

**Voltage Variable Attenuator,  
900-2500 MHz**

**MAAV-007087-000100  
V1**

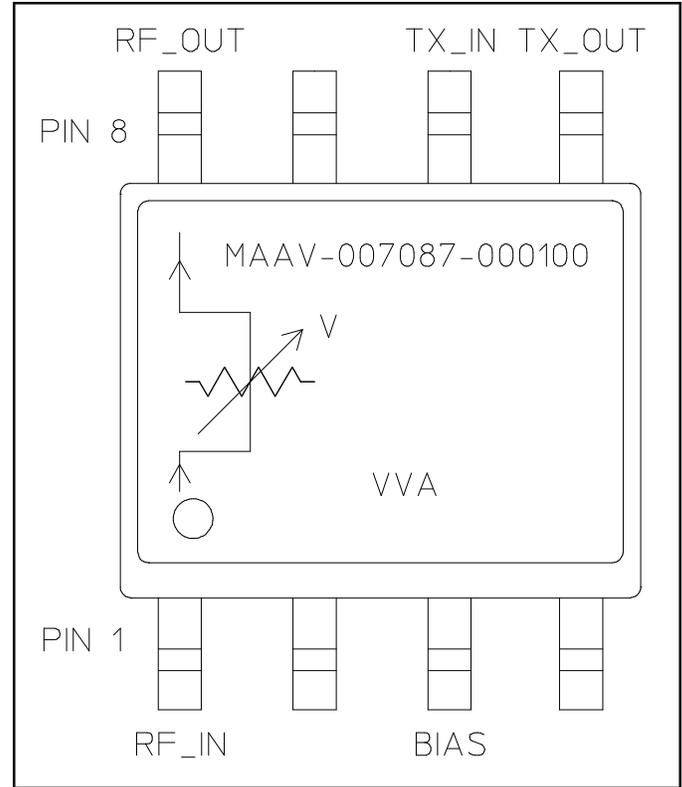
**Features**

- High Third Order Intercept Point
- Surface Mount Package
- 25 dB Dynamic Range
- ±5% Operating Bandwidth
- PIN Diode Based
- Single Control Voltage
- Lead-Free SO-8 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS\* Compliant Version of AT65-0008

**Description**

M/A-COM’s MAAV-007087-000100 is a PIN diode based voltage variable attenuator. It is packaged in an 8 lead small outline narrow body plastic, surface mount package. The attenuator has linear operating power and intercept point levels higher than GaAs FET MMIC based voltage variable attenuators. The VVA is suited for use where low distortion and high linear operating power are required. The device operating frequency is selected in the 900 to 2500 MHz frequency band by defining the length of the  $\lambda/4$  (a quarter wave transmission line at the operating frequency) connected to pins 5 and 6.

**Functional Block Diagram**



**Ordering Information**

Part Number	Package
MAAV-007087-000100	Bulk Packaging
MAAV-007087-0001TR	1000 piece reel
MAAV-007087-0001TB	Sample Test Board

Note: Reference Application Note M513 for reel size information.

Note: Die quantity varies.

**Pin Configuration**

Pin No.	Function	Pin No.	Function
1	RF Input	5	Transmission Line Out
2	GND	6	Transmission Line In
3	Bias Input	7	GND
4	GND	8	RF Output

\* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50\Omega$ , Frequency:  $\pm 5\%$  Bandwidth, 900-2500 MHz**

Parameter	Test Conditions <sup>1</sup>	Units	Min	Typ	Max
Insertion Loss <sup>2</sup>	Bias Input = 10 mA (approximately 4.2V)	dB	—	1.2	1.5
VSWR	0 to 20 dB	Ratio	—	1.7:1	2.5:1
Attenuation	0V	dB	23	28	—
Attenuation Flatness vs Frequency Relative to Loss	to 10 dB	dB	—	0.1	—
	to 20 dB	dB	—	1.3	—
	to 25 dB	dB	—	3.0	—
Switching Speed	50% Control to 90%/10% RF	$\mu\text{s}$	—	2	—
Linear Operation	0 to 20 dB	dBm	—	+17	—
Input IP <sub>3</sub>	Two-tone inputs to +5 dBm	dBm	—	+40	—

- External DC blocking capacitors are required on all RF ports.
- Insertion loss can be optimized by varying the DC blocking capacitor value. Use approximately 100 pF at 900 MHz, 43 pF at 2500 MHz and interpolate for intermediate frequencies.

**Absolute Maximum Ratings<sup>3,4</sup>**

Parameter	Absolute Maximum
Input Power	+27 dBm
Operating Voltage	+ 10 Volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- M/A-COM does not recommend sustained operation near these survivability limits.

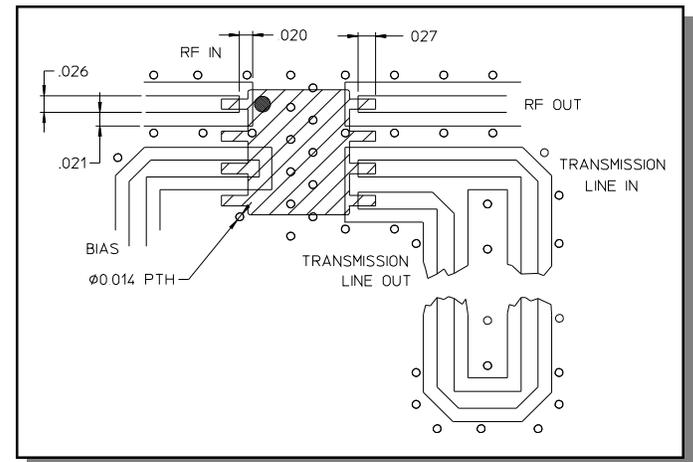
**Handling Procedures**

Please observe the following precautions to avoid damage:

**Static Sensitivity**

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

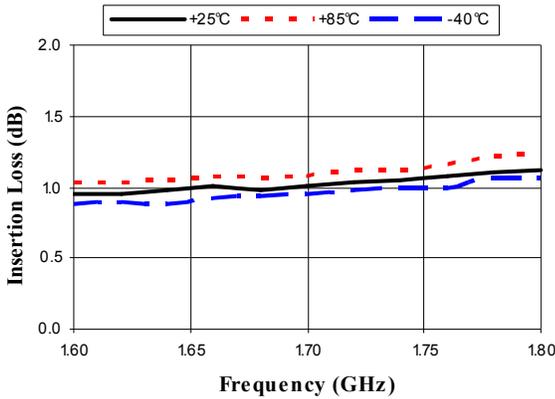
**Recommended PCB Configuration<sup>5,6</sup>**



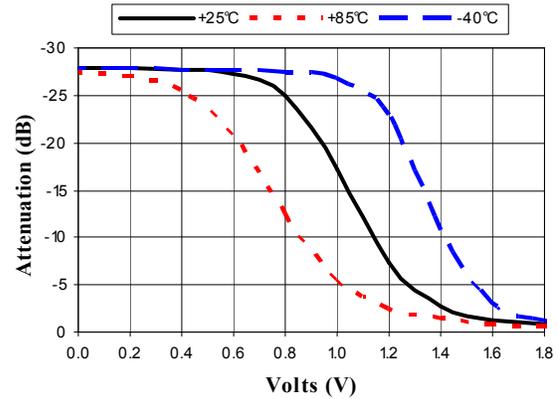
- Circuit Material - GETEK, .014 Thick
- 90° of length consists of printed transmission line plus effective length of internal circuitry and lead length.

**Typical Performance Curves**

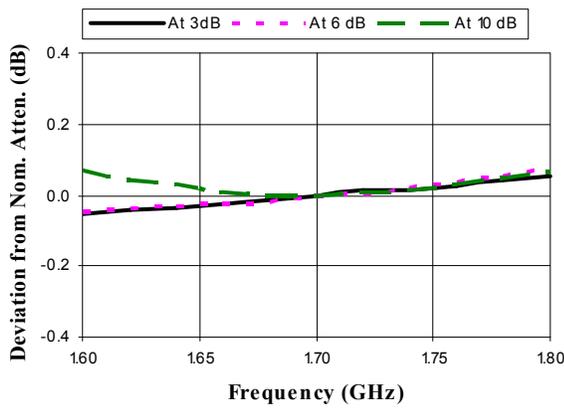
**Typical Insertion Loss**



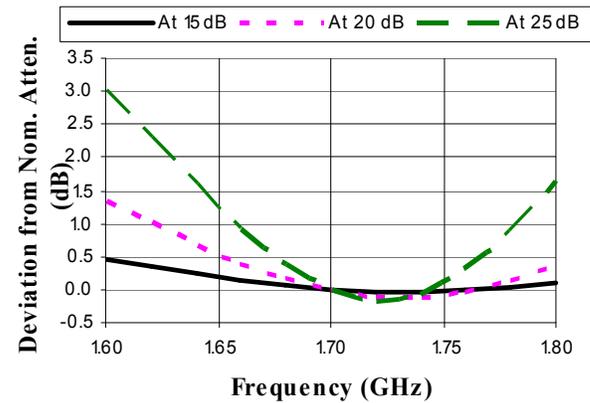
**Attenuation vs. Voltage @ Fc**



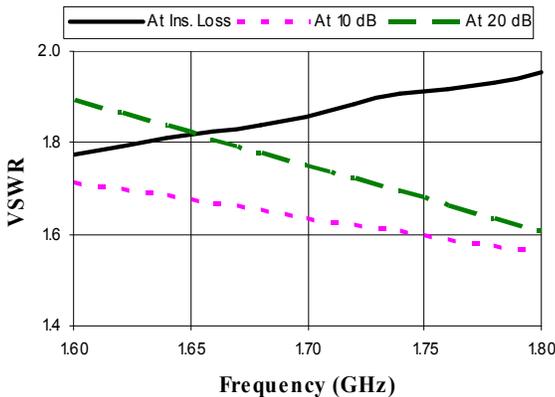
**Attenuation Flatness**



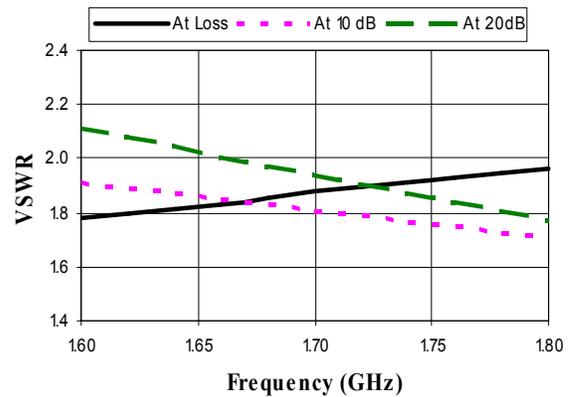
**Attenuation Flatness**



**Typical Input VSWR**



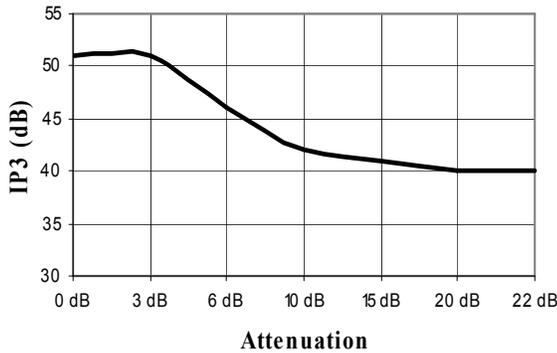
**Typical Output VSWR**



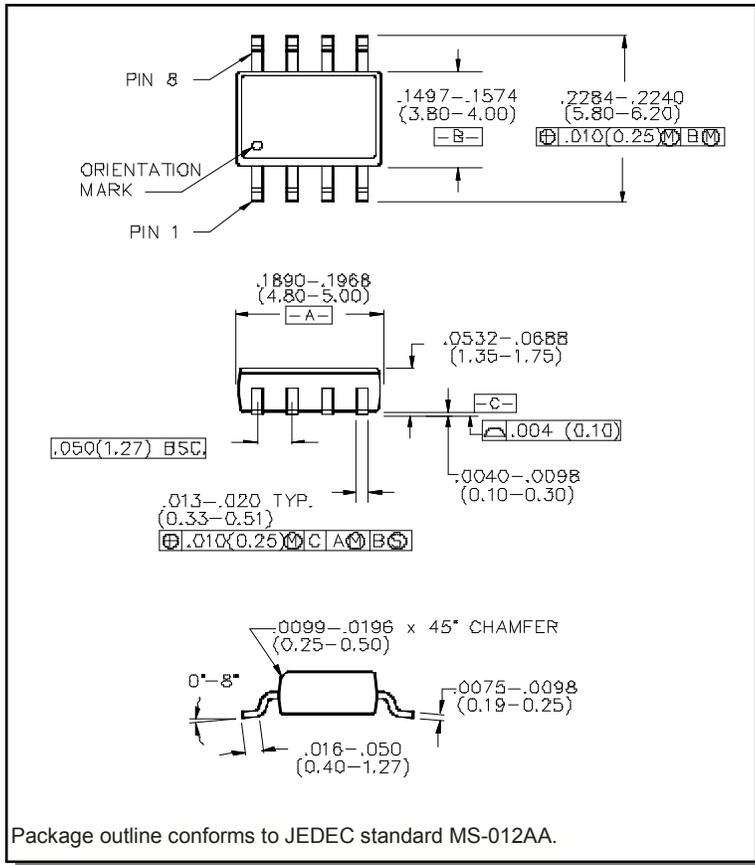
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**IP3 vs. Attenuation**



**Lead-Free, SO-8<sup>†</sup>**



<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.