Surface Mount

Power Splitter/Combiner

SCP-4-122-75+

4 Way-0° 75Ω 5 to 1250 MHz

CASE STYLE: YY161

+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
13"	500

Features

- wideband, 5 to 1250 MHz
- high isolation,25 dB typ
- excellent amplitude unbalance, 0.4 dB typ.

Applications

- DOCSIS® 3.1 Systems
- cellular
- CATV
- receivers/transmitters

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1250	MHz
Insertion Loss, above 6.0 dB	5-100	—	0.6	1.0	dB
	100-1000	—	1.1	1.9	
	1000-1250	—	2.0	2.9	
Isolation	5-1000	16	25	—	dB
	1000-1250	14	18	—	
Phase Unbalance	5-100	—	1.0	3.0	Degree
	100-1000	—	6.0	12.0	
	1000-1250	—	9.0	16.0	
Amplitude Unbalance	5-1000	—	0.5	0.9	dB
	1000-1250	—	0.9	1.5	
VSWR (Port S)	5-1000	—	1.22	1.32	:1
	1000-1250	—	1.28	1.49	
VSWR (Port 1 - 4)	5-1000	—	1.28	1.57	:1
	1000-1250	—	1.57	2.32	

Maximum Ratings

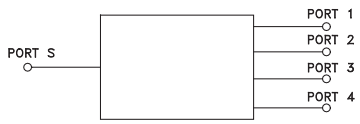
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.
Internal Dissipation	0.375W max.

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

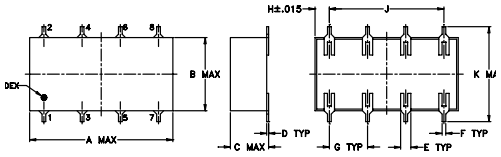
Function	Pin Number
SUM PORT	3
PORT 1	2
PORT 2	4
PORT 3	6
PORT 4	8
GND	1,5,7

Electrical Schematic

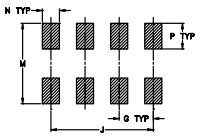


SCP-4-122-75+

Outline Drawing



PCB Land Pattern



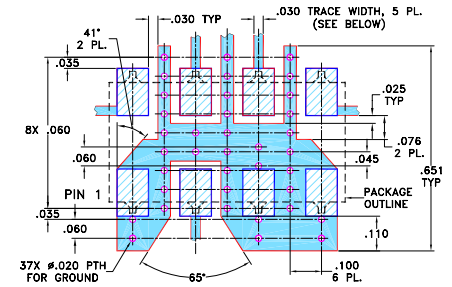
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
0.75	0.38	0.28	0.01	0.05	0.02	0.2
19.05	9.65	7.11	0.25	1.27	0.51	5.08

H	J	K	M	N	P	wt
0.075	0.6	0.45	0.47	0.1	0.15	grams
1.91	15.24	11.43	11.94	2.54	3.81	1.60

Demo Board MCL P/N: TB-184
Suggested PCB Layout (PL-175)



NOTE: 1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS: .030 ± .002; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

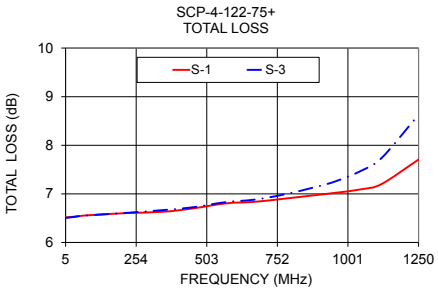
DENOTES PCB COPPER LAYOUT

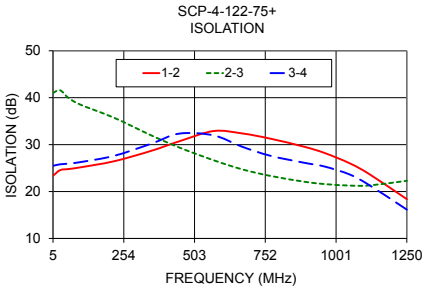
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

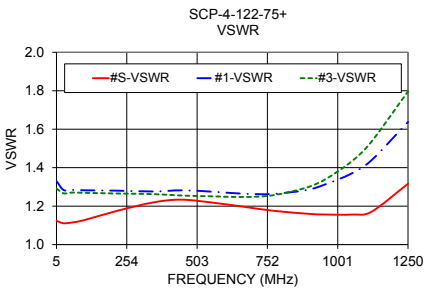
Typical Performance Data

Freq. (MHz)	Total Loss[1] (dB)				Amp. Unbal. (dB)	Isolation (dB)			Phase Unbal. (deg.)	VSWR	VSWR	VSWR	VSWR	VSWR
	S-1	S-2	S-3	S-4		1-2	2-3	3-4		S	1	2	3	4
5	6.51	6.52	6.51	6.51	0.01	23.35	41.04	25.49	0.04	1.12	1.33	1.33	1.29	1.29
30	6.53	6.52	6.52	6.52	0.01	24.56	41.58	25.80	0.21	1.11	1.28	1.28	1.27	1.26
60	6.55	6.55	6.55	6.55	0.00	24.80	39.92	25.94	0.43	1.12	1.28	1.29	1.27	1.27
100	6.57	6.57	6.56	6.57	0.01	25.14	38.55	26.26	0.69	1.13	1.28	1.29	1.27	1.27
220	6.60	6.62	6.61	6.61	0.02	26.46	35.72	27.61	1.54	1.18	1.28	1.29	1.27	1.27
350	6.63	6.69	6.67	6.67	0.06	28.67	31.99	30.18	2.29	1.22	1.28	1.29	1.26	1.28
450	6.70	6.77	6.72	6.72	0.07	30.72	29.37	32.35	2.87	1.23	1.28	1.29	1.25	1.28
570	6.80	6.90	6.83	6.83	0.10	32.89	26.67	31.97	3.65	1.22	1.27	1.28	1.25	1.29
670	6.84	6.97	6.88	6.86	0.13	32.39	24.74	29.56	4.45	1.20	1.26	1.28	1.25	1.29
770	6.90	7.08	6.98	6.95	0.19	31.27	23.33	27.62	5.21	1.18	1.26	1.30	1.26	1.30
890	6.98	7.24	7.15	7.09	0.26	29.53	22.08	26.12	6.22	1.16	1.28	1.33	1.30	1.34
960	7.02	7.34	7.26	7.19	0.31	28.23	21.60	25.34	6.90	1.16	1.31	1.36	1.34	1.39
1050	7.10	7.49	7.48	7.37	0.40	26.00	21.27	23.61	7.81	1.16	1.37	1.42	1.43	1.48
1120	7.20	7.66	7.74	7.59	0.54	23.64	21.31	21.29	8.47	1.17	1.44	1.50	1.53	1.59
1250	7.71	8.31	8.63	8.39	0.92	18.38	22.30	16.15	9.57	1.32	1.64	1.68	1.80	1.85

1. Total Loss = Insertion Loss + 6dB splitter loss.







Additional Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

4 Way-0° Power Splitter/Combiner SCP-4-122-75+

Typical Performance Data

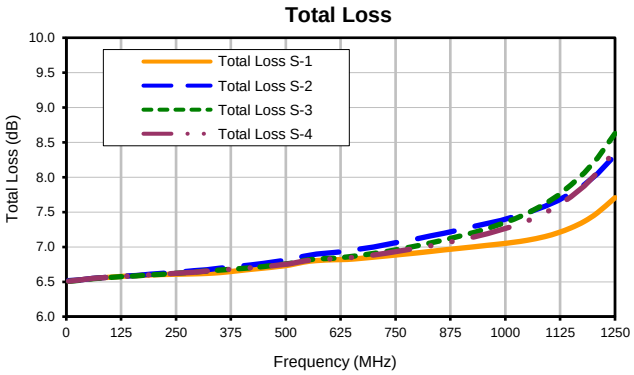
FREQ. (MHz)	TOTAL LOSS[1] (dB)				AMP. UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (deg.)
	S-1	S-2	S-3	S-4		1-2	2-3	3-4	
5	6.51	6.52	6.51	6.51	0.06	23.35	41.04	25.49	0.17
30	6.53	6.52	6.52	6.52	0.06	24.56	41.58	25.80	0.44
60	6.55	6.55	6.55	6.55	0.04	24.80	39.92	25.94	0.81
100	6.57	6.57	6.56	6.57	0.03	25.14	38.55	26.26	1.22
130	6.58	6.58	6.58	6.58	0.04	25.42	37.82	26.52	1.49
160	6.59	6.59	6.59	6.59	0.05	25.73	37.18	26.82	1.74
190	6.60	6.61	6.60	6.60	0.07	26.07	36.42	27.19	1.97
220	6.60	6.62	6.61	6.61	0.09	26.46	35.72	27.61	2.19
260	6.61	6.64	6.62	6.63	0.12	27.04	34.57	28.28	2.48
290	6.61	6.66	6.64	6.64	0.13	27.54	33.74	28.85	2.71
320	6.62	6.67	6.65	6.65	0.16	28.07	32.87	29.49	2.90
350	6.63	6.69	6.67	6.67	0.20	28.67	31.99	30.18	3.05
380	6.65	6.72	6.68	6.68	0.24	29.25	31.20	30.89	3.10
420	6.68	6.74	6.70	6.70	0.27	30.09	30.12	31.78	3.05
450	6.70	6.77	6.72	6.72	0.28	30.72	29.37	32.35	3.04
480	6.72	6.79	6.74	6.74	0.28	31.39	28.67	32.79	3.07
510	6.74	6.82	6.76	6.76	0.28	32.03	28.02	32.92	3.14
540	6.78	6.87	6.81	6.79	0.29	32.60	27.35	32.69	3.20
570	6.80	6.90	6.83	6.83	0.29	32.89	26.67	31.97	3.32
610	6.82	6.92	6.84	6.83	0.30	32.80	25.79	30.93	3.46
640	6.82	6.94	6.85	6.84	0.31	32.65	25.24	30.24	3.57
670	6.84	6.97	6.88	6.86	0.31	32.39	24.74	29.56	3.68
700	6.85	7.00	6.90	6.88	0.32	32.09	24.29	28.90	3.83
730	6.87	7.03	6.93	6.91	0.32	31.78	23.86	28.31	3.96
770	6.90	7.08	6.98	6.95	0.32	31.27	23.33	27.62	4.20
800	6.91	7.12	7.02	6.98	0.33	30.87	22.98	27.16	4.44
830	6.94	7.16	7.06	7.02	0.34	30.41	22.64	26.78	4.66
860	6.96	7.20	7.10	7.05	0.36	29.97	22.36	26.43	4.96
890	6.98	7.24	7.15	7.09	0.38	29.53	22.08	26.12	5.32
930	7.00	7.30	7.21	7.15	0.41	28.81	21.79	25.71	5.79
960	7.02	7.34	7.26	7.19	0.43	28.23	21.60	25.34	6.22
990	7.04	7.38	7.33	7.24	0.47	27.59	21.45	24.90	6.69
1020	7.07	7.44	7.40	7.30	0.52	26.85	21.34	24.34	7.15
1050	7.10	7.49	7.48	7.37	0.57	26.00	21.27	23.61	7.67
1090	7.15	7.58	7.61	7.49	0.68	24.70	21.24	22.38	8.38
1120	7.20	7.66	7.74	7.59	0.76	23.64	21.31	21.29	8.90
1150	7.27	7.77	7.89	7.72	0.87	22.48	21.40	20.13	9.48
1180	7.37	7.89	8.06	7.87	0.99	21.28	21.58	18.93	10.01
1210	7.49	8.05	8.27	8.07	1.11	20.04	21.83	17.72	10.54
1250	7.71	8.31	8.63	8.39	1.31	18.38	22.30	16.15	11.24

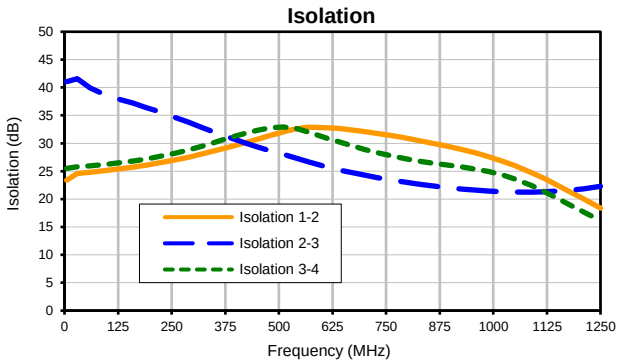
FREQ. (MHz)	VSWR (:1)				
	S	1	2	3	4
5	1.12	1.33	1.33	1.29	1.29
30	1.11	1.28	1.28	1.27	1.26
60	1.12	1.28	1.29	1.27	1.27
100	1.13	1.28	1.29	1.27	1.27
130	1.13	1.29	1.29	1.27	1.27
160	1.15	1.29	1.29	1.27	1.27
190	1.16	1.28	1.29	1.27	1.27
220	1.18	1.28	1.29	1.27	1.27
260	1.19	1.28	1.29	1.27	1.27
290	1.20	1.27	1.29	1.26	1.27
320	1.21	1.27	1.29	1.26	1.28
350	1.22	1.28	1.29	1.26	1.28
380	1.23	1.28	1.29	1.26	1.28
420	1.23	1.28	1.29	1.25	1.28
450	1.23	1.28	1.29	1.25	1.28
480	1.23	1.28	1.28	1.25	1.28
510	1.23	1.28	1.28	1.25	1.29
540	1.22	1.28	1.29	1.25	1.29
570	1.22	1.27	1.28	1.25	1.29
610	1.21	1.27	1.28	1.25	1.29
640	1.20	1.27	1.28	1.24	1.29
670	1.20	1.26	1.28	1.25	1.29
700	1.19	1.26	1.28	1.25	1.29
730	1.18	1.26	1.29	1.25	1.29
770	1.18	1.26	1.30	1.26	1.30
800	1.17	1.27	1.30	1.26	1.30
830	1.17	1.27	1.30	1.27	1.31
860	1.16	1.28	1.31	1.28	1.32
890	1.16	1.28	1.33	1.30	1.34
930	1.16	1.30	1.34	1.32	1.36
960	1.16	1.31	1.36	1.34	1.39
990	1.16	1.33	1.38	1.37	1.41
1020	1.15	1.35	1.40	1.40	1.44
1050	1.16	1.37	1.42	1.43	1.48
1090	1.16	1.41	1.46	1.49	1.54
1120	1.17	1.44	1.50	1.53	1.59
1150	1.19	1.48	1.54	1.58	1.65
1180	1.21	1.52	1.57	1.64	1.70
1210	1.25	1.56	1.62	1.71	1.76
1250	1.32	1.64	1.68	1.80	1.85

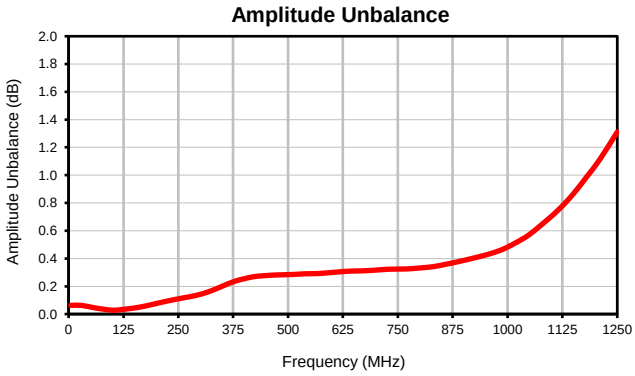
[1]Total Loss = Insertion Loss + 6dB Splitter Loss

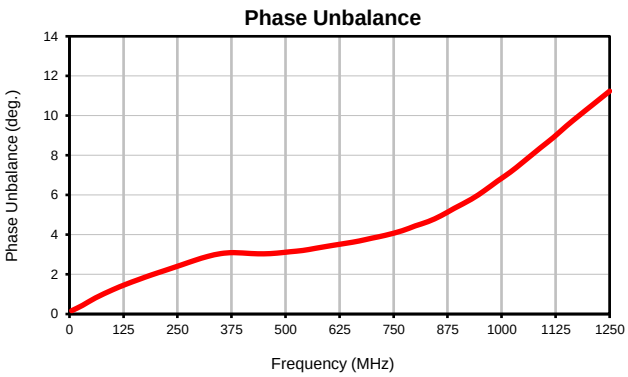
4 Way-0° Power Splitter/Combiner SCP-4-122-75+

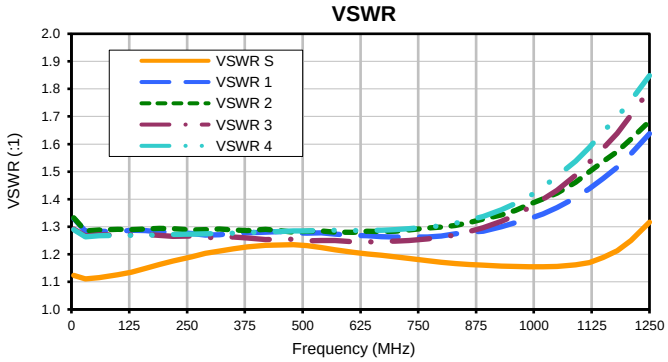
Typical Performance Curves







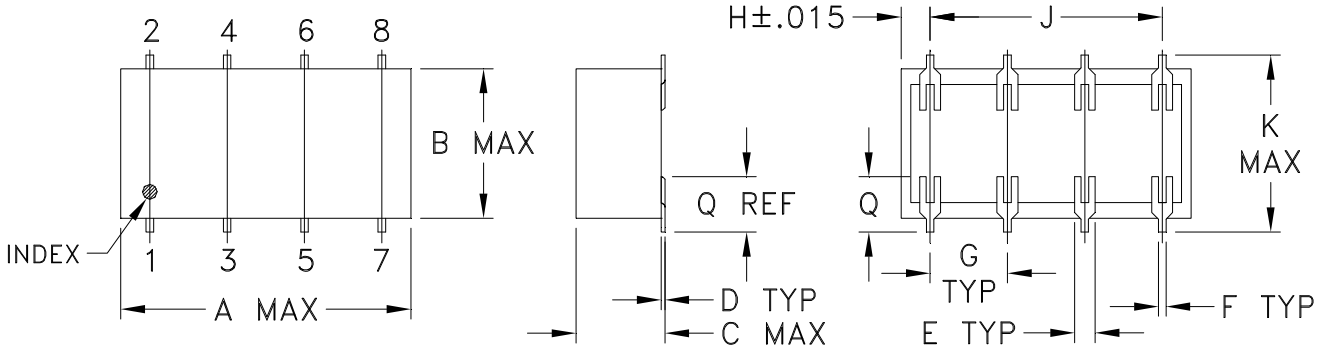




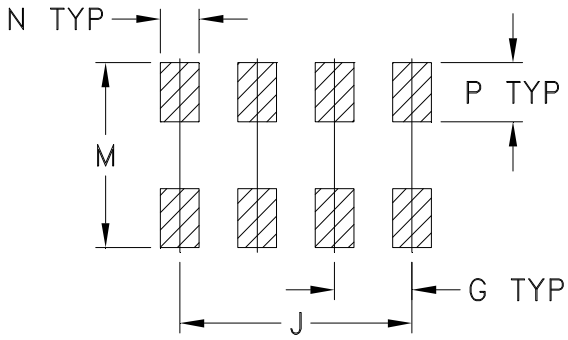
Case Style YY

Outline Dimensions

YY101
YY109
YY161



PCB Land Pattern



Suggested Layout
Tolerance to be within ±.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	WT. GRAMS
YY101*	.75 (19.05)	.38 (9.65)	.20 (5.08)	.010 (0.25)	.050 (1.27)	.020 (0.51)	.200 (5.08)	.075 (1.91)	.600 (15.24)	.450 (11.43)	-- --	.470 (11.94)	.100 (2.54)	.150 (3.81)	.148 (3.76)	1.6
YY109*			.20 (5.08)							.720 (18.29)	-- --	.740 (18.80)				1.6
YY161			.28 (7.11)							.450 (11.43)	-- --	.470 (11.94)				1.6

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate.
   For RoHS-5 Case Styles: Tin-Lead plate.
3. Special Tolerances: Termination thickness ± .003 inch.
4. * Denotes: For SCM mixers, long termination version (case YY109) is available upon request, consult factory. To order short termination version (case YY101) add -NL suffix.

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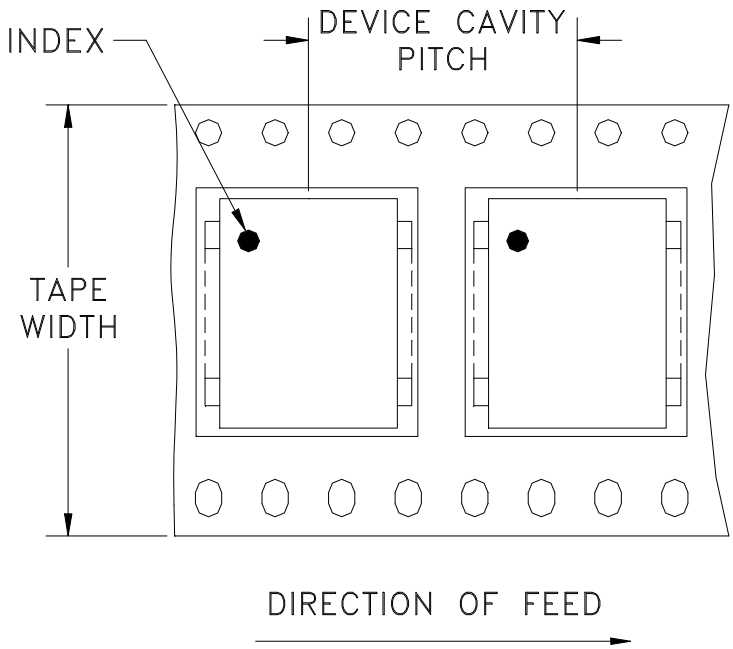
Tape & Reel Packaging TR-F5

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	500

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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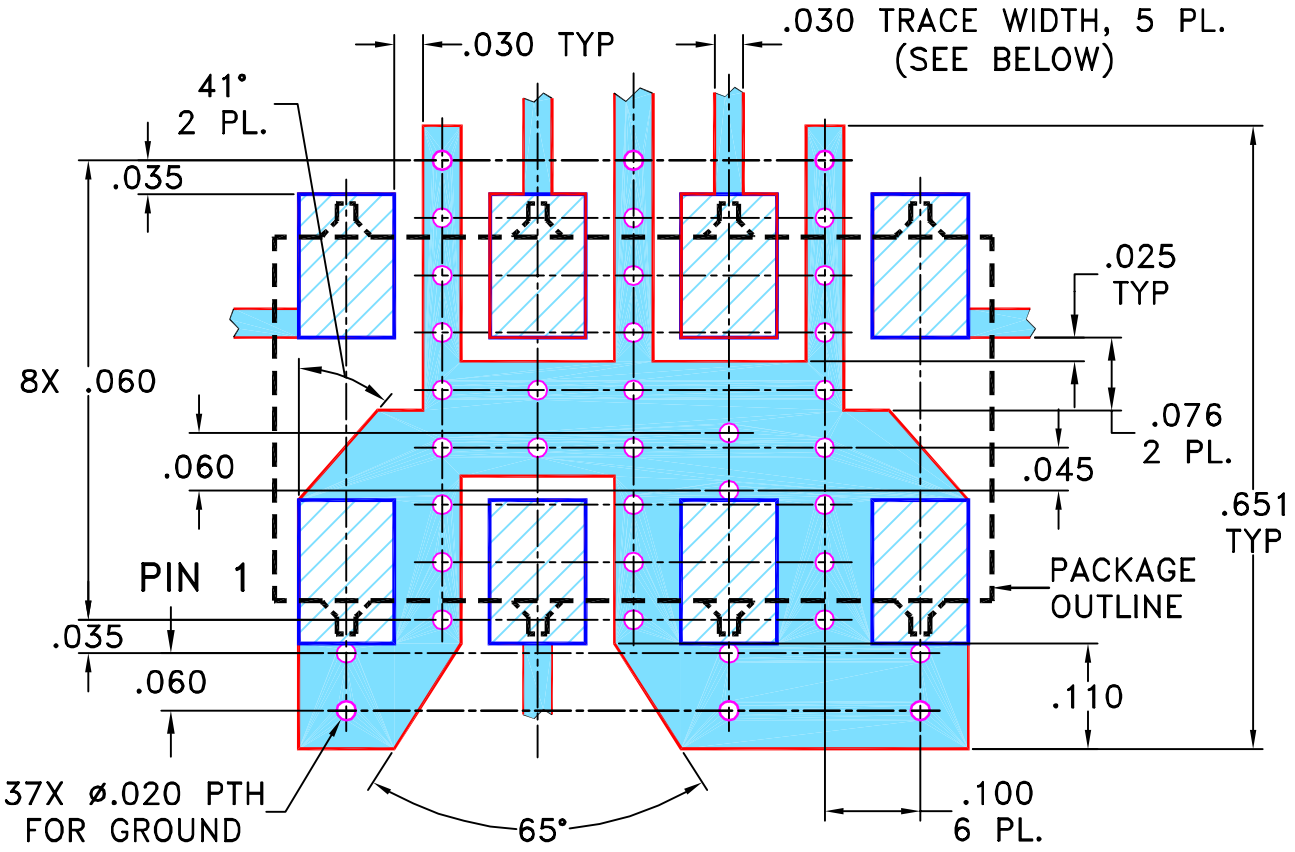
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M96392	NEW RELEASE	01/27/05	MMG	HY
A	M102713	UPDATED NOTES, ADDED "...WITH SMOBC"	01/20/06	GT	IL

SUGGESTED MOUNTING CONFIGURATION FOR YY161 CASE STYLE, "bv" PIN CONNECTION



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	MMG	01/24/05
TOLERANCES ON:	CHECKED	AV	01/27/05
2 PL DECIMALS ±	APPROVED	HY	01/27/05
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

ASHEETA1.DWG REV:A DATE:01/12/95

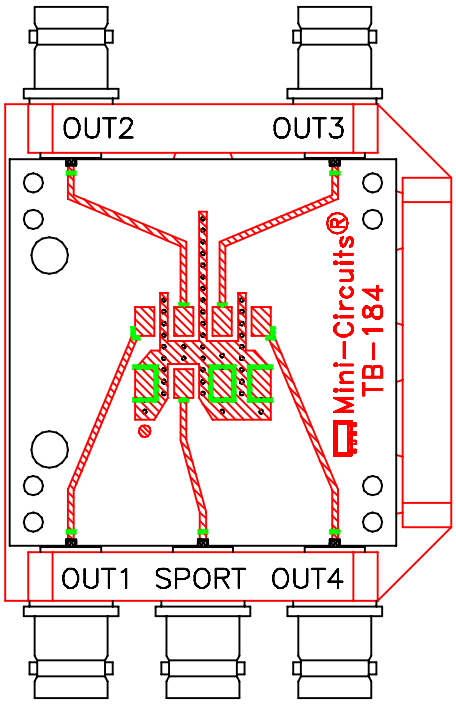
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, bv, 75, YY161, SCP, TB-184

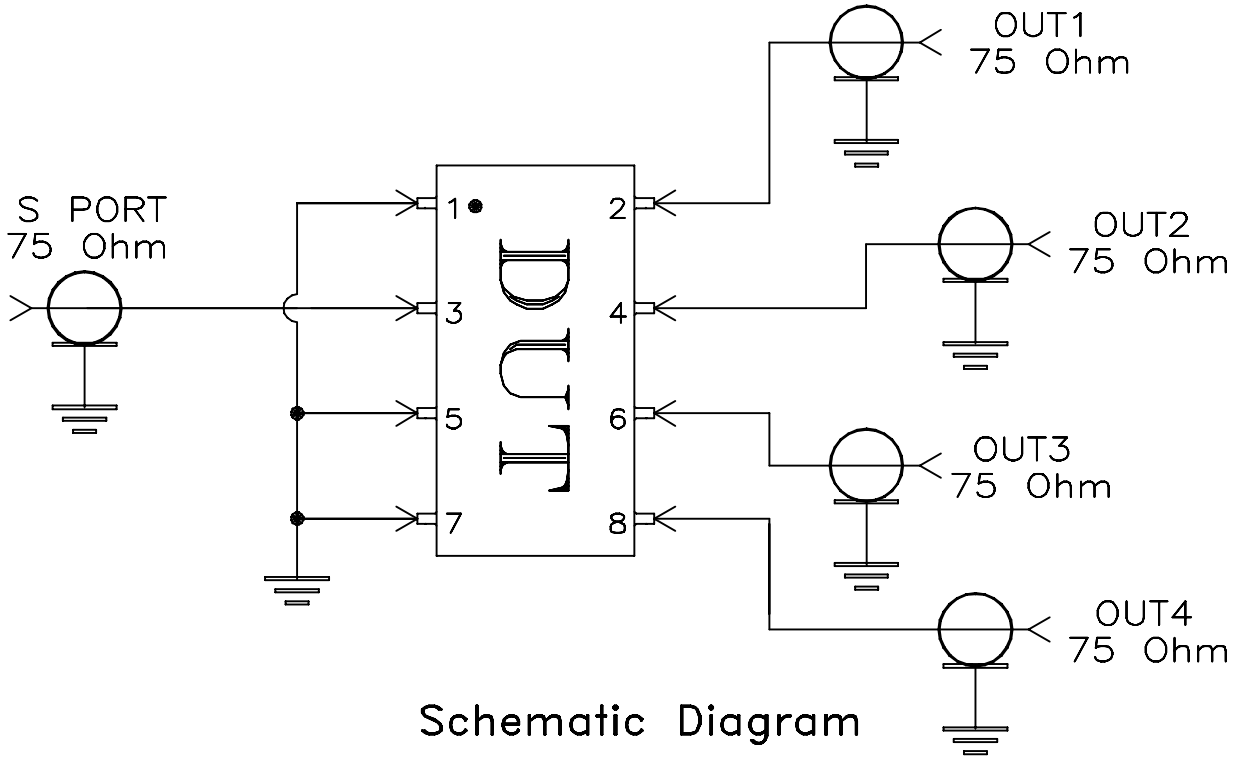
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-175	A

FILE:	SCALE:	SHEET:
98PL175	5:1	1 OF 1

Evaluation Board and Circuit



TB-184



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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Environmental Specifications ENV02T1

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215