



**SMPM / SMP / SMP-LOCK / SMP-COM /
SMP-MAX**

R201 / R222 / R222L / R222M

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SECTION 2 TABLE OF CONTENTS

Introduction



	SMP	SMP-COM	SMPM
50Ω	DC - 40 GHz	DC - 12.4 GHz	DC-65GHz

GENERAL

- Small, lightweight connectors
- Snap-in, suitable for blindmate applications
- Excellent vibration and shock performances
- Allows axial and radial misalignment

APPLICATIONS

- Active array antenna
- Satellite
- Airborne / Ship / Ground radar
- Communication equipment
- High speed electro-optical devices
- Board to board applications

SMP series

Radiall SMP series meets MIL STD 348, figure 326 interface standard and DESC specifications 94007 & 94008. They are intermateable with GPO® (Gilbert Engineering Inc.).

There are 3 levels of retention (applicable to the male connectors when ordering) which provide different levels of force required to connect and disconnect the connectors:

- full detent for a positive locking with a maximum retention
- limited detent for a positive locking with a medium retention
- smooth bore for the lowest retention (slide connection)

Radiall also offers multiport solutions with SMP interface allowing better alignment control while mating multiple connectors. The multiport concept increases density and allows the operator to save installation time by connecting several SMP connectors in one operation.

SMP-COM

SMP-COM is an economically priced alternative fully intermateable with standard SMP connectors. It has been optimized to operate up to 12.4 GHz meeting the needs of telecom applications. Compared to SMP primarily made of stainless steel material, SMP-COM uses brass material.

SMPM

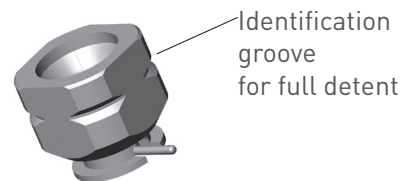
30% smaller than SMP, SMPM connectors are designed for very high frequency applications where space and package density are a necessity.

Radiall SMPM series meets MIL STD 348, figure 328 interface standard. They are intermateable with GPPO® (Gilbert Engineering Inc.).

There are 2 levels of retention (applicable to the male connectors when ordering):

- full detent for a positive locking with a maximum retention
- smooth bore for a lower retention but higher durability (mating cycles)

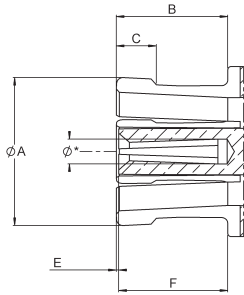
Unique visual identification groove: in order to easily identify full detent connectors versus smooth bore, Radiall SMPM full detent receptacles feature a groove on the outer body. This method of identification is an innovation by Radiall.



SMPM SMT receptacle

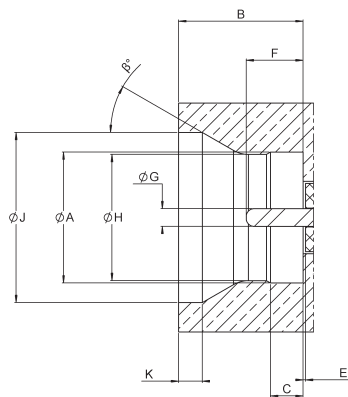
Interface SMPM

PLUG WITH FEMALE CENTER CONTACT



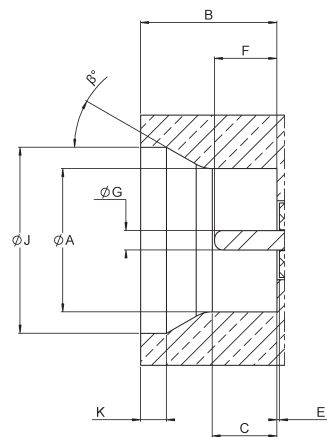
Letter	mm		inch		Note
	min.	max.	min.	max.	
A		2.41		.095	dia
B	1.73		.068		
C		0.58		.023	
E	0	0.20	0	.008	Center contact recession
F	1.27		.050		
*	Accept 0.305 +/-0.025 (.012" +/- .001) dia pin				

JACK WITH MALE CENTER CONTACT (FULL DETENT)



Letter	mm		inch		Note
	min.	max.	min.	max.	
A	2.18	2.24	.086	.088	dia
B	2.08	2.13	.082	.084	
C	0.53	0.58	.021	.023	
E	0	0.12	0	.004	
F	0.76	1.14	.030	.045	
G	0.28	0.33	.011	.013	dia
H	2.11	2.16	.083	.085	dia
J	2.82	2.92	.111	.115	dia
K	0.25	0.56	.010	.022	
b	25	35			degree

JACK WITH MALE CENTER CONTACT (SMOOTH BORE)



Letter	mm		inch		Note
	min.	max.	min.	max.	
A	2.18	2.24	.086	.088	dia
B	2.08	2.13	.082	.084	
E	0	0.12	0	.004	
F	0.76	1.14	.030	.045	
G	0.28	0.33	.011	.013	dia
J	2.82	2.92	.111	.115	dia
K	0.25	0.56	.010	.022	
b	25	35			degree

Characteristics

Test/characteristics	Values/remarks
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ELECTRICAL CHARACTERISTICS

Impedance	50Ω
Frequency range	DC - 65 GHz
V.S.W.R. • Straight styles • Right angle styles • Adapters • Hermetic receptacles	1.10 to 12GHz / 1.15 to 26GHz / 1.30 to 40GHz 1.25 to 12GHz / 1.30 to 18GHz 1.10 to 12GHz / 1.20 to 40GHz / 1.30 to 65GHz 1.15 to 18GHz / 1.35 to 40GHz
Insertion loss (dB)	0.10 × √F Max typ
Insulation resistance (MΩ)	5000
Voltage rating (V.R.M.S.)	335
Dielectric withstanding voltage (V.R.M.S.)	500
RF leakage (dB)	-80 to 3GHz / -65 from 3 to 40GHz

MECHANICAL CHARACTERISTICS

	smooth bore	full detent
Mechanical endurance (durability)	500	100
Engagement and separation force (N)	18 max - 7 min.	36 max - 20 min.
Radial misalignment Axial misalignment	± 0.25 mm (.010") 0 / + 0.25 mm (.010")	
Vibration	MIL-STD 202G Method 104, test condition D	
Shock	MIL-STD 202G Method 213, test condition I	
Thermal shock	-65° C / +125° C	
Cable retention (N) .47"	> 45 N	
.85"	> 200 N	
Contact captivation axial (N)	6.7	

ENVIRONMENTAL CHARACTERISTICS

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

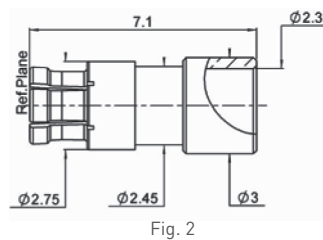
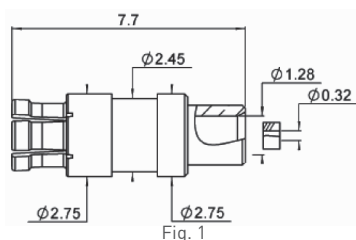
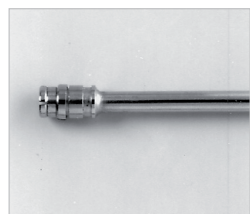
Cable connector with female center contact	Beryllium copper
Cable connector with male center contact Bodies Soldering part	Stainless steel, Beryllium copper Brass
Receptacles, shrouds	stainless steel & Beryllium copper
In series adapters	Beryllium copper
Center contacts	Beryllium copper
Center contacts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

PLATING

Cable connector with female center contact	Gold
Cable connector with male center contact Bodies Soldering part	Passivated Gold
Receptacles, shrouds	Passivated
Center contacts	Gold

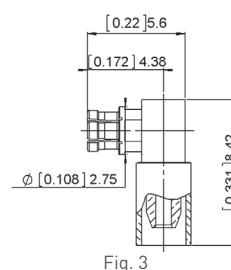
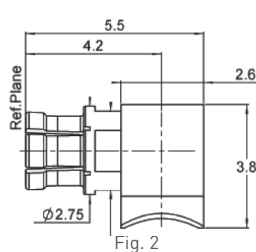
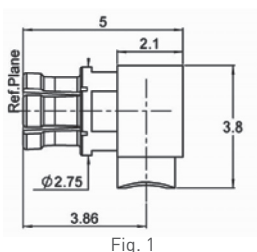
Plugs and jacks

STRAIGHT PLUGS, SOLDER TYPE FOR SEMI-RIGID CABLES



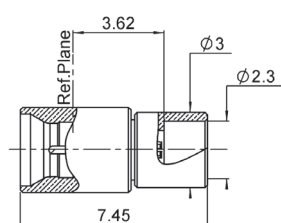
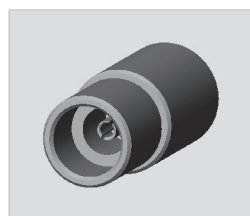
Cable group	Cable group dia.	Part number	Fig	Captive Center contact	Finish
.047" semi-rigid	.047"	R201 051 000	1	yes	Gold
RG405	.085"	R201 052 000	2		

RIGHT ANGLE PLUGS, FOR SEMI-RIGID AND FLEXIBLE CABLES



Cable group	Cable group dia.	Part number	Fig	Captive Center contact	Finish
.047" semi-rigid	.047"	R201 151 000	1	yes	Gold
RG405	.085"	R201 152 000	2		
RG178/RG196	2 / 50S	R201 170 110	3		

JACK, SOLDER TYPE FOR SEMI-RIGID CABLES



Cable group	Cable group dia.	Part number	Captive Center contact	Retention	Finish
RG405	.085"	R201 223 100		Full detent	Gold
		R201 223 700	yes	Smooth bore	

Receptacles

PCB STRAIGHT RECEPTACLES (with male center contact)

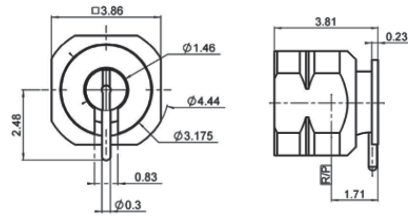
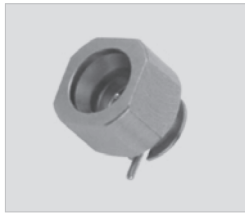


Fig. 1

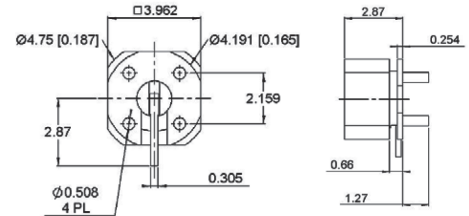


Fig. 2

Part number	Fig	Retention	Assembly instructions	Finish	Note	Packaging
R201 428 010	2	full detent	M01	gold	4 solder legs	Unit
R201 508 000	1				smooth bore	surface mount

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

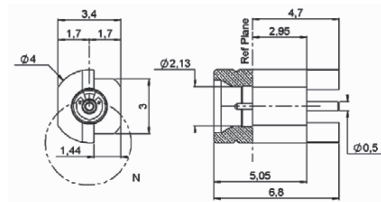
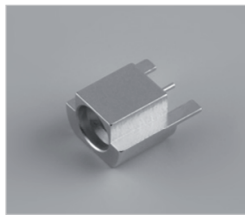


Fig. 1

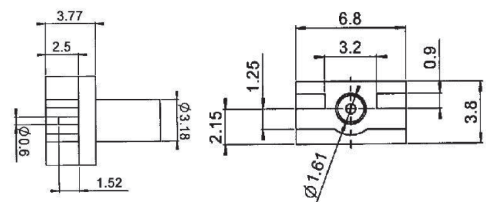


Fig. 2

Part number	Fig	Retention	Assembly instructions	Finish	Note	Packaging
R201 423 100	2	full detent	M02	gold	for 0.9mm PCB	100 pieces
R201 423 110	1					

PANEL STRAIGHT HERMETIC RECEPTACLE, SOLDER MOUNT (with male center contact)

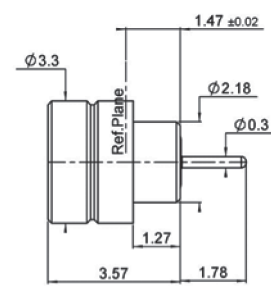


Fig. 1

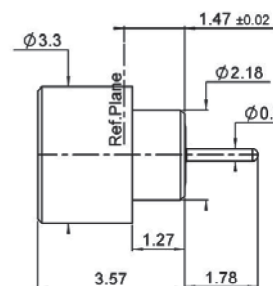
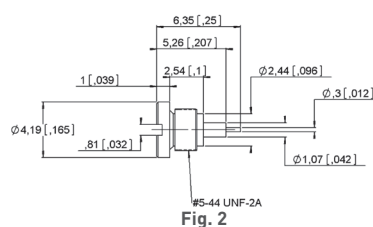
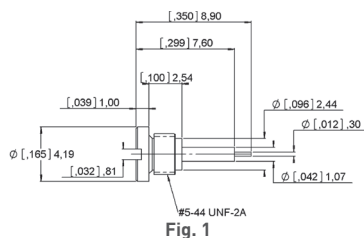


Fig. 2

Part number	Fig	Retention	Panel drilling	Finish
R201 645 000	1	full detent	P02	gold
R201 645 700	2	smooth bore		

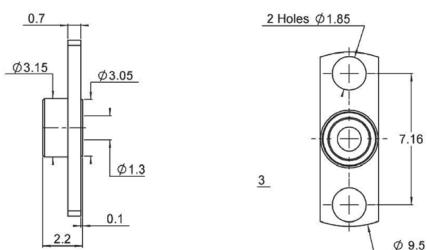
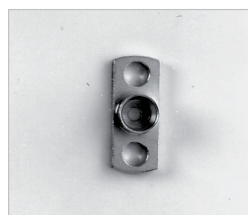
Receptacles ,panel shroud and adapters

THREAD-IN RECEPTACLES (with male center contact)



Part number	Fig	Retention	Panel drilling	Finish
R201 561 021	1	Full detent	P03	passivated
R201 561 721	2	Smooth bore		

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

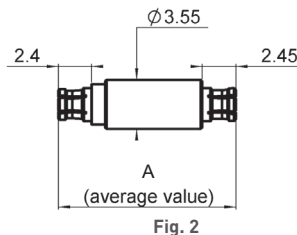
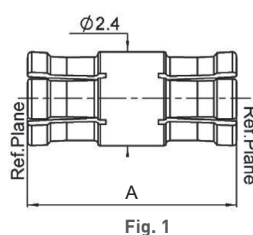


Part number	Retention	Panel drilling	Finish
R201 450 001	Full detent	P01	passivated
R201 450 701	Smooth bore		

Note:

We recommend to use Radiall glass bead R280 760 050. Glass beads can be found in the tooling & accessories chapter 19-A of this catalog.

IN SERIES ADAPTERS (female to female center contact)



Part number	Fig	Dimension A	Type	Finish
R201 705 000	1	5.33 (.210)	fixed length	Gold
R201 723 1_0	2	Consult us	Spring loaded	

Adapters
BETWEEN SERIES ADAPTERS, DC-40 GHz

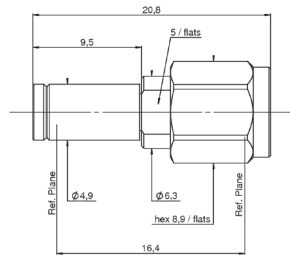
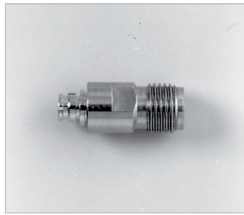


Fig. 1

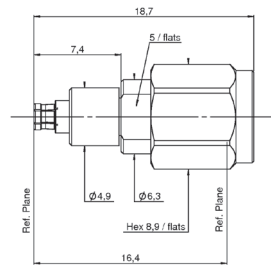


Fig. 2

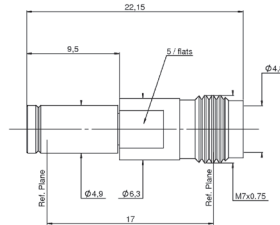


Fig. 3

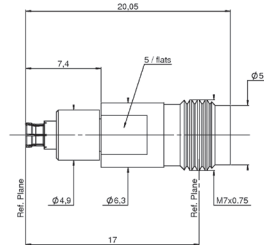
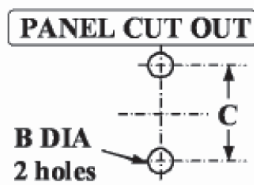


Fig. 4

Part number	Fig	Description	Finish	Packaging
R191 562 000	1	SMPM male full detent / 2.4 MM male	Gold	Unit
R191 563 000	2	SMPM female / 2.4 MM male		
R191 564 000	3	SMPM male full detent / 2.4 MM female		
R191 565 000	4	SMPM female / 2.4 MM female		

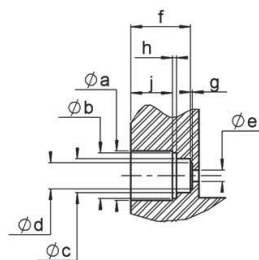
All adapters feature identical electrical lengths.

Panel drilling



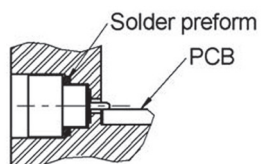
B DIA
2 holes

P01	
B	1.8 - 1.9 (.071 - .075)
C	7.11 - 7.21 (.0280 - .284)

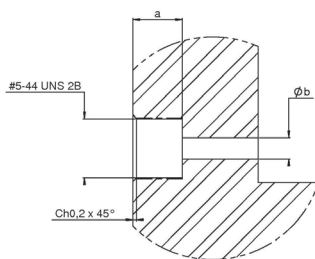


P02	
a	3.36 - 3.38
b	3.03 - 3.15
c	2.27 - 2.29
d	1.63 - 1.73
e	0.79 - 0.83
f	4.52 - 4.56
g	0.13 - 0.17
h	0.28 - 0.38
j	3.15 - 3.19

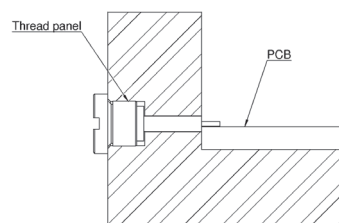
Panel drilling



1. Degrease and clean connector and box.
2. Solder the connector on the panel. We advise using SnAg4 Cu0.5 and a low residue flux. Preheating at 100°C is recommended. Take care not to exceed 260°C during soldering operation.
3. Solder the pin on the track. We advise using SnAg4 Cu0.5 and a low residue flux. Preheating at 100°C is recommended for ceramic substrate. Take care not to exceed 260°C during soldering operation.



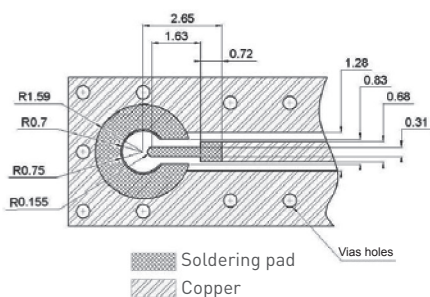
P03	
a	5.31 - 5.33
b	1.09 - 1.12



1. Degrease and clean connector and box
2. Screw-on the connector on the panel
3. Solder the pin on the track

Assembly instructions

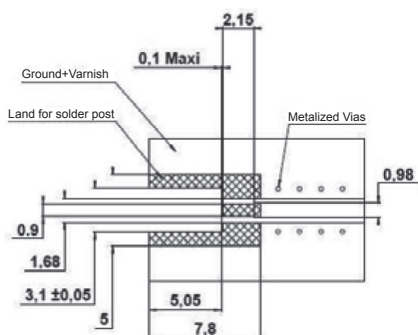
M01



Connectors
R201 508 000
R201 508 700

Valid for RT DUROID 5880 type PCB, thickness 0.254mm, with copper layer 35µm on both sides. Add via between both sides along upper ground plane according to engineering practices.

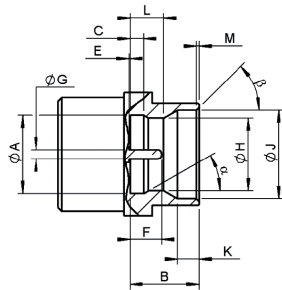
M02



Connectors
R201 423 110

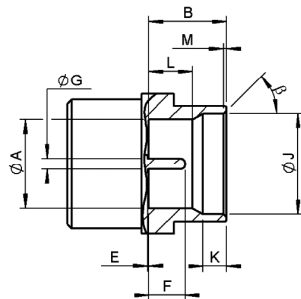
Interface SMP

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



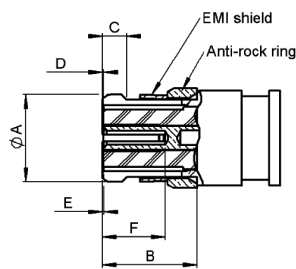
Letter	mm		inch		Note
	min.	max.	min.	max.	
A	3.15	3.20	.124	.126	Dia
B	2.74	2.84	.108	.112	
C	0.52	0.60	.0205	.0235	
E	0.00		0		Center contact recession
F	1.14	1.40	.045	.055	
G	0.36	0.41	.014	.016	Dia
H	2.90	3.00	.114	.118	Dia: Full Detent
	3.00	3.10	.118	.122	Dia: Limited Detent
J	3.53	3.68	.139	.145	Dia
K	0.84	0.94	.033	.037	
L	1.30	1.45	.051	.057	Full Detent
	1.37	1.52	.054	.060	Limited Detent
M	0.08	0.20	.003	.008	
a	30				Degree (nom.)
b	40	50	40	50	Degree

JACK WITH MALE CENTER CONTACT (Smooth Bore)



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

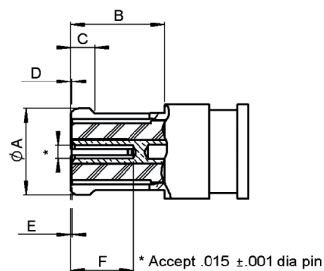
PLUG WITH FEMALE CENTER CONTACT AND EMI SHIELD (Cabled connection)



* Accept .015 ±.001 dia pin

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

PLUG WITH FEMALE CENTER CONTACT (Cabled connection)

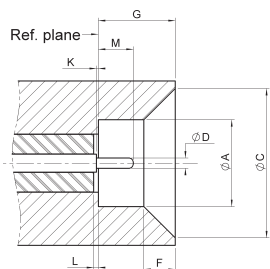


* Accept .015 ±.001 dia pin

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

Interface SMP

JACK WITH MALE CENTER CONTACT (Catcher's mitt)

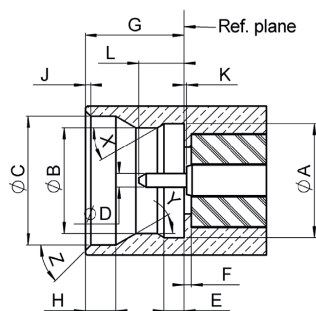


Letter	mm		inch		Note
	min.	max.	min.	max.	
A	3.12	3.23	.123	.127	Dia
C	5.40	5.50	.213	.217	Dia
D	0.37	0.39	.0146	.0154	Dia
F	1.10	1.18	.043	.046	
G	2.77	2.81	.109	.111	
K	0.00		0		Center contact recess
L	0.00		0		Insulator recess
M	1.15	1.39	.045	.055	

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

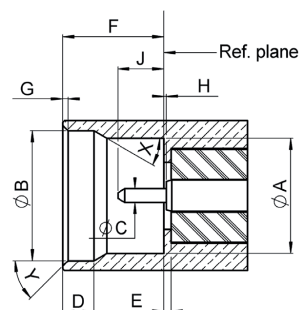
Interface SMP-COM

MALE CONNECTOR (Full detent or Limited detent)



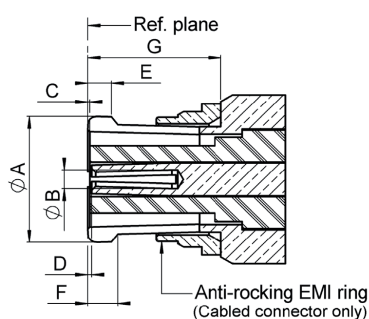
Dia A	3.18+/-0.02
Dia B (Full detent)	2.95+/-0.02
Dia B (Limited detent)	3.05+/-0.02
Dia C	3.59 +/-0.02
Dia D	0.38+/-0.02
E	0.56+/-0.03
F	0.2+/-0.025
G (Full detent)	2.79+/-0.02
G (Limited detent)	2.77+/-0.02
H	0.86+/-0.02
J	0.15+/-0.05
K	0.07+/-0.07
L	1.27+/-0.12
X	30°+/-0.5°
Y	30°+/-0.5°
Z	45° nom

MALE CONNECTOR (Smooth bore)



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

FEMALE CONNECTOR



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

Characteristics

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

ELECTRICAL CHARACTERISTICS

Impedance	50Ω		
Frequency range	DC - 40 GHz		
Typical V.S.W.R.	DC-12 GHz	12-26.5 GHz	26.5-40 GHz
• Straight styles	1.15	1.15	1.5
• Right angle styles	1.25	1.35	-
• Adapters	1.10	1.15	1.5
• Receptacles	1.30	-	-
Insertion loss (dB)	0.12 vF (F in GHz)		
Insulation resistance (MΩ)	5000		
Voltage rating (V.R.M.S.)	335		
Dielectric withstanding voltage (V.R.M.S.)	500		
RF leakage • Standard plugs • Plug with EMI gasket	-80 dB to 3 GHz / -65 dB from 3 to 26.5 GHz - 100 dB DC to 18 GHz		

MECHANICAL CHARACTERISTICS

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

ENVIRONMENTAL CHARACTERISTICS

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

MATERIALS

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

PLATING

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

Characteristics

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

ELECTRICAL CHARACTERISTICS

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

MECHANICAL CHARACTERISTICS

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

ENVIRONMENTAL CHARACTERISTICS

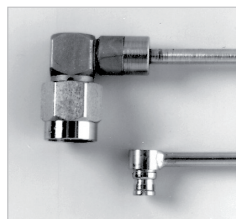
Operating temperature • Standard • Semi-rigid	-55°C / +125°C -55°C / +105°C
---	----------------------------------

MATERIALS

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

PLATING

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



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

Standard packaging = 100 pieces
All dimensions are given in mm

Plugs and jacks

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

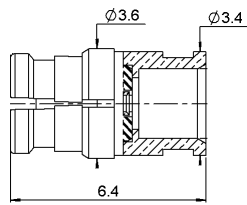
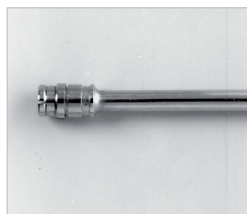


Fig. 1

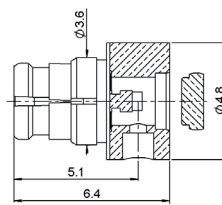


Fig. 2

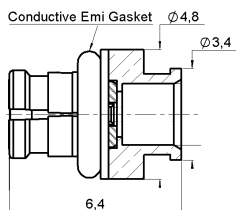
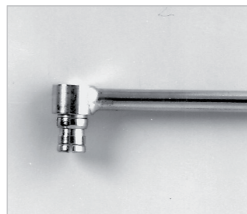


Fig. 3

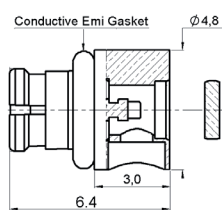


Fig. 4

Cable group	Cable group dia.	Part number	Fig	Captive center contact	Orientation	Finish	Note
.047" semi-rigid	.047"	R222 051 000	1	no	Straight	Gold	With EMI gasket low RF leakage
RG405	.085"	R222 052 000					
.085" micro-porous	.085"	R222 052 300					
.047" semi-rigid	.047"	R222 151 000	2	yes	Right angle		
RG405	.085"	R222 152 000					
		R222 062 100	3	no	Straight		
		R222 162 100	4	yes	Right angle		

STRAIGHT JACK, SOLDER TYPE FOR SEMI RIGID CABLES (with male center contact)

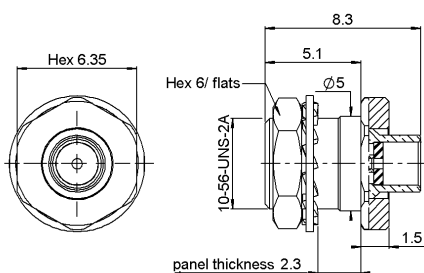


Fig. 1

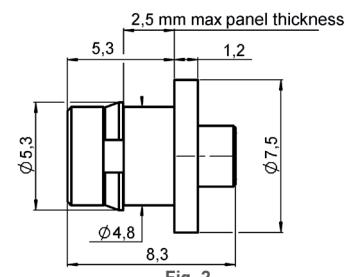
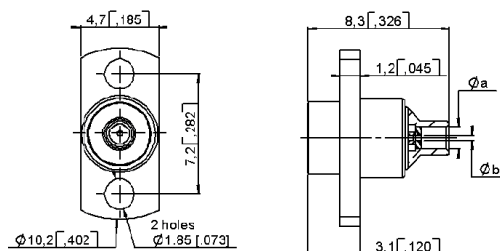
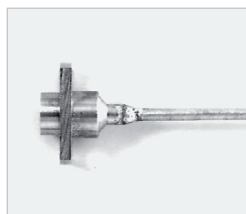


Fig. 2

Cable group	Cable group dia.	Part number	Retention	Fig	Note	Captive center contact	Panel drilling	Finish
RG405	.085"	R222 302 002	Full detent	1	Bulkhead feedthrough	no	P05	Passivated + gold (soldering part)
		R222 302 302	Limited detent					
		R222 302 702	Smooth bore					
		R222 223 002	Full detent	2	Snap-in			
		R222 223 302	Limited detent					
		R222 223 702	Smooth bore					

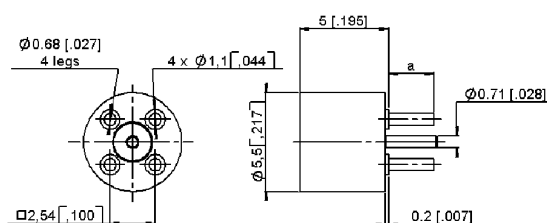
Jacks and receptacles

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



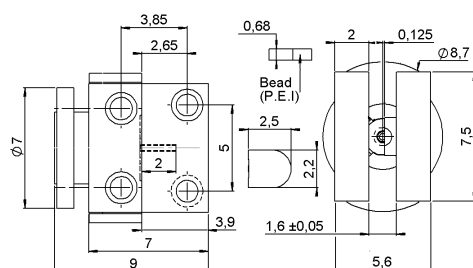
Cable group	Cable group dia.	Part number	Retention	Dimensions mm (inch)		Captive center contact	Panel drilling	Finish
				ϕa	ϕb			
RG405	.085"	R222 252 001	Full detent	2.30 [.091]	0.60 [.024]	no	P01	passivated + gold (soldering part)
		R222 252 301	Limited detent					
		R222 252 702	Smooth bore					

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



Part number	Retention	Dimensions mm (inch)	PCB mounting	Finish
		a		
R222 426 000	Full detent	2.5 [.098]	P03	Gold
R222 426 300	Limited detent			
R222 426 700	Smooth bore			

MICROSTRIP RECEPTACLE, EDGE CARD MOUNT



Part number	Retention	Finish	Assembly instructions	Note
R222 423 041	Full detent	Passivated	See technical data sheet	Supplied with dielectric bead

Receptacles

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

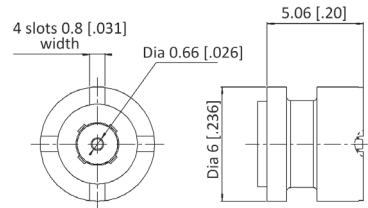


Fig. 1

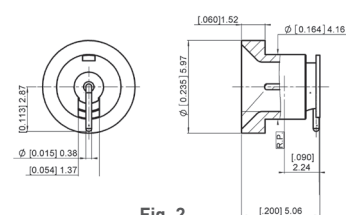


Fig. 2

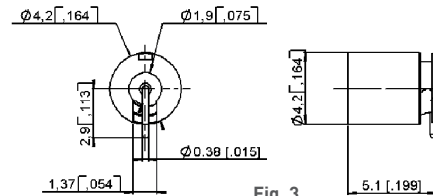


Fig. 3

Part number	Fig	Retention	Assembly instructions	Finish	Packaging
R222 408 350	1	Limited detent	M04	Gold	Tape & reel - 500 pieces
R222 408 750		Smooth bore			Tray 100 pieces
R222 508 000	3	Full detent	M03	Passivated + gold (soldering area)	Tape & reel 500 pieces
R222 508 300		Limited detent			
R222 508 700		Smooth bore			
R222 508 722	2	Catcher's mitt			

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

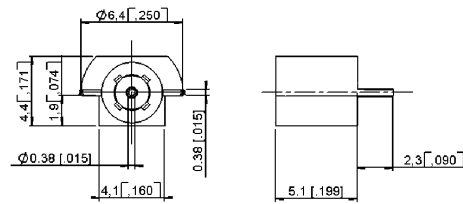
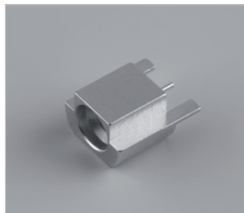


Fig. 1

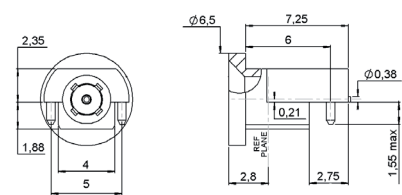


Fig. 2

Part number	Retention	Fig	Assembly instructions	Finish	Packaging
R222 423 023	Full detent	1	M01	Gold	Tape & reel - 500 pieces
R222 423 320	Limited detent				
R222 423 720	Smooth bore				
R222 680 710	Catcher's mitt	2	M06		

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

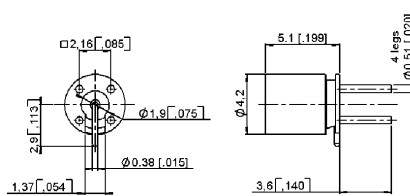


Fig. 1

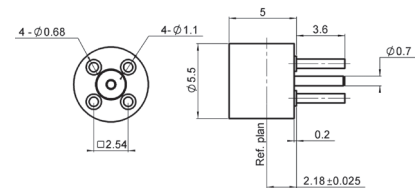
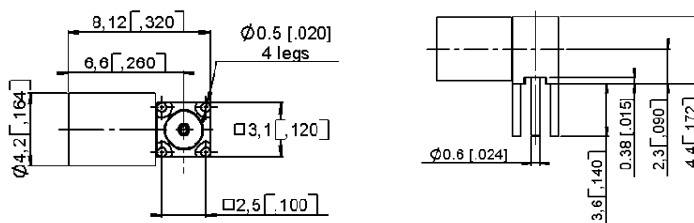


Fig. 2

Part number	Fig.	Retention	Assembly instructions	Finish
R222 428 000	1	Full detent	M02	passivated + gold (soldering part)
R222 428 300		Limited detent		
R222 428 700		Smooth bore		
R222 426 020	2	Full detent		gold

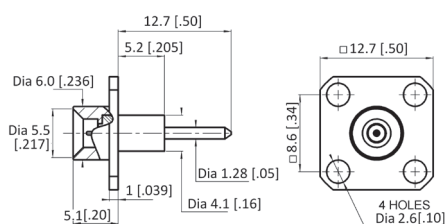
Receptacles

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



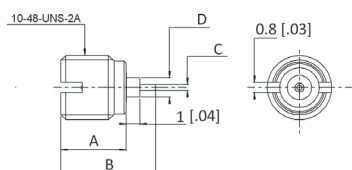
Part number	Retention	PCB mounting	Finish
R222 680 000	Full detent	P04	passivated + gold (soldering part)
R222 680 300	Limited detent		
R222 680 700	Smooth bore		

SQUARE FLANGE EXTENDED DIELECTRIC RECEPTACLE



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

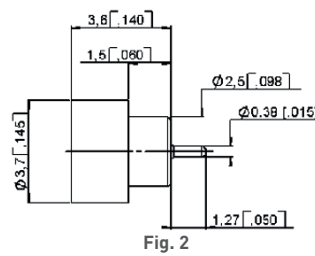
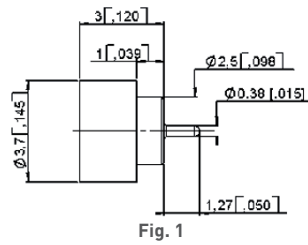
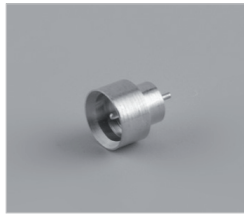
THREAD-IN RECEPTACLE (with male center contact)



Part number	Retention	Dimensions mm (inch)				Finish
		A	B	C	D	
R222 561 001	Full detent	4.8 (.191)	7.1 (.278)	0.46 (.018)	1.45 (.057)	passivated
R222 561 301	Limited detent					
R222 561 701	Smooth bore					
R222 561 331	Limited detent	6.2 (.243)	8.3 (.326) +/-0.5 with sliding pin R280 473 1X0	1.0 (.04)		

Receptacles and panel shroud

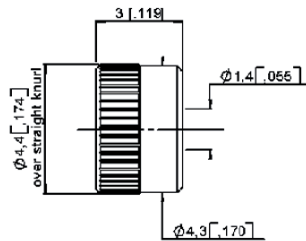
PANEL STRAIGHT HERMETIC RECEPTACLE, SOLDER MOUNT (with male center contact)



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

Other dimensions available, please consult us.

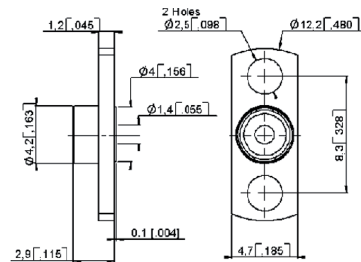
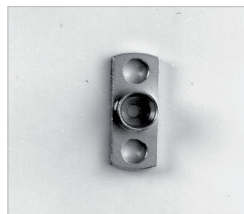
PANEL SHROUD, PRESS-IN MOUNT (no center contact)



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

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

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

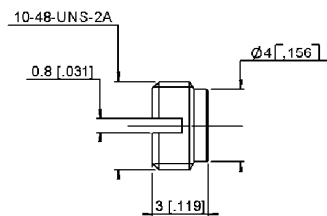
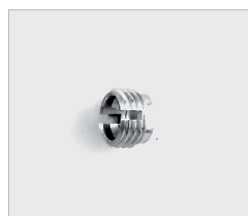


Part number	Retention	Panel drilling	Finish
R222 450 001	Full detent	P02	Passivated

This shroud is designed to be used with hermetic glass bead R280 752 000, more glass beads can be found in the tooling & accessories chapter 19-A of this catalog.

Panel shroud, glass bead and adapters

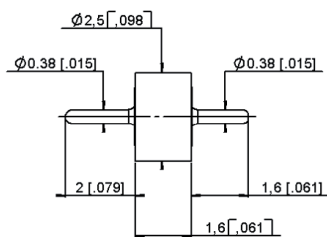
PANEL SHROUD, THREAD-IN MOUNT (no center contact)



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

This shroud is designed to be used with hermetic glass seal R280 752 000

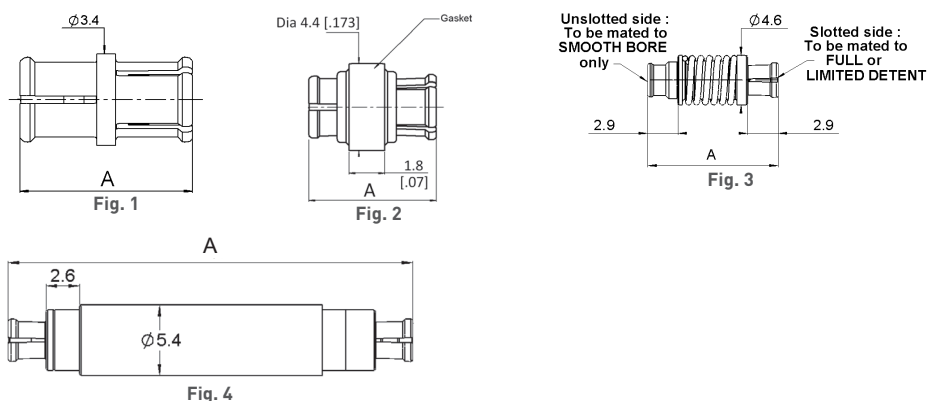
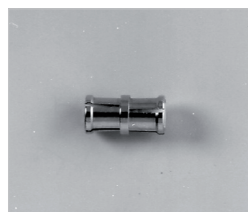
HERMETIC GLASS BEAD



Part number
R280 752 000

More glass beads can be found in the tooling & accessories chapter 19-A.

IN SERIES ADAPTERS (female to female center contact)



Part number	Fig	Dimensions A mm (inch)	Type	Finish
R222 705 000	1	6.45 [.254]	Fixed length	gold
R222 705 200		5.7 [.224]		
R222 705 220		10.3 [.405]		
R222 705 230		10.0 [.395]		
R222 705 400	2	6.45 [.254]	Fixed length with sealing gasket IP54	
R222 723 110	3	min 11.71 [.461] max 12.88 [.507]	Spring loaded axial travel 1.17mm [.046"]	
R222 723 120		min 17.65 [.695] max 18.82 [.741]		
R222 723 140	4	min 31.3 [1.23] max 37.3 [1.47]	Spring loaded axial travel 6.0mm [.236"]	

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

Adapters BETWEEN SERIES ADAPTERS

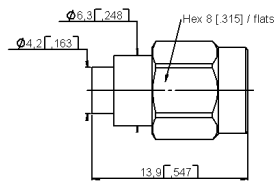
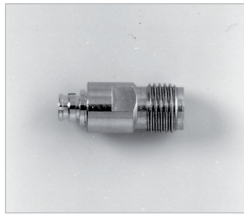


Fig. 1

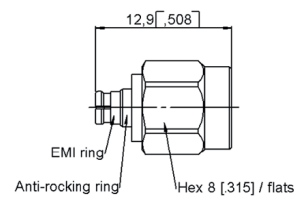


Fig. 2

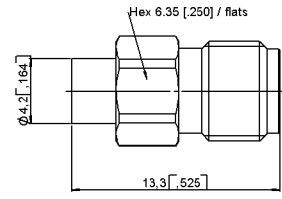


Fig. 3

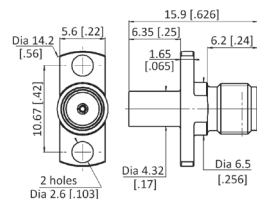


Fig. 4

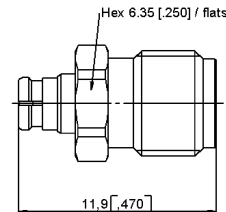


Fig. 5

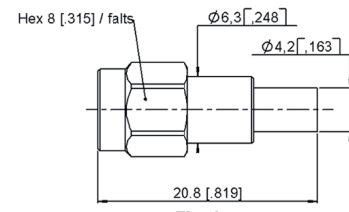


Fig. 6

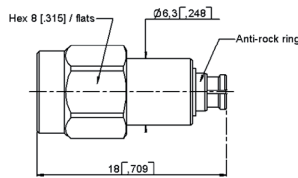


Fig. 7

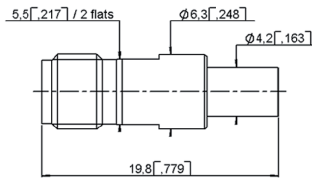


Fig. 8

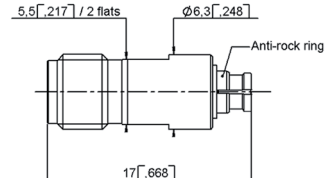
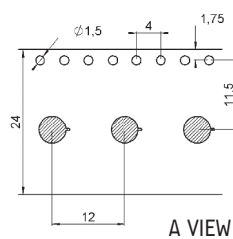
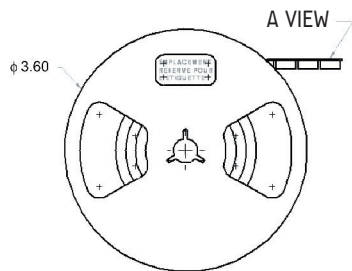


Fig. 9

Part number	Fig	Description	Captive center contact	Finish	Packaging
R191 841 001	1	SMA male/SMP male full detent	Yes	Passivated	100
R191 842 002	2	SMA male/SMP female		Passivated/gold	
R191 843 001	3	SMA female/SMP male full detent		Passivated	Unit
R191 843 401	4	SMA female/SMP male smooth bore			
R191 843 421	4	SMA female/SMP male full detent		Passivated/gold	100
R191 844 002	5	SMA female/SMP female			
R191 966 001	6	SMA 2.9 male/SMP male full detent		Passivated	
R191 967 002	7	SMA 2.9 male/SMP female		Passivated/gold	
R191 968 001	8	SMA 2.9 female/SMP male full detent		Passivated	
R191 969 002	9	SMA 2.9 female/SMP female		Passivated/gold	

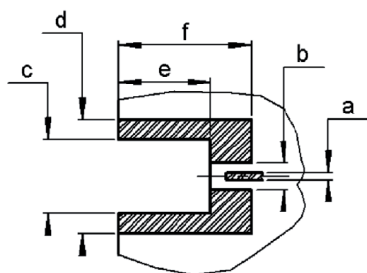
Packaging



Connectors	Packaging
R222 508 000	Tape & reel 500 pieces
R222 508 300	
R222 508 700	
R222 508 722	
R222 680 710	

Assembly instructions

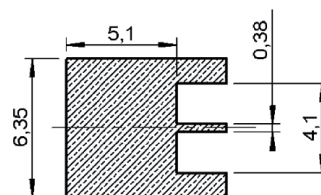
M01



Connectors	
R222 423 023 R222 423 320	R222 423 720

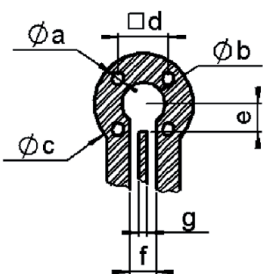
PCB mounting pattern

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



Shadow of receptacle for video camera

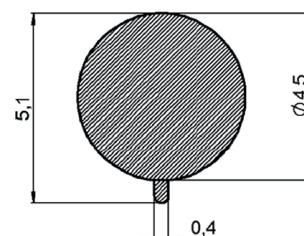
M02



Connectors	
R222 428 000 R222 428 300	R222 428 700

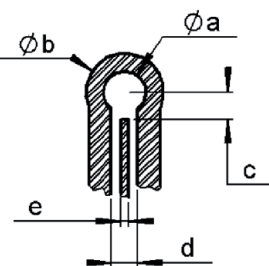
PCB mounting pattern

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



Shadow of receptacle for video camera

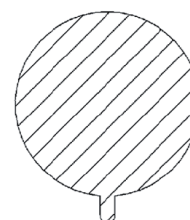
M03



Connectors	
R222 508 000 R222 508 300	R222 508 700 R222 508 722

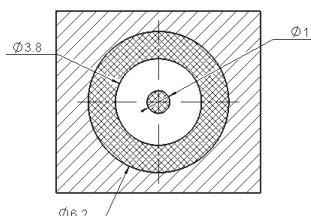
PCB mounting pattern

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



Shadow of receptacle for video camera

M04

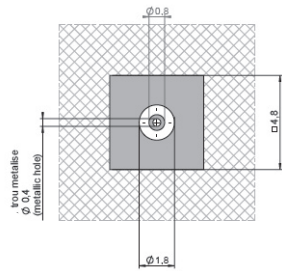


Connectors	
R222 408 350	R222 408 750

PCB mounting pattern

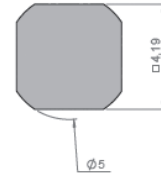
Assembly instructions

M05



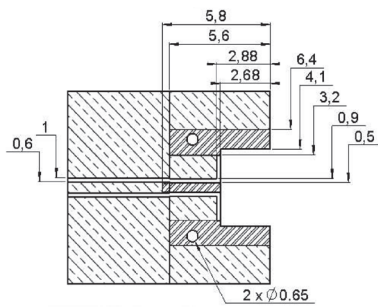
PCB mounting pattern

Connectors
R222 409 030



Shadow for video camera

M06



Connectors
R222 680 710

Introduction

SMP-LOCK, the Ultimate Secure Connection

Radiall has expanded its broad range of SMP products with SMP-LOCK connectors featuring a robust locking mechanism, which dramatically increases the retention force of the interface and prevents accidental disconnection.

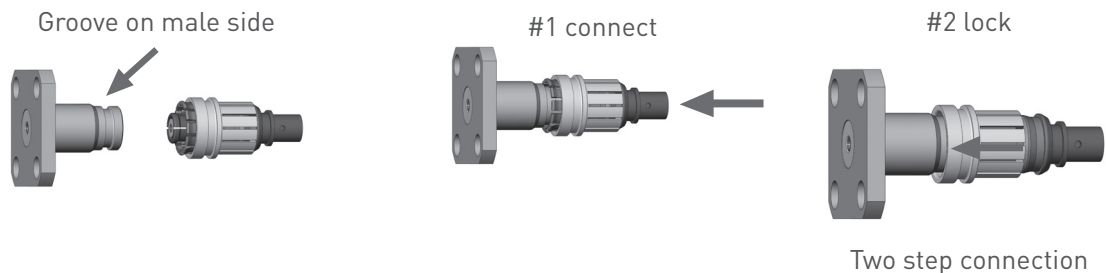
They have been specially designed for harsh environments and to withstand more severe vibration and drop tests.

SMP-LOCK connectors are suitable for cable-to-cable or cable-to-module interconnections inside equipment subject to harsh mechanical stress such as airborne radars, avionics, satellites, missile, UAV and UGV applications.



Features & benefits

- Excellent electrical performance combined with robust locking feature
- Two step connection, low insertion force
- Audible click indicates that plug is locked, eliminating accidental disconnections
- Locking sleeve provides greater retention force more than 450 N with RG-405 cable
- SMP interface has a high frequency DC-40 GHz
- Plug equipped with EMI ring offers improved RF leakage performance -92dB at 18 GHz
- SMP-LOCK uses limited detent interface for lower connect/disconnect forces, less mechanical stress and a longer life cycle
- Extraction tool available for easy unmating in high density panels



SMP-LOCK

Plugs and receptacles

FEMALE PLUGS, SOLDER TYPE FOR SEMI-RIGID CABLE

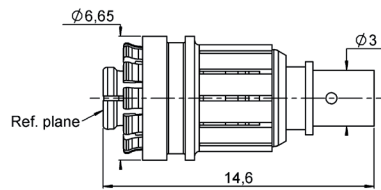


Fig. 1

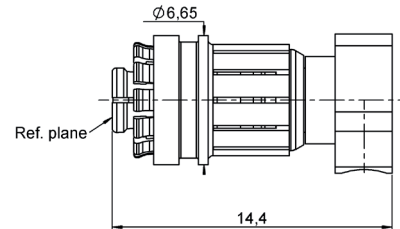
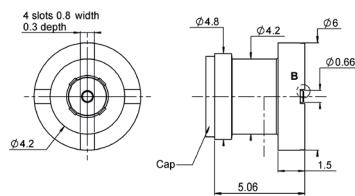
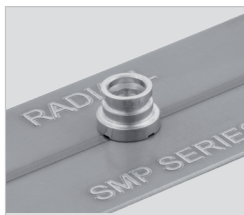


Fig. 2

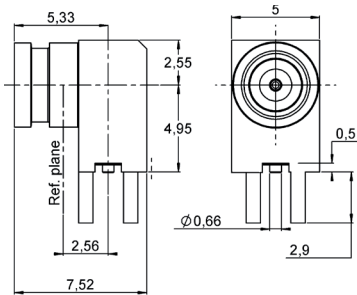
Cable group	Cable group dia.	Part number	Fig	Finish	Captive center contact	Geometry
RG405	.085"	R222 L80 010	1	Nickel + gold	No	Straight
		R222 L80 300	2		Yes	Right angle

STRAIGHT MALE SMT RECEPTACLE



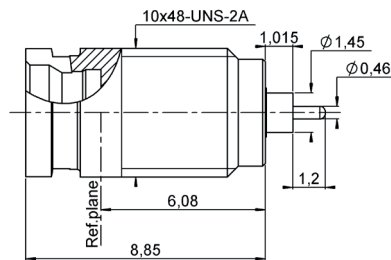
Part number	Body & finish	Captive center contact
R222 L00 010	Brass, N2PGR	Yes

RIGHT ANGLE MALE PCB RECEPTACLE



Part number	Panel drilling	Body & finish	Captive center contact	Note
R222 L80 010	P01	Brass, N2PGR	Yes	

SCREW-ON MALE RECEPTACLE



Part number	Panel drilling	Body & finish	Captive center contact	Contact type
R222 L10 001	P02	Stainless steel passivated	Yes	Cylindrical

Receptacles and adapters

NARROW AND SQUARE FLANGE EXTENDED DIELECTRIC MALE PANEL RECEPTACLES

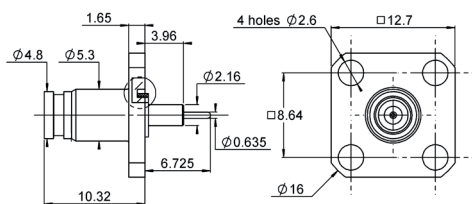


Fig. 1

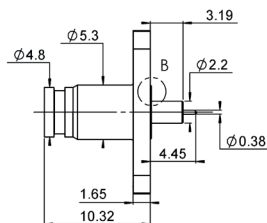
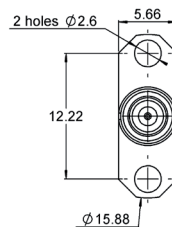
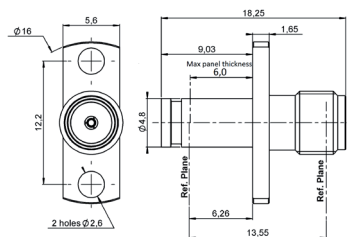


Fig. 2



Part number	Fig	Panel drilling	Body & finish	Captive center contact	Panel mount	Contact type
R222 L10 010	1	P04	Brass gold plated	Yes	4-hole flange	Cylindrical
R222 L10 020	2	P05			2 hole flange	

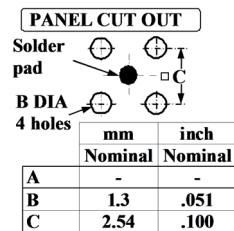
ADAPTERS



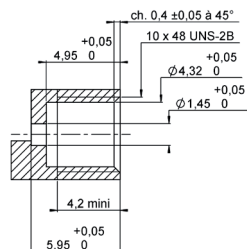
Part number	Panel drilling	Body & finish	Captive center contact
R191 593 400	P03	Brass gold plated	Yes

Panel drilling

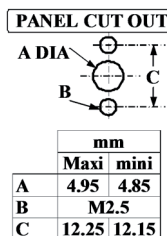
P01



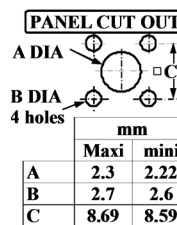
P02



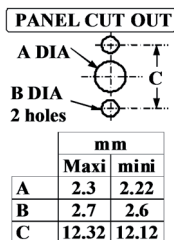
P03



P04

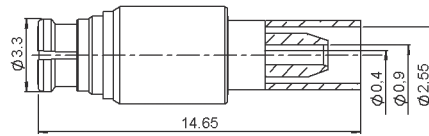


P05



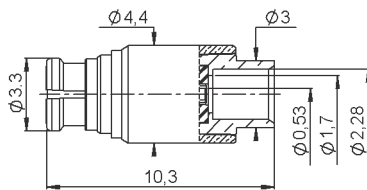
Plugs

STRAIGHT PLUG, FULL CRIMP TYPE FOR FLEXIBLE CABLE (female center contact)



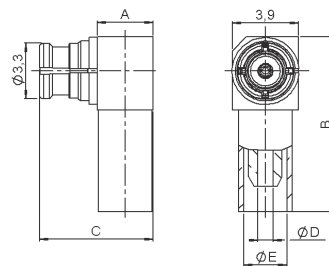
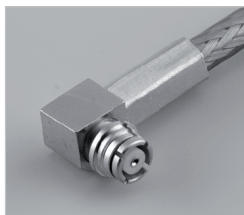
Cable group	Cable group dia.	Part number	Captive center contact
RG178/RG196	2/50/S	R222 900 100	yes

STRAIGHT PLUG, SOLDER TYPE (female center contact)



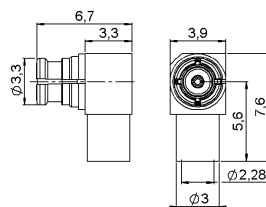
Cable group	Cable group dia.	Part number	Captive center contact
RG405	.085"	R222 900 200	no

RIGHT ANGLE PLUGS, CRIMP TYPE FOR FLEXIBLE CABLE (female center contact)



Cable group	Cable group dia.	Part number	Dimensions (mm)					Captive center contact
			A	B	C	D	E	
RG178/RG196	2/50/S	R222 900 310	3.3	10.3	6.7	0.9	2.55	yes
RG174/RG316	2.6/50/S	R222 900 320	3.7	11.3	7	1.58	3.25	
RD316	2.6/50/D	R222 900 330		13.3	7.4		3.50	

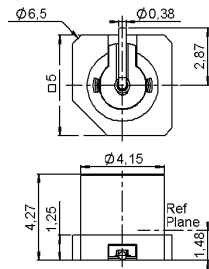
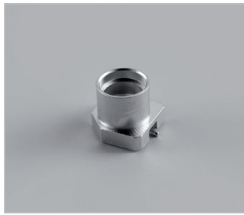
RIGHT ANGLE PLUG, SOLDER TYPE (female center contact)



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

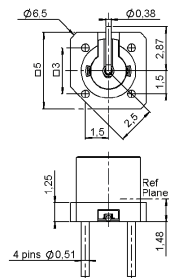
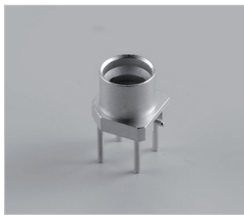
Receptacles and adapter

STRAIGHT SMT RECEPTACLE (male center contact)



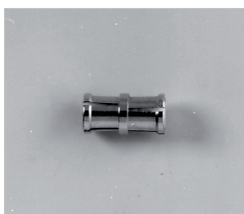
Part number	Retention	Captive center contact	Assembly instructions	Packaging
R222 941 100	Full detent	yes	M01	Tape & reel 500 pieces
R222 941 300	Limited detent			
R222 941 700	Smooth bore			

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



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

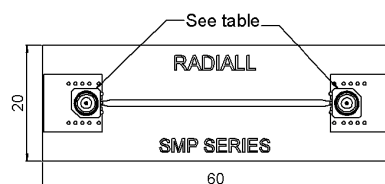
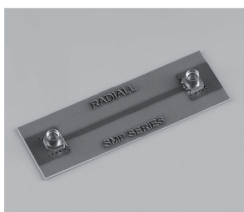
IN SERIES ADAPTER (female to female center contact)



Please refer to page 3-21

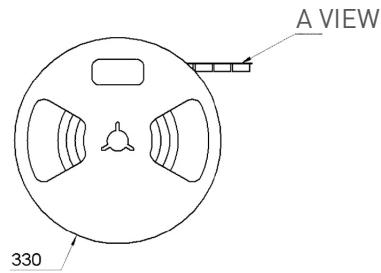
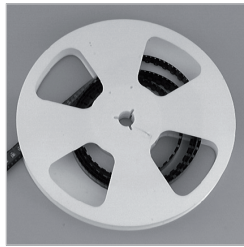
Measurement PCB

MEASUREMENT PCB WITH SMT RECEPTACLE



Part numberz	Packaging	Connector
R222 995 320	Unit	2 x R222 941 300

Packaging

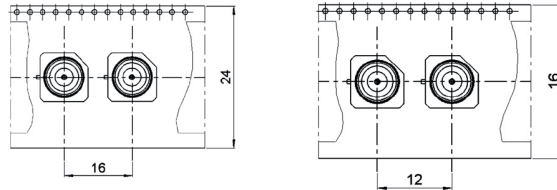
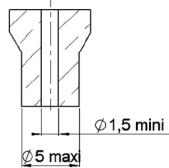


Part number	Packaging
R222 940 100	Tape & reel 500 pieces
R222 940 300	
R222 940 700	
R222 941 100	
R222 941 300	
R222 941 700	

Connectors
R222 941 100
R222 941 300
R222 941 700

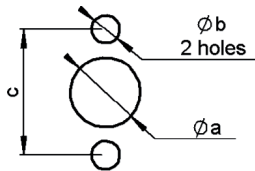
Connectors
R222 940 100
R222 940 300
R222 940 700

AIR SUNCTION

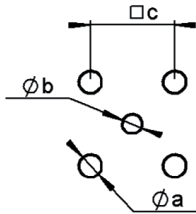


A VIEW

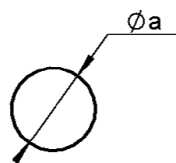
Panel drilling



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



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



	P05	P06	P08
a	5.20 - 5.30 [.205 - .209]	4.37 - 4.39 [.172 - .173]	4.90 - 4.95 [.193 - .195]

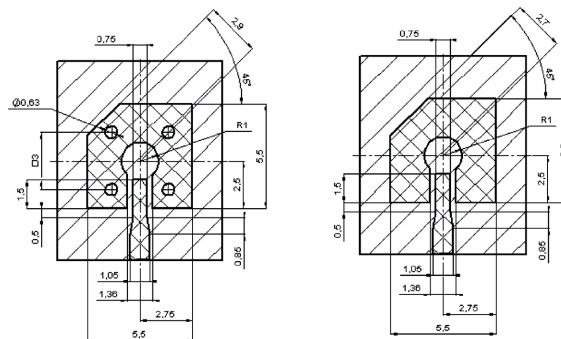
Assembly instructions

M01

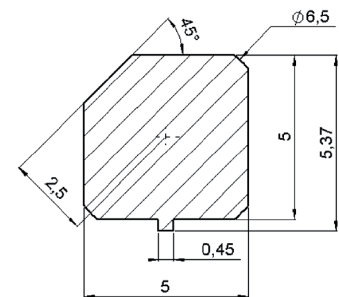
Connectors
R222 941 100
R222 941 300
R222 941 700

Connectors
R222 940 100
R222 940 300
R222 940 700

SOLDERING PATTERN



VIDEO SHADOW



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 2 board distance tolerance with a tilt (radial travel) up to 4.5°.

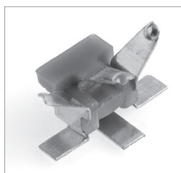
The new SMP-Spring and MMBX-Spring offer up to .078" (2 mm) board 2 board distance tolerance and a 4.5° tilt (radial travel).

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



IMP-Spring and SMP-Spring

See page 4-23 for BMR-Spring.



IMP

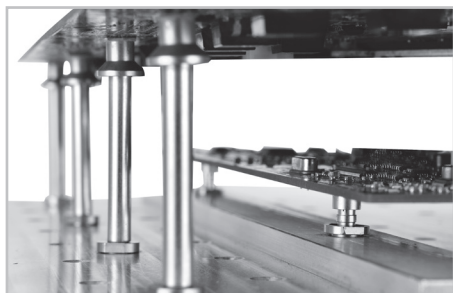
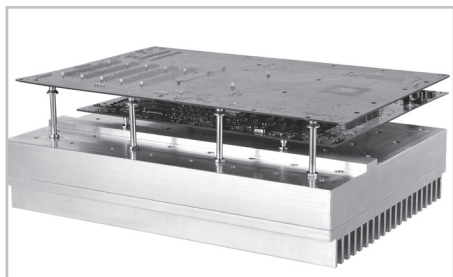
Limited Misalignment

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

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

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

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

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

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

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

Characteristics

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

ELECTRICAL CHARACTERISTICS

Impedance	50Ω		
Frequency	DC - 6 GHz		
Typical V.S.W.R. (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 (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 > 200W @ 2.7 GHz, 85°C		
RF leakage	-70dB to 3 GHz, axial misalignment 0mm		

MECHANICAL CHARACTERISTICS

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

ENVIRONMENTAL CHARACTERISTICS

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

MATERIALS

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

PLATING

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

Packaging = 100 pieces box / 500 pieces reel.
All dimensions are given in mm

Jacks, plugs and receptacles

BULKHEAD STRAIGHT SLIDE-ON MALE JACKS FOR CABLES

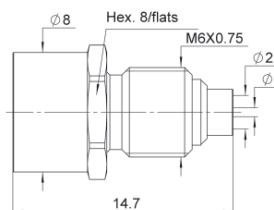


Fig. 1

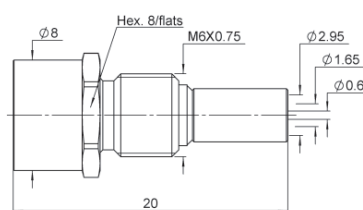
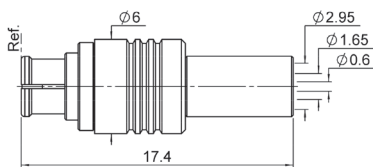


Fig. 2

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

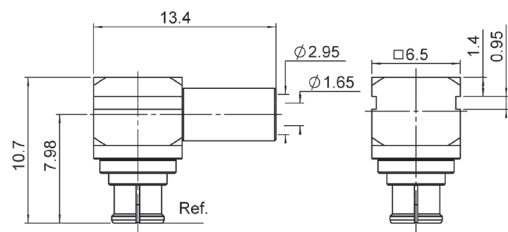


Fig. 1

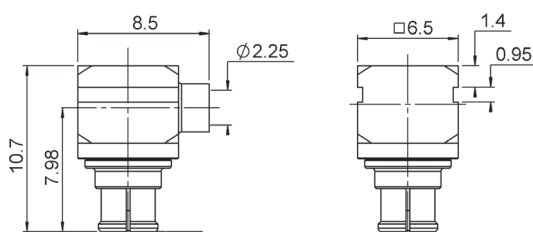
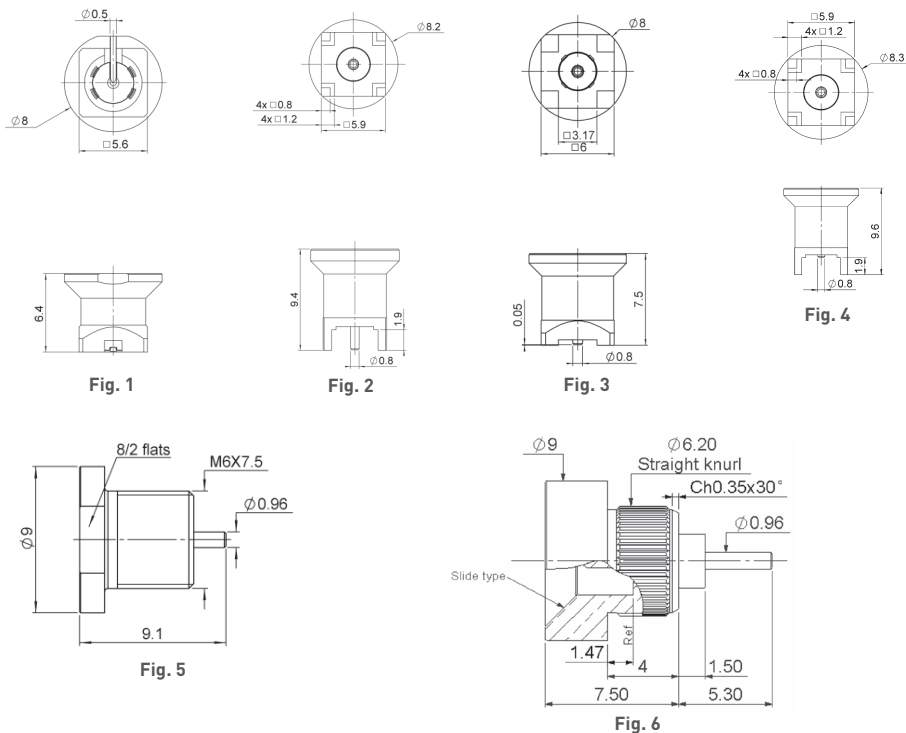


Fig. 2

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	yes	

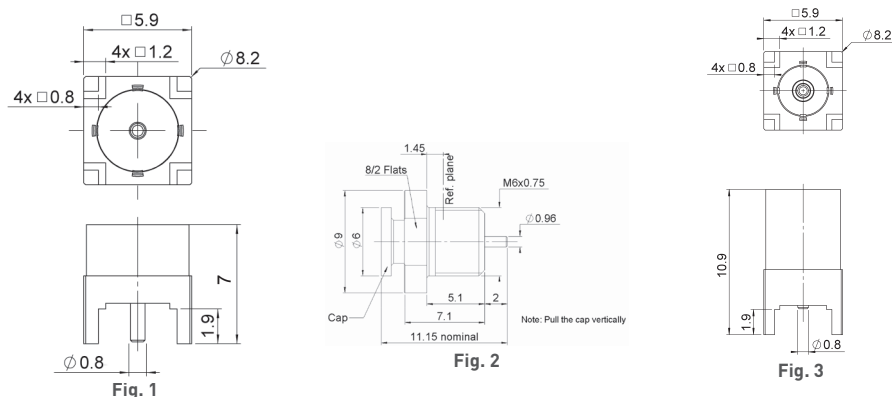
Receptacles

STRAIGHT SLIDE-ON MALE RECEPTACLES



Part number	Fig	Captive center contact	Panel drilling	Packaging	Note
R222 M00 700	1	yes		Tape & reel 500 pieces	SMT
R222 M00 720	2		P02	Bulk 100 pieces	Solder legs
R222 M00 730	4		P03	Tape & reel 500 pieces	PIH + SMT
R222 M00 740	3				SMT
R222 M10 700	5		P01	Bulk 100 pieces	Screw-on
R222 M10 730	6		P04		Press in

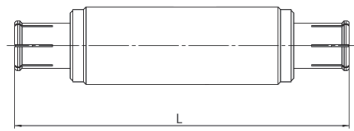
STRAIGHT SNAP-ON MALE RECEPTACLES



Part number	Fig	Captive center contact	Panel drilling	Packaging	Note
R222 M10 000	2	yes	P01	Bulk 100 pieces	Screw-on
R222 M00 080	1		P02		Solder legs
R222 M00 090	3		P03	Tape & reel 500 pieces	PIH + SMT

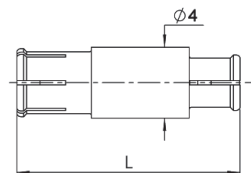
Adapters

IN-SERIES BOARD TO BOARD ADAPTERS



Part number	Lenght L (mm)	Series	Packaging
R222 M40 010	9.5	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		

BETWEEN-SERIES BOARD TO BOARD ADAPTERS



Part number	Lenght 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

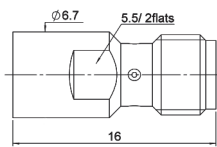


Fig. 1

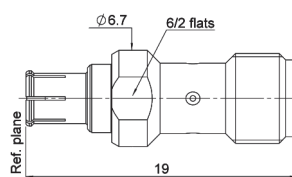


Fig. 2

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

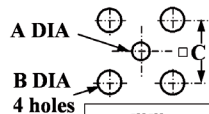
Panel drilling

P01



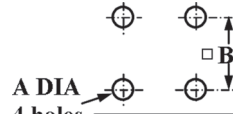
mm	
A	M6x0.75

P02



	mm	
	Maxi	mini
A	1.2	1.1
B	1.4	1.3
C	5.13	5.03

P03



	mm	
	Maxi	mini
A	1.4	1.3
B	5.13	5.03

P04



mm		
	Maxi	mini
A	6.13	6.07