HMC-ABH241

v03.0412

GAAS HEMT MMIC MEDIUM POWER Amplifier, 50 - 66 GHz

Typical Applications

This HMC-ABH241 is ideal for:

- Short Haul / High Capacity Links
- Wireless LAN Bridges
- Military & Space

Features

Output IP3: +25 dBm

P1dB: +17 dBm

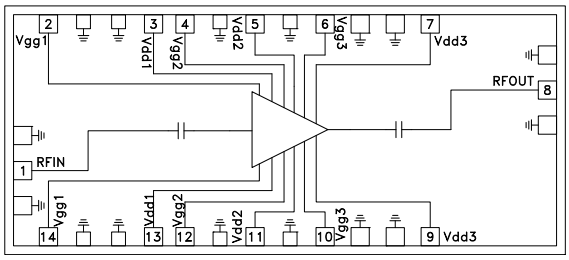
Gain: 24 dB

Supply Voltage: +5V

50 Ohm Matched Input/Output

Die Size: 3.2 x 1.42 x 0.1 mm

Functional Diagram



General Description

The HMC-ABH241 is a four stage GaAs HEMT MMIC Medium Power Amplifier which operates between 50 and 66 GHz. The HMC-ABH241 provides 24 dB of gain, and an output power of +17 dBm at 1dB compression from a +5V supply voltage. All bond pads and the die backside are Ti/Au metallized and the amplifier device is fully passivated for reliable operation. The HMC-ABH241 GaAs HEMT MMIC Medium Power Amplifier is compatible with conventional die attach methods, as well as thermocompression and thermosonic wire bonding, making it ideal for MCM and hybrid microcircuit applications. All data shown herein is measured with the chip in a 50 Ohm environment and contacted with RF probes.

Electrical Specifications, T_A = +25° C, Vdd1= Vdd2= Vdd3= 5V, Idd1 + Idd2 + Idd3= 220mA [2]

Parameter	Min.	Typ.	Max.	Units
Frequency Range		50 - 66		GHz
Gain	19	24		dB
Input Return Loss		15		dB
Output Return Loss		15		dB
Output Power for 1 dB Compression (P1dB)		17		dBm
Output Third Order Intercept (IP3)		25		dBm
Saturated Output Power (Psat)		19		dBm
Supply Current (Idd1 + Idd2 + Idd3)		220		mA

[1] Unless otherwise indicated, all measurements are from probed die

[2] Adjust Vgg1 = Vgg2 = Vgg3 between -1V to +0.3V (typ -0.3V) to achieve Idd_{total} = 220mA

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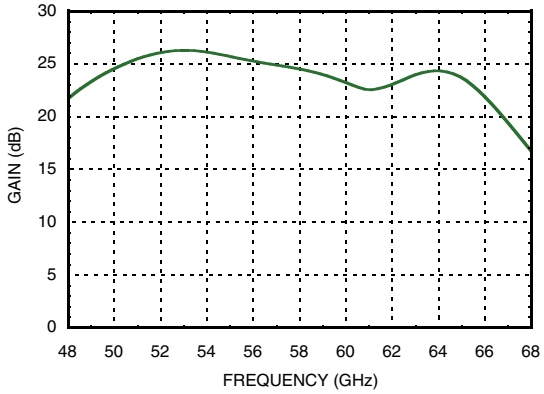
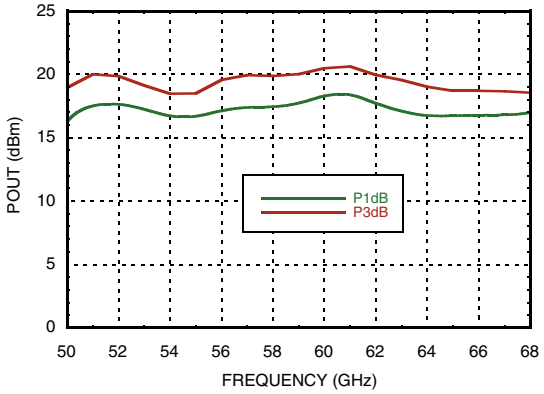
GAAS HEMT MMIC MEDIUM POWER Amplifier, 50 - 66 GHz

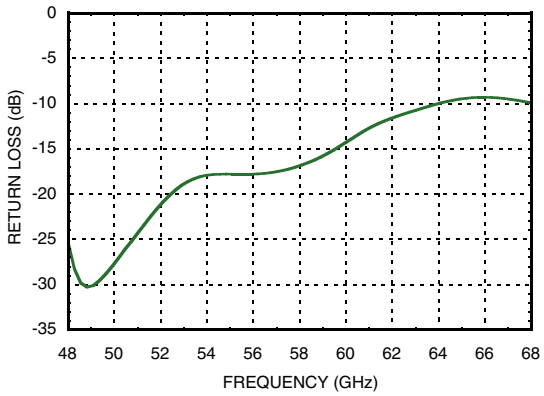
Linear Gain vs. Frequency



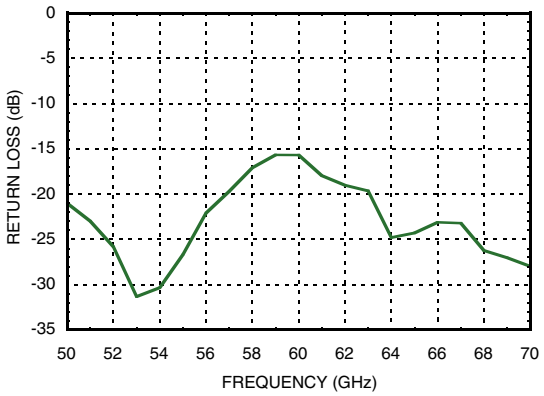
Fixtured Output Power vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



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RoHS✓ EARTH FRIENDLY

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Absolute Maximum Ratings

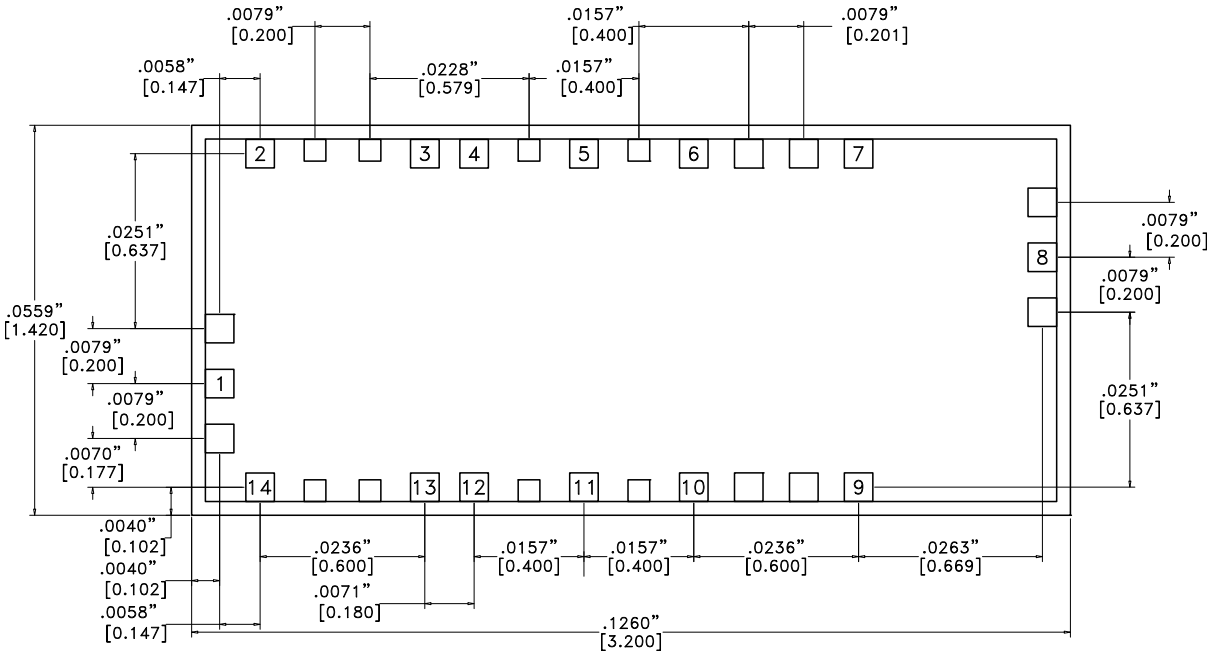
Normal 5.0 V Supply to GND	+5.5 Vdc
Gate Bias Voltage	-1 to +0.3 Vdc
RF Input Power (Vdd = +5.0 V)	2 dBm
Storage Temperature	-65 °C to + 150°C
Max Peak Reflow Temperature	+180 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Reliability Information

Junction Temperature to maintain 1 Million Hour MTTF	+180 °C
Normal Junction Temperature (T = +85 °C)	+140.6 °C
Thermal Resistance (Junction to Die Bottom)	+50.6 °C/W
Operating Temperature	-55 °C to + 85°C

Outline Drawing



Die Packaging Information [1]

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

[1] Refer to the "Packaging Information" section for die packaging dimensions.
[2] For alternate packaging information contact Hittite Microwave Corporation.

NOTES:

1. ALL DIMENSIONS ARE IN INCHES [MM].
2. TYPICAL BOND PAD IS .004" SQUARE.
3. BACKSIDE METALLIZATION: GOLD.
4. BACKSIDE METAL IS GROUND.
5. BOND PAD METALLIZATION: GOLD.
6. CONNECTION NOT REQUIRED FOR UNLABELED BOND PADS.
7. OVERALL DIE SIZE ±.002"
8. DIE THICKNESS = 0.004"

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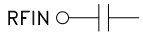
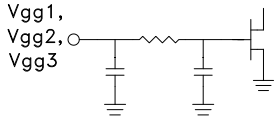
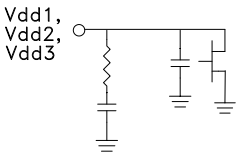
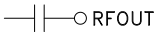
Pad Descriptions

Pad Number	Function	Description	Interface Schematic
1	RFIN	This pad is AC coupled and matched to 50 Ohms.	
2, 4, 6, 10, 12, 14	Vgg1, Vgg2 Vgg3	Gate control for amplifier. Please follow "MMIC Amplifier Biasing Procedure" application note. See assembly for required external components.	
3, 5, 7, 9, 11, 13	Vdd1, Vdd2, Vdd3	Power Supply Voltage for the amplifier. See assembly for required external components.	
8	RFOUT	This pad is AC coupled and matched to 50 Ohms.	
Die Bottom	GND	Die bottom must be connected to RF/DC ground.	

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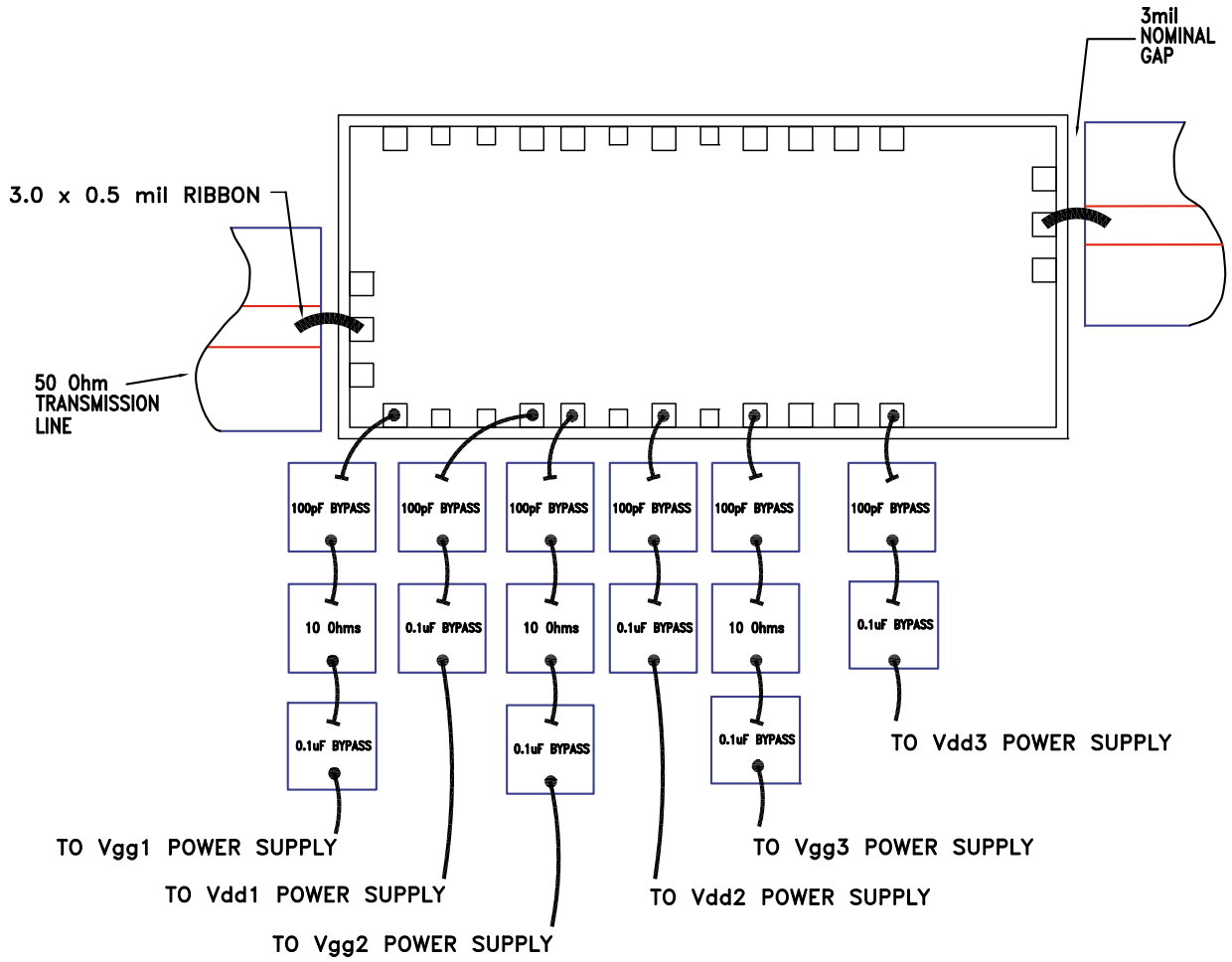
Assembly Diagram



Note 1: Bypass caps should be 100 pF (approximately) ceramic (single-layer) placed no farther than 30 mils from the amplifier.

Note 2: Best performance obtained from use of <10 mil (long) by 3 by 0.5 mil ribbons on input and output.

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