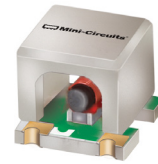


50Ω Wideband 10 MHz to 12 GHz



CASE STYLE: GU1414

The Big Deal

- Extremely Wideband, 10 MHz to 12 GHz
- Very low insertion loss, 0.5 dB
- Excellent VSWR, 1.25:1
- Tiny size, 0.15 x 0.15 x 0.14”

Product Overview

Mini-Circuits’ TCBT-123+ is an ultra-wideband surface-mount bias tee covering applications from 10 MHz to 12 GHz 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 comes housed in a miniature, shielded package (0.15 x 0.15 x 0.14”) with wraparound terminations for excellent solderability.

Key Features

| Feature | Advantages |
|---|---|
| Ultra-wideband, 10 MHz to 12 GHz | Supports a wide range of applications with a single device, including biasing broadband amplifiers, laser diodes, active antennas and more. |
| Low insertion loss, 0.5 dB | Preserves signal strength from input to output and minimizes overall system loss |
| Excellent VSWR, 1.25:1 | 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 • 55 dB, 10 to 100 MHz • 33 dB, 100 to 6000 MHz • 22 dB, 6000 to 12000 MHz | 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-123+ a space-saver in dense PCB-layouts. |

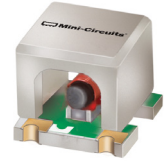
Notes

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 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/MCLStore/terms.jsp

Surface Mount Bias-Tee

50Ω Wideband 10 MHz to 12 GHz

TCBT-123+



CASE STYLE: GU1414

+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

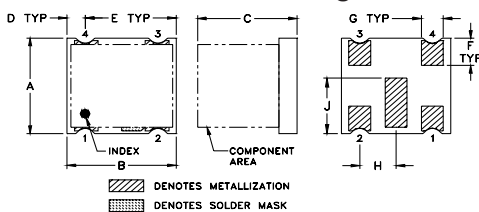
| | |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 30dBm max. |
| Voltage at DC port | 25V max. |
| Input Current | 200mA |

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

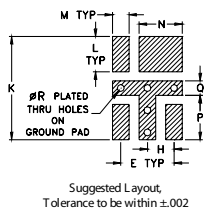
Pad Terminations

| | |
|----------|---|
| RF | 2 |
| RF&DC | 1 |
| DC | 3 |
| NOT USED | 4 |

Outline Drawing



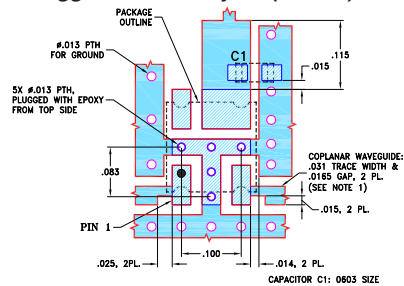
PCB Land Pattern



Outline Dimensions (inch)

| 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-879+ Suggested PCB Layout (PL-481)



- NOTES:
- COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020"±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
 - FOOTPRINT OF C1 IS SHOWN FOR REFERENCE.
 - 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 12000 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

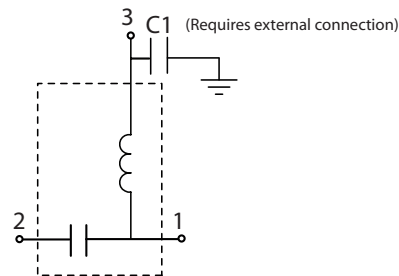
Electrical Specifications at 25°C

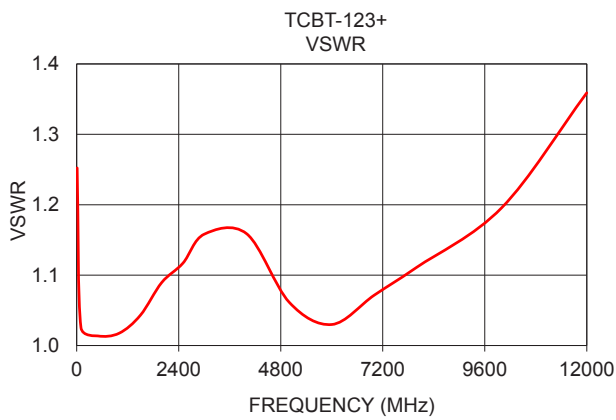
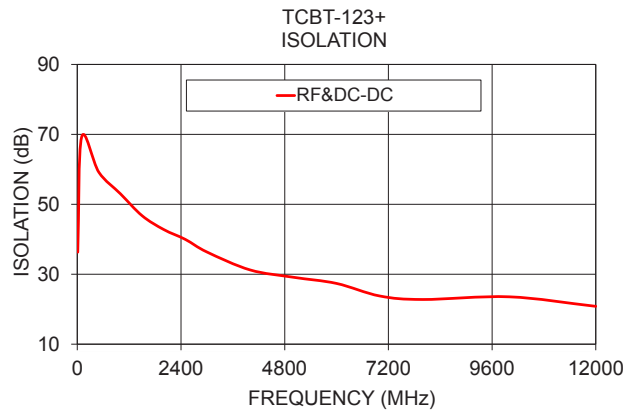
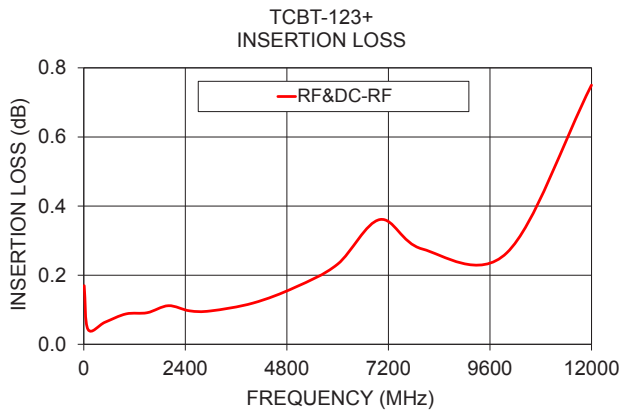
| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------------|-----------------|------|------|-------|------|
| Frequency Range | | 10 | | 12000 | MHz |
| Insertion Loss | 10-100 | — | 0.1 | 0.5 | dB |
| | 100-6000 | — | 0.3 | 0.8 | |
| | 6000-12000 | — | 0.8 | 1.6 | |
| Isolation | 10-100 | 30 | 55 | — | dB |
| | 100-6000 | 18 | 33 | — | |
| | 6000-12000 | 15 | 22 | — | |
| VSWR | 10-100 | | 1.05 | 1.3 | :1 |
| | 100-6000 | | 1.2 | 1.5 | |
| | 6000-12000 | | 1.3 | 1.7 | |

Typical Performance Data

| FREQUENCY (MHz) | INSERTION LOSS (dB) | VSWR (:1) | ISOLATION (dB) |
|-----------------|----------------------------|-----------------------|---------------------|
| | with current RF & DC-RF | with current RF-DC | 0mA RF & DC - DC |
| 10 | 0.17 | 1.25 | 36.31 |
| 100 | 0.04 | 1.03 | 69.24 |
| 500 | 0.06 | 1.01 | 59.14 |
| 1000 | 0.09 | 1.02 | 52.98 |
| 1500 | 0.09 | 1.04 | 46.74 |
| 2000 | 0.11 | 1.09 | 42.79 |
| 2500 | 0.10 | 1.12 | 39.96 |
| 3000 | 0.10 | 1.16 | 36.36 |
| 4000 | 0.12 | 1.16 | 31.23 |
| 5000 | 0.17 | 1.06 | 29.13 |
| 6000 | 0.23 | 1.03 | 27.37 |
| 7000 | 0.36 | 1.07 | 23.78 |
| 8000 | 0.28 | 1.11 | 22.78 |
| 10000 | 0.26 | 1.20 | 23.54 |
| 12000 | 0.75 | 1.36 | 20.82 |

Functional Schematic





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