



GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 8 GHz

Typical Applications

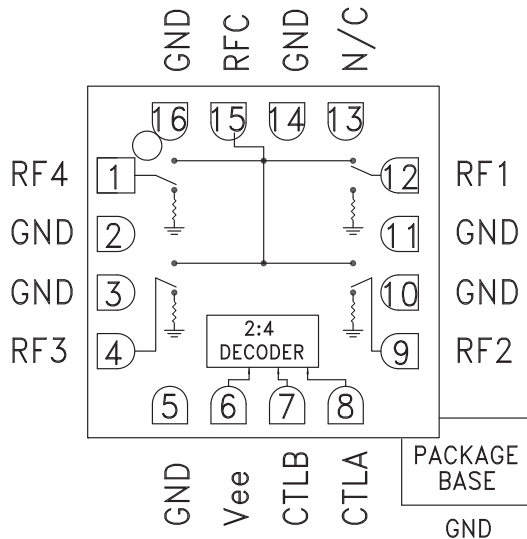
The HMC344LC3 is ideal for:

- Broadband, Military, Radar & ECM
- Fiber Optics
- Switched Filter Banks
- Wireless below 8 GHz
- Test Instrumentation

Features

- Broadband Performance: DC - 8 GHz
- Integrated 2:4 TTL Decoder
- High Isolation: 40 dB@ 6 GHz
- Low Insertion Loss: 2 dB@ 6 GHz
- Non-Reflective Topology

Functional Diagram



General Description

The HMC344LC3 is a broadband non-reflective GaAs MESFET SP4T switch in a ceramic 3x3 mm leadless surface mount package. Covering DC to 8 GHz, this switch offers high isolation and low insertion loss. The HMC344LC3 includes an integrated binary decoder circuit which reduces the required logic control lines to two. The switch operates using a negative control voltage of 0/-5V, and requires a fixed bias of -5V. Simple external level shifting circuitry allows this switch to be controlled with most TTL/CMOS positive logic families.

Electrical Specifications, $T_A = +25^\circ C$, With 0/-5V Control, 50 Ohm System

| Parameter | Frequency | Min. | Typ. | Max. | Units |
|--|---------------|----------------------------------|------|------|-------|
| Insertion Loss | DC - 2.0 GHz | | 1.6 | 2.0 | dB |
| | DC - 6.0 GHz | | 2.0 | 2.8 | dB |
| | DC - 8.0 GHz | | 2.5 | 3.0 | dB |
| Isolation | DC - 2.0 GHz | 43 | 50 | | dB |
| | DC - 4.0 GHz | 35 | 45 | | dB |
| | DC - 6.0 GHz | 32 | 45 | | dB |
| | DC - 8.0 GHz | 30 | 40 | | dB |
| Return Loss | DC - 2.0 GHz | 15 | 17 | | dB |
| | DC - 4.0 GHz | 12 | 16 | | dB |
| | DC - 6.0 GHz | 12 | 16 | | dB |
| | DC - 8.0 GHz | 12 | 17 | | dB |
| Return Loss | "Off State" | DC - 8.0 GHz | 12 | 15 | dB |
| Input Power for 0.1 dB Compression | 0.5 - 8.0 GHz | 22 | 26 | | dBm |
| Input Third Order Intercept (Two-Tone Input Power = +7 dBm Each Tone) | 0.5 - 8.0 GHz | | 43 | | dBm |
| Switching Characteristics | DC - 8.0 GHz | tRISE, tFALL (10/90% RF) | 20 | | ns |
| | | tON, tOFF (50% CTL to 10/90% RF) | 70 | | ns |

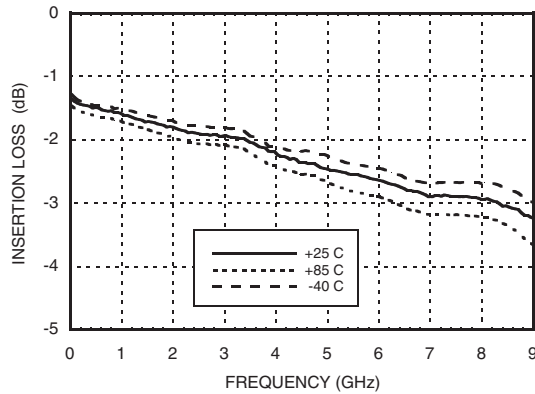
For price, delivery, and to place orders, please contact Hittite Microwave Corporation:

SUNSTAR 微波光电 <http://www.hittite.com> / www.rfmic.com / TEL:0755-83396822 FAX:0755-83376182 E-MAIL: szss20@163.com
Order On-line at www.hittite.com

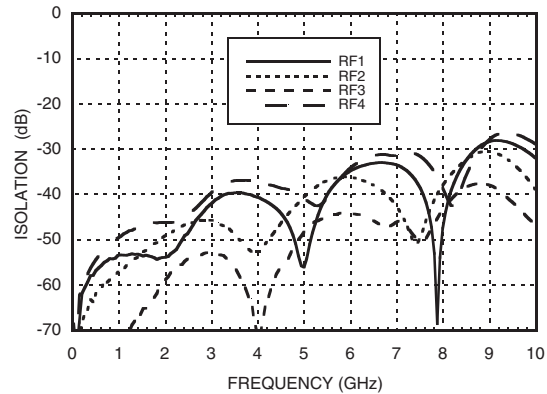


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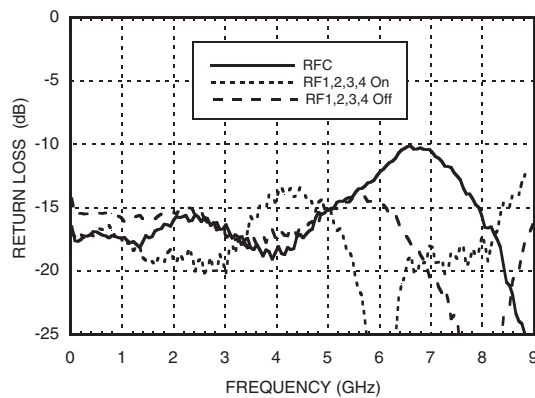
Insertion Loss vs. Temperature



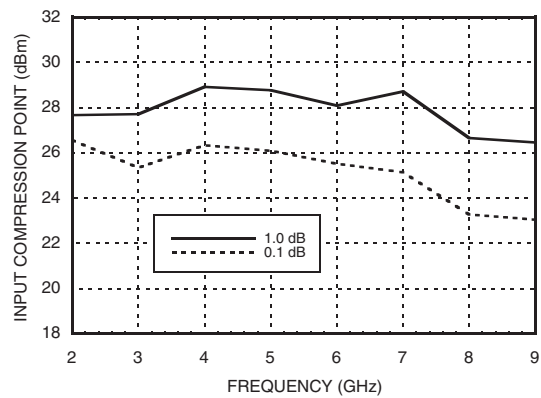
Isolation



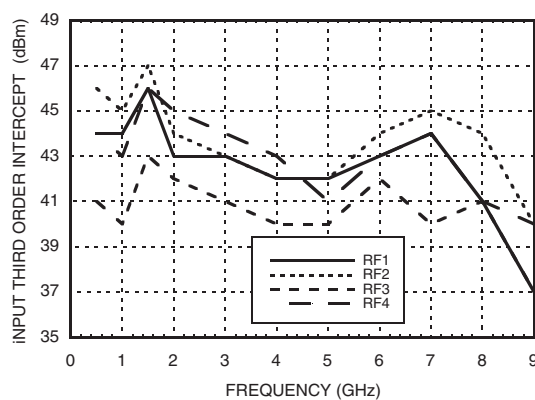
Return Loss



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point



Bias Voltage & Current

| Vee Range = -5.0 Vdc ± 10% | | |
|----------------------------|-----------------------------|-----------------------------|
| Vee (Vdc) | I _{ee} (Typ.) (mA) | I _{ee} (Max.) (mA) |
| -5.0 | 3.0 | 6.0 |

Control Voltages

| State | Bias Condition |
|-------|-------------------------------|
| Low | -3V to 0 Vdc @ 60 uA Typical |
| High | -5 to -4.2 Vdc @ 5 uA Typical |

* Isolation is recorded above insertion loss & measured at output of switch.



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Absolute Maximum Ratings

| | |
|--|-----------------------|
| Bias Voltage Range (Vee) | -7.0 Vdc |
| Control Voltage Range (A & B) | Vee -0.5V to +1.0 Vdc |
| Channel Temperature | 150 °C |
| Thermal Resistance (Insertion Loss Path) | 100 °C/W |
| Thermal Resistance (Terminated Path) | 180 °C/W |
| Storage Temperature | -65 to +150 °C |
| Operating Temperature | -40 to +85 °C |
| Maximum Input Power (Low Loss State) | +28 dBm |
| ESD Sensitivity (HBM) | Class 1A |

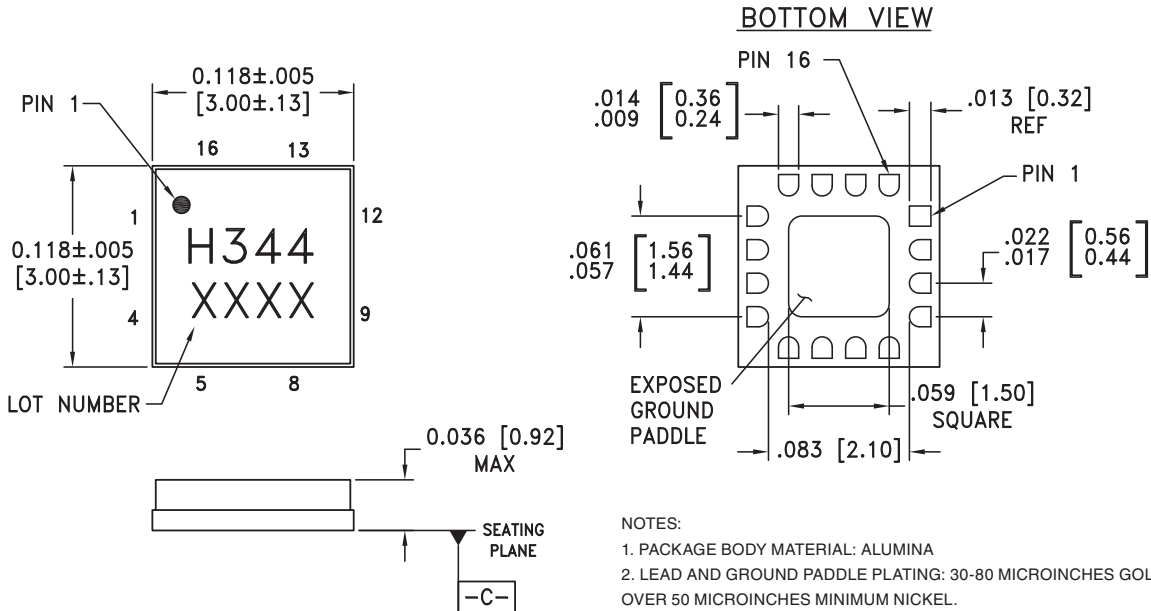
Truth Table

| Control Input | | Signal Path State |
|---------------|------|-------------------|
| A | B | RFC to: |
| High | High | RF1 |
| Low | High | RF2 |
| High | Low | RF3 |
| Low | Low | RF4 |



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing





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Pin Descriptions

| Pin Number | Function | Description | Interface Schematic |
|-------------------------|-------------------------|---|---------------------|
| 1, 4, 9, 12, 15 | RF4, RF3, RF2, RF1, RFC | This pin is DC coupled and matched to 50 Ohm. Blocking capacitors are required if RF line potential is not equal to 0V. | |
| 2, 3, 5, 10, 11, 14, 16 | GND | Package bottom has exposed metal paddle that must also be connected to PCB RF ground. | |
| 6 | Vee | Supply Voltage -5V ± 10% | |
| 7 | CTLB | See truth table and control voltage table. | |
| 8 | CTLA | See truth table and control voltage table. | |
| 13 | N/C | This pin should be connected to PCB RF ground to maximize isolation. | |

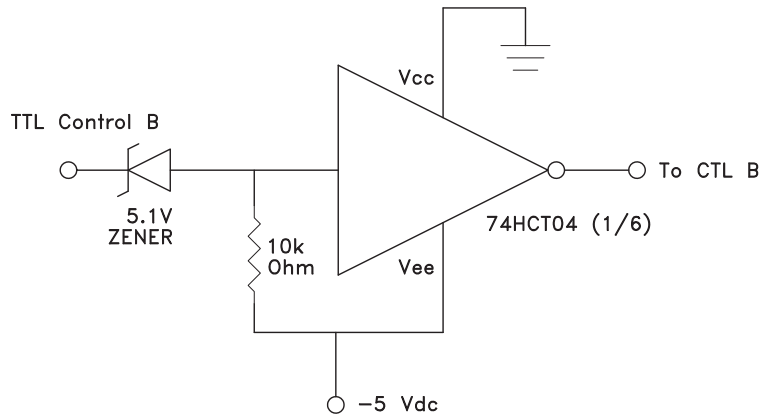
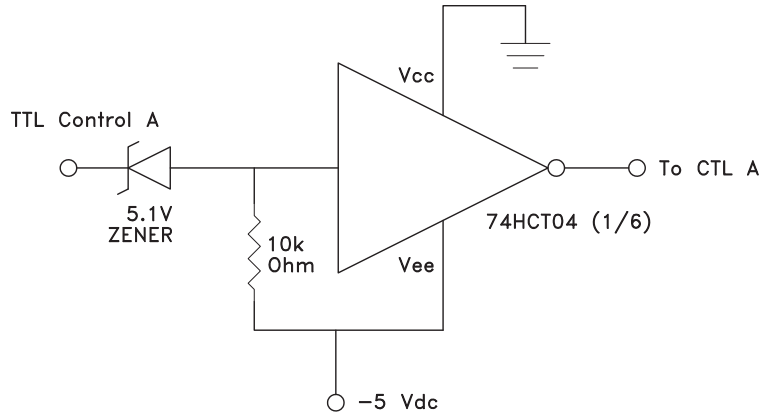
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SWITCHES - MULTI-THROW - SMT



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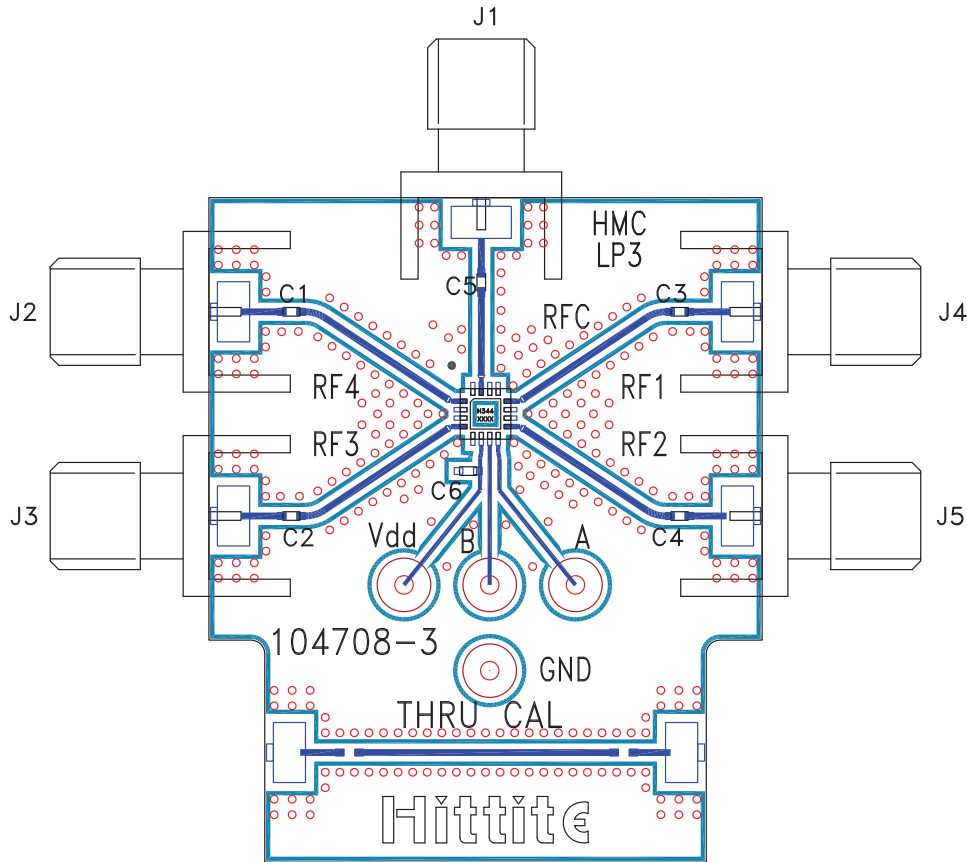
TTL Interface Circuit





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Evaluation PCB



List of Materials for Evaluation PCB 105311 [1]

| Item | Description |
|----------|-----------------------------------|
| J1 - J7 | PCB Mount SMA RF Connector |
| J8 - J11 | DC Pin |
| C1 - C5 | 0Ω Resistor, 0402 Pkg. |
| C6 | 1000 pF Capacitor, 0402 Pkg. |
| U1 | HMC344LC3 |
| PCB [2] | 104708 Evaluation PCB 1.29"x1.55" |

[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.