

**SECTION 3**



**Board-to-Board: MMBX / SMP-MAX**  
R223 / R222M



**Contents**

**MMBX**

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**SMP-MAX**

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Introduction



50Ω

DC - 12.4 GHz

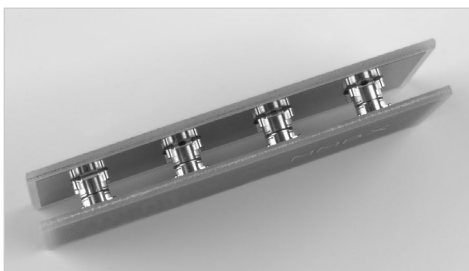
**GENERAL**

- 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

MMBX™ connector series is particularly suitable for board to board connection in 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 size is a main advantage for applications requiring board to board distance less than 7mm.

• **Recommended use**

Receptacles and in-series adapters can be either sold separately or with the 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.

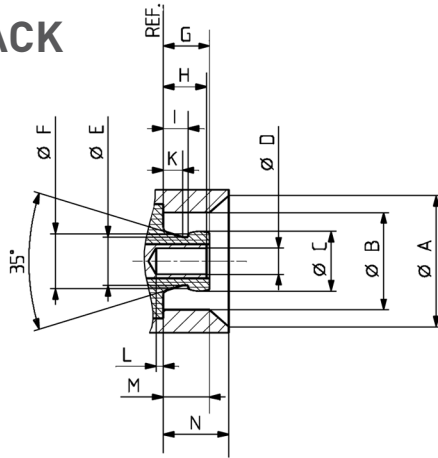


- Retention between receptacle and in-series adapter is ensured by the asymmetrical design of the adapter.
- Snap side: for board to board application, it allows all in-series adapters to remain on the same board during disassembly.
  - Slide side: it allows quick and easy connections with large axial and radial misalignment tolerance.

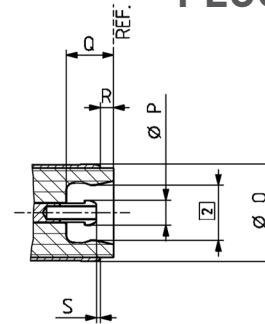
Interface

PCB connectors

JACK



PLUG

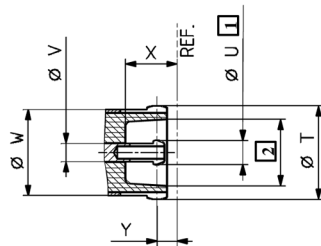


| Letter | mm        |           | inch      |           |
|--------|-----------|-----------|-----------|-----------|
|        | min.      | max.      | min.      | max.      |
| A      | 5.00 nom. | 5.00 nom. | .197 nom. | .197 nom. |
| B      | 3.68      | 3.71      | .145      | .146      |
| C      | 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      |           |

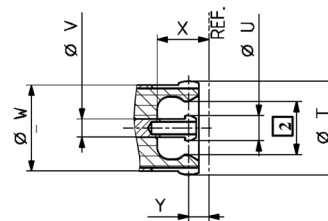
| Letter | mm        |           | inch      |           |
|--------|-----------|-----------|-----------|-----------|
|        | min.      | max.      | min.      | max.      |
| K      | 0.75 nom. | 0.75 nom. | .029 nom. | .029 nom. |
| L      | 0         |           | 0         |           |
| M      | 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 |
| <ul style="list-style-type: none"> <li>• Straight connectors:</li> <li>- 2/50/S</li> <li>- 2.6/50/S</li> <li>- 2.6/50/D</li> <li>• Right angle connectors:</li> <li>- 2/50/S</li> <li>- 2.6/50/S</li> <li>- 2.6/50/D</li> </ul> |       | 1.05                               | 1.06        | 1.10        |
|   |       | 1.05                               | 1.06        | 1.10        |
|   |       | 1.05                               | 1.06        | 1.10        |
|   |       | 1.05                               | 1.13        | 1.22        |
|   |       | 1.05                               | 1.06        | 1.17        |
|   |       | 1.05                               | 1.06        | 1.13        |
| Insulation resistance   |       | > 1 GΩ                             |             |             |
| Dielectric withstanding voltage (sea level)   | 4.4.5 | 500 Vrms. 50 Hz<br>750 Vrms. 50 Hz |             |             |
| <ul style="list-style-type: none"> <li>• 2/50</li> <li>• 2.6/50</li> </ul>  |       |                                    |             |             |
| Contact resistance  |       | ≤ 5 mΩ                             |             |             |
| <ul style="list-style-type: none"> <li>• Center contact</li> <li>• Outer contact</li> </ul>   | 4.4.2 | ≤ 1 mΩ                             |             |             |
|   | 4.4.3 |                                    |             |             |

### MECHANICAL CHARACTERISTICS

| Mechanical endurance   | 4.7.1                 | 100 matings                            |
|--|-----------------------|--|
| Engagement and separation force  |                       |  |
| <ul style="list-style-type: none"> <li>• Engagement</li> <li>• Separation</li> </ul> | 4.5.4                 | 30 N max<br>8-30 N                     |
| Contact captivation  | 4.5.2                 | ≥ 10 N                                 |
| Cable retention force  |                       |  |
| <ul style="list-style-type: none"> <li>• 2/50</li> <li>• 2.6/50</li> </ul>           |                       | 58 N<br>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.

Plugs and PCB receptacles

**STRAIGHT PLUGS (male center contact)**

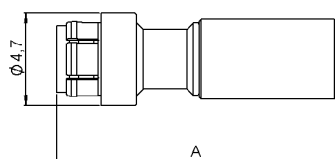


Fig. 1

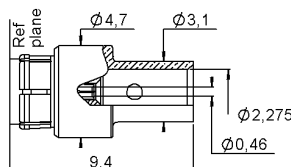


Fig. 2

| 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 |      | 14.5 |                        |                                   |
| RG316         | 2.6/50/D         | R223 083 000 |      |      |                        |                                   |
| RG405         | .085"            | R223 062 000 | 2    |      |                        | Solder type for semi-rigid cables |

**RIGHT ANGLE PLUGS (male center contact)**

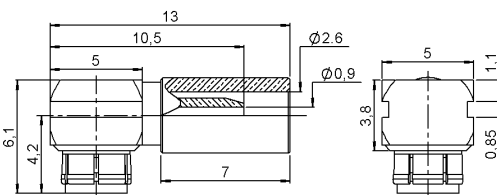
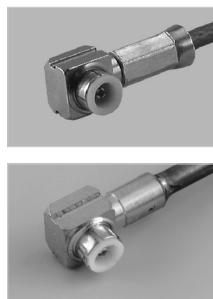


Fig. 1

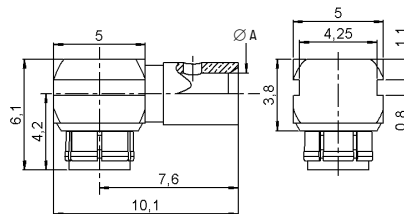


Fig. 2

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

**STRAIGHT PCB RECEPTACLES WITH PRE-ASSEMBLED ADAPTER (male center contact)**

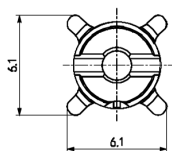


Fig. 1

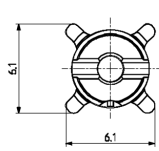


Fig. 2

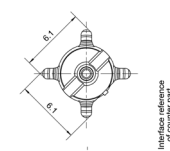
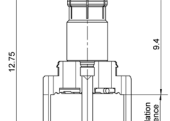
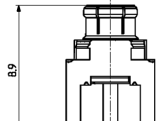
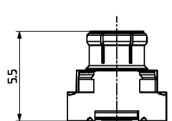


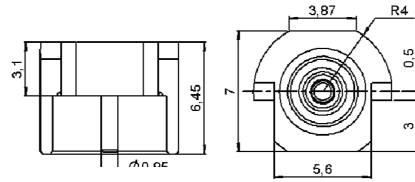
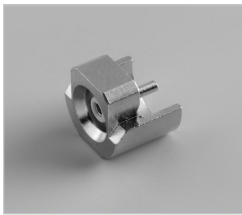
Fig. 3



| Part number  | Fig. | Captive center contact | PCB | Assembly instructions | Packaging              | Note |
|--------------|------|------------------------|-----|-----------------------|------------------------|------|
| R223 434 000 | 1    | yes                    |     | M01                   | Bulk 100 pieces        | SMT  |
| R223 434 800 |      |                        |     |                       | Tape & Reel 750 pieces |      |
| R223 435 000 | 2    |                        |     |                       | P01                    |      |
| R223 435 010 | 3    |                        |     |                       |                        |      |

PCB receptacles

**EDGE CARD PCB RECEPTACLES (female center contact)**



| Part number  | Captive center contact | Packaging              | Note |
|--------------|------------------------|------------------------|------|
| R223 423 010 | yes                    | Bulk 100 pieces        | SMT  |
| R223 423 800 |                        | Tape & Reel 650 pieces |      |

**STRAIGHT PCB RECEPTACLES (female center contact)**

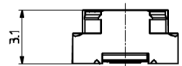
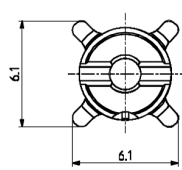
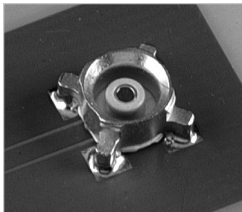


Fig. 1

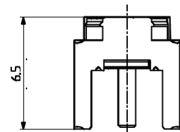
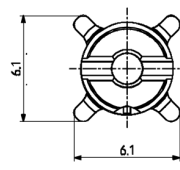


Fig. 2

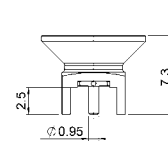
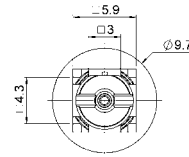


Fig. 3

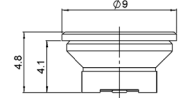
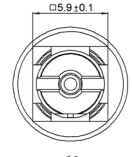
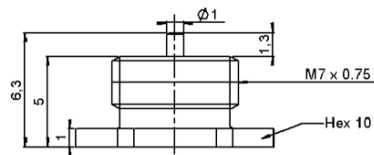
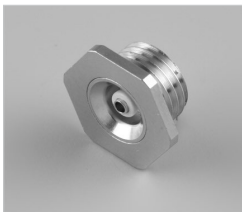


Fig. 4

| Part number  | Fig. | Captive center contact | PCB | Assembly instructions  | Packaging              | Note                   |
|--------------|------|------------------------|-----|------------------------|------------------------|------------------------|
| R223 424 000 | 1    | yes                    | P01 | M01                    | Bulk 100 pieces        | SMT                    |
| R223 424 800 |      |                        |     |                        | Tape & Reel 750 pieces |                        |
| R223 424 870 | 4    |                        |     | M02                    | Tape & Reel 750 pieces | Catcher's mitt         |
| R223 425 000 | 2    |                        |     | Bulk 100 pieces        | Bulk 100 pieces        |                        |
| R223 425 800 |      |                        |     | Tape & Reel 500 pieces | Tape & Reel 500 pieces |                        |
| R223 425 810 | 3    |                        |     |                        |                        | Tape & Reel 500 pieces |

**SCREW-ON RECEPTACLE (female center contact)**



| Part number  | Captive center contact | Panel drilling |
|--------------|------------------------|----------------|
| R223 555 000 | yes                    | P02            |

Adapters

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

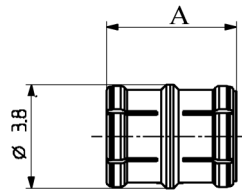
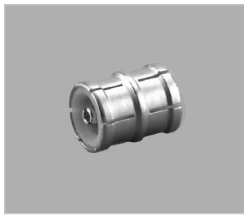


Fig. 1

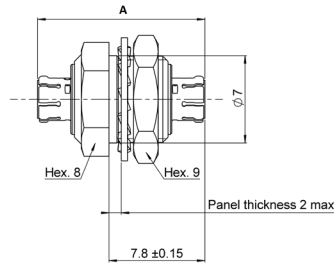


Fig. 2

| Part number  | Fig. | Length A (mm) | Type                 | Nominal board to board distance |
|--------------|------|---------------|----------------------|---------------------------------|
| R223 703 180 | 1    | 4.8           | Snap-slide           | 6.7                             |
| R223 703 020 |      | 9.7           | Slide-slide          | 11.7                            |
| R223 703 040 |      | 12            | Snap-slide           | 14                              |
| R223 703 080 |      | 7             |                      | 9                               |
| R223 703 230 |      | 20.4          |                      | 22.4                            |
| R223 720 020 | 2    | 13.6          | Slide-slide Bulkhead | -                               |

Other lengths available, please contact us.

**BETWEEN-SERIES ADAPTERS**

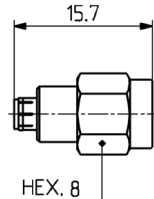


Fig. 1

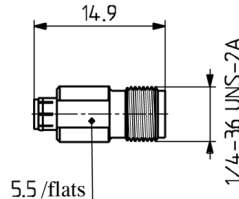


Fig. 2

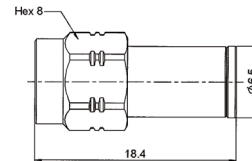


Fig. 3

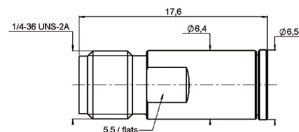


Fig. 4

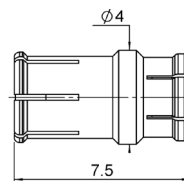


Fig. 5

| 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        |                 |
| R191 560 000 | 5    | SMP-MAX female/MMBX male snap | Bulk 100 pieces |

Other configurations available, with flange, straight and right angle. Please contact us.



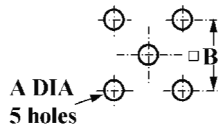
Demo board



| Part number  | Note              |
|--------------|-------------------|
| R223 990 000 | 2 SMT receptacles |

Panel drilling

P01



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

P02



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

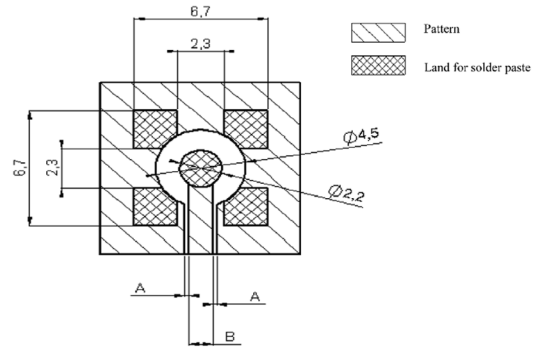
Assembly instructions

M01

| Part number  |              |              |              |              |              |
|--------------|--------------|--------------|--------------|--------------|--------------|
| R223 424 000 | R223 424 800 | R223 434 000 | R223 434 800 | R223 435 000 | R223 435 010 |

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.

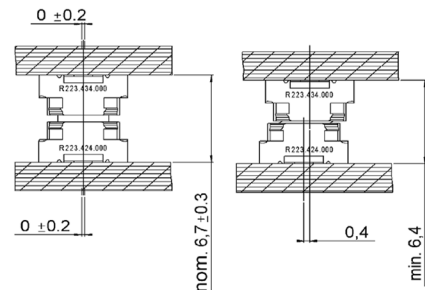
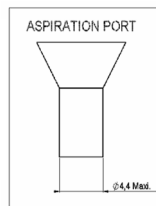
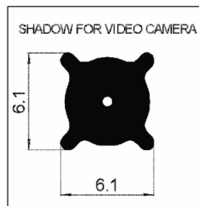


APPLICATION 75Ω WITH B = 0.55 mm

| 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                |



Not valid for R223 424 870, please consult data sheet.

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 to 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-to-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, MMBX-Spring, and BMR-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 to 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-to-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

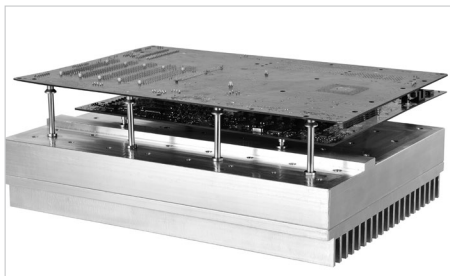
Limited Misalignment

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.

Introduction



|     |            |
|-----|------------|
| 50Ω | DC - 6 GHz |
|-----|------------|

**GENERAL**

- Microminiature coaxial connectors
- Power up to 300 Watts
- Board to board distance misalignment of at least 0.078" (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 was 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                                 |            |         |
|---|--|------------|---------|
| <b>ELECTRICAL CHARACTERISTICS</b>               |  |            |         |
| 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<br>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.

Jacks, plugs and cabling

**BULKHEAD STRAIGHT SLIDE-ON MALE JACKS FOR CABLES**

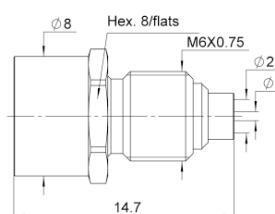


Fig. 1

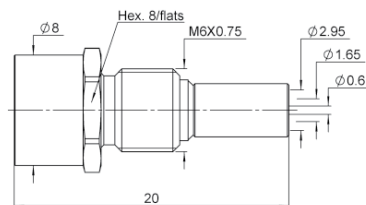
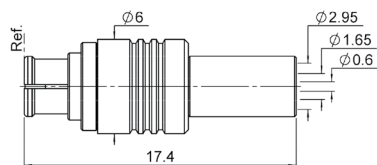


Fig. 2

| 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**

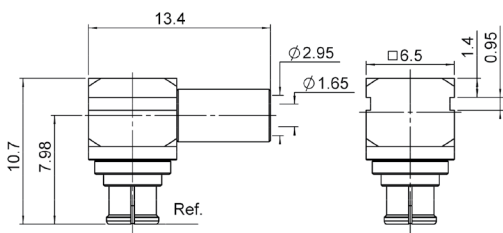


Fig. 1

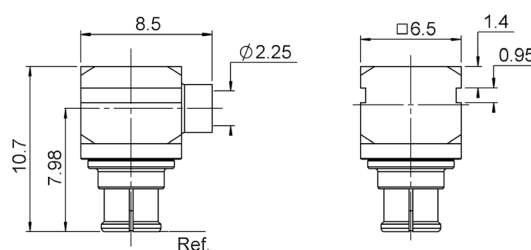
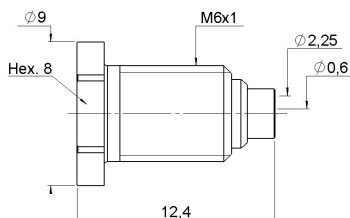


Fig. 2

| Cable group   | Fig. | Cable group dia. | Part number  | Captive center contact | Packaging       |
|---------------|------|------------------|--------------|------------------------|-----------------|
| RG174 / RG316 | 1    | 2.6/50/S         | R222 M80 500 | yes                    | Bulk 100 pieces |
| RG405         | 2    | .085"            | R222 M80 517 |                        |                 |

**BULKHEAD MALE JACK SNAP TYPE**



| Cable group | Cable group dia. | Part number  | Captive center contact | Panel drilling | Packaging |
|-------------|------------------|--------------|------------------------|----------------|-----------|
| RG405       | .085"            | R222 M20 017 | no                     | P05            | 100       |

Receptacles

STRAIGHT SLIDE-ON MALE RECEPTACLES

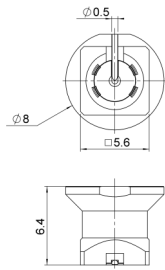


Fig. 1

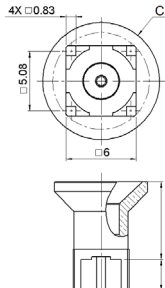


Fig. 2

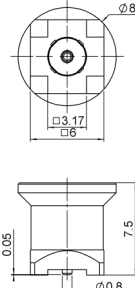


Fig. 3

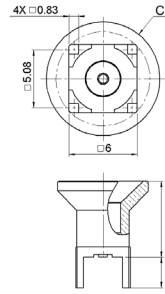


Fig. 4

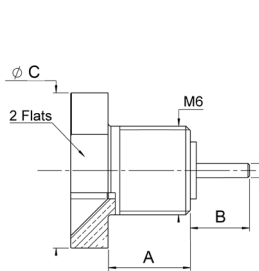


Fig. 5

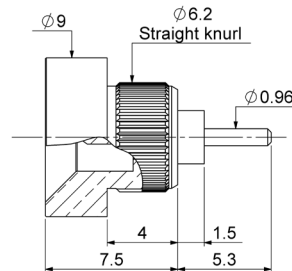


Fig. 6

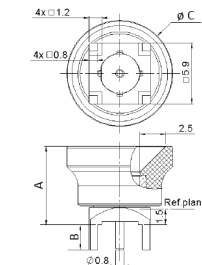


Fig. 7

| Part number  | Fig. | Dimensions (mm) |     |      | Captive center contact | Panel drilling | Packaging              | Note                                   |
|--------------|------|-----------------|-----|------|------------------------|----------------|------------------------|--|
|              |      | A               | B   | C    |                        |                |                        |  |
| R222 M00 700 | 1    |                 |     |      | yes                    |                | Tape & Reel 500 pieces | SMT                                    |
| R222 M00 720 | 2    | 7.5             | 1.9 | 8.3  |                        | P02            | Bulk 100 pieces        | Solder legs                            |
| R222 M00 770 |      | 8.4             | 3.4 | 10   |                        |                |                        | Center contact dia. 0.95               |
| R222 M00 730 | 4    | 7.7             | 1.9 | 8.3  |                        | P03            | Tape & Reel 400 pieces | PIH + SMT, with cap                    |
| R222 M00 740 | 3    |                 |     |      |                        |                | Tape & Reel 500 pieces | SMT                                    |
| R222 M10 700 | 5    | 5.6             | 2   | 9    |                        | P01            |                        | Screw-on                               |
| R222 M10 730 | 6    |                 |     |      |                        | P04            |                        | Press in                               |
| R222 M10 750 | 5    | 5.6             | 4   | 10.5 |                        | P01            |                        |  |
| R222 M00 790 | 4    | 13.3            | 1.9 | 12   |                        | P03            | Bulk 100 pieces        | PIH + SMT                              |
| R222 M00 860 | 2    | 7.3             | 3.5 |      |                        | P02            |                        | Solder legs                            |
| R222 M00 880 |      | 7.7             | 2.4 | 10   |                        |                |                        |  |
| R222 M00 890 | 4    | 7.2             | 1.7 |      |                        |                |                        | Composite catcher's mitt / SMT         |
| R222 M03 700 | 7    | 7.6             | 0   | 10.2 |                        |                | 500                    | Composite catcher's mitt / SMT         |
| R222 M03 880 |      | 7.7             | 2.4 | 10   |                        | P02            | Bulk 100 pieces        | Composite catcher's mitt / Solder legs |

Receptacles and adapters

STRAIGHT SNAP-ON MALE RECEPTACLES

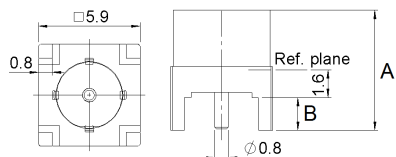


Fig. 1

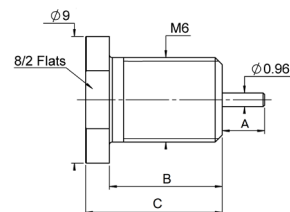


Fig. 2

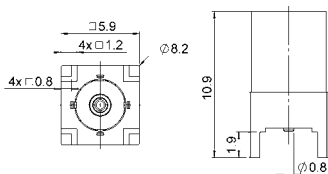


Fig. 3

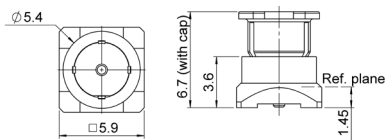


Fig. 4

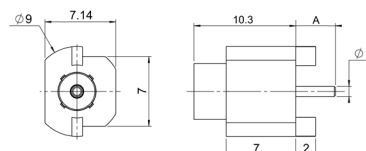


Fig. 5

| Part number  | Fig. | Dimensions (mm) |     |       | Captive center contact | Panel drilling         | Packaging              | Note               |
|--------------|------|-----------------|-----|-------|------------------------|------------------------|------------------------|--------------------|
|              |      | A               | B   | C     |                        |                        |                        |                    |
| R222 M10 000 | 2    | 2               | 7.1 | 11.15 | yes                    | P01                    | Bulk 100 pieces        | Screw-on, with cap |
| R222 M10 030 |      | 3.5             | 9.1 | 11.2  |                        |                        |                        |                    |
| R222 M10 060 |      | 4.1             | 6.5 | 8.5   |                        |                        |                        |                    |
| R222 M00 080 | 1    | 7               | 1.9 | P02   |                        | Tape & Reel 500 pieces | PIH + SMT, with cap    |                    |
| R222 M00 090 | 3    |                 |     |       |                        |                        |                        |                    |
| R222 M00 160 | 1    | 8.6             | 3.5 |       |                        | P02                    | Bulk 100 pieces        | Solder legs        |
| R222 M01 000 |      | 6.7             | 1.7 |       |                        |                        |                        |                    |
| R222 M01 040 | 3    |                 |     |       |                        | P03                    | Bulk 400 pieces        | PIN + SMT          |
| R222 M01 090 |      |                 |     |       |                        |                        |                        |                    |
| R222 M01 140 | 5    | 4               |     |       |                        |                        | Tape & Reel 500 pieces | Edge type          |
| R222 M01 140 |      | 3               |     |       |                        |                        |                        |                    |
| R222 M03 000 | 4    |                 |     |       | P05                    | Tape & Reel 500 pieces | Screw-on               |                    |

IN-SERIES BOARD-TO-BOARD ADAPTERS

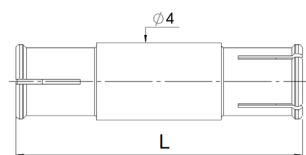


Fig. 1

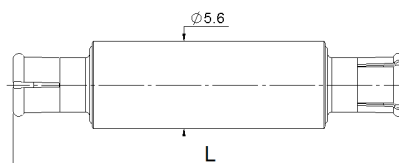
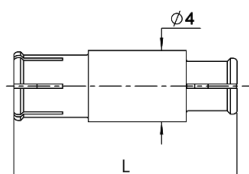


Fig. 2

| Part number  | Length L (mm) | Fig. | Series                          | Packaging       |
|--------------|---------------|------|---------------------------------|-----------------|
| R222 M40 010 | 9.5           | 1    | SMP-MAX female / SMP-MAX female | Bulk 100 pieces |
| R222 M40 050 | 25.3          |      |                                 |                 |
| R222 M40 060 | 12.15         |      |                                 |                 |
| R222 M40 070 | 14.9          |      |                                 |                 |
| R222 M40 080 | 13.8          |      |                                 |                 |
| R222 M43 052 | 25.3          |      |                                 |                 |
| R222 M43 072 | 14.9          |      |                                 |                 |
| R222 M43 112 | 16.7          |      |                                 |                 |
| R222 M43 192 | 50.5          |      |                                 |                 |
| R222 M43 202 | 45.2          |      |                                 |                 |
| R222 M43 212 | 46.25         | 2    | SMP-MAX female / SMP-MAX female | Bulk 100 pieces |
| R222 M43 222 | 51.15         |      |                                 |                 |
| R222 M43 262 | 67.5          |      |                                 |                 |
| R222 M46 012 | 9.5           |      |                                 |                 |
| R222 M46 032 | 7.2           | 1    |                                 |                 |

Receptacles

**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**

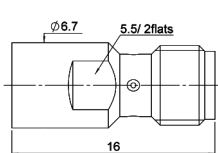


Fig. 1

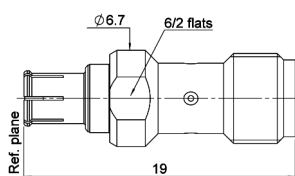
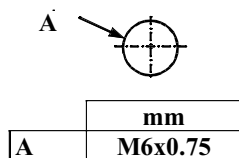


Fig. 2

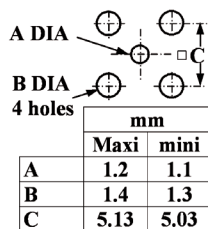
| Part number  | Fig. | Series                      | Packaging |
|--------------|------|-----------------------------|-----------|
| R191 552 000 | 1    | SMP-MAX male / SMA female   | Unit      |
| R191 553 000 | 2    | SMP-MAX female / SMA female |           |

Panel drilling

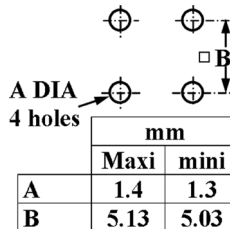
**P01**



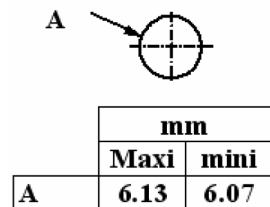
**P02**



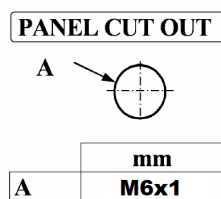
**P03**



**P04**



**P05**





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