



GaAs MMIC SP3T Non-REFLECTIVE SWITCH, DC - 3.5 GHz

Typical Applications

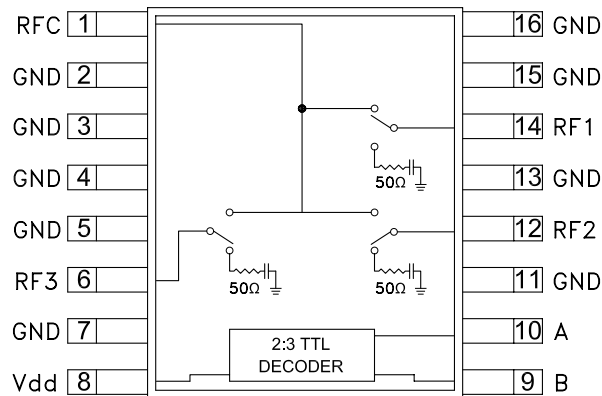
The HMC245AQS16 / 245AQS16E is ideal for:

- Basestation Infrastructure
- CATV / DBS
- Wireless Local Loop
- Test Equipment

Features

- Low Insertion Loss: 0.7 dB @ 2.0 GHz
- Non-Reflective Design
- Integrated 2:3 TTL Decoder
- "All Off" Isolation State
- Single Positive Supply: Vdd = +5V
- 16 Lead QSOP SMT Package

Functional Diagram



General Description

The HMC245AQS16E is a low cost non-reflective SP3T switches in 16-lead QSOP surface mount packages. Covering DC to 3.5 GHz, the switch offers 30 to 40 dB isolation and a low insertion loss of 0.7 dB. A 2:3 TTL/CMOS compatible decoder is integrated on the switch requiring only 2 control lines and a single +5V bias to select each path, replacing 6 control lines normally required by GaAs SP3T switches.

Electrical Specifications,

$T_A = +25^\circ \text{C}$, For TTL Control and Vdd = +5V in a 50 Ohm System

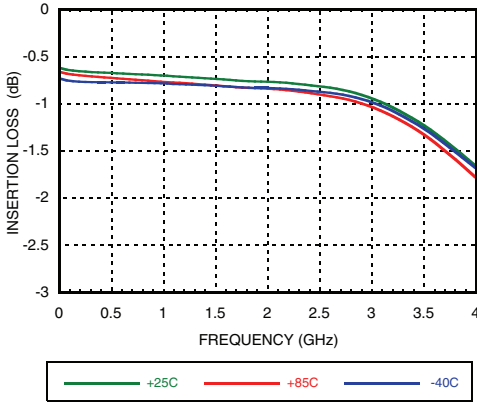
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 2.0 GHz		0.7	1.0	dB
	DC - 3.0 GHz		0.8	1.3	dB
	DC - 3.5 GHz		1.1	1.5	dB
Isolation	DC - 1.0 GHz	40	46		dB
	DC - 2.0 GHz	35	42		dB
	DC - 2.5 GHz	31	40		dB
	DC - 3.5 GHz	26	32		dB
Return Loss	"On State"	DC - 1.5 GHz		23	dB
		DC - 3.5 GHz		17	dB
Return Loss RF1 - 3	"Off State"	0.3 - 3.5 GHz		12	dB
		0.5 - 3.5 GHz		15	dB
Input Power for 1 dB Compression	0.3 - 2.5 GHz	26	29		dBm
	0.3 - 3.5 GHz	25	28		dBm
Input Third Order Intercept (Two-tone Input Power = +10 dBm each tone)	0.3 - 2.5 GHz	44	48		dBm
	0.3 - 3.5 GHz	40	44		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



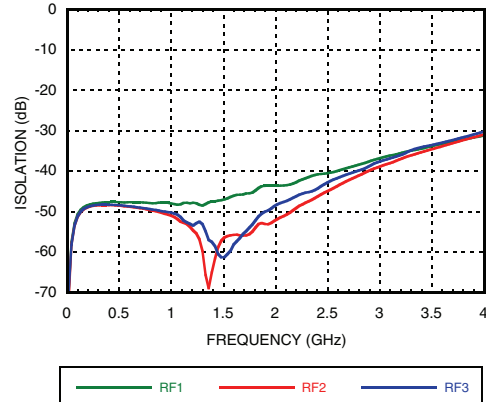
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SWITCHES - MULTI-THROW - SMT

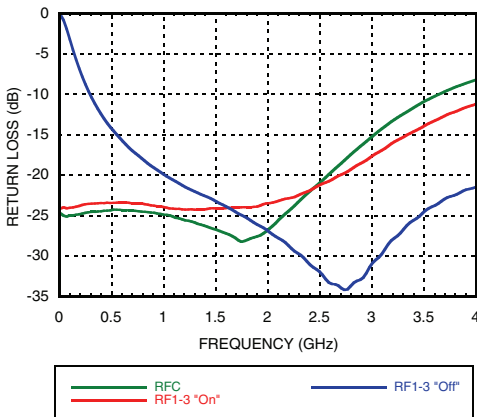
Insertion Loss vs. Temperature



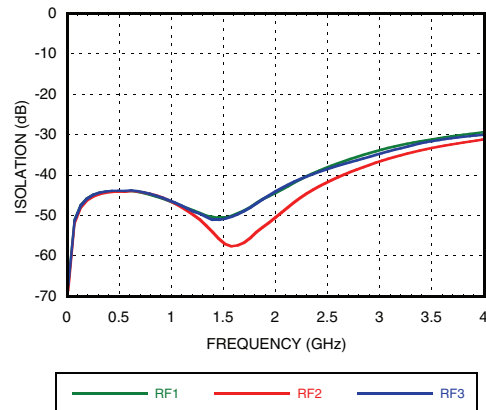
Isolation



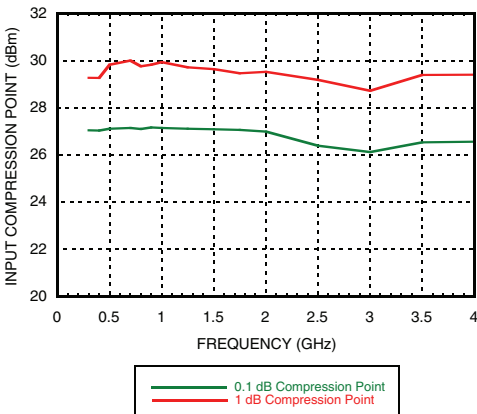
Return Loss



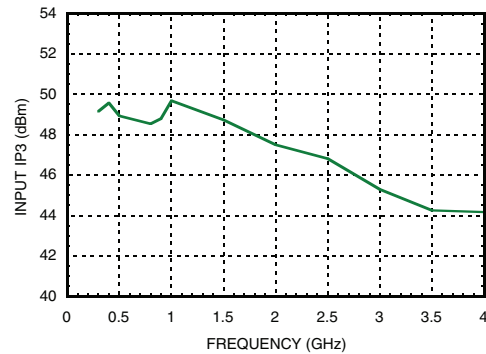
Off State Isolation



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point




**GaAs MMIC SP3T Non-REFLECTIVE
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Bias Voltage & Current

Vdd Range= +5 Vdc ±10%		
Vdd (Vdc)	Idd (Typ) (mA)	Idd (Max) (mA)
+5	2.2	6.0

TTL/CMOS Control Voltages

State	Bias Condition
Low	0 to +0.8 Vdc @ 0.2 μ A Typ.
High	+2.0 to +5 Vdc @ 35 μ A Typ.

Truth Table

Control Input		Signal Path State
A	B	RF COM to:
Low	Low	RF1
High	Low	RF2
Low	High	RF3
High	High	All Off

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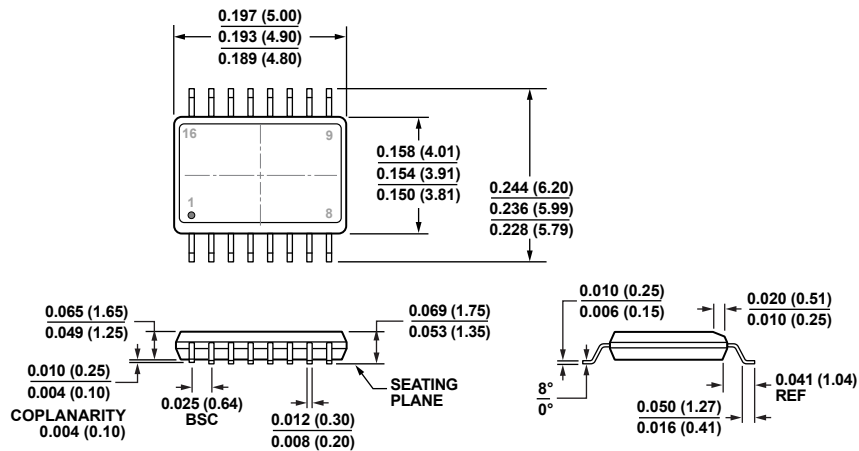
Absolute Maximum Ratings

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



COMPLIANT TO JEDEC STANDARDS MO-137-AB
CONTROLLING DIMENSIONS ARE IN INCHES; MILLIMETER DIMENSIONS
(IN PARENTHESES) ARE ROUNDED-OFF INCH EQUIVALENTS FOR
REFERENCE ONLY AND ARE NOT APPROPRIATE FOR USE IN DESIGN.

16-Lead Shrink Small Outline Package [QSOP]
(RQ-16)

Dimensions shown in inches and (millimeters)

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
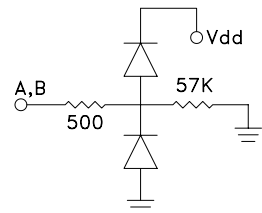
Package Information

Part Number	Package Body Material	Leadframe Plating	MSL Rating	Package Marking [2]
HMC245AQS16E	RoHS-compliant Low Stress Injection Molding Plastic Silica and Silicon Impregnated	100% Matte Tin	MSL1 [1]	H245A XXXX

[1] Max peak reflow temperature of 260 °C

[2] 4-Digit lot number XXXX


**GaAs MMIC SP3T Non-REFLECTIVE
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Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 6, 12, 14	RF3, RF2, RF1, RFC	This pin is DC coupled and matched to 50 Ohms. Blocking capacitors are required.	
2 - 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 \pm 10%	
9	B	See truth table and control voltage table.	
10	A	See truth table and control voltage table.	