Wan7com, Inc.

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820-980 MHz LOW NOISE BALANCE AMPLIFIER WA08-2433A[1]

WA08-2433A LNA is a super low noise figure, wideband, and high linearity amplifier with unconditional stable design. The amplifier offers typical noise figure of 0.45 dB and typical output IP3 of 38 dBm at the frequency range from 820 MHz to 980 MHz. WA08-2433A LNA is most suitable for cellular base stations, wireless data communications, tower top receiver amplifiers, cellular micro-cells, last-mile wireless communication systems, and wireless measurement applications.



Key Features:

Unconditional Stability:	k>1
Low Noise:	0.45 dB **typical**
Output IP3:	38 dBm typical
Gain:	21 dB
P1dB:	18 dBm minimum
Current Consumption:	125 mA @ +7 ~ +15V, option: +5V
Frequency Range:	820 ~ 980 MHz
Operating Temperature:	-40 ~ +85 ºC
Return Losses:	20 dB typical
Alarm Output:	Soft Alarm, Hard Alarm, Soft Alarm Open Collector, Hard Alarm Open Collector, Branch 1 Alarm, Branch 2 Alarm.

Specifications:

a) Table 1 Summary of the electrical specifications WA08-2433A at room temperature

Index	Testing Item	Symbol	Test Constraints	Unit	Nom (RT)	Min	Max	Unit
1	Gain	S21	820 - 980	MHz	21			dB
2	Gain Variation	ΔG	20 MHz Bandwidth	MHz	0.20		0.30	dB
3	Input Return Loss	S11	820 - 980	MHz	20	19		dB
4	Output Return Loss	S22	820 - 980	MHz	20	19		dB
5	Reverse Isolation	S12	820 - 980	MHz		40		dB
6	Noise figure	NF	820 - 980	MHz	0.45		0.55	dB
7	Output P1dB compression	P1dB	820 - 980	MHz		18		dBm
8	Output-Third-Order Interception point	TOIP3	Two-Tone, Pout +0 dBm each, 1 MHz separation	MHz	38	37		dBm
10	Current Consumption	Idd	Vdd= +7 ~ +15	V	125			mA
11	Power Supply Voltage	Vdd				+7	+15	V
12	Soft Alarm TTL Output	Vs	Normal/Fail, +/- 30% Id1 or Id2	V	4.65/0.0			V
	Soft Alarm Open Collector Output	Vso	Normal/Fail, External 10K to an external +Vcc	V	Low/High[2]			

[1] Specifications are subject to change without notice.

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	Hard Alarm TTL Output	Vh	Normal/Fail, +/- 30% Idd	V	4.65/0.0			V
	Hard Alarm Open Collector Output	Vho	Normal/Fail, External 10K to an external +Vcc		Low/High			
	Branch 1 Alarm TTL Output	Va1	Normal/Fail, +/- 30% Id1	V	4.65/0.0			V
	Branch 2 Alarm TTL Output	Va2	Normal/Fail, +/- 30% Id2	V	4.65/0.0			V
13	Maximum RF Input Power	Pinmax	820- 980, single tone	MHz		15		dBm

b) Passband Frequency Response

As shown in **Figure 1**, the typical gain of the WA08-2433A is 21 dB across 820 MHz to 980MHz. The input and output return losses are 20 dB typical.

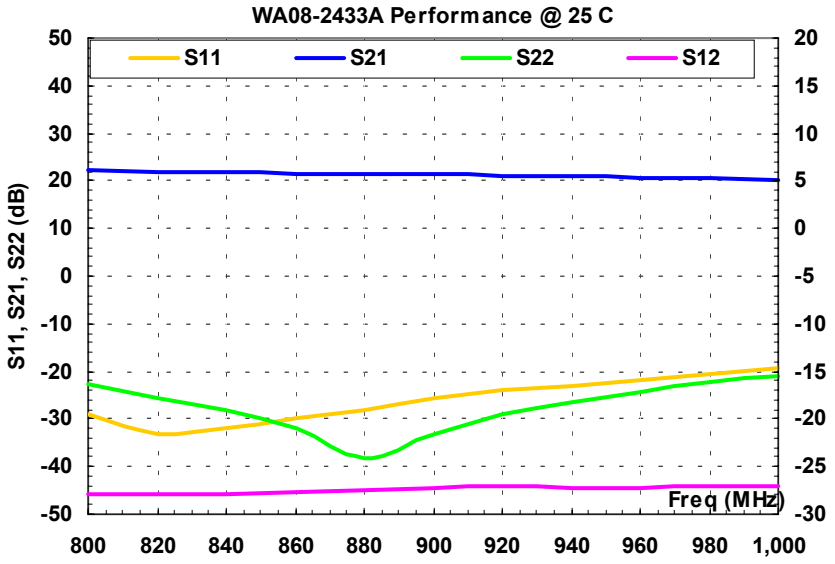


FIG. 1 Typical small signal performance of WA08-2433A

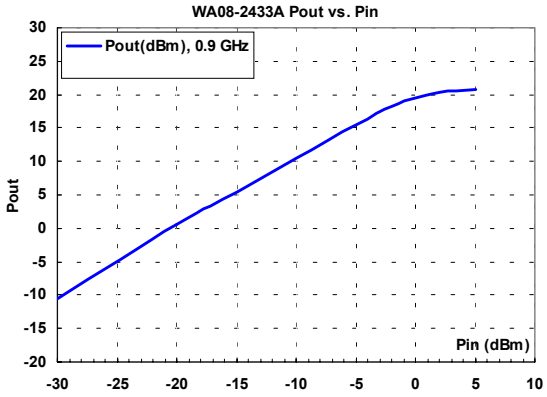
c) Output Power

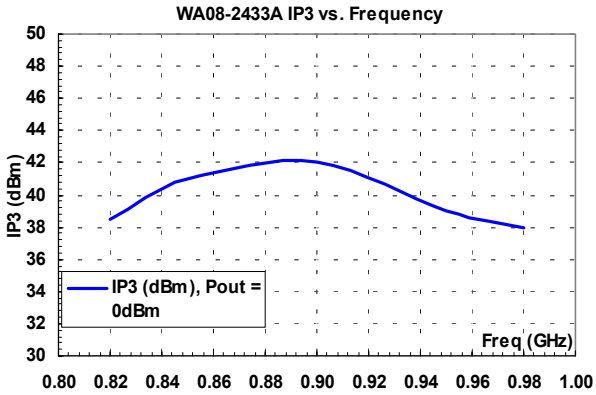
[2] Need a 10 k Ohm pull up resistor to a high potential voltage such as +5 V.

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Figure 2 shows the output power vs. input power of WA08-2433A.





Vdd=+5.0 ~ +15V, Idd=125 mA

FIG. 2 Typical output power at room temperature.

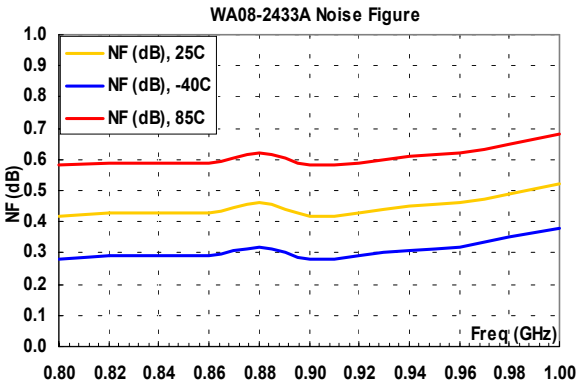
FIG. 3 Output IP3 of WA08-2433A.

d) Output IP3

Figure 3 demonstrate the output IP3 performance of WA08-2433A. The minimum IP3 is 38 dBm.

e) Noise Figure

The noise figure of WA08-2433A is 0.60 dB at room temperature and add 0.15 dB at +85 °C.



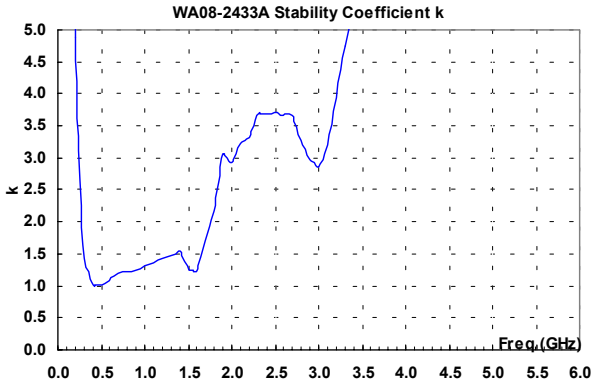


FIG. 4 WA08-2433A noise figure at full temperature

FIG. 5 The stability coefficient k of WA08-2433A

f) WA08-2433A Mechanical Outline: WP-1
g) Ordering Information

Model Number	WA08-2433A

h) Small Signal S-Parameters:

!WA08-2433A
!s-parameters at Vds=7~15V, Id=125mA. Last updated 10/13/02.

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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	0.38	-48.7	0.44	-35.2	0.00183	-69.3	0.99	-20.2
0.1	0.44	-84.2	1.85	-64.2	0.00068	158.4	0.98	-42.3
0.2	0.51	-148.7	8.79	-142.3	0.00526	129.6	0.64	-107.8
0.3	0.62	164.0	14.99	154.2	0.01500	85.3	0.17	-10.2
0.4	0.55	117.5	15.14	84.4	0.02100	19.8	0.40	-86.0
0.5	0.42	77.9	15.23	31.2	0.02700	-25.5	0.31	-119.2
0.6	0.29	41.4	14.92	-18.6	0.03200	-71.4	0.23	-136.1
0.7	0.16	0.6	14.02	-66.2	0.03500	-112.2	0.16	-158.6
0.8	0.04	-18.1	12.85	-112.5	0.04000	-156.9	0.07	170.2
0.9	0.05	26.2	11.56	-157.8	0.04400	164.0	0.02	-88.9
1	0.11	-59.7	10.29	157.6	0.04400	122.8	0.09	-90.4
1.1	0.25	-132.7	8.84	112.3	0.04500	81.4	0.09	-104.3
1.2	0.41	172.5	7.32	68.7	0.04300	39.1	0.10	-94.2
1.3	0.54	126.8	5.99	27.8	0.04000	0.8	0.15	-94.9
1.4	0.60	88.2	5.04	-9.9	0.03900	-35.0	0.21	-111.2
1.5	0.64	54.7	4.89	-51.9	0.04300	-70.4	0.32	-119.9
1.6	0.69	17.8	4.37	-105.5	0.03700	-117.7	0.52	-157.4
1.7	0.66	-25.9	3.64	-147.0	0.03400	-162.2	0.52	164.4
1.8	0.57	-75.5	3.36	169.5	0.03600	150.7	0.51	135.6
1.9	0.43	-136.0	2.88	121.9	0.03700	105.9	0.47	106.2
2	0.39	157.4	3.04	72.6	0.04100	63.0	0.42	90.0
2.1	0.36	91.8	2.80	21.1	0.04100	13.0	0.43	64.1
2.2	0.35	36.5	2.58	-24.0	0.04400	-29.7	0.42	33.9
2.3	0.27	-10.6	2.52	-70.3	0.04400	-74.0	0.39	3.5
2.4	0.16	-57.4	2.43	-115.2	0.04800	-120.6	0.38	-26.3
2.5	0.05	176.8	2.41	-156.1	0.04900	-161.8	0.37	-61.0
2.6	0.17	72.6	2.27	164.4	0.05000	157.1	0.38	-92.8
2.7	0.30	29.4	2.09	128.0	0.04900	117.4	0.40	-124.4
2.8	0.40	-8.1	1.94	90.2	0.05300	81.0	0.42	-154.0
2.9	0.44	-46.8	1.89	52.0	0.05500	48.5	0.45	-178.5
3	0.42	-90.8	1.92	13.6	0.05600	12.1	0.48	158.7
3.5	0.51	-50.5	1.11	171.7	0.03100	172.4	0.63	53.9
4	0.26	131.0	0.59	18.1	0.02400	38.3	0.52	-9.3
4.5	0.19	-151.3	0.36	-164.9	0.04000	-170.8	0.51	-80.1
5	0.64	-107.2	0.05	-56.7	0.00802	174.4	0.32	-131.2
5.5	0.08	-21.2	0.14	-145.8	0.01200	-142.7	0.29	-158.6
6	0.26	-167.2	0.13	-5.8	0.02300	-20.6	0.20	-150.7