

## LEAD-FREE / RoHS-COMPLIANT HIGH POWER BIAS TEE

**BT1-0050**

The BT1-0050 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 BT1-0050 is a superior option in terms of performance, reliability and ease-of-use when compared to cumbersome user-designed bias tees employing off-the-shelf conical inductors. The extremely low cutoff and resonance free operation makes the BT1-0050 suitable for biasing amplifiers, lasers, and modulators driven with high frequency data patterns.



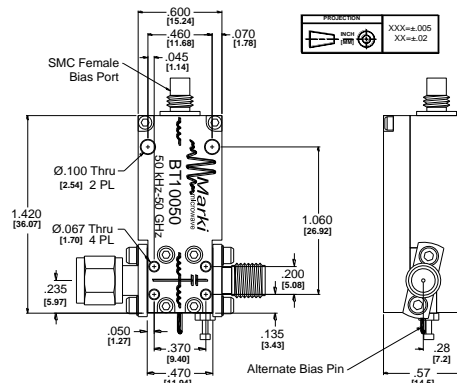
### Features

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

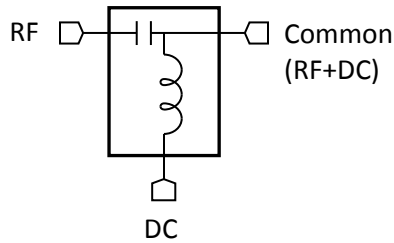
**Electrical Specifications** - Specifications guaranteed from -55 to +100°C, measured in a 50Ω system.

Parameter	Frequency Range	Min	Typ	Max
Insertion Loss (dB)	200 kHz-50 GHz		1.5	2.5
	50-200 kHz		2	
DC Port Isolation (dB)	50 kHz -1 GHz		50	
	1-50 GHz		30	
Return Loss (dB)	50 kHz-50 GHz		13	
RF Power (W)				5
DC Current (A)				1
DC Voltage (V)				50
DC Resistance (Ω)			1	
Inductance (uH)			330	
Capacitance (nF)			100	
Weight (g)			23.5	
Risetime /Falltime (ps) <sup>1</sup>			10	

<sup>1</sup>Specified as 90%/10%. Calculated from  $\tau_{bt}^2 = (\tau_{out}^2 - \tau_{in}^2)$



**Schematic**



**Application Examples**

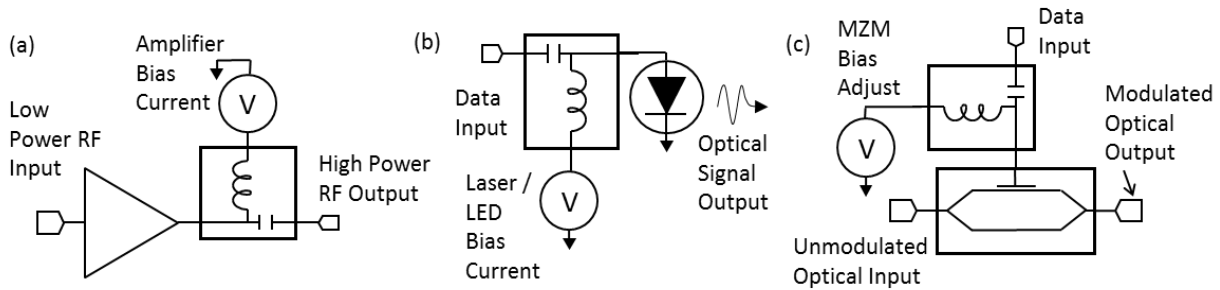


Fig. 1. Example Schematics of a) Broadband Microwave Amplifier Biasing, b) Laser/LED Biasing for Data Communication and c) Mach-Zender Modulator Biasing for Data Communication

**Typical Performance**

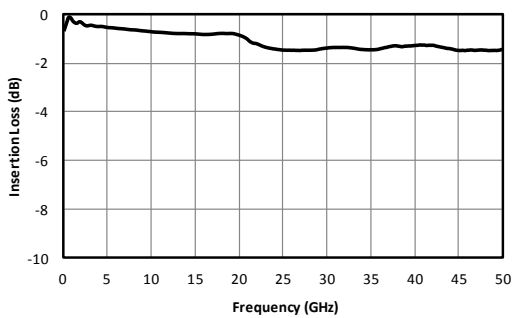


Fig. 2. RF insertion loss.

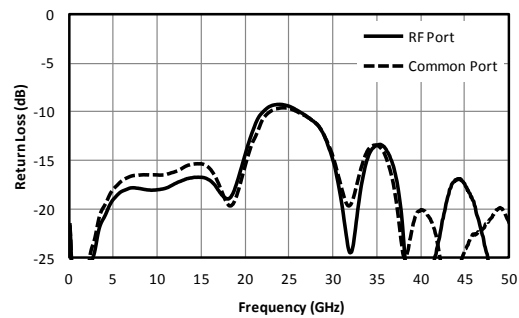


Fig. 3. Return loss.

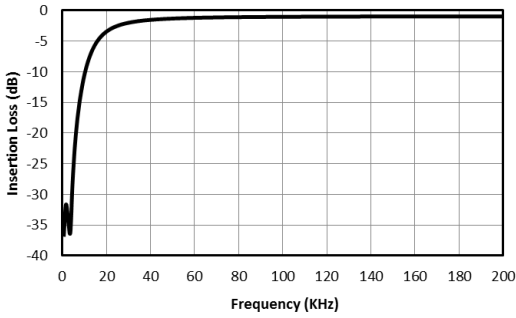


Fig. 4. Low frequency RF response.

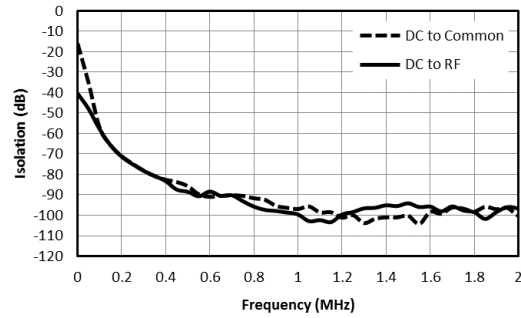


Fig. 5. Low frequency isolation.

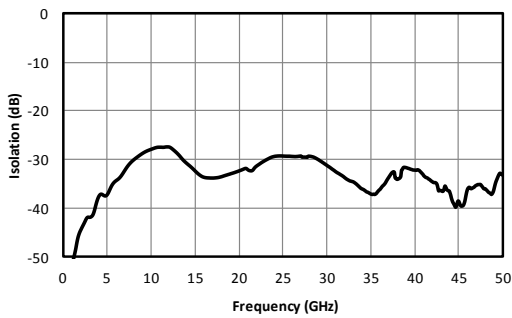


Fig. 6. DC-RF isolation.

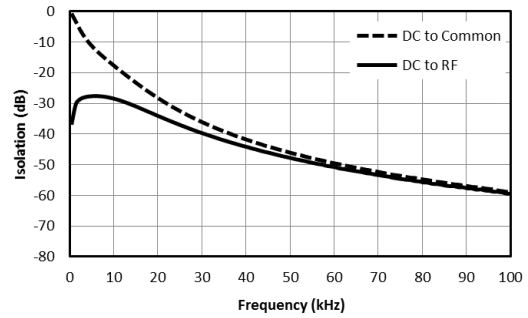


Fig. 7. Near DC isolation

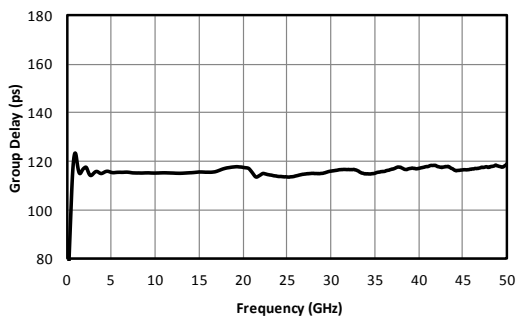


Fig. 8. Group delay.

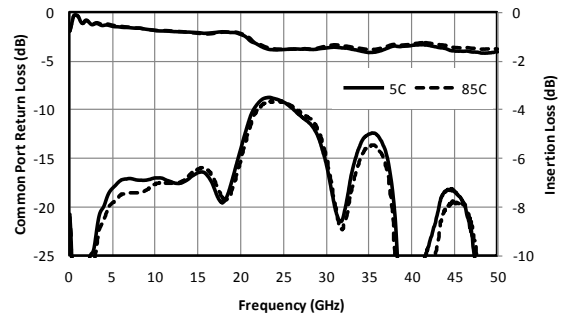


Fig. 9. Performance over temperature

**Typical Performance vs Bias Current at Low frequencies**

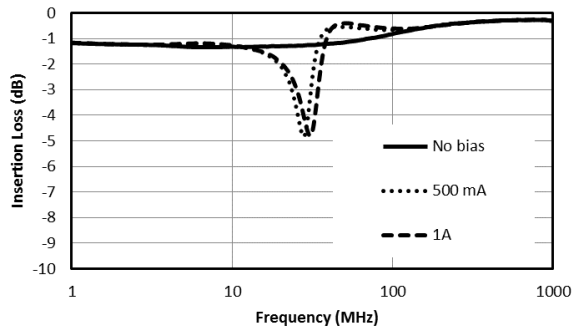


Fig. 10. Insertion Loss vs Bias Current.

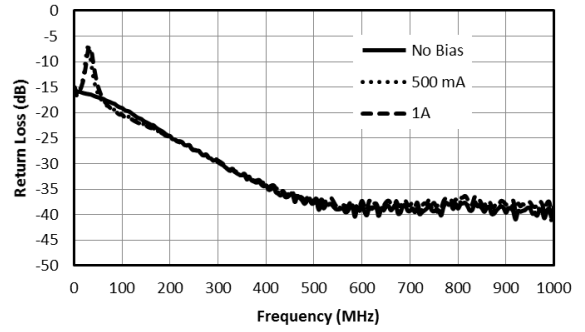


Fig. 11. Input Return Loss vs Bias Current.

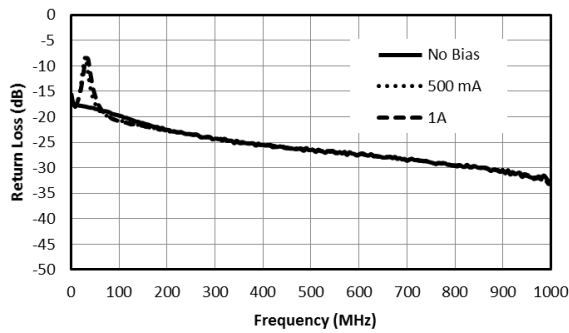


Fig. 12. Output Return Loss vs Bias Current.

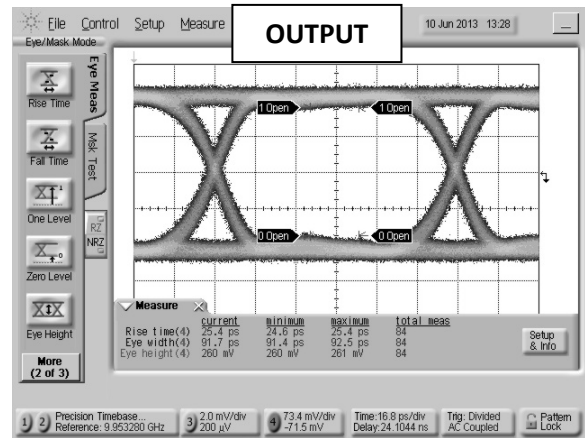
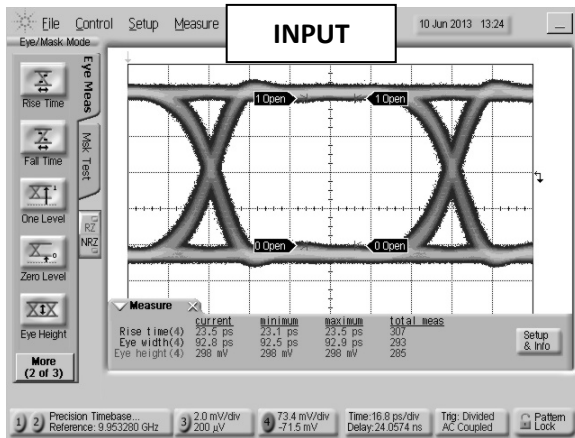


Fig. 7. Oscilloscope measurements of the BT1-0050 with a 10Gb/s PRBS pattern. Eye diagrams are taken with a  $2^{31}-1$  PRBS input demonstrating minimal eye distortion/closure afforded by the extremely low frequency operation of the bias tee.

Model Number	Description
BT1-0050	50 kHz to 50 GHz High Power Bias Tee with 2.4 mm connectors <sup>1</sup> , <b>LEAD-FREE/RoHS COMPLIANT</b>

<sup>1</sup>Consult factory for other connector options.

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**Revision History**

Revision code	Revision Date	Comment
B	April 2020	Performance vs Bias current plots