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HMC318MS8G

GaAs MMIC LOW NOISE AMPLIFIER with AGC, 5.0 - 6.0 GHz

Typical Applications

The HMC318MS8G is ideal for:

- UNII
- HiperLAN

Features

LNA with 18 dB Gain Control

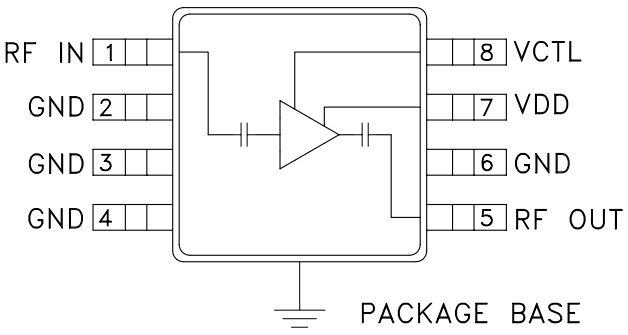
+3V Operation

Low Noise Figure: 2.5 dB

No External Components

Ultra Small 8 Lead MSOP:
14.8mm^2 x 1mm High

Functional Diagram



General Description

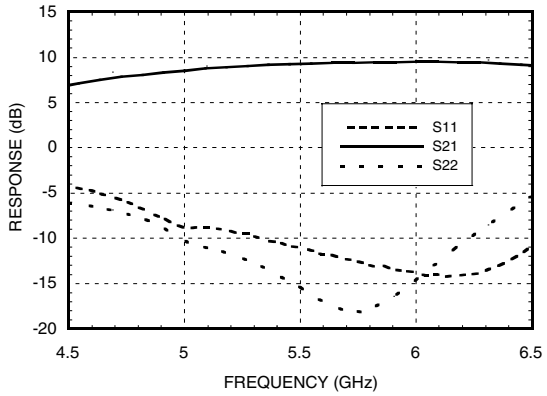
The HMC318MS8G is a surface mount low cost C-band variable gain low noise amplifier (VGLNA) that serves the full UNII and HiperLAN bands. The HMC318MS8G operates using a single positive supply that can be set between +3V or +5V. When a control voltage of 0V to +3V is applied, the gain of the amplifier will decrease while maintaining excellent return loss performance. A maximum gain of 9 dB is achieved when VCTL is set to 0V and a minimum gain of -9 dB is achieved when Vctl is set to +3V.

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

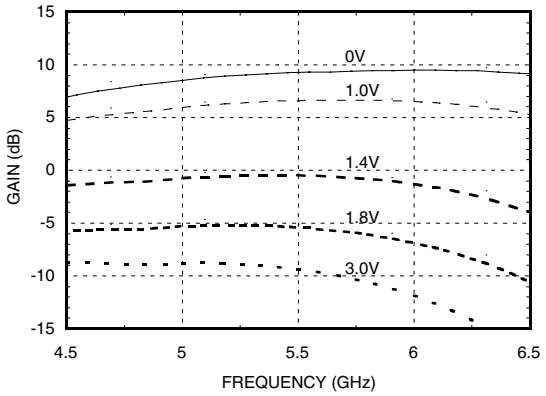
Parameter*	Min.	Typ.	Max.	Units
Frequency Range		5.0 - 6.0		GHz
Gain	6	9	12	dB
Gain Variation over Temperature		0.03	0.04	dB/°C
Gain Control Range	11	18	23	dB
Noise Figure		2.5	4.0	dB
Input Return Loss	6	12		dB
Output Return Loss	7	13		dB
Output Power for 1 dB Compression (P1dB)	-1	2		dBm
Output Third Order Intercept (OIP3)	10	13		dBm
Supply Current (Idd)		6	10	mA

** Specifications refer to the maximum gain state (Vctl = 0V) unless otherwise noted.*

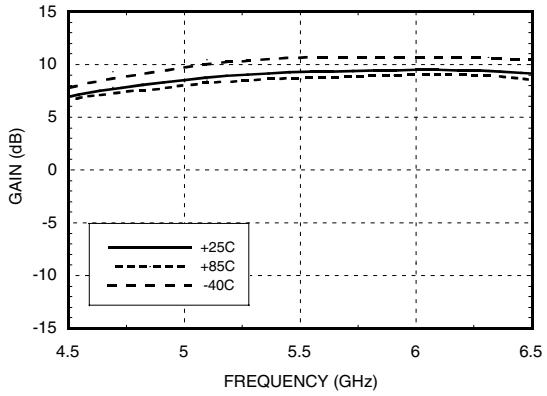
Gain & Return Loss @ Vctl = 0V



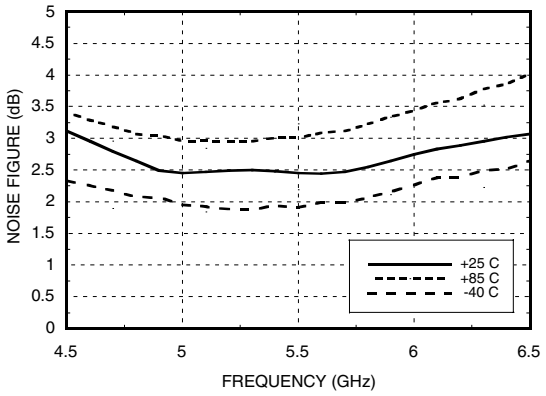
Gain over Control Range



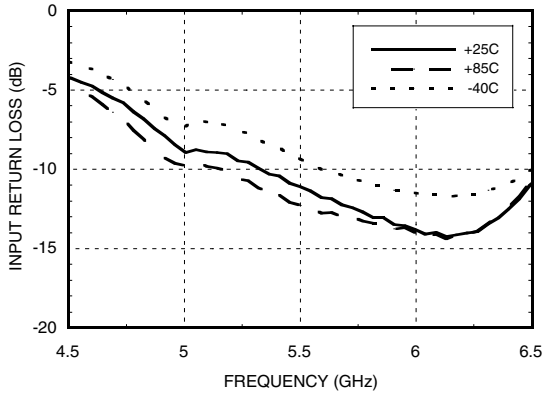
Gain vs. Temperature, Vctl = 0V



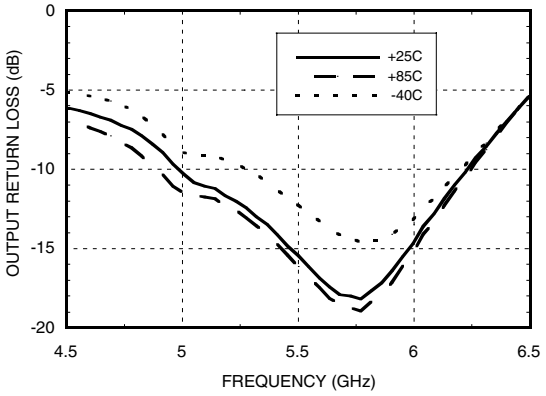
Noise Figure vs. Temperature, Vctl = 0V



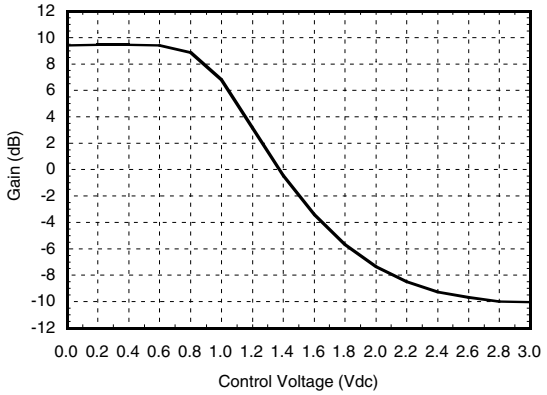
Input Return Loss vs. Temperature, Vctl = 0V



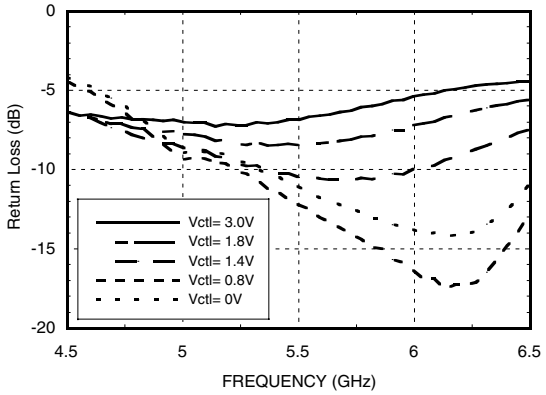
Output Return Loss vs. Temperature, Vctl = 0V



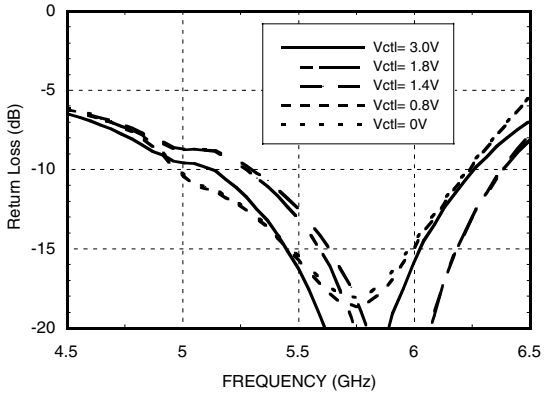
Gain vs. Control Voltage @ 5.8 GHz



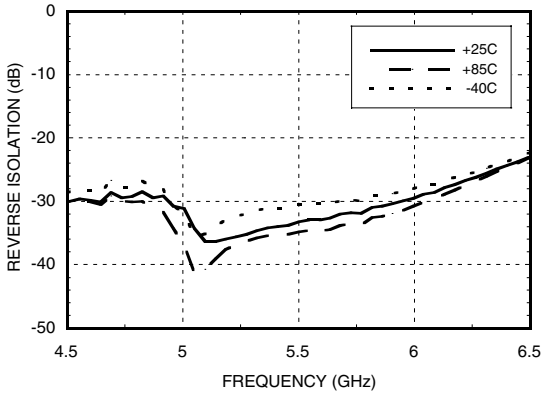
Input Return Loss over Control Range



Output Return Loss over Control Range



Reverse Isolation vs. Temperature, Vctl = 0V



Noise Figure and OIP3 vs. Control Voltage

Frequency = 5.8 GHz		
VCTL	Noise Figure (dB)	OIP3 (dBm)*
0V	2.5	13.0
1.4V	4.5	1.2
3.0V	10.5	-6.7
*Two-tone input power = -20 dBm per tone.		

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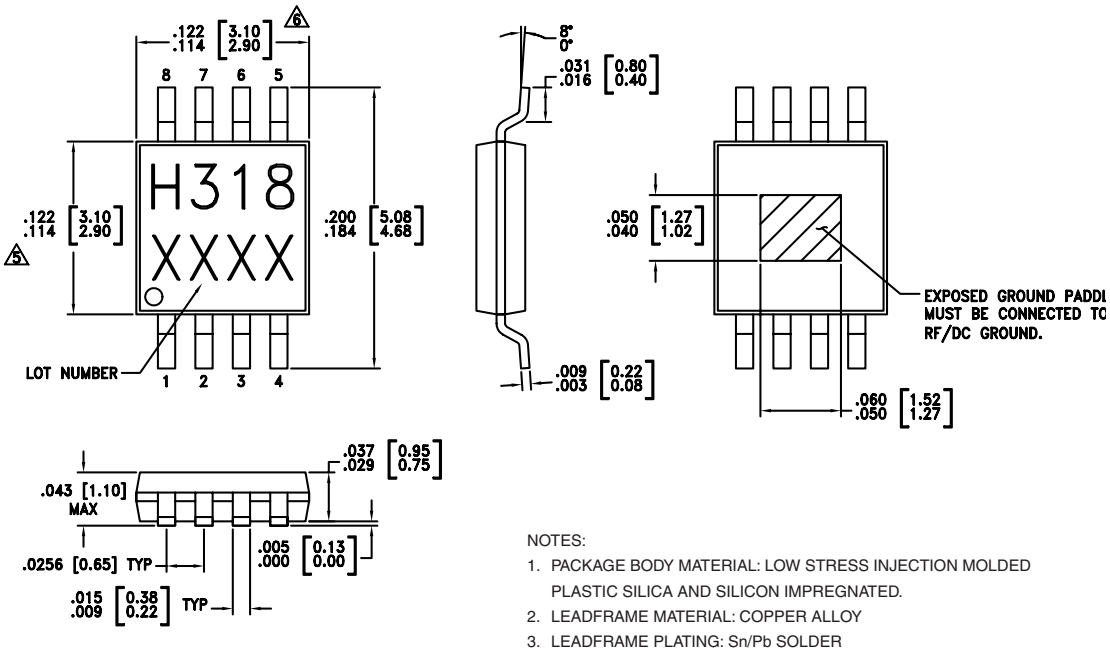
Absolute Maximum Ratings

Drain Bias Voltage (Vdd)	+7.0 Vdc
Control Voltage Range (Vctl)	-0.2 to Vdd
RF Input Power (RFin)(Vdd = +3.0 Vdc)	0 dBm
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C) (derate 9.76 mW/°C above 85 °C)	0.634 W
Thermal Resistance (channel to ground paddle)	102 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

Gain Control

Vctl (Vdc)	Gain State	Typical Ictl (uA)
0	Maximum	25
Vdd	Minimum	25

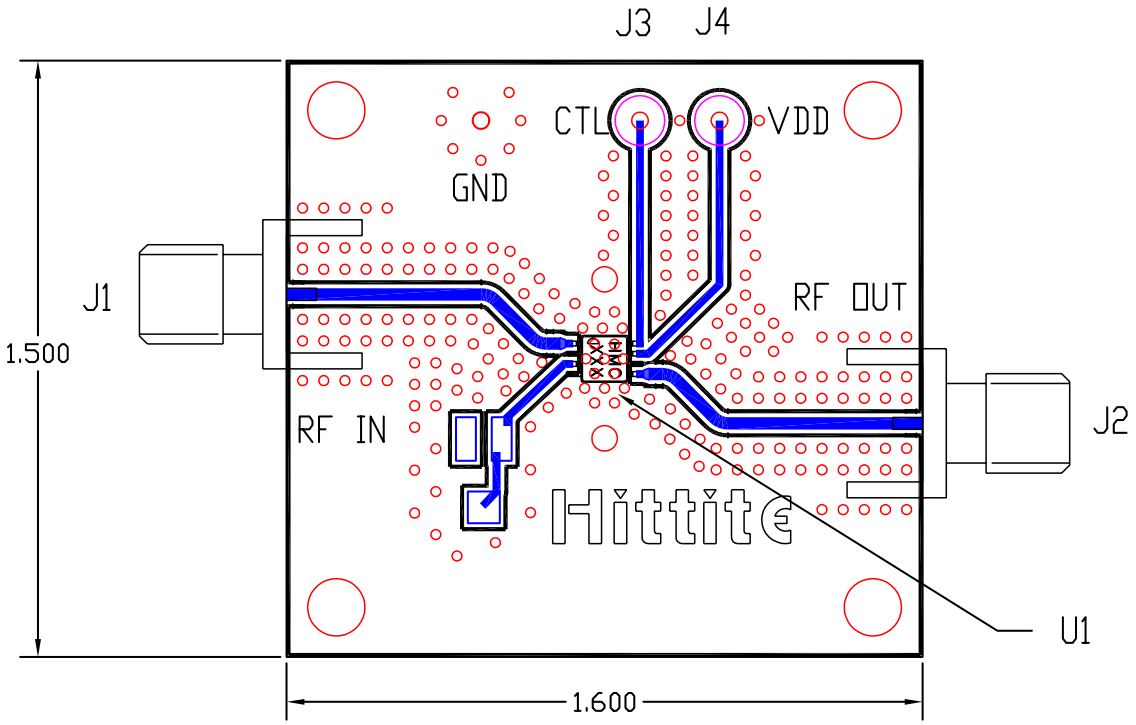
Outline Drawing



NOTES:

1. PACKAGE BODY MATERIAL: LOW STRESS INJECTION MOLDED PLASTIC SILICA AND SILICON IMPREGNATED.
2. LEADFRAME MATERIAL: COPPER ALLOY
3. LEADFRAME PLATING: Sn/Pb SOLDER
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
7. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.

Evaluation PCB



List of Material

Item	Description
J1, J2	PC Mount SMA Connector
J3, J4	DC Pin
U1	HMC318MS8G Amplifier
PCB*	Evaluation PCB 1.6" x 1.5"
*Circuit Board Material: Roger 4350	

The circuit board used in the final 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.

Notes: