

HMC241QS16 / 241QS16E

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

Typical Applications

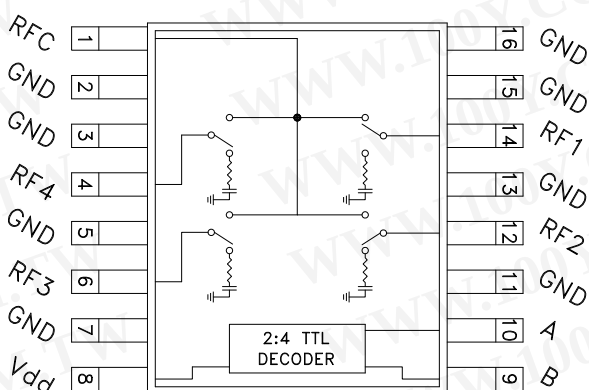
The HMC241QS16 & HMC241QS16E are ideal for:

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

Features

- RoHS Compliant Product
- Low Insertion Loss (2 GHz): 0.5 dB
- Single Positive Supply: $V_{dd} = +5V$
- Integrated 2:4 TTL Decoder
- 16 Lead QSOP Package

Functional Diagram



General Description

The HMC241QS16 & HMC241QS16E 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 0.5 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.

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
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Electrical Specifications, $T_A = +25^\circ C$, For TTL Control and $V_{dd} = +5V$ in a 50 Ohm System

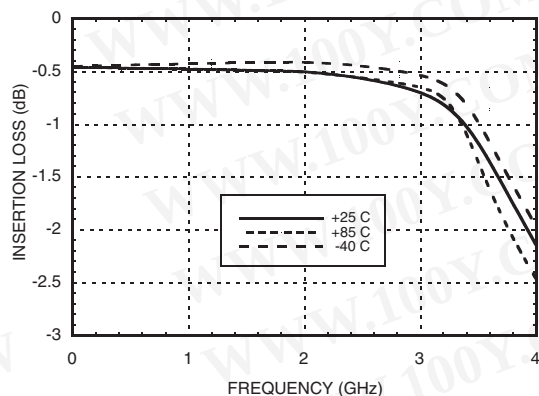
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 1.0 GHz		0.5	0.8	dB
	DC - 2.0 GHz		0.5	0.8	dB
	DC - 2.5 GHz		0.6	0.9	dB
	DC - 3.5 GHz		1.0	1.5	dB
Isolation	DC - 1.0 GHz	40	45		dB
	DC - 2.0 GHz	32	36		dB
	DC - 2.5 GHz	28	32		dB
	DC - 3.5 GHz	23	26		dB
Return Loss	"On State"	DC - 2.5 GHz	17	21	dB
		DC - 3.5 GHz	9	12	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	22	25		dBm
Input Third Order Intercept (Two-Tone Input Power = +7 dBm Each Tone)	0.3 - 3.5 GHz	40	44		dBm
Switching Characteristics	0.3 - 3.5 GHz	t_{RISE}, t_{FALL} (10/90% RF)	40		ns
		t_{ON}, t_{OFF} (50% CTL to 10/90% RF)	150		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
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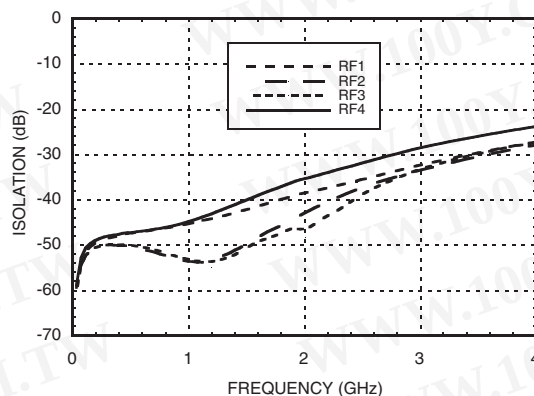
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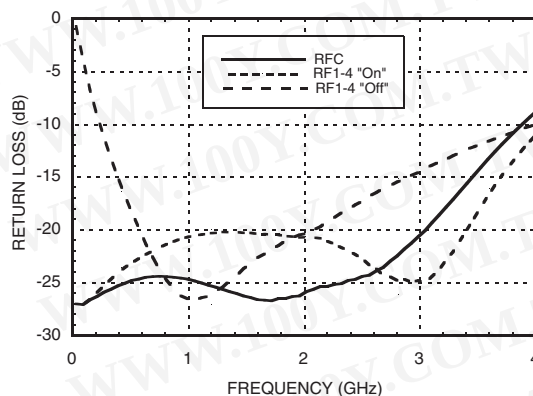
Insertion Loss



Isolation



Return Loss



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Bias Voltage & Current

Vdd Range = +5.0 Vdc $\pm$ 10%		
Vdd (Vdc)	Idd (Typ.) (mA)	Idd (Max.) (mA)
+5.0	4.0	7.0

TTL/CMOS Control Voltages

State	Bias Condition
Low	0 to +0.8 Vdc @ 5uA Typ.
High	+2.0 to +5.0 Vdc @ 70 uA Typ.

Truth Table

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

NOTE:

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

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ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

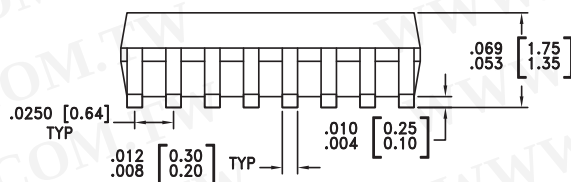
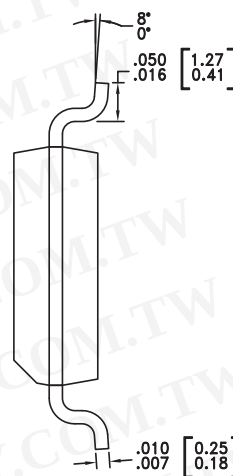
Bias Voltage Range (Port Vdd)	+7.0 Vdc
Control Voltage Range (A & B)	-0.5V to Vdd +1 Vdc
Channel Temperature	150 °C
Thermal Resistance (Insertion Loss Path)	210 °C/W
Thermal Resistance (Terminated Path)	250 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Maximum Input Power Vdd = +5 Vdc	+20 dBm (0.05 - 0.5 GHz) +27 dBm (0.5 - 3.5 GHz)

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SWITCHES - SMT

Mechanical drawing of the HMCNNN package. The package is rectangular with pins on all four sides. The top pins are numbered 16 to 9 from left to right. The bottom pins are numbered 1 to 8 from left to right. The left side has pins numbered 15 to 8 from top to bottom. The right side has pins numbered 14 to 7 from top to bottom. The package is labeled "HMCNNN" and "XXXX". A "LOT NUMBER" is indicated by a circle and a line pointing to the bottom-left corner. Dimensions are given in inches and millimeters. The top width is .197 [5.00] and .189 [4.80]. The bottom width is .244 [6.20] and .228 [5.80]. The left height is .158 [4.00] and .150 [3.80]. The right height is .244 [6.20] and .228 [5.80]. A triangle symbol with the number 4 is shown at the top right, and a triangle symbol with the number 3 is shown at the bottom left.



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.

Part Number	Package Body Material	Leadframe Plating	MSL Rating	Package Marking ^[3]
HMC241QS16	Low Stress Injection Molded Plastic Silica and Silicon Impregnated	Sn/Pb Solder	MSL1 ^[1]	HMC241 XXXX
HMC241QS16E	RoHS-compliant Low Stress Injection Molded Plastic Silica and Silicon Impregnated	100% Matte Tin	MSL1 ^[2]	<u>HMC241</u> XXXX

[3] 4-Digit lot number XXXX

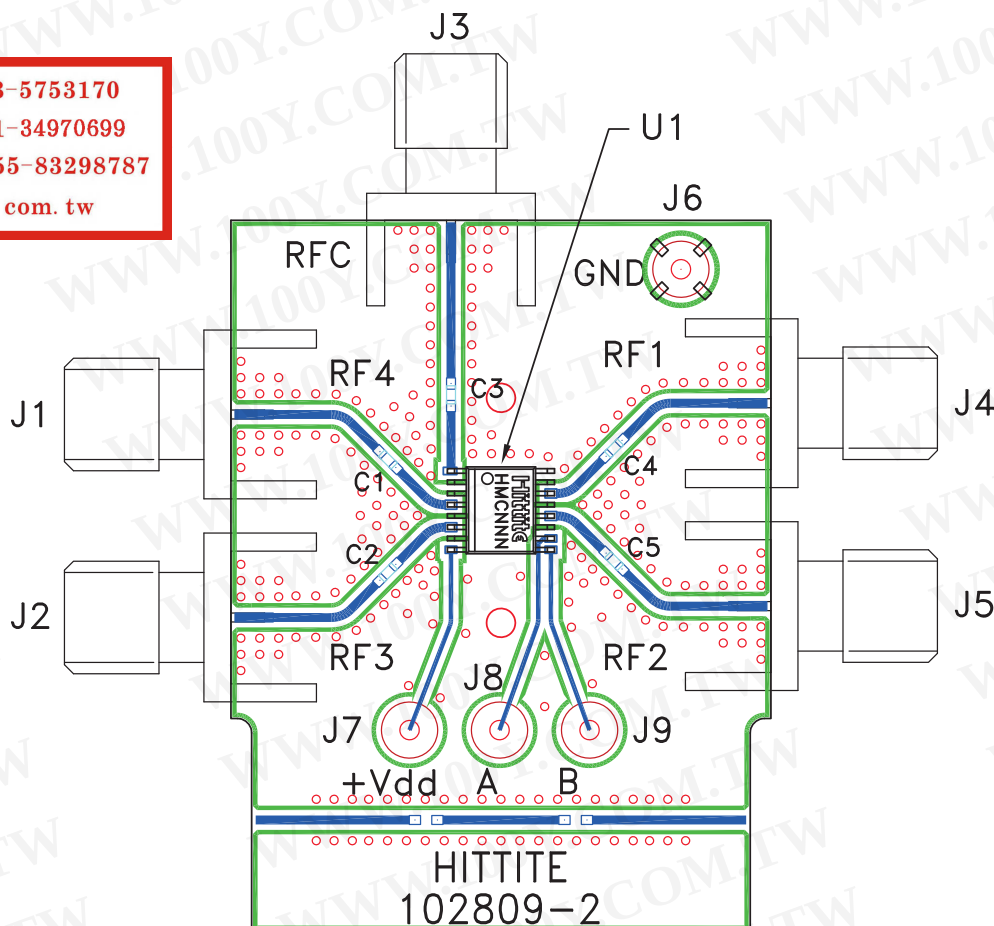
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Evaluation PCB

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List of Materials for Evaluation PCB 102913 [1]

Item	Description
J1 - J5	PCB Mount SMA RF Connector
J6 - J9	DC Pin
C1 - C5	330 pF capacitor, 0402 Pkg.
U1	HMC241QS16 / HMC241QS16E 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 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 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.