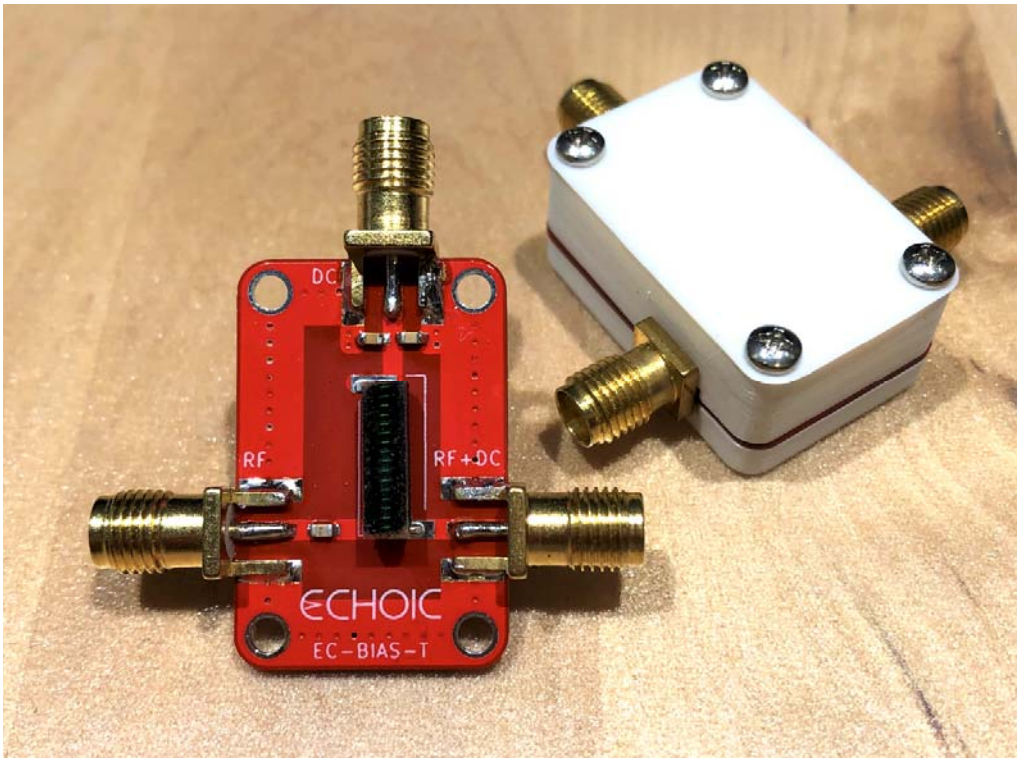
Data Sheet

EC-BIAS-T High Power Bias Network 50MHz to 6GHz



Applications

- RF transistor characterization
- Power amplifiers
- Broadband amplifiers

Features

- Max VDC = 200V, Max IDC = 4A
- Return Loss > 15, Isolation > 30dB 4 GHz BW
- Insertion loss < 1.5dB over 5 GHz BW

Description

The EC-BIAS-T is a high-power, high-voltage, high-current DC bias network (bias tee) for RF transistor biasing applications. This static DC bias network can be used for RF and microwave transistor characterization as well as broadband, low-noise and power amplifier development. The DC bias network has three ports: RF, DC and RF+DC. The RF port accepts RF signals, the DC port accepts DC biases, and the RF+DC port presents the combined signal to the device. The EC-BIAS-T can handle DC voltages up to 200 V and DC currents up to 4 A. The DC bias network is especially well-suited for biasing high-voltage, high-current RF power devices like GaN HEMT transistors.

The RF-to-RF+DC path operates from 50 MHz to 6 GHz when considering a maximum insertion loss of 1.6 dB and minimum return loss of 10 dB. The DC-to-RF and DC-to-RF+DC isolation is > 30 dB from 80 MHz to 4.8 GHz.

Front side of EC-BIAS-T

Back side of EC-BIAS-T

Specifications

Parameter	*Test Cond.*	*Min.*	*Typ.*	*Max.*	*Units*
Impedance			50		Ohm
Operating Frequency	IL < 1.6dB	0.05		6.0	GHz
VSWR	0.05 to 6 GHz	1.04	1.4	2.0	
Return Loss	0.05 to 6 GHz			10	dB
	0.10 to 4.42 GHz			15	dB
Insertion loss	0.05 to 6 GHz	0	0.6	1.62	dB
Isolation	0.05 to 6 GHz	27			dB
	0.29 to 3.30 GHz	40			dB
DC port voltage				200*	VDC/Vpulsed
DC port current				4*	ADC

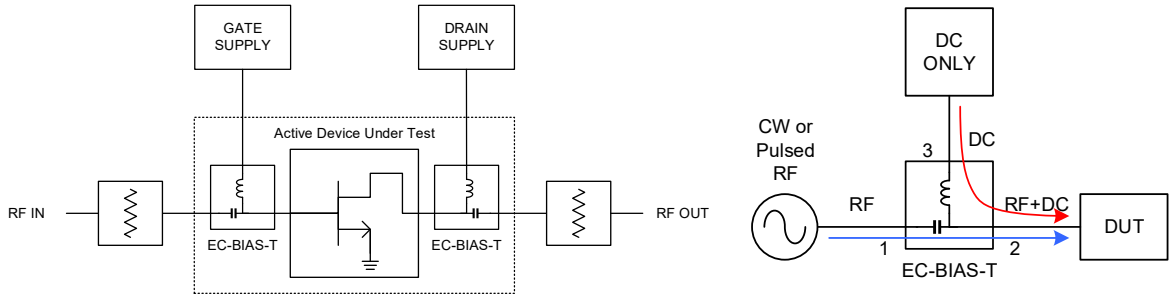
*based on component specs

Typical Application

The EC-BIAS-T is typically used in conjunction with an active transistor device or amplifier requiring a DC bias at the device terminals. A conventional application with a transistor test fixture is shown below. In the diagram, one EC-BIAS-T is placed at the gate of the device and one is placed at the drain of the device. The input bias tee module receives an RF signal from a source, combines this with the bias voltage and applies the composite signal to the device gate. The gate voltage can be positive or negative, making it suitable for all FET devices. The output bias tee simultaneously feeds the bias voltage to the drain and allows for the RF output produced by the transistor to pass to the next stage.

A typical connection to the EC-BIAS-T is shown below. The DC signal is supplied by a static DC voltage. The RF signal is supplied by a pulsed RF or a CW RF signal.

Transistor characterization setup using EC-BIAS-T

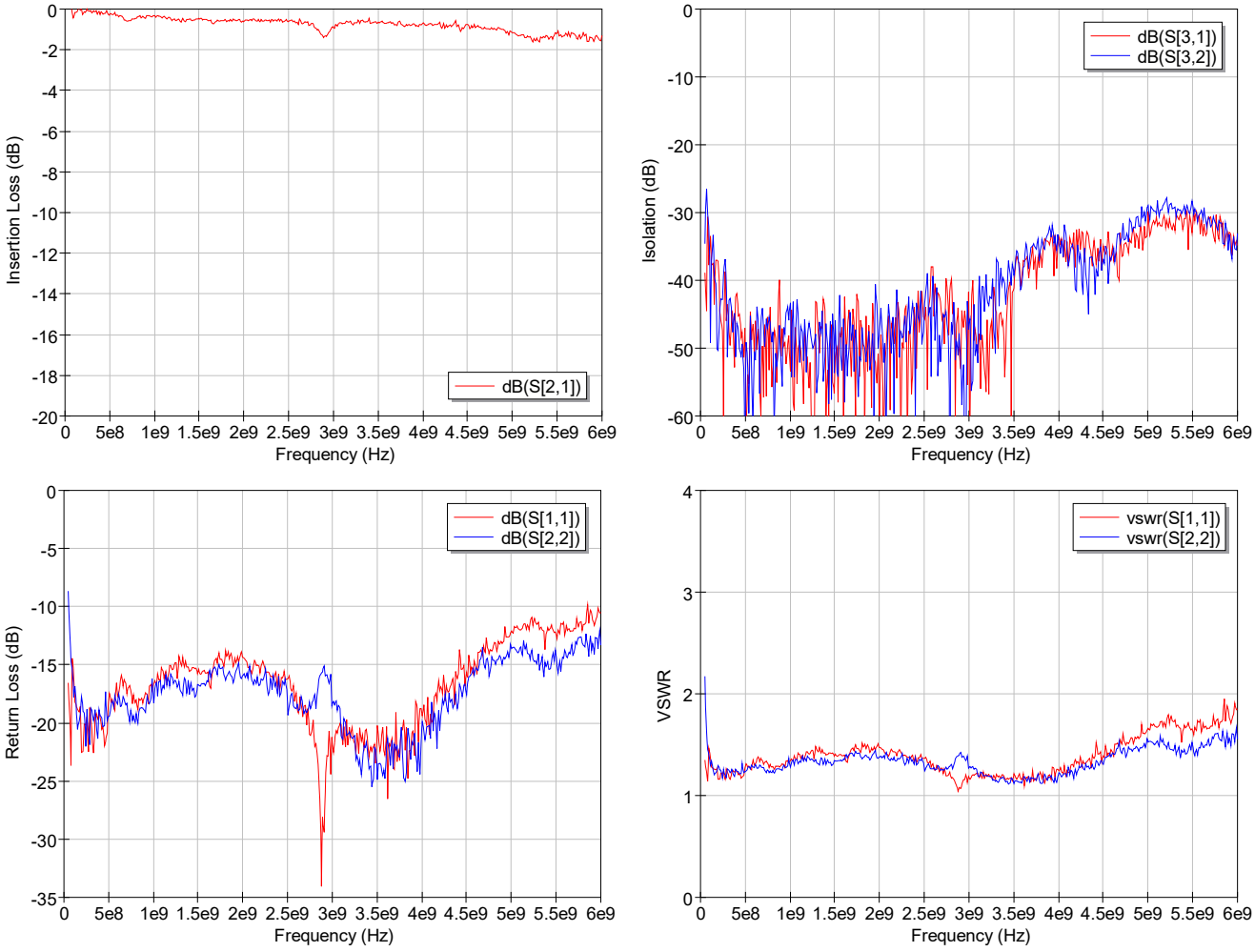


Performance

Small-signal Performance

The S-parameters for the EC-BIAS-T are provided below. The three port network consisting of RF (port 1), RF+DC (port 2), DC (port 3) ports are measured from 0.05 GHz to 6.0 GHz and show excellent insertion loss, return loss and isolation.

Typical S-parameters from 0.05 to 6.0 GHz

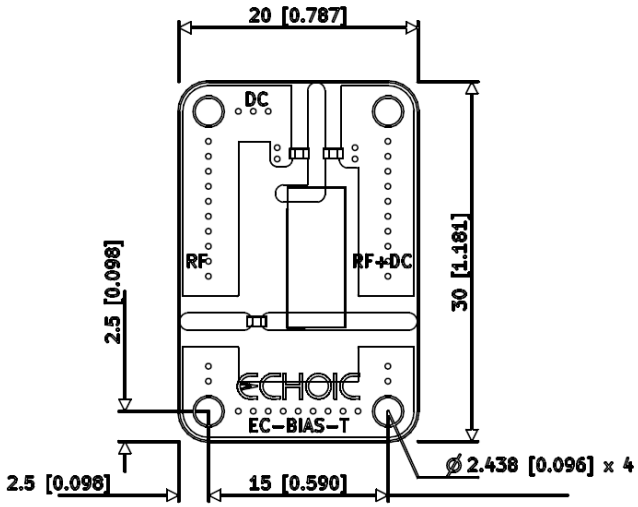


Mechanical

PCB mechanical drawing. All units in mm [inches]. Connectors not shown.

Configuration	*Parameter*	*Typical*	*Units*
PCB only	Width	20	mm
(w/o case, w/o connectors)	Length	30	mm
	Height	4.5	mm
PCB and case	Width	20.15	mm
(w/o connectors)	Length	30.15	mm
	Height	13.28	mm
Connector	Torque	8	In-lbs

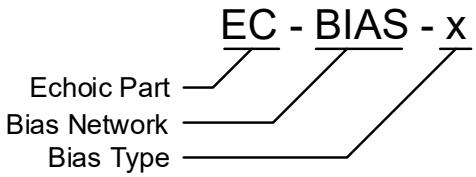
PCB mechanical drawing. All units in mm [inches]. Connectors not shown.



The EC-BIAS-T can be used with the optional case.

Ordering Information

Please use the following model number designation for ordering this and any other part from our bias line:



For example, EC-BIAS-T is an Echoic part, bias network for static DC operation.

Web Resource

For more information on other industrial RF and microwave solutions please visit our website at: www.echoicrf.com