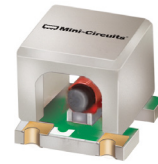




# THE DATASHEET OF TCBT-14+



50Ω Wideband 10 MHz to 10 GHz



CASE STYLE: GU1414

## The Big Deal

- Extremely Wideband
- Very high DC current up to 200mA
- Very low insertion loss, <1dB
- Well matched, VSWR1.1:1

## Product Overview

TCBT-14+ is the world's smallest footprint wideband Bias-Tee measuring 3.8 mm x 3.8 mm which utilizes a unique design to cover a frequency range of 10 MHz to 10 GHz without resonances that are typically observed over such broad bands. It is designed to handle 1W of RF power and 200 mA current and is suitable for automated pick and place operation.

## Key Features

Feature	Advantages
Extremely wideband: 10 MHz to 10 GHz	Broad bandwidth enables biasing of wideband MMIC amplifiers or other active circuits starting at extremely low frequencies through microwave bands.
DC Current, 200 mA	Able to support most Class-A MMIC amplifiers with a P1dB of up to 22 dBm need less than 200 mA.
Low Insertion Loss: 0.2 dB typ. To 3 GHz 0.5 dB typ. to 5 GHz 1.0 dB typ. at 10 GHz	When used at the output of the amplifiers in a typical bias application; the low loss of the TCBT-14+ exhibits minimal impact on gain and over temperature improving reliability.
Excellent matching: 1:1.1 over 0.1- 4 GHz 1.2:1 over entire band	Excellent VSWR of TCBT minimizes interaction effects and resulting gain ripple. Use of TCBT-14+ with Mini-Circuits MMIC amplifiers has shown performance improvements over traditional L-C networks over the entire band.

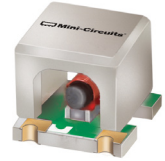
### Notes

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# Surface Mount Bias-Tee

50Ω Wideband 10 MHz to 10 GHz

# TCBT-14+



CASE STYLE: GU1414

**+RoHS Compliant**

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

Reel Size	Available Tape and Reel at no extra cost
7"	Devices/Reel
13"	10, 20, 50, 100, 200, 500
	1000

## Maximum Ratings

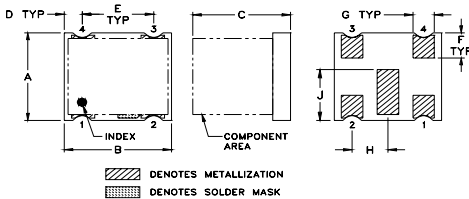
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	30dBm max.
Voltage at DC port	25V max.
Input Current	200mA

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

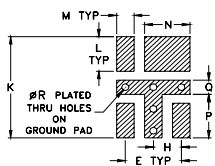
## Pad Terminations

RF	2
RF&DC	1
DC	3
NOT USED	4

## Outline Drawing



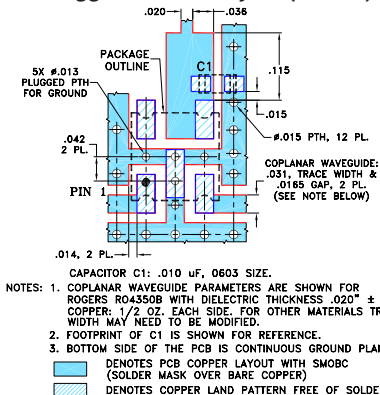
## PCB Land Pattern



## Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J
.150	.150	.14	.025	.100	.043	.030	.050	.087
3.81	3.81	3.56	0.64	2.54	1.09	0.76	1.27	2.21
K	L	M	N	P	Q	R	wt	
.193	.066	0.031	.081	.083	.027	0.013	grams	
4.90	1.68	0.79	2.06	2.11	0.69	0.33		0.06

## Demo Board MCL P/N: TB-510+ Suggested PCB Layout (PL-321)



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## Features

- wideband, 10 to 10000 MHz
- low insertion loss, 0.5 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

## Bias-Tee Electrical Specifications

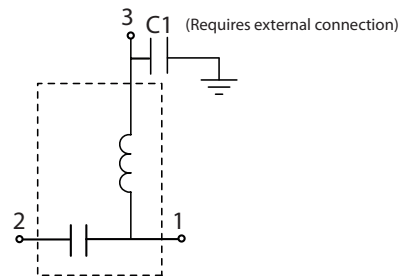
FREQUENCY (MHz)	INSERTION LOSS (dB)			ISOLATION (dB) (RF port to DC port) (RF&DC port to DC port)			VSWR (:1)											
	$f_L$	$f_U$		L	M	U	L	M	U									
10	10000	Typ. Max.	Typ. Max.	Typ. Max.	Typ. Min.	Typ. Min.	Typ. Min.	Typ. Max.	Typ. Max.	Typ. Max.								
		0.1	0.5	0.35	0.8	1.6	55	30	33	18	22	15	1.05	1.3	1.2	1.5	1.3	1.5

L= 10-100 MHz M=100-5000 MHz U=5000-10000 MHz  
External C1(0.01µF) is required. See functional schematic and PCB layout.

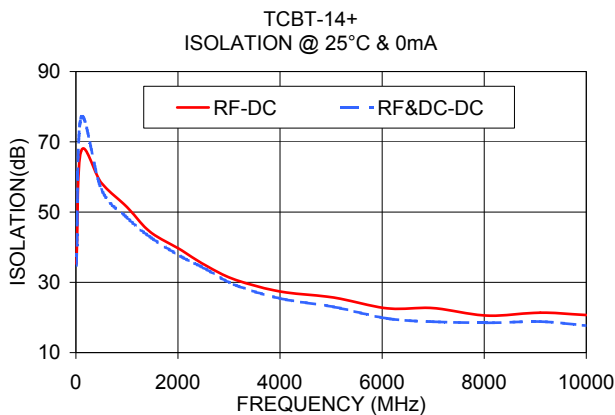
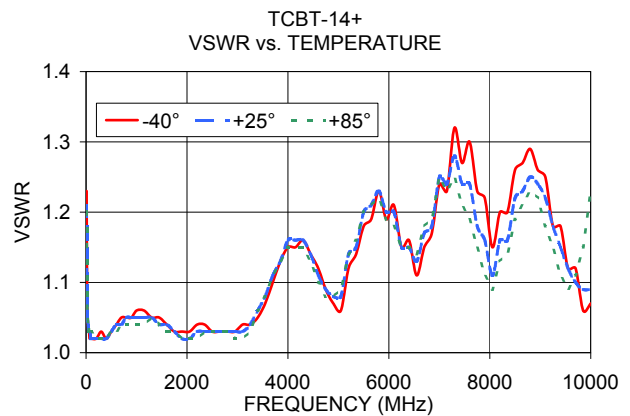
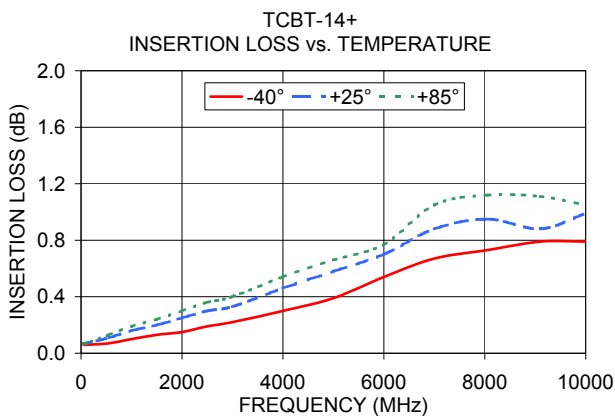
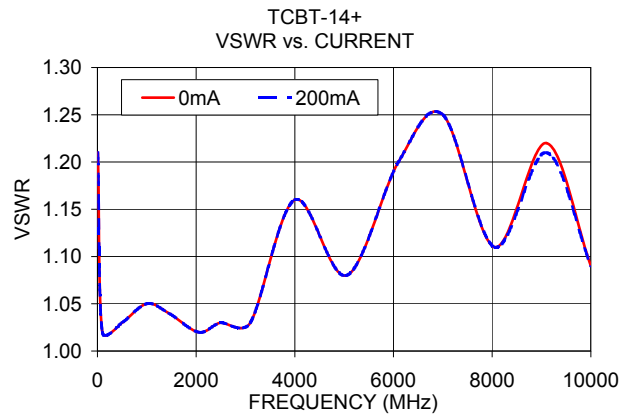
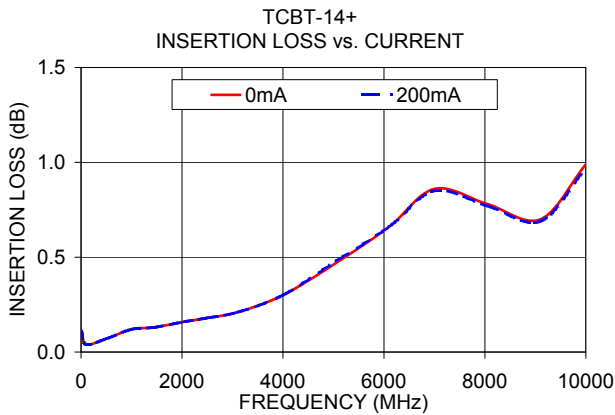
## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB) with current		VSWR (:1) with current		ISOLATION (dB) 0mA	
	0mA	200mA	0mA	200mA	RF-DC	RF & DC - DC
10.00	0.11	0.11	1.21	1.21	35.29	34.85
100.00	0.04	0.04	1.02	1.02	67.27	76.84
500.00	0.07	0.07	1.03	1.03	58.28	56.42
1000.00	0.12	0.12	1.05	1.05	51.44	48.45
1450.00	0.13	0.13	1.04	1.04	44.41	42.96
2050.00	0.16	0.16	1.02	1.02	39.31	37.44
2500.00	0.18	0.18	1.03	1.03	35.19	34.15
3100.00	0.21	0.21	1.03	1.03	30.85	29.35
4000.00	0.30	0.30	1.16	1.16	27.39	25.43
5050.00	0.47	0.48	1.08	1.08	25.68	23.02
6100.00	0.66	0.66	1.20	1.20	22.61	19.71
7000.00	0.86	0.85	1.25	1.25	22.68	18.80
8050.00	0.78	0.77	1.11	1.11	20.55	18.49
9100.00	0.70	0.69	1.22	1.21	21.37	18.82
10000.00	0.99	0.97	1.09	1.09	20.70	17.68

## Functional Schematic



[www.minicircuits.com](http://www.minicircuits.com) P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com




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