1.0- 3.0 GHz LOW NOISE AMPLIFIER WBA1030A[1]

WBA1030A is a low noise figure, wideband, and high linearity amplifier. The amplifier offers typical 1.1 dB noise figure, +/- 0.30 dB exceptional gain flatness, 22.0 dB output P_{1dB}, and 35.0 dBm output IP_3 at the frequency range from 1.0 GHz to 3.0 GHz of GPS, DCS, PCS, 3G, and ISN bands.

WBA1030A is most suitable for cellular base stations, wireless data communications, tower top receiver amplifiers, last-mile wireless communication systems, and wireless measurement applications.

WBA1030A is designed to meet the rugged standards of MIL-STD-202, and MIL-STD-883.

Preliminary

Key Features:

Impedance:	50 Ohm
MTBF[2]:	>300,000 hrs (34 years)
Low Noise:	**1.1 dB**
Output IP_3:	**35 dBm**
Input & Output VSWR:	**1.5:1 & 1.25:1**
Gain Flatness:	**+/- 0.30 dB**
Gain:	32.0 dB
P_{1dB}:	22.0 dBm
Single power supply:	160 mA @ +5V
Wide Bandwidth:	1.0 ~ 3.0 GHz
Operating Temperature:	-40 ~ +85 ºC
Small size:	SMA Female, 0.90" x 0.70" x 0.4" (41.9 mm x 17.8 mm x 10.2 mm) gold plated housing.
Built-in Functions:	DC blocks at input and output, temperature compensation circuits, and auto DC biases.

Absolute Maximum Ratings[3]:

Symbol	Parameters	Units	Absolute Maximum
V_{dd}	DC Power Supply Voltage	V	6.0
I_{dd}	Drain Current	mA	200
P_{diss}	Total Power Dissipation	mW	700
$P_{In,Max}$	RF Input Power	dBm	10
T_{ch}	Channel Temperature	°C	150
T_{STG}	Storage Temperature	°C	-55 ~ 125
$T_{O,MAX}$	Maximum Operating Temperature	°C	-40 ~ 85
$R_{th,c}$	Thermal Resistance	°C/W	128

[1] Specifications are subject to change without notice.
[2] MTBF: Mean Time Between Failure, Per TR-NWT-000332, ISSUE 3, SEPTEMBER, 1990, T=40℃
[3] Operation of this device above any one of these parameters may cause permanent damage.

Specifications:

a) Table 1 Summary of the electrical specifications WBA1030A at room temperature

Index	Testing Item	Symbol	Test Constraints	Nom (RT)	Min	Max	Unit
1	Gain	S_{21}	1.0 – 3.0 GHz	32.0	31		dB
2	Gain Variation	ΔG	1.0 – 3.0 GHz	+/- 0.30		+/-0.60	dB
3	Input VSWR	SWR_1	1.0 – 3.0 GHz	1.5:1		1.8:1	
4	Output VSWR	SWR_2	1.0 – 3.0 GHz	1.22:1		1.5:1	
5	Reverse Isolation	S_{12}	1.0 – 3.0 GHz	40	35		dB
6	Noise figure	NF	1.0 – 3.0 GHz	1.1		1.3	dB
7	Output Power 1dB compression Point	P_{1dB}	1.0 – 3.0 GHz	22	20		dBm
8	Output-Third-Order Interception point	IP_3	Two-Tone, P_{out} +0 dBm each, 1 MHz separation	35	32		dBm
9	Current Consumption	I_{dd}	V_{dd}= +5 V	160	150	170	mA
10	Power Supply Voltage	V_{dd}		+5	+4.7	+5.3	V
11	Thermal Resistance	$R_{th,c}$	Junction to case			125	°C/W
12	Operating Temperature	T_o			-40	+85	°C
13	Maximum Average RF Input Power	$P_{IN, MAX}$	1.0 – 3.0 GHz			10	dBm

b) Passband Frequency Response

As shown in **Figure 1**, the typical gain of the WBA1030A is 32.0 dB across 1.0 to 3.0 GHz. The amplifier provides excellent gain flatness across the passband. The typical input and output VSWR are 1.5:1 and 1.22:1 across the frequency of 1.0 to 3.0 GHz.

Figure 2 shows P_{1dB} and IP_3 of the WBA1030A. The typical P_{1dB} and IP_3 are 22.0 dBm and 35.0 dBm in the frequency range of 1.0 to 3.0 GHz, respectively.

Figure 3 illustrates the noise figure performance of WBA1030A. The noise figure is 1.1 dB across the frequency range of 1.0 to 3.0 GHz at room temperature.

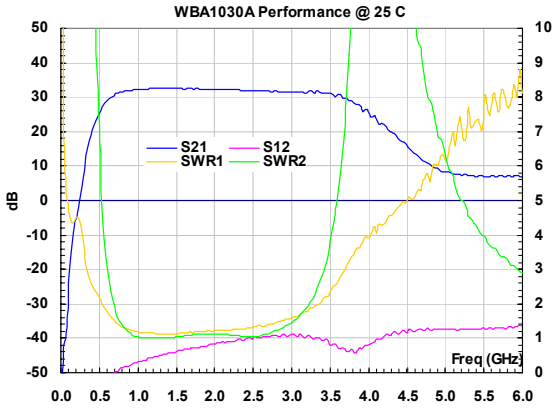

FIG. 1 Typical small signal performance.

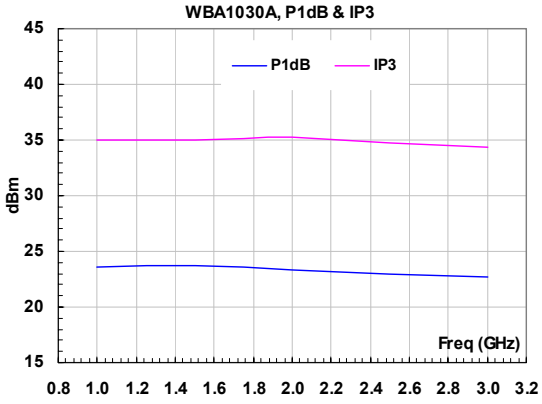

FIG. 2 Typical P_{1dB} and IP_3 at full temperature.

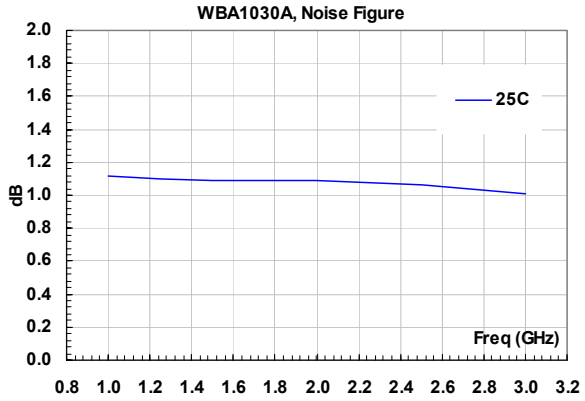

FIG. 3 Noise figure performance

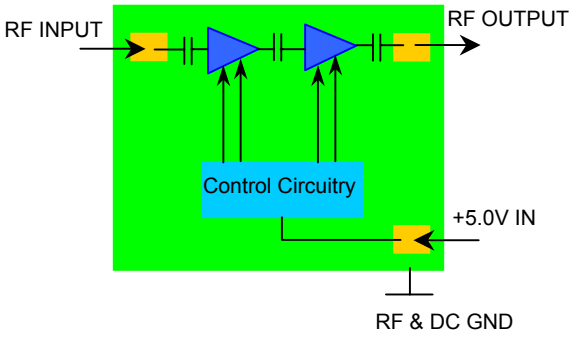

FIG. 4 Block diagram of WBA1030A

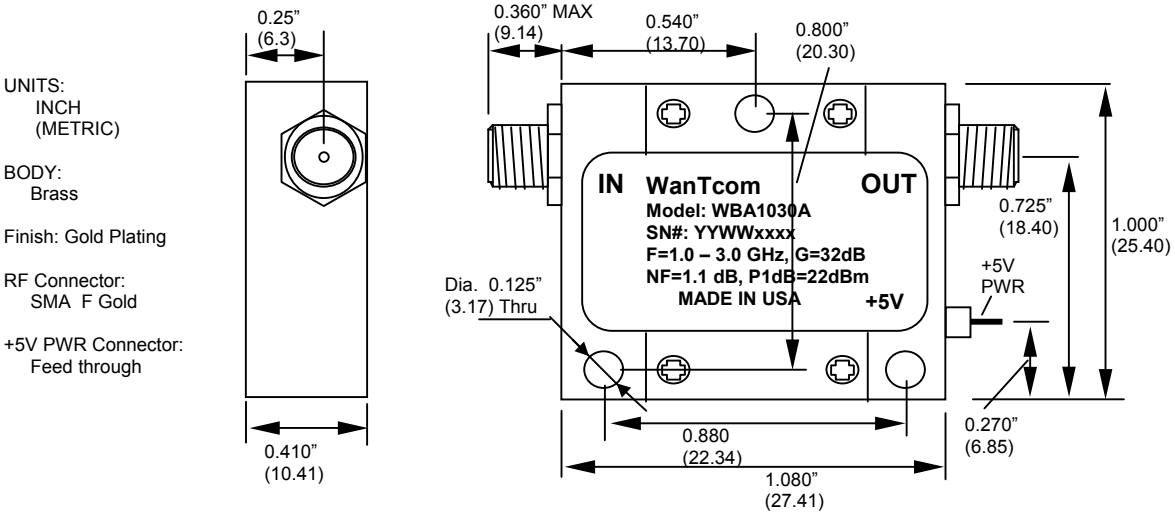

FIG. 5 WBA1030A outline

WBA1030A LNA Mechanical Outline, WP-5:

Figure 5 shows the mechanical outline of WBA1030A LNA. It is a WanTcom's standard WP-5 housing with gold plating finish. Both RF input and output ports are equipped with SMA female connectors and the DC port connector is an EMI filtered feed thru pin.

Ordering Information

Model Number:	WBA1030A

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