

# Coaxial Bias-Tee

50Ω Wideband 10 to 6000 MHz

## ZFBT-6G-FT+



Generic photo used for illustration purposes only  
CASE STYLE: Y460

Connectors Model  
SMA ZFBT-6G-FT+  
BRACKET (OPTION "B")

**+RoHS Compliant**

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

### Maximum Ratings

|                                     |                |
|-------------------------------------|----------------|
| Operating Temperature               | -55°C to 100°C |
| Storage Temperature                 | -55°C to 100°C |
| RF Power                            | 30 dBm max.    |
| Voltage at DC port                  | 30 V max.      |
| Input Current                       | 500 mA         |
| DC resistance from DC to RF&DC port | 4.5 ohm typ.   |

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

### Coaxial Connections

|        |                    |
|--------|--------------------|
| RF     | in (SMA female)    |
| RF&DC  | out (SMA male)     |
| DC     | (feed-through pin) |
| GROUND | GROUND             |

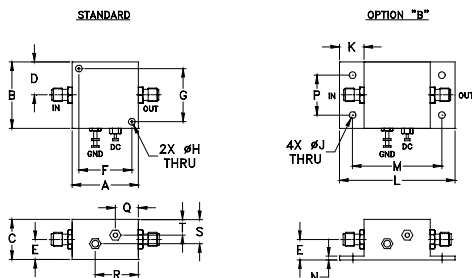
### Features

- wideband, 10 to 6000 MHz
- low insertion loss, 0.6 dB typ.
- feed through terminal per DC port

### Applications

- biasing amplifiers
- biasing of laser diodes
- biasing of active antennas
- DC return
- DC blocking
- test accessory

### Outline Drawing



### Outline Dimensions (inch / mm)

| A     | B     | C     | D     | E    | F     | G     | H     | J     | K     |
|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| 1.25  | 1.25  | .75   | .63   | .36  | 1.000 | 1.000 | .125  | .125  | .46   |
| 31.75 | 31.75 | 19.05 | 16.00 | 9.14 | 25.40 | 25.40 | 3.18  | 3.18  | 11.68 |
| L     | M     | N     | P     | Q    | R     | S     | T     | wt.   |       |
| 2.18  | 1.688 | .06   | .750  | .50  | .80   | .45   | .29   | grams |       |
| 55.37 | 42.88 | 1.524 | 19.05 | 12.7 | 20.32 | 11.43 | 7.366 | 38    |       |

### 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    | L           | M    | U    |      |
|                 |       | Typ.                 | Max. | Typ. | Max.   | Typ. | Max. | Typ.        | Max. | Typ. | Max. |
| 10              | 6000  | 0.15                 | 0.6  | 0.6  | 1.4  | 1.0  | 2.2  | —           | —    | —    | —    |
|                 |       |                      |      |      |  |      |      | 1.06        | 1.2  | 1.13 | 1.3  |
|                 |       |                      |      |      |  |      |      |             |      | 1.13 | 1.5  |

L= low range ( $f_L$  to 10  $f_L$ ) M= mid range (10  $f_L$  to  $f_U/2$ ) U= upper range ( $f_U/2$  to  $f_U$ )

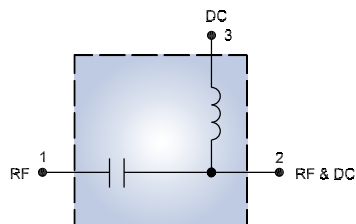
\* Insertion Loss and Isolation are guaranteed up to 20 dBm-RF power and 200mA DC current.

\*\*VSWR measured with open and short at DC port.

### Typical Performance Data

| Freq. (MHz) | Pin (dBm) | INSERTION LOSS (dB) with Current |      |      |       |       |       | ISOLATION (dB) (Pin=-10dBm) with current |       |       |       |       |       | VSWR (:1) |
|-------------|-----------|----------------------------------|------|------|-------|-------|-------|--|-------|-------|-------|-------|-------|-----------|
|             |           | 0mA                              | 20mA | 50mA | 100mA | 150mA | 200mA | 10mA                                     | 20mA  | 50mA  | 100mA | 150mA | 200mA |           |
| 10.00       | 18.50     | 0.16                             | 0.17 | 0.17 | 0.16  | 0.16  | 0.16  | 30.06                                    | 30.07 | 30.07 | 30.20 | 30.38 | 30.56 | 1.04      |
| 114.75      | 19.50     | 0.22                             | 0.25 | 0.24 | 0.22  | 0.22  | 0.22  | 34.45                                    | 34.49 | 34.27 | 33.99 | 33.83 | 33.59 | 1.07      |
| 324.25      | 19.70     | 0.50                             | 0.55 | 0.53 | 0.52  | 0.53  | 0.56  | 44.65                                    | 44.61 | 44.25 | 43.90 | 43.91 | 43.34 | 1.06      |
| 743.25      | 18.70     | 0.28                             | 0.31 | 0.30 | 0.29  | 0.29  | 0.29  | 51.19                                    | 50.50 | 50.16 | 50.65 | 51.69 | 52.47 | 1.06      |
| 952.75      | 18.20     | 0.31                             | 0.33 | 0.33 | 0.31  | 0.32  | 0.33  | 40.75                                    | 40.80 | 40.97 | 40.97 | 40.93 | 40.95 | 1.11      |
| 1581.25     | 18.00     | 0.46                             | 0.48 | 0.47 | 0.46  | 0.48  | 0.49  | 42.58                                    | 42.59 | 43.94 | 43.77 | 44.36 | 44.17 | 1.13      |
| 2000.25     | 17.10     | 0.46                             | 0.48 | 0.47 | 0.46  | 0.46  | 0.47  | 45.46                                    | 45.57 | 45.73 | 45.48 | 46.14 | 45.28 | 1.12      |
| 2524.00     | 14.40     | 0.40                             | 0.42 | 0.41 | 0.42  | 0.43  | 0.44  | 53.15                                    | 53.72 | 52.19 | 53.17 | 52.67 | 53.67 | 1.12      |
| 3047.75     | 14.20     | 0.45                             | 0.48 | 0.47 | 0.46  | 0.46  | 0.49  | 52.46                                    | 52.25 | 51.55 | 51.33 | 51.46 | 50.99 | 1.09      |
| 3676.25     | 15.10     | 0.73                             | 0.74 | 0.75 | 0.75  | 0.75  | 0.75  | 46.32                                    | 47.19 | 46.36 | 45.53 | 46.19 | 45.65 | 1.07      |
| 4200.00     | 17.90     | 1.04                             | 1.07 | 1.07 | 1.06  | 1.05  | 1.06  | 28.42                                    | 28.36 | 28.24 | 28.14 | 28.01 | 27.92 | 1.09      |
| 4502.50     | -0.60     | 1.17                             | 1.19 | 1.18 | 1.19  | 1.17  | 1.16  | 28.15                                    | 28.10 | 28.05 | 27.96 | 27.84 | 27.87 | 1.14      |
| 4802.00     | -0.70     | 1.26                             | 1.26 | 1.27 | 1.25  | 1.22  | 1.20  | 37.95                                    | 38.01 | 38.19 | 37.93 | 37.58 | 37.51 | 1.12      |
| 5251.75     | -1.10     | 1.19                             | 1.17 | 1.16 | 1.13  | 1.11  | 1.09  | 49.68                                    | 51.04 | 49.12 | 49.37 | 49.13 | 48.19 | 1.11      |
| 5550.75     | -2.00     | 1.65                             | 1.63 | 1.60 | 1.56  | 1.54  | 1.51  | 38.44                                    | 38.56 | 38.36 | 38.07 | 37.85 | 38.19 | 1.10      |
| 6000.00     | -2.40     | 1.70                             | 1.71 | 1.65 | 1.59  | 1.54  | 1.50  | 34.37                                    | 34.36 | 34.23 | 34.40 | 34.49 | 34.48 | 1.12      |

### Electrical Schematic



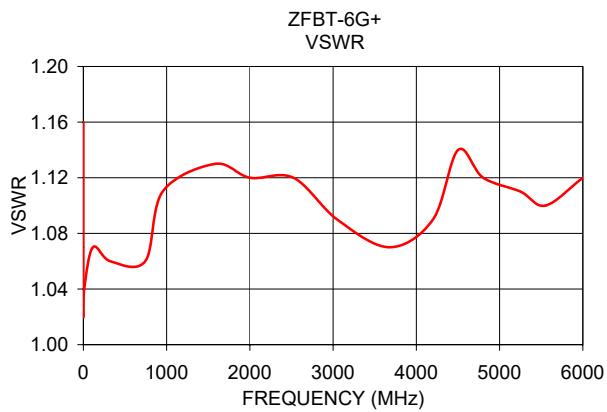
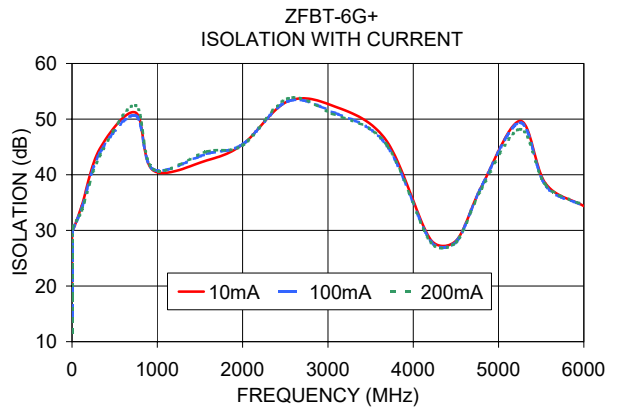
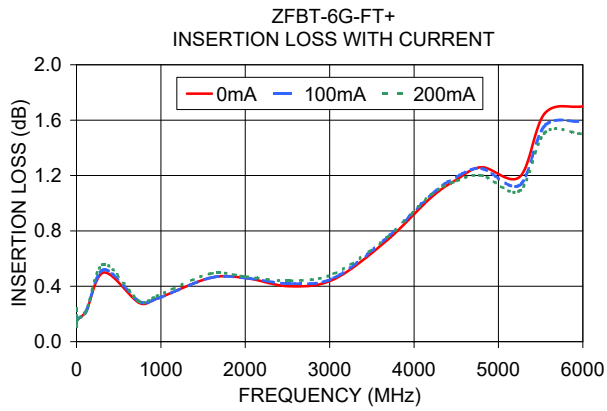
#### Notes

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REV. B  
M151107  
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DJ/RS/CP/AM  
151007



**Notes**

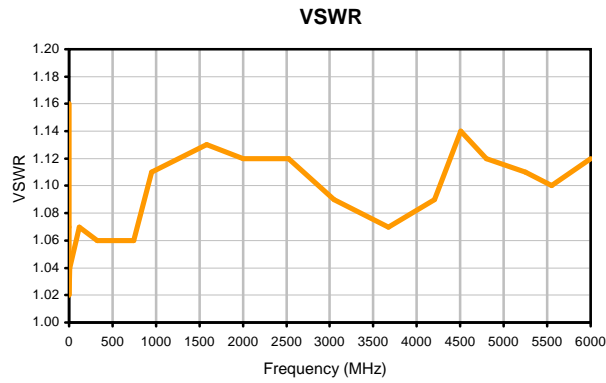
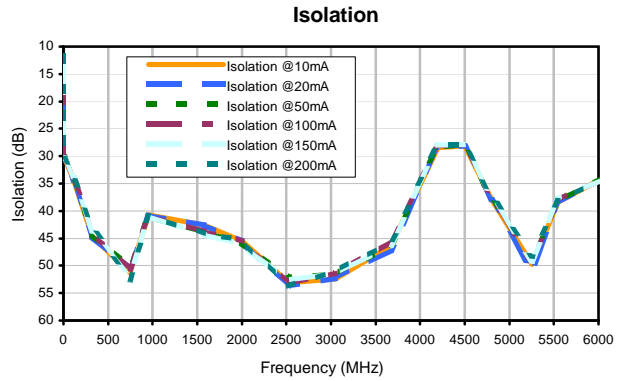
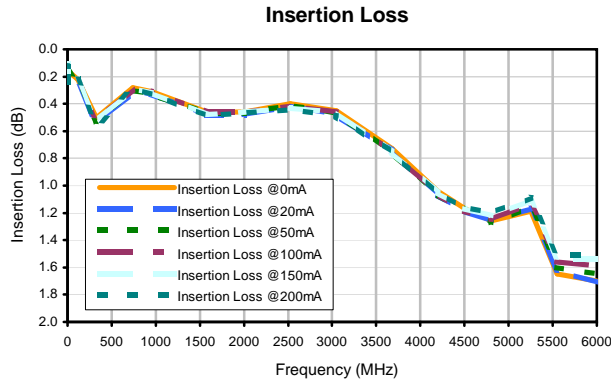
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## Typical Performance Data

| FREQ.<br>(MHz) | INSERTION LOSS with current<br>(RF Port to RF&DC Port)<br>(dB) |      |      |       |       |       | ISOLATION with current<br>(RF Port to DC Port, RF&DC Port to DC Port)<br>(dB) |       |       |       |       |       | VSWR<br>(:1) |
|----------------|--|------|------|-------|-------|-------|---|-------|-------|-------|-------|-------|--------------|
|                | 0mA  | 20mA | 50mA | 100mA | 150mA | 200mA | 10mA  | 20mA  | 50mA  | 100mA | 150mA | 200mA |              |
|                | 0.10   | 0.17 | 0.17 | 0.16  | 0.17  | 0.20  | 0.24  | 19.46 | 19.04 | 17.83 | 14.58 | 12.66 |              |
| 0.27           | 0.13   | 0.13 | 0.13 | 0.14  | 0.14  | 0.15  | 25.86   | 25.53 | 24.52 | 21.43 | 19.31 | 18.16 | 1.07         |
| 0.53           | 0.12   | 0.12 | 0.12 | 0.11  | 0.11  | 0.11  | 29.17   | 28.98 | 28.36 | 26.18 | 24.40 | 23.37 | 1.04         |
| 1.06           | 0.13   | 0.13 | 0.12 | 0.11  | 0.12  | 0.12  | 30.81   | 30.74 | 30.56 | 29.62 | 28.62 | 27.92 | 1.02         |
| 10.00          | 0.16   | 0.17 | 0.17 | 0.16  | 0.16  | 0.16  | 30.06   | 30.07 | 30.07 | 30.20 | 30.38 | 30.56 | 1.04         |
| 114.75         | 0.22   | 0.25 | 0.24 | 0.22  | 0.22  | 0.22  | 34.45   | 34.49 | 34.27 | 33.99 | 33.83 | 33.59 | 1.07         |
| 324.25         | 0.50   | 0.55 | 0.53 | 0.52  | 0.53  | 0.56  | 44.65   | 44.61 | 44.25 | 43.90 | 43.91 | 43.34 | 1.06         |
| 743.25         | 0.28   | 0.31 | 0.30 | 0.29  | 0.29  | 0.29  | 51.19   | 50.50 | 50.16 | 50.65 | 51.69 | 52.47 | 1.06         |
| 952.75         | 0.31   | 0.33 | 0.33 | 0.31  | 0.32  | 0.33  | 40.75   | 40.80 | 40.97 | 40.97 | 40.93 | 40.95 | 1.11         |
| 1581.25        | 0.46   | 0.48 | 0.47 | 0.46  | 0.48  | 0.49  | 42.58   | 42.59 | 43.94 | 43.77 | 44.36 | 44.17 | 1.13         |
| 2000.25        | 0.46   | 0.48 | 0.47 | 0.46  | 0.46  | 0.47  | 45.46   | 45.57 | 45.73 | 45.48 | 46.14 | 45.28 | 1.12         |
| 2524.00        | 0.40   | 0.42 | 0.41 | 0.42  | 0.43  | 0.44  | 53.15   | 53.72 | 52.19 | 53.17 | 52.67 | 53.67 | 1.12         |
| 3047.75        | 0.45   | 0.48 | 0.47 | 0.46  | 0.46  | 0.49  | 52.46   | 52.25 | 51.55 | 51.33 | 51.46 | 50.99 | 1.09         |
| 3676.25        | 0.73   | 0.74 | 0.75 | 0.75  | 0.75  | 0.75  | 46.32   | 47.19 | 46.36 | 45.53 | 46.19 | 45.65 | 1.07         |
| 4200.00        | 1.04   | 1.07 | 1.07 | 1.06  | 1.05  | 1.06  | 28.42   | 28.36 | 28.24 | 28.14 | 28.01 | 27.92 | 1.09         |
| 4502.50        | 1.17   | 1.19 | 1.18 | 1.19  | 1.17  | 1.16  | 28.15   | 28.10 | 28.05 | 27.96 | 27.84 | 27.87 | 1.14         |
| 4802.00        | 1.26   | 1.26 | 1.27 | 1.25  | 1.22  | 1.20  | 37.95   | 38.01 | 38.19 | 37.93 | 37.58 | 37.51 | 1.12         |
| 5251.75        | 1.19   | 1.17 | 1.16 | 1.13  | 1.11  | 1.09  | 49.68   | 51.04 | 49.12 | 49.37 | 49.13 | 48.19 | 1.11         |
| 5550.75        | 1.65   | 1.63 | 1.60 | 1.56  | 1.54  | 1.51  | 38.44   | 38.56 | 38.36 | 38.07 | 37.85 | 38.19 | 1.10         |
| 6000.00        | 1.70   | 1.71 | 1.65 | 1.59  | 1.54  | 1.50  | 34.37   | 34.36 | 34.23 | 34.40 | 34.49 | 34.48 | 1.12         |

## Typical Performance Curves



### Outline Dimensions



| CASE# | A               | B               | C              | D             | E             | F               | G               | H             | J             | K             | L              | M               | N            |
|-------|-----------------|-----------------|----------------|---------------|---------------|-----------------|-----------------|---------------|---------------|---------------|----------------|-----------------|--------------|
| Y460  | 1.25<br>(31.75) | 1.25<br>(31.75) | .75<br>(19.05) | .63<br>(16.0) | .36<br>(9.15) | 1.000<br>(25.4) | 1.000<br>(25.4) | .125<br>(3.2) | .125<br>(3.2) | .46<br>(11.7) | 2.18<br>(55.4) | 1.688<br>(42.9) | .06<br>(1.5) |

| CASE# | P              | Q             | R             | S             | T            | WT. GRAMS |
|-------|----------------|---------------|---------------|---------------|--------------|-----------|
| Y460  | .750<br>(19.0) | .50<br>(12.7) | .80<br>(20.3) | .45<br>(11.4) | .29<br>(7.4) | 38        |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

#### Notes:

1. Case material: Aluminum alloy.
2. Case finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| <b>Specification</b>       | <b>Test/Inspection Condition</b>   | <b>Reference/Spec</b>                |
|----------------------------|--|--------------------------------------|
| Operating Temperature      | -55° to 100°C<br>Ambient Environment   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet   | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles  | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)    | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |