ANALOG DEVICES

v03.0514

RoHS✓
EARTH FRIENDLY

LOW NOISE AMPLIFIERS - SMT

Broadband Gain & Return Loss

Gain vs. Temperature
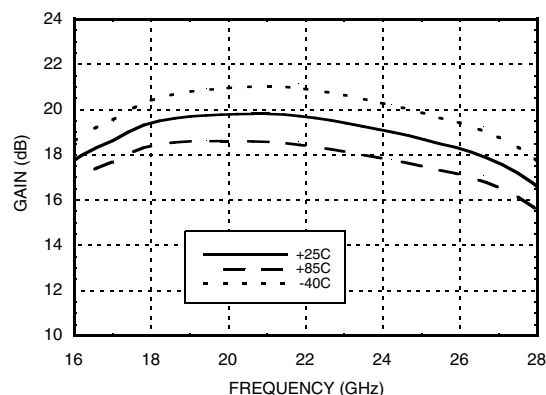
Input Return Loss vs. Temperature
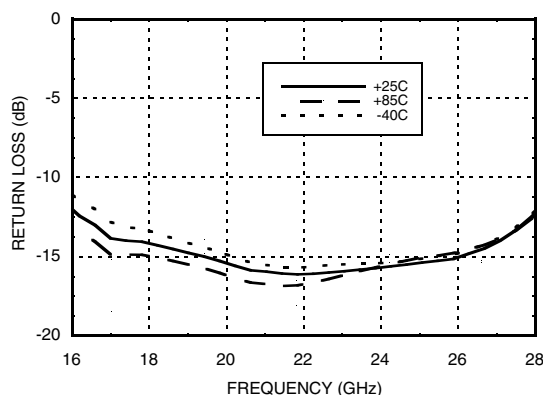
Output Return Loss vs. Temperature
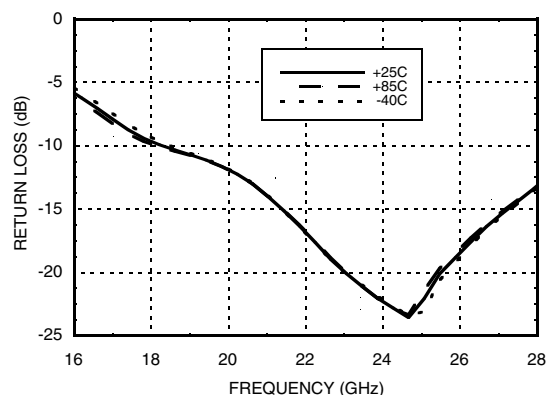
Noise Figure vs. Temperature
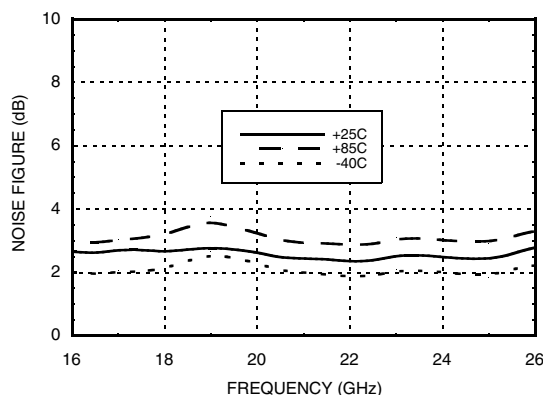
Output IP3 vs. Temperature

*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*
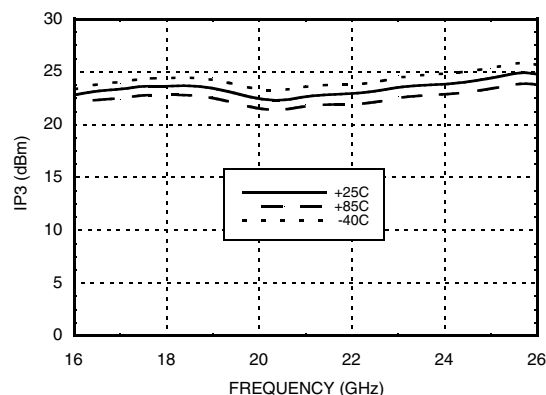
LOW NOISE AMPLIFIERS - SMT

P1dB vs. Temperature
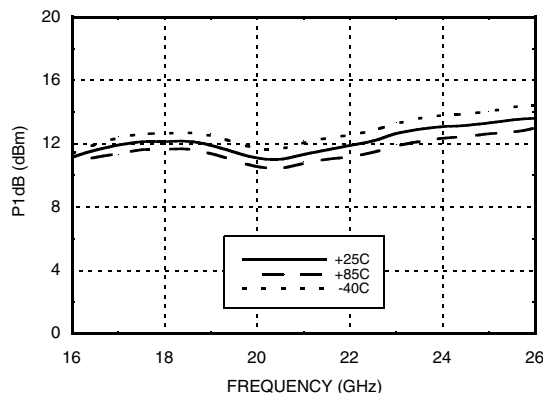
Psat vs. Temperature
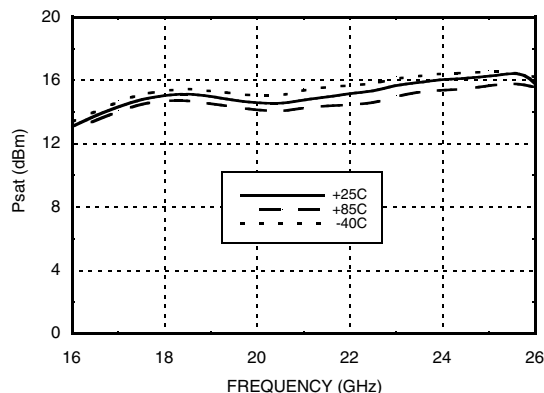
Reverse Isolation vs. Temperature
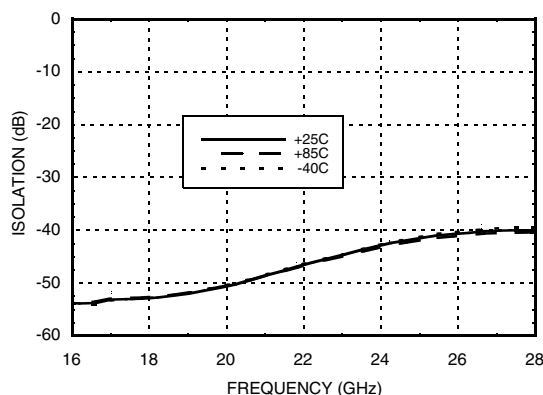
Power Compression @ 21 GHz
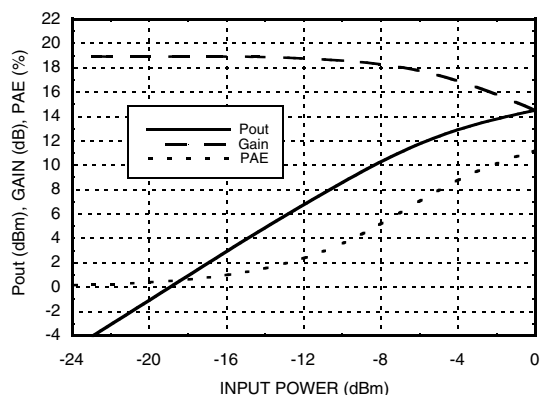
Gain, Noise Figure & Power vs. Supply Voltage @ 21 GHz

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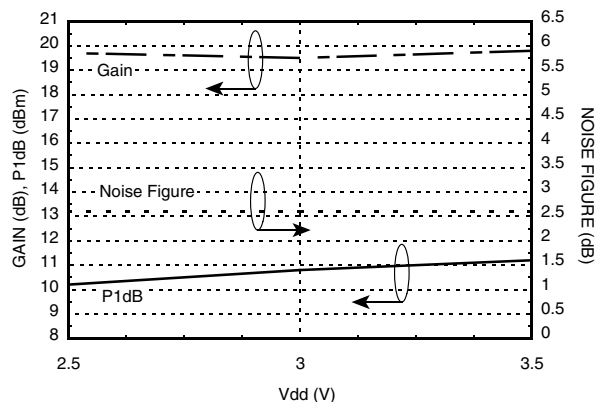
Absolute Maximum Ratings

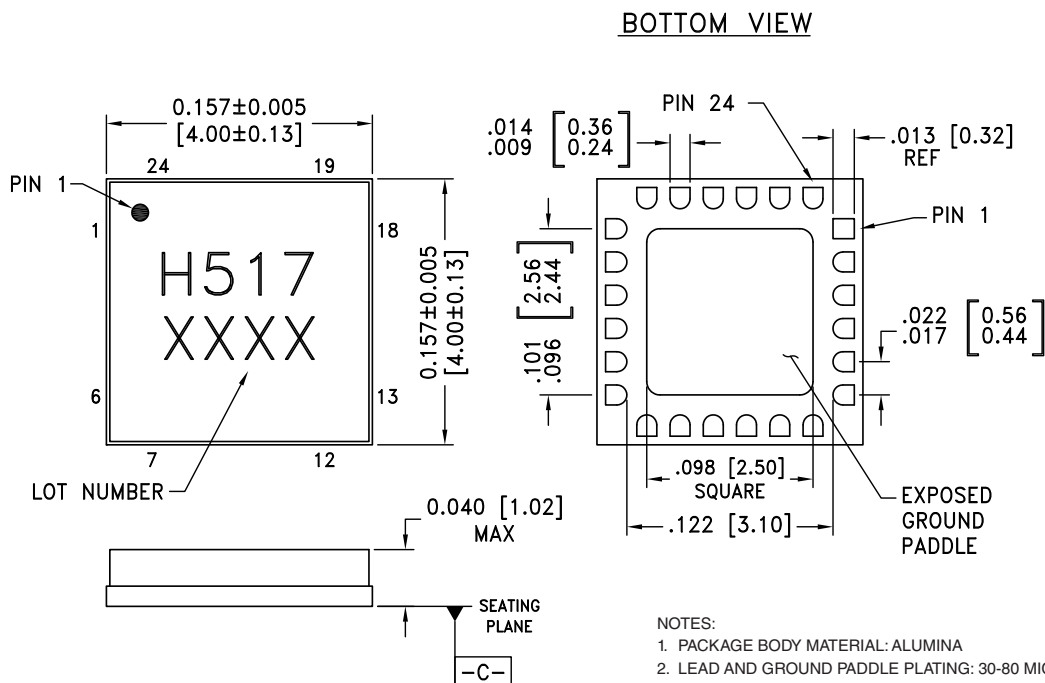|	
Drain Bias Voltage (Vdd1, Vdd2, Vdd3)	+5.5 Vdc
RF Input Power (RFIN)(Vdd = +3.0 Vdc)	+2 dBm
Channel Temperature	175 °C
Continuous Pdiss (T= 85 °C) (derate 29 mW/°C above 85 °C)	2.65 W
Thermal Resistance (channel to die bottom)	34 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +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

BOTTOM VIEW

NOTES:
1. PACKAGE BODY MATERIAL: ALUMINA
2. LEAD AND GROUND PADDLE PLATING: 30-80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKEL
3. DIMENSIONS ARE IN INCHES [MILLIMETERS]
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm DATUM
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]
HMC517LC4	Alumina, White	Gold over Nickel	MSL3 [1]	H517 XXXX

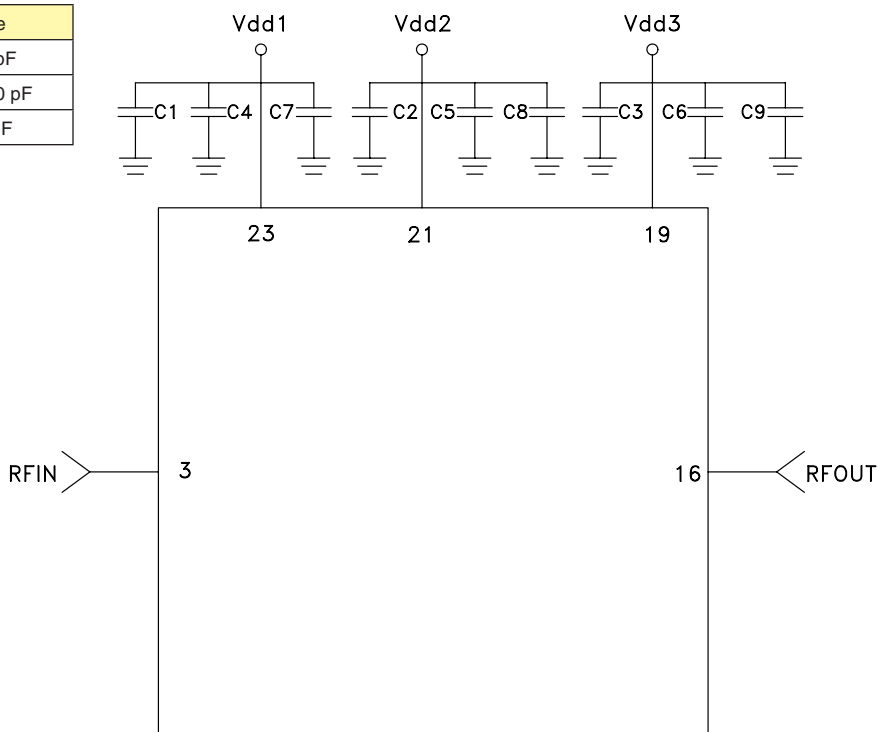[1] Max peak reflow temperature of 260 °C
[2] 4-Digit lot number XXXX
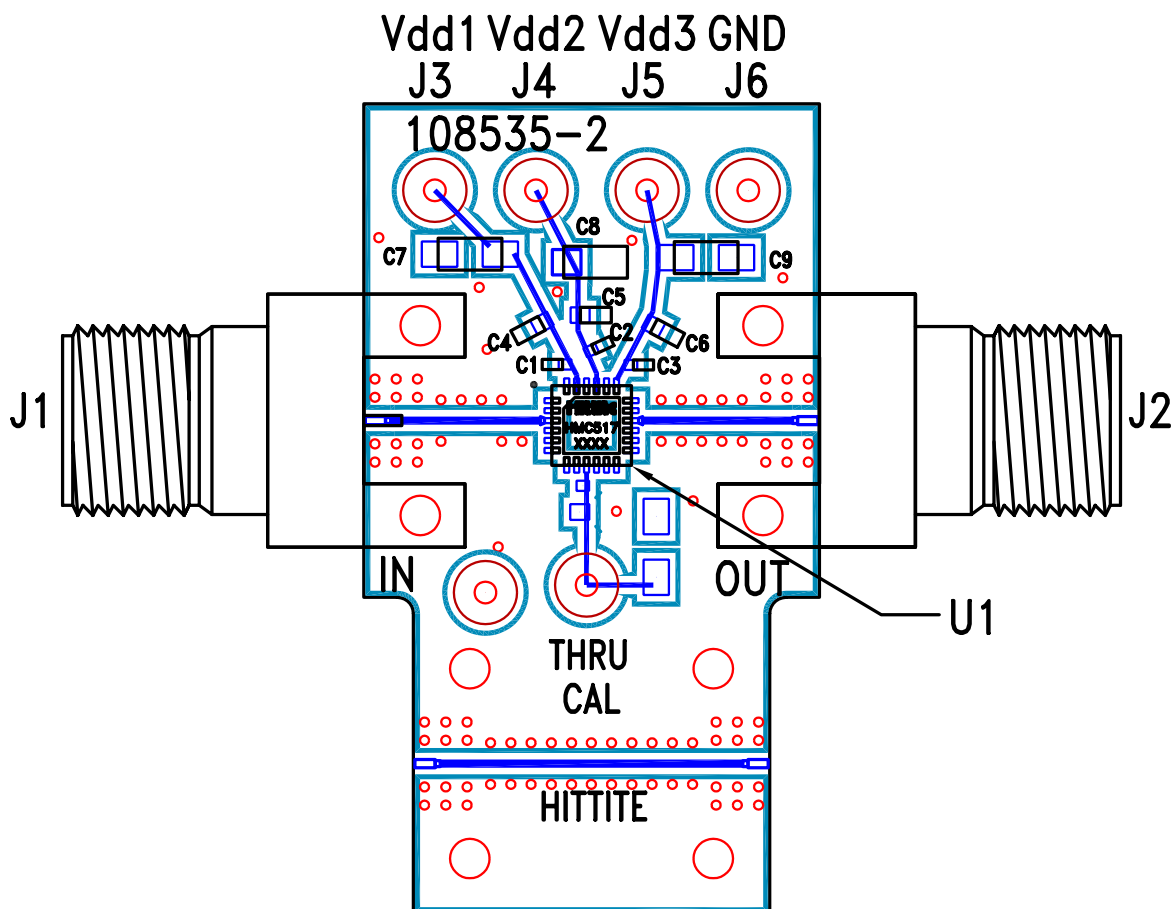
LOW NOISE AMPLIFIERS - SMT

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.	○ Vdd1,2,3
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.	○ GND

Application Circuit

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

Vdd1   Vdd2   Vdd3

C1   C4   C7   C2   C5   C8   C3   C6   C9

23   21   19

RFIN   3   16   RFOUT

![ANALOG DEVICES]

HMC517LC4

v03.0514

SMT PHEMT LOW NOISE
AMPLIFIER, 17 - 26 GHz

LOW NOISE AMPLIFIERS - SMT

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 Hittite upon request.