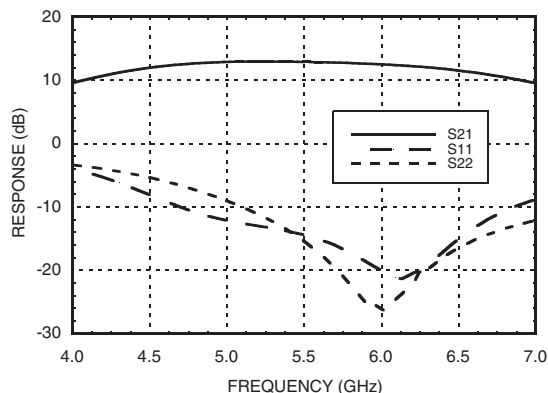
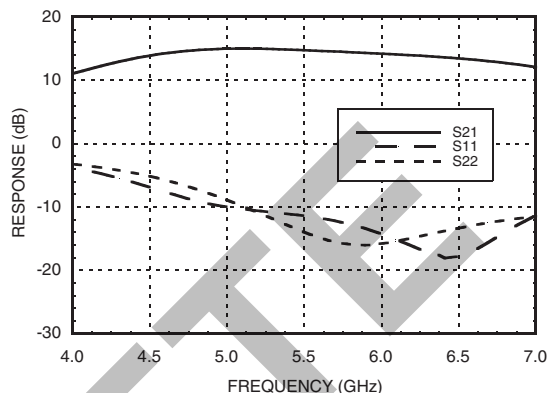
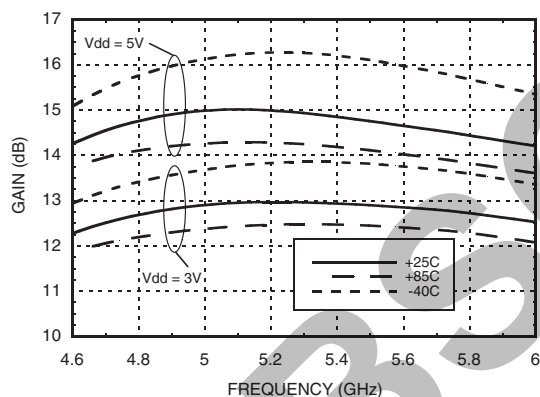
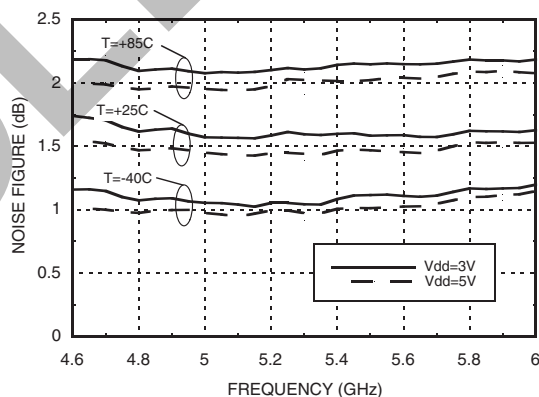
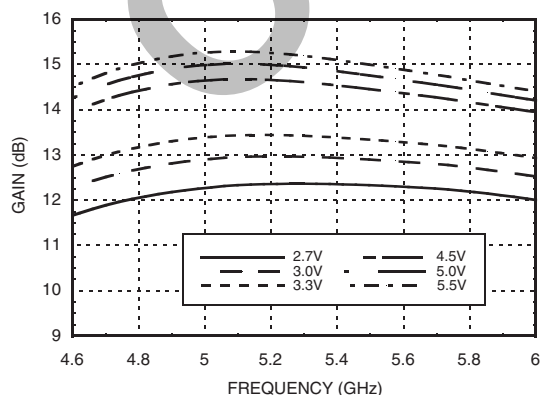
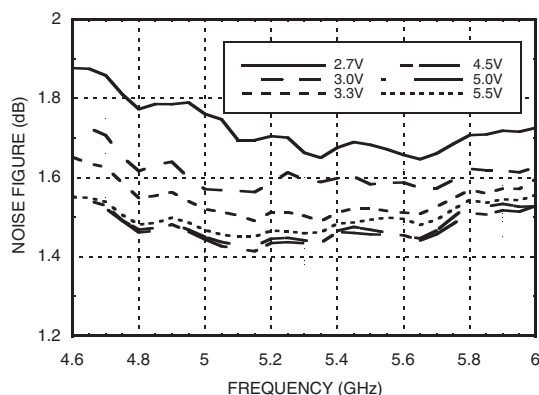
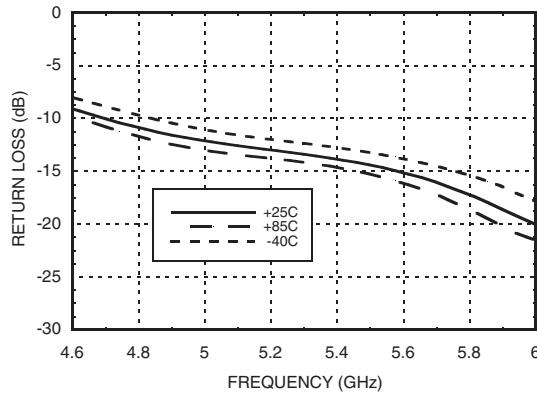
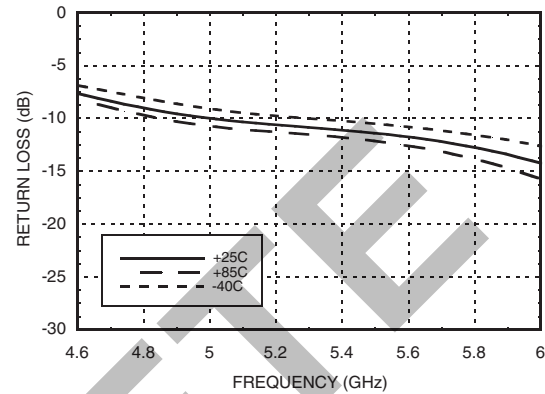
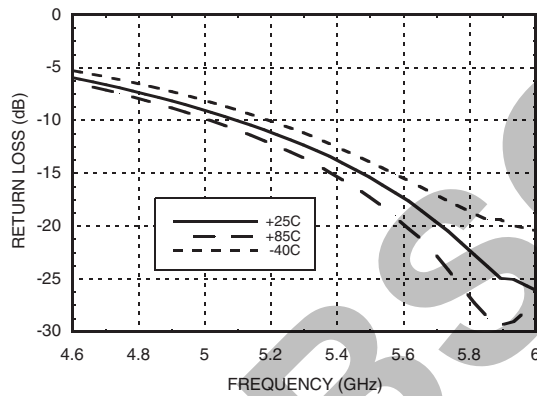
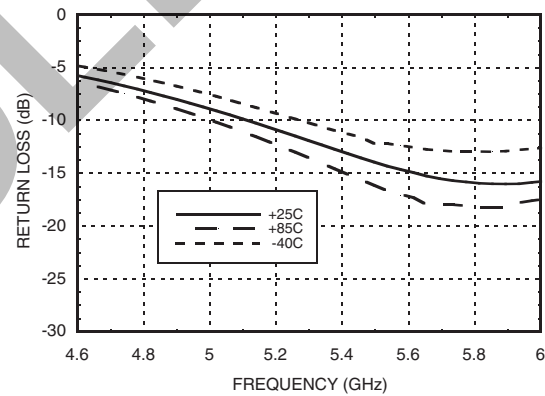
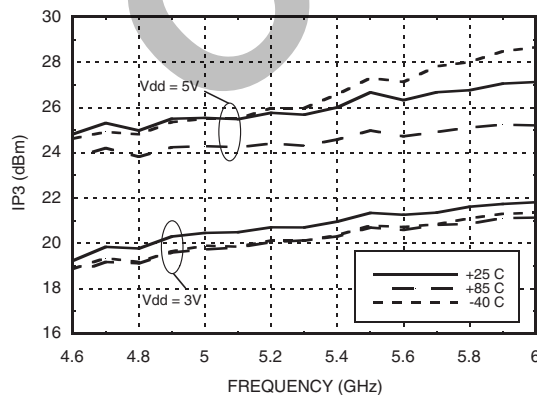
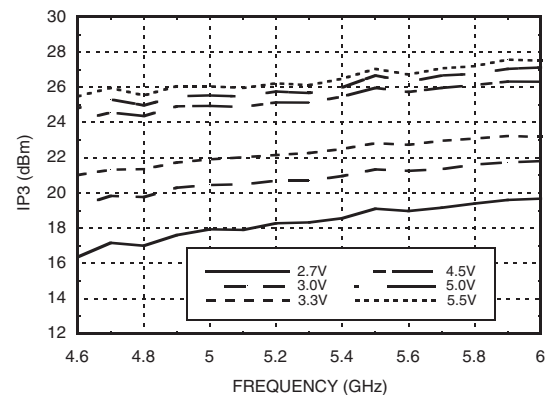
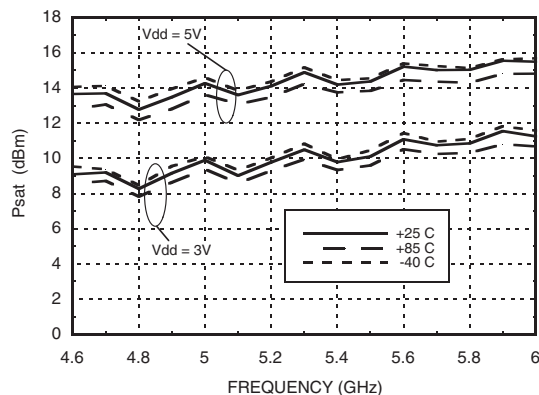
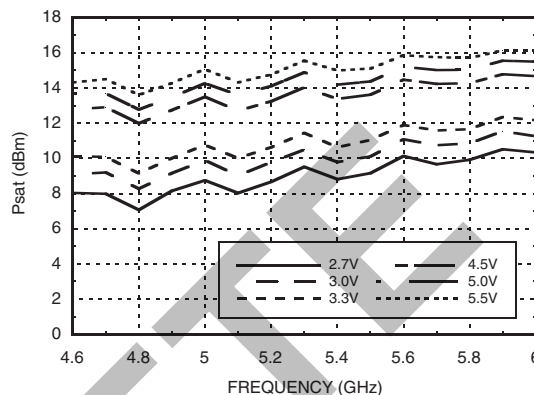
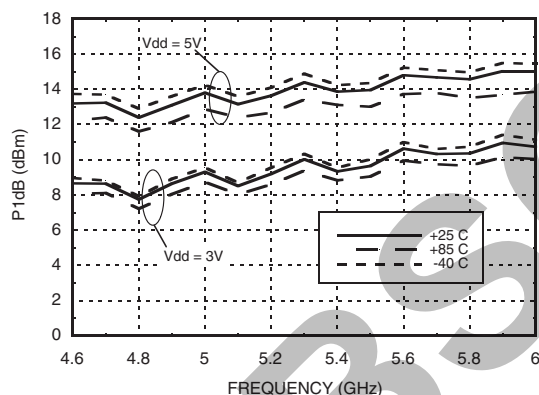
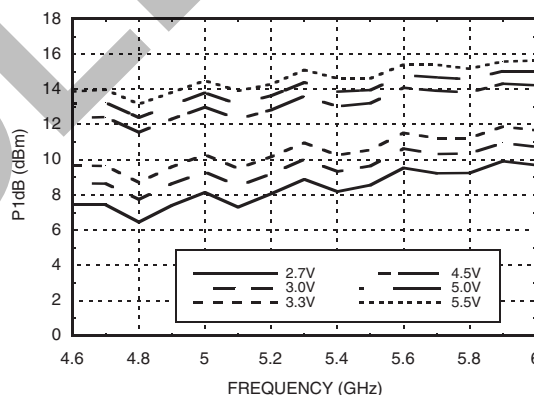
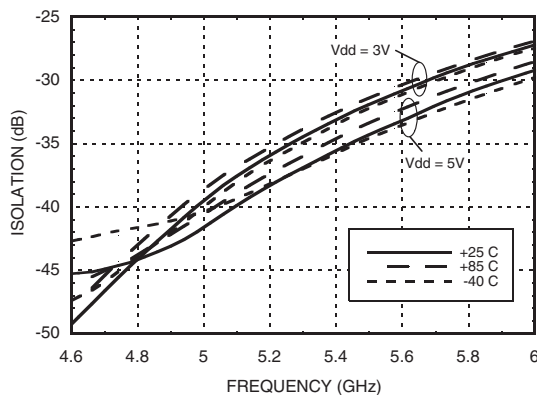



**GaAs PHEMT MMIC LOW NOISE
AMPLIFIER w/ BYPASS MODE, 4.8 - 6.0 GHz**
7
AMPLIFIERS - LOW NOISE - SMT
**LNA Broadband Gain
& Return Loss @ Vdd = 3V**

**LNA Broadband Gain
& Return Loss @ Vdd = 5V**

LNA Gain vs. Temperature

LNA Noise Figure vs. Temperature

LNA Gain vs. Vdd

LNA Noise Figure vs. Vdd


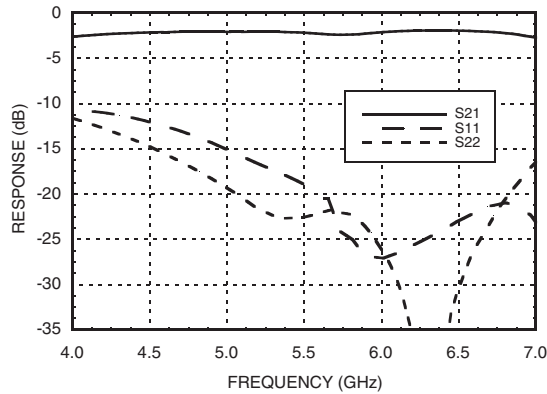

**GaAs PHEMT MMIC LOW NOISE
AMPLIFIER w/ BYPASS MODE, 4.8 - 6.0 GHz**
**LNA Input Return Loss
vs. Temperature @ Vdd= 3V**

**LNA Input Return Loss
vs. Temperature @ Vdd= 5V**

**LNA Output Return Loss
vs. Temperature @ Vdd= 3V**

**LNA Output Return Loss
vs. Temperature @ Vdd= 5V**

LNA Output IP3 vs. Temperature

LNA Output IP3 vs. Vdd


LNA Psat vs. Temperature

LNA Psat vs. Vdd

LNA Output P1dB vs. Temperature

LNA Output P1dB vs. Vdd

LNA Reverse Isolation vs. Temperature


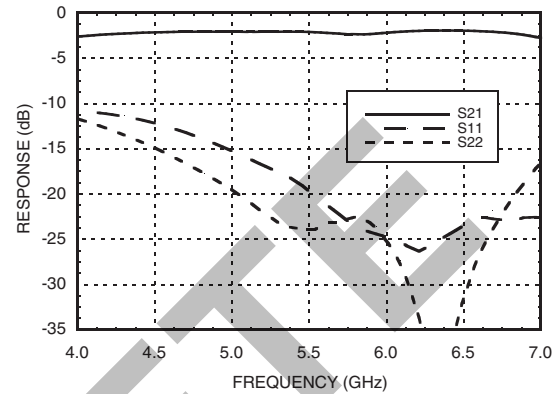


**GaAs PHEMT MMIC LOW NOISE
AMPLIFIER w/ BYPASS MODE, 4.8 - 6.0 GHz**

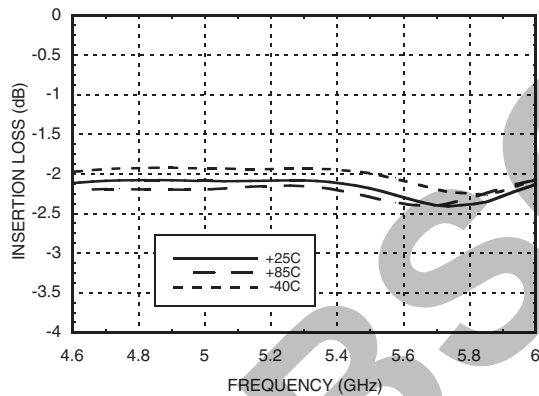
**Bypass Mode
Broadband Gain & Return Loss [1]**



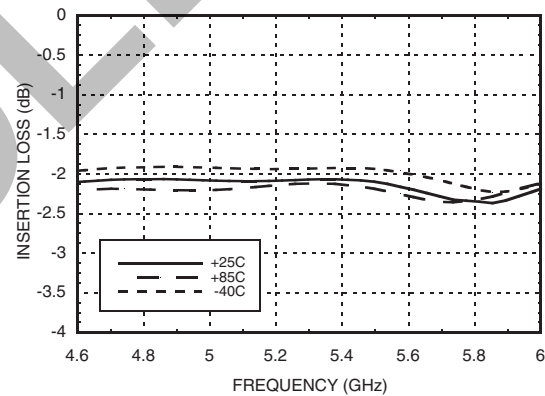
**Bypass Mode
Broadband Gain & Return Loss [2]**



**Bypass Mode
Insertion Loss vs. Temperature [1]**



**Bypass Mode
Insertion Loss vs. Temperature [2]**



[1] Vdd = 3V [2] Vdd = 5V

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

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



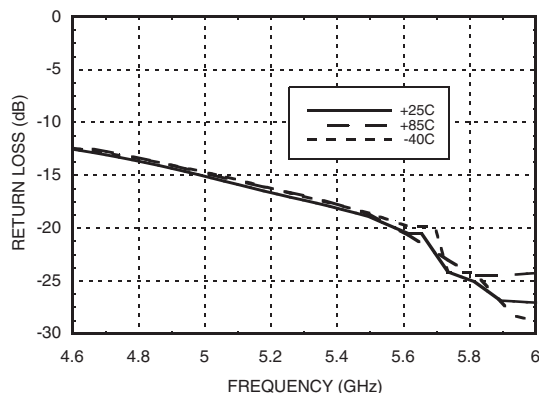
**GaAs PHEMT MMIC LOW NOISE
AMPLIFIER w/ BYPASS MODE, 4.8 - 6.0 GHz**

7

AMPLIFIERS - LOW NOISE - SMT

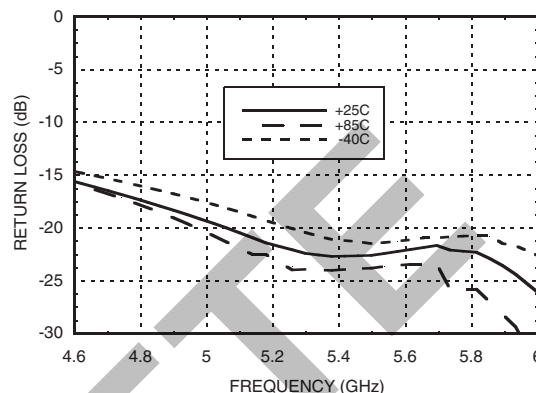
Bypass Mode

Input Return Loss vs. Temperature [1]



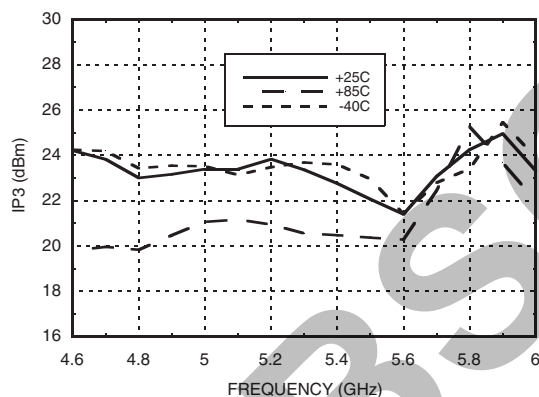
Bypass Mode

Output Return Loss vs. Temperature [1]



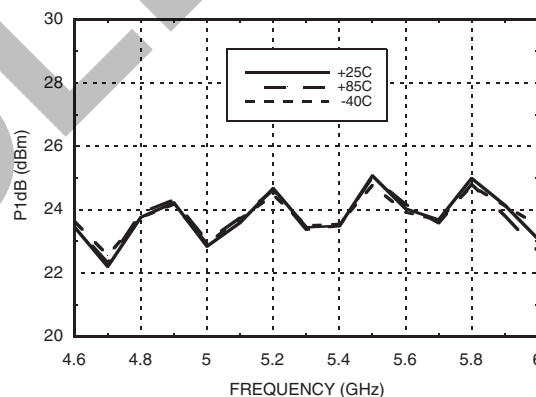
Bypass Mode

Output IP3 vs. Temperature [1]

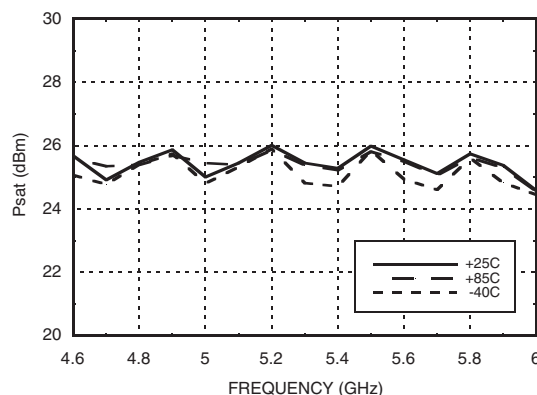


Bypass Mode

Output P1dB vs. Temperature [1]



**Bypass Mode
Psat vs. Temperature [1]**



[1] Vdd = 3V or Vdd = 5V

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

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


**GaAs PHEMT MMIC LOW NOISE
AMPLIFIER w/ BYPASS MODE, 4.8 - 6.0 GHz**

7

AMPLIFIERS - LOW NOISE - SMT

Absolute Maximum Ratings

Drain Bias Voltage (Vdd)	+8 Vdc
RF Input Power (RFIN)	LNA Mode +15 dBm
(Vdd = +5.0 Vdc)	Bypass Mode +30 dBm
Channel Temperature	150 °C
Continuous P _{diss} (T = 85 °C) (derate 13 mW/°C above 85 °C)	850 mW
Thermal Resistance (channel to ground paddle)	76.9 °C/W
Storage Temperature	-65 to +150° C
Operating Temperature	-40 to +85° C



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

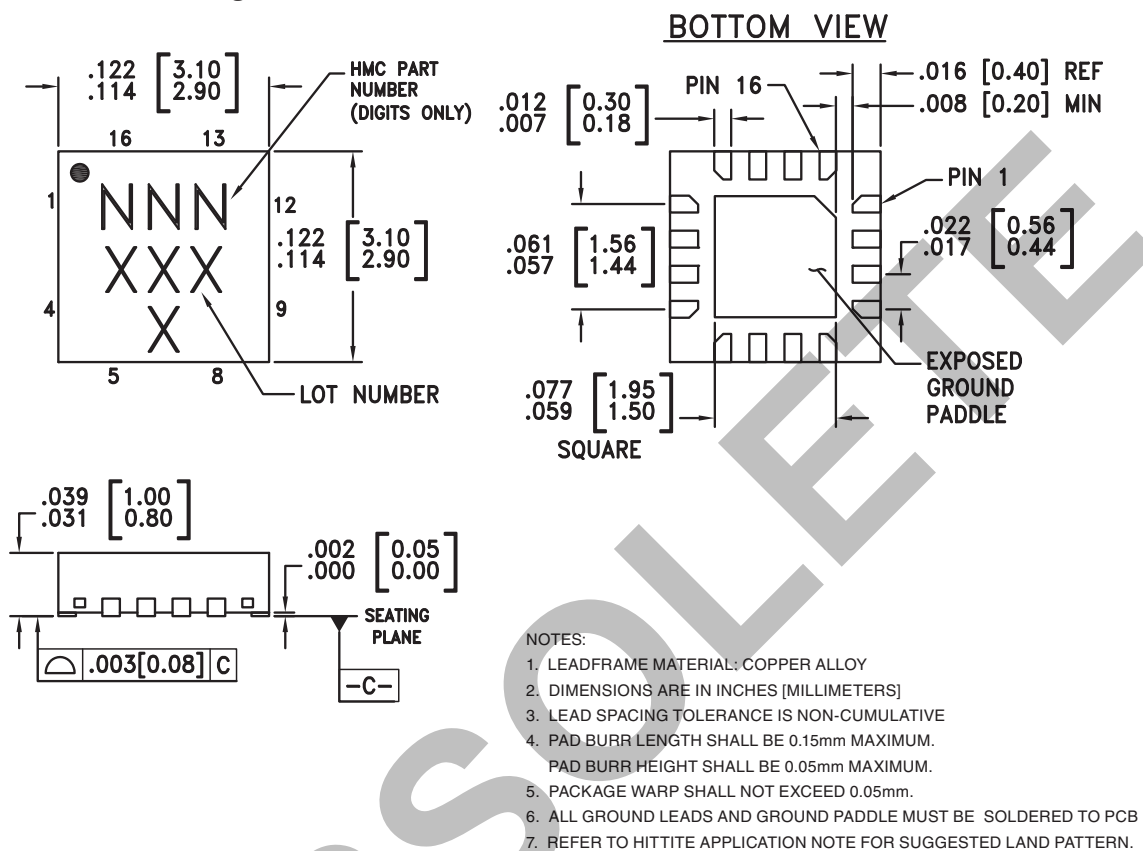
Typical Supply Current vs. Vdd

Vdd (Vdc)	Idd (mA)
+2.7	13
+3.0	17
+3.3	21
+4.5	37
+5.0	42
+5.5	46

Truth Table

LNA Mode	Vctl= Vdd
Bypass Mode	Vctl= 0V

Outline Drawing



Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[3]
HMC604LP3	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	604 XXXX
HMC604LP3E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	604 XXXX

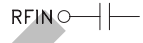


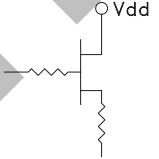
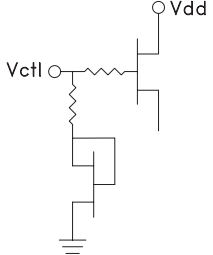
[1] Max peak reflow temperature of 235 °C

[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

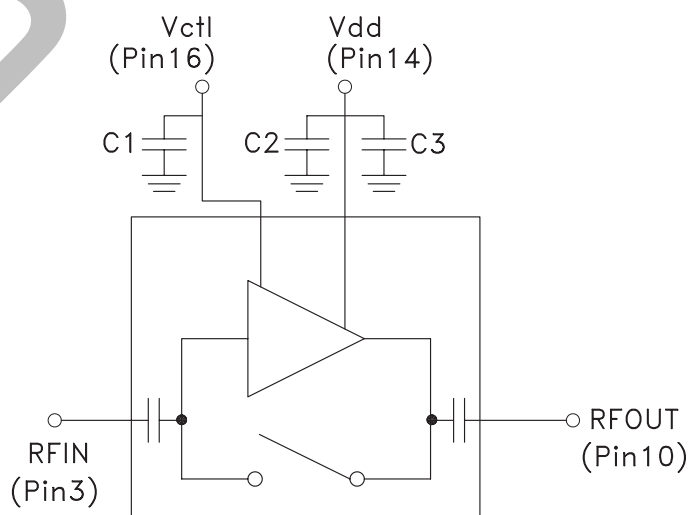


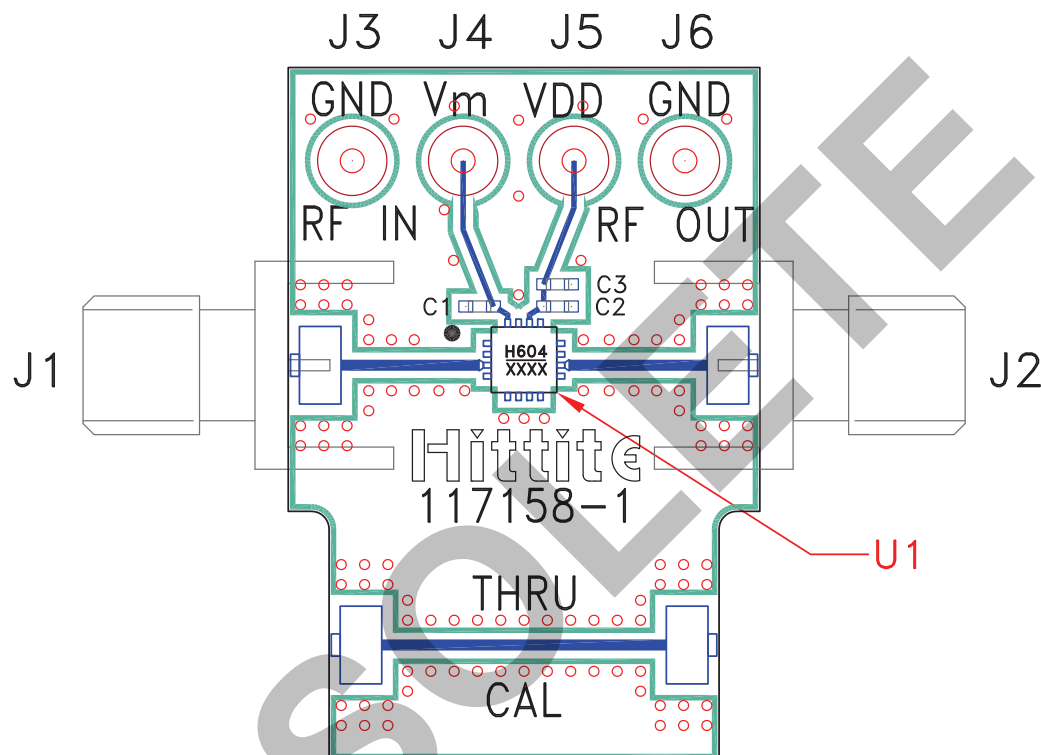
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2, 5, 6, 8, 12	N/C	No connection necessary. These pins may be connected to RF/DC ground.	
3	RFIN	This pin is AC coupled and matched to 50 Ohms.	
4, 7, 9, 11, 15	GND	These pins must be connected to RF/DC ground.	
10	RFOUT	This pin is AC coupled and matched to 50 Ohms.	
14	Vdd	Power supply voltage. Bypass capacitors are required. See application circuit.	
16	Vctl	LNA/Bypass Mode Control Voltage. See truth table.	

Application Circuit

Components	Value
C1, C2	100pF
C3	10KpF



Evaluation PCB

List of Materials for Evaluation PCB 117160 [1]

Item	Description
J1 - J2	PCB Mount SMA RF Connector
J3 - J6	DC Pin
C1, C2	100 pF Capacitor, 0402 Pkg.
C3	10 KpF Capacitor, 0402 Pkg.
U1	HMC604LP3 / HMC604LP3E Amplifier
PCB [2]	117158 Evaluation Board

[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 circuit board shown is available from Hittite upon request.