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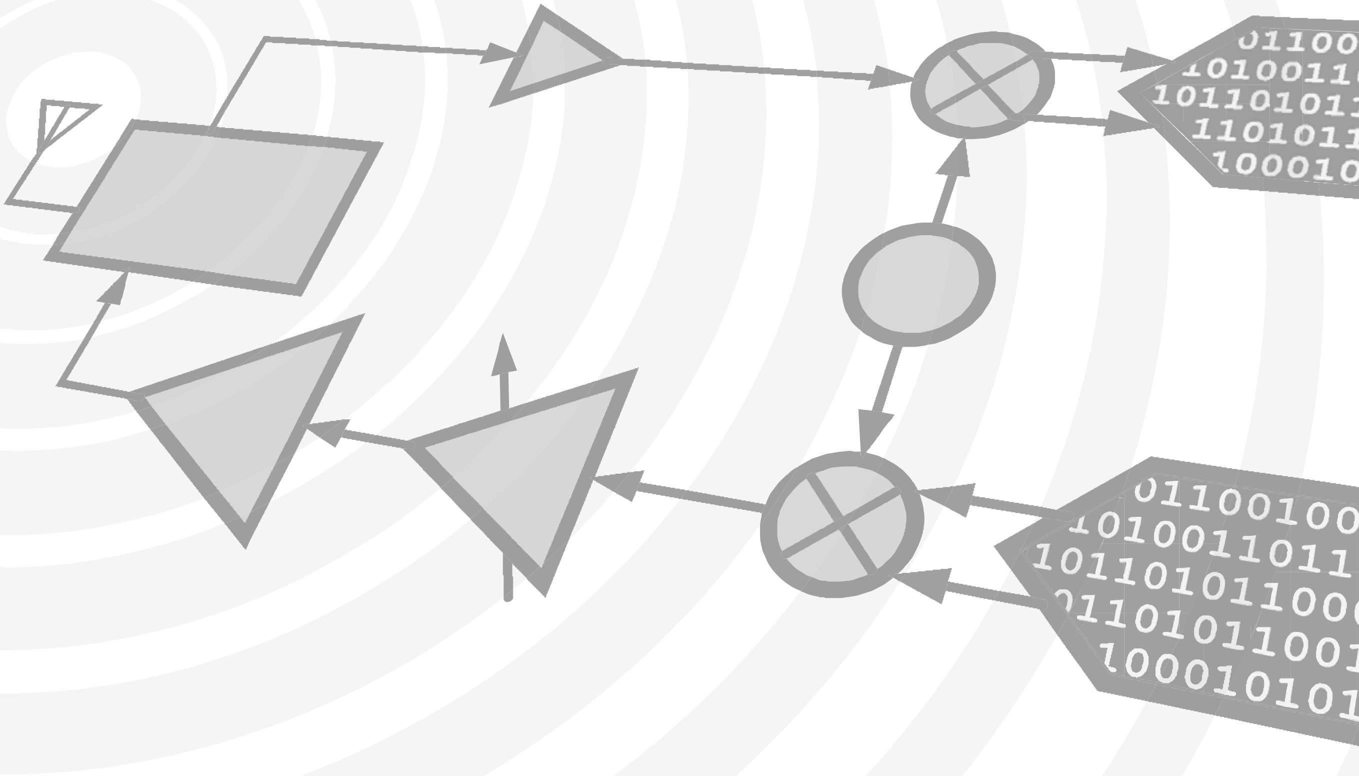

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HMC284A* Product Page Quick Links

Last Content Update: 11/01/2016

Comparable Parts

View a parametric search of comparable parts

Evaluation Kits

- HMC284AMS8G Evaluation Board

Documentation

Data Sheet

- HMC284A Data Sheet

Tools and Simulations

- HMC284A S-Parameters

Reference Materials

Quality Documentation

- Package/Assembly Qualification Test Report: MS8G (QTR: 2014-00393)
- PCN: MS, QS, SOT, SOIC packages - Sn/Pb plating vendor change
- Semiconductor Qualification Test Report: pHEMT-J (QTR: 2012-00042)
- Semiconductor Qualification Test Report: PHEMT-J (QTR: 2013-00285)

Design Resources

- HMC284A Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

Discussions

View all HMC284A EngineerZone Discussions

Sample and Buy

Visit the product page to see pricing options

Technical Support

Submit a technical question or find your regional support number

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MICROWAVE CORPORATION
v00.0612

HMC284AMS8G / HMC284AMS8GE

SPDT NON-REFLECTIVE SWITCH
DC - 3.5 GHz

RoHS✓
EARTH FRIENDLY

Typical Applications

The HMC284AMS8G / HMC284AMS8GE is ideal for:

- Cellular/PCS Base Stations
- 2.4 GHz ISM
- 3.5 GHz Wireless Local Loop

Features

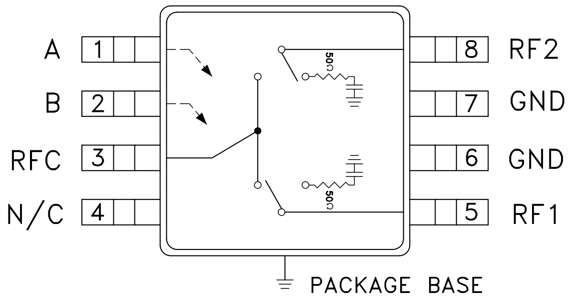
High Isolation: >45 dB

Positive control: 0/+5V

Non-Reflective Design

Ultra Small Package: MSOP8G

Functional Diagram



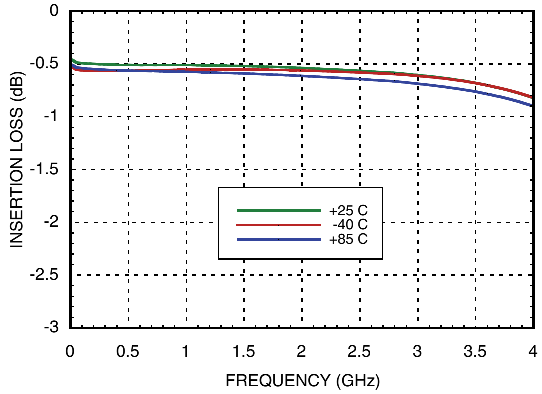
General Description

The HMC284AMS8G & HMC284AMS8GE are low-cost SPDT switches in 8-lead grounded base MSOP packages. The design has been optimized to provide high isolation with minimal insertion loss for medium and low power applications. On-chip circuitry allows positive voltage control operation at very low DC currents with control inputs compatible with CMOS and most TTL logic families. In the “OFF” state, RF1 and RF2 are non-reflective.

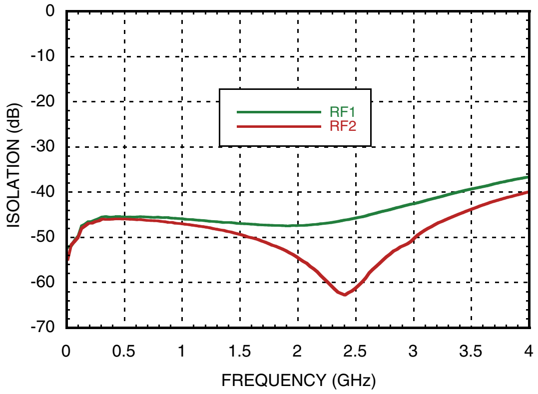
Electrical Specifications, T_A = +25° C, Vctl = 0/+5 Vdc, 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 2.0 GHz DC - 3.0 GHz DC - 3.5 GHz		0.5 0.6 0.7	0.8 0.9 1.1	dB dB dB
Isolation RF1 & RF2 RF1 / RF2 RF1 / RF2 RF1 & RF2	DC - 2.0 GHz DC - 2.5 GHz DC - 3.0 GHz DC - 3.5 GHz	41 38/41 34/36 30	45 44/45 42/45 40		dB dB dB
Return Loss (On State)	DC - 2.0 GHz DC - 2.5 GHz DC - 3.5 GHz	21 13 10	25 22 17		dB dB dB
Return Loss (Off State)	0.5 - 3.5 GHz	10	15		dBm
Input Power for 1 dB Compression	0.5 - 1.0 GHz 0.5 - 3.5 GHz	20 18	30 29		dBm dBm
Input Third Order Intercept (Two-Tone Input Power = 0 dBm Each Tone)	0.5 - 3.5 GHz	43	50		dBm
Switching Speed tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 3.5 GHz		5 20		ns ns

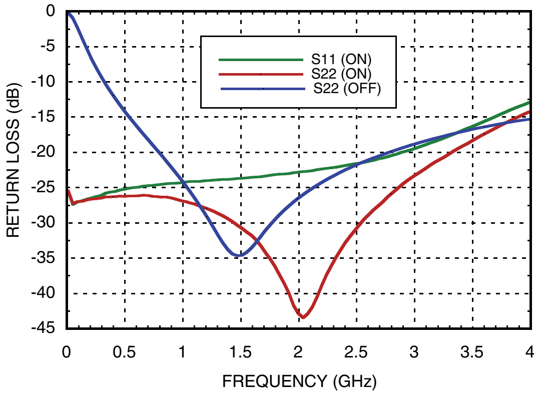
Insertion Loss



Isolation



Return Loss



Compression vs Frequency

	Carrier at 900 MHz		Carrier at 1900 MHz	
CTL Input	Input Power for 0.1 dB Compression	Input Power for 1.0 dB Compression	Input Power for 0.1 dB Compression	Input Power for 1.0 dB Compression
(Vdc)	(dBm)	(dBm)	(dBm)	(dBm)
+5	27	30	27	29

Caution:
Do not operate continuously at RF power input greater than 1 dB compression. (Vctl = 0/+5 Vdc).

Distortion vs Frequency

Control Input	Third Order Intercept (dBm) 0 dBm Each Tone	
(Vdc)	900 MHz	1900 MHz
+5	50	50

Truth Table

***Control Input Tolerances are ±0.2 Vdc**

Control Input*		Control Current		Signal Path State	
A (Vdc)	B (Vdc)	Ia (uA)	Ib (uA)	RFC to RF1	RFC to RF2
0	+5	-0.2	0.2	ON	OFF
+5	0	0.2	-0.2	OFF	ON

DC blocks are required at ports RFC, RF1, RF2.

HMC284AMS8G / HMC284AMS8GE

v00.0612

RoHS✓
EARTH FRIENDLY

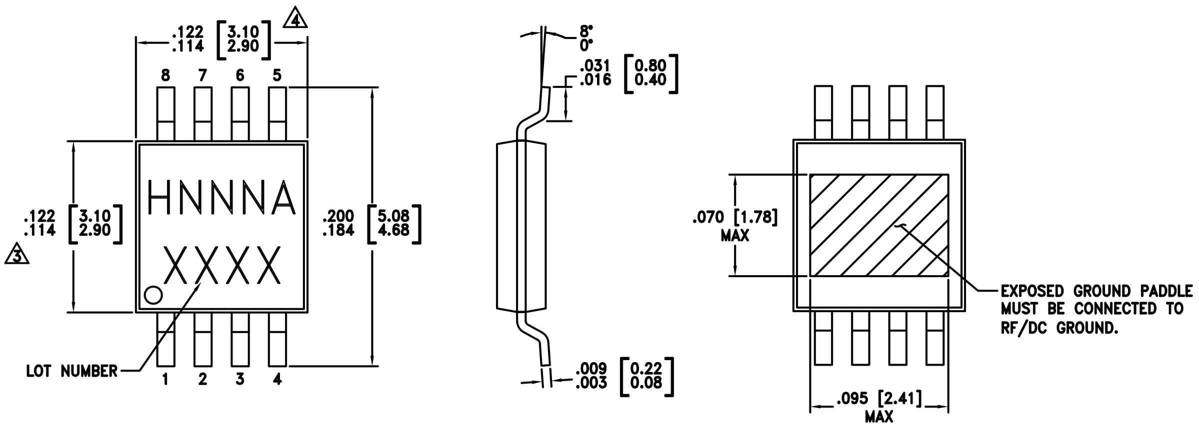
SPDT NON-REFLECTIVE SWITCH
DC - 3.5 GHz

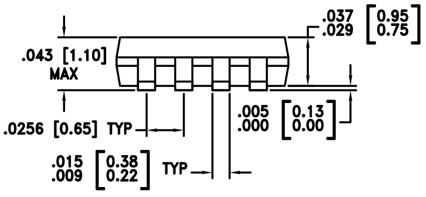
Absolute Maximum Ratings

RF Input Power (Vctl = 0/+5V)	+26 dBm
Control Voltage Range	-0.5 to +7.5 Vdc
Hot Switch Power Level (Vctl = 0/+5V)	+18 dBm
Channel Temperature	150 °C
Thermal Resistance (Insertion Loss Path)	130 °C/W
Thermal Resistance (Terminated Path)	252 °C/W
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

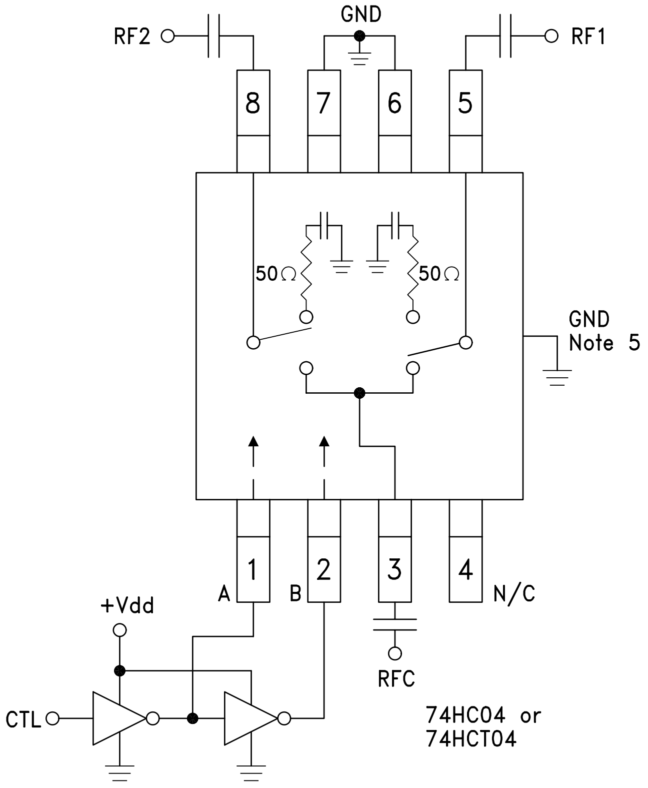
Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC284AMS8G	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H284A XXXX
HMC284AMS8GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H284A XXXX

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

RoHS✓ EARTH FRIENDLY

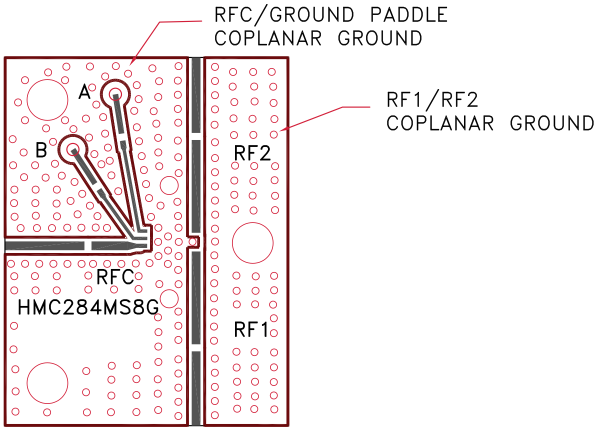
SPDT NON-REFLECTIVE SWITCH
DC - 3.5 GHz

Typical Application Circuit

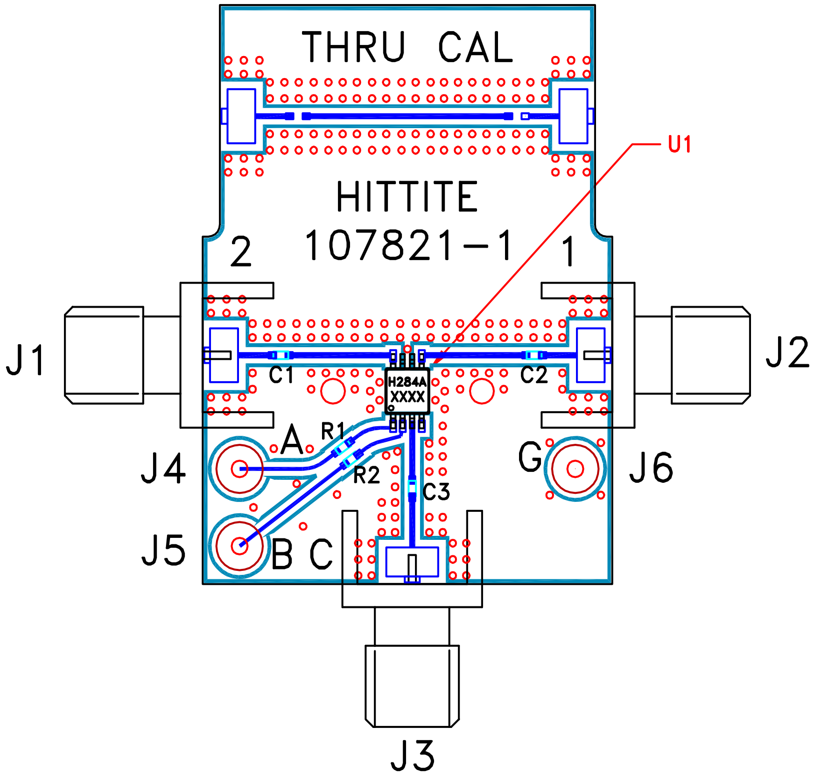


Notes:

1. Set A/B control to 0/+5V, Vdd = +5V and use HCT series logic to provide a TTL driver interface.
2. Control inputs A/B can be driven directly with CMOS logic (HC) with Vdd = +5 Volts applied to the CMOS logic gates.
3. DC blocking capacitors are required for each RF port as shown. Capacitor value determines lowest frequency of operation.
4. Highest RF signal power capability is achieved with Vdd = +7V and A/B set to 0/+7V.
5. Back side paddle must be connected to RF ground.
6. A grounded coplanar waveguide PCB layout technique is recommended to achieve high isolation. The component side ground plane between RFC/grounded paddle and RF1/RF2 should be continuous, see below. There should be a continuous ground plane under component side layout.



Evaluation PCB



List of Materials for Evaluation PCB 105143 [1]

Item	Description
J1 - J3	PCB Mount SMA RF Connector
J4 - J6	DC Pin
C1 - C3	100 pF capacitor, 0402 Pkg.
R1, R2	100 Ohm resistor, 0402 Pkg.
U1	HMC284AMS8G / HMC284AMS8GE SPDT Switch
PCB [2]	107821 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the 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 package bottom 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.