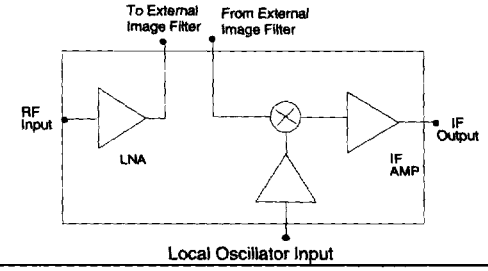
AWR8001

800 MHz - 1 GHz Receiver MMIC

Data Sheet
Rev 0

FEATURES	FUNCTIONAL BLOCK DIAGRAM
Monolithic Down Converter 2.5 dB Noise Figure 20 dB Conversion Gain Single +5V Supply 14 Pin SOIC Low Power Consumption	

The ANADIGICS Wireless receiver is a fully monolithic downconverter intended for cellular telephone, cordless telephone and wireless local area network (LAN) applications in the 800 MHz to 1 GHz frequency range.
The high level of integration enables wireless manufacturers to produce in high volume, receivers with reduced component count, resulting in higher reliability and lower cost.
The very small package and low current consumption make the AWR8001 ideal for both hand held and battery operated applications.

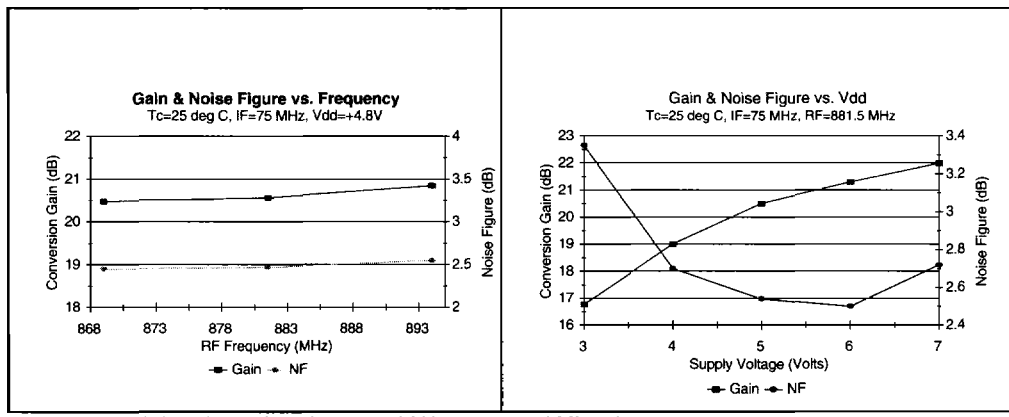
ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	MAX.	UNITS
V_{DD}/V_{IF}		+ 8	V
$V_{RF}/ V_{LO}/ V_{LNA\ Out}/V_{MIXER}$		+ 10	V
Storage Temperature	- 55	+150	°C
Input Power RF(All Ports)		+ 10	dBm

Electrical Specs (V_{DD} = + 5V; RF = 881.5 MHz, LO = 956.5 MHz, IF = 75 MHz, Tc = 25°C)

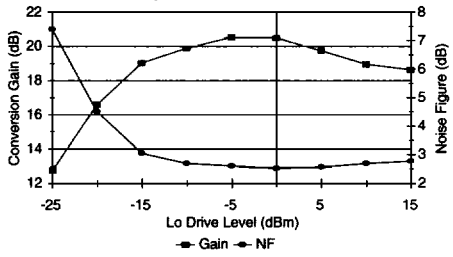
PARAMETER	MIN.	TYP.	MAX.	UNITS
Frequency Range RF IF	 800 45		 1000 150	MHz
Conversion Gain[1]	17	20		dB
Noise Figure[1]		2.5	3.5	dB
Input 3rd Order Intercept (IIP_3)	- 10.5	- 7		dBm
LO Drive Level		- 5	0	dBm
RF Input Impedance[2]	See Smith Chart			
IF Output Impedance[2]	See Smith Chart			
Power supply current (+5V)		12	15	mA
Operating Temperature Range*	- 30		+ 85*	°C
Operating Supply Voltage		5.0		Volts

* Operation above this temperature will degrade the median time to failure (MTF)

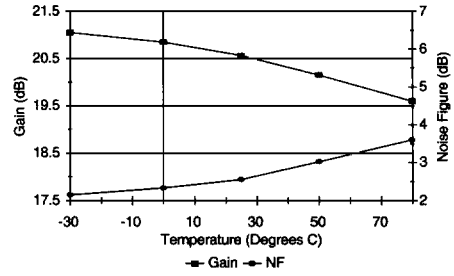


1. Measured with bandpass filter between LNA output and Mixer input.
2. Measured at the pin of the device, all other ports terminated into 50 Ω.

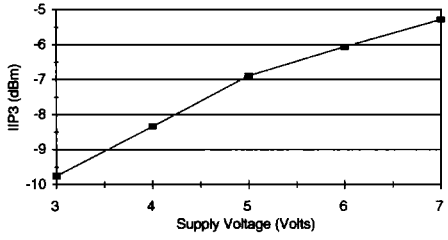
Gain & Noise Figure vs. Lo Drive Level
Tc=25 deg C, IF=75 MHz, RF=881.5 MHz



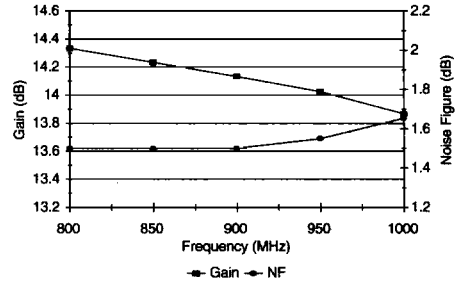
Gain & Noise Figure vs. Temperature
RF= 881.5 MHz, IF = 75 MHz, Vdd = 4.8V



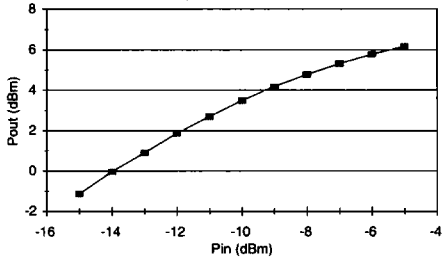
IIP3 vs. Vdd
RF=881 & 881.5 MHz @ -30 dBm



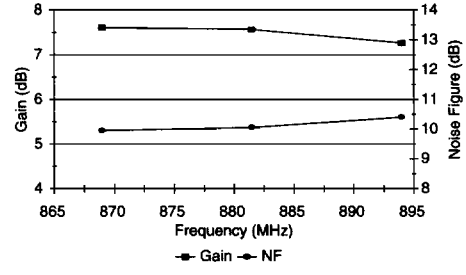
LNA
Gain & NF vs. Frequency
Tc = 25 deg C, Vdd = 4.8V



LNA
Pin vs. Pout
Tc = 25 deg C, Freq=900 MHz, Vdd=4.8V



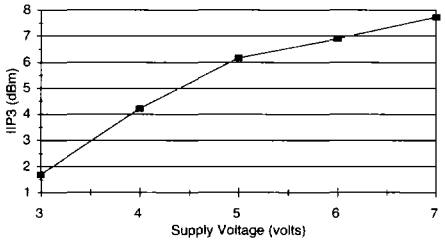
Mixer
Gain and Noise Figure
Tc = 25 deg C, IF = 75 MHz, Vdd = 4.8v



Mixer

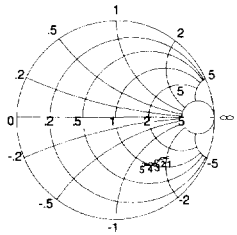
IIP3 vs. Vdd

RF=881 & 881.5 MHz @ -15 dBm



MIXER
INPUT IMPEDANCE

START: 0.80 GHz
STOP: 1.00 GHz

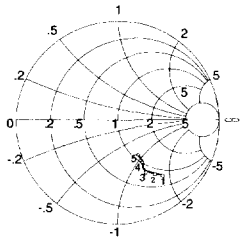


1: 0.800 GHz 1.22 Ω -2.05 jΩ
2: 0.850 GHz 1.24 Ω - 1.83 jΩ
3: 0.900 GHz 1.11 Ω - 1.69 jΩ
4: 0.950 GHz 1.07 Ω - 1.57 jΩ
5: 1.000 GHz 0.96 Ω - 1.44 jΩ

Normalized to 50 Ω

LNA
INPUT IMPEDANCE

START: 0.80 GHz
STOP: 1.00 GHz

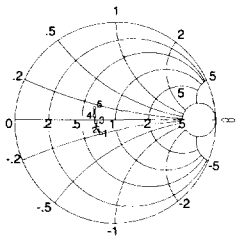


1: 0.800 GHz 0.64 Ω - 1.63 jΩ
2: 0.850 GHz 0.87 Ω - 1.45 jΩ
3: 0.900 GHz 0.94 Ω - 1.20 jΩ
4: 0.950 GHz 1.11 Ω - 1.13 jΩ
5: 1.000 GHz 1.27 Ω - 0.92 jΩ

Normalized to 50 Ω

LNA
OUTPUT IMPEDANCE

START: 0.80 GHz
STOP: 1.00 GHz

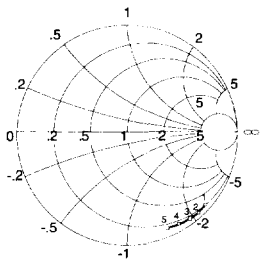


1: 0.800 GHz 0.81 Ω - 0.17 jΩ
2: 0.850 GHz 0.76 Ω - 0.96 jΩ
3: 0.900 GHz 0.73 Ω - 7.35 jΩ
4: 0.950 GHz 0.72 Ω -0.08 jΩ
5: 1.000 GHz 0.72 Ω -0.16 jΩ

Normalized to 50 Ω

MIXER LO
INPUT IMPEDANCE

START: 0.80 GHz
STOP: 1.2 GHz

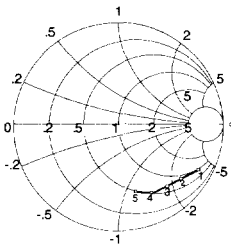


1: 0.800 GHz 0.15 Ω - 2.45 jΩ
2: 0.900 GHz .14 Ω - 2.13 jΩ
3: 1.000 GHz .13 Ω - 1.89 jΩ
4: 1.100 GHz .13 Ω - 1.68 jΩ
5: 1.200 GHz .12 Ω - 1.49 jΩ

Normalized to 50 Ω

IF
OUTPUT IMPEDANCE

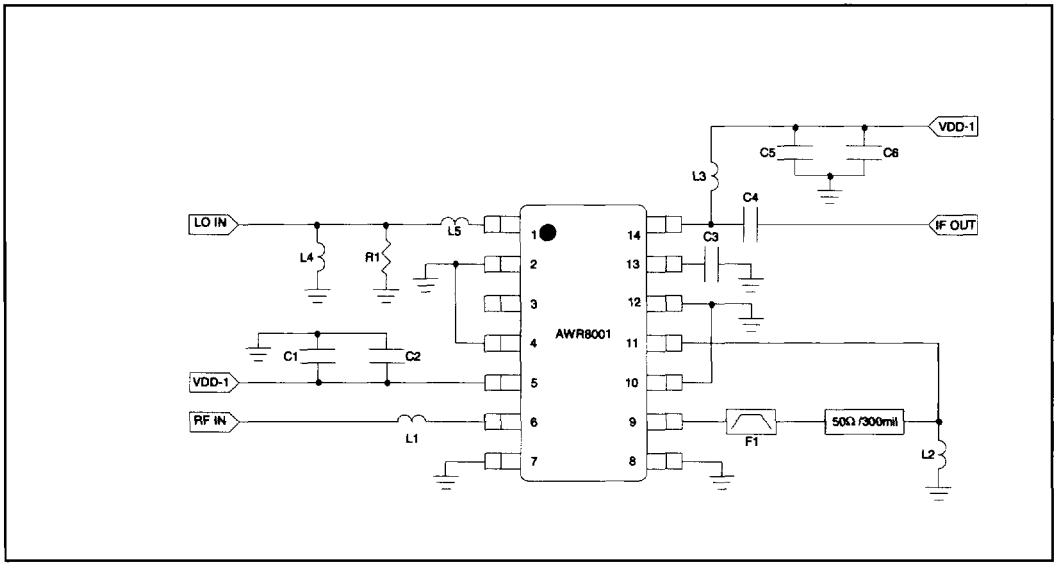
START: 50 MHz
STOP: 150 MHz



1: 50 MHz 1.06 Ω -3.41 jΩ
2: 75 MHz .69 Ω - 2.34 jΩ
3: 100 MHz .56 Ω - 1.75 jΩ
4: 125 MHz .51 Ω - 1.40 jΩ
5: 150 MHz .49 Ω - 1.22 jΩ

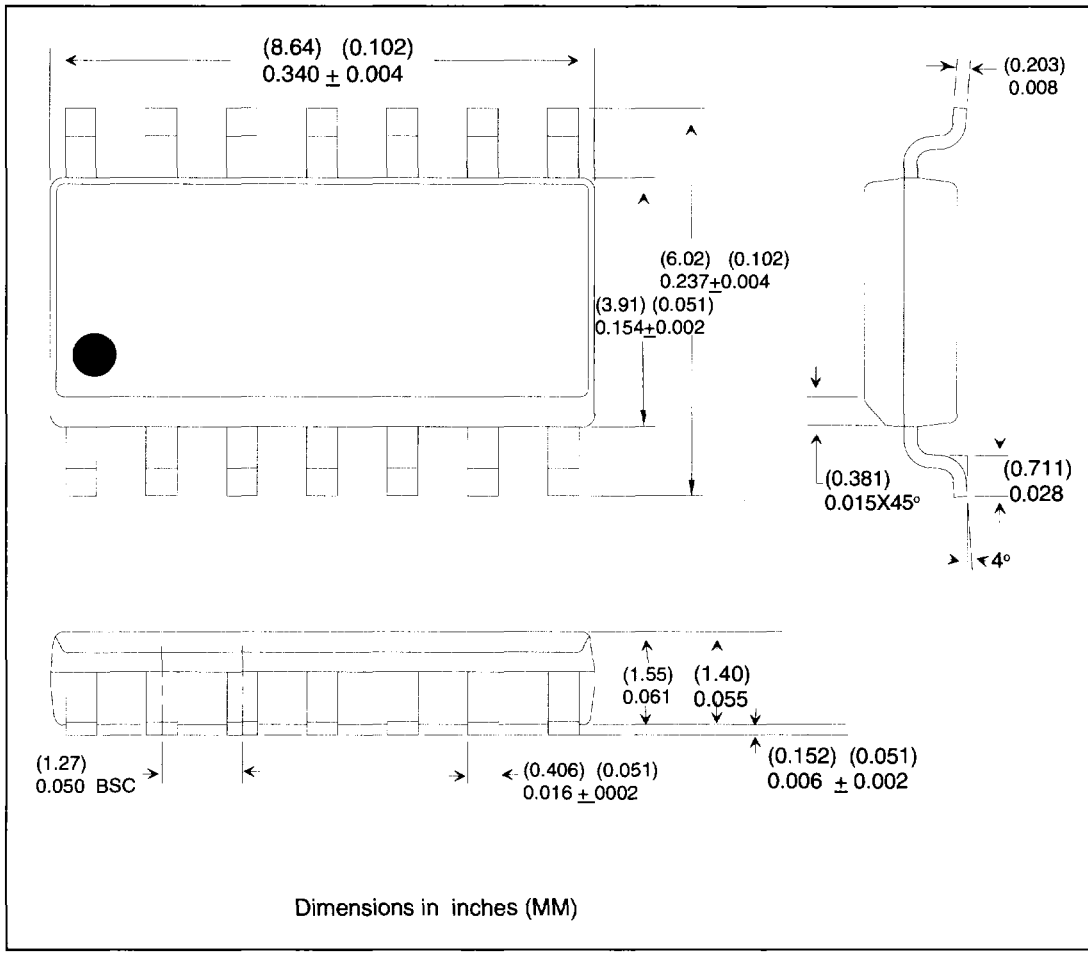
Normalized to 50 Ω

AWR8001



PIN	SIGNAL
1	LO_{IN}
2	GND
3	N/C
4	GND
5	V_{DD}
6	RF_{IN}
7	GND
8	GND
9	LNA_{OUT}
10	GND
11	MXR_{IN}
12	GND
13	C_{BY}
14	IF_{OUT},V_{DD}

PARTS LIST		
ITEM	VALUE	TYPE
C1	0.033µf	0402
C2	0.033µf	0402
C3	0.033µf	0402
C4	15pf	0402
C5	33pf	0402
C6	0.033µf	0402
R1	510Ω	0603
L1	8.2nH	0603
L2	15nH	0603
L3	220nH	C.C. 0805
L4	4.7nH	0603
L5	8.2 nH	0603
F1	LFA30	869-894



Dimensions in inches (MM)