

# Bias Tee

## 0.03 - 67 GHz



MABT-011011

Rev. V1

### Features

- Low Insertion Loss: 2 dB @ 55 GHz
- Return Loss: Well Matched >15 dB
- High Current: 300 mA max.
- SMT Compatible
- Post SMT Aqueous Wash Compatible
- Lead-Free 4 mm Laminate Package
- RoHS\* Compliant

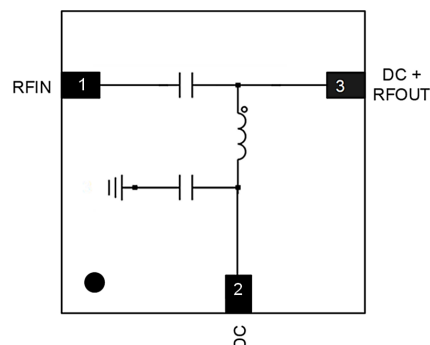
### Applications

- Test & Measurement
- Wideband Amplifiers & Wideband Switches

### Description

The MABT-011011 is a wideband high current Bias Tee. It functions as an RF-DC de-coupling network as well as the DC return and contains a series DC blocking capacitor and shunt DC decoupling capacitor on the DC feed. Providing a high performance robust solution suitable for use on a standard SMT production line. Ideal biasing solution for wideband amplifier and switch circuits.

### Functional Schematic



### Pin Names

Pin #	Function	Pin #	Function
1	RF <sub>IN</sub>	3	DC & RF <sub>OUT</sub>
2	DC	Paddle	GND <sup>3</sup>

3. The exposed pad centered on the package bottom must be connected to RF, DC and thermal ground.

### AC Electrical Specifications: Freq. = 0.03 - 67 GHz, V<sub>CC</sub> = 0 V, Z<sub>0</sub> = 50 Ω, T<sub>A</sub> = 25°C

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.03 - 2 GHz	dB	—	1.0	2.1
	2 - 10 GHz			0.4	0.7
	10 - 20 GHz			0.7	1.4
	20 - 40 GHz			1.1	1.7
	40 - 55 GHz			2.0	3.8
Input & Output Return Loss	0.03 - 45 GHz	dB	—	15	—
	45 - 67 GHz			13	
RF- DC Isolation	0.03 - 67 GHz	dB	—	22	—

### Ordering Information<sup>1,2</sup>

Part Number	Package
MABT-011011	Cut Tape or Tray
MABT-011011-TR0300	300 Piece Reel
MABT-011011-TR0500	500 Piece Reel
MABT-011011-SB1	Sample Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

### Absolute Maximum Ratings<sup>4,5</sup>

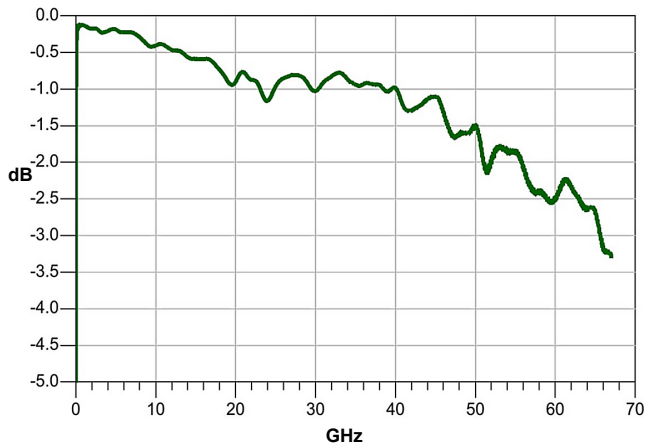
Parameter	Maximum
Input Power (pin 1 & 3)	30 dBm
DC Bias Voltage (pin 2)	25 V
DC Bias Current (pin 2)	300 mA
Operating Temperature	-55°C to +105°C
Storage Temperature	-65°C to +150°C

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. MACOM does not recommend sustained operation near these survivability limits.

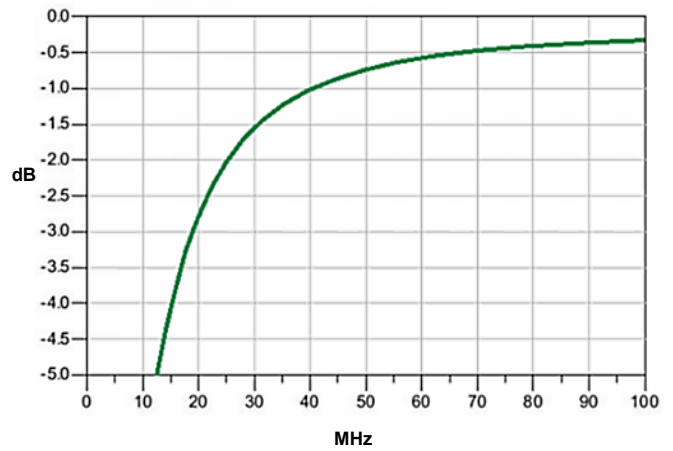
\* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

**Typical Performance Curves:  $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 0\text{ V}$ ,  $Z_0 = 50\ \Omega$**

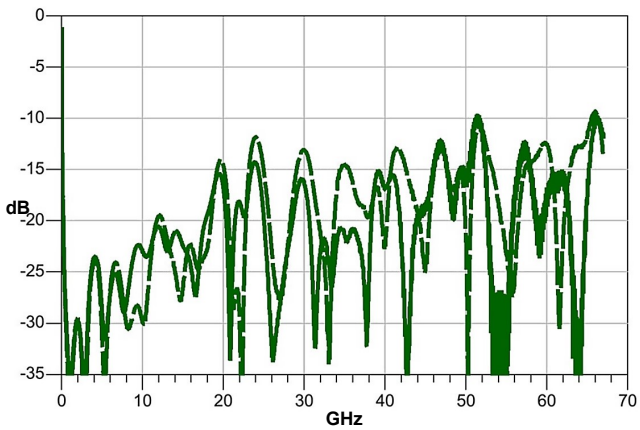
**Insertion Loss (pin 1 to 3) Broadband Span**



**Insertion Loss (pin 1 to 3) Low Frequency Sweep**



**Return Loss: (pin 1 solid and pin 3 dashed)**

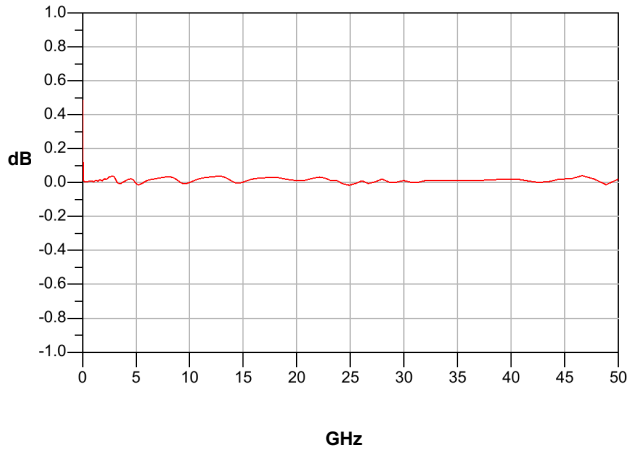


**Isolation (pin 1 to 2)**

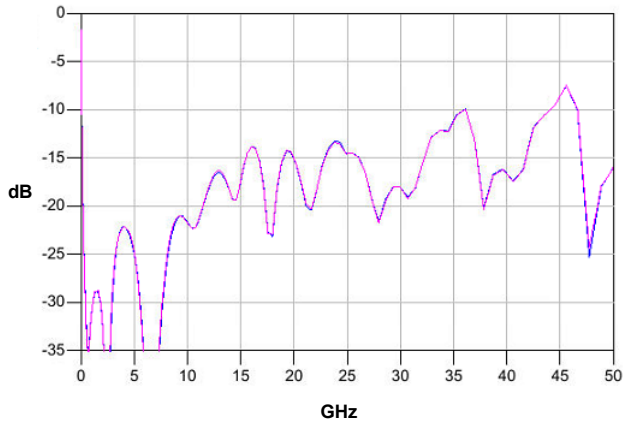


### DC Bias Current Robustness

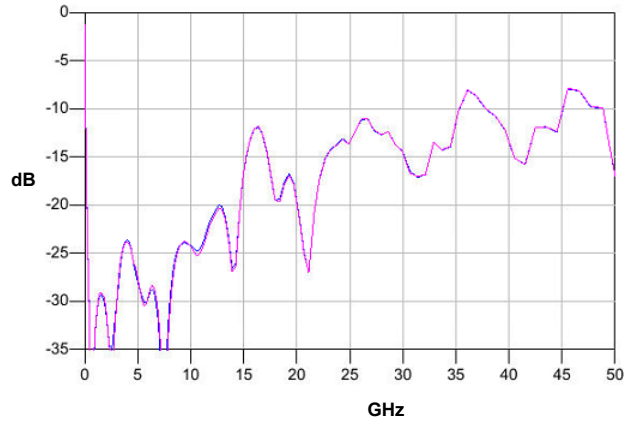
*Insertion Loss Delta from 0 to 300 mA (pin 1 to pin 3)*



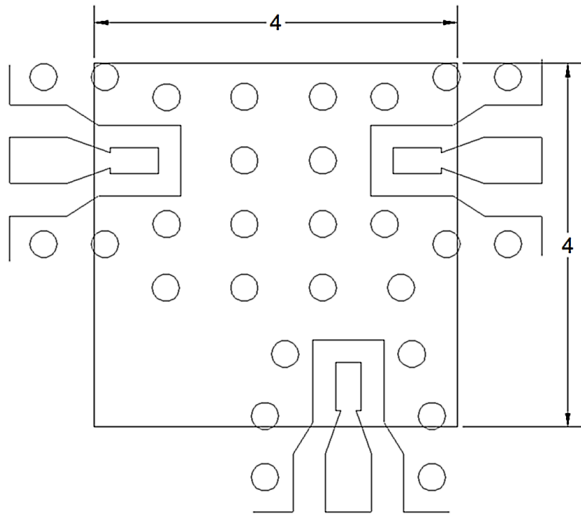
*Input Return Loss: Input (pin 1) Blue 0 mA, Pink 300 mA*



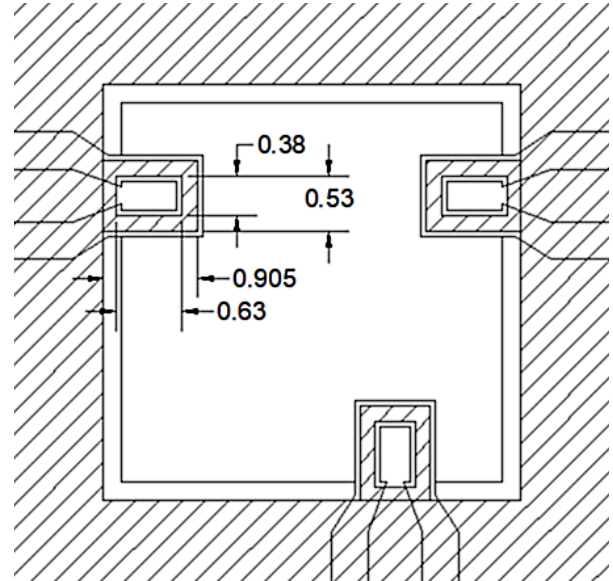
*Output Return Loss: Output (pin 3) Blue 0 mA, Pink 300 mA*



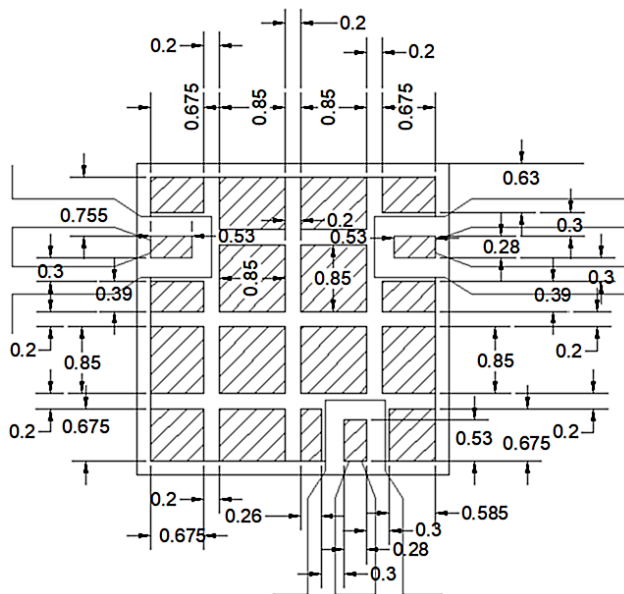
**Recommended PCB Footprint<sup>6,7</sup>**



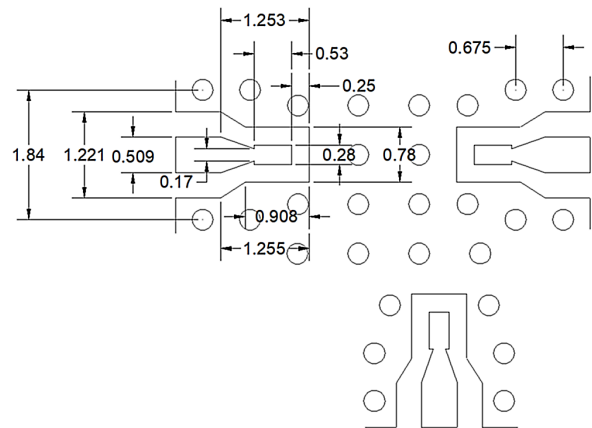
**Solder Mask Coverage<sup>6</sup>**



**Solder Paste Template<sup>6</sup>**

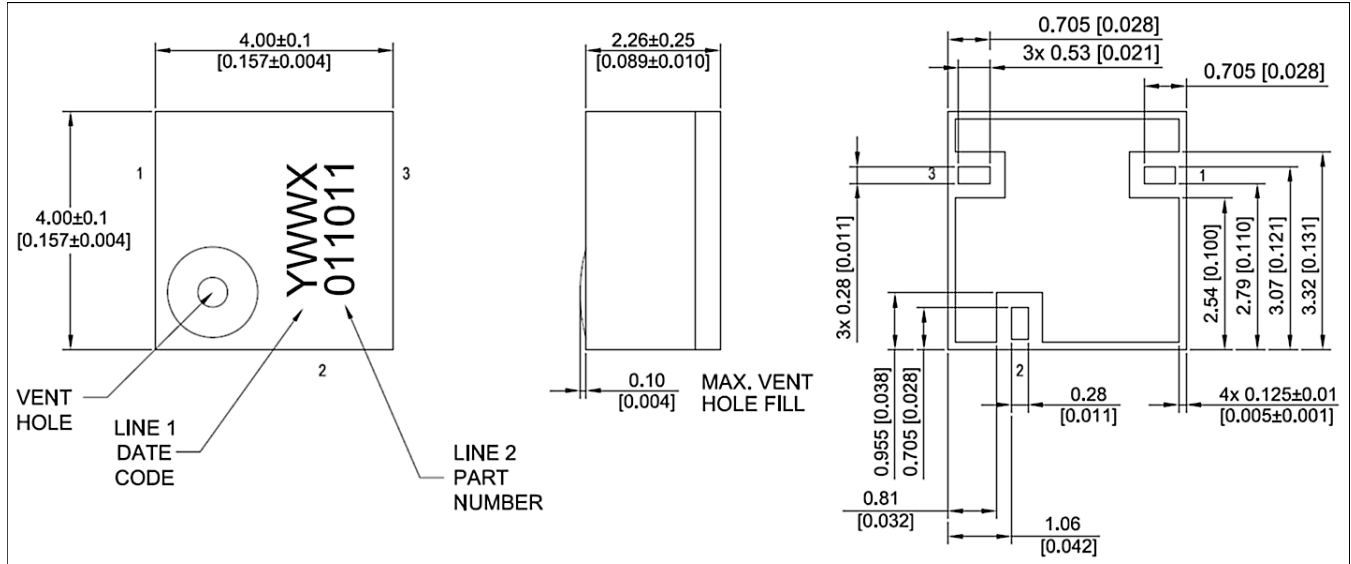


**RF Line Dimensions<sup>6,7</sup>**



6. Dimensions in mm.  
 7. Use Rogers RO4350 dielectric, thickness 254 µm

**Lead-Free 4 mm Air-Cavity Laminate Module<sup>†</sup>**



<sup>†</sup> Reference Application Note J-STD-020E for both Lead (Pb) or Lead free solder reflow recommendations.  
 Meets JEDEC moisture sensitivity level MSL1 requirements.  
 Plating is ENEPIG

MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.

These materials are provided in connection with MACOM's products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.