

GaAs IC 25 dB Voltage Variable Attenuator Single Positive Control 0.5–2.5 GHz



AV104-12

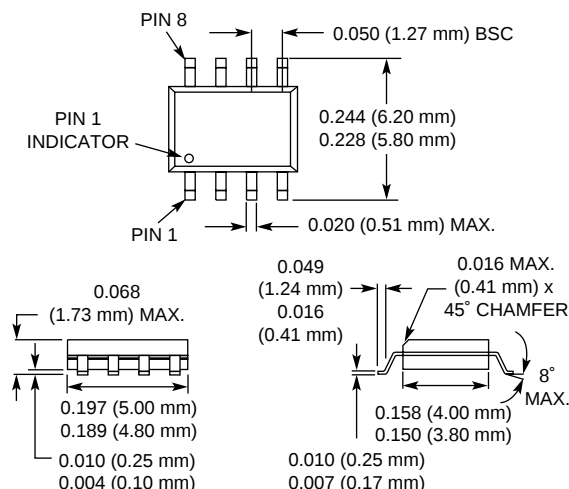
Features

- Single Positive +5 V Control Voltage
- 25 dB Attenuation Range @ 0.9 GHz
- High IP3 (20 dBm @ 0.9 GHz)
- Excellent Linearity Performance

Description

The AV104-12 GaAs IC FET voltage variable attenuator provides 25 dB attenuation range at 900 MHz controlled by a single positive voltage. The VVA has a linear transfer curve of 5 dB/V slope, with input and output VSWR better than 1.4:1 over all states. Its attenuation range at 1900 MHz is 22 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		2.7	3.0	dB
	1.0–2.0 GHz		3.0	3.4	dB
	2.0–2.5 GHz		3.2	3.7	dB
Maximum Attenuation ($V_C = 0$ V) ²	0.5–0.8 GHz	16	20		dB
	0.8–1.0 GHz	21	25		dB
	1.0–1.7 GHz	19	23		dB
	1.7–2.0 GHz	17	21		dB
	2.0–2.5 GHz	15	19		dB
VSWR (I/O) ³	0.5–2.5 GHz		1.4:1		

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

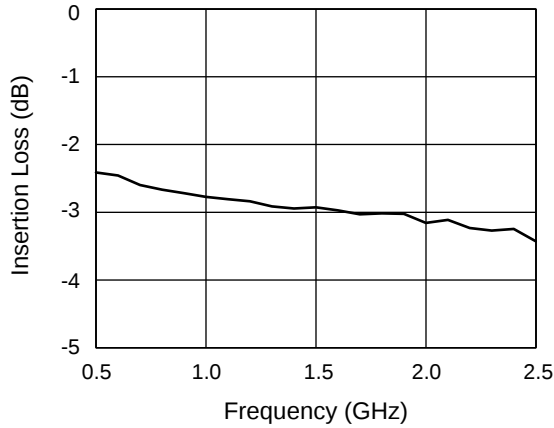
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, On (10/90% or 50% CTL to 90% RF)			1.0		μS
	Fall, Off (90/10% RF or 50% CTL to 10% RF)			1.5		μS
Intermodulation Intercept Point (IIP3) ³	For Two-tone Input Power +0 dBm	0.9 GHz		20		dBm
Control Voltage (V_C)			0.0		V_S	V
Supply Voltage (V_S)				5.0		V
Control Current (I_C)				2.5		mA
Supply Current (I_S)				2.5		μA

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

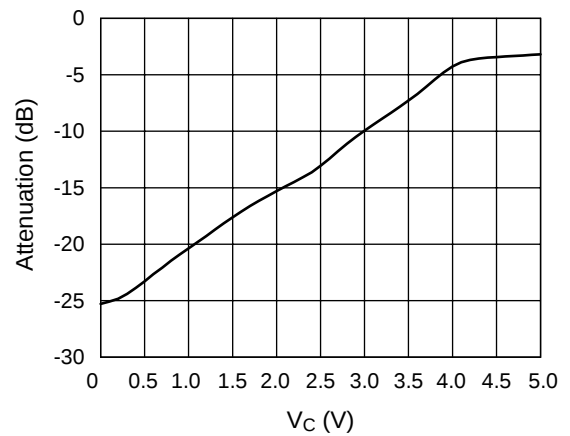
2. Maximum attenuation includes insertion loss.

3. For worst case state.

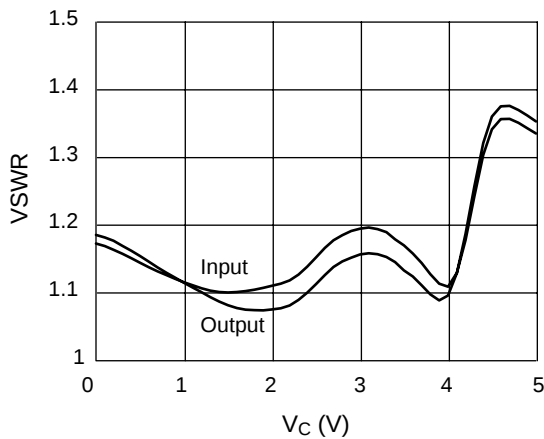
Typical Performance Data @ 0.9 GHz (Unless Otherwise Specified)



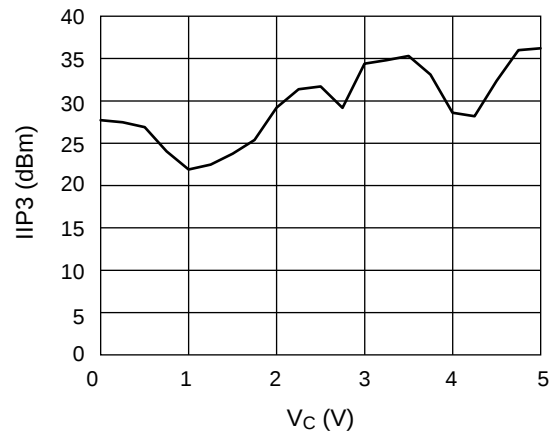
Insertion Loss vs. Frequency



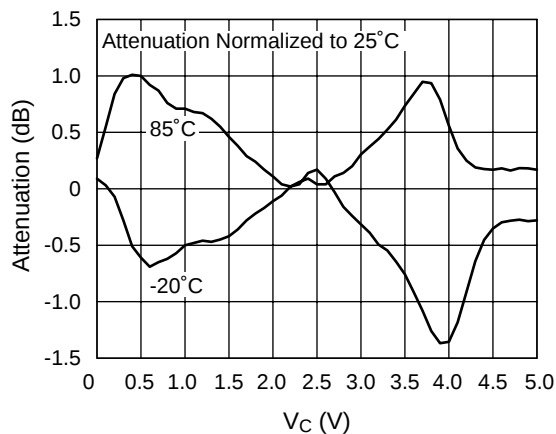
Attenuation vs. Control Voltage



VSWR vs. Control Voltage



Input IP3 vs. Control Voltage



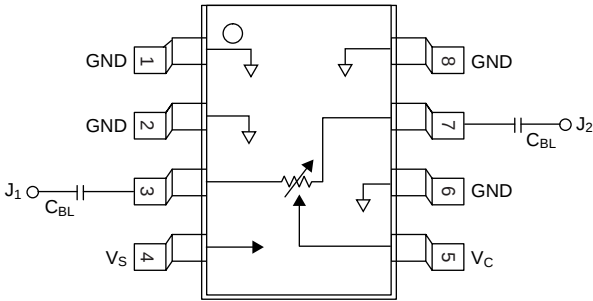
**Attenuation vs. Control Voltage
Over Temperature**

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	100 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.