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0.5-8GHz Low Noise Amplifier SL16

DESCRIPTION

Sanland's SL16 is a broadband GaAs MMIC low noise amplifier ideally suited for 0.5-8GHz microwave radios where small size and low power consumption are critical design requirments. The broadband device delivers 21 dB of gain with a corresponding output 1 dB compression point of +18 dBm and a noise figure of 1.8 dB. The SL16 Low Noise Amplifier MMIC is a 50 ohm matched design eliminating the need for external RF port matching. The SL16 also offers full passivation for increased reliability and moisture protection

KEY FEATURES

•Single 5 V Supply

•High gain broadband performance

•Low current consumption 62mA@5V

•1.65 dB noise figure at 2000MHz

• Miniature DFN (8-pin, 2 x 2 mm) package

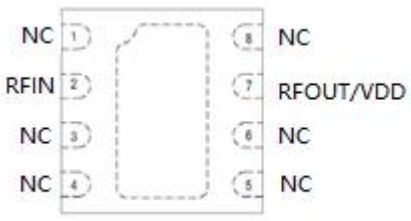
8 pin 2x2 mm DFN Package

RoHS Compliant & Green Package

Major Applications

•Electronic Warfare (EW)
•Analog optical links
•S Band Radar
•C Band Radar
•Space
•Satellite Communications (Satcom)
•Phased Arrays

Pin Assignment



Pin Details

Pin Number	Name	Description
1,3,4,5,6,8	NC	No connection. May be connected to ground with no change in performance.
2	RF in	RF input. DC blocking capacitor required.
7	RFOUT/ VDD	RF output. Apply VDD through RF choke inductor. DC blocking capacitor required.

Absolute Maximum Ratings

Parameter	Rating	Unit
DC Power Supply	+5.5	V
Quiescent supply current	90	mA
RF Input Power	20	dBm
Operating Temperature	-40 to +105	℃
Storage Temperature	-65 to +150	℃
Operation beyond any one of these limits may cause permanent damage.		

Thermal Data

Parameter	Specification			Units	Notes
	Min	Typ.	Max		
Thermal resistance		45		˚C/W	
Channel temperature @ +85 ˚C reference (package heat slug)		101		˚C	VDD = 5 V, IDQ = 62mA, no RF applied , dissipated power=0.31W
Test Conditions：VDD = 5V, TA = +25 ˚C, PIN = –25 dBm , Characteristic Impedance [ZO] = 50 Ω,Unless Otherwise Noted.					

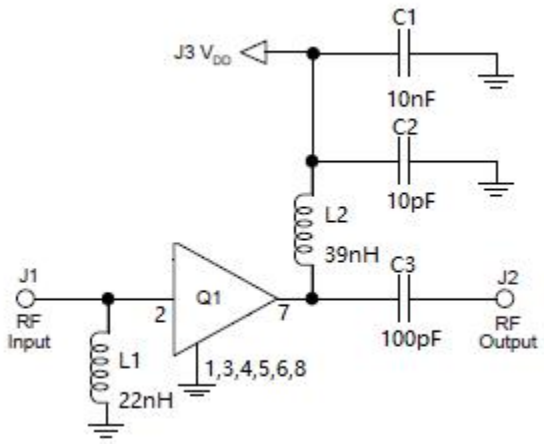
Important Note:

The information provided in this datasheet is deemed to be accurate and reliable only at present time. Sanland Technology Corp. reserves the right to make any changes to the specifications in this datasheet without prior notice.

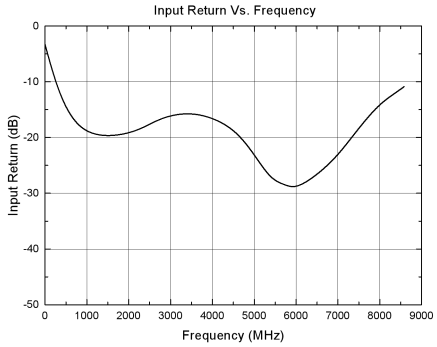
Caution: ESD Sensitive
Appropriate precaution in handling, packaging
And testing devices must be observed.

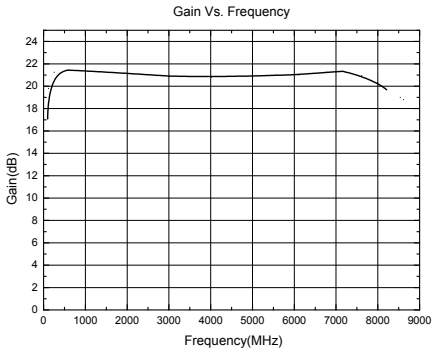
400 to 8500 MHz Optimized Tuning

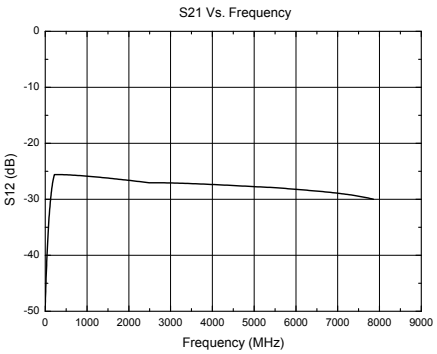
Parameter	Specification			Units	Notes
	Min	Typ.	Max		
RF Specifications					
NF		1.5		dB	1 GHz, includes Evaluation Board loss
S21		21.4		dB	1 GHz
S11		19.1		dB	1 GHz
S22		20.3		dB	1 GHz
S12		25.7		dB	1 GHz
OIP3		+32.4		dBm	1 GHz, Δf = 1 MHz, PIN = –25 dBm/tone
OP1dB		+18.9		dBm	1 GHz
DC Specifications					
VDD		5		V	
IDQ		62		mA	Set with external resistor
Test Conditions：VDD = 5 V, TA = +25 °C, PIN = –25 dBm, Characteristic Impedance [ZO] = 50 Ω, Unless Otherwise Noted					

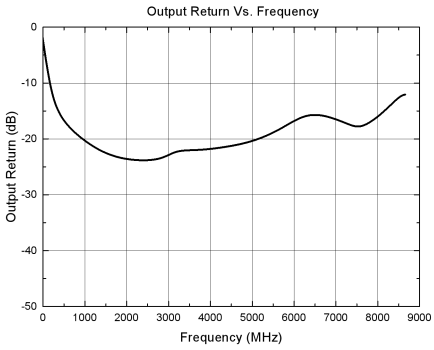


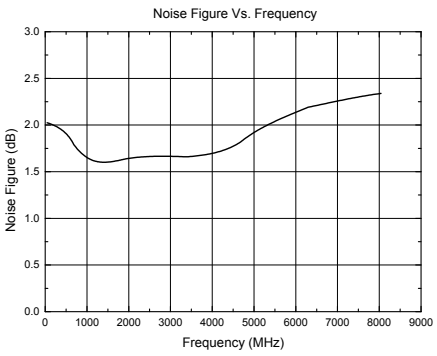
Component	Description	Value	Size	Manufacturer	Part Number
L1	Inductor	22nH	0402	Coilcraft	
L2	Inductor	39nH	0402	Coilcraft	
C1	Capacitor	10nF	0402	Murata	
C2	Capacitor	10pF	0402	Murata	
C3	Capacitor	100pF	0402	Murata	

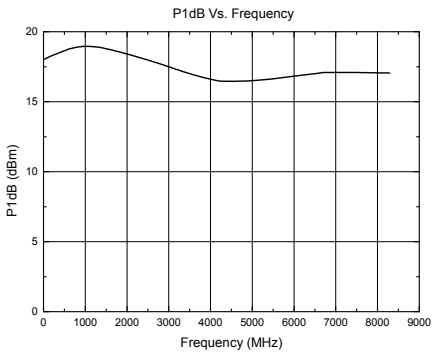

Input Return Vs. Frequency
Input Return (dB)
0
-10
-20
-30
-40
-50
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency (MHz)

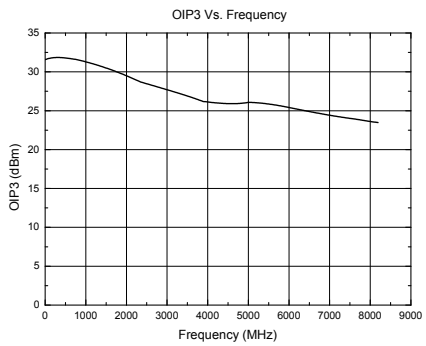

Gain Vs. Frequency
Gain(dB)
24
22
20
18
16
14
12
10
8
6
4
2
0
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency(MHz)

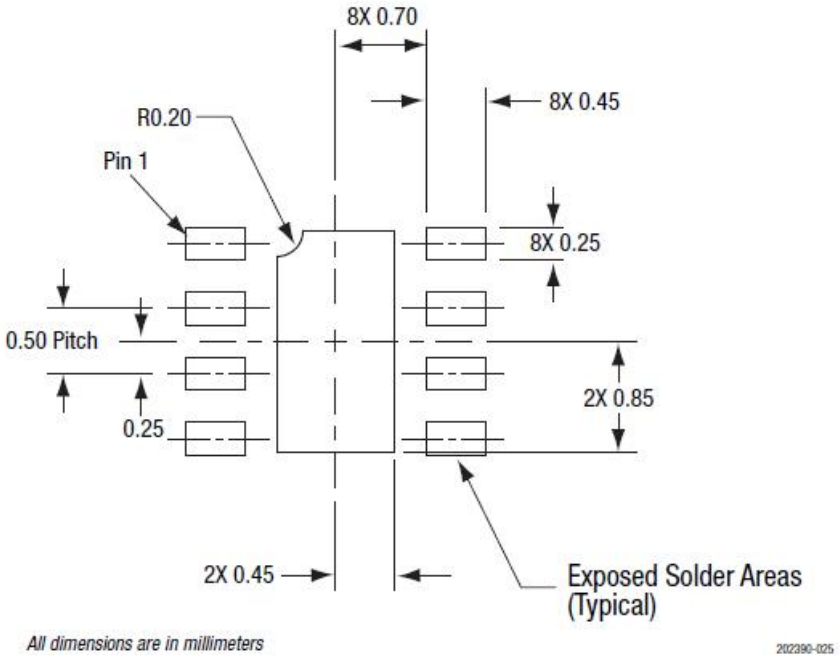

S21 Vs. Frequency
S12 (dB)
0
-10
-20
-30
-40
-50
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency (MHz)


Output Return Vs. Frequency
Output Return (dB)
0
-10
-20
-30
-40
-50
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency (MHz)

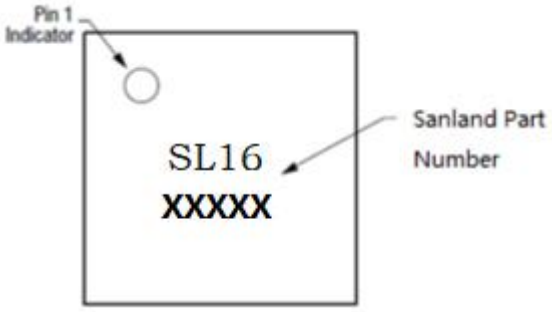

Noise Figure Vs. Frequency
Noise Figure (dB)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency (MHz)


P1dB Vs. Frequency
P1dB (dBm)
20
15
10
5
0
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency (MHz)

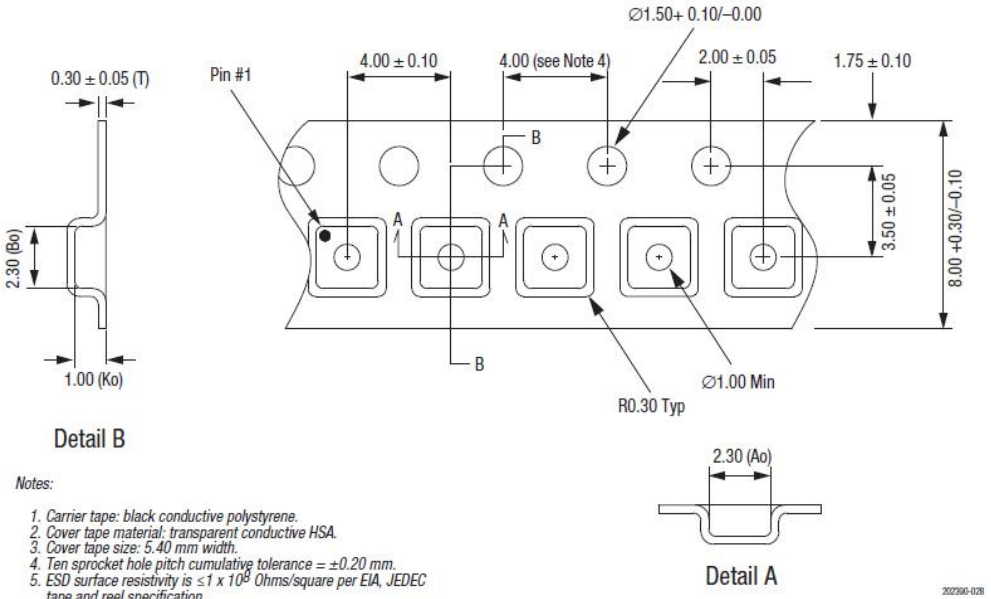

OIP3 Vs. Frequency
OIP3 (dBm)
35
30
25
20
15
10
5
0
0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Frequency (MHz)



PCB Layout Footprint (Top View)



Typical Part Markings (Top View)



Notes:

1. *Carrier tape: black conductive polystyrene.*
2. *Cover tape material: transparent conductive HSA.*
3. *Cover tape size: 5.40 mm width.*
4. *Ten sprocket hole pitch cumulative tolerance = ±0.20 mm.*
5. *ESD surface resistivity is ≤1 x 10^8 Ohms/square per EIA, JEDEC tape and reel specification.*
6. *Ao and Bo measurement point to be 0.30 mm from bottom pocket.*
7. *All measurements are in millimeters.*

Tape and Reel Dimensions