WBA0918A

0.90- 1.70 GHz LOW NOISE WIDE BAND AMPLIFIER

REV A
November 2007

Key Features

- 0.90 ~ 1.70 GHz
- 1.0 dB noise figure
- 32.0 dBm output IP_3
- 19.5 dB Gain
- +/-0.10 dB Gain Flatness
- 18.0 dBm P1dB
- 1.35:1 VSWR
- Single power supply
- >68 years MTBF
- Reverse DC Bias Protection
- RoHS compliant

Product Description

WBA0918A integrates WanTcom proprietary low noise amplifier technology, high frequency micro electronic assembly techniques, and high reliability design to realize optimum low noise figure, wideband, high linearity, and exceptional gain flatness performances together. With single +5.0V DC operation, the amplifier has optimal input and output matching in the specified frequency range at 50-Ohm impedance system. The amplifier has standard SMA connectorized WP-5 gold plated housing.

The amplifier is designed to meet the rugged standard of MIL-STD-202.

Applications

- Mobile Infrastructures
- GPS
- Defense
- Security System
- Measurement
- Fixed Wireless

Specifications

Summary of the electrical specifications WBA0918A at room temperature

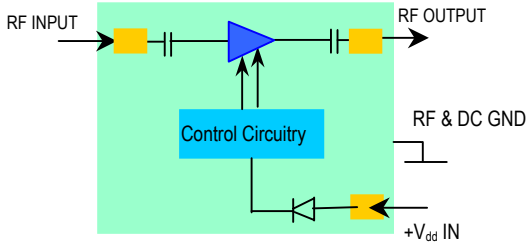
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S_{21}	0.95 – 1.65 GHz		19.5		dB
2	Gain Variation	ΔG	0.95 – 1.65 GHz		+/- 0.05	+/-0.15	dB
3	Input VSWR	SWR_1	0.95 – 1.65 GHz		1.35:1	1.5:1	Ratio
4	Output VSWR	SWR_2	0.95 – 1.65 GHz		1.35:1	1.5:1	Ratio
5	Reverse Isolation	S_{12}	0.95 – 1.65 GHz		20		dB
6	Noise figure	NF	0.95 – 1.65 GHz		1.0	1.2	dB
7	Output Power 1dB compression Point	P_{1dB}	0.95 – 1.65 GHz		18		dBm
8	Output-Third-Order Interception point	IP_3	Two-Tone, P_{out} +0 dBm each, 1 MHz separation		32		dBm
9	Current Consumption	I_{dd}	V_{dd}= +5 V		65		mA
10	Power Supply Voltage	V_{dd}	WBA0918A	+4.7	+5	+5.3	V
11	Thermal Resistance	$R_{th,c}$	Junction to case			220	°C/W
12	Operating Temperature	T_o		-40		+85	°C
13	Maximum Average RF Input Power	$P_{IN, MAX}$	DC – 12.7 GHz			5	dBm

Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	6.0
Drain Current	mA	90
Total Power Dissipation	mW	400
RF Input Power	dBm	5
Channel Temperature	°C	150
Storage Temperature	°C	-55 ~ 125
Operating Temperature	°C	-40 ~ 85
Thermal Resistance	°C/W	220

Operation of this device above any one of these parameters may cause permanent damage.

Functional Block Diagram



Ordering Information

Model Number	WBA0918A

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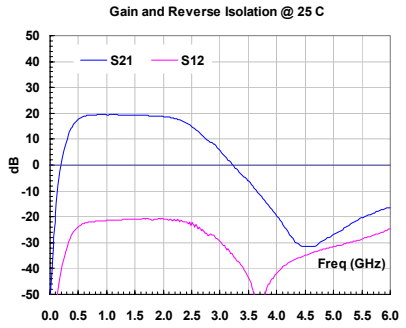
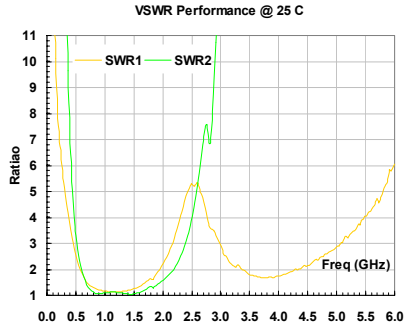
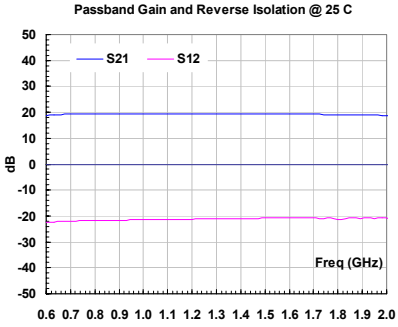
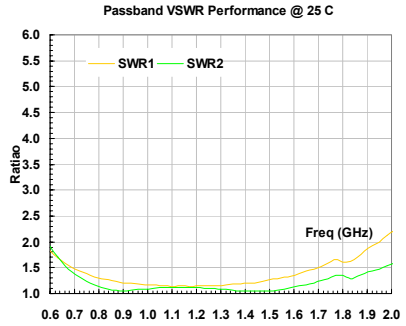
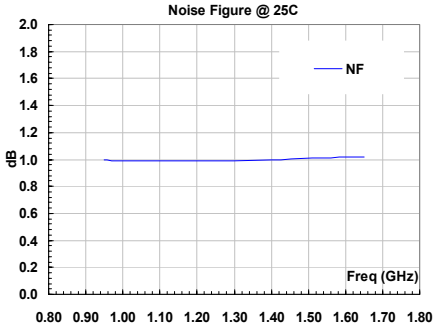
Typical Data

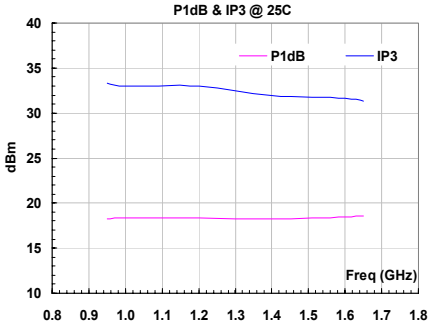


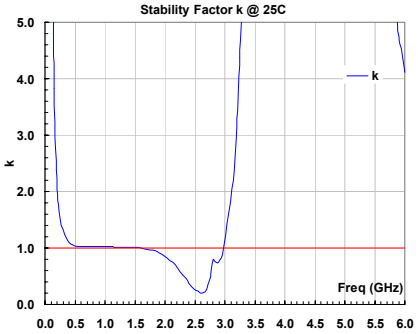






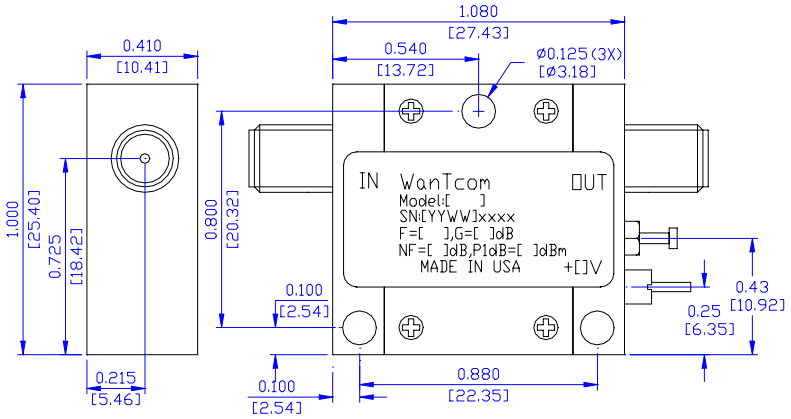






Outline, WP-5 Housing

UNITS:	INCH [mm]
BODY:	Brass
Finish:	Gold Plating
RF Connector:	SMA F Gold
V_{dd} PWR:	Feed through



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Small Signal S-Parameters:

!WBA0918AA, +25C, S-parameters at V_{dd}=5V, I_{dd}=65mA. Last updated 11/20/07.
GHZ s MA R 50

!Freq(GHz)	MAGS11	ANGS11	MAGS21	ANGS21	MAGS12	ANGS12	MAGS22	ANGS22
0.05	0.954	-38.5	0.089	34.1	0.0003	-138.1	0.983	164.0
0.1	0.885	-74.0	0.295	13.2	0.0018	-139.4	0.975	147.0
0.5	0.426	95.3	7.400	-137.8	0.0650	80.8	0.527	-8.7
0.7	0.196	42.1	9.057	163.5	0.0790	35.8	0.162	-82.4
0.9	0.093	14.2	9.275	120.3	0.0830	7.0	0.026	137.6
1	0.075	3.9	9.265	101.8	0.0840	-4.2	0.045	66.5
1.2	0.067	-29.5	9.272	67.1	0.0870	-24.3	0.053	7.3
1.4	0.088	-78.7	9.246	34.1	0.0890	-43.3	0.025	-69.5
1.6	0.151	-125.1	9.145	0.9	0.0910	-62.0	0.057	152.5
1.7	0.207	-147.5	9.048	-16.4	0.0920	-71.5	0.103	126.7
1.9	0.299	175.6	8.809	-49.4	0.0910	-89.1	0.166	91.1
2	0.373	155.7	8.595	-68.2	0.0900	-100.2	0.222	77.4
2.3	0.598	94.8	7.258	-127.5	0.0840	-132.3	0.423	37.2
2.5	0.684	53.2	5.638	-169.2	0.0710	-157.3	0.600	6.6
2.7	0.642	13.3	3.637	152.3	0.0560	177.0	0.754	-27.4
3	0.491	-31.1	1.840	105.2	0.0330	150.0	0.868	-70.0
3.3	0.373	-53.0	0.790	66.9	0.0140	123.7	0.923	-110.3
3.5	0.290	-67.7	0.454	45.3	0.0065	104.6	0.936	-134.7
4	0.273	-78.9	0.083	-24.1	0.0083	-73.0	0.946	170.6
4.5	0.364	-107.4	0.056	-114.6	0.0180	-102.0	0.956	120.5
5	0.480	-145.0	0.081	-130.9	0.0260	-119.1	0.947	72.0
5.5	0.604	169.6	0.130	-147.8	0.0370	-131.8	0.926	24.9
6	0.716	124.1	0.177	-173.1	0.0580	-147.2	0.902	-22.0

Application Notes:

A. SMA Torque Wrench Selection

Always use a torque wrench with 5 ~ 6 inch-lb coupling torque setting for mating the SMA cables to the amplifier. Never use torque more than 8 inch-lb wrench for tightening the mating cable to the connector. Otherwise, the permanent damage will occur to the SMA connectors of the amplifier. 8710-1582 (5 inch-lb) is one of the ideal torque wrench choice from Agilent Technology.

B. DC Power Line Connection

Strip the insulation layer at the end of DC power supply wire. The stripped distance should be in the range of 0.100” to 0.200”. The 24 ~ 26 American Wire Gauge wire is suitable. Wound the stripped terminal wire about 1 to 2 turns on the DC feed thru center pin. Solder the wounded wire and the center pin together. Clean the soldering area by Q-tip with alcohol to remove the flux and residue.

Repeat the process to solder the DC return wire on the ground turret.

C. Mounting the Amplifier

Use three pieces of #4-40 with longer than 9/16” screws for mounting the amplifier on a metal-based chase. Flat and spring washers are needed to prevent the screw loosening during the shock and vibration. Always use the appropriate torque setting of the power screwdriver to mount them.

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