

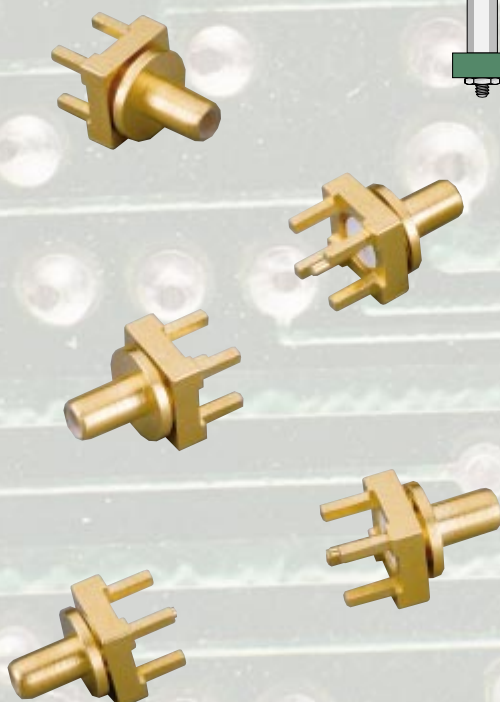
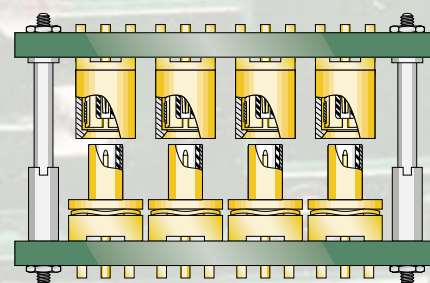
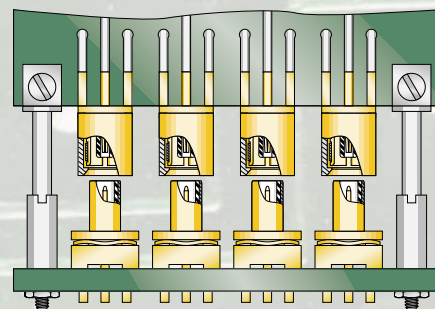
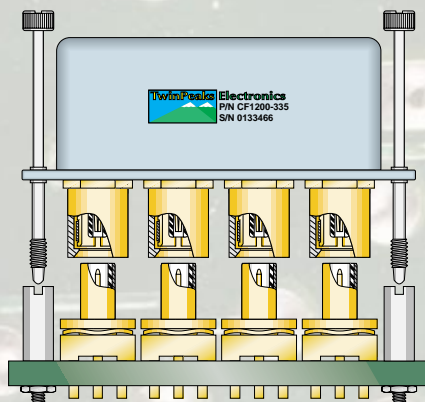
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# SLB/SA

## Self-Aligning P.C. Board Connectors

- Eliminate inter-board cable assemblies
- Ideal for daughtercard applications
- Simplify modular designs
- Save time, space, and expense



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# Self-Aligning P.C. Board Connectors

## How They Work

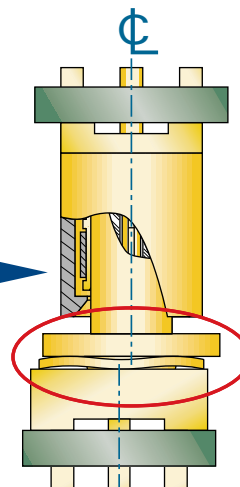
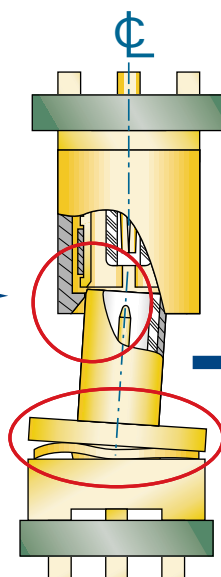
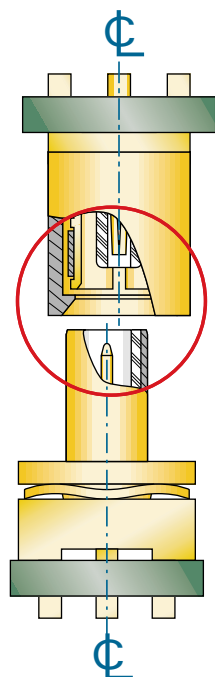
**SLB/SA** self-aligning PC board receptacles from AEP are a new, *patented\** way to cure your board-interconnection headaches. The unique “floating” front end of these connectors tilts and shifts during mating to accommodate axial and radial misalignment between mating pairs without damage to the connectors or the boards.

These connectors have a slide-on mating interface and low mating force—only 1.5 pounds average per mated pair.

With AEP’s **SLB/SA** connectors, you can stack your boards in parallel, in a right-angle daughtercard layout, or easily customize your product with pluggable modules.

These connectors feature low VSWR from DC through 6 GHz, and the minimum mounting distance between centerlines of only .350" allows for dense packaging.

When misaligned connector pairs come into contact, the front end of the self-aligning connector tilts as it is guided by the closed-entry hood of the mating connector.



When fully mated, the front end of the self-aligning connector is shifted radially into alignment with the mating connector.

The spring washer prevents ground interrupts, and compensates for axial misalignment.

(Proportions altered to illustrate detail)

\* U.S. patent #5,769,652



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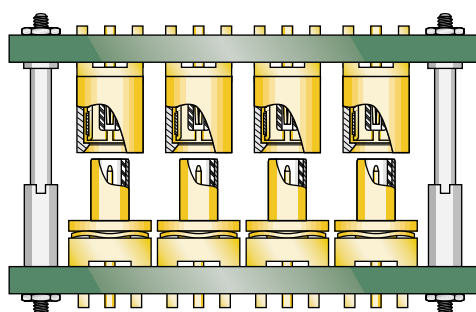
# SLB/SA Self-Aligning P.C. Board Connectors

## Applications

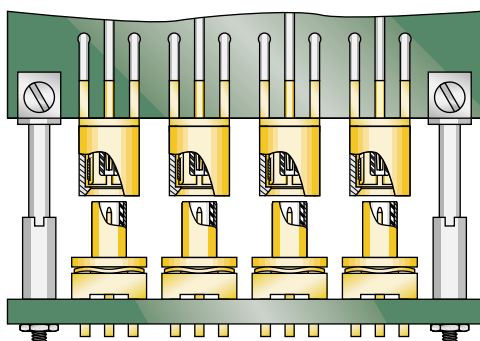
When you need to move RF or shielded signals from one P.C. board to another, **SLB/SA** connectors allow you to plug the boards directly together—no more expensive cable assemblies needed to compensate for connector misalignment.

Customizing your products with pluggable modules is easy, too. And downloading data from logging instrumentation can be simpler and more reliable.

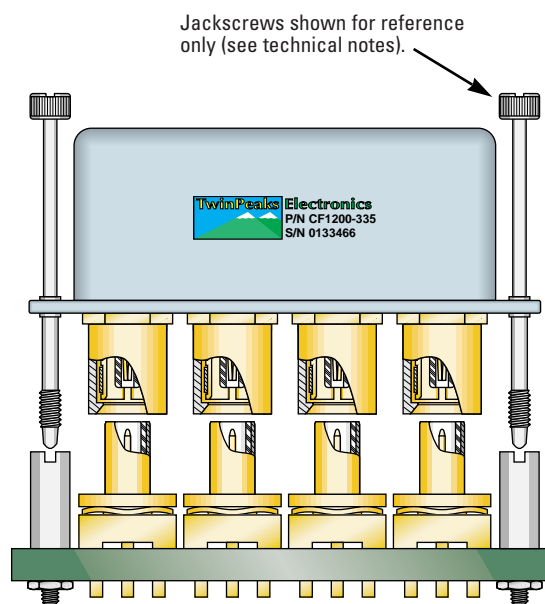
The possibilities are almost endless. Here are just a few ways that **SLB/SA** connectors can help make your products simpler, smaller, and more versatile. If you don't see what you need, call us—our engineers are ready to help with your requirements.



Stacked P.C. board configuration, using straight mating plugs with through-hole mounting (3025 series).



Daughterboard configuration, using straight edge-mount mating plugs (3025 series).

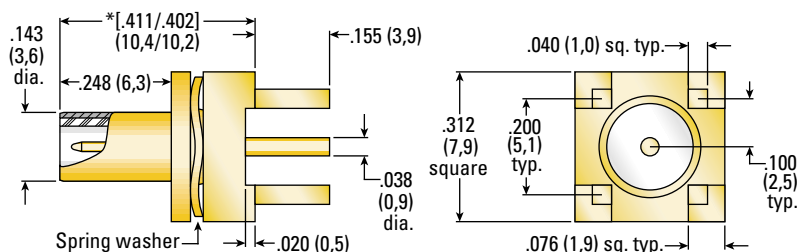


Modular component to motherboard, using straight bulkhead-mounted mating plugs (3017 series).



## Self-Aligning P.C. Board Jack

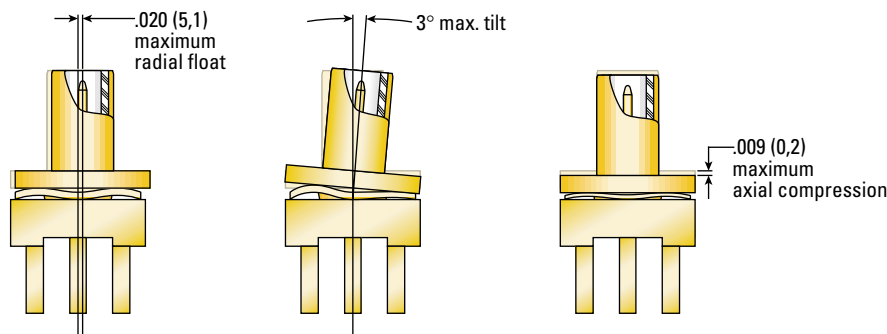
Through-hole mounting, stepped legs: 3509-1511-000



Dimensions in inches (mm).

$^*$ [Spring washer uncompressed/fully compressed]

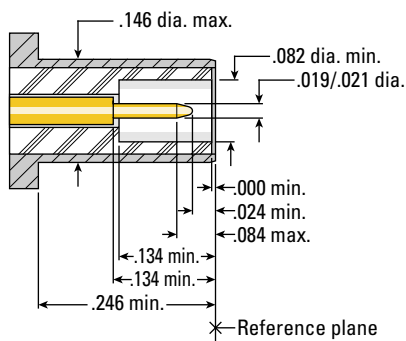
### Range of movement (floating front end)



Dimensions in inches (mm).

### Interface dimensions and specifications

#### Interface dimensions



Dimensions in inches.

See pages 5 and 6 for mounting dimensions, application notes, and electrical performance charts.

#### SLB/SA PCB Jack Specifications

##### Materials:

**Body components, center contacts:** Brass per ASTM-B-16, Alloy 360,  $\frac{1}{2}$  hard.

**Springs:** Stainless steel.

**Insulators:** Teflon (TFE) per ASTM-D-1710.

##### Finish:

**All metal parts:** Gold plated per MIL-G-45204.

##### Electrical:

**Impedance:**  $50\Omega$ .

**Frequency range:** DC–6 GHz.

**Voltage Rating:** 335 VRMS @ sea level.

**VSWR:** 1.15:1 maximum to 6 GHz.

**Insertion Loss:** .2 dB maximum @ 6 GHz.

**Contact Resistance:** *Center contact:* 0.3 ohms maximum.

*Outer contact:* 4.0 milliohms maximum.

**Dielectric Withstanding Voltage:** 1,000 VRMS @ sea level.

**Corona level:** 230VRMS @ 70,000 ft.

**Insulation Resistance:** 1,000 megohms minimum.

##### Mechanical:

**Force to engage and disengage:** 1.5 pounds average per mated pair.

**Contact retention:** 4 pounds minimum axial force.

**Durability:** 500 mating cycles.

##### Environmental (MIL-STD-202):

**Temperature range:**  $-65^\circ\text{C}$  to  $+165^\circ\text{C}$ .

**Corrosion:** Method 101, condition B, 5% salt solution.

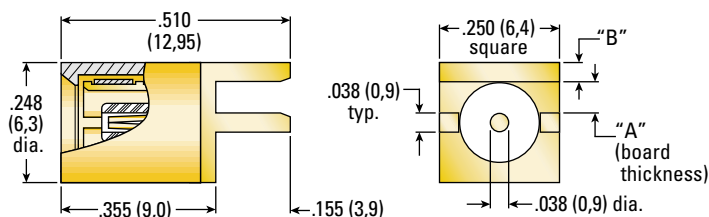
**Vibration (Method 204):** Condition B.

**Mechanical shock (Method 213):** Condition B.

**Thermal shock (Method 107):** Condition B.

## Mating Plugs

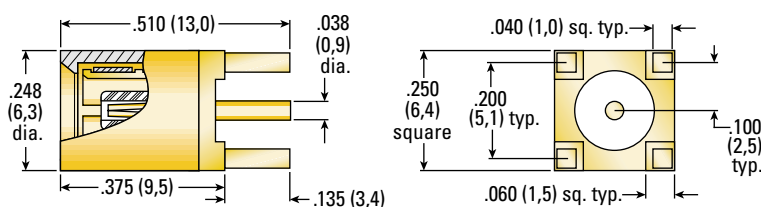
### Straight PCB plug, edge mount



A	B	AEP P/N
.031	.069	3025-1511-016
.062	.040	3025-1511-014

Dimensions in inches (mm).

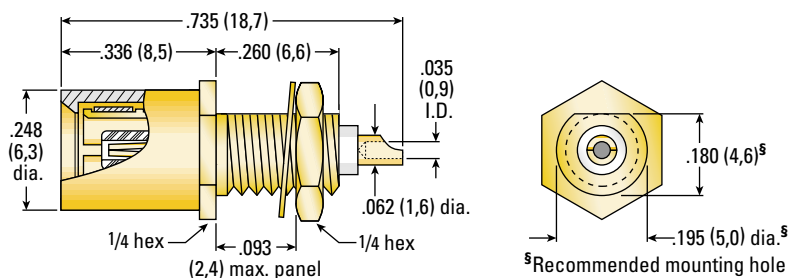
### Straight PCB plug, stepped legs: 3025-1511-011



Dimensions in inches (mm).

See page 5 for mounting dimensions.

### Straight bulkhead plug: 3017-1511-005

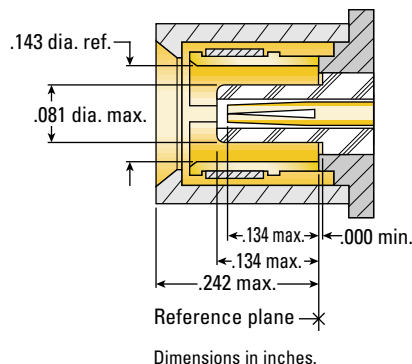


Dimensions in inches (mm).

§Recommended mounting hole

## Interface dimensions and specifications

### Interface dimensions



Dimensions in inches.

### SLB Closed-Entry Plug Specifications

#### Materials:

**Body components:** Brass per ASTM-B-16, Alloy 360, 1/2 hard.

**Center contact and outer contact retainer spring:**

Beryllium copper per ASTM-B-196, condition HT.

**Insulators:** Teflon (TFE) per ASTM-D-1710.

#### Finish:

**All metal parts:** Gold plated per MIL-G-45204.

#### Environmental (MIL-STD-202):

**Temperature range:** -65° C to +165° C.

**Corrosion:** Method 101, condition B, 5% salt solution.

**Vibration (Method 204):** Condition B.

**Mechanical shock (Method 213):** Condition B.

**Thermal shock (Method 107):** Condition B.

### Mechanical:

**Force to engage and disengage:**

1.5 pounds average per mated pair.

**Contact retention:** 4 pounds min. axial force.

**Durability:** 500 mating cycles.

### Electrical:

**Impedance:** 50Ω.

**Frequency range:** DC-6 GHz.

**Voltage Rating:** 335 VRMS @ sea level.

**VSWR:** 1.15:1 maximum to 6 GHz.

**Insertion Loss:** .2 dB maximum @ 6 GHz.

**Contact Resistance:**

*Center contact:* 6.0 milliohms maximum.

*Outer contact:* 4.0 milliohms maximum.

**Dielectric Withstanding Voltage:**

1,000 VRMS @ sea level.

**Corona level:** 230VRMS @ 70,000 ft.

**Insulation Resistance:** 1,000 megohms min.

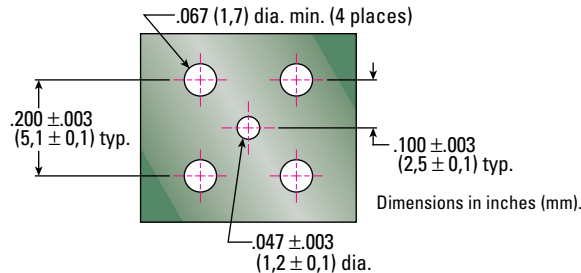


## Application Notes

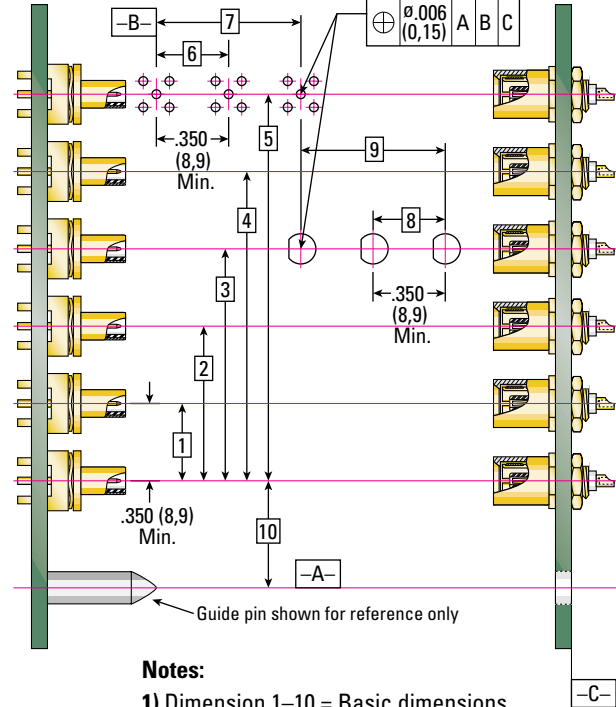
### Mounting, spacing, and tolerances

#### P.C. board drilling dimensions

(for 3509-1511-000 and 3025-1511-011)



#### Mounting tolerances



### Application Notes

#### Mating forces:

Average mating force of 1.5 pounds per mated pair has been tested and shown to be linear up to 12 mated pairs of connectors, and is unaffected by connector misalignment within the specified mounting tolerances per the specifications drawing on this page.

#### External P.C. board hardware:

**External hardware for guiding the boards into proper mating alignment and for preventing unmating of board pairs must be incorporated into final designs.** The design of this fixturing hardware should be based on the requirements of your specific application.

The connectors themselves should **not** be used to guide the boards into proper alignment during mating, nor should the unmating force of the connectors be relied upon to hold the boards together after mating.

#### Mounting surface deflection:

In all applications, consideration should be given to the modulus of elasticity of the boards or panels on which the connectors are mounted. If the total mating force of the connector pairs exceeds the stiffness of the boards or panels, bending of the boards or panels will occur, and will be most severe at the center of the row or array.

In such cases, electrical performance can be significantly degraded due to incomplete mating of the connector pairs in the affected area.

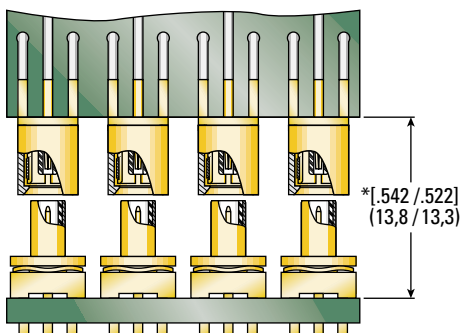
### Board spacing for selected applications

\*[Spring washer uncompressed/fully compressed.]

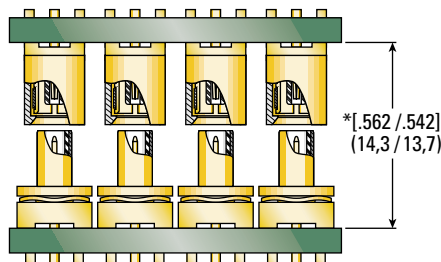
Dimensions in [inches] (mm).

**Note: Shown without guide hardware for clarity.**

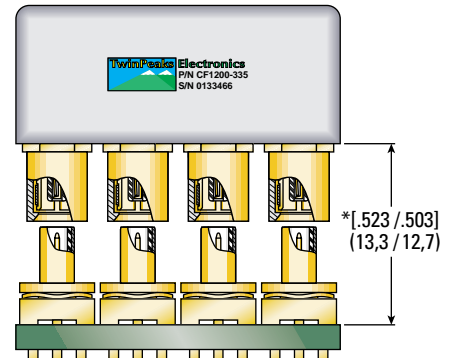
#### Daughterboard configuration, using 3509-1511-000 and 3025-1511-014 or -016



#### Stacked P.C. board configuration, using 3509-1511-000 and 3025-1511-011



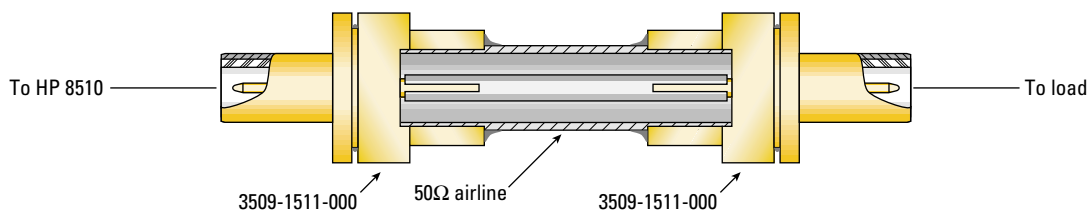
#### Modular component to P.C. board, using 3509-1511-000 and 3017-1511-005



## Electrical Performance

## Test method and results

## Fixture for testing electrical performance

**Test setup:**

Two connectors soldered to 50Ω rigid airline, with floating front ends fixed in fully-compressed position. Fixture terminated with 100' of coaxial cable as load and tested on HP 8510.

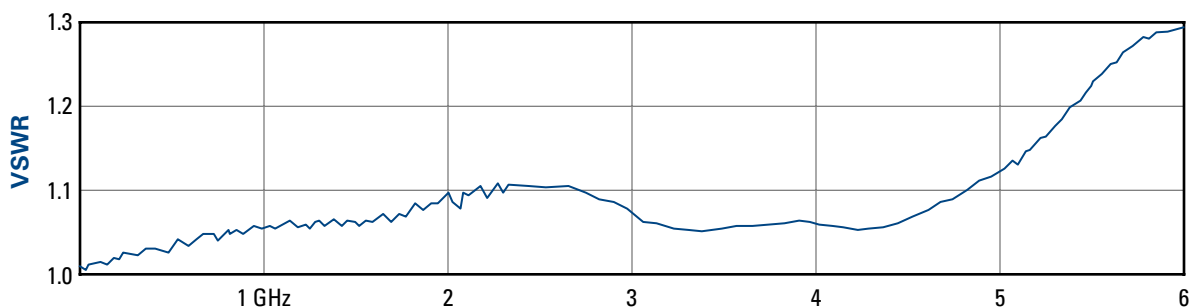
**Test results:**

The plots below show the VSWR and insertion loss for the pair of connectors as mounted on the airline. The data is presented in this format in order to convey a more accurate representation of the electrical performance of a self-aligning P.C. board jack together with its mating plug.

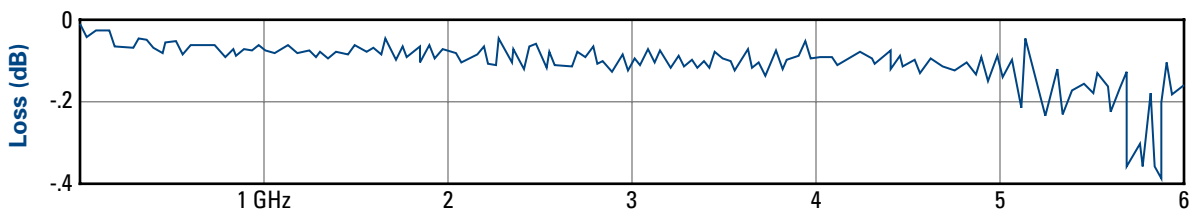
To obtain VSWR for individual connectors, extract the square root of the VSWR reading at a particular frequency.

To obtain insertion loss for individual connectors, divide the insertion loss reading at a particular frequency by two.

## Electrical performance—VSWR, DC–6 GHz

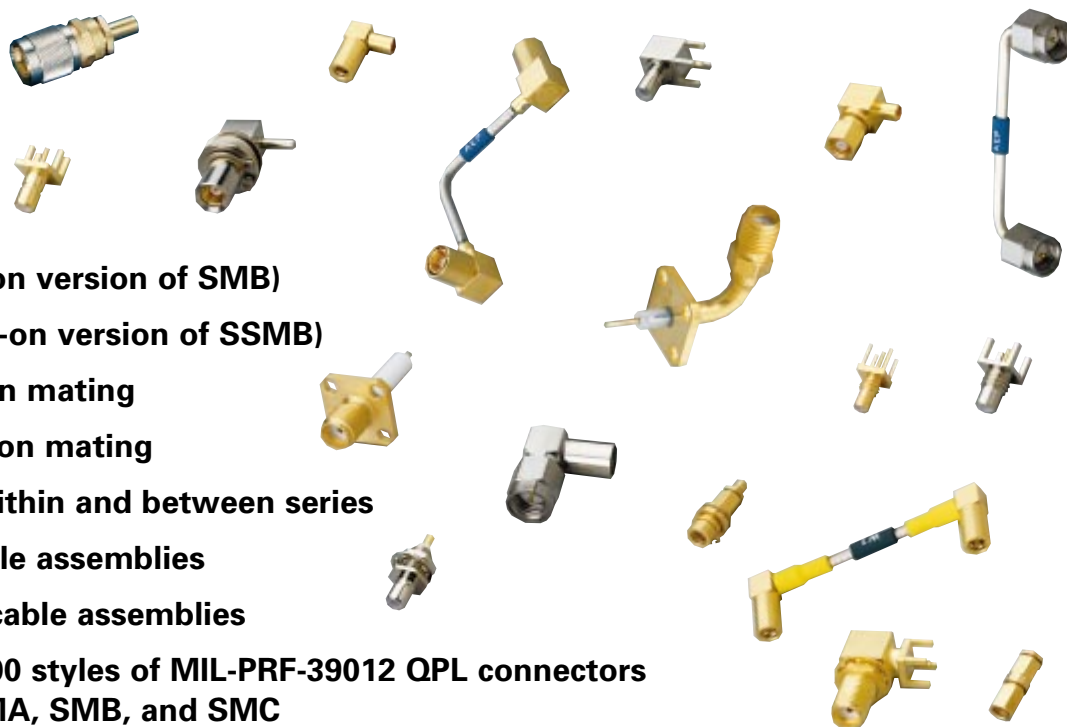


## Electrical performance—Insertion loss, DC–6 GHz



The connectors in this brochure are just the latest addition to our complete line of subminiature and microminiature coaxial connectors and cable assemblies, including:

- SMA
- SMB
- SMC
- SSMB
- SSMC
- SLB (Slide-on version of SMB)
- SSLB (Slide-on version of SSMB)
- 75Ω Snap-on mating
- 75Ω Screw-on mating
- Adapters within and between series
- Flexible cable assemblies
- Semi-rigid cable assemblies
- And over 100 styles of MIL-PRF-39012 QPL connectors in series SMA, SMB, and SMC



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Since our foundation in 1973, we have always believed that having our customers take a look "inside AEP" is important in fostering strong vendor/customer relationships. We are proud of our physical plant and equipment, but even more so of our dedicated staff.



When customers see first-hand how AEP's people keep a constant focus on maintaining and improving customer service and satisfaction, the reason for our consistently strong on-time delivery and quality records becomes clear.

We invite you to see for yourself. Call us to arrange a plant tour—or, if you can't make a visit, ask for your copy of *INSIDE AEP*, our facilities and capabilities brochure.



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