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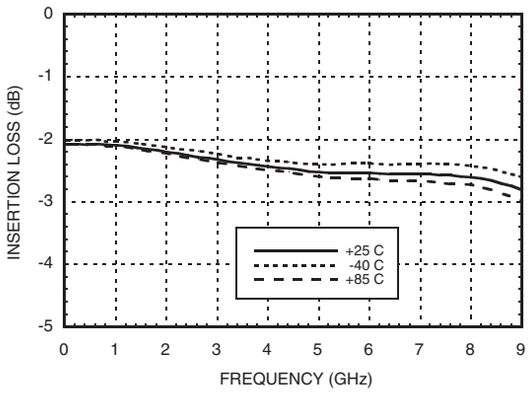
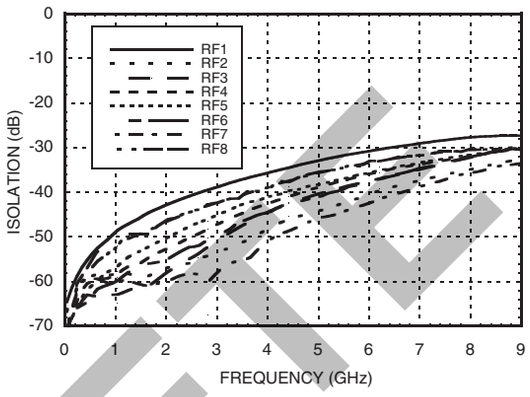
## GaAs MMIC SP8T NON-REFLECTIVE POSITIVE CONTROL SWITCH, DC* - 8 GHz

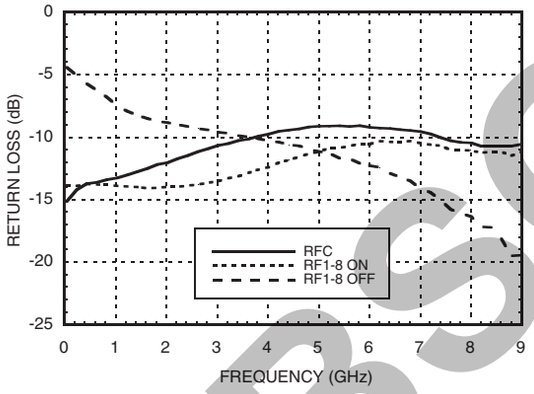
### Insertion Loss vs. Temperature



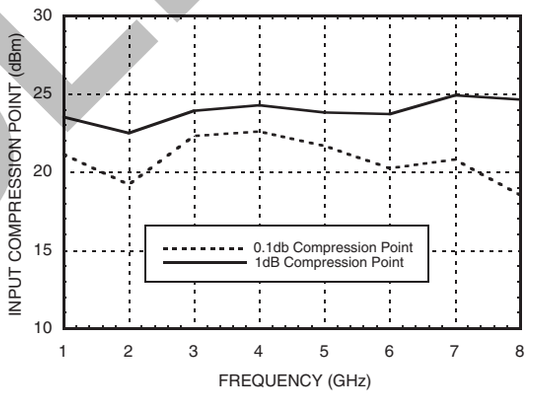

### Isolation



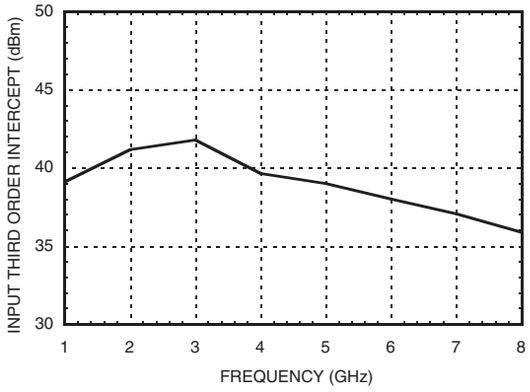

### Return Loss




### 0.1 and 1 dB Input Compression Point




### Input Third Order Intercept Point

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



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## Bias Voltage & Current

| Vdd Range = +5.0 Vdc ± 10% | | |
|---|---|---|
| Vdd (Vdc) | Idd (Typ.) (mA) | Idd (Max.) (mA) |
| +5.0 | 5.0 | 9.0 |

## Control Voltages

| State | Bias Condition |
|---|---|
| Low | 0 to +0.8 Vdc @ 5 uA Typical |
| High | +2.0 to +5.0 Vdc @ 25 uA Typical |

## Truth Table

| Control Input | | | Signal Path State |
|---|---|---|---|
| A | B | C | RFCOM to: |
| Low | Low | Low | RF1 |
| High | Low | Low | RF2 |
| Low | High | Low | RF3 |
| High | High | Low | RF4 |
| Low | Low | High | RF5 |
| High | Low | High | RF6 |
| Low | High | High | RF7 |
| High | High | High | RF8 |

*Note:*
*DC blocking capacitors are required at ports RFC and RF1, 2, 3, 4, 5, 6, 7, 8. Their value will determine the lowest transmission frequency.*

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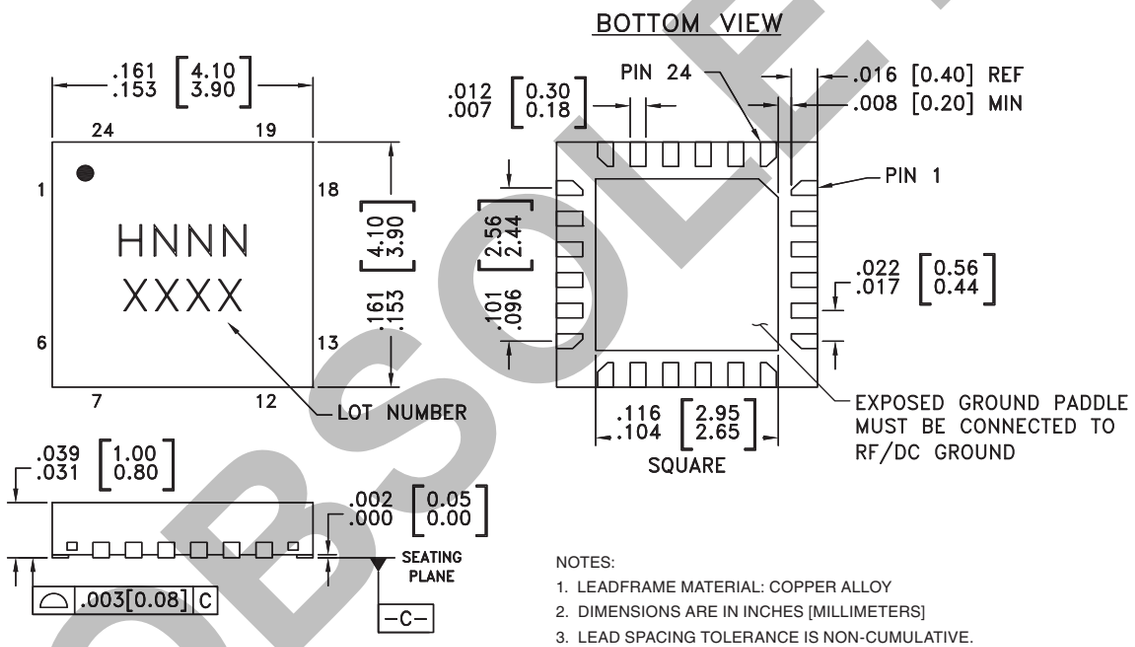
### Absolute Maximum Ratings

| | |
|---|---|
| Bias Voltage Range (Port Vdd) | +7.0 Vdc |
| Control Voltage Range (A, B, & C) | -0.5V to Vdd +1.0 Vdc |
| Storage Temperature | -65 to +150 °C |
| Operating Temperature | -40 to +85 °C |
| Maximum Input Power Vdd = +5V | +26 dBm |
| ESD Sensitivity (HBM) | Class 1A |

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

### Outline Drawing




NOTES:

1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
7. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED LAND PATTERN.

### Package Information

| Part Number | Package Body Material | Lead Finish | MSL Rating | Package Marking [3] |
|---|---|---|---|---|
| HMC321LP4 | Low Stress Injection Molded Plastic | Sn/Pb Solder | MSL1 [1] | H321<br>XXXX |
| HMC321LP4E | RoHS-compliant Low Stress Injection Molded Plastic | 100% matte Sn | MSL1 [2] | H321<br>XXXX |

[1] Max peak reflow temperature of 235 °C
[2] Max peak reflow temperature of 260 °C
[3] 4-Digit lot number XXXX

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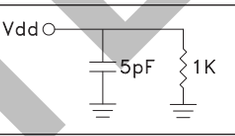
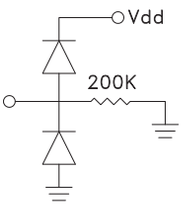
## Pin Descriptions

| Pin Number | Function | Description | Interface Schematic |
|---|---|---|---|
| 1, 3, 5, 7, 12, 14, 16, 18, 21, 23 | GND | Package bottom has exposed metal paddle that must also be connected to PCB RF ground. |   |
| 2, 4, 6, 13, 15, 17, 19, 22, 24 | RF1 - RF8 & RFC | This pin is DC coupled and matched to 50 Ohm. Blocking capacitors are required. | |
| 8 | VDD | Supply Voltage +5V ± 10% |   |
| 9 | CTLC | See truth table and control voltage table. |   |
| 10 | CTLB | See truth table and control voltage table. | |
| 11 | CTLA | See truth table and control voltage table. | |
| 20 | N/C | This pin should be connected to PCB RF ground to maximize isolation. | |

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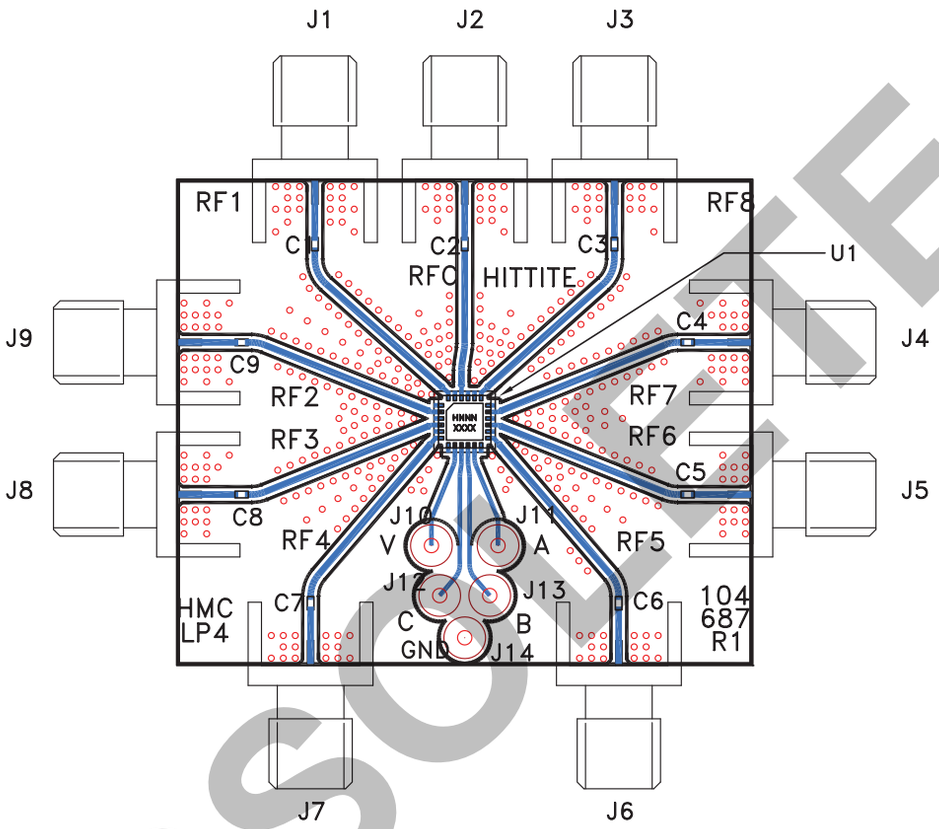
## Evaluation PCB

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## List of Materials for Evaluation PCB 104769 [1]

| Item | Description |
|---|---|
| J1 - J9 | PCB Mount SMA RF Connector |
| J10 - J14 | DC Pin |
| C1 - C9 | 100 pF Capacitor, 0402 Pkg. |
| U1 | HMC321LP4 / HMC321LP4E SP8T Switch |
| PCB [2] | 104687 Evaluation PCB 1.73" x 1.46" |

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

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 backside ground slug 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.

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