Wideband EMC Benchtop Power Amplifier 0.2GHz-2.5GHz

Product Description

REMC0225G100A is a wideband EMC power amplifier with a frequency range of 0.2 to 2.5GHz.

The power output of this amplifier is 48.5dBm typical. The typical small signal gain is 55dB with a flatness of ±3dB. This excellent performance is achieved through the use of GaN devices.

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

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 48.5dBm Typical
- Supply Voltage 110/220 VAC
- 50 Ohm Matched Input/Output
- Over temperature protection
- Over current protection

Typical Applications

- Wireless Infrastructure
- 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		0.2		2.5	GHz
Small Signal Gain		50	55		dB
Gain Flatness			±3.0		dB
Gain Variation Over Temperature (0ºC to +50ºC)			±2.0		dB
Input VSWR			1.2	1.5	:1
Output 1dB Compression Point (P1dB)			47.5		dBm
Saturated Output Power (Psat) (CW)		47	48.5		dBm
Supply Current (220V AC)			1.5	3.0	A
IM3			-20		dBc
Power Added Efficiency (PAE)			30		%
Turn On/Off Speed (Switch Disable)	ON		200		ns
	OFF		200		ns
Turn On/Off Speed (Drain Disable)	ON		15		us
	OFF		600		us
Turn On/Off Speed (Gate Disable)	ON		650		us
	OFF		200		us
Weight			49.3 Max.		lbs.
Impedance			50		Ohms
Input / Output Connectors			N-Female		
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	90VAC to 264VAC
*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	-40ºC to +85ºC
Thermal Shock	0ºC → +50ºC (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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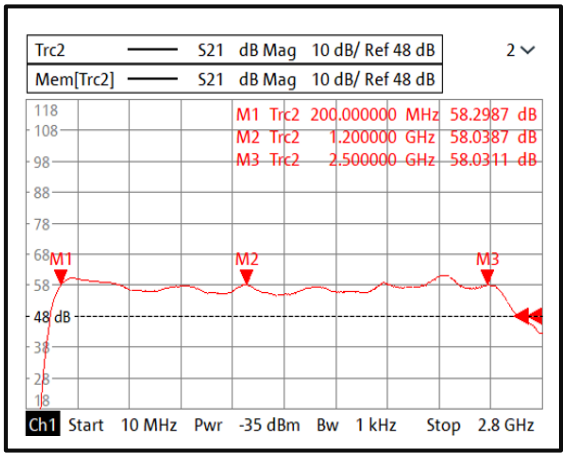
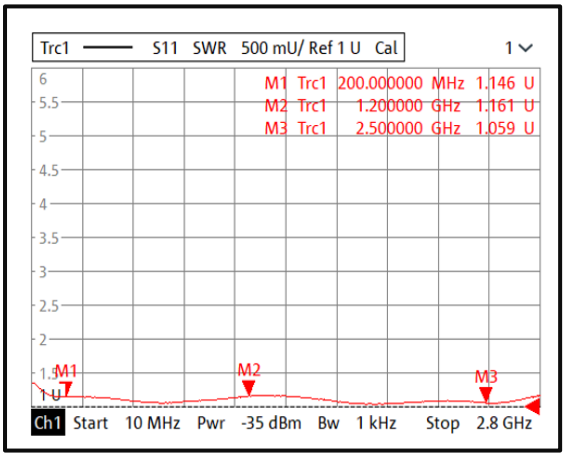
Typical Performance Plots

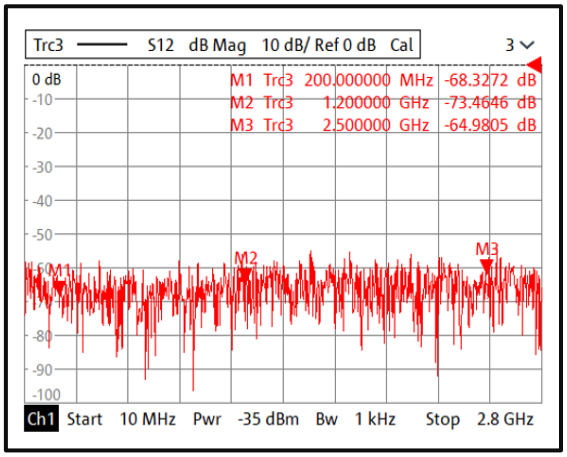
Gain



Input VSWR



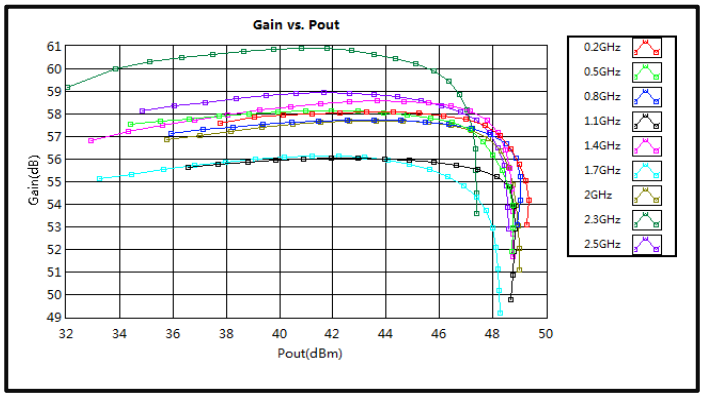
Isolation



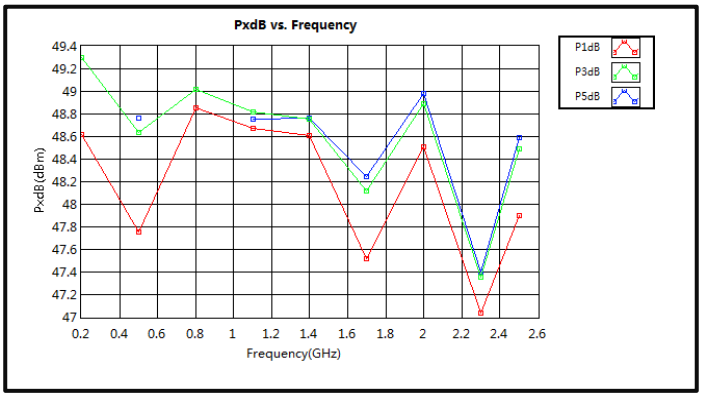
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

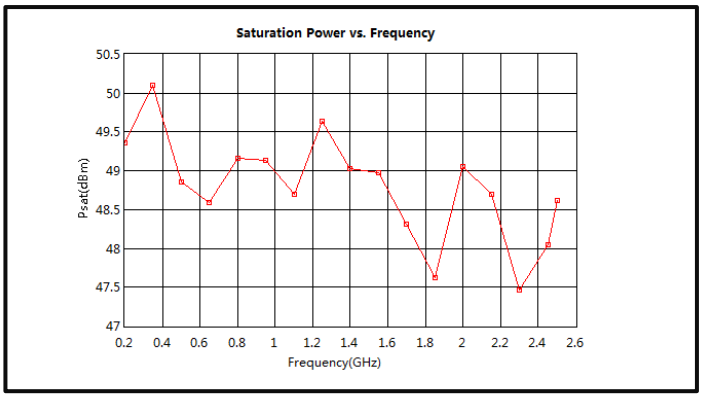
Gain vs. Output Power CW



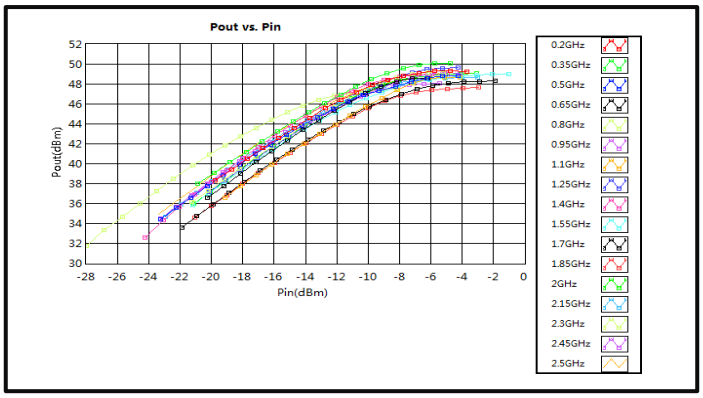
PndB vs. Frequency CW



Saturation Power vs. Frequency CW

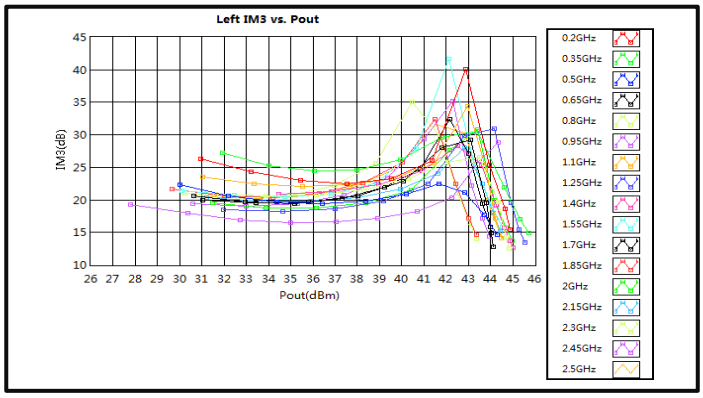


Pout vs. Pin

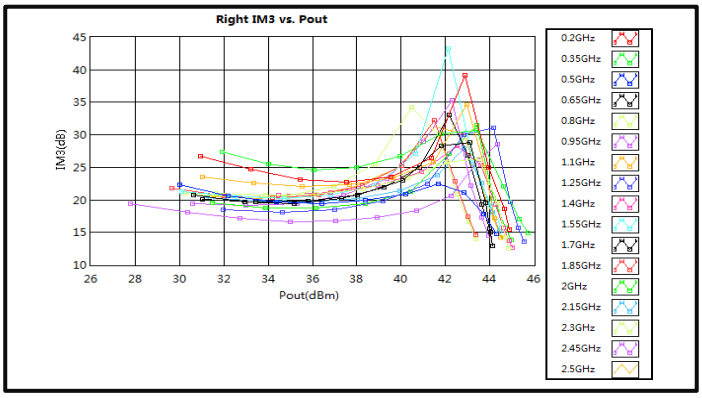


Typical Performance Plots

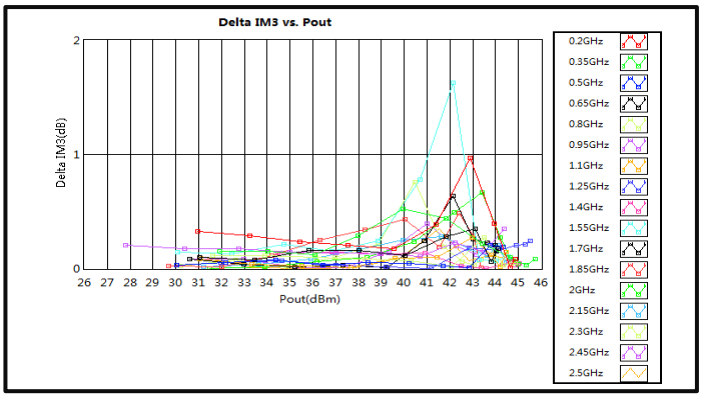
Left IM3 vs. Pout



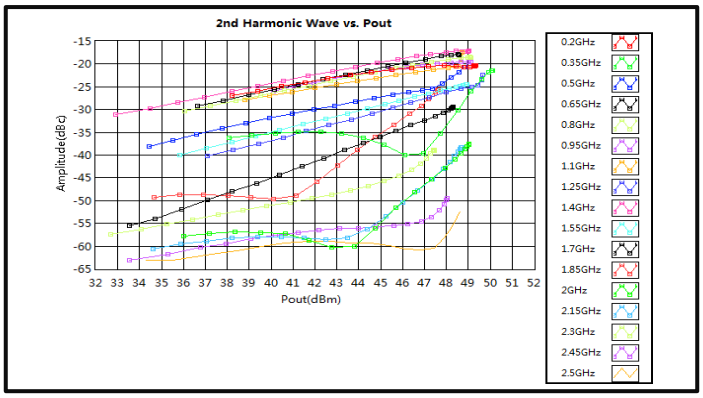
Right IM3 vs. Pout



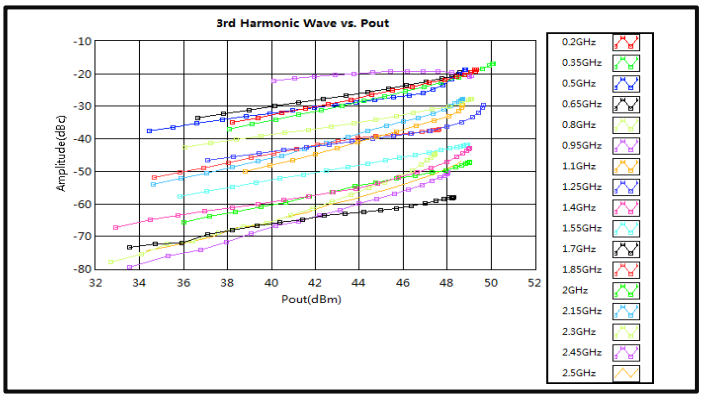
Delta IM3 vs. Pout



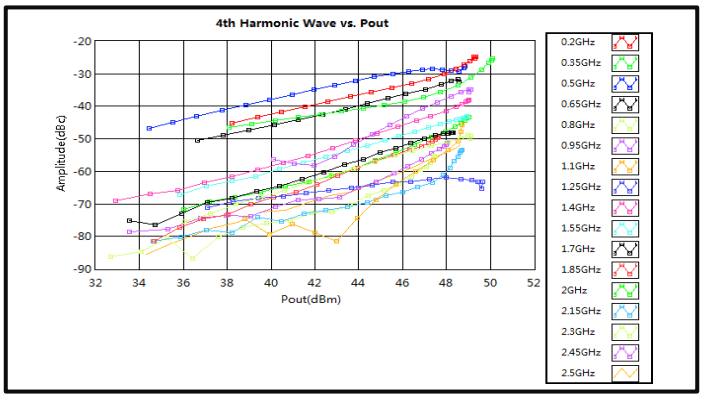
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power



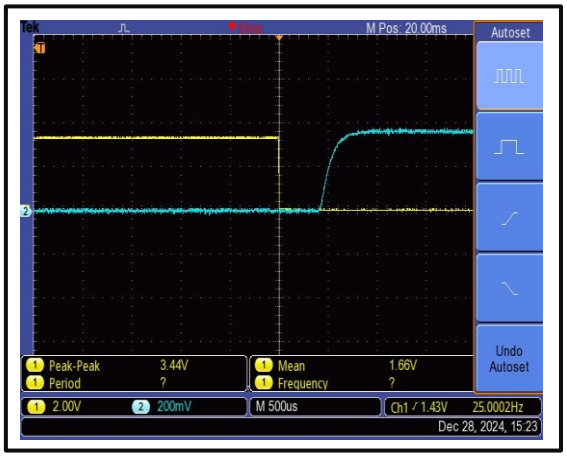
4th Harmonic Wave Output Power



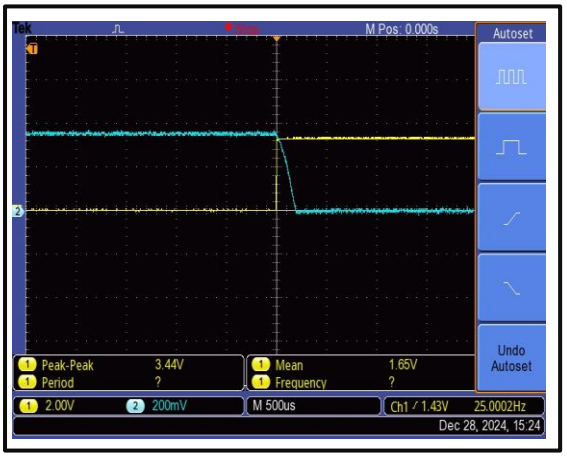
Note: IM3 test performed with 1MHz tone spacing

Typical Performance Plots

The Gates Open Time is 650 us @+25℃



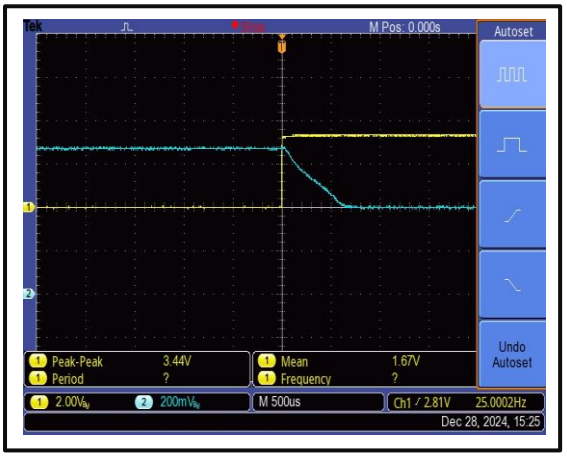
The Gates Closure Time is 200 us @+25℃



The gate control port：D-sub 15 PIN #2 (Gate Disable).
The yellow curve is the gate control signal, the blue curve is RF output envelope.

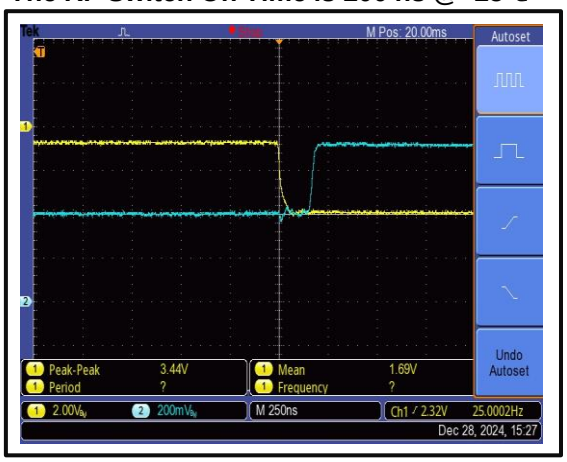
The Drains Open Time is 15 us @+25℃

The Drains Closure Time is 600 us @+25℃

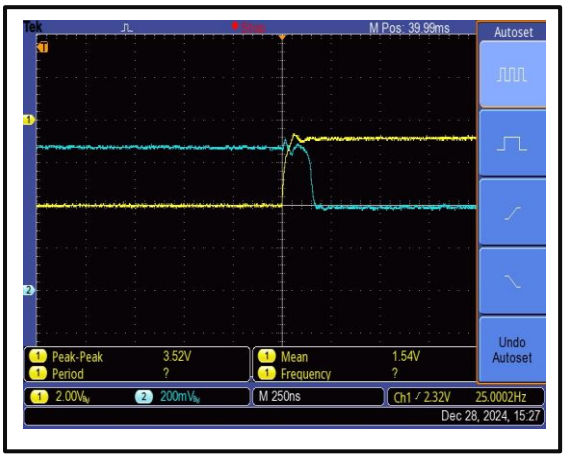


The drain control port：D-sub 15 PIN #3(Drain Disable).
The yellow curve is the drain control signal, the blue curve is RF output envelope.

The RF Switch On Time is 200 ns @+25℃



The RF Switch Off Time is 200 ns @+25℃

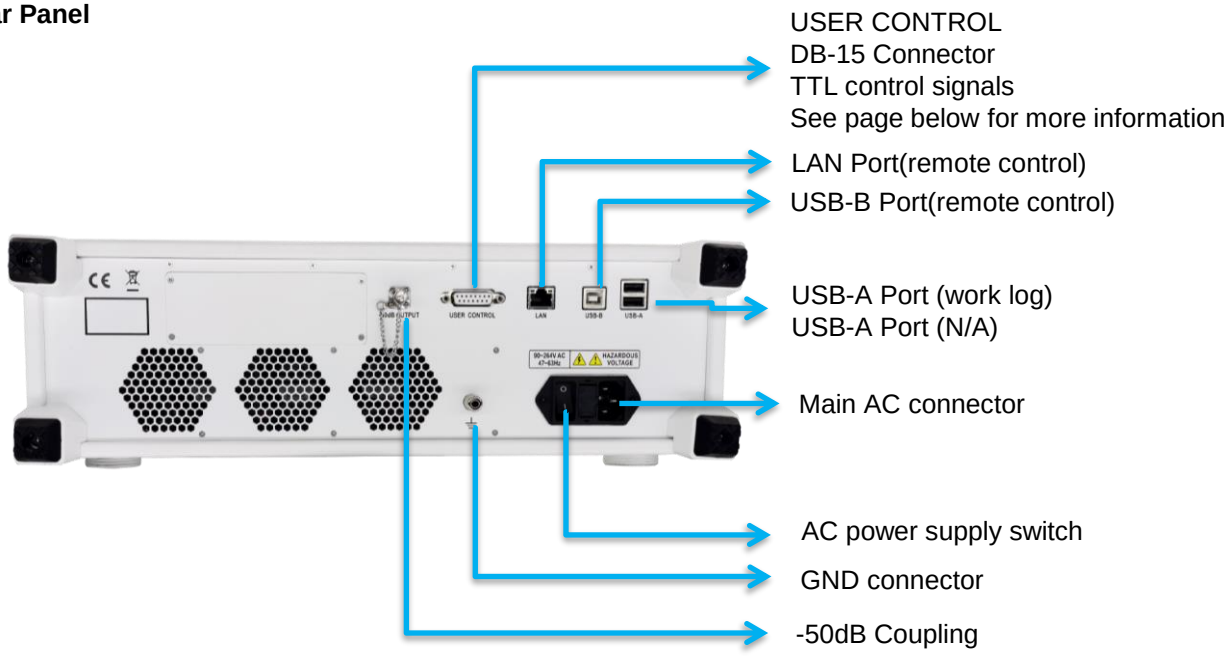


Switch control port: D-sub 15 PIN #10(Switch Disable) .
The yellow curve is the switch control signal, the blue curve is RF output envelope.

EMC Equipment Specifications

Front Panel

Rear Panel



Front Panel LCD Screen Display

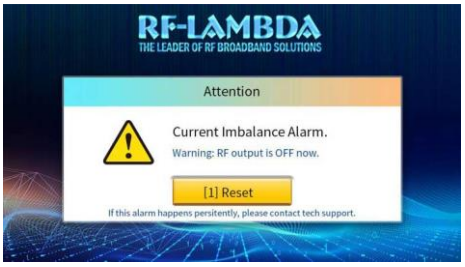
Switching On The Instrument

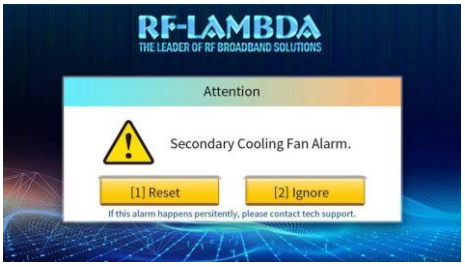
Please follow the instructions on the front panel LCD screen after switching on the power.
Press “1” on keypad to continue.

Self Calibration Screen

The Calibration key is invalid.

Instrument Protection Alarms





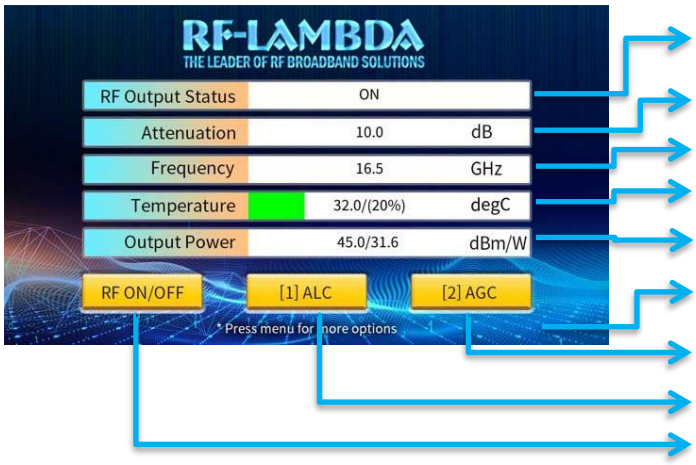
The front panel LCD screen will display the error code or error message when instrument self protection is triggered. Front panel alarm indicator will light up.

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: ON or OFF

RF output attenuation (Change with adjustment knob)

RF input signal frequency (For illustrative purposes only)

Instrument temperature (For illustrative purposes only)

Instrument RF output power (For illustrative purposes only)

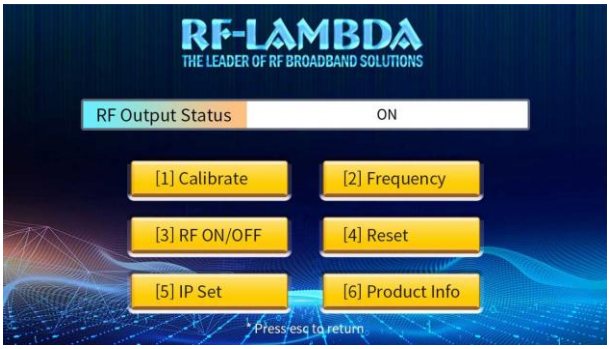
Press “Menu” on keypad to enter instrument functions selection menu

AGC mode, this function is invalid

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**” the calibrate key is invalid

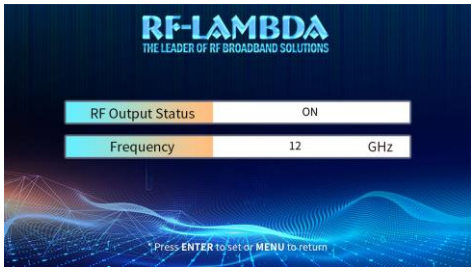
“**[2] Frequency**” enters RF input signal frequency

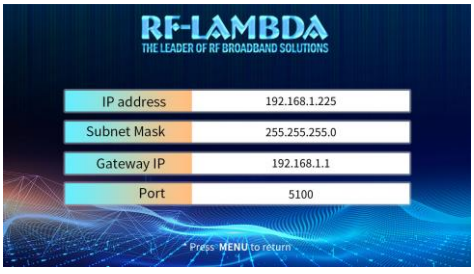
“**[3] RF ON/OFF**” switches the RF output port on or off

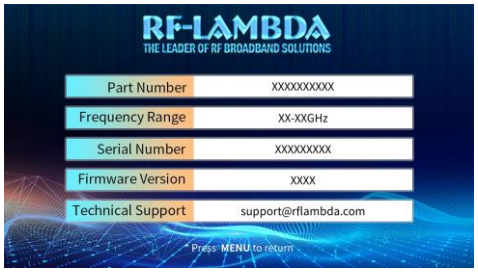
“**[4] Reset**” Restarts the instrument (Turns RF output off)

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

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





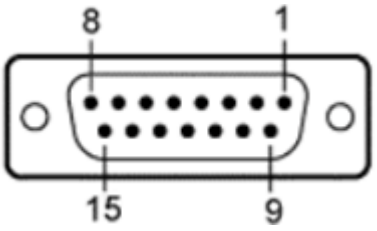


All action functions will ask for confirming execution when selected from function selection menu.

Note: The data shown here is just for presentation.

Protection Connector Table

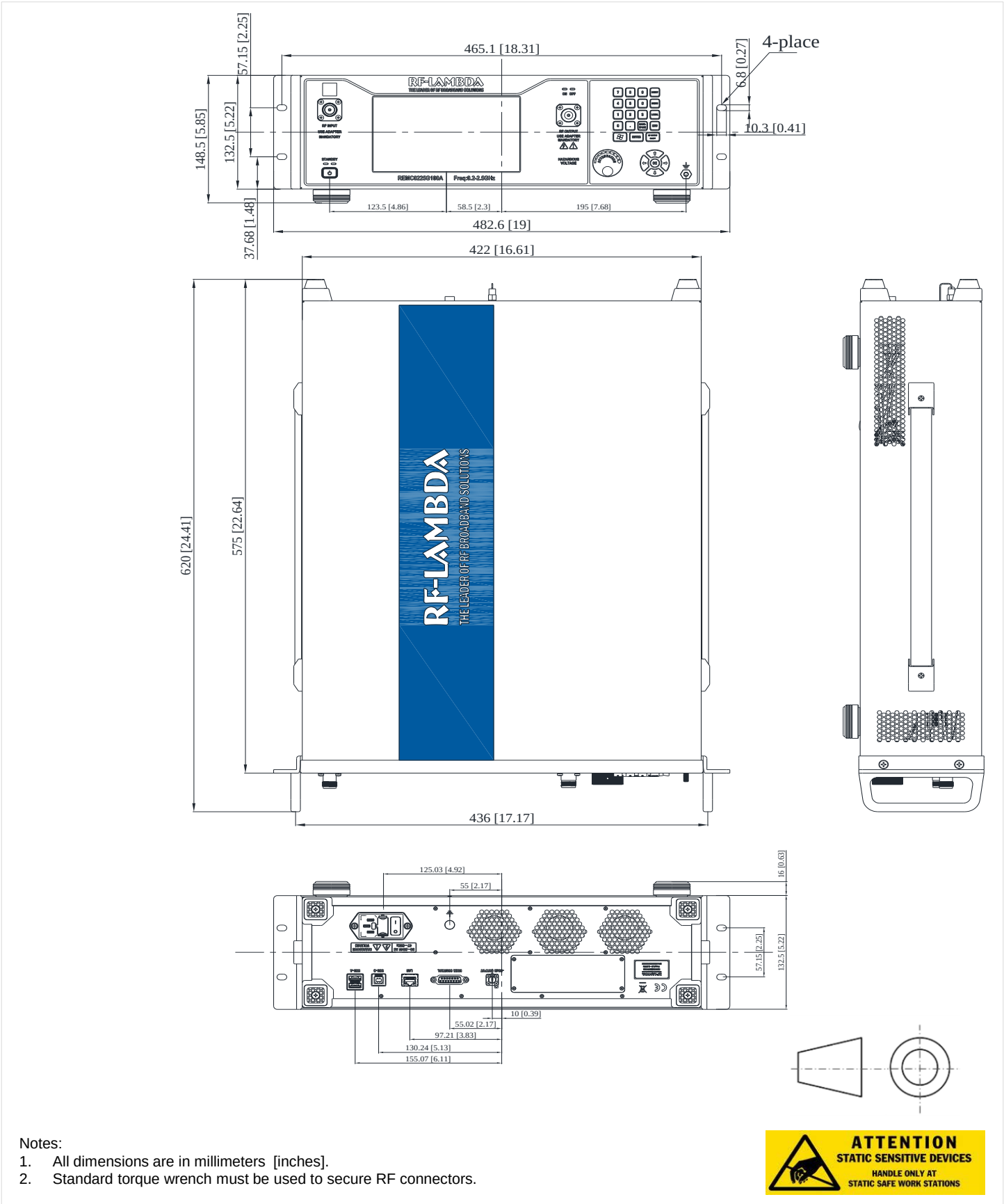
Female D-Sub is on the housing
The mating Male part number: 172-E15-103R001



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	Applying logic HIGH disable gates of amplifiers	Yes
3	Drain Disable	Control	LOW	Applying logic HIGH disable drains of amplifiers	Yes
4	RF Input Over Drive	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	Current Imbalance	Indicator	LOW	Pin will be latched to logic HIGH when an imbalance in the drain current of the combining branches occurs	NO
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 supplied for reference (200mA)	Yes
15	GND	Ground	GND	Ground	Yes

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

Outline Drawing



Notes:
1. All dimensions are in millimeters [inches].
2. Standard torque wrench must be used to secure RF connectors.

Packing List

ID	Description	QTY
1	Fig a. AC power supply line	1

Fig a.

Ordering Information

Part Number	Modification	Description
REMC0225G100A	Input connector N-Female Type and Output connector N-Female Type	0.2GHz-2.5GHz 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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