

50Ω Wideband 10 MHz to 10 GHz



CASE STYLE: GU1414-2

## The Big Deal

- Extremely Wideband 10 GHz
- Miniature SMT (0.15" x 0.15")

## 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 – 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 (0.15" x 0.15") 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.

### 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.  
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# Surface Mount Bias-Tee

50Ω Wideband 10 MHz to 10 GHz

## TCBT-14R+



CASE STYLE: GU1414-2

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

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200, 500
13"	1000

### Maximum Ratings

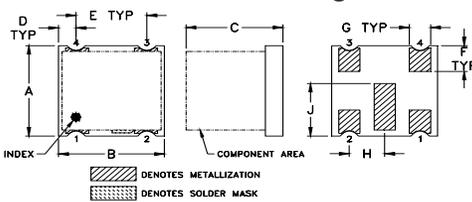
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	30dBm max.
Voltage at DC port	25V max.
Input Current	200mA

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

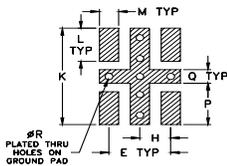
### Pad Terminations

RF	1
RF&DC	2
DC	4
NOT USED	3

### Outline Drawing



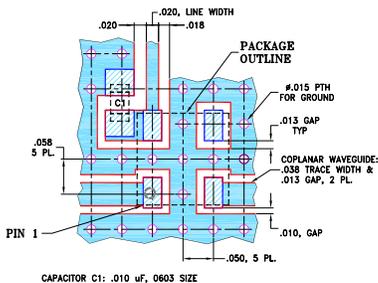
### PCB Land Pattern



### Outline Dimensions (inch)

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

### Demo Board MCL P/N: TB-268 Suggested PCB Layout (PL-146A)



- NOTES:
- 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.
  - 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.

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### Features

- wideband, 10 to 10000 MHz
- low insertion loss, 0.6 dB typ.
- excellent VSWR, 1.25:1 typ.
- miniature surface mount 0.15"x0.15"
- aqueous washable
- protected by US Patent 8,644,029

### Applications

- biasing amplifiers
- biasing of laser diodes
- biasing of active antennas

### Electrical Specifications at 25°C

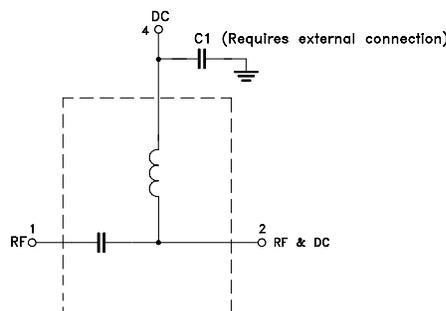
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		10		10000	MHz
Insertion Loss	10 - 10000	0.05	0.6	1.6	dB
Isolation*	10 - 10000	15	33	—	dB
VSWR	10 - 10000	1.02	1.25	1.7	:1
DC Resistance, DC to RF and DC port	10 - 10000	—	1.0	—	ohms

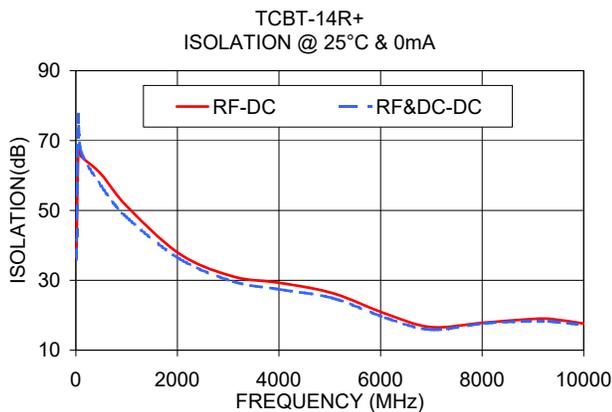
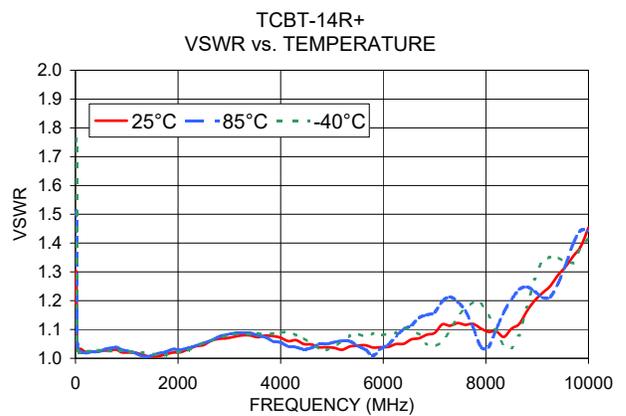
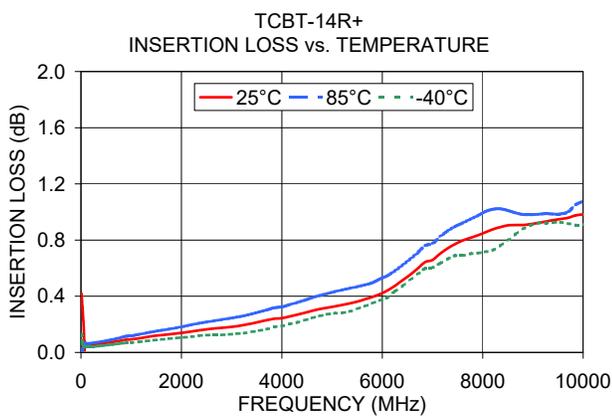
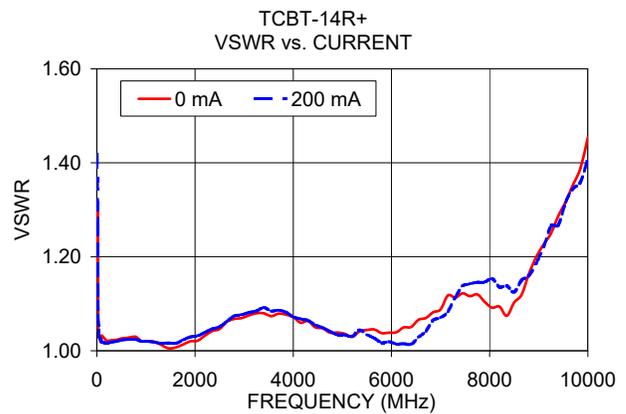
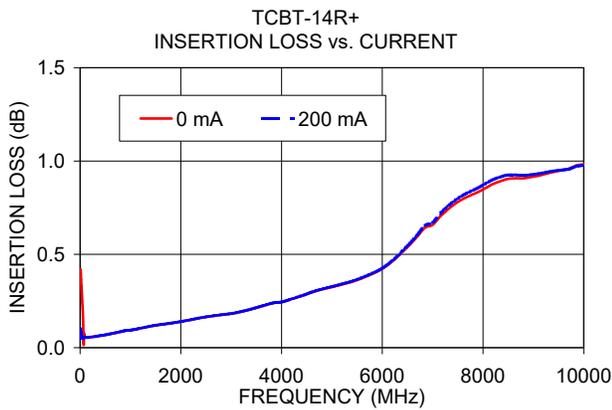
\* Isolation between DC to RF & DC 14 dB/min at 6-10 GHz

### Typical Performance Data

Frequency (MHz)	INSERTION LOSS (dB)	VSWR (:1)		Isolation 0 mA	
		RF	RF&DC	RF-DC	RF&DC-DC
10.00	0.42	1.19	1.42	36.38	35.97
50.00	0.21	1.03	1.03	67.83	76.42
100.00	0.05	1.03	1.02	65.56	66.99
500.00	0.07	1.03	1.02	60.34	56.95
1000.00	0.09	1.02	1.02	51.24	48.05
2050.00	0.14	1.02	1.03	37.50	36.11
3100.00	0.19	1.08	1.08	31.08	29.64
4000.00	0.24	1.07	1.07	29.31	27.43
5050.00	0.33	1.04	1.03	26.34	24.91
6100.00	0.44	1.04	1.01	20.43	19.27
7000.00	0.66	1.09	1.07	16.60	15.87
8050.00	0.86	1.09	1.15	17.92	17.69
9100.00	0.92	1.23	1.22	19.03	18.34
9400.00	0.94	1.29	1.27	18.86	18.17
10000.00	0.98	1.45	1.41	17.61	17.20

### Functional Schematic





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