

GaAs HEMT MMIC LOW NOISE AMPLIFIER, 1 - 12 GHz

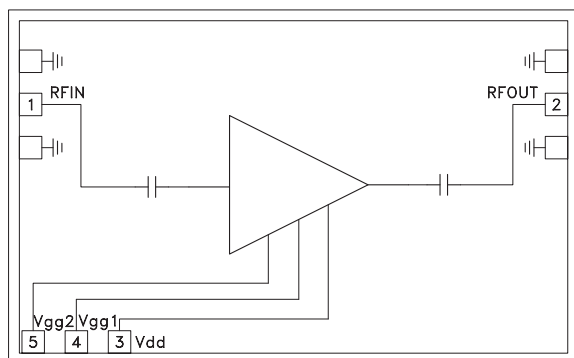
Typical Applications

This HMC-ALH444 is ideal for:

- Wideband Communication Systems
- Surveillance Systems
- Point-to-Point Radios
- Point-to-Multi-Point Radios
- Military & Space
- Test Instrumentation

* VSAT

Functional Diagram



Features

Noise Figure: 1.75 dB @ 10 GHz

Gain: 17 dB

P1dB Output Power: +19 dBm @ 5 GHz

Supply Voltage: +5V @ 55 mA

Die Size: 2.64 x 1.64 x 0.1 mm

General Description

The HMC-ALH444 is a GaAs MMIC HEMT Low Noise Wideband Amplifier die which operates between 1 and 12 GHz. The amplifier provides 17 dB of gain, 1.5 dB noise figure and +19 dBm of output power at 1 dB gain compression while requiring only 55 mA from a +5V supply voltage.

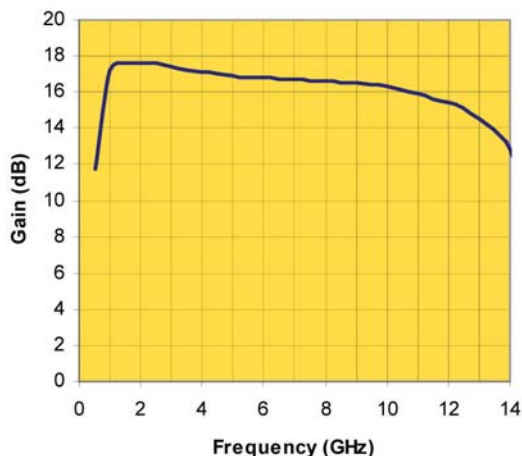
Electrical Specifications*, $T_A = +25^\circ \text{C}$, $V_{dd} = +5V$

Parameter	Min.	Typ.	Max.	Units
Frequency Range	1 - 12			GHz
Gain	15	17		dB
Gain Variation over Temperature		0.02		dB / °C
Noise Figure		1.5	2	dB
Input Return Loss		10		dB
Output Return Loss		14		dB
Output IP3		28		dBm
Output Power for 1 dB Compression		19		dBm
Supply Current (I _{dd}) (V _{dd} = 5V, V _{gg1} = -0.5V Typ., V _{gg2} = 1.5V Typ)		55		mA

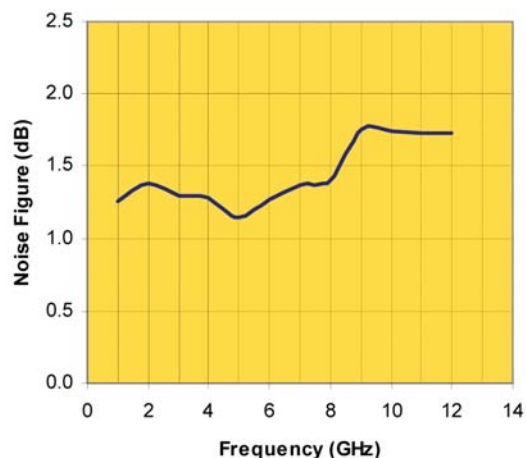
*Unless otherwise indicated, all measurements are from probed die

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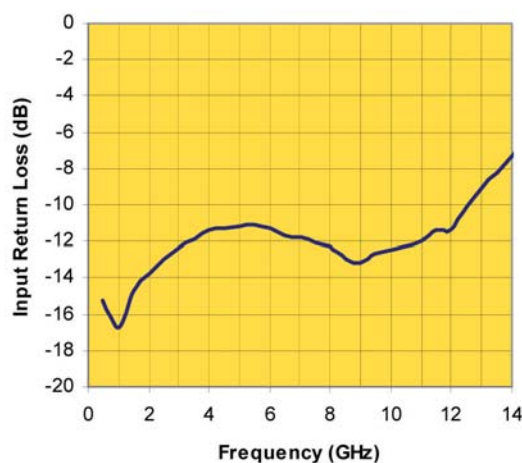
Linear Gain vs. Frequency



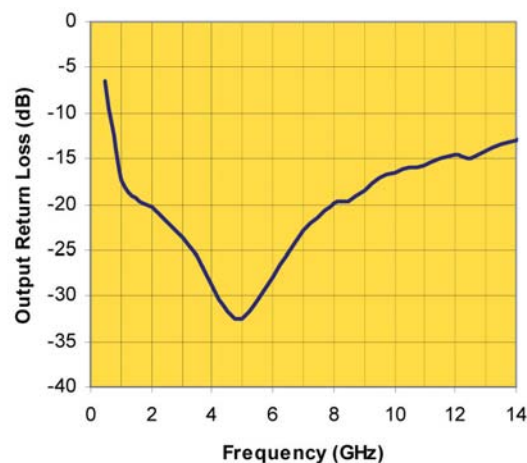
Noise Figure vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



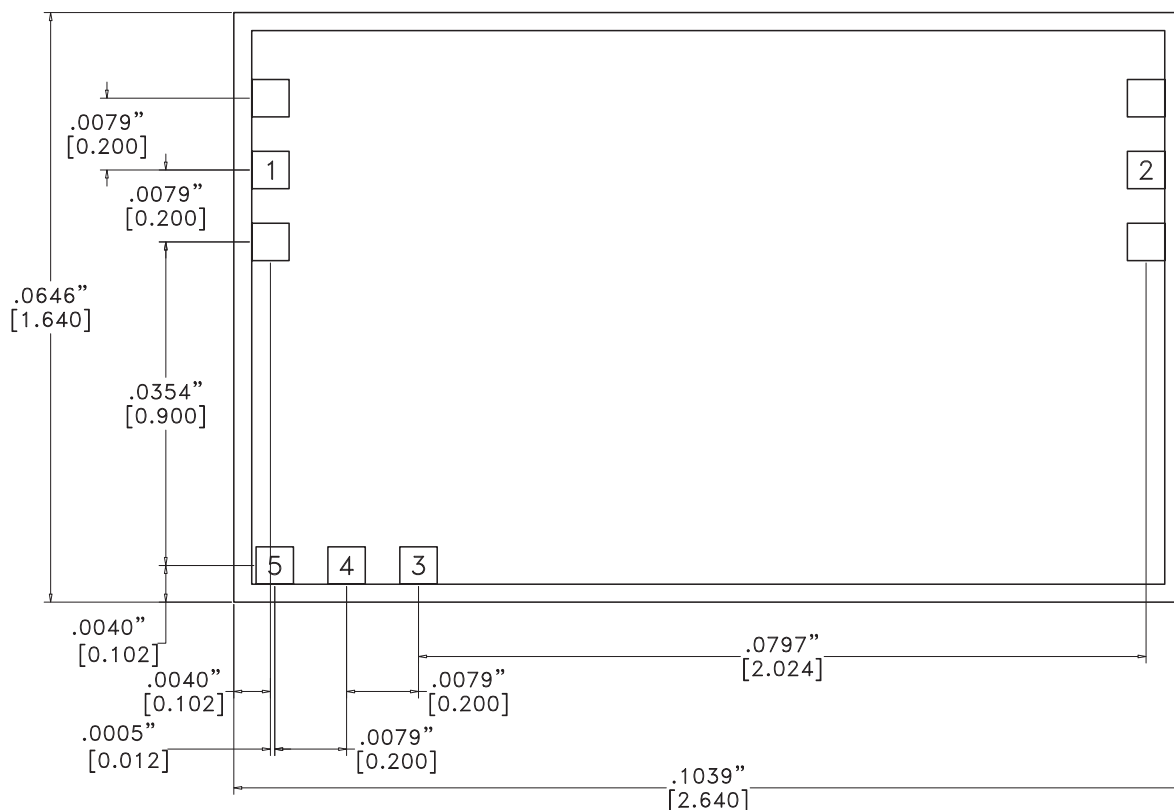
Note: Measured Performance Characteristics (Typical Performance at 25°C) $V_d = 5$ V, $V_{g2} = 1.5$ V, $I_d = 55$ mA

**GaAs HEMT MMIC LOW NOISE
AMPLIFIER, 1 - 12 GHz**
Absolute Maximum Ratings

Drain Bias Voltage	+5.5 Vdc
RF Input Power	12 dBm
Gate Bias Voltage Vgg1	-1 to 0.3 Vdc
Gate Bias Voltage Vgg2	0 to 2.5 Vdc
Channel Temperature	180 °C
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing

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 $\pm .002$ "