

# PRODUCT CATALOG

## RF & Microwave Connectors & Cable Assemblies



  
**EMERSON**  
Network Power

**Johnson**  
Connectivity Solutions

Emerson Network Power Connectivity Solutions has a wide range of cable assemblies and connectors suited for RF, Microwave and Fiber Optic signal transmission. Connectivity Solutions is a vertically integrated supplier of custom, fixed length and semi-rigid cable assemblies from DC to 50 GHz. Our product lines deliver custom-engineered products and solutions to satisfy the most demanding and complex requirements.

AIM-Cambridge  
Connectivity Solutions



AIM-Cambridge has a universal line of products that offer cost effective, high quality solutions for connectivity. Our connectors are available in BNC, Type N, F Type, RCA, UHF, Mini-UHF, TNC, D-Sub and Modular Plugs for Data/Telecom applications. In addition, we stock a wide variety of cables for A/V, SATV, CATV, computer and LAN applications, as well as a complete line of termination tools and structured cabling products. AIM-Cambridge promises that its product will provide you with unmatched consistency, quality, reliability and ease of use.

Johnson  
Connectivity Solutions



Johnson designs and manufactures an industry leading line of RF coaxial connectors and adapters, which are available in both 50 and 75 ohm versions. Johnson connectors are designed to provide the highest quality data transmission for audio, video and data applications. The Johnson line of products can address frequency ranges from DC to 46GHz and all sizes from Ultra-miniature interfaces (UMC), Micro-miniature, (MCX, MMCX, SMP), Subminiature (SMA, SMB, SMK, kwiQMate™), Medium connectors (Type N connectors) through to large connectors (DIN7/16). The breadth of products available within the Johnson range includes board and cable mount connectors as well as semi-rigid, conformable, and flexible RF coaxial cables.

Midwest Microwave  
Connectivity Solutions



Midwest Microwave manufacturers passive coaxial microwave components that are known for their precision performance and high quality that meets the precise requirements of the RF/Microwave industry. Our broad product portfolio includes: Attenuators, Precision Adapters, Terminations, DC Blocks, Power Dividers, Couplers, Equalizers, Phase Shifters, Connectors, Custom Cable Assemblies and Test Cables that are designed and manufactured for both military and commercial applications.

Midwest also offers a wide variety of Qualified Product List (QPL) approved products in the M3933, M39030 and M39012 series, as well as many DESC/DSCC approved models.

Semflex  
Connectivity Solutions



Semflex designs and manufactures low loss, flexible, microwave coaxial cable and custom cable assemblies for the military/aerospace, commercial OEM and test instrumentation markets. Semflex offers cables ranging from DC to 50 GHz, available with ultra low insertion loss, power ratings up to 21 KW, and available with all popular connectors.

Stratos  
Connectivity Solutions



Stratos optical connectivity products is globally recognized as highly reliable, cost-effective, and provides optical connectivity solutions that are virtually immune to dust, mud, oil, water, and other contaminants.

Our expanded beam connectivity products are ideal for harsh environment applications in the broadcast, industrial, petrochemical and military/aerospace markets where high reliability, low maintenance and quick serviceability are critical requirements. Our optical active products are used mainly in military, aerospace and industrial markets where high speed/high reliable performance is mission critical. The actives product line includes optical transceivers, optical media converters and custom devices tailored to your application.

Trompeter  
Connectivity Solutions



Trompeter is recognized as a global leader in delivering best in class RF connectivity products. The Trompeter line of patch jacks, RF connectors, cable assemblies, HDTV digital technology and DS3 connectivity solutions is unrivalled. Our mission is to provide products that continually deliver the highest quality signal integrity for the most demanding applications in Telecom, Central Office, Broadcast, Military Aerospace, and Instrumentation markets worldwide. Our extensive line of cost-effective products are rigorously designed and tested to provide the critically engineered solutions necessary to enhance the end-user's overall experience.

Vitelec  
Connectivity Solutions



Vitelec provides a comprehensive range of RF coaxial interconnect products and cable assemblies. The company has a long established reputation for offering quality and innovation with a wide range of both standard and custom designed products for the electronic and communication industries.

MMCX Connectors

|                                     |     |
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| 50 Ohm Connectors                   |     |
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While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without notice.

|     |                                  |
|-----|----------------------------------|
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Specifications

Electrical Specifications

|                                                                                    |                               |                         |
|------------------------------------------------------------------------------------|-------------------------------|-------------------------|
| <b>Impedance:</b> 50 Ohms                                                          |                               |                         |
| <b>Frequency Range:</b>                                                            |                               |                         |
| Connectors.....                                                                    | 0-6 GHz                       |                         |
| Dummy loads.....                                                                   | 0-1 GHz                       |                         |
| <b>VSWR (max):</b> (f = GHz)                                                       |                               |                         |
|                                                                                    | Straight                      | Right Angle             |
|                                                                                    | <u>Cable Connectors</u>       | <u>Cable Connectors</u> |
| .047 OD .....                                                                      | 1.20                          | 1.14 + .07f             |
| RG-178, RG-316, RG-316 DS .....                                                    | 1.20                          | 1.25                    |
| RG-405 .....                                                                       | 1.15                          | 1.15                    |
| Uncabled receptacles, dummy loads .....                                            | N/A                           |                         |
| <b>Working Voltage:</b>                                                            |                               |                         |
| Connectors .....                                                                   | 170 VRMS at sea level†        |                         |
| Dummy loads.....                                                                   | N/A                           |                         |
| <b>Dielectric Withstanding Voltage:</b>                                            |                               |                         |
| Connectors... ..                                                                   | 500 VRMS at sea level†        |                         |
| Dummy loads.....                                                                   | N/A                           |                         |
| <b>Insulation Resistance:</b> 1000 megohms min                                     |                               |                         |
| <b>Contact Resistance:</b> (milliohms max)                                         |                               |                         |
|                                                                                    | Initial                       | After                   |
|                                                                                    |                               | <u>Environmental</u>    |
| Center contact (straight cabled connectors and uncabled receptacles) .....         | 5.0                           | 8.0                     |
| Center contact (right angle cabled connectors).....                                | 5.0                           | 15.0                    |
| Outer contact (all connectors).....                                                | 1.0                           | 1.5                     |
| Braid to body .....                                                                | 1.5                           | N/A                     |
| <b>Corona Level:</b>                                                               |                               |                         |
| Connectors .....                                                                   | 190 volts min at 70,000 feet† |                         |
| Dummy loads.....                                                                   | N/A                           |                         |
| <b>Insertion Loss:</b> (dB max, tested at 1 GHz)                                   |                               |                         |
| Straight cabled connectors .....                                                   | 0.1                           |                         |
| Right angle cabled connectors.....                                                 | 0.2                           |                         |
| Uncabled receptacles, dummy loads.....                                             | N/A                           |                         |
| <b>RF Leakage:</b> (dB min, tested at 2.5 GHz)                                     |                               |                         |
| Flexible cable .....                                                               | -60 dB                        |                         |
| RG-405 .....                                                                       | -70 dB                        |                         |
| Dummy loads .....                                                                  | N/A                           |                         |
| <b>RF High Potential Withstanding Voltage:</b> (400 VRMS at 4 and 7 MHz)†          |                               |                         |
| <b>Power Rating (Dummy Load):</b> 0.5 watt @ +25°C, derated to 0.25 watt @ +125° C |                               |                         |

†Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Mechanical Specifications

|                                                                                                      |                    |                |
|------------------------------------------------------------------------------------------------------|--------------------|----------------|
| <b>Engagement Design:</b> Series MMCX                                                                |                    |                |
| <b>Engagement/Disengagement Force:</b> 8 lbs max axial engagement<br>1.4 lbs min axial disengagement |                    |                |
| <b>Contact Retention:</b> 2.0 lbs min axial force                                                    | Axial Force* (lbs) | Torque (oz-in) |
| <b>Cable Retention:</b>                                                                              |                    |                |
| .047 flexible .....                                                                                  | 3.5                | N/A            |
| RG-178 .....                                                                                         | 7.0                | N/A            |
| RG-316 .....                                                                                         | 20.0               | N/A            |
| RG-316 DS .....                                                                                      | 25.0               | N/A            |
| RG-405 .....                                                                                         | 30.0               | 16             |
| *Or cable breaking strength whichever is less.                                                       |                    |                |
| <b>Durability:</b> .....                                                                             |                    |                |
| 500 cycles min                                                                                       |                    |                |

Specifications

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                             |                                                                                |
|-----------------------------|--------------------------------------------------------------------------------|
| <b>Temperature Range:</b>   |                                                                                |
| Connectors .....            | - 65°C to + 165°C                                                              |
| Dummy loads .....           | - 65°C to + 125°C                                                              |
| <b>Thermal Shock:</b>       | MIL-STD-202, Method 107, Condition C, except -55°C to +155°C (N/A dummy loads) |
| <b>Corrosion:</b>           | MIL-STD-202, Method 101, Condition B (N/A dummy loads)                         |
| <b>Shock:</b>               | MIL-STD-202, Method 213, Condition B (N/A dummy loads)                         |
| <b>Vibration:</b>           | MIL-STD-202, Method 204, Condition D (N/A dummy loads)                         |
| <b>Moisture Resistance:</b> | MIL-STD-202, Method 106 (N/A dummy loads)                                      |

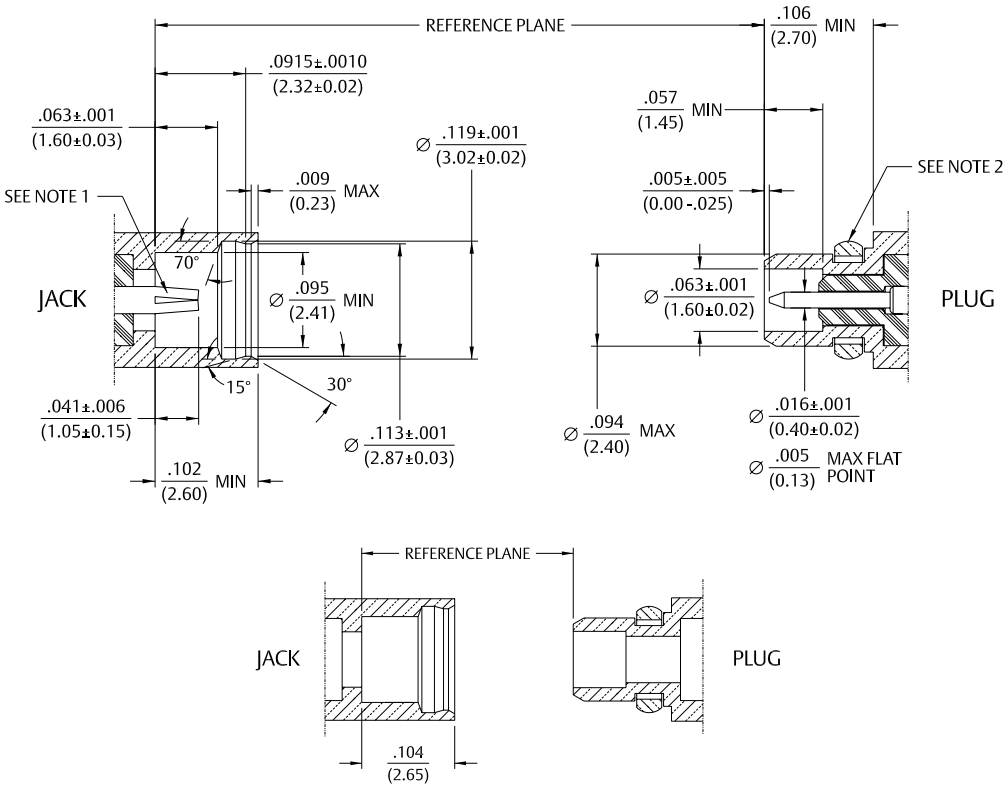
Material Specifications

|                           |                                                                                                                     |
|---------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Bodies:</b>            | Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001” min                                                     |
| <b>Contacts:</b>          | Beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min                                           |
| <b>Interface Spring:</b>  | Beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min                                           |
| <b>Insulators:</b>        | PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457                                                                   |
| <b>Crimp Sleeves:</b>     | Copper per ASTM B301 or brass per ASTM B16, gold plated per MIL-DTL-45204 .00001” min                               |
| <b>Mounting Hardware:</b> | Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) per ASTM B139, gold plated per MIL-DTL-45204 .00001” min |

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

Mating Engagement for MMCX Series

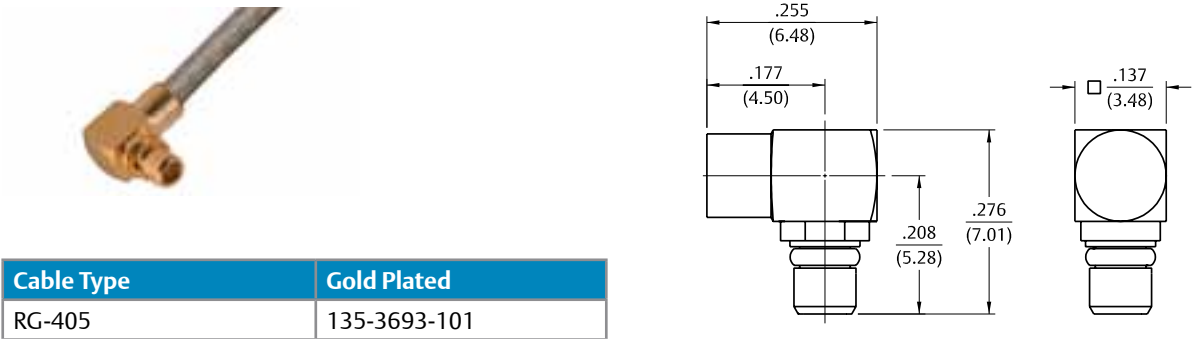
1. ID of contact to meet VSWR mating characteristics and connector durability when mated with a dia .016 +/- .001 male contact.
2. Must meet the force to engage and disengage when mated with mating part.



For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • www.EmersonConnectivity.com  
Illustrations are shown in inches (millimeters).

Semi-Rigid and Flexible Cable

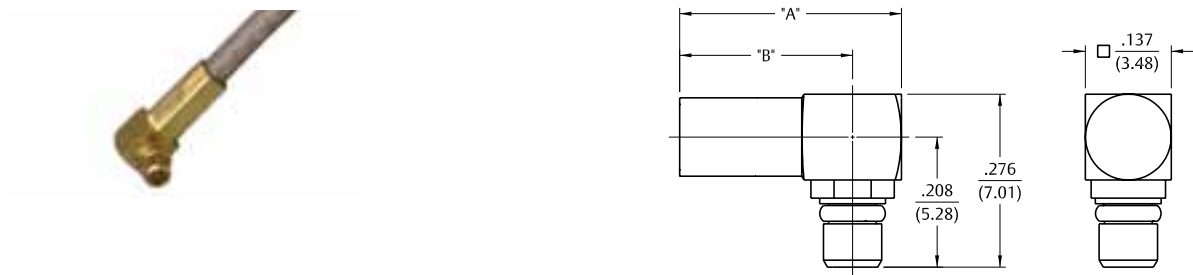
Right Angle Solder Type Plug – Captivated Contact



| Cable Type | Gold Plated  |
|------------|--------------|
| RG-405     | 135-3693-101 |

Assembly instructions page 198.

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                      | Gold Plated  | "A"          | "B"         | Termination  |
|---------------------------------|--------------|--------------|-------------|--------------|
| .047" OD Flexible               | 135-3436-101 | .354 (8.99)  | .276 (7.01) | Crimp Insert |
| RG-178, 196                     | 135-3402-101 | .354 (8.99)  | .276 (7.01) | Crimp Insert |
| RG-178, 196                     | 135-3402-111 | .412 (10.46) | .334 (8.48) | Crimp Sleeve |
| RG-316, 188, 161, 174, 179, 187 | 135-3403-101 | .412 (10.46) | .334 (8.48) | Crimp Sleeve |
| RG-316 DS, 188 DS               | 135-3404-101 | .412 (10.46) | .334 (8.48) | Crimp Sleeve |

Assembly instructions page 200 and 201.

Semi-Rigid and Flexible Cable

Straight Crimp Type Plug – Solder or Crimp Captivated Contact



| Cable Type            | Gold Plated  | "A"          | "D"         | Termination  |
|-----------------------|--------------|--------------|-------------|--------------|
| .047" OD Flexible     | 135-3436-001 | .462 (11.73) | .137 (3.48) | Crimp Insert |
| RG-178, 196           | 135-3402-001 | .462 (11.73) | .137 (3.48) | Crimp Insert |
| RG-316, 188, 161, 174 | 135-3403-001 | .509 (12.93) | .173 (4.39) | Crimp Sleeve |
| RG-316 DS, 188 DS     | 135-3404-001 | .509 (12.93) | .173 (4.39) | Crimp Sleeve |
| RG-179, 187           | 135-3433-001 | .509 (12.93) | .173 (4.39) | Crimp Sleeve |

Assembly instructions page 202 and 203.

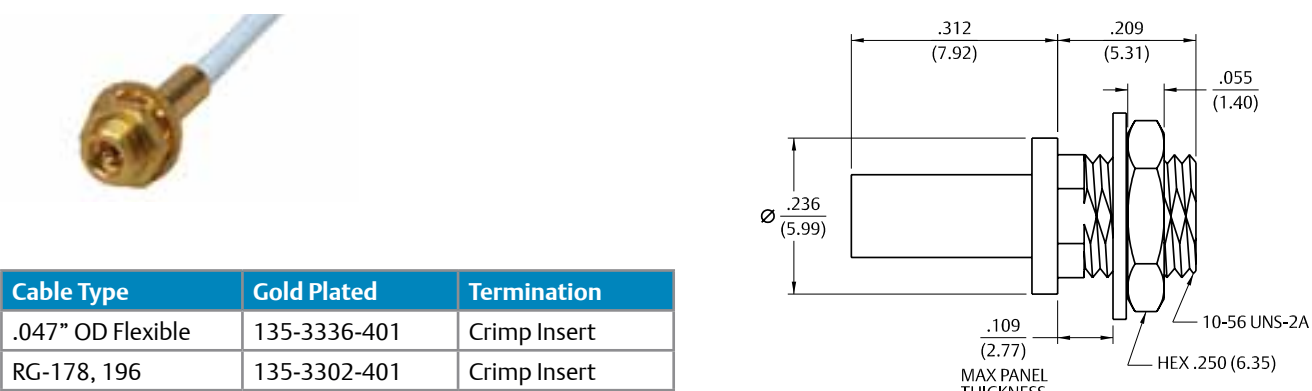
Straight Crimp Type Jack – Solder or Crimp Captivated Contact



| Cable Type            | Part No.     | "A"           | "D"         | Termination  |
|-----------------------|--------------|---------------|-------------|--------------|
| .047" OD Flexible     | 135-3336-001 | .462 (11.73)  | .137 (3.48) | Crimp Insert |
| RG-178, 196           | 135-3302-001 | .462 (11.73)  | .137 (3.48) | Crimp Insert |
| RG-316, 188, 161, 174 | 135-3303-001 | .545 (13.84)  | .173 (4.39) | Crimp Sleeve |
| RG-316 DS, 188 DS     | 135-3304-001 | .545 (13.84)  | .173 (4.39) | Crimp Sleeve |
| RG-179, 187           | 135-3333-001 | .545 (13.84)) | .173 (4.39) | Crimp Sleeve |

Assembly instructions page 204 and 205.

Straight Crimp Type Bulkhead Jack – Solder or Crimp Captivated Contact



| Cable Type        | Gold Plated  | Termination  |
|-------------------|--------------|--------------|
| .047" OD Flexible | 135-3336-401 | Crimp Insert |
| RG-178, 196       | 135-3302-401 | Crimp Insert |

Assembly instructions page 205.  
Mounting Hole layout figure 5 page 194.

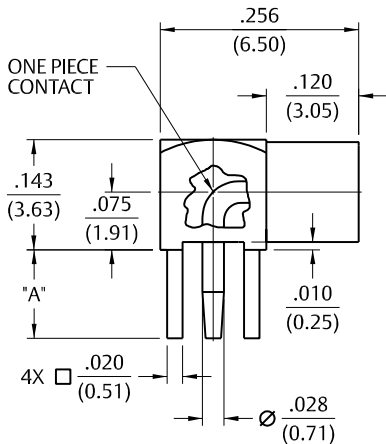
PC Mount

Right Angle Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 135-3701-301 | .115 (2.92) |
| 135-3701-311 | .068 (1.73) |

Mounting Hole layout figure 12 page 194.

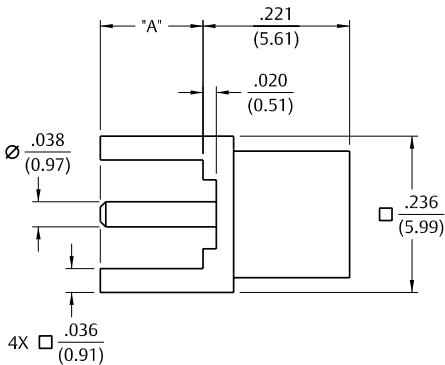


Straight Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 135-3701-201 | .115 (2.92) |
| 135-3701-211 | .068 (1.73) |

Mounting Hole layout figure 12 page 194.

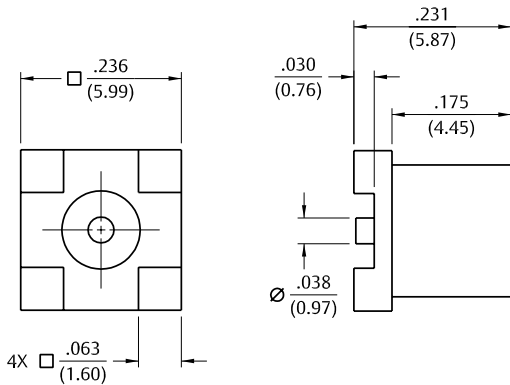


Straight Surface Mount Jack Receptacle



| Gold Plated  | Packaging                    |
|--------------|------------------------------|
| 135-3711-201 | Stock                        |
| 135-3711-202 | Tape and Reel, 1500 pcs/reel |

Recommended Land Pattern figure 15 page 195.  
Tape and Reel .315 (8.0) component pitch .630 (16.0) wide.



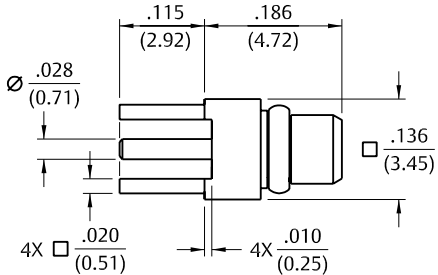
PC Mount

Straight Plug Receptacle



| Gold Plated  |
|--------------|
| 135-3801-201 |

Mounting Hole layout figure 12 page 194.

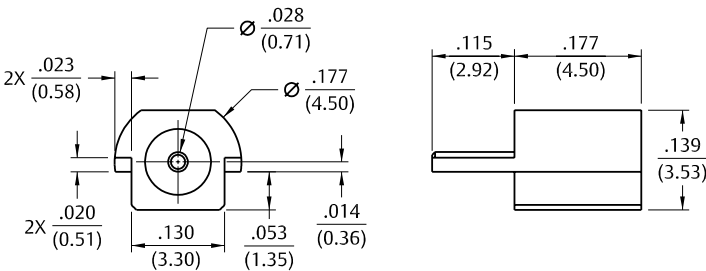


End Launch Surface Mount Jack Receptacle



| Gold Plated  | Packaging                    |
|--------------|------------------------------|
| 135-3711-801 | Stock                        |
| 135-3711-802 | Tape and Reel, 1000 pcs/reel |

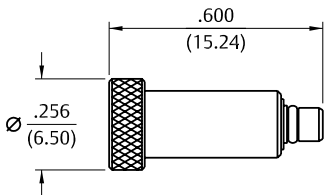
Recommended Land Pattern and Board Notch figure 14 page 195.  
Tape and Reel .316 (8.0) component pitch .630 (16.0) wide.



Plug Dummy Load



| Gold Plated  | Resistance |
|--------------|------------|
| 135-3801-811 | 50 Ohms    |



Non-Magnetic RF Connectors

Non-Magnetic Connectors

Our line of non-magnetic connectors is one of many successful examples of how Johnson® commercializes the high-end, custom application into the cost-sensitive solution that maintains the original Mil-Spec performance. As MRI and other magnetically sensitive technologies grow and evolve so to must the Johnson connector portfolio. Stronger magnetic fields, demands for better signal-to-noise ratios, custom-sized and modular flex coils for increasingly smaller machines: the RF connectors within the equipment have to bear an increasingly tricky role of delivering higher through-put while creating less interference.

With SMA, SMB, MCX, MMCX and soon SMP interfaces made available in a variety of PC and Cable-Mount designs, we can deliver the imaging performance your customers count on.

- The materials and finishes of our connectors meet the stringent limits of image and magnetic field distortion in an MR environment.
- The connector electrical performance exceeds the frequency requirements of the Receive/Transmit RF Coils in MR equipment (typically DC-6 GHz).
- The copper alloys of the body, springs and contact parts are designed to provide uniformity and maintain low permeability and magnetic susceptibility.
- Gold finishes are altered to eliminate magnetic barrier layers and provide excellent corrosion resistance and wear characteristics.
- Plugs maintain their electrical and mechanical performances in the environments of high-vibration common with MRI machines.
- A robust connector assembly design allows for a high count of mating cycles.
- As a helpful visual cue the connectors are marked “NM”.



Emerson Connectivity Solutions Non-Magnetic design capabilities expand beyond the parts and interfaces listed in this catalog. Please contact technical support to discuss the options for manufacturing your customized interconnects.

Specifications

Electrical Specifications

|                                                                                      |                               |                            |
|--------------------------------------------------------------------------------------|-------------------------------|----------------------------|
| <b>Impedance:</b> 50 Ohms                                                            |                               |                            |
| <b>Frequency Range:</b> ..... 0-6 GHz                                                |                               |                            |
| <b>VSWR (max):</b> (max) (f = GHz)                                                   |                               |                            |
|                                                                                      | Straight                      | Right Angle                |
|                                                                                      | <u>Cabled Connectors</u>      | <u>Cabled Connectors</u>   |
| .047 dia.....                                                                        | 1.20                          | 1.14 + .07f                |
| RG-178, RG-316, RG-316 DS.....                                                       | 1.20                          | 1.25                       |
| <b>Working Voltage:</b>                                                              |                               |                            |
| Connectors .....                                                                     | 170 VRMS at sea level†        |                            |
| <b>Dielectric Withstanding Voltage:</b>                                              |                               |                            |
| Connectors .....                                                                     | 500 VRMS at sea level†        |                            |
| <b>Insulation Resistance:</b> 1000 megohms min                                       |                               |                            |
| <b>Contact Resistance:</b> (milliohms max)                                           |                               |                            |
|                                                                                      | <u>Initial</u>                | <u>After Environmental</u> |
| Center contact (straight cabled connectors and uncabled receptacles) .....           | 5.0                           | 8.0                        |
| Center contact (right angle cabled connectors) .....                                 | 5.0                           | 15.0                       |
| Outer contact (all connectors) .....                                                 | 1.0                           | 1.5                        |
| Braid to body .....                                                                  | 1.5                           | N/A                        |
| <b>Corona Level:</b>                                                                 |                               |                            |
| Connectors .....                                                                     | 190 volts min at 70,000 feet† |                            |
| <b>Insertion Loss:</b> (dB max, tested at 1 GHz)                                     |                               |                            |
| Straight cabled connectors .....                                                     | 0.1                           |                            |
| Right angle cabled connectors.....                                                   | 0.2                           |                            |
| Uncabled receptacles.....                                                            | N/A                           |                            |
| <b>RF Leakage:</b> (dB min, tested at 2.5 GHz)                                       |                               |                            |
| Flexible cable .....                                                                 | -60 dB                        |                            |
| <b>RF High Potential Withstanding Voltage:</b> 400 VRMS min (tested at 4 and 7 MHz)† |                               |                            |

Mechanical Specifications

|                                                                                                      |                    |                |
|------------------------------------------------------------------------------------------------------|--------------------|----------------|
| <b>Engagement Design:</b> Series MMCX                                                                |                    |                |
| <b>Engagement/Disengagement Force:</b> 8 lbs max axial engagement<br>1.4 lbs min axial disengagement |                    |                |
| <b>Contact Retention:</b> 2.0 lbs min axial force                                                    |                    |                |
| <b>Cable Retention:</b>                                                                              |                    |                |
|                                                                                                      | Axial Force* (lbs) | Torque (oz-in) |
| .047 flexible .....                                                                                  | 3.5                | N/A            |
| RG-178 .....                                                                                         | 7.0                | N/A            |
| RG-316 .....                                                                                         | 20.0               | N/A            |
| RG-316 DS .....                                                                                      | 25.0               | N/A            |
| RG-405 .....                                                                                         | 30.0               | 16             |
| *Or cable breaking strength whichever is less.                                                       |                    |                |
| <b>Durability:</b> .....                                                                             | 500 cycles min     |                |

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                                 |                                                                 |
|---------------------------------|-----------------------------------------------------------------|
| <b>Temperature Range:</b> ..... | - 65°C to + 165°C                                               |
| <b>Thermal Shock:</b>           | MIL-STD-202, Method 107, Condition C (except -55° C to +155° C) |
| <b>Corrosion:</b>               | MIL-STD-202, Method 101, Condition B                            |
| <b>Shock:</b>                   | MIL-STD-202, Method 213, Condition B                            |
| <b>Vibration:</b>               | MIL-STD-202, Method 204, Condition D                            |
| <b>Moisture Resistance:</b>     | MIL-STD-202, Method 106                                         |

Material Specifications

(See non-magnetic materials page 10)

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

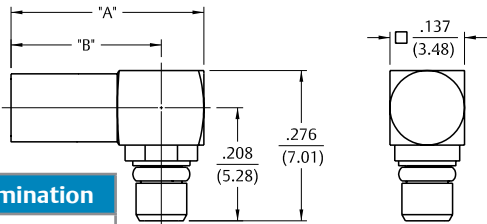
Flexible Cable and PC Mount

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                      | Gold Plated  | "A"          | "B"         | Termination  |
|---------------------------------|--------------|--------------|-------------|--------------|
| RG-316, 188, 187, 179, 161, 174 | 135-9403-101 | .412 (10.46) | .334 (8.48) | Crimp Sleeve |
| RG-178, 196                     | 135-9402-111 | .412 (10.46) | .334 (8.48) | Crimp Sleeve |
| .047 OD Flexible                | 135-9436-101 | .354 (8.99)  | .276 (6.98) | Crimp Insert |

Assembly instructions page 199 and 200.

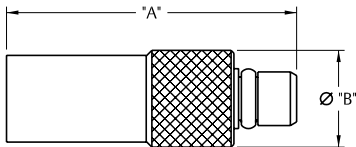


Straight Crimp Type Plug – Solder or Crimp Contact – Captivated Contact



| Cable Type            | Gold Plated  | "A"          | "B"         | Termination  |
|-----------------------|--------------|--------------|-------------|--------------|
| RG-316, 188, 161, 174 | 135-9403-001 | .509 (12.93) | .173 (4.39) | Crimp Sleeve |
| RG-178, 196           | 135-9402-001 | .462 (11.73) | .137 (3.48) | Crimp Insert |
| .047 OD Flexible      | 135-9436-001 | .462 (11.73) | .137 (7.01) | Crimp Insert |

Assembly instructions page 204 and 205.

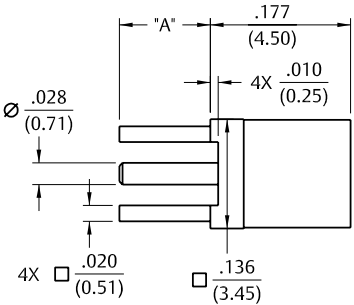


Straight Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 135-9701-201 | .115 (2.92) |
| 135-9701-211 | .068 (1.73) |

Mounting hole layout figure 12 on page 195.

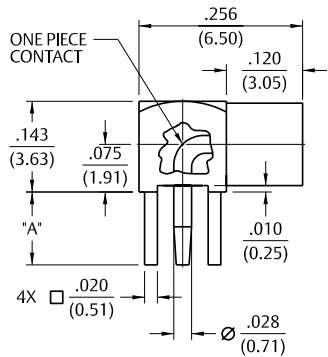


Right Angle Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 135-9701-301 | .155 (3.94) |
| 135-9701-311 | .068 (1.73) |

Mounting hole layout figure 12 on page 195.

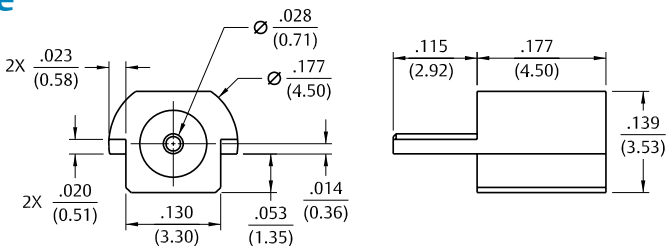


End Launch Surface Mount Jack Receptacle



| Gold Plated  | Packaging                   |
|--------------|-----------------------------|
| 135-9711-801 | Stock                       |
| 135-9711-802 | Tape and Reel 1000 pcs/reel |

Recommended land pattern figure 14 on page 195.  
Tape and Reel .316 (8.0) component pitch .630 (16.0) wide.



MCX Connectors

50 Ohm Connectors

|                                  |    |
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Reverse Polarity 50 Ohm Connectors

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75 Ohm Connectors

|                                  |    |
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50 Ohm Non-Magnetic Connectors

|                                  |    |
|----------------------------------|----|
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While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without notice.

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Specifications

Electrical Specifications

|                                                                                   |                                                      |                          |
|-----------------------------------------------------------------------------------|------------------------------------------------------|--------------------------|
| <b>Impedance:</b> 50 Ohms                                                         |                                                      |                          |
| <b>Frequency Range:</b>                                                           |                                                      |                          |
| Connectors.....                                                                   | 0-6 GHz                                              |                          |
| Dummy loads.....                                                                  | 0-1 GHz                                              |                          |
| <b>VSWR:</b> (max) (f = GHz)                                                      | Straight                                             | Right Angle              |
|                                                                                   | <u>Cabled Connectors</u>                             | <u>Cabled Connectors</u> |
| RG-178.....                                                                       | 1.17 + .04f                                          | 1.07 + .06f              |
| RG-316 and RG-405 .....                                                           | 1.13 + .04f                                          | 1.07 + .04f              |
| Adapters.....                                                                     | 1.13 + .04f                                          |                          |
| Uncabled receptacles, Dummy loads.....                                            | N/A                                                  |                          |
| <b>Working Voltage:</b> (VRMS max)†                                               | <u>Sea Level</u>                                     | <u>70K Feet</u>          |
|                                                                                   | RG-178.....                                          | 250                      |
| RG-316, RG-405, uncabled receptacles, adapters.....                               | 335                                                  | 85                       |
| Dummy loads .....                                                                 | N/A                                                  |                          |
| <b>Dielectric Withstanding Voltage:</b> (VRMS min at sea level)†                  |                                                      |                          |
|                                                                                   | RG-178 .....                                         | 750                      |
|                                                                                   | RG-316, RG-405, uncabled receptacles, adapters ..... | 1000                     |
|                                                                                   | Dummy loads .....                                    | N/A                      |
| <b>Insulation Resistance:</b> 1,000 megohms min                                   |                                                      |                          |
| <b>Contact Resistance:</b> (milliohms max)                                        |                                                      | After                    |
|                                                                                   | <u>Initial</u>                                       | <u>Environmental</u>     |
| Center contact (straight cabled connectors and uncabled receptacles) .....        | 5.0                                                  | 8.0                      |
| Center contact (right angle cabled connectors, adapters).....                     | 5.0                                                  | 15.0                     |
| Outer contact (all connectors) .....                                              | 1.0                                                  | 1.5                      |
| Braid to body (gold plated connectors).....                                       | 1.0                                                  | N/A                      |
| Braid to body (nickel plated connectors).....                                     | 2.5                                                  | N/A                      |
| <b>Corona Level:</b> (Volts min at 70,000 feet)                                   |                                                      |                          |
| RG-178 .....                                                                      | 190                                                  |                          |
| RG-316, RG-405 uncabled receptacles, adapters .....                               | 250                                                  |                          |
| Dummy loads .....                                                                 | N/A                                                  |                          |
| <b>Insertion Loss:</b> (dB max tested at 1 GHz)                                   |                                                      |                          |
| Straight cabled connectors, adapters .....                                        | 0.1 dB                                               |                          |
| Right angle cabled connectors .....                                               | 0.2 dB                                               |                          |
| Uncabled receptacles, dummy loads .....                                           | N/A                                                  |                          |
| <b>RF Leakage:</b> (dB min, tested at 2.5 GHz)                                    |                                                      |                          |
| Cable connectors .....                                                            | -55 dB                                               |                          |
| Uncabled receptacles and adapters, dummy load .....                               | N/A                                                  |                          |
| <b>RF High Potential Withstanding Voltage:</b> (VRMS min, tested at 4 and 7 MHz)† |                                                      |                          |
| RG-178 .....                                                                      | 500                                                  |                          |
| RG-316 and adapters .....                                                         | 700                                                  |                          |
| RG-405 .....                                                                      | 670                                                  |                          |
| Uncabled receptacles .....                                                        | 600                                                  |                          |
| Dummy loads .....                                                                 | N/A                                                  |                          |
| <b>Power Rating (Dummy Load):</b> 0.5 watt @ +25°C, derated to 0.25 watt @ +125°C |                                                      |                          |

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Mechanical Specifications

|                                                                                                                  |                    |                |
|------------------------------------------------------------------------------------------------------------------|--------------------|----------------|
| <b>Engagement Design:</b> Compatible with CECC 22220, Series MCX                                                 |                    |                |
| <b>Engagement Force:</b> 5.6 lbs max axial force                                                                 |                    |                |
| <b>Disengagement Force:</b> 8 lbs max axial force, 1 lb min                                                      |                    |                |
| <b>Contact Retention:</b> 2.3lbs min axial force (captivated contacts) 1 oz-in min torque (uncabled receptacles) |                    |                |
|                                                                                                                  | Axial Force* (lbs) | Torque (oz-in) |
| RG-178.....                                                                                                      | 10.0               | N/A            |
| RG-316.....                                                                                                      | 20.0               | N/A            |
| RG-316 DS.....                                                                                                   | 25.0               | N/A            |
| RG-405.....                                                                                                      | 30.0               | 16             |
| *Or cable breaking strength whichever is less.                                                                   |                    |                |
| <b>Durability:</b> .....500 cycles min                                                                           |                    |                |

Specifications

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                                                                              |                   |
|------------------------------------------------------------------------------|-------------------|
| <b>Temperature Range:</b>                                                    |                   |
| Connectors.....                                                              | - 65°C to + 165°C |
| Dummy loads.....                                                             | - 65°C to + 125°C |
| <b>Thermal Shock:</b> MIL-STD-202, Method 107, Condition F (N/A dummy loads) |                   |
| <b>Corrosion:</b> MIL-STD-202, Method 101, Condition B (N/A dummy loads)     |                   |
| <b>Shock:</b> MIL-STD-202, Method 213, Condition B (N/A dummy loads)         |                   |
| <b>Vibration:</b> MIL-STD-202, Method 204, Condition B (N/A dummy loads)     |                   |
| <b>Moisture Resistance:</b> MIL-STD-202, Method 106 (N/A dummy loads)        |                   |

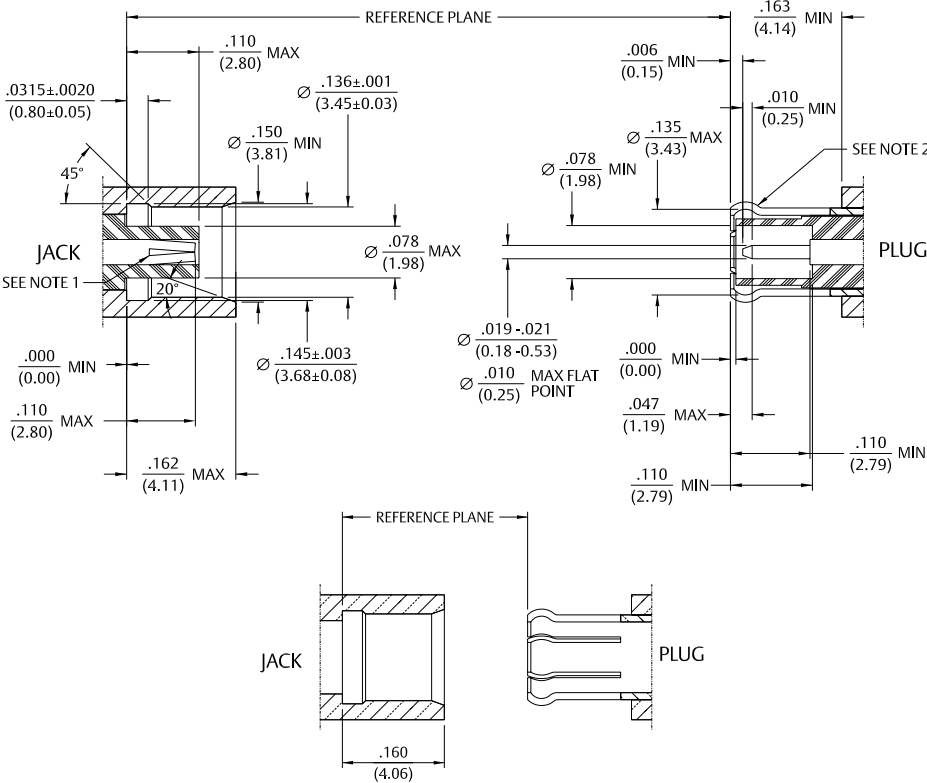
Material Specifications

|                           |                                                                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bodies:</b>            | Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001” min or nickel plated per AMS-QQ-N-290                                                           |
| <b>Contacts:</b>          | Male - brass per ASTM B16 , gold plated per MIL-DTL-45204 .00003” min<br>Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min |
| <b>Insulators:</b>        | PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457                                                                                                           |
| <b>Expansion Caps:</b>    | Brass per ASTM B16 , gold plated per MIL-DTL-45204 .00001” min or nickel plated per AMS-QQ-N-290                                                            |
| <b>Crimp Sleeves:</b>     | Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001” min or nickel plated per AMS-QQ-N-290                                                           |
| <b>Mounting Hardware:</b> | Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) per ASTM B139, gold plated per MIL-DTL-45204 .00001” min or nickel plated per AMS-QQ-N-290       |

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

Mating Engagement for MCX Series Compatible with CECC 22220

1. ID of contact to meet VSWR mating characteristics and connector durability when mated with a dia. .019-.021 (0.48-0.53) male contact.
2. Must meet the force to engage and disengage when mated with mating part.



For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)  
Illustrations are shown in inches (millimeters).

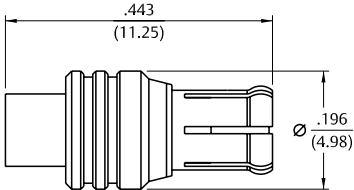
Semi-Rigid Cable & Flexible Cable

Straight Solder Type Plug



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 133-3693-001 | 133-3693-006  |

Assembly instructions page 206.

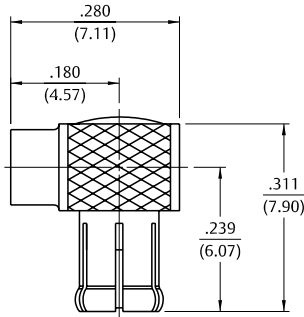


Right Angle Solder Type Plug – Captivated Contact



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 133-3693-101 | 133-3693-106  |

Assembly instructions page 206.

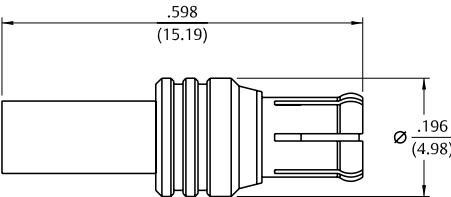


Straight Crimp Type Plug – Solder or Crimp Contact

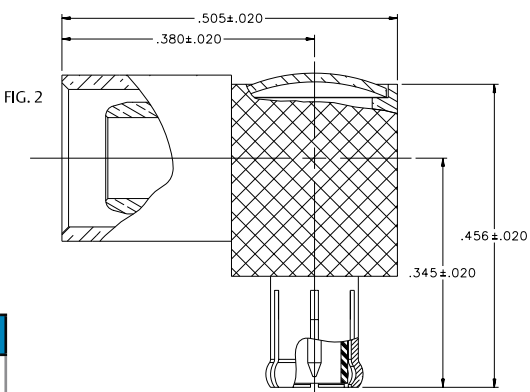
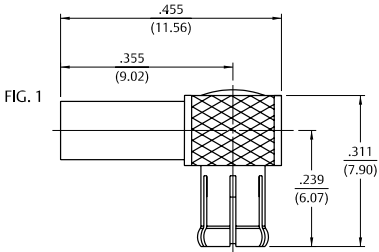


| Cable Type            | Gold Plated  | Nickel Plated | Captivated Contact |
|-----------------------|--------------|---------------|--------------------|
| RG-178, 196           | 133-3402-001 | 133-3402-006  | No                 |
| RG-316, 188, 161, 174 | 133-3403-001 | 133-3403-006  | Yes                |
| RG-316 DS, 188DS      | 133-3404-001 | 133-3404-006  | Yes                |
| RG-179, 187           | 133-3433-001 | 133-3433-006  | Yes                |

Assembly instructions page 207.



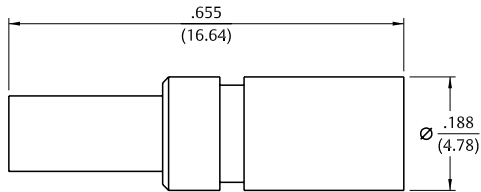
Right Angle Crimp Type Plug – Captivated Contact



| Cable Type            | Gold Plated  | Nickel Plated | Fig. |
|-----------------------|--------------|---------------|------|
| RG-178, 196           | 133-3402-101 | 133-3402-106  | 1    |
| RG-316, 188, 161, 174 | 133-3403-101 | 133-3403-106  | 1    |
| RG-316 DS, 188 DS     | 133-3404-101 | 133-3404-106  | 1    |
| RG-58, 303, 141       | 133-3407-101 | 133-3407-106  | 2    |
| RG-179, 187           | 133-3433-101 | 133-3433-106  | 1    |

Assembly instructions page 210.

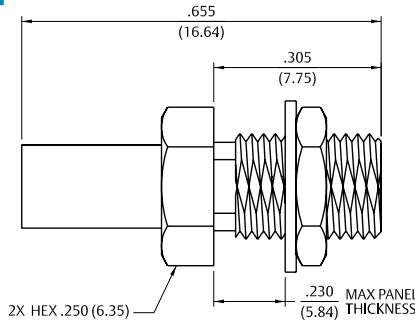
Straight Crimp Type Jack – Solder or Crimp Contact



| Cable Type                      | Gold Plated  | Nickel Plated | Captivated Contact |
|---------------------------------|--------------|---------------|--------------------|
| RG-178, 196                     | 133-3302-001 | 133-3302-006  | No                 |
| RG-316, 188, 161, 174, 179, 187 | 133-3303-001 | 133-3303-006  | Yes                |
| RG-316 DS, 188 DS               | 133-3304-001 | 133-3304-006  | Yes                |

Assembly instructions page 207.

Straight Crimp Type Bulkhead Jack – Solder or Crimp Contact



| Cable Type                      | Gold Plated  | Nickel Plated | Captivated Contact |
|---------------------------------|--------------|---------------|--------------------|
| RG-178, 196                     | 133-3302-401 | 133-3302-406  | No                 |
| RG-316, 188, 161, 174, 179, 187 | 133-3303-401 | 133-3303-406  | Yes                |
| RG-316 DS, 188 DS               | 133-3304-401 | 133-3304-406  | Yes                |

Assembly instructions page 207. Mounting hole layout figure 5 page 194.

Flexible Cable

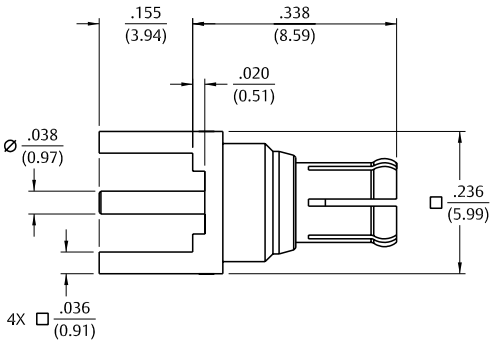
PC Mount

Straight Plug Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-3801-201 | 133-3801-206  |

Mounting hole layout figure 4 page 194.

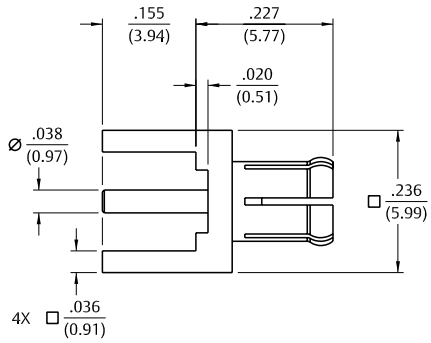


Straight Plug Receptacle – Low Profile



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-3801-211 | 133-3801-216  |

Mounting hole layout figure 4 page 194.

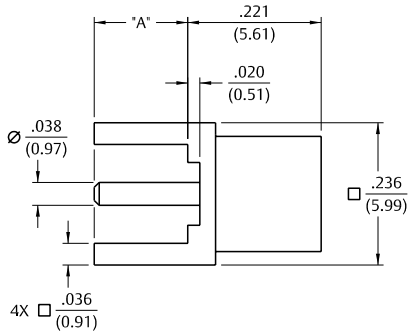


Straight Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 133-3701-201 | 133-3701-206  | .155 (3.94) |
| 133-3701-211 | 133-3701-216  | .110 (2.79) |
| 133-3701-221 | 133-3701-226  | .068 (1.73) |

Mounting hole layout figure 4 page 194.  
Four and six connector ganged receptacles available. See page 190.



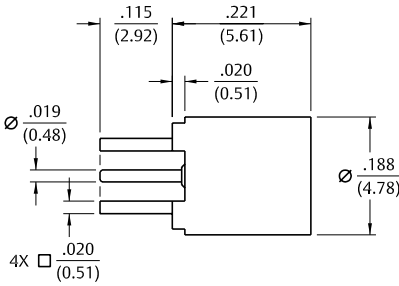
PC Mount

Straight Jack Receptacle – .100" Layout



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-3701-231 | 133-3701-236  |

Mounting hole layout figure 12 page 194.

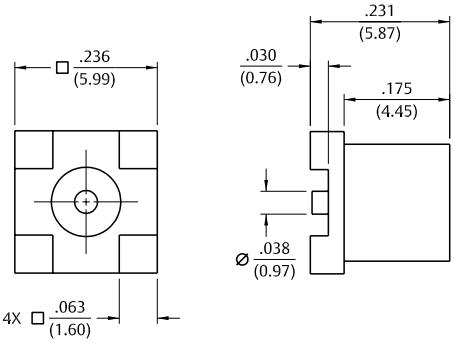


Straight Surface Mount Jack Receptacle



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 133-3711-201 | Stock                      |
| 133-3711-202 | Tape and Reel 750 pcs/reel |

Recommended land pattern figure 13 on page 195.  
Tape and Reel .315 (8.0) component pitch .630 (16.0) wide.

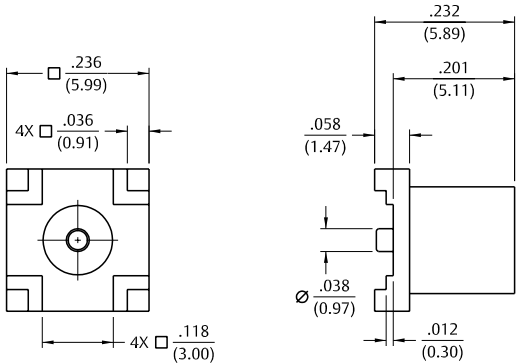


Straight Surface Mount Jack Receptacle



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 133-3711-211 | Stock                      |
| 133-3711-212 | Tape and Reel 750 pcs/reel |

Recommended land pattern figure 13 on page 195.  
Tape and Reel .472 (12.0) component pitch .630 (16.0) wide.



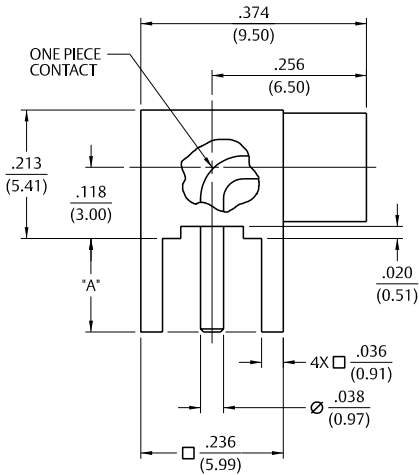
PC Mount

Right Angle Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 133-3701-301 | 133-3701-306  | .155 (3.94) |
| 133-3701-311 | 133-3701-316  | .110 (2.79) |
| 133-3701-321 | 133-3701-326  | .068 (1.73) |

Mounting hole layout figure 4 page 194.

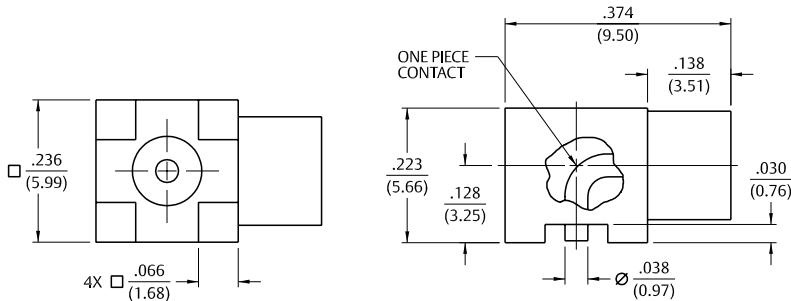


Right Angle Surface Mount Jack Receptacle



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 133-3711-301 | Stock                      |
| 133-3711-302 | Tape and Reel 750 pcs/reel |

Recommended land pattern figure 13 on page 195.  
Tape and Reel .472 (12.0) component pitch .945 (24.0) wide.

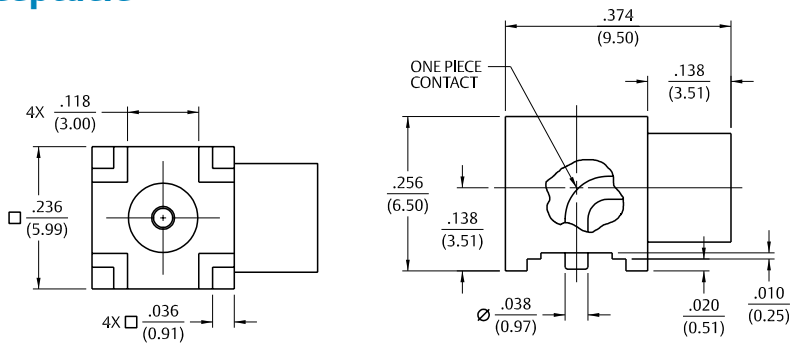


Right Angle Surface Mount Jack Receptacle



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 133-3711-311 | Stock                      |
| 133-3711-312 | Tape and Reel 750 pcs/reel |

Recommended land pattern figure 4 on page 194.  
Tape and Reel .472 (12.0) component pitch .945 (24.0) wide.

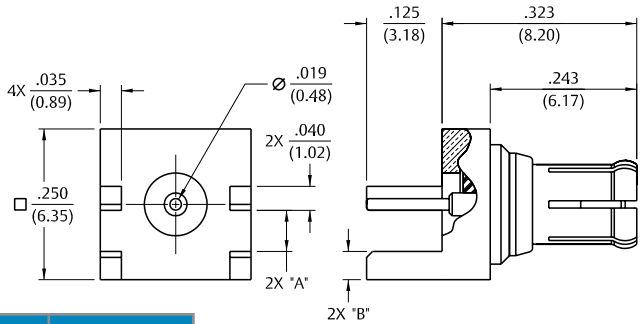


PC Mount

End Launch Plug Receptacle



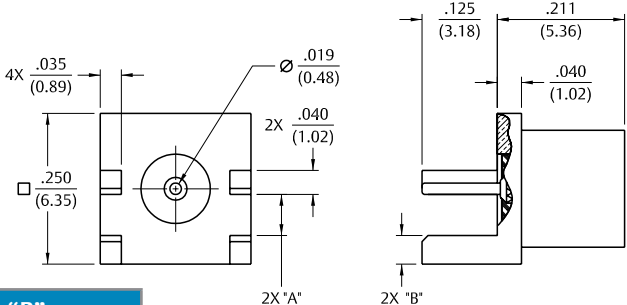
| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         |
|--------------|---------------|-----------------|-------------|-------------|
| 133-3801-841 | 133-3801-846  | .062 (1.57)     | .068 (1.73) | .048 (1.22) |
| 133-3801-851 | 133-3801-856  | .042 (1.07)     | .048 (1.22) | .068 (1.73) |



End Launch Jack Receptacle



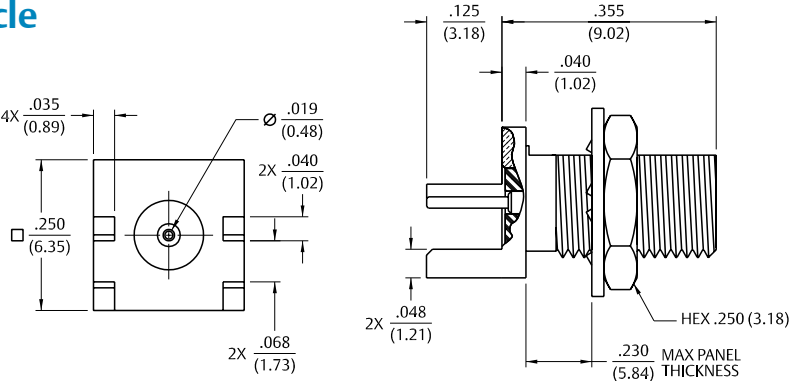
| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         |
|--------------|---------------|-----------------|-------------|-------------|
| 133-3701-801 | 133-3701-806  | .062 (1.57)     | .068 (1.73) | .048 (1.22) |
| 133-3701-811 | 133-3701-816  | .042 (1.07)     | .048 (1.22) | .068 (1.73) |



End Launch Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated | Board Thickness |
|--------------|---------------|-----------------|
| 133-3701-821 | 133-3701-826  | .062 (1.57)     |



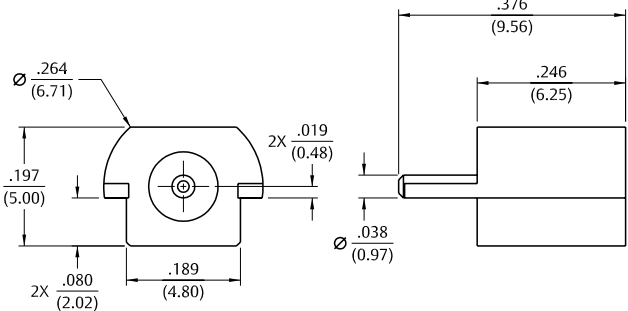
PC Mount, Bulkhead Mount & Panel Mount

End Launch Surface Mount Jack Receptacle



| Gold Plated  | Packaging                   |
|--------------|-----------------------------|
| 133-3711-801 | Stock                       |
| 133-3711-802 | Tape and Reel 1000 pcs/reel |

Recommended land pattern figure 21 page 195.  
Tape and Reel .472 (12.0) component pitch .945 (24.0) wide

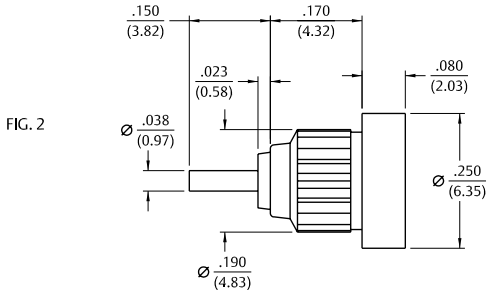
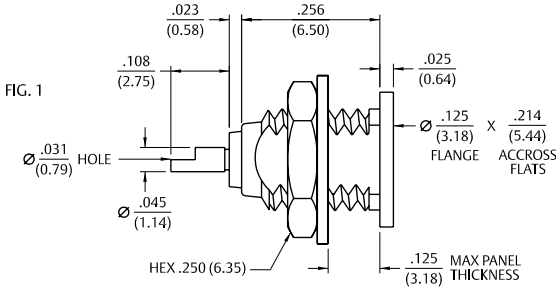


Front Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated | Mounting Style  | Fig |
|--------------|---------------|-----------------|-----|
| 133-3701-401 | 133-3701-406  | D Flat Threaded | 1   |
| 133-3701-411 | 133-3701-416  | Press Fit Knurl | 2   |

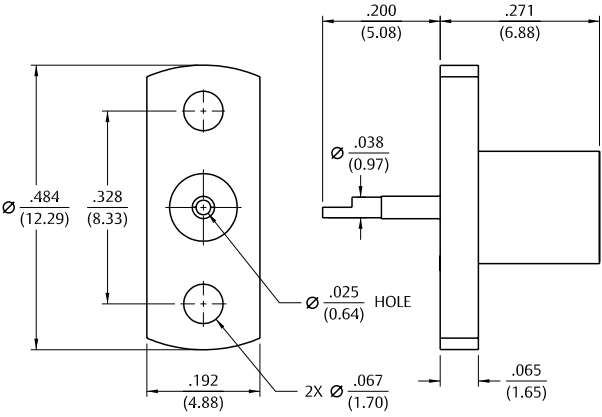
Mounting hole layout for 133-3701-401 figure 5 page 194.  
Mounting hole layout for 133-3701-406 figure 5 page 194.  
Mounting hole layout for 133-3701-411 figure 10 page 194.  
Mounting hole layout for 133-3701-416 figure 10 page 194.



2-Hole Flange Mount Jack Receptacle – Flush Dielectric



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-3701-601 | 133-3701-606  |

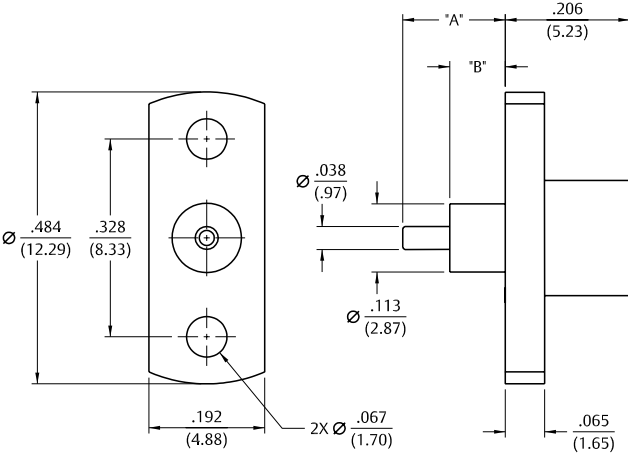


Panel Mount, In-Series Adapters & Terminations

2-Hole Flange Mount Jack Receptacle – Extended Dielectric



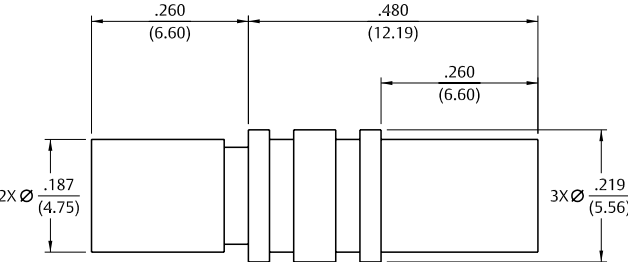
| Gold Plated  | Nickel Plated | "A"         | "B"         |
|--------------|---------------|-------------|-------------|
| 133-3701-611 | 133-3701-616  | .170 (4.32) | .092 (2.34) |
| 133-3701-621 | 133-3701-626  | .300 (7.62) | .200 (5.08) |



Jack to Jack Adapter



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-3901-801 | 133-3901-806  |

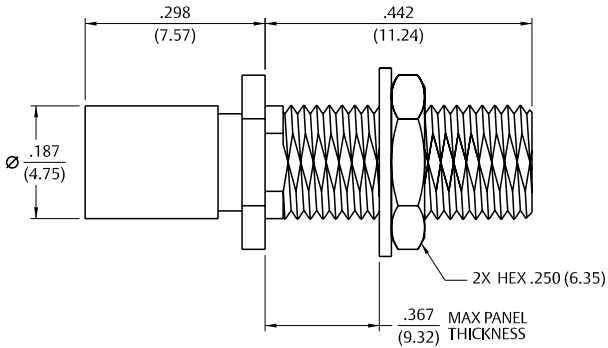


Jack to Bulkhead Jack Adapter



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-3901-401 | 133-3901-406  |

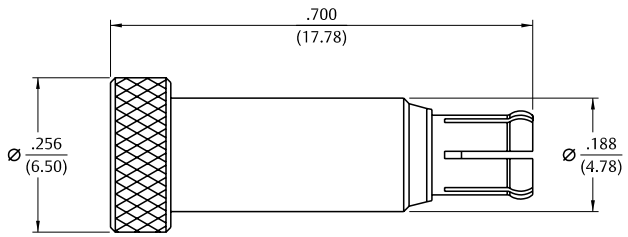
Mounting hole layout figure 5 page 194.



Plug Dummy Load



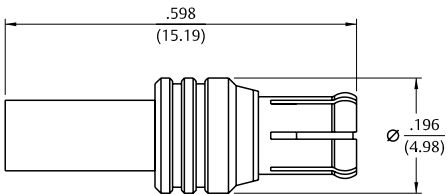
| Freq. Range | Gold Plated  | Nickel Plated | Resistance |
|-------------|--------------|---------------|------------|
| 0-1 GHz     | 133-3801-801 | 133-3801-806  | 50 Ohm     |
| 0-1 GHz     | 133-3801-821 | 133-3801-826  | 75 Ohm     |





Flexible Cable

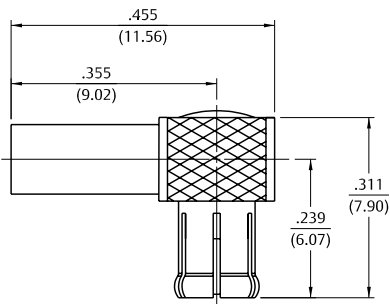
Straight Crimp Type Plug – Solder or Crimp Contact



| Cable Type            | Gold Plated  | Nickel Plated | Captivated Contact |
|-----------------------|--------------|---------------|--------------------|
| RG-178, 196           | 133-5402-001 | 133-5402-006  | No                 |
| RG-316, 188, 161, 174 | 133-5403-001 | 133-5403-006  | Yes                |
| RG-316 DS, 188 DS     | 133-5404-001 | 133-5404-006  | Yes                |

Assembly instructions page 207.

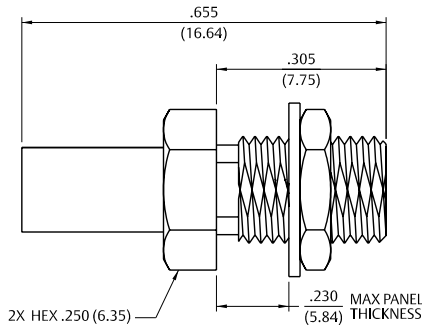
Right Angle Crimp Type Plug – Captivated Contact



| Cable Type            | Gold Plated  | Nickel Plated |
|-----------------------|--------------|---------------|
| RG-178, 196           | 133-5402-101 | 133-5402-106  |
| RG-316, 188, 161, 174 | 133-5403-101 | 133-5403-106  |
| RG-316 DS, 188 DS     | 133-5404-101 | 133-5404-106  |

Assembly instructions page 210.

Straight Crimp Type Bulkhead Jack – Solder or Crimp Contact



| Cable Type            | Gold Plated  | Nickel Plated | Captivated Contact |
|-----------------------|--------------|---------------|--------------------|
| RG-178, 196           | 133-5302-401 | 133-5302-406  | No                 |
| RG-316, 188, 161, 174 | 133-5303-401 | 133-5303-406  | Yes                |
| RG-316 DS, 188 DS     | 133-5304-401 | 133-5304-406  | Yes                |

Mounting hole layout figure 5 page 194.  
Assembly instructions page 207.

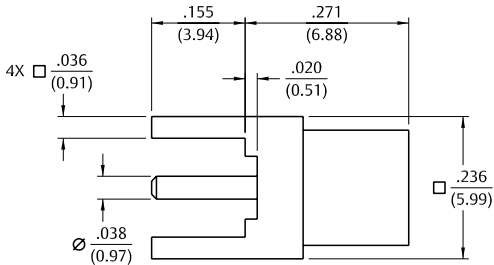
PC Mount

Straight Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-5701-201 | 133-5701-206  |

Mounting hole layout figure 4 page 194.

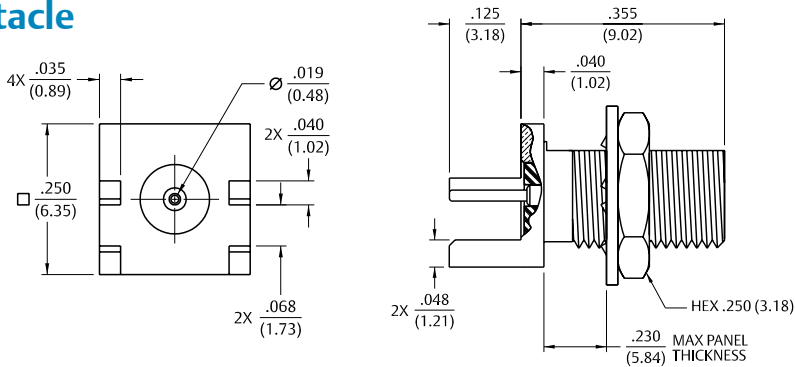


End Launch Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 133-5701-801 | 133-5701-806  |

Mounting hole layout figure 4 page 194.



# Specifications

## Electrical Specifications

|                                                                                         |                               |                                  |
|-----------------------------------------------------------------------------------------|-------------------------------|----------------------------------|
| <b>Impedance:</b> 75 Ohms                                                               |                               |                                  |
| <b>Frequency Range:</b> ..... 0-6 GHz                                                   |                               |                                  |
| <b>VSWR:</b> (max) (f= GHz)                                                             |                               |                                  |
|                                                                                         | Straight<br>Cabled Connectors | Right Angle<br>Cabled Connectors |
| RG-179 .....                                                                            | 1.13 + .04f                   | 1.07 + .04f                      |
| In-series adapters .....                                                                | 1.07 + .03f                   |                                  |
| Between-series adapters, loads .....                                                    | 1.05 + .01f                   |                                  |
| Uncabled receptacles.....                                                               |                               | N/A                              |
| <b>Working Voltage:</b> (VRMS max)†                                                     | Sea Level                     | 70K Feet                         |
| RG-179 .....                                                                            | 335                           | 85                               |
| Uncabled receptacles, adapters .....                                                    | 335                           | 85                               |
| Loads, matching pad .....                                                               |                               | N/A                              |
| <b>Dielectric Withstanding Voltage:</b> (VRMS min at sea level)†                        |                               |                                  |
| RG-179 .....                                                                            |                               | 1000                             |
| Uncabled receptacles, adapters .....                                                    |                               | 1000                             |
| Loads.....                                                                              |                               | N/A                              |
| <b>Insulation Resistance:</b> 1,000 megohms min                                         |                               |                                  |
| <b>Contact Resistance:</b> (milliohms max)                                              |                               |                                  |
|                                                                                         | Initial                       | After<br>Environmental           |
| Center contact (straight cabled connectors and uncabled receptacles) .....              | 5.0                           | 8.0                              |
| Center contact (right angle cabled connectors, adapters) .....                          | 10.0                          | 15.0                             |
| Center contact (loads).....                                                             | N/A                           |                                  |
| Outer contact.....                                                                      | 1.0                           | 1.5                              |
| Braid to body (gold plated connectors).....                                             | 1.0                           | N/A                              |
| <b>Corona Level:</b> (Volts min at 70,000 feet) †                                       |                               |                                  |
| RG-179 .....                                                                            |                               | 250                              |
| Uncabled receptacles, adapters .....                                                    |                               | 250                              |
| Loads matching pad.....                                                                 |                               | N/A                              |
| <b>Insertion Loss:</b> (dB max tested at 1 GHz)                                         |                               |                                  |
| Straight cabled connectors .....                                                        |                               | 0.1 dB                           |
| Right angle cabled connectors.....                                                      |                               | 0.2 dB                           |
| Uncabled receptacles, adapters .....                                                    |                               | N/A                              |
| <b>RF Leakage:</b> (dB min, tested at 2.5 GHz)                                          |                               |                                  |
| Cable connectors .....                                                                  |                               | -55 dB typical                   |
| Uncabled receptacles, adapters, loads .....                                             |                               | N/A                              |
| <b>RF High Potential Withstanding Voltage:</b> (VRMS min, tested at 4 and 7 MHz)†       |                               |                                  |
| Cabled Connectors for RG-179 .....                                                      |                               | 700                              |
| Uncabled receptacles, adapters .....                                                    |                               | 600                              |
| Loads .....                                                                             |                               | N/A                              |
| <b>Power Rating:</b> (Loads) 1.0 Watt at +25°C, derated linearly to 0.5 Watts at +125°C |                               |                                  |

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Specifications

## Mechanical Specifications

|                                                |                                                                                           |                     |                |
|------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------|----------------|
| <b>Engagement Design:</b>                      | Compatible with CECC 22220, Series MCX 50 Ohm                                             |                     |                |
| <b>Engagement Force:</b>                       | 5.6 lbs max axial force                                                                   |                     |                |
| <b>Disengagement Force:</b>                    | 8 lbs max axial force, 1 lb min                                                           |                     |                |
| <b>Contact Retention:</b>                      | 2.3 lbs min axial force (captivated contacts) 1 oz-in - min torque (uncabled receptacles) |                     |                |
|                                                |                                                                                           | Axial Force (lbs) * | Torque (oz-in) |
| RG-179, BELDEN 735A .....                      |                                                                                           | 20.0                | N/A            |
| RG-179 DS.....                                 |                                                                                           | 25.0                | N/A            |
| *Or cable breaking strength whichever is less. |                                                                                           |                     |                |
| <b>Durability:</b> .....                       |                                                                                           |                     | 500 cycles min |

## Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                                 |                                                  |
|---------------------------------|--------------------------------------------------|
| <b>Temperature Range:</b>       |                                                  |
| All Connectors, Adapters.....   | - 65°C to + 165°C                                |
| Loads .....                     | - 65°C to + 125°C                                |
| <b>Thermal Shock:</b>           | MIL-STD-202, Method 107, Condition F (N/A Loads) |
| <b>Temperature Coefficient:</b> | Loads +/- 300ppm/°C                              |
| <b>Corrosion:</b>               | MIL-STD-202, Method 101, Condition B (N/A Loads) |
| <b>Shock:</b>                   | MIL-STD-202, Method 213, Condition B (N/A Loads) |
| <b>Vibration:</b>               | MIL-STD-202, Method 204, Condition B (N/A Loads) |
| <b>Moisture Resistance:</b>     | MIL-STD-202, Method 106 (N/A Loads)              |

## Material Specifications

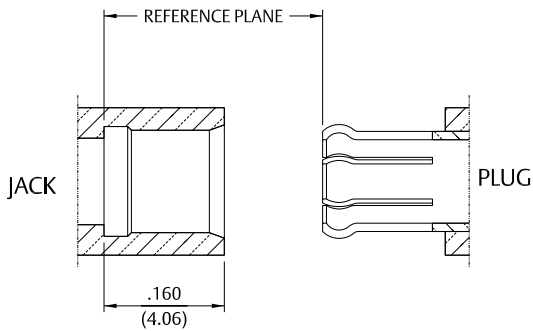
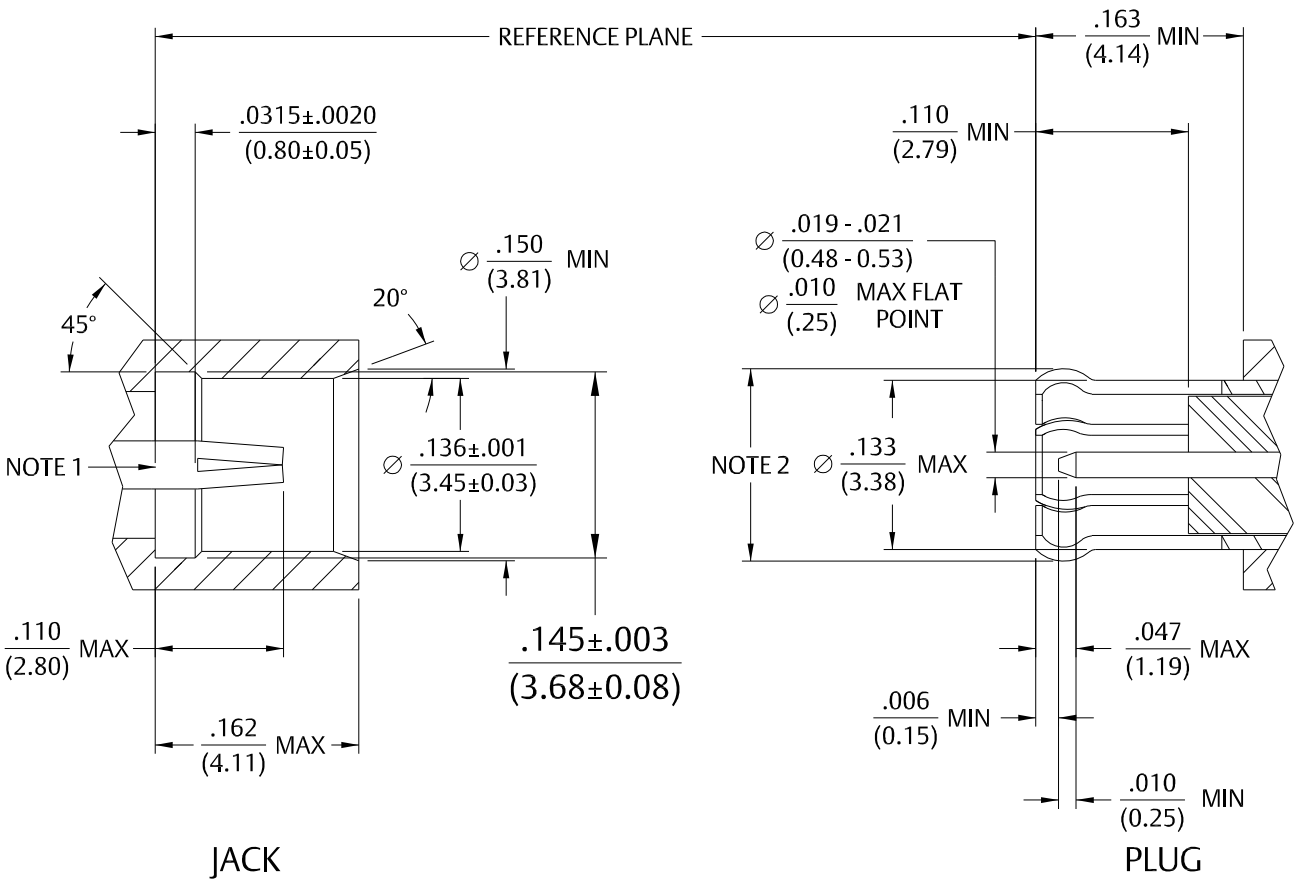
|                           |                                                                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bodies:</b>            | Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001” min or stainless steel, type 303 per ASTM A582, passivated per MIL-F-14072 (EL70)               |
| <b>Contacts:</b>          | Male - brass per ASTM B16 , gold plated per MIL-DTL-45204 .00003” min<br>Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min |
| <b>Insulators:</b>        | PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457                                                                                                           |
| <b>Expansion Caps:</b>    | Brass per ASTM B16 , gold plated per MIL-DTL-45204 .00001” min                                                                                              |
| <b>Crimp Sleeves:</b>     | Copper, gold plated per MIL-DTL-45204 .00001” min                                                                                                           |
| <b>Mounting Hardware:</b> | Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) ASTM B139, gold plated per MIL-DTL-45204 .00001” min                                             |

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

Specifications

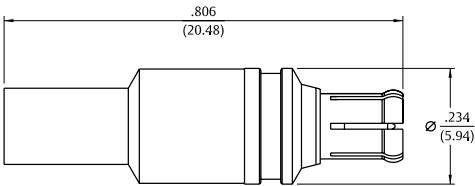
Mating Engagement for 75 Ohm MCX Series  
(Intermatable with CECC22220 50 Ohm MCX)

- 1. ID of contact to meet VSWR mating characteristics and connector durability when mated with a dia. .019-.021 (0.48-0.53) dia. male contact.
- 2. Must meet the force to engage and disengage when mated with mating part.
- 3. Interface shall intermiate with MCX 50 Ohm interface per CECC 22220.



Flexible Cable

Straight Crimp Type Plug – Solder or Crimp Captivated Contact



| Cable Type  | Gold Plated  |
|-------------|--------------|
| RG-179      | 133-8433-001 |
| RG-179 DS   | 133-8434-001 |
| Belden 735A | 133-8445-001 |

Assembly instructions page 209.

Right Angle Crimp Type Plug – Captivated Contact

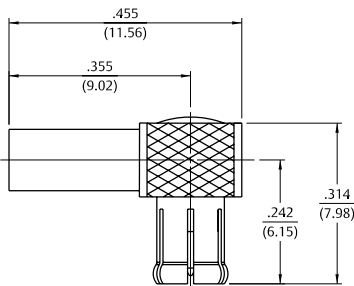


FIG. 1

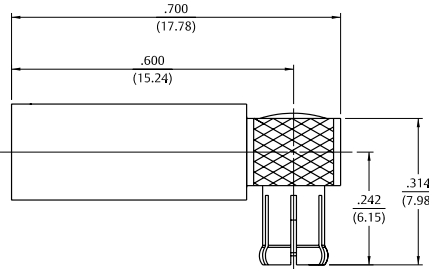
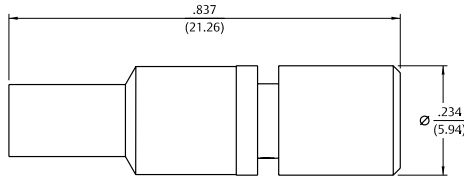


FIG. 2

Assembly instructions page 211.

Straight Crimp Type Jack – Solder or Crimp Captivated Contact



| Cable Type | Gold Plated  |
|------------|--------------|
| RG-179     | 133-8333-001 |
| RG-179 DS  | 133-8334-001 |

Assembly instructions page 209.

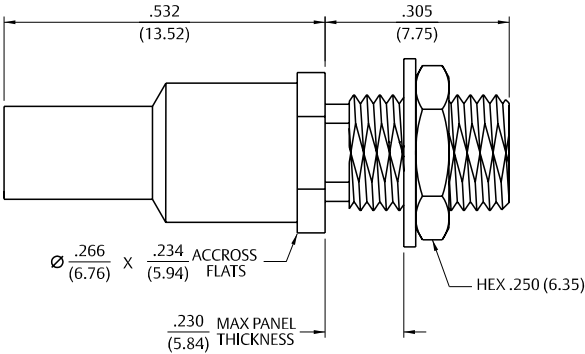
Flexible Cable & PC Mount

Straight Crimp Type Bulkhead Jack – Solder or Crimp Captivated Contact



| Cable Type | Gold Plated  |
|------------|--------------|
| RG-179     | 133-8333-401 |
| RG-179 DS  | 133-8334-401 |

Assembly instructions page 209.  
Mounting hole layout figure 5 page 194.

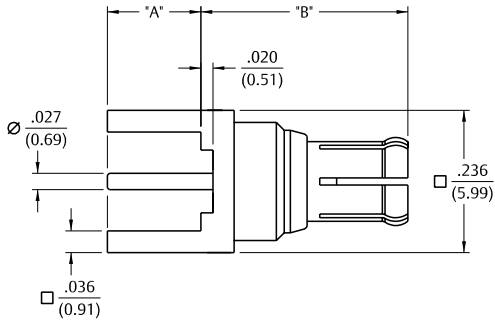


Straight Plug Receptacle



| Gold Plated  | "A"         | "B"          |
|--------------|-------------|--------------|
| 133-8801-201 | .155 (3.80) | .343 (8.71)  |
| 133-8801-211 | .110 (2.70) | .343 (8.71)  |
| 133-8801-221 | .155 (3.80) | .510 (12.95) |

Mounting hole layout figure 20 page 195.

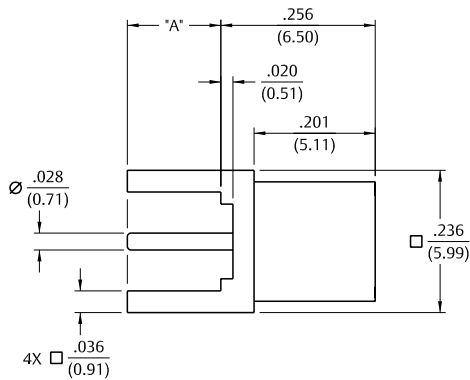


Straight Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 133-8701-201 | .155 (3.80) |
| 133-8701-211 | .100 (2.54) |

Mounting hole layout figure 20 page 195.

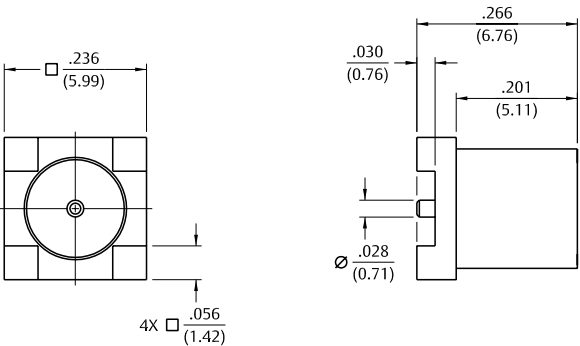


Surface Mount Jack Receptacle



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 133-8711-201 | Bulk Packs                 |
| 133-8711-202 | Tape and Reel 770 pcs/reel |

Mounting hole layout figure 11 page 194.  
Tape and Reel .472 (12.0) component pitch .630 (16.0) wide.

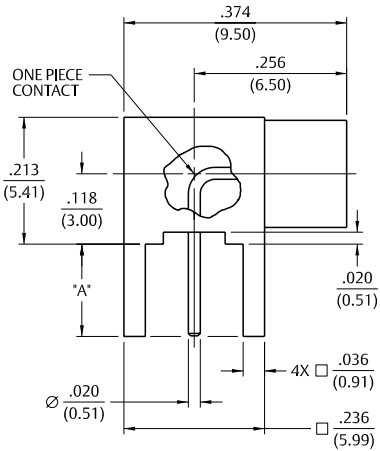


Right Angle Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 133-8701-301 | .155 (3.80) |
| 133-8701-311 | .110 (2.70) |

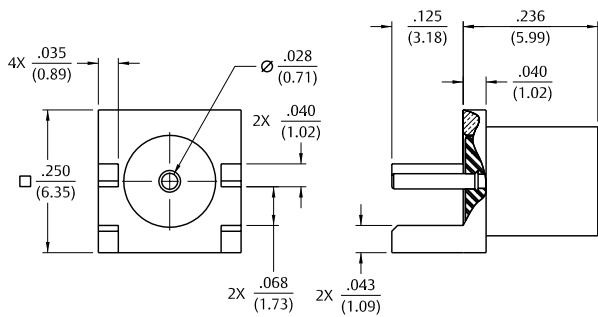
Mounting hole layout figure 20 page 195.



End Launch Jack Receptacle



| Cable Type   | Board Thickness |
|--------------|-----------------|
| 133-8701-801 | .062 (1.57)     |



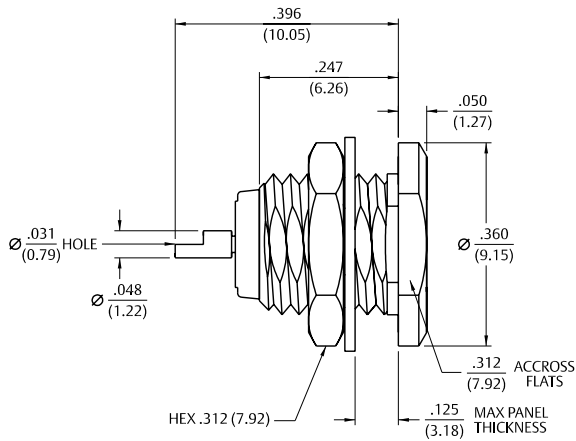
Bulkhead Mount & In-Series Adapters

Bulkhead Jack Receptacle



| Gold Plated  |
|--------------|
| 133-8701-401 |

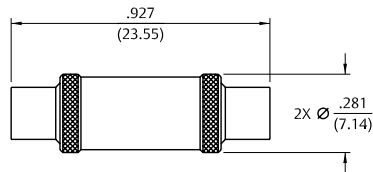
Mounting hole layout figure 1 page 194.



Jack to Jack Adapter



| Gold Plated  |
|--------------|
| 133-8901-801 |



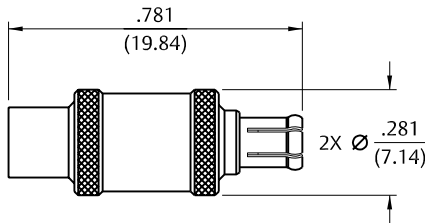
For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)  
Illustrations are shown in inches (millimeters).

In-Series Adapters & Between Series Adapters

Jack to Plug Adapter



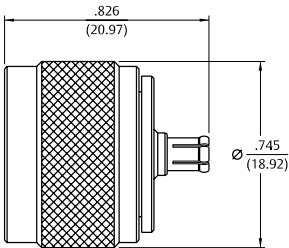
Gold Plated  
133-8901-821



75 Ohm Type N Plug to 75 Ohm MCX Plug Adapter



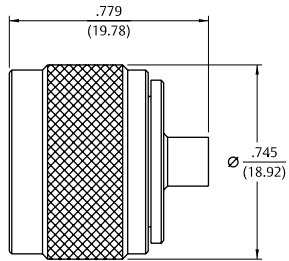
Stainless Steel Passivated  
134-1068-001



75 Ohm Type N Plug to 75 Ohm MCX Jack Adapter



Stainless Steel Passivated  
134-1068-011

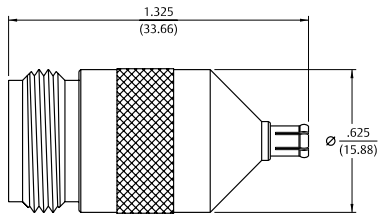


Between-Series Adapters & Terminations

75 Ohm Type N Jack to 75 Ohm MCX Plug Adapter



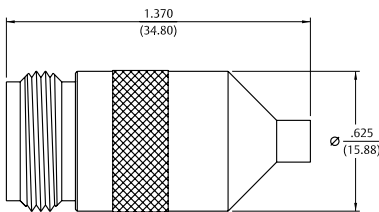
Stainless Steel Passivated  
134-1068-021



75 Ohm Type N Jack to 75 Ohm MCX Jack Adapter



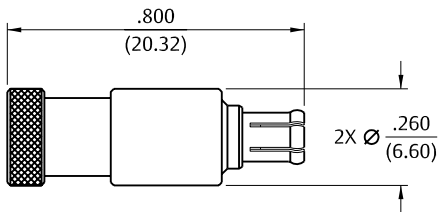
Stainless Steel Passivated  
134-1068-031



Plug Precision Load



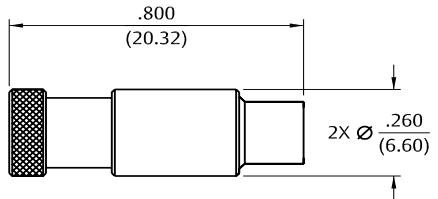
Gold Plated  
133-8801-831



Jack Precision Load



Gold Plated  
133-8701-831



# Specifications

## Electrical Specifications

|                                                                                 |                          |                          |
|---------------------------------------------------------------------------------|--------------------------|--------------------------|
| <b>Impedance:</b> 50 Ohms                                                       |                          |                          |
| <b>Frequency Range:</b> .....                                                   | 0-6 GHz                  |                          |
| <b>VSWR (max):</b> (f=GHz)                                                      |                          |                          |
|                                                                                 | <u>Straight</u>          | <u>Right Angle</u>       |
|                                                                                 | <u>Cabled Connectors</u> | <u>Cabled Connectors</u> |
| RG-316 cable.....                                                               | 1.13 + .04f              | 1.07 + .04f              |
| Uncabled receptacles.....                                                       | N/A                      |                          |
| <b>Working Voltage:</b> (VRMS max)†                                             | <u>Sea Level</u>         | <u>70K Feet</u>          |
| RG-316 .....                                                                    | 335                      | 85                       |
| <b>Dielectric Withstanding Voltage:</b> (VRMS min at sea level)†                |                          |                          |
| RG-316, uncabled receptacles .....                                              | 1000                     |                          |
| <b>Insulation Resistance:</b> 1,000 megohms min                                 |                          |                          |
| <b>Contact Resistance:</b> (milliohms max)                                      |                          |                          |
|                                                                                 | <u>Initial</u>           | <u>After</u>             |
|                                                                                 |                          | <u>Environmental</u>     |
| Center contact (straight cabled connectors and uncabled receptacles) .....      | 5.0                      | 8.0                      |
| Center contact (right angle cabled connectors).....                             | 5.0                      | 15.0                     |
| Outer contact.....                                                              | 1.0                      | 1.5                      |
| Braid to body.....                                                              | 1.0                      | N/A                      |
| <b>Corona Level:</b> (Volts min at 70,000 feet) †                               |                          |                          |
| RG-316, uncabled receptacles .....                                              | 250                      |                          |
| <b>Insertion Loss:</b> (dB max tested at 1 GHz)                                 |                          |                          |
| Straight cabled connectors .....                                                | 0.1 dB                   |                          |
| Right angle cabled connectors .....                                             | 0.2 dB                   |                          |
| Uncabled receptacles .....                                                      | N/A                      |                          |
| <b>RF Leakage:</b> (dB min, tested at 2.5 GHz)                                  |                          |                          |
| Cabled connectors.....                                                          | -55 dB                   |                          |
| Uncabled receptacles .....                                                      | N/A                      |                          |
| <b>RF High Potential Withstanding Voltage:</b> (VRMS min tested at 4 and 7 MHz) |                          |                          |
| Cabled Connectors .....                                                         | 700                      |                          |
| Uncabled receptacles .....                                                      | 600                      |                          |

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

## Mechanical Specifications

|                                                 |                                                                                         |                            |                       |
|-------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------|-----------------------|
| <b>Engagement Design:</b>                       | Compatible with CECC 22220, Series MCX 50 Ohm                                           |                            |                       |
| <b>Engagement Force:</b>                        | 5.6 lbs max axial force                                                                 |                            |                       |
| <b>Disengagement Force:</b>                     | 8 lbs max axial force, 1 lb min                                                         |                            |                       |
| <b>Contact Retention:</b>                       | 2.3 lbs min axial force (captivated contacts) 1 oz-in min torque (uncabled receptacles) |                            |                       |
|                                                 |                                                                                         | <u>Axial Force (lbs) *</u> | <u>Torque (oz-in)</u> |
| RG-316.....                                     |                                                                                         | 20.0                       | N/A                   |
| RG-316 DS.....                                  |                                                                                         | 25.0                       | N/A                   |
| * Or cable breaking strength whichever is less. |                                                                                         |                            |                       |
| <b>Durability:</b> .....                        | 500 cycles min                                                                          |                            |                       |

## Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

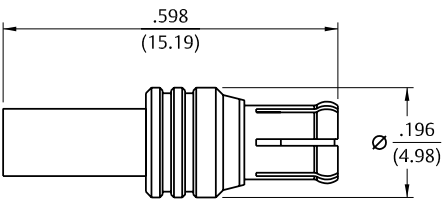
|                                 |                                      |
|---------------------------------|--------------------------------------|
| <b>Temperature Range:</b> ..... | - 65°C to + 165°C                    |
| <b>Thermal Shock:</b>           | MIL-STD-202, Method 107, Condition F |
| <b>Corrosion:</b>               | MIL-STD-202, Method 101, Condition B |
| <b>Shock:</b>                   | MIL-STD-202, Method 213, Condition B |
| <b>Vibration:</b>               | MIL-STD-202, Method 204, Condition B |
| <b>Moisture Resistance:</b>     | MIL-STD-202, Method 106              |

## Material Specifications

(See non-magnetic materials page 10)

# Non-Magnetic RF Connectors – For Flexible Cable

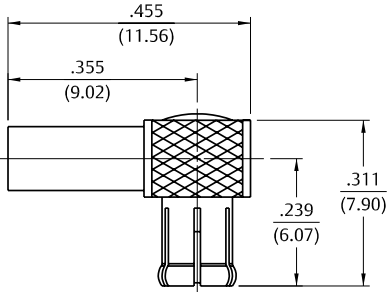
## Straight Crimp Type Plug – Solder or Crimp Contact – Captivated Contact



| Cable Type        | Gold Plated  |
|-------------------|--------------|
| RG-316, 188, 174  | 133-9403-001 |
| RG-316 DS, 188 DS | 133-9404-001 |

Assembly instructions page 208.

## Right Angle Crimp Type Plug – Captivated Contact



| Cable Type        | Gold Plated  |
|-------------------|--------------|
| RG-316, 188, 174  | 133-9403-101 |
| RG-316 DS, 188 DS | 133-9404-101 |

Assembly instructions page 207.

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Illustrations are shown in inches (millimeters).

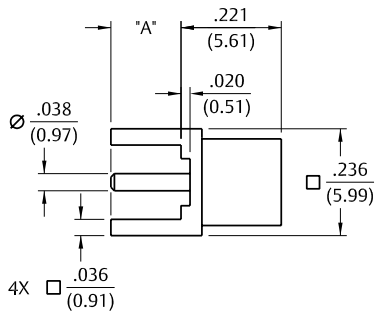
Non-Magnetic RF Connectors – For PC Mount

Straight Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 133-9701-201 | .155 (3.94) |
| 133-9701-211 | .110 (2.79) |

Mounting hole layout figure 4 page 194.

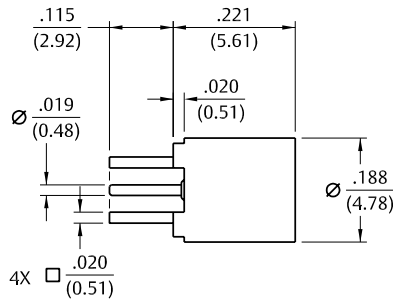


Straight Jack Receptacle – .100" Layout



| Gold Plated  |
|--------------|
| 133-9701-231 |

Mounting hole layout figure 12 page 194.

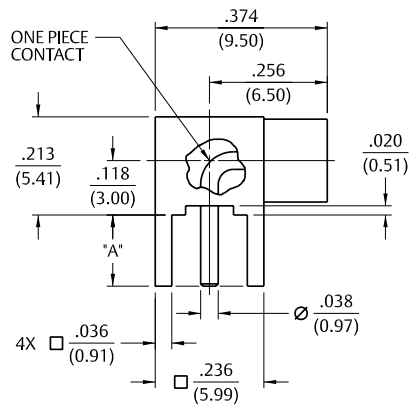


Right Angle Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 133-9701-301 | .155 (3.94) |
| 133-9701-311 | .110 (2.79) |

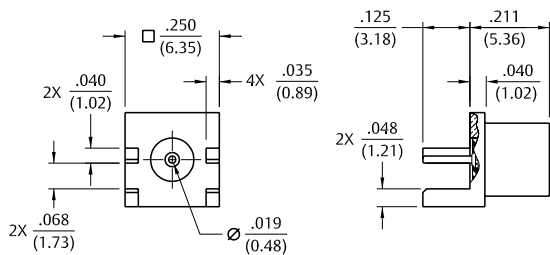
Mounting hole layout figure 4 page 194.



End Launch Jack Receptacle – Round Contact



| Gold Plated  | Board Thickness |
|--------------|-----------------|
| 133-9701-801 | .062 (1.57)     |



SMK Connectors

|                                  |    |
|----------------------------------|----|
| 50 Ohm Connectors                |    |
| Specifications.....              | 40 |
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Specifications

Field Replaceable Application Notes

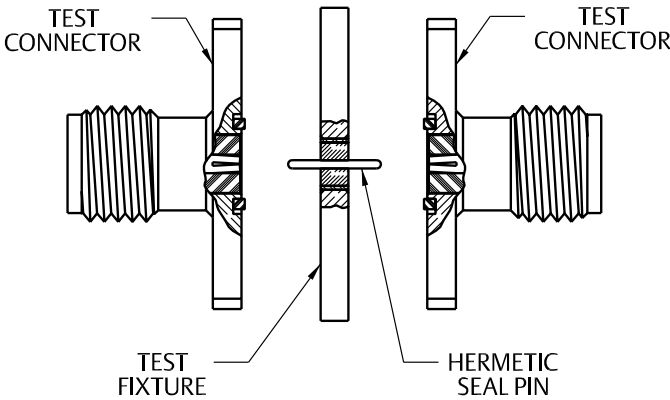
These field replaceable connectors are easy to install and replace. The hermetic seal is mounted into the circuit module wall and the connector can be removed and replaced without destroying the hermeticity of the circuit housing.

The field replaceable connector creates a transition from microstrip circuitry to a coaxial transmission line. The SMK (2.92mm) seal pin diameter is .012 (.030) to minimize the capacitive effects on the circuit trace. For optimum electrical performance, the transition from the hermetic seal to the microstrip trace must be properly compensated which involves adjusting the microstrip trace width to minimize any impedance discontinuities found in the transition area.

The plot shown below is representative of the typical return loss of a Johnson field replaceable SMK connector. To produce the data shown below, a test fixture is created using the Johnson SMK hermetic seal. The fixture consists of a suitably thick spacer plate with the hermetic seal mounted flush to both surfaces. Two connectors are mounted back to back around the fixture and the VSWR of this test assembly is measured. The calculated return loss trace shown is equivalent to the square root of the measured VSWR of the test assembly. Since the connectors tested are of identical design, it can be stated with fair accuracy that the calculated data shown represents the response of a single field replaceable connector and its transition to the hermetic seal.

Although we do not publish a VSWR specification for field replaceable connectors, typical connector return loss can be expected to be better than 20 dB through 40 GHz. A VSWR specification is not stated because an industry standard method for testing field replaceable connectors does not exist. The actual performance of the connector is dependent upon the following:

- 1. For optimum electrical performance, we recommend the use of our standard 142-1000-033 hermetic seal with a pin diameter of .0120+/-0.0005 (0.305+/-0.013).
- 2. It is recommended that the hermetic seal be mounted flush with the circuit housing. Tolerance variations between the hermetic seal and machined housing do not always guarantee an optimum transition to the connector. Some manufacturers recommend an additional counterbore in the circuit housing to accommodate a solder washer during installation of the seal. We do not recommend this type of installation because, if the counterbore is not completely filled with solder, electrical discontinuities may be created.
- 3. The transition between the hermetic seal pin and the microstrip trace will effect electrical performance, as stated above. Several different methods of hermetic seal mounting and seal pin to microstrip trace attachment are used in the industry.



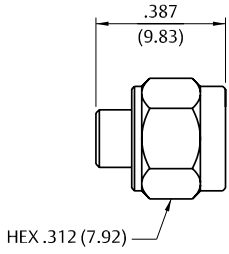
Semi-Rigid Cable

Straight Solder Type Plug – with Contact, Slide-On Nut



| Cable Type    | Gold Plated  | Passivated * |
|---------------|--------------|--------------|
| RG-405 RG-402 | 145-0693-001 | 145-0693-002 |
| RG-405 RG-402 | 145-0694-001 | 145-0694-002 |

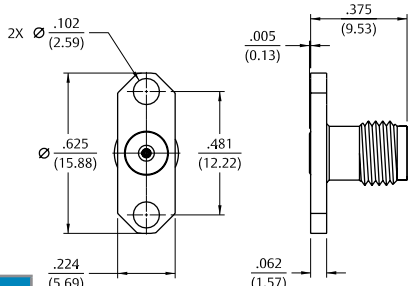
Assembly instructions page 212.  
\* Passivated coupling nut with gold plated body.



2-Hole Flange Mount Jack Receptacle



| Gold Plated  | Passivated   | Accepts Pin Size              |
|--------------|--------------|-------------------------------|
| 145-0701-601 | 145-0701-602 | .0120+/-0.0005(0.305+/-0.013) |

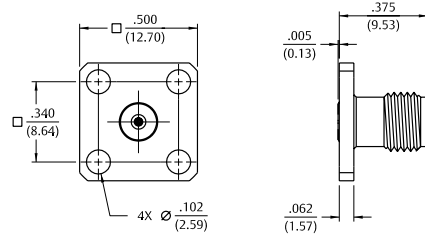


Mounting hole layout

4-Hole Flange Mount Jack Receptacle



| Gold Plated  | Passivated   | Accepts Pin Size              |
|--------------|--------------|-------------------------------|
| 145-0701-611 | 145-0701-612 | .0120+/-0.0005(0.305+/-0.013) |

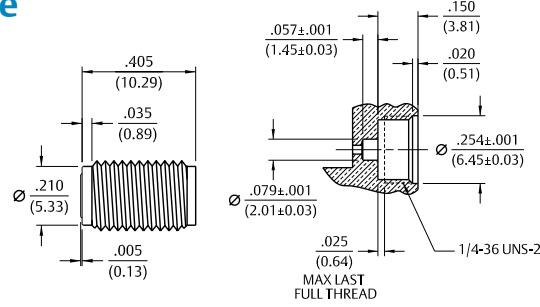


Mounting hole layout

Jack Receptacle – Thread Mount Field Replaceable



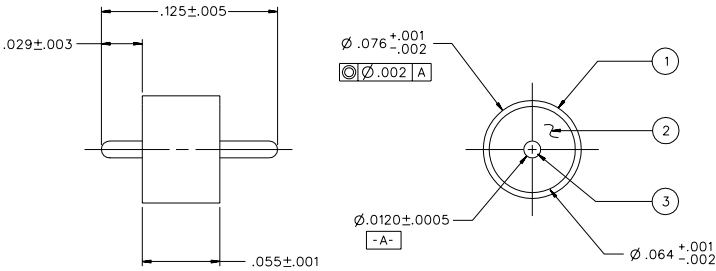
| Gold Plated  | Passivated   | Accepts Pin Size                 |
|--------------|--------------|----------------------------------|
| 145-0701-001 | 145-0701-002 | .0120 +/-0.0005 (0.305 +/-0.013) |



Mounting hole layout

In-Series Adapters

Hermetic Seal Feedthru



| Part No.     | Item 1 – Outer Ring                                      | Item 2 – Insulator                     | Item 3 – Pin                                               |
|--------------|----------------------------------------------------------|----------------------------------------|------------------------------------------------------------|
| 142-1000-033 | Kovar<br>Gold Pl .00005 min over<br>Nickel Pl .00005 min | Glass<br>Corning 7070<br>Or Equivalent | Kovar<br>Gold Pl .00005 min. over<br>Nickel Pl .00005 min. |

Notes:  
1.The hermetic seal should be mounted as flush as possible with the housing. Excessive recession will create a high impedance air gap between connection and housing which degrades electrical performance.  
2.The use of an additional counterbore to accommodate a solder ring for seal mounting is not recommended. A slight chamfer may be used if care is taken to completely fill the area with solder. **Avoid air gaps!**

Electrical

**Impedance:** 50 Ohms  
**Frequency Range:** DC to 40 GHz  
**VSWR:** Dependent upon application  
**Working Voltage:** 250 VRMS max at sea level  
**Dielectric Withstanding Voltage:** 500 VRMS min at sea level  
**Insulation Resistance:** 5000 Megohm min  
**Insertion Loss:** 0.2 dB max at 40 GHz

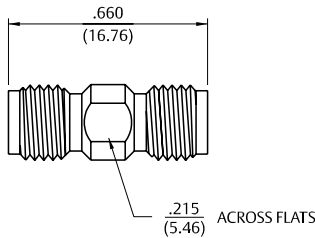
Environmental

**Hermeticity:** 1x10-8 cc/sec at one atmosphere  
**Solderability:** MIL-STD-202, Method 209  
**Operating Temperature:** -55° C to +165° C

Jack to Jack In-Series Adapter



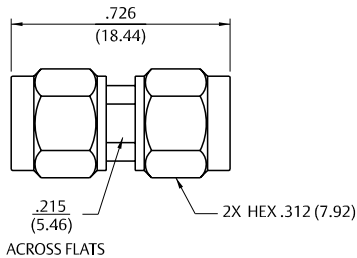
Gold Plated  
145-0901-801



Plug to Plug In-Series Adapter



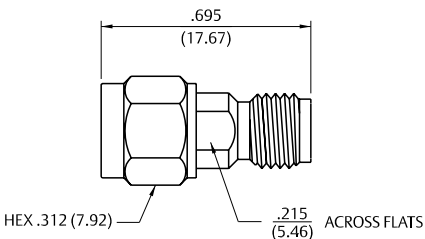
Gold Plated  
145-0901-811



Plug to Jack In-Series Adapter



Gold Plated  
145-0901-821



SMA Connectors

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Specifications

Electrical Ratings

Impedance: 50 Ohms

Frequency Range:

|                                                                                  |            |
|----------------------------------------------------------------------------------|------------|
| Dummy loads .....                                                                | 0-2.00 GHz |
| Flexible cabled connectors .....                                                 | 0-12.4 GHz |
| Uncabled receptacles, Right Angle Semi-Rigid cabled connectors and adapters..... | 0-18.0 GHz |
| Straight Semi-Rigid cabled connectors and field replaceable connectors .....     | 0-26.5 GHz |

|                                                        | Straight          | Right Angle       |
|--------------------------------------------------------|-------------------|-------------------|
|                                                        | Cabled Connectors | Cabled Connectors |
| RG-178.....                                            | 1.20 + .025f      | 1.20 + .03f       |
| RG-316, LMR-100.....                                   | 1.15 + .02f       | 1.15 + .03f       |
| RG-58, LMR-195.....                                    | 1.15 + .01f       | 1.15 + .02f       |
| RG-142.....                                            | 1.15 + .01f       | 1.15 + .02f       |
| LMR-200, LMR-240 .....                                 | 1.10 + .03f       | 1.10 + .06f       |
| RG-405.....                                            | 1.07 + .008f      | 1.18 + .015f      |
| RG-402 (w/contact) .....                               | 1.05 + .008f      | 1.15 + .015f      |
| RG-402 (w/o contact) .....                             | 1.035 + .005f     |                   |
| Jack-bulkhead jack adapter and plug-plug adapter ..... |                   | 1.05 + .010f      |
| Jack-jack adapter and plug-jack adapter .....          |                   | 1.05 + .005f      |
| Uncabled receptacles, dummy loads.....                 |                   | N/A               |
| Field replaceable (see page 80).....                   |                   | N/A               |

|                                                                               | Sea Level | 70K Feet |
|-------------------------------------------------------------------------------|-----------|----------|
| Working Voltage: (VRMS max)†                                                  |           |          |
| RG-178 .....                                                                  | 170       | 45       |
| RG-316, LMR-100, 195, 200 .....                                               | 250       | 65       |
| RG-58, RG-142, LMR-240, RG-405, uncabled receptacles, RG-402 w/o contact..... | 335       | 85       |
| RG-402 with contact and adapters.....                                         | 500       | 125      |
| Dummy loads .....                                                             |           | N/A      |

|                                                                              |      |
|------------------------------------------------------------------------------|------|
| Dielectric Withstanding Voltage: (VRMS min at sea level)†                    |      |
| RG-178.....                                                                  | 500  |
| RG-316, LMR-100, 195, 200 .....                                              | 750  |
| RG-58, RG-142, LMR-240, RG-405, field replaceable, uncabled receptacles..... | 1000 |
| RG-402 with contact and adapters .....                                       | 1500 |
| RG-402 w/o contact, dummy loads.....                                         | N/A  |

Insulation Resistance: 5000 megohms min

| Contact Resistance: (milliohms max)                                        | 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

|                                                                               |     |
|-------------------------------------------------------------------------------|-----|
| Corona Level: (Volts min at 70,000 feet)†                                     |     |
| RG-178 .....                                                                  | 125 |
| RG-316, LMR-100, 195, 200 .....                                               | 190 |
| RG-58, RG-142, LMR-240, RG-405, uncabled receptacles, RG-402 w/o contact..... | 250 |
| RG-402 with contact and adapters .....                                        | 375 |
| Dummy loads.....                                                              | N/A |

Specifications

Insertion Loss: (dB max)

|                                                         |                                                |
|---------------------------------------------------------|------------------------------------------------|
| Straight flexible cable connectors and adapters .....   | $0.06\sqrt{f\text{ (GHz)}}$ , tested at 6 GHz  |
| Right angle flexible cable connectors .....             | $0.15\sqrt{f\text{ (GHz)}}$ , tested at 6 GHz  |
| Straight Semi-Rigid cable connectors with contact ..... | $0.03\sqrt{f\text{ (GHz)}}$ , tested at 10 GHz |
| Right angle Semi-Rigid cable connectors .....           | $0.05\sqrt{f\text{ (GHz)}}$ , tested at 10 GHz |
| Straight Semi-Rigid cable connectors w/o contact .....  | $0.03\sqrt{f\text{ (GHz)}}$ , tested at 16 GHz |
| Straight low loss flexible cable connectors .....       | $0.06\sqrt{f\text{ (GHz)}}$ , tested at 1 GHz  |
| Right Angle low loss flexible cable connectors .....    | $0.15\sqrt{f\text{ (GHz)}}$ , tested at 1 GHz  |

Uncabled receptacles, field replaceable, dummy loads..... N/A

RF Leakage: (dB min, tested at 2.5 GHz)

|                                                                                                  |        |
|--------------------------------------------------------------------------------------------------|--------|
| Flexible cable connectors, adapters and RG-402 connectors w/o contact .....                      | -60 dB |
| Field replaceable w/o EMI gasket.....                                                            | -70 dB |
| RG-405 connectors and RG-402 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 min, tested at 4 and 7 MHz)†                                                        |      |
| RG-178.....                                                                               | 335  |
| RG-316, LMR-100, 195, 200.....                                                            | 500  |
| RG-58, RG-142, LMR-240, RG-405, RG-402 connectors w/o contact, uncabled receptacles ..... | 670  |
| RG-402 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-STD-348, Series SMA                                                                  |
| Engagement/Disengagement Force: | 2 lb-in max                                                                              |
| Mating Torque:                  | 7 to 10 lb-in                                                                            |
| Bulkhead Mounting Nut Torque:   | 15 lb-in                                                                                 |
| Coupling Proof Torque:          | 15 lb-in min                                                                             |
| Coupling Nut Retention:         | 60 lbs min                                                                               |
| Contact Retention:              | 6 lbs min axial force (captivated contacts)<br>4 oz-in min torque (uncabled receptacles) |

| Cable Retention: ..... | Axial Force* (lbs) | Torque (oz-in) |
|------------------------|--------------------|----------------|
| RG-178.....            | 10                 | N/A            |
| RG-316, LMR-100.....   | 20                 | N/A            |
| LMR-195, 200 .....     | 30                 | N/A            |
| RG-58, LMR-240.....    | 40                 | N/A            |
| RG-142.....            | 45                 | N/A            |
| RG-405.....            | 30                 | 16             |
| RG-402.....            | 60                 | 55             |

\* Or cable breaking strength whichever is less.

Durability: 500 cycles min 100 cycles min for RG-402 connectors w/o contact

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                      |                                                        |
|----------------------|--------------------------------------------------------|
| Temperature Range:   | - 65°C to + 165°C                                      |
| Thermal Shock:       | MIL-STD-202, Method 107, Condition B (N/A dummy loads) |
| Corrosion:           | MIL-STD-202, Method 101, Condition B (N/A dummy loads) |
| Shock:               | MIL-STD-202, Method 213, Condition I (N/A dummy loads) |
| Vibration:           | MIL-STD-202, Method 204, Condition Dv                  |
| Moisture Resistance: | MIL-STD-202, Method 106 (N/A dummy loads)              |

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

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Illustrations are shown in inches (millimeters).

Specifications

Material Specifications

- Bodies:**
- Contacts:**
- Nut Retention Spring:**
- Insulators:**
- Expansion Caps:**
- Crimp Sleeves:**
- Mounting Hardware:**
- Seal Rings:**
- EMI Gaskets:**
- Brass per ASTM B16, gold plated\* per MIL-DTL-45204 .00001” min. or nickel plated per SAE-AMS2423

Male - brass per ASTM B16, gold plated per MIL-DTL-45204 .00005” min

Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00005” min

Beryllium copper per ASTM B196, Unplated

PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457 or Tefzel per ASTM D 3159 or PFA 340 per ASTM D 3307

Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001” min. or nickel plated per SAE-AMS2423

Copper per ASTM B301 or brass per ASTM B16, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423

Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers), gold plated per MIL-DTL-45204 .00005” min or nickel plated per SAE-AMS2423

Silicone rubber per A-A-59588A

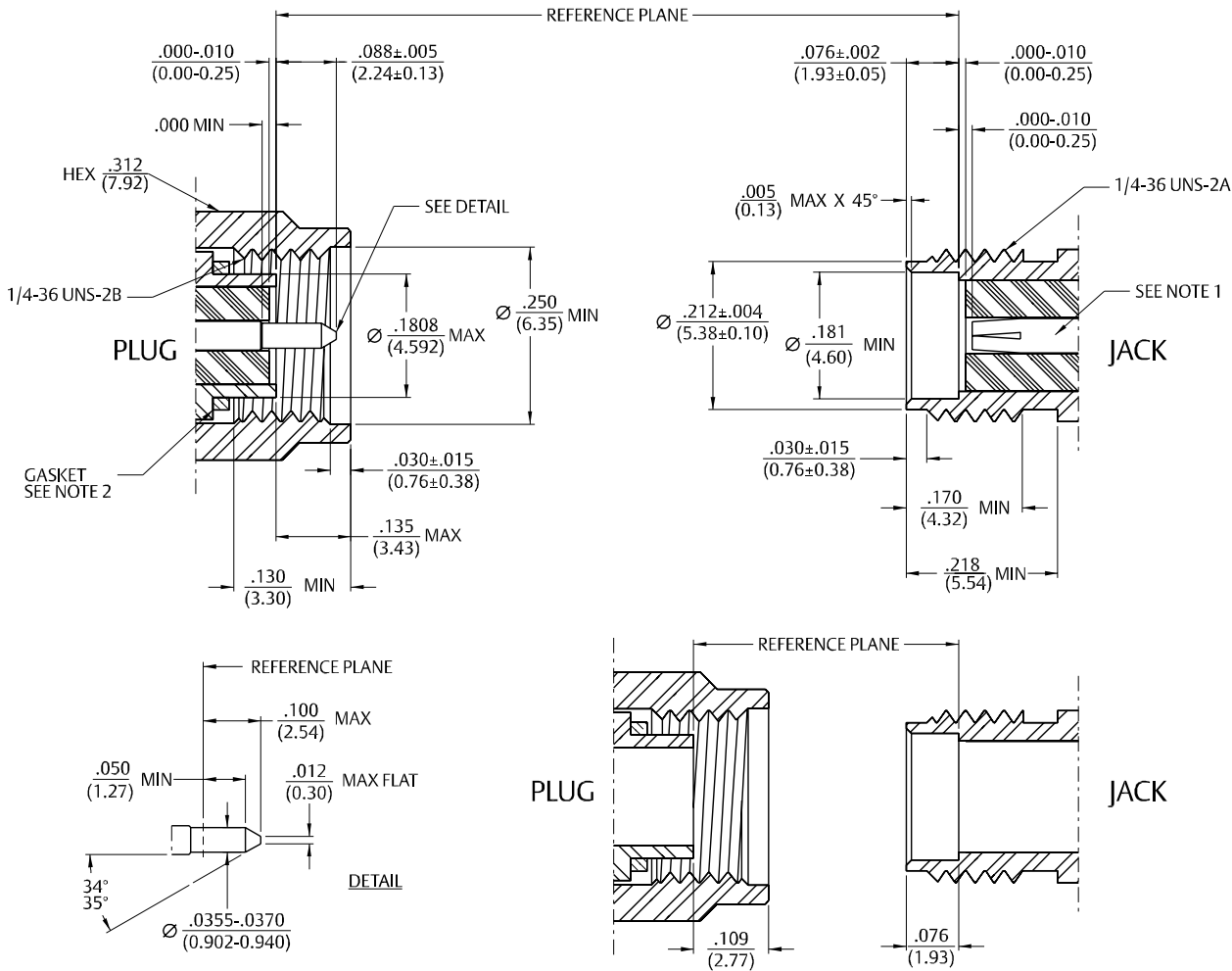
Conductive silicone rubber per MIL-G-83528, Type M

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

Mating Engagement for SMA Series

- NOTES
1. ID to meet VSWR, contact resistance and insertion withdrawl forces when mated with a dia. .0355-.0370 pin.

2. Gasket is not supplied with brass connectors.



Quick Connect

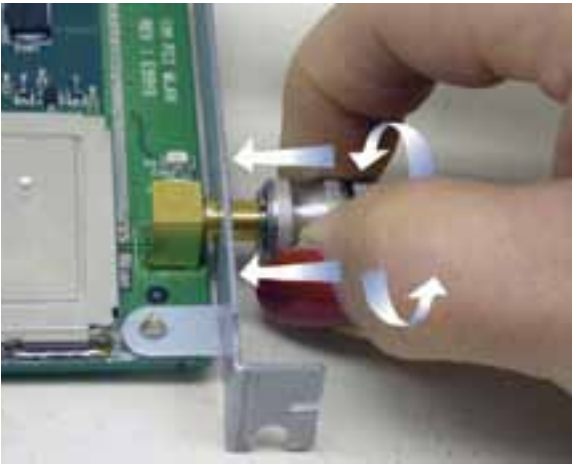
The Johnson line of **SMA Quick-Connect Plug** quickly mates to a standard, threaded SMA Jack receptacle allowing rapid test connections to devices utilizing SMA threaded jacks.

SMA electrical performance is not compromised because the connector retains all the benefits of a threaded coaxial coupling. The final connection is a solid metal to metal coupling not relying on spring forces to maintain the coupling. This results in a more reliable connection with less signal leakage and a lower VSWR than most push-on connectors.

Full MIL-PRF-39012 electrical compatibility is obtained with a push and twist motion. The knurled thumbnut requires only one half to one full turn to create a solid electromechanical connection. Rapid disconnect is accomplished with a twist and pull motion.

The SMA Quick-Connect Plug Adapter converts a standard SMA Plug test cable into a Quick-Connect cable. This makes the testing process more efficient by reducing the time and effort required to connect and disconnect the test cable.

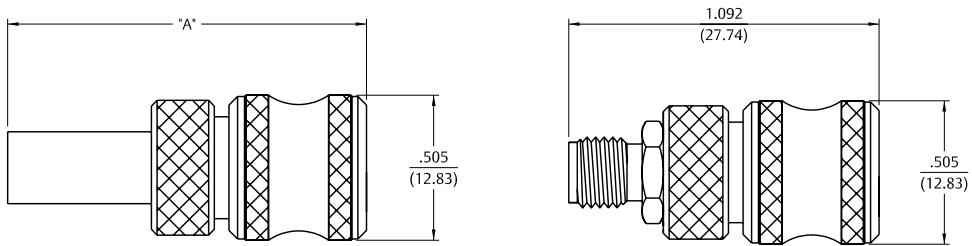
Note: Push-on using front of connector, twist back-end coupling nut to secure.



| Plugs                 |               |       |
|-----------------------|---------------|-------|
| Cable Type            | Gold Plated * | "A"   |
| RG-161, 174, 188, 316 | 142-1403-001  | 1.249 |
| RG-188 DS, RG-316 DS  | 142-1404-001  | 1.249 |
| RG-58, 141, 303       | 142-1407-001  | 1.099 |
| RG-55, 142, 223, 400  | 142-1408-001  | 1.249 |

\*Nickel plated coupling hardware, gold plated body  
Assembly instructions page 219.

| Adapters      |  |
|---------------|--|
| Gold Plated * |  |
| 142-1901-821  |  |



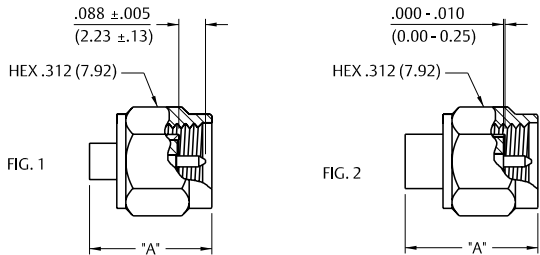
Semi-Rigid Cable

Straight Solder Type Plug – with Contact, Captive Nut Thin Wall Connector Interface



| Cable Type | Gold Plated   | Nickel Plated | Fig. | "A"          |
|------------|---------------|---------------|------|--------------|
| RG-405     | 142-0693-001  | 142-0693-006  | 1    | .405 (10.29) |
| RG-402     | 142-0694-001* | 142-0694-006* | 2    | .440 (11.18) |

Assembly instructions page 214.  
\*Mating torque 8 lb-in max, coupling proof torque 8 lb-in max.

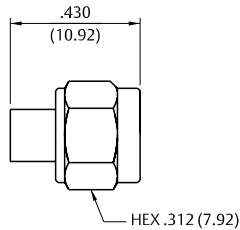


Straight Solder Type Plug – without Contact, Thread-on Nut



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-402     | 142-0694-011 | 142-0694-016  |

Assembly instructions page 214.  
Center conductor of cable serves as contact.

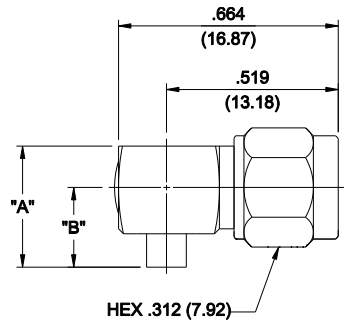


Right Angle Solder Type Plug (1-piece body)



| Cable Type | Gold Plated  | Nickel Plated | "A"          | "B"         |
|------------|--------------|---------------|--------------|-------------|
| RG-405     | 142-0693-101 | 142-0693-106  | .336 (8.53)  | .253 (6.43) |
| RG-402     | 142-0694-101 | 142-0694-106  | .462 (11.73) | .306 (7.77) |

Assembly instructions page 213.

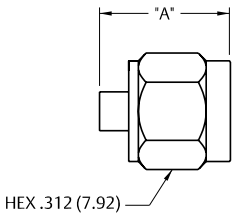


Straight Solder Type Plug – with Contact, Thread-on Nut



| Cable Type | Gold Plated  | Nickel Plated | "A"          |
|------------|--------------|---------------|--------------|
| RG-405     | 142-0693-051 | 142-0693-056  | .405 (10.29) |
| RG-402     | 142-0694-051 | 142-0694-056  | .438 (11.13) |

Assembly instructions page 216.

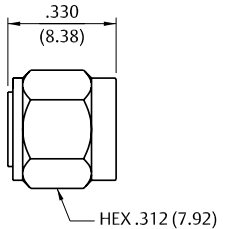


Straight Solder Type Plug – Short Profile – without Contact, Captive Nut



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-402     | 142-0694-031 | 142-0694-036  |

Assembly instructions page 215. Center conductor of cable serves as contact.

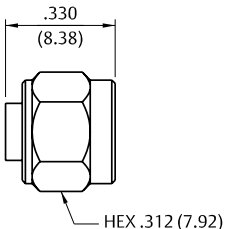


Straight Solder Type Plug – without Contact, Slide-on Nut



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-402     | 142-0694-021 | 142-0694-026  |

Assembly instructions page 215.  
Center conductor of cable serves as contact.

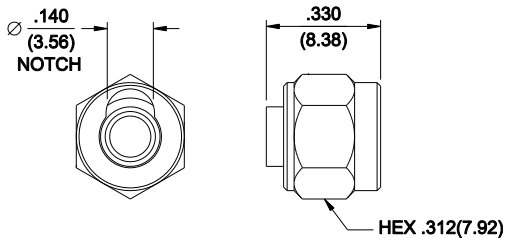


Straight Solder Type Plug – without Contact, Slide-on Notched Nut



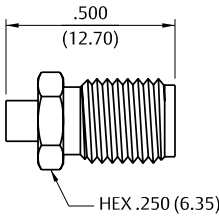
| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-402     | 142-0694-041 | 142-0694-046  |

Assembly instructions page 215. Center conductor of cable serves as contact.



Semi-Rigid Cable

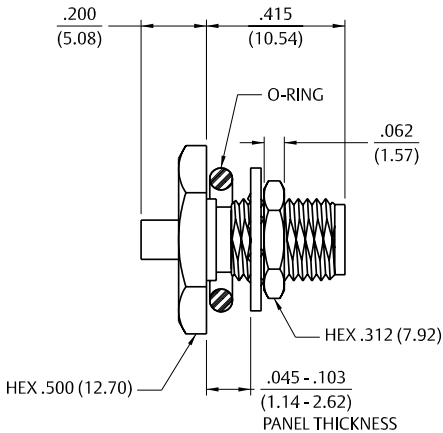
Straight Solder Type Jack



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 142-0593-001 | 142-0593-006  |
| RG-402     | 142-0594-001 | 142-0594-006  |

Assembly instructions page 214.

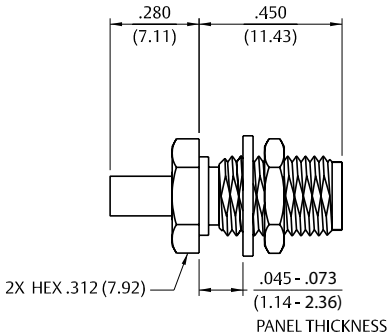
Straight Solder Type Bulkhead Jack with O-Ring



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 142-0593-401 | 142-0593-406  |
| RG-402     | 142-0594-401 | 142-0594-406  |

Assembly instructions page 214.  
Mounting hole layout figure 1 page 194.

Straight Solder Type Bulkhead Jack

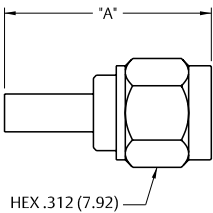


| Cable Type | Gold Plated  |
|------------|--------------|
| RG-405     | 142-0593-411 |

Assembly instructions page 214.  
Mounting hole layout figure 1 page 194.

Flexible Cable

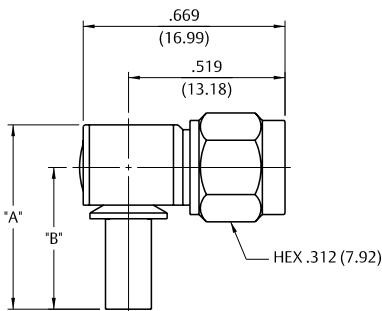
Straight Crimp Type Plug (3-piece) – Solder or Crimp Captivated Contact



| Cable Type                                    | Gold Plated  | Nickel Plated | "A"          |
|-----------------------------------------------|--------------|---------------|--------------|
| RG-178, 196                                   | 142-0402-011 | 142-0402-016  | .591 (15.01) |
| RG-161, 174, 188, 316, LMR-100 HPF-100 RF-100 | 142-0403-011 | 142-0403-016  | .706 (17.93) |
| RG-188 DS, RG-316 DS                          | 142-0404-011 | 142-0404-016  | .706 (17.93) |
| RG-58, 141, 303, LMR-195, HPF-195, RF-195     | 142-0407-011 | 142-0407-016  | .706 (17.93) |
| RG-55, 142, 223, 400                          | 142-0408-011 | 142-0408-016  | .706 (17.93) |
| RG-179, 187                                   | 142-0433-011 | 142-0433-016  | .706 (17.93) |
| LMR-200, HPF-200, RF-200                      | 142-0439-001 | 142-0439-006  | .844 (21.44) |
| LMR-240, HPF-240, RF-240                      | 142-0435-001 | 142-0435-006  | .844 (21.44) |

Assembly Instructions: RG-178 page 217. LMR 195, 200 and 240, see page 220.  
Other cable groups, see page 219.

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                                     | Gold Plated  | Nickel Plated | "A"          | "B"          |
|------------------------------------------------|--------------|---------------|--------------|--------------|
| RG-178, 196                                    | 142-0402-101 | 142-0402-106  | .611 (15.52) | .470 (11.94) |
| R-161, 174, 188, 316, LMR-100, HPF-100, RF-100 | 142-0403-101 | 142-0403-106  | .611 (15.52) | .470 (11.94) |
| RG-188 DS, RG-316 DS                           | 142-0404-101 | 142-0404-106  | .611 (15.52) | .470 (11.94) |
| LMR-195, HPF-195, RF-195, RG-58, 141, 303      | 142-0407-101 | 142-0407-106  | .611 (15.52) | .470 (11.94) |
| RG-55, 142, 223, 400                           | 142-0408-101 | 142-0408-106  | .611 (15.52) | .470 (11.94) |
| RG-179, 187                                    | 142-0433-101 | 142-0433-106  | .611 (15.52) | .470 (11.94) |
| LMR-200, HPF-200, RF-200                       | 142-0439-101 | 142-0439-106  | .611 (15.52) | .470 (11.94) |
| LMR-240, HPF-240, RF-240                       | 142-0435-101 | 142-0435-106  | .635 (16.13) | .490 (12.45) |

Assembly Instructions: LMR 195, 200 and 240 page 229.  
Other cable groups, see page 224.

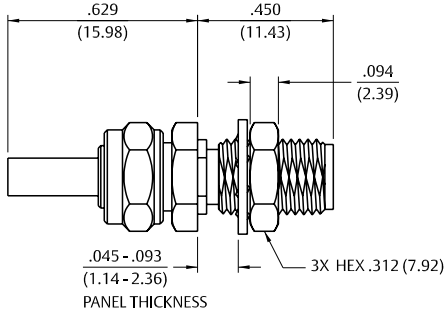
Flexible Cable

Straight Crimp Type Bulkhead Jack – Captivated Contact



| Cable Type           | Gold Plated  | Nickel Plated |
|----------------------|--------------|---------------|
| RG-178, 196          | 142-0302-401 | 142-0302-406  |
| RG-161, 174,188, 316 | 142-0303-401 | 142-0303-406  |
| RG-188 DS, RG-316 DS | 142-0304-401 | 142-0304-406  |
| RG-58, 141, 303      | 142-0307-401 | 142-0307-406  |
| RG-55, 142, 223, 400 | 142-0308-401 | 142-0308-406  |

Assembly instructions page 225.  
Mounting hole layout figure 1 page 194.

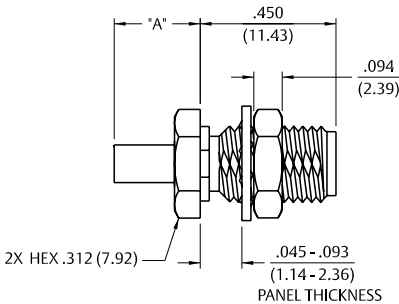


Straight Crimp Type Bulkhead Jack (3-piece) – Solder or Crimp Captivated Conact



| Cable Type                                          | Gold Plated  | Nickel Plated | "A"          |
|-----------------------------------------------------|--------------|---------------|--------------|
| RG-178, 196                                         | 142-0302-431 | 142-0302-436  | .285 (7.24)  |
| RG-161, RG-16, 174,188, 316, LMR-100 HPF-100 RF-100 | 142-0303-411 | 142-0303-416  | .385 (9.78)  |
| RG-188 DS, RG-316 DS                                | 142-0304-411 | 142-0304-416  | .385 (9.78)  |
| RG-58, 141, 303, LMR-195, HPF-195, RF-195           | 142-0307-411 | 142-0307-416  | .385(9.78)   |
| RG-55, 142, 223, 400                                | 142-0308-411 | 142-0308-416  | .385 (9.78)  |
| RG-179, 187                                         | 142-0333-411 | 142-0333-416  | .385 (9.78)  |
| LMR-200, HPF-200, RF-200                            | 142-0339-401 | 142-0339-406  | .545 (13.84) |
| LMR-240, HPF-240, RF-240                            | 142-0335-401 | 142-0335-406  | .545 (13.84) |

Assembly Instructions: RG-178 page 217. LMR 195, 200 and 240, see page 220.  
Other cable groups, see page 219. Mounting hole layout figure 1 page 194.

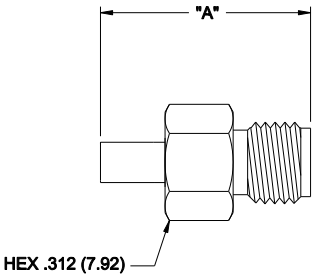


Straight Crimp Type Jack (3-piece) – Solder or Crimp Captivated Contact



| Cable Type           | Gold Plated  | Nickel Plated | "A"          |
|----------------------|--------------|---------------|--------------|
| RG-178, 196          | 142-0302-011 | 142-0302-016  | .651 (16.54) |
| RG-161, 174,188, 316 | 142-0303-011 | 142-0303-016  | .756 (19.20) |
| RG-188 DS, RG-316 DS | 142-0304-011 | 142-0304-016  | .756 (19.20) |
| RG-58, 141, 303      | 142-0307-011 | 142-0307-016  | .756 (19.20) |
| RG-55, 142, 223, 400 | 142-0308-011 | 142-0308-016  | .756 (19.20) |

Assembly Instructions: RG-178 page 217. LMR 195, 200 and 240, see page 220.  
Other cable groups, see page 219. Mounting hole layout figure 1 page 194.



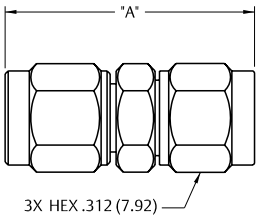
Flexible Cable

Straight Clamp Type Plug – Captivated Contact



| Cable Type                         | Gold Plated  | Nickel Plated | "A"          |
|------------------------------------|--------------|---------------|--------------|
| RG-178, 196                        | 142-0202-011 | 142-0202-016  | .816 (20.73) |
| RG-161, 174, 188, 316              | 142-0203-011 | 142-0203-016  | .816 (20.73) |
| RG-58, 141, 303, 55, 142, 223, 400 | 142-0207-011 | 142-0207-016  | .895 (22.73) |

Assembly instructions page 230.  
Mounting hole layout figure 1 page 194.

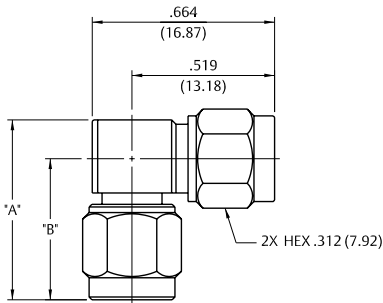


Right Angle Clamp Type Plug – Captivated Contact



| Cable Type                         | Gold Plated  | Nickel Plated | "A"          | "B"          |
|------------------------------------|--------------|---------------|--------------|--------------|
| RG-178 196                         | 142-0202-101 | 142-0202-106  | .569 (14.45) | .428 (10.81) |
| RG-161 174, 188,316                | 142-0203-101 | 142-0203-106  | .574 (14.58) | .433 (11.00) |
| RG-58, 141, 303, 55, 142, 223, 400 | 142-0207-101 | 142-0207-106  | .686 (17.42) | .545 (13.84) |

Assembly instructions page 231.  
Mounting hole layout figure 1 page 194.

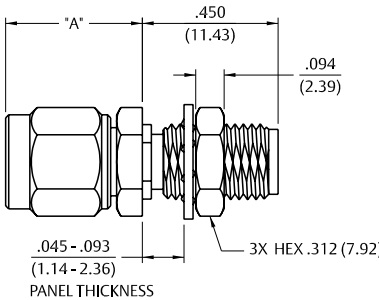


Straight Clamp Type Bulkhead Jack – Captivated Contact



| Cable Type                         | Gold Plated  | Nickel Plated | "A"          |
|------------------------------------|--------------|---------------|--------------|
| RG-178, 196                        | 142-0102-401 | 142-0102-406  | .452 (11.48) |
| RG-161, 174, 188, 316              | 142-0103-401 | 142-0103-406  | .487 (12.37) |
| RG-58, 141, 303, 55, 142, 223, 400 | 142-0107-401 | 142-0107-406  | .531 (13.49) |

Assembly instructions page 230.

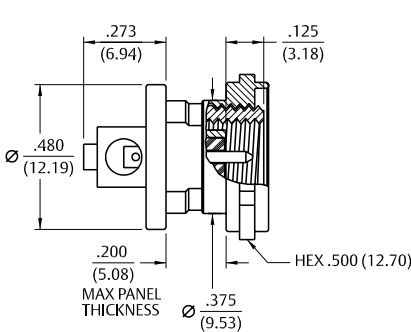


Rear Mount Bulkhead Plug – Antenna Connector



| Cable Type              | Gold Plated    |
|-------------------------|----------------|
| RG-178, .047 Semi-Rigid | 142-0801-421 * |

\* With Nickel mounting nut. Assembly instructions page 216.  
Mates with SMA Jack Antenna Interface.



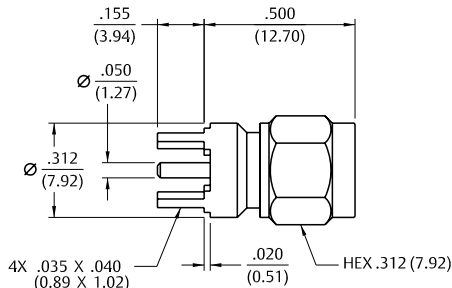
PC Mount

Straight Plug Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0801-201 | 142-0801-206  |

Mounting hole layout figure 2 page 194.

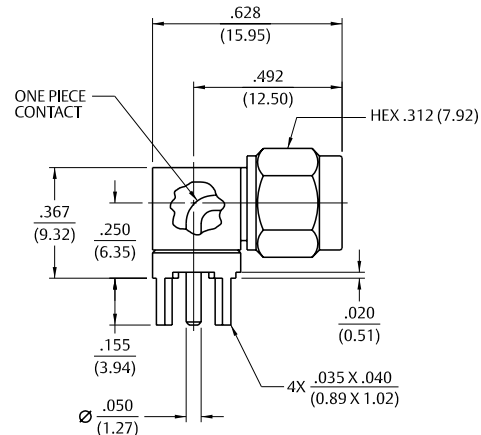


Right Angle Plug Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0801-301 | 142-0801-306  |

Mounting hole layout figure 2 page 194.

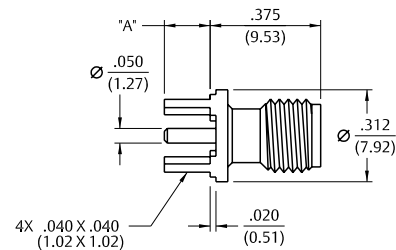


Straight Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 142-0701-201 | 142-0701-206  | .155 (3.94) |
| 142-0701-231 | 142-0701-236  | .110 (2.79) |

Mounting hole layout figure 2 page 194.

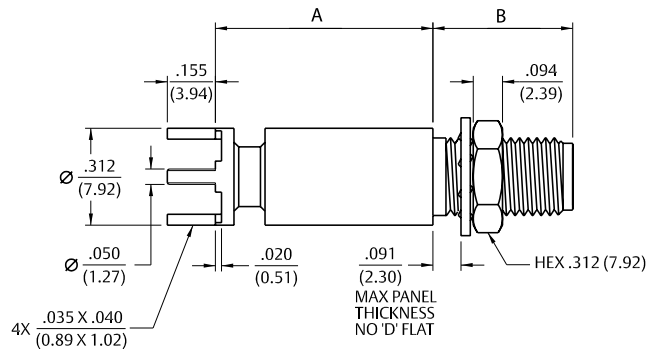


Straight Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated | "A"          | "B"          |
|--------------|---------------|--------------|--------------|
| 142-0701-421 | 142-0701-426  | .700 (17.78) | .450 (11.43) |
| 142-0701-491 | 142-0701-496  | .065 (1.65)  | .755 (19.18) |

Mounting hole layout figure 2 page 194.

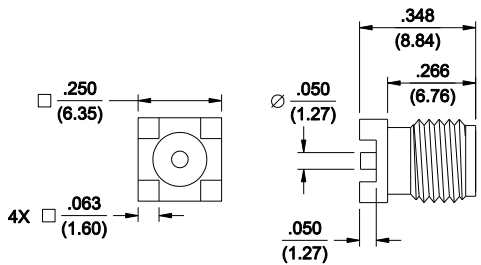


PC Mount

Straight Jack Receptacle – Surface Mount



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 142-0711-201 | Stock                      |
| 142-0711-202 | Tape and Reel 500 pcs/reel |

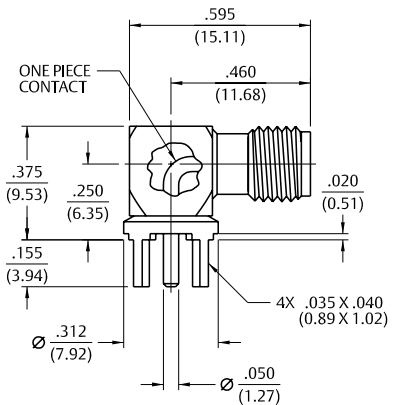


Right Angle Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-301 | 142-0701-306  |

Recommended Land Pattern figure 2 page 194.

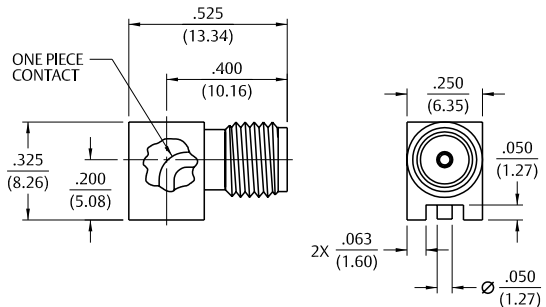


Right Angle Jack Receptacle – Surface Mount



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 142-0711-301 | Stock                      |
| 142-0711-302 | Tape and Reel 425 pcs/reel |

Recommended Land Pattern figure 7 page 194.

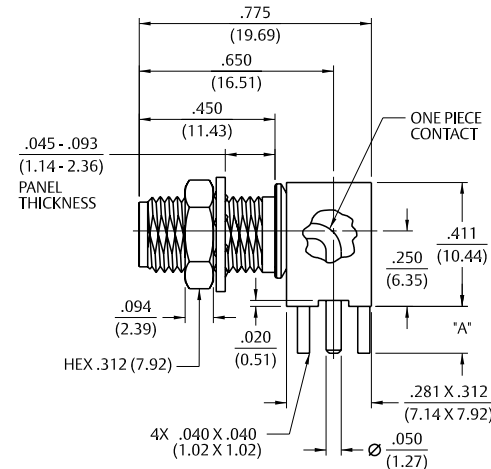


Right Angle Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 142-0701-501 | 142-0701-506  | .155 (3.94) |
| 142-0701-551 | 142-0701-556  | .110 (2.79) |

Mounting hole layout figure 1 and 2 page 194.



For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

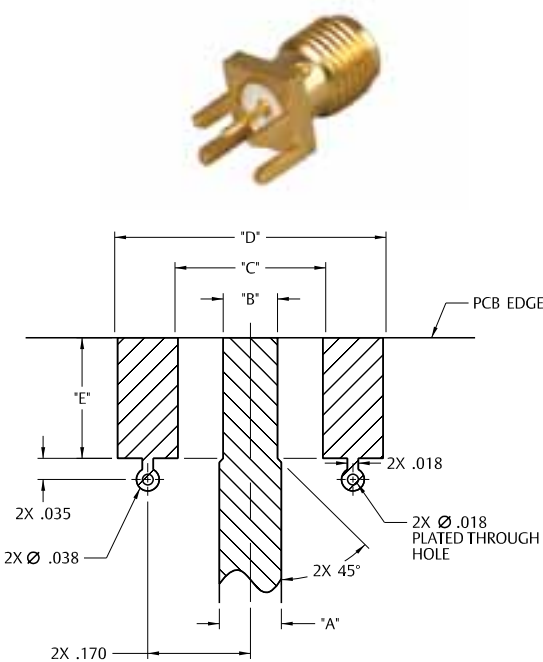
PC Mount

The **End Launch** connector is attached to the circuit board by inserting the board edge between the legs and soldering the legs and center conductor to pads on the board. For optimum high frequency performance, the connector to circuit board transition must be adjusted for low VSWR. To compensate for the transition from coax to microstrip, trace widths “A” and “B” must be adjusted based on circuit board thickness. When properly adjusted, this technique yields a low VSWR over a wide bandwidth.

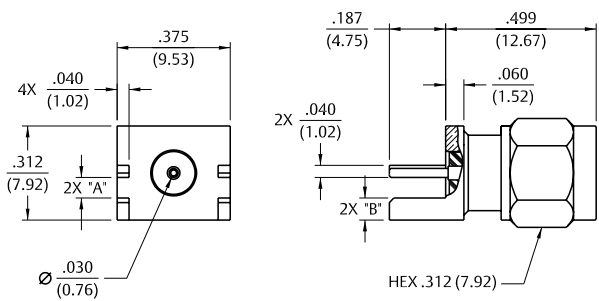
The tabulated dimensions “A”, “B”, “C”, “D”, and “E” were determined experimentally to achieve low VSWR (typically less than 1.5 up to 18 GHz). The circuit board used connectors for these tests was double-sided FR 4 with 1 oz. copper on both sides. The copper was left on the bottom of the board to create a ground plane for the 50 Ohm microstrip structure. While not all inclusive, these dimensions are given as reference information for selected SMA End Launch connectors. Further adjustments may be necessary depending upon the application. All dimensions are in inches.

| Part No.         | Base Width | Board Thickness | “A”  | “B”  | “C”  | “D”  | “E”  |
|------------------|------------|-----------------|------|------|------|------|------|
| 142-0701-801/806 | .375       | .062            | .103 | .090 | .250 | .440 | .200 |
| 142-0701-851/858 | .375       | .062            | .103 | .090 | .250 | .440 | .200 |
| 142-0701-871/876 | .375       | .062            | .103 | .090 | .250 | .440 | .200 |
| 142-0711-821/826 | .250       | .062            | .103 | .070 | .170 | .380 | .165 |
| 142-0711-871/876 | .375       | .047            | .083 | .075 | .250 | .440 | .200 |
| 142-0711-881/886 | .375       | .047            | .083 | .075 | .250 | .440 | .200 |
| 142-0701-881/886 | .375       | .031            | .050 | .045 | .250 | .440 | .200 |

Tabulated Dimensions “A”, “B”, “C”, and “D” are symmetrical about the center line.

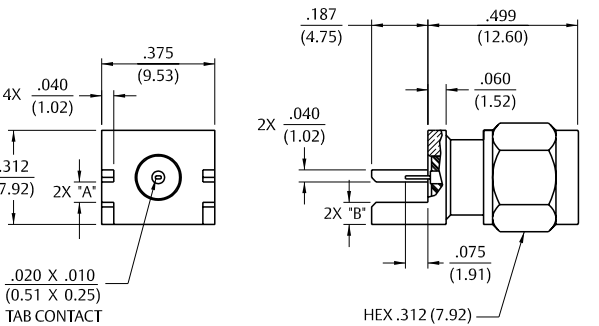


End Launch Plug Receptacle – Round Contact



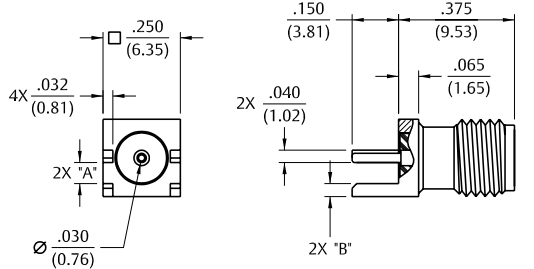
| Gold Plated  | Nickel Plated | Board Thickness | “A”         | “B”         |
|--------------|---------------|-----------------|-------------|-------------|
| 142-0801-801 | 142-0801-806  | .062 (1.57)     | .068 (1.73) | .073 (1.85) |
| 142-0801-821 | 142-0801-826  | .042 (1.07)     | .048 (1.22) | .093 (2.36) |

End Launch Plug Receptacle – Tab Contact



| Gold Plated  | Nickel Plated | Board Thickness | “A”         | “B”         |
|--------------|---------------|-----------------|-------------|-------------|
| 142-0801-811 | 142-0801-816  | .062 (1.57)     | .068 (1.73) | .083 (2.11) |
| 142-0801-831 | 142-0801-836  | .042 (1.07)     | .048 (1.22) | .103 (2.62) |

End Launch Plug Receptacle – Round Contact

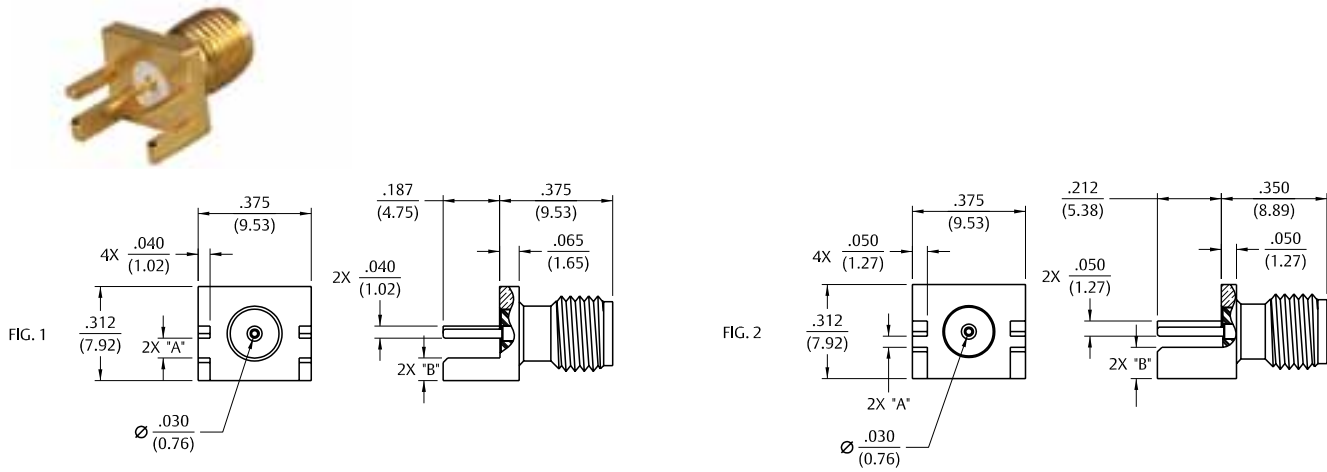


| Gold Plated  | Nickel Plated | Board Thickness | “A”         | “B”         |
|--------------|---------------|-----------------|-------------|-------------|
| 142-0711-821 | 142-0711-826  | .062 (1.57)     | .068 (1.73) | .042 (1.07) |
| 142-0711-841 | 142-0711-846  | .042 (1.07)     | .048 (1.22) | .062 (1.57) |

Coupling proof torque 8 lb-ins maximum without support .083 (2.11) wrench.

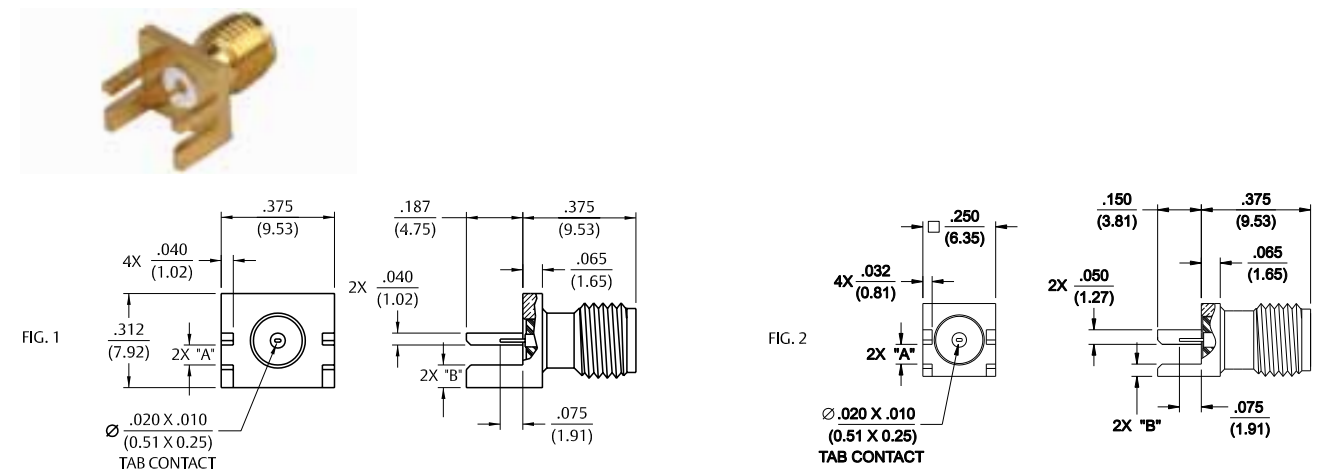
PC Mount

End Launch Jack Receptacle – Round Contact



| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         | Figure |
|--------------|---------------|-----------------|-------------|-------------|--------|
| 142-0701-801 | 142-0701-806  | .062 (1.57)     | .068 (1.73) | .073 (1.85) | 1      |
| 142-0701-831 | 142-0701-836  | .042 (1.07)     | .048 (1.22) | .093 (2.36) | 1      |
| 142-0701-881 | 142-0701-886  | .031 (0.79)     | .037 (0.94) | .104 (2.64) | 2      |
| 142-0711-871 | 142-0711-876  | .047 (1.19)     | .053 (1.35) | .088 (2.24) | 1      |

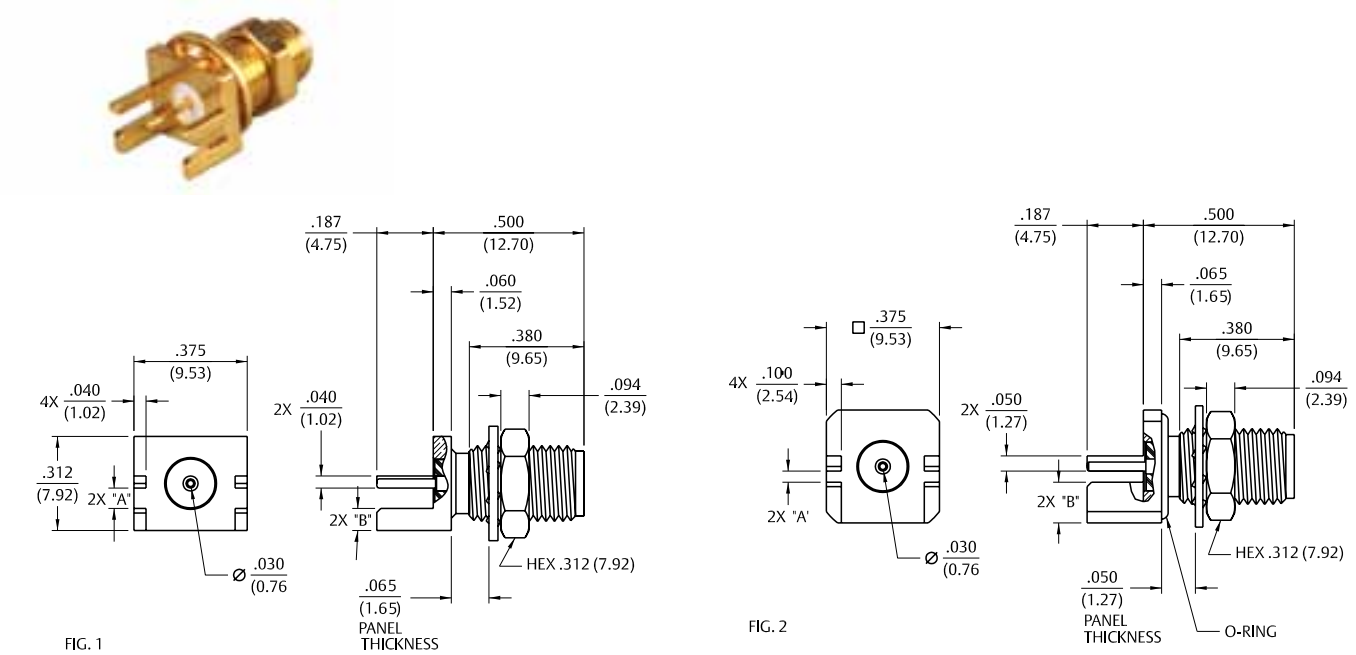
End Launch Jack Receptacle – Tab Contact



| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         | Figure |
|--------------|---------------|-----------------|-------------|-------------|--------|
| 142-0701-851 | 142-0701-856  | .062 (1.57)     | .068 (1.73) | .083 (2.11) | 1      |
| 142-0701-841 | 142-0701-846  | .042 (1.07)     | .048 (1.22) | .103 (2.62) | 1      |
| 142-0711-881 | 142-0711-886  | .047 (1.19)     | .053 (1.35) | .098 (2.24) | 1      |
| 142-0721-811 | 142-0721-816  | .025 (0.64)     | .030 (0.76) | .121 (3.07) | 1      |
| 142-0721-861 | 142-0721-866  | .032 (0.81)     | .037 (0.94) | .083 (2.11) | 2      |

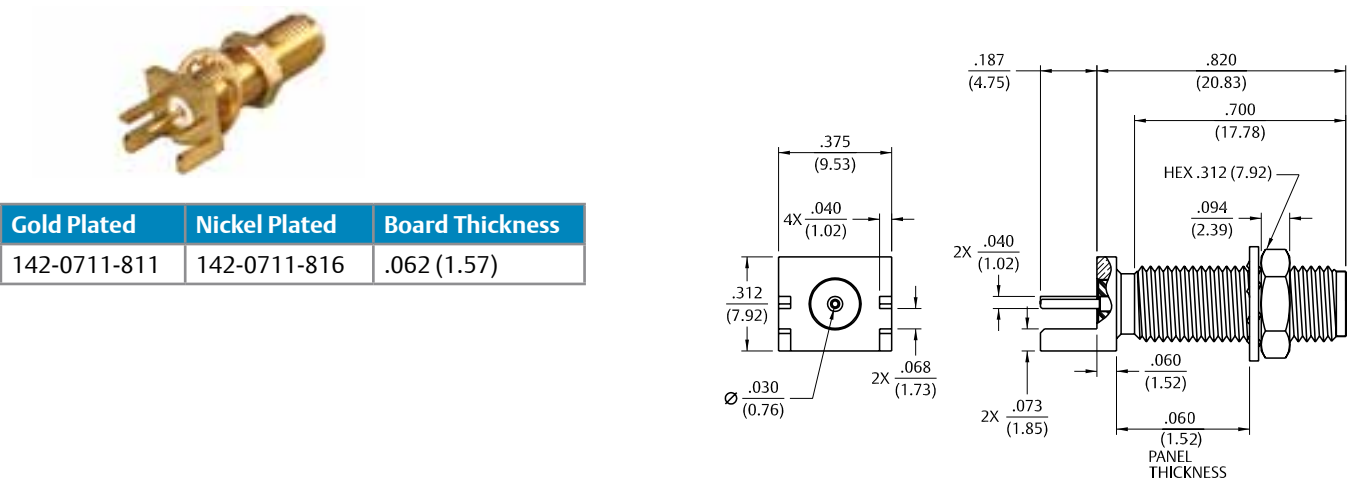
PC Mount

End Launch Bulkhead Jack Receptacle – Round Contact



| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         | "O" Ring | Figure |
|--------------|---------------|-----------------|-------------|-------------|----------|--------|
| 142-0701-871 | 142-0701-876  | .062 (1.57)     | .068 (1.73) | .073 (1.85) | No       | 1      |
| 142-0721-871 | 142-0721-876  | .074 (1.88)     | .080 (2.03) | .061 (1.55) | No       | 1      |
| 142-0721-841 | 142-0721-846  | .069 (1.75)     | .075 (1.91) | .066 (1.68) | No       | 1      |
| 142-0731-861 | 142-0731-866  | .031 (0.79)     | .037 (0.94) | .135 (3.43) | Yes      | 2      |

End Launch Bulkhead Jack Receptacle – Round Contact



| Gold Plated  | Nickel Plated | Board Thickness |
|--------------|---------------|-----------------|
| 142-0711-811 | 142-0711-816  | .062 (1.57)     |

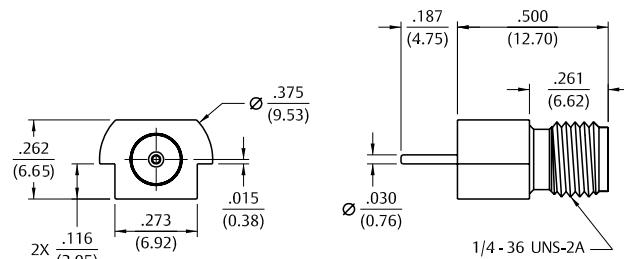
## Bulkhead Mount

## End Launch Jack Receptacle – Surface Mount



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 142-0721-881 | Stock                      |
| 142-0721-882 | Tape and Reel 475 pcs/reel |

Recommended land pattern figure 22 page 195.

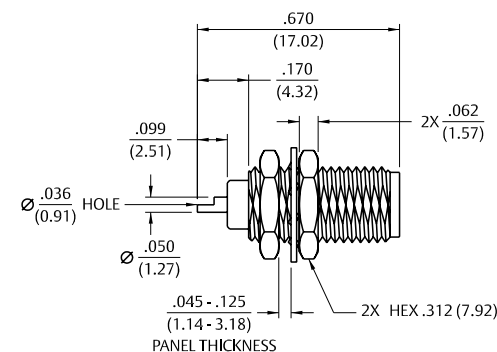


## Front Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-411 | 142-0701-416  |

Mounting hole layout figure 1 page 194.

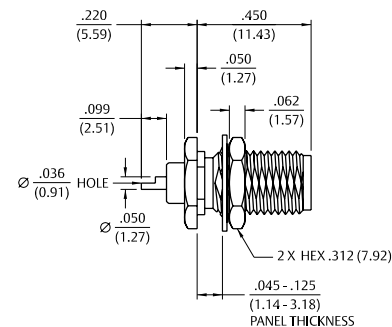


## Rear Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-401 | 142-0701-406  |

Mounting hole layout figure 1 page 194.

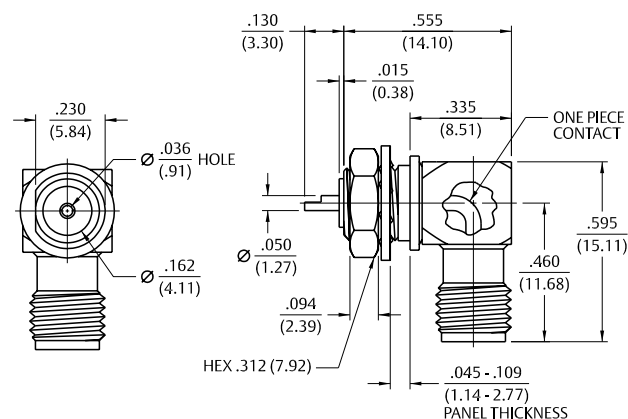


## Right Angle Bulkhead Mount Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-531 | 142-0701-536  |

Mounting hole layout figure 1 page 194.



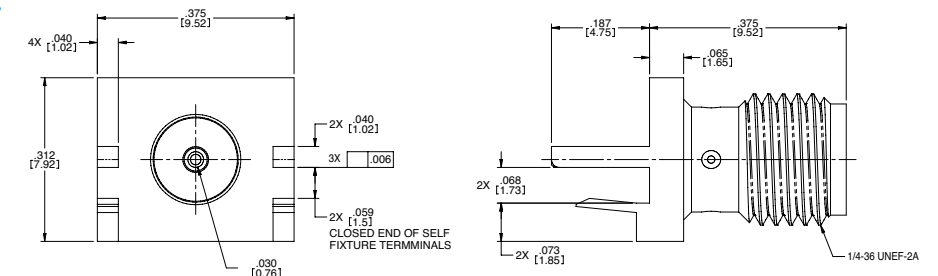
## Self-Fixture End Launch

## Gold Plated, Round Contact

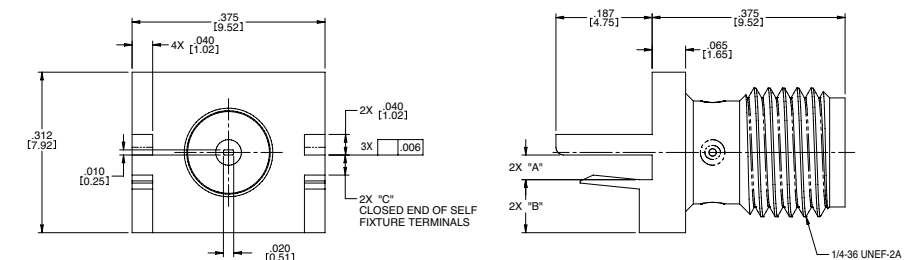


| Part No.     | Board Thickness |
|--------------|-----------------|
| 142-0791-801 | .062 (1.57)     |

Assembly instructions page 227.



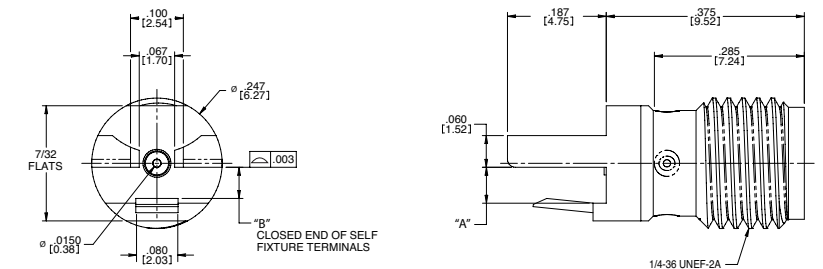
### Gold Plated, Tab Contact



| Part No.     | Board Thickness | "A"         | "B"         | "C"         |
|--------------|-----------------|-------------|-------------|-------------|
| 142-0791-811 | .042 (1.07)     | .048 (1.22) | .103 (2.62) | .039 (0.99) |
| 142-0791-821 | .062 (1.57)     | .068 (1.73) | .083 (2.11) | .059 (1.50) |

Assembly instructions page 227.

## Gold Plated, Round Contact – High Frequency



| Part No.     | Frequency Range | Board Thickness | "A"  | "B"  |
|--------------|-----------------|-----------------|------|------|
| 142-1701-821 | 0-26.5 GHz      | .062 (1.57)     | .068 | .059 |
| 142-1701-831 | 0-26.5 GHz      | .059 (1.49)     | .063 | .054 |

Assembly instructions page 227.

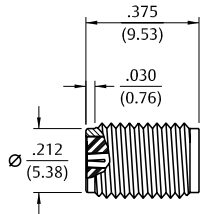
Spark Plugs

Jack Receptacle – Thread Mount Field Replaceable



| Gold Plated  | Nickel Plated | Accepts Pin Size |
|--------------|---------------|------------------|
| 142-1731-001 | 142-1731-006  | .020 (0.51)      |
| 142-1731-011 | 142-1731-016  | .036 (0.91)      |

Mounting hole layout figure 19 page 195.

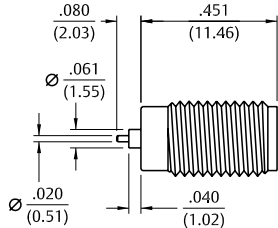


Jack Receptacle – Thread Mount Extended Dielectric (Non-Hermetic)



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-1731-021 | 142-1731-026  |

Mounting hole layout for 142-1731-021 figure 19 page 195.  
Mounting hole layout for 142-1731-026 figure 18 page 195.

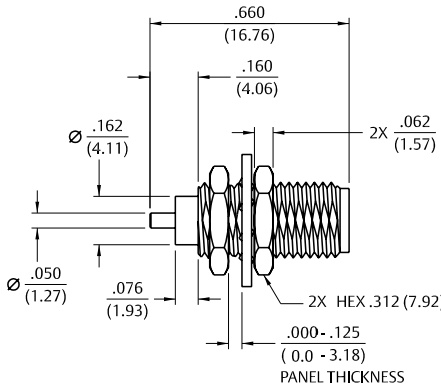


Jack Receptacle – Thread Mount with Hardware Extended Dielectric Bulkhead



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-1731-031 | 142-1731-036  |

Mounting hole layout for 142-1731-031 figure 18 page 195.  
Mounting hole layout for 142-1731-036 figure 1 page 194.



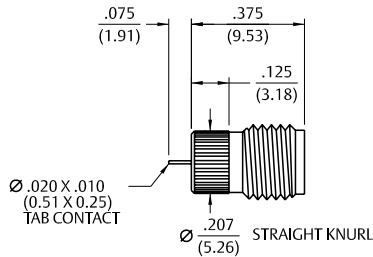
Spark Plugs

Jack Receptacle – Knurl Mount \* Tab Contact



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-1721-001 | 142-1721-006  |

\* Not intended for use in materials harder than Rockwell B82.  
Assembly tool 140-0000-954 page 188.  
Mounting hole layout figure 17 page 195.

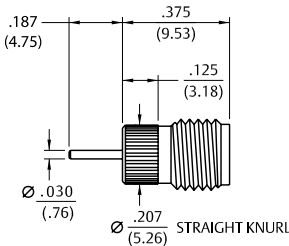


Jack Receptacle – Knurl Mount \* Round Contact



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-1721-011 | 142-1721-016  |

\* Not intended for use in materials harder than Rockwell B82.  
Assembly tool 140-0000-954 page 188.  
Mounting hole layout figure 17 page 195.



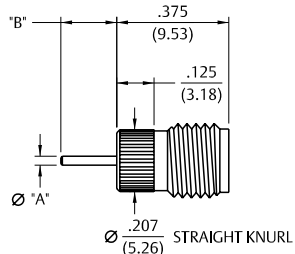
Spark Plugs

Jack Receptacle – Knurl Mount \* Round Contact



| Gold Plated  | Nickel Plated | “A”         | “B”         |
|--------------|---------------|-------------|-------------|
| 142-1721-011 | 142-1721-016  | .030 (0.76) | .187 (3.18) |
| 142-1721-021 | 142-1721-026  | .050 (1.24) | .190 (4.83) |

\* Not intended for use in materials harder than Rockwell B82.  
Mounting hole layout figure 17 page 195.

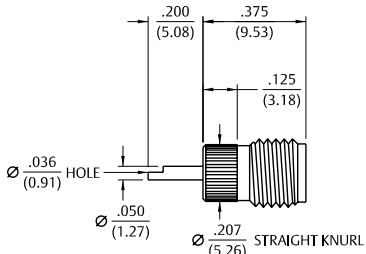


Jack Receptacle – Knurl Mount \* Solder Cup Contact



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-481 | 142-0701-486  |

\* Not intended for use in materials harder than Rockwell B82.  
Mounting hole layout figure 17 page 195.

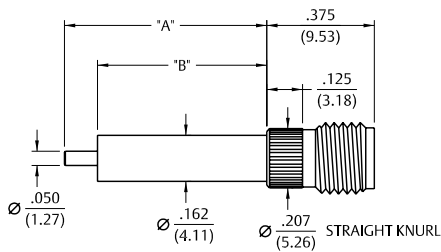


Jack Receptacle – Knurl Mount \* Extended Dielectric



| Gold Plated  | Nickel Plated | “A”          | “B”          |
|--------------|---------------|--------------|--------------|
| 142-1721-031 | 142-1721-036  | .190 (4.83)  | .095 (2.41)  |
| 142-1721-041 | 142-1721-046  | .240 (6.10)  | .180 (4.57)  |
| 142-1721-051 | 142-1721-056  | .705 (17.91) | .590 (14.99) |

\* Not intended for use in materials harder than Rockwell B82.  
Mounting hole layout figure 17 page 195.

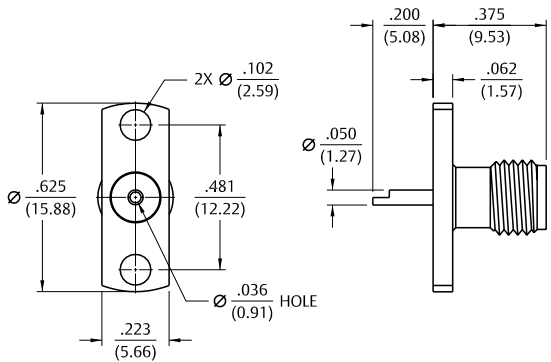


Panel Mount

2-Hole Flange Mount Jack Receptacle – Flush Dielectric



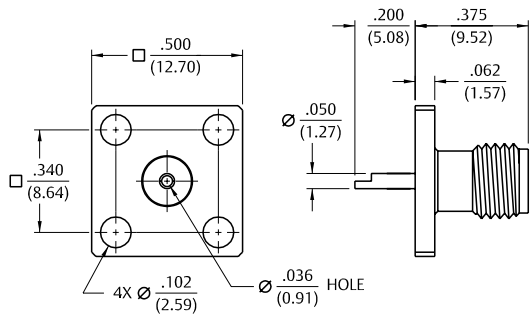
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-621 | 142-0701-626  |



4-Hole Flange Mount Jack Receptacle – Flush Dielectric



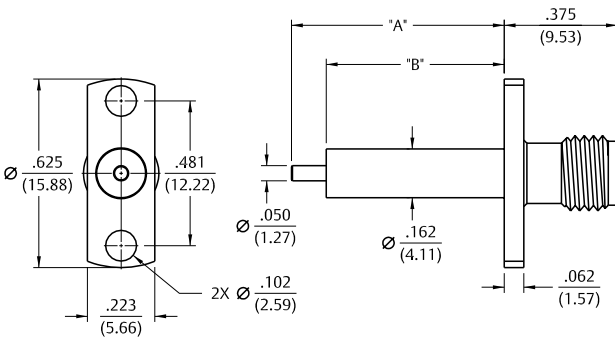
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0701-631 | 142-0701-636  |



2-Hole Flange Mount Jack Receptacle – Extended Dielectric

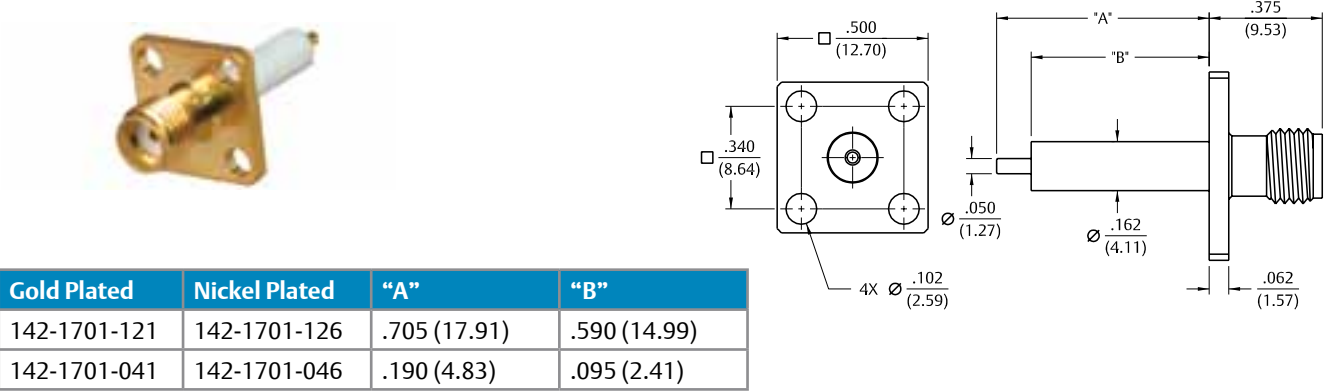


| Gold Plated  | Nickel Plated | “A”          | “B”          |
|--------------|---------------|--------------|--------------|
| 142-1701-131 | 142-1701-136  | .705 (17.91) | .590 (14.99) |
| 142-1701-031 | 142-1701-036  | .240 (6.10)  | .180 (4.57)  |

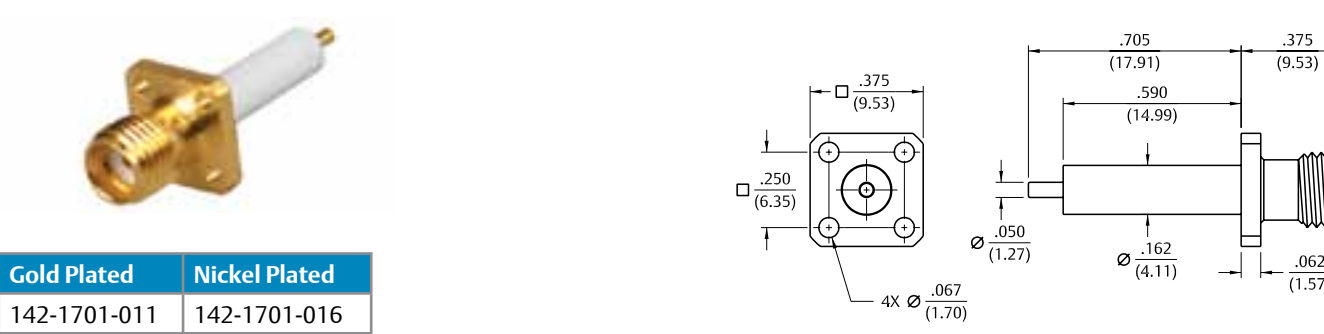


Panel Mount

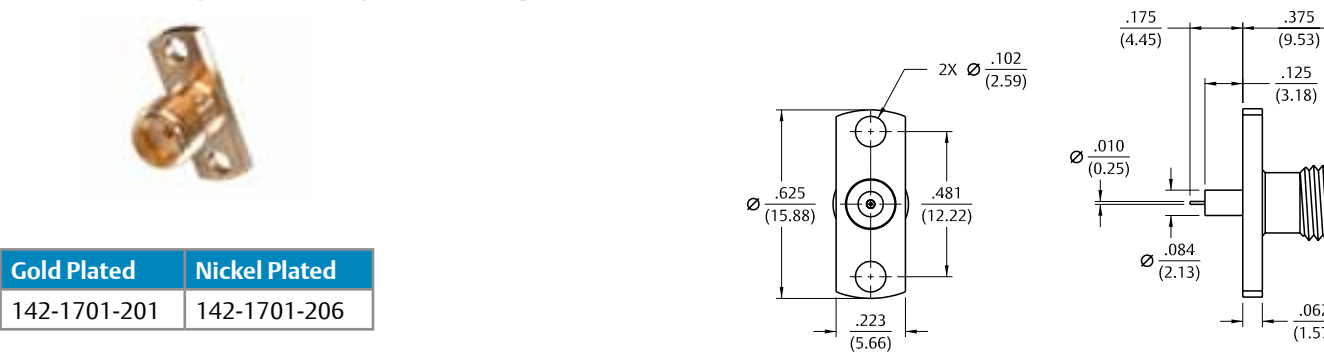
4-Hole Flange Mount Jack Receptacle – Extended Dielectric



4-Hole Flange Mount Jack Receptacle – Extended Dielectric

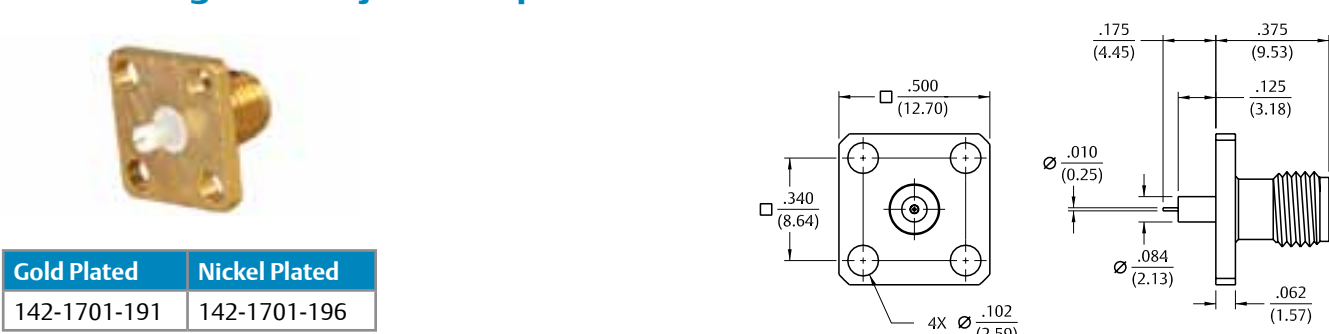


2-Hole Flange Mount Jack Receptacle – Extended Dielectric

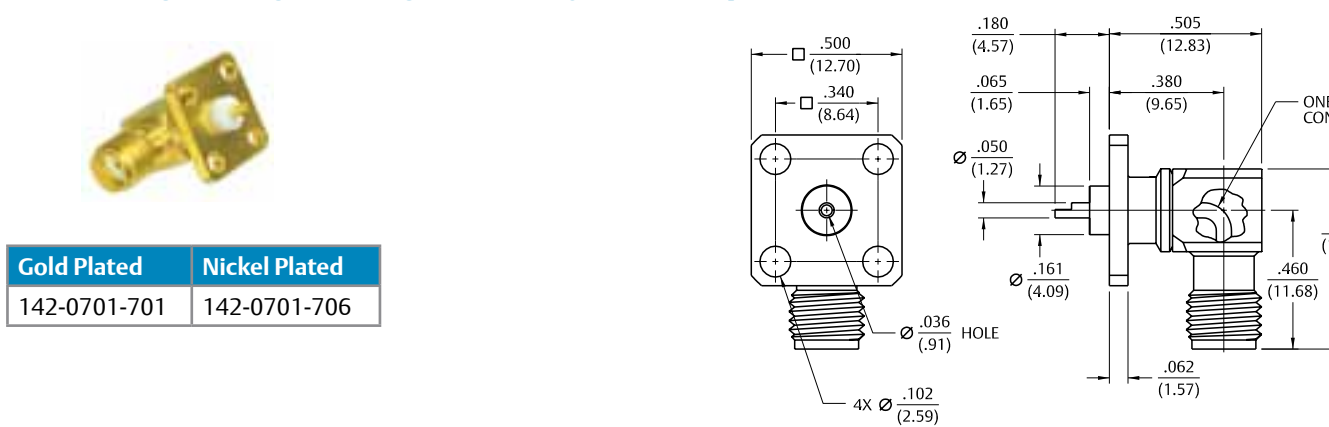


Panel Mount

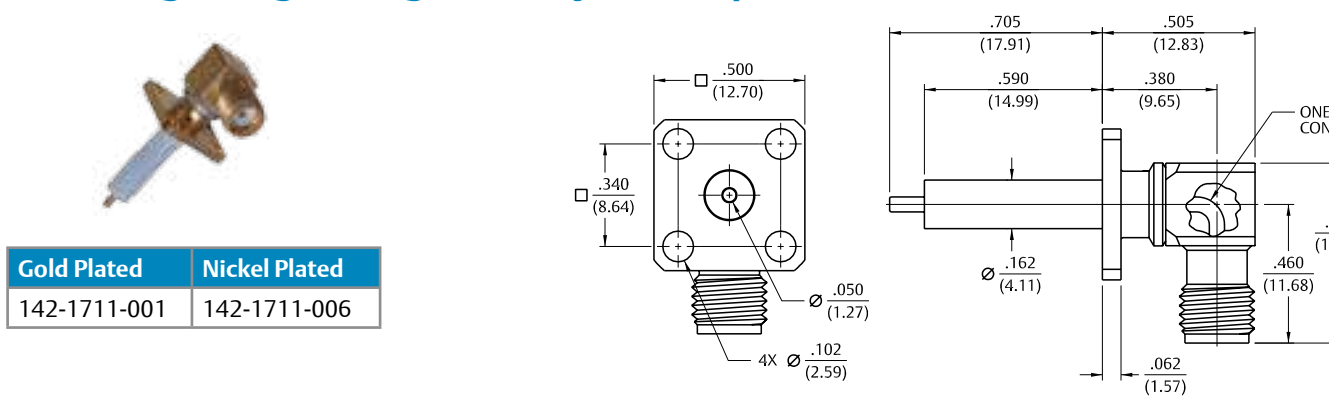
4-Hole Flange Mount Jack Receptacle – Extended Dielectric



4-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric

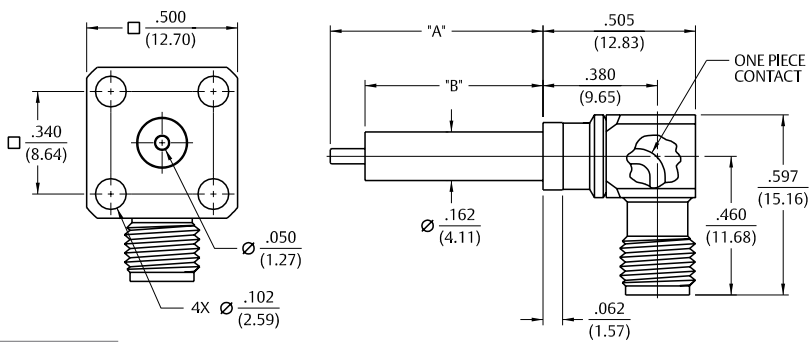


4-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric



Panel Mount

2-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric 90° Orientation

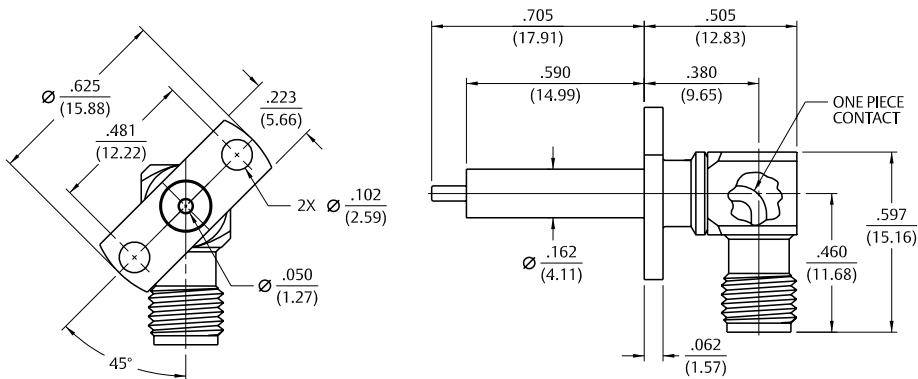


| Gold Plated  | Nickel Plated | "A"          | "B"          |
|--------------|---------------|--------------|--------------|
| 142-1711-011 | 142-1711-016  | .705 (17.91) | .590 (14.99) |
| 142-1711-061 | 142-1711-066  | .195 (4.95)  | .130 (3.30)  |

2-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric +45° Orientation



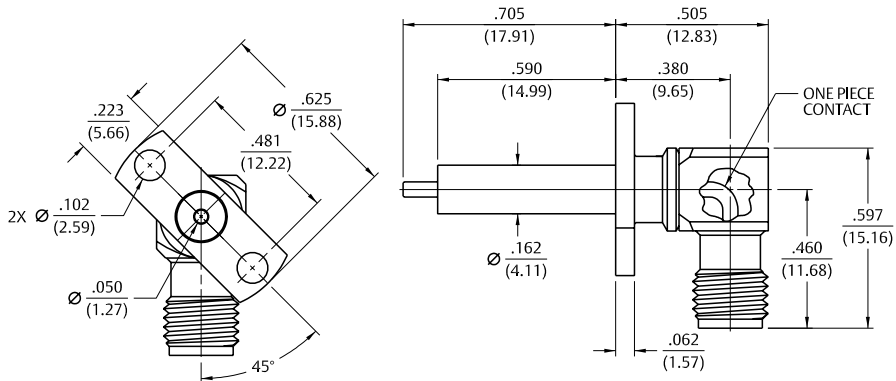
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-1711-021 | 142-1711-026  |



2-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric -45° Orientation



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-1711-031 | 142-1711-036  |



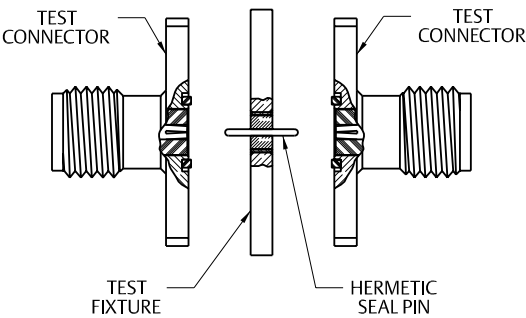
Field Replaceable

Application Notes

The field replaceable style of connector is known by many names in the industry, such as MIC launcher, hermetic seal launcher, spark plug launcher, etc. Some types, such as those known as “spark plugs,” have the hermetic seal incorporated into the connector. These types require special welding to install and can not be replaced without destroying the hermeticity of the circuit housing. True field replaceable connectors, such as the Johnson line, are easy to install and replace. Because the hermetic seal is not incorporated into the connector design, the connector can be removed and replaced without destroying the hermetic seal or the hermeticity of the circuit housing.

All of the above-mentioned connector types perform the same basic function-creating a transition from microstrip circuitry to a coaxial transmission line. Whenever possible, the hermetic seal pin diameter should be chosen as close as possible to the microstrip trace width. For optimum electrical performance, the transition from the hermetic seal to the microstrip trace must be properly compensated which involves adjusting the microstrip trace width to minimize any impedance discontinuities found in the transition area.

The plot shown below is representative of the typical return loss of a Johnson SMA field replaceable connector. To produce the data shown below, a test fixture is created using the appropriate Johnson hermetic seal. The fixture consists of a suitably thick spacer plate with the hermetic seal mounted flush to both surfaces. Two connectors are mounted back to back around the fixture and the VSWR of this test assembly is measured. The return loss data shown is equivalent to the square root of the measured VSWR of the test assembly. Since the connectors tested are of identical design, it can be stated with fair accuracy that the data shown represents the response of a single field replaceable connector and its transition to the hermetic seal.



Although we do not publish a VSWR specification for field replaceable connectors, typical connector VSWR can be expected to be better than 1.1 + .01f (f = GHz). A VSWR specification is not stated because an industry standardized method for testing field replaceable connectors does not exist. The actual performance of the connector is dependent upon the application for the following reasons:

1. The choice of hermetic seal to be used by the customer is not specified by the connector manufacturer. Hermetic seals produced by different manufacturers will not have the same electrical characteristics. For optimum electrical performance, we recommend the use of our standard 142-1000-001, 002, 003 and 004 hermetic seals for pin diameters of .012 (.30), .015 (.38), .018 (0.46) and .020 (0.51). Custom hermetic seal configurations can be quoted.
2. It is recommended that the hermetic seal be mounted flush with the circuit housing. Tolerance variations between the hermetic seal and machined housing do not always guarantee an optimum transition to the connector. Emerson does not recommend the addition of a counter bore in the circuit housing to accommodate solder washers as solder voids will cause electrical discontinuities.
3. As stated above, the transition between the hermetic seal pin and the microstrip trace will affect electrical performance. Several different methods of hermetic seal mounting and seal pin to microstrip trace attachment are used in the industry. We cannot recommend one method over the other as this is dependent upon the customer’s application.

“As always, quotes for non-standard field replaceable connectors and/or hermetic seals are welcome.”

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

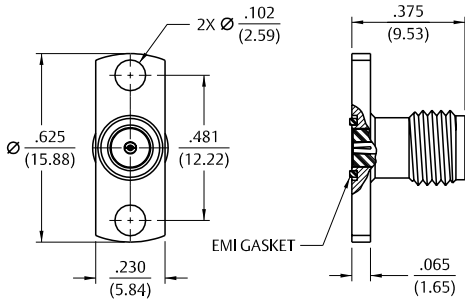
Illustrations are shown in inches (millimeters).

Field Replaceable Panel Mount

2-Hole Flange Mount Jack Receptacle – with EMI Gasket



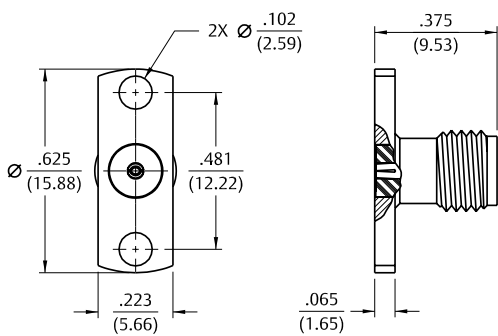
| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .012 (0.30)      | 142-1701-601 | 142-1701-606  |
| .015 (0.38)      | 142-1701-611 | 142-1701-616  |
| .018 (0.46)      | 142-1701-621 | 142-1701-626  |



2-Hole Flange Mount Jack Receptacle – without EMI Gasket



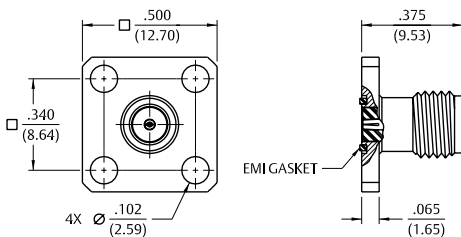
| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .020 (0.51)      | 142-1701-631 | 142-1701-636  |
| .036 (0.91)      | 142-1701-641 | 142-1701-646  |



4-Hole Flange Mount Jack Receptacle – with EMI Gasket



| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .012 (0.30)      | 142-1701-501 | 142-1701-506  |
| .015 (0.38)      | 142-1701-511 | 142-1701-516  |
| .018 (0.46)      | 142-1701-521 | 142-1701-526  |

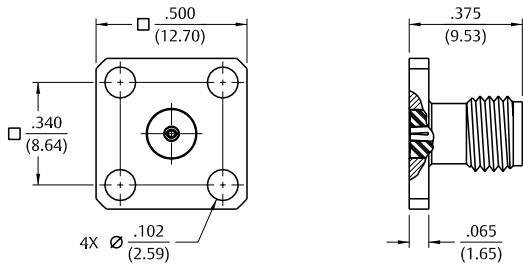


Field Replaceable Panel Mount

4-Hole Flange Mount Jack Receptacle – without EMI Gasket



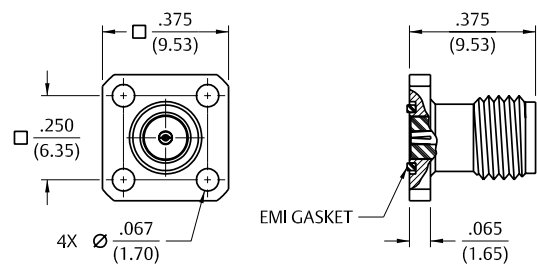
| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .020 (0.51)      | 142-1701-531 | 142-1701-536  |
| .036 (0.91)      | 142-1701-541 | 142-1701-546  |



4-Hole Flange Mount Jack Receptacle – with EMI Gasket



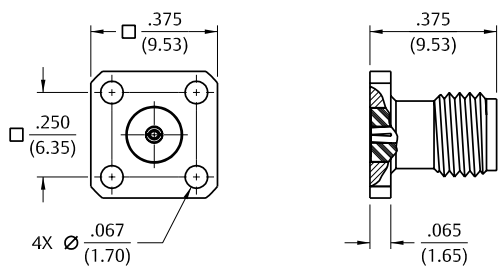
| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .012 (0.30)      | 142-1701-551 | 142-1701-556  |
| .015 (0.38)      | 142-1701-561 | 142-1701-566  |
| .018 (0.46)      | 142-1701-571 | 142-1701-576  |



4-Hole Flange Mount Jack Receptacle – without EMI Gasket

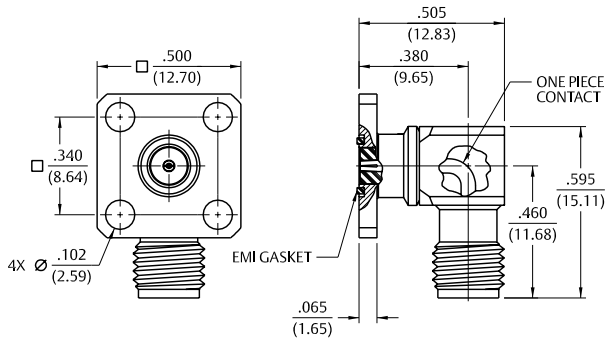


| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .020 (0.51)      | 142-1701-581 | 142-1701-586  |
| .036 (0.91)      | 142-1701-591 | 142-1701-596  |



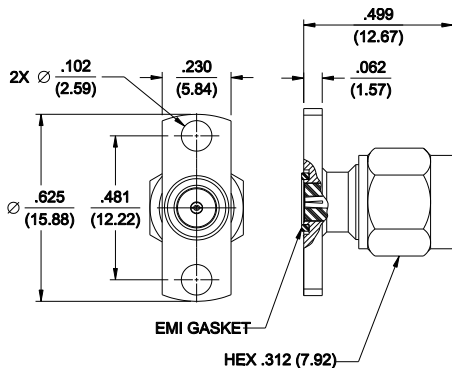
Field Replaceable Panel Mount

4-Hole Right Angle Flange Mount Jack Receptacle – with EMI Gasket



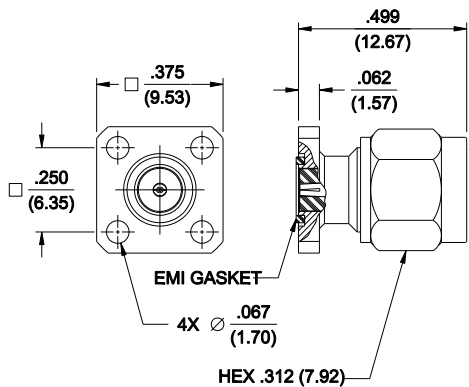
| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .015 (0.38)      | 142-1711-511 | 142-1711-516  |
| .018 (0.46)      | 142-1711-521 | 142-1711-526  |

2-Hole Flange Mount Plug Receptacle – with EMI Gasket



| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .012 (0.30)      | 142-1801-601 | 142-1801-606  |
| .015 (0.38)      | 142-1801-611 | 142-1801-616  |
| .018 (0.46)      | 142-1801-621 | 142-1801-626  |

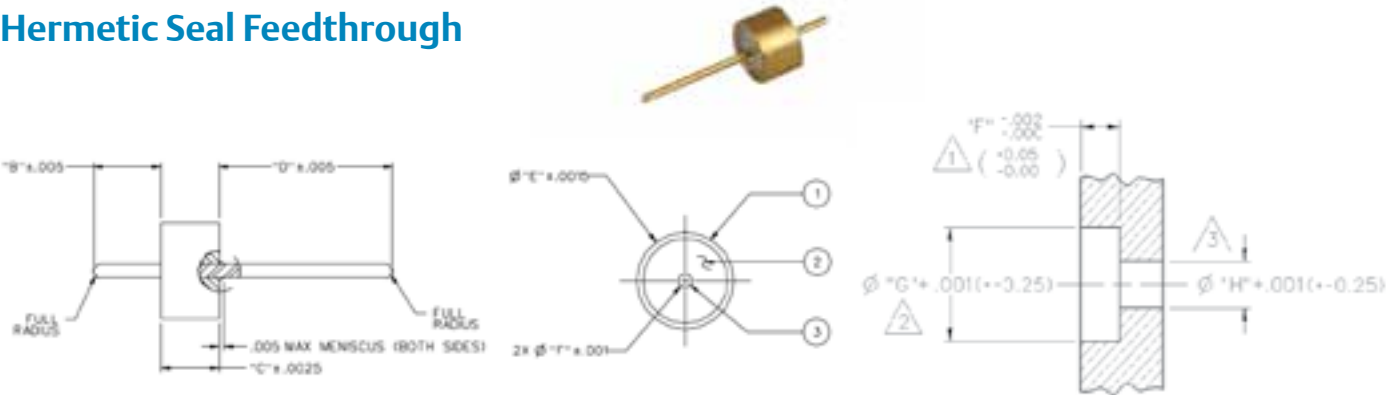
4-Hole Flange Mount Plug Receptacle – with EMI Gasket



| Accepts Pin Size | Gold Plated  | Nickel Plated |
|------------------|--------------|---------------|
| .012 (0.30)      | 142-1801-551 | 142-1801-556  |
| .015 (0.38)      | 142-1801-561 | 142-1801-566  |
| .018 (0.46)      | 142-1801-571 | 142-1801-576  |

Field Replaceable

Hermetic Seal Feedthrough



Recommended Mounting Hole Detail

| Part No.     | Item 1<br>Outer Ring                                      | Item 2<br>Insulator                    | Item 3<br>Pin                                             | "A"            | "B"             | "C"            | "D"             | "E"            |
|--------------|-----------------------------------------------------------|----------------------------------------|-----------------------------------------------------------|----------------|-----------------|----------------|-----------------|----------------|
| 142-1000-001 | Kovar<br>Gold pl .00005 min over<br>Nickel pl .000005 min | Glass<br>Corning 7052<br>or equivalent | Kovar<br>Gold pl .00005 min over<br>Nickel pl .000005 min | .070<br>(1.78) | .0625<br>(1.59) | .180<br>(4.57) | .0985<br>(2.50) | .012<br>(0.30) |
| 142-1000-002 | Kovar<br>Gold pl .00005min over<br>Nickel pl .000005 min  | Glass<br>Corning 7070<br>or equivalent | Kovar<br>Gold pl .00005 min over<br>Nickel pl .000005 mm  | .072<br>(1.83) | .0625<br>(1.59) | .180<br>(4.57) | .0985<br>(2.50) | .015<br>(0.38) |
| 142-1000-003 | Kovar<br>Gold pl .00005 min over<br>Nickel pl .000005 min | Glass<br>Corning 7050<br>or equivalent | Kovar<br>Gold pl .00005 min over<br>Nickel pl .000005 min | .072<br>(1.83) | .0600<br>(1.52) | .180<br>(4.57) | .1100<br>(2.79) | .018<br>(0.46) |
| 142-1000-004 | Kovar<br>Gold pl .00005min over<br>Nickel pl .000005 min  | Glass<br>Corning 7052<br>or equivalent | Kovar<br>Gold pl .00005 min over<br>Nickel pl .000005 min | .070<br>(1.78) | .0600<br>(1.52) | .203<br>(5.16) | .1580<br>(4.01) | .020<br>(0.51) |

Mounting Hole Dimensions

| Part No.     | Pin Diameter | "F"         | "G"         | Air "H"     | Teflon * "H" |
|--------------|--------------|-------------|-------------|-------------|--------------|
| 142-1000-001 | .012 (0.30)  | .063 (1.60) | .102 (2.59) | .028 (0.71) | .039 (0.99)  |
| 142-1000-002 | .015 (0.38)  | .063 (1.60) | .102 (2.59) | .035 (0.89) | .049 (1.24)  |
| 142-1000-003 | .018 (0.46)  | .060 (1.52) | .114 (2.90) | .042 (1.07) | .059 (1.50)  |
| 142-1000-004 | .020 (0.51)  | .060 (1.52) | .162 (4.11) | .046 (1.17) | .065 (1.65)  |

\* Teflon is a registered trademark of DuPont

Notes:

1. The hermetic seal should be mounted as flush as possible with the housing. Excessive recession will create a high impedance air gap which degrades electrical performance.
2. The use of an additional counterbore to accommodate a solder ring for seal mounting is not recommended. A slight chamfer may be used if care is taken to completely fill the area with solder—avoid air gaps.
3. Dimensions shown are given to achieve 50 Ohms with either air or a teflon insulator. A teflon insulator may be helpful insupporting small pin diameters.

Electrical

|                                  |                            |
|----------------------------------|----------------------------|
| Impedance:                       | 50 Ohms                    |
| Frequency Range:                 | DC to 26.5 GHz             |
| VSWR:                            | Dependent upon application |
| Working Voltage:                 | 250 VRMS max at sea level  |
| Dielectric Withstanding Voltage: | 500 VRMS min at sea level  |
| Insulation Resistance:           | 5000 Megohm min            |
| Insertion Loss:                  | .015F dB max (F in GHz)    |

Environmental

|                        |                                             |
|------------------------|---------------------------------------------|
| Hermeticity:           | 1x10 <sup>-8</sup> cc/sec at one atmosphere |
| Solderability:         | MIL-STD-202, Method 209                     |
| Operating Temperature: | -55° C to +165° C                           |

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

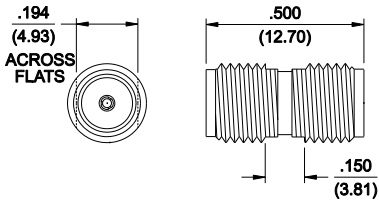
Illustrations are shown in inches (millimeters).

In-Series Adapters

Jack to Jack Adapter



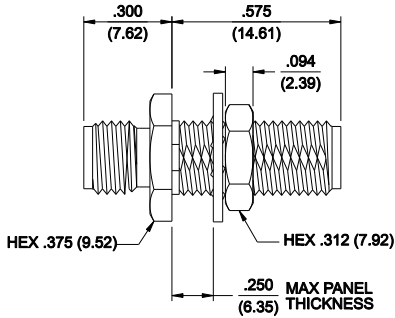
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0901-801 | 142-0901-806  |



Jack to Bulkhead Jack Adapter



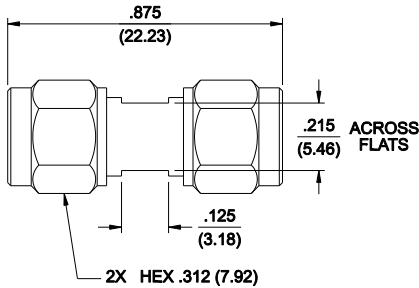
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0901-401 | 142-0901-406  |



Plug to Plug Adapter



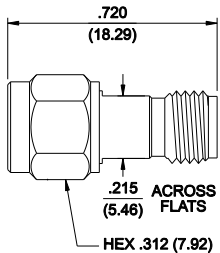
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0901-811 | 142-0901-816  |



Plug to Jack Adapter



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-0901-821 | 142-0901-826  |



Right Angle Jack to Jack Adapter



| Gold Plated  |
|--------------|
| 142-0901-921 |

Right Angle Plug to Plug Adapter



| Gold Plated  |
|--------------|
| 142-0901-931 |

Right Angle Jack to Plug Adapter



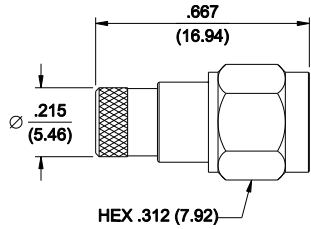
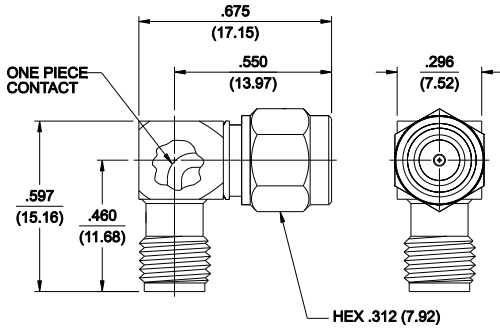
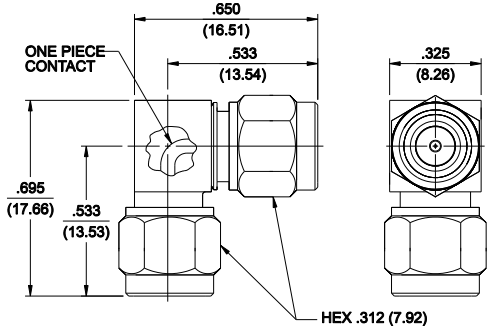
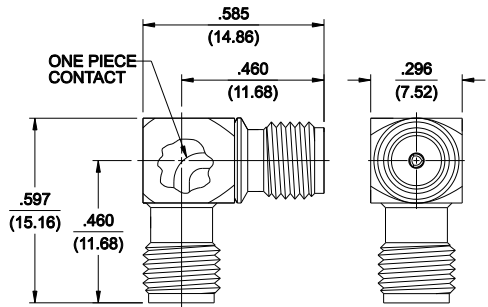
| Gold Plated  |
|--------------|
| 142-0901-941 |

Dummy Load Plug



| Gold Plated  | Nickel Plated | Resistance |
|--------------|---------------|------------|
| 142-0801-861 | 142-0801-866  | 50 Ohm     |

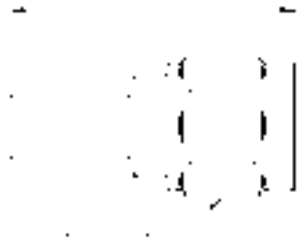
In-Series Adapters





Flexible Cable

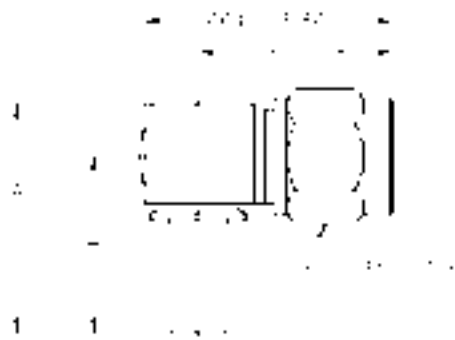
Straight Crimp Type Plug – Solder or Crimp Captivated Contact



| Cable Type                                       | Gold Plated  | Nickel Plated | “A”          |
|--------------------------------------------------|--------------|---------------|--------------|
| RG-316/U, 188, 174, 161, LMR-100 HPF-100, RF-100 | 142-4403-001 | 142-4403-006  | .706 (17.93) |
| RG-316 DS, 188 DS                                | 142-4404-001 | 142-4404-006  | .706 (17.93) |
| RG-58, 141, 303 LMR-195, HPF-195,RF-195          | 142-4407-001 | 142-4407-006  | .706 (17.93) |
| RG-142, 55, 223, 400                             | 142-4408-001 | 142-4408-006  | .706 (17.93) |
| LMR-200, HPF-200, RF-200                         | 142-4439-001 | 142-4439-006  | .844 (21.44) |
| LMR-240, HPF-240, RF-240                         | 142-4435-001 | 142-4435-006  | .844 (21.44) |

Assembly Instructions: LMR 195, 200 and 240 page 219. All other cables page 220.

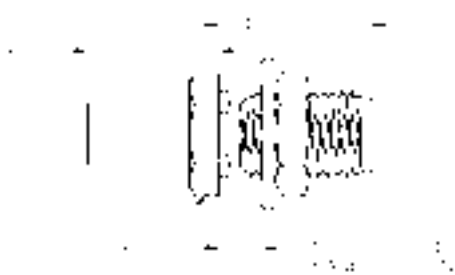
Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                                      | Gold Plated  | Nickel Plated | “A”          | “B”          |
|-------------------------------------------------|--------------|---------------|--------------|--------------|
| RG-316, 188, 174, 161, LMR-100, HPF-100, RF-100 | 142-4403-101 | 142-4403-106  | .611 (15.52) | .470 (11.94) |
| RG-316 DS, 188 DS                               | 142-4404-101 | 142-4404-106  | .611 (15.52) | .470 (11.94) |
| RG-58, 141, 303, LMR-195, HPF-195, RF-195       | 142-4407-101 | 142-4407-106  | .611 (15.52) | .470 (11.94) |
| RG-142, 55, 223, 400                            | 142-4408-101 | 142-4408-106  | .611 (15.52) | .470 (11.94) |
| LMR-200, HPF-200, RF-200                        | 142-4439-101 | 142-4439-106  | .611 (15.52) | .470 (11.94) |
| LMR-240, HPF-240, RF-240                        | 142-4435-101 | 142-4435-106  | .635 (16.13) | .490 (12.45) |

Assembly Instructions: LMR 195, 200 and 240 page 224. All other cables page 229.  
Center conductor of cable serves as contact.

Straight Crimp Type Bulkhead Jack – Captivated Contact



| Cable Type            | Gold Plated  | Nickel Plated |
|-----------------------|--------------|---------------|
| RG-316, 188, 174, 161 | 142-4303-401 | 142-4303-406  |
| RG-316 DS, 188 DS     | 142-4304-401 | 142-4304-406  |
| RG-58, 141, 303       | 142-4307-401 | 142-4307-406  |
| RG-142, 55, 223, 400  | 142-4308-401 | 142-4308-406  |

Assembly instructions page 219.  
Mounting hole layout figure 1 page 194.

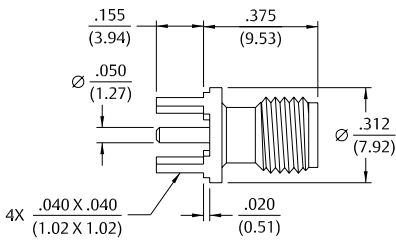
PC Mount

Straight Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-4701-201 | 142-4701-206  |

Mounting hole layout figure 2 page 194.



Right Angle Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-4701-501 | 142-4701-506  |

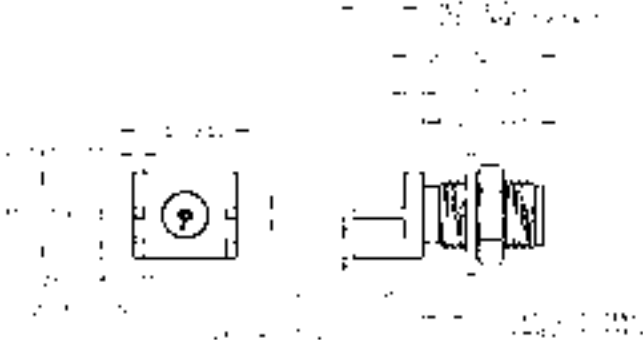
Mounting hole layout figure 1 and 2 page 194.



End Launch Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated | Board Thickness |
|--------------|---------------|-----------------|
| 142-4701-801 | 142-4701-806  | .062 (1.57)     |



Specifications

Electrical Specifications

Impedance: 50 Ohms

Frequency Range:

|                                 |            |
|---------------------------------|------------|
| Flexible cable connectors ..... | 0-12.4 GHz |
| Uncabled receptacles .....      | 0-18.0 GHz |

VSWR: (max) (f = GHz)

|                              | Straight<br>Cabled Connectors | Right Angle<br>Cabled Connectors |
|------------------------------|-------------------------------|----------------------------------|
| 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                      |
| Uncabled receptacles.....    | N/A                           |                                  |

Working Voltage: (VRMS max)

|                                                   | Sea Level | 70K Feet |
|---------------------------------------------------|-----------|----------|
| RG-316; LMR-100, 195, 200 .....                   | 250       | 65       |
| RG-58, RG-142, LMR-240, uncabled receptacles..... | 335       | 85       |

Dielectric Withstanding Voltage: (VRMS min at sea level)

| RG-316; LMR-100, 195, 200 .....                   | 750  |
|---------------------------------------------------|------|
| RG-58, RG-142, LMR-240, uncabled receptacles..... | 1000 |

Insulation Resistance: 5000 megohms min

Contact Resistance: (milliohms max)

|                                                                            | Initial | After Environmental |
|----------------------------------------------------------------------------|---------|---------------------|
| Center contact (straight cabled connectors and uncabled receptacles) ..... | 3.0     | 4.0                 |
| Center contact (right angle cabled connectors) .....                       | 4.0     | 6.0                 |
| 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                 |

Corona Level: (Volts min at 70,000 feet)†

|                                                    |     |
|----------------------------------------------------|-----|
| RG-316, LMR-100, 195, 200 .....                    | 190 |
| RG-58, RG-142, LMR-240, uncabled receptacles ..... | 250 |

Insertion Loss: (dB max)

|                                                     |                                               |
|-----------------------------------------------------|-----------------------------------------------|
| Straight flexible cable connectors .....            | $0.06\sqrt{f\text{ (GHz)}}$ , tested at 6 GHz |
| Right angle flexible cable connectors .....         | $0.15\sqrt{f\text{ (GHz)}}$ , tested at 6 GHz |
| Low loss flexible straight cable connectors .....   | $0.06\sqrt{f\text{ (GHz)}}$ , tested at 1 GHz |
| Low loss flexible right angle cable connectors..... | $0.15\sqrt{f\text{ (GHz)}}$ , tested at 1 GHz |
| Uncabled receptacles, field replaceable .....       | N/A                                           |

RF Leakage: (dB min tested at 2.5 GHz)

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

Mechanical Ratings

Engagement Design:

Reverse Thread, Series SMA

Engagement/Disengagement Force:

2 lb-in max

Mating Torque:

7 to 10 lb-in

Bulkhead Mounting Nut Torque:

15 lb-in

Coupling Proof Torque:

15 lb-in min

Coupling Nut Retention:

60 lbs min

Contact Retention:

6 lbs. min axial force (captivated contacts)

4 oz-in min torque (uncabled receptacles)

Cable Retention:

Axial Force\* (lbs)

Torque (oz-in)

|                      |    |     |
|----------------------|----|-----|
| RG-316, LMR-100..... | 20 | N/A |
| LMR195, 200.....     | 30 | N/A |
| RG-58, LMR-240.....  | 40 | N/A |
| RG-142.....          | 45 | N/A |

\*Or cable breaking strength whichever is less.

Durability: 500 cycles min

Specifications

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-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

Material Specifications

Bodies:

Brass per ASTM B16, gold plated\* per MIL-DTL-45204 .00001” min or nickel plated per ASTM B16

Contacts:

Male - brass per QQ-B-626, gold plated\* per MIL-DTL-45204 .00003” min

Female - beryllium copper per ASTM B196, gold plated\* per MIL-DTL-45204 .00003” min

Nut Retention Spring: Beryllium copper per ASTM B196. Unplated

Insulators: PTFE fluorocarbon per ASTM D1710 and ASTM D1457 or Tefzel per ASTM D 3159

Expansion Caps: Brass per ASTM B16, gold plated per MIL-DTL-45204 .00001” min or nickel plated\* per SAE-AMS2423

Crimp Sleeves: Copper per ASTM B301 or brass per ASTM B301, gold plated\* per MIL-DTL-45204 .00001” min or nickel

plated per SAE-AMS2423

Mounting Nut:

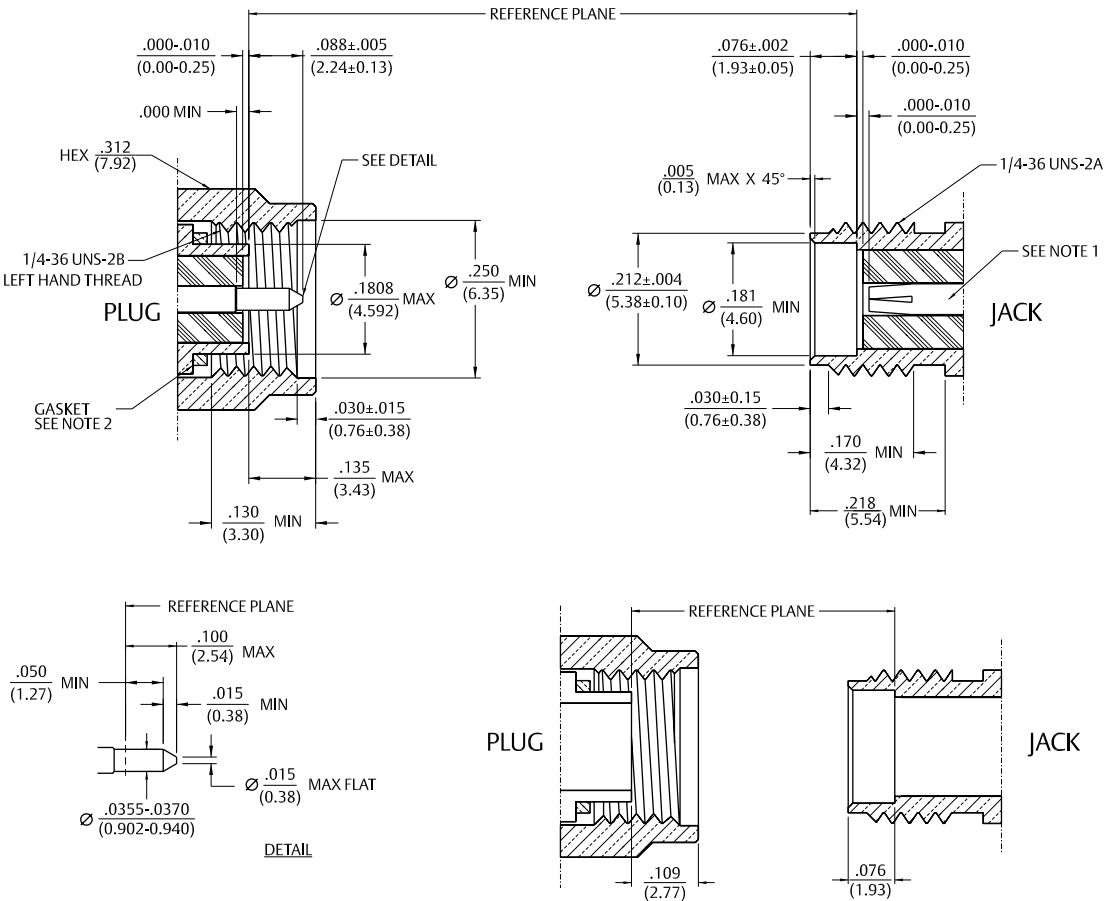
Brass per ASTM B16, green chromate over zinc plated Mounting Lockwasher: Phosphor bronze per

ASTM B139, gold plated\* per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423

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

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

Mating Engagement for SMA Reverse Thread Series

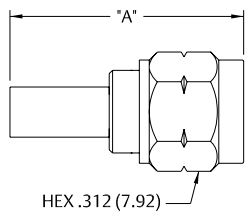


For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

Flexible Cable

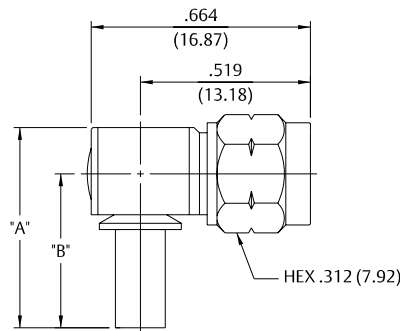
Straight Crimp Type Plug – Solder or Crimp Captivated Contact



| Cable Type                                    | Gold Plated  | Nickel Plated | "A"          |
|-----------------------------------------------|--------------|---------------|--------------|
| RG-316, 188, 174, 161, LMR-100 HPF-100 RF-100 | 142-5403-001 | 142-5403-006  | .706 (17.93) |
| RG-316 DS, 188 DS,                            | 142-5404-001 | 142-5404-006  | .706 (17.93) |
| RG-58, 141, 303 LMR-195, HPF-195, RF-195      | 142-5407-001 | 142-5407-006  | .706 (17.93) |
| RG-142, 55, 223, 400                          | 142-5408-001 | 142-5408-006  | .706 (17.93) |
| LMR-200, HPF-200, RF-200                      | 142-5439-001 | 142-5439-006  | .844 (21.44) |
| LMR-240, HPF-240, RF-240                      | 142-5435-001 | 142-5435-006  | .844 (21.44) |

Assembly Instructions: LMR 195, 200 and 240 page 220. All other cables page 219.

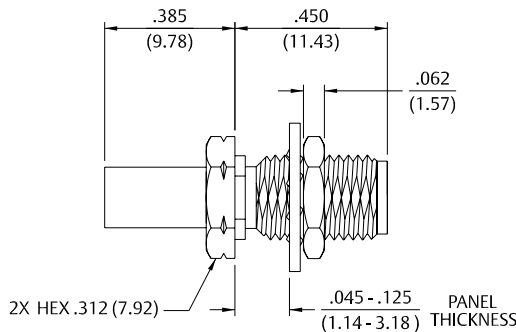
Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                                    | Gold Plated  | Nickel Plated | "A"          | "B"          |
|-----------------------------------------------|--------------|---------------|--------------|--------------|
| RG-316, 188, 174, 161, LMR-100 HPF-100 RF-100 | 142-5403-101 | 142-5403-106  | .611 (15.52) | .470 (11.94) |
| RG-316 DS 188 DS                              | 142-5404-101 | 142-5404-106  | .611 (15.52) | .470 (11.94) |
| RG-58, 141, 303, LMR-195 HPF-195 RF195        | 142-5407-101 | 142-5407-106  | .611 (15.52) | .470 (11.94) |
| RG-142, 55, 223, 400                          | 142-5408-101 | 142-5408-106  | .611 (15.52) | .470 (11.94) |
| LMR-200 HPF-200 RF-200                        | 142-5439-101 | 142-5439-106  | .611 (15.52) | .470 (11.94) |
| LMR-240 HPF-240 RF-240                        | 142-5435-101 | 142-5435-106  | .635 (16.13) | .490 (12.45) |

Assembly instructions: LMR 195, 200 and 240 page 229. All other cables page 224.

Straight Crimp Type Bulkhead Jack – Solder or Crimp



| Cable Type            | Gold Plated  | Nickel Plated |
|-----------------------|--------------|---------------|
| RG-316, 188, 174, 161 | 142-5303-401 | 142-5303-406  |
| RG-316 DS, 188 DS     | 142-5304-401 | 142-5304-406  |
| RG-58, 141, 303       | 142-5307-401 | 142-5307-406  |
| RG-142, 55, 223, 400  | 142-5308-401 | 142-5308-406  |

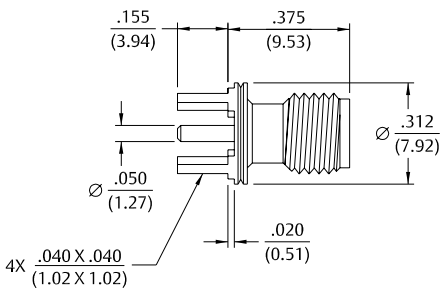
Assembly instructions page 219.  
Mounting hole layout figure 1 page 194.

Straight Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-5701-201 | 142-5701-206  |

Mounting hole layout figure 2 page 194.

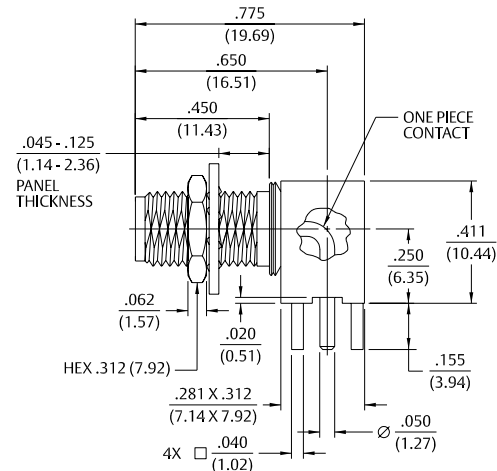


Right Angle Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 142-5701-501 | 142-5701-506  |

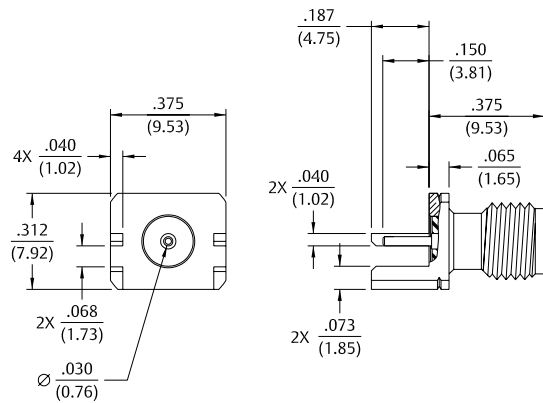
Mounting hole layout figures 1 and 2 page 194.



End Launch Bulkhead – Round Contact



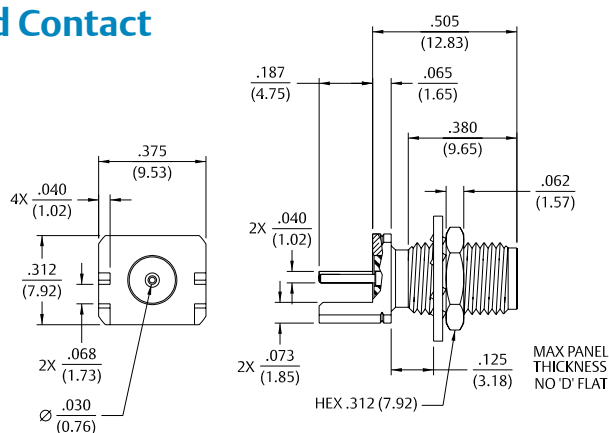
| Gold Plated  | Nickel Plated | Board Thickness |
|--------------|---------------|-----------------|
| 142-5701-801 | 142-5701-806  | .062 (1.57)     |



End Launch Bulkhead Jack Receptacle – Round Contact



| Gold Plated  | Nickel Plated | Board Thickness |
|--------------|---------------|-----------------|
| 142-5701-811 | 142-5701-816  | .062 (1.57)     |



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Illustrations are shown in inches (millimeters).

Specifications

Electrical Specifications

|                                                                                       |                                |                   |
|---------------------------------------------------------------------------------------|--------------------------------|-------------------|
| <b>Impedance:</b> 50 Ohms                                                             |                                |                   |
| <b>Frequency Range:</b> Flexible cable connectors. ....0-12.4 GHz                     |                                |                   |
| Uncabled receptacles .....0-18.0 GHz                                                  |                                |                   |
| <b>VSWR:</b> (max) (f = GHz)                                                          |                                |                   |
|                                                                                       | Straight                       | Right Angle       |
|                                                                                       | Cabled Connectors              | Cabled Connectors |
| RG-316 cable .....                                                                    | 1.15 + .02f                    | 1.15 + .03f       |
| RG-58 cable .....                                                                     | 1.15 + .01f                    | 1.15 + .02f       |
| Uncabled receptacles.....                                                             |                                | N/A               |
| <b>Working Voltage:</b> (VRMS max)†                                                   |                                |                   |
|                                                                                       | Sea Level                      | 70K Feet          |
| RG-316 .....                                                                          | 250                            | 65                |
| RG-58, uncabled receptacles .....                                                     | 335                            | 85                |
| <b>Dielectric Withstanding Voltage:</b> (VRMS min at sea level)†                      |                                |                   |
| RG-316 .....                                                                          |                                | 750               |
| RG-58, uncabled receptacles .....                                                     |                                | 1000              |
| <b>Insulation Resistance:</b> 5000 megohms min                                        |                                |                   |
| <b>Contact Resistance:</b> (milliohms max )                                           |                                |                   |
|                                                                                       | Initial                        | After             |
|                                                                                       |                                | Environmental     |
| Center contact (straight cabled connectors, uncabled receptacles).....                | 3.0                            | 4.0               |
| Center contact (right angle cabled connectors).....                                   | 4.0                            | 6.0               |
| Outer contact (all connectors).....                                                   | 2.0                            | N/A               |
| Braid to body .....                                                                   | 0.5                            | N/A               |
| <b>Corona Level:</b> (Volts min at 70,000 feet)†                                      |                                |                   |
| RG-316 190                                                                            |                                |                   |
| RG-58, uncabled receptacles .....                                                     |                                | 250               |
| <b>Insertion Loss:</b> (dB max)                                                       |                                |                   |
| Straight flexible cable connectors .....                                              | .006 √f (GHz), tested at 6 GHz |                   |
| Right angle flexible cable connectors .....                                           | .015 √f (GHz), tested at 6 GHz |                   |
| Uncabled receptacles .....                                                            | N/A                            |                   |
| <b>RF Leakage:</b> (dB min tested at 2.5 GHz)                                         |                                |                   |
| Flexible cable connectors .....                                                       | -60 dB                         |                   |
| Uncabled receptacles .....                                                            | N/A                            |                   |
| <b>RF High Potential Withstanding Voltage:</b> (VRMS minimum, tested at 4 and 7 MHz)† |                                |                   |
| RG-316 .....                                                                          | 500                            |                   |
| RG-58, uncabled receptacles .....                                                     | 670                            |                   |

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Mechanical Specifications

|                                                |                                             |                       |
|------------------------------------------------|---------------------------------------------|-----------------------|
| <b>Engagement Design:</b>                      | MIL-STD-348, Series SMA                     |                       |
| <b>Engagement/Disengagement Force:</b>         | 2 lb-in min max                             |                       |
| <b>Mating Torque:</b>                          | 7 to 10 lb-in min                           |                       |
| <b>Coupling Proof Torque:</b>                  | 15 lb-in min                                |                       |
| <b>Coupling Nut Retention:</b>                 | 60 lbs min                                  |                       |
| <b>Contact Retention:</b>                      | 6 lbs min axial force (captivated contacts) |                       |
|                                                | 4 oz-in min torque (uncabled receptacles)   |                       |
| <b>Cable Retention:</b>                        | <u>Axial Force* (lbs)</u>                   | <u>Torque (oz-in)</u> |
| RG-316 .....                                   | 20                                          | N/A                   |
| RG-58 .....                                    | 40                                          | N/A                   |
| *Or cable breaking strength whichever is less. |                                             |                       |
| <b>Durability:</b> 500 cycles min              |                                             |                       |

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                             |                                      |
|-----------------------------|--------------------------------------|
| <b>Temperature Range:</b>   | - 65°C to + 165°C                    |
| <b>Thermal Shock:</b>       | MIL-STD-202, Method 107, Condition B |
| <b>Corrosion:</b>           | MIL-STD-202, Method 101, Condition B |
| <b>Shock:</b>               | MIL-STD-202, Method 213, Condition I |
| <b>Vibration:</b>           | MIL-STD-202, Method 204, Condition D |
| <b>Moisture Resistance:</b> | MIL-STD-202, Method 106              |

Material Specifications

(See non-magnetic materials page 10)

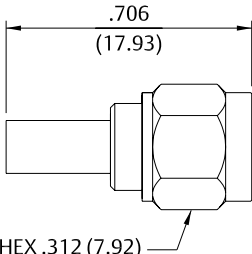
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Flexible Cable

Straight Crimp Type Plug (3-piece) – Captivated Contact



| Cable Type        | Gold Plated  |
|-------------------|--------------|
| RG-316, 188, 174  | 142-9403-011 |
| RG-316 DS, 188 DS | 142-9404-011 |
| RG-58, 141, 303   | 142-9407-001 |

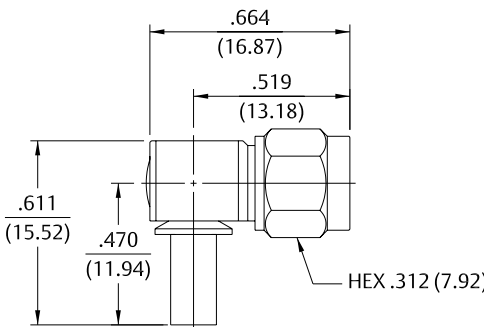


Assembly instructions page 219.

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type        | Gold Plated  |
|-------------------|--------------|
| RG-316, 188, 174  | 142-9403-101 |
| RG-316 DS, 188 DS | 142-9404-101 |
| RG-58, 141        | 142-9407-101 |

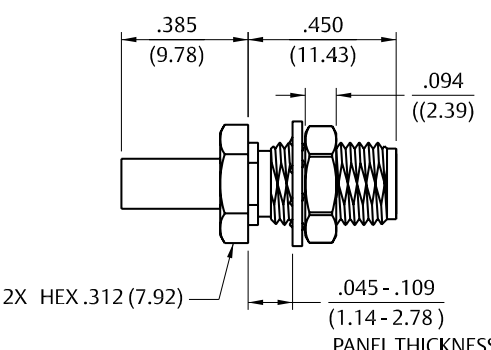


Assembly instructions page 224.

Straight Crimp Type Bulkhead Jack (3-piece) – Captivated Contact



| Cable Type       | Gold Plated  |
|------------------|--------------|
| RG-316, 188, 174 | 142-9303-411 |



Assembly instructions page 219.

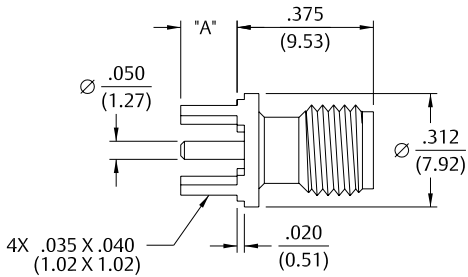
PC Mount

Straight Jack Receptacle



| Gold Plated  | "A"         |
|--------------|-------------|
| 142-9701-201 | .155 (3.94) |
| 142-9701-211 | .110 (2.79) |

Mounting hole layout figure 3 on page 194.

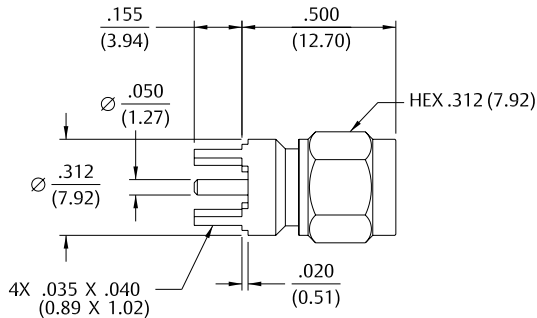


Straight Plug Receptacle



| Gold Plated  |
|--------------|
| 142-9801-201 |

Mounting hole layout figure 3 on page 194.

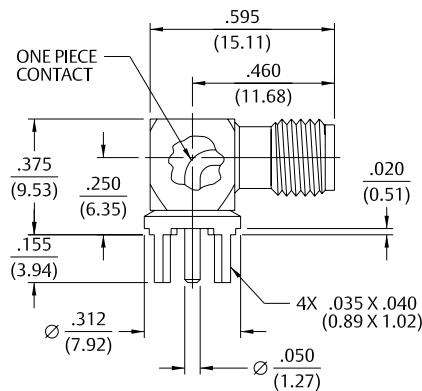


Right Angle Jack Receptacle



| Gold Plated  |
|--------------|
| 142-9701-301 |

Mounting hole layout figure 3 on page 194.

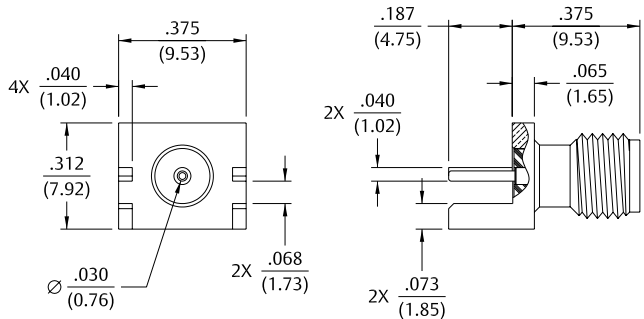


PC Mount

End Launch Jack Receptacle – Round Contact



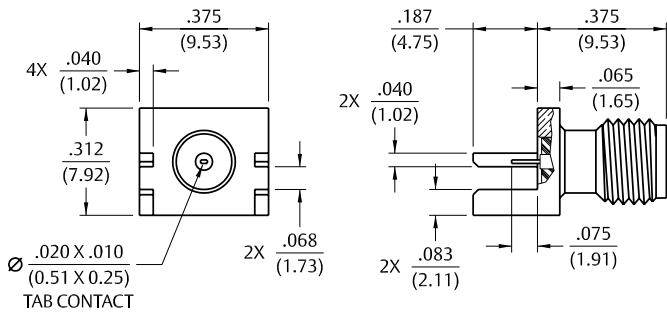
| Gold Plated  | Board Thickness |
|--------------|-----------------|
| 142-9701-801 | .062 (1.57)     |



End Launch Jack Receptacle – Tab Contact



| Gold Plated  | Board Thickness |
|--------------|-----------------|
| 142-9701-811 | .062 (1.57)     |



Specifications

Electrical Specifications

|                                         |                                                              |                              |                     |
|-----------------------------------------|--------------------------------------------------------------|------------------------------|---------------------|
| Impedance:                              | 50 Ohms                                                      |                              |                     |
| Frequency Range:                        | 0-26.5 GHz                                                   |                              |                     |
| VSWR: (max)                             | 1.05+.02f(GHz) max at 0-18 GHz, <1.50 typical at 18-26.5 GHz |                              |                     |
| Working Voltage:                        | 170 VRMS max at sea level, 45 VRMS max at 70K feet           |                              |                     |
| Dielectric Withstanding Voltage:        | 500 VRMS min at sea level                                    |                              |                     |
| Insulation Resistance:                  | 1000 Megohms min                                             |                              |                     |
| Contact Resistance: (milliohms max)     |                                                              | Initial                      | After Environmental |
| Center Contact                          |                                                              | 3.0                          | 4.0                 |
| Outer Conductor                         |                                                              | 2.0                          | NA                  |
| Corona Level:                           |                                                              | 125 Volts at 70K feet        |                     |
| Insertion Loss:                         |                                                              | (Dependant upon application) |                     |
| RF Leakage:                             | Not Applicable                                               |                              |                     |
| RF High Potential Withstanding Voltage: | 335 VRMS min at 4 and 7 MHz                                  |                              |                     |

Mechanical Specifications

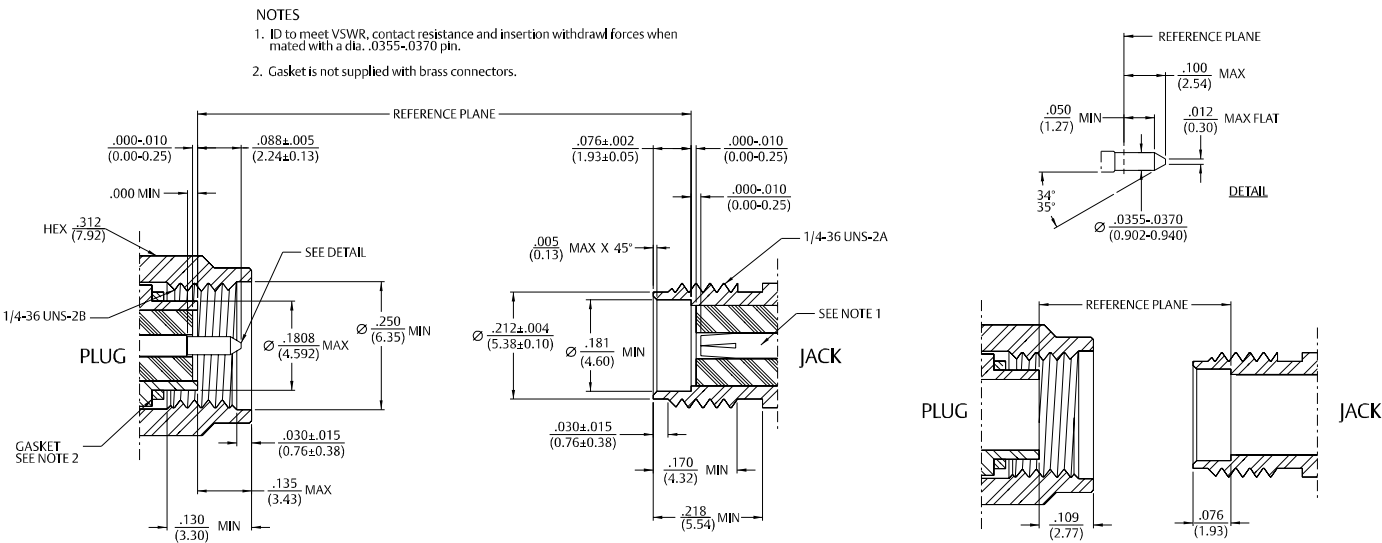
|                                 |                                                  |
|---------------------------------|--------------------------------------------------|
| Engagement Design:              | MIL-STD-348, Series SMA                          |
| Engagement/Disengagement Force: | 2 lb-in max                                      |
| Mating Torque:                  | 7 to 10 lb-in                                    |
| Contact Retention:              | 6 lbs min axial force, 4 oz-in min radial torque |

Environmental Ratings

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                      |                                                               |
|----------------------|---------------------------------------------------------------|
| Temperature Range:   | - 65°C to + 165°C                                             |
| Thermal Shock:       | MIL-STD-202, Method 107, Condition B - Except 115°C High Temp |
| 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                                       |

Mating Engagement for SMA Series Thickwall Plug  
Compatible with MIL-STD-348

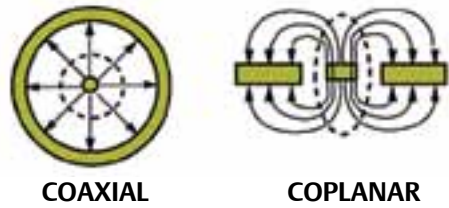


Applications & Design Features

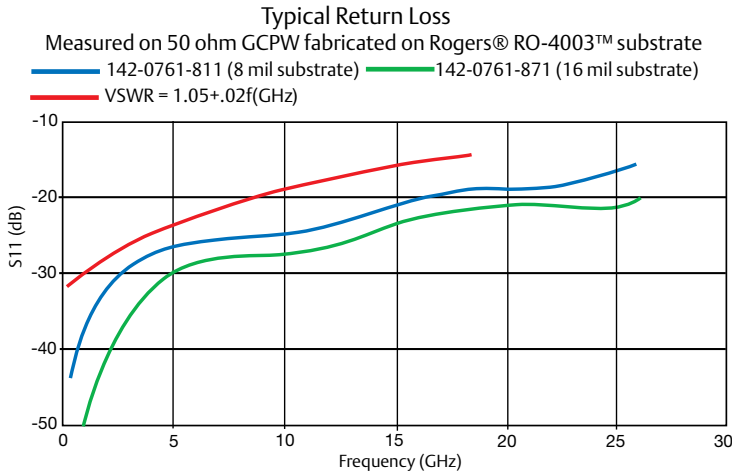
High Frequency SMA End Launch Connectors for Microwave PC Board Substrates

The Johnson line of High Frequency End Launch connectors are used to transition microwave energy from coaxial to planar transmission line structures. These connectors provide a unique solution for microwave engineers who fabricate circuit designs on very thin high frequency board substrates. The in-line connector design minimizes reflections as compared to a right-angle (perpendicular) pc mount transition.

- Cellular Linear Power Amplifiers
- Broadband MMIC Power Amplifiers
- Microwave Filters, Mixers and Combiners
- Wireless Infrastructure Antennas
- DBS Low-Noise Block Down Converters
- Remote Sensing and Metering
- Global Positioning Satellite Antennas
- Phased Array Antennas
- Radar Systems
- High Speed Routers and Switches
- Automated Test Equipment
- RF Identification Tags



High Frequency End Launch connectors are designed to attach directly to a high frequency coplanar waveguide (CPW) circuit board transmission line, although other lines such as microstrip can be used with good results. These connectors can be used on high frequency PC board substrate layers as thin as 8 mils, and operate at frequencies up to 26.5 GHz (see Return Loss chart).



Design Features

This connector is an economical alternative to other high frequency designs in the industry. This design differentiates itself from other launch connectors:

- Design of the connector is self contained, no external mounting screws, adapter sections, spring clips, etc. are required for assembly to the circuit board.
- Center contact pin does not require special orientation to the surface of the circuit board. The center contact is mechanically captivated and optimized to maintain proper impedance while withstanding torque and axial force stress.
- Output coax of the connector at board launch is sized appropriately to match the thickness of the high frequency board substrate. The output coax section extends well within the connector while maintaining constant inner and outer coaxial diameters.
- Signal side grounding legs of the connector are spaced close enough to keep grounding paths short, but far enough apart to maintain constant impedance in the launch transition area.
- Signal side grounding legs and GCPW geometry control radiation, no additional shielding is required to prevent signal cross-talk effects in the transition area. The launch transition is effectively isolated from adjacent transmis-

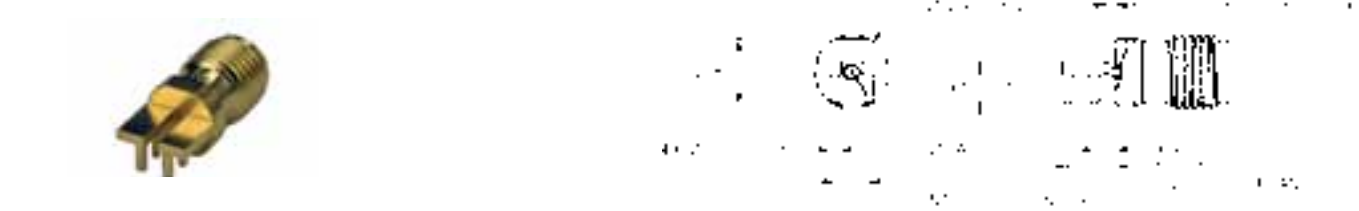
- sion lines in the signal plane.
- Connector is not locked into position when placed on the circuit board. Intentional floating design allows proper alignment in X, Y and Z, minimizing discontinuities due to manufacturing tolerances.
- The distinctive through hole mounting technique allows the use of one connector with varying circuit board thicknesses. The connectors are also available in a traditional straddle mount end launch design, which was pioneered by Emerson Network Power Connectivity Solutions over 30 years ago.
- A small amount of PTFE insulation projects from the rear mating plane of the connector, acting as a seal when soldering the center conductor pin to the trace. The connector is held against the circuit board edge during the soldering process, compressing the PTFE insulation. This effectively creates a barrier between the inner and outer conductors, preventing the bridging of solder.
- Appropriate sized connectors do not require additional compensation to standard coplanar or microstrip matched impedance line geometries. Transition can be fine-tuned by pulling the trace back a slight amount from the board edge.

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

PC Mount

Jack Receptacle – Round Body



| Gold Plated  | High Frequency Substrate Thickness | “A”         | “B”         | “C”         |
|--------------|------------------------------------|-------------|-------------|-------------|
| 142-0761-801 | .008 (0.20) - .014 (0.36)          | .010 (0.25) | .050 (1.27) | .096 (2.44) |
| 142-0761-821 | .014 (0.36) - .020 (0.51)          | .015 (0.38) | .067 (1.70) | .113 (2.87) |

Assembly instructions page 228.

Jack Receptacle, Square Body



| Gold Plated  | High Frequency Substrate Thickness | “A”         | “B”         | “C”         |
|--------------|------------------------------------|-------------|-------------|-------------|
| 142-0761-811 | .008 (0.20) - .014 (0.36)          | .010 (0.25) | .050 (1.27) | .096 (2.44) |
| 142-0761-831 | .014 (0.36) - .020 (0.51)          | .015 (0.38) | .067 (1.70) | .113 (2.87) |

Assembly instructions page 228.

Jack Receptacle – PC Mount, Round Body with Thick Legs



| Gold Plated  | High Frequency Substrate Thickness | “A”         | “B”         | “C”         |
|--------------|------------------------------------|-------------|-------------|-------------|
| 142-0761-881 | .008 (0.20) - .014 (0.36)          | .010 (0.25) | .050 (1.27) | .096 (2.44) |
| 142-0771-821 | .014 (0.36) - .020 (0.51)          | .015 (0.38) | .067 (1.70) | .113 (2.87) |

Assembly instructions page 228.

\* Coupling proof torque 8 inch pounds maximum without support wrench.

PC Mount

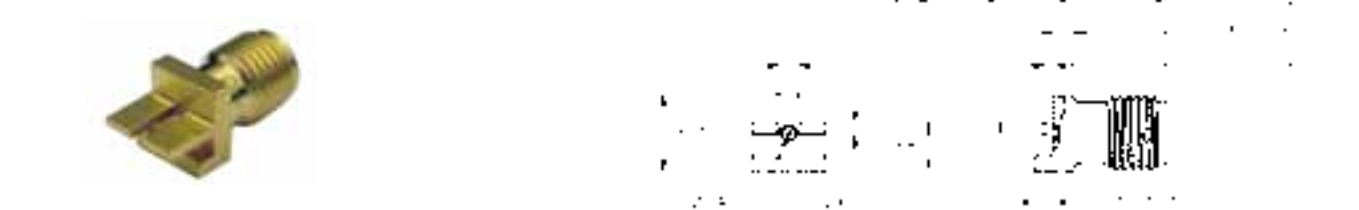
Jack Receptacle – for .062 Board, Round Body



| Gold Plated  | High Frequency Substrate Thickness | “A”         | “B”         | “C”         |
|--------------|------------------------------------|-------------|-------------|-------------|
| 142-0761-841 | .008 (0.20) - .014 (0.36)          | .010 (0.25) | .050 (1.27) | .032 (0.81) |
| 142-0761-861 | .014 (0.36) - .020 (0.51)          | .015 (0.38) | .067 (1.70) | .040 (1.02) |

Assembly instructions page 228.

Jack Receptacle – for .062 Board, Square Body



| Gold Plated  | High Frequency Substrate Thickness | “A”         | “B”         | “C”         |
|--------------|------------------------------------|-------------|-------------|-------------|
| 142-0761-851 | .008 (0.20) - .014 (0.36)          | .010 (0.25) | .050 (1.27) | .032 (0.81) |
| 142-0761-871 | .014 (0.36) - .020 (0.51)          | .015 (0.38) | .067 (1.70) | .040 (1.02) |

Assembly instructions page 228.

Jack Receptacle – for .062 Board, Round Body with Thick Legs



| Gold Plated  | High Frequency Substrate Thickness | “A”         | “B”         | “C”         |
|--------------|------------------------------------|-------------|-------------|-------------|
| 142-0761-891 | .008 (0.20) - .014 (0.36)          | .010 (0.25) | .050 (1.27) | .032 (0.81) |
| 142-0771-831 | .014 (0.36) - .020 (0.51)          | .015 (0.38) | .067 (1.70) | .040 (1.02) |

Assembly instructions page 228.

\* Coupling proof torque 8 inch pounds maximum without support wrench.

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

Specifications

Electrical Ratings

Impedance: 50 Ohms

Frequency Range:

|                                           |            |
|-------------------------------------------|------------|
| Flexible cable connectors .....           | 0-12.4 GHz |
| Uncabled receptacles.....                 | 0-18.0 GHz |
| Straight Semi-Rigid cable connectors..... | 0-26.5 GHz |

| VSWR: (max) (f = GHz)              | Straight<br>Cabled Connectors | Right Angle<br>Cabled Connectors |
|------------------------------------|-------------------------------|----------------------------------|
| 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                        |
| RG-405 cable (0 - 18 GHz) .....    | 1.07+.008f                    |                                  |
| RG-405 cable (18 - 26.5 GHz) ..... | 1.35 max                      |                                  |
| RG-402 cable (w/contact).....      | 1.05+.008f                    |                                  |
| RG-402 cable (w/o contact).....    | 1.035+.005f                   |                                  |

Insertion Loss: (dB max)

|                                                        |                                         |
|--------------------------------------------------------|-----------------------------------------|
| Straight flexible cable connectors .....               | 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 |
| Straight Semi-Rigid cable connectors w/o contact.....  | 0.03 $\sqrt{f}$ (GHz), tested at 16 GHz |
| Uncabled receptacles .....                             | N/A                                     |

| Working Voltage: (VRMS max)                                           | Sea Level | 70K Feet |
|-----------------------------------------------------------------------|-----------|----------|
| RG-316, LMR-100, 195 .....                                            | 250       | 65       |
| RG-58, RG-142, RG-405, uncabled receptacles, RG-402 w/o contact ..... | 335       | 85       |
| RG-402 with contact.....                                              | 500       | 125      |

| Dielectric Withstanding Voltage: (VRMS min at sea level) † | Sea Level |
|------------------------------------------------------------|-----------|
| RG-316, LMR-100, 195 .....                                 | 750       |
| RG-58, RG-142, RG-405, uncabled receptacles .....          | 1000      |
| RG-402 with contact.....                                   | 1500      |
| RG-402 w/o contact.....                                    | N/A       |

| Corona Level: (Volts min at 70,000 feet)                                      | 70K Feet |
|-------------------------------------------------------------------------------|----------|
| RG-316, LMR-100, 195 .....                                                    | 190      |
| RG-58, RG-142, .086 Semi-Rigid, uncabled receptacles, RG-402 w/o contact..... | 250      |
| RG-402 with contact .....                                                     | 375      |

Insulation Resistance: 5000 Megohms min

| Contact Resistance: (milliohms max)                                        | Initial | After Environmental |
|----------------------------------------------------------------------------|---------|---------------------|
| Center contact (straight cabled connectors and uncabled receptacles) ..... | 3.0*    | 4.0*                |
| Center contact (right angle cabled connectors) .....                       | 4.0     | 6.0                 |
| Outer contact (all connectors) .....                                       | 2.0     | N/A                 |
| Braid to Body (gold plated bodies).....                                    | 0.5     | N/A                 |

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

RF Leakage: (dB min, tested at 2.5 GHz)

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| Flexible cable connectors and RG-402 connectors w/o contact ..... | -60 |
| RG-405 connectors and RG-402 connectors with contact .....        | -90 |
| Uncabled receptacles .....                                        | N/A |

RF High Potential Withstanding Voltage: (VRMS min, tested at 4 and 7 MHz)

|                                                                                |      |
|--------------------------------------------------------------------------------|------|
| RG-316, LMR-100, 195 .....                                                     | 500  |
| RG-58, RG-142, RG-405,<br>RG-402 cable w/o contact, Uncabled receptacles ..... | 670  |
| RG-402 with contact .....                                                      | 1000 |

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

Specifications

Mechanical Specifications

|                                 |                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------|
| Engagement Design:              | MIL-STD-348, Series SMA                                                                   |
| Durability:                     | 500 cycles min<br>100 cycles min for RG-402 connectors w/o contact                        |
| Engagement/Disengagement Force: | 2 inch-pounds max                                                                         |
| Mating Torque:                  | 7 to 10 lb-in                                                                             |
| Bulkhead Mounting Nut Torque:   | 15 lb-ins recommended                                                                     |
| Coupling Proof Torque:          | 15 lb-ins min                                                                             |
| Coupling Nut Retention:         | 60-lbs min                                                                                |
| Contact Retention:              | 6 lbs. min axial force (captivated contacts)<br>4 oz-in min torque (uncabled receptacles) |

| Cable Retention: (minimum*) | Axial Force (lbs) | Torque (oz-in) |
|-----------------------------|-------------------|----------------|
| RG-316, LMR-100 .....       | 20                | N/A            |
| RG-58.....                  | 40                | N/A            |
| RG-142 Cabled .....         | 45                | N/A            |
| RG-405 .....                | 30                | 16             |
| RG-402 .....                | 60                | 55             |
| LMR-195.....                | 30                | N/A            |

\* Or cable breaking strength, whichever is less

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                      |                                                                      |
|----------------------|----------------------------------------------------------------------|
| Temperature Range:   | -65°C to +165°C                                                      |
| Thermal Shock:       | MIL-STD-202, Method 107, Condition B (except +85°C high temperature) |
| 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                                              |

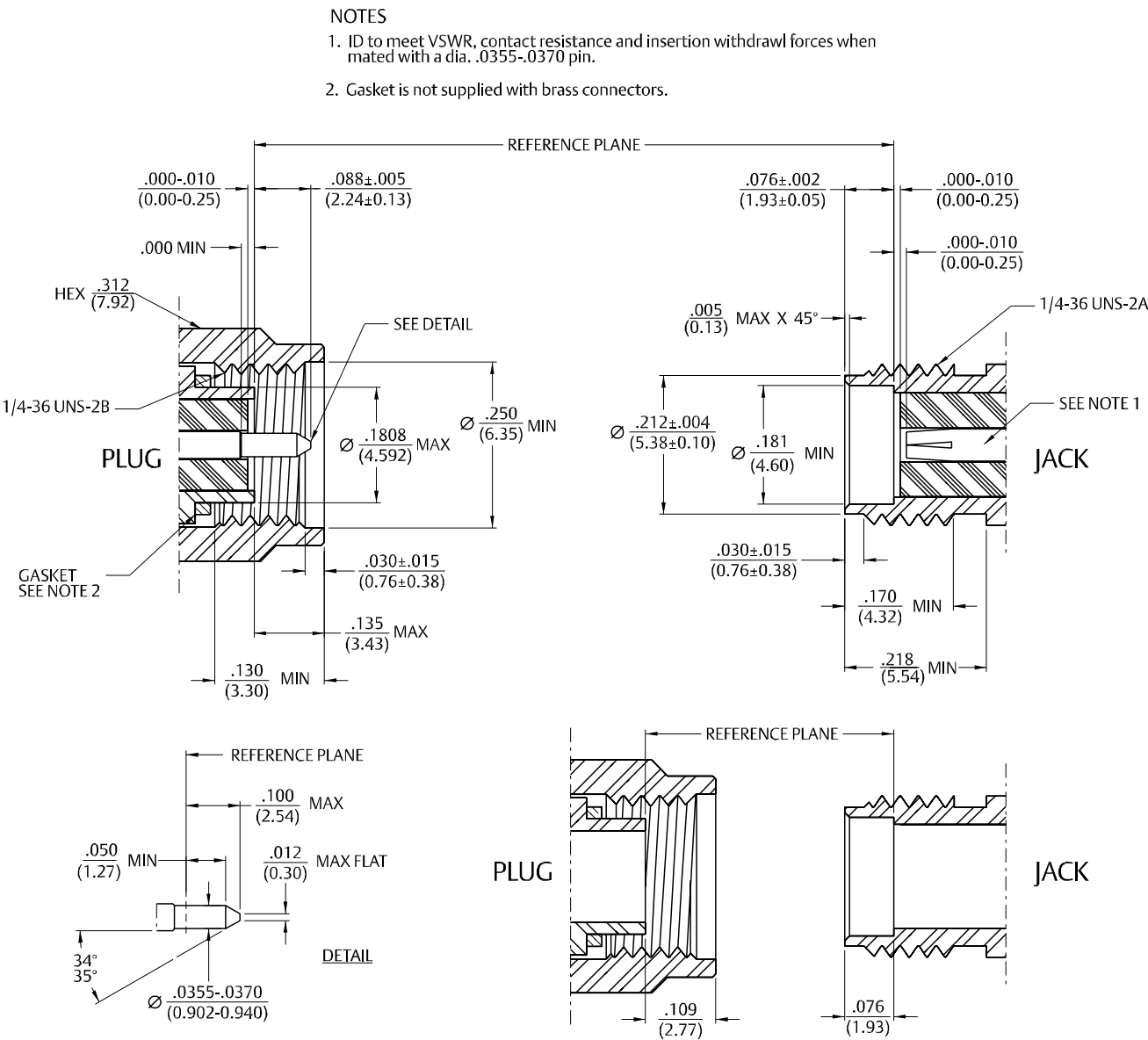
Material Specifications

|                               |                                                                                                                                                           |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bodies:                       | Stainless Steel, type 303, per ASTM A 582, passivated per MIL-DTL-14072 (EL 300), or gold Plated per MIL-G-45204 .00005” min                              |
| Contacts:                     | Male - Brass per ASTM B16, Gold plated* per MIL-G-45204 (.00005” min) Female – Beryllium Copper per ASTM B196, Gold plated* per MIL-G-45204 (.00005” min) |
| Insulators:                   | PTFE Fluorocarbon per ASTM D1710 and ASTM D1457                                                                                                           |
| Gaskets:                      | Silicon Rubber per A-A-59588A                                                                                                                             |
| Expansion Caps:               | Brass per ASTM B16, gold plated per MIL-G-45204 .00005” min or nickel plated per AMS-QQ-N-290                                                             |
| Crimp Sleeves:                | Copper per ASTM A75, gold plated per MIL-G-45204 .0005” min or nickel per AMS-QQ-N-290 plated (.00005” min)                                               |
| Nut Retention Spring (Plugs): | Beryllium Copper per ASTM B196, un-plated                                                                                                                 |
| Mounting Hardware:            | Stainless Steel, type 303, Per ASTM A582, passivated per MIL-DTL-14072 (EL 300), or gold plated* per MIL-G-45204 .00005” min                              |

Note: All Gold plated parts include a .00005” min Nickel under plated barrier layer.

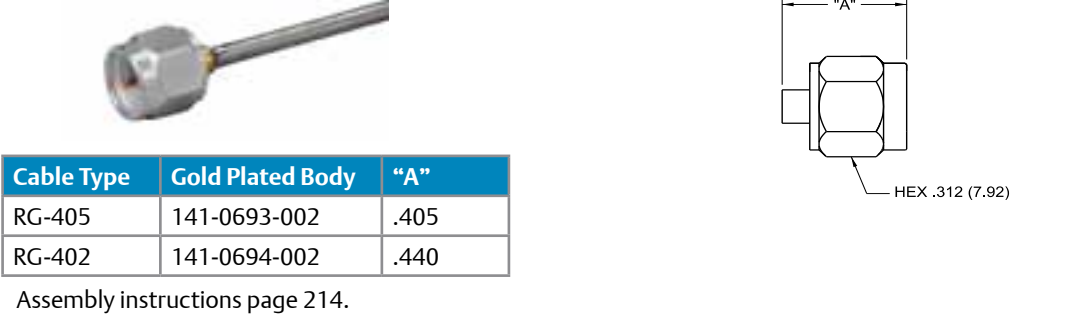
Specifications

Mating Engagement for Stainless Steel SMA Series Per MIL-STD-348A



Semi-Rigid

Straight Solder Type Plug – with Contact, Captive Nut Thin Wall



Straight Solder Type Plug – Without Contact, Thread-On Nut



Straight Solder Type Plug with Captivated Solderless Contact, Captive Nut and Thick Wall Interface



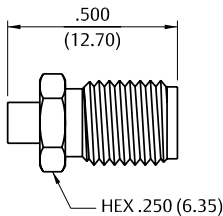
Semi-Rigid

Straight Solder Type Jack



| Cable Type | Gold Plated Body |
|------------|------------------|
| RG-405     | 141-0593-001     |
| RG-402     | 141-0594-001     |

Assembly instructions page 214.

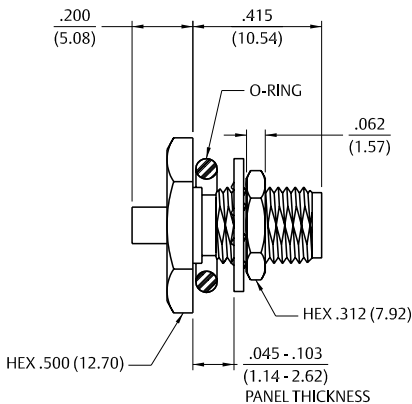


Straight Solder Type Bulkhead Jack with O-Ring



| Cable Type | Gold Plated Body |
|------------|------------------|
| RG-405     | 141-0593-401     |
| RG-402     | 141-0594-401     |

Assembly instructions page 214.

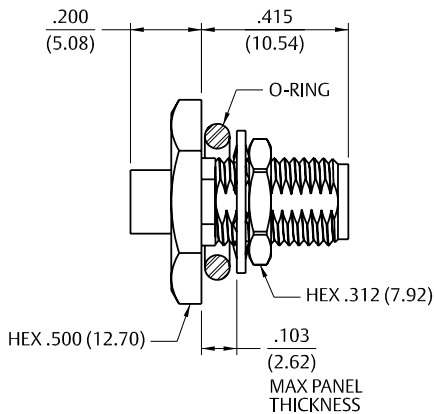


Straight Solder Type Bulkhead Jack with Captivated Solderless Contact and O-Ring



| Cable Type | Gold Plated Body |
|------------|------------------|
| RG-405     | 141-0593-421     |
| RG-402     | 141-0594-421     |

Assembly instructions page 222.



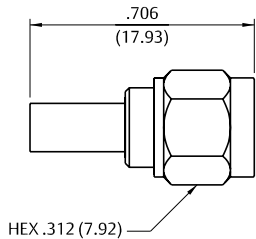
Flexible Cable

Straight Crimp Type Plug (3-piece) – Solder or Crimp Captivated Contact



| Cable Type                                     | Passivated   |
|------------------------------------------------|--------------|
| RG-161, 174,188, 316, LMR-100, HPF-100, RF-100 | 141-0403-012 |
| RG-188 DS, RG-316 DS                           | 141-0404-012 |
| RG-58, 141, 303, LMR-195, HPF-195, RF-195      | 141-0407-012 |
| RG-55, 142, 223, 400                           | 141-0408-012 |

Assembly instructions page 219.

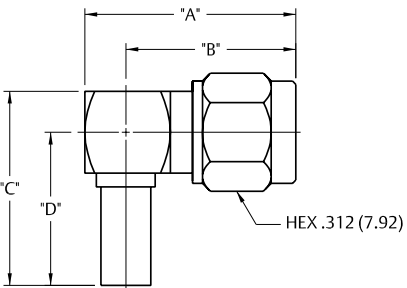


Right Angle Crimp Type Plug – Captivated Contact



| Cable Type           | Passivated   | "A"  | "B"  | "C"  | "D"  |
|----------------------|--------------|------|------|------|------|
| RG-161, 174,188, 316 | 141-0403-102 | .652 | .527 | .593 | .467 |
| RG-188 DS, RG-316 DS | 141-0404-112 | .652 | .527 | .593 | .467 |
| RG-58, 141, 303      | 141-0407-102 | .636 | .519 | .596 | .471 |
| RG-55, 142, 223, 400 | 141-0408-102 | .636 | .519 | .596 | .471 |

Assembly instructions page 224.

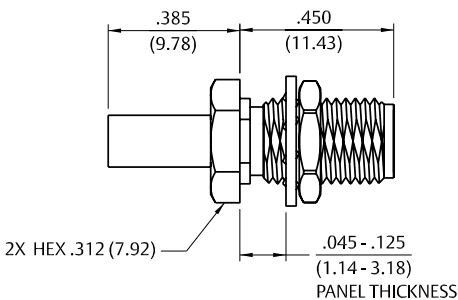


Straight Crimp Type Bulkhead Jack (3-piece) – Solder or Crimp Captivated Contact



| Cable Type           | Passivated   |
|----------------------|--------------|
| RG-161, 174,188, 316 | 141-0303-412 |
| RG-188 DS, RG-316 DS | 141-0304-412 |
| RG-58, 141, 303      | 141-0307-412 |
| RG-55, 142, 223, 400 | 141-0308-412 |

Assembly instructions page 219.



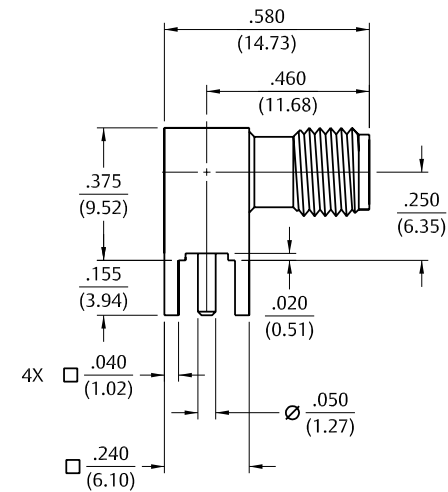
## PC Mount, Bulkhead and Panel Mount

## Right Angle PC Mount Jack Receptacle



**Gold Plated**

141-0701-301

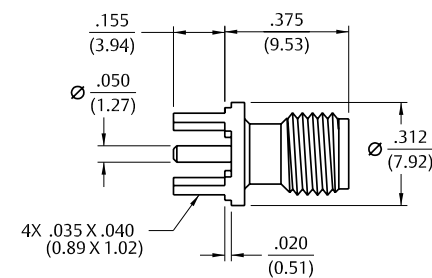


## Straight PC Mount Jack Receptacle



**Gold Plated**

141-0701-201

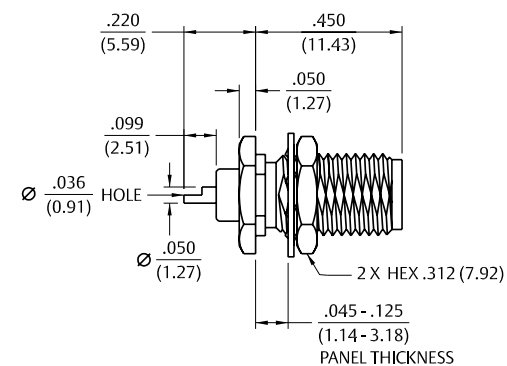


## Rear Mount Bulkhead Jack Receptacle



Passivated

141-0701-402

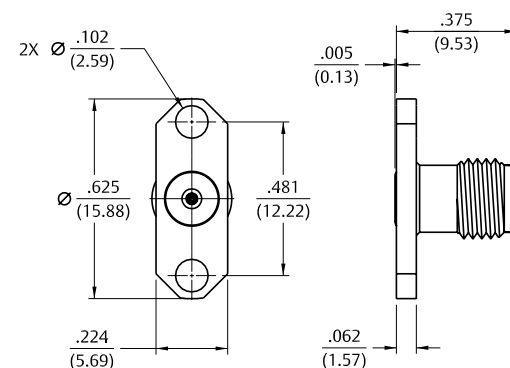


## 2-Hole Flange Mount Jack Receptacle – Flush Dielectric



Passivated

141-0701-602



## Panel Mount

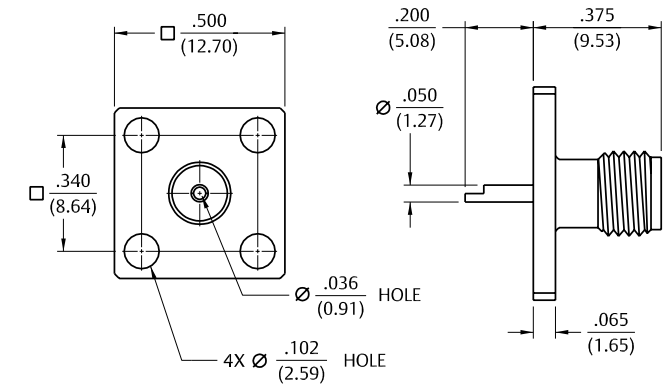
101

## 4-Hole Flange Mount Jack Receptacle – Flush Dielectric



Passivated

141-0701-612

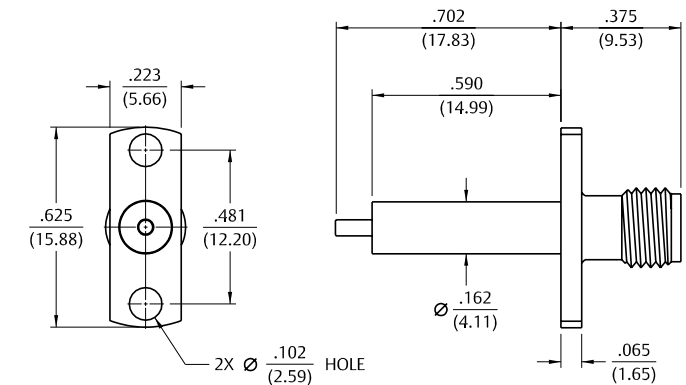


## 2-Hole Flange Mount Jack Receptacle – Extended Dielectric



Passivated

141-0701-622

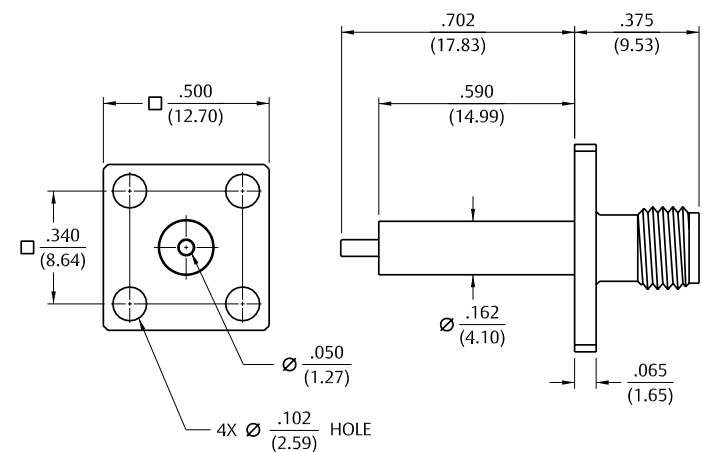


## 4-Hole Flange Mount Jack Receptacle – Extended Dielectric



Passivated

141-0701-632



For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

Specifications

Electrical Specifications

|                              |                                    |             |           |
|------------------------------|------------------------------------|-------------|-----------|
| <b>Impedance:</b>            | 50 Ohms                            |             |           |
| <b>Frequency Range:</b>      | 0-6 GHz                            |             |           |
| <b>Attenuation Values:</b>   | 1, 2, 3, 6 and 10 dB Nominal*      |             |           |
| <b>Attenuation Accuracy:</b> |                                    |             |           |
| dB*                          | 0 - 4 GHz                          | 4 - 6 GHz   |           |
| 1-3                          | ±0.3                               | ±0.5        |           |
| 4-6                          | ±0.4                               | ±0.5        |           |
| 7-10                         | ±0.5                               | ±0.5        |           |
| <b>VSWR Max:</b>             |                                    |             |           |
| dB*                          | 0 - 2.5 GHz                        | 2.5 - 4 GHz | 4 - 6 GHz |
| 1-3                          | 1.15 : 1                           | 1.20 : 1    | 1.25 : 1  |
| 4-6                          | 1.15 : 1                           | 1.20 : 1    | 1.25 : 1  |
| 7-10                         | 1.15 : 1                           | 1.25 : 1    | 1.30 : 1  |
| <b>Average Input Power:</b>  | 2 W Max @ +25°C                    |             |           |
|                              | Derated Linearly to 0.5W at +125°C |             |           |

\*Other values available, please contact Factory

Mechanical Specifications

SMA Connectors: Per MIL-STD-348A

Environmental Specifications

|                    |                                                                      |
|--------------------|----------------------------------------------------------------------|
| Temperature Range: | -55°C to +125°C                                                      |
| Thermal Shock:     | MIL-STD-202, Method 107, Condition B except +100°C high temperature) |
| Shock:             | MIL-STD-202, Method 213, Condition I                                 |
| Vibration:         | MIL-STD-202, Method 204, Condition D                                 |

Material Specifications

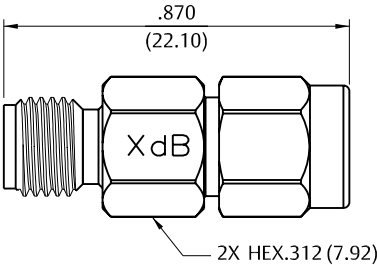
|                  |                                                                          |
|------------------|--------------------------------------------------------------------------|
| Connector Body:  | 303 Stainless Steel per ASTM A582, Passivated per MIL-F-14-72 (EL 300)   |
| Coupling Nut:    | 303 Stainless Steel per ASTM A582, Passivated per MIL-F-14-72 (EL 300)   |
| Retaining Ring:  | Beryllium Copper per ASTM B196, Unplated                                 |
| SMA Plug Gasket: | Silicone Rubber per ZZ-R-765                                             |
| Male Contact:    | Brass per ASTM B16, Gold Plated per MIL-G-45204 (.00003 min)             |
| Female Contact:  | Beryllium Copper per ASTM B196, Gold Plated per MIL-G-45204 (.00003 min) |
| Insulators:      | PTFE per ASTM D1710                                                      |
| Attenuator Card: | Alumina per Mil-I-10, RoHS Compliant Terminals                           |

SMA Fixed Attenuators Commercial Series



| Attenuation (dB Nominal)* | Freq. Range | Stainless Steel Passivated |
|---------------------------|-------------|----------------------------|
| 1                         | (0-6 GHz)   | 141-3901-801               |
| 2                         | (0-6 GHz)   | 141-3901-802               |
| 3                         | (0-6 GHz)   | 141-3901-803               |
| 6                         | (0-6 GHz)   | 141-3901-806               |
| 10                        | (0-6 GHz)   | 141-3901-810               |

\* Standard values shown. Contact factory for other requirements. Inches (millimeters).



SMB Connectors

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|                                  |     |
|----------------------------------|-----|
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While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without notice.

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Specifications

Electrical Specifications

|                                                                                    |                          |                            |
|------------------------------------------------------------------------------------|--------------------------|----------------------------|
| <b>Impedance:</b> 50 Ohms                                                          |                          |                            |
| <b>Frequency Range:</b>                                                            |                          |                            |
| Connectors.....                                                                    |                          | 0-4 GHz                    |
| Dummy loads.....                                                                   |                          | 0-1 GHz                    |
| <b>VSWR:</b> (max) (f = GHz)                                                       |                          |                            |
|                                                                                    | <u>Straight</u>          | <u>Right Angle</u>         |
|                                                                                    | <u>Cabled Connectors</u> | <u>Cabled Connectors</u>   |
| RG-178                                                                             | 1.30 + .04f              | 1.45 + .06f                |
| RG-316, RG-58, and RG-405                                                          | 1.25 + .04f              | 1.35 + .04f                |
| Adapters                                                                           | 1.20 + .04f              |                            |
| Uncabled receptacles, dummy loads .....                                            |                          | N/A                        |
| <b>Working Voltage:</b> (VRMS max)†                                                |                          |                            |
|                                                                                    | <u>Sea Level</u>         | <u>70K Feet</u>            |
| RG-178 .....                                                                       | 250                      | 60                         |
| RG-316, RG-58, RG-405, uncabled receptacles, adapters .....                        | 335                      | 85                         |
| Dummy loads.....                                                                   |                          | N/A                        |
| <b>Dielectric Withstanding Voltage:</b> (VRMS min at sea level)                    |                          |                            |
| RG-316 .....                                                                       |                          | 750                        |
| RG-58, RG-142, uncabled receptacles .....                                          |                          | 1000                       |
| Dummy loads.....                                                                   |                          | N/A                        |
| <b>Corona Level:</b> (Volts min at 70,000 feet)†                                   |                          |                            |
| RG-178 .....                                                                       |                          | 185                        |
| RG-316, RG-58, RG-405 .....                                                        |                          | 250                        |
| Uncabled receptacles, adapters, dummy loads .....                                  |                          | N/A                        |
| <b>Insertion Loss:</b> (dB max, tested at 1.5 GHz)                                 |                          |                            |
| Straight cabled connectors .....                                                   |                          | 0.30 dB                    |
| Right angle cabled connectors.....                                                 |                          | 0.60 dB                    |
| Uncabled receptacles, adapters, dummy loads .....                                  |                          | N/A                        |
| <b>Insulation Resistance:</b> 1000 megohms min                                     |                          |                            |
| <b>Contact Resistance:</b> (milliohms max)                                         |                          |                            |
|                                                                                    | <u>Initial</u>           | <u>After Environmental</u> |
| Center contact (straight cabled connectors and uncabled receptacles)               | 6.0                      | 8.0                        |
| Center contact (right angle cabled connectors and adapters)                        | 12.0                     | 16.0                       |
| Outer contact (gold plated connectors)                                             | 1.0                      | 1.5                        |
| Outer contact (nickel plated connectors)                                           | 2.5                      | 3.5                        |
| Braid to body (gold plated connectors)                                             | 1.0                      | N/A                        |
| Braid to body (nickel plated connectors)                                           | 2.5                      | N/A                        |
| <b>RF Leakage:</b> (dB min, tested at 2.5 GHz)                                     |                          |                            |
| Cabled connectors .....                                                            |                          | -55 dB                     |
| Uncabled recepacles, adapters, dummy loads .....                                   |                          | N/A                        |
| <b>RF High Potential Withstanding Voltage:</b>                                     |                          |                            |
| (VRMS min, tested at 4 and 7 MHz)†                                                 |                          |                            |
| RG-178 .....                                                                       |                          | 500                        |
| RG-316, RG-58 .....                                                                |                          | 700                        |
| Uncabled receptacles and adapters .....                                            |                          | 600                        |
| Dummy loads.....                                                                   |                          | N/A                        |
| <b>Power Rating (Dummy Load):</b> 0.5 watt @ +25°C, derated to 0.25 watt @ +125° C |                          |                            |

Specifications

Mechanical Specifications

|                                                |                                             |                       |
|------------------------------------------------|---------------------------------------------|-----------------------|
| <b>Engagement Design:</b>                      | MIL-STD-348, Series SMB                     |                       |
| <b>Engagement/Disengagement Force:</b>         | 2 lbs min to 14 lbs max axial force         |                       |
| <b>Contact Retention:</b>                      | 4 lbs min axial force (captivated contacts) |                       |
|                                                | 1 oz-in min torque (uncabled receptacles)   |                       |
| <b>Cable Retention:</b>                        | <u>Axial Force* (lbs)</u>                   | <u>Torque (oz-in)</u> |
| RG-178 .....                                   | 10                                          | N/A                   |
| RG-316 .....                                   | 20                                          | N/A                   |
| RG-58 .....                                    | 40                                          | N/A                   |
| RG-405 .....                                   | 30                                          | 16                    |
| *Or cable breaking strength whichever is less. |                                             |                       |
| <b>Durability:</b> 500 cycles min              |                                             |                       |

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                           |                                                        |                   |                   |
|---------------------------|--------------------------------------------------------|-------------------|-------------------|
| <b>Temperature Range:</b> |                                                        | Connectors .....  | - 65°C to + 165°C |
|                           |                                                        | Dummy loads ..... | - 65°C to + 125°C |
| <b>Thermal Shock:</b>     | MIL-STD-202, Method 107, Condition B (N/A dummy loads) |                   |                   |
| <b>Corrosion:</b>         | MIL-STD-202, Method 101, Condition B (N/A dummy loads) |                   |                   |
| <b>Shock:</b>             | MIL-STD-202, Method 213, Condition B (N/A dummy loads) |                   |                   |
| <b>Vibration:</b>         | MIL-STD-202, Method 204, Condition B (N/A dummy loads) |                   |                   |

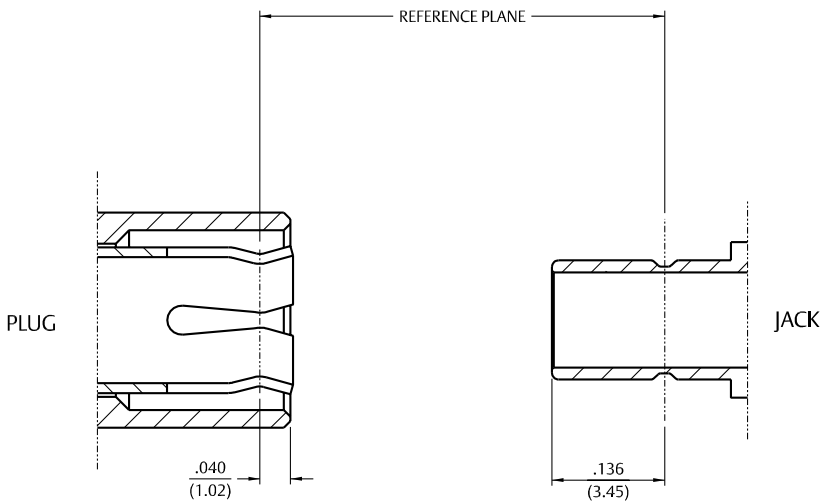
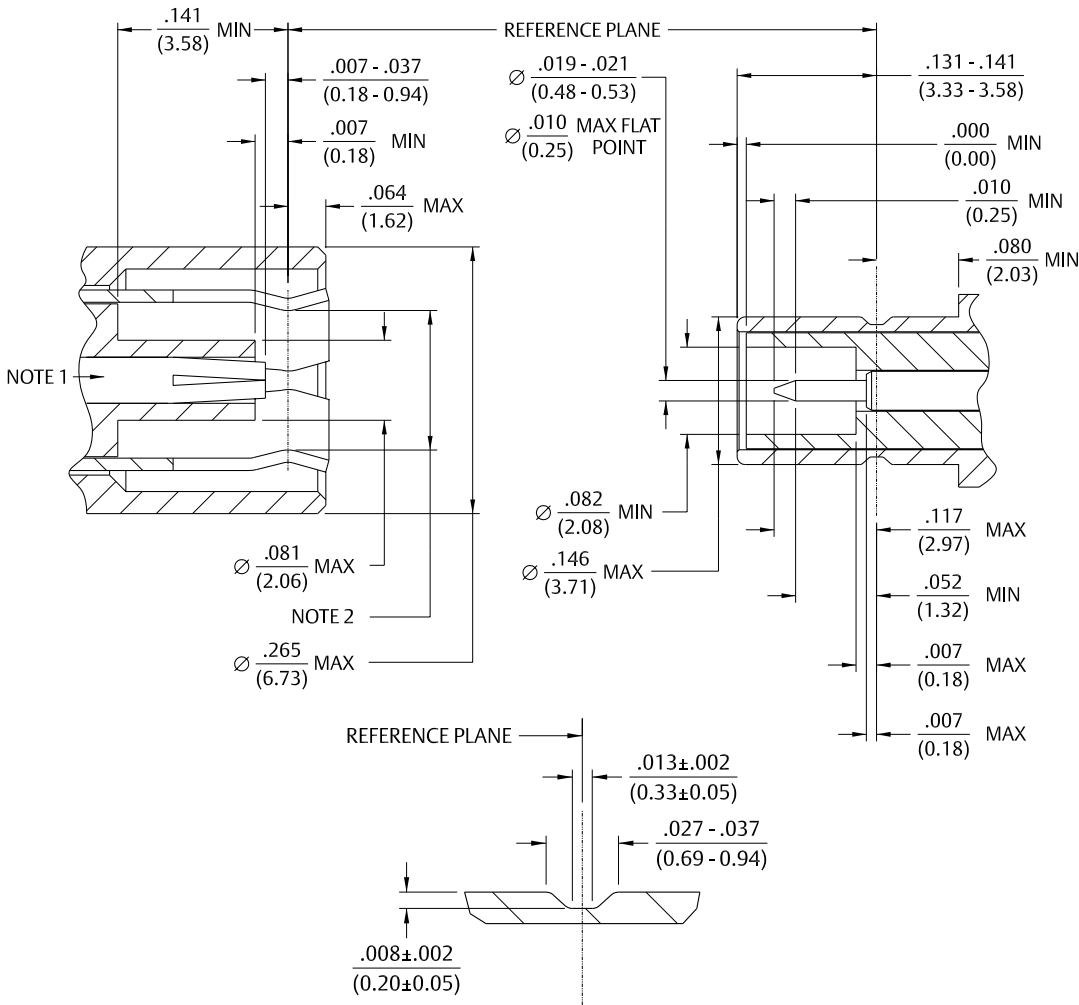
Material Specifications

|                           |                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bodies:</b>            | Brass per ASTM B16 or zinc per ASTM B86-71, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423                               |
| <b>Contacts:</b>          | Male - brass per ASTM B16, gold plated per MIL-DTL-45204 .00003” min                                                                                 |
|                           | Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min                                                                   |
| <b>Insulators:</b>        | PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457 or Teflon PFA 340                                                                                  |
| <b>Expansion Caps:</b>    | Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423                                                       |
| <b>Crimp Sleeves:</b>     | Copper per ASTM B301 or brass per ASTM B16, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423                               |
| <b>Mounting Hardware:</b> | Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) per ASTM B139, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423 |
| <b>Cover Rings:</b>       | Phosphor Bronze per ASTM B139, gold plated per MIL-DTL-45204 .00001 min or nickel plated per SAE-AMS2423                                             |

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.  
Note: All Gold plated parts include a .00005” min Nickel under plated barrier layer.

Specifications

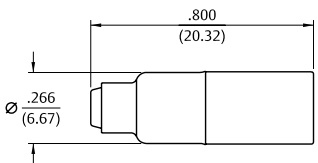
Mating Engagement for SMB Series



Notes 1. ID of contact to meet VSWR, mating characteristics and connector durability when mated with a dia .019/.021 (0.48/0.53) male contact.  
2. Must meet the force to engage and disengage when mated with mating part.

Semi-Rigid Cable

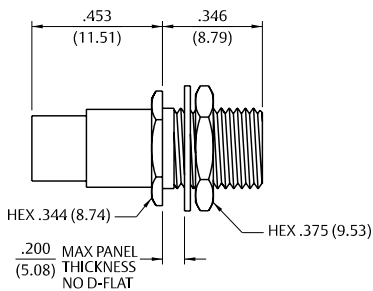
Straight Solder Type Plug – Captivated Contact



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 131-3693-001 | 131-3693-016  |

Assembly instructions page 233.

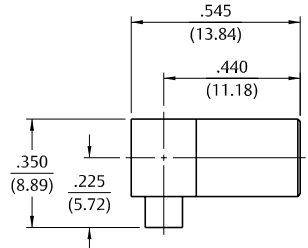
Straight Solder Type Bulkhead Plug – Captivated Contact



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-402     | 131-3694-401 | 131-3694-406  |

Assembly instructions page 233.  
Mounting hole dia. .290 (7.05).

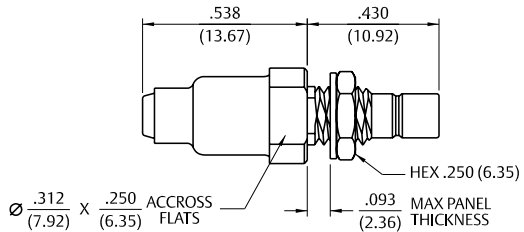
Right Angle Solder Type Plug – Captivated Contact



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 131-3693-101 | 131-3693-116  |

Assembly instructions page 234.

Straight Bulkhead Solder Type Jack – Captivated Contact

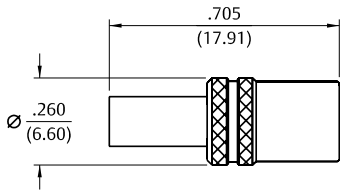


| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 131-3593-401 | 131-3593-406  |

Assembly instructions page 233.  
Mounting hole layout figure 5 page 194.

Flexible Cable

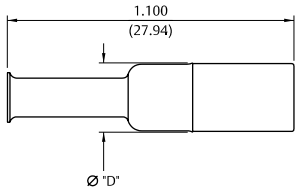
Straight Crimp Type Plug (3-Piece) – Solder or Crimp Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-161, 174, 179, 187, 188, 316   | 131-3403-021 | 131-3403-026  |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-3404-021 | 131-3404-026  |
| RG-58, 141, 303                   | 131-3407-011 | 131-3407-016  |

Assembly instructions page 232.

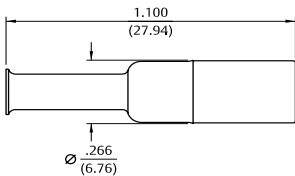
Straight Solder Type Bulkhead Plug – Solder or Crimp Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated | Crimp Contact | “D”         |
|-----------------------------------|--------------|---------------|---------------|-------------|
| RG-178, 196                       | 131-3402-001 | 131-3402-016  | No            | .266 (6.76) |
| RG-161, 174, 179, 187, 188, 316   | 131-3403-001 | 131-3403-016  | Yes           | .266 (6.76) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-3404-001 | 131-3404-016  | Yes           | .266 (6.76) |
| RG-58, 141, 303                   | 131-3407-001 | 131-3407-006  | Yes           | .270 (6.86) |

Assembly instructions page 237.

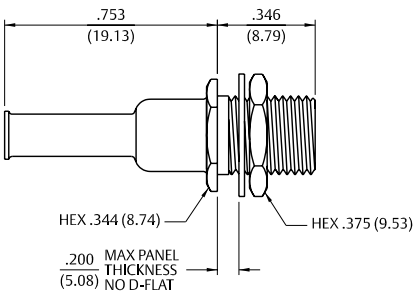
Straight Crimp Type Plug – Die Cast – Solder or Crimp Captivated Contact



| Cable Type                       | Gold Plated  | Nickel Plated |
|----------------------------------|--------------|---------------|
| RG-161, 174, 179, 187,188,316    | 131-1403-001 | 131-1403-016  |
| RG-316 DS, 188 DS, 179 DS, 187DS | 131-1404-001 | 131-1404-016  |

Assembly instructions page 237.

Straight Crimp Type Bulkhead Plug – Solder or Crimp Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-161U, 174, 179, 187, 188, 316  | 131-3403-401 | 131-3403-406  |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-3404-401 | 131-3404-406  |

Assembly instructions page 237. Mounting hole dia. .290 (7.05).

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-178, 196                       | 131-3402-101 | 131-3402-116  |
| RG-161, 174, 179, 187, 188, 316   | 131-3403-101 | 131-3403-116  |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-3404-101 | 131-3404-116  |

Assembly instructions page 238.

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type      | Gold Plated  | Nickel Plated |
|-----------------|--------------|---------------|
| RG-58, 141, 303 | 131-3407-101 | 131-3407-106  |

Assembly instructions page 238.

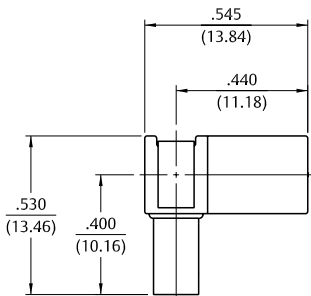
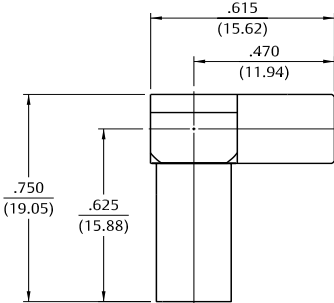
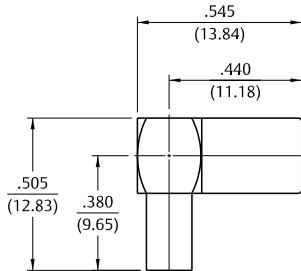
Right Angle Crimp Type Plug – Die Cast – Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-178, 196                       | 131-1402-101 | 131-1402-116  |
| RG-161, 174, 179, 187, 188, 316   | 131-1403-101 | 131-1403-116  |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-1404-101 | 131-1404-116  |

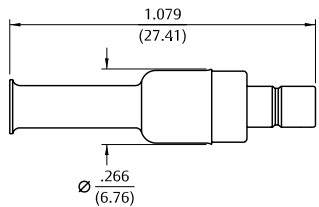
Assembly instructions page 238.

Flexible Cable



Flexible Cable

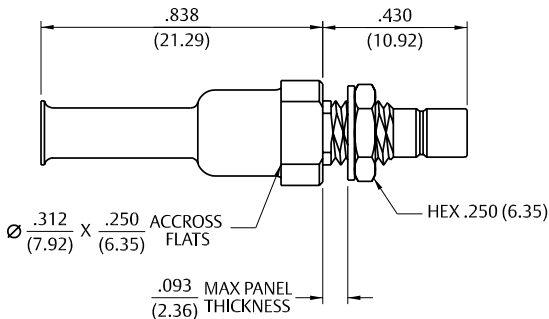
Straight Crimp Type Jack – Solder or Crimp Captivated Contact



| Cable Type                      | Gold Plated  | Nickel Plated | Crimp Contact |
|---------------------------------|--------------|---------------|---------------|
| RG-178, 196                     | 131-3302-001 | 131-3302-006  | No            |
| RG-161, 174, 179, 187, 188, 316 | 131-3303-001 | 131-3303-006  | Yes           |

Assembly instructions page 237.  
Mounting hole layout figure 5 page 194.

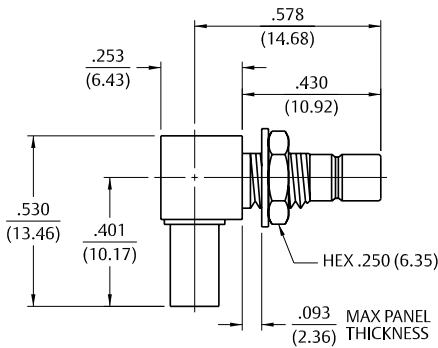
Straight Crimp Type Bulkhead Jack – Solder or Crimp Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-161, 174, 179, 187, 188, 316   | 131-3303-401 | 131-3303-406  |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-3304-401 | 131-3304-406  |

Assembly instructions page 237.  
Mounting hole layout figure 5 page 194.

Right Angle Crimp Type Bulkhead Jack – Captivated Contact



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-161, 174, 179,187,188,316      | 131-3303-501 | 131-3303-506  |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-3304-501 | 131-3304-506  |

Assembly instructions page 238.  
Mounting hole layout figure 5 page 194.

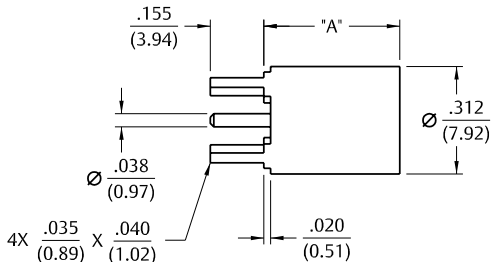
PC Mount

Straight Plug Receptacle



| Gold Plated  | Nickel Plated | "A"          |
|--------------|---------------|--------------|
| 131-3801-201 | 131-3801-216  | .395 (10.03) |
| 131-3801-231 | 131-3801-236  | .500 (12.70) |

Mounting hole layout figure 4 page 194.

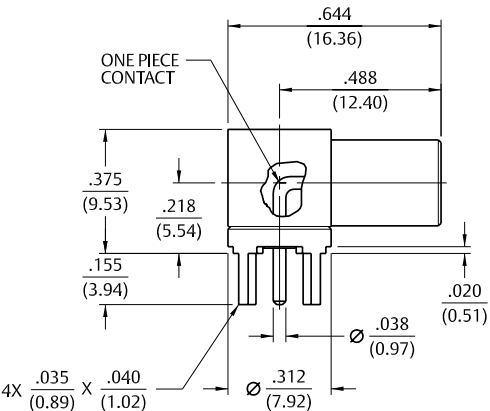


Right Angle Plug Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3801-301 | 131-3801-316  |

Mounting hole layout figure 4 page 194.

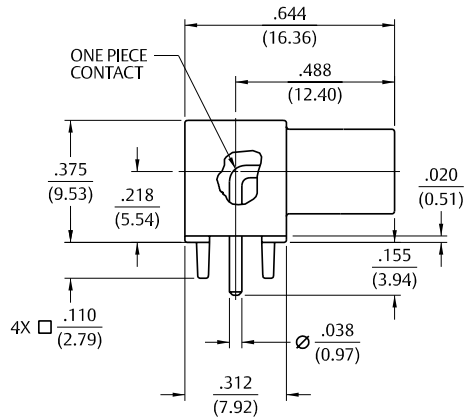


Right Angle Plug Receptacle – Die Cast



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-1801-371 | 131-1801-376  |

Mounting hole layout figure 4 page 194.



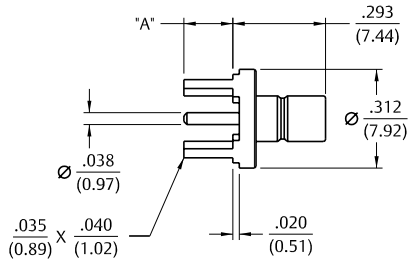
PC Mount

Straight Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 131-3701-201 | 131-3701-206  | .155 (3.94) |
| 131-3701-211 | 131-3701-216  | .110 (2.79) |

Mounting hole layout figure 4 page 194.

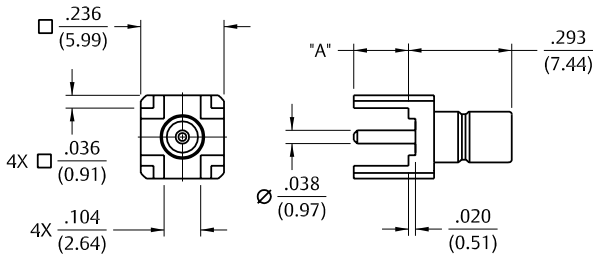


Straight Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 131-3701-261 | 131-3701-266  | .155 (3.94) |
| 131-3701-271 | 131-3701-276  | .095 (2.41) |

Mounting hole layout figure 4 page 194.

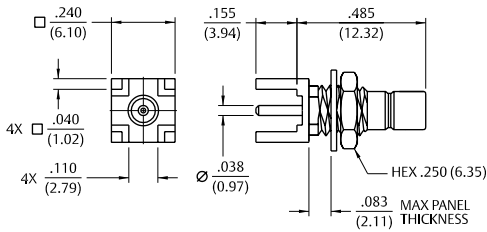


Straight Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-231 | 131-3701-236  |

Mounting hole layout figures 4 and 5 page 195.



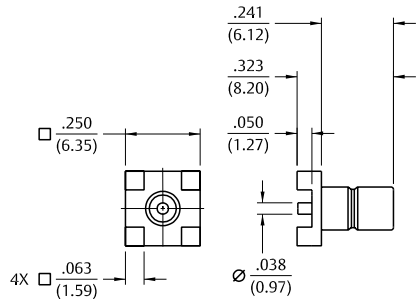
PC Mount

Straight Jack Receptacle – Surface Mount



| Gold Plated  |
|--------------|
| 131-3711-201 |

Recommended Land pattern figure 9 page 194.

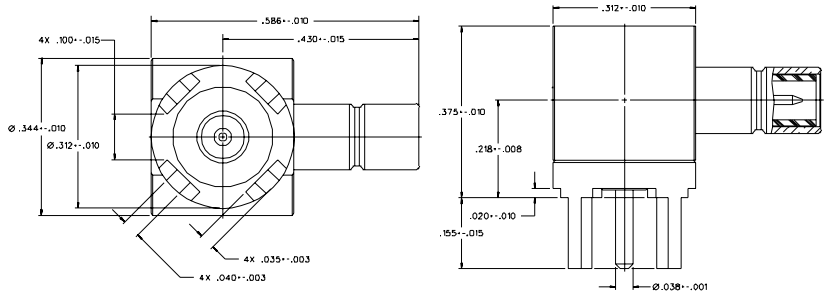


Right Angle Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-301 | 131-3701-306  |

Mounting hole layout figure 4 page 194.

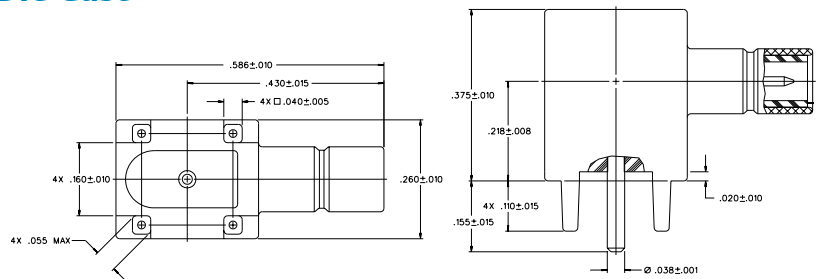


Right Angle Jack Receptacle – Die Cast



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-1701-371 | 131-1701-376  |

Mounting hole layout figure 4 page 194.



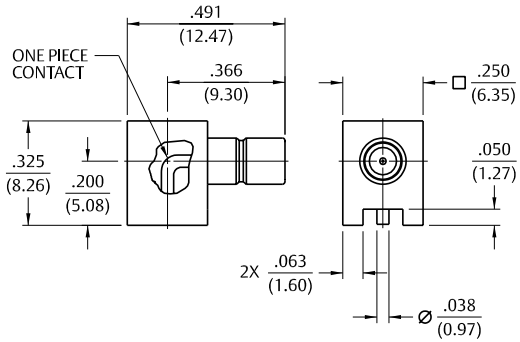
PC Mount

Right Angle Surface Mount Jack Receptacle



| Gold Plated  | Packaging                   |
|--------------|-----------------------------|
| 131-3711-301 | Stock                       |
| 131-3711-302 | Tape and Reel, 425 pcs/reel |

Mounting hole layout figure 9 page 194.  
Tape and Reel .630 (16.0) component pitch .945 (24.0) wide

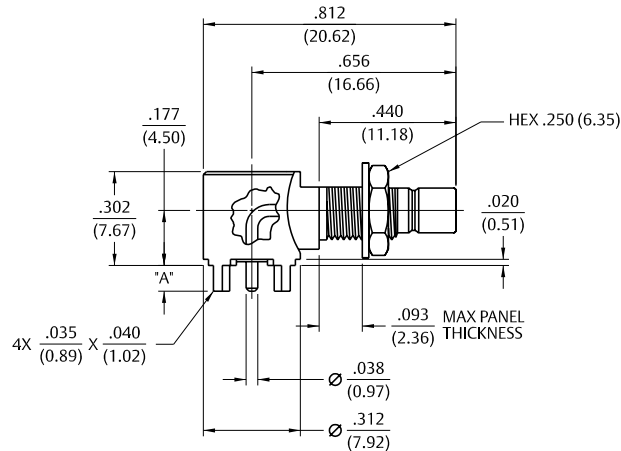


Right Angle Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 131-3701-501 | 131-3701-506  | .083 (2.11) |
| 131-3701-511 | 131-3701-516  | .110 (2.79) |
| 131-3701-341 | 131-3701-346  | .155 (3.94) |

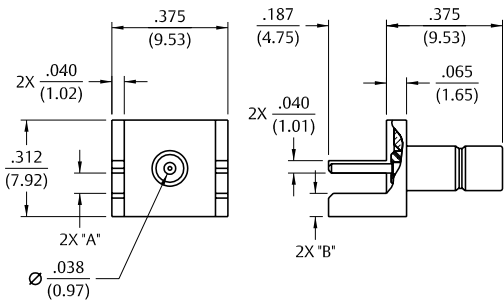
Mounting hole layout figures 4 and 5 page 194.



End Launch Jack Receptacle – Round Contact



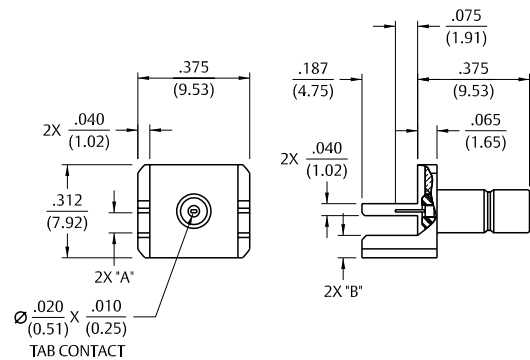
| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         |
|--------------|---------------|-----------------|-------------|-------------|
| 131-3701-801 | 131-3701-806  | .062 (1.57)     | .068 (1.73) | .073 (1.85) |
| 131-3701-821 | 131-3701-826  | .042 (1.07)     | .048 (1.22) | .093 (2.36) |



End Launch Jack Receptacle – Tab Contact



| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         |
|--------------|---------------|-----------------|-------------|-------------|
| 131-3701-811 | 131-3701-816  | .062 (1.57)     | .068 (1.73) | .083 (2.11) |
| 131-3701-831 | 131-3701-836  | .042 (1.07)     | .048 (1.22) | .103 (2.62) |



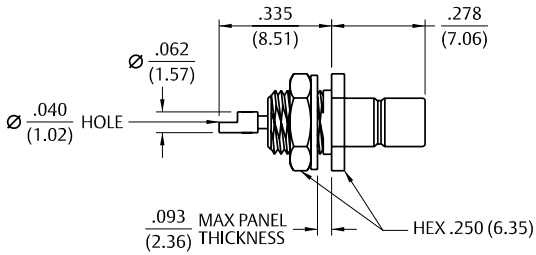
Bulkhead and Panel Mount

Front Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-411 | 131-3701-416  |

Mounting hole layout figure 5 page 194.

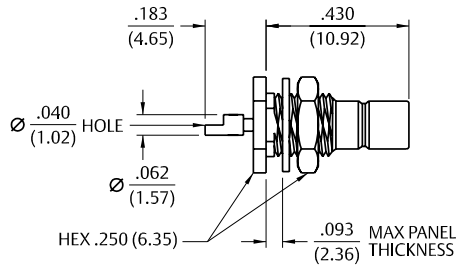


Rear Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-401 | 131-3701-406  |

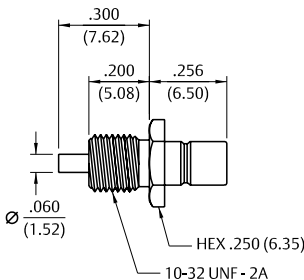
Mounting hole layout figure 5 page 194.



Front Mount Bulkhead Jack Receptacle – Thread Mount Ruggedized Interface – Round Contact



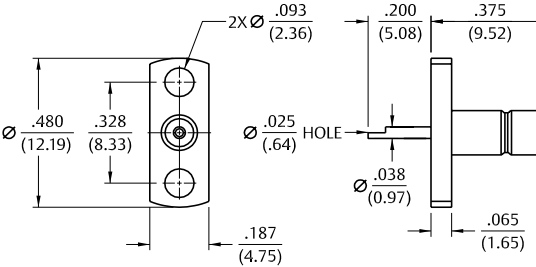
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-441 | 131-3701-446  |



2-Hole Flange Mount Jack Receptacle



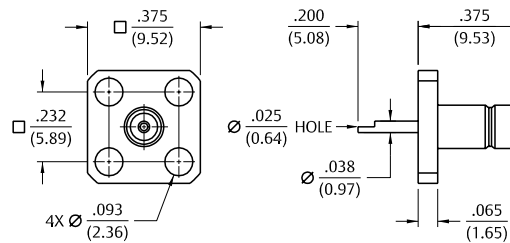
| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-621 | 131-3701-626  |



4-Hole Flange Mount Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3701-631 | 131-3701-636  |



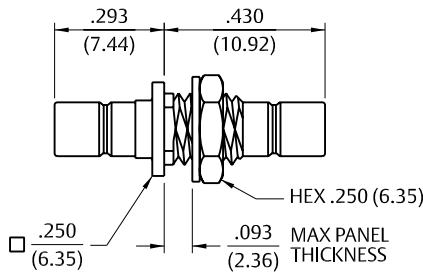
In-Series Adapters & Terminations

Jack to Bulkhead Jack Adapter



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3901-401 | 131-3901-406  |

Mounting hole layout figure 5 page 194.

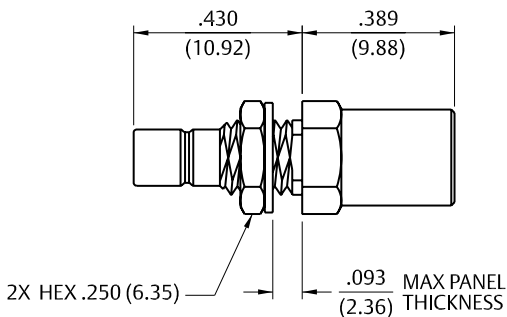


Plug to Bulkhead Jack Adapter



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-3901-411 | 131-3901-416  |

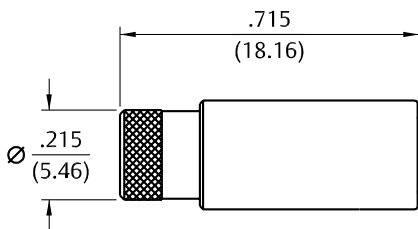
Mounting hole layout figure 5 page 194.



Plug Dummy Load – 50 Ohm and 75 Ohm



| Gold Plated  | Nickel Plated | Resistance |
|--------------|---------------|------------|
| 131-3801-811 | 131-3801-816  | 50 Ohm     |
| 131-3801-821 | 131-3801-826  | 75 Ohm     |



Specifications

Electrical Specifications

**Impedance:** 50 Ohms

**Frequency Range:**

|                       |                                                                                |
|-----------------------|--------------------------------------------------------------------------------|
| Connectors .....      | 0-4 GHz                                                                        |
| VSWR: (max) (f = GHz) |                                                                                |
|                       | <div>Straight Cabled Connectors</div> <div>Right Angle Cabled Connectors</div> |

|                           |             |             |
|---------------------------|-------------|-------------|
| RG-316 .....              | 1.25 + .04f | 1.35 + .04f |
| Uncabled receptacles..... | N/A         |             |

**Working Voltage:** (VRMS max)†

|                                  |                                          |    |
|----------------------------------|------------------------------------------|----|
|                                  | <div>Sea Level</div> <div>70K Feet</div> |    |
| RG-316, uncabled connectors..... | 335                                      | 85 |

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

|                                    |      |
|------------------------------------|------|
| RG-316, uncabled receptacles ..... | 1000 |
|------------------------------------|------|

**Corona Level:** (Volts min at 70,000 feet)†

|                           |     |
|---------------------------|-----|
| RG-316 .....              | 250 |
| Uncabled receptacles..... | N/A |

**Insertion Loss:** (dB max, tested at 1.5 GHz)

|                                    |         |
|------------------------------------|---------|
| Straight cabled connectors .....   | 0.30 dB |
| Right angle cabled connectors..... | 0.60 dB |
| Uncabled receptacles.....          | N/A     |

**Insulation Resistance:** 1000 megohms min

**Contact Resistance:** (milliohms max)

|                                                                      |                                                   |      |
|----------------------------------------------------------------------|---------------------------------------------------|------|
|                                                                      | <div>Initial</div> <div>After Environmental</div> |      |
| Center contact (straight cabled connectors and uncabled receptacles) | 6.0                                               | 8.0  |
| Center contact (right angle cabled connectors)                       | 12.0                                              | 16.0 |
| Outer contact                                                        | 1.0                                               | 1.5  |
| Braid to body                                                        | 1.0                                               | N/A  |

**RF Leakage:** (dB min tested at 2.5 GHz)

|                           |        |
|---------------------------|--------|
| Cabled connectors.....    | -55 dB |
| Uncabled receptacles..... | N/A    |

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

|                             |     |
|-----------------------------|-----|
| Connectors for RG-316 ..... | 700 |
| Uncabled receptacles.....   | 600 |

Mechanical Specifications

**Engagement Design:**

MIL-STD-348, Series SMB

**Engagement/Disengagement Force:**

2 pounds min to 14 pounds max axial force

**Contact Retention:**

4 lbs. min axial force (captivated contacts)

1 inch-ounce min torque (uncabled receptacles)

**Cable Retention:**

|             |                                                         |                                                         |
|-------------|---------------------------------------------------------|---------------------------------------------------------|
|             | <div>Axial Force* (lbs)</div> <div>Torque (oz-in)</div> | <div>Axial Force* (lbs)</div> <div>Torque (oz-in)</div> |
| RG-316..... | 20                                                      | N/A                                                     |

\*or cable breaking strength whichever is less.

**Durability:** 500 cycles min

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-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 B

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

\* See Non-Magnetic materials specifications page X.

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Refer back to Page 121 for Mating Engagement detail.

Material Specifications

(See non-magnetic materials page 10)

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

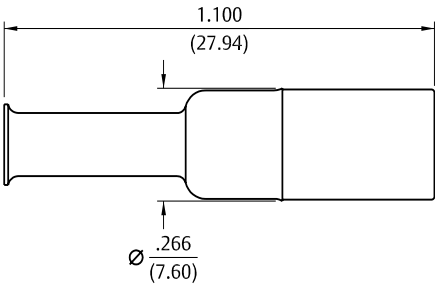
Flexible Cable

Straight Crimp Type Plug – Solder or Crimp Captivated Contact



| Cable Type                        | Gold Plated  |
|-----------------------------------|--------------|
| RG-316, 188, 174, 179, 187        | 131-9403-001 |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-001 |

Assembly instructions page 235.

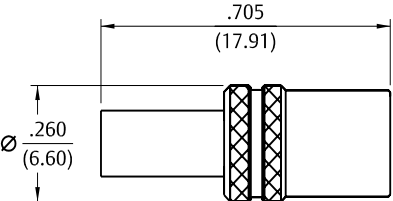


Straight Crimp Type Plug (3-piece) Solder or Crimp Captivated Contact



| Cable Type                        | Gold Plated  |
|-----------------------------------|--------------|
| RG-316, 188, 174, 179, 187        | 131-9403-021 |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-021 |

Assembly instructions page 232.

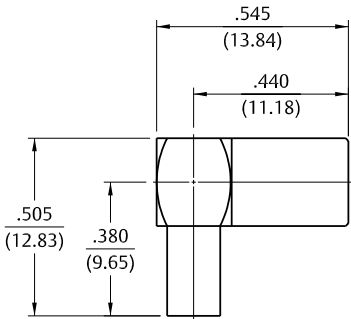


Right Angle Crimp Type Plug – Captivated Contact



| Cable Type                        | Gold Plated  |
|-----------------------------------|--------------|
| RG-316, 188, 174, 179, 187        | 131-9403-101 |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-101 |

Assembly instructions page 236.

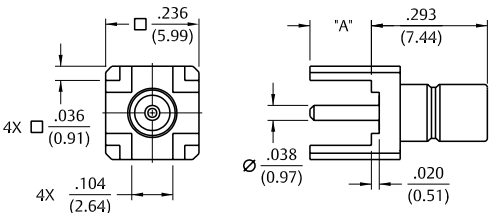


Straight Jack Receptacle



| Gold Plated  | “A”         |
|--------------|-------------|
| 131-9701-201 | .155 (3.94) |
| 131-9701-211 | .095 (2.41) |

Mounting hole layout figure 4 page 194.

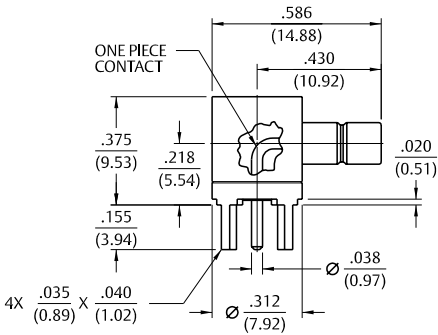


Right Angle Jack Receptacle



| Gold Plated  |
|--------------|
| 131-9701-301 |

Mounting hole layout figure 4 page 194.



Specifications

Electrical Specifications

|                                                                                               |                  |                            |
|-----------------------------------------------------------------------------------------------|------------------|----------------------------|
| <b>Impedance:</b> 75 Ohms                                                                     |                  |                            |
| <b>Frequency Range:</b> 0-2 GHz                                                               |                  |                            |
| <b>VSWR:</b> (max) (f = GHz)                                                                  |                  |                            |
| RG-179, RG-59, Belden 735A:                                                                   |                  |                            |
| Straight cabled connectors.....                                                               | 1.25 + .04f      |                            |
| Right angle cabled connectors .....                                                           | 1.35 + .04f      |                            |
| Adapters .....                                                                                | 1.20 + .04f      |                            |
| Type N Adapters .....                                                                         | 1.05 + .01f      |                            |
| Precision loads .....                                                                         | 1.05 + .01f      |                            |
| Uncabled receptacles, opens, shorts .....                                                     | N/A              |                            |
| <b>Working Voltage:</b> (VRMS max)                                                            | <u>Sea Level</u> | <u>70K Feet</u>            |
| RG-179, RG-59, Belden 735A, uncabled receptacles, adapters.....                               | .335             | 85                         |
| Open, shorts, loads.....                                                                      | N/A              | N/A                        |
| <b>Dielectric Withstanding Voltage:</b> (Vrms min at sea level)†                              |                  |                            |
| RG-179, RG-59, Belden 735A, uncabled receptacles, adapters .....                              | 1000             |                            |
| Open, shorts, loads.....                                                                      | N/A              |                            |
| <b>Insulation Resistance:</b> 1000 megohms min                                                |                  |                            |
| <b>Contact Resistance:</b> (milliohms max)                                                    | <u>Initial</u>   | <u>After Environmental</u> |
| Center contact (straight cabled connectors, uncabled receptacles, opens, shorts, loads) ..... | 6.0              | 8.0                        |
| Center contact (right angle cabled connectors and adapters) .....                             | 12.0             | 16.0                       |
| Outer contact (gold plated connectors).....                                                   | 1.0              | 1.5                        |
| Outer contact (nickel plated connectors).....                                                 | 2.5              | 3.5                        |
| Braid to body (gold plated connectors).....                                                   | 1.0              | N/A                        |
| <b>Corona Level:</b> (Volts min at 70,000 ft)†                                                |                  |                            |
| RG-179, RG-59, Belden 735A .....                                                              | 250              |                            |
| Uncabled receptacles, adapters, open, shorts, loads.....                                      | N/A              |                            |
| <b>Insertion Loss:</b> (dB max, tested at 1.5 GHz)                                            |                  |                            |
| Straight cabled connectors .....                                                              | 0.30 dB          |                            |
| Right angle cabled connectors .....                                                           | 0.60 dB          |                            |
| Uncabled receptacles, adapters, opens, shorts, loads.....                                     | N/A              |                            |
| <b>RF Leakage:</b> (dB min tested at 2.0 GHz)                                                 |                  |                            |
| Cabled connectors.....                                                                        | -55 dB           |                            |
| Uncabled receptacles, adapters opens, shorts, loads.....                                      | N/A              |                            |
| <b>RF High Potential Withstanding Voltage:</b><br>(VRMS min, tested at 4 and 7 MHz)†          |                  |                            |
| RG-179, RG-59, Belden 735A.....                                                               | 700              |                            |
| Uncabled receptacles and adapters.....                                                        | 600              |                            |
| Opens, shorts, loads .....                                                                    | N/A              |                            |
| <b>Power Rating:</b> (Loads) 1.0 watt at +25°C derated linearly to .5 watt at +125°C          |                  |                            |
| <b>Electrical Length:</b> Open ± 1.5° (±5.2° relative to short)                               |                  |                            |
| Short ± 1.5° (±5.2° relative to open)                                                         |                  |                            |
| Adapters ±5.2° (N/A for Jack-Bulkhead Jack and N Types)                                       |                  |                            |

Specifications

Mechanical Specifications

|                                                 |                                              |                       |
|-------------------------------------------------|----------------------------------------------|-----------------------|
| <b>Engagement Design:</b>                       | Compatible with MIL-STD-348, Series SMB      |                       |
| <b>Engagement/Disengagement Force:</b>          | 2 lbs min to 14 lbs max axial force          |                       |
| <b>Contact Retention:</b>                       | 4 lbs. min axial force (captivated contacts) |                       |
|                                                 | 1 oz-in min torque (uncabled receptacles)    |                       |
| <b>Cable Retention:</b>                         | <u>Axial Force* (lbs)</u>                    | <u>Torque (oz-in)</u> |
| RG-179, Belden 735A .....                       | 20                                           | N/A                   |
| RG-59 .....                                     | 40                                           | N/A                   |
| * or cable breaking strength whichever is less. |                                              |                       |
| <b>Durability:</b> 500 cycles min               |                                              |                       |

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                                                                                                                               |                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>Temperature Range:</b> - 65°C to +165°C - Connectors and adapters, - 65°C to +125°C - Loads, 20°C to 26°C -- Opens, shorts |                                                                 |
| <b>Thermal Shock:</b>                                                                                                         | MIL-STD-202, Method 107, Condition B (N/A opens, shorts, loads) |
| <b>Corrosion:</b>                                                                                                             | MIL-STD-202, Method 101, Condition B (N/A opens, shorts, loads) |
| <b>Shock:</b>                                                                                                                 | MIL-STD-202, Method 213, Condition B (N/A opens, shorts, loads) |
| <b>Vibration:</b>                                                                                                             | MIL-STD-202, Method 204, Condition B (N/A opens, shorts, loads) |
| <b>Temperature Coefficient:</b>                                                                                               | (Loads only) ± 300 ppm/°C                                       |

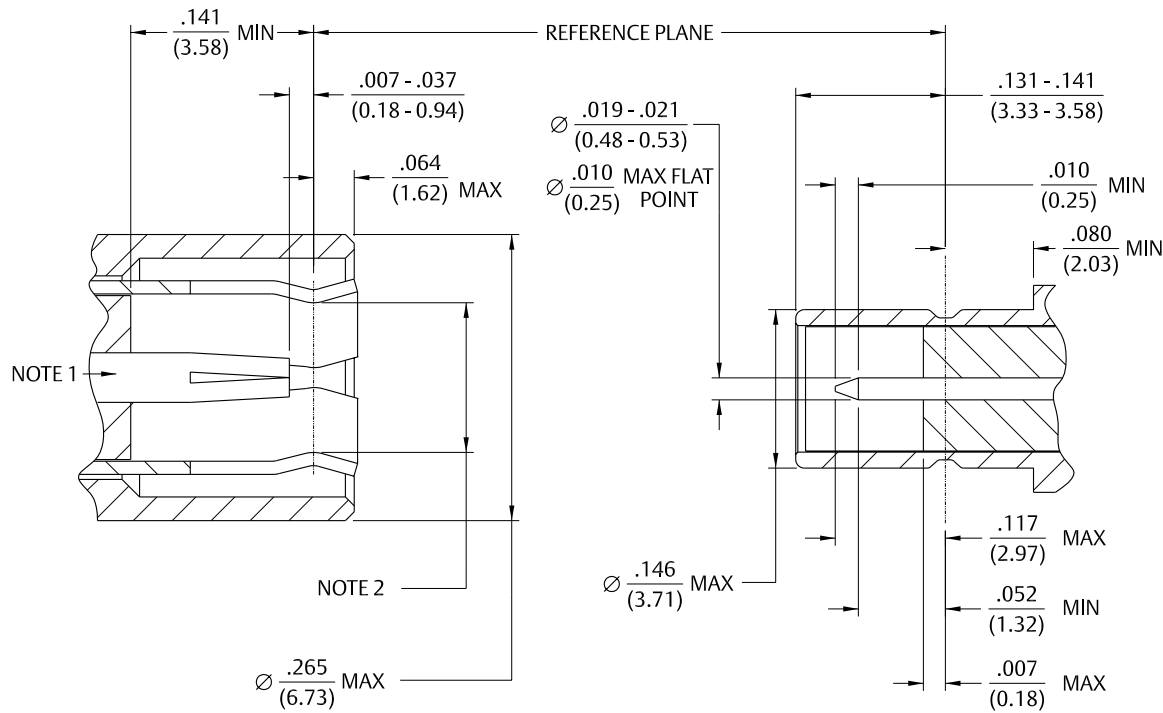
Material Specifications

|                           |                                                                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bodies:</b>            | Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423 N type adapters stainless steel per SAE-AMS QQ-S-763, passivated per MIL-DTL-14072 |
| <b>Contacts:</b>          | Male & Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min                                                                                           |
| <b>Insulators:</b>        | PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457                                                                                                                                   |
| <b>Expansion Caps:</b>    | Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423                                                                                      |
| <b>Crimp Sleeves:</b>     | Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423                                                                                    |
| <b>Mounting Hardware:</b> | Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) per ASTM B139, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2423                                |

*Note: All gold plated parts include a .00005”min nickel underplate barrier layer.*  
*† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.*

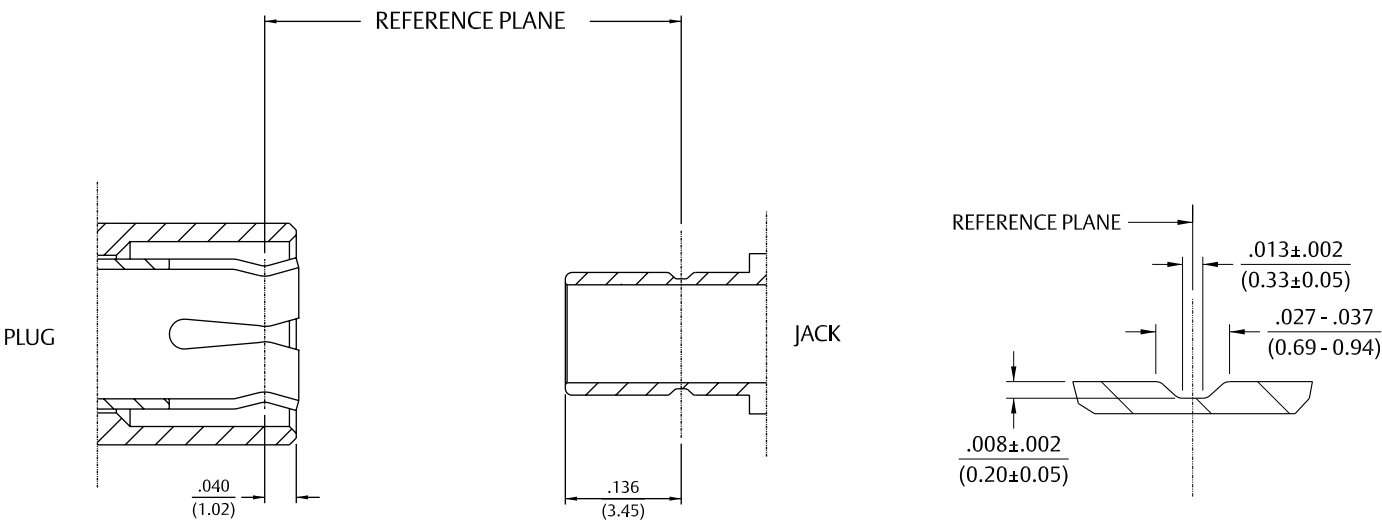
Specifications

Mating Engagement for Mini-75 Ohm SMB Series  
(Intermatable with Standard 50 Ohm SMB)



PLUG

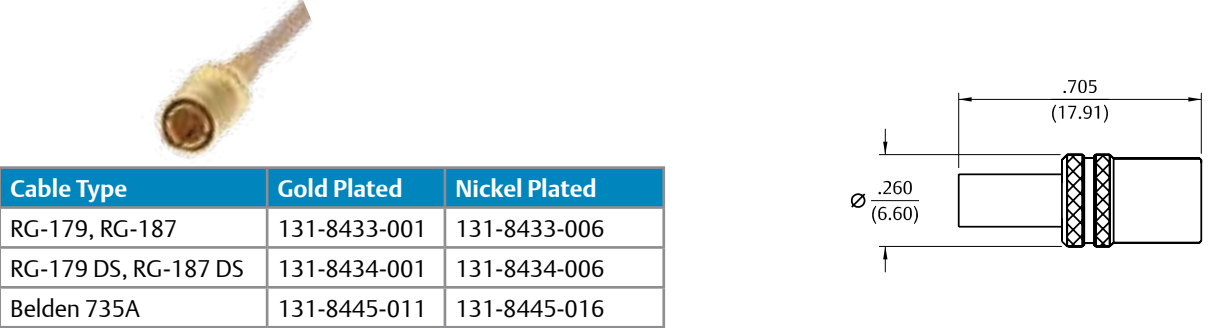
JACK



- Notes
- 1. ID of contact to meet VSWR, mating characteristics and connector durability when mated with a dia .019/.021 (0.48/0.53) male contact.
  - 2. Must meet the force to engage and disengage when mated with mating part.

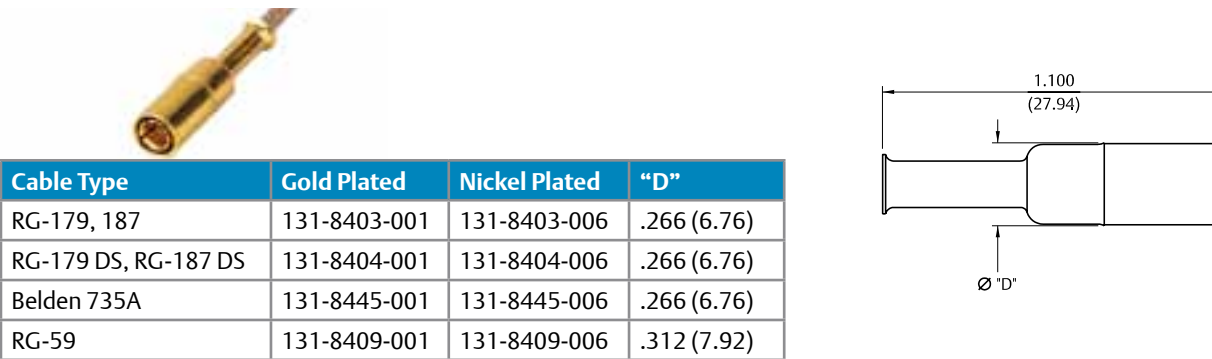
Flexible Cable

Straight Crimp Type Plug (3-piece) – Solder or Crimp Captivated Contact



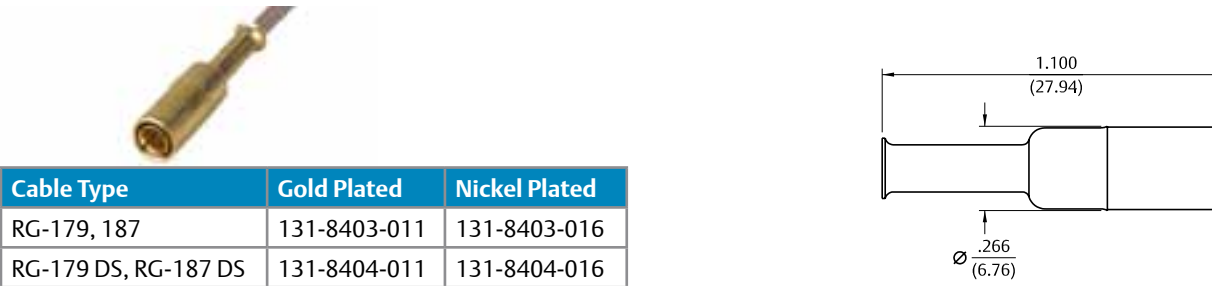
Assembly instructions page 232.

Straight Crimp Type Plug – Solder or Crimp Captivated Contact



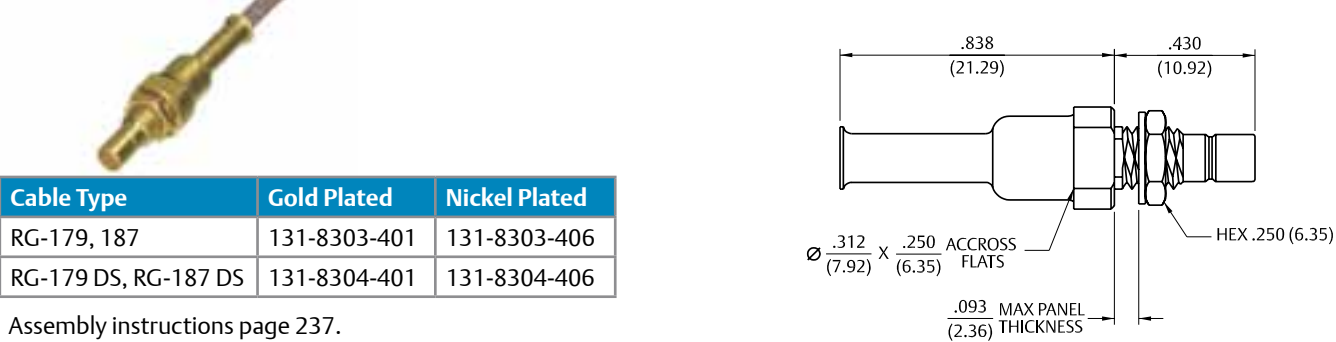
Assembly instructions page 237.

Straight Crimp Type Plug – Die Cast – Solder or Crimp Captivated Contact



Assembly instructions page 237.

Straight Crimp Type Bulkhead Jack – Solder or Crimp Captivated Contact



Assembly instructions page 237.

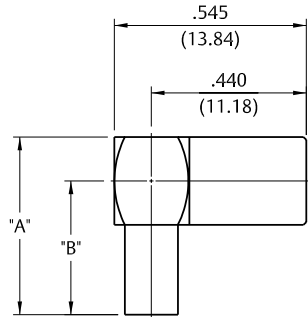
Flexible Cable

Right Angle Crimp Type Plug – Captivated Contact



| Cable Type           | Gold Plated  | Nickel Plated | "A"          | "B"          |
|----------------------|--------------|---------------|--------------|--------------|
| RG-179, 187          | 131-8403-101 | 131-8403-106  | .505 (12.83) | .380 (9.65)  |
| RG-179 DS, RG-187 DS | 131-8404-101 | 131-8404-106  | .505 (12.83) | .380 (9.65)  |
| Belden 735A          | 131-8445-101 | 131-8445-106  | .750 (19.05) | .625 (15.88) |

Assembly instructions page 238.

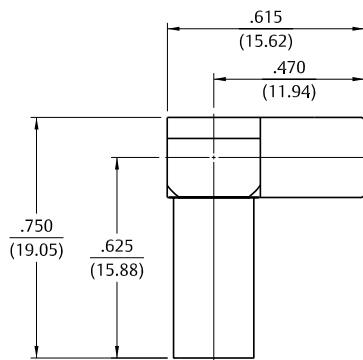


Right Angle Crimp Type Plug – Captivated Contact



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-59      | 131-8409-101 | 131-8409-106  |

Assembly instructions page 238.

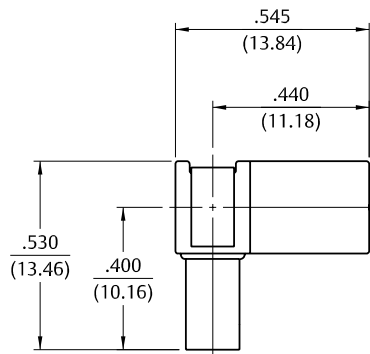


Right Angle Crimp Type Plug – Captivated Contact – Die Cast



| Cable Type          | Gold Plated  | Nickel Plated |
|---------------------|--------------|---------------|
| RG-179, 187         | 131-8403-111 | 131-8403-116  |
| RG-179 DS, RG-187DS | 131-8404-111 | 131-8404-116  |

Assembly instructions page 238.

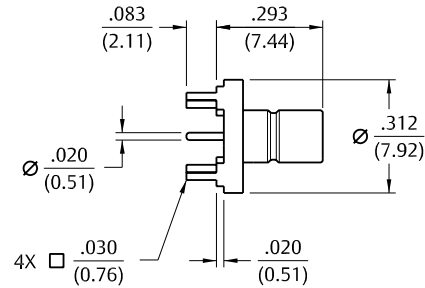


Straight Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-8701-201 | 131-8701-206  |

Mounting hole layout figure 6 page 194.

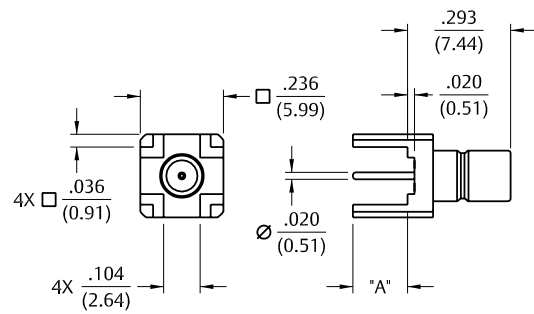


Straight Jack Receptacle



| Cable Type   | Gold Plated  | "A"         |
|--------------|--------------|-------------|
| 131-8701-251 | 131-8701-256 | .155 (3.94) |
| 131-8701-261 | 131-8701-266 | .095 (2.41) |

Mounting hole layout figure 6 page 194.

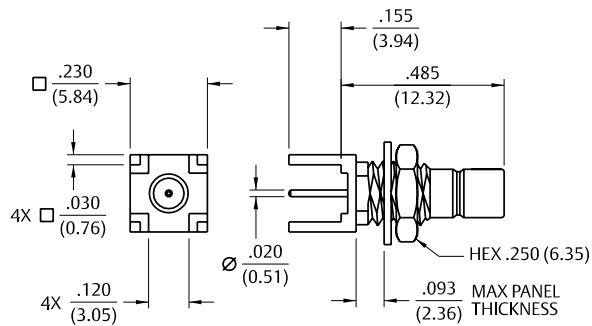


Straight Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-8701-211 | 131-8701-216  |

Mounting hole layout figures 5 and 6 page 195.



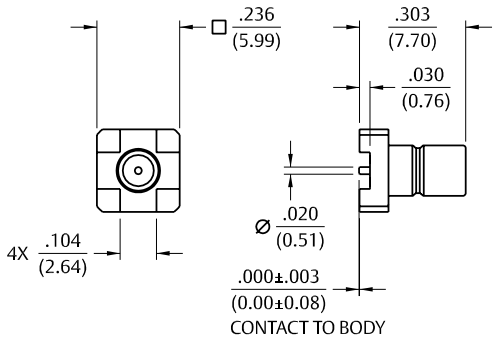
PC Mount

Straight Jack Receptacle – Surface Mount



| Gold Plated  | Packaging                  |
|--------------|----------------------------|
| 131-8711-201 | Stock                      |
| 131-8711-202 | Tape and Reel 750 pcs/reel |

Mounting hole layout figure 11 page 194.

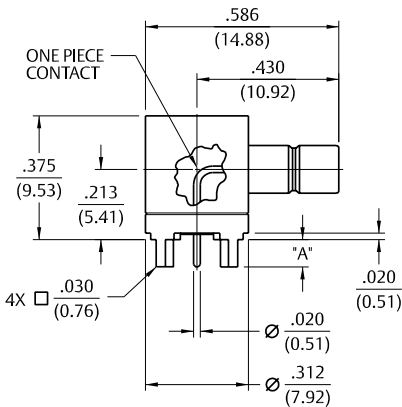


Right Angle Jack Receptacle



| Gold Plated  | Nickel Plated | "A"  |
|--------------|---------------|------|
| 131-8701-301 | 131-8701-306  | .083 |
| 131-8701-311 | 131-8701-316  | .125 |

Mounting hole layout figure 7 page 194.

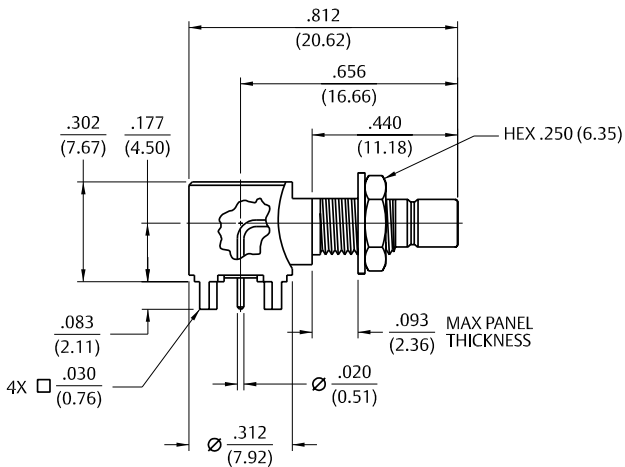


Right Angle Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-8701-501 | 131-8701-506  |

Mounting hole layout figures 5 and 7 page 194.

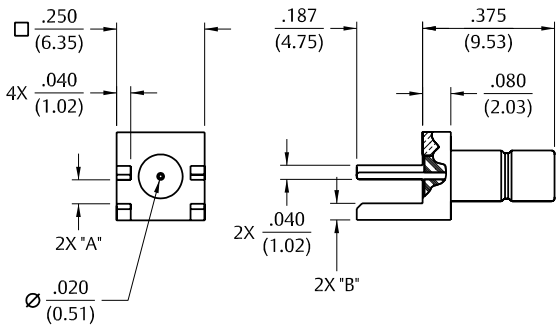


PC Mount & Panel Mount

End Launch Jack Receptacle



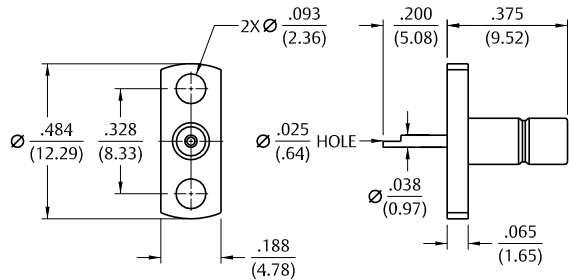
| Gold Plated  | Nickel Plated | Board Thickness | "A"         | "B"         |
|--------------|---------------|-----------------|-------------|-------------|
| 131-8701-841 | 131-8701-846  | .062 (1.57)     | .068 (1.73) | .047 (1.19) |



2-Hole Flange Mount Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-8701-601 | 131-8701-606  |

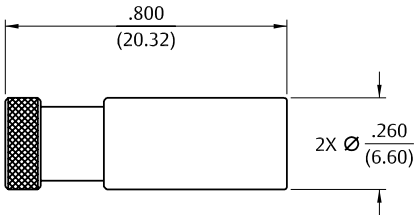


# Terminations

## Plug Precision Load



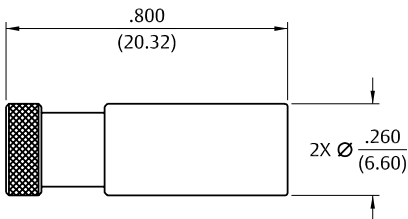
| Gold Plated  |
|--------------|
| 131-8801-801 |



## Matched Plug Open and Short



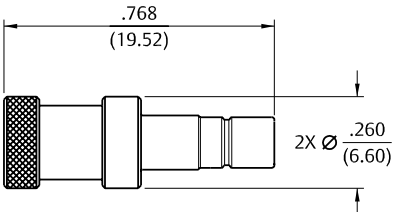
| Type  | Gold Plated  |
|-------|--------------|
| OPEN  | 131-8801-821 |
| SHORT | 131-8801-811 |



## Matched Jack Open and Short



| Type  | Gold Plated  |
|-------|--------------|
| OPEN  | 131-8701-821 |
| SHORT | 131-8701-811 |



## Jack to Jack Adapter



| Gold Plated  |
|--------------|
| 131-8901-801 |

## Plug to Plug Adapter



| Gold Plated  |
|--------------|
| 131-8901-811 |

## Jack to Plug Adapter



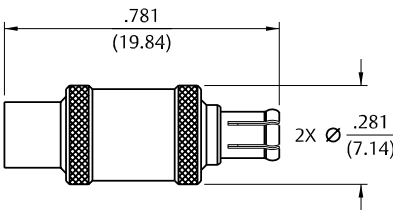
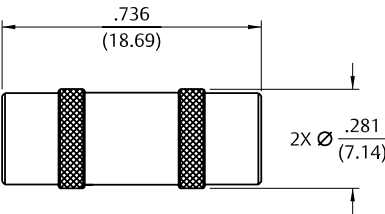
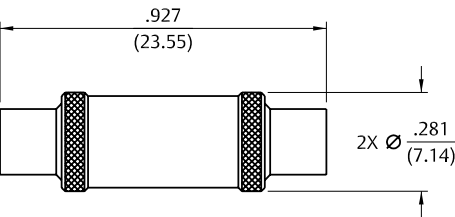
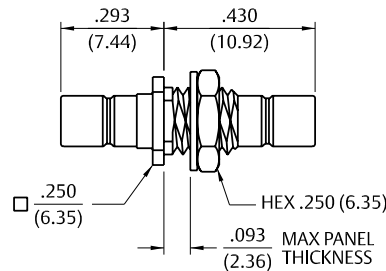
| Gold Plated  |
|--------------|
| 131-8901-821 |

## Jack to Bulkhead Jack \* Adapter



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-8901-401 | 131-8901-406  |

Mounting hole layout figure 5 page 194. \* Electrical length not matched to other adapters shown.



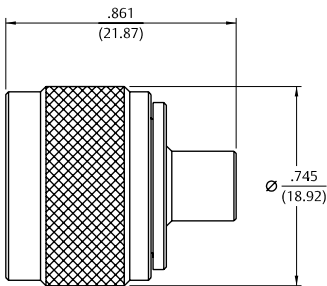
# In-Series Matched Adapters

Between-Series Adapter

75 Ohm Type N Plug to Mini-75 Ohm SMB Plug Adapter



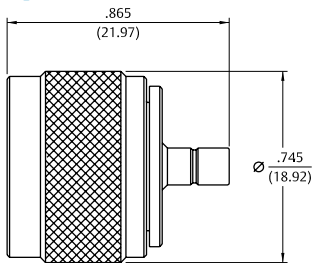
Stainless Steel Passivated  
134-1069-001



75 Ohm Type N Plug to Mini-75 Ohm SMB Jack Adapter



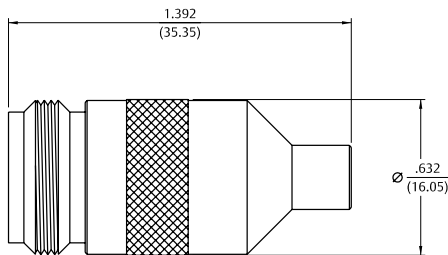
Stainless Steel Passivated  
134-1069-011



75 Ohm Type N Jack to Mini-75 SMB Plug Adapter



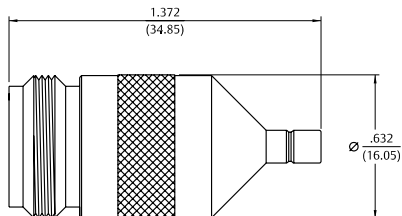
Stainless Steel Passivated  
134-1069-021



75 Ohm Type N Plug to Mini-75 Ohm SMB Jack Adapter



Stainless Steel Passivated  
134-1069-031



SMC Connectors

50 Ohm Connectors

|                                  |     |
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Specifications

Electrical Specifications

|                                                                                   |                          |                          |
|-----------------------------------------------------------------------------------|--------------------------|--------------------------|
| <b>Impedance:</b> 50 Ohms                                                         |                          |                          |
| <b>Frequency Range:</b> ..... 0-10 GHz                                            |                          |                          |
| <b>VSWR:</b> (max) (f = GHz)                                                      |                          |                          |
|                                                                                   | <u>Straight</u>          | <u>Right Angle</u>       |
|                                                                                   | <u>Cabled Connectors</u> | <u>Cabled Connectors</u> |
| RG-178.....                                                                       | 1.25 + .04f              | 1.40 + .06f              |
| RG-316 and RG-405 .....                                                           | 1.20 + .04f              | 1.30 + .04f              |
| Uncabled receptacles.....                                                         | N/A                      |                          |
| <b>Working Voltage:</b> (VRMS max)†                                               |                          |                          |
|                                                                                   | <u>Sea Level</u>         | <u>70K Feet</u>          |
| RG-178.....                                                                       | 250                      | 60                       |
| RG-316, RG-405 uncabled receptacles .....                                         | 335                      | 85                       |
| <b>Dielectric Withstanding Voltage:</b> (VRMS min at sea level)†                  |                          |                          |
| RG-178 .....                                                                      |                          | 750                      |
| RG-316, RG-405 uncabled receptacles .....                                         |                          | 1000                     |
| <b>Corona Level:</b> (Volts min at 70,000 feet)†                                  |                          |                          |
| RG-178 .....                                                                      |                          | 185                      |
| RG-316, RG-405 .....                                                              |                          | 250                      |
| Uncabled receptacles.....                                                         |                          | N/A                      |
| <b>Insertion Loss:</b> (dB max, tested at 4 GHz)                                  |                          |                          |
| Straight cabled connectors.....                                                   |                          | 0.25 dB                  |
| Right angle cabled connectors .....                                               |                          | 0.50 dB                  |
| Uncabled receptacles .....                                                        |                          | N/A                      |
| <b>Insulation Resistance:</b> 1000 megohms min                                    |                          |                          |
| <b>Contact Resistance:</b> (milliohms max)                                        |                          |                          |
|                                                                                   | <u>Initial</u>           | <u>After</u>             |
|                                                                                   |                          | <u>Environmental</u>     |
| Center contact (straight cabled connectors and uncabled receptacles) .....        | 6.0                      | 8.0                      |
| Center contact (right angle cabled connectors) .....                              | 12.0                     | 16.0                     |
| Outer contact (gold plated connectors) .....                                      | 1.0                      | N/A                      |
| Outer contact (nickel plated connectors) .....                                    | 2.5                      | N/A                      |
| Braid to body (gold plated connectors) .....                                      | 1.0                      | N/A                      |
| Braid to body (nickel plated connectors) .....                                    | 2.5                      | N/A                      |
| <b>RF Leakage:</b> (dB min tested at 2.5 GHz)                                     |                          |                          |
| Cabled connectors .....                                                           |                          | -55 dB                   |
| Uncabled receptacles .....                                                        |                          | N/A                      |
| <b>RF High Potential Withstanding Voltage:</b> (VRMS min, tested at 4 and 7 MHz)† |                          |                          |
| RG-178.....                                                                       |                          | 500                      |
| RG-316.....                                                                       |                          | 700                      |
| Uncabled receptacles .....                                                        |                          | 600                      |

Mechanical Specifications

|                                                |                                             |                       |
|------------------------------------------------|---------------------------------------------|-----------------------|
| <b>Engagement Design:</b>                      | MIL-STD-348, Series SMC                     |                       |
| <b>Engagement/Disengagement Force:</b>         | 16 oz-in max torque                         |                       |
| <b>Mating Torque:</b>                          | 35 to 50 oz-in                              |                       |
| <b>Coupling Proof Torque:</b>                  | 100 oz-in min                               |                       |
| <b>Coupling Nut Retention:</b>                 | 35 lbs min                                  |                       |
| <b>Contact Retention:</b>                      | 4 lbs min axial force (captivated contacts) |                       |
|                                                | 1 oz-in min torque (uncabled receptacles)   |                       |
| <b>Cable Retention:</b>                        | <u>Axial Force* (lbs)</u>                   | <u>Torque (oz-in)</u> |
| RG-178.....                                    | 10                                          | N/A                   |
| RG-316.....                                    | 20                                          | N/A                   |
| RG-405.....                                    | 30                                          | 16                    |
| * or cable breaking strength whichever is less |                                             |                       |
| <b>Durability:</b> 500 cycles min              |                                             |                       |

Specifications

Environmental Ratings

Meets or exceeds the applicable paragraph of MIL-PRF-39012

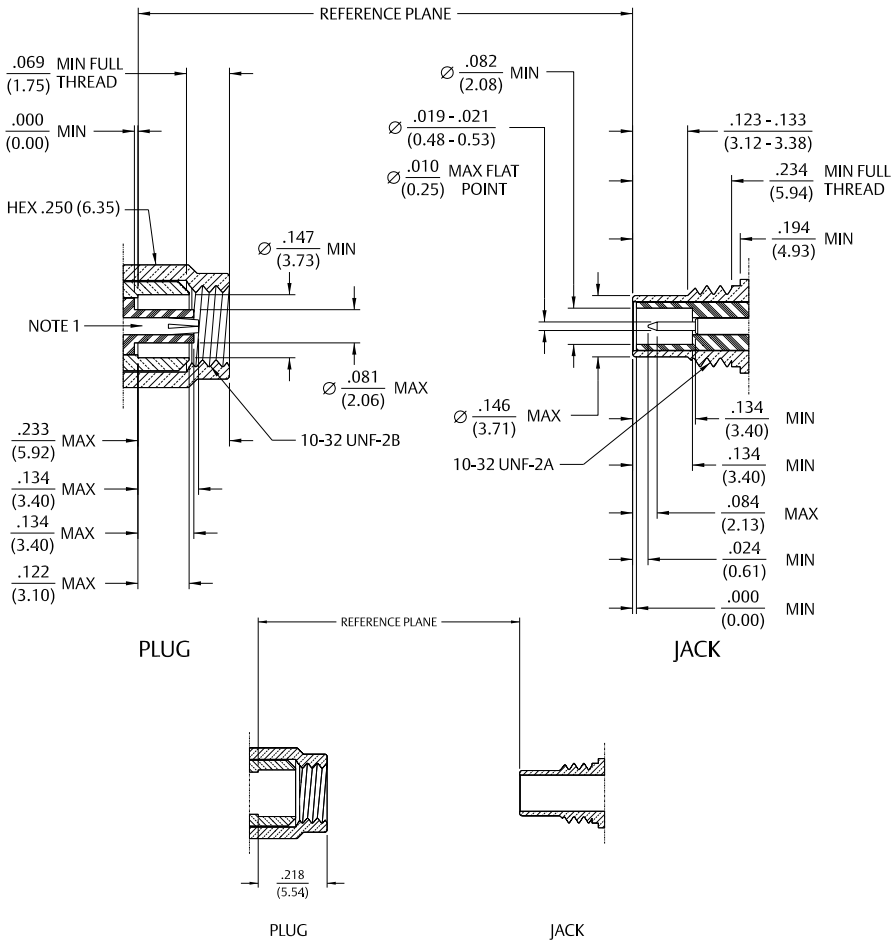
|                           |                                      |
|---------------------------|--------------------------------------|
| <b>Temperature Range:</b> | - 65°C to + 165°C                    |
| <b>Thermal Shock:</b>     | MIL-STD-202, Method 107, Condition B |
| <b>Corrosion:</b>         | MIL-STD-202, Method 101, Condition B |
| <b>Shock:</b>             | MIL-STD-202, Method 213, Condition C |
| <b>Vibration:</b>         | MIL-STD-202, Method 204, Condition D |

Material Specifications

|                              |                                                                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bodies:</b>               | Brass per ASTM B16, gold plated per MIL-DTL-45204 .00001” min or nickel plated per SAE-AMS2432                                                               |
| <b>Contacts:</b>             | Male – Brass per ASTM B16, gold plated per MIL-DTL-45204 .00003” min.<br>Female – Beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003” min. |
| <b>Nut Retention Spring:</b> | Beryllium copper per ASTM B196, unplated                                                                                                                     |
| <b>Insulators:</b>           | PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457                                                                                                            |
| <b>Expansion Caps:</b>       | Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001” min. or nickel plated per SAE-AMS2423                                                              |
| <b>Crimp Sleeves:</b>        | Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001” min. or nickel plated per SAE-AMS2423                                                            |
| <b>Mounting Hardware:</b>    | Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) per ASTM B139, gold plated per MIL-DTL-45204 .00001” min. or nickel plated per SAE-AMS2423        |

\*\* All Gold plated parts include a .00005” minimum Nickel under plated barrier layer

Mating Engagement for SMC Series



Notes:  
1. Inside of contact to meet VSWR mating characteristics and connector durability when mated with a dia. .019/.021 (.48/.53) male contact.

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)  
Illustrations are shown in inches (millimeters).

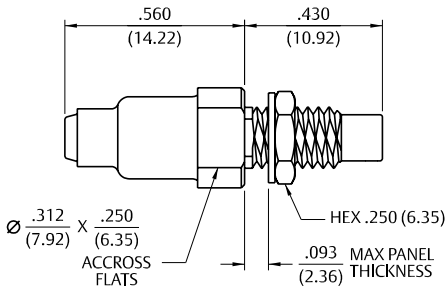
Semi-Rigid and Flexible Cable

Straight Solder Type Bulkhead Jack – Captivated Contact



| Cable Type | Gold Plated  | Nickel Plated |
|------------|--------------|---------------|
| RG-405     | 131-6593-401 | 131-6593-406  |

Assembly instructions page 233.  
Mounting hole layout figure 5 page 194.

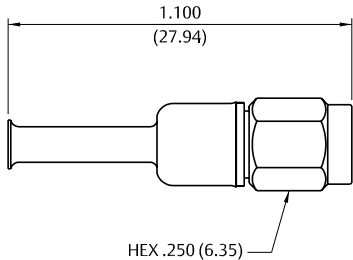


Straight Crimp Type Plug – Captivated Contact



| Cable Type            | Gold Plated  | Nickel Plated |
|-----------------------|--------------|---------------|
| RG-161, 174, 188, 316 | 131-6403-001 | 131-6403-006  |
| RG-316 DS, 188 DS     | 131-6404-001 | 131-6404-006  |
| RG-179, 187           | 131-6433-001 | 131-6433-006  |

Assembly instructions page 237.

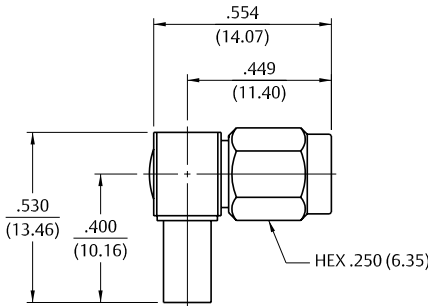


Right Angle Crimp Type Plug – Captivated Contact



| Cable Type            | Gold Plated  | Nickel Plated |
|-----------------------|--------------|---------------|
| RG-161, 174, 188, 316 | 131-6403-101 | 131-6403-106  |
| RG-316 DS, 188 DS     | 131-6404-101 | 131-6404-106  |
| RG-179, 187           | 131-6433-101 | 131-6433-106  |

Assembly instructions page 238.

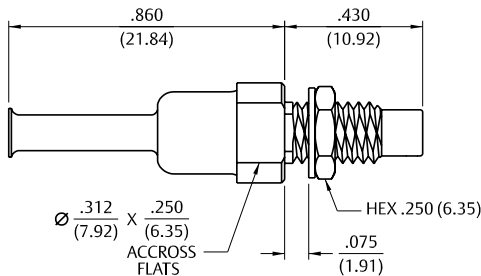


Straight Crimp Type Bulkhead Jack – Captivated Contact



| Cable Type            | Gold Plated  | Nickel Plated |
|-----------------------|--------------|---------------|
| RG-161, 174, 188, 316 | 131-6303-401 | 131-6303-406  |
| RG-316 DS, 188 DS     | 131-6304-401 | 131-6304-406  |
| RG-179, 187           | 131-6333-401 | 131-6333-406  |

Assembly instructions page 237.  
Mounting hole layout figure 5 page 194.



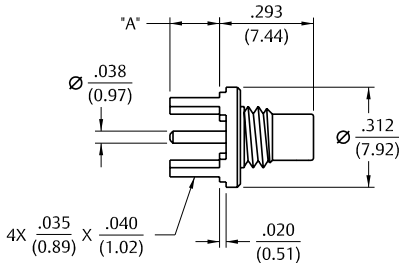
PC Mount

Straight Jack Receptacle



| Gold Plated  | Nickel Plated | "A"         |
|--------------|---------------|-------------|
| 131-6701-201 | 131-6701-206  | .155 (3.94) |
| 131-6701-211 | 131-6701-216  | .110 (2.79) |

Mounting hole layout figure 4 page 194.

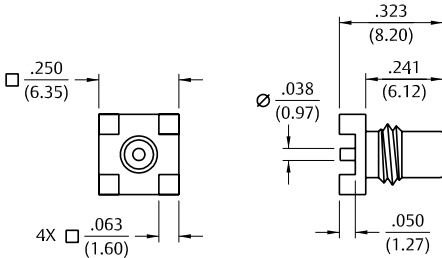


Straight Jack Receptacle – Surface Mount



| Gold Plated  |
|--------------|
| 131-6711-201 |

Mounting hole layout figure 7 page 194.

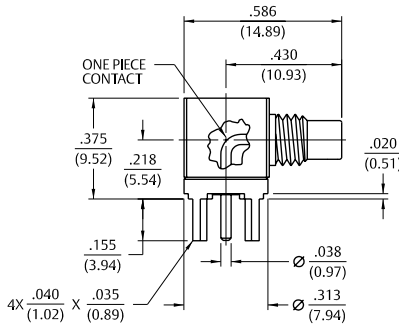


Right Angle Jack Receptacle



| Gold Plated  |
|--------------|
| 131-6701-301 |

Mounting hole layout figure 4 page 194.

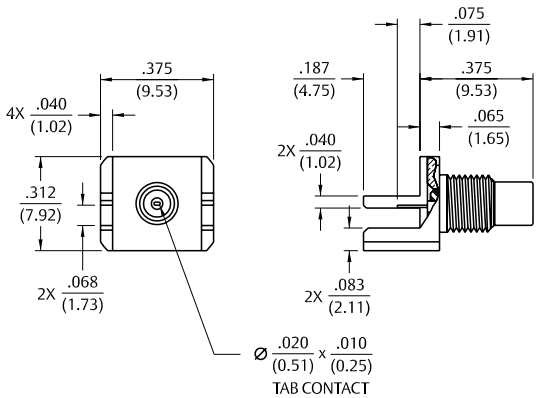


PC Mount and Bulkhead Mount

End Launch Jack Receptacle – Tab Contact



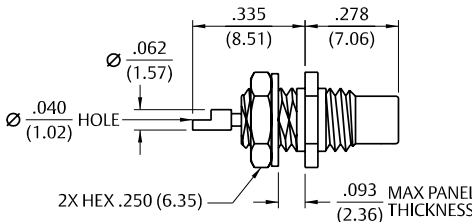
| Gold Plated  | Nickel Plated | Board Thickness |
|--------------|---------------|-----------------|
| 131-6701-831 | 131-6701-836  | .062 (1.57)     |



Front Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-6701-411 | 131-6701-416  |

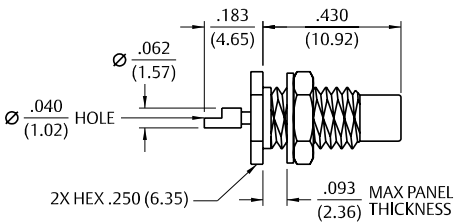


Rear Mount Bulkhead Jack Receptacle



| Gold Plated  | Nickel Plated |
|--------------|---------------|
| 131-6701-401 | 131-6701-406  |

Mounting hole layout figure 5 page 194.



SMP Connectors

50 Ohm Connectors

|                                  |     |
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Introduction

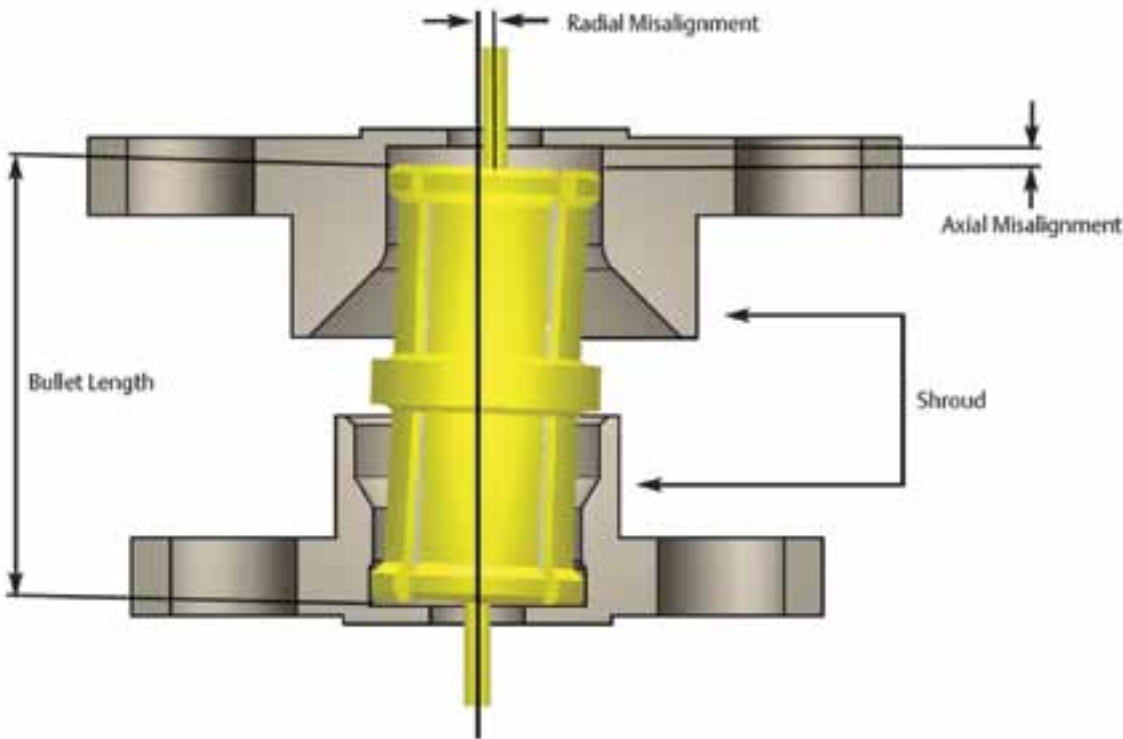
Description

One of the key benefits of the SMP connector interface is its use in high frequency blind-mate applications. The design of the SMP bullet and shroud system allows for both axial and radial misalignment. The basic system is comprised of an inner “bullet” adapter, and two outer receptacles called “shrouds”. The bullet provides a flexible link between the shroud connections.

In blind-mate applications, one shroud connector will be typically specified as a snap-on interface and the other as a slide-on. This ensures that the bullet adapter remains fixed in the same shroud connector when the connection is disengaged.

The two snap-on interfaces Full Detent (FD) and Limited Detent (LD) each have different engage and disengage coupling forces. The LD is typically selected as the snap-on interface in PCB mount or blind-mate applications, while the FD is mainly used for cabled connections where higher retention forces are required.

The two slide-on interfaces Smooth Bore (SB) and Catcher’s Mitt (CM) allow for reduced connection forces as compared to the snap-on versions. The push-on interface creates a sliding connection that does not physically locate the mating reference planes, allowing for axial and radial misalignment. Both the SB and CM have the same engage/disengage forces; however the CM is typically specified as the shroud configuration in blind-mate applications as its generous lead-in chamfer helps capture and guide the bullet into place.



Specifications

Electrical Specifications

|                                                                                                                                                            |                             |                  |                    |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|--------------------|--------------------|
| <b>Impedance:</b> 50 Ohms                                                                                                                                  |                             |                  |                    |                    |
| <b>Frequency Range:</b>                                                                                                                                    |                             |                  |                    |                    |
| Bullet Adapter (.254 length), Semi-Rigid Straight Cabled Connectors .....                                                                                  | 0-40 GHz                    |                  |                    |                    |
| All other In-Series Adapters, Semi-Rigid Right Angle Cabled Connectors,<br>Field Replaceable Connectors, End Launch Connectors, Hermetic Feedthroughs..... | 0-18 GHz                    |                  |                    |                    |
| PC Mount Connectors .....                                                                                                                                  | 0-12 GHz                    |                  |                    |                    |
| <b>VSWR:</b> (max) (f = GHz)                                                                                                                               | <u>0-18 GHz</u>             | <u>18-23 GHz</u> | <u>23-26.5 GHz</u> | <u>26.5-40 GHz</u> |
| Bullet Adapter (.254 length)                                                                                                                               | 1.10                        | 1.15             | 1.30               | 1.70               |
| Semi-Rigid Straight Cabled Connectors                                                                                                                      |                             | <u>0-18 GHz</u>  | <u>18-26.5 GHz</u> | <u>26.5-40 GHz</u> |
|                                                                                                                                                            |                             | 1.20             | 1.35               | 1.70               |
| All other In-Series Adapters                                                                                                                               |                             | <u>0-4 GHz</u>   | <u>4-12 GHz</u>    | <u>12-18 GHz</u>   |
|                                                                                                                                                            |                             | 1.10             | 1.15               | 1.20               |
| Semi-Rigid Right Angle Cabled Connectors                                                                                                                   |                             |                  |                    | <u>0-18 GHz</u>    |
|                                                                                                                                                            |                             |                  |                    | 1.20               |
|                                                                                                                                                            |                             |                  |                    | <u>0-18 GHz</u>    |
| Field Replaceable Connectors (typical, measured back to back with seal pin).....                                                                           | 1.15                        |                  |                    |                    |
| Un-cabled Connectors (dependant on application) .....                                                                                                      | N/A                         |                  |                    |                    |
| <b>Working Voltage:</b> 335 VRMS max at sea level, 65 VRMS max at 70,000 feet                                                                              |                             |                  |                    |                    |
| <b>Dielectric Withstanding Voltage:</b> 500 Vrms min at sea level                                                                                          |                             |                  |                    |                    |
| <b>Insulation Resistance:</b> 5000 megohms min                                                                                                             |                             |                  |                    |                    |
| <b>Contact Resistance:</b> (milliohms max initial, not applicable after environmental testing)                                                             |                             |                  |                    |                    |
| Center Contact (Connectors and Adapters) .....                                                                                                             | 6.0                         |                  |                    |                    |
| Outer Contact (Connectors and Adapters) .....                                                                                                              | 2.0                         |                  |                    |                    |
| Cable Shield to Body (Semi-Rigid Cabled Connectors Only) .....                                                                                             | 0.5                         |                  |                    |                    |
| <b>Corona Level:</b> 190 VRMS min at 70,000 feet                                                                                                           |                             |                  |                    |                    |
| <b>Insertion Loss:</b> (dB max)                                                                                                                            |                             |                  |                    |                    |
| <b>Insertion Loss:</b> (dB max, tested at 10 GHz)                                                                                                          |                             |                  |                    |                    |
| In-Series Adapters, Field Replaceable Connectors .....                                                                                                     | $0.10\sqrt{f\text{ (GHz)}}$ |                  |                    |                    |
| Semi-Rigid Cabled Connectors .....                                                                                                                         | $0.12\sqrt{f\text{ (GHz)}}$ |                  |                    |                    |
| All other Un-cabled Connectors .....                                                                                                                       | N/A                         |                  |                    |                    |
| <b>Insertion Loss:</b> (dB max)                                                                                                                            |                             |                  |                    |                    |
| <b>RF Leakage:</b> (dB typical, tested at 2.5 GHz)                                                                                                         |                             |                  |                    |                    |
| Cabled and Field Replaceable Connectors .....                                                                                                              | -80                         |                  |                    |                    |
| In-Series Adapters .....                                                                                                                                   | -65                         |                  |                    |                    |
| All other Un-cabled Connectors .....                                                                                                                       | N/A                         |                  |                    |                    |
| <b>RF High Potential Withstanding Voltage:</b> 325 VRMS min at sea level, tested at 4 and 7 MHz                                                            |                             |                  |                    |                    |

Mechanical Specifications

|                                                                                                   |                           |                       |
|---------------------------------------------------------------------------------------------------|---------------------------|-----------------------|
| <b>Interface Design:</b> MIL-STD-348A, Series SMP                                                 |                           |                       |
| <b>Engagement Force:</b> (lbs max, mated pair)                                                    |                           |                       |
| Full Detent (FD) .....                                                                            |                           | 15.0                  |
| Limited Detent (LD) .....                                                                         |                           | 10.0                  |
| Smooth Bore and Catcher's Mitt (SB and CM) .....                                                  |                           | 2.0                   |
| <b>Disengagement Force:</b> (lbs min, mated pair)                                                 |                           |                       |
| Full Detent (FD) .....                                                                            |                           | 5.0                   |
| Limited Detent (LD) .....                                                                         |                           | 2.0                   |
| Smooth Bore and Catcher's Mitt (SB and CM) .....                                                  |                           | 0.5                   |
| <b>Mated Radial Misalignment:</b> (in max allowed, female adapters only)                          |                           |                       |
| Between Centerlines of Mating Planes (FD, LD, SB) .....                                           |                           | .010                  |
| Between Centerlines of Mating Planes (CM only).....                                               |                           | .020                  |
| <b>Mated Axial Misalignment:</b> .010 in max allowed between mating planes (female adapters only) |                           |                       |
| <b>Durability:</b> (mating cycles min)                                                            |                           |                       |
| Full Detent (all female connectors and adapters).....                                             |                           | 100                   |
| Limited Detent (female adapters only) .....                                                       |                           | 500                   |
| Smooth Bore and Catcher's Mitt (female adapters only) .....                                       |                           | 1000                  |
| <b>Contact Retention:</b> 1.5 lbs min axial force (captivated contacts only)                      |                           |                       |
| <b>Cable Retention:</b> (min)                                                                     | <u>Axial Force* (lbs)</u> | <u>Torque (oz-in)</u> |
| Cabled Connectors for RG-405.....                                                                 | 30                        | 16.0                  |
| Cabled Connectors for M17/151 .....                                                               | 20                        | N/A                   |

\* Or cable breaking strength, whichever is less

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Illustrations are shown in inches (millimeters).

Specifications

Environmental Ratings

(Meets or exceeds the applicable paragraph of MIL-PRF-39012)

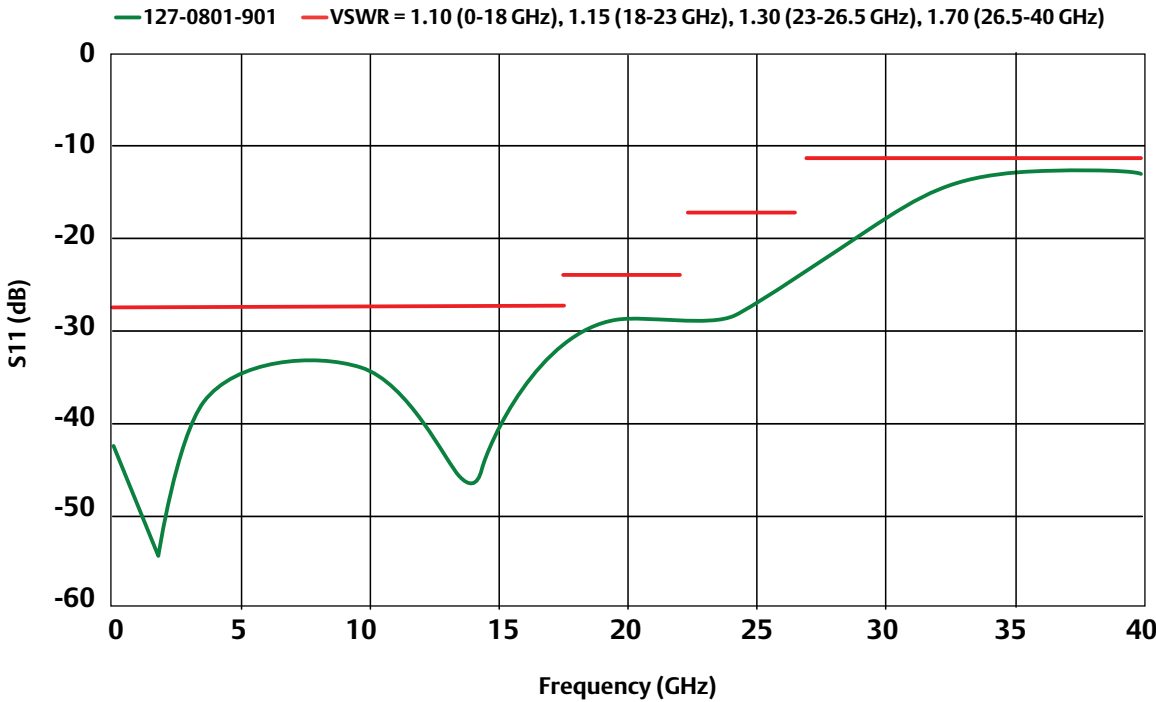
- Operating Temperature:** -65°C to +165°C
- Thermal Shock:** MIL-STD-202, Method 107, Condition B (except high temp +165°C or max high temp of cable)
- Corrosion:** MIL-STD-202, Method 101, Condition B
- Shock (specified pulse):** MIL-STD-202, Method 213, Condition I
- Vibration:** MIL-STD-202, Method 204, Condition D
- Moisture Resistance:** MIL-STD-202, Method 106 (except step 7b omitted)

Material Specifications

- Spring Finger (female) and End Launch (male) Bodies:** Beryllium Copper per ASTM B196, Gold plated\* per MIL-DTL-45204 (.00005" min)
- Hermetic Seal Bodies (male):** Kovar Alloy per ASTM F15, Gold plated\* per MIL-DTL-45204 (.00005" min)
- All other Shroud Bodies (male):** Stainless Steel, Type 303, per ASTM A582, Passivated per MIL-DTL-14072 (EL 300)
- Connector and Adapter Contacts (male and female):** Beryllium Copper per ASTM B196, Gold plated\* per MIL-DTL-45204 (.00005" min)
- Hermetic Seal Center Pins:** Kovar Alloy per ASTM F15, Gold plated\* per MIL-DTL-45204 (.00005" min)
- EMI/Anti-Rock Rings:** Beryllium Copper per ASTM B196, Gold plated\* per MIL-DTL-45204 (.00003" min)
- PC Mount Legs:** Brass per ASTM B16, Gold plated\* per MIL-DTL-45204 (.00003" min)
- Connector and Adapter Insulators:** PTFE per ASTM D1710
- Hermetic Seal Glass:** Corning 7070

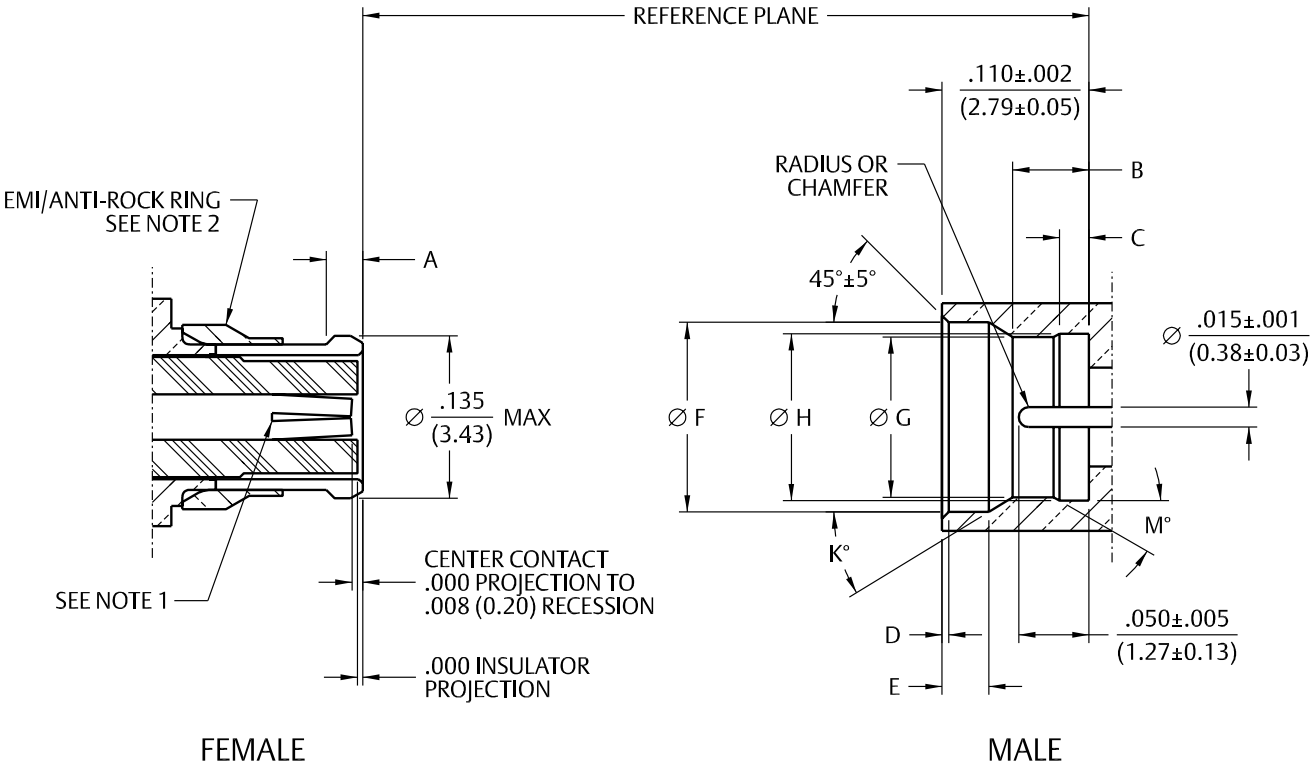
\* All Gold plated parts include a .00005" minimum Nickel barrier layer

Typical Measured Return Loss  
Bullet Adapter 127-0901-801



Specifications

Mating Engagement for SMP Series per MIL-STD-348A



- Notes:
- 1. Socket to accept mating pin  $\varnothing .015 \pm .001$  (0.38±0.03).
  - 2. EMI/Anti-Rock Ring configuration optional, used on cabled connectors only. Shall not prevent proper mating engagement.
  - 3. All dimensions shown in inches. Metric equivalents (rounded to nearest 0.01mm) are given for general information only.

SMP Female Connector Interface

| Dimension | Cabled      |             | Uncabled    |             |
|-----------|-------------|-------------|-------------|-------------|
|           | Min         | Max         | Min         | Max         |
| A         | .025 (0.64) | .035 (0.89) | .018 (0.46) | .025 (0.64) |

SMP Male Connector Interface

| Dimension | Full Detent  |              | Limited Detent |              | Smooth Bore |             | Catcher's Mitt |             |
|-----------|--------------|--------------|----------------|--------------|-------------|-------------|----------------|-------------|
|           | Min          | Max          | Min            | Max          | Min         | Max         | Min            | Max         |
| B         | .051 (1.30)  | .057 (1.45)  | .054 (1.37)    | .060 (1.52)  | .059 (1.50) | .065 (1.65) | N/A            | N/A         |
| C         | .0205 (0.52) | .0235 (0.60) | .0205 (0.52)   | .0235 (0.60) | N/A         | N/A         | N/A            | N/A         |
| D         | .003 (0.08)  | .008 (0.20)  | .003 (0.08)    | .008 (0.20)  | .003 (0.08) | .008 (0.20) | .043 (1.09)    | .047 (1.19) |
| E         | .033 (0.84)  | .037 (0.94)  | .033 (0.84)    | .037 (0.94)  | .033 (0.84) | .037 (0.94) | N/A            | N/A         |
| F         | .139 (3.53)  | .145 (3.68)  | .139 (3.53)    | .145 (3.68)  | .139 (3.53) | .145 (3.68) | .123 (3.12)    | .127 (3.23) |
| G         | .114 (2.90)  | .118 (3.00)  | .118 (3.00)    | .122 (3.10)  | .123 (3.12) | .127 (3.23) | N/A            | N/A         |
| H         | .124 (3.15)  | .126 (3.20)  | .124 (3.15)    | .126 (3.20)  | N/A         | N/A         | N/A            | N/A         |
| K         | 35° REF      | 35° REF      | 35° REF        | 35° REF      | 35° REF     | 35° REF     | N/A            | N/A         |
| M         | 30° REF      | 30° REF      | 30° REF        | 30° REF      | N/A         | N/A         | N/A            | N/A         |

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Illustrations are shown in inches (millimeters).

## Semi-Rigid Cable and PC Mount

## Female Straight Cabled, Semi-Rigid



| Cable Type | Gold Plated  | Figure |
|------------|--------------|--------|
| M17/151    | 127-0692-001 | 1      |
| RG-405     | 127-0693-001 | 2      |

\* Specifications dependant on cable ratings.

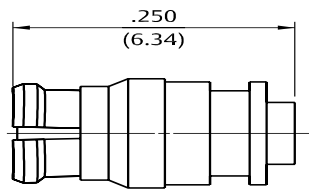


Fig 1

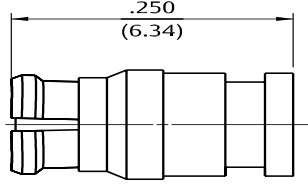


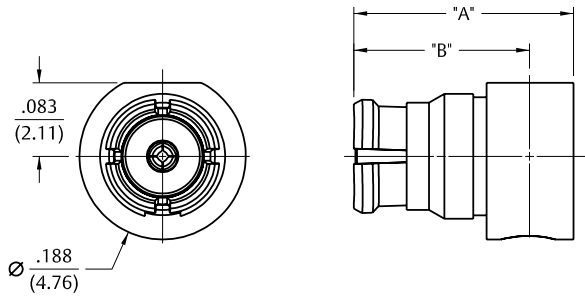
Fig 2

## Right Angle Cabled Female



| Cable Type | Gold Plated  | "A"         | "B"         |
|------------|--------------|-------------|-------------|
| M17/151    | 127-0692-101 | .248 (6.30) | .197 (5.00) |
| RG-405     | 127-0693-101 | .271 (6.88) | .209 (5.31) |

\* Specifications dependant on cable ratings.

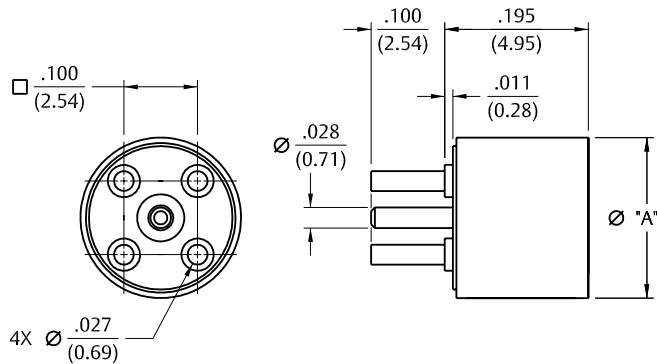


## Straight PC Mount Male Receptacle



| Interface      | Passivated   | "A"         |
|----------------|--------------|-------------|
| Full Detent    | 127-0701-201 | .218 (5.54) |
| Limited Detent | 127-1701-201 | .218 (5.54) |
| Smooth Bore    | 127-2701-201 | .218 (5.54) |
| Catcher's Mitt | 127-3701-201 | .234 (5.94) |

Base and legs gold plated brass.



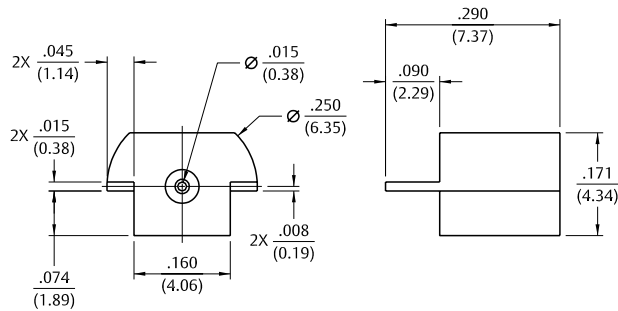
## PC Mount and Panel Mount

## End Launch Male Receptacle – Surface Mount



| Interface      | Gold Plated  | Packaging                   |
|----------------|--------------|-----------------------------|
| Full Detent    | 127-0701-801 | Stock                       |
| Full Detent    | 127-0701-802 | Tape and Reel 1000 pcs/reel |
| Limited Detent | 127-1701-801 | Stock                       |
| Limited Detent | 127-1701-802 | Tape and Reel 1000 pcs/reel |
| Smooth Bore    | 127-2701-801 | Stock                       |
| Smooth Bore    | 127-2701-802 | Tape and Reel 1000 pcs/reel |

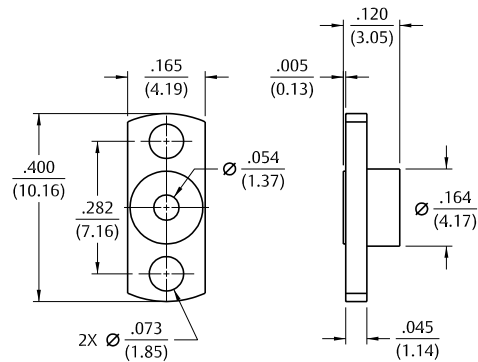
Mounting hole layout figure 1 page 194.



## 2-Hole Flange Mount Male Shroud – Without Contact



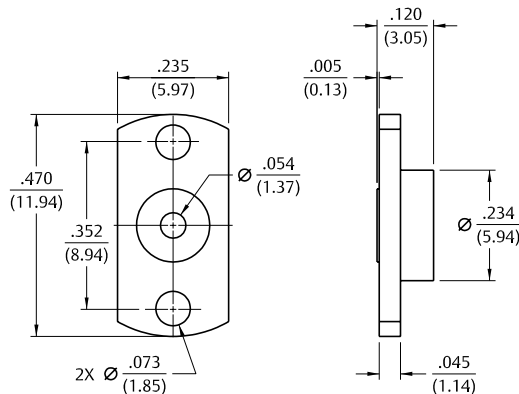
| Interface      | Passivated   |
|----------------|--------------|
| Full Detent    | 127-0701-602 |
| Limited Detent | 127-1701-602 |
| Smooth Bore    | 127-2701-602 |



## 2-Hole Flange Mount Male Catcher's Mitt Shroud – Without Contact



| Interface      | Passivated   |
|----------------|--------------|
| Catcher's Mitt | 127-3701-602 |



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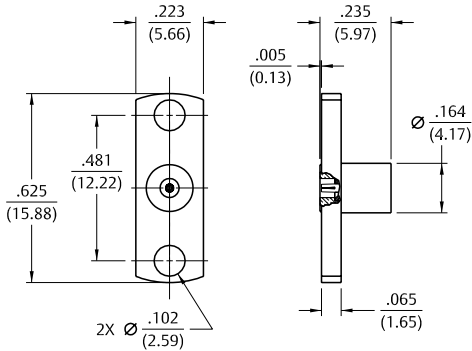
*Illustrations are shown in inches (millimeters).*

Panel Mount and Adapters

2-Hole Flange Mount Male Field Replaceable



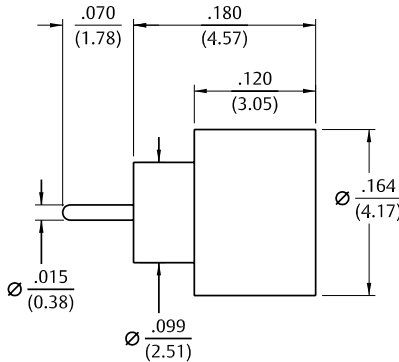
| Interface      | Passivated   | Pin Size    |
|----------------|--------------|-------------|
| Full Detent    | 127-0701-612 | .012 (.030) |
| Limited Detent | 127-1701-612 | .012 (.030) |
| Smooth Bore    | 127-2701-612 | .012 (.030) |



Hermetic Seal Male



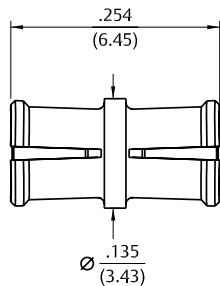
| Interface      | Gold Plated  |
|----------------|--------------|
| Full Detent    | 127-0711-601 |
| Limited Detent | 127-1711-601 |
| Smooth Bore    | 127-2711-601 |



Female to Female Bullet Adapter



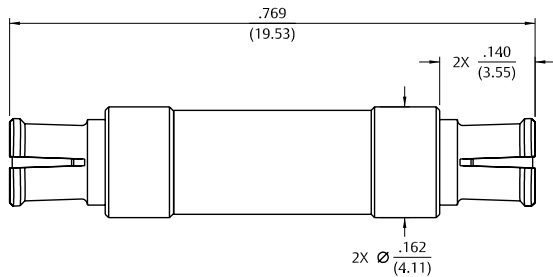
| Gold Plated  |
|--------------|
| 127-0901-801 |



Female to Female Adapter



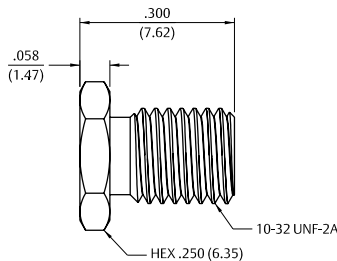
| Gold Plated  |
|--------------|
| 127-0901-811 |



Male to Male Catcher's Mitt Adapter



| Interface      | Passivated   |
|----------------|--------------|
| Full Detent    | 127-0901-821 |
| Limited Detent | 127-1901-821 |
| Smooth Bore    | 127-2901-821 |



Type N Connectors

|                                   |     |
|-----------------------------------|-----|
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Specifications

Electrical Specifications

Impedance: 50 Ohms

Frequency Range:

|                                                    |                 |                  |
|----------------------------------------------------|-----------------|------------------|
| Flexible Cabled Connectors and Receptacles .....   | 0-11 GHz        |                  |
| Semi-rigid Cabled Connectors and Receptacles ..... | 0-18 GHz        |                  |
| <b>VSWR:</b> max (f-GHz).....                      | 0-11 GHz        |                  |
| Straight Flexible Cabled Connectors.....           | 1.30 max        |                  |
|                                                    | <u>0-9 GHz</u>  | <u>9-11 GHz</u>  |
| Right Angle Flexible Cabled                        | 1.35 max        | 1.50 max         |
|                                                    | <u>0-11 GHz</u> | <u>11-18 GHz</u> |
| RG-405 Semi-Rigid Plugs.....                       | 1.07+.01f       | <1.25 Typical    |
| RG-402 Semi-Rigid Plugs.....                       | 1.05+.01f       | <1.25 Typical    |
| RG-401 Semi-Rigid Plugs.....                       | 1.06+.01f       | <1.25 Typical    |
| RG-405 Semi-Rigid Jacks .....                      | 1.15+.02f       | <1.50 Typical    |
| RG-402 Semi-Rigid Jacks .....                      | 1.10+.02f       | <1.50 Typical    |
| RG-401 Semi-Rigid Jacks .....                      | 1.10+.02f       | <1.50 Typical    |

|                                         |           |           |
|-----------------------------------------|-----------|-----------|
| Adapters.....                           | 0-18 GHz  | 1.05+.01f |
| Uncabled Receptacles .....              | N/A       |           |
| Working Voltage: (VRMS max)†            | Sea Level | 70K Feet  |
| RG-316, 316 DS .....                    | 250       | 65        |
| RG-58, 142, 405 .....                   | 335       | 85        |
| RG-402 .....                            | 500       | 125       |
| RG-213, 214, 401, LMR-400.....          | 1000      | 250       |
| Uncabled Receptacles and Adapters ..... | 1000      | 250       |

|                                                           |      |
|-----------------------------------------------------------|------|
| Dielectric Withstanding Voltage: (VRMS min at sea level)† |      |
| RG-316, 316 DS.....                                       | 750  |
| RG-58, 142, 405 .....                                     | 1000 |
| RG-402 .....                                              | 1500 |
| RG-213, 214, 401, LMR-400.....                            | 2500 |
| Uncabled Receptacles and Adapters .....                   | 2500 |

Insulation Resistance: 5000 Megohms min

Contact Resistance: (milliohms max)

|                                                       |         |                     |
|-------------------------------------------------------|---------|---------------------|
| Center Contact                                        | Initial | After Environmental |
| Straight Cabled Connectors (non-captivated).....      | 1.0     | 1.5                 |
| Straight Cabled Connectors (captivated) .....         | 2.5     | 3.0                 |
| Right Angle Cabled Connectors .....                   | 2.5     | 3.0                 |
| Uncabled Receptacles and Adapters.....                | 1.0     | 1.5                 |
| Outer Contact .....                                   | 0.2     | N/A                 |
| Braid to Body (Flexible Cabled Connectors Only) ..... | 0.05    | N/A                 |

|                                              |     |
|----------------------------------------------|-----|
| Corona Level: (Volts min at 70K feet)†       |     |
| RG-316, 316 DS.....                          | 190 |
| RG-58, 142, 405 .....                        | 250 |
| RG-402 .....                                 | 375 |
| RG-213, 214, 401, LMR-400 and Adapters ..... | 500 |
| Uncabled Receptacles .....                   | N/A |

|                                                 |               |
|-------------------------------------------------|---------------|
| Insertion Loss: (dB max, tested at 9 GHz)       |               |
| Straight Flexible Cabled Connectors .....       | 0.15 max      |
| Right Angle Flexible Cabled Connectors.....     | 0.30          |
| Semi-rigid Cabled Connectors and Adapters ..... | 0.05 √ f(GHz) |
| Uncabled Receptacles .....                      | N/A           |

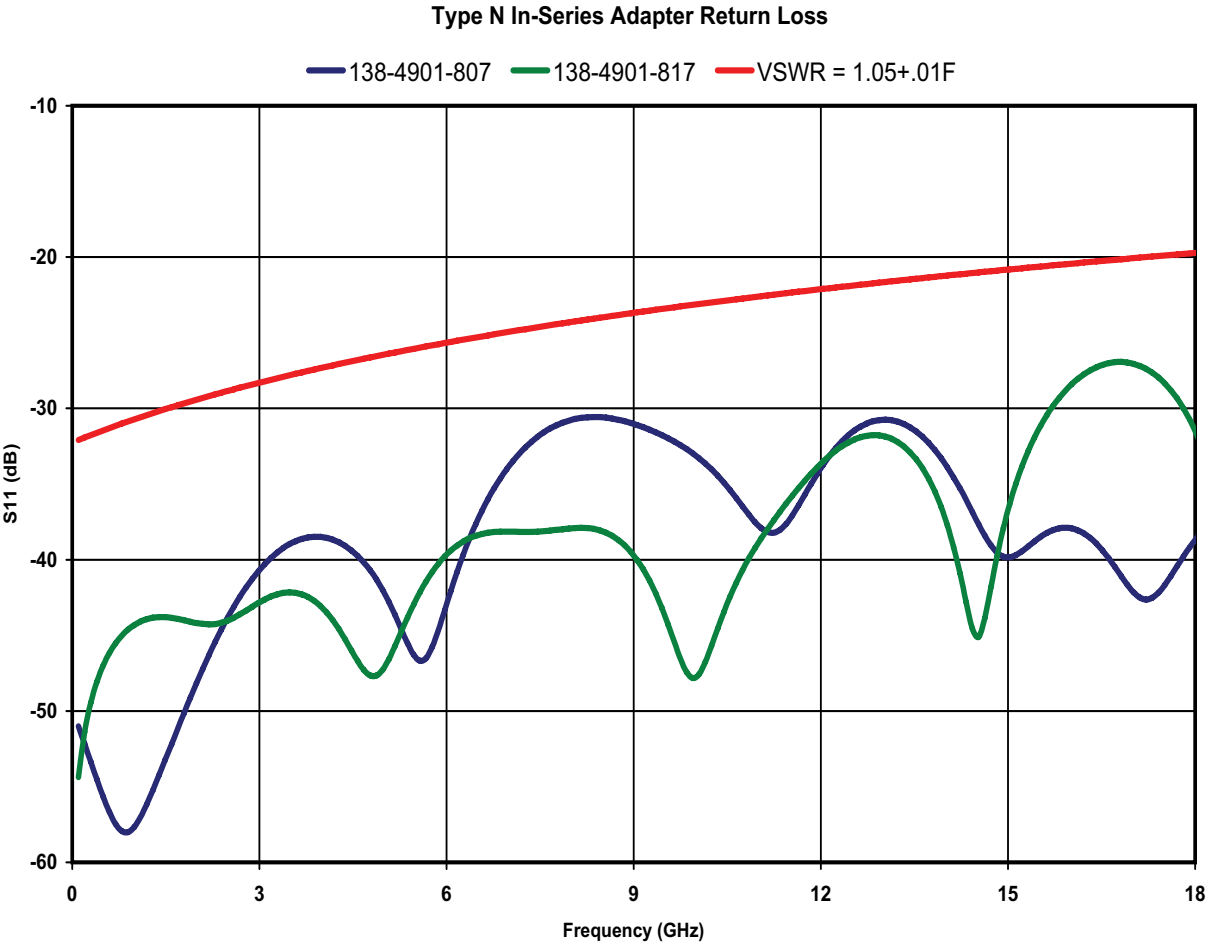
|                                         |     |
|-----------------------------------------|-----|
| RF Leakage: (dB min, tested at 2.5 GHz) |     |
| Cabled Connectors and Adapters .....    | -90 |
| Uncabled Receptacles .....              | N/A |

|                                                                            |      |
|----------------------------------------------------------------------------|------|
| RF High Potential Withstanding Voltage: (Vrms min, tested at 4 and 7 MHz)† |      |
| RG-316, 316 DS .....                                                       | 500  |
| RG-58, 142, 405 .....                                                      | 670  |
| RG-402 .....                                                               | 1000 |
| RG-213, 214, 401, LMR-400 .....                                            | 1500 |
| Uncabled Receptacles and Adapters .....                                    | 1500 |

IMP3: Typically <-90 dBm (tested per IEC Guidelines using 20W inputs swept over 1930-1990 MHz)

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Specifications



Mechanical Specifications

|                                 |                                  |
|---------------------------------|----------------------------------|
| Engagement Design:              | MIL-STD-348A, Series N           |
| Durability:                     | 500 Cycles min                   |
| Engagement/Disengagement Force: | 6 lb-in max                      |
| Mating Torque:                  | 7 to 10 lb-in                    |
| Bulkhead Mounting Nut Torque:   | 15 lb-in recommended             |
| Coupling Proof Torque:          | 15 lb-in min                     |
| Coupling Nut Retention:         | 100 lbs min                      |
| Contact Retention:              | (min - captivated contacts only) |

|                                      |                   |                |
|--------------------------------------|-------------------|----------------|
|                                      | Axial Force (lbs) | Torque (oz-in) |
| Cabled Connectors and Adapters ..... | 6                 | N/A            |
| Uncabled Receptacles .....           | 6                 | 4              |

Cable Retention: (minimum \*)

|                               |                   |                |
|-------------------------------|-------------------|----------------|
|                               | Axial Force (lbs) | Torque (oz-in) |
| RG-316 .....                  | 20                | N/A            |
| RG-316DS.....                 | 30                | N/A            |
| RG-58 .....                   | 40                | N/A            |
| RG-142 .....                  | 45                | N/A            |
| RG-213, 214 and LMR-400 ..... | 90                | N/A            |
| RG-405 .....                  | 30                | 16             |
| RG-402 .....                  | 60                | 55             |
| RG-401 .....                  | 90                | 80             |

\* or cable breaking strength, whichever is less.

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)

Illustrations are shown in inches (millimeters).

Specifications

Environmental Specifications

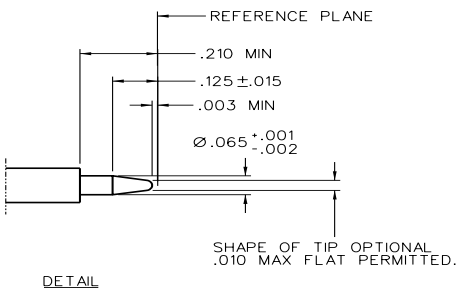
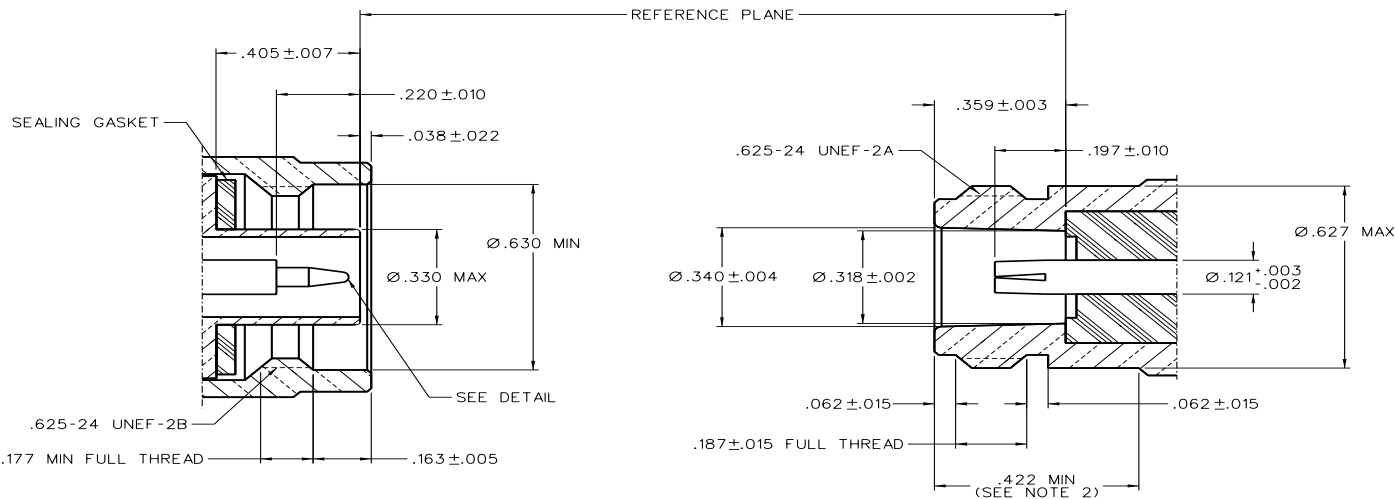
(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

- Temperature Range: -65°C to +165°C
- Thermal Shock: MIL-STD-202, Method 107, Condition B (except +85°C high temperature)
- Corrosion: MIL-STD-202, Method 101, Condition B
- Shock: MIL-STD-202, Method 213, Condition I
- Vibration: MIL-STD-202, Method 204, Condition B
- Moisture Resistance: MIL-STD-202, Method 106

Material Specifications

- Bodies: Crimp – Brass per ASTM B16, Tri-Alloy (Cu/Sn/Zn) plated (.0001” min)  
Solder – Brass per ASTM B16, Gold plated\* per SAE-AMS2423 (.00001” min)  
Adapter – Brass per ASTM B16, Tri-Alloy (Cu/Sn/Zn) or Nickel per QQ-N-290 plated (.0001” min)
- Contacts: Male – Brass per ASTM B16, Gold plated\* per MIL-G-45204 (.00005” min)  
Female – Beryllium Copper per ASTM B196, Gold plated\* per MIL-DTL-45204 (.00005” min)  
Adapter – Beryllium Copper per ASTM B196, Gold plated\* per MIL-DTL-45204 (.00005” min)
- Insulators: PTFE Fluorocarbon per ASTM D1710 and ASTM D1457
- Gaskets: Silicon Rubber per A-A-59588A
- Crimp Sleeves: Copper per ASTM B301, Tri-Alloy (Cu/Sn/Zn) plated (.0001” min)
- End Caps: Brass per ASTM B16, Tri-Alloy (Cu/Sn/Zn) plated (.0001” min)
- Nut Retention Spring (Plugs): Beryllium Copper per ASTM B196, un-plated
- Mounting Nut (Bulkhead Jacks): Brass per ASTM B16, Nickel plated per SAE-AMS2423 (.0001” min)
- Lock Washer (Bulkhead Jacks): Steel, Zinc plated (.0001” min)

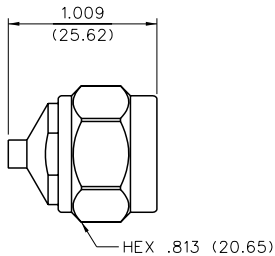
\* All Gold plated parts include a .00005” minimum Nickel under plated barrier layer



- NOTES:
1. THIS INTERFACE SHALL MEET THE GAUGE REQUIREMENTS AS SPECIFIED IN MIL-PRF-39012/1G AND /2G.
  2. CLEARANCE FOR MATING CONNECTOR COUPLING NUT.

Semi-Rigid Cable

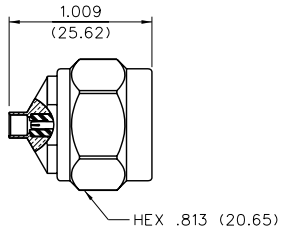
Straight Solder Type Plug – With Solder Contact



| Cable Type | Gold Plated    |
|------------|----------------|
| RG-405     | 138-4693-001 * |
| RG-402     | 138-4694-001 * |
| RG-401     | 138-4696-001 * |

Assembly instructions page 246.  
\* Tri-Alloy plated coupling nut

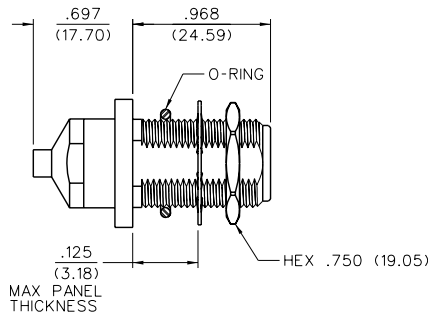
Straight Solder Type Plug – Captivated Solderless Contact



| Cable Type | Gold Plated    |
|------------|----------------|
| RG-405     | 138-4693-011 * |
| RG-402     | 138-4694-011 * |
| RG-401     | 138-4696-011 * |

Assembly instructions page 247.  
\* Tri-Alloy plated coupling nut

Straight Solder Type Bulkhead Jack – With Solder Contact



| Cable Type | Gold Plated    |
|------------|----------------|
| RG-405     | 138-4593-401 * |
| RG-402     | 138-4594-401 * |
| RG-401     | 138-4596-401 * |

Assembly instructions page 250.  
\* Tri-Alloy plated bulkhead jack body  
Mounting hole layout figure 5 page 194.

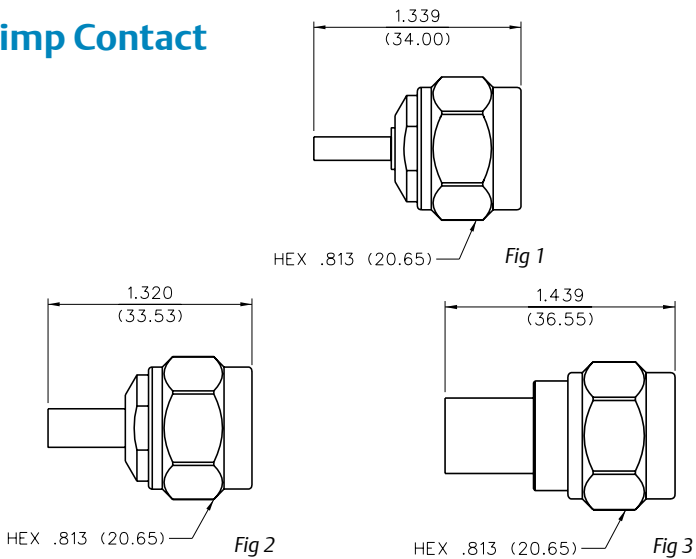
Flexible Cable

Straight Crimp Type Plug – Solder or Crimp Contact



| Cable Type            | Tri-Alloy Plated | Figure |
|-----------------------|------------------|--------|
| RG-161, 174, 188, 316 | 138-4403-007     | 1      |
| RG-188 DS, RG-316 DS  | 138-4404-007     | 1      |
| RG-58, 141, 303       | 138-4407-007     | 2      |
| RG-55, 142, 223, 400  | 138-4408-007     | 2      |
| RG-8, 213             | 138-4416-007     | 3      |
| RG-9, 214             | 138-4418-007     | 3      |
| LMR-400, BELDEN 9913  | 138-4449-007     | 3      |

Assembly instructions page 242 and 243.  
\* Tri-Alloy plated coupling nut

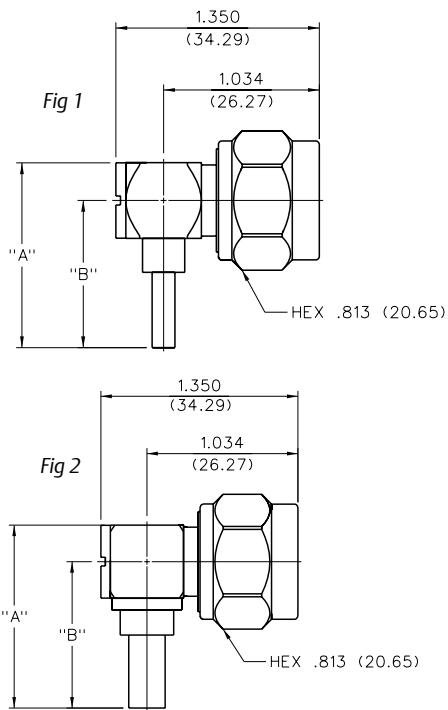


Right Angle Crimp Type Plug – Captivated Contact



| Cable Type            | Tri-Alloy Plated | Figure | "A"           | "B"           |
|-----------------------|------------------|--------|---------------|---------------|
| RG-161, 174, 188, 316 | 138-4403-107     | 1      | 1.227 (31.17) | 0.977 (24.82) |
| RG-188 DS, RG-316 DS  | 138-4404-107     | 1      | 1.227 (31.17) | 0.977 (24.82) |
| RG-58, 141, 303       | 138-4407-107     | 2      | 1.253 (31.83) | 1.003 (25.48) |
| RG-55, 142, 223, 400  | 138-4408-107     | 2      | 1.253 (31.83) | 1.003 (25.48) |
| RG-8, 213             | 138-4416-107     | 2      | 1.365 (34.67) | 1.115 (28.32) |
| RG-9, 214             | 138-4418-107     | 2      | 1.365 (34.67) | 1.115 (28.32) |

Assembly instructions page 244 and 245.  
\* Tri-Alloy plated coupling nut

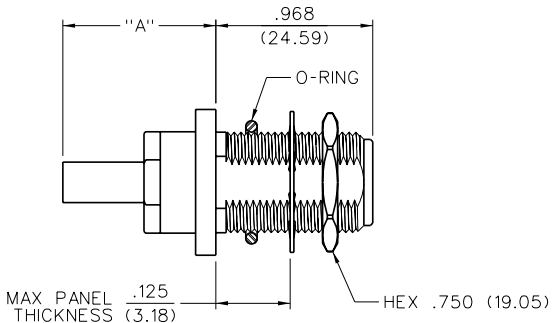


Straight Crimp Type Bulkhead Jack – Solder or Crimp Contact



| Cable Type            | Tri-Alloy Plated | "A"          |
|-----------------------|------------------|--------------|
| RG-161, 174, 188, 316 | 138-4303-407     | .943 (23.95) |
| RG-188 DS, RG-316 DS  | 138-4304-407     | .943 (23.95) |
| RG-58, 141, 303       | 138-4307-407     | .943 (23.95) |
| RG-55, 142, 223, 400  | 138-4308-407     | .943 (23.95) |
| RG-8, 213             | 138-4316-407     | .997 (25.32) |
| RG-9, 214             | 138-4318-407     | .997 (25.32) |
| LMR-400, BELDEN 9913  | 138-4349-407     | .997 (25.32) |

Assembly instructions page 248 and 251.  
Mounting hole layout figure 9 page 194.

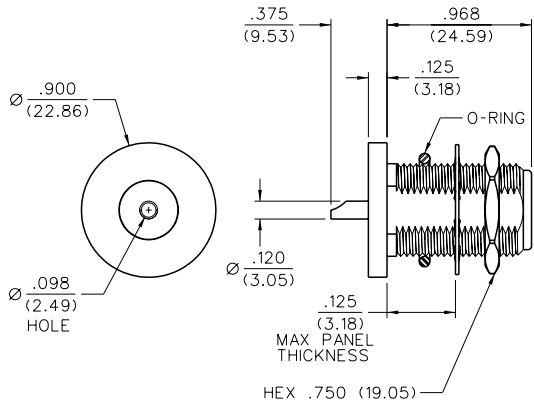


Bulkhead, Panel Mount and In-Series Adapters

Rear Mount Bulkhead Jack Receptacle



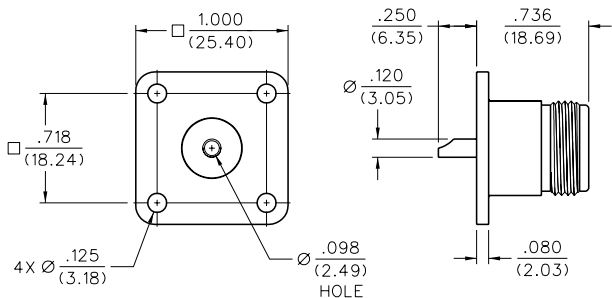
Tri-Alloy Plated  
138-4701-407



4-Hole Flange Mount Jack Receptacle – Flush Dielectric



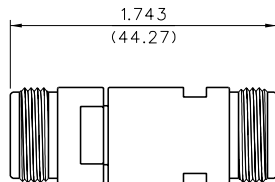
Tri-Alloy Plated  
138-4701-607



Jack to Jack Adapter



Tri-Alloy Plated  
138-4901-807



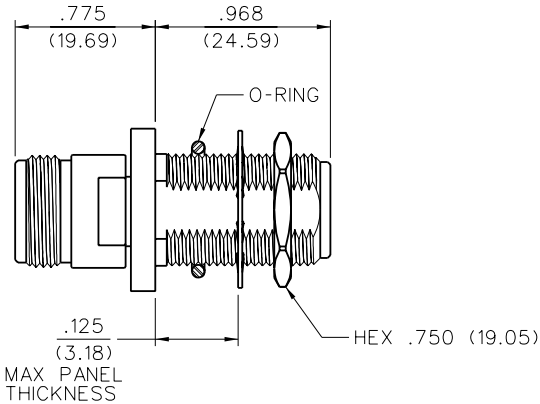
# In-Series Adapters

## Jack to Bulkhead Jack Adapter



Tri-Alloy Plated  
138-4901-407

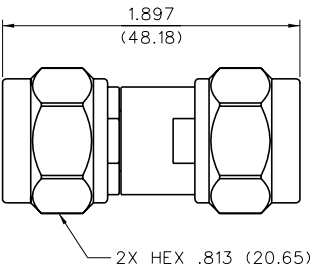
Mounting hole layout figure 1 page 194.



## Plug to Plug Adapter



Tri-Alloy Plated  
138-4901-817



### Shielded Cable Terminations

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Specifications

Electrical Specifications

Engagement Design: Impedance: 29 ohms  
Frequency Range: 0 - 2 GHz  
Working Voltage: 300 VRMS†  
Dielectric Withstanding Voltage: 2000 VDC†  
Contact Resistance: Center Contact: 6 milliohms  
Outer conductor: 2.5 milliohms

Mechanical Specifications

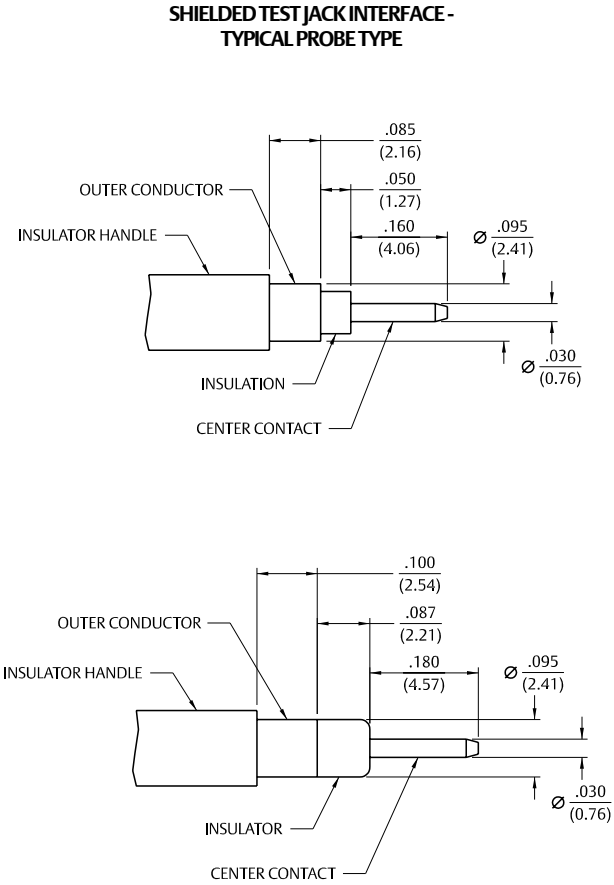
Insertion Force: Inner conductor: 32 oz. max. 2 oz. min.  
Outer conductor: 48 oz. max. 6 oz. min.  
Durability: 250 cycles

Environmental Ratings

Temperature Range: -65° C to + 85° C  
Corrosion: Salt spray, 24 hours  
Shock: Method 213, Test Condition B, MIL-STD-202  
Vibration: Method 204, Test Condition B, MIL-STD-202

Material Specifications

Contact: Beryllium copper per QQ-C-533/530  
Insulator Material: TFE Fluorocarbon per L-P-403  
Finish: Center Contact and Body: Gold



Flexible Cable – Straight Crimp Type



| Cable Type                       | Gold Plated  | Nickel Plated |
|----------------------------------|--------------|---------------|
| RG-161/U, 174, 179, 187,188, 316 | 142-0003-201 | 142-0003-206  |
| RG-316 DS, RG-188 DS             | 142-0004-201 | 142-0004-206  |

Assembly instructions page 252. Mounting hole layout figure 3 page 194.

Flexible Cable – Straight Crimp Type



| Cable Type                        | Gold Plated  | Nickel Plated | "A"         |
|-----------------------------------|--------------|---------------|-------------|
| RG-178/U, 196                     | 142-0002-221 | 142-0002-226  | .110 (2.79) |
| RG-316/U, 188, 174, 161, 179, 187 | 142-0003-231 | 142-0003-236  | .155 (3.94) |
|                                   | 142-0003-241 | 142-0003-246  | .110 (2.79) |
| RG-316 DS, 188 DS                 | 142-0004-211 | 142-0004-216  | .155 (3.94) |
|                                   | 142-0004-221 | 142-0004-226  | .110 (2.79) |

Assembly instructions page 252. Mounting hole layout figure 14 page 195.

Flexible Cable – Right Angle Crimp Type



| Cable Type                        | Gold Plated  | Nickel Plated |
|-----------------------------------|--------------|---------------|
| RG-161/U, 174, 179, 187, 188, 316 | 142-0003-301 | 142-0003-306  |
| RG-316 DS, RG-188 DS              | 142-0004-301 | 142-0004-306  |

Assembly instructions page 252. Mounting hole layout figure 3 page 194.

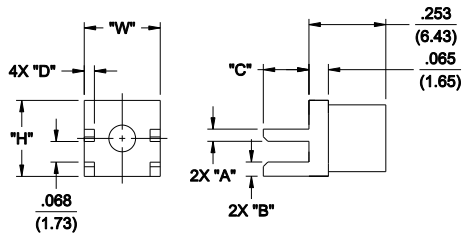
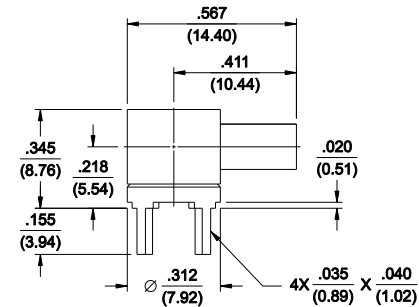
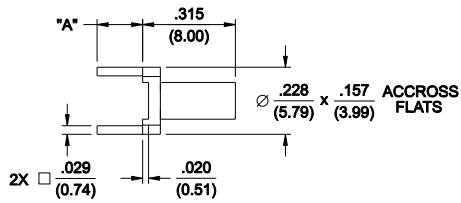
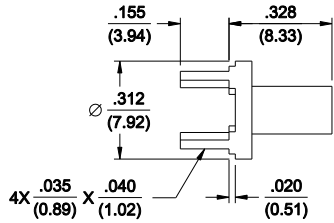
Semi-Rigid – Straight Solder Type End Launch



| Cable Type      | Gold Plated  | Board Thickness | "A"          | "B"          | "C"          | "D"          | "H"          | "W"          |
|-----------------|--------------|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|
| .086 Semi-Rigid | 142-0093-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.046 (1.42) | 0.150 (3.81) | 0.032 (0.81) | 0.250 (6.35) | 0.250 (6.35) |
| .141 Semi-Rigid | 142-0094-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.070 (1.78) | 0.187 (4.77) | 0.040 (1.02) | 0.312 (7.92) | 0.375 (9.52) |
| .250 Semi-Rigid | 142-0096-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.053 (1.35) | 0.187 (4.77) | 0.050 (1.27) | 0.312 (7.92) | 0.375 (9.52) |

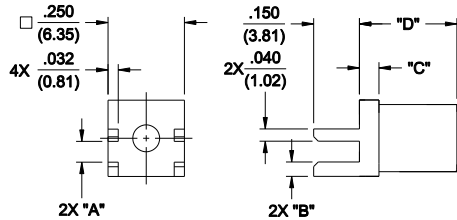
Assembly instructions page 253.

Flexible & Semi-Rigid Cable



Flexible Cable & PC Mount

Flexible Cable – Straight Crimp Type End Launch



| Cable Type                        | Gold Plated  | Board Thickness | "A"          | "B"          | "C"          | "D"          |
|-----------------------------------|--------------|-----------------|--------------|--------------|--------------|--------------|
| RG-316/U, 188, 174, 161, 179, 187 | 142-0003-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.046 (1.02) | 0.055 (1.40) | 0.310 (7.87) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 142-0004-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.046 (1.02) | 0.065 (1.65) | 0.320 (8.13) |
| RG-58/U, 141, 303                 | 142-0007-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.037 (1.65) | 0.065 (1.65) | 0.320 (8.13) |
| RG-142/U, 55, 223, 400            | 142-0008-801 | 0.062 (1.57)    | 0.068 (1.73) | 0.037 (1.65) | 0.065 (1.65) | 0.320 (8.13) |
| RG-178/U, 196                     | 142-0002-811 | 0.047 (1.19)    | 0.053 (1.35) | 0.065 (1.65) | 0.065 (1.65) | 0.320 (8.13) |
| RG-316/U, 188, 174, 161, 179, 187 | 142-0003-811 | 0.047 (1.19)    | 0.053 (1.35) | 0.061 (1.55) | 0.065 (1.65) | 0.320 (8.13) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 142-0004-811 | 0.047 (1.19)    | 0.053 (1.35) | 0.061 (1.55) | 0.065 (1.65) | 0.320 (8.13) |
| RG-58/U, 141, 303                 | 142-0007-811 | 0.047 (1.19)    | 0.053 (1.35) | 0.052 (1.32) | 0.065 (1.65) | 0.320 (8.13) |
| RG-142/U, 55, 223, 400            | 142-0008-811 | 0.047 (1.19)    | 0.053 (1.35) | 0.052 (1.32) | 0.065 (1.65) | 0.320 (8.13) |

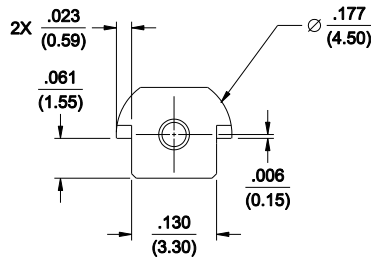
Assembly instructions page 253.

Flexible Cable – Straight Crimp Type Surface Mount End Launch



| Cable Type    | Gold Plated  |
|---------------|--------------|
| RG-178/U, 196 | 142-0002-821 |

Recommended land pattern figure 12 page 194.  
Assembly instructions page 254.

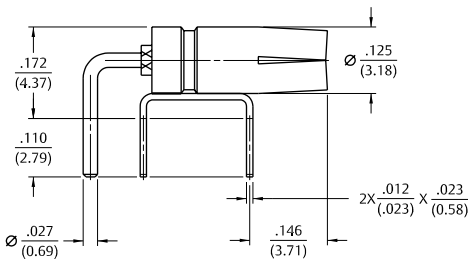


Horizontal



| Gold Plated  |
|--------------|
| 129-0701-302 |

Mounting hole layout figure 15 page 195.

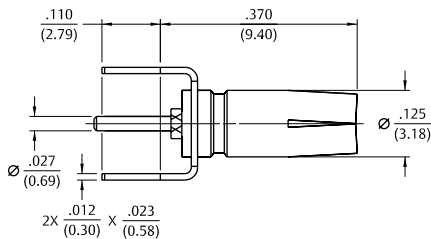


Vertical



| Gold Plated  |
|--------------|
| 129-0701-202 |

Mounting hole layout figure 16 page 195.



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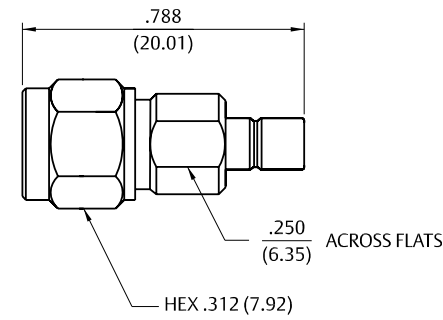
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SMA to SMB

SMA Plug to SMB Jack Adapter



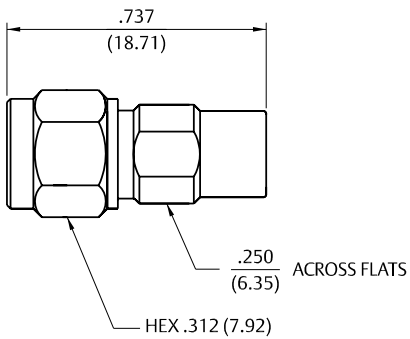
Gold Plated  
134-1012-011



SMA Plug to SMB Plug Adapter



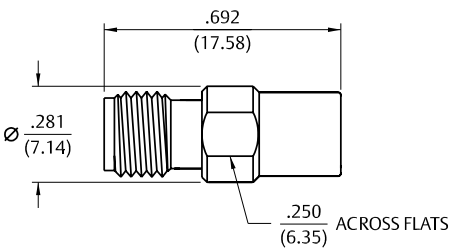
Gold Plated  
134-1012-021



SMA Jack to SMB Plug Adapter



Gold Plated  
134-1012-041

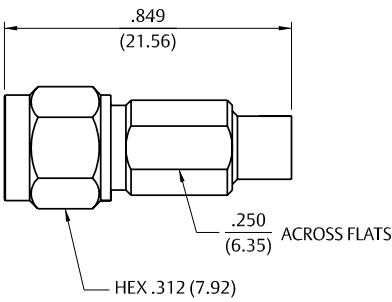


SMA to MCX

SMA Plug to MCX Jack Adapter



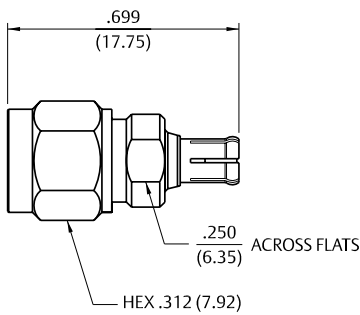
Gold Plated  
134-1018-001



SMA Plug to MCX Plug Adapter



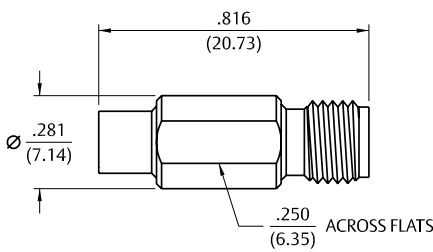
Gold Plated  
134-1018-011



SMA Jack to MCX Jack Adapter



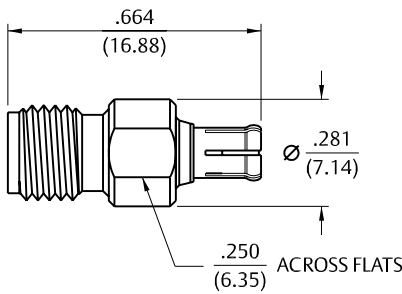
Gold Plated  
134-1018-021



SMA Jack to MCX Plug Adapter



Gold Plated  
134-1018-031

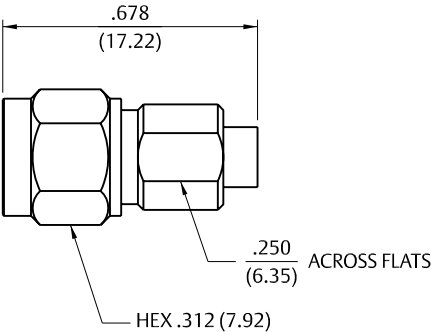


# SMA to MMCX

## SMA Plug to MMCX Jack Adapter



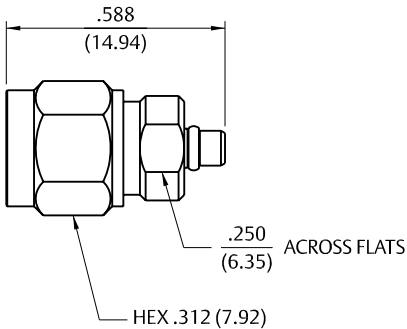
Gold Plated  
134-1019-151



## SMA Plug to MMCX Plug Adapter



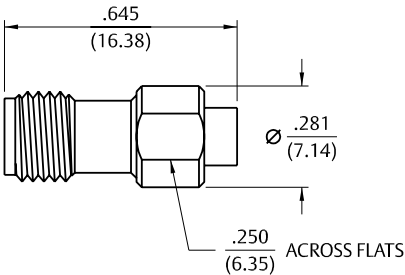
Gold Plated  
134-1019-161



## SMA Jack to MMCX Jack Adapter



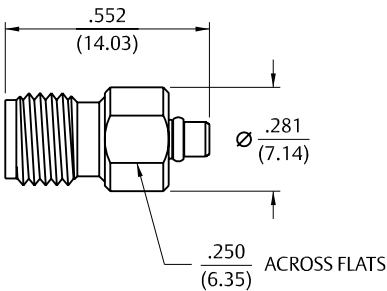
Gold Plated  
134-1019-171



## SMA Jack to MMCX Plug Adapter



Gold Plated  
134-1019-181



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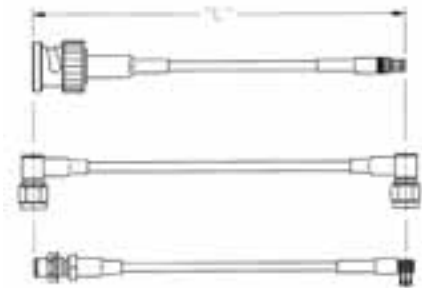
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Specifications

Electrical Ratings

Electrical ratings of a cable assembly are determined by the limiting connector type and cable size.

| Connector       | Cable              | Connector Impedance (Ohms) | Frequency (GHz) | Dielectric With-standing Voltage (VRMS) | Working Voltage (VRMS) |
|-----------------|--------------------|----------------------------|-----------------|-----------------------------------------|------------------------|
| MMCX            | RG-178             | 50                         | 6               | 500 Vms                                 | 170 Vms                |
|                 | RG-316             | 50                         | 6               | 500 Vms                                 | 170 Vms                |
| MCX             | RG-178             | 50                         | 6               | 750 Vms                                 | 250 Vms                |
|                 | RG-316             | 50                         | 6               | 1000 Vms                                | 335 Vms                |
|                 | RG-316DS           | 50                         | 6               | 1000 Vms                                | 335 Vms                |
| MCX 75 Ohm      | RG-179             | 75                         | 6               | 1000 Vms                                | 335 Vms                |
|                 | BELDEN 735A        | 75                         | 6               | 1000 Vms                                | 335 Vms                |
| SMA             | RG-178             | 50                         | 12.4            | 500 Vms                                 | 170 Vms                |
|                 | RG-316             | 50                         | 12.4            | 750 Vms                                 | 250 Vms                |
|                 | RG-316DS           | 50                         | 12.4            | 750 Vms                                 | 250 Vms                |
|                 | RG-58              | 50                         | 12.4            | 1000 Vms                                | 335 Vms                |
|                 | RG-142             | 50                         | 12.4            | 1000 Vms                                | 335 Vms                |
|                 | Hand-Formable .086 | 50                         | 26.5            | 1000 Vms                                | 335 Vms                |
|                 | Hand-Formable .141 | 50                         | 26.5            | 1500 Vms                                | 500 Vms                |
| SMB             | RG-178             | 50                         | 4               | 750 Vms                                 | 250 Vms                |
|                 | RG-316             | 50                         | 4               | 1000 Vms                                | 335 Vms                |
| SMB Mini 75 Ohm | RG-179             | 75                         | 2               | 1000 Vms                                | 335 Vms                |
|                 | RG-179DS           | 75                         | 2               | 1000 Vms                                | 335 Vms                |
|                 | BELDEN 735A        | 75                         | 2               | 1000 Vms                                | 335 Vms                |
| BNC             | RG-58              | 50                         | 4               | 1500 Vms                                | 500 Vms                |
|                 | BELDEN 8218        | 50                         | 4               | 1500 Vms                                | 500 Vms                |
|                 | RG-59              | 50                         | 4               | 1500 Vms                                | 500 Vms                |
|                 | RG-59 PLENUM       | 50                         | 4               | 1500 Vms                                | 500 Vms                |
| BNC 75 Ohm      | BELDEN 8218        | 75                         | 3               | 1500 Vms                                | 500 Vms                |
|                 | RG-59              | 75                         | 3               | 1500 Vms                                | 500 Vms                |
|                 | BELDEN 8281        | 75                         | 3               | 1500 Vms                                | 500 Vms                |
|                 | COMM SCOPE 735     | 75                         | 3               | 1500 Vms                                | 500 Vms                |
|                 | BELDEN 735A        | 75                         | 3               | 1500 Vms                                | 500 Vms                |
|                 | BELDEN 734A        | 75                         | 3               | 1500 Vms                                | 500 Vms                |
|                 | BELDEN 1694A       | 75                         | 3               | 1500 Vms                                | 500 Vms                |
| N               | RG-58              | 50                         | 11              | 1500 Vms                                | 500 Vms                |
|                 | RG -142            | 50                         | 11              | 1500 Vms                                | 500 Vms                |
|                 | RG-8               | 50                         | 11              | 1500 Vms                                | 500 Vms                |
|                 | RG-213             | 50                         | 11              | 1500 Vms                                | 500 Vms                |



Emerson Connectivity Solutions cable length applies to the end of straight connectors. The length is applied to the vertical centroid of right angle connectors.

MMCX Straight Plug to MMCX Straight Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  | Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|
| 415-0066-006 | RG-176     | 6"           | 135-3402-001 | 135-3402-001 | 415-0067-006 | RG-316     | 6"           | 135-3403-001 | 135-3403-001 |
| 415-0066-012 | RG-178     | 12"          | 135-3402-001 | 135-3402-001 | 415-0067-012 | RG-316     | 12"          | 135-3403-001 | 135-3403-001 |
| 415-0066-018 | RG-178     | 18"          | 135-3402-001 | 135-3402-001 | 415-0067-018 | RG-316     | 18"          | 135-3403-001 | 135-3403-001 |
| 415-0066-024 | RG-178     | 24"          | 135-3402-001 | 135-3402-001 | 415-0067-024 | RG-316     | 24"          | 135-3403-001 | 135-3403-001 |

MMCX Right Angle Plug to MMCX Right Angle Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  | Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|
| 415-0068-006 | RG-178     | 6"           | 135-3402-101 | 135-3402-101 | 415-0069-006 | RG-316     | 6"           | 135-34       | 135-3403-101 |
| 415-0068-012 | RG-178     | 12"          | 135-3402-101 | 135-3402-101 | 415-0069-012 | RG-316     | 12"          | 135-3403-101 | 135-3403-101 |
| 415-0068-018 | RG-178     | 18"          | 135-3402-101 | 135-3402-101 | 415-0069-018 | RG-316     | 18"          | 135-3403-101 | 135-3403-101 |
| 415-0068-024 | RG-178     | 24"          | 135-3402-101 | 135-3402-101 | 415-0069-024 | RG-316     | 24"          | 135-3403-101 | 135-3403-101 |

MMCX Straight Plug to SMA Straight Bulkhead Jack



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  | Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|
| 415-0070-006 | RC -178    | 6"           | 135-3402-001 | 142-0302-431 | 415-0071-006 | RC -316    | 6"           | 135-3403-001 | 142-0303-411 |
| 415-0070-012 | RG-178     | 12"          | 135-3402-001 | 142-0302-431 | 415-0071-012 | RG-316     | 12"          | 135-3403-001 | 142-0303-411 |
| 415-0070-018 | RG-178     | 18"          | 135-3402-001 | 142-0302-431 | 415-0071-018 | RG-316     | 18"          | 135-3403-001 | 142-0303-411 |
| 415-0070-024 | RG-178     | 24"          | 135-3402-001 | 142-0302-431 | 415-0071-024 | RG-316     | 24"          | 135-3403-001 | 142-0303-411 |
| 415-0070-036 | RG-178     | 36"          | 135-3402-001 | 142-0302-431 | 415-0071-036 | RG-316     | 36"          | 135-3403-001 | 142-0303-411 |

MMCX Right Angle Plug to SMA Straight Bulkhead Jack



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  | Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|
| 415-0072-006 | RG-178     | 6"           | 135-3402-101 | 142-0302-431 | 415-0073-006 | RG-316     | 6"           | 135-3403-101 | 142-0303-411 |
| 415-0072-012 | RG-178     | 12"          | 135-3402-101 | 142-0302-431 | 415-0073-012 | RG-316     | 12"          | 135-3403-101 | 142-0303-411 |
| 415-0072-018 | RG-178     | 18"          | 135-3402-101 | 142-0302-431 | 415-0073-018 | RG-316     | 18"          | 135-3403-101 | 142-0303-411 |
| 415-0072-024 | RG-178     | 24"          | 135-3402-101 | 142-0302-431 | 415-0073-024 | RG-316     | 24"          | 135-3403-101 | 142-0303-411 |
| 415-0072-036 | RG-178     | 36"          | 135-3402-101 | 142-0302-431 | 415-0073-036 | RG-316     | 36"          | 135-3403-101 | 142-0303-411 |

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Illustrations are shown in inches (millimeters).

MCX Straight Plug to MCX Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0014-006 | RG -178    | 6"           | 133-3402-021 | 133-3402-021 |
| 415-0014-012 | RG -176    | 12"          | 133-3402-021 | 133-3402-021 |
| 415-0014-018 | RG -178    | 18"          | 133-3402-021 | 133-3402-021 |
| 415-0014-024 | RG -178    | 24"          | 133-3402-021 | 133-3402-021 |
| 415-0014-030 | RG -178    | 30"          | 133-3402-021 | 133-3402-021 |
| 415-0014-036 | RG -178    | 36"          | 133-3402-021 | 133-3402-021 |
| 415-0018-006 | RG -316    | 6"           | 133-3403-001 | 133-3403-001 |
| 415-0018-012 | RG -316    | 12           | 133-3403-001 | 133-3403-001 |
| 415-0018-018 | RG -316    | 18"          | 133-3403-001 | 133-3403-001 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0018-024 | RG -316    | 24"          | 133-3403-001 | 133-3403-001 |
| 415-0018-030 | RG -316    | 30"          | 133-3403-001 | 133-3403-001 |
| 415-0018-036 | RG -316    | 36"          | 133-3403-001 | 133-3403-001 |
| 415-0020-006 | RG -316    | 6"           | 133-3404-001 | 133-3404-001 |
| 415-0020-012 | RG-316DS   | 12"          | 133-3404-001 | 133-3404-001 |
| 415-0020-018 | RG-316DS   | 18"          | 133-3404-001 | 133-3404-001 |
| 415-0020-024 | RG-316DS   | 24"          | 133-3404-001 | 133-3404-001 |
| 415-0020-030 | RG-316DS   | 30"          | 133-3404-001 | 133-3404-001 |
| 415-0020-036 | RG-316DS   | 36"          | 133-3404-001 | 133-3404-001 |

MCX Straight Plug to MCX Straight Bulkhead Jack

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0016-006 | RG -316    | 6"           | 133-3403-001 | 133-3303-401 |
| 415-0016-012 | RG -316    | 12"          | 133-3403-001 | 133-3303-401 |
| 415-0016-018 | RG -316    | 18"          | 133-3403-001 | 133-3303-401 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0016-024 | RG -316    | 24"          | 133-3403-001 | 133-3303-401 |
| 415-0016-030 | RG -316    | 30"          | 133-3403-001 | 133-3303-401 |
| 415-0016-036 | RG -316    | 36"          | 133-3403-001 | 133-3303-401 |

MCX Straight Plug to MCX Right Angle Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0017-006 | RG -316    | 6"           | 133-3403-001 | 133-3403-101 |
| 415-0017-012 | RG -316    | 12"          | 133-3403-001 | 133-3403-101 |
| 415-0017-018 | RG -316    | 18"          | 133-3403-001 | 133-3403-101 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0017-024 | RG -316    | 24"          | 133-3403-001 | 133-3403-101 |
| 415-0017-030 | RG -316    | 30"          | 133-3403-001 | 133-3403-101 |
| 415-0017-036 | RG -316    | 36"          | 133-3403-001 | 133-3403-101 |

MCX Right Angle Plug to MCX Right Angle Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0015-006 | RG -178    | 6"           | 133-3402-101 | 133-3402-101 |
| 415-0015-012 | RG -178    | 12"          | 133-3402-101 | 133-3402-101 |
| 415-0015-018 | RG -178    | 18"          | 133-3402-101 | 133-3402-101 |
| 415-0015-024 | RG -178    | 24"          | 133-3402-101 | 133-3402-101 |
| 415-0015-030 | RG -178    | 30"          | 133-3402-101 | 133-3402-101 |
| 415-0015-036 | RG -178    | 36"          | 133-3402-101 | 133-3402-101 |
| 415-0012-006 | RG -316    | 6"           | 133-3403-101 | 133-3403-101 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0021-006 | RG-316DS   | 6"           | 133-3404-101 | 133-3404-101 |
| 415-0021-012 | RG-316DS   | 12"          | 133-3404-101 | 133-3404-101 |
| 415-0021-018 | RG-316DS   | 18"          | 133-3404-101 | 133-3404-101 |
| 415-0021-024 | RG-316DS   | 24"          | 133-3404-101 | 133-3404-101 |
| 415-0021-030 | RG-316DS   | 30"          | 133-3404-101 | 133-3404-101 |
| 415-0021-036 | RG-316DS   | 36"          | 133-3404-101 | 133-3404-101 |

MCX 75 Ohm Straight Plug to MCX 75 Ohn Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0022-006 | RG -179    | 6"           | 133-8433-001 | 133-8433-001 |
| 415-0022-012 | RG -179    | 12"          | 133-8433-001 | 133-8433-001 |
| 415-0022-018 | RG -179    | 18"          | 133-8433-001 | 133-8433-001 |
| 415-0022-024 | RG-179     | 24"          | 133-8433-001 | 133-8433-001 |
| 415-0022-030 | RG -179    | 30"          | 133-8433-001 | 133-8433-001 |
| 415-0022-036 | RG -179    | 36"          | 133-8433-001 | 133-8433-001 |

| Part No.     | Cable Type  | Cable Length | Connector A  | Connector B  |
|--------------|-------------|--------------|--------------|--------------|
| 415-0023-006 | Belden 735A | 6"           | 133-8445-001 | 133-8445-001 |
| 415-0023-012 | Belden 735A | 12"          | 133-8445-001 | 133-8445-001 |
| 415-0023-018 | Belden 735A | 18"          | 133-8445-001 | 133-8445-001 |
| 415-0023-024 | Belden 735A | 24"          | 133-8445-001 | 133-8445-001 |
| 415-0023-030 | Belden 735A | 30"          | 133-8445-001 | 133-8445-001 |
| 415-0023-036 | Belden 735A | 36"          | 133-8445-001 | 133-8445-001 |

MCX 75 Ohm Right Angle Plug to MCX 75 Ohm Right Angle Plug

| Part No.     | Cable Type  | Cable Length | Connector A  | Connector B  |
|--------------|-------------|--------------|--------------|--------------|
| 415-0024-006 | Belden 735A | 6"           | 133-8445-101 | 133-8445-101 |
| 415-0024-012 | Belden 735A | 12"          | 133-8445-101 | 133-8445-101 |
| 415-0024-018 | Belden 735A | 18"          | 133-8445-101 | 133-8445-101 |

| Part No.     | Cable Type  | Cable Length | Connector A  | Connector B  |
|--------------|-------------|--------------|--------------|--------------|
| 415-0024-024 | Belden 735A | 24"          | 133-8445-101 | 133-8445-101 |
| 415-0024-030 | Belden 735A | 30"          | 133-8445-101 | 133-8445-101 |
| 415-0024-036 | Belden 735A | 36"          | 133-8445-101 | 133-8445-101 |

SMA Straight Plug to SMA Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0025-006 | RG -178    | 6"           | 142-0402-011 | 142-0402-011 |
| 415-0025-012 | RG -178    | 12"          | 142-0402-011 | 142-0402-011 |
| 415-0025-018 | RG -178    | 18"          | 142-0402-011 | 142-0402-011 |
| 415-0025-024 | RG -178    | 24"          | 142-0402-011 | 142-0402-011 |
| 415-0025-036 | RG -178    | 36"          | 142-0402-011 | 142-0402-011 |
| 415-0025-048 | RG -178    | 48"          | 142-0402-011 | 142-0402-011 |
| 415-0029-006 | RG -316    | 6"           | 142-0403-011 | 142-0403-011 |
| 415-0029-012 | RG -316    | 12"          | 142-0403-011 | 142-0403-011 |
| 415-0029-018 | RG -316    | 18"          | 142-0403-011 | 142-0403-011 |
| 415-0029-024 | RG -316    | 24"          | 142-0403-011 | 142-0403-011 |
| 415-0029-036 | RG -316    | 36"          | 142-0403-011 | 142-0403-011 |
| 415-0029-048 | RG -316    | 48"          | 142-0403-011 | 142-0403-011 |
| 415-0033-006 | RG -316DS  | 6"           | 142-0404-011 | 142-0404-011 |
| 415-0033-012 | RG -316DS  | 12"          | 142-0404-011 | 142-0404-011 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0033-018 | RG-316DS   | 18"          | 142-0404-011 | 142-0404-011 |
| 415-0033-024 | RG-316DS   | 24"          | 142-0404-011 | 142-0404-011 |
| 415-0033-036 | RG-316DS   | 36"          | 142-0404-011 | 142-0404-011 |
| 415-0033-048 | RG-316DS   | 48"          | 142-0404-011 | 142-0304-411 |
| 415-0038-012 | RG -58     | 12"          | 142-0407-011 | 142-0307-411 |
| 415-0038-024 | RG -58     | 24"          | 142-0407-011 | 142-0307-411 |
| 415-0038-036 | RG -58     | 36"          | 142-0407-011 | 142-0307-411 |
| 415-0038-048 | RG -58     | 48"          | 142-0407-011 | 142-0307-411 |
| 415-0038-060 | RG-58      | 60"          | 142-0407-011 | 142-0307-411 |
| 415-0043-012 | RG-142     | 12"          | 142-0408-011 | 142-0308-411 |
| 415-0043-024 | RG-142     | 24"          | 142-0408-011 | 142-0308-411 |
| 415-0043-036 | RG-142     | 36"          | 142-0408-011 | 142-0308-411 |
| 415-0043-048 | RG -142    | 48"          | 142-0408-011 | 142-0308-411 |
| 415-0043-060 | RG-142     | 60"          | 142-0408-011 | 142-0308-411 |

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Illustrations are shown in inches (millimeters).

Hand Formable SMA Straight Plug to SMA Straight Plug



| Part No.     | Cable Type         | Cable Length | Connector A  | Connector B  |
|--------------|--------------------|--------------|--------------|--------------|
| 415-0081-003 | Hand Formable .086 | 3"           | 142-0693-001 | 142-0693-001 |
| 415-0081-004 | Hand Formable .086 | 4"           | 142-0693-001 | 142-0693-001 |
| 415-0081-005 | Hand Formable .086 | 5"           | 142-0693-001 | 142-0693-001 |
| 415-0081-006 | Hand Formable .086 | 6"           | 142-0693-001 | 142-0693-001 |
| 415-0081-007 | Hand Formable .086 | 7"           | 142-0693-001 | 142-0693-001 |

Hand Formable SMA Straight Plug to SMA Straight Plug



| Part No.     | Cable Type         | Cable Length | Connector A  | Connector B  |
|--------------|--------------------|--------------|--------------|--------------|
| 415-0082-003 | Hand Formable .141 | 3"           | 142-0694-001 | 142-0694-001 |
| 415-0082-004 | Hand Formable .141 | 4"           | 142-0694-001 | 142-0694-001 |
| 415-0082-005 | Hand Formable .141 | 5"           | 142-0694-001 | 142-0694-001 |
| 415-0082-006 | Hand Formable .141 | 6"           | 142-0694-001 | 142-0694-001 |
| 415-0082-007 | Hand Formable .141 | 7"           | 142-0694-001 | 142-0694-001 |

SMA Straight Plug to SMA Straight Bulkhead Jack



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B   |
|--------------|------------|--------------|--------------|---------------|
| 415-0031-006 | RG-316     | 6"           | 142-0403-011 | 142-0303 -411 |
| 415-0031-012 | RG-316     | 12"          | 142-0403-011 | 142-0303 -411 |
| 415-0031-018 | RG-316     | 18"          | 142-0403-011 | 142-0303 -411 |
| 415-0031-024 | RG-316     | 24"          | 142-0403-011 | 142-0303 -411 |
| 415-0031-036 | RG-316     | 36"          | 142-0403-011 | 142-0303 -411 |
| 415-0031-048 | RG-316     | 48"          | 142-0403-011 | 142-0303 -411 |
| 415-0035-006 | RG -316 DS | 6"           | 142-0404-011 | 142-0304-411  |
| 415-0035-012 | RG -316 DS | 12"          | 142-0404-011 | 142-0304-411  |
| 415-0035-018 | RG -316 DS | 18"          | 142-0404-011 | 142-0304-411  |
| 415-0035-024 | RG -316 DS | 24"          | 142-0404-011 | 142-0304-411  |
| 415-0035-036 | RG -316 DS | 36"          | 142-0404-011 | 142-0304-411  |

| Part No.     | Cable Type         | Cable Length | Connector A  | Connector B  |
|--------------|--------------------|--------------|--------------|--------------|
| 415-0081-008 | Hand Formable .086 | 8"           | 142-0693-001 | 142-0693-001 |
| 415-0081-012 | Hand Formable .086 | 12"          | 142-0693-001 | 142-0693-001 |
| 415-0081-018 | Hand Formable .086 | 18"          | 142-0693-001 | 142-0693-001 |
| 415-0081-024 | Hand Formable .086 | 24"          | 142-0693-001 | 142-0693-001 |

| Part No.     | Cable Type         | Cable Length | Connector A  | Connector B  |
|--------------|--------------------|--------------|--------------|--------------|
| 415-0082-008 | Hand Formable .141 | 8"           | 142-0694-001 | 142-0694-001 |
| 415-0082-012 | Hand Formable .141 | 12"          | 142-0694-001 | 142-0694-001 |
| 415-0082-018 | Hand Formable .141 | 18"          | 142-0694-001 | 142-0694-001 |
| 415-0082-024 | Hand Formable .141 | 24"          | 142-0694-001 | 142-0694-001 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0035-048 | RG-316DS   | 48"          | 142-0404-011 | 142-0304-411 |
| 415-0040-012 | RG -58     | 12"          | 142-0407-011 | 142-0307-411 |
| 415-0040-024 | RG -58     | 24"          | 142-0407-011 | 142-0307-411 |
| 415-0040-036 | RG -58     | 36"          | 142-0407-011 | 142-0307-411 |
| 415-0040-048 | RG -58     | 48"          | 142-0407-011 | 142-0307-411 |
| 415-0040-060 | RG-58      | 60"          | 142-0407-011 | 142-0307-411 |
| 415-0045-012 | RG-142     | 12"          | 142-0408-011 | 142-0308-411 |
| 415-0045-024 | RG-142     | 24"          | 142-0408-011 | 142-0308-411 |
| 415-0045-036 | RG-142     | 36"          | 142-0408-011 | 142-0308-411 |
| 415-0045-048 | RG -142    | 48"          | 142-0408-011 | 142-0308-411 |
| 415-0045-060 | RG-142     | 60"          | 142-0408-011 | 142-0308-411 |

SMA Straight Plug to SMA Right Angle Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0026-006 | RG-178     | 6"           | 142-0402-011 | 142-0402-101 |
| 415-0026-012 | RG-176     | 12"          | 142-0402-011 | 142-0402-101 |
| 415-0026-016 | RG -178    | 18"          | 142-0402-011 | 142-0402-101 |
| 415-0026-024 | RG-178     | 24"          | 142-0402-011 | 142-0402-101 |
| 415-0026-036 | RG-178     | 36"          | 142-0402-011 | 142-0402-101 |
| 415-0026-048 | RG-178     | 48"          | 142-0402-011 | 142-0402-101 |
| 415-0030-006 | RG-316     | 6"           | 142-0403-011 | 142-0403-101 |
| 415-0030-012 | RG-316     | 12"          | 142-0403-011 | 142-0403-101 |
| 415-0030-018 | RG-316     | 18"          | 142-0403-011 | 142-0403-101 |
| 415-0030-024 | RG-316     | 24"          | 142-0403-011 | 142-0403-101 |
| 415-0030-036 | RG-316     | 36"          | 142-0403-011 | 142-0403-101 |
| 415-0030-048 | RG-316     | 48"          | 142-0403-011 | 142-0403-101 |

SMA Right Angle Plug to SMA Right Angle Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0027-006 | RG-178     | 6"           | 142-0402-101 | 142-0402-101 |
| 415-0027-012 | RG-178     | 12"          | 142-0402-101 | 142-0402-101 |
| 415-0027-018 | RG-178     | 18"          | 142-0402-101 | 142-0402-101 |
| 415-0027-024 | RG-178     | 24"          | 142-0402-101 | 142-0402-101 |
| 415-0027-036 | RG-178     | 36"          | 142-0402-101 | 142-0402-101 |
| 415-0027-048 | RG-178     | 48"          | 142-0402-101 | 142-0402-101 |
| 415-0032-006 | RG-316     | 6"           | 142-0403-101 | 142-0403-101 |
| 415-0032-012 | RG-316     | 12"          | 142-0403-101 | 142-0403-101 |
| 415-0032-018 | RG-316     | 18"          | 142-0403-101 | 142-0403-101 |
| 415-0032-024 | RG-316     | 24"          | 142-0403-101 | 142-0403-101 |
| 415-0032-036 | RG-316     | 36"          | 142-0403-101 | 142-0403-101 |
| 415-0032-048 | RG-316     | 48"          | 142-0403-101 | 142-0403-101 |
| 415-0036-006 | RG-316DS   | 6"           | 142-0404-101 | 142-0404-101 |
| 415-0036-012 | RG-316DS   | 12"          | 142-0404-101 | 142-0404-101 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0036-018 | RG-316     | 18"          | 142-0404-101 | 142-0404-101 |
| 415-0036-024 | RG-316     | 24"          | 142-0404-101 | 142-0404-101 |
| 415-0036-036 | RG-316     | 36"          | 142-0404-101 | 142-0404-101 |
| 415-0036-048 | RG-316     | 48"          | 142-0404-101 | 142-0404-101 |
| 415-0041-012 | RG-58      | 12"          | 142-0407-101 | 142-0407-101 |
| 415-0041-024 | RG-58      | 24"          | 142-0407-101 | 142-0407-101 |
| 415-0041-036 | RG-58      | 36"          | 142-0407-101 | 142-0407-101 |
| 415-0041-048 | RG -58     | 48"          | 142-0407-101 | 142-0407-101 |
| 415-0041-060 | RG-58      | 60"          | 142-0407-101 | 142-0407-101 |
| 415-0046-012 | RG-142     | 12"          | 142-0408-101 | 142-0408-101 |
| 415-0046-024 | RG-142     | 24"          | 142-0408-101 | 142-0408-101 |
| 415-0046-036 | RG-142     | 36"          | 142-0408-101 | 142-0408-101 |
| 415-0046-048 | RG-142     | 48"          | 142-0408-101 | 142-0408-101 |
| 415-0046-060 | RG-142     | 60"          | 142-0408-101 | 142-0408-101 |

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Illustrations are shown in inches (millimeters).

SMA Right Angle Plug to SMA Straight Bulkhead Jack



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0074-006 | RG-316     | 6"           | 142-0403-101 | 142-0303-411 |
| 415-0074-012 | RG-316     | 12"          | 142-0403-101 | 142-0303-411 |
| 415-0074-024 | RG-316     | 24"          | 142-0403-101 | 142-0303-411 |
| 415-0074-036 | RG-316     | 36"          | 142-0403-101 | 142-0303-411 |
| 415-0074-048 | RG-316     | 48"          | 142-0403-101 | 142-0303-411 |
| 415-0064-006 | RG-316DS   | 6"           | 142-0404-101 | 142-0304-411 |
| 415-0064-012 | RG-316DS   | 12"          | 142-0404-101 | 142-0304-411 |
| 415-0064-024 | RG-316DS   | 24"          | 142-0404-101 | 142-0304-411 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0064-036 | RG-316DS   | 36"          | 142-0404-101 | 142-0304-411 |
| 415-0064-048 | RG-316DS   | 48"          | 142-0404-101 | 142-0304-411 |
| 415-0075-006 | RG-142     | 6"           | 142-0406-101 | 142-0306-411 |
| 415-0075-012 | RG-142     | 12"          | 142-0406-101 | 142-0306-411 |
| 415-0075-024 | RG-142     | 24"          | 142-0406-101 | 142-0306-411 |
| 415-0075-036 | RG-142     | 36"          | 142-0406-101 | 142-0306-411 |
| 415-0075-048 | RG-142     | 48"          | 142-0406-101 | 142-0306-411 |

Straight SMA Quick-Connect Plug to Straight SMA Quick-Connect Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0065-006 | RG-316     | 6"           | 142-1403-001 | 142-1403-001 |
| 415-0065-012 | RG-316     | 12"          | 142-1403-001 | 142-1403-001 |
| 415-0065-018 | RG-316     | 18"          | 142-1403-001 | 142-1403-001 |
| 415-0065-024 | RG-316     | 24"          | 142-1403-001 | 142-1403-001 |
| 415-0065-036 | RG-316     | 36"          | 142-1403-001 | 142-1403-001 |
| 415-0065-048 | RG-316     | 48"          | 142-1403-001 | 142-1403-001 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0076-012 | RG-316DS   | 12"          | 142-1404-001 | 142-1404-001 |
| 415-0076-024 | RG-316DS   | 24"          | 142-1404-001 | 142-1404-001 |
| 415-0076-036 | RG-316DS   | 36"          | 142-1404-001 | 142-1404-001 |
| 415-0077-012 | RG-142     | 12"          | 142-1408-001 | 142-1408-001 |
| 415-0077-024 | RG-142     | 24"          | 142-1408-001 | 142-1408-001 |
| 415-0077-036 | RG-142     | 36"          | 142-1408-001 | 142-1408-001 |

Straight SMA Quick-Connect Plug to Straight SMA Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0078-012 | RG-316DS   | 12"          | 142-1404-001 | 142-0404-011 |
| 415-0078-024 | RG-316DS   | 24"          | 142-1404-001 | 142-0404-011 |
| 415-0078-036 | RG-316DS   | 36"          | 142-1404-001 | 142-0404-011 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0079-012 | RG-142     | 12"          | 142-1408-001 | 142-0408-011 |
| 415-0079-024 | RG-142     | 24"          | 142-1408-001 | 142-0408-011 |
| 415-0079-036 | RG-142     | 36"          | 142-1408-001 | 142-0408-011 |

SMB Straight Plug to SMB Straight Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 413-0003-000 | RG-316     | 6"           | 131-1403-001 | 131-1403-001 |
| 415-0003-012 | RG-316     | 12"          | 131-1403-001 | 131-1403-001 |
| 415-0003-018 | RG-316     | 18"          | 131-1403-001 | 131-1403-001 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 413-0003-024 | RG-316     | 24"          | 131-1403-001 | 131-1403-001 |
| 415-0003-030 | RG-316     | 30"          | 131-1403-001 | 131-1403-001 |
| 415-0003-036 | RG-316     | 36"          | 131-1403-001 | 131-1403-001 |

SMB Straight Plug to SMB Right Angle Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0007-006 | RG -178    | 6"           | 131-3462-661 | 131-1462-161 |
| 415-0007-012 | RG -178    | 12"          | 131-3402-001 | 131-1402-101 |
| 415-0007-018 | RG -178    | 18"          | 131-3462-661 | 131-1462-161 |
| 415-0007-024 | RG -178    | 24"          | 131-3462-661 | 131-1462-161 |
| 415-0007-030 | RG -178    | 36"          | 131-3462-661 | 131-1462-161 |
| 415-0007-036 | RG -178    | 36"          | 131-3462-661 | 131-1462-161 |
| 415-0002-006 | RG-316     | 6"           | 131-1463-661 | 131-1463-161 |
| 415-0002-012 | RG-316     | 12"          | 131-1463-661 | 131-1463-161 |
| 415-0002-018 | RG-316     | 18"          | 131-1463-661 | 131-1463-161 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0002-024 | RG-316     | 24"          | 131-1403-001 | 131-1403-101 |
| 415-0002-030 | RG-316     | 30"          | 131-1403-001 | 131-1403-101 |
| 415-0002-036 | RG-316     | 36"          | 131-1403-001 | 131-1403-101 |
| 415-0005-006 | RG-316 DS  | 6"           | 131-1404-001 | 131-1404-101 |
| 415-0005-012 | RG-316 DS  | 12"          | 131-1404-001 | 131-1404-101 |
| 415-0005-018 | RG-316 DS  | 16"          | 131-1404-001 | 131-1404-101 |
| 415-0005-024 | RG-316 DS  | 24"          | 131-1404-001 | 131-1404-101 |
| 415-0005-030 | RG-316 DS  | 30"          | 131-1404-001 | 131-1404-101 |
| 415-0005-036 | RG-316 DS  | 36"          | 131-1404-001 | 131-1404-101 |

SMB Right Angle Plug to SMB Right Angle Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0001-006 | RG-178     | 6"           | 131-1402-101 | 131-1402-101 |
| 415-0001-012 | RG-178     | 12"          | 131-1402-101 | 131-1402-101 |
| 415-0001-018 | RG-178     | 18"          | 131-1402-101 | 131-1402-101 |
| 415-0001-024 | RG-178     | 24"          | 131-1402-101 | 131-1402-101 |
| 415-0001-030 | RG-178     | 30"          | 131-1402-101 | 131-1402-101 |
| 415-0001-036 | RG-178     | 36"          | 131-1402-101 | 131-1402-101 |
| 415-0004-006 | RG-316     | 6"           | 131-1403-101 | 131-1403-101 |
| 415-0004-012 | RG-316     | 12"          | 131-1403-101 | 131-1403-101 |
| 415-0004-018 | RG-316     | 18"          | 131-1403-101 | 131-1403-101 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0004-024 | RG -316    | 24"          | 131-1403-101 | 131-1403-101 |
| 415-0004-030 | RG-316     | 30"          | 131-1403-101 | 131-1403-101 |
| 415-0004-036 | RG-316     | 36"          | 131-1403-101 | 131-1403-101 |
| 415-0006-006 | RG-316DS   | 6"           | 131-1404-101 | 131-1404-101 |
| 415-0006-012 | RG-316DS   | 12"          | 131-1404-101 | 131-1404-101 |
| 415-0006-018 | RG-316DS   | 18"          | 131-1404-101 | 131-1404-101 |
| 415-0006-024 | RG-316DS   | 24"          | 131-1404-101 | 131-1404-101 |
| 415-0006-030 | RG-316DS   | 30"          | 131-1404-101 | 131-1404-101 |
| 415-0006-036 | RG-316DS   | 36"          | 131-1404-101 | 131-1404-101 |

SMB Mini-75 Ohm Straight Plug to SMB Mini-75 Ohm Straight Plug



| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0008-006 | RG -179    | 6"           | 131-8403-011 | 131-8403-011 |
| 415-0008-012 | RG -179    | 12"          | 131-8403-011 | 131-8403-011 |
| 415-0008-018 | RG-179     | 18"          | 131-6403-011 | 131-6403-011 |
| 415-0008-024 | RG-179     | 24"          | 131-6403-011 | 131-6403-011 |
| 415-0008-030 | RG -179    | 30"          | 131-8403-011 | 131-8403-011 |
| 415-0008-036 | RG -179    | 36"          | 131-8403-011 | 131-8403-011 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0010-006 | RG -179 DS | 6"           | 131-6404-011 | 131-6404-011 |
| 415-0010-012 | RG -179 DS | 12"          | 131-6404-011 | 131-6404-011 |
| 415-0010-018 | RG -179 DS | 18"          | 131-6404-011 | 131-6404-011 |
| 415-0010-024 | RG -179 DS | 24"          | 131-6404-011 | 131-6404-011 |
| 415-0010-030 | RG -179 DS | 30"          | 131-6404-011 | 131-6404-011 |
| 415-0010-036 | RG -179 DS | 36"          | 131-6404-011 | 131-6404-011 |

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Illustrations are shown in inches (millimeters).

SMB Mini-75 Ohm Straight Plug to  
SMB Mini-75 Ohm Right Angle Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0009-006 | RG -179    | 6"           | 131-8403-111 | 131-8403-111 |
| 415-0009-012 | RG -179    | 12"          | 131-8403-111 | 131-8403-111 |
| 415-0009-018 | RG -179    | 18"          | 131-8403-111 | 131-8403-111 |
| 415-0009-024 | RG -179    | 24"          | 131-8403-111 | 131-8403-111 |
| 415-0009-030 | RG -179    | 30"          | 131-8403-111 | 131-8403-111 |
| 415-0009-036 | RG -179    | 36"          | 131-8403-111 | 131-8403-111 |
| 415-0011-006 | RG-179 DS  | 6"           | 131-8404-111 | 131-8404-111 |
| 415-0011-012 | RG-179 DS  | 12"          | 131-8404-111 | 131-8404-111 |
| 415-0011-018 | RG-179 DS  | 18"          | 131-8404-111 | 131-8404-111 |

| Part No.     | Cable Type  | Cable Length | Connector A  | Connector B  |
|--------------|-------------|--------------|--------------|--------------|
| 415-0011-024 | RG-179 DS   | 24"          | 131-8404-111 | 131-8404-111 |
| 415-0011-030 | RG-179 DS   | 30"          | 131-8404-111 | 131-8404-111 |
| 415-0011-036 | RG-179 DS   | 36"          | 131-8404-111 | 131-8404-111 |
| 415-0013-006 | Belden 735A | 6"           | 131-8445-101 | 131-8445-101 |
| 415-0013-012 | Belden 735A | 12"          | 131-8445-101 | 131-8445-101 |
| 415-0013-018 | Belden 735A | 18"          | 131-8445-101 | 131-8445-101 |
| 415-0013-024 | Belden 735A | 24"          | 131-8445-101 | 131-8445-101 |
| 415-0013-030 | Belden 735A | 30"          | 131-8445-101 | 131-8445-101 |
| 415-0013-036 | Belden 735A | 36"          | 131-8445-101 | 131-8445-101 |

N Straight Plug to N Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A | Connector B |
|--------------|------------|--------------|-------------|-------------|
| 415-0058-012 | RG -58     | 12"          | CPN -1      | CPN -1      |
| 415-0058-024 | RG -58     | 24"          | CPN -1      | CPN -1      |
| 415-0058-036 | RG -58     | 36"          | CPN -1      | CPN -1      |
| 415-0058-048 | RG -58     | 48"          | CPN -1      | CPN -1      |
| 415-0058-060 | RG -58     | 60"          | CPN -1      | CPN -1      |
| 415-0060-012 | RG -142    | 12"          | CPN -142T   | CPN -142T   |
| 415-0060-024 | RG -142    | 24"          | CPN -142T   | CPN -142T   |
| 415-0060-036 | RG -142    | 36"          | CPN -142T   | CPN -142T   |
| 415-0060-048 | RG -142    | 48"          | CPN -142T   | CPN -142T   |
| 415-0060-060 | RG -142    | 60"          | CPN -142T   | CPN -142T   |

| Part No.     | Cable Type | Cable Length | Connector A | Connector B |
|--------------|------------|--------------|-------------|-------------|
| 415-0062-012 | RG-8       | 12"          | CPN -8      | CPN -8      |
| 415-0062-024 | RG-8       | 24"          | CPN -8      | CPN -8      |
| 415-0062-036 | RG-8       | 36"          | CPN -8      | CPN -8      |
| 415-0062-048 | RG-8       | 48"          | CPN -8      | CPN -8      |
| 415-0062-060 | RG-8       | 60"          | CPN -8      | CPN -8      |
| 415-0063-012 | RG -213    | 12"          | CPN -8      | CPN -8      |
| 415-0063-024 | RG -213    | 24"          | CPN -8      | CPN -8      |
| 415-0063-036 | RG -213    | 36"          | CPN -8      | CPN -8      |
| 415-0063-048 | RG -213    | 48"          | CPN -8      | CPN -8      |
| 415-0063-060 | RG -213    | 60"          | CPN -8      | CPN -8      |

BNC Straight Plug to BNC Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A | Connector B |
|--------------|------------|--------------|-------------|-------------|
| 415-0054-012 | RG -58     | 12"          | CPMC-88-1   | CPMC-88-1   |
| 415-0054-024 | RG -58     | 24"          | CPMC-88-1   | CPMC-88-1   |
| 415-0054-036 | RG-58      | 36"          | CPMC-88-1   | CPMC-88-1   |
| 415-0054-048 | RG -58     | 48"          | CPMC-88-1   | CPMC-88-1   |
| 415-0054-060 | RG -58     | 60"          | CPMC-88-1   | CPMC-88-1   |
| 415-0057-012 | RG-59      | 12"          | CPMC-88-2   | CPMC-88-2   |
| 415-0057-024 | RG-59      | 24"          | CPMC-88-2   | CPMC-88-2   |
| 415-0057-036 | RG-59      | 36"          | CPMC-88-2   | CPMC-88-2   |
| 415-0057-048 | RG-59      | 48"          | CPMC-88-2   | CPMC-88-2   |

| Part No.      | Cable Type  | Cable Length | Connector A | Connector B |
|---------------|-------------|--------------|-------------|-------------|
| 415-0056-012+ | Belden 8218 | 12"          | CPMC-88-18  | CPMC-88-18  |
| 415-0056-024+ | Belden 8218 | 24"          | CPMC-88-18  | CPMC-88-18  |
| 415-0056-036+ | Belden 8218 | 36"          | CPMC-88-18  | CPMC-88-18  |
| 415-0056-048+ | Belden 8218 | 48"          | CPMC-88-18  | CPMC-88-18  |
| 415-0056-060+ | Belden 8218 | 60"          | CPMC-88-18  | CPMC-88-18  |

+ with Heat Shrink

75 Ohm BNC Straight Plug to  
75 Ohm BNC Straight Plug

| Part No.     | Cable Type  | Cable Length | Connector A | Connector B |
|--------------|-------------|--------------|-------------|-------------|
| 415-0048-012 | RG -59      | 12"          | CPMC-68-2   | CPMC-68-2   |
| 415-0048-024 | RG -59      | 24"          | CPMC-68-2   | CPMC-68-2   |
| 415-0048-036 | RG-59       | 36"          | CPMC-68-2   | CPMC-68-2   |
| 415-0048-048 | RG -59      | 48"          | CPMC-68-2   | CPMC-68-2   |
| 415-0048-060 | RG -59      | 60"          | CPMC-68-2   | CPMC-68-2   |
| 415-0052-012 | Belden 734A | 12"          | CPMC-68-35  | CPMC-68-35  |
| 415-0052-024 | Belden 734A | 24"          | CPMC-68-3   | CPMC-68-35  |
| 415-0052-036 | Belden 734A | 36"          | CPMC-68-35  | CPMC-68-35  |
| 415-0052-048 | Belden 734A | 48"          | CPMC-68-35  | CPMC-68-35  |
| 415-0052-060 | Belden 734A | 60"          | CPMC-68-35  | CPMC-68-35  |

SMA Straight Plug to  
BNC Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B |
|--------------|------------|--------------|--------------|-------------|
| 415-0028-006 | RG -316    | 6"           | 142-0403-011 | CPM -88-19  |
| 415-0028-012 | RG -316    | 12"          | 142-0403-011 | CPM -88-19  |
| 415-0028-018 | RG -316    | 18"          | 142-0403-011 | CPM -88-19  |
| 415-0028-024 | RG -316    | 24"          | 142-0403-011 | CPM -88-19  |
| 415-0028-036 | RG -316    | 36"          | 142-0403-011 | CPM -88-19  |
| 415-0028-048 | RG -316    | 48"          | 142-0403-011 | CPM -88-19  |
| 415-0037-012 | RG -58     | 12"          | 142-0407-011 | CPMC-88-1   |
| 415-0037-024 | RG -58     | 24"          | 142-0407-011 | CPMC-88-1   |

SMA Straight Plug to N Straight Plug

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B |
|--------------|------------|--------------|--------------|-------------|
| 415-0059-012 | RG -58     | 12"          | 142-0407-011 | CPN -1      |
| 415-0059-024 | RG -58     | 24"          | 142-0407-011 | CPN -1      |
| 415-0059-036 | RG -58     | 36"          | 142-0407-011 | CPN -1      |
| 415-0059-048 | RG -58     | 48"          | 142-0407-011 | CPN -1      |
| 415-0059-060 | RG -58     | 60"          | 142-0407-011 | CPN -1      |

| Part No.     | Cable Type     | Cable Length | Connector A | Connector B |
|--------------|----------------|--------------|-------------|-------------|
| 415-0047-012 | Belden 8218    | 12"          | CPMC-68-18  | CPMC-58-18  |
| 415-0047-024 | Belden 8218    | 24"          | CPMC-68-18  | CPMC-68-18  |
| 415-0047-036 | Belden 8218    | 36"          | CPMC-68-18  | CPMC-68-18  |
| 415-0047-048 | Belden 8218    | 48"          | CPMC-68-18  | CPMC-68-18  |
| 415-0047-060 | Belden 8218    | 60"          | CPMC-68-18  | CPMC-68-18  |
| 415-0049-012 | Belden 8281    | 12"          | CPMC-68-3   | CPMC-68-3   |
| 415-0049-024 | Belden 8281    | 24"          | CPMC-68-3   | CPMC-68-3   |
| 415-0049-036 | Belden 8281    | 36"          | CPMC-68-3   | CPMC-68-3   |
| 415-0049-048 | Belden 8281    | 48"          | CPMC-68-3   | CPMC-68-3   |
| 415-0049-060 | Belden 8281    | 60"          | CPMC-68-3   | CPMC-68-3   |
| 415-0050-012 | Comm Scope 735 | 12"          | CPMC-68-33  | CPMC-68-33  |
| 415-0050-024 | Comm Scope 735 | 24"          | CPMC-68-33  | CPMC-68-33  |
| 415-0050-036 | Comm Scope 735 | 36"          | CPMC-68-33  | CPMC-68-33  |
| 415-0050-048 | Comm Scope 735 | 48"          | CPMC-68-33  | CPMC-68-33  |
| 415-0050-060 | Comm Scope 735 | 60"          | CPMC-68-33  | CPMC-68-33  |
| 415-0051-012 | Belden 735A    | 12"          | CPMC-68-33  | CPMC-68-33  |
| 415-0051-024 | Belden 735A    | 24"          | CPMC-68-33  | CPMC-68-33  |
| 415-0051-036 | Belden 735A    | 36"          | CPMC-68-33  | CPMC-68-33  |
| 415-0051-048 | Belden 735A    | 48"          | CPMC-68-33  | CPMC-68-33  |
| 415-0051-060 | Belden 735A    | 60"          | CPMC-68-33  | CPMC-68-33  |
| 415-0053-012 | Belden 1694A   | 12"          | CPMC-68-45  | CPMC-68-45  |
| 415-0053-024 | Belden 1694A   | 24"          | CPMC-68-45  | CPMC-68-45  |
| 415-0053-036 | Belden 1694A   | 36"          | CPMC-68-45  | CPMC-68-45  |
| 415-0053-048 | Belden 1694A   | 48"          | CPMC-68-45  | CPMC-68-45  |
| 415-0053-060 | Belden 1694A   | 60"          | CPMC-68-45  | CPMC-68-45  |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B |
|--------------|------------|--------------|--------------|-------------|
| 415-0037-036 | RG-58      | 36"          | 142-0407-011 | CPMC-88-1   |
| 415-0037-048 | RG -58     | 48"          | 142-0407-011 | CPMC-88-1   |
| 415-0037-060 | RG -58     | 60"          | 142-0407-011 | CPMC-88-1   |
| 415-0042-012 | RG -142    | 12"          | 142-0408-011 | CPMC-88-13  |
| 415-0042-024 | RG -142    | 24"          | 142-0408-011 | CPMC-88-13  |
| 415-0042-036 | RG -142    | 36"          | 142-0408-011 | CPMC-88-13  |
| 415-0042-048 | RG -142    | 48"          | 142-0408-011 | CPMC-88-13  |
| 415-0042-060 | RG -142    | 60"          | 142-0408-011 | CPMC-88-13  |

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Illustrations are shown in inches (millimeters).

kwiQMate™ Straight to Straight

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0162-006 | RG-316DS   | 6"           | 146-0404-007 | 146-0404-007 |
| 415-0162-012 | RG-316DS   | 12"          | 146-0404-007 | 146-0404-007 |
| 415-0162-024 | RG-316DS   | 24"          | 146-0404-007 | 146-0404-007 |
| 415-0162-036 | RG-316DS   | 36"          | 146-0404-007 | 146-0404-007 |
| 415-0162-048 | RG-316DS   | 48"          | 146-0404-007 | 146-0404-007 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0163-006 | RG-316     | 6"           | 146-0403-007 | 146-0403-007 |
| 415-0163-012 | RG-316     | 12"          | 146-0403-007 | 146-0403-007 |
| 415-0163-024 | RG-316     | 24"          | 146-0403-007 | 146-0403-007 |
| 415-0163-036 | RG-316     | 36"          | 146-0403-007 | 146-0403-007 |
| 415-0163-048 | RG-316     | 48"          | 146-0403-007 | 146-0403-007 |

kwiQMate™ Straight to Right Angle

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0171-006 | RG-316DS   | 6"           | 146-0404-007 | 146-0404-107 |
| 415-0171-012 | RG-316DS   | 12"          | 146-0404-007 | 146-0404-107 |
| 415-0171-024 | RG-316DS   | 24"          | 146-0404-007 | 146-0404-107 |
| 415-0171-036 | RG-316DS   | 36"          | 146-0404-007 | 146-0404-107 |
| 415-0171-048 | RG-316DS   | 48"          | 146-0404-007 | 146-0404-107 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0172-006 | RG-316     | 6"           | 146-0403-007 | 146-0403-107 |
| 415-0172-012 | RG-316     | 12"          | 146-0403-007 | 146-0403-107 |
| 415-0172-024 | RG-316     | 24"          | 146-0403-007 | 146-0403-107 |
| 415-0172-036 | RG-316     | 36"          | 146-0403-007 | 146-0403-107 |
| 415-0172-048 | RG-316     | 48"          | 146-0403-007 | 146-0403-107 |

kwiQMate™ Right Angle to Right Angle

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0174-006 | RG-316DS   | 6"           | 146-0404-107 | 146-0404-107 |
| 415-0174-012 | RG-316DS   | 12"          | 146-0404-107 | 146-0404-107 |
| 415-0174-024 | RG-316DS   | 24"          | 146-0404-107 | 146-0404-107 |
| 415-0174-036 | RG-316DS   | 36"          | 146-0404-107 | 146-0404-107 |
| 415-0174-048 | RG-316DS   | 48"          | 146-0404-107 | 146-0404-107 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0175-006 | RG-316     | 6"           | 146-0403-107 | 146-0403-107 |
| 415-0175-012 | RG-316     | 12"          | 146-0403-107 | 146-0403-107 |
| 415-0175-024 | RG-316     | 24"          | 146-0403-107 | 146-0403-107 |
| 415-0175-036 | RG-316     | 36"          | 146-0403-107 | 146-0403-107 |
| 415-0175-048 | RG-316     | 48"          | 146-0403-107 | 146-0403-107 |

kwiQMate™ Straight to SMA Straight

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0165-006 | RG-316DS   | 6"           | 146-0404-007 | 142-0404-016 |
| 415-0165-012 | RG-316DS   | 12"          | 146-0404-007 | 142-0404-016 |
| 415-0165-024 | RG-316DS   | 24"          | 146-0404-007 | 142-0404-016 |
| 415-0165-036 | RG-316DS   | 36"          | 146-0404-007 | 142-0404-016 |
| 415-0165-048 | RG-316DS   | 48"          | 146-0404-007 | 142-0404-016 |

| Part No.     | Cable Type | Cable Length | Connector A  | Connector B  |
|--------------|------------|--------------|--------------|--------------|
| 415-0166-006 | RG-316     | 6"           | 146-0403-007 | 142-0403-016 |
| 415-0166-012 | RG-316     | 12"          | 146-0403-007 | 142-0403-016 |
| 415-0166-024 | RG-316     | 24"          | 146-0403-007 | 142-0403-016 |
| 415-0166-036 | RG-316     | 36"          | 146-0403-007 | 142-0403-016 |
| 415-0166-048 | RG-316     | 48"          | 146-0403-007 | 142-0403-016 |

Ultra Miniature Cable Assemblies

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While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without notice.

Specifications

- Impedance :

Temperature Range:

Frequency Rating:

VSWR:

Contact Resistance:

Withstanding Voltage:

Insulation Resistance:

Durability:

Holding Force (min.):
- 50 Ω (Nominal)

-40°C to +90°C

0-6 GHz

1.30 max (0-6 GHz)

20 m Ω max. (Center)

20 m Ω max. (Outer, for plug)

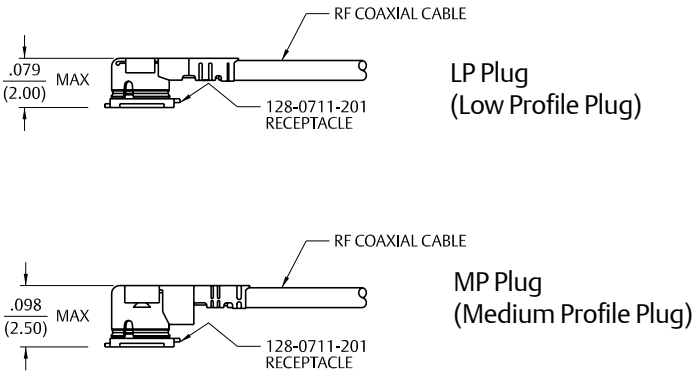
10 m Ω max. (Outer, for receptacle)

200 V AC

500 M Ω min.

30 cycles

0.15 N (Female contact)



Low Profile UMC Right Angle Cable Plug to UMC Right Angle Cable Plug

| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B |
|--------------|---------------------------|--------------|-------------|-------------------|-------------|
| 415-0084-050 | 0.81 mm                   | 50 mm        | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |
| 415-0084-100 | 0.81 mm                   | 100 mm       | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |
| 415-0084-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |
| 415-0084-200 | 0.81 mm                   | 200 mm       | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |
| 415-0084-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |
| 415-0084-300 | 0.81 mm                   | 300 mm       | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |
| 415-0084-500 | 0.81 mm                   | 500 mm       | UMC LP PLUG | 2.0 mm            | UMC LP PLUG |

Medium Profile UMC Right Angle Cable Plug to UMC Right Angle Cable Plug

| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B |
|--------------|---------------------------|--------------|-------------|-------------------|-------------|
| 415-0085-050 | 0.81 mm                   | 50 mm        | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0085-100 | 0.81 mm                   | 100 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0085-150 | 0.81 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0085-200 | 0.81 mm                   | 200 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0085-250 | 0.81 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0085-300 | 0.81 mm                   | 300 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0085-500 | 0.81 mm                   | 500 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-050 | 1.13 mm                   | 50 mm        | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-100 | 1.13 mm                   | 100 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-150 | 1.13 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-200 | 1.13 mm                   | 200 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-250 | 1.13 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-300 | 1.13 mm                   | 300 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0086-500 | 1.13 mm                   | 500 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-050 | 1.32 mm                   | 50 mm        | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-100 | 1.32 mm                   | 100 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-150 | 1.32 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-200 | 1.32 mm                   | 200 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-250 | 1.32 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-300 | 1.32 mm                   | 300 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0087-500 | 1.32 mm                   | 500 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-050 | 1.37 mm                   | 50 mm        | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-100 | 1.37 mm                   | 100 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-150 | 1.37 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-200 | 1.37 mm                   | 200 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-250 | 1.37 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-300 | 1.37 mm                   | 300 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |
| 415-0088-500 | 1.37 mm                   | 500 mm       | UMC MP PLUG | 2.5 mm            | UMC MP PLUG |

MMCX Cable Assembly

UMC Right Angle Cable Plug to MMCX Right Angle Plug



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B  |
|--------------|---------------------------|--------------|-------------|-------------------|--------------|
| 415-0101-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | MMCX RA PLUG |
| 415-0101-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | MMCX RA PLUG |

Medium Profile

| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B  |
|--------------|---------------------------|--------------|-------------|-------------------|--------------|
| 415-0102-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.5 mm            | MMCX RA PLUG |
| 415-0102-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.5 mm            | MMCX RA PLUG |

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Illustrations are shown in inches (millimeters).

SMA Cable Assembly

UMC Right Angle Cable Plug to SMA Straight Plug



Low Profile

| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B   |
|--------------|---------------------------|--------------|-------------|-------------------|---------------|
| 415-0089-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | SMA STR. PLUG |
| 415-0089-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | SMA STR. PLUG |

Medium Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B   |
|--------------|---------------------------|--------------|-------------|-------------------|---------------|
| 415-0090-150 | 0.81 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. PLUG |
| 415-0090-250 | 0.81 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. PLUG |
| 415-0091-150 | 1.37 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. PLUG |
| 415-0091-250 | 1.37 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. PLUG |

UMC Right Angle Cable Plug to SMA Bulkhead Straight Jack



Low Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B        |
|--------------|---------------------------|--------------|-------------|-------------------|--------------------|
| 415-0095-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | SMA STR BKHD. JACK |
| 415-0095-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | SMA STR BKHD. JACK |

Medium Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B        |
|--------------|---------------------------|--------------|-------------|-------------------|--------------------|
| 415-0096-150 | 0.81 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. JACK |
| 415-0096-250 | 0.81 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. JACK |
| 415-0097-150 | 1.37 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. JACK |
| 415-0097-250 | 1.37 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. JACK |

SMA Reverse Polarity Cable Assembly

UMC Right Angle Cable Plug to SMA Straight Reverse Polarity Plug



Low Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B      |
|--------------|---------------------------|--------------|-------------|-------------------|------------------|
| 415-0092-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | SMA STR. RP PLUG |
| 415-0092-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | SMA STR. RP PLUG |

Medium Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B      |
|--------------|---------------------------|--------------|-------------|-------------------|------------------|
| 415-0093-150 | 0.81 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. RP PLUG |
| 415-0093-250 | 0.81 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. RP PLUG |
| 415-0094-150 | 1.37 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. RP PLUG |
| 415-0094-250 | 1.37 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR. RP PLUG |

UMC Right Angle Cable Plug to SMA Straight Bulkhead Rev. Polarity Jack



Low Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B           |
|--------------|---------------------------|--------------|-------------|-------------------|-----------------------|
| 415-0098-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | SMA STR BKHD. RP JACK |
| 415-0098-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | SMA STR BKHD. RP JACK |

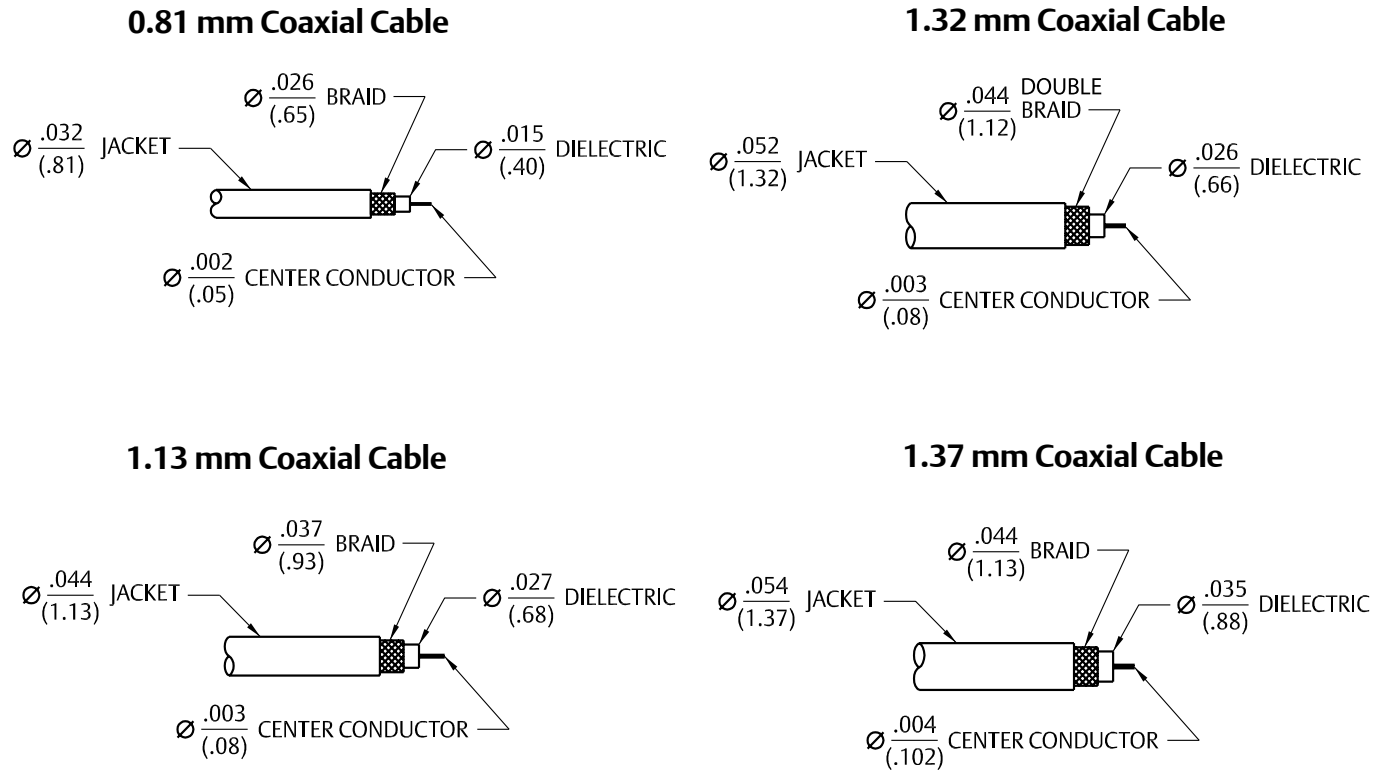
Medium Profile



| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B           |
|--------------|---------------------------|--------------|-------------|-------------------|-----------------------|
| 415-0099-150 | 0.81 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. RP JACK |
| 415-0099-250 | 0.81 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. RP JACK |
| 415-0100-150 | 1.37 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. RP JACK |
| 415-0100-250 | 1.37 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | SMA STR BKHD. RP JACK |

Pigtail Cable Assembly

UMC Surface Mount

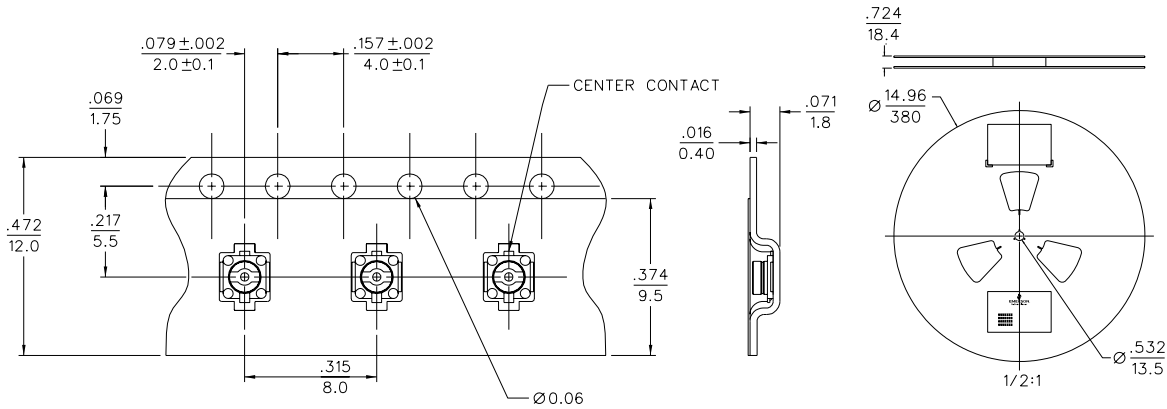


Straight Jack Receptable – Surface Mount



| Part No.     | Packaging                  |
|--------------|----------------------------|
| 128-0711-201 | Stock                      |
| 128-0711-202 | Tape & Reel 2,500 pcs/reel |

Tape and Reel Specifications



UMC Right Angle Cable Plug to Bare End

Low Profile

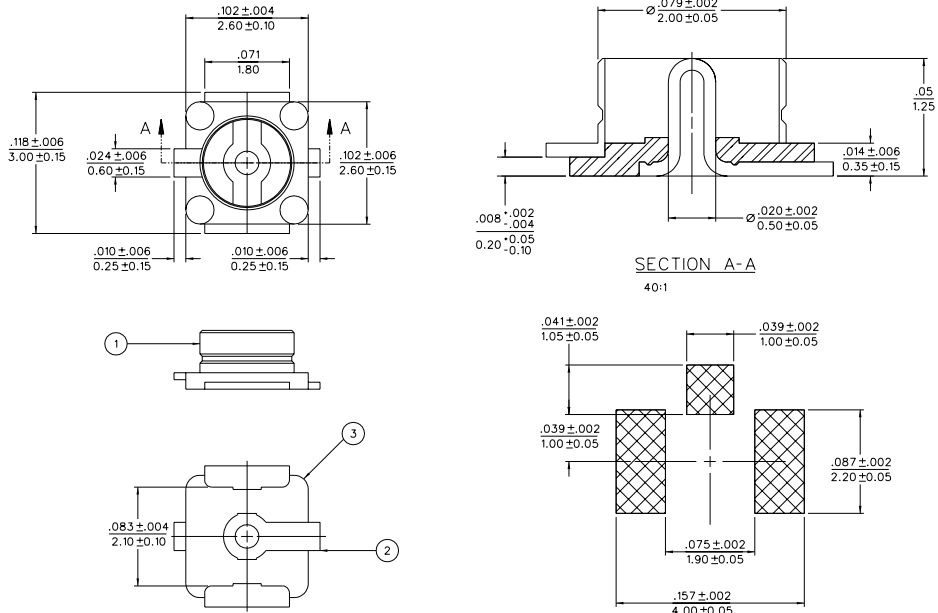


| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B |
|--------------|---------------------------|--------------|-------------|-------------------|-------------|
| 415-0104-150 | 0.81 mm                   | 150 mm       | UMC LP PLUG | 2.0 mm            | BARE END    |
| 415-0104-250 | 0.81 mm                   | 250 mm       | UMC LP PLUG | 2.0 mm            | BARE END    |

Medium Profile

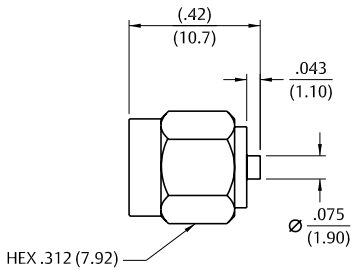


| Part No.     | Teflon Coaxial Cable O.D. | Cable Length | Connector A | Plug Mated Height | Connector B |
|--------------|---------------------------|--------------|-------------|-------------------|-------------|
| 415-0105-150 | 0.81 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0105-250 | 0.81 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0106-150 | 1.13 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0106-250 | 1.13 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0107-150 | 1.32 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0107-250 | 1.32 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0108-150 | 1.37 mm                   | 150 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |
| 415-0108-250 | 1.37 mm                   | 250 mm       | UMC MP PLUG | 2.5 mm            | BARE END    |

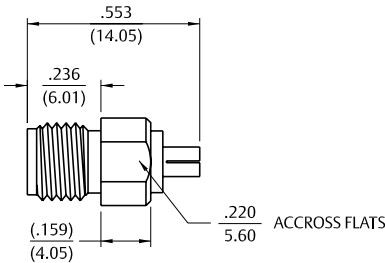


Pigtail Assembly Adapters

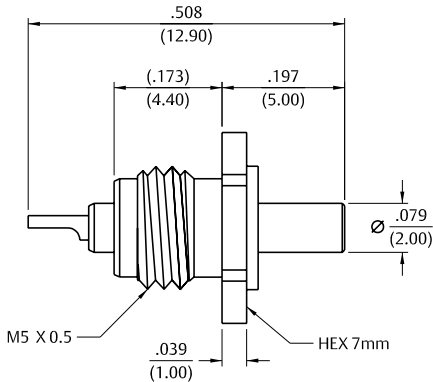
SMA Conversion Adapter for Mating UMC Plugs (SMA Plug to UMC Jack)



SMA Conversion Adapter for Surface Mt. Jack Receptacle 128-0711-201 (SMA Jack to UMC Plug)



Inspection Tool for Cable Assembly



UMC Separation Key



kwiQMAt<sup>™</sup>e Connectors

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Specifications

Electrical Specifications

Impedance: 50 Ohms  
Frequency Range: 12.4 GHz

| VSWR: (f = GHz)      | Straight         | Right Angle      |
|----------------------|------------------|------------------|
|                      | Cable Connectors | Cable Connectors |
| RG-316, RG-316 DS    | 1.15+.02f        | 1.15+.03f        |
| Uncabled receptacles | N/A              |                  |

| Working Voltage: (VRMS max) | Sea Level | 70K Feet |
|-----------------------------|-----------|----------|
|                             |           |          |
| RG-316, RG-316 DS           | 250       | 65       |
| Uncabled receptacles        | 335       | 85       |

Dielectric Withstanding Voltage: VRMS min (at sea level)

|                                  |      |
|----------------------------------|------|
| Connectors for RG-316, RG-316 DS | 750  |
| Uncabled receptacles             | 1000 |

Insulation Resistance: 5000 Megohms min

| Contact Resistance: (milliohms max)                                  | Initial | After Environmental |
|----------------------------------------------------------------------|---------|---------------------|
| Center contact (straight cabled connectors and Uncabled receptacles) | 3.0     | 4.0                 |
| Center contact (right angle cabled connectors)                       | 4.0     | 6.0                 |
| Outer Contact (all connectors)                                       | 2.0     | N/A                 |
| Braid to Body (Tri-Alloy plated bodies)                              | 3.0     | N/A                 |
| Braid to Body (gold plated bodies)                                   | 0.5     | N/A                 |

| Corona Level: (Volts min at 70,000 feet) |     |
|------------------------------------------|-----|
| Connectors for RG-316, RG-316 DS         | 190 |
| Uncabled receptacles                     | 250 |

| Insertion Loss: (dB max)              |                                             |
|---------------------------------------|---------------------------------------------|
| Straight flexible cable connectors    | 0.06 $f\sqrt{\text{GHz}}$ , tested at 6 GHz |
| Right angle flexible cable connectors | 0.15 $f\sqrt{\text{GHz}}$ , tested at 6 GHz |
| Uncabled receptacles                  | N/A                                         |

| RF Leakage: (dB max, tested at 3 GHz) |     |
|---------------------------------------|-----|
| Cable connectors                      | -80 |
| Uncabled receptacles                  | N/A |

| RF High Potential Withstanding Voltage: (Vrms min, tested at 4 and 7 MHz) |     |
|---------------------------------------------------------------------------|-----|
| Connectors for RG-316, RG-316 DS                                          | 500 |
| Uncabled receptacles                                                      | 670 |

Mechanical Specifications

|                                 |                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------|
| Engagement Design:              |                                                                                          |
| Durability:                     | 500 cycles min                                                                           |
| Engagement/Disengagement Force: | 8 lbs max (5 lbs typical)                                                                |
| Coupling Retention Force:       | 10 lbs min                                                                               |
| Contact Retention:              | 6 lbs min axial force (captivated contacts)<br>4 oz-in min torque (uncabled receptacles) |

| Cable Retention: (min*)          | Axial Force (lbs) | Torque (oz-in) |
|----------------------------------|-------------------|----------------|
|                                  |                   |                |
| Connectors for RG-316, RG-316 DS | 20                | N/A            |

\* Or cable breaking strength, whichever is less

Specifications

Material Specifications

|                                    |                                                                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bodies:                            | Brass per QQ-B-626, Tri-Alloy (Cu/Sn/Zn) plated .0001” min                                                                                               |
| Contacts:                          | Male - Brass per ASTM B16, Gold plated* per MIL-G-45204 .00005” min<br>Female – Beryllium Copper per ASTM B196, Gold plated* per MIL-G-45204 .00005” min |
| Insulators:                        | PTFE Fluorocarbon per ASTM D1710 and ASTM D1457                                                                                                          |
| Gaskets:                           | Silicon Rubber per ZZ-R-765                                                                                                                              |
| Expansion Caps:                    | Brass per QQ-B-613, Tri-Alloy (Cu/Sn/Zn) plated .0001” min                                                                                               |
| Crimp Sleeves:                     | Copper per ASTM A75, Tri-Alloy (Cu/Sn/Zn) plated .0001”min                                                                                               |
| Coupling Retention Spring (Plugs): | Beryllium Copper per ASTM B196, Tri-Alloy (Cu/Sn/Zn) plated .0001”min                                                                                    |
| Mounting Hardware:                 | Brass per QQ-B-626, or QQ-B 613, Tri-Alloy (Cu/Sn/Zn) plated .0001”min                                                                                   |

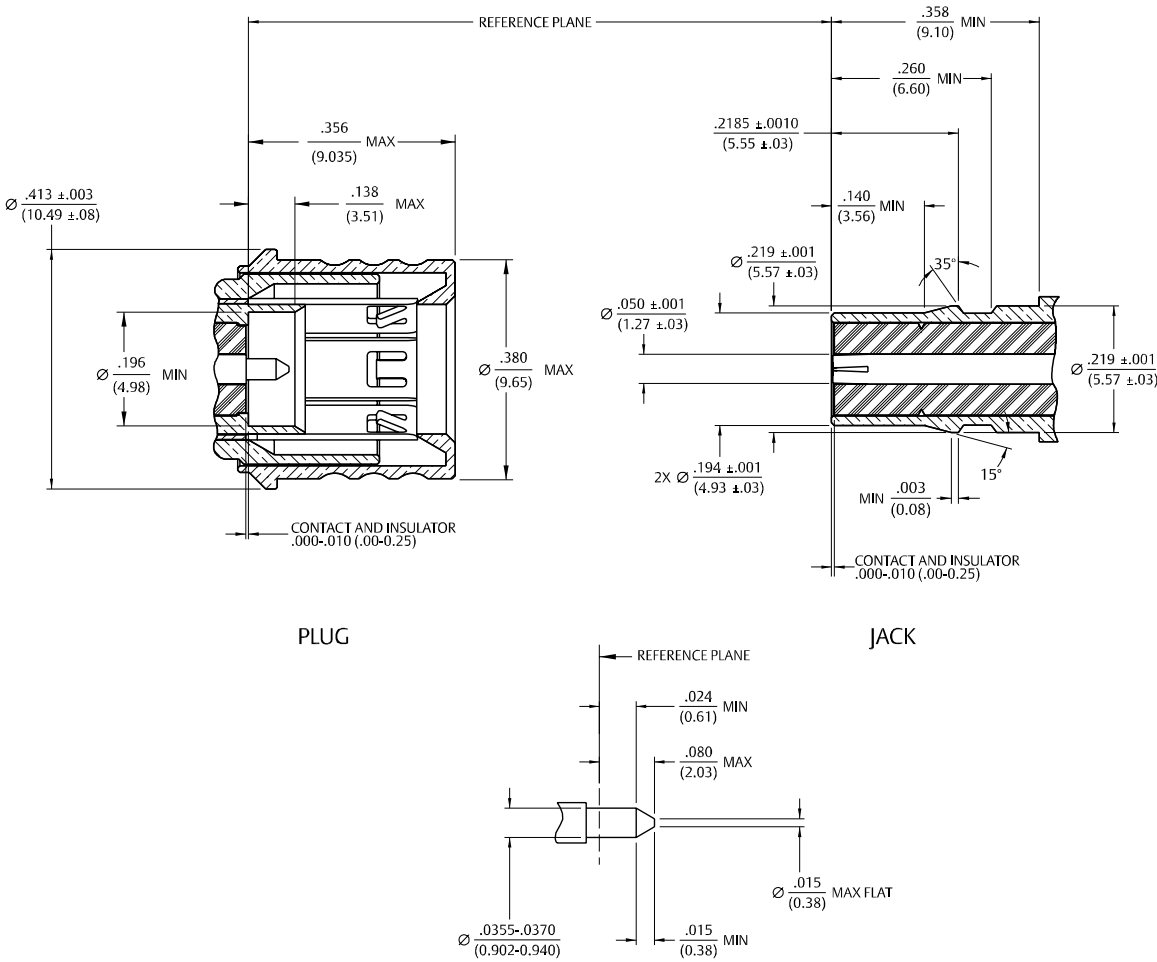
\* Gold plated parts include a .00005” min nickel barrier layer

Environmental Specifications

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

|                      |                                                                      |
|----------------------|----------------------------------------------------------------------|
| Temperature Range:   | -65°C to +165°C                                                      |
| Thermal Shock:       | MIL-STD-202, Method 107, Condition B (except +85°C high temperature) |
| 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                                              |

MATING ENGAGEMENT FOR kwiQMate™



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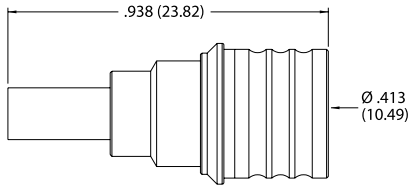
Illustrations are shown in inches (millimeters).

Straight Crimp Type Plug (3-piece) – Captivated Contact



| Cable Type | Tri-Alloy Plated |
|------------|------------------|
| RG-316     | 146-0403-007     |
| RG-316 DS  | 146-0404-007     |

Assembly instructions page 256.

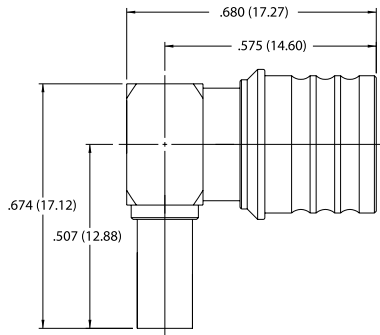


Right Angle Crimp Type Plug (1-piece body) – Captivated Contact



| Cable Type | Tri-Alloy Plated |
|------------|------------------|
| RG-316     | 146-0403-107     |
| RG-316 DS  | 146-0404-107     |

Assembly instructions page 255.

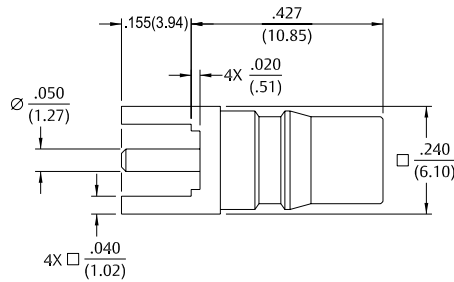


Straight Jack Receptacle



| Gold Plated  |
|--------------|
| 146-0701-201 |

Mounting hole layout figure 2 page 194.

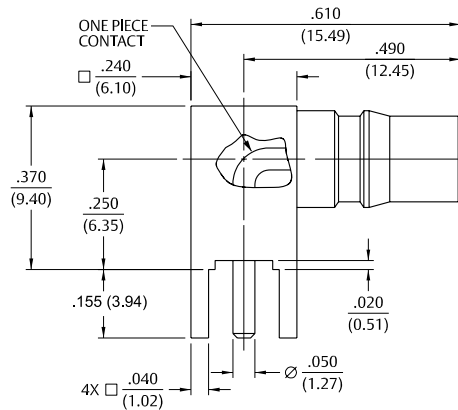


Right Angle Jack Receptacle



| Gold Plated  |
|--------------|
| 146-0701-301 |

Mounting hole layout figure 2 page 194.



Tools

|                                  |     |
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# Coaxial Connector Assembly Tools

## Hand Crimp Tool

Precision Astro Tool hand crimping tool makes cable assembly fast and easy. Crimping tool features interchangeable steel dies. Ratchet action of tool controls crimping operation for precise uniform ferrule crimps.



| Connector Type                         | Cable Type                                                                                           | Preferred Die Set | Crimp Dimensions                          |
|----------------------------------------|------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------|
| MCX<br>SMA<br>SMB<br>SMC               | RG-178/U<br>RG-196/U                                                                                 | 141-0000-901      | Hex = .105 (2.67)<br>Width = .325 (8.26)  |
| MCX<br>SMA<br>SMB<br>SMC<br>75 Ohm SMB | RG-161/U, RG-174/U<br>RG-179/U, RG-187/U<br>RG-188/U, RG-316/U<br>LMR-100                            | 141-0000-902      | Hex = .128 (3.25)<br>Width = .400 (10.16) |
|                                        | RG-188/U, RG316/U<br>RG-179/U, RG-187/U<br>BELDEN 735A                                               | 141-0000-905      | Hex = .151 (3.83)<br>Width = .400 (10.16) |
| MCX<br>SMA<br>SMB                      | RG-58/U<br>RG-141/U<br>RG-303/U<br>RG-55/U<br>RG-142/U<br>RG-223/U<br>RG-400/U<br>LMR-195<br>LMR-200 | 141-0000-903      | Hex = .213 (5.41)<br>Width = .375 (9.52)  |
| SMA<br>75 Ohm SMB                      | LMR-240, RG-59                                                                                       | 141-0000-925      | Hex = .255 (6.48)<br>Width = .400 (10.16) |
| N Type                                 | RG-316/U, 316 DS                                                                                     | 141-0000-927      | Hex = .160 (4.06)<br>Width = .400 (10.16) |

\* Economy Hand Crimp Tool also available with four hex sizes in one tool page 187.

## Ordering Information for Crimp Tool

| Part No.     | Description    | ASTRO Tool Part No. |
|--------------|----------------|---------------------|
| 144-0000-900 | Frame Only     | 620175              |
| 141-0000-901 | Single Hex Die | 620932              |
| 141-0000-902 | Single Hex Die | 620419              |
| 141-0000-903 | Single Hex Die | 620676              |
| 141-0000-905 | Single Hex Die | 630055              |
| 141-0000-925 | Single Hex Die | 620938              |
| 141-0000-927 | Single Hex Die | 620297              |

## Ordering Information for Crimp Tool

| Connector Type                                    | Preferred Die Ste | Crimp Style    |
|---------------------------------------------------|-------------------|----------------|
| SMB Cross Hole Style Body 50 Ohm Only             | 141-0000-911      | Double Diamond |
| Mini 75 Ohm SMB, MCX 75 Ohm Cross Hole Style Body | 141-0000-924      | Double Diamond |

# Coaxial Connector Assembly Tools

## Economy Hand Crimp Tool

Hand crimp tool and die set includes all hex sizes necessary for subminiature connector applications. Ratchet tool action insures a complete crimp every time.



| Part No.     | Description                                                                           | Hex                                                                                    | Width                                                    | Connector Type                  |
|--------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------|
| 140-0000-952 | Hand Crimp Tool Frame Only                                                            |                                                                                        |                                                          |                                 |
| 140-0000-953 | Die for .047" dia. flexible cable; RG-178, RG-316, RG-316 DS and Contact Crimp w/stop | .105 (2.67)<br>.128 (3.25)<br>.151 (3.83)<br>Diamond Crimp for 038 (0.96) Dia. Contact | .250 (6.35)<br>.250 (6.35)<br>.250 (6.35)<br>.035 (0.89) | MMCX*, MCX                      |
| 140-0000-951 | Die for RG-178, 316, 316 DS 58, 142, LMR-100, LMR-195, LMR-200A                       | .105 (2.67)<br>.128 (3.25)<br>.151 (3.83)<br>.213 (5.41)                               | .390 (9.91)<br>.390 (9.91)<br>.390 (9.91)<br>.390 (9.91) | MCX, SMB, SMC, SMA, 75 OHM SMB  |
| 140-0000-955 | Die for RG-179, 179 DS, 735A, RG-59, LMR-240                                          | .128 (3.25)<br>.151 (3.83)<br>.178 (4.52)<br>.255 (6.48)                               | .390 (9.91)<br>.390 (9.91)<br>.390 (9.91)<br>.390 (9.91) | 75 Ohm MCX, SMA Mini-75 Ohm SMB |

\* Use 140-0000-951 for MMCX straight cabled bulkhead jack body crimp.

## Economy Hand Crimp Tool

Hand crimp tool and die set includes all hex sizes necessary for subminiature connector applications. Ratchet tool action insures a complete crimp every time.



| Part No.     | Description | ASTRO Tool Part No. | Military Part No. |
|--------------|-------------|---------------------|-------------------|
| 144-0000-910 | Frame Only  | 615708              | M22520/1-01       |
| 141-0000-907 | Positioner  | 650027              | N/A               |

## Economy Hand Crimp Tool

Hand crimp tool and die set includes all hex sizes necessary for subminiature connector applications. Ratchet tool action insures a complete crimp every time.



| Part No.     | Description | ASTRO Tool Part No. |
|--------------|-------------|---------------------|
| 140-0000-970 | Frame Only  | 612118-1            |
| 140-0000-971 | Positioner  | N/A                 |

## MMCX Assembly/Decoupling Tool

This tool will assemble the end cap to a standard right angle MMCX plug connector in the field. Simply insert connector and cap into tool cavity, then turn handle to swage the cap into place. The slotted end of the tool can be used to disengage a right angle MMCX plug from a mating receptacle.

| Part No.     |
|--------------|
| 141-0000-910 |



# Coaxial Connector Assembly Tools

## MCX Right Angle Plug Assembly Tool

This quick and easy to use tool will press the end cap onto standard right angle MCX plug connectors. Simply insert the connector and cap into the staking nest and a light squeeze of the handles will swage the cap into place. The jaw tips are shaped to grip a right angle MCX plug body for insertion or disengagement to a mating receptacle. The jaws are hardened steel and the handles are cushioned to minimize stress to the user. For use with all cable groups except RG-58.



| Part No.     |
|--------------|
| 141-0000-908 |

## SMA Knurl Mount Assembly Tool

The Knurl Mount SMA Spark Plug Connectors can be pressed into position using this thread-on fixture designed for low volume lab use.



| Part No.     |
|--------------|
| 140-0000-954 |

## SMB Plug Removal Tool

Reaches in to disengage SMB connectors in high density packaging applications.



| Part No.     |
|--------------|
| 140-0000-956 |

# Coaxial Connector Assembly Tools

## SMK (2.92mm) Tools

Accurate assembly of the SMK cabled connectors is obtained with the tools listed below. Industry standard devices are used if possible for customer convenience and tool compatibility.



| Item | Part No.                     | Description                                                                  |
|------|------------------------------|------------------------------------------------------------------------------|
| A    | 140-0000-962                 | Semi-Rigid Cable Vise (does not include inserts (B) or Vise Stop (F))        |
| B    | 140-0000-964<br>140-0000-965 | Cable Clamp Inserts, .086 Semi-Rigid<br>Cable Clamp Inserts, .141 Semi-Rigid |
| C    | 140-0000-960<br>140-0000-961 | Contact Soldering Tool, .086 Plug<br>Contact Soldering Tool, .141 Plug       |
| D    | 140-0000-958<br>140-0000-959 | Body Soldering Tool, .086 Plug<br>Body Soldering Tool, .141 Plug             |
| E    | 140-0000-957                 | Bead Assembly Tool, Semi-Rigid Plugs, All Cables                             |
| F    | 140-0000-968                 | Vise Stop, (2.92mm)                                                          |

## We Have What You Are Looking For ... and If We Don't, We'll Design and Manufacture It!!!

Emerson Network Power Connectivity Solutions prides itself in meeting our customers' needs by providing them with customized solutions. We have configured our technical staff and equipped our model shop and QA lab to meet the quick-turn demands of new product development. Prototypes, samples, and short-run quantities are delivered expediently and to print. Your new product development life cycle will be greatly enhanced with us as a partner on your design team.

We have an extensive log of special variations of MMCX, MCX, 75 Ohm MCX, SMK, SMA, SMP, SMB, Mini-75 Ohm SMB, SMC, BNC, TNC and N connectors. Special cable sizes, cable assemblies, PC board terminations, adapters, antenna connectors, multi-packs, calibration terminations and hardware products give us a large pool of design experience to assist you with custom development. See page 259 for more information on our custom hardware products.

Our sales representatives will review your product application and initiate the quotation process, and our sales and engineering staff will assist you in defining the performance and cost parameters required by your end product. Providing details such as dimensional limitations, frequency, and VSWR performance to our field sales representative will speed the process.

After you have chosen us as your supplier, we can provide samples and a short run quantity prior to production of your custom product. We look forward to providing your special electronic components in the future.

### We do it all...

**Virtually any RF coaxial connector or RF cable assembly from the engineering, prototyping and tooling stages, to complete production and testing.**



N Jack 75 Ohm to MCX Plug  
75 Ohm Assembly, Adapter



Ganged MCX Right-Angle  
Board Mount



SMB Vertical  
PC Plug

## Custom Engineered RF Coaxial Cable Assemblies

With over 75 years of experience, Emerson Network Power Connectivity Solutions is your interconnect solution for cable assembly design, high quality production and on-time delivery. Our Johnson line of precision cable assemblies includes standard RF coaxial cable assemblies such as flexible, conformable and semi-rigid types for 50 or 75 ohm systems from 0 to 40 GHz. We can work with almost any connector, including our complete line of Johnson connectors including SMK, SMP, SMA, SMB, SMC, BNC, TNC, N, F, UHF, Mini-UHF, MCX and MMCX connectors. Cable assemblies manufactured with our RF connectors assure you controlled impedance throughout the cable length. Our skilled personnel adhere to rigorous quality assurance procedures, giving you the cables you need, on time, without hassles.

Backed by test data shipped with the product! Our assemblies are delivered completely tested to customer specifications and carry our complete customer satisfaction guarantee. By having us make your cable assemblies, you save the cost of training personnel; discarding damaged parts; cable testing; and replacing faulty inventory. You save on overhead, manufacturing and equipment costs and you receive proven cost effective cable assemblies on time and to your specifications. We are an industry leader in the RF coaxial connector and electronic hardware market...you can rely on Emerson Network Power Connectivity Solutions for all your assembly needs.

**We're responsive, reliable and ready to work with you.**



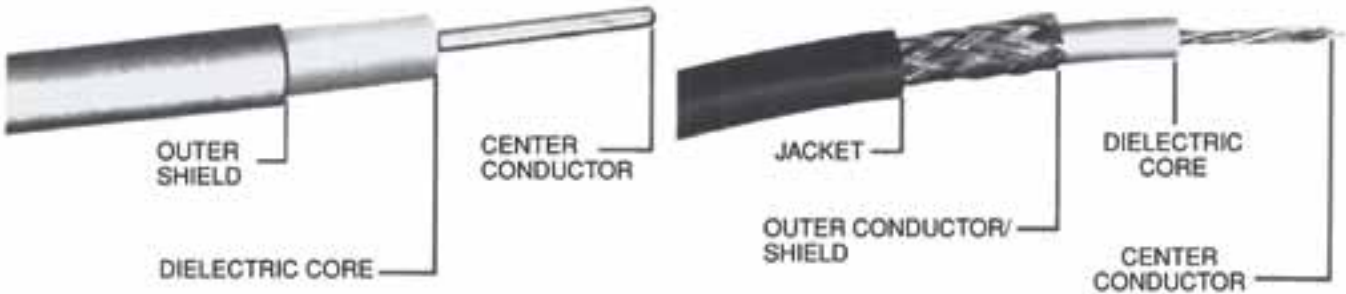
2x3 Position SMA Straight Plug  
to MCX Straight Plug



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*Illustrations are shown in inches (millimeters).*

Cable Information



Semi-Rigid Cable Dimensions

| Cable    | Center Conductor O.D. | O.D. Dielectric | O.D. Shield | Impedance |
|----------|-----------------------|-----------------|-------------|-----------|
| RG-405/U | .0201 (0.51)          | .0658 (1.67)    | .086 (2.18) | 50        |
| RG-402/U | .0359 (0.91)          | .1175 (2.98)    | .141 (3.58) | 50        |

RF Flexible Cable Dimension

| Cable     | Center Conductor | O.D. Dielectric | O.D. Shield      | O.D. Jacket | Impedance |
|-----------|------------------|-----------------|------------------|-------------|-----------|
| .047 dia. | .007 (0.19)      | .020 (0.52)     | .035 (0.90)      | .047 (1.20) | 50        |
| RG-178B/U | .012 (.030)      | .034 (0.86)     | .054 (1.37)      | .071 (1.80) | 50        |
| RG-196A/U | .012 (.030)      | .034 (0.86)     | .054 (1.37)      | .071 (1.80) | 50        |
| RG-174/U  | .019 (0.48)      | .060 (1.52)     | .080 (2.03)      | .110 (2.79) | 50        |
| RG-179B/U | .012 (.030)      | .063 (1.60)     | .084 (2.13)      | .110 (2.79) | 75        |
| RG-187A/U | .012 (.030)      | .060 (1.52)     | .084 (2.13)      | .110 (2.79) | 75        |
| RG-188A/U | .020 (0.51)      | .060 (1.52)     | .081 (2.06)      | .110 (2.79) | 50        |
| RG-316/U  | .020 (0.51)      | .060 (1.52)     | .081 (2.06)      | .110 (2.79) | 50        |
| RG-316 DS | .020 (0.51)      | .060 (1.52)     | (DS) .100 (2.54) | .120 (3.05) | 50        |
| RG-179 DS | .012 (.030)      | .063 (1.60)     | (DS) .103 (2.62) | .120 (3.05) | 75        |
| RG-187 DS | .012 (.030)      | .060 (1.52)     | (DS) .100 (2.54) | .120 (3.05) | 75        |
| RG-188 DS | .020 (0.51)      | .060 (1.52)     | (DS) .100 (2.54) | .120 (3.05) | 50        |
| RG-141A/U | .039 (0.99)      | .116 (2.95)     | .146 (3.71)      | .190 (4.83) | 50        |
| RG-303/U  | .039 (0.96)      | .116 (2.95)     | .146 (3.71)      | .190 (4.83) | 50        |
| RG-400/U  | .038 (0.96)      | .116 (2.95)     | (DS) .171 (4.34) | .195 (4.85) | 50        |
| RG-142B/U | .039 (0.99)      | .116 (2.95)     | (DS) .171 (4.34) | .195 (4.95) | 50        |
| RG-58C/U  | .038 (0.96)      | .116 (2.95)     | .150 (3.81)      | .195 (4.95) | 50        |
| RG-55B/U  | .032 (0.81)      | .116 (2.95)     | (DS) .176 (4.47) | .206 (5.23) | 53.5      |
| RG-223/U  | .032 (0.81)      | .116 (2.95)     | (DS) .176 (4.47) | .206 (5.23) | 53.5      |
| LMR-100   | .022 (.056)      | .062 (1.57)     | .085 (2.16)      | .105 (2.67) | 50        |
| LMR-195   | .037 (0.94)      | .110 (2.79)     | .139 (3.53)      | .195 (4.95) | 50        |
| LMR-200   | .044 (1.12)      | .116 (2.95)     | .144 (3.66)      | .195 (4.95) | 50        |
| LMR-240   | .056 (1.42)      | .150 (3.81)     | .178 (4.52)      | .240 (6.10) | 50        |
| 735A      | .016 (0.41)      | .077 (1.96)     | .101 (2.57)      | .128 (3.25) | 75        |
| RG-59     | .0226 (0.57)     | .146 (3.71)     | .191 (4.85)      | .242 (6.15) | 75        |

Assembly Instructions

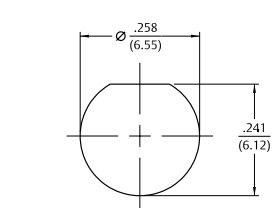
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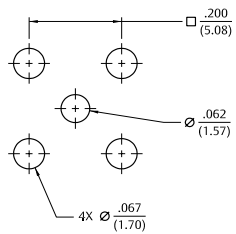
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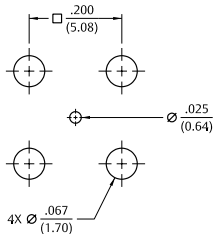
Recommended Mounting Hole Dimensions



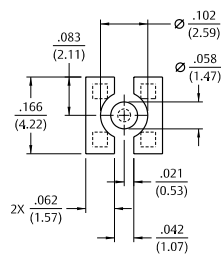
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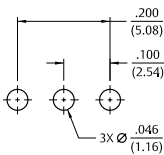
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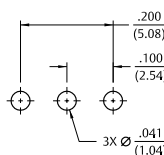
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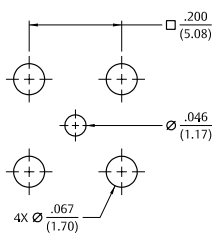
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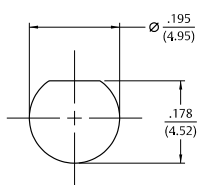
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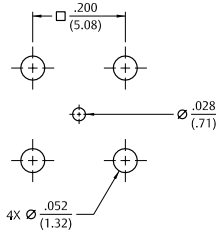
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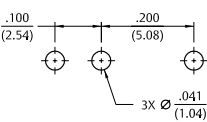
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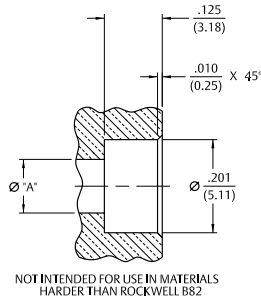
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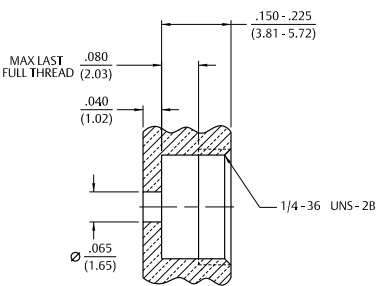
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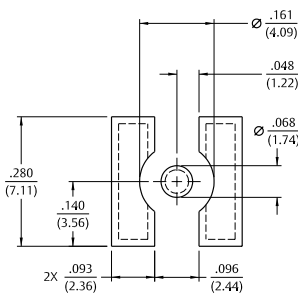
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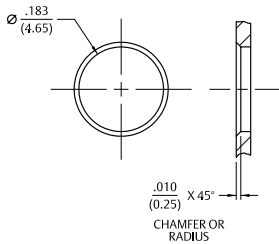
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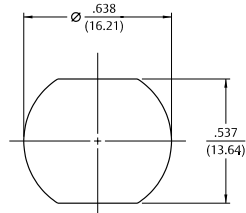
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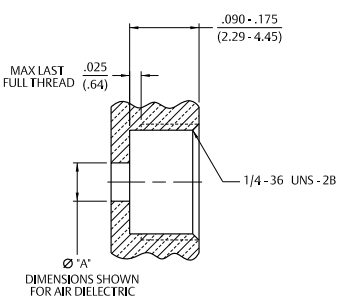
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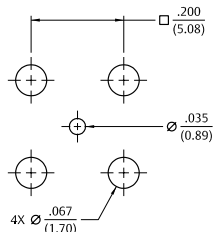
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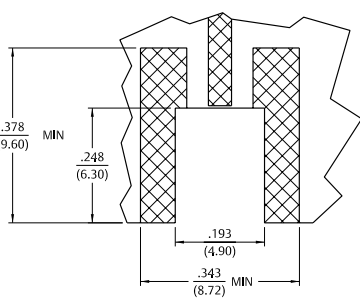
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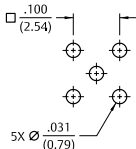
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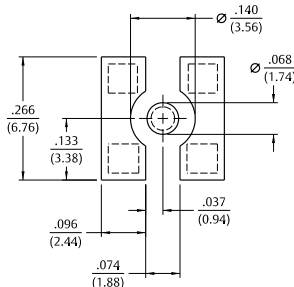
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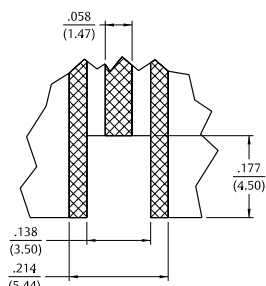
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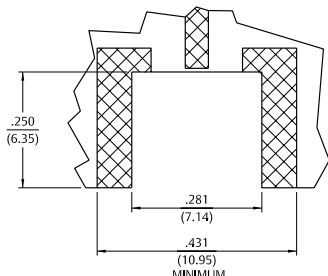
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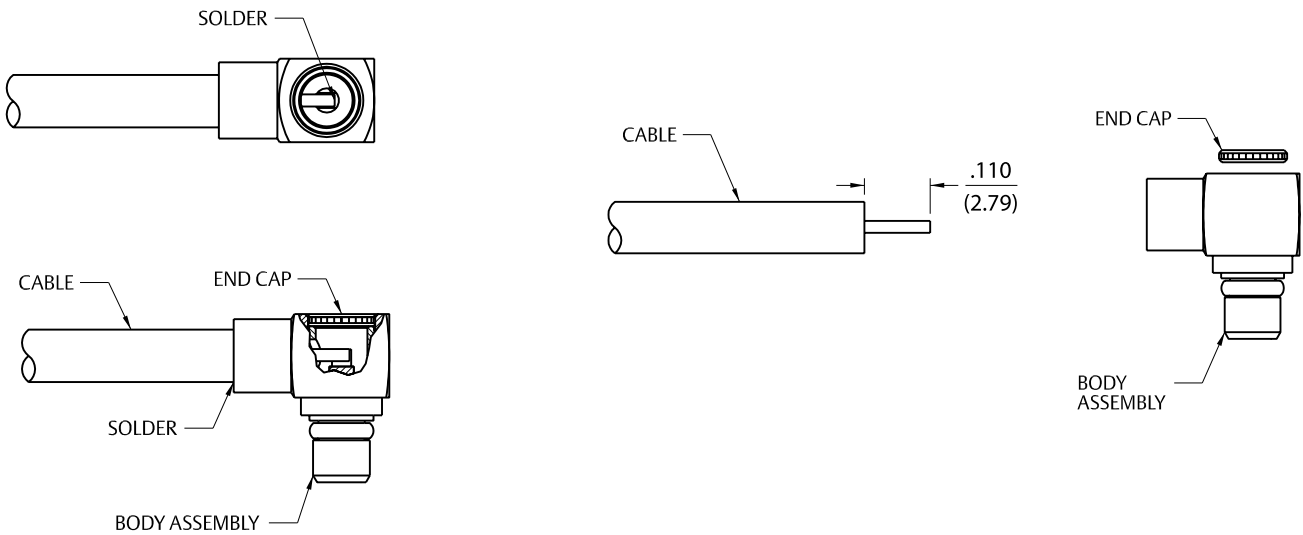
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MMCX Right Angle Plug  
for .086 (2.18) Semi-Rigid Cable

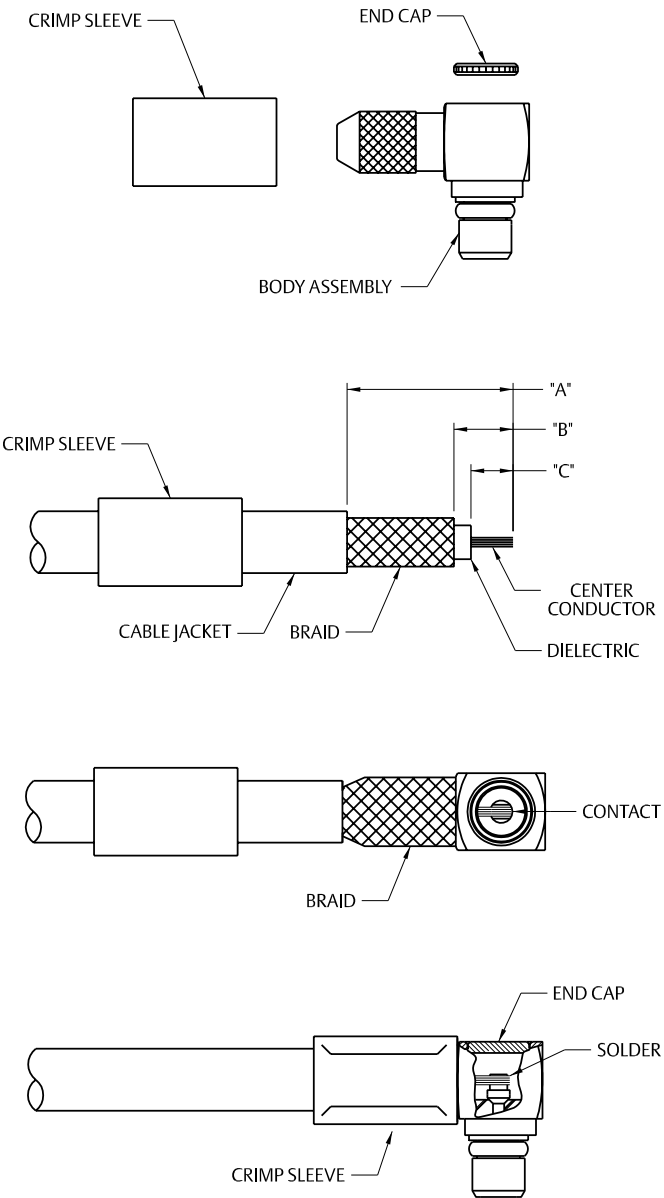
- 1. Identify piece parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor.
- 3. Insert cable into body making certain that jacket bottoms on the connector body. Fixture cable and assembly to prevent movement during soldering.
- 4. Solder center conductor to contact as shown. Use a minimum amount of solder for a good joint.
- 5. Solder body to cable as shown. Use a minimum amount of heat to minimize cable insulation movement.
- 6. Press end cap into body access port using .156 (3.96) diameter flat punch or Johnson assembly tool 141-0000-910.

| Cable Group                | Part No.     |
|----------------------------|--------------|
| RG-405/U (.086 Semi-Rigid) | 135-3693-101 |



MMCX Right Angle Plug for  
RG-178 and RG-316 Size Flexible Cable

- 1. Identify piece parts. (3 piece parts)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations. Tin center conductor. Slide crimp sleeve onto cable jacket.
- 3. Flair braid and assemble crimp stem of body subassembly under braid onto cable making certain that the cable center conductor enters contact slot as shown. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp hex.
- 4. Solder center conductor to contact through rear access port. Use a minimum amount of solder for a full fillet joint.
- 5. Press end cap into body access port using .156 (3.96) diameter flat punch or Johnson assembly tool 141-0000-91.

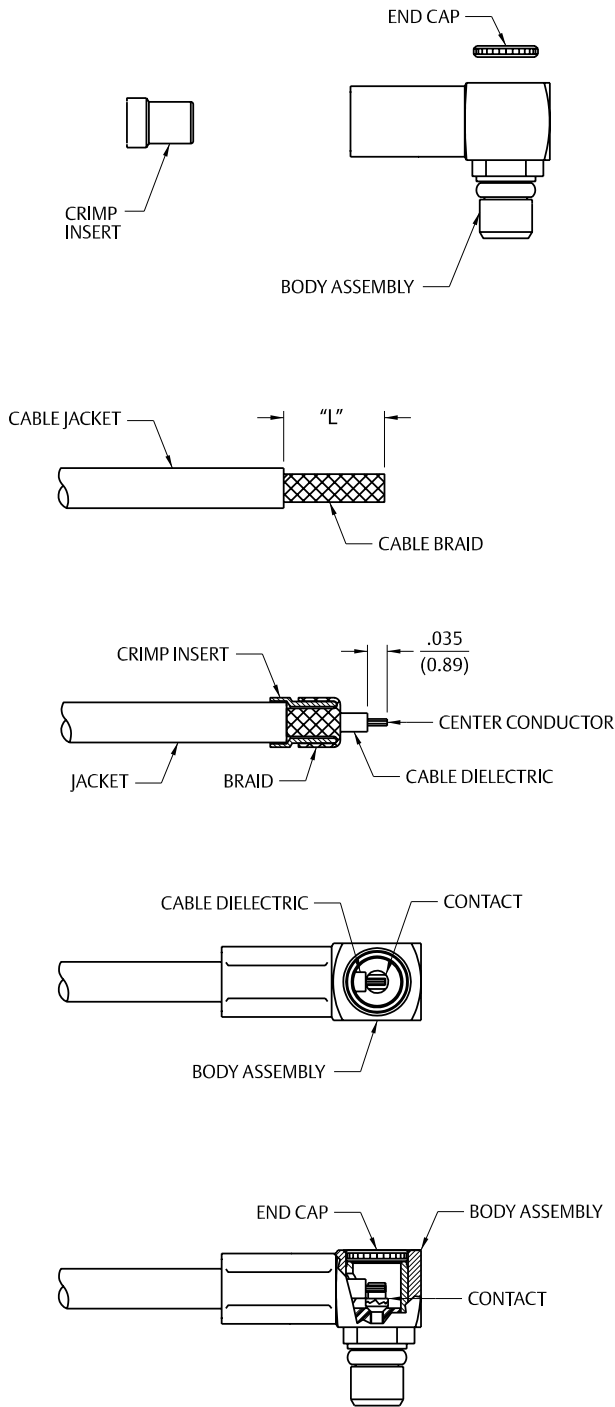


| Cable Group             | Part No.     | Sleeve Hex  | "A"  | "B"  | "C"  |
|-------------------------|--------------|-------------|------|------|------|
| RG-178, 196             | 135-9402-111 | .105 (2.67) | .310 | .100 | .035 |
| RG-316/U, 188, 187, 179 | 135-9403-101 | .128 (3.25) | .295 | .105 | .075 |

MMCX Right Angle Plug  
for .047 (1.20) Diameter and RG-178  
Size Flexible Cable with Crimp Insert

- 1. Identify piece parts. (3 piece parts)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations.
- 3. Slide crimp insert over braid and against jacket. Fold braid around crimp insert as shown. Strip cable dielectric to dimension shown. Tin center conductor.
- 4. Slide body assembly over cable and crimp insert, then seat firmly so cable dielectric butts against contact as shown. Crimp body using recommended crimp hex. Maintain forward pressure on cable while crimping.
- 5. Solder contact to center conductor through rear access port. Use a minimum amount of solder for a full fillet joint.
- 6. Press end cap into access port using .156 (3.96) diameter flat punch or Johnson assembly tool 141-0000-910.

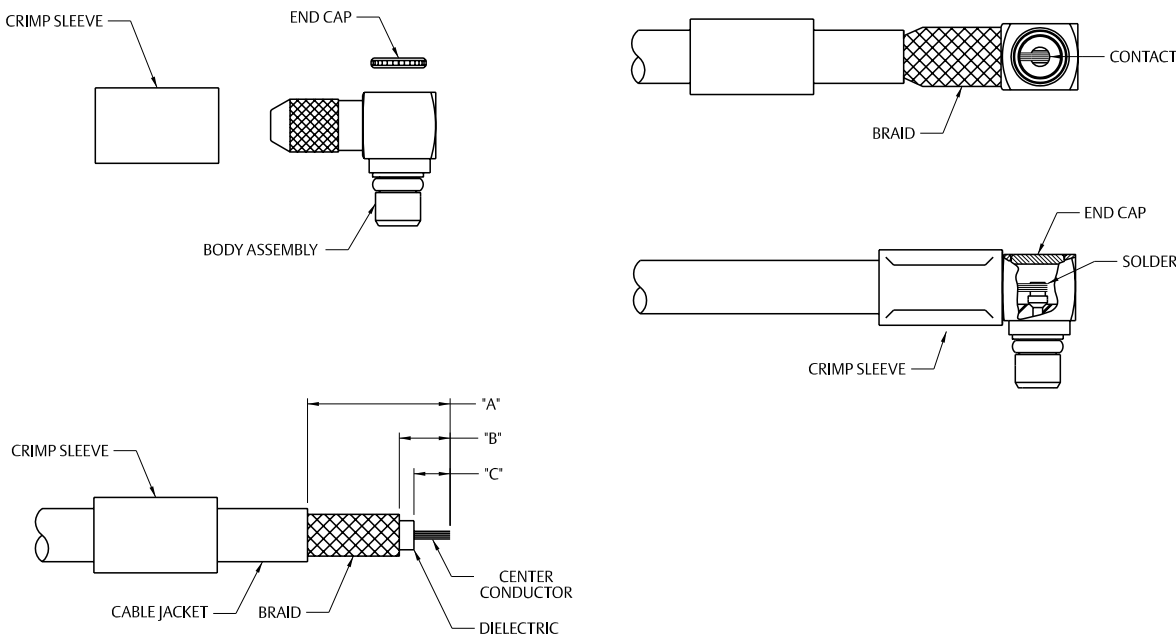
| Cable Group   | Part No.     | "L"         | Crimp Hex   |
|---------------|--------------|-------------|-------------|
| .047 Flexible | 135-3436-101 | .140 (3.56) | .105 (2.67) |
| RG-178/U, 196 | 135-3402-101 | .188 (4.78) | .105 (2.67) |
| .047 Flexible | 135-9436-101 | .140 (3.56) | .105 (2.67) |



MMCX Right Angle Plug for RG-178, RG-316,  
RG-316 DS and RG-179 Size Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations. Tin center conductor. Slide crimp sleeve onto cable jacket.
- 3. Flair braid and assemble crimp stem of body subassembly under braid onto cable making certain that the cable center conductor enters contact slot as shown. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp hex.
- 4. Solder center conductor to contact through rear access port. Use a minimum amount of solder for a full fillet joint.
- 5. Press end cap into body access port using .156 (3.96) diameter flat punch or Johnson assembly tool 141-000-910.

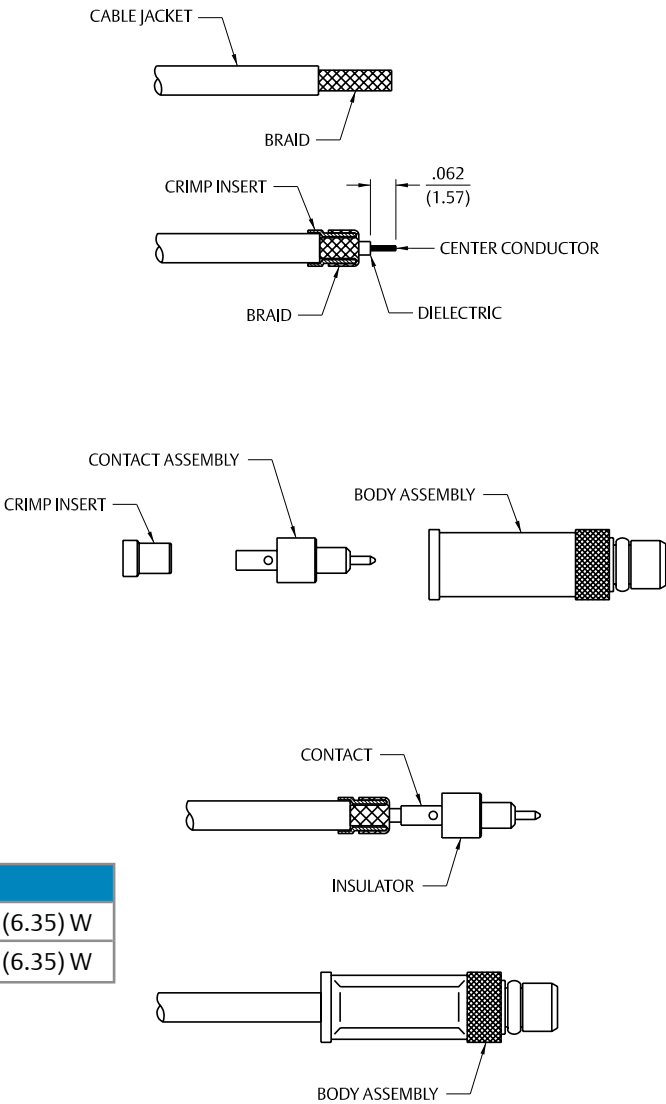
| Cable Group             | Part No.     | Crimp Hex   | "A"  | "B"  | "C"  |
|-------------------------|--------------|-------------|------|------|------|
| RG-178, 196             | 135-3402-111 | .105 (2.67) | .310 | .100 | .035 |
| RG-316/U, 188, 187, 179 | 135-3403-101 | .128 (3.25) | .295 | .105 | .075 |
| RG-316 DS, 188 DS       | 135-3404-101 | .151 (3.83) | .295 | .105 | .075 |



MMCX Straight Plug for .047 (1.19) Diameter and RG-178 Size Flexible Cable

- 1. Identify piece parts. (3 piece parts)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations.
- 3. Slide crimp insert over braid and against jacket. Fold braid around crimp insert as shown. Strip dielectric to dimension shown. Tin center conductor if contact is to be soldered attached. Do not tin center conductor if contact is to be crimp attached.
- 4. Assemble contact assembly onto cable as shown.  
**Solder attachment:** Solder contact to center conductor. Care should be taken that excess solder is not applied.  
**Crimp attachment:** Crimp contact to center conductor using Johnson hand tool 140-0000-952 and die set 140-0000-953. Crimp location should be centered between and of contact and cross-hole. Crimp attachment to solid center conductor cables is not recommended.
- 5. Slide body assembly over contact and crimp insert, then seat firmly as shown. Crimp body using recommended crimp die hex. Maintain forward pressure on cable while crimping.

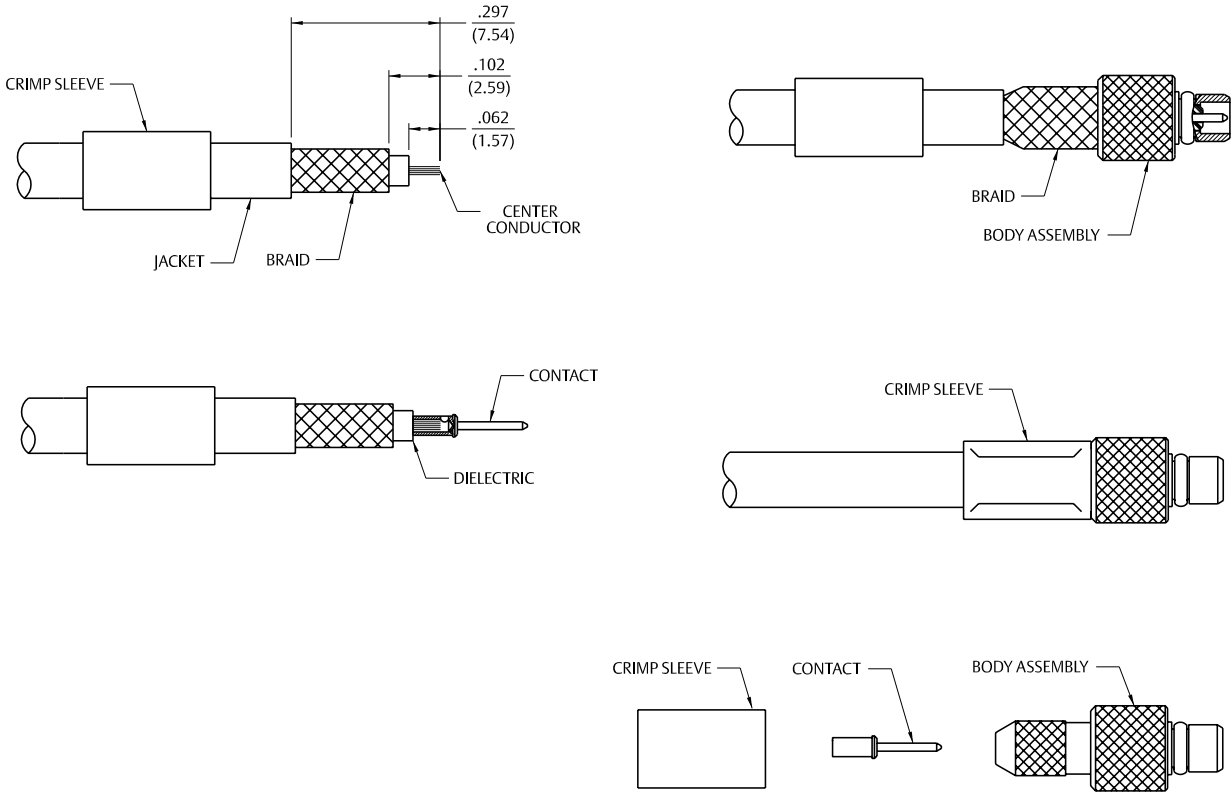
| Cable Group   | Part No.     | Strip Length | Crimp Hex                   |
|---------------|--------------|--------------|-----------------------------|
| .047 Flexible | 135-3436-001 | .135 (3.43)  | .105 (2.67) x .250 (6.35) W |
| RG-178/U, 196 | 135-3402-001 | .184 (4.67)  | .105 (2.67) x .250 (6.35) W |



MMCX Straight Plug for RG-316, RG-179 and RG-316 DS Size Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide crimp sleeve onto cable jacket.
- 3. Assemble contact onto cable as shown.  
**Solder attachment:** Solder contact to center conductor. Care should be taken that excess solder is not applied.  
**Crimp attachment:** Crimp contact to center conductor using Johnson hand tool 140-0000-952 and die set 140-0000-953. Crimp location should be centered between end of contact and cross-hole. Crimp attachment to solid center conductor cables is not recommended.
- 4. Slide body assembly over contact and under braid, then seat firmly onto contact as shown. The body assembly will “snap” over the contact barb. The cable may have to be held in a soft jawed clamping fixture. Slide crimp sleeve forward and crimp using recommended crimp die hex.

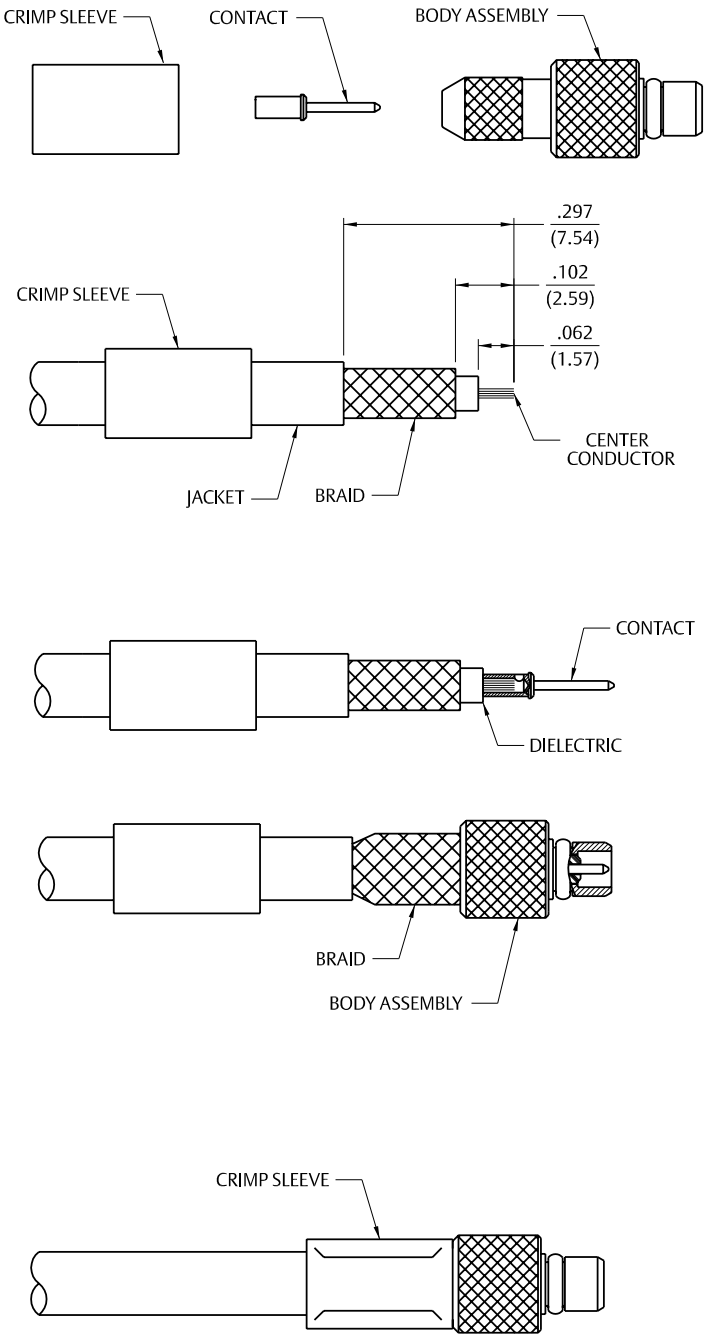
| Cable Group               | Part No.     | Crimp Hex   |
|---------------------------|--------------|-------------|
| RG-316/U, 188, 161, 174   | 135-3403-001 | .128 (3.25) |
| RG-316 DS, 188 DS, 187 DS | 135-3404-001 | .151 (3.83) |
| RG-179/U, 187             | 135-3433-001 | .128 (3.25) |



MMCX Straight Jack for  
RG-316, RG-316 DS and  
RG-179 Size Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide crimp sleeve onto cable jacket.
- 3. Assemble contact onto cable.  
**Solder attachment:** Solder contact to center conductor. Care should be taken that excess solder is not applied.  
**Crimp attachment:** Crimp contact to center conductor using Johnson hand tool 140-0000-952 and die set 140-0000-953. Crimp location should be centered between end of contact and cross-hole. Crimp attachment to solid center conductor cables is not recommended.
- 4. Slide body assembly over contact and under braid, then seat firmly onto contact. The body assembly will “snap” over the contact barb. The cable may have to be held in a soft jawed clamping fixture. Slide crimp sleeve forward and crimp using recommended crimp die hex.

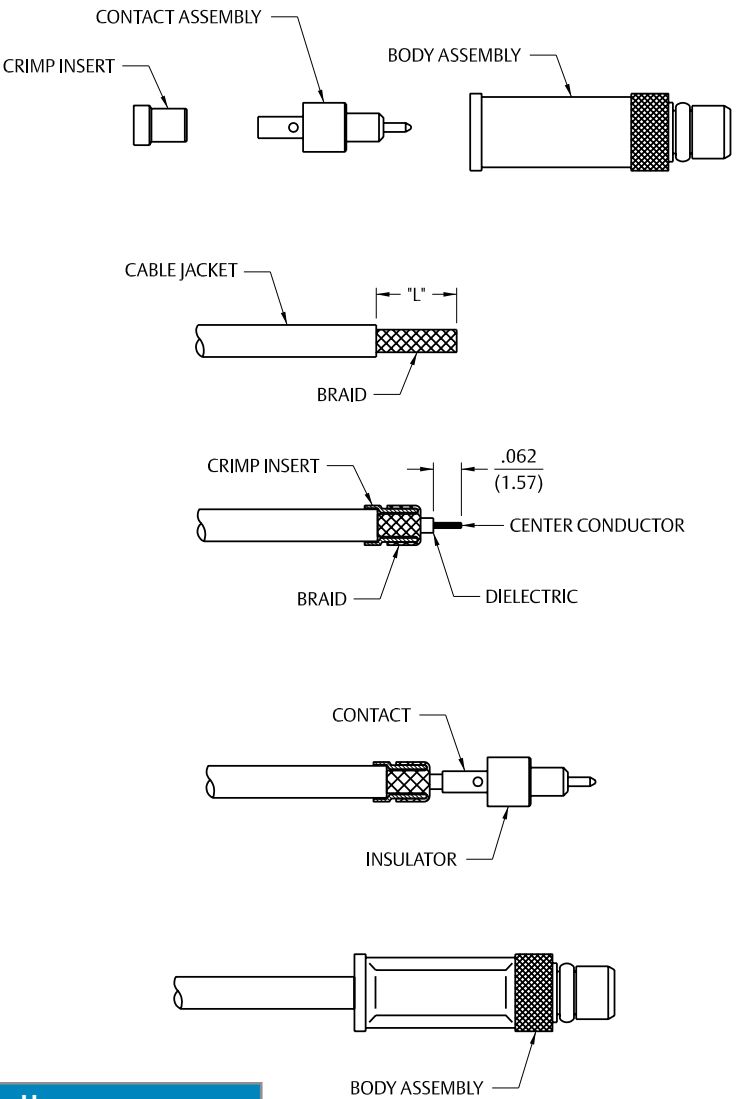
| Cable Group               | Part No.     | Crimp Hex   |
|---------------------------|--------------|-------------|
| RG-316/U, 188, 161, 174   | 135-3303-001 | .128 (3.25) |
| RG-316 DS, 188 DS, 187 DS | 135-3304-001 | .151 (3.83) |
| RG-179/U, 187             | 135-3333-001 | .128 (3.25) |
| RG-316/u, 188, 174        | 135-9403-001 | .128 (3.25) |
| RG-316 DS, 188 DS         | 135-9404-001 | .151 (3.83) |



MMCX Straight Jack for .047 Diameter  
and RG-178 Size Flexible Cable

- 1. Identify connector parts. (3 piece parts – except bulkhead jack as shown.)
- 2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations.
- 3. Slide crimp insert over braid and against jacket, fold braid around crimp insert. Strip dielectric to dimension shown. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached.
- 4. Assemble contact assembly onto cable as shown.  
**Solder attachment:** Solder contact to center conductor. Care should be taken that excess solder is not applied.  
**Crimp attachment:** Crimp contact to center conductor using Johnson hand tool 140-0000-952 and die set 140-0000-953. Crimp location should be centered between end of contact and cross-hole. Crimp attachment to solid center conductor cables is not recommended.
- 5. Slide body assembly over contact and crimp insert, then seat firmly onto contact. Crimp body using recommended crimp hex. Bulkhead jack requires 140-000-951 dieset. Maintain forward pressure on cable while crimping.

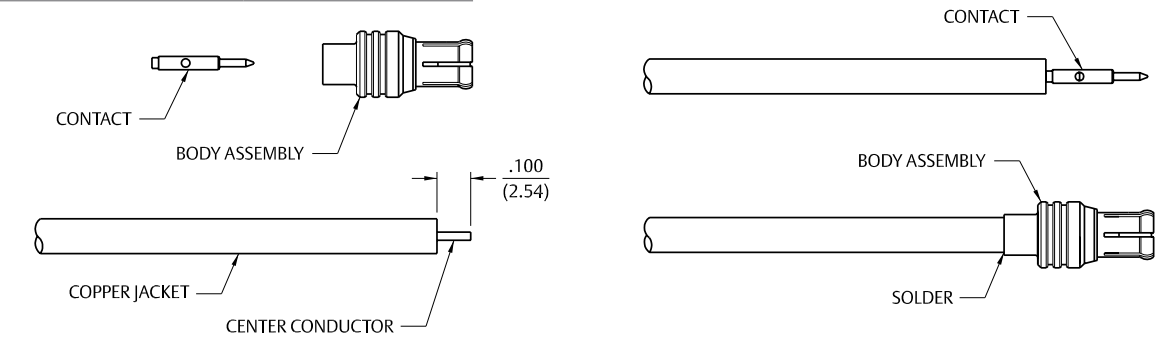
| Cable Group   | Part No.     | “L”         | Crimp Hex                   |
|---------------|--------------|-------------|-----------------------------|
| .047 Flexible | 135-3336-001 | .135 (3.43) | .105 (2.67) x .250 (6.35) W |
|               | 135-3336-401 | .135 (3.43) | .105 (2.67) x .250 (6.35) W |
| RG-178/U, 196 | 135-3302-001 | .185 (4.67) | .105 (2.67) x .250 (6.35) W |
|               | 135-3302-401 | .185 (4.67) | .105 (2.67) x .250 (6.35) W |
| .047 Flexible | 135-9436-001 | .135 (3.43) | .105 (2.67) x .250 (6.35) W |
| RG-178/U, 196 | 135-9402-001 | .185 (4.67) | .105 (2.67) x .250 (6.35) W |



MCX Solder Type Straight Plug for Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor.
- 3. Place center contact on center conductor making sure contact bottoms against cable insulation. Solder center conductor to center contact through solder hole. Solder must not be allowed to run on outside of contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Trim excess insulation.
- 4. Insert contact and cable into body assembly making sure cable is bottomed against insulator in body. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement.

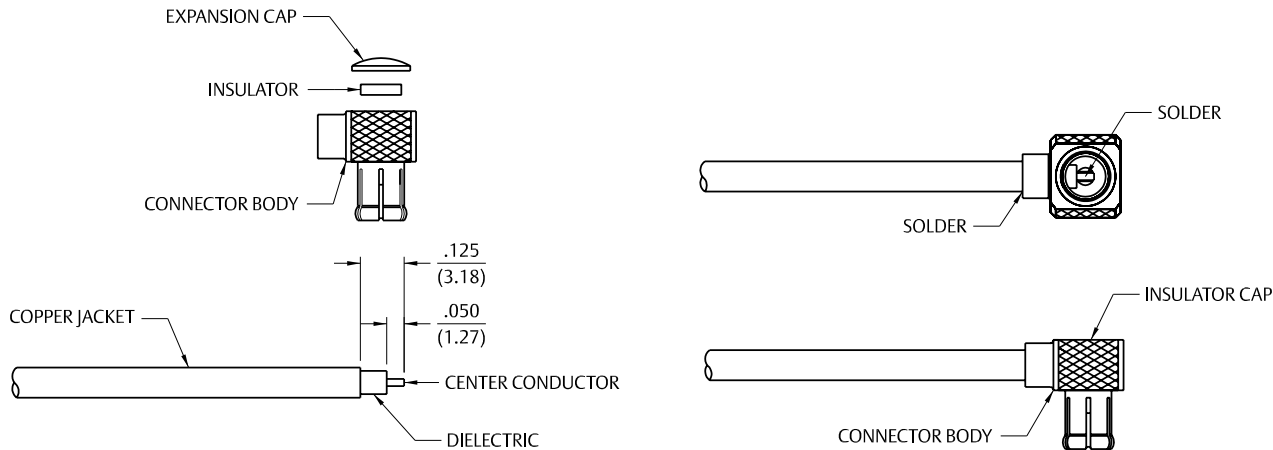
| Cable Group                   | Part No.     |
|-------------------------------|--------------|
| RG-405/U<br>(.086 Semi-Rigid) | 133-3693-001 |
|                               | 133-3693-006 |



MCX Solder Type Right Angle Plug for Semi-Rigid Cable

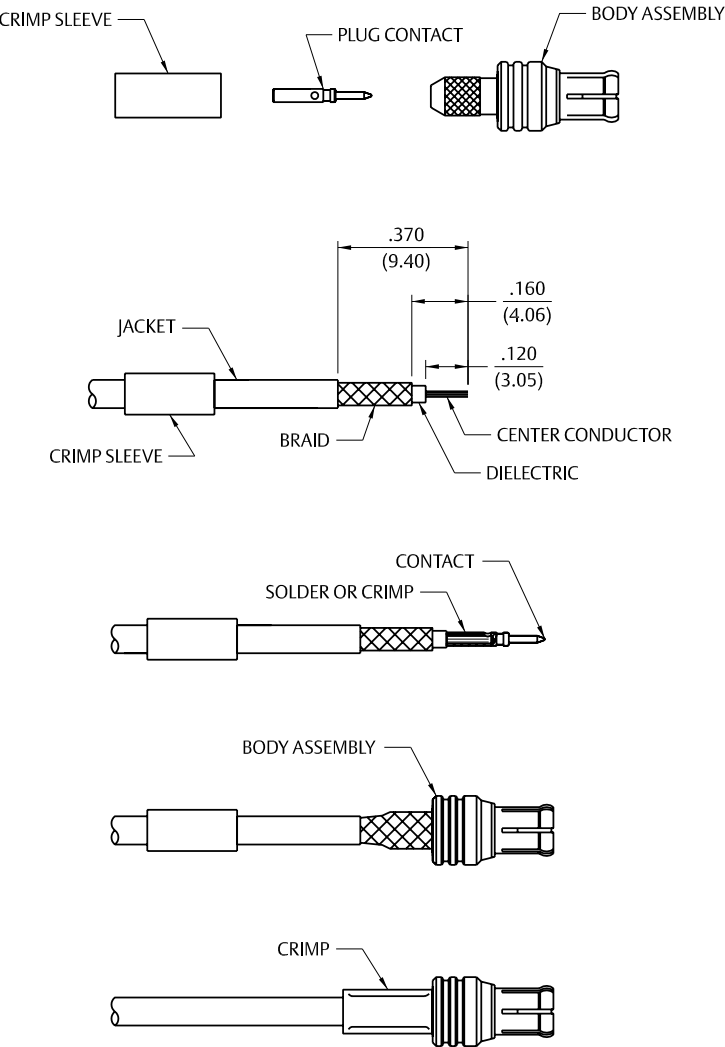
- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor.
- 3. Insert cable into body making sure cable insulation bottoms on center contact. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended.
- 4. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement. Assemble insulator then place expansion cap in access port and seat with a .156 (3.96) diameter punch or hand tool 141-0000-908.

| Cable Group                   | Part No.     |
|-------------------------------|--------------|
| RG-405/U<br>(.086 Semi-Rigid) | 133-3693-101 |
|                               | 133-3693-106 |



MCX Crimp Type Straight Connectors for Flexible Cable

- 1. Identify connector parts. (3 piece parts – except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact is to be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.
- 3. Assemble contact onto cable as shown.  
**Solder attachment.** Solder contact to center conductor through solder hole using .020 (0.51) diameter solder. Use a minimum of solder for a good joint.  
**Crimp attachment.** Crimp contact to center conductor using a miniature 8 indent tool 140-0000-970 with positioner 140-0000-971. Crimp location should be centered between end of contact and cross hole. Crimp attachment to solid center conductor cable is not recommended.
- 4. Flair braid and slide body assembly over contact and under braid. Then seat body assembly firmly onto contact. (RG-178 is non-captivated, RG-316 incorporates snap-fit captivation.) The cable may have to be held in a clamping fixture. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using recommended crimp tool. Slide heat shrink forward and shrink (as applicable).



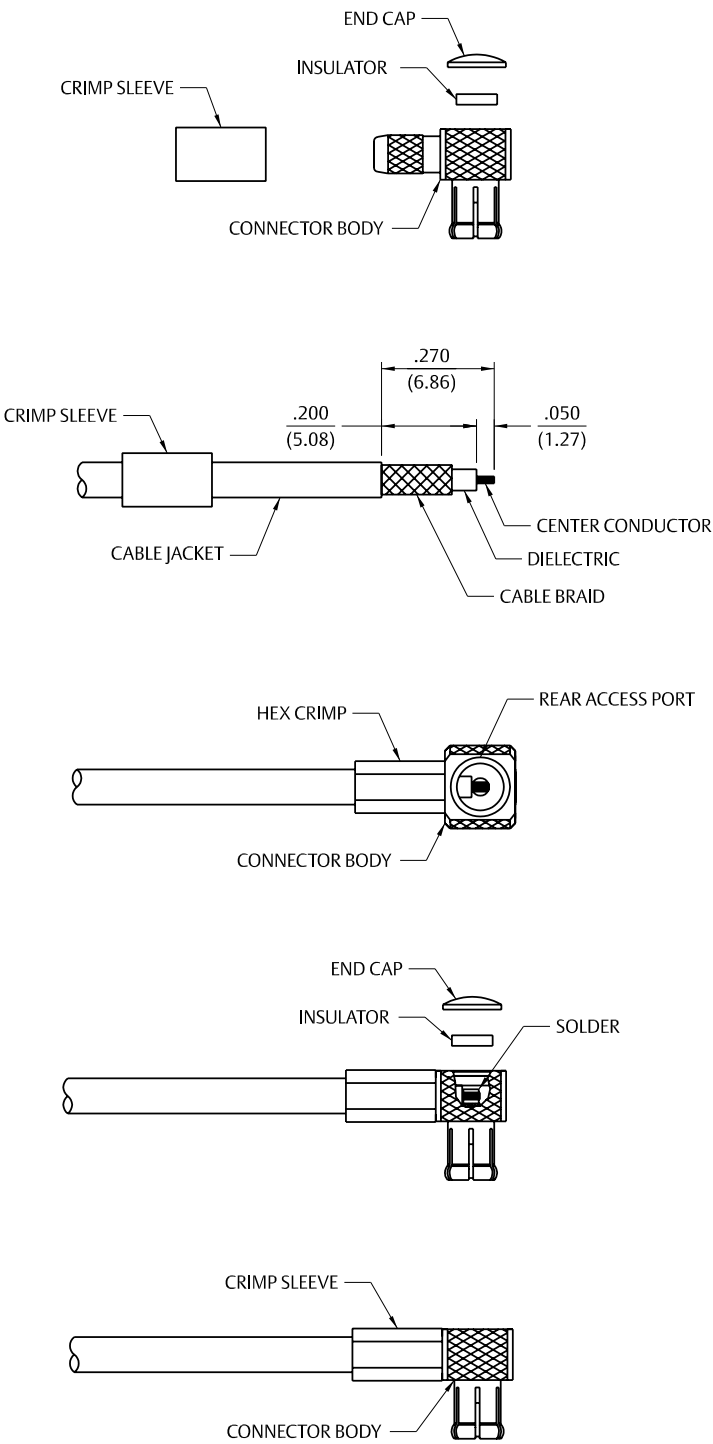
| Cable Group             | Part No.         | Crimp Hex   |
|-------------------------|------------------|-------------|
| RG-178/U, 196           | 133-3302-001/006 | .105 (2.67) |
|                         | 133-3302-401/406 | .105 (2.67) |
| RG-316/U, 161, 174, 188 | 133-3303-001/006 | .128 (3.25) |
|                         | 133-3303-401/406 | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-3304-001/006 | .151 (3.83) |
|                         | 133-3304-401/406 | .151 (3.83) |
| RG-178/U, 196           | 133-3402-001/006 | .105 (2.67) |
| RG-316/U, 161, 174, 188 | 133-3403-001/006 | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-3404-001/006 | .151 (3.83) |
| RG-179/U, 187           | 133-3433-001/006 | .128 (3.25) |
| RG-178/U, 196           | 133-5302-401/406 | .105 (2.67) |
| RG-316/U, 161, 174, 188 | 133-5303-401/406 | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-5304-401/406 | .151 (3.83) |
| RG-178/U, 196           | 133-5402-001/006 | .105 (2.67) |
| RG-316/U, 161, 174, 188 | 133-5403-001/006 | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-5404-001/006 | .151 (3.83) |
| RG-316/U, 188, 174      | 133-9403-001     | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-9404-001     | .151 (3.83) |

For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)  
Illustrations are shown in inches (millimeters).

MCX Crimp Type Right Angle Plugs  
for Flexible Cable

- 1. Identify connector parts. (4 piece parts).
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable dielectric bottoms against center contact. Solder: Solder center conductor to contact through the side access ports and hole in center contact. Use a minimum amount of solder for a full fillet joint. .015 (0.38) diameter solder is recommended. Crimp: Crimp Contact Attachment Crimp contact using 41-0000-924 dieset in 144-0000-900 tool frame.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and access ports. Crimp securely using recommended hex size and crimp tool.

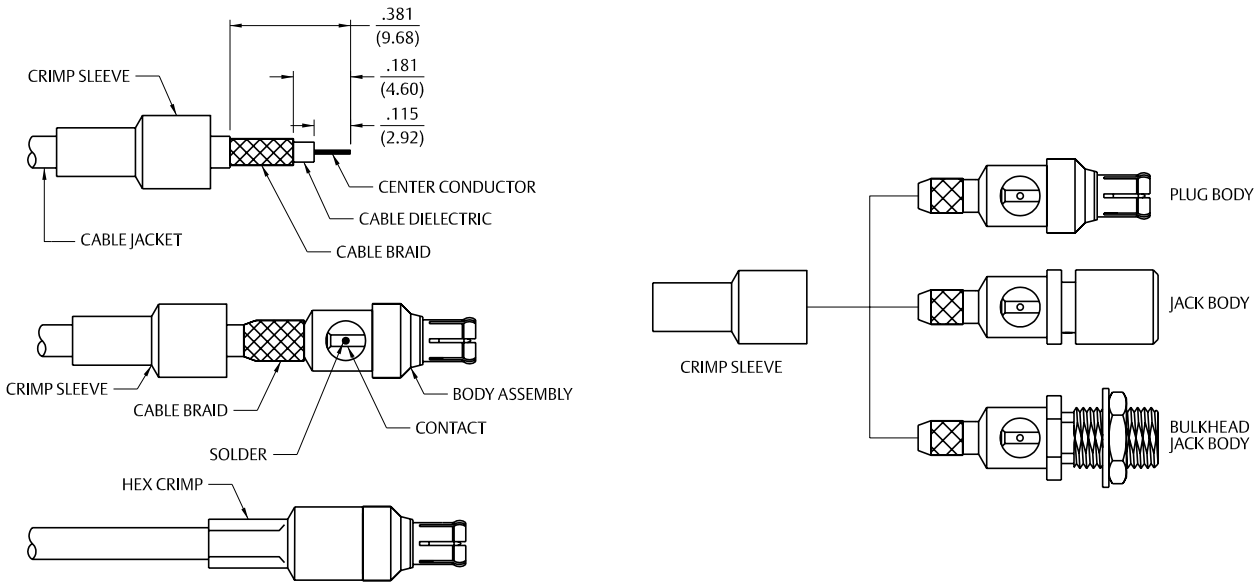
| Cable Group        | Part No.         | Sleeve Hex  |
|--------------------|------------------|-------------|
| RG-316/U, 188, 174 | 133-9403-101/104 | .128 (3.25) |
| RG-316 DS, 188 DS  | 133-9404-101     | .151 (3.83) |
| RG-178             | 133-9402-101     | .105 (2.67) |



MCX Crimp Type Straight Connectors for Flexible Cable – 75 Ohm

- 1. Identify connector parts. (2 piece parts—except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable dielectric bottoms against center contact. **Solder:** Solder center conductor to contact through the side access ports and hole in center contact. Use a minimum amount of solder for a full fillet joint. .015 (0.38) diameter solder is recommended. **Crimp:** Crimp Contact Attachment: Crimp contact using 141-0000-924 dieset in 144-0000-900 tool frame.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and access ports. Crimp securely using recommended hex size and crimp tool.

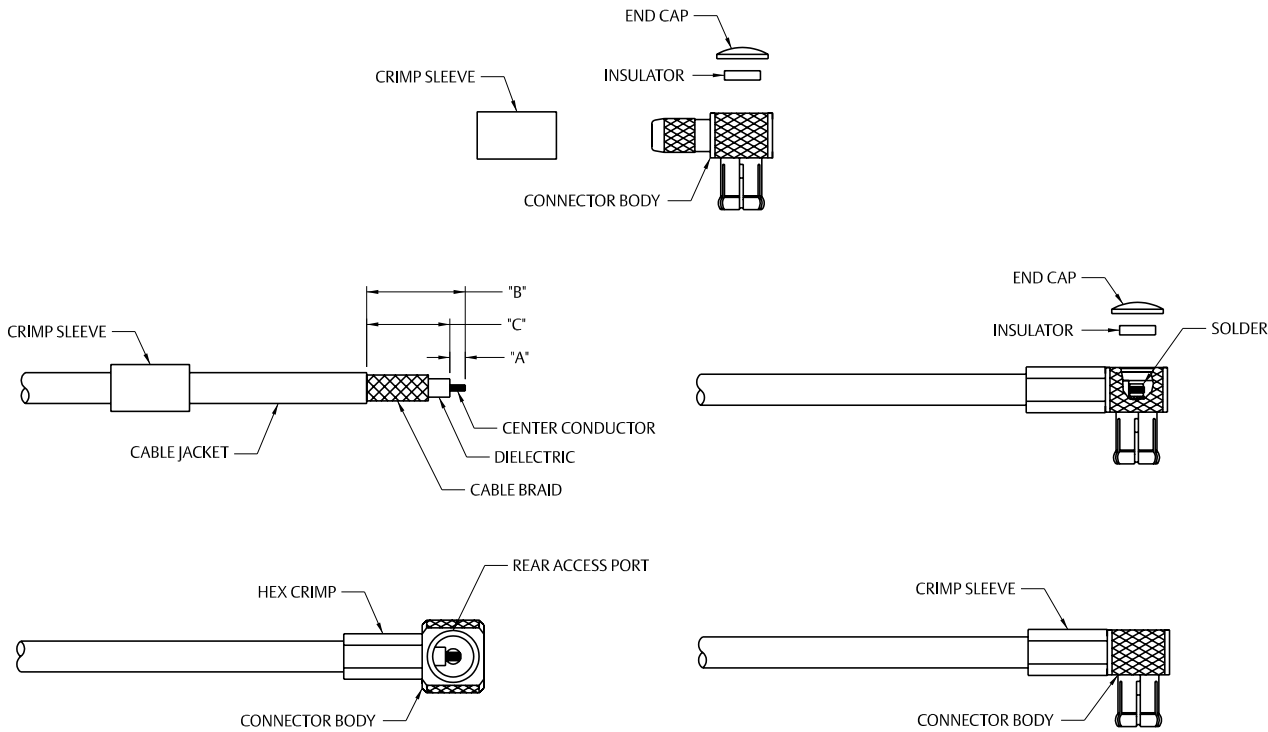
| Cable Group | Part No.     | Crimp Hex   |
|-------------|--------------|-------------|
| RG-179      | 133-8433-001 | .128 (3.25) |
| RG-179 DS   | 133-8434-001 | .151 (3.83) |
| RG-179      | 133-8333-001 | .128 (3.25) |
| RG-179 DS   | 133-8334-001 | .151 (3.83) |
| RG-179      | 133-8333-401 | .128 (3.25) |
| RG-179 DS   | 133-8334-401 | .151 (3.83) |
| BELDEN 735A | 133-8445-001 | .151 (3.83) |



MCX Crimp Type Right Angle Plugs for Flexible Cable – 50 Ohm

- 1. Identify connector parts. (4 piece parts except RG-58)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable shown.
- 3. Flair braid and slide cable into body making certain that the cable insulation bottoms on center contact. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.
- 4. Solder center conductor to contact through rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended.
- 5. Assemble insulator, if applicable; then place expansion cap in access port and seat with .156 (3.96) diameter flat punch or MCX hand assembly tool 141-0000-908. Shrink heat shrink tubing over crimp sleeve if applicable.

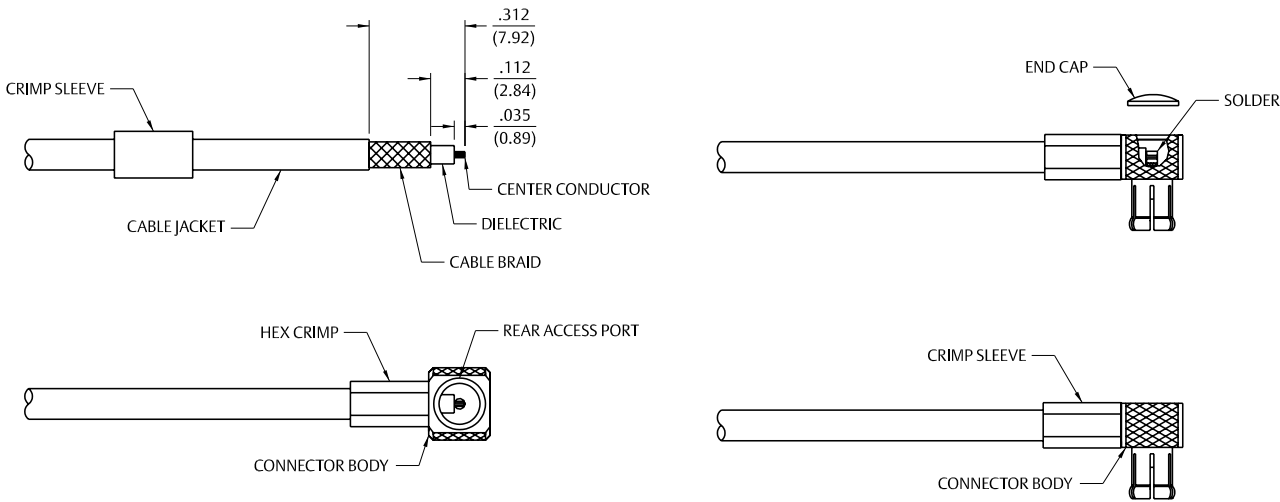
| Cable Group             | Part No.         | "A"         | "B"         | "C"         | Crimp Hex   |
|-------------------------|------------------|-------------|-------------|-------------|-------------|
| RG-178/U, 196           | 133-3402-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .105 (2.67) |
| RG-188/U, 316, 161, 174 | 133-3403-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-3404-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .151 (3.83) |
| RG-179/U, 187           | 133-3433-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .128 (3.25) |
| RG-178/U, 196           | 133-5402-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .105 (2.67) |
| RG-188/U, 316, 161, 174 | 133-5403-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .128 (3.25) |
| RG-316 DS, 188 DS       | 133-5404-101/106 | .050 (1.27) | .270 (6.86) | .200 (5.08) | .151 (3.83) |
| RG-58/U, 303, 141       | 133-3407-101/106 | .067 (1.70) | .295 (7.49) | .210 (5.33) | .213 (5.41) |



MCX Crimp Type Right Angle Plugs for Flexible Cable – 75 Ohm

- 1. Identify connector parts (3-piece parts).
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flair braid and slide cable into body making certain that the cable dielectric bottoms on center contact. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.
- 4. Solder center conductor to contact through rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended.
- 5. Place expansion cap in access port and seat with .156 (3.96) diameter flat punch or MCX hand assembly tool 141-0000-908. Shrink heat shrink tubing over crimp sleeve if applicable.

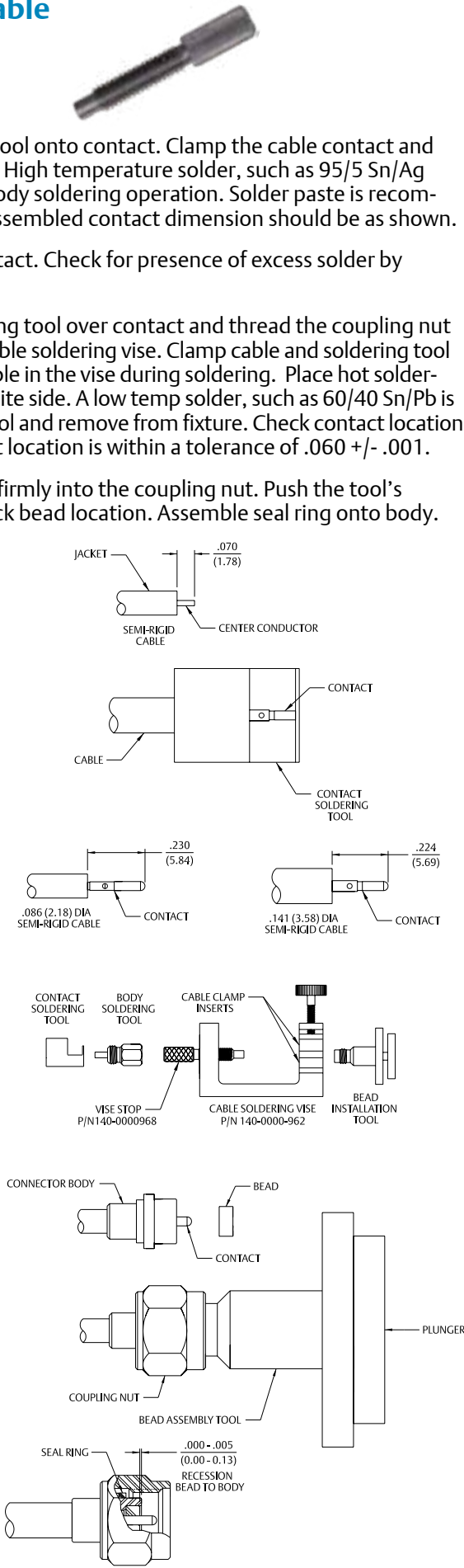
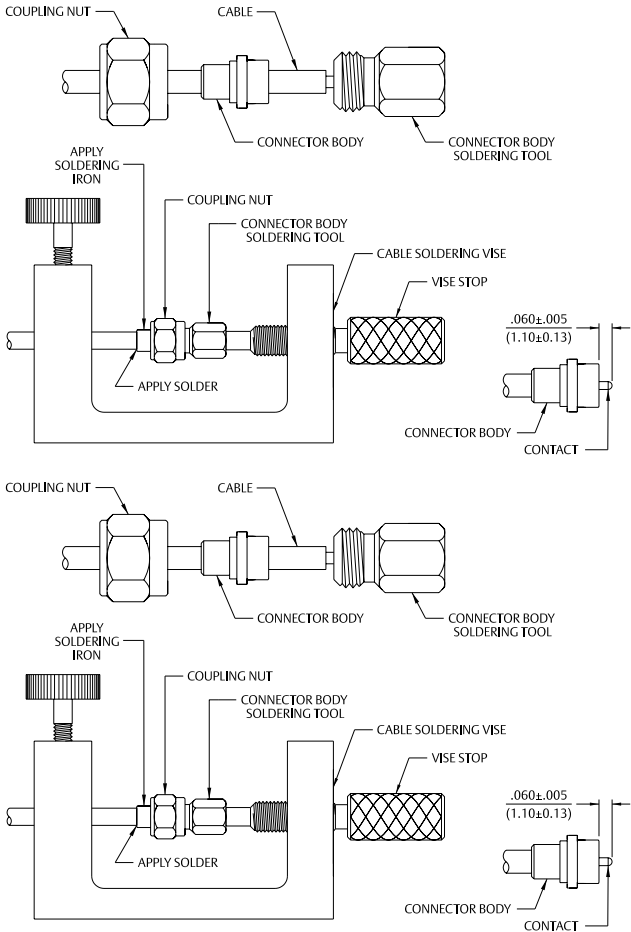
| Cable Group | Part No.     | Crimp Hex   |
|-------------|--------------|-------------|
| RG-179      | 133-8433-101 | .128 (3.25) |
| RG-179 DS   | 133-8434-101 | .151 (3.83) |
| BELDEN 735A | 133-8445-101 | .151 (3.83) |



SMK Solder Type Straight Plugs for Semi-Rigid Cable

- 1. Identify connector parts (5 piece parts) and tools (5 tools.)
- 2. Strip cable jacket and dielectric to dimension shown.
- 3. Place center contact onto center conductor. Slide contact soldering tool onto contact. Clamp the cable contact and tool into cable soldering vise and solder contact to center conductor. High temperature solder, such as 95/5 Sn/Ag is recommended so that contact solder joint remains stable during body soldering operation. Solder paste is recommended for the contact solder joint to minimize excess solder. The assembled contact dimension should be as shown.
- 4. Remove excess solder from contact with a sharp blade and clean contact. Check for presence of excess solder by sliding body soldering tool over the contact. Remove soldering tool.
- 5. Place connector nut and body on cable. Place connector body soldering tool over contact and thread the coupling nut and connector body firmly to the tool. Place cable subassembly into cable soldering vise. Clamp cable and soldering tool securely to insure the cable dielectric expansion will not disturb the cable in the vise during soldering. Place hot soldering iron on the connector body sleeve and apply solder from the opposite side. A low temp solder, such as 60/40 Sn/Pb is recommended for the body solder joint. Allow the soldered joint to cool and remove from fixture. Check contact location to the body. The best electrical results are achieved when the contact location is within a tolerance of .060 +/- .001.
- 6. Place bead onto neck portion of the tool. Thread Bead Assembly tool firmly into the coupling nut. Push the tool's plunger between your thumb and fingers to assemble the bead. Check bead location. Assemble seal ring onto body.

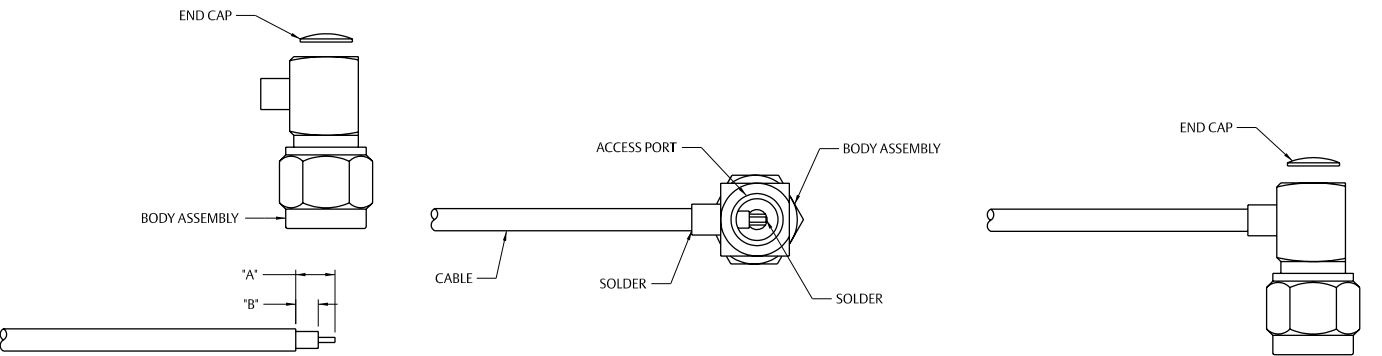
| Tool                   | 145-0693-001/002<br>(for .086 Semi-Rigid) | 145-0694-001/02<br>(for .141 Semi-Rigid) |
|------------------------|-------------------------------------------|------------------------------------------|
| Semi-Rigid Cable Vise  | 140-0000-962                              | 140-0000-962                             |
| Vise Stop              | 140-0000-968                              | 140-0000-968                             |
| Bead Assy. Tool        | 140-0000-957                              | 140-0000-957                             |
| Contact Soldering Tool | 140-0000-960                              | 140-0000-961                             |
| Body Soldering Tool    | 140-0000-958                              | 140-0000-959                             |
| Cable Clamp Insert     | 140-0000-964                              | 140-0000-965                             |



SMA Right Angle Solder Type Plug for Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor during strip operations.
- 3. Insert cable into body making certain that the cable jacket is butted against internal body shoulder and cable dielectric is started into cross hole. Solder center conductor to contact using 60/40 tin/lead solder as shown. Use a minimum amount of solder for a good joint.
- 4. Solder body to cable using 60/40 tin/lead solder as shown. Use a minimum of heat to minimize cable dielectric growth. Any growth of cable dielectric shall be flush with contact.
- 5. Press end cap into body access port using .187 (4.75) dia. flat punch.

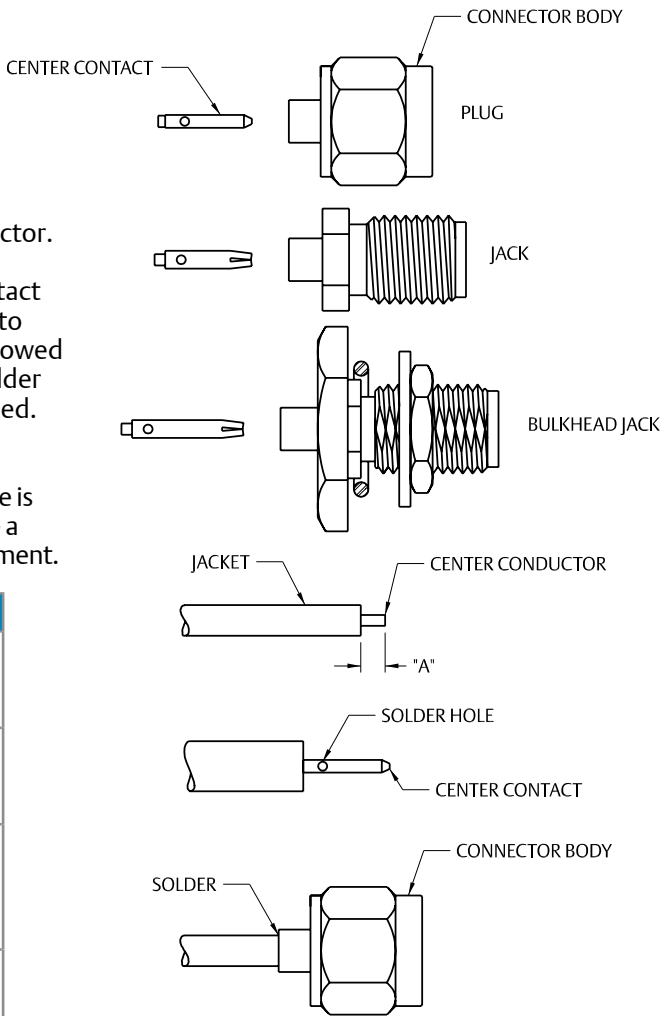
| Cable Group                | Part No.         | "A"         | "B"         |
|----------------------------|------------------|-------------|-------------|
| RG-405/U (.086 Semi-Rigid) | 142-0693-101/106 | .145 (3.68) | .075 (1.90) |
| RG-402/U (.141 Semi-Rigid) | 142-0694-101/106 | .170 (4.32) | .105 (2.67) |



SMA Solder Type Straight Jacks, Straight Plugs, and Straight Bulkhead Jacks for Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor.
- 3. Place center contact on center conductor making sure contact bottoms against cable insulation. Solder center conductor to center contact through solder hole. Solder must not be allowed to run on outside of contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Trim excess insulation.
- 4. Insert contact and cable into body assembly making sure cable is bottomed against insulator in body. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement.

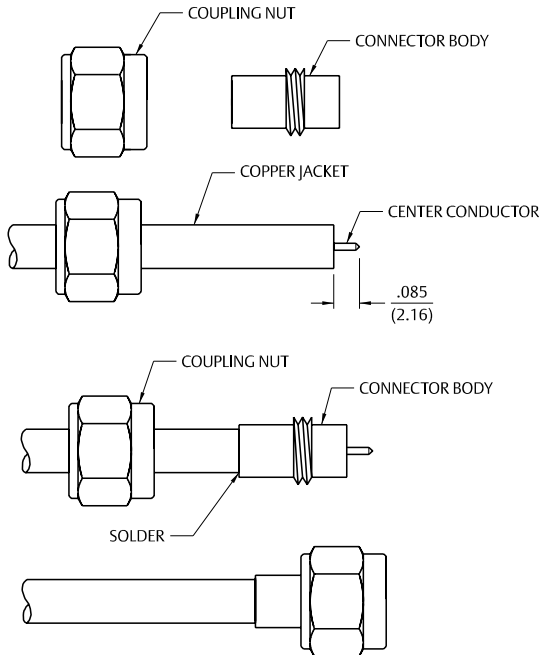
| Cable Group                | Part No.         | "A"         |
|----------------------------|------------------|-------------|
| RG-405/U (.086 Semi-Rigid) | 141-0593-001     | .070 (1.78) |
|                            | 141-0593-401     | .070 (1.78) |
|                            | 141-0693-002     | .070 (1.78) |
| RG-402/U (.141 Semi-Rigid) | 141-0594-001     | .085 (2.16) |
|                            | 141-0594-401     | .085 (2.16) |
|                            | 141-0694-002     | .085 (2.16) |
| RG-405/U (.086 Semi-Rigid) | 142-0593-001/006 | .070 (1.78) |
|                            | 142-0593-401/406 | .070 (1.78) |
|                            | 142-0593-411/416 | .070 (1.78) |
|                            | 142-0693-001/006 | .070 (1.78) |
| RG-402/U (.141 Semi-Rigid) | 142-0594-001/006 | .085 (2.16) |
|                            | 142-0594-401/406 | .085 (2.16) |
|                            | 142-0694-001/006 | .085 (2.16) |



SMA Solder Type Straight Plugs for Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. Bevel the cable center conductor per contact detail of SMA interface on page 48. Slide coupling nut onto cable as shown.
- 3. Insert cable into body making sure cable jacket is flush with front of body. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement. Trim expanded insulation flush with front of body or fixture body and cable during soldering to prevent cable insulation expansion.
- 4. Thread coupling nut over body.

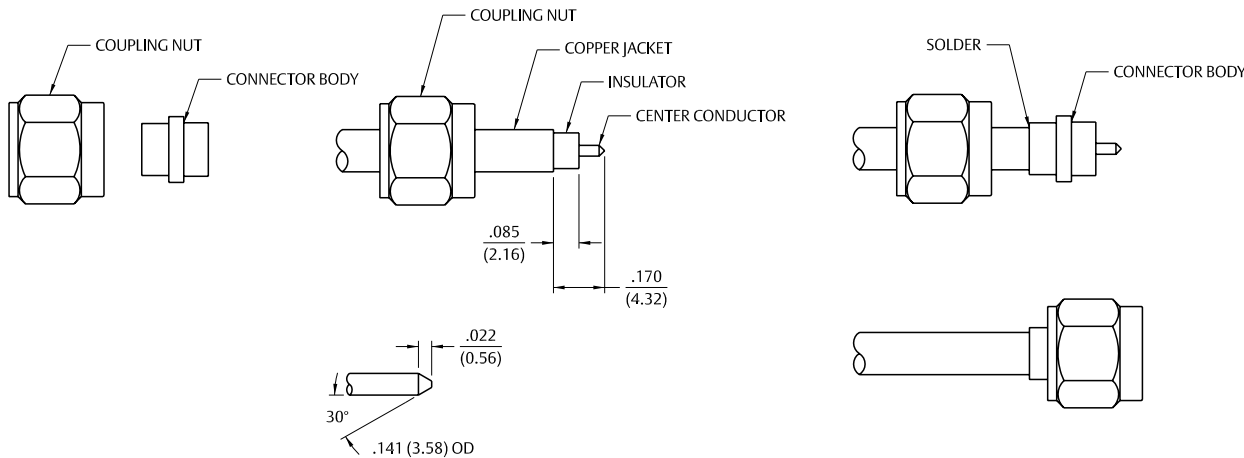
| Cable Group                | Part No.     |
|----------------------------|--------------|
| RG-402/U (.141 Semi-Rigid) | 142-0694-011 |
|                            | 142-0694-016 |
|                            | 141-0694-012 |



SMA Solder Type Straight Plugs for Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. Bevel the cable center conductor per contact detail of SMA interface on page 48. Slide coupling nut onto cable as shown.
- 3. Insert cable into body making sure cable jacket is bottomed against shoulder inside of body. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement. Trim expanded insulation flush with front of body or fixture body and cable during soldering to prevent insulation expansion.
- 4. Thread coupling nut over body.

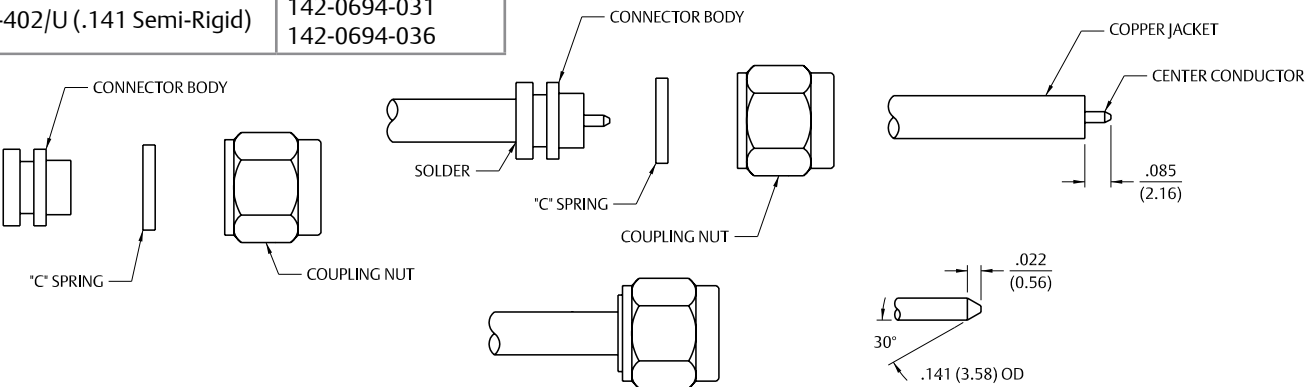
| Cable Group                | Part No.     |
|----------------------------|--------------|
| RG-402/U (.141 Semi-Rigid) | 142-0694-021 |
|                            | 142-0694-026 |
|                            | 142-0694-041 |
|                            | 142-0694-046 |



SMA Solder Type Straight Plugs for Semi-Rigid Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. Bevel the cable center conductor per contact detail of SMA interface on page 48.
- 3. Insert cable into body making sure cable jacket is flush with front of body. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement. Trim expanded cable insulation flush with front of body or fixture body and cable during soldering to prevent insulation expansion.
- 4. Snap "C" spring onto connector body groove. Compress "C" spring using 141-0000-904 compression tool. Install coupling nut onto connector body. Nut should spin freely.

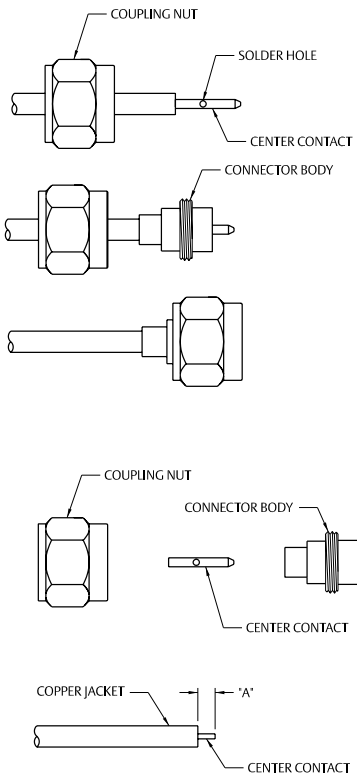
| Cable Group                | Part No.     |
|----------------------------|--------------|
| RG-402/U (.141 Semi-Rigid) | 142-0694-031 |
|                            | 142-0694-036 |



SMA Solder Type Straight Plugs  
for Semi-Rigid Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. Slide coupling nut onto cable as shown.
- 3. Place center contact on center conductor making sure contact bottoms against cable insulation. Solder center conductor to center contact through solder hole. Solder must not be allowed to run on outside of contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Trim excess insulation.
- 4. Insert contact and cable into body making sure cable is bottomed against insulator in body. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement.
- 5. Thread coupling nut over body

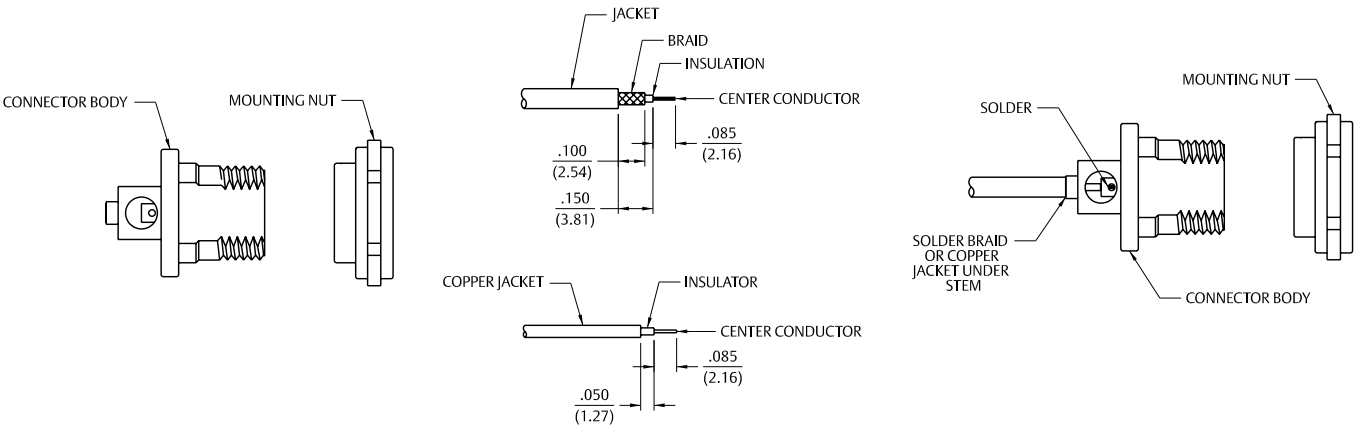
| Cable Group                | Part No.     | "A"         |
|----------------------------|--------------|-------------|
| RG-405/U (.086 Semi-Rigid) | 142-0693-051 | .070 (1.78) |
|                            | 142-0693-056 | .070 (1.78) |
| RG-402/U (.141 Semi-Rigid) | 142-0694-051 | .085 (2.16) |
|                            | 142-0694-056 | .085 (2.16) |



SMA Solder Type Antenna Connector Plug for Flexible or Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor or braid on flexible cable.
- 3. **Flexible Cable Attachment:** Twist stranded center conductor into tight bundle and tin (optional). Slide cable into body, making sure cable insulation bottoms on center contact and braid fits inside stem. Solder center conductor to contact through the side access ports. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Solder braid to body. Use a minimum amount of solder to completely join the braid to the body. **Semi-Rigid Cable Attachments:** Slide cable into body making certain cable insulation bottoms on center contact. Solder center conductor to contact through the side access ports. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Solder body to cable jacket. Use a minimum amount of heat to minimize cable insulation movement.

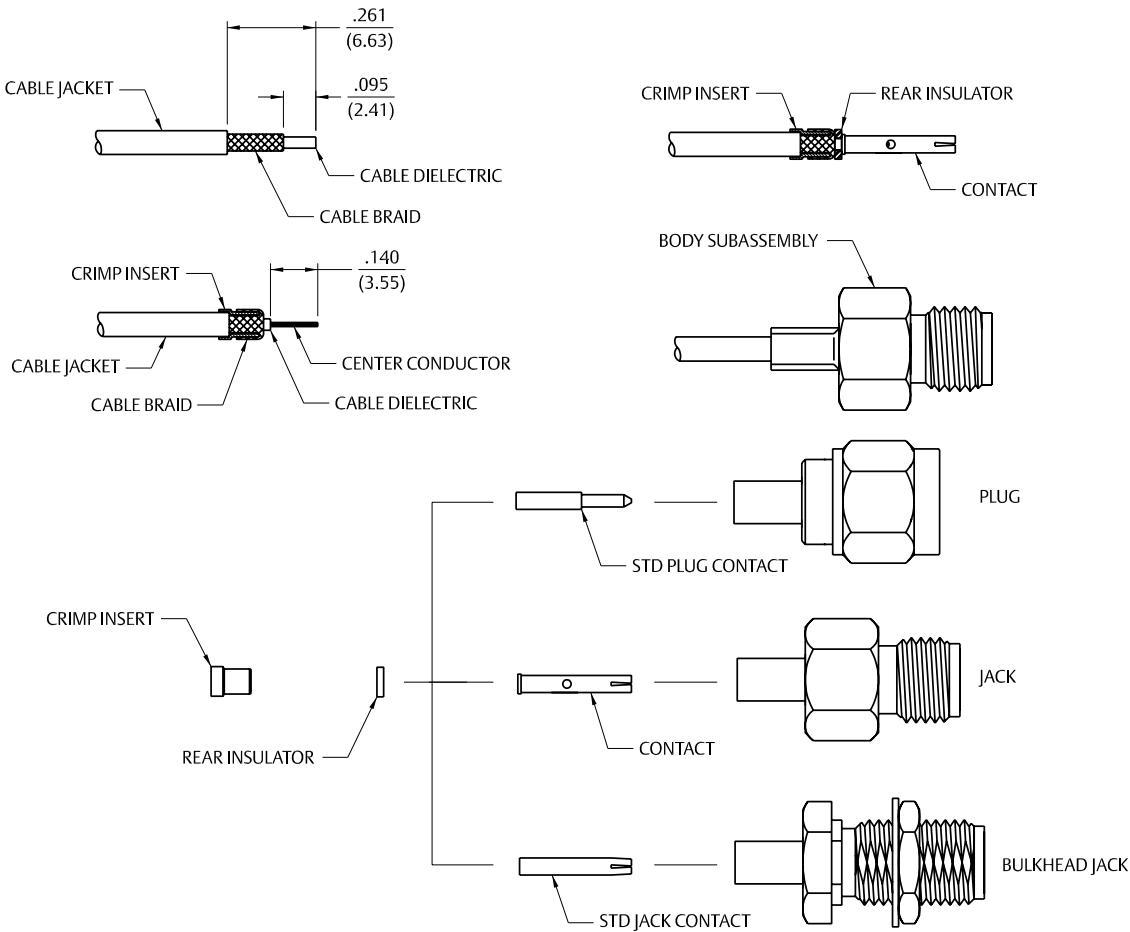
| Cable Group               | Part No.     |
|---------------------------|--------------|
| RG-178/U, .047 Semi-Rigid | 142-0801-421 |



SMA 3-Piece Plug, Jack and Bulkhead Jack for RG-178 Flexible Cable

- 1. Identify piece parts. (4 piece parts plus nut and washer for bulkhead.)
- 2. Strip cable jacket and braid to dimensions shown. Do not nick braid during strip operations.
- 3. Slide crimp insert over braid and against jacket. Fold braid around crimp insert as shown. Strip dielectric to dimension shown. If cable is being manually stripped the rear insulator can be assembled and used as a guide. Do not nick center conductor during strip operation. Tin center conductor if contact is to be solder attached. Do not tin center conductor if contact is to be crimp attached.
- 4. Assemble rear insulator over cable dielectric and contact over center conductor as shown. **Solder attachment:** Solder contact to center conductor using 60/40 tin/lead solder. Care should be taken that excess solder is not applied. **Crimp attachment:** Crimp contact to center conductor using production tooling or hand tool 144-0000-910, setting #2 with positioner 141-0000-907. Crimp location should be centered between end of contact and x-hole. Crimp attachment to solid center conductor cables is not recommended.
- 5. Slide body assembly over contact, rear insulator and crimp insert. Crimp body using recommended crimp tool. Maintain forward pressure on cable while crimping. Body crimp die hex: .105 (2.67) hex.

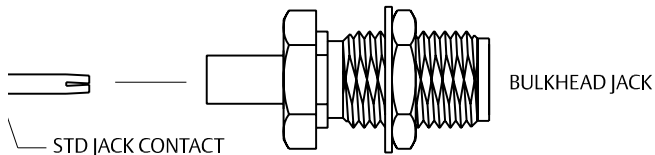
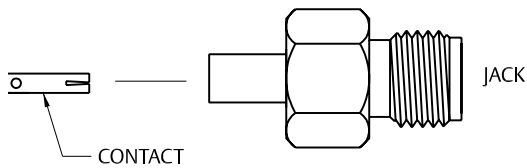
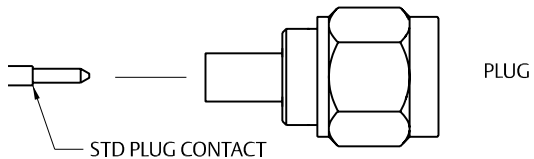
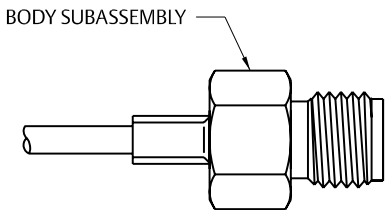
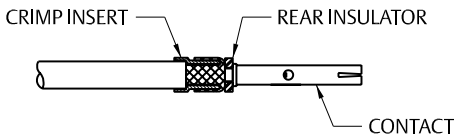
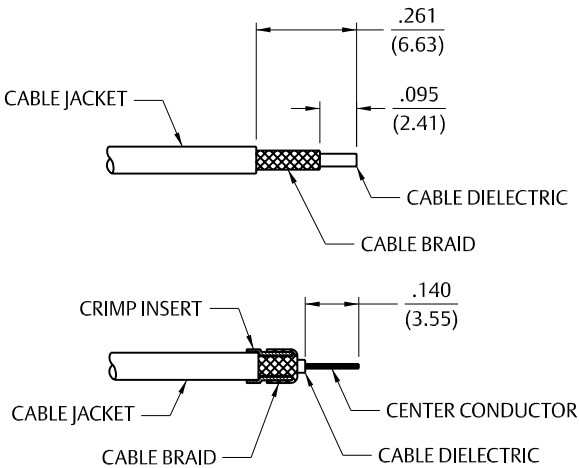
| Cable Group   | Part No.     | Crimp Hex   |
|---------------|--------------|-------------|
| RG-178/U, 196 | 142-0402-011 | .105 (2.67) |
|               | 142-0402-016 | .105 (2.67) |
|               | 142-0302-011 | .105 (2.67) |
|               | 142-0302-016 | .105 (2.67) |
|               | 142-0302-431 | .105 (2.67) |
|               | 142-0302-436 | .105 (2.67) |



For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • [www.EmersonConnectivity.com](http://www.EmersonConnectivity.com)  
Illustrations are shown in inches (millimeters).

SMA Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable – Crimp or Solder Contacts

- 1. Identify connector parts. (3 piece parts – except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. When stripping LMR-100 low loss cable, remove foil back to where cable jacket is stripped. A wire stripper of correct size is recommended for this step. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.
- 3. Assemble contact onto cable as shown.  
**Solder Attachment:** Solder contact to center conductor through solder hole using .020 (0.51) diameter solder. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** Crimp contact to center conductor using Johnson Hand Tool 144-0000-910, setting #2, with positioner 141-0000-907. Crimp location should be centered between end of contact and X-hole. Crimp attachment to solid center conductor cables is not recommended.
- 4. Flare braid and slide body assembly over contact and under braid. Then seat body assembly firmly onto contact. The cable may have to be held in a clamping fixture. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using recommended crimp tool. Slide heat shrink forward and shrink (as applicable).



SMA Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable – Crimp or Solder Contacts (cont'd from last page)

| Cable Group                      | Part No.                                             | "A"                        | "B"                        | Crimp Hex                  |
|----------------------------------|------------------------------------------------------|----------------------------|----------------------------|----------------------------|
| RG-316/U, 161, 174, 188; LMR-100 | 141-0303-412                                         | .128 (3.25)                | .270 (6.86)                | .105 (2.67)                |
| RG-316 DS, 188 DS                | 141-0304-412                                         | .151 (3.83)                | .270 (6.86)                | .128 (3.25)                |
| RG-58/U, 141, 303                | 141-0307-412                                         | .213 (5.41)                | .270 (6.86)                | .151 (3.83)                |
| RG-55/U, 142, 223, 400           | 141-0308-412                                         | .213 (5.41)                | .270 (6.86)                | .128 (3.25)                |
| RG-316/U, 161, 174, 188; LMR-100 | 141-0403-012                                         | .128 (3.25)                | .270 (6.86)                | .105 (2.67)                |
| RG-316 DS, 188 DS                | 141-0404-012                                         | .151 (3.83)                | .270 (6.86)                | .128 (3.25)                |
| RG-58/U, 141, 303                | 141-0407-012                                         | .213 (5.41)                | .270 (6.86)                | .151 (3.83)                |
| RG-55/U, 142, 223, 400           | 141-0408-012                                         | .213 (5.41)                | .295 (7.49)                | .213 (5.41)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-0303-011/016<br>142-0303-411/416<br>142-9303-411 | .215 (5.46)<br>.215 (5.46) | .278 (7.06)<br>.278 (7.06) | .128 (3.25)<br>.128 (3.25) |
| RG-316 DS, 188 DS                | 142-0304-011/016<br>142-0304-411/416                 | .215 (5.46)<br>.215 (5.46) | .278 (7.06)<br>.278 (7.06) | .151 (3.83)<br>.151 (3.83) |
| RG-58/U, 141, 303                | 142-0307-011/016<br>142-0307-411/416                 | .215 (5.46)<br>.215 (5.46) | .278 (7.06)<br>.278 (7.06) | .213 (5.41)<br>.213 (5.41) |
| RG-55/U, 142, 223, 400           | 142-0308-011/016<br>142-0308-411/416                 | .215 (5.46)<br>.215 (5.46) | .278 (7.06)<br>.278 (7.06) | .213 (5.41)<br>.213 (5.41) |
| RG-179/U, 187                    | 142-0333-011/016<br>142-0333-411/416                 | .215 (5.46)<br>.215 (5.46) | .278 (7.06)<br>.278 (7.06) | .128 (3.25)<br>.128 (3.25) |
| RG-316/U, 161, 174, 188; LMR-100 | 142-0403-011/016                                     | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-0404-011/016                                     | .215 (5.46)                | .278 (7.06)                | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-0407-011/016                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-55/U, 142, 223, 400           | 142-0408-011/016                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-179/U, 187                    | 142-0433-011/016                                     | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-1403-001/006                                     | .280 (7.11)                | .715 (18.16)               | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-1404-001/006                                     | .280 (7.11)                | .715 (18.16)               | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-1407-001/006                                     | .280 (7.11)                | .715 (18.16)               | .213 (5.41)                |
| RG-55/U, 142, 223, 400           | 142-1408-001/006                                     | .280 (7.11)                | .715 (18.16)               | .213 (5.41)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-4303-401/406                                     | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-4304-401/406                                     | .215 (5.46)                | .278 (7.06)                | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-4307-401/406                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-55/u, 142, 223, 400           | 142-4308-401/406                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-4403-001/006                                     | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-4404-001/006                                     | .215 (5.46)                | .278 (7.06)                | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-4407-001/006                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-55/U, 142, 223, 400           | 142-4408-001/006                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-5303-401/406                                     | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-5304-401/406                                     | .215 (5.46)                | .278 (7.06)                | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-5307-401/406                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-55/U, 142, 223, 400           | 142-5308-401/406                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-5403-001/006                                     | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316 DS, 18 DS                 | 142-5404-001/006                                     | .215 (5.46)                | .278 (7.06)                | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-5407-001/006                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-55/U, 142, 223, 400           | 142-5408-001/006                                     | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |
| RG-316/U, 161, 174, 188; LMR-100 | 142-9403-011                                         | .215 (5.46)                | .278 (7.06)                | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-9404-011                                         | .215 (5.46)                | .278 (7.06)                | .151 (3.83)                |
| RG-58/U, 141, 303                | 142-9407-011                                         | .215 (5.46)                | .278 (7.06)                | .213 (5.41)                |

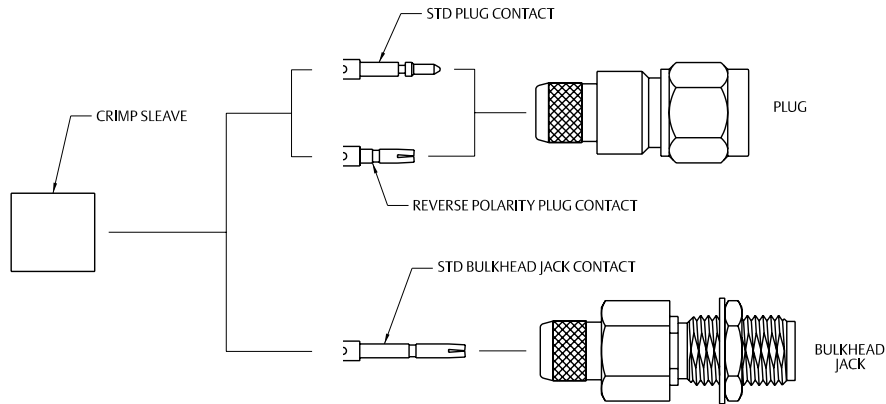
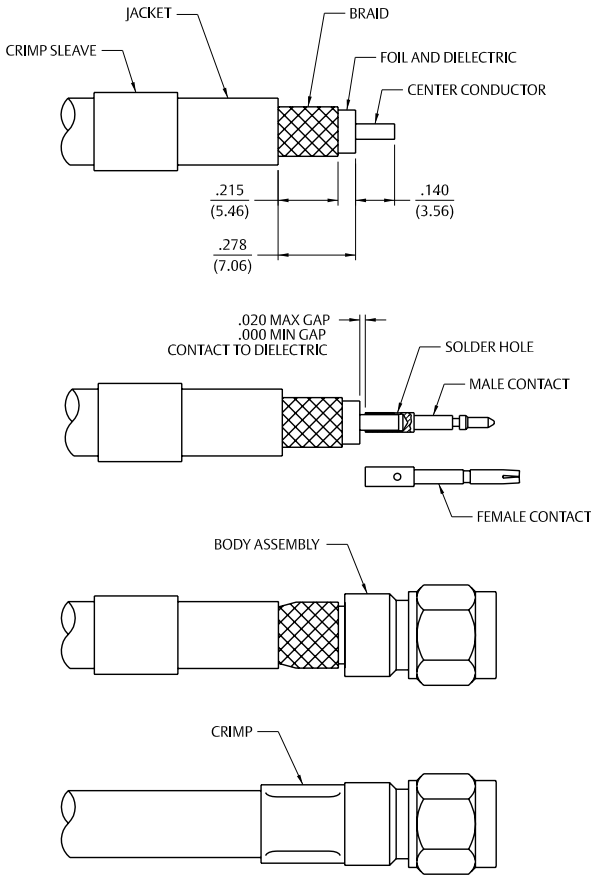
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Illustrations are shown in inches (millimeters).

Straight SMA Low Loss Diameter .195, .200 and .240 Straight Type Plugs

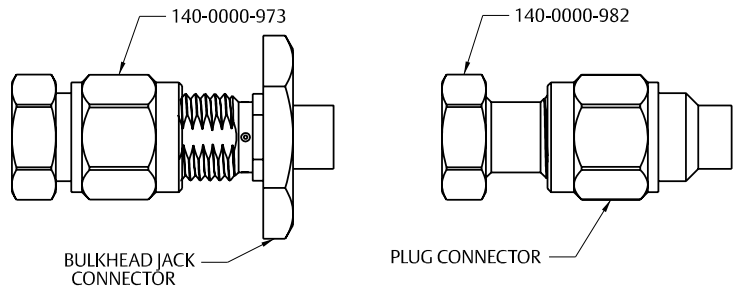
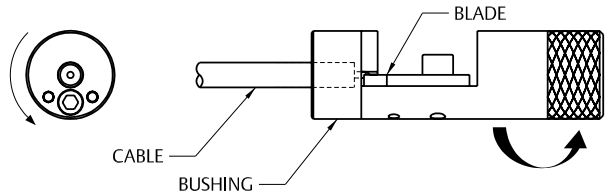
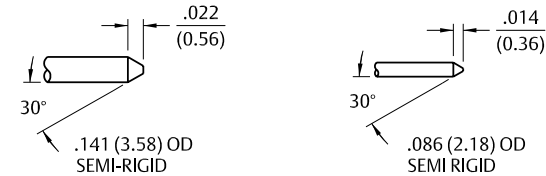
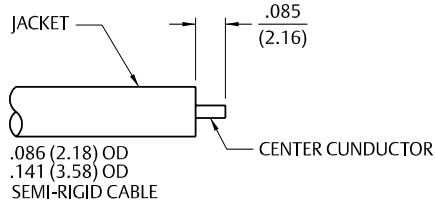
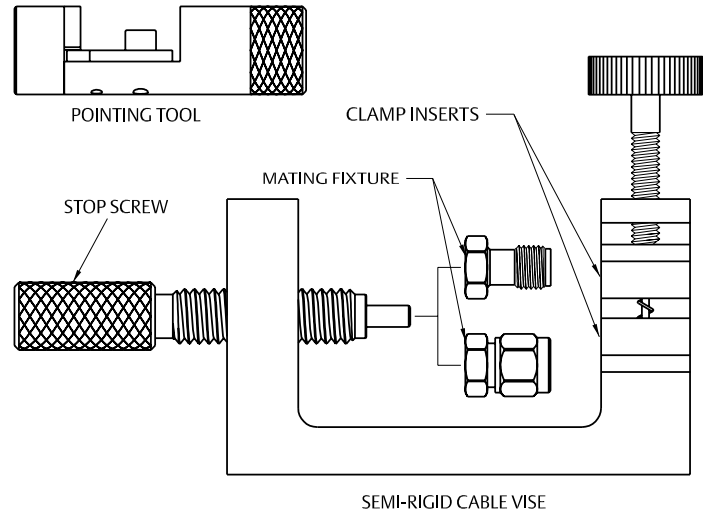
- 1. Identify connector parts. (3 piece parts – except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick braid, foil or center conductor. Cut foil flush with dielectric, do not remove foil. Make sure that dielectric is clean and free from all particles. Tin center conductor, keeping solder amount to a minimum. Slide crimp sleeve onto jacket of cable.
- 3. Assemble contact onto cable as shown. Position contact such that a gap of no more than .020 (0.51) is kept between dielectric and contact. Solder contact to center conductor through solder hole using .020 (0.51) Diameter solder. Use a minimum amount of solder for a good joint. Do not allow contact to move into dielectric during soldering process.
- 4. Flare braid and slide body assembly over contact, foil and dielectric, then under braid. Seat body assembly firmly onto contact. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson hand crimp tool 141-0000-913 and recommended crimp die hex.

| Cable Group | Part No.     | Crimp Hex   |
|-------------|--------------|-------------|
| LMR-195     | 142-0307-411 | .213 (5.41) |
|             | 142-0307-416 | .213 (5.41) |
| LMR-240     | 142-0335-401 | .255 (6.48) |
|             | 142-0335-406 | .255 (6.48) |
| LMR-200     | 142-0339-401 | .213 (5.41) |
|             | 142-0339-406 | .213 (5.41) |
| LMR-195     | 142-0407-011 | .213 (5.41) |
|             | 142-0407-016 | .213 (5.41) |
| LMR-240     | 142-0435-001 | .255 (6.48) |
|             | 142-0435-006 | .255 (6.48) |
| LMR-200     | 142-0439-001 | .213 (5.41) |
|             | 142-0439-006 | .213 (5.41) |
| LMR-240     | 142-4435-001 | .255 (6.48) |
|             | 142-4435-006 | .255 (6.48) |
| LMR-200     | 142-4439-001 | .213 (5.41) |
|             | 142-4439-006 | .213 (5.41) |
| LMR-195     | 142-4407-001 | .213 (5.41) |
|             | 142-4407-006 | .213 (5.41) |
| LMR-240     | 142-5435-001 | .255 (6.48) |
|             | 142-5435-006 | .255 (6.48) |
| LMR-200     | 142-5439-001 | .213 (5.41) |
|             | 142-5439-006 | .213 (5.41) |
| LMR-195     | 142-5407-001 | .213 (5.41) |
|             | 142-5407-006 | .213 (5.41) |



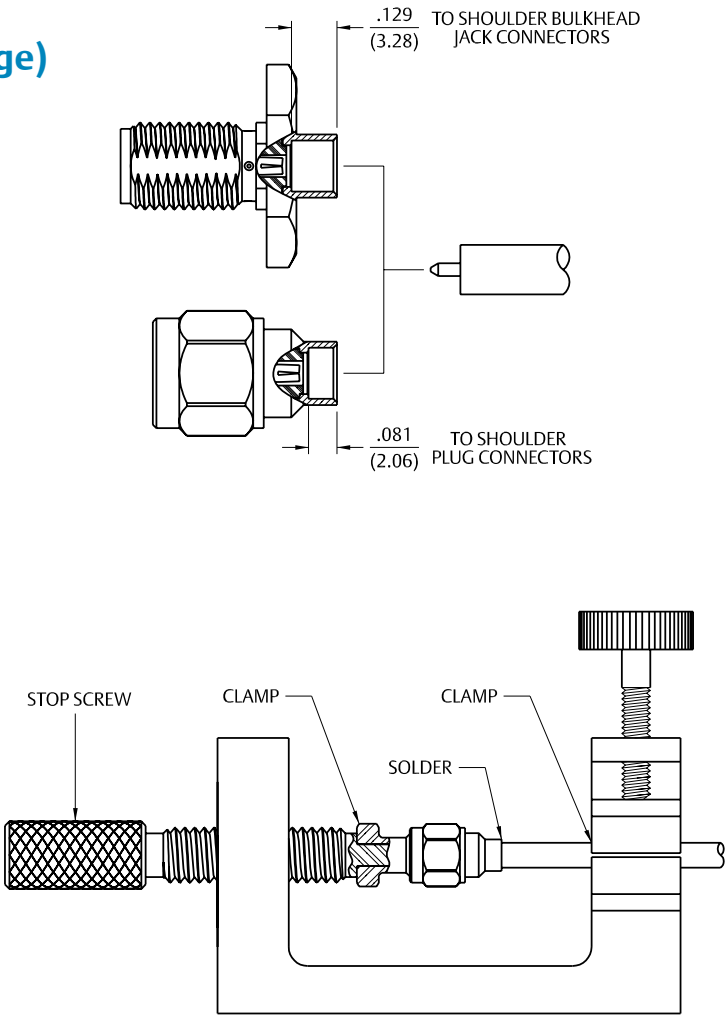
SMA Straight Solder Type for Semi-Rigid Cables

- 1. Identify the connector (plug or jack) and tools.
- 2. Strip the cable jacket and dielectric to dimension shown. Do not nick the center conductor.
- 3. Bevel the entire diameter on the end of the cable center conductor until the point resembles the appropriate dimensional profile. This operation can be accomplished effectively by using the recommended center conductor pointing tool as described in step 4.
- 4. Insert the stripped cable into the bushing of the appropriate pointing tool until the center conductor just touches the blade. While maintaining light pressure on the center conductor against the blade, turn the tool in a counter-clockwise fashion as viewed from the bushing end of the tool. Continue cutting the center conductor point until the cable jacket bottoms out inside the bushing.
- 5. Attach the appropriate soldering mating fixture to the connector and tighten to a maximum of 8 inch pounds of torque.
- 6. Clean all debris from the prepared cable and insert the cable into the connector, making sure that the cable jacket bottoms out against the internal shoulder of the connector body.
- 7. Insert the stop screw into the mating fixture. Clamp the cable and fixtured connector assembly securely in the soldering vise. Solder the connector body to the cable as shown, while insuring the cable dielectric expansion does not move the assembly. Allow the assembly to cool before removing the connector from the fixture.



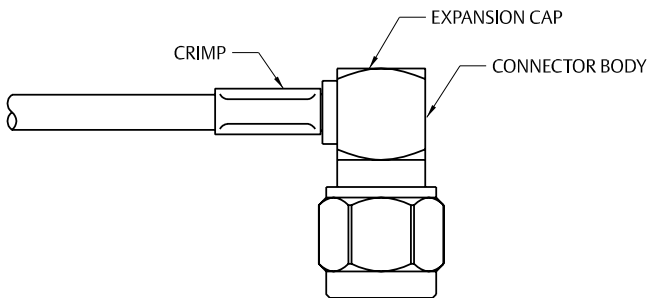
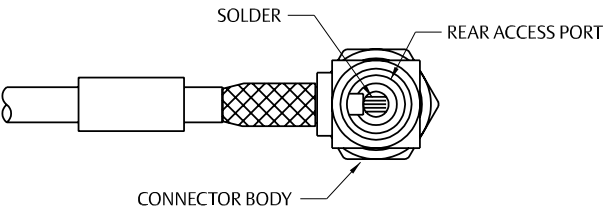
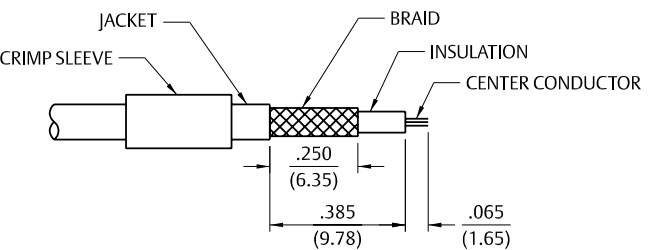
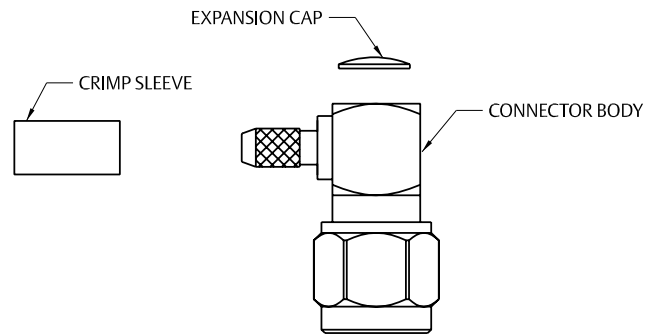
SMA Straight Solder Type for Semi-Rigid Cables (cont'd from last page)

| Cable Group                | Part No.                     |
|----------------------------|------------------------------|
| RG-405/U (.086 Semi-Rigid) | 141-0593-421<br>141-0693-062 |
| RG-402/U (.141 Semi-Rigid) | 141-0594-421<br>141-0694-062 |



SMA Crimp Type Right Angle Plugs for Flexible Cable

1. Identify connector parts. (3 piece parts)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. When stripping LMR-100 low loss cable, remove foil back to where cable jacket is stripped. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
3. Flare braid and slide cable into body making certain that the cable insulation bottoms on center contact. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended.
4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool. Place expansion cap in access port and seat with .187 (4.75) diameter flat punch. Shrink heat shrink tubing over crimp sleeve if applicable.



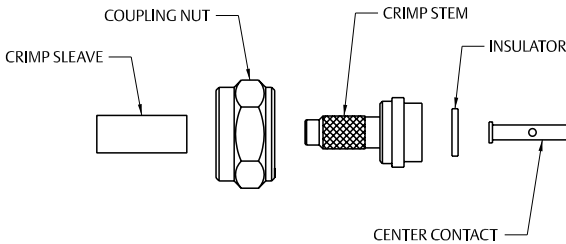
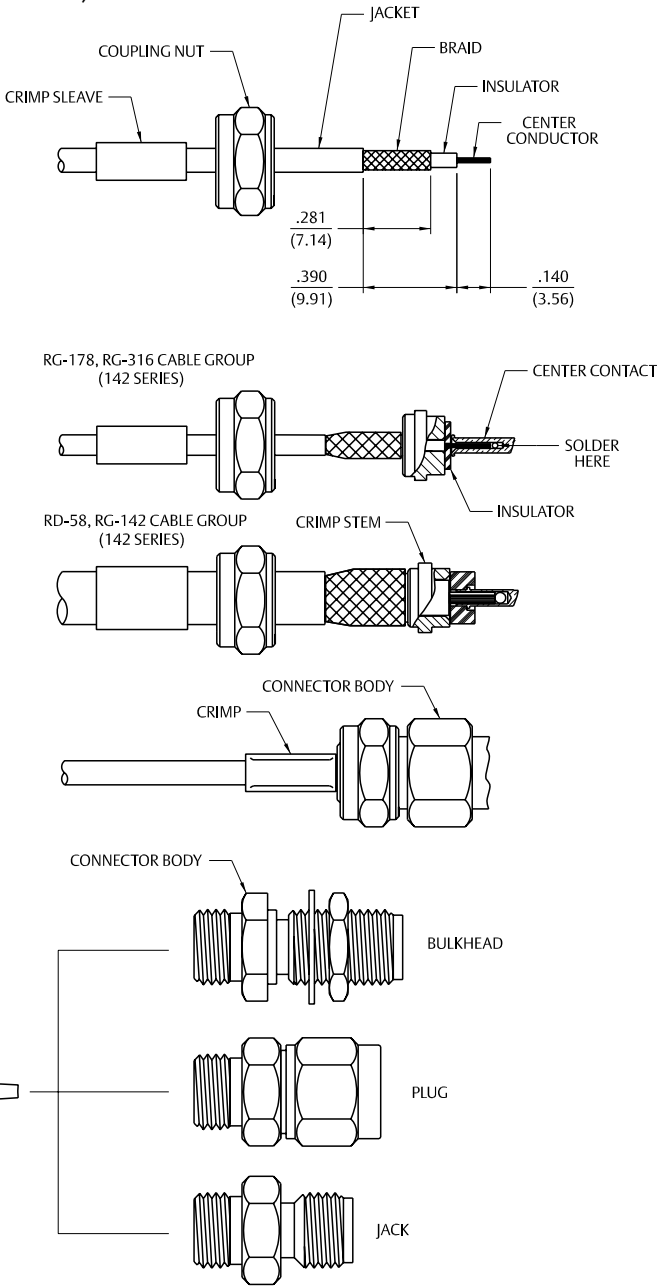
SMA Crimp Type Right Angle Plugs for Flexible Cable (cont'd from last page)

| Cable Group                      | Part No.                     | Crimp Hex                  |
|----------------------------------|------------------------------|----------------------------|
| RG-316/U, 161, 174, 188; LMR-100 | 141-0403-102                 | .128 (3.25)                |
| RG-316 DS, 188 DS                | 141-0404-112                 | .151 (3.83)                |
| RG-58/U, 141, 303                | 141-0407-102                 | .213 (5.41)                |
| RG-55/U, 142, 223, 400           | 141-0408-102                 | .213 (5.41)                |
| RG-178/U, 196                    | 142-0402-101<br>142-0402-106 | .105 (2.67)<br>.105 (2.67) |
| RG-316/U, 161, 174, 188; LMR-100 | 142-0403-101<br>142-0403-106 | .128 (3.25)<br>.128 (3.25) |
| RG-316 DS, 188 DS                | 142-0404-101<br>142-0404-106 | .151 (3.83)<br>.151 (3.83) |
| RG-58/U, 141, 303                | 142-0407-101<br>142-0407-106 | .213 (5.41)<br>.213 (5.41) |
| RG-55/U, 142, 223, 400           | 142-0408-101<br>142-0408-106 | .213 (5.41)<br>.213 (5.41) |
| RG-179/U, 187                    | 142-0433-101<br>142-0433-106 | .128 (3.25)<br>.128 (3.25) |
| RG-316/U, 161, 174, 188; LMR-100 | 142-4403-101<br>142-4403-106 | .128 (3.25)<br>.128 (3.25) |
| RG-316 DS, 188 DS                | 142-4404-101<br>142-4404-106 | .151 (3.83)<br>.151 (3.83) |
| RG-58/U, 141, 303                | 142-4407-101<br>142-4407-106 | .213 (5.41)<br>.213 (5.41) |
| RG-55/U, 142, 223, 400           | 142-4408-101<br>142-4408-106 | .213 (5.41)<br>.213 (5.41) |
| RG-316/U, 161, 174, 188; LMR-100 | 142-5403-101<br>142-5403-106 | .128 (3.25)<br>.128 (3.25) |
| RG-316 DS, 188 DS                | 142-5404-101<br>142-5404-106 | .151 (3.83)<br>.151 (3.83) |
| RG-58/U, 141, 303                | 142-5407-101<br>142-5407-106 | .213 (5.41)<br>.213 (5.41) |
| RG-55/U, 142, 223, 400           | 142-5408-101<br>142-5408-106 | .213 (5.41)<br>.213 (5.41) |
| RG-316/U, 188, 174               | 142-9403-101                 | .128 (3.25)                |
| RG-316 DS, 188 DS                | 142-9404-101                 | .151 (3.83)                |
| RG-58/U, 141                     | 142-9407-101                 | .213 (5.41)                |

SMA Crimp Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable

1. Identify connector parts. (6 piece parts – except bulkhead)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve, nut and heat shrink tubing (as applicable) onto cable as shown.
3. Flare braid and slide cable into crimp stem. Place rear insulator and center contact over center conductor and position as shown for different cable sizes. Solder center conductor to contact through the solder hole. Solder must not be allowed to gather and run on outside of contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended.
4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool. Slide center contact assembly into connector body. Thread coupling nut onto body and tighten to 10 in.-lb. torque. Slide heat shrink forward and shrink (as applicable).

| Cable Group             | Part No.                     | Crimp Hex                  |
|-------------------------|------------------------------|----------------------------|
| RG-178/U, 196           | 142-0302-401<br>142-0302-406 | .105 (2.67)<br>.105 (2.67) |
| RG-316/U, 161, 174, 188 | 142-0303-401<br>142-0303-406 | .128 (3.25)<br>.128 (3.25) |
| RG-316 DS, 188 DS       | 142-0304-401<br>142-0304-406 | .151 (3.83)<br>.151 (3.83) |
| RG-58/U, 141, 303       | 142-0307-401<br>142-0307-406 | .213 (5.41)<br>.213 (5.41) |
| RG-55/U, 142, 223, 400  | 142-0308-401<br>142-0308-406 | .213 (5.41)<br>.213 (5.41) |
| RG-316/U, 161, 174, 188 | 142-0403-001<br>142-0403-006 | .128 (3.25)<br>.128 (3.25) |



## SMA High Frequency End Launch Connectors PC Mounting Instructions

- High frequency end launch performance is dependent upon proper mounting. The following factors must be controlled for optimum performance:
- a. The connector should fit tightly against the circuit board edge, avoid gaps.
  - b. The center contact pin must lie parallel and flat against the circuit board, avoid gaps.
  - c. The contact pin should be centered on the circuit board signal trace.
  - d. Use a minimal amount of solder between the contact pin and signal trace. Do not allow excess solder to build up or flow down the trace.
  - e. Clean all excess flux and other residue from the launch area, especially between the trace and ground.

The basic steps required to mount the end launch connector to the circuit board are as follows:

1. Fixture 140-0000-973 should be used as an aid during manual soldering. The fixture protects the connector from damage during clamping and also maintains the proper location of the connector's insulator and contact. To use the fixture, thread the coupling nut on the mating end of the connector and hand tighten. This mounting assembly can now be held in a vice or similar clamping device, as shown in Figure 1.
2. Position connector on the circuit board, making sure the contact pin is aligned with the center of the signal trace as shown in Figure 2. Make sure that the connector legs and contact pin are held flush against the top of the circuit board, keeping the axis of the connector parallel to the plane of the circuit board, as shown in Figure 3.
3. A small amount of Teflon® insulation projects from rear mating plane of the connector, which acts as a seal when soldering the center conductor pin to the trace. Clamp the connector tightly against the edge of the board. This action compresses the insulator seal against the board edge. This effectively creates a barrier between the inner and outer conductors, preventing the bridging of solder.
4. While ensuring the connector is held in the correct position, solder the ground legs and/or ground posts to the top and bottom of the board prior to bonding the center pin to the trace.
5. Once the connector body is properly grounded to the board, the center contact pin can be bonded to the trace by using a minimal amount of solder as shown in Figure 4. It is important that solder flows along the length of the exposed pin, creating a good electrical and mechanical connection. Remove any excess solder that is not required for a solid joint.
6. Clean all flux and other residues from the trace area between the signal side ground legs, as any flux present between the signal trace and ground will affect performance. The completed mounting assembly should look similar to the one shown in Figure 5.



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

The **End Launch** connector is attached to the circuit board by inserting the board edge between the legs and soldering the legs and center conductor to the pads on the board. For optimum high frequency performance, the connector to circuit board transition must be adjusted for low VSWR. To compensate for the transition from coax to microstrip, trace widths "A" and "B" must be adjusted based on circuit board thickness. When properly adjusted, this technique yields a low VSWR over a wide bandwidth.

The tabulated dimensions "A", "B", "C", "D", and "E" were determined experimentally to achieve low VSWR (typically less than 1.5 up to 18 GHz). The circuit board uses connectors for these tests that are double-sided FR4 with 1 oz. copper on both sides. The copper was left on the bottom of the board to create a ground plane for the 50 Ohm microstrip structure. While not all inclusive, these dimensions are given as reference information for selected SMA End Launch connectors. Further adjustments may be necessary depending upon the application. All dimensions are in inches (millimeters).

| Part No.     | Base Width | Board Thickness | "A"                                          | "B"  | "C"  | "D"  | "E"  |
|--------------|------------|-----------------|----------------------------------------------|------|------|------|------|
| 142-0791-801 | .375       | .062 (1.57)     | .073                                         | .073 | .250 | .440 | .200 |
| 142-0791-811 | .375       | .042 (1.07)     | .103                                         | .103 | .250 | .440 | .200 |
| 142-0791-821 | .375       | .062 (1.57)     | .083                                         | .083 | .250 | .440 | .200 |
| 142-1701-821 | .375       | .062 (1.57)     | See Figure 2 below for attachment dimensions |      |      |      |      |
| 142-1701-831 | .375       | .059 (1.50)     | See Figure 2 below for attachment dimensions |      |      |      |      |

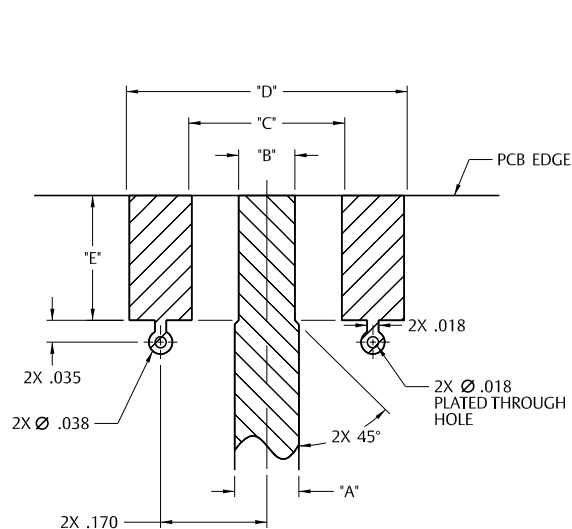


Figure 1

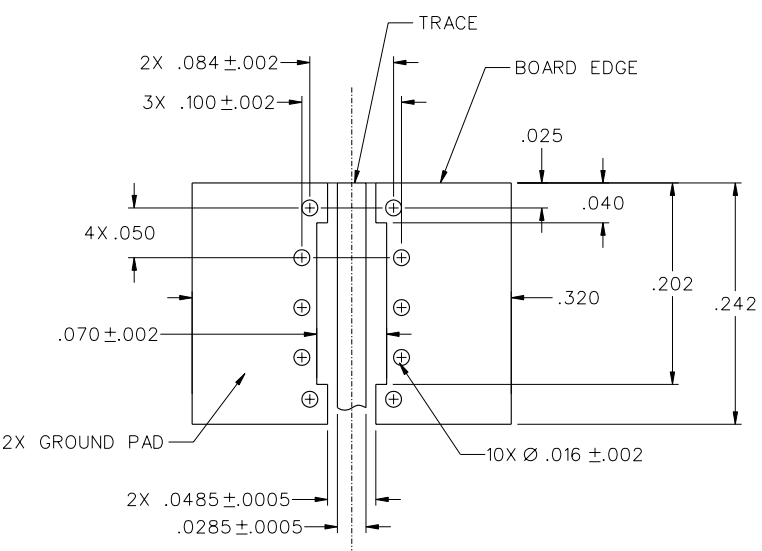


Figure 2



Reference dimensions for 50 Ohm grounded coplanar waveguide using Rogers Corporation RO4003C™ high frequency substrate laminate \*

| GCPW 50Ω Impedance Reference Dimensions * |                     |                     |                 |                 | Mounting and Via |             |             |
|-------------------------------------------|---------------------|---------------------|-----------------|-----------------|------------------|-------------|-------------|
| Part No.                                  | Substrate Thickness | Conductor Thickness | Trace Width "A" | Ground Gaps "B" | Fig              | "C"         | "D"         |
| 142-0761-801                              | .0080 (0.203)       | .0014 (0.036)       | .0155 (0.394)   | .0100 (0.254)   | 1                | .066 (1.68) | .096 (2.44) |
| 142-0761-811                              | .0080 (0.203)       | .0014 (0.036)       | .0155 (0.394)   | .0100 (0.254)   | 1                | .066 (1.68) | .096 (2.44) |
| 142-0761-821                              | .0160 (0.406)       | .0014 (0.036)       | .0285 (0.724)   | .0100 (0.254)   | 1                | .084 (2.13) | .113 (2.87) |
| 142-0761-831                              | .0160 (0.406)       | .0014 (0.036)       | .0285 (0.724)   | .0100 (0.254)   | 1                | .084 (2.13) | .113 (2.87) |
| 142-0761-841                              | .0080 (0.203)       | .0014 (0.036)       | .0155 (0.394)   | .0100 (0.254)   | 2                | .066 (1.68) |             |
| 142-0761-851                              | .0080 (0.203)       | .0014 (0.036)       | .0155 (0.394)   | .0100 (0.254)   | 2                | .066 (1.68) |             |
| 142-0761-861                              | .0160 (0.406)       | .0014 (0.036)       | .0285 (0.724)   | .0100 (0.254)   | 2                | .084 (2.13) |             |
| 142-0761-871                              | .0160 (0.406)       | .0014 (0.036)       | .0285 (0.724)   | .0100 (0.254)   | 2                | .084 (2.13) |             |
| 142-0761-881                              | .0080 (0.203)       | .0014 (0.036)       | .0155 (0.394)   | .0100 (0.254)   | 1                | .066 (1.68) | .096 (2.44) |
| 142-0761-891                              | .0080 (0.203)       | .0014 (0.036)       | .0155 (0.394)   | .0100 (0.254)   | 2                | .066 (1.68) |             |
| 142-0771-821                              | .0160 (0.406)       | .0014 (0.036)       | .0285 (0.724)   | .0100 (0.254)   | 1                | .084 (2.13) | .113 (2.87) |
| 142-0771-831                              | .0160 (0.406)       | .0014 (0.036)       | .0285 (0.724)   | .0100 (0.254)   | 2                | .084 (2.13) |             |

\* These calculated dimensions assume a quasi-static mode of propagation, but dispersion does exist for coplanar waveguide. The characteristic impedance and effective dielectric constant may increase slightly for X-band and higher frequencies, unless very small ground to ground gap spacing is used.

It is assumed the conductors have rectangular cross-sections. The etching process used in circuit board fabrication actually produces trapezoidal shapes. Therefore, the GCPW impedance may increase somewhere between that of a perfect rectangular conductor and a theoretical zero thickness conductor.



Figure 1

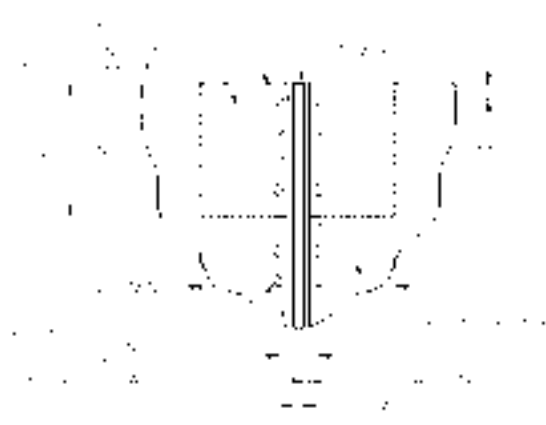


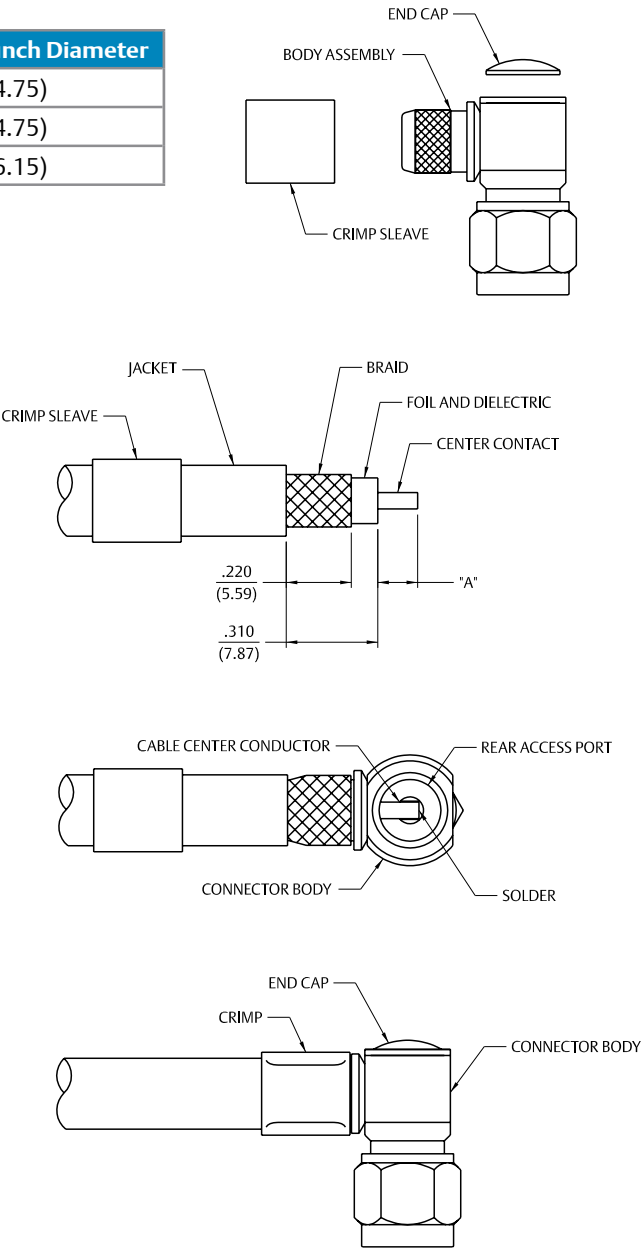
Figure 2

Right Angle SMA Low Loss Diameter .195, .200 and .240

1. Identify connector parts. (3 piece parts)
2. Strip cable to dimensions shown. Do not nick braid, foil or center conductor. Cut foil flush with dielectric, do not remove foil. Make sure that dielectric is clean and free from all particles. Tin center conductor, keeping solder amount to a minimum. Slide crimp sleeve onto jacket of cable.
3. Flare braid and slide body assembly over foil and dielectric, then under braid. Make sure cable center conductor is contained within connector contact, but do not allow foil and dielectric to enter body access port. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) Diameter solder is recommended.
4. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson hand crimp tool 141-0000-913 and recommended crimp die hex. Place expansion cap in access port and seat with recommended Diameter flat punch.

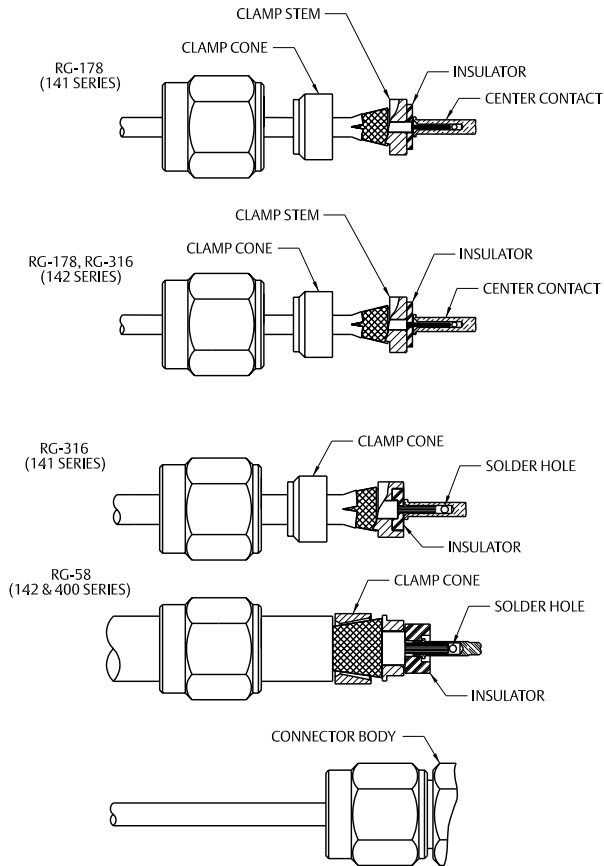
| Low Loss Diameter | "A"         | Crimp Die Hex   | Flat Punch Diameter |
|-------------------|-------------|-----------------|---------------------|
| 0.195             | .110 (2.79) | .213 (5.41) hex | .187 (4.75)         |
| 0.200             | .110 (2.79) | .213 (5.41) hex | .187 (4.75)         |
| 0.240             | .135 (3.43) | .255 (6.48) hex | .242 (6.15)         |

| Cable Group | Part No.     | Crimp Hex   |
|-------------|--------------|-------------|
| LMR-195     | 142-0407-101 | .213 (5.41) |
|             | 142-0407-106 | .213 (5.41) |
| LMR-200     | 142-4439-101 | .213 (5.41) |
|             | 142-4439-106 | .213 (5.41) |
| LMR-240     | 142-0435-101 | .255 (6.48) |
|             | 142-0435-106 | .255 (6.48) |
| LMR-195     | 142-5407-101 | .213 (5.41) |
|             | 142-5407-106 | .213 (5.41) |
| LMR-200     | 142-0439-101 | .213 (5.41) |
|             | 142-0439-106 | .213 (5.41) |
| LMR-240     | 142-5435-101 | .255 (6.48) |
|             | 142-5435-106 | .255 (6.48) |
| LMR-195     | 142-4407-101 | .213 (5.41) |
|             | 142-4407-106 | .213 (5.41) |
| LMR-200     | 142-5439-101 | .213 (5.41) |
|             | 142-5439-106 | .213 (5.41) |
| LMR-240     | 142-4435-101 | .255 (6.48) |
|             | 142-4435-106 | .255 (6.48) |

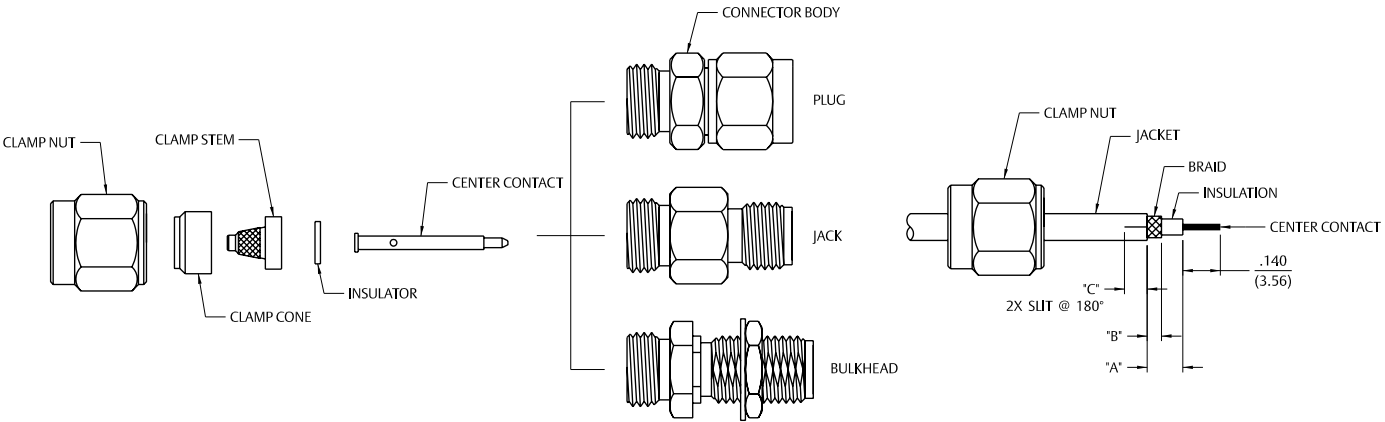


SMA Clamp Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable

- 1. Identify connector parts. (6 piece parts – except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide clamp nut and clamp cone onto cable as shown. Clamp cone must be oriented as shown for each size of cable. The RG-58/142 clamp cone slides over braid and against jacket.
- 3. Flare braid and slide cable into clamp stem. Place rear insulator and center contact over center conductor and position as shown for different cable sizes. Solder center conductor to contact through the solder hole. Solder must not be allowed to gather and run on outside of contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended.
- 4. Arrange braid uniformly around clamp stem. Slide center contact assembly into body. Slide clamp nut against clamp cone and braid and tighten to 10 in.-lb. torque.



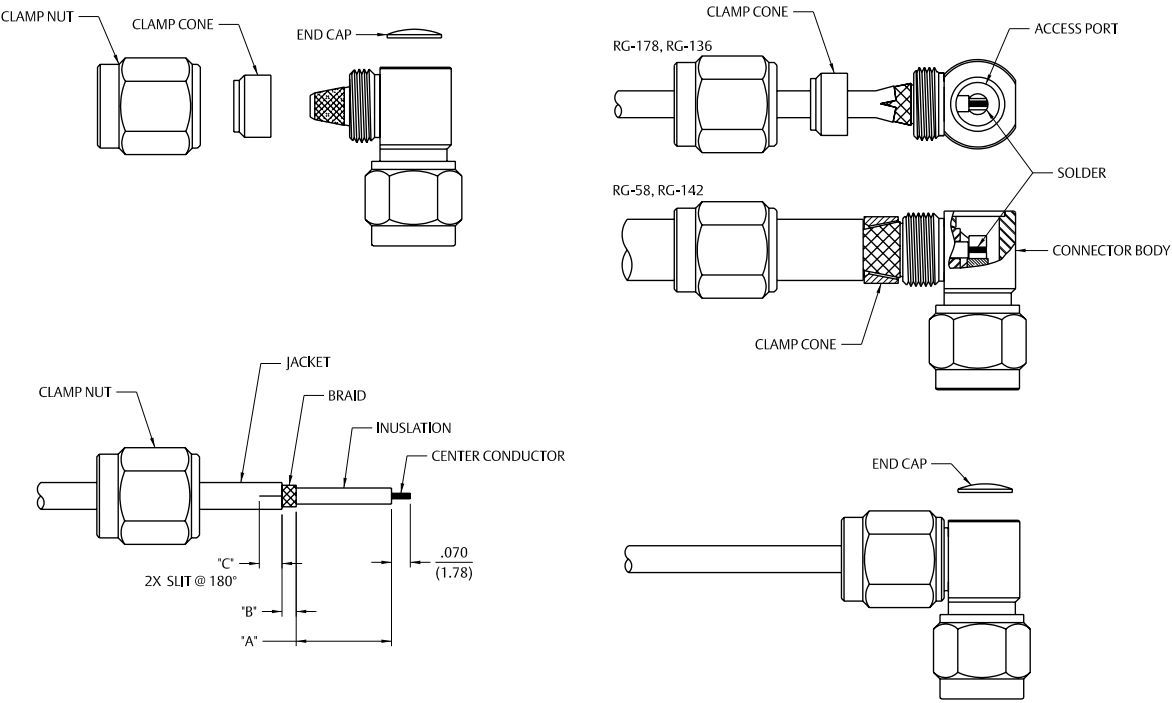
| Cable Group            | Part No.         | "A"         | "B"         | "C"         |
|------------------------|------------------|-------------|-------------|-------------|
| RG-178/U, 196          | 142-0202-011/016 | .133 (3.38) | .053 (1.35) | .085 (2.16) |
| RG-161/U, 174,188, 316 | 142-0203-011/016 | .133 (3.38) | .053 (1.35) | .085 (2.16) |
| RG-58/U, 141, 303      | 142-0207-011/016 | .225 (5.72) | .145 (3.68) | NONE        |
| RG-142, 223, 55, 400   | 142-0207-011/016 | .285 (7.24) | .165 (4.19) | NONE        |
| RG-178/U, 196          | 142-0102-401/406 | .133 (3.38) | .053 (1.35) | .085 (2.16) |
| RG-161/U, 174,188, 316 | 142-0103-401/406 | .133 (3.38) | .053 (1.35) | .085 (2.16) |
| RG-58/U, 141, 303      | 142-0107-401/406 | .225 (5.72) | .145 (3.68) | NONE        |
| RG-142, 223, 55, 400   | 142-0107-401/406 | .285 (7.24) | .165 (4.19) | NONE        |



SMA Clamp Type Right Angle Plugs for Flexible Cable

- 1. Identify connector parts. (4 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide clamp nut and clamp cone onto cable as shown. Clamp cone must be oriented as shown for each size of cable. The RG-58/142 clamp cone slides over braid and against jacket.
- 3. Flare braid and slide cable into body making certain that the cable insulation bottoms on center contact. Stepped down diameter of stem must slide under braid and jacket. Arrange braid uniformly around crimp stem. Slide clamp nut against clamp cone and braid and tighten to 10 in.-lb. torque.
- 4. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended. Place expansion cap in access port and seat with .187 (4.75) diameter flat punch.

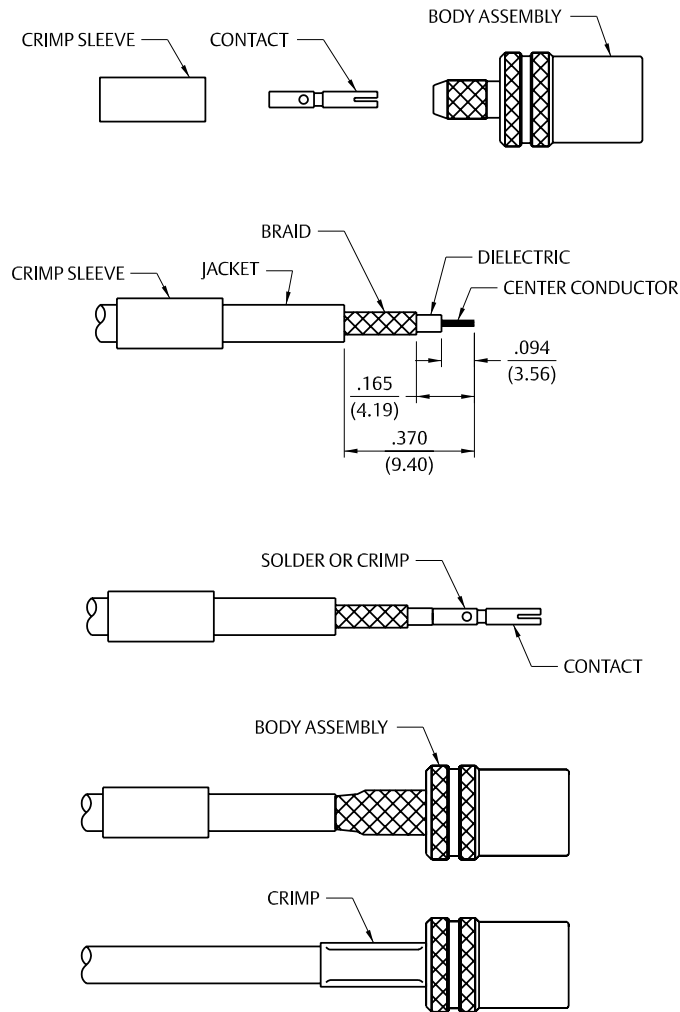
| Cable Group             | Part No.     | "A"          | "B"         | "C"         |
|-------------------------|--------------|--------------|-------------|-------------|
| RG-178/U, 196           | 142-0202-101 | .280 (7.11)  | .053 (1.35) | .085 (2.16) |
|                         | 142-0202-106 | .280 (7.11)  | .053 (1.35) | .085 (2.16) |
| RG-316/U, 161, 174, 188 | 142-0203-101 | .280 (7.11)  | .053 (1.35) | .085 (2.16) |
|                         | 142-0203-106 | .280 (7.11)  | .053 (1.35) | .085 (2.16) |
| RG-58/U 141, 303        | 142-0207-101 | .395 (10.03) | .160 (4.06) | NONE        |
|                         | 142-0207-106 | .395 (10.03) | .160 (4.06) | NONE        |
| RG-55/U, 142, 233, 400  | 142-0207-101 | .420 (10.67) | .180 (4.57) | NONE        |
|                         | 142-0207-106 | .420 (10.67) | .180 (4.57) | NONE        |



SMB 3-Piece Straight Plugs

- 1. Identify connector parts. (3 piece parts): Crimp sleeve, body assembly and contact
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.
- 3. Assemble contact onto cable as shown.  
**Solder Attachment:** Solder contact to center conductor through solder hole using .015 (0.38) diameter solder. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** A miniature 8 indent crimp tool 140-0000-970 is recommended. Crimp location should be centered between end of contact and X-hole using positioner 140-0000-971. Crimp attachment to solid center conductor cables is not recommended.
- 4. Flare braid and slide body assembly over contact and under braid. Then seat body assembly firmly onto contact. The cable may have to be held in a clamping fixture. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using recommended crimp tool. Slide heat shrink forward and shrink (as applicable).

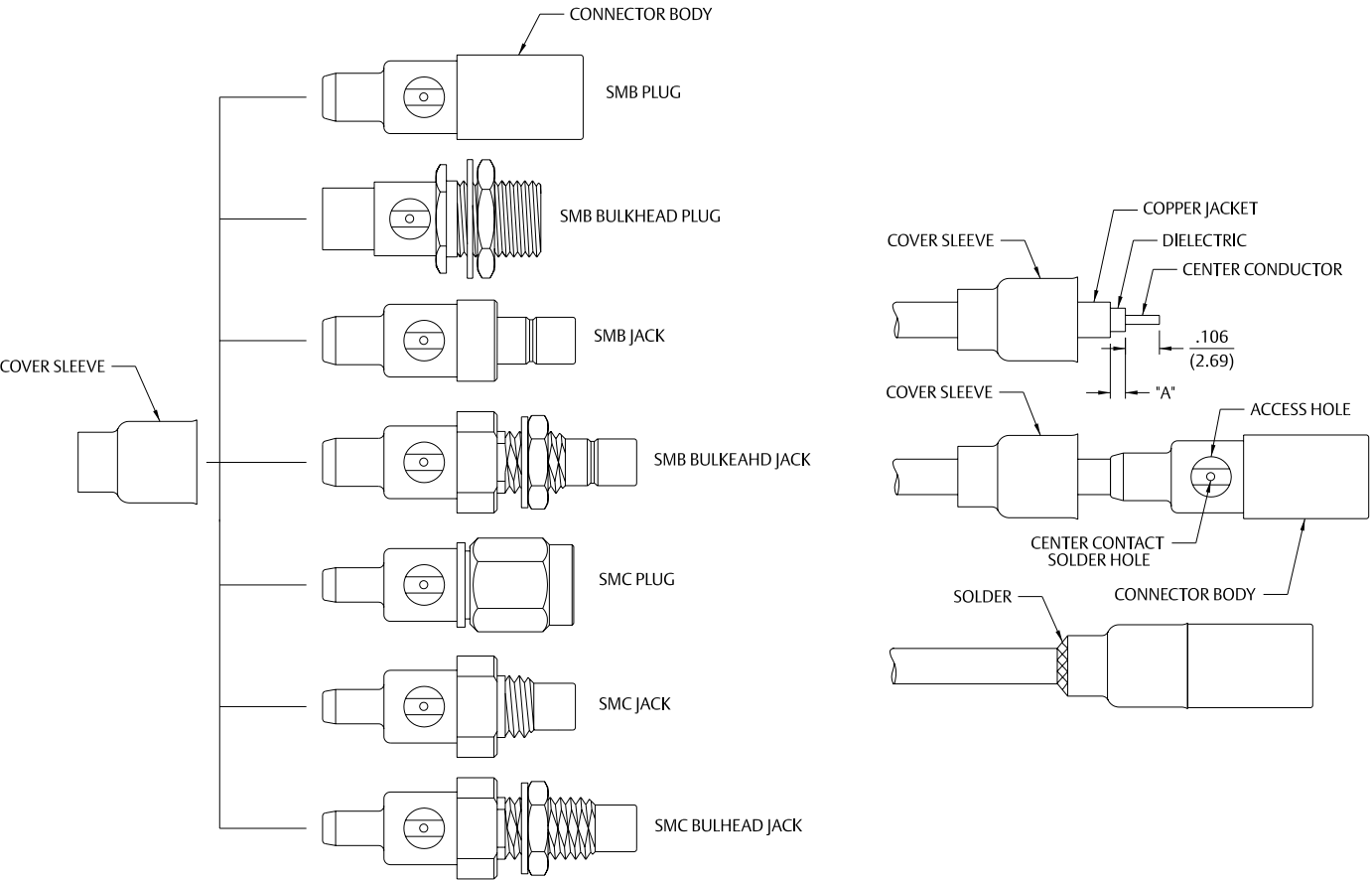
| Cable Group                       | Part No.         | Crimp Hex   |
|-----------------------------------|------------------|-------------|
| RG-316/U, 161, 174, 179, 187, 188 | 131-3403-021/026 | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS         | 131-3404-021/026 | .151 (3.83) |
| RG-58/U, 141, 303                 | 131-3407-011/016 | .213 (5.41) |
| RG-179/U, 187                     | 131-8433-001/006 | .128 (3.25) |
| RG-179 DS, 187 DS                 | 131-8434-001/006 | .151 (3.83) |
| Belden 735A                       | 131-8445-011/016 | .178 (4.52) |
| RG-316/U, 188, 174, 179, 187      | 131-9403-021     | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-021     | .151 (3.83) |



SMB/SMC Solder Type Straight Plugs and Jacks for Semi-Rigid Cable

- 1. Identify connector parts. (2 piece parts – except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick center conductor. Slide cover sleeve onto cable as shown.
- 3. Insert cable into body making certain that the cable insulation bottoms on center contact. Solder center conductor to contact through the side access ports and hole in center contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended.
- 4. Slide cover sleeve over access ports and solder body to cable and cover sleeve to body. Use a minimum amount of heat to minimize cable insulation movement.

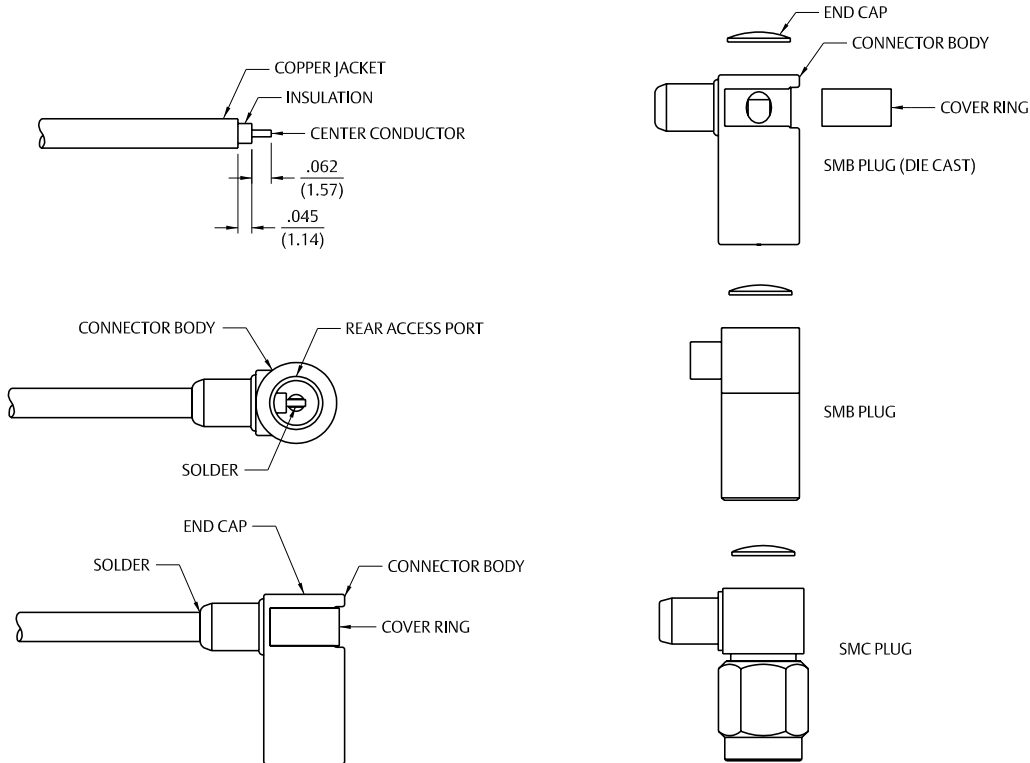
| Cable Group                | Part No.         | "A"         |
|----------------------------|------------------|-------------|
| RG-405/U (.086 Semi-Rigid) | 131-3593-401/406 | .025 (0.64) |
|                            | 131-3693-001/016 | .025 (0.64) |
| RG-402/U (.141 Semi-Rigid) | 131-3694-401/406 | .050 (1.27) |
| RG-405/U (.086 Semi-Rigid) | 131-6593-401/406 | .025 (0.64) |



SMB/SMC Solder Type Right Angle Plugs for Semi-Rigid Cable

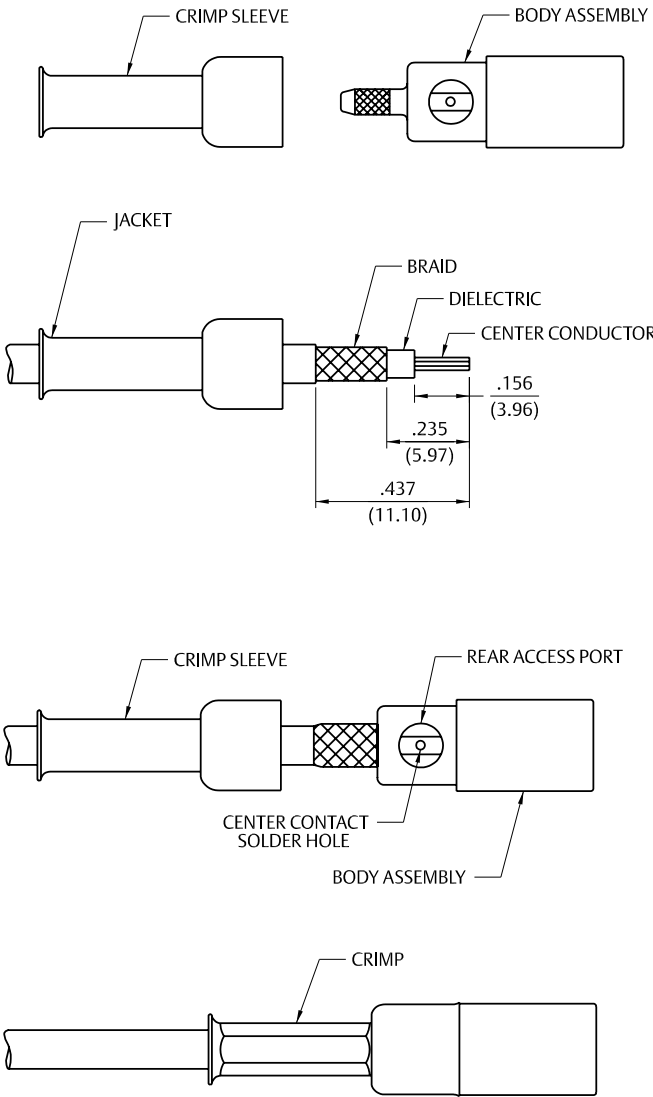
- 1. Identify connector parts. (2 piece parts – except diecast)
- 2. Strip cable to dimensions shown. Do not nick center conductor.
- 3. Insert cable into body making certain that the cable insulation bottoms on center contact. Solder center conductor to contact through the rear and side access ports. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended.
- 4. Solder body to cable. Use a minimum amount of heat to minimize cable insulation movement. Place expansion cap in access port and set with .125 (3.17) diameter punch. Snap cover ring over side access port.

| Cable Group                | Part No.                                                     |
|----------------------------|--------------------------------------------------------------|
| RG-405/U (.086 Semi-Rigid) | 131-1693-101<br>131-1693-116<br>131-3693-101<br>131-3693-116 |



SMB Straight Crimp Type Straight Plugs for Flexible Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin. Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable dielectric bottoms against center contact.  
**Solder Attachment:** Solder center conductor to contact through the side access ports and hole in center contact. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended.  
**Crimp Attachment:** Crimp contacts with 141-0000-911 dieset in 144-0000-900 tool frame.

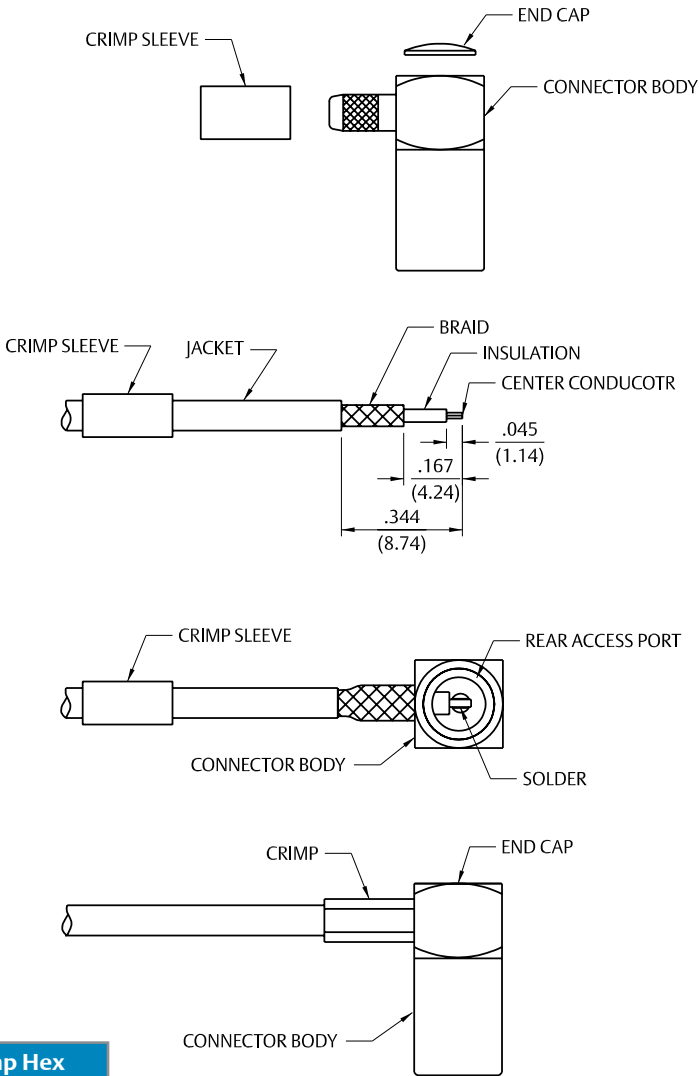


| Cable Group                       | Part No.     | Crimp Hex   |
|-----------------------------------|--------------|-------------|
| RG-316/U, 188, 174, 179, 187      | 131-9403-001 | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-001 | .151 (3.83) |

SMB Right Angle Crimp Type Straight  
Plugs for Flexible Cable

- 1. Identify connector parts. (3 piece parts: crimp sleeve, body assembly and expansion cap.)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body assembly making certain that the cable insulation bottoms on center contact. Arrange braid uniformly around crimp stem of body assembly. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.
- 4. Solder center conductor to contact through the rear and side access ports. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Place expansion cap in access port and seat with a .125 (3.17) diameter flat punch. Snap cover ring over side access port.

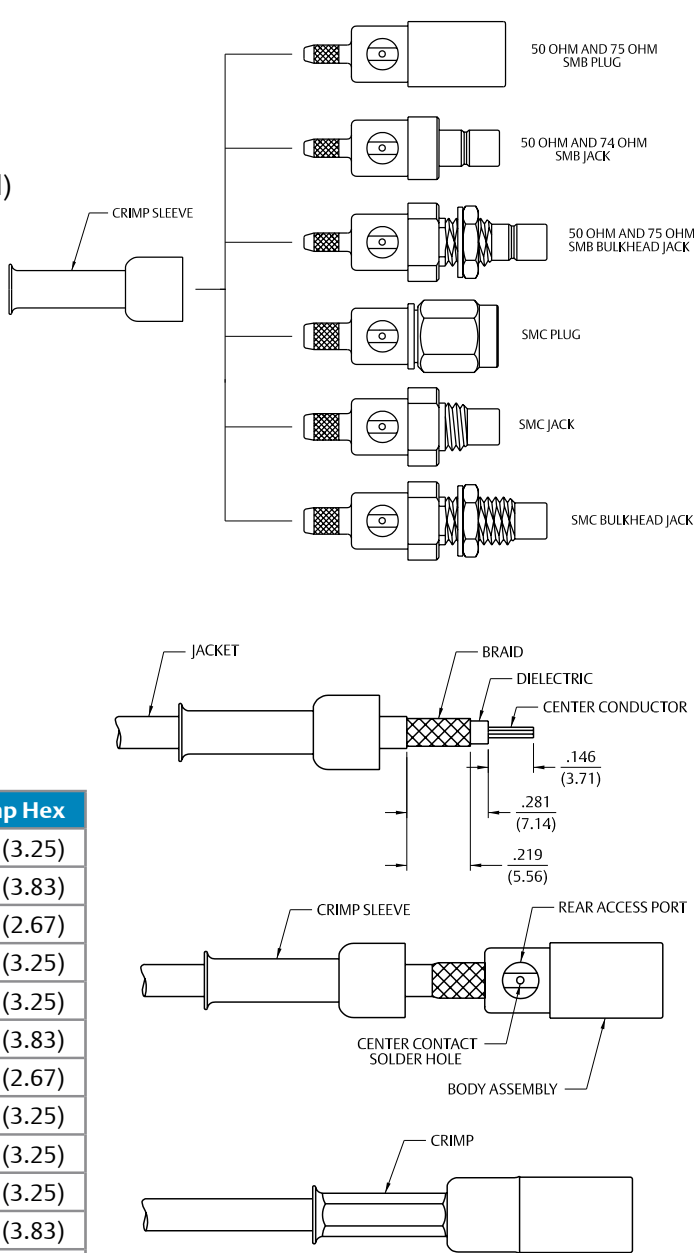
| Cable Group                       | Part No.            | Crimp Hex   |
|-----------------------------------|---------------------|-------------|
| RG-316/U, 188, 174, 179,187       | 131-9403-101 / -116 | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-101 / -116 | .151 (3.83) |



SMB/SMC/Mini-75Ohm SMB (2-Piece)  
Crimp Type Straight Plugs, Jacks and  
Bulkhead Jacks for Flexible Cable

- 1. Identify connector parts. (2 piece parts – except bulkhead)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin. Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable dielectric bottoms against center contact.  
**Solder Attachment:** Solder center conductor to contact through the side access ports and hole in center contact. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended.  
**Crimp Attachment:** Crimp applicable 50 Ohm connector contacts with 141-0000-911 dieset in 144-0000-900 tool frame. Crimp 75 Ohm connector contacts with 141-0000-924 dieset in 144-0000-900 tool frame. Crimp attachment to solid center conductor cables is not recommended.

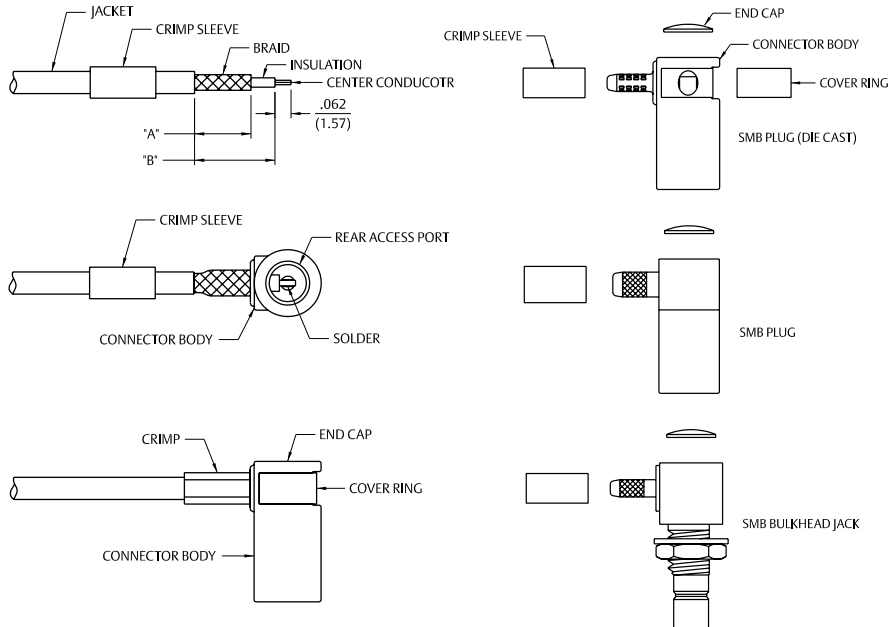
| Cable Group                       | Part No.         | Crimp Hex   |
|-----------------------------------|------------------|-------------|
| RG-316/U, 161, 174, 179, 187, 188 | 131-1403-001/016 | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS         | 131-1404-001/016 | .151 (3.83) |
| RG-178/U, 196                     | 131-3302-001/006 | .105 (2.67) |
| RG-316/U, 161, 174, 179, 187, 188 | 131-3303-001/006 | .128 (3.25) |
| RG-179 DS, 187 DS,188 DS, 316 DS  | 131-3304-401/406 | .151 (3.83) |
| RG-178/U, 196                     | 131-3402-001/016 | .105 (2.67) |
| RG-316/U, 161, 174, 179, 187, 188 | 131-3403-001/016 | .128 (3.25) |
| RG-179 DS, 187 DS, 188 DS, 316 DS | 131-3404-001/016 | .151 (3.83) |
| RG-58/U, 141, 303                 | 131-3407-001/006 | .213 (5.41) |
| RG-316/U, 161, 174, 188           | 131-6303-401/406 | .128 (3.25) |
| RG-316 DS, 188 DS                 | 131-6304-401/406 | .151 (3.83) |
| RG-179/U, 187                     | 131-6333-401/406 | .128 (3.25) |
| RG-316/U, 161, 174, 188           | 131-6403-001/006 | .128 (3.25) |
| RG-316 DS, 188 DS                 | 131-6404-001/006 | .151 (3.83) |
| RG-179/U, 187                     | 131-6433-001/006 | .128 (3.25) |
| RG-179/U, 187, 316, 161, 174, 188 | 131-8303-401/406 | .128 (3.25) |
| RG-179 DS, 187 DS, 188DS, 316DS   | 131-8304-401/406 | .151 (3.83) |
| RG-179/U, 187, 316, 161, 174, 188 | 131-8403-001/006 | .128 (3.25) |
| RG-179 DS, 187 DS, 188 DS, 316 DS | 131-8404-001/006 | .151 (3.83) |
| RG-59                             | 131-8409-001/006 | .255 (6.48) |
| BELDEN 735A                       | 131-8445-001/006 | .178 (4.52) |



SMB/SMC/Mini-75Ohm SMB Crimp Type Right Angle Plugs and Right Angle Bulkhead Jacks for Flexible Cable

- 1. Identify connector parts. (4 piece parts: crimp sleeve, body assembly, expansion cap and covering ring. Die cast body only.)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body assembly making certain that the cable insulation bottoms on center contact. Arrange braid uniformly around crimp stem of body assembly. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.

- 4. Solder center conductor to contact through the rear and side access ports. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended. Place expansion cap in access port and seat with a .125 (3.17) diameter flat punch. Snap cover ring over side access port if applicable.

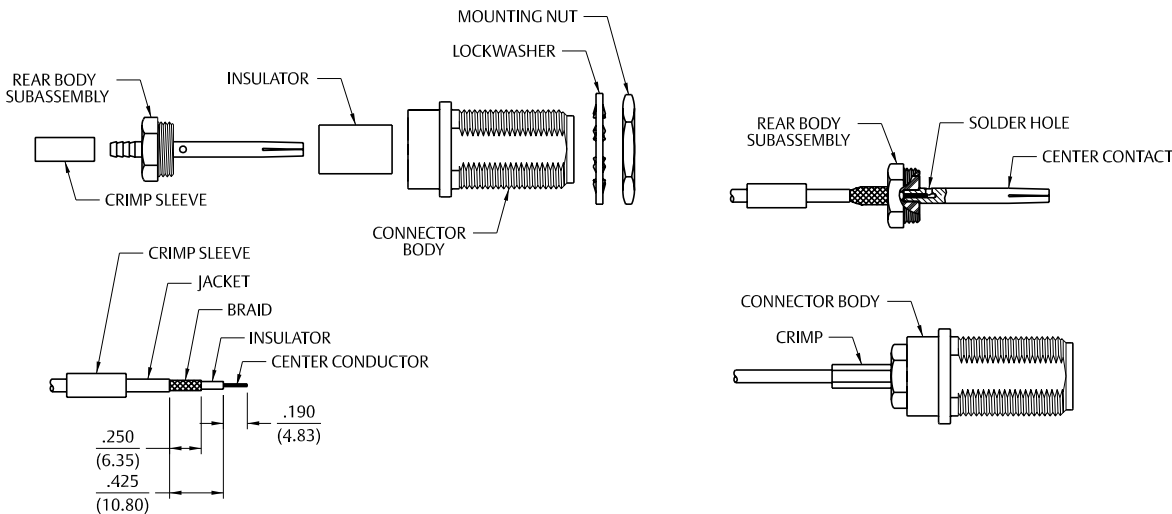


| Cable Group                       | Part No.         | "A"         | "B"         | Crimp Hex   |
|-----------------------------------|------------------|-------------|-------------|-------------|
| RG-178/U, 196                     | 131-1402-101/116 | .219 (5.56) | .312 (7.92) | .105 (2.67) |
| RG-316/U, 161, 174, 179, 187, 188 | 131-1403-101/116 | .219 (5.56) | .312 (7.92) | .128 (3.25) |
| RG-179 DS, 187 DS,188DS, 316 DS   | 131-1404-101/116 | .219 (5.56) | .312 (7.92) | .151 (3.83) |
| RG-316/U, 161, 174,179, 187, 188  | 131-3303-501/506 | .219 (5.56) | .312 (7.92) | .128 (3.25) |
| RG-179 DS, 187 DS,188 DS, 316 DS  | 131-3304-501/506 | .219 (5.56) | .312 (7.92) | .151 (3.83) |
| RG-178/U, 196                     | 131-3402-101/116 | .177 (4.50) | .289 (7.34) | .105 (2.67) |
| RG-316/U, 161, 174,179, 187, 188  | 131-3403-101/116 | .177 (4.50) | .289 (7.34) | .128 (3.25) |
| RG-179 DS, 187 DS,188 DS, 316 DS  | 131-3404-101/116 | .177 (4.50) | .289 (7.34) | .151 (3.83) |
| RG-58/U, 141, 303                 | 131-3407-101/106 | .219 (5.56) | .289 (7.34) | .213 (5.41) |
| RG-316/U, 161, 174, 188           | 131-6403-101/106 | .219 (5.56) | .312 (7.92) | .128 (3.25) |
| 316 DS, 188 DS                    | 131-6404-101/106 | .219 (5.56) | .312 (7.92) | .151 (3.83) |
| RG-179/U, 187                     | 131-6433-101/106 | .219 (5.56) | .312 (7.92) | .151 (3.83) |
| RG-179/U, 187, 316,               | 131-8403-101/106 | .177 (4.50) | .289 (7.34) | .128 (3.25) |
| 161, 174, 188                     | 131-8403-111/116 | .219 (5.56) | .312 (7.92) | .128 (3.25) |
| RG-179 DS, 187 DS                 | 131-8404-101/106 | .177 (4.50) | .289 (7.34) | .151 (3.83) |
| 316 DS, 188 DS                    | 131-8404-111/116 | .219 (5.56) | .312 (7.92) | .151 (3.83) |
| RG-59                             | 131-8409-101/106 | .219 (5.56) | .289 (7.34) | .255 (6.48) |
| BELDEN 735A                       | 131-8445-101/106 | .177 (4.50) | .289 (7.34) | .178 (4.52) |
| RG-316/U, 188, 174, 179, 187      | 131-9403-101/116 | .177 (4.50) | .289 (7.34) | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 131-9404-101/116 | .177 (4.50) | 2.89 (7.34) | .151 (3.83) |

Type N Crimp Type Bulkhead Jack for Flexible Cable

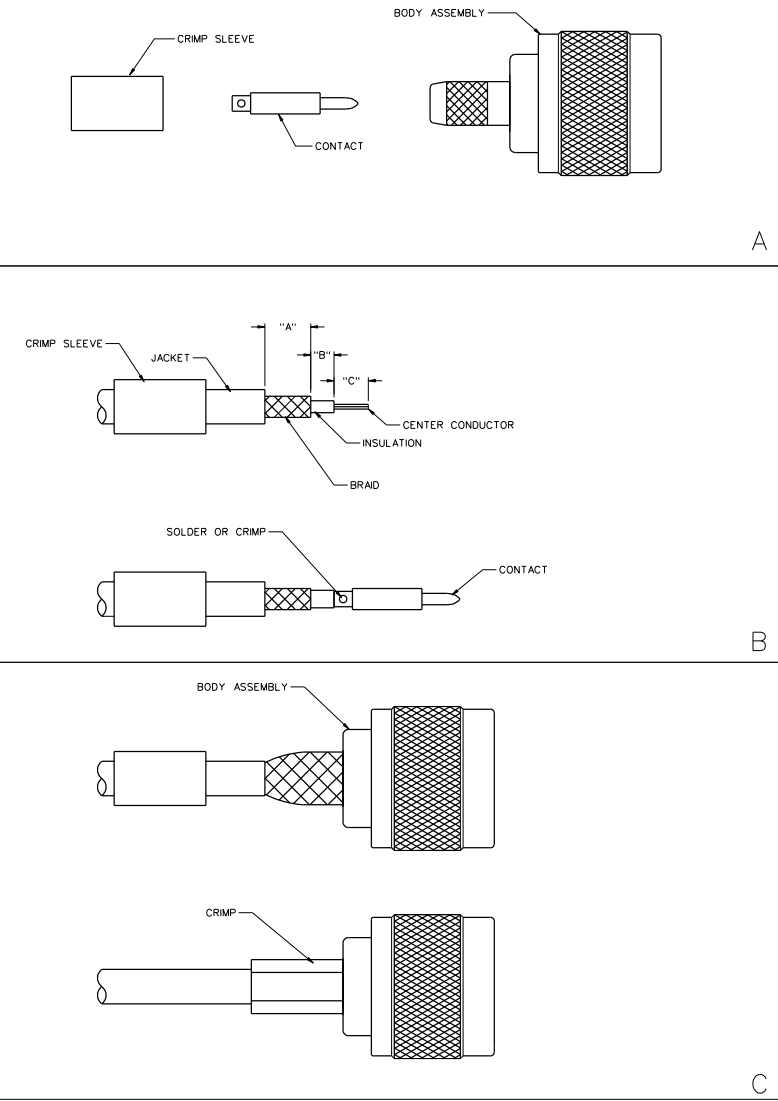
- 1. Identify connector parts. (6 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into a tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flare body and slide cable into crimp stem of rear body subassembly, until cable dielectric bottoms out on center contact. Solder center conductor to contact through the solder hole. Solder must not be allowed to gather and run on outside of contact. Use a minimum amount of solder for a good joint. .020 (0.51) diameter solder is recommended.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool. Slide insulator over center conductor and slide center contact assembly into connector body. Thread rear body subassembly into body and tighten securely (ref. 30 in-lbs torque.)

| Cable Group             | Part No.     | Crimp Hex   |
|-------------------------|--------------|-------------|
| RG-316/U, 161, 174, 188 | 134-0303-406 | .160 (4.06) |
| RG-316 DS, 188 DS       | 134-0304-406 | .160 (4.06) |
| RG-58/U, 141, 303       | 134-0307-406 | .213 (5.41) |
| RG-55/U, 142, 223, 400  | 134-0308-406 | .213 (5.41) |



Type N Straight Crimp Type Plugs  
for Flexible Cable

- 1. Identify connector parts. (3 piece parts – except bulkheads)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. A wire stripper of correct size is recommended for this step. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.
- 3. Assemble contact onto cable as shown.  
**Solder Attachment:** Solder contact to center conductor through hole using a minimum amount of solder for a good joint.  
**Crimp Attachment (where applicable):** Crimp contact to center conductor using recommended crimp hex.
- 4. Flare braid and slide body assembly over contact and under braid. Then seat body assembly firmly onto contact. The cable may have to be held in a clamping fixture. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using recommended crimp hex. Slide heat shrink forward and shrink (as applicable).



| Part No.     | Cable                  | Strip Dimensions |             |             | Crimp Sleeve Hex | Contact Crimp Hex | Recommended Crimp |
|--------------|------------------------|------------------|-------------|-------------|------------------|-------------------|-------------------|
| Hex          |                        | "A"              | "B"         | "C"         |                  |                   |                   |
| CPN681       | RG-58                  | .335 (8.50)      | .079 (2.00) | .157 (4.00) | .215 (5.46)      | .065 (1.65)       | 24-8858P          |
| CPN6813      | RG-142                 | .335 (8.50)      | .079 (2.00) | .157 (4.00) | .215 (5.46)      | .065 (1.65)       | 24-8858P          |
| CPN688       | RG-8, 213              | .354 (9.00)      | .138 (3.50) | .157 (4.00) | .429 (10.90)     | .100 (2.54)       | 24-313            |
| 138-4408-007 | RG-55/U, 142, 223, 400 | .301 (7.65)      | .140 (3.56) |             | .213 (5.41)      | .068 (1.73)       | .113 (2.87)       |
| 138-4449-007 | LMR-400, BELDEN 9913   | .385 (9.78)      | .170 (4.32) |             | .429 (10.90)     | .116 (2.95)       |                   |

Type N Crimp – Crimp Plugs  
for Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Slide the crimp sleeve onto the jacket; crimp narrow end first.
- 3. Crimp and solder the contact onto the center conductor using the recommended crimp hex or the minimum amount of solder for a good joint. Note: Contacts may need to be pre-fit onto the center conductor and soldered through the hole.
- 4. Flare the braid and slide the connector body over the contact and under the braid. Then seat the body FIRMLY onto the contact; the cable may need to be held in a clamping fixture. Arrange the braid uniformly around the crimp stem, then slide the crimp sleeve forward to the body and crimp the sleeve using the recommended crimp hex.

\* Cable Assembly Notes: The contact of the CPN-8/110 Connector fits RG-8 cable types with a center conductor diameter up to .110".

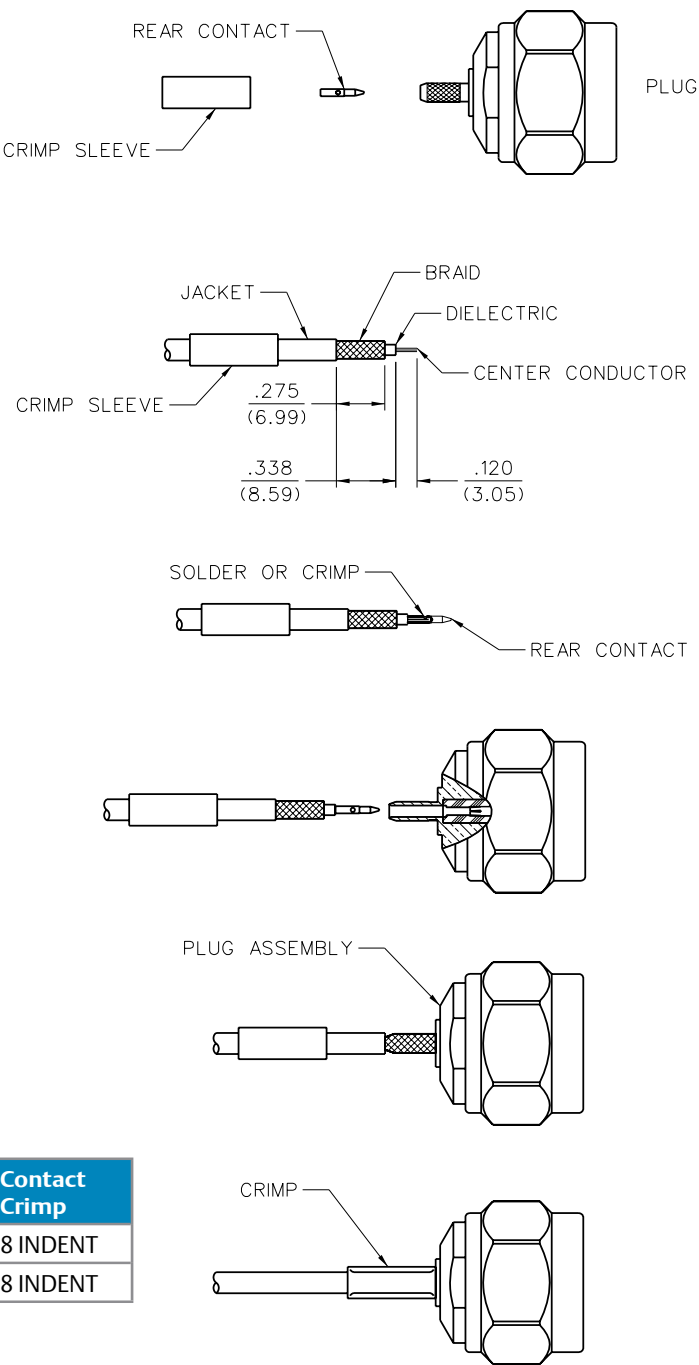
| Part No.    | Cable Type          | Wire Gauge | Wire Decimal | Jacket O.D.               | Hex Size     | Contact Crimp Hex | Recommended Crimp Tool |
|-------------|---------------------|------------|--------------|---------------------------|--------------|-------------------|------------------------|
| CPN-1       | RG-58               | 18         | .043 (1.09)  | .185 (4.07)-.205 (5.21)   | .213 (5.41)  | .100 (2.54)       | 24-312                 |
| CPN-2       | RG-59               | 22         | .0253 (6.43) | .220 (5.59)-.250 (6.35)   | .255 (6.48)  | .100 (2.54)       | 24-312                 |
| CPN-8       | RG-8, 213           | 13         | .072 (1.83)  | .400 (10.16)-.410 (10.44) | .406 (10.31) | .102 (2.59)       | 24-7712P               |
| CPN-8/110 * | RG-58 Low Loss, 213 | 10         | .110 (2.80)  | .400 (10.16)-.410 (10.44) | .406 (10.31) | .102 (2.59)       | 24-7712P               |
| CPN-16      | Proflex RG-450      | 18         | .056 (1.42)  | .220 (5.59)-.250 (6.35)   | .255 (6.48)  | .100 (2.54)       | 24-312                 |
| CPN-17      | RG-8X               | 16         | .065 (1.65)  | .220 (5.59)-.250 (6.35)   | .255 (6.48)  | .100 (2.54)       | 24-312                 |
| CPN-142T    | RG-142TFE           | 20         | .034 (0.86)  | 200 (5.08)-.220 (5.59)    | .213 (5.41)  | .100 (2.54)       | 24-312                 |

Type N Straight Plug Crimp Style for RG-316 and 316DS Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.
- 3. Assemble rear contact onto cable as shown  
Rear contact should butt against cable dielectric during attachment.  
**Solder Attachment:** Solder rear contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** Crimp rear contact to center conductor using Johnson indent hand tool 140-0000-970. Crimp location should be centered between end of rear contact and solder hole using positioning tool 140-0000-971. Crimp attachment to solid center conductor cables is not recommended.
- 4. Flare braid and slide plug connector assembly over rear contact and under braid. Rear contact must engage fully with internal captivated plug contact. Cable jacket should be located near end of crimp stem when contacts are fully engaged.
- 5. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.

| Cable Group             | Part No.     | Crimp Sleeve Hex Size | Contact Crimp |
|-------------------------|--------------|-----------------------|---------------|
| RG-316/U, 161, 174, 188 | 138-4403-007 | .128 (3.25)           | 8 INDENT      |
| RG-316 DS, 188 DS       | 138-4404-007 | .151 (3.84)           | 8 INDENT      |

|              | Assembly          |
|--------------|-------------------|
| Tool         | 138-4403/4404-007 |
| Crimp Frame  | 140-0000-967      |
| Die Set      | 140-0000-990      |
| Contact Tool | 140-0000-970      |
| Positioner   | 140-0000-971      |

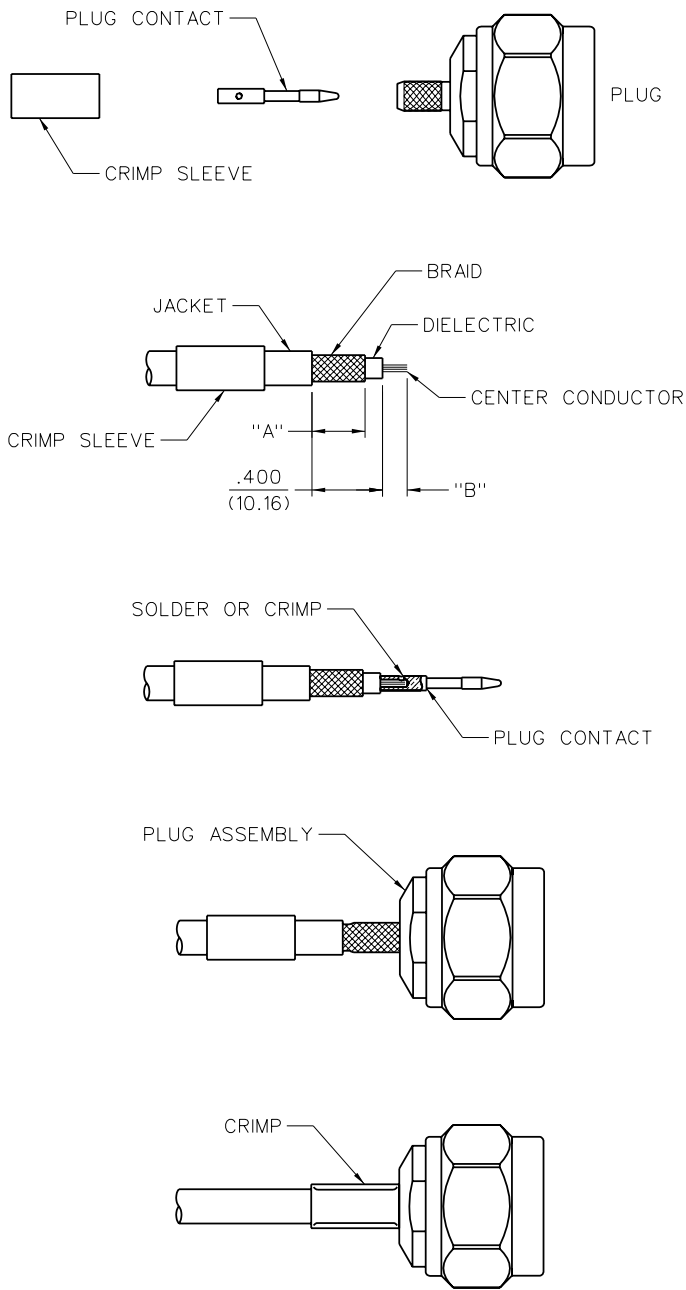


Type N Straight Plug Crimp Style for RG-58, 142, 213, 214 and LMR-400 Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.
- 3. Assemble plug contact onto cable as shown.  
Plug contact should butt against cable dielectric during attachment.  
**Solder Attachment:** Solder plug contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** Crimp plug contact to center conductor using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Crimp location should be on end of plug contact next to cable dielectric. Crimp attachment to solid center conductor cables is not recommended.
- 4. Flare braid and slide plug connector assembly over plug contact and under braid. Seat plug connector assembly firmly onto contact. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.

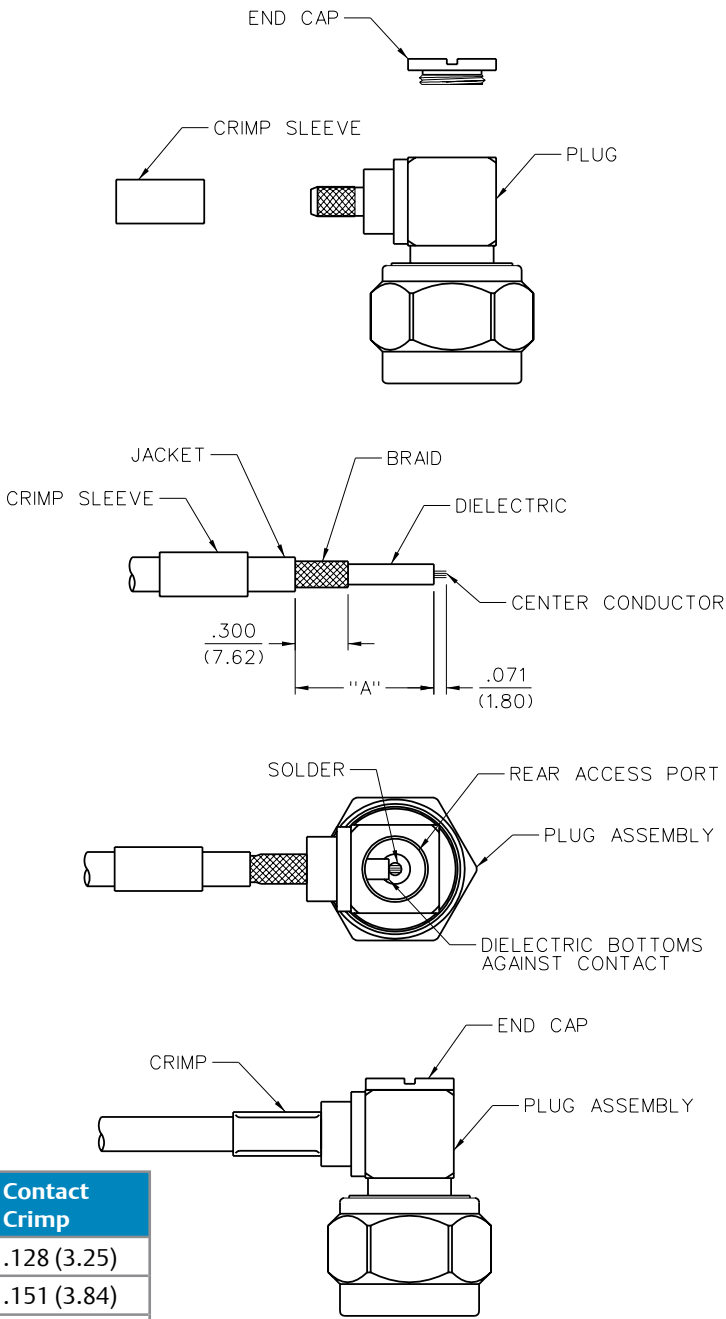
| Cable Group            | Part No.     | "A"         | "B"         | Crimp Sleeve Hex Size | Contact Hex Size |
|------------------------|--------------|-------------|-------------|-----------------------|------------------|
| RG-58/U, 141, 303      | 138-4407-007 | .301 (7.65) | .140 (3.56) | .213 (5.41)           | .068 (1.73)      |
| RG-55/U, 142, 223, 400 | 138-4408-007 | .301 (7.65) | .140 (3.56) | .213 (5.41)           | .068 (1.73)      |
| RG-8, 213              | 138-4416-007 | .385 (9.78) | .170 (4.32) | .429 (10.90)          | .111 (2.82)      |
| RG-9, 214              | 138-4418-007 | .385 (9.78) | .170 (4.32) | .429 (10.90)          | .111 (2.82)      |
| LMR-400, BELDEN 9913   | 138-4449-007 | .385 (9.78) | .170 (4.32) | .429 (10.90)          | .116 (2.95)      |

|             | Assembly          |                        |
|-------------|-------------------|------------------------|
| Tool        | 138-4407/4408-007 | 138-4416/4418/4449-007 |
| Crimp Frame | 140-0000-967      | 140-0000-967           |
| Die Set     | 140-0000-990      | 140-0000-991           |



Type N Right Angle Plug Crimp Style  
for RG-316, 316DX, 58, and  
142 Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto jacket of cable.
- 3. Flare braid and slide plug connector assembly over cable dielectric and under braid. Make sure cable dielectric bottoms against plug contact as shown. Solder center conductor to contact through rear access port. Use a minimum amount of solder for a full fillet joint.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Screw end cap into access port.



| Cable Group             | Part No.     | Crimp Sleeve Hex Size | Contact Crimp |
|-------------------------|--------------|-----------------------|---------------|
| RG-316/U, 161, 174, 188 | 138-4403-107 | .755 (19.18)          | .128 (3.25)   |
| RG-316 DS, 188 DS       | 138-4404-107 | .755 (19.18)          | .151 (3.84)   |
| RG-58/U, 141, 303       | 138-4407-107 | .788 (20.02)          | .213 (5.41)   |
| RG-55/U, 142, 223, 400  | 138-4408-107 | .788 (20.02)          | .213 (5.41)   |

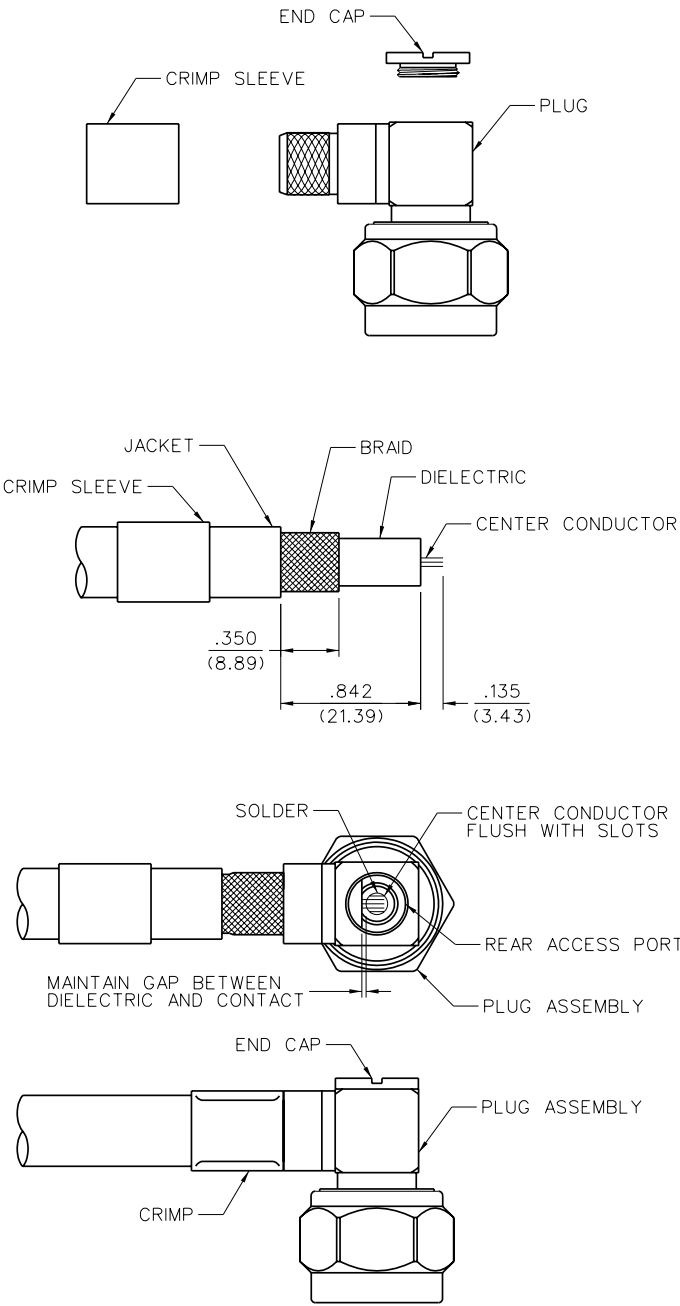
|             | Assembly                    |
|-------------|-----------------------------|
| Tool        | 138-4403/4404/4407/4408-107 |
| Crimp Frame | 140-0000-967                |
| Die Set     | 140-0000-990                |

Type N Right Angle Plug Crimp Style  
for RG-213 and 214 Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Slide crimp sleeve onto jacket of cable.
- 3. Flare braid and slide plug connector assembly over cable dielectric and under braid. Make sure center conductor is contained within plug contact as shown. Center conductor should not protrude above slots in plug contact and cable dielectric should not touch plug contact. Solder center conductor to plug contact through rear access port. Use a minimum amount of solder for a full fillet joint.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Screw end cap into access port.

| Cable Group | Part No.     | Contact Crimp |
|-------------|--------------|---------------|
| RG-8, 213   | 138-4416-107 | .429 (10.90)  |
| RG-9, 214   | 138-4418-107 | .429 (10.90)  |

|             | Assembly          |
|-------------|-------------------|
| Tool        | 138-4416/4418-107 |
| Crimp Frame | 140-0000-967      |
| Die Set     | 140-0000-991      |

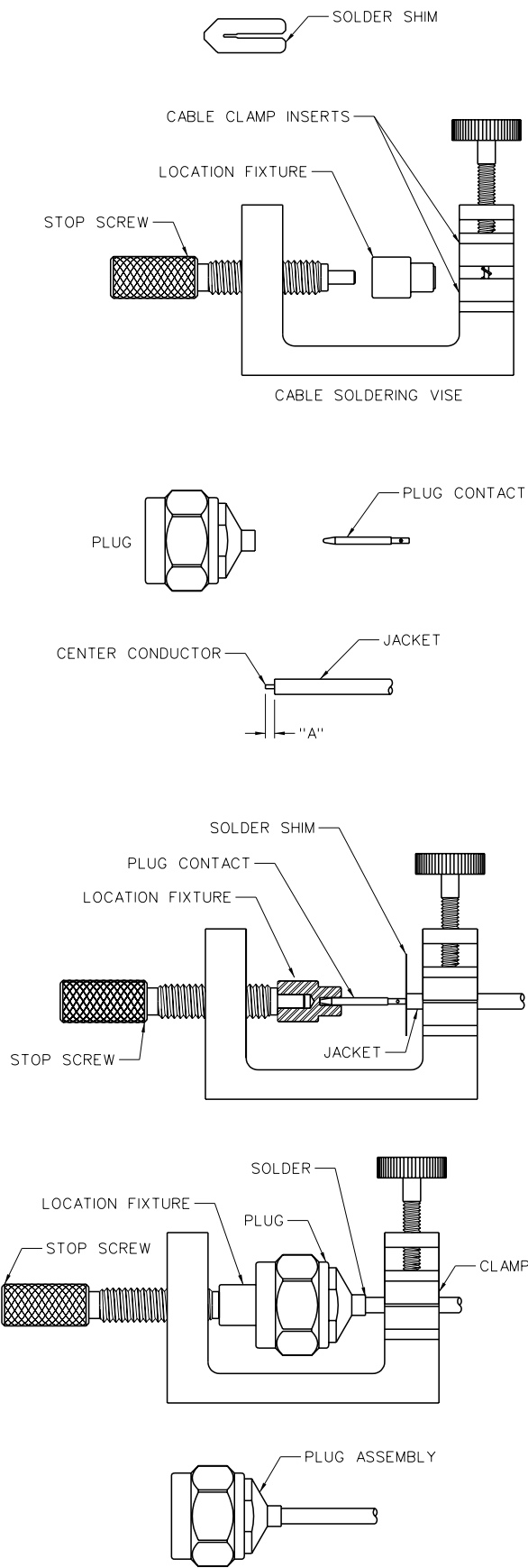


Type N Straight Plug Solder Style  
for Semi-Rigid Cable

1. Identify connector parts (2 piece parts) and tools (5 piece parts).
2. Strip cable jacket and dielectric to dimension shown. Do not nick center conductor. Clean all debris from cable.
3. Place plug contact onto center conductor, insert appropriate sized solder shim between cable jacket and contact.
4. Insert contact into location fixture and clamp cable in vise. Tighten stop screw until light pressure is applied between contact, solder shim and cable jacket.
5. Solder contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.
6. After solder joint has cooled, loosen stop screw and remove solder shim. Remove cable from vise and remove any excess solder from contact with a sharp blade and clean all debris from contact and cable.
7. Insert contact and cable into plug connector assembly, making sure cable jacket bottoms out against internal shoulder of connector assembly. Insert location fixture into connector assembly and clamp cable in vise. Tighten stop screw until light pressure is applied between connector assembly and cable jacket.
8. Solder connector body to cable jacket, using a minimum amount of solder for a full fillet joint. Allow assembly to cool before removing connector from vise.

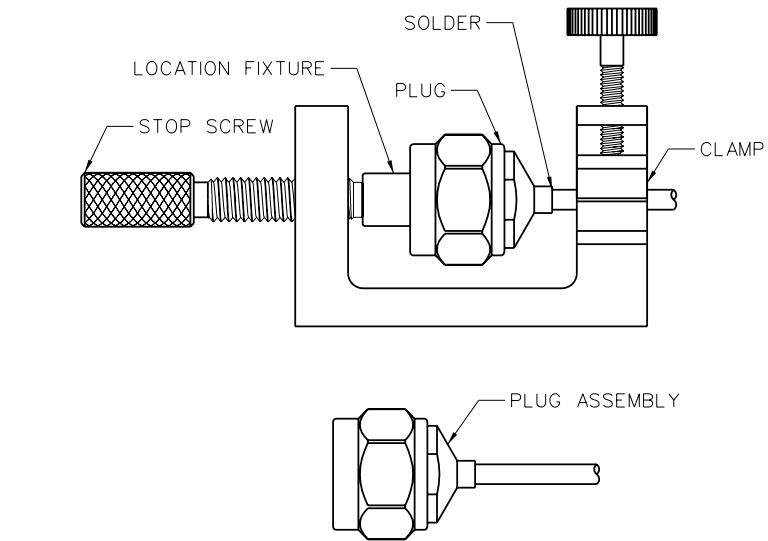
| Cable Group             | Part No.     | "A"         |
|-------------------------|--------------|-------------|
| RG-405, .086 Semi-Rigid | 138-4693-001 | .085 (2.16) |
| RG-402, .141 Semi-Rigid | 138-4694-001 | .085 (2.16) |
| RG-401, .250 Semi-Rigid | 138-4696-001 | .100 (2.54) |

| Assembly         |              |              |              |
|------------------|--------------|--------------|--------------|
| Tool             | 138-4693-001 | 138-4694-001 | 138-4696-001 |
| Solder Shim      | 140-0000-984 | 140-0000-984 | 140-0000-985 |
| Location Fixture | 140-0000-983 | 140-0000-983 | 140-0000-983 |
| Cable Vise       | 140-0000-962 | 140-0000-962 | 140-0000-962 |
| Clamp Inserts    | 140-0000-964 | 140-0000-965 | 140-0000-986 |



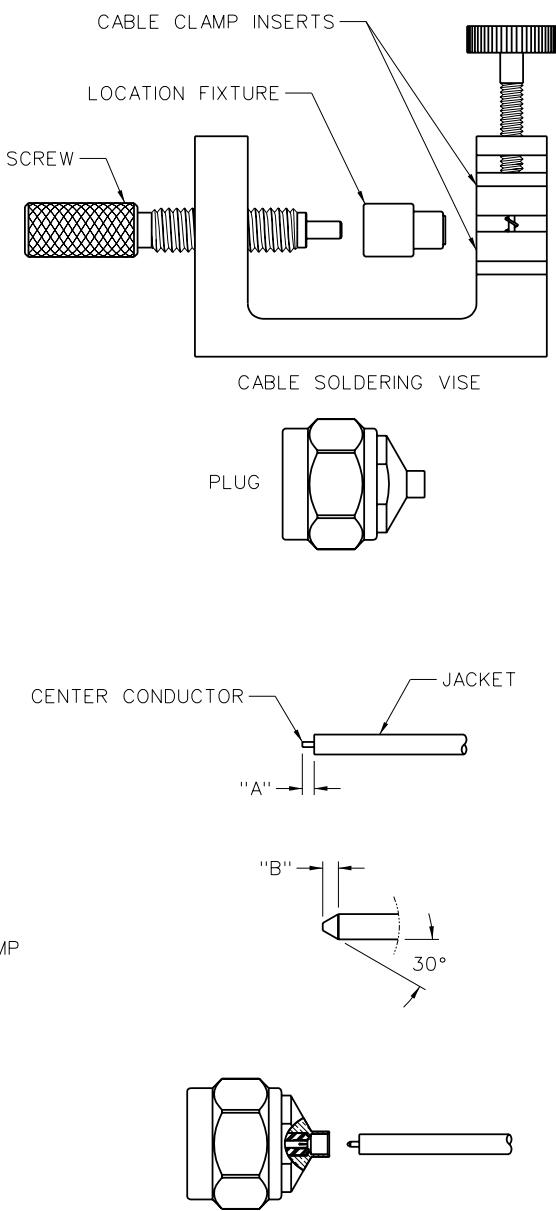
Type N Straight Plug One Piece Style  
for Semi-Rigid Cable

1. Identify connector and tools. (4 piece parts)
2. Strip cable jacket and dielectric to dimension shown. Do not nick center conductor.
3. Bevel end of cable center conductor per appropriate dimensional profile.
4. Clean all debris from prepared cable and insert cable into connector assembly, making sure cable jacket bottoms out against internal shoulder of connector assembly and center conductor engages with internal captivated plug contact.
5. Insert location fixture into connector assembly and clamp cable in vise. Tighten stop screw until light pressure is applied between connector assembly and cable jacket.
6. Solder connector body to cable jacket, using a minimum amount of solder for a full fillet joint. Allow assembly to cool before removing connector from vise.



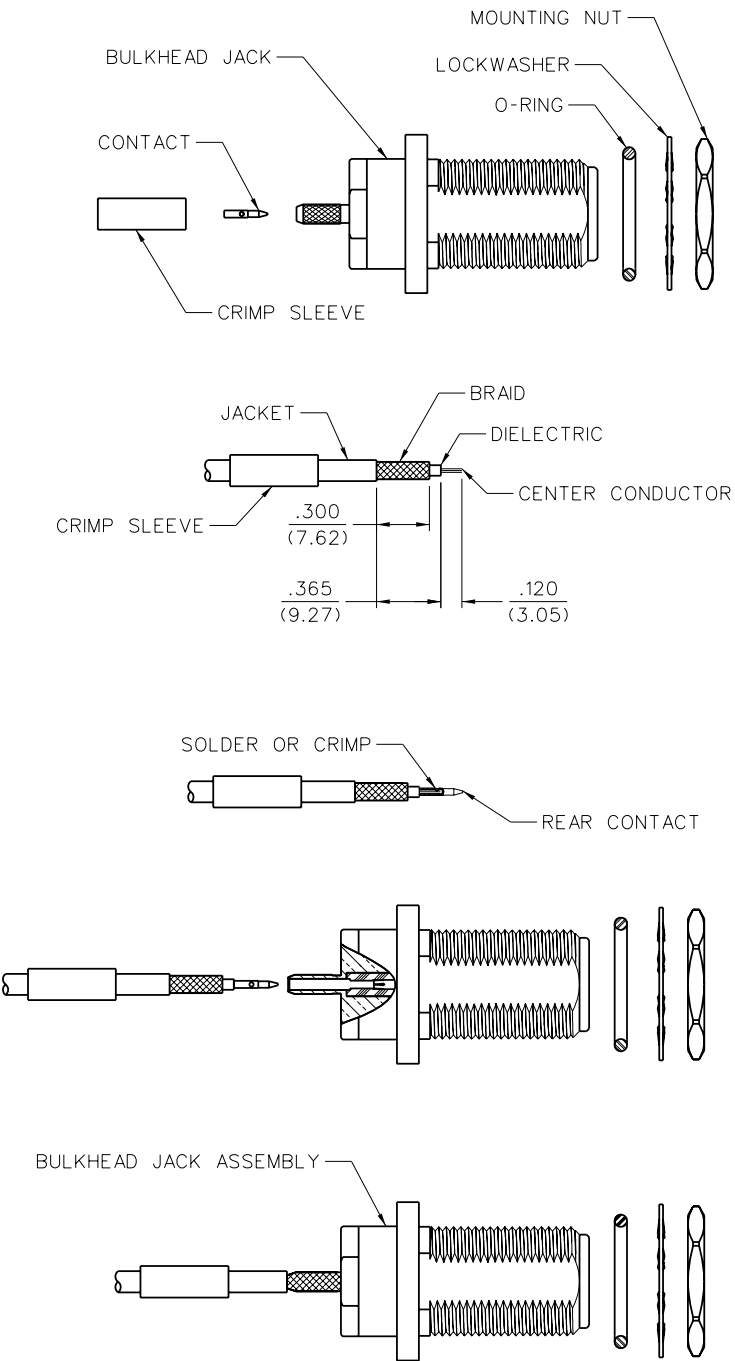
| Cable Group             | Part No.     | "A"         | "B"         |
|-------------------------|--------------|-------------|-------------|
| RG-405, .086 Semi-Rigid | 138-4693-011 | .085 (2.16) | .014 (0.36) |
| RG-402, .141 Semi-Rigid | 138-4694-011 | .085 (2.16) | .022 (0.56) |
| RG-401, .250 Semi-Rigid | 138-4696-011 | .150 (3.81) | .045 (1.14) |

| Assembly         |              |              |              |
|------------------|--------------|--------------|--------------|
| Location Fixture | 140-0000-983 | 140-0000-983 | 140-0000-983 |
| Cable Vise       | 140-0000-962 | 140-0000-962 | 140-0000-962 |
| Clamp Inserts    | 140-0000-964 | 140-0000-965 | 140-0000-986 |
| Stop Screw       | 140-0000-981 | 140-0000-981 | 140-0000-981 |



## Type N Bulkhead Jack Crimp Style for RG-316 and 316DS Flexible Cable

1. Identify connector parts. (6 piece parts)
2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.
3. Assemble rear contact onto cable as shown. Rear contact should butt against cable dielectric during attachment.  
**Solder Attachment:** Solder rear contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** Crimp rear contact to center conductor using Johnson indent hand tool 140-0000-970. Crimp location should be centered between end of rear contact and solder hole using positioning tool 140-0000-971. Crimp attachment to solid center conductor cables is not recommended.
4. Flare braid and slide bulkhead jack connector assembly over rear contact and under braid. Rear contact must engage fully with internal captivated jack contact. Cable jacket should be located near end of crimp stem when contacts are fully engaged.
5. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.
6. Add gasket, lock washer and mounting nut when installing.

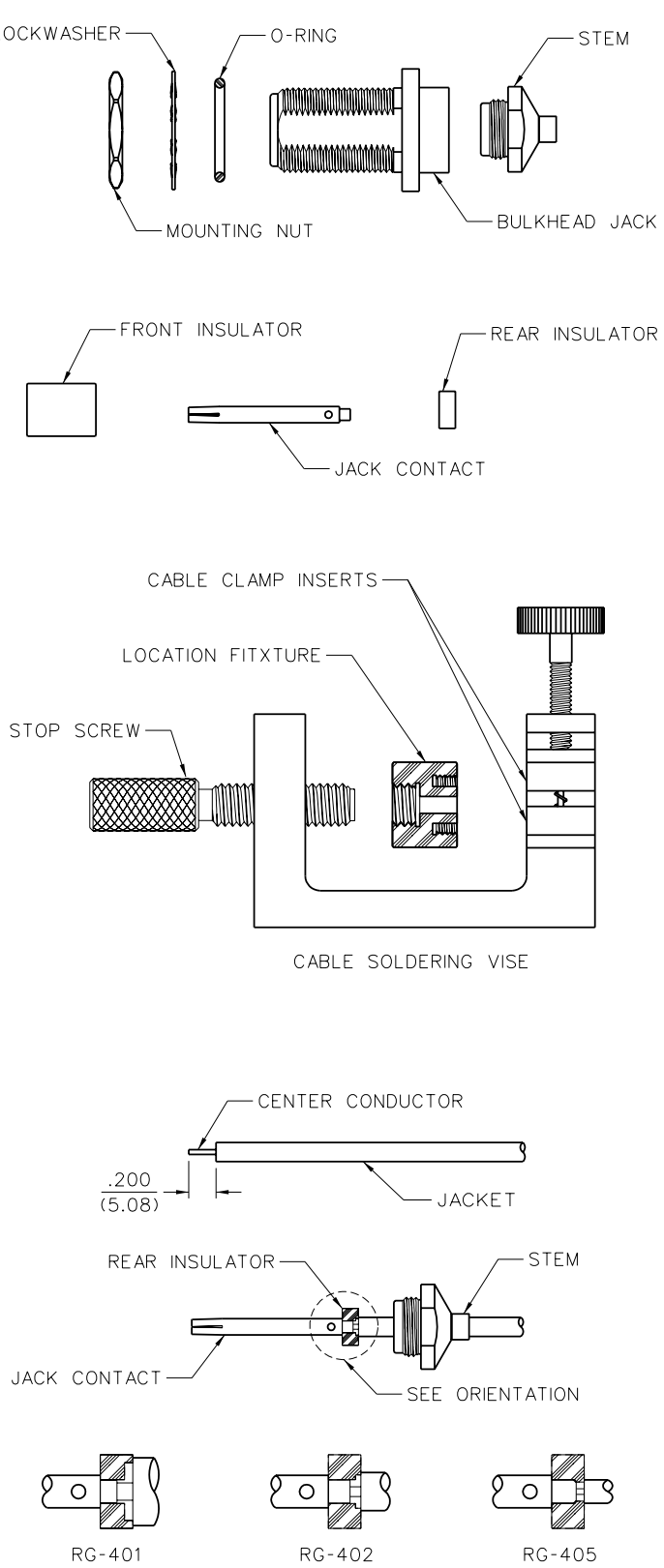


| Cable Group             | Part No.     | Crimp Sleeve Hex Size | Contact Crimp |
|-------------------------|--------------|-----------------------|---------------|
| RG-316/U, 161, 174, 188 | 138-4303-407 | .128 (3.25)           | 8 INDENT      |
| RG-316 DS, 188 DS       | 138-4304-407 | .151 (3.84)           | 8 INDENT      |

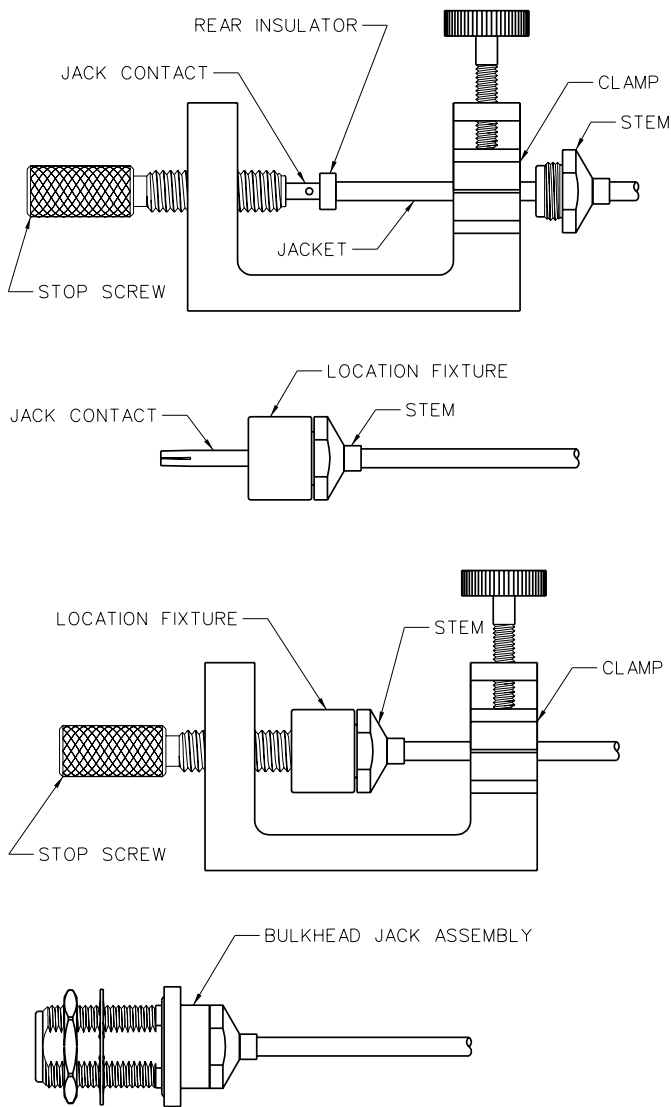
|              | Assembly     |
|--------------|--------------|
| Die Set      | 140-0000-990 |
| Contact Tool | 140-0000-970 |
| Positioner   | 140-0000-971 |

## Type N Bulkhead Jack Solder Style for Semi-Rigid Cable

1. Identify connector parts (8 piece parts) and tools (4 piece parts).
2. Strip cable jacket and dielectric to dimension shown. Do not nick center conductor. Clean all debris from cable.
3. Slide stem over cable jacket, keeping stem correctly oriented to end of cable.
4. Insert jack contact into rear insulator. Make sure insulator is correctly oriented to contact. Place jack contact and rear insulator onto center conductor, keeping insulator correctly oriented between cable jacket and contact.
5. Slide stem away from jack contact. Insert contact into stop screw and clamp cable in vise. Tighten stop screw until light pressure is applied between jack contact, rear insulator and cable jacket.
6. Solder jack contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.
7. After solder joint has cooled, remove cable from vise and remove any excess solder from jack contact with a sharp blade and clean all debris from contact and rear insulator.
8. Slide stem over rear insulator and tighten stem into location fixture until stem bottoms out.
9. Insert cable into vise, but do not clamp. Insert jack contact into stop screw and tighten location fixture until stop screw bottoms out. Clamp cable in vise.
10. Solder stem to cable jacket, using a minimum amount of solder for a full fillet joint. Allow assembly to cool before removing from vise.
11. After solder joint has cooled, un-clamp cable and remove location fixture from stop screw and cable assembly. Insert front insulator into bulkhead jack body. Insert cable assembly into body and tighten to 25-30 in-lbs.
12. Add gasket, lock washer and mounting nut when installing connector to panel.



Type N Bulkhead Jack Solder Style for Semi-Rigid Cable (cont'd from last page)

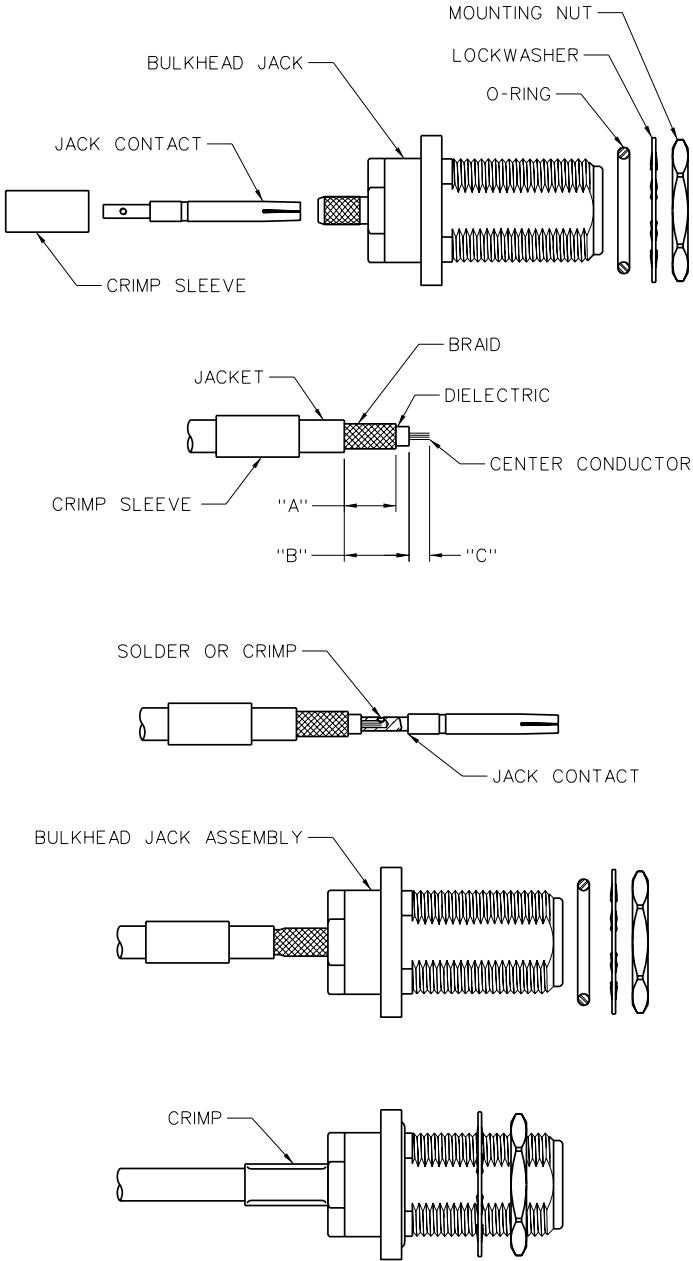


| Cable Group             | Part No.     |
|-------------------------|--------------|
| RG-405, .086 Semi-Rigid | 138-4593-401 |
| RG-402, .141 Semi-Rigid | 138-4594-401 |
| RG-401, .250 Semi-Rigid | 138-4596-401 |

| Assembly         |              |              |              |
|------------------|--------------|--------------|--------------|
| Tool             | 138-4593-401 | 138-4594-401 | 138-4596-401 |
| Stop Screw       | 140-0000-972 | 140-0000-972 | 140-0000-972 |
| Cable Vise       | 140-0000-962 | 140-0000-962 | 140-0000-962 |
| Clamp Inserts    | 140-0000-964 | 140-0000-965 | 140-0000-986 |
| Location Fixture | 140-0000-987 | 140-0000-988 | 140-0000-989 |

Type N Bulkhead Jack Crimp Style for RG-58, 142, 213, 214 and LMR-400 Flexible Cable

1. Identify connector parts. (6 piece parts)
2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.
3. Assemble jack contact onto cable as shown. Jack contact should butt against cable dielectric during attachment.  
**Solder Attachment:** Solder jack contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** Crimp jack contact to center conductor using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Crimp location should be on end of jack contact next to cable dielectric. Crimp attachment to solid center conductor cables is not recommended.
4. Flare braid and slide bulkhead jack connector assembly over jack contact and under braid. Seat bulkhead jack connector assembly firmly onto contact. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.



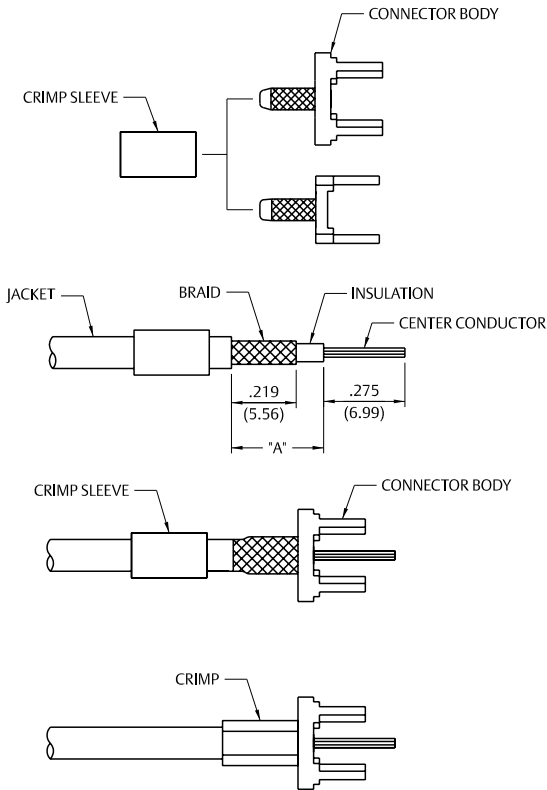
| Cable Group            | Part No.     | "A"         | "B"          | Crimp Sleeve "C" | Contact Hex Size | Hex Size    |
|------------------------|--------------|-------------|--------------|------------------|------------------|-------------|
| RG-58/U, 141, 303      | 138-4307-407 | .310 (7.87) | .389 (9.88)  | .135 (3.43)      | .213 (5.41)      | .068 (1.73) |
| RG-55/U, 142, 223, 400 | 138-4308-407 | .310 (7.87) | .389 (9.88)  | .135 (3.43)      | .213 (5.41)      | .068 (1.73) |
| RG-8, 213              | 138-4316-407 | .385 (9.78) | .400 (10.16) | .165 (4.19)      | .429 (10.90)     | .111 (2.82) |
| RG-9, 214              | 138-4318-407 | .385 (9.78) | .400 (10.16) | .165 (4.19)      | .429 (10.90)     | .111 (2.82) |

| Assembly    |                   |                        |
|-------------|-------------------|------------------------|
| Tool        | 138-4307/4308-407 | 138-4316/4318/4349-407 |
| Crimp Frame | 140-0000-967      | 140-0000-967           |
| Die Set     | 140-0000-990      | 140-0000-991           |

Crimp Type Straight Cable Termination for Flexible Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin. Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable insulation is flush with bottom of connector.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.

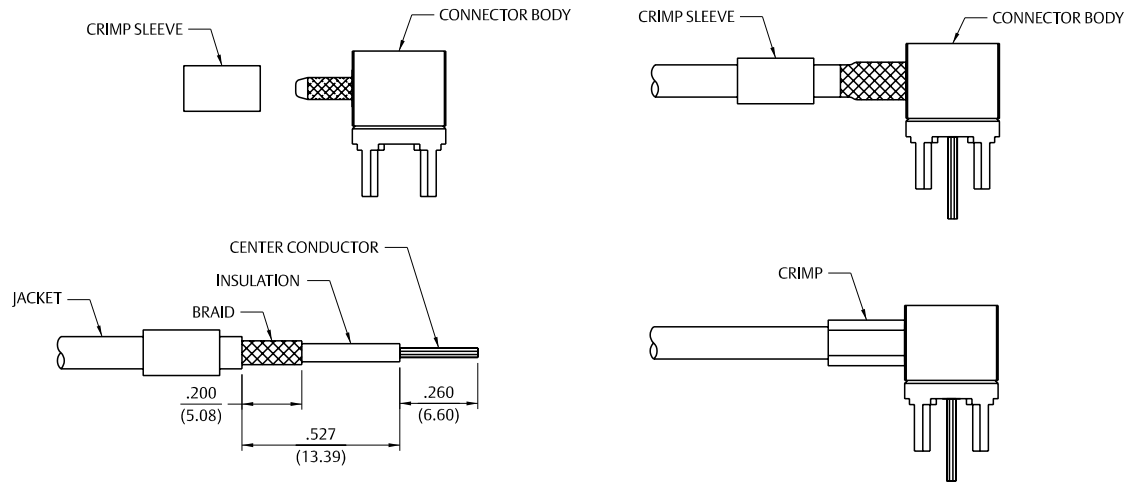
| Cable Group                       | Part No.         | "A"         | Crimp Hex   |
|-----------------------------------|------------------|-------------|-------------|
| RG-178/U, 196                     | 142-0002-221/226 | .259 (6.58) | .105 (2.67) |
| RG-316/U, 161, 174, 179, 187, 188 | 142-0003-201/206 | .312 (7.92) | .128 (3.25) |
|                                   | 142-0003-231/236 | .259 (6.58) | .128 (3.25) |
|                                   | 142-0003-241/246 | .259 (6.58) | .128 (3.25) |
| RG-316 DS, 188 DS                 | 142-0004-201/206 | .312 (7.92) | .151 (3.83) |
|                                   | 142-0004-211/216 | .259 (6.58) | .151 (3.83) |
|                                   | 142-0004-221/226 | .259 (6.58) | .151 (3.83) |



Crimp Type Right Angle Cable Termination for Flexible Cable

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin. Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable insulation is flush with bottom of connector body.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.

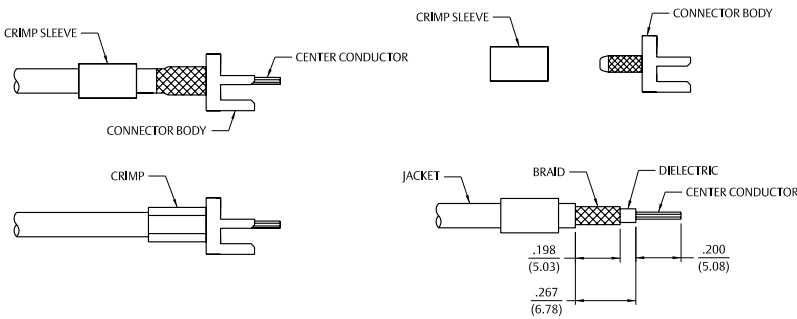
| Cable Group                       | Part No.         | Crimp Hex   |
|-----------------------------------|------------------|-------------|
| RG-316/U, 161, 174, 179, 187, 188 | 142-0003-301/306 | .128 (3.25) |
| RG-316 DS, 188 DS                 | 142-0004-301/306 | .151 (3.83) |



Crimp Type Straight Cable Termination for End Launch

- 1. Identify connector parts. (2 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin. Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable insulation is flush with bottom of connector body.
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.

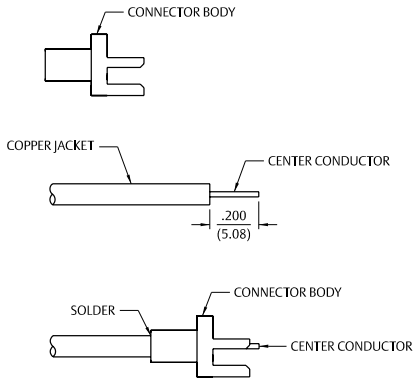
| Cable Group                       | Part No.     | Crimp Hex   |
|-----------------------------------|--------------|-------------|
| RG-178/U, 196                     | 142-0002-811 | .105 (2.67) |
| RG-316/U, 161, 174, 179, 187, 188 | 142-0003-801 | .128 (3.25) |
|                                   | 142-0003-811 | .128 (3.25) |
| RG-316 DS, 188 DS, 179 DS, 187 DS | 142-0004-801 | .151 (3.84) |
|                                   | 142-0004-811 | .151 (3.84) |
| RG-58/U, 141, 303                 | 142-0007-801 | .213 (5.41) |
|                                   | 142-0007-811 | .213 (5.41) |
| RG-142/U, 55, 223, 400            | 142-0008-801 | .213 (5.41) |
|                                   | 142-0008-811 | .213 (5.41) |



Solder Type Straight Cable Termination for End Launch

- 1. Identify connector parts. (1 piece part)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor.
- 3. Insert cable into body making sure cable is bottomed against shoulder body. Solder body to cable. Use a minimum amount of heat to minimize cable dielectric movement.

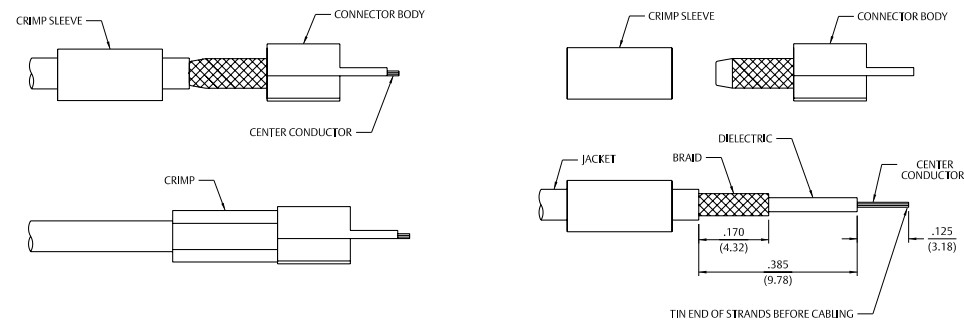
| Cable Group                | Part No.         |
|----------------------------|------------------|
| RG-405/U (.086 Semi-Rigid) | 142-0093-801/806 |
| RG-402/U (.141 Semi-Rigid) | 142-0094-801/806 |
| .250 Semi-Rigid            | 142-0096-801/806 |



Solder Type Straight Cable Termination for End Launch Surface Mount

- 1. Identify connector parts. (2-piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tine. Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable dielectric is flush with the end of the connector body.
- 4. Arrange braid uniformly around crimp sleeve. Slide crimp sleeve over braid and crimp securely using recommended crimp tool.

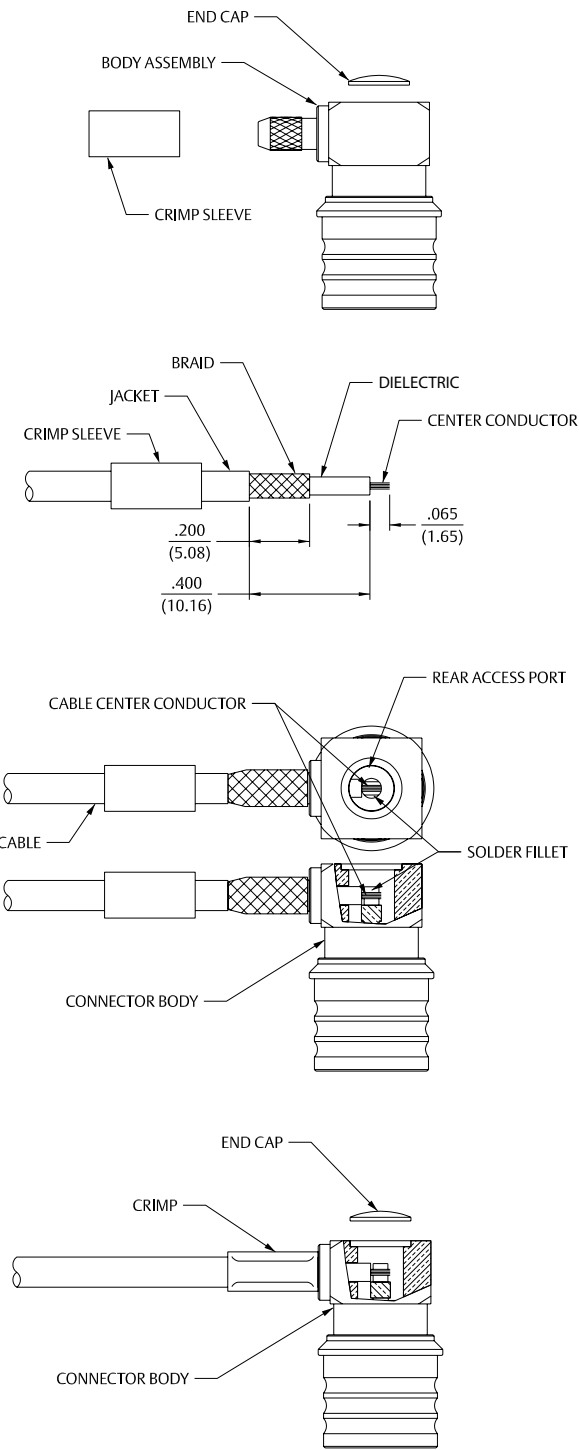
| Cable Group   | Part No.     | Crimp Hex   |
|---------------|--------------|-------------|
| RG-178/U, 196 | 142-0002-821 | .105 (2.67) |



kwiQMAt<sup>™</sup> Crimp Type Right Angle Plugs for Flexible Cable

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
- 3. Flare braid and slide cable into body making certain that the cable dielectric bottoms on center contact. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. **.020 (0.51) diameter solder is recommended.**
- 4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool. Place expansion cap in access port and seat with .187 (4.75) diameter flat punch. Shrink heat shrink tubing over crimp sleeve if applicable.

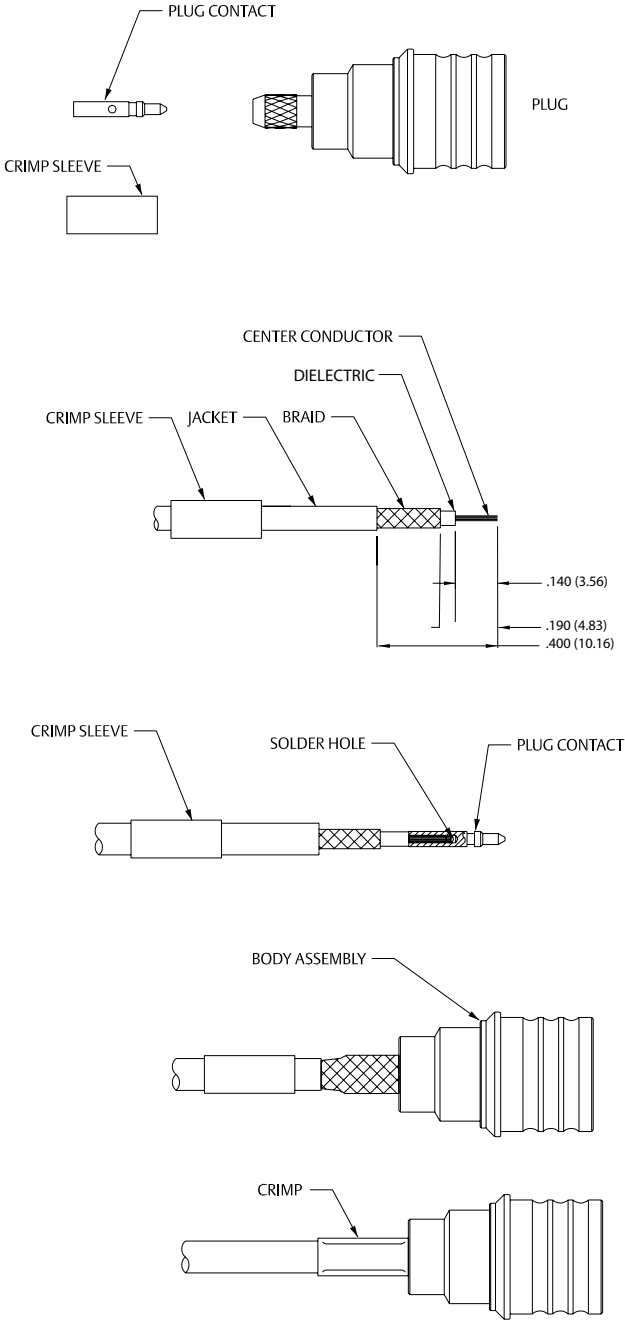
| Cable Type | Part No.     | Crimp Hex   |
|------------|--------------|-------------|
| RG-316     | 146-0403-107 | .128 (3.25) |
| RG-316 DS  | 146-0404-107 | .151 (3.83) |



kwiQMate™ Straight Plugs for Flexible Cable – Crimp or Solder Contacts

- 1. Identify connector parts. (3 piece parts)
- 2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.
- 3. Assemble contact onto cable as shown.  
**Solder Attachment:** Solder contact to center conductor through solder hole using .020 (0.51) diameter solder. Use a minimum amount of solder for a good joint.  
**Crimp Attachment:** Crimp contact to center conductor using Johnson® Hand Tool 144-0000-910, setting #2. Crimp location should be centered between end of contact and X-hole. Crimp attachment to solid center conductor cables is not recommended.
- 4. Flare braid and slide body assembly over contact and under braid. Then seat body assembly firmly onto contact. The cable may have to be held in a clamping fixture. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using recommended crimp tool. Slide heat shrink forward and shrink (as applicable).

| Cable Type | Part No.     | Crimp Hex   |
|------------|--------------|-------------|
| RG-316     | 146-0403-007 | .128 (3.25) |
| RG-316 DS  | 146-0404-007 | .151 (3.83) |



Electronic Hardware

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While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without notice.

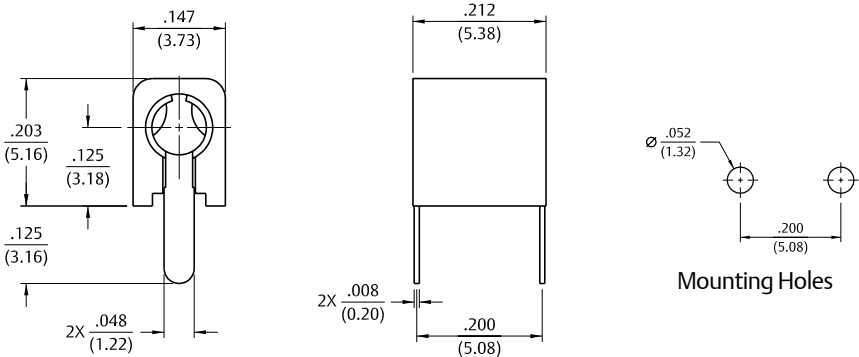
|     |                                  |
|-----|----------------------------------|
| 3   | MMCX Connectors                  |
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Horizontal Test Jacks – For Test Points

Insulated Miniature



| Silver Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 105-1101-001   | White  |
| 105-1102-001   | Red    |
| 105-1103-001   | Black  |
| 105-1104-001   | Green  |
| 105-1107-001   | Yellow |



**SPECIFICATIONS**  
**Contact:** Copper aluminum alloy\*  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 5 amps  
**Breakdown Voltage:** 2100 VRMS minimum  
**Contact Resistance:** 0.010 ohms maximum  
**Adjacent Jack C:** 1 pF maximum at 1 MHz

**For Standard Tip Plug:**  
**.080 (2.00) Diameter**  
**FEATURES**

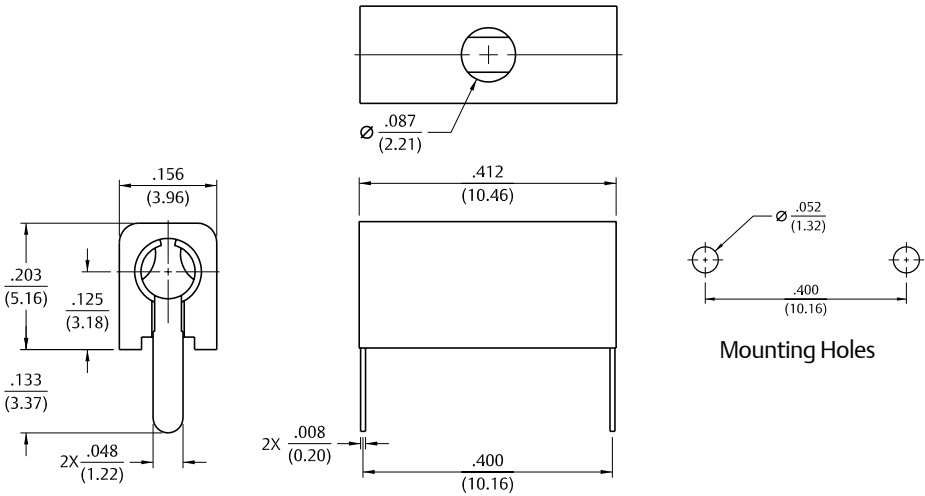
- Contact protected from flux and solder
- Probe access from both ends
- Nylon UL approved for self extinguishing

\*A new material development that, for this application, meets or exceeds beryllium copper.

Insulated Standard



| Silver Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 105-0751-001   | White  |
| 105-0752-001   | Red    |
| 105-0753-001   | Black  |
| 105-0754-001   | Green  |
| 105-0756-001   | Orange |
| 105-0757-001   | Yellow |
| 105-0758-001   | Brown  |
| 105-0760-001   | Blue   |
| 105-0762-001   | Violet |
| 105-0763-001   | Gray   |



**SPECIFICATIONS**  
**Contact:** Copper aluminum alloy\*  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 5 amps  
**Breakdown Voltage:** 2100 VRMS minimum  
**Contact Resistance:** Silver: 0.010 ohms maximum  
**Adjacent Jack C:** 1 pF maximum at 1 MHz

**For Standard Tip Plug:**  
**.080 (2.00) Diameter**  
**FEATURES**

- Contact protected from flux and solder
- Probe access from both ends
- Nylon UL approved for self extinguishing

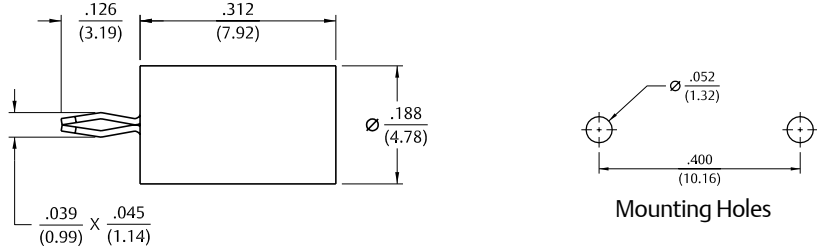
\*A new material development that, for this application, meets or exceeds beryllium copper.

Vertical Test Jacks – For Test Points

Insulated: Formed Contact



| Silver Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 105-2201-201   | White  |
| 105-2202-201   | Red    |
| 105-2203-201   | Black  |
| 105-2204-201   | Green  |
| 105-2207-201   | Yellow |



**SPECIFICATIONS**  
**Contact:** Beryllium copper per QQ-C-533  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 5 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** Silver: 0.010 ohms maximum  
**Adjacent Jack C:** 1 pF maximum at 1 MHz

**For Standard Tip Plug:**  
**.080 (2.00) Diameter**  
**FEATURES**

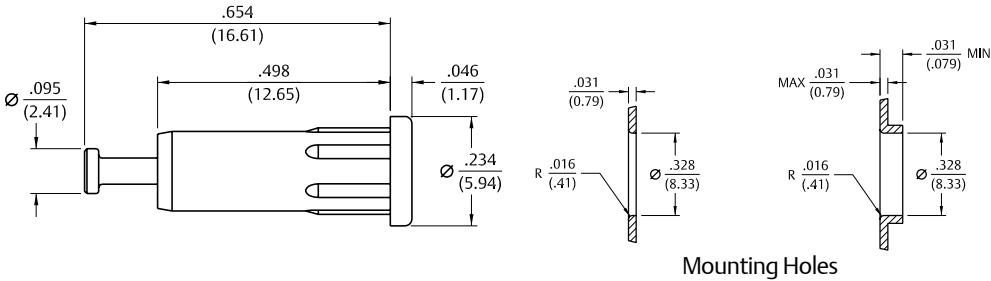
- Spring loaded lead to hold in board
- Contact protected from flux and solder
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Insulated Standard: Rib-Lock™ Type



| Silver Plating |       |
|----------------|-------|
| Part No.       | Color |
| 105-1041-001   | White |
| 105-1042-001   | Red   |
| 105-1043-001   | Black |



**SPECIFICATIONS**  
**Contact:** Brass body per QQ-B-626D with wrap around beryllium copper spring per QQ-C-553  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066  
**Panel Thickness:** up to .375 (9.05)

**RATINGS**  
**Current:** 5 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.005 ohms maximum  
**Adjacent Jack C:** 1 pF nominal

**For Standard Tip Plug:**  
**.080 (2.00) Diameter**  
**FEATURES**

- Machined contact with turret terminal
- Installs by pressing into mounting hole, no mounting hardware required
- Closed entry blocks access or probes greater than .085 (2.16)
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Tip Jacks – For Connections to Test Equipment, Power Supplies, and Electronic Instrumentation

## Insulated Metal Clad: Military Type



| Gold Plating<br>Part No. to Mil-Spec. Part No. Cross Reference |       |                |
|----------------------------------------------------------------|-------|----------------|
| Part No.                                                       | Color | Mil-C-39024/10 |
| 105-0201-200                                                   | White | -01            |
| 105-0202-200                                                   | Red   | -02            |
| 105-0203-200                                                   | Black | -03            |

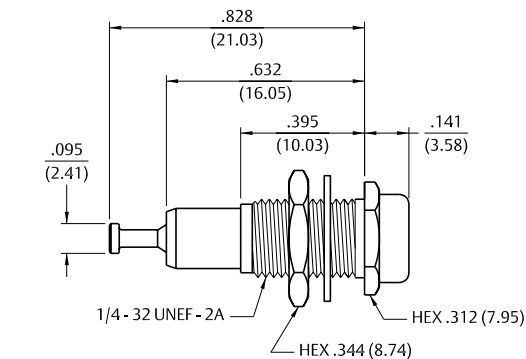
### SPECIFICATIONS

**Contact:** Brass per QQ-B-626D with wrap around beryllium copper spring per QQ-C-533  
**Finish:** Gold  
**Body:** Nylon 6/6 per ASTM D4066  
**Threaded Brass Jacket:** Per QQ-B-626D, nickel  
**Hardware:** Nickel plated washer and nut (unassembled)  
**Panel Thickness:** Up to .218 (5.45)

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 5700 VRMS minimum  
**Contact Resistance:** 0.004 ohms maximum  
**Contact-To-Panel C:** 2 pF nominal

Manufactured to meet MIL-C-39024/10



### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

- Machined contact with turret terminal
- For military or industrial applications
- Closed entry blocks access of probes greater than .085 (2.16)
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Metal Clad: Standard Type



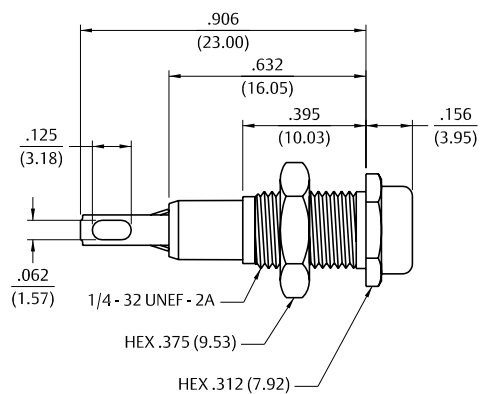
| Silver Plating |       |
|----------------|-------|
| Part No.       | Color |
| 105-0251-001   | White |
| 105-0252-001   | Red   |
| 105-0253-001   | Black |

### SPECIFICATIONS

**Contact:** Phosphor bronze per QQ-B-750  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066  
**Panel Thickness:** Up to .281 (7.10)

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 5700 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel C:** 2 pF nominal



### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

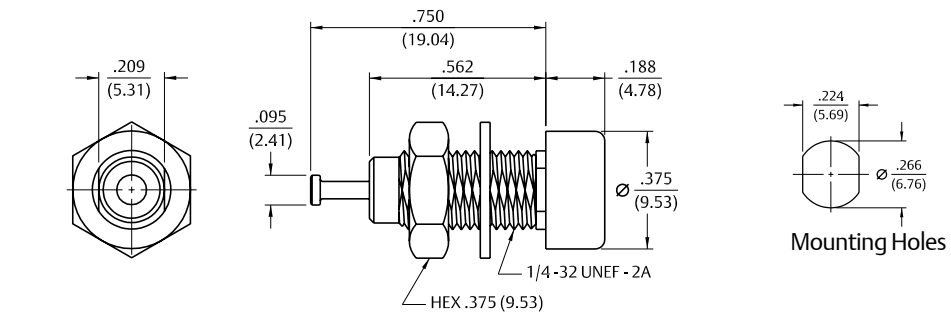
- Formed contact with slotted terminal
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Deluxe



| Silver Plating |       |
|----------------|-------|
| Part No.       | Color |
| 105-0601-001   | White |
| 105-0602-001   | Red   |
| 105-0603-001   | Black |



### SPECIFICATIONS

**Contact:** Brass per QQ-B-626D with wrap around beryllium copper spring per QQ-C-533  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066  
**Hardware:** Nickel plated nut (unassembled)  
**Body Thread Stripping Torque:** 0.4 lb. in (4.5 kg cm)  
**Panel Thickness:** Up to .437 (11.10)

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 5700 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel C:** 2 pF nominal

### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

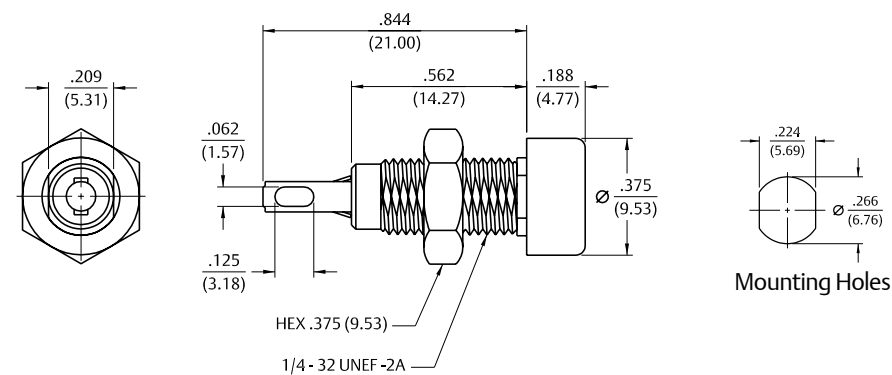
- Machined contact with turret terminal
- Hex socket head .188 (4.77) for ease in mounting
- Closed entry blocks access of probes greater than .085 (2.16)
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Standard



| Bright Tin Plating |        |
|--------------------|--------|
| Part No.           | Color  |
| 105-0801-001       | White  |
| 105-0802-001       | Red    |
| 105-0803-001       | Black  |
| 105-0804-001       | Green  |
| 105-0807-001       | Yellow |



### SPECIFICATIONS

**Contact:** Phosphor bronze per QQ-B-750  
**Finish:** Bright tin  
**Body:** Nylon 6/6 per ASTM D4066  
**Hardware:** Nickel plated nut (unassembled)  
**Body Thread Stripping Torque:** 4.0 lb. in (4.5 kg cm)  
**Panel Thickness:** Up to .437 (11.10)

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 5700 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel C:** 2 pF nominal

### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

- Formed contact with slotted terminal
- Hex socket head .188 (4.77) for ease in mounting
- Nylon UL approved for self extinguishing

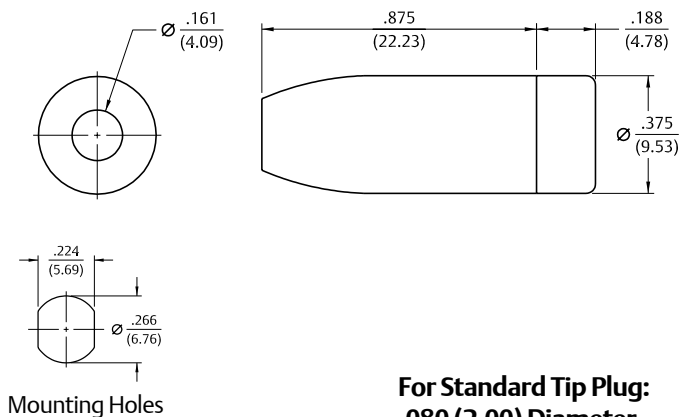
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Tip Jacks – For Connections to Test Equipment, Power Supplies, and Electronic Instrumentation

## Insulated Metal Clad: Military Type



| Silver Plating |       |
|----------------|-------|
| Part No.       | Color |
| 105-0701-001   | White |
| 105-0702-001   | Red   |
| 105-0703-001   | Black |



### SPECIFICATIONS

**Contact:** Brass per QQ-B-626D with wrap around beryllium copper spring per QQ-C-533  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066  
**Threaded Brass Jacket:** Per QQ-B-626D, nickel  
**Hardware:** Nickel plated washer and nut (unassembled)  
**Panel Thickness:** Up to .218 (5.45)

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 5700 VRMS minimum  
**Contact Resistance:** 0.004 ohms maximum  
**Contact-To-Panel C:** 2 pF nominal

Manufactured to meet MIL-C-39024/10

### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

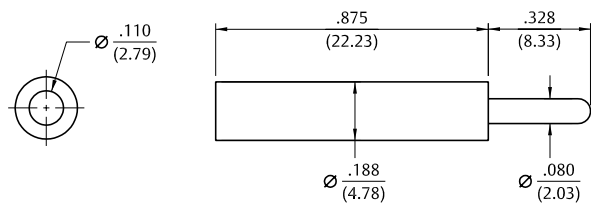
- Machined contact with turret terminal
- For military or industrial applications
- Closed entry blocks access of probes greater than .085 (2.16)
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Metal Clad: Standard Type



| Nickel Plating                      |                                   |
|-------------------------------------|-----------------------------------|
| Solder Type Up to 16 Gauge Part No. | Crimp Type 16 Gauge Plating Color |
| 105-0771-001                        | White                             |
| 105-0772-001                        | Red                               |
| 105-0773-001                        | Black                             |



### SPECIFICATIONS

**Contact:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

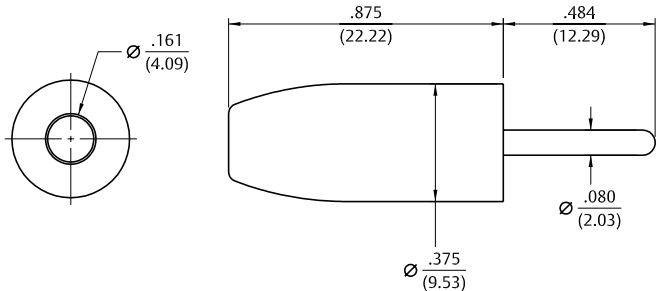
- Solder or crimp type connection
- Accepts wire sizes up to 16 gauge
- Nylon UL approved for self extinguishing
- Designed for use with horizontal and vertical test jacks only

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Deluxe



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 105-0301-001   | White |
| 105-0302-001   | Red   |
| 105-0303-001   | Black |
| 105-0304-001   | Green |
| 105-0310-001   | Blue  |



### SPECIFICATIONS

**Contact:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

### RATINGS

**Current:** 10 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

### For Standard Tip Plug: .080 (2.00) Diameter FEATURES

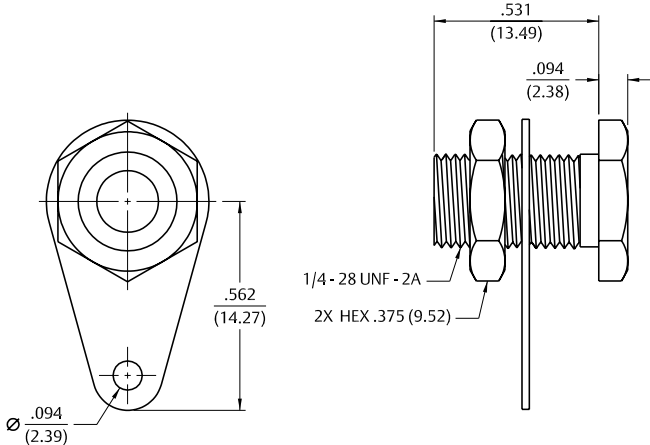
- Recessed head to reduce shock hazard
- Accepts wire sizes up to 16 gauge
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Standard



| Nickel Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 108-0740-001   | Nickel |



### SPECIFICATIONS

**Jack Body:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Hardware:** Nickel plated nut; stamped tin plated solder terminal (unassembled)  
**Panel Thickness:** Up to .375 (9.50)

### RATINGS

**Current:** 15 amps  
**Contact Resistance:** 0.010 ohms maximum

### For Standard Banana Plug: .175 (4.44) Across Flats FEATURES

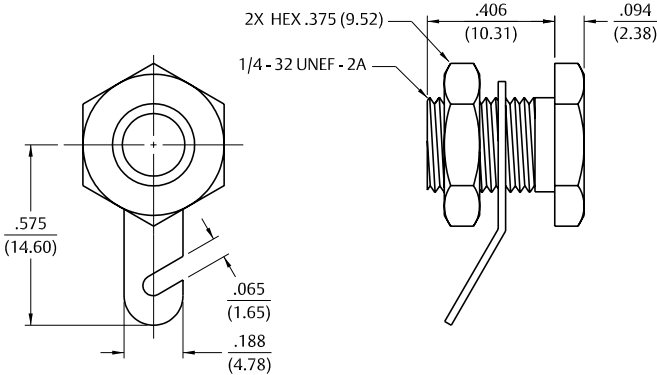
- Accepts up to 12 gauge wire
- Hex head for faster installation
- For higher current designs

# Banana Jacks – For Test Equipment and Power Supplies

## Uninsulated Standard Type: Slotted Lug Terminal



| Nickel Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 108-0740-102   | Nickel |



**SPECIFICATIONS**  
**Jack Body:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Hardware:** Nickel plated nut; stamped tin plated solder terminal (unassembled)  
**Panel Thickness:** Up to .250 (6.35)

**RATINGS**  
**Current:** 15 amps  
**Contact Resistance:** 0.010 ohms maximum

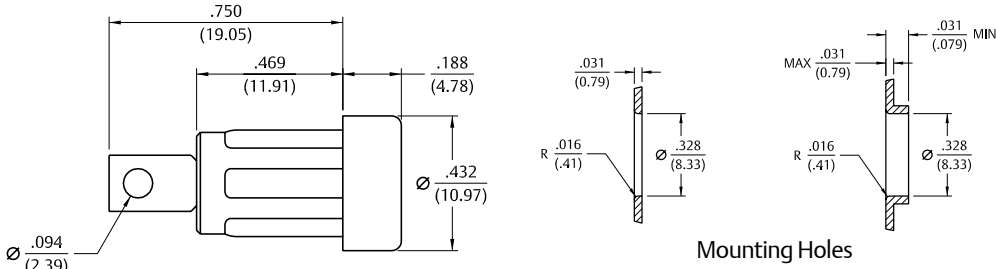
**For Standard Banana Plug:**  
**.175 (4.44) Across Flats**  
**FEATURES**

- Accepts up to 12 gauge wire
- Hex head for faster installation
- For higher current designs

## Insulated Rib-Loc™ Solder Terminal



| Bright Tin Plating |        |
|--------------------|--------|
| Part No.           | Color  |
| 108-2301-801       | White  |
| 108-2302-801       | Red    |
| 108-2303-801       | Black  |
| 108-2307-801       | Yellow |
| 108-2310-801       | Blue   |



**SPECIFICATIONS**  
**Contact:** Formed brass per QQ-B-626D  
**Finish:** Bright Tin  
**Body:** Nylon 6/6 per ASTM D4066  
**Panel Thickness:** Up to .250 (6.35)

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 7000 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel C:** 2.4 pF nominal

**For Standard Banana Plug:**  
**.175 (4.44) Across Flats**  
**FEATURES**

- Requires no mounting hardware
- Accepts up to 16 gauge wire
- Nylon UL approved for self extinguishing

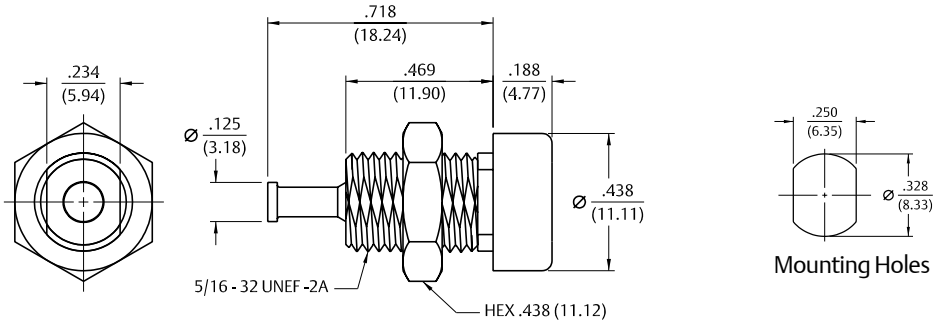
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Banana Jacks – For Test Equipment and Power Supplies

## Insulated Turret Terminal



| Silver Plating |       |
|----------------|-------|
| Part No.       | Color |
| 108-2302-621   | Red   |
| 108-2303-621   | Black |



**SPECIFICATIONS**  
**Contact:** Machined brass per QQ-B-626D  
**Finish:** Silver  
**Body:** Nylon 6/6 per ASTM D4066  
**Hardware:** Nickel plated nut (unassembled)  
**Body Thread Stripping Torque:** 6.0 lb. in. (7 kg cm)  
**Panel Thickness:** Up to .343 (8.80)

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 7000 VRMS minimum  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel:** 2.4 pF nominal

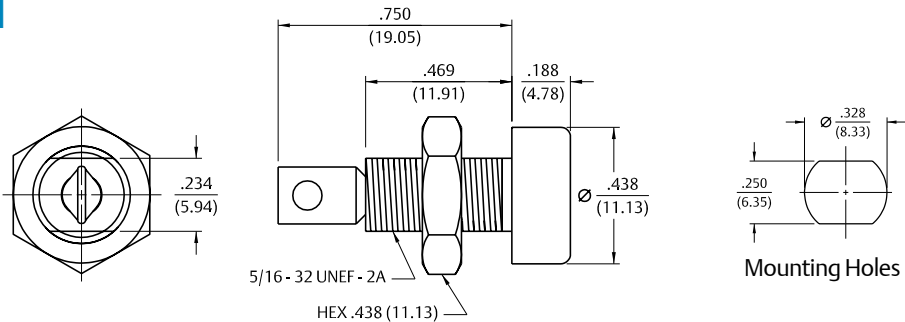
**For Standard Banana Plug:**  
**.175 (4.44) Across Flat**  
**FEATURES**

- Keyed mounting with double flats
- Nylon UL approved for self extinguishing

## Insulated Solder Terminal



| Bright Tin Plating |        |
|--------------------|--------|
| Part No.           | Color  |
| 108-0901-001       | White  |
| 108-0902-001       | Red    |
| 108-0903-001       | Black  |
| 108-0904-001       | Green  |
| 108-0906-001       | Orange |
| 108-0907-001       | Yellow |
| 108-0908-001       | Brown  |
| 108-0910-001       | Blue   |
| 108-0912-001       | Violet |
| 108-0913-001       | Gray   |



**SPECIFICATIONS**  
**Jack Body:** Formed brass per QQ-B-626D  
**Finish:** Bright tin  
**Body:** Nylon 6/6 per ASTM D4066  
**Hardware:** Nickel plated nut (unassembled)  
**Body Thread Stripping Torque:** 6.0 lb. in. (7 kg cm)  
**Panel Thickness:** Up to .343 (8.80)

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 7000 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel:** 2.4 pF nominal

**For Standard Banana Plug:**  
**.175 (4.44) Across Flats**  
**FEATURES**

- Accepts up to 12 gauge wire
- Hex head for faster installation
- For higher current designs

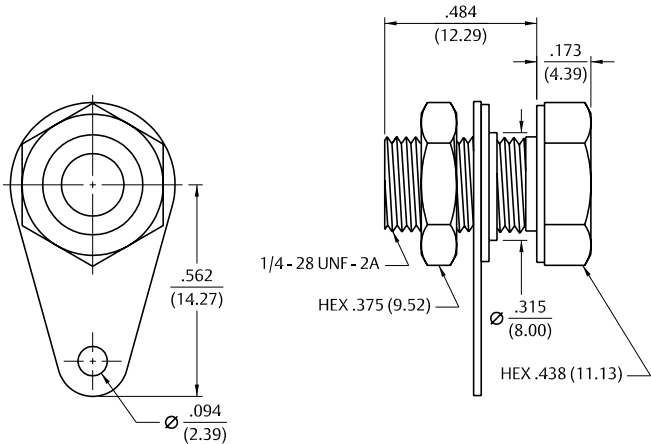
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Banana Jacks & Plugs – For Test Equipment and Power Supplies

## Insulated Pierced Lug Terminal



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 108-0745-001   | Red   |
| 108-0745-002   | Black |



### SPECIFICATIONS

**Contact:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Hex Head:** Molded phenolic  
**Hardware:** Nickel plated nut, fiber insulating washer and stamped tin plated solder terminal (unassembled)  
**Panel Thickness:** Up to .281 (7.15)

### RATINGS

**Current:** 15 amps  
**Breakdown Voltage:** 1500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum  
**Contact-To-Panel:** 2.4 pF nominal

**For Standard Banana Plug:**  
**.175 (4.44) Across Flats**  
**FEATURES**

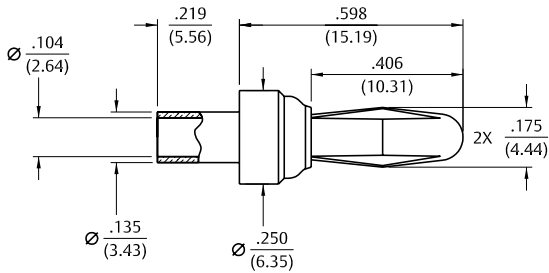
- Withstands extreme temperatures and abuse
- Stamped tin plated solder terminal with hole for up to 12 gauge wire
- Integrally molded hex head for fast installation

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Uninsulated Rivet Type



| Silver Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 108-0754-001   | Silver |



### SPECIFICATIONS

**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Beryllium copper per QQ-C-533  
**Finish:** Silver  
**Panel Thickness:** Up to .156 (4.00)

### RATINGS

**Current:** 15 amps  
**Contact Resistance:** 0.010 ohms maximum

**For Standard Banana Plug:**  
**.166 (4.23) Diameter**  
**FEATURES**

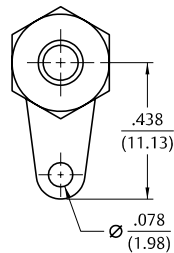
- Shorter spring adapts to standard jack or special size jack
- Ideal for limited space applications

# Banana Plugs – For Test Equipment and Power Supplies

## Uninsulated Panel Mount Threaded Stud



| Nickel Plating |                 |
|----------------|-----------------|
| Part No.       | Stud Length "A" |
| 108-0750-001   | .375 (9.50)     |
| 108-0750-002   | .750 (19.05)    |

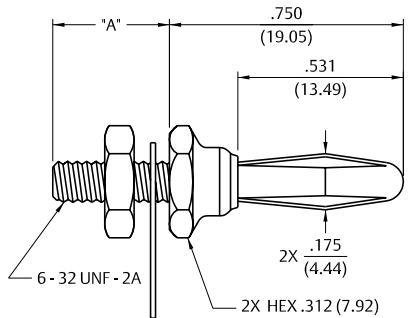


### SPECIFICATIONS

**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-585  
**Finish:** Nickel  
**Panel Thickness:** Up to .25 (6.35) .625 (16.00)  
**Hardware:** Nickel plated nut, stamped tin plated solder terminal (unassembled)

### RATINGS

**Current:** 15 amps  
**Contact Resistance:** 0.010 ohms maximum



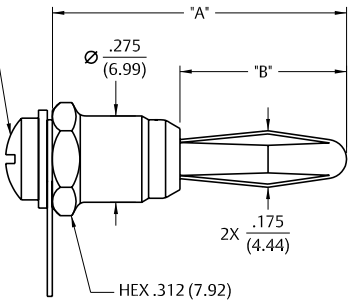
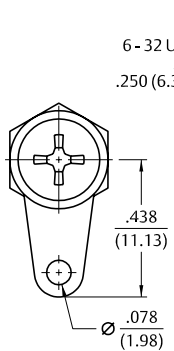
**For Standard Banana Plug:**  
**.166 (4.23) Diameter**  
**FEATURES**

- Pierced hole for up to 14 gauge wires

## Uninsulated Panel Mount Screw Type Beryllium Copper Spring



| Nickel Plating |             |             |                 |          |
|----------------|-------------|-------------|-----------------|----------|
| Part No.       | Body Length |             | Panel Thickness |          |
|                | A           | B           | A               | B        |
| 108-0753-102   | 906 (32.01) | 562 (14.27) | .156 max        | .125 max |



### SPECIFICATIONS

**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Beryllium copper per QQ-C-533  
**Finish:** Nickel  
**Panel Thickness:** Up to .156 (4.00)  
**Hardware:** Nickel plated nut, stamped tin plated solder terminal (unassembled)

### RATINGS

**Current:** 15 amps  
**Contact Resistance:** 0.010 ohms maximum

**For Standard Banana Plug:**  
**.166 (4.23) Diameter**  
**FEATURES**

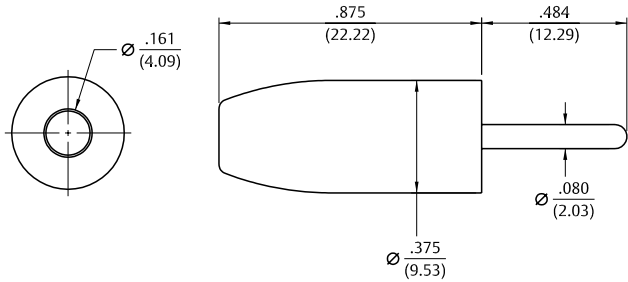
- Rugged screw type
- Stamped tin plated solder terminal with hole for up to 14 gauge wire

# Banana Plugs – For Test Equipment and Power Supplies

## Insulated Solderless Tapered Handle



| Nickel Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 108-0301-001   | White  |
| 108-0302-001   | Red    |
| 108-0303-001   | Black  |
| 108-0304-001   | Green  |
| 108-0306-001   | Orange |
| 108-0307-001   | Yellow |
| 108-0308-001   | Brown  |
| 108-0310-001   | Blue   |
| 108-0312-001   | Violet |
| 108-0313-001   | Gray   |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-533  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**Panel Thickness:** Up to .281 (7.15)

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

**For Standard Banana Plug: .166 (4.23) Diameter**  
**FEATURES**

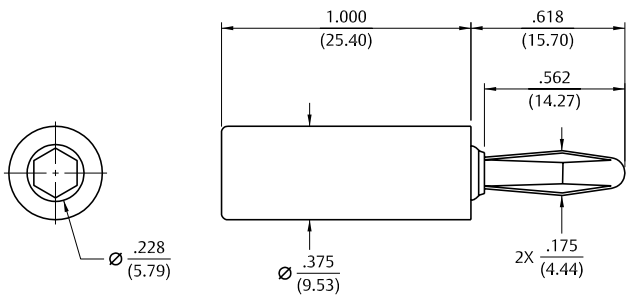
- Fast solderless connection of up to 16 gauge wire
- Recessed plug body to limit shock hazard
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Side Set Screw Solderless



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 108-1702-101   | Red   |
| 108-1703-101   | Black |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-585  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 35 VRMS minimum†

**For Standard Banana Plug: .166 (4.23) Diameter For Low Voltage (50 WVDC) Applications**  
**FEATURES**

- Fast solderless connection of up to 16 gauge wire
- Set screw for dependable connections with low voltage
- Nylon UL approved for self extinguishing

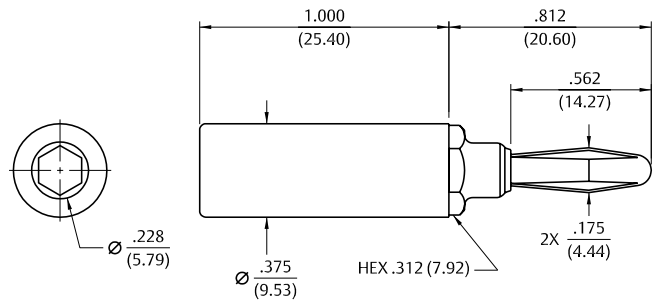
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Banana Plugs – For Test Equipment and Power Supplies

## Insulated Hex Body Solder Stud



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 108-1762-101   | Red   |
| 108-1763-101   | Black |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-585  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

**For Standard Banana Plug: .166 (4.23) Diameter**  
**FEATURES**

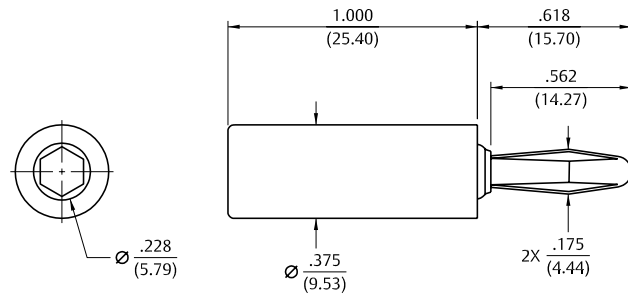
- Wire can be soldered to threaded stud
- Solder stud accepts up to 16 gauge wire
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Round Body Solder Stud



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 108-1722-101   | Red   |
| 108-1723-101   | Black |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-585  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 3500 VRMS minimum†

**For Standard Banana Plug: .166 (4.23) Diameter**  
**FEATURES**

- Wire can be soldered to threaded stud
- Solder stud accepts up to 16 gauge wire
- Nylon UL approved for self extinguishing

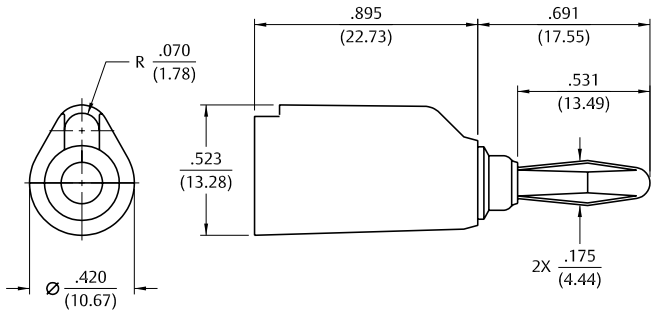
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Banana Plugs – For Test Equipment and Power Supplies

## Insulated Stacking Single Type



| Nickel Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 108-1081-001   | White  |
| 108-1082-001   | Red    |
| 108-1083-001   | Black  |
| 108-1087-001   | Yellow |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-585  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**Panel Thickness:** Up to .281 (7.15)  
**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

**For Standard Banana Plug:**  
**.166 (4.23) Diameter**  
**FEATURES**

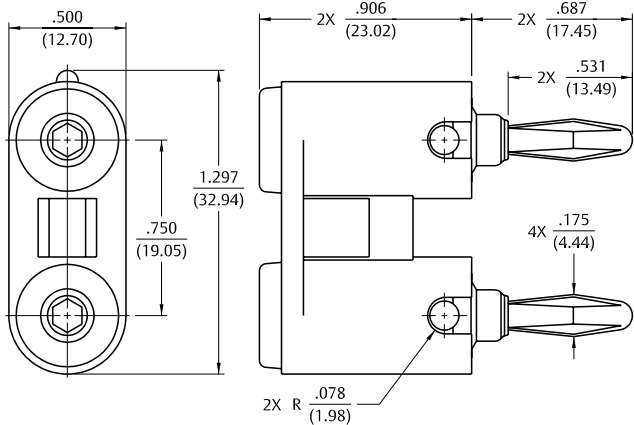
- Wire can be soldered to threaded stud
- Solder stud accepts up to 16 gauge wire
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Insulated Stacking Dual Type



| Nickel Plating<br>Set Screw<br>(Accepts Wire Sizes<br>Up To 14 Gauge) |       |
|-----------------------------------------------------------------------|-------|
| Part No.                                                              | Color |
| 108-0252-001                                                          | Red   |
| 108-0253-001                                                          | Black |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Nickel silver per QQ-C-586  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 15 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

**For Standard Banana Plug:**  
**.166 (4.23) Diameter**  
**FEATURES**

- Accepts standard banana plug from rear
- Built-in strain relief for long life
- Nylon UL approved for self extinguishing

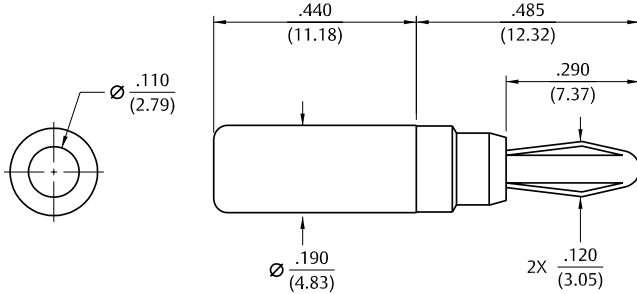
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

# Banana Plugs – For Audio Circuitry and RF Circuitry

## Insulated Solder Type



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 108-1002-001   | Red   |
| 108-1003-001   | Black |



**SPECIFICATIONS**  
**Plug Body:** Brass per QQ-B-626D  
**Plug Spring:** Beryllium copper per QQ-C-533  
**Finish:** Nickel  
**Insulated Handle:** Nylon 6/6 per ASTM D4066

**RATINGS**  
**Current:** 10 amps  
**Breakdown Voltage:** 3500 VRMS minimum†  
**Contact Resistance:** 0.010 ohms maximum

**For Miniature Banana Jack:**  
**.104 (2.64) Diameter**  
**FEATURES**

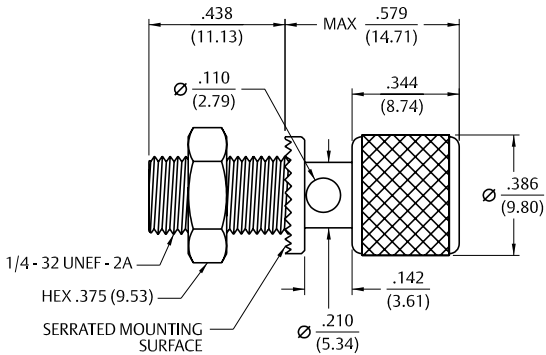
- Wire can be soldered to threaded stud
- Solder stud accepts up to 16 gauge wire
- Nylon UL approved for self extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

## Uninsulated With Knurled Thumb-Nut-Grounded Type



| Nickel Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 111-2223-001   | Nickel |



**SPECIFICATIONS**  
**Stud:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Hardware:** Nickel plated nut (unassembled)  
**Panel Thickness:** Up to .281 (7.15)

**RATINGS**  
**Current:** 15 amps

**For Standard Banana Plug:**  
**.175 (4.44) Across Flats**  
**FEATURES**

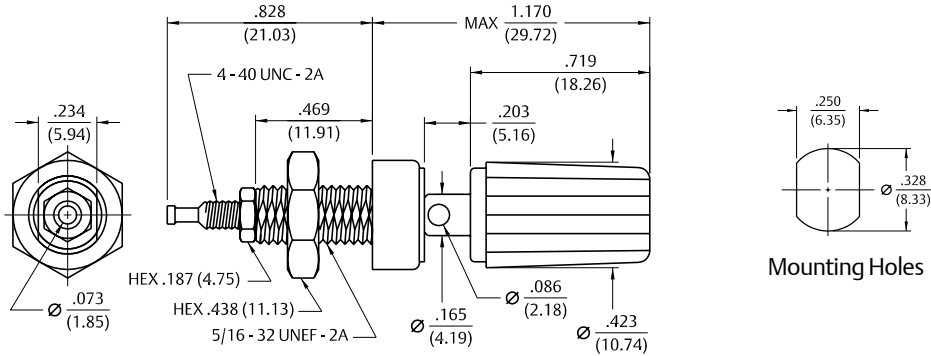
- Nickel plated stud with serrated mounting surface prevents turning
- Captive thumb nut .110 (2.79) diameter cross-hole accommodates up to 10 gauge wire

Binding Posts – For Audio Circuitry and RF Circuitry

Insulated Standard



| Silver Plating |        |
|----------------|--------|
| Part No.       | Color  |
| 111-0101-001   | White  |
| 111-0102-001   | Red    |
| 111-0104-001   | Green  |
| 111-0103-001   | Black  |
| 111-0107-001   | Yellow |
| 111-0110-001   | Blue   |



**SPECIFICATIONS**  
**Stud:** Brass per QQ-B-626D  
**Finish:** Silver  
**Insulating Material:** Nylon 6/6 per ASTM D4066  
**Hardware:** Nickel plated nut (unassembled)  
**Body Thread Stripping Torque:** 6.0 lb. in. (7.0 kg cm)  
**Panel Thickness:** Up to .281 (7.15)  
**RATINGS**  
**Current:** 15 amps  
**Contact Resistance:** 0.010 ohms maximum  
**Breakdown Voltage:** 5700 VRMS minimum†  
**Stud-To-Panel:** 3.3 pF nominal

**For Standard Banana Plug: .175 (4.44) Diameter**  
**FEATURES**

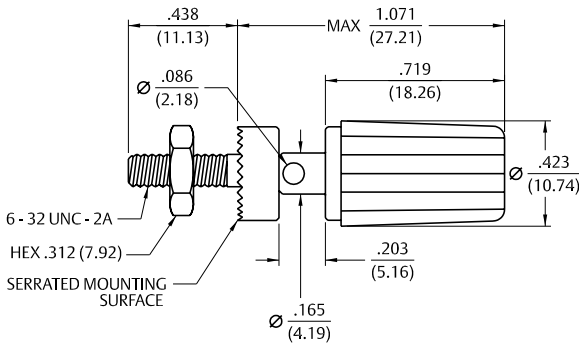
- Turret terminal
- Captive thumb nut
- Insulated body is flatted to prevent turning
- Nylon UL approved for self-extinguishing

† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Insulated Standard With – Thumb Nut – Grounded Type



| Nickel Plating |       |
|----------------|-------|
| Part No.       | Color |
| 111-0702-001   | Red   |
| 111-0703-001   | Black |



**SPECIFICATIONS**  
**Stud:** Brass per QQ-B-626D  
**Finish:** Nickel  
**Insulating Material:** Nylon 6/6 per ASTM D4066  
**Hardware:** Nickel plated nut (unassembled)  
**Panel Thickness:** Up to .313 (7.95)

**RATINGS**  
**Current:** 15 amps

**For Standard Banana Plug: .166 (4.23) Diameter**  
**FEATURES**

- Accepts standard banana plug from rear
- Built-in strain relief for long life
- Nylon UL approved for self-extinguishing

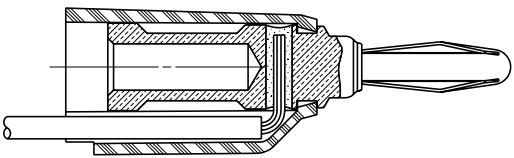
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Assembly Tools and Fixtures

Assembly Tools and Fixtures (108-108X-001 Series)



| Fixture Part No. | Tool Part No. |
|------------------|---------------|
| 251-0111-003     | 251-0115-002  |



**For Standard Stacking Banana Plugs: .175 (4.44) Across Flats**  
Quick and easy assembly of standard banana plug .175 (4.44) diameter is possible with the assembly tool and fixtures shown here. Strip wire jacket back 3/4" and feed wire through cross hole of metal contact. Fold stripped wire against metal plug body and slide insulated handle over banana plug body and wires. Insert contact wire into housing. Place into fixture. Push tip of tool into rear of contact. Snap contact into place. Handle of tool is curved to fit hand comfortably. Fixture and tip of tool made from tool steel.

Crimp Tool (105-077X-XXX Series)



| Tool Part No. | MIL Part No. |
|---------------|--------------|
| 144-0000-910  | M22520/1-01  |

**For Insulated Standard Small Handle Tip Plugs: .080 (2.00) Diameter and .060 (1.50) Tip Jacks**  
Quick and easy assembly of standard banana plug .175 (4.44) diameter is possible with the assembly tool and fixtures shown here. Strip wire jacket back 3/4" and feed wire through cross hole of metal contact. Fold stripped wire against metal plug body and slide insulated handle over banana plug body and wires. Insert contact wire into housing. Place into fixture. Push tip of tool into rear of contact. Snap contact into place. Handle of tool is curved to fit hand comfortably. Fixture and tip of tool made from tool steel.

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| 73303-1912 ..... | 142-0593-001 |
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| 73447-1212 ..... | 133-3403-101 |
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| 451-900-0630N .....            | 133-3303-006 | 29 Z 101-102 D3 .....        | 142-0003-231 | 55-607-0369-31 .....         | 142-0694-031 |
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| 451-980-0630H .....            | 133-3303-401 | 50-024-0000 .....            | 131-6403-001 | 55-607-9173-31 .....         | 142-0694-001 |
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| 29 K 101-102 A3 .....          | 133-3303-006 | 50-628-9188-31 .....         | 142-0403-101 | 39JR293-3 .....              | 142-1701-526 |
| 29 K 101-102 D3 .....          | 133-3303-001 | 50-628-9196-31 .....         | 142-0402-101 | 39JR293-4 .....              | 142-1701-536 |
| 29 K 101-103 A3 .....          | 133-3304-006 | 50-643-0000-31 .....         | 142-0701-401 | 39JR293-5 .....              | 142-1701-546 |
| 29 K 101-103 D3 .....          | 133-3304-001 | 50-643-4312-31 .....         | 142-0701-411 | 39JR294-1 .....              | 142-1701-606 |
| 29 K 101-400 A3 .....          | 133-3701-206 | 50-645-4504-31 .....         | 142-0701-631 | 39JR294-2 .....              | 142-1701-616 |
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| SF2960-6025.....        | 142-1711-006   |                       |                |
| SF2960-6268.....        | 142-1711-026   | <b>TYCO/AMP.....</b>  | <b>EMERSON</b> |
| SF2960-6274.....        | 142-1711-036   | 1-221128-0.....       | CPMC-88-1      |
| SF2960-6613.....        | 142-1711-536   | 1-221128-1.....       | CPMC-88-2      |
| SF2960-6701.....        | 142-1711-526   | 1-221128-2.....       | CPMC-88-3      |
| SF2960-6703.....        | 142-1711-516   | 1-221128-6.....       | CPMC-88-2      |
| 211-03SF.....           | 142-1801-536   | 1-221128-7.....       | CPMC-88-2      |
| 211-12SF.....           | 142-1801-556   | 1-226208-3.....       | CPL-259-18     |
| 211-14SF.....           | 142-1801-566   | 1-227079-0.....       | CPMC-88-13     |
| 211-16SF.....           | 142-1801-576   | 1-227079-1.....       | CPMC-88-2      |
| 212-01SF.....           | 142-1701-516   | 1-227079-3.....       | CPMC-88-2      |
| 212-03SF.....           | 142-1701-536   | 1-227079-4.....       | CPM-88-19      |
| 212-06SF.....           | 142-1701-526   | 1-227079-5.....       | CPM-88-19      |
| 212-08SF.....           | 142-1701-566   | 1-227079-6.....       | CPM-88-19      |
| 212-10SF.....           | 142-1701-586   | 1-227079-7.....       | CPMC-88-18     |
| 212-12SF.....           | 142-1701-576   | 1-227079-9.....       | CPMC-88-18     |
| 212-13SF.....           | 142-1701-556   | 1-227086-0.....       | CPN-1          |
| 212-26SF.....           | 142-1701-506   | 1-228509-2.....       | CP-625SU       |
| 213-01SF.....           | 142-1801-616   | 1-330022-2.....       | CP-BNC-CAP-1   |
| 213-03SF.....           | 142-1801-636   | 134866-1.....         | CPMC-TNC-2     |
| 213-06SF.....           | 142-1801-626   | 1-413592-4.....       | CP-AD505       |
| 213-08SF.....           | 142-1801-606   | 1-414586-4.....       | CPMC-88-3      |
| 214-01SF.....           | 142-1701-616   | 1060031-1.....        | 145-0701-602   |
| 214-03SF.....           | 142-1701-636   | 1060035-1.....        | 145-0701-002   |
| 214-06SF.....           | 142-1701-626   | 1060041-1.....        | 145-0901-801   |
| 214-08SF.....           | 142-1701-606   | 1060041-1.....        | 145-0901-811   |
|                         |                | 1063404-11.....       | 142-1000-033   |
| <b>TELEGARTNER.....</b> | <b>EMERSON</b> | 2-221128-5.....       | CPMC-88-14     |
| H01000A005 7.....       | 142-0003-236   | 2-221128-7.....       | CPMC-88-2      |
| J01270A000 1.....       | 133-3402-001   | 2-225395-0.....       | CPMC-88-2      |
| J01270A000 9.....       | 133-3402-006   | 2-225395-9.....       | CPMC-88-3      |

Competitor Cross Reference

Ultra Miniature Connectors UMC to U.FL Cross Reference

| Emerson      | Hirose                 |
|--------------|------------------------|
| 128-0711-201 | U.FL-R-SMT(10)         |
| 415-0084-050 | U.FL-2LP(V)-04N1-A-50  |
| 415-0084-100 | U.FL-2LP(V)-04N1-A-100 |
| 415-0084-150 | U.FL-2LP(V)-04N1-A-150 |
| 415-0084-200 | U.FL-2LP(V)-04N1-A-200 |
| 415-0084-250 | U.FL-2LP(V)-04N1-A-250 |
| 415-0084-300 | U.FL-2LP(V)-04N1-A-300 |
| 415-0084-500 | U.FL-2LP(V)-04N1-A-500 |
| 415-0085-050 | U.FL-2LP-04N2-A-50     |
| 415-0085-100 | U.FL-2LP-04N2-A-100    |
| 415-0085-150 | U.FL-2LP-04N2-A-150    |
| 415-0085-200 | U.FL-2LP-04N2-A-200    |
| 415-0085-250 | U.FL-2LP-04N2-A-250    |
| 415-0085-300 | U.FL-2LP-04N2-A-300    |
| 415-0085-300 | U.FL-2LP-04N2-A-500    |
| 415-0086-050 | U.FL-2LP-068N2-A-50    |
| 415-0086-100 | U.FL-2LP-068N2-A-100   |
| 415-0086-150 | U.FL-2LP-068N2-A-150   |
| 415-0086-200 | U.FL-2LP-068N2-A-200   |
| 415-0086-250 | U.FL-2LP-068N2-A-250   |
| 415-0086-300 | U.FL-2LP-068N2-A-300   |
| 415-0086-500 | U.FL-2LP-068N2-A-500   |
| 415-0087-050 | U.FL-2LP-066J2-A-50    |

| Emerson      | Hirose                |
|--------------|-----------------------|
| 415-0087-100 | U.FL-2LP-066J2-A-100  |
| 415-0087-150 | U.FL-2LP-066J2-A-150  |
| 415-0087-200 | U.FL-2LP-066J2-A-200  |
| 415-0087-250 | U.FL-2LP-066J2-A-250  |
| 415-0087-300 | U.FL-2LP-066J2-A-300  |
| 415-0087-500 | U.FL-2LP-066J2-A-500  |
| 415-0088-050 | U.FL-2LP-088K2T-A-50  |
| 415-0088-100 | U.FL-2LP-088K2T-A-100 |
| 415-0088-150 | U.FL-2LP-088K2T-A-150 |
| 415-0088-200 | U.FL-2LP-088K2T-A-200 |
| 415-0088-250 | U.FL-2LP-088K2T-A-250 |
| 415-0088-300 | U.FL-2LP-088K2T-A-300 |
| 415-0088-500 | U.FL-2LP-088K2T-A-500 |
| 415-0104-150 | U.FL-LP(V)-04N1-A-150 |
| 415-0104-250 | U.FL-LP(V)-04N1-A-250 |
| 415-0105-150 | U.FL-LP-04N2-A-150    |
| 415-0105-250 | U.FL-LP-04N2-A-250    |
| 415-0106-150 | U.FL-LP-068N2-A-150   |
| 415-0106-250 | U.FL-LP-068N2-A-250   |
| 415-0107-150 | U.FL-LP-066J2-A-150   |
| 415-0107-250 | U.FL-LP-066J2-A-250   |
| 415-0108-150 | U.FL-LP-088K2T-A-150  |
| 415-0108-250 | U.FL-LP-088K2T-A-25   |

Competitor Cross Reference

UMC Compatibility Table Emerson vs. HIROSE

| UMC Family     | Mated Height (mm) | AWG (O.D. mm) | Emerson                  |              | HIROSE                   |                  |
|----------------|-------------------|---------------|--------------------------|--------------|--------------------------|------------------|
|                |                   |               | Plating (Contact/Ground) | Part No.     | Plating (Contact/Ground) | Part No.         |
| UMC Receptacle | 2.5               | N/A           | Gold                     | 128-0711-201 | Gold/Silver              | U.FL-R-SMT (10)  |
| UMC MP Plug    | 2.5               | 30 (1.37)     | Gold                     | 415-0088-xxx | Gold/Silver              | U.FL-LP-088      |
| UMC MP Plug    | 2.5               | 32 (1.32)     | Gold                     | 415-0087-xxx | Gold/Silver              | U.FL-LP-066      |
|                |                   | 32 (1.13)     | Gold                     | 415-0086-xxx | Gold/Silver              | U.FL-LP-066      |
|                |                   | 36 (0.81)     | Gold                     | 415-0085-xxx | Gold/Silver              | U.FL-LP-040      |
| UMC LP Plug    | 2.0               | 36 (0.81)     | Gold                     | 415-0084-xxx | Gold/Silver              | U.FL-LP(V)-040   |
| UMC ULP Plug   | 1.55              | N/A           | Gold                     | 415-0109-xxx | Gold/Silver              | CL-331-0482-6-10 |

Non-Magnetic RF Competitor Cross Reference

| Emerson Part No. | Competitor Part No. | Competitor |
|------------------|---------------------|------------|
| 135-9403-001     | 908-NM41300         | Amphenol   |
| 135-9402-001     | 908-NM41200         | Amphenol   |
| 135-9403-101     | 908-NM43300         | Amphenol   |
| 135-9402-111     | 908-NM43200         | Amphenol   |
| 135-9701-201     | 908-NM22106         | Amphenol   |
| 135-9701-301     | 908-NM24100         | Amphenol   |
| 133-9403-001     | 919-NM101P-51S      | Amphenol   |
| 133-9403-101     | 919-NM104P-51A      | Amphenol   |
| 133-9402-101     | 919-NM109J-51P      | Amphenol   |
| 133-9701-201     | 919-NM109J-51P      | Amphenol   |
| 131-9403-021     | 903NM285P-51S       | Amphenol   |
| 131-9403-101     | 903-NM289P-51A      | Amphenol   |
| 131-9701-201     | 903-NM415J-51P      | Amphenol   |
| 135-9402-111     | R110 170 117        | Radiall    |
| 135-9701-201     | R110 426 097        | Radiall    |
| 142-9407-001     | R125 075 097        | Radiall    |
| 142-9403-101     | R125 172 167        | Radiall    |
| 142-9701-201     | R125 426 067        | Radiall    |
| 131-9403-021     | R114 082 097        | Radiall    |
| 131-9403-101     | R114 186 097        | Radiall    |

Competitor Cross Reference

Type N Competitor Cross Reference

| Emerson      | Radiall    | M/A-Com       | Amphenol     | Tyco/Amp    | Telegartner | Rosenberger  | Huber-Suhner |
|--------------|------------|---------------|--------------|-------------|-------------|--------------|--------------|
| 138-4303-407 | R161311300 | 3004-7388-10  | 82-6156      |             |             | 53K507-802N3 |              |
| 138-4304-407 | R161311300 |               |              |             |             | 53K507-803N3 |              |
| 138-4307-407 | R161329000 | 3004-7341-10  | 82-5378      | 1-225667-2  | J01021A0147 | 53K507-106N3 | 24N-50-3-11C |
| 138-4308-407 | R161329200 | 3004-7341-10  | 82-5373      | 225363-2    | J01021A0148 | 53K507-108N3 | 24N-50-3-12C |
| 138-4316-407 | R161331000 | N15H61H001X99 | 82-346-RFX   | 225094-2    | J01021A0060 | 53K501-115N3 | 24N-50-7-14C |
| 138-4318-407 | R161331200 | N15H61H004X99 |              | 225667-1    | J01021A0092 | 53K501-117N3 | 24N-50-7-15C |
| 138-4349-407 | R161331060 |               | 82-6143-1000 |             |             |              |              |
| 138-4403-007 | R161072000 | 3031-7338-10  |              |             | J01020A0103 | 53S107-802N3 |              |
| 138-4403-107 | R161181000 |               | 82-6048-1000 |             | J01020A0040 |              |              |
| 138-4404-007 | R161072000 |               |              |             | J01020A0104 | 53S107-803N3 |              |
| 138-4404-107 | R161181300 |               |              |             | J01020A0039 |              |              |
| 138-4407-007 | R161082000 | 3031-7358-10  | 82-5375      | 1-225661-2  | J01010A0108 | 53S107-106N3 | 11N-50-3-28C |
| 138-4407-107 | R161182000 |               |              | 1-225669-2  | J01020A0035 | 53S205-315N3 | 16N-50-3-26C |
| 138-4408-007 | R161083000 | 3031-7341-10  | 82-5370      | 225699-1    | J01020A0113 | 53S107-108N3 | 11N-50-3-29C |
| 138-4408-107 | R161183000 |               | 82-4442      | 225365-2    | J01020A0036 | 53S205-317N3 | 16N-50-3-27C |
| 138-4416-007 | R161075000 | N15A61H001X99 | 82-340       | 225661-2    | J01020A0107 | 53S101-115N3 | 11N-50-7-43C |
| 138-4416-107 | R161184000 | N15B61H001X99 | 82-336       | 225669-2    | J01020A0046 |              | 16N-50-7-30C |
| 138-4418-007 | R161088000 | N15A61H004X99 | 82-332       | 225661-1    | J01020A0110 | 53S101-115N3 | 11N-50-7-44C |
| 138-4418-107 | R161186000 | N15B61H004X99 | 82-4440-1001 | 225669-1    | J01020A0045 |              | 16N-50-7-31C |
| 138-4449-007 | R161075060 |               | 82-340-1052  |             | J01020A0127 | 53S101-1N9N3 |              |
| 138-4593-401 | R161335200 | 3004-7985-00  | 82-6093-RFX  | 228658-2    | J01021H0087 | 52K504-271N3 | 24N-50-2-14  |
| 138-4594-401 | R161336000 | 3004-7941-00  | 82-6097-RFX  | 228658-1    | J01021A0151 | 53K504-272N3 | 24N-50-3-14  |
| 138-4596-401 | R161337200 |               | 82-6162      |             | J01021A0109 | 53K504-273N3 | 24N-50-5-39C |
| 138-4693-001 | R161050300 | 3001-7985-00  |              | 1057094-1   |             |              | 11N-50-2-14  |
| 138-4693-011 | R161050300 | 3001-7985-00  |              |             |             |              | 11N-50-2-14  |
| 138-4694-001 | R161051000 | 3001-7941-00  | 82-5955-RFX  | 1057088-1   | J01020A0109 | 53S101-272B1 | 11N-50-3-13  |
| 138-4694-011 | R161051000 | 3001-7941-00  | 82-5955-RFX  |             | J01020A0109 | 53S101-272B1 | 11N-50-3-13  |
| 138-4696-001 | R161054000 |               | 82-6124      |             | J01020A0112 | 53S101-273B1 | 11N-50-5-39C |
| 138-4696-011 | R161054000 |               | 82-6124      |             | J01020A0112 | 53S101-273B1 | 11N-50-5-39C |
| 138-4701-407 | R161586137 | N15M35999X99  |              |             | J01021A1084 | 53K505-200N3 |              |
| 138-4701-607 | R161404000 | 3052-0000-10  | 82-97        | 1-1337418-0 | J01021A1082 | 53K401-200N3 | 23N-50-0-23  |
| 138-4901-407 | R161730000 | N15R07999X99  | 82-66        |             | J01024A1088 | 53K501-K00N3 | 34N-50-0-51  |
| 138-4901-807 | R161705000 | 3680-0000-02  | 82-101       | 227945-2    | J01024A1092 | 53K101-K00N3 | 31N-50-0-51  |
| 138-4901-817 | R161703000 | 3681-0000-02  | 82-100       | 1058661-1   | J01024A1094 | 53K101-S00N3 | 32N-50-0-51  |

Competitor Cross Reference

SMA Stainless Steel Competitor Cross Reference

| Emerson      | Huber-Suhner   | Amp/Tyco   | Radiall    | Amphenol       | AEP            |
|--------------|----------------|------------|------------|----------------|----------------|
| 141-0403-012 | 11SMA-50-2-55C | 225532-4   | R125072001 | 901-9511-3SFC  | 9101-9573-03   |
| 141-0404-012 | 11SMA-50-2-56C |            | R125072081 | 901-9511-12SFC | 9101-9573-19   |
| 141-0407-012 | 11SMA-50-3-55C | 225532-1   | R125075001 | 901-9511-2SF   | 9101-9573-06   |
| 141-0408-012 | 11SMA-50-3-56C | 225532-3   | R125076001 | 901-9511-1SF   | 9101-9573-01   |
| 141-0403-102 | 16SMA-50-2-55C | 225609-4   | R125172001 | 901-9531-3SF   | 9043-9523-03   |
| 141-0404-102 | 16SMA-50-2-56C |            | R125174011 | 901-9531-12SF  | 9043-9523-19   |
| 141-0407-102 | 16SMA-50-3-55C | 225609-1   | R125175001 | 901-9531-2SF   | 9043-9523-06   |
| 141-0408-102 | 16SMA-50-3-56C | 225609-3   | R125176001 | 901-9531-1     | 9043-9523-01   |
| 141-0693-002 | 11SMA-50-2-65  |            | R125052002 | 901-9201-2A    | 9401-1083-010  |
| 141-0694-002 | 11SMA-50-3-65  |            |            |                | 9401-1083-109  |
| 141-0694-012 | 11SMA-50-3-64  |            | R125054002 | 901-9201-1A    | 9301-1063-009  |
| 141-0693-062 | 11SMA-50-2-65  |            | R125052002 | 901-9723       | 9401-1583-010  |
| 141-0694-062 | 11SMA-50-3-65  |            | R125057002 | 901-9808       | 9401-1583-109  |
| 141-0303-412 |                | 225608-4   | R125312121 | 901-9610-3SF   | 9130-9573-03   |
| 141-0304-412 |                | 1-225608-1 | R125313121 | 901-9610-12SF  | 9130-9573-19   |
| 141-0307-412 |                |            | R125314121 | 901-9610-2SF   | 9130-9573-06   |
| 141-0308-412 |                | 225608-3   | R125315121 | 901-9610-1SF   | 9130-9573-01   |
| 141-0593-001 |                |            | R125222000 | 901-9202-2A    | 9402-1533-010  |
| 141-0594-001 |                |            | R125225000 | 901-9202-1A    | 9402-1583-009  |
| 141-0593-401 | 24SMA-50-2-41  |            | R125326000 |                | 9453-1083-010  |
| 141-0594-401 | 24SMA-50-3-41  |            | R125325000 |                | 9453-1083-009  |
| 141-0593-421 | 24SMA-50-2-41  |            | R125326000 |                | 9453-1583-010  |
| 141-0594-421 | 24SMA-50-3-41  |            | R125325000 |                | 9453-1083-009  |
| 141-0701-201 | 82SMA-50-0-1   | 221789-1   | R125426000 | 901-144        | 9650-1113-000  |
| 141-0701-301 | 85SMA-50-0-1   | 221790-1   | R125680000 | 901-143        | 9647-1513-000  |
| 141-0701-402 | 22SMA-50-0-54  | 228496-1   | R125553001 | 901-9211-SF    | 9412-9113-000  |
| 141-0701-602 | 23SMA-50-0-61  | 221641-1   | R125454001 |                | 9408-9113-000  |
| 141-0701-612 | 23SMA-50-0-51  | 221640-1   | R125403001 | 901-9215-SF    | 9404-9113-000  |
| 141-0701-622 | 23SMA-50-0-63  |            | R125464274 | 901-9000-CCSF  | 9008-9113-000  |
| 141-0701-602 | 23SMA-50-0-53  |            | R125415275 | 901-9204-CCSF  | 9004-9113-0001 |

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Shortages or damages must be identified and signed for at the time of delivery. Buyer shall inspect Goods delivered to it by Seller immediately upon receipt, and, any course of dealing to the contrary notwithstanding, failure of Buyer to give Seller notice of any claim within 30 days after receipt of such Goods shall be an unqualified acceptance of such Goods.

**5. LIMITED WARRANTY:** Subject to the limitations of Section 6, Seller warrants that the Goods manufactured by Seller will be free from defects in material and workmanship under normal use and regular service and maintenance for a period of one year from the date of shipment of the Goods by Seller, unless otherwise specified by Seller in writing. **THIS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SELLER WITH RESPECT TO THE GOODS AND IS IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MER-**

**CHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT SELLER’S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER’S USE OR PURPOSE.**

This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, negligence (other than Seller’s), unauthorized modification or alteration, use beyond rated capacity, unsuitable power sources or environmental conditions, improper installation, repair, handling, maintenance or application or any other cause not the fault of Seller. To the extent that Buyer or its agents has supplied specifications, information, representation of operating conditions or other data to Seller in the selection or design of the Goods and the preparation of Seller’s quotation, and in the event that actual operating conditions or other conditions differ from those represented by Buyer, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

If within thirty (30) days after Buyer’s discovery of any warranty defects within the warranty period, Buyer notifies Seller thereof in writing, Seller shall, at its option and as Buyer’s exclusive remedy, repair, correct or replace F.O.B. point of manufacture, or refund the purchase price for, that portion of the Goods found by Seller to be defective. Failure by Buyer to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of Buyer’s claim for such defects. All costs of dismantling, reinstallation and freight and the time and expense of Seller’s personnel and representatives for site travel and diagnosis under this warranty shall be borne by Buyer unless accepted in writing by Seller. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days from the date of shipment, whichever is longer.

Buyer assumes all other responsibility for any loss, damage, or injury to persons or property arising out of, connected with, or resulting from the use of Goods, either alone or in combination with other products/components.

Section 5 applies to any entity or person who may buy, acquire or use the Goods, including any entity or person who obtains the Goods from Buyer, and shall be bound by the limitations therein, including Section 6. Buyer agrees to provide such subsequent transferee conspicuous, written notice of the provisions of Sections 5 and 6.

**6. LIMITATION OF REMEDY AND LIABILITY: THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER OTHER THAN THE WARRANTY PROVIDED UNDER SECTION 7 SHALL BE LIMITED TO REPAIR, CORRECTION OR REPLACEMENT, OR REFUND OF THE PURCHASE PRICE UNDER SECTION 5.**

**SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND THE REMEDIES SET FORTH IN THIS AGREEMENT ARE EXCLUSIVE. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER’S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE PAID BY BUYER FOR THE SPECIFIC GOODS PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER’S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES.** The term “consequential damages” shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use, revenue, reputation and data, costs incurred, including without limitation, for capital, fuel, power and loss or damage to property or equipment.

Buyer expressly acknowledges and agrees that Seller has set its prices and entered into this agreement in reliance upon the limitations of liability and other terms and conditions specified herein, which allocates the risk between Seller and Buyer and form a basis of this bargain between the parties.

It is expressly understood that any technical advice furnished by Seller with respect to the use of the Goods is given without charge, and Seller assumes no obligation or liability for the advice given, or results obtained, all such advice being given and accepted at Buyer’s risk.

**7. PATENTS AND COPYRIGHTS:** Subject to the limitations of the second

paragraph of Section 6, Seller warrants that the Goods sold, except as are made specifically for Buyer according to Buyer’s specifications, do not infringe any valid U.S. patent or copyright in existence as of the date of shipment. This warranty is given upon the condition that Buyer promptly notify Seller of any claim or suit involving Buyer in which such infringement is alleged and cooperate fully with Seller and permit Seller to control completely the defense, settlement or compromise of any such allegation of infringement. Seller’s warranty as to use patents only applies to infringement arising solely out of the inherent operation according to Seller’s specifications and instructions (i) of such Goods, or (ii) of any combination of Goods acquired from Seller in a system designed by Seller. In the event such Goods are held to infringe such a U.S. patent or copyright in such suit, and the use of such Goods is enjoined, or in the case of a compromise or settlement by Seller, Seller shall have the right, at its option and expense, to procure for Buyer the right to continue using such Goods, or replace them with non-infringing Goods, or modify same to become non-infringing, or grant Buyer a credit for the depreciated value of such Goods and accept return of them. In the event of the foregoing, Seller may also, at its option, cancel the agreement as to future deliveries of such Goods, without liability.

**8. EXCUSE OF PERFORMANCE:** Seller shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; weather; sabotage; strikes or labor disputes; civil disturbances or riots; governmental requests, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller’s reasonable control. Deliveries or other performance may be suspended for an appropriate period of time or canceled by Seller upon notice to Buyer in the event of any of the foregoing, but the balance of the agreement shall otherwise remain unaffected as a result of the foregoing.

If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth in the preceding paragraph, Seller may allocate its available supply of the Goods or such material without obligation to acquire other supplies of any such Goods or material among itself and its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom.

**9. CANCELLATION:** Unless otherwise agreed in writing by Seller, orders under this agreement may not be canceled by Buyer for any reason.

**10. CHANGES:** Buyer may request changes or additions to the Goods consistent with Seller’s specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price and dates of delivery.

Seller reserves the right to change designs and specifications for the Goods without prior notice to Buyer, except with respect to Goods being made-to-order for Buyer. Seller shall have no obligation to install or make such change in any Goods manufactured prior to the date of such change.

**11. NUCLEAR/MEDICAL.** GOODS AND SERVICES SOLD HEREUNDER ARE NOT FOR USE IN CONNECTION WITH ANY NUCLEAR, MEDICAL, LIFESUPPORT AND RELATED APPLICATIONS. Buyer accepts goods and services with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchasers or users and to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller’s liability is based on negligence or strict liability.

**12. BUYER’S COMPLIANCE WITH LAWS:** In connection with the transactions contemplated by this agreement, Buyer is familiar with and shall fully comply with all applicable laws, regulations, rules and other requirements of the United States and of any applicable state, foreign and local governmental body in connection with the purchase, receipt, use, transfer and disposal of the Goods.

**13. EXPORT/IMPORT:** Buyer agrees that all applicable import and export control laws, regulations, orders and requirements, including without limitation those of the United States and the European Union, and the jurisdictions in which the Seller and Buyer are established or from which Goods and Services may be supplied, will apply to their receipt and use. In no event shall Buyer use, transfer, release, import, export, Goods in violation of such applicable laws, regulations, orders or requirements.

**14. TOOLING:** Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tool-

ing. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interest in, or rights to possession or removal, or prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

**15. RETURNED GOODS:** Except as otherwise provided with respect to warranty defects in Section 5, advance written permission to return Goods must be obtained from Seller’s customer service department. Such Goods must be current, unused, catalogued Goods and must be shipped, transportation pre-paid, to the Seller’s specified return location. Returns made without proper written permission will not be accepted by Seller. Credit or exchange for such returned Goods will be at the billing price or current price, whichever is lower, from which will be deducted an inspection, restocking and repacking charge and the cost of any reconditioning. Seller reserves the right to inspect Goods prior to authorizing return.

**16. BUYER SUPPLIED DATA:** To the extent that Seller has been provided by or on behalf of Buyer any specifications, description of operating conditions or other data and information in connection with the selection or design of the Goods, and the actual operating conditions or other circumstances differ from those provided by Buyer and relied upon by Seller, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

**17. SOFTWARE<sup>1</sup>:** Notwithstanding any other provision herein to the contrary, Seller or applicable third party licensor to Seller shall retain all rights of ownership and title in its respective Software, including without limitation all rights of ownership and title in its respective copies of such Software. Except as otherwise provided herein, Buyer is hereby granted a nonexclusive, nontransferable royalty free license to use the Software incorporated into the Goods solely for purposes of Buyer properly utilizing such Goods purchased from Seller. All other Software shall be furnished to, and used by, Buyer only after execution of Seller’s (or the licensor’s) applicable standard license agreement, the terms of which are incorporated herein by reference.

**18. DRAWINGS:** Seller’s prints and drawings (including without limitation, the underlying technology) furnished by Seller to Buyer in connection with this agreement are the property of Seller and Seller retains all rights, including without limitation, exclusive rights of use, licensing and sale. Possession of such prints or drawings does not convey to Buyer any rights or license, and Buyer shall return all copies (in whatever medium) of such prints or drawings to Seller immediately upon request therefore.

**18. ASSIGNMENT:** Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of Seller, and any such assignment, without such consent, shall be void.

**19. GENERAL PROVISIONS:** These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon the Seller unless made in writing and signed on its behalf by a duly authorized representative of Seller. No conditions, usage of trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification or additional terms shall be applicable to this agreement by Seller’s receipt, acknowledgment, or acceptance of purchase orders, shipping instruction forms, or other documentation containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected and deemed a material alteration hereof. If this document shall be deemed an acceptance of a prior offer by Buyer, such acceptance is expressly conditional upon Buyer’s assent to any additional or different terms set forth herein. No waiver by either party with respect to any breach or default or of any right or remedy, and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. All typographical or clerical errors made by Seller in any quotation, acknowledgment or publication are subject to correction.

The validity, performance, and all other matters relating to the interpretation and effect of this agreement shall be governed by the law of the state of Missouri. Buyer and Seller agree that the proper venue for all actions arising in connection herewith shall be only in Missouri and the parties agree to submit to such jurisdiction. No action, regardless of form, arising out of transactions relating to this contract, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.

<sup>1</sup> Note the definition of “Software” includes “firmware.”  
(Revision 7/2009)

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Toll Free: 800.247.8256

Tel: 507.833.8822

Fax: 507.833.6287

**ECSorders@Emerson.com**

#### Europe, Middle East, Africa

Emerson Network Power Connectivity Solutions, Ltd.  
11 Bilton Road  
Chelmsford  
Essex CM1 2UP  
England  
Tel: +44 1245.359.515  
Fax: +44 1245.358.938

**EMEACconnectivitySales@Emerson.com**

#### Asia Pacific

Emerson Network Power Connectivity Solutions  
(Shanghai) Co., Ltd.  
Building 1, No. 800 ShenFu Road  
XinZhuang Industry Park  
Shanghai, China 201108  
Tel: +86 21.5442.7668  
Fax: +86 21.5442.7628

**APConnectivitySales@Emerson.com**

### About Emerson Network Power Connectivity Solutions

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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

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