



Mini-Circuits

SURFACE MOUNT ^{top hat} Bias Tee

50Ω Wideband 50 to 6000 MHz

TCBT-6G+

FEATURES

- Wideband, 50 to 6000 MHz
- Low Insertion Loss, 0.7 dB Typ.
- Miniature Surface Mount 0.15x0.15"
- Aqueous Washable
- Protected by US Patent 7,012,486



Generic photo used for illustration purposes only

CASE STYLE: GU1604

APPLICATIONS

- Biasing Amplifiers
- Biasing of Laser Diodes
- Biasing of Active Antennas

+RoHS Compliant

The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		50		6000	MHz
Insertion Loss	50-500		0.2	0.8	dB
	500-3000		0.7	1.8	
	3000-6000		1.1	2.5	
Isolation (RF Port to DC Port) (RF & DC Port to DC Port)	50-500	38	52		dB
	500-3000	18	28		
	3000-6000	14	19		
VSWR	50-500		1.05	1.5	:1
	500-3000		1.1	1.3	
	3000-6000		1.2	2.2	

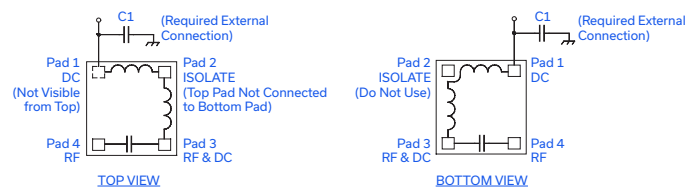
External C1(0.01 µF) is required. See functional schematic and PCB layout.

ABSOLUTE MAXIMUM RATINGS

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
RF Power	+30 dBm max.
Voltage at DC Port	+25 V max.
DC Current	200 mA

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

FUNCTIONAL SCHEMATIC



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ECO-026344
TCBT-6G+
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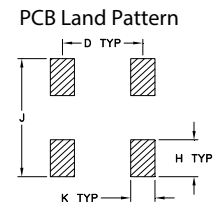
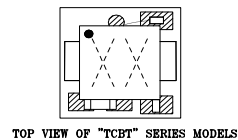
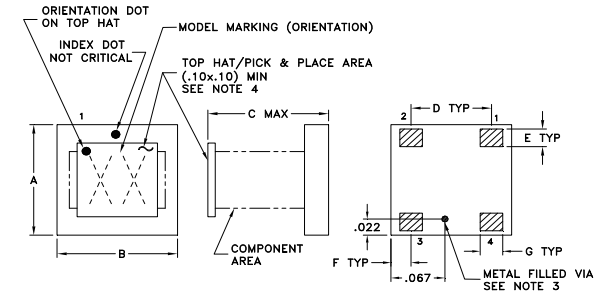


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PAD CONNECTIONS

RF	4
RF & DC	3
DC	1
ISOLATE (See PCB Layout)	2

OUTLINE DRAWING



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN $\pm .002$

Notes:

3. Must be isolated from external conductors on mounting surface. Suggested solder mask area is .025 x .025. At Mini-Circuits option via may be removed.

4. Top-Hat total thickness: .013 inches MAX.

Figure 1 is a detailed PCB layout for a 100 MHz, 10 W CW transmitter. The layout is on a blue substrate with a red coplanar waveguide (CPW) trace. The trace has a width of .038 inches and a gap of .013 inches. The layout includes a package outline, a capacitor C1 (.010 uF, 0603 size), and various dimensions for the layout, including .020 inch line width, .018 inch gap, .058 inch 5 PL, .010 inch gap, and .050 inch 5 PL. The layout is labeled with dimensions and component values.

CAPACITOR C1: .010 μ F, 0603 SIZE

NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020 ± 0.0015 ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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.

OUTLINE DIMENSIONS (Inches)

A	B	C	D	E	F
.150	.150	.150	.100	.030	.025
3.81	3.81	3.81	2.54	0.76	0.64
G	H	J	K		wt
.028	.050	.160	.030		grams
0.71	1.27	4.06	0.76		0.10

TAPE & REEL INFORMATION: F77



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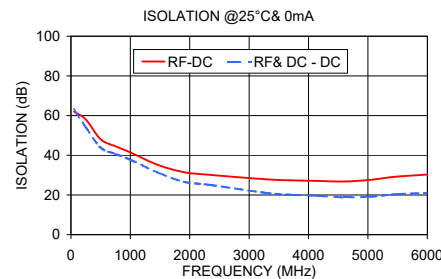
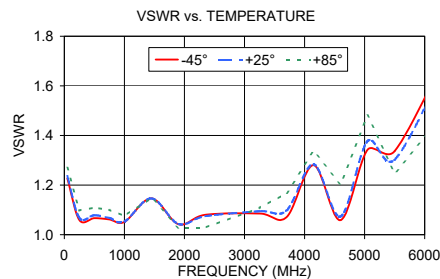
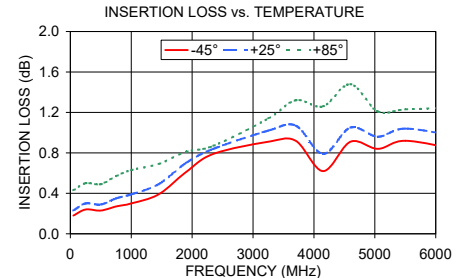
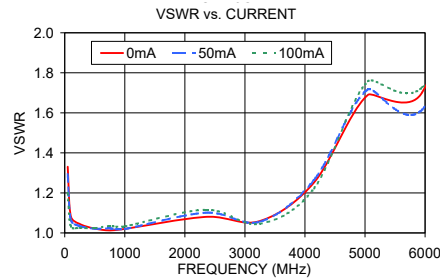
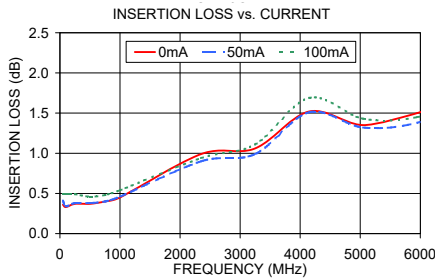
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TCBT-6G+

50Ω Wideband 50 to 6000 MHz

TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB) with Temperature			VSWR (:1) with Temperature			Isolation (dB) 0 mA	
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	RF-DC	RF & DC - DC
50	0.18	0.23	0.43	1.23	1.24	1.27	62.01	63.14
250	0.24	0.30	0.50	1.06	1.07	1.10	58.05	54.10
500	0.23	0.29	0.49	1.07	1.08	1.11	48.04	43.88
750	0.27	0.35	0.57	1.06	1.07	1.10	44.58	40.67
1000	0.30	0.39	0.63	1.05	1.05	1.08	41.47	37.79
1450	0.39	0.49	0.69	1.15	1.15	1.15	35.33	31.47
1900	0.61	0.70	0.81	1.04	1.04	1.03	31.51	26.67
2350	0.79	0.84	0.87	1.08	1.07	1.03	30.13	25.03
3250	0.91	1.02	1.14	1.09	1.09	1.11	27.98	21.20
3700	0.92	1.07	1.32	1.07	1.10	1.17	27.37	20.10
4150	0.62	0.79	1.26	1.28	1.28	1.34	27.10	19.55
4600	0.91	1.05	1.48	1.06	1.07	1.20	26.78	18.79
5050	0.84	0.96	1.21	1.34	1.38	1.48	27.64	19.18
5500	0.92	1.04	1.23	1.34	1.30	1.25	29.30	20.39
6400	0.83	0.96	1.25	1.74	1.70	1.51	31.01	21.50



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/terms/viewterm.html

