

# 3.5-8.0 GHz GaAs MMIC Packaged Low Noise Amplifier



February 2007 - Rev 08-Feb-07

XL1007-QT  
RoHS

## Features

- ✕ 12 dB Gain
- ✕ 2 dB Noise Figure
- ✕ 3x3 QFN Package
- ✕ Single Power Supply
- ✕ 3-5 V, 40 mA Self Bias
- ✕ On-Chip ESD Protection



## Circuit Description

Mimix Broadband's 3.5 to 8.0 GHz low noise amplifier is packaged in surface mount 3x3 QFN package. The device is a self-biased, single supply design with 12 dB gain and 2 dB noise figure. This MMIC uses Mimix Broadband's 0.25um optical pHEMT process.

## Absolute Maximum Ratings

Supply Voltage	+6 V
RF Input Power	+10 dBm
Storage Temperature (Tstg)	-55 °C to +125 °C
Junction Temperature	175 °C
Operating Temperature	-40 °C to +85°C

Operation beyond these conditions may cause permanent damage to the device.

## Electrical Characteristics (T=25°C)

Parameter	Units	Min.	Typ.	Max.
Frequency Range	GHz	3.5	-	8
Gain	dB	-	12	-
Input Return Loss		-	-10	-
Noise Figure	dB	-	2.0	-
Output P1dB	dBm	-	13	-
Output IP3	dBm	-	22	-
Supply Voltage	V	-	3	-

## Typical Parameters

Parameter	Typical					
	3.5	4	5	6	7	8
Frequency	3.5	4	5	6	7	8
Gain	13	13	12.5	11	10	7.5
IP Return Loss	-15	-15	-11	-12.5	-12.5	-10
Op Return Loss	-7.5	-11	-14	-15	-15	-10
NF	2.2	1.5	1.8	1.5	1.8	2.4



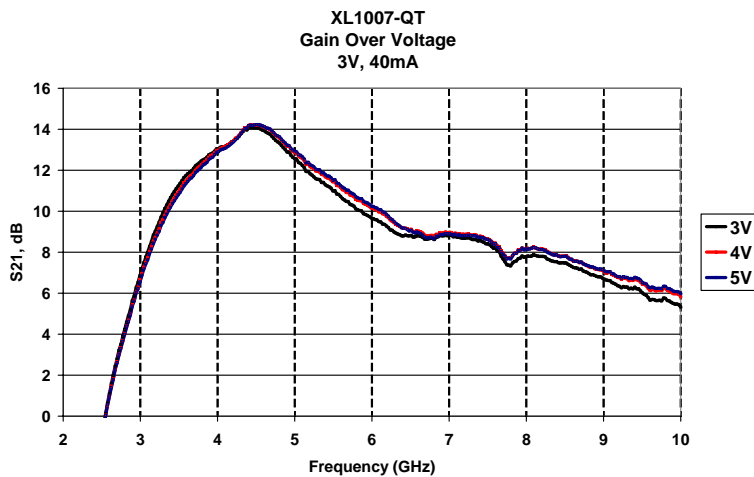
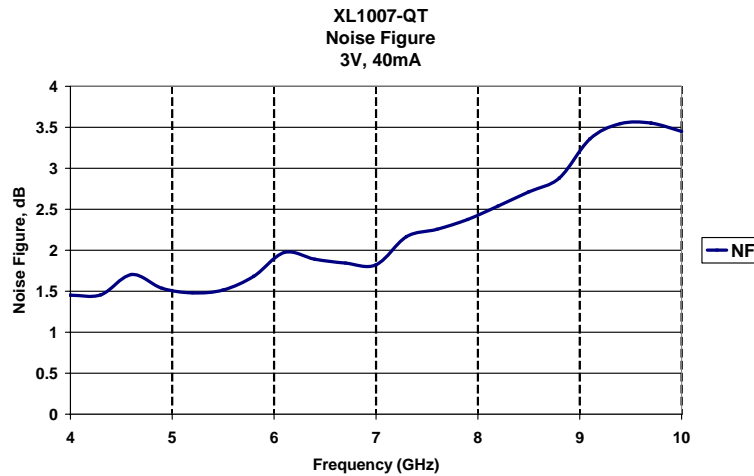
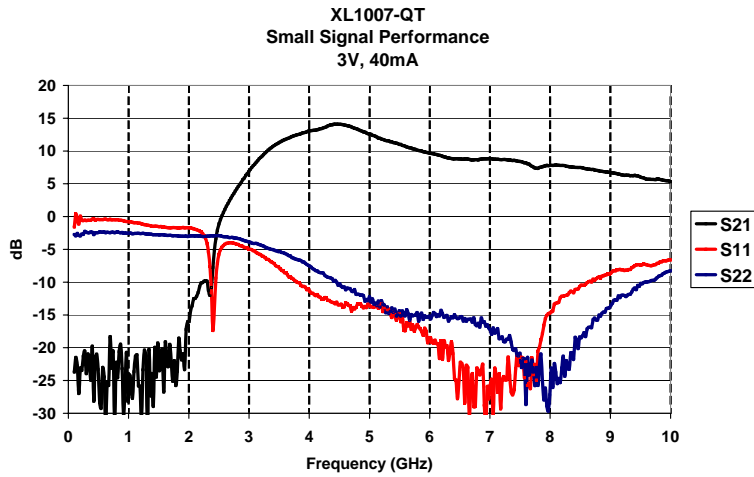
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## Low Noise Amplifier Measurements



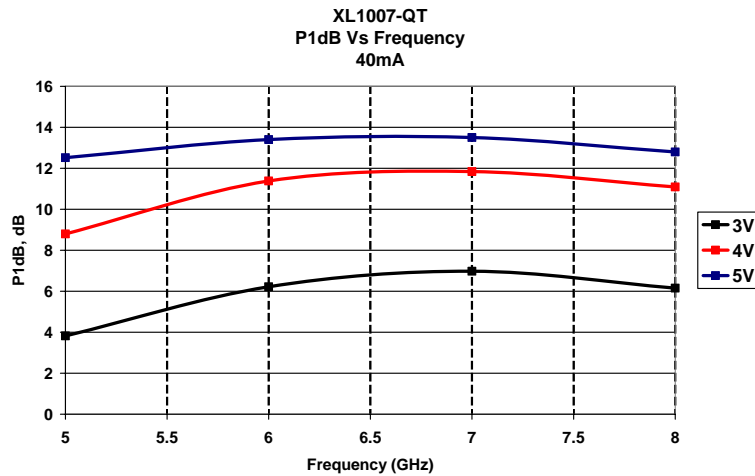
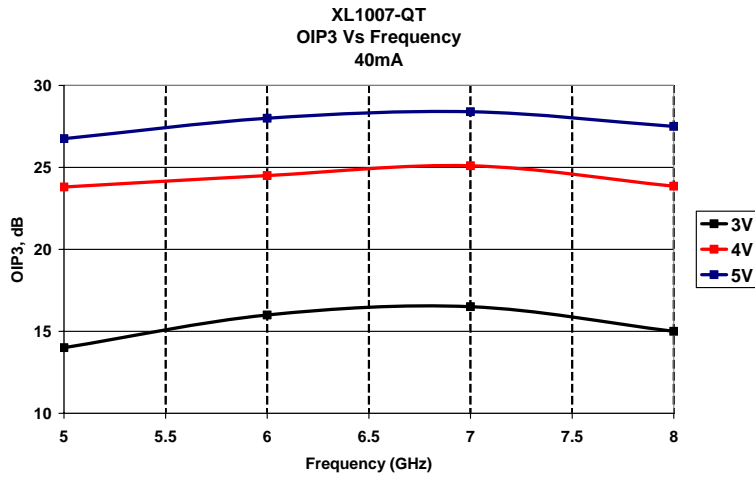
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## Low Noise Amplifier Measurements (cont.)



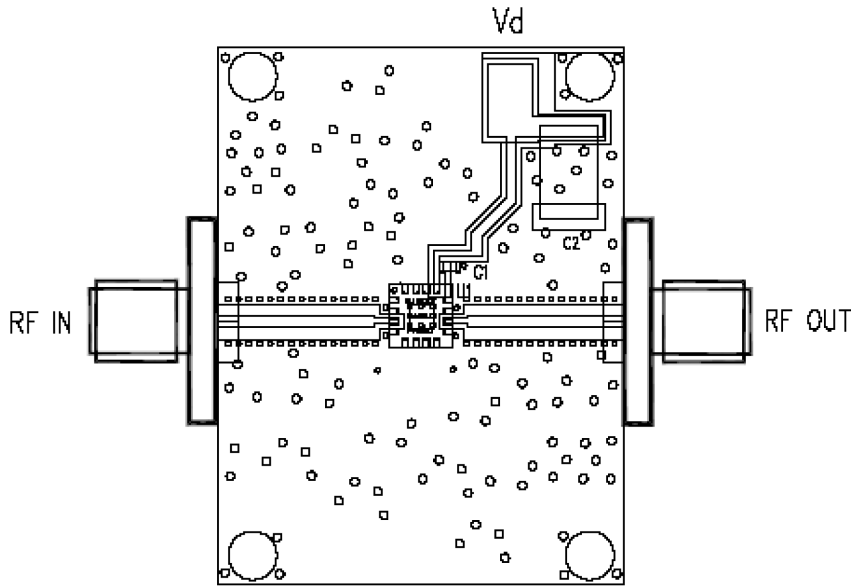
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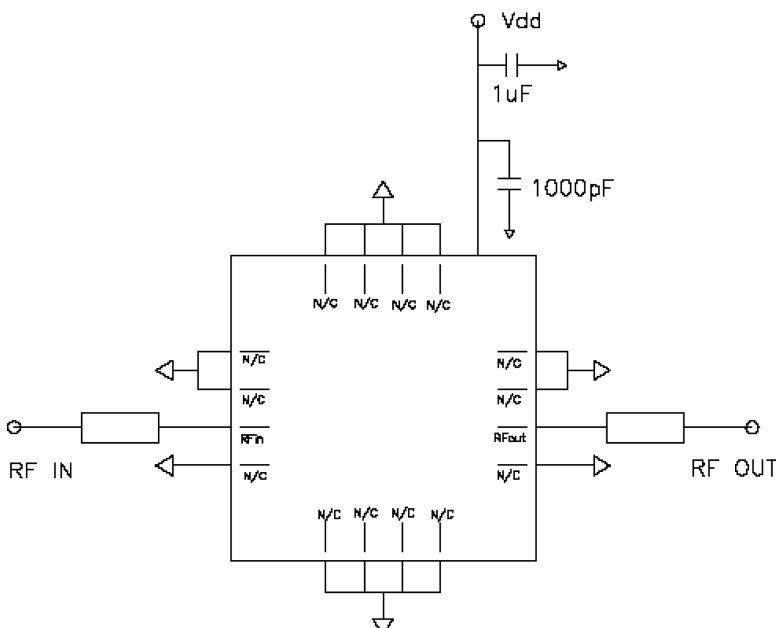
## Evaluation Board Layout



## Package Pin-out Table

Pin Designator	Description
1,2,4,5,6,7,8,9, 11,12,14,15,16	NC
3	RF Input
10	RF Output
13	Vd

## Evaluation Board Schematic



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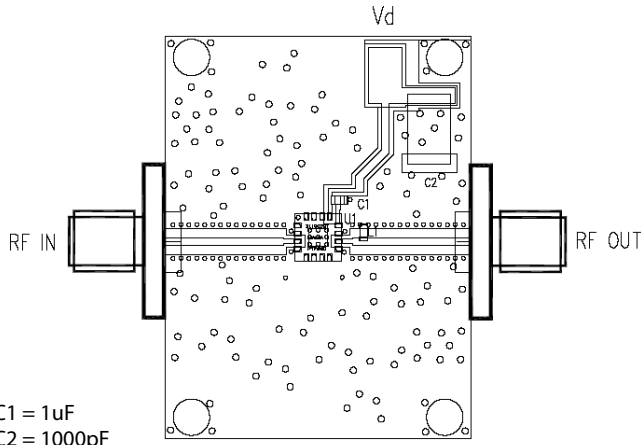


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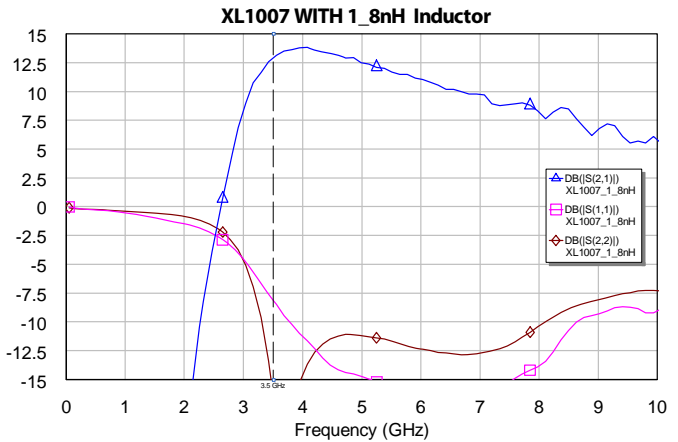
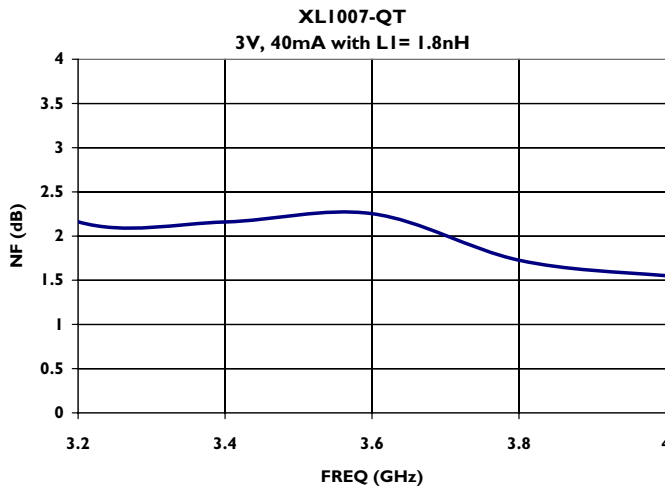
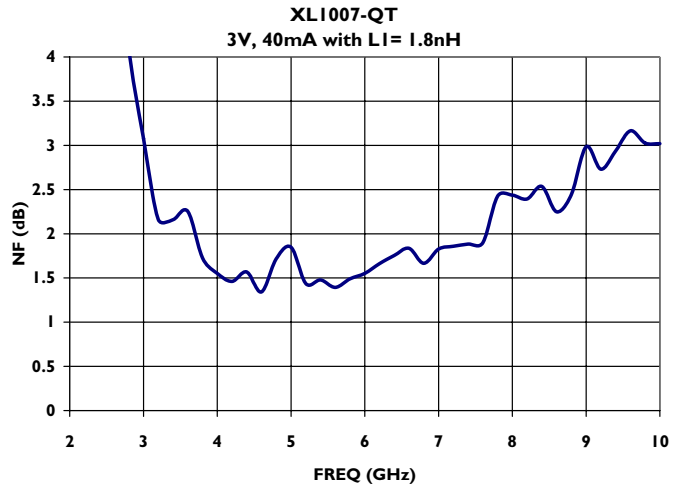
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## Typical Performance for 3.5 GHz WiMAX

Evaluation Board Layout for 3.2 ~ 3.8GHz WiMAX application:



C1 = 1uF  
C2 = 1000pF  
L1 = 1.8nH



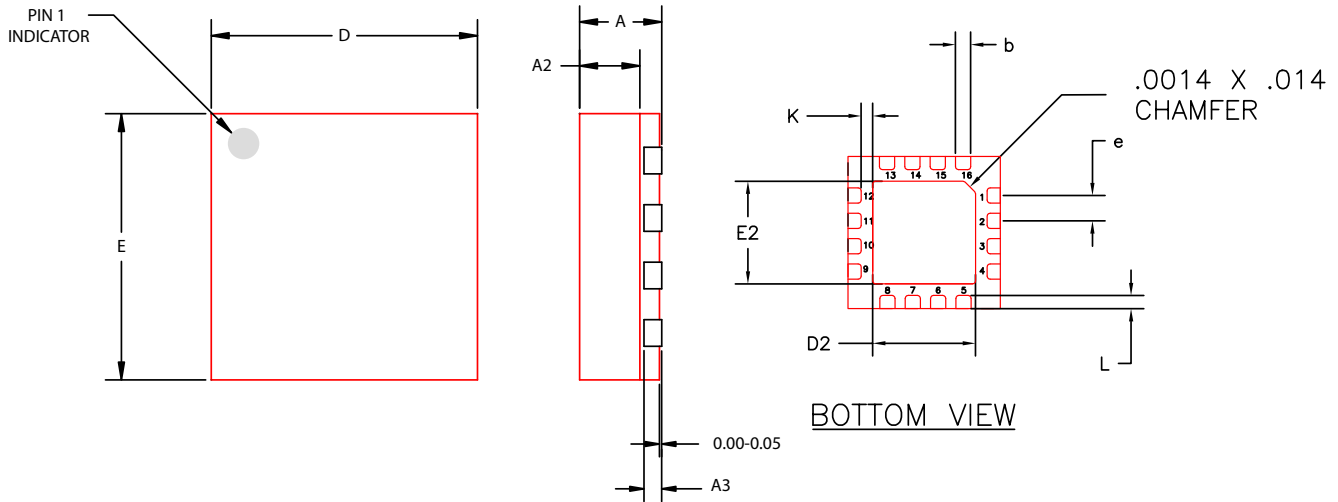
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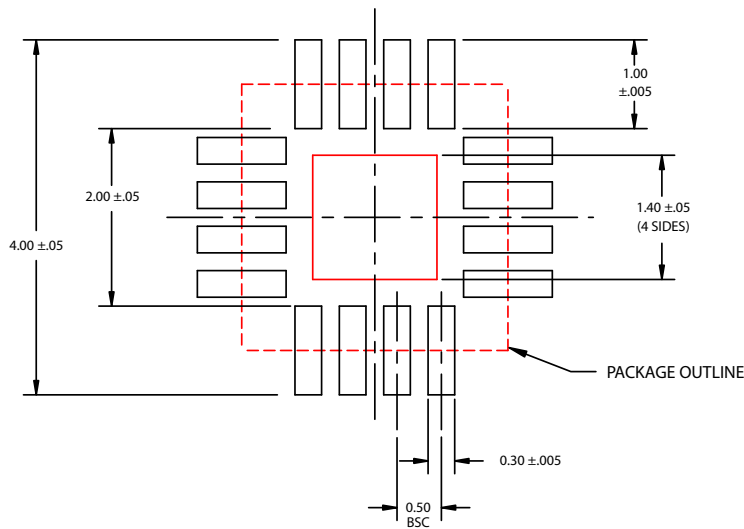
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## Package Outline and Assembly



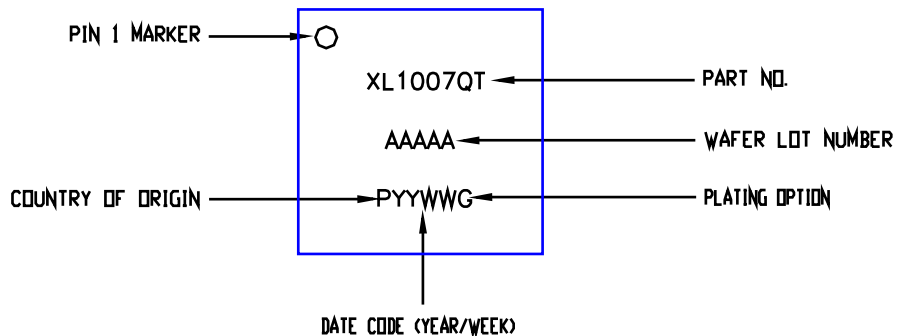
RECOMMENDED SOLDER PAD PITCH AND DIMENSIONS



NOTE:

1. ALL DIMENSIONS ARE IN mm

	MIN	NOM	MAX
A	0.80	0.90	1.00
A3	0.20 REF		
A2	0	0.65	1.00
b	0.20	0.25	0.30
K	0.20	-	-
D	3.00 BSC		
E	3.00 BSC		
e	0.50		
D2	1.50	1.65	1.80
E2	1.50	1.65	1.80
L	0.16	0.26	0.36



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## Handling and Assembly Information

**CAUTION!** - Mimix Broadband MMIC Products contain gallium arsenide (GaAs) which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- Do not ingest.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

**Life Support Policy** - Mimix Broadband's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President and General Counsel of Mimix Broadband. As used herein: (1) Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user. (2) A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

**Package Attachment** - This packaged product from Mimix Broadband is provided as a rugged surface mount package compatible with high volume solder installation. Care should be taken not to apply heavy pressure to the top or base material to avoid package damage. Vacuum tools or other suitable pick and place equipment may be used to pick and place this part. Care should be taken to ensure that there are no voids or gaps in the solder connection so that good RF, DC and ground connections are maintained. Voids or gaps can eventually lead not only to RF performance degradation, but reduced reliability and life of the product due to thermal stress.

**Mimix Lead-Free RoHS Compliant Program** - Mimix has an active program in place to meet customer and governmental requirements for eliminating lead (Pb) and other environmentally hazardous materials from our products. All Mimix RoHS compliant components are form, fit and functional replacements for their non-RoHS equivalents. Lead plating of our RoHS compliant parts is 100% matt tin (Sn) over copper alloy and is backwards compatible with current standard SnPb low-temperature reflow processes as well as higher temperature (260°C reflow) "Pb Free" processes.

## Ordering Information

<u>Part Number for Ordering</u>	<u>Description</u>
XL1007-QT-0G00	Matte Tin finished RoHS compliant 3x3 QFN in bulk quantity
XL1007-QT-0G0T	Matte Tin finished RoHS compliant 3x3 QFN in tape and reel
XL1007-QT-EV1	Evaluation Board

We also offer this part with SnPb (Tin-Lead) or NiPdAu plating. Please contact your regional sales manager for more information regarding different plating types.

XL1007-BD-000X Where "X" is RoHS compliant die packed in "V" -vacuum released gel paks or "W" -waffle trays.