HMC772LC4

v02.0514

GaAs HEMT MMIC LOW NOISE AMPLIFIER, 2 - 12 GHz

Typical Applications

This HMC772LC4 is ideal for:

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

Features

Noise Figure: 1.8 dB

Gain: 15 dB

Output IP3: +25 dBm

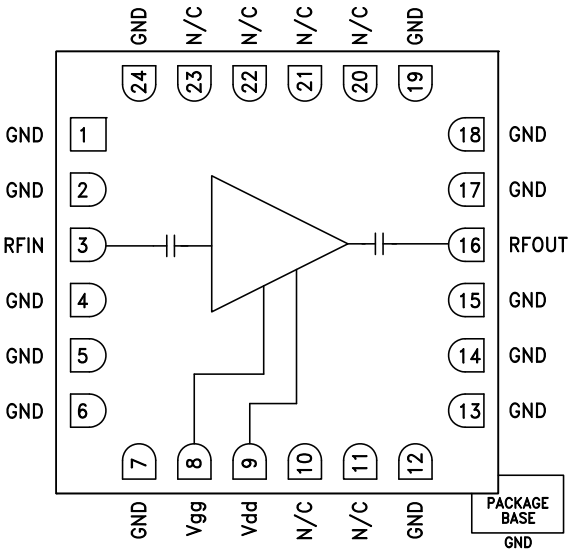
P1dB Output Power: +13 dBm

50 Ohm Matched Input/Output

Supply Voltage: +4V @ 45 mA

24 Lead Ceramic 4x4mm SMT Package: 16mm²

Functional Diagram



General Description

The HMC772LC4 is a GaAs MMIC HEMT Low Noise Wideband Amplifier which operates between 2 and 12 GHz. The amplifier provides 15 dB of gain, 1.8 dB noise figure up to 12 GHz and output IP3 of +25 dBm, while requiring only 45 mA from a +4V supply voltage. The Psat output power of up to +15 dBm enables the LNA to function as a LO driver for many of HIttite's balanced, I/Q or image reject mixers. The HMC772LC4 also features I/Os that are DC blocked and internally matched to 50 Ohms, making it ideal for SMT based high capacity microwave radio applications. The HMC772LC4 is housed in a RoHS compliant 4x4 mm QFN leadless ceramic package.

Electrical Specifications, T_A = +25° C, Vdd= +4V, Idd = 45 mA*

Parameter	Min.	Typ.	Max.	Units
Frequency Range		2 - 12		GHz
Gain	14	15		dB
Gain Variation over Temperature		0.01		dB / °C
Noise Figure		1.8	2.5	dB
Input Return Loss		15		dB
Output Return Loss		15		dB
Output Power for 1 dB Compression		13		dBm
Output Third Order Intercept (IP3)		25		dBm
Supply Current (Idd) (Vdd = 4V, Vgg = -0.2V Typ.)*		45		mA

* Adjust Vgg between -1 to 0.3V to achieve Idd = 45mA typical.

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RoHS✓ EARTH FRIENDLY

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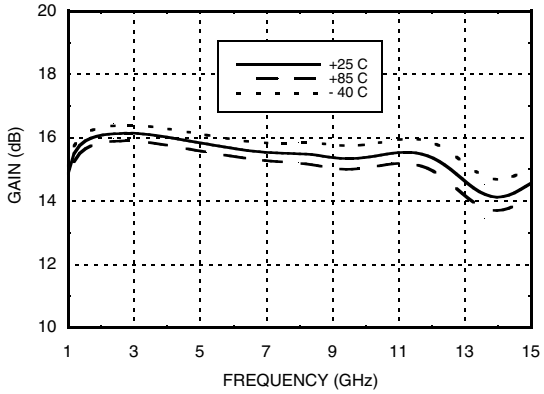
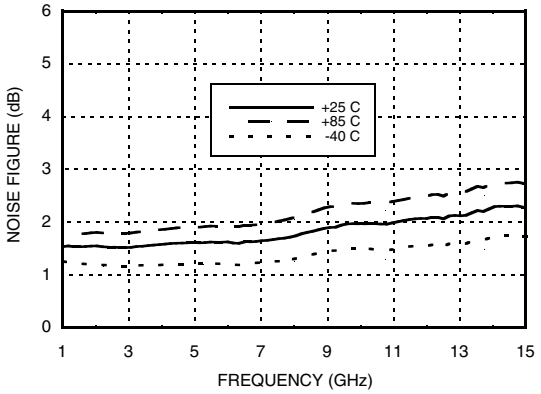
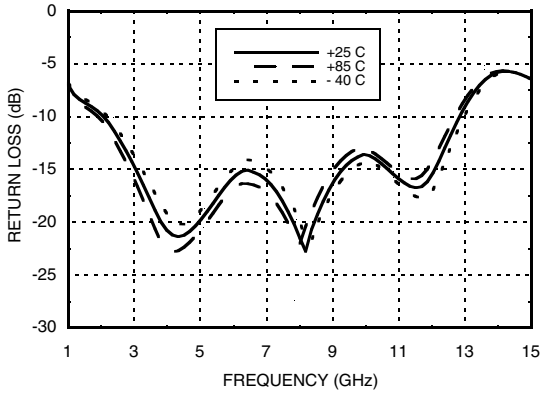
Gain vs. Temperature



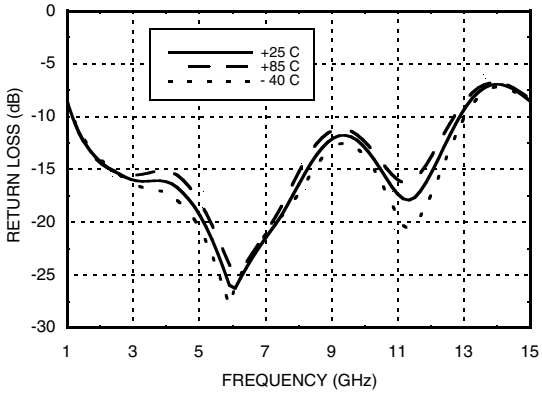
Noise Figure vs. Temperature



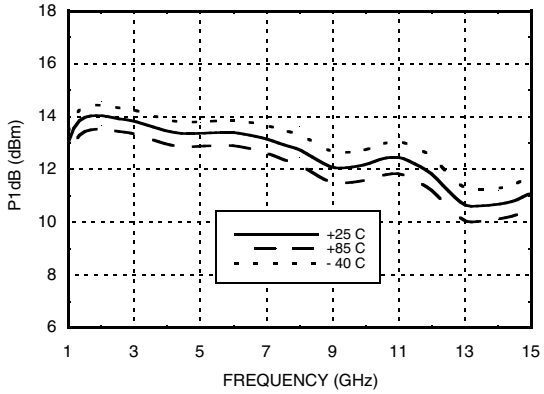
Output Return Loss vs. Temperature



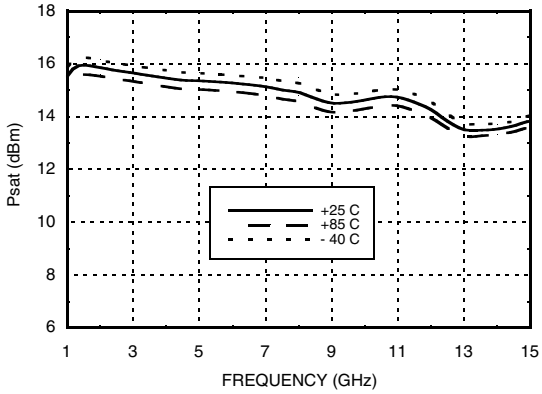
Input Return Loss vs. Temperature



Output P1dB vs. Temperature



Output Psat vs. Temperature



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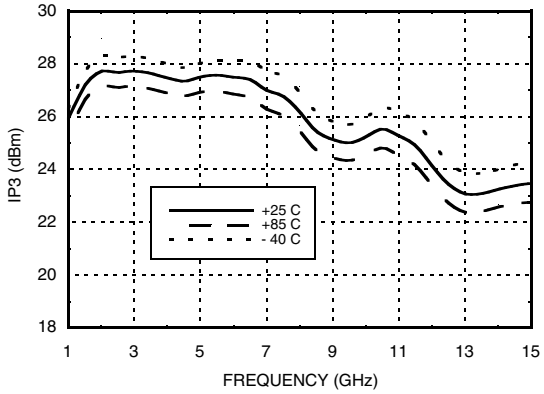
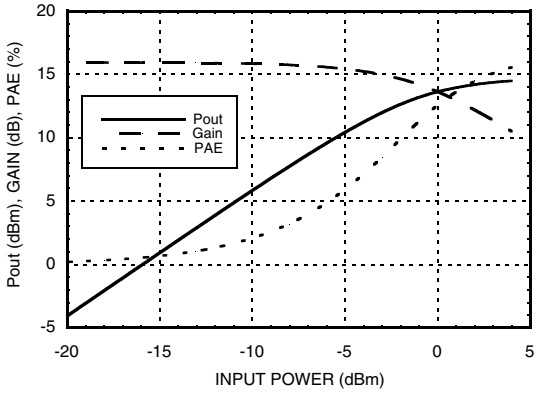
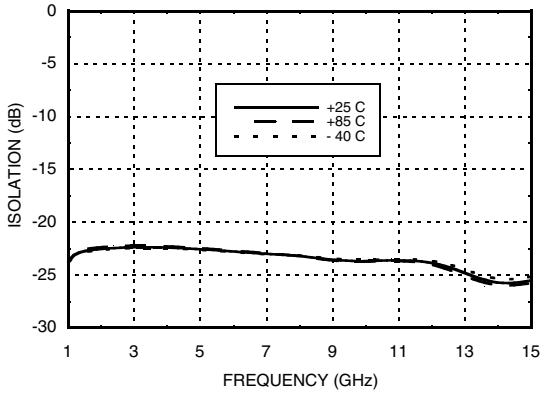
Output IP3 vs. Temperature



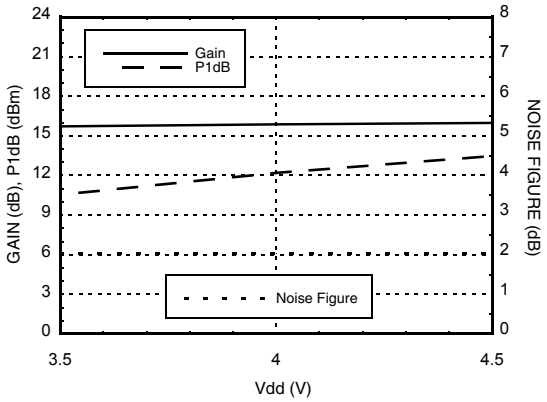
Power Compression @ 12 GHz



Reverse Isolation vs. Temperature



Gain, Noise Figure & Power vs. Supply Voltage @ 12 GHz



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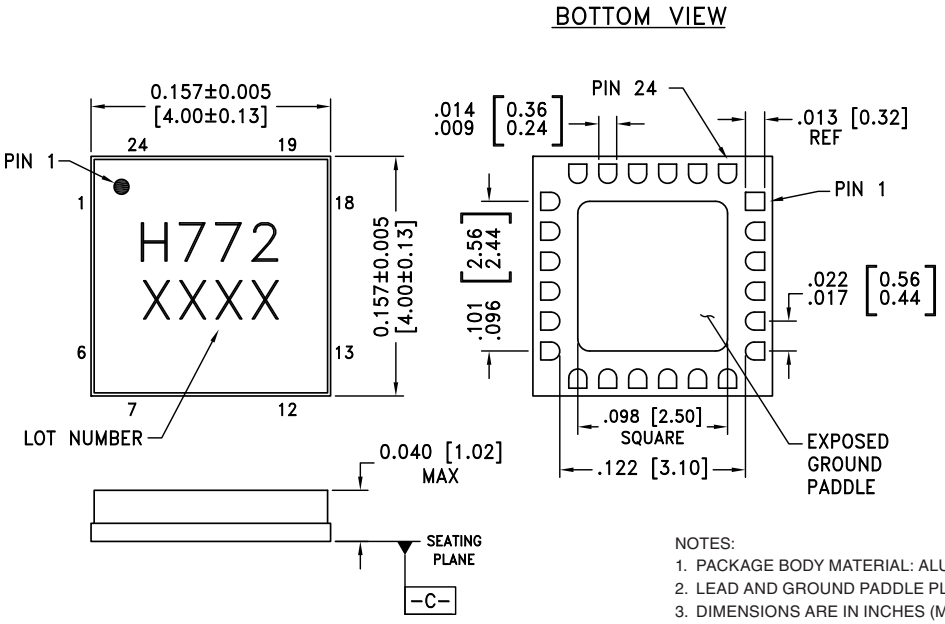
Absolute Maximum Ratings

Drain Bias Voltage	+5V
Drain Bias Current	60 mA
RF Input Power	5 dBm
Gate Bias Voltage	-1 to 0.3 V
Continuous Pdiss (T = 85 °C) (derate 5.8 mW/°C above 85 °C)	0.55 W
Thermal Resistance (Channel to ground paddle)	172 °C/W
Channel Temperature	180 °C
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:
1. PACKAGE BODY MATERIAL: ALUMINA.
2. LEAD AND GROUND PADDLE PLATING: GOLD FLASH OVER NICKEL.
3. DIMENSIONS ARE IN INCHES (MILLIMETERS).
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
5. PACKAGE WARP SHALL NOT EXCEED 0.05MM DATUM -C-
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [2]
HMC772LC4	Alumina, White	Gold over Nickel	MSL3 [1]	H772 XXXX

[1] Max peak reflow temperature of 260 °C
[2] 4-Digit lot number XXXX

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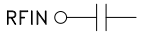
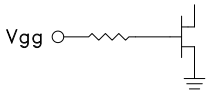
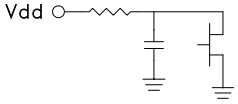
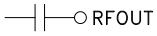
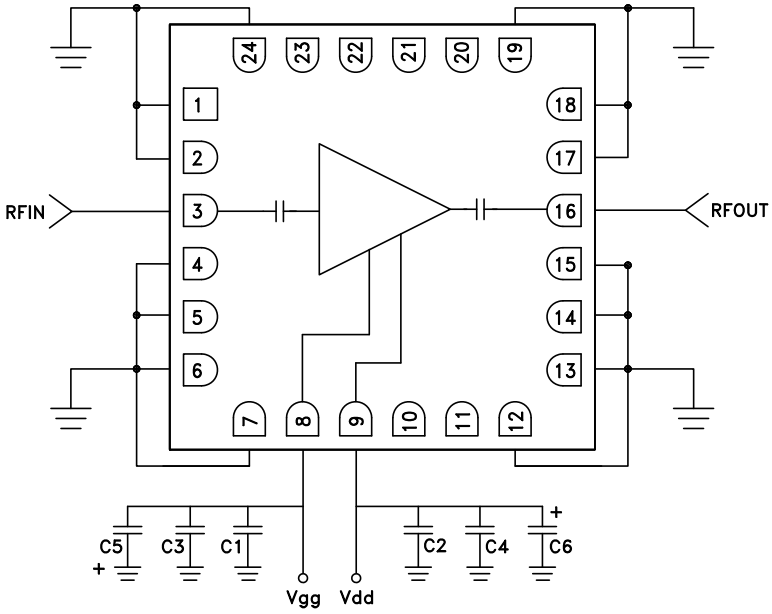
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2, 4 - 7, 12 - 15, 17 - 19, 24	GND	These pins and ground paddle must be connected to RF/DC ground.	
3	RFIN	This pin is AC coupled and matched to 50 Ohms.	
8	Vgg	Gate control for amplifier. Please follow "MMIC Amplifier Biasing Procedure" application note. See application circuit for required external components.	
9	Vdd	Power Supply Voltage for the amplifier. See application circuit for required external components.	
10, 11, 20 - 23	N/C	The pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	
16	RFOUT	This pin is AC coupled and matched to 50 Ohms.	

Application Circuit



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