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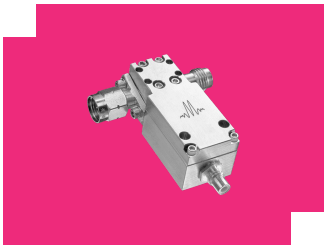
BT1-0040

High Power Bias Tee

DEVICE OVERVIEW

General Description

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.



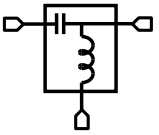
Features

- Broadband: 200 kHz to 40 GHz
- Low Insertion Loss
- High Power
- 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
BT1-0040	High Power Bias Tee	Standard	REACH RoHS	Released	EAR99

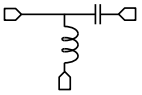
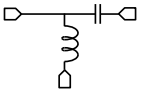
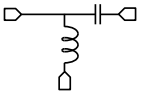
Table Of Contents

Revision History

Revision Code	Revision Date	Comment
B	2020-04-01	Performance vs Bias current plots
C	2021-03-01	Updated Spec Table and Low Frequency Plots
D	2025-08-07	Connector Type under Port Functions updated

Port Configuration and Functions

Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
Common	RF+DC	2.92M	This port is DC blocked to the RF port and DC connected to the DC port through an internal RF choke.	
DC	DC	SMCM	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	1	A
DC Voltage	50	V
Maximum Storage Temperature	125	°C
Minimum Storage Temperature	-65	°C
RF Power Handling	10	W

Package Information

Parameter	Details	Rating
Weight	-	23.5g
Dimensions	-	15.24 x 36.07 mm

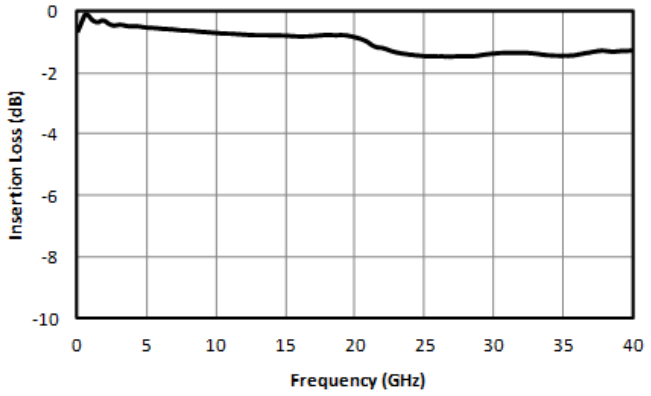
Electrical Specifications

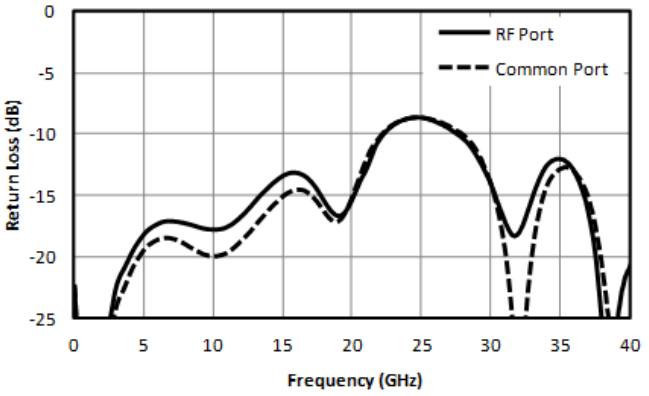
Specifications guaranteed at +25C, measured in a 50-Ohm system

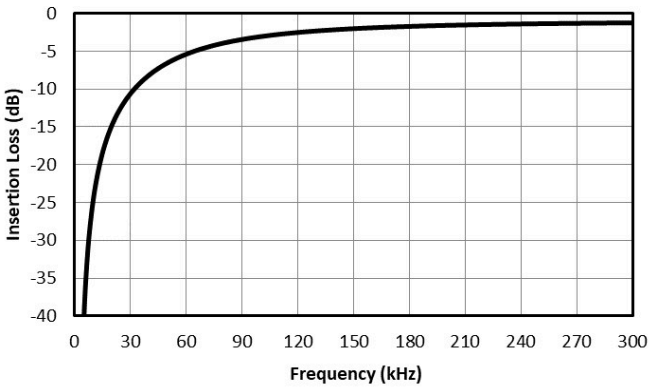
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Capacitance	-	-	-	-	100	-	nF
DC Port Isolation	-	1	40	-	30	-	dB
DC Port Isolation	-	0.0002	1	-	50	-	dB
DC Resistance	-	-	-	-	1	-	Ω
Inductance	-	-	-	-	330	-	µH
Insertion Loss	-	0.0003	40	-	1.5	2.5	dB
Insertion Loss	-	0.0002	0.0003	-	2	-	dB
Return Loss	-	0.0002	40	-	12	-	dB
Risetime/Falltime [1]	-	-	-	-	10	-	ps

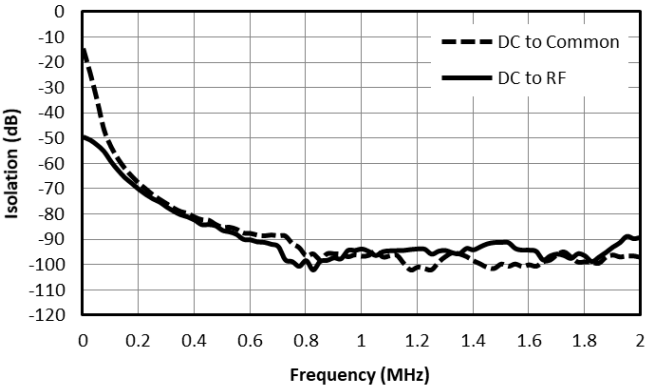
[1] Specified as 90%/10%. Calculated from $\tau_{bt}^2 = (\tau_{out}^2 - \tau_{in}^2)$

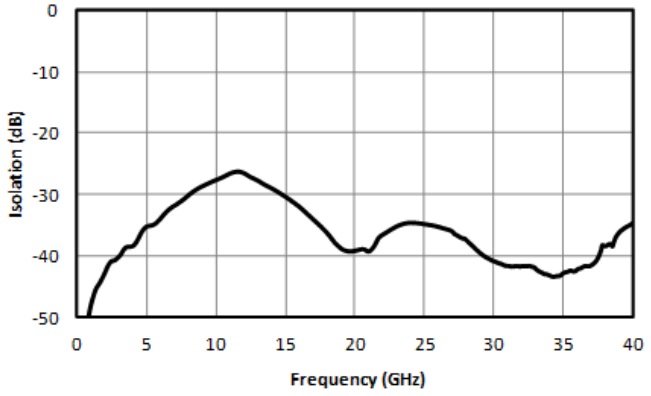
Typical Performance Plots

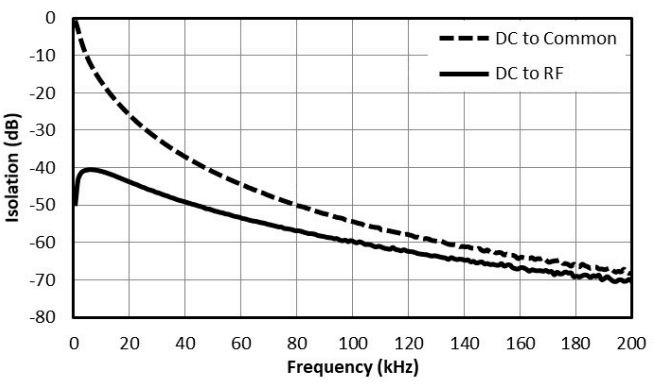


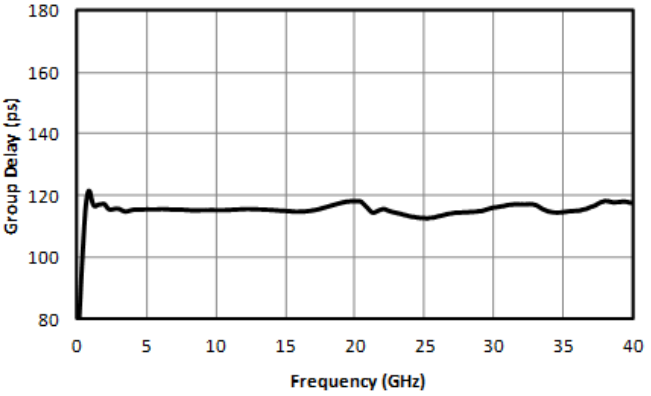


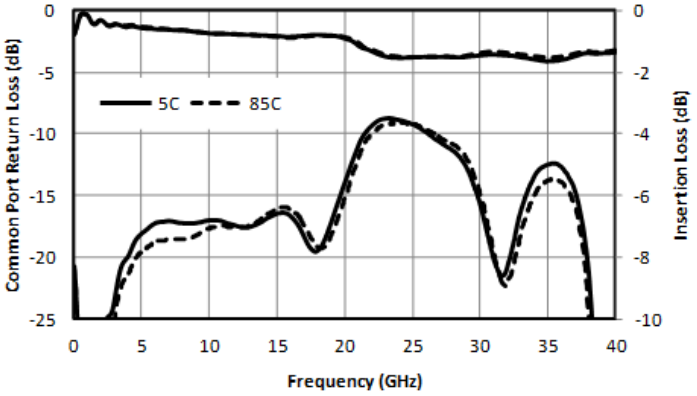


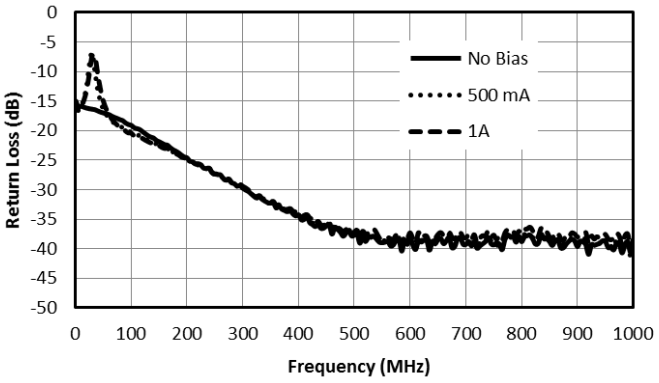


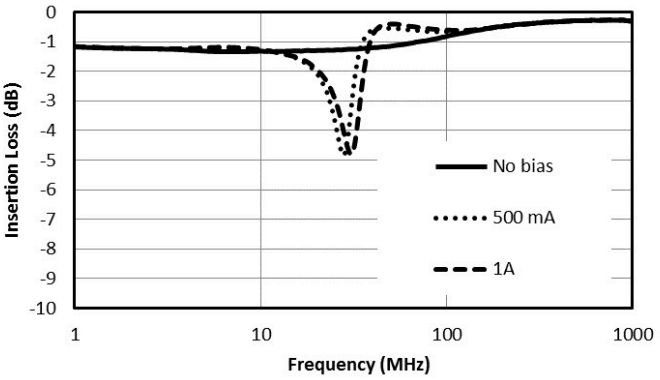


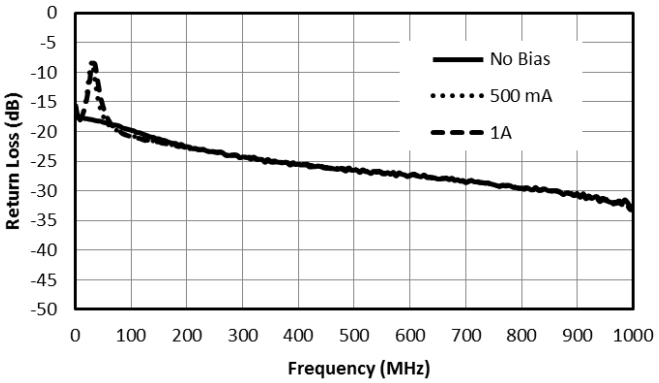






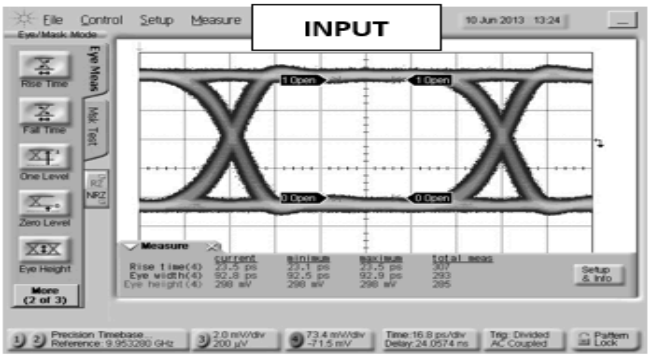


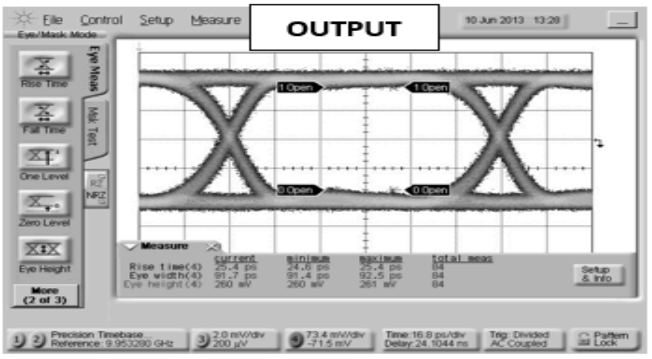




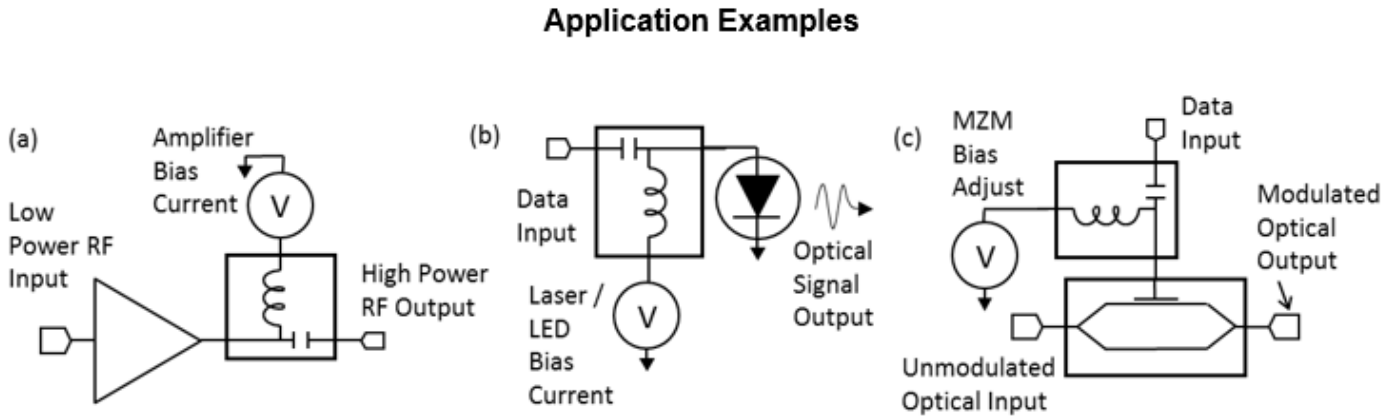
Time Domain Performance Plots

Oscilloscope measurements of the BT1-0040 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

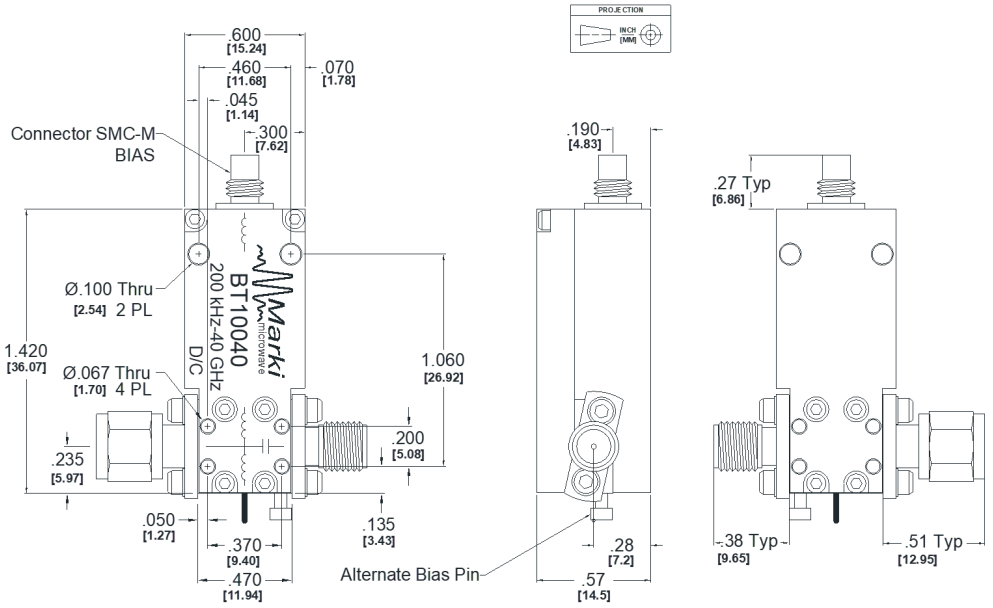


Example Schematics of a) Broadband Microwave Amplifier Biasing, b) Laser/LED Biasing for Data Communication and c) Mach-Zender Modulator Biasing for Data Communication

Mechanical Data

Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



Port	Connector Type
Bias	2.92 mm Male
RF in	2.92 mm Female
Note: Bias-Tee Connectors are not removeable.	

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