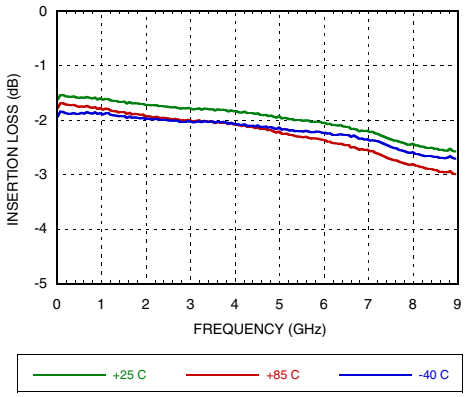
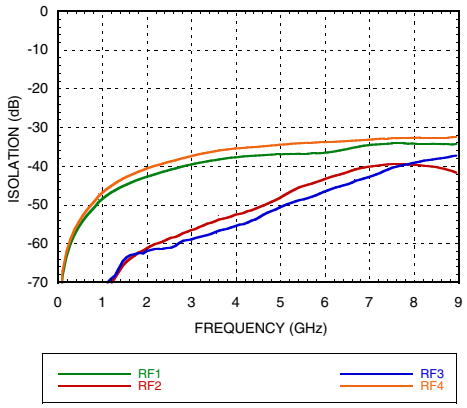
RoHS✓ EARTH FRIENDLY

GaAs MMIC SP4T NON-REFLECTIVE POSITIVE CONTROL SWITCH, DC* - 8 GHz

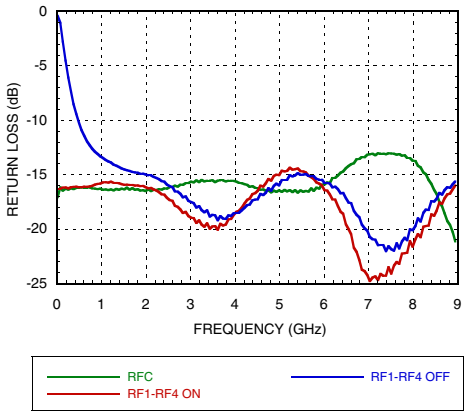
Insertion Loss vs. Temperature



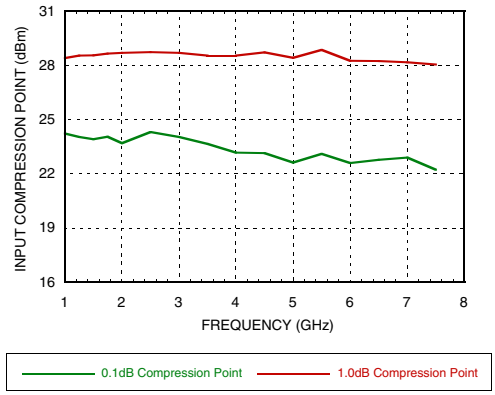
Isolation



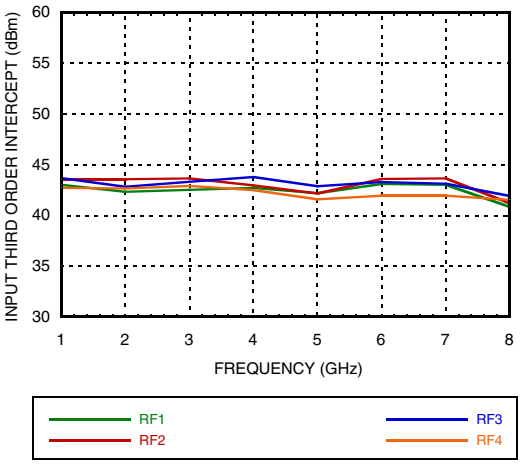
Return Loss



0.1 and 1 dB Input Compression Point



Input Third Order Intercept Point



GaAs MMIC SP4T NON-REFLECTIVE POSITIVE CONTROL SWITCH, DC* - 8 GHz

Absolute Maximum Ratings

Bias Voltage Range (Vdd)	+7.0 Vdc
Control Voltage Range (A & B)	-0.5V to Vdd +1.0 Vdc
Channel Temperature	150 °C
Thermal Resistance (Insertion Loss Path)	154 °C/W
Thermal Resistance (Terminated Path)	228 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Maximum Input Power	+24 dBm
ESD Sensitivity (HBM)	Class 1A

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Bias Voltage & Current

Vdd Range = +5 Vdc ± 10%		
Vdd (Vdc)	Idd (Typ.) (mA)	Idd (Max.) (mA)
+5	2.5	6.0

Control Voltages

State	Bias Condition
Low	0 to +0.8 Vdc @ 1 µA Typical
High	+2.0 to +5 Vdc @ 50 µA Typical

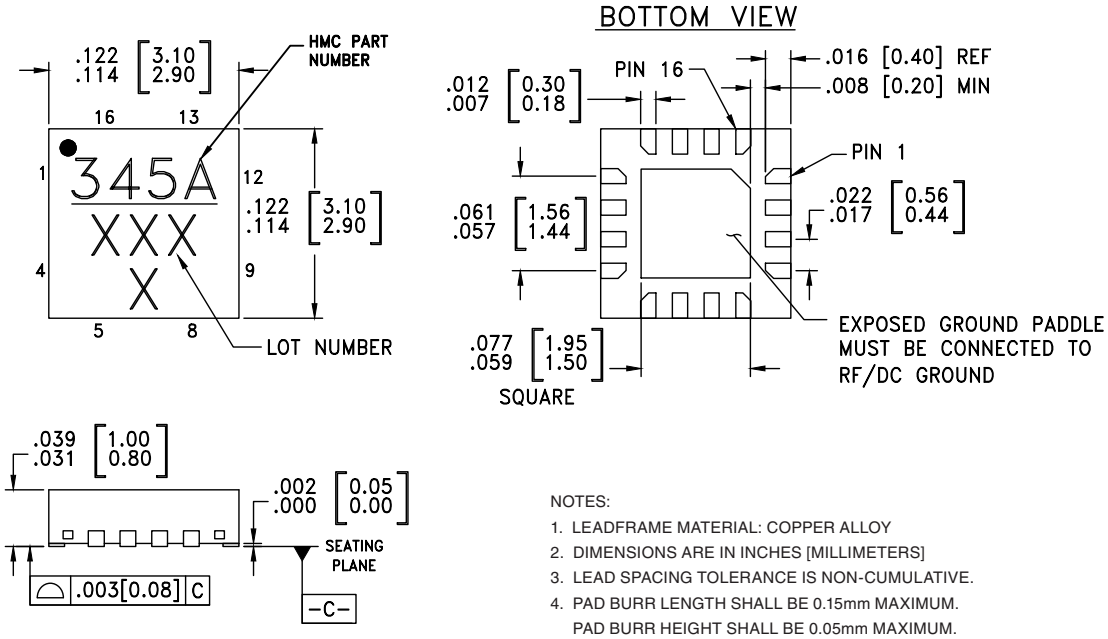
Truth Table

Control Input		Signal Path State
A	B	RFCOM to:
Low	Low	RF1
High	Low	RF2
Low	High	RF3
High	High	RF4

Note: DC blocking capacitors are required at ports RFC and RF1, 2, 3, & 4. Their value will determine the lowest transmission frequency.

GaAs MMIC SP4T NON-REFLECTIVE POSITIVE CONTROL SWITCH, DC* - 8 GHz

Outline Drawing



NOTES:

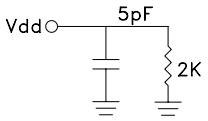
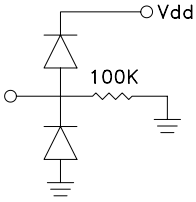
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED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

Package Information

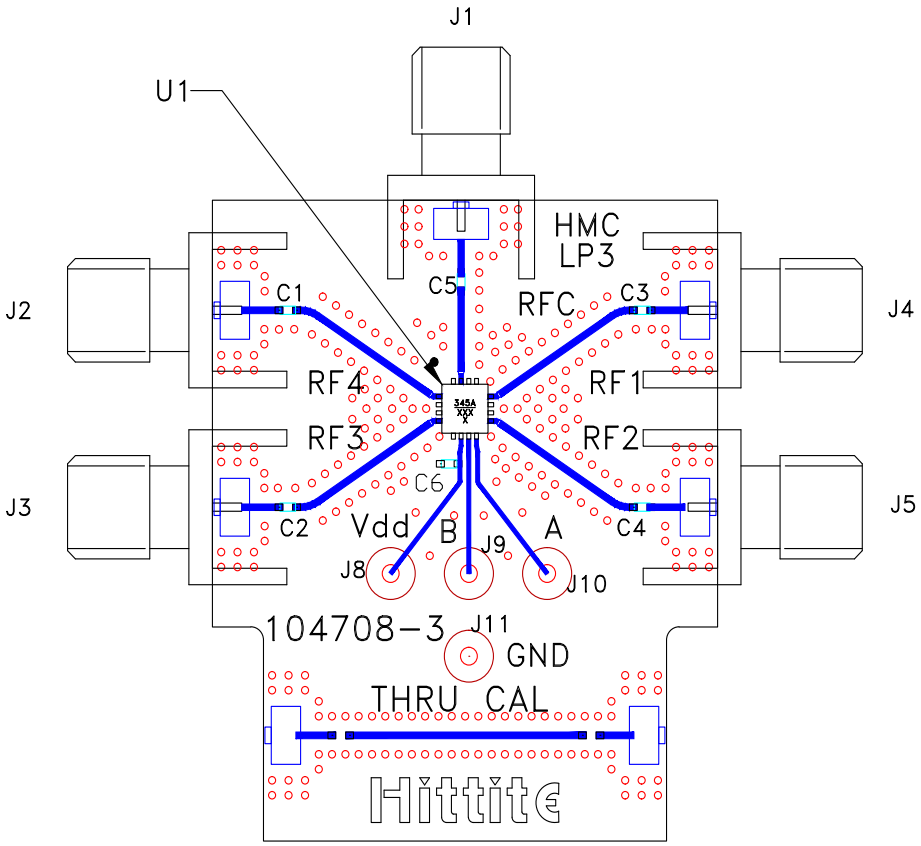
Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [2]
HMC345ALP3E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 [1]	345A XXXX

[1] Max peak reflow temperature of 260 °C
[2] 4-Digit lot number XXXX

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 4, 9, 12, 15	RF4, RF3, RF2, RF1, RFC	This pin is DC coupled and matched to 50 Ohm. Blocking capacitors are required.	
2, 3, 10, 11, 13	N/C	This pin should be connected to PCB RF ground to maximize isolation.	
5, 14, 16	GND	Package bottom has exposed metal paddle that must also be connected to PCB RF ground.	
6	VDD	Supply Voltage +5V ± 10%	
7	CTLB	See truth table and control voltage table.	
8	CTLA	See truth table and control voltage table.	

Evaluation PCB



List of Materials for Evaluation PCB EV1HMC345ALP3[1]

Item	Description
J1 - J5	PCB Mount SMA RF Connector
J8 - J11	DC Pin
C1 - C5	100 pF Capacitor, 0402 Pkg.
C6	1k pF Capacitor, 0402 Pkg.
U1	HMC345ALP3E SP4T Switch
PCB [2]	104708 Evaluation PCB 1.29"x1.55"

[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 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.