## SMA Cable Attachment Methods

#### **Semi-Rigid Cable**

Direct Solder (cable center conductor used as contact): This type of cable attachment ensures the best possible electrical performance because there are no discontinuities introduced by contact geometry changes. It is best used in applications not requiring frequent mating and unmating, because the pointed center conductor and exposed cable jacket will shed metal chips when mated with SMA female connectors.



Direct Solder (with contact and insulator): Although this cable attachment exhibits higher VSWR than types without contacts, it provides an outer conductor that does not have the copper cable jacket exposed to mating forces. This, along with the beryllium-copper contact, ensures clean interfaces through many mating cycles.



Direct Solder (with captive contact): These connectors have electrical performance similar to types with non-captive contacts, but with faster and easier cable assembly. The cable is simply stripped and inserted into the connector, and the cable jacket soldered to the connector. The proper contact gap is automatically maintained, and no contact soldering is required.



**Solder-clamp:** This attachment is most useful for right angle plugs and bulkhead jacks. After the connector is assembled to the cable jacket, it can be repositioned relative to the cable by loosening the clamp nut. Electrical performance is similar to direct-solder plugs with contacts.







### **SMA Cable Attachment Methods**

#### Flexible Cable

**Crimp (non-captive contact):** This attachment method provides the best possible electrical performance, and the fastest assembly. **Solder type** connectors for flexible cable have the same construction, but add a hole in the side of the crimp sleeve for soldering the cable braid to the connector. We do **not** recommend the use of solder type connectors with flexible cable—the heat from soldering may damage the cable dielectric.



**Crimp (captive contact):** This attachment method mechanically captivates the center contact to eliminate movement during cable flexure or thermal stress.

**Clamp (captive contact)**: These connectors can be assembled without special tooling, and are field replaceable.



### **SMA Captivation**

All AEP SMA receptacles and adapters use our unique mechanical captivation for contacts and insulators. This method provides retention strength to meet MIL-PRF-39012 requirements, and eliminates RF leakage from epoxy fill holes. The contact barbs and body staking are designed and located to provide electrical performance that equals or exceeds epoxy-captivated types.





APPLIED ENGINEERING PRODUCTS

(203) 776-2813 • FAX (203) 776-8294 www.aepconnectors.com • aepsales@aepconnectors.com

# **SMA Cable Plugs for Semi-Rigid Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Plugs**





- Direct solder attachment
- · Retractable coupling nut
- · Cable center conductor used as contact

For .141" semi-rigid: 9301-1063-009 (Gold plated) 9301-7063-009 (Nickel plated)

QPL version available (M39012/92)

- Direct solder attachment
- · Retractable coupling nut
- Cable center conductor used as contact
- Stepped body for use in applications requiring frequent mating and unmating

For .141" semi rigid: 9301-1063-109 (Gold plated) 9301-7063-109 (Nickel plated)

- Direct solder attachment
- Provided with contact and insulator
- Noncaptive contact

For .085" semi-rigid (A = .089): 9401-1083-010 (Gold plated) 9401-7083-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9401-1083-109 (Gold plated) 9401-7083-109 (Nickel plated)

- Direct solder attachment
- Provided with contact and insulator
- Captive contact for one-step cable assembly

For .085" semi-rigid (A = .089): 9401-1583-010 (Gold plated) 9401-7583-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9401-1583-109 (Gold plated) 9401-7583-109 (Nickel plated)





#### Continued on next page



# **SMA Cable Plugs for Semi-Rigid Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Plugs**



- Solder-clamp attachment
- Captive contact

For .085" semi-rigid: 9501-1593-010 (Gold plated) 9501-9593-010 (Passivated)

For .141" semi-rigid: 9501-1593-009 (Gold plated) 9501-9593-009 (Passivated)

QPL version available (M39012/79)

#### **Right Angle Plugs**





- Direct solder attachment
- · Provided with contact and insulator
- Noncaptive contact
- Short body length allows very tight cable bend in dense packaging applications

For .085" semi-rigid: 9401-1083-210 (Gold plated) 9401-7083-210 (Nickel plated)



• Direct solder attachment

For .085" semi-rigid (A = .089): 9443-1563-010 (Gold plated) 9443-7563-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9443-1563-009 (Gold plated) 9443-7563-009 (Nickel plated)

Solder-clamp attachment

For .085" semi-rigid: 9543-1593-010 (Gold plated) 9543-9593-010 (Passivated)

For .141" semi-rigid: 9543-1593-009 (Gold plated) 9543-9593-009 (Passivated)

APPLIED ENGINEERING PRODUCTS (203) 776-2813 • FAX (203) 776-8294 www.aepco

# SMA Cable Plugs for Flexible Cable Click on part number to go directly to cable assembly instructions

#### **Straight Plugs**



#### Straight Plug

 Noncaptive contact Crimp type: 9001-1023-0XX (Gold plated) 9001-9023-0XX (Passivated) Solder type: 9001-1033-0XX (Gold plated)



### Straight Plug

Captive contact

Crimp type: 9101-1573-0XX (Gold plated) 9101-9573-0XX (Passivated)

QPL version available (M39012/55)



#### Straight Plug

Captive contact

Clamp type: 9201-1553-0XX (Gold plated) 9201-9553-0XX (Passivated)

QPL version available (M39012/55)

Substitute the appropriate cable group number for "XX" when ordering:					
GROUP	CABLE TYPES	GROUP	CABLE TYPES	GROUP	CABLE TYPES
01	RG142, RG223, M17/60, M17/84, M17/158	04	RG180 RG195 M17/95	06	RG58, RG141, RG303, M17/111, M17/155
02	RG178, RG196, M17/93, M17/169			19	RG174DS, RG316DS, M17/151, M17/152,
03	RG174, RG179, RG316, M17/113, M17/119, M17/172, M17/189	05	RG178DS, RG196DS		Times RD-316

#### **APPLIED ENGINEERING PRODUCTS**



# SMA Cable Plugs for Flexible Cable Click on part number to go directly to cable assembly instructions

### **Right Angle Plugs**

### **Right Angle Plug**

Captive contact

Crimp type: 9043-1523-0XX (Gold plated) 9043-9523-0XX (Passivated)

Solder type: 9043-1533-0XX (Gold plated)



### **Right Angle Plug**

Captive contact

Clamp type: 9243-1553-0XX (Gold plated) 9243-9553-0XX (Passivated)



Substitute the appropriate cable group number for "XX" when ordering:					
GROUP	CABLE TYPES	GROUP	CABLE TYPES	GROUP	CABLE TYPES
01	RG142, RG223, M17/60, M17/84, M17/158	04	RG180 RG195 M17/95	06	RG58, RG141, RG303, M17/111, M17/155
02	RG178, RG196, M17/93, M17/169			19	RG174DS, RG316DS, M17/151, M17/152,
03	RG174, RG179, RG316, M17/113, M17/119, M17/172, M17/189	05	RG178DS, RG196DS	15	Times RD-316

#### **APPLIED ENGINEERING PRODUCTS**



### **SMA Cable Jacks for Semi-Rigid Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Jacks**

#### Straight Jack

- Direct solder attachment
- Noncaptive contact

For .085" semi-rigid (A = .089): 9402-1083-010 (Gold plated) 9402-7083-010 (Nickel plated)

For .141" semi rigid (A = .144): 9402-1083-009 (Gold plated) 9402-7083-009 (Nickel plated)



#### Straight Jack

- Direct solder attachment
- Captive contact for one-step cable assembly

For .085" semi-rigid (A = .089): 9402-1583-010 (Gold plated) 9402-7583-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9402-1583-009 (Gold plated) 9402-7583-009 (Nickel plated)



#### Straight Jack

- Solder-clamp attachment
- · Captive contact

For .085" semi-rigid: 9502-1593-010 (Gold plated) 9502-9593-010 (Passivated)

For .141" semi-rigid: 9502-1593-009 (Gold plated) 9502-9593-009 (Passivated)







### **SMA Cable Jacks for Flexible Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Jacks**



#### Straight Jack

Noncaptive contact
 Crimp type:
 9002-1023-0XX (Gold plated)
 9002-9023-0XX (Passivated)

Solder type: 9002-1033-0XX (Gold plated)



### Straight Jack

Captive contact

Crimp type: 9102-1573-0XX (Gold plated) 9102-9573-0XX (Passivated)



### Straight Jack

Captive contact

Clamp type: 9202-1553-0XX (Gold plated) 9202-9553-0XX (Passivated)

Subst	Substitute the appropriate cable group number for "XX" when ordering:				
GROUP	CABLE TYPES	GROUP	CABLE TYPES	GROUP	CABLE TYPES
01	RG142, RG223, M17/60, M17/84, M17/158	04	BG180 BG195 M17/95	06	RG58, RG141, RG303, M17/111, M17/155
02	RG178, RG196, M17/93, M17/169	04		19	RG174DS, RG316DS, M17/151, M17/152,
03	RG174, RG179, RG316, M17/113, M17/119, M17/172, M17/189	05	RG178DS, RG196DS	15	Times RD-316

#### APPLIED ENGINEERING PRODUCTS

(203) 776-2813 • FAX (203) 776-8294 www.aepconnectors.com • aepsales@aepconnectors.com

# **SMA Bulkhead Jacks for Semi-Rigid Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Jacks**







#### **Right Angle Jack**



- Direct solder attachment
- With mounting gasket
- Noncaptive contact

For .085" semi-rigid (A = .089) 9453-1083-010 (Gold plated) 9453-7083-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9453-1083-009 (Gold plated) 9453-7083-009 (Nickel plated)

- Direct solder attachment
- · With mounting gasket
- · Captive contact for one-step cable assembly

For .085" semi-rigid (A = .089): 9453-1583-010 (Gold plated) 9453-7583-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9453-1583-009 (Gold plated) 9453-7583-009 (Nickel plated)

• Solder-clamp attachment

Captive contact
For .085" semi-rigid:
9530-1593-010 (Gold plated)
9530-9593-010 (Passivated)
For .141" semi-rigid:
9530-1593-009 (Gold plated)
9530-9593-009 (Passivated)
QPL version available (M39012/83)

• Direct solder attachment

For .085" semi-rigid (A = .089): 9613-1563-010 (Gold plated) 9613-7563-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9613-1563-009 (Gold plated) 9613-7563-009 (Nickel plated)

## **SMA Bulkhead Jacks for Flexible Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Jacks**

#### Straight Bulkhead Jack

Noncaptive contact
Crimp type:
9030-1023-0XX (Gold plated)
9030-9023-0XX (Passivated)
Solder type:
9030-1033-0XX (Gold plated)



### Straight Bulkhead Jack

Captive contact

Crimp type: 9130-1573-0XX (Gold plated) 9130-9573-0XX (Passivated)



Captive contact
 Clamp type:
 9230-1553-0XX (Gold plated)
 9230-9553-0XX (Passivated)

QPL version available (M39012/59)





#### **Right Angle Jack**

#### **Right Angle Bulkhead Jack**

Crimp type: 9613-1523-0XX (Gold plated) 9613-9523-0XX (Passivated)



Substitute the appropriate cable group number for "XX" when ordering:					
GROUP	CABLE TYPES	GROUP	CABLE TYPES	GROUP	CABLE TYPES
01	RG142, RG223, M17/60, M17/84, M17/158	04	RG180 RG195 M17/95	06	RG58, RG141, RG303, M17/111, M17/155
02	RG178, RG196, M17/93, M17/169		19	RG174DS, RG316DS, M17/151, M17/152,	
03	RG174, RG179, RG316, M17/113, M17/119, M17/172, M17/189	05	RG178DS, RG196DS	15	Times RD-316

#### APPLIED ENGINEERING PRODUCTS

(203) 776-2813 • FAX (203) 776-8294 www.aepconnectors.com • aepsales@aepconnectors.com



# **SMA Panel Jacks for Semi-Rigid Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Jacks**

- Direct solder attachment
- Square flange

Noncaptive contact
For .085" semi-rigid (A = .089):
9431-1083-010 (Gold plated)
9431-7083-010 (Nickel plated)
For .141" semi-rigid (A = .144):
9431-1083-009 (Gold plated)
9431-7083-009 (Nickel plated)



- Direct solder attachment
- Square flange
- · Captive contact for one-step cable assembly

For .085" semi-rigid (A = .089): 9431-1583-010 (Gold plated) 9431-7583-010 (Nickel plated)

For .141" semi-rigid (A = .144) 9431-1583-009 (Gold plated) 9431-7583-009 (Nickel plated)

- Direct solder attachment
- 2-hole flange
- Noncaptive contact

For .085" semi-rigid (A = .089): 9441-1083-010 (Gold plated) 9441-7083-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9441-1083-009 (Gold plated) 9441-7083-009 (Nickel plated)







- Direct solder attachment
- 2-hole flange
- Captive contact for one-step cable assembly

For .085" semi-rigid (A = .089): 9441-1583-010 (Gold plated) 9441-7583-010 (Nickel plated)

For .141" semi-rigid (A = .144): 9441-1583-009 (Gold plated) 9441-7583-009 (Nickel plated)





APPLIED ENGINEERING PRODUCTS (203) 776-2813 • FAX (203) 776-8294

### **SMA Panel Jacks for Flexible Cable**

Click on part number to go directly to cable assembly instructions

#### **Straight Jacks**



#### **Straight Panel Jack**

- Noncaptive contact
- Square flange

Crimp type:

9031-1023-0XX (Gold plated) 9031-9023-0XX (Passivated)

Solder type: 9031-1033-0XX (Gold plated)



#### **Straight Panel Jack**

- Captive contact
- Square flange

Crimp type: 9131-1573-0XX (Gold plated) 9131-9573-0XX (Passivated)



#### **Straight Panel Jack**

- Captive contact
- Square flange

Clamp type: 9231-1553-0XX (Gold plated) 9231-9553-0XX (Passivated)

Substitute the appropriate cable group number for "XX" when ordering:					
GROUP	CABLE TYPES	GROUP	CABLE TYPES	GROUP	CABLE TYPES
01	RG142, RG223, M17/60, M17/84, M17/158	04	RG180 RG195 M17/95	06	RG58, RG141, RG303, M17/111, M17/155
02	RG178, RG196, M17/93, M17/169		19	RG174DS, RG316DS, M17/151, M17/152,	
03	RG174, RG179, RG316, M17/113, M17/119, M17/172, M17/189	05	RG178DS, RG196DS	15	Times RD-316

#### APPLIED ENGINEERING PRODUCTS





### Clamp type connectors for flexible cable



#### (203) 776-2813 • FAX (203) 776-8294 www.aepconnectors.com • aepsales@aepconnectors.com

Crimp type connectors for flexible cable



CONNECTOR TYPE	Α	В	С
Captive contact	.100	.470	.720
Non-captive contact	.100	.160	.390

#### **APPLIED ENGINEERING PRODUCTS** (203) 776-2813 • FAX (203) 776-8294

.213

.156

06

19



Jacket

Crimp type connectors for flexible cable



- -Trim cable per trim code below; tin end of center conductor.
- —Slide heat-shrink tubing and crimp sleeve over cable.
- -Flare cable braid by rotating dielectric and slide cable into crimp tail.



- —Position cable so braid touches rear of body assembly.
- -Slide crimp sleeve forward to touch rear of body assembly.
- -Crimp braid with appropriate die size from chart below.



--Solder center conductor into notch in rear of contact with .025–.032" diameter chisel-tip soldering iron.

—Solder should cover center conductor, but not extend over top of notch in contact, or exceed contact diameter.



—Place insulator in body cavity, and press cap into place. Properly assembled cap will be slightly below end of body assembly.

-Slide shrink tubing over crimp sleeve and shrink to fit.

#### **Cable Trim Dimensions**



CONNECTOR TYPE	Α	В	С
RIGHT ANGLE CONNECTORS	.100	.230	.500

#### **Crimp Die Sizes**

-	
CABLE GROUP	HEX DIE SIZE
01	.213
02	.128
03	.128
04	.156
05	.128
06	.213
19	.156

APPLIED ENGINEERING PRODUCTS (203) 776-2813 • FAX (203) 776-8294



Solder-clamp connectors for semi-rigid cable



#### Right Angle Connectors—Semi-Rigid Cable

Сар

Solder Ferrule

Backnut



**APPLIED ENGINEERING PRODUCTS** 

Right angle connectors-.141" cable

.290

.125

Direct solder connectors for semi-rigid cable



<sup>—</sup>Place insulator in body cavity, and press cap into place. Properly assembled cap will be slightly below end of body assembly.

### Direct solder connectors for semi-rigid cable





- -Trim cable per trim code below; point end of center conductor to 45° as shown.
- -Slide backnut over cable. Slide body over cable until trimmed end of cable is flush with front of body.
- -Solder cable jacket to body. Retrim cable dielectric flush with body if it has extruded due to heat from soldering.
- -Assemble gasket into groove on body.



-Slide coupling nut forward until it stops and assemble "C" ring into groove.

#### Cable Trim Dimensions



CONNECTOR TYPE	Α	В
9301-1063-009	.090	.090
9301-1063-109	.090	.180

#### P/N 9301-1063-109



- -Trim cable per trim code below; point end of center conductor to 45° as shown.
- -Slide backnut over cable. Slide body over cable until trimmed end of cable jacket stops against step in body.
- -Solder cable jacket to body. Retrim cable dielectric flush with body if it has extruded due to heat from soldering.
- -Assemble gasket into groove on body.

2



-Slide coupling nut forward until it stops and assemble "C" ring into groove.



# **Assembly Tooling**

#### **Crimp tools**



DESCRIPTION	AEP P/N
Crimp tool with .128" and .213" hex dies	TA-0007
Crimp tool with .156" hex die	TA-0071
Crimp tool with .105" and .128" hex dies	TA-0105
Crimp tool with .255" and .068" hex dies	TA-0190
Crimp tool with .255" hex die	TA-0234

#### **Torque Wrench**



DESCRIPTION	AEP P/N
Torque wrench with 5/16" jaw for SMA coupling nuts; 8 inch-pounds torque	TA-0397

### **Capping Press**



DESCRIPTION	AEP P/N
Capping tool (arbor press) with base for SMA right angle plugs	Contact Factory
Capping tool (arbor press) with base for SMA right angle jacks	Contact Factory

### **Mounting Dimensions**



