



Mini-Circuits

SURFACE MOUNT

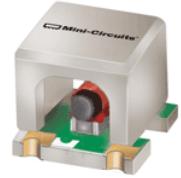
Bias Tee

TCBT-14R+

50Ω Wideband 10 MHz to 10 GHz

THE BIG DEAL

- Wideband, 10 MHz to 10 GHz
- Low Insertion Loss, 0.6 dB Typ.
- Excellent VSWR, 1.25:1 Typ.
- Miniature Surface Mount 0.15x0.15"
- Aqueous Washable
- Protected by US Patent 8,644,029



Generic photo used for illustration purposes only

CASE STYLE: GU1414-2

+RoHS Compliant

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

APPLICATIONS

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

PRODUCT OVERVIEW

The TCBT-14R+ surface mount bias tee provides outstanding application versatility, covering an ultra-wide frequency range of 10 MHz to 10 GHz with excellent isolation performance over the band. Its miniature package and surface mount are space-efficient and practical for automated pick and place operation. Designed to handle +30 dBm of RF power and 200 mA input current, the TCBT-14R+ is ideal for many communications and testing applications including biasing of amplifiers and MMICs, laser diodes and active antennas.

KEY FEATURES

Feature	Advantages
Wideband	The TCBT-14R+ achieves wide 10 MHz to 10 GHz frequency range to serve a large host of applications.
Low Insertion Loss	0.6 dB typ. insertion loss enables highly efficient signal amplification with minimal impact on gain.
Excellent VSWR	Well-matched for 50Ω systems at 1.25:1 typ. VSWR.
Miniature Size	Its miniature footprint (0.15x0.15") makes the TCBT-14R+ a high-performing space-saver in surface mount assemblies.
Aqueous Washable	The TCBT-14R+ features a unique open casing style which allows easy washing without trapping water.





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Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		10		10000	MHz
Insertion Loss	10-10000	0.05	0.6	1.6	dB
Isolation ¹	10-10000	15	33		dB
VSWR	10-10000	1.02	1.25	1.7	:1
DC Resistance, DC to RF and DC Port	10-10000		1.0		Ohms

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.
Input Current	200 mA





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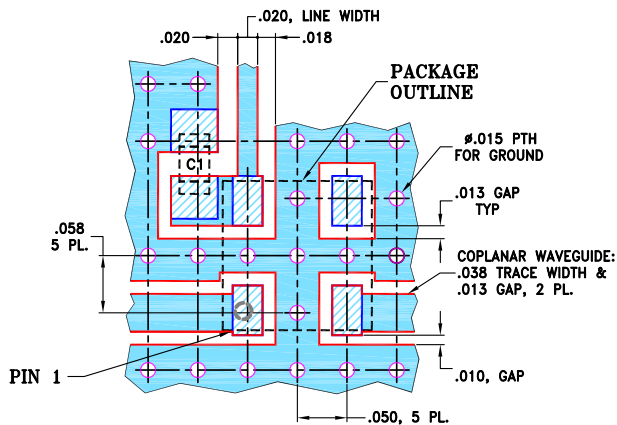
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PAD CONNECTIONS

RF	1
RF & DC	2
DC	4
NOT USED	3

PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-TCBT-14R+
SUGGESTED PCB LAYOUT (PL-146A)

CAPACITOR C1: .010 uF, 0603 SIZE

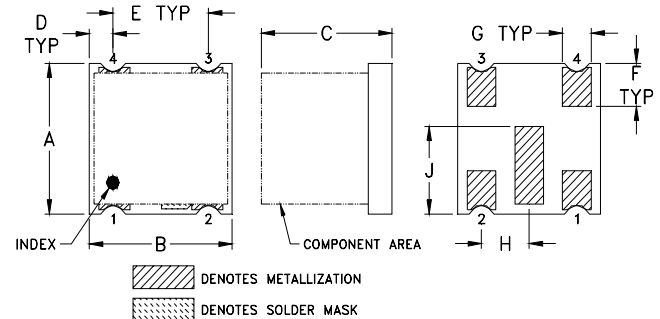
NOTES:

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.

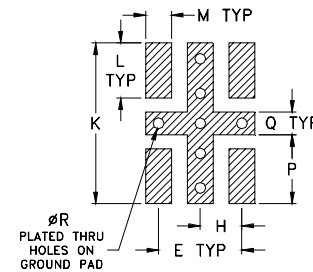
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

OUTLINE DRAWING



PCB Land Pattern

Suggested Layout,
Tolerance to be within ± 0.002 OUTLINE DIMENSIONS (Inches)
mm

A	B	C	D	E	F	G	H
0.150	0.150	0.140	0.025	0.100	0.043	0.030	0.050
3.81	3.81	3.56	0.64	2.54	1.09	0.76	1.27
J	K	L	M	P	Q	R	wt
0.087	0.193	0.066	0.031	0.083	0.027	0.013	grams
2.21	4.90	1.68	0.79	2.11	0.69	0.33	0.06



SURFACE MOUNT

Bias Tee

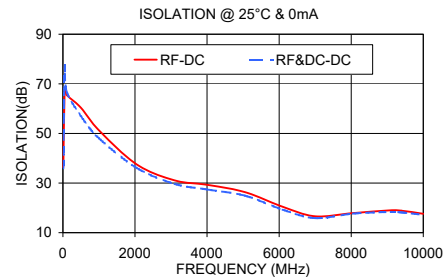
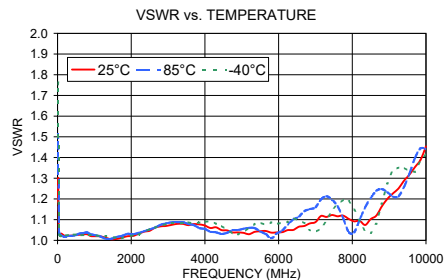
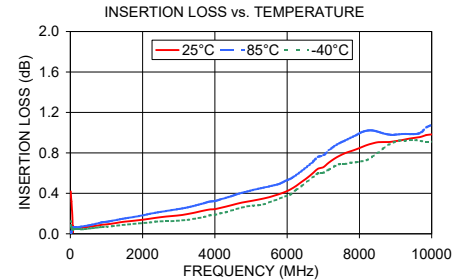
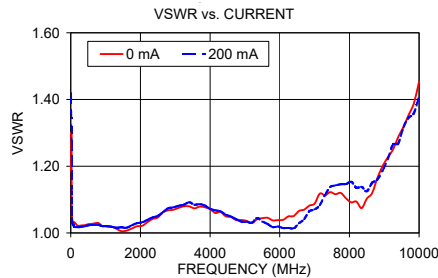
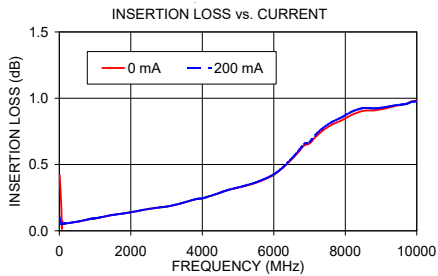
TCBT-14R+

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TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)		Isolation 0 mA	
		RF	RF & DC	RF-DC	RF & DC - DC
10	0.42	1.19	1.42	36.38	35.97
50	0.21	1.03	1.03	67.83	76.42
100	0.05	1.03	1.02	65.56	66.99
500	0.07	1.03	1.02	60.34	56.95
1000	0.09	1.02	1.02	51.24	48.05
2050	0.14	1.02	1.03	37.50	36.11
3100	0.19	1.08	1.08	31.08	29.64
4000	0.24	1.07	1.07	29.31	27.43
5050	0.33	1.04	1.03	26.34	24.91
6100	0.44	1.04	1.01	20.43	19.27
7000	0.66	1.09	1.07	16.60	15.87
8050	0.86	1.09	1.15	17.92	17.69
9100	0.92	1.23	1.22	19.03	18.34
9400	0.94	1.29	1.27	18.86	18.17
10000	0.98	1.45	1.41	17.61	17.20



NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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

