

GaAs MMIC HERMETIC SMT SPDT SWITCH, DC - 8.0 GHz

Typical Applications

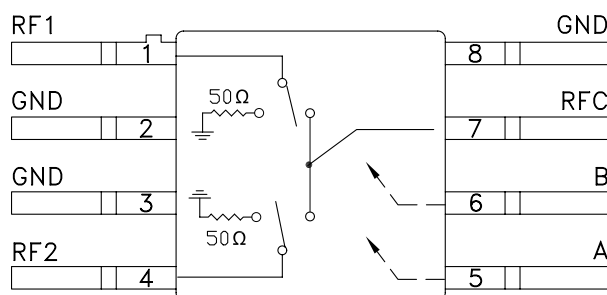
The HMC347G8 is ideal for:

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

Features

- Isolation: 42 dB @ 2.5 GHz
30 dB @ 6.0 GHz
- Insertion Loss: 2.0 dB @ 6.0 GHz
- Non-Reflective Design
- 8 Lead Hermetic SMT Package

Functional Diagram



General Description

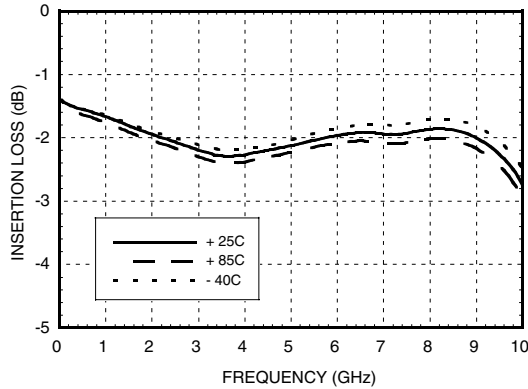
The HMC347G8 is a broadband high isolation non-reflective GaAs MESFET SPDT switch in a 8 lead glass/metal (hermetic) surface mount package. Covering DC to 8.0 GHz, the switch features >42 dB isolation up to 2 GHz and >25 dB isolation up to 8.0 GHz. The switch operates using complementary negative control voltage logic lines of -5/0V and requires no bias supply. This SPDT is a good replacement for the HMC132G7 SPDT.

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

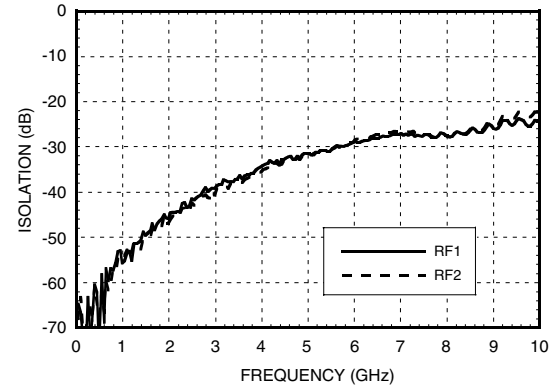
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 2.0 GHz		2.0	2.3	dB
	DC - 6.0 GHz		2.2	2.6	dB
	DC - 8.0 GHz		2.2	2.7	dB
Isolation	DC - 2.0 GHz	41	45		dB
	DC - 6.0 GHz	27	30		dB
	DC - 8.0 GHz	25	28		dB
Return Loss	"On State"	DC - 2.0 GHz	9	12	dB
		DC - 8.0 GHz	6	10	dB
Return Loss RF1, RF2	"Off State"	DC - 2.0 GHz	9		dB
		DC - 8.0 GHz	6		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	DC - 8.0 GHz		3		ns
			6		ns

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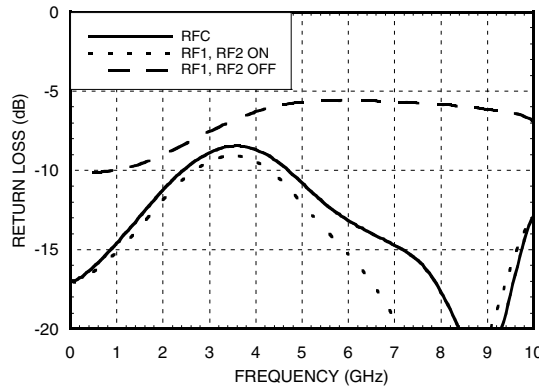
Insertion Loss



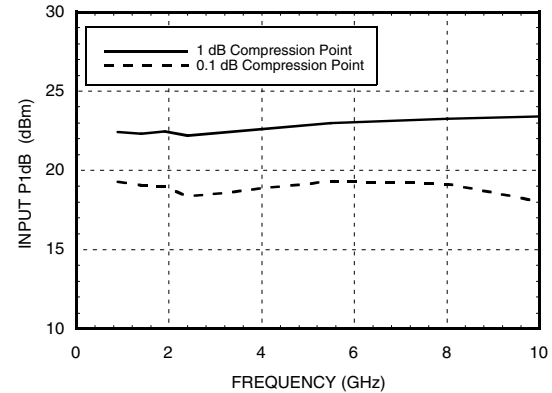
Isolation



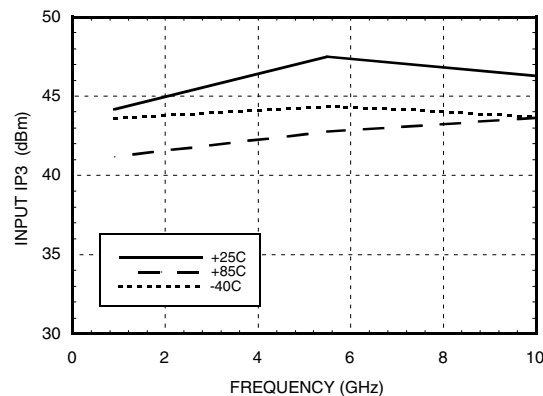
Return Loss



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point



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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)

Absolute Maximum Ratings

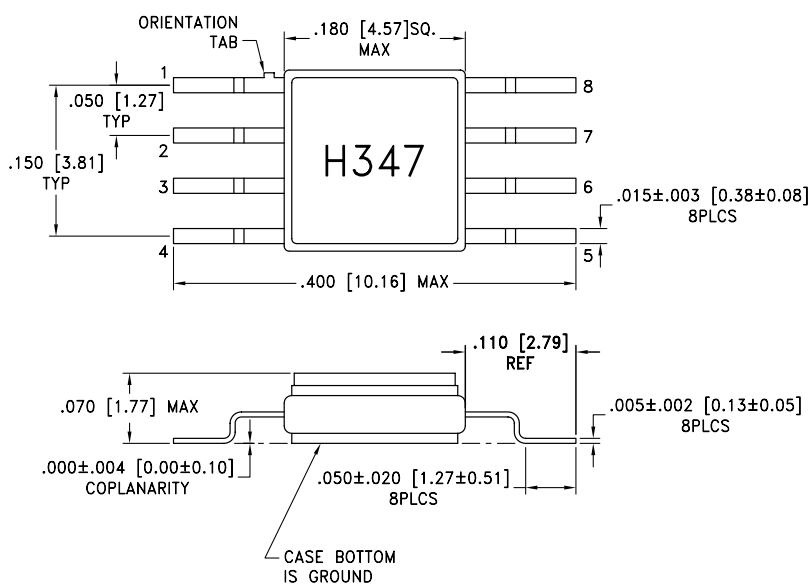
RF Input Power ($V_{ctl} = -5V$)	+27 dBm
Control Voltage Range (A & B)	+0.5V to -7.5 Vdc
Channel Temperature	150 °C
Thermal Resistance (Insertion Loss Path)	440 °C/W
Thermal Resistance (Terminated Path)	540 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

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 ($V_{ctl} = 0/-5$ Vdc).

Outline Drawing

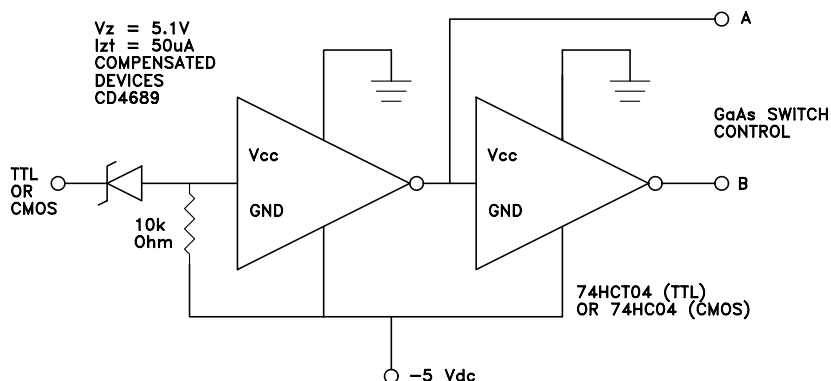


NOTES:

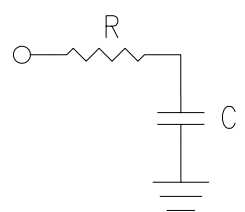
1. PACKAGE MATERIAL: ALUMINA LOADED BOROSILICATE GLASS.
2. LEAD, BASE, COVER MATERIAL: KOVAR™ (#7052 CORNING).
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 50 MICROINCHES MIN.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES: $\pm .005$ [0.13] UNLESS OTHERWISE SPECIFIED.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

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Suggested Driver Circuit

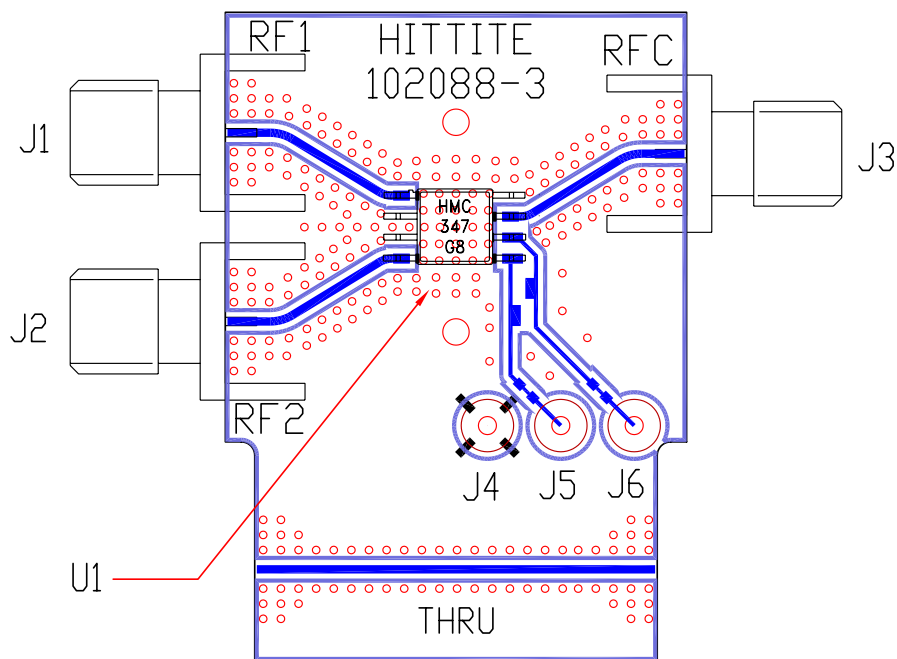


Pin Descriptions

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 Material

Item	Description
J1 - J3	PC Mount SMA RF Connector
J4 - J6	DC Pin
U1	HMC347G8 SPDT Switch
PCB*	102088-3 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.

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Notes: