

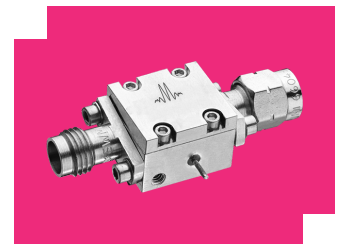
## BTN-0050

### 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.



[Download s-parameters here](#)

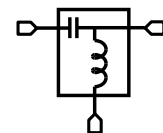
### Features

- 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 | Package | Packing Size | Green Status | Product Lifecycle | Export Classification |
|-------------|-------------|---------|--------------|--------------|-------------------|-----------------------|
| BTN-0050    | Bias Tee    | -       | -            | RoHS         | Released          | EAR99                 |

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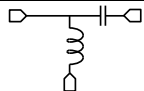
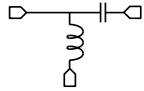
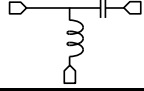
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## Revision History

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

## Port Configuration and Functions

### Port Functions

| Port   | Function | Description                                                                                                             | Equivalent Circuit for Package                                                      |
|--------|----------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 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       | 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    |
| RF Power   | 1              | W    |

### Package Information

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

### Electrical Specifications

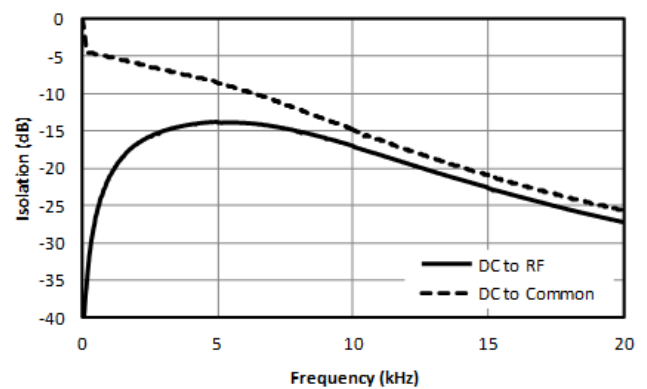
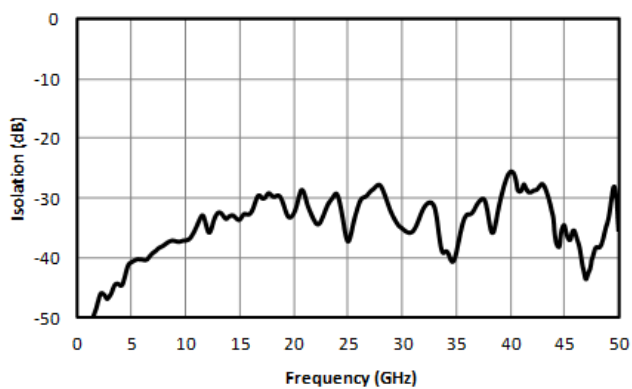
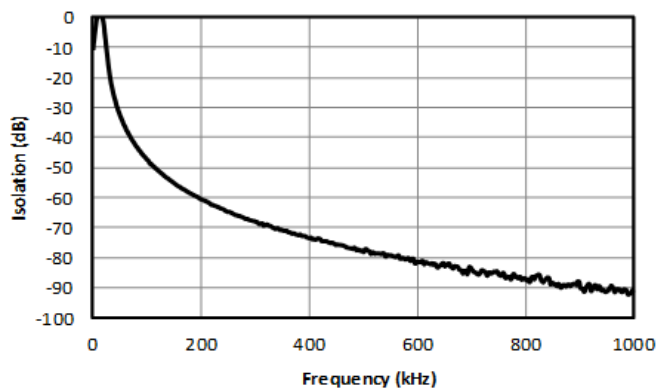
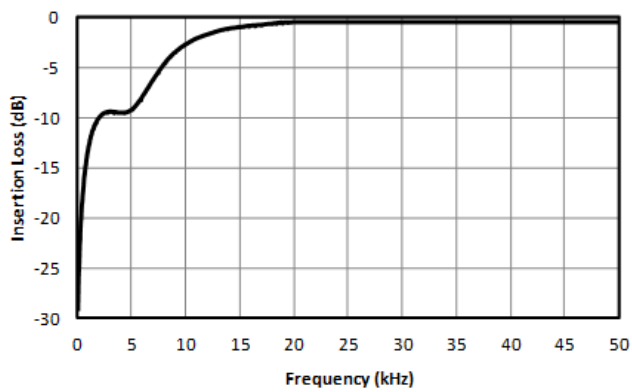
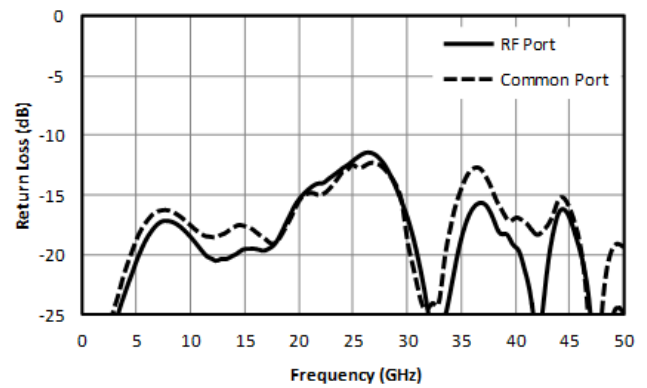
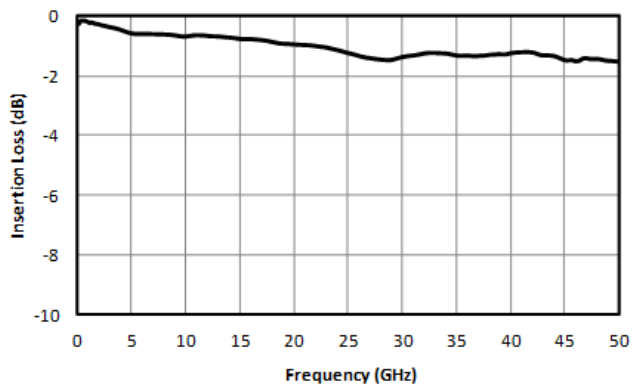
Specifications guaranteed from -55 to +100°C, measured in a 50Ω system.

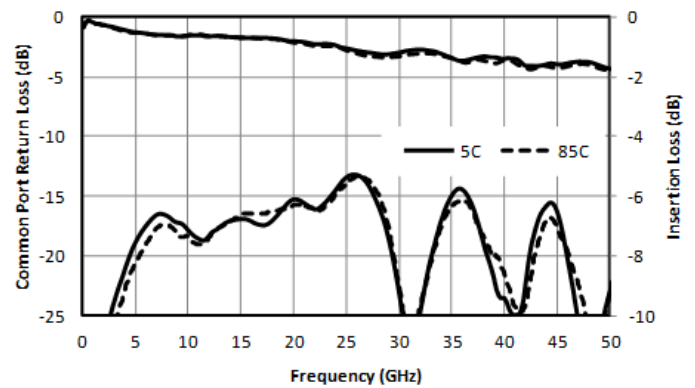
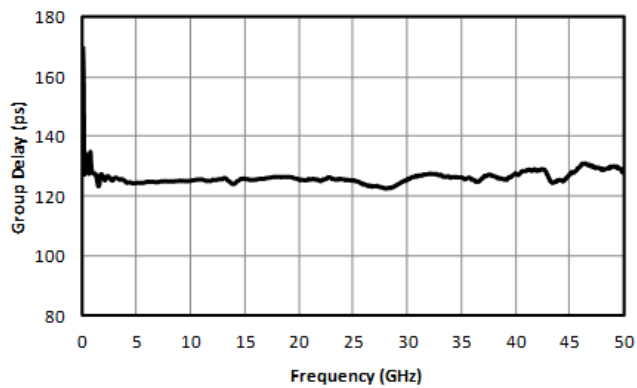
| Parameter                      | Test Conditions | Minimum Frequency (GHz) | Maximum Frequency (GHz) | Min | Typ  | Max | Unit |
|--------------------------------|-----------------|-------------------------|-------------------------|-----|------|-----|------|
| Capacitance                    | -               | 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 <sup>1</sup>    | -               | 0.00004                 | 50                      | -   | 1.8  | 2.5 | dB   |
| Return Loss                    | -               | 0.00004                 | 50                      | -   | 14   | -   | dB   |
| Risetime/Falltime <sub>2</sub> | -               | 0.00004                 | 50                      | -   | 11   | -   | ps   |

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

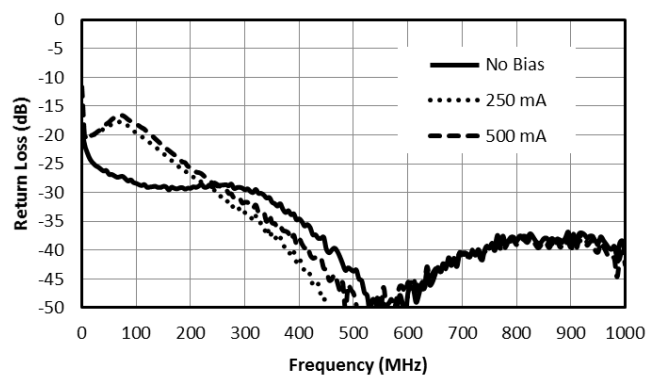
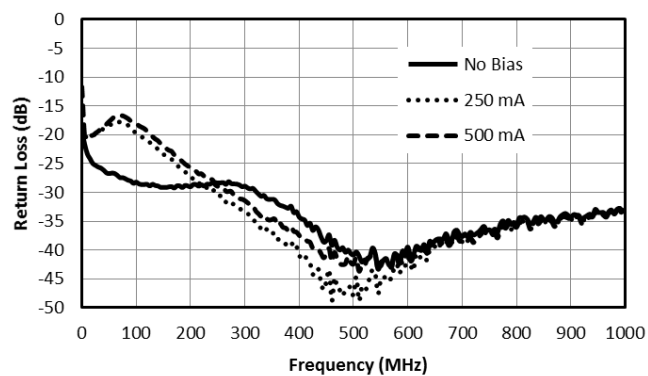
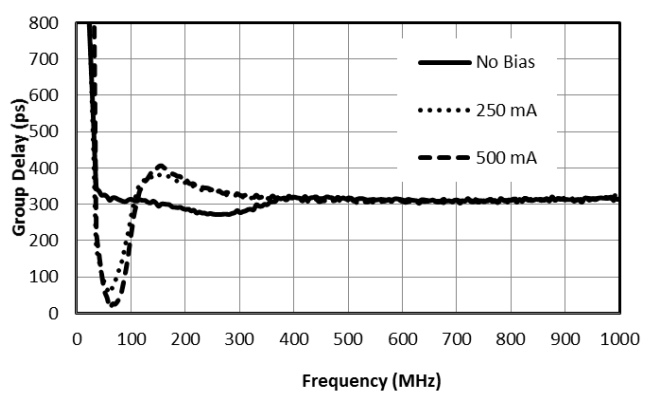
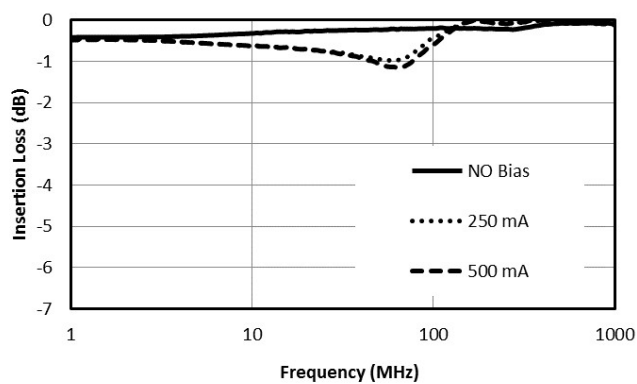
<sup>[2]</sup> Specified as 90%/10%. Calculated from  $\tau_{bt}^2 = (\tau_{out}^2 - \tau_{in}^2)$

## Typical Performance

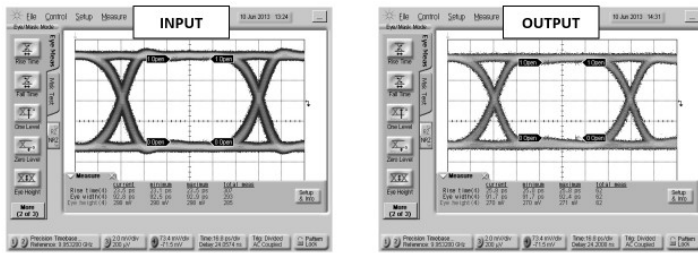




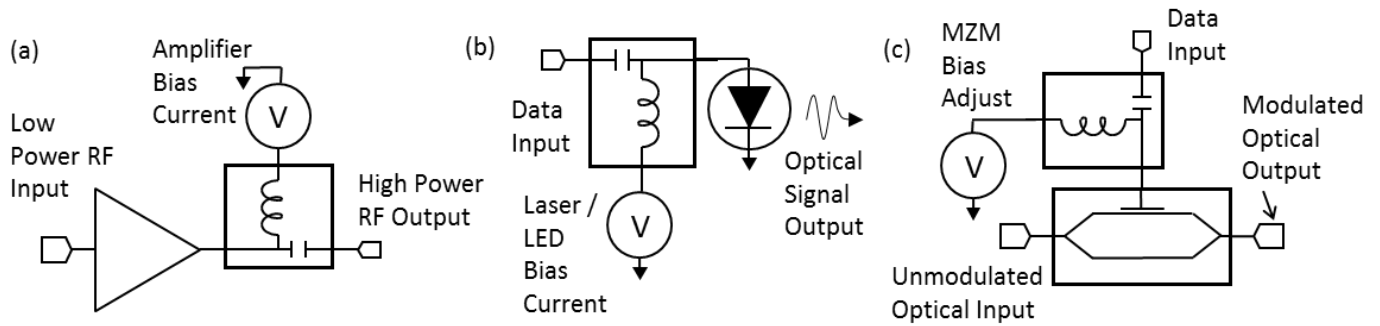
### Typical Performance vs Bias Current at Low frequencies



## Time Domain Performance Plot



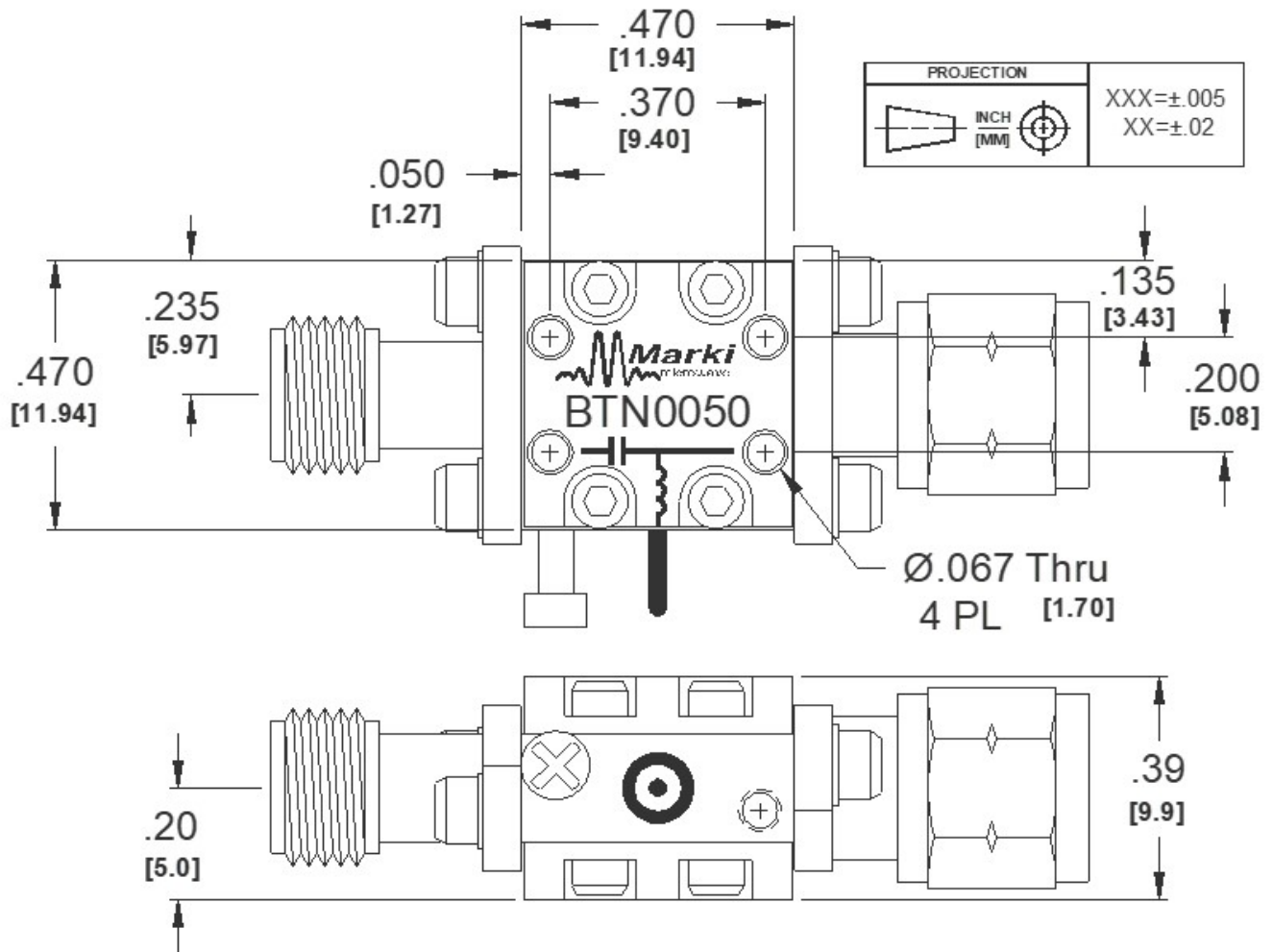
## Application Information



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**



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