

GaAs MMIC SMT VOLTAGE-VARIABLE ATTENUATOR, DC - 8 GHz

Typical Applications

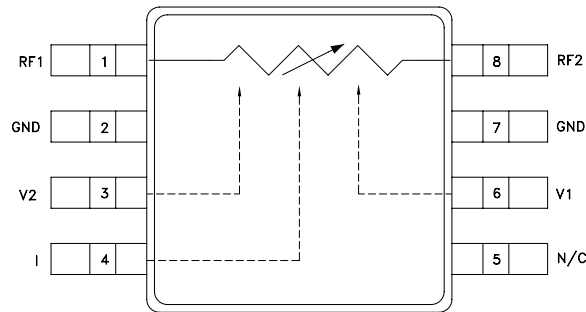
This attenuator is ideal for use as a VVA for DC - 8 GHz applications:

- Point-to-Point Radio
- VSAT Radio

Features

- Wide Bandwidth: DC - 8 GHz
- Low Phase Shift vs. Attenuation
- 32 dB Attenuation Range

Functional Diagram



General Description

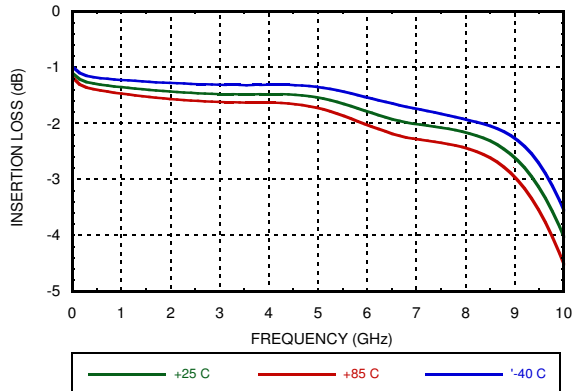
The HMC346AMS8GE is absorptive Voltage Variable Attenuators (VVA) in 8 lead surface-mount packages operating from DC - 8 GHz. It features an on-chip reference attenuator for use with an external op-amp to provide simple single voltage attenuation control, 0 to -5V. The device is ideal in designs where an analog DC control signal must control RF signal levels over a 30 dB amplitude range. Applications include AGC circuits and temperature compensation of multiple gain stages in microwave point-to-point and VSAT radios.

Electrical Specifications, $T_A = +25^\circ\text{C}$, 50 Ohm system

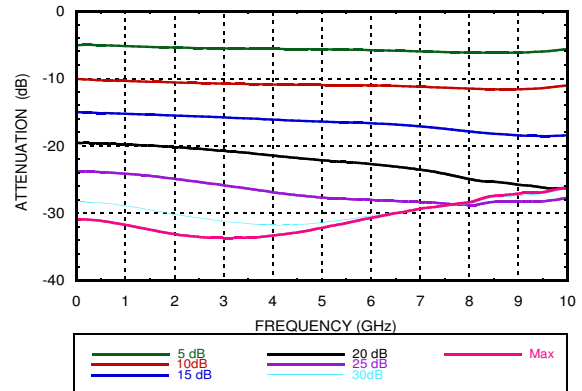
Parameter	Min	Typical	Max	Units
Insertion Loss DC - 8 GHz		2.1	3.1	dB
Attenuation Range DC - 8 GHz	23	28		dB
Return Loss DC - 8 GHz	5	10		dB
Switching Characteristics	tRISE, tFALL (10/90% RF)	8		ns
	tON, tOFF (50% CTL to 10/90% RF)		16	ns
Input Power for 0.25 dB Compression (0.5 - 8 GHz)	Min. Atten.	+8		dBm
	Atten. >2 dB		+4	dBm
Input Third Order Intercept (0.5 - 8 GHz) (Two-tone Input Power = -8 dBm Each Tone)	Min. Atten.	+30		dBm
	Atten. >2 dB		+10	dBm

GaAs MMIC SMT VOLTAGE-VARIABLE ATTENUATOR, DC - 8 GHz

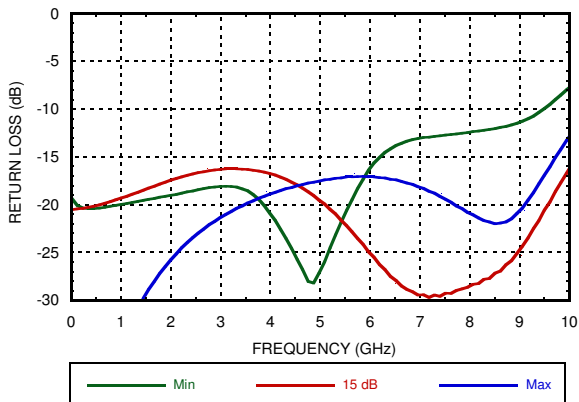
Insertion Loss vs. Temperature



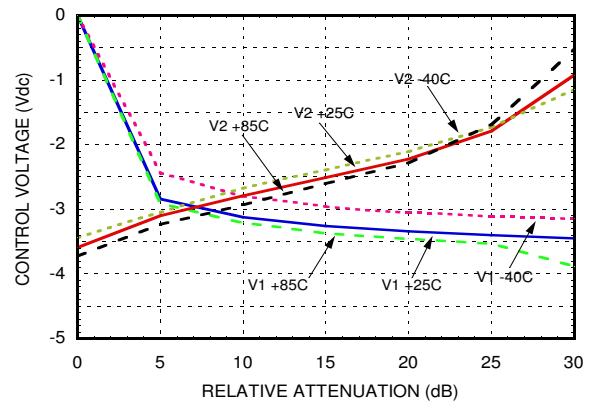
Relative Attenuation



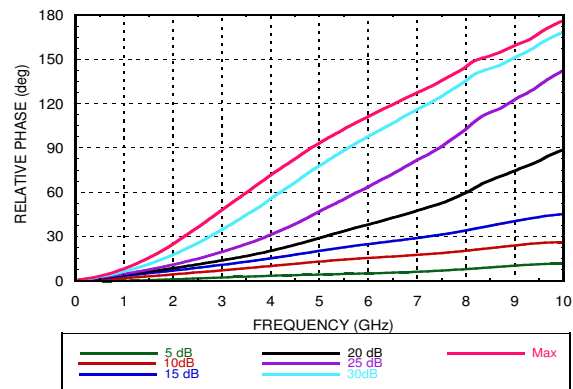
Return Loss vs. Attenuation



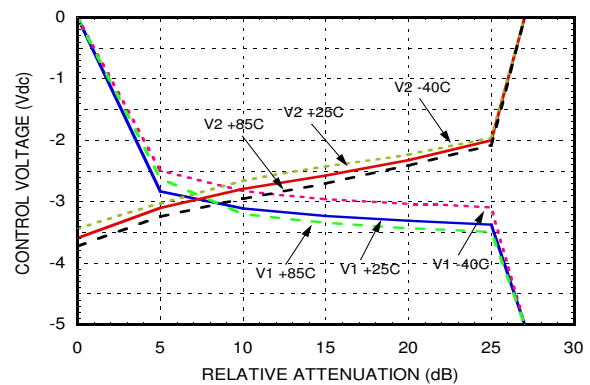
Relative Attenuation vs. Control Voltage @ 4 GHz



Relative Phase

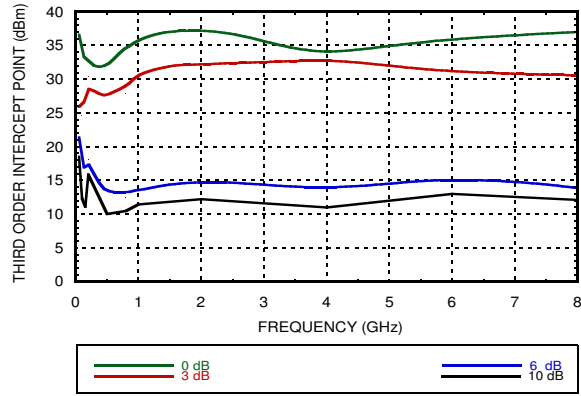


Relative Attenuation vs. Control Voltage @ 8 GHz

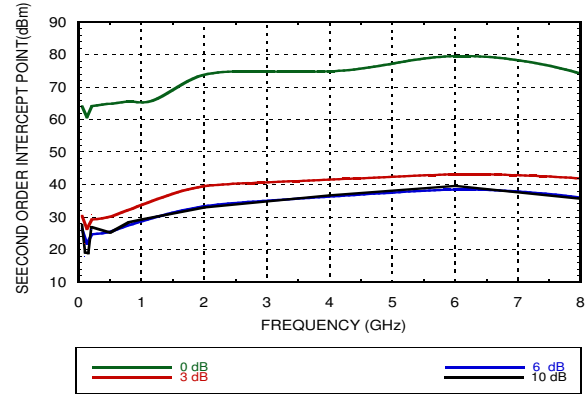


GaAs MMIC SMT VOLTAGE-VARIABLE ATTENUATOR, DC - 8 GHz

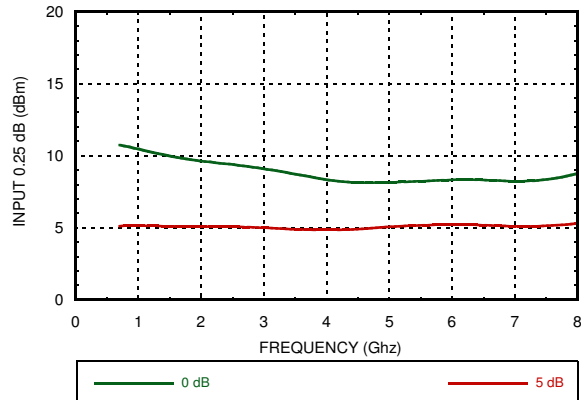
Input Third Order Intercept vs Attenuation*



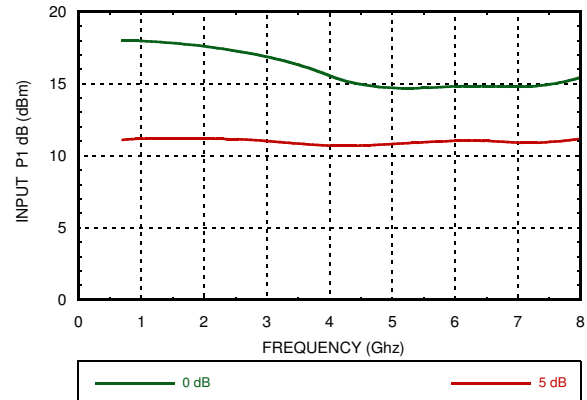
Input Second Order Intercept vs. Attenuation*



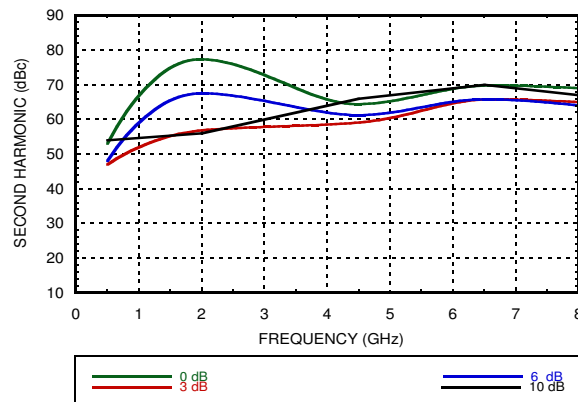
0.25 dB Compression vs. Attenuation



1 dB Compression vs. Attenuation



Second Harmonic vs. Attenuation



*Two-tone input power = -8 dBm each tone, 1 MHz spacing.

GaAs MMIC SMT VOLTAGE-VARIABLE ATTENUATOR, DC - 8 GHz

Absolute Maximum Ratings

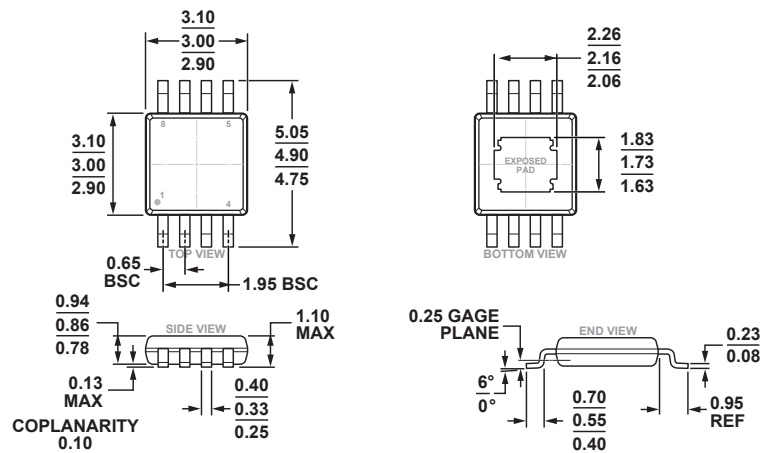
RF Input Power	+18 dBm
DC Voltage on I Pin	+/- 0.8V
Control Voltage Range	+0.3 to -6 V
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Junction Temperature	+175 °C
Junction to Case Thermal Resistance	10 °C/W
ESD Sensitivity	Class 1 A

State	Bias Condition
V1	-5 to 0V @ 9mA typical
V2	-5 to 0V @ 9mA typical



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



COMPLIANT TO JEDEC STANDARDS MO-187-AA-T

8-Lead Mini Small Outline Package with Exposed Pad [MINI_SO_EP]
(RH-8-1)

Dimensions shown in millimeters

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[2]
HMC346AMS8GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 ^[1]	H346A XXXX
HMC346AMS8GETR	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 ^[1]	H346A XXXX
EV1HMC346AMS8G	Eval Board			

[1] Max peak reflow temperature of 260 °C

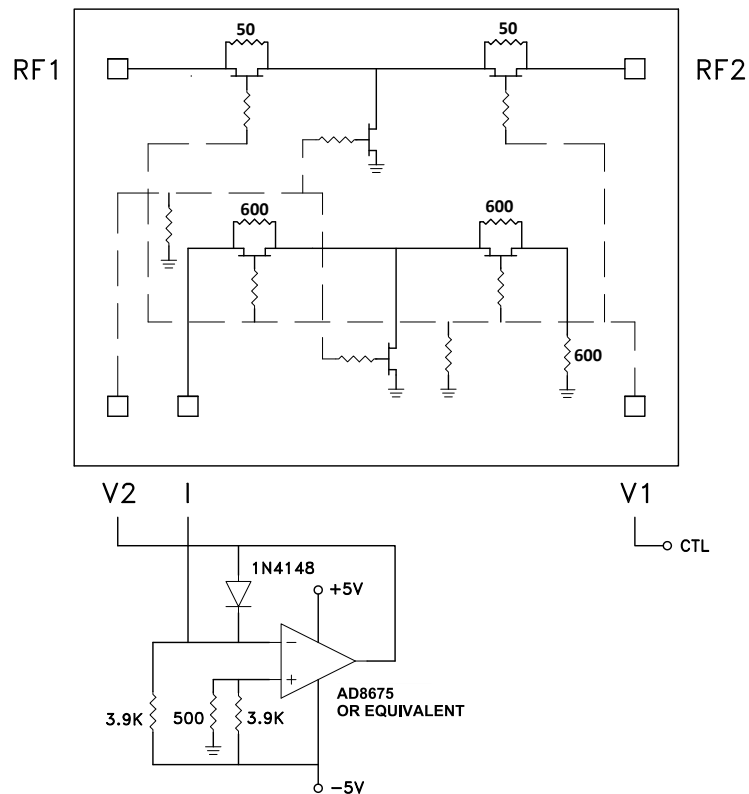
[2] 4-Digit lot number XXXX

GaAs MMIC SMT VOLTAGE-VARIABLE ATTENUATOR, DC - 8 GHz

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 8	RF1 RF2	This pin is DC coupled and matched to 50 Ohm. Blocking capacitors are required if RF line potential is not equal to 0V.	
2, 7	GND	This pin must be DC grounded.	
3, 6	V2, V1	Control Input (Master).	
4	I	Control Input (Slave).	
5	N/C	Not Connected.	

Single-Line Control Driver



External op-amp control circuit maintains impedance match while attenuation is varied. Input control ranges from 0 Volts (min. attenuation) to -5 Volts (max. attenuation.)