HMC326MS8G

HBT DRIVER AMPLIFIER 3.0 - 4.5 GHz

FEBRUARY 2001

v00.1200

Features

Psat Output Power: +26 dBm

> 40% PAE

Output IP3 : +36 dBm

High Gain: 21 dB

Vs: +5.0V

Ultra Small Package: MSOP8G

General Description

The HMC326MS8G is a high efficiency GaAs InGaP Heterojunction Bipolar Transistor (HBT) MMIC driver amplifier which operates between 3.0 and 4.5 GHz. The amplifier is packaged in a low cost, surface mount 8 leaded package with an exposed base for improved RF and thermal performance. The amplifier provides 21 dB of gain and +26 dBm of saturated power from a +5.0V supply voltage. Power down capability is available to preserve current consumption when the amplifier is not in use. Internal circuit matching was optimized to provide greater than 40% PAE. This amplifier is ideal for usage as a driver amplifier for wireless local loop applications in the 3.3 - 3.6 GHz frequency range.

Guaranteed Performance, *Vs = +5V*, 50 ohm System, -40 to +85 deg C*

Parameter		Min.	Typ.	Max.	Units
Frequency Range			3.0 - 4.5		GHz
Gain @ 25 °C		18	21	24	dB
Gain Variation over Temperature			0.025	0.035	dB/ °C
Input Return Loss		8	12		dB
Output Return Loss		5	7		dB
Output Power for 1dB Compression (P1dB)		21	23.5		dBm
Saturated Output Power (Psat)		23	26		dBm
Output Third Order Intercept (IP3)		32	36		dBm
Noise Figure			5		dB
Switching Speed	On/Off		10		ns
Supply Current (Icc)	Off/On		0.001 / 120		mA
Control Voltage (Vpd)	Off/On		0 / +5		Volts
Control Current (Ipd)	Off/On		0.001 / 7		mA

* See application circuit on pg. 1-167.

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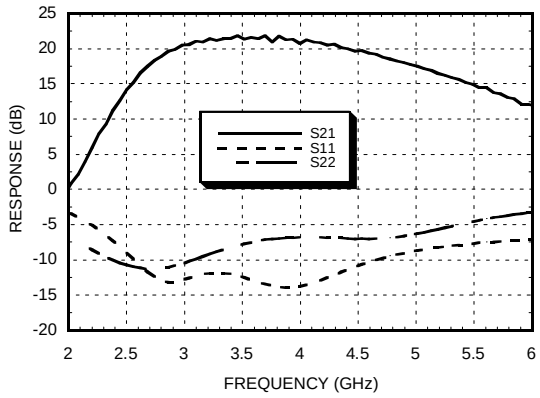
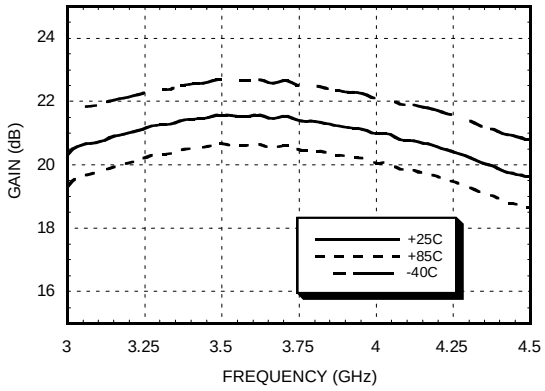
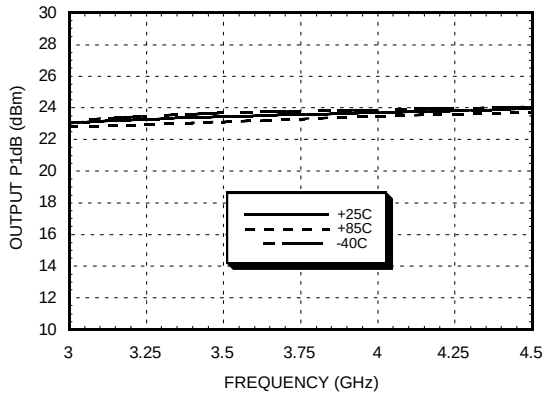
Broadband Gain & Return Loss



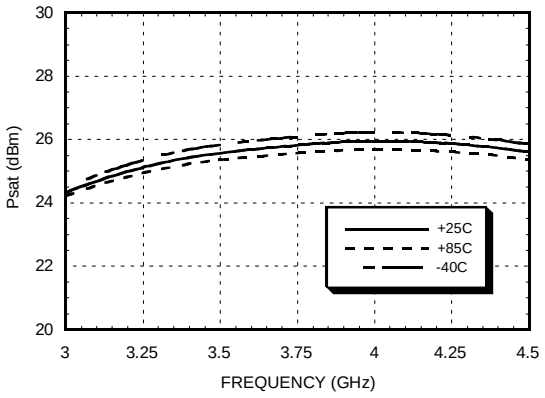
Gain vs. Temperature, Vcc= +4.5



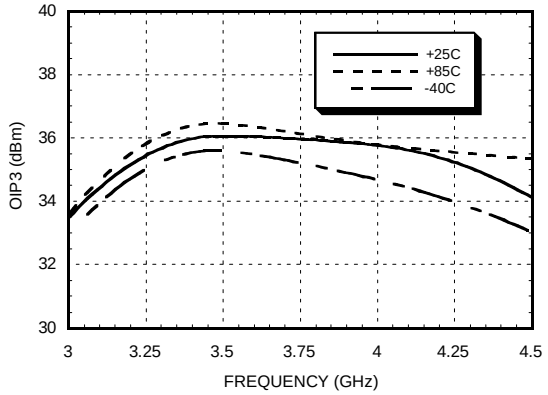
P1dB vs. Temperature



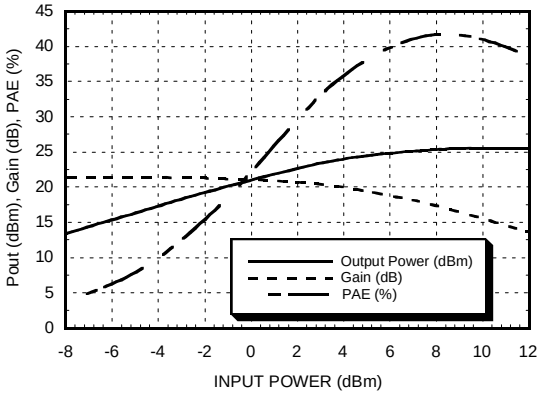
Psat vs. Temperature



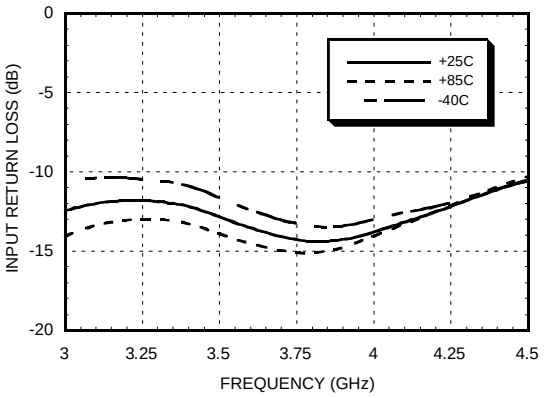
Output IP3 vs. Temperature



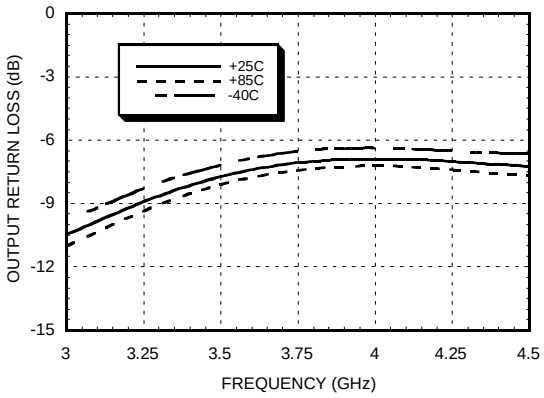
Output Power vs. Input Power@ 3.5 GHz



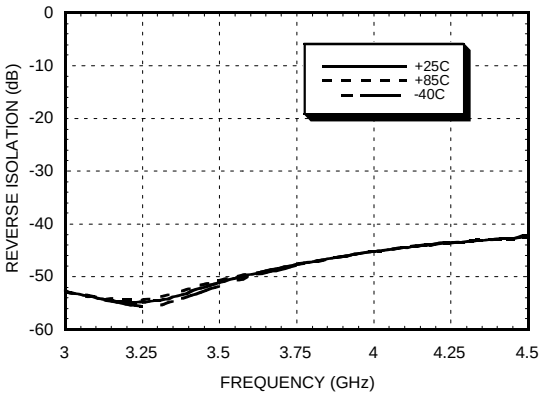
Input Return Loss vs. Temperature



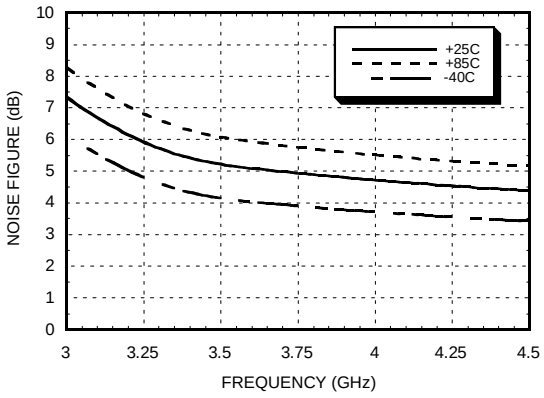
Output Return Loss vs. Temperature



Reverse Isolation vs. Temperature



Noise Figure vs. Temperature



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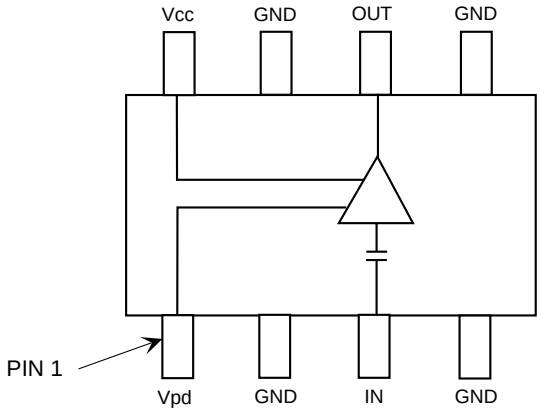
Functional Diagram

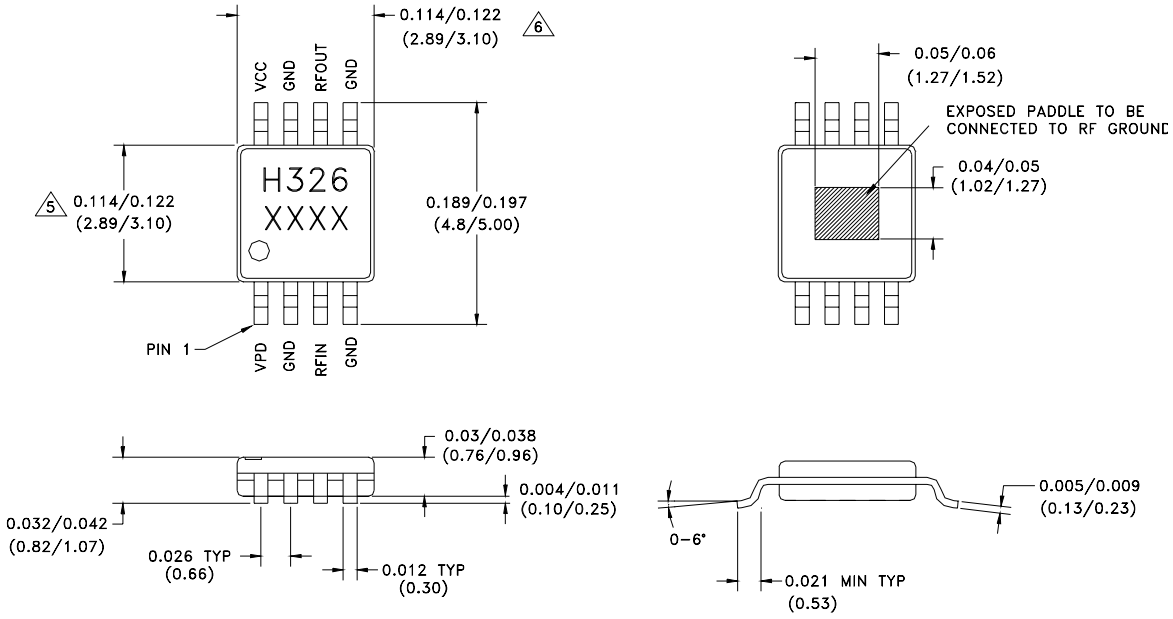


Absolute Maximum Ratings

Supply Voltage (Vcc)	+5.5 Vdc
Control Voltage (Vpd)	+5.5 Vdc
Input Power (RFin)(Vcc = +4.5V)	+20 dBm
Channel Temperature (Tc)	175 °C
Continuous Pdiss (Ta= 85 °C) (derate 11.49 mW/°C above 85 °C)	1034 mW
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

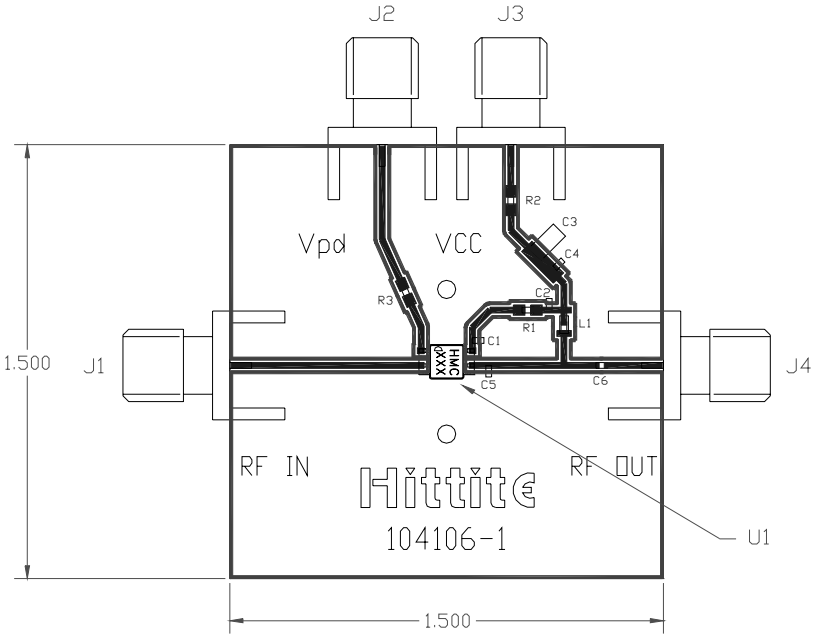
See page 1 - 167 for HMC326MS8G Application Circuit.

Outline



1. MATERIAL:
   A) PACKAGE BODY - LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.
   B) LEADFRAME MATERIAL: COPPER ALLOY
2. PLATING : LEAD - TIN SOLDER PLATE
3. DIMENSIONS ARE IN INCHES (MILLIMETERS).
   UNLESS OTHERWISE SPECIFIED ALL TOL. ARE ±0.005 (±0.13).
4. CHARACTERS TO BE HELVETICA MEDIUM, APPROX .020 HIGH WHITE INK, LOCATED APPROXIMATELY AS SHOWN.
5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15 MM PER SIDE
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25 MM PER SIDE

Evaluation PCB for HMC326MS8G

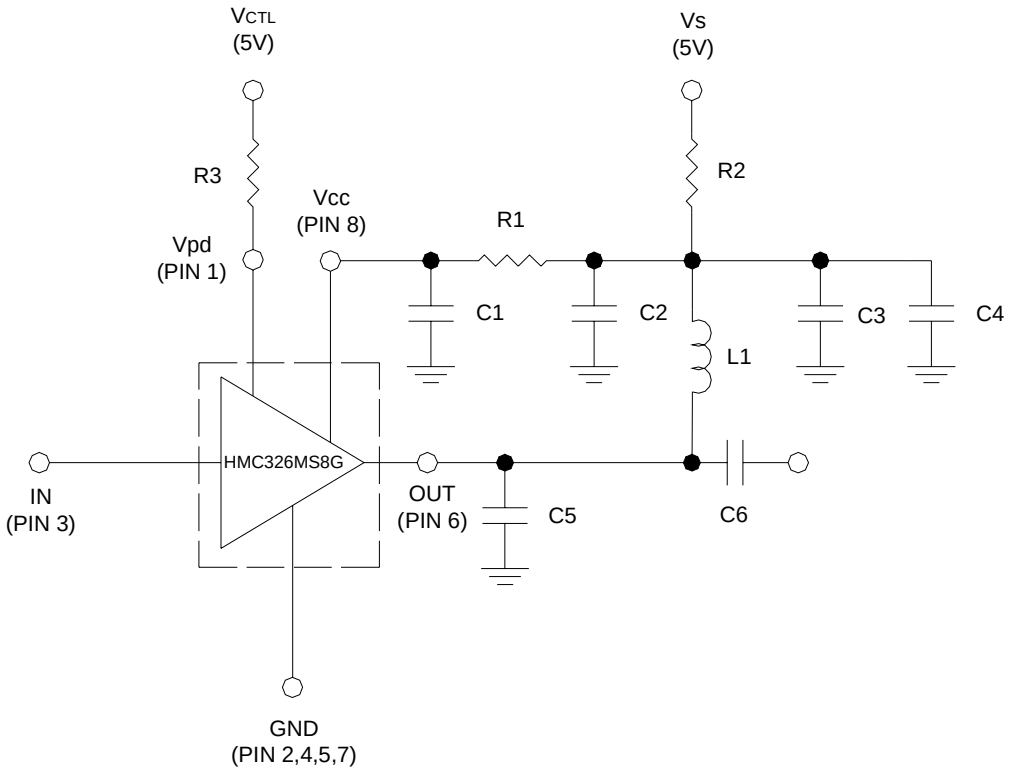


The circuit board used in the final application should use RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown above. A sufficient number of VIA holes should be used to connect the top and bottom ground planes. The evaluation board should be mounted to an appropriate heat sink. The evaluation circuit board as shown is available from Hittite upon request.

List of Material

Item	Description
J1, J2, J3, J4	PC Mount SMA RF Connector
R1	10 Ohm Resistor
R2	4.3 Ohm Resistor
R3	330 Ohm Resistor
C1, C2	330 pF Capacitor
C3	0.01 µF Capacitor
C4	4700 pF Capacitor
C5	0.7 pF Capacitor
C6	3.0 pF Capacitor
L1	3.3 nH Inductor
U1	HMC326MS8G Amplifier
PCB*	104106 Eval Board
** Circuit Board Material : Rogers 4350*	

HMC326MS8G Application Circuit



Recommended Component Values	
L1	3.3 nH
C1, C2	330 pF
C3	0.01 µF
C4	4700 pF
C5	0.7 pF
C6	3.0 pF
R1	10 Ohm
R2	4.3 Ohm
R3	330 Ohm

NOTES: