HMC121C8

GaAs MMIC SMT VOLTAGE-VARIABLE ATTENUATOR, DC - 10 GHz

Typical Applications

- Base Station Infrastructure
- Portable Wireless CATV & DBS
- MMDS & Wireless LAN
- Wireless Local Loop
- Military, Space, & Test Equipment

Features

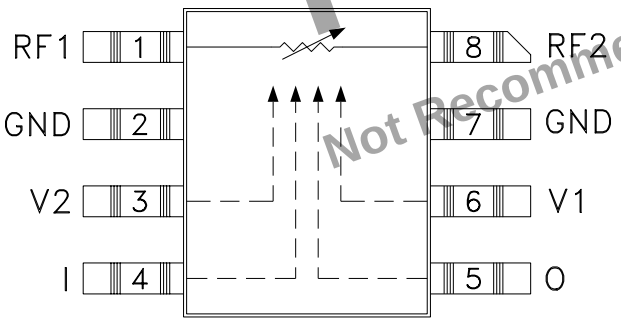
Wide Bandwidth: DC - 10 GHz

Low Phase Shift vs. Attenuation

25 dB Attenuation Range

Simplified Voltage Control

Functional Diagram



General Description

The HMC121C8 is an absorptive Voltage Variable Attenuator (VVA) in a non-hermetic surface-mount package covering DC - 10 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 25 dB amplitude range. Applications include AGC circuits and temperature compensation of multiple gain stages in microwave point-to-point and VSAT radios. See HMC121G8 for a hermetic SMT version of this device.

Electrical Specifications, T_A = +25° C, 50 ohm system

Parameter		Min.	Typ.	Max.	Units
Insertion Loss	DC - 6 GHz DC - 8 GHz DC - 10 GHz		2.0 2.2 3.5		dB dB dB
Attenuation Range	DC - 6 GHz DC - 10 GHz	20 25	25 30		dB dB
Return Loss	DC - 8 GHz DC - 10 GHz	11 8	15 12		dB dB
Switching Characteristics	tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)		3 6		ns ns
Input Power for 0.25 dB Compression (0.5 - 10 GHz)	Min Atten: Atten. >2 dB:		+3 -3		dBm dBm
Input Third Order Intercept (0.5 - 10 GHz) (Two-tone Input Power = -8 dBm Each Tone)	Min Atten: Atten. >2 dB:		+18 +10		dBm dBm

For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
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Visit us at www.hittite.com, or Email at sales@hittite.com

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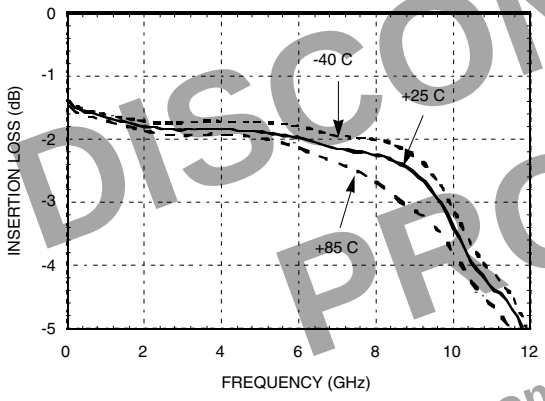
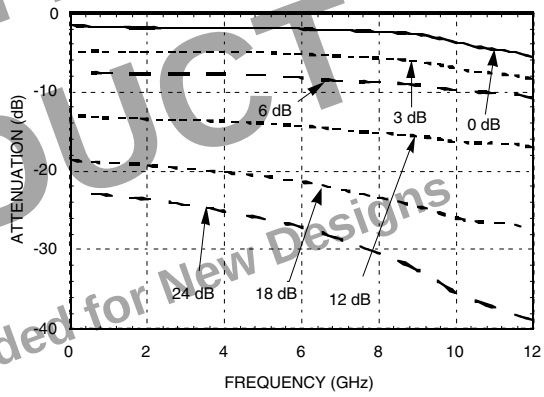
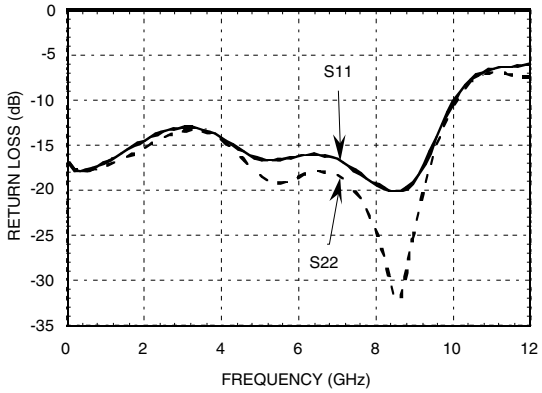
Insertion Loss



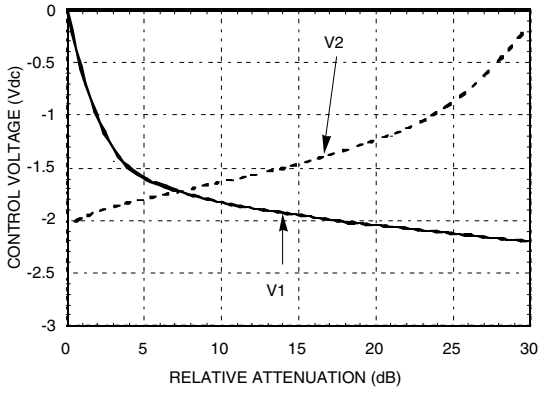
Relative Attenuation



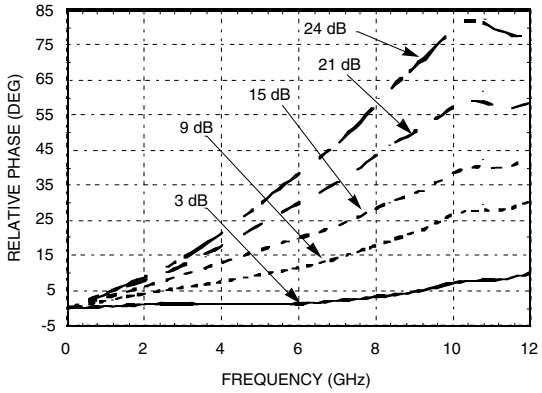
Return Loss



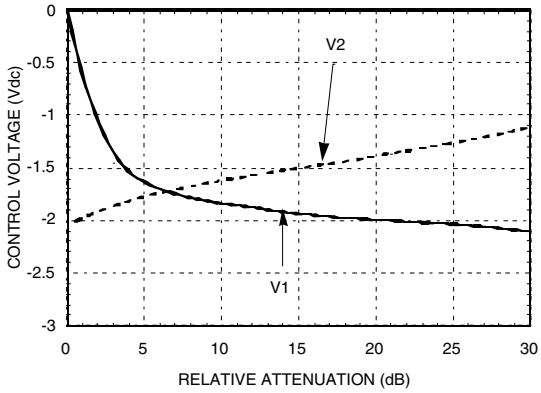
Relative Attenuation vs. Control Voltage @ 4.2 GHz



Relative Phase



Relative Attenuation vs. Control Voltage @ 10 GHz



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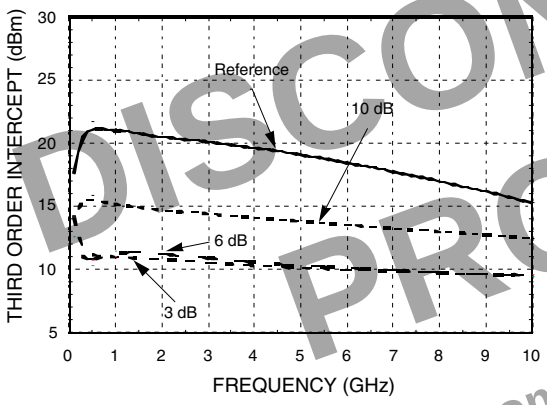
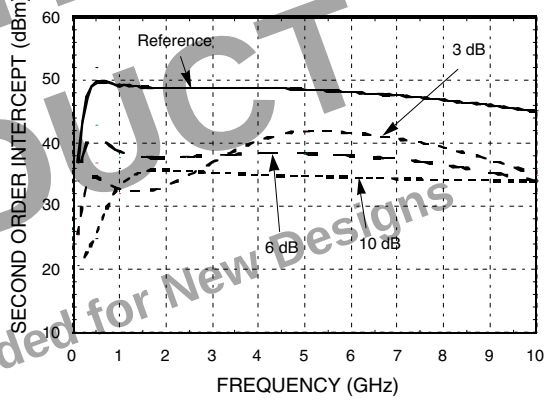
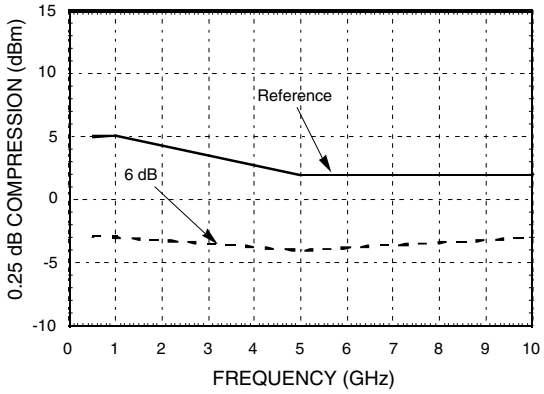
Input Third Order Intercept vs. Attenuation



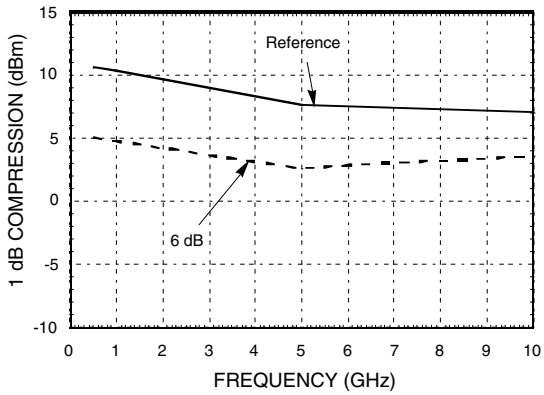
Input Second Order Intercept vs. Attenuation



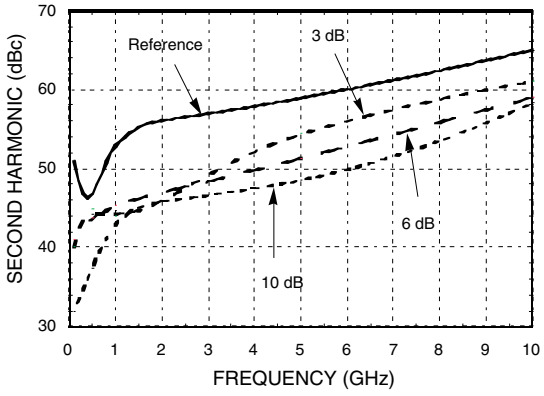
0.25 dB Compression vs. Attenuation



1 dB Compression vs. Attenuation



Second Harmonic vs. Attenuation



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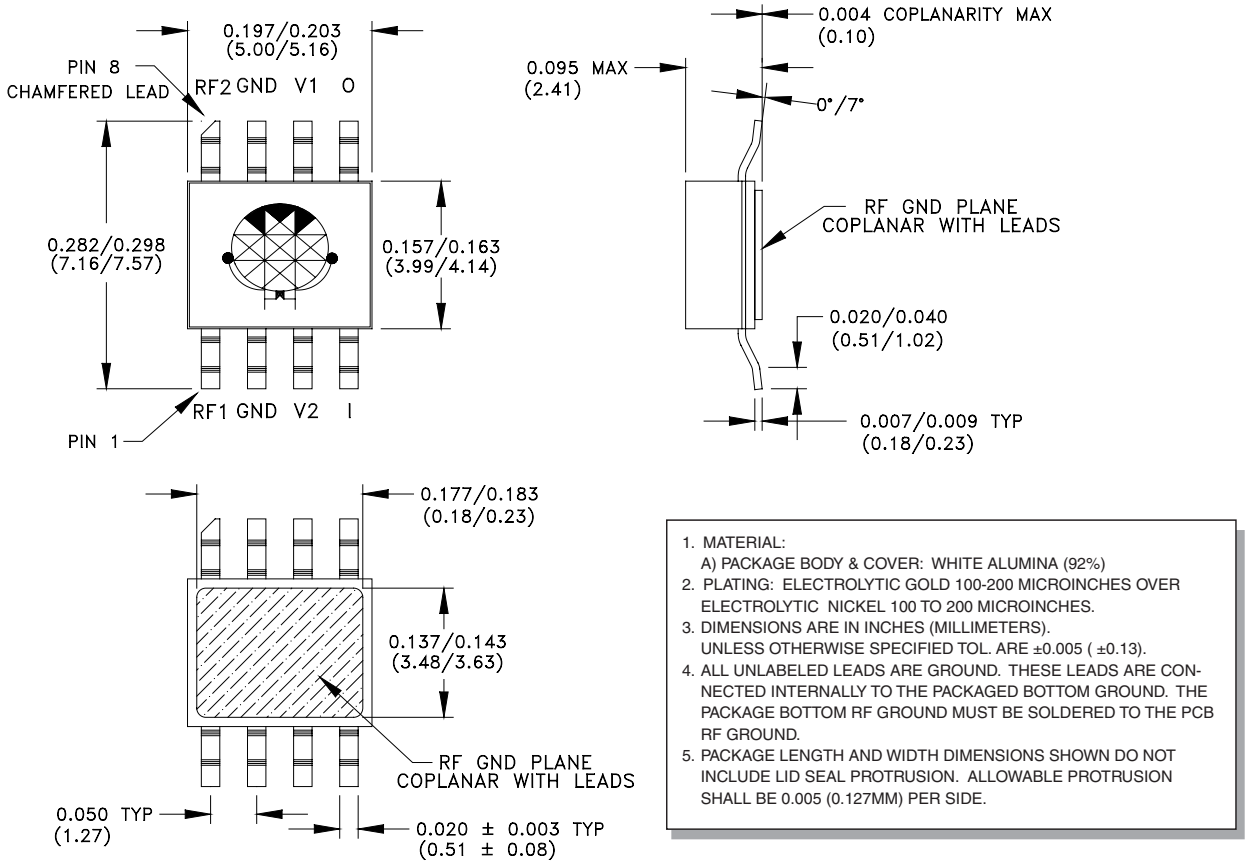
Absolute Maximum Ratings

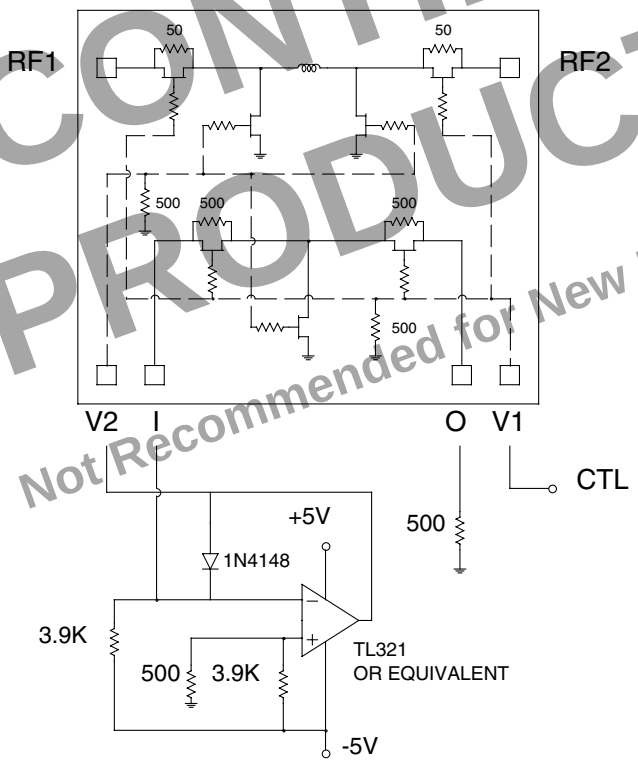
RF Input Power	+16 dBm
Control Voltage Range	+1.0 to -6.0 Vdc
Storage Temperature	-65 to +150 deg C
Operating Temperature	-55 to +125 deg C

Outline Drawing



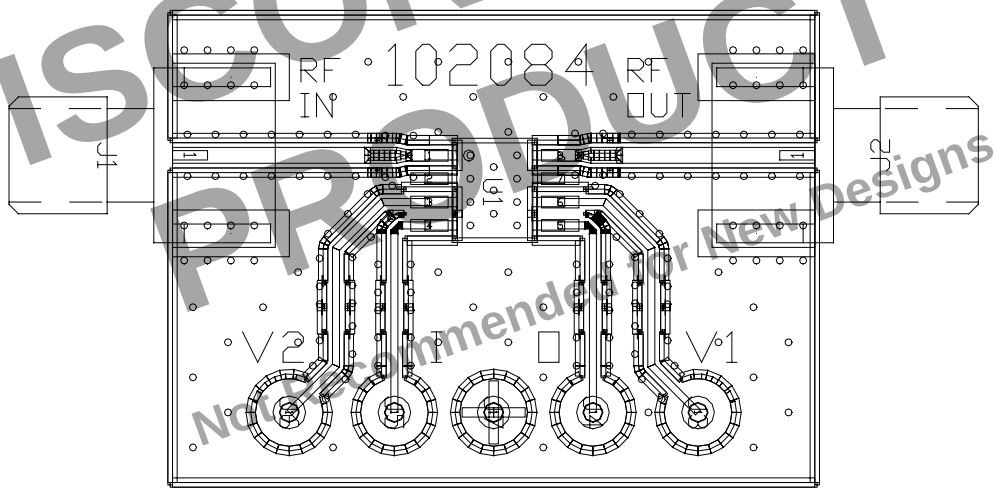
1. MATERIAL:
   A) PACKAGE BODY & COVER: WHITE ALUMINA (92%)
2. PLATING: ELECTROLYTIC GOLD 100-200 MICROINCHES OVER ELECTROLYTIC NICKEL 100 TO 200 MICROINCHES.
3. DIMENSIONS ARE IN INCHES (MILLIMETERS).
   UNLESS OTHERWISE SPECIFIED TOL. ARE ±0.005 (±0.13).
4. ALL UNLABELED LEADS ARE GROUND. THESE LEADS ARE CONNECTED INTERNALLY TO THE PACKAGED BOTTOM GROUND. THE PACKAGE BOTTOM RF GROUND MUST BE SOLDERED TO THE PCB RF GROUND.
5. PACKAGE LENGTH AND WIDTH DIMENSIONS SHOWN DO NOT INCLUDE LID SEAL PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.005 (0.127MM) PER SIDE.

Single-Line Control Driver



External op-amp control circuit maintains impedance match while attenuation is varied. Input control ranges from 0 Volts (min. attenuation) to -2.5 Volts (max. attenuation).

Evaluation PCB for HMC121C8



The circuit board used in the final application should be generated with proper RF circuit design techniques. Signal lines at the RF port should have 50 ohm impedance and the package ground leads and package bottom ground should be connected directly to the ground plane similar to that shown above. The evaluation circuit board shown above is available from Hittite Microwave Corporation upon request.

List of Material

Item	Description
J1 - J2	PC Mount SMA RF Connector
J3 - J7	DC PIN
U1	HMC121C8 VVA
PCB*	102084 Eval Board
*Circuit Board Material: Rogers 4350	