

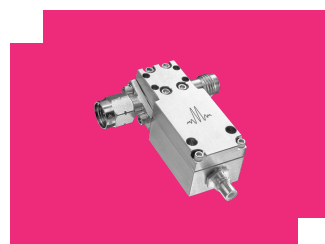
BT-0040

Bias Tee

DEVICE OVERVIEW

General Description

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



[Download s-parameters here](#)

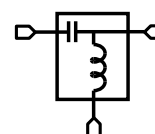
Features

- Broadband: 4 kHz to 40 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 |
|-------------|-------------|--------------------------|---------------|-------------------|-----------------------|
| BT-0040 | Bias Tee | Standard | RoHS REACH | Released | EAR99 |

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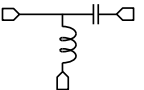
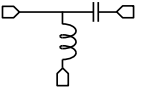
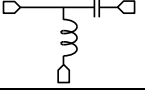
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Revision History

| Revision Code | Revision Date | Comment |
|---------------|---------------|-----------------------------------|
| B | 2020-04-01 | 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 | 2.92F | 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 | - | 23.5g |
| Dimensions | - | 15.24 x 36.07 mm |

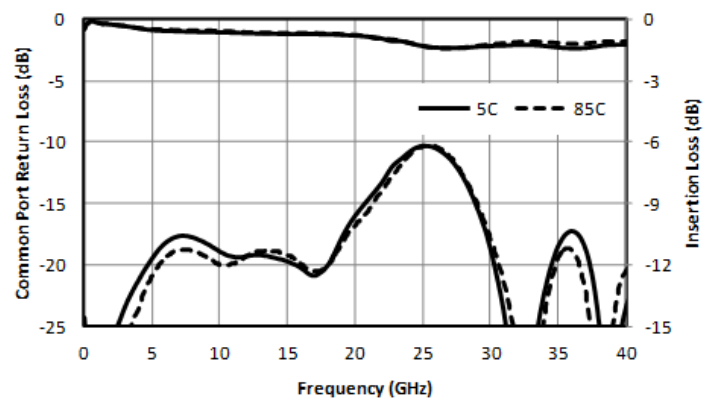
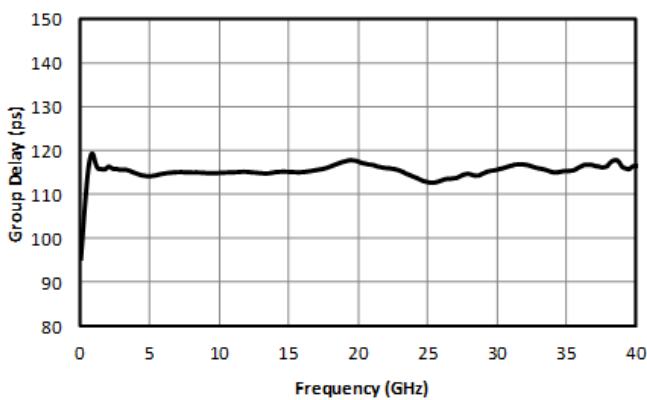
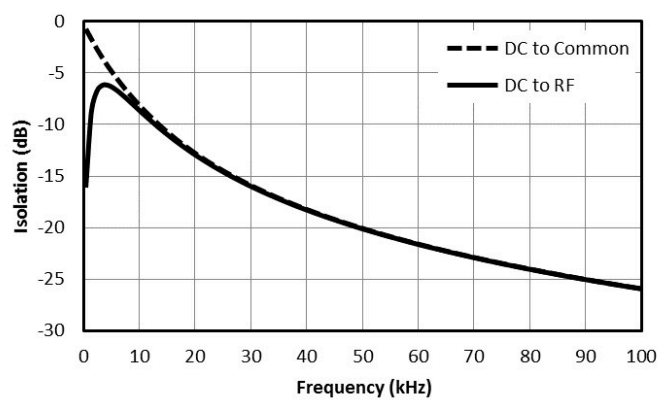
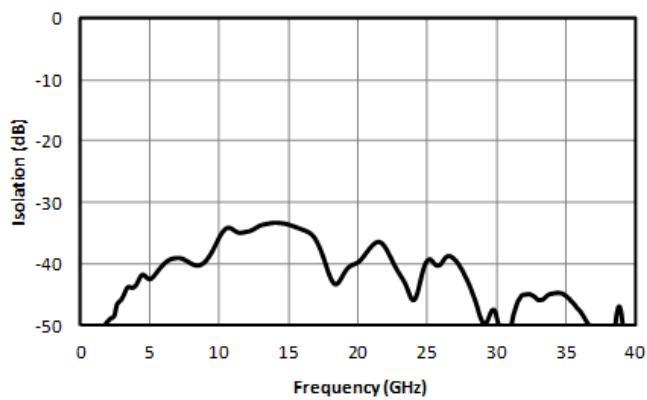
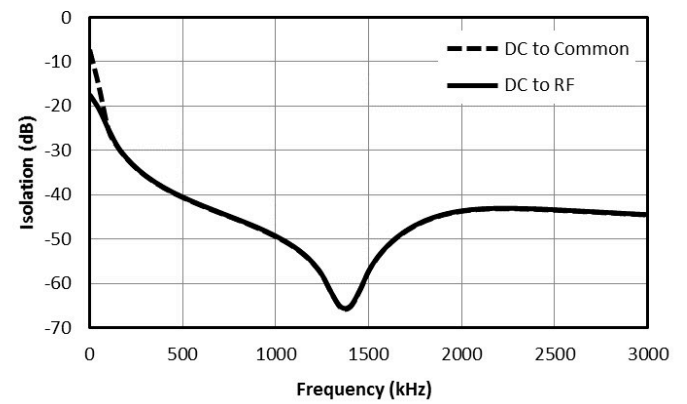
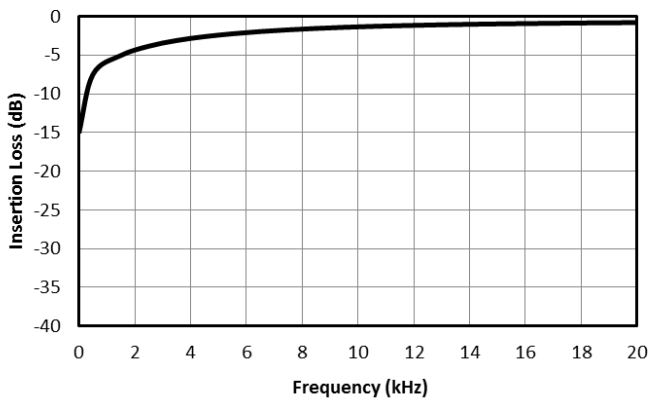
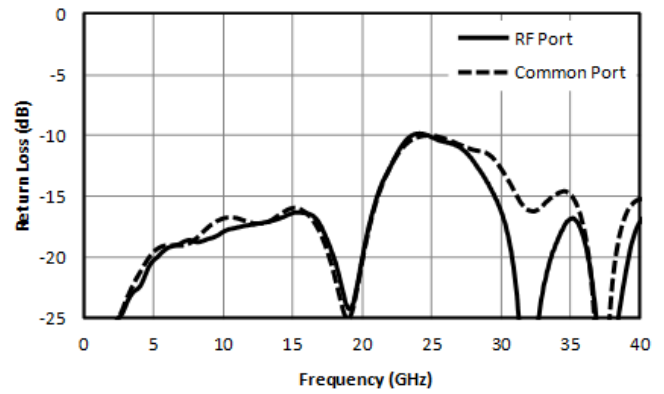
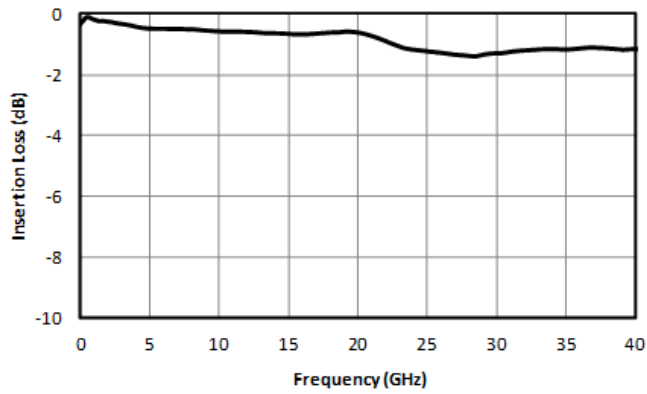
Electrical Specifications

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

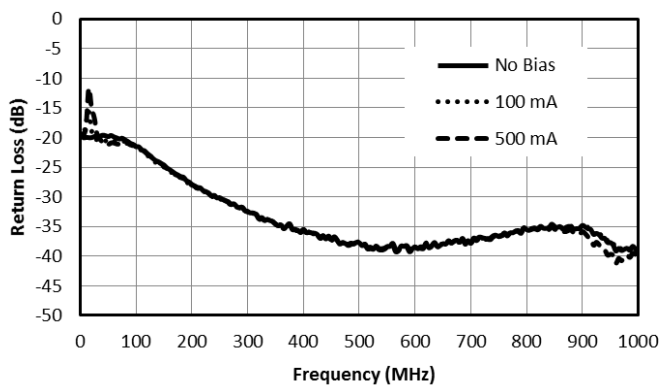
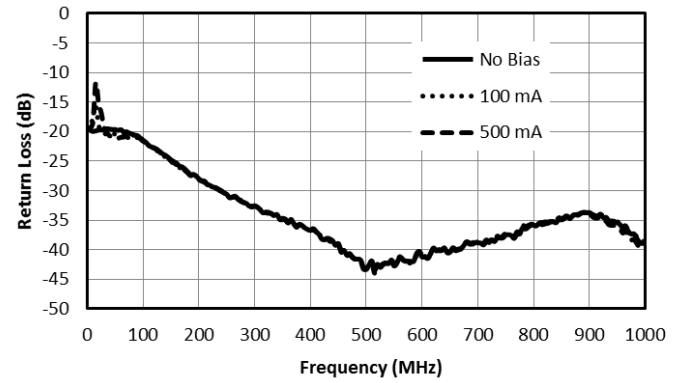
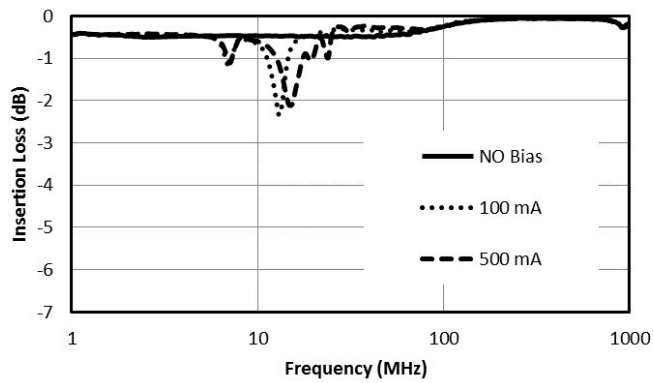
| Parameter | Test Conditions | Minimum Frequency (GHz) | Maximum Frequency (GHz) | Min | Typ | Max | Unit |
|--------------------------------|-----------------|-------------------------|-------------------------|-----|------|-----|------|
| Capacitance | - | 0.000004 | 40 | - | 1.1 | - | μF |
| DC Port Isolation | - | 0.000004 | 40 | - | 30 | - | dB |
| DC Resistance | - | 0.000004 | 40 | - | 3 | - | Ω |
| Inductance | - | 0.000004 | 40 | - | 1000 | - | μH |
| Insertion Loss | - | 0.000004 | 40 | - | 1.5 | 2.2 | dB |
| Return Loss | - | 0.000004 | 40 | - | 12 | - | dB |
| Risetime/Falltime ¹ | - | 0.000004 | 40 | - | 10 | - | ps |

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

Typical Performance Plots

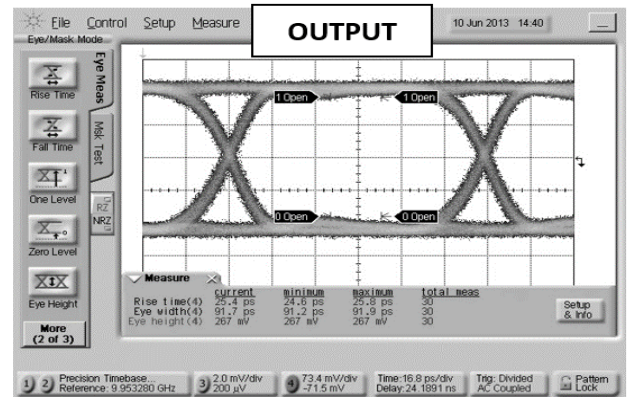
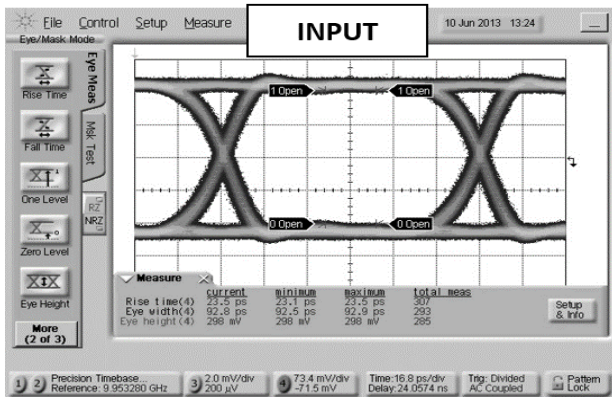


Typical Performance vs Bias Current at Low frequencies

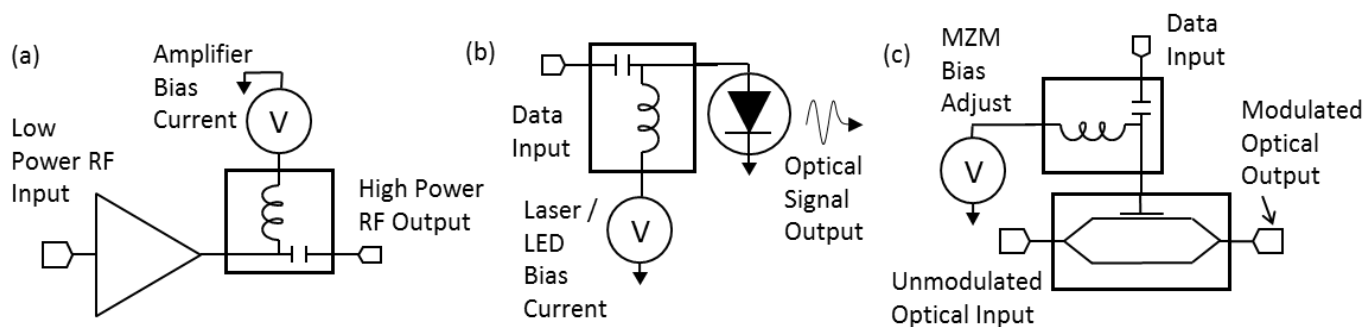


Time Domain Performance Plots

Oscilloscope measurements of the BT-0040 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

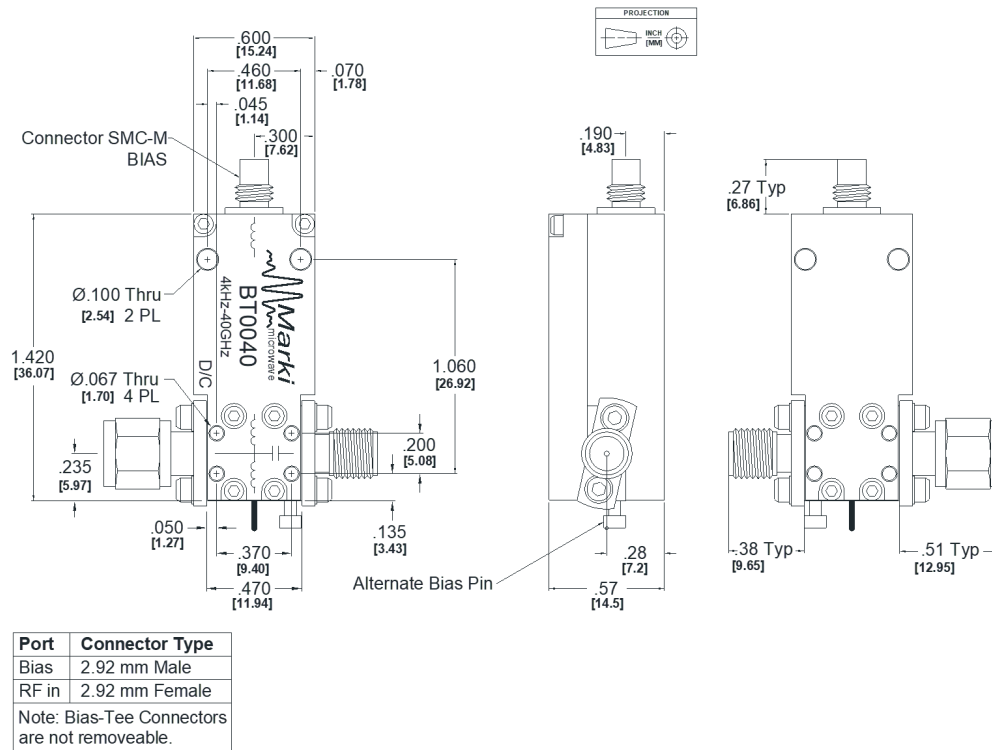


Example Schematics of a) Broadband Microwave Amplifier Biasing, b) Laser/LED Biasing for Data Communication and c) Mach-Zender Modulator Biasing for Data Communication

Mechanical Data

Outline Drawing

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



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