

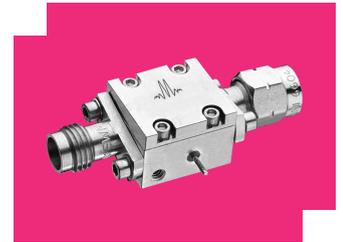
BTN-0050

Bias Tee

DEVICE OVERVIEW

General Description

The BTN-0050 is constructed using a custom-made, resonance-free conical inductor to achieve extremely broadband performance. By minimizing the overall inductor size and using proprietary packaging techniques, the BTN-0050 is a superior option in terms of performance, reliability and ease-of-use when compared to cumbersome self-made bias tees employing off-the-shelf conical inductors. The extremely low cutoff and resonance free operation makes the BTN-0050 suitable for biasing amplifiers, lasers, and modulators driven with high frequency data patterns.



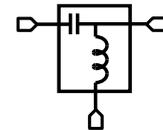
Features

- Broadband: 40 kHz to 50 GHz
- Low Insertion Loss
- Non-Resonant
- Compact Size

Applications

- Test and Measurement Equipment

Functional Block Diagram



Part Ordering Options

Part Number	Description	Connectors	Green Status	Product Lifecycle	Export Classification
BTN-0050	Bias Tee	<u>Standard</u>	REACH RoHS	Released	EAR99

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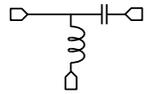
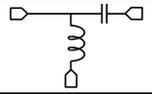
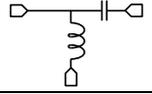
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Revision History

Revision Code	Revision Date	Comment
B	2020-03-01	Performance vs Bias Current plots

Port Configuration and Functions

Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
Common	RF+DC	-	This port is DC blocked to the RF port and DC connected to the DC port through an internal RF choke.	
DC	DC	-	This port is internally connected to an RF choke which is DC connected to the RF+DC port and DC blocked to the RF port.	
RF	RF	2.4F	This port is internally DC blocked to the RF+DC and DC ports.	

Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
DC Current	0.5	A
DC Voltage	30	V
Maximum Storage Temperature	125	°C
Minimum Storage Temperature	-65	°C
RF Power Handling	1	W

Package Information

Parameter	Details	Rating
Weight	-	10g
Dimensions	-	11.94 x 11.94 mm

Electrical Specifications

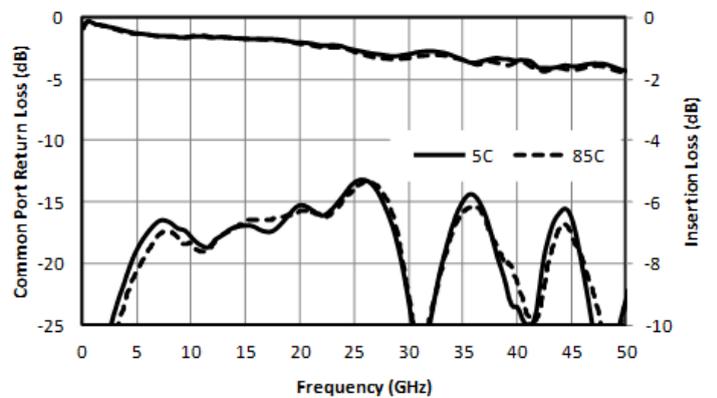
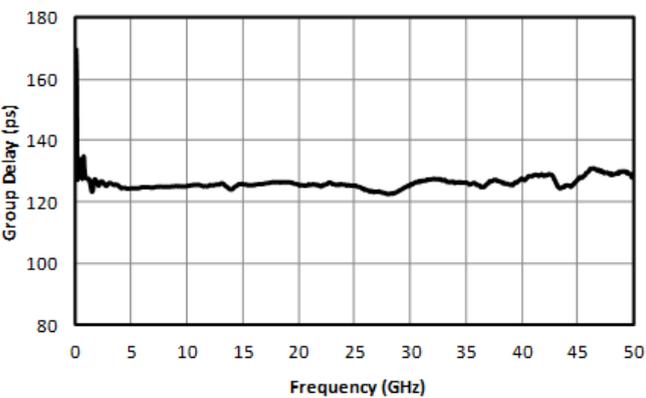
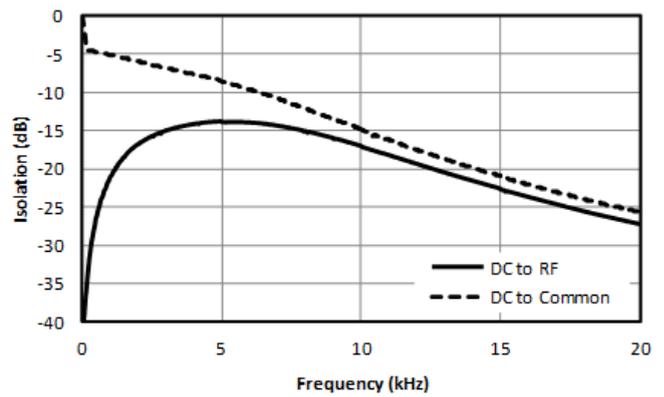
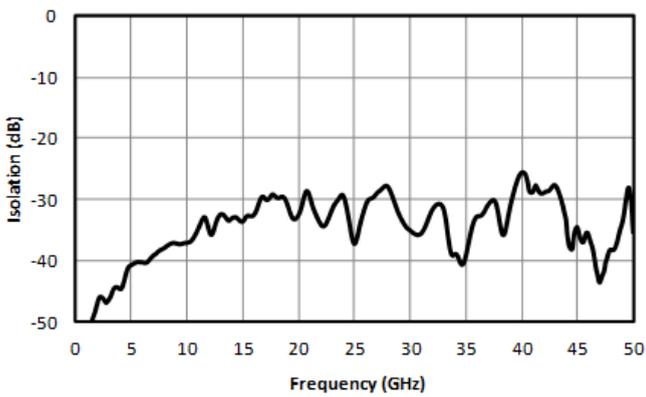
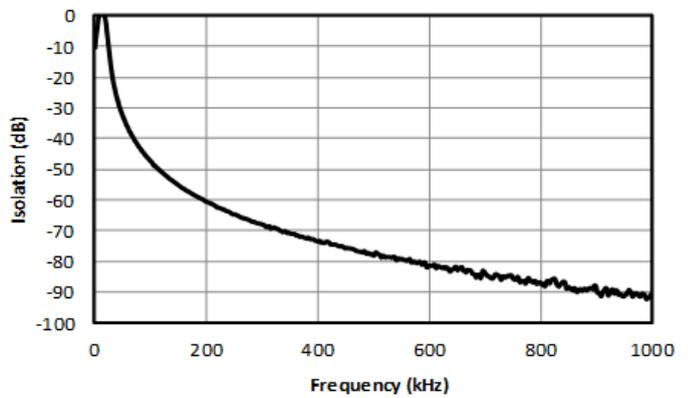
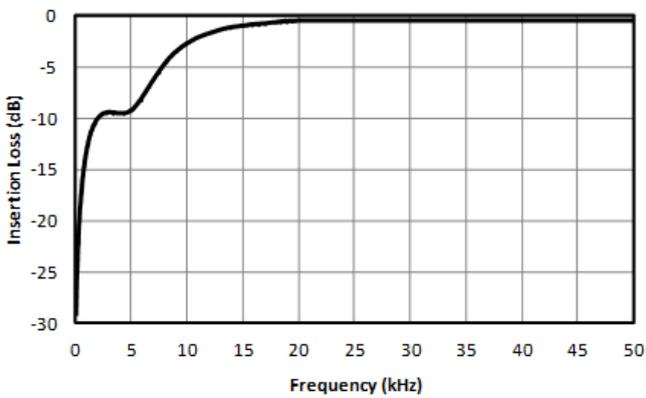
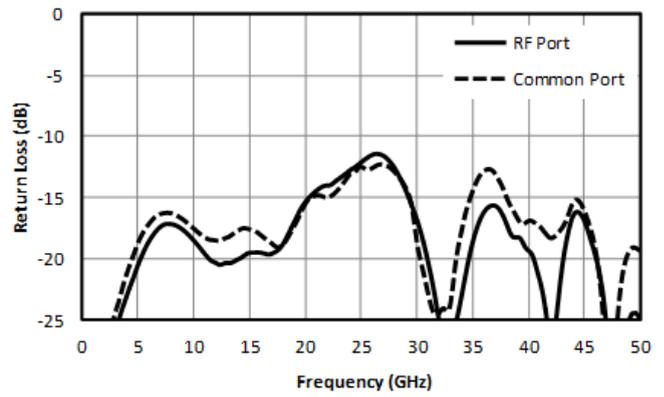
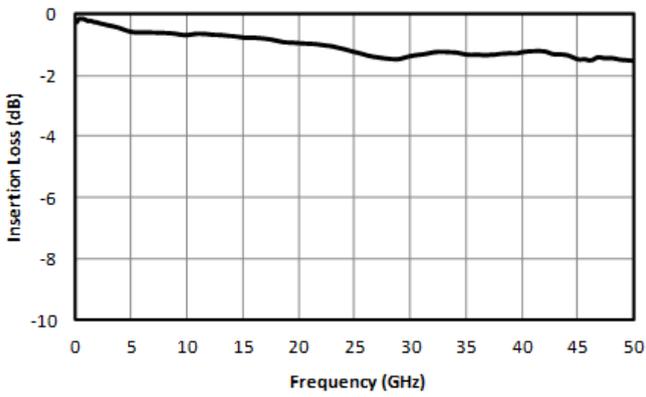
Specifications guaranteed at +25C, measured in a 50-Ohm system

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Capacitance	-	0.00004	50	-	1.1	-	μF
DC Port Isolation	-	0.00004	50	-	30	-	dB
DC Resistance	-	0.00004	50	-	6	-	Ω
Inductance	-	0.00004	50	-	1000	-	μH
Insertion Loss ¹	-	0.00004	50	-	1.8	2.5	dB
Return Loss	-	0.00004	50	-	14	-	dB
Risetime/Falltime ²	-	0.00004	50	-	11	-	ps

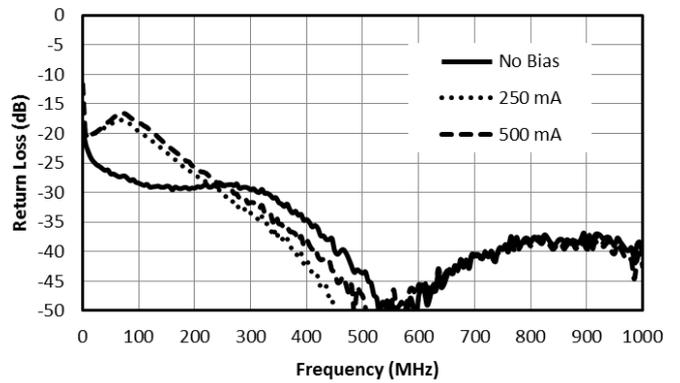
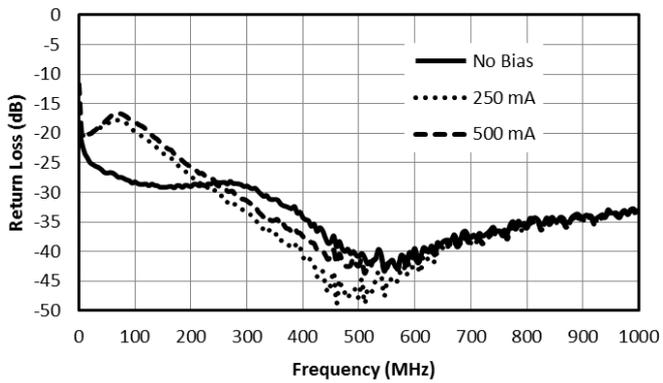
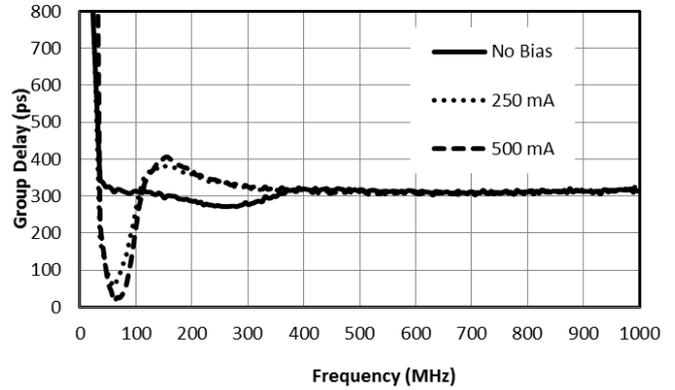
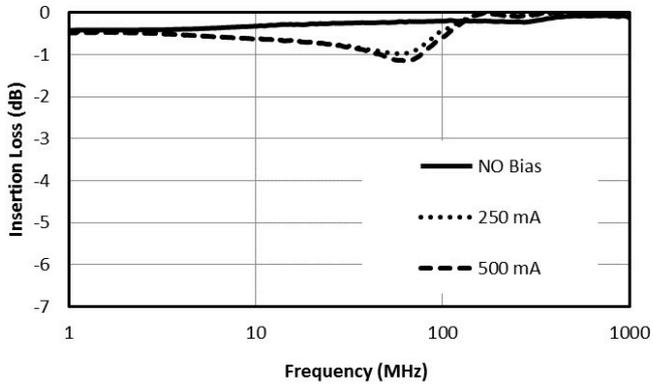
^[1] Insertion loss is specified without DC current applied. DC current limit is destructive limit, application of lower current levels will affect RF performance.

^[2] Specified as 90%/10%. Calculated from $\mathbb{R}_{bt}^2 = (\mathbb{R}_{out}^2 - \mathbb{R}_{in}^2)$

Typical Performance

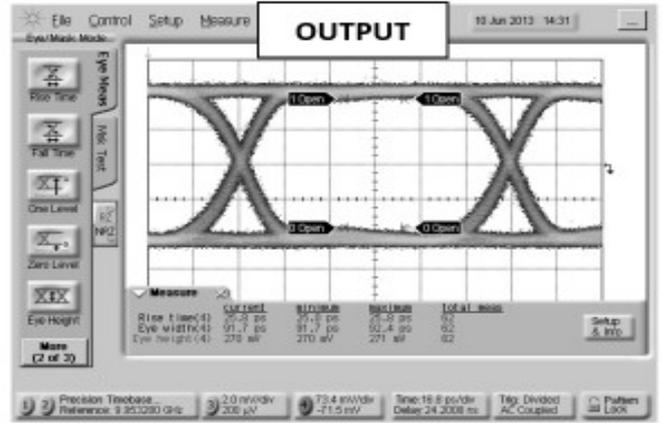
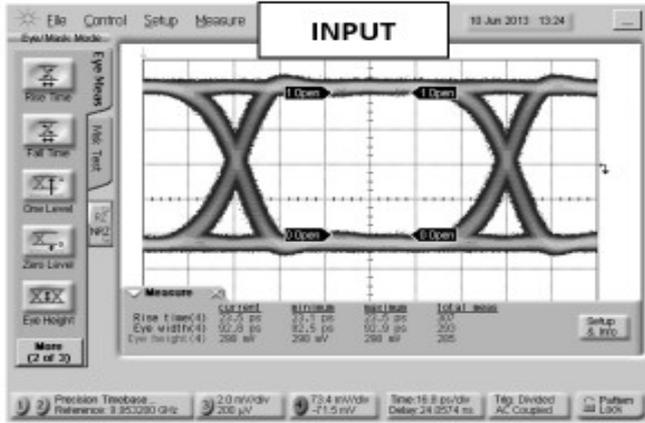


Typical Performance vs Bias Current at Low frequencies

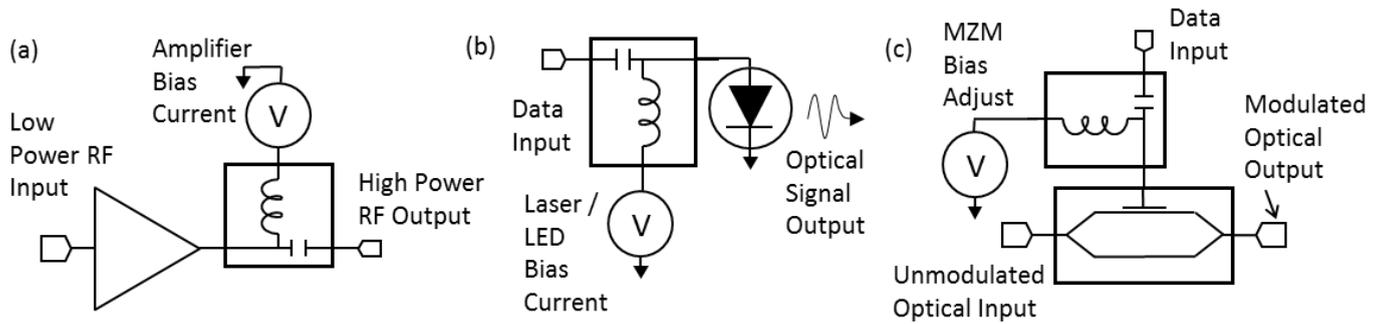


Time Domain Performance Plot

Oscilloscope measurements of the BTN-0050 with a 10Gb/s PRBS pattern. Eye diagrams are taken with a $2^{31}-1$ PRBS input demonstrating minimal eye distortion/closure afforded by the extremely low frequency operation of the bias tee.



Application Information

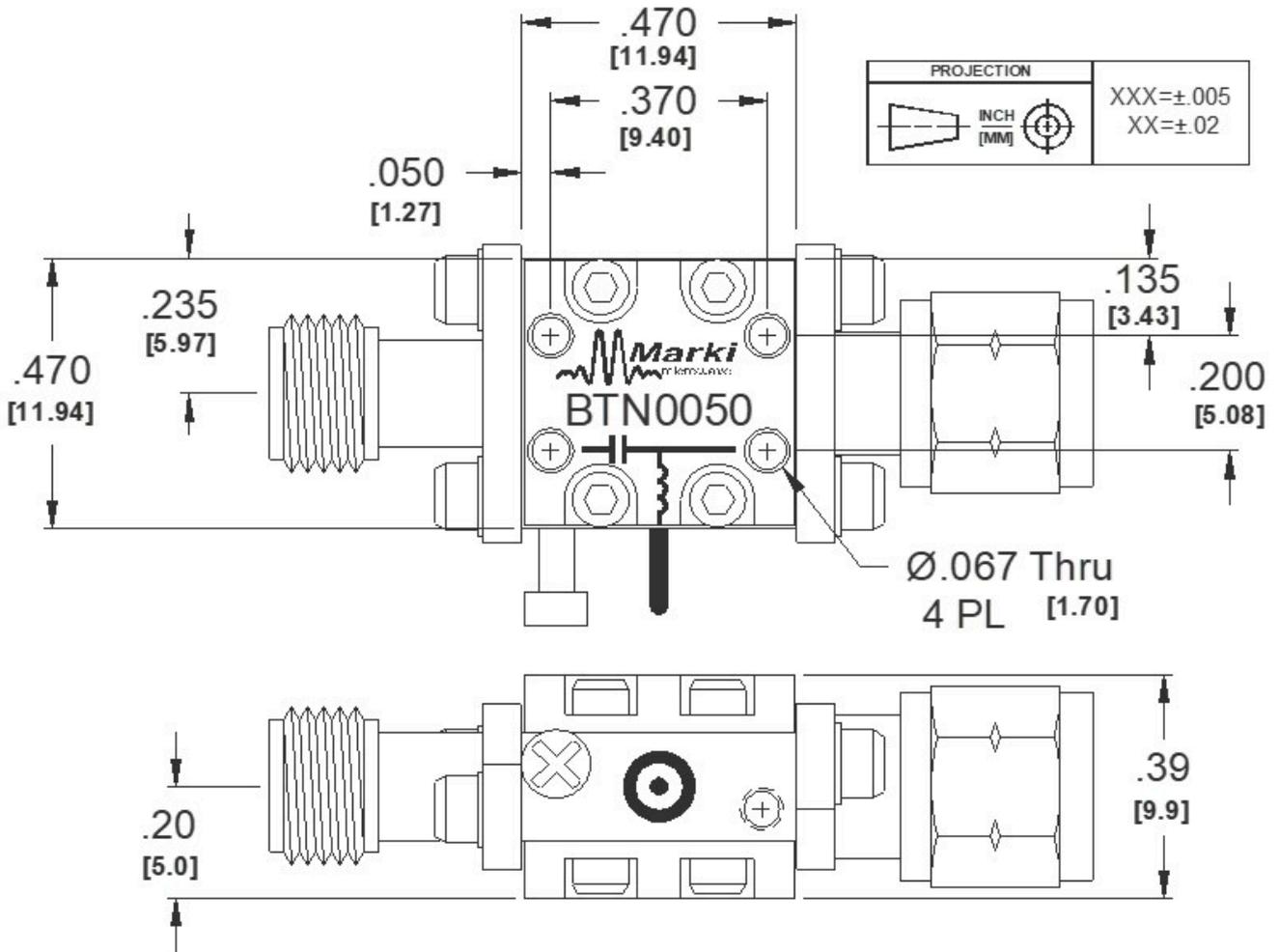


Example Schematics of a) Broadband Microwave Amplifier Biasing, b) Laser/LED Biasing for Data Communication and c) Mach-Zender Modulator Biasing for Data Communication.

Mechanical Data

Outline Drawing

Download : [Outline 2D Drawing](#) | [Outline 3D Drawing](#) | [Outline 3D STP](#)



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