

SMT PHEMT LOW NOISE AMPLIFIER, 17 - 26 GHz

Typical Applications

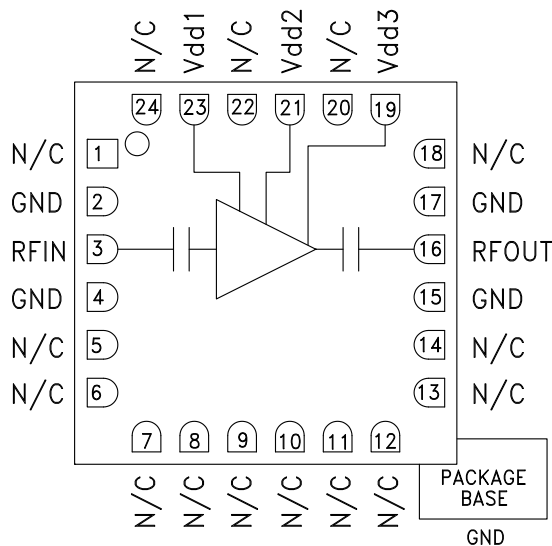
The HMC517LC4 is ideal for use as a LNA or driver amplifier for:

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

Features

- Noise Figure: 2.5 dB
- Gain: 19 dB
- OIP3: +23 dBm
- Single Supply: +3V @ 67 mA
- 50 Ohm Matched Input/Output
- RoHS Compliant 4 x 4 mm Package

Functional Diagram



General Description

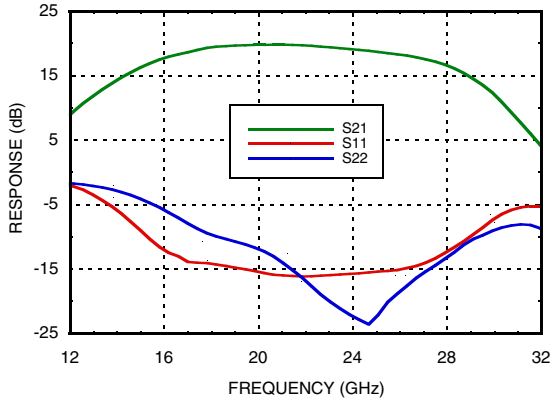
The HMC517LC4 chip is a high dynamic range GaAs pHEMT MMIC Low Noise Amplifier (LNA) housed in a leadless “Pb free” RoHS compliant SMT package. The HMC517LC4 provides 19 dB of small signal gain, 2.5 dB of noise figure and has an output IP3 of +23 dBm. The P1dB output power of +13 dBm enables the LNA to also function as a LO driver for balanced, I/Q or image reject mixers. The HMC517LC4 allows the use of surface mount manufacturing techniques.

Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_{dd\ 1, 2, 3} = +3\text{V}$

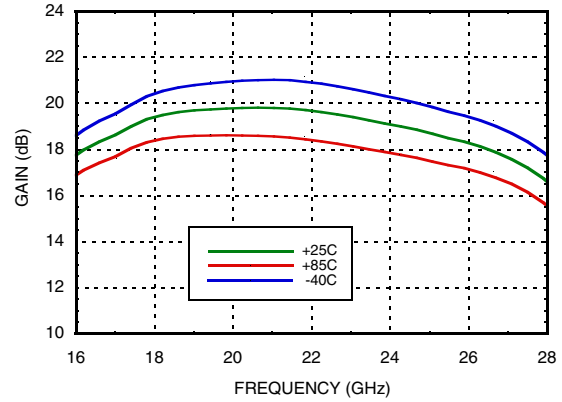
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	17 - 22		22 - 26				GHz
Gain	16	19		15	18		dB
Gain Variation Over Temperature		0.02	0.03		0.02	0.03	dB/ °C
Noise Figure		2.5	3.1		2.6	3.3	dB
Input Return Loss		15			15		dB
Output Return Loss		11			17		dB
Output Power for 1 dB Compression (P1dB)		12			13		dBm
Saturated Output Power (P _{sat})		15			16		dBm
Output Third Order Intercept (IP3)		23			24		dBm
Supply Current (I _{dd})(V _{dd} = +3V)		67			67		mA

SMT PHEMT LOW NOISE AMPLIFIER, 17 - 26 GHz

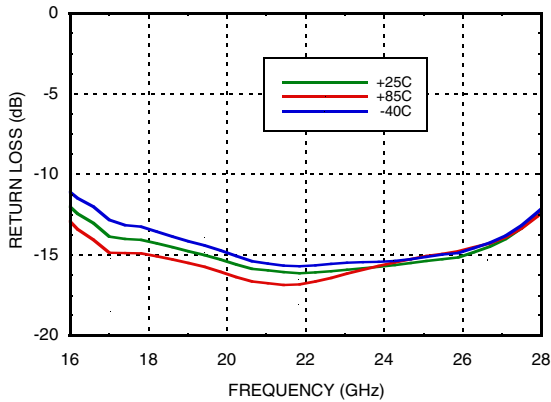
Broadband Gain & Return Loss



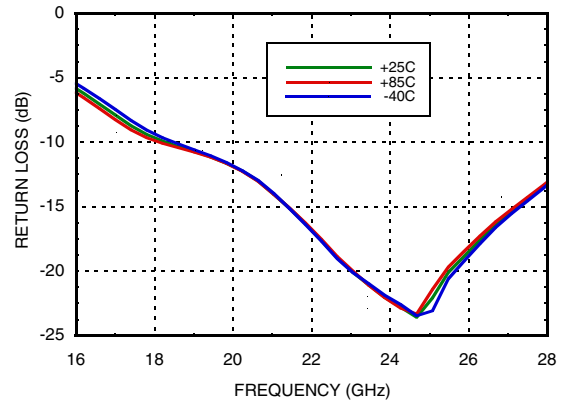
Gain vs. Temperature



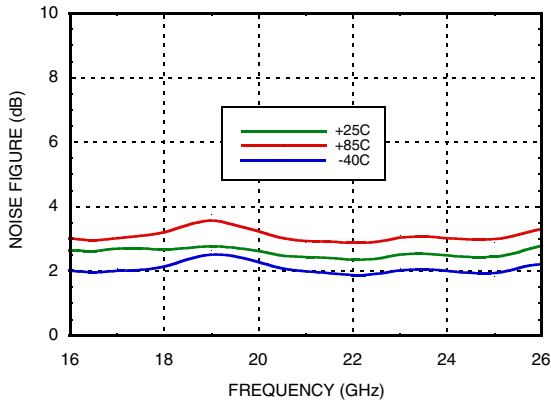
Input Return Loss vs. Temperature



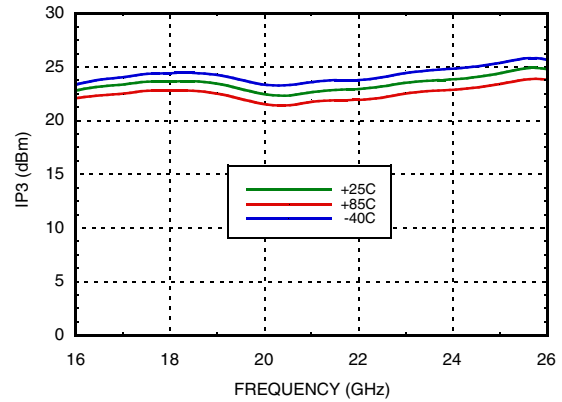
Output Return Loss vs. Temperature



Noise Figure vs. Temperature

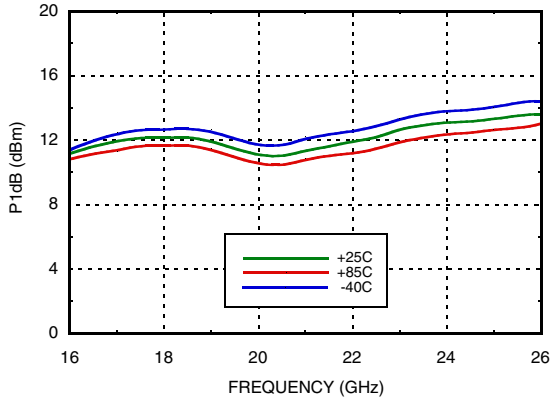


Output IP3 vs. Temperature

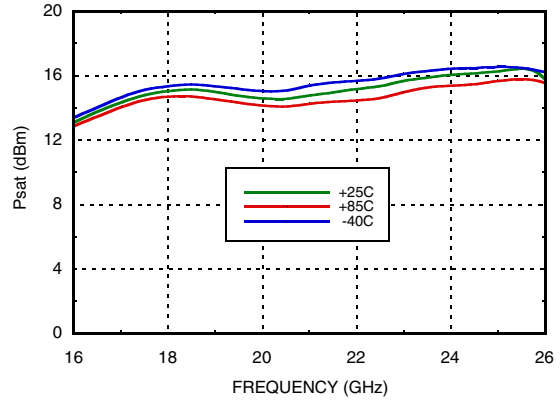


SMT PHEMT LOW NOISE AMPLIFIER, 17 - 26 GHz

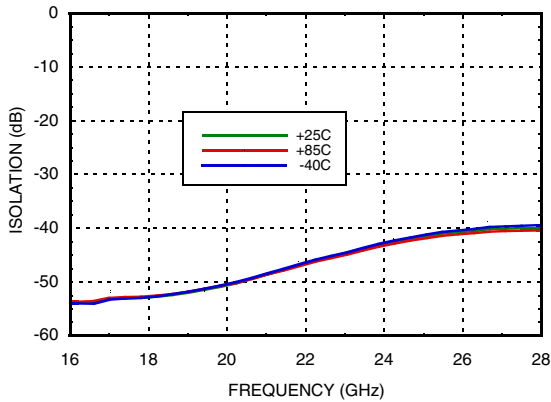
P1dB vs. Temperature



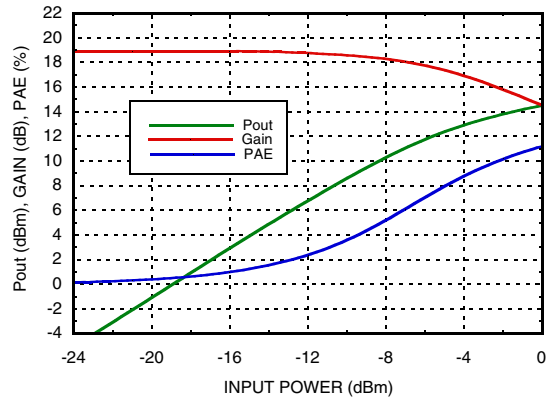
Psat vs. Temperature



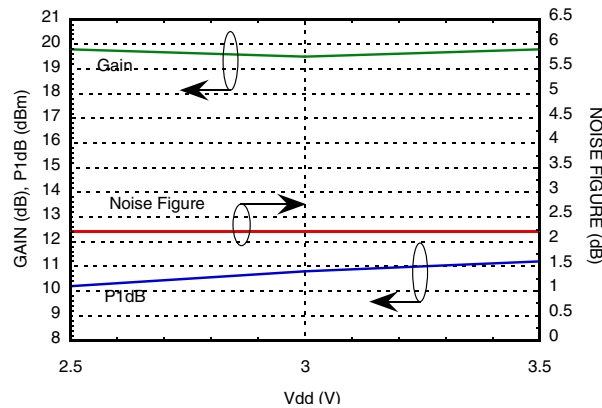
Reverse Isolation vs. Temperature



Power Compression @ 21 GHz



Gain, Noise Figure & Power vs. Supply Voltage @ 21 GHz



SMT PHEMT LOW NOISE AMPLIFIER, 17 - 26 GHz

Absolute Maximum Ratings

Drain Bias Voltage (Vdd1, Vdd2, Vdd3)	+5.5 Vdc
RF Input Power (RFIN)(Vdd = +3.0 Vdc)	+14 dBm
Channel Temperature	175 °C
Continuous Pdiss (T= 85 °C) (derate 13 mW/°C above 85 °C)	1.2 W
Thermal Resistance (channel to die bottom)	76.9 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

Typical Supply Current vs. Vdd

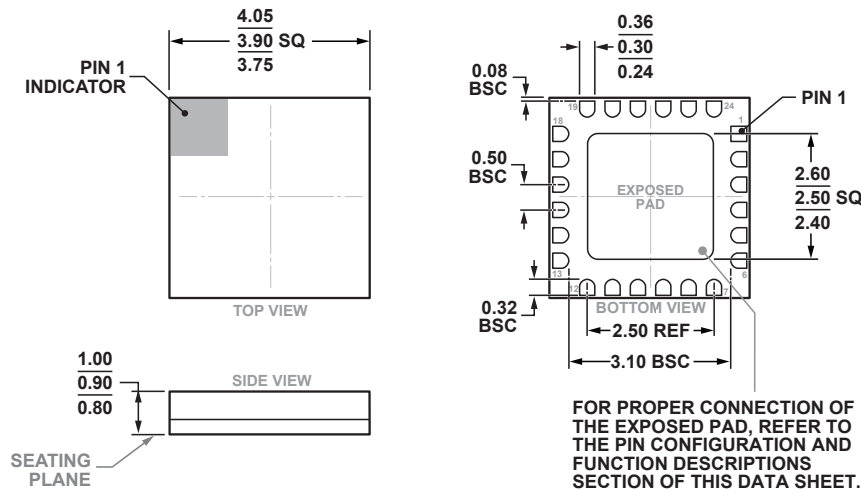
Vdd (V)	Idd (mA)
+2.5	66
+3.0	68
+3.5	71

Note: Amplifier will operate over full voltage range 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]
HMC517LC4	Alumina, White	Gold over Nickel	MSL3 ^[1]	H517 XXXX

[1] Max peak reflow temperature of 260 °C

[2] 4-Digit lot number XXXX

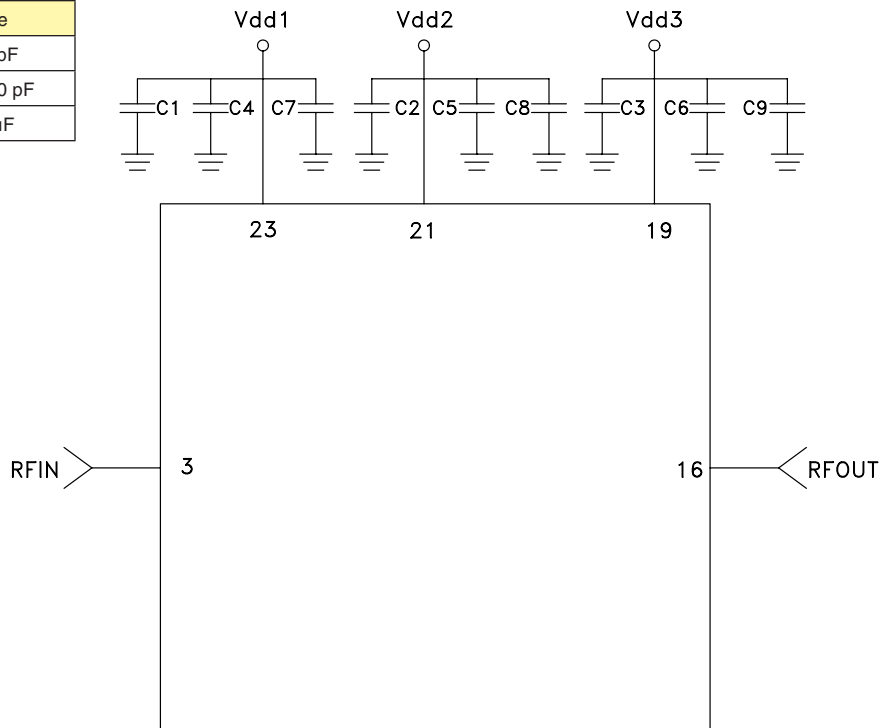
SMT PHEMT LOW NOISE AMPLIFIER, 17 - 26 GHz

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 5 - 14, 18, 20, 22, 24	N/C	This pin may be connected to RF/DC ground. Performance will not be affected.	
3	RFIN	This pin is AC coupled and matched to 50 Ohms.	RFIN
23, 21, 19	Vdd1, 2, 3	Power Supply Voltage for the amplifier. External bypass capacitors of 100 pF, 1,000 pF and 2.2 μF are required.	
16	RFOUT	This pin is AC coupled and matched to 50 Ohms.	RFOUT
2, 4, 15, 17	GND	These pins and package bottom must be connected to RF/DC ground.	

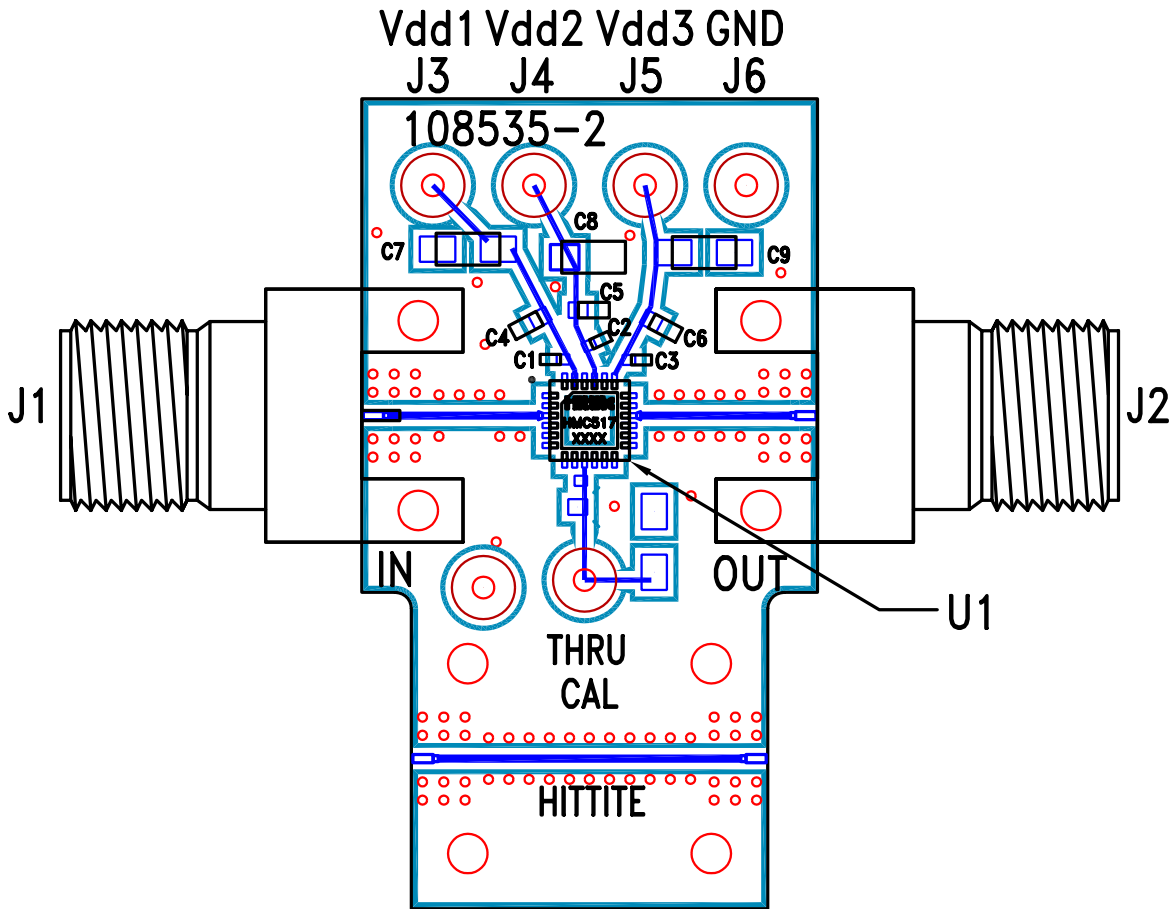
Application Circuit

Component	Value
C1, C2, C3	100 pF
C4, C5, C6	1,000 pF
C7, C8, C9	2.2 μF



**SMT PHEMT LOW NOISE
AMPLIFIER, 17 - 26 GHz**

Evaluation PCB



List of Materials for Evaluation PCB 108537 [1]

Item	Description
J1 - J2	PCB Mount K Connector
J3 - J6	DC Pin
C1 - C3	100 pF Capacitor, 0402 Pkg.
C4 - C6	1,000 pF Capacitor, 0603 Pkg.
C7 - C9	2.2 μF Capacitor, Tantalum
U1	HMC517LC4 Amplifier
PCB [2]	108535 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the 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 Analog Devices, upon request.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.