

Solid State Broadband EMC Benchtop Power Amplifier 6GHz-18GHz



Product Description

RAMP06G18GF is a wideband EMC benchtop power amplifier with a frequency range of 6 to 18GHz

The power output of this amplifier is 51.5dBm typical. The typical small signal gain is 60 dB with a great flatness of ± 3 dB. This performance is achieved through the use of GaN devices.

The power amplifier's input connector is N-Female and output connector is N-Female.

The operating temperature of this product is within -30°C to +70°C.

Features

- Wideband EMC Solid State Power Amplifier
- Small Signal Gain 60dB Typical
- Output Saturation Power 51.5dBm Typical
- Supply Voltage 110/220 VAC
- 50 Ohm Matched Input/Output
- Overvoltage Protection
- Overcurrent 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 ($T_A = +25^\circ\text{C}$)

Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		6 - 13			13 - 18		GHz
Gain(Small signal)		60			60		dB
Gain Flatness		± 3.0			± 3.0		dB
Gain Adjustment Step (20dB Range)		0.1			0.1		dB
Input Return Loss		15			15		dB
Output Power 1dB Compression Point (P1dB)		45			45		dBm
Output Power for 3 dB Compression (P3dB)		49			48		dBm
Saturated Output Power (Psat)		51.5			50		dBm
IM3		20			20		dBc
Harmonic Compression		10			10		dBc
Supply Current(220V)		3.4			3.4		A
Weight			55 Typ.				lbs.
Impedance			50				Ohms
Input / Output Connectors			N-Female(Input) – N-Female(Output)				
Package			4U Please see the detail mechanical drawing				

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

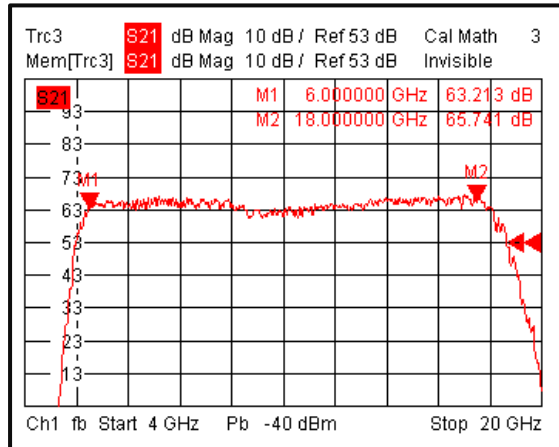
Parameter	Description
Operational Temperature	-30°C to +70°C (Ambient Temperature)
Storage Temperature	-40°C to +85°C
Thermal Shock	-30°C → +70°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +50°C for 72 Hours
Shock	1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction).
Altitude	Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min)
Hermetically Sealed (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.

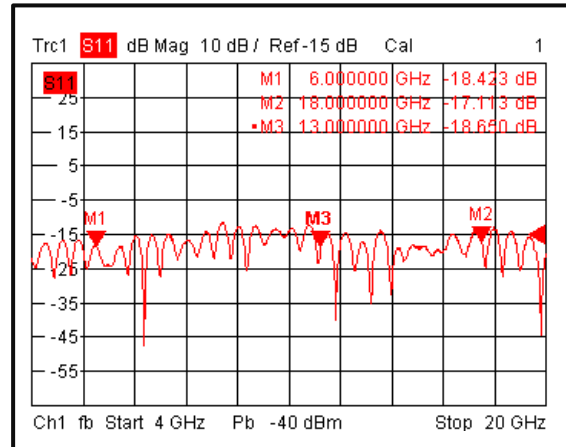
**For vibration testing details please see additional information section.

Typical Performance Plots

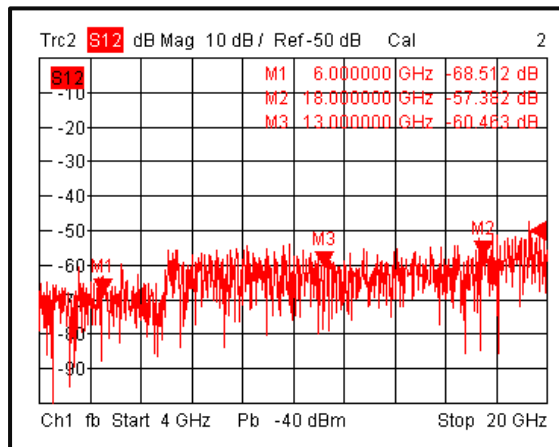
Gain



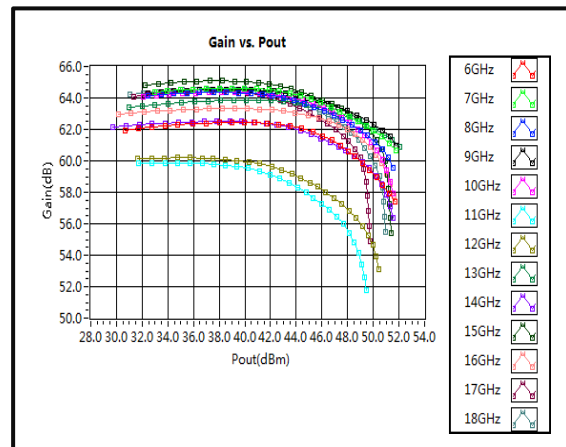
Input Return Loss



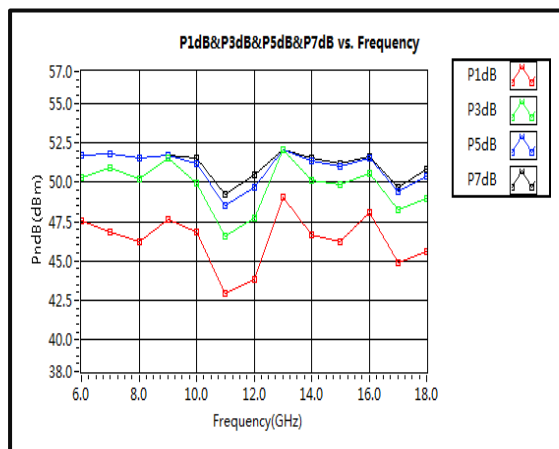
Isolation



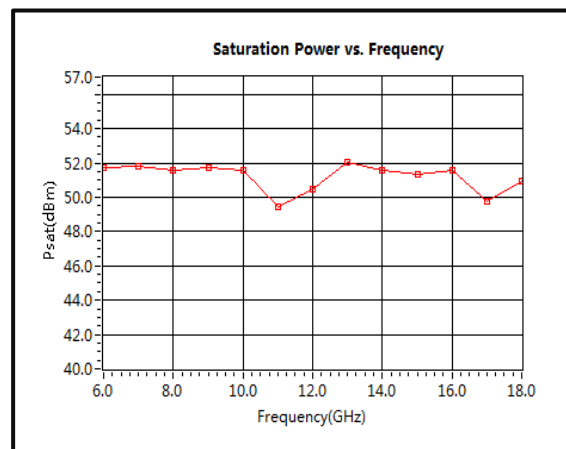
Gain vs. Output Power



PndB vs. Frequency



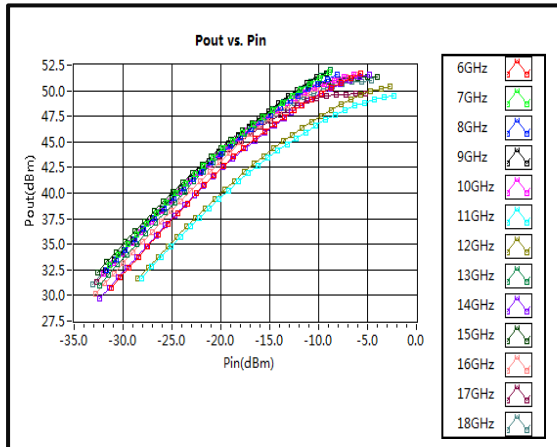
Saturated Power vs. Frequency



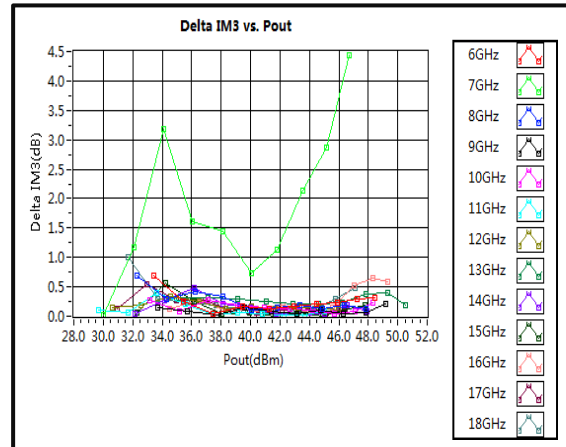
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

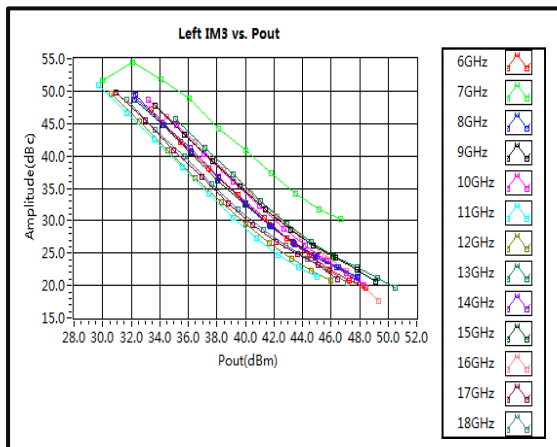
Pout vs. Pin



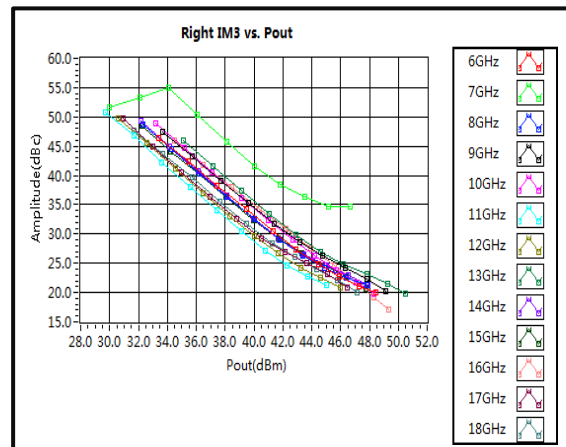
Delta IM3 vs. Pout



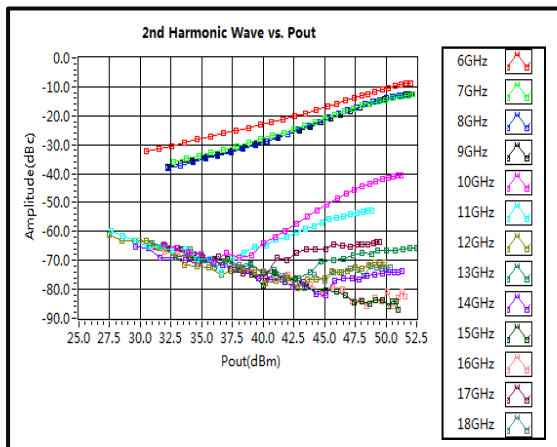
Left IM3 vs. Pout



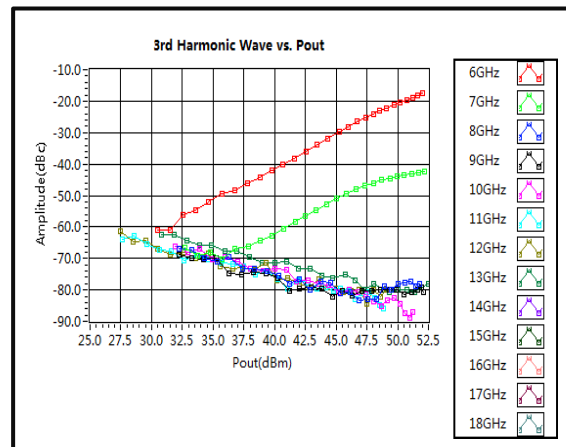
Right IM3 vs. Pout



2nd Harmonic Wave Output Power



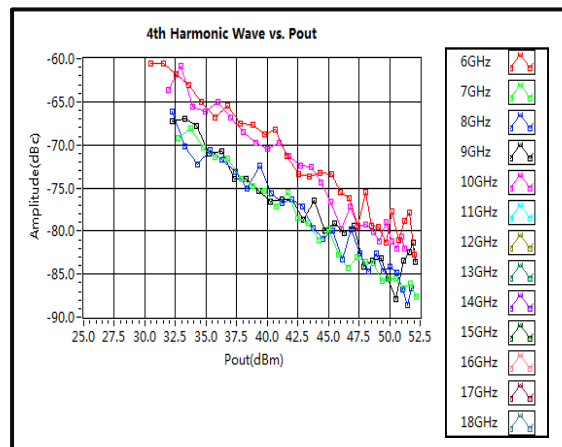
3rd Harmonic Wave Output Power



Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

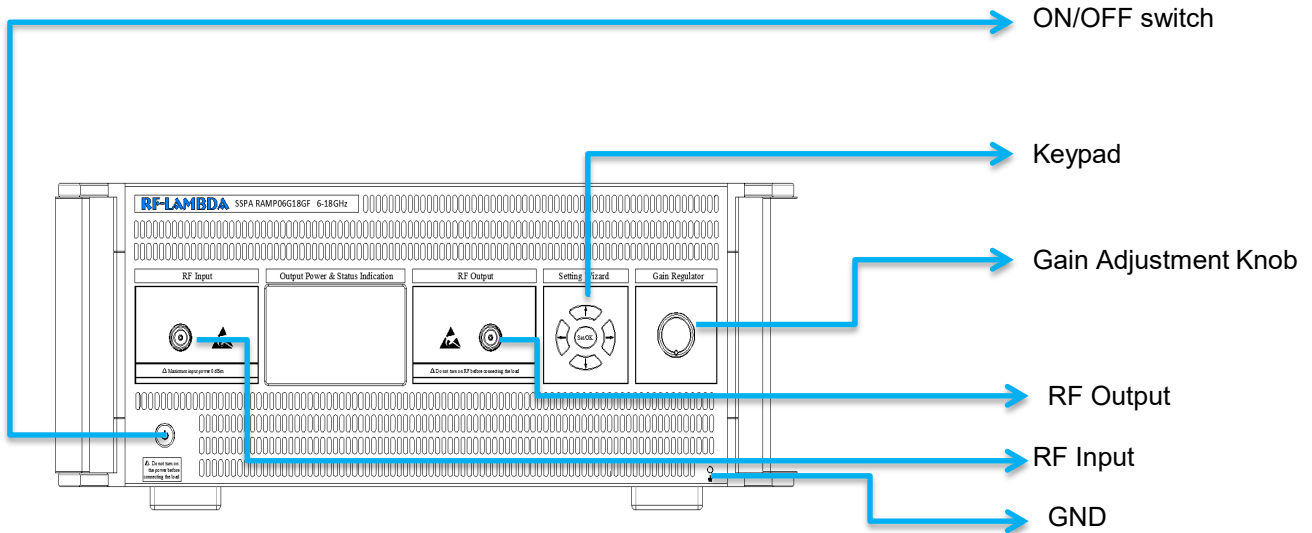
4th Harmonic Wave Output Power



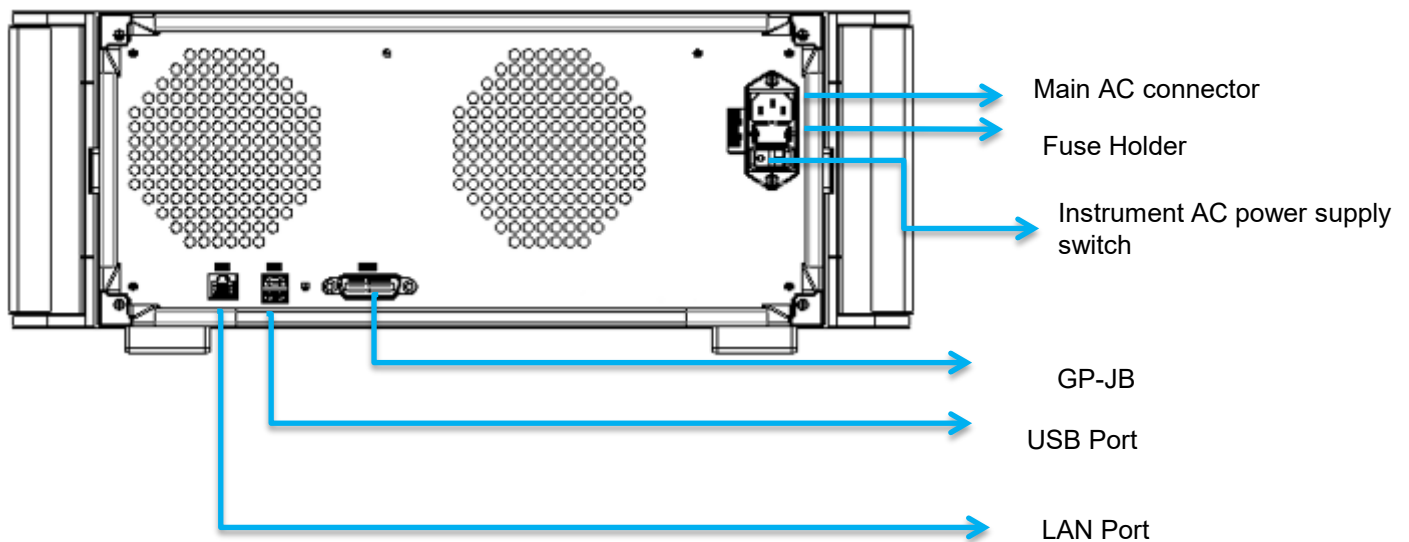
Note: Small signal VNA measurements include attenuators to protect equipment

EMC Equipment Specifications

Front Panel

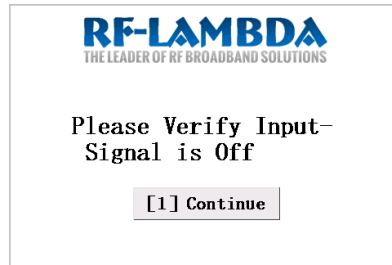


Rear Panel



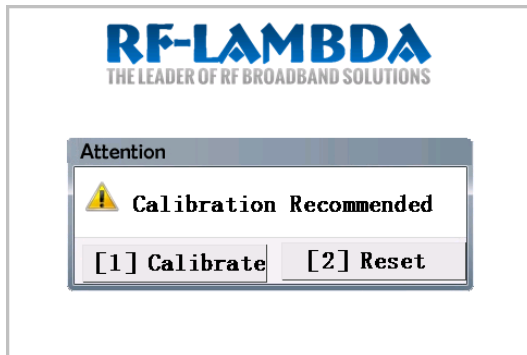
Front Panel LCD Screen Display

Switching On 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

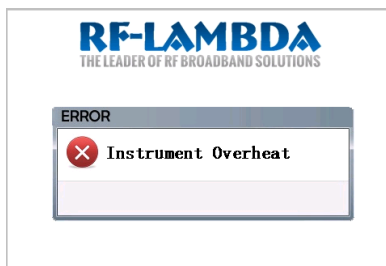
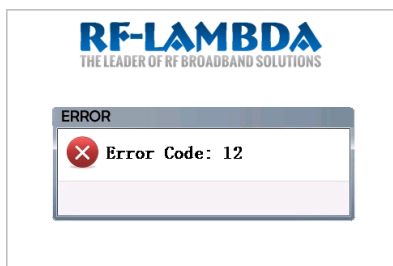


Calibration is may be recommended
"[1] Calibrate" to execute instrument self calibration process.

"[2] Reset" to reboot the instrument.

*Please turn OFF RF input power, and terminate the RF output port while applying calibration function

Instrument Protection Alarms



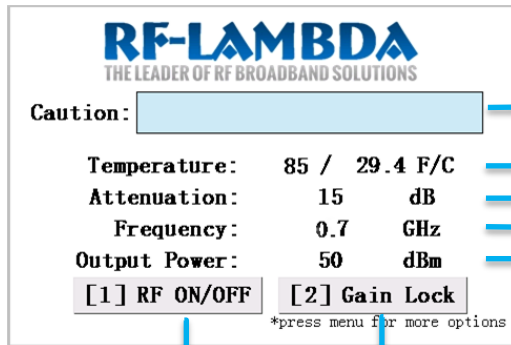
The front panel LCD screen will display the error code or error message when instrument self protection is triggered. Front panel alarm indicator will light up.

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

Instrument temperature

RF output attenuation (change with adjustment knob)

RF input signal center frequency

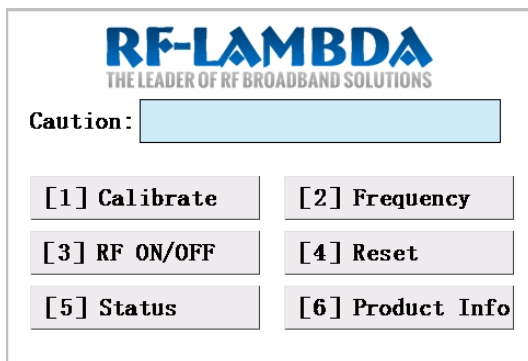
Instrument RF output power

Press "Menu" on keypad to enter instrument functions selection menu

User can set a constant gain for the unit. Equipment will automatically adjust the gain at certain frequency

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.

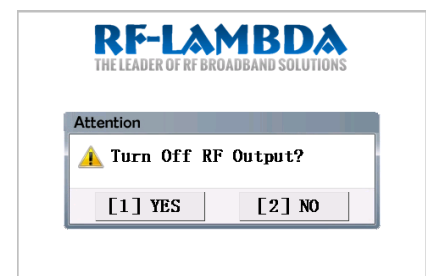
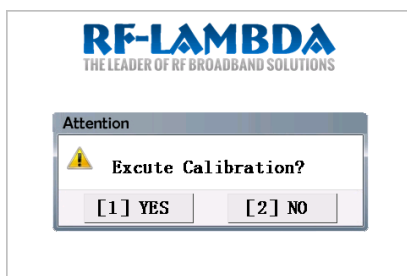
"[2] Frequency" enters RF input signal center frequency.

"[3] RF ON/OFF" switches the RF output port on or off.

"[4] Reset" Restarts the instrument (Turns RF output off)

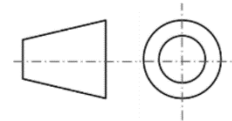
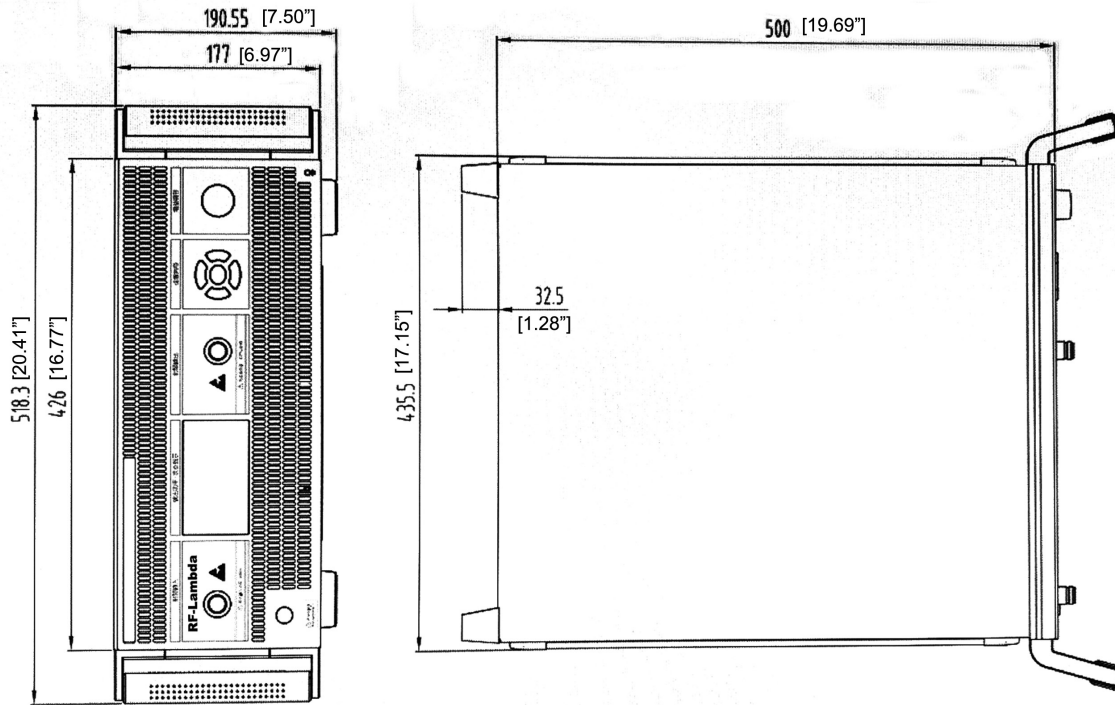
"[5] Status" enters instrument status display page.

"[6] Product Info" displays product part number and serial number



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

Outline Drawing



Notes:

1. All dimensions are in millimeters [inches].



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
RAMP06G18GF	Input connector N-Female and Output connector N-Female	6GHz-18GHz 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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