



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

### Typical Applications

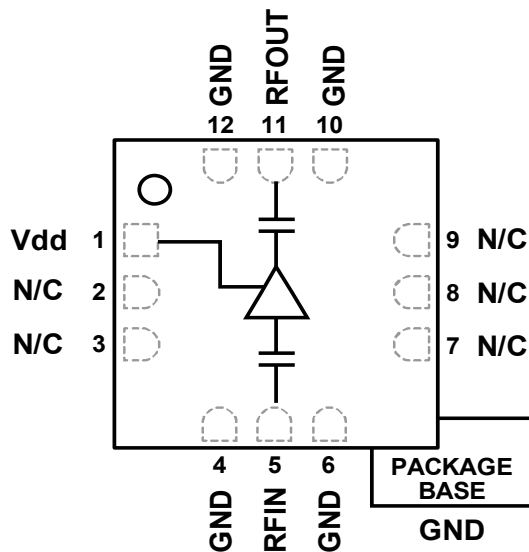
The HMC341LC3B is ideal for:

- 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.

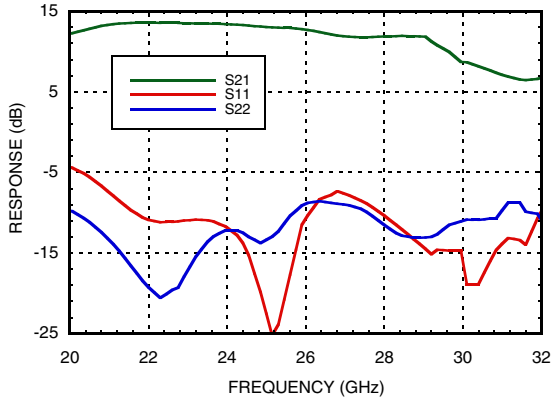
### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $V_{dd} = +3\text{V}$ , $I_{dd} = 35\text{mA}$

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

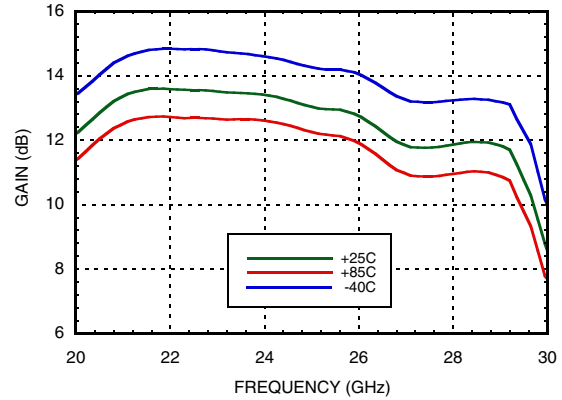


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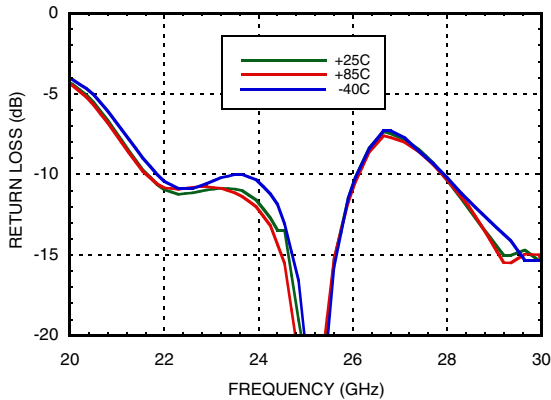
**Broadband Gain & Return Loss**



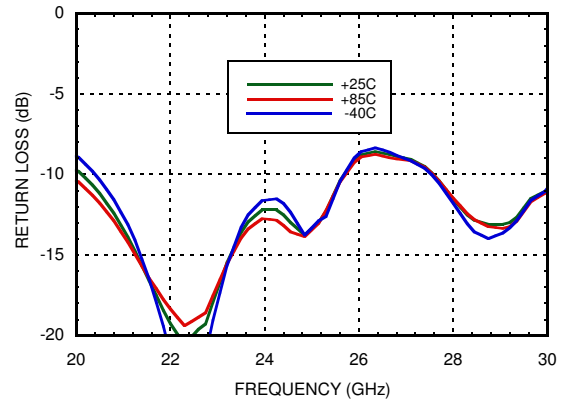
**Gain vs. Temperature**



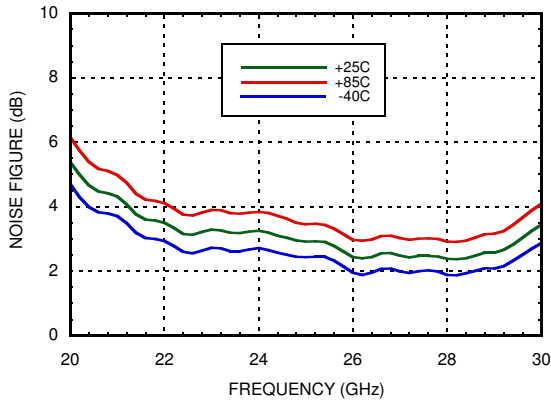
**Input Return Loss vs. Temperature**



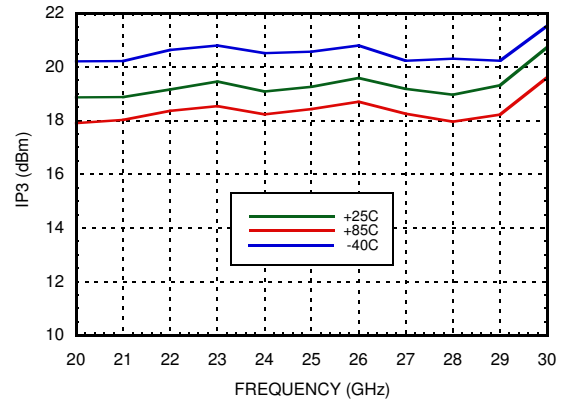
**Output Return Loss vs. Temperature**



**Noise Figure vs. Temperature**



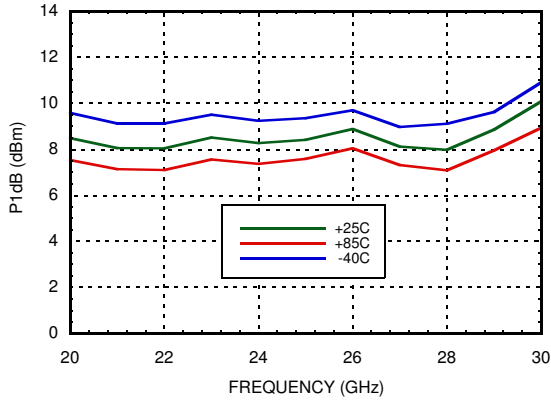
**Output IP3 vs. Temperature**



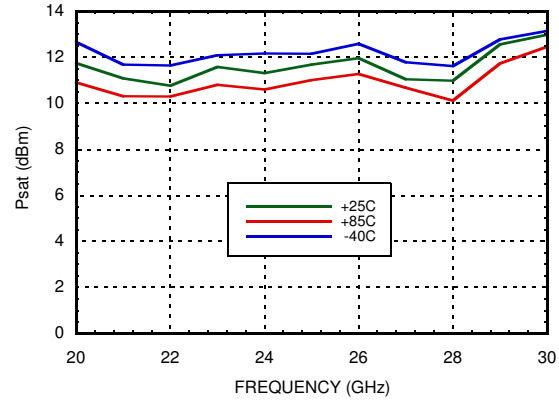


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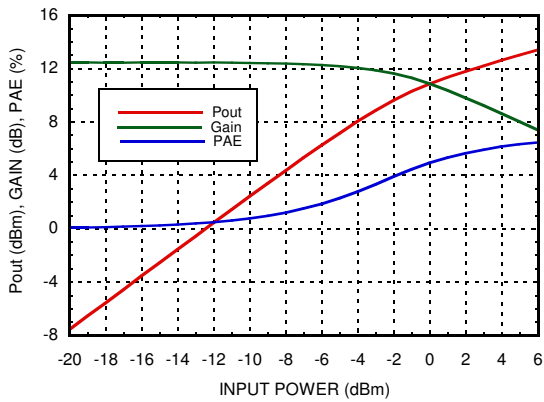
**P1dB vs. Temperature**



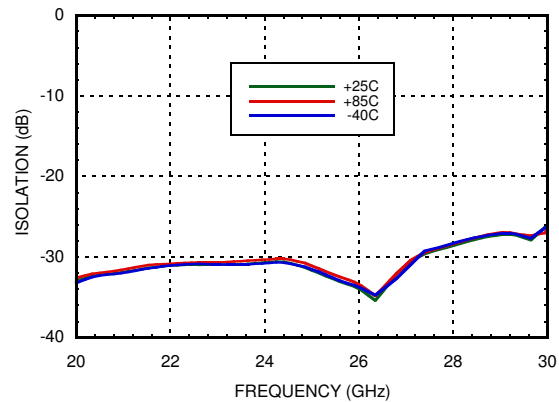
**Psat vs. Temperature**



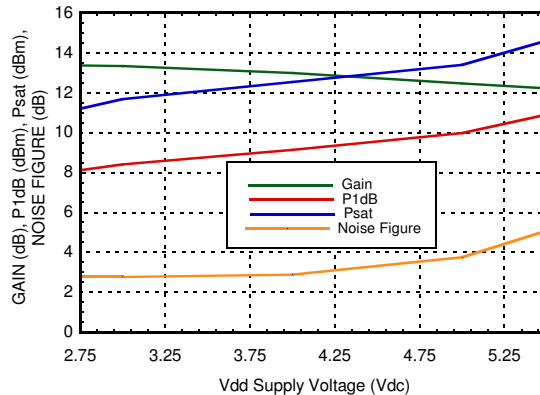
**Power Compression @ 25 GHz**



**Reverse Isolation vs. Temperature**



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





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### 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 P <sub>diss</sub> (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
ESD Sensitivity (HBM)	Class 1A (Passed 250V)

### Typical Supply Current vs. Vdd

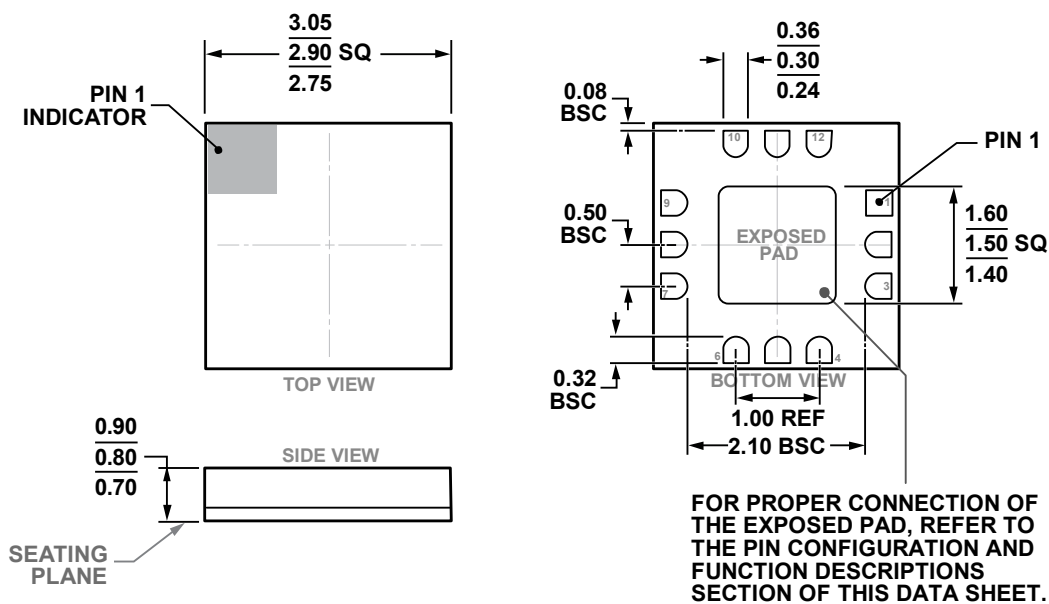
Vdd (Vdc)	I <sub>dd</sub> (mA)
+2.7	34
+3.0	35
+4.0	38
+5.0	41

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



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

### Outline Drawing



PKG-004837

03-02-2017-A

12-Terminal Leadless Chip Carrier (LCC)  
(E-12-4)  
Dimensions shown in millimeters

### Package Information

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

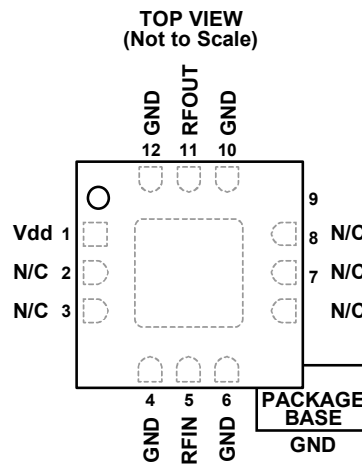
[1] Max peak reflow temperature of 260 °C

[2] 4-Digit lot number XXXX



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**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

