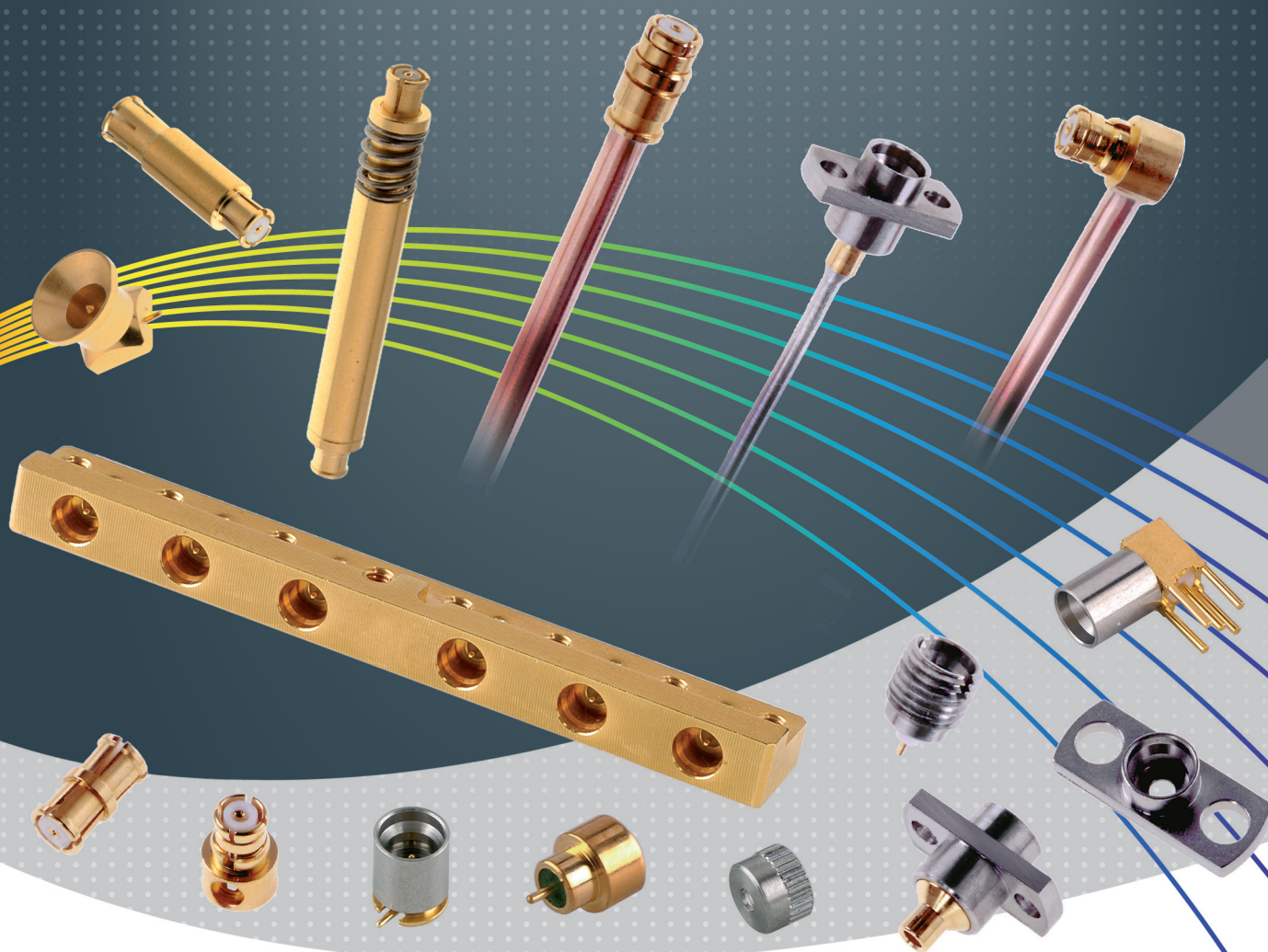




## SMP / SMP-COM / SMP-MAX series

R222

**RADIAL**   
The next conneXion



## Pages

### SMP

|                             |              |
|-----------------------------|--------------|
| Introduction .....          | 3-5          |
| Interface .....             | 3-6 to 3-7   |
| Characteristics .....       | 3-8          |
| Plugs and jacks .....       | 3-10         |
| Receptacles .....           | 3-11 to 3-13 |
| Panel shroud .....          | 3-13 to 3-14 |
| Glass bead .....            | 3-14         |
| Adapters .....              | 3-14 to 3-15 |
| Packaging .....             | 3-15         |
| Assembly instructions ..... | 3-16         |
| Panel drilling .....        | 3-20         |

### SMP-COM

|                             |              |
|-----------------------------|--------------|
| Introduction .....          | 3-5          |
| Interface .....             | 3-7          |
| Characteristics .....       | 3-9          |
| Plugs and jacks .....       | 3-17 to 3-18 |
| Receptacles .....           | 3-18         |
| Adapters .....              | 3-19         |
| Measurement .....           | 3-19         |
| Packaging .....             | 3-19         |
| Panel drilling .....        | 3-20         |
| Assembly instructions ..... | 3-20         |

### SMP-MAX

|                       |              |
|-----------------------|--------------|
| Introduction .....    | 3-4 and 3-21 |
| Characteristics ..... | 3-22         |
| Jacks .....           | 3-23         |
| Plugs .....           | 3-23         |
| Receptacles .....     | 3-24         |
| Adapters .....        | 3-25         |
| Panel drilling .....  | 3-26         |

## INTRODUCTION

### BOARD TO BOARD SOLUTIONS



#### The Best Systems

Radiall's engineers work with your engineers allowing us to develop the best competitively priced misalignment RF coaxial interconnect solutions on the market today.

#### The Best Choices

Radiall offers more board 2 board choices with four different product groups and ten connector series that can address the most demanding wireless telecom applications required for the new generation of infrastructure compact equipment. From base stations to repeaters and even handheld and GPS devices, we have a tailored connector solution for you; including the new SMP-MAX, SMP-Spring, IMP-Spring and other large, limited and no misalignment solutions.



*SMP-MAX  
Receptacle*

#### SMP-MAX

Get the best for less with the new SMP-MAX large misalignment solution. Its patented impedance matching insulator is optimized for a larger operating gap between connectors making it easier for engineers to handle a board 2 board distance tolerance of at least .078" (2.0 mm) without a spring, which is 300% more than the standard SMP! It features a 3° minimum tilt (radial travel) and it has an operating frequency range of DC-6 GHz and a 1.2 max VSWR guaranteed at DC-3 GHz.



*SMP-MAX Adapter*

#### Spring-loaded Connectors

Radiall's one connector IMP-Spring and three connector SMP-Spring and MMBX-Spring large misalignment spring-loaded series are the best for increased maximum distance tolerances.

IMP-Spring is a cost effective unique one connector solution that offers up to .023" (.6 mm) board 2 board distance tolerance with a tilt (radial travel) up to 4.5°.

The new SMP-Spring and MMBX-Spring offer up to .078" (2 mm) board 2 board distance tolerance and a 4.5° tilt (radial travel).

All spring-loaded solutions feature consistent VSWR and low RF leakage.



*IMP-Spring and SMP-Spring*



*IMP*

#### Limited Misalignment

Radiall's one connector IMP and three connector SMP and MMBX limited misalignment series are designed for applications requiring relatively precise distance tolerance of up to .023" (.6 mm) with a tilt (radial travel) of up to 4.5°.

#### No Misalignment

Radiall's MMT, MMS and MCX series are designed for applications requiring little or no distance tolerance between boards.



|     | SMP         | SMP-COM       |
|-----|-------------|---------------|
| 50Ω | DC - 40 GHz | DC - 12.4 GHz |

## GENERAL

- Microminiature
- Blindmate
- Excellent vibration and shock performances
- Allows axial and radial misalignments

## APPLICATIONS

- High density packaging
- Phased array antenna
- Satellite
- Airborne/Shipborne/Ground radar
- Communication equipment
- Board to board applications

The SMP series offers 3 levels of retention provided by the connectors with male center contact:

- **full detent** for a positive locking with a maximum retention
- **limited detent** for a positive locking with a medium retention
- **smooth bore** for the lowest retention.

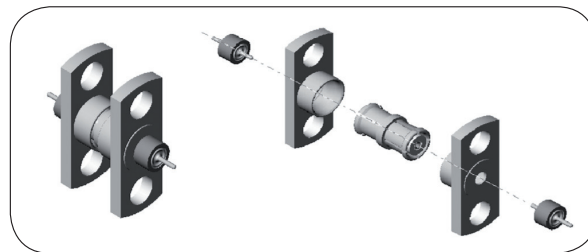
The SMP series meets MIL STD 348 specifications the DESC specifications 94007 & 94008.

Their small size permits connector center-to-center spacing as low as 4.8 mm.

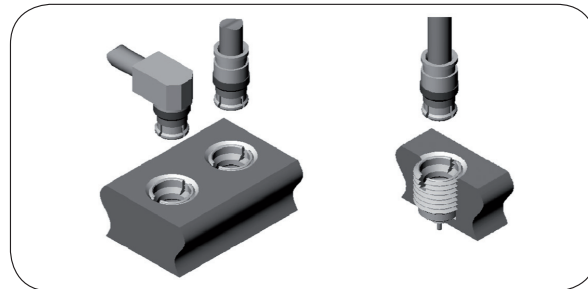
Radiall also offers multi-way connectors with SMP interface to optimize the positioning of connectors, increasing density and misalignment tolerances through the design of a metal bar. The metal bar, in which connectors are already inserted, permits the design engineer to connect several SMP connectors while at the same time maintain reasonable retention.

SMP-COM is fully intermateable with the standard SMP and has been optimized up to 12.4 GHz meeting the telecommunication applications needs.

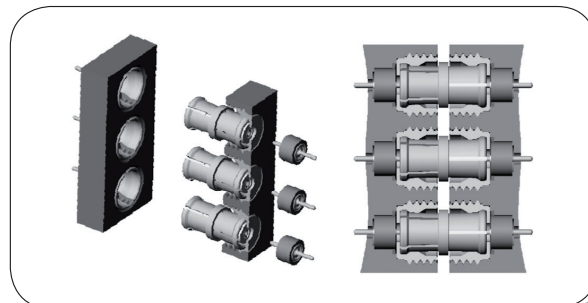
Typical combinations of SMP connectors:



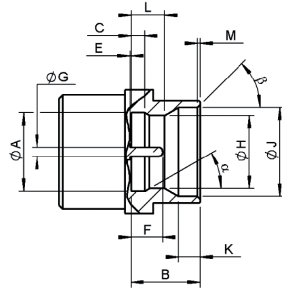
Module to module (2 hole flange shroud)



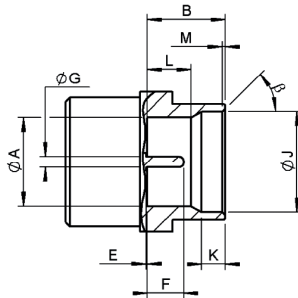
Cable to module



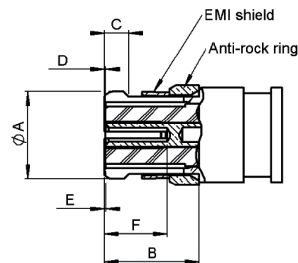
Thread-in shroud for limited space

**JACK WITH MALE CENTER CONTACT** (Full Detent or Limited Detent)

| Letter   | mm   |      | inch  |       | Note                     |
|----------|------|------|-------|-------|--------------------------|
|          | min. | max. | min.  | max.  |                          |
| A        | 3.15 | 3.20 | .124  | .125  | Dia                      |
| B        | 2.74 | 2.84 | .108  | .112  |                          |
| C        | 0.52 | 0.60 | .0205 | .0235 |                          |
| E        | 0.00 |      | 0     |       | Center contact recession |
| F        | 1.14 | 1.40 | .045  | .055  |                          |
| G        | 0.36 | 0.41 | .014  | .016  | Dia                      |
| H        | 2.90 | 3.00 | .114  | .118  | Dia: Full Detent         |
|          | 3.00 | 3.10 | .118  | .122  | Dia: Limited Detent      |
| J        | 3.53 | 3.68 | .139  | .145  | Dia                      |
| K        | 0.84 | 0.94 | .033  | .037  |                          |
| L        | 1.30 | 1.45 | .051  | .057  | Full Detent              |
|          | 1.37 | 1.52 | .054  | .060  | Limited Detent           |
| M        | 0.08 | 0.20 | .003  | .008  |                          |
| $\alpha$ | 30   |      |       |       | Degree (nom.)            |
| $\beta$  | 40   | 50   | 40    | 50    | Degree                   |

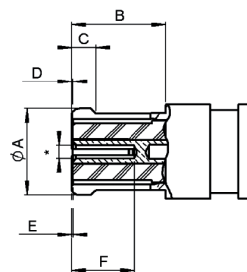
**JACK WITH MALE CENTER CONTACT** (Smooth Bore)

| Letter  | mm   |      | inch |      | Note                     |
|---------|------|------|------|------|--------------------------|
|         | min. | max. | min. | max. |                          |
| A       | 3.12 | 3.23 | .123 | .127 | Dia                      |
| B       | 2.74 | 2.84 | .108 | .112 |                          |
| E       | 0.00 |      | 0    |      | Center contact recession |
| F       | 1.14 | 1.40 | .045 | .055 |                          |
| G       | 0.36 | 0.41 | .014 | .016 |                          |
| J       | 3.53 | 3.68 | .139 | .145 | Dia                      |
| K       | 0.84 | 0.94 | .033 | .037 |                          |
| L       | 1.50 | 1.65 | .059 | .065 |                          |
| M       | 0.08 | 0.20 | .003 | .008 |                          |
| $\beta$ | 40   | 50   | 40   | 50   | Degree                   |

**PLUG WITH FEMALE CENTER CONTACT AND EMI SHIELD** (Cabled connection)

\* Accept .015  $\pm$  .001 dia pin

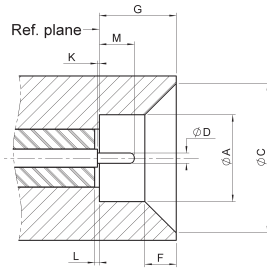
| Letter | mm   |      | inch |      | Note                     |
|--------|------|------|------|------|--------------------------|
|        | min. | max. | min. | max. |                          |
| A      |      | 3.43 |      | .135 | Dia                      |
| B      | 2.84 |      | .112 |      |                          |
| C      | 0.46 | 0.64 | .018 | .025 |                          |
| D      |      | 0.00 |      | 0    | Dielectric projection    |
| E      | 0.00 | 0.20 | 0    | .008 | Center contact recession |
| F      | 1.78 |      | 0.70 |      |                          |

**PLUG WITH FEMALE CENTER CONTACT** (Cabled connection)

\* Accept .015  $\pm$  .001 dia pin

| Letter | mm   |      | inch |      | Note                     |
|--------|------|------|------|------|--------------------------|
|        | min. | max. | min. | max. |                          |
| A      |      | 3.43 |      | .135 | Dia                      |
| B      | 2.84 |      | .112 |      |                          |
| C      | 0.46 | 0.64 | .018 | .025 |                          |
| D      |      | 0.00 |      | 0    | Dielectric projection    |
| E      | 0.00 | 0.20 | 0    | .008 | Center contact recession |
| F      | 1.78 |      | 0.70 |      |                          |

## JACK WITH MALE CENTER CONTACT (Catcher's Mitt)

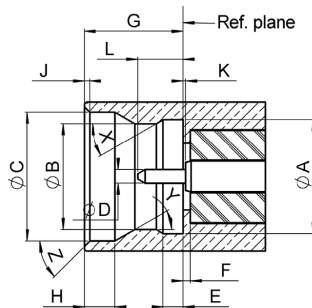


| Letter | mm   |      | inch  |       | Note                  |
|--------|------|------|-------|-------|-----------------------|
|        | min. | max. | min.  | max.  |                       |
| A      | 3.12 | 3.23 | .123  | .127  | Dia                   |
| C      | 5.40 | 5.50 | .213  | .217  | Dia                   |
| D      | 0.37 | 0.39 | .0146 | .0154 | Dia                   |
| F      | 1.10 | 1.18 | .043  | .046  |                       |
| G      | 2.77 | 2.81 | .109  | .111  |                       |
| K      | 0.00 |      | 0     |       | Center contact recess |
| L      | 0.00 |      | 0     |       | Insulator recess      |
| M      | 1.15 | 1.39 | .045  | .055  |                       |

Note: Catcher's Mitt interface is not defined in MIL-STD-348 standard.

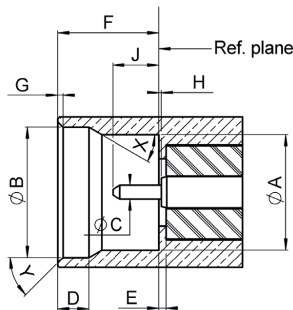
## INTERFACE SMP-COM

### MALE CONNECTOR (Full detent or Limited detent)



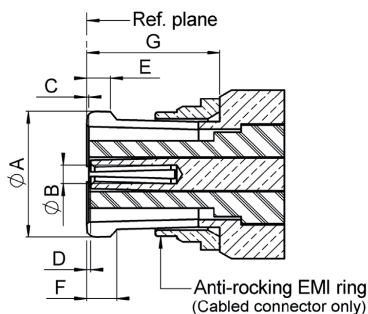
|                        |              |
|------------------------|--------------|
| Dia A                  | 3.18+/-0.02  |
| Dia B (Full detent)    | 2.95+/-0.02  |
| Dia B (Limited detent) | 3.05+/-0.02  |
| Dia C                  | 3.59 +/-0.02 |
| Dia D                  | 0.38+/-0.02  |
| E                      | 0.56+/-0.03  |
| F                      | 0.2+/-0.025  |
| G (Full detent)        | 2.79+/-0.02  |
| G (Limited detent)     | 2.77+/-0.02  |
| H                      | 0.86+/-0.02  |
| J                      | 0.15+/-0.05  |
| K                      | 0.07+/-0.07  |
| L                      | 1.27+/-0.12  |
| X                      | 30°+/-0.5°   |
| Y                      | 30°+/-0.5°   |
| Z                      | 45° nom      |

### MALE CONNECTOR (Smooth bore)



|       |             |
|-------|-------------|
| Dia A | 3.18+/-0.02 |
| Dia B | 3.59+/-0.02 |
| Dia C | 0.38+/-0.02 |
| D     | 0.86+/-0.02 |
| E     | 0.2+/-0.025 |
| F     | 2.79+/-0.02 |
| G     | 0.15+/-0.05 |
| H     | 0.07+/-0.07 |
| J     | 1.27+/-0.12 |
| X     | 30°+/-0.5°  |
| Y     | 45° nom     |

### FEMALE CONNECTOR



|       |               |
|-------|---------------|
| Dia A | 3.275+/-0.025 |
| Dia B | 0.49+/-0.02   |
| C     | 0.05+/-0.05   |
| D     | 0.05+/-0.05   |
| E     | 0.59+/-0.02   |
| F     | 0.76+/-0.1    |
| G     | 3.4+/-0.03    |

# CHARACTERISTICS

| Test/characteristics                       | Values/remarks                               |             |             |
|--------------------------------------------|----------------------------------------------|-------------|-------------|
| <b>ELECTRICAL CHARACTERISTICS</b>          |                                              |             |             |
| Impedance                                  | 50Ω                                          |             |             |
| Frequency range                            | DC - 40 GHz                                  |             |             |
| Typical V.S.W.R.                           | DC-12 GHz                                    | 12-26.5 GHz | 26.5-40 GHz |
| • Straight styles                          | 1.15                                         | 1.15        | 1.5         |
| • Right angle styles                       | 1.25                                         | 1.35        | -           |
| • Adapters                                 | 1.10                                         | 1.15        | 1.5         |
| • Receptacles                              | 1.30                                         | -           | -           |
| Insertion loss (dB)                        | 0.12 V/F (F in GHz)                          |             |             |
| Insulation resistance (MΩ)                 | 5000                                         |             |             |
| Voltage rating (V.R.M.S.)                  | 335                                          |             |             |
| Dielectric withstanding voltage (V.R.M.S.) | 500                                          |             |             |
| RF leakage                                 | -80 dB to 3 GHz<br>-65 dB from 3 to 26.5 GHz |             |             |

## MECHANICAL CHARACTERISTICS

|                                     |                                          |                  |                   |
|-------------------------------------|------------------------------------------|------------------|-------------------|
|                                     | smooth bore                              | limited detent   | full detent       |
| Mechanical endurance (matings)      | 1000                                     | 500              | 100               |
| Engagement and separation force (N) | 9 max. - 2.2 min.                        | 45 max. - 9 min. | 68 max. - 22 min. |
| Radial misalignment                 | ± 0.25 mm (± .010")                      |                  |                   |
| Axial misalignment                  | 0, + 0.25 mm (0/ .010")                  |                  |                   |
| Vibration                           | MIL-STD-202 method 204, test condition D |                  |                   |
| Shock                               | MIL-STD-202 method 213, test condition I |                  |                   |
| Thermal shock                       | MIL-STD-202 method 107, test condition B |                  |                   |
| Cable retention (N)                 | .047"                                    | 45               |                   |
|                                     | .085"                                    | 200              |                   |
| Contact captivation axial (N)       | 6.8                                      |                  |                   |

## ENVIRONMENTAL CHARACTERISTICS

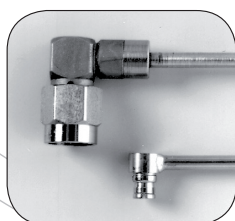
|                       |                |
|-----------------------|----------------|
| Operating temperature | -65°C / +165°C |
|-----------------------|----------------|

## MATERIALS

|                                            |                                  |
|--------------------------------------------|----------------------------------|
| Cable connector with female center contact | Beryllium copper                 |
| Cable connector with male center contact   |                                  |
| Bodies                                     | Stainless steel                  |
| Soldering part                             | Brass                            |
| Receptacles, shrouds                       | Stainless steel                  |
| In series adapters                         | Beryllium copper                 |
| Center contacts                            | Beryllium copper                 |
| Center contacts for glass seal             | Iron nickel cobalt sealing alloy |
| Insulators                                 | PTFE                             |

## PLATING

|                                            |            |
|--------------------------------------------|------------|
| Cable connector with female center contact | Gold       |
| Cable connector with male center contact   |            |
| Bodies                                     | Passivated |
| Soldering part                             | Gold       |
| Receptacles, shrouds                       | Passivated |
| In series adapters                         | Gold       |
| Center contacts                            | Gold       |
| Center contacts for glass seal             | Gold       |



The SMP small size dramatically increases the packaging density of 40 GHz connections (see picture: SMA 2.9/SMP).

Standard packaging = 100 pieces.  
All dimensions are given in mm

| Test/characteristics | Values/remarks |
|----------------------|----------------|
|----------------------|----------------|

## ELECTRICAL CHARACTERISTICS

|                                                                                |                                                         |                                     |
|--------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------|
| Impedance                                                                      | 50Ω                                                     |                                     |
| Frequency range                                                                | DC - 6 GHz (optimized)<br>DC - 12.4 GHz (working range) |                                     |
| Typical V.S.W.R.<br>• Straight styles<br>• Right angle styles<br>• Receptacles | DC - 2.5 GHz<br>1.10<br>1.15<br>1.06                    | 2.5 - 6 GHz<br>1.15<br>1.25<br>1.10 |
| Insertion loss (dB)                                                            | 0.12 √F (F in GHz)                                      |                                     |
| Insulation resistance (MΩ)                                                     | 5000                                                    |                                     |
| Voltage rating (V.R.M.S.)                                                      | 750                                                     |                                     |
| RF leakage                                                                     | -55 dB 0 to 3 GHz<br>-40 dB from 3 to 6 GHz             |                                     |

## MECHANICAL CHARACTERISTICS

|                                                                  | smooth bore            | limited detent   | full detent       |
|------------------------------------------------------------------|------------------------|------------------|-------------------|
| Mechanical endurance (matings)                                   | 100                    |                  |                   |
| Engagement and separation force (N)                              | 9 max. - 2.2 min.      | 45 max. - 9 min. | 68 max. - 22 min. |
| Radial misalignment                                              | ± 0.25 mm              |                  |                   |
| Axial misalignment                                               | 0, +0.25 mm            |                  |                   |
| Moisture resistance                                              | MIL-STD-202 method 106 |                  |                   |
| Cable retention (N) • .085" semi-rigid<br>• 2/50/S<br>• 2.6/50/S | 200<br>35<br>58        |                  |                   |
| Contact captivation axial (N)                                    | 6.8                    |                  |                   |

## ENVIRONMENTAL CHARACTERISTICS

|                                                  |                                  |
|--------------------------------------------------|----------------------------------|
| Operating temperature • Standard<br>• Semi-rigid | -55°C / +125°C<br>-55°C / +105°C |
|--------------------------------------------------|----------------------------------|

## MATERIALS

|                    |                           |
|--------------------|---------------------------|
| Cable connectors   | Beryllium copper or brass |
| Receptacles        | Brass                     |
| In series adapters | Beryllium copper          |
| Center contacts    | Beryllium copper/brass    |
| Insulators         | PTFE/PEEK                 |

## PLATING

|                    |      |
|--------------------|------|
| Cable connectors   | NPGR |
| Receptacles        | NPGR |
| In series adapters | NPGR |
| Center contacts    | NPGR |

Standard packaging = 100 pieces.

All dimensions are given in mm

## PLUGS AND JACKS

## PLUG, SOLDER TYPE FOR SEMI-RIGID CABLES (with female center contact)

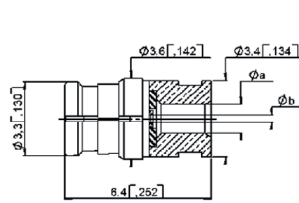
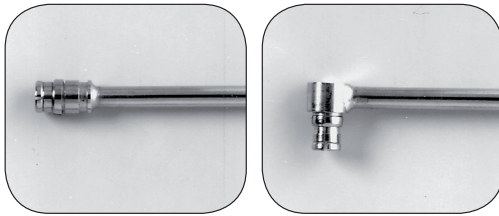


Fig. 1

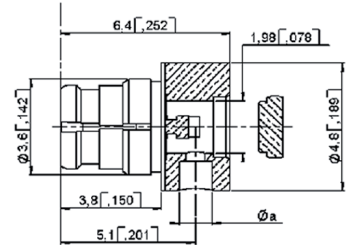
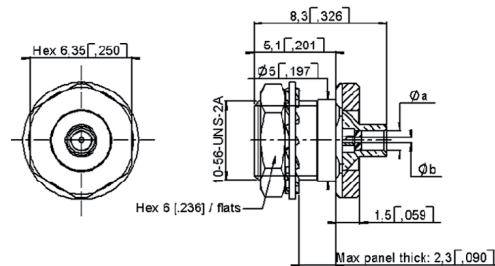


Fig. 2

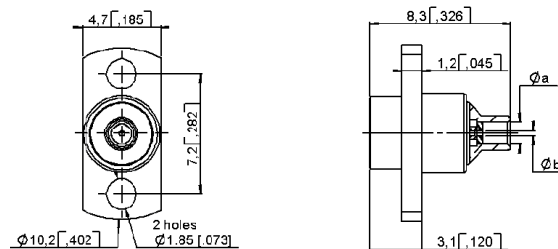
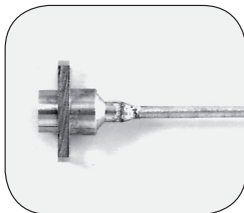
| Cable group      | Cable group dia. | Part number  | Fig | Dimensions mm (inch) |             | Captive center contact | Orientation | Finish |
|------------------|------------------|--------------|-----|----------------------|-------------|------------------------|-------------|--------|
|                  |                  |              |     | $\phi$ a             | $\phi$ b    |                        |             |        |
| .047" semi-rigid | .047"            | R222 051 000 | 1   | 1.30 (.050)          | 0.30 (.012) | no                     | straight    | Gold   |
| RG405            | .085"            | R222 052 000 |     | 2.30 (.091)          | 0.53 (.021) |                        |             |        |
| .047" semi-rigid | .047"            | R222 151 000 | 2   | 1.30 (.050)          |             | yes                    | right angle |        |
| RG405            | .085"            | R222 152 000 |     | 2.30 (.091)          |             |                        |             |        |

## BULKHEAD FEEDTHROUGH JACK, SOLDER TYPE FOR SEMI RIGID CABLES (with male center contact)



| Cable group | Cable group dia. | Part number  | Retention      | Dimensions mm (inch) |             | Captive center contact | Panel drilling | Finish                             |
|-------------|------------------|--------------|----------------|----------------------|-------------|------------------------|----------------|------------------------------------|
|             |                  |              |                | $\phi a$             | $\phi b$    |                        |                |                                    |
| RG405       | .085"            | R222 302 002 | Full detent    | 2.30 (.091)          | 0.55 (.022) | no                     | P05            | passivated + gold (soldering part) |
|             |                  | R222 302 302 | Limited detent |                      |             |                        |                |                                    |
|             |                  | R222 302 702 | Smooth bore    |                      |             |                        |                |                                    |

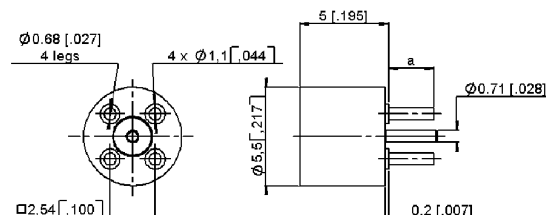
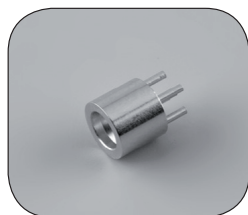
## TWO HOLE FLANGE JACK SOLDER TYPE FOR SEMI RIGID CABLES (with male center contact)



| Cable group | Cable group dia. | Part number  | Retention      | Dimensions mm (inch) |             | Captive center contact | Panel drilling | Finish                             |
|-------------|------------------|--------------|----------------|----------------------|-------------|------------------------|----------------|------------------------------------|
|             |                  |              |                | $\phi a$             | $\phi b$    |                        |                |                                    |
| RG405       | .085"            | R222 252 001 | Full detent    | 2.30 (.091)          | 0.60 (.024) | no                     | P01            | passivated + gold (soldering part) |
|             |                  | R222 252 301 | Limited detent |                      |             |                        |                |                                    |
|             |                  | R222 252 702 | Smooth bore    |                      |             |                        |                |                                    |

To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.  
**Bold** part numbers represent products typically in stock & available for immediate shipment.  
 See page 8 and 9 for packaging information.

## PCB STRAIGHT RECEPTACLE, 4 SOLDER LEGS (with male center contact)



| Part number  | Retention      | Dimensions mm (inch) | PCB mounting | Finish |
|--------------|----------------|----------------------|--------------|--------|
|              |                | a                    |              |        |
| R222 426 000 | full detent    | 2.5 (.098)           | P03          | Gold   |
| R222 426 300 | limited detent |                      |              |        |
| R222 426 700 | smooth bore    |                      |              |        |

## PCB STRAIGHT RECEPTACLE, SURFACE MOUNT (with male center contact)

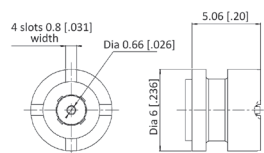


Fig. 1

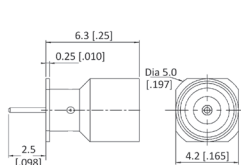


Fig. 2

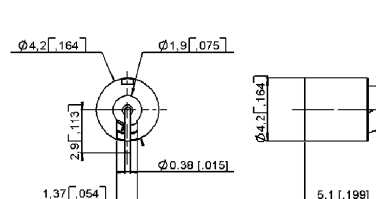
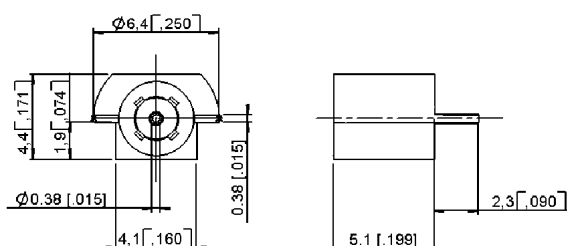
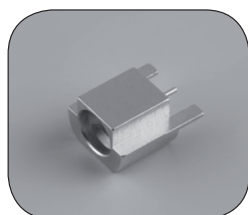


Fig. 3

| Part number  | Fig | Retention      | Assembly instructions | Finish                             | Packaging                |
|--------------|-----|----------------|-----------------------|------------------------------------|--------------------------|
| R222 408 350 | 1   | limited detent | M04                   | Gold                               | Tape & reel - 500 pieces |
| R222 408 750 |     | smooth bore    |                       |                                    | Tray 100 pieces          |
| R222 409 030 | 2   | full detent    | M05                   | Passivated + gold (soldering area) | 100 pieces               |
| R222 508 000 |     | full detent    |                       |                                    | M03                      |
| R222 508 300 | 3   | limited detent |                       |                                    |                          |
| R222 508 700 |     | smooth bore    |                       |                                    |                          |
| R222 508 722 |     | catcher's mitt |                       |                                    |                          |

## PCB RECEPTACLE, EDGE CARD MOUNT (with male center contact)



| Part number  | Retention      | Assembly instructions | Finish | Packaging                |
|--------------|----------------|-----------------------|--------|--------------------------|
| R222 423 023 | full detent    | M01                   | Gold   | Tape & reel - 100 pieces |
| R222 423 320 | limited detent |                       |        |                          |
| R222 423 720 | smooth bore    |                       |        |                          |

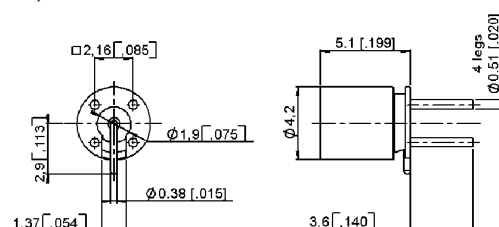
To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.

**Bold** part numbers represent products typically in stock & available for immediate shipment.

See page 8 and 9 for packaging information.

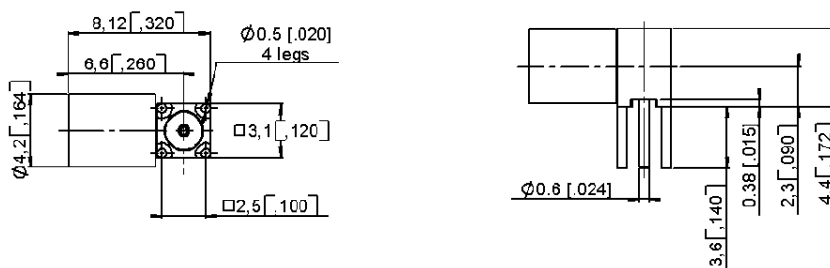
## RECEPTACLES

## PCB STRAIGHT RECEPTACLE, PIN &amp; PASTE MOUNT (with male center contact)



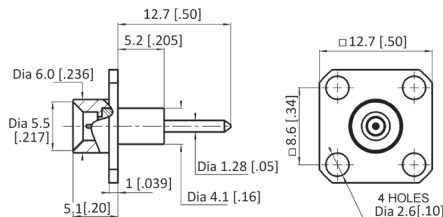
| Part number  | Retention      | Assembly instructions | Finish                                |
|--------------|----------------|-----------------------|---------------------------------------|
| R222 428 000 | Full detent    | M02                   | passivated<br>+ gold (soldering part) |
| R222 428 300 | Limited detent |                       |                                       |
| R222 428 700 | Smooth bore    |                       |                                       |

## PCB RIGHT ANGLE RECEPTACLE, 4 SOLDER LEGS (with male center contact)



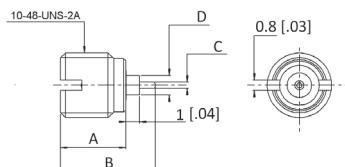
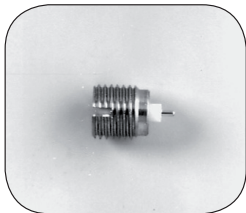
| Part number  | Retention      | PCB mounting | Finish                                |
|--------------|----------------|--------------|---------------------------------------|
| R222 680 000 | Full detent    | P04          | passivated<br>+ gold (soldering part) |
| R222 680 300 | Limited detent |              |                                       |
| R222 680 700 | Smooth bore    |              |                                       |

## SQUARE FLANGE EXTENDED DIELECTRIC RECEPTACLE



| Part number  | Retention   | Captive center contact | Panel drilling | Finish     |
|--------------|-------------|------------------------|----------------|------------|
| R222 414 701 | Smooth bore | yes                    | P07            | passivated |

## THREAD-IN RECEPTACLE (with male center contact)



| Part number  | Retention      | Dimensions mm (inch) |                                     |        |        | Finish     |
|--------------|----------------|----------------------|-------------------------------------|--------|--------|------------|
|              |                | A                    | B                                   | C      | D      |            |
| R222 561 001 | Full detent    | 4.8                  | 7.1                                 | 0.46   | 1.45   | passivated |
| R222 561 301 | Limited detent | (.191)               | (.278)                              | (.018) | (.057) |            |
| R222 561 701 | Smooth bore    |                      |                                     |        |        |            |
| R222 561 331 | Limited detent | 6.2                  | 8.3 (.326) adjustable<br>pin +/-0.5 | 1.0    | 0.3    |            |
|              |                | (.243)               |                                     | (.04)  | (.012) |            |

To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.  
**Bold** part numbers represent products typically in stock & available for immediate shipment.  
 See page 8 and 9 for packaging information.

## PANEL STRAIGHT HERMETIC RECEPTACLE, SOLDER MOUNT

(with male center contact)

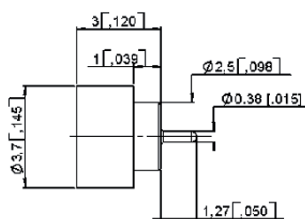
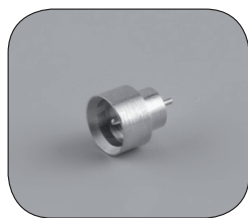


Fig. 1

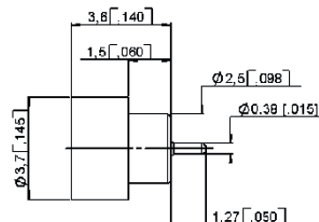
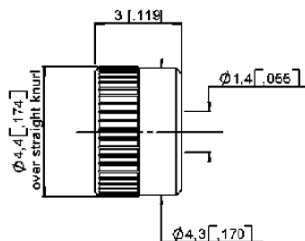


Fig. 2

| Part number  | Retention      | Fig | Finish | Note                       |
|--------------|----------------|-----|--------|----------------------------|
| R222 645 020 | Full detent    | 1   | gold   | Short body 1 mm glass seal |
| R222 645 300 | Limited detent | 2   |        | 1.5 mm glass seal          |
| R222 645 700 | Smooth bore    |     |        |                            |

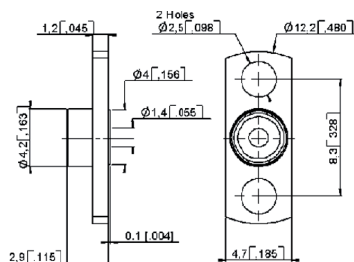
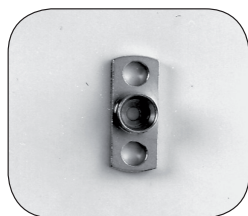
## PANEL SHROUD, PRESS-IN MOUNT (no center contact)



| Part number  | Retention      | Panel drilling | Finish     |
|--------------|----------------|----------------|------------|
| R222 402 021 | Full detent    | P06            | passivated |
| R222 402 321 | Limited detent |                |            |
| R222 402 721 | Smooth bore    |                |            |

This shroud is designed to be used with hermetic glass seal R280 752 000 (see page 3-14)

## PANEL SHROUD, 2 HOLES FLANGE MOUNT (no center contact)



| Part number  | Retention   | Panel drilling | Finish     |
|--------------|-------------|----------------|------------|
| R222 450 001 | Full detent | P02            | passivated |

This shroud is designed to be used with hermetic glass seal R280 752 000 (see page 3-14)

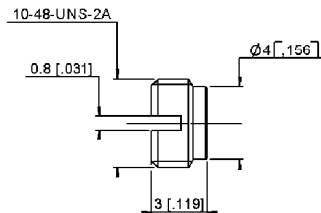
To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.

**Bold** part numbers represent products typically in stock & available for immediate shipment.

See page 8 and 9 for packaging information.

# PANEL SHROUD, GLASS BEAD AND ADAPTERS

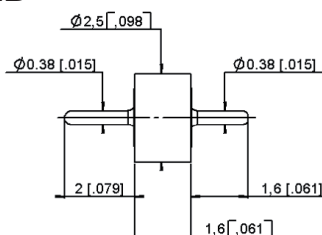
## PANEL SHROUD, THREAD-IN MOUNT (no center contact)



| Part number  | Retention      | Finish     |
|--------------|----------------|------------|
| R222 550 001 | Full detent    | passivated |
| R222 550 301 | Limited detent |            |
| R222 550 701 | Smooth bore    |            |

This shroud is designed to be used with hermetic glass seal R280 752 000 (see page 3-14)

## HERMETIC GLASS BEAD



Part number  
R280 752 000

This hermetic glass bead is designed to be used with the above shrouds.

## IN SERIES ADAPTERS (female to female center contact)

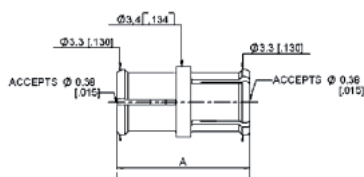
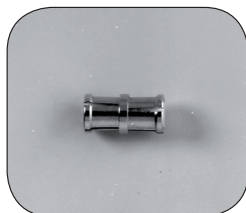


Fig. 1

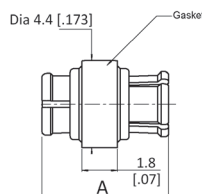


Fig. 2

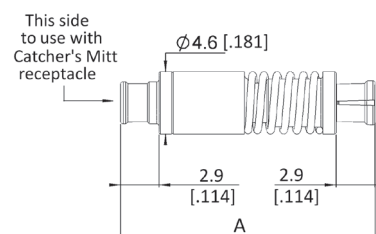


Fig. 3

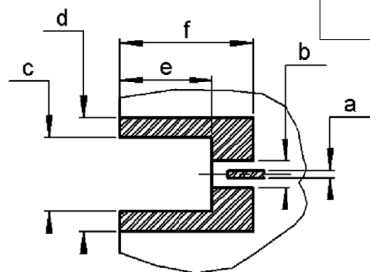
| Part number  | Fig | Dimensions A mm (inch)                 | Type                                         | Finish |
|--------------|-----|----------------------------------------|----------------------------------------------|--------|
| R222 705 000 | 1   | 6.45 (.254)                            | Fixed length                                 | gold   |
| R222 705 200 |     | 5.7 (.224)                             |                                              |        |
| R222 705 220 |     | 10.3 (.405)                            |                                              |        |
| R222 705 230 |     | 10.0 (.395)                            |                                              |        |
| R222 705 400 | 2   | 6.45 (.254)                            | Fixed length with sealing gasket             |        |
| R222 723 100 | 3   | min 33.68 (1.326)<br>max 34.85 (1.372) | Spring loaded<br>axial travel 1.17mm (.046") |        |
| R222 723 110 |     | min 11.71 (.461)<br>max 12.88 (.507)   |                                              |        |
| R222 723 120 |     | min 17.65 (.695)<br>max 18.82 (.741)   |                                              |        |

Note: use removal tool R282 918 100 or R282 918 120 with SMP in series adapters  
Contact us for self aligning options in board to board or module to module applications.



# ASSEMBLY INSTRUCTIONS

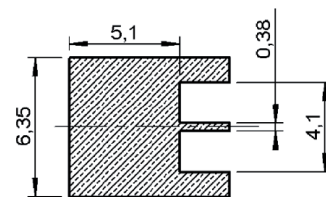
## M01



| Connectors   |              |
|--------------|--------------|
| R222 423 023 | R222 423 720 |
| R222 423 320 |              |

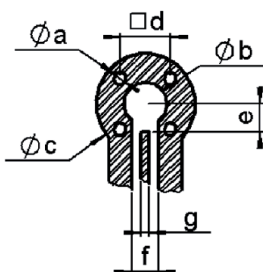
PCB mounting pattern

|   |             |
|---|-------------|
| a | 0.48        |
| b | 1.5         |
| c | 4.18 - 4.32 |
| d | 6.5         |
| e | 4.95 - 5.45 |
| f | 7.52        |



Shadow of receptacle for video camera

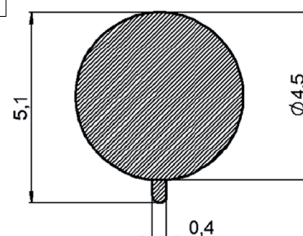
## M02



| Connectors   |              |
|--------------|--------------|
| R222 428 000 | R222 428 700 |
| R222 428 300 |              |

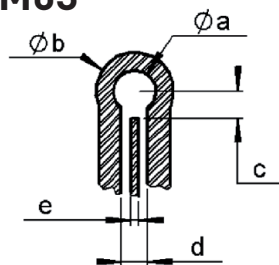
PCB mounting pattern

|   |           |
|---|-----------|
| a | 0.63      |
| b | 1.90      |
| c | 4.45 min. |
| d | 2.16      |
| e | 2.29 max. |
| f | 1.52 max. |
| g | 0.45 min. |



Shadow of receptacle for video camera

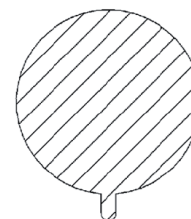
## M03



| Connectors   |              |
|--------------|--------------|
| R222 508 000 | R222 508 700 |
| R222 508 300 | R222 508 722 |

PCB mounting pattern

|   |           |
|---|-----------|
| a | 1.91      |
| b | 4.45 min. |
| c | 2.29 min. |
| d | 1.52      |
| e | 0.38 max. |

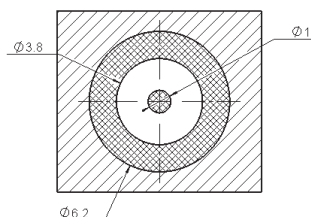


Shadow of receptacle for video camera

## M04

PCB mounting pattern

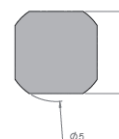
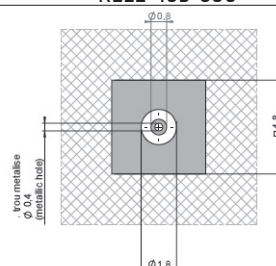
| Connectors   |              |
|--------------|--------------|
| R222 408 350 | R222 408 750 |



## M05

PCB mounting pattern

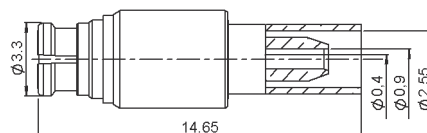
| Connectors   |  |
|--------------|--|
| R222 409 030 |  |



Shadow for video camera

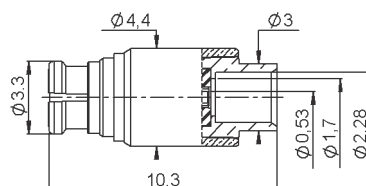
## STRAIGHT PLUG, FULL CRIMP TYPE FOR FLEXIBLE CABLE

(female center contact)



| Cable group | Cable group dia. | Part number  | Captive center contact |
|-------------|------------------|--------------|------------------------|
| RG178/RG196 | 2/50/S           | R222 900 100 | yes                    |

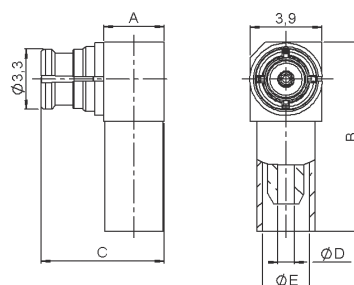
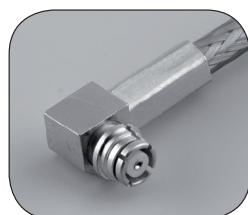
## STRAIGHT PLUG, SOLDER TYPE (female center contact)



| Cable group | Cable group dia. | Part number  | Captive center contact |
|-------------|------------------|--------------|------------------------|
| RG405       | .085"            | R222 900 200 | no                     |

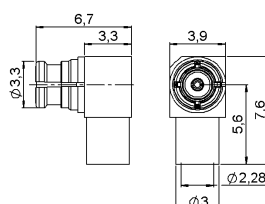
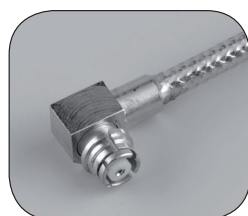
## RIGHT ANGLE PLUGS, CRIMP TYPE FOR FLEXIBLE CABLE

(female center contact)



| Cable group | Cable group dia. | Part number  | Dimensions (mm) |      |     |      |      | Captive center contact |
|-------------|------------------|--------------|-----------------|------|-----|------|------|------------------------|
|             |                  |              | A               | B    | C   | D    | E    |                        |
| RG178/RG196 | 2/50/S           | R222 900 310 | 3.3             | 10.3 | 6.7 | 0.9  | 2.55 | yes                    |
| RD316       | 2.6/50/D         | R222 900 330 | 3.7             | 13.3 | 7.4 | 1.58 | 3.50 |                        |

## RIGHT ANGLE PLUG, SOLDER TYPE (female center contact)



| Cable group | Cable group dia. | Part number  | Captive center contact |
|-------------|------------------|--------------|------------------------|
| RG405       | .085"            | R222 900 340 | yes                    |

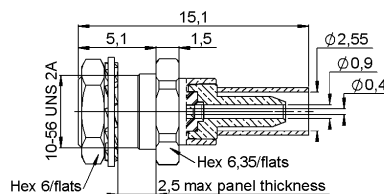
To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.

**Bold** part numbers represent products typically in stock & available for immediate shipment.

See page 8 and 9 for packaging information.

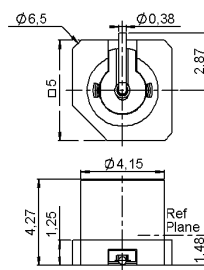
## JACK AND RECEPTACLES

### STRAIGHT BULKHEAD JACK, FULL CRIMP TYPE (male center contact)



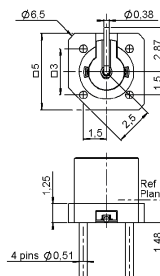
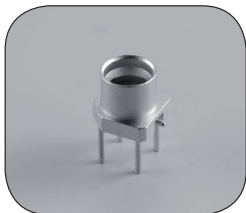
| Cable group | Cable group dia. | Part number  | Retention      | Captive center contact | Panel drilling |
|-------------|------------------|--------------|----------------|------------------------|----------------|
| RG178/RG196 | 2/50/S           | R222 920 300 | Limited detent | yes                    | P05            |

### STRAIGHT SMT RECEPTACLE (male center contact)



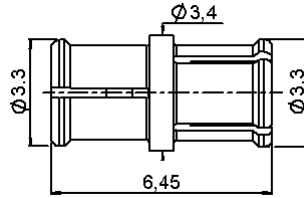
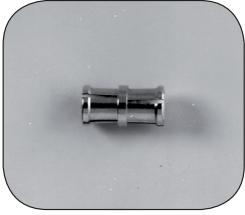
| Part number  | Retention      | Captive center contact | Assembly instructions | Packaging              |
|--------------|----------------|------------------------|-----------------------|------------------------|
| R222 941 100 | Full detent    | yes                    | M01                   | Tape & reel 500 pieces |
| R222 941 300 | Limited detent |                        |                       |                        |
| R222 941 700 | Smooth bore    |                        |                       |                        |

### STRAIGHT RECEPTACLES, PIN & PASTE MOUNT (male center contact)



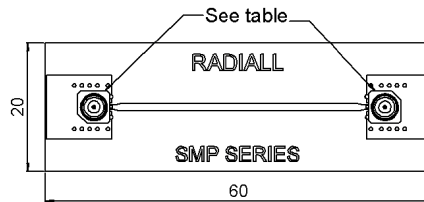
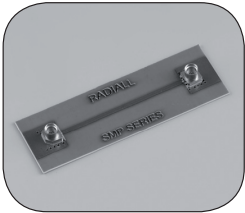
| Part number  | Retention      | Captive center contact | Assembly instructions | Packaging              |
|--------------|----------------|------------------------|-----------------------|------------------------|
| R222 940 100 | Full detent    | yes                    | M01                   | Tape & reel 500 pieces |
| R222 940 300 | Limited detent |                        |                       |                        |
| R222 940 700 | Smooth bore    |                        |                       |                        |

## IN SERIES ADAPTER (female to female center contact)



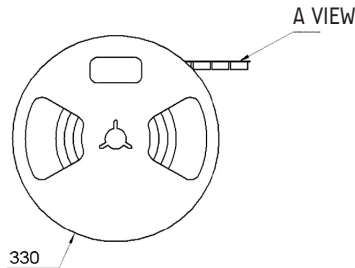
| Part number  | Finish | Packaging  |
|--------------|--------|------------|
| R222 970 000 | NPGR   | 100 pieces |

## MEASUREMENT PCB WITH SMT RECEPTACLE



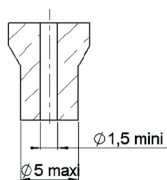
| Part number  | Packaging | Connector        |
|--------------|-----------|------------------|
| R222 995 320 | Unit      | 2 x R222 941 300 |

## PACKAGING

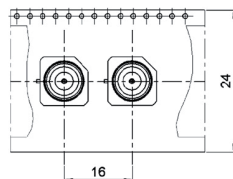


| Part number  | Packaging                 |
|--------------|---------------------------|
| R222 940 100 | Tape & reel<br>500 pieces |
| R222 940 300 |                           |
| R222 940 700 |                           |
| R222 941 100 |                           |
| R222 941 300 |                           |
| R222 941 700 |                           |

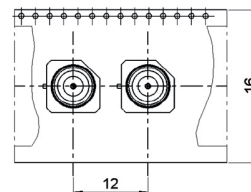
### AIR SUNCTION



| Connectors   |
|--------------|
| R222 940 100 |
| R222 940 300 |
| R222 940 700 |

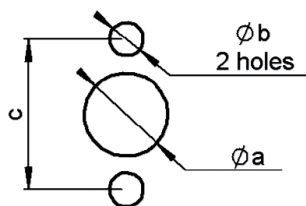


| Connectors   |
|--------------|
| R222 941 100 |
| R222 941 300 |
| R222 941 700 |

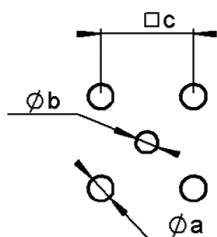


A VIEW

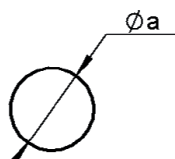
## PANEL DRILLING



|   | P01                       | P02                       |
|---|---------------------------|---------------------------|
| a | 4.7 - 4.8 (.185 - .189)   | 4.05 - 4.15 (.159 - .163) |
| b | 1.8 - 1.9 (.071 - .075)   | 2.5 - 2.6 (.098 - .102)   |
| c | 7.11 - 7.21 (.280 - .284) | 8.28 - 8.38 (.326 - .330) |



|   | P03                       | P04                       | P07                       |
|---|---------------------------|---------------------------|---------------------------|
| a | 0.94 - 0.98 (.037 - .039) | 0.71 - 0.81 (.028 - .032) | 2.7 - 2.8 (.106 - .110)   |
| b | 0.79 - 0.86 (.031 - .034) | 0.79 - 0.86 (.031 - .034) | 4.1 - 4.15 (.161 - .163)  |
| c | 2.49 - 2.59 (.098 - .102) | 2.49 - 2.59 (.098 - .102) | 8.59 - 8.69 (.338 - .342) |

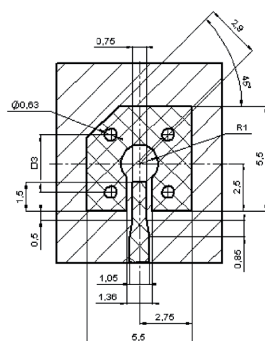


|   | P05                       | P06                       |
|---|---------------------------|---------------------------|
| a | 5.20 - 5.30 (.205 - .209) | 4.37 - 4.39 (.172 - .173) |

## ASSEMBLY INSTRUCTIONS

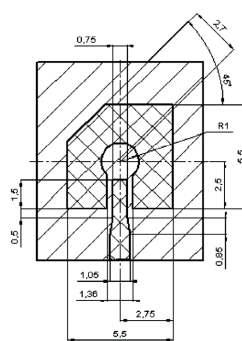
## M01

## SOLDERING PATTERN



## Connectors

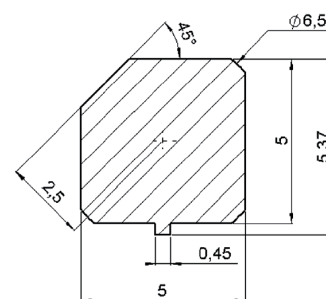
|      |     |     |
|------|-----|-----|
| R222 | 940 | 100 |
| R222 | 940 | 300 |
| R222 | 940 | 700 |



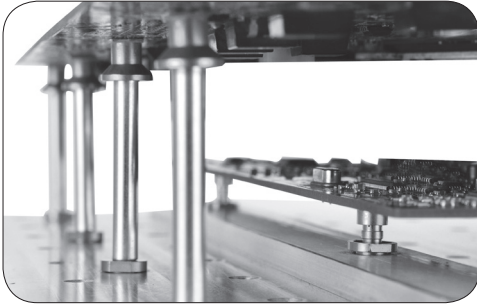
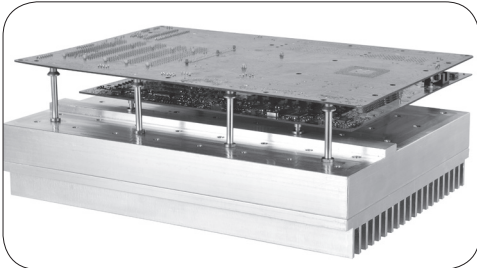
## Connectors

|      |     |     |
|------|-----|-----|
| R222 | 941 | 100 |
| R222 | 941 | 300 |
| R222 | 941 | 700 |

## VIDEO SHADOW



## INTRODUCTION



50Ω

DC - 6 GHz

### GENERAL

- Microminiature coaxial connectors
- Power up to 300 Watts
- Board to board distance misalignment of at least .078" (2.0 mm)
- Tilt (radial misalignment): 3° minimum
- 1.2 max VSWR at DC-3 GHz

### APPLICATIONS

- Broadcast
- RF components (filters, amplifiers, ....)
- Wireless communications

### The cost-effective solution for maximum mechanical misalignment

Of the several RF connectors available for interconnections in wireless remote radio heads, repeaters, base stations, GPS devices, and similar applications, the board to board style connector is growing in popularity. The product line has evolved from accommodating limited misalignment to offering the widest tolerances available.

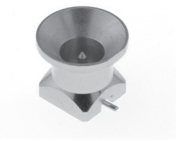
SMP-MAX is introduced by RADIALl to provide larger misalignment tolerances than the early version board to board connectors like SMP or SMP-spring while offering lower cost.

Featuring an optimized interface, SMP-MAX can work up to 6 GHz board to board distance misalignment at least 2.0 mm and radial misalignment 3° minimum.

The SMP-MAX series offers 2 levels of retention provided by the receptacles:

- Slide-on, for the lowest retention
- Snap-on, for a positive locking with a retention

A complete SMP-MAX board to board system is made of 3 parts:

| SMP-MAX Slide-on receptacle                                                         | SMP-MAX In series adapter                                                           | SMP-MAX Snap-on receptacle                                                            |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |

Many other custom configurations are available. Larger distance misalignment and larger tilt versions are also available.

# CHARACTERISTICS

| Test/characteristics                            | Values/remarks                                   |            |         |
|-------------------------------------------------|--------------------------------------------------|------------|---------|
| ELECTRICAL CHARACTERISTICS                      |                                                  |            |         |
| Impedance                                       | 50Ω                                              |            |         |
| Frequency                                       | DC - 6 GHz                                       |            |         |
| Typical V.S.W.R.<br>(Board to Board connection) | Misalignment                                     | DC - 3 GHz | 3-6 GHz |
|                                                 | Radial 0°, Axial 0 mm                            | < 1.15     | < 1.25  |
|                                                 | Radial 0°, Axial +/- 1 mm                        | < 1.20     | < 1.35  |
|                                                 | Radial 3°, Axial 0 mm                            | < 1.15     | < 1.25  |
|                                                 | Radial 3°, Axial +/- 1 mm                        | < 1.20     | < 1.35  |
| Insertion loss<br>(Board to Board connection)   | Misalignment                                     | DC - 3 GHz | 3-6 GHz |
|                                                 | Radial 0°, Axial 0 mm                            | 0.10       | 0.15    |
|                                                 | Radial 0°, Axial +/- 1 mm                        | 0.12       | 0.25    |
|                                                 | Radial 3°, Axial 0 mm                            | 0.10       | 0.15    |
|                                                 | Radial 3°, Axial +/- 1 mm                        | 0.12       | 0.25    |
| Insulation resistance                           | 5000 MΩ                                          |            |         |
| Center contact resistance                       | < 3 mΩ                                           |            |         |
| Outer contact resistance                        | < 1.5 mΩ                                         |            |         |
| Working voltage                                 | 330 VRMS                                         |            |         |
| Dielectric withstanding voltage                 | 1000 VRMS                                        |            |         |
| Power handling (typical)                        | > 300W @ 2.7 GHz, 25°C<br>> 200W @ 2.7 GHz, 85°C |            |         |
| RF leakage                                      | -70dB to 3 GHz, axial misalignment 0mm           |            |         |

## MECHANICAL CHARACTERISTICS

|                                |                                             |             |
|--------------------------------|---------------------------------------------|-------------|
| Mating cycles                  | 100 cycles                                  |             |
|                                | Slide-on                                    | Snap-on     |
| Engagement force               | < 14 N                                      | < 45 N      |
| Disengagement force            | < 9 N                                       | > 9, < 45 N |
| Center contact retention force | > 7 N                                       |             |
| Minimum distance between PCB   | 13 mm                                       |             |
| Radial misalignment tolerance  | 3°min                                       |             |
| Axial misalignment tolerance   | 2.0 mm                                      |             |
|                                | Larger axial misalignment version available |             |

## ENVIRONMENTAL CHARACTERISTICS

|                      |                                      |
|----------------------|--------------------------------------|
| Temperature range    | -55°C / +165°C                       |
| Thermal shock        | MIL-STD-202, method 107, condition B |
| Vibration            | MIL-STD-202, method 204, condition B |
| Shock                | MIL-STD-202, method 213, condition A |
| Corrosion salt spray | MIL-STD-202, method 101, condition B |
| Moisture resistance  | MIL-STD-202, method 106              |

## MATERIALS

|                       |                        |
|-----------------------|------------------------|
| Body                  | Brass/Beryllium copper |
| Male center contact   | Brass                  |
| Female center contact | Beryllium copper       |
| Gasket                | Silicon rubber         |
| Insulator             | PTFE/PEEK              |

## PLATING

|                       |          |
|-----------------------|----------|
| Body                  | NPGR/BBR |
| Male center contact   | NPGR     |
| Female center contact | NPGR     |

Packaging = 100 pieces box / 500 pieces reel.

All dimensions are given in mm

## BULKHEAD STRAIGHT SLIDE-ON MALE JACKS FOR CABLES

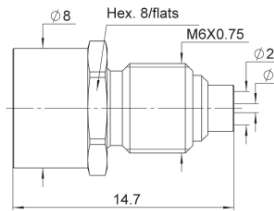


Fig. 1

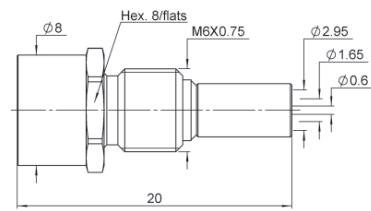
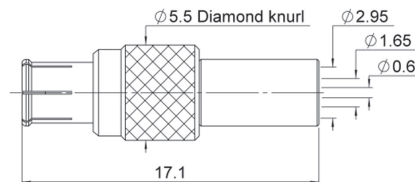


Fig. 2

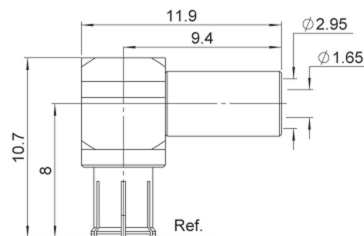
| Cable group | Cable group dia. | Part number  | Fig | Captive center contact | Panel drilling | Packaging       |
|-------------|------------------|--------------|-----|------------------------|----------------|-----------------|
| RG405       | .085"            | R222 M20 700 | 1   | yes                    | P01            | Bulk 100 pieces |
| RG174/RG316 | 2.6/50/S         | R222 M20 710 | 2   |                        |                |                 |

## STRAIGHT FEMALE PLUG FOR FLEXIBLE CABLE



| Cable group | Cable group dia. | Part number  | Captive center contact | Packaging       |
|-------------|------------------|--------------|------------------------|-----------------|
| RG174/RG316 | 2.6/50/S         | R222 M80 400 | yes                    | Bulk 100 pieces |

## RIGHT ANGLE FEMALE PLUG FOR FLEXIBLE CABLE



| Cable group | Cable group dia. | Part number  | Captive center contact | Packaging       |
|-------------|------------------|--------------|------------------------|-----------------|
| RG174/RG316 | 2.6/50/S         | R222 M80 500 | yes                    | Bulk 100 pieces |

To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.  
**Bold** part numbers represent products typically in stock & available for immediate shipment.  
 See page 8 and 9 for packaging information.

# RECEPTACLES

## STRAIGHT SLIDE-ON MALE RECEPTACLES

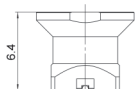
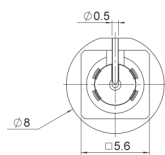


Fig. 1

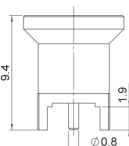
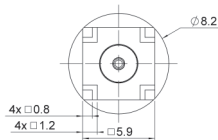


Fig. 2

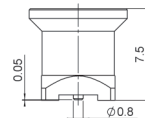
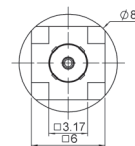


Fig. 3

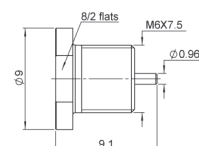


Fig. 4

| Part number  | Fig | Captive center contact | Panel drilling | Packaging              | Note        |
|--------------|-----|------------------------|----------------|------------------------|-------------|
| R222 M00 700 | 1   | yes                    |                | Tape & reel 500 pieces | SMT         |
| R222 M00 720 | 2   |                        | P02            | Bulk 100 pieces        | Solder legs |
| R222 M00 740 | 3   |                        |                | Tape & reel 500 pieces | SMT         |
| R222 M10 700 | 4   |                        | P01            | Bulk 100 pieces        | Screw on    |

## STRAIGHT SNAP-ON MALE RECEPTACLES

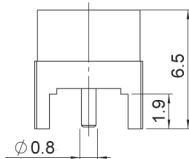
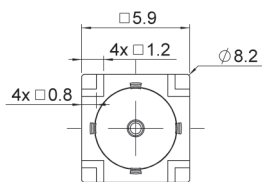


Fig. 1

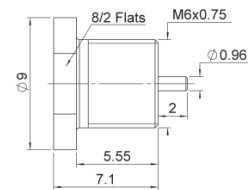


Fig. 2

| Part number  | Fig | Captive center contact | Panel drilling | Packaging       | Note        |
|--------------|-----|------------------------|----------------|-----------------|-------------|
| R222 M00 080 | 1   | yes                    | P02            | Bulk 100 pieces | Solder legs |
| R222 M10 000 | 2   |                        | P01            |                 | Screw on    |

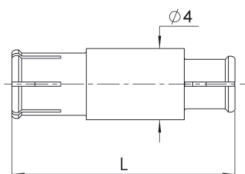
To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.  
**Bold** part numbers represent products typically in stock & available for immediate shipment.  
 See page 8 and 9 for packaging information.

## IN-SERIES BOARD TO BOARD ADAPTERS



| Part number  | Length L (mm) | Series                          | Packaging       |
|--------------|---------------|---------------------------------|-----------------|
| R222 M40 010 | 9.5           | SMP-MAX female / SMP-MAX female | Bulk 100 pieces |
| R222 M40 050 | 25.3          |                                 |                 |

## BETWEEN-SERIES BOARD TO BOARD ADAPTERS



| Part number  | Length L (mm) | Series                          | Packaging       |
|--------------|---------------|---------------------------------|-----------------|
| R191 996 110 | 12.6          | SMP-MAX female / SMP female     | Bulk 100 pieces |
| R191 996 130 | 8.9           |                                 |                 |
| R191 560 000 | 7.5           | SMP-MAX female / MMBX male snap |                 |

## BETWEEN-SERIES ADAPTERS

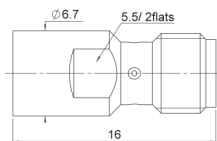


Fig. 1

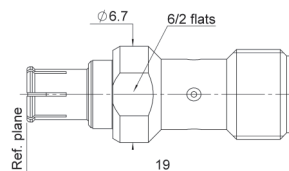


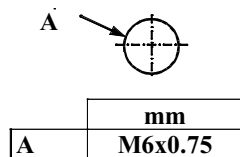
Fig. 2

| Part number  | Fig | Series                      | Packaging |
|--------------|-----|-----------------------------|-----------|
| R191 552 000 | 1   | SMP-MAX male / SMA female   | Unit      |
| R191 553 000 | 2   | SMP-MAX female / SMA female |           |

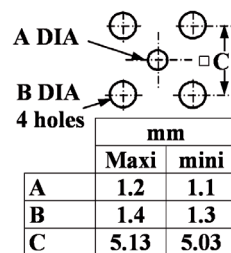
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**Bold** part numbers represent products typically in stock & available for immediate shipment.  
 See page 8 and 9 for packaging information.

# PANEL DRILLING

P01



P02





AEROSPACE



AUTOMOTIVE



DEFENSE



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TELECOM

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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
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