THE PERFORMANCE LEADER IN

MICROWAVE CONNECTORS

2022 - 2023

SuperMini

Board-to-Board Connectors (SSBB) DC to 67 GHz

Microstrip
Grounded Coplanar Waveguide
Stripline

- Low VSWR
- Low Insertion Loss
- Low Mate/Demate Forces
- Low Misalignment Loss

SOUTHWEST MICROWAVE

SuperMini Board-to-Board Connectors (SSBB) DC to 67 GHz

Southwest Microwave RF / millimeter wave blind-mate connectors optimize interconnect performance for board-to-board stacking applications. These SuperMini Board-to-Board solutions maximize electrical performance of the transmission path between connector and circuit. The unique bullet and PCB receptacle designs offer the industry's lowest mate/demate forces and misalignment loss.

- Reach higher frequencies with the 0.9 mm interface
- Achieve board-to-board spacing as close as 3 mm
- Lowest mating / demating forces for smooth bore (6 oz. / 6 oz.) and detent (9 oz. / 12 oz.) typ.
- Accommodates misalignment of up to 10 mils axial and +/- 10° radial with no performance degradation
- Unique bullet design enables extended mating and de-mating cycles

SPECIFICATIONS

Materials:

Receptacles and Contacts	BeCu Alloy
Dielectric Bead (Receptacle)	PEEK HT
Dielectric Bead (Bullet)	PTFE
Finishes vary by product type	

Mechanical:

Mating Cycles	500 min. (smooth bore), 100 min. (detent)
Force to Engage	6 oz. (smooth bore), 9 oz. (detent)
Force to Disengage	6 oz. (smooth bore), 12 oz. (detent)
Radial Misalignment	+/- 10°
Axial Misalignment	.010" (0.254 mm)
Min. board-to-spacing	.118" (3 mm)

Environmental:

Temperature	-55 to +250 °C (receptacle), -55 to +165 °C (bullet)
Thermal Shock	MIL-STD-202, Method 107, Condition B
Moisture Resistance	MIL-STD-202, Method 106, (excluding step 7B)
Vibration	MIL-STD-202, Method 204
Shock	MIL-STD-202, Method 213, Condition I
Corrosion	MIL-STD-202, Method 101, Condition B
Moisture Resistance	MIL-STD-202, Method 106

Electrical: *Electrical performance is dependent on board material and stack-up, and connector PCB layout.*

Frequency	Up to 67 GHz
Impedance	50 Ω
Insulation Resistance	5000 mΩ min.
Center Contact Resistance	3.0 mΩ max.
Outer Conductor Resistance	2.0 mΩ max.
DWV	288 V (rms)
Insertion Loss*	
Connector	.040*sqrt (f) GHz
Bullet	.025*sqrt (f) GHz
VSWR*	
DC to 18 GHz	1.10:1 max.
18 to 40 GHz	1.15:1 max.
40 to 50 GHz	1.25:1 max.
50 to 67 GHz	1.30:1 max.

(*) Values listed are for standalone connector, bullet or adapter.

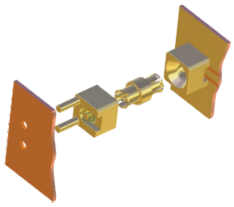
DESIGN AND TEST ASSISTANCE

Performance is dependent on board type and launch design. Southwest Microwave can provide the following support for optimal results.

- Board layout/launch
- Encrypted HFSS models
- 3D models for mechanical layout
- Cable assemblies

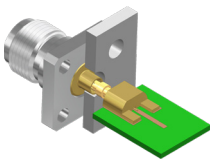
APPLICATIONS

SuperMini Board-to-Board connectors successfully address the physical and performance limitations of standard SMP designs. These ultra-high frequency, miniaturized push-on interconnect solutions for high density PCB interface feature advanced bullet and receptacle construction that maximize product lifespan and significantly improve resilience against RF signal degradation.

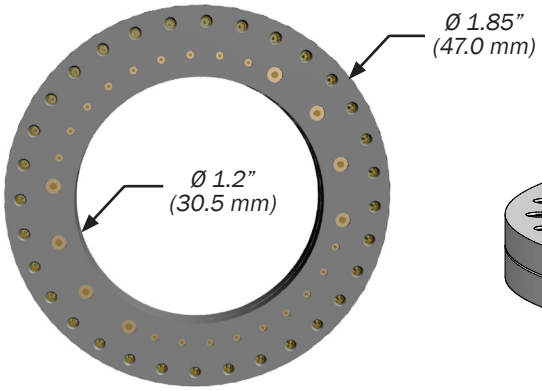


Board-to-Board Application

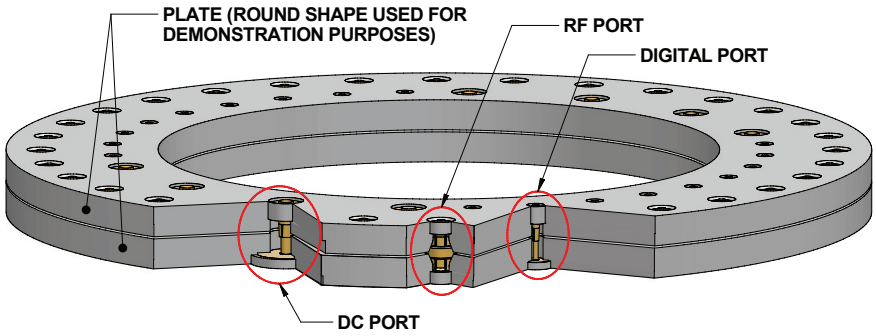
Ideal for defense, aerospace, communications, networking and test applications, these lightweight yet rugged blind-mate connectors enhance reliability and performance for board-to-board stacking, edge-mount to backplane or board-to-panel interconnections. With horizontal and vertical mount options, they are an excellent answer where space and weight efficiencies are essential, such as radar systems, phased array antennas, amplifiers, receiver units, switch matrices, channelizers and circuit cards.



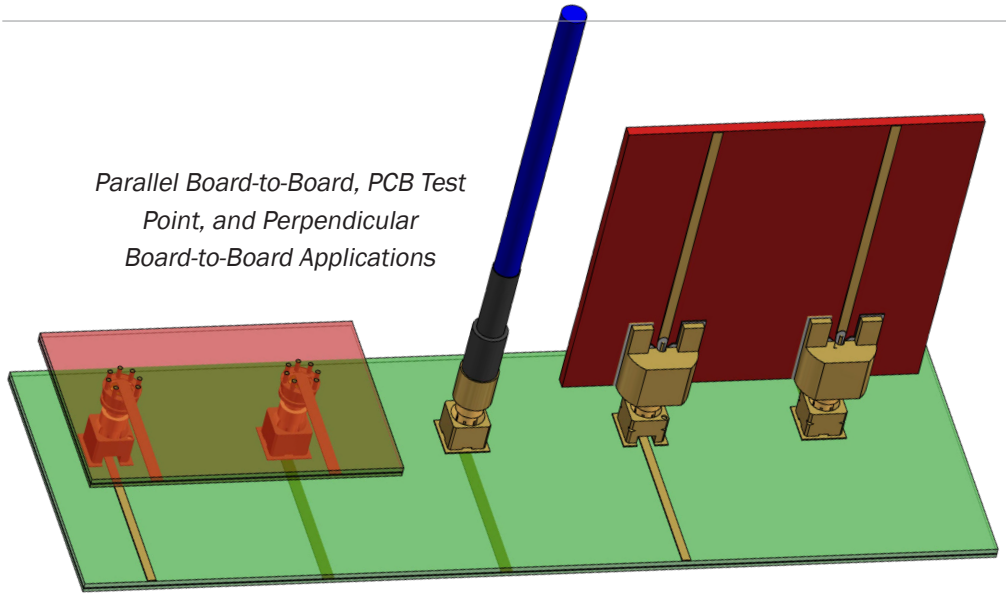
Board-to-Panel Application



High Density Application (aerial view of custom design)



Cross-section view of custom design. Southwest Microwave SSBB RF connectors can be built onto any plate shape with DC and digital ports.



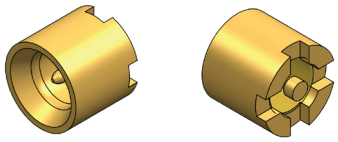
Parallel Board-to-Board, PCB Test Point, and Perpendicular Board-to-Board Applications

From left to right:

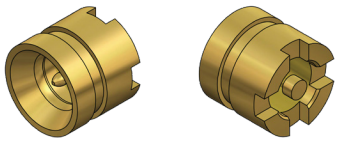
Microstrip to Stripline
Stripline to Stripline
Stripline to .047 Cable
Microstrip to Microstrip Edge Launch
Stripline to Microstrip Edge Launch

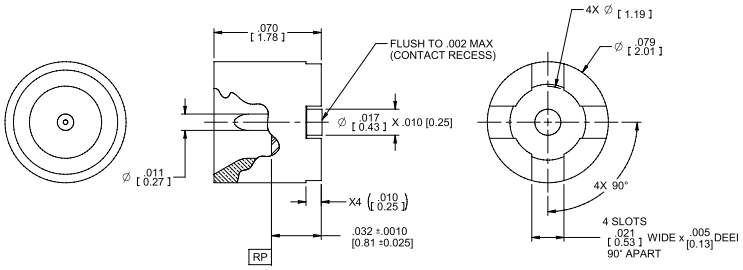
VERTICAL MOUNT JACK (FEMALE), SURFACE MOUNT

55053-002J (smooth bore)

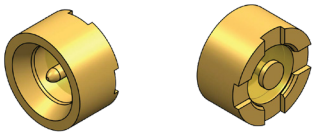


55053-008J (detent)

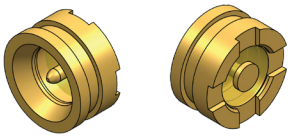


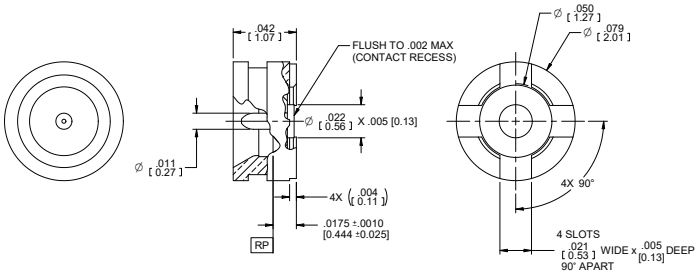


55053-005J (smooth bore)

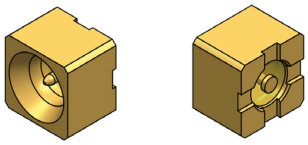


55053-006J (detent)

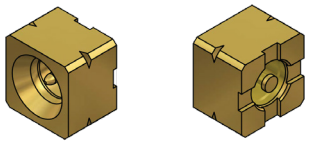


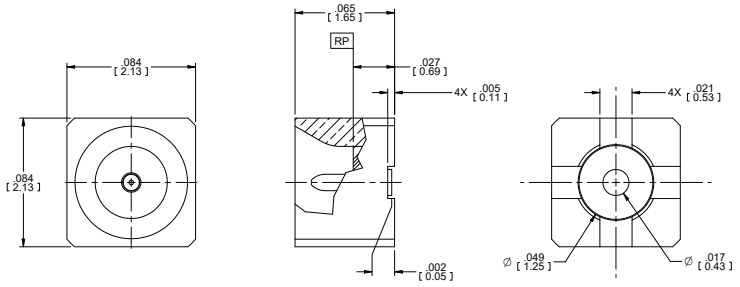


55057-011J (smooth bore)



55057-012J (detent)

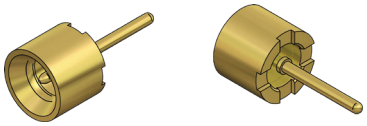


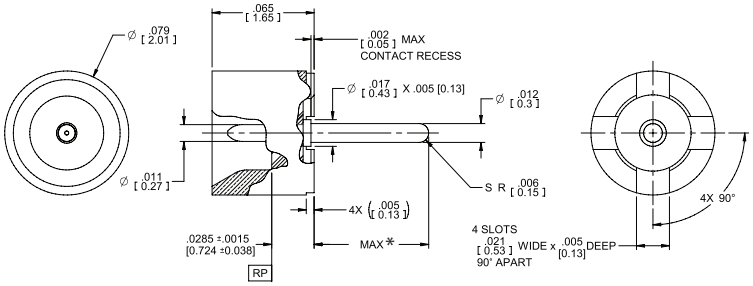


VERTICAL MOUNT JACK (FEMALE), THRU-HOLE

55050-003J (smooth bore) *Pin Length: .077

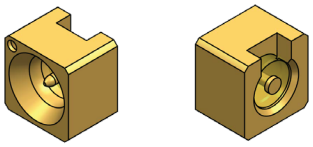
55050-004J (detent)*Pin Length: .108



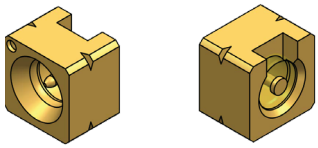


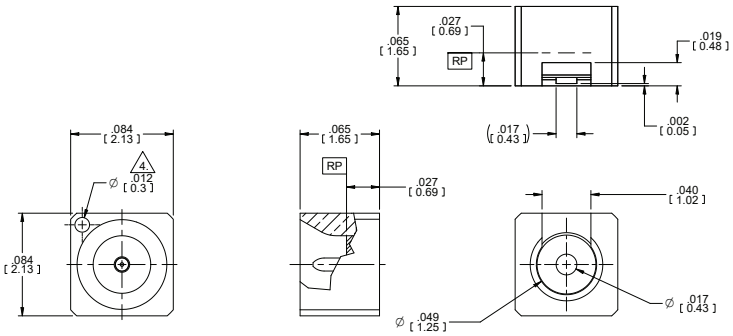
VERTICAL MOUNT JACK (FEMALE), SURFACE MOUNT

55057-009J (smooth

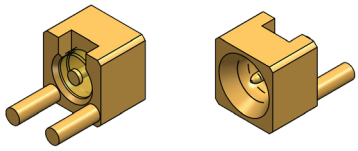


55057-010J (detent)

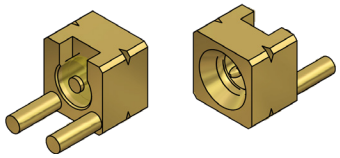


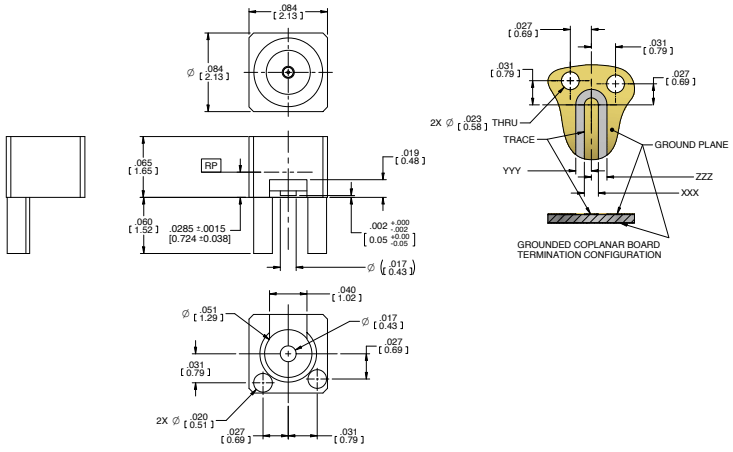


55057-005J (smooth



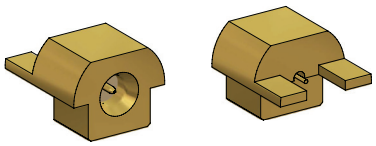
55057-006J (detent)

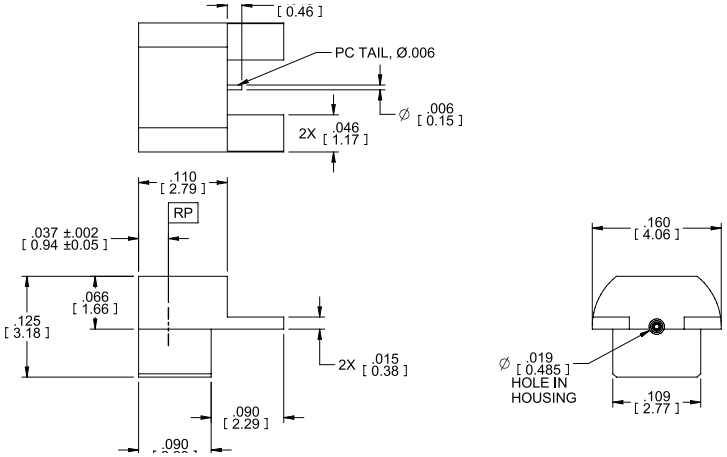




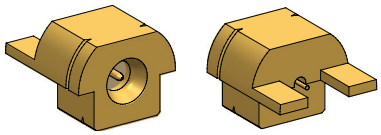
EDGE LAUNCH JACK (FEMALE)

55056-001J (smooth bore)





55056-002J (detent)

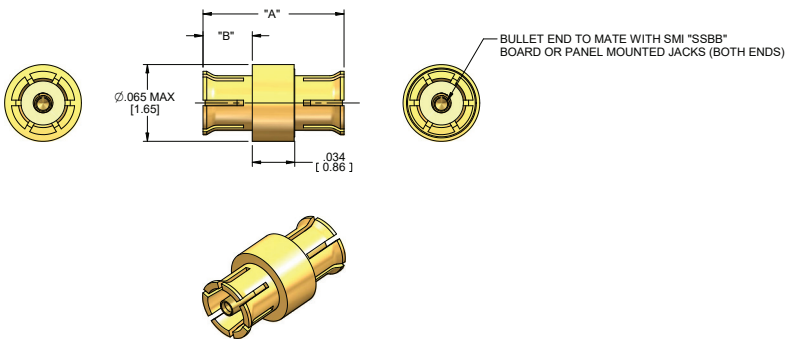


BULLETS

VARYING BOARD-TO-BOARD SPACING

For mating with all SuperMini Board-to-Board Female (Jack) Receptacles

	Dim. “A”	Dim. “B”
54033-001B	.113 (2.87)	.039 (0.99)
54033-002B	.149 (3.78)	.057 (1.46)
54033-003B	.203 (5.16)	.084 (2.15)
54033-004B	.103 (2.62)	.034 (0.88)
54033-005B	.139 (3.53)	.052 (1.33)
54033-006B	.193 (4.90)	.079 (2.02)
54033-007B	.439 (11.15)	.202 (5.13)
54033-008B	.452 (11.48)	.209 (5.31)



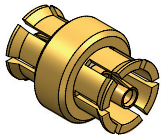
DETERMINING BULLET LENGTH:

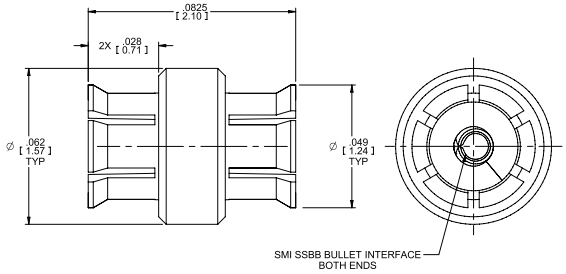
Dim. “A” = (min. board spacing) – 2 (receptacle RP DIM) – 2 (max. pad and solder thickness)

3mm BOARD-TO-BOARD SPACING

For mating with 55053-005J or 55053-006J Female (Jack) Receptacles only

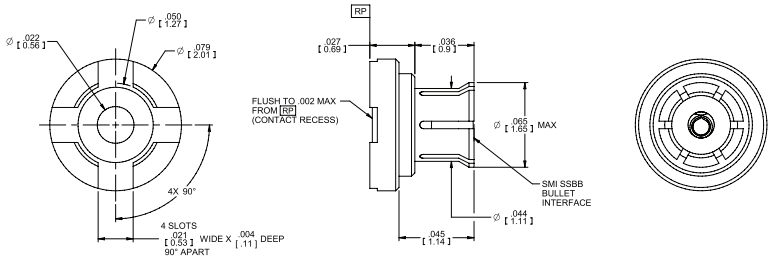
54033-009B



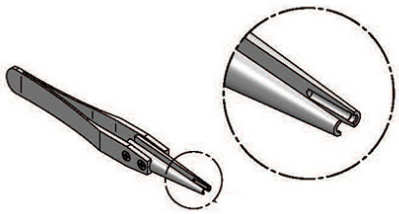


SURFACE MOUNT

54053-002B

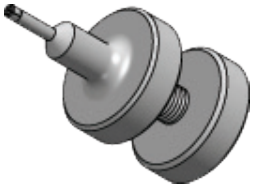


TWEEZER, T-54033-1



- Handle: Stainless Steel, AISI 316L
- Tips: Stainless Steel Alloy 17-4, UNS S17400, Temper A Per ASTM 564
- Screws: Stainless Steel, UNS S30400

PLUNGER, T-54033-2

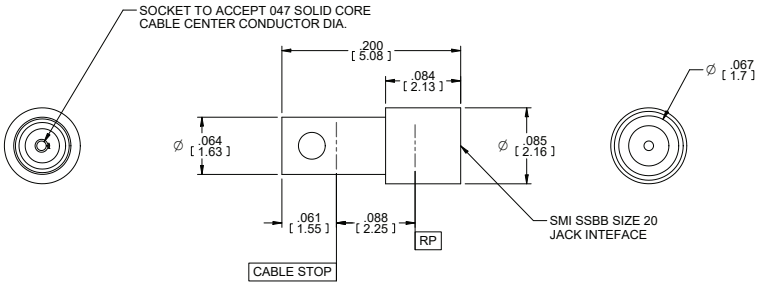


- Housing: Stainless Steel Alloy 17-4, UNS S17400
- Collet: Nickel Plated Per AMS 2454
- Spring: Stainless Steel

SSBB SIZE 20 DIRECT SOLDER CABLE JACK

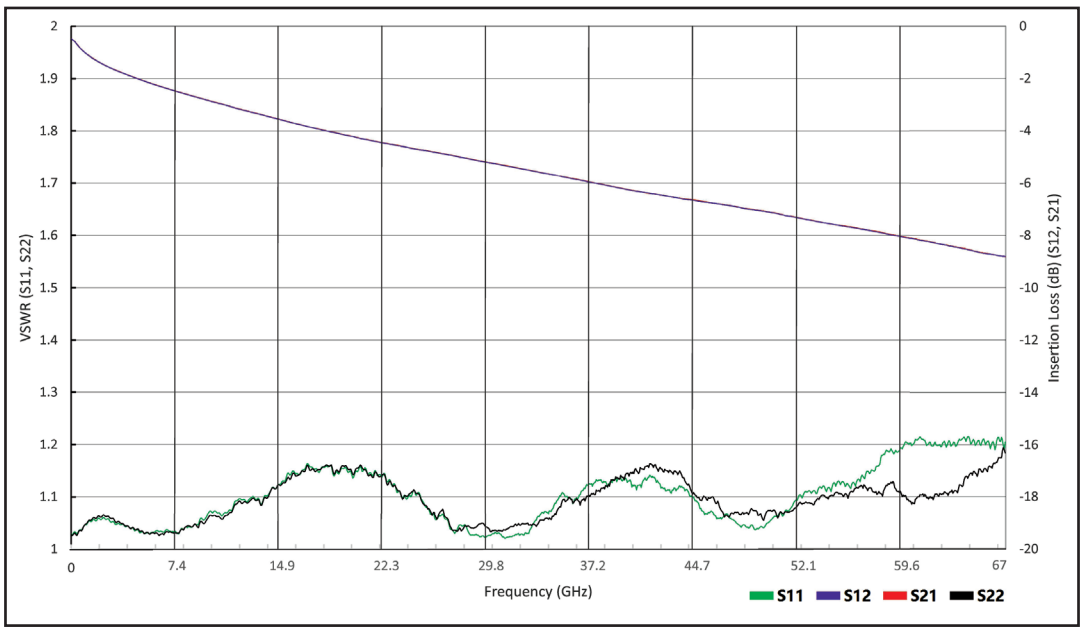
For .047 Solid Core Cable

55070-001J (detent)
(Requires bullet)



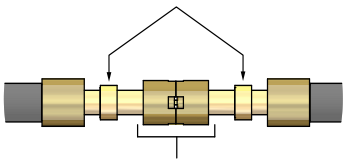
Southwest Microwave can supply .047 flex cables with SMA, 2.92 mm, 2.40 mm, 1.85 mm, or 1.0 mm plug connectors on one end. Contact us for more information.

Typical Test Data - 1.85 mm Plug to SSBB J, 12 Inch Long Cable

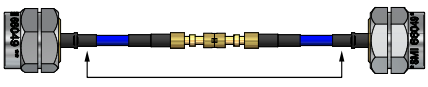


SuperMini

Board-to-Board Bullets



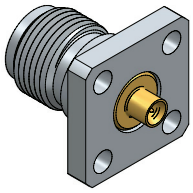
Back-to-Back SuperMini
Board-to-Board
Surface Mount Vertical Jacks



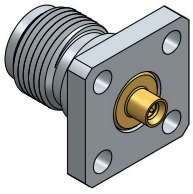
TEST CABLE ASSEMBLY (0.047 Flex Cable)
1.85mm Plug to SuperMini Board-to-Board Cable Connector Jack

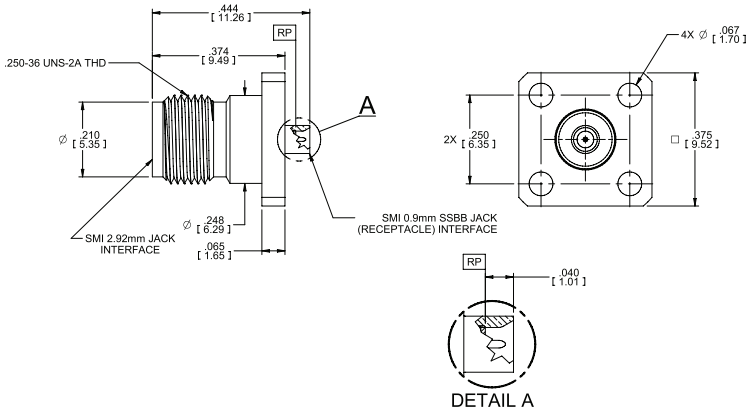
SSBB SIZE 20 JACK TO 2.92 mm JACK 4-HOLE .375 SQUARE FLANGE (40 GHz)

105310-00SF (smooth bore)



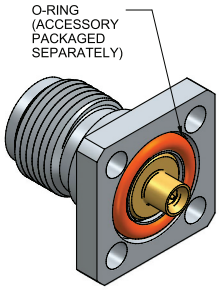
105310-01SF (detent)



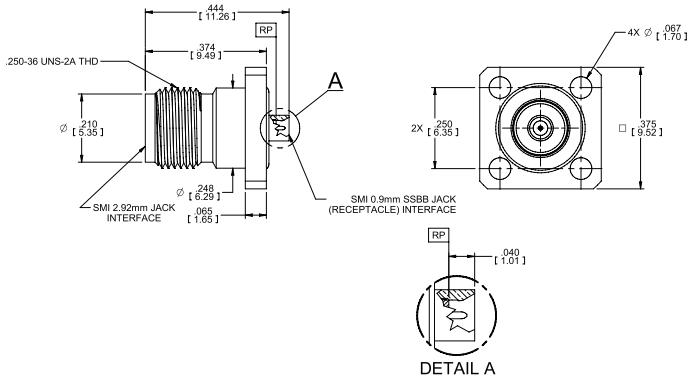


SSBB SIZE 20 HERMETIC JACK TO 2.92 mm JACK 4-HOLE .375 SQUARE FLANGE (18 GHz)

105310-02SF (detent)

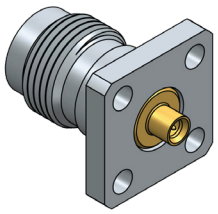


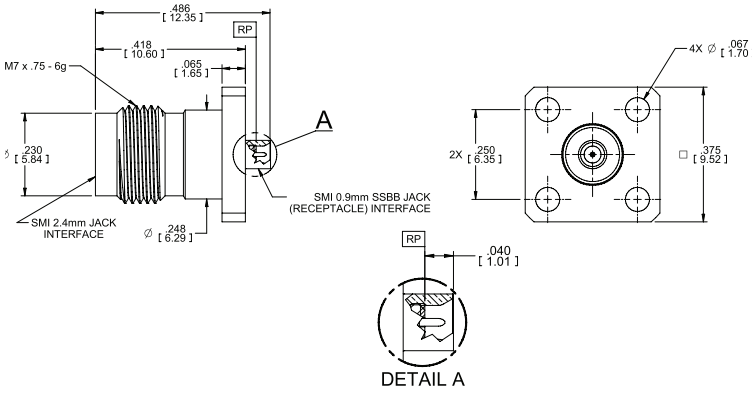
Leak rate < $1x10^{-6}$ cc/sec
He @ 1 atm



SSBB SIZE 20 JACK TO 2.40 mm JACK 4-HOLE .375 SQUARE FLANGE (50 GHz)

145310-00SF

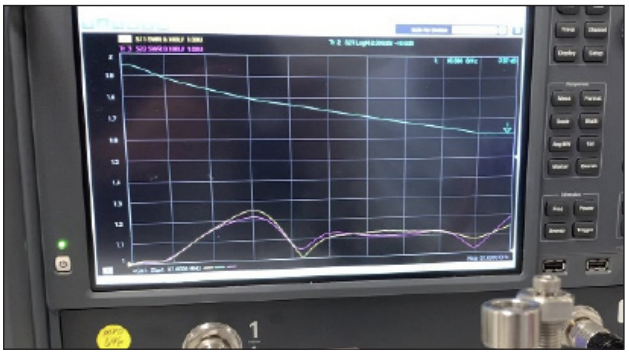




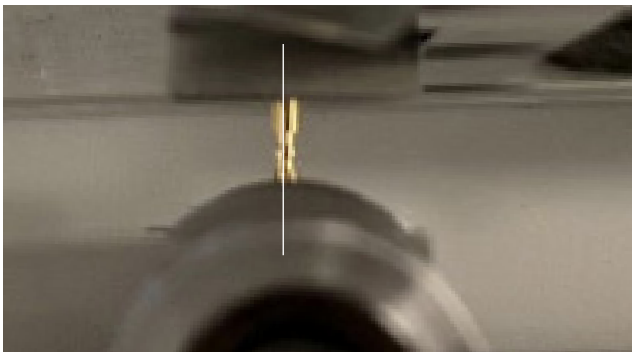
Southwest Microwave SuperMini Board-to-Board Connector solutions maximize electrical performance of the transmission path between connector and circuit while accommodating axial misalignment of 10 mils and radial misalignment of +/- 10 degrees with no resonance.

RADIAL MISALIGNMENT

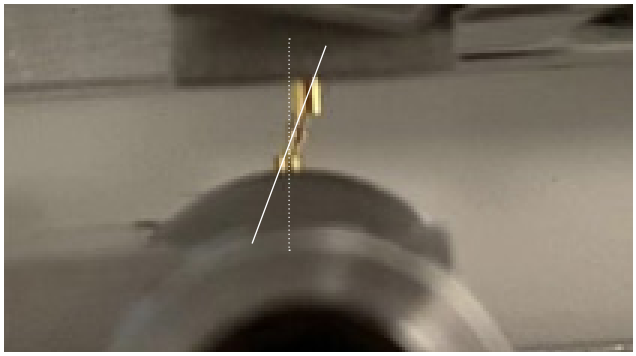
The test setup featured below consists of two twelve-inch long .047 flex cables with 1.85 mm plug cable connectors attached to the VNA and 55070-001J receptacle cable connectors. A 54033-003B bullet is placed in between the two 55070-001J cable connectors.



Aligned

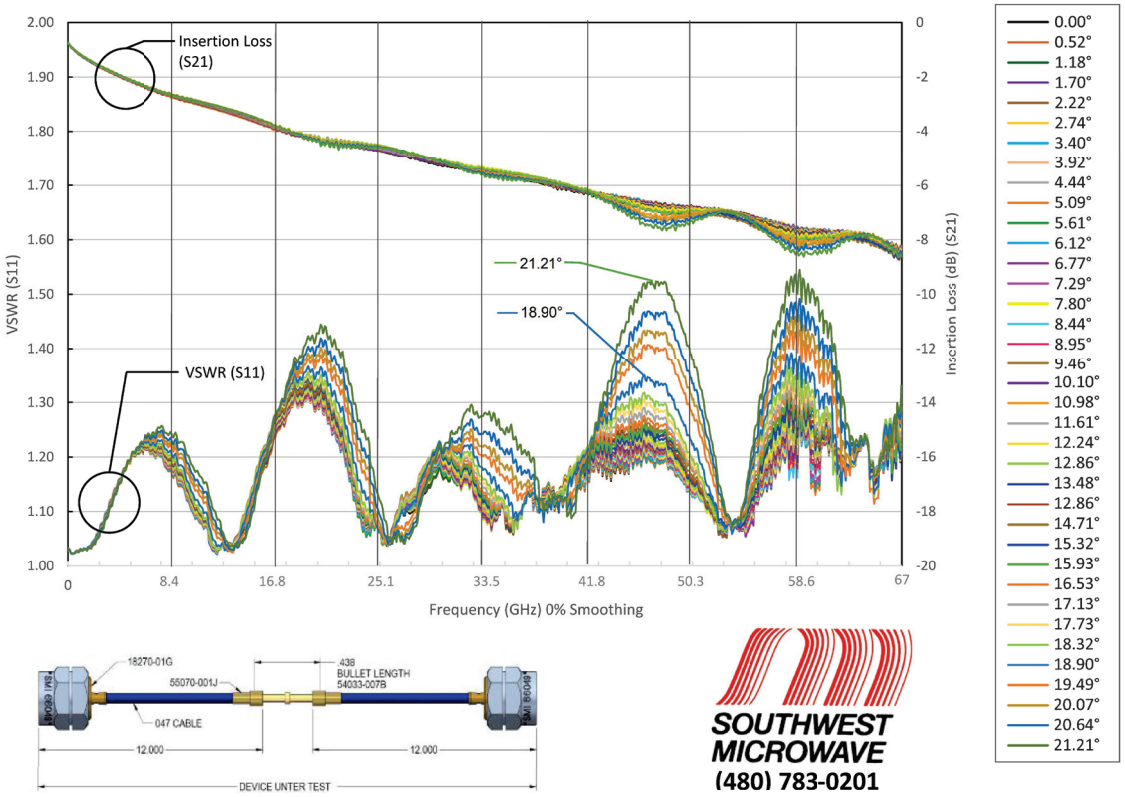


Misaligned



For the full video demonstration on radial misalignment, please visit our website:
https://mpd.southwestmicrowave.com/product-category/supermini-board-to-board/

RADIAL MISALIGNMENT TEST DATA



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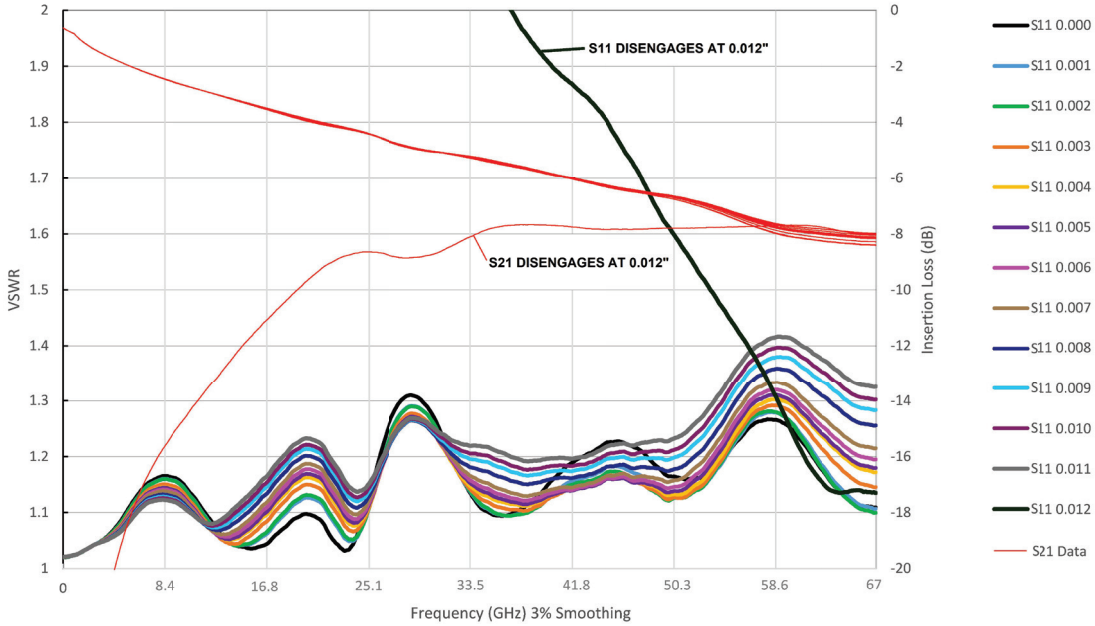
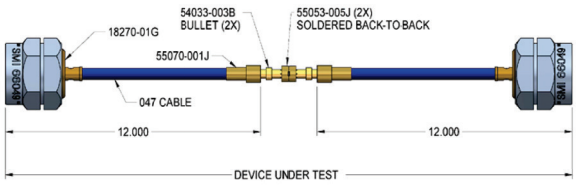
AXIAL MISALIGNMENT TEST DATA





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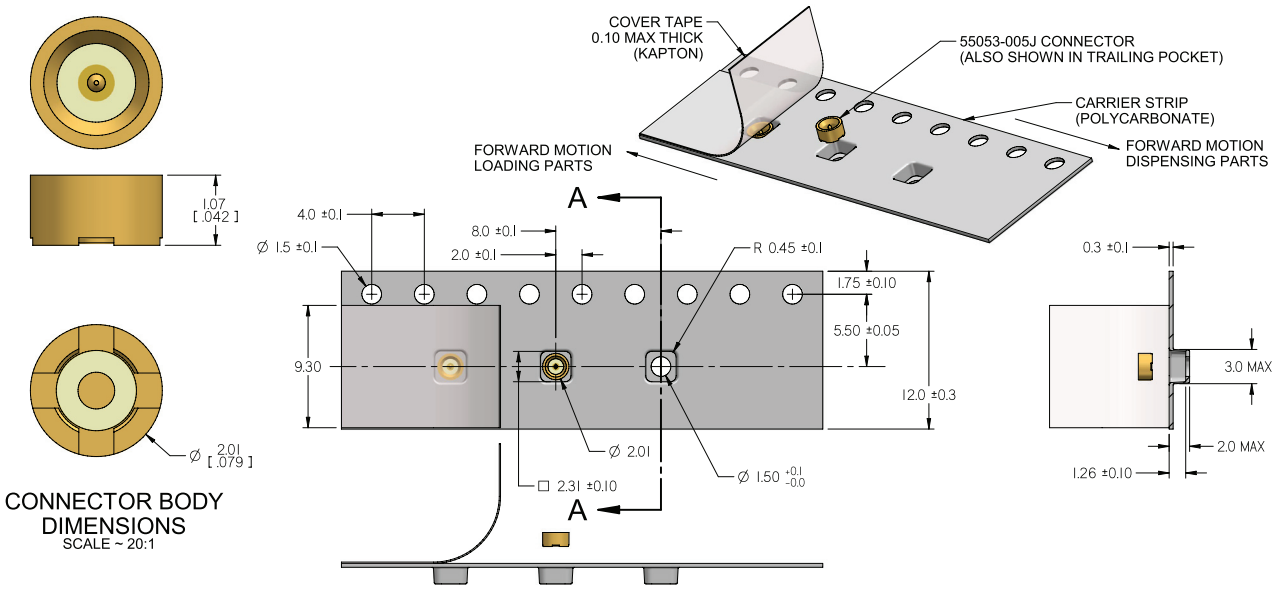
PACKAGING OPTIONS

SSBB receptacles are available in a tape and reel format in quantities of 500 or 1,000 on a 13-inch reel that accommodates most pick-and-place tape feeders.

Both bullets and receptacles can be purchased in trays. Contact us for further details.



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