

LEAD-FREE / RoHS-COMPLIANT

HIGH POWER BIAS TEE

BT1-0040

The BT1-0040 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 BT1-0040 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 BT1-0040 suitable for biasing amplifiers, lasers, and modulators driven with high frequency data patterns.



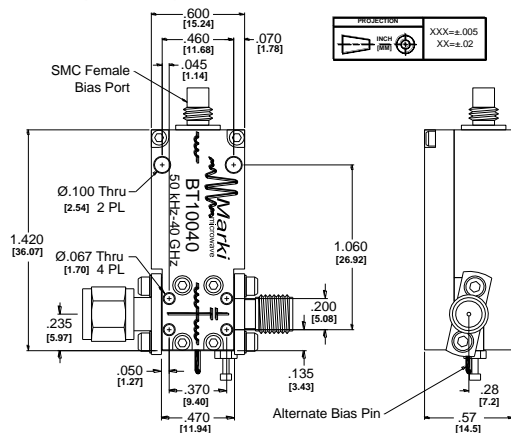
Features

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

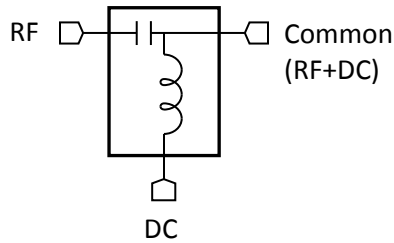
Electrical Specifications - Specifications guaranteed from -55 to +100°C, measured in a 50Ω system.

| Parameter | Frequency Range | Min | Typ | Max |
|--------------------------------------|-----------------|-----|------|-----|
| Insertion Loss (dB) | 200 kHz-40 GHz | | 1.5 | 2.5 |
| | 50-200 kHz | | 2 | |
| DC Port Isolation (dB) | 50 kHz -1 GHz | | 50 | |
| | 1-40 GHz | | 30 | |
| Return Loss (dB) | 50 kHz-40 GHz | | 12 | |
| RF Power (W) | | | | 10 |
| 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) ¹ | | | 10 | |

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



Schematic



Application Examples

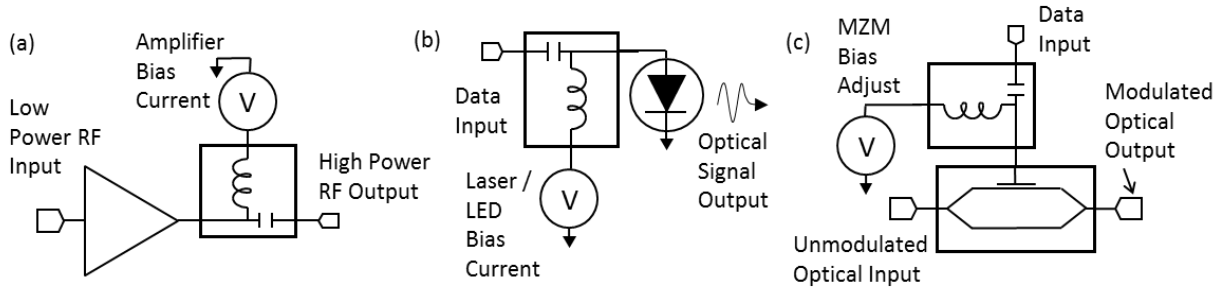


Fig. 1. Example Schematics of a) Broadband Microwave Amplifier Biasing, b) Laser/LED Biasing for Data Communication and c) Mach-Zender Modulator Biasing for Data Communication

Typical Performance

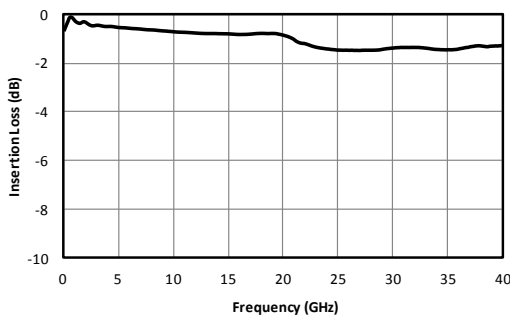


Fig. 2. RF insertion loss.

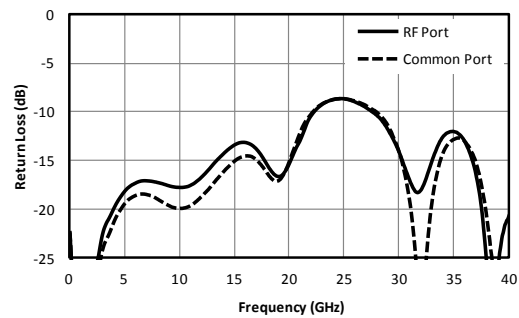


Fig. 3. Return loss.

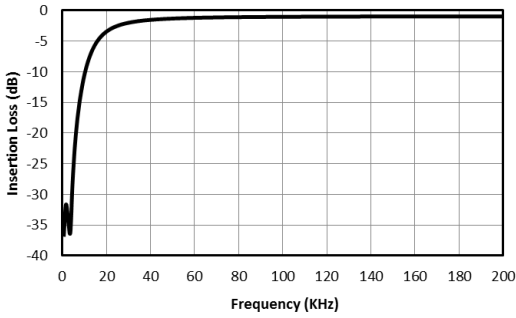


Fig. 4. Low frequency RF response.

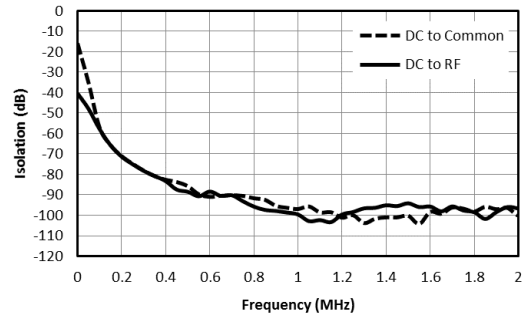


Fig. 5. Low frequency isolation.

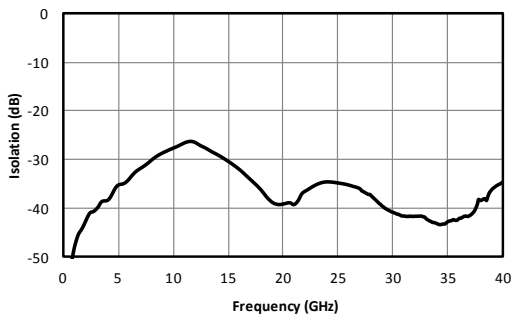


Fig. 6. DC-RF isolation.

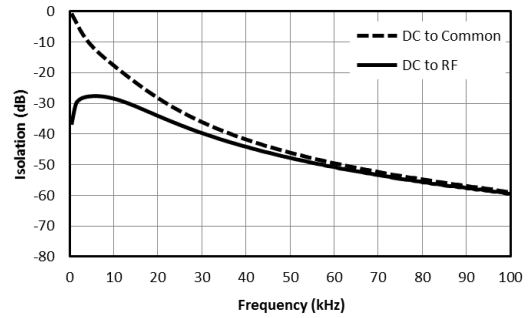


Fig. 7. Near DC isolation

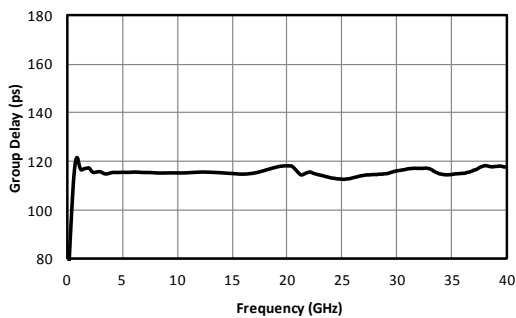


Fig. 8. Group delay.

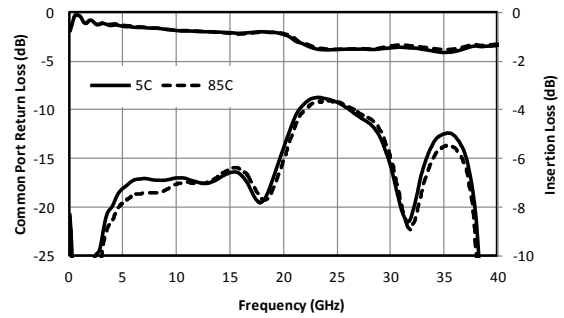


Fig. 9. Performance over temperature

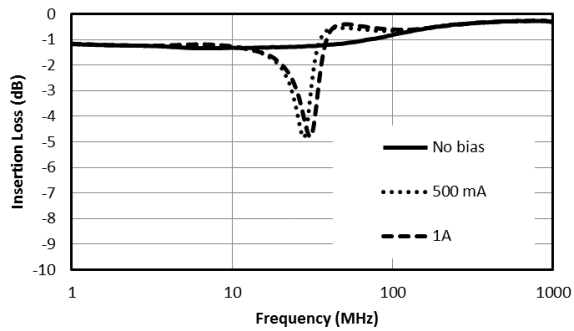


Fig. 10. Insertion Loss vs Bias Current.

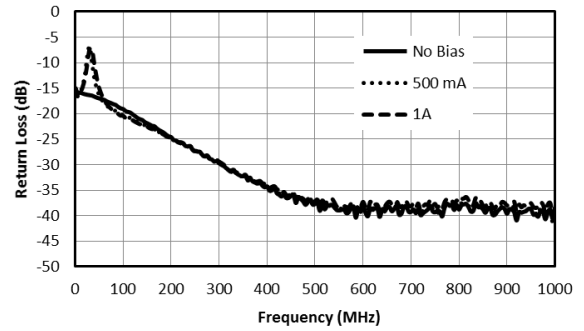


Fig. 11. Input Return Loss vs Bias Current.

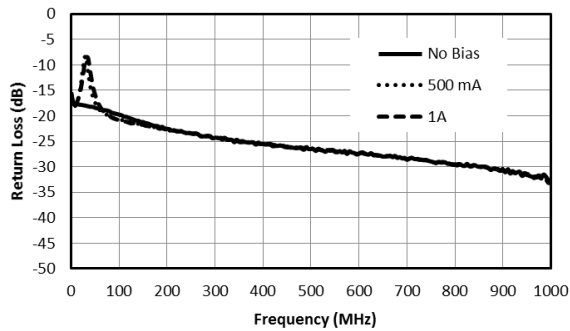


Fig. 12. Output Return Loss vs Bias Current.

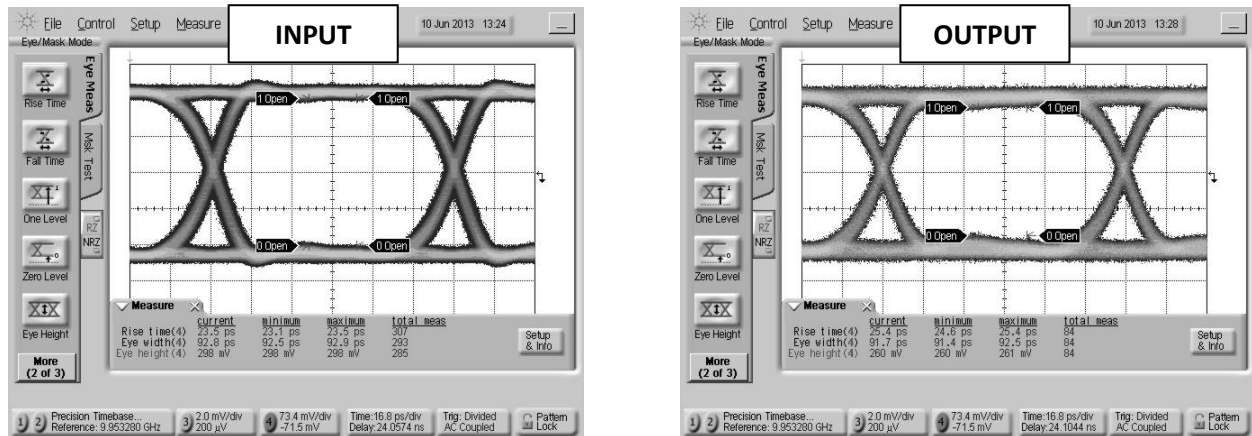


Fig. 13. Oscilloscope measurements of the BT1-0040 with a 10Gb/s PRBS pattern. Eye diagrams are taken with a 2³¹-1 PRBS input demonstrating minimal eye distortion/closure afforded by the extremely low frequency operation of the bias tee.

| Model Number | Description |
|--------------|---|
| BT1-0040 | 50 kHz to 40 GHz High Power Bias Tee with 2.92 mm connectors ¹ , LEAD-FREE/RoHS COMPLIANT |

¹Consult factory for other connector options.

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Revision History

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