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## 1.20-1.60 GHz LOW NOISE GPS AMPLIFIER WLA14-3030A<sup>1</sup>

WLA14-3030A LNA is a low noise figure, wideband, and +3V operation low power consumption amplifiers with unconditional stable design for GPS applications. The amplifier offers typical noise figure of 0.60 dB and minimum output IP3 of 21 dBm at the frequency range from 1.20 GHz to 1.60 GHz, which covers both L1 band and L2 band. WLA14-3030A LNA is most suitable for GPS communication systems and other wireless measurement applications.

WLA14-3030A can be configured with built-in bias-T for remote 5 V DC power supply.



### Key Features:

Unconditional Stability:	k>1
Low Noise:	0.60 dB
Output IP3:	21 dBm minimum @ 3.0V DC Power
Gain:	28 dB
P1dB:	10 dBm minimum
Current Consumption:	35 mA @ +3V, option: built-in bias-T for remote power supply
Frequency Range:	1.20 ~ 1.60 GHz
Operating Temperature:	-40 ~ +85 °C
Return Losses:	20 dB typical
VSWR:	1.25 maximum

### Specifications:

a) Table 1 Summary of the electrical specifications WLA14-3030A at room temperature

Index	Testing Item	Symbol	Test Constraints	Unit	Nom (RT)	Min	Max	Unit
1	Gain	S21	1.20 – 1.60	GHz	30	26		dB
2	Gain Variation	ΔG	20 MHz Bandwidth	MHz	0.10		0.25	dB
3	Input Return Loss	S11	1.20 – 1.60	GHz	20	16		dB
4	Output Return Loss	S22	1.20 – 1.60	GHz	20	16		dB
5	Reverse Isolation	S12	1.20 – 1.60	GHz	40	36		dB
6	Noise figure	NF	1.20 – 1.60	GHz	0.6		0.65	dB
7	Output compression P1dB	P1dB	1.20 – 1.60 @ +3V	GHz		10		dBm
8	Output-Third-Order Interception point	TOIP3	Two-Tone, Pout +0 dBm each, 1 MHz separation, @ +3V	MHz	21	20		dBm
10	Current Consumption	I <sub>dd</sub>	V <sub>dd</sub> = +3	V	35			mA
11	Power Supply Voltage	V <sub>dd</sub>			+3	+2.5	+5.5	V

<sup>1</sup> Specifications are subject to change without notice.



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### b) Passband Frequency Response

As shown in **Figure 1**, the typical gain of the WLA14-3030A is 29 dB across 1.2 GHz to 1.6 GHz. The input and output return losses are typical to be 20 dB.

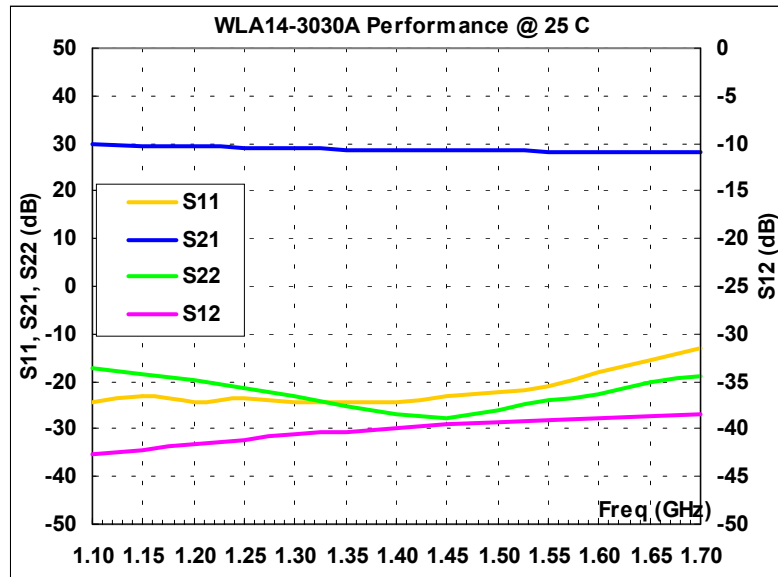


FIG. 1 Typical small signal performance of WLA14-3030A

### c) Output Power

Figure 2 shows the output power vs. input power of WLA14-3030A.

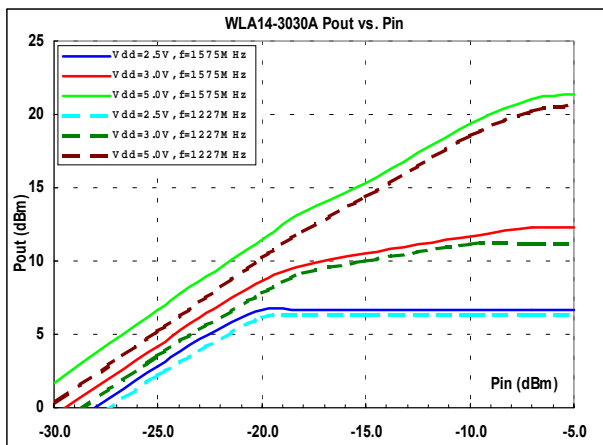


FIG. 2 Typical output power at room temperature.

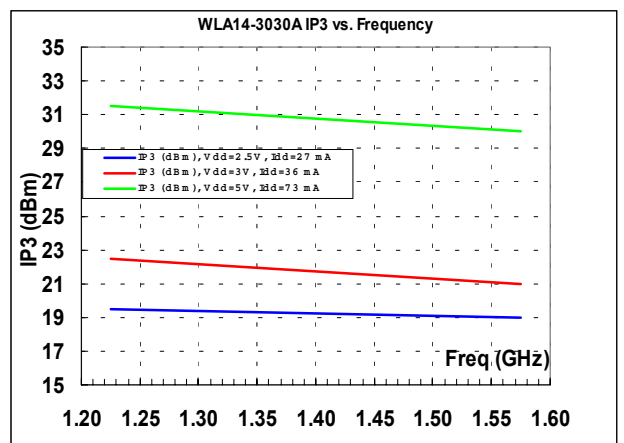


FIG. 3 Output IP3 of WLA14-3030A.



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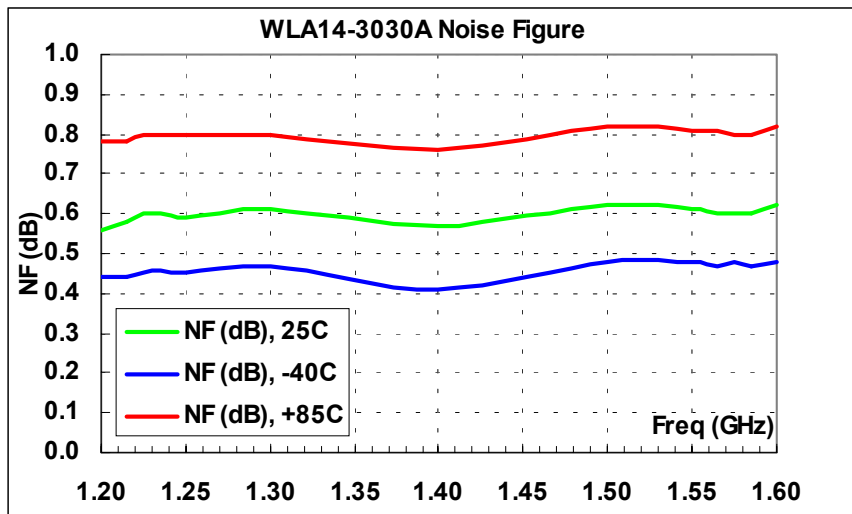
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**d) Output IP3**

**Figure 3** demonstrate the output IP3 performance of WLA14-3030A. The minimum IP3 is 20 dBm at +3 V DC power operation.

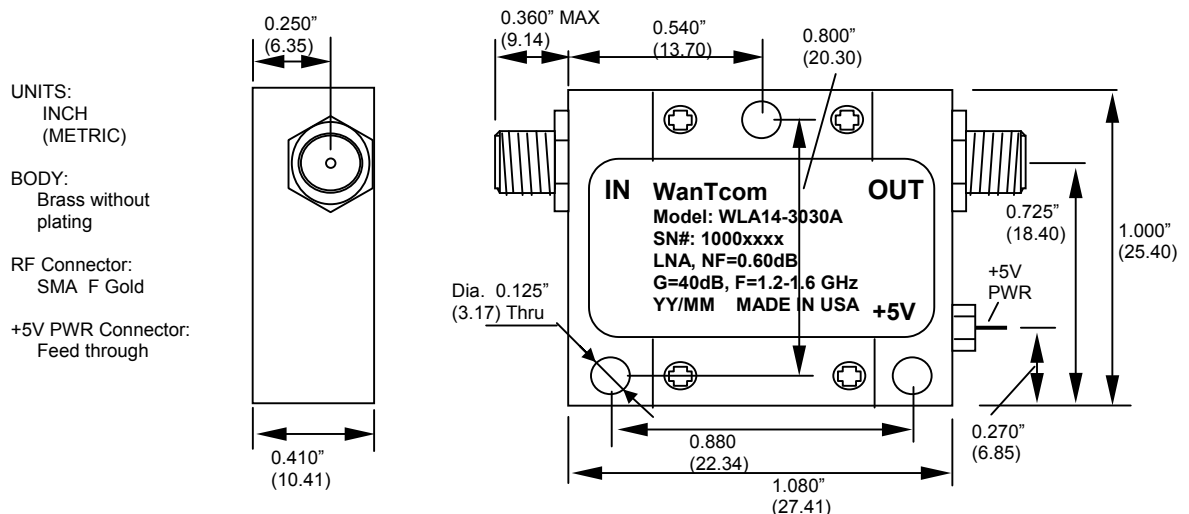
**e) Noise Figure**

The noise figure of WLA14-3030A is 0.60 dB at room temperature and add 0.20 dB at +85 °C.



**FIG. 4** WLA14-3030A noise figure performance at full temperature

**f) WLA14-3030A Mechanical Outline: WP-5**



**FIG. 5** WP-5 Outline



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**g) Ordering Information**

Model Number	WLA14-3030A	WLA14-3030ABT
Built-In Bias-T	NO	Yes

**h) Small Signal S-Parameters:**

!WLA14-3030A

!s-parameters at Vds=3V, Id=35mA. Last updated 8/26/02.

# GHZ s MA R 50

!F(GHz) MAG S11 ANG S11 MAG S21 ANG S21 MAG S12 ANG S12 MAG S22 ANG S22

0.05	0.51	-9.6	4.03	156.3	0.0000	-180.0	0.74	165.8
0.1	0.49	-12.5	14.68	116.8	0.0001	-164.8	0.63	138.5
0.2	0.56	-10.8	41.29	56.2	0.0006	176.1	0.42	98.9
0.3	0.73	-43.3	62.50	-2.3	0.0016	133.1	0.28	85.2
0.4	0.58	-77.7	62.54	-49.8	0.0025	101.8	0.25	75.5
0.5	0.38	-100.7	55.77	-84.4	0.0030	80.0	0.25	58.7
0.6	0.24	-118.1	48.71	-111.6	0.0036	64.9	0.24	40.6
0.7	0.12	-130.1	42.81	-135.1	0.0043	51.2	0.22	23.4
0.8	0.05	-123.7	38.98	-156.4	0.0048	39.3	0.20	3.5
0.9	0.03	-40.6	35.62	-175.1	0.0056	28.0	0.18	-15.9
1	0.05	-15.7	32.87	166.9	0.0064	16.5	0.16	-38.4
1.1	0.06	-13.4	30.73	148.7	0.0074	4.7	0.14	-59.1
1.2	0.06	-9.0	29.18	131.1	0.0084	-7.4	0.10	-85.1
1.3	0.06	1.1	27.86	113.7	0.0093	-20.1	0.07	-118.9
1.4	0.06	19.4	26.87	96.1	0.0100	-33.6	0.05	-172.4
1.5	0.08	43.9	26.22	78.1	0.0110	-46.6	0.05	123.6
1.6	0.12	61.0	25.67	58.8	0.0110	-59.5	0.07	76.2
1.7	0.23	66.4	25.32	37.2	0.0120	-72.4	0.12	44.8
1.8	0.39	52.8	24.13	13.4	0.0120	-84.6	0.15	15.9
1.9	0.54	33.5	21.51	-9.5	0.0130	-96.4	0.17	-9.7
2	0.66	14.2	18.31	-29.9	0.0130	-108.4	0.19	-30.9
2.1	0.75	-3.4	15.55	-48.5	0.0130	-120.6	0.22	-54.0
2.2	0.80	-18.9	13.23	-65.9	0.0140	-131.9	0.23	-74.6
2.3	0.83	-32.8	11.03	-80.8	0.0140	-143.0	0.24	-96.1
2.4	0.84	-45.3	9.45	-95.8	0.0140	-154.7	0.24	-114.5
2.5	0.85	-56.6	8.39	-109.6	0.0140	-163.9	0.25	-132.7
2.6	0.85	-66.9	7.57	-121.8	0.0140	-172.5	0.25	-149.6
2.7	0.85	-77.0	6.89	-131.8	0.0140	176.9	0.25	-165.5
2.8	0.84	-86.2	6.10	-143.9	0.0140	165.4	0.25	177.9
2.9	0.83	-95.4	5.51	-156.9	0.0140	155.8	0.26	166.1
3	0.82	-104.5	5.18	-169.1	0.0150	148.4	0.26	151.1
3.5	0.69	-143.0	4.24	121.8	0.0180	93.1	0.28	99.7
4	0.58	-175.7	2.45	63.5	0.0160	42.8	0.45	33.2
4.5	0.58	168.8	2.10	-20.7	0.0190	-29.3	0.53	-22.5
5	0.55	129.1	1.19	-94.8	0.0140	-96.0	0.62	-81.2
5.5	0.34	116.7	0.61	-166.8	0.0089	-162.0	0.66	-140.3
6	0.49	109.1	0.25	140.5	0.0041	141.9	0.66	162.8