HMC323

GaAs InGaP HBT MMIC DRIVER AMPLIFIER, DC - 3.0 GHz

Typical Applications

This Amplifier is ideal for RF Systems where high linearity is required such as:

- 2.2 - 2.7 MMDS
- Cellular & Basestations
- CATV
- WirelessLAN

Features

P1dB Output Power: +16 dBm

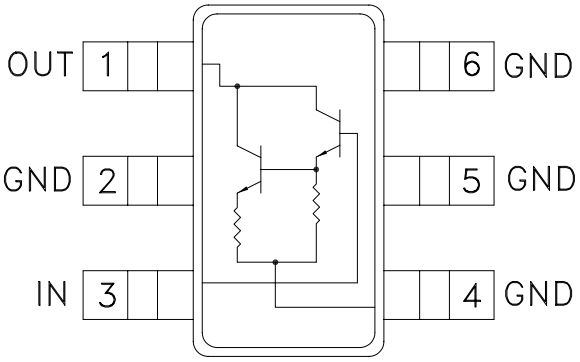
Output IP3: +31 dBm

Gain: 13 dB

Single Supply: 8.75V

Ultra Small Package: SOT26

Functional Diagram



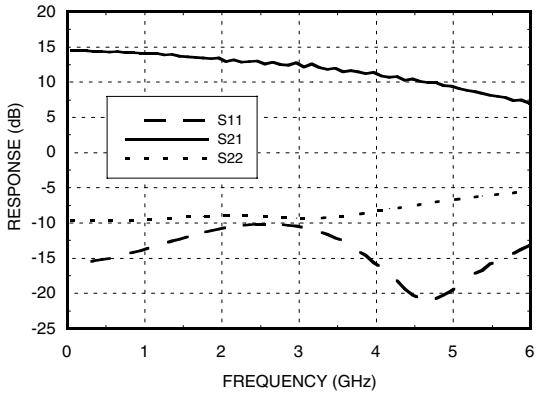
General Description

The HMC323 is a GaAs InGaP Heterojunction Bipolar Transistor (HBT) MMIC amplifier that operates from a single Vcc supply. The surface mount SOT26 amplifier can be used as a broadband gain stage or used with external matching for optimized narrow band applications. The HMC323 offers 13 dB of gain and +19 dBm of saturated power while only requiring 57 mA from a 8.75V supply. Using a Darlington feedback pair results in reduced sensitivity to normal process variations and provides a good 50-ohm input/output port match.

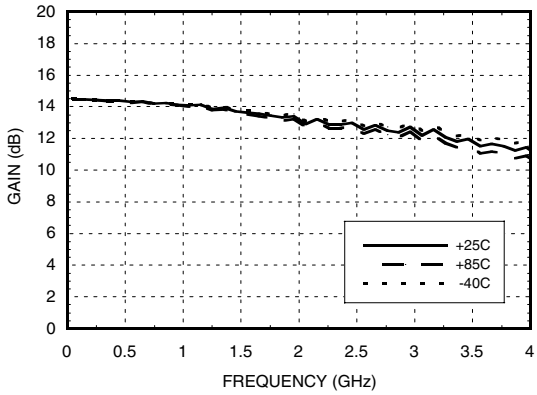
Electrical Specifications, T_A = +25° C

Parameter	Vs= +8.75V, Rbias= 22 Ohm			Units
	Min.	Typ.	Max.	
Frequency Range		DC - 3.0		GHz
Gain	10	13	16	dB
Gain Variation Over Temperature		0.015	0.025	dB/ °C
Input Return Loss	8	13		dB
Output Return Loss	6	9		dB
Reverse Isolation	16	20		dB
Output Power for 1dB Compression (P1dB) @ 1 GHz	13	16		dBm
Saturated Output Power (Psat) @ 1 GHz	16	19		dBm
Output Third Order Intercept (IP3) @ 1 GHz	28	31		dBm
Noise Figure		6		dB
Supply Current (Icc)		57		mA

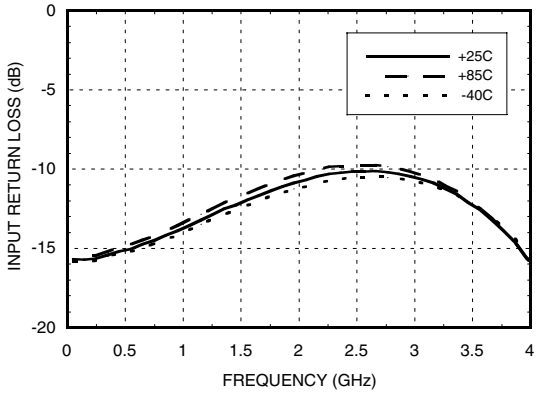
Gain & Return Loss



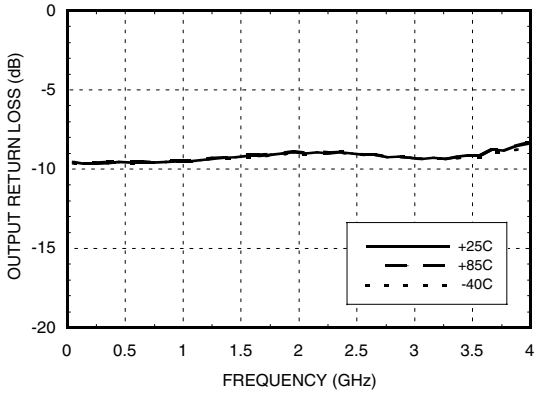
Gain vs. Temperature



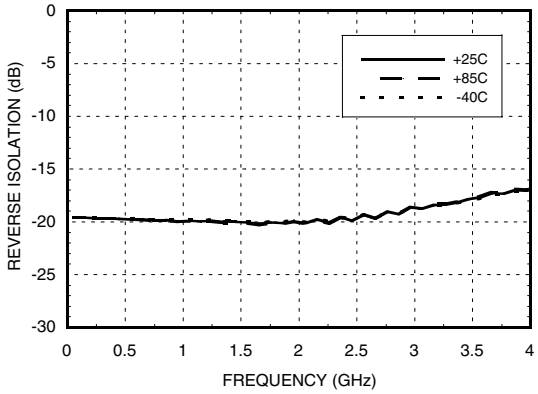
Input Return Loss vs. Temperature



Output Return Loss vs. Temperature

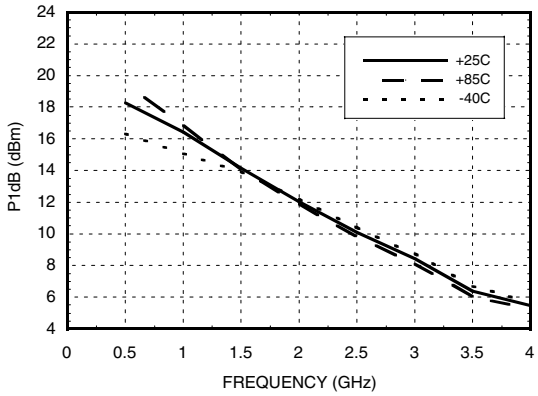


Reverse Isolation vs. Temperature

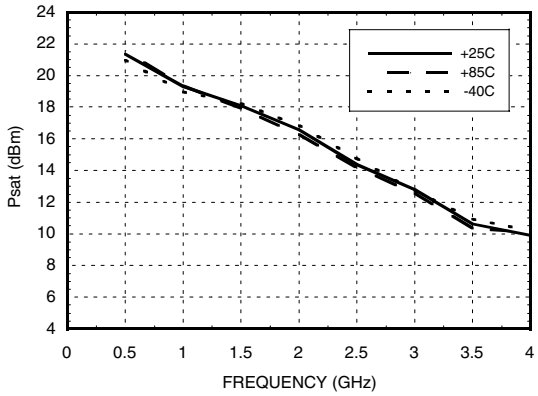


GaAs InGaP HBT MMIC DRIVER AMPLIFIER, DC - 3.0 GHz

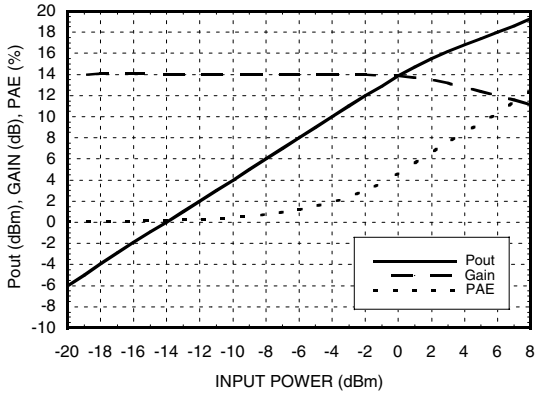
P1dB vs. Temperature



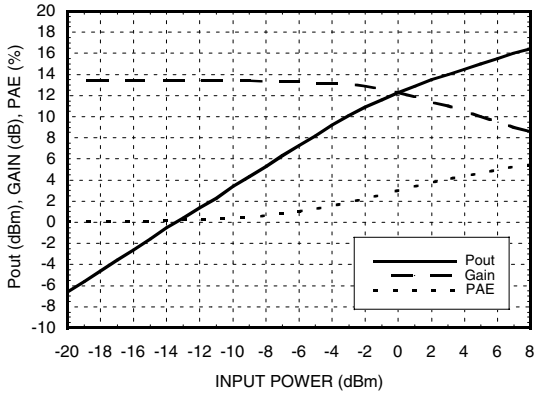
Psat vs. Temperature



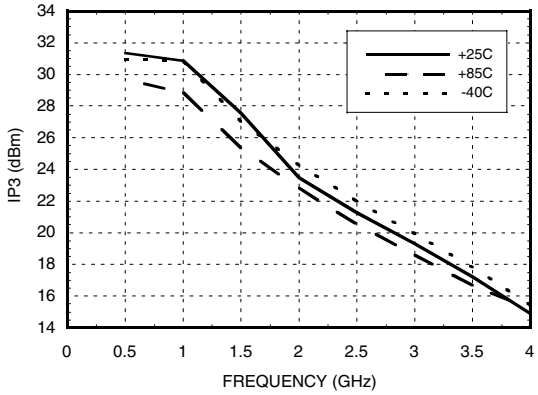
Power Compression @ 1 GHz



Power Compression @ 2 GHz



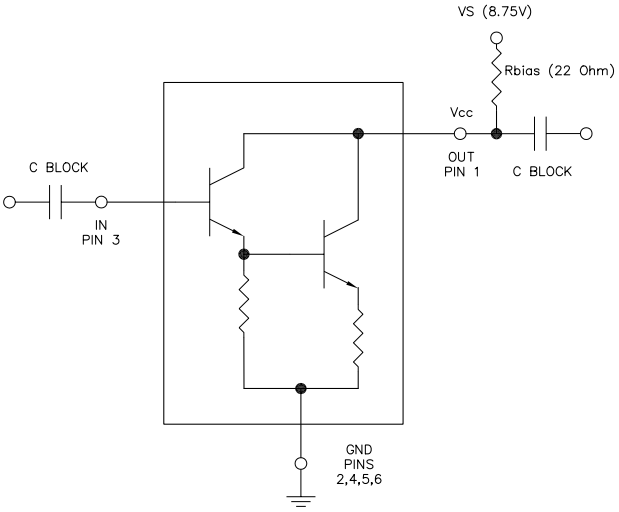
Output IP3 vs. Temperature



HMC323

GaAs InGaP HBT MMIC DRIVER AMPLIFIER, DC - 3.0 GHz

Application Circuit

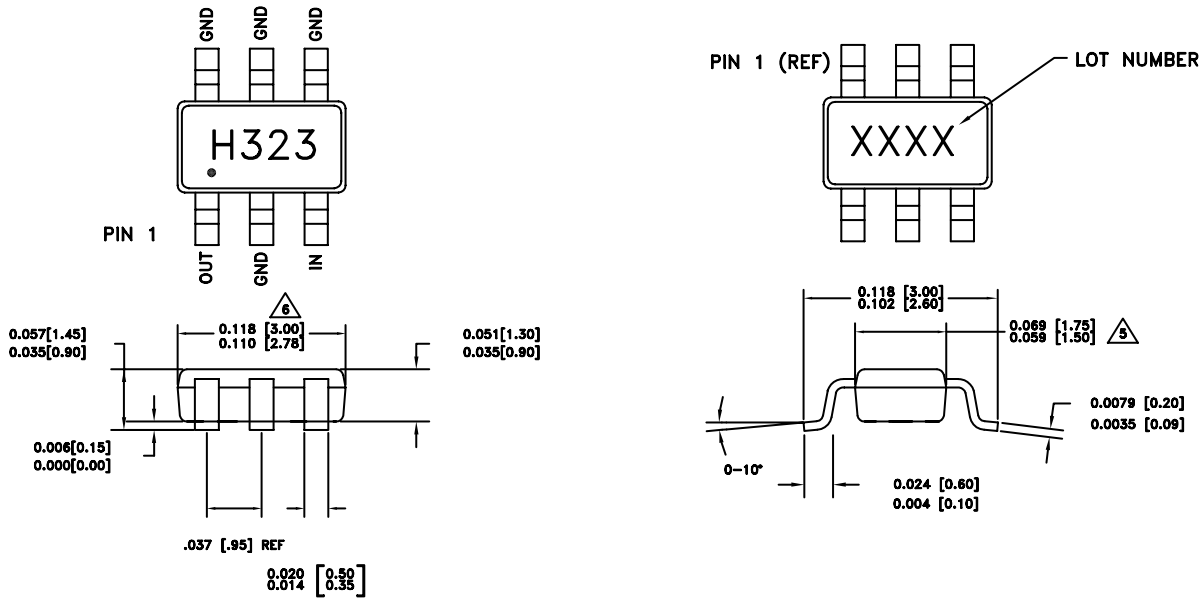


Absolute Maximum Ratings

DC Voltage on Pin 1	8 Volts
Input Power (RFin)(Vcc= +5V)	+20 dBm
Channel Temperature (Tc)	150 °C
Continuous Pdiss (T= 60 °C) (derate 4.41 mW/°C above 60 °C)	507 mW
Storage Temperature	-65 to +150° C
Operating Temperature	-40 to +60° C

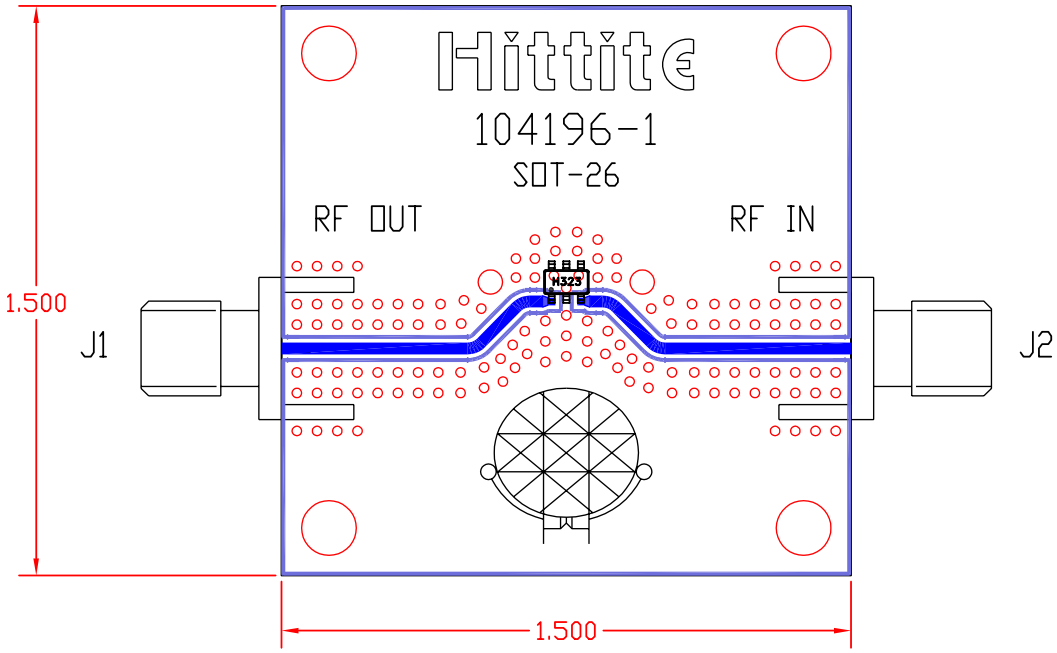
Note:
1. Select Rbias to achieve desired Vcc voltage on Pin 1.
2. External blocking capacitors are required on Pins 1 and 3.

Outline Drawing



1. MATERIAL:
   A. PACKAGE BODY - LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE INPREGNATED.
   B. LEADFRAME MATERIAL: COPPER ALLOY
2. PLATING: LEAD-TIN SOLDER PLATE
3. DIMENSIONS ARE IN INCHES (MILLIMETER). UNLESS OTHERWISE SPECIFIED, ALL TOL. ARE ± 0.005 (± 0.13).
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.

Evaluation PCB for HMC323



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 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.

Evaluation Circuit Board Layout Design Details

Item	Description
J1 - J2	PC Mount SMA Connector
U1	HMC323
PCB*	104196 Evaluation PCB 1.5" x 1.5"
* Circuit Board Material: Rogers 4350	

Notes: