WBA0121A

0.1- 2.1 GHz LOW NOISE WIDE BAND AMPLIFIER

REV D
September 2013

Key Features

- 50 Ohm Impedance
- 0.1 ~ 2.1 GHz
- 0.7 ~ 1.35 dB Noise Figure
- 28 ~ 35 dBm Output IP_3
- 25 ~ 35 dB Gain
- 15 ~ 19 dBm P_{1dB}
- 18 dB Return Losses
- Single Power Supply
- >34 Years MTBF
- RoHS Compliant

Product Description

CAUTION: ELECTROSTATIC DISCHARGE SENSITIVE

WBA0121A 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 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-6 Gold plated housing.

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

Applications

- Mobile Infrastructures
- GPS
- CATV/DBS
- Defense
- PCS & 3G
- Measurement
- Fixed Wireless

Specifications

Summary of the electrical specifications at room temperature, 21 ^{0}C

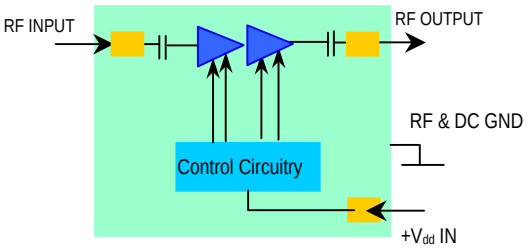
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S_{21}	0.1 – 2.1 GHz	24		36	dB
2	Gain Variation	ΔG	20 MHz Bandwidth		+/- 0.1	+/-0.25	dB
3	Input Return Loss	S_{11}	0.1 – 2.1 GHz	16	18		dB
4	Output Return Loss	S_{22}	0.1 – 2.1 GHz	18	20		dB
5	Reverse Isolation	S_{12}	0.1 – 2.1 GHz	38	40		dB
6	Noise Figure	NF	0.1 – 2.1 GHz	0.6		1.5	dB
7	Output Power 1dB Compression Point	P_{1dB}	0.1 – 2.1 GHz	15		20	dBm
8	Output-Third-Order Interception Point	IP_3	Two-Tone, P_{out} + 0 dBm each, 1 MHz separation	28			dBm
9	Current Consumption	I_{dd}	V_{dd} = + 5 V	95	100	110	mA
10	Power Supply Voltage	V_{dd}		+4.7	+5.0	+5.3	V
11	Operating Temperature	T_o		-40		+85	^{o}C
12	Maximum CW RF Input Power	$P_{IN, MAX}$	DC – 6.0 GHz			10	dBm

Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	-0.5, +6
Drain Current	mA	120
Total Power Dissipation	mW	600
RF Input CW Power	dBm	10
Channel Temperature	°C	150
Storage Temperature	°C	-55 ~ 125
Operating Temperature	°C	-40 ~ 85
Thermal Resistance*	$R_{th, c}$	220 ^{0}C/W

Operation of this device above any one of these parameters may cause permanent damage.
*Junction-to-case thermal resistance, last stage transistor, which is biased at 65 mA at 4.5V

Functional Block Diagram



Ordering Information

Model Number	WBA0121A	WBA0121A BT
Built-In Bias-T	NO	Yes

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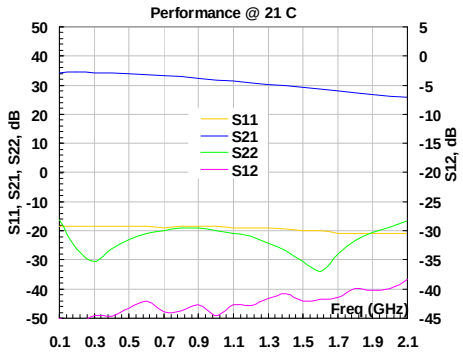
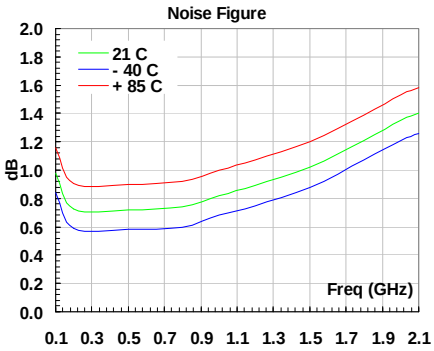
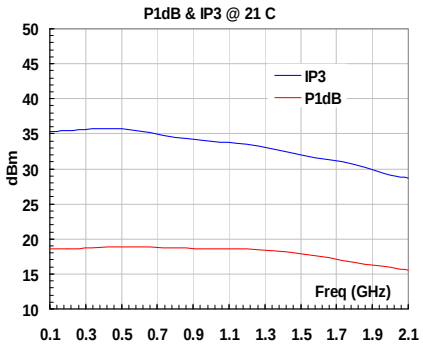
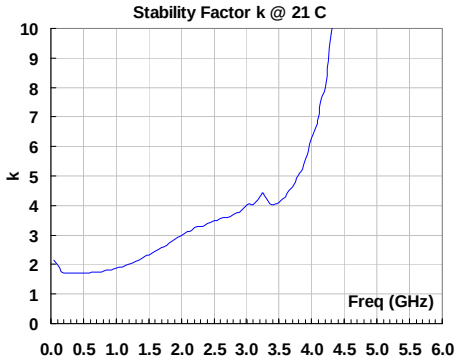
Typical Data



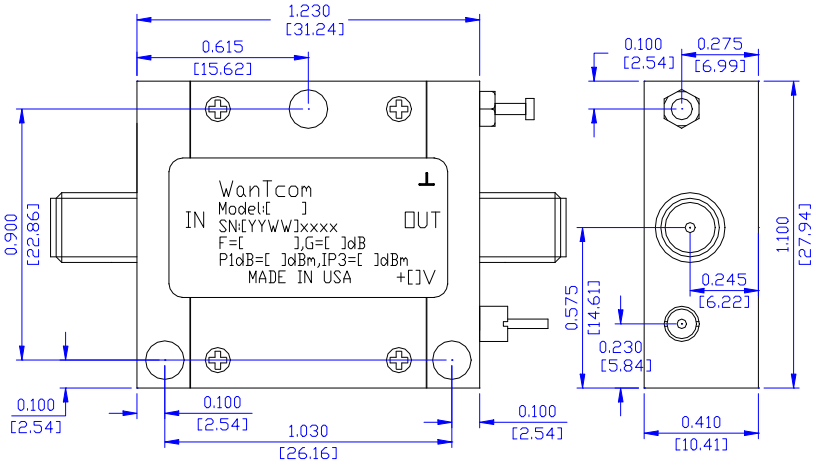






Outline, WP-6 Housing

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



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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 good 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 turn 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. Never use too large soldering iron tip and too high temperature soldering this DC power line. Too hot tip will damage the feed thru and causes permanent damage to the amplifier.

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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