



SKYWORKS®

DATA SHEET

# AV111-12, AV111-12LF: HIP3™ Variable Attenuator 0.80–1.00 GHz

### Features

- 40 dBm IP3 typical
- Low loss 1 dB typical
- Attenuation 30 dB typical
- Good VSWR <1.5:1 typical
- Low phase shift
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

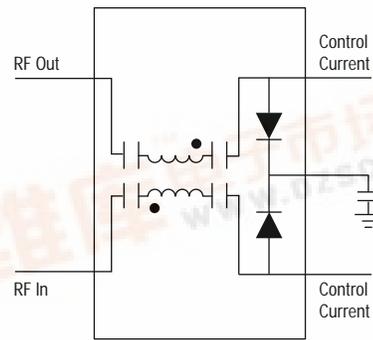
### Description

The AV111-12 is a current controlled, variable attenuator from Skyworks series of HIP3™ components. It is designed to meet the wide dynamic range required in spread spectrum, wireless base station applications. A monolithic quadrature hybrid is teamed with a silicon PIN diode pair in a plastic surface mount package reducing size and assuring consistency from part to part. AV111-12LF is packaged in a lead (Pb)-free, fully RoHS-compliant SOIC-8 package and is electrically identical to AV111-12.

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



### Connection Diagram



### Electrical Specifications at 25 °C

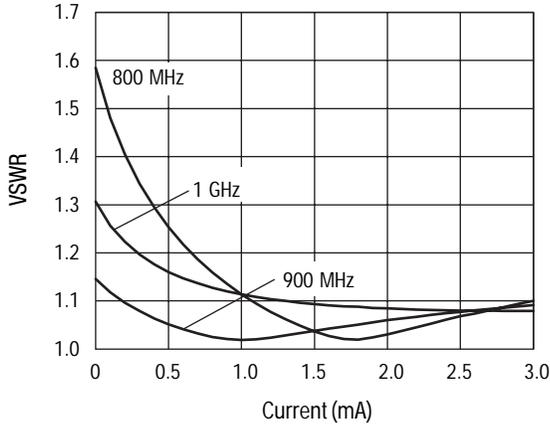
Parameter	Min.	Typ.	Max.	Unit
Frequency	0.8		1	GHz
Insertion loss (0 mA control current)		1	1.5	dB
Attenuation @ 1.2 mA control current (900 MHz)	17.5		21.5	dB
VSWR all ports		1.5	1.8	
Input 3rd order intercept	37	40		dBm
Relative phase shift up to 20 dB attenuation <sup>(1)</sup>		7	10	Deg.
Group delay		0.4	0.9	ns

### Operating Characteristics at 25 °C (0, 5 V)

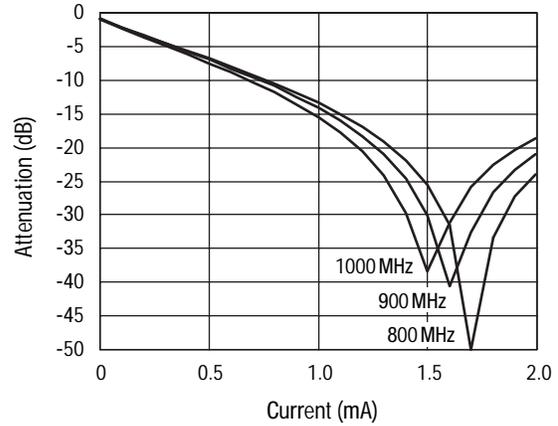
Parameter <sup>(2)</sup>	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics <sup>(3)</sup>						
Rise, fall	10/90% or 90/10% RF				5	µs
On, off	50% CTL to 90/10% RF				8	µs
Video feedthru (peak)					5	mV
Maximum input power for <1 dB attenuation variation					15	dBm

1. When built with external components as shown in the Pin Out diagram.
2. All measurements made in a 50 Ω system, unless otherwise specified.
3. 0–4 mA square wave total control current.

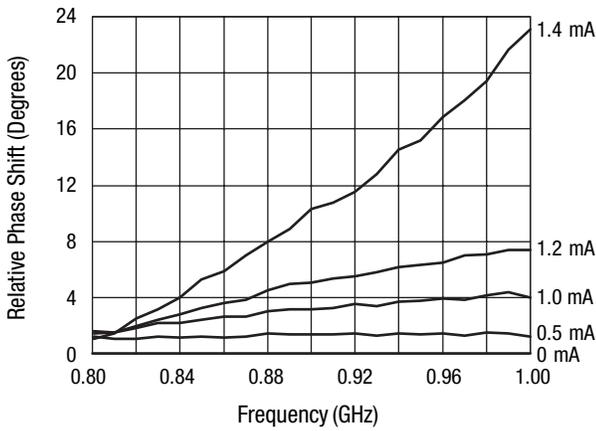
**Typical Performance Data**



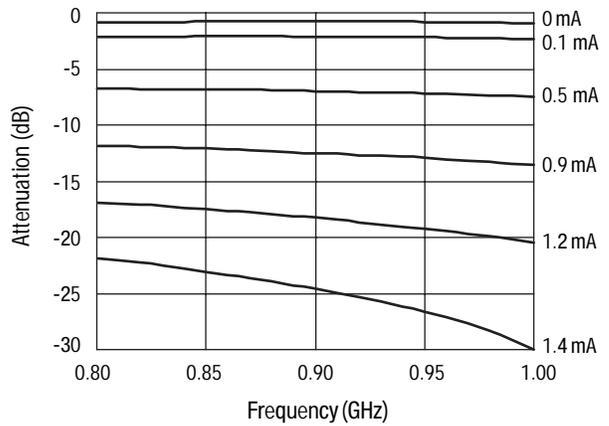
**Input/Output VSWR vs. Current**



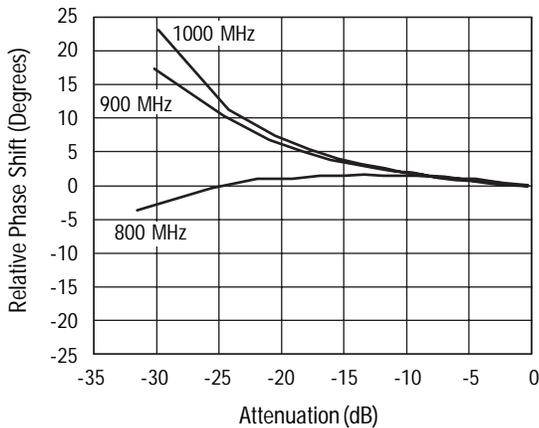
**Attenuation vs. Current**



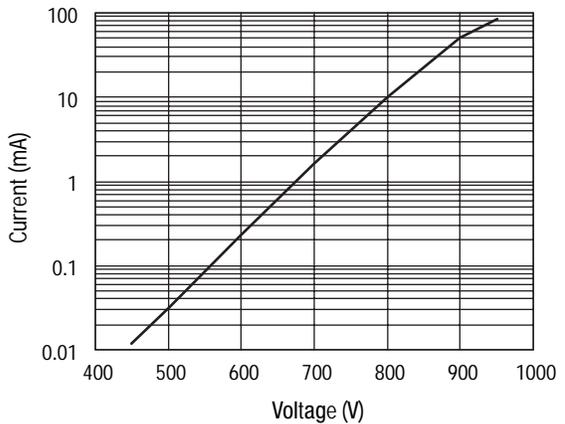
**Relative Phase vs. Frequency**



**Attenuation vs. Frequency**

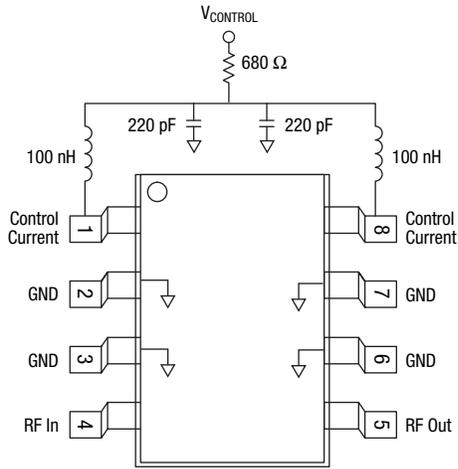


**Relative Phase vs. Attenuation**

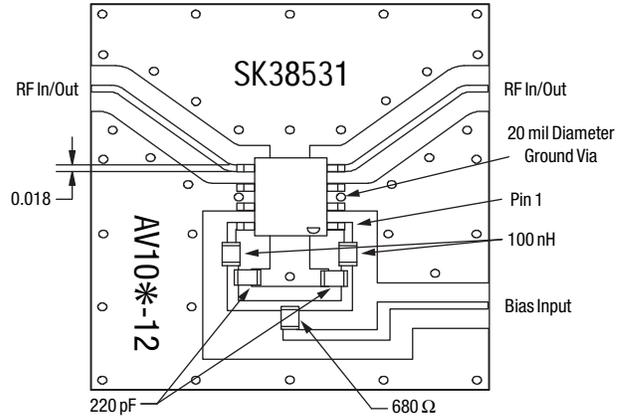


**Typical PIN Diode Current vs. Voltage**

### Pin Out



### Recommended Board Layout



Material is 10 mil FR4.

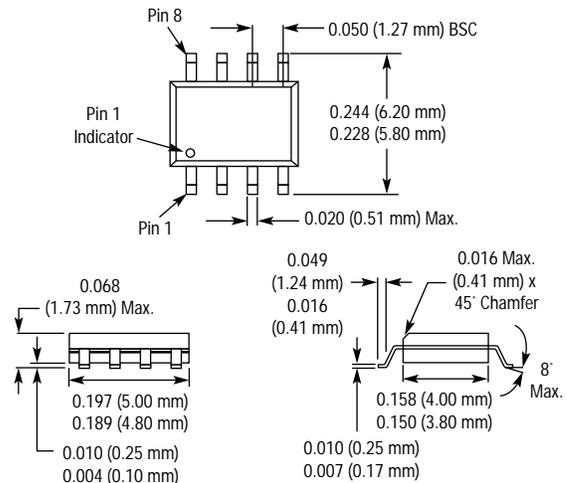
### Absolute Maximum Ratings

Characteristic	Value
RF input power	0.5 W CW, 4 W @ 12.5% duty cycle
Control current	50 mA per diode
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C
Maximum reverse diode voltage	-100 V
Electrostatic discharge	125 V

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.

### SOIC-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.

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