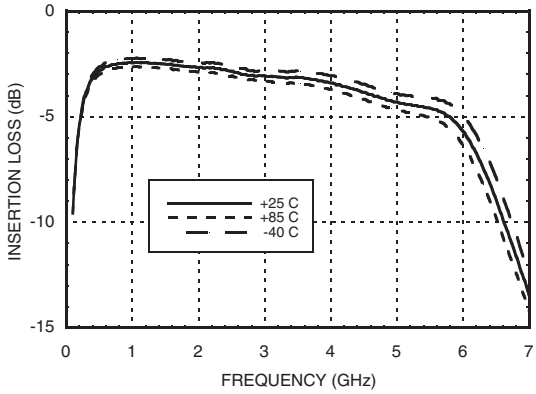
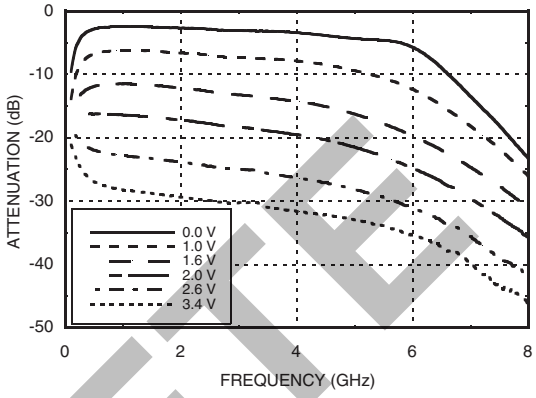
GaAs MMIC VOLTAGE-VARIABLE ATTENUATOR, 0.5 - 6.0 GHz

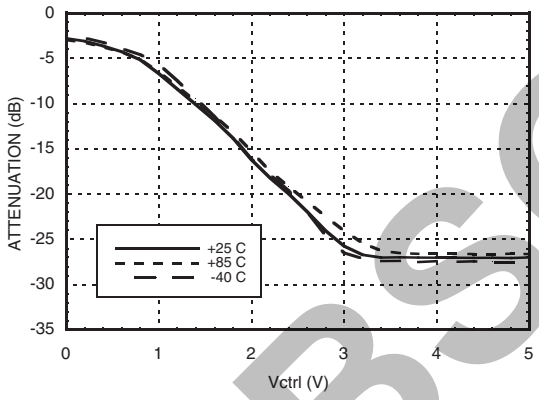
Insertion Loss vs. Frequency Over Temperature



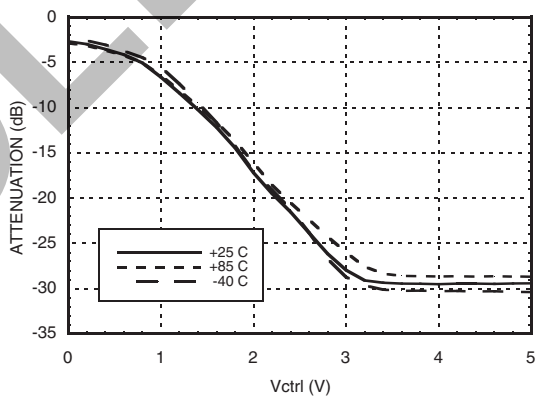
Attenuation vs. Frequency Over Vctrl



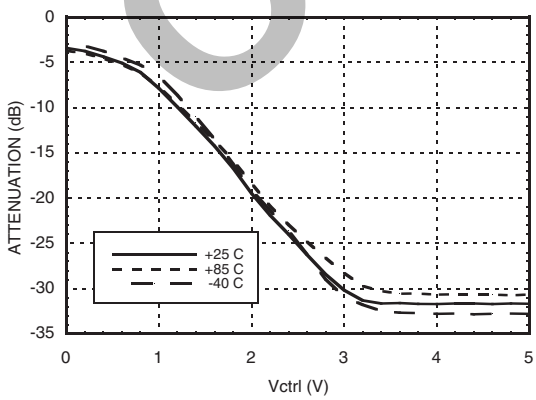
Attenuation vs. Vctrl Over Temperature @ 0.5 GHz



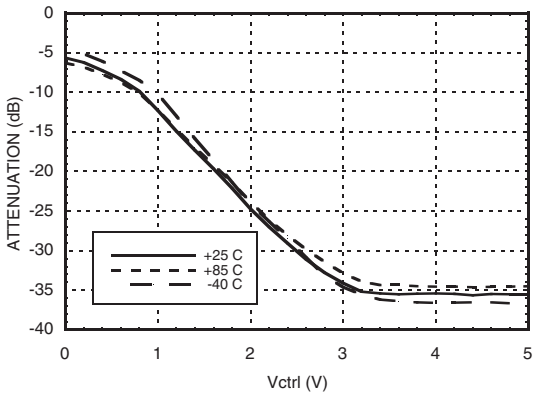
Attenuation vs. Vctrl Over Temperature @ 2 GHz



Attenuation vs. Vctrl Over Temperature @ 4 GHz



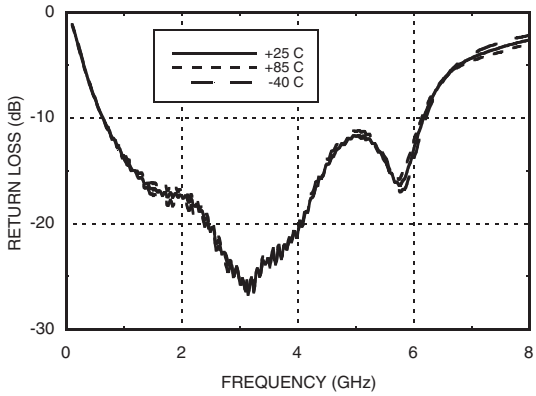
Attenuation vs. Vctrl Over Temperature @ 6 GHz



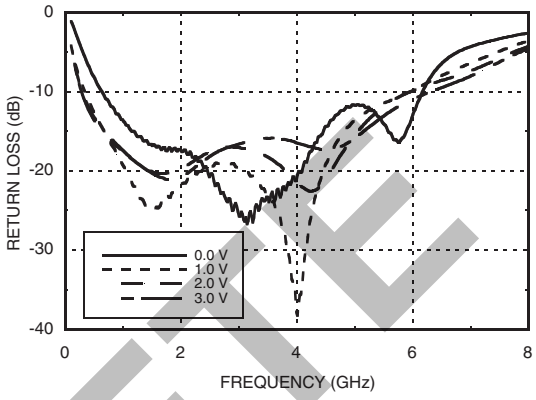
For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

GaAs MMIC VOLTAGE-VARIABLE ATTENUATOR, 0.5 - 6.0 GHz

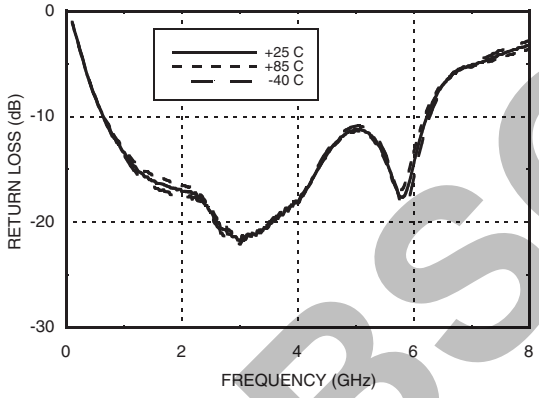
Input Return Loss Over Temperature (Vctrl = 0)



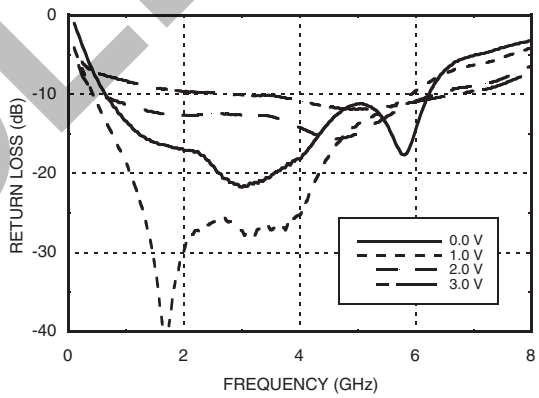
Input Return Loss Over Vctrl



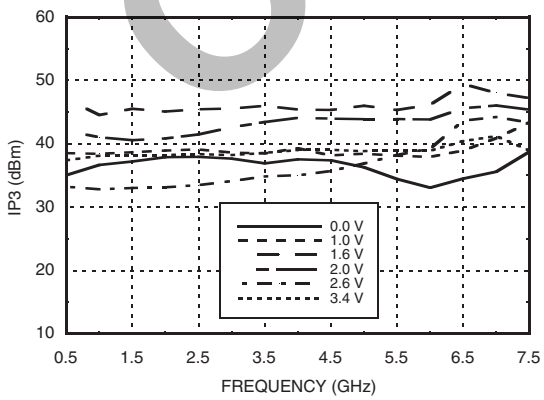
Output Return Loss Over Temperature (Vctrl = 0)



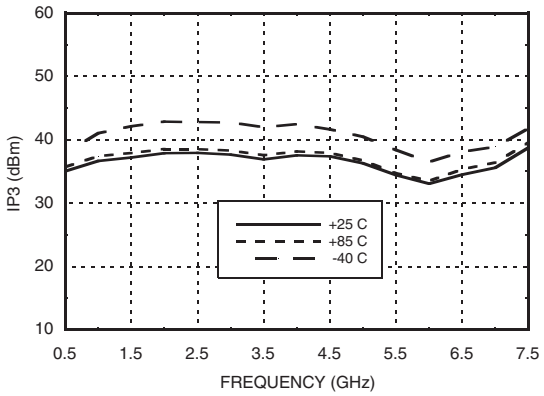
Output Return Loss Over Vctrl



Input IP3 Over Vctrl



Input IP3 Over Temperature (Vctrl = 0V)



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
Application Support: Phone: 1-800-ANALOG-D

GaAs MMIC VOLTAGE-VARIABLE ATTENUATOR, 0.5 - 6.0 GHz

Absolute Maximum Ratings

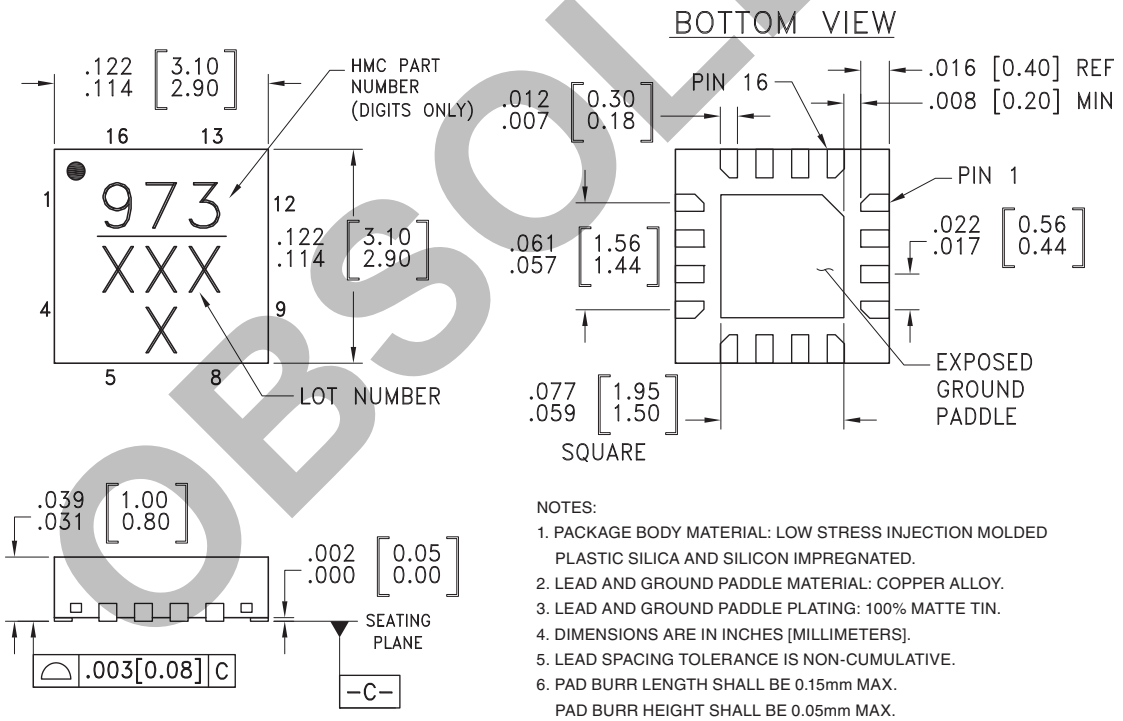
RF Input Power	+29 dBm
Vdd	5.5V
Control Voltage Range	-0.5 to 5.5V
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C)	0.8W
Thermal Resistance (Channel to ground paddle)	80 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

Voltages & Currents

Vdd	5V @ 200 µA
Vctrl	0 to +5V @ 100 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.

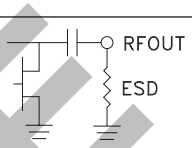
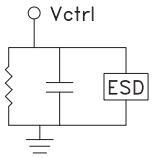
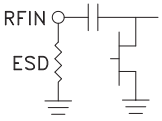
Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [1]
HMC973LP3E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H973 XXXX

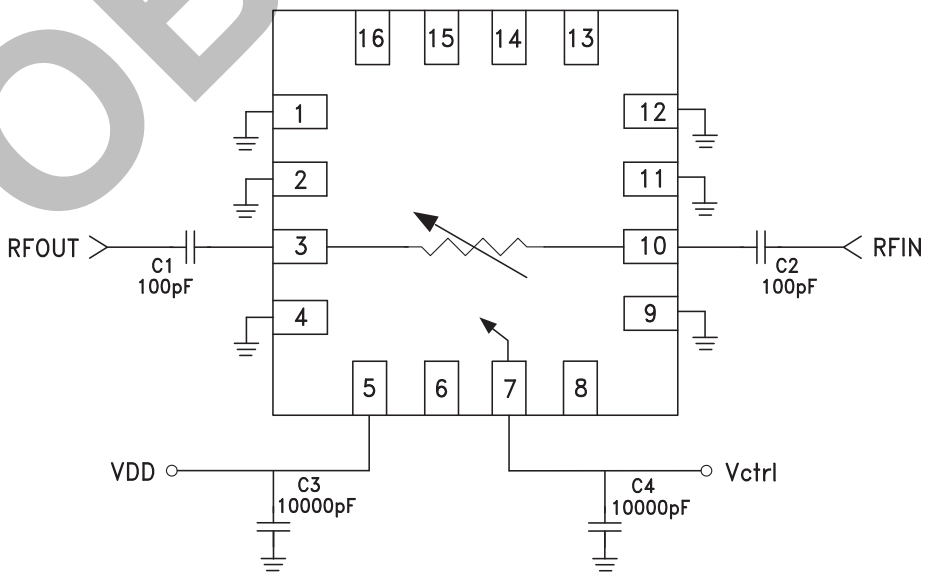
[1] 4-Digit lot number XXXX
[2] Max peak reflow temperature of 260 °C

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
Application Support: Phone: 1-800-ANALOG-D

Pin Descriptions

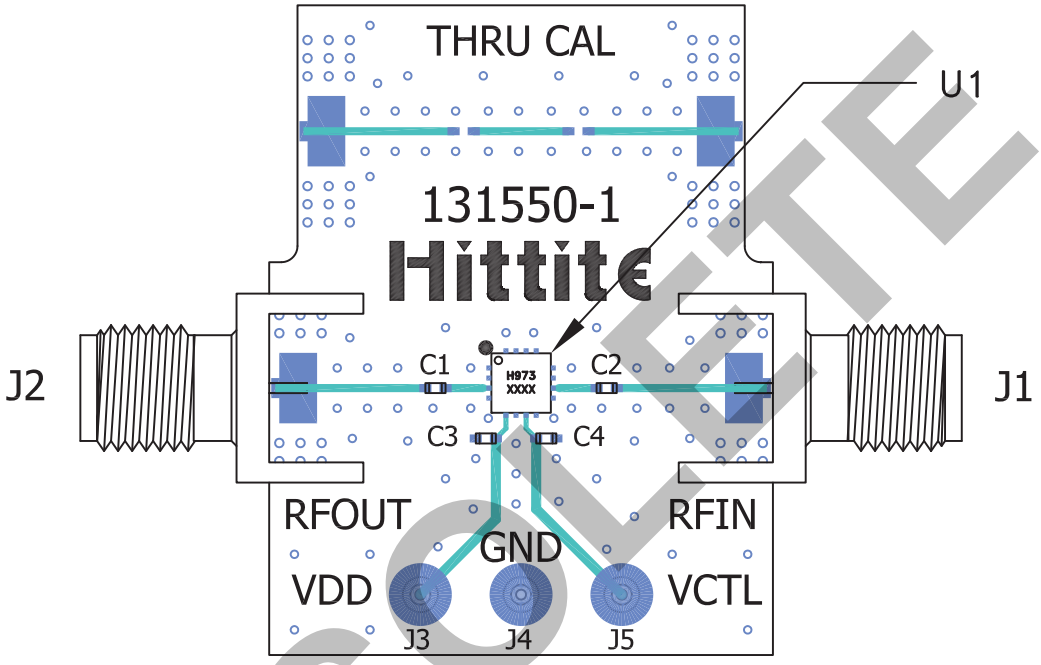
Pin Number	Function	Description	Interface Schematic
1, 2, 4, 9, 11, 12 Ground Paddle	GND	These pins and the exposed ground paddle must be connected to RF/DC ground.	
3	RFOUT	This pin is DC coupled and matched to 50 Ohms. A blocking capacitor is required if RF line potential is not equal to 0V.	
5	Vdd	Supply Voltage	
6, 8, 13 - 16	N/C	The pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	
7	Vctrl	Control Voltage	
10	RFIN	This pin is DC coupled and matched to 50 Ohms. A blocking capacitor is required if RF line potential is not equal to 0V. The HMC973LP3E is a unidirectional device with optimum linearity performance achieved with RF input signal applied to RFIN package lead.	

Application Circuit



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
Application Support: Phone: 1-800-ANALOG-D

Evaluation PCB



List of Materials for Evaluation PCB 131552 [1]

Item	Description
J1, J2	PCB Mount SMA RF Connector
J3 - J5	DC Pin
C1, C2	100 pF Capacitor, 0402 Pkg.
C3, C4	10000 pF Capacitor, 0402 Pkg.
U1	HMC973LP3E Voltage Variable Attenuator
PCB [2]	131550 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Arlon 25FR or Rogers 4350

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.

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
Application Support: Phone: 1-800-ANALOG-D