

DESCRIPTION

The LX5561 is a low noise amplifier (LNA) for WLAN applications in the 2.4-2.5 GHz frequency range. This LNA is manufactured with an InGaAs Enhancement mode pseudomorphic HEMT (E-pHEMT) process.

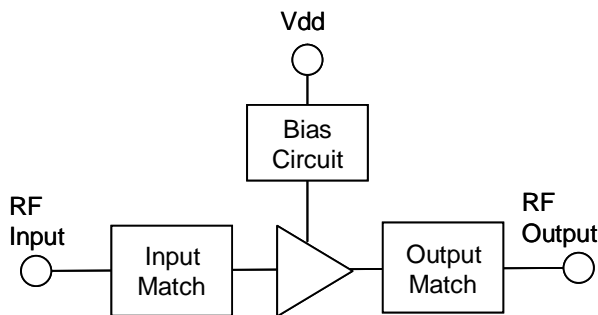
It operates with a single positive voltage supply of 3.3V, with noise figure of 1.5dB while maintaining input third order intercept point(IIP3) of up to +6.5dBm.

The LNA is implemented with bias circuit and input/output matching circuit on chip, resulting in simple external circuit on board. In addition, the on-chip bias circuit provides stable performance of gain, NF and current for voltage variation compared to a general resistor-network bias circuit.

The LX5561 is available in a 12-pin 2mm x 2mm micro-lead package (MLPQ-12L).

KEY FEATURES

- 0.5µm InGaAs E-mode pHEMT
- 2.4 – 2.5GHz Operation
- Single 3.3V Supply
- Gain ~ 13.0dB
- Noise Figure ~ 1.5dB
- Input IP3 ~ +6.5dBm
- Input P1dB ~ +2.5dBm
- On-Chip Bias Circuit
- On-Chip Input/Output Match
- 2mm x 2mm MLPQ-12L
- Low Profile 0.5mm

BLOCK DIAGRAM

APPLICATIONS

- Wireless LAN 802.11b/g
- WiMax

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

PRODUCT HIGHLIGHT

PACKAGE ORDER INFO
LL
Plastic MLPQ
12 pin

RoHS Compliant / Pb-free

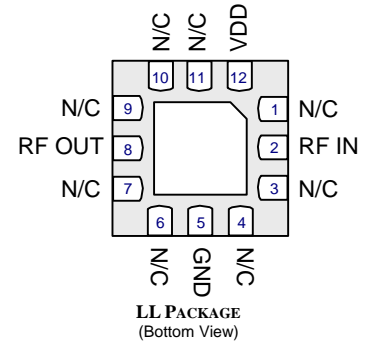
LX5561LL

Note: Available in Tape & Reel. Append the letters "TR" to the part number. (i.e. LX5561LL-TR)

ABSOLUTE MAXIMUM RATINGS

| | |
|--|----------------|
| DC Supply Voltage, RF Off | 4 V |
| Drain Current | 40 mA |
| Total Power Dissipation | 0.15 W |
| RF Input Power | +10 dBm |
| Operation Ambient Temperature | -40°C to +85°C |
| Storage Temperature Range | -65°C to 150°C |
| Package Peak Temp. for Solder Reflow (40 seconds maximum exposure).... | 260°C (+0 -5) |

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

PACKAGE PIN OUT


RoHS / Pb-free NiPdAu Finish

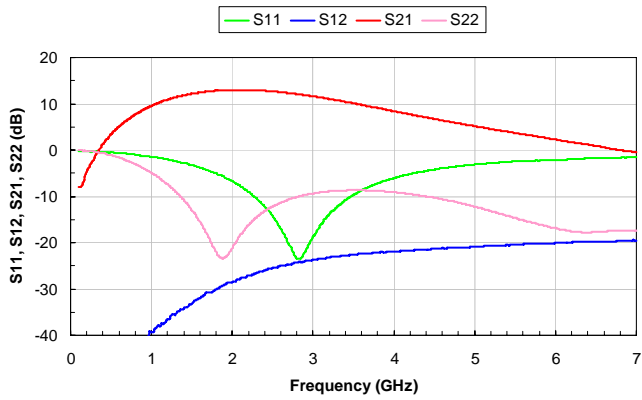
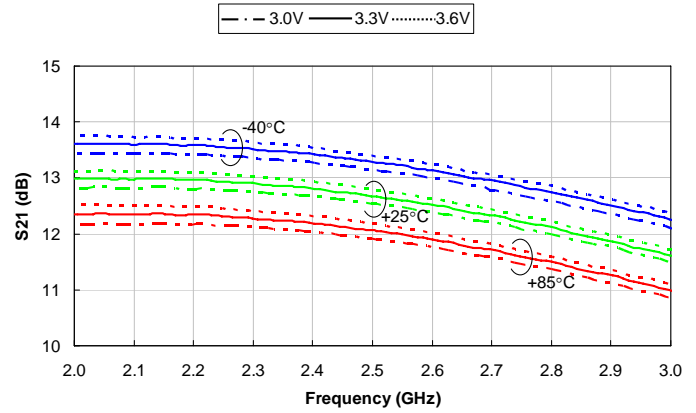
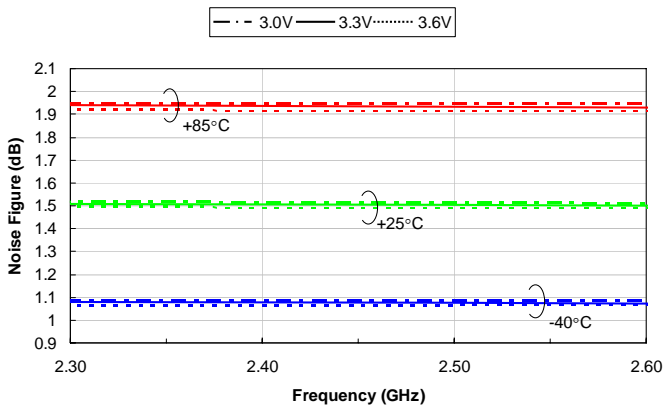
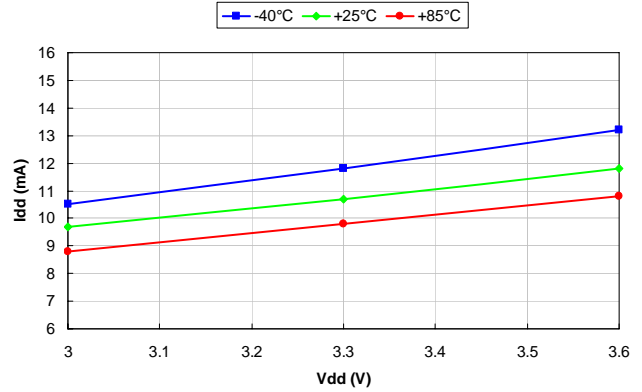
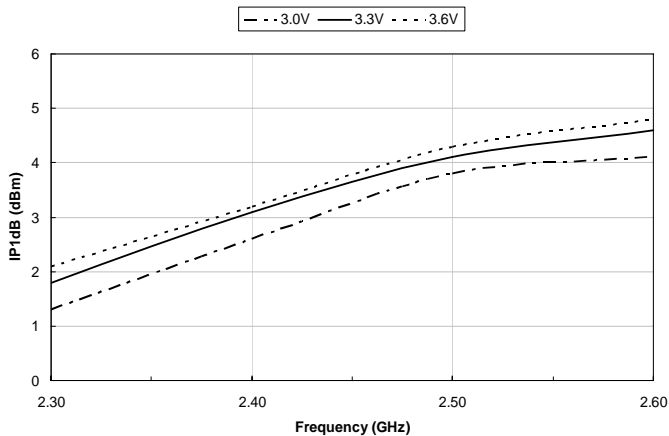
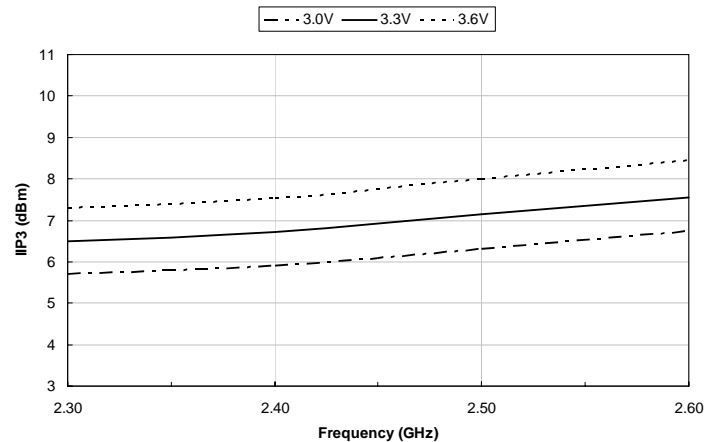
FUNCTIONAL PIN DESCRIPTION

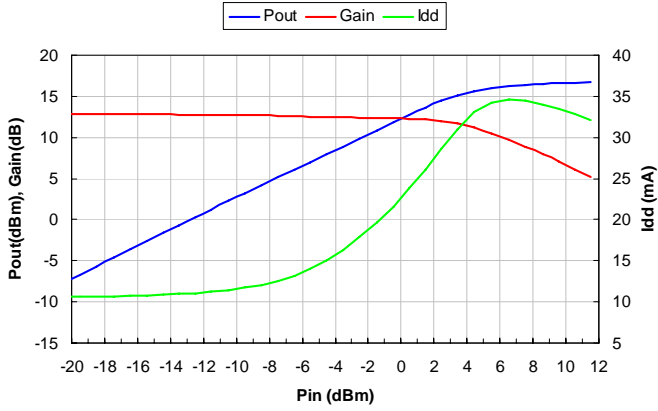
| Name | Pin # | Description |
|--------|---------------------------------|---|
| RF IN | 2 | RF input for the low noise amplifier. This pin is AC-coupled and does not require a DC-blocking capacitor. |
| RF OUT | 8 | RF output for the low noise amplifier. This pin is AC-coupled and does not require a DC-blocking capacitor. |
| VDD | 12 | Supply voltage. |
| GND | 5 | Ground. |
| N/C | 1,3,4,6,7,9,10,11, Center Metal | Not Connected. They can be treated either as open pins or connected to ground. |

ELECTRICAL CHARACTERISTICS

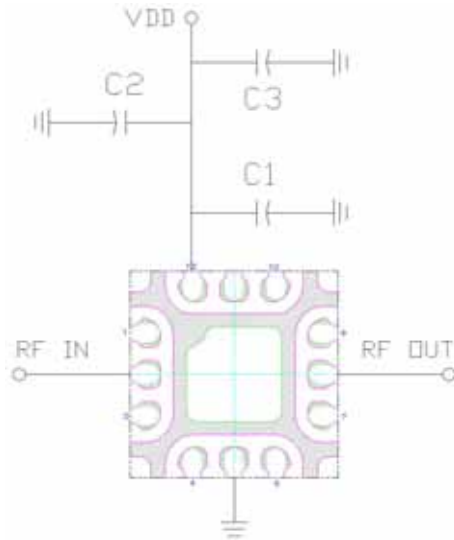
 Test conditions: $V_{DD} = 3.3V$, $I_{DD} = 10.5mA$, $T_A = +25^{\circ}C$ (Room Temperature)

| Parameter | Symbol | Test Conditions | LX5561 | | | Units |
|---|----------|--|--------|------|-----|-------|
| | | | Min | Typ | Max | |
| Application Frequency Range | f | | 2.4 | | 2.5 | GHz |
| Small-Signal Gain | S21 | | | 13.0 | | dB |
| Noise Figure | NF | | | 1.5 | 1.8 | dB |
| Input 3 rd Order Intercept Point | IIP3 | Freq. 1 = 2.412GHz, Freq. 2 = 2.432GHz | | 6.5 | | dBm |
| Input P1dB | IP1dB | Freq. = 2.45GHz | | 2.5 | | dBm |
| Input Return Loss | S11 | | | 12 | | dB |
| Output Return Loss | S22 | | | 12 | | dB |
| Supply Voltage | V_{DD} | | | 3.3 | | V |
| Supply Current | I_{DD} | | | 10.5 | | mA |

S-PARAMETER

GAIN OVER TEMP

NOISE FIGURE OVER TEMP

CURRENT OVER TEMP

INPUT P1DB (+25°C)

INPUT IP3 (+25°C)


POWER SWEEP @ 2.45GHZ


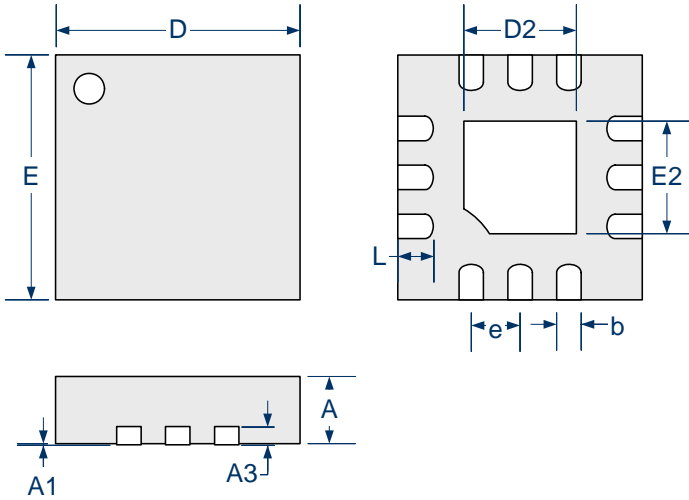
(Vdd=3.3V, Idq=10.5mA at Room Temperature)

APPLICATION SCHEMATIC

BOM LIST

| Reference Designator | Part Description | Case |
|----------------------|-----------------------|------|
| C1 | Capacitor, 1 nF | 0402 |
| C2 | Capacitor, 1 μ F | 0603 |
| C3 | Capacitor, 10 μ F | 0805 |

NOTES

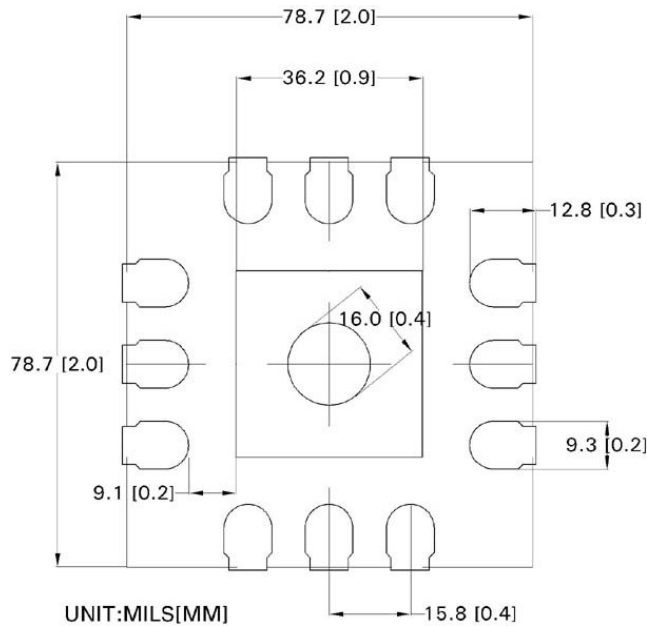
- It is recommended to place C1 at 20-50mil from MLP package outline.
- C2 and C3 are used for standalone evaluation board test only. They are not needed in final applications.

PACKAGE DIMENSIONS
LL 12-Pin MLPQ Plastic (2x2mm)


| Dim | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.40 | 0.50 | 0.016 | 0.020 |
| A1 | 0.00 | 0.05 | 0.000 | 0.002 |
| A3 | 0.15 REF | | 0.006 REF | |
| b | 0.15 | 0.25 | 0.006 | 0.010 |
| D | 2.00 BSC | | 0.079 BSC | |
| D2 | 0.77 | 1.02 | 0.030 | 0.040 |
| E | 2.00 BSC | | 0.079 BSC | |
| E2 | 0.77 | 1.02 | 0.030 | 0.040 |
| e | 0.40 BSC | | 0.016 BSC | |
| L | 0.19 | 0.39 | 0.007 | 0.015 |

Note:

- Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.



Recommended Land Pattern



Microsemi[®]

LX5561

InGaAs – E-Mode pHEMT Low Noise Amplifier

PRODUCTION DATA SHEET

NOTES

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