

# SMA - 50 Ohm Connectors

Specifications



INCHES (MILLIMETERS)  
CUSTOMER DRAWINGS AVAILABLE UPON REQUEST

## ELECTRICAL RATINGS

**Impedance:** 50 ohms

**Frequency Range:**

|   |            |
|---|------------|
| Dummy loads .....   | 0-2 GHz    |
| Flexible cable connectors .....   | 0-12.4 GHz |
| Uncabled receptacles, RA semi-rigid and adapters .....                      | 0-18.0 GHz |
| Straight semi-rigid cable connectors and field replaceable connectors ..... | 0-26.5 GHz |

**VSWR:** (f = GHz)

|  | Straight Cabled Connectors | Right Angle Cabled Connectors |
|--|----------------------------|-------------------------------|
| RG-178 cable .....                                     | 1.20 + .025f               | 1.20 + .03f                   |
| RG-316, LMR-100 cable .....                            | 1.15 + .02f                | 1.15 + .03f                   |
| RG-58, LMR-195 cable .....                             | 1.15 + .01f                | 1.15 + .02f                   |
| RG-142 cable .....                                     | 1.15 + .01f                | 1.15 + .02f                   |
| LMR-200, LMR-240 cable .....                           | 1.10 + .03f                | 1.10 + .06f                   |
| .086 semi-rigid .....                                  | 1.07 + .008f               | 1.18 + .015f                  |
| .141 semi-rigid (w/contact) .....                      | 1.05 + .008f               | 1.15 + .015f                  |
| .141 semi-rigid (w/o contact) .....                    | 1.035 + .005f              |                               |
| Jack-bulkhead jack adapter and plug-plug adapter ..... | 1.05 + .01f                |                               |
| Jack-jack adapter and plug-jack adapter .....          | 1.05 + .005f               |                               |
| Uncabled receptacles, dummy loads .....                | N/A                        |                               |
| Field replaceable (see page 59) .....                  | N/A                        |                               |

**Working Voltage:** (Vrms maximum)\*

| Connectors for Cable Type  | Sea Level | 70K Feet |
|--|-----------|----------|
| RG-178 .....   | 170       | 45       |
| RG-316; LMR-100, 195, 200 .....  | 250       | 65       |
| RG-58, RG-142, LMR-240, .086 semi-rigid, uncabled receptacles, .141 semi-rigid w/o contact ... | 335       | 85       |
| .141 semi-rigid with contact and adapters .....  | 500       | 125      |
| Dummy loads .....  | N/A       |          |

**Dielectric Withstanding Voltage:** (VRMS minimum at sea level)†

|   |      |
|---|------|
| Connectors for RG-178 .....   | 500  |
| Connectors for RG-316; LMR-100, 195, 200 .....  | 750  |
| Connectors for RG-58, RG-142, LMR-240, .086 semi-rigid, field replaceable, uncabled receptacles ..... | 1000 |
| Connectors for .141 semi-rigid with contact and adapters .....  | 1500 |
| Connectors for .141 semi-rigid w/o contact, dummy loads .....   | N/A  |

**Corona Level:** (Volts minimum at 70,000 feet)\*

|   |     |
|---|-----|
| Connectors for RG-178 .....   | 125 |
| Connectors for RG-316; LMR-100, 195, 200 .....  | 190 |
| Connectors for RG-58, RG-142, LMR-240, .086 semi-rigid, uncabled receptacles, .141 semi-rigid w/o contact ..... | 250 |
| Connectors for .141 semi-rigid with contact and adapters .....  | 375 |
| Dummy loads .....   | N/A |

**Insertion Loss:** (dB maximum)

|  |      |                                    |
|--|------|------------------------------------|
| Straight flexible cable connectors and adapters .....      | 0.06 | $\sqrt{f}$ (GHz), tested at 6 GHz  |
| Right angle flexible cable connectors .....                | 0.15 | $\sqrt{f}$ (GHz), tested at 6 GHz  |
| Straight semi-rigid cable connectors with contact .....    | 0.03 | $\sqrt{f}$ (GHz), tested at 10 GHz |
| Right angle semi-rigid cable connectors .....              | 0.05 | $\sqrt{f}$ (GHz), tested at 10 GHz |
| Straight semi-rigid cable connectors w/o contact .....     | 0.03 | $\sqrt{f}$ (GHz), tested at 16 GHz |
| Straight low loss flexible cable connectors .....          | 0.06 | $\sqrt{f}$ (GHz), tested at 1 GHz  |
| Right Angle low loss flexible cable connectors .....       | 0.15 | $\sqrt{f}$ (GHz), tested at 1 GHz  |
| Uncabled receptacles, field replaceable, dummy loads ..... |      | N/A                                |

**Insulation Resistance:** 5000 megohms minimum

**Contact Resistance:** (milliohms maximum) **Initial** **After Environmental**

|  |      |      |
|--|------|------|
| Center contact (straight cabled connectors and uncabled receptacles) ..... | 3.0* | 4.0* |
| Center contact (right angle cabled connectors and adapters) .....          | 4.0  | 6.0  |
| Field replaceable connectors .....   | 6.0  | 8.0  |
| Outer contact (all connectors) .....                                       | 2.0  | N/A  |
| Braid to body (gold plated connectors) .....                               | 0.5  | N/A  |
| Braid to body (nickel plated connectors) .....                             | 5.0  | N/A  |

\*N/A where the cable center conductor is used as a contact

**RF Leakage:** (dB minimum, tested at 2.5 GHz)

|   |        |
|---|--------|
| Flexible cable connectors, adapters and .141 semi-rigid connectors w/o contact .....                                | -60 dB |
| Field replaceable w/o EMI gasket .....  | -70 dB |
| .086 semi-rigid connectors and .141 semi-rigid connectors with contact, and field replaceable with EMI Gasket ..... | -90 dB |
| Two-way adapters .....  | -90 dB |
| Uncabled receptacles, dummy loads .....   | N/A    |

**RF High Potential Withstanding Voltage:** (Vrms minimum, tested at 4 and 7 MHz)†

|   |      |
|---|------|
| Connectors for RG-178 .....   | 335  |
| Connectors for RG-316; LMR-100, 195, 200 .....  | 500  |
| Connectors for RG-58, RG-142, LMR-240, .086 semi-rigid, .141 semi-rigid cable w/o contact, uncabled receptacles ..... | 670  |
| Connectors for .141 semi-rigid with contact and adapters .....  | 1000 |

**Power Rating (Dummy Load):** 0.5 watt @ +25°C, derated to 0.25 watt @ +125°C

## MECHANICAL RATINGS

**Engagement Design:** MIL-C-39012, Series SMA

**Engagement/Disengagement Force:** 2 inch-pounds maximum

**Mating Torque:** 7 to 10 inch-pounds

**Bulkhead Mounting Nut Torque:** 15 inch-pounds minimum

**Coupling Proof Torque:** 15 inch-pounds minimum

**Coupling Nut Retention:** 60 pounds minimum

**Contact Retention:**

6 lbs. minimum axial force (captivated contacts)

4 inch-ounce minimum torque (uncabled receptacles)

**Cable Retention:**

|                                      | Axial Force*(lbs) | Torque (in-oz) |
|--------------------------------------|-------------------|----------------|
| Connectors for RG-178 .....          | 10                | N/A            |
| Connectors for RG-316, LMR-100 ..... | 20                | N/A            |
| Connectors for LMR-195, 200 .....    | 30                | N/A            |
| Connectors for RG-58, LMR-240 .....  | 40                | N/A            |
| Connectors for RG-142 .....          | 45                | N/A            |
| Connectors for .086 semi-rigid ..... | 30                | 16             |
| Connectors for .141 semi-rigid ..... | 60                | 55             |

\*Or cable breaking strength whichever is less.

**Durability:** 500 cycles minimum

100 cycles minimum for .141 semi-rigid connectors w/o contact

**ENVIRONMENTAL RATINGS** (Meets or exceed the applicable paragraph of MIL-C-39012)

**Temperature Range:** -65°C to +165°C

**Thermal Shock:** MIL-STD-202, Method 107, Condition B

**Corrosion:** MIL-STD-202, Method 101, Condition B

**Shock:** MIL-STD-202, Method 213, Condition I

**Vibration:** MIL-STD-202, Method 204, Condition D

**Moisture Resistance:** MIL-STD-202, Method 106

†Avoid user injury due to misapplication. See safety advisory definitions on page 2.

## MATERIAL SPECIFICATIONS

**Bodies:** Brass per QQ-B-626, gold plated\* per MIL-G-45204 .00001" min. or nickel plated per QQ-N-290

**Contacts:** Male - brass per QQ-B-626, gold plated per MIL-G-45204 .00003" min.

Female - beryllium copper per QQ-C-530, gold plated per MIL-G-45204 .00003" min.

**Nut Retention Spring:** Beryllium copper per QQ-C-533. Unplated

**Insulators:** PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457 or Tefzel per ASTM D 3159

**Expansion Caps:** Brass per QQ-B-613, gold plated per MIL-G-45204 .00001" min. or nickel plated per QQ-N-290

**Crimp Sleeves:** Copper per WW-T-799 or brass per QQ-B-613, gold plated per MIL-G-45204 .00001" min. or nickel plated per QQ-N-290

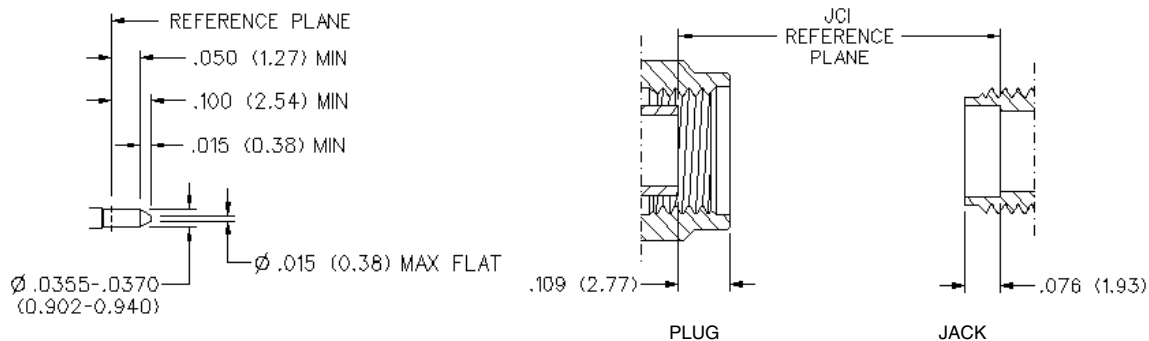
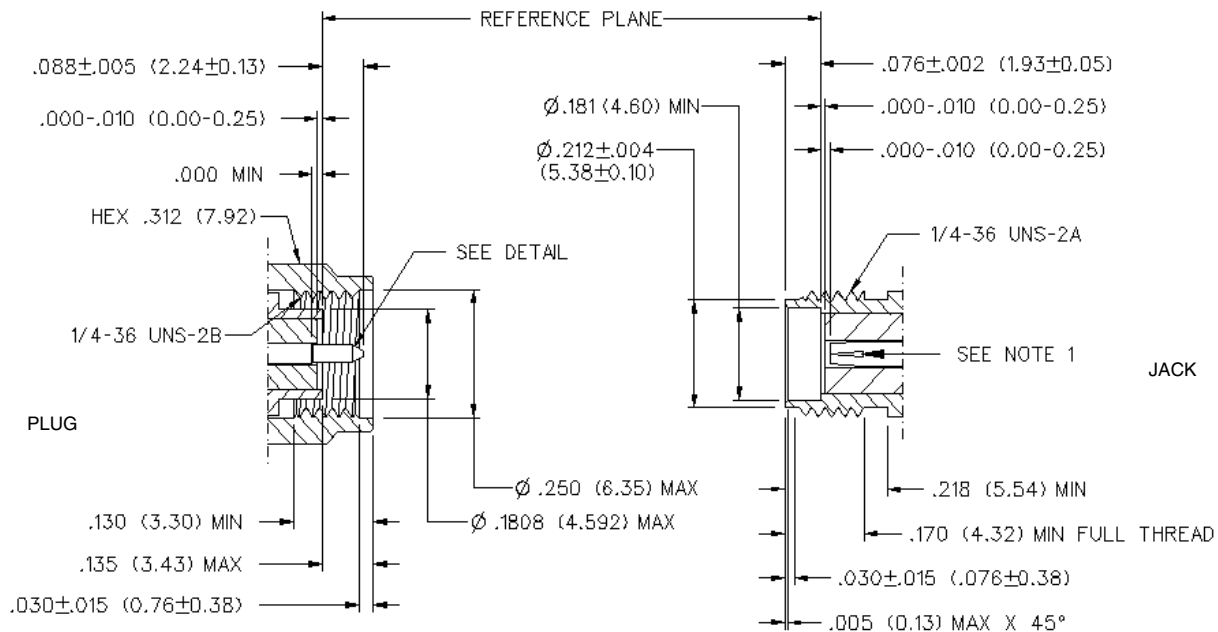
**Mounting Hardware:** Brass per QQ-B-626 or QQ-B-613, gold plated per MIL-G-45204 .00001" min. or nickel plated per QQ-N-290

**Seal Rings:** Silicone rubber per ZZ-R-765

**EMI Gaskets:** Conductive silicone rubber per MIL-G-83528, Type M

\* All gold plated parts include a .00005" min. nickel underplate barrier layer.

### Mating Engagement for SMA Series per MIL-C-39012



#### NOTES

1. ID OF CONTACT TO MEET VSWR, CONTACT RESISTANCE AND INSERTION WITHDRAWAL FORCES WHEN MATED WITH DIA. .0355-.0370 MALE PIN.