MA4VAT900-1277T

HMIC PIN Diode Variable Attenuator
0.8 - 1.0 GHz

Rev. V3

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

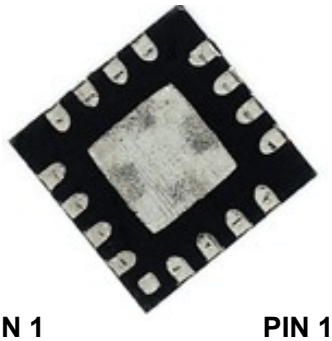
M/A-COM's MA4VAT900-1277T is a HMIC MONLITHIC PIN Diode Variable Attenuator which utilizes an integrated 90 degree 3dB hybrid with a pair of Silicon PIN Diodes to perform the required attenuation function as Voltage (Current) is applied.

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 [1]

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			

1. RF Input & RF Output Ports are Functionally Symmetrical

Absolute Maximum Ratings @ +25 °C [2,3]

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

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

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 [4,5]

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	

4. All are typical values only.
5. 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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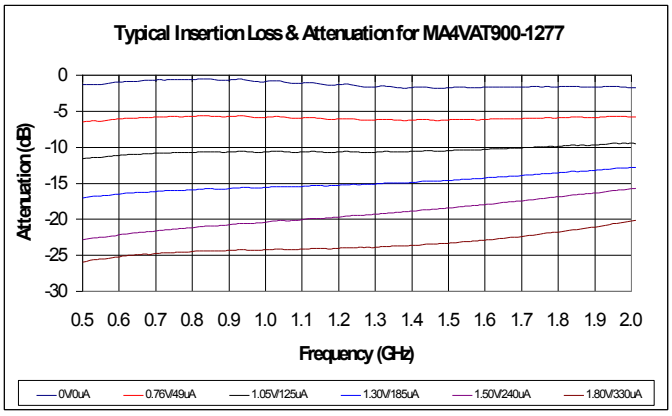
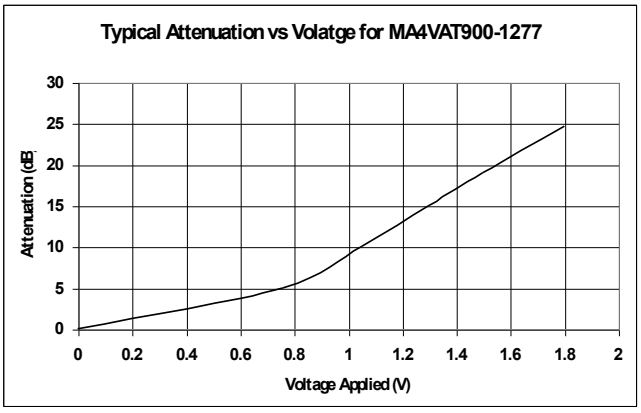
Plots of Typical RF Characteristics @ +25 °C

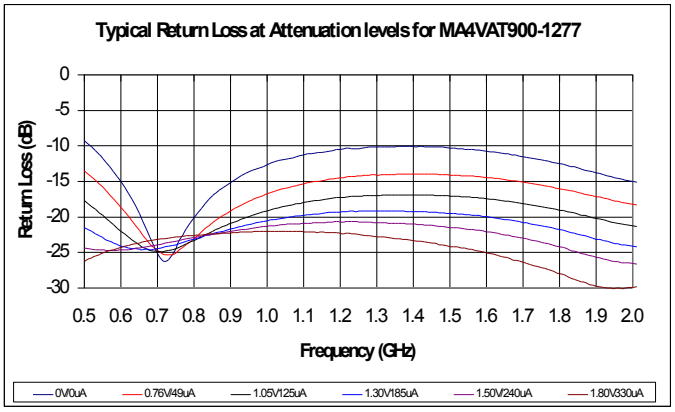
Typical Insertion Loss & Attenuation



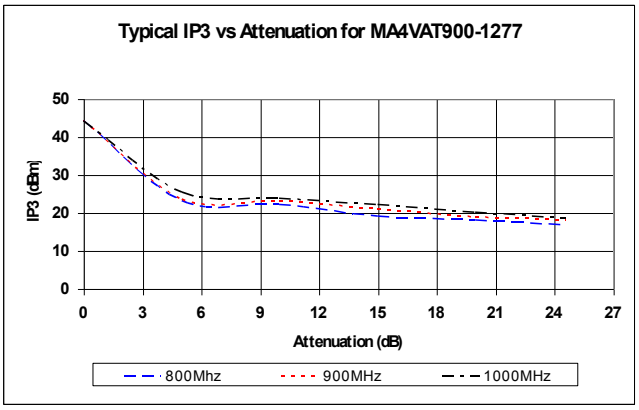
Typical Attenuation vs Voltage (@900 MHz)



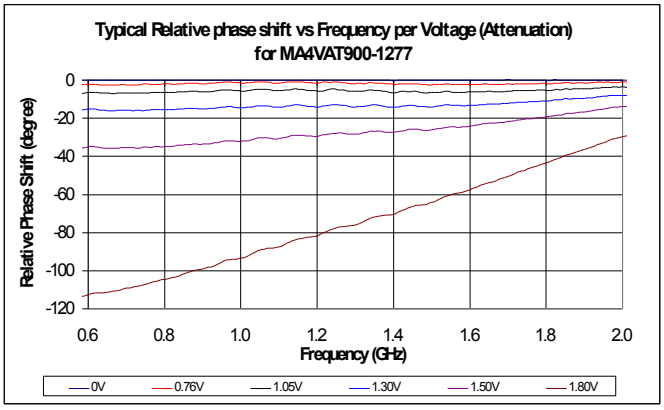
Typical Return Loss @ All Attenuation Levels



Typical IIP3 vs Attenuation



Typical Relative Phase Shift Per Attenuation (Voltage)



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 @ 125uA
- 15dB Attenuation = 1.30 V @ 185 uA
- 20dB Anttenuation = 1.50 V @ 240 uA
- Max Attenuation = 1.8 V @ 330 uA

Package PIN Designation, External Components, and Equivalent Circuit