HMC-ALH459

v00.0907

GaAs HEMT LOW NOISE AMPLIFIER, 71 - 86 GHz

Typical Applications

This HMC-ALH459 is ideal for:

- Short Haul / High Capacity Links
- Wireless LANs
- Automotive Radar
- Military & Space
- E-Band Communication Systems

Features

Noise Figure: <5 dB

P1dB: +7 dBm

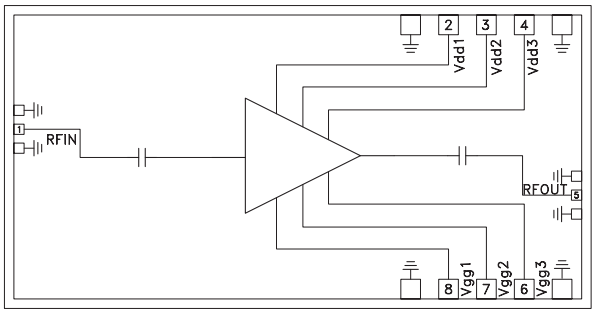
Gain: 14 dB

Supply Voltage: +2.4V

50 Ohm Matched Input/Output

Die Size: 3.10 x 1.60 x 0.1 mm

Functional Diagram



General Description

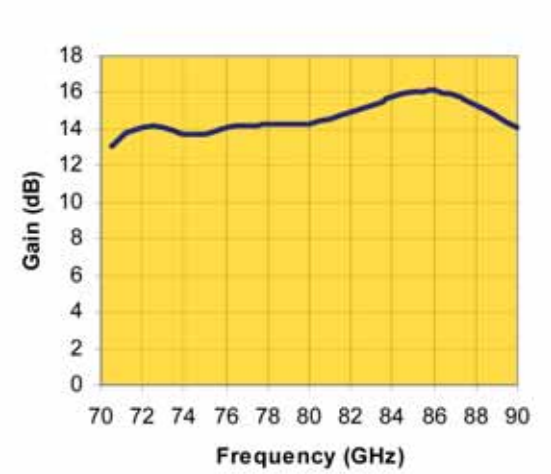
The HMC-ALH459 is a three stage GaAs HEMT MMIC Low Noise Amplifier (LNA) which operates between 71 and 86 GHz. The HMC-ALH459 features 14 dB of small signal gain, 4.5 dB of noise fi gure and an output power of +7 dBm at 1dB compression from two supply voltages at 2.1V and 2.4V respectively. All bond pads and the die backside are Ti/Au metallized and the amplifier device is fully passivated for reliable operation. This versatile LNA 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 [1], T_A = +25° C
Vdd1=Vdd2 = 2.1V, Vdd3=2.4V, Idd1+Idd2+Idd3 = 30 mA [2]

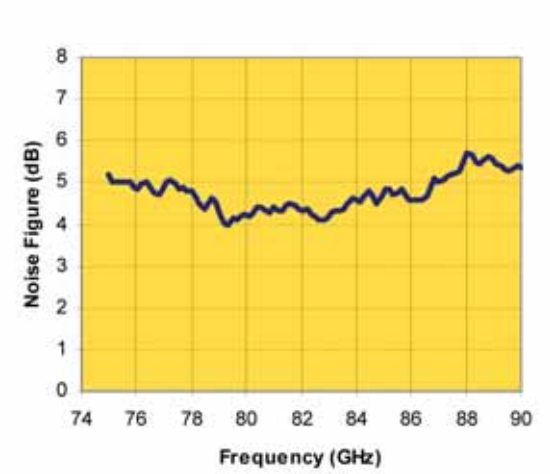
Parameter	Min.	Typ.	Max.	Units
Frequency Range		71 - 86		GHz
Gain	13	14		dB
Noise Figure		4.5		dB
Input Return Loss		8		dB
Output Return Loss		10		dB
Output Power for 1 dB Compression (P1dB)		7		dBm
Supply Current (Idd1+Idd2+Idd3)		30		mA

[1] Unless otherwise indicated, all measurements are from probed die
[2] Adjust Vgg1=Vgg2 between -1V to +0.3V (typ -0.5V).

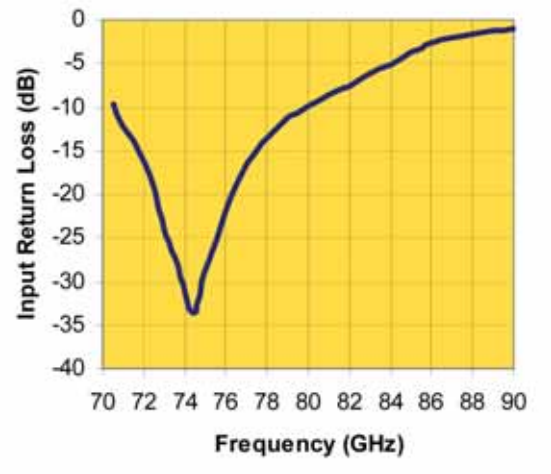
Linear Gain vs. Frequency



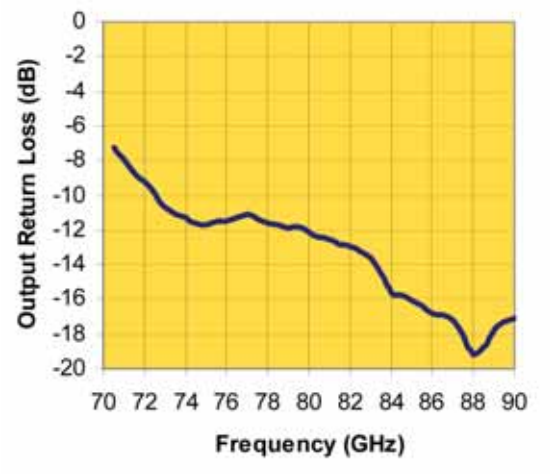
Noise Figure vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



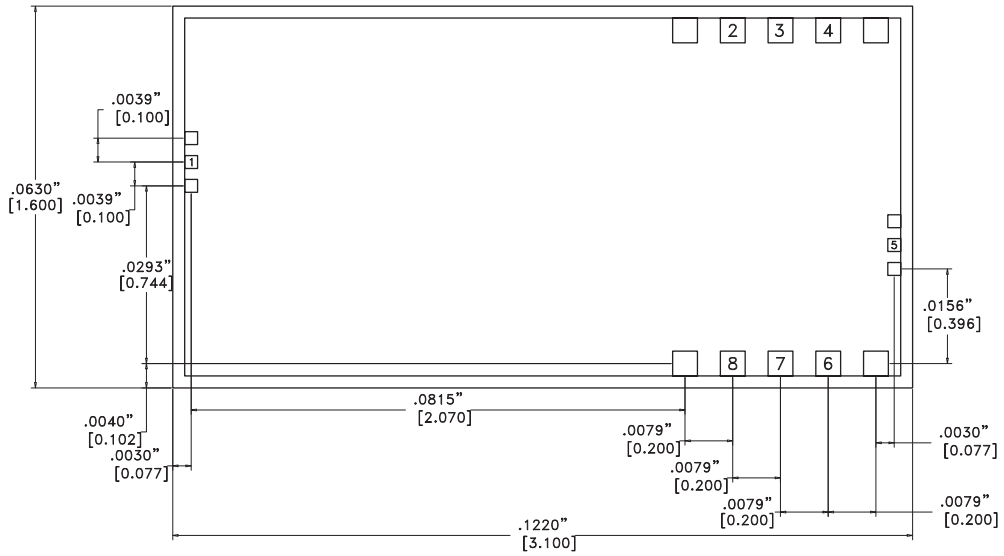
Note: Measured Performance Characteristics (Typical Performance at 25°C) Vdd = 2.5 V, Idd = 52 mA

Absolute Maximum Ratings

Drain Bias Voltage	+3 Vdc
Gate Bias Voltage	-1 to +0.3 Vdc
RF Input Power	-5 dBm
Thermal Resistance (channel to die bottom)	195.6 °C/W
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 ±.002"