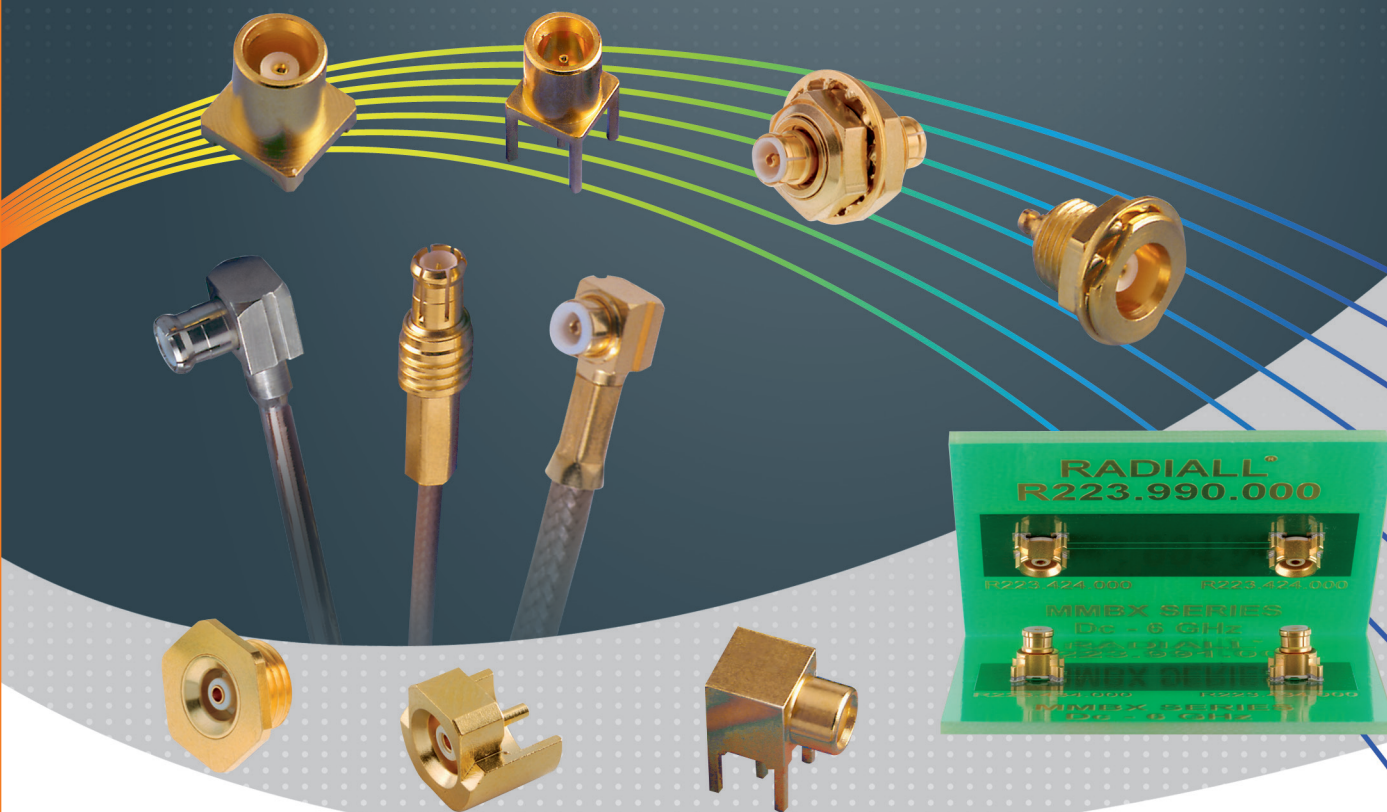




## MMBX / MCX series

R223 / R113 / R213

**RADIAL**   
The next conneXion



## Pages

### MMBX

|                             |             |
|-----------------------------|-------------|
| Introduction .....          | 4-4 to 4-6  |
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### MCX

|                             |                     |
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| Introduction .....          | 4-4 to 4-5 and 4-14 |
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## 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.

| Family                                  | Series      | Misalignment tolerances                                                   |                                            | Dimensions                               |                                | Performance          |                                          |                              |
|-----------------------------------------|-------------|---------------------------------------------------------------------------|--------------------------------------------|------------------------------------------|--------------------------------|----------------------|------------------------------------------|------------------------------|
|                                         |             | Angle tolerance<br>(example with<br>a 10mm distance<br>between<br>boards) | Board<br>to board<br>distance<br>tolerance | Board<br>to board<br>minimum<br>distance | PCB surface / size             | Maximum<br>frequency | Typical<br>VSWR<br>(min/max)<br>at 3 GHz | Power<br>at 3 GHz<br>at 25°C |
| No<br>misalignment                      | MMT         | 0                                                                         | 0                                          | 6.4 mm                                   | 4.2 X 4.9 / 25 mm <sup>2</sup> | 8 GHz                | 1,5                                      | 80W                          |
|                                         | MMS         | 0                                                                         | 0                                          | 7.65 mm                                  | 4.2 X 5.1 / 21 mm <sup>2</sup> | 6 GHz                | 1,5                                      | 80W                          |
|                                         | MCX         | 0                                                                         | 0                                          | 7.95 mm                                  | 6 X 6 / 36 mm <sup>2</sup>     | 6 GHz                | 1,25                                     | 120W                         |
| Limited<br>misalignment                 | IMP         | 0                                                                         | 0.4 mm                                     | 2 mm                                     | 4.5 X 4.5 / 20 mm <sup>2</sup> | 6 GHz                | 1,25                                     | 50 W                         |
|                                         | SMP         | 3.5°/0.3mm Max                                                            | 0.5 mm                                     | 9.5 mm                                   | 5 X 5 / 25 mm <sup>2</sup>     | 12.4 GHz             | 1,12                                     | 120 W                        |
|                                         | MMBX        | 4.5°/0.7mm Max                                                            | 0.6 mm                                     | 6.7 mm                                   | 4 X 4 / 16 mm <sup>2</sup>     | 6 GHz                | 1,15                                     | 150 W                        |
| Large<br>misalignment<br>Spring loaded  | IMP-Spring  | Not specified                                                             | 1.2 mm                                     | 8.1 mm                                   | Ø 7 / 38 mm <sup>2</sup>       | 18 GHz               | 1,2                                      | 150 W                        |
|                                         | IMP-Spring  | 1 ° / 1 mm Max                                                            | 2.0 mm                                     | 16 mm                                    | Ø 7 / 38 mm <sup>2</sup>       | 6 GHz                | 1,15                                     | 150 W                        |
|                                         | SMP-Spring  | 3.5°/0.3mm Max                                                            | 1.2 mm                                     | 15.6 mm                                  | 5 X 5 / 25 mm <sup>2</sup>     | 12.4 GHz             | 1,15                                     | 150 W                        |
|                                         | MMBX-Spring | 4.5°/0.7mm Max                                                            | 1.6 mm                                     | 18 mm                                    | 6 X 6 / 36 mm <sup>2</sup>     | 6 GHz                | 1,18                                     | 150 W                        |
| Large<br>misalignment<br>cost effective | SMP-Max     | 3°/1mm Min                                                                | 2.0 mm Min                                 | 13 mm                                    | 5.6 X 5.6 / 31 mm <sup>2</sup> | 6 GHz                | 1,2                                      | 300 W<br>at 2.7 GHz          |

## INTRODUCTION



50Ω

DC - 12.4 GHz

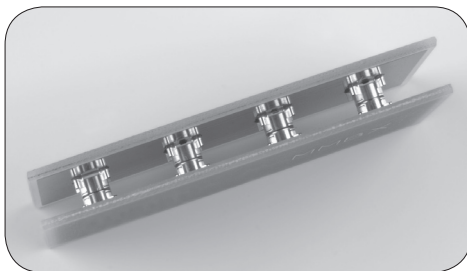
### GENERAL

- Snap-on mating
- Microminiature coaxial connectors
- Robust
- Surface mount receptacles
- Fully compatible with automated pick and place machines

### APPLICATIONS

- Board to board applications
- Base station
- High density packaging

The MMBX™ connector series is particularly suitable for board to board connection in new generation telecommunication systems. MMBX™ connectors allow a quick connection in a minimum space requirement. Frequency range is DC to 12.4 GHz. SMT connectors are totally compatible with pick and place machines.

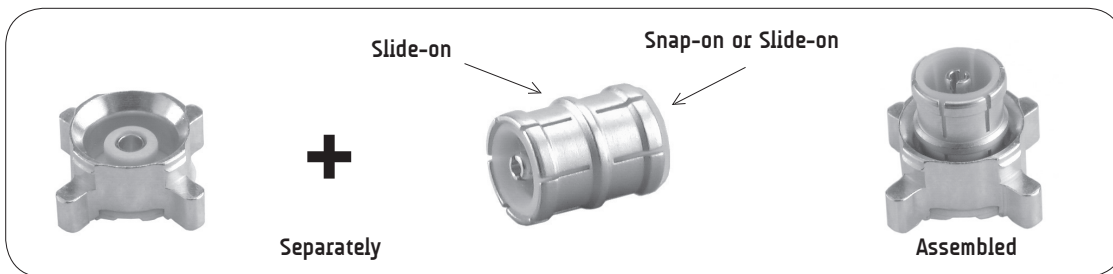


### • Space saving

Its small space requirement is a main advantage for applications such as board to board connections as the height is only 7 mm.

### • Series Range

Receptacles and in-series adapters can be either sold separately or with the in-series adapter already inserted in the receptacle. In this case, assembly time will be reduced and you will be sure that the in-series adapter is properly inserted, as it has to be assembled perpendicularly to the receptacle.



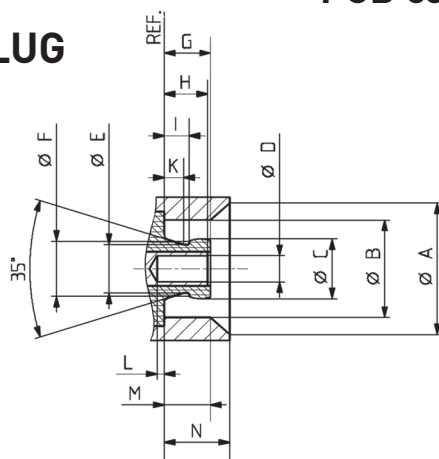
Retention between receptacle and in-series adapter is ensured by the design of the adapter.

- Slide-on/Snap-on: for board to board application, all in-series adapters remain on the same side during disconnection.
- Slide-on/Slide-on

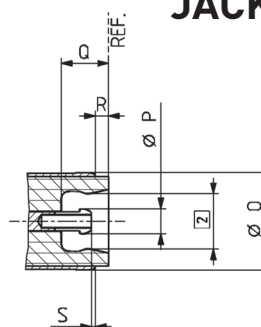
In addition of PCB connectors and in-series adapters, Radiall offers you a wide range of products like straight plugs, right angle plugs and between-series adapters.

## PCB connectors

### PLUG



### JACK

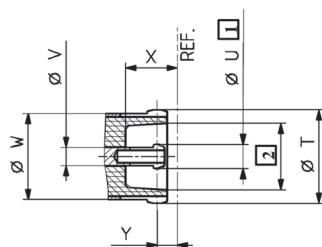


| Letter | mm        |           | inch      |           |
|--------|-----------|-----------|-----------|-----------|
|        | min.      | max.      | min.      | max.      |
| A      | 5.00 nom. | 5.00 nom. | .197 nom. | .197 nom. |
| B      | 3.68      | 3.71      | .145      | .146      |
| C      | 2.25      | 2.30      | .088      | .090      |
| D      | 0.98      | 1.01      | .038      | .040      |
| E      | 1.85 nom. | 1.85 nom. | .073 nom. | .073 nom. |
| F      | 2.10 nom. | 2.10 nom. | .083 nom. | .083 nom. |
| G      |           | 1.80      |           | .071      |
| H      | 1.55      | 1.75      | .061      | .069      |
| I      | 0.90      |           | .035      |           |

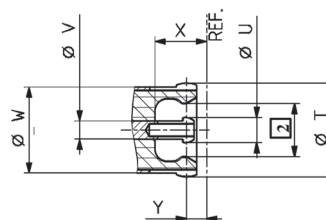
| Letter | mm        |           | inch      |           |
|--------|-----------|-----------|-----------|-----------|
|        | min.      | max.      | min.      | max.      |
| K      | 0.75 nom. | 0.75 nom. | .029 nom. | .029 nom. |
| L      | 0         |           | 0         |           |
| M      | 1.45      |           | .057      |           |
| N      | 2.50 nom. | 2.50 nom. | .098 nom. | .098 nom. |
| O      | 3.70 nom. | 3.70 nom. | .146 nom. | .146 nom. |
| P      | 0.95 nom. | 0.95 nom. | .037 nom. | .037 nom. |
| Q      | 1.85 nom. | 1.85 nom. | .073 nom. | .073 nom. |
| R      | 0.50 nom. | 0.50 nom. | .020 nom. | .020 nom. |
| S      | 0.10 nom. | 0.10 nom. | .004 nom. | .004 nom. |

## In series adapters

### Slide-on



### Snap-on



| Letter | mm        | inch      |
|--------|-----------|-----------|
| T      | 3.70 nom. | .146 nom. |
| U      | 0.95 nom. | .037 nom. |
| V      | 0.70 nom. | .027 nom. |

| Letter | mm        | inch      |
|--------|-----------|-----------|
| W      | 3.65 nom. | .144 nom. |
| X      | 2.05 nom. | .080 nom. |
| Z      | 0.80 nom. | .031 nom. |

- 1 Slotted and flared to meet electrical and mechanical requirements
- 2 Dimension to meet electrical and mechanical requirements

# CHARACTERISTICS

| Test/characteristics | CECC 22000 | Values/remarks |
|----------------------|------------|----------------|
|----------------------|------------|----------------|

## ELECTRICAL CHARACTERISTICS

|                                 |       |                 |             |             |
|---------------------------------|-------|-----------------|-------------|-------------|
| Impedance                       |       | 50Ω             |             |             |
| Frequency range                 |       | DC - 12.4 GHz   |             |             |
| Typical V.S.W.R.                |       | DC - 1 GHz      | 1 - 2.5 GHz | 2.5 - 6 GHz |
| straight connectors: 2/50/S     |       | 1.05            | 1.06        | 1.10        |
| 2.6/50/S                        |       | 1.05            | 1.06        | 1.10        |
| 2.6/50/D                        |       | 1.05            | 1.06        | 1.10        |
| right angle connectors: 2/50/S  |       | 1.05            | 1.13        | 1.22        |
| 2.6/50/S                        |       | 1.05            | 1.06        | 1.17        |
| 2.6/50/D                        |       | 1.05            | 1.06        | 1.13        |
| Insulation resistance           |       | > 1 GΩ          |             |             |
| Dielectric withstanding voltage | 4.4.5 | 500 Vrms. 50 Hz |             |             |
| (sea level) 2.50                |       | 750 Vrms. 50 Hz |             |             |
| 2.6/50                          |       |                 |             |             |
| Contact resistance              |       |                 |             |             |
| center contact                  | 4.4.2 | ≤ 5 mΩ          |             |             |
| outer contact                   | 4.4.3 | ≤ 1 mΩ          |             |             |

## MECHANICAL CHARACTERISTICS

|                                 |                       |                                        |
|---------------------------------|-----------------------|----------------------------------------|
| Mechanical endurance            | 4.7.1                 | 100 matings                            |
| Engagement and separation force |                       | 30 N max                               |
| Engagement                      | 4.5.4                 | 8-30 N                                 |
| Separation                      |                       |                                        |
| Contact captivation             | 4.5.2                 | ≥ 10 N                                 |
| Cable retention force 2/50      |                       | 58 N                                   |
| 2.6/50                          |                       | 110 N                                  |
| Vibration                       | 4.6.3 - IEC 68-2-6 Fc | MIL-STD-202, Method 204 D, condition A |

## ENVIRONMENTAL CHARACTERISTICS

|                     |                         |                                        |
|---------------------|-------------------------|----------------------------------------|
| Temperature range   |                         | -55°C + 155°C                          |
| Thermal shock       | 4.6.7 - IEC 68-2-14 Na  | MIL STD 202, method 107G, condition B1 |
| Moisture resistance | 4.6.6 - IEC 68-2-3 Ca   | MIL STD 202, method 106F               |
| Corrosion           | 4.6.10 - IEC 68-2-11 Ka | MIL STD 202, method 101, condition B   |
| Vibration           | 4.6.3 - IEC 68-2-6 Fc   | MIL STD 202, method 204D, condition A  |

## MATERIALS

|                         |  |                  |
|-------------------------|--|------------------|
| Center & outer contacts |  | Beryllium copper |
| Bodies                  |  | Brass            |
| Ferrules                |  | Copper           |
| Insulators              |  | PTFE             |

## PLATING

|                         |  |           |
|-------------------------|--|-----------|
| Center & outer contacts |  | Gold/NPGR |
| Bodies                  |  | NPGR      |
| Ferrules                |  | NPGR      |

All dimensions are given in mm.

Standard packaging = 100 pieces.



## STRAIGHT PLUGS (male center contact)

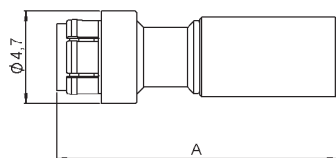
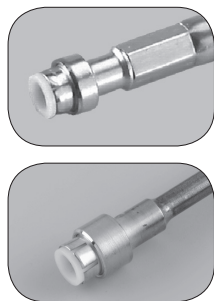


Fig. 1

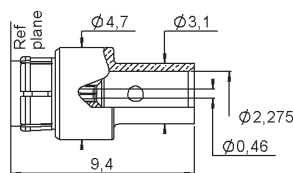


Fig. 2

| Cable group | Cable group dia. | Part number  | Fig. | A    | Captive center contact | Note                              |
|-------------|------------------|--------------|------|------|------------------------|-----------------------------------|
| RG178/RG196 | 2/50/S           | R223 081 000 | 1    | 14.3 | yes                    | Crimp type for flexible cables    |
| RG174/RG316 | 2.6/50/S         | R223 082 000 | 1    | 14.5 |                        |                                   |
| RG316       | 2.6/50/D         | R223 083 000 | 1    |      |                        |                                   |
| RG405       | .085"            | R223 062 000 | 2    |      |                        | Solder type for semi-rigid cables |

## RIGHT ANGLE PLUGS (male center contact)

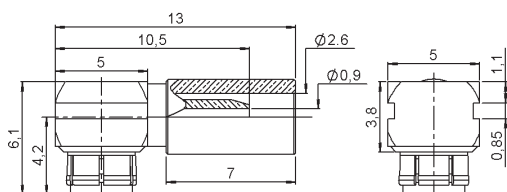
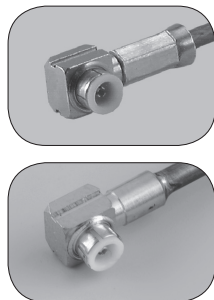


Fig. 1

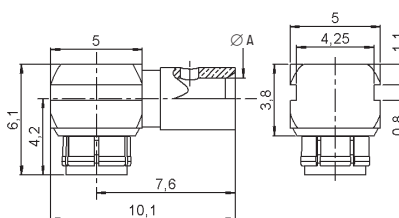


Fig. 2

| Cable group | Cable group dia. | Part number  | Fig. | A     | Captive center contact | Note                              |
|-------------|------------------|--------------|------|-------|------------------------|-----------------------------------|
| RG178/RG196 | 2/50/S           | R223 181 000 | 1    | 2.275 | yes                    | Crimp type for flexible cables    |
| RG174/RG316 | 2.6/50/S         | R223 182 000 | 1    |       |                        |                                   |
| RG316       | 2.6/50/D         | R223 183 000 | 1    |       |                        |                                   |
| RG405       | .085"            | R223 162 000 | 2    |       |                        | Solder type for semi-rigid cables |

## STRAIGHT PCB RECEPTACLES (male center contact)

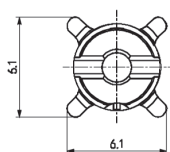


Fig. 1

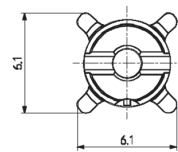
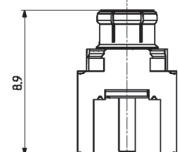
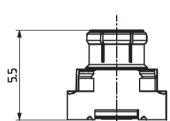


Fig. 2



| Part number  | Fig. | Captive center contact | PCB | Assembly instructions | Packaging              | Note |
|--------------|------|------------------------|-----|-----------------------|------------------------|------|
| R223 434 000 | 1    | yes                    |     | M01                   | bulk 100 pieces        | SMT  |
| R223 434 800 | 1    |                        |     |                       | tape & reel 720 pieces |      |
| R223 435 000 | 2    |                        | P01 |                       | 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.

## PCB RECEPTACLES

## EDGE CARD PCB RECEPTACLES (female center contact)

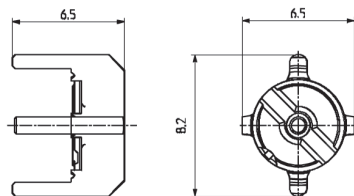
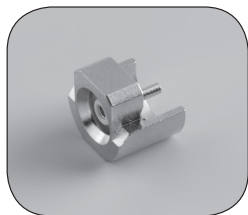


Fig. 1

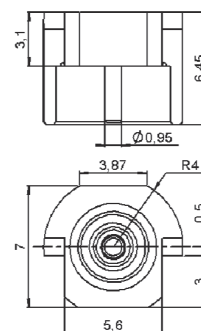


Fig. 2

| Part number  | Fig. | Captive center contact | Packaging       | Note          |
|--------------|------|------------------------|-----------------|---------------|
| R223 423 000 | 1    | yes                    | bulk 100 pieces | SMT edge card |
| R223 423 010 | 2    |                        |                 |               |

## STRAIGHT PCB RECEPTACLES (female center contact)

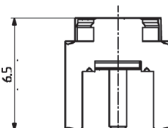
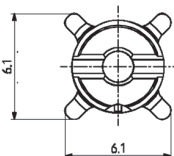
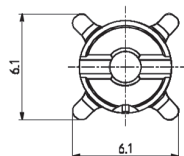
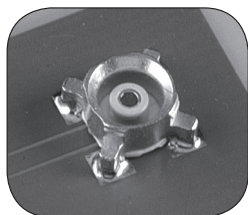
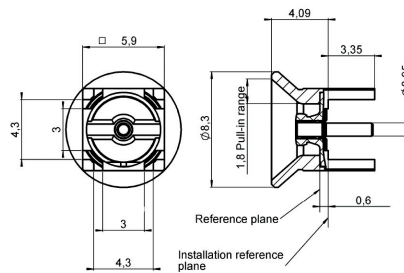


Fig. 1

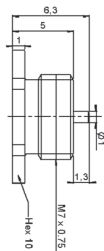
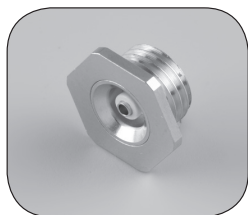
**Fig. 2**



**Fig. 3**

| Part number  | Fig. | Captive center contact | PCB | Assembly instructions | Packaging              | Note |
|--------------|------|------------------------|-----|-----------------------|------------------------|------|
| R223 424 000 | 1    | yes                    |     | M01                   | bulk 100 pieces        | SMT  |
| R223 424 800 | 1    |                        |     |                       | tape & reel 720 pieces |      |
| R223 425 000 | 2    |                        | P01 |                       | bulk 100 pieces        |      |
| R223 425 110 | 3    |                        | P01 |                       | bulk 100 pieces        |      |

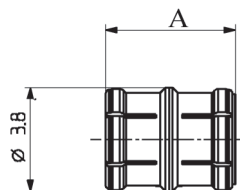
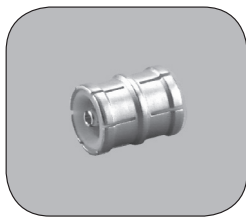
## SCREW-ON RECEPTACLE (female center contact)



| Part number  | Captive center contact | Panel drilling |
|--------------|------------------------|----------------|
| R223 555 000 | yes                    | P03            |

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.

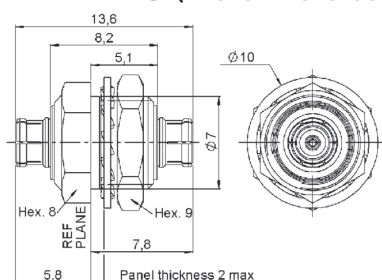
## IN SERIES ADAPTERS (male-male center contact)



| Part number  | Length A (mm) | interface:  | Nominal board to board |
|--------------|---------------|-------------|------------------------|
| R223 703 000 | 4.8           | snap-slide  | 6.7                    |
| R223 703 080 | 7.1           | slide-slide | 9                      |

Other length can be designed upon request: minimum board to board height is 6.7 mm.

## IN SERIES BULKHEAD ADAPTERS (male-male center contact)



| Part number  | Series              | Panel drilling |
|--------------|---------------------|----------------|
| R223 720 020 | MMBX male/MMBX male | P02            |

## BETWEEN-SERIES ADAPTERS

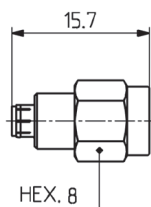


Fig. 1

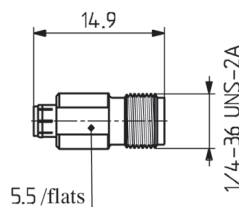


Fig. 2

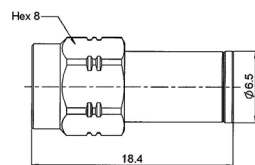


Fig. 3

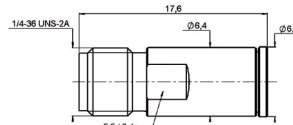


Fig. 4

| Part number  | Fig. | Series                 | Packaging |
|--------------|------|------------------------|-----------|
| R191 389 100 | 1    | MMBX male/SMA male     | unit      |
| R191 389 200 | 2    | MMBX male/SMA female   |           |
| R191 389 300 | 3    | MMBX female/SMA male   |           |
| R191 389 400 | 4    | MMBX female/SMA female |           |

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.

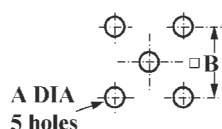
## DEMO BOARDS



| Part number  | Note                            |
|--------------|---------------------------------|
| R223 990 000 | 2 SMT receptacles               |
| R223 991 000 | 2 SMT receptacles with adapters |

## PANEL DRILLING

P01



|   | mm   |      | inch |      |
|---|------|------|------|------|
|   | maxi | mini | maxi | mini |
| A | 1.4  | 1.2  | .055 | .047 |
| B | 5.16 | 5    | .203 | .197 |

P02



|   | mm   |      | inch |      |
|---|------|------|------|------|
|   | maxi | mini | maxi | mini |
| A | 7.27 | 7.13 | .283 | .281 |

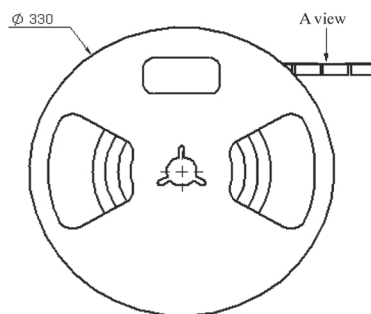
P03



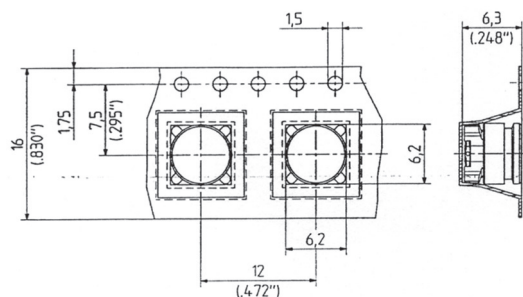
| Threading |           |
|-----------|-----------|
| ØA        | M7 x 0.75 |

## RECEPTACLE PACKAGING

The tape is delivered on reels of 330 mm diameter



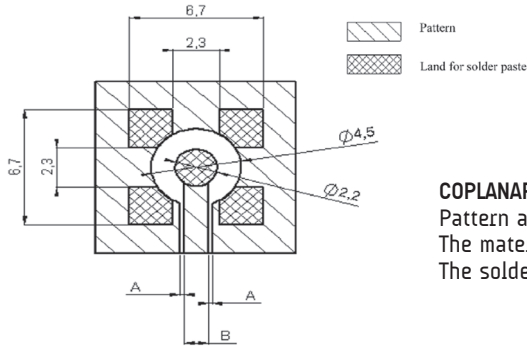
A VIEW



| Part number  | Note                      |
|--------------|---------------------------|
| R223 424 800 | including 750 receptacles |
| R223 434 800 |                           |

## M01

| Part number  |              |              |              |
|--------------|--------------|--------------|--------------|
| R223 424 000 | R223 424 800 | R223 434 000 | R223 434 800 |



### COPLANAR LINE

Pattern and signal are on the same side.

The material of PCB is epoxy resin (FR4) (Er = 4.6).

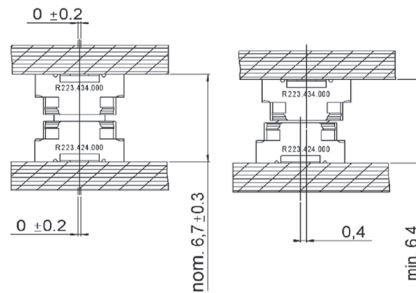
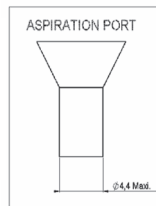
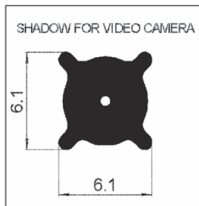
The solder resist should be printed except for the land pattern on the PCB.

### APPLICATION 75Ω WITH B = 0.55 mm

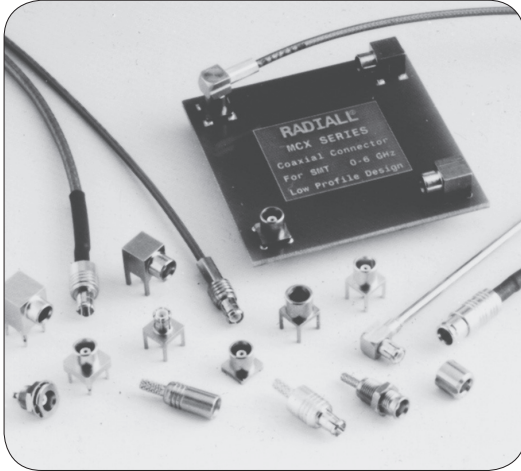
| PCB thickness (mm) | Coplanar line A (mm) |
|--------------------|----------------------|
| 0.8                | 0.350                |
| 1.0                | 0.360                |
| 1.2                | 0.365                |
| 1.6                | 0.375                |

### APPLICATION 50Ω WITH B = 1.2 mm

| PCB thickness (mm) | Coplanar line A (mm) |
|--------------------|----------------------|
| 0.8                | 0.190                |
| 1.0                | 0.200                |
| 1.2                | 0.205                |
| 1.6                | 0.210                |



## INTRODUCTION



50Ω - 75Ω

DC - 6 GHz

### GENERAL

- Subminiature coaxial connectors
- "Push-pull" snap-on mating
- Complies with specification CECC 22220
- CEI standard 1169-36

### APPLICATIONS

#### 50Ω models

- Wireless communications
- Civil and military radio-telecommunication equipment

#### 75Ω models

- Videocommunication
- Television broadcasting

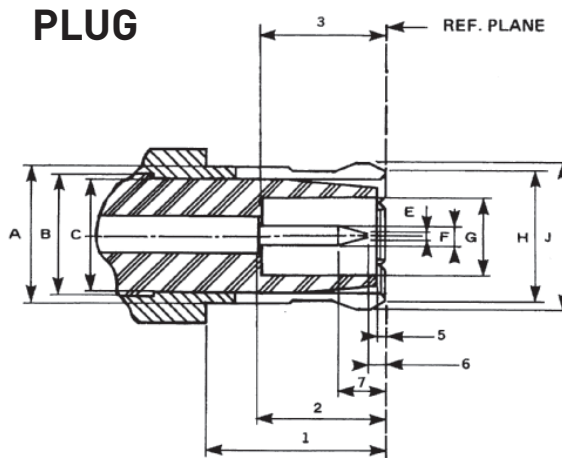
The **MCX series** utilizes the SMB series electrical line and features a particularly simple, compact and robust interface.

The MCX series is 30 % smaller than the SMB.

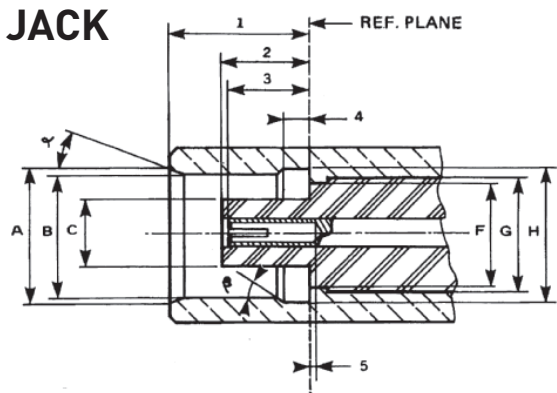
The **MCX series** helps to **miniaturize equipment**. It lowers wiring connection costs through its full crimp and solder crimp versions as the centre contact of the straight models can be either crimped or soldered. It optimizes PCB layouts with its range of models for PCBs including surface mount and press-fit receptacles.

## INTERFACE

### PLUG



### JACK



| ITEM | mm        |      | inch      |      |
|------|-----------|------|-----------|------|
|      | min.      | max. | min.      | max. |
| 1    | 4.15      | -    | .163      |      |
| 2    | 2.80      | 3.20 | .110      | .126 |
| 3    | 2.80      |      | .110      |      |
| 5    | 0         | 0.30 | 0         | .012 |
| 6    | 0.15      |      | .006      |      |
| 7    |           | 1.20 |           | .047 |
| A    |           | 3.40 |           | .134 |
| B    | 3.05 nom. |      | .120 nom. |      |
| C    |           | 3.00 |           | .118 |
| E    |           | 0.25 |           | .010 |
| F    | 0.48      | 0.53 | .019      | .021 |
| G    | 2.00      |      | .079      |      |
| H    |           | 3.60 |           | .142 |
| J    |           | 3.80 |           | .150 |

| ITEM | mm        |      | inch      |      |
|------|-----------|------|-----------|------|
|      | min.      | max. | min.      | max. |
| 1    | 4.00      | 4.12 | .157      | .162 |
| 2    | 2.60      | 2.80 | .102      | .110 |
| 3    | 2.30      | 2.80 | .090      | .110 |
| 4    | 0.75      | 0.85 | .029      | .033 |
| 5    | 0         |      | 0         |      |
| a    | 18°       | 22°  | 18°       | 22°  |
| β    | 43°       | 47°  | 43°       | 47°  |
| A    | 3.80      |      | .150      |      |
| B    | 3.42      | 3.48 | .135      | .137 |
| C    |           | 1.98 |           | .078 |
| F    |           | 3.00 |           | .118 |
| G    | 3.05 nom. |      | 3.05 nom. |      |
| H    | 3.60      | 3.75 | .142      | .148 |

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

## ELECTRICAL CHARACTERISTICS

|                                      |                                                                                                        |                   |       |
|--------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------|-------|
| Impedance                            | 50Ω and 75Ω                                                                                            |                   |       |
| Frequency range                      | DC - 6 GHz                                                                                             |                   |       |
| Typical V.S.W.R.                     | 1 GHz                                                                                                  | 2.5 GHz           | 6 GHz |
| straight styles: .085                | 1.04                                                                                                   | 1.08              | 1.13  |
| 2.6/50/S                             | 1.06                                                                                                   | 1.09              | 1.12  |
| right angle styles: .085             | 1.03                                                                                                   | 1.06              | 1.10  |
| 2.6/50/S                             | 1.04                                                                                                   | 1.07              | 1.10  |
| Insulation resistance                | 1 000 MΩ                                                                                               |                   |       |
| Contact resistance (mΩ)              | Initial                                                                                                | After environment |       |
| center contact                       | ≤ 5                                                                                                    | ≤ 15              |       |
| outer contact                        | ≤ 2.5                                                                                                  | ≤ 7.5             |       |
| Voltage rating (V.R.M.R.)            | At sea level                                                                                           | At 70.000 Ft      |       |
| • Cable RG 196/U - RG 188A/U - .047" | 170 V rms max                                                                                          | 45 V rms max      |       |
| • Ø 2.6 double screen                | 335 V rms max                                                                                          | 85 V rms max      |       |
| • RG 405/U - .085                    | 250 V rms max                                                                                          | 65 V rms max      |       |
| Dielectric withstanding voltage      | At sea level                                                                                           | At 70.000 Ft      |       |
| • Cable RG 196/U - RG 188A/U - .047" | 500 V rms max                                                                                          | 100 V rms max     |       |
| • Ø 2.6 double screen                | 750 V rms max                                                                                          | 100 V rms max     |       |
| • RG 405/U - .085                    | 750 V rms max                                                                                          | 100 V rms max     |       |
| Power                                | P = 120W at 1.8 GHz, T = 40°C at sea level, VSWR = 1.1 for a straight plug MCX<br>for Ø 2.6/50/D cable |                   |       |

## MECHANICAL CHARACTERISTICS

|                       |                                                                                                       |
|-----------------------|-------------------------------------------------------------------------------------------------------|
| Mechanical endurance  | 500 matings                                                                                           |
| Engagement            | ≤ 14.2 lbs - 63 N max                                                                                 |
| Separation force      | ≥ 1.8 Lbs - 8N ≤ 4.5 lbs 20 N                                                                         |
| Cable retention force | RG 196A/U<br>RG 188A/U<br>Ø 2.6/50 Ω double screen<br>.047"<br>RG 405/U-.085                          |
|                       | ≥ 7.2 lbs - 32 N<br>≥ 11.9 lbs - 53 N<br>≥ 24.1 lbs - 107 N<br>≥ 9.7 lbs - 43 N<br>≥ 34.9 lbs - 155 N |
| Contact captivation   | Axial force 2.25 Lbs 10 N                                                                             |

## ENVIRONMENTAL CHARACTERISTICS

|                        |                             |                                       |
|------------------------|-----------------------------|---------------------------------------|
| Operating temperature  | -55°C +155°C                |                                       |
| Temperature cycling    | CECC 22220 paragraph 4-6-5  |                                       |
| Thermal shock          | CECC 22220 paragraph 4-6-7  | MIL STD 202 - method 107 condition C  |
| High temperature test  | CECC 22220 paragraph 4-7-2  | MIL STD 202 - method 108A condition D |
| Corrosion (salt spray) | CECC 22220 paragraph 4-6-10 | MIL STD 202 - method 101 condition B  |
| Vibration              | CECC 22220 paragraph 4-6-3  | MIL STD 202 - method 204 condition D  |

## MATERIALS AND PLATING

|                          | Materials        | Platings          |
|--------------------------|------------------|-------------------|
| Bodies and male contacts | Brass            | Gold/BBR (bodies) |
| Female center contacts   | Beryllium copper | Gold              |
| Ferrules                 | Brass            |                   |
| Insulators               | PTFE             |                   |

All dimensions are given in mm.

Standard packaging = 100 pieces.

## CHARACTERISTICS

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

### ELECTRICAL CHARACTERISTICS

|                                      |                |
|--------------------------------------|----------------|
| Impedance                            | 50Ω            |
| Frequency range                      | DC - 6 GHz     |
| Typical V.S.W.R. straight connectors | 1.3            |
| right angle connectors               | 1.35           |
| Mating cycles                        | 100            |
| Temperature range                    | -40°C to +85°C |

### MATERIALS

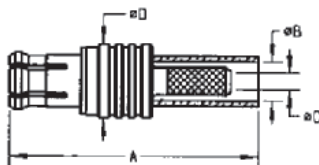
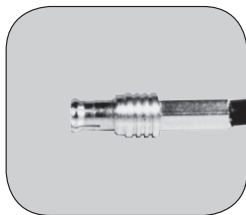
|                       |                         |
|-----------------------|-------------------------|
| Connector body        | Brass                   |
| Insulator             | PTFE                    |
| Female center contact | Bronze/Beryllium copper |
| Male center contact   | Brass                   |
| Outer contact         | Brass                   |

### PLATING AND PACKAGING

|                |                                 |
|----------------|---------------------------------|
| Body           | Gold                            |
| Center contact | Gold                            |
| Outer contact  | Gold                            |
| Female         | Nickel                          |
| Packaging/MOQ  | 100 pieces bulk/MOQ 1000 pieces |
|                | 500 pieces reel/MOQ 1000 pieces |
|                | unit packaging/MOQ 100 pieces   |

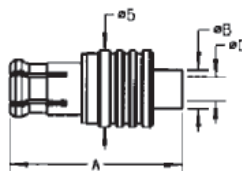
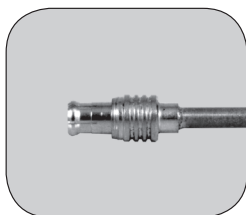


## STRAIGHT PLUGS, FULL CRIMP TYPE, FOR FLEXIBLE CABLES



| Cable group | Cable group dia. | Part number         | Imp. (Ω) | Dimensions (mm) |      |      |     | Captive center contact | Finish           |
|-------------|------------------|---------------------|----------|-----------------|------|------|-----|------------------------|------------------|
|             |                  |                     |          | A               | B    | C    | D   |                        |                  |
| RG178/RG196 | 2/50/S           | <b>R113 081 000</b> | 50       | 16.1            | 2.55 | 1.1  | 5   | no                     | Gold             |
| RG174/RG316 | 2.6/50/S         | <b>R113 082 000</b> |          | 16.1            | 2.95 | 1.65 |     | yes                    | Gold             |
|             |                  | R113A 082 000       |          | 18.7            | -    | 1.55 |     |                        | Gold ECO version |
| RD316       | 2.6/50/D         | R113 083 000        |          | 16.2            | 3.25 | 1.65 |     |                        | Gold             |
|             |                  | R113A 083 000       |          | 18.7            | -    | 1.55 |     |                        | Gold ECO version |
| RG179       | 2.6/75/S         | <b>R213 082 007</b> | 75       | 18.2            | 2.95 | 1.7  | 5.8 |                        | BBR              |
| RD179       | 2.6/75/D         | R213 083 007        |          | 18.3            | 3.25 |      |     |                        |                  |

## STRAIGHT PLUGS, SOLDER TYPE, FOR SEMI-RIGID CABLES



| Cable group      | Cable group dia. | Part number  | Imp. (Ω) | Dimensions (mm) |   |      | Captive center contact | Finish |
|------------------|------------------|--------------|----------|-----------------|---|------|------------------------|--------|
|                  |                  |              |          | A               | B | C    |                        |        |
| .047" semi-rigid | .047"            | R113 051 000 | 50       | 11.3            | 2 | 1.3  | no                     | Gold   |
| RG405            | .085"            | R113 053 000 |          |                 | 3 | 2.25 |                        |        |

## RIGHT ANGLE PLUGS, CRIMP TYPE, FOR FLEXIBLE CABLES

(captive center contact)

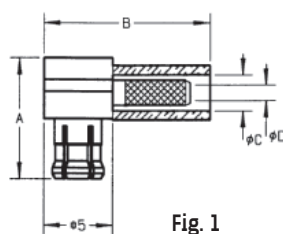
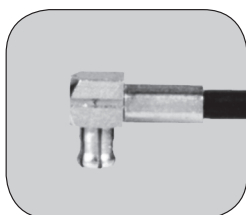


Fig. 1

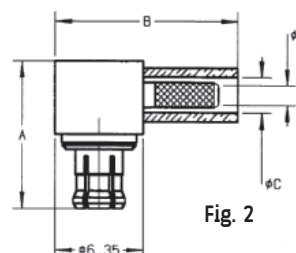


Fig. 2

| Cable group | Cable group dia. | Part number         | Fig. | Imp. (Ω) | Dimensions (mm) |      |      |      | Finish           |
|-------------|------------------|---------------------|------|----------|-----------------|------|------|------|------------------|
|             |                  |                     |      |          | A               | B    | C    | D    |                  |
| RG178/RG196 | 2/50/S           | <b>R113 181 000</b> | 1    | 50       | 8.6             | 11.9 | 2.55 | 1.1  | Gold             |
| RG174/RG316 | 2.6/50/S         | R113 182 000        |      |          |                 | 11.9 | 2.95 | 1.65 | Gold             |
|             |                  | R113A 182 000       |      |          | 8.9             | 14.1 |      | 1.55 | Gold ECO version |
| RD316       | 2.6/50/D         | <b>R113 183 000</b> |      |          | 8.6             | 11.9 | 3.25 | 1.65 | Gold             |
|             |                  | R113A 183 000       |      |          | 8.9             | 14.1 |      | 1.55 | Gold ECO version |
| RG179       | 2.6/75/S         | <b>R213 182 007</b> | 2    | 75       | 10.6            | 13.3 | 2.95 | 1.7  | BBR              |
| RD179       | 2.6/75/D         | R213 183 007        |      |          |                 |      | 3.25 |      |                  |

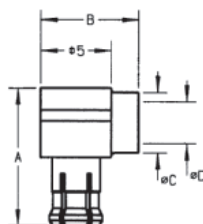
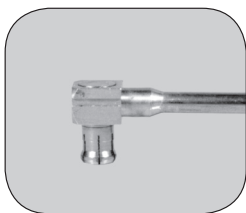
To download data sheets and assembly instructions, visit [www.radiall.com](http://www.radiall.com) & enter the part number in the Search box.

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

See page 8 and 9 for packaging information.

## PLUGS AND JACKS

### RIGHT ANGLE PLUGS, SOLDER TYPE (captive center contact)



| Cable group       | Cable group dia.          | Part number  | Imp. ( $\Omega$ ) | Dimensions (mm) |   |     |      | Finish |
|-------------------|---------------------------|--------------|-------------------|-----------------|---|-----|------|--------|
|                   |                           |              |                   | A               | B | C   | D    |        |
| .047" semi-rigid  | .047"                     | R113 151 000 | 50                | 8.6             | 7 | 2.1 | 1.25 | Gold   |
| RG405             | .085"                     | R113 153 000 |                   |                 |   | 3.1 | 2.25 |        |
| RG178/RG174/RG405 | 2/50/S - 2.6/50/S - .085" | R113 161 000 |                   | 8               | 8 | 3.0 | 2.35 |        |

### STRAIGHT JACKS, FULL CRIMP TYPE, FOR FLEXIBLE CABLES

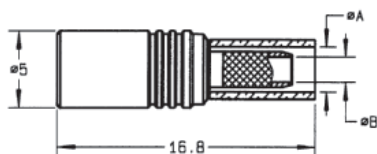


Fig. 1

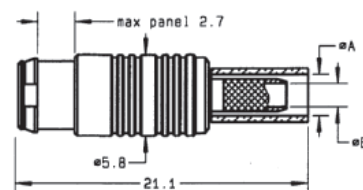
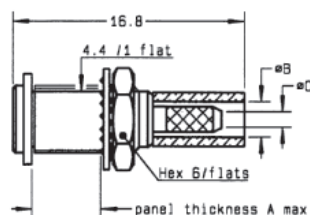
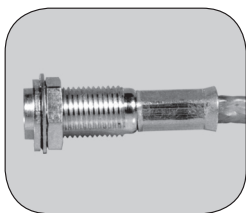


Fig. 2

| Cable group | Cable group dia. | Part number  | Fig. | Imp. ( $\Omega$ ) | Dimensions (mm) |      | Captive center contact | Panel drilling | Finish                                                                      |
|-------------|------------------|--------------|------|-------------------|-----------------|------|------------------------|----------------|-----------------------------------------------------------------------------|
|             |                  |              |      |                   | A               | B    |                        |                |                                                                             |
| RG178/RG196 | 2/50/S           | R113 236 000 | 1    | 50                | 2.55            | 1.1  | no                     |                | Gold                                                                        |
| RG174/RG316 | 2.6/50/S         | R113 240 000 |      |                   | 2.95            | 1.65 |                        |                |                                                                             |
| RG179       | 2.6/75/S         | R213 238 007 | 2    | 75                | 2.95            | 1.7  | yes                    | P01            | BBR<br>(Snap mount<br>Panel thickness<br>2.5 <sup>0</sup> <sub>-0.1</sub> ) |

### STRAIGHT BULKHEAD JACKS, FULL CRIMP TYPE, FOR FLEXIBLE CABLES



| Cable group | Cable group dia. | Part number  | Imp. ( $\Omega$ ) | 5 | Dimensions (mm) |      |   | Captive center contact | Panel drilling | Finish |
|-------------|------------------|--------------|-------------------|---|-----------------|------|---|------------------------|----------------|--------|
|             |                  |              |                   |   | A               | B    | C |                        |                |        |
| RG178/RG196 | 2/50/S           | R113 306 000 | 50                | 5 | 2.55            | 1.1  |   | no                     | P02            | Gold   |
| RG174/RG316 | 2.6/50/S         | R113 310 000 |                   |   | 2.95            | 1.65 |   | 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.

## STRAIGHT FEMALE PANEL RECEPTACLES (captive center contact)

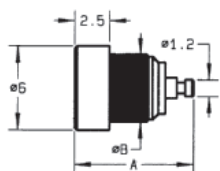
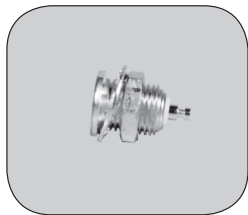


Fig. 1

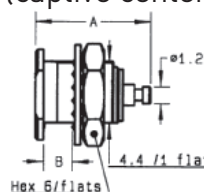
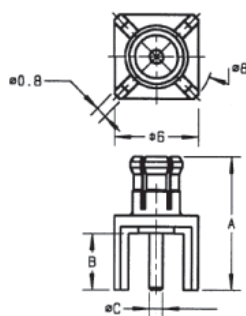


Fig. 2

| Part number         | Fig. | Imp. ( $\Omega$ ) | Dimensions (mm) |     | Panel drilling | Finish | Note                 |
|---------------------|------|-------------------|-----------------|-----|----------------|--------|----------------------|
|                     |      |                   | A               | B   |                |        |                      |
| <b>R113 402 220</b> | 1    | 50                | 8.7             | 4.8 | P03            | BBR    | Press-in mount       |
| R113 553 000        | 2    |                   | 8.65            | 2.5 | P02            | Gold   | Recessed front mount |

## STRAIGHT MALE PCB RECEPTACLES (captive center contact)



| Part number  | Imp. ( $\Omega$ ) | Dimensions (mm) |     |      | Panel drilling | Finish |
|--------------|-------------------|-----------------|-----|------|----------------|--------|
|              |                   | A               | B   | C    |                |        |
| R113 425 000 | 50                | 9.65            | 4.1 | 0.98 | P05            | Gold   |

## STRAIGHT FEMALE PCB RECEPTACLES (captive center contact)

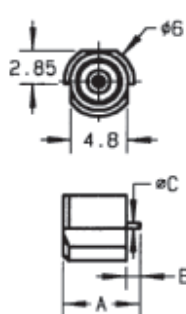
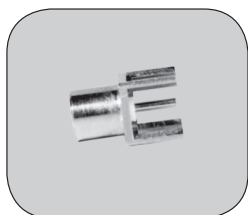


Fig. 1

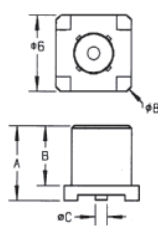


Fig. 2

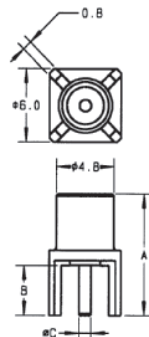


Fig. 3

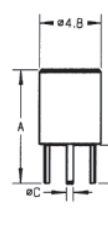


Fig. 4

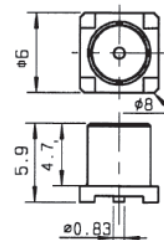


Fig. 5

| Part number   | Fig. | Imp. (Ω) | Dimensions (mm) |     |                                 | Assembly instructions | Panel drilling | Finish | Note                   |
|---------------|------|----------|-----------------|-----|---------------------------------|-----------------------|----------------|--------|------------------------|
|               |      |          | A               | B   | C                               |                       |                |        |                        |
| R113 423 000  | 1    | 50       | 6.9             | 1.4 | 0.5                             | M01                   |                | Gold   | SMT/Edge-card          |
| R113 424 000  | 2    |          | 5.9             | 4.7 | 0.96                            |                       |                |        | SMT                    |
| R113 424 010  |      |          |                 |     |                                 |                       |                |        | SMT/reel 100 pieces    |
| R113 424 020  |      |          |                 |     |                                 |                       |                |        | SMT/reel 500 pieces    |
| R113A 424 020 |      |          |                 |     | SMT/reel 500 pieces ECO version |                       |                |        |                        |
| R113 426 000  | 3    |          | 10              | 4.1 | 0.98                            | P05                   |                | BBR    | 100 pieces ECO version |
| R113A 426 000 |      |          |                 |     |                                 |                       |                |        |                        |
| R113 426 020  |      |          |                 |     |                                 |                       |                |        |                        |
| R113 427 000  | 4    |          | 9               | 3   | 0.5                             |                       | P06            | Gold   | Space saving on PCB    |
| R213 426 000  | 3    | 75       | 10              | 4.1 | 0.71                            |                       | P05            | Gold   |                        |
| R213 424 800  | 5    |          |                 |     |                                 | M01                   |                | Gold   | SMT/reel 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 AND IN SERIES ADAPTERS

## RIGHT ANGLE FEMALE PCB RECEPTACLES (captive center contact)

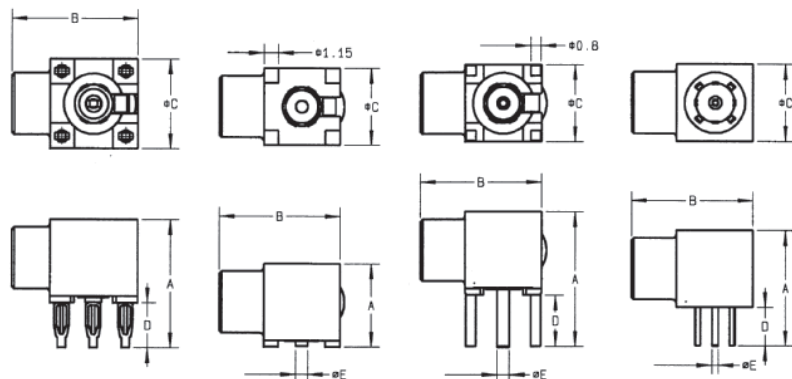
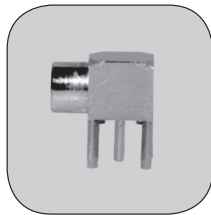


Fig. 1

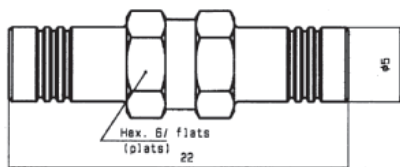
Fig. 2

Fig. 3

Fig. 4

| Part number   | Fig. | Imp. ( $\Omega$ ) | Dimensions (mm) |     |   |     |      | Assembly instructions | Panel drilling | Finish | Note                 |
|---------------|------|-------------------|-----------------|-----|---|-----|------|-----------------------|----------------|--------|----------------------|
|               |      |                   | A               | B   | C | D   | E    |                       |                |        |                      |
| R113 661 000  | 1    | 50                | 10              | 10  | 7 | 3.5 |      |                       | P04            | Gold   | Press-fit PCB mount  |
| R113 664 000  | 2    |                   | 6.5             | 9.5 | 6 |     |      | M01                   |                |        | SMT                  |
| R113A 664 120 |      |                   |                 |     |   |     |      |                       |                |        | SMT/reel 500 pieces  |
| R113 665 000  | 3    |                   | 10.5            |     |   | 4   | 0.96 |                       | P05            | BBR    |                      |
| R113 665 020  |      |                   |                 |     |   |     |      |                       |                |        |                      |
| R113 666 000  | 4    | 75                | 9               | 9.4 |   | 3   | 0.5  |                       | P06            | Gold   | Space saving pattern |
| R213 664 800  | 2    |                   | 6.5             | 9.5 | 6 |     | 0.83 | M01                   |                |        | SMT/reel 100 pieces  |
| R213 665 000  | 3    |                   | 10.5            |     |   | 4   | 0.83 |                       | P05            |        |                      |

## IN SERIES ADAPTERS (female - female)



| Part number  | Imp. ( $\Omega$ ) | Finish |
|--------------|-------------------|--------|
| R113 704 000 | 50                | Gold   |

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.

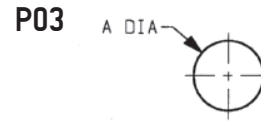
## PANEL DRILLING



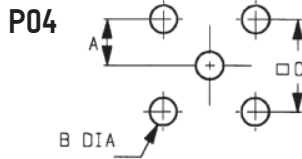
|   | MM   |      | INCH  |       |
|---|------|------|-------|-------|
|   | maxi | mini | maxi  | mini  |
| A | 5    | 4.97 | 0.197 | 0.196 |



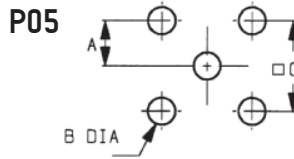
|   | MM   |      | INCH  |       |
|---|------|------|-------|-------|
|   | maxi | mini | maxi  | mini  |
| A | 5    | 4.9  | 0.197 | 0.19  |
| B | 4.58 | 4.46 | 0.18  | 0.176 |



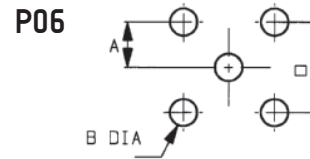
|   | MM   |      | INCH  |       |
|---|------|------|-------|-------|
|   | maxi | mini | maxi  | mini  |
| A | 4.77 | 4.74 | 0.188 | 0.187 |



|   | MM    |       | INCH  |       |
|---|-------|-------|-------|-------|
|   | maxi  | mini  | maxi  | mini  |
| A | 2.565 | 2.515 | 0.101 | 0.1   |
| B | 1.09  | 0.94  | 0.043 | 0.037 |
| C | 5.105 | 5.055 | 0.201 | 0.199 |



|   | MM   |      | INCH  |       |
|---|------|------|-------|-------|
|   | maxi | mini | maxi  | mini  |
| A | 2.56 | 2.52 | 0.101 | 0.099 |
| B | 1.4  | 1.3  | 0.055 | 0.051 |
| C | 5.13 | 5.03 | 0.202 | 0.198 |

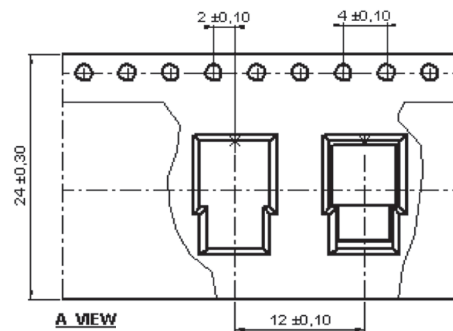
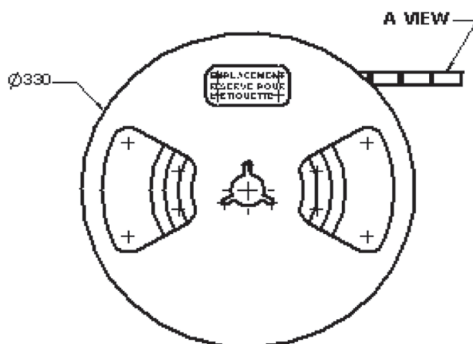


|   | MM   |      | INCH |      |
|---|------|------|------|------|
|   | maxi | mini | maxi | mini |
| A | 1.30 | 1.24 | .051 | .049 |
| B | 0.89 | 0.79 | .035 | .031 |
| C | 2.59 | 2.49 | .102 | .098 |



|   | MM   |      | INCH  |       |
|---|------|------|-------|-------|
|   | maxi | mini | maxi  | mini  |
| A | 1.4  | 1.3  | 0.055 | 0.051 |
| B | 5.13 | 5.03 | 0.202 | 0.198 |

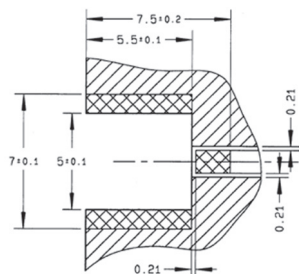
## PACKAGING



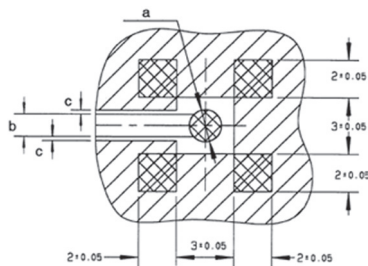
## ASSEMBLY INSTRUCTIONS

# M01

| Part number  |
|--------------|
| R113 423 000 |



| Part number                                  |                               | a                         | b   | c    |
|----------------------------------------------|-------------------------------|---------------------------|-----|------|
| R113 424 000<br>R113 424 010<br>R113 424 020 | R113A 424 020<br>R113 664 000 | $\emptyset 1.7^{+0.1}_0$  | 1.2 | 0.21 |
| R113A 664 120                                |                               | $\emptyset 1.05$          | 1.2 | 0.21 |
| R213 424 800                                 |                               | $\emptyset 1.57^{+0.1}_0$ | 1   | 0.63 |



### Pattern



Land for solder paste

## COPLANAR LINE

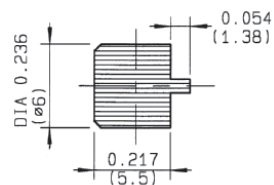
Pattern and signal are on the same side.  
Thickness of PCB: .063 (1.6 mm).

The material of PCB is the epoxy resin of glass fabrics bacs ( $E_r = 4.8$ ).

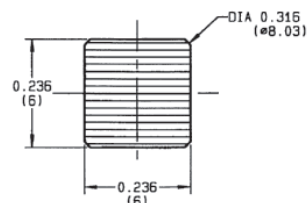
The solder resist should be printed

## VIDEO SHADOW

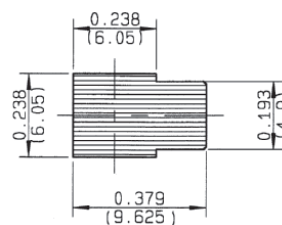
|              |
|--------------|
| Part number  |
| R113 423 000 |



| Part number  |               |
|--------------|---------------|
| R113 424 000 | R113 424 020  |
| R113 424 010 | R113A 424 020 |
|              | R213 424 800  |



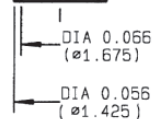
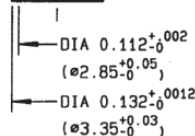
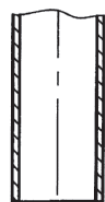
| Part number   |              |
|---------------|--------------|
| R113 664 000  | R213 664 800 |
| R113A 664 120 |              |



### Vaccum nozzle dimensions

MCX 50Ω

MCX 75Ω





AEROSPACE



AUTOMOTIVE



DEFENSE



INDUSTRIAL



INSTRUMENTATION



MEDICAL



SPACE



TELECOM

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