HMC270MS8G / 270MS8GE

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

Typical Applications

The HMC270MS8G / HMC270MS8GE is ideal for DC - 8.0 GHz applications:

- CATV
- MMDS & WirelessLAN
- Wireless Local Loop

Features

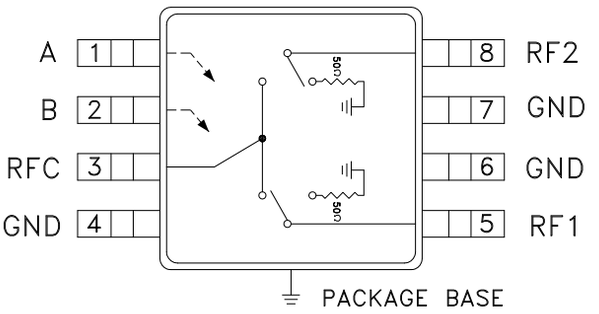
Broadband Performance: DC - 8 GHz

Very High Isolation: 45 dB @ 6 GHz

Non-Reflective Design

Low Cost MSOP-8 Package: 14.8 mm^2

Functional Diagram



General Description

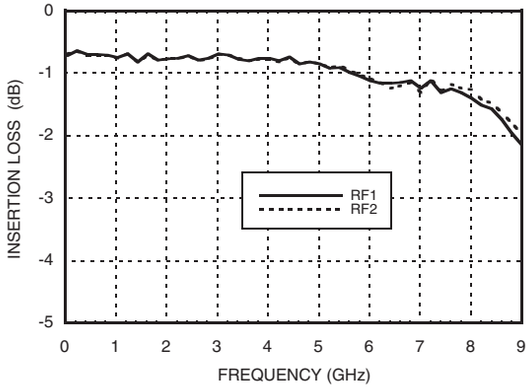
The HMC270MS8G & HMC270MS8GE are broadband non-reflective GaAs SPDT switches in 8 lead MSOP grounded base surface mount plastic packages. Covering DC to 8 GHz, the switch offers excellent isolation from 70 to 35 dB. The negative control voltage of -5 volts allows operation down to DC. If positive control is required along with high isolation, see the DC to 3.5 GHz HMC284MS8G non-reflective SPDT.

Electrical Specifications, T_A = +25° C, With 0/-5V Control, 50 Ohm system

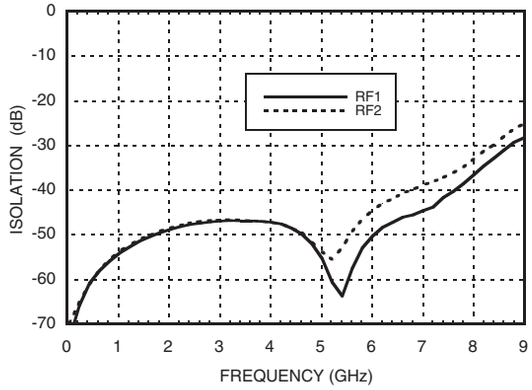
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz		0.8 1.0 1.5	1.2 1.7 2.4	dB dB dB
Isolation	DC - 2.0 GHz DC - 4.0 GHz DC - 6.0 GHz DC - 8.0 GHz	43 42 37 28	48 47 45 33		dB dB dB dB
Return Loss "On State"	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz	11 9 7	14 12 10		dB dB dB
Return Loss RF1, RF2 "Off State"	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz	15 13 10	20 18 15		dB dB dB
Input Power for 1 dB Compression	0.5 - 8.0 GHz	20	23		dBm
Input third Order Intercept (Two-Tone Input Power = +7 dBm Each Tone)	0.5 - 8.0 GHz	33	36		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 8.0 GHz		 20 50		 ns ns

For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
20 Alpha Road, Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373
Order On-line at www.hittite.com

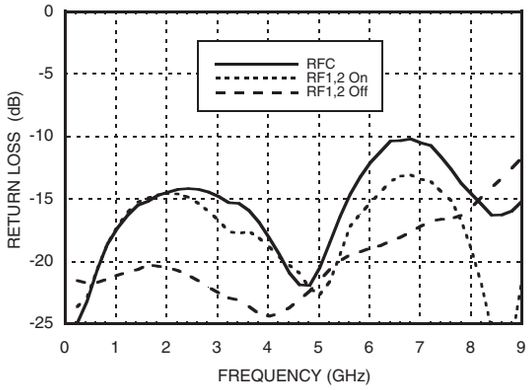
Insertion Loss



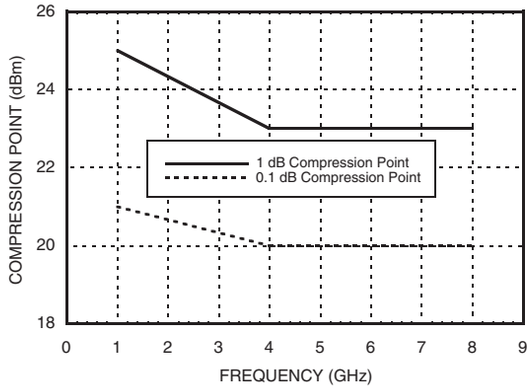
Isolation



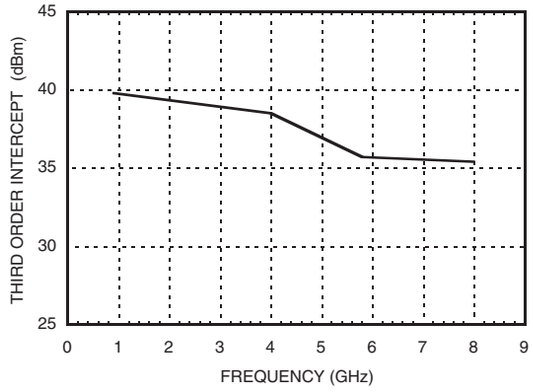
Return Loss



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point



Control Voltages

State	Bias Condition
Low	0 to -0.2V @ 10 uA Typ.
High	-5V @ 35 uA Typ. to -7V @ 100 uA Typ (±0.5 Vdc)

RFC, RF1, & RF2 should be at <100 mV DC potential. Otherwise, DC blocking capacitors are recommended. Choose value for lowest frequency of operation.

Do not "HOT" switch power levels >+13 dBm (Vctl = 0/-5Vdc)

Truth Table

Control Input		Signal Path State	
A	B	RFC to RF1	RFC to RF2
High	Low	ON	OFF
Low	High	OFF	ON

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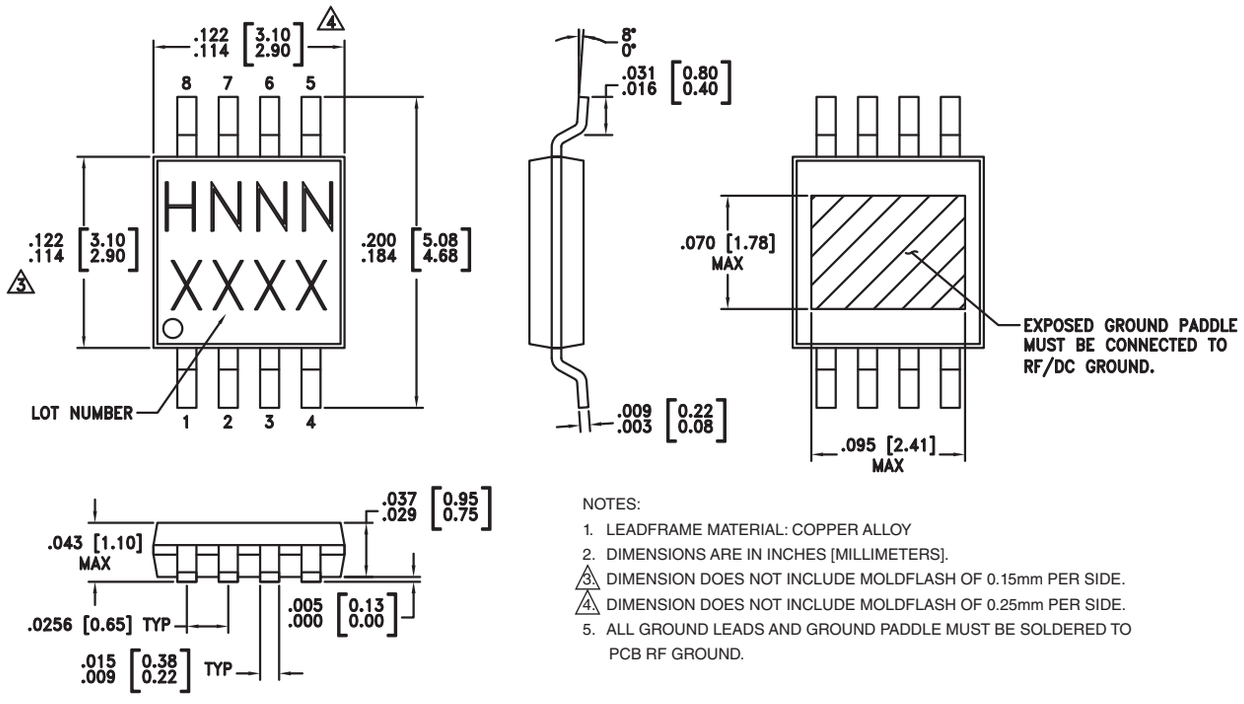
Absolute Maximum Ratings

Max RF Input Power, Vctl = -5V	+24 dBm
Control Voltage Range	+0.5 to -7.5 Vdc
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

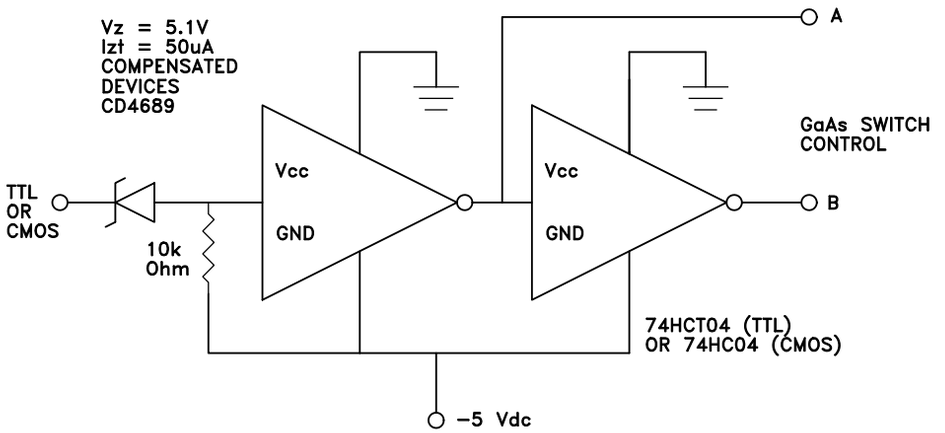
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS].
3. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
5. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC70MS8G	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H270 XXXX
HMC270MS8GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H270 XXXX

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

Suggested Driver Circuit for HMC270MS8G



Simple driver using inexpensive standard logic ICs provides fast switching using minimum DC current while translating from standard positive voltage TTL or CMOS logic to negative voltage GaAs IC logic.

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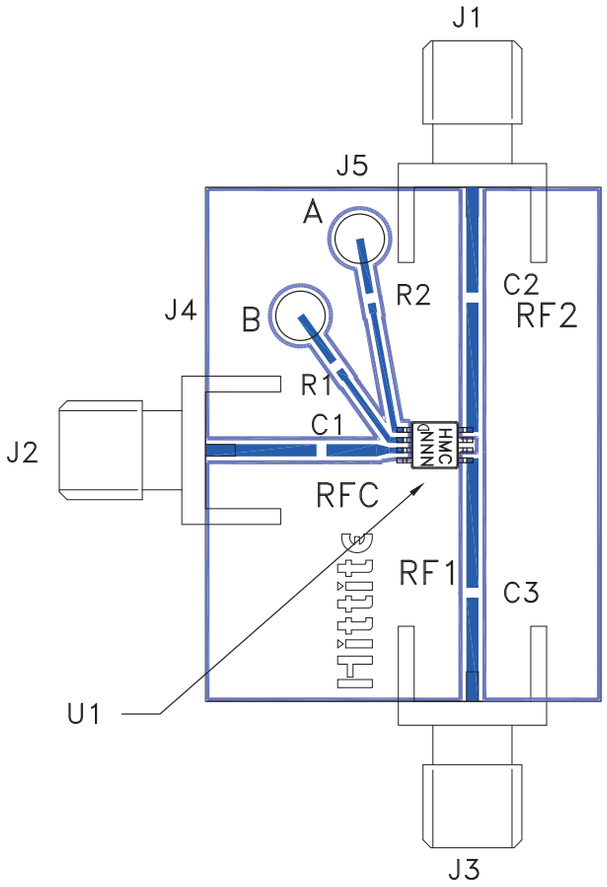
Eval Board Layout (Top View)



*R1 = R2 = 100 Ohm.
These are optional resistors.

List of Materials for Evaluation PCB 107949 [1]

Item	Description
J1 - J3	PCB Mount SMA Connector
J4 - J5	DC Pin
C1 - C3	Chip Capacitor, 0402 Pkg, choose value for lowest frequency of operation. PCBs are provided with 100 ~ 300 pF capacitors. User may jumper capacitor mounting gaps on PCB to allow operation to "DC".
R1 - R2	100 Ohm Resistor, 0402 Pkg.
U1	HMC270MS8G / HMC270MS8GE SPDT Switch
PCB [2]	102807 Evaluation PCB 2.0" x 2.6"

[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 ports should have 50 ohm impedance and the package ground leads and exposed ground paddle 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.