EMC Benchtop Power Amplifier
50MHz-500MHz

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

Product Description

The REMC50M500M is an EMC rack mount power amplifier with a frequency range of 50 to 500MHz

The power output of this amplifier is 53dBm typical. The typical small signal gain is 53 dB with a great flatness of ±3.0dB. This excellent performance is achieved through the use of GaN devices.

This product has a calibration feature which enables customer to obtain the best performance through time and temperature changes.

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

Features

- EMC Solid State Power Amplifier
- Small Signal Gain 53dB Typical
- Output Saturation Power 53dBm 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=+25ºC)

Parameter		Min	Typ	Max	Units
Frequency Range		50		500	MHz
Small Signal Gain		48	53		dB
Gain Flatness			±3.0		dB
Gain Variation Over Temperature (0ºC to +50ºC)			±3.0		dB
Noise Figure			8		dB
Input Return Loss			-15		dB
Output 1dB Compression Point (P1dB)			51		dBm
Saturated Output Power (Psat)			53		dBm
Supply Current (Vcc = 110VAC)			5		A
IM3			-		dBc
Power Added Efficiency (PAE)			30		%
Turn On/Off Speed (Switch Disable)	ON		-		ns
	OFF		-		ns
Turn On/Off Speed (Drain Disable)	ON		-		us
	OFF		-		us
Turn On/Off Speed (Gate Disable)	ON		-		us
	OFF		-		us
Weight			-		lbs.
Impedance			50		Ohms
Input / Output Connectors			N Female(Input) – N- Female(Output)		
Package			3U Please see the detail mechanical drawing		

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Absolute Maximum Ratings

Parameter	Rating
Supply Voltage Range	110VAC to 220VAC
*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 (Case Temperature)
Storage Temperature	-50ºC to +105ºC
Thermal Shock	-40ºC → +85ºC (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 +50ºC 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.

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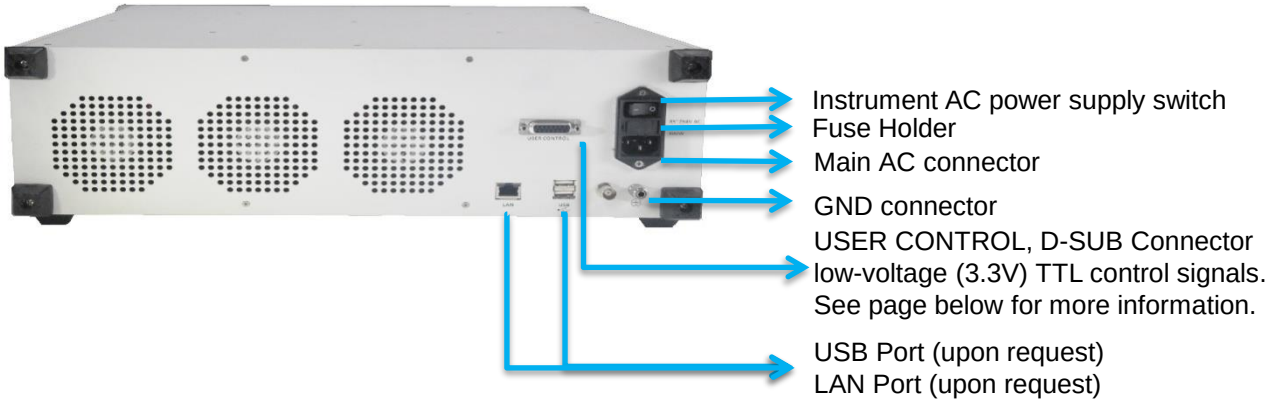
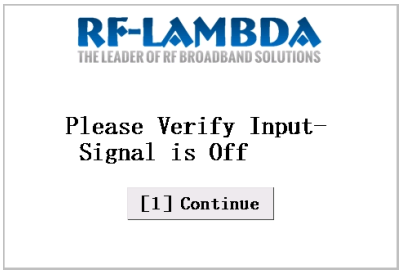
Front Panel

Rear Panel



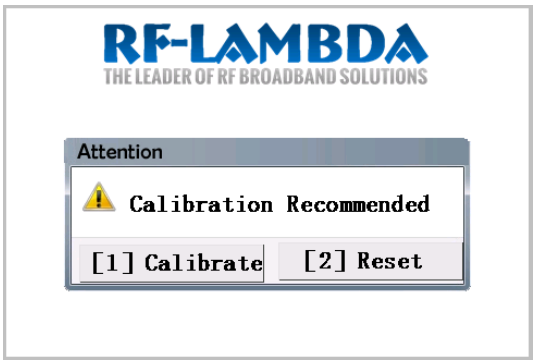
Front Panel LCD Screen Display

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

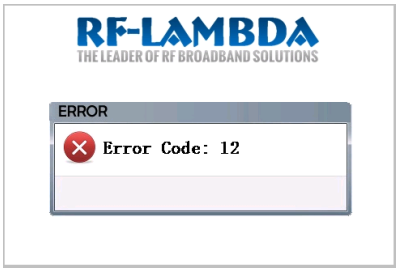


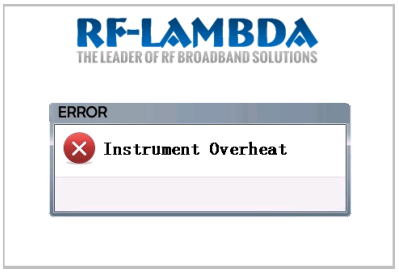
Calibration is may be recommended
“**[1] Calibrate**” to execute instrument self calibration process.

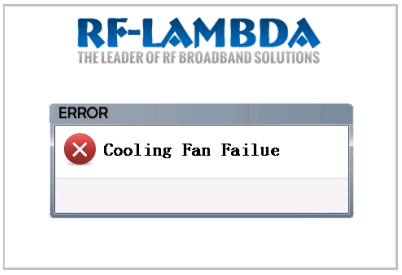
“**[2] Reset**” to reboot the instrument.

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

Instrument Protection Alarms



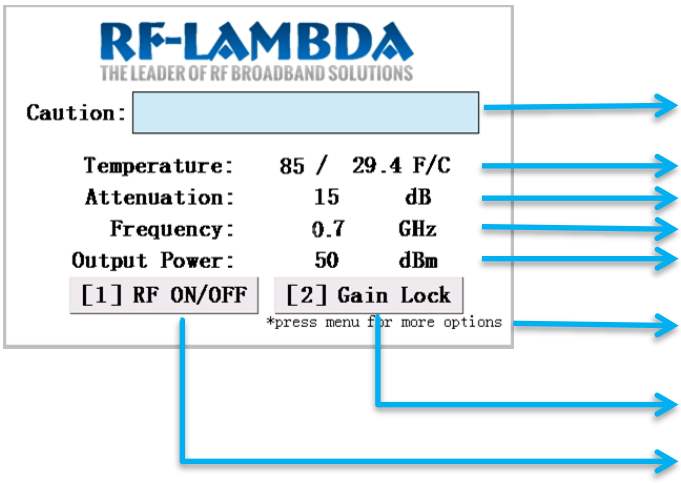




The front panel LCD screen will display the error code or error message when instrument self protection is triggered. Front panel alarm indicator will light up.
To eliminate the error code, press “RESET” on front panel keypad to reboot the instrument and clear the alarms.
If error code can not be eliminated 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

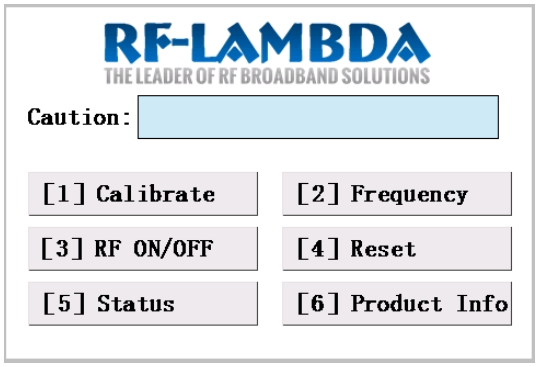
Instrument RF output power

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.

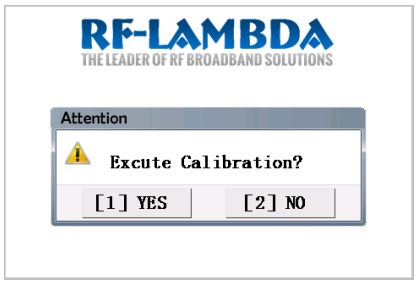
“**[2] Frequency**” enters RF input signal center frequency.

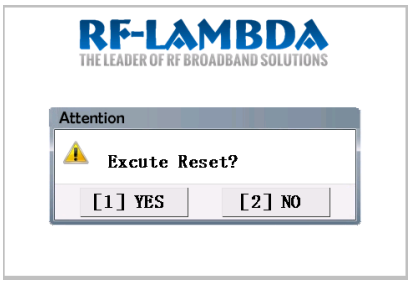
“**[3] RF ON/OFF**” switches the RF output port on or off.

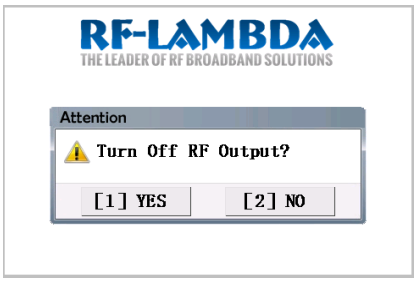
“**[4] Reset**” Restarts the instrument (Turns RF output off)

“**[5] Status**” enters instrument status display page.

“**[6] Product Info**” displays product part number and serial number



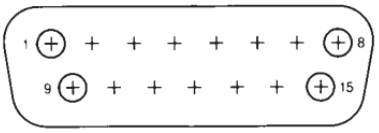




All action functions will ask for confirming execution when selected from function selection menu.

Protection Connector Table

Male D-Sub is on the housing
The mating Female part number: 172-E15-203R001



Pin #	Name	Function	Initial State	Description	Applied
1	Reset	Control	HIGH	Resets PA when logic LOW is applied and released	Yes
2	Switch Disable	Control	HIGH	Applying logic LOW disconnects RF signal of amplifiers	Yes
3	Drain Disable	Control	HIGH	Applying logic LOW disables drains of amplifiers	Yes
4	Gate Disable	Control	HIGH	Applying logic LOW disables gates of amplifiers	Yes
5	RF Input Over Drive	Indicator	LOW	Pin will be latched to logic HIGH when input signal is over limit	Yes
6	Over Current	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached	Yes
7	Over Temp	Indicator	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	Yes
8	VSWR	Indicator	LOW	Pin will be latched to logic HIGH when output reflection is over limit	Yes
9	ACDC Alarm	Indicator	LOW	Pin will be latched to logic HIGH when ACDC limit is reached	Yes
10	Fan Alarm	Indicator	LOW	Pin will be latched to logic HIGH when Fan limit is reached	Yes
11	PA-OFF	Indicator	LOW	Amplifier working state, high level is off	Yes
12	PA output FW power	Indicator	VOLTAGE	PA output forward detection is represented by voltage	Yes
13	PA output RE power	Indicator	VOLTAGE	PA output reverse detection is represented by voltage	Yes
14	+5V-User	Power	+5V	+5V DC is supplied for reference(700mA)	Yes
15	GND	Ground	GND	Ground	Yes

Notes:
- HIGH/LOW voltages are standard TTL signals 0V to 0.8V = LOW. 2.8V to 5V = HIGH. Input current is 10uA.
- Matching connector and cable will be shipped with the product.
- Applied=Yes means the feature is included. Applied=No means the feature is not included with this model.
- 5V reference supply can source 700mA.
- Indicator output signals can source 24mA.

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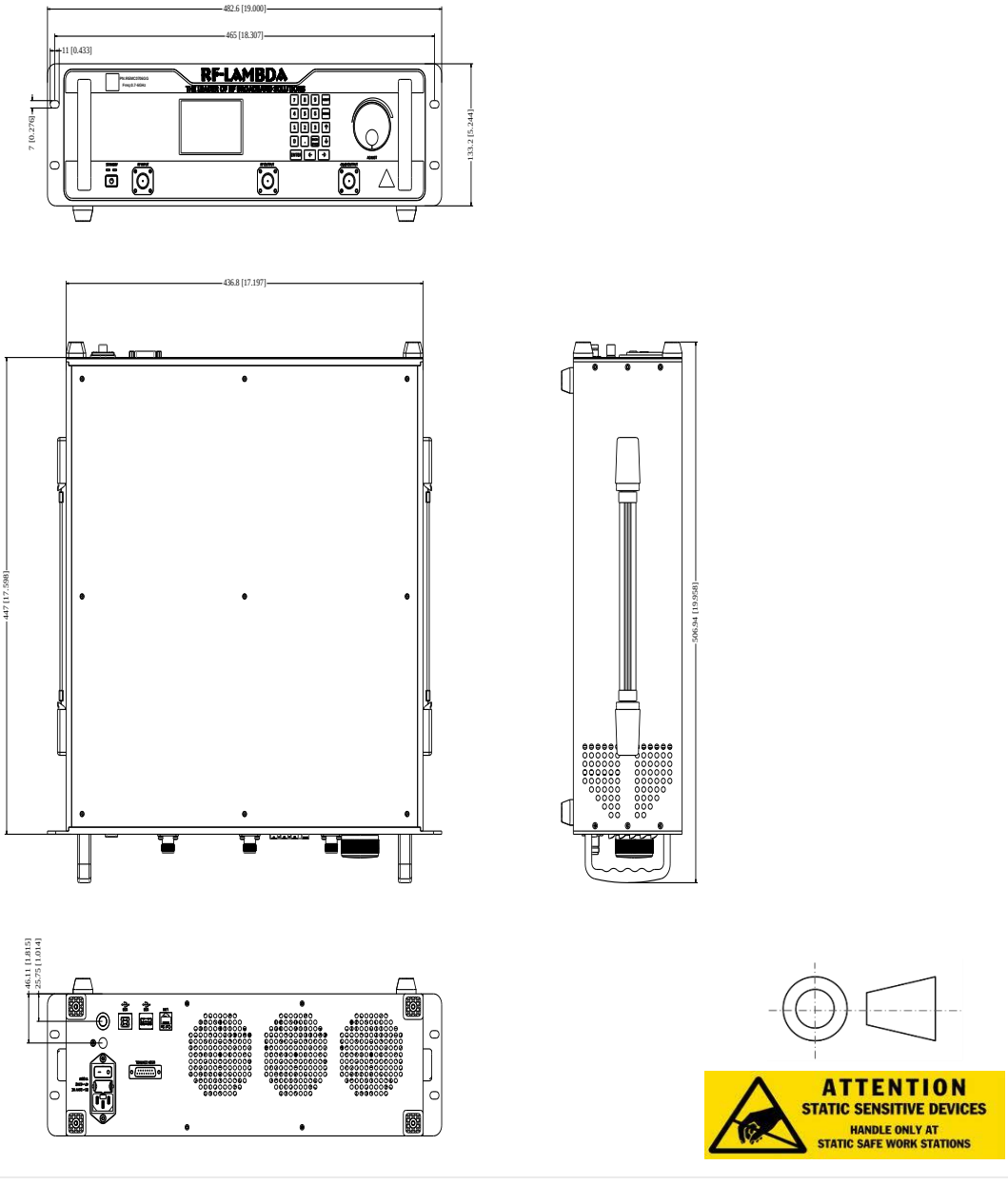
Outline Drawing

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

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Ordering Information

Part Number	Modification	Description
REMC50M500M	Input connector N-Type and Output connector N-Type	50MHz-500MHz EMC 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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