

**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.

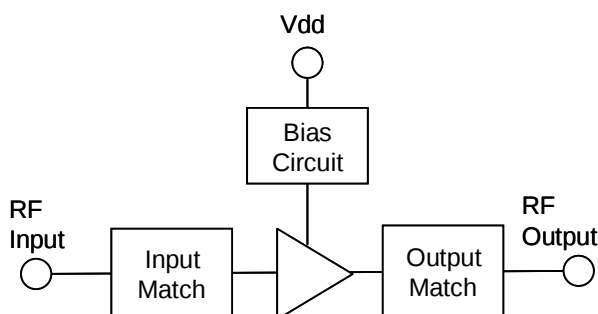
It operates with a single positive voltage supply of 3.3V, with noise figure of 1.5dB while maintaining input third order intercept point(IIP3) of up to +6.5dBm.

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

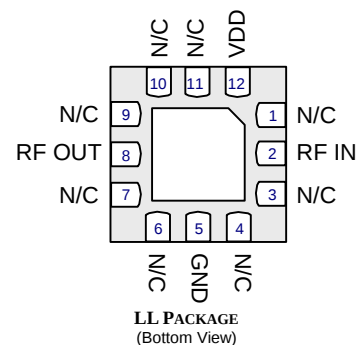
**LX5561LL**

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

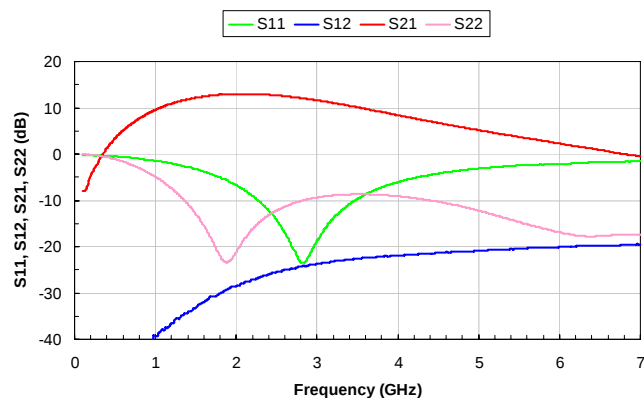
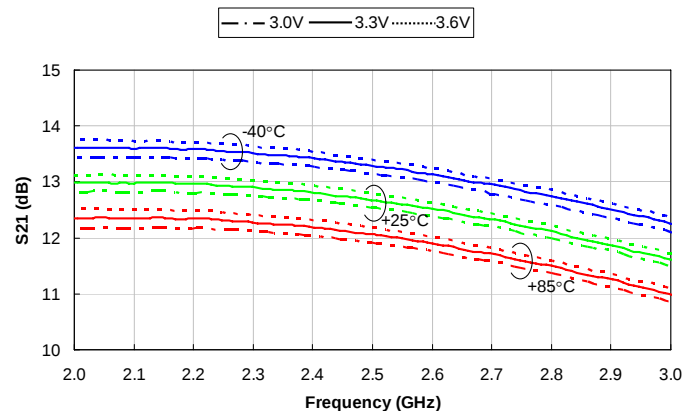
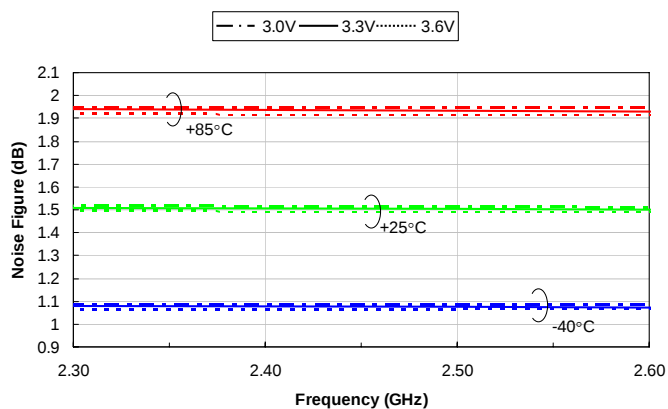
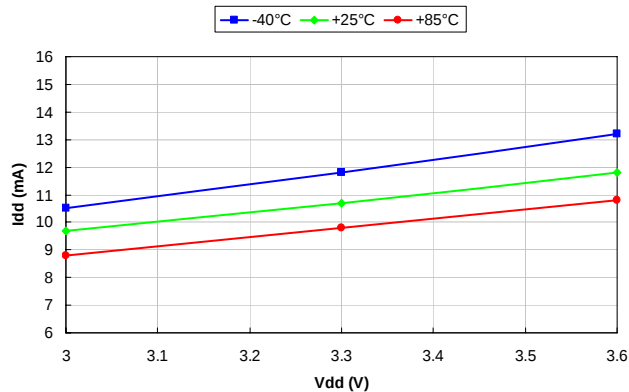
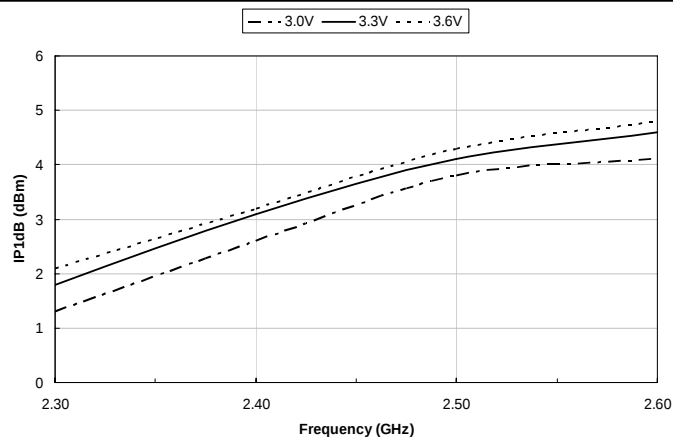
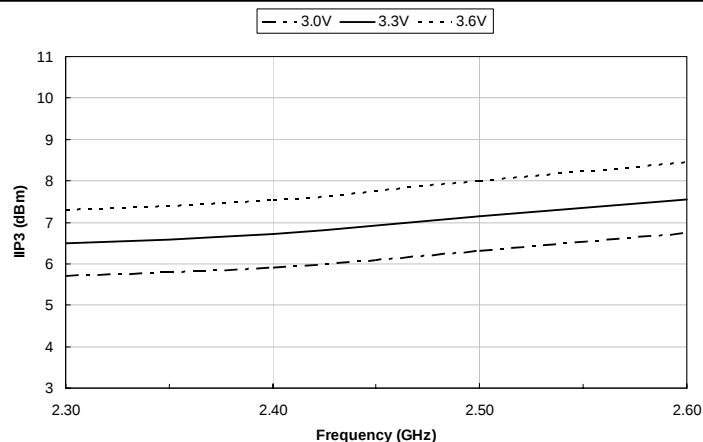
**FUNCTIONAL PIN DESCRIPTION**

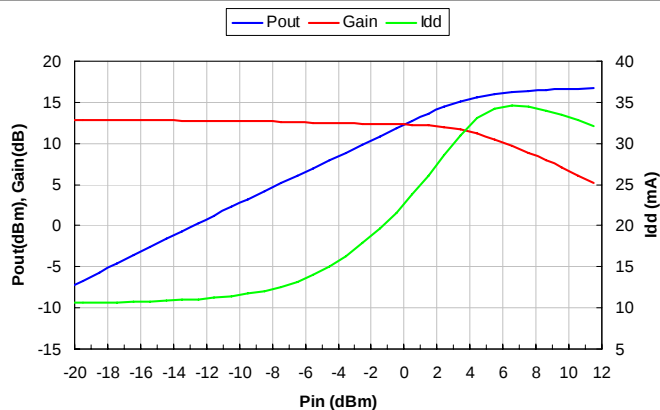
| Name   | Pin #                           | Description                                                                                                 |
|--------|---------------------------------|-------------------------------------------------------------------------------------------------------------|
| 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**

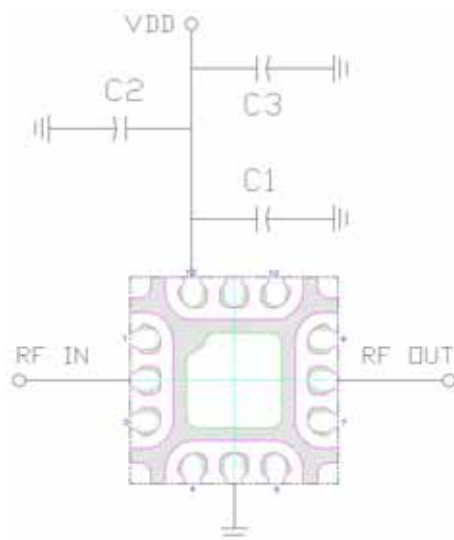
Test conditions:  $V_{DD} = 3.3V$ ,  $I_{DD} = 10.5mA$ ,  $T_A = +25^{\circ}C$  (Room Temperature)

| 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 <sup>rd</sup> 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**


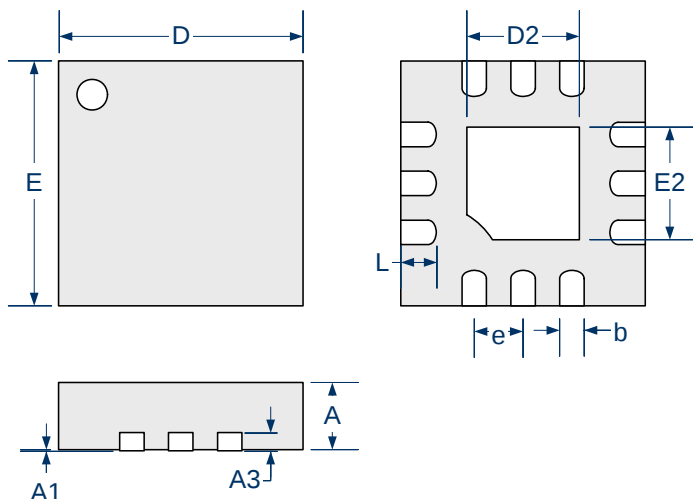
(Vdd=3.3V, Idq=10.5mA at Room Temperature)

**APPLICATION SCHEMATIC**

**BOM LIST**

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

**NOTES**

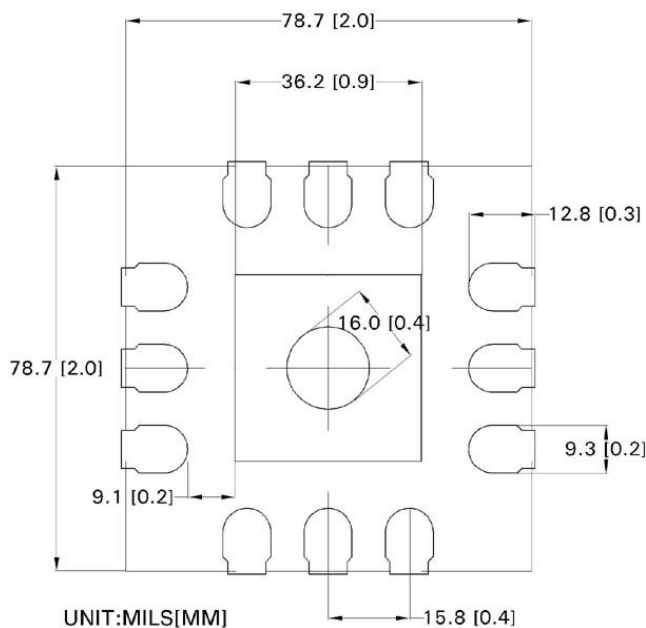
- It is recommended to place C1 at 20-50mil from MLP package outline.
- C2 and C3 are used for standalone evaluation board test only. They are not needed in final applications.

**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**



LX5561

InGaAs – E-Mode pHEMT Low Noise Amplifier

PRODUCTION DATA SHEET

NOTES

www.Microsemi.com

NOTES

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