAX

### Summary of Characteristics

#### Electrical & Mechanical Performance

<table>
<thead>
<tr>
<th>Current Rating</th>
<th>3 A max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Resistance</td>
<td>8 mΩ max.</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>5000 MΩ min. @ 500 Vac</td>
</tr>
<tr>
<td>Dielectric Withstanding Voltage</td>
<td>Sea Level: 600 Vac</td>
</tr>
<tr>
<td>Contact Engaging Force</td>
<td>170 g max. (6 oz)</td>
</tr>
<tr>
<td>Contact Retaining Force</td>
<td>14 g min. (0.5 oz)</td>
</tr>
<tr>
<td>Contact Retention</td>
<td>2.26 kg (5 lbs)</td>
</tr>
<tr>
<td>Durability</td>
<td>500 mating cycles min.</td>
</tr>
<tr>
<td>Vibration</td>
<td>20g’s – No discontinuity &gt; 1 µs</td>
</tr>
<tr>
<td>Shock</td>
<td>50g’s – No discontinuity &gt; 1 µs</td>
</tr>
</tbody>
</table>

#### Material & Finish

- **Shell**
  - Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
- **Moulded Insulator**
  - Liquid Crystal Polymer (LCP)
- **Interfacial Seal**
  - Fluorosilicone rubber
- **Pin Contact**
  - Copper and beryllium copper, gold over nickel plating
- **Socket Contact**
  - Copper alloy, gold over nickel plating
- **Solder Cup**
  - Copper alloy, gold over nickel plating
- **Encapsulant**
  - Epoxy resin

---

**See Page 24 for More Information**
**PIGTAIL CONNECTOR**

**METAL SHELL**
- Metal shell recommended for environmental and EMI applications.
- Supplied pre-wired and fully potted.

**IDENTIFICATION CODE**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>M83513/</th>
<th>03-</th>
<th>04-</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>03-: Pin connector, metal shell.</td>
<td>04-: Socket connector, metal shell.</td>
<td></td>
</tr>
</tbody>
</table>

**NUMBER OF CONTACTS**

- **A**: 9.
- **B**: 15.
- **C**: 21.
- **D**: 25.
- **E**: 31.
- **F**: 37.
- **G**: 51.
- **H**: 100.

See pages 26 & 27 for contact arrangements.

**WIRE TYPE**

<table>
<thead>
<tr>
<th>M22759/11-26</th>
<th>PTFE Insulated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>01: 46 cm (18&quot;) white.</td>
<td></td>
</tr>
<tr>
<td>02: 92 cm (36&quot;) white.</td>
<td></td>
</tr>
<tr>
<td>03: 46 cm (18&quot;) 10 colour repeat.</td>
<td></td>
</tr>
<tr>
<td>04: 92 cm (36&quot;) 10 colour repeat.</td>
<td></td>
</tr>
<tr>
<td>13: 183 cm (72&quot;) white.</td>
<td></td>
</tr>
<tr>
<td>14: 183 cm (72&quot;) 10 colour repeat.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M22759/33-26</th>
<th>Irradiated ETFE insulated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>09: 46 cm (18&quot;) white.</td>
<td></td>
</tr>
<tr>
<td>10: 92 cm (36&quot;) white.</td>
<td></td>
</tr>
<tr>
<td>11: 46 cm (18&quot;) 10 colour repeat.</td>
<td></td>
</tr>
<tr>
<td>12: 92 cm (36&quot;) 10 colour repeat.</td>
<td></td>
</tr>
<tr>
<td>15: 183 cm (72&quot;) white.</td>
<td></td>
</tr>
<tr>
<td>16: 183 cm (72&quot;) 10 colour repeat.</td>
<td></td>
</tr>
</tbody>
</table>

See page 30 for colour codes & page 29 for wire types.

**SOLID UNINSULATED**

- **05**: 13 mm (0.5") gold plated.
- **06**: 26 mm (1") gold plated.
- **07**: 13 mm (0.5") tin plated.
- **08**: 26 mm (1") tin plated.

**SHELL FINISH**

- **C**: Cadmium plating.
- **N**: Nickel plating.
- **P**: Passivated stainless steel.

**CAGE CODE: OK0J2**

**METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS**
### DIMENSIONS
Dimensions are in millimetres (inches).

**Rectangular Micro-D connectors**

**MIL-DTL-83513 CONNECTORS**

#### DIMENSIONS
- **A**: ± 0.25 (±0.10)
- **B max.**: Male 8.48 Female 10.16
- **C**: -0.46/+0.25 (-0.018/+0.010)
- **D**: ± 0.13 (±0.005)
- **E**: ± 0.25 (±0.10)
- **F max.**: Male 4.69 Female 6.35
- **G max.**: 6.86

<table>
<thead>
<tr>
<th>9 P / 9 S</th>
<th>15 P / 15 S</th>
<th>21 P / 21 S</th>
<th>25 P / 25 S</th>
<th>31 P / 31 S</th>
<th>37 P / 37 S</th>
<th>51 P / 51 S</th>
<th>100 P / 100 S</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.69 ± .775</td>
<td>23.50 ± .925</td>
<td>27.31 ± 1.075</td>
<td>29.85 ± 1.175</td>
<td>33.66 ± 1.325</td>
<td>37.47 ± 1.475</td>
<td>36.20 ± 1.425</td>
<td>54.86 ± 2.160</td>
</tr>
<tr>
<td>8.48 ± .344</td>
<td>12.29 ± .484</td>
<td>16.10 ± .634</td>
<td>18.64 ± .734</td>
<td>22.45 ± .884</td>
<td>26.26 ± 1.034</td>
<td>24.99 ± .984</td>
<td>35.15 ± 1.384</td>
</tr>
<tr>
<td>10.16 ± .400</td>
<td>14.00 ± .551</td>
<td>17.81 ± .701</td>
<td>20.35 ± .801</td>
<td>24.16 ± .951</td>
<td>27.96 ± 1.101</td>
<td>26.70 ± 1.051</td>
<td>36.86 ± 1.451</td>
</tr>
<tr>
<td>9.91 ± .900</td>
<td>13.72 ± .540</td>
<td>17.53 ± .690</td>
<td>20.07 ± .790</td>
<td>23.88 ± .940</td>
<td>27.69 ± 1.090</td>
<td>26.42 ± 1.040</td>
<td>36.37 ± 1.432</td>
</tr>
<tr>
<td>7.57 ± .298</td>
<td>7.57 ± .298</td>
<td>7.57 ± .298</td>
<td>7.57 ± .298</td>
<td>7.57 ± .298</td>
<td>7.57 ± .298</td>
<td>7.57 ± .298</td>
<td>9.75 ± .384</td>
</tr>
<tr>
<td>4.69 ± .185</td>
<td>4.69 ± .185</td>
<td>4.69 ± .185</td>
<td>4.69 ± .185</td>
<td>4.69 ± .185</td>
<td>4.69 ± .185</td>
<td>4.69 ± .185</td>
<td>6.88 ± .271</td>
</tr>
<tr>
<td>6.35 ± .250</td>
<td>6.35 ± .250</td>
<td>6.35 ± .250</td>
<td>6.35 ± .250</td>
<td>6.35 ± .250</td>
<td>6.35 ± .250</td>
<td>6.35 ± .250</td>
<td>8.46 ± .333</td>
</tr>
<tr>
<td>6.86 ± .270</td>
<td>6.86 ± .270</td>
<td>6.86 ± .270</td>
<td>6.86 ± .270</td>
<td>6.86 ± .270</td>
<td>6.86 ± .270</td>
<td>6.86 ± .270</td>
<td>9.14 ± .360</td>
</tr>
</tbody>
</table>

### SUMMARY OF CHARACTERISTICS

#### ELECTRICAL & MECHANICAL PERFORMANCE
- **CURRENT RATING**: 3 A max.
- **CONTACT RESISTANCE**: 8 mΩ max.
- **INSULATION RESISTANCE**: 5000 MΩ min. @ 500 Vdc
- **DIELECTRIC WITHSTANDING VOLTAGE**: Sea level: 600 Vac, Altitude 21 km (70,000 ft): 150 Vac
- **CONTACT ENGAGING FORCE**: 170 g max. (6 oz)
- **CONTACT SEPARATING FORCE**: 14 g min. (0.5 oz)
- **CONTACT RETENTION**: 2.26 kg (5 lbs)
- **DURABILITY**: 500 Mating cycles min.
- **VIBRATION**: 20g’s – No discontinuity > 1 µs
- **SHOCK**: 50g’s – No discontinuity > 1 µs

#### MATERIAL & FINISH
- **SHELL**: Aluminium alloy 6061 or 300 Series stainless steel, see ordering info for plating options
- **MOULDED INSULATOR**: Liquid Crystal Polymer (LCP)
- **INTERFACIAL SEAL**: Fluorosilicone rubber
- **PIN CONTACT**: Copper and beryllium copper, gold over nickel plating
- **SOCKET CONTACT**: Copper alloy, gold over nickel plating
- **ENCAPSULANT**: Epoxy resin

**SEE PAGE 24 FOR MORE INFORMATION**

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Rectangular Micro-D connectors

MIL-DTL-83513 CONNECTORS

SOLDER CUP CONNECTOR

PLASTIC SHELL

- Ideal for prototyping or where pigtail type connectors cannot be used.

IDENTIFICATION CODE

SERIES
M83513f: QPL series.

TYPE

06-: Pin connector, plastic shell.
07-: Socket connector, plastic shell.

NUMBER OF CONTACTS

A: 9.
B: 15.
C: 21.
D: 25.
E: 31.
F: 37.
G: 51.

See pages 26 & 27 for contact arrangements.
**DIMENSIONS**
Dimensions are in millimetres (inches).

**MALE connector**

2.79 (.110) MAX
5.08 (.200) MAX

**FEMALE connector**

2.79 (.110) MAX
5.08 (.200) MAX

---

### SUMMARY OF CHARACTERISTICS

#### ELECTRICAL & MECHANICAL PERFORMANCE

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A ± 0.25 (+.010)</strong></td>
<td>19.76</td>
<td>.778</td>
<td>23.57</td>
<td>.926</td>
<td>27.38</td>
<td>1.078</td>
<td>29.92</td>
<td>1.178</td>
<td>33.73</td>
<td>1.328</td>
<td>37.54</td>
<td>1.478</td>
<td>36.27</td>
<td>1.428</td>
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<tr>
<td><strong>B max.</strong></td>
<td>7.41</td>
<td>.292</td>
<td>11.22</td>
<td>.442</td>
<td>15.03</td>
<td>.592</td>
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<td>21.38</td>
<td>.692</td>
<td>25.19</td>
<td>.922</td>
<td>23.92</td>
<td>.942</td>
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<tr>
<td><strong>C -0.48/+0.25 (-.018/+.010)</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D ± 0.13 (+.005)</strong></td>
<td>10.11</td>
<td>.398</td>
<td>13.92</td>
<td>.548</td>
<td>17.73</td>
<td>.698</td>
<td>20.27</td>
<td>.798</td>
<td>24.08</td>
<td>.948</td>
<td>27.89</td>
<td>1.098</td>
<td>26.62</td>
<td>1.048</td>
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<tr>
<td><strong>F max.</strong></td>
<td>5.53</td>
<td>.218</td>
<td>5.53</td>
<td>.218</td>
<td>5.53</td>
<td>.218</td>
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<td>5.53</td>
<td>.218</td>
<td>5.53</td>
<td>.218</td>
<td>6.60</td>
<td>.260</td>
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#### MATERIAL & FINISH

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MOULDED SHELL</strong></td>
<td>Liquid Crystal Polymer (LCP)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>PIN CONTACT</strong></td>
<td>Copper and beryllium copper, gold over nickel plating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SOCKET CONTACT</strong></td>
<td>Copper alloy, gold over nickel plating</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SOLDER CUP</strong></td>
<td>Copper alloy, gold over nickel plating</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>ENCAPSULANT</strong></td>
<td>Epoxy resin</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

---

SEE PAGE 24 FOR MORE INFORMATION
### Rectangular Micro-D Connectors

#### MIL-DTL-83513 Connectors

- **Series**: M83513
- **Type**: QPL series.

#### Pigtails

- **Series**: M83513
- **Type**: QPL series.
  - **08-**: Pin connector, plastic shell.
  - **09-**: Socket connector, plastic shell.

#### Number of Contacts

- **A**: 9
- **B**: 15
- **C**: 21
- **D**: 25
- **E**: 31
- **F**: 37
- **G**: 51

See pages 26 & 27 for contact arrangements.

#### Wire Type

<table>
<thead>
<tr>
<th>Wire Type</th>
<th>01</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>05</th>
<th>06</th>
<th>07</th>
<th>08</th>
<th>09</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M22759/11-26</strong></td>
<td>46 cm (18&quot;) white.</td>
<td>92 cm (36&quot;) white.</td>
<td>46 cm (18&quot;)</td>
<td>92 cm (36&quot;)</td>
<td>183 cm (72&quot;) white.</td>
<td>183 cm (72&quot;)</td>
<td>183 cm (72&quot;)</td>
<td>183 cm (72&quot;)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>M22759/33-26</strong></td>
<td>46 cm (18&quot;)</td>
<td>92 cm (36&quot;)</td>
<td>46 cm (18&quot;)</td>
<td>92 cm (36&quot;)</td>
<td>183 cm (72&quot;)</td>
<td>183 cm (72&quot;)</td>
<td>183 cm (72&quot;)</td>
<td>183 cm (72&quot;)</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

See page 30 for colour codes & page 29 for wire type.

#### Solid Uninsulated

- **05**: 13 mm (0.5") gold plated.
- **06**: 26 mm (1") gold plated.
- **07**: 13 mm (0.5") tin plated.
- **08**: 26 mm (1") tin plated.

See page 30 for colour codes & page 29 for wire type.

### Cage Code

- **Code**: 0K0J2

---


www.axon-cable.com
Rectangular Micro-D connectors

**MIL-DTL-83513 CONNECTORS**

**DIMENSIONS**
Dimensions are in millimetres (inches).

**MALE connector**

**FEMALE connector**

**SUMMARY OF CHARACTERISTICS**

### ELECTRICAL & MECHANICAL PERFORMANCE

<table>
<thead>
<tr>
<th></th>
<th>A ± 0.25 (±.010)</th>
<th>B max.</th>
<th>C -0.46/+0.25 (-.018/+.010)</th>
<th>D ± 0.13 (±.005)</th>
<th>E max.</th>
<th>F max.</th>
<th>G max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
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<tr>
<td><strong>21 P / 21 S</strong></td>
<td>27.38</td>
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<td>17.27</td>
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<td>17.73</td>
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<td><strong>31 P / 31 S</strong></td>
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<td>1.030</td>
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</table>

### MATERIAL & FINISH

- **MOULDED SHELL**: Liquid Crystal Polymer (LCP)
- **PIN CONTACT**: Copper and beryllium copper, gold over nickel plating
- **SOCKET CONTACT**: Copper alloy, gold over nickel plating
- **ENCAPSULANT**: Epoxy resin

SEE PAGE 24 FOR MORE INFORMATION
MIL-DTL-83513 /10 TO /15

PCB CONNECTOR
NARROW PROFILE
RIGHT ANGLE
0.100" PITCH
METAL SHELL
- Only available in metal shell version.
- Environmentally sealed.
- Most frequently used connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0KOJ2

IDENTIFICATION CODE

SERIES
M83513/

TYPE
10-A: Pin connector, metal shell, 9 contacts.
10-B: Pin connector, metal shell, 15 contacts.
10-C: Pin connector, metal shell, 21 contacts.
10-D: Pin connector, metal shell, 25 contacts.
10-E: Pin connector, metal shell, 31 contacts.
10-F: Pin connector, metal shell, 37 contacts.
11-G: Pin connector, metal shell, 51 contacts.
12-H: Pin connector, metal shell, 100 contacts.
13-A: Socket connector, metal shell, 9 contacts.
13-B: Socket connector, metal shell, 15 contacts.
13-C: Socket connector, metal shell, 21 contacts.
13-D: Socket connector, metal shell, 25 contacts.
13-E: Socket connector, metal shell, 31 contacts.
13-F: Socket connector, metal shell, 37 contacts.
14-G: Socket connector, metal shell, 51 contacts.
15-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH
01: 2.80 mm (0.109”).
02: 3.56 mm (0.140”).
03: 4.37 mm (0.172”).
Tolerance ± 0.13 mm (0.005”).

SHELL FINISH
C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE
N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed for 10-A to 11-G and 13-A to 14-G only.
W: Jackpost and threaded inserts installed for 10-A to 11-G and 13-A to 14-G only.
U: Threaded inserts installed. For 12-H and 15-H only.
Y: Jackpost and threaded installed. For 12-H and 15-H only.

Metal connectors are supplied with anti-static protective dust caps.

**Dimensions**

Dimensions are in millimetres (inches).

**FEMALE connector**

**31-51 way connectors**

**100 way connectors**

**SUMMARY OF CHARACTERISTICS**

**ELECTRICAL & MECHANICAL PERFORMANCE**

- **CURRENT RATING**: 3 A max.
- **CONTACT RESISTANCE**: 8 mΩ max.
- **INSULATION RESISTANCE**: 5000 MΩ min. @ 500 Vac
- **DIELECTRIC WITHSTANDING VOLTAGE**:
  - Sea level: 600 V ac
  - Altitude 21 km (70,000 ft): 150 V ac
- **CONTACT ENGAGING FORCE**: 170 g max. (6 oz)
- **CONTACT RETAINING FORCE**: 14 g min. (0.5 oz)
- **DURABILITY**: 500 mating cycles min.
- **VIBRATION**: 20g’s – No discontinuity > 1 µs
- **SHOCK**: 60g’s – No discontinuity > 1 µs

**MATERIAL & FINISH**

- **SHELL**: Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
- **MOULDED INSULATOR**: Liquid Crystal Polymer (LCP)
- **INTERFACIAL SEAL**: Fluorosilicone rubber
- **PIN CONTACT**: Copper and beryllium copper, gold over nickel plating
- **SOCKET CONTACT**: Copper alloy, gold over nickel plating
- **ENCAPSULANT**: Epoxy resin
- **MOULDED TRAY**: Liquid Crystal Polymer (LCP)
- **PCB TERMINALS**: AWG24 gold plated copper, solder dipped in 63/37 tin-lead
- **HARDWARE**: 300 series stainless steel, passivated

**DIMENSIONS GRID**

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<th></th>
<th>A max. (±0.13)</th>
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<th>C max. (±0.13)</th>
<th>D max. (±0.13)</th>
<th>E max. (±0.13)</th>
<th>F max. (±0.25)</th>
<th>G ± 0.25 (±0.01)</th>
<th>H ± 0.25 (±0.01)</th>
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<td>7.87</td>
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<td>37 P / 37 S</td>
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<td>4.69</td>
<td>6.35</td>
<td>7.87</td>
<td>13.34</td>
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<td>35.15</td>
<td>36.86</td>
<td>6.88</td>
<td>8.46</td>
<td>10.29</td>
<td>25.65</td>
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</table>

SEE PAGE 24 FOR MORE INFORMATION
MIL-DTL-83513 /10 TO /15

PCB LAYOUT FOR NARROW PROFILE, RIGHT ANGLE
0.100" PITCH - FEMALE CONNECTORS

VIEW A

9 CONTACTS - VIEW B

15 CONTACTS - VIEW B

21 CONTACTS - VIEW B

25 CONTACTS - VIEW B

31 CONTACTS - VIEW B

37 CONTACTS - VIEW B

51 CONTACTS - VIEW B

100 CONTACTS - VIEW B

PCB BOARD LAYOUT

CONNECTORS


www.axon-cable.com
MIL-DTL-83513 /16 TO /21

PCB CONNECTOR
STANDARD PROFILE
RIGHT ANGLE
0.100" PITCH

METAL SHELL
- Only available in metal shell version.
- Environmentally sealed.
- Board right angle connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0K0J2

IDENTIFICATION CODE
SERIES
M83513/

TYPE
16-A: Pin connector, metal shell, 9 contacts.
16-B: Pin connector, metal shell, 15 contacts.
16-C: Pin connector, metal shell, 21 contacts.
16-D: Pin connector, metal shell, 25 contacts.
16-E: Pin connector, metal shell, 31 contacts.
16-F: Pin connector, metal shell, 37 contacts.
17-G: Pin connector, metal shell, 51 contacts.
18-H: Pin connector, metal shell, 100 contacts.
19-A: Socket connector, metal shell, 9 contacts.
19-B: Socket connector, metal shell, 15 contacts.
19-C: Socket connector, metal shell, 21 contacts.
19-D: Socket connector, metal shell, 25 contacts.
19-E: Socket connector, metal shell, 31 contacts.
19-F: Socket connector, metal shell, 37 contacts.
20-G: Socket connector, metal shell, 51 contacts.
21-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH
01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").
Tolerance ± 0.13 mm (.005").

SHELL FINISH
C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE
N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed. For 16-A to 17-G and 19-A to 20-G only.
W: Jackpost and threaded inserts installed for 16-A to 17-G and 19-A to 20-G only.
U: Threaded inserts installed. For 18-H and 21-H only.
Y: Jackpost and threaded inserts installed. For 18-H and 21-H only.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS
DIMENSIONS
Dimensions are in millimetres (inches).

FEMALE connector

<table>
<thead>
<tr>
<th></th>
<th>A max.</th>
<th>B ± 0.18 (±0.007)</th>
<th>C ± 0.13 (±0.005)</th>
<th>D max.</th>
<th>E max.</th>
<th>F max.</th>
<th>G ± 0.25 (±0.010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 P / 9 S</td>
<td>35.31</td>
<td>29.21</td>
<td>14.35</td>
<td>8.48</td>
<td>10.16</td>
<td>4.69</td>
<td>6.35</td>
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<td>18.16</td>
<td>12.29</td>
<td>14.00</td>
<td>4.69</td>
<td>6.35</td>
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<td>21 P / 21 S</td>
<td>42.93</td>
<td>36.83</td>
<td>21.97</td>
<td>16.10</td>
<td>17.81</td>
<td>4.69</td>
<td>6.35</td>
</tr>
<tr>
<td>25 P / 25 S</td>
<td>45.47</td>
<td>39.37</td>
<td>24.51</td>
<td>18.64</td>
<td>20.35</td>
<td>4.69</td>
<td>6.35</td>
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<tr>
<td>31 P / 31 S</td>
<td>51.82</td>
<td>45.72</td>
<td>28.32</td>
<td>22.45</td>
<td>24.16</td>
<td>4.69</td>
<td>6.35</td>
</tr>
<tr>
<td>37 P / 37 S</td>
<td>59.44</td>
<td>53.34</td>
<td>32.13</td>
<td>26.26</td>
<td>27.96</td>
<td>4.69</td>
<td>6.35</td>
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<td>51 P / 51 S</td>
<td>47.63</td>
<td>40.64</td>
<td>30.86</td>
<td>24.99</td>
<td>26.70</td>
<td>5.79</td>
<td>7.44</td>
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<tr>
<td>100 P / 100 S</td>
<td>70.61</td>
<td>63.50</td>
<td>45.72</td>
<td>35.15</td>
<td>36.86</td>
<td>6.88</td>
<td>8.46</td>
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</table>

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>VALUE</th>
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</thead>
<tbody>
<tr>
<td>CURRENT RATING</td>
<td>3 A max.</td>
</tr>
<tr>
<td>CONTACT RESISTANCE</td>
<td>8 mΩ max.</td>
</tr>
<tr>
<td>INSULATION RESISTANCE</td>
<td>5000 MΩ min. @ 500 Vcc</td>
</tr>
<tr>
<td>DIELECTRIC WITHSTANDING VOLTAGE</td>
<td>Sea level: 600 Vcc</td>
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<tr>
<td>ALTITUDE 21 km (70,000 ft): 150 Vcc</td>
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<tr>
<td>CONTACT ENGAGING FORCE</td>
<td>170 g max. (6 oz)</td>
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<tr>
<td>CONTACT SEPARATING FORCE</td>
<td>14 g min. (0.5 oz)</td>
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<tr>
<td>DURABILITY</td>
<td>500 mating cycles min.</td>
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<tr>
<td>VIBRATION</td>
<td>20g’s – No discontinuity &gt; 1 μs</td>
</tr>
<tr>
<td>SHOCK</td>
<td>60g’s – No discontinuity &gt; 1 μs</td>
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</table>

MATERIAL & FINISH

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MATERIAL</th>
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<tr>
<td>SHELL</td>
<td>Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options</td>
</tr>
<tr>
<td>MOULDED INSULATOR</td>
<td>Liquid Crystal Polymer (LCP)</td>
</tr>
<tr>
<td>INTERFACIAL SEAL</td>
<td>Fluorosilicone rubber</td>
</tr>
<tr>
<td>PIN CONTACT</td>
<td>Copper and beryllium copper, gold overnickel plating</td>
</tr>
<tr>
<td>SOCKET CONTACT</td>
<td>Copper alloy, gold overnickel plating</td>
</tr>
<tr>
<td>ENGAPSULANT</td>
<td>Epoxy resin</td>
</tr>
<tr>
<td>MOULDED TRAY</td>
<td>Liquid Crystal Polymer (LCP)</td>
</tr>
<tr>
<td>PCB TERMINALS</td>
<td>AWG24 gold plated copper, solder dipped in 63/37 tin-lead</td>
</tr>
<tr>
<td>HARDWARE</td>
<td>300 series stainless steel, passivated</td>
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</tbody>
</table>

SEE CONTACT LAYOUT ON PCB PAGES 52 & 53
Rectangular Micro-D connectors
MIL-DTL-83513 CONNECTORS

PCB LAYOUT FOR STANDARD PROFILE, RIGHT ANGLE
0.100" PITCH - FEMALE CONNECTORS

VIEW A

9 CONTACTS - VIEW B

15 CONTACTS - VIEW B

21 CONTACTS - VIEW B

25 CONTACTS - VIEW B

31 CONTACTS - VIEW B

37 CONTACTS - VIEW B

51 CONTACTS - VIEW B

100 CONTACTS - VIEW B

MIL-DTL-83513 /16 TO /21

view A 9 CONTACTS - view B

view A 15 CONTACTS - view B

view A 21 CONTACTS - view B

view A 25 CONTACTS - view B

view A 31 CONTACTS - view B

view A 37 CONTACTS - view B

view A 51 CONTACTS - view B

view A 100 CONTACTS - view B

PCB BOARD LAYOUT

0.100" PITCH - FEMALE CONNECTORS
MIL-DTL-83513 /22 TO /27

PCB CONNECTOR

STRAIGHT
0.100" PITCH

METAL SHELL

- Only available in metal shell version.
- Environmentally sealed.
- Board straight connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0K0J2

IDENTIFICATION CODE

SERIES
M83513: QPL series.

TYPE

22-A: Pin connector, metal shell, 9 contacts.
22-B: Pin connector, metal shell, 15 contacts.
22-C: Pin connector, metal shell, 21 contacts.
22-D: Pin connector, metal shell, 25 contacts.
22-E: Pin connector, metal shell, 31 contacts.
22-F: Pin connector, metal shell, 37 contacts.
23-G: Pin connector, metal shell, 51 contacts.
24-H: Pin connector, metal shell, 100 contacts.
25-A: Socket connector, metal shell, 9 contacts.
25-B: Socket connector, metal shell, 15 contacts.
25-C: Socket connector, metal shell, 21 contacts.
25-D: Socket connector, metal shell, 25 contacts.
25-E: Socket connector, metal shell, 31 contacts.
25-F: Socket connector, metal shell, 37 contacts.
26-G: Socket connector, metal shell, 51 contacts.
27-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH

01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").

Tolerance ± 0.13 mm (.005").

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE

N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed for 22-A to 23-G and 25-A to 26-G only.
W: Jackpost and threaded inserts installed for 22-A to 23-G and 25-A to 26-G only.
U: Threaded inserts installed. For 24-H and 27-H only.
Y: Jackpost and threaded inserts installed. For 24-H and 27-H only.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS
DIMENSIONS
Dimensions are in millimetres (inches).

FEMALE connector

9-51 contacts: 4.20 (1.65)
100 contacts: 7.70 (3.03)

SUMMARY OF CHARACTERISTICS
SEE CONTACT LAYOUT ON PCB PAGES 56 & 57

<table>
<thead>
<tr>
<th></th>
<th>A max.</th>
<th>B ± 0.18 (±0.007)</th>
<th>C ± 0.13 (±0.005)</th>
<th>D max.</th>
<th>E max.</th>
<th>F max.</th>
<th>G max.</th>
<th>H max.</th>
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<td>35.31</td>
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<td>82.55</td>
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</tbody>
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ELECTRICAL & MECHANICAL PERFORMANCE

CURRENT RATING 3 A max.
CONTACT RESISTANCE 8 mΩ max.
INSULATION RESISTANCE 5000 MΩ min. @ 500 Vcc
DIELECTRIC WITHSTANDING VOLTAGE Sea level: 600 Vcc
Altitude 21 km (70,000 ft): 150 Vcc
CONTACT ENGAGING FORCE 170 g max. (6 oz)
CONTACT SEPARATING FORCE 14 g min. (0.5 oz)
CONTACT RETENTION 2.26 kg (5 lbs)
DURABILITY 500 mating cycles min.
VIBRATION 20g’s – No discontinuity > 1 µs
SHOCK 50g’s – No discontinuity > 1 µs

MATERIAL & FINISH

SHELL Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL Fluorosilicone rubber
PIN CONTACT Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT Copper alloy, gold over nickel plating
ENCAPSULANT Epoxy resin
MOULDED TRAY Liquid Crystal Polymer (LCP)
PCB TERMINALS AWG24 gold plated copper, solder dipped in 63/37 tin-lead
HARDWARE 300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION
Rectangular Micro-D connectors
MIL-DTL-83513

CONNECTORS

- 15 CONTACTS - VIEW A
- 21 CONTACTS - VIEW A
- 25 CONTACTS - VIEW A
- 31 CONTACTS - VIEW A
- 37 CONTACTS - VIEW A
- 51 CONTACTS - VIEW A
- 100 CONTACTS - VIEW A

PCB LAYOUT FOR STRAIGHT 0.100" PITCH - MALE CONNECTORS

Rectangular Micro-D connectors
MIL-DTL-83513 CONNECTORS

PCB LAYOUT FOR STRAIGHT, 0.100" PITCH - FEMALE CONNECTORS

VIEW A

9 CONTACTS - VIEW A

21 CONTACTS - VIEW A

25 CONTACTS - VIEW A

31 CONTACTS - VIEW A

37 CONTACTS - VIEW A

51 CONTACTS - VIEW A

100 CONTACTS - VIEW A

MIL-DTL-83513 /22 TO /27
MIL-DTL-83513 /28 TO /33

PCB CONNECTOR

STRAIGHT

0.075" PITCH

METAL SHELL

- Only available in metal shell version.
- Environmentally sealed.
- Board straight connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0K0J2

IDENTIFICATION CODE

SERIES

M83513/: QPL series.

TYPE

28-A: Pin connector, metal shell, 9 contacts.
28-B: Pin connector, metal shell, 15 contacts.
28-C: Pin connector, metal shell, 21 contacts.
28-D: Pin connector, metal shell, 25 contacts.
28-E: Pin connector, metal shell, 31 contacts.
28-F: Pin connector, metal shell, 37 contacts.
29-G: Pin connector, metal shell, 51 contacts.
30-H: Pin connector, metal shell, 100 contacts.
31-A: Socket connector, metal shell, 9 contacts.
31-B: Socket connector, metal shell, 15 contacts.
31-C: Socket connector, metal shell, 21 contacts.
31-D: Socket connector, metal shell, 25 contacts.
31-E: Socket connector, metal shell, 31 contacts.
31-F: Socket connector, metal shell, 37 contacts.
32-G: Socket connector, metal shell, 51 contacts.
33-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH

01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").

Tolerance ± 0.13 mm (.005").

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE

N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed. For 28-A to 29-G and 31-A to 32-G only.
W: Jackpost and threaded inserts installed for 28-A to 29-G and 31-A to 32-G only.
U: Threaded inserts installed. For 30-H and 33-H only.
Y: Jackpost and threaded inserts installed. For 30-H and 33-H only.

Hardware Code P: Long jackpost and thru-hole

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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DIMENSIONS
Dimensions are in millimetres (inches).

FEMALE connector

9-51 contacts:
Ø2.24/2.44 (0.088/0.096) or THD INSERT 2-56 UNC 2B
100 contacts
Ø3.68/3.81 (0.145/0.150) or THD INSERT 4-40 UNC 2B

SEE CONTACT LAYOUT ON PCB PAGES 60 & 61

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>9 P / 9 S</td>
<td>19.94</td>
<td>.785</td>
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<td>45.72</td>
<td>1.800</td>
<td>35.15</td>
<td>36.86</td>
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</table>

MATERIAL & FINISH

SHELL
Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options

MOULDED INSULATOR
Liquid Crystal Polymer (LCP)

INTERFACIAL SEAL
Fluorosilicone rubber

PIN CONTACT
Copper and beryllium copper, gold over nickel plating

SOCKET CONTACT
Copper alloy, gold over nickel plating

ENCAPSULANT
Epoxy resin

MOULDED TRAY
Liquid Crystal Polymer (LCP)

PCB TERMINALS
AWG24 gold plated copper, solder dipped in 63/37 tin-lead

HARDWARE
300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION
MIL-DTL-83513 /28 TO /33

PCB LAYOUT FOR QPL STRAIGHT
0.075" PITCH - MALE CONNECTORS

9 CONTACTS - VIEW A

15 CONTACTS - VIEW A

21 CONTACTS - VIEW A

25 CONTACTS - VIEW A

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PCB LAYOUT FOR QPL STRAIGHT 0.075" PITCH - FEMALE CONNECTORS

VIEW A

15 CONTACTS - VIEW A

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