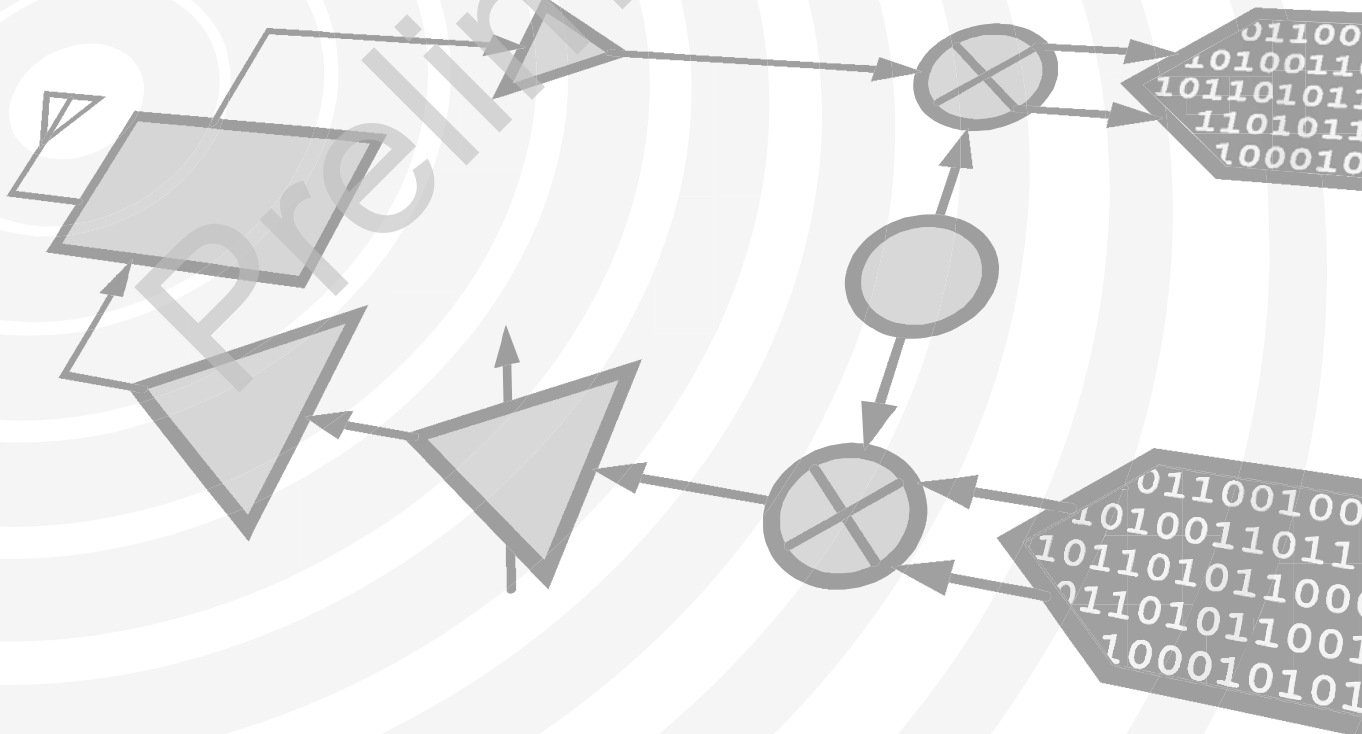


Analog Devices Welcomes Hittite Microwave Corporation



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Preliminary

GaAs MMIC SPDT NON-REFLECTIVE SWITCH, DC - 28.0 GHz

Typical Applications

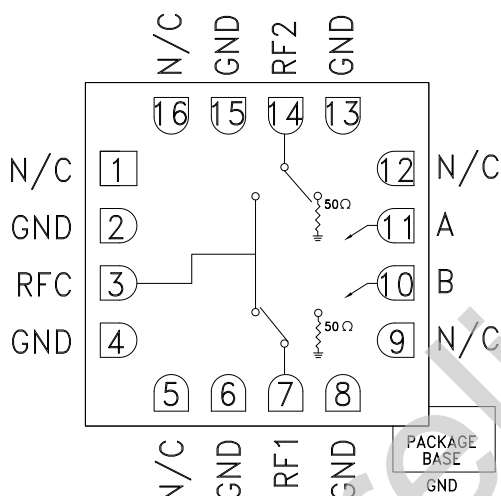
The HMC547ALC3 is ideal for:

- Fiber Optics & Broadband Telecom
- Microwave Radio & VSAT
- Military Radios, Radar, & ECM
- Test Instrumentation

Features

- High Isolation: 45 dB @ 10 GHz
40 dB @ 20 GHz
- Low Insertion Loss: 1.6 dB @ 10 GHz
1.9 dB @ 20 GHz
- Fast Switching: 6 ns
- Non-Reflective Design
- 16 Lead Ceramic 3x3 mm SMT Package: 9mm²

Functional Diagram



General Description

The HMC547ALC3 is a general purpose broadband high isolation non-reflective GaAs MESFET SPDT switch in a ceramic 3x3 mm leadless surface mount package. Covering DC to 28.0 GHz, the switch offers over 40 dB isolation and less than 2 dB insertion loss at midband. The wide bandwidth, fast switching, and compact size make this absorptive SPDT ideal for military EW/ECM and test equipment applications. The switch operates using complementary negative control voltage logic lines of -5/0V and requires no bias supply.

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

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 10.0 GHz		1.6	2.2	dB
	10.0 - 20.0 GHz		1.9	2.5	dB
	20.0 - 28.0 GHz		2.4	3.0	dB
Isolation	DC - 10.0 GHz	40	45		dB
	10.0 - 20.0 GHz	34	40		dB
	20.0 - 28.0 GHz	30	34		dB
Return Loss "On State"	DC - 28.0 GHz		17		dB
Return Loss RF1, RF2 "Off State"	DC - 10.0 GHz		25		dB
	10.0 - 20.0 GHz		15		dB
	20.0 - 28.0 GHz		8		dB
Input Power for 1 dB Compression	DC - 0.5 GHz		16		dBm
	0.5 - 28.0 GHz	20	23		dBm
Input Third Order Intercept (Two-Tone Input Power= +7 dBm Each Tone)	DC - 0.5 GHz		26		dBm
	0.5 - 28.0 GHz		46		dBm
Switching Characteristics	DC - 28.0 GHz	tRISE, tFALL (10/90% RF)	3		ns
		tON, tOFF (50% CTL to 10/90% RF)	6		ns

**GaAs MMIC SPDT NON-REFLECTIVE
SWITCH, DC - 28.0 GHz**
Absolute Maximum Ratings

RF Input Power (A,B = 0V/-5V)	+25 dBm
Control Voltage Range (A & B)	+5.0V to -7.5V
Hot Switch Power Level (A,B = 0V/-5V)	+22 dBm
Channel Temperature	150 °C
Continuous Pdiss (T=85°C) (derate 3.3 mW/°C above 85°C) (Insertion Loss Path)	0.215 W
Thermal Resistance (Insertion Loss Path)	302 °C/W
Continuous Pdiss (T=85°C) (derate 5.6 mW/°C above 85°C) (Terminated Path)	0.363 W
Thermal Resistance (Terminated Path)	179 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

Control Voltages

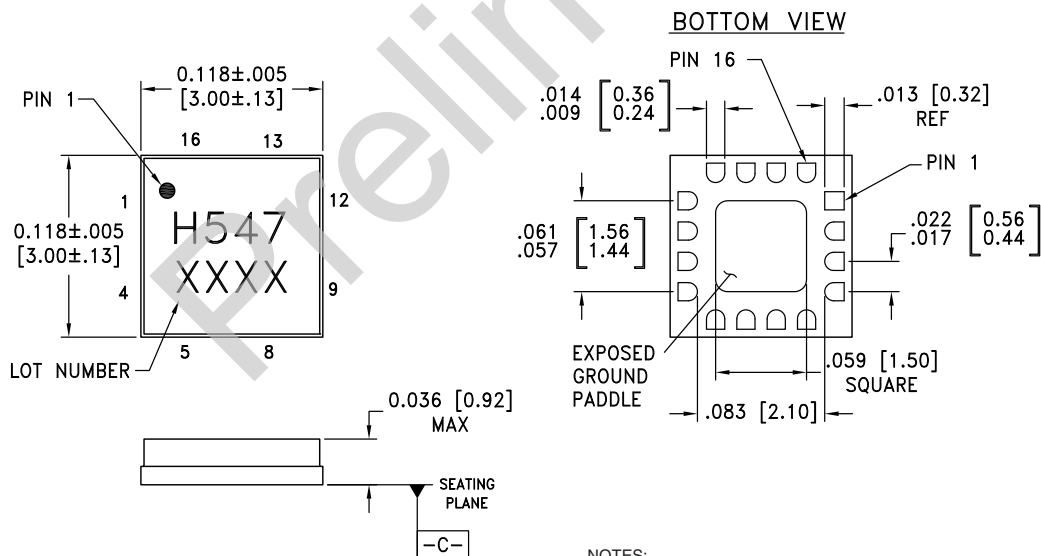
State	Bias Condition
Low	0 to -0.5V @ 10 uA Max.
High	-5V @ 3 uA Typ. to -7V @ 10 uA Typ. (± 0.5V)

Truth Table

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



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing

NOTES:

1. PACKAGE BODY MATERIAL: ALUMINA.
2. LEAD AND GROUND PADDLE PLATING: GOLD FLASH OVER NICKEL.
3. DIMENSIONS ARE IN INCHES (MILLIMETERS).
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
5. PACKAGE WARP SHALL NOT EXCEED 0.05MM DATUM .
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.