WINSOURCE ELECTRONICS

THE DATASHEET OF

HMC347C8

HMC347C8

v01.0404

GaAs MMIC SMT HIGH ISOLATION SPDT SWITCH, DC - 8 GHz

Typical Applications

The HMC347C8 is ideal for:

- Telecom Infrastructure
- Microwave Radio & VSAT
- Military Radios, Radar & ECM
- Test Instrumentation

Features

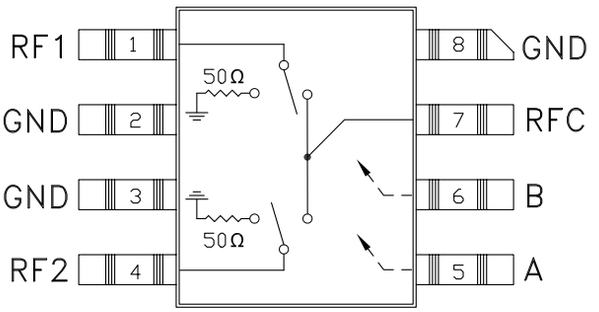
Isolation: 50 dB @ 2.5 GHz
36 dB @ 8 GHz

Insertion Loss: 2 dB Typical

Non-Reflective Design

Surface Mount Ceramic Package

Functional Diagram



General Description

The HMC347C8 is a broadband high isolation non-reflective GaAs MESFET SPDT switch in a non-hermetic surface mount ceramic package. Covering DC to 8 GHz, the switch features >50 dB isolation up to 2 GHz and >35 dB isolation up to 8 GHz. The switch operates using complementary negative control voltage logic lines of -5/0V and requires no bias supply. This SPDT is an excellent replacement for the HMC132C8 SPDT.

Electrical Specifications, T_A = +25° C, With 0/-5V Control, 50 Ohm System

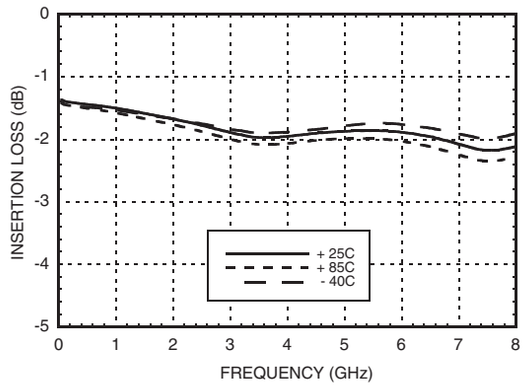
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz		1.7 2.0 2.4	2.0 2.4 2.8	dB dB dB
Isolation	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz	49 35 32	54 40 36		dB dB dB
Return Loss “On State”	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz	10 7 6	13 10 9		dB dB dB
Return Loss RF1, RF2 “Off State”	DC - 2.0 GHz DC - 6.0 GHz DC - 8.0 GHz		9 6 6		dB dB dB
Input Power for 1 dB Compression	0.5 - 8.0 GHz	19	23		dBm
Input Third Order Intercept (Two-Tone Input Power= +7 dBm Each Tone, 1 MHz Tone Separation)	0.5 - 8.0 GHz	38	43		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 8.0 GHz		 3 6		 ns ns

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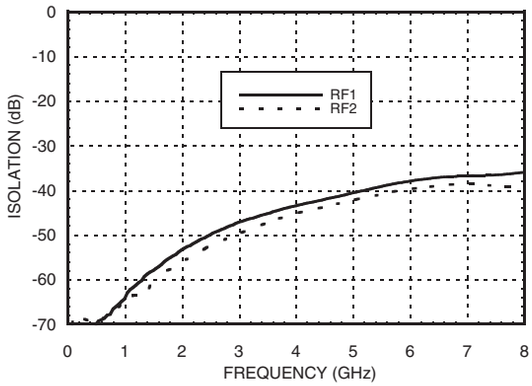
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GaAs MMIC SMT HIGH ISOLATION SPDT SWITCH, DC - 8 GHz

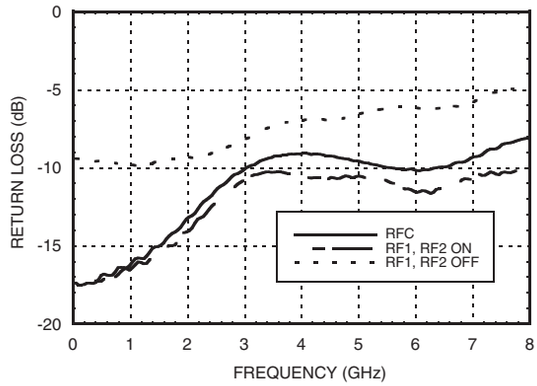
Insertion Loss



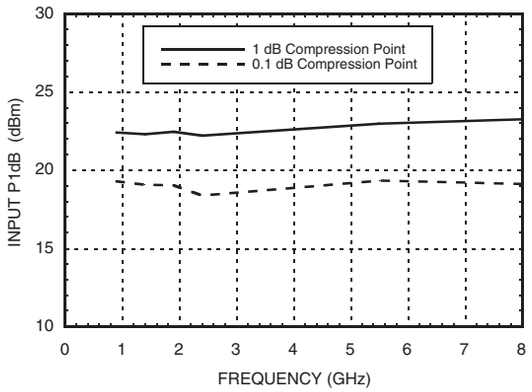
Isolation



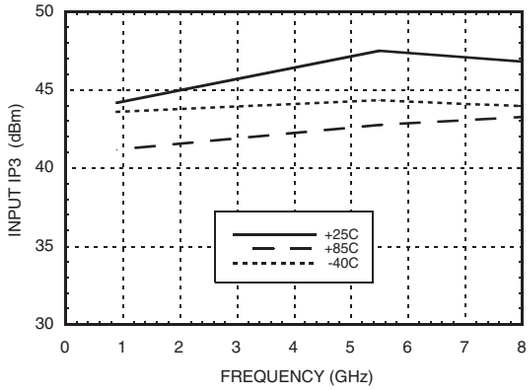
Return Loss



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point



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Absolute Maximum Ratings

RF Input Power (Vctl = -5V)	+27 dBm
Control Voltage Range (A & B)	+0.5V to -7.5 Vdc
Channel Temperature	150 °C
Thermal Resistance (Insertion Loss Path)	440 °C/W
Thermal Resistance (Terminated Path)	540 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C
ESD Sensitivity (HBM)	Class 1A

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Control Voltages

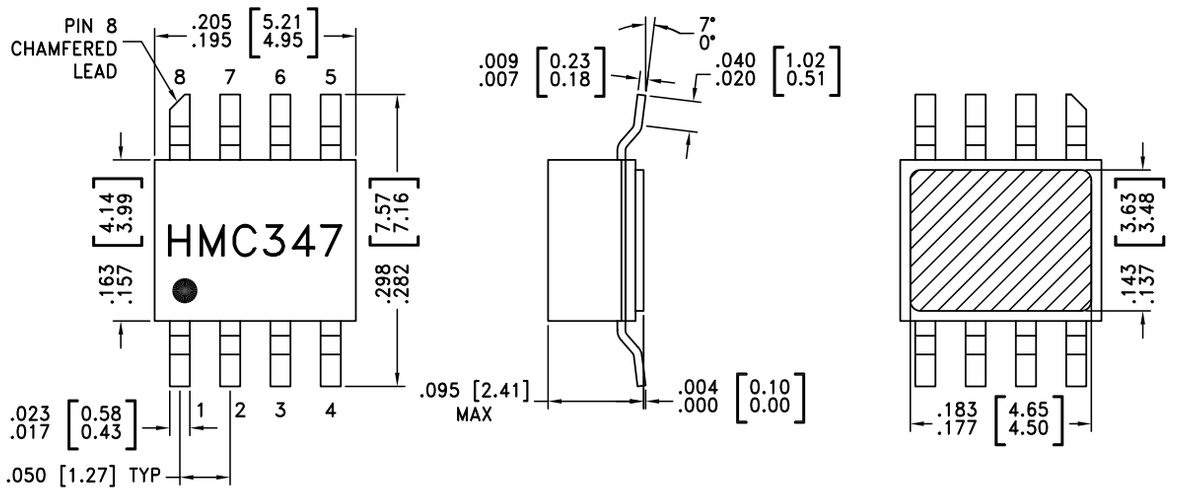
State	Bias Condition
Low	0 to -0.2V @ 10 uA Max.
High	-5V @ 10 uA Typ. to -7V @ 40 uA Typ. (± 0.5 Vdc)

Truth Table

Control Input		Signal Path State	
A	B	RFC to RF1	RFC to RF2
High	Low	On	Off
Low	High	Off	On

Caution: Do not "Hot Switch" power levels greater than +13 dBm (Vctl = 0/-5 Vdc).

Outline Drawing



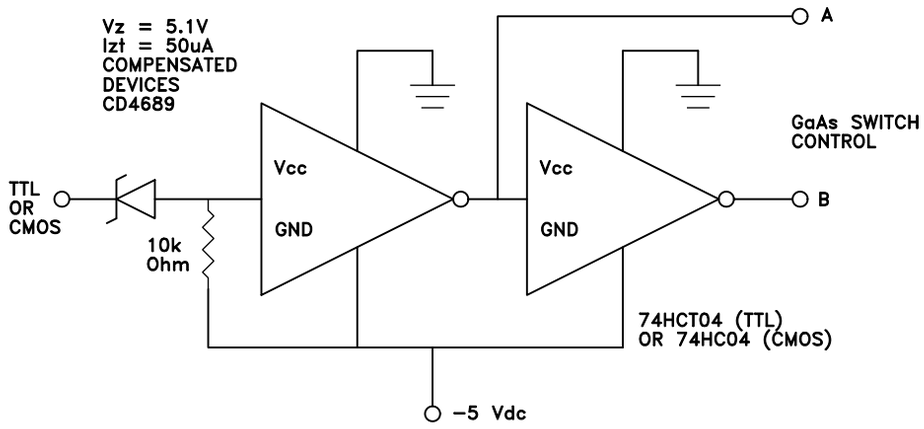
NOTES:

1. PACKAGE BODY MATERIAL: WHITE ALUMINA 92%
2. LEAD, PACKAGE BOTTOM MATERIAL: COPPER
3. PLATING: ELECTROLYTIC GOLD 100-200 MICROINCHES, OVER ELECTROLYTIC NICKEL 100-250 MICROINCHES.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. PACKAGE LENGTH AND WIDTH DIMENSIONS DO NOT INCLUDE LID SEAL PROTRUSION .005 PER SIDE.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.

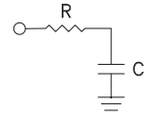
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Suggested Driver Circuit



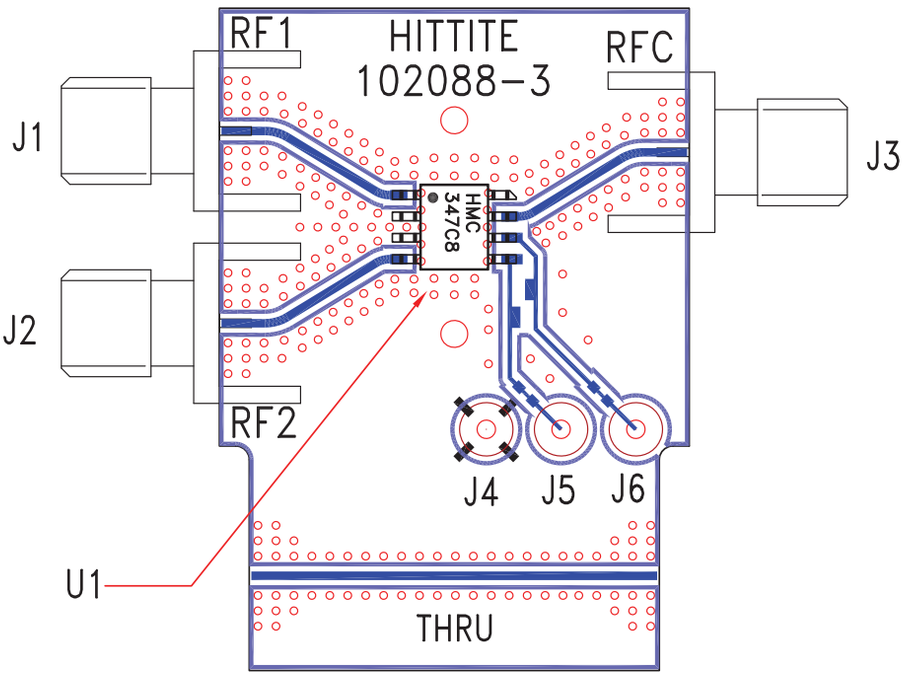
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 4, 7	RFC, RF1, RF2	This pin is DC coupled and matched to 50 Ohm. Blocking capacitors are required if RF line potential is not equal to 0V.	
2, 3, 8	GND	Package bottom must also be connected to PCB RF ground.	
5	CTLA	See truth table and control voltage table.	
6	CTLB	See truth table and control voltage table.	

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Evaluation PCB



List of Materials for Evaluation PCB 107261 [1]

Item	Description
J1 - J3	PCB Mount SMA RF Connector
J4 - J6	DC Pin
U1	HMC347C8 SPDT Switch
PCB [2]	102088 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 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.

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