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.

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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

Impedance: 50 Ohms
Frequency Range:
Connectors ..... 0-6 GHz
Dummy loads ..... 0-1 GHz
VSWR (max): (f = GHz)

	Straight Cable Connectors	Right Angle Cable Connectors
.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

Working Voltage:
Connectors ..... 170 VRMS at sea level†
Dummy loads ..... N/A
Dielectric Withstanding Voltage:
Connectors ..... 500 VRMS at sea level†
Dummy loads ..... N/A
Insulation Resistance: 1000 megohms min
Contact Resistance: (milliohms max)

	Initial	After Environmental
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

Corona Level:
Connectors ..... 190 volts min at 70,000 feet†
Dummy loads ..... N/A
Insertion Loss: (dB max, tested at 1 GHz)
Straight cabled connectors 0.1
Right angle cabled connectors 0.2
Uncabled receptacles, dummy loads ..... N/A
RF Leakage: (dB min, tested at 2.5 GHz)
Flexible cable ..... -60 dB
RG-405 ..... -70 dB
Dummy loads ..... N/A
RF High Potential Withstanding Voltage: (400 VRMS at 4 and 7 MHz)†
Power Rating (Dummy Load): 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

Engagement Design: Series MMCX
Engagement/Disengagement Force: 8 lbs max axial engagement
1.4 lbs min axial disengagement
Contact Retention: 2.0 lbs min axial force

	Axial Force* (lbs)	Torque (oz-in)
Cable Retention:		
.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.
Durability: ..... 500 cycles min

Environmental Specifications

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

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

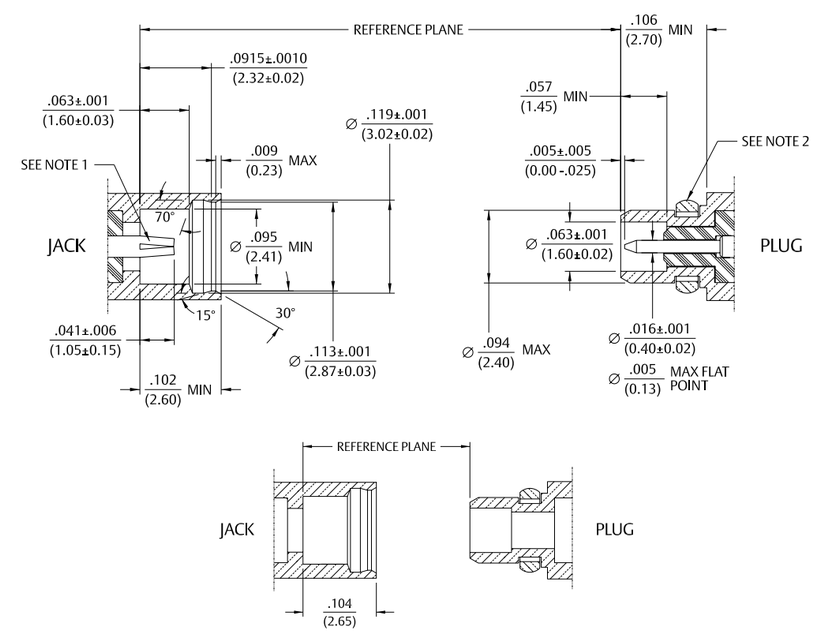
Material Specifications

Bodies: Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001" min
Contacts: Beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003" min
Interface Spring: Beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003" min
Insulators: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457
Crimp Sleeves: Copper per ASTM B301 or brass per ASTM B16, gold plated per MIL-DTL-45204 .00001" min
Mounting Hardware: 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.*

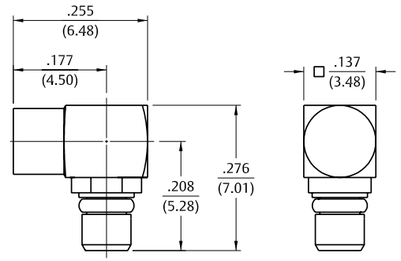
Mating Engagement for MMCX Series

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).

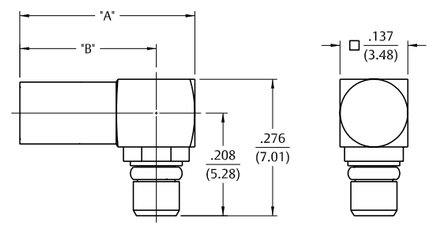
Right Angle Solder Type Plug – Captivated Contact



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

Assembly instructions page 198.

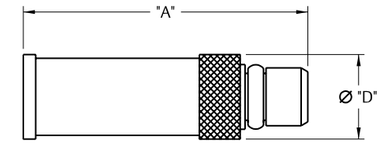
Right Angle Crimp Type Plug – Captivated Contact



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.

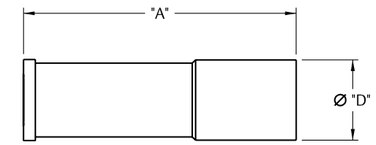
Straight Crimp Type Plug – Solder or Crimp Captivated Contact



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.

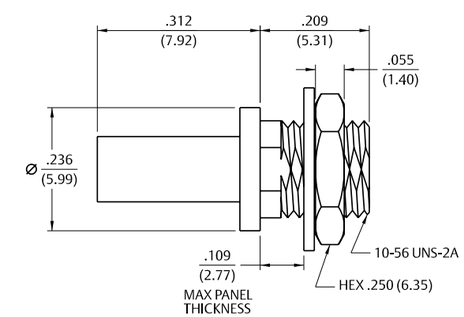
Straight Crimp Type Jack – Solder or Crimp Captivated Contact



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.

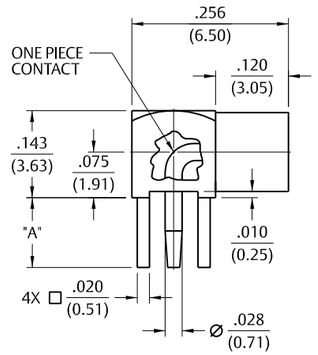
Illustrations are shown in inches (millimeters).

PC Mount

Right Angle Jack Receptacle

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

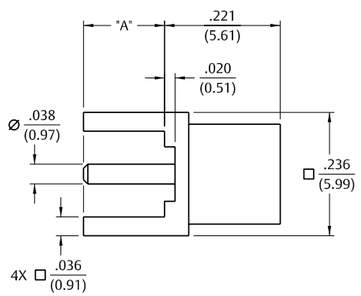
Mounting Hole layout figure 12 page 194.



Straight Jack Receptacle

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

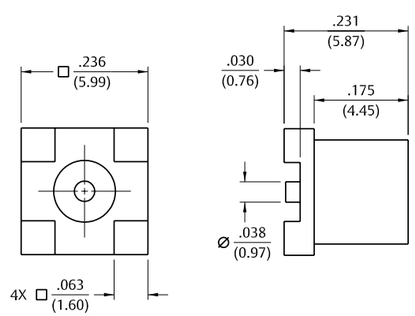
Mounting Hole layout figure 12 page 194.



Straight Surface Mount Jack Receptacle

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

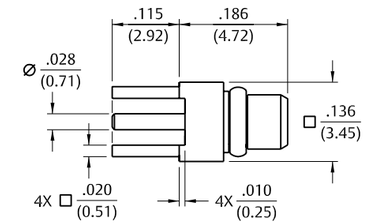
Recommended Land Pattern figure 15 page 195.
Tape and Reel .315 (8.0) component pitch .630 (16.0) wide.



Straight Plug Receptacle

Gold Plated
135-3801-201

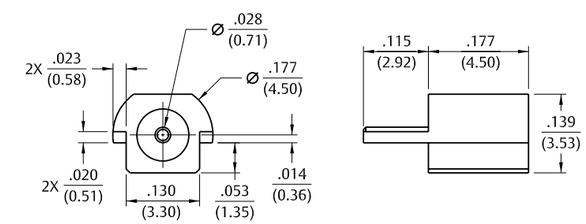
Mounting Hole layout figure 12 page 194.



End Launch Surface Mount Jack Receptacle

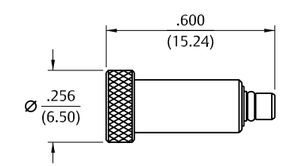
Gold Plated	Packaging
135-3711-801	Stock
135-3711-802	Tape and Reel, 1000 pcs/reel

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.

Electrical Specifications

Impedance: 50 Ohms
Frequency Range: ..... 0-6 GHz

VSWR (max): (max) (f = GHz)	Straight Cabled Connectors	Right Angle Cabled Connectors
.047 dia	1.20	1.14 + .07f
RG-178, RG-316, RG-316 DS	1.20	1.25

Working Voltage:
Connectors ..... 170 VRMS at sea level†
Dielectric Withstanding Voltage:
Connectors ..... 500 VRMS at sea level†
Insulation Resistance: 1000 megohms min

Contact Resistance: (milliohms max)	Initial	After Environmental
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

Corona Level:
Connectors ..... 190 volts min at 70,000 feet†
Insertion Loss: (dB max, tested at 1 GHz)
Straight cabled connectors 0.1
Right angle cabled connectors 0.2
Uncabled receptacles ..... N/A
RF Leakage: (dB min, tested at 2.5 GHz)
Flexible cable ..... -60 dB
RF High Potential Withstanding Voltage: 400 VRMS min (tested at 4 and 7 MHz)†

Mechanical Specifications

Engagement Design: Series MMCX
Engagement/Disengagement Force: 8 lbs max axial engagement
1.4 lbs min axial disengagement
Contact Retention: 2.0 lbs min axial force

Cable Retention:	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.
Durability: ..... 500 cycles min

Environmental Specifications

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

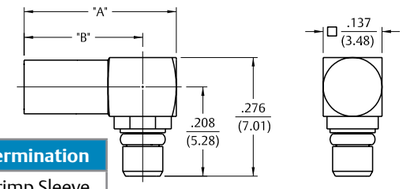
Temperature Range: ..... - 65°C to + 165°C
Thermal Shock: MIL-STD-202, Method 107, Condition C (except -55° C to +155° C)
Corrosion: MIL-STD-202, Method 101, Condition B
Shock: MIL-STD-202, Method 213, Condition B
Vibration: MIL-STD-202, Method 204, Condition D
Moisture Resistance: MIL-STD-202, Method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

Material Specifications

(See non-magnetic materials page 10)

Flexible Cable and PC Mount

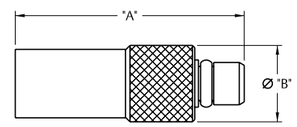
Right Angle Crimp Type Plug – Captivated Contact



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.

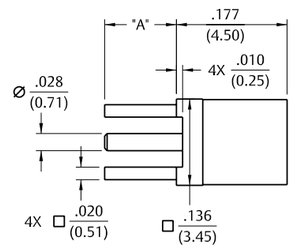
Straight Crimp Type Plug – Solder or Crimp Contact – Captivated Contact



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.

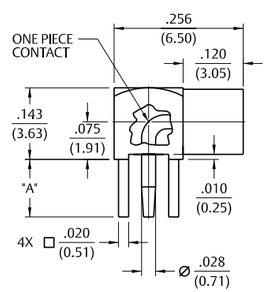
Straight Jack Receptacle



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

Mounting hole layout figure 12 on page 195.

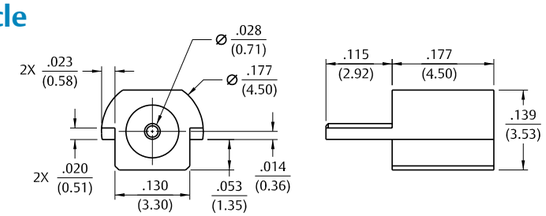
Right Angle Jack Receptacle



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.

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131 SMC Connectors
137 SMP Connectors
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157 Between-Series Adapters
161 Fixed Length Cable Assemblies
173 Ultra Miniature Connectors (UMC)
181 kwiQMAte ™ Connectors
185 Tools
193 Assembly Instructions
257 Electronic Hardware
274 Index

Specifications

Electrical Specifications

Impedance: 50 Ohms
Frequency Range:
Connectors ..... 0-6 GHz
Dummy loads ..... 0-1 GHz

VSWR: (max) (f = GHz)	Straight Cabled Connectors	Right Angle Cabled Connectors
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	

Working Voltage: (VRMS max)†	Sea Level	70K Feet
RG-178	250	65
RG-316, RG-405, uncabled receptacles, adapters	335	85
Dummy loads		N/A

Dielectric Withstanding Voltage: (VRMS min at sea level)†
RG-178 750
RG-316, RG-405, uncabled receptacles, adapters 1000
Dummy loads ..... N/A

Insulation Resistance: 1,000 megohms min

Contact Resistance: (milliohms max)	Initial	After Environmental
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

Corona Level: (Volts min at 70,000 feet)
RG-178 190
RG-316,RG-405 uncabled receptacles, adapters 250
Dummy loads ..... N/A

Insertion Loss: (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

RF Leakage: (dB min, tested at 2.5 GHz)
Cable connectors ..... -55 dB
Uncabled receptacles and adapters, dummy load ..... N/A

RF High Potential Withstanding Voltage: (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

Power Rating (Dummy Load): 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

Engagement Design: Compatible with CECC 22220, Series MCX
Engagement Force: 5.6 lbs max axial force
Disengagement Force: 8 lbs max axial force, 1 lb min
Contact Retention: 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.

Durability: ..... 500 cycles min

Environmental Specifications

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

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

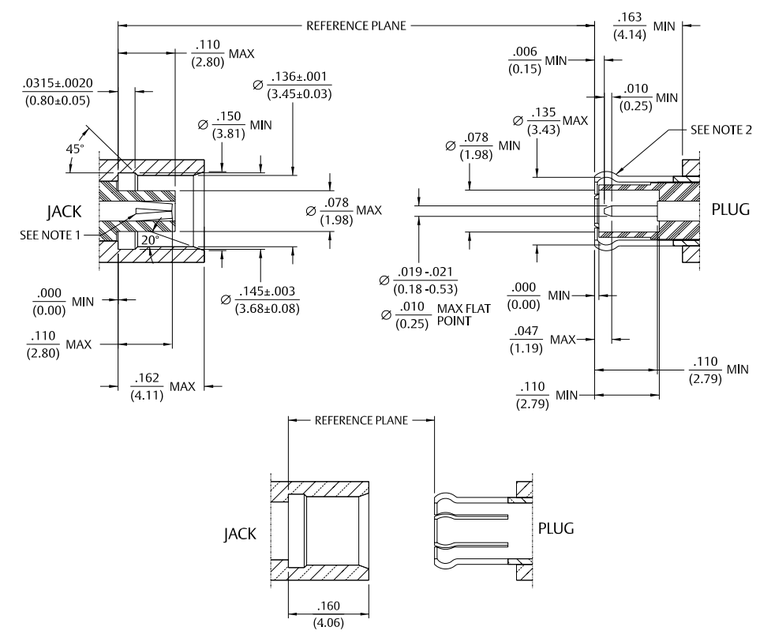
Material Specifications

Bodies: Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001" min or nickel plated per AMS-QQ-N-290
Contacts: 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
Insulators: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457
Expansion Caps: Brass per ASTM B16 , gold plated per MIL-DTL-45204 .00001" min or nickel plated per AMS-QQ-N-290
Crimp Sleeves: Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001" min or nickel plated per AMS-QQ-N-290
Mounting Hardware: 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.

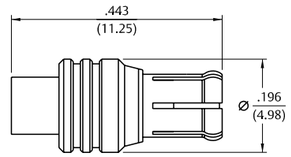


For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • www.EmersonConnectivity.com

Illustrations are shown in inches (millimeters).

Semi-Rigid Cable & Flexible Cable

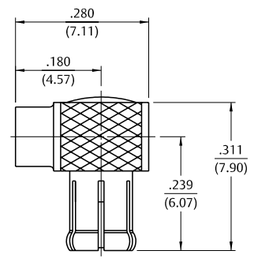
Straight Solder Type Plug



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

Assembly instructions page 206.

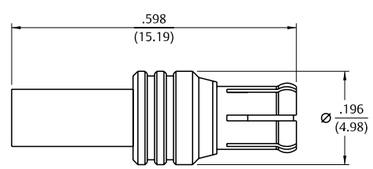
Right Angle Solder Type Plug – Captivated Contact



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

Assembly instructions page 206.

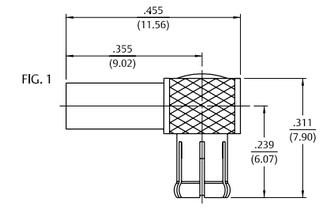
Straight Crimp Type Plug – Solder or Crimp Contact

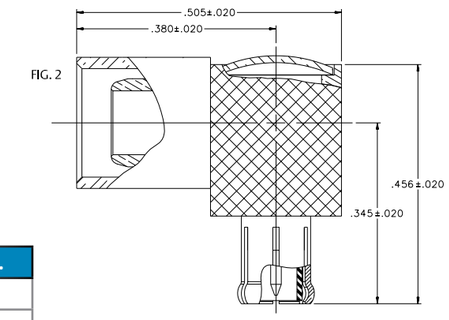


Cable Type	Gold Plated	Nickel Plated	Captivated Contact
RG-178, 196	133-3402-001	133-3402-006	No
RG-316, 188, 161, 174	133-3403-001	133-3403-006	Yes
RG-316 DS, 188DS	133-3404-001	133-3404-006	Yes
RG-179, 187	133-3433-001	133-3433-006	Yes

Assembly instructions page 207.

Right Angle Crimp Type Plug – Captivated Contact

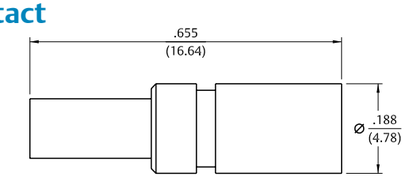




Cable Type	Gold Plated	Nickel Plated	Fig.
RG-178, 196	133-3402-101	133-3402-106	1
RG-316, 188, 161, 174	133-3403-101	133-3403-106	1
RG-316 DS, 188 DS	133-3404-101	133-3404-106	1
RG-58, 303, 141	133-3407-101	133-3407-106	2
RG-179, 187	133-3433-101	133-3433-106	1

Assembly instructions page 210.

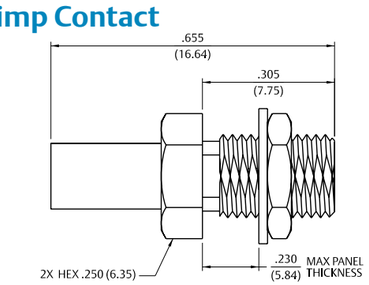
Straight Crimp Type Jack – Solder or Crimp Contact



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

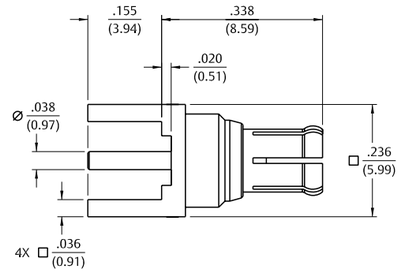
Assembly instructions page 207. Mounting hole layout figure 5 page 194.

PC Mount

Straight Plug Receptacle

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

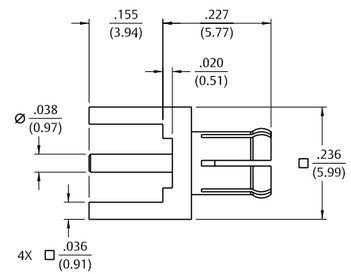
Mounting hole layout figure 4 page 194.



Straight Plug Receptacle – Low Profile

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

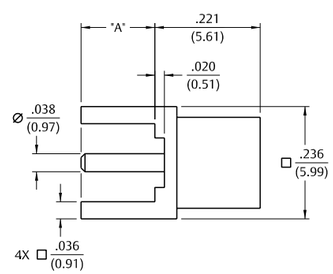
Mounting hole layout figure 4 page 194.



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)

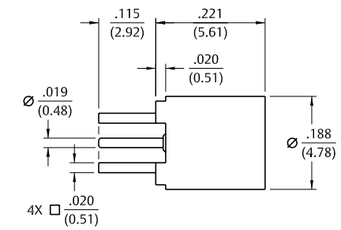
Mounting hole layout figure 4 page 194.
Four and six connector ganged receptacles available. See page 190.



Straight Jack Receptacle – .100" Layout

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

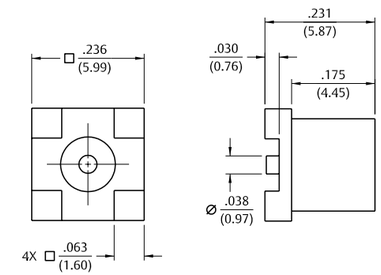
Mounting hole layout figure 12 page 194.



Straight Surface Mount Jack Receptacle

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

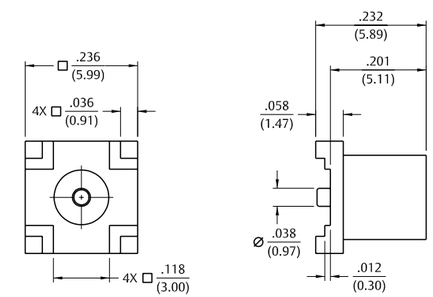
Recommended land pattern figure 13 on page 195.
Tape and Reel .315 (8.0) component pitch .630 (16.0) wide.



Straight Surface Mount Jack Receptacle

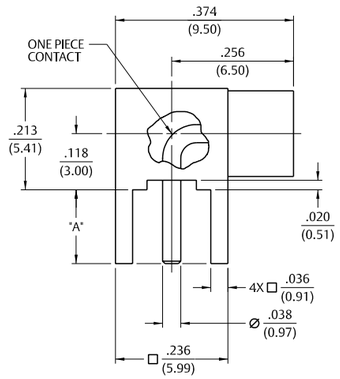
Gold Plated	Packaging
133-3711-211	Stock
133-3711-212	Tape and Reel 750 pcs/reel

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



PC Mount

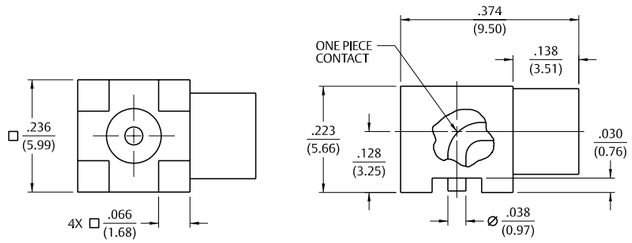
Right Angle Jack Receptacle



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.

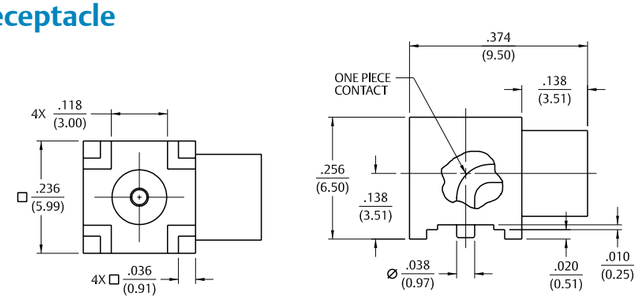
Right Angle Surface Mount Jack Receptacle



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.

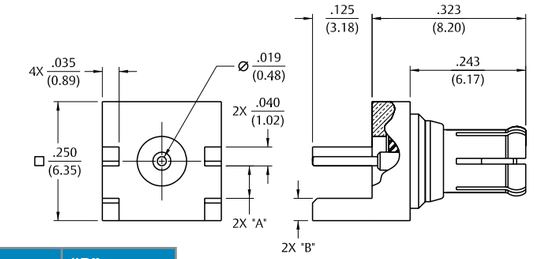
Right Angle Surface Mount Jack Receptacle



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

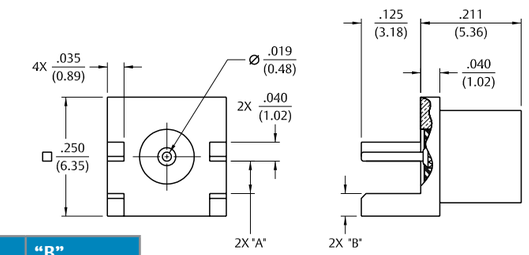
Recommended land pattern figure 4 on page 194.
Tape and Reel .472 (12.0) component pitch .945 (24.0) wide.

End Launch Plug Receptacle



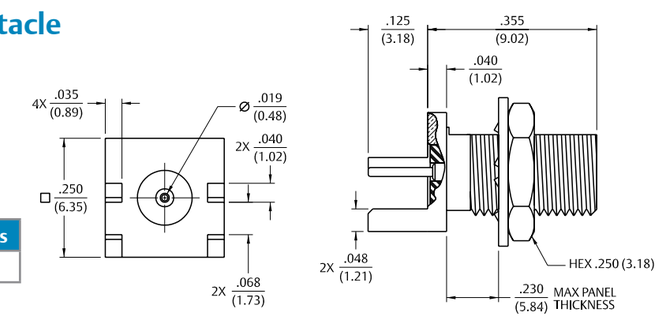
Gold Plated	Nickel Plated	Board Thickness	"A"	"B"
133-3801-841	133-3801-846	.062 (1.57)	.068 (1.73)	.048 (1.22)
133-3801-851	133-3801-856	.042 (1.07)	.048 (1.22)	.068 (1.73)

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)

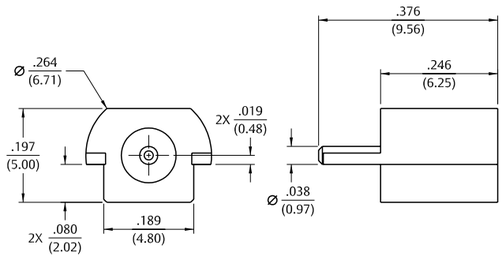
End Launch Bulkhead Jack Receptacle



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

PC Mount, Bulkhead Mount & Panel Mount

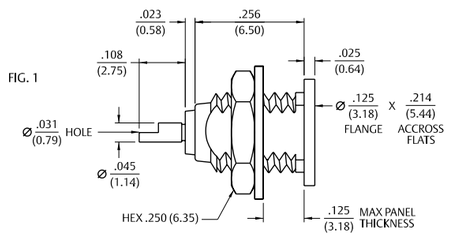
End Launch Surface Mount Jack Receptacle



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

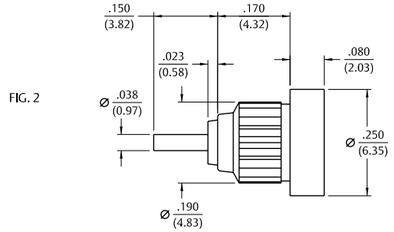
Recommended land pattern figure 21 page 195.
Tape and Reel .472 (12.0) component pitch .945 (24.0) wide

Front Mount Bulkhead Jack Receptacle

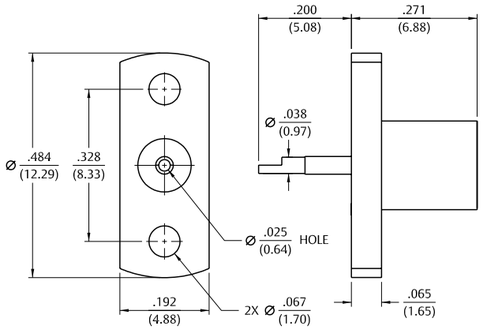


Gold Plated	Nickel Plated	Mounting Style	Fig
133-3701-401	133-3701-406	D Flat Threaded	1
133-3701-411	133-3701-416	Press Fit Knurl	2

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.

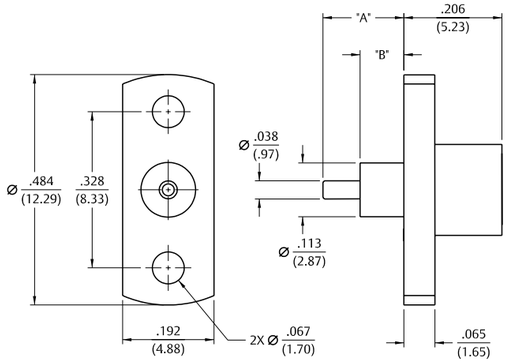


2-Hole Flange Mount Jack Receptacle – Flush Dielectric



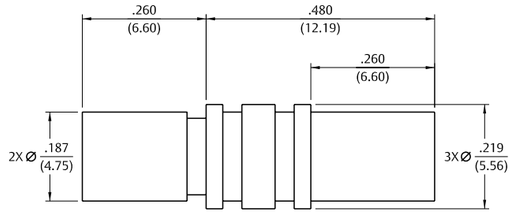
Gold Plated	Nickel Plated
133-3701-601	133-3701-606

2-Hole Flange Mount Jack Receptacle – Extended Dielectric



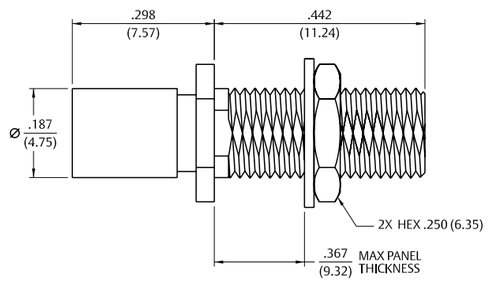
Gold Plated	Nickel Plated	"A"	"B"
133-3701-611	133-3701-616	.170 (4.32)	.092 (2.34)
133-3701-621	133-3701-626	.300 (7.62)	.200 (5.08)

Jack to Jack Adapter



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

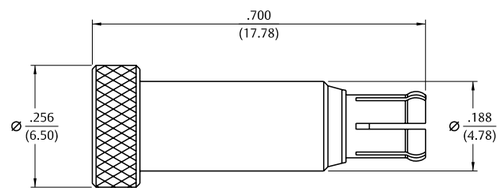
Jack to Bulkhead Jack Adapter



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

Specifications

Electrical Specifications

Impedance: 50 Ohms
Frequency Range: ..... 0-6 GHz

VSWR (max): (f = GHz)	Straight Cabled Connectors	Right Angle Cabled Connectors
RG-178	1.17 + .04f	1.07 + .06f
RG-316	1.13 + .04f	1.07 + .04f
Uncabled receptacles		N/A

Working Voltage: (VRMS max)†	Sea Level	70K Feet
RG-178	250	65
RG-316	335	85

Dielectric Withstanding Voltage: (VRMS min at sea level)†
RG-178 750
RG-316, uncabled receptacles 1000

Corona Level: (Volts min at 70,000 feet)
RG-178 190
RG-316, uncabled receptacles 250

Insertion Loss: (dB max tested at 1 GHz)
Straight cabled connectors ..... 0.1 dB
Right angle cabled connectors ..... 0.2 dB
Uncabled receptacles ..... N/A

Insulation Resistance: 1000 megohms min

Contact Resistance: (milliohms max)	Initial	After Environmental
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 (gold plated connectors)	1.0	N/A
Braid to body (nickel plated connectors)	2.5	N/A

RF Leakage: (dB min, tested at 2.5 GHz)
Cable connectors ..... -55 dB
Uncabled receptacles ..... N/A

RF High Potential Withstanding Voltage: (VRMS min tested at 4 and 7 MHz) †
RG-178 500
RG-316 700
Uncabled receptacles 600

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

Mechanical Specifications

Engagement Force: 5.6 lbs max axial force
Disengagement Force: 8 lbs max axial force, 1 lbs min.
Contact Retention: 2.3 lbs min axial force (captivated contacts) 1 oz-in min torque (uncabled receptacles)

Cable Retention:	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

*Or cable breaking strength whichever is less.

Durability: ..... 500 cycles min

Environmental Specifications

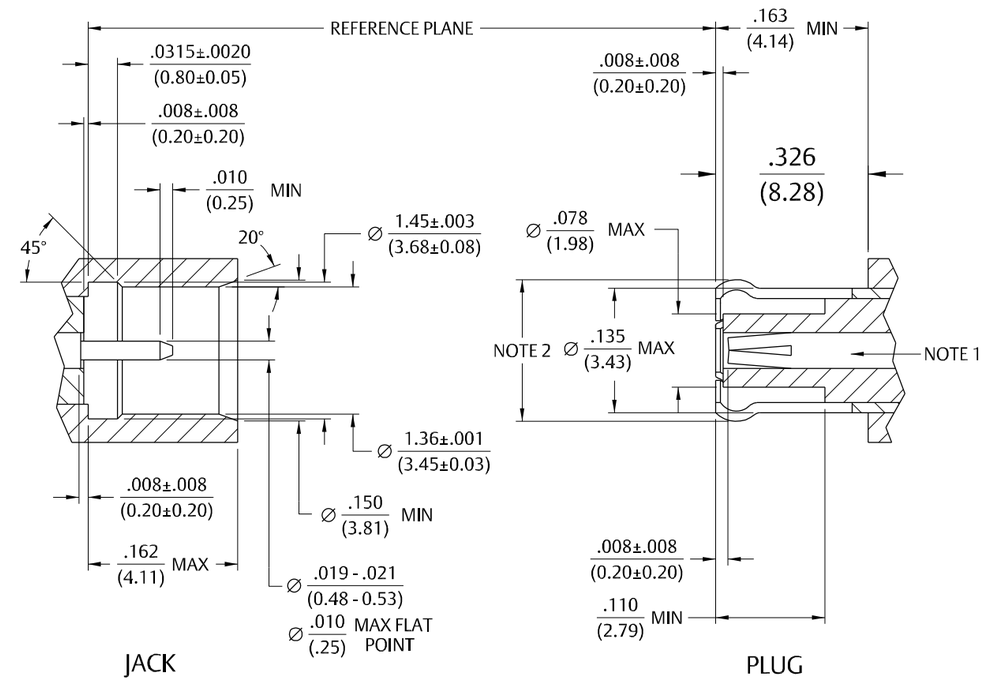
(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

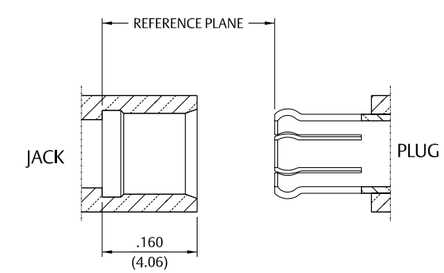
Temperature Range: ..... - 65°C to + 165°C
Thermal Shock: MIL-STD-202, Method 107, Condition F
Corrosion: MIL-STD-202, Method 101, Condition B
Shock: MIL-STD-202, Method 213, Condition B
Vibration: MIL-STD-202, Method 204, Condition B
Moisture Resistance: MIL-STD-202, Method 106

Material Specifications

Bodies: Brass per ASTM B16 or zinc per ASTM B86-71, gold plated** per MIL-DTL-45204 .00001" min or nickel plated per AMS-QQ-N-290
Contacts: 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
Insulators: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457
Expansion Caps: Brass per ASTM B16 , gold plated per MIL-DTL-45204 .00001" min or nickel plated per AMS-QQ-N-290
Crimp Sleeves: Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001" min or nickel plated per AMS-QQ-N-290
Mounting Hardware: Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) 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.*



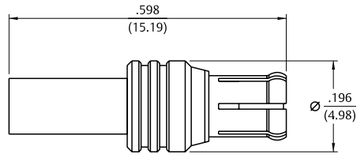


Notes:
1. ID of contact to meet VSWR mating characteristics and connector durability when mated with a dia. .019-.021 (.48-.53) male contact.
2. Must meet the force to engage and disengage when mated with mating part.

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

Flexible Cable

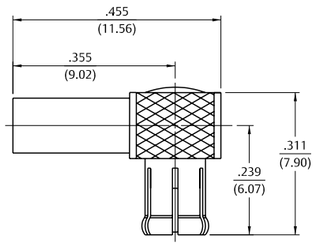
Straight Crimp Type Plug – Solder or Crimp Contact



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.

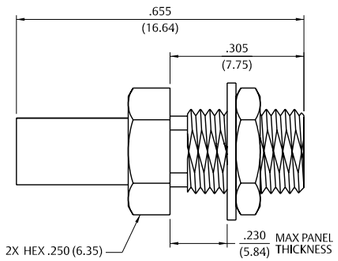
Right Angle Crimp Type Plug – Captivated Contact



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.

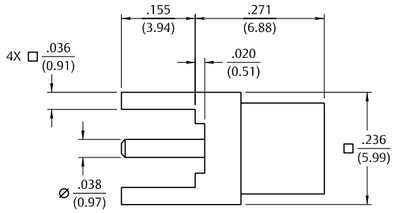
Straight Crimp Type Bulkhead Jack – Solder or Crimp Contact



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.

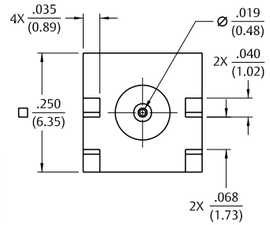
Straight Jack Receptacle

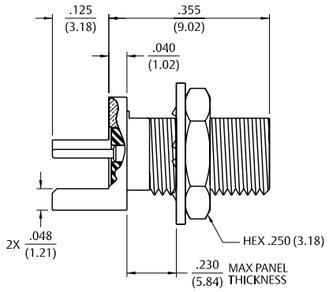


Gold Plated	Nickel Plated
133-5701-201	133-5701-206

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.

Johnson Connectivity Solutions

MCX CONNECTORS – REVERSE POLARITY – 50 OHM

Specifications

Electrical Specifications

Impedance: 75 Ohms
Frequency Range: ..... 0-6 GHz
VSWR: (max) (f = GHz)

	Straight Cabled Connectors	Right Angle 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

Working Voltage: (VRMS max)†	Sea Level	70K Feet
RG-179	335	85
Uncabled receptacles, adapters	335	85
Loads, matching pad		N/A

Dielectric Withstanding Voltage: (VRMS min at sea level)†
RG-179 1000
Uncabled receptacles, adapters 1000
Loads ..... N/A
Insulation Resistance: 1,000 megohms min

Contact Resistance: (milliohms max)	Initial	After 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

Corona Level: (Volts min at 70,000 feet) †
RG-179 250
Uncabled receptacles, adapters 250
Loads matching pad ..... N/A
Insertion Loss: (dB max tested at 1 GHz)
Straight cabled connectors ..... 0.1 dB
Right angle cabled connectors ..... 0.2 dB
Uncabled receptacles, adapters ..... N/A
RF Leakage: (dB min, tested at 2.5 GHz)
Cable connectors ..... -55 dB typical
Uncabled receptacles, adapters, loads ..... N/A
RF High Potential Withstanding Voltage: (VRMS min, tested at 4 and 7 MHz)†
Cabled Connectors for RG-179 700
Uncabled receptacles, adapters 600
Loads ..... N/A
Power Rating: (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.

Mechanical Specifications

Engagement Design: Compatible with CECC 22220, Series MCX 50 Ohm
Engagement Force: 5.6 lbs max axial force
Disengagement Force: 8 lbs max axial force, 1 lb min
Contact Retention: 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.
Durability: ..... 500 cycles min

Environmental Specifications

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

Temperature Range:
All Connectors, Adapters ..... - 65°C to + 165°C
Loads ..... - 65°C to + 125°C

Thermal Shock:	MIL-STD-202, Method 107, Condition F (N/A Loads)
Temperature Coefficient:	Loads +/- 300ppm/°C
Corrosion:	MIL-STD-202, Method 101, Condition B (N/A Loads)
Shock:	MIL-STD-202, Method 213, Condition B (N/A Loads)
Vibration:	MIL-STD-202, Method 204, Condition B (N/A Loads)
Moisture Resistance:	MIL-STD-202, Method 106 (N/A Loads)

Material Specifications

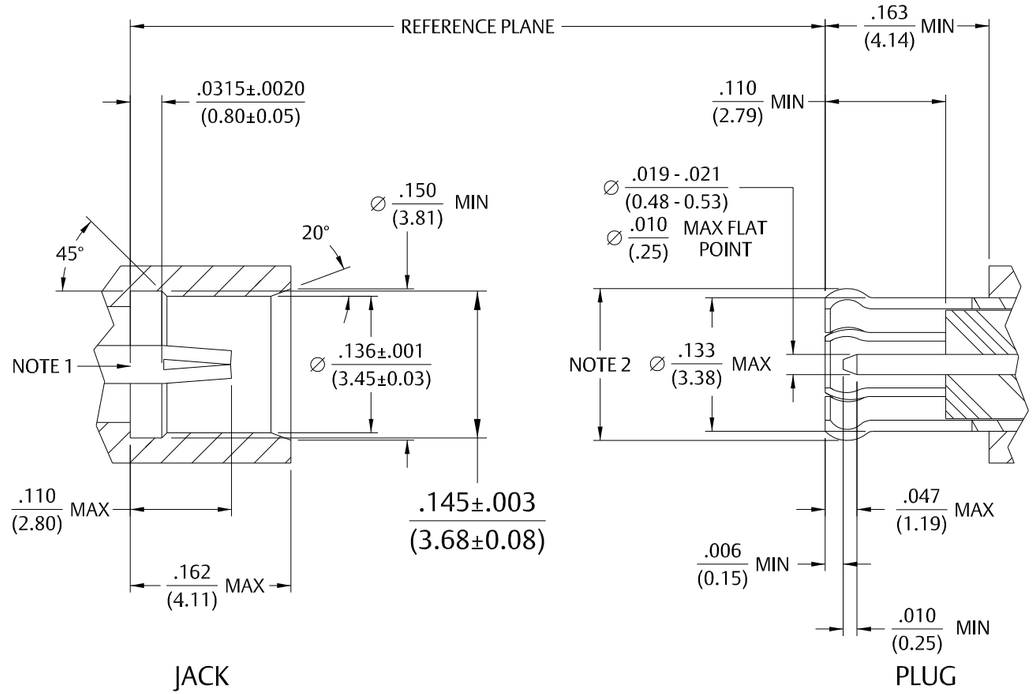
Bodies:	Brass per ASTM B16, gold plated** per MIL-DTL-45204 .00001" min or stainless steel, type 303 per ASTM A582, passivated per MIL-F-14072 (EL70)
Contacts:	Male - brass per ASTM B16 , gold plated per MIL-DTL-45204 .00003" min Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204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

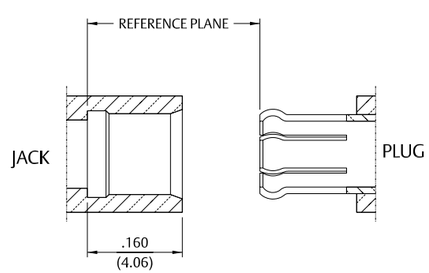
*** All gold plated parts include a .00005" min. nickel underplate barrier layer.*

Specifications

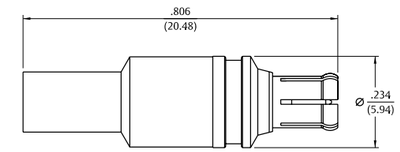
Mating Engagement for 75 Ohm MCX Series (Intermatable with CECC22220 50 Ohm MCX)

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.





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

Cable Type	Gold Plated	Fig
RG-179	133-8433-101	1
RG-179 DS	133-8434-101	1
Belden 735A	133-8445-101	2

Assembly instructions page 211.

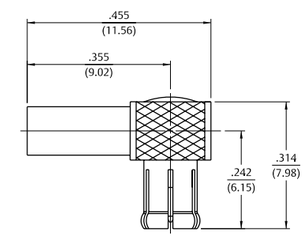


FIG. 1

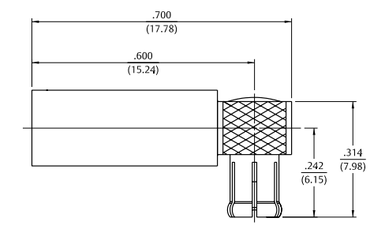
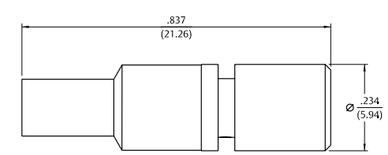


FIG. 2

Straight Crimp Type Jack – Solder or Crimp Captivated Contact



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

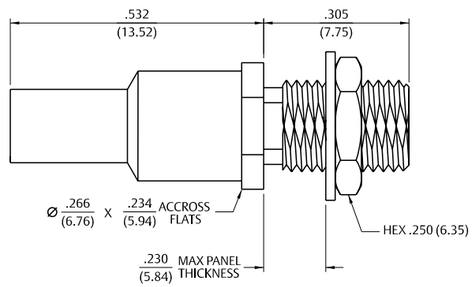
Assembly instructions page 209.

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

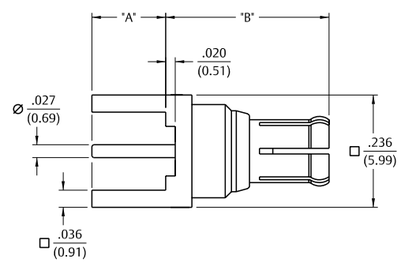
Assembly instructions page 209.
Mounting hole layout figure 5 page 194.



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)

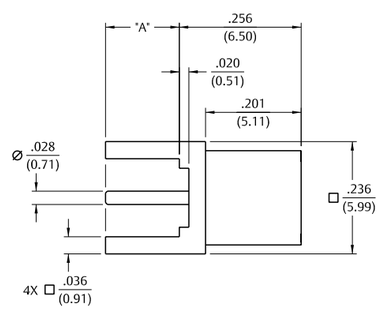
Mounting hole layout figure 20 page 195.



Straight Jack Receptacle

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

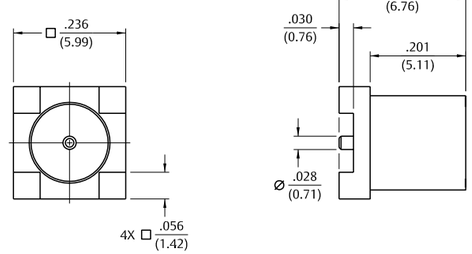
Mounting hole layout figure 20 page 195.



Surface Mount Jack Receptacle

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

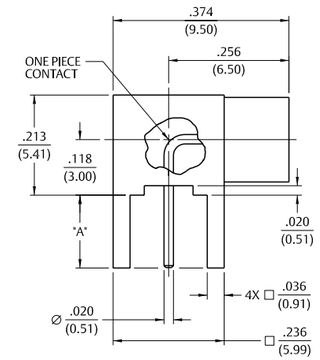
Mounting hole layout figure 11 page 194.
Tape and Reel .472 (12.0) component pitch .630 (16.0) wide.



Right Angle Jack Receptacle

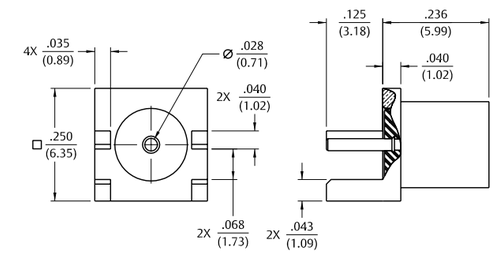
Gold Plated	"A"
133-8701-301	.155 (3.80)
133-8701-311	.110 (2.70)

Mounting hole layout figure 20 page 195.



End Launch Jack Receptacle

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

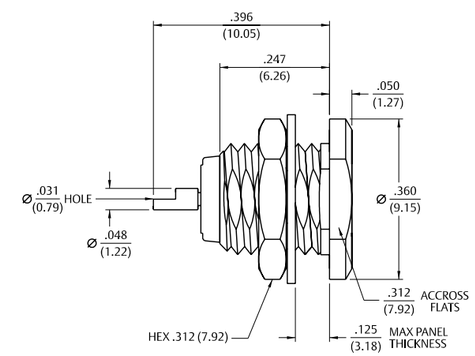


Bulkhead Mount & In-Series Adapters

Bulkhead Jack Receptacle

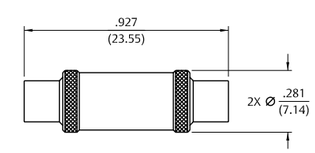
Gold Plated
133-8701-401

Mounting hole layout figure 1 page 194.



Jack to Jack Adapter

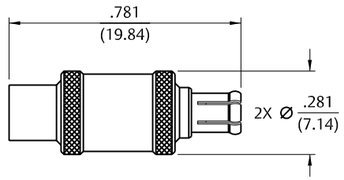
Gold Plated
133-8901-801



In-Series Adapters & Between Series Adapters

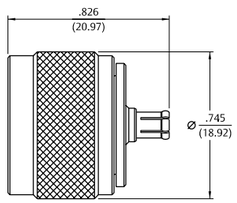
Jack to Plug Adapter

Gold Plated
133-8901-821



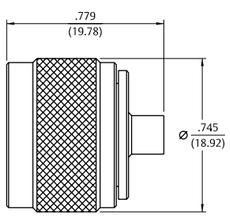
75 Ohm Type N Plug to 75 Ohm MCX Plug Adapter

Stainless Steel Passivated
134-1068-001



75 Ohm Type N Plug to 75 Ohm MCX Jack Adapter

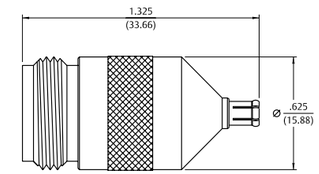
Stainless Steel Passivated
134-1068-011



Between-Series Adapters & Terminations

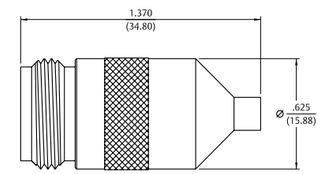
75 Ohm Type N Jack to 75 Ohm MCX Plug Adapter

Stainless Steel Passivated
134-1068-021



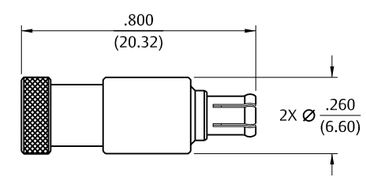
75 Ohm Type N Jack to 75 Ohm MCX Jack Adapter

Stainless Steel Passivated
134-1068-031



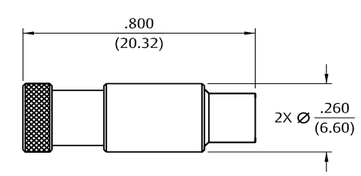
Plug Precision Load

Gold Plated
133-8801-831



Jack Precision Load

Gold Plated
133-8701-831



Specifications

Electrical Specifications

Impedance: 50 Ohms
Frequency Range: ..... 0-6 GHz
VSWR (max): (f = GHz)

	Straight Cabled Connectors	Right Angle Cabled Connectors
RG-316 cable	1.13 + .04f	1.07 + .04f
Uncabled receptacles		N/A

Working Voltage: (VRMS max)†

	Sea Level	70K Feet
RG-316	335	85

Dielectric Withstanding Voltage: (VRMS min at sea level)†
RG-316, uncabled receptacles 1000
Insulation Resistance: 1,000 megohms min
Contact Resistance: (milliohms max)

	Initial	After Environmental
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

Corona Level: (Volts min at 70,000 feet) †
RG-316, uncabled receptacles 250
Insertion Loss: (dB max tested at 1 GHz)
Straight cabled connectors ..... 0.1 dB
Right angle cabled connectors ..... 0.2 dB
Uncabled receptacles ..... 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)
Cabled Connectors 700
Uncabled receptacles 600

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

Mechanical Specifications

Engagement Design: Compatible with CECC 22220, Series MCX 50 Ohm
Engagement Force: 5.6 lbs max axial force
Disengagement Force: 8 lbs max axial force, 1 lb min
Contact Retention: 2.3 lbs min axial force (captivated contacts) 1 oz-in min torque (uncabled receptacles)

	Axial Force (lbs) *	Torque (oz-in)
RG-316	20.0	N/A
RG-316 DS	25.0	N/A

*Or cable breaking strength whichever is less.
Durability: ..... 500 cycles min

Environmental Specifications

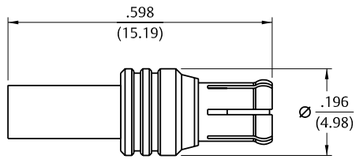
(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

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

Material Specifications

(See non-magnetic materials page 10)

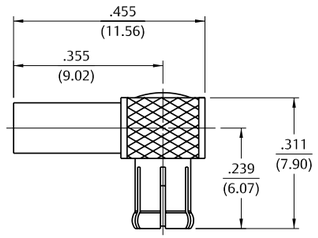
Straight Crimp Type Plug – Solder or Crimp Contact – Captivated Contact



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

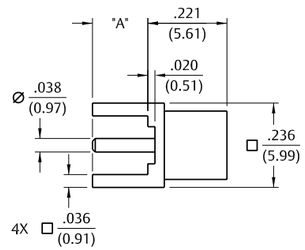
Assembly instructions page 207.

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)

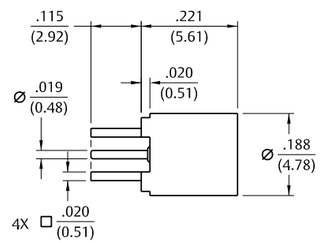
Mounting hole layout figure 4 page 194.



Straight Jack Receptacle – .100" Layout

Gold Plated
133-9701-231

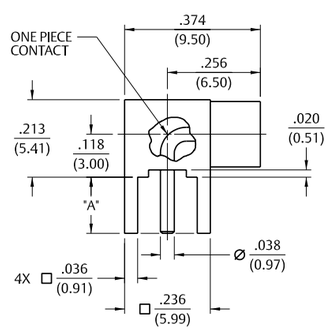
Mounting hole layout figure 12 page 194.



Right Angle Jack Receptacle

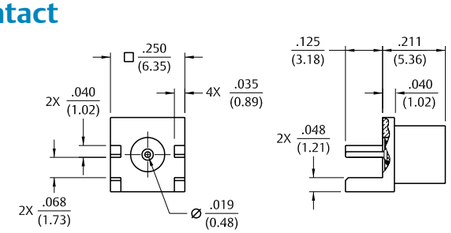
Gold Plated	"A"
133-9701-301	.155 (3.94)
133-9701-311	.110 (2.79)

Mounting hole layout figure 4 page 194.



End Launch Jack Receptacle – Round Contact

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



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Specifications

SMK (2.92mm) Connectors

The Johnson line of SMK Connectors provides an excellent solution for demanding applications requiring high frequency transmission. Although similar to the SMA interface, a smaller internal body diameter (2.92mm) and air dielectric provide a higher cutoff frequency and other key advantages:

- Precision manufacturing allows superior electrical performance to 40 GHz
- Female contacts have a unique three-slot construction, which enhances connectivity by creating a more rugged connector while reducing the chance of intermittent connections
- Precise assembly tooling assures excellent, repeatable contact and support bead location on cabled connectors
- Connector mating interface per MIL-STD-348
- Mating interface control provides consistent electrical performance
- Plug connector VSWR is 1.20 Max to 40 GHz and a 12 inch SMK plug to plug cable assembly performs better than 1.35 VSWR to 40 GHz
- Field Replaceable Jacks are teamed with a high quality hermetic seal feed thru for use in sealed circuit modules
- SMK plug interface employs more precise dimensions than an SMA and uses a shorter snub nose male pin such that the connector bodies align before the contacts engage

Electrical Specifications

Impedance: 50 Ohms
Frequency Range: 0-40 GHz
VSWR (max): (f = GHz)
Semi-Rigid straight cabled connectors and adapters ..... 1.20 max
Field replaceable (see typical return loss graph) ..... N/A
Working Voltage: (VRMS max)

Connectors for Cable Type	Sea Level	70K Feet
RG-405 and field replaceable	335	85
RG-402 and adapters	500	125

Dielectric Withstanding Voltage: (VRMS min at sea level)
RG-405 and field replaceable 1000
RG-402 and adapters 1500
Corona Level: (Volts min at 70,000 feet)
RG-405 and field replaceable 250
RG-402 and adapters 375
Insertion Loss: (dB max)
Adapters ..... 0.06 f (GHz), tested at 6 GHz
Straight Semi-Rigid cable connectors ..... 0.03 f (GHz), tested at 10 GHz
Insulation Resistance: 5000 megohms min

Contact Resistance: (milliohms max)	Initial	After Environmental
Center contact straight cabled connectors	3.0*	4.0
Center contact adapters	4.0	6.0
Field replaceable connectors	6.0	8.0
Outer contact (all connectors)	2.0	N/A
Body to cable (gold plated connectors)	0.5	N/A
Body to cable (passivated connectors)	5.0	N/A

RF Leakage: (dB min, tested at 2.5 GHz) ..... -90dB
RF High Potential Withstanding Voltage: (VRMS min., tested at 4 and 7 MHz)†
RG-405 and field replaceable 670
RG-402 and adapters 1000

Mechanical Specifications

Engagement Design: MIL-STD-348, Series SMK (2.92mm)
Engagement/Disengagement Force: 2 lb-in max
Mating Torque: 7 to 10 in-lb
Bulkhead Mounting Nut Torque: 15 in-lb
Coupling Proof Torque: 15 in-lb min
Coupling Nut Retention: 60 lbs min
Contact Retention: 6 lbs min axial force (captivated contacts)

Cable Retention:	Axial Force* (lbs)	Torque (in-oz)
RG-405	30	16
RG-402	60	55

*Or cable breaking strength whichever is less
Durability: 500 cycles min

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

Environmental Specifications

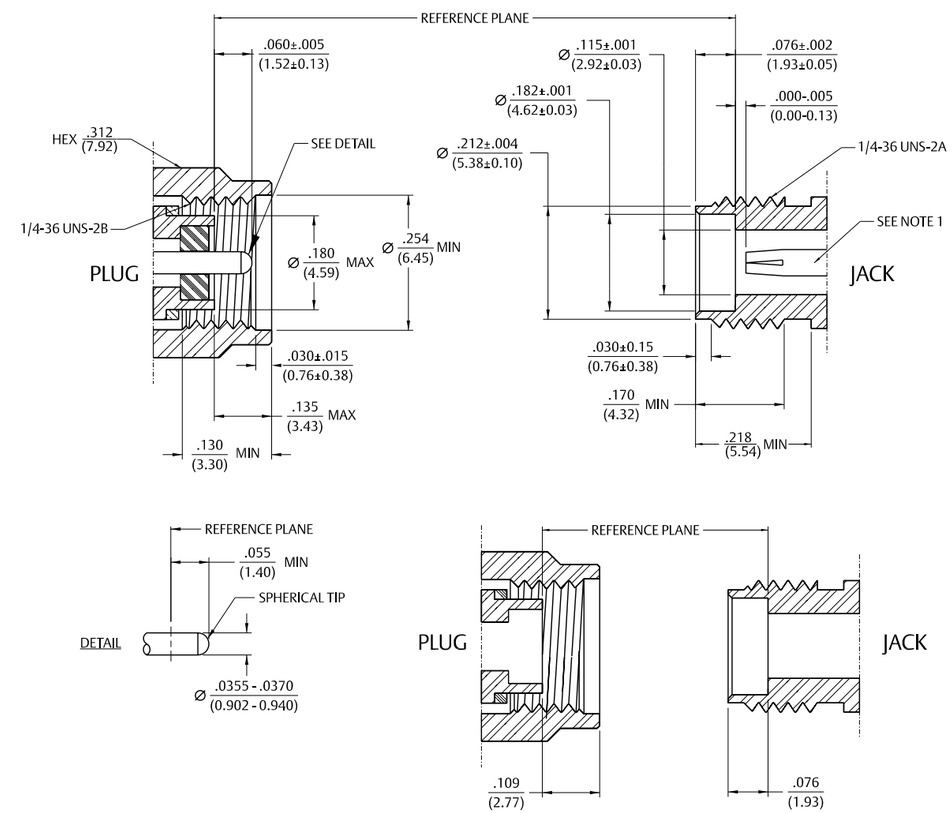
(Meets or Exceeds the Applicable Paragraph of MIL-PRF-C-39012)

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

Material Specifications

Bodies: Stainless steel per ASTM B16, gold plated* per MIL-G-45204 .00005" min. or passivated per MIL-DTL-14072
Contacts: Female - beryllium copper per ASTM B1960, gold plated per MIL-DTL- G-45204 .00005" min
Contact Support Beads: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457 or modified PPE resin
Seal Rings: Silicone rubber per ZZ-R-765
* All gold plated parts include a .00005" min. nickel underplate barrier layered

Mating Engagement for SMK (2.92mm) Series



Notes:
1. ID of contact shall meet VSWR and connectivity requirements when mated with dia. .0355-.0365 male pin.

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

Specifications

Field Replaceable Application Notes

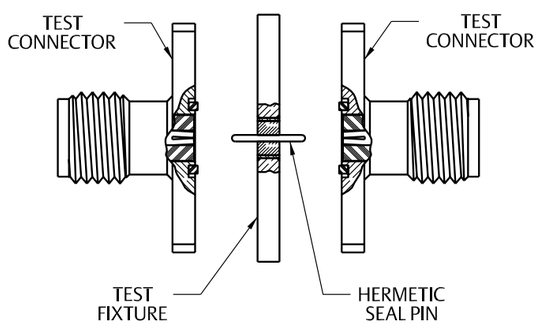
These field replaceable connectors are easy to install and replace. The hermetic seal is mounted into the circuit module wall and the connector can be removed and replaced without destroying the hermeticity of the circuit housing.

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.

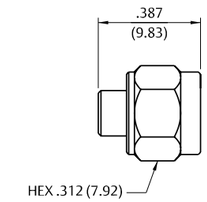
The plot shown below is representative of the typical return loss of a Johnson field replaceable SMK connector. To produce the data shown below, a test fixture is created using the Johnson SMK hermetic seal. The fixture consists of a suitably thick spacer plate with the hermetic seal mounted flush to 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+/-.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.



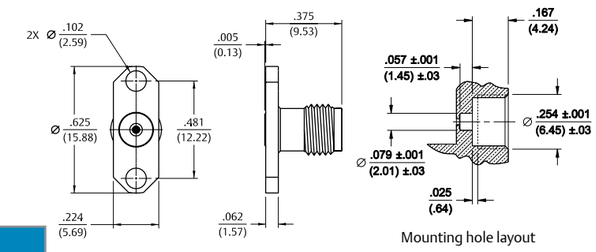
Straight Solder Type Plug – with Contact, Slide-On Nut



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

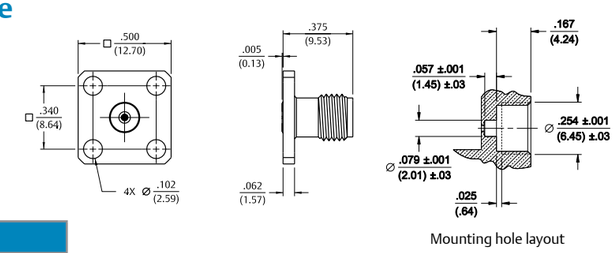
Assembly instructions page 212.
*Passivated coupling nut with gold plated body.

2-Hole Flange Mount Jack Receptacle



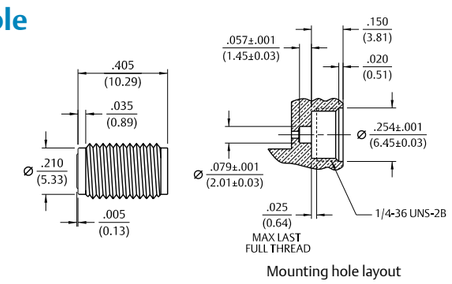
Gold Plated	Passivated	Accepts Pin Size
145-0701-601	145-0701-602	.0120+/-.0005(0.305+/-0.013)

4-Hole Flange Mount Jack Receptacle



Gold Plated	Passivated	Accepts Pin Size
145-0701-611	145-0701-612	.0120+/-.0005(0.305+/-0.013)

Jack Receptacle – Thread Mount Field Replaceable

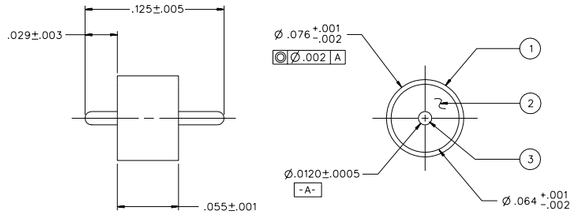


Gold Plated	Passivated	Accepts Pin Size
145-0701-001	145-0701-002	.0120 +/-.0005 (0.305 +/-0.013)

Illustrations are shown in inches (millimeters).

In-Series Adapters

Hermetic Seal Feedthru



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

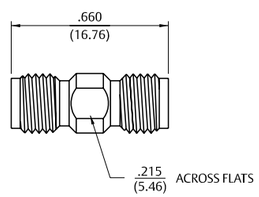
Impedance: 50 Ohms
Frequency Range: DC to 40 GHz
VSWR: Dependent upon application
Working Voltage: 250 VRMS max at sea level
Dielectric Withstanding Voltage: 500 VRMS min at sea level
Insulation Resistance: 5000 Megohm min
Insertion Loss: 0.2 dB max at 40 GHz

Environmental

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

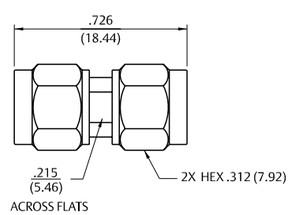
Jack to Jack In-Series Adapter

Gold Plated
145-0901-801



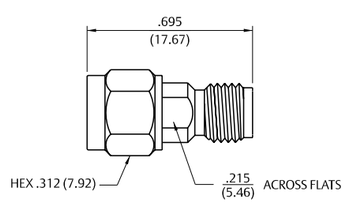
Plug to Plug In-Series Adapter

Gold Plated
145-0901-811



Plug to Jack In-Series Adapter

Gold Plated
145-0901-821



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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

VSWR: (max) (f = GHz)

	Straight Cabled Connectors	Right Angle 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

Working Voltage: (VRMS max)†

	Sea Level	70K Feet
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

Insertion Loss: (dB max)

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

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) 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.

Specifications

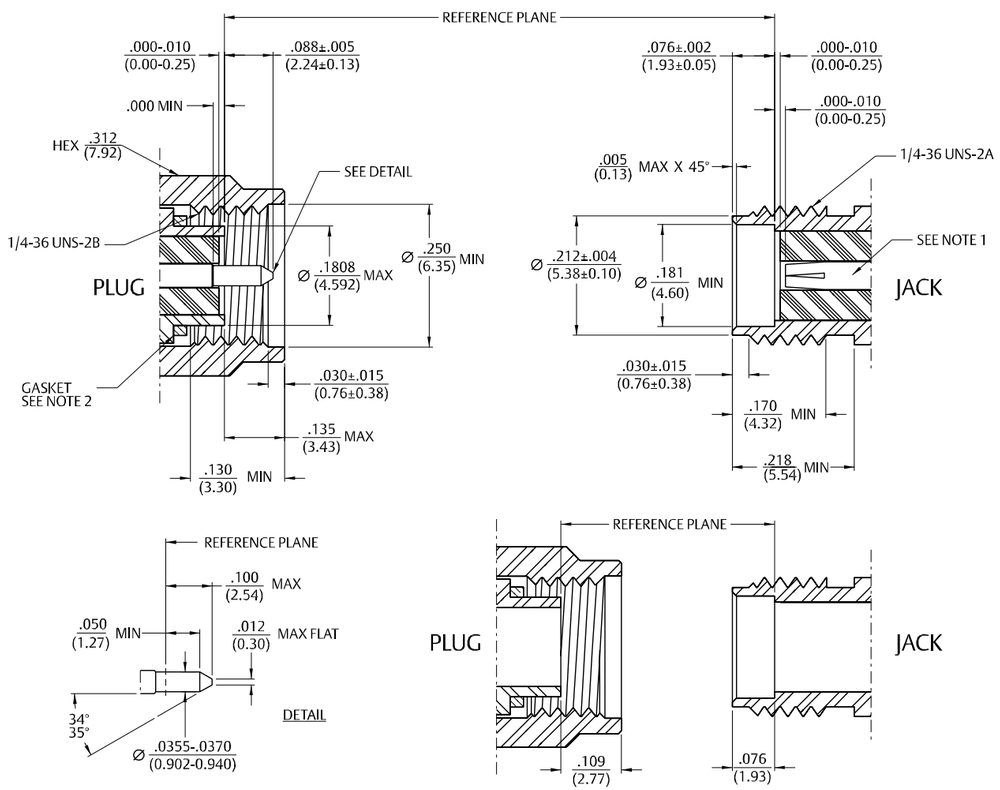
Material Specifications

Bodies:	Brass per ASTM B16, gold plated* per MIL-DTL-45204 .00001" min. or nickel plated per SAE-AMS2423
Contacts:	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
Nut Retention Spring:	Beryllium copper per ASTM B196, Unplated
Insulators:	PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457 or Tefzel per ASTM D 3159 or PFA 340 per ASTM D 3307
Expansion Caps:	Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001" min. or nickel plated per SAE-AMS2423
Crimp Sleeves:	Copper per ASTM B301 or brass per ASTM B16, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Mounting Hardware:	Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers), gold plated per MIL-DTL-45204 .00005" min or nickel plated per SAE-AMS2423
Seal Rings:	Silicone rubber per A-A-59588A
EMI Gaskets:	Conductive silicone rubber per MIL-G-83528, Type M

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

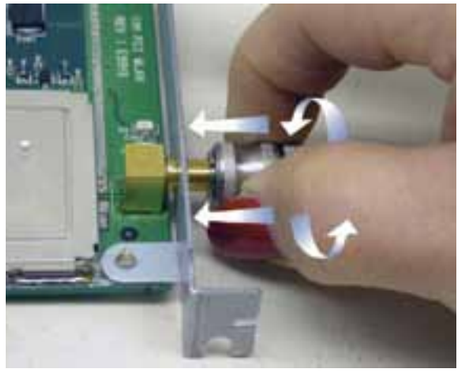
Mating Engagement for SMA Series

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.



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.

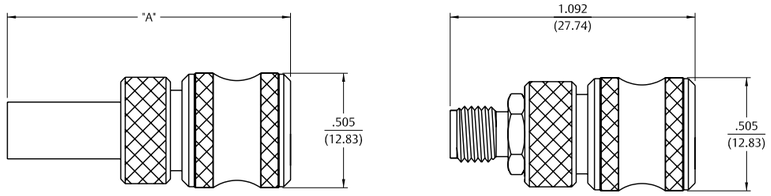
The SMA Quick-Connect Plug Adapter converts a standard SMA Plug test cable into a Quick-Connect cable. This makes the testing process more efficient by reducing the time and effort required to connect and disconnect the test cable.

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

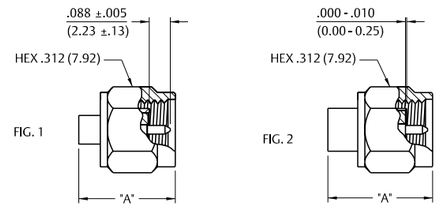
Plugs		
Cable Type	**Gold Plated***	**"A"**
RG-161, 174, 188, 316	142-1403-001	1.249
RG-188 DS, RG-316 DS	142-1404-001	1.249
RG-58, 141, 303	142-1407-001	1.099
RG-55, 142, 223, 400	142-1408-001	1.249

Adapters
Gold Plated*
142-1901-821

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



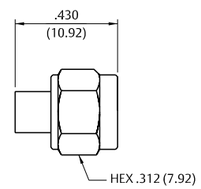
Straight Solder Type Plug – with Contact, Captive Nut Thin Wall Connector Interface



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.

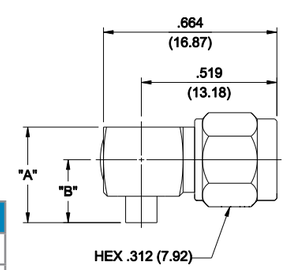
Straight Solder Type Plug – without Contact, Thread-on Nut



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.

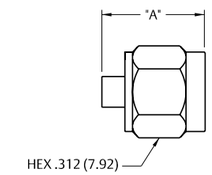
Right Angle Solder Type Plug (1-piece body)



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.

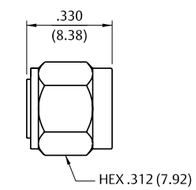
Straight Solder Type Plug – with Contact, Thread-on Nut



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.

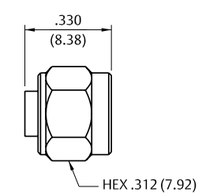
Straight Solder Type Plug – Short Profile – without Contact, Captive Nut



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.

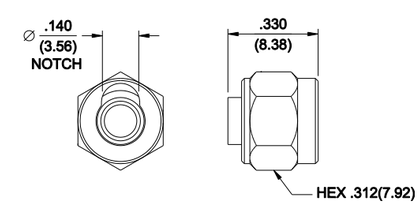
Straight Solder Type Plug – without Contact, Slide-on Nut



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



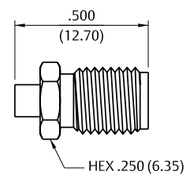
Cable Type	Gold Plated	Nickel Plated
RG-402	142-0694-041	142-0694-046

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

Illustrations are shown in inches (millimeters).

Semi-Rigid Cable

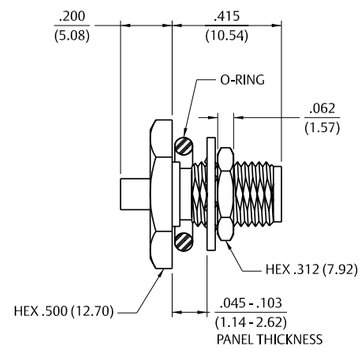
Straight Solder Type Jack



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.

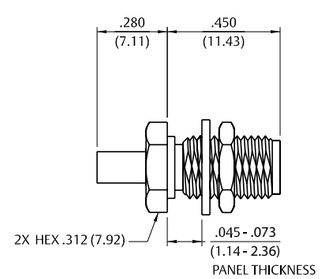
Straight Solder Type Bulkhead Jack with O-Ring



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.

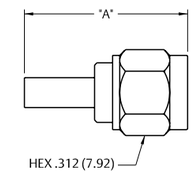
Straight Solder Type Bulkhead Jack



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

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

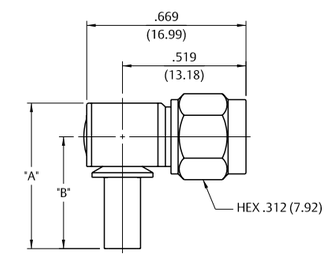
Straight Crimp Type Plug (3-piece) – Solder or Crimp Captivated Contact



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.

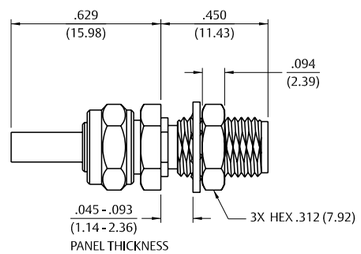
Right Angle Crimp Type Plug – Captivated Contact



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.

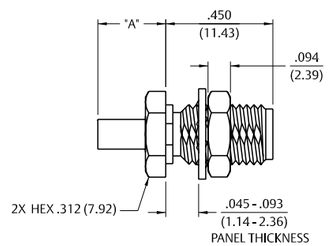
Straight Crimp Type Bulkhead Jack – Captivated Contact



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.

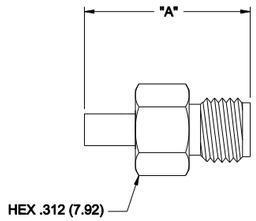
Straight Crimp Type Bulkhead Jack (3-piece) – Solder or Crimp Captivated Conact



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.

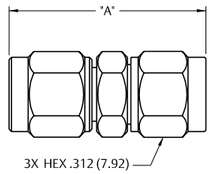
Straight Crimp Type Jack (3-piece) – Solder or Crimp Captivated Contact



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.

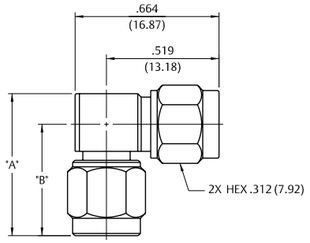
Straight Clamp Type Plug – Captivated Contact



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.

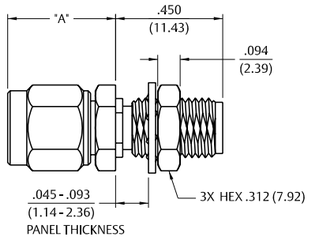
Right Angle Clamp Type Plug – Captivated Contact



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.

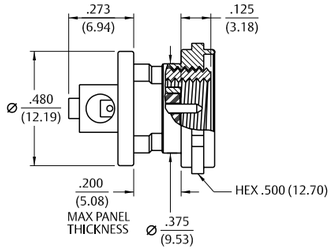
Straight Clamp Type Bulkhead Jack – Captivated Contact



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.

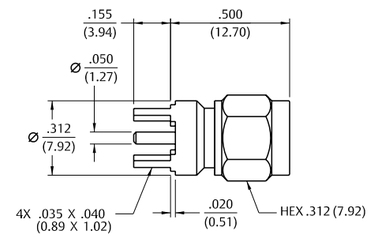
Illustrations are shown in inches (millimeters).

PC Mount

Straight Plug Receptacle

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

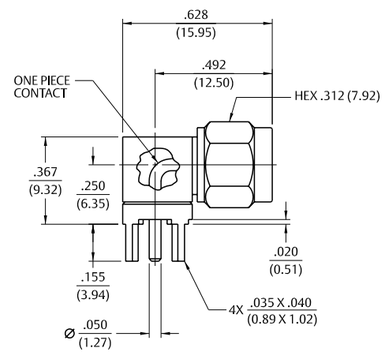
Mounting hole layout figure 2 page 194.



Right Angle Plug Receptacle

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

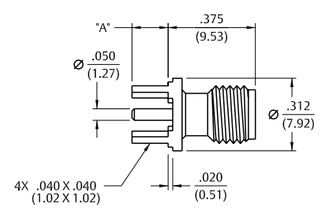
Mounting hole layout figure 2 page 194.



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)

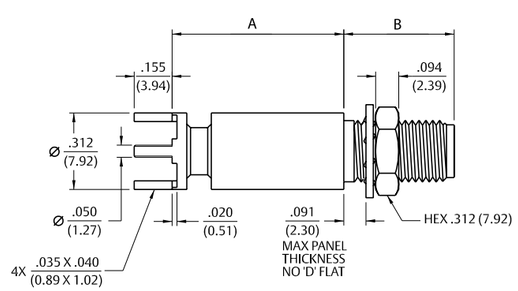
Mounting hole layout figure 2 page 194.



Straight Bulkhead Jack Receptacle

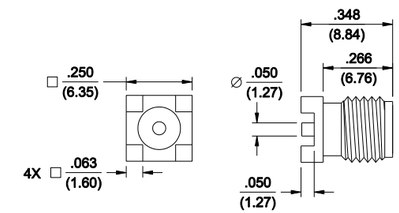
Gold Plated	Nickel Plated	"A"	"B"
142-0701-421	142-0701-426	.700 (17.78)	.450 (11.43)
142-0701-491	142-0701-496	.065 (1.65)	.755 (19.18)

Mounting hole layout figure 2 page 194.



Straight Jack Receptacle – Surface Mount

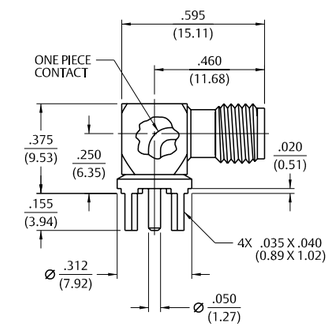
Gold Plated	Packaging
142-0711-201	Stock
142-0711-202	Tape and Reel 500 pcs/reel



Right Angle Jack Receptacle

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

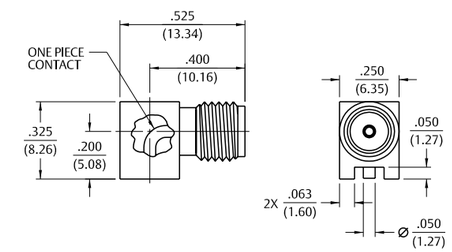
Recommended Land Pattern figure 2 page 194.



Right Angle Jack Receptacle – Surface Mount

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

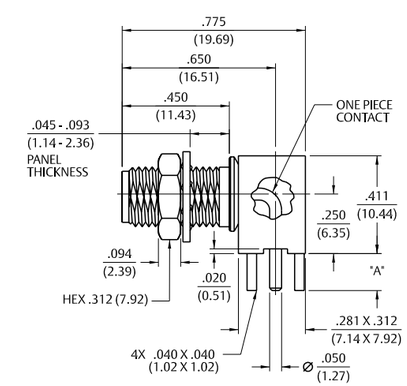
Recommended Land Pattern figure 7 page 194.



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)

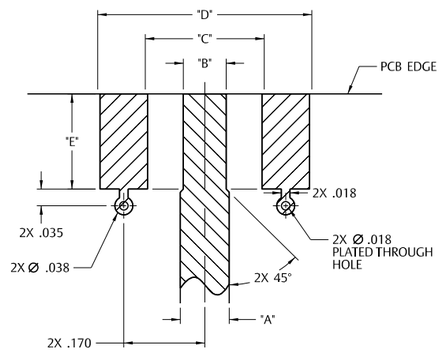
Mounting hole layout figure 1 and 2 page 194.



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.

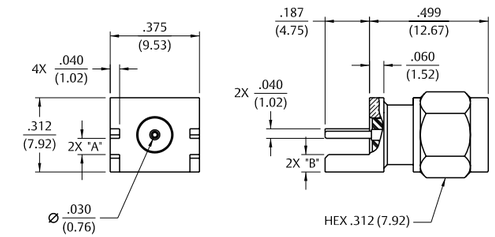
The tabulated dimensions "A", "B", "C", 'D', and "E" were determined experimentally to achieve low VSWR (typically less than 1.5 up to 18 GHz). The circuit board used connectors for these tests was double-sided FR 4 with 1 oz. copper on both sides. The copper was left on the bottom of the board to create 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

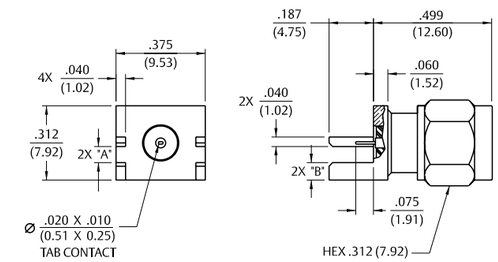
Tabulated Dimensions "A", "B", "C", and "D" are symmetrical about the center line.

End Launch Plug Receptacle – Round Contact



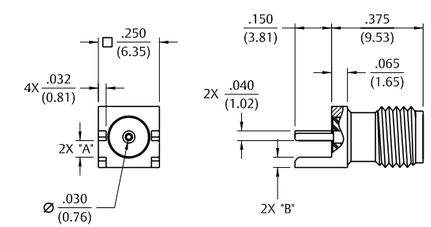
Gold Plated	Nickel Plated	Board Thickness	"A"	"B"
142-0801-801	142-0801-806	.062 (1.57)	.068 (1.73)	.073 (1.85)
142-0801-821	142-0801-826	.042 (1.07)	.048 (1.22)	.093 (2.36)

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)

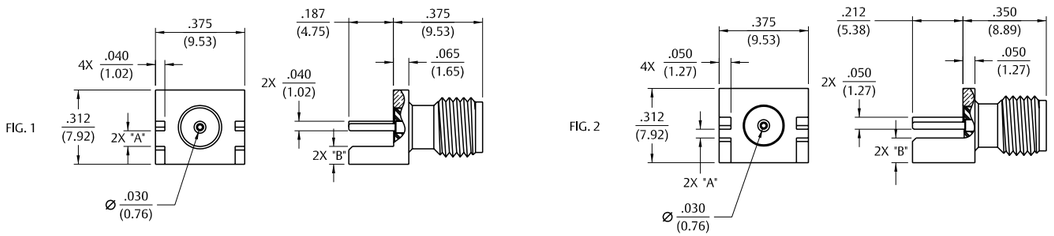
End Launch Plug Receptacle – Round Contact



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)

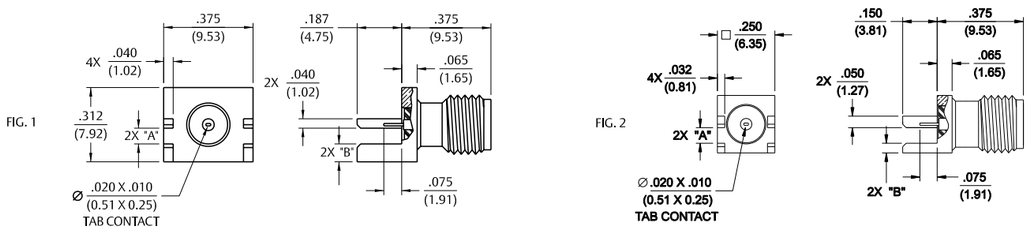
Coupling proof torque 8 lb-ins maximum without support .083 (2.11) wrench.

End Launch Jack Receptacle – Round Contact



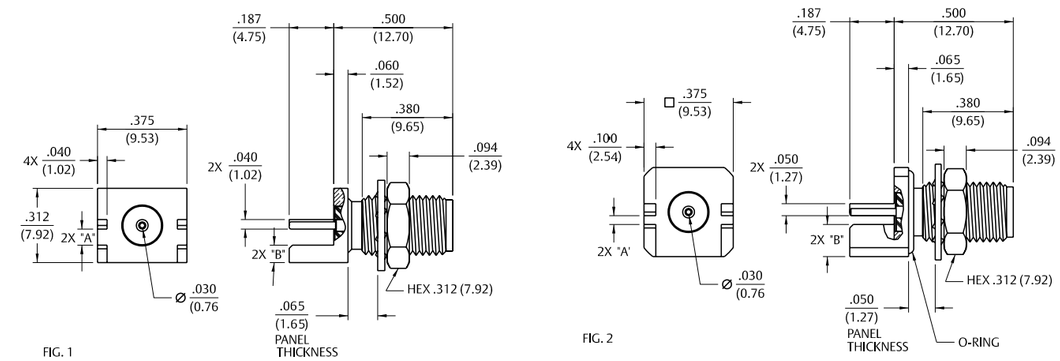
Gold Plated	Nickel Plated	Board Thickness	"A"	"B"	Figure
142-0701-801	142-0701-806	.062 (1.57)	.068 (1.73)	.073 (1.85)	1
142-0701-831	142-0701-836	.042 (1.07)	.048 (1.22)	.093 (2.36)	1
142-0701-881	142-0701-886	.031 (0.79)	.037 (0.94)	.104 (2.64)	2
142-0711-871	142-0711-876	.047 (1.19)	.053 (1.35)	.088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

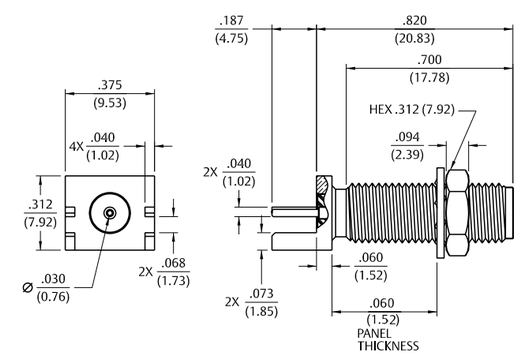
End Launch Bulkhead Jack Receptacle – Round Contact



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

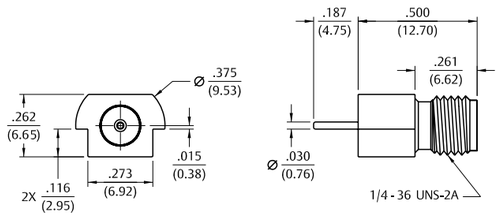
Gold Plated	Nickel Plated	Board Thickness
142-0711-811	142-0711-816	.062 (1.57)



Illustrations are shown in inches (millimeters).

Bulkhead Mount

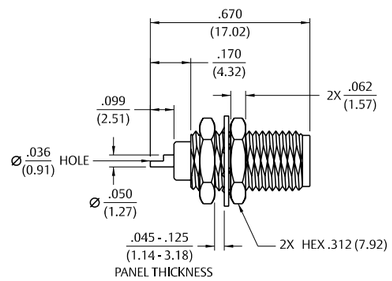
End Launch Jack Receptacle – Surface Mount



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

Recommended land pattern figure 22 page 195.

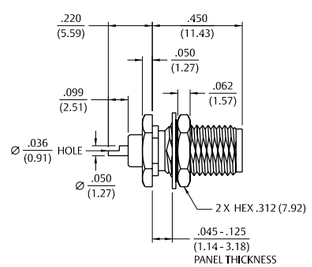
Front Mount Bulkhead Jack Receptacle



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

Mounting hole layout figure 1 page 194.

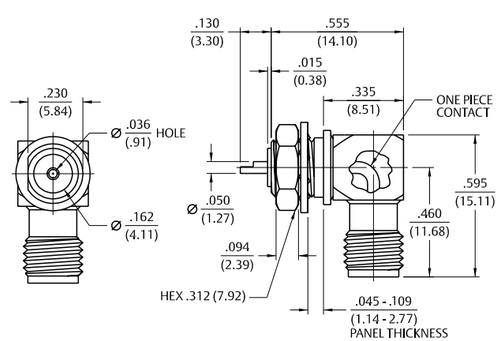
Rear Mount Bulkhead Jack Receptacle



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

Mounting hole layout figure 1 page 194.

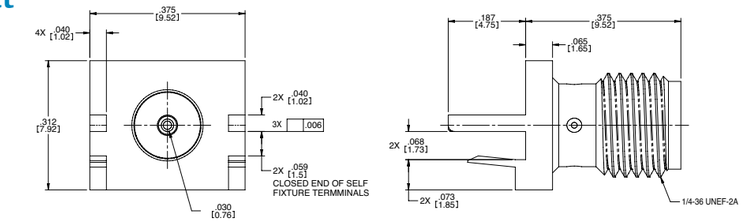
Right Angle Bulkhead Mount Jack Receptacle



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

Mounting hole layout figure 1 page 194.

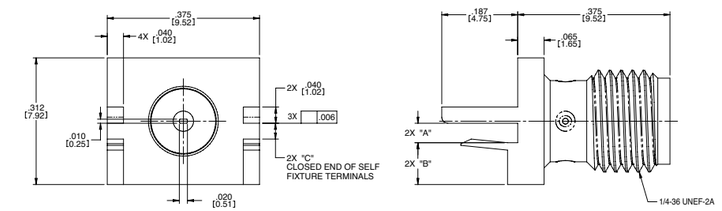
Gold Plated, Round Contact



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

Assembly instructions page 227.

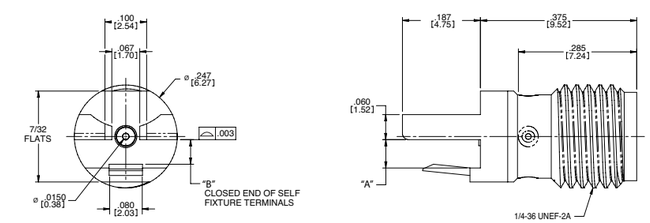
Gold Plated, Tab Contact



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.

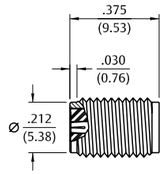
Gold Plated, Round Contact – High Frequency



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.

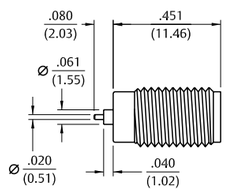
Jack Receptacle – Thread Mount Field Replaceable



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.

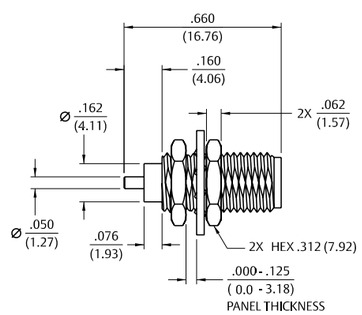
Jack Receptacle – Thread Mount Extended Dielectric (Non-Hermetic)



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.

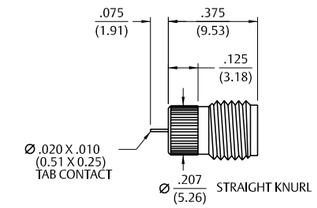
Jack Receptacle – Thread Mount with Hardware Extended Dielectric Bulkhead



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.

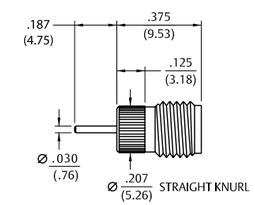
Jack Receptacle – Knurl Mount* Tab Contact



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



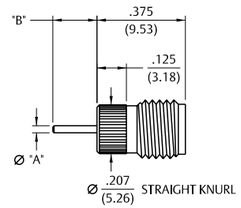
Gold Plated	Nickel Plated
142-1721-011	142-1721-016

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

Illustrations are shown in inches (millimeters).

Spark Plugs

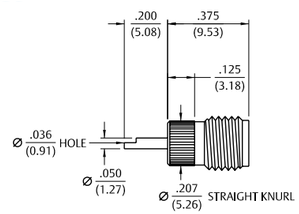
Jack Receptacle – Knurl Mount* Round Contact



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.

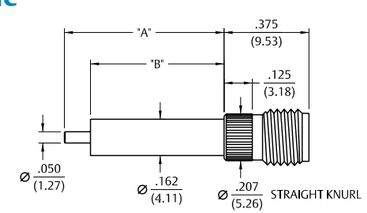
Jack Receptacle – Knurl Mount* Solder Cup Contact



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.

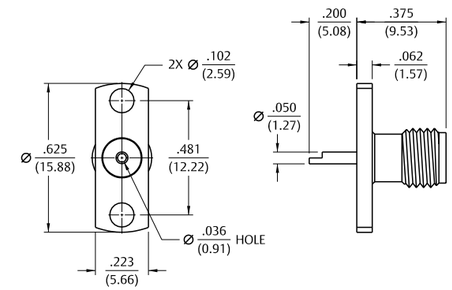
Jack Receptacle – Knurl Mount* Extended Dielectric



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)

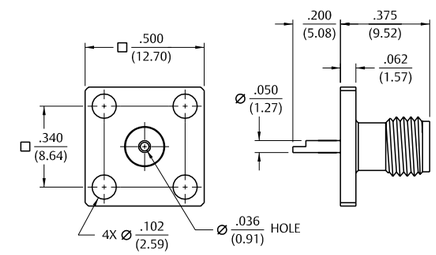
* Not intended for use in materials harder than Rockwell B82.
Mounting hole layout figure 17 page 195.

2-Hole Flange Mount Jack Receptacle – Flush Dielectric



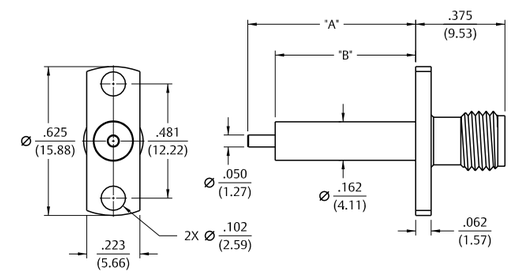
Gold Plated	Nickel Plated
142-0701-621	142-0701-626

4-Hole Flange Mount Jack Receptacle – Flush Dielectric



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

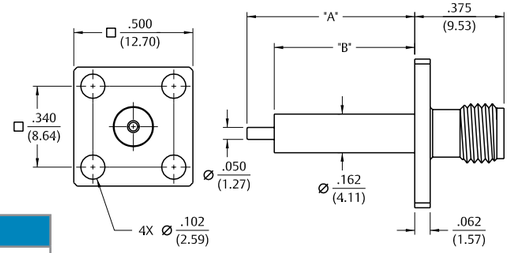
2-Hole Flange Mount Jack Receptacle – Extended Dielectric



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)

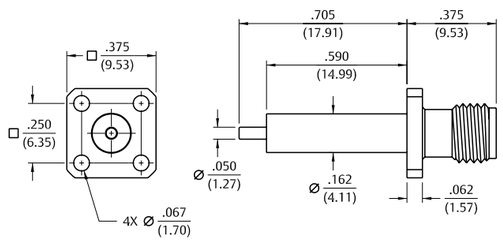
Panel Mount

4-Hole Flange Mount Jack Receptacle – Extended Dielectric



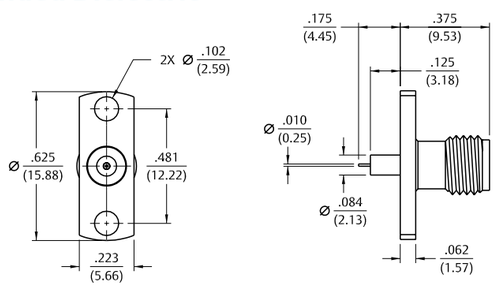
Gold Plated	Nickel Plated	"A"	"B"
142-1701-121	142-1701-126	.705 (17.91)	.590 (14.99)
142-1701-041	142-1701-046	.190 (4.83)	.095 (2.41)

4-Hole Flange Mount Jack Receptacle – Extended Dielectric



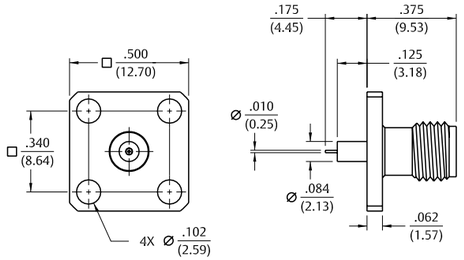
Gold Plated	Nickel Plated
142-1701-011	142-1701-016

2-Hole Flange Mount Jack Receptacle – Extended Dielectric



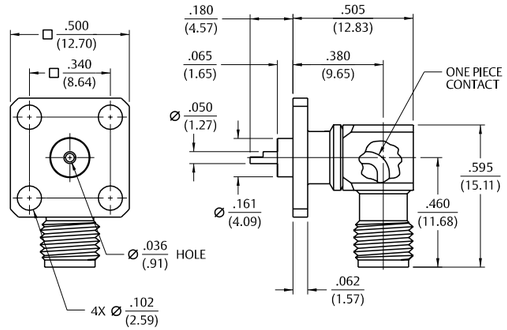
Gold Plated	Nickel Plated
142-1701-201	142-1701-206

4-Hole Flange Mount Jack Receptacle – Extended Dielectric



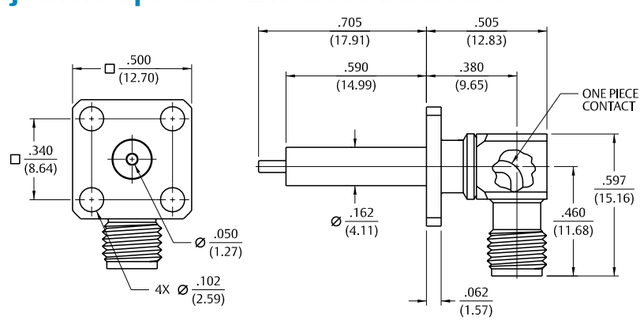
Gold Plated	Nickel Plated
142-1701-191	142-1701-196

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



Gold Plated	Nickel Plated
142-0701-701	142-0701-706

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

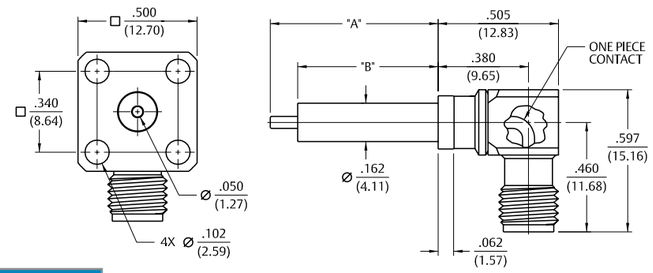


Gold Plated	Nickel Plated
142-1711-001	142-1711-006

Illustrations are shown in inches (millimeters).

Panel Mount

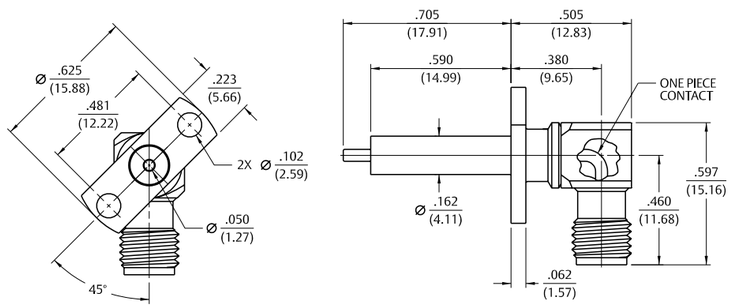
2-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric 90° Orientation



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)

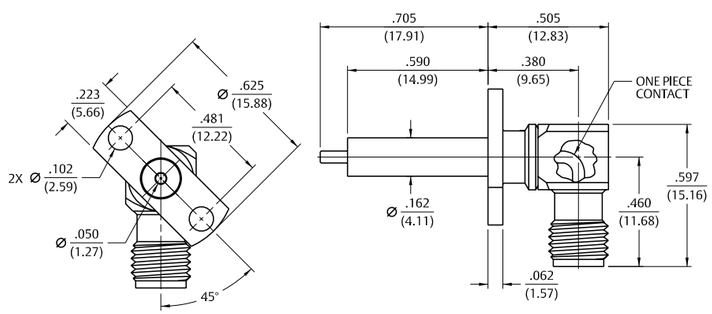
2-Hole Right Angle Flange Mount Jack Receptacle – Extended Dielectric +45° Orientation

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

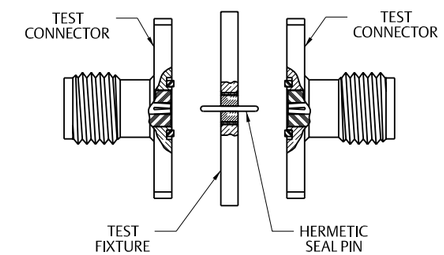


Application Notes

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.

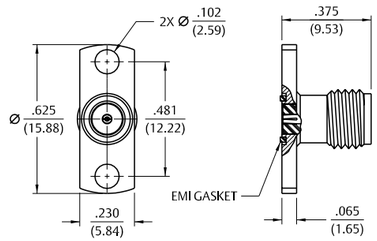
2. It is recommended that the hermetic seal be mounted flush with the circuit housing. Tolerance variations between the hermetic seal and machined housing do not always guarantee an optimum transition to the connector. Emerson does not recommend the addition of a counter bore in the circuit housing to 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."

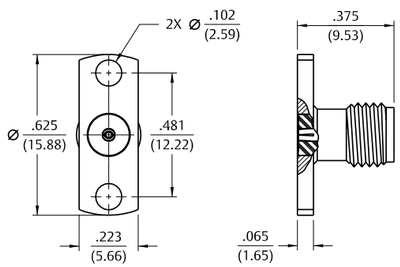
Field Replaceable Panel Mount

2-Hole Flange Mount Jack Receptacle – with EMI Gasket



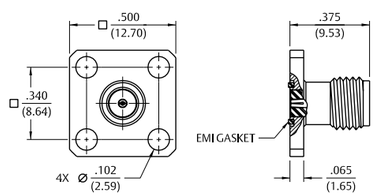
Accepts Pin Size	Gold Plated	Nickel Plated
.012 (0.30)	142-1701-601	142-1701-606
.015 (0.38)	142-1701-611	142-1701-616
.018 (0.46)	142-1701-621	142-1701-626

2-Hole Flange Mount Jack Receptacle – without EMI Gasket



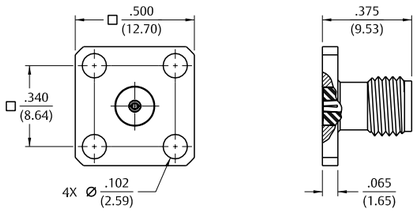
Accepts Pin Size	Gold Plated	Nickel Plated
.020 (0.51)	142-1701-631	142-1701-636
.036 (0.91)	142-1701-641	142-1701-646

4-Hole Flange Mount Jack Receptacle – with EMI Gasket



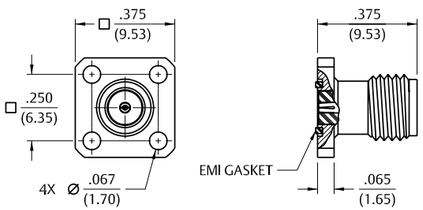
Accepts Pin Size	Gold Plated	Nickel Plated
.012 (0.30)	142-1701-501	142-1701-506
.015 (0.38)	142-1701-511	142-1701-516
.018 (0.46)	142-1701-521	142-1701-526

4-Hole Flange Mount Jack Receptacle – without EMI Gasket



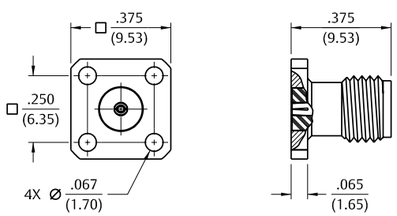
Accepts Pin Size	Gold Plated	Nickel Plated
.020 (0.51)	142-1701-531	142-1701-536
.036 (0.91)	142-1701-541	142-1701-546

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

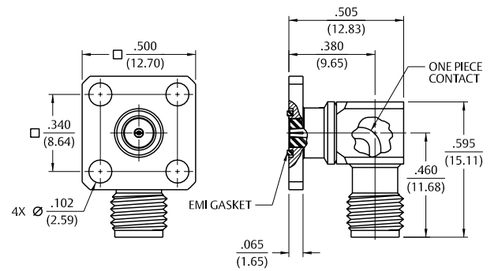


Accepts Pin Size	Gold Plated	Nickel Plated
.020 (0.51)	142-1701-581	142-1701-586
.036 (0.91)	142-1701-591	142-1701-596

Illustrations are shown in inches (millimeters).

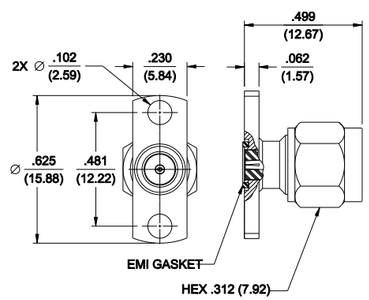
Field Replaceable Panel Mount

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



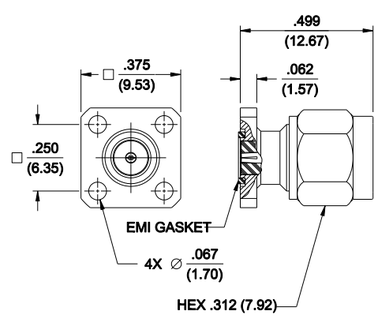
Accepts Pin Size	Gold Plated	Nickel Plated
.015 (0.38)	142-1711-511	142-1711-516
.018 (0.46)	142-1711-521	142-1711-526

2-Hole Flange Mount Plug Receptacle – with EMI Gasket



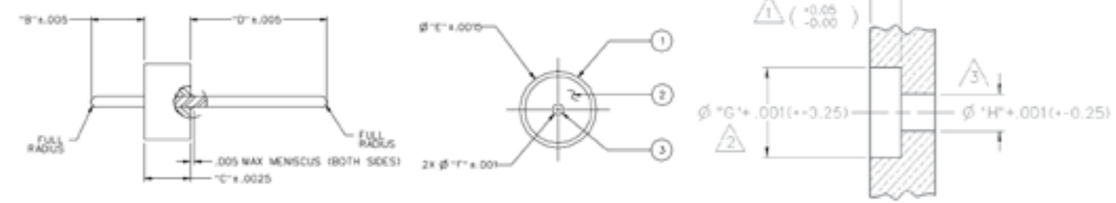
Accepts Pin Size	Gold Plated	Nickel Plated
.012 (0.30)	142-1801-601	142-1801-606
.015 (0.38)	142-1801-611	142-1801-616
.018 (0.46)	142-1801-621	142-1801-626

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

Hermetic Seal Feedthrough



Recommended Mounting Hole Detail

Part No.	Item 1 Outer Ring	Item 2 Insulator	Item 3 Pin	"A"	"B"	"C"	"D"	"E"
142-1000-001	Kovar Gold pl .00005 min over Nickel pl .000005 min	Glass Corning 7052 or equivalent	Kovar Gold pl .00005 min over Nickel pl .000005 min	.070 (1.78)	.0625 (1.59)	.180 (4.57)	.0985 (2.50)	.012 (0.30)
142-1000-002	Kovar Gold pl .00005min over Nickel pl .000005 min	Glass Corning 7070 or equivalent	Kovar Gold pl .00005 min over Nickel pl .000005 mm	.072 (1.83)	.0625 (1.59)	.180 (4.57)	.0985 (2.50)	.015 (0.38)
142-1000-003	Kovar Gold pl .00005 min over Nickel pl .000005 min	Glass Corning 7050 or equivalent	Kovar Gold pl .00005 min over Nickel p1 .000005 min	.072 (1.83)	.0600 (1.52)	.180 (4.57)	.1100 (2.79)	.018 (0.46)
142-1000-004	Kovar Gold pl .00005min over Nickel pl .000005 min	Glass Corning 7052 or equivalent	Kovar Gold pl .00005 min over Nickel pl .000005 min	.070 (1.78)	.0600 (1.52)	.203 (5.16)	.1580 (4.01)	.020 (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)

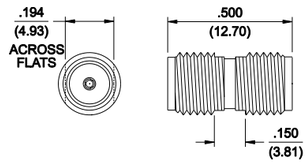
Environmental

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

In-Series Adapters

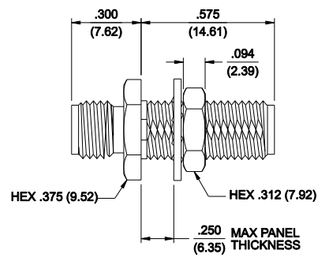
Jack to Jack Adapter

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



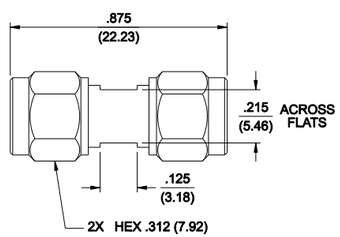
Jack to Bulkhead Jack Adapter

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



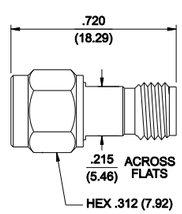
Plug to Plug Adapter

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



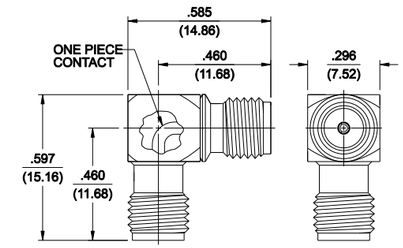
Plug to Jack Adapter

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



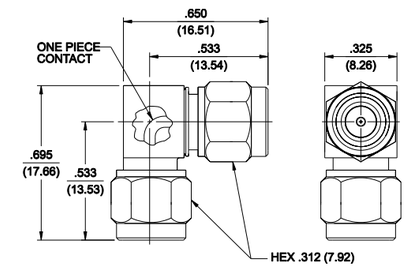
Right Angle Jack to Jack Adapter

Gold Plated
142-0901-921



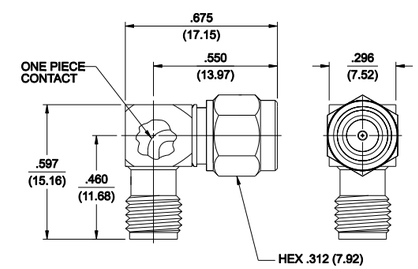
Right Angle Plug to Plug Adapter

Gold Plated
142-0901-931



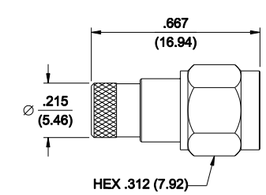
Right Angle Jack to Plug Adapter

Gold Plated
142-0901-941



Dummy Load Plug

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



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

Illustrations are shown in inches (millimeters).

Specifications

Electrical Specifications

Impedance: 50 Ohms
Frequency Range:
Flexible cable connectors ..... 0-12.4 GHz
Flexible cable connectors ..... 0-18.0 GHz

VSWR: (max) (f = GHz)	Straight Cabled Connectors	Right Angle Cabled Connectors
RG-316, LMR-100 cable	1.15 + .02f	1.15 + .03f
RG-58, LMR-195 cable	1.17 + .025f	1.17 + .06f
RG-142 cable	1.17 + .02f	1.15 + .03f
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 ..... $0.06\sqrt{f\,(GHz)}$, tested at 6 GHz
Right angle flexible cable connectors ..... $0.15\sqrt{f\,(GHz)}$, tested at 6 GHz
Low loss flexible straight cable connectors ..... $0.06\sqrt{f\,(GHz)}$, tested at 1 GHz
Low loss flexible right angle cable connectors ..... $0.15\sqrt{f\,(GHz)}$, tested at 1 GHz
Uncabled receptacles, field replaceable ..... N/A
RF Leakage: (dB min, tested at 2.5 GHz)
Flexible cable connectors ..... -60 dB
Uncabled receptacles and adapters ..... N/A
RF High Potential Withstanding Voltage:
(VRMS min tested at 4 and 7 MHz)† RG-316; LMR-100, 195, 200 500
RG-58, RG-142, LMR-240, uncabled receptacles 670

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

Mechanical Ratings

Engagement Design: Reverse Polarity, Series SMA
Engagement/Disengagement Force: 2 lb-in max 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 4 oz-in min

Cable Retention:	Axial Force* (lbs)	Torque (oz-in)
Connectors for RG-316, LMR-100	20	N/A
Connectors for LMR195, 200	30	N/A
Connectors for RG-58, LMR-240	40	N/A
Connectors for RG-142	45	N/A

*Or cable breaking strength whichever is less.
Durability: 500 cycles minimum

Environmental Specifications

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

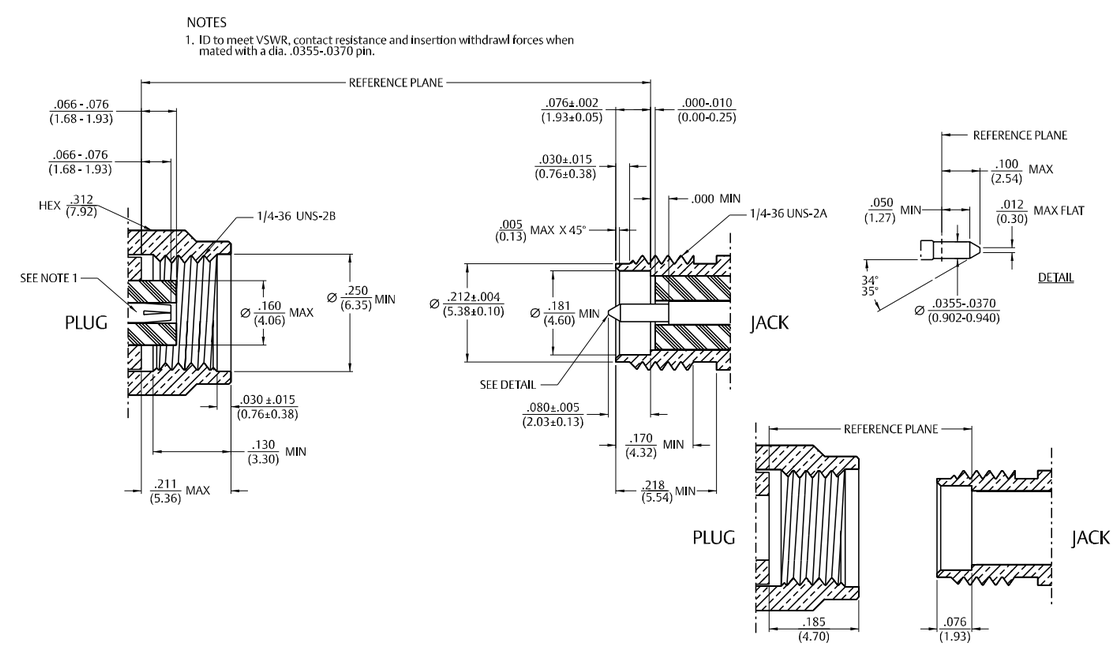
Temperature Range:	- 65°C to + 165°C
Thermal Shock:	MIL-STD-202, Method 107, Condition B
Corrosion:	MIL-STD-202, Method 101, Condition B
Shock:	MIL-STD-202, Method 213, Condition I
Vibration:	MIL-STD-202, Method 204, Condition D
Moisture Resistance:	MIL-STD-202, Method 106

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 D 1710 and ASTM D 1457 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 B16, gold plated* per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Mounting Hardware:	Brass (nuts) per ASTM B16 or phosphor bronze (lockwashers) per ASTM B139, gold plated* per MIL-DTL-45204 .00001" min

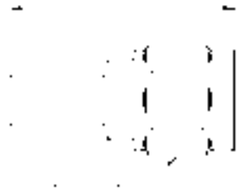
** All gold plated parts include a .00005" min nickel barrier layer.*
† Avoid user injury due to misapplication. See safety advisory definitions.

Mating Engagement for SMA Reverse Polarity Series



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)

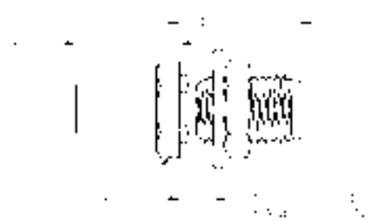
Assembly Instructions: LMR 195, 200 and 240 page 219. All other cables page 220.

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.

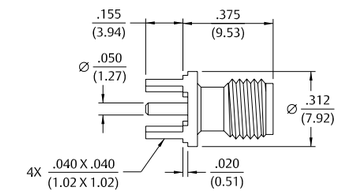
Straight Crimp Type Bulkhead Jack – Captivated Contact



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.

Straight Jack Receptacle



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

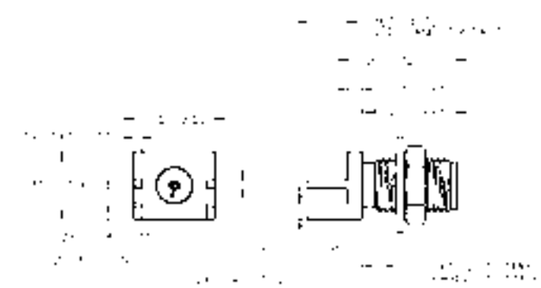
Mounting hole layout figure 2 page 194.

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)

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 Cabled Connectors	Right Angle 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	$0.06\sqrt{f\,(GHz)}$, tested at 6 GHz
Right angle flexible cable connectors	$0.15\sqrt{f\,(GHz)}$, tested at 6 GHz
Low loss flexible straight cable connectors	$0.06\sqrt{f\,(GHz)}$, tested at 1 GHz
Low loss flexible right angle cable connectors	$0.15\sqrt{f\,(GHz)}$, 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

Environmental Specifications

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

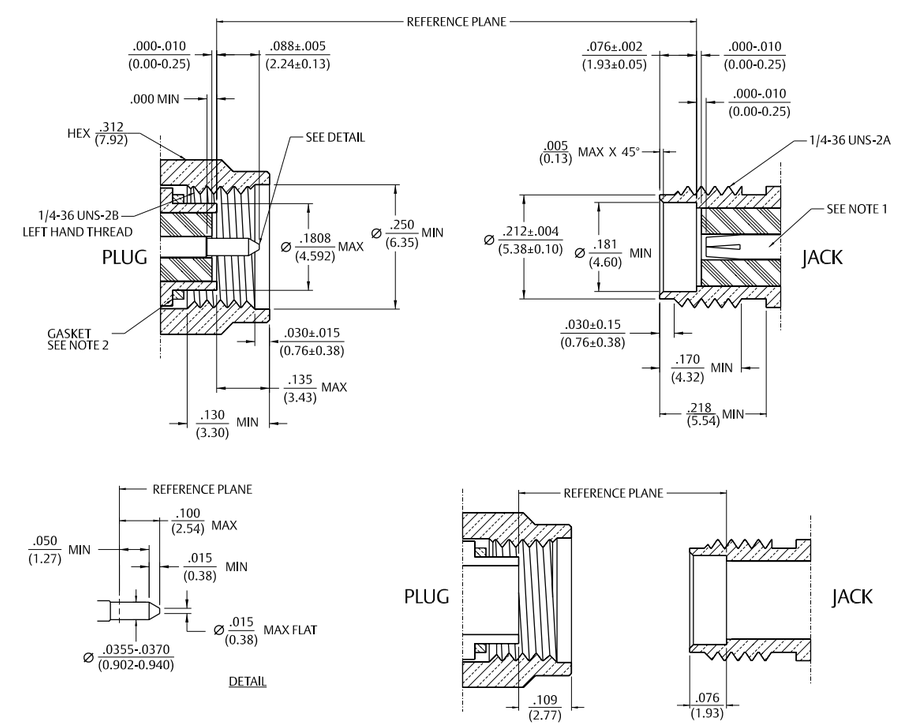
Temperature Range:	- 65°C to + 165°C
Thermal Shock:	MIL-STD-202, Method 107, Condition B
Corrosion:	MIL-STD-202, Method 101, Condition B
Shock:	MIL-STD-202, Method 213, Condition I
Vibration:	MIL-STD-202, Method 204, Condition D
Moisture Resistance:	MIL-STD-202, Method 106

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.

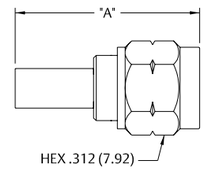
Mating Engagement for SMA Reverse Thread Series



Illustrations are shown in inches (millimeters).

Flexible Cable

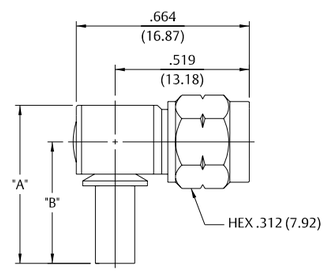
Straight Crimp Type Plug – Solder or Crimp Captivated Contact



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.

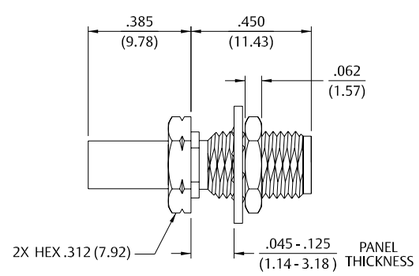
Right Angle Crimp Type Plug – Captivated Contact



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.

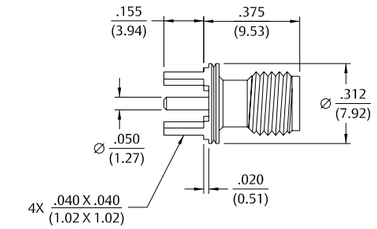
Straight Crimp Type Bulkhead Jack – Solder or Crimp



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.

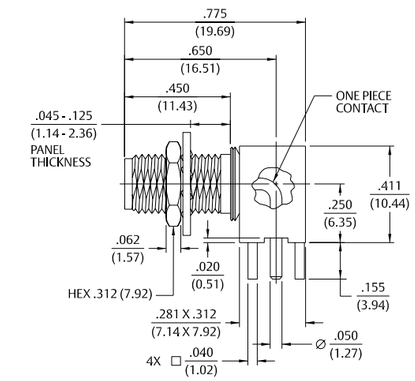
Straight Jack Receptacle



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

Mounting hole layout figure 2 page 194.

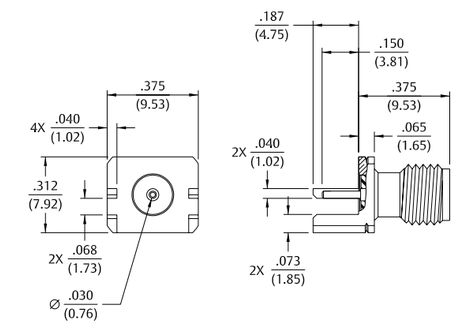
Right Angle Bulkhead Jack Receptacle



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

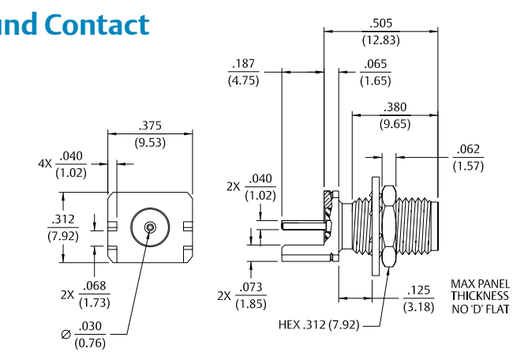
Mounting hole layout figures 1 and 2 page 194.

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



Illustrations are shown in inches (millimeters).

SMA CONNECTORS – REVERSE THREAD – 50 OHM

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 Cabled Connectors	Right Angle Cabled Connectors
RG-316 cable	1.15 + .02f	1.15 + .03f
RG-58 cable	1.15 + .01f	1.15 + .02f
Uncabled receptacles		N/A

Working Voltage: (VRMS max)†	Sea Level	70K Feet
RG-316	250	65
RG-58, uncabled receptacles	335	85

Dielectric Withstanding Voltage: (VRMS min at sea level)†
RG-316 750
RG-58, uncabled receptacles 1000
Insulation Resistance: 5000 megohms min

Contact Resistance: (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

Corona Level: (Volts min at 70,000 feet)†
RG-316 190
RG-58, uncabled receptacles 250
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
Uncabled receptacles ..... N/A
RF Leakage: (dB min tested at 2.5 GHz)
Flexible cable connectors ..... -60 dB
Uncabled receptacles ..... N/A
RF High Potential Withstanding Voltage: (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

Engagement Design: MIL-STD-348, Series SMA
Engagement/Disengagement Force: 2 lb-in min max
Mating Torque: 7 to 10 lb-in min
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	20	N/A
RG-58	40	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)

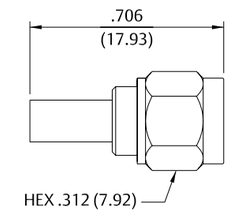
Temperature Range: - 65°C to + 165°C
Thermal Shock: MIL-STD-202, Method 107, Condition B
Corrosion: MIL-STD-202, Method 101, Condition B
Shock: MIL-STD-202, Method 213, Condition I
Vibration: MIL-STD-202, Method 204, Condition D
Moisture Resistance: MIL-STD-202, Method 106

Material Specifications

(See non-magnetic materials page 10)

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

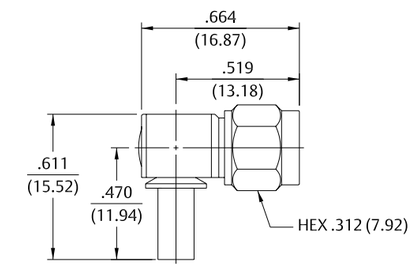
Straight Crimp Type Plug (3-piece) – Captivated Contact



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.

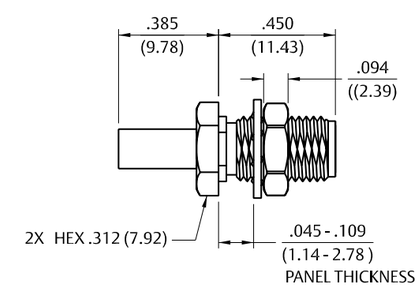
Right Angle Crimp Type Plug – Captivated Contact



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

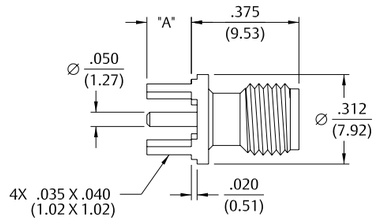
Assembly instructions page 219.

PC Mount

Straight Jack Receptacle

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

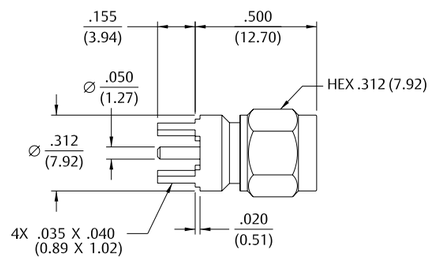
Mounting hole layout figure 3 on page 194.



Straight Plug Receptacle

Gold Plated
142-9801-201

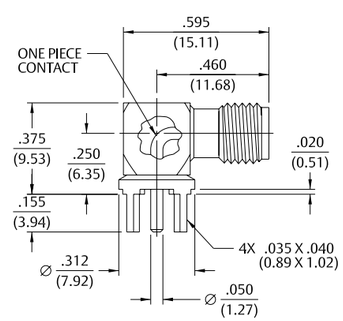
Mounting hole layout figure 3 on page 194.



Right Angle Jack Receptacle

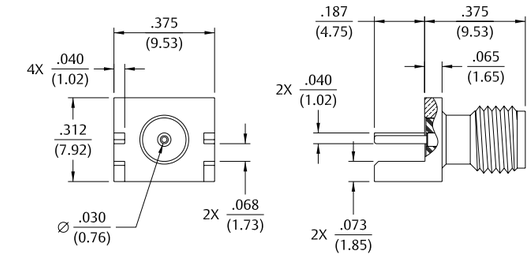
Gold Plated
142-9701-301

Mounting hole layout figure 3 on page 194.



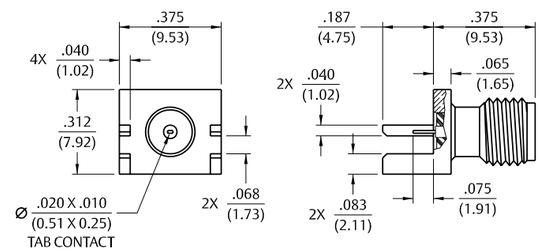
End Launch Jack Receptacle – Round Contact

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)



Illustrations are shown in inches (millimeters).

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

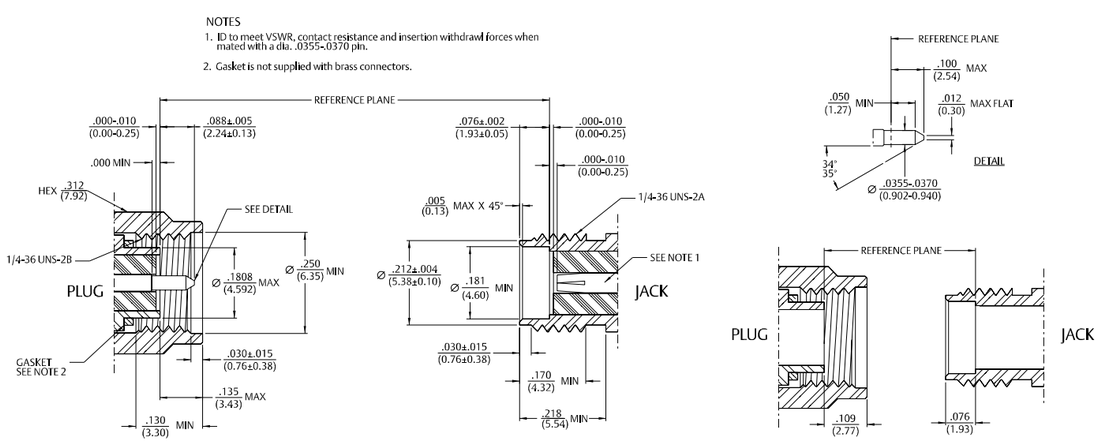
Engagement Design: MIL-STD-348, Series SMA
Engagement/Disengagement Force: 2 lb-in max
Mating Torque: 7 to 10 lb-in
Contact Retention: 6 lbs min axial force, 4 oz-in min radial torque

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 Compatable with MIL-STD-348

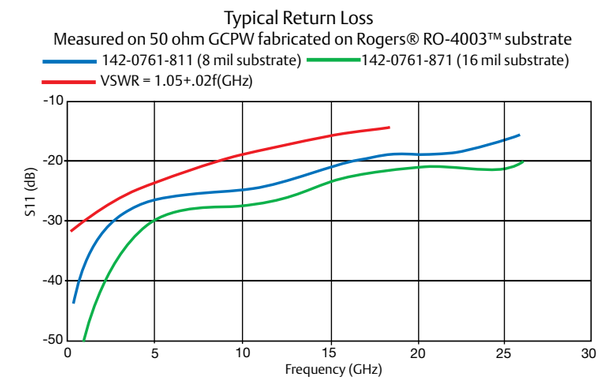


High Frequency SMA End Launch Connectors for Microwave PC Board Substrates

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).

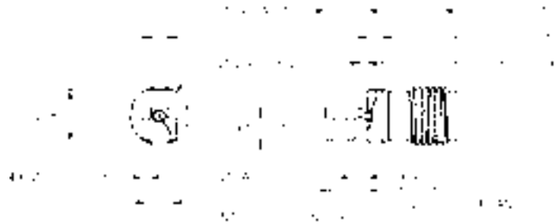


Design Features

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 transmission 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.

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.*

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.*

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 Cabled Connectors	Right Angle 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, RG-402 cable w/o contact, Uncabled receptacles	670
RG-402 with contact	1000

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

Mechanical Specifications

Engagement Design:	MIL-STD-348, Series SMA
Durability:	500 cycles min 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) 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

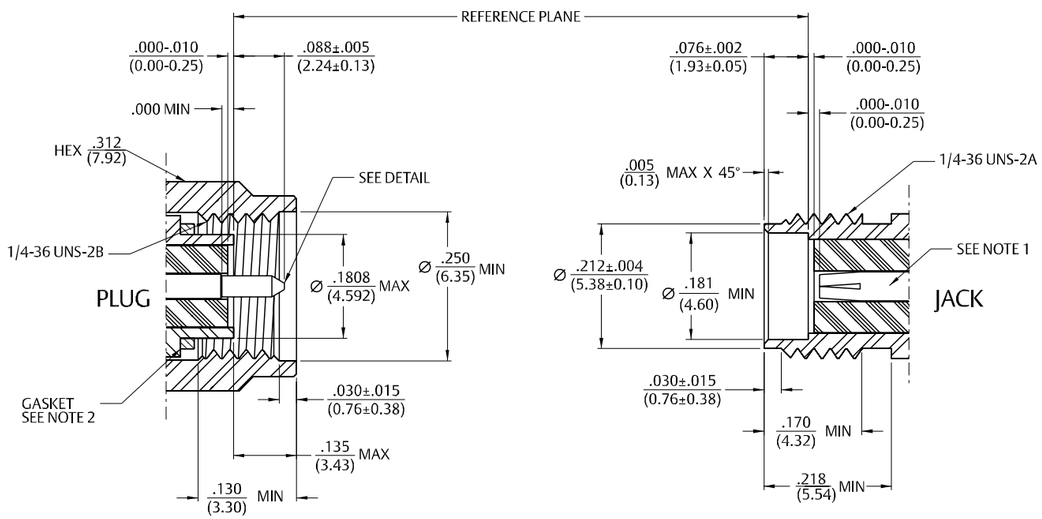
Bodies:	Stainless Steel, type 303, per ASTM A 582, passivated per MIL-DTL-14072 (EL 300), or gold Plated per MIL-G-45204 .00005" min
Contacts:	Male - Brass per ASTM B16, Gold plated* per MIL-G-45204 (.00005" min) Female – Beryllium Copper per ASTM B196, Gold plated* per MIL-G-45204 (.00005" min)
Insulators:	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

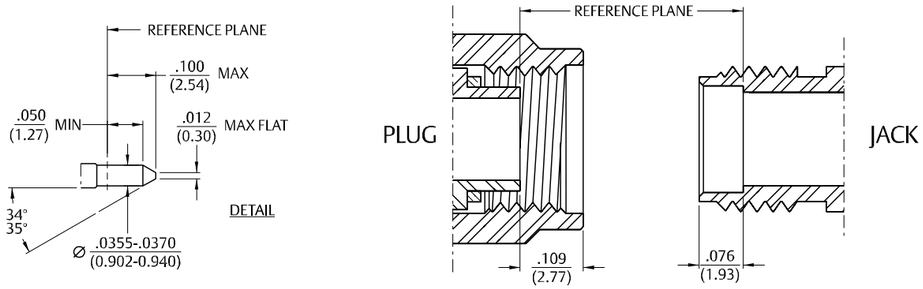
Note: All Gold plated parts include a .00005" min Nickel under plated barrier layer.

Specifications

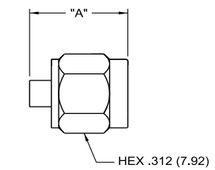
Mating Engagement for Stainless Steel SMA Series Per MIL-STD-348A

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.





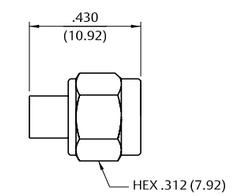
Straight Solder Type Plug – with Contact, Captive Nut Thin Wall



Cable Type	Gold Plated Body	"A"
RG-405	141-0693-002	.405
RG-402	141-0694-002	.440

Assembly instructions page 214.

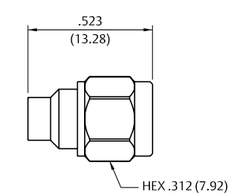
Straight Solder Type Plug – Without Contact, Thread-On Nut



Cable Type	Gold Plated Body
RG-402	141-0694-012

Assembly instructions page 214.

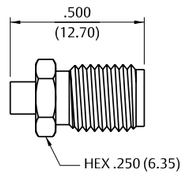
Straight Solder Type Plug with Captivated Solderless Contact, Captive Nut and Thick Wall Interface



Cable Type	Gold Plated Body
RG-405	141-0693-062
RG-402	141-0694-062

Assembly instructions page 222.

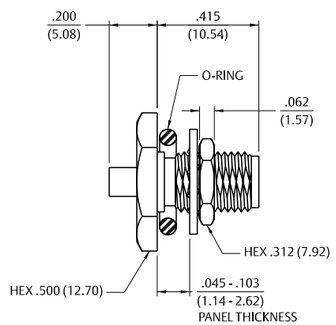
Straight Solder Type Jack



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

Assembly instructions page 214.

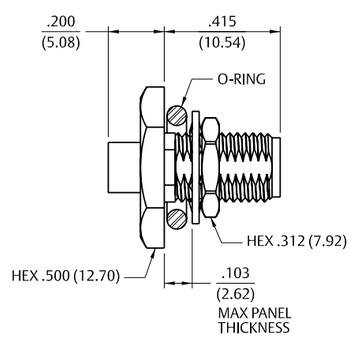
Straight Solder Type Bulkhead Jack with O-Ring



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

Assembly instructions page 214.

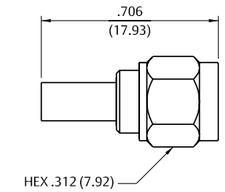
Straight Solder Type Bulkhead Jack with Captivated Solderless Contact and O-Ring



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

Assembly instructions page 222.

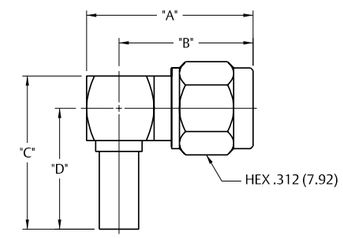
Straight Crimp Type Plug (3-piece) – Solder or Crimp Captivated Contact



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.

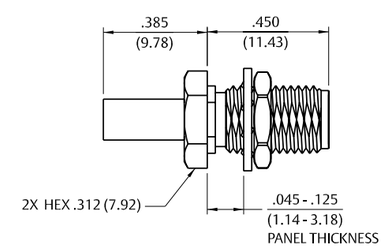
Right Angle Crimp Type Plug – Captivated Contact



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

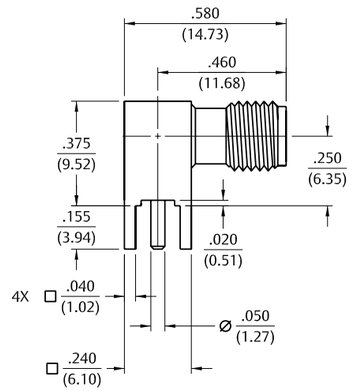
Assembly instructions page 219.

Illustrations are shown in inches (millimeters).

PC Mount, Bulkhead and Panel Mount

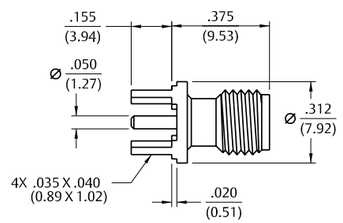
Right Angle PC Mount Jack Receptacle

Gold Plated
141-0701-301



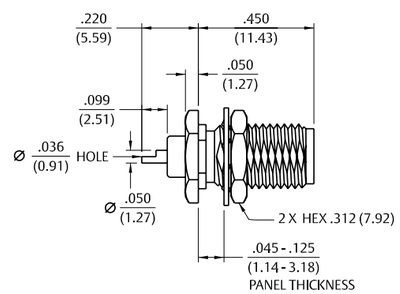
Straight PC Mount Jack Receptacle

Gold Plated
141-0701-201



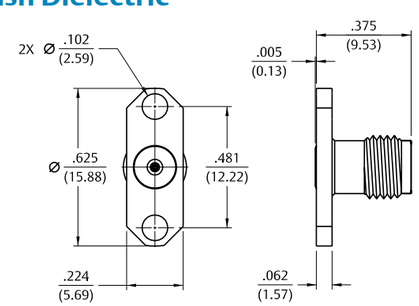
Rear Mount Bulkhead Jack Receptacle

Passivated
141-0701-402



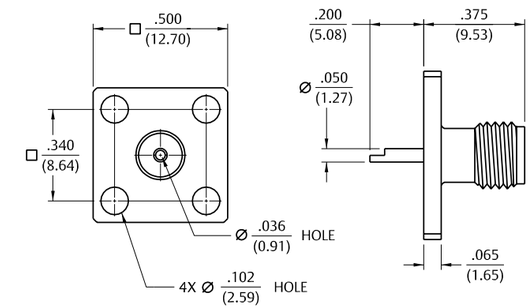
2-Hole Flange Mount Jack Receptacle – Flush Dielectric

Passivated
141-0701-602



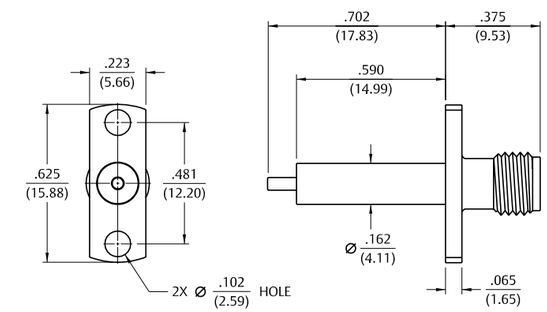
4-Hole Flange Mount Jack Receptacle – Flush Dielectric

Passivated
141-0701-612



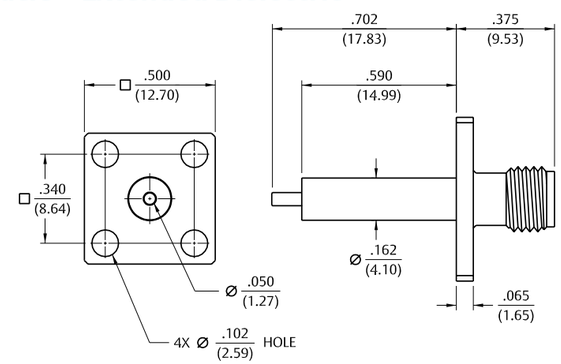
2-Hole Flange Mount Jack Receptacle – Extended Dielectric

Passivated
141-0701-622



4-Hole Flange Mount Jack Receptacle – Extended Dielectric

Passivated
141-0701-632



Illustrations are shown in inches (millimeters).

Specifications

Electrical Specifications

Impedance: 50 Ohms
Frequency Range: 0-6 GHz
Attenuation Values: 1, 2, 3, 6 and 10 dB Nominal*
Attenuation Accuracy:

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

VSWR Max:

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

Average Input Power: 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

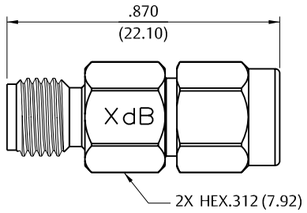
Environmental Specifications

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).

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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

Electrical Specifications

Impedance: 50 Ohms

Frequency Range:

Connectors	0-4 GHz
Dummy loads	0-1 GHz

VSWR: (max) (f = GHz)

	Straight Cabled Connectors	Right Angle Cabled Connectors
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

Working Voltage: (VRMS max)†

	Sea Level	70K Feet
RG-178	250	60
RG-316, RG-58, RG-405, uncabled receptacles, adapters	335	85
Dummy loads		N/A

Dielectric Withstanding Voltage: (VRMS min at sea level)

RG-316	750
RG-58, RG-142, uncabled receptacles	1000
Dummy loads	N/A

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

RG-178	185
RG-316, RG-58, RG-405	250
Uncabled receptacles, adapters, dummy loads	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, adapters, dummy loads	N/A

Insulation Resistance: 1000 megohms min

Contact Resistance: (milliohms max)

	Initial	After Environmental
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

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

Cabled connectors	-55 dB
Uncabled recepacles, adapters, dummy loads	N/A

RF High Potential Withstanding Voltage:
(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

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

Mechanical Specifications

Engagement Design: MIL-STD-348, Series SMB
Engagement/Disengagement Force: 2 lbs min to 14 lbs max axial force
Contact Retention: 4 lbs min axial force (captivated contacts)
1 oz-in min torque (uncabled receptacles)

Cable Retention:

	Axial Force* (lbs)	Torque (oz-in)
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.

Durability: 500 cycles min

Environmental Specifications

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

Temperature Range: Connectors ..... - 65°C to + 165°C
Dummy loads ..... - 65°C to + 125°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 B (N/A dummy loads)
Vibration: MIL-STD-202, Method 204, Condition B (N/A dummy loads)

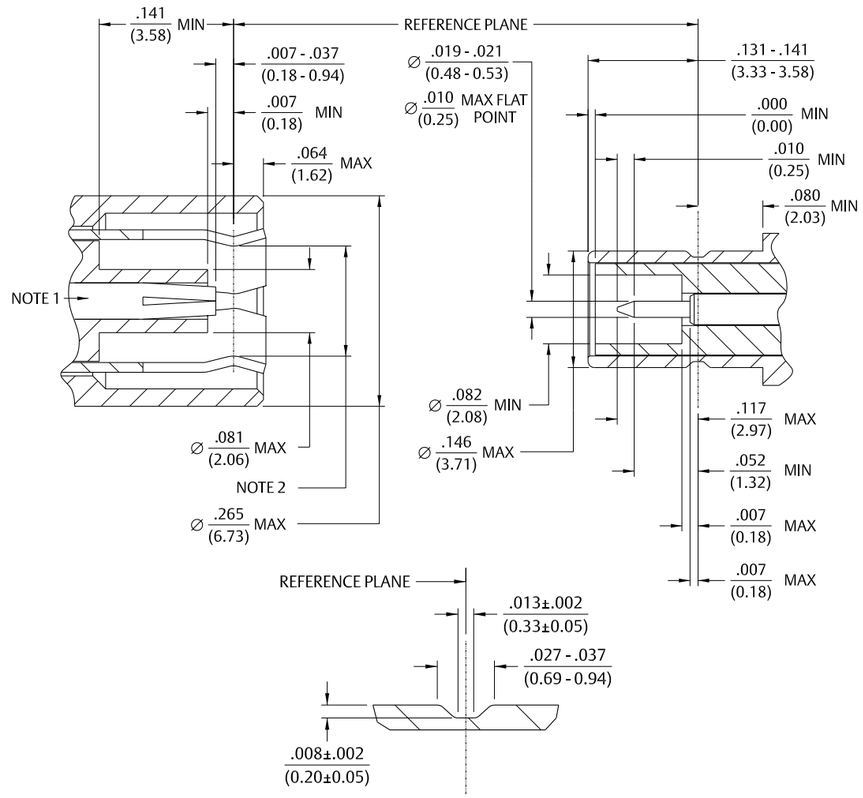
Material Specifications

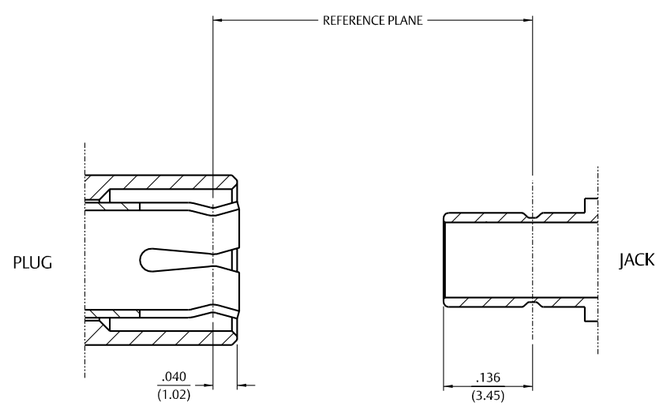
Bodies: Brass per ASTM B16 or zinc per ASTM B86-71, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Contacts: Male - brass per ASTM B16, gold plated per MIL-DTL-45204 .00003" min
Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003" min
Insulators: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457 or Teflon PFA 340
Expansion Caps: Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Crimp Sleeves: Copper per ASTM B301 or brass per ASTM B16, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Mounting Hardware: 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
Cover Rings: 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

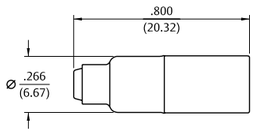
Mating Engagement for SMB Series





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.

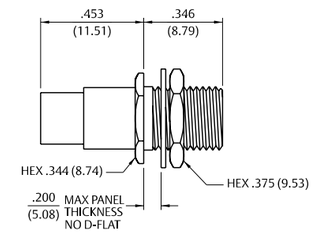
Straight Solder Type Plug – Captivated Contact



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

Assembly instructions page 233.

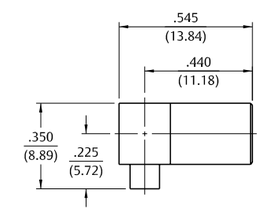
Straight Solder Type Bulkhead Plug – Captivated Contact



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

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

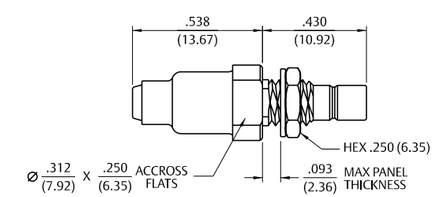
Right Angle Solder Type Plug – Captivated Contact



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

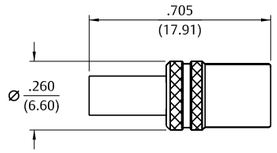


Cable Type	Gold Plated	Nickel Plated
RG-405	131-3593-401	131-3593-406

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

Flexible Cable

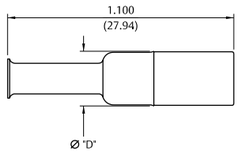
Straight Crimp Type Plug (3-Piece) – Solder or Crimp Captivated Contact



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.

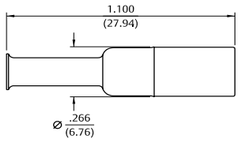
Straight Solder Type Bulkhead Plug – Solder or Crimp Captivated Contact



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.

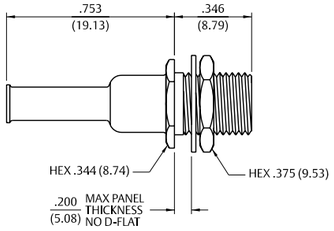
Straight Crimp Type Plug – Die Cast – Solder or Crimp Captivated Contact



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.

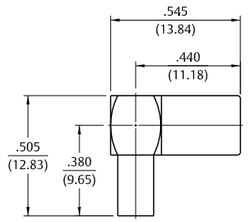
Straight Crimp Type Bulkhead Plug – Solder or Crimp Captivated Contact



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).

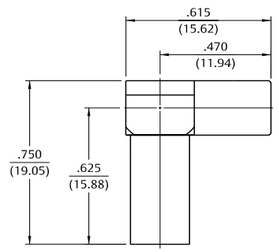
Right Angle Crimp Type Plug – Captivated Contact



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.

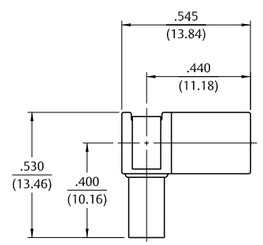
Right Angle Crimp Type Plug – Captivated Contact



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

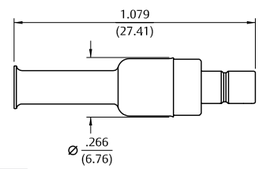


Cable Type	Gold Plated	Nickel Plated
RG-178, 196	131-1402-101	131-1402-116
RG-161, 174, 179, 187, 188, 316	131-1403-101	131-1403-116
RG-316 DS, 188 DS, 179 DS, 187 DS	131-1404-101	131-1404-116

Assembly instructions page 238.

Flexible Cable

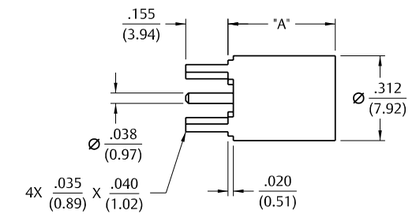
Straight Crimp Type Jack – Solder or Crimp Captivated Contact



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.

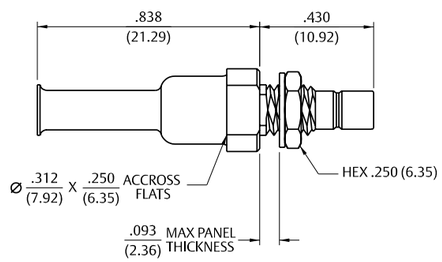
Straight Plug Receptacle



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.

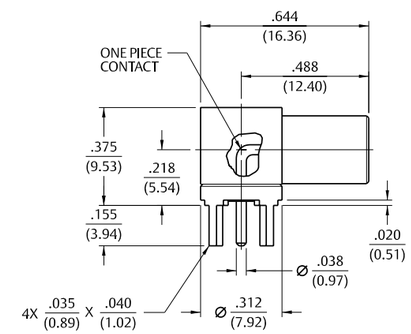
Straight Crimp Type Bulkhead Jack – Solder or Crimp Captivated Contact



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.

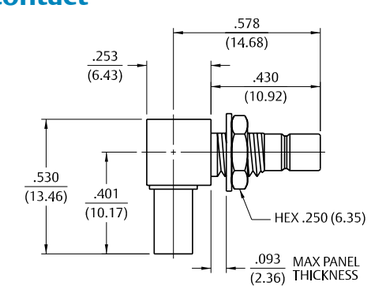
Right Angle Plug Receptacle



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

Mounting hole layout figure 4 page 194.

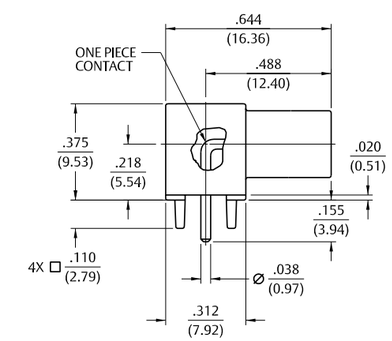
Right Angle Crimp Type Bulkhead Jack – Captivated Contact



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.

Right Angle Plug Receptacle – Die Cast



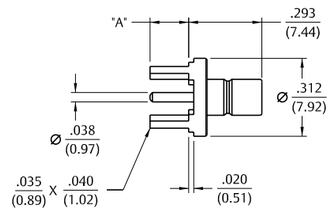
Gold Plated	Nickel Plated
131-1801-371	131-1801-376

Mounting hole layout figure 4 page 194.

Illustrations are shown in inches (millimeters).

PC Mount

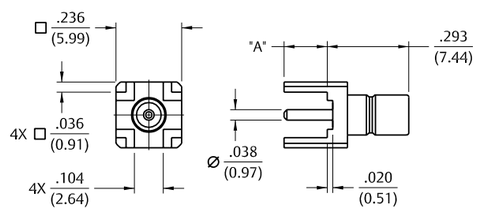
Straight Jack Receptacle



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.

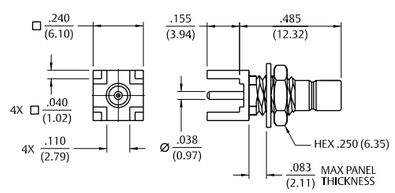
Straight Jack Receptacle



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.

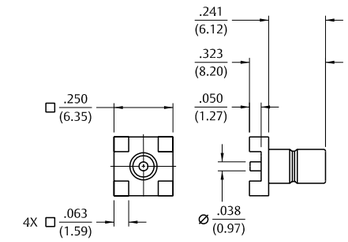
Straight Bulkhead Jack Receptacle



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

Mounting hole layout figures 4 and 5 page 195.

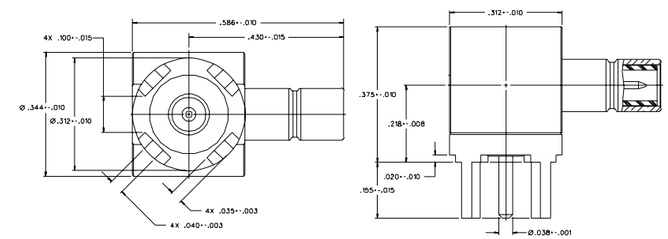
Straight Jack Receptacle – Surface Mount



Gold Plated
131-3711-201

Recommended Land pattern figure 9 page 194.

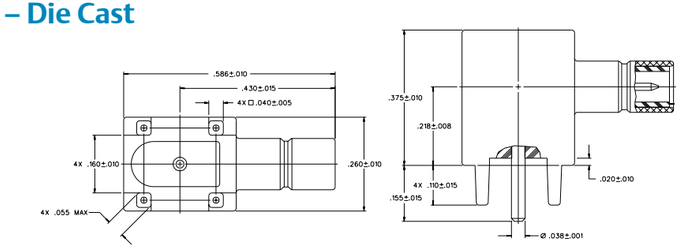
Right Angle Jack Receptacle



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

Mounting hole layout figure 4 page 194.

Right Angle Jack Receptacle – Die Cast

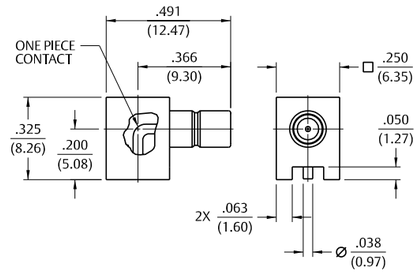


Gold Plated	Nickel Plated
131-1701-371	131-1701-376

Mounting hole layout figure 4 page 194.

PC Mount

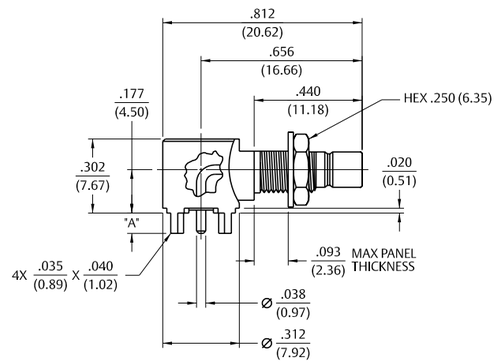
Right Angle Surface Mount Jack Receptacle



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

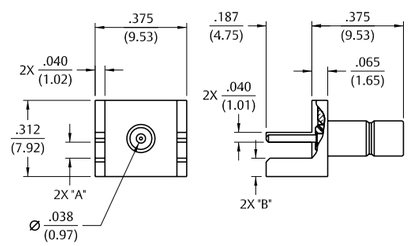
Right Angle Bulkhead Jack Receptacle



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)

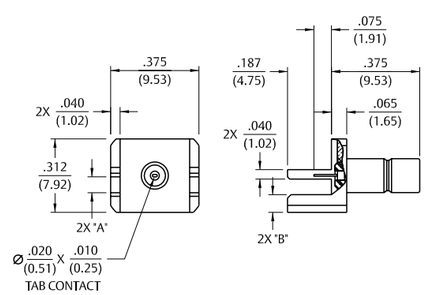
Mounting hole layout figures 4 and 5 page 194.

End Launch Jack Receptacle – Round Contact



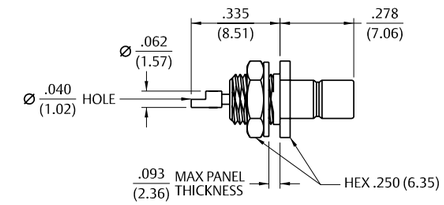
Gold Plated	Nickel Plated	Board Thickness	"A"	"B"
131-3701-801	131-3701-806	.062 (1.57)	.068 (1.73)	.073 (1.85)
131-3701-821	131-3701-826	.042 (1.07)	.048 (1.22)	.093 (2.36)

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)

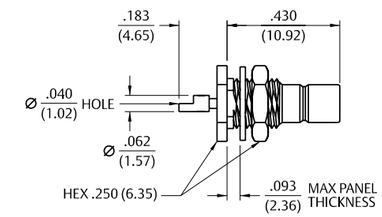
Front Mount Bulkhead Jack Receptacle



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

Mounting hole layout figure 5 page 194.

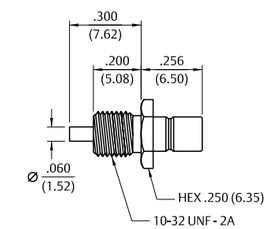
Rear Mount Bulkhead Jack Receptacle



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

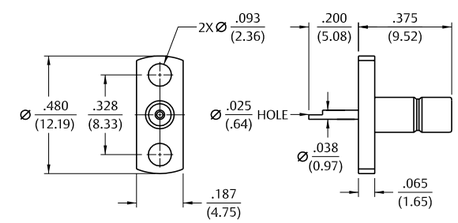
Mounting hole layout figure 5 page 194.

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



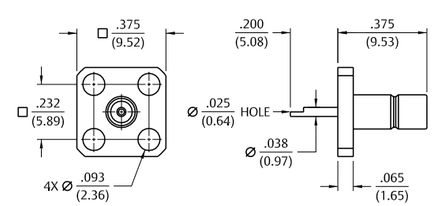
Gold Plated	Nickel Plated
131-3701-441	131-3701-446

2-Hole Flange Mount Jack Receptacle



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

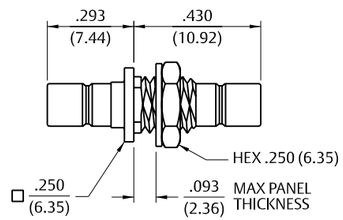
4-Hole Flange Mount Jack Receptacle



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

In-Series Adapters & Terminations

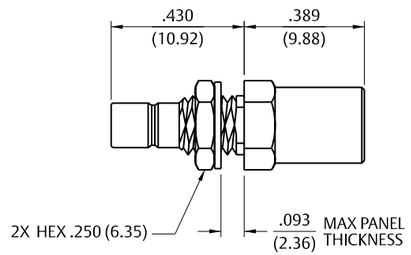
Jack to Bulkhead Jack Adapter



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

Mounting hole layout figure 5 page 194.

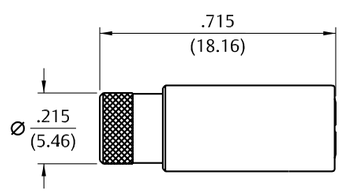
Plug to Bulkhead Jack Adapter



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

Electrical Specifications

Impedance: 50 Ohms
Frequency Range:
Connectors ..... 0-4 GHz

VSWR: (max) (f = GHz)	Straight Cabled Connectors	Right Angle Cabled Connectors
RG-316	1.25 + .04f	1.35 + .04f
Uncabled receptacles	N/A	

Working Voltage: (VRMS max)†

	Sea Level	70K Feet
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)	Initial	After Environmental
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:	Axial Force* (lbs)	Torque (oz-in)
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

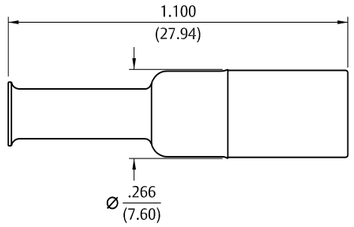
** See Non-Magnetic materials specifications page X.*
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.
Refer back to Page 121 for Mating Engagement detail.

Material Specifications

(See non-magnetic materials page 10)

Flexible Cable

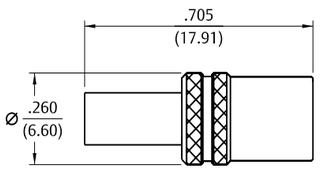
Straight Crimp Type Plug – Solder or Crimp Captivated Contact



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.

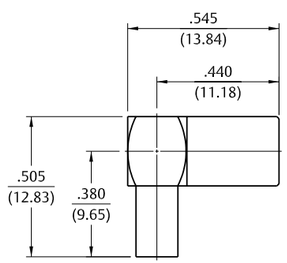
Straight Crimp Type Plug (3-piece) Solder or Crimp Captivated Contact



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.

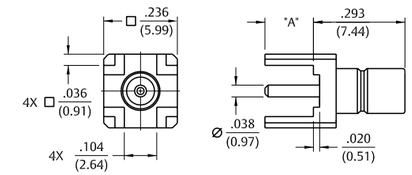
Right Angle Crimp Type Plug – Captivated Contact



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.

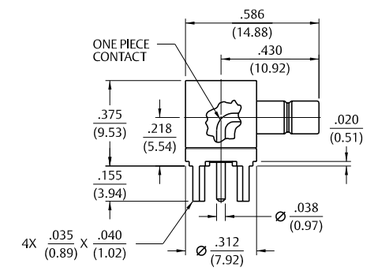
Straight Jack Receptacle



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

Impedance: 75 Ohms
Frequency Range: 0-2 GHz
VSWR: (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

Working Voltage: (VRMS max)	Sea Level	70K Feet
RG-179, RG-59, Belden 735A, uncabled receptacles, adapters	335	85
Open, shorts, loads	N/A	N/A

Dielectric Withstanding Voltage: (Vrms min at sea level)†
RG-179, RG-59, Belden 735A, uncabled receptacles, adapters 1000
Open, shorts, loads ..... N/A
Insulation Resistance: 1000 megohms min

Contact Resistance: (milliohms max)	Initial	After Environmental
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

Corona Level: (Volts min at 70,000 ft)†
RG-179, RG-59, Belden 735A 250
Uncabled receptacles, adapters, open, shorts, loads ..... 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, adapters, opens, shorts, loads ..... N/A
RF Leakage: (dB min tested at 2.0 GHz)
Cabled connectors ..... -55 dB
Uncabled receptacles, adapters opens, shorts, loads ..... N/A
RF High Potential Withstanding Voltage:
(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
Power Rating: (Loads) 1.0 watt at +25°C derated linearly to .5 watt at +125°C
Electrical Length: 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)

Mechanical Specifications

Engagement Design: Compatable with MIL-STD-348, Series SMB
Engagement/Disengagement Force: 2 lbs min to 14 lbs max axial force
Contact Retention: 4 lbs. min axial force (captivated contacts)
1 oz-in min torque (uncabled receptacles)

Cable Retention:	Axial Force* (lbs)	Torque (oz-in)
RG-179, Belden 735A	20	N/A
RG-59	40	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 - Connectors and adapters, - 65°C to +125°C - Loads, 20°C to 26°C -- Opens, shorts
Thermal Shock: MIL-STD-202, Method 107, Condition B (N/A opens, shorts, loads)
Corrosion: MIL-STD-202, Method 101, Condition B (N/A opens, shorts, loads)
Shock: MIL-STD-202, Method 213, Condition B (N/A opens, shorts, loads)
Vibration: MIL-STD-202, Method 204, Condition B (N/A opens, shorts, loads)
Temperature Coefficient: (Loads only) ± 300 ppm/°C

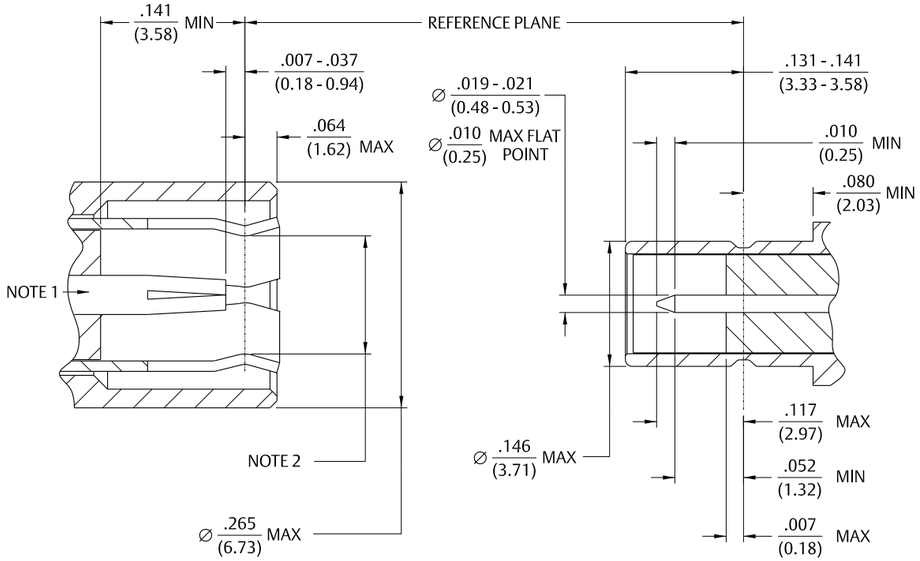
Material Specifications

Bodies: 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
Contacts: Male & Female - beryllium copper per ASTM B196, gold plated per MIL-DTL-45204 .00003" min
Insulators: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457
Expansion Caps: Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Crimp Sleeves: Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2423
Mounting Hardware: 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

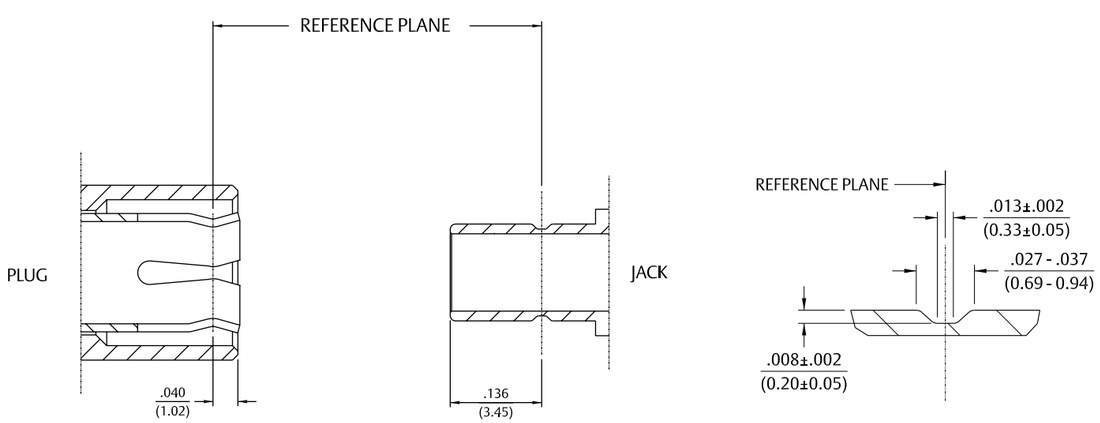
Note: All gold plated parts include a .00005"min nickel underplate barrier layer.
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Specifications

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



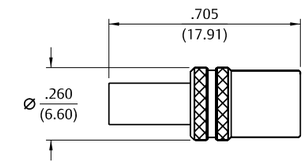
PLUG JACK



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.

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

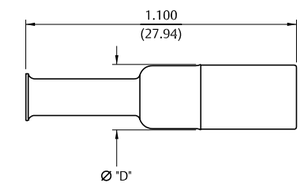
Cable Type	Gold Plated	Nickel Plated
RG-179, RG-187	131-8433-001	131-8433-006
RG-179 DS, RG-187 DS	131-8434-001	131-8434-006
Belden 735A	131-8445-011	131-8445-016



Assembly instructions page 232.

Straight Crimp Type Plug – Solder or Crimp Captivated Contact

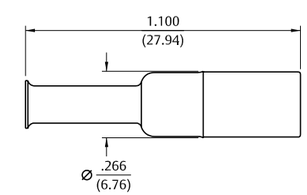
Cable Type	Gold Plated	Nickel Plated	"D"
RG-179, 187	131-8403-001	131-8403-006	.266 (6.76)
RG-179 DS, RG-187 DS	131-8404-001	131-8404-006	.266 (6.76)
Belden 735A	131-8445-001	131-8445-006	.266 (6.76)
RG-59	131-8409-001	131-8409-006	.312 (7.92)



Assembly instructions page 237.

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

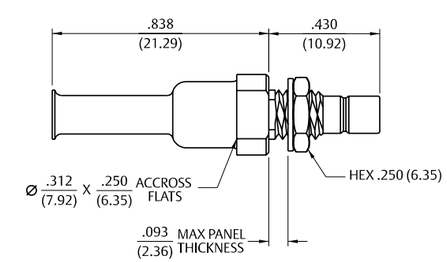
Cable Type	Gold Plated	Nickel Plated
RG-179, 187	131-8403-011	131-8403-016
RG-179 DS, RG-187 DS	131-8404-011	131-8404-016



Assembly instructions page 237.

Straight Crimp Type Bulkhead Jack – Solder or Crimp Captivated Contact

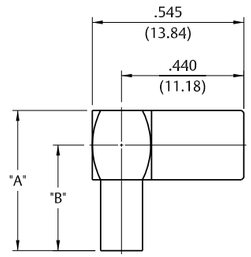
Cable Type	Gold Plated	Nickel Plated
RG-179, 187	131-8303-401	131-8303-406
RG-179 DS, RG-187 DS	131-8304-401	131-8304-406



Assembly instructions page 237.

Flexible Cable

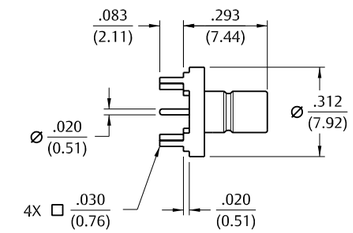
Right Angle Crimp Type Plug – Captivated Contact



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.

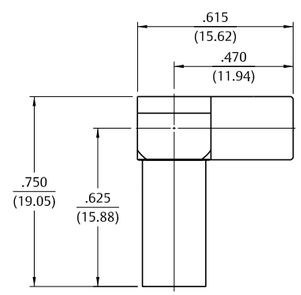
Straight Jack Receptacle



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

Mounting hole layout figure 6 page 194.

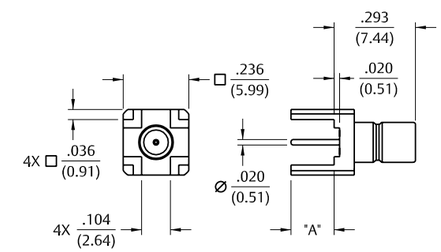
Right Angle Crimp Type Plug – Captivated Contact



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

Assembly instructions page 238.

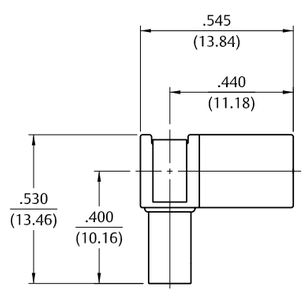
Straight Jack Receptacle



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.

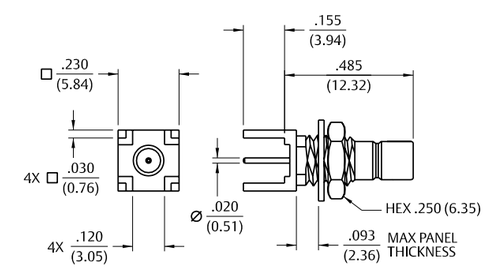
Right Angle Crimp Type Plug – Captivated Contact – Die Cast



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 Bulkhead Jack Receptacle



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

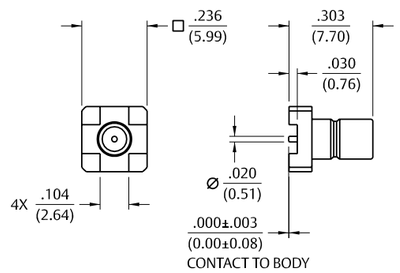
Mounting hole layout figures 5 and 6 page 195.

PC Mount

Straight Jack Receptacle – Surface Mount

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

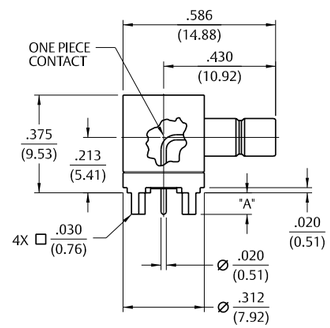
Mounting hole layout figure 11 page 194.



Right Angle Jack Receptacle

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

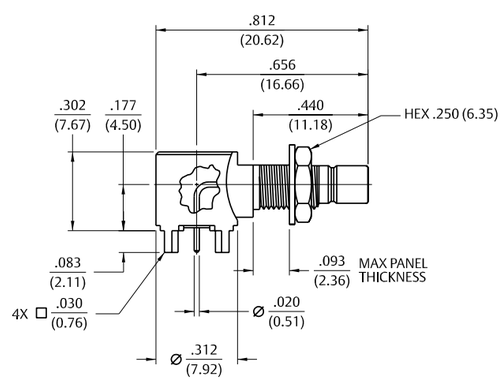
Mounting hole layout figure 7 page 194.



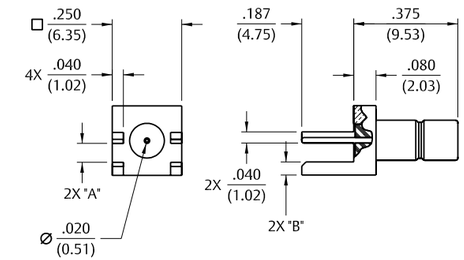
Right Angle Bulkhead Jack Receptacle

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

Mounting hole layout figures 5 and 7 page 194.



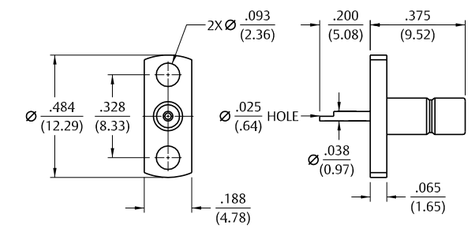
End Launch Jack Receptacle



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

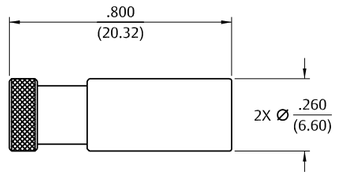
Gold Plated	Nickel Plated
131-8701-601	131-8701-606



Terminations

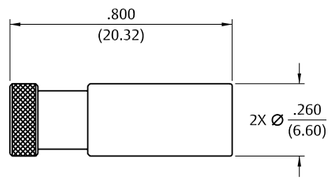
Plug Precision Load

Gold Plated
131-8801-801



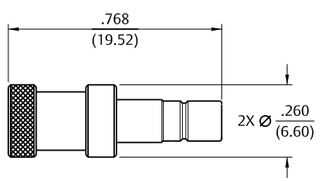
Matched Plug Open and Short

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



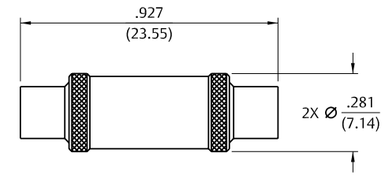
Matched Jack Open and Short

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



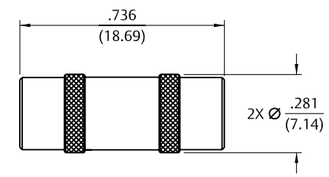
Jack to Jack Adapter

Gold Plated
131-8901-801



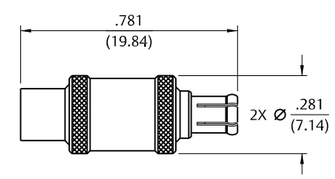
Plug to Plug Adapter

Gold Plated
131-8901-811



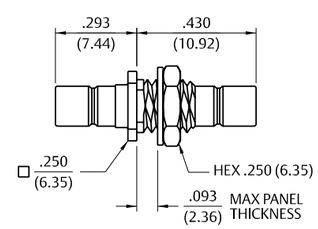
Jack to Plug Adapter

Gold Plated
131-8901-821



Jack to Bulkhead Jack* Adapter

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

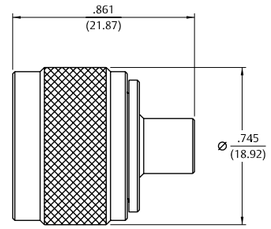


Mounting hole layout figure 5 page 194. * Electrical length not matched to other adapters shown.

Between-Series Adapter

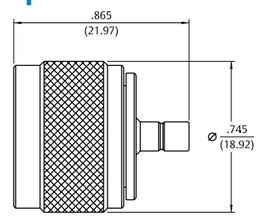
75 Ohm Type N Plug to Mini-75 Ohm SMB Plug Adapter

Stainless Steel Passivated
134-1069-001



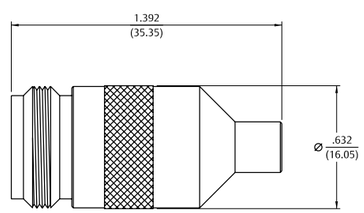
75 Ohm Type N Plug to Mini-75 Ohm SMB Jack Adapter

Stainless Steel Passivated
134-1069-011



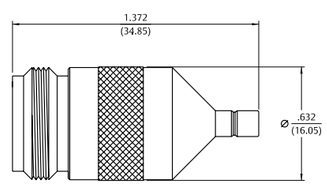
75 Ohm Type N Jack to Mini-75 SMB Plug Adapter

Stainless Steel Passivated
134-1069-021



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

Stainless Steel Passivated
134-1069-031



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Specifications

Electrical Specifications

Impedance: 50 Ohms
Frequency Range: ..... 0-10 GHz

VSWR: (max) (f = GHz)	Straight Cabled Connectors	Right Angle Cabled Connectors
RG-178	1.25 + .04f	1.40 + .06f
RG-316 and RG-405	1.20 + .04f	1.30 + .04f
Uncabled receptacles	N/A	

Working Voltage: (VRMS max)†	Sea Level	70K Feet
RG-178	250	60
RG-316, RG-405 uncabled receptacles	335	85

Dielectric Withstanding Voltage: (VRMS min at sea level)†
RG-178 750
RG-316, RG-405 uncabled receptacles 1000

Corona Level: (Volts min at 70,000 feet)†
RG-178 185
RG-316, RG-405 250
Uncabled receptacles ..... N/A

Insertion Loss: (dB max, tested at 4 GHz)
Straight cabled connectors ..... 0.25 dB
Right angle cabled connectors ..... 0.50 dB
Uncabled receptacles ..... N/A

Insulation Resistance: 1000 megohms min

Contact Resistance: (milliohms max)	Initial	After Environmental
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

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)†
RG-178 500
RG-316 700
Uncabled receptacles 600

Mechanical Specifications

Engagement Design: MIL-STD-348, Series SMC
Engagement/Disengagement Force: 16 oz-in max torque
Mating Torque: 35 to 50 oz-in
Coupling Proof Torque: 100 oz-in min
Coupling Nut Retention: 35 lbs min
Contact Retention: 4 lbs min axial force (captivated contacts)
1 oz-in min torque (uncabled receptacles)

Cable Retention:	Axial Force* (lbs)	Torque (oz-in)
RG-178	10	N/A
RG-316	20	N/A
RG-405	30	16

* or cable breaking strength whichever is less
Durability: 500 cycles min

Environmental Ratings

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

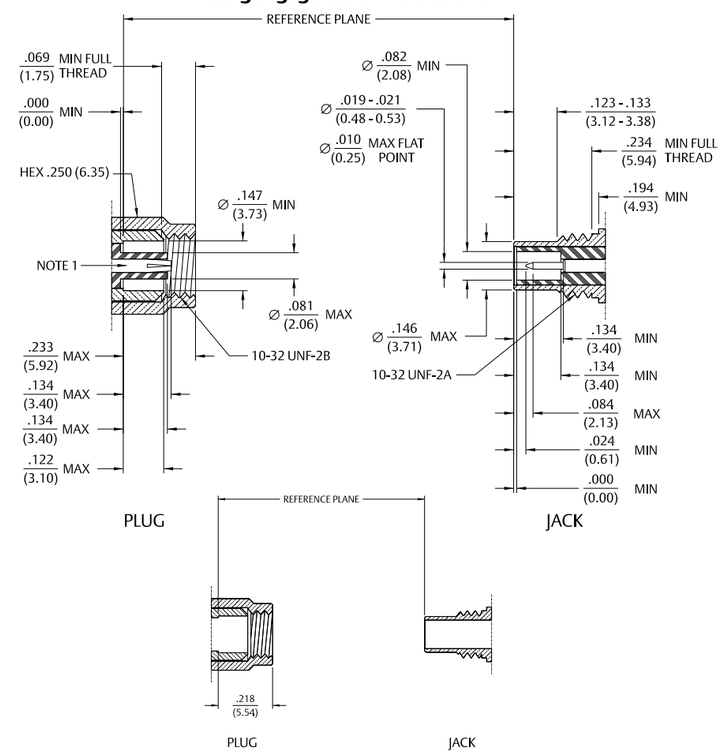
Temperature Range: - 65°C to + 165°C
Thermal Shock: MIL-STD-202, Method 107, Condition B
Corrosion: MIL-STD-202, Method 101, Condition B
Shock: MIL-STD-202, Method 213, Condition C
Vibration: MIL-STD-202, Method 204, Condition D

Material Specifications

Bodies: Brass per ASTM B16, gold plated per MIL-DTL-45204 .00001" min or nickel plated per SAE-AMS2432
Contacts: 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.
Nut Retention Spring: Beryllium copper per ASTM B196, unplated
Insulators: PTFE fluorocarbon per ASTM D 1710 and ASTM D 1457
Expansion Caps: Brass per ASTM B36, gold plated per MIL-DTL-45204 .00001" min. or nickel plated per SAE-AMS2423
Crimp Sleeves: Copper per ASTM B301, gold plated per MIL-DTL-45204 .00001" min. or nickel plated per SAE-AMS2423
Mounting Hardware: 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" minumum Nickel under plated barrier layer

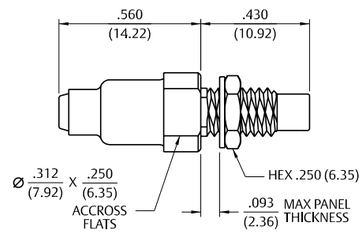
Mating Engagement for SMC Series



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
Illustrations are shown in inches (millimeters).

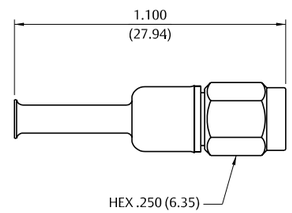
Straight Solder Type Bulkhead Jack – Captivated Contact



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.

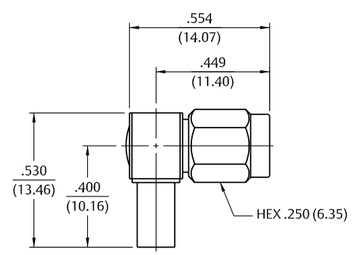
Straight Crimp Type Plug – Captivated Contact



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.

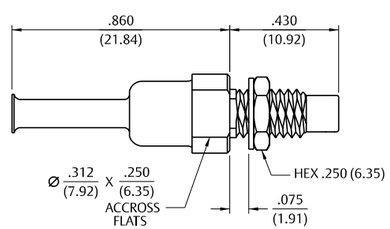
Right Angle Crimp Type Plug – Captivated Contact



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.

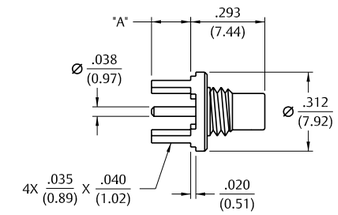
Straight Crimp Type Bulkhead Jack – Captivated Contact



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.

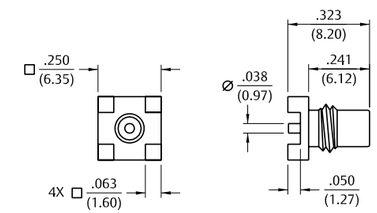
Straight Jack Receptacle



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.

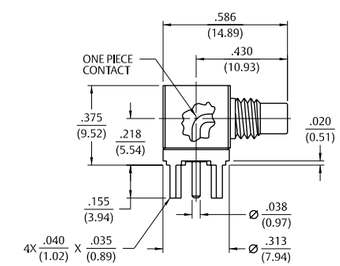
Straight Jack Receptacle – Surface Mount



Gold Plated
131-6711-201

Mounting hole layout figure 7 page 194.

Right Angle Jack Receptacle



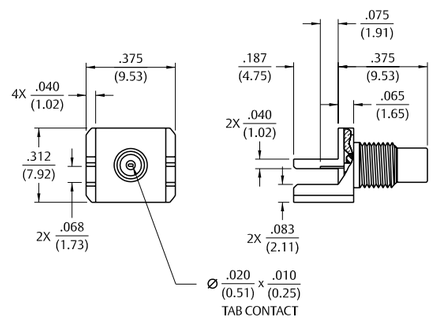
Gold Plated
131-6701-301

Mounting hole layout figure 4 page 194.

PC Mount and Bulkhead Mount

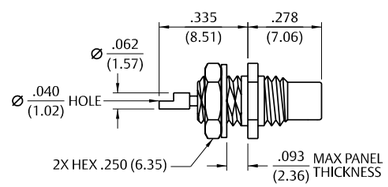
End Launch Jack Receptacle – Tab Contact

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



Front Mount Bulkhead Jack Receptacle

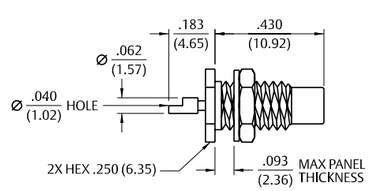
Gold Plated	Nickel Plated
131-6701-411	131-6701-416



Rear Mount Bulkhead Jack Receptacle

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

Mounting hole layout figure 5 page 194.



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Introduction

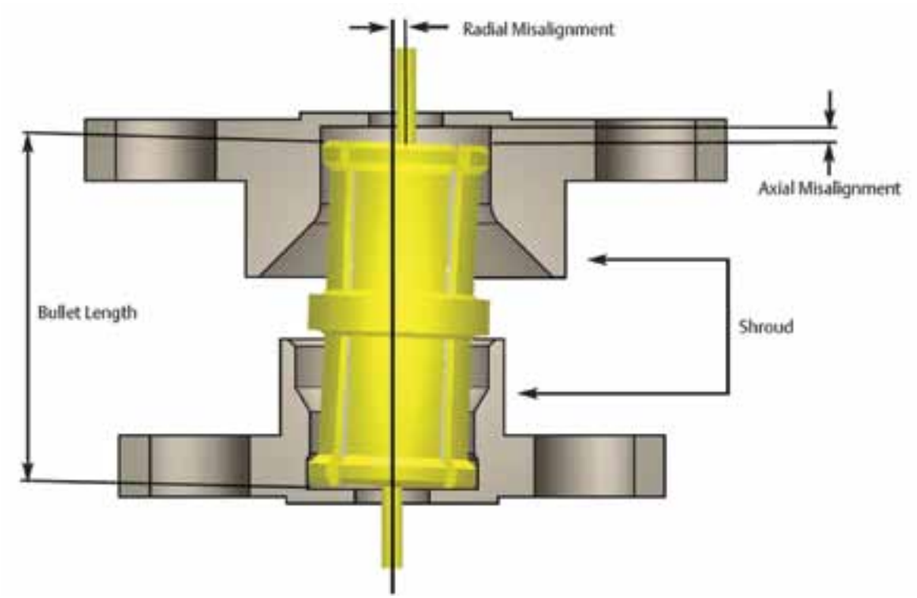
Description

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.



Electrical Specifications

Impedance: 50 Ohms
Frequency Range:
- Bullet Adapter (.254 length), Semi-Rigid Straight Cabled Connectors ..... 0-40 GHz
- All other In-Series Adapters, Semi-Rigid Right Angle Cabled Connectors, Field Replaceable Connectors, End Launch Connectors, Hermetic Feedthroughs ..... 0-18 GHz
- PC Mount Connectors ..... 0-12 GHz

VSWR: (max) (f = GHz)

	0-18 GHz	18-23 GHz	23-26.5 GHz	26.5-40 GHz
Bullet Adapter (.254 length)	1.10	1.15	1.30	1.70

	0-18 GHz	18-26.5 GHz	26.5-40 GHz
Semi-Rigid Straight Cabled Connectors	1 .20	1.35	1.70

	0-4 GHz	4-12 GHz	12-18 GHz
All other In-Series Adapters	1.10	1.15	1.20

	0-18 GHz
Semi-Rigid Right Angle Cabled Connectors	1.20

	0-18 GHz
Field Replaceable Connectors (typical, measured back to back with seal pin)	1.15
Un-cabled Connectors (dependant on application)	N/A

Working Voltage: 335 VRMS max at sea level, 65 VRMS max at 70,000 feet
Dielectric Withstanding Voltage: 500 Vrms min at sea level
Insulation Resistance: 5000 megohms min
Contact Resistance: (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

Corona Level: 190 VRMS min at 70,000 feet
Insertion Loss: (dB max)
Insertion Loss: (dB max, tested at 10 GHz)
- In-Series Adapters, Field Replaceable Connectors ..... $0.10\sqrt{F\ (GHz)}$
- Semi-Rigid Cabled Connectors ..... $0.12\sqrt{F\ (GHz)}$
- All other Un-cabled Connectors ..... N/A

Insertion Loss: (dB max)
RF Leakage: (dB typical, tested at 2.5 GHz)
- Cabled and Field Replaceable Connectors ..... -80
- In-Series Adapters ..... -65
- All other Un-cabled Connectors ..... N/A

RF High Potential Withstanding Voltage: 325 VRMS min at sea level, tested at 4 and 7 MHz

Mechanical Specifications

Interface Design: MIL-STD-348A, Series SMP
Engagement Force: (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

Disengagement Force: (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

Mated Radial Misalignment: (in max allowed, female adapters only)
- Between Centerlines of Mating Planes (FD, LD, SB) ..... .010
- Between Centerlines of Mating Planes (CM only) ..... .020

Mated Axial Misalignment: .010 in max allowed between mating planes (female adapters only)
Durability: (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

Contact Retention: 1.5 lbs min axial force (captivated contacts only)
Cable Retention: (min)

	Axial Force* (lbs)	Torque (oz-in)
Cabled Connectors for RG-405	30	16.0
Cabled Connectors for M17/151	20	N/A

* 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

Illustrations are shown in inches (millimeters).

Specifications

Environmental Ratings

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

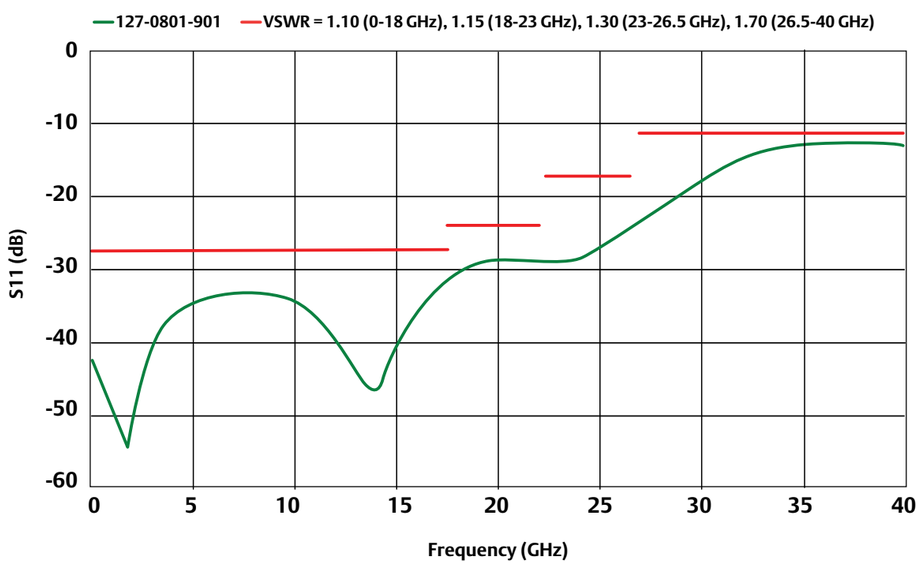
Operating Temperature: -65°C to +165°C
Thermal Shock: MIL-STD-202, Method 107, Condition B (except high temp +165°C or max high temp of cable)
Corrosion: MIL-STD-202, Method 101, Condition B
Shock (specified pulse): MIL-STD-202, Method 213, Condition I
Vibration: MIL-STD-202, Method 204, Condition D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

Material Specifications

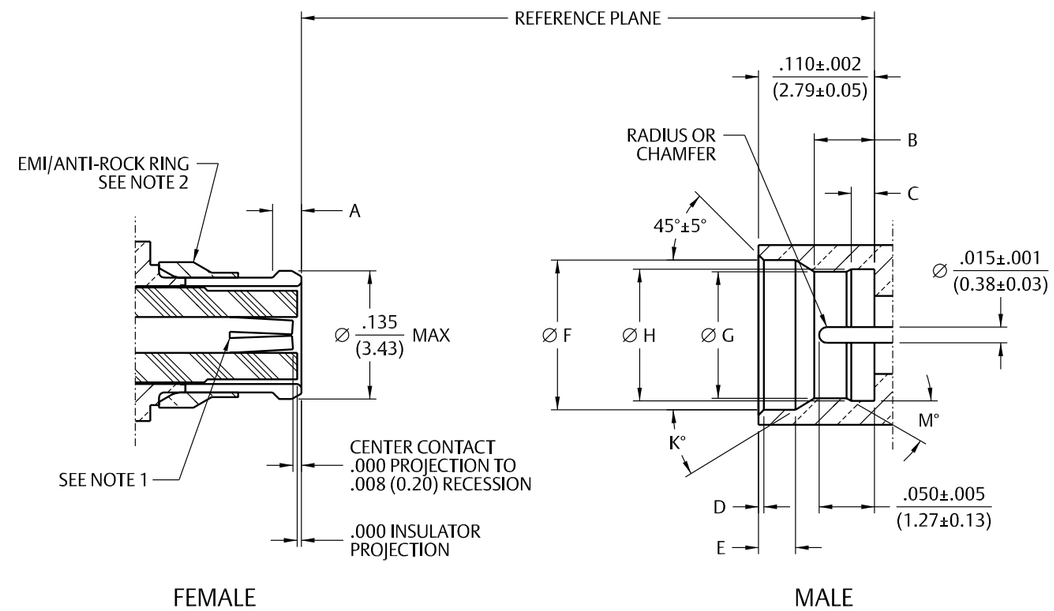
Spring Finger (female) and End Launch (male) Bodies: Beryllium Copper per ASTM B196, Gold plated* per MIL-DTL-45204 (.00005" min)
Hermetic Seal Bodies (male): Kovar Alloy per ASTM F15, Gold plated* per MIL-DTL-45204 (.00005" min)
All other Shroud Bodies (male): Stainless Steel, Type 303, per ASTM A582, 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" minumum Nickel barrier layer

Typical Measured Return Loss
Bullet Adapter 127-0901-801



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



Notes:

1. *Socket to accept mating pin Ø.015±.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

Semi-Rigid Cable and PC Mount

Female Straight Cabled, Semi-Rigid

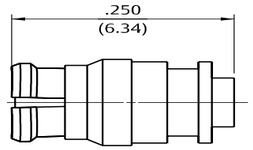


Fig 1

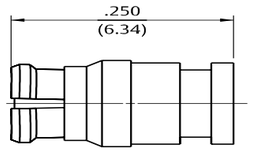
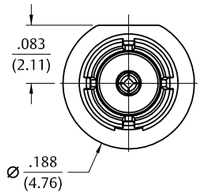


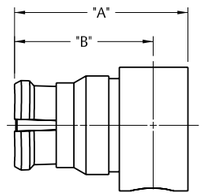
Fig 2

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

* Specifications dependant on cable ratings.

Right Angle Cabled Female

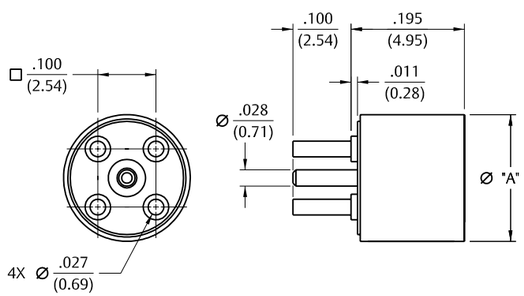




Cable Type	Gold Plated	"A"	"B"
M17/151	127-0692-101	.248 (6.30)	.197 (5.00)
RG-405	127-0693-101	.271 (6.88)	.209 (5.31)

* Specifications dependant on cable ratings.

Straight PC Mount Male Receptacle



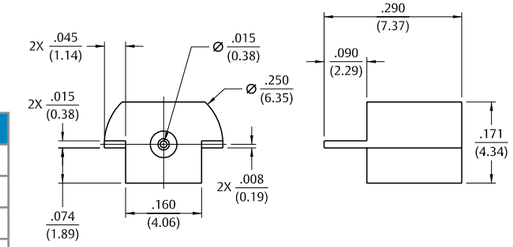
Interface	Passivated	"A"
Full Detent	127-0701-201	.218 (5.54)
Limited Detent	127-1701-201	.218 (5.54)
Smooth Bore	127-2701-201	.218 (5.54)
Catcher's Mitt	127-3701-201	.234 (5.94)

Base and legs gold plated brass.

End Launch Male Receptacle – Surface Mount

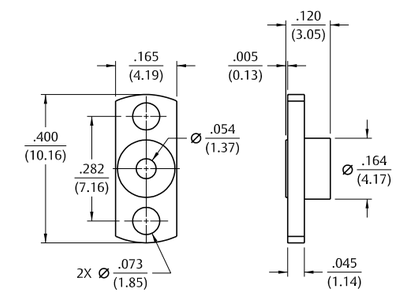
Interface	Gold Plated	Packaging
Full Detent	127-0701-801	Stock
Full Detent	127-0701-802	Tape and Reel 1000 pcs/reel
Limited Detent	127-1701-801	Stock
Limited Detent	127-1701-802	Tape and Reel 1000 pcs/reel
Smooth Bore	127-2701-801	Stock
Smooth Bore	127-2701-802	Tape and Reel 1000 pcs/reel

Mounting hole layout figure 1 page 194.



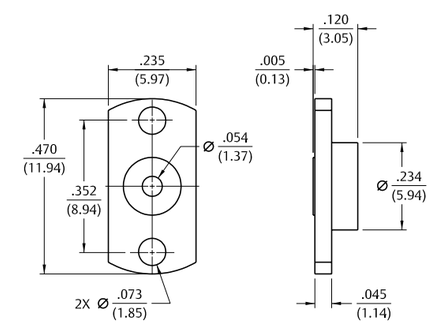
2-Hole Flange Mount Male Shroud – Without Contact

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



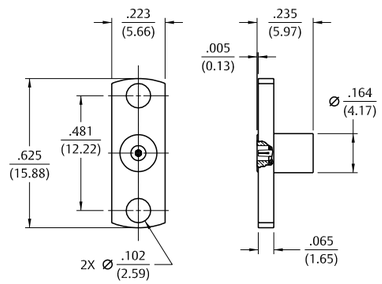
Illustrations are shown in inches (millimeters).

Johnson Connectivity Solutions

Panel Mount and Adapters

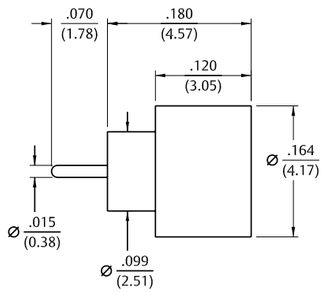
2-Hole Flange Mount Male Field Replaceable

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)



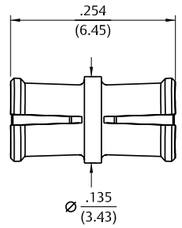
Hermetic Seal Male

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



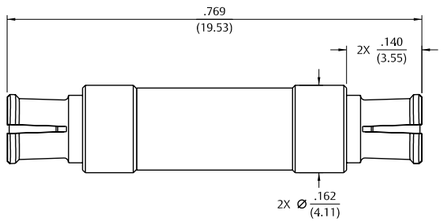
Female to Female Bullet Adapter

Gold Plated
127-0901-801



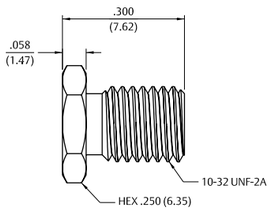
Female to Female Adapter

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



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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.

Electrical Specifications

Impedance: 50 Ohms
Frequency Range:
Flexible Cabled Connectors and Receptacles ..... 0-11 GHz
Semi-rigid Cabled Connectors and Receptacles ..... 0-18 GHz
VSWR: max (f-GHz) ..... 0-11 GHz
Straight Flexible Cabled Connectors ..... 1.30 max

	0-9 GHz	9-11 GHz
Right Angle Flexible Cabled	1.35 max	1.50 max

	0-11 GHz	11-18 GHz
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

	0-18 GHz
Adapters	1.05+.01f
Uncabled Receptacles	N/A

Working Voltage: (VRMS max)†

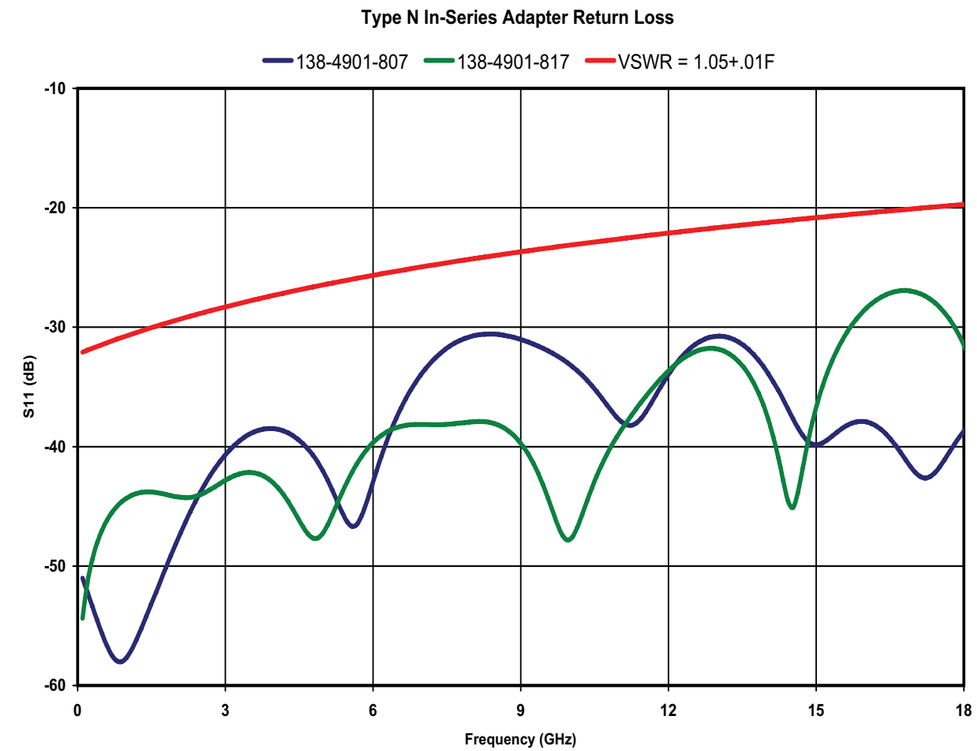
	Sea Level	70K Feet
RG-316, 316 DS	250	65
RG-58, 142, 405	335	85
RG-402	500	125
RG-213, 214, 401, LMR-400	1000	250
Uncabled Receptacles and Adapters	1000	250

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 ..... $0.05\sqrt{f(GHz)}$
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.



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.

Illustrations are shown in inches (millimeters).

Specifications

Environmental Specifications

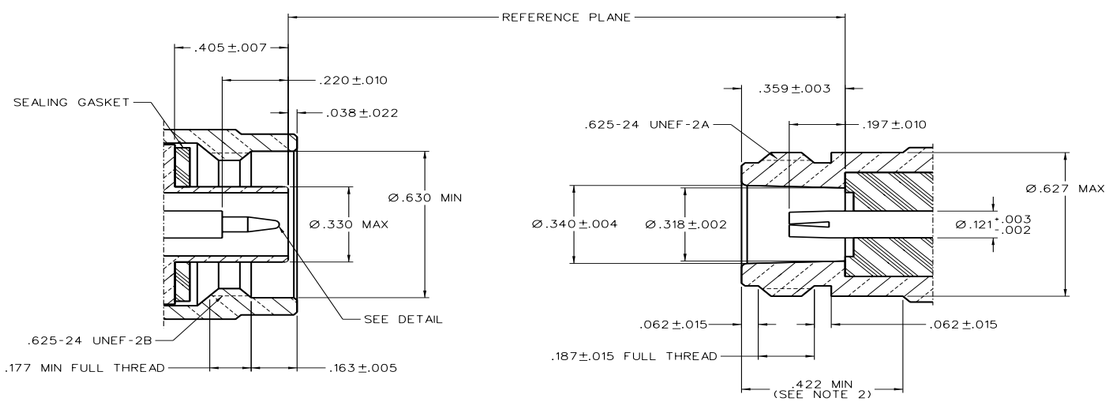
(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

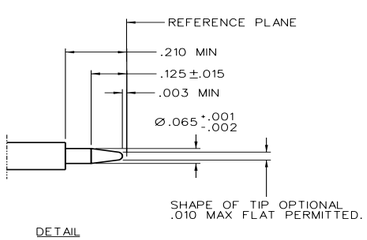
Temperature Range: -65°C to +165°C
Thermal Shock: MIL-STD-202, Method 107, Condition B (except +85°C high temperature)
Corrosion: MIL-STD-202, Method 101, Condition B
Shock: MIL-STD-202, Method 213, Condition I
Vibration: MIL-STD-202, Method 204, Condition B
Moisture Resistance: MIL-STD-202, Method 106

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)

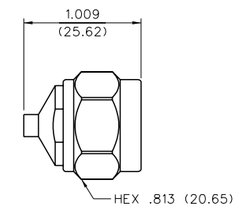
** All Gold plated parts include a .00005" minumum Nickel under plated barrier layer*





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.

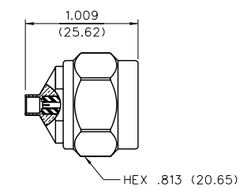
Straight Solder Type Plug – With Solder Contact



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

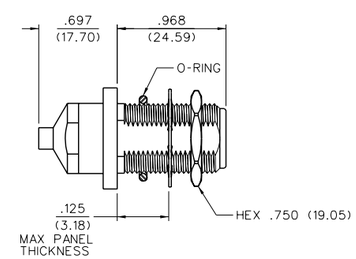
Straight Solder Type Plug – Captivated Solderless Contact



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

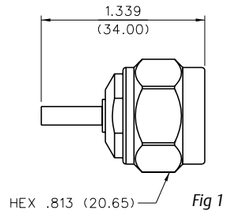


Fig 1

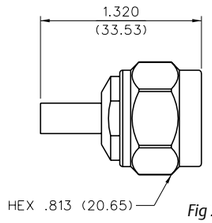


Fig 2

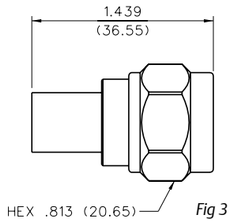


Fig 3

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

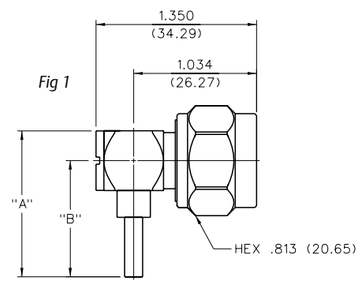


Fig 1

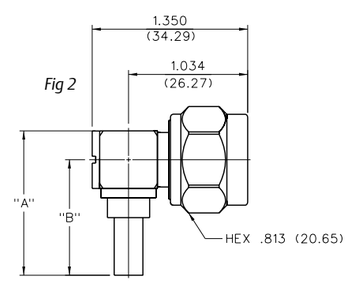
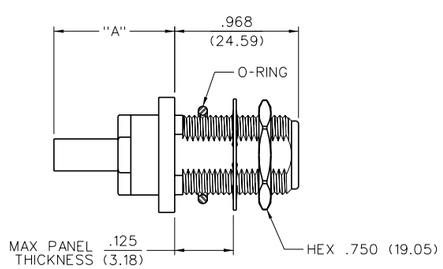


Fig 2

Straight Crimp Type Bulkhead Jack – Solder or Crimp Contact

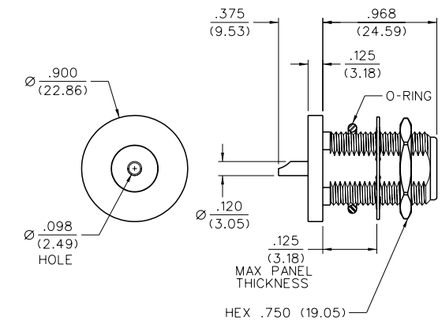
Cable Type	Tri-Alloy Plated	"A"
RG-161, 174, 188, 316	138-4303-407	.943 (23.95)
RG-188 DS, RG-316 DS	138-4304-407	.943 (23.95)
RG-58, 141, 303	138-4307-407	.943 (23.95)
RG-55, 142, 223, 400	138-4308-407	.943 (23.95)
RG-8, 213	138-4316-407	.997 (25.32)
RG-9, 214	138-4318-407	.997 (25.32)
LMR-400, BELDEN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

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



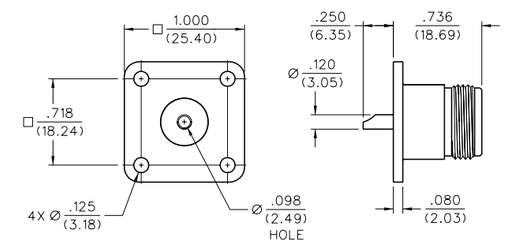
Rear Mount Bulkhead Jack Receptacle

Tri-Alloy Plated
138-4701-407



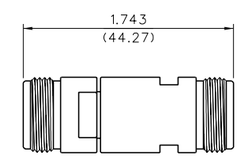
4-Hole Flange Mount Jack Receptacle – Flush Dielectric

Tri-Alloy Plated
138-4701-607



Jack to Jack Adapter

Tri-Alloy Plated
138-4901-807

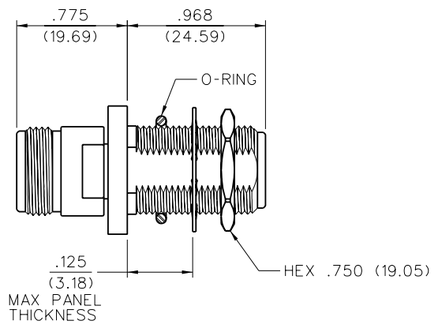


In-Series Adapters

Jack to Bulkhead Jack Adapter

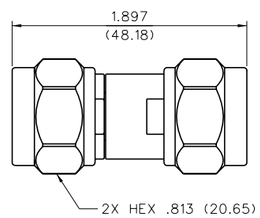
Tri-Alloy Plated
138-4901-407

Mounting hole layout figure 1 page 194.



Plug to Plug Adapter

Tri-Alloy Plated
138-4901-817



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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

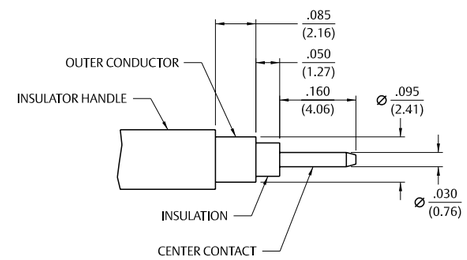
Environmental Ratings

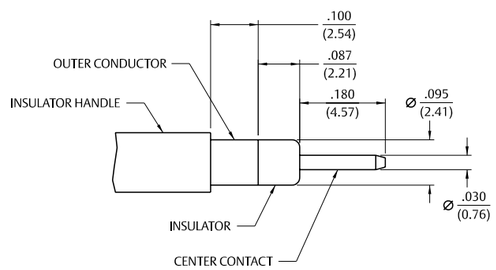
Temperature Range: -65° C to + 85° C
Corrosion: Salt spray, 24 hours
Shock: Method 213, Test Condition B, MIL-STD-202
Vibration: Method 204, Test Condition B, MIL-STD-202

Material Specifications

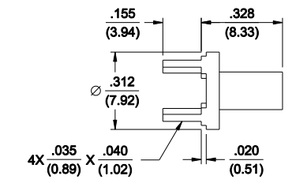
Contact: Beryllium copper per QQ-C-533/530
Insulator Material: TFE Fluorocarbon per L-P-403
Finish: Center Contact and Body: Gold

SHIELDED TEST JACK INTERFACE - TYPICAL PROBE TYPE





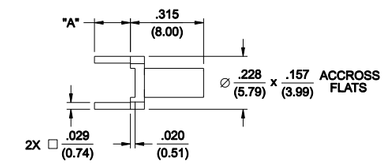
Flexible Cable – Straight Crimp Type



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.

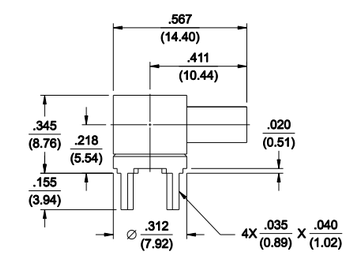
Flexible Cable – Straight Crimp Type



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.

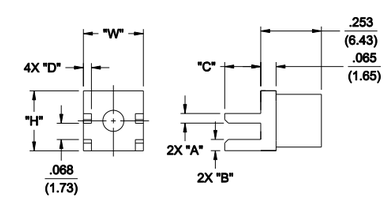
Flexible Cable – Right Angle Crimp Type



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

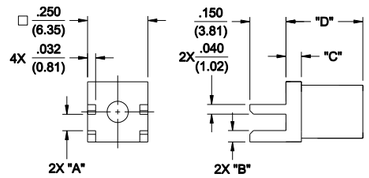


Cable Type	Gold Plated	Board Thickness	"A"	"B"	"C"	"D"	"H"	"W"
.086 Semi-Rigid	142-0093-801	0.062 (1.57)	0.068 (1.73)	0.046 (1.42)	0.150 (3.81)	0.032 (0.81)	0.250 (6.35)	0.250 (6.35)
.141 Semi-Rigid	142-0094-801	0.062 (1.57)	0.068 (1.73)	0.070 (1.78)	0.187 (4.77)	0.040 (1.02)	0.312 (7.92)	0.375 (9.52)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

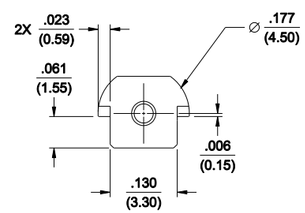
Flexible Cable – Straight Crimp Type End Launch



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.

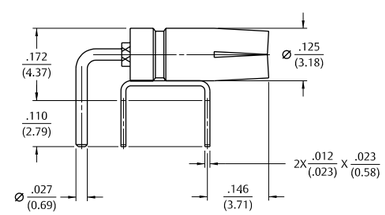
Flexible Cable – Straight Crimp Type Surface Mount End Launch



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

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

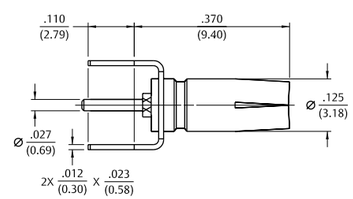
Horizontal



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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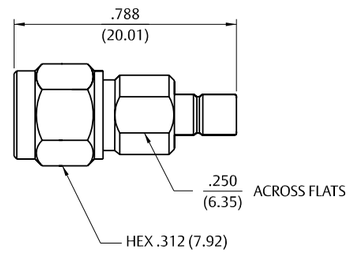
SMA to SMB

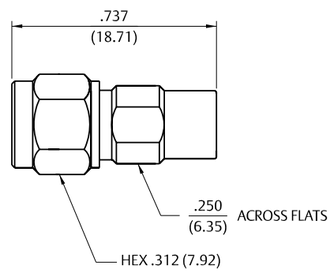
SMA Plug to SMB Jack Adapter

Gold Plated
134-1012-011



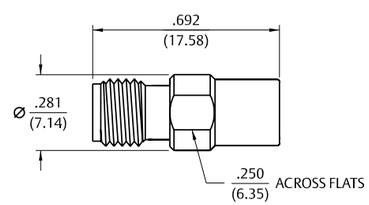
SMA Plug to SMB Plug Adapter

Gold Plated
134-1012-021



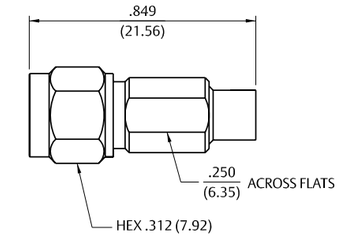
SMA Jack to SMB Plug Adapter

Gold Plated
134-1012-041



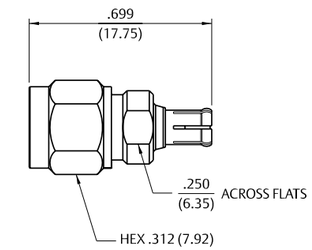
SMA Plug to MCX Jack Adapter

Gold Plated
134-1018-001



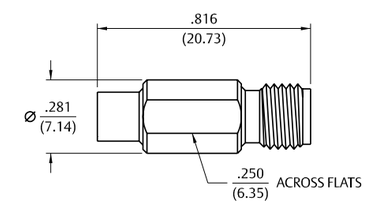
SMA Plug to MCX Plug Adapter

Gold Plated
134-1018-011



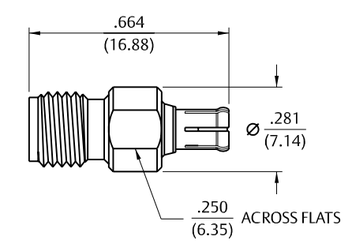
SMA Jack to MCX Jack Adapter

Gold Plated
134-1018-021



SMA Jack to MCX Plug Adapter

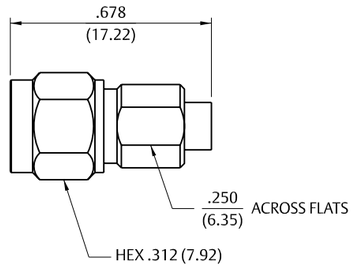
Gold Plated
134-1018-031



SMA to MMCX

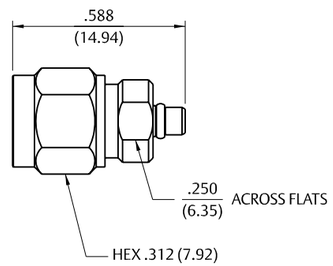
SMA Plug to MMCX Jack Adapter

Gold Plated
134-1019-151



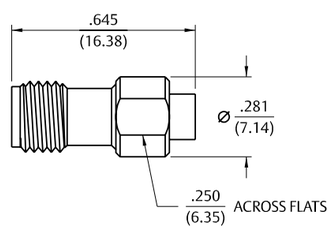
SMA Plug to MMCX Plug Adapter

Gold Plated
134-1019-161



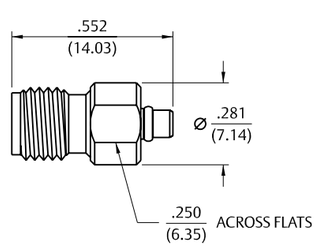
SMA Jack to MMCX Jack Adapter

Gold Plated
134-1019-171



SMA Jack to MMCX Plug Adapter

Gold Plated
134-1019-181



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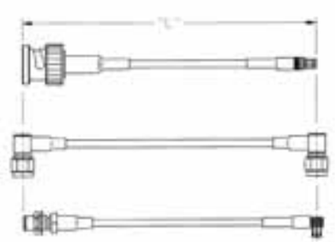
Specifications

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
415-0066-006	RG-176	6”	135-3402-001	135-3402-001
415-0066-012	RG-178	12”	135-3402-001	135-3402-001
415-0066-018	RG-178	18”	135-3402-001	135-3402-001
415-0066-024	RG-178	24”	135-3402-001	135-3402-001

Part No.	Cable Type	Cable Length	Connector A	Connector B
415-0067-006	RG-316	6”	135-3403-001	135-3403-001
415-0067-012	RG-316	12”	135-3403-001	135-3403-001
415-0067-018	RG-316	18”	135-3403-001	135-3403-001
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
415-0068-006	RG-178	6”	135-3402-101	135-3402-101
415-0068-012	RG-178	12”	135-3402-101	135-3402-101
415-0068-018	RG-178	18”	135-3402-101	135-3402-101
415-0068-024	RG-178	24”	135-3402-101	135-3402-101

Part No.	Cable Type	Cable Length	Connector A	Connector B
415-0069-006	RG-316	6”	135-34	135-3403-101
415-0069-012	RG-316	12”	135-3403-101	135-3403-101
415-0069-018	RG-316	18”	135-3403-101	135-3403-101
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
415-0070-006	RC -178	6”	135-3402-001	142-0302-431
415-0070-012	RG-178	12”	135-3402-001	142-0302-431
415-0070-018	RG-178	18”	135-3402-001	142-0302-431
415-0070-024	RG-178	24”	135-3402-001	142-0302-431
415-0070-036	RG-178	36”	135-3402-001	142-0302-431

Part No.	Cable Type	Cable Length	Connector A	Connector B
415-0071-006	RC -316	6”	135-3403-001	142-0303-411
415-0071-012	RG-316	12”	135-3403-001	142-0303-411
415-0071-018	RG-316	18”	135-3403-001	142-0303-411
415-0071-024	RG-316	24”	135-3403-001	142-0303-411
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
415-0072-006	RG-178	6”	135-3402-101	142-0302-431
415-0072-012	RG-178	12”	135-3402-101	142-0302-431
415-0072-018	RG-178	18”	135-3402-101	142-0302-431
415-0072-024	RG-178	24”	135-3402-101	142-0302-431
415-0072-036	RG-178	36”	135-3402-101	142-0302-431

Part No.	Cable Type	Cable Length	Connector A	Connector B
415-0073-006	RG-316	6”	135-3403-101	142-0303-411
415-0073-012	RG-316	12”	135-3403-101	142-0303-411
415-0073-018	RG-316	18”	135-3403-101	142-0303-411
415-0073-024	RG-316	24”	135-3403-101	142-0303-411
415-0073-036	RG-316	36”	135-3403-101	142-0303-411

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

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

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

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

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

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

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
415-0035-048	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

Part No.	Cable Type	Cable Length	Connector A	Connector B
415-0034-006	RG-316	6”	142-0404-011	142-0404-101
415-0034-012	RG-316	12”	142-0404-011	142-0404-101
415-0034-018	RG-316	18”	142-0404-011	142-0404-101
415-0034-024	RG-316	24”	142-0404-011	142-0404-101
415-0034-036	RG-316	36”	142-0404-011	142-0404-101
415-0034-048	RG-316	48”	142-0404-011	142-0404-101
415-0044-012	RG-142	12”	142-0408-011	142-0408-101
415-0044-024	RG-142	24”	142-0408-011	142-0408-101
415-0044-036	RG-142	36”	142-0408-011	142-0408-101
415-0044-048	RG-142	48”	142-0408-011	142-0408-101
415-0044-060	RG-142	60”	142-0408-011	142-0408-101

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

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

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

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

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

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

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
415-0061-012	RG -142	12”	142-0408-011	CPN -142T
415-0061-024	RG -142	24”	142-0408-011	CPN -142T
415-0061-036	RG -142	36”	142-0408-011	CPN -142T
415-0061-048	RG -142	48”	142-0408-011	CPN -142T
415-0061-060	RG -142	60”	142-0408-011	CPN -142T

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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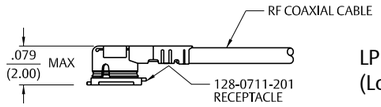
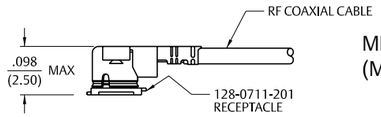
Specifications

Impedance:	50 Ω (Nominal)
Temperature Range:	-40°C to +90°C
Frequency Rating:	0-6 GHz
VSWR:	1.30 max (0-6 GHz)
Contact Resistance:	20 m Ω max. (Center) 20 m Ω max. (Outer, for plug) 10 m Ω max. (Outer, for receptacle)
Withstanding Voltage:	200 V AC
Insulation Resistance:	500 M Ω min.
Durability:	30 cycles
Holding Force (min.):	0.15 N (Female contact)



LP Plug
(Low Profile Plug)



MP Plug
(Medium Profile Plug)

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

UMC Right Angle Cable Plug to MMCX Right Angle Plug

Low Profile

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

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

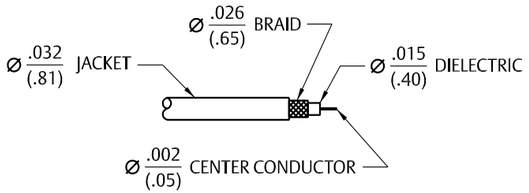
Medium Profile

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

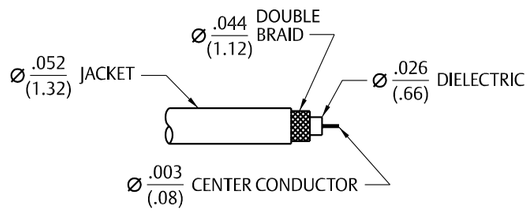
Illustrations are shown in inches (millimeters).

Pigtail Cable Assembly

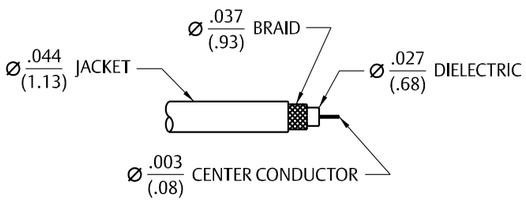
0.81 mm Coaxial Cable



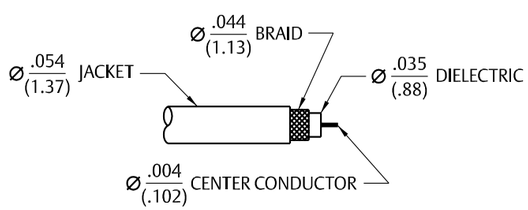
1.32 mm Coaxial Cable



1.13 mm Coaxial Cable



1.37 mm Coaxial Cable



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

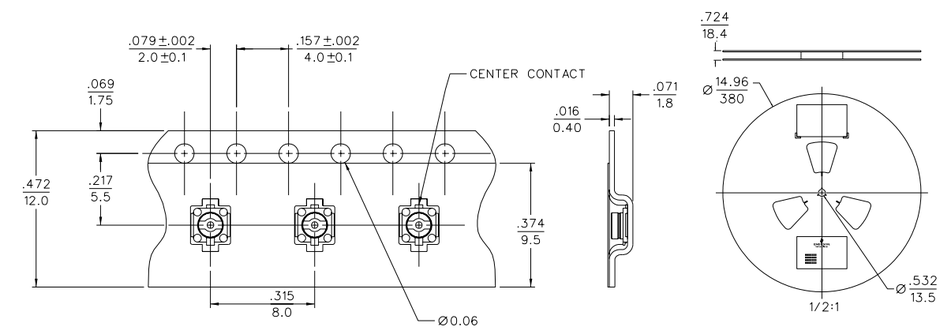
Medium Profile

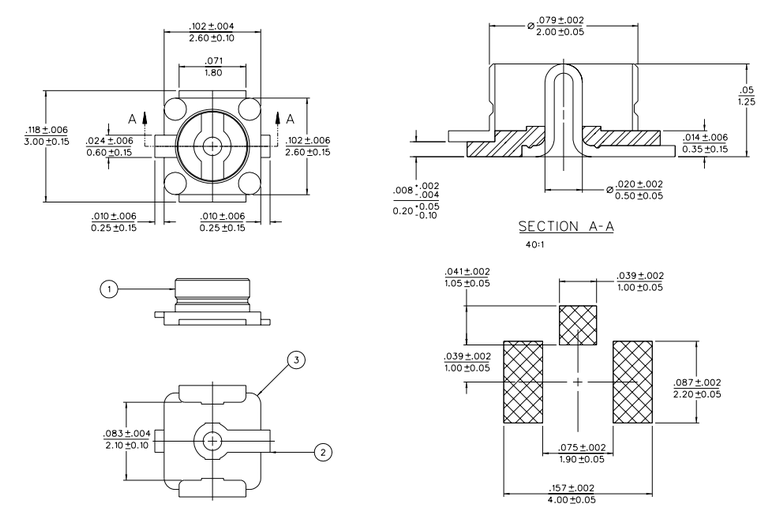
Part No.	Teflon Coaxial Cable O.D.	Cable Length	Connector A	Plug Mated Height	Connector B
415-0105-150	0.81 mm	150 mm	UMC MP PLUG	2.5 mm	BARE END
415-0105-250	0.81 mm	250 mm	UMC MP PLUG	2.5 mm	BARE END
415-0106-150	1.13 mm	150 mm	UMC MP PLUG	2.5 mm	BARE END
415-0106-250	1.13 mm	250 mm	UMC MP PLUG	2.5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

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





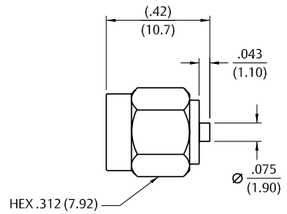
For more information, please contact customer service at (507) 833-8822 or (800) 247-8256 • www.EmersonConnectivity.com

Illustrations are shown in inches (millimeters).

Pigtail Assembly Adapters

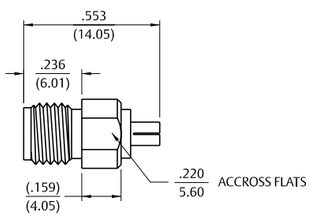
SMA Conversion Adapter for Mating UMC Plugs (SMA Plug to UMC Jack)

Part No.
134-1019-361



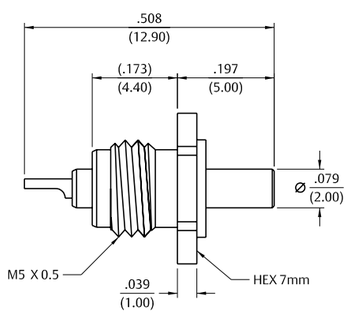
SMA Conversion Adapter for Surface Mt. Jack Receptacle 128-0711-201 (SMA Jack to UMC Plug)

Part No.
134-1019-371



Inspection Tool for Cable Assembly

Part No.
134-1019-381



UMC Separation Key

Part No.
128-0000-901

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kwiQMAte™ Connectors

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Electrical Specifications

Impedance: 50 Ohms
Frequency Range: 12.4 GHz

VSWR: (f = GHz)

	Straight Cable Connectors	Right Angle 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 $f\sqrt{(GHz)}$, tested at 6 GHz
Right angle flexible cable connectors	0.15 $f\sqrt{(GHz)}$, 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)
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

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 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

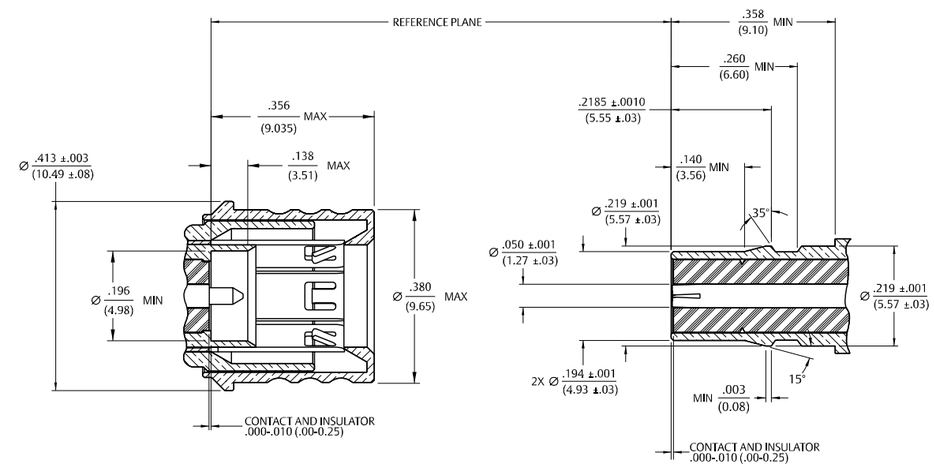
* Gold plated parts include a .00005" min nickel barrier layer

Environmental Specifications

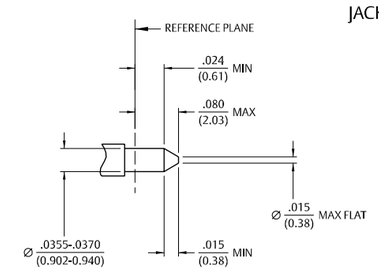
(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

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™



PLUG JACK



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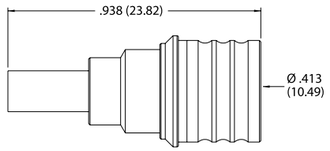
Illustrations are shown in inches (millimeters).

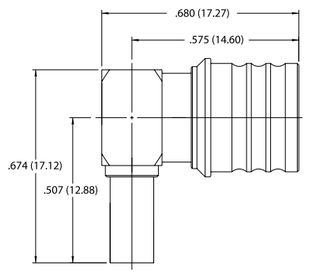
Straight Crimp Type Plug (3-piece) – Captivated Contact



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

Assembly instructions page 256.

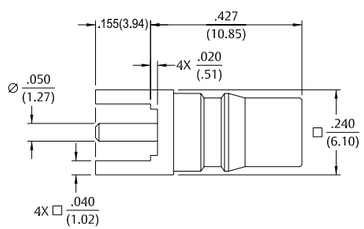
Right Angle Crimp Type Plug (1-piece body) – Captivated Contact



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

Assembly instructions page 255.

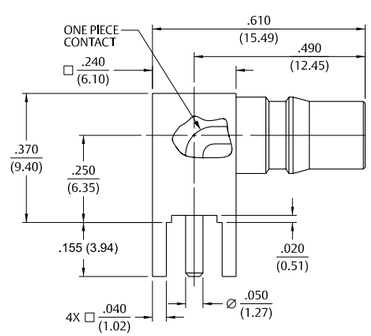
Straight Jack Receptacle



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.

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

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

Ordering Information for Crimp Tool

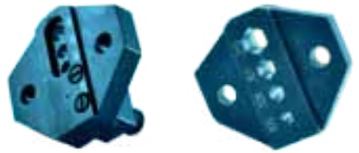
Part No.	Description	ASTRO Tool Part No.
144-0000-900	Frame Only	620175
141-0000-901	Single Hex Die	620932
141-0000-902	Single Hex Die	620419
141-0000-903	Single Hex Die	620676
141-0000-905	Single Hex Die	630055
141-0000-925	Single Hex Die	620938
141-0000-927	Single Hex Die	620297

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

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) .128 (3.25) .151 (3.83) Diamond Crimp for 038 (0.96) Dia. Contact	.250 (6.35) .250 (6.35) .250 (6.35) .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) .128 (3.25) .151 (3.83) .213 (5.41)	.390 (9.91) .390 (9.91) .390 (9.91) .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) .151 (3.83) .178 (4.52) .255 (6.48)	.390 (9.91) .390 (9.91) .390 (9.91) .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

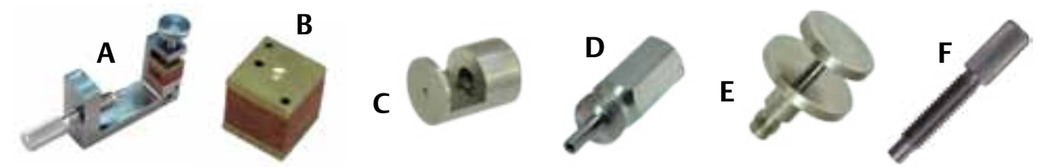
SMB Plug Removal Tool

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

Part No.
140-0000-956

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	140-0000-964 140-0000-965	Cable Clamp Inserts, .086 Semi-Rigid Cable Clamp Inserts, .141 Semi-Rigid
C	140-0000-960 140-0000-961	Contact Soldering Tool, .086 Plug Contact Soldering Tool, .141 Plug
D	140-0000-958 140-0000-959	Body Soldering Tool, .086 Plug 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

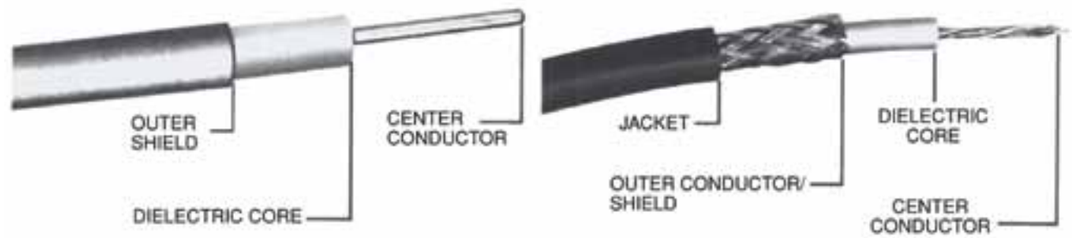
With over 75 years of experience, Emerson Network Power Connectivity Solutions is your interconnect solution for cable assembly design, high quality production and on-time delivery. Our Johnson line of precision cable assemblies includes standard RF coaxial cable assemblies such as flexible, conformable 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

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

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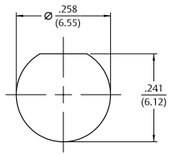
While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without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

Recommended Mounting Hole Dimensions



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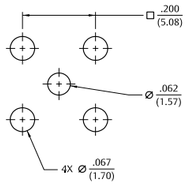

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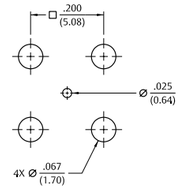

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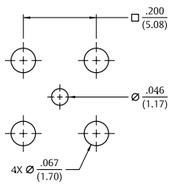

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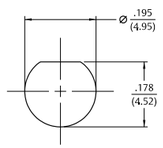

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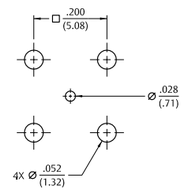

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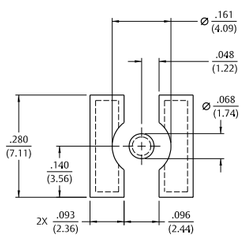

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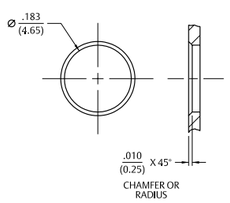

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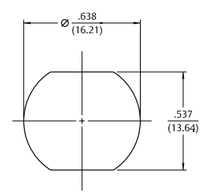

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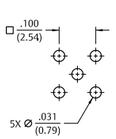

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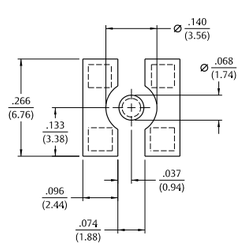

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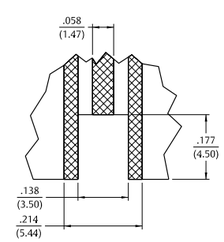

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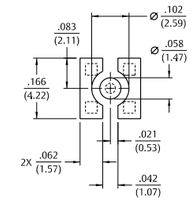

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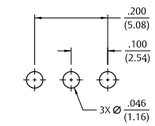

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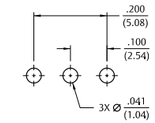

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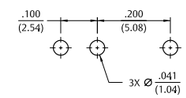

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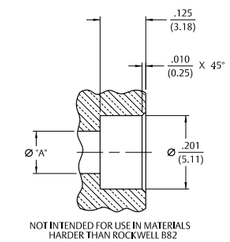

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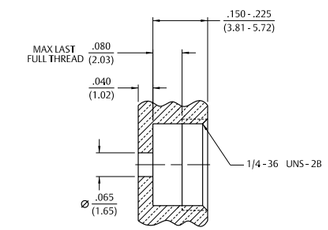

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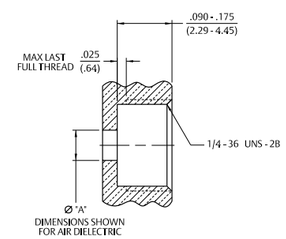

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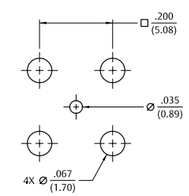

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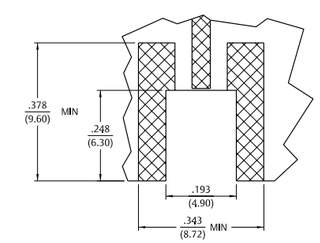

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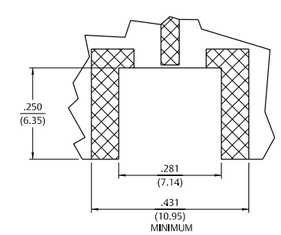

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Illustrations are shown in inches (millimeters).

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146-0404-007 256
146-0404-107 255
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CPN-110 241
CPN-142T 241
CPN-16 241
CPN-17 241
CPN-2 241
CPN-68-1 240
CPN-68-13 240
CPN-68-8 240
CPN-8 241

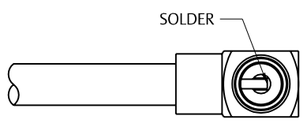
Illustrations are shown in inches (millimeters).

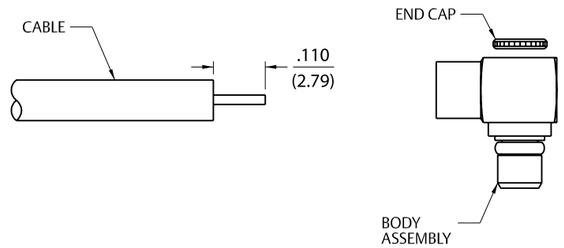
ASSEMBLY INSTRUCTIONS

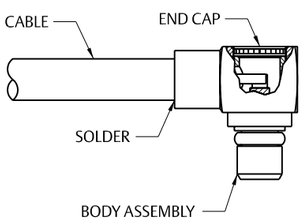
MMCX Right Angle Plug for .086 (2.18) Semi-Rigid Cable

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

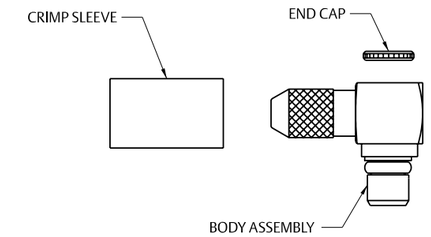


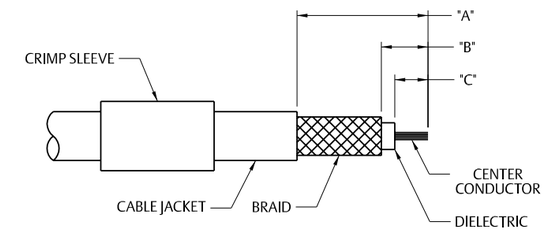


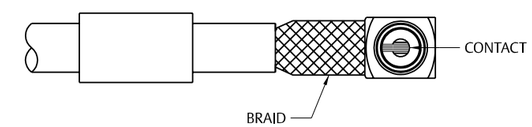


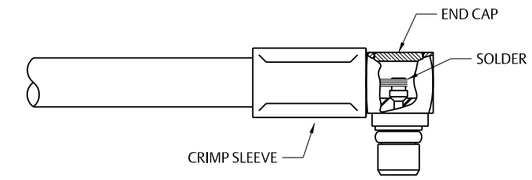
MMCX Right Angle Plug for RG-178 and RG-316 Size Flexible Cable

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.







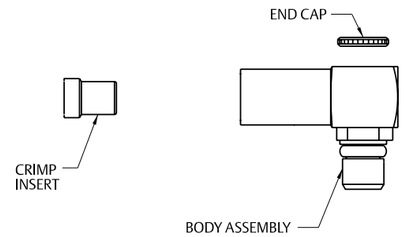


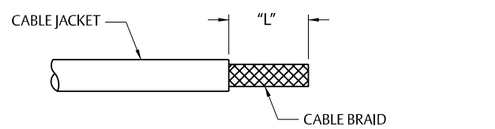
Cable Group	Part No.	Sleeve Hex	"A"	"B"	"C"
RG-178, 196	135-9402-111	.105 (2.67)	.310	.100	.035
RG-316/U, 188, 187, 179	135-9403-101	.128 (3.25)	.295	.105	.075

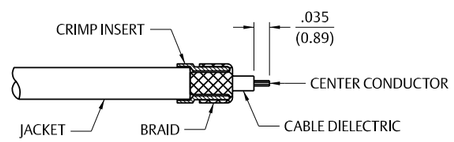
MMCX Right Angle Plug for .047 (1.20) Diameter and RG-178 Size Flexible Cable with Crimp Insert

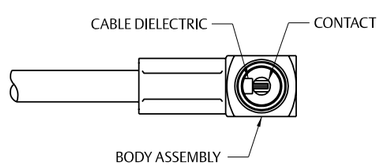
1. Identify piece parts. (3 piece parts)
2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations.
3. Slide crimp insert over braid and against jacket. Fold braid around crimp insert as shown. Strip cable dielectric to dimension shown. Tin center conductor.
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.

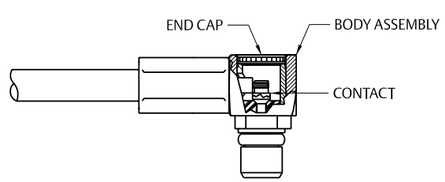
Cable Group	Part No.	"L"	Crimp Hex
.047 Flexible	135-3436-101	.140 (3.56)	.105 (2.67)
RG-178/U, 196	135-3402-101	.188 (4.78)	.105 (2.67)
.047 Flexible	135-9436-101	.140 (3.56)	.105 (2.67)







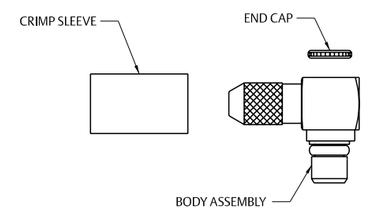


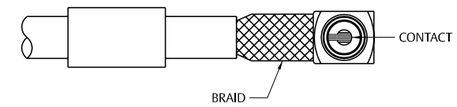


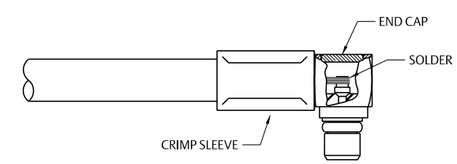
MMCX Right Angle Plug for RG-178, RG-316, RG-316 DS and RG-179 Size Flexible Cable

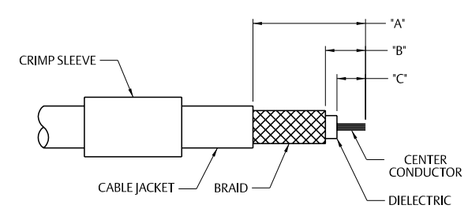
1. Identify connector parts. (3 piece parts)
2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations. Tin center conductor. Slide crimp sleeve onto cable jacket.
3. Flair braid and assemble crimp stem of body subassembly under braid onto cable making certain 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 prot. 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)

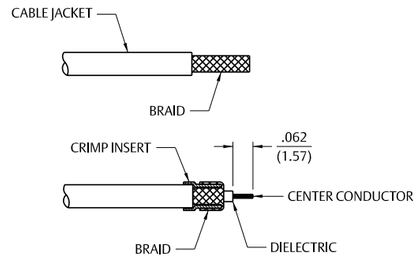
2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations.

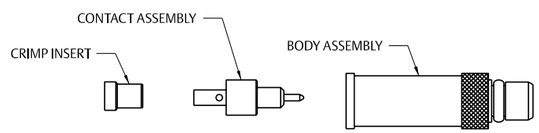
3. Slide crimp insert over braid and against jacket. Fold braid around crimp insert as shown. Strip dielectric to dimension shown. Tin center conductor if contact is to be soldered attached. Do not tin center conductor if contact is to be crimp attached.

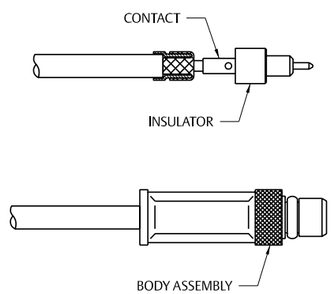
4. Assemble contact assembly onto cable as shown. **Solder attachment:** Solder contact to center conductor. Care should be taken that excess solder is not applied. **Crimp attachment:** Crimp contact to center conductor using Johnson hand tool 140-0000-952 and die set 140-000-953. Crimp location should 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

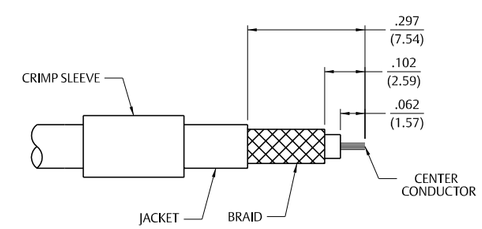
1. Identify connector parts. (3 piece parts)

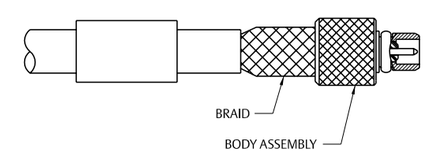
2. Strip cable jacket to dimensions shown. Do not nick braid or center conductor during strip operations. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide crimp sleeve onto cable jacket.

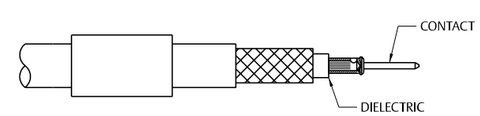
3. Assemble contact onto cable as shown. **Solder attachment:** Solder contact to center conductor. Care should be taken that excess solder is not applied. **Crimp attachment:** Crimp contact to center conductor using Johnson hand tool 140-0000-952 and die set 140-0000-953. Crimp location should be centered between end of contact and cross-hole. Crimp attachment to solid center conductor cables is not recommended.

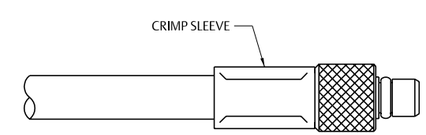
4. Slide body assembly over contact and under braid, then seat firmly onto contact as shown. The body assembly will "snap" over the contact barb. The cable may have to be held in a soft jawed clamping fixture. Slide crimp sleeve forward and crimp using recommended crimp die hex.

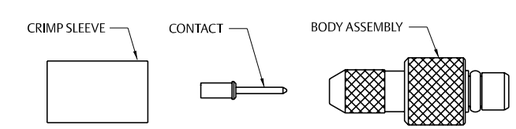
Cable Group	Part No.	Crimp Hex
RG-316/U, 188, 161, 174	135-3403-001	.128 (3.25)
RG-316 DS, 188 DS, 187 DS	135-3404-001	.151 (3.83)
RG-179/U, 187	135-3433-001	.128 (3.25)











Illustrations are shown in inches (millimeters).

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

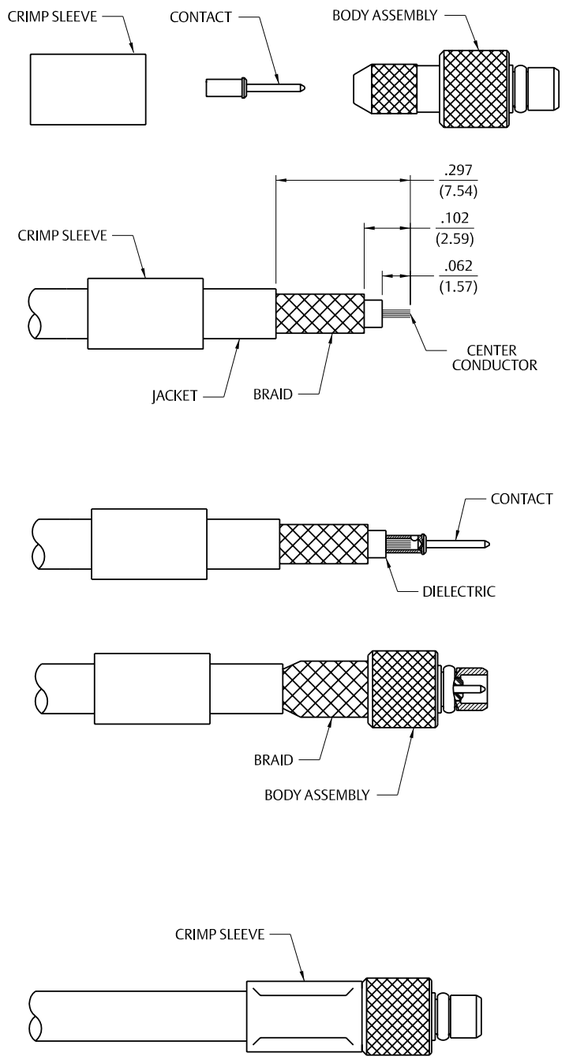
1. Identify connector parts. (3 piece parts)

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

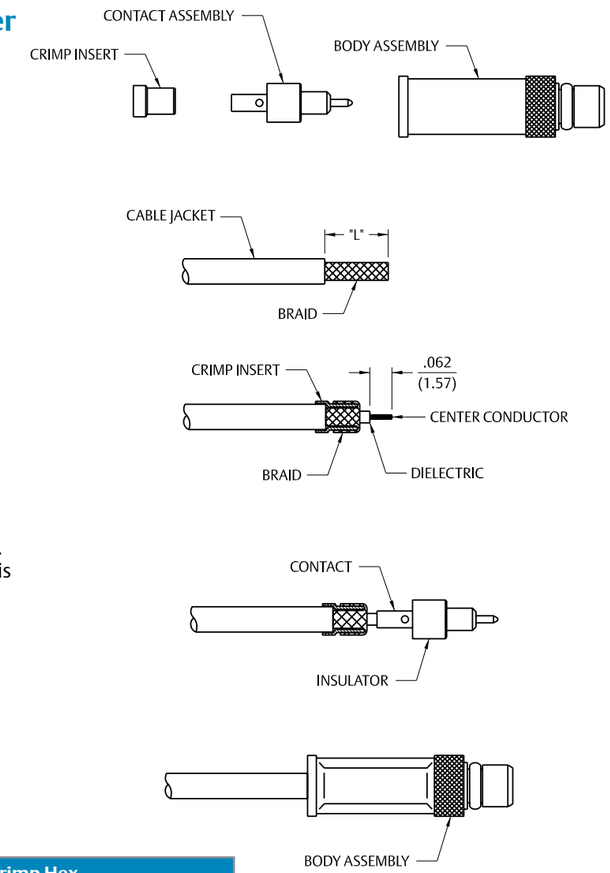
1. Identify connector parts. (3 piece parts – except bulkhead jack as shown.)

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	135-3336-001 135-3336-401	.135 (3.43) .135 (3.43)	.105 (2.67) x .250 (6.35) W .105 (2.67) x .250 (6.35) W
RG-178/U, 196	135-3302-001 135-3302-401	.185 (4.67) .185 (4.67)	.105 (2.67) x .250 (6.35) W .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

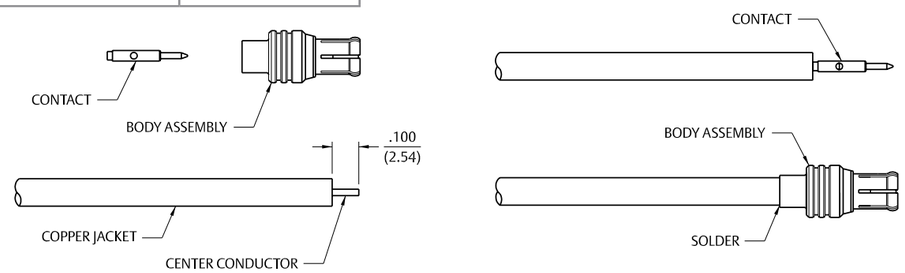
1. Identify connector parts. (2 piece parts)

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 (.086 Semi-Rigid)	133-3693-001
	133-3693-006



MCX Solder Type Right Angle Plug for Semi-Rigid Cable

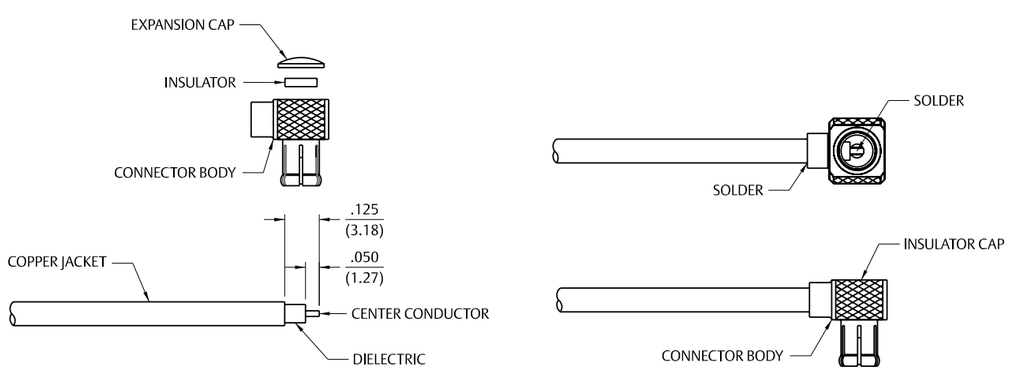
1. Identify connector parts. (3 piece parts)

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 (.086 Semi-Rigid)	133-3693-101
	133-3693-106



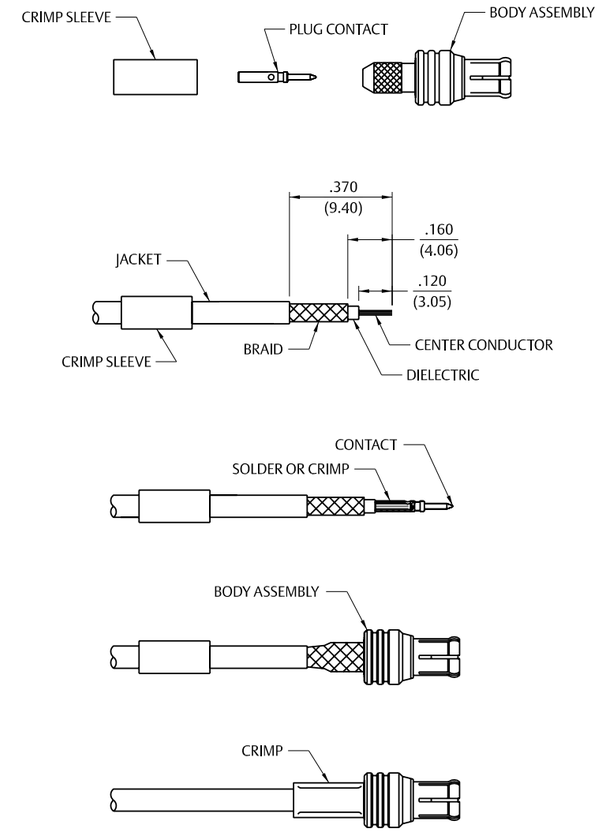
MCX Crimp Type Straight Connectors for Flexible Cable

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).

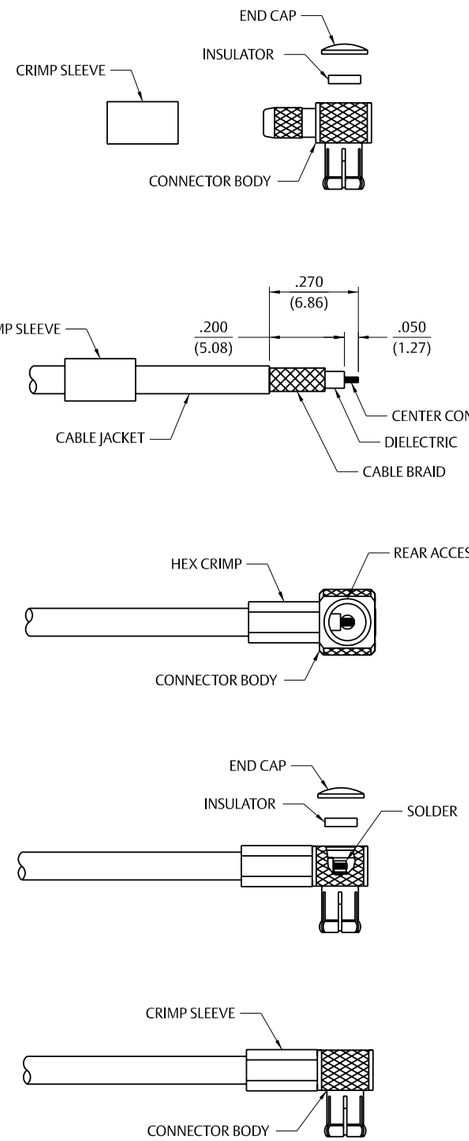


Cable Group	Part No.	Crimp Hex
RG-178/U, 196	133-3302-001/006 133-3302-401/406	.105 (2.67) .105 (2.67)
RG-316/U, 161, 174, 188	133-3303-001/006 133-3303-401/406	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	133-3304-001/006 133-3304-401/406	.151 (3.83) .151 (3.83)
RG-178/U, 196	133-3402-001/006	.105 (2.67)
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)

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.

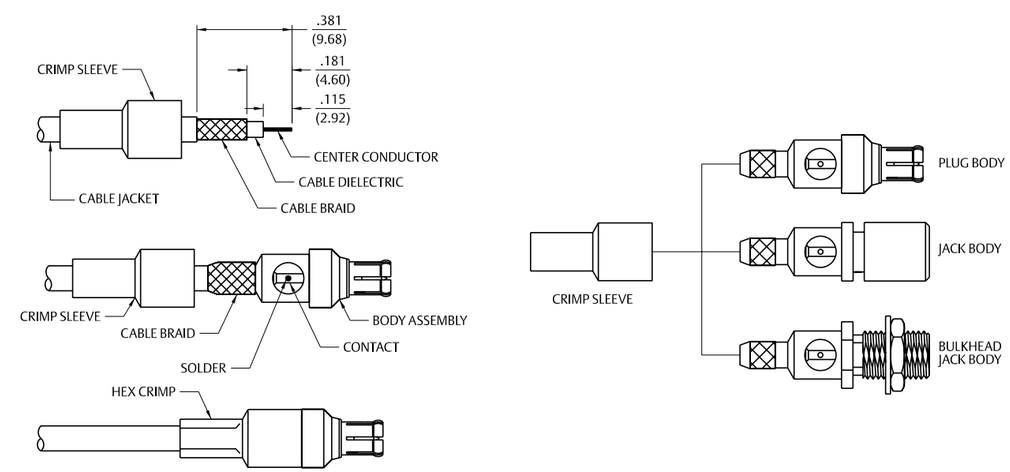
Cable Group	Part No.	Sleeve Hex
RG-316/U, 188, 174	133-9403-101/104	.128 (3.25)
RG-316 DS, 188 DS	133-9404-101	.151 (3.83)
RG-178	133-9402-101	.105 (2.67)



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.

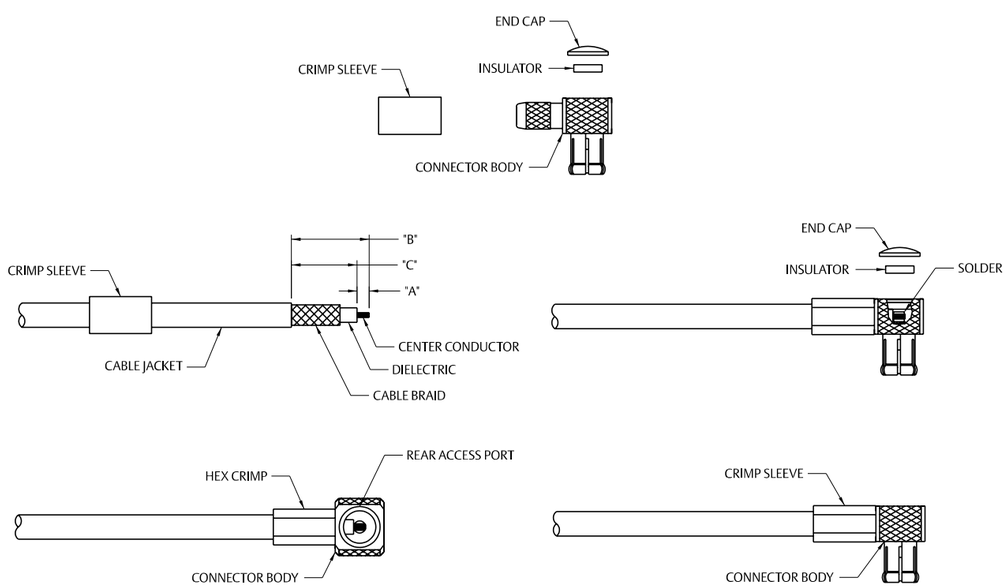
Cable Group	Part No.	Crimp Hex
RG-179	133-8433-001	.128 (3.25)
RG-179 DS	133-8434-001	.151 (3.83)
RG-179	133-8333-001	.128 (3.25)
RG-179 DS	133-8334-001	.151 (3.83)
RG-179	133-8333-401	.128 (3.25)
RG-179 DS	133-8334-401	.151 (3.83)
BELDEN 735A	133-8445-001	.151 (3.83)



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.

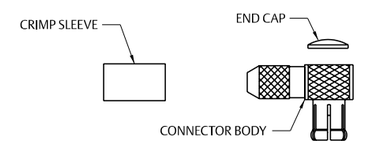
Cable Group	Part No.	"A"	"B"	"C"	Crimp Hex
RG-178/U, 196	133-3402-101/106	.050 (1.27)	.270 (6.86)	.200 (5.08)	.105 (2.67)
RG-188/U, 316, 161, 174	133-3403-101/106	.050 (1.27)	.270 (6.86)	.200 (5.08)	.128 (3.25)
RG-316 DS, 188 DS	133-3404-101/106	.050 (1.27)	.270 (6.86)	.200 (5.08)	.151 (3.83)
RG-179/U, 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)

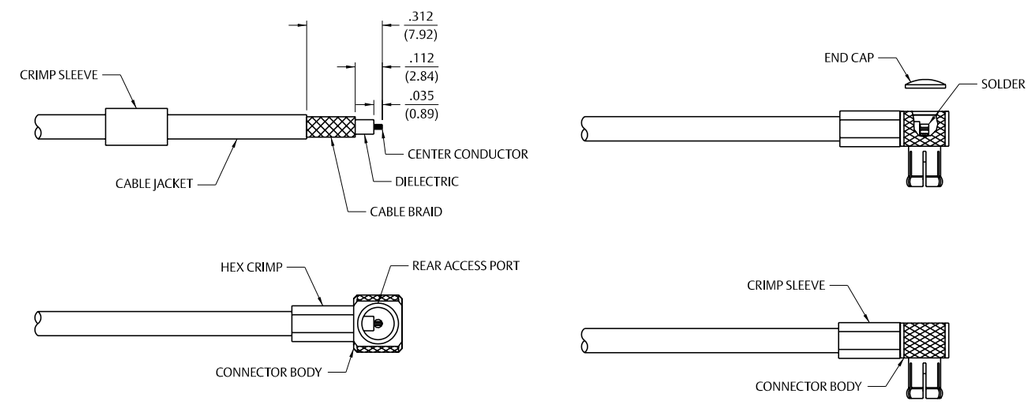


MCX Crimp Type Right Angle Plugs for Flexible Cable – 75 Ohm

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)

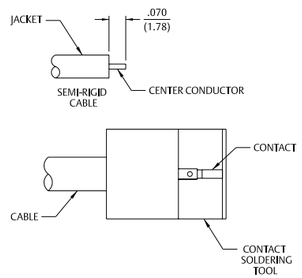


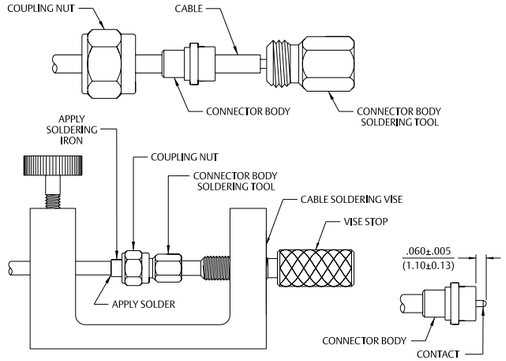


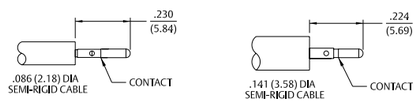
SMK Solder Type Straight Plugs for Semi-Rigid Cable

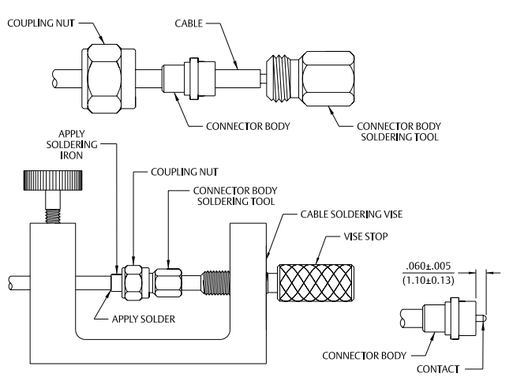
1. Identify connector parts (5 piece parts) and tools (5 tools.)
2. Strip cable jacket and dielectric to dimension shown.
3. Place center contact onto center conductor. Slide contact soldering tool onto contact. Clamp the cable contact and tool into cable soldering vise and solder contact to center conductor. 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.

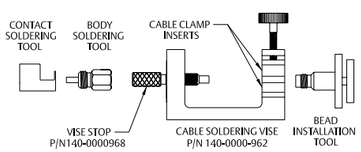
Tool	145-0693-001/002 (for .086 Semi-Rigid)	145-0694-001/02 (for .141 Semi-Rigid)
Semi-Rigid Cable Vise	140-0000-962	140-0000-962
Vise Stop	140-0000-968	140-0000-968
Bead Assy. Tool	140-0000-957	140-0000-957
Contact Soldering Tool	140-0000-960	140-0000-961
Body Soldering Tool	140-0000-958	140-0000-959
Cable Clamp Insert	140-0000-964	140-0000-965

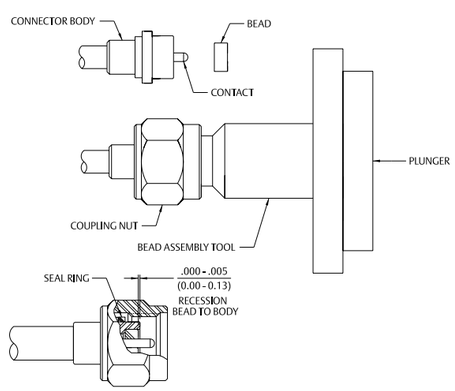








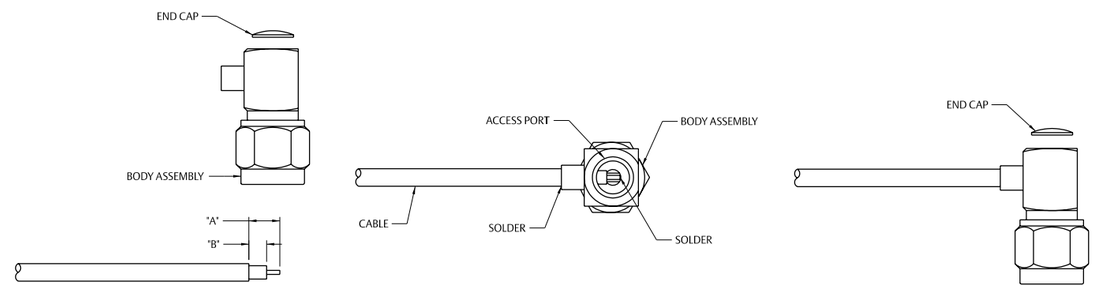




SMA Right Angle Solder Type Plug for Semi-Rigid Cable

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)

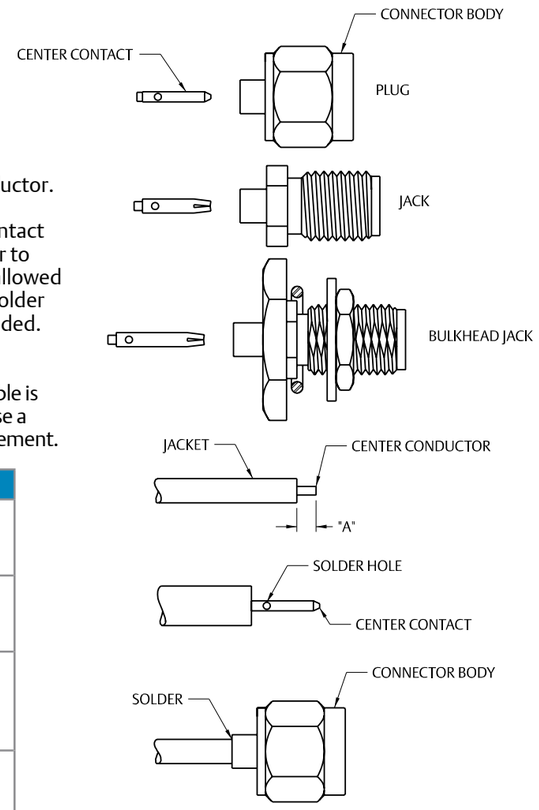


Illustrations are shown in inches (millimeters).

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.

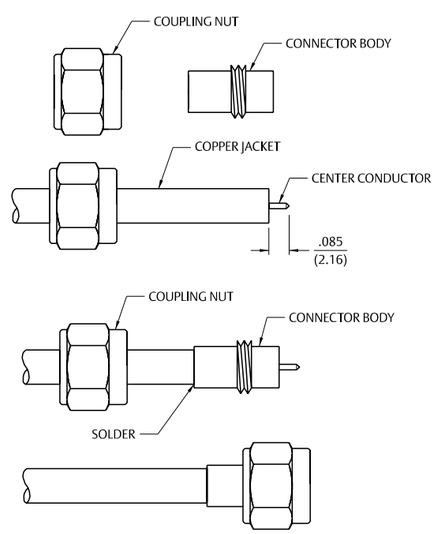
Cable Group	Part No.	"A"
RG-405/U (.086 Semi-Rigid)	141-0593-001 141-0593-401 141-0693-002	.070 (1.78) .070 (1.78) .070 (1.78)
RG-402/U (.141 Semi-Rigid)	141-0594-001 141-0594-401 141-0694-002	.085 (2.16) .085 (2.16) .085 (2.16)
RG-405/U (.086 Semi-Rigid)	142-0593-001/006 142-0593-401/406 142-0593-411/416 142-0693-001/006	.070 (1.78) .070 (1.78) .070 (1.78) .070 (1.78)
RG-402/U (.141 Semi-Rigid)	142-0594-001/006 142-0594-401/406 142-0694-001/006	.085 (2.16) .085 (2.16) .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.

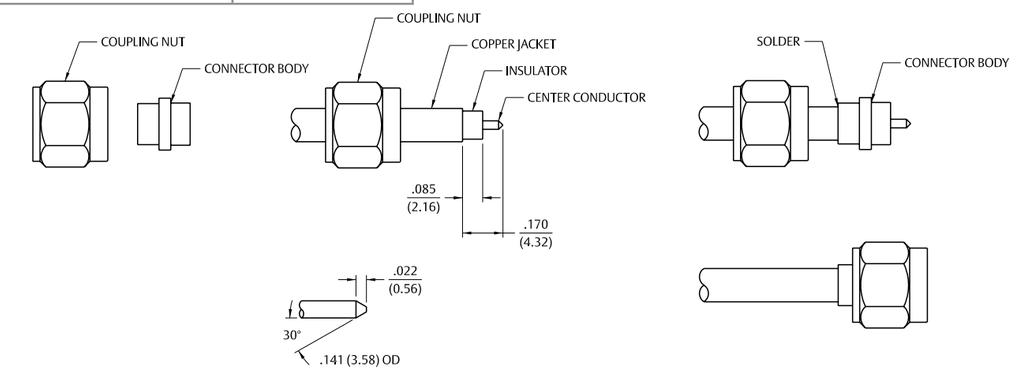
Cable Group	Part No.
RG-402/U (.141 Semi-Rigid)	142-0694-011 142-0694-016 141-0694-012



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.

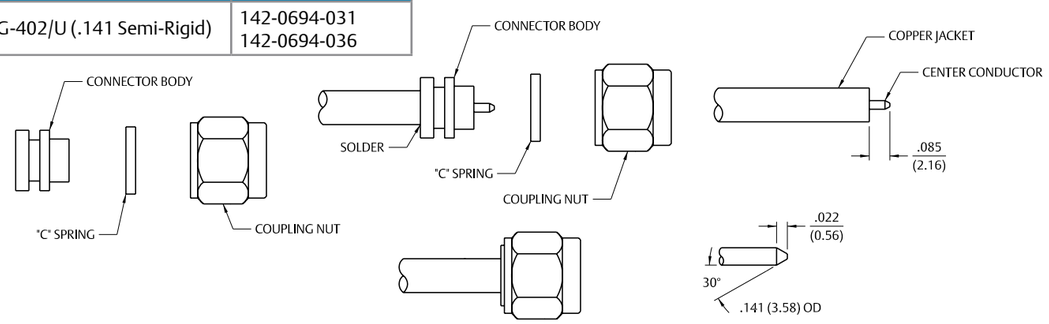
Cable Group	Part No.
RG-402/U (.141 Semi-Rigid)	142-0694-021 142-0694-026 142-0694-041 142-0694-046



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

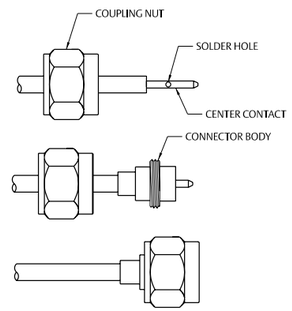


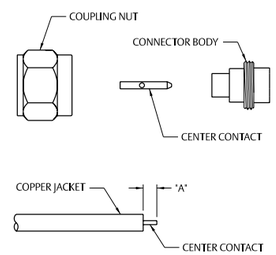
Illustrations are shown in inches (millimeters).

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)	142-0693-051 142-0693-056	.070 (1.78) .070 (1.78)
RG-402/U (.141 Semi-Rigid)	142-0694-051 142-0694-056	.085 (2.16) .085 (2.16)

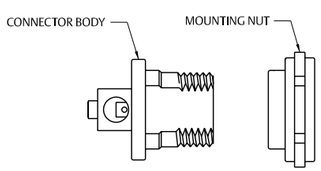


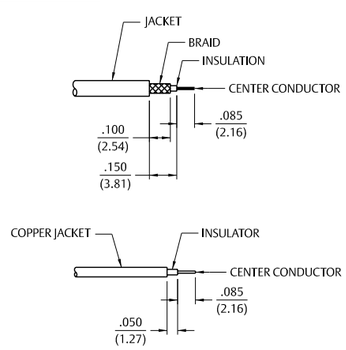


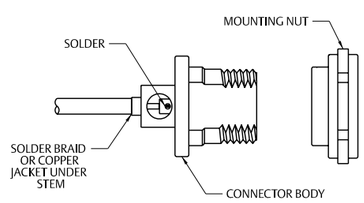
SMA Solder Type Antenna Connector Plug for Flexible or Semi-Rigid Cable

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



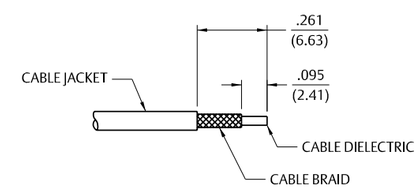


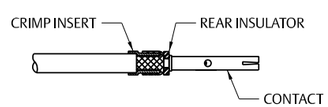


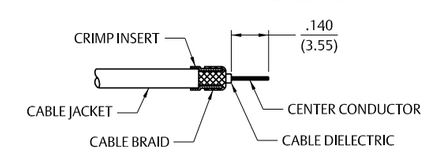
SMA 3-Piece Plug, Jack and Bulkhead Jack for RG-178 Flexible Cable

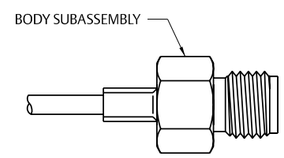
1. Identify piece parts. (4 piece parts plus nut and washer for bulkhead.)
2. Strip cable jacket and braid to dimensions shown. Do not nick braid during strip operations.
3. Slide crimp insert over braid and against jacket. Fold braid around crimp insert as shown. Strip dielectric to dimension shown. 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.

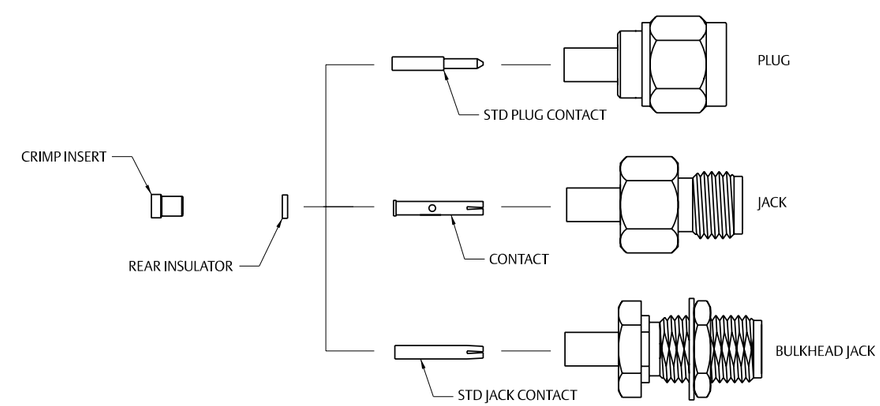
Cable Group	Part No.	Crimp Hex
RG-178/U, 196	142-0402-011 142-0402-016 142-0302-011 142-0302-016 142-0302-431 142-0302-436	.105 (2.67) .105 (2.67) .105 (2.67) .105 (2.67) .105 (2.67) .105 (2.67)











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

Illustrations are shown in inches (millimeters).

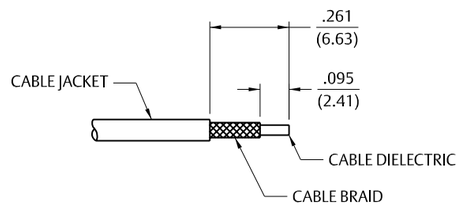
SMA Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable – Crimp or Solder Contacts

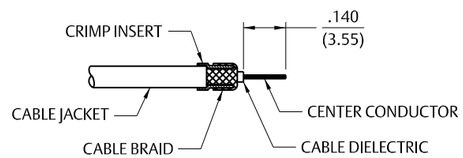
1. Identify connector parts. (3 piece parts – except bulkhead)

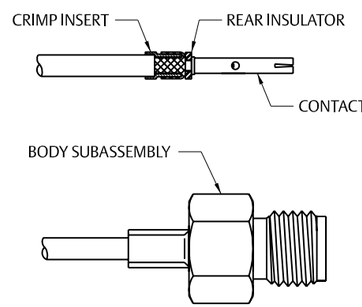
2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. When stripping LMR-100 low loss cable, remove foil back to where cable jacket is stripped. A wire stripper of correct size is recommended for this step. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.

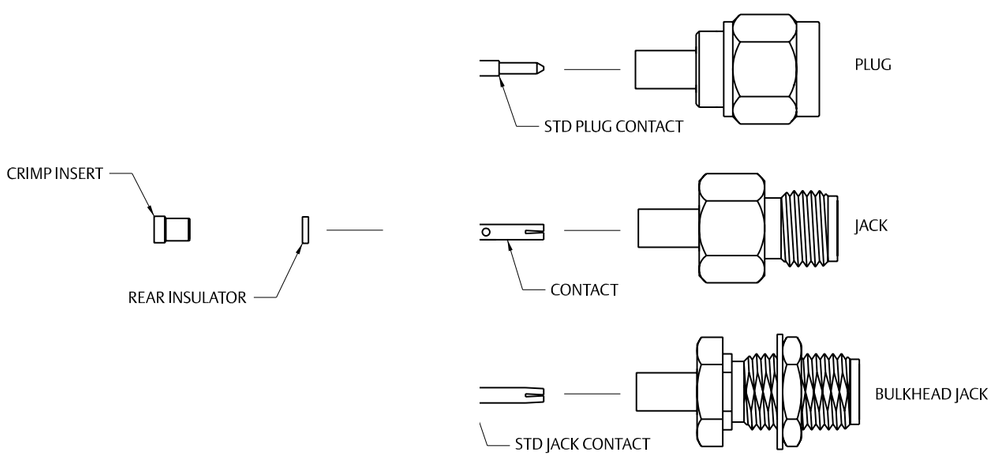
3. Assemble contact onto cable as shown.
   Solder Attachment: Solder contact to center conductor through solder hole using .020 (0.51) diameter solder. Use a minimum amount of solder for a good joint.
   Crimp Attachment: Crimp contact to center conductor using Johnson Hand Tool 144-0000-910, setting #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).









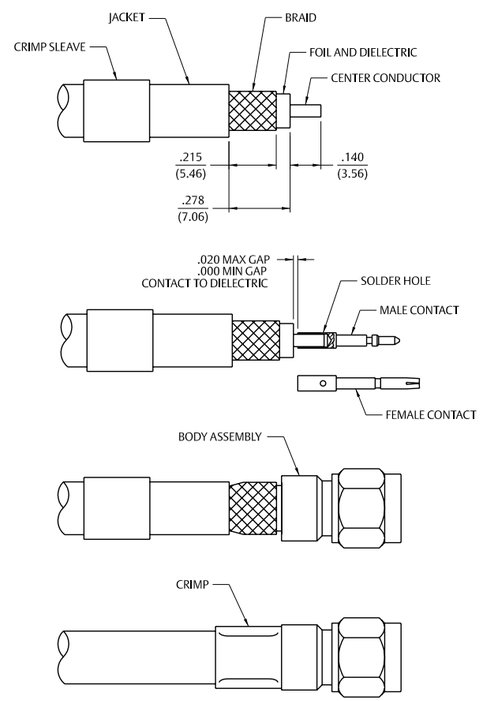
SMA Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable – Crimp or Solder Contacts (cont'd from last page)

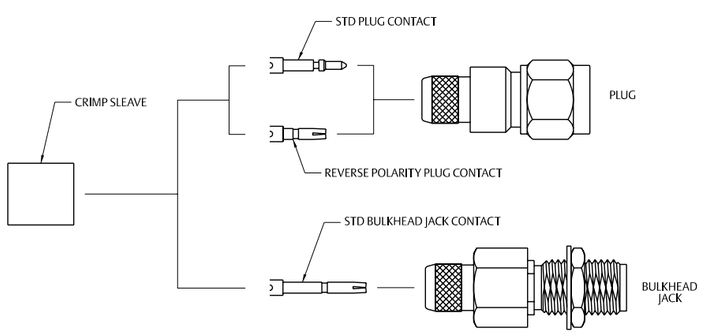
Cable Group	Part No.	"A"	"B"	Crimp Hex
RG-316/U, 161, 174, 188; LMR-100	141-0303-412	.128 (3.25)	.270 (6.86)	.105 (2.67)
RG-316 DS, 188 DS	141-0304-412	.151 (3.83)	.270 (6.86)	.128 (3.25)
RG-58/U, 141, 303	141-0307-412	.213 (5.41)	.270 (6.86)	.151 (3.83)
RG-55/U, 142, 223, 400	141-0308-412	.213 (5.41)	.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	142-0303-011/016 142-0303-411/416 142-9303-411	.215 (5.46) .215 (5.46)	.278 (7.06) .278 (7.06)	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	142-0304-011/016 142-0304-411/416	.215 (5.46) .215 (5.46)	.278 (7.06) .278 (7.06)	.151 (3.83) .151 (3.83)
RG-58/U, 141, 303	142-0307-011/016 142-0307-411/416	.215 (5.46) .215 (5.46)	.278 (7.06) .278 (7.06)	.213 (5.41) .213 (5.41)
RG-55/U, 142, 223, 400	142-0308-011/016 142-0308-411/416	.215 (5.46) .215 (5.46)	.278 (7.06) .278 (7.06)	.213 (5.41) .213 (5.41)
RG-179/U, 187	142-0333-011/016 142-0333-411/416	.215 (5.46) .215 (5.46)	.278 (7.06) .278 (7.06)	.128 (3.25) .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)

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.

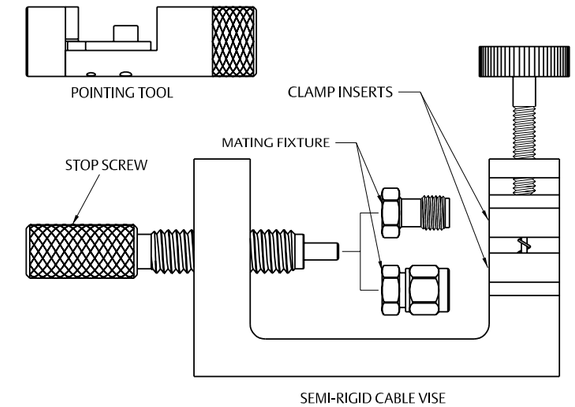
Cable Group	Part No.	Crimp Hex
LMR-195	142-0307-411 142-0307-416	.213 (5.41) .213 (5.41)
LMR-240	142-0335-401 142-0335-406	.255 (6.48) .255 (6.48)
LMR-200	142-0339-401 142-0339-406	.213 (5.41) .213 (5.41)
LMR-195	142-0407-011 142-0407-016	.213 (5.41) .213 (5.41)
LMR-240	142-0435-001 142-0435-006	.255 (6.48) .255 (6.48)
LMR-200	142-0439-001 142-0439-006	.213 (5.41) .213 (5.41)
LMR-240	142-4435-001 142-4435-006	.255 (6.48) .255 (6.48)
LMR-200	142-4439-001 142-4439-006	.213 (5.41) .213 (5.41)
LMR-195	142-4407-001 142-4407-006	.213 (5.41) .213 (5.41)
LMR-240	142-5435-001 142-5435-006	.255 (6.48) .255 (6.48)
LMR-200	142-5439-001 142-5439-006	.213 (5.41) .213 (5.41)
LMR-195	142-5407-001 142-5407-006	.213 (5.41) .213 (5.41)

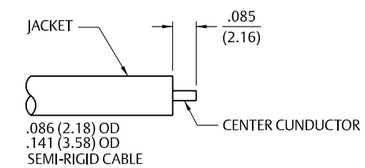


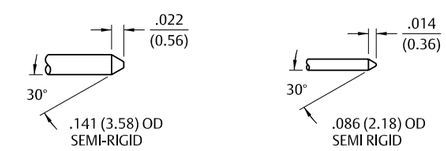


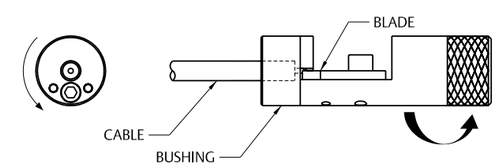
SMA Straight Solder Type for Semi-Rigid Cables

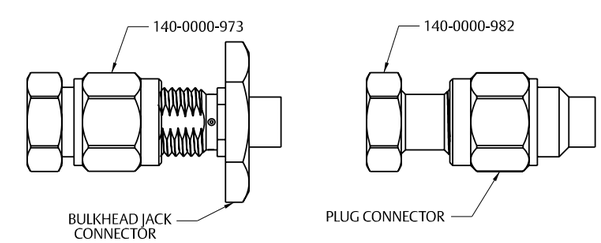
1. Identify the connector (plug or jack) and tools.
2. Strip the cable jacket and dielectric to dimension shown. Do not nick the center conductor.
3. Bevel the entire diameter on the end of the cable center conductor until the point resembles the appropriate dimensional profile. This operation can be 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.





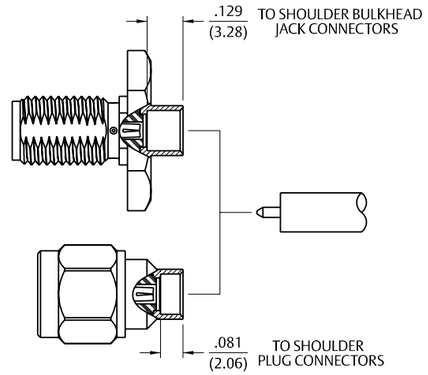


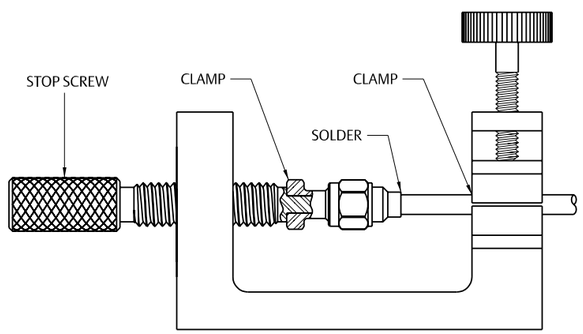




SMA Straight Solder Type for Semi-Rigid Cables (cont'd from last page)

Cable Group	Part No.
RG-405/U (.086 Semi-Rigid)	141-0593-421 141-0693-062
RG-402/U (.141 Semi-Rigid)	141-0594-421 141-0694-062





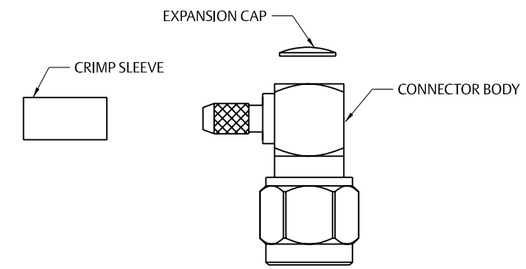
SMA Crimp Type Right Angle Plugs for Flexible Cable

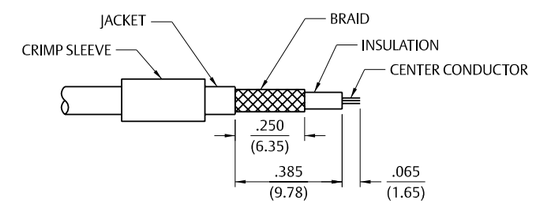
1. Identify connector parts. (3 piece parts)

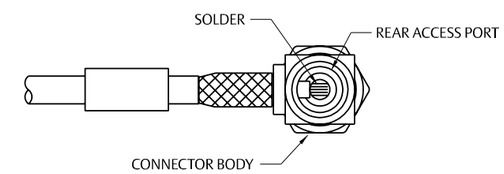
2. Strip cable to dimensions shown. Do not nick braid or center conductor. When stripping LMR-100 low loss cable, remove foil back to where cable jacket is stripped. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.

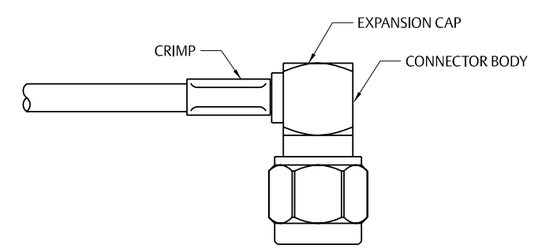
3. Flare braid and slide cable into body making certain that the cable insulation bottoms on center contact. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended.

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.









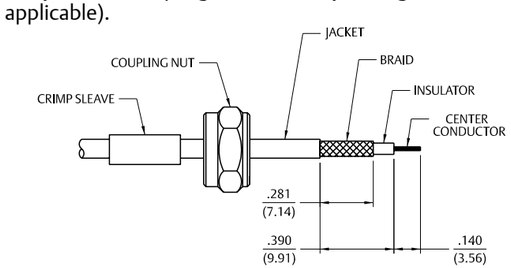
SMA Crimp Type Right Angle Plugs for Flexible Cable (cont'd from last page)

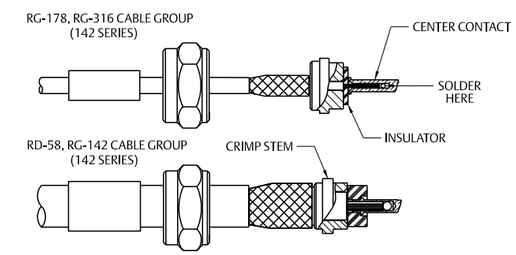
Cable Group	Part No.	Crimp Hex
RG-316/U, 161, 174, 188; LMR-100	141-0403-102	.128 (3.25)
RG-316 DS, 188 DS	141-0404-112	.151 (3.83)
RG-58/U, 141, 303	141-0407-102	.213 (5.41)
RG-55/U, 142, 223, 400	141-0408-102	.213 (5.41)
RG-178/U, 196	142-0402-101 142-0402-106	.105 (2.67) .105 (2.67)
RG-316/U, 161, 174, 188; LMR-100	142-0403-101 142-0403-106	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	142-0404-101 142-0404-106	.151 (3.83) .151 (3.83)
RG-58/U, 141, 303	142-0407-101 142-0407-106	.213 (5.41) .213 (5.41)
RG-55/U, 142, 223, 400	142-0408-101 142-0408-106	.213 (5.41) .213 (5.41)
RG-179/U, 187	142-0433-101 142-0433-106	.128 (3.25) .128 (3.25)
RG-316/U, 161, 174, 188; LMR-100	142-4403-101 142-4403-106	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	142-4404-101 142-4404-106	.151 (3.83) .151 (3.83)
RG-58/U, 141, 303	142-4407-101 142-4407-106	.213 (5.41) .213 (5.41)
RG-55/U, 142, 223, 400	142-4408-101 142-4408-106	.213 (5.41) .213 (5.41)
RG-316/U, 161, 174, 188; LMR-100	142-5403-101 142-5403-106	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	142-5404-101 142-5404-106	.151 (3.83) .151 (3.83)
RG-58/U, 141, 303	142-5407-101 142-5407-106	.213 (5.41) .213 (5.41)
RG-55/U, 142, 223, 400	142-5408-101 142-5408-106	.213 (5.41) .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)

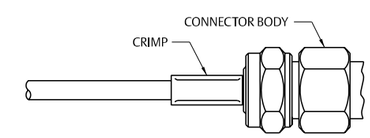
SMA Crimp Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable

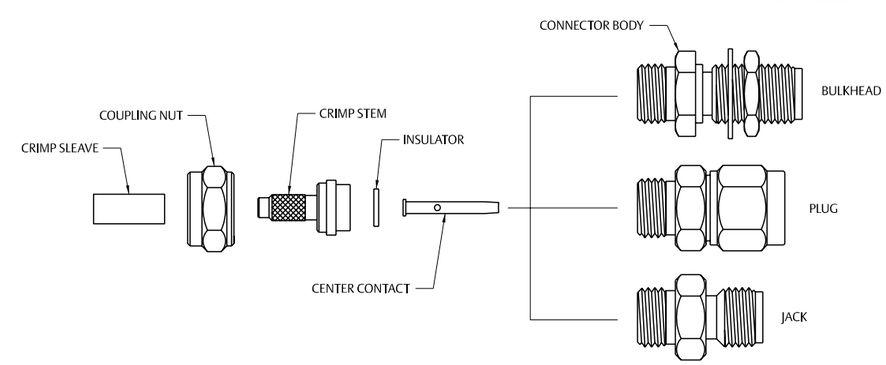
1. Identify connector parts. (6 piece parts – except bulkhead)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve, nut and heat 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	142-0302-401 142-0302-406	.105 (2.67) .105 (2.67)
RG-316/U, 161, 174, 188	142-0303-401 142-0303-406	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	142-0304-401 142-0304-406	.151 (3.83) .151 (3.83)
RG-58/U, 141, 303	142-0307-401 142-0307-406	.213 (5.41) .213 (5.41)
RG-55/U, 142, 223, 400	142-0308-401 142-0308-406	.213 (5.41) .213 (5.41)
RG-316/U, 161, 174, 188	142-0403-001 142-0403-006	.128 (3.25) .128 (3.25)









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

Illustrations are shown in inches (millimeters).

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

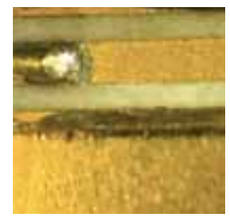


Figure 4

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 preformance, the connector to circuit board transtion must be ajdusted 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 tabluated 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				

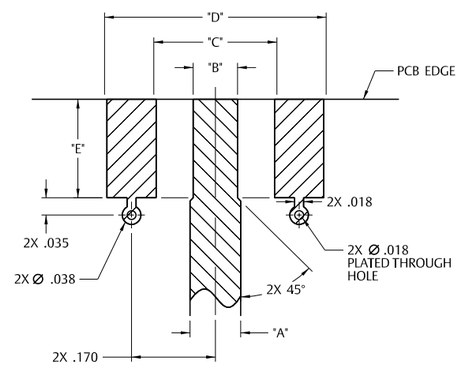


Figure 1

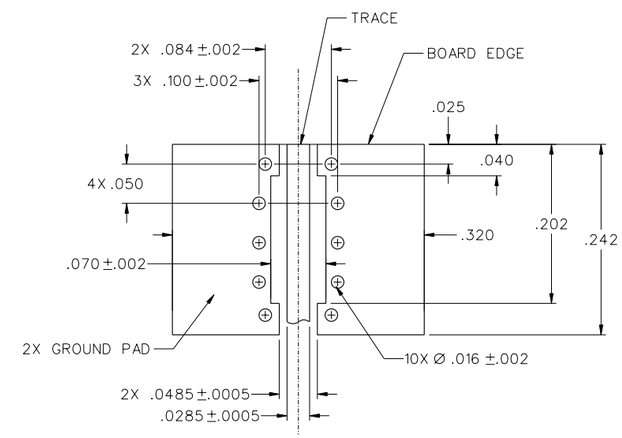


Figure 2

Reference dimensions for 50 Ohm grounded coplanar waveguide using Rogers Corporation RO4003C™ high frequency substrate laminate*

Holes	GCPW 50Ω Impedence 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.

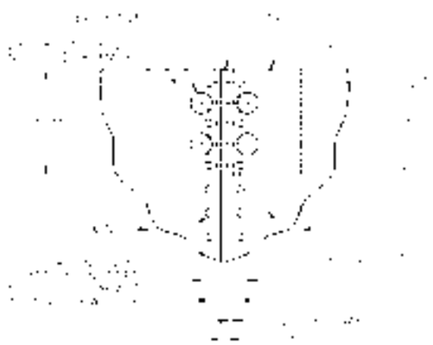


Figure 1

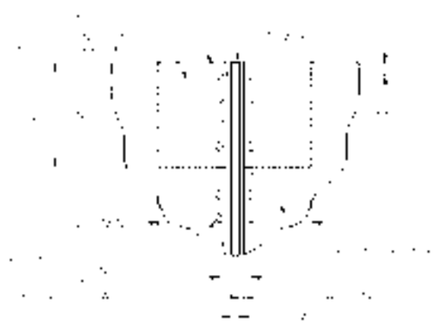
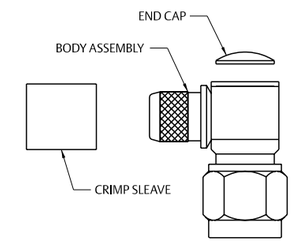


Figure 2

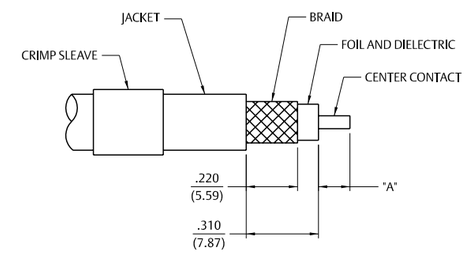
Right Angle SMA Low Loss Diameter .195, .200 and .240

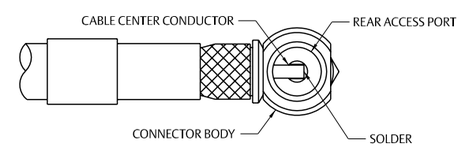
1. Identify connector parts. (3 piece parts)
2. Strip cable to dimensions shown. Do not nick braid, foil or center conductor. Cut foil flush with dielectric, do not remove foil. Make sure that dielectric is clean and free from all particles. Tin center conductor, keeping solder amount to a minimum. Slide 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.

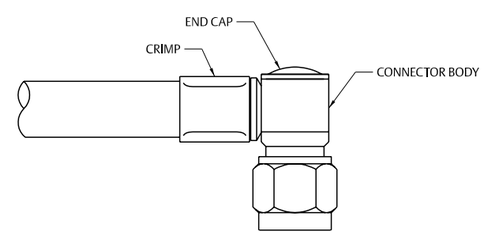
Low Loss Diameter	"A"	Crimp Die Hex	Flat Punch Diameter
0.195	.110 (2.79)	.213 (5.41) hex	.187 (4.75)
0.200	.110 (2.79)	.213 (5.41) hex	.187 (4.75)
0.240	.135 (3.43)	.255 (6.48) hex	.242 (6.15)



Cable Group	Part No.	Crimp Hex
LMR-195	142-0407-101 142-0407-106	.213 (5.41) .213 (5.41)
LMR-200	142-4439-101 142-4439-106	.213 (5.41) .213 (5.41)
LMR-240	142-0435-101 142-0435-106	.255 (6.48) .255 (6.48)
LMR-195	142-5407-101 142-5407-106	.213 (5.41) .213 (5.41)
LMR-200	142-0439-101 142-0439-106	.213 (5.41) .213 (5.41)
LMR-240	142-5435-101 142-5435-106	.255 (6.48) .255 (6.48)
LMR-195	142-4407-101 142-4407-106	.213 (5.41) .213 (5.41)
LMR-200	142-5439-101 142-5439-106	.213 (5.41) .213 (5.41)
LMR-240	142-4435-101 142-4435-106	.255 (6.48) .255 (6.48)







Illustrations are shown in inches (millimeters).

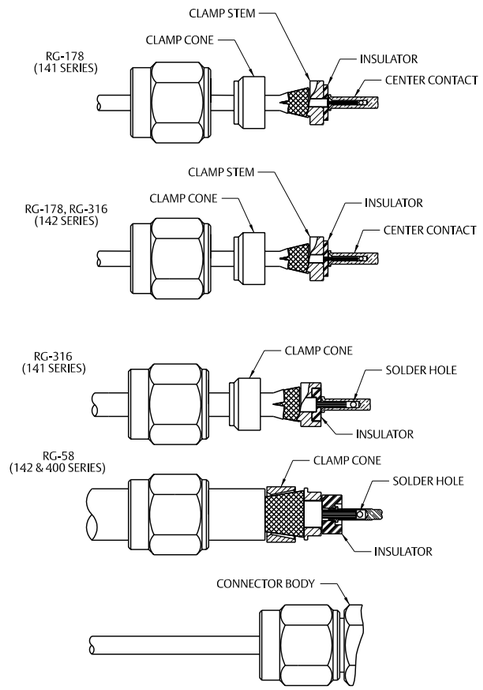
SMA Clamp Type Straight Plugs, Straight Jacks, and Straight Bulkhead Jacks for Flexible Cable

1. Identify connector parts. (6 piece parts – except bulkhead)

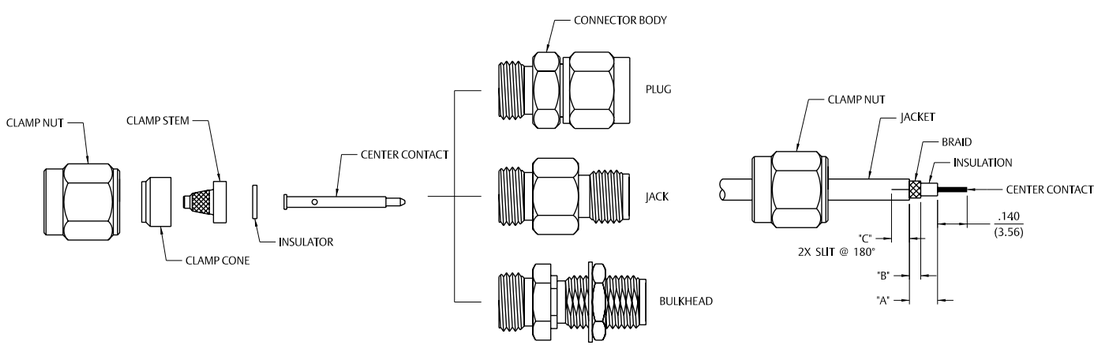
2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin (optional). Slide clamp nut and clamp cone onto cable as shown. Clamp cone must be oriented as shown for each 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

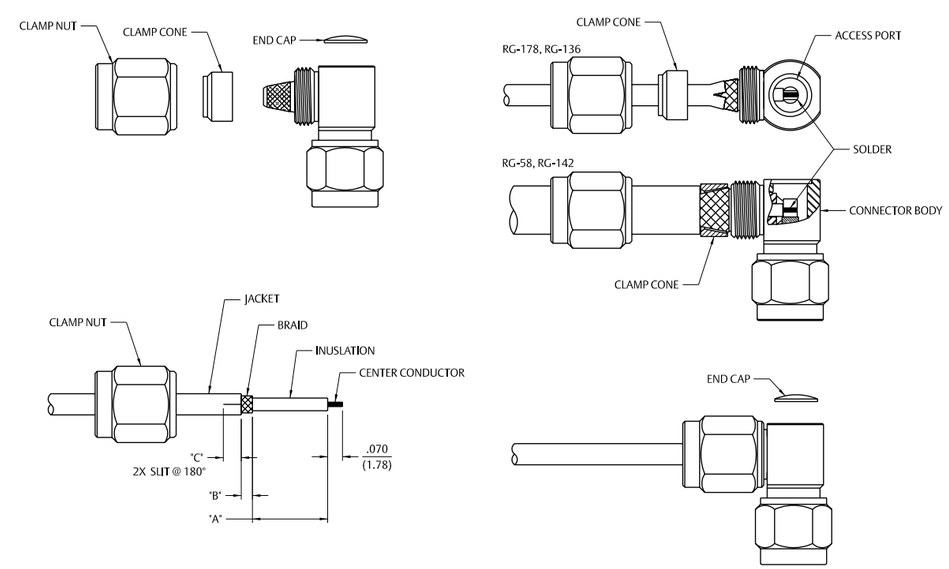
1. Identify connector parts. (4 piece parts)

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.

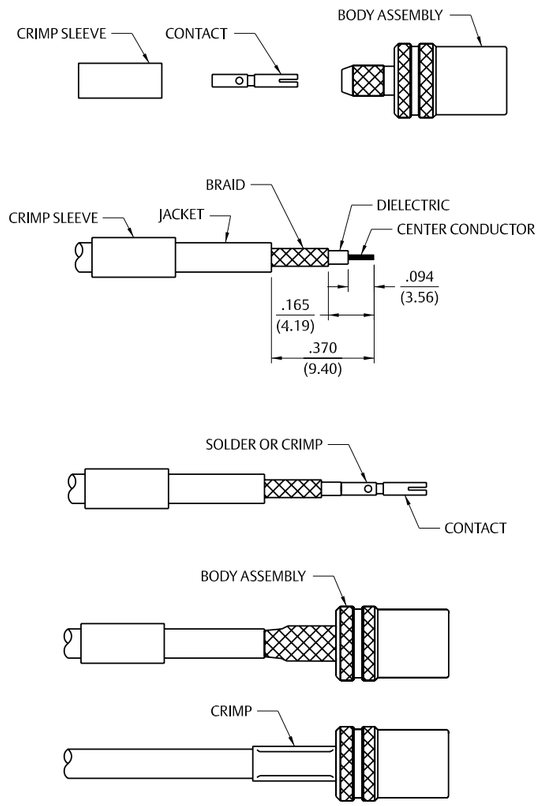
4. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. .020 (0.51) diameter solder is recommended. Place expansion cap in access port and seat with .187 (4.75) diameter flat punch.

Cable Group	Part No.	"A"	"B"	"C"
RG-178/U, 196	142-0202-101 142-0202-106	.280 (7.11) .280 (7.11)	.053 (1.35) .053 (1.35)	.085 (2.16) .085 (2.16)
RG-316/U, 161, 174, 188	142-0203-101 142-0203-106	.280 (7.11) .280 (7.11)	.053 (1.35) .053 (1.35)	.085 (2.16) .085 (2.16)
RG-58/U 141, 303	142-0207-101 142-0207-106	.395 (10.03) .395 (10.03)	.160 (4.06) .160 (4.06)	NONE NONE
RG-55/U, 142, 233, 400	142-0207-101 142-0207-106	.420 (10.67) .420 (10.67)	.180 (4.57) .180 (4.57)	NONE 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).

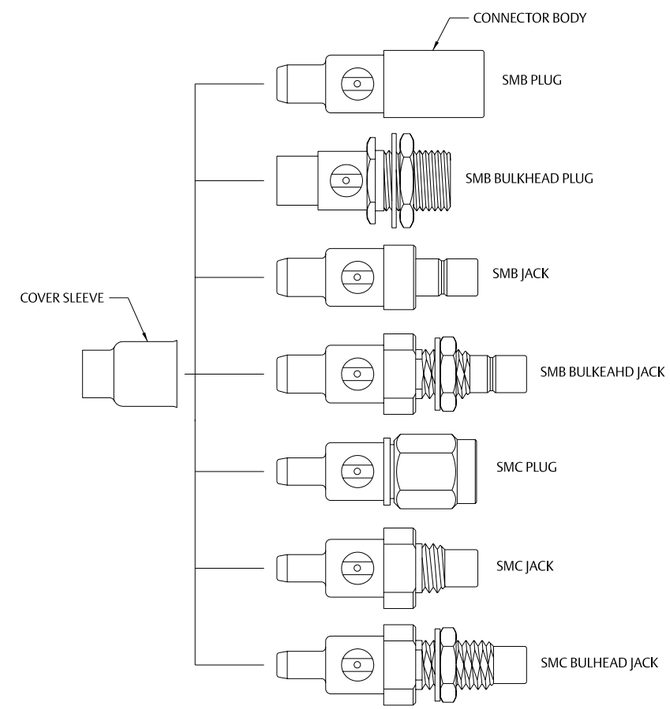


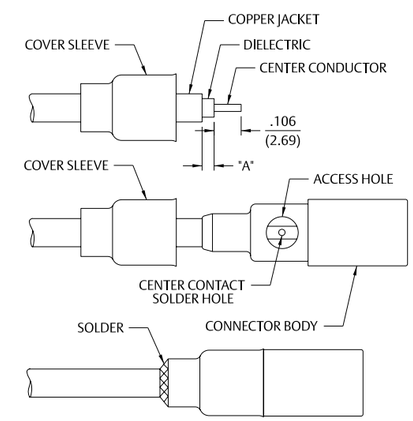
Cable Group	Part No.	Crimp Hex
RG-316/U, 161, 174, 179, 187, 188	131-3403-021/026	.128 (3.25)
RG-316 DS, 188 DS, 179 DS	131-3404-021/026	.151 (3.83)
RG-58/U, 141, 303	131-3407-011/016	.213 (5.41)
RG-179/U, 187	131-8433-001/006	.128 (3.25)
RG-179 DS, 187 DS	131-8434-001/006	.151 (3.83)
Belden 735A	131-8445-011/016	.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)	131-3593-401/406 131-3693-001/016	.025 (0.64) .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)

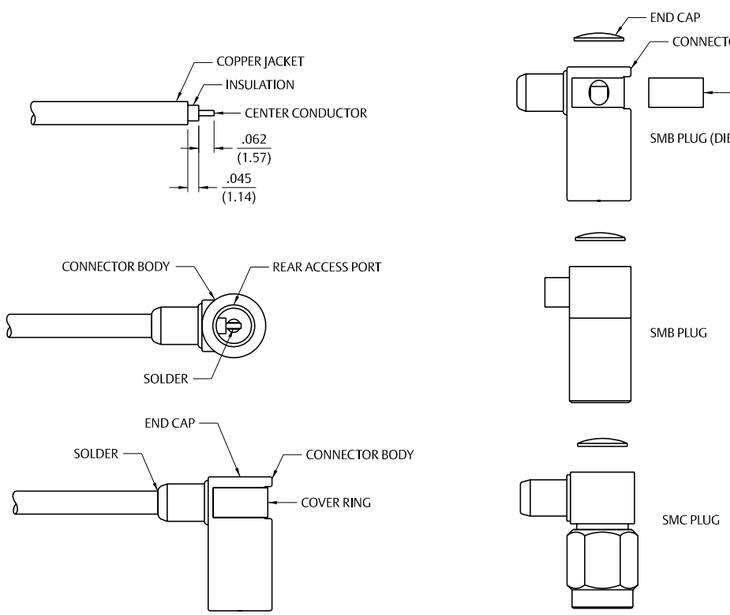




SMB/SMC Solder Type Right Angle Plugs for Semi-Rigid Cable

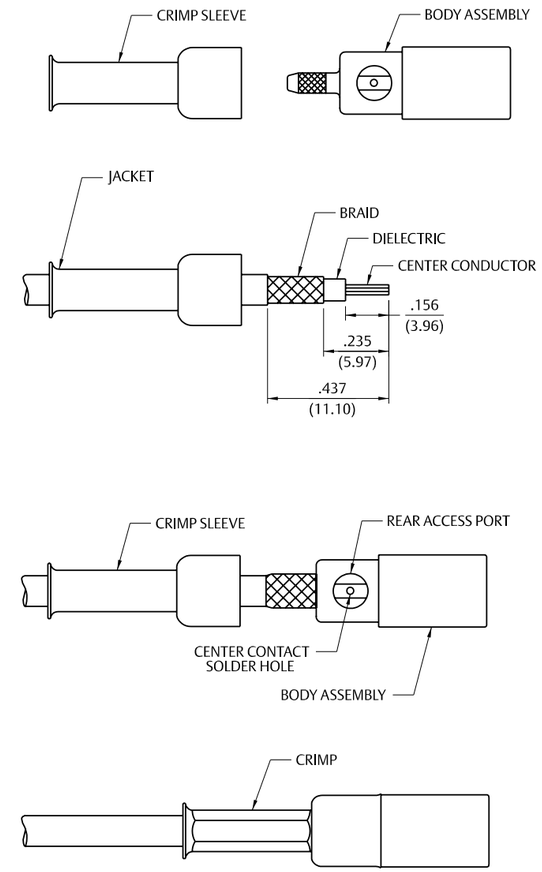
1. Identify connector parts. (2 piece parts – except diecast)
2. Strip cable to dimensions shown. Do not nick center conductor.
3. Insert cable into body making certain that the cable insulation bottoms on center contact. Solder center conductor to contact through the rear and side access ports. Use 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)	131-1693-101 131-1693-116 131-3693-101 131-3693-116



SMB Straight Crimp Type Straight Plugs for Flexible Cable

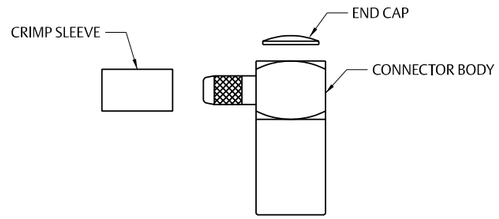
1. Identify connector parts. (2 piece parts)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. A wire stripper of correct size is recommended for this step. Twist stranded center conductor into tight bundle and tin. Slide crimp sleeve onto cable as shown.
3. Flare braid and slide 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.

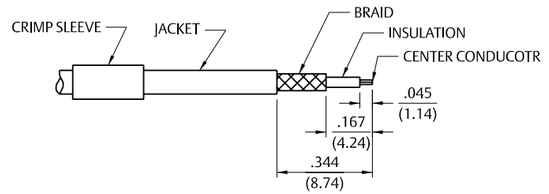


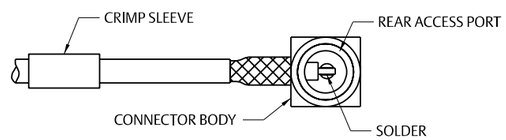
Cable Group	Part No.	Crimp Hex
RG-316/U, 188, 174, 179, 187	131-9403-001	.128 (3.25)
RG-316 DS, 188 DS, 179 DS, 187 DS	131-9404-001	.151 (3.83)

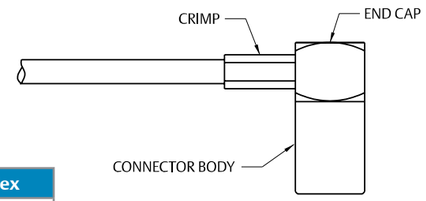
SMB Right Angle Crimp Type Straight Plugs for Flexible Cable

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.





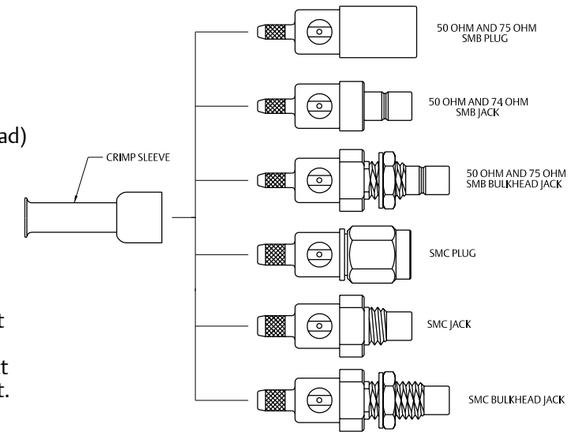


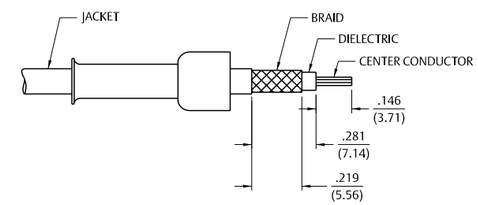


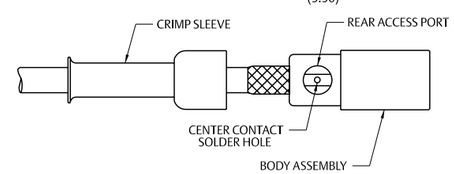
Cable Group	Part No.	Crimp Hex
RG-316/U, 188, 174, 179,187	131-9403-101 / -116	.128 (3.25)
RG-316 DS, 188 DS, 179 DS, 187 DS	131-9404-101 / -116	.151 (3.83)

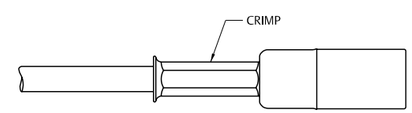
SMB/SMC/Mini-75Ohm SMB (2-Piece) Crimp Type Straight Plugs, Jacks and Bulkhead Jacks for Flexible Cable

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,	131-3303-001/006	.128 (3.25)
174, 179, 187, 188	131-3303-401/406	.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,	131-3403-001/016	.128 (3.25)
174, 179, 187, 188	131-3403-401/406	.128 (3.25)
RG-179 DS, 187 DS,	131-3404-401/406	.128 (3.25)
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,	131-8403-001/006	.128 (3.25)
161, 174, 188	131-8403-011/016	.128 (3.25)
RG-179 DS, 187 DS,	131-8404-001/006	.151 (3.83)
188 DS, 316 DS	131-8404-011/016	.151 (3.83)
RG-59	131-8409-001/006	.255 (6.48)
BELDEN 735A	131-8445-001/006	.178 (4.52)

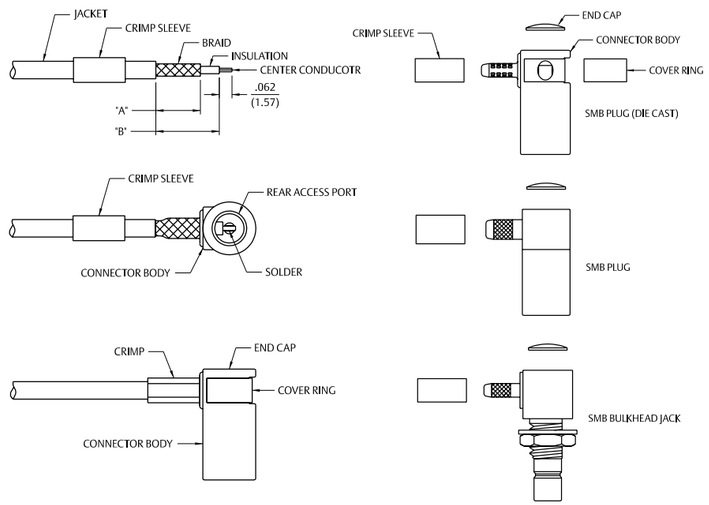
SMB/SMC/Mini-75Ohm SMB Crimp Type Right Angle Plugs and Right Angle Bulkhead Jacks for Flexible Cable

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

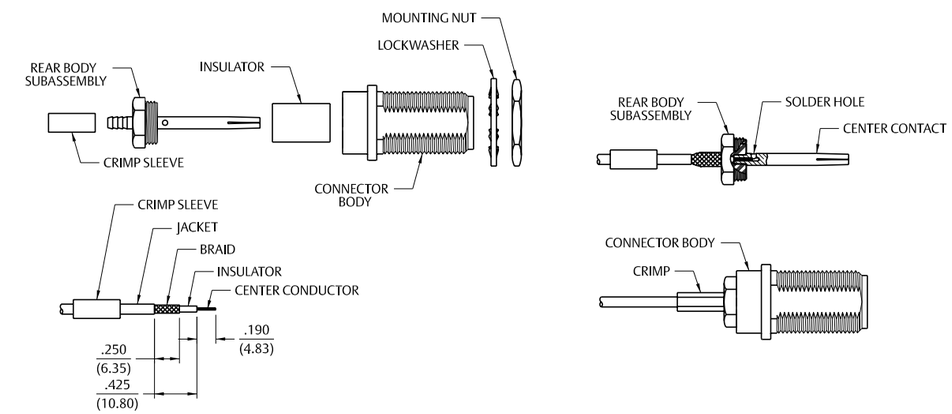
1. Identify connector parts. (6 piece parts)

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)



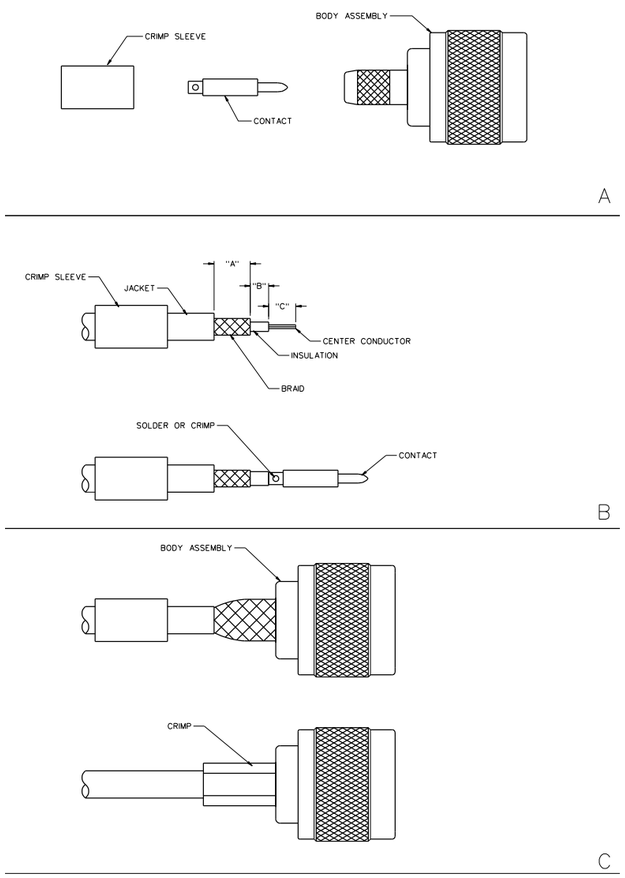
Type N Straight Crimp Type Plugs for Flexible Cable

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

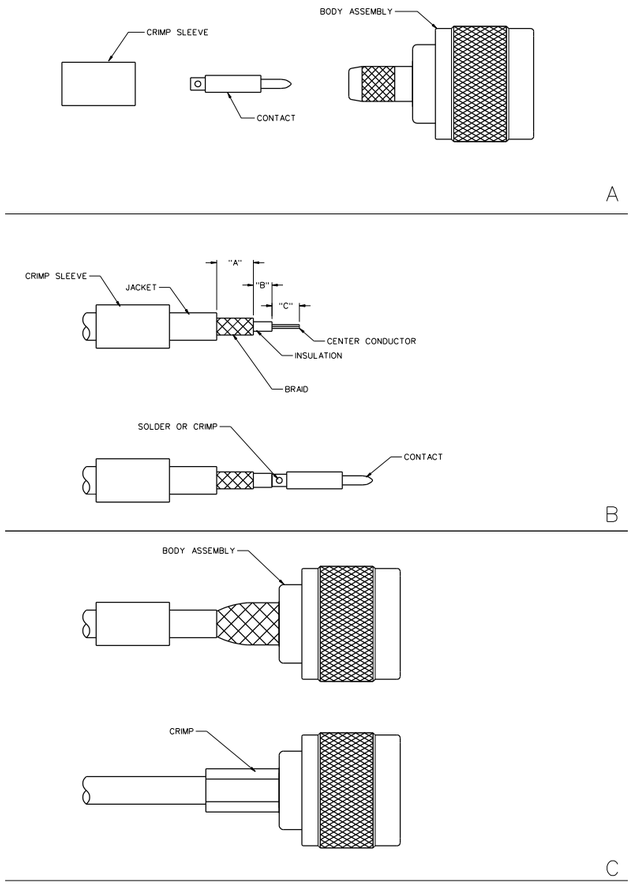
1. Identify connector parts. (3 piece parts)

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

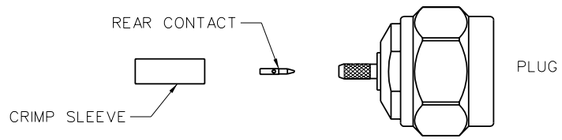
1 Identify connector parts. (3 piece parts)

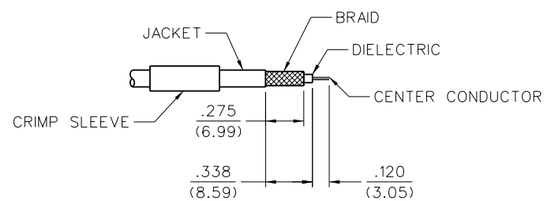
2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.

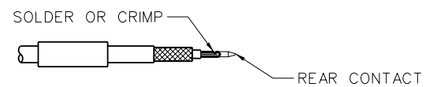
3. Assemble rear contact onto cable as shown Rear contact should butt against cable dielectric during attachment.
Solder Attachment: Solder rear contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.
Crimp Attachment: 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.

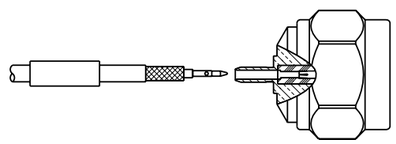
4. Flare braid and slide plug connector assembly over rear contact and under braid. Rear contact must engage fully with internal captivated plug contact. Cable jacket should be located near end of crimp stem when contacts are fully engaged.

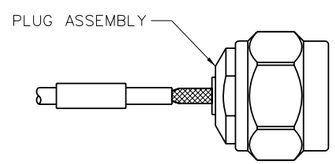
5. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.

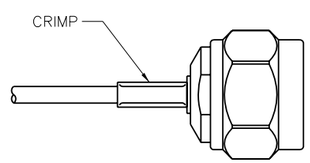












Cable Group	Part No.	Crimp Sleeve Hex Size	Contact Crimp
RG-316/U, 161, 174, 188	138-4403-007	.128 (3.25)	8 INDENT
RG-316 DS, 188 DS	138-4404-007	.151 (3.84)	8 INDENT

	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

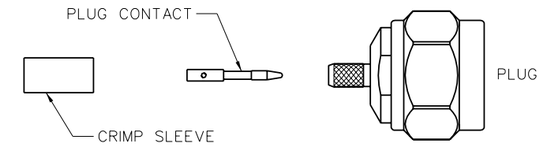
Type N Straight Plug Crimp Style for RG-58, 142, 213, 214 and LMR-400 Flexible Cable

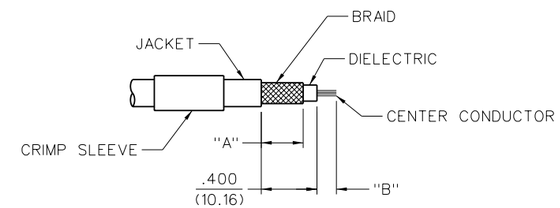
1. Identify connector parts. (3 piece parts)

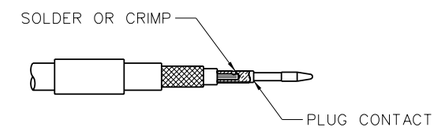
2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.

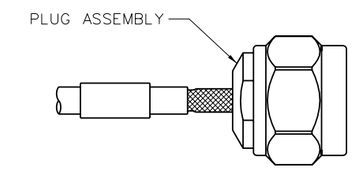
3. Assemble plug contact onto cable as shown. Plug contact should butt against cable dielectric during attachment.
Solder Attachment: Solder plug contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.
Crimp Attachment: 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.

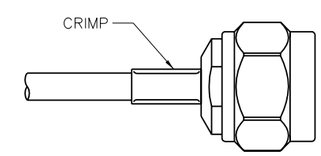
4. Flare braid and slide plug connector assembly over plug contact and under braid. Seat plug connector assembly firmly onto contact. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.











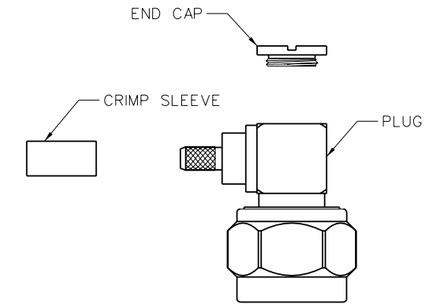
Cable Group	Part No.	"A"	"B"	Crimp Sleeve Hex Size	Contact Hex Size
RG-58/U, 141, 303	138-4407-007	.301 (7.65)	.140 (3.56)	.213 (5.41)	.068 (1.73)
RG-55/U, 142, 223, 400	138-4408-007	.301 (7.65)	.140 (3.56)	.213 (5.41)	.068 (1.73)
RG-8, 213	138-4416-007	.385 (9.78)	.170 (4.32)	.429 (10.90)	.111 (2.82)
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)

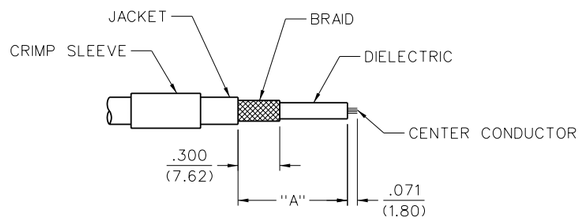
	Assembly	
Tool	138-4407/4408-007	138-4416/4418/4449-007
Crimp Frame	140-0000-967	140-0000-967
Die Set	140-0000-990	140-0000-991

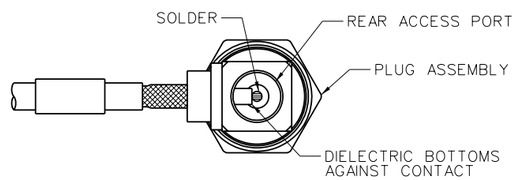
Illustrations are shown in inches (millimeters).

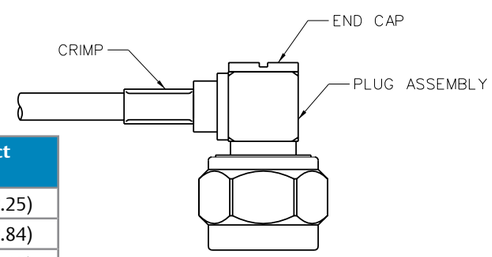
Type N Right Angle Plug Crimp Style for RG-316, 316DX, 58, and 142 Flexible Cable

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.







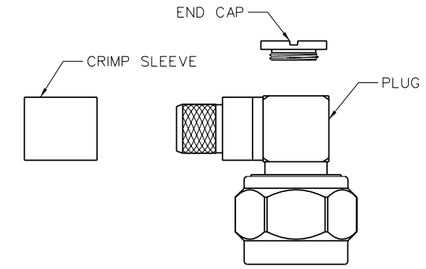


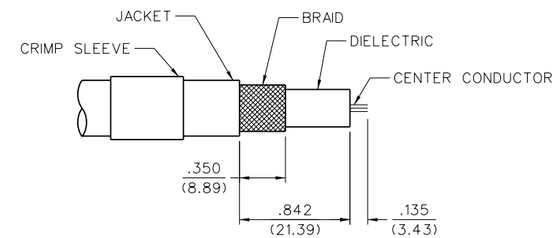
Cable Group	Part No.	Crimp Sleeve Hex Size	Contact Crimp
RG-316/U, 161, 174, 188	138-4403-107	.755 (19.18)	.128 (3.25)
RG-316 DS, 188 DS	138-4404-107	.755 (19.18)	.151 (3.84)
RG-58/U, 141, 303	138-4407-107	.788 (20.02)	.213 (5.41)
RG-55/U, 142, 223, 400	138-4408-107	.788 (20.02)	.213 (5.41)

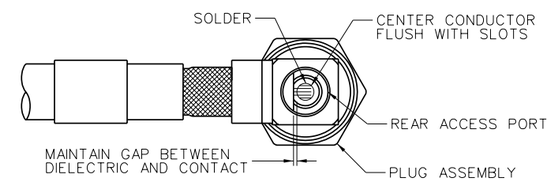
	Assembly
Tool	138-4403/4404/4407/4408-107
Crimp Frame	140-0000-967
Die Set	140-0000-990

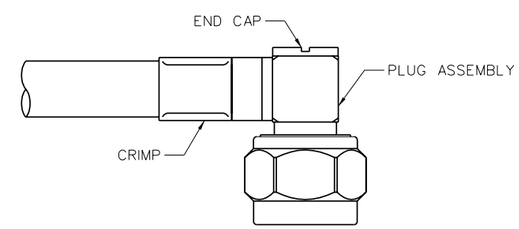
Type N Right Angle Plug Crimp Style for RG-213 and 214 Flexible Cable

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

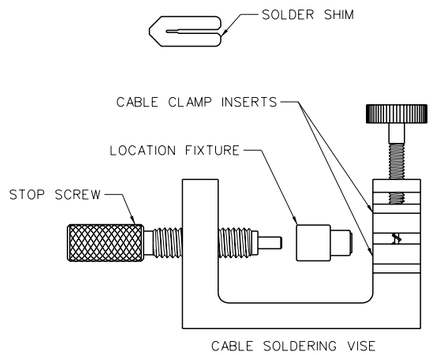
Illustrations are shown in inches (millimeters).

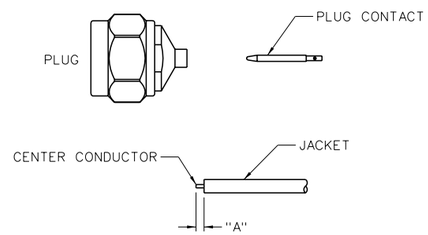
Type N Straight Plug Solder Style for Semi-Rigid Cable

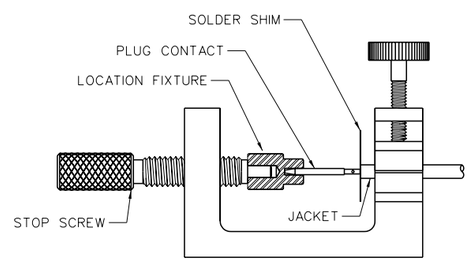
1. Identify connector parts (2 piece parts) and tools (5 piece parts).
2. Strip cable jacket and dielectric to dimension shown. Do not nick center conductor. Clean all debris from cable.
3. Place plug contact onto center conductor, insert appropriate sized solder shim between cable jacket and contact.
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.

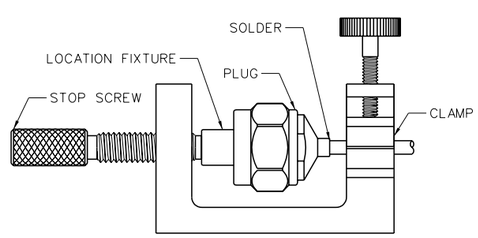
Cable Group	Part No.	"A"
RG-405, .086 Semi-Rigid	138-4693-001	.085 (2.16)
RG-402, .141 Semi-Rigid	138-4694-001	.085 (2.16)
RG-401, .250 Semi-Rigid	138-4696-001	.100 (2.54)

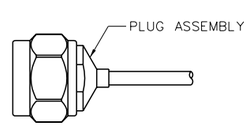
Assembly			
Tool	138-4693-001	138-4694-001	138-4696-001
Solder Shim	140-0000-984	140-0000-984	140-0000-985
Location Fixture	140-0000-983	140-0000-983	140-0000-983
Cable Vise	140-0000-962	140-0000-962	140-0000-962
Clamp Inserts	140-0000-964	140-0000-965	140-0000-986





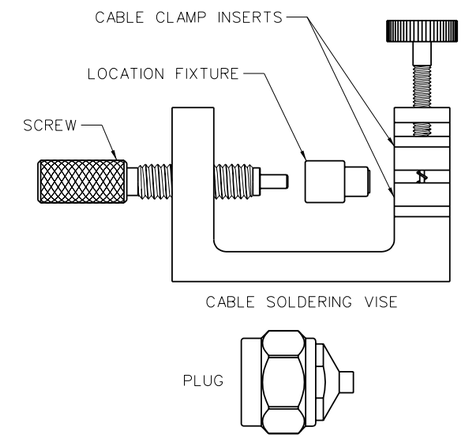


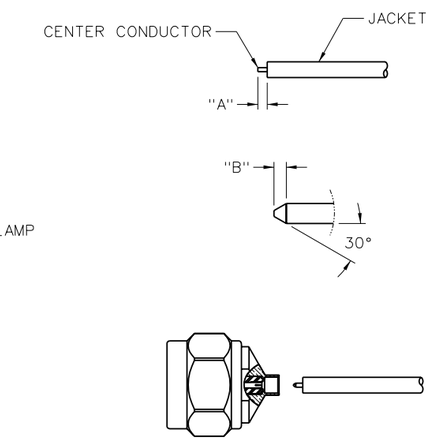


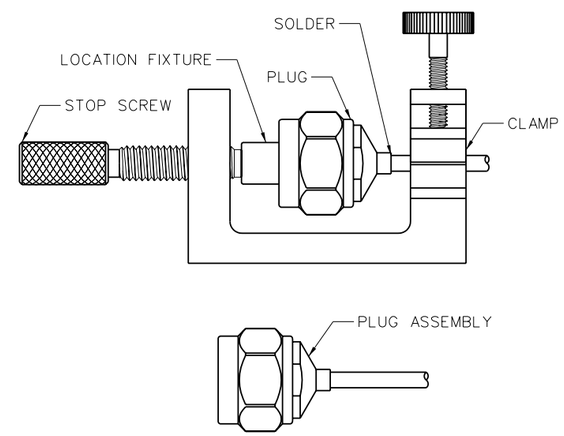


Type N Straight Plug One Piece Style for Semi-Rigid Cable

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)

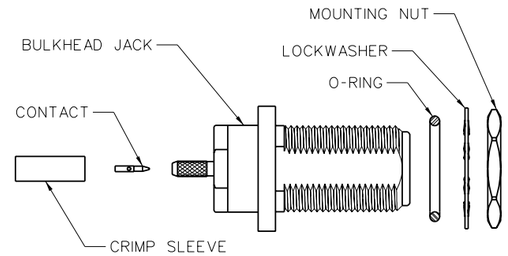
2. Strip cable to dimensions shown. Do not nick center conductor. A wire stripper of correct size is recommended for this step. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact will be crimp attached. Slide crimp sleeve onto jacket of cable.

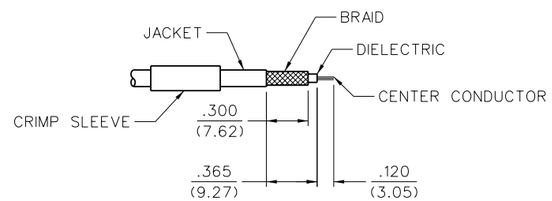
3. Assemble rear contact onto cable as shown. Rear contact should butt against cable dielectric during attachment.
   Solder Attachment: Solder rear contact to center conductor through solder hole using .020 (.051) diameter flux core solder wire. Use a minimum amount of solder for a good joint.
   Crimp 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.

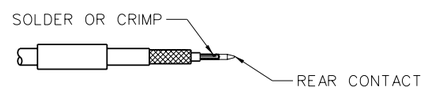
4. Flare braid and slide bulkhead jack connector assembly over rear contact and under braid. Rear contact must engage fully with internal captivated jack contact. Cable jacket should be located near end of crimp stem when contacts are fully engaged.

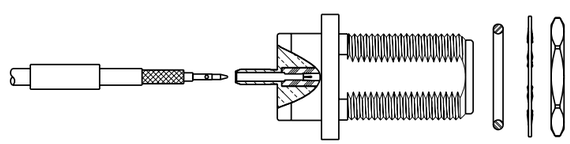
5. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using Johnson ergonomic hand crimp frame 140-0000-967 with recommended hex size die set. Maintain forward pressure on cable while crimping.

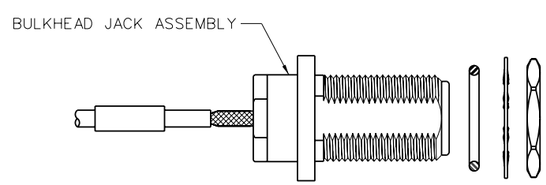
6. Add gasket, lock washer and mounting nut when installing.

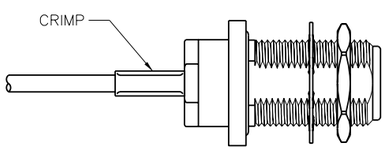












Cable Group	Part No.	Crimp Sleeve Hex Size	Contact Crimp
RG-316/U, 161, 174, 188	138-4303-407	.128 (3.25)	8 INDENT
RG-316 DS, 188 DS	138-4304-407	.151 (3.84)	8 INDENT

	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.

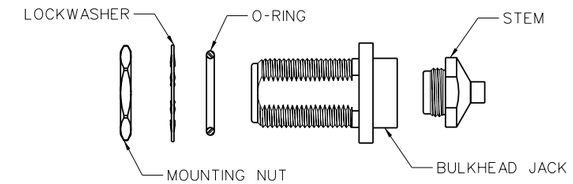
8. Slide stem over rear insulator and tighten stem into location fixture until stem bottoms out.

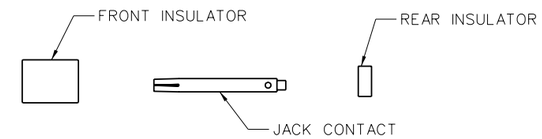
9. Insert cable into vise, but do not clamp. Insert jack contact into stop screw and tighten location fixture until stop screw bottoms out. Clamp cable in vise.

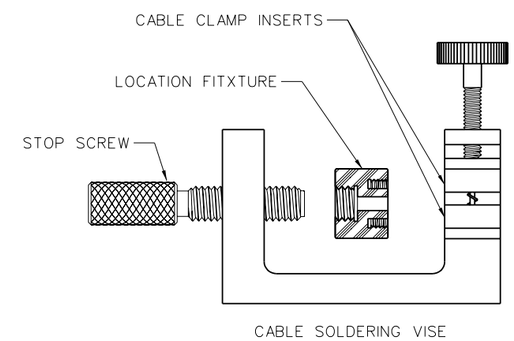
10. Solder stem to cable jacket, using a minimum amount of solder for a full fillet joint. Allow assembly to cool before removing from vise.

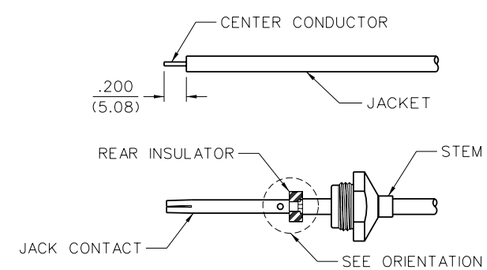
11. After solder joint has cooled, un-clamp cable and remove location fixture from stop screw and cable assembly. Insert front insulator into bulkhead jack body. Insert cable assembly into body and tighten to 25-30 in-lbs.

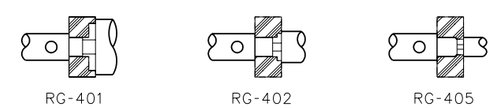
12. Add gasket, lock washer and mounting nut when installing connector to panel.



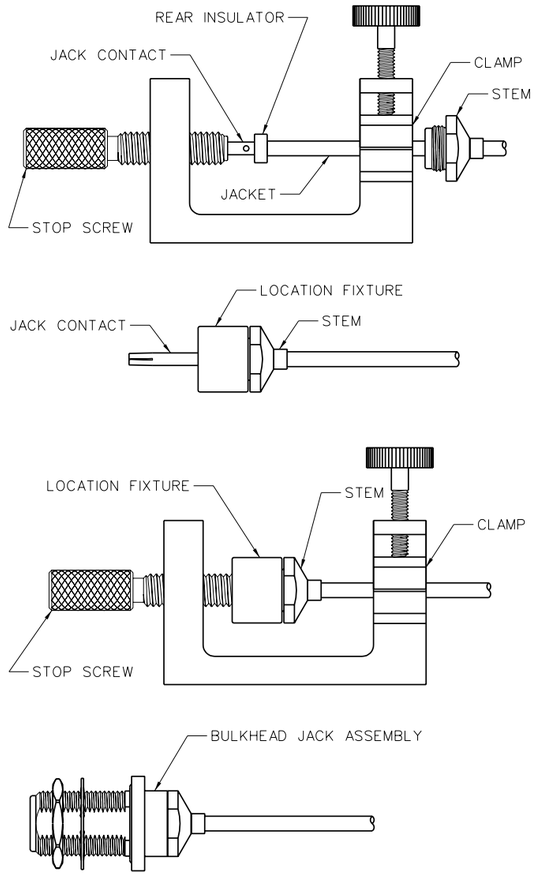








Type N Bulkhead Jack Solder Style for Semi-Rigid Cable (cont'd from last page)



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

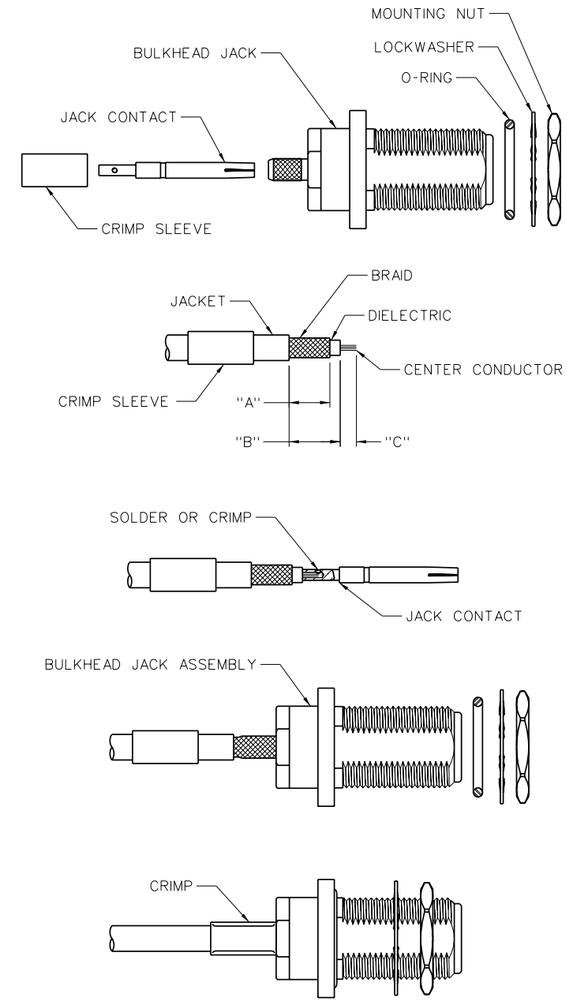
Type N Bulkhead Jack Crimp Style for RG-58, 142, 213, 214 and LMR-400 Flexible Cable

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.



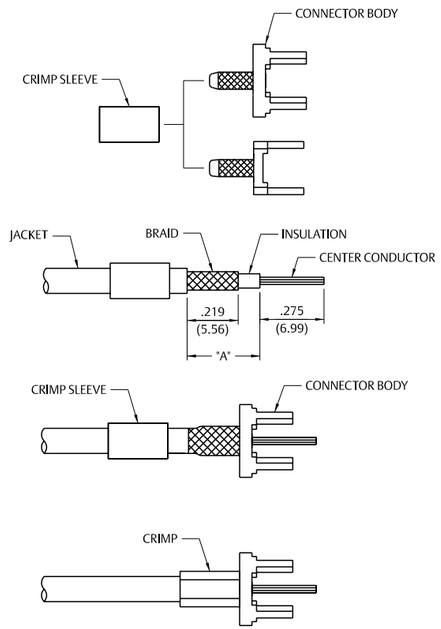
Cable Group	Part No.	"A"	"B"	Crimp Sleeve "C"	Contact Hex Size	Hex Size
RG-58/U, 141, 303	138-4307-407	.310 (7.87)	.389 (9.88)	.135 (3.43)	.213 (5.41)	.068 (1.73)
RG-55/U, 142, 223, 400	138-4308-407	.310 (7.87)	.389 (9.88)	.135 (3.43)	.213 (5.41)	.068 (1.73)
RG-8, 213	138-4316-407	.385 (9.78)	.400 (10.16)	.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.

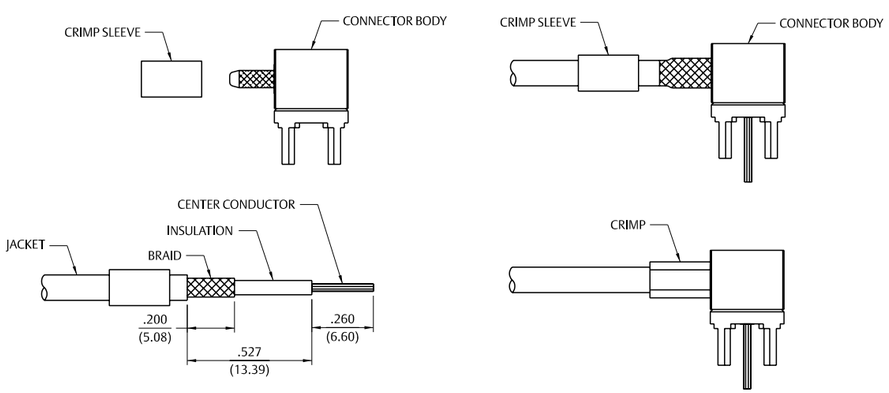
Cable Group	Part No.	"A"	Crimp Hex
RG-178/U, 196	142-0002-221/226	.259 (6.58)	.105 (2.67)
RG-316/U, 161, 174, 179, 187, 188	142-0003-201/206 142-0003-231/236 142-0003-241/246	.312 (7.92) .259 (6.58) .259 (6.58)	.128 (3.25) .128 (3.25) .128 (3.25)
RG-316 DS, 188 DS	142-0004-201/206 142-0004-211/216 142-0004-221/226	.312 (7.92) .259 (6.58) .259 (6.58)	.151 (3.83) .151 (3.83) .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.

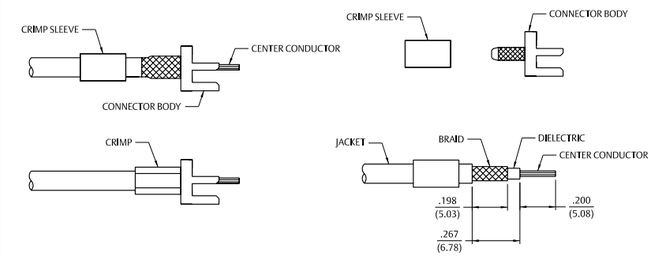
Cable Group	Part No.	Crimp Hex
RG-316/U, 161, 174, 179, 187, 188	142-0003-301/306	.128 (3.25)
RG-316 DS, 188 DS	142-0004-301/306	.151 (3.83)



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.

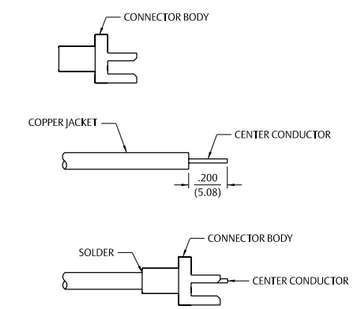
Cable Group	Part No.	Crimp Hex
RG-178/U, 196	142-0002-811	.105 (2.67)
RG-316/U, 161, 174, 179, 187, 188	142-0003-801 142-0003-811	.128 (3.25) .128 (3.25)
RG-316 DS, 188 DS, 179 DS, 187 DS	142-0004-801 142-0004-811	.151 (3.84) .151 (3.84)
RG-58/U, 141, 303	142-0007-801 142-0007-811	.213 (5.41) .213 (5.41)
RG-142/U, 55, 223, 400	142-0008-801 142-0008-811	.213 (5.41) .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

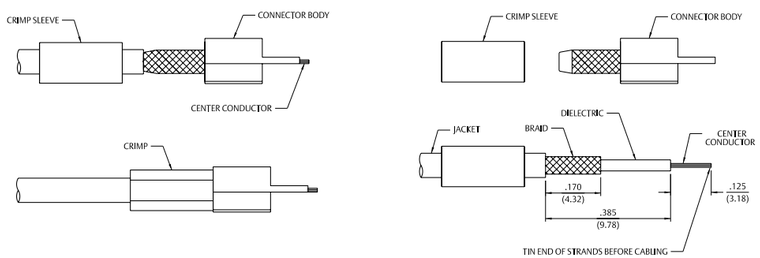


Illustrations are shown in inches (millimeters).

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.

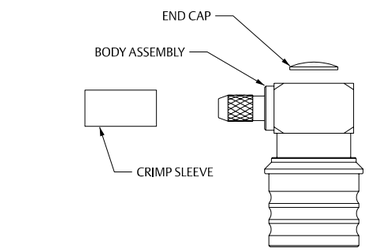
Cable Group	Part No.	Crimp Hex
RG-178/U, 196	142-0002-821	.105 (2.67)

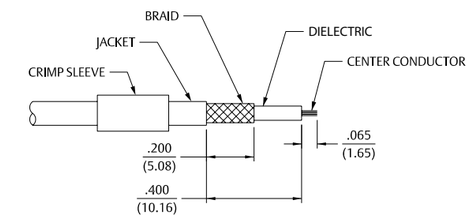


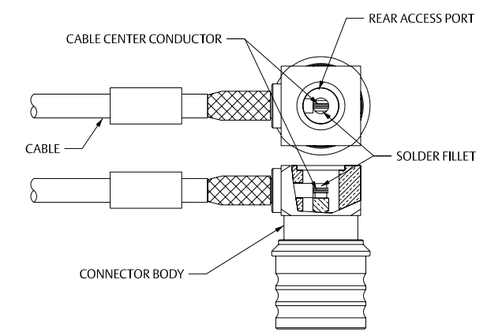
kwiQMAte™ Crimp Type Right Angle Plugs for Flexible Cable

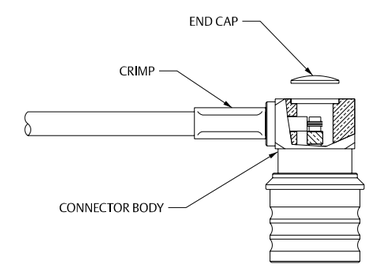
1. Identify connector parts. (3 piece parts)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
3. Flare braid and slide cable into body making certain that the cable 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

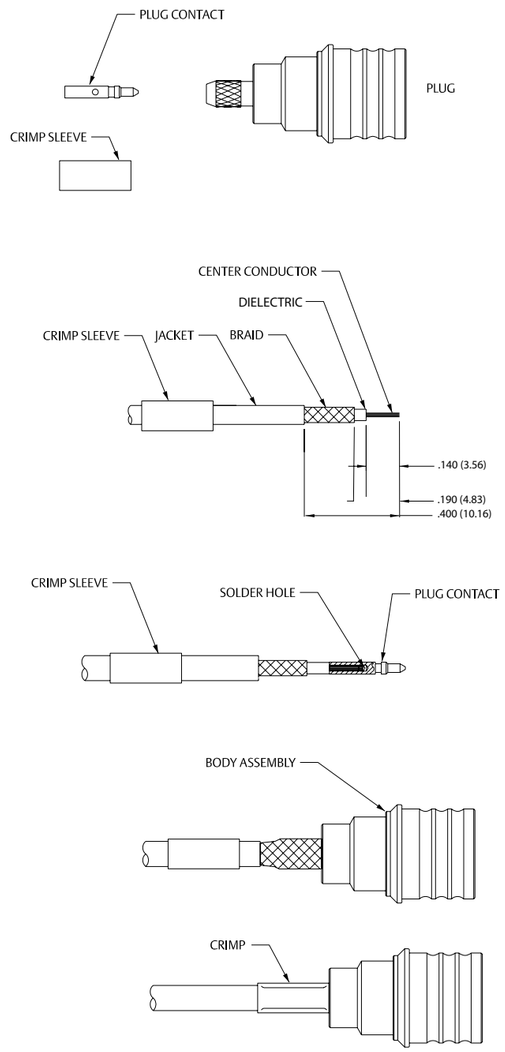
1. Identify connector parts. (3 piece parts)

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)



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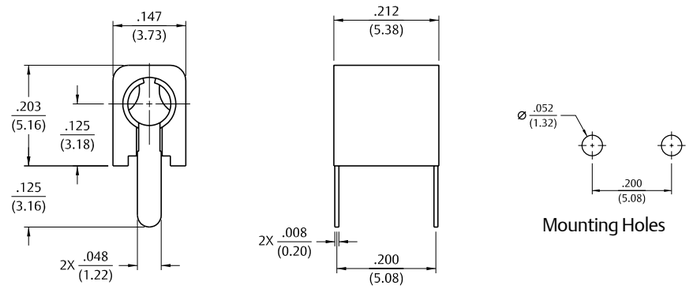
While every precaution has been taken to ensure accuracy and completeness herein, Emerson Network Power Connectivity Solutions assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without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

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

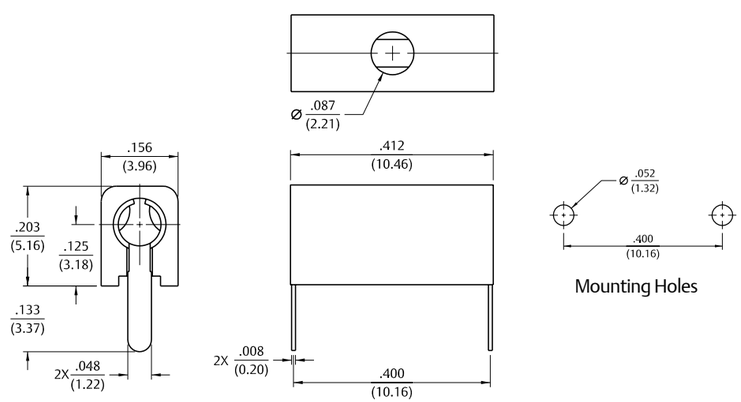
RATINGS
Current: 5 amps
Breakdown Voltage: 2100 VRMS minimum
Contact Resistance: 0.010 ohms maximum
Adjacent Jack C: 1 pF maximum at 1 MHz

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

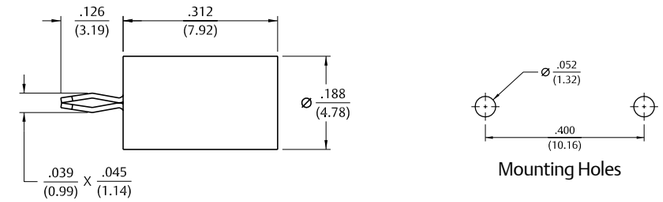
For Standard Tip Plug:
.080 (2.00) Diameter
FEATURES
- Contact protected from flux and solder
- Probe access from both ends
- Nylon UL approved for self extinguishing

*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

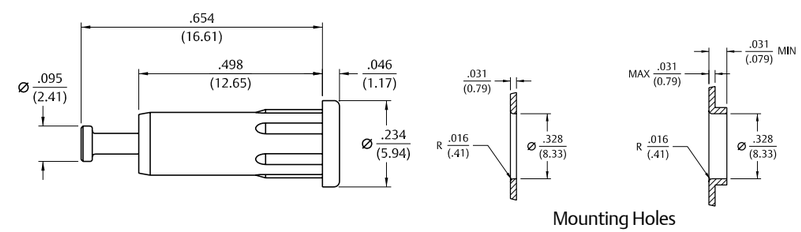
RATINGS
Current: 5 amps
Breakdown Voltage: 3500 VRMS minimum†
Contact Resistance: Silver: 0.010 ohms maximum
Adjacent Jack C: 1 pF maximum at 1 MHz

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

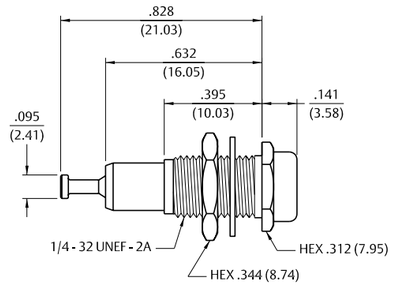
For Standard Tip Plug:
.080 (2.00) Diameter
FEATURES
- Machined contact with turret terminal
- Installs by pressing into mounting hole, no mounting hardware required
- Closed entry blocks access or probes greater than .085 (2.16)
- Nylon UL approved for self extinguishing

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

Illustrations are shown in inches (millimeters).

Tip Jacks – For Connections to Test Equipment, Power Supplies, and Electronic Instrumentation

Insulated Metal Clad: Military Type



Gold Plating 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)

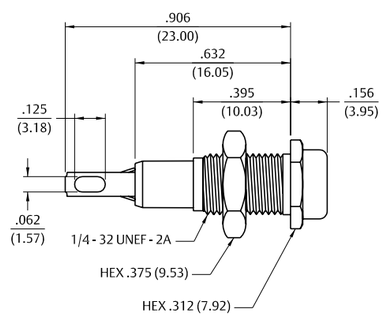
RATINGS
Current: 10 amps
Breakdown Voltage: 5700 VRMS minimum
Contact Resistance: 0.004 ohms maximum
Contact-To-Panel C: 2 pF nominal

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

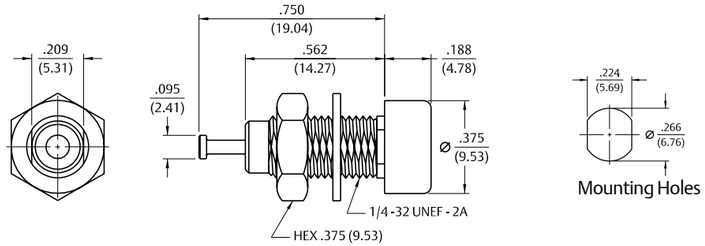
SPECIFICATIONS
Contact: Phosphor bronze per QQ-B-750
Finish: Silver
Body: Nylon 6/6 per ASTM D4066
Panel Thickness: Up to .281 (7.10)

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

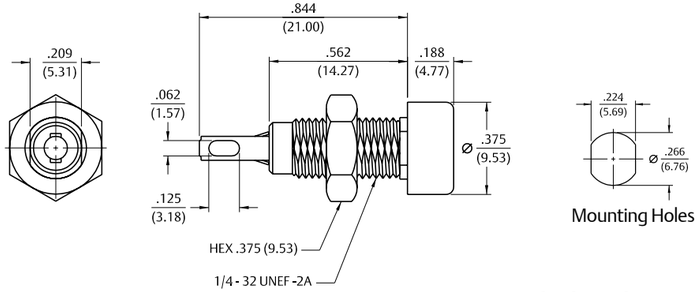
SPECIFICATIONS
Contact: Brass per QQ-B-626D with wrap around beryllium copper spring per QQ-C-533
Finish: Silver
Body: Nylon 6/6 per ASTM D4066
Hardware: Nickel plated nut (unassembled)
Body Thread Stripping Torque: 0.4 lb. in (4.5 kg cm)
Panel Thickness: Up to .437 (11.10)

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)

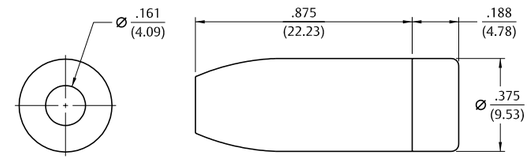
RATINGS
Current: 10 amps
Breakdown Voltage: 5700 VRMS minimum†
Contact Resistance: 0.010 ohms maximum
Contact-To-Panel C: 2 pF nominal

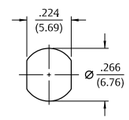
For Standard Tip Plug:
.080 (2.00) Diameter
FEATURES
- Formed contact with slotted terminal
- Hex socket head .188 (4.77) for ease in mounting
- Nylon UL approved for self extinguishing

† 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





Mounting Holes

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)

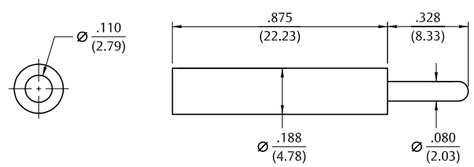
RATINGS
Current: 10 amps
Breakdown Voltage: 5700 VRMS minimum
Contact Resistance: 0.004 ohms maximum
Contact-To-Panel C: 2 pF nominal

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

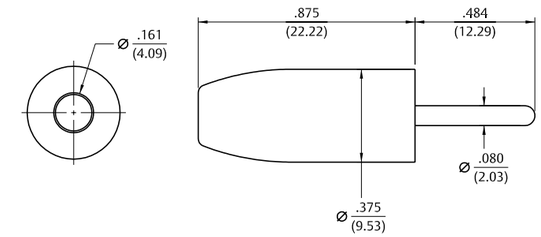
RATINGS
Current: 10 amps
Breakdown Voltage: 3500 VRMS minimum†
Contact Resistance: 0.010 ohms maximum

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.

Tip Plugs & Banana Jacks – For Connections to Monitoring Equipment

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

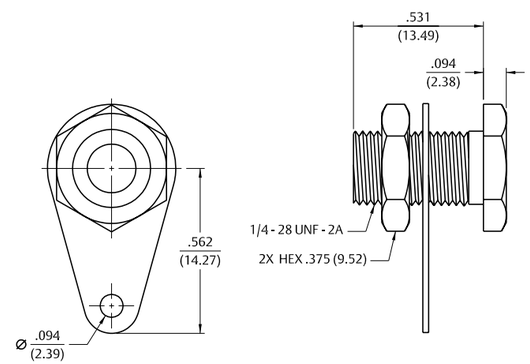
SPECIFICATIONS
Contact: Brass per QQ-B-626D
Finish: Nickel
Insulated Handle: Nylon 6/6 per ASTM D4066

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)

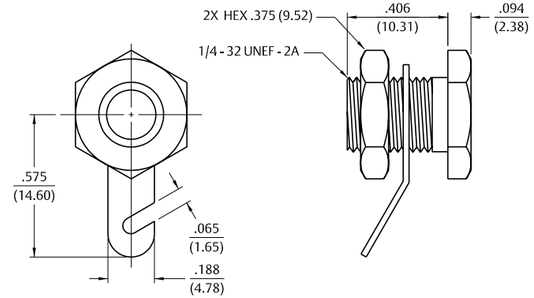
RATINGS
Current: 15 amps
Contact Resistance: 0.010 ohms maximum

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



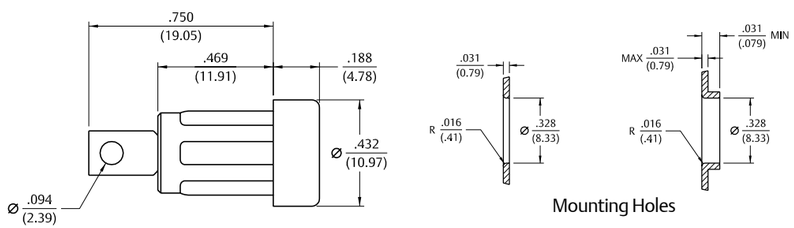
SPECIFICATIONS
Jack Body: Brass per QQ-B-626D
Finish: Nickel
Hardware: Nickel plated nut; stamped tin plated solder terminal (unassembled)
Panel Thickness: Up to .250 (6.35)

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)

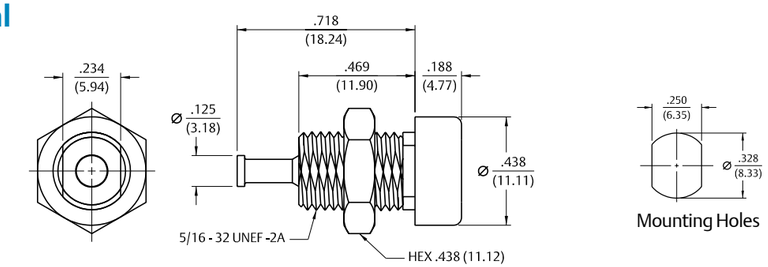
RATINGS
Current: 15 amps
Breakdown Voltage: 7000 VRMS minimum†
Contact Resistance: 0.010 ohms maximum
Contact-To-Panel C: 2.4 pF nominal

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.

Insulated Turret Terminal

Silver Plating	
Part No.	Color
108-2302-621	Red
108-2303-621	Black



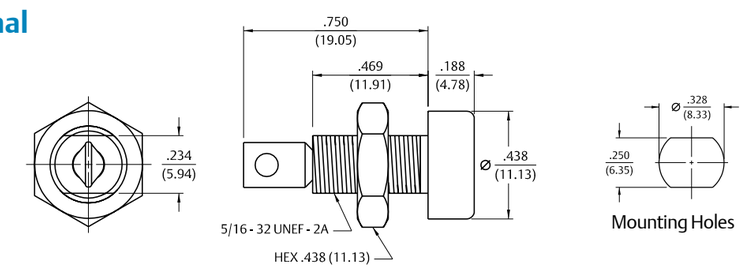
SPECIFICATIONS
Contact: Machined brass per QQ-B-626D
Finish: Silver
Body: Nylon 6/6 per ASTM D4066
Hardware: Nickel plated nut (unassembled)
Body Thread Stripping Torque: 6.0 lb. in. (7 kg cm)
Panel Thickness: Up to .343 (8.80)

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

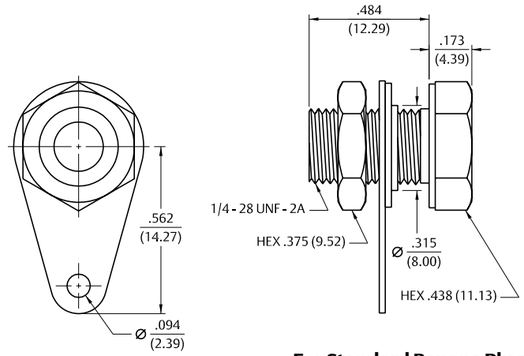
For Standard Banana Plug: .175 (4.44) Across Flats
FEATURES
- Accepts up to 12 gauge wire
- Hex head for faster installation
- For higher current designs

† 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)

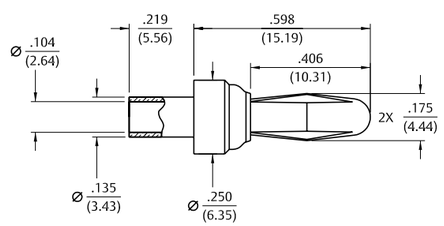
RATINGS
Current: 15 amps
Breakdown Voltage: 1500 VRMS minimum†
Contact Resistance: 0.010 ohms maximum
Contact-To-Panel: 2.4 pF nominal

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



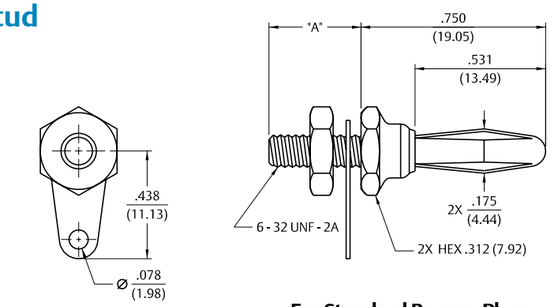
SPECIFICATIONS
Plug Body: Brass per QQ-B-626D
Plug Spring: Beryllium copper per QQ-C-533
Finish: Silver
Panel Thickness: Up to .156 (4.00)

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

Uninsulated Panel Mount Threaded Stud

Nickel Plating	
Part No.	Stud Length "A"
108-0750-001	.375 (9.50)
108-0750-002	.750 (19.05)



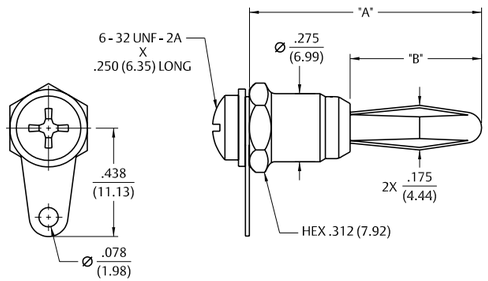
SPECIFICATIONS
Plug Body: Brass per QQ-B-626D
Plug Spring: Nickel silver per QQ-C-585
Finish: Nickel
Panel Thickness: Up to .25 (6.35) .625 (16.00)
Hardware: Nickel plated nut, stamped tin plated solder terminal (unassembled)

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				
	Body Length		Panel Thickness	
Part No.	A	B	A	B
108-0753-102	906 (32.01)	562 (14.27)	.156 max	.125 max



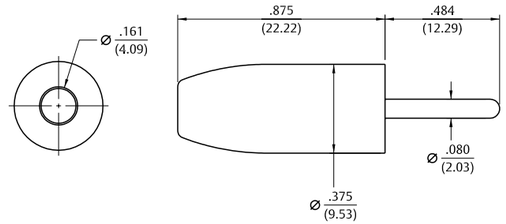
SPECIFICATIONS
Plug Body: Brass per QQ-B-626D
Plug Spring: Beryllium copper per QQ-C-533
Finish: Nickel
Panel Thickness: Up to .156 (4.00)
Hardware: Nickel plated nut, stamped tin plated solder terminal (unassembled)

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

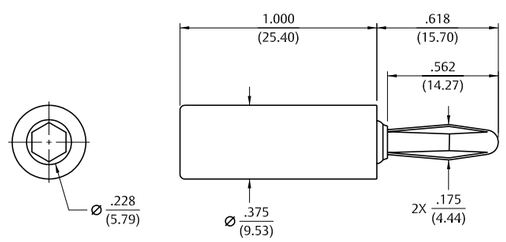
Panel Thickness: Up to .281 (7.15)

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

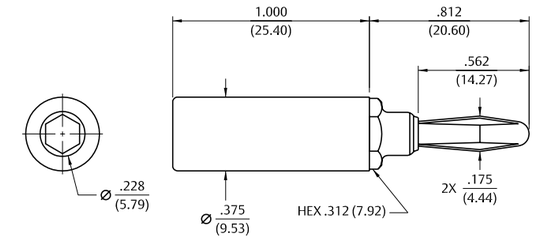
RATINGS
Current: 15 amps
Breakdown Voltage: 35 VRMS minimum†

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

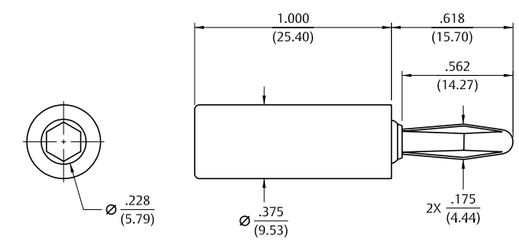
SPECIFICATIONS
Plug Body: Brass per QQ-B-626D
Plug Spring: Nickel silver per QQ-C-585
Finish: Nickel
Insulated Handle: Nylon 6/6 per ASTM D4066

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

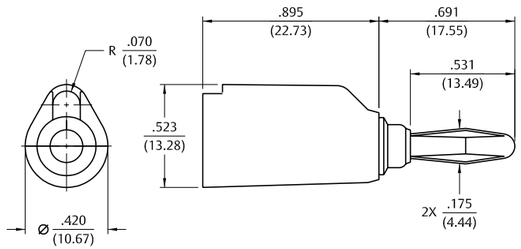
† Avoid user injury due to misapplication. See safety advisory definitions inside front cover.

Illustrations are shown in inches (millimeters).

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)

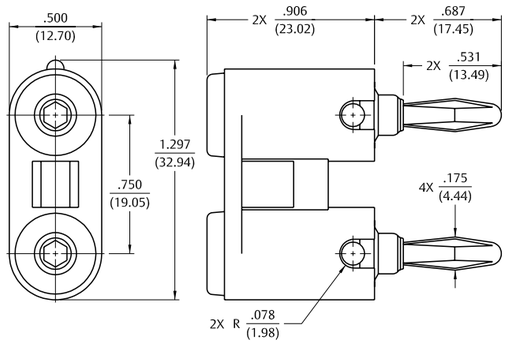
RATINGS
Current: 15 amps
Breakdown Voltage: 3500 VRMS minimum†
Contact Resistance: 0.010 ohms maximum

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 Set Screw (Accepts Wire Sizes 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

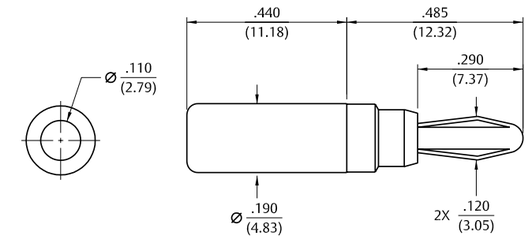
For Standard Banana Plug:
.166 (4.23) Diameter
FEATURES
- Accepts standard banana plug from rear
- Built-in strain relief for long life
- Nylon UL approved for self extinguishing

† 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

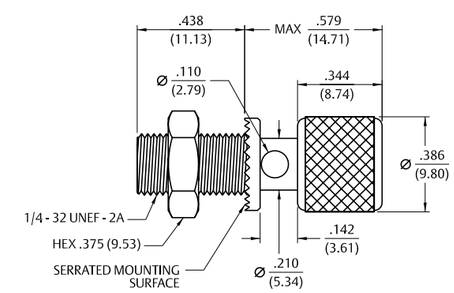
RATINGS
Current: 10 amps
Breakdown Voltage: 3500 VRMS minimum†
Contact Resistance: 0.010 ohms maximum

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)

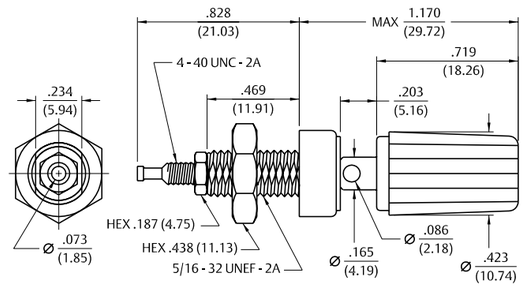
RATINGS
Current: 15 amps

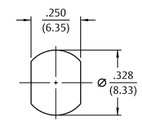
For Standard Banana Plug:
.175 (4.44) Across Flats
FEATURES
- Nickel plated stud with serrated mounting surface prevents turning
- Captive thumb nut .110 (2.79) diameter cross-hole accommodates up to 10 gauge wire

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





Mounting Holes

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)

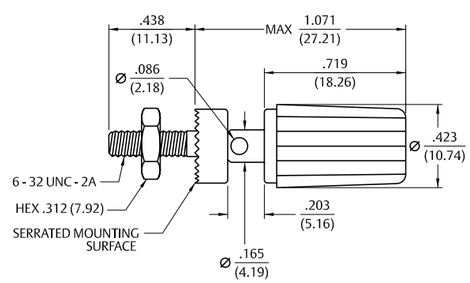
RATINGS
Current: 15 amps
Contact Resistance: 0.010 ohms maximum
Breakdown Voltage: 5700 VRMS minimum†
Stud-To-Panel: 3.3 pF nominal

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)

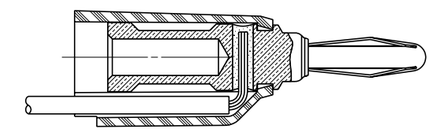
RATINGS
Current: 15 amps

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 (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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9650-1113-000	142-0701-201
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221984-5	CPFI-UG88-3
221984-7	CPFI-UG88-1
221988-1	CP-AD506
222165-2	CP-AD503
222319-1	CP-AD512
222321-1	CP-AD809
222428-1	CPFI-UG89-2
222506-2	CPMC-TNC-2
222506-4	CPMC-TNC-13
225395-1	CPMC-88-1
225395-2	CPMC-88-2
225395-5	CPMC-88-1
225395-6	CPMC-88-13
225395-7	CPM-88-19
225395-8	CPM-88-20
225395-9	CPMC-88-14
225532-1	142-0407-016
225532-9	142-0407-016
225542-1	142-0307-016
225608-9	142-0307-416
225609-1	142-0407-101
225609-4	142-0403-101
225661-2	CPN-1
225886-4	CPMC-88-26
226279-1	CPL-259-1
226279-2	CPL-259-8
226279-3	CPL-259-2
226600-1	MINI-UHF-1
227000-5	CPMC-TNC-1
227000-7	CPMC-TNC-2
227079-1	CPMC-88-1
227079-2	CPMC-88-13
227079-3	CPMC-88-2
227079-5	CPMC-88-1
227079-7	CPMC-88-2
227079-9	CPMC-88-1
227632-1	131-6701-406
227633-1	131-6701-416
227677-1	CP-BNC-PC-009
227726-3	CP-AD520
227754-1	CP-1094-U
227754-2	CP-1094-U
227754-3	CP-1094-U
227945-2	CP-AD850
227945-5	CP-AD850
227839-1	CP-TNC-PC-002
228226-3	CP-AD556
227984-1	CPFI-UG88-2
228026-2	131-6402-006
228026-3	131-6403-006
228028-1	131-6303-406
228028-3	131-6303-406
228030-1	131-6403-106
228030-2	131-6402-106
228030-3	131-6403-106
228212-1	131-1701-206
228212-1	131-3701-206
228213-1	131-1403-016
228213-1	131-3403-016
228213-2	131-3402-016
228213-3	131-1403-016
228213-3	131-3403-016
228214-1	131-1403-116
228214-1	131-3403-116
228214-2	131-1402-116
228214-2	131-3402-116
228215-1	131-3701-406
228216-1	131-3701-416
228226-1	CP-AD556
228509-9	CP-625U
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3-227079-1	CPMC-88-5
3-227079-2	CPMC-88-5
3-227079-7	CPMC-88-14
3-227086-6	CPN-1
329517	CP-AD503
329518	CP-AD505
330024	CP-AD556
331350	CPMC-88-2
4-227079-1	CPMC-88-1
4-227079-3	CPMC-88-1
4-227079-9	CPMC-88-10
4-331350-0	CPMC-88-3
413592-2	CP-AD505
413592-9	CP-AD505
413771-3	CP-89-19-BM1
414160-7	CPN-68-13
414160-9	CPN-68-1
414168-3	CP-TNC-89-19-BM
414265-1	CPFI-UG88-1
414265-3	CPFI-UG89-2
414265-4	CPFI-UG88-10
414265-5	CPFI-UG88-3
414311-1	CP-AD506
414414-1	CP-AD555
414459-1	CP-BNC-PC-016
414580-2	CPFI-UG88-1
414580-3	CPFI-UG89-2
414580-5	CPFI-UG88-10
414586-1	CPMC-88-1
414586-5	CPMC-88-1
414666-1	CP-AD503
51751-1	131-6303-401
51751-3	131-6303-401
51753-1	131-6403-101
51753-4	131-6403-101
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5-331350-3	CPMC-88-2
5801-7985-63	133-3693-001
5818-5002-10	142-0003-236
5818-5003-10	142-0003-246
5818-5005-10	142-0002-226
5831-5002-10	133-3402-006
5831-5003-10	133-3403-006
5837-5002-10	133-3402-106
5837-5003-10	133-3403-106
5837-5010-63	133-3403-101
5862-5002-10	133-3701-216
5862-5003-10	133-3701-206
5862-5004-10	133-3701-226
5863-0000-10	133-3801-201
5864-5001-10	133-3701-306
5864-5002-10	133-3701-326
5864-5003-10	133-3701-316
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6-227079-5	CPMC-88-5
6-227079-7	CPMC-88-11
BNC58HPC	CPMC-88-1
BNC58J	CP-89-1
BNC58PC	CPMC-88-1
BNC58PP	CPMC-88-11
BNC58PTV	CPFI-UG-88-1
BNC59HPC	CPMC-88-2
BNC59J	CP-89-2
BNC59JTW	CPFI-UG89-2
BNC59P	CPMC-88-2
BNC59PC	CPMC-88-2
BNC59PC75	CPMC-78-2
BNC59PP	CPMC-88-10
BNC59PPC	CPMC-88-10
BNC59PTW	CPFI-UG88-2
BNC59PTWP	CPFI-UG88-10
BNC8281HPS	CPMC-88-3
BNCBHS	CP-AD556
BNCILS	CP-AD555
BNCISJ	CP-AD520
BNCTC	CP-AD505
F59PIC	CPF-59-1/4
NP8C	CP-N-1
TNC58P	CPMC-TNC-1
TNC58PC	CPMC-TNC-1
TNC59P	CPMC-TNC-2
TNC59PC	CPMC-TNC-2
TNCBHS	CP-AD356
TNCILS	CP-AD355
AMPHENOL	**EMERSON**
27-10	131-6303-401
27-101	131-6701-401
27-175	131-1801-371
27-175	131-3801-301
27-2	131-3303-001
27-31	131-3302-001
27-5	131-3901-401
27-5050	131-3693-001
27-5052	131-1693-101
27-5052	131-3693-101
27-845	131-6303-401
27-849	131-3303-001
2900	CP-AD512
2925	CP-AD512
5575	CP-1094U
12025	CP-AD500
17450	CP-AD506
34525	CPN-2
36650	CPMC-88-14
36875	CPMC-88-13
68175	CPMC-88-2
79100	CP-AD356
79675	CP-AD300
31-10	CP-AD520
31-10-75-RFX	CP-AD520
31-10-RFX	CP-AD520
31-203	CP-AD519
31-203-RFX	CP-AD519
31-208	CP-AD505
31-208RFX	CP-AD505
31-217	CP-AD807
31-218	CP-AD511
31-218-RFX	CP-AD511
31-219	CP-AD555
31-219RFX	CP-AD555
31-2208	CP-AD505
31-221	CP-1094U
31-221-RFX	CP-1094U
31-2218	CP-AD511
31-2221	CP-1094U
31-2242-RFX	CPM-TNC-19
31-2315-RFX	CPM-TNC-19
31-2318-RFX	CP-TNC-89-19-BM
31-236	CP-1094U
31-2367-RFX	CPMC-TNC-1
31-2368-RFX	CPMC-TNC-1
31-2373	CPMC-TNC-13
31-242	CPM-88-20
31-242-RFX	CPM-88-20
31-245-RFX	CP-79-20-BM1
31-28	CP-AD500
31-315	CPM-88-19
31-315-RFX	CPM-88-19
31-318-RFX	CP-89-19-BM1
31-320	CPMC-88-1
31-320-1006	CPMC-88-11
31-320-RFX	CPMC-88-1
31-321	CPMC-88-2
31-321-1 RFX1	CPMC-88-2
31-321-1000	CPMC-88-3
31-321-RFX1	CPMC-88-2
31-3220	CP-AD521
31-323	CPMC-88-14
31-325	CPMC-88-18
31-326	CPMC-88-13
31-326-RFX	CPMC-88-3
31-4791	CP-AD355
31-4791-RFX	CP-AD355
31-4803	CP-AD521
31-4803-RFX	CP-AD580
31-5136	CPFI-UG88-2
31-5136-RFX	CPFI-UG88-2
31-5137	CPFI-UG88-1
31-5137-RFX	CPFI-UG88-1
31-5138	CPFI-UG89-2
31-5141	CPMC-88-18
31-5151	CPFI-UG88-3
31-5156	CPMC-88-2
31-5157	CPMC-TNC-2
31-5369-RFX	CPFI-UG88-10
31-5493-RFX	CP-BNCPC-007
31-5556-RFX	CP-88-2
31-5557-RFX	CP-88-1
31-5558-RFX	CPMC-88-5
31-5560-RFX	CP-88-10
31-5633	CP-BNCPC-005
31-5640-RFX	CP-BNCPC-009
31-5888-RFX	CP-TNC-PC-002
31-5893-RFX	CP-AD355
31-5900	CPMC-88-21
31-5912-RFX	CPMC-88-19
31-5913-RFX	CPMC-78-20
31-5976-50-RFX	CP-BNCPC-001
31-5980-RFX	CP-AD558
31-6-RFX	CP-BNC-CAP-1
31-70008	CPMC-68-2
31-70008	CPMC-78-2
31-70036	CP-AD705
31-70222	CPMC-78-3
31-70234	CPMC-68-45
31-70235	CPMC-68-3
31-70236	CPMC-68-18
31-70237	CPMC-68-35
31-70238	CPMC-68-33
31-71008	CPMC-78-2
31-71008-2000	CPMC-78-10
31-71008-RFX	CPMC-78-2
31-71013	CPMC-68-20
31-71032	CPMC-78-3
31-71042-RFX	CP-BNCPC-012
31-71043-RFX	CP-BNCPC-010
31-71047-10-RFX	CP-BNCPC-016
31-71058-RFX	CP-BNCPC-008
31-8	CP-AD505
31-830	CP-AD809
31-9	CP-AD503
31-9-RFX	CP-AD503
36650-3RFX1	CPMC-88-11
36650-RFX	CPMC-88-11
37-71008-RFX	CPMC-78-2
68175-1004	CPMC-88-2
68175-1005	CPMC-88-2
68175-11-RFX	CPMC-88-10
68175-5-RFX	CPMC-88-2
68175-5RFX1	CPMC-88-2
79100-NRFX	CP-AD356
81-115	MINI-UHF-1
81-115-RFX	MINI-UHF-1
82-100	CP-AD800
82-100-RFX	CP-AD800
82-101	CP-AD850
82-101-RFX	CP-AD850
82-24	CP-AD801
82-36	CP-AD803
82-4352-1	CPN-8
82-4426-11-RFX	CPN-8
82-5375	CPN-1
82-5375-RFX	CPN-1
82-5380	CPN-2
82-61	CPN-8
82-64	CP-AD803
82-97-RFX	CP-AD801
83-15P-15-RFX	CP-AD250
83-1F	CP-AD207
83-1J	CP-AD204
83-1J-RFX	CP-AD204
83-1R	CP-AD206
83-1R-RFX	CP-AD206
83-58FCP-RFX	CPL-259-1
83-58SCP	CPL-259-1
83-58SCP-RFX	CPL-259-1
83-59DCP	CPL-259-2
83-59DCP-RFX	CPL-259-2
83-85P	CPL-259-8
83-8SP-RFX	CPL-259-8
901-164	CP-AD582
901-165	CP-AD583
901-166	CP-AD508
901-130	142-0207-101
901-140	142-0203-101
901-143-6RFX	142-0701-301
901-144-8RFX	142-0701-201
901-149	142-0407-101
901-155	142-0403-001
901-168	CP-AD311
901-191	142-0901-401
901-255	142-0102-401
901-256	142-0103-401
901-276	142-0901-821
901-281	142-0202-011
901-292	CP-AD817
901-293	CP-AD818
901-294	CP-AD810
901-295	CP-AD819
901-302	142-0901-801
901-303	142-0901-811
901-367	142-0202-101
901-9183-1	142-0694-031
901-9201-2A	142-0693-001
901-9202-1A	142-0594-001
901-9202-2A	142-0593-001
901-9207-1	142-0694-021
901-9210-1	142-0594-401
901-9210-2	142-0593-401
901-9215	142-0701-631
901-9220	142-0701-411
901-9221-1A	142-0694-101
901-9221-2A	142-0693-101
901-9244-2	142-0701-621
901-9511-1	142-0408-011
901-9511-12SF	142-0404-016
901-9511-12SFC	142-0404-016
901-9511-1S	142-0408-016
901-9511-1SFC	142-0408-016
901-9511-3	142-0403-011
901-9511-3SF	142-0403-016
901-9511-3SFC	142-0403-016
901-9531-3	142-0403-101
901-9867-RFX	142-0693-001
901-9868-RFX	142-0694-001
901-9876-RFX	142-0407-011
901-9877-RFX	142-0403-011
901-9879-RFX	142-0303-411
901-9880-RFX	142-0407-101
901-9881-RFX	142-0403-101
901-9889-RFX	142-0701-411
901-9890-RFX	142-0701-401
901-9891-RFX	142-1701-131
901-9892-RFX	142-0701-631
901-9893-RFX	142-0701-621
901-9894-RFX	142-0801-301
901-9895-RFX	142-0801-201
901-9940-RFX	142-0694-011
901-9943-RFX	142-0593-001
901-9944-RFX	142-0594-001
901-9945-RFX	142-0593-401
901-9946-RFX	142-0594-401
901-9951-RFX	142-0693-101
901-9952-RFX	142-0694-101
901-9953-RFX	142-0307-011
901-9954-RFX	142-0303-011
901-9955-RFX	142-0307-411
901-9978-RFX	142-1701-511
901-9979-RFX	142-1701-611
901-9984-RFX	142-0901-811
901-9985-RFX	142-0901-801
901-9986-RFX	142-0901-401
901-9987-RFX	142-0901-821
901-B2501-519	CP-AD507
901-B2501-520	CP-AD508
903-284-52S	131-6403-001
903-285P-51S	131-1403-001
903-285P-51S	131-3403-001
903-287P-51S	131-3402-001
903-288P-52A	131-6403-101
903-289P-51A	131-1403-101
903-289P-51A	131-3403-101
903-291P-51A	131-1402-101
903-291P-51A	131-3402-101
903-305J-51R	131-3701-401
903-373J-51A	131-1701-371
903-373J-51A	131-3701-301
903-376J-51A	131-3701-341
903-402J-51R	131-3701-411
903-407J-51R	131-3701-421
903-408J-52R	131-6701-411
903-419J-52A	131-6701-341
903-420J-52P	131-6701-201
903-422J-51A	131-3303-501
903-550P-51SX	131-1403-001
903-551P-52SX	131-6403-001
903-552J-51SX	131-3303-001
903-555J-52SX	131-6303-401
903-556P-51AX	131-3403-101
903-557P-52AX	131-6403-101
903-558P-51AX	131-1403-101
903-561P-51PX	131-3801-201
903-564J-52PX	131-6701-201
903-565P-51A	131-3801-301
903-566P-52A	131-6801-301
903-567J-51A	131-3701-301
903-568J-52A	131-6701-301
903-569J-51RX	131-3701-411
903-570J-52RX	131-6701-411
903-571J-51RX	131-3701-401
903-572J-52RX	131-6701-401
908-21103	135-3801-201
908-22100	135-3711-801
908-24100	135-3701-301
908-41200	135-3402-001
908-41300	135-3403-001
908-41500	135-3404-001
908-42300	135-3303-001
908-43200	135-3402-101
908-43300	135-3403-101
908-43400	135-3693-101
908-43500	135-3404-101
BNC-AAPJ	CP-AD503
BNC-AS-JJ	CP-AD555
BNC-PC2C-P5962	CP-88-10
BNC-PS2C-58	CP-88-1
BNC-PS2C-5962	CP-88-2

COMPETITOR CROSS REFERENCE

Competitor Cross Reference

BNC-PS3C-174	CPM-88-19
BNC-PS3C-P5962	CPMC-88-10
BNC-PS3C-PL58	CPMC-88-11
BNC-T-JPJ	CP-AD505
TNC-A5-JJ	CP-AD355
TNC-PS3C-58	CPMC-TNC-1
TNC-PS3C-5962	CPMC-TNC-2

ANRITSU ..... EMERSON

K100B	142-1000-033
K101M-85	145-0693-002
K102F	145-0701-002
K103F	145-0701-602
K104F	145-0701-612

AUTOMATIC ..... EMERSON

3301-640-919	142-0403-001
3301-940-801	142-0202-011
3301-940-819	142-0203-011
3301-940-888	142-0207-011
3302-640-901	142-0402-101
3302-640-980	142-0407-101
3302-940-801	142-0202-101
3302-940-819	142-0203-101
3302-940-888	142-0207-101
3307-640-901	142-0302-401
3307-640-919	142-0303-401
3307-940-801	142-0102-401
3307-940-819	142-0103-401
E-3301-042-104	142-0694-001
E-3301-044-104	142-0694-031
E-3301-044-124	142-0693-001
E-3302-045-919	142-0403-101
E-3306-942-104	142-0594-001
E-3306-942-124	142-0593-001
E-3307-962-104	142-0594-401
E-3307-962-124	142-0593-401
E-3337-945-000	142-0701-401
E-3341-000-000	142-0701-631
E-3341-960-100	142-0701-621
E-3352-960-000	142-0901-811
E-3353-000-000	142-0901-821
E-3356-000-000	142-0901-801
E-3357-040-000	142-0901-401
H-4601-004-919	131-6403-001
H-4602-045-919	131-6403-101
H-4607-004-919	131-6303-401
H-4632-000-000	131-6701-411
H-4637-000-000	131-6701-401
H-4695-000-000	131-6701-201
H-4697-000-000	131-6701-301
H-6491-000-703	131-3701-631
H-6901-004-919	131-1403-001
H-6901-004-919	131-3403-001
H-6901-045-125	131-3693-001
H-6902-040-125	131-1693-101
H-6902-040-125	131-3693-101
H-6902-045-901	131-1402-101
H-6902-045-919	131-1403-101
H-6902-045-919	131-3403-101
H-6906-004-901	131-3302-001
H-6906-004-919	131-3303-001
H-6907-045-125	131-3593-401
H-6932-000-000	131-3701-411
H-6937-000-000	131-3701-401
H-6957-000-000	131-3901-401
H-6991-000-000	131-3801-201
H-6993-000-000	131-1801-371
H-6995-000-000	131-1701-201
H-6995-000-000	131-3701-201
H-6997-000-000	131-1701-371
H-6997-000-000	131-3701-301
Sl333-2704-308	142-0701-411

BERG ..... EMERSON

32AS100-1	131-3901-401
32J102-1	131-3303-001
32JR104-1	131-3701-401
32JR107-1	131-3701-201
32JR110-1	131-3701-411
32JR111-1	131-3701-301
32JR122-1	131-3701-341
32JR189-1	131-3711-201
32P100-1	131-1403-001
32P100-6	131-3402-001
32P111-1	131-1403-101
32P111-13	131-1402-101
32PR103-1	131-3801-201
32PR104-1	131-3801-301
37JR101-1	131-6701-411
37JR104-2	131-6701-201
37JR108-1	131-6701-401
37JR110-1	131-6701-301
37JS102-1	131-6303-401
37P104-1	131-6403-101
37P106-1	131-6403-001
37T100-1	142-0003-301
39JR128-5	142-0701-301
39JR359-1	142-0701-201
39JR363-1	142-0701-876
39JR364-1	142-0701-506
39JR364-2	142-0701-501
69JR100-2	135-3701-201
69JR101-2	135-3701-301
69JR103-2	135-3711-801
69P101-2	135-3801-201
69P103-4	135-3404-001
69P103-6	135-3403-001
69P104-3	135-3403-101
69P104-4	135-3404-101
69P104-6	135-3402-101

BIRNBACH ..... EMERSON

400	108-0750-001
401	108-0753-001
406	108-0745-101
414	108-0750-002
1160	108-030X-001
1164	108-030X-001
1169	108-030X-001
400A	108-0750-001

CABLEWAVE ..... EMERSON

700012	131-6701-401
700013	131-6701-401
700015	131-6701-411
700053	131-6701-201
700056	131-6701-301
700166	131-3701-411
700169	131-3701-401
700178	131-3593-401
700188	131-3901-401
700209	131-1701-201
700209	131-3701-201
700213	131-3801-201
700214	131-1701-371
700214	131-3701-301
700218	131-1801-371
700218	131-3801-301
700306	131-6403-001
700311	131-6303-401
700326	131-6403-101
700400	131-3303-001
700401	131-3302-001
700405	131-1403-001
700405	131-3403-001
700406	131-3402-001
700425	131-1403-101
700425	131-3403-101
700426	131-1402-101
700426	131-3402-101
700466	131-3693-001
700473	131-1693-101
700473	131-3693-101

CDI/TENSOLITE ..... EMERSON

201-1CC	145-0694-001
201-1CCSF	145-0694-002
201-2CC	145-0693-001
201-2CCSF	145-0693-002
204CC	145-0701-001
223CC	145-0901-811
224CC	145-0901-801
225CC	145-0901-821
230CC	145-0701-611
230CCSF	145-0701-612
231CC	145-0701-601
231CCSF	145-0701-602
240CCSF	145-0701-002
5602-2CC	142-1701-631
5602-2CC-SF	142-1701-636
5602-4CC	142-1701-601
5602-4CC-SF	142-1701-606
5602-5CC	142-1701-611
5602-5CC-SF	142-1701-616
5602-6CC	142-1701-621
5602-6CC-SF	142-1701-626
5603-2CC	142-1701-581
5603-2CC-SF	142-1701-586
5603-4CC	142-1701-551
5603-4CC-SF	142-1701-556
5603-5CC	142-1701-561
5603-5CC-SF	142-1701-566
5603-6CC	142-1701-571
5603-6CC-SF	142-1701-576
5604-2CC	142-1701-531
5604-2CC-SF	142-1701-536
5604-4CC	142-1701-501
5604-4CC-SF	142-1701-506
5604-5CC	142-1701-511
5604-5CC-SF	142-1701-516
5604-6CC	142-1701-521
5604-6CC-SF	142-1701-526
5606-2CC	142-1801-631
5606-2CC-SF	142-1801-636
5606-4CC	142-1801-601
5606-4CC-SF	142-1801-606
5606-5CC	142-1801-611
5606-5CC-SF	142-1801-616
5606-6CC	142-1801-621
5606-6CC-SF	142-1801-626
5607-4CC	142-1801-551
5607-4CC-SF	142-1801-556
5607-5CC	142-1801-561
5607-5CC-SF	142-1801-566
5607-6CC	142-1801-571
5607-6CC-SF	142-1801-576
5608-2CC	142-1801-531
5608-2CC-SF	142-1801-536
5663-2CC	142-1701-631
5663-2CC-SF	142-1701-636
5663-4CC	142-1701-601
5663-4CC-SF	142-1701-606
5663-5CC	142-1701-611
5663-5CC-SF	142-1701-616
5663-6CC	142-1701-621
5663-6CC-SF	142-1701-626
5664-2CC	142-1801-631
5664-2CC-SF	142-1801-636
5664-4CC	142-1801-601
5664-4CC-SF	142-1801-606
5664-5CC	142-1801-611
5664-5CC-SF	142-1801-616
5664-6CC	142-1801-621
5664-6CC-SF	142-1801-626
5665-2CC	142-1701-531
5665-2CC-SF	142-1701-536
5665-4CC	142-1701-501
5665-4CC-SF	142-1701-506
5665-5CC	142-1701-511
5665-5CC-SF	142-1701-516
5665-6CC	142-1701-521
5665-6CC-SF	142-1701-526
5666-2CC	142-1801-531
5666-2CC-SF	142-1801-536
5850-1CC	142-0693-101
5850-2CC	142-0694-101
5937-2CC	142-1701-581
5937-2CC-SF	142-1701-586
5937-4CC	142-1701-551
5937-4CC-SF	142-1701-556
5937-5CC	142-1701-561
5937-5CC-SF	142-1701-566
5937-6CC	142-1701-571
5937-6CC-SF	142-1701-576
5938-4CC	142-1801-551
5938-4CC-SF	142-1801-556
5938-5CC	142-1801-561
5938-5CC-SF	142-1801-566
5938-6CC	142-1801-571
5938-6CC-SF	142-1801-576
5941-2CC	142-1701-581
5941-2CC-SF	142-1701-586
5941-4CC	142-1701-551
5941-4CC-SF	142-1701-556
5941-5CC	142-1701-561
5941-5CC-SF	142-1701-566
5941-6CC	142-1701-571
5941-6CC-SF	142-1701-576
5942-4CC	142-1801-551
5942-4CC-SF	142-1801-556
5942-5CC	142-1801-561
5942-5CC-SF	142-1801-561
5942-6CC	142-1801-571
5942-6CC-SF	142-1801-576
5980-1CC	142-1701-541
5980-1CC-SF	142-1701-546
5980-2CC	142-1701-531
5980-2CC-SF	142-1701-536
5980-4CC	142-1701-501
5980-4CC-SF	142-1701-506
5980-5CC	142-1701-511
5980-5CC-SF	142-1701-516
5980-6CC	142-1701-521
5980-6CC-SF	142-1701-526
5981-1CC	142-1701-641
5981-1CC-SF	142-1701-646
5981-2CC	142-1701-631
5981-2CC-SF	142-1701-636
5981-4CC	142-1701-601
5981-4CC-SF	142-1701-606
5981-5CC	142-1701-611
5981-5CC-SF	142-1701-616
5981-6CC	142-1701-621
5981-6CC-SF	142-1701-626
5982-1CC	142-1801-541
5982-1CC-SF	142-1801-546
5982-2CC	142-1801-531
5982-2CC-SF	142-1801-536
5983-1CC	142-1801-641
5983-1CC-SF	142-1801-646
5983-2CC	142-1801-631
5983-2CC-SF	142-1801-636
5983-4CC	142-1801-601
5983-4CC-SF	142-1801-606
5983-5CC	142-1801-611
5983-5CC-SF	142-1801-616
5983-6CC	142-1801-621
5983-6CC-SF	142-1801-626

COAXIM ..... EMERSON

3130-12-1	142-1701-601
3130-12-9	142-1701-606
3130-15-1	142-1701-611
3130-15-9	142-1701-616
3130-18-1	142-1701-621
3130-18-9	142-1701-626
3130-20-1	142-1701-631
3130-20-9	142-1701-636
3130-36-1	142-1701-641
3130-36-9	142-1701-646
12/1/31	142-1701-501
12/9/31	142-1701-506
3131-15-1	142-1701-511
3131-15-9	142-1701-516

3131-18-1	142-1701-521
3131-18-9	142-1701-526
3131-20-1	142-1701-531
3131-20-9	142-1701-536
3131-36-1	142-1701-541
3131-36-9	142-1701-546
3131K-12-1	142-1701-551
3131K-12-9	142-1701-556
3131K-15-1	142-1701-561
3131K-15-9	142-1701-566
3131K-18-1	142-1701-571
3131K-18-9	142-1701-576
3131K-20-1	142-1701-581
3131K-20-9	142-1701-586
3310-20-1	142-1801-531
3310-20-9	142-1801-536
3310-36-1	142-1801-541
3310-36-9	142-1801-546
3310K-12-1	142-1801-551
3310K-12-9	142-1801-556
3310K-15-1	142-1801-561
3310K-15-9	142-1801-566
3310K-18-1	142-1801-571
3310K-18-9	142-1801-576
12/1/11	142-1801-601
12/9/11	142-1801-606
3311-15-1	142-1801-611
3311-15-9	142-1801-616
3311-18-1	142-1801-621
3311-18-9	142-1801-626
3311-20-1	142-1801-631
3311-20-9	142-1801-636
3311-36-1	142-1801-641
3311-36-9	142-1801-646

CONCORD ..... EMERSON

01-1044-1-0210	111-0103-001
01-1044-1-0212	111-0102-001
01-1044-1-0214	111-0107-001
01-1044-1-0215	111-0104-001
01-1044-1-0216	111-0110-001
01-1044-1-0219	111-0101-001
01-2002-1-0210	108-1763-101
01-2002-1-0212	108-1762-101
01-2006-1-0210	108-1703-101
01-2006-1-0212	108-1702-101
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01-2011-1-0212	108-1722-101
01-2071-1-0210	108-0303-001
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01-2071-1-0213	108-0306-001
01-2071-1-0214	108-0307-001
01-2071-1-0215	108-0304-001
01-2071-1-0216	108-0310-001
01-2071-1-0217	108-0312-001
01-2071-1-0218	108-0313-001
01-2071-1-0219	108-0301-001
01-2135-1-0210	105-0303-001
01-2135-1-0212	105-0302-001
01-2135-1-0215	105-0304-001
01-2135-1-0216	105-0310-001
01-2135-1-0219	105-0301-001
01-2255-3	108-0754-001
01-2310-1	108-0750-001
01-2312-1	108-0750-002
01-2341-1-02	108-0753-102
01-2520-2	108-2300-501
01-2540-1-02	108-0740-102
01-2552-1-0210	108-0253-001
01-2552-1-0212	108-0252-001
09-9074-1-0310	105-0203-200
09-9074-1-0312	105-0202-200
09-9074-1-0315	105-0204-200
09-9074-1-0316	105-0210-200
09-9074-1-0319	105-0201-200
09-9126-1-04410	108-0903-001
09-9126-1-04411	108-0908-001
09-9126-1-04412	108-0902-001
09-9126-1-04413	108-0906-001
09-9126-1-04414	108-0907-001
09-9126-1-04415	108-0904-001
09-9126-1-04416	108-0910-001
09-9126-1-04417	108-0912-001
09-9126-1-04418	108-0913-001
09-9126-1-04419	108-0901-001
09-9201-1-0310	105-2203-105
09-9201-1-0312	105-2202-105
09-9201-1-0314	105-2207-105
09-9201-1-0315	105-2204-105
09-9201-1-0319	105-2201-105
09-9221-1-0110	105-0853-001
09-9221-1-0111	105-0858-001
09-9221-1-0112	105-0852-001
09-9221-1-0113	105-0856-001
09-9221-1-0114	105-0857-001
09-9221-1-0115	105-0854-001
09-9221-1-0116	105-0860-001
09-9221-1-0119	105-0851-001
21-9205-1-0110	105-0753-001
21-9205-1-0111	105-0758-001
21-9205-1-0112	105-0752-001
21-9205-1-0113	105-0756-001
21-9205-1-0114	105-0757-001
21-9205-1-0115	105-0754-001
21-9205-1-0116	105-0760-001
21-9205-1-0117	105-0762-001
21-9205-1-0118	105-0763-001
21-9205-1-0119	105-0751-001
21-9205-1-0310	105-0753-150
21-9205-1-0312	105-0752-150
21-9205-1-0314	105-0757-150
21-9205-1-0319	105-0751-150
25-2573-1-0210	108-0253-001
25-2573-1-0212	108-0252-001
BP105B	111-0103-001
BP106R	111-0102-001
TJ103R	105-0202-200
TJ105BL	105-0203-200
TJ106GN	105-0204-200
TJ107MB	105-0210-200
TJ108W	105-0201-200

DYNAWAVE ..... EMERSON

9852-0081-6215	142-1801-606
9852-0081-6215	142-1801-616
9852-0081-6220	142-1801-626
9852-0081-6220	142-1801-636
9852-0781-6215	142-1801-606
9852-0781-6215	142-1801-616
9852-0781-6220	142-1801-626
9852-0781-6220	142-1801-636
9854-0081-6217	142-1801-556
9854-0081-6217	142-1801-566
9854-0081-6220	142-1801-536
9854-0081-6227	142-1801-576
9854-0781-6217	142-1801-556
9854-0781-6217	142-1801-566
9854-0781-6220	142-1801-536
9854-0781-6227	142-1801-576
9952-0081-6215	142-1701-606
9952-0081-6215	142-1701-616
9952-0081-6220	142-1701-626
9952-0081-6220	142-1701-636
9952-0081-6236	142-1701-646
9952-0781-6215	142-1701-606
9952-0781-6215	142-1701-616
9952-0781-6220	142-1701-626
9952-0781-6220	142-1701-636
9954-0081-6215	142-1701-506
9954-0081-6215	142-1701-516
9954-0081-6217	142-1701-556
9954-0081-6217	142-1701-566
9954-0081-6220	142-1701-526
9954-0081-6220	142-1701-536
9954-0081-6227	142-1701-576
9954-0081-6236	142-1701-546
9954-0781-6215	142-1701-506
9954-0781-6215	142-1701-516
9954-0781-6217	142-1701-556
9954-0781-6217	142-1701-566
9954-0781-6220	142-1701-526
9954-0781-6220	142-1701-536
9954-0781-6227	142-1701-576
9954-0781-6227	142-1701-586

HH SMITH ..... EMERSON

100	108-0753-001
101	108-0740-102
102	108-0750-001
109	108-0740-001
121	108-0754-001
190	108-0753-102
431	108-0750-001
433	108-0750-002
443	108-0750-001
445	108-0750-002
2079	108-2300-501
1463-101	111-0101-001
1463-102	111-0102-001
1463-103	111-0103-001
1463-104	111-0104-001
1463-105	111-0110-001
1463-107	111-0107-001
1464-101	111-0101-001
1464-102	111-0102-001
1464-103	111-0103-001
1464-104	111-0104-001
1464-105	111-0110-001
1464-107	111-0107-001
1483-102	111-0702-001
1483-103	111-0703-001
1498-102	108-2302-621
1498-103	108-2303-621
1499-102	108-2302-621
1499-103	108-2303-621
1501-101	105-0201-200
1501-102	105-0202-200
1501-103	105-0203-200
1501-104	105-0204-200
1501-105	105-0210-200
1502-10X	105-025X-001
1508-101	108-0901-001
1508-102	108-0902-001
1508-103	108-0903-001
1508-104	108-0904-001
1508-105	108-0910-001
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1509-101	108-0901-001
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1509-107	108-0907-001
1509-108	108-0908-001
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1509-113	108-0913-001
1513-102	105-0702-001
1513-103	105-0703-001
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1675-10X	108-025X-001
1677-102	108-0252-001
1677-103	108-0253-001
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204-103	108-1703-101
205-102	108-0745-101
205-103	108-0745-102
210-102	108-0252-001
210-103	108-0253-001
211-102	108-1722-101
211-103	108-1723-101
212-102	108-1762-101
212-103	108-1763-101
219-10X	108-0745-10X
232-10X	108-176X-101
242-10X	108-176X-101
244-102	105-0772-001
244-103	105-0773-001
254-10X	108-170X-101
261-10X	108-172X-101
262-10X	108-176X-101
268-102	108-1002-001
268-103	108-1003-001
271-10X	108-172X-101
281-10X	108-172X-101
325-101	105-2201-105
325-102	105-2202-105
325-103	105-2203-105
325-104	105-2204-105
325-107	105-2207-105
3502-101	105-0251-001
3502-102	105-0252-001
3502-103	105-0253-001
359-101	105-2201-101
359-102	105-2202-101
359-103	105-2203-101
359-104	105-2204-101
359-107	105-2207-101
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398-102	108-2302-801
398-103	108-2303-801
398-104	108-2304-801
398-105	108-2310-801
398-107	108-2307-801
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455-102	108-0302-001
455-103	108-0303-001
455-104	108-0304-001
455-105	108-0310-001
455-106	108-0306-001
455-107	108-0307-001
455-108	108-0308-001
455-112	108-0312-001
455-113	108-0313-001
456-101	108-0301-001
456-102	108-0302-001
456-103	108-0303-001
456-104	108-0304-001
456-105	108-0310-001
456-106	108-0306-001
456-107	108-0307-001
456-108	108-0308-001
456-112	108-0312-001
456-113	108-0313-001
457-10X	108-030X-001
458-10X	108-030X-001
476-10X	108-030X-001
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478-10X	108-030X-001
479-10X	108-030X-001
491-101	105-0301-001
491-102	105-0302-001
491-103	105-0303-001
491-104	105-0304-001
491-105	105-0310-001
492-101	105-0301-001
492-102	105-0302-001
492-103	105-0303-001
492-104	105-0304-001
492-105	105-0310-001

HUBER-SUHNER ..... EMERSON

11MCX-50-2-10	133-3403-001
11MCX-50-1-10	133-3402-001
11MCX-50-2-3	133-3693-001
11MMCX-50-1-1	135-3402-001
11MMCX-50-1-2	135-3436-001
11SMA-50-2-42	142-0403-011
11SMA-50-2-65	142-0693-001

Competitor Cross Reference

11SMA-50-3-42 142-0694-031
11SMA-50-3-64 142-0694-011
11SMA-50-3-65 142-0694-001
11SMB-50-2-13 131-3693-001
11SMB-50-1-10 131-3402-001
11SMC-50-2-10/111 131-6403-001
16MCX-50-1-5 133-3402-101
16MCX-50-2-5/111 133-3403-101
16MCX-50-2-5/133 133-3403-106
16MCX-50-2-3 133-3693-101
16MMCX-50-1-1 135-3402-101
16MMCX-50-1-2 135-3436-101
16MMCX-50-2-1 135-3693-101
16MMCX-50-2-4 135-3403-101
16MMCX-50-2-6 135-3404-101
16SMA-50-2-45 142-0403-101
16SMA-50-2-3 142-0693-101
16SMA-50-2-3 142-0694-101
16SMB-50-1-20 131-1402-101
16SMB-50-2-20 131-1403-101
16SMC-50-2-20 131-6403-101
21MCX-50-1-10 133-3302-001
21MCX-50-2-10 133-3303-001
21MMCX-50-1-1 135-3302-001
21MMCX-50-1-2 135-3303-001
22MCX-50-0-2 133-3701-401
22SMA-50-0-44 142-0701-401
22SMB-50-0-11 131-3701-421
22SMB-50-0-2 131-3701-411
22SMB-50-0-3 131-3701-401
22SMC-50-0-2 131-6701-411
22SMC-50-0-3 131-6701-401
23SMA-50-0-41 142-0701-621
23SMA-50-0-44 142-0701-631
23SMA-50-0-120 142-1701-201
23SMA-50-0-122 142-1701-191
23SMA-50-0-170 142-1701-206
23SMA-50-0-172 142-1701-196
24MCX-50-1-10 133-3302-401
24MCX-50-1-10 133-3303-401
24SMA-50-2-41 142-0593-401
24SMA-50-3-41 142-0594-401
24SMC-50-2-10C/111 131-6303-401
27SMA-50-0-1 142-0701-531
27SMA-50-0-51 142-0701-536
28SMA-50-0-1 142-0701-701
28SMA-50-0-51 142-0701-706
31MCX-50-0-1 133-3901-801
34SMB-50-0-2 131-3901-401
81MCX-50-0-1 133-3801-201
81MMCX-50-0-1 135-3801-201
81SMB-50-0-1/111 131-3801-201
82MCX-50-0-1/111 133-3701-201
82MCX-50-0-1/133 133-3701-206
82MCX-50-0-10 133-3701-231
82MCX-50-0-2 133-3701-201
82MMCX-50-0-1 135-3701-201
82SMA-50-0-41 142-0701-201
82SMB-50-0-1/111 131-1701-201
82SMC-50-0-1 131-6701-201
83MCX-0-2-5 142-0003-231
83SMC-0-2-2 142-0003-201
84SMB-50-0-1 131-1801-371
85 MCX-50-0-1 133-3701-301
85MMCX-50-0-1 135-3701-301
85SMA-50-0-44 142-0701-301
85SMB-50-0-1 131-1701-371
85SMC-50-0-1/111 131-6701-301
86SMC-50-2-2 142-0003-301

KEYSTONE ..... EMERSON

6000 105-0301-001
6001 105-0302-001
6002 105-0303-001
6003 105-0304-001
6005 105-0310-001
6006 105-0771-001
6007 105-0772-001
6008 105-0773-001
6012 105-0201-200
6013 105-0202-200
6014 105-0203-200
6015 105-0204-200
6017 105-0210-200
6018 105-0801-001
6019 105-0802-001
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6023 105-0810-001
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6025 105-0252-001
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6039 105-0857-001
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6044 105-2203-201
6045 105-2207-201
6046 105-2204-201
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6052 105-1104-001
6053 105-1110-001
6054 105-0751-001
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6058 105-0754-001
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6061 105-2202-105
6062 105-2203-105
6063 105-2207-105
6064 105-2204-105
6066 105-2201-101
6067 105-2202-101
6068 105-2203-101
6069 105-2207-101
6070 105-2204-101
6072 108-0753-001
6076 108-1002-001
6077 108-1003-001
6078 108-0302-001
6079 108-0303-001
6080 108-1762-101
6081 108-1763-101
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6083 108-1763-101
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6085 108-1703-101
6088 108-0252-001
6089 108-0253-001
6091 108-0902-001
6092 108-0903-001
6093 108-0745-001
6094 108-0745-002
6095 108-0740-102
7004 111-0102-001
7005 111-0103-001
7006 111-0702-001
7007 111-0703-001
552-4 108-0754-001
6074-1 108-0750-001
6074-2 108-0750-002
872-1 142-0594-401
872-11 142-0302-401
872-12 142-0303-401
872-8 142-0593-401
873-4 142-0594-001
873-9 142-0593-001
874-1 142-0701-401
874-5 142-0701-411
875-10-M09 142-0693-001
875-13 142-0403-001
875-4-M09 142-0694-031
875-8-M09 142-0694-001
876-1 142-0407-101
876-6 142-0403-101
877-1 142-0701-631
877-2 142-0701-621
877-21 142-0701-301
879-13 142-0901-401
879-2-M09 142-0901-811
879-3 142-0901-801

KINGS ..... EMERSON

1209-1-15-MA9 CP-AD810
1209-10 CP-AD803
1209-13 CP-AD850
1209-18 CP-AD807
1209-7 CP-AD809
2025-36-9 CPMC-78-2
2025-37-9 CPMC-78-3
2025-44-9 CPMC-68-33
2025-51-9 CPMC-78-2
2025-59-9 CPMC-78-2
2025-6-9-MO6 CPMC-78-2
2025-7-9 CPMC-78-3
2029-16-5 CP-AD705
2029-16-9 CP-AD705
2029-17-9 CP-AD557
2029-3-5 CP-AD705
2065-1-9 CPMC-68-2
2065-2-9 CPMC-68-35
2065-3-9 CPMC-68-50
2065-5-9 CPMC-68-20
2065-6-9 CPMC-68-3
2065-7-9 CPMC-68-2
2065-10-9 CPMC-68-36
2065-10-9 CPMC-68-45
2065-11-9 CPMC-68-34
759-1 CP-AD555
759-3 CP-AD505
759-4 CP-AD503
759-5 CP-AD511
879-11-15-MA9 CP-AD507
879-5-15-MA9 CP-AD508
KA-59-103 CPMC-TNC-1
KA-59-225 CPMC-TNC-1
KA-59-230 CPMC-TNC-13
KA-59-231 CPMC-TNC-1
KA-59-232 CPMC-TNC-2
KA-59-263 CPMC-TNC-2
KA-59-265 CPMC-TNC-1
KA-59-287 CPMC-TNC-1
KA-59-292 CPMC-TNC-13
KA-59-385-MO6 CPMC-TNC-2
KA-59-406-MO6 CPMC-TNC-1
KA-59-44 CPMC-TNC-1
KA-59-45 CPMC-TNC-13
KA-59-46 CPMC-TNC-2
KA-59-57 CPMC-TNC-13
KA-59-69 CPM-TNC-19
KA-59-86 CPMC-TNC-13
KA-59-94 CPMC-TNC-2
KA-91-01 CP-AD355
KA-91-05 CP-AD306
KA-91-09 CP-AD355
KA-91-18 CP-AD300
KA-99-114-MO6 CP-AD356
KA-99-59 CP-AD300
KA-99-62 CP-AD355
KC-59-104 CPMC-88-13
KC-59-107 CPMC-88-12
KC-59-115 CPMC-88-13
KC-59-116 CPMC-88-13
KC-59-123 CPMC-88-1
KC-59-128 CPMC-88-2
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KC-59-162 CPMC-88-13
KC-59-167 CPMC-88-13
KC-59-180 CPMC-88-3
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KC-59-223 CPMC-88-18
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KC-59-291 CPMC-88-1
KC-59-293 CPMC-88-1
KC-59-294 CPMC-88-2
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KC-59-306 CPMC-88-18
KC-59-307 CPMC-88-18
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KC-59-348 CPMC-88-1
KC-59-362 CPMC-88-19
KC-59-397 CPMC-88-2
KC-59-399 CPMC-88-13
KC-59-400 CPMC-88-1
KC-59-414 CPMC-88-1
KC-59-414-MO6 CPMC-88-1
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KC-59-423 CPMC-88-1
KC-59-465 CPMC-88-2
KC-59-482 CPMC-88-2
KC-59-61 CPMC-88-1
KC-59-616-MO6 CPMC-88-3
KC-59-632-MO6 CPMC-88-1
KC-59-655-MO6 CPMC-88-14
KC-59-78 CPMC-88-1
KC-59-79 CPMC-88-1
KC-59-80 CPMC-88-13
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KC-59-98 CPMC-88-1
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KC-79-109 CP-AD519
KC-79-121 CP-1094-U
KC-79-123 CP-AD519
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KC-79-132 CP-AD519
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KC-79-46 CP-1094-U
KC-99-20 CP-AD506
KC-99-30 CP-AD555
KC-99-31 CP-AD505
KC-99-32 CP-AD511
KC-99-33 CP-AD556
KC-99-34 CP-AD500
KC-99-35 CP-AD503
KC-99-37 CP-AD506
KC-99-40 CP-AD521
KC-99-42 CP-AD500
KC-99-44 CP-AD555
KC-99-52 CP-AD505
KC-99-54 CP-AD521
KC-99-56 CP-AD511
KC-99-64 CP-AD505
KC-99-95-MO6 CP-AD556
KN-59-132 CPN-8
KN-59-204-MO6 CPN-1
KN-59-207 CP-AD802
KN-59-273-MO6 CPN-2
KN-99-35 CP-AD809
KN-99-36 CP-AD809

KN-99-44 CP-AD800
KN-99-46 CP-AD807
KN-99-50 CP-AD850
KN-99-69 CP-AD803
KU-59-22 CP-AD250
KU-59-35 CPL-259-2
KU-59-48 CPL-259-8
KU-59-53 CPL-259-1
KU-99-08 CP-AD250
PL-259 CP-AD250
UG-224/U CP-AD207
UG-57 B/U CP-AD800
UG-914/U CP-AD555

MA/COM ..... SEE TYCO/AMP

MOLEX ..... EMERSON

73301-1812 142-0694-001
73301-1912 142-0693-001
73303-1812 142-0594-001
73303-1912 142-0593-001
73304-1812 142-0594-401
73304-1912 142-0593-401
73312-1212 142-0403-001
73313-1122 142-0407-101
73313-1222 142-0403-101
73314-1112 142-0207-011
73314-1212 142-0203-011
73315-1122 142-0207-101
73315-1222 142-0203-101
73324-1212 142-0303-401
73327-1212 142-0103-401
73333-5002 142-0701-631
73334-5002 142-0701-621
73352-5002 142-0701-401
73355-5002 142-0901-811
73356-5002 142-0901-821
73357-5002 142-0901-801
73359-5002 142-0901-401
73446-1212 133-3403-001
73446-1412 133-3402-001
73447-1212 133-3403-101
73447-1412 133-3402-101
73448-1922 133-3693-101
73452-1212 133-3303-001
73453-5002 133-3701-301
73454-5002 133-3701-231
73455-5002 133-3701-201
73457-5002 133-3701-401

PHOENIX ..... EMERSON

09-0450-00 131-3801-201
09-0800-677 131-1403-001
09-1080-00 131-3701-401
09-1080-01 131-3701-411
09-1450-04 131-3701-201
09-2800-0400 131-1402-101
09-2800-0670 131-1403-101
09-2800-2670 131-1404-101
09-3450-00 131-1701-371
0909-1180-00 131-3901-401
10-0800-0670 131-6403-001
10-0800-2670 131-6404-001
10-1080-00 131-6701-401
10-1080-01 131-6701-411
10-1450-00 131-6701-201
10-2800-0670 131-6403-101
10-2800-2670 131-6404-101
10-3450-0 131-6701-301
13-0200-0860 133-3693-001
13-0450-00 133-3801-201
13-0900-0400 133-3402-001
13-0900-0670 133-3403-001
13-0900-2670 133-3404-001
13-1450-00 131-3701-201
13-1900-0400 133-3302-001
13-1900-0670 133-3303-001
13-1900-2670 133-3304-001
13-2200-0860 133-3693-101
13-2800-0400 133-3402-101
13-2800-0670 133-3403-101
13-2800-2670 133-3404-101
13-3450-00 131-3701-301
20-1265-1410G 142-0594-401
20-1464-00G 142-0701-411
20-1565-0400G 142-0102-401
20-1565-0670G 142-0103-401
20-1865-0402G 142-0302-401
20-1865-672G 142-0303-401
20-2200-0860G 142-0693-101
20-2200-1410G 142-0694-101
20-2450-00G 142-0801-301
20-2500-0400G 142-0202-101
20-2500-0670G 142-0203-101
20-2500-1200G 142-0207-101
20-2800-0400G 142-0402-101
20-2800-0670G 142-0403-101
20-2800-1200G 142-0407-101
20-3450-00G 142-0701-301
20-3450-65G 142-0701-501
2020-0000-00G 142-0901-811
2020-0100-00G 142-0901-821
2020-1100-00G 142-0901-801
2020-1165-00G 142-0901-401
32-2800-0400 135-3402-101
32-2800-0670 135-3403-101
32-2800-2670 135-3404-101
33-0900-0400 135-3402-001
33-0900-0670 135-3403-001
33-0900-2670 135-3404-001
33-1442-00 135-3701-201
33-1486-00 135-3711-801
33-2200-086 135-3693-101

POMONA ..... EMERSON

3259 108-0754-001
3263 108-0750-001
4511 108-0750-002
1581-0 108-2303-621
1581-2 108-2302-621

RADIALL ..... EMERSON

R112075 131-6403-001
R112186 131-6403-101
R112307 131-6303-401
R112426 131-6701-201
R112553 131-6701-411
R112554 131-6701-401
R112665 131-6701-301
R113053 133-3693-001
R113053020 133-3693-006
R113081 133-3402-001
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R113082 133-3403-001
R113082020 133-3403-006
R113083 133-3404-001
R113083020 133-3404-006
R113153 133-3693-101
R113153020 133-3693-106
R113181 133-3402-101
R113181020 133-3402-106
R113182 133-3403-101
R113182020 133-3403-106
R113183 133-3404-101
R113183020 133-3404-106
R113236 133-3302-001
R113236020 133-3302-006
R113240 133-3303-001
R113240020 133-3303-006
R113241 133-3304-001
R113241020 133-3304-006
R113280280100 142-0003-231
R113280280120 142-0003-236
R113306 133-3302-401
R113306020 133-3302-406
R113310 133-3303-401
R113310020 133-3303-406
R113311 133-3304-401
R113311020 133-3304-406
R113426 133-3701-201
R113426020 133-3701-206
R113427 133-3701-231
R113427020 133-3701-236
R113553 133-3701-401
R113553020 133-3701-406
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R113665020 133-3701-306
R113704 133-3901-801
R113704020 133-3901-806
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R114183 131-1402-101
R114186 131-1402-101
R114222 131-3593-401
R114237 131-3302-001
R114238 131-3303-001
R114239 131-3303-001
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R114553 131-3701-411
R114554 131-3701-401
R114566 131-3701-421
R114665 131-1701-371
R114720 131-3901-401
R125052 142-0693-001
R125054 142-0694-031
R125055 142-0694-001
R125072 142-0403-011
R125072001 142-0403-016
R125072008 142-0404-011
R125073 142-0403-001
R125075 142-0407-011
R125075001 142-0407-016
R125076 142-0408-011
R125076001 142-0408-016
R125091 142-0203-011
R125172 142-0403-101
R125175 142-0407-101
R125222 142-0593-001
R125225 142-0594-001
R125237001 142-0307-016
R125238 142-0308-011
R125238001 142-0308-016
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R125326 142-0593-401
R125403 142-0701-631
R125553 142-0701-401
R125560 142-0701-411
R125680 142-0701-301
R125703 142-0901-811
R125704 142-0901-821
R125705 142-0901-801
R125720 142-0901-401
RETCONN ..... EMERSON
350-060-0040H 142-0801-201
350-060-0040N 142-0801-206
350-700-0360H 142-0202-011
350-700-0360N 142-0202-016
350-700-0630H 142-0203-011
350-700-0630N 142-0203-016
350-700-1161H 142-0207-011
350-700-1161N 142-0207-016
350-800-0630H 142-0403-001
350-800-0630N 142-0403-006
350-900-0630H 142-0403-011
350-900-0630N 142-0403-016
350-900-0631H 142-0404-011
350-900-0631N 142-0404-016
350-900-1160H 142-0407-011
350-900-1160N 142-0407-016
350-900-1161H 142-0408-011
350-900-1161N 142-0408-016
351-060-0040H 142-1701-201
351-060-0040N 142-1701-206
351-065-0000H 142-0701-631
351-065-0000N 142-0701-636
351-066-0000H 142-0701-621
351-066-0000N 142-0701-626
351-066-0040H 142-1701-131
351-066-0040N 142-1701-136
351-075-0001H 142-0701-401
351-075-0001N 142-0701-406
351-075-0002H 142-0701-411
351-075-0002N 142-0701-416
351-875-0360H 142-0302-401
351-875-0360N 142-0302-406
351-875-0630H 142-0303-401
351-875-0630N 142-0303-406
351-875-1161H 142-0308-401
351-875-1161N 142-0308-406
351-900-0630H 142-0303-011
351-900-0630N 142-0303-016
351-900-0631H 142-0304-011
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351-900-1160N 142-0307-016
351-900-1161H 142-0308-011
351-900-1161N 142-0308-016
351-975-0630H 142-0303-411
351-975-0630N 142-0303-416
351-975-0631H 142-0304-411
351-975-0631N 142-0304-416
351-975-1160H 142-0307-411
351-975-1160N 142-0307-416
351-975-1161H 142-0308-411
351-975-1161N 142-0308-416
352-060-0040H 142-0801-301
352-060-0040N 142-0801-306
352-700-0360H 142-0202-101
352-700-0360N 142-0202-106
352-700-0630H 142-0203-101
352-700-0630N 142-0203-106
352-700-1161H 142-0207-101
352-700-1161N 142-0207-106
352-900-0630H 142-0403-101
352-900-0630N 142-0403-106

Competitor Cross Reference

352-900-0631H 142-0404-101
352-900-0631N 142-0404-106
352-900-1160H 142-0407-101
352-900-1160N 142-0407-106
352-900-1161H 142-0408-101
352-900-1161N 142-0408-106
353-060-0040H 142-0701-301
353-060-0040N 142-0701-306
450-060-0046H 133-3801-201
450-060-0046N 133-3801-206
450-500-0850H 133-3693-001
450-500-0850N 133-3693-006
450-900-0360H 133-3402-001
450-900-0360N 133-3402-006
450-900-0630H 133-3403-001
450-900-0630N 133-3403-006
450-900-0631H 133-3404-001
450-900-0631N 133-3404-006
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451-060-0046N 133-3701-206
451-061-0040H 133-3711-201
451-451-0000H 133-3901-801
451-451-0000N 133-3901-806
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451-900-0630H 133-3303-001
451-900-0630N 133-3303-006
451-900-0631H 133-3304-001
451-900-0631N 133-3304-006
451-980-0360H 133-3302-401
451-980-0360N 133-3302-406
451-980-0630H 133-3303-401
451-980-0630N 133-3303-406
451-980-0631H 133-3304-401
451-980-0631N 133-3304-406
452-500-0850H 133-3693-101
452-500-0850N 133-3693-106
452-900-0360H 133-3402-101
452-900-0360N 133-3402-106
452-900-0630H 133-3403-101
452-900-0630N 133-3403-106
452-900-0631H 133-3404-101
452-900-0631N 133-3404-106
453-060-0046H 133-3701-301
453-060-0046N 133-3701-306

ROSENBERGER..... EMERSON
02-K-521-800S3.....145-0701-002
02-S-121-271S3.....142-0693-002
02-Z-101-000.....142-1000-033
29 K 100-K00 D3 133-3901-801
29 K 101-101 A3.....133-3302-006
29 K 101-101 D3 133-3302-001
29 K 101-102 A3.....133-3303-006
29 K 101-102 D3 133-3303-001
29 K 101-103 A3.....133-3304-006
29 K 101-103 D3 133-3304-001
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29 K 101-400 D3 133-3701-201
29 K 101-K00 A3 133-3901-806
29 K 104-400 A3.....133-3701-236
29 K 104-400 D3 133-3701-231
29 K 203-400 A3.....133-3701-306
29 K 203-400 D3 133-3701-301
29 K 501-101 A3.....133-3302-406
29 K 501-101 D3 133-3302-401
29 K 501-102 A3.....133-3303-406
29 K 501-102 D3 133-3303-401
29 K 501-103 A3.....133-3304-406
29 K 501-103 D3 133-3304-401
29 K 501-500 A3.....133-3701-406
29 K 501-500 D3 133-3701-401
29 S 101-101 A3.....133-3402-006
29 S 101-101 D3.....133-3402-001
29 S 101-102 A3.....133-3403-006
29 S 101-102 D3.....133-3403-001
29 S 101-103 A3.....133-3404-006
29 S 101-103 D3.....133-3404-001
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29 S 101-271 D3.....133-3693-001
29 S 201-271 A3.....133-3693-106
29 S 201-271 D3.....133-3693-101
29 S 201-301 A3.....133-3402-106
29 S 201-301 D3.....133-3402-101
29 S 201-302 A3.....133-3403-106
29 S 201-302 D3.....133-3403-101
29 S 201-303 A3.....133-3404-106
29 S 201-303 D3.....133-3404-101
29 Z 101-102 A3.....142-0003-236
29 Z 101-102 D3 142-0003-231
29 Z 101-103 A3.....142-0004-216
29 Z 101-103 D3 142-0004-211

SEALECTRO ..... EMERSON
50-024-0000.....131-6403-001
50-027-0000.....131-6303-401
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50-053-0000.....131-6701-301
50-328-3188.....131-6403-101
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128-0711-201	U.FL-R-SMT(10)
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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
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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

UMC Compatibility Table Emerson vs. HIROSE

			Emerson		HIROSE	
UMC Family	Mated Height (mm)	AWG (O.D. mm)	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

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

Emerson Network Power Connectivity Solutions, Inc., including its subsidiaries Stratos International, Inc., Trompeter Electronics, Inc., and Semflex, Inc.

TERMS AND CONDITIONS OF SALE

Emerson Network Power Connectivity Solutions, Inc. is herein referred to as the "Seller" and the customer or person or entity purchasing goods ("Goods") from Seller is referred to as the "Buyer." These Terms and Conditions, any price list or schedule, quotation, acknowledgment or invoice from Seller relevant to the sale of the Goods and all documents incorporated by specific reference herein or therein, constitute the complete and exclusive statement of the terms of the agreement governing the sale of Goods by Seller to Buyer. Buyer's acceptance of the Goods will manifest Buyer's assent to these Terms and Conditions. Seller reserves the right in its sole discretion to refuse orders.

1. PRICES: Unless otherwise specified in writing by Seller, the price quoted or specified by Seller for the Goods shall remain in effect for thirty (30) days after the date of Seller's quotation or acknowledgment of Buyer's order for the Goods, whichever occurs first, provided an unconditional authorization from Buyer for the shipment of the Goods is received and accepted by Seller within such time period. If such authorization is not received by Seller within such thirty (30) day period, Seller shall have the right to change the price for the Goods to Seller's price for the Goods at the time of shipment. All prices are exclusive of taxes, transportation and insurance, which are to be borne by Buyer.

2. TAXES: Any current or future tax or governmental charge (or increase in same) affecting Seller's costs of production, sale, or delivery or shipment, or which Seller is otherwise required to pay or collect in connection with the sale, purchase, delivery, storage, processing, use or consumption of Goods, shall be for Buyer's account and shall be added to the price.

3. TERMS OF PAYMENT: Unless otherwise specified by Seller, terms are net thirty (30) days from date of Seller's invoice in U.S. currency. Seller shall have the right, among other remedies, either to terminate this agreement or to suspend further performance under this and/or other agreements with Buyer in the event Buyer fails to make any payment when due, which other agreements Buyer and Seller hereby amend accordingly. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts. If any payment owed to Seller is not paid when due, it shall bear interest, at a rate to be determined by Seller, which shall not exceed the maximum rate permitted by law, from the date on which it is due until it is paid. Should Buyer's financial responsibility become unsatisfactory to Seller, cash payments or security satisfactory to Seller may be required by Seller for future deliveries and for the Goods theretofore delivered. If such cash payment or security is not provided, in addition to Seller's other rights and remedies, Seller may discontinue deliveries.

4. SHIPMENT AND DELIVERY: While Seller will use all reasonable commercial efforts to maintain the delivery date(s) acknowledged or quoted by Seller, all shipping dates are approximate and not guaranteed. Seller reserves the right to make partial shipments. Seller, at its option, shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions and other required information. If the shipment of the Goods is postponed or delayed by Buyer for any reason, Buyer agrees to reimburse Seller for any and all storage costs and other additional expenses resulting therefrom. Risk of loss and legal title to the Goods shall transfer to Buyer for sales in which the end destination of the Goods is outside of the United States immediately after the Goods have passed beyond the territorial limits of the United States. For all other shipments, risk of loss for damage and responsibility shall pass from Seller to Buyer upon delivery to and receipt by carrier at Seller's shipping point. All shipments are F.O.B. Seller's shipping point. Any claims for shortages or damages suffered in transit are the responsibility of Buyer and shall be submitted by Buyer directly to the carrier.

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, MERCHANTABILITY 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 tooling. 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 prepaid, 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[1]: 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.

[1] Note the definition of "Software" includes "firmware."

(Revision 7/2009)

Notes

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About Emerson Network Power Connectivity Solutions

Emerson Network Power Connectivity Solutions, an Emerson business, serves the needs of wireless communications, military, telephony and data networks, CATV security systems, health care and industrial facilities with a full spectrum of RF/microwave and fiber optic connectivity products. For more information, visit **www.EmersonConnectivity.com**

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