Preliminary

GaAs IC 35 dB Voltage Variable Attenuator Single Positive Control 0.5–2.5 GHz

Alpha

AV105-12

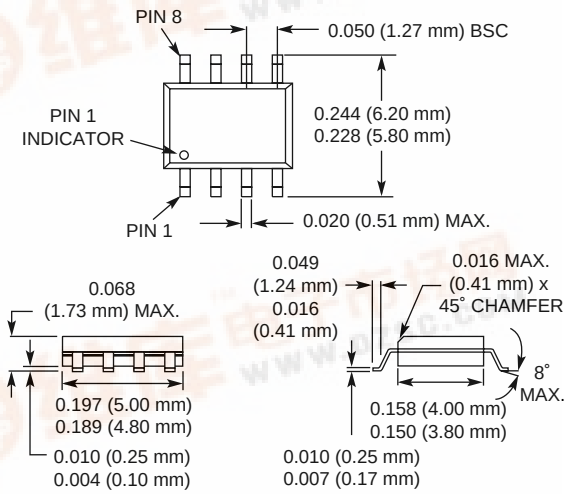
Features

- 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 V)

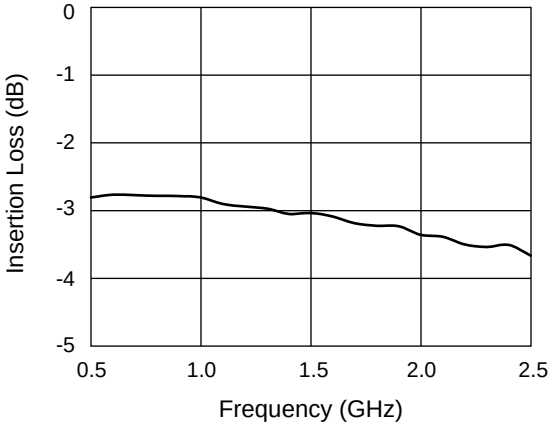
Parameter[1]	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss (V_C = 5 V)	0.5–1.0 GHz 1.0–2.0 GHz 2.0–2.5 GHz		2.8 3.2 3.5	3.1 3.6 3.8	dB dB dB
Maximum Attenuation (V_C = 0 V)[2]	0.5–0.8 GHz 0.8–1.0 GHz 1.0–1.7 GHz 1.7–2.0 GHz 2.0–2.5 GHz	25 35 32 28 26	33 38 35 31 30		dB dB dB dB dB
VSWR (I/O)[3]	0.5–2.5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

Operating Characteristics at 25°C (V_S = 5 V)

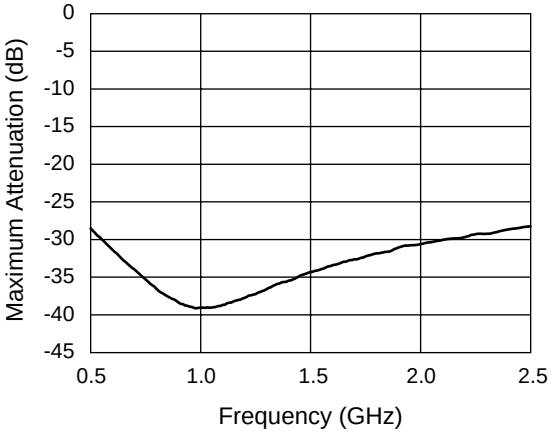
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, On (10/90% or 50% CTL to 90% RF) Fall, Off (90/10% RF or 50% CTL to 10% RF)			350 250		nS nS
Intermodulation Intercept Point (IIP3)[3]	For Two-tone Input Power +0 dBm	0.9 GHz		15		dBm
Control Voltage (V_C)			0.0		V_S	V
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.

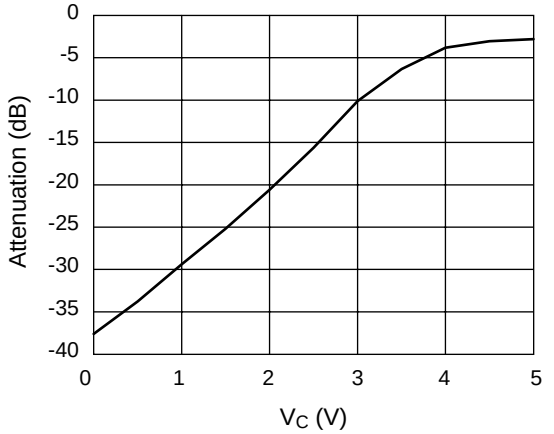
Typical Performance Data @ 0.9 GHz
(Unless Otherwise Specified)



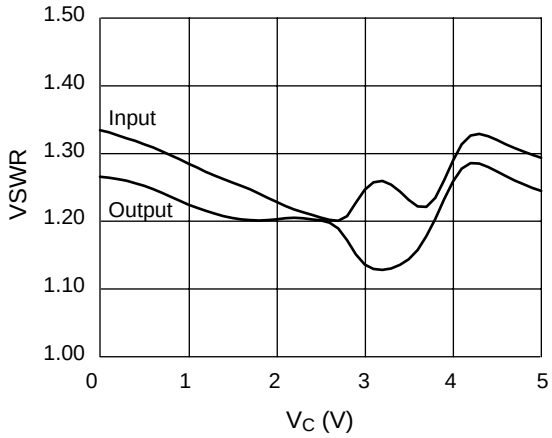
Insertion Loss vs. Frequency



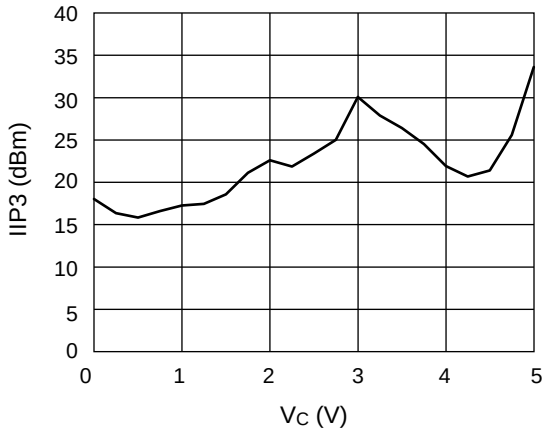
Maximum Attenuation vs. Frequency



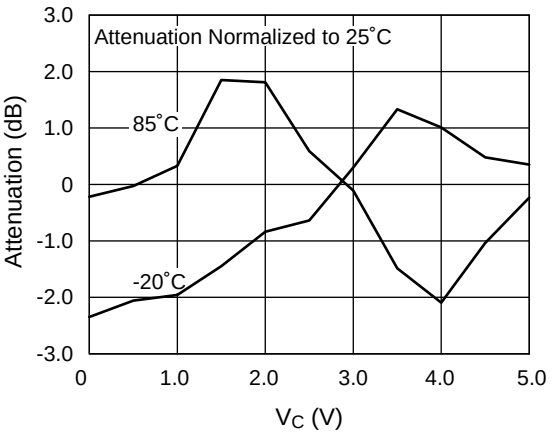
Attenuation vs. Control Voltage



VSWR vs. Control Voltage



Input IP3 vs. Control Voltage



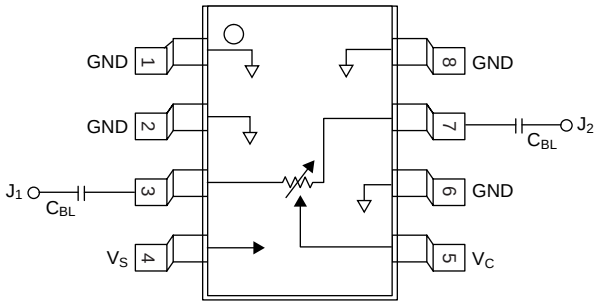
Attenuation vs. Control Voltage Over Temperature

Absolute Maximum Ratings

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

Note: Exceeding these parameters may cause irreversible damage.

Pin Out



DC blocking capacitors (C_{BL}) supplied externally.
C_{BL} = 25 pF for operation >500 MHz.