HMC326MS8G

GaAs InGaP HBT MMIC DRIVER AMPLIFIER, 3.0 - 4.5 GHz

Typical Applications

The HMC326MS8G is ideal for:

- Microwave Radios
- Broadband Radio Systems
- Wireless Local Loop Driver Amplifier

Features

Psat Output Power: +26 dBm

> 40% PAE

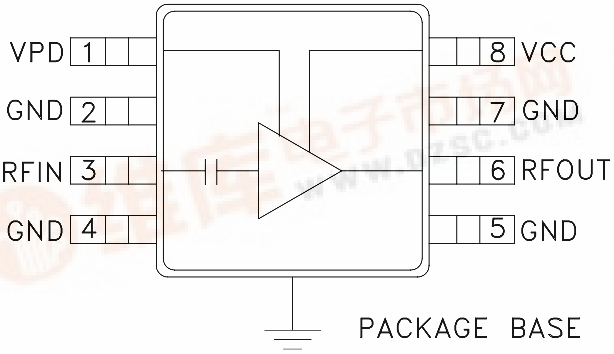
Output IP3: +36 dBm

High Gain: 21 dB

Vs: +5.0V

Ultra Small Package: MSOP8G

Functional Diagram



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 conserve current consumption when the amplifier is not in use. Internal circuit matching was optimized to provide greater than 40% PAE.

Electrical Specifications, $T_A = +25° C, Vs = 5V, Vpd = 5V$

Parameter	Min.	Typ.	Max.	Units
Frequency Range	3.0 - 4.5			GHz
Gain	18	21		dB
Gain Variation Over Temperature		0.025	0.035	dB / °C
Input Return Loss		12		dB
Output Return Loss		7		dB
Output Power for 1dB Compression (P1dB)	21	23.5		dBm
Saturated Output Power (Psat)		26		dBm
Output Third Order Intercept (IP3)	32	36		dBm
Noise Figure		5		dB
Supply Current (Icc) Vpd = 0V / 5V		0.001 / 130		mA
Control Current (Ipd)		7		mA
Switching Speed tOn/tOff		10		ns

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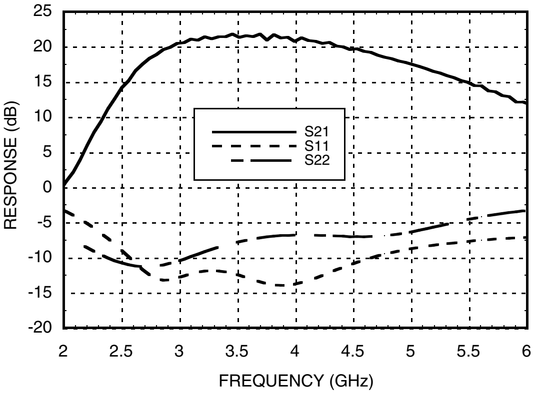
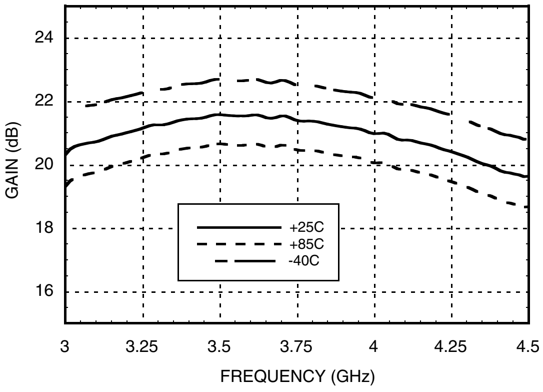
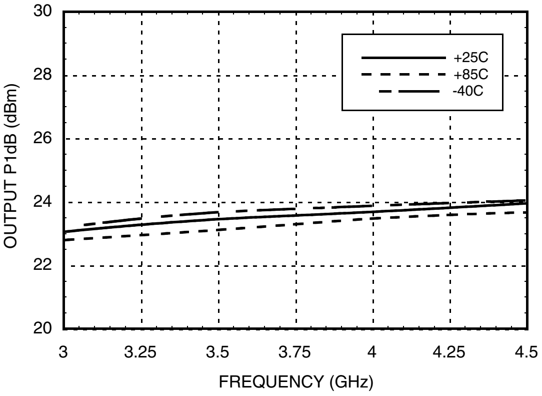
Broadband Gain & Return Loss



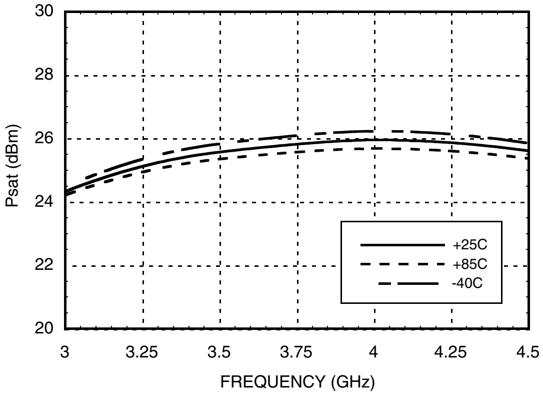
Gain vs. Temperature



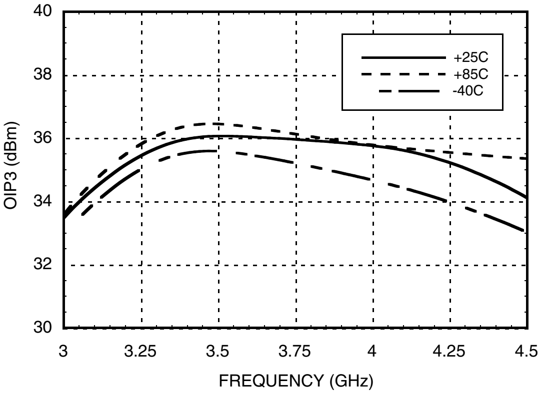
P1dB vs. Temperature



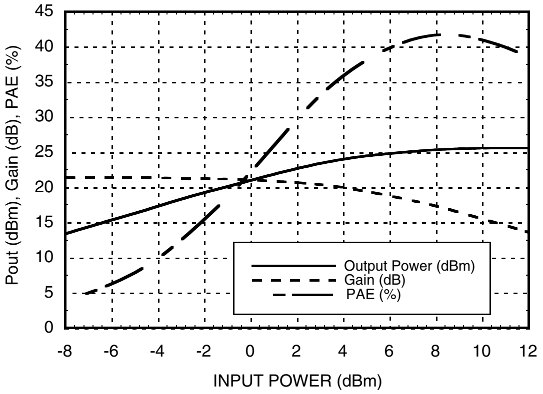
Psat vs. Temperature



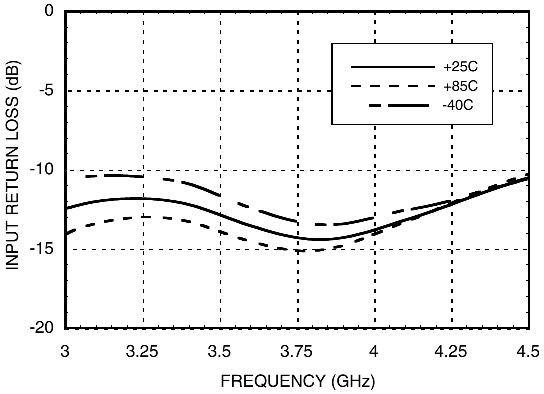
Output IP3 vs. Temperature



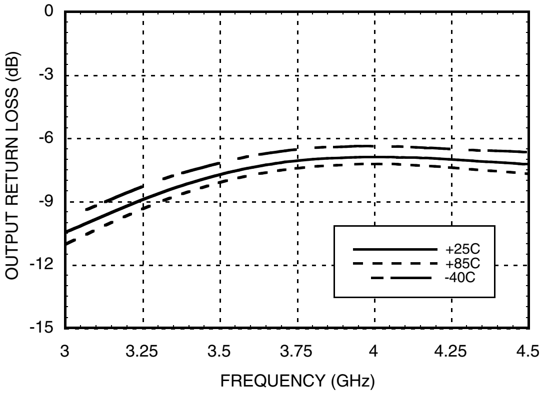
Power Compression @ 3.5 GHz



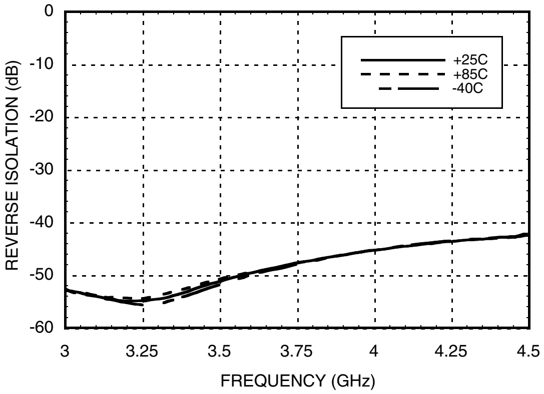
Input Return Loss vs. Temperature



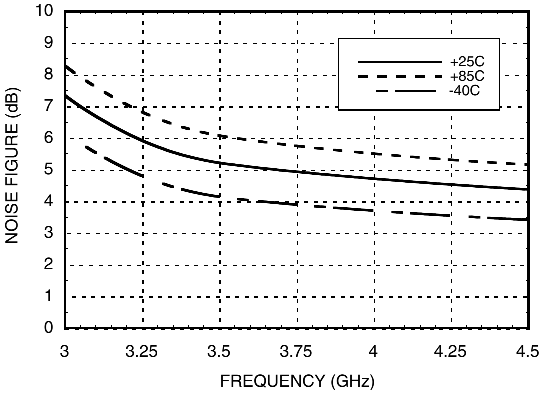
Output Return Loss vs. Temperature



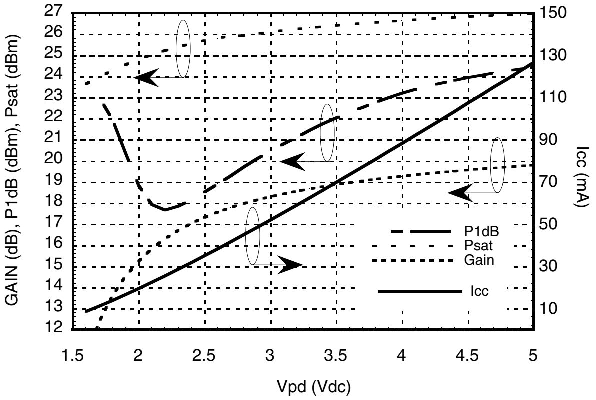
Reverse Isolation vs. Temperature



Noise Figure vs. Temperature



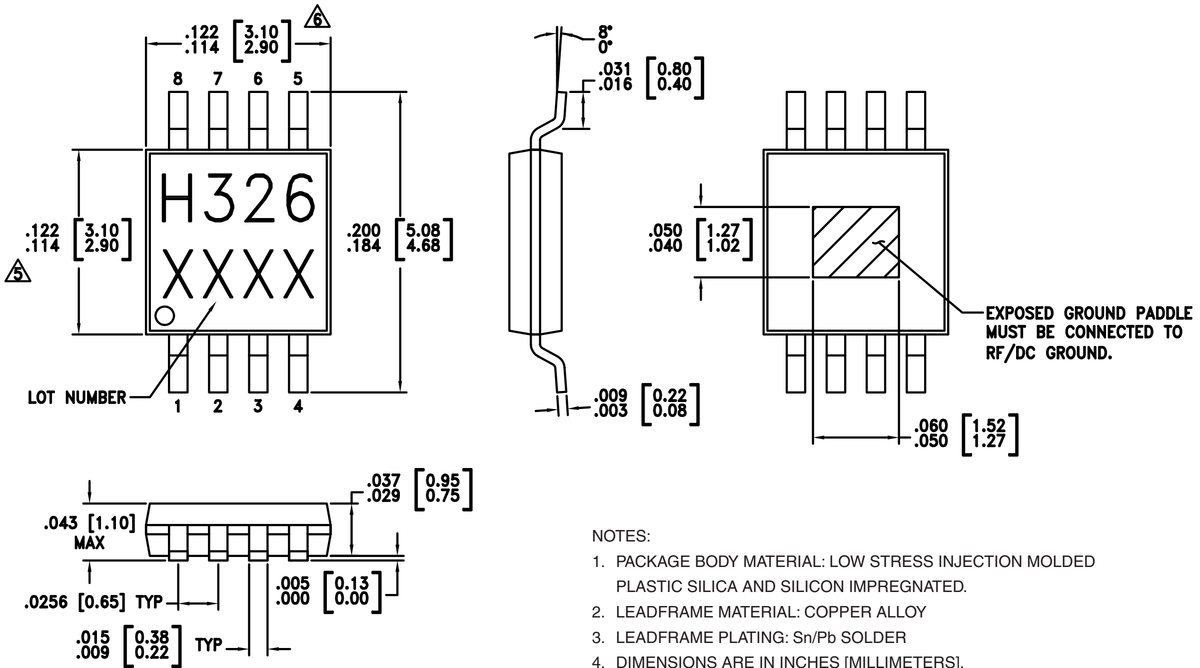
Gain, Power & Quiescent Supply Current vs. Vpd @3.5 GHz



Absolute Maximum Ratings

Collector Bias Voltage (Vcc)	+5.5 Vdc
Control Voltage Range (Vpd)	+5.5 Vdc
RF Input Power (RFin)(Vs = Vpd = +5.0 Vdc)	+20 dBm
Junction Temperature	150 °C
Continuous Pdiss (T = 85 °C) (derate 11.49 mW/°C above 85 °C)	0.747 W
Thermal Resistance (junction to ground paddle)	87 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

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.

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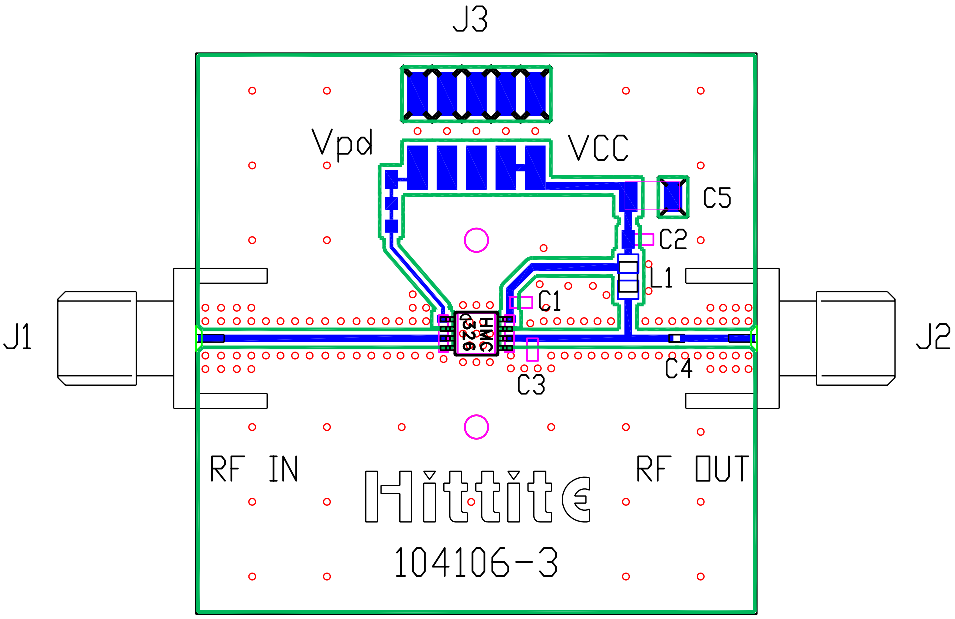
Evaluation PCB

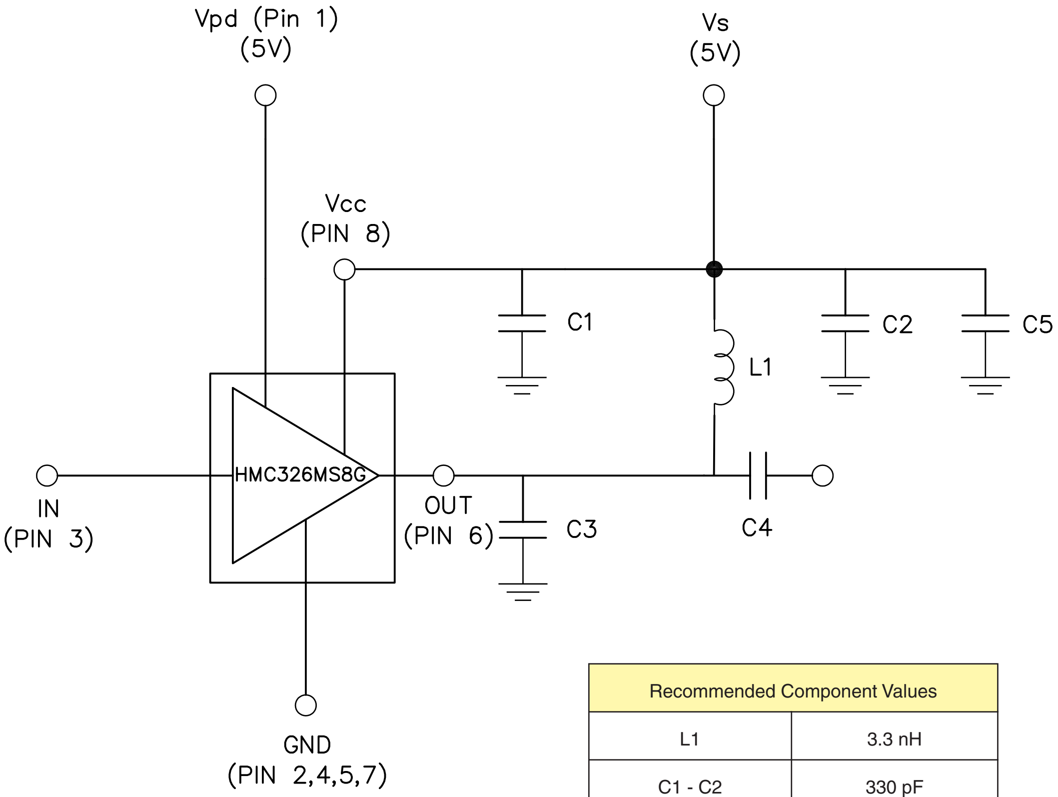


List of Material

Item	Description
J1 - J2	PC Mount SMA RF Connector
J3	2mm DC Header
C1 - C2	330 pF Capacitor, 0603 Pkg.
C3	0.7 pF Capacitor, 0603 Pkg.
C4	3.0 pF Capacitor, 0402 Pkg.
C5	2.2 µF Capacitor, Tantalum
L1	3.3 nH Inductor, 0805 Pkg.
U1	HMC326MS8G Amplifier
PCB*	104106 Eval Board
*Circuit Board Material: Rogers 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 board should be mounted to an appropriate heat sink. The evaluation circuit board shown is available from Hittite upon request.

Application Circuit



Recommended Component Values	
L1	3.3 nH
C1 - C2	330 pF
C3	0.7 pF
C4	3.0 pF
C5	2.2 µF

Note 1: C1 should be located < 0.1" (2.54 mm) from pin 8 (Vcc).
Note 2: C2 should be located < 0.1" (2.54 mm) from L1.