



# WPA0822A

## 0.82- 2.2 GHz 5-WATT LOW NOISE WIDE BAND AMPLIFIER

REV A  
May 2011

### Key Features



- 50 Ohm Impedance
- 0.82 ~ 2.2 GHz
- 1.8 dB Noise Figure
- 47.0 dBm output IP<sub>3</sub>
- 38.0 dB Gain
- 37.0 dBm P<sub>1dB</sub>
- 20 dB Return Losses
- Class A Operation
- Output ∞:1 Load Handling
- >34 years MTBF
- Unconditional Stable
- RoHS Compliant

### Product Description

WPA0822A integrates WanTcom proprietary low noise power amplifier technology, high frequency micro electronic assembly techniques, and high reliability design to realize optimum low noise figure, wideband, high power, and unconditional stable performances together. With single +10.0V 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
- PCS, 3G
- Defense
- Security System
- Measurement
- Fixed Wireless



### Specifications

Summary of the electrical specifications WPA0822A at room temperature

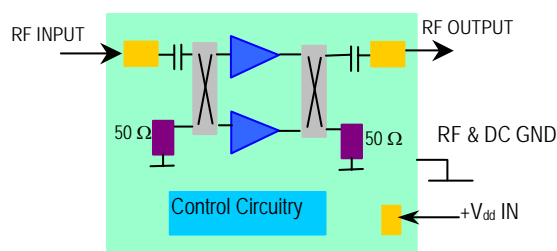
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S <sub>21</sub>	0.82 ~ 2.2 GHz	36	38	41	dB
2	Gain Variation	ΔG	0.82 ~ 2.2 GHz		+/- 1.5		dB
3	Input Return Loss	S <sub>11</sub>	0.82 ~ 2.2 GHz	14	20		dB
4	Output Return Loss	S <sub>22</sub>	0.82 ~ 2.2 GHz	14	20		dB
5	Reverse Isolation	S <sub>12</sub>	0.82 ~ 2.2 GHz		70		dB
6	Noise Figure	NF	0.82 ~ 2.2 GHz		1.8	2.5	dB
7	Output Power 1dB Compression Point	P <sub>1dB</sub>	0.82 ~ 2.2 GHz	36	37		dBm
8	Output-Third-Order Interception Point	IP <sub>3</sub>	0.82 ~ 2.2 GHz, Two-Tone, +27 dBm each, 1 MHz spe.	45	47		dBm
9	Current Consumption	I <sub>dd</sub>			2.0		A
10	Power Supply Voltage	V <sub>dd</sub>		+9.5	+10	+10.5	V
11	Thermal Resistance <sup>1</sup>	R <sub>th,c</sub>	Junction to case		6.0	8.0	°C/W
12	Operating Temperature	T <sub>o</sub>	Case temperature (reduced output power at > 70 °C)	-40		+85	°C
13	Maximum CW RF Input Power	P <sub>IN, MAX</sub>	DC ~ 6.0 GHz			13	dBm

### Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	10.5 (12.5V for B version)
Drain Current	A	2.5
Total Power Dissipation	W	28
CW RF Input Power	dBm	13
Channel Temperature	°C	160
Storage Temperature	°C	-55 ~ 125
Operating Temperature	°C	-40 ~ 85
Thermal Resistance	°C/W	8.0

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

### Functional Block Diagram



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

### Ordering Information

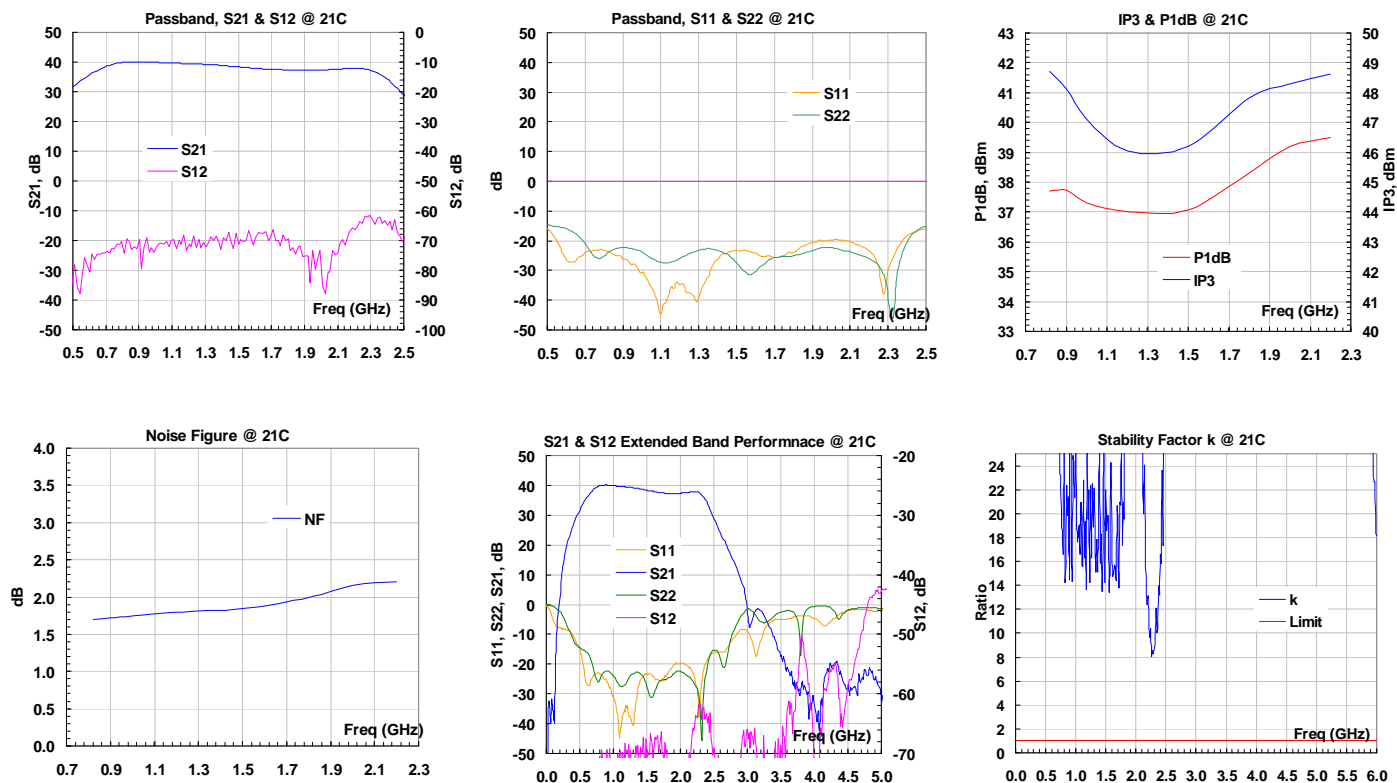
V <sub>dd</sub>	+10V	+12V
Model Number	WPA0822A	WPA0822B

<sup>1</sup> Last stage transistor biased at I<sub>ds</sub> = 800 mA @ V<sub>ds</sub> = 10.0V. The total maximum junction temperature at 85 °C case temperature thus is 10 x 0.8 x 8 + 85 = 149 °C

Specifications and information are subject to change without notice.

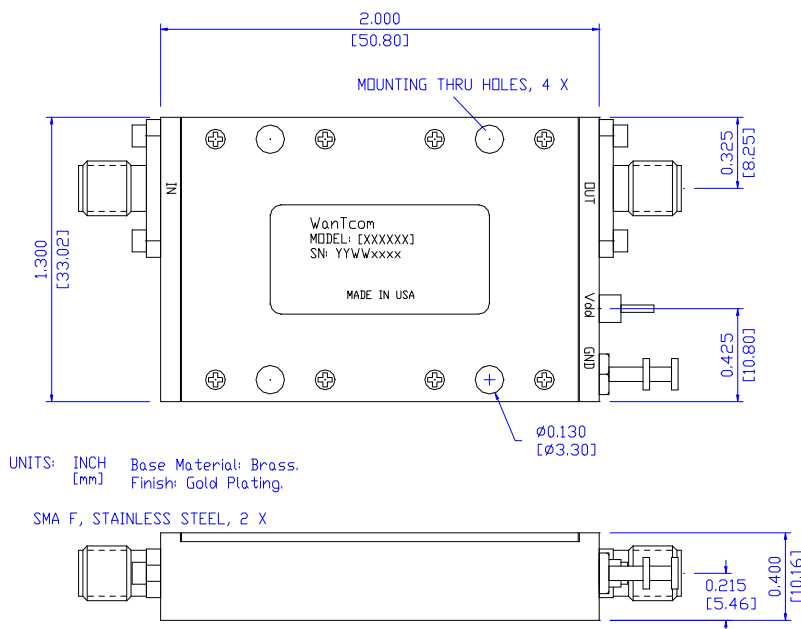
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## Typical Data



## Outline, WP-9 Housing

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



UNITS: INCH [mm] Base Material: Brass.  
 Finish: Gold Plating.

SMA F, STAINLESS STEEL, 2 X

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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 20 ~ 24 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.

Make sure the voltage to the Pin is +10V or +12V, which is specified in the data sheet. Too thin or too long wire may drop the DC voltage significantly.

### **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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