HMC849ALP4CE

v01.0818

HIGH ISOLATION SPDT NON-REFLECTIVE SWITCH, DC - 6 GHz

Typical Applications

The HMC849ALP4CE is ideal for:

- Cellular/4G Infrastructure
- WiMAX, WiBro & Fixed Wireless
- Automotive Telematics
- Mobile Radio
- Test Equipment

Features

High Isolation: up to 60 dB

Single Positive Control: 0/+3V to +5V

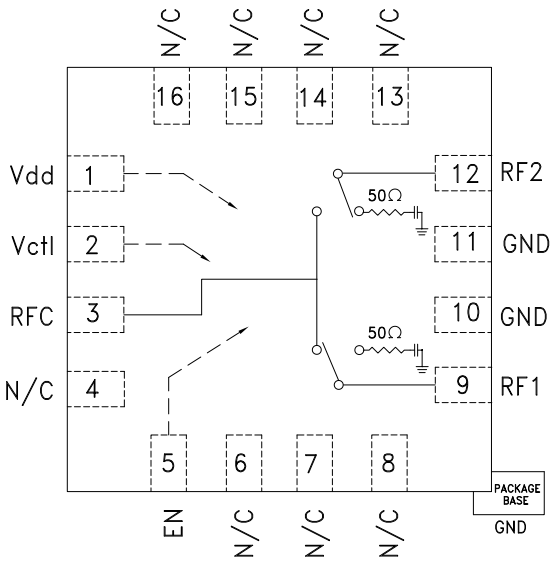
High Input IP3: +52 dBm

Non-Reflective Design

"All Off" State

16 Lead 4x4 mm QFN Package: 16 mm²

Functional Diagram



General Description

The HMC849ALP4CE is a high isolation non-reflective DC to 6 GHz GaAs pHEMT SPDT switch in a low cost leadless surface mount package. The switch is ideal for cellular/WiMAX/4G Infrastructure applications yielding up to 60 dB isolation, low 0.8 dB insertion loss and +52 dBm input IP3. Power handling is excellent up through the 5 - 6 GHz WiMAX band with the switch offering a P1dB compression point of +31 dBm. On-chip circuitry allows a single positive voltage control of 0/+3V or 0/+5V at very low DC currents. An enable input (EN) set to logic high will put the switch in an "all off" state.

Electrical Specifications, T_A = +25 °C, Vctl = 0/Vdd, Vdd = +3V to +5V, 50 Ohm System

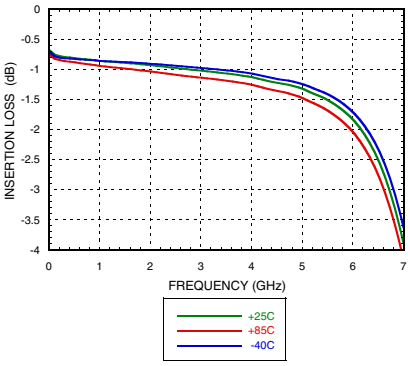
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 2.0 GHz 2.0 - 4.0 GHz 4.0 - 6.0 GHz		0.9 1.0 1.8	1.3 1.5 2.5	dB dB
Isolation (RFC to RF1/RF2)	DC - 2.0 GHz 2.0 - 4.0 GHz 4.0 - 6.0 GHz	53 48 35	60 56 50		dB dB
Return Loss (On State)	DC - 4.0 GHz 4.0 - 6.0 GHz		17 14		dB dB
Return Loss (Off State)	DC - 6.0 GHz		15		dB
Input Power for 1 dB Compression +3V +5V	0.35 - 6.0 GHz	24 30	27 33		dBm dBm
Input Third Order Intercept (Two-Tone Input Power = +10 dBm Each Tone)	DC - 6.0 GHz		52		dBm
Switching Speed tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 6.0 GHz		 60 150	 600	 ns ns

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

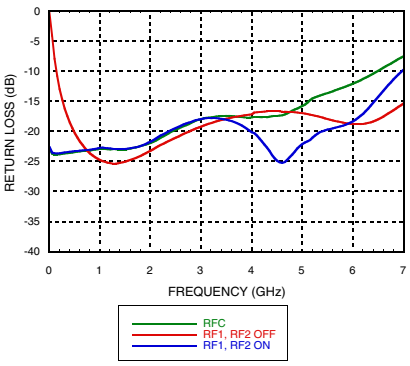
RoHS✓ EARTH FRIENDLY

HIGH ISOLATION SPDT NON-REFLECTIVE SWITCH, DC - 6 GHz

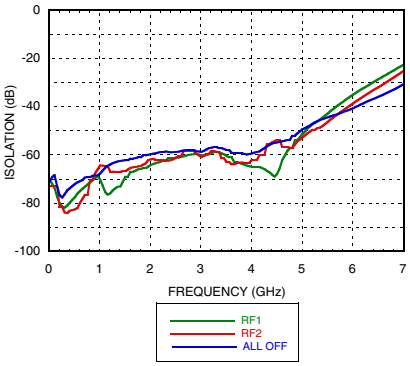
Insertion Loss



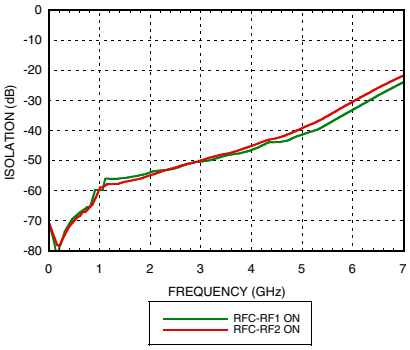
Return Loss [1]



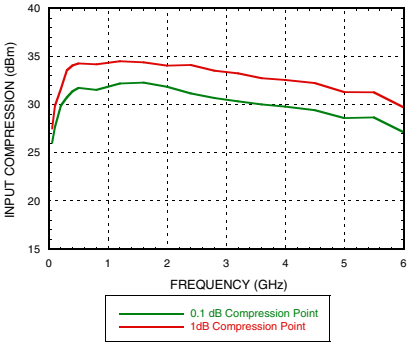
Isolation Between Ports RFC and RF1 / RF2



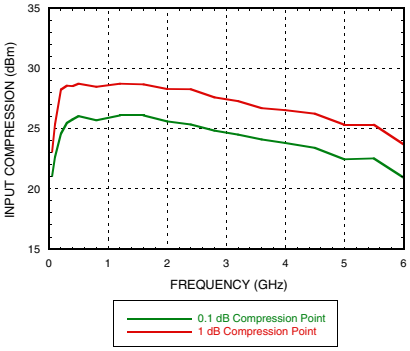
Isolation Between Ports RF1 and RF2



0.1 and 1 dB Input Compression Point, Vdd = 5V, Linear



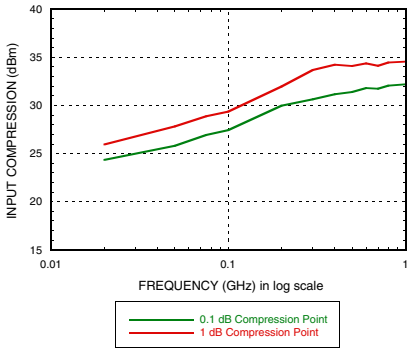
0.1 and 1 dB Input Compression Point, Vdd = 3V, Linear



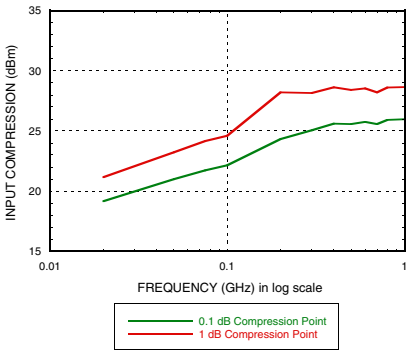
[1] RFC is reflective in “all off” state.

HIGH ISOLATION SPDT NON-REFLECTIVE SWITCH, DC - 6 GHz

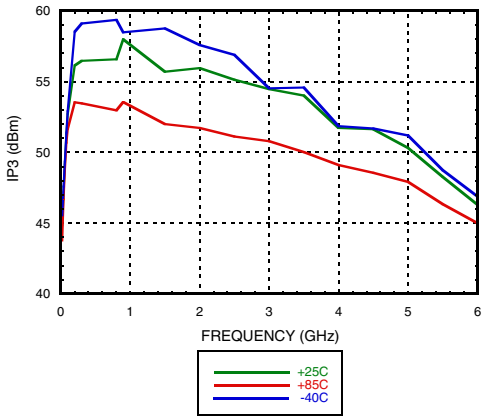
0.1 and 1 dB Input Compression Point, Vdd = 5V



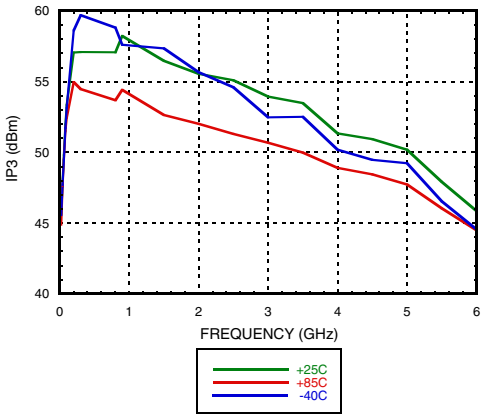
0.1 and 1 dB Input Compression Point, Vdd = 3V



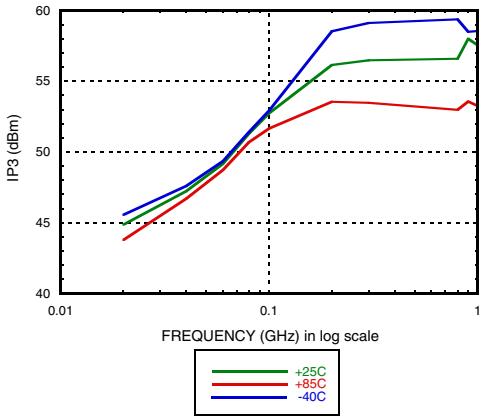
Input Third Order Intercept Point, Vdd = 5V, Linear



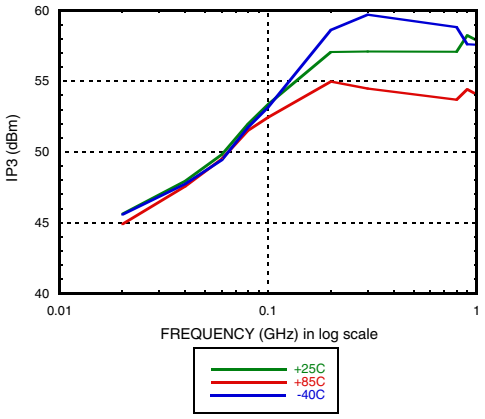
Input Third Order Intercept Point, Vdd = 3V, Linear



Input Third Order Intercept Point, Vdd = 5V



Input Third Order Intercept Point, Vdd = 3V



RoHS✓ EARTH FRIENDLY

HIGH ISOLATION SPDT NON-REFLECTIVE SWITCH, DC - 6 GHz

Absolute Maximum Ratings

Bias Voltage (Vdd)	7V
Control Voltage (Vctl, EN)	-1V to Vdd +1V
RF Input Power *	
Through Path 3V/5V	31 / 33 dBm
Termination Path 3V/5V	26.5 dBm
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C) (derate 14.9 mW/°C for through path, and 6.9 mW/°C for termination path above 85 °C)	
Through Path	0.969 W
Termination Path	0.451 W
Thermal Resistance (channel to package bottom)	
Through Path	67.1 °C/W
Termination Path	144.2°C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

* The RF input power is quite lower than the breakdown power levels. Hence, the only concern with this product is the thermal limit.

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Bias Voltage & Current

Vdd (V)	Idd (Typ.) (mA)
3	1.2
5	1.3

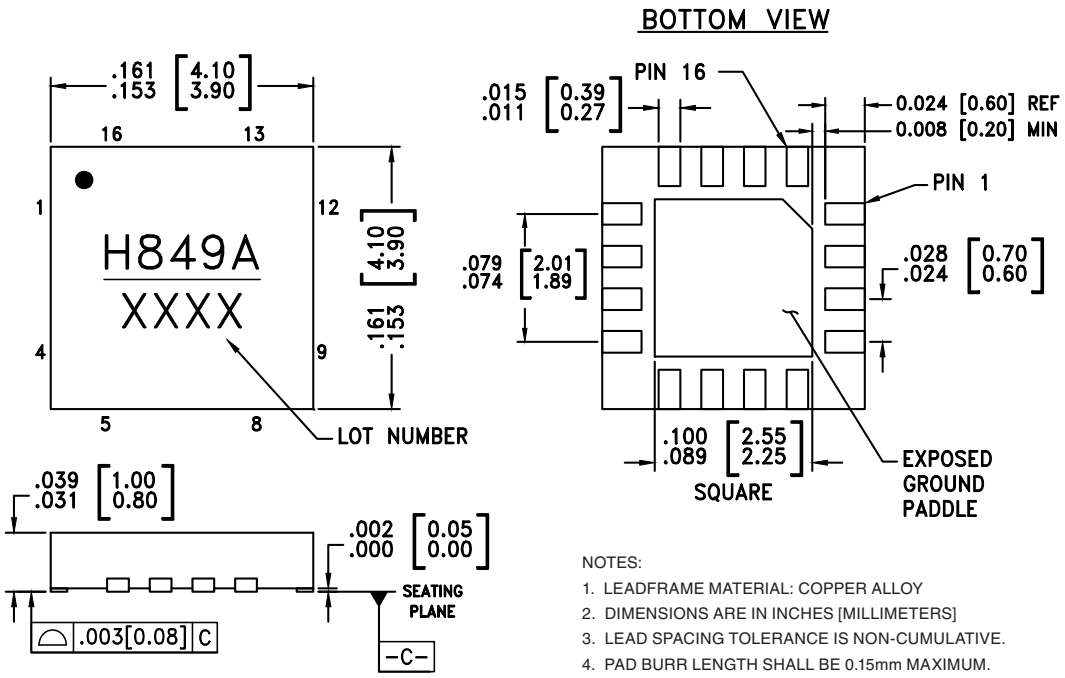
Digital Control Voltages

State	Bias Condition
Low	0 to +0.8 Vdc @ <1 µA Typical
High	+2.0 to +5.0 Vdc @ 40 µA Typical

Truth Table

Control Input		Signal Path State	
Vctl	EN	RFC - RF1	RFC - RF2
Low	Low	OFF	ON
High	Low	ON	OFF
Low	High	OFF	OFF
High	High	OFF	OFF

Outline Drawing



NOTES:

1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
7. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED LAND PATTERN.

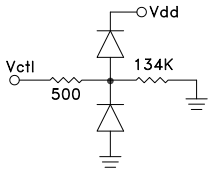
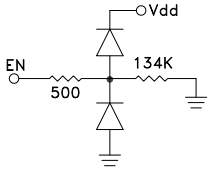
Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [1]
HMC849ALP4CE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 [2]	H849A XXXX

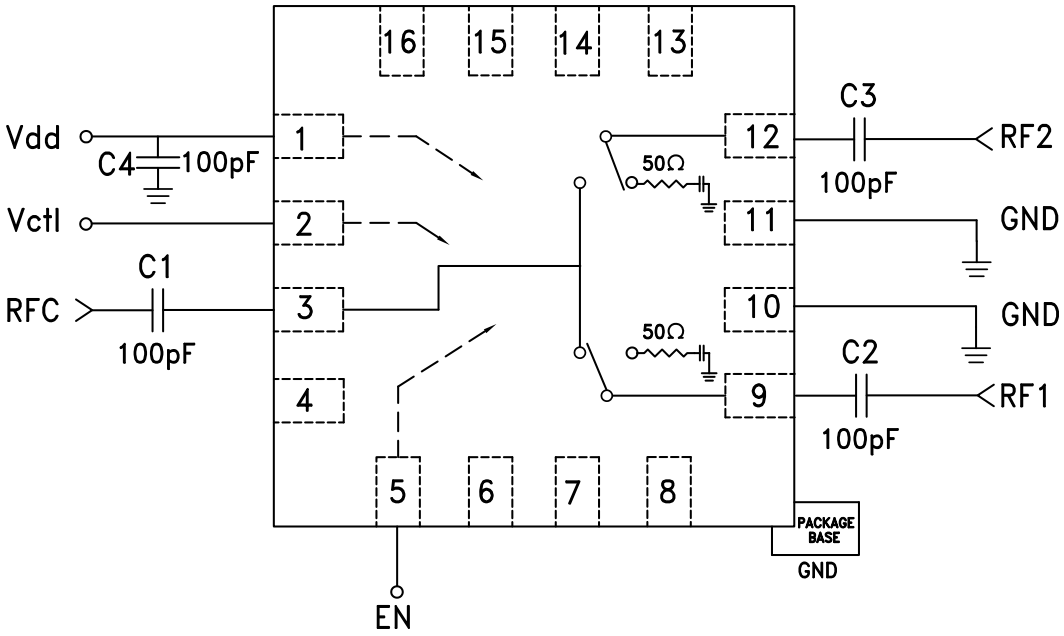
[1] 4-Digit lot number XXXX

[2] Max peak reflow temperature of 260 °C

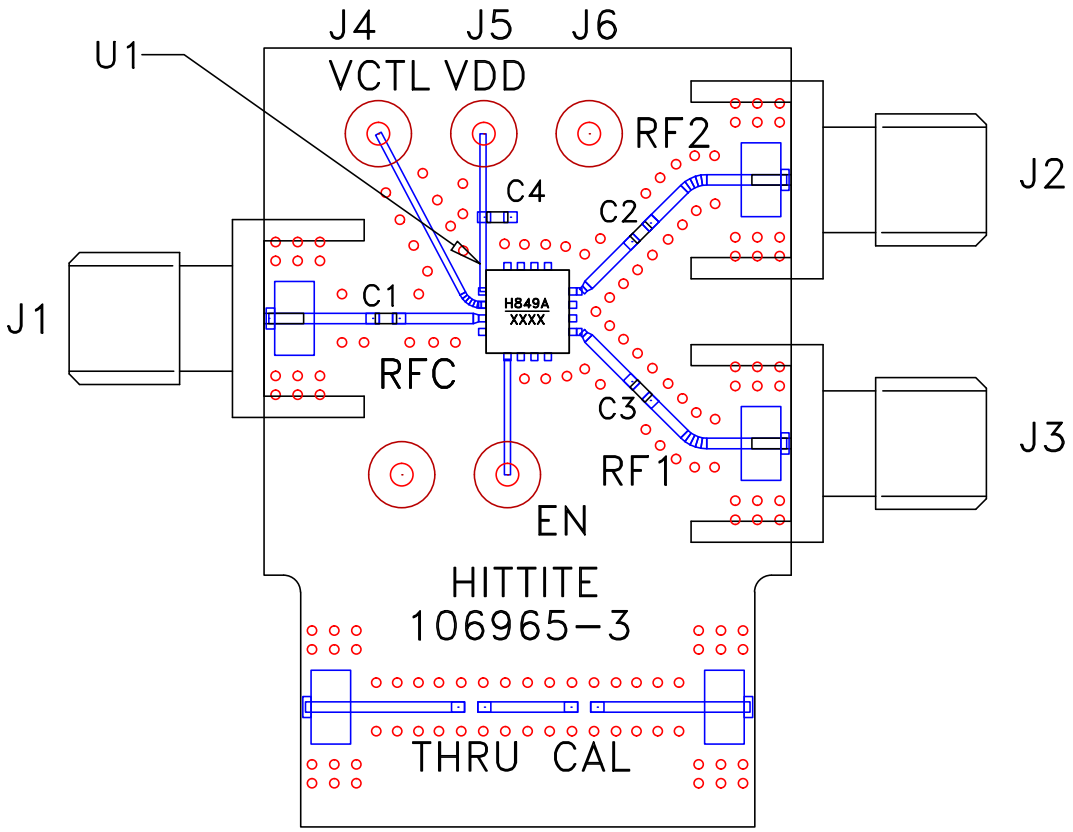
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	Vdd	Supply Voltage.	
2	Vctl	Control input. See truth and control voltage tables.	
3, 9, 12	RFC, RF1, RF2	These pins are DC coupled and matched to 50 Ohms. Blocking capacitors are required.	
4, 6, 7, 8, 13, 14, 15, 16	N/C	The pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	
5	EN	Enable. See truth and control voltage tables.	
10, 11	GND	Package bottom must also be connected to PCB RF ground.	

Application Circuit



Evaluation PCB



List of Materials for Evaluation PCB EV1HMC849ALP4C [1]

Item	Description
J1 - J3	PC Mount SMA RF Connector
J4 - J8	DC Pin
C1 - C4	100 pF Capacitor, 0402 Pkg.
U1	HMC849ALP4CE SPDT Switch
PCB [2]	106965 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350 or Arlon 25FR

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 backside ground slug should be connected directly to the ground plane similar to that shown above. The evaluation circuit board shown above is available from Analog Devices, upon request.

RoHS✓ EARTH FRIENDLY

Notes:

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for RF Development Tools ***category:***

Click to view products by Analog Devices ***manufacturer:***

Other Similar products are found below :

MAAM-011117 MAAP-015036-DIEEV2 EV1HMC1113LP5 EV1HMC6146BLC5A EV1HMC637ALP5 EVAL-ADG919EBZ ADL5363-EVALZ LMV228SDEVAL SKYA21001-EVB SMP1331-085-EVB EV1HMC618ALP3 EVAL01-HMC1041LC4 MAAL-011111-000SMB MAAM-009633-001SMB 107712-HMC369LP3 107780-HMC322ALP4 SP000416870 EV1HMC470ALP3 EV1HMC520ALC4 EV1HMC244AG16 124694-HMC742ALP5 SC20ASATEA-8GB-STD MAX2837EVKIT+ MAX2612EVKIT# MAX2692EVKIT# SKY12343-364LF-EVB 108703-HMC452QS16G EV1HMC863ALC4 EV1HMC427ALP3E 119197-HMC658LP2 EV1HMC647ALP6 ADL5725-EVALZ 106815-HMC441LM1 EV1HMC1018ALP4 UXN14M9PE MAX2016EVKIT EV1HMC939ALP4 MAX2410EVKIT MAX2204EVKIT+ EV1HMC8073LP3D SIMSA868-DKL SIMSA868C-DKL SKY65806-636EK1 SKY68020-11EK1 SKY67159-396EK1 SKY66181-11-EK1 SKY65804-696EK1 SKY13396-397LF-EVB SKY13380-350LF-EVB SKY13373-460LF-EVB