



MICROWAVE CORPORATION v08.0808



HMC326MS8G / 326MS8GE

GaAs InGaP HBT MMIC DRIVER AMPLIFIER, 3.0 - 4.5 GHz

Typical Applications

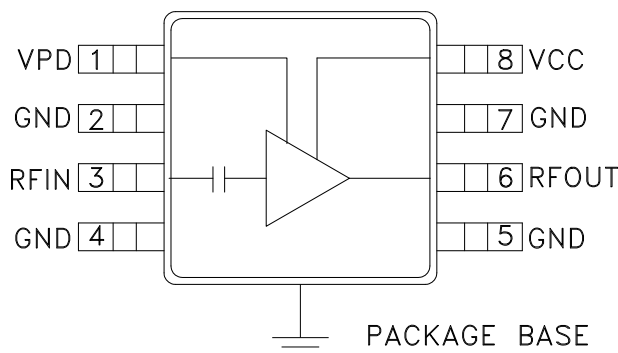
The HMC326MS8G / HMC326MS8GE is ideal for:

- 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: +5V
Ultra Small Package: MSOP8G

Functional Diagram



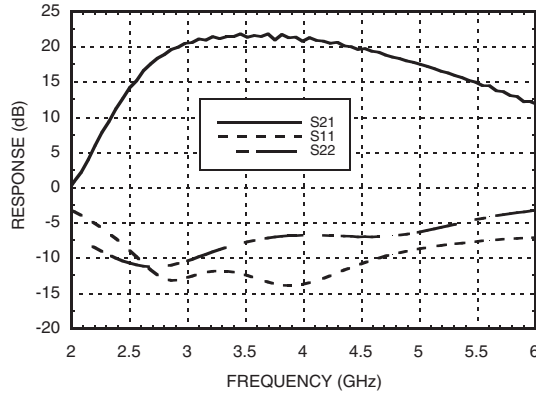
General Description

The HMC326MS8G & HMC326MS8GE are high efficiency GaAs InGaP Heterojunction Bipolar Transistor (HBT) MMIC driver amplifiers which operate 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 +5V 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.

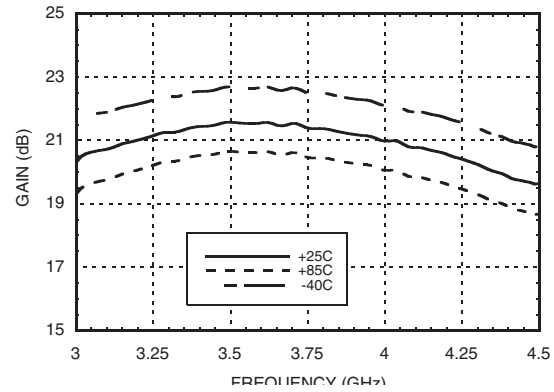
Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_s = 5\text{V}$, $V_{pd} = 5\text{V}$

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			mA
Control Current (Ipd)		7		mA
Switching Speed	tOn/tOff	10		ns

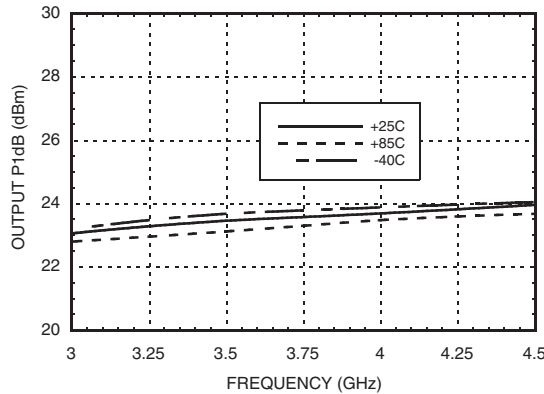
Broadband Gain & Return Loss



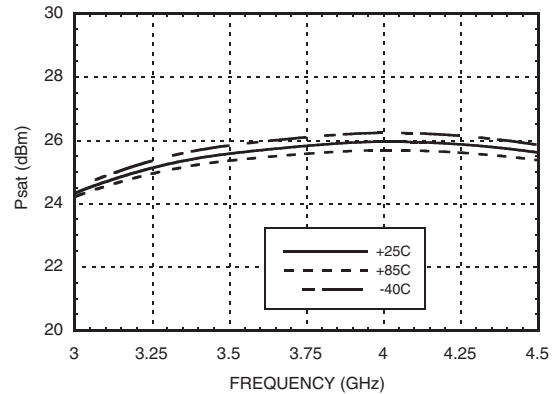
Gain vs. Temperature



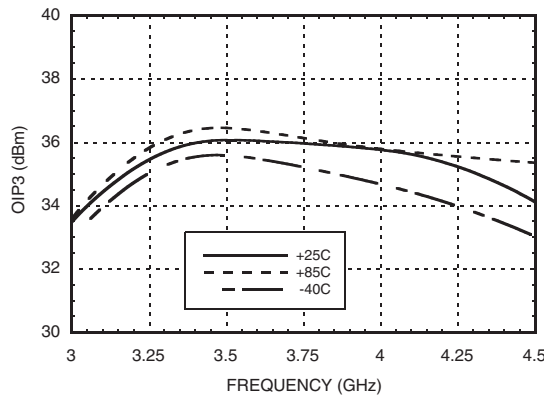
P1dB vs. Temperature



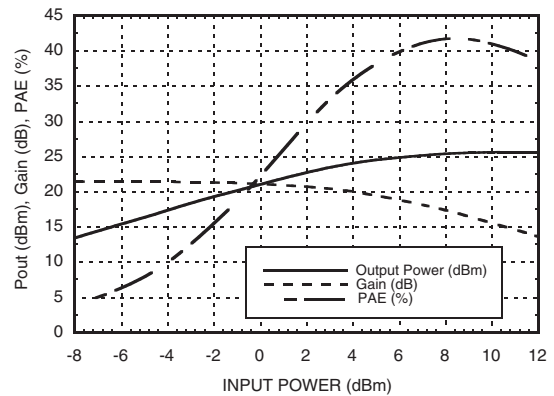
Psat vs. Temperature



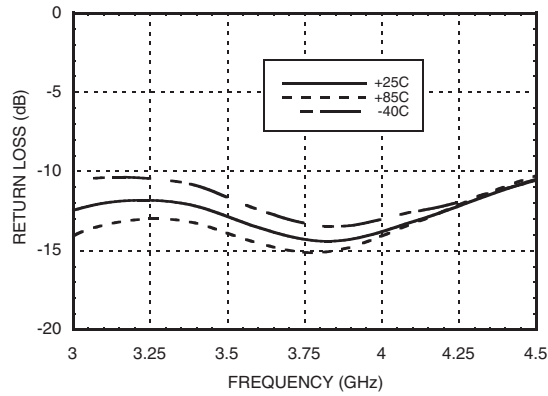
Output IP3 vs. Temperature



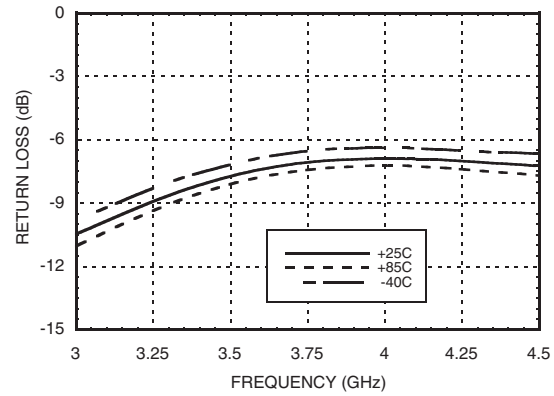
Power Compression @ 3.5 GHz



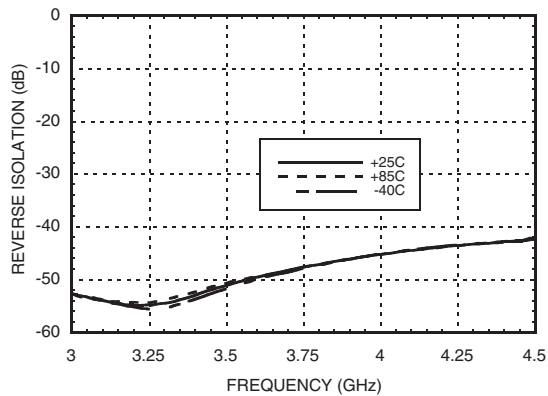
Input Return Loss vs. Temperature



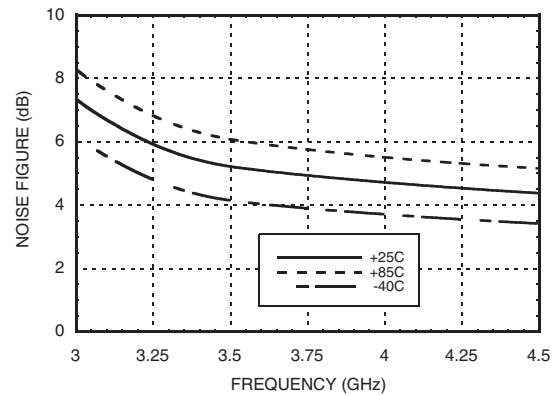
Output Return Loss vs. Temperature



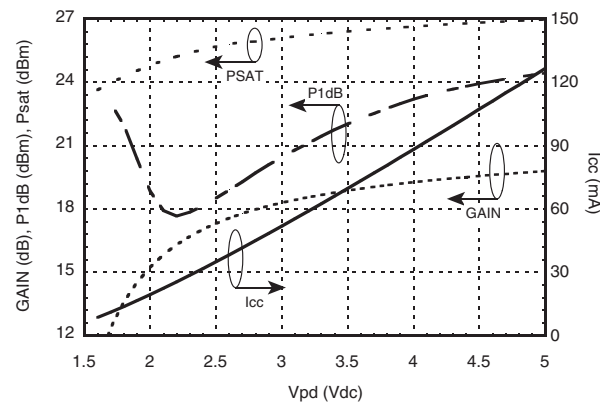
Reverse Isolation vs. Temperature



Noise Figure vs. Temperature



**Gain, Power & Quiescent Supply
Current vs. V_{pd} @3.5 GHz**





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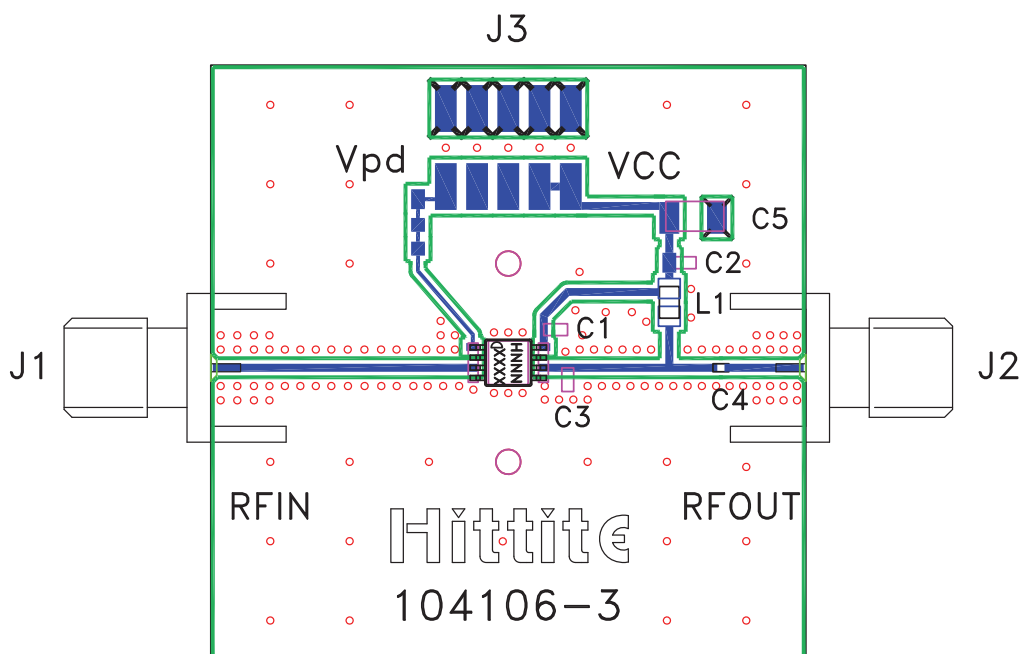
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**GaAs InGaP HBT MMIC DRIVER
AMPLIFIER, 3.0 - 4.5 GHz**

Evaluation PCB



List of Materials for Evaluation PCB 104356 ^[1]

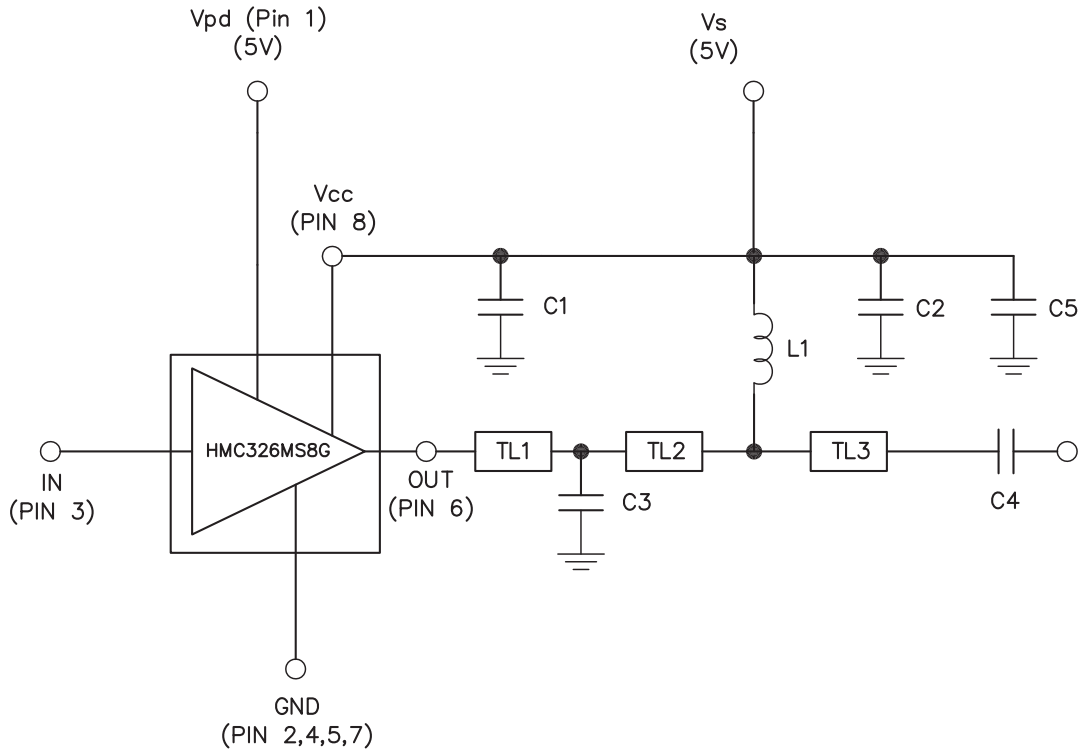
Item	Description
J1 - J2	PCB Mount SMA RF Connector
J3	2mm DC Header
C1 - C2	330 pF Capacitor, 0603 Pkg.
C3	0.7 pF Capacitor, 0603 Pkg.
C4	3.0 pF Capacitor, 0402 Pkg.
C5	2.2 µF Capacitor, Tantalum
L1	3.3 nH Inductor, 0805 Pkg.
U1	HMC326MS8G / HMC326MS8GE Amplifier
PCB ^[2]	104106 Eval Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350, 10 mil thick, $\epsilon_r = 3.48$

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



Impedance	TL1	TL2	TL3
Physical Length (mils)	65	256	128
Electrical Length (deg)	12	47	23.3

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