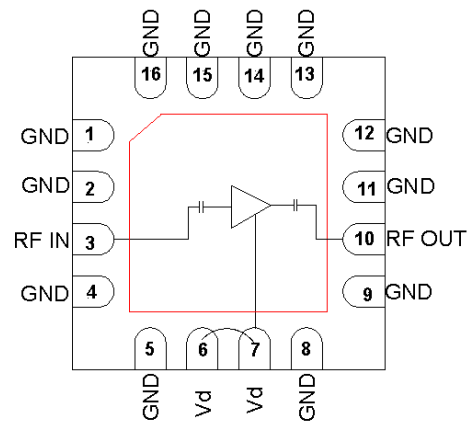


0.5 - 4GHz Low Noise Amplifier

Features

- ◆ Frequency Range: 0.5- 4 GHz
- ◆ Better than 2.0dB Noise Figure
- ◆ Single supply operation
- ◆ 13 dB Nominal Gain
- ◆ 15 dBm Nominal P1dB
- ◆ Input Return Loss > 12 dB
- ◆ Output Return Loss > 10 dB
- ◆ DC decoupled Input and Output
- ◆ Nominal Bias : 3V@ 50mA
- ◆ 0.15-um InGaAs pHEMT Technology
- ◆ QFN Plastic package: 3mm x 3mm x 0.8mm

Functional Diagram



Typical Applications

- ◆ Cellular system
- ◆ Base stations
- ◆ Narrow Band Applications from 800MHz to 4GHz
- ◆ Communication receivers and transmitters.

Description

The ASL1000P3 is a broadband MMIC LNA operating from 0.5 - 4GHz. The MMIC employs a single stage self-biased amplifier design featuring 50 Ohm input/output impedance. The amplifier operates on a single +3V supply. The LNA features 13dB of nominal gain and has a typical mid-band noise figure of 1.8 dB. The Amplifier can also be operated at 2V for lower current operation and at 4V for a higher power output requirement. The LNA features midband input/output return loss of 14dB and a nominal P1dB of 14dBm. In addition to being used as the first stage, the LNA's excellent linearity encourages its usage in the succeeding stages of a receiver chain. To minimize board area the design is offered in a low profile (3mm x 3mm) QFN package.

Absolute Maximum Ratings ⁽¹⁾

Parameter	Absolute Maximum	Units
Positive DC Supply	6	V
RF Input Power	20	dBm
Supply current	100	mA
Operating Temperature	-55 to +85	°C
Storage Temperature	-65 to +150	°C

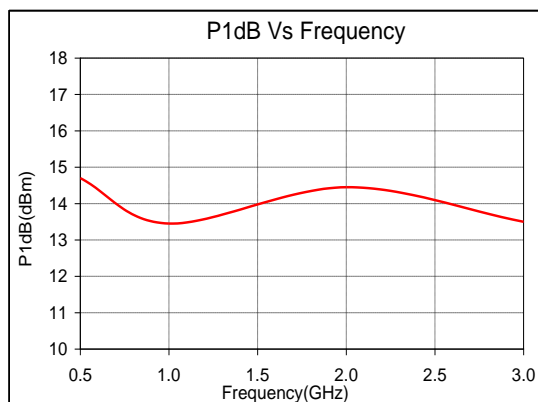
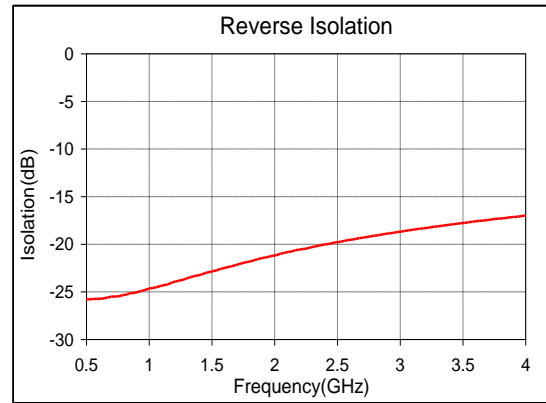
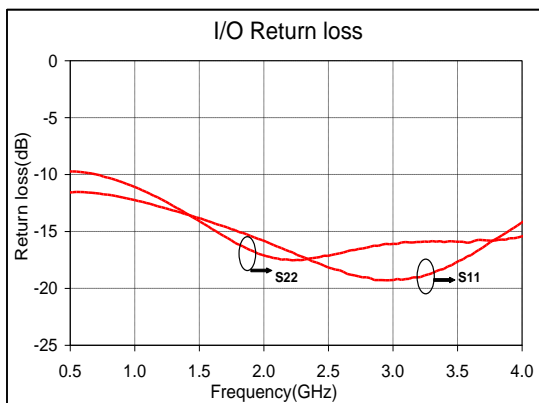
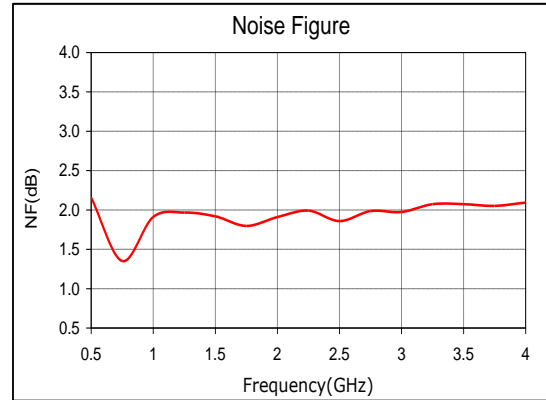
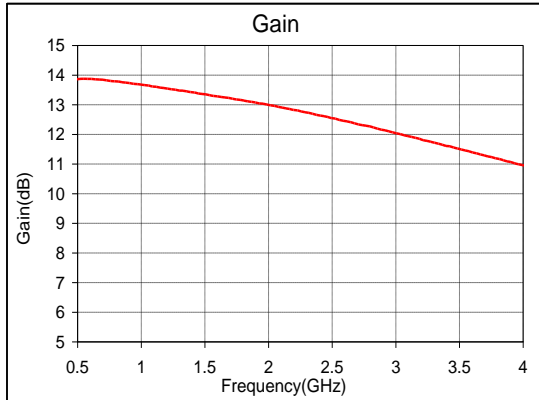
1. Operation beyond these limits may cause permanent damage to the component

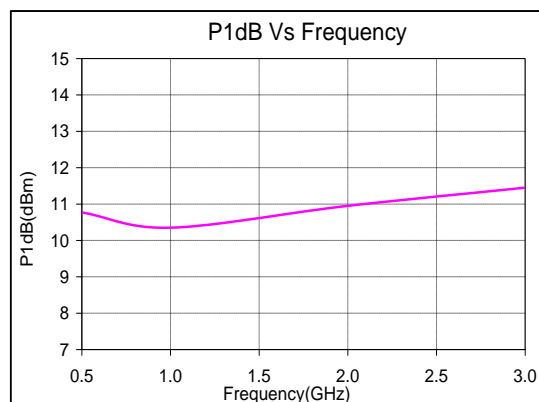
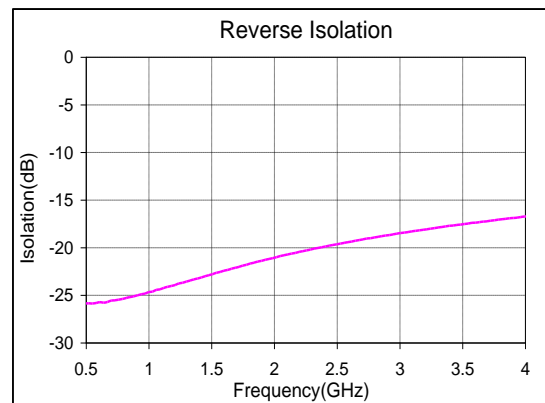
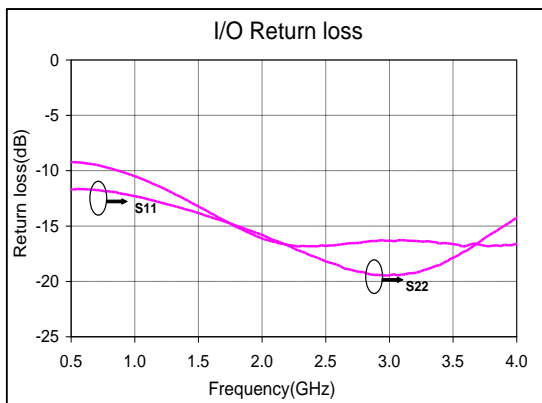
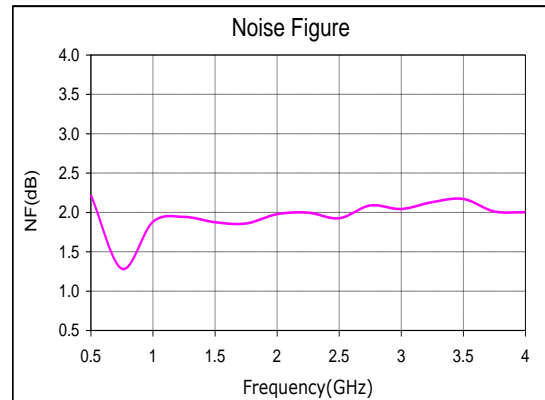
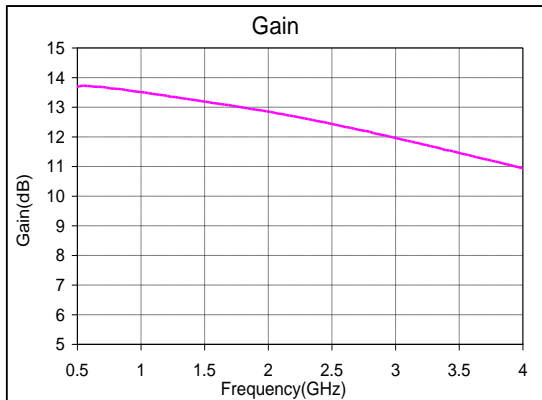
Electrical Specifications ⁽¹⁾ @ T_A = 25 °C, V_d = +3V, Z_o =50 Ω

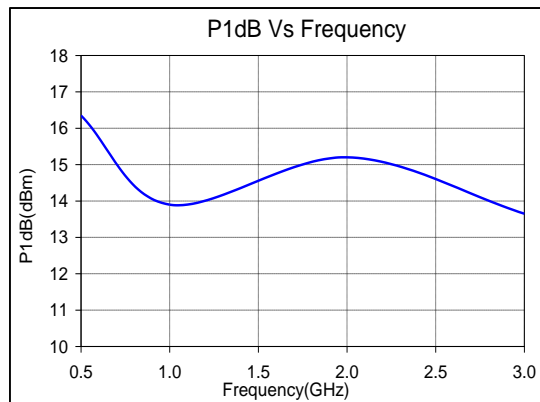
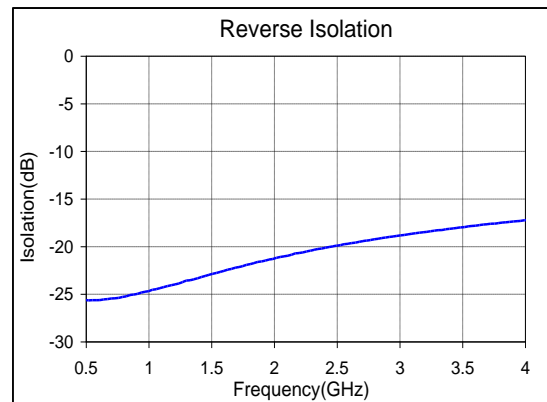
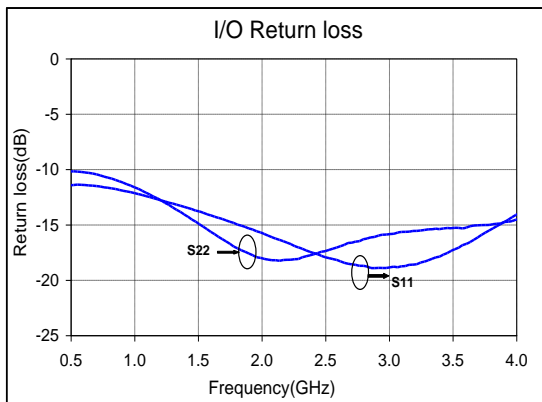
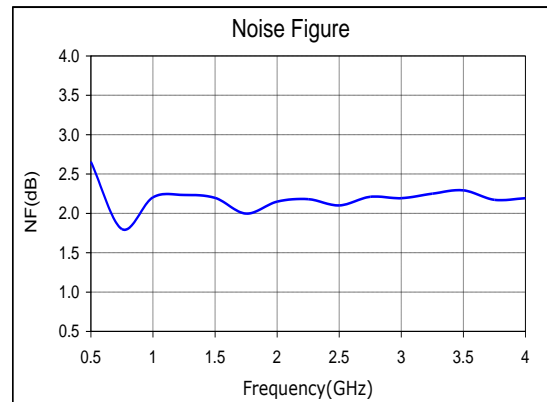
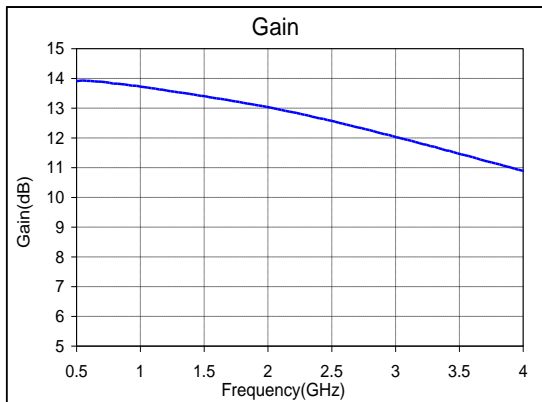
Parameter	Min.	Typ.	Max.	Units
Frequency	0.5	-	4	GHz
Gain	-	13	-	dB
Gain Flatness	-	±1.5	-	dB
Noise Figure(max)	-	2	-	dB
Input Return Loss	10	12	-	dB
Output Return Loss	10	12	-	dB
Output Power (P1dB)	12	14	-	dBm
Output Third Order Intercept(IP3)	-	22	-	dBm
Supply Current	45	50	65	mA

Note:

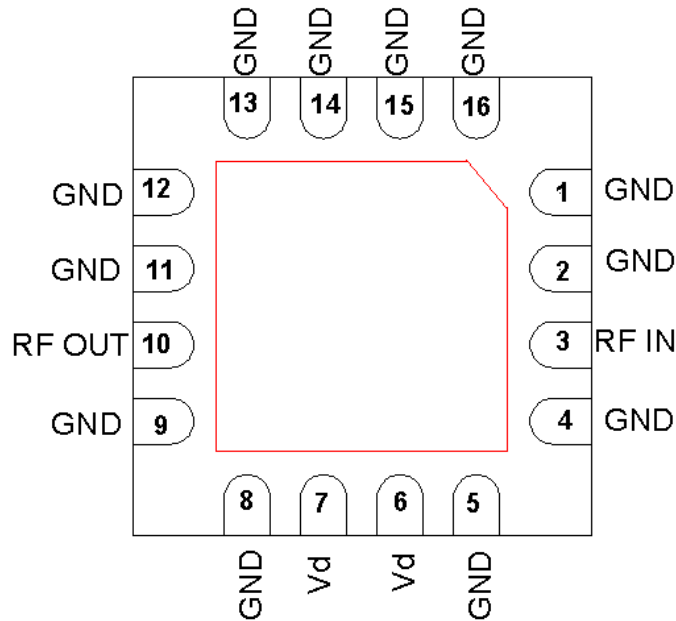
1. Electrical specifications as measured in test fixture.

Test fixture data
 $V_d = 3V, \text{ Total Current} = 50mA, T_A = 25^\circ C$


Test fixture data
 $V_d = 2V$, Total Current = 45 mA, $T_A = 25^\circ C$


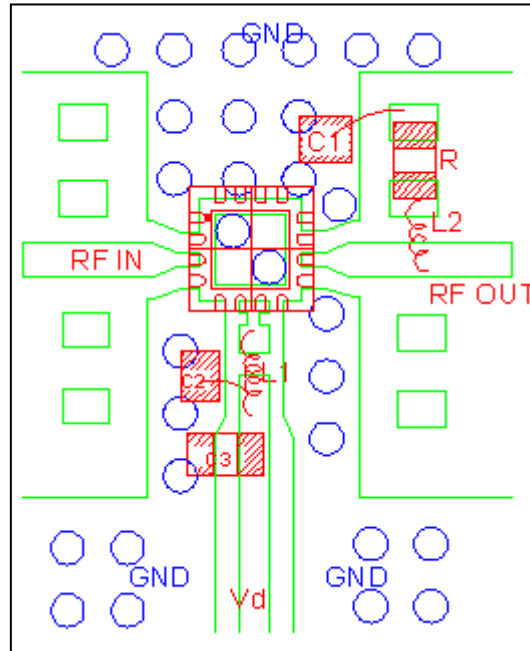
Test fixture data
V_d = 4V, Total Current = 55 mA, T_A = 25 °C


Pin Configuration



Pin Designations

Symbol	Pin No.	Description
GND	1,2,4,5,8,9,11-16	Ground
RF In	3	RF Input
Vd	6,7	Drain Voltage Input
RF Out	10	RF output

Test Board Pattern

QFN mounted on test pattern
List of components

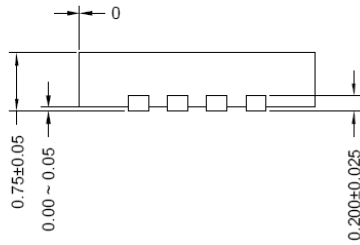
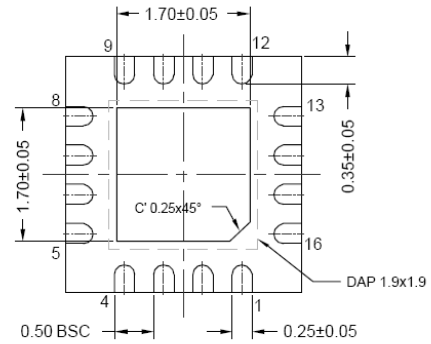
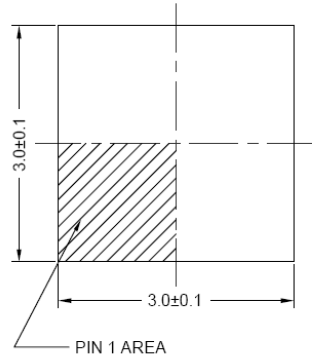
Component	value	Part No.
L1	68nH	Any standard Air core inductor or equivalent hand-wound part
L2	15nH	
R	100 Ω	0603/0402 chip resistor
C1	5.1pF	ATC(116REA5R1M100TT) or equivalent
C2	470pF	ATC(116UK471M100TT) or equivalent
C3	0.1 μ F	0603/0402 chip capacitor

Note:

1. Input and output 50 ohm lines are on 10 mil RT duroid substrate
2. 0.1 μ F capacitors may be additionally used as a second level of bypass for reliable operation
3. All capacitors shown in the assembly diagram (except 0.1 μ F) are single layer capacitors. The use of Multilayer capacitors and inductors with smaller footprint (0402) is suggested only for frequencies < 2.0 GHz.

Package Outline

All units are in millimeters



NOTE

1. JEDEC REFERENCE : MO 2201 ; WEED-4
2. PACKAGE OUTLINE SPECIFIED HERE IS FOR REFERENCE ONLY