

查询HMC346供应商



v01.0304

捷多邦, 专业PCB打样工厂, 24小时加急出货

HMC346

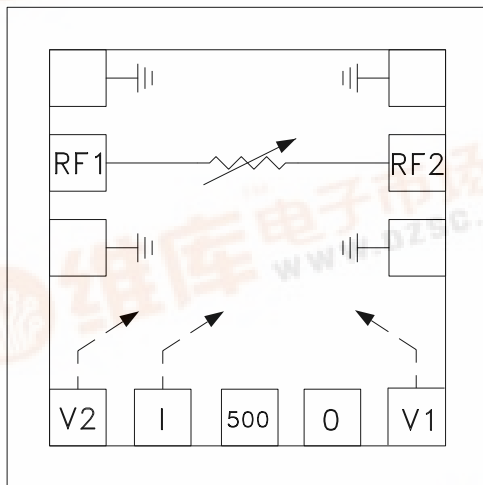
GaAs MMIC VOLTAGE-VARIABLE ATTENUATOR, DC - 20 GHz

Typical Applications

This attenuator is ideal for use as a VVA for DC - 20 GHz applications:

- Point-to-Point Radio
- VSAT Radio

Functional Diagram



Features

Wide Bandwidth: DC - 20 GHz

Low Phase Shift vs. Attenuation

32 dB Attenuation Range

Die Size: 0.85 mm x 0.85 mm x 0.1 mm

General Description

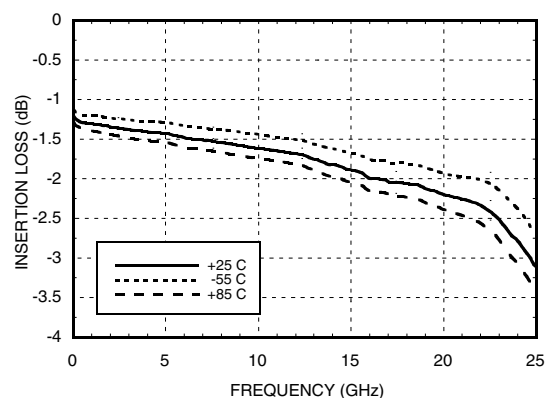
The HMC346 die is an absorptive Voltage Variable Attenuator (VVA) operating from DC - 20 GHz. It features an on-chip reference attenuator for use with an external op-amp to provide simple single voltage attenuation control, 0 to -3V. The device is ideal in designs where an analog DC control signal must control RF signal levels over a 30 dB amplitude range. For plastic packaged version, see the HMC346MS8G which operates from DC - 8 GHz.

Electrical Specifications, $T_A = +25^\circ\text{C}$, 50 ohm system

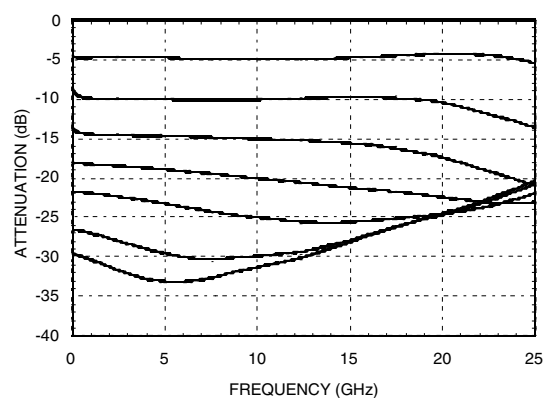
| Parameter | Min. | Typ. | Max. | Units |
|---|-------------|------|------|-------|
| Insertion Loss | | 1.7 | 2.3 | dB |
| | | | | |
| Attenuation Range | 27 | 32 | 2.8 | dB |
| | | | | |
| Return Loss | 6 | 10 | | dB |
| | | | | |
| Switching Characteristics | | 2 | | ns |
| | | | | |
| Input Power for 0.25 dB Compression (0.5 - 20 GHz) | Min. Atten: | +8 | | dBm |
| | | | | |
| Input Third Order Intercept (0.5 - 20 GHz) (Two-tone Input Power = -8 dBm Each Tone) | Min. Atten: | +25 | | dBm |
| | | | | |

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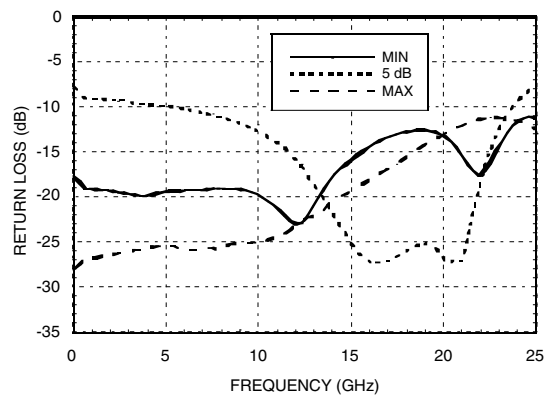
Insertion Loss vs. Temperature



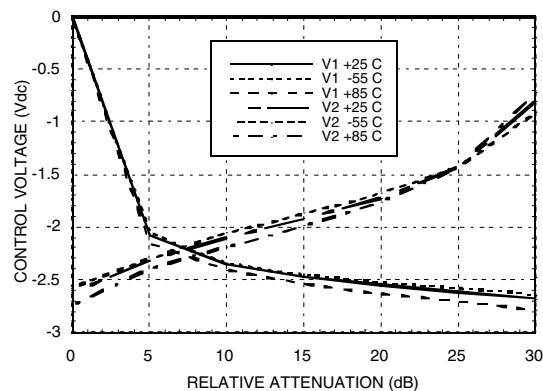
Relative Attenuation



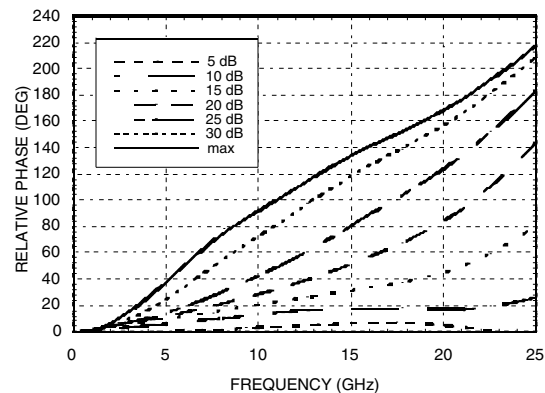
Return Loss vs. Attenuation



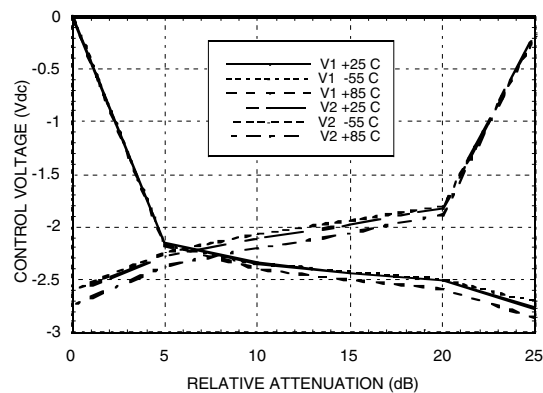
**Relative Attenuation vs.
Control Voltage @ 10 GHz**



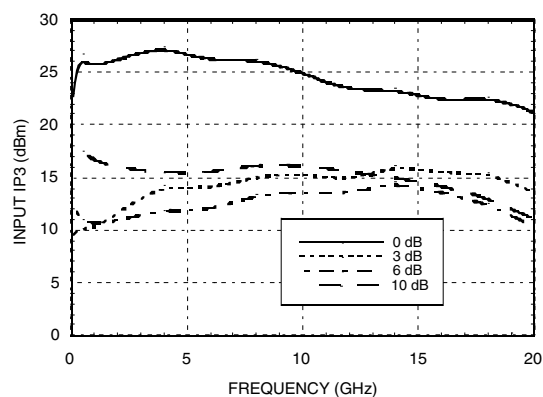
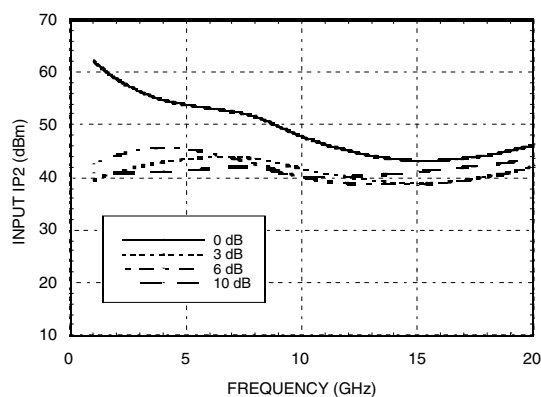
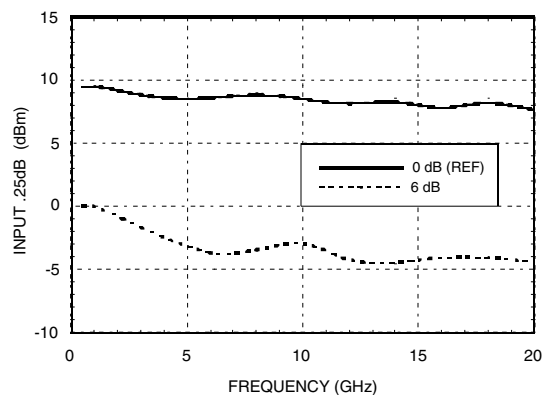
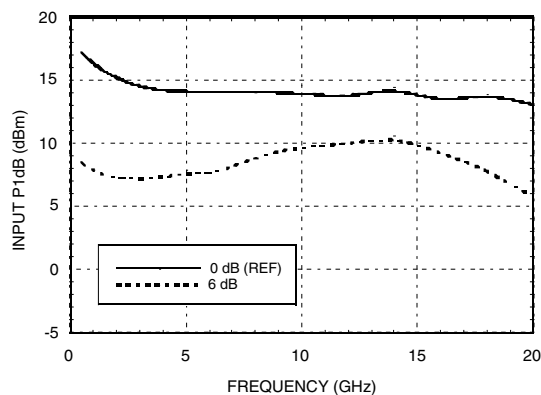
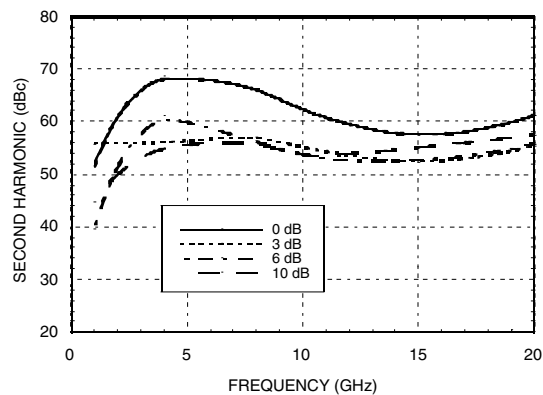
Relative Phase



**Relative Attenuation vs.
Control Voltage @ 20 GHz**



GaAs MMIC VOLTAGE-VARIABLE ATTENUATOR, DC - 20 GHz

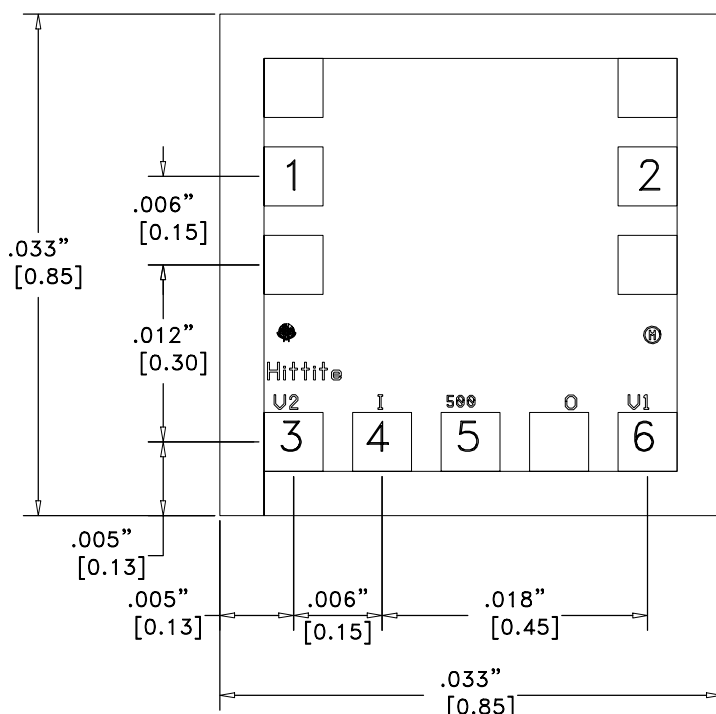
Input IP3 vs. Attenuation***Input IP2 vs. Attenuation*****0.25 dB Compression vs. Attenuation****1 dB Compression vs. Attenuation****Second Harmonic vs. Attenuation*****Absolute Maximum Ratings**

| | |
|-----------------------|------------------|
| RF Input Power | +18 dBm |
| Control Voltage Range | +1.0 to -5.0 Vdc |
| Storage Temperature | -65 to +150 °C |
| Operating Temperature | -55 to +85 °C |

*Two-tone input power = -8 dBm each tone, 1 MHz spacing.

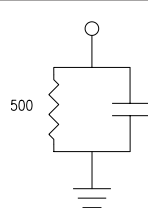
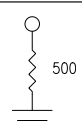

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Outline Drawing



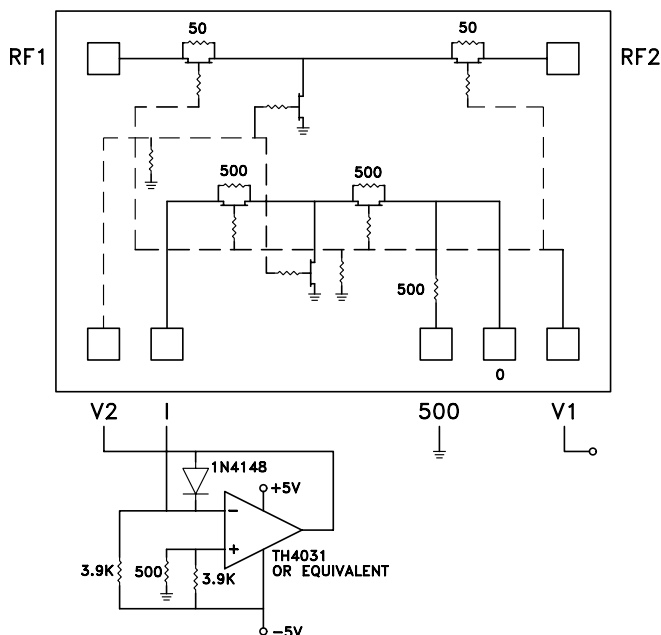
1. ALL DIMENSIONS ARE IN INCHES (MILLIMETERS).
2. TYPICAL BOND PAD IS .004" SQUARE.
3. TYPICAL BOND PAD SPACING IS .006" CENTER TO CENTER EXCEPT AS NOTED.
4. BACKSIDE METALIZATION: GOLD
5. BACKSIDE METAL IS GROUND
6. BOND PAD METALIZATION: GOLD

Pad Descriptions

| Pad Number | Function | Description | Interface Schematic |
|------------|--------------------------|---|---|
| 1, 2 | RF1 Input, RF2 Output | This pad is DC coupled and matched to 50 Ohm. Blocking capacitors are required if RF line potential is not equal to 0V. | |
| 3, 6 | V2, V1 | Control Input (Master). |  |
| 4 | I | Control Input (Slave). |  |
| 5 | 500 | This pad must be DC grounded. |  |
| | GND | Die bottom must be connected to RF ground. | |

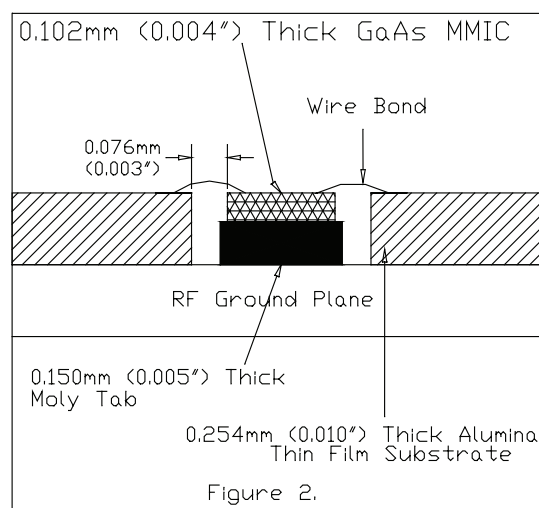
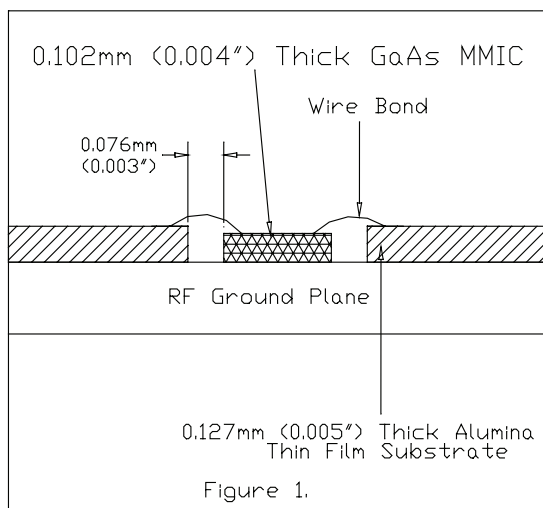
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ATTENUATORS - CHIP



Microstrip substrates should be brought as close to the die as possible in order to minimize bond wire length. Typical die-to-substrate spacing is 0.076mm to 0.152 mm (3 to 6 mils).

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Handling Precautions

Follow these precautions to avoid permanent damage.

Cleanliness:

Handle the chips in a clean environment. DO NOT attempt to clean the chip using liquid cleaning systems.

Static Sensitivity:

Follow ESD precautions to protect against > ± 250V ESD strikes.

Transients:

Suppress instrument and bias supply transients while bias is applied. Use shielded signal and bias cables to minimize inductive pick-up.

General Handling:

Handle the chip along the edges with a vacuum collet or with a sharp pair of bent tweezers. The surface of the chip has fragile air bridges and should not be touched with vacuum collet, tweezers, or fingers.

Mounting

The chip is back-metallized and can be die mounted with AuSn eutectic preforms or with electrically conductive epoxy. The mounting surface should be clean and flat.

Eutectic Die Attach:

A 80/20 gold tin preform is recommended with a work surface temperature of 255 deg. C and a tool temperature of 265 deg. C. When hot 90/10 nitrogen/hydrogen gas is applied, tool tip temperature should be 290 deg. C. DO NOT expose the chip to a temperature greater than 320 deg. C for more than 20 seconds. No more than 3 seconds of scrubbing should be required for attachment.

Epoxy Die Attach:

Apply a minimum amount of epoxy to the mounting surface so that a thin epoxy fillet is observed around the perimeter of the chip once it is placed into position. Cure epoxy per the manufacturer's schedule.

Wire Bonding

Ball or wedge bond with 0.025 mm (1 mil) diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150 deg. C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package or substrate. All bonds should be as short as possible <0.31 mm (12 mils).