



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 3.5 GHz

Typical Applications

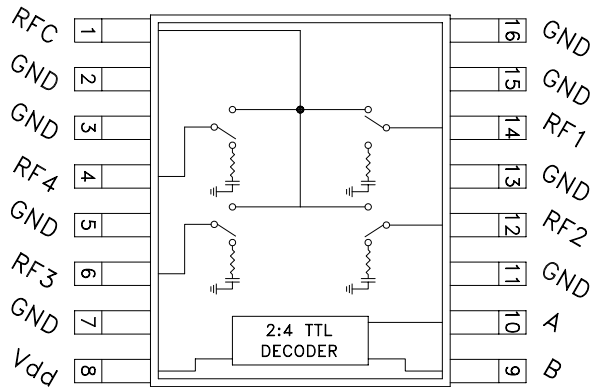
The HMC241AQS16 & HMC241AQS16E are ideal for:

- Base Stations & Portable Wireless
- CATV / DBS
- Wireless Local Loop
- Test Equipment

Features

- RoHS Compliant Product
- Low Insertion Loss (2 GHz): 0.7 dB
- Single Positive Supply: $V_{dd} = +5V$
- Integrated 2:4 TTL Decoder
- 16 Lead QSOP Package

Functional Diagram



General Description

The HMC241AQS16 & HMC241AQS16E are general purpose low-cost non-reflective SP4T switches in 16-lead QSOP packages. Covering DC - 3.5 GHz, this switch offers high isolation and has a low insertion loss of 0.7 dB at 2 GHz. The switch offers a single positive bias and true TTL/CMOS compatibility. A 2:4 decoder is integrated on the switch requiring only 2 control lines and a positive bias to select each path, replacing 8 control lines normally required by GaAs SP4T switches.

Electrical Specifications, $T_A = +25^\circ C$, For TTL Control and $V_{dd} = +5V$ in a 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 1.0 GHz		0.7	1.0	dB
	DC - 2.0 GHz		0.8	1.1	dB
	DC - 2.5 GHz		0.8	1.1	dB
	DC - 3.5 GHz		1.0	1.5	dB
Isolation	DC - 1.0 GHz	40	47		dB
	DC - 2.0 GHz	32	40		dB
	DC - 2.5 GHz	28	36		dB
	DC - 3.5 GHz	23	32		dB
Return Loss	"On State"	DC - 2.5 GHz	17	21	dB
		DC - 3.5 GHz	9	18	dB
Return Loss	RF1-4 "Off State"	0.3 - 3.5 GHz	8	12	dB
		0.5 - 2.5 GHz	12	16	dB
Input Power for 1dB Compression	0.3 - 3.5 GHz	26	29		dBm
Input Third Order Intercept (Two-Tone Input Power = +10 dBm Each Tone)	0.3 - 3.5 GHz	40	48		dBm
Switching Characteristics	0.3 - 3.5 GHz	tRISE, tFALL (10/90% RF)	40		ns
		tON, tOFF (50% CTL to 10/90% RF)	150		ns

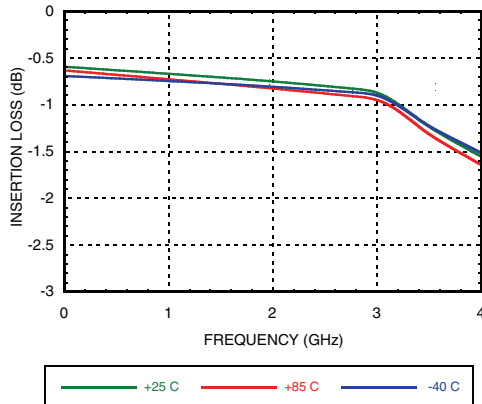
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

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

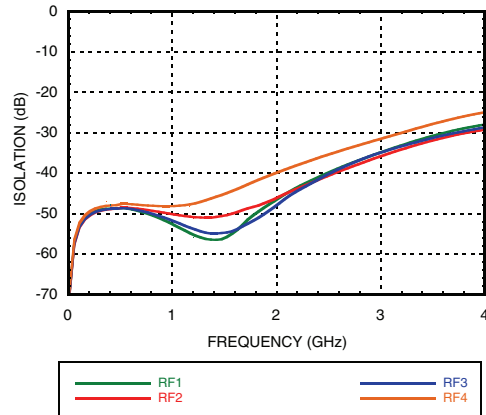


GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 3.5 GHz

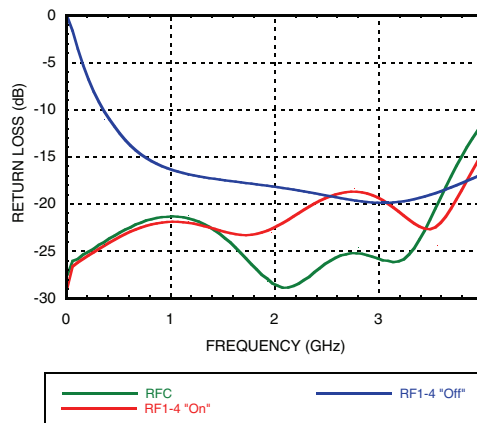
Insertion Loss



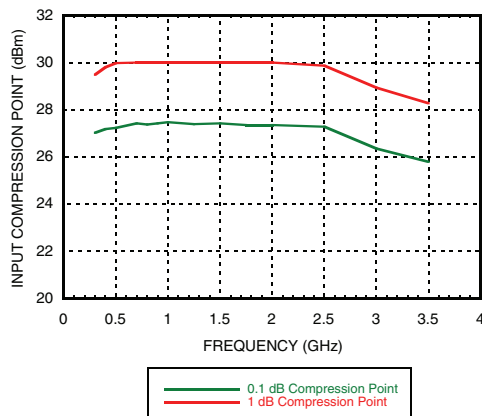
Isolation



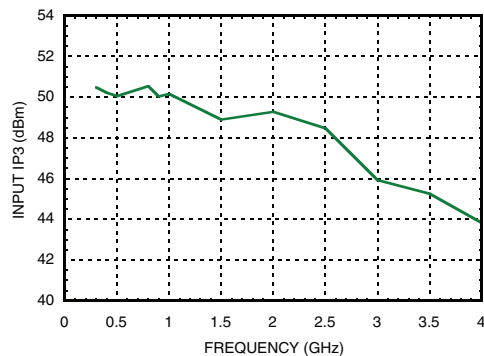
Return Loss



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point



NOTE:

DC Blocking capacitors are required at ports RFC and RF1, 2, 3, 4.

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

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 SP4T NON-REFLECTIVE
SWITCH, DC - 3.5 GHz**
Bias Voltage & Current

Vdd Range = +5 Vdc ± 10%		
Vdd (Vdc)	Idd (Typ.) (mA)	Idd (Max.) (mA)
+5	2.5	6.0

TTL/CMOS Control Voltages

State	Bias Condition
Low	0 to +0.8 Vdc @ 0.5µA Typ.
High	+2.0 to +5 Vdc @ 50 µA Typ.

Truth Table

Control Input		Signal Path State
A	B	RFCOM to:
LOW	LOW	RF1
HIGH	LOW	RF2
LOW	HIGH	RF3
HIGH	HIGH	RF4



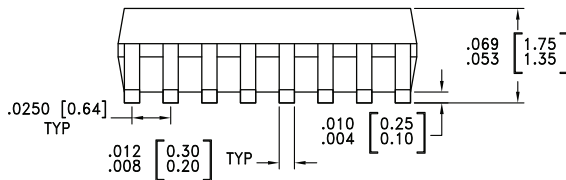
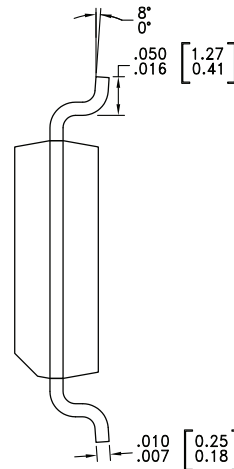
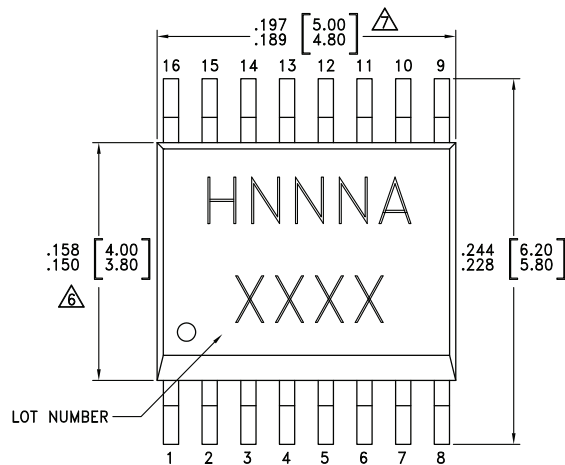
Absolute Maximum Ratings

Bias Voltage Range (Port Vdd)	+7.0 Vdc
Control Voltage Range (A & B)	-0.5V to Vdd +1 Vdc
Channel Temperature	150 °C
Thermal Resistance	
Insertion Loss Path	150 °C/W
Terminated Path	297 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Maximum Input Power Vdd = +5 Vdc	
Insertion Loss Path	+28.5 dBm
Terminated Path	+23.4 dBm
ESD Sensitivity (HBM)	Class 1A



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

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

Package Information

Part Number	Package Body Material	Leadframe Plating	MSL Rating	Package Marking ^[3]
HMC241AQS16	Low Stress Injection Molding Plastic Silica and Silicon Impregnated	Sn/Pb Solder	MSL1 ^[1]	HMC241A XXXX
HMC241AQS16E	RoHS-compliant Low Stress Injection Molding Plastic Silica and Silicon Impregnated	100% Matte Tin	MSL1 ^[2]	HMC241A XXXX

[1] Max peak reflow temperature of 235 °C


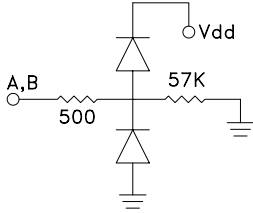
[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 3.5 GHz

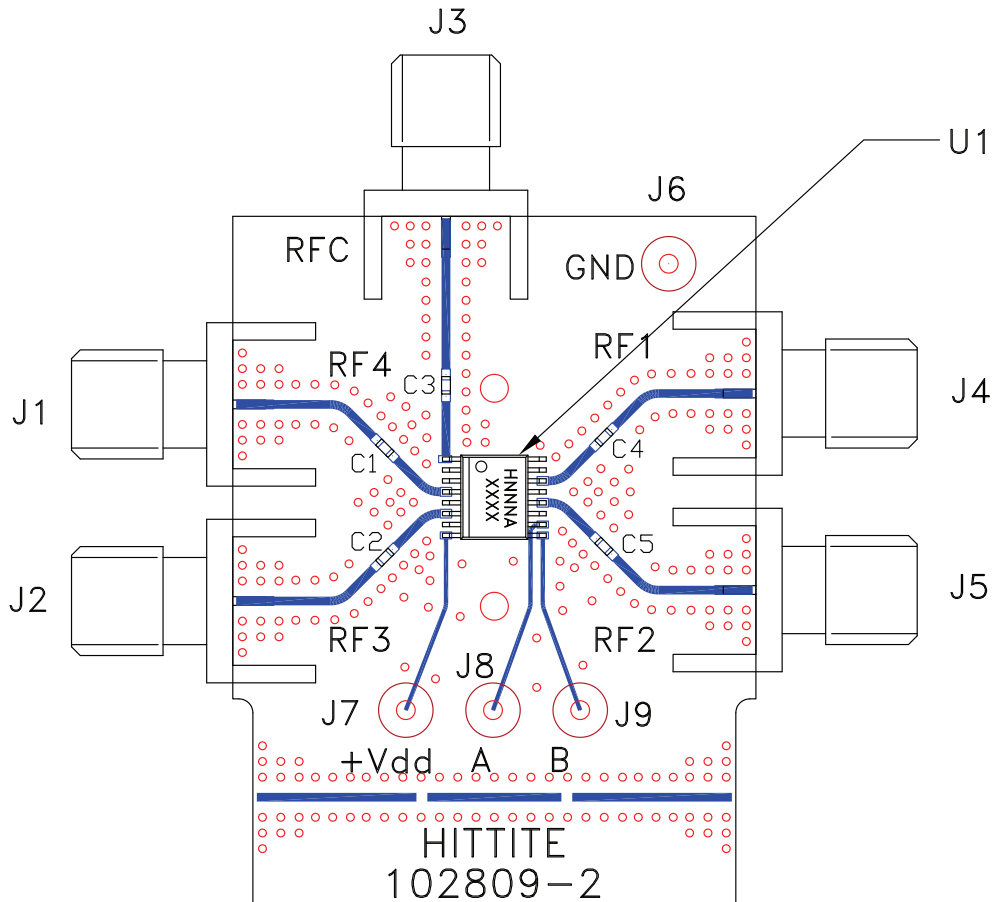


Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 4, 6, 12, 14	RF4, RF3, RF2, RF1, RFC	This pin is DC coupled and matched to 50 Ohms. Blocking capacitors are required.	
2, 3, 5, 7, 11, 13, 15, 16	GND	This pin must be connected to PCB RF ground to maximize isolation.	
8	Vdd	Supply Voltage +5 Vdc ±10%	
9	B	See truth table and control voltage table.	
10	A	See truth table and control voltage table.	



Evaluation PCB



List of Materials for Evaluation PCB EV1HMC241AQS16 [1]

Item	Description
J1 - J5	PCB Mount SMA RF Connector
J6 - J9	DC Pin
C1 - C5	330 pF capacitor, 0402 Pkg.
U1	HMC241AQS16 / 241AQS16E SP4T Switch
PCB [2]	102809 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 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.