AL1

Low Noise Amplifier

The Communications Edge™

Advanced Product Information

Product Features

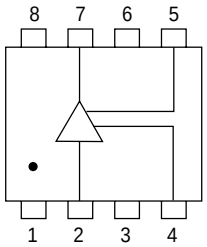
- 1.4 dB Noise Figure
- 23 dB Gain
- +20 dBm Output IP3
- 45 dB Reverse Isolation
- Single +5.0 V Bias Supply
- SOIC-8 SMT Package

Actual Size

Product Description

The AL1 is a high intercept, low-noise amplifier designed for wide dynamic range receiver applications. Exceptional low noise performance and low input VSWR can be achieved simultaneously with the use of low cost SMT components to implement the input-matching network. The AL1 operates from a single +5 V supply voltage, has a DC blocking capacitor on the RF output, and is available in a low cost SOIC-8 package. The AL1 is designed for wireless local loop, wireless LAN, and other applications within the ISM band.

Functional Diagram



Function	Pin No.
Ground	1, 3, 6, 8
RF In	2
RF Out	7
VDD1	4
VDD2	5

Specifications

Parameter	Units	Minimum	Typical	Maximum	Condition
Frequency	MHz		2300-2500		
S21 - Gain	dB	21	23		
S11-Input Return Loss	dB	-7.3	-8.5		
S22-Output Return Loss	dB	-9.5	-15		
S12-Isolation	dB	35	45		
Gain Temperature Coefficient	dB/˚C		-0.025		
Noise Temperature Coefficient	dB/˚C		0.0067		
Output IP3	dBm	18	+20		
Output P1dB	dBm		+10		
Noise Figure	dB		1.4	1.8	
Operating Current Range	mA	27	45	60	

Test conditions unless otherwise noted:
1. Tests performed in Application Circuit Fixture with external input match.
2. Electrical specification: T = 25˚C, Vdd = 5.0 V, unless otherwise specified.
3. Typical values are measured at 2.4 GHz.

Absolute Maximum Ratings

Parameter	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-55 to +125°C
Supply Voltage	+8 V
Input RF Power (Instantaneous)	+16 dBm
Junction Temperature	155°C

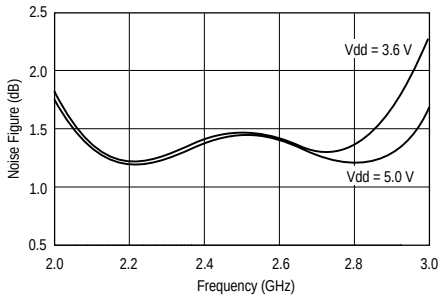
Operation of this device above any of these parameters may cause permanent damage.

Ordering Information

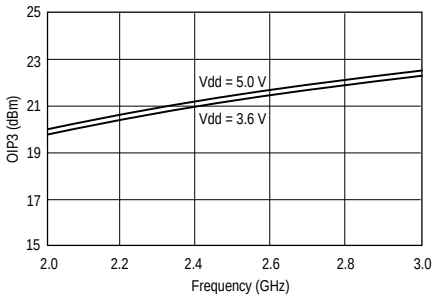
Part No.	Description
AL1	Low Noise Amplifier (Available in tape and reel)

Performance Charts (Measured in Application Circuit)

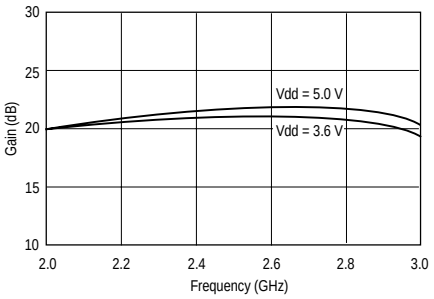
Noise Figure vs. Frequency



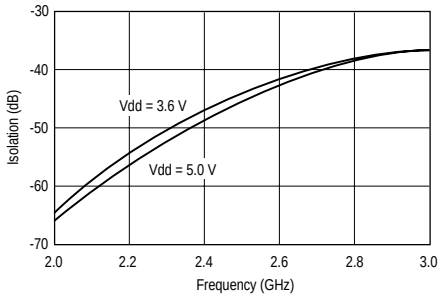
OIP3 vs. Frequency



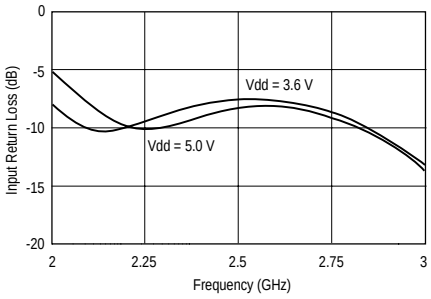
Gain vs. Frequency



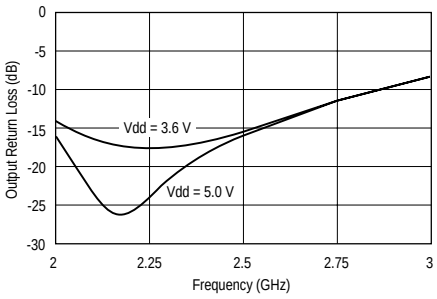
Isolation vs. Frequency



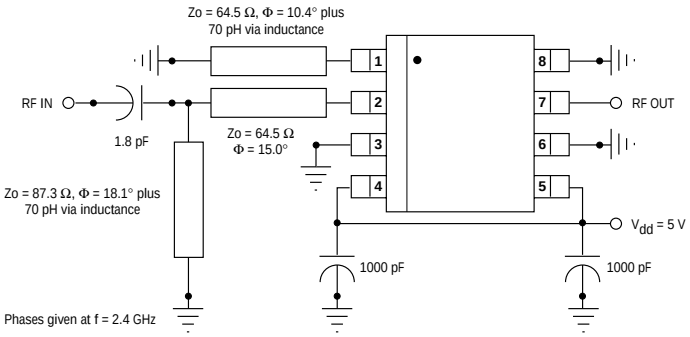
Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



Application Circuit Schematic

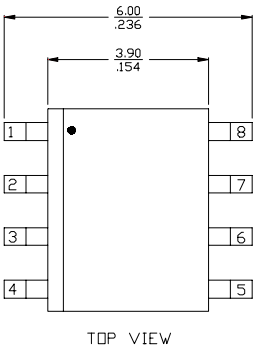


Noise Parameters T = 25°C, Vdd = +5.0 V

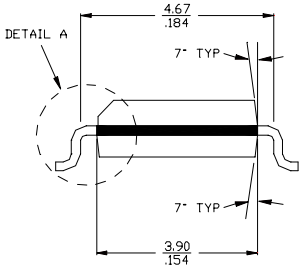
Frequency (GHz)	NFO (dB)	ΓOPT Mag	ΓOPT Ang	Rn/ZO	Gassoc (dB)
1.95	0.87	0.72	62.4	0.44	21.8
2.10	0.84	0.68	68.4	0.38	22.3
2.25	0.91	0.66	73.1	0.34	22.6
2.40	0.93	0.63	79.2	0.30	23.1
2.55	1.02	0.30	84.5	0.27	23.5
2.70	1.05	0.54	90.6	0.24	23.9
2.85	1.15	0.52	96.6	0.22	24.1

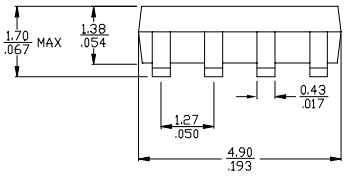
Note: Noise parameters are measured without external input match. The reference planes are located at outer ends of the package leads, shown as the dimension 236 mil in SOIC-8 package outline.

Outline Drawing

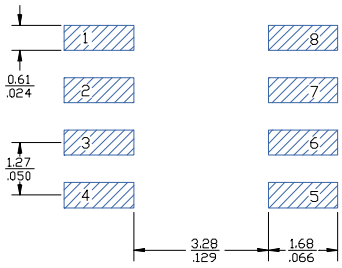


mm
inch



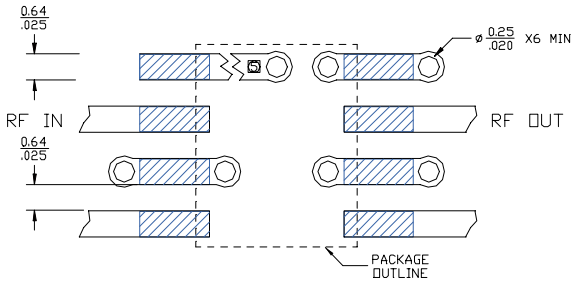


Land Pattern



FUNCTION	PIN NO.
IND. STUB	1
INPUT	2
GROUND	3
Vdd 1	4
Vdd 2	5
GROUND	6
OUTPUT	7
GROUND	8

Mounting Configuration



Notes: 1. Ground vias are critical for thermal and RF grounding considerations.
2. A minimun of 6 ground vias are required for 14 mil and 28 mil FR4 board.
3. If your PCB design rules allow, ground vias should be placed under the land pattern for better RF and thermal performance. Otherwise ground vias should be placed as close to land pattern as possible.
4. Trace width depends on PC board.
5. Inductive stub length and width depends on PC board.

This document contains information on a new product.
Specifications and information are subject to change without notice.

Caution! ESD sensitive device.