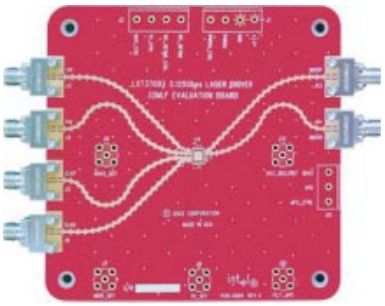
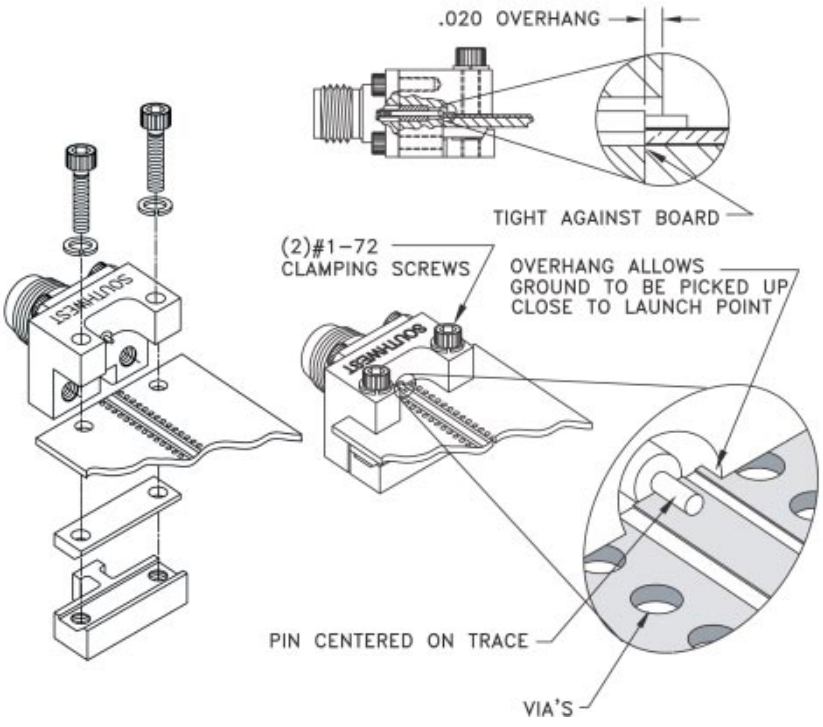
End Launch Connectors

Super SMA, 2.92mm, or 2.40mm



Southwest Microwave's End Launch connectors allow a low VSWR, low return loss, launch to 50 GHz to a board with only 2 through holes added to the board. They are recommended for multi-layer boards with coplanar waveguide or single layer microstrip circuit boards. Available fully assembled with SMA, 2.92mm, or 2.40mm connectors.



FEATURES:

- Works on Multi-layer boards with coplanar waveguide.
- Works on single layer boards with microstrip.
- Shipped fully assembled.
- The internal transition is designed to > 50 GHz.
- Connector types available are SMA, 2.92mm, or 2.40mm (frequency will be limited by connector type).
- Only 2 holes needed on the circuit board for mounting.
- New bottom clamp design improves grounding.

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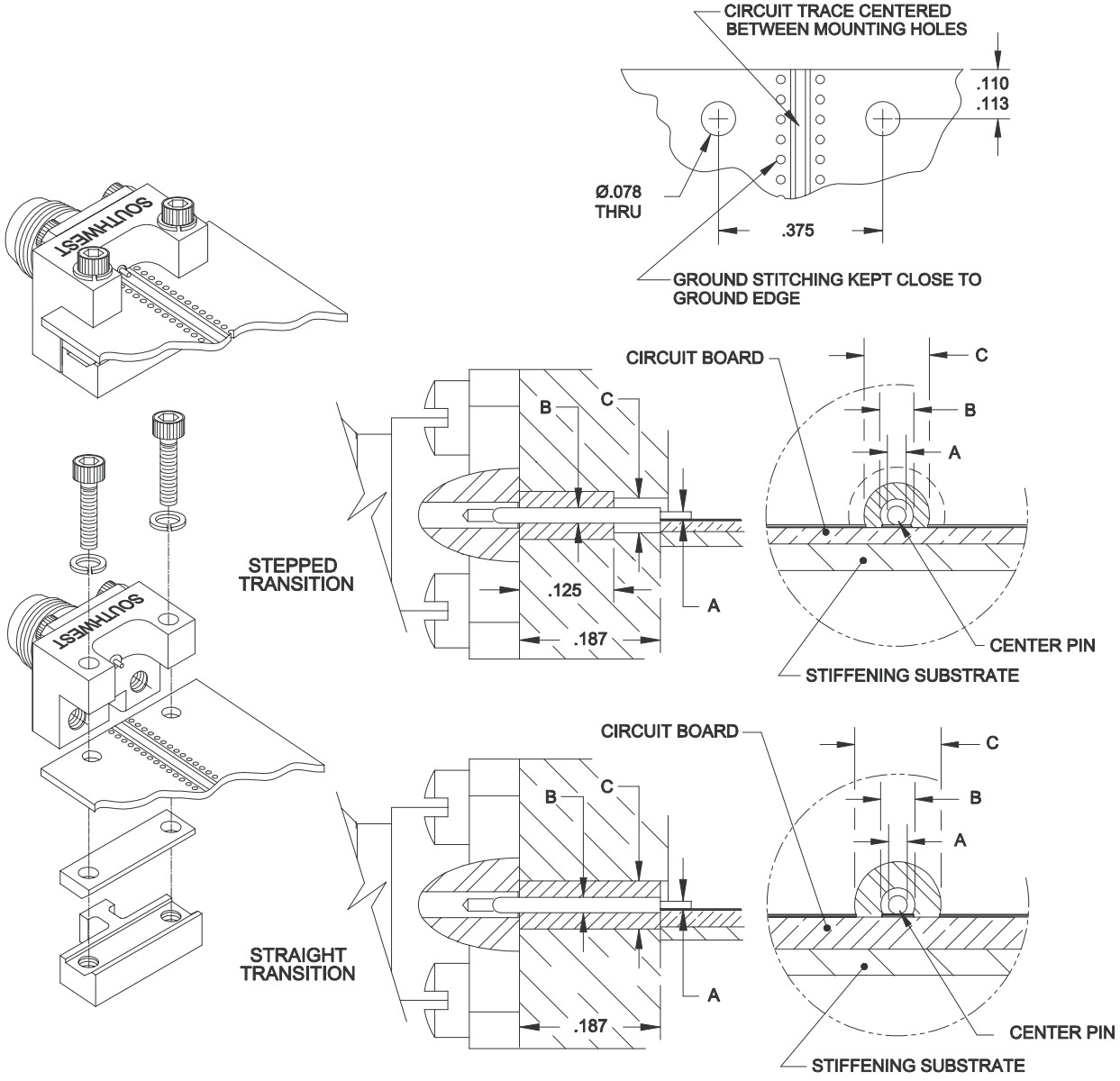
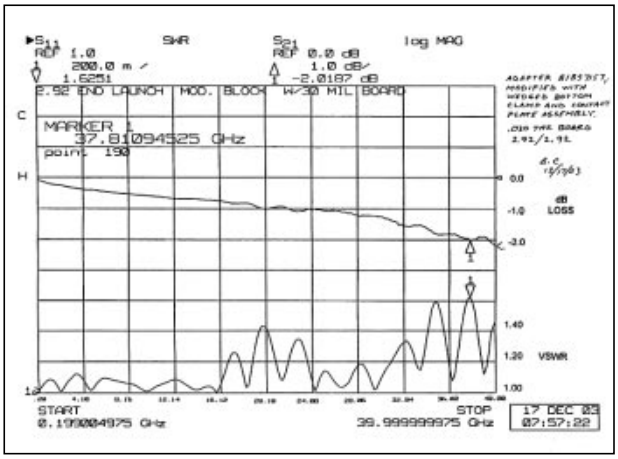


		END LAUNCH CONNECTOR MODEL NUMBERS											
LAUNCH TRANSITION		SMA CONNECTOR (27 GHz)		2.92mm CONNECTOR (40 GHz)		2.40mm CONNECTOR (50.0 GHz)		TRANSITION DIAMETERS			COPLANAR	MICROSTRIP CIRCUIT GEOMETRY	
THRU HOLE	PIN DIA.	JACK (FEMALE)	PLUG (MALE)	JACK (FEMALE)	PLUG (MALE)	JACK (FEMALE)	PLUG (MALE)	A	B	C	RECOMMENDED GROUND TO GROUND SPACING	OPTIMAL SUBSTRAIGHT THICKNESS	OPTIMAL TRACE WIDTH
STRAIGHT	.010	292-04A-5	293-01A-5	1092-03A-5	1093-01A-5	1492-02A-5	1493-01A-5	.010	.020	.0635	.045" TO .062"	.027"	.010"-.063"
STEPPED	.010	292-05A-5	293-02A-5	1092-02A-5	1093-02A-5	1492-01A-5	1493-02A-5	.010	.020	.0465	.037" TO .045"	.018"	.010"-.047"
STRAIGHT	.007	292-06A-5	293-03A-5	1092-04A-5	1093-03A-5	1492-03A-5	1493-03A-5	.007	.012	.0390	.026" TO .037"	.016"	.007"-.039"
STEPPED	.007	292-07A-5	293-04A-5	1092-01A-5	1093-04A-5	1492-04A-5	1493-04A-5	.007	.012	.0276	.020" TO .026"	.010"	.007"-.027"

Key Data:

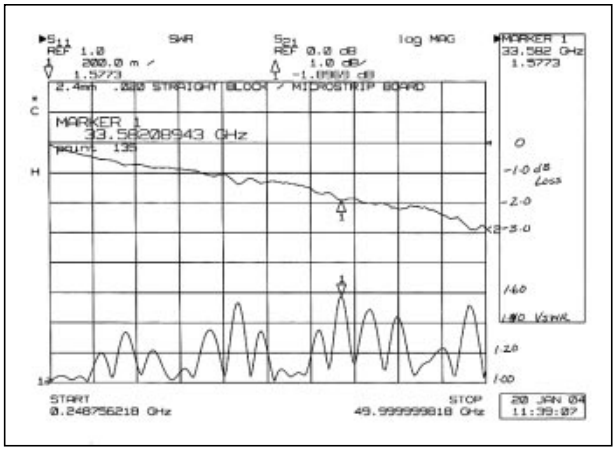
Coplanar Data



1092-04A-5 (2.92mm)

This plot shows the VSWR and insertion loss to 40 GHz on a 1 inch long test board. The test board is used with the 2 connectors as a 2 port device so the values are for the whole assembly. The test board substrate material is Rogers 4350.

Microstrip Data



1492-02A-5 (2.40mm)

Microstrip data 1492-02A-5 The above plot shows the VSWR and insertion loss of an 8 mil microstrip board with the new bottom clamp end launch with 2.40mm connectors. The test board is used with the 2 connectors as a 2 port device so the values are for the whole assembly. The test board substrate material is Rogers 4350.

This shows that the new design works with single layer microstrip as well as with coplanar circuits. The results of this test are not optimal as the circuit and the end launch were not matched properly. The only microstrip board available was a .008" thick and the only new end launch connector was the 1492-04A-5 which has the largest pin and outer conductor diameter available. This caused a large inductive mismatch at the launch.

Definitions:

Coplanar ground plane spacing = trace width + gap + gap. This is the distance from the inside edge of one top ground plane to the inside edge of the other top ground plane.

Optimal substrate thickness *(see below for detail):*
For microstrip this is the substrate thickness that will best match the end launch connector. For coplanar this is not as important an issue as the ground plane spacing.

Optimal trace width *(see below for detail):*
This is the trace width that will best match the end launch pin. For traces much larger than the pin they can be tapered down for a better match.

Straight thru hole: The dielectric around the launch pin extends all the way through the body of the transition block. This is for wider ground plane spacing or thicker circuit boards.

Stepped thru hole: The dielectric around the launch pin ends before the launch and there is an air line at the launch. This is for more narrow ground plane spacing or thinner circuit boards.

Ground stitching: These are vias connecting the top ground planes with the substrate ground. The purpose of the vias is to ensure both coplanar ground planes stay at the same potential. The best placement of these is near the trace at a distance of 1/4 wavelength of the highest frequency.

Maximum board thickness:
The maximum board thickness is .110 inches.

Microstrip to coplanar transition: When using microstrip on a multilayer board or on a board where the microwave ground is not accessible then a microstrip to coplanar transition should be used.

Choosing the correct launch transition:

(refer to drawings on opposite page)

For Coplanar:
Choose the launch transition where dimension C, the outer conductor of the launch (coax ground), is matched to the ground plane spacing.

The ***ground plane spacing*** = trace width + gap + gap. This is the distance from the inside edge of one top ground plane to the inside edge of the other top ground plane.

For microstrip:
Choose the transition that will best match the substrate thickness. This is the transition that has a minimal discontinuity between the microstrip ground plane and the outer conductor of the launch.

The ***optimal substrate thickness*** = outer conductor radius – inner conductor radius = C/2-A/2 = (C-A)/2. This is the distance from the bottom of the launch pin to the outer diameter of the end launch.

The ***optimal trace width*** is <C and >A. This is the width of the pin, to the outer diameter of end launch. For traces much larger than the pin the trace can be tapered for a better match.

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Installation Procedure

Step 1: Mount the end launch connector on the board in the desired position.

Step 2: Ensure the launch pin is centered on the trace.

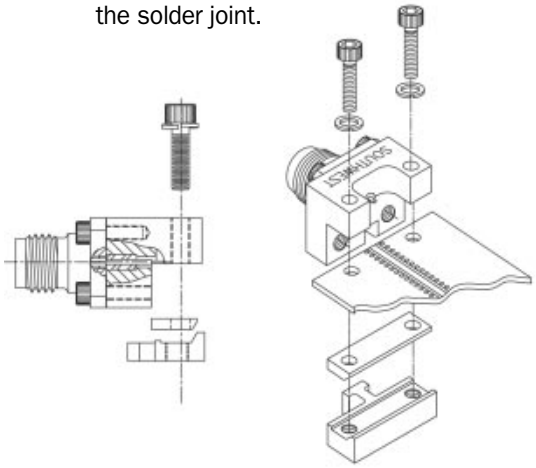
Step 3: Ensure the transition block is tight against the board.

Step 4: Tighten the 1-72 mounting screws until the connector is secured.

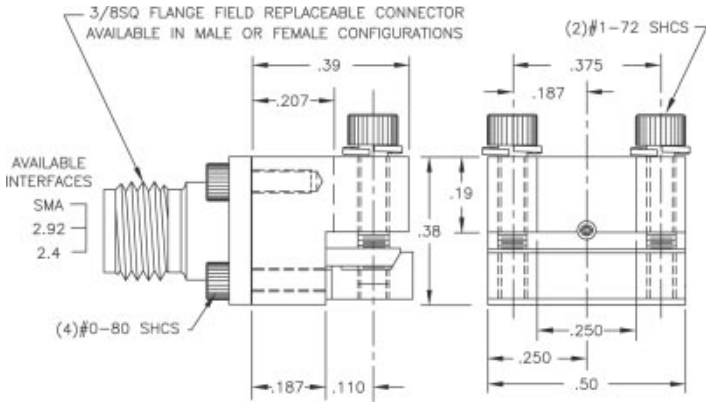
Step 5: Solder the launch pin to the trace. (Note: Be sure the solder flows the entire length of the launch pin/trace contact area.)

Step 6: Remove any excess solder. (Note: Excess solder will affect performance.)

Step 7: Clean any flux or other residue from around the solder joint.



Dimensions:

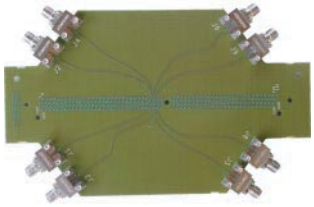


Accessories:

Pin Diameter: (Termination)	(Barrel)	Transition	Launch Pin / Dielectric
0.010"	.020"	straight	**290-13G**
0.010"	.020"	stepped	**290-13P-14D**
0.007"	.012"	straight	**1090-11G**
0.007"	.012"	stepped	**1090-11P-12D**

Examples of Applications

- Chip set evaluation boards.
- Test boards.
- Not limited to launching off the edge of the board only.
- Use them to test boards before assembly.
- Custom flanges used to mount boards securely.



Special Version

SOUTHWEST MICROWAVE

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