HMC519LC4

v04.1017

GAAS PHEMT MMIC LOW NOISE AMPLIFIER, 18 - 31 GHz

Typical Applications

The HMC519LC4 is ideal for:

- Point-to-Point Radios
- Point-to-Multi-Point Radios & VSAT
- Test Equipment & Sensors
- Military & Space

Features

Noise Figure: 3.5 dB

Gain: 14 dB

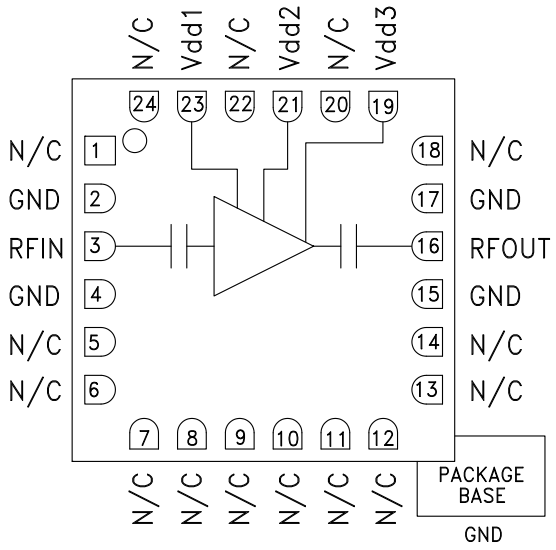
Output IP3: +23 dBm

Single Supply: +3V @ 75 mA

50 Ohm Matched Input/Output

24 Lead Ceramic 4x4mm SMT Package: $16mm^2$

Functional Diagram



General Description

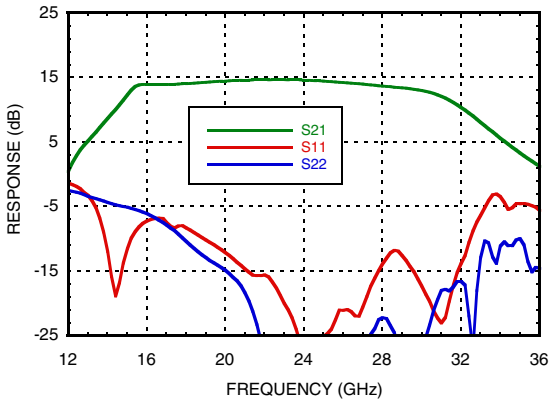
The HMC519LC4 is a high dynamic range GaAs pHEMT MMIC Low Noise Amplifier (LNA) housed in a leadless 4 x 4 mm ceramic surface mount package. The amplifier operates between 18 and 31 GHz, providing 14 dB of small signal gain, 3.5 dB noise figure and output IP3 of +23 dBm, while requiring only 75 mA from a +3V single supply. The P1dB output power of +11 dBm, enables the LNA to function as a LO driver for balanced, I/Q or image reject mixers. The HMC519LC4 also features I/Os that are DC blocked and internally matched to 50 Ohms, making it ideal for microwave radio and VSAT applications.

Electrical Specifications, T_A = +25° C, Vdd 1, 2, 3 = +3V

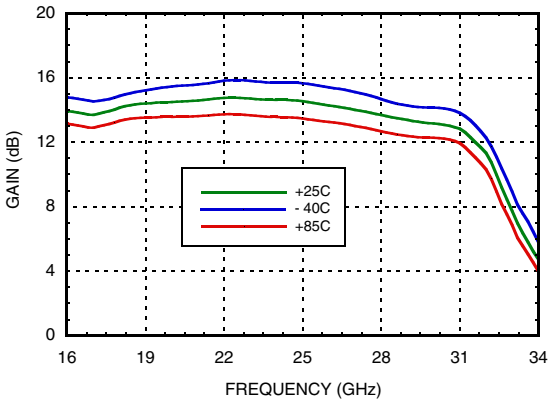
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		18 - 28			28 - 31		GHz
Gain	11.4	14.4		10.2	13.2		dB
Gain Variation Over Temperature		0.016	0.026		0.016	0.026	dB/ °C
Noise Figure		3.5	5.5		3	5	dB
Input Return Loss		15			17		dB
Output Return Loss		20			22		dB
Output Power for 1 dB Compression (P1dB)	8	11		9.2	12.2		dBm
Saturated Output Power (Psat)		14			15.4		dBm
Output Third Order Intercept (IP3)		23			24		dBm
Supply Current (Idd)		75	95		75	95	mA

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

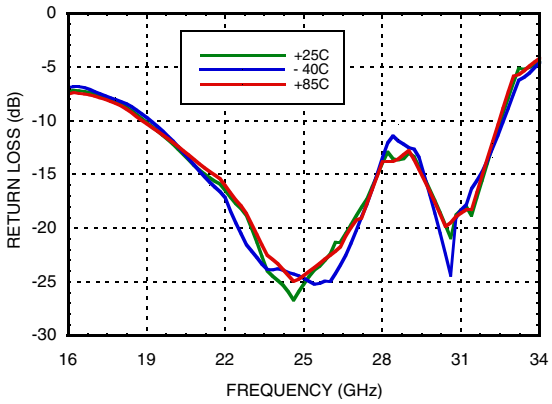
Broadband Gain & Return Loss



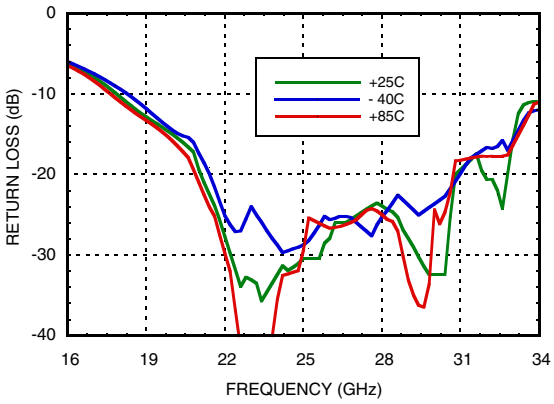
Gain vs. Temperature



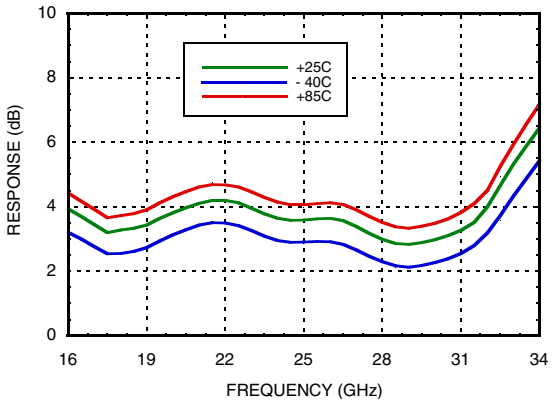
Input Return Loss vs. Temperature



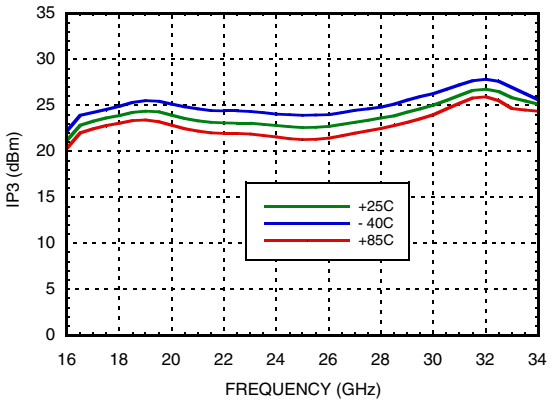
Output Return Loss vs. Temperature



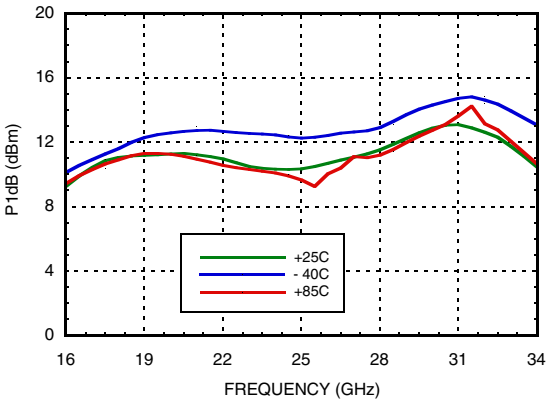
Noise Figure vs. Temperature



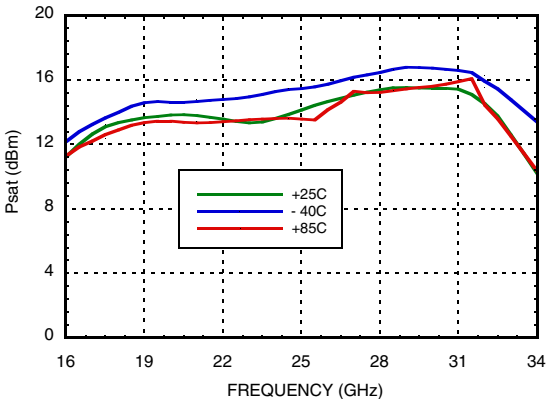
Output IP3 vs. Temperature



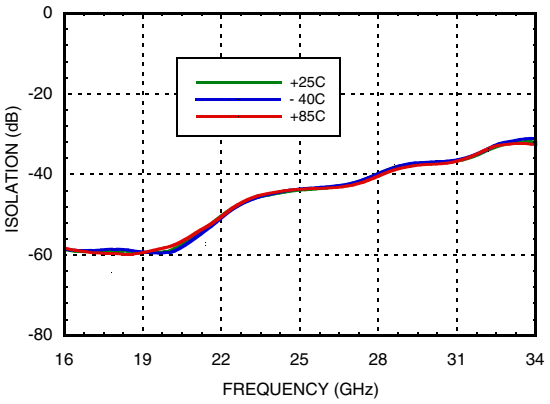
P1dB vs. Temperature



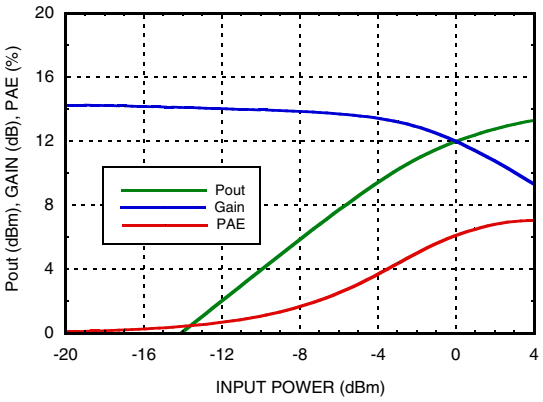
Psat vs. Temperature



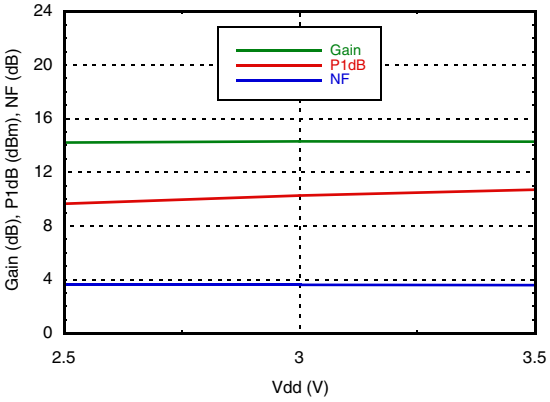
Reverse Isolation vs. Temperature



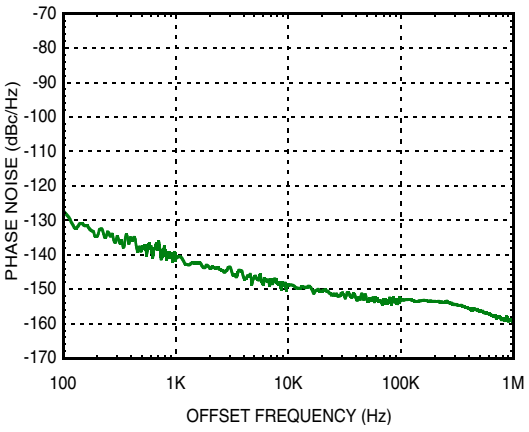
Power Compression @ 24 GHz



Gain, Noise Figure & Power vs. Supply Voltage @ 24 GHz



Additive Phase Noise Vs Offset Frequency, RF Frequency = 26.5 GHz, RF Input Power = 5 dBm (Psat)



Absolute Maximum Ratings

Drain Bias Voltage (Vdd1, Vdd2, Vdd3)	+3.5 Vdc
RF Input Power (RFIN)(Vdd = +3.0 Vdc)	+20 dBm
Channel Temperature	175 °C
Continuous Pdiss (T= 85 °C) (derate 13 mW/°C above 85 °C)	1.2 W
Thermal Resistance (channel to package bottom)	76.9 °C/W
Storage Temperature	-65 to 150 °C
Operating Temperature	-40 to 85 °C
ESD Sensitivity (HBM)	Class 1B

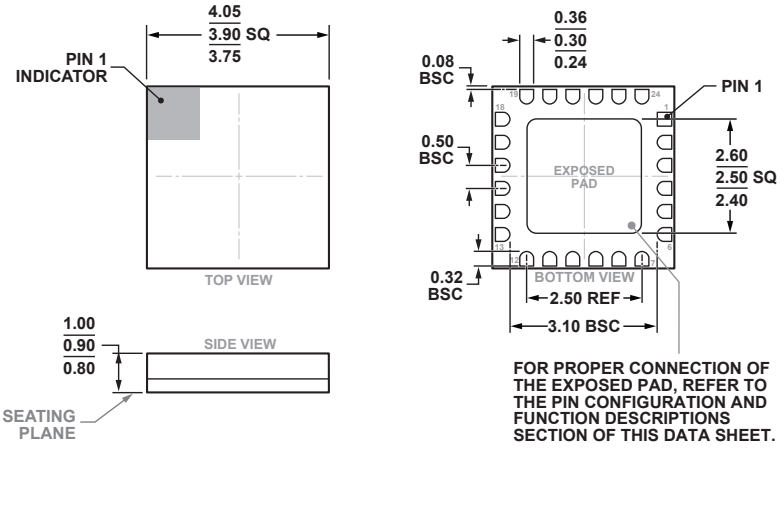
Typical Supply Current vs. Vdd

Vdd (V)	Idd (mA)
2.5	72
3.0	75
3.5	78

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

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



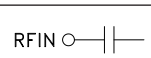
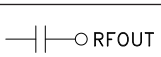
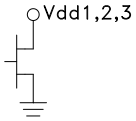
24-Terminal Ceramic Leadless Chip Carrier [LCC]
(E-24-1)
Dimensions shown in millimeters.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [2]
HMC519LC4	Alumina, White	Gold over Nickel	MSL3 [1]	H519 XXXX

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

Pad Descriptions

Pad Number	Function	Description	Interface Schematic
1, 5 - 14, 18, 20, 22, 24	N/C	Not Connected	
2, 4, 15, 17	GND	Package bottom has exposed metal paddle that must be connected to RF/DC ground.	
3	RFIN	This pad is AC coupled and matched to 50 Ohms	
16	RFOUT	This pad is AC coupled and matched to 50 Ohms	
19, 21, 23	Vdd3, Vdd2, Vdd1	Power Supply Voltage for the amplifier. See application circuit for required external components.	

Application Circuit