

DATA SHEET

# AV108-59, AV108-59LF: GaAs IC 35 dB Voltage Variable Attenuator Single Positive 3 V Control 0.5–2.5 GHz

## Features

- Single positive 3 V control voltage
- 35 dB attenuation range @ 0.9 GHz
- Excellent linearity performance
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

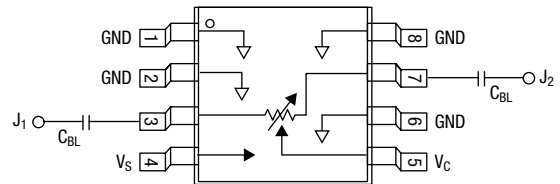
## Description

The AV108-59 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 12 dB/V slope, with input and output VSWR better than 2:1 over all states. Its attenuation range at 1900 MHz is 25 dB. It operates with supply voltage of 3 V and control voltage of 0 V to 3 V in a low-cost MSOP-8 package. The RF ports require 25 pF DC blocking capacitors.

**NEW** Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.



## Pin Out



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

## Electrical Specifications at 25 °C ( $V_S = 3$ V)

Parameter <sup>(1)</sup>	Frequency	Min.	Typ.	Max.	Unit
Insertion loss ( $V_C = 0$ V)	0.5–1.0 GHz		3.4	3.6	dB
	1.0–2.0 GHz		3.5	3.8	dB
	2.0–2.5 GHz		3.8	4.2	dB
Maximum attenuation ( $V_C = 3$ V) <sup>(2)</sup>	0.5–0.8 GHz	25	32		dB
	0.8–1.0 GHz	34	37		dB
	1.0–1.7 GHz	28	33		dB
	1.7–2.0 GHz	25	30		dB
	2.0–2.5 GHz	23	26		dB
VSWR (I/O) <sup>(3)</sup>	0.5–2.5 GHz		1.8:1		

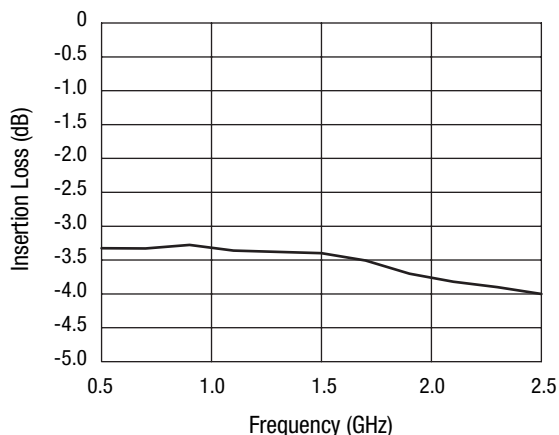
### Operating Characteristics at 25 °C ( $V_S = 3\text{ V}$ )

Parameter <sup>(1)</sup>	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, on	10/90% or 50% CTL to 90% RF			1.0		$\mu\text{s}$
Fall, off	90/10% RF or 50% CTL to 10% RF			0.3		$\mu\text{s}$
Intermodulation intercept point (IIP3) <sup>(3)</sup>	For two-tone input power 0 dBm	0.9 GHz		10		dBm
Thermal resistance				25		$^{\circ}\text{C}/\text{W}$
Control voltage ( $V_C$ )			0		$V_S$	V
Supply voltage ( $V_S$ )				3	3.3	V
Control current ( $I_C$ )				$0.2 \times V_C$		mA
Supply current ( $I_S$ )				150		$\mu\text{A}$

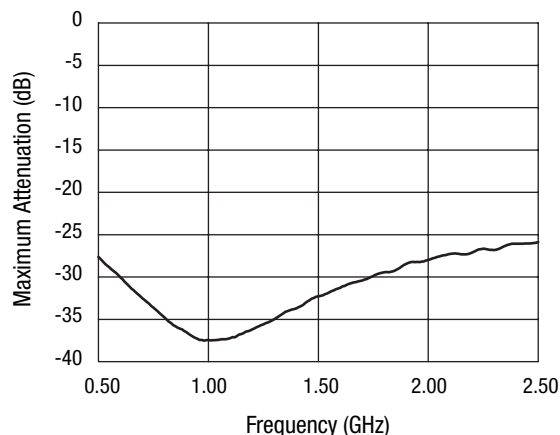
1. All measurements made in a 50  $\Omega$  system, unless otherwise specified.
2. Maximum attenuation includes insertion loss.
3. For worst-case state.

### Typical Performance Data @ 0.9 GHz

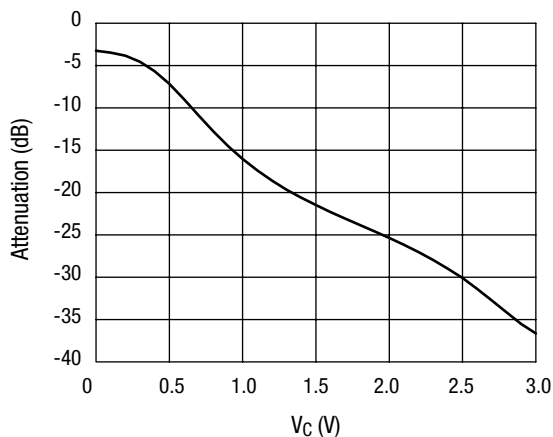
(Unless Otherwise Specified)



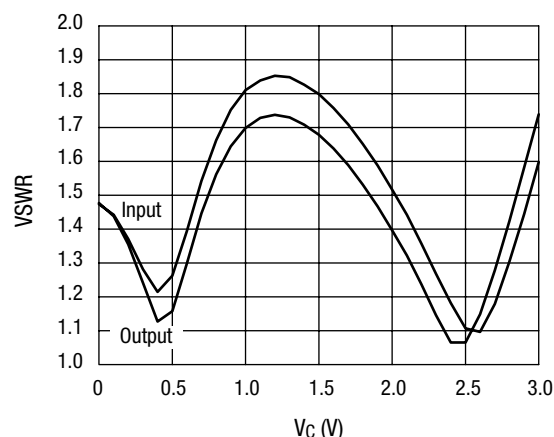
Insertion Loss vs. Frequency



Maximum Attenuation vs. Frequency

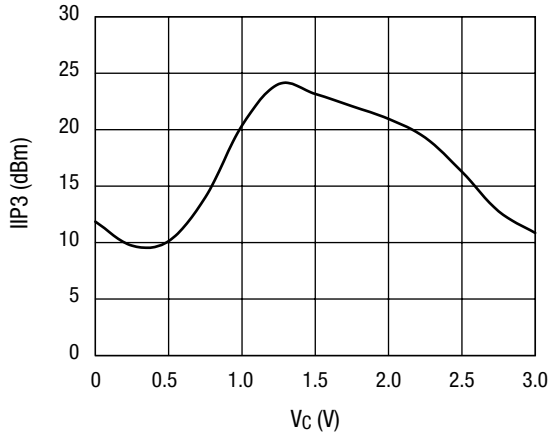


Attenuation vs. Control Voltage

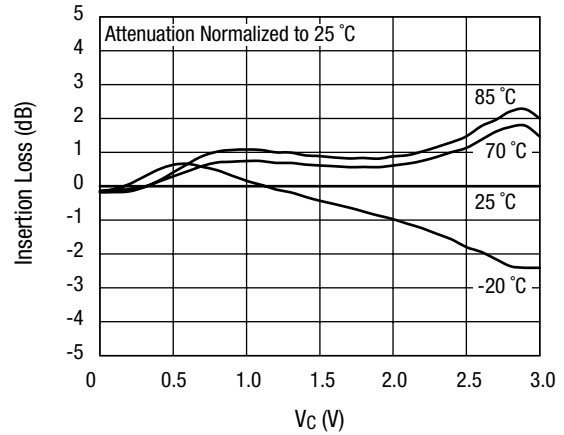


VSWR vs. Control Voltage

## Attenuators



**Input IP3 vs. Control Voltage**



**Attenuation vs. Control Voltage Over Temperature**

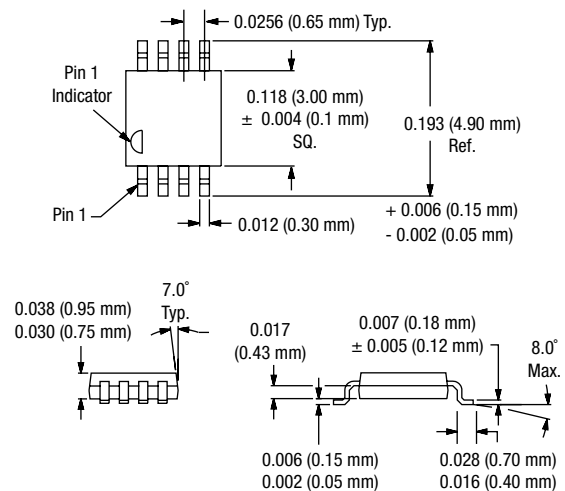
## Absolute Maximum Ratings

Characteristic	Value
RF input power	50 mW > 500 MHz
Supply voltage	7 V
Control voltage	3.3 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

**CAUTION:** Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

## MSOP-8



## Recommended Solder Reflow Profiles

Refer to the “[Recommended Solder Reflow Profile](#)” Application Note.

## Tape and Reel Information

Refer to the “[Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation](#)” Application Note.