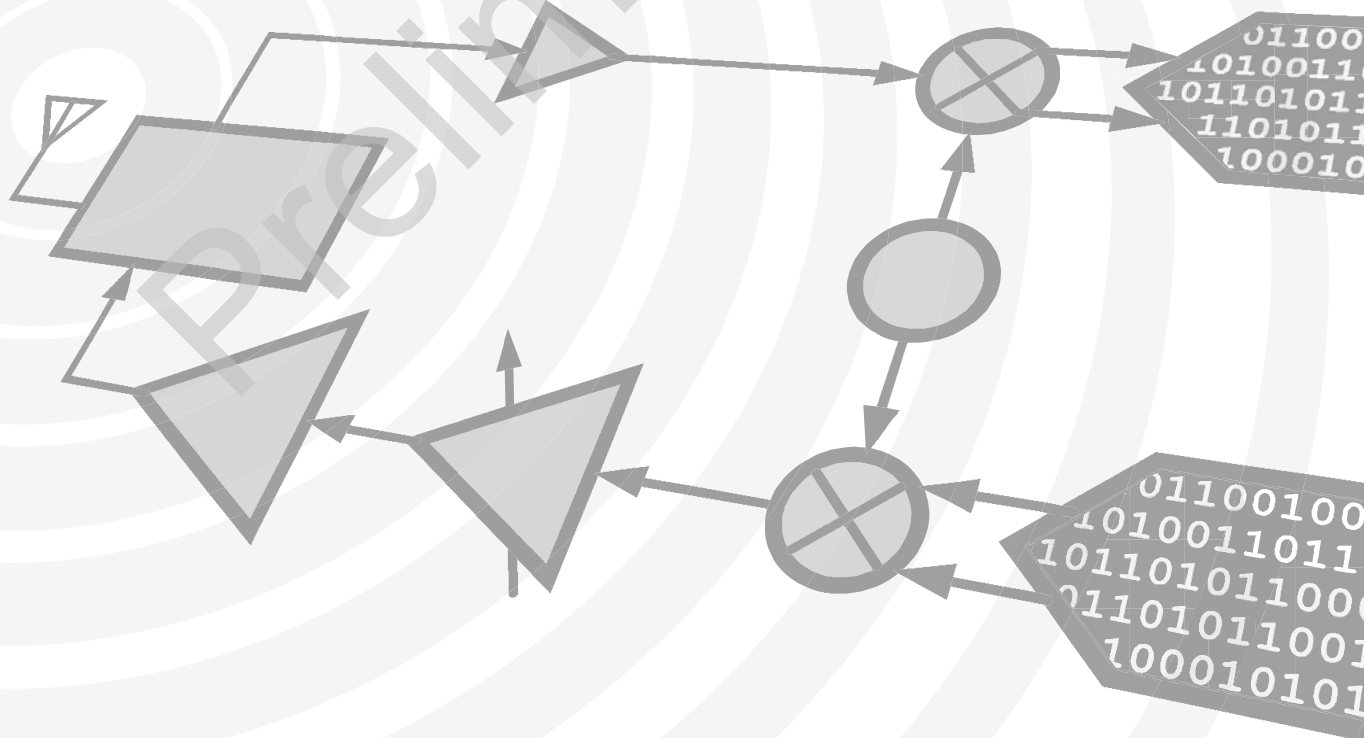


# Analog Devices Welcomes Hittite Microwave Corporation



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Preliminary

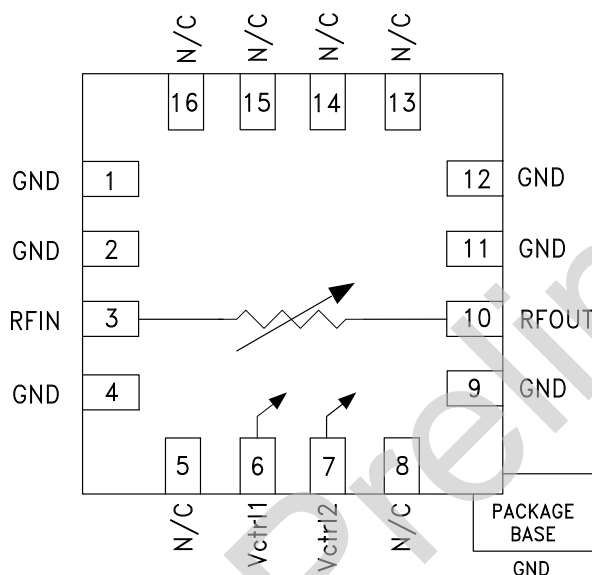
## GaAs MMIC VOLTAGE-VARIABLE ATTENUATOR, 5 - 26.5 GHz

### Typical Applications

The HMC712ALP3CE is ideal for:

- Point-to-Point Radio
- VSAT Radio
- Test Instrumentation
- Microwave Sensors
- Military, ECM & Radar

### Functional Diagram



### Features

- Wide Bandwidth: 5 - 26.5 GHz
- Excellent Linearity: +28 dBm Input P1dB
- Wide Attenuation Range: 28 dB
- Absorptive Topology
- Singe or Dual Control Operation
- 16 Lead 3x3mm SMT Package: 9mm<sup>2</sup>

### General Description

The HMC712ALP3CE is an absorptive Voltage Variable Attenuator (VVA) which operates from 5 - 26.5 GHz and is ideal in designs where an analog DC control signal must be used to control RF signal levels over a 28 dB amplitude range. It features two shunt-type attenuators which are controlled by two analog voltages, Vctrl1 and Vctrl2. Optimum linearity performance of the attenuator is achieved by first varying Vctrl1 of the 1st attenuation stage from -3V to 0V with Vctrl2 fixed at -3V. The control voltage of the 2nd attenuation stage, Vctrl2, should then be varied from -3V to 0V, with Vctrl1 fixed at 0V. The HMC712ALP3CE is housed in a RoHS compliant 3x3 mm QFN leadless package

However, if the Vctrl1 and Vctrl2 pins are connected together it is possible to achieve the full analog attenuation range with only a small degradation in input IP3 performance. Applications include AGC circuits and temperature compensation of multiple gain stages in microwave point-to-point and VSAT radios.

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

Parameter	Min.	Typ.	Max.	Units
Insertion Loss		3.5		dB
		4.5		dB
		5.5		dB
Attenuation Range		28		dB
Input Return Loss		12		dB
Output Return Loss		10		dB
Input Power for 1 dB Compression (any attenuation)		28		dBm
Input Third Order Intercept (Two-tone Input Power = 10 dBm Each Tone)		32		dBm

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For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106 Phone: 781-329-4700 • Order online at [www.analog.com](http://www.analog.com) Application Support: Phone: 1-800-ANALOG-D

**GaAs MMIC VOLTAGE-VARIABLE  
ATTENUATOR, 5 - 26.5 GHz**
**Absolute Maximum Ratings**

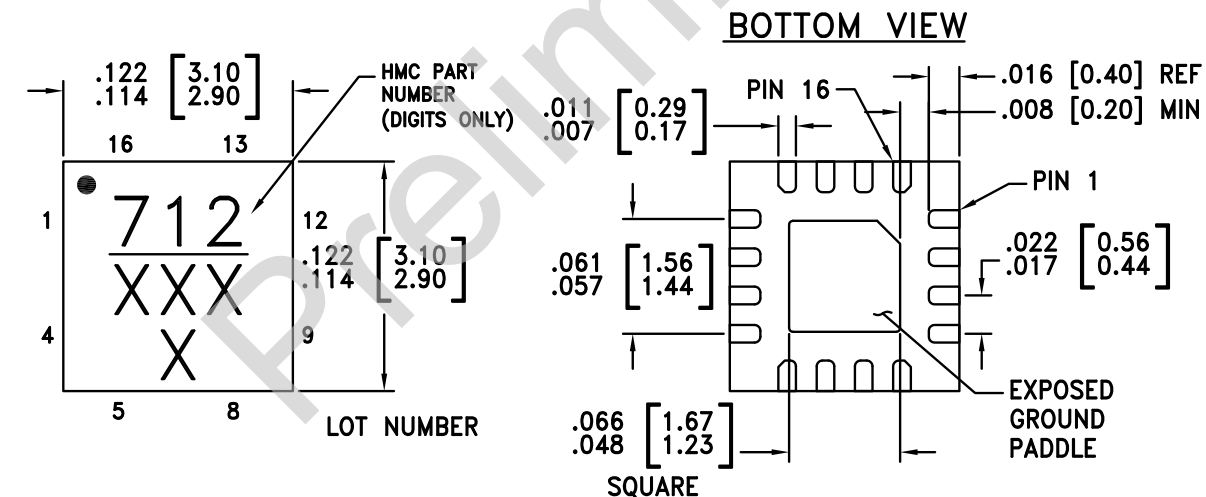
RF Input Power	+30 dBm
Control Voltage Range	+1 to -5V
Channel Temperature	150 °C
Continuous P <sub>diss</sub> (T = 85 °C)	1W
Thermal Resistance (Channel to ground paddle)	66 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

**Control Voltages**

V <sub>ctrl1</sub>	-3 to 0V @ 10 µA
V <sub>ctrl2</sub>	-3 to 0V @ 10 µA



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

**Outline Drawing**

**NOTES:**

1. PACKAGE BODY MATERIAL: LOW STRESS INJECTION MOLDED PLASTIC SILICA AND SILICON IMPREGNATED.
2. LEAD AND GROUND PADDLE MATERIAL: COPPER ALLOY.
3. LEAD AND GROUND PADDLE PLATING: 100% MATTE TIN.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
6. PAD BURR LENGTH SHALL BE 0.15mm MAX.  
PAD BURR HEIGHT SHALL BE 0.05mm MAX.
7. PACKAGE WARP SHALL NOT EXCEED 0.05mm
8. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
9. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED PCB LAND PATTERN.