



# WBPA0438A

## 0.4- 3.8 GHz LOW NOISE WIDE BAND AMPLIFIER

REV C  
May 2013

### Key Features



- 50 Ohm Impedance
- 0.4 ~ 3.8 GHz
- 1.20 dB Noise Figure
- 45.0 dBm output IP<sub>3</sub>
- 36.0 dB Gain
- 27.0 dBm P<sub>1dB</sub>
- 1.5:1 VSWR
- Single Power Supply
- >34 years MTBF
- Unconditional stable
- RoHS compliant

### Product Description

WBPA0438A 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 unconditional stable performances together. With single +15.0V 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-9 gold plated housing.

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

### Applications

- Mobile Infrastructures
- GPS
- CATV/DBS
- Defense
- Security System
- Measurement
- Fixed Wireless



### Specifications

Summary of the electrical specifications WBPA0438A at room temperature

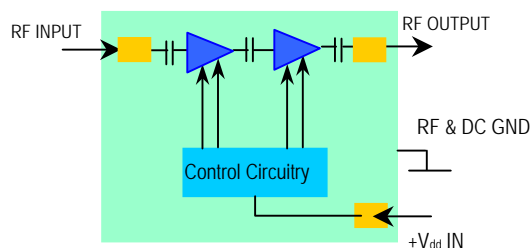
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S <sub>21</sub>	0.4 – 3.8 GHz		36		dB
2	Gain Variation	ΔG	0.4 – 3.8 GHz		+/- 1.0	+/-1.5	dB
3	Input VSWR	SWR <sub>i</sub>	0.4 – 3.8 GHz		1.5:1	2:1	Ratio
4	Output VSWR	SWR <sub>o</sub>	0.4 – 3.8 GHz		1.5:1	2:1	Ratio
5	Reverse Isolation	S <sub>12</sub>	0.4 – 3.8 GHz		60		dB
6	Noise figure	NF	0.4 – 3.8 GHz		1.20	1.5	dB
7	Output Power 1dB compression Point	P <sub>1dB</sub>	0.4 – 3.8 GHz	24	27		dBm
8	Output-Third-Order Interception point	IP <sub>3</sub>	0.38 – 2.0 GHz, Two-Tone, P <sub>out</sub> +10 dBm each, 1 MHz separation	43	45		dBm
			2.0 – 3.8 GHz, Two-Tone, P <sub>out</sub> +10 dBm each, 1 MHz separation	40	45		
9	Current Consumption	I <sub>dd</sub>			400		mA
10	Power Supply Voltage	V <sub>dd</sub>		+12	+15	+16	V
11	Thermal Resistance <sup>1</sup>	R <sub>th,c</sub>	Junction to case			45	°C/W
12	Operating Temperature	T <sub>o</sub>		-40		+85	°C
13	Maximum Average RF Input Power	P <sub>IN, MAX</sub>	DC – 6.0 GHz			10	dBm

### Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	18
Drain Current	mA	500
Total Power Dissipation	W	3.5
RF Input Power	dBm	10
Channel Temperature	°C	150
Storage Temperature	°C	-55 ~ 125
Operating Temperature	°C	-40 ~ 85
Thermal Resistance	°C/W	45

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

### Functional Block Diagram



**!Additional heat sink required for continuous operation!**

<sup>1</sup> Last stage transistor biased at I<sub>ds</sub> = 190 mA @ V<sub>ds</sub> = 9.0V. The total maximum junction temperature at 85 °C case temperature thus is 9 x 0.19 x 45 + 85 = 162 °C

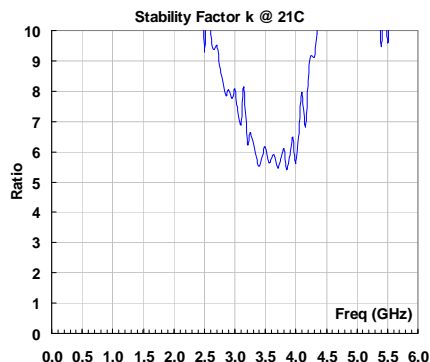
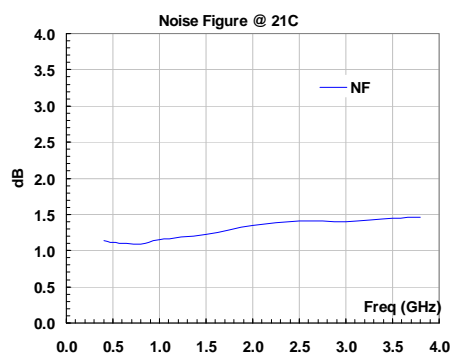
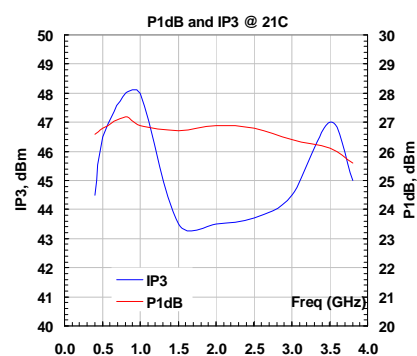
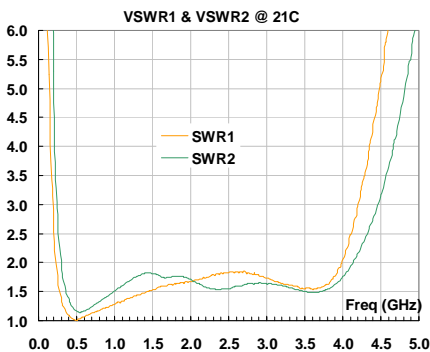
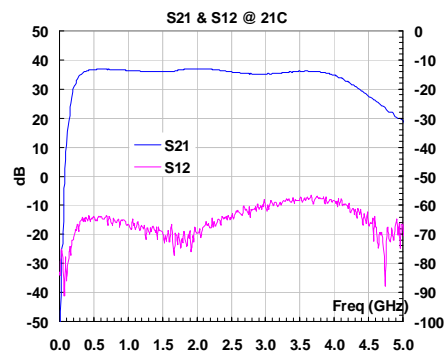
Specifications and information are subject to change without notice.

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## Ordering Information

Model Number	WBPA0438A
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## Typical Data



## Outline, WP-9 Housing

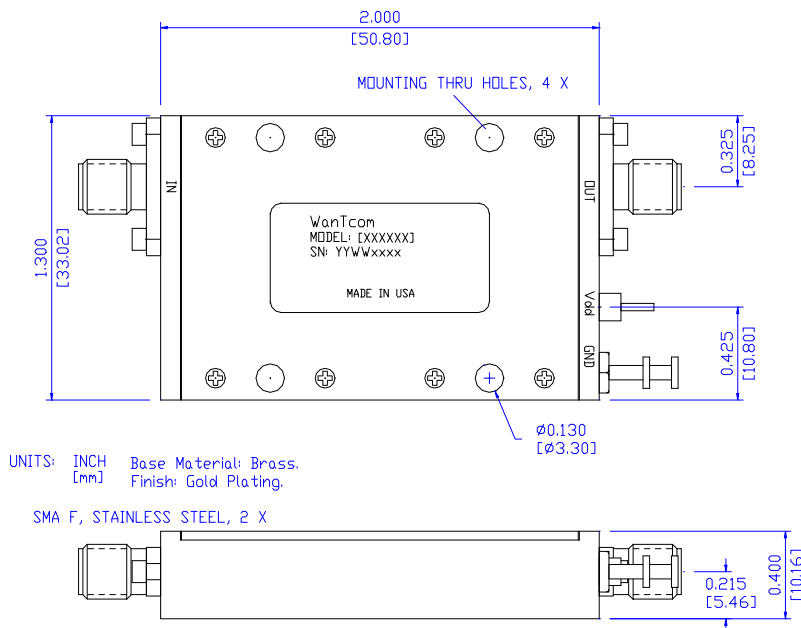
UNITS: INCH  
[mm]

BODY: Brass

Finish: Gold Plating

RF Connector: SMA F Gold

V<sub>dd</sub> 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 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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