GaAs HBT MMIC DRIVER AMPLIFIER, 3.0 - 4.5 GHz

DESCRIPTION

The CBG9326 is high efficiency GaAs 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 19 dB of gain and +25 dBm of saturated power from a +3.3V supply voltage，and 23dB of gain and +26dBm 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.

The device is provided in an EMSOP8 package.

BLOCK DIAGRAM

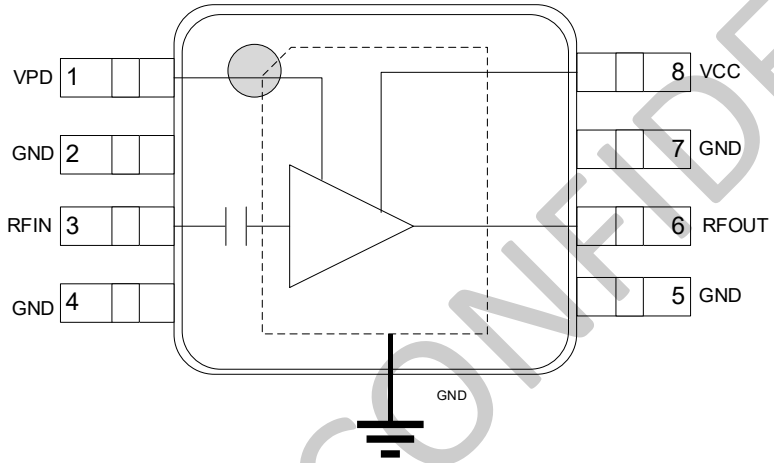


Figure 1. CBG9326 Block Diagram

FEATURES

- Psat Output Power: +26 dBm
- PAE > 40%
- Output IP3: +32 dBm
- High Gain: 24 dB
- Vs: +5V
- Ultra-Small Package: EMSOP8 (MSL1, 260℃ per JEDEC J-STD-020)

APPLICATIONS

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

PIN-OUT DIAGRAM

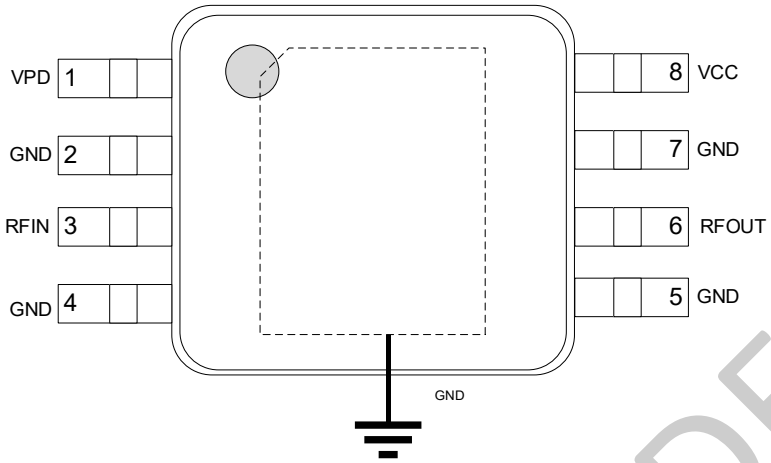


Figure 2. CBG9326 Pin out (Top View)

PIN ASSIGNMENTS

Pin	Name	Description	Pin	Name	Description
1	VPD	Control Voltage	5	GND	Ground
2	GND	Ground	6	RFOUT	RF Output Power
3	RFIN	RF Input Power	7	GND	Ground
4	GND	Ground	8	VCC	Collector Bias Voltage

ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Min	Max	Units
Collector Bias Voltage (Vcc)	V_{CC}		+5.5	V
Control Voltage Range (Vpd)	V_{PD}		+5.5	V
RF Input Power (RFIN)(Vs = Vpd = +5Vdc)	P_{IN}		+15	dBm
Supply current	I_{CC}		800	mA
Storage temperature	T_{st}	-40	+150	°C
Operating Temperature	T_C	-40	+85	
Junction Temperature	T_J		+150	°C
Continuous Pdiss (T = 85 °C) (derate 14 mW/°C above 85 °C)			0.92	W
Electrostatic discharge: Human Body Model (HBM)			1000	V

NOTE:

Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

ESD HANDLING:	Although this device is designed to be as robust as possible, electrostatic discharge (ESD) can damage this device. This device must be protected at all times from ESD when handling or transporting. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD handling precautions should be used at all times.

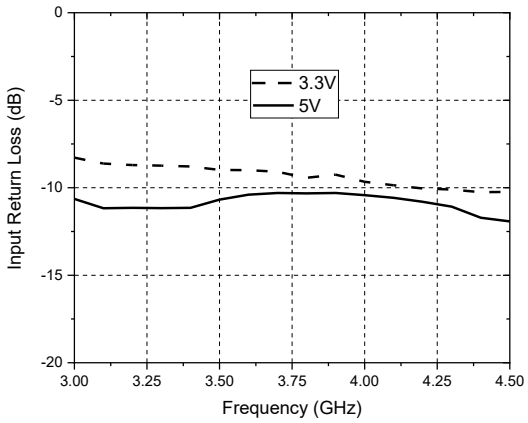
CBG9326 ELECTRICAL SPECIFICATIONS[1]

Parameters	Symbol	Test Condition	Min	Typ.	Max	Units
(TC = +25℃, Input/Output Load = 50 Ω, Unless Otherwise Noted)						
Frequency	f	Main frequency band	3000		4500	MHz
Gain	G	Pin = -30dBm 3.3V 5V	16 21	20 24	21.5 28	dB
Input return loss	|S11|	Pin = -30dBm 3.3V 5V		9 11		dB
Output return loss	|S22|	Pin = -30dBm 3.3V 5V		7 6		dB
Output Power for 1dB Compression	P1dB	CW, Reference to small signal gain 3.3V 5V	23 21	24 24		dBm
Saturated Output Power	Psat	CW, Pin =8dBm 3.3V 5V	24 25.5	25 27		dBm
PAE@Psat	PAE	@Psat	35	42	50	%
Output Third Order Intercept	IP3			30.5		dBm
Noise Figure	NF			5		dB
Supply Current	Icq	Vpd = 0V Vpd = 3.3V/Vcc = 3.3V Vpd = 5V/Vcc = 5V	0 20 90	1 25 95		uA mA mA
Control Current	Ipd			7		mA
Switching time	tON/tOFF			10		ns

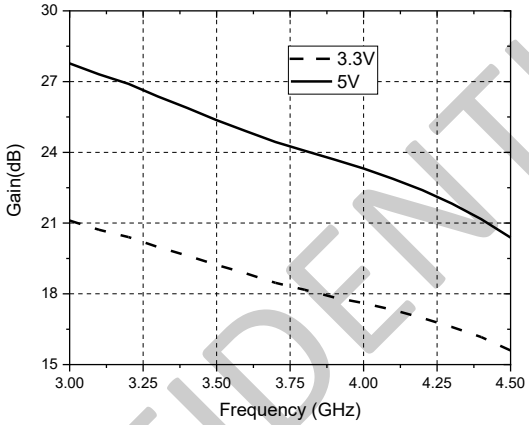
PERFORMANCE PLOTS

(Test conditions unless otherwise noted: Temp. = +25 °C, Input/Output Load = 50 Ω)

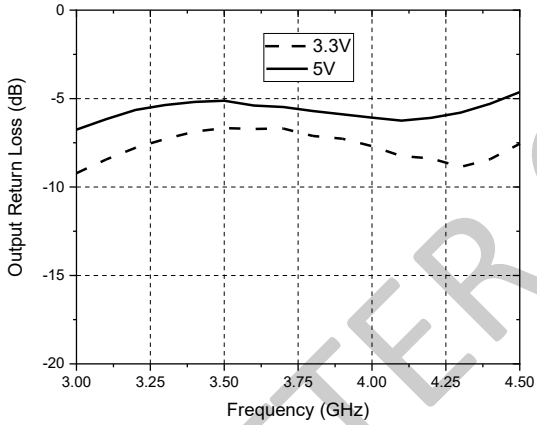
Input Return Loss



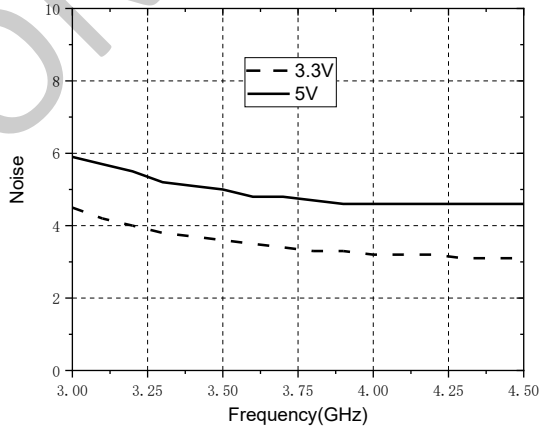
Gain



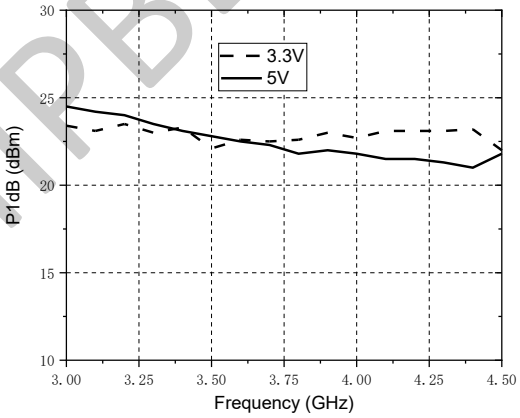
Output Return Loss



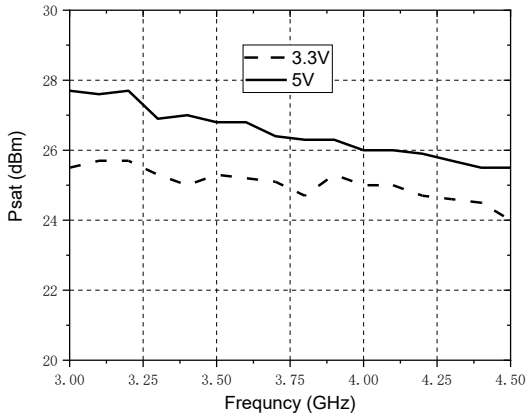
Noise Figure



P1dB



Psat



EVALUATION BOARD SCHEMATIC

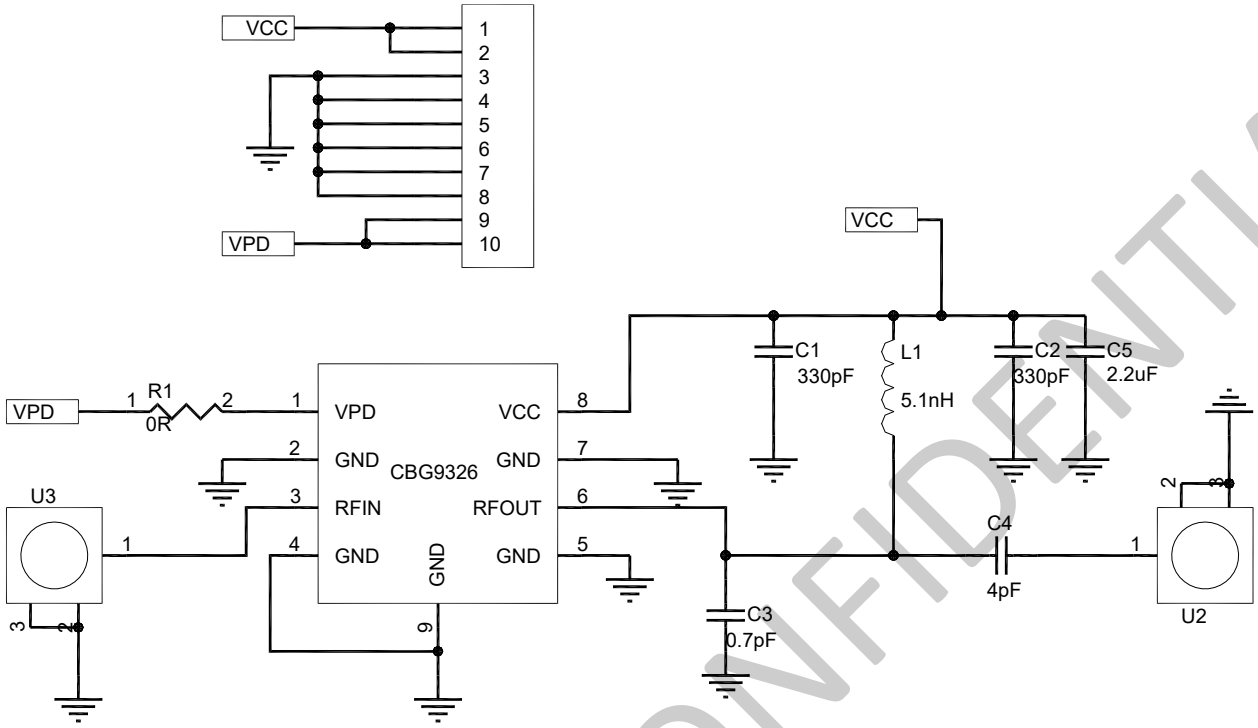


Figure 3. CBG9326 Evaluation Board Schematic

EVALUATION BOARD ASSEMBLY DRAWING

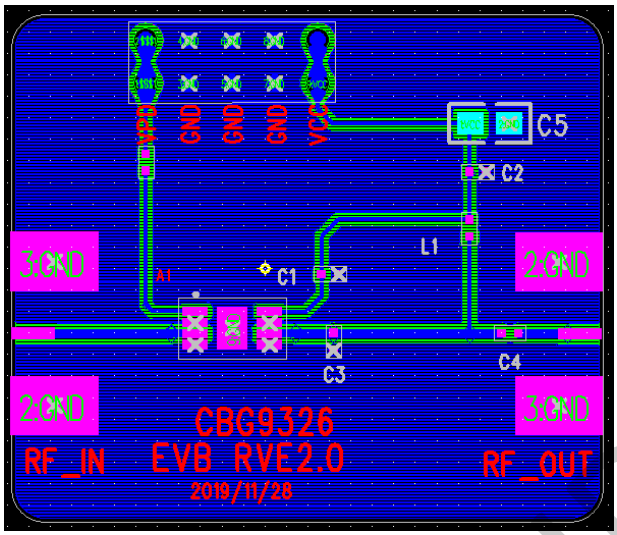


Figure 4. CBG9326 Evaluation Board Assembly Drawing

BILL OF MATERIALS

Component	Value	Size	Vendor	Part Number
C1	330pF	0402	Murata	
C2	330pF	0402	Murata	
C3,	0.7pF	0402	Murata	
C4	4pF	0402	Murata	
C5	2.2 μF	0805	Murata	
L1	5.1nH	0402	Murata	

PCB LAND PATTERN

	A	B
1	Dimensions	
2	Land X1	4.40
3	Land Y1	0.45
4	Tab Land X2	1.45
5	Tab Land Y2	1.75
6	Silkscreen R1	2.40
7	Silkscreen R2	0.00
8	Courtyard V1	0.00
9	Courtyard V2	3.60

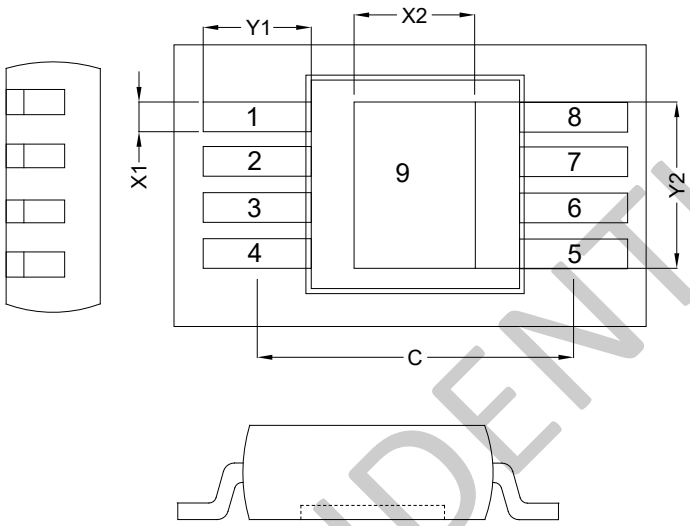


Figure 5. CBG9326 PCB Layout Footprint

TYPICAL PART MARKING

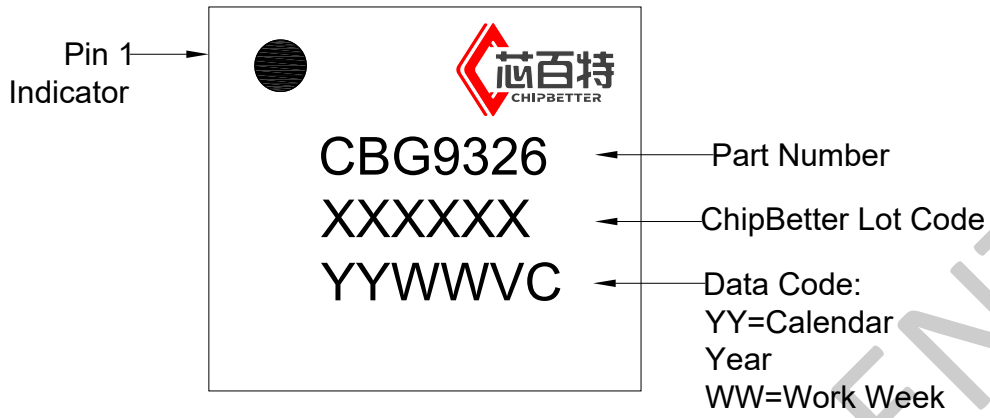
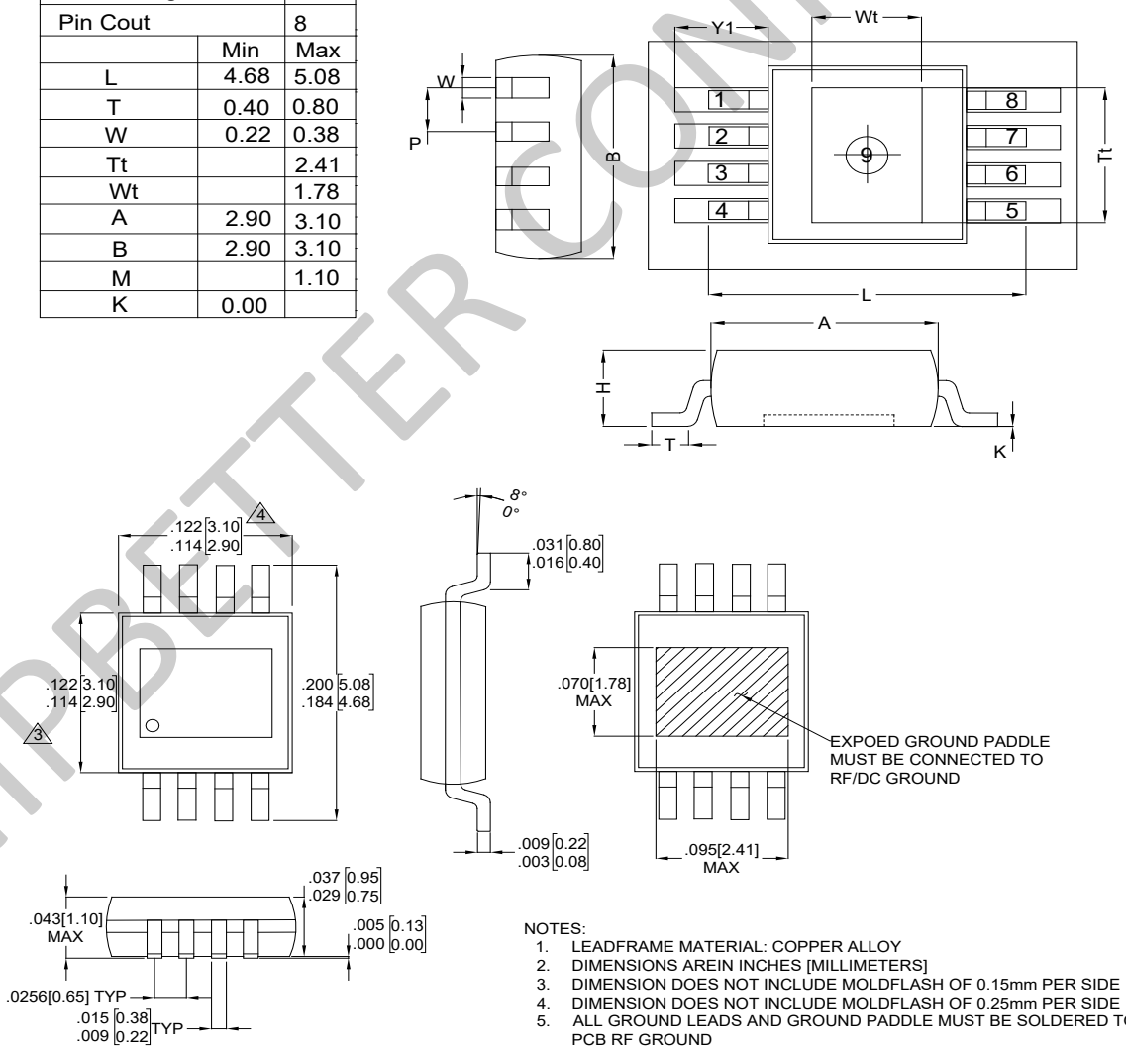


Figure 6. Typical Part Marking for the CBG9326

PACKAGE DIMENSIONS (All Dimensions in mm):

Pitch (P)		0.65
Pin Package		8
Pin Cout		8
	Min	Max
L	4.68	5.08
T	0.40	0.80
W	0.22	0.38
Tt		2.41
Wt		1.78
A	2.90	3.10
B	2.90	3.10
M		1.10
K	0.00	



NOTES:
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS AREIN INCHES [MILLIMETERS]
3. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE
5. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND

Figure 7. CBG9326 Package Dimension

CONTACT INFORMATION

For the latest specifications, additional product information, worldwide sales and distribution locations:

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