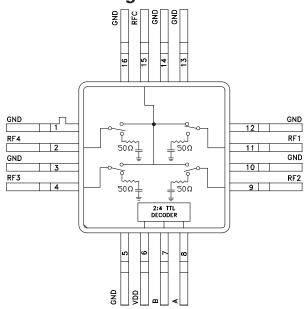


## Typical Applications

The HMC244G16 is ideal for:

- Telecom Infrastructure
- Military Radios, Radar & ECM
- Space Applications
- Test Instrumentation

## **Functional Diagram**



#### **Features**

Low Insertion Loss: 0.7 dB Non-Reflective Design Integrated 2:4 TTL Decoder

Single Positive Suppy: Vdd = +5V 16 Lead Hermetic SMT Package

### General Description

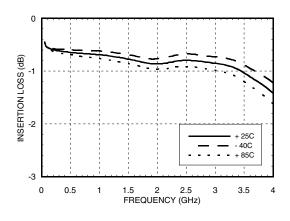
The HMC244G16 is a non-reflective SP4T switch in a 16 lead glass/metal (hermetic) package. Covering DC to 4.0 GHz, the switch offers 30~50 dB isolation and a low insertion loss of 0.7 dB through 3 GHz. A 2:4 TTL/CMOS compatable decoder is integrated on the switch requiring only 2 control lines and a positive 5V bias to select each path, replacing 8 control lines normally required by GaAs SP4T switches.

# Electrical Specifications, $T_A = +25^{\circ}$ C, With 0/+5V Control, 50 Ohm System

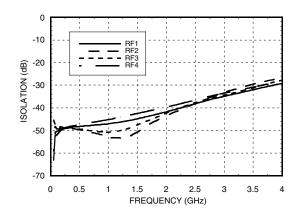
Parameter		Frequency	Min.	Тур.	Max.	Units
Insertion Loss		DC - 1.0 GHz DC - 3.0 GHz DC - 3.5 GHz DC - 4.0 GHz		0.6 0.7 1.0 1.4	0.9 1.0 1.4 1.8	dB dB dB dB
Isolation		DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz DC - 4.0 GHz	40 36 30 24	45 40 35 28		dB dB dB dB
Return Loss	"On State"	DC - 3.5 GHz DC - 4.0 GHz		18 13		dB dB
Return Loss	RF 1 -4 "Off State"	0.2 - 4.0 GHz 0.5 - 4.0 GHz		10 15		dB dB
Input Power for 1 dB Compression		0.5 - 4.0 GHz	21	25		dBm
Input Third Order Intercept (Two-Tone Input Power = +7 dBm Each Tone)		0.5 - 3.0 GHz 0.5 - 4.0 GHz	43 40	47 43		dBm dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)		DC - 4.0 GHz		40 150		ns ns



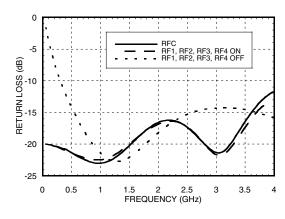
### Insertion Loss



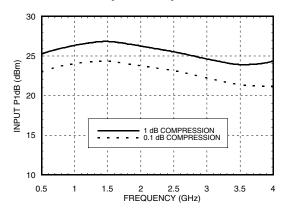
### Isolation



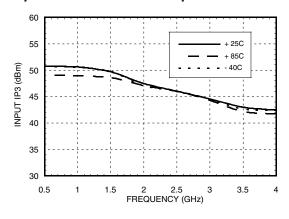
### Return Loss



### 0.1 and 1 dB Input Compression Point



### Input Third Order Intercept Point



## Bias Voltage & Current

Vdd Range= +5.0 Vdc ±10%			
Vdd (Vdc)	ldd (Typ) (mA)	Idd (Max) (mA)	
+5.0	3.0	7.0	

## TTL/CMOS Control Voltages

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



## 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)	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)

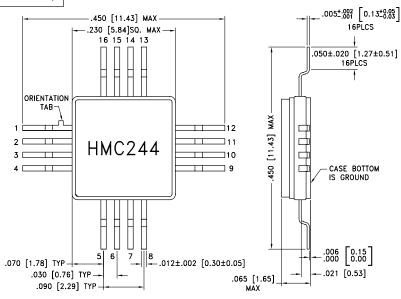
### Truth Table

Control Input		Signal Path State	
А	B RF COM to:		
Low	Low	RF1	
High	Low	RF2	
Low	High	RF3	
High	High	RF4	

## **Outline Drawing**

#### NOTES:

- PACKAGE MATERIAL: ALUMINA LOADED BOROSILICATE GLASS.
- 2. LEAD, BASE, COVER MATERIAL: KOVAR™ (#7052 CORNING).
- 3. PLATING: ELECTROLYTIC GOLD
  50 MICROINCHES MIN., OVER
  ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
- 4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
- 5. TOLERANCES: ±.005 [0.13] UNLESS OTHERWISE SPECIFIED.
- 6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.

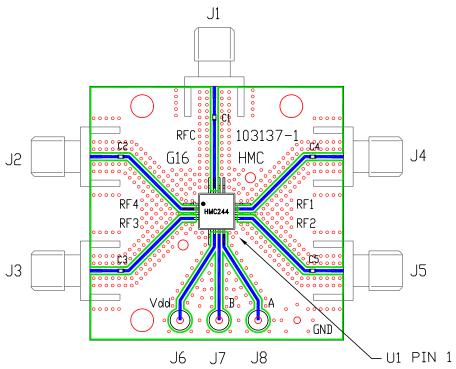


## Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 3, 5, 10, 12, 13, 14, 16	GND	Package bottom has exposed metal paddle that must also be connected to PCB RF ground.	<u> </u>
2, 4, 9, 11, 15	RF4, RF3, RF2, RF1, RFC	These pins are DC coupled and matched to 50 Ohms. Blocking capacitors are required.	
6	Vdd	Supply Voltage +5.0 Vdc ±10%	
7	В	See truth table and control voltage table.	Vdd 57K
8	А	See truth table and control voltage table.	A,B 0 500 =



### **Evaluation PCB**



#### List of Material

Item	Description	
J1 - J5	PC Mount SMA RF Connector	
J6 - J8	DC Pin	
C1 - C5	330 pF Capacitors, 0402 Pkg.	
U1	HMC244G16 SP4T Switch	
PCB*	103137 Evaluation PCB	
* 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 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.