ANALOG DEVICES

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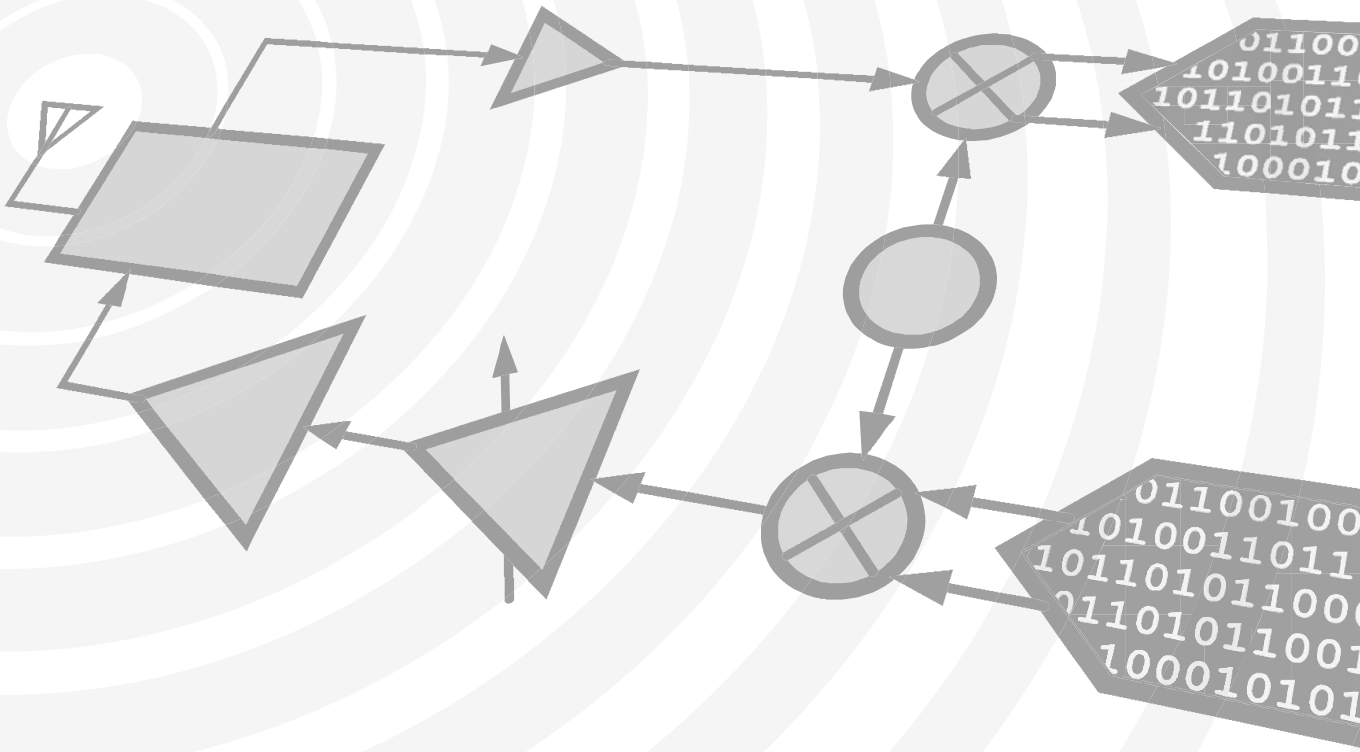
NO CONTENT ON THE ATTACHED DOCUMENT HAS CHANGED



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HMC241AQS16 / 241AQS16E

v00.1213

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

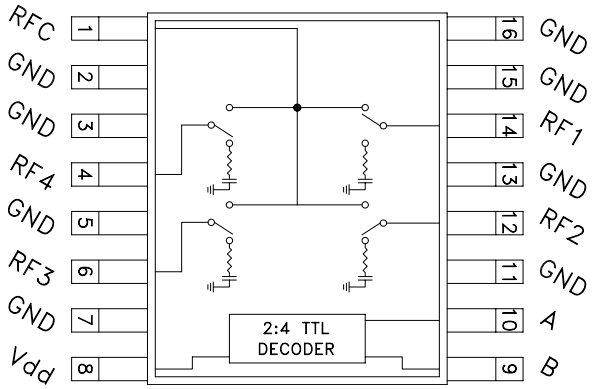
Low Insertion Loss (2 GHz): 0.7 dB

Single Positive Supply: Vdd = +5V

Integrated 2:4 TTL Decoder

16 Lead QSOP Package

Functional Diagram



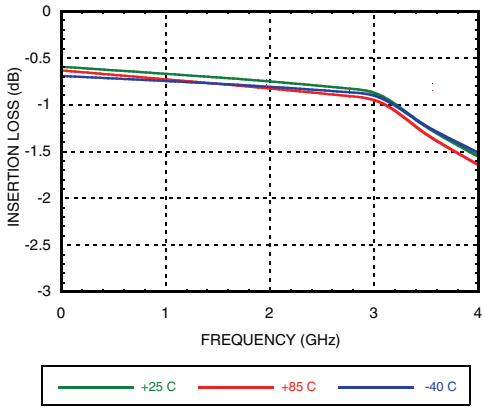
General Description

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.

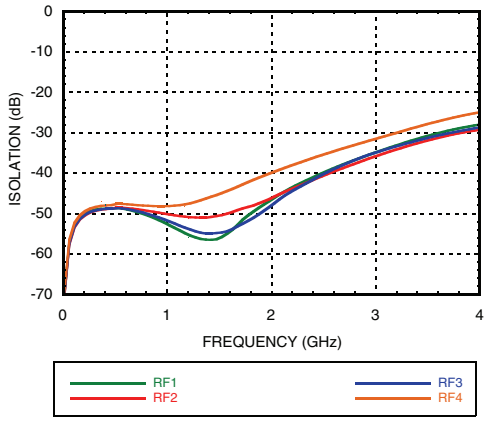
Electrical Specifications, T_A = +25° C, For TTL Control and Vdd = +5V in a 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz DC - 3.5 GHz		0.7 0.8 0.8 1.0	1.0 1.1 1.1 1.5	dB dB dB dB
Isolation	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz DC - 3.5 GHz	40 32 28 23	47 40 36 32		dB dB dB dB
Return Loss "On State"	DC - 2.5 GHz DC - 3.5 GHz	17 9	21 18		dB dB
Return Loss RF1-4 "Off State"	0.3 - 3.5 GHz 0.5 - 2.5 GHz	8 12	12 16		dB 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 tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	0.3 - 3.5 GHz		 40 150		 ns ns

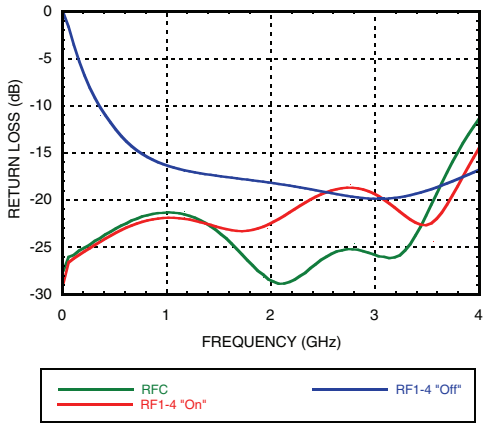
Insertion Loss



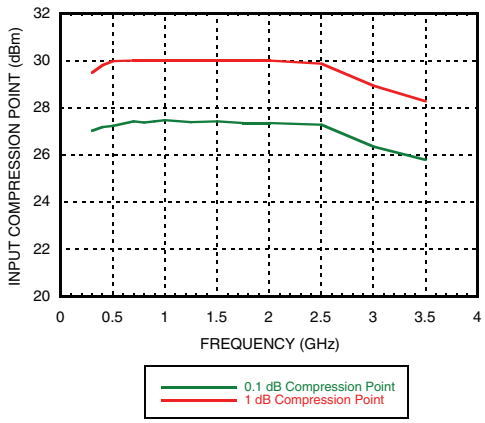
Isolation



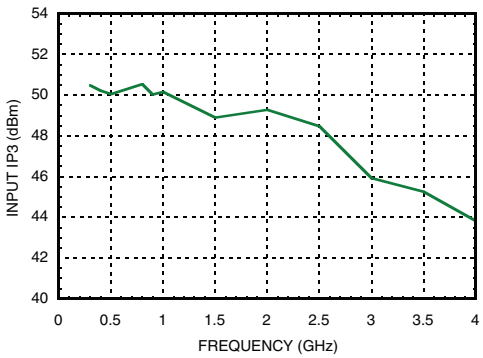
Return Loss



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.

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

HMC241AQS16 / 241AQS16E

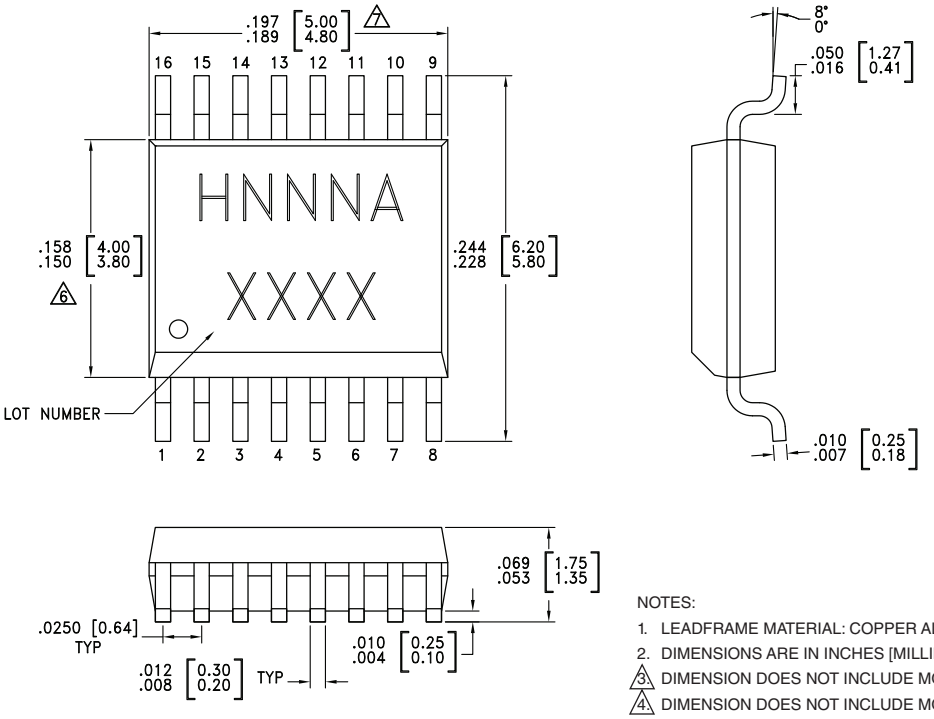
GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 3.5 GHz

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 Terminated Path	 150 °C/W 297 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Maximum Input Power Vdd = +5 Vdc Insertion Loss Path Terminated Path	 +28.5 dBm +23.4 dBm
ESD Sensitivity (HBM)	Class 1A

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

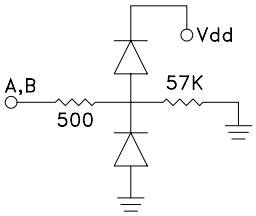
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS].
3. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
5. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

Package Information

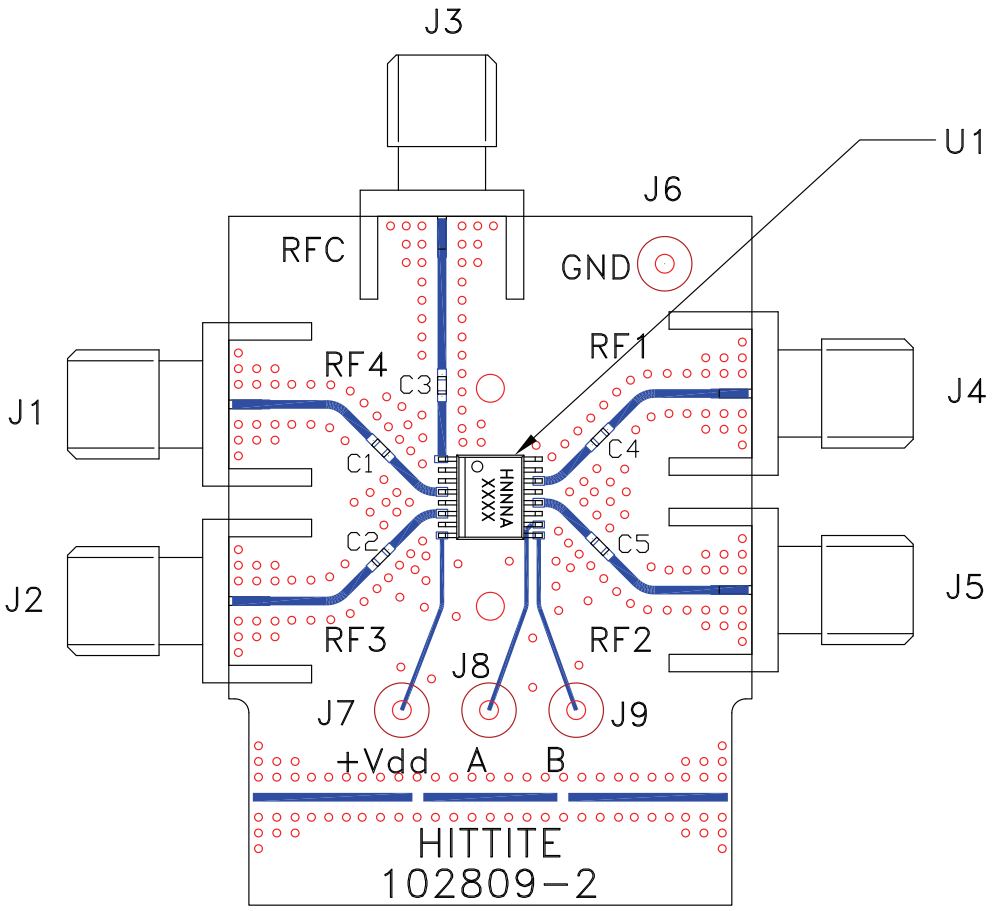
Part Number	Package Body Material	Leadframe Plating	MSL Rating	Package Marking [3]
HMC241AQS16	Low Stress Injection Molded Plastic Silica and Silicon Impregnated	Sn/Pb Solder	MSL1 [1]	HMC241A XXXX
HMC241AQS16E	RoHS-compliant Low Stress Injection Molded Plastic Silica and Silicon Impregnated	100% Matte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

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.

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