



CASE STYLE: GU1840

## The Big Deal

- Wideband, 20 to 2500 MHz
- Very low insertion loss, 0.4 dB
- Excellent VSWR, 1.05:1
- Tiny size, 0.15 x 0.15 x 0.14"

## Product Overview

Mini-Circuits' TCBT-2R5GL+ is an ultra-wideband surface-mount bias tee covering applications from 20 to 2500 MHz with low insertion loss, excellent VSWR, and high DC-RF isolation over its entire frequency range. This model is capable of handling up to +30 dBm (1W) RF input power and DC input current up to 200mA. The unit features core and wire construction mounted on a ceramic base (0.15 x 0.15 x 0.14") with Mini-Circuits Top-Hat feature for faster, more accurate pick and place assembly.

## Key Features

Feature	Advantages
Wideband, 20 to 2500 MHz	Supports a wide range of applications with a single device, including biasing broadband amplifiers, laser diodes, active antennas and more.
Low insertion loss, 0.4 dB	Preserves signal strength from input to output and minimizes overall system loss
Excellent VSWR, 1.05:1	Provides excellent matching for 50Ω systems with minimal signal reflection.
RF power handling up to 1W	This model supports applications with a variety of power requirements.
Excellent DC-RF isolation	High DC-RF isolation (44 dB typ. at midband) minimizes RF leakage and interference with other elements in the system.
Miniature size, 0.15 x 0.15 x 0.14"	Small footprint makes the TCBT-2R5GL+ a space-saver in dense PCB-layouts.
Top-Hat feature	Improves speed and accuracy of pick and place assembly.
Leads for excellent solderability.	This model features leads to facilitate soldering on PCB assemblies.

Surface Mount   
**Bias-Tee**

50Ω Wideband 20 to 2500 MHz

**TCBT-2R5GL+**



Generic photo used for illustration purposes only

CASE STYLE: GU1840

**+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
7"	20, 50, 100, 200, 500, 1000
13"	2000

**Features**

- wideband, 20 to 2500 MHz
- low insertion loss, 0.4 dB typ.
- miniature surface mount 0.15"x0.15"
- aqueous washable
- protected by US Patent 7,012,486

**Applications**

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

**Electrical Specifications**

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		20		2500	MHz
Insertion Loss	20-200	—	0.2	0.8	dB
	200-1250	—	0.35	0.8	
	1250-2500	—	0.7	1.2	
Isolation	20-200	40	65	—	dB
	200-1250	25	44	—	
	1250-2500	20	40	—	
VSWR	20-200	—	1.05	1.5	:1
	200-1250	—	1.05	1.2	
	1250-2500	—	1.1	1.25	
DC Resistance, DC to RF and DC port		—	0.2	—	ohms

**Maximum Ratings**

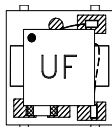
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	30 dBm max.
Voltage at DC port	25 V max.
DC Current	200mA

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

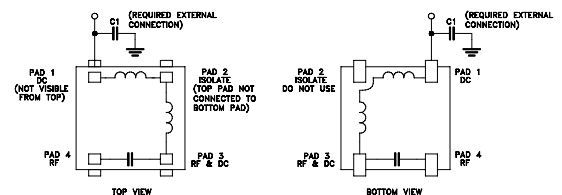
**Pad Terminations**

Function	Pad Number
RF	4
RF&DC	3
DC	1
ISOLATE (see PCB Layout)	2

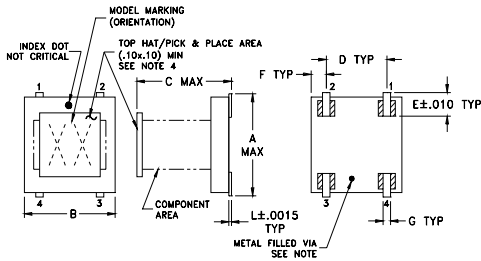
**Product Marking**



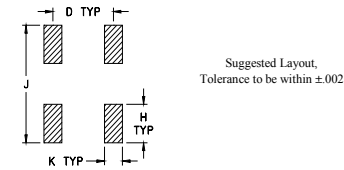
**Functional Schematic**



## Outline Drawing



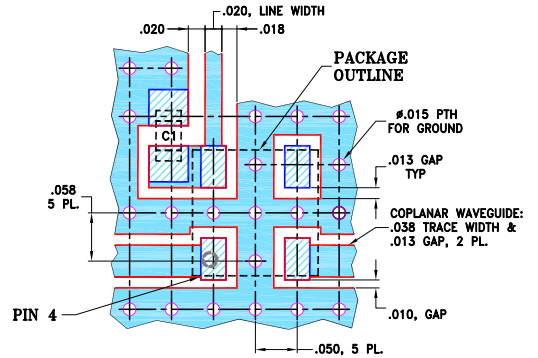
## PCB Land Pattern



## Outline Dimensions (inch/mm)

A	B	C	D	E	F
.166	.150	.155	.100	.037	.025
4.22	3.81	3.94	2.54	0.94	0.64
G	H	J	K	L	wt
.012	.060	.184	.030	0.004	grams
0.30	1.52	4.67	0.76	0.10	0.10

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



CAPACITOR C1: .010 uF, 0603 SIZE

### NOTES:

- COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $0.020 \pm 0.0015$ ; 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.

## Typical Performance Data

Frequency (MHz)	INSERTION LOSS (dB)	VSWR (:1)		Isolation 0 mA	
		RF	RF&DC	RF-DC	RF&DC-DC
		20.00	0.26	1.13	1.11
50.00	0.24	1.05	1.04	59.60	75.37
100.00	0.22	1.02	1.02	69.83	72.61
500.00	0.28	1.02	1.01	51.83	51.15
1000.00	0.43	1.04	1.04	40.89	38.59
1500.00	0.64	1.06	1.08	35.46	31.24
2000.00	0.72	1.04	1.11	33.88	26.97
2200.00	0.74	1.04	1.13	33.78	25.75
2400.00	0.75	1.03	1.14	33.55	24.74
2500.00	0.75	1.03	1.14	33.30	24.28

