



# WBA0242F

## 0.2- 4.2 GHz LOW NOISE WIDE BAND AMPLIFIER

REV A  
November 2012

### Key Features



- 0.2 ~ 4.2 GHz
- 1.20 dB Noise Figure
- 26.0 dBm Output IP<sub>3</sub>
- 29.0 dB Gain
- +/-0.50 dB Gain Flatness
- 14.0 dBm P<sub>1dB</sub>
- 1.5:1 VSWR
- Single Power Supply
- >34 years MTBF
- Unconditional Stable
- RoHS Compliant

### Product Description

WBA0242F 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 +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 WPM-3 gold plated pallet.

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 WBA0242F at room temperature

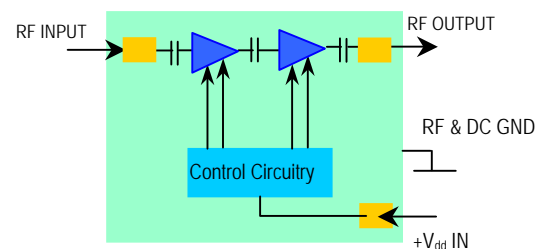
| Index | Testing Item                          | Symbol              | Test Constraints   | Min  | Nom     | Max     | Unit  |
|-------|---------------------------------------|---------------------|--|------|---------|---------|-------|
| 1     | Gain                                  | S <sub>21</sub>     | 0.2 – 4.2 GHz  |      | 29      |         | dB    |
| 2     | Gain Variation                        | ΔG                  | 0.2 – 4.2 GHz  |      | +/- 0.5 | +/-0.75 | dB    |
| 3     | Input VSWR                            | SWR <sub>1</sub>    | 0.2 – 4.2 GHz  |      | 1.5:1   | 1.8:1   | Ratio |
| 4     | Output VSWR                           | SWR <sub>2</sub>    | 0.2 – 4.2 GHz  |      | 1.5:1   | 1.8:1   | Ratio |
| 5     | Reverse Isolation                     | S <sub>12</sub>     | 0.2 – 4.2 GHz  |      | 42      |         | dB    |
| 6     | Noise figure                          | NF                  | 0.2 – 4.2 GHz  |      | 1.20    | 1.40    | dB    |
| 7     | Output Power 1dB compression Point    | P <sub>1dB</sub>    | 0.2 – 4.2 GHz  | 12   | 14      |         | dBm   |
| 8     | Output-Third-Order Interception point | IP <sub>3</sub>     | Two-Tone, P <sub>out</sub> +0 dBm each, 1 MHz separation | 24   | 26      |         | dBm   |
| 9     | Current Consumption                   | I <sub>dd</sub>     | V <sub>dd</sub> = +5 V                                   |      | 50      |         | mA    |
| 10    | Power Supply Voltage                  | V <sub>dd</sub>     | WBA0242F   | +4.7 | +5      | +5.3    | V     |
| 11    | Thermal Resistance                    | R <sub>th,c</sub>   | Junction to case   |      |         | 220     | °C/W  |
| 12    | Operating Temperature                 | T <sub>o</sub>      |  | -40  |         | +85     | °C    |
| 13    | Maximum Average RF Input Power        | P <sub>IN,MAX</sub> | 0.2 – 4.2 GHz  |      |         | 5       | dBm   |

### Absolute Maximum Ratings

| Parameters              | Units | Ratings   |
|-------------------------|-------|-----------|
| DC Power Supply Voltage | V     | 6.0       |
| Drain Current           | mA    | 70        |
| 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



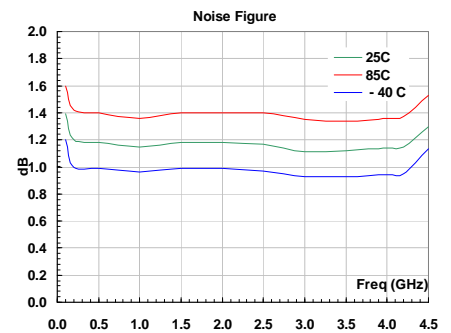
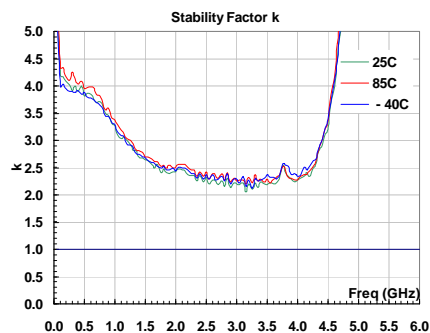
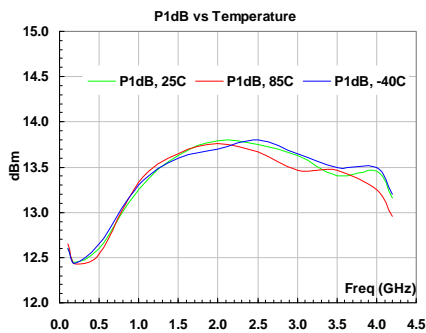
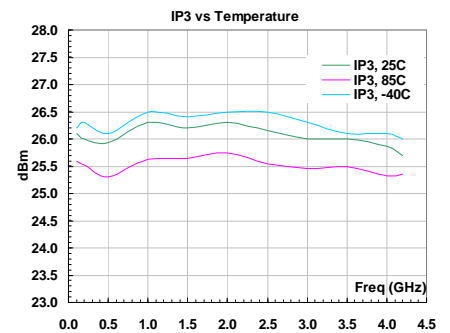
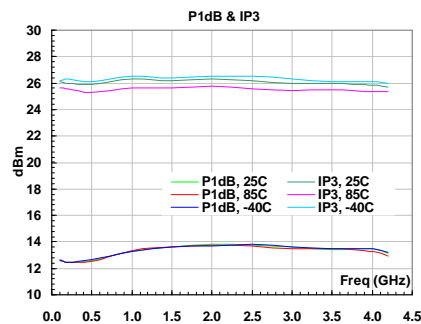
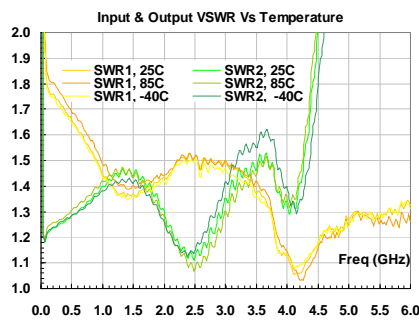
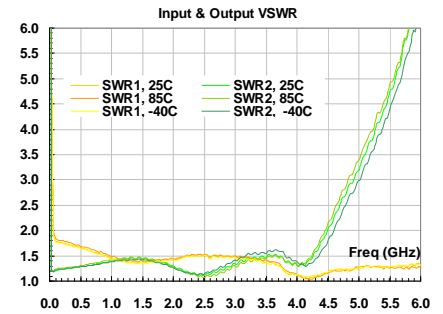
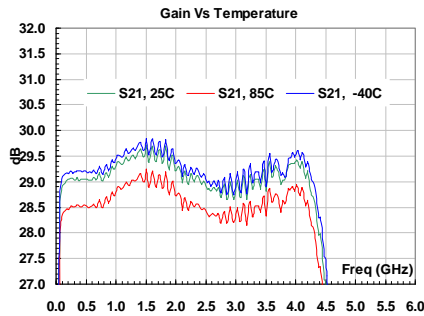
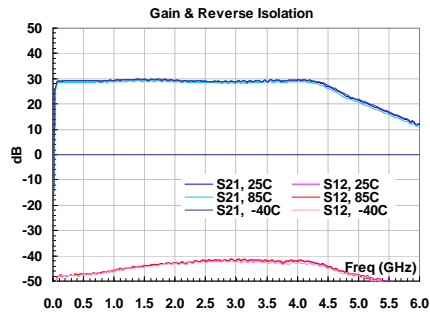
### Ordering Information

|              |          |
|--------------|----------|
| Model Number | WBA0242F |
|--------------|----------|

Specifications and information are subject to change without notice.



### Typical Data

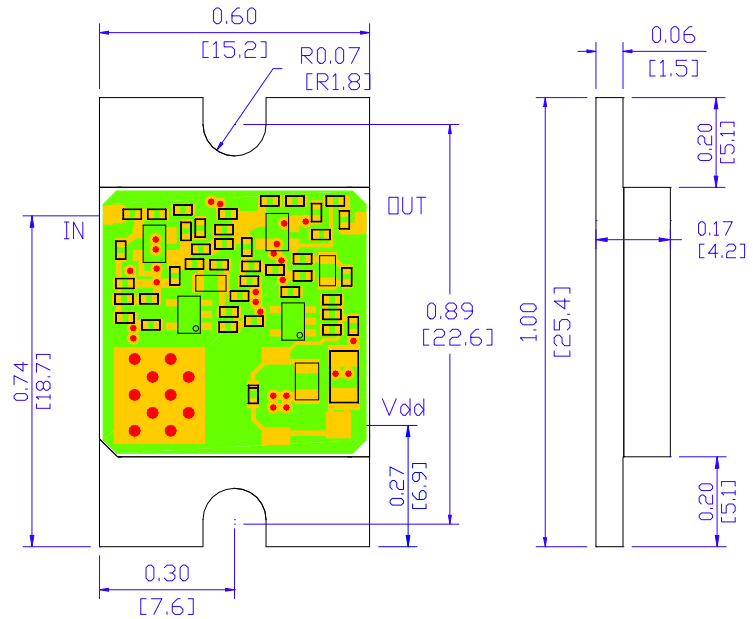


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### Outline, WP-3

UNITS: INCH  
[mm]  
BODY: Brass  
Finish: Gold Plating  
RF I/O: Microstrip  
V<sub>dd</sub> PWR: Microstrip



### Application Notes:

#### A. Mounting the Amplifier

Use 2 pieces of #4-40 or M3.0 with longer than 1/4" screws for mounting the amplifier on a metal-based chase or heat sink. 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 the amplifier.

Always be very careful to solder the RF and DC connections to the amplifier. Use 0.01" diameter soldering iron tip to solder the connections. Do not touch any components of the amplifier.

#### B. Optimizing the RF ports Performance

The input and output RF ports are the microstrip launches on the LNA. The edges of these launches need to be as close as to their mating I/O. The width of the mating 50 Ohm lines shall be close the 0.040 or 1.0 mm wide of the launch width to minimize the mis-match. The I/O and the launches shall be on the same level.

Fine tune the I/O joints with an added capacitive stub metal to optimize the return losses if it is needed.

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