

HMIC PIN Diode Variable Attenuator 0.80-1.0 GHz

**MA4VAT900-1277T
V2**

Features

- Bandwidth: 0.80 GHz to 1.00 GHz
- <1.0 dB Insertion Loss, Typical
- 1.4:1 VSWR, Typical
- 24 dB Attenuation, Typical
- 40 dBm IIP3, Typical (1MHz Offset, @ +0dBm Pinc)
- 0-1.8 Volt Control Voltage.
- User can add an External Resistor for higher voltage requirements.
- RoHs Compliant

Extra Features

- Usable Bandwidth: 0.60 GHz to 2.00 GHz
- 1.9 dB Insertion Loss, Max
- 2:1 VSWR, Max
- 20 dB Attenuation, Max

Description and Applications

M/A-COM's MA4VAT900-1277T is a HMIC MONLITHIC 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 Voltage (Current) is applied.

This device operates from 0 to 2 Volts at 330 uA 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 MA4VAT900-1277T 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

MLP 3mm Package—Circuit Side View



PIN 1

PIN 16

PIN Configuration

PIN	Function	PIN	Function
1	GND	9	DC2
2	GND	10	GND
3	GND	11	GND
4	GND	12	DC1
5	GND	13	GND
6	RF2	14	GND
7	GND	15	RF1
8	GND	16	GND

Center Paddle is RF and D.C. Ground

Note: RF Input & RF Output Ports are Functionally Symmetrical

Absolute Maximum Ratings @ +25 °C

Parameter	Maximum Ratings
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C
Junction Temperature	+175 °C
RF C.W. Incident Power	+33 dBm C.W.
Reversed Current @ -30 V	50nA
Control Current	5 mA per Diode

Notes:

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

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Electrical Specifications @ +25 °C

Parameter	Frequency Band	Unit	Min	Typ	Max
No DC Bias RF Parameter					
Insertion Loss	0.80 GHz—1.00 GHz	dB	-	1.0	1.2
Input Return Loss		dB	11	14	-
Output Return Loss		dB	11	14	-
P1dB		dBm	30	33	-
IIP3		dBm	37	40	-
Control Voltage		V	-	0 V @ 0uA	-
DC Bias RF Parameter					
Maximum Attenuation	0.80 GHz—1.00 GHz	dB	21	24	-
Input Return Loss @ Max Attenuation		dB	17	20	-
Output Return Loss @ Max Attenuation		dB	17	20	-
Input IP3		dBm	15	18	-
Control Voltage @ Max Attenuation		V	-	1.80 V @ 330 uA	-

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	24	13	40	-15°
	TX	869-894	0.9	24	13	40	
GSM	RX	880-915	1.1	21	11	40	-15°
	TX	925-960	1.1	21	11	40	

Notes:

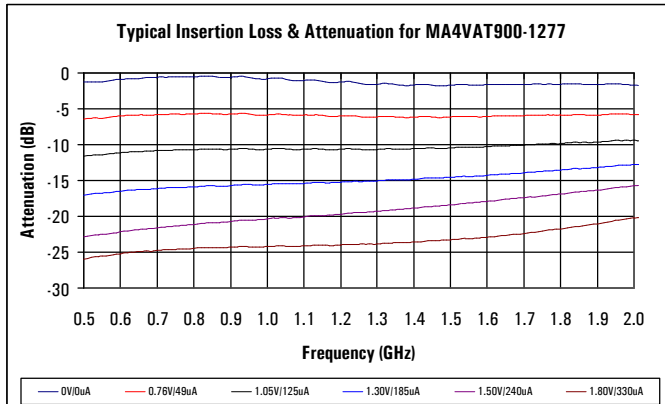
1. All are typical values only.
2. Relative phase is the measured Insertion Phase difference between Insertion Loss and 15 dB Attenuation. (Please refer to the plots below)

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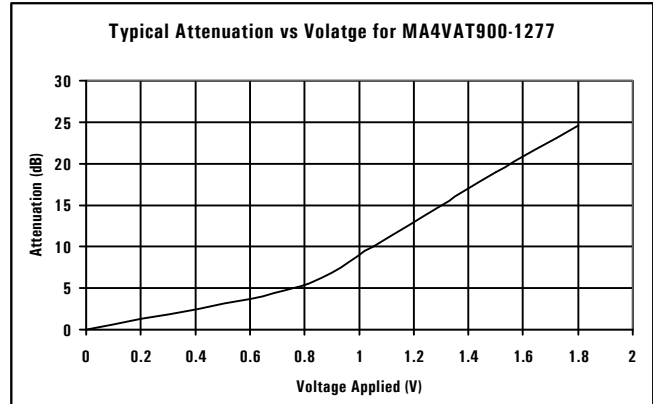
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Plots of Typical RF Characteristics @ +25 °C

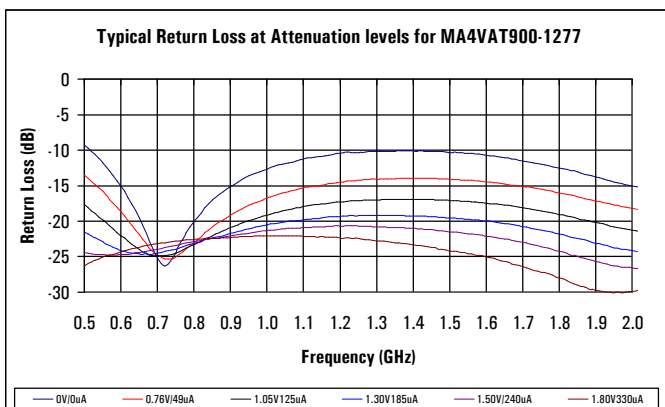
Typical Insertion Loss & Attenuation Plot



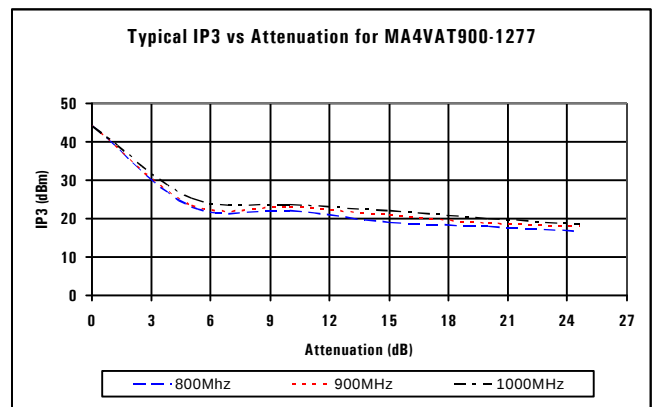
Typical Attenuation vs Voltage Plot (@900 MHz)



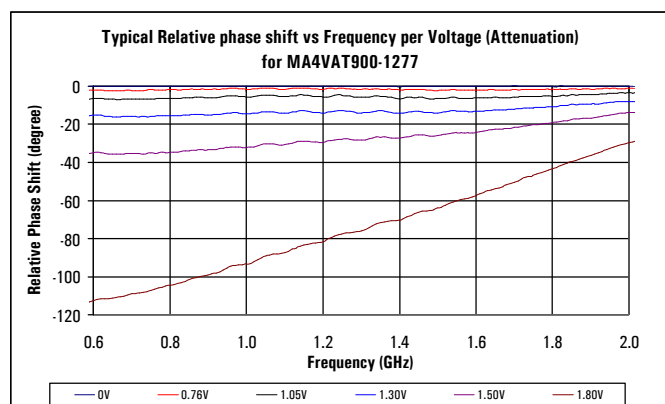
Typical Return Loss @ All Attenuation Levels Plot



Typical IIP3 vs Attenuation Plot



Typical Relative Phase Shift Per Attenuation (Voltage) Plot



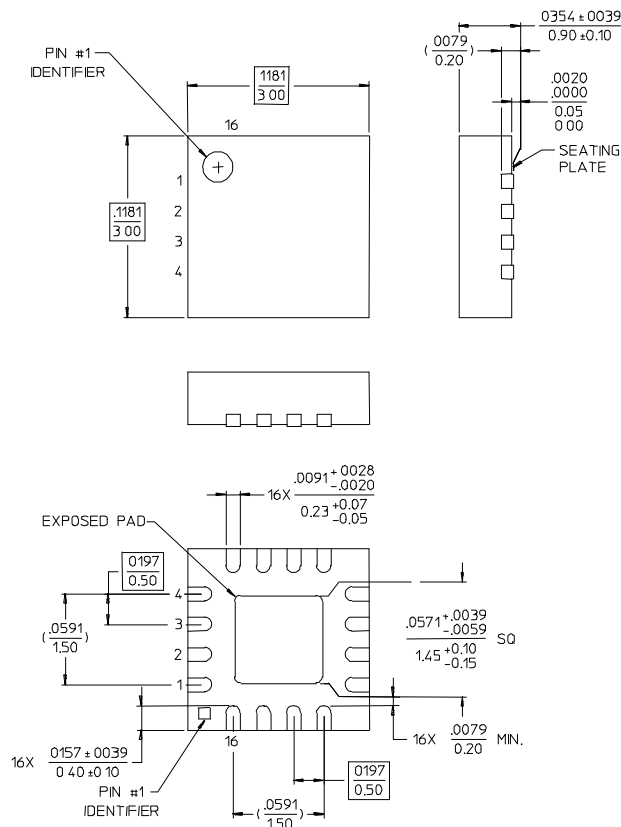
For Reference ONLY:
With 0 Ω External Bias Resistor, the following are
Approximate Values:

- Insertion Loss = 0 V @ 0 uA
- 5dB Attenuation = 0.76 V @ 49 uA
- 10dB Attenuation = 1.05 V @ 125 uA
- 15dB Attenuation = 1.30 V @ 185 uA
- 20dB Attenuation = 1.50 V @ 240 uA
- Max Attenuation = 1.8 V @ 330 uA

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Package PIN Designation, External Components, and Equivalent Circuit



NOTES: 1. REFERENCE JEDEC MO-220, VAR. VB8D-1 FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.
2. REFERENCE S2083 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

