

DATA SHEET

AV113-12, AV113-12LF: HIP3™ Variable Attenuator 2.1–2.3 GHz

Features

- Low Loss 1.4 dB typical
- Attenuation 18 dB typical
- Good VSWR <1.5:1 typical
- Small SOIC-8 package
- For IMT-2000 applications
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

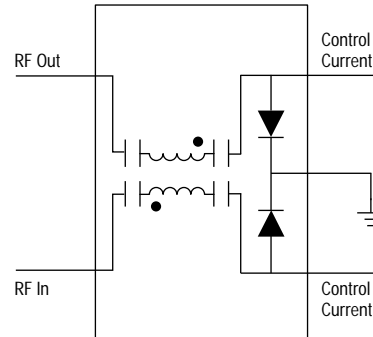
Description

The AV113-12 is a current controlled, variable attenuator from Skyworks series of HIP3™ components. It is designed to meet the wide dynamic range required in IMT-2000 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. AV113-12LF is packaged in a lead (Pb)-free, fully RoHS-compliant SOIC-8 package and is electrically identical to AV113-12.

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 | 2.1 | | 2.3 | GHz |
| Insertion loss (0 mA control current) | | 1.4 | 1.6 | dB |
| Attenuation @ 1.0 mA control current | 16.5 | 18 | | dB |
| VSWR all ports | | 1.5 | | |
| Input 3rd order intercept point | | 40 | | dBm |
| Group delay | | 0.4 | 0.8 | ns |

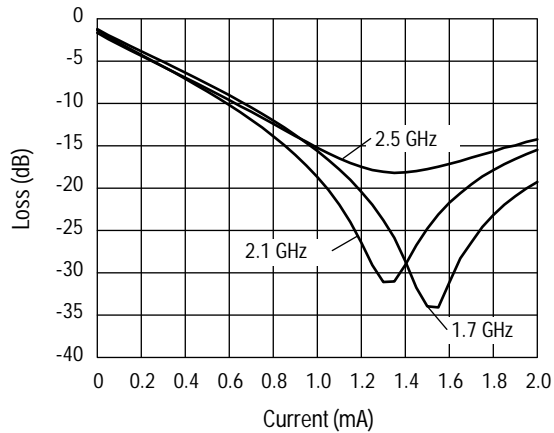
Operating Characteristics at 25 °C (0, 5 V)

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

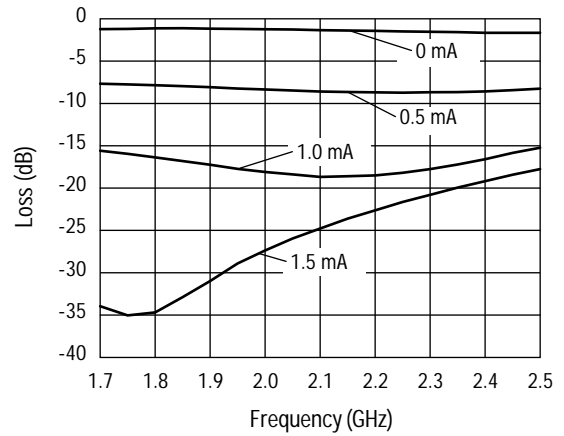
1. All measurements made in a 50 Ω system, unless otherwise specified.

2. 0–4 mA square wave total control current.

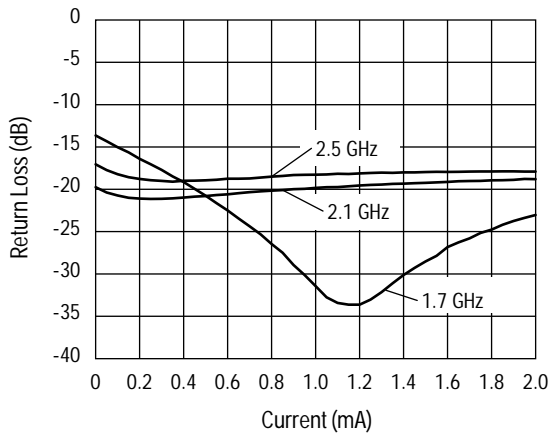
Typical Performance Data



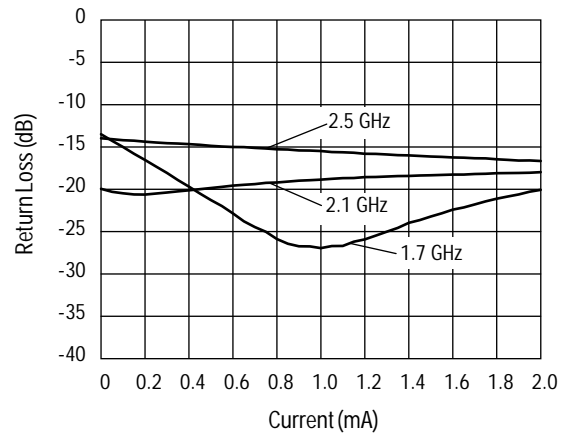
Attenuation vs. Control Current



Attenuation vs. Frequency

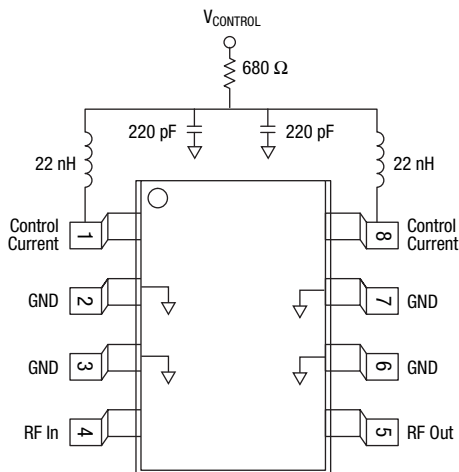


Input Return Loss vs. Current Control

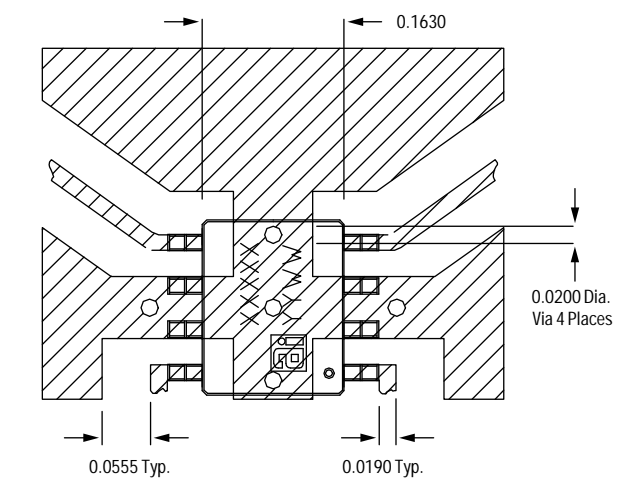


Output Return Loss vs. Current Control

Pin Out



Recommended Board Layout



Material is 10 mil FR4.

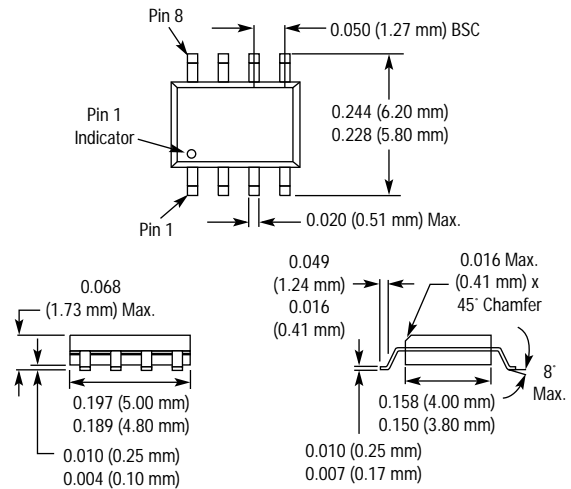
Absolute Maximum Ratings

| 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 | -10 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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