MA4VAT907-1061T

High IIP3 PIN Diode Variable Attenuator 0.8 - 1.0 GHz

Rev. V5

Features

- Bandwidth: 0.80 GHz to 1.0 GHz
- 1.0 dB Insertion Loss, Typical
- 12 dB Return Loss, Typical
- 25 dB Attenuation, Typical
- 50 dBm Input IP3, Typical (1MHz Offset, @+0dBm Pinc)
- 0 – 3.0 Volts Control Voltage @3.3mA Typical
- RoHs Compliant

Extra Features

- Covers the following Bands:
  - GSM
  - AMPS
- Usable Bandwidth: 0.60 GHz to 1.20 GHz
- 1.5 dB Insertion Loss, Typical
- 1.8:1 VSWR, Typical
- 18.5 dB Attenuation, Typical

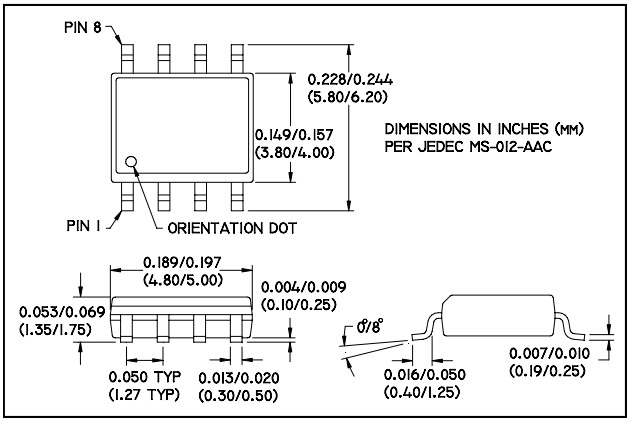
Description and Applications

M/A-COM's MA4VAT907-1061T is a HMIC PIN Diode Variable Attenuator which utilizes an integrated 90 degree 3dB hybrid with a pair of Silicon PIN Diodes to perform the required attenuation function as D.C. Voltage (Current) is applied.

This device operates from 0 to 2.77Volts at 3.0mA typical control current for maximum attenuation. The user can add external biasing resistors to the bias ports for higher voltage requirements as required.

M/A-COM's MA4VAT907-1061T PIN Diode Variable Attenuator is designed for AGC Circuit Applications requiring:

- Lower Insertion Loss
- Lower distortion through attenuation
- Larger dynamic range for wide spread spectrum applications



SOIC-8 PIN Configuration (Topview)

PIN	Function	Comments
1	DC1	
2	GND	
3	GND	
4	RFin/out	Symetrical as RF Input/Ouput
5	RFout/in	Symetrical as RF Input/Ouput
6	GND	
7	GND	
8	DC2	

Absolute Maximum Ratings @ +25 ℃ [1,2]

Parameter	Maximum Ratings
Operating Temperature	-40 ℃ to +85 ℃
Storage Temperature	-65 ℃ to +150 ℃
Junction Temperature	+175 ℃
RF C.W. Incident Power	+33 dBm C.W.
Reversed Current @ -30 V	50nA
Control Current	50 mA per Diode

1. All the above values are at +25 ℃, unless otherwise noted.
2. Exceeding these limits may cause permanent damage.

• **North America** Tel: 800.366.2266 • **Europe** Tel: +353.21.244.6400
• **India** Tel: +91.80.43537383 • **China** Tel: +86.21.2407.1588
Visit www.macomtech.com for additional data sheets and product information.

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Electrical Specifications @ +25 ℃

Parameter	Frequency Band	Unit	Min	Typ	Max
Low Loss RF Parameter (Pin = +10 dBm, except for P1dB, & IP3)					
Insertion Loss	0.80 GHz—1.00 GHz	dB	-	1.0	1.2
Input Return Loss		dB	11	12	-
Output Return Loss		dB	11	12	-
P1dB		dBm	30	-	-
Input IP3		dBm	45	49	-
Control Voltage		V	-	0 V @ OuA	-
Maximum Attenuation RF Parameter (Pin = +10 dBm, except for P1dB, & IP3)					
Maximum Attenuation	0.80 GHz—1.00 GHz	dB	18.5	24	-
Input Return Loss @ Max Attenuation		dB	15	21	-
Output Return Loss @ Max Attenuation		dB	15	21	-
Input IP3		dBm	36	39	-
Control Voltage @ Max Attenuation		V	-	3.0 V @ 3.35 mA	-
Current@ Max Attenuation	Bias = 3.0V	mA	2.5		4.5

Typical RF Performance Over Industry Designated RF Frequency Bands

Band		Freq	I. Loss	Att.	R. Loss	IIP3	Phase -Relative-
		(MHz)	(dB)	(dB)	(dB)	(dBm)	(Degree)
AMPS	**RX**	824-849	0.9	22	12	50	-15°
	TX	869-894	0.9	22	12	50	
GSM	**RX**	880-915	1.2	20	11	50	-20°
	TX	925-960	1.2	20	11	50	

3. All are typical values only.
4. Relative phase is the measured Insertion Phase difference between Insertion Loss and 15 dB Attenuation. (Please refer to the plots below)

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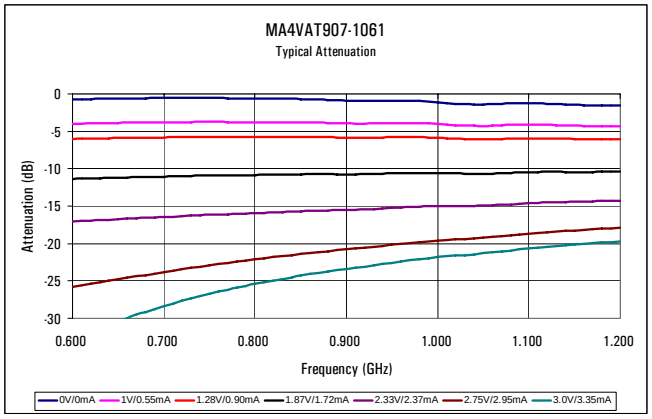
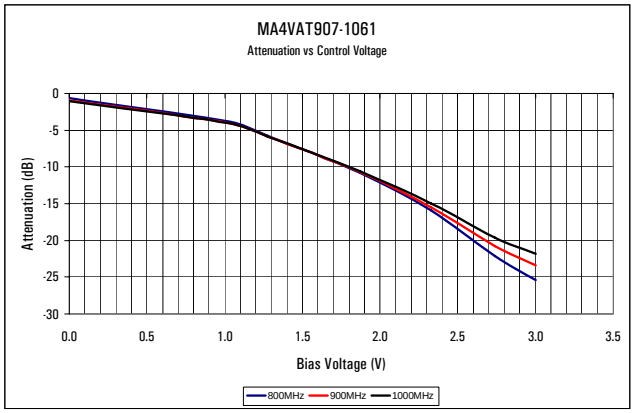
Plots of Typical RF Characteristics @ +25 ℃

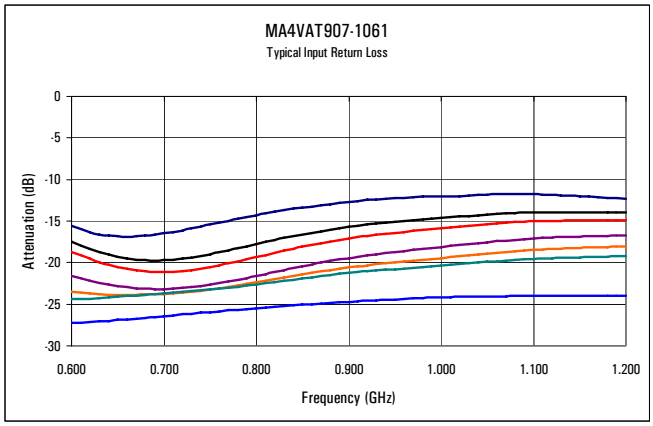
Typical Insertion Loss & Attenuation Plot



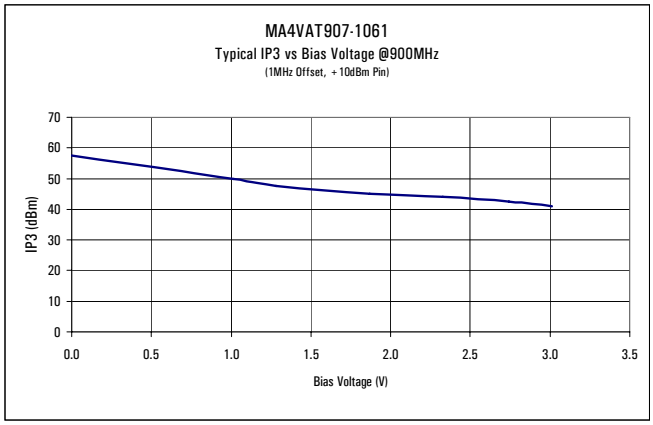
Typical Attenuation vs Voltage



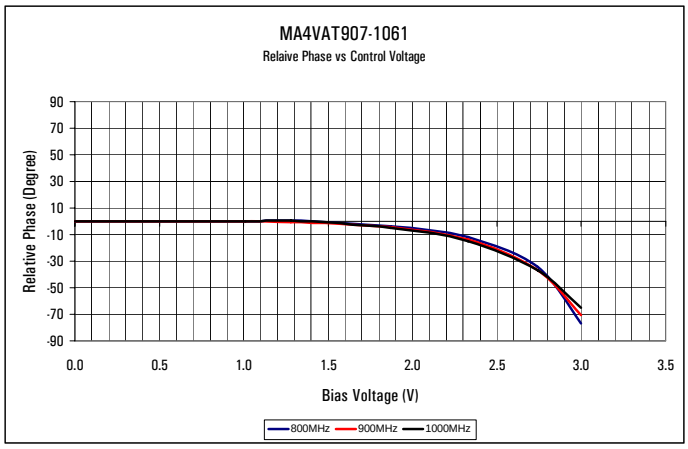
Typical Return Loss @ All Attenuation Levels Plot



Typical IIP3 vs Attenuation Plot



Typical Relative Phase Shift Per Attenuation (Voltage)



For Reference ONLY:

- Insertion Loss = 0.00 V @ 0.00 mA
- 5dB Attenuation = 1.30 V @ 0.95 mA
- 10dB Attenuation = 1.94 V @ 1.78 mA
- 15dB Attenuation = 2.36 V @ 2.42 mA
- 20dB Anttenuation = 2.67 V @ 2.90 mA
- Max Attenuation = 2.77 V @ 3.00 mA

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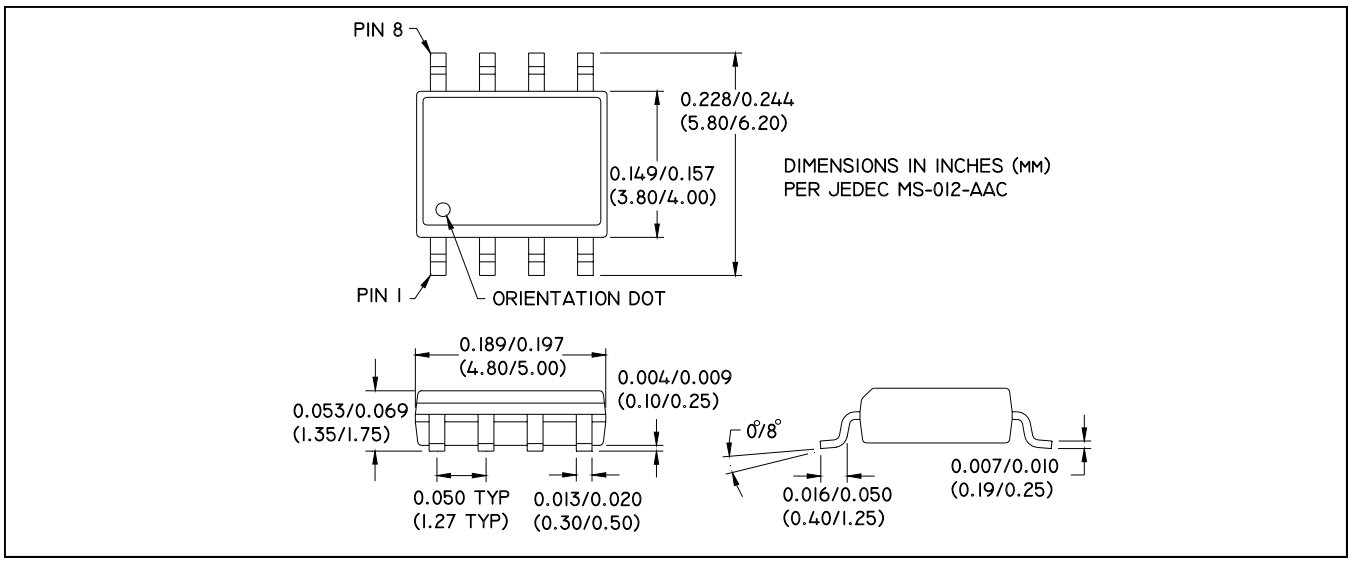
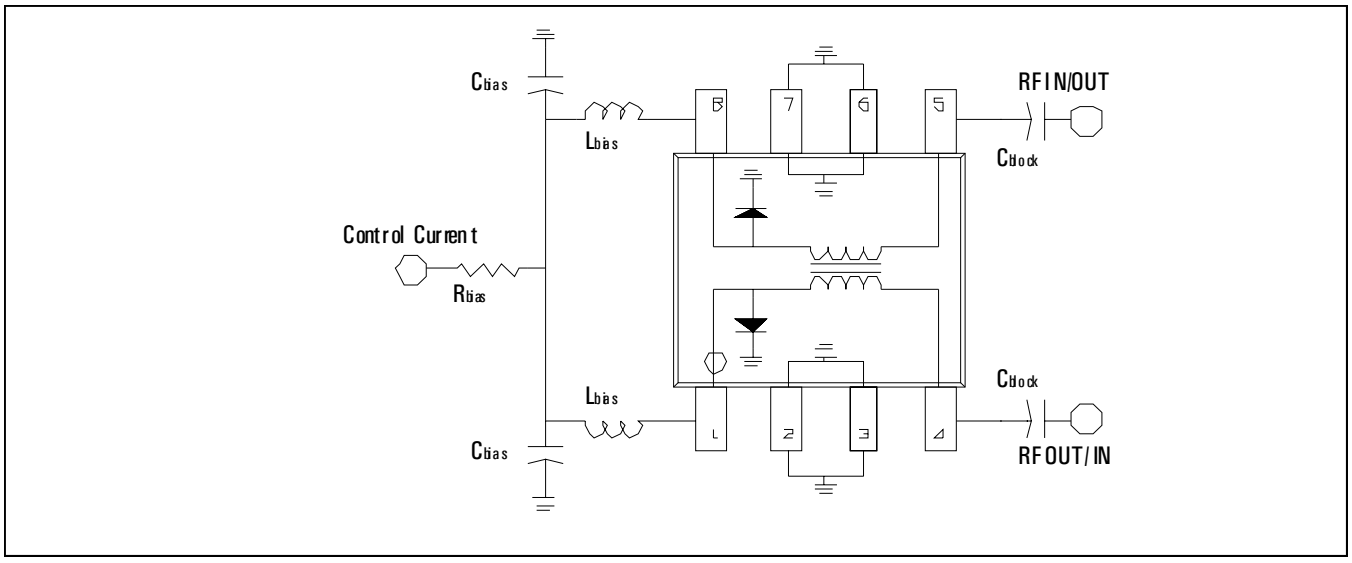
Package PIN Designation, External Components, and Equivalent Circuit





External Bias Components

Rbias= 680 Ohms (3.0 V @ 3.5 mA)
Lbias= 150 nH
Cbias =100 pF
Cblock =100 pF