HMC625BLP5E

v01.1215

0.5 dB LSB GaAs MMIC 6-BIT DIGITAL VARIABLE GAIN AMPLIFIER, DC - 6 GHz

Typical Applications

The HMC625BLP5E is ideal for:

- Cellular/3G Infrastructure
- WiBro / WiMAX / 4G
- Microwave Radio & VSAT
- Test Equipment and Sensors
- IF & RF Applications

Features

-13.5 to +18 Gain Control in 0.5 dB Steps

Power-up State Selection

High Output IP3: +33 dBm

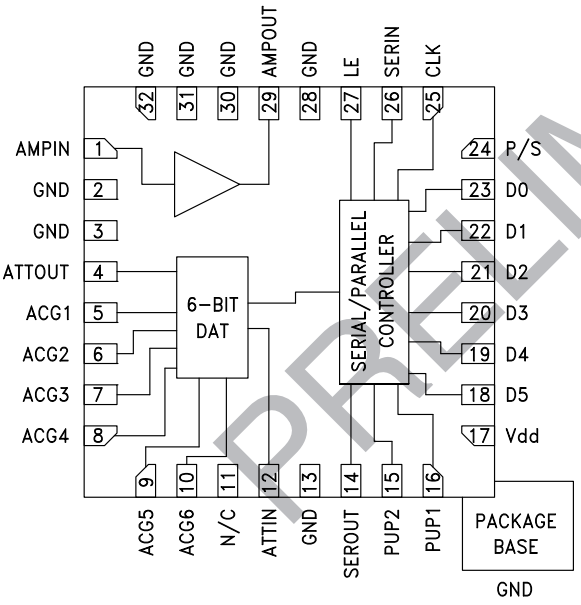
TTL/CMOS Compatible
Serial, Parallel, or latched Parallel Control

±0.25 dB Typical Gain Step Error

Single +5V Supply

32 Lead 5x5 mm SMT Package: 25 mm^2

Functional Diagram



General Description

The HMC625BLP5E is a digitally controlled variable gain amplifier which operates from DC to 6 GHz, and can be programmed to provide anywhere from 13.5 dB attenuation, to 18 dB of gain, in 0.5 dB steps. The HMC625BLP5E delivers noise figure of 6 dB in its maximum gain state, with output IP3 of up to +33 dBm in any state. The dual mode control interface is CMOS/TTL compatible, and accepts either a three wire serial input or a 6 bit parallel word. The HMC625BLP5E also features a user selectable power up state and a serial output port for cascading other Hittite serial controlled components. The HMC625BLP5E is housed in a RoHS compliant 5x5 mm QFN leadless package, and requires no external matching components.

Electrical Specifications, T_A = +25° C, 50 Ohm System, Vdd= +5V, Vs= +5V

Parameter	Frequency	Min.	Typ.	Max.	Units
Gain (Maximum Gain State)	DC - 3.0 GHz 3.0 - 6.0 GHz	13 5	18 13		dB dB
Gain Control Range			31.5		dB
Input Return Loss	DC - 6.0 GHz		15		dB
Output Return Loss	DC - 6.0 GHz		13		dB
Gain Accuracy: (Referenced to Maximum Gain State) All Gain States	DC - 0.8 GHz 0.8 - 6.0 GHz	± (0.10 + 5% of Gain Setting) Max. ± (0.30 + 3% of Gain Setting) Max.			dB dB
Output Power for 1dB Compression	DC - 3.0 GHz 3.0 - 6.0 GHz	16 13	19 16		dBm dBm
Output Third Order Intercept Point (Two-Tone Output Power= 0 dBm Each Tone, 1 MHz Spacing)	DC - 6.0 GHz		33		dBm
Noise Figure	900 MHz		6		dB
Total Supply Current (Idd + Is)	DC - 6.0 GHz	60	87.5	100	mA

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

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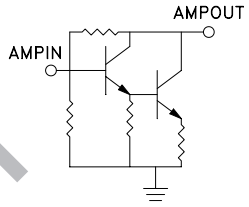
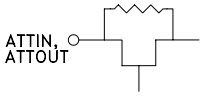
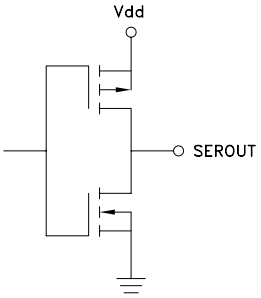
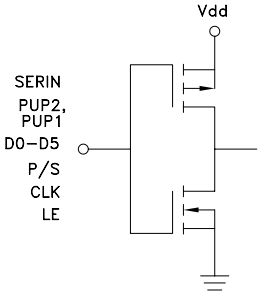
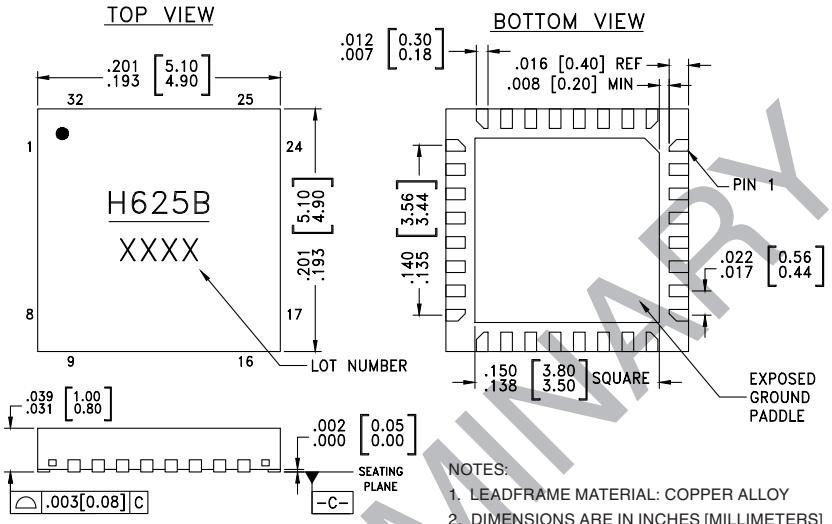
Outline Drawing

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	AMPIN	This pin is DC coupled. An off chip DC blocking capacitor is required.	
29	AMPOUT	RF output and DC bias (Vcc) for the output stage of the amplifier.	
2, 3, 13, 28, 30 - 32	GND	These pins and package bottom must be connected to RF/DC ground.	
4, 12	ATTIN, ATTOUT	These pins are DC coupled and matched to 50 Ohms. Blocking capacitors are required. Select value based on lowest frequency of operation.	
5 - 10	ACG1 - ACG6	External capacitors to ground is required. Select value for lowest frequency of operation. Place capacitor as close to pins as possible.	
11	N/C	The pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	
14	SEROUT	Serial input data delayed by 6 clock cycles.	
15, 16	PUP2, PUP1		
18 - 23	D5, D4, D3, D2, D1, D0		
24	P/S		
25	CLK		
26	SERIN		
27	LE		
17	Vdd	Supply Voltage	

Package Information



NOTES:

1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
7. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED LAND PATTERN.

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [2]
HMC625aLP5E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 [1]	H625B XXXX

[1] Max peak reflow temperature of 260 °C

[2] 4-Digit lot number XXXX