

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

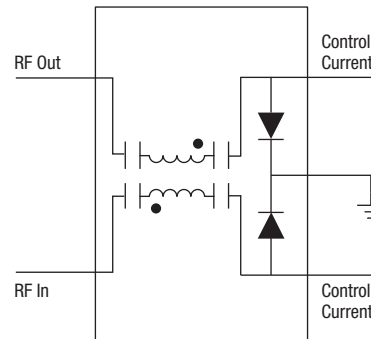
Description

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 ⁽¹⁾ | | 7 | 10 | Deg. |
| Group delay | | 0.4 | 0.9 | ns |

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

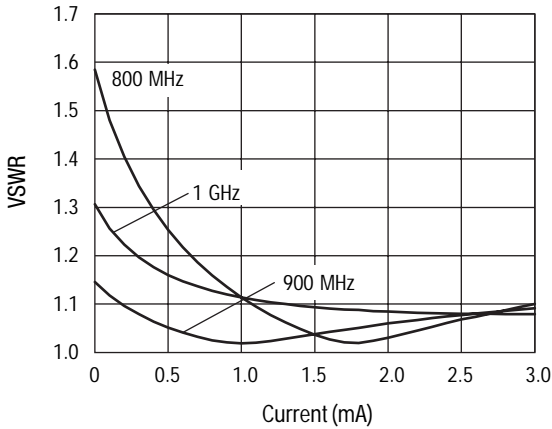
| Parameter ⁽²⁾ | Condition | Frequency | Min. | Typ. | Max. | Unit |
|---|----------------------|-----------|------|------|------|------|
| Switching characteristics ⁽³⁾ | | | | | | |
| Rise, fall | 10/90% or 90/10% RF | | | | 5 | µs |
| On, off | 50% CTL to 90/10% RF | | | | 8 | µs |
| Video feedthru (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.

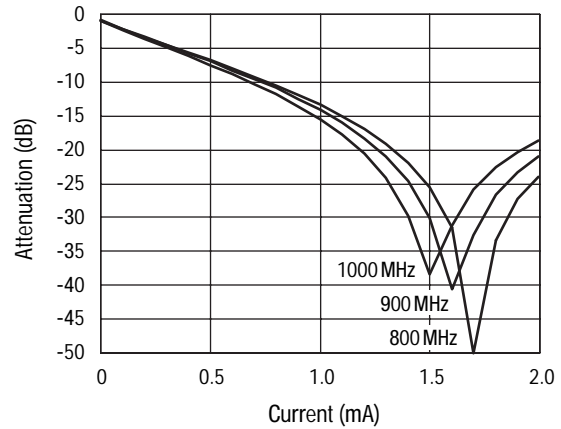
2. All measurements made in a 50 Ω system, unless otherwise specified.

3. 0–4 mA square wave total control current.

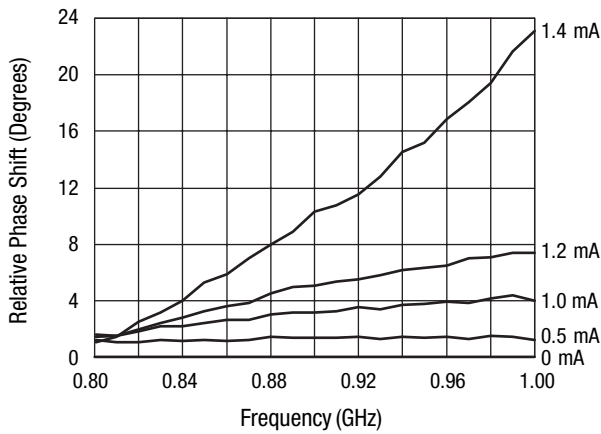
Typical Performance Data



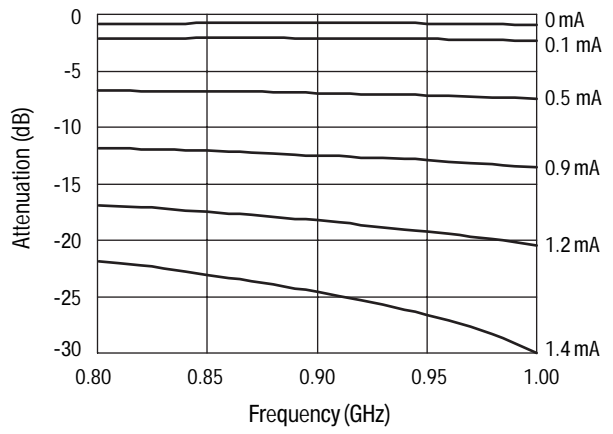
Input/Output VSWR vs. Current



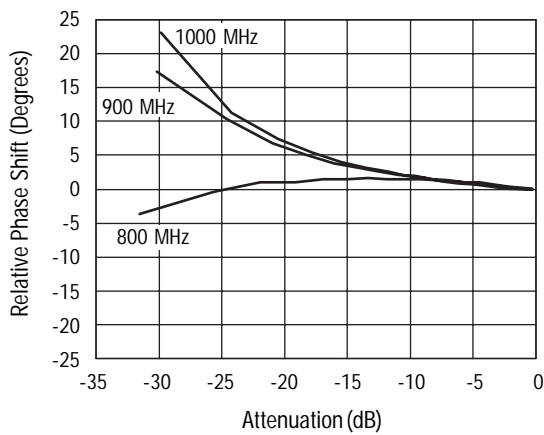
Attenuation vs. Current



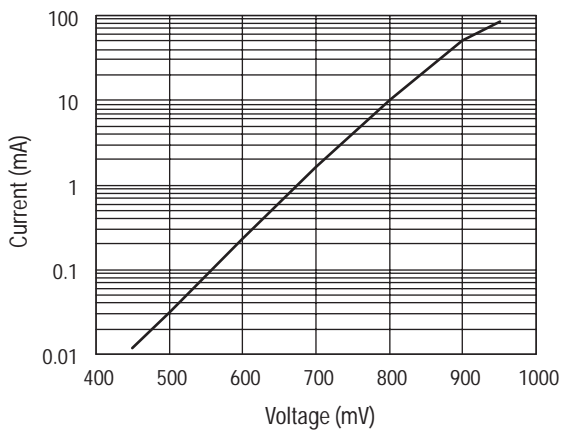
Relative Phase vs. Frequency



Attenuation vs. Frequency

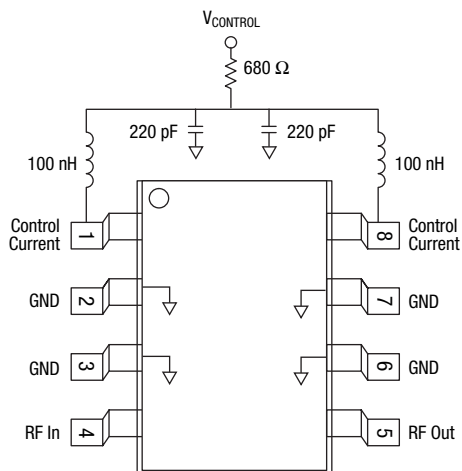


Relative Phase vs. Attenuation

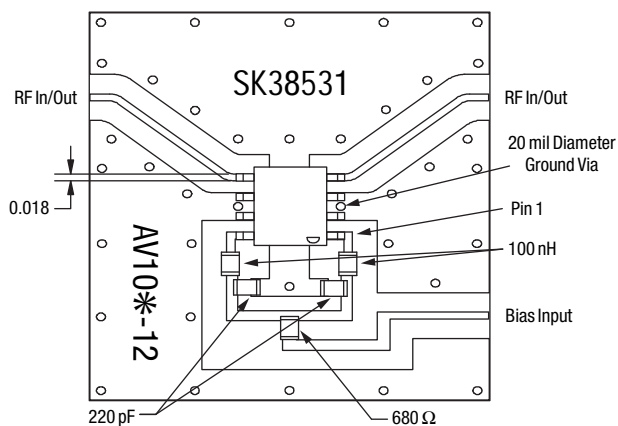


Typical PIN Diode Current vs. Voltage

Pin Out



Recommended Board Layout



Material is 10 mil FR4.

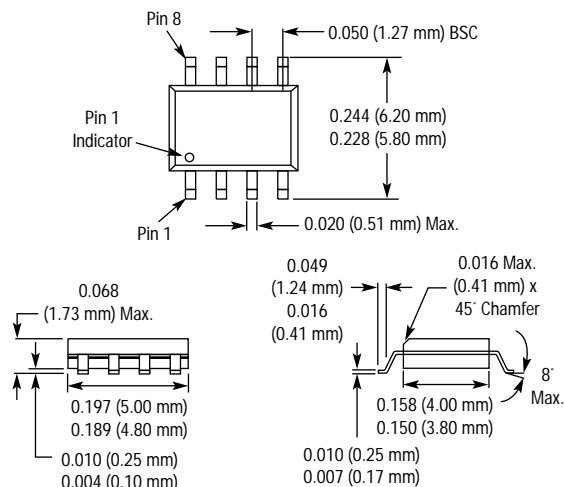
Absolute Maximum Ratings

| 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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