

top hat<sup>®</sup>  
**Surface Mount**  
**Power Splitter/Combiner**

**SBTC-2-10-75X+**

2 Way-0° 75Ω 10 to 1000 MHz

**Features**

- 75 ohm input, 50 ohm output
- very good isolation, 24 dB typ.
- excellent amplitude unbalance, 0.15 dB typ.
- very good phase unbalance, 1 deg. typ.
- temperature stable base
- small size, 0.15"x0.15"x0.15"
- low cost
- aqueous washable
- protected by US patent 6,963,255



Generic photo used for illustration purposes only

CASE STYLE: AT1667

**+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

**Applications**

- impedance matching
- balanced amplifiers

**Electrical Specifications**

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		10		1000	MHz
Insertion Loss Above 3.0 dB	10 - 100	—	0.7	1.2	dB
	100 - 500	—	0.6	1.2	
	500 - 1000	—	0.7	1.4	
Isolation	10 - 100	20	35	—	dB
	100 - 500	20	28	—	
	500 - 1000	17	21	—	
Phase Unbalance	10 - 100	—	—	3	Degree
	100 - 500	—	—	3	
	500 - 1000	—	—	5	
Amplitude Unbalance	10 - 100	—	—	0.7	dB
	100 - 500	—	—	0.6	
	500 - 1000	—	—	0.6	

**Maximum Ratings**

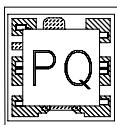
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Internal Dissipation	0.125W max

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

**Pin Connections**

Function	Pin Number
SUM PORT	6
PORT 1	3
PORT 2	4
GROUND	1,2
NOT USED	5

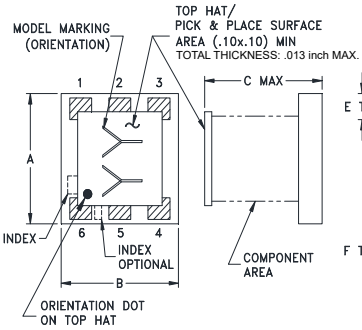
**Product Marking**



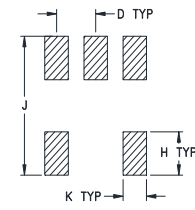
**Electrical Schematic**



## Outline Drawing



## PCB Land Pattern

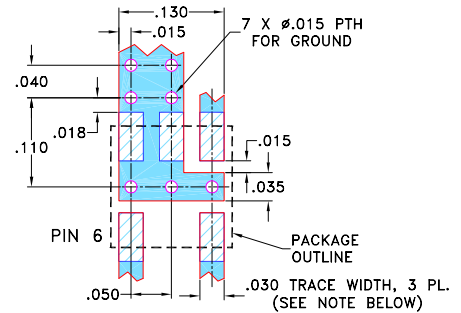


Suggested Layout, Tolerance to be within ±.002

## Outline Dimensions (inch/mm)

A	B	C	D	E	F
.150	.150	.150	.050	.030	.025
3.81	3.81	3.81	1.27	0.76	0.64
G	H	J	K	wt	
.028	.050	.160	.030	grams	
0.71	1.27	4.06	0.76	0.10	

## Demo Board MCL P/N: TB-277 Suggested PCB Layout (PL-153)

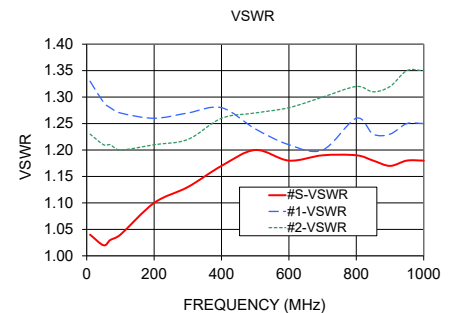
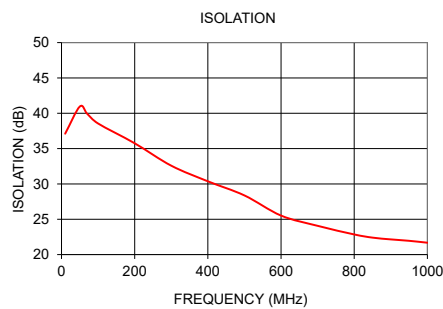
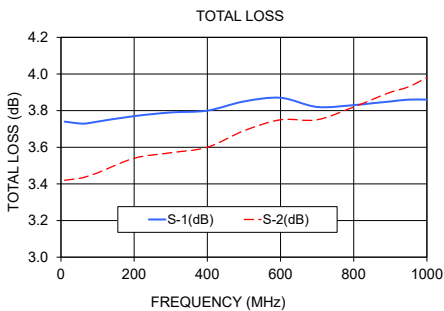


- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $0.030 \pm 0.002$ "; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Typical Performance Data

Frequency (MHz)	Total Loss <sup>1</sup> (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
10.00	3.74	3.42	0.31	37.11	0.66	1.04	1.33	1.23
50.00	3.73	3.43	0.30	40.95	0.14	1.02	1.29	1.21
70.00	3.73	3.44	0.29	39.94	0.14	1.03	1.28	1.21
100.00	3.74	3.46	0.29	38.55	0.13	1.04	1.27	1.20
200.00	3.77	3.54	0.22	35.75	0.09	1.10	1.26	1.21
300.00	3.79	3.57	0.22	32.58	0.54	1.13	1.27	1.22
400.00	3.80	3.60	0.20	30.37	0.60	1.17	1.28	1.26
500.00	3.85	3.69	0.16	28.37	0.64	1.20	1.24	1.27
600.00	3.87	3.75	0.12	25.52	0.74	1.18	1.21	1.28
700.00	3.82	3.75	0.07	24.07	0.75	1.19	1.20	1.30
800.00	3.83	3.82	0.03	22.85	0.77	1.19	1.26	1.32
850.00	3.84	3.86	0.03	22.40	0.73	1.18	1.23	1.31
900.00	3.85	3.90	0.06	22.15	0.69	1.17	1.23	1.32
950.00	3.86	3.93	0.08	21.95	0.64	1.18	1.25	1.35
1000.00	3.86	3.98	0.11	21.68	0.58	1.18	1.25	1.35

1. Total Loss = Insertion Loss + 3dB 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-Circuits' 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](http://www.minicircuits.com/MCLStore/terms.jsp)