

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



AV104-12

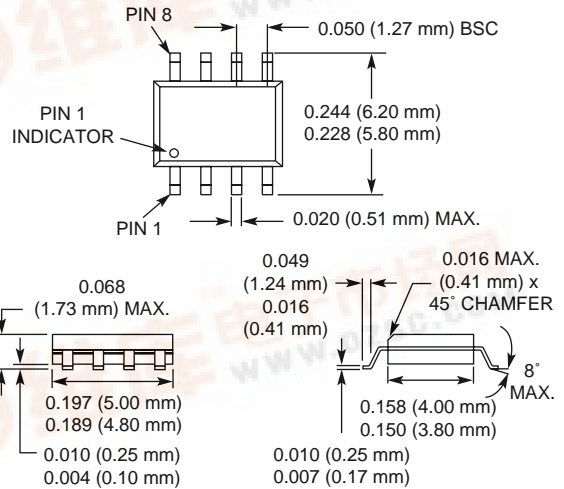
## Features

- 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<sub>S</sub> = 5 V)

Parameter <sup>1</sup>	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss (V <sub>C</sub> = 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 <sub>C</sub> = 0 V) <sup>2</sup>	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) <sup>3</sup>	0.5–2.5 GHz		1.4:1		

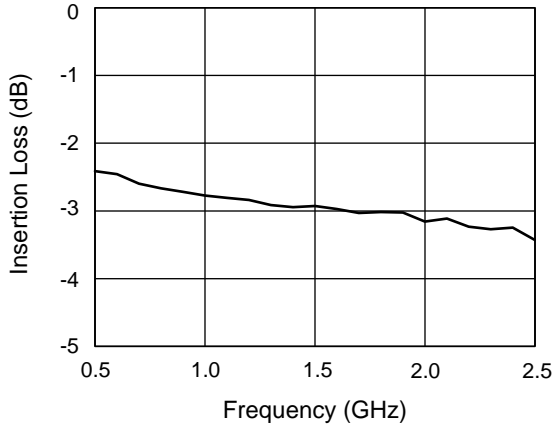
## Operating Characteristics at 25°C (V<sub>S</sub> = 5 V)

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) <sup>3</sup>	For Two-tone Input Power +0 dBm	0.9 GHz		20		dBm
Control Voltage (V <sub>C</sub> )			0.0		V <sub>S</sub>	V
Supply Voltage (V <sub>S</sub> )				5.0		V
Control Current (I <sub>C</sub> )				2.5		mA
Supply Current (I <sub>S</sub> )				2.5		μA

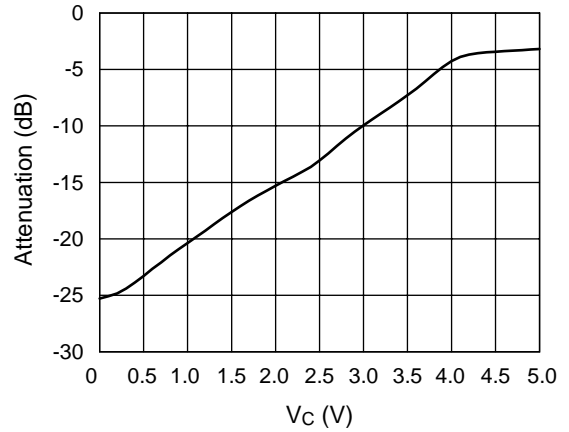
1. All measurements made in a 50 Ω system, unless otherwise specified.  
 2. Maximum attenuation includes insertion loss.  
 3. For worst case state.



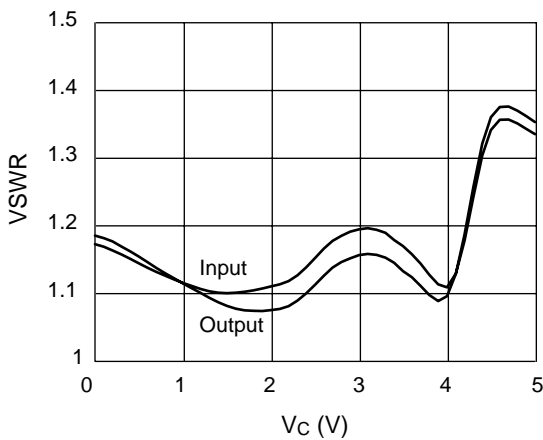
**Typical Performance Data @ 0.9 GHz**  
(Unless Otherwise Specified)



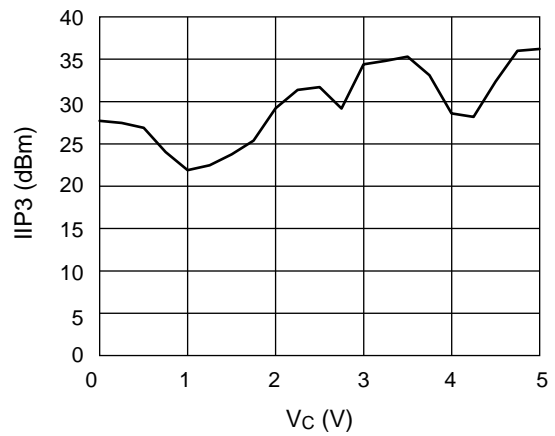
**Insertion Loss vs. Frequency**



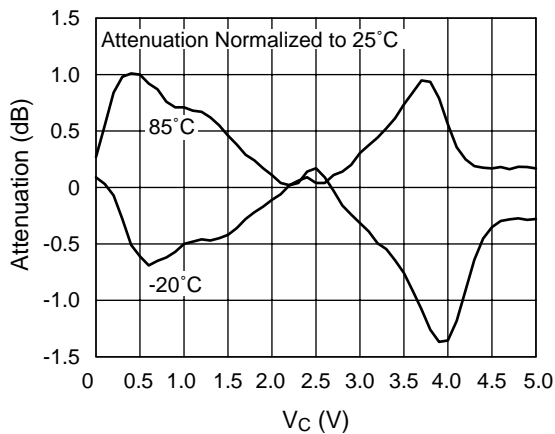
**Attenuation vs. Control Voltage**



**VSWR vs. Control Voltage**



**Input IP3 vs. Control Voltage**



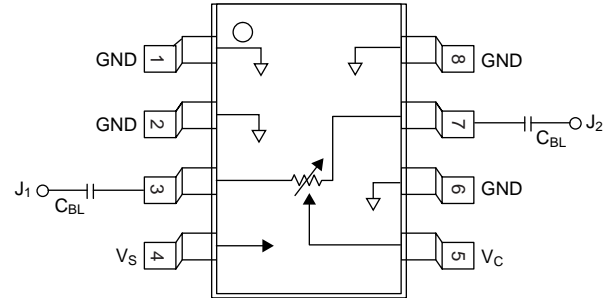
**Attenuation vs. Control Voltage Over Temperature**

### Absolute Maximum Ratings

Characteristic	Value
RF Input Power	100 mW > 500 MHz
Supply Voltage	+4 to +8 V
Control Voltage	$-0.2\text{ V} < V_C < V_S + 0.2\text{ V}$
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>BL</sub>) supplied externally.  
 C<sub>BL</sub> = 25 pF for operation >500 MHz.