

## 16W Ultra Wide Band AC Power Amplifier 50GHz-75GHz



Note: Photo is for illustration purposes only.  
Please refer to outline drawing.

### Product Description

RAMP5075G16W is an ultra wide band AC power amplifier with a frequency range of 50 to 75GHz.

The power output of this amplifier is 42dBm typical. The typical gain is 55 dB with a gain flatness of  $\pm 5$ dB.

The AC power amplifier uses a standard convenient 110V/220 VAC power supply.

### Features

- Ultra Wide Band AC Power Amplifier
- Gain 55dB Typical
- Output Saturation Power 42dBm Typical
- Supply Voltage 110/220 VAC
- 50 Ohm Matched Input / Output

### Typical Applications

- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

### Electrical Specifications ( $T_A = +25^\circ\text{C}$ )

| Parameter                                         | Min                                 | Typ  | Max  | Units |
|---------------------------------------------------|-------------------------------------|------|------|-------|
| Frequency Range                                   | 50                                  |      | 75   | GHz   |
| Small Signal Gain                                 | 45                                  | 55   |      | dB    |
| Gain Flatness                                     |                                     | ±5.0 | ±6.0 | dB    |
| Gain Variation Over Temperature<br>(-40°C~+60°C ) |                                     | ±3.0 |      | dB    |
| Input VSWR                                        |                                     | 2.0  |      | : 1   |
| Output 1dB Compression Point (P1dB)               | 35                                  | 36   |      | dBm   |
| Saturated Output Power (Psat)                     | 40                                  | 42   |      | dBm   |
| Isolation S12                                     |                                     | 50   |      | dB    |
| Supply Current (Vcc=220 VAC)                      |                                     | 1.2  | 2    | A     |
| Weight                                            |                                     | /    |      | lbs.  |
| Impedance                                         |                                     | 50   |      | Ohms  |
| Input / Output Connectors                         | 1.0mm-Female(Input) / WR-15(Output) |      |      |       |
| Package                                           | Epoxy Sealed (Standard)             |      |      |       |
|                                                   | Hermetically Sealed (Optional)      |      |      |       |

### Absolute Maximum Ratings

| Parameter              | Rating                   |
|------------------------|--------------------------|
| Supply Voltage Range   | 110 to 220 VAC           |
| *RF Input Power (RFIN) | Psat – Large Signal Gain |

### Bias Up Procedure

1. Connect input and output with 50 Ohm source and load with in band return loss better than 10dB.
2. Connect AC Plug
3. Flip switch to "ON" position

### Bias Down Procedure

1. Flip switch to "OFF" position
2. Remove AC Plug
3. Remove RF Connection

### Environmental Specifications and Test Standards

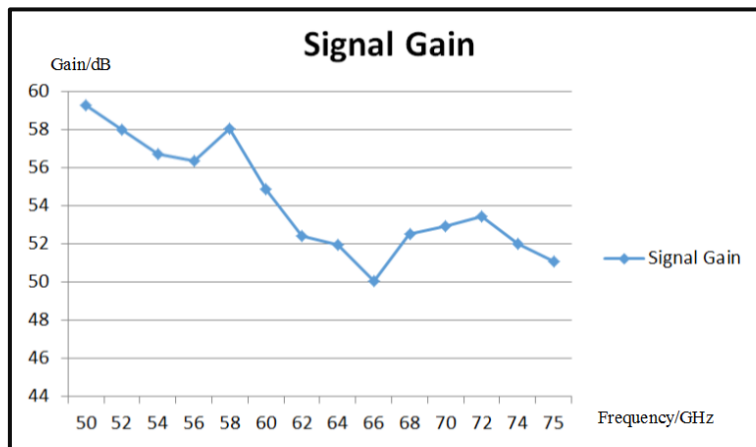
| Parameter                         | Description                                                                                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operational Temperature           | -40°C to +60°C<br>(Case Temperature)                                                                                                                                                                            |
| Storage Temperature               | -50°C to +105°C                                                                                                                                                                                                 |
| Thermal Shock                     | -40°C → +85°C<br>(5 Cycles / 10 hours)                                                                                                                                                                          |
| **Random Vibration                | MIL-STD-202G<br>Table 214-I, Test Condition Letter C<br>1.5 Hours Per Axis                                                                                                                                      |
| High Temperature Burn In          | Temperature +85°C for 72 Hours                                                                                                                                                                                  |
| Shock                             | 1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s<br>2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s<br>3. Total 18 times (6 directions, 3 repetitions per direction). |
| Altitude                          | Standard: 30,000 Ft (Epoxy Sealed Controlled Environment)<br>Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min)                                                                                             |
| Hermetically Sealed<br>(Optional) | MIL-STD-883 (For Hermetically Sealed Units)                                                                                                                                                                     |

\*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.

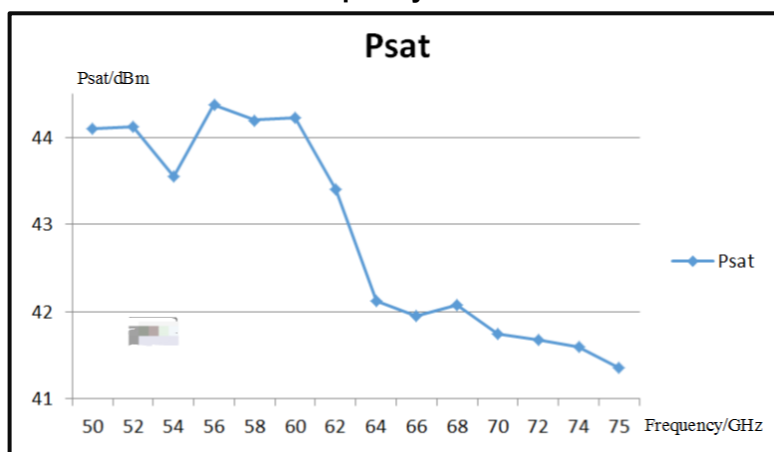
\*\*For vibration testing details please see additional information section.

**Typical Performance Plots**

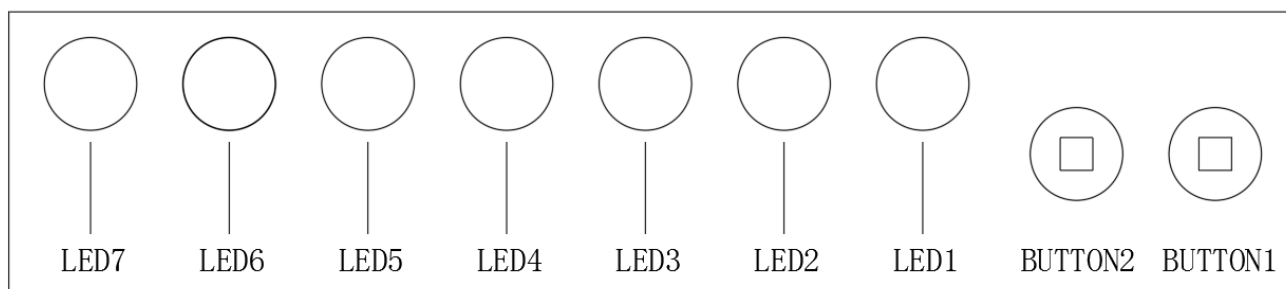
**Gain**



**Saturation Power vs. Frequency CW**



## Alarm Status Panel



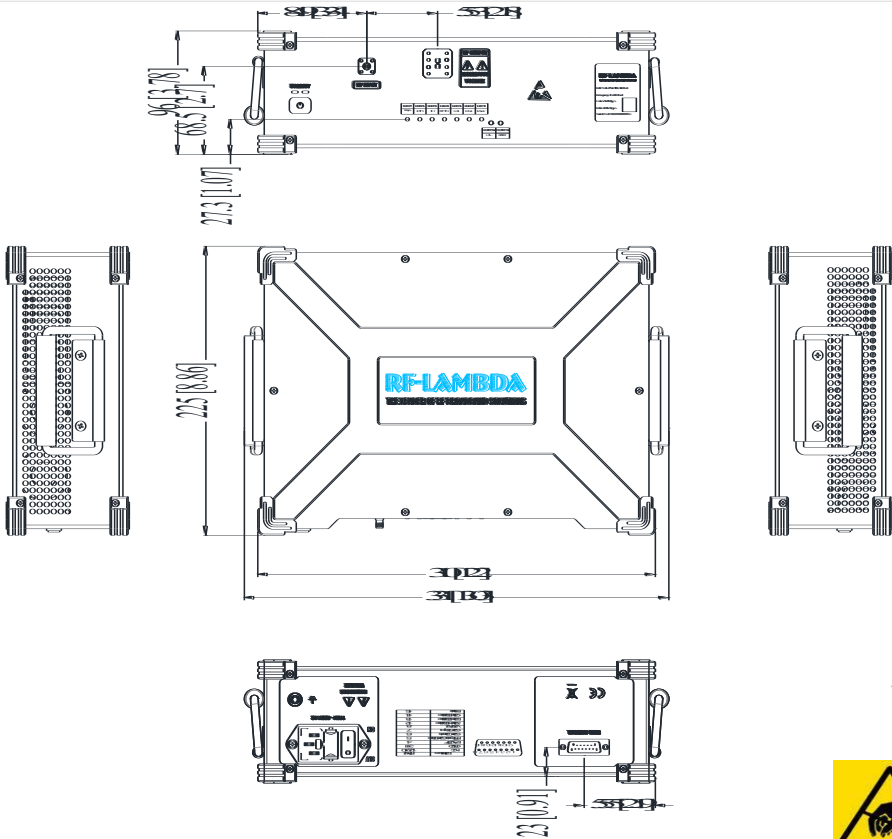
|  | Name    | Function            | Initial State | Description                                                                                                                          | Applied |
|--|---------|---------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------|---------|
|  | BUTTON1 | Reset               | Control       | Manual reset button to reset PA                                                                                                      | Yes     |
|  | BUTTON2 | Calibration         | Control       | Manual calibration button to correct PA                                                                                              | Yes     |
|  | LED 1   | RF ON/OFF           | Indicator     | RF output status indicator. PA will shut down and latch this LED to a <u>RED</u> color when any protection is triggered *            | Yes     |
|  | LED 2   | Calibration State   | Indicator     | Calibration status indicator. The red light indicates that calibration is required. The indicator will flash during calibration *    | Yes     |
|  | LED 3   | VSWR Over           | Indicator     | PA will shut down and latch this LED to a <u>RED</u> color when when output reflection is over limit*                                | Yes     |
|  | LED 4   | RF Input Over Drive | Indicator     | PA will shut down and latch this LED to a <u>RED</u> color when input signal is over limit *                                         | Yes     |
|  | LED 5   | Current Over        | Indicator     | PA will shut down and latch this LED to a <u>RED</u> color when current limit is reached *                                           | Yes     |
|  | LED 6   | Current Imbalance   | Indicator     | PA will shut down and latch this LED to a <u>RED</u> color when an imbalance in the drain current of the combining branches occurs * | Yes     |
|  | LED 7   | Temperature Over    | Indicator     | PA will shut down and latch this LED to a <u>RED</u> color when driven over temperature *                                            | Yes     |

\*LED needs to be manually reset to initial state by pressing RESET button.

Equipment Specifications

| Name  | Description                |
|-------|----------------------------|
| USB-B | USB-B Port(remote control) |
| LAN   | LAN Port (remote control)  |

Outline Drawing



Packing List

| ID | Description                                                         | QTY |
|----|---------------------------------------------------------------------|-----|
| 1  | Fig a. AC power supply line(Consulting Sales)                       | 1   |
| 2  | Fig b. Waveguide to coaxial adapter (RFA15V0COAL)(Consulting Sales) | 1   |



Fig a.



Fig b.

## Additional Information

| Documentation                   | Webpage                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ESD Policy                      | <a href="https://rflambda.com/pdf/rflambda_esd_control.pdf">https://rflambda.com/pdf/rflambda_esd_control.pdf</a>                                             |
| Heatsink Lookup Specifications  | <a href="https://rflambda.com/search_heatsink.jsp">https://rflambda.com/search_heatsink.jsp</a>                                                               |
| Connector Torque Specifications | <a href="https://www.rflambda.com/pdf/Torque_Specifications.pdf">https://www.rflambda.com/pdf/Torque_Specifications.pdf</a>                                   |
| Random Vibration Test Standard  | <a href="https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf">https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf</a> |

## Ordering Information

| Part Number  | Modification                                               | Description                    |
|--------------|------------------------------------------------------------|--------------------------------|
| RAMP5075G16W | Input Connector 1.0mm-Female<br>and Output Connector WR-15 | 50GHz-75GHz AC Power Amplifier |

## Amplifier Use

Ensure that the amplifier input and output ports are safely terminated into a proper 50 ohm load before turning on the power. Never operate the amplifier without a load. A proper 50 ohm load is defined as a load with impedance less than 1.9:1 or return loss larger than 10dB relative to 50 Ohm within the specified operating band width.

### Power Supply Requirements

Power supply must be able to provide adequate current for the amplifier. Power supply should be able to provide 1.5 times the typical current or 1.2 times the maximum current (whichever is greater).

In most cases, RF - Lambda amplifiers will withstand severe mismatches without damage. However, operation with poor loads is discouraged. If prolonged operation with poor or unknown loads is expected, an external device such as an isolator or circulator should be used to protect the amplifier.

Ensure that the power is off when connecting or disconnecting the input or output of the amp.

Prevent overdriving the amplifier. Do not exceed the recommended input power level.

Adequate heat-sinking required for RF amplifier modules. Please inquire.

Amplifiers do not contain Thermal protection, Reverse DC polarity or Over voltage protection with the exception of a few models. Please inquire.

Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

### What is not covered with warranty?

Each RF - Lambda amplifier will go through power and temperature stress testing.

Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.

## Important Notice

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