

# GaAs IC 35 dB Voltage Variable Attenuator

## Single Positive Control 0.5–2.5 GHz



AV105-12

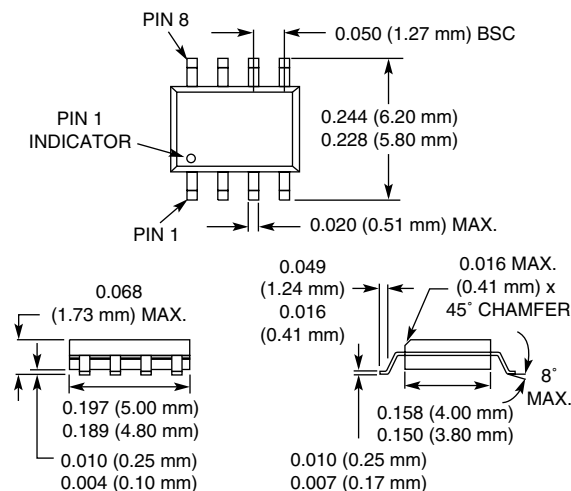
### Features

- Single Positive +5 V Control Voltage
- 35 dB Attenuation Range @ 0.9 GHz
- Excellent Linearity Performance

### Description

The AV105-12 GaAs IC FET voltage variable attenuator provides 35 dB attenuation range at 900 MHz controlled by a single positive voltage. The VVA has a linear transfer curve of 8 dB/V slope, with input and output VSWR better than 1.4:1 over all states. Its attenuation range at 1900 MHz is 31 dB. It operates with supply voltage of +5 V and control voltage of 0 V to +5 V in a low cost SOIC-8 package. The RF ports require 25 pF DC blocking capacitors.

### SOIC-8



### Electrical Specifications at 25°C ( $V_S = 5\text{ V}$ )

Parameter <sup>1</sup>	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ( $V_C = 5\text{ V}$ )	0.5–1.0 GHz		2.8	3.1	dB
	1.0–2.0 GHz		3.2	3.6	dB
	2.0–2.5 GHz		3.5	3.8	dB
Maximum Attenuation ( $V_C = 0\text{ V}$ ) <sup>2</sup>	0.5–0.8 GHz	25	33		dB
	0.8–1.0 GHz	35	38		dB
	1.0–1.7 GHz	32	35		dB
	1.7–2.0 GHz	28	31		dB
	2.0–2.5 GHz	26	30		dB
VSWR (I/O) <sup>3</sup>	0.5–2.5 GHz		1.8:1		

### Operating Characteristics at 25°C ( $V_S = 5\text{ V}$ )

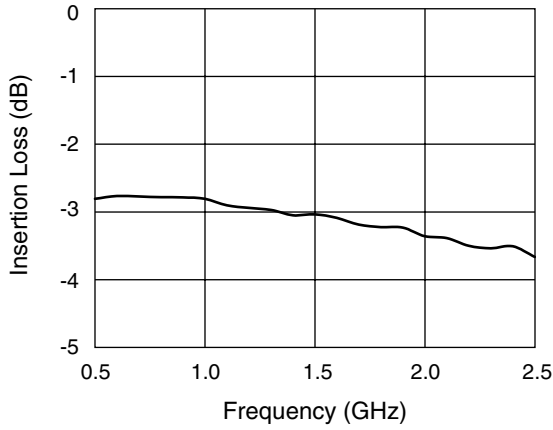
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, On (10/90% or 50% CTL to 90% RF)			350		nS
	Fall, Off (90/10% RF or 50% CTL to 10% RF)			250		nS
Intermodulation Intercept Point (IIP3) <sup>3</sup>	For Two-tone Input Power +0 dBm	0.9 GHz		15		dBm
Control Voltage ( $V_C$ )			0		$V_S$	V
Supply Voltage ( $V_S$ )				5.0		V
Control Current ( $I_C$ )				800		μA
Supply Current ( $I_S$ )				800		μA

1. All measurements made in a 50 Ω system, unless otherwise specified.

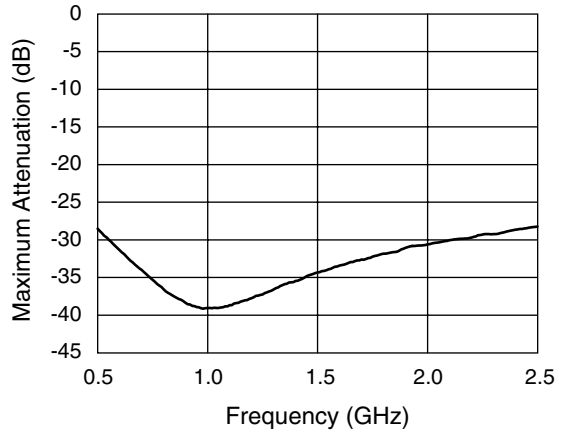
2. Maximum attenuation includes insertion loss.

3. For worst case state.

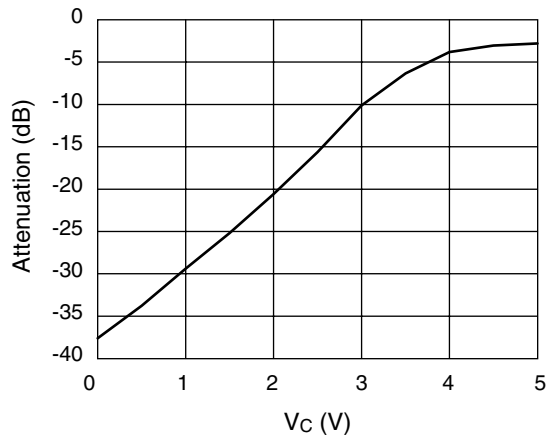
**Typical Performance Data @ 0.9 GHz**  
(Unless Otherwise Specified)



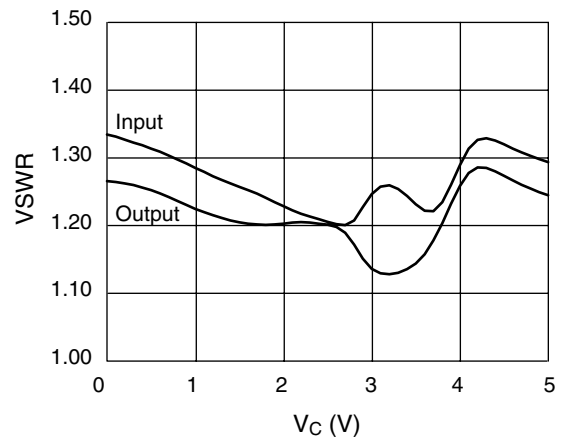
**Insertion Loss vs. Frequency**



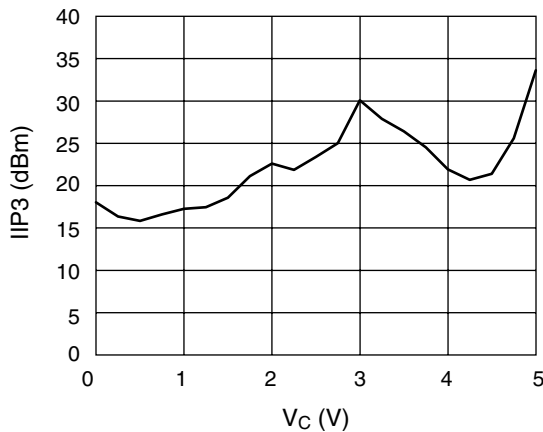
**Maximum Attenuation vs. Frequency**



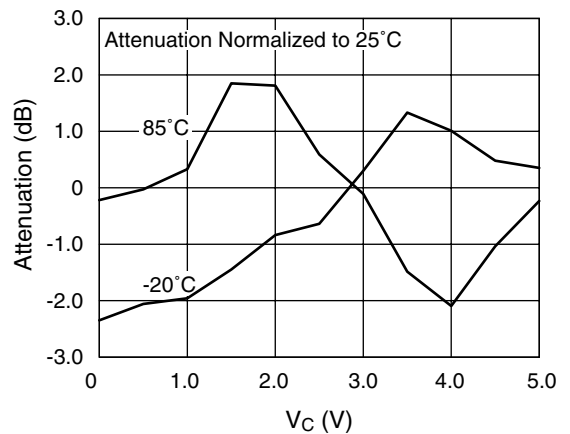
**Attenuation vs. Control Voltage**



**VSWR vs. Control Voltage**



**Input IP3 vs. Control Voltage**



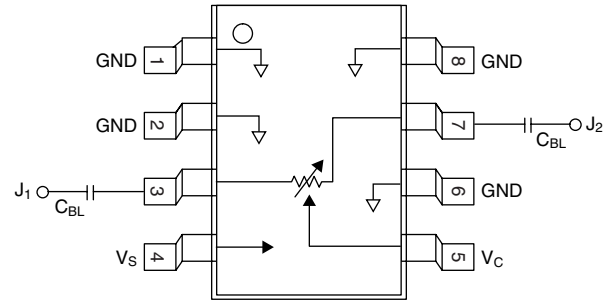
**Attenuation vs. Control Voltage Over Temperature**

### Absolute Maximum Ratings

Characteristic	Value
RF Input Power	50 mW > 500 MHz
Supply Voltage	+4 to +8 V
Control Voltage	$-0.2 \text{ V} < V_C < V_S + 0.2 \text{ V}$
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
$\Theta_{JC}$	25°C/W

Note: Exceeding these parameters may cause irreversible damage.

### Pin Out



DC blocking capacitors (C<sub>B</sub>L) supplied externally.  
C<sub>B</sub>L = 25 pF for operation >500 MHz.



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