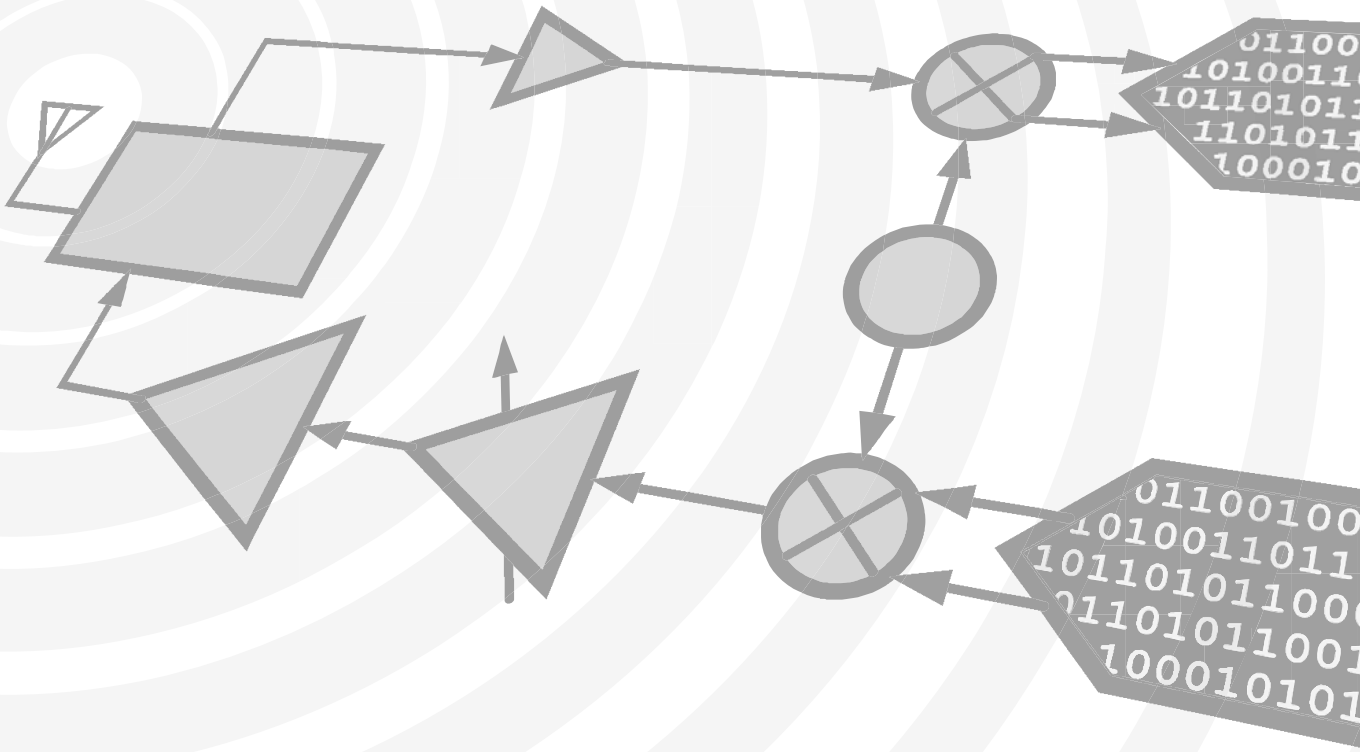
ANALOG DEVICES

Hittite MICROWAVE PRODUCTS FROM ANALOG DEVICES

Analog Devices Welcomes Hittite Microwave Corporation

NO CONTENT ON THE ATTACHED DOCUMENT HAS CHANGED



www.analog.com

www.hittite.com

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HMC341LC3B

SMT GaAs PHEMT MMIC LOW NOISE AMPLIFIER, 21 - 29 GHz

Typical Applications

The HMC341LC3B is ideal for:

- Point-to-Point Radios
- Point-to-Multi-Point Radios & VSAT
- Test Equipment & Sensors
- Military End-Use

Features

2.5 dB Noise Figure

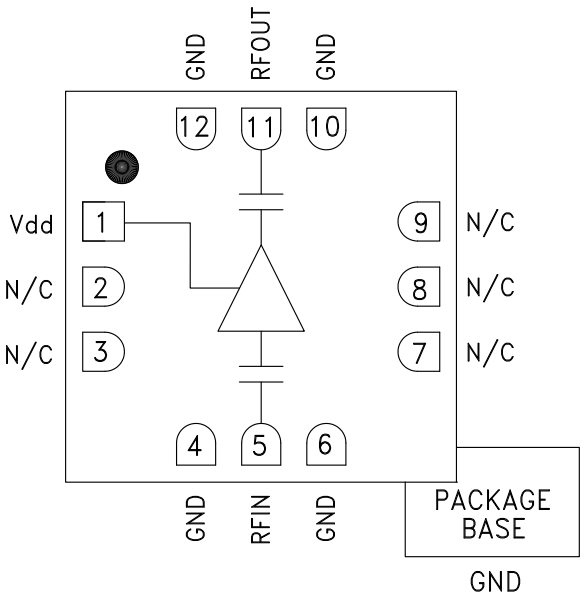
13 dB Gain

+3V @ 35 mA Supply

50 Ohm Matched Input/Output

RoHS Compliant 3x3 mm SMT Package

Functional Diagram



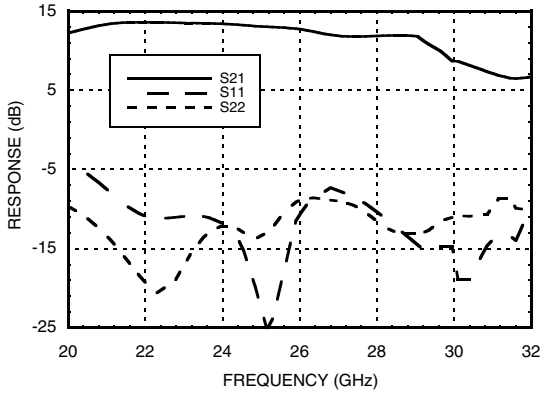
General Description

The HMC341LC3B is a GaAs pHEMT MMIC Low Noise Amplifier housed in a leadless RoHS compliant SMT package. Operating from 21 to 29 GHz, the amplifier provides 13 dB of gain and a noise figure of 2.5 dB from a single +3V supply. The RF I/Os are DC blocked and matched to 50 Ohms requiring no external components. The HMC341LC3B eliminates the need for wire bonding, allowing the use of surface mount manufacturing techniques.

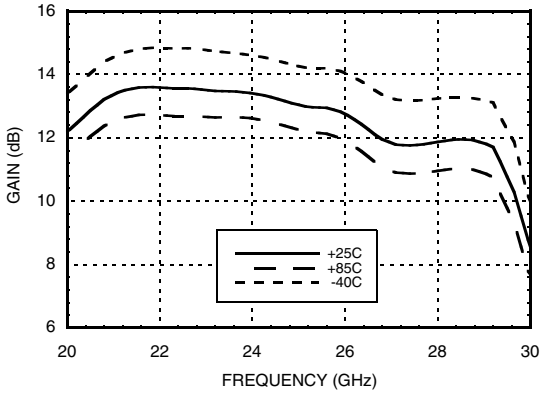
Electrical Specifications, T_A = +25° C, Vdd = +3V, Idd = 35 mA

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		21 - 24			24 - 26			26 - 29		GHz
Gain	10.5	13.5		10	13		9	12		dB
Gain Variation Over Temperature		0.016	0.025		0.016	0.025		0.016	0.025	dB/ °C
Noise Figure		3.25	5		3	3.5		2.5	3	dB
Input Return Loss		10			11			9		dB
Output Return Loss		14			10			9		dB
Output Power for 1 dB Compression (P1dB)		8			8.5			8.5		dBm
Saturated Output Power (Psat)		11			11.5			11.5		dBm
Output Third Order Intercept (IP3)		19			19			19		dBm
Supply Current (Idd) (Vdd = +3V)		35			35			35		mA

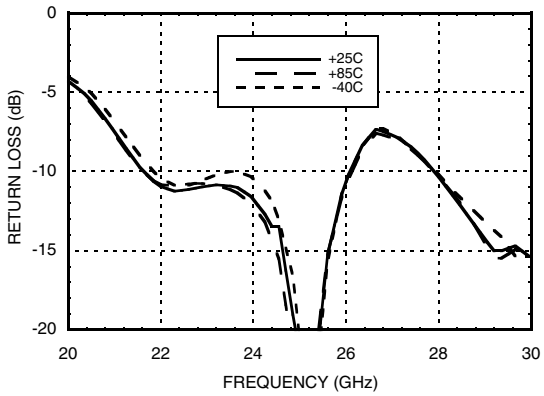
Broadband Gain & Return Loss



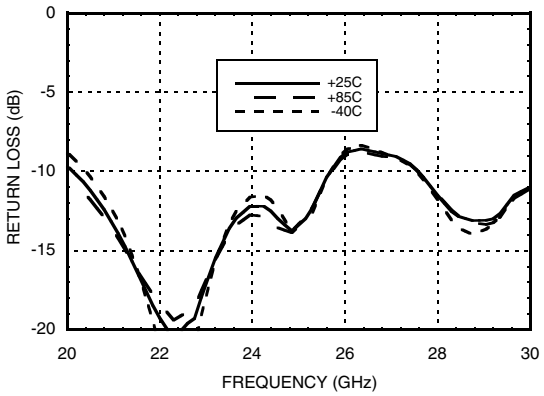
Gain vs. Temperature



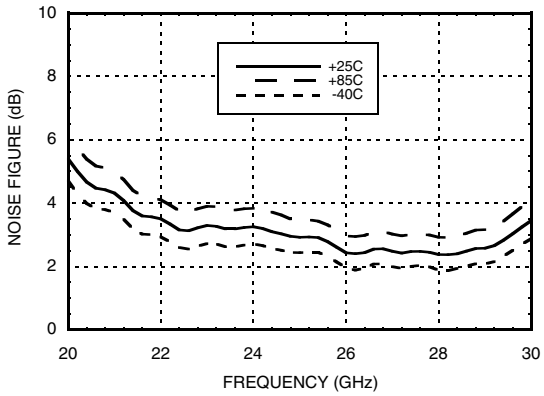
Input Return Loss vs. Temperature



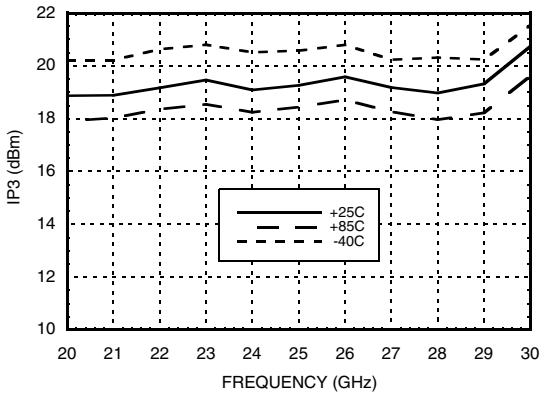
Output Return Loss vs. Temperature



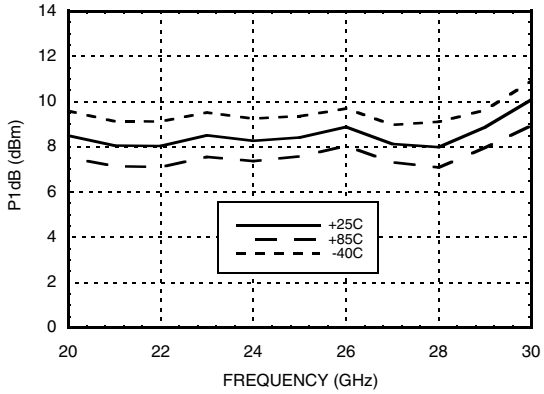
Noise Figure vs. Temperature



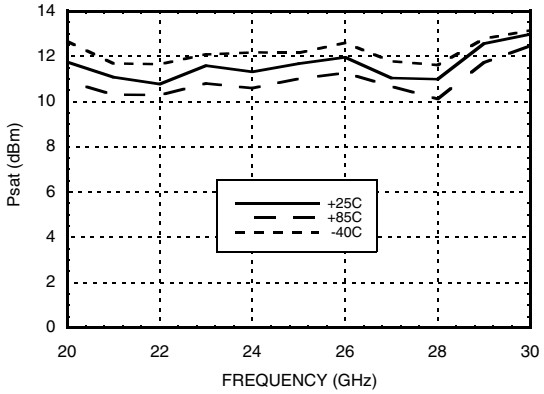
Output IP3 vs. Temperature



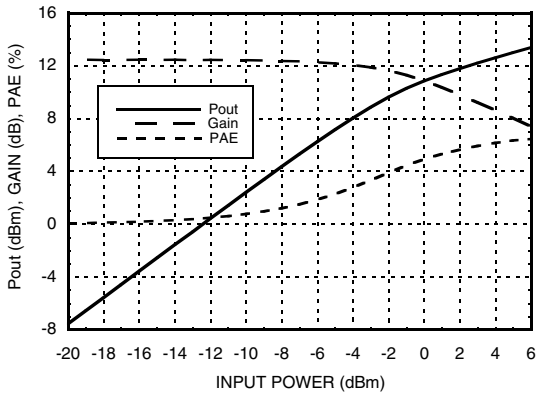
P1dB vs. Temperature



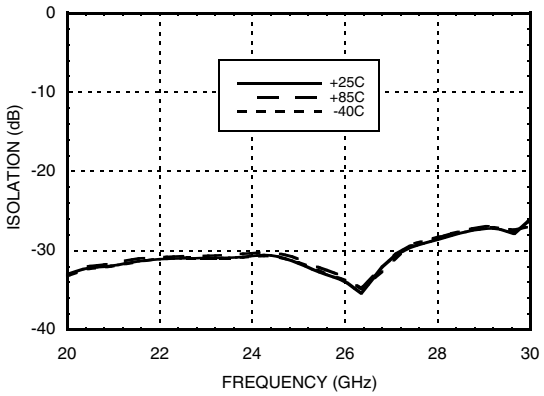
Psat vs. Temperature



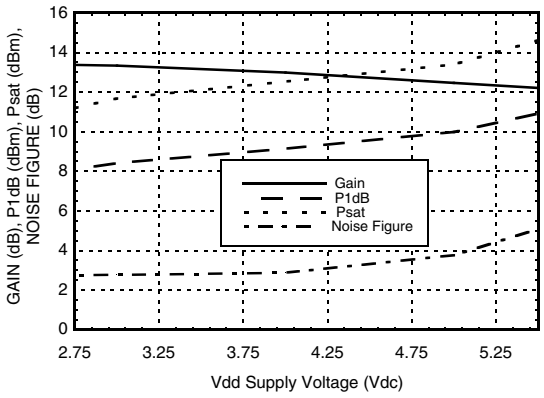
Power Compression @ 25 GHz



Reverse Isolation vs. Temperature



Gain, Power & Noise Figure vs. Supply Voltage @ 25 GHz



SMT GaAs PHEMT MMIC LOW NOISE AMPLIFIER, 21 - 29 GHz

Absolute Maximum Ratings

Drain Bias Voltage (Vdd)	+5.5 Vdc
RF Input Power (RFIN)(Vdd = +3.0 Vdc)	+5 dBm
Channel Temperature	175 °C
Continuous Pdiss (T= 85 °C) (derate 5.43 mW/°C above 85 °C)	0.489 W
Thermal Resistance (channel to ground paddle)	184 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

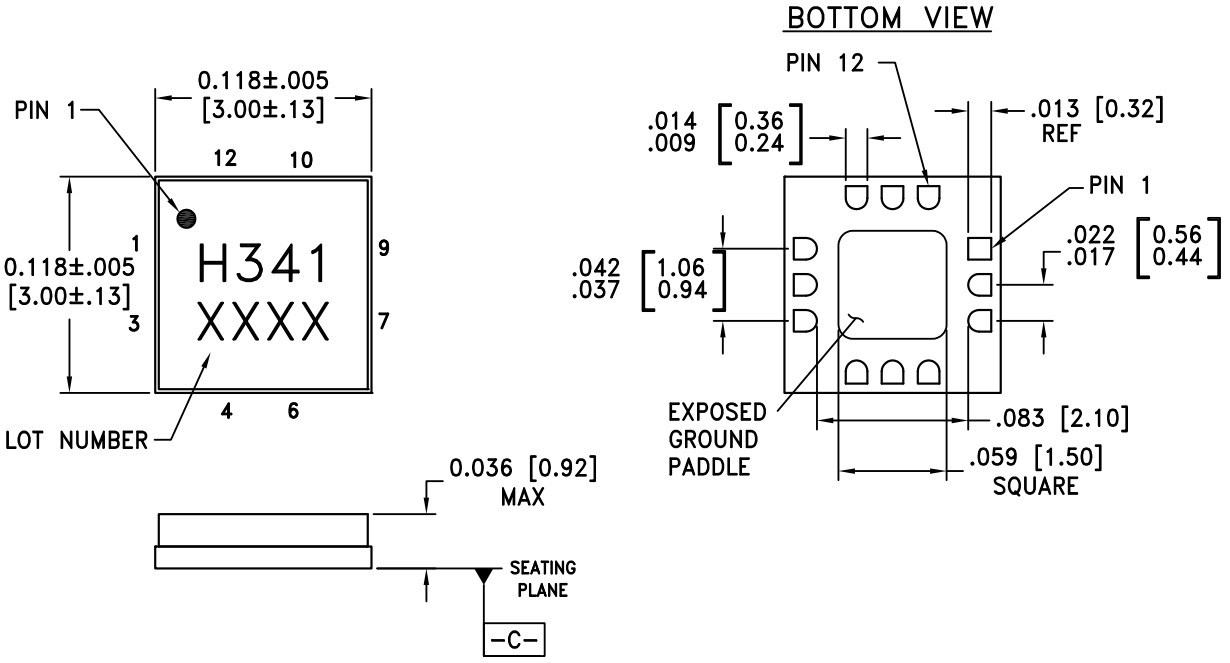
Typical Supply Current vs. Vdd

Vdd (Vdc)	Idd (mA)
+2.7	34
+3.0	35
+4.0	38
+5.0	41

Note: Amplifier will operate over full voltage ranges shown above.

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



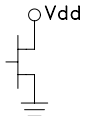
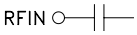
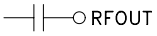
NOTES:
1. PACKAGE BODY MATERIAL: ALUMINA.
2. LEAD AND GROUND PADDLE PLATING: GOLD FLASH OVER NICKEL.
3. DIMENSIONS ARE IN INCHES (MILLIMETERS).
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
5. PACKAGE WARP SHALL NOT EXCEED 0.05MM DATUM [-C-]
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB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

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [2]
HMC341LC3B	Alumina, White	Gold over Nickel	MSL3 [1]	H341 XXXX

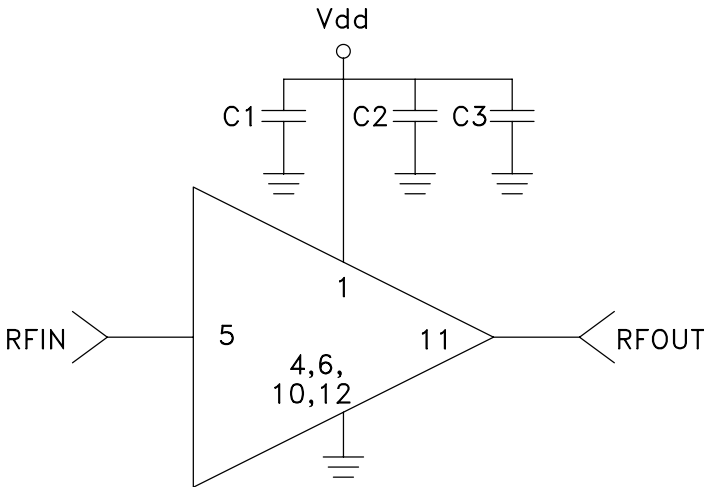
[1] Max peak reflow temperature of 260 °C
[2] 4-Digit lot number XXXX

Pin Descriptions

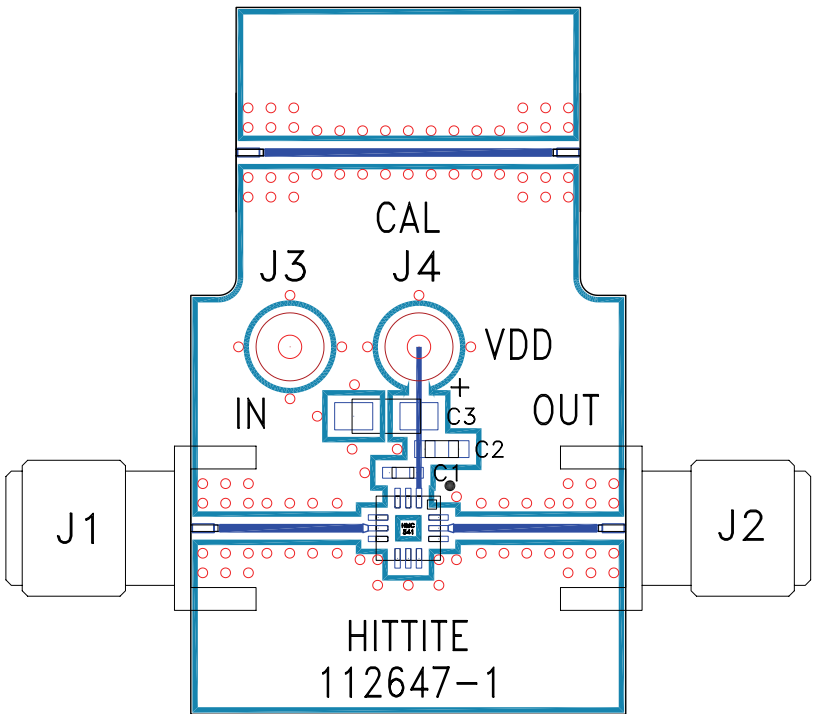
Pin Number	Function	Description	Interface Schematic
1	Vdd	Power Supply Voltage for the amplifier. External bypass capacitors of 100 pF, 1000pF, and 2.2 µF are required.	
2, 3, 7-9	N/C	No connection required. These pins may be connected to RF/DC ground without affecting performance.	
4, 6, 10, 12	GND	Package bottom has an exposed metal paddle that must also be connected to RF/DC ground.	
5	RFIN	This pin is AC coupled and matched to 50 Ohms from 21 - 29 GHz.	
11	RFOUT	This pin is AC coupled and matched to 50 Ohms from 21 - 29 GHz.	

Application Circuit

Component	Value
C1	100 pF
C2	1,000 pF
C3	2.2 µF



Evaluation PCB



List of Materials for Evaluation PCB 112646 [1]

Item	Description
J1, J2	SRI K-connector
J3, J4	DC Pin
C1	100 pF capacitor, 0402 Pkg..
C2	1,000 pF Capacitor, 0603 Pkg..
C3	2.2µF Capacitor, Tantalum
U1	HMC341LC3B Amplifier
PCB [2]	112647 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350.

The circuit board used in this application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation board should be mounted to an appropriate heat sink. The evaluation circuit board shown is available from Hittite upon request.