HMC998A

v01.1215

GaAs pHEMT MMIC
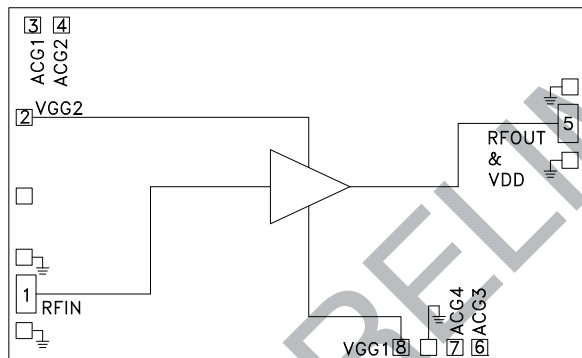## *2 WATT POWER AMPLIFIER, 0.1 - 22 GHz*

Typical Applications

The HMC998A is ideal for:

• Test Instrumentation

• Microwave Radio & VSAT

• Military & Space

• Telecom Infrastructure

• Fiber Optics

Functional Diagram

Features

High P1dB Output Power: +31 dBm

High Psat Output Power: +33 dBm

High Gain: 12 dB

High Output IP3: +41 dBm

Supply Voltage: Vdd = +10V to +15V @ 500 mA

50 Ohm Matched Input/Output

Die Size: 2.99 x 1.84 x 0.1 mm

General Description

The HMC998A is a GaAs MMIC PHEMT Distributed Power Amplifier die which operates between 0.1 and 22 GHz. The amplifier provides 12 dB of gain, +41 dBm output IP3 and +31 dBm of output power at 1 dB gain compression while requiring 500 mA from a +15V supply. This versatile PA exhibits a positive gain slope from 1 to 18 GHz making it ideal for EW, ECM, Radar and test equipment applications. The HMC998A amplifier I/Os are internally matched to 50 Ohms facilitating integration into mutli-chip-modules (MCMs). All data is taken with the chip connected via two 0.025mm (1 mil) wire bonds of minimal length 0.31 mm (12 mils).
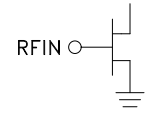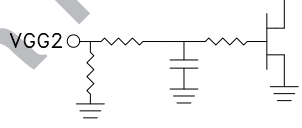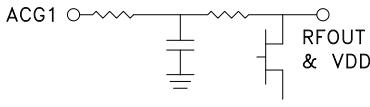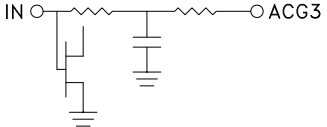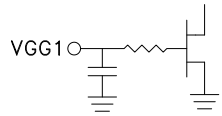
*Electrical Specifications, T_A = +25° C, Vdd = +15V, Vgg2 = +9.5V, Idd = 500 mA**

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		0.1 - 2			2 - 18			18 - 22		GHz
Gain	9.5	11.5		10.5	12.5		10.5	12.5		dB
Gain Flatness		±0.1			±0.7			±0.6		dB
Gain Variation Over Temperature		0.006			0.11			0.016		dB/ °C
Input Return Loss		-20			-20			-15		dB
Output Return Loss		-7			-20			-20		dB
Output Power for 1 dB Compression (P1dB)	29	31		29	31.5		27	30		dBm
Saturated Output Power (Psat)		33			33.5			33		dBm
Output Third Order Intercept (IP3)		41			41			40		dBm
Noise Figure		10			4			5		dB
Supply Current (Idd) (Vdd= 15V, Vgg1= -0.7V Typ.)		500			500			500		mA

* Adjust Vgg1 between -2 to 0V to achieve Idd = 500mA typical.

AMPLIFIERS - LINEAR & POWER - CHIP

Pad Descriptions

Pad Number	Function	Description	Interface Schematic
1	RFIN	This pad is DC coupled and matched to 50 Ohms. Blocking capacitor is required.	
2	VGG2	Gate control 2 for amplifier. Attach bypass capacitor per application circuit herein. For nominal operation +9.5V should be applied to Vgg2.	
4, 7	ACG2, ACG4	Low frequency termination. Attach bypass capacitor per application circuit herein.	
3	ACG1	Low frequency termination. Attach bypass capacitor per application circuit herein.	
5	RFOUT & VDD	RF output for amplifier. Connect DC bias (Vdd) network to provide drain current (Idd). See application circuit herein.	
6	ACG3	Low frequency termination. Attach bypass capacitor per application circuit herein.	
8	VGG1	Gate control 1 for amplifier. Attach bypass capacitor per application circuit herein. Please follow "MMIC Amplifier Biasing Procedure" application note.	
Die Bottom	GND	Die bottom must be connected to RF/DC ground.	

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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AMPLIFIERS - LINEAR & POWER - CHIP

Outline Drawing
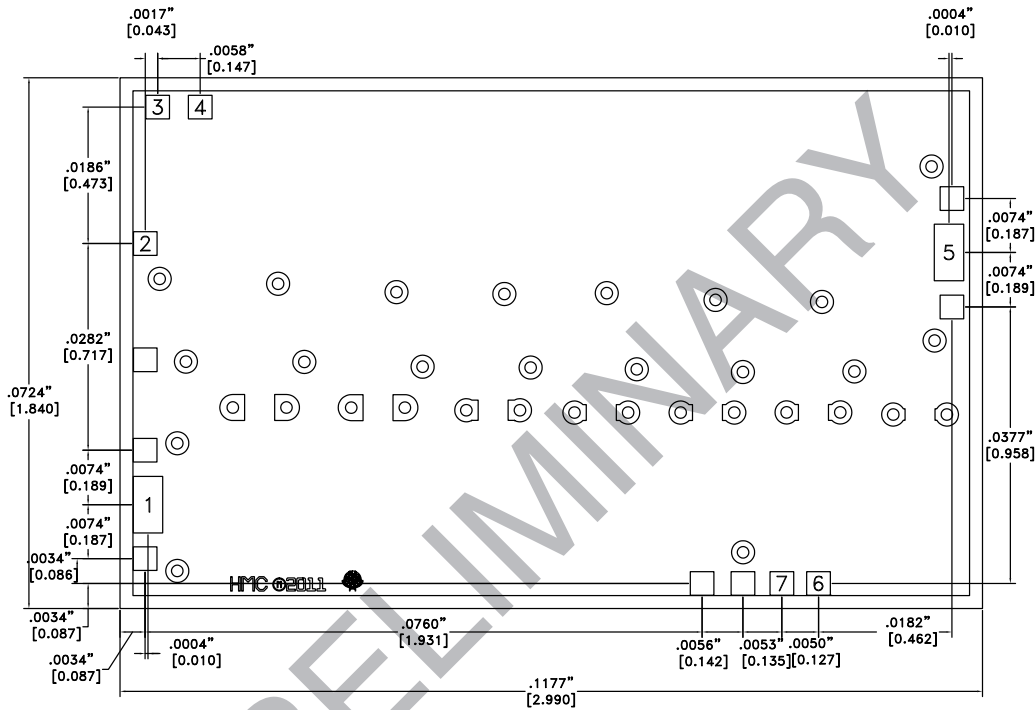
Die Packaging Information [1]

Standard	Alternate
GP-1 (Gel Pack)	[2]

[1] For more information refer to the "Packaging Information" Document in the Product Support Section of our website .

[2] For alternate packaging information contact Hittite Microwave Corporation.

NOTES:
1. ALL DIMENSIONS ARE IN INCHES [MM]
2. DIE THICKNESS IS 0.004"
3. TYPICAL BOND PAD IS 0.004" SQUARE
4. BOND PAD METALIZATION: GOLD
5. BACKSIDE METALIZATION: GOLD
6. BACKSIDE METAL IS GROUND
7. NO CONNECTION REQUIRED FOR UNLABELED BOND PADS
8. OVERALL DIE SIZE ±0.002"

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