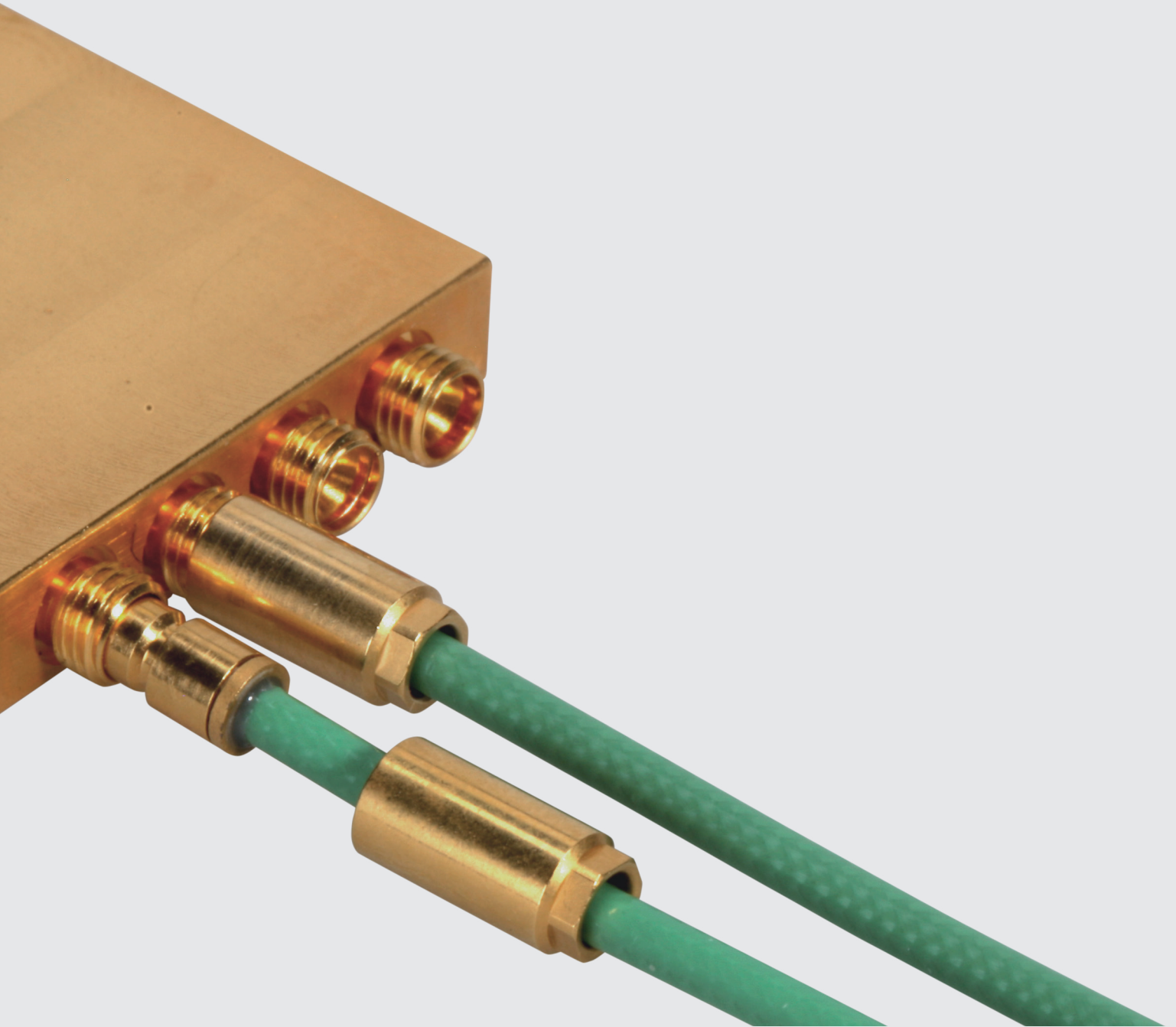


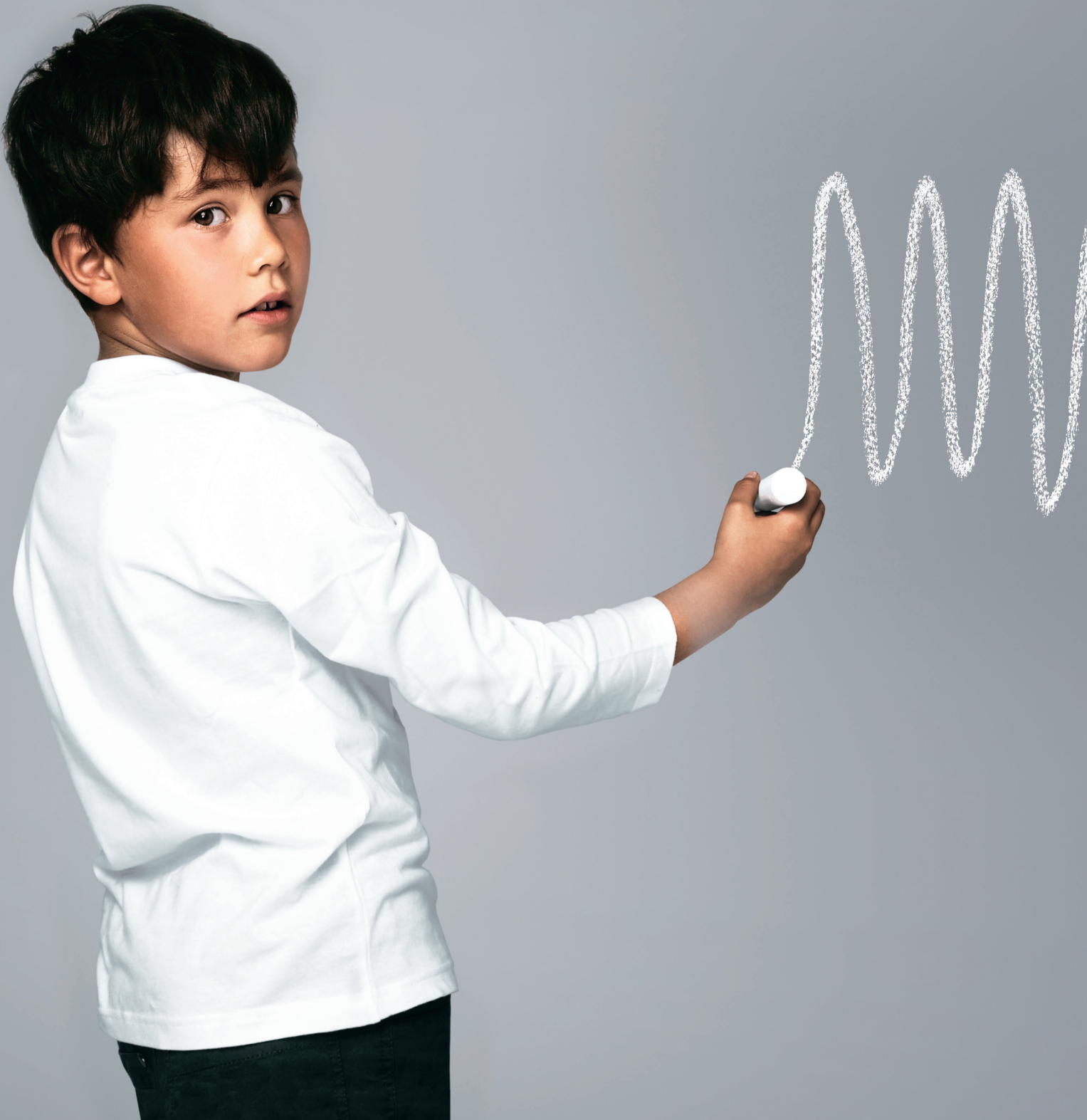
# High density solutions

## Connectors, adaptors

Edition 2014



# Excellence in connectivity solutions





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### Your partner for system solutions

The HUBER+SUHNER Group is a leading global supplier of components and systems for electrical and optical connectivity. We offer technical expertise in radio frequency technology, fiber optics and low frequency under one roof, thus providing a unique basis for continual innovation focused on the needs of our customers all over the world.

### Solutions and services from HUBER+SUHNER Astrolab

HUBER+SUHNER Astrolab has a history of significant contributions to the military, space, test & measurement, medical and other electronic industries. As the industry continuously moves toward higher operating frequencies, smaller components and higher density packages, HUBER+SUHNER Astrolab has recognised and met the growing demand for high-density interconnect solutions that incorporate precision performance, high reliability, and open source technology. This catalogue is a resource for RF and microwave system engineers seeking to improve performance while minimising mass, volume, and footprint.

# AS12

AS12 according to MIL-C-39029/102 and /103

## Description

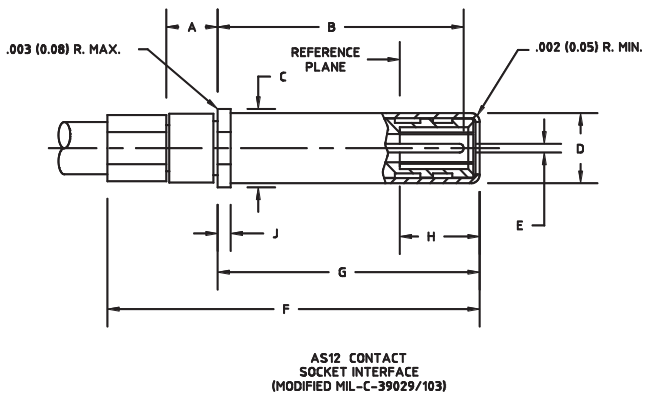
HUBER+SUHNER Astrolab size 12 contacts are RF contacts designed for installation in MIL-DTL-38999 and similar circular/sub-D connectors. The AS12 contacts are fully compatible with MIL-C-39029/102 and /103 designs but have been internally redesigned to provide exceptional RF performance from DC to 12.4 GHz.

## Compatibility

50 Ω AS12 size 12 contacts are intermateable to MIL-C-39029/102 and /103 contacts without restrictions.

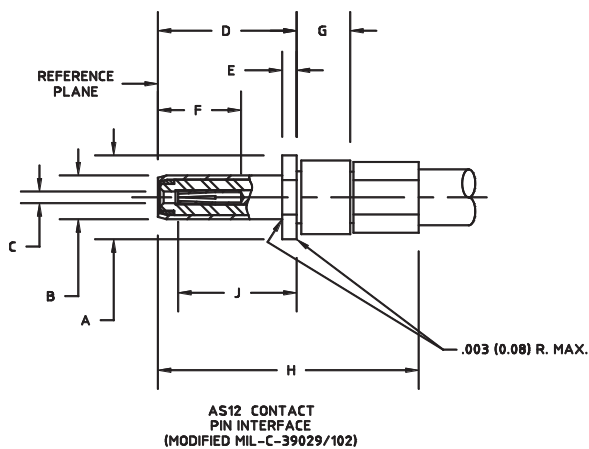
## Interface dimensions, inches (mm)

### Socket



	Socket		Pin	
	min.	max.	min.	max.
A	0.067 (1.70)	-	0.179 (4.55)	0.182 (4.62)
B	0.603 (15.31)	0.613 (15.57)	0.093 (2.36)	0.095 (2.41)
C	0.179 (4.55)	0.182 (4.62)	0.025 (0.64)	0.027 (0.68)
D	0.158 (4.01)	0.160 (4.06)	0.295 (7.49)	0.300 (7.62)
E	0.0195 (0.495)	0.0205 (0.521)	0.029 (0.74)	0.033 (0.84)
F	-	0.896 (22.76)	0.162 (4.11)	-
G	0.620 (15.74)	0.626 (15.89)	0.067 (1.70)	-
H	0.166 (4.22)	-	-	0.570 (14.48)
J	0.029 (0.74)	0.033 (0.84)	0.248 (6.30)	-

### Pin



Interface dimensions conformable to the following standards:

USA: MIL-C-39029  
Size 12 contact interface per MIL-C-39029/102 and /103

# AS12

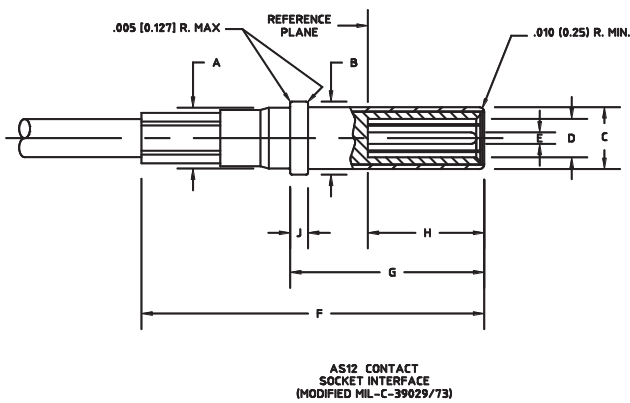
AS12 according to MIL-C-29029/73 BIN-396, -397 and -555 and MIL-C-39029/74

## Compatibility

50 Ω AS12 size 12 contacts are intermateable to MIL-C-39029/73 BIN-396, -397, -398 and -555 and MIL-C-39029/74 contacts without restrictions.

## Interface dimensions, inches (mm)

### Socket



	Socket		Pin	
	min.	max.	min.	max.
A	0.155 (3.94)	0.158 (4.01)	0.035 (0.89)	-
B	0.187 (4.75)	0.190 (4.85)	0.093 (2.36)	0.095 (2.41)
C	0.158 (4.01)	0.161 (4.09)	0.148 (3.76)	0.151 (3.84)
D	0.097 (2.46)	0.100 (2.54)	0.187 (4.75)	0.190 (4.83)
E	0.028 (0.711)	0.295 (0.749)	0.155 (3.94)	0.158 (4.01)
F	see table 1		-	1.028 (26.11)
G	see table 1		0.606 (15.39)	0.613 (15.57)
H	0.300 (7.62)	-	0.300 (7.62)	-
J	0.044 (1.12)	0.048 (1.22)	0.030 (0.76)	0.050 (1.27)
K	-	-	0.115 (2.92)	0.120 (3.05)
L	-	-	-	0.030 (0.76)
M	-	-	0.045 (1.14)	0.055 (1.40)

### Pin

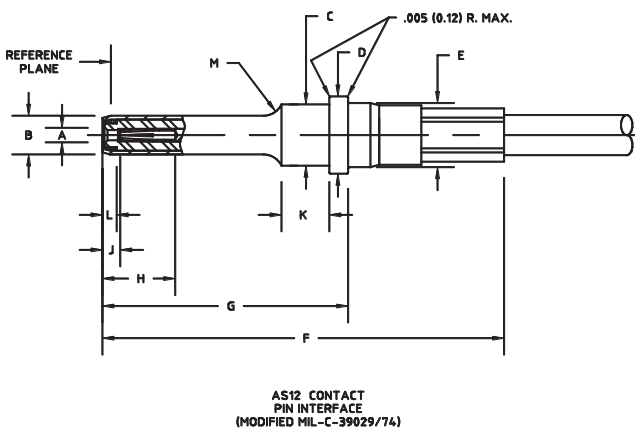


Table 1

BIN Code	F	G
396, 397, 398	0.915 (23.24) / 0.907 (23.03)	0.500 (12.70) / 0.492 (12.50)
555	1.13 (28.70) / 1.12 (28.44)	0.715 (17.91) / 0.705 (17.90)

Interface dimensions conformable to the following standards:

USA: MIL-C-39029  
Size 12 contact interface per  
MIL-C-39029/73 BIN codes 396, 397,  
398 and 555, and MIL-C-39029/74

# AS12 - technical data

Electrical data	Requirements
Impedance	50 Ω
Frequency range	MIL-C-39029/73 and /74: DC to 12.4 GHz MIL-C-39029/102 and /103: DC to 2 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	500 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	125 Vrms at 70 000 ft
RF high potential	325 Vrms at 5 MHz
RF leakage	-80 dB max. at 2 GHz -60 dB max. at 2 to 12.4 GHz
Magnetic permeability	< 2 Mu
VSWR	MIL-C-39029/73 and /74: 1.35:1 to 12.4 GHz MIL-C-39029/102 and /103: 1.25:1 to 2 GHz
Insertion loss	0.09 + 0.08 √f in GHz

Mechanical data	Requirements
Durability	500 cycles min.
Force to engage	AS12 pin: 20 oz (5.560 N) max. AS12 socket: 36 oz (10.008 N) max.
Force to disengage	AS12 pin: 0.4 oz (0.111 N) min. AS12 socket: 2.5 oz (0.695 N) min.

Environmental data	Requirements
Temperature range	-55 °C to +125 °C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, condition D
Random vibration	MIL-STD-202, method 214, condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, condition I

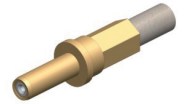
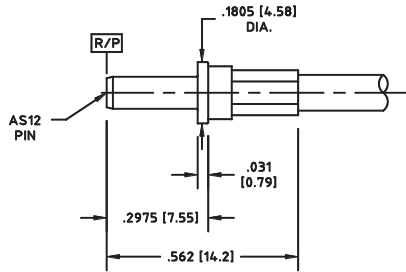
# AS12 – technical data

Material data		
Cable connectors	Material	Plating
Body	brass per ASTM B-16 or beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, Code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1	-
Ferrule	brass per ASTM B-135	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Adaptors	Material	Plating
Body	brass per ASTM B-16	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
	#303 SS per ASTM A- 582	passivated per SAE-AMS-2700
Nut	#303 SS per ASTM A- 582	passivated per SAE-AMS-2700
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 and Noryl® PPO modified polyphenylene oxide resin	-
Retaining ring	beryllium copper per ASTM B-197	-
Gasket	silicone rubber per SAE-AMS-3304	-

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.

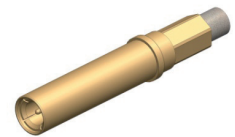
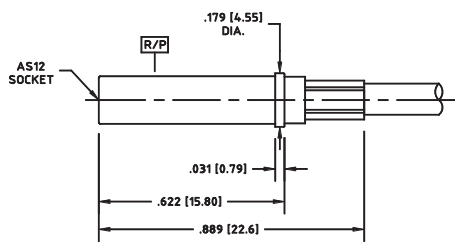
# AS12 - cable connectors

## AS12 pin contact (MIL-C-39029/102)



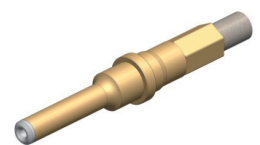
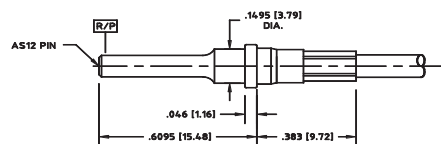
Cable	Part no.
32024	29930-32-24
32081	29930-32-81

## AS12 socket contact (MIL-C-39029/103)



Cable	Part no.
32024	29931-32-24
32081	29931-32-81

## AS12 pin contact (MIL-C-39029/74)

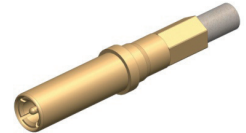
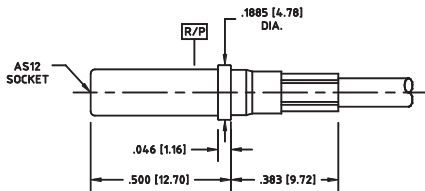


Cable	Part no.
32024	29933-32-24
32081	29933-32-81



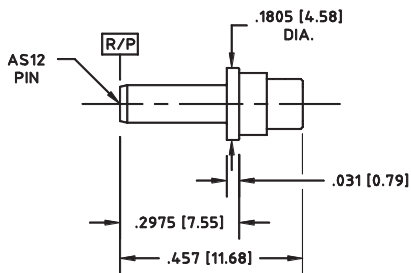
# AS12 - cable connectors

## AS12 socket contact (MIL-C-39029/73)



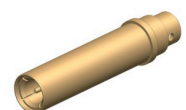
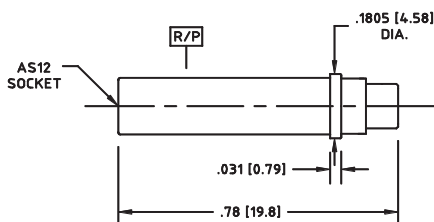
Cable	Part no.
32024	29934-32-24
32081	29934-32-81

## AS12 pin contact (MIL-C-39029/102)



Cable dia.	Part no.
0.086 inches (2.18 mm)	29930-2

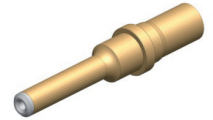
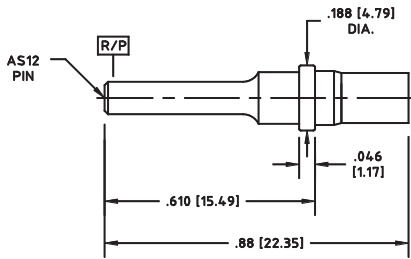
## AS12 socket contact (MIL-C-39029/103)



Cable dia.	Part no.
0.086 inches (2.18 mm)	29931-2

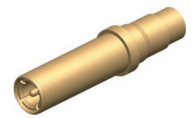
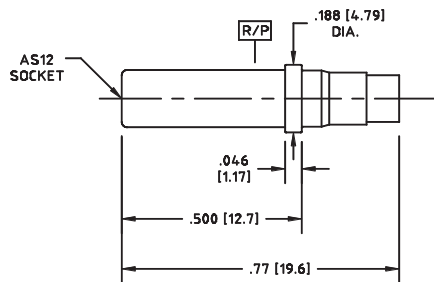
# AS12 - cable connectors

## AS12 pin contact (MIL-C-39029/74)



Cable dia.	Part no.
0.086 inches (2.18 mm)	29933-2

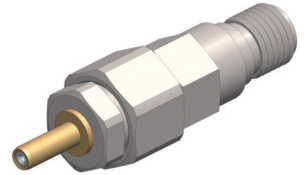
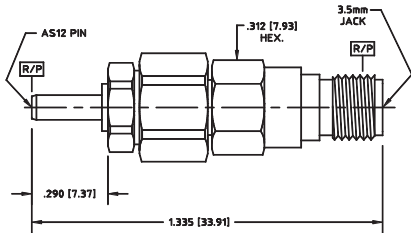
## AS12 socket contact (MIL-C-39029/73)



Cable dia.	Part no.
0.086 inches (2.18 mm)	29934-2

# AS12 - adaptors

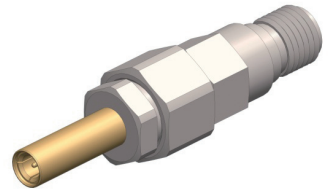
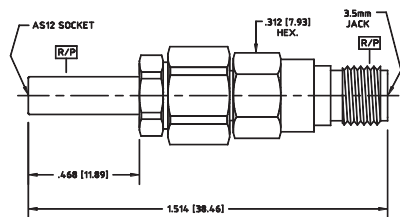
AS12 pin contact (MIL-C-39029/102) - 3.5 mm jack



Part no.

29932-1

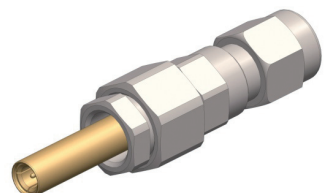
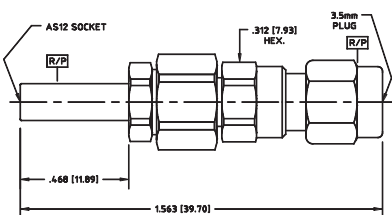
AS12 socket contact (MIL-C-39029/103) - 3.5 mm jack



Part no.

29932-2

AS12 socket contact (MIL-C-39029/103) - 3.5 mm plug

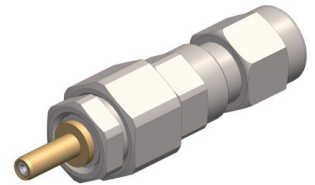
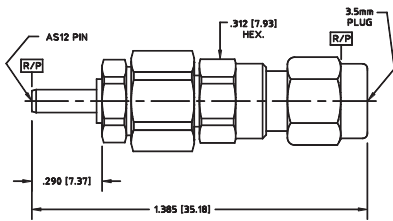


Part no.

29932-3

# AS12 - adaptors

AS12 pin contact (MIL-C-39029/102) - 3.5 mm plug



Part no.

29932.4

# AS16

## Description

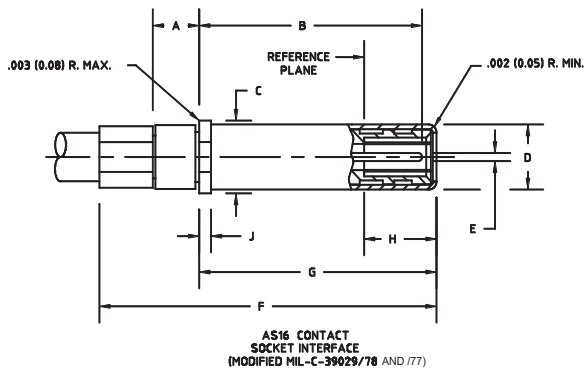
HUBER+SUHNER Astrolab size 16 contacts are RF contacts designed for installation in MIL-DTL-38999 and similar circular/sub-D connectors. The AS16 contacts are fully compatible with MIL-C-39029/102 and /103 designs but have been internally redesigned to provide exceptional RF performance from DC to 2 GHz. The AS16 contact is a smaller diameter RF blind mate solution than the AS12 interface.

## Compatibility

50 Ω AS16 size 16 contacts are intermateable to MIL-C-39029/76, /77 and /78 contacts without restrictions.

## Interface dimensions, inches (mm)

### Socket



	Socket		Pin	
	min.	max.	min.	max.
A	0.063 (1.60)	-	0.127 (3.23)	0.130 (3.30)
B	see table 1		0.0615 (1.562)	0.0635 (1.613)
C	0.127 (3.23)	0.130 (3.30)	0.038 (0.97)	0.041 (1.04)
D	-	0.113 (2.87)	0.018 (0.46)	0.022 (0.56)
E	0.0145 (0.368)	0.0155 (0.394)	0.295 (7.49)	0.300 (7.62)
F	see table 1		0.166 (4.22)	-
G	see table 1		0.029 (0.74)	0.033 (0.84)
H	0.166 (4.22)	-	-	0.570 (14.48)
J	0.029 (0.74)	0.033 (0.84)	0.262 (6.65)	-

### Pin

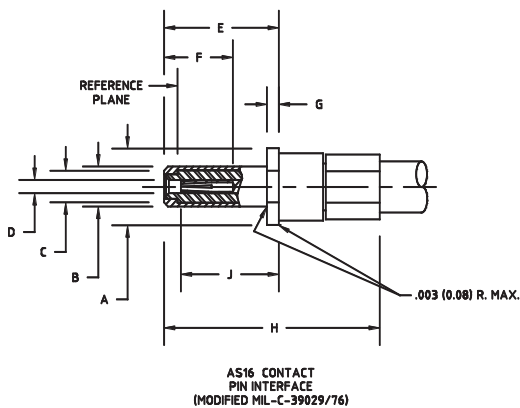


Table 1

	Socket			
	MIL-C-39029/78		MIL-C-39029/77	
	min.	max.	min.	max.
B	0.264 (6.71)	0.274 (6.95)	0.601 (15.27)	0.611 (15.52)
F	-	0.560 (14.22)	-	0.896 (22.76)
G	0.279 (7.09)	0.289 (7.34)	0.620 (15.75)	0.626 (15.90)

Interface dimensions conformable to the following standards:

USA: MIL-C-39029/76, /77, /78

# AS16 – technical data

Electrical data	Requirements
Impedance	50 $\Omega$
Frequency range	DC to 2 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	375 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	90 Vrms at 70 000 ft
RF high potential	190 Vrms at 5 MHz
RF leakage	-80 dB max. at 2 GHz
Magnetic permeability	< 2 $\mu$
VSWR	1.2:1 to 2 GHz
Insertion loss	0.09 + 0.08 $\sqrt{f}$ in GHz

Mechanical data	Requirements
Durability	500 cycles min.
Force to engage	AS16 pin: 14 oz (3.892 N) max. AS16 socket: 36 oz (10.008 N) max.
Force to disengage	AS16 pin: 0.4 oz (0.111 N) min. AS16 socket: 1.5 oz (0.417 N) min.

Environmental data	Requirements
Temperature range	-55 °C to +125 °C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, condition D
Random vibration	MIL-STD-202, method 214, condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, condition I

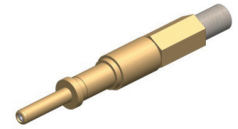
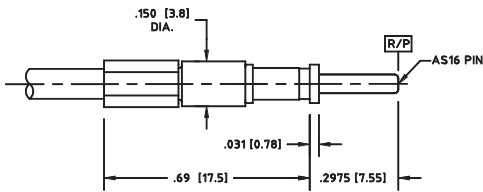
## AS16 – technical data

Material data		
Cable and PCB connectors	Material	Plating
Body and contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1	-
Ferrule	brass per ASTM B-135	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Adaptors	Material	Plating
Body	#303 SS per ASTM A- 582	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 or passivated per SAE-AMS-2700
Sheath	#303 SS per ASTM A- 582	passivated per SAE-AMS-2700
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1	-

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.

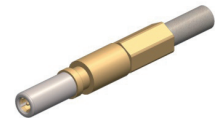
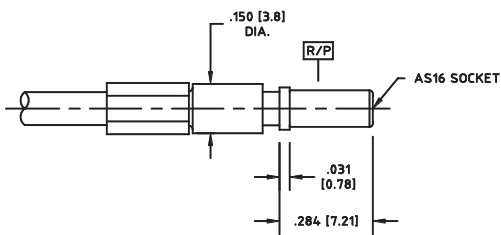
# AS16 - cable connectors

## AS16 pin contact (MIL-C-39029/76)



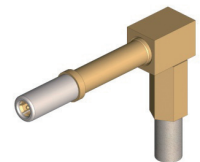
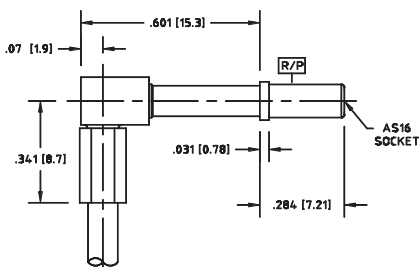
Cable	Part no.
32024	29956-32-24
32081	29556-32-81

## AS16 socket contact (MIL-C-39029/78)



Cable	Part no.
32024	29915-32-24
32081	29915-32-81

## AS16 socket contact (MIL-C-39029/78)

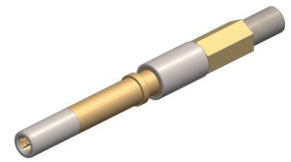
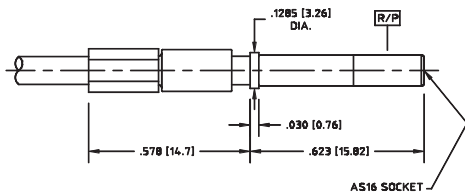


Cable	Part no.
32024	29922-32-24
32081	29922-32-81



# AS16 - cable connectors

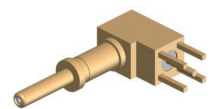
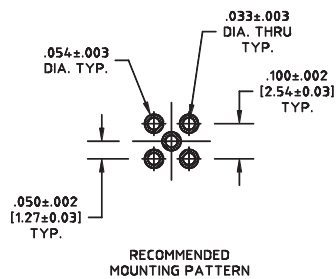
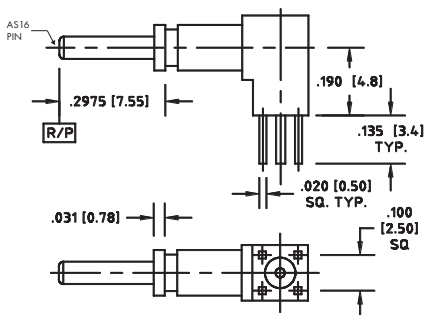
## AS16 socket contact (MIL-C-39029/77)



Cable	Part no.
32024	29936-32-24
32081	29936-32-81

# AS16 - PCB mount connectors

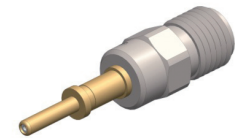
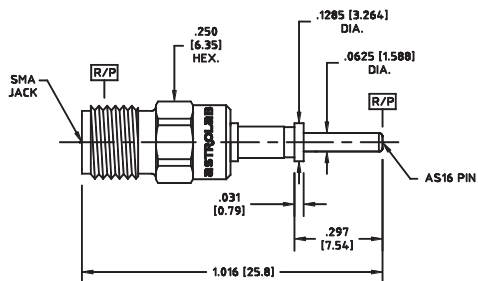
## AS16 pin contact (MIL-C-39029/76)



Part no.
29556A-BM1

# AS16 - adaptors

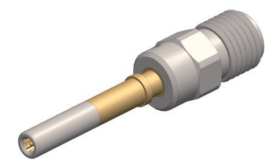
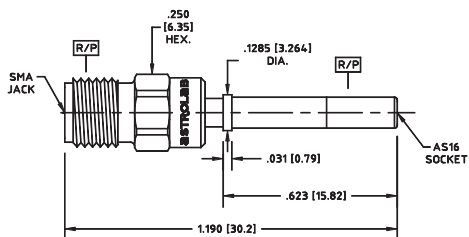
## AS16 pin contact (MIL-C-39029/76) - SMA jack



Part no.

29557-4

## AS16 socket contact (MIL-C-39029/77) - SMA jack



Part no.

29557-5

# AS20

## Description

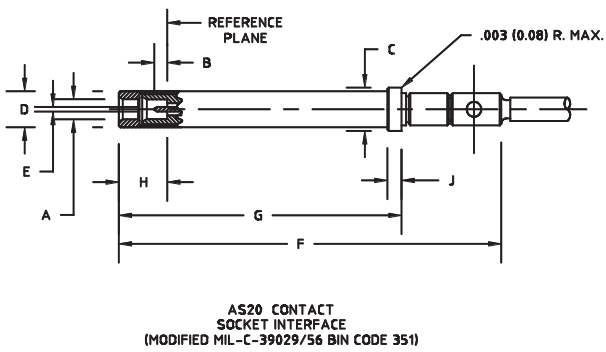
HUBER+SUHNER Astrolab size 20 contacts are the smallest diameter MIL-C-39029 type RF contacts in the market. The contacts are designed for installation in MIL-DTL-38999 and similar circular/sub-D connectors. The AS20 contacts feature a spring-loaded socket design that provides constant interface reference plane contact to improve high frequency electrical performance while providing for the full mechanical mating tolerances of MIL-C-39029.

## Compatibility

50 Ω AS20 size 20 contacts are compatible with connector shell inserts for MIL-C-39029/56 BIN code 351 and MIL-C-39029/58 BIN code 363. Size 20 coaxial line interface dimensions are not defined in MIL-C-39029. The contact pair should be selected and designed by a single manufacturer to guarantee specified performance levels.

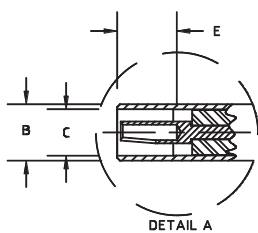
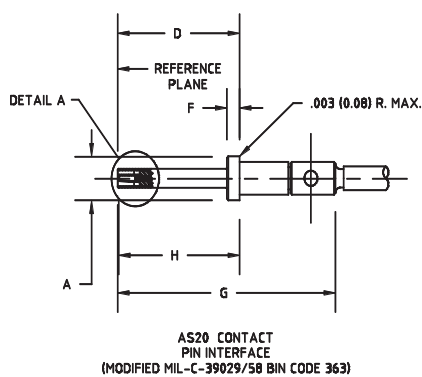
## Interface dimensions, inches (mm)

### Socket



	Socket		Pin	
	min.	max.	min.	max.
A	0.0415 (1.054)	-	0.091 (2.31)	0.094 (2.38)
B	0.024 (0.60)	0.034 (0.86)	0.039 (0.99)	0.041 (1.04)
C	0.091 (2.31)	0.094 (2.38)	0.033 (0.83) nominal	
D	-	0.078 (1.98)	0.295 (7.49)	0.300 (7.62)
E	0.010 (0.254) nominal		0.0395 (1.00)	0.0455 (1.15)
F	-	0.855 (21.71)	0.029 (0.73)	0.033 (0.83)
G	0.616 (15.64)	0.626 (15.90)	0.529 (13.43)	0.534 (13.56)
H	0.101 (2.56)	0.113 (2.87)	0.292 (7.41)	0.298 (7.56)
J	0.029 (0.74)	0.033 (0.84)	-	-

### Pin



Interface dimensions conformable to the following standards:

USA: MIL-C-39029/56 and /58  
BIN codes 351 and 363

# AS20 – technical data

Electrical data	Requirements
Impedance	50 Ω
Frequency range	DC to 6 GHz
Contact resistance	center conductor 10.0 milliohms max. outer conductor 5.0 milliohms max.
DWV	190 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	55 Vrms at 70 000 ft.
RF high potential	120 Vrms at 5 MHz
RF leakage	-70 dB max. at 6 GHz
Magnetic permeability	< 2 Mu
VSWR	1.45:1 to 6 GHz
Insertion loss	0.12 + .08 √f in GHz

Mechanical data	Requirements
Center contact retention	1.5 lbs (6.672 N) min. (captivated designs)
Durability	100 cycles min.
Axial displacement	0.060 inches (1.52 mm) min.

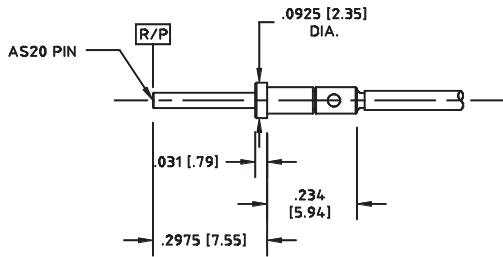
Environmental data	Requirements
Temperature range	-55 °C to +125 °C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Sine vibration	MIL-STD-202, method 204, condition D
Shock	MIL-STD-202, method 213, condition I

Material data		
Cable connectors	Material	Plating
Body and contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Sleeve	#303 SS per ASTM A-582	passivated per SAE-AMS-2700
Dielectric	PTFE per ASTM D-1710, type I, grade 1 and Ultem™ per ASTM D-5205	-
Spring	#302 SS per ASTM A-313	passivated per SAE-AMS-2700

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.

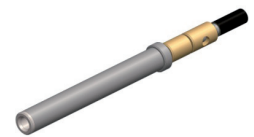
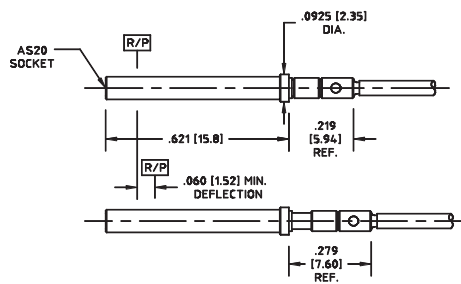
# AS20 - cable connectors

## AS20 pin contact (MIL-C-39029/58)



Cable	Part no.
32018DS	29440-32-18DS

## AS20 socket contact (MIL-C-39029/56)



Cable	Part no.
32018DS	29441-32-18DS

# BMA

## Description

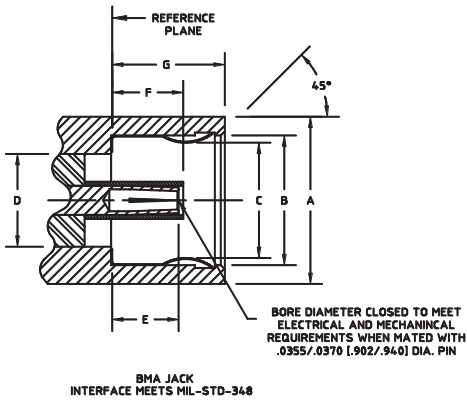
HUBER+SUHNER Astrolab BMA blind mate connectors open up special dimensions in microwave applications up to 26 GHz. HUBER+SUHNER Astrolab offers a range of connectors for fixed as well as «floating» configurations with any axial or radial misalignment compensated by the outer contact of the jack connector. The BMA series presents an outstanding range of products featuring high reliability and ease of assembly.

## Compatibility

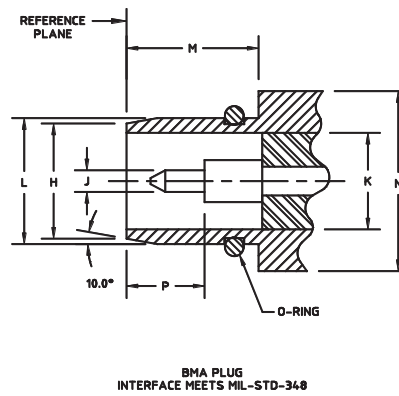
50 Ω BMA connectors are intermateable without restrictions.

## Interface dimensions, inches (mm)

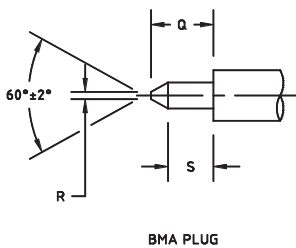
### BMA jack



### BMA plug



### BMA plug



	min.	max.		min.	max.
A	0.290 (7.37)	-	K	0.161 (4.08) nominal	
B	0.225 (5.71)	-	L	0.209 (5.31)	0.211 (5.35)
C	-	0.200 (5.08)	M	0.198 (5.03)	0.503 (12.77)
D	0.161 (4.08) nominal		N	0.300 (7.62) nominal	
E	0.115 (2.92)	-	P	0.128 (3.25)	-
F	0.120 (3.0)	0.127 (3.22)	Q	0.090 (2.29) nominal	
G	-	0.198 (4.95)	R	-	0.015 (0.38)
H	0.192 (4.88) nominal		S	0.053 (1.35)	-
J	0.0354 (0.90)	0.037 (0.94)			

Interface dimensions conformable to the following standards:

USA: MIL-PRF-31031  
BMA Interface MIL-STD-348

# BMA – technical data

Electrical data	Requirements
Impedance	50 $\Omega$
Frequency range	DC to 26 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	500 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	190 Vrms at 70 000 ft.
RF high potential	335 Vrms at 5 MHz
RF leakage	-85 dB max. at 12 GHz
Magnetic permeability	< 2 $\mu$
VSWR	1.25:1 to 26 GHz
Insertion loss	0.03 $\sqrt{f}$ in GHz

Mechanical data	Requirements
Center contact retention	6 lbs (26.689 N) min. (captivated designs)
Durability	500 cycles min.
Radial misalignment	$\pm 0.020$ inches (0.51 mm) min.
Axial displacement	0.060 inches (1.52 mm) min.
Force vs. axial displacement	0.010 inches (0.25 mm) = 3.0 (13.34) $\pm$ 0.5 lbf (2.22 N) 0.050 inches (1.27 mm) = 3.7 (16.45) $\pm$ 0.5 lbf (2.22 N) 0.060 inches (1.52 mm) = 3.8 (16.90) $\pm$ 0.5 lbf (2.22 N)

Environmental data	Requirements
Temperature range	-65 $^{\circ}$ C to +165 $^{\circ}$ C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, 28 g peak
Random vibration	MIL-STD-202, method 214, test condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, 12 000 g peak

# BMA – technical data

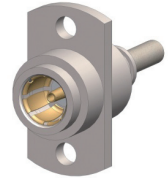
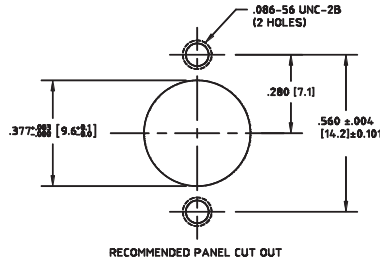
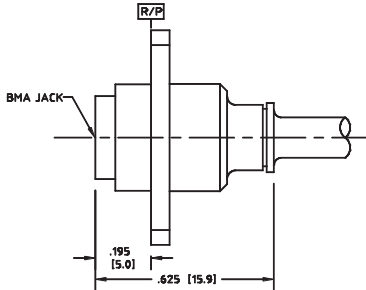
Material data		
Cable connectors	Material	Plating
Body and mounting nut	#303 SS per ASTM A-582	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 or passivated per SAE-AMS-2700
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 or PCTFE	-
Lockwasher	copper alloy CDA 425 per ASTM B-591	nickel plate per ASTM B-733
Back nut	#303 SS per ASTM A-582	gold plate per ASTM B-488, code C, type II over nickel alloy plate
O-Ring	fluorosilicone polymer per SAE-AMS-R-25988	-
Retaining ring	beryllium copper per ASTM B-197	-
	#302 SS per ASTM A-313	passivated per SAE-AMS-2700
Lock ring	#304 SS per ASTM A-240	passivated per SAE-AMS-2700
Spring, retaining clip and compression spring	#302 SS per ASTM A-313	passivated per SAE-AMS-2700
Gasket	silicone rubber per SAE-AMS-3304	-

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.



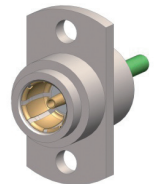
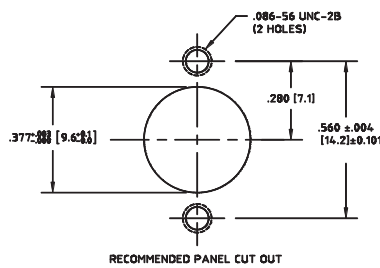
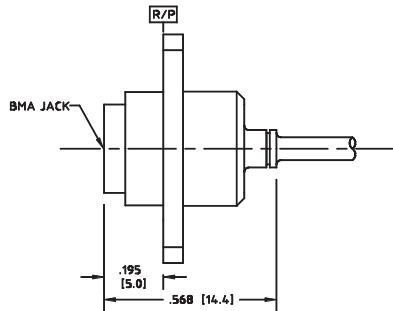
# BMA - cable connectors

## BMA jack connector



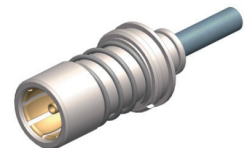
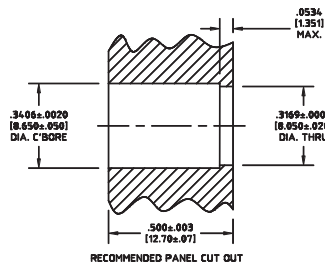
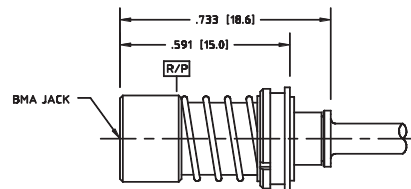
Cable	Part no.
32022E	29482CR-32-22
32024	29482C-32-24
32024E	29482CR-32-24
32081	29482C-32-81
32081E	29482CR-32-81

## BMA jack connector



Cable	Part no.
32041E	29482CR-32-41

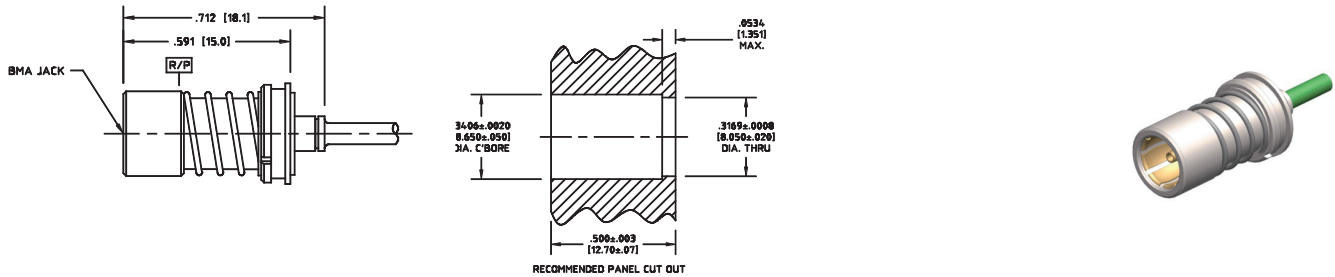
## BMA jack connector



Cable	Part no.
32024	29904C-32-24
32024E	29904CR-32-24
32081	29904C-32-81
32081E	29904CR-32-81

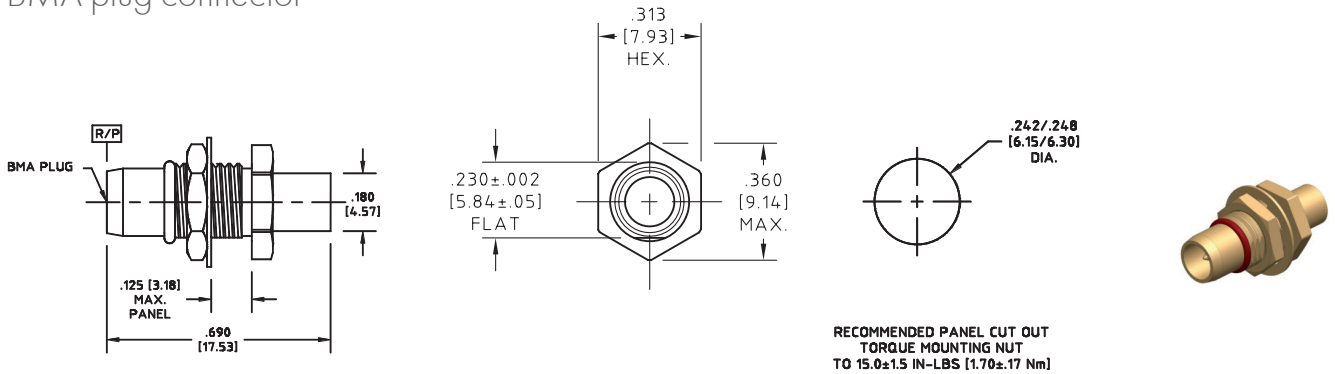
# BMA - cable connectors

## BMA jack connector



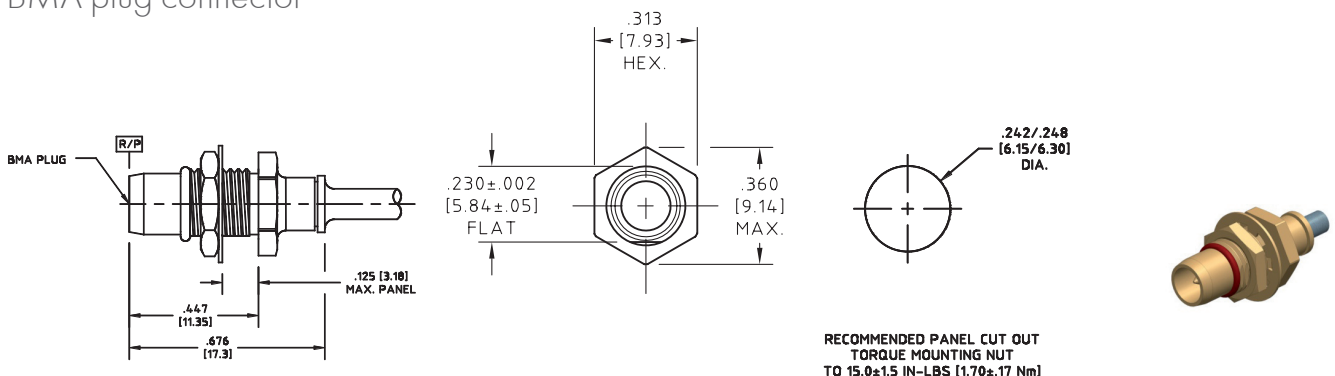
Cable	Part no.
32041E	29904CR-32-41

## BMA plug connector



Cable dia.	Part no.
0.141 inches (3.58 mm)	29905-1

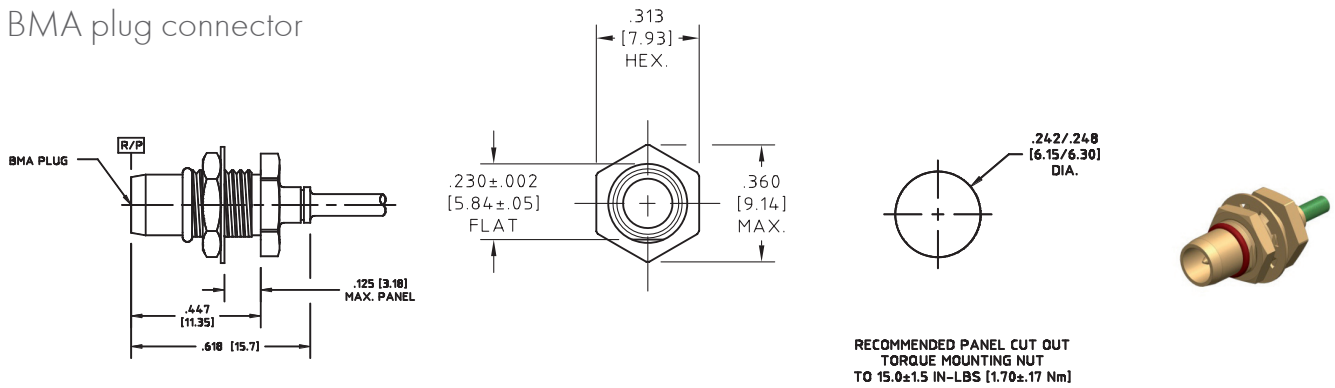
## BMA plug connector



Cable	Part no.
32024	29905C-32-24
32024E	29905CR-32-24
32081	29905C-32-81
32081E	29905CR-32-81

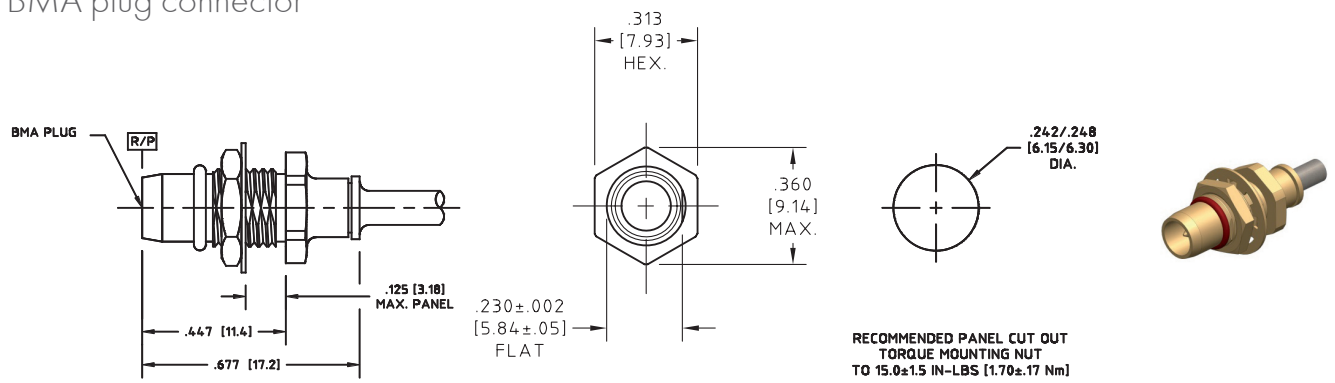
# BMA - cable connectors

## BMA plug connector



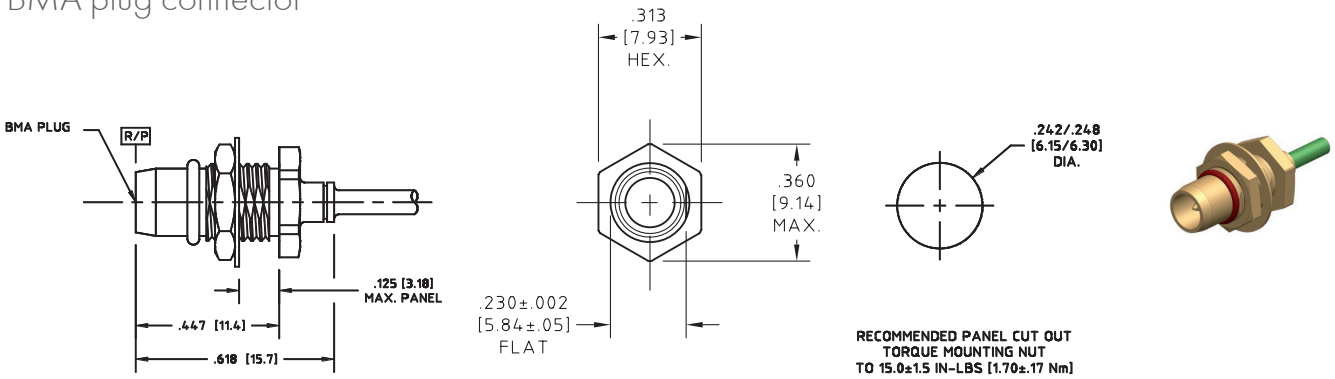
Cable	Part no.
32041E	29905CR-32-41

## BMA plug connector



Cable	Part no.
32024	29907C-32-24
32024E	29907-CR-32-24
32081	29907C-32-81
32081E	29907CR-32-81

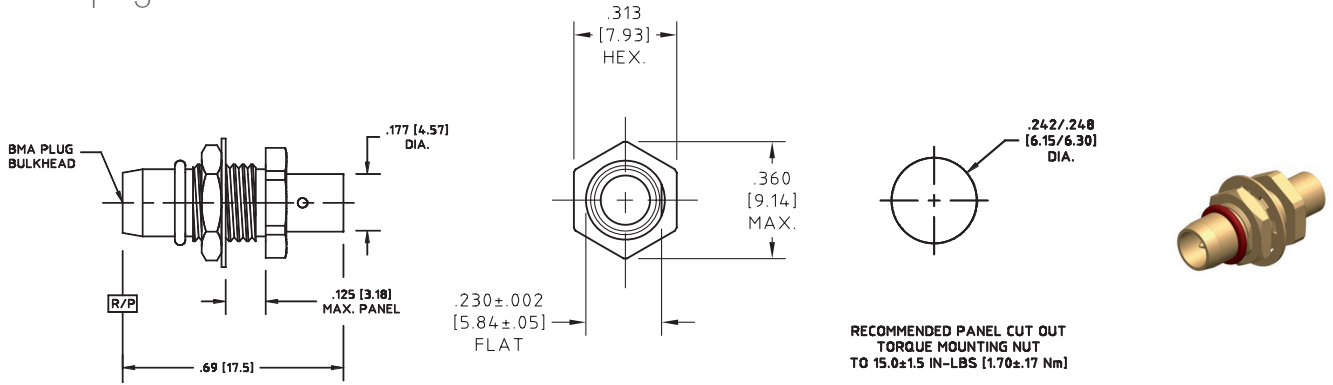
## BMA plug connector



Cable	Part no.
32041E	29907CR-32-41

# BMA - cable connectors

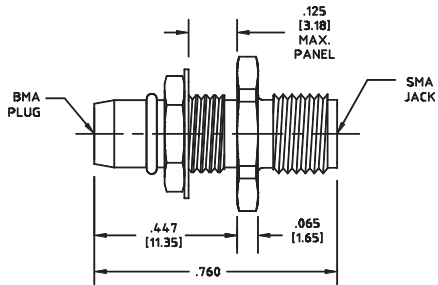
## BMA plug connector



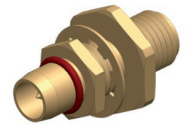
Cable	Part no.
31000	29907-31

# BMA - adaptors

## SMA jack - bulkhead BMA plug



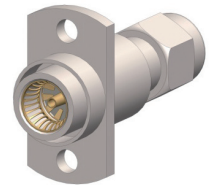
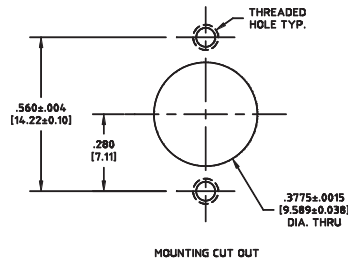
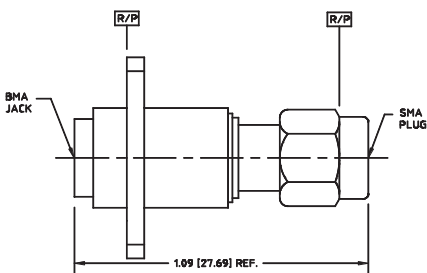
RECOMMENDED PANEL CUT OUT  
TORQUE MOUNTING NUT  
TO 15.0±1.5 IN-LBS [1.70±.17 Nm]



Part no.

29427-1

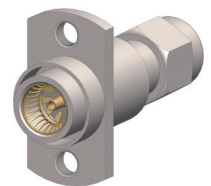
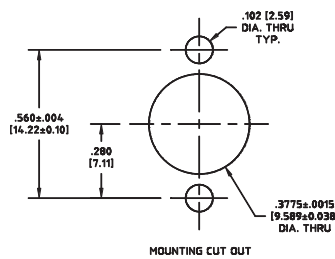
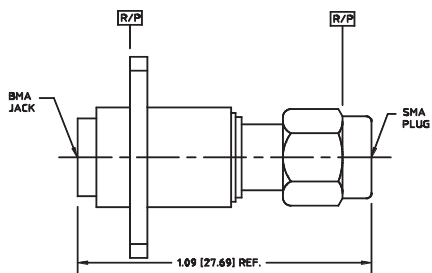
## BMA jack float mount - SMA plug



Part no.

29427-3

## BMA jack float mount - SMA plug



Part no.

29427T-3

# BMZ

## Description

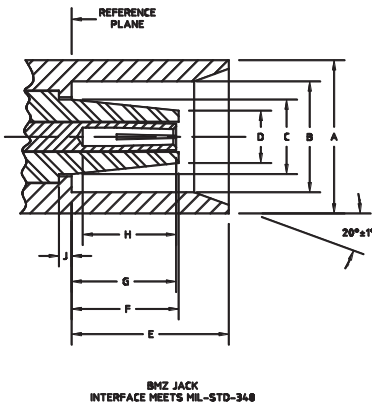
HUBER+SUHNER Astrolab BMZ blind mate connectors provide a highly durable and unique RF interconnect solution. The design of the connector provides the same mechanical misalignment range of a BMA connector but within a smaller geometric envelope. The unique design of the nesting tapered PTFE insulator also provides an exceptional potential voltage handling for a blind mate connector.

## Compatibility

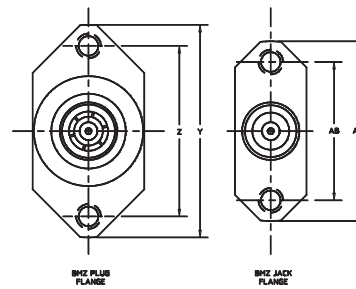
50 Ω BMZ connectors are intermateable without restrictions.

## Interface dimensions inches (mm)

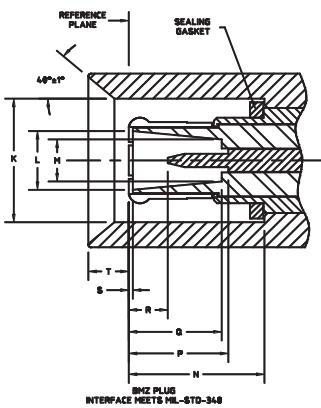
### Jack



### Flange

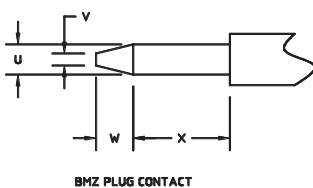


### Plug



	min.	max.		min.	max.
A	-	0.182 (4.62)	P	0.130 (3.30)	-
B	-	0.131 (3.33)	Q	0.130 (3.30)	-
C	-	0.087 (2.21)	R	0.030 (0.76)	-
D	-	0.062 (1.57)	S	0.000 (0.00)	0.010 (0.25)
E	0.182 (4.62)	0.188 (4.78)	T	0.055 (1.40)	0.065 (1.65)
F	-	0.130 (3.30)	U	0.0195 (0.50)	0.0210 (0.53)
G	-	0.130 (3.30)	V	-	0.011 (0.028)
H	0.095 (2.41)	-	W	0.015 (0.38)	-
J	0.00 (0.00)	0.010 (0.25)	X	0.060 (1.52)	-
K	0.184 (4.67)	-	Y	0.739 (18.77) dia. nominal	
L	0.087 (2.21)	-	Z	0.593 (15.06) nominal	
M	0.062 (1.57)	-	AA	0.625 (15.87) dia. nominal	
N	0.197 (5.00)	0.203 (5.16)	AB	0.481 (12.22) nominal	

### Plug contact



Interface dimensions conformable to the following standards:

USA: MIL-PRF-31031  
BMZ interface MIL-STD-348

# BMZ – technical data

Electrical data	Requirements
Impedance	50 Ω
Frequency range	DC to 18 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	500 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	125 Vrms at 70 000 ft
RF high potential	350 Vrms at 5 MHz
RF leakage	-85 dB max. at 3 GHz
Magnetic permeability	< 2 Mu
VSWR	1.25:1 to 18 GHz
Insertion loss	0.04 √f in GHz

Mechanical data	Requirements
Center contact retention	4 lbs (17.792 N) min. (captivated designs)
Durability	500 cycles min.
Radial misalignment	± 0.020 inches (0.51 mm) min.
Axial displacement	0.060 inches (1.52 mm) min.

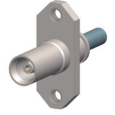
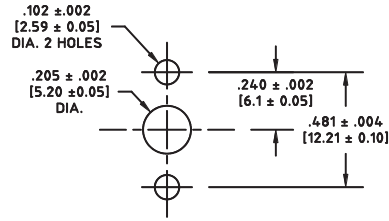
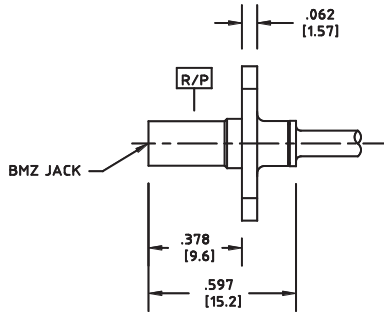
Environmental data	Requirements
Temperature range	-65 °C to +165 °C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, condition D
Random vibration	MIL-STD-202, method 214, test condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, condition I

Material data		
Cable connectors	Material	Plating
Body	#303 SS per ASTM A-582	passivated per SAE-AMS-2700
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1	-
Back nut	#303 SS per ASTM A-582	nickel alloy plated
O-Ring	fluorosilicone polymer filled with silver plated aluminium	-
Spring	#302 SS per ASTM A-313	passivated per SAE-AMS-2700

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configuration.

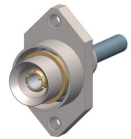
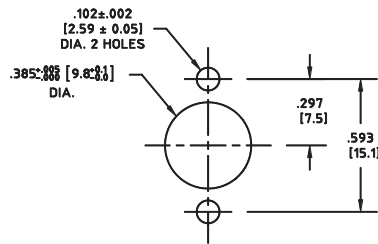
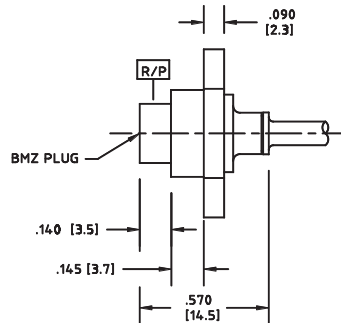
# BMZ - cable connectors

## BMZ jack connector



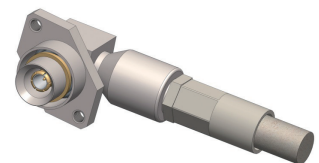
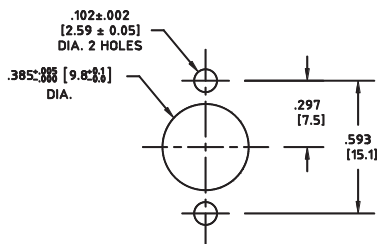
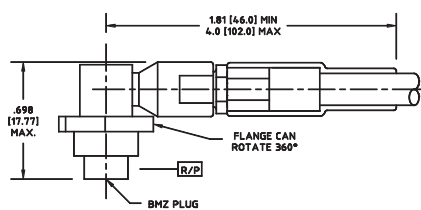
Cable	Part no.
32024	29184FC-32-24
32024E	29184FCR-32-24
32041E	29184FCR-32-41
32081	29184FC-32-81
32081E	29184FCR-32-81

## BMZ plug connector



Cable	Part no.
32024	29185FFC-32-24
32024E	29185FFCR-32-24
32041E	29185FFCR-32-41
32081	29185FFC-32-81
32081E	29185FFCR-32-81

## BMZ plug connector



Cable	Part no.
32026	29186FF-32-26



# SMP

## Description

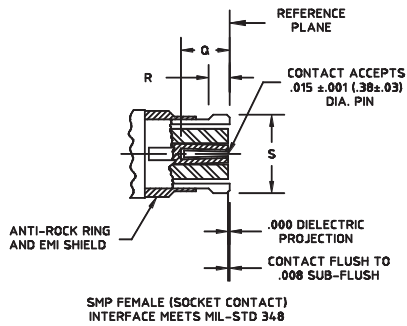
HUBER+SUHNER Astrolab SMP connectors provide a robust, proven and fully compatible plug-in solution for applications up to 40 GHz. HUBER+SUHNER Astrolab SMP connectors have been MIL-SPEC qualified for defence and space flight hardware. The design of the interface and materials treating provide true compatibility as well as guaranteed mechanical performance over the mating life of the connector with all MIL-STD-348 SMP connectors in the market.

## Compatibility

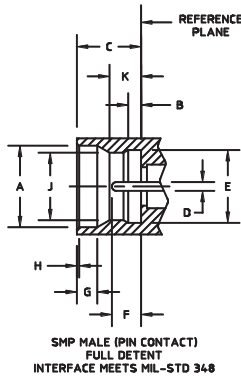
50 Ω SMP connectors are intermateable without restrictions.

## Interface dimensions, inches (mm)

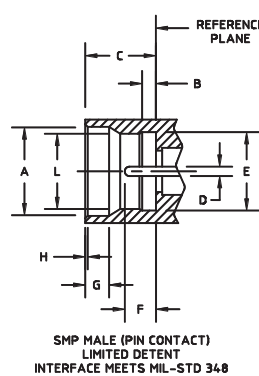
### SMP female



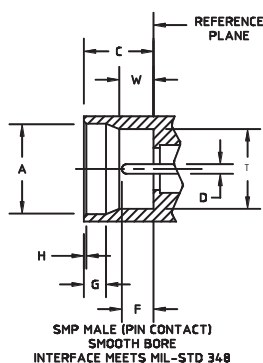
### SMP male, full detent



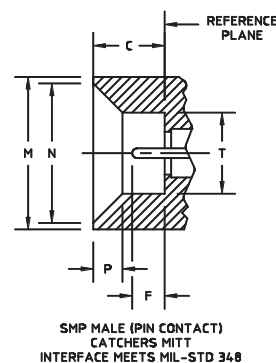
### SMP male, limited detent



### SMP male, smooth bore



### SMP male, catchers mitt



	min.	max.
A	0.139 (3.53)	0.145 (3.68)
B	0.0205 (0.521)	0.0235 (0.597)
C	0.108 (2.74)	0.112 (2.84)
D	0.014 (0.36)	0.016 (0.41)
E	0.124 (3.15)	0.126 (3.20)
F	0.045 (1.14)	0.055 (1.40)
G	0.033 (0.84)	0.037 (0.94)
H	0.003 (0.08)	0.008 (0.20)
J	0.114 (2.90)	0.118 (3.00)
K	0.051 (1.30)	0.057 (1.45)
L	0.118 (3.00)	0.122 (3.10)
M	0.230 (5.84)	0.240 (6.10)
N	0.210 (5.33)	0.220 (5.59)
P	0.043 (1.09)	0.047 (1.19)
Q	0.070 (1.77)	-
R	0.025 (0.63)	0.035 (0.88) (cabled connector)
	0.018 (0.45)	0.025 (0.63) (uncabled connector)
S	-	0.135 (3.43)
T	0.123 (3.12)	0.127 (3.22)
W	0.059 (1.49)	0.065 (1.65)

## Interface dimensions conformable to the following standards:

USA:

MIL-PRF-31031  
SMP interface MIL-STD-348

# SMP – technical data

Electrical data	Requirements
Impedance	50 Ω
Frequency range	DC to 40 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	500 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	190 Vrms at 70,000 ft.
RF high potential	325 Vrms at 5 MHz
RF leakage	-80 dB max. at 3 GHz -65 dB max. at 3 to 26.5 GHz
Magnetic permeability	< 2 Mu
VSWR	1.2:1 to 18 GHz 1.35:1 to 26.5 GHz 1.5:1 to 40 GHz
Insertion loss	0.06 √f in GHz (non-hermetic connectors) 0.12 √f in GHz (hermetic connectors)

Mechanical data	Requirements
Center contact retention	1.5 lbs (6.672 N) min. (captivated designs)
Durability	100 cycles min. into a full detent shroud 500 cycles min. into a limited detent shroud 1000 cycles min. into a smooth bore shroud
Force to engage	SMP full detent - 15 lbs (66.723 N) max. SMP limited detent - 10 lbs (44.482 N) max. SMP smooth bore - 2 lbs (8.896 N) max.
Force to disengage	SMP full detent - 5 lbs (22.241 N) min. SMP limited detent - 2 lbs (8.896 N) min. SMP smooth bore - 0.5 lbs (2.224 N) min.
Radial misalignment	Standard - ± 0.010 inches (0.25 mm) min. Float mount - ± 0.030 inches (0.76 mm) min.
Axial misalignment	Standard - 0.010 inches (0.25 mm) min. Float mount - 0.050 inches (1.27 mm) min.

Environmental data	Requirements
Temperature range	-65 °C to +165 °C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, 28 g peak
Random vibration	MIL-STD-202, method 214, condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, 12 000 g peak

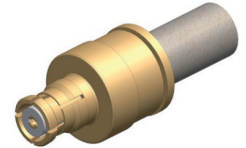
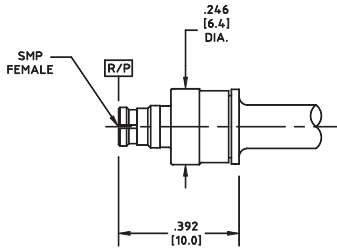
# SMP – technical data

Material data		
Cable and shroud connectors	Material	Plating
Body	beryllium copper per ASTM B-196 or brass per QQ-B-626	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
	#303 SS per ASTM A-582	passivated per SAE-AMS-2700
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 or Torlon™ per ASTM D-5204	-
Ferrule	brass per ASTM B-135	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Spring	carbon steel per ASTM A-228	nickel plate per SAE-AMS-QQ-N-290, class 1
Lockwasher	copper alloy CDA425 per ASTM B-591	nickel plate per ASTM B-733
Hermetic shroud connectors	Material	Plating
Body and contact	Kovar® per ASTM F-15, class 1	gold plate per ASTM B-488, code A, type III over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	Corning 7070 glass or equivalent	-
Adaptors	Material	Plating
Body and nut	beryllium copper per ASTM B-196 or #303 SS per ASTM A-582	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 and Ultem™ per ASTM D-5205	-
O-Ring	silicone rubber per SAE-AMS-3304	-

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.

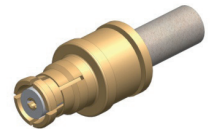
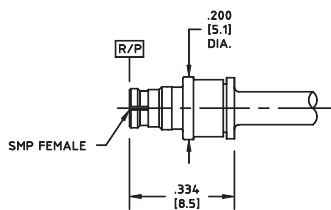
# SMP - cable connectors

## SMP female connector



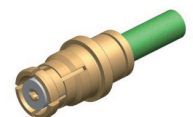
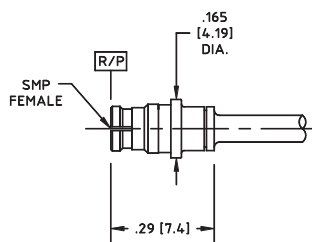
Cable	Part no.
32022E	29473CR-32-22

## SMP female connector



Cable	Part no.
32024	29473C-32-24
32024E	29473CR-32-24
32081	29473C-32-81
32081E	29473CR-32-81

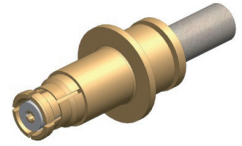
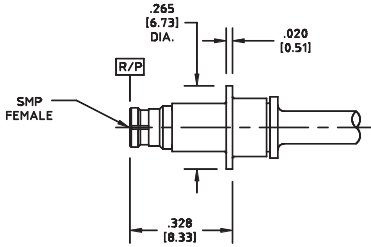
## SMP female connector



Cable	Part no.
32041E	29473CR-32-41

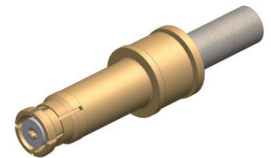
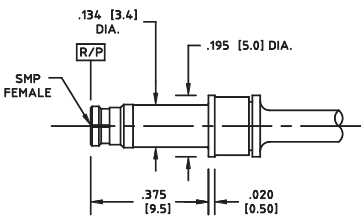
# SMP - cable connectors

## SMP female connector



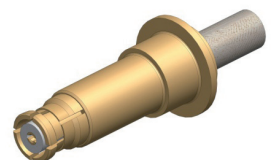
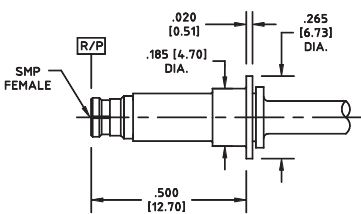
Cable	Part no.
32024	29473FC-32-24
32024E	29473FCR-32-24
32081	29473FC-32-81
32081E	29473FCR-32-81

## SMP female connector



Cable	Part no.
32024	29473L2C-32-24
32024E	29473L2CR-32-24

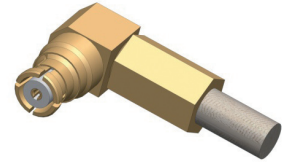
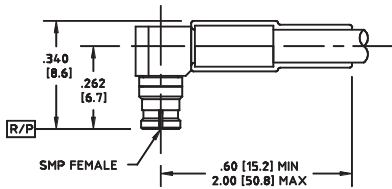
## SMP female connector



Cable	Part no.
32024	29473LFC-32-24
32024E	29473LFCR-32-24
32081	29473LFC-32-81
32081E	29473LFCR-32-81

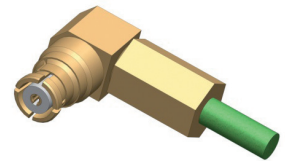
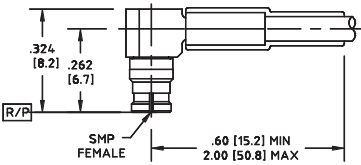
# SMP - cable connectors

## SMP female connector



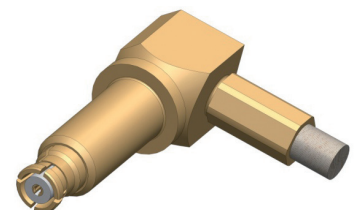
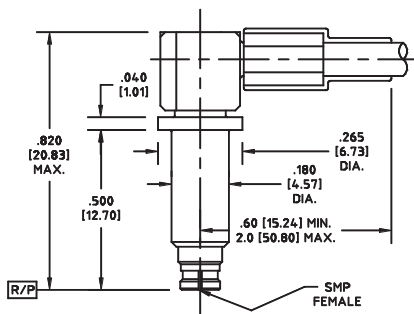
Cable	Part no.
32024	29477-32-24-3
32081	29477-32-81-3

## SMP female connector



Cable	Part no.
32041E	29477-32-41

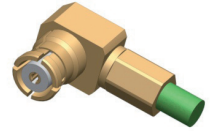
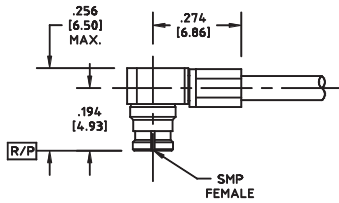
## SMP female connector



Cable	Part no.
32024	29477F2-32-24
32081	29477F2-32-81

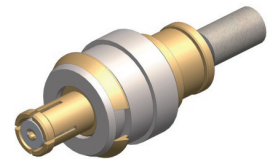
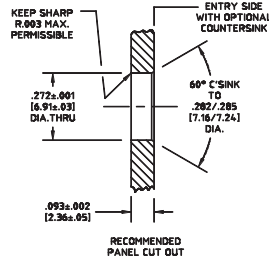
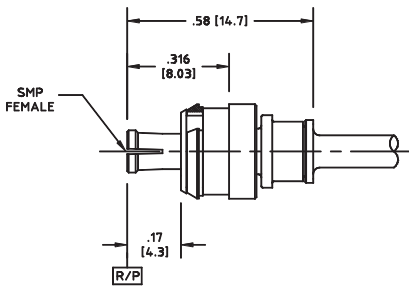
# SMP - cable connectors

## SMP female connector



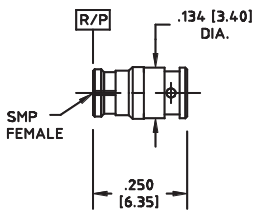
Cable	Part no.
32021E	29478-32-41

## SMP female, float mount, connector



Cable	Part no.
32024	29921C-32-24
32024E	29921CR-32-24
32041E	29921CR-32-41
32081	29921C-32-81
32081E	29921CR-32-81

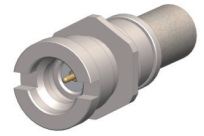
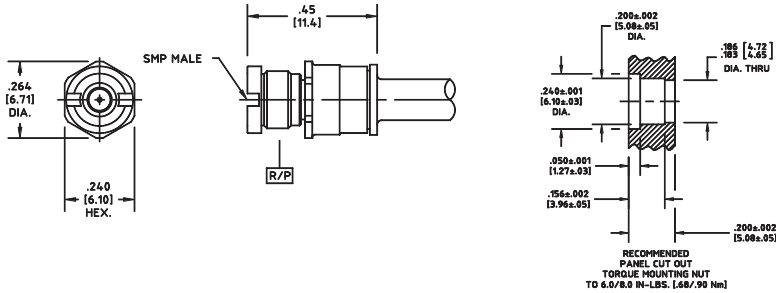
## SMP female connector



Cable dia.	Part no.
0.086 inches (2.18 mm)	29473-1

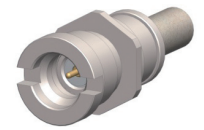
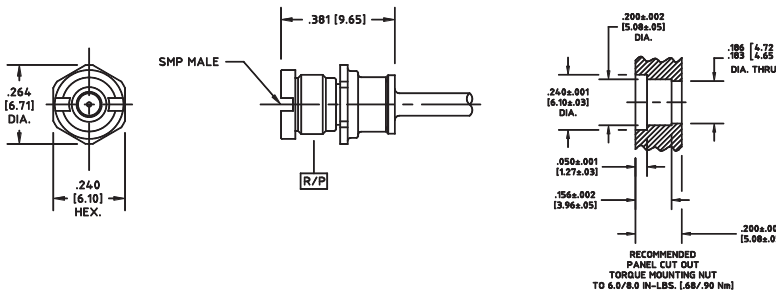
# SMP – cable connectors

## SMP male connector



Detent	Cable	Part no.
Full	32022E	29474C2R-32-22
Limited	32022E	29474C3R-32-22
Smooth bore	32022E	29474C4R-32-22
Catchers mitt	32022E	29474C5R-32-22

## SMP male connector

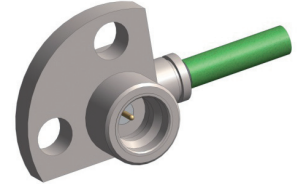
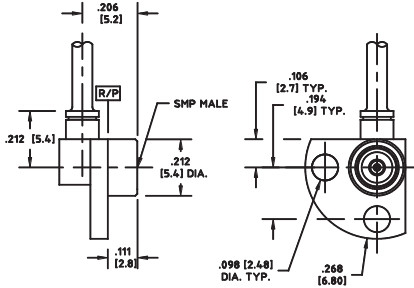


Detent	Cable	Part no.
Full	32024	29474C2-32-24
Limited	32024	29474C3-32-24
Smooth bore	32024	29474C4-32-24
Catchers mitt	32024	29474C5-32-24
Full	32024E	29474C2R-32-24
Limited	32024E	29474C3R-32-24
Smooth bore	32024E	29474C4R-32-24
Catchers mitt	32024E	29474C5R-32-24
Full	32041E	29474C2R-32-41
Limited	32041E	29474C3R-32-41
Smooth bore	32041E	29474C4R-32-41
Catchers mitt	32041E	29474C5R-32-41
Full	32081	29474C2-32-81
Limited	32081	29474C3-32-81
Smooth bore	32081	29474C4-32-81
Catchers mitt	32081	29474C5-32-81
Full	32081E	29474C2R-32-81
Limited	32081E	29474C3R-32-81
Smooth bore	32081E	29474C4R-32-81
Catchers mitt	32081E	29474C5R-32-81



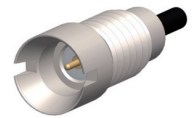
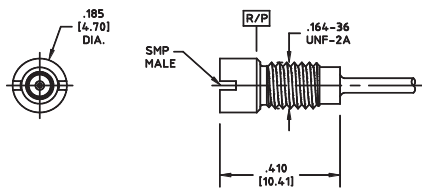
# SMP - cable connectors

## SMP male connector



Detent	Cable	Part no.
Full	32041E	29474QFC2R-32-41
Limited	32041E	29474QFC3R-32-41
Smooth bore	32041E	29474QFC4R-32-41
Catchers mitt	32041E	29474QFC5R-32-41

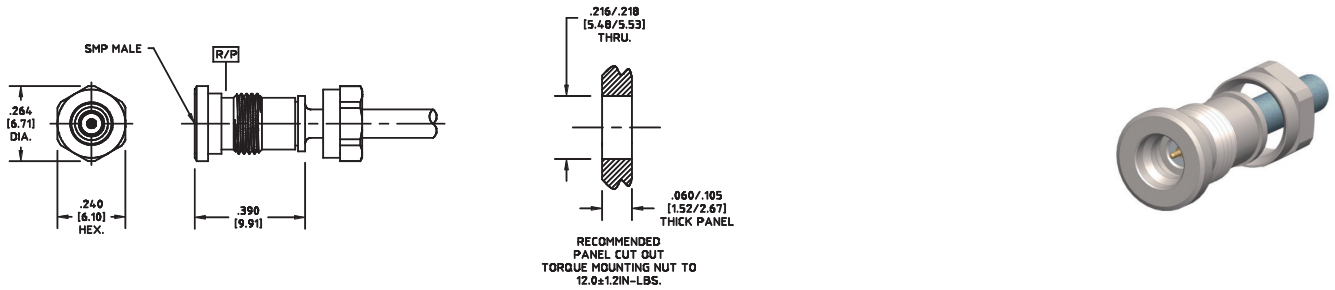
## SMP male connector



Detent	Cable	Part no.
Full	32018DSE	29474SC2R-32-18DSE
Limited	32018DSE	29474SC3R-32-18DSE
Smooth bore	32018DSE	29474SC4R-32-18DSE
Catchers mitt	32018DSE	29474SC5R-32-18DSE

# SMP - cable connectors

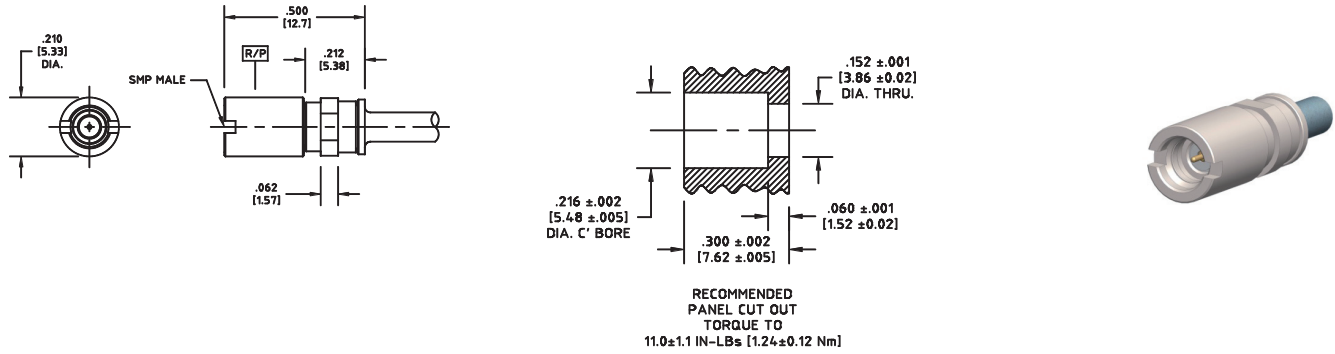
## SMP male connector



Detent	Cable	Part no.
Full	32024	29479C2-32-24
Limited	32024	29479C3-32-24
Smooth bore	32024	29479C4-32-24
Catchers mitt	32024	29479C5-32-24
Full	32024E	29479C2R-32-24
Limited	32024E	29479C3R-32-24
Smooth bore	32024E	29479C4R-32-24
Catchers mitt	32024E	29479C5R-32-24
Full	32081	29479C2-32-81
Limited	32081	29479C3-32-81
Smooth bore	32081	29479C4-32-81
Catchers mitt	32081	29479C5-32-81
Full	32081E	29479C2R-32-81
Limited	32081E	29479C3R-32-81
Smooth bore	32081E	29479C4R-32-81
Catchers mitt	32081E	29479C5R-32-81

# SMP - cable connectors

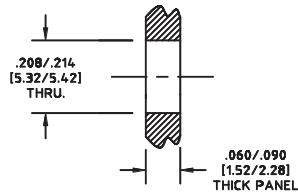
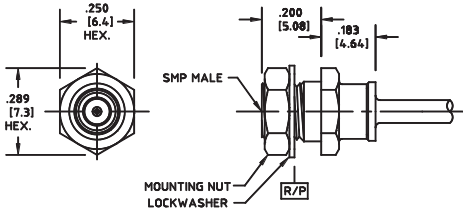
## SMP male connector



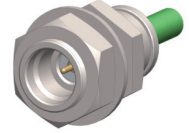
Detent	Cable	Part no.
Full	32024	29574C2-32-24
Limited	32024	29574C3-32-24
Smooth bore	32024	29574C4-32-24
Catchers mitt	32024	29574C5-32-24
Full	32024E	29574C2R-32-24
Limited	32024E	29574C3R-32-24
Smooth bore	32024E	29574C4R-32-24
Catchers mitt	32024E	29574C5R-32-24
Full	32081	29574C2-32-81
Limited	32081	29574C3-32-81
Smooth bore	32081	29574C4-32-81
Catchers mitt	32081	29574C5-32-81
Full	32081E	29574C2R-32-81
Limited	32081E	29574C3R-32-81
Smooth bore	32081E	29574C4R-32-81
Catchers mitt	32081E	29574C5R-32-81

# SMP - cable connectors

## SMP male connector



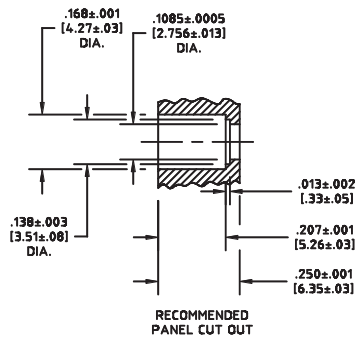
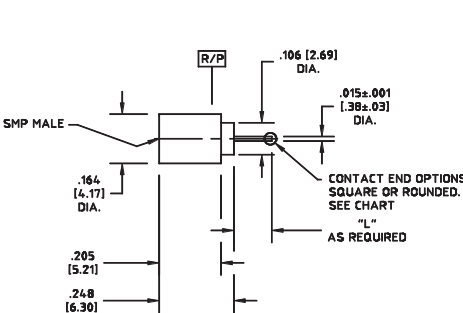
RECOMMENDED  
PANEL CUT-OUT  
TORQUE MOUNTING  
NUT TO 12.0±1.2 IN-LBS.



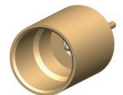
Detent	Cable	Part no.
Full	32041E	29974C2R-32-41
Limited	32041E	29974C3R-32-41
Smooth bore	32041E	29974C4R-32-41
Catchers mitt	32041E	29974C5R-32-41

# SMP - hermetic shrouds

## SMP male connector



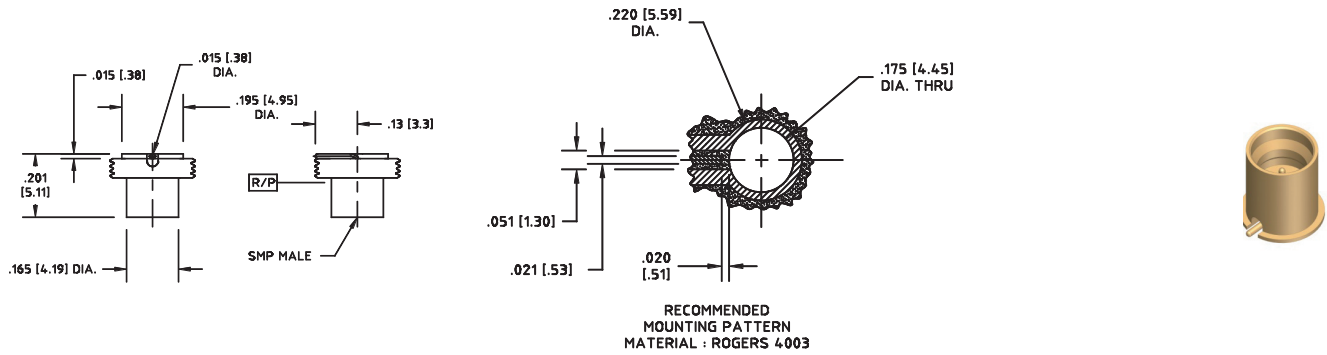
RECOMMENDED  
PANEL CUT OUT



«L»	End option	Part no.
0.050 inches (1.25 mm)	radius	29474H-1
0.050 inches (1.25 mm)	square	29474H-1S

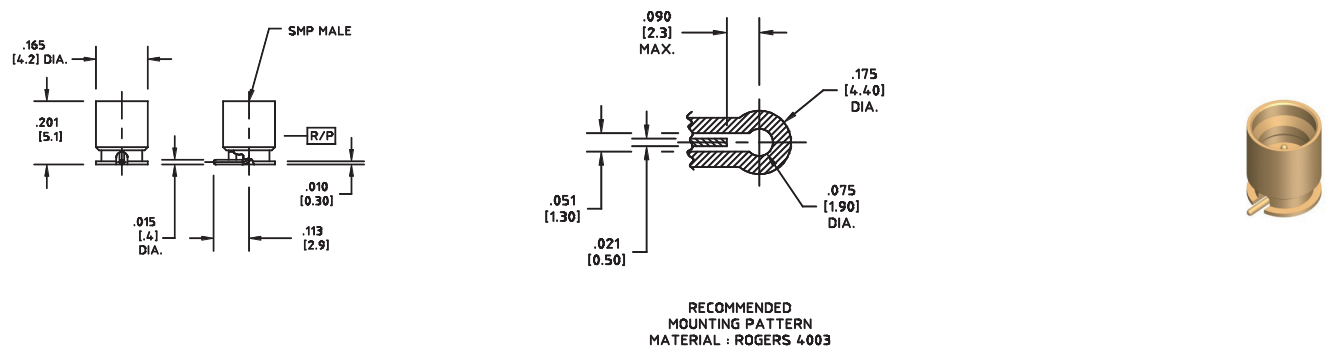
# SMP – PCB mount connectors

## SMP male connector



Detent	Part no.
Full	29474-RM2
Limited	29474-RM3
Smooth bore	29474-RM4
Catchers mitt	29474-RM5

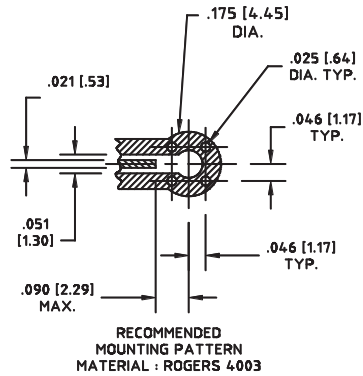
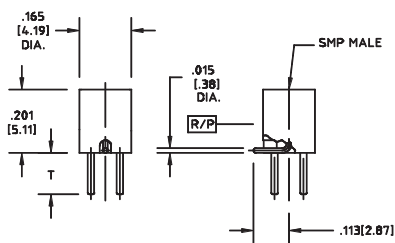
## SMP male connector



Detent	Part no.
Full	29474-SM1-2
Limited	29474-SM1-3
Smooth bore	29474-SM1-4
Catchers mitt	29474-SM1-5

# SMP – PCB mount connectors

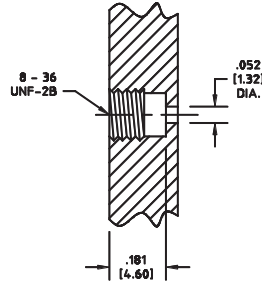
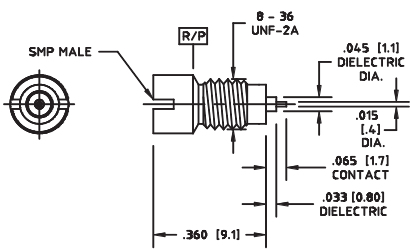
## SMP male connector



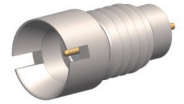
<b>Detent</b>	<b>Part no. «T» = 0.075 inches (1.91 mm)</b>
Full	29474-ST2S
Limited	29474-ST3S
Smooth bore	29474-ST4S
Catchers mitt	29474-ST5S
<b>Detent</b>	<b>Part no. «T» = 0.140 inches (3.56 mm)</b>
Full	29474-ST2
Limited	29474-ST3
Smooth bore	29474-ST4
Catchers mitt	29474-ST5
<b>Detent</b>	<b>Part no. «T» = 0.200 inches (5.08 mm)</b>
Full	29474-ST2L
Limited	29474-ST3L
Smooth bore	29474-ST4L
Catchers mitt	29474-ST5L

# SMP - panel mount connectors

## SMP male connector

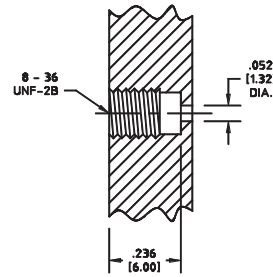
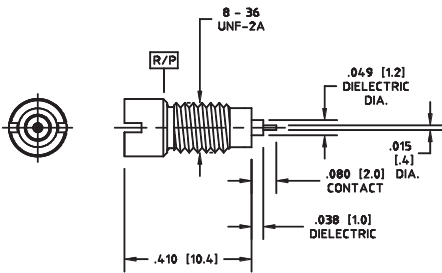


RECOMMENDED PANEL CUT OUT

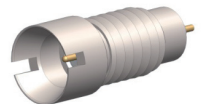


Detent	Part no.
Catchers mitt	29474PMC-033-065

## SMP male connector



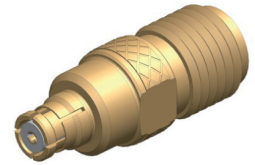
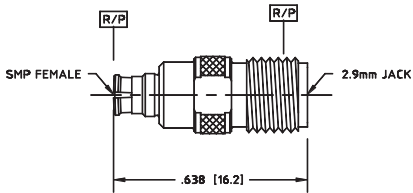
RECOMMENDED PANEL CUT OUT



Detent	Part no.
Catchers mitt	29474PMC-038-080

# SMP - adaptors

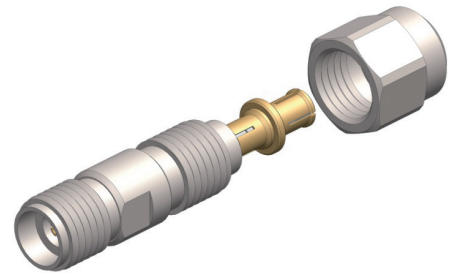
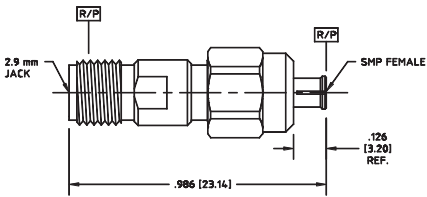
## SMP female - 2.9 mm jack



Part no.

29487-3

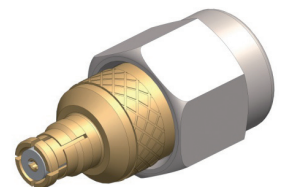
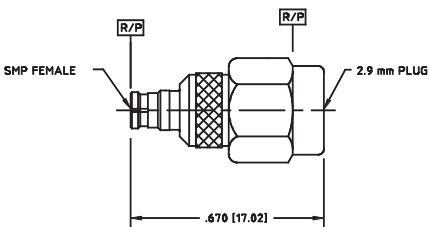
## 2.9 mm jack - SMP female, field replaceable



Part no.

29487-3-2

## SMP female - 2.9 mm plug



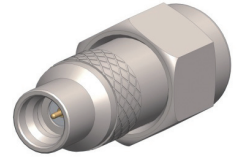
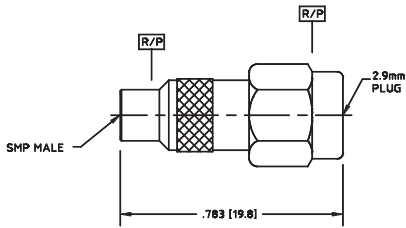
Part no.

29487-4



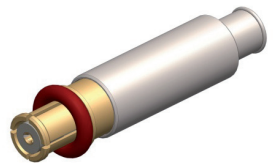
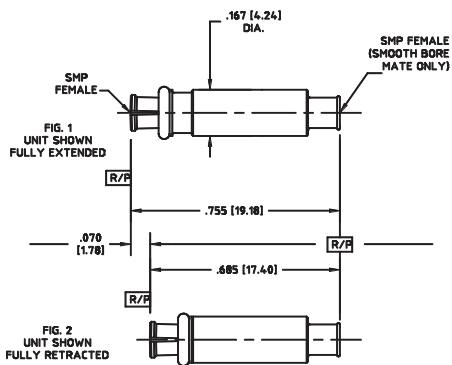
# SMP - adaptors

## SMP male - 2.9 mm plug



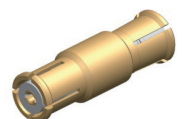
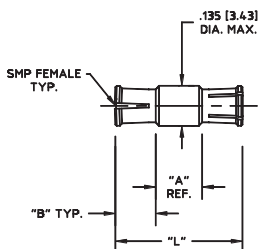
Detent	Part no.
Full	29487-1

## SMP female - SMP female adaptor, compressible



Part no.
29473-B2F-001

## SMP female - SMP female adaptor



Part no.	«L»	«A»	«B»
29473-A2F1	0.345 inches (8.76 mm)	0.075 inches (1.91 mm)	0.135 inches (3.43 mm)
29473-A2F2	0.425 inches (10.80 mm)	0.155 inches (3.94 mm)	0.135 inches (3.43 mm)
29473-A2F3	0.254 inches (6.45 mm)	0.024 inches (0.61 mm)	0.115 inches (2.92 mm)

# SMPM

## Description

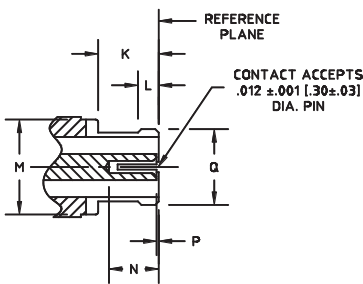
HUBER+SUHNER Astrolab SMPM connectors offer unrivaled miniaturization and performance for RF applications up to 65 GHz. HUBER+SUHNER Astrolab SMPM connectors are MIL-SPEC qualified for defence and space flight applications. Along with the unique bend-to-the-end microbend style cable connectors, HUBER+SUHNER Astrolab offers a large portfolio of different PCB mount SMPM connectors that have been designed with optimized PCB trace launch geometries to offer a complete interconnect design solution from «wire-to-trace».

## Compatibility

50 Ω SMPM connectors are intermateable without restrictions.

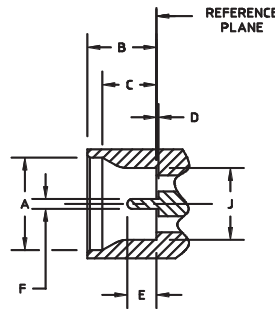
## Interface dimensions, inches (mm)

### SMPM female (socket contact)



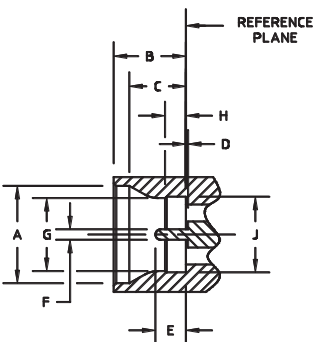
**SMPM FEMALE (SOCKET CONTACT)**  
INTERFACE MEETS MIL-STD-348

### SMPM male (pin contact), smooth bore



**SMPM MALE (PIN CONTACT)**  
**SMOOTH BORE**  
INTERFACE MEETS MIL-STD-348

### SMPM male (pin contact), full detent



**SMPM MALE (PIN CONTACT)**  
**FULL DETENT**  
INTERFACE MEETS MIL-STD-348

	min.	max.		min.	max.
A	0.111 (2.82)	0.115 (2.92)	J	0.086 (2.18)	0.088 (2.24)
B	0.082 (2.08)	0.084 (2.13)	K	0.068 (1.73)	-
C	0.062 (1.57)	0.072 (1.83)	L	-	0.023 (0.58)
D	0.000 (0.00)	-	M	-	0.110 (2.79)
E	0.030 (0.76)	0.045 (1.14)	N	0.050 (1.27)	-
F	0.011 (0.28)	0.013 (0.33)	P	0.000 (0.00)	0.008 (0.20)
G	0.083 (2.11)	0.085 (2.16)	Q	-	0.095 (2.41)
H	0.021 (0.53)	0.023 (0.58)			

Interface dimensions conformable to the following standards:

USA: MIL-PRF-31031  
SMPM interface MIL-STD-348

# SMPM – technical data

Electrical data	Requirements
Impedance	50 $\Omega$
Frequency range	DC to 65 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	335 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	125 Vrms at 70 000 ft.
RF high potential	200 Vrms at 5 MHz
RF leakage	-80 dB max. at 3 GHz -65 dB max. at 3 to 26.5 GHz
Magnetic permeability	<2 $\mu$
VSWR	1.1:1 to 26.5 GHz 1.3:1 to 65 GHz
Insertion loss	0.05 + 0.04 $\sqrt{f}$ in GHz (non-hermetic connectors) 0.12 $\sqrt{f}$ in GHz (hermetic connectors)

Mechanical data	Requirements
Center contact retention	1.5 lbs (6.672 N) min. (captivated designs)
Durability	100 cycles min. into a full detent shroud 1 000 cycles min. into a smooth bore shroud
Force to engage	SMPM full detent - 3.5 lbs (15.569 N) typical SMPM smooth bore - 1.5 lbs (6.672 N) typical
Force to disengage	SMPM full detent - 5 lbs (22.241 N) typical SMPM smooth bore - 1.5 lbs (6.672 N) typical

Environmental data	Requirements
Temperature range	-65 °C to +165 °C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, 28g peak
Random vibration	MIL-STD-202, method 214, condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, 12 000 g peak

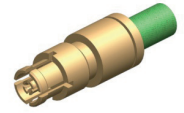
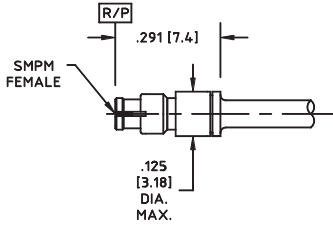
# SMPM – technical data

Material data		
Cable and shroud connectors	Material	Plating
Body and contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 or Torlon™ per ASTM D-5204	-
Shroud	#303 SS per ASTM A-582	passivated per SAE-AMS-2700
Hermetic shroud connectors	Material	Plating
Body and contact	Kovar® per ASTM F-15, class 1	gold plate per ASTM B-488, code A, type III over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	Corning 7070 glass or equivalent	-
Adaptors	Material	Plating
Body and nut	#303 SS per ASTM A-582	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 and Ultem™ per ASTM D-5205	-

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.

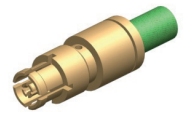
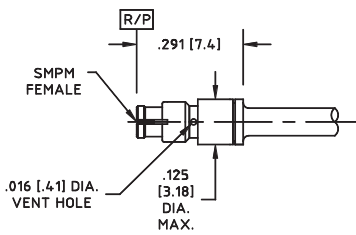
# SMPM - cable connectors

## SMPM female connector



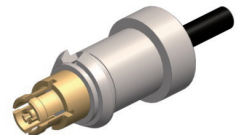
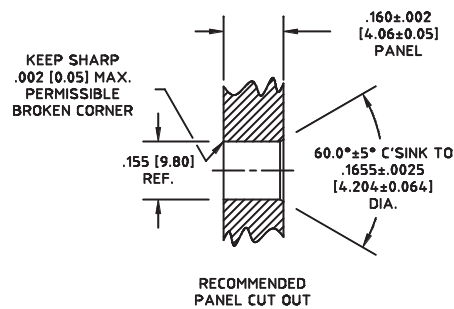
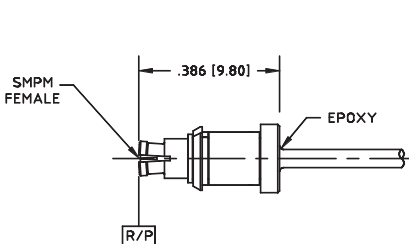
Cable	Part no.
32041E	29971CR-32-41

## SMPM female connector, vented



Cable	Part no.
32041E	29971VCR-32-41

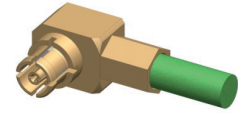
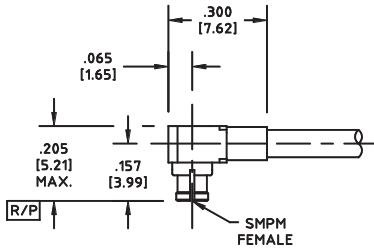
## SMPM female connector, non floating bulkhead mount



Cable	Part no.
32018DSE	29971CRC-32-18DSE

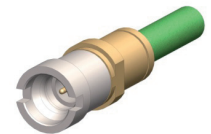
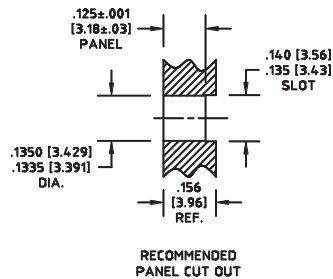
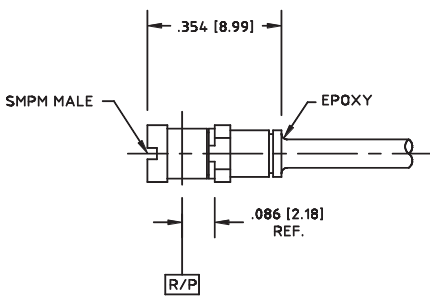
# SMPM - cable connectors

## SMPM female connector



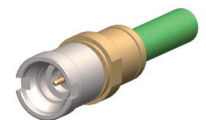
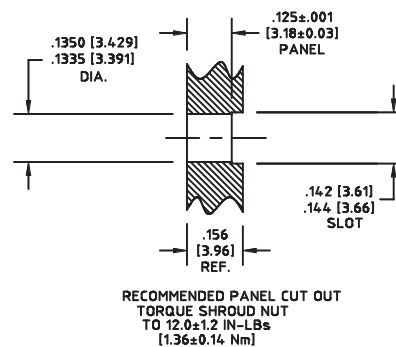
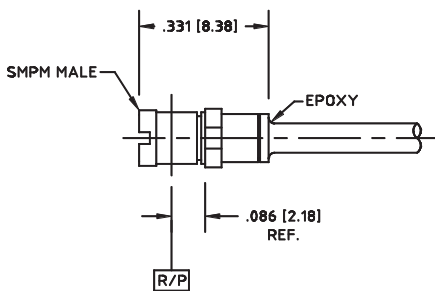
Cable	Part no.
32041E	29973-32-41

## SMPM male connector



Detent	Part no.
Full	29972C2R-32-41
Smooth bore	29972C4R-32-41

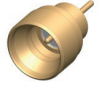
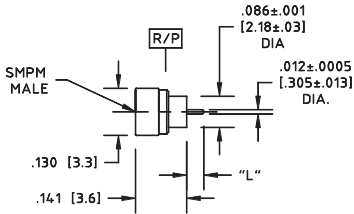
## SMPM male connector



Detent	Part no.
Full	29972C2RB-32-41
Smooth bore	29972C4RB-32-41

# SMPM – hermetic shrouds

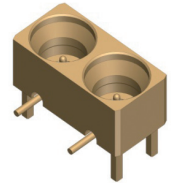
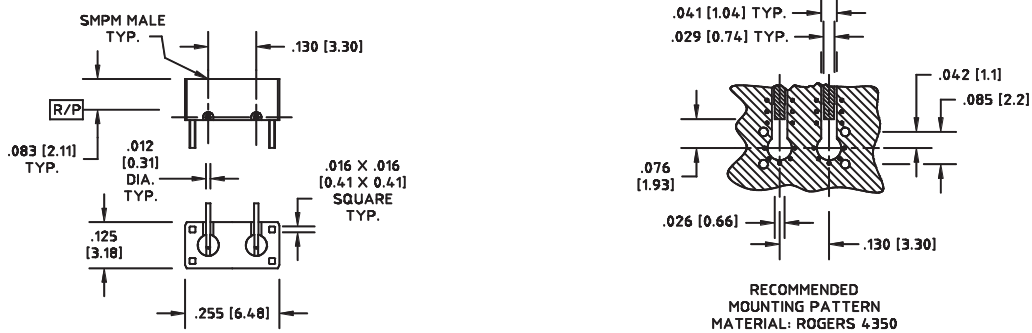
## SMPM male connector



«L»	Detent	Part no.
0.030 inches (0.762 mm)	full	29927H1-2-030S
0.050 inches (1.270 mm)	full	29927H1-2-050S
0.060 inches (1.524 mm)	full	29927H1-2-060S
0.070 inches (1.778 mm)	full	29927H1-2-070S
0.090 inches (2.286 mm)	full	29927H1-2-090S
0.030 inches (0.762 mm)	smooth bore	29972H1-4-030S
0.050 inches (1.270 mm)	smooth bore	29972H1-4-050S
0.060 inches (1.524 mm)	smooth bore	29972H1-4-060S
0.070 inches (1.778 mm)	smooth bore	29972H1-4-070S
0.090 inches (2.286 mm)	smooth bore	29972H1-4-090S

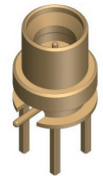
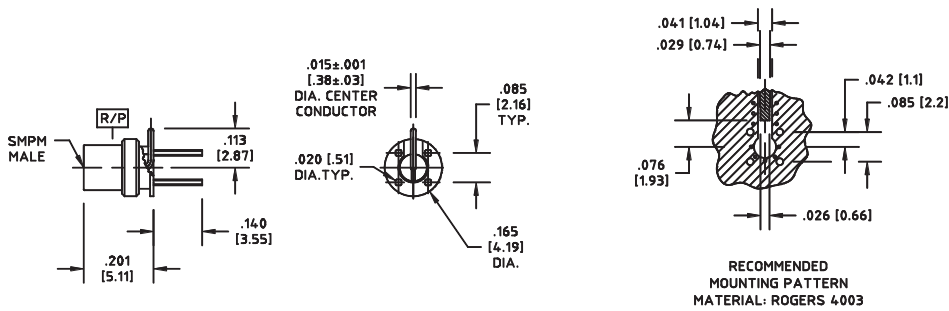
# SMPM - PCB mount connectors

## Dual SMPM male connector



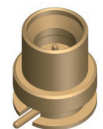
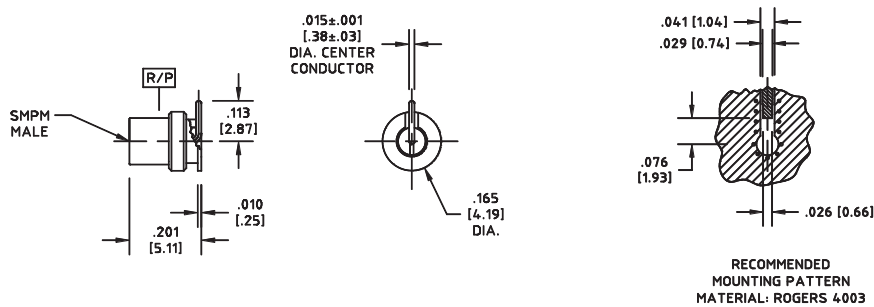
Detent	Part no.
Full	29976CB2-2-001
Smooth bore	29976CB2-4-001

## SMPM male connector



Detent	Part no.
Full	29972S1-2-001
Smooth bore	29972S1-4-001

## SMPM male connector

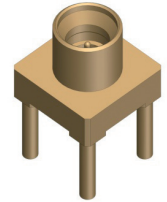
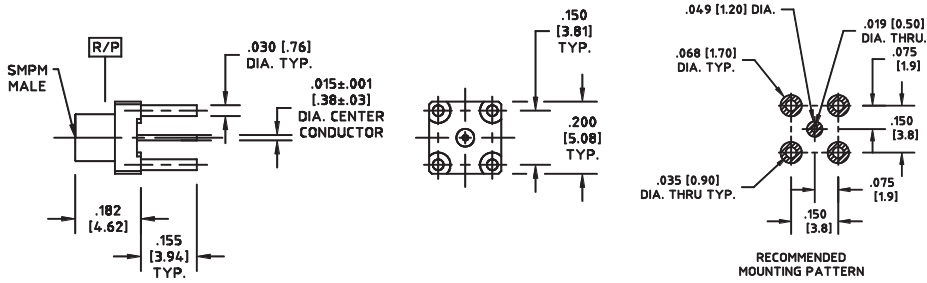


Detent	Part no.
Full	29972SM-2-001
Smooth bore	29972SM-4-001



# SMPM – PCB mount connectors

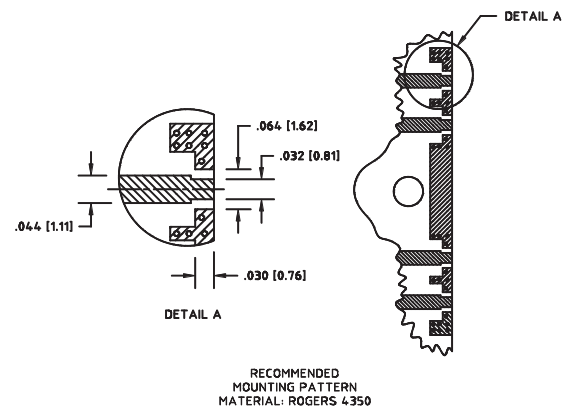
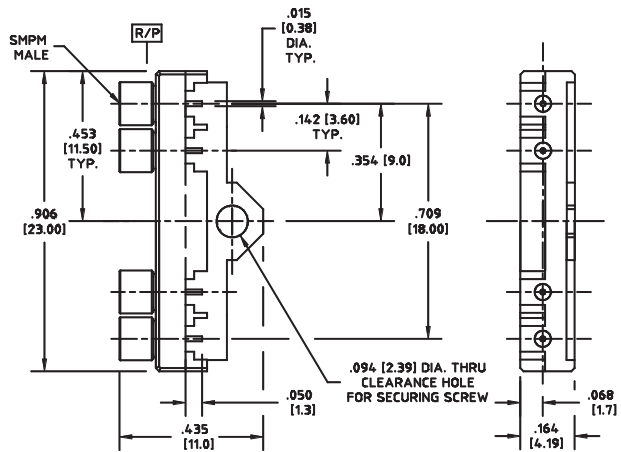
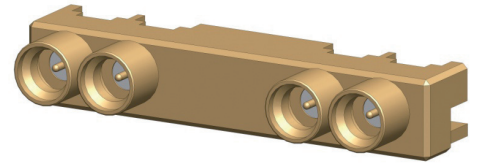
## SMPM male connector



Detent	Part no.
Full	29972T1-2-155
Smooth bore	29972T1-4-155

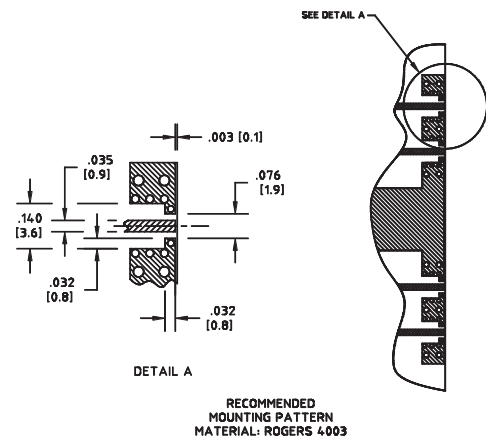
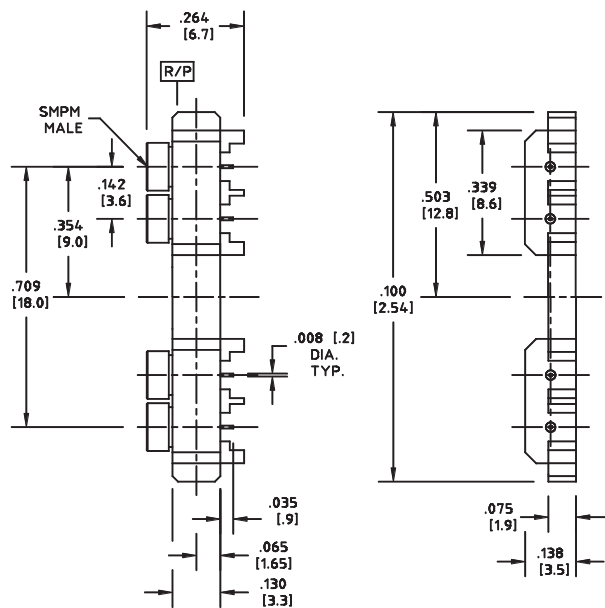
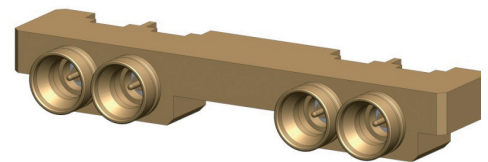
# SMPM - edge mount connectors

## SMPM male connector



Detent	Part no.
Full	29976CB2-2-4
Smooth bore	29926CB2-4-4

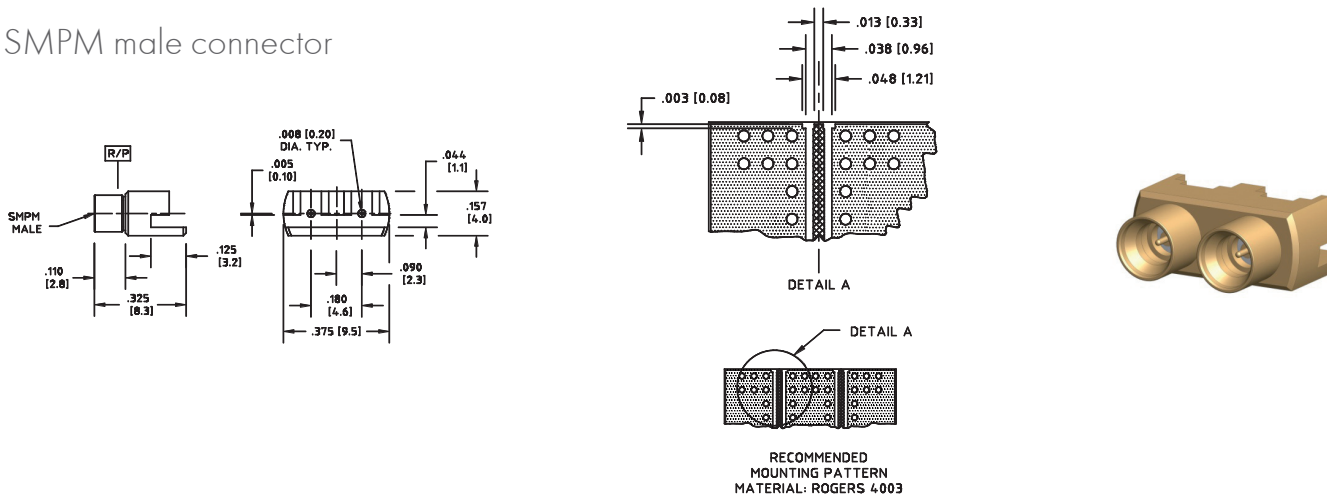
## SMPM male connector



Detent	Part no.
Full	29976CB7-2-4
Smooth bore	29976CB7-4-4

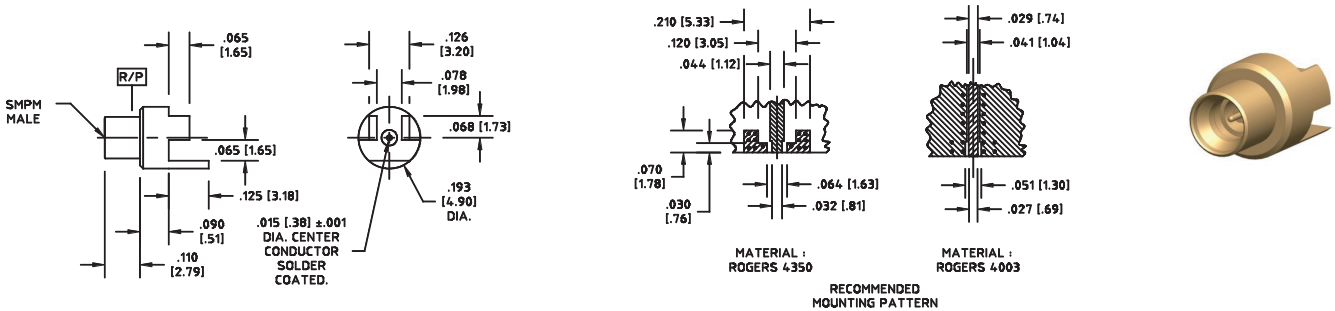
# SMPM - edge mount connectors

## SMPM male connector



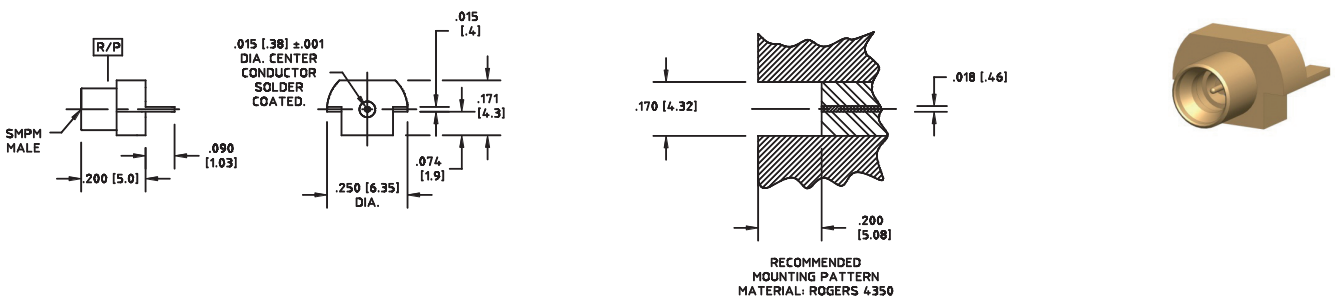
Detent	Part no.
Full	29976EM-2-004
Smooth bore	29976EM-4-004

## SMPM male connector



Detent	Part no.
Full	29972BM-2-001
Smooth bore	29972BM-4-001

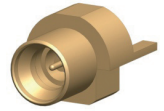
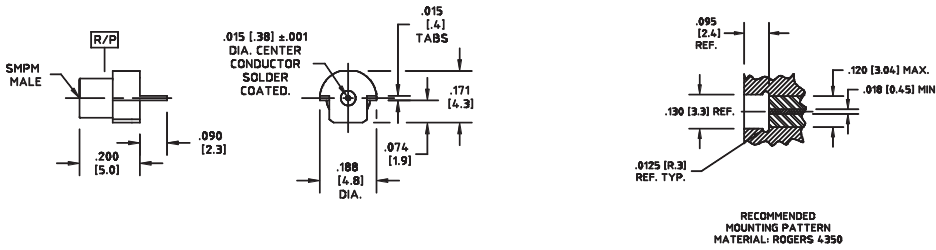
## SMPM male connector



Detent	Part no.
Full	29972BM-2-002
Smooth bore	29972BM-4-002

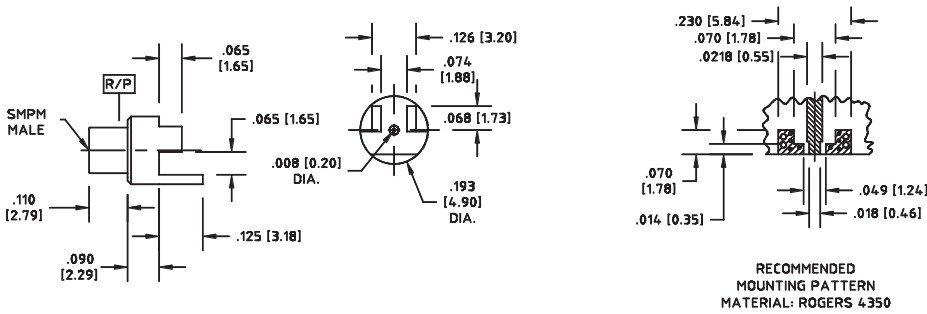
# SMPM - edge mount connectors

## SMPM male connector



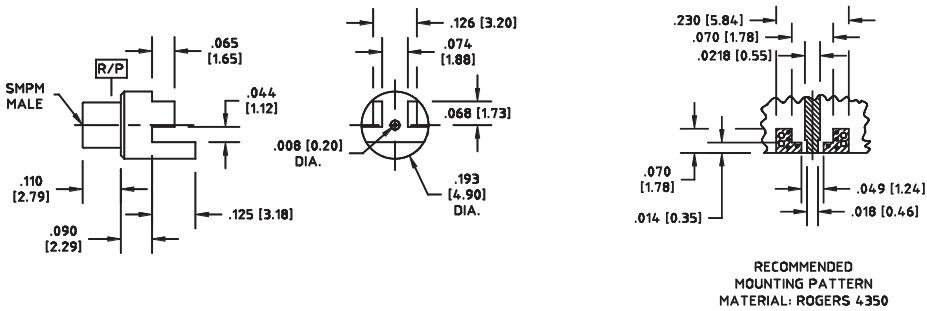
Detent	Part no.
Full	29972BM-2-004
Smooth bore	29972BM-4-004

## SMPM male connector



Detent	Part no.
Full	29972EM-2-001
Smooth bore	29972EM-4-001

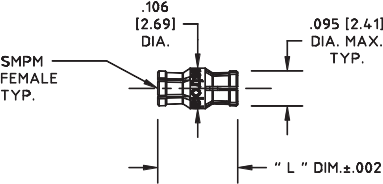
## SMPM male connector



Detent	Part no.
Full	29972EM-2-002
Smooth bore	29972EM-4-002

# SMPM - adaptors

SMPM female - SMPM female adaptor



«L»	Part no.
0.210 inches (5.33 mm)	29981-A2F1
0.500 inches (12.7 mm)	29981-A2F2
0.254 inches (6.45 mm)	29981-A2F3

# SMPM-T

## Description

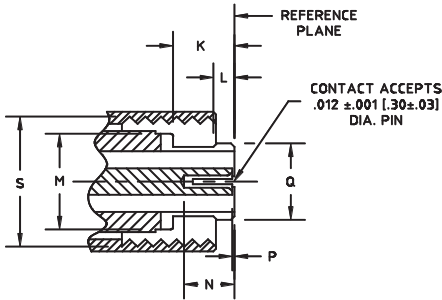
The SMPM-T is the smallest threaded open source connector on the market. Its unique and innovative combination of a MIL-STD-348 SMPM female interface connector together with a retractable threaded nut provides an integrated solution offering unprecedented electrical and mechanical performance. The SMPM-T handles high density requirements with a connector centerline-to-centerline spacing of just 0.20 inches (5 mm) while offering unmatched electrical stability at frequencies up to 67 GHz in even the harshest operating environments.

## Compatibility

50 Ω SMPM-T connectors are intermateable without restrictions.

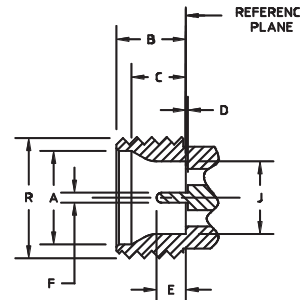
## Interface dimensions, inches (mm)

### SMPM-T female (socket contact)



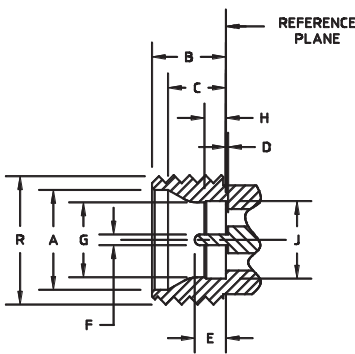
**SMPM-T FEMALE (SOCKET CONTACT)**  
INTERFACE MEETS MIL-STD-348

### SMPM-T male (pin contact), smooth bore



**SMPM-T MALE (PIN CONTACT)**  
**SMOOTH BORE**  
INTERFACE MEETS MIL-STD-348

### SMPM-T male (pin contact), full detent



**SMPM-T MALE (PIN CONTACT)**  
**FULL DETENT**  
INTERFACE MEETS MIL-STD-348

	min.	max.		min.	max.
A	0.111 (2.82)	0.115 (2.92)	K	0.068 (1.73)	-
B	0.082 (2.08)	0.084 (2.13)	L	-	0.023 (0.58)
C	0.062 (1.57)	0.072 (1.83)	M	-	0.110 (2.79)
D	0.000 (0.00)	-	N	0.050 (1.27)	-
E	0.030 (0.76)	0.045 (1.14)	P	0.000 (0.00)	0.008 (0.20)
F	0.011 (0.28)	0.013 (0.33)	Q	-	0.095 (2.41)
G	0.083 (2.11)	0.085 (2.16)	R	-	0.145 (3.66)
H	0.021 (0.53)	0.023 (0.58)	S	0.130 (3.30)	-
J	0.086 (2.18)	0.088 (2.24)			

Interface dimensions conformable to the following standards:

USA: MIL-PRF-31031  
SMPM interface MIL-STD-348

## SMPM-T – technical data

Electrical data	Requirements
Impedance	50 $\Omega$
Frequency range	DC to 67 GHz
Contact resistance	center conductor 6.0 milliohms max. outer conductor 2.0 milliohms max.
DWV	335 Vrms at sea level
Insulation resistance	5 000 megaohms min.
Corona levels	125 Vrms at 70 000 ft.
RF high potential	200 Vrms at 5 MHz
RF leakage	-80 dB max. at 3 GHz -65 dB max. at 3 to 26.5 GHz
Magnetic permeability	<2 $\mu$
VSWR	1.1:1 to 26.5 GHz 1.3:1 to 65 GHz
Insertion loss	0.05 + 0.04 $\sqrt{f}$ in GHz (non-hermetic connectors) 0.12 $\sqrt{f}$ in GHz (hermetic connectors)

Mechanical data	Requirements
Center contact retention	1.5 lbs (6.672 N) min. (captivated designs)
Durability	100 cycles min. into a full detent shroud 1 000 cycles min. into a smooth bore shroud
Force to engage	SMPM full detent - 3.5 lbs (15.569 N) typical SMPM smooth bore - 1.5 lbs (6.672 N) typical
Force to disengage	SMPM full detent - 5 lbs (22.241 N) typical SMPM smooth bore - 1.5 lbs (6.672 N) typical
Mating torque	22 $\pm$ 2 in-oz (0.155 $\pm$ 0.014 N-m)
Proof torque	36 in-oz min. (0.254 N-m)

Environmental data	Requirements
Temperature range	-65 $^{\circ}$ C to +165 $^{\circ}$ C
Thermal shock	MIL-STD-202, method 107, condition B
Moisture resistance	MIL-STD-202, method 106
Corrosion	MIL-STD-202, method 101, condition B
Sine vibration	MIL-STD-202, method 204, 28 g peak
Random vibration	MIL-STD-202, method 214, condition K-I, 46.3 g
Shock	MIL-STD-202, method 213, 12 000 g peak

## SMPM-T – technical data

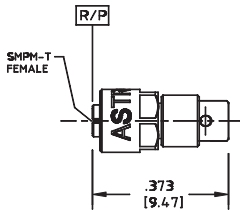
Material data		
Cable and shroud connectors	Material	Plating
Body and contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1, Torlon™ per ASTM D-5204 or Ultem™ per ASTM D-5205	-
Hermetic shroud connectors	Material	Plating
Body and contact	Kovar® per ASTM F-15, class 1	gold plate per ASTM B-488, code A, type III over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	Corning 7070 glass or equivalent	-
Adaptors	Material	Plating
Body and nut	#303 SS per ASTM A-582	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Contact	beryllium copper per ASTM B-196	gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1
Dielectric	PTFE per ASTM D-1710, type I, grade 1 and Ultem™ per ASTM D-5205	-

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER Astrolab for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER Astrolab for analysis prior to release of final performance levels and mounting configurations.



# SMPM-T - cable connectors

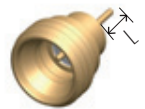
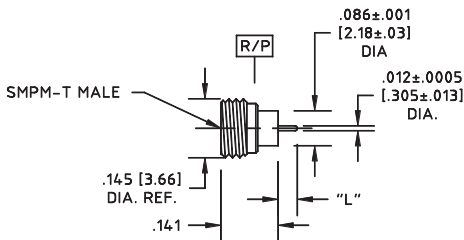
## SMPM-T panel mount female connector



Cable dia.	Part no.
0.096 inches (2.43 mm)	29971T-096FLEX

# SMPM-T - hermetic shrouds

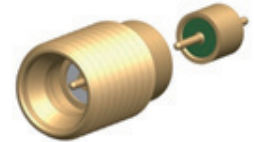
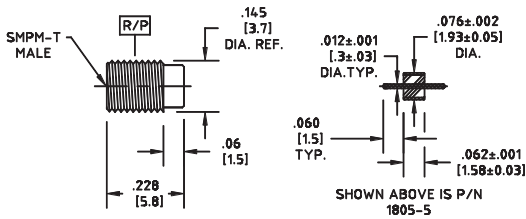
## SMPM-T hermetic male shrouds



Contact type	Interface	Contact length «L»	Part no.	Item no.
Square	full detent	0.06 inches (1.52 mm)	29976H1-2-060S	80362701
	full detent	0.09 inches (2.28 mm)	29976H1-2-090S	80362703
	smooth bore	0.06 inches (1.52 mm)	29976H1-4-060S	80362705
	smooth bore	0.09 inches (2.28 mm)	29976H1-4-090S	80362707

# SMPM-T – panel mount connectors

## SMPM-T – panel mount male connector

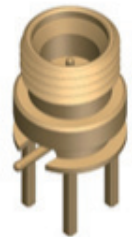
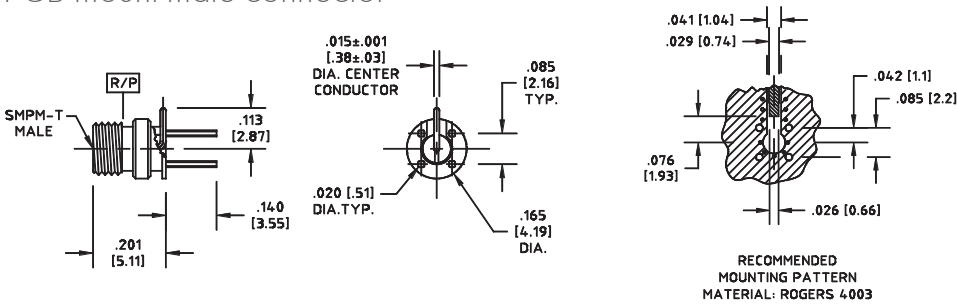


Bead as shown on picture sold separately.

Interface	Part no.	Item no.
Full detent SMPM-T male	29976TSP-2-005	80370422
Smooth bore SMPM-T male	29976TSP-4-005	80374421

# SMPM-T – PCB mount connectors

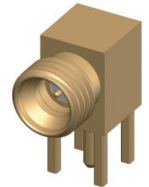
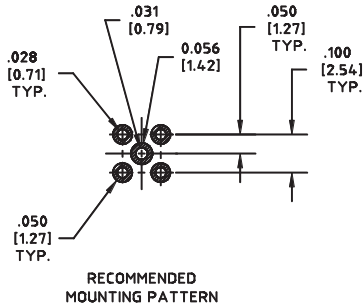
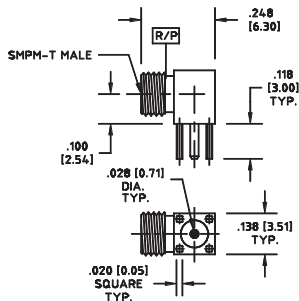
## PCB mount male connector



Detent	Part no.	Item no.
Full	29976S1-2-140	80362694
Smooth bore	29976S1-4-140	80362695

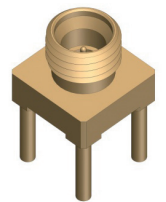
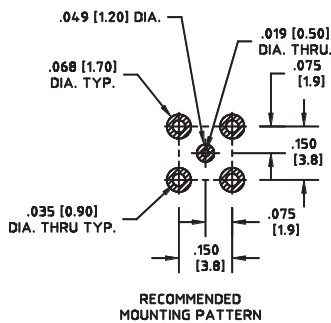
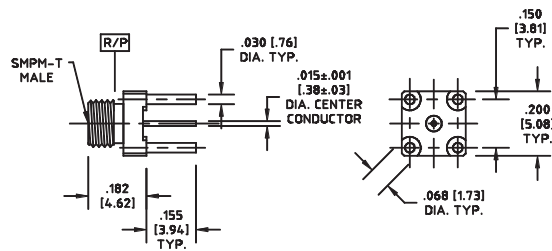
# SMPM-T - PCB mount connectors

## PCB mount male connectors



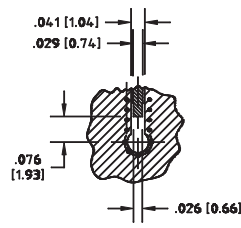
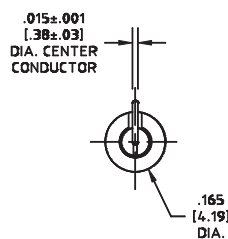
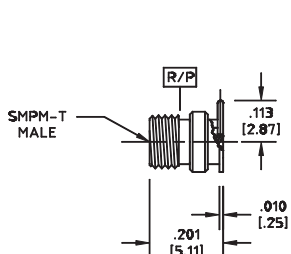
Detent	Part no.	Item no.
Full	29976RA-2-001	80374263
Smooth bore	29976RA-4-001	80374264

## PCB mount male connectors



Detent	Part no.	Item no.
Full	29976T1-2-115	80366706
Smooth bore	29976T1-4-155	80370524

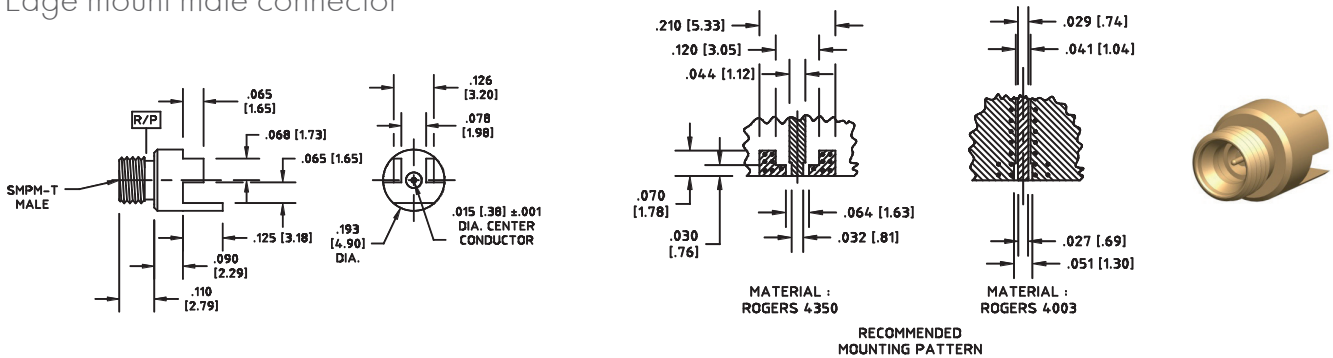
## PCB mount male connector



Detent	Part no.
Full	29976SM-2-001
Smooth bore	29976SM-4-001

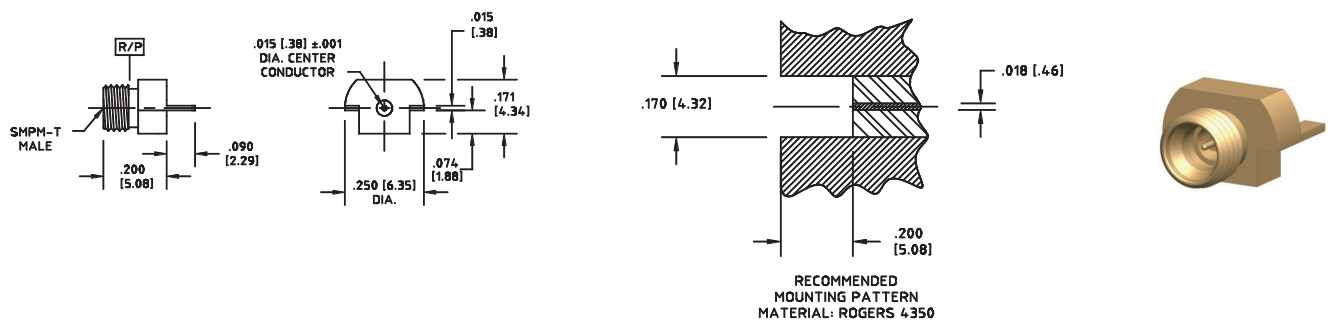
# SMPM-T - edge mount connectors

## Edge mount male connector



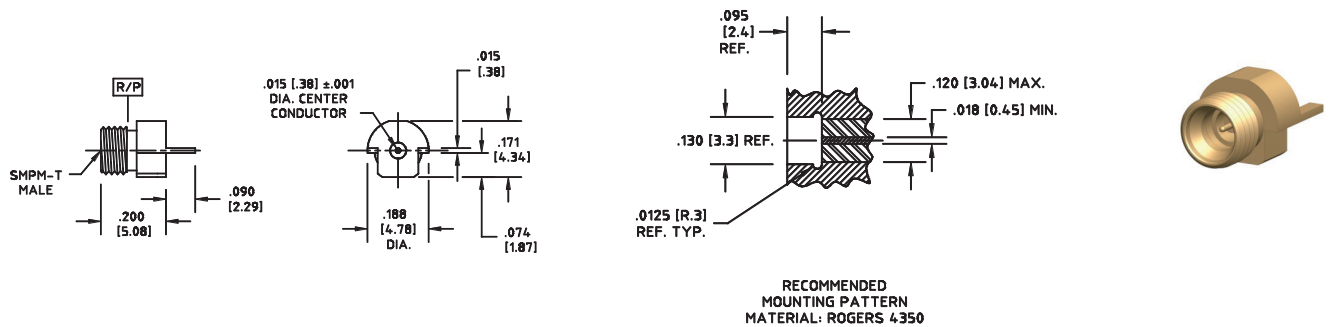
Detent	Part no.	Item no.
Full	29976BM-2-001	80320230
Smooth bore	29976BM-4-001	80320231

## Edge mount male connectors



Detent	Part no.	Item no.
Full	29976BM-2-002	80362690
Smooth bore	29976BM-4-002	80362691

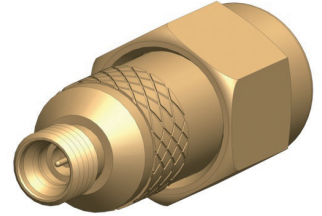
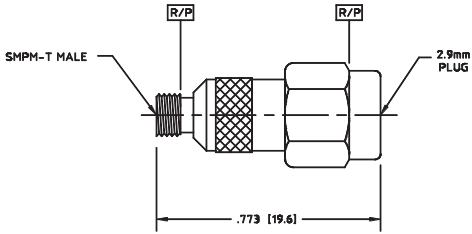
## Edge mount male connectors



Detent	Part no.	Item no.
Full	29976BM-2-004	80366009
Smooth bore	29976BM-4-004	80363975

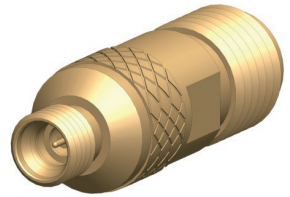
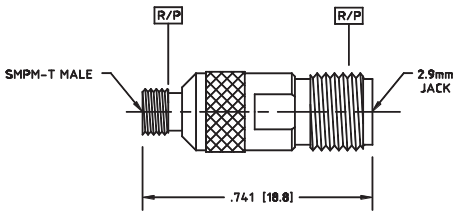
# SMPM-T - adaptors

## SMPM-T male - SK (2.92 mm) plug



Detent	Part no.	Item no.
Full	29429-1T2	80317870

## SMPM-T male - SK (2.92 mm) jack



Detent	Part no.	Item no.
Full	29429-4T2	80362561





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