

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



AV103-12

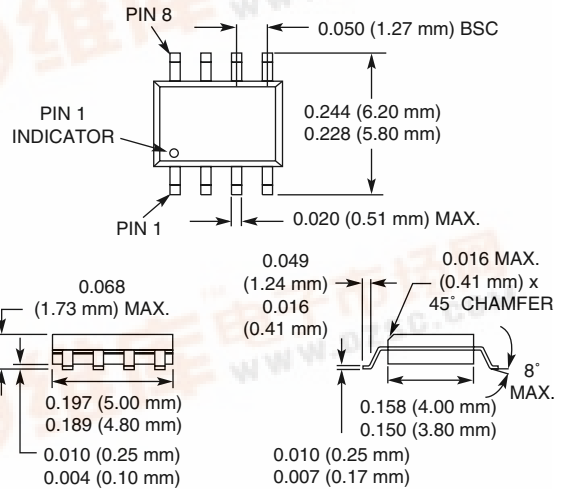
## Features

- Single Positive +5 V Control Voltage
- 35 dB Attenuation Range @ 0.9 GHz
- Less Than  $\pm 1$  dB Attenuation Change Over Temperature
- Excellent Linearity Performance

## Description

The AV103-12 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 9 dB/V slope, with input and output VSWR better than 2.1:1 over all states. Its attenuation range at 1900 MHz is 33 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 100 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		2.5	2.7	dB
	1.0–2.0 GHz		2.8	3.0	dB
	2.0–2.5 GHz		3.2	3.4	dB
Maximum Attenuation (V <sub>C</sub> = 0 V) <sup>2</sup>	0.5–0.8 GHz	28	32		dB
	0.8–1.0 GHz	31	35		dB
	1.0–1.7 GHz	30	34		dB
	1.7–2.0 GHz	29	33		dB
	2.0–2.5 GHz	28	32		dB
VSWR (I/O) <sup>3</sup>	0.5–2.5 GHz		2.1:1		

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

Parameter <sup>1</sup>	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, On (10/90% or 50% CTL to 90% RF)			130		nS
	Fall, Off (90/10% RF or 50% CTL to 10% RF)			60		nS
Intermodulation Intercept Point (IIP3) <sup>3</sup>	For Two-tone Input Power 0 dBm	0.9 GHz		12		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> )				1.1 x V <sub>C</sub>		mA
Supply Current (I <sub>S</sub> )				150		μA

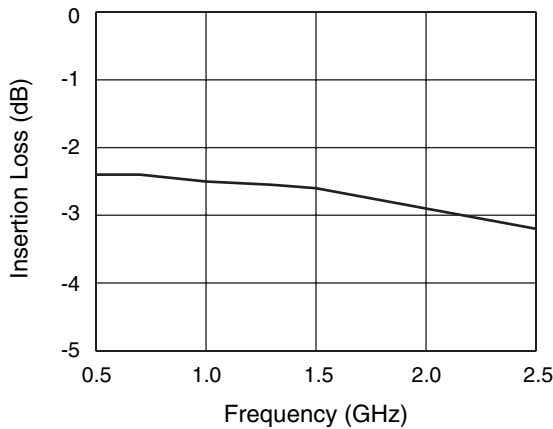
1. All measurements made in a 50 Ω system, unless otherwise specified.

2. Maximum attenuation includes insertion loss.

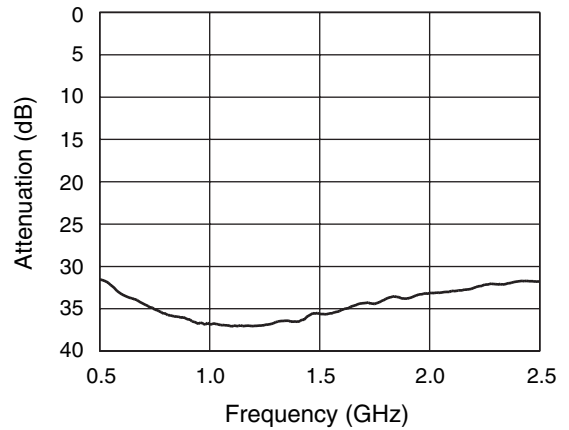
3. For worst case state.



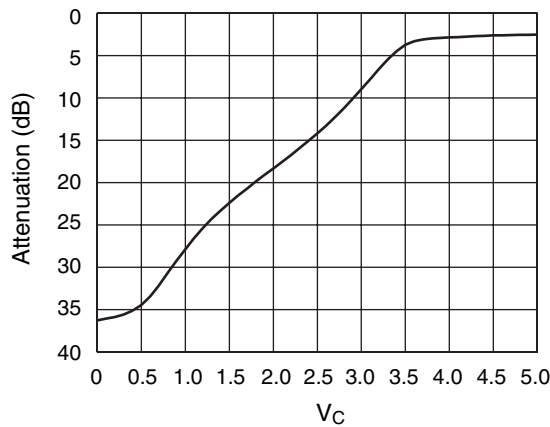
**Typical Performance Data @ 0.9 GHz**  
(Unless Otherwise Specified)



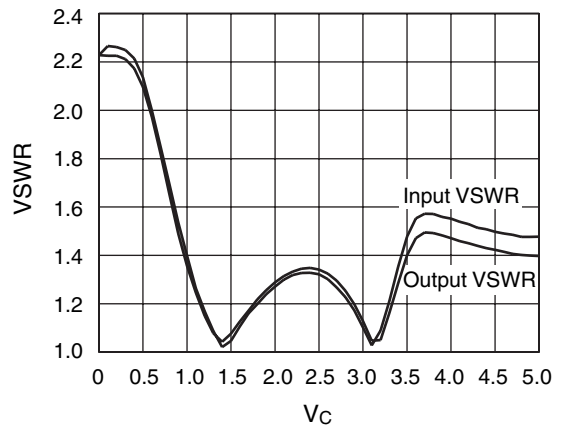
**Insertion Loss vs. Frequency**



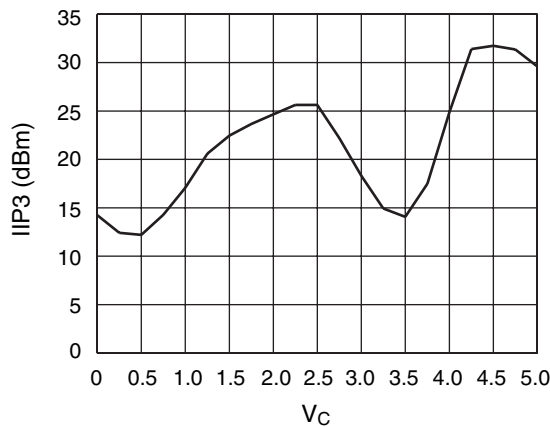
**Maximum Attenuation vs. Frequency**



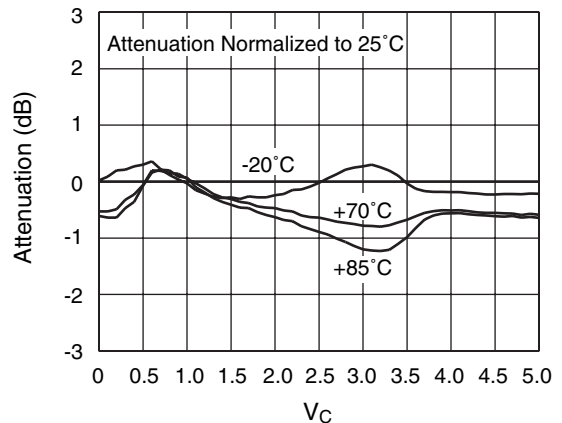
**Attenuation vs. Control Voltage**



**VSWR vs. Control Voltage**



**Input IP3 vs. Control Voltage**



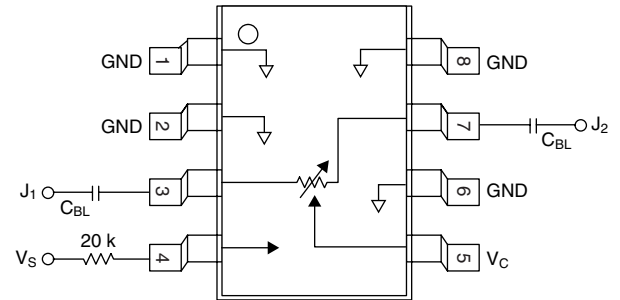
**Attenuation vs. Control Voltage Over Temperature**

### Absolute Maximum Ratings

Characteristic	Value
RF Input Power	50 mW > 500 MHz
Supply Voltage	+4 to +8 V
Control Voltage	-0.2 V, +6.5 V (Do not allow control voltage to exceed $V_S$ voltage.)
Operating Temperature	-55°C to +125°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 ( $C_{BL}$ ) supplied externally.  
 $C_{BL} = 100 \text{ pF}$  for operation >500 MHz.