# Wideband EMC Benchtop Power Amplifier 18GHz-26.5GHz

## Product Description

REMC18G26GF is a wideband EMC power amplifier with a frequency range of 18 to 26.5GHz.

The power output of this amplifier is 52dBm typical. The typical small signal gain is 55dB with a flatness of ±6dB. This performance is achieved through the use of GaN devices.

The power amplifier input connector is 2.92mm-female and output connector is WR42 (E-Plane).

The operating temperature of this product is within 0ºC to +50ºC.

## Features

- Wideband EMC Solid State Power Amplifier
- Small Signal Gain 55dB Typical
- Output Saturation Power 52dBm Typical
- Supply Voltage 110/220 VAC
- 50 Ohm Matched Input/Output
- Over temperature protection
- Over current protection
- Auto Calibration

## 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 ($T_A$=+25ºC)

| Parameter | | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Frequency Range | | 18 | | 26.5 | GHz |
| Small Signal Gain | | 50 | 55 | | dB |
| Gain Flatness | | | ±6.0 | | dB |
| Gain Variation Over Temperature (0ºC to +50ºC) | | | ±3.0 | | dB |
| Input VSWR | | | 1.5 | 2.0 | :1 |
| Output 1dB Compression Point (P1dB) | | | 49 | | dBm |
| Saturated Output Power (Psat) (CW) | | 51 | 52 | | dBm |
| Supply Current (220V AC) | | | 15 | 20 | A |
| Power Added Efficiency (PAE) | | | 10 | | % |
| Turn On/Off Speed (Switch Disable) | ON | | 100 | | ns |
| | OFF | | 100 | | ns |
| Turn On/Off Speed (Drain Disable) | ON | | 1000 | | us |
| | OFF | | 250 | | us |
| Turn On/Off Speed (Gate Disable) | ON | | 2000 | | us |
| | OFF | | 250 | | us |
| Weight | | | 100 | | lbs. |
| Impedance | | | 50 | | Ohms |
| Input / Output Connectors | | | 2.92mm-Female(Input)/WR42(Output) (H-Plane available with adapter) | | |
| Package | | | 3U Rack-mount/Tabletop Chassis | | |


RF-LAMBDA USA LLC: www.rflambda.com
Sales: sales@rflambda.com Technical: support@rflambda.com

## Absolute Maximum Ratings

| Parameter | Rating |
|---|---|
| Supply Voltage Range | 110VAC to 240VAC |
| *RF Input Power (RFIN) | Psat – Large Signal Gain |

## Bias Up Procedure

1. Connect input and output with 50 Ohm source/load.
(In band VSWR < 1.9:1 or >10dB return loss.)
2. Connect Power Cable
3. Turn On Back Panel AC Power Supply Switch
4. Press Front Panel Power Switch to Power Display

## Bias Down Procedure

1. Press Front Panel Power Switch to Power Off Display
2. Turn Off Back Panel AC Power Supply Switch
3. Remove Power Cable (If Moving Equipment)
4. Disconnect input and output with 50 Ohm source/load.
(In band VSWR < 1.9:1 or >10dB return loss.)

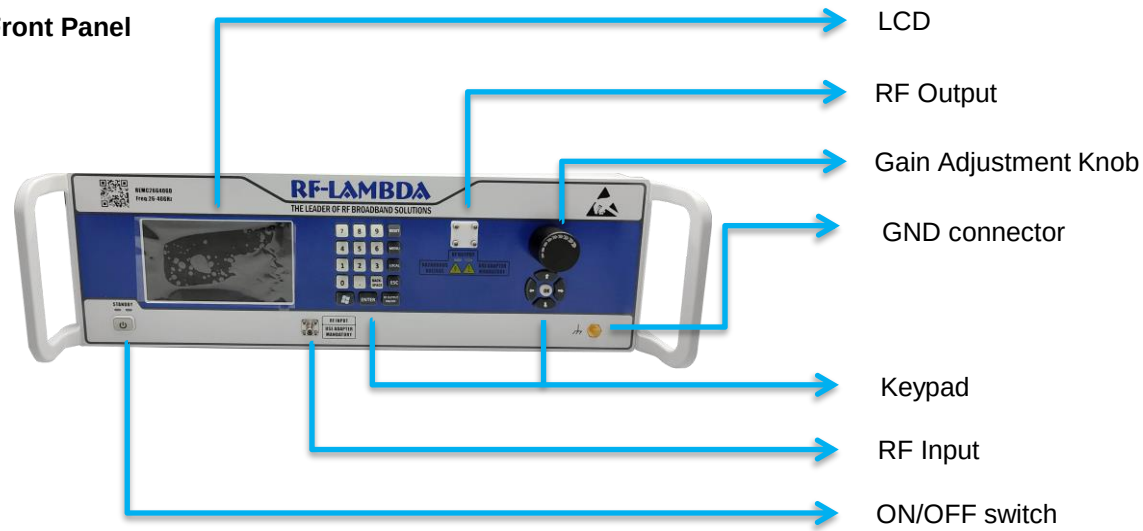
## Environmental Specifications and Test Standards

| Parameter | Description |
|---|---|
| Operational Temperature | 0ºC to +50ºC<br>(Case Temperature) |
| Storage Temperature | -55ºC to +125ºC |
| Thermal Shock | 0ºC → +50ºC<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 +50ºC 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) |

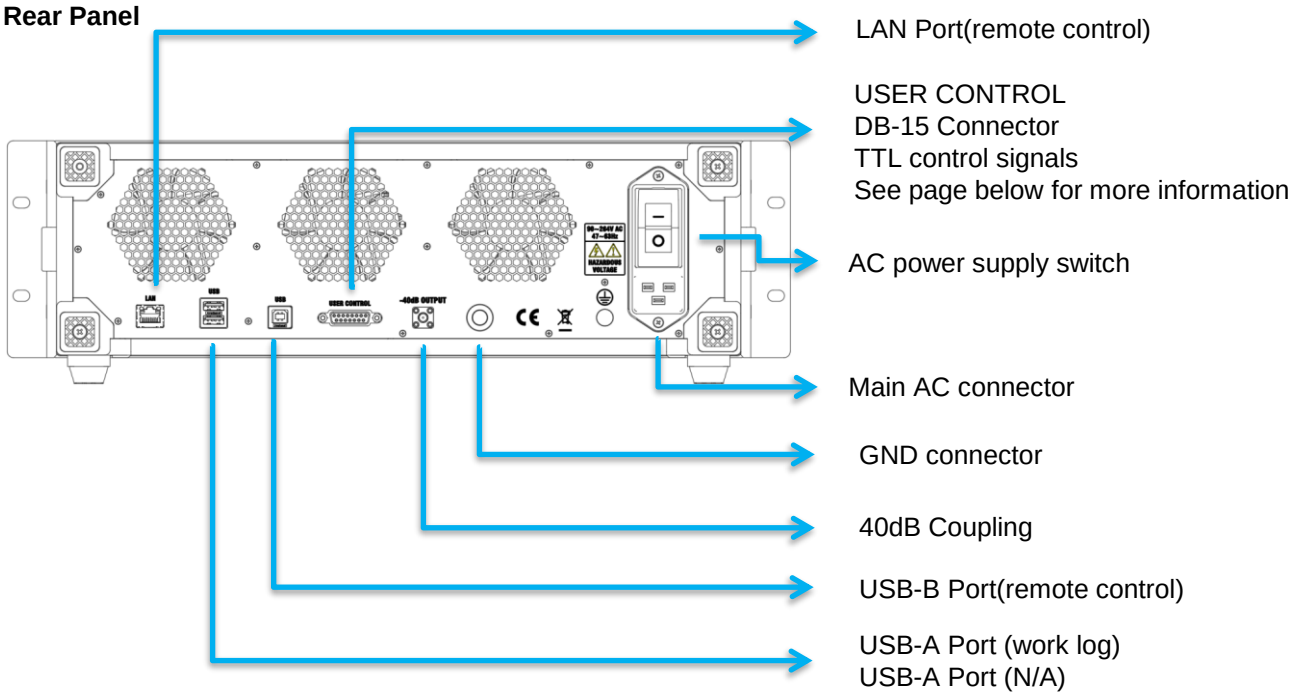
*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.
**For vibration testing details please see additional information section.

## EMC Equipment Specifications

**Front Panel**




**Rear Panel**

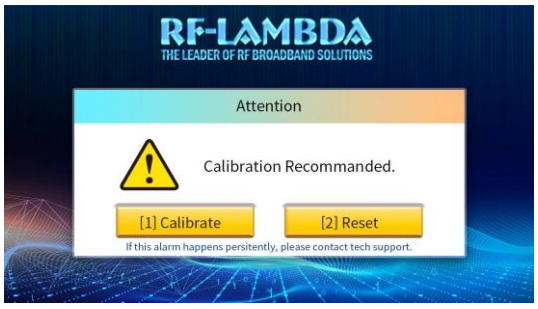


## Front Panel LCD Screen Display

### Switching On The Instrument

Please follow the instructions on the front panel LCD screen after switching on the power.
Press “1” on keypad to continue.

### Self Calibration Screen




Calibration is may be recommended
“**[1] Calibrate**” to execute instrument self calibration process.

“**[2] Reset**” to reboot the instrument.

*Please turn OFF RF input power.

### Instrument Protection Alarms

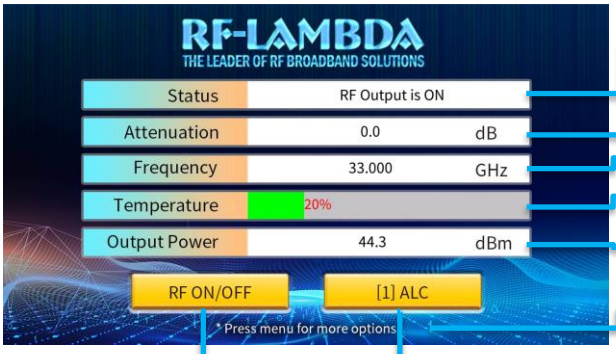
The front panel LCD screen will display the error code or error message when instrument self protection is triggered. Front panel alarm indicator will light up.

To eliminate the error code, press “RESET” on front panel keypad to reboot the instrument and clear the alarms.

If error code can not be eliminated after reboot, please contact support@rflambda.com

## Front Panel LCD Screen Function

### Instrument Status Display Page




Indicates instrument RF output status. It will display: Output is Ready to Turn on or RF Output is ON

RF output attenuation (change with adjustment knob)

RF input signal frequency

Instrument temperature

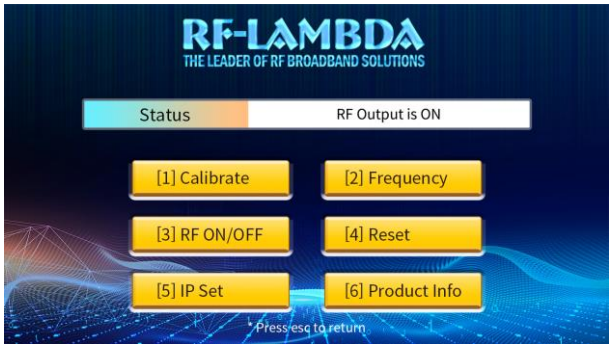
Instrument RF output power

Press “Menu” on keypad to enter instrument functions selection menu

ALC mode, power lock

Switches On or Off for instrument RF output port

### Instrument Function Selection Page




To enter this function selection page, press “Menu” on front panel keypad while the instrument is showing the status page.

Press the corresponding number on front panel keypad to select:

“**[1] Calibrate**” calibrates the instruments

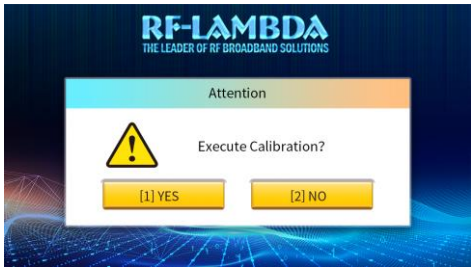
“**[2] Frequency**” enters RF input signal frequency

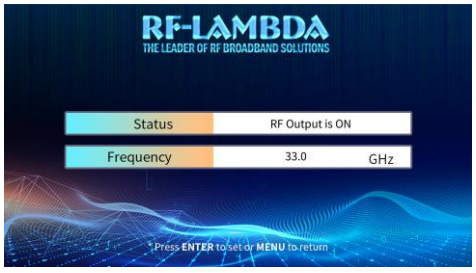
“**[3] RF ON/OFF**” switches the RF output port on or off

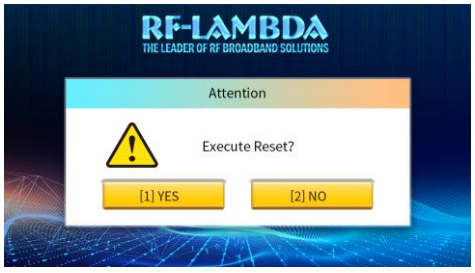
“**[4] Reset**” Restarts the instrument (Turns RF output off)

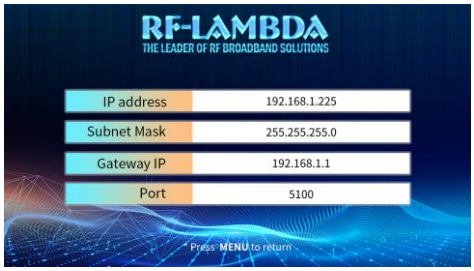
“**[5] IP Set**” enters IP display page

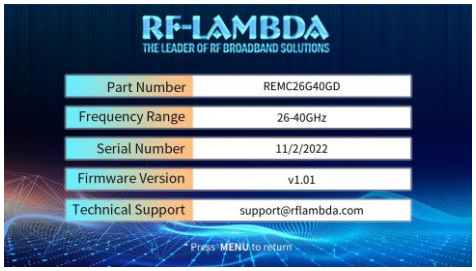
“**[6] Product Info**” displays product information

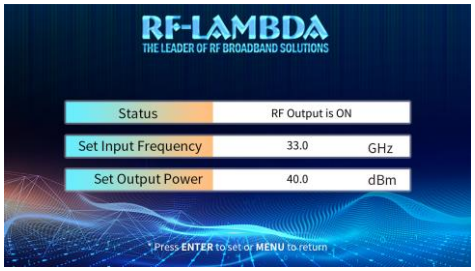


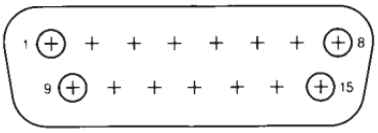




All action functions will ask for confirming execution when selected from function selection menu.

## Protection Connector Table

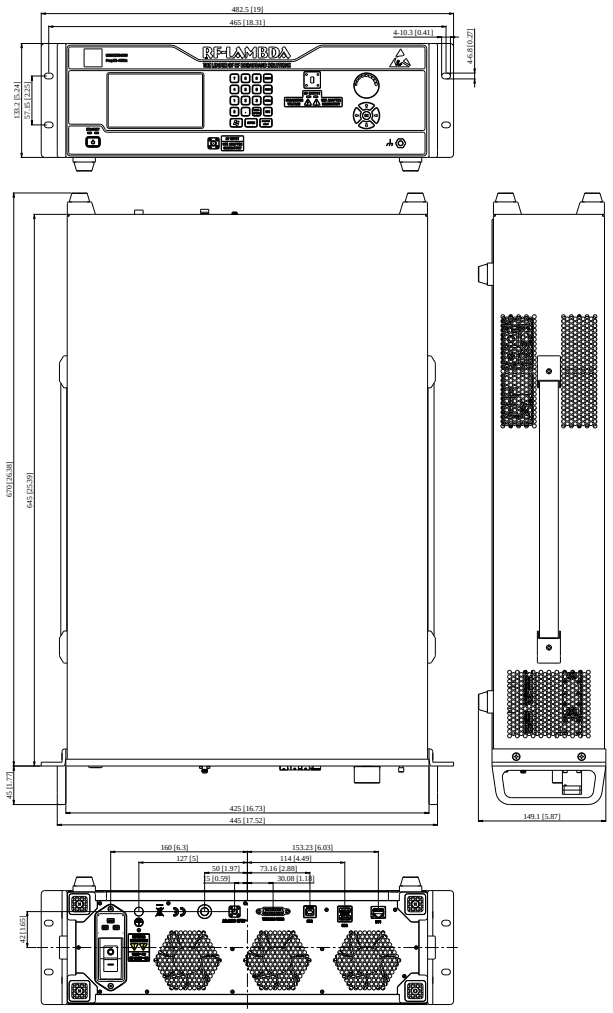
Female D-Sub is on the housing
The mating Male part number: 172-E15-113R001

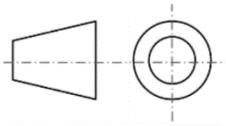



| Pin # | Name | Function | Initial State | Description | Applied |
|---|---|---|---|---|---|
| 1 | Reset | Control | HIGH | Resets PA when logic LOW is applied for five more seconds and released | Yes |
| 2 | Gate Disable | Control | LOW | Appling logic HIGH disables gate of amplifiers | Yes |
| 3 | Drian Disable | Control | LOW | Applying logic HIGH disables drain of amplifiers | Yes |
| *3 | Fast Blinking Control | Control | LOW | Turns OFF last stage amplifiers with faster speed in micro-second level. | available upon request in PO |
| 4 | RF IN Over | Indicator | LOW | Pin will be latched to logic HIGH when input signal is over limit | Yes |
| 5 | Temp Over | Indicator | LOW | Pin will be latched to logic HIGH when amplifier is driven over temperature | Yes |
| 6 | Current Over | Indicator | LOW | Pin will be latched to logic HIGH when drain current limit is reached | Yes |
| 7 | ID Imbalance | Indicator | LOW | Pin will be latched to logic HIGH when an imbalance in the drain current of the combining branches occurs | Yes |
| 8 | PA Off Alarm | Indicator | LOW | Pin will be latched to logic HIGH when any of the protection limit is reached | Yes |
| 9 | Fan Alarm | Indicator | LOW | Pin will be latched to logic HIGH when Fan limit is reached | Yes |
| 10 | RF Input Switch | Control | LOW | Applying logic HIGH turns OFF RF front-end switch to terminator | Yes |
| 11 | VSWR | Indicator | LOW | Pin will be latched to logic HIGH when output reflection is over limit | Yes |
| 12 | Fixed Attenuation 10dB | Control | LOW | Applying and holding logic HIGH to enable 10dB fixed attenuation | Yes |
| 13 | Fixed Attenuation 20dB | Control | LOW | Applying and holding logic HIGH to enable 20dB fixed attenuation | Yes |
| 14 | +5V | Power Supply | +5V | +5V DC is provided for reference * | Yes |
| 15 | GND | GND | GND | GND | Yes |

Notes:
- HIGH/LOW voltages are standard TTL signals 0.0V-0.8V = LOW. 2.8V-5V = HIGH.

## Outline Drawing



Notes:
1. Package Material: Aluminum
2. Finish: White Baking Paint
3. All dimensions are in millimeters [inches].
4. Housing Tolerances±0.25 [0.01]unless otherwise specified.
5. Standard torque wrench must be used to secure RF connectors.

### Additional Information

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

## Ordering Information

| Part Number | Modification | Description |
|---|---|---|
| REMC18G26GF | Input connector 2.92mm-Female and Output connector WR42 | 18GHz-26.5GHz Wideband EMC Benchtop 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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