LEAD-FREE / RoHS-COMPLIANT

BIAS TEE

BTN-0050

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

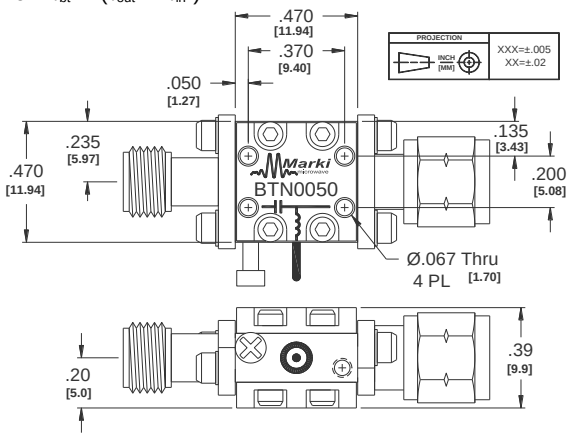
- Broadband: 40 kHz to 50 GHz
- Low Insertion Loss
- Non-Resonant
- Compact Size

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

Parameter	Frequency Range	Min	Typ	Max
Insertion Loss (dB)[1]	40 kHz-50 GHz		1.8	2.5
DC Port Isolation (dB)			30	
Return Loss (dB)			14	
RF Power (W)				1
DC Current (mA)				500
DC Voltage (V)				30
DC Resistance (Ω)			6	
Inductance (uH)			1000	
Capacitance (uF)			1.1	
Weight (g)			10	
Risetime/Falltime (ps)[2]			11	

[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 $\tau_{bt}^2 = (\tau_{out}^2 - \tau_{in}^2)$



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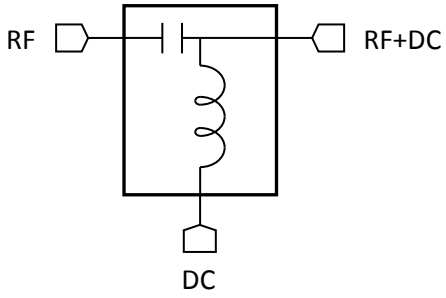
Schematic



Application Examples

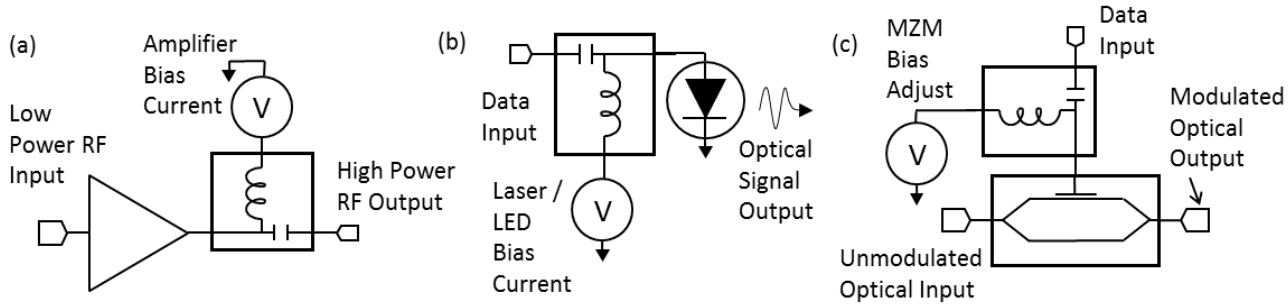


Fig. 1. Example Schematics of a) Broadband Microwave Amplifier Biasing, b) Laser/LED Biasing for Data Communication and c) Mach-Zender Modulator Biasing for Data Communication

Typical Performance

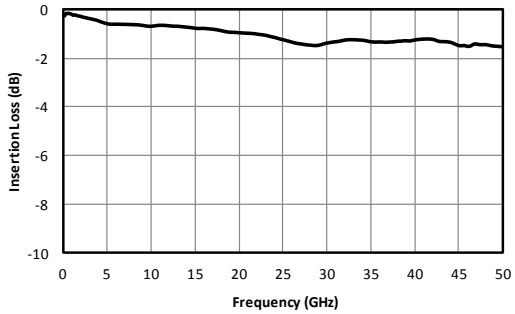


Fig. 2. RF insertion loss.

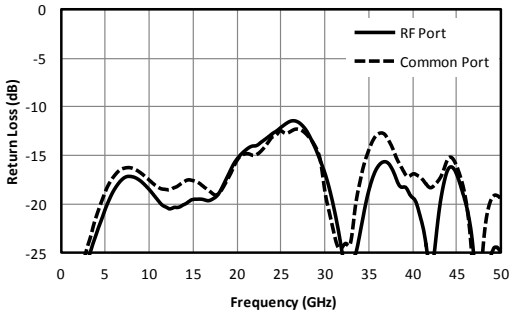


Fig. 3. Return loss.

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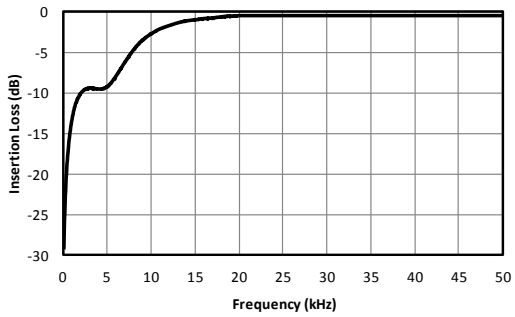

Fig. 4. Low frequency RF response.

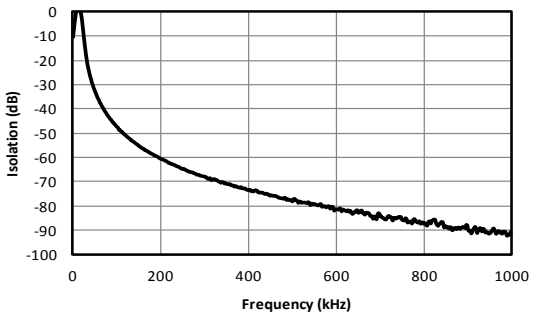

Fig. 5. Low frequency isolation.

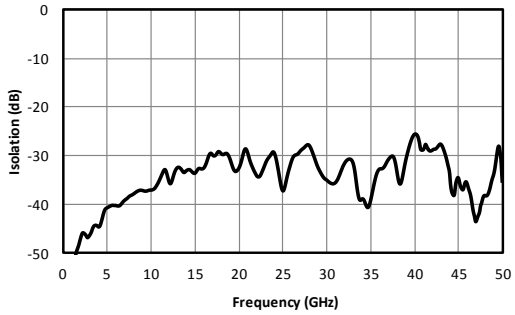

Fig. 6. DC-RF isolation.

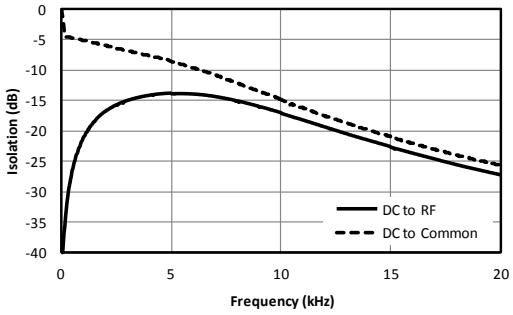

Fig. 7. Near DC isolation

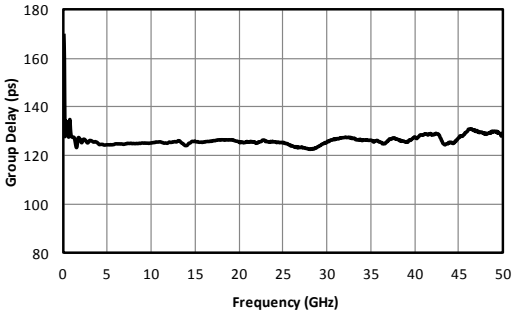

Fig. 8. Group delay.

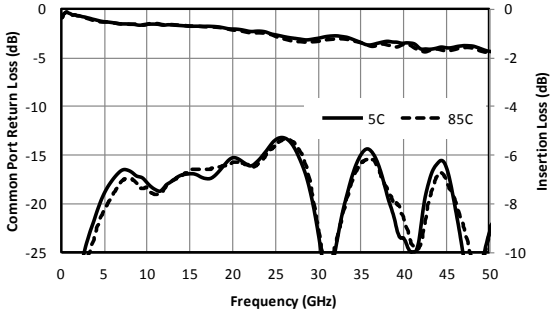

Fig. 9. Performance over temperature

Typical Performance vs Bias Current at Low frequencies

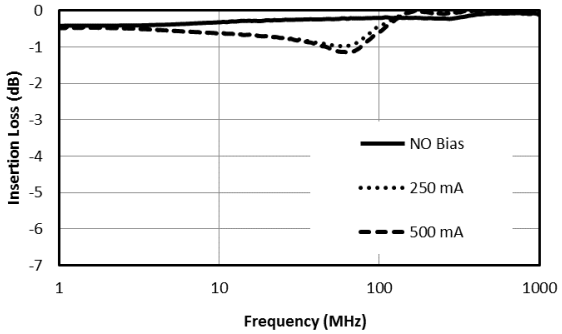

Fig. 10. Insertion Loss vs Bias Current.

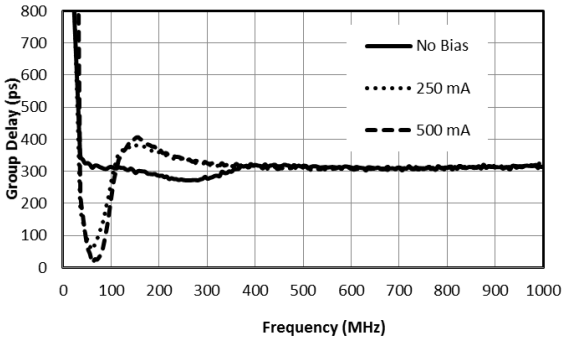

Fig. 11. Group delay vs Bias Current.

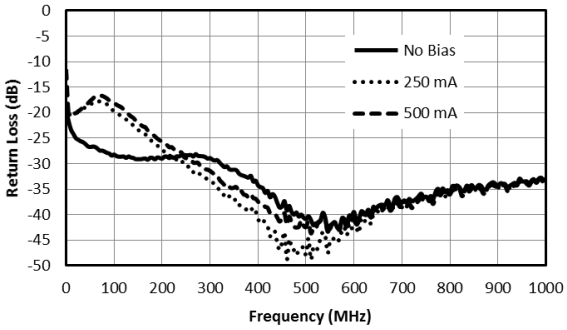

Fig. 12. Input Return Loss vs Bias Current.

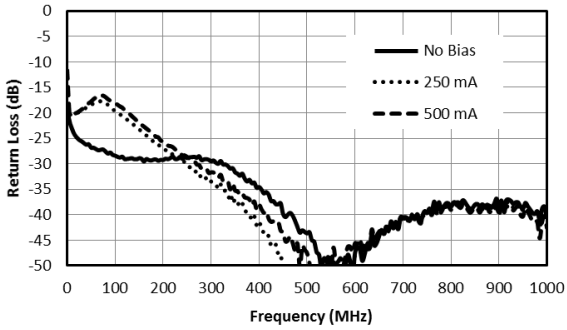

Fig. 13. Output Return Loss vs Bias Current.

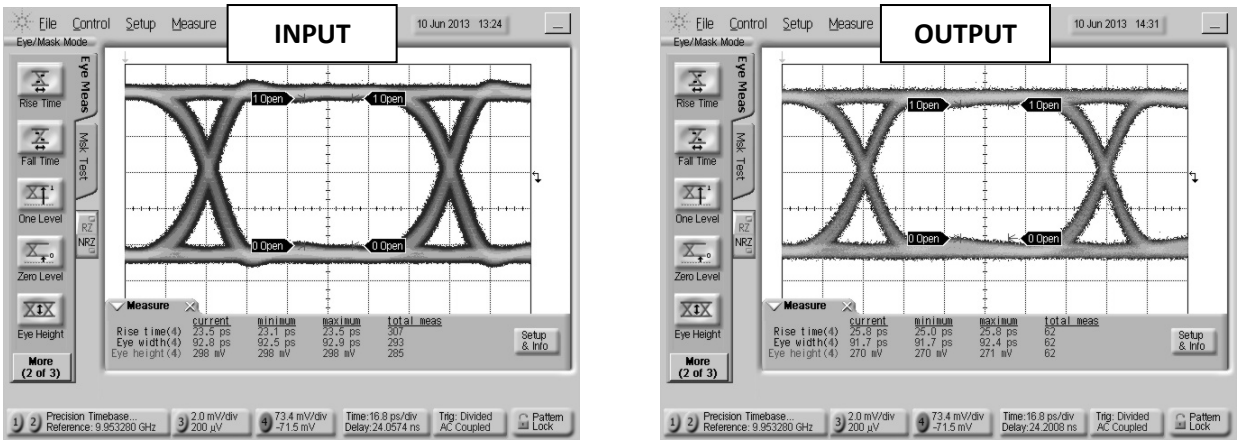

Fig. 14. Oscilloscope measurements of the BTN-0050 with a 10Gb/s PRBS pattern. Eye diagrams are taken with a 2^{31}-1 PRBS input demonstrating minimal eye distortion/closure afforded by the extremely low frequency operation of the bias tee.

Model Number	Description
BTN-0050	40 kHz to 50 GHz Bias Tee with 2.4 mm connectors[1], LEAD-FREE/RoHS COMPLIANT

[1]Consult factory for other connector options.

Revision History

Revision code	Revision Date	Comment
B	March 2020	Performance vs Bias Current plots