

RF-LAMBDA

THE LEADER OF RF BROADBAND SOLUTIONS

EMC Benchtop Power Amplifier
63W 18-40GHz
(Optional Built-In Signal Generator)

REMC18G40GD



Sales: sales@rflambda.com

Technical: support@rflambda.com

Rev 7. 05-26-2026 | Subject to change without notice

www.rflambda.com

PRODUCT SUMMARY

PRODUCT OVERVIEW

GENERAL DESCRIPTION

The **REMC18G40GD** is a wideband EMC power amplifier covering **18 to 40 GHz**, designed for high-performance EMC and RF test applications. Built with advanced GaN technology, it delivers **48 dBm** typical output power, 60 dB typical small-signal gain, and ± 5 dB gain flatness across the operating band.

An **optional integrated signal generator** supports **signal pre-programming** and **frequency hopping** for flexible automated testing. The amplifier also features internal calibration for stable performance over time and temperature variations. It includes a 2.92 mm male RF input and WRD180C24 waveguide output, with an operating temperature range of 0°C to +50°C.



FEATURES

- » Wide band EMC Solid State Power Amplifier
- » Small Signal Gain 60dB Typical
- » Output Saturation Power 48dBm Typical
- » Supply Voltage 110/220 VAC
- » 50 Ohm Matched Input / Output
- » Fast RF Blanking
- » Real Time VSWR measurement
- » Internal Signal Generator – Optional
- » Over temperature Protection
- » Over current Protection
- » Over voltage 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

QUALITY STANDARDS



ESD Policy

https://rflambda.com/pdf/rflambda_esd_control.pdf

Random Vibration Test Standard

https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf

Connector Torque Specifications

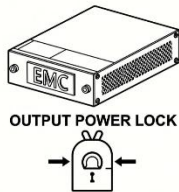
https://www.rflambda.com/pdf/Torque_Specifications.pdf

Parameter	Description
Operational Temperature	0°C to +50°C (Ambient Temperature)
Thermal Shock	0°C → +50°C (5 Cycles / 10 hours, Only internal modules tested prior to final assembly)
*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
Storage Temperature	-40°C to +85°C

*For vibration testing details please see additional information section.

RF-Lambda is ISO: 9000 certified with 25,000 ft² combined R&D and production space, including an ISO7 10K Clean Room to meet ISO-14644-1.

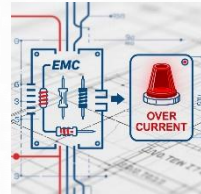
PRODUCT FUNCTIONS



Local/Remote Control Toggle



Select control mode:
Local (direct) or Remote (network)



1 EMC Functions

- Output Power Lock
- Automatic Calibration

2 Mode Selections

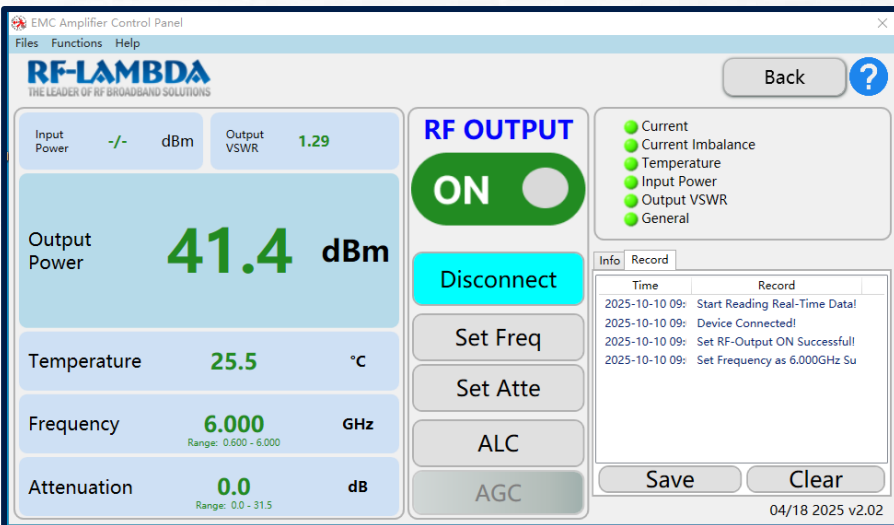
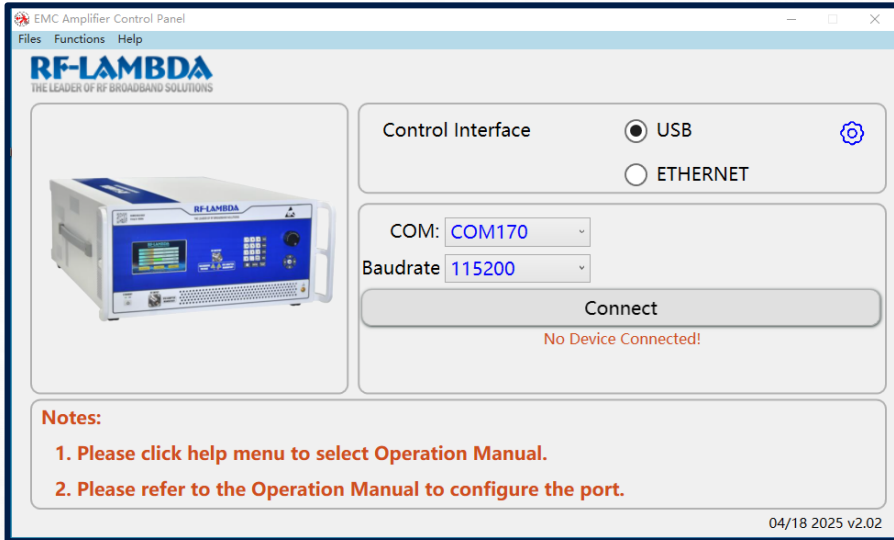
- Local
- Remote Control

3 Product Safety Interlock

- Input Power Overload Protection
- Output Mismatch Protection
- Over Temperature Protection
- Over Current Protection
- Cooling System Anomaly Protection

Category	Function	Included	Optional (Licensing)	Optional (Hardware)	NOT Applicable
Product Safety Interlock	Input Overload Protection	☒	☐	☐	☐
	Output VSWR Protection	☒	☐	☐	☐
	Current Overload Protection	☒	☐	☐	☐
	Temperature Protection	☒	☐	☐	☐
	Current Imbalance Protection	☒	☐	☐	☐
	Overvoltage and Undervoltage Protection	☒	☐	☐	☐
	AC Power Abnormality Protection	☒	☐	☐	☐
	Fan Abnormality Protection	☒	☐	☐	☐
User Operation Functions	USB, LAN Communication	☒	☐	☐	☐
	DB Interface	☒	☐	☐	☐
	Self-Calibration Function	☒	☐	☐	☐
	Gain Compensation Over Temperature	☒	☐	☐	☐
	Current Compensation Over Temperature	☒	☐	☐	☐
	TDD Control - RF Switch Enable	☒	☐	☐	☐
	TDD Control - Positive Voltage Enable	☒	☐	☐	☐
	TDD Control - Negative Voltage Enable	☒	☐	☐	☐
	GUI Interface	☒	☐	☐	☐
	Parameter Setting	☒	☐	☐	☐
	Gain Calibration Each Stage	☒	☐	☐	☐
	Software ON/OFF Function	☒	☐	☐	☐
	Modularized System Integration	☒	☐	☐	☐
	Remote Software Control ON/OFF	☒	☐	☐	☐
	Rotary Gain Adjustment	☒	☐	☐	☐
EMC Functions	Screen Protection Function	☒	☐	☐	☐
	Touch Screen Display	☒	☐	☐	☐
	Developer Interface	☒	☐	☐	☐
	System Log Recording	☒	☒	☐	☐
User Customization Functions	Output VSWR Measurement	☒	☒	☐	☐
	Input Power Measurement	☒	☒	☐	☐
	ALC - Automatic Loop Control Gain	☒	☒	☐	☐
	AGC - Automatic Gain Control Function	☐	☒	☐	☐
	Input Circulator Protection (Internal Load)	☐	☐	☒	☐
	Output Circulator Protection (Internal Load)	☐	☐	☒	☐
	Waveguide Adapter (E-H)	☐	☐	☒	☐
	Fast RF Blanking	☒	☐	☐	☐
	Single Frequency Output	☐	☒	☐	☐
	Frequency Auto Sweeping	☐	☒	☐	☐
Internal Signal Generator	Frequency Hopping	☐	☒	☐	☐
	Signal Source External Output	☐	☒	☐	☐

REMOTE CONTROL



TECHNICAL DATA SPECIFICATIONS

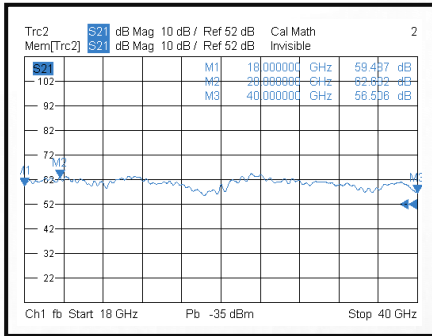
Parameter	Min	Typ	Max	Units
Frequency Range	18		40	GHz
Small Signal Gain	52	60		dB
Gain Flatness		±5		dB
Gain Variation Over Temperature (0°C to 50°C)		±3		dB
Input Return Loss		12		dB
Output 1dB Compression Point (P1dB)		43		dBm
Saturated Output Power (Psat)(CW)	46	48		dBm
Supply Current (220V AC)		3	5	A
Power Added Efficiency (PAE)		10		%
IM3		-30		dBc
*Frequency Step		1		MHz
*Frequency Accuracy		50		KHz
*Single-Sideband (SSB) Phase Noise(29GHz)		-80		dBc/Hz@10KHz
Turn On/Off Speed (Switch Disable)	ON	100		ns
	OFF	100		ns
Turn On/Off Speed (Drain Disable)	ON	100		us
	OFF	200		us
Turn On/Off Speed (Gate Disable)	ON	1500		us
	OFF	200		us
RF Fast Blanking Speed (Optional)	ON	/		us
(Mute RF Output signal and noise)	OFF	/		us
Optional RF Fast Blanking Frequency (Optional)		/		kHz
Weight		66 Max		lbs.
Impedance		50		Ohms
**RF Input Power (RFIN)		Psat – Large Signal Gain		
Package		3U Rack-mount/Tabletop Chassis		
Cooling System		Forced air (Self-contained fan)		
Supply Voltage		90 to 264		VAC
Supply Frequency		47 to 63		Hz
Supply Power		660		W

*Performance parameters of built-in signal source.

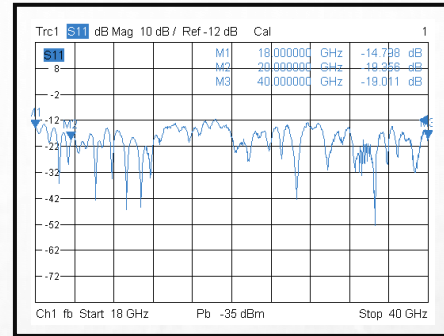
**Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.

TYPICAL PERFORMANCE PLOTS

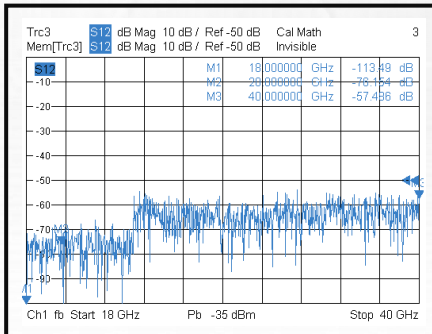
Gain



Input Return Loss



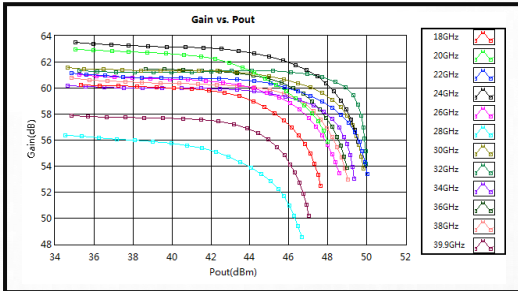
Isolation



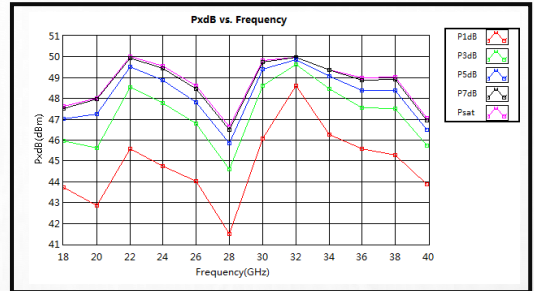
Note: Small signal VNA measurements include attenuators to protect equipment.

TYPICAL PERFORMANCE PLOTS

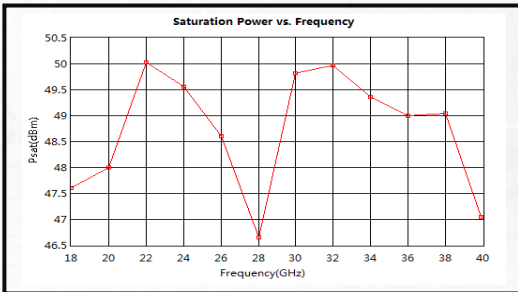
Gain vs. Output Power CW



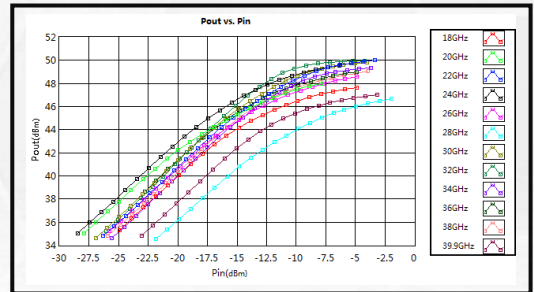
PndB vs. Frequency CW



Saturation Power vs. Frequency CW

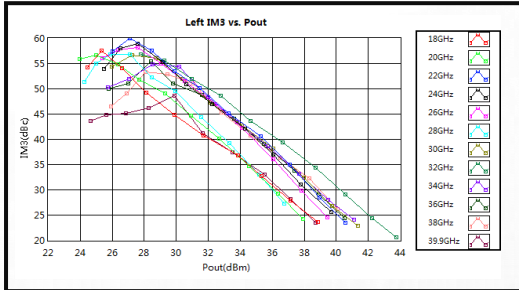


Pout vs. Pin

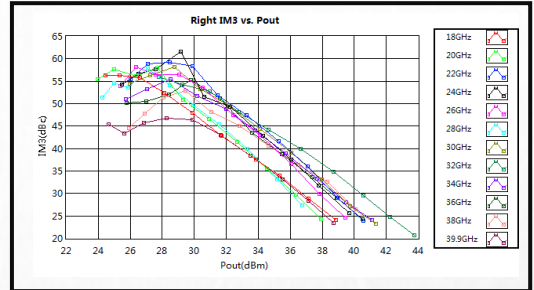


TYPICAL PERFORMANCE PLOTS

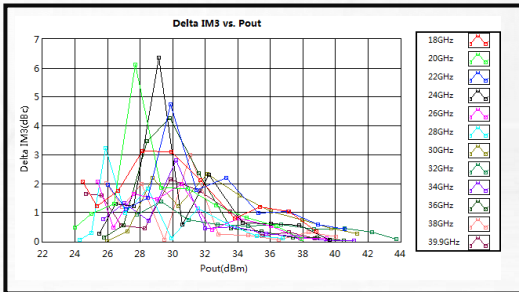
Left IM3 vs. Pout



Right IM3 vs. Pout



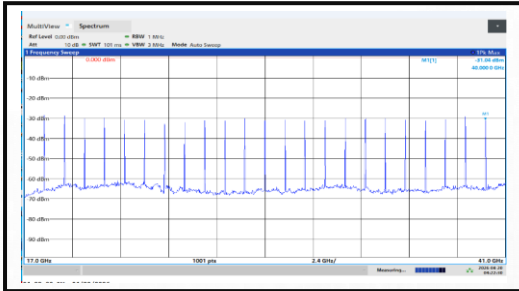
Delta IM3 vs. Pout



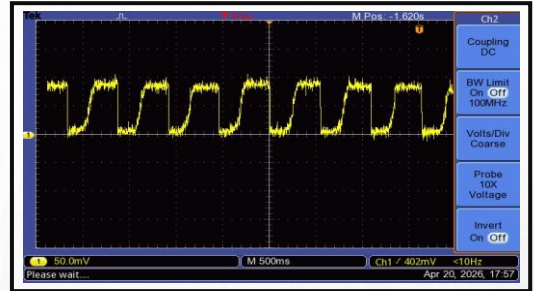
Note: IM3 test performed with 1 MHz tone spacing

TYPICAL PERFORMANCE PLOTS

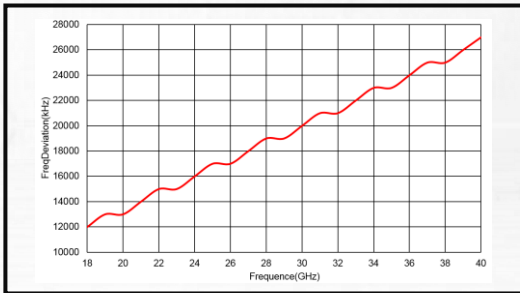
Sweep Frequency Spectrum



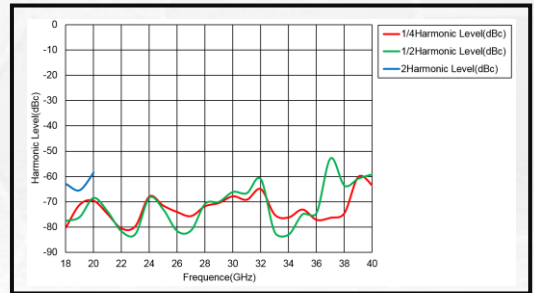
The minimum hopping time is 500 ms



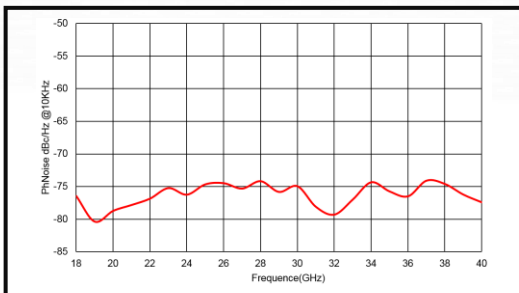
FreqDeviation



Harmonic Level



Phase Noise

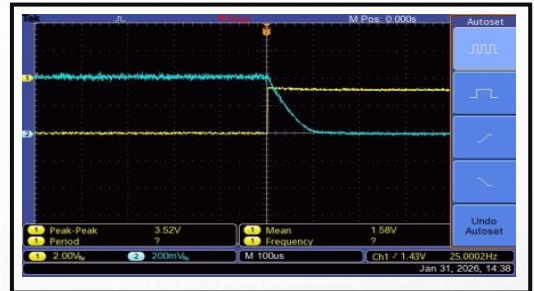


TYPICAL PERFORMANCE PLOTS

The Gates Open Time is 1500 us



The Gates Closure Time is 200 us



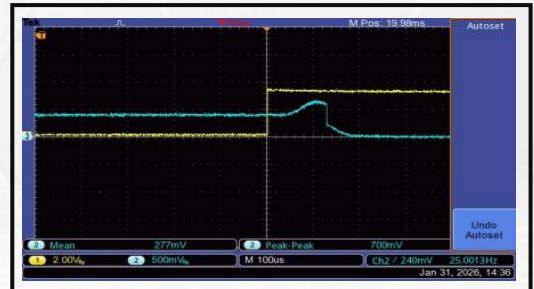
The gate control port : D-sub 15 PIN #2 (Gate Disable).

The yellow curve is the gate control signal, the blue curve is RF output envelope.

The Drains Open Time is 100 us



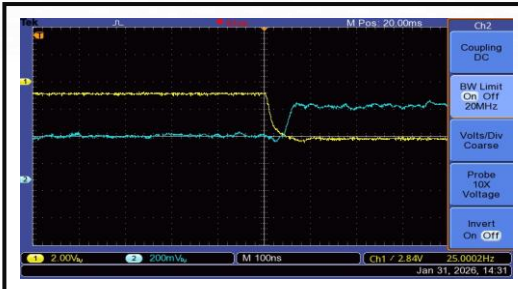
The Drains Closure Time is 200 us



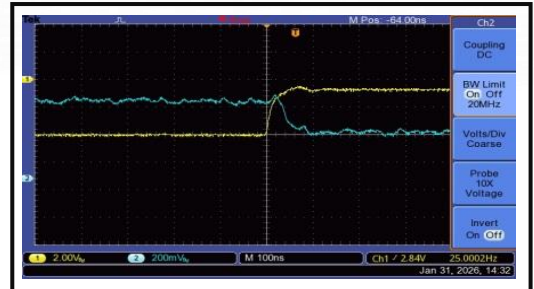
The drain control port : D-sub 15 PIN #3(Drain Disable).

The yellow curve is the drain control signal, the blue curve is RF output envelope.

The RF Switch On Time is 100 ns



The RF Switch Off Time is 100 ns



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.

INSTRUCTIONS FOR USE



CAUTION!

1. Please connect and turn OFF input RF signal.
2. Please verify output-load is connected.

ENTER



Signal Source Selection

[1] External Source **ESC**

[2] Internal Source **ENTER**

[2] Internal Source Function Not Licensed. Please contact Technical Support.



Output Status **ON** Band 18.0 - 40.0 GHz

Frequency **22.8** GHz **MENU**

Output Power **45.2** dBm **[1] Freq. Set**

33.1 W **[2] ALC Set**

ALC **ON** AGC **OFF** **[3] AGC Set**

Temp. 35.2 °C/95.4 °F Atten. 15.5 dB **RF ON/OFF**

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

Please follow the instructions.

Name	Description
RF Output Status	Indicates instrument RF output status. It will display: ON or OFF
Frequency	RF input signal frequency (For illustrative purposes only)
Output Power	Instrument RF output power (For illustrative purposes only)
RF ON/OFF	Switches On or Off for instrument RF output port
ALC	ALC mode , Automatic Loop Control
AGC	AGC mode , Automatic Gain Control, this function is invalid
Temperature	Instrument temperature (For illustrative purposes only)
Attenuation	RF output attenuation (change with adjustment knob)

Power On/Off Procedure

Power On Procedure	Power Off Procedure
1. Connect the back panel grounding post to the common ground wire.	1. Turn off the RF output and the input source signal.
2. Connect RF input and RF output with 50 Ohm source/load. (In band VSWR < 1.9:1 or >10dB VSWR).	2. Turn off the unit, turn off the display, and enter standby mode.
3. Connect the AC power cord, turn on the AC switch, and enter standby mode.	3. Turn off the AC switch and remove the AC power cord.
4. Press the front panel switch button to enter operating mode.	4. Remove RF Connection.
5. Ensure the input signal is a low-power signal and turn on the RF output.	5. Remove ground.

*When using two identical devices simultaneously for testing or power combining applications, it is necessary to add reverse isolation protection measures at the output port of each device to prevent mutual interference from large signals between the devices under different operating conditions, which could cause equipment damage. For example: add an isolator at the output of each device.

INTERNAL SIGNAL GENERATOR

Output Status	ON	Band	18.0 - 40.0 GHz
Frequency	22.8 GHz	MENU	
Output Power	45.2 dBm	[1] Freq. Set	
	33.1 W	[2] ALC Set	
ALC	ON	AGC	OFF
Temp.	35.2 °C/95.4 °F	Atten.	15.5 dB
RF ON/OFF			

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

Signal Source Selection

Signal Source Selection	
[1] External Source	☒
[2] Internal Source	☐
[3] Internal Source Independent Output	☐
NOTE: The amplifier's RF output will turn off when the signal source is changed.	
ESC	
ENTER	

Internal Signal Source Mode

Internal Signal Source Mode	
[1] Single Frequency	☒
[2] Sweep Frequency	☐
[3] Frequency Hopping	☐
ESC	
ENTER	

*Single Frequency Setting

Signal Source Settings	
Frequency (set)	12.500 GHz
Signal Level (set)	-6.5 dBm
Please use the keypad to enter value.	
ESC	
ENTER	

*Real-Time Tuning of Single Frequency Point

Signal Source Settings	
Output Status	ON
Output Power	45.8 dBm
Frequency (set)	15.5 GHz
Signal Level (set)	-5.5 dBm
Please use the keypad to enter value and press 'ENTER' to confirm.	
ESC	
ENTER	

Frequency Sweep Setting

Frequency Sweep Settings	
Start Freq.	18.0 GHz
Step Freq.	40.0 GHz
Stop Freq.	0.5 GHz
Delay	200 ms
Output Power	40.2 dBm
Enter the required data using the keypad, click "Enter" to start sweep.	
ESC	
ENTER	

Frequency Hopping Setting

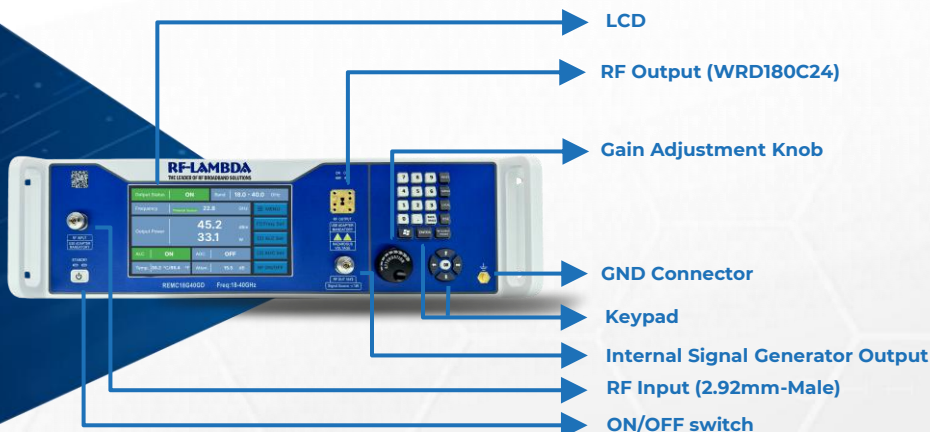
Frequency Hopping Settings							
ID	Freq. (GHz)	RF Power (dBm)	Delay (ms)	ID	Freq. (GHz)	RF Power (dBm)	Delay (ms)
1				13			
2				14			
3				15			
4				16			
5				17			
6				18			
7				19			
8				20			
9				21			
10				22			
11				23			
12				24			
Please use the keypad to enter value, and press 'ENTER' to start the hopping.							
ESC							
ENTER							

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

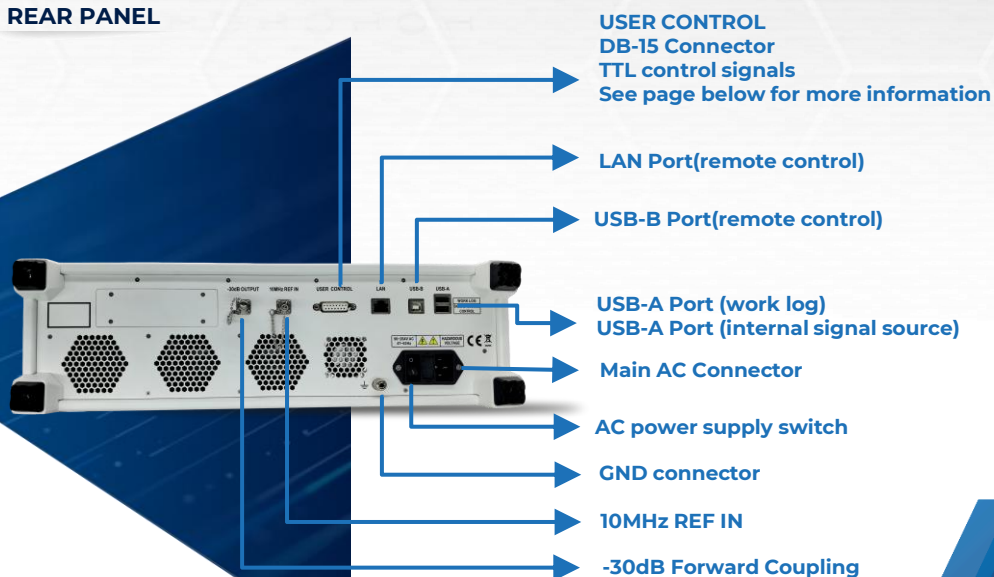
*When setting the signal source power level, you need to press the dot character key twice consecutively to enter a dash (-).

INTERFACE DESCRIPTION

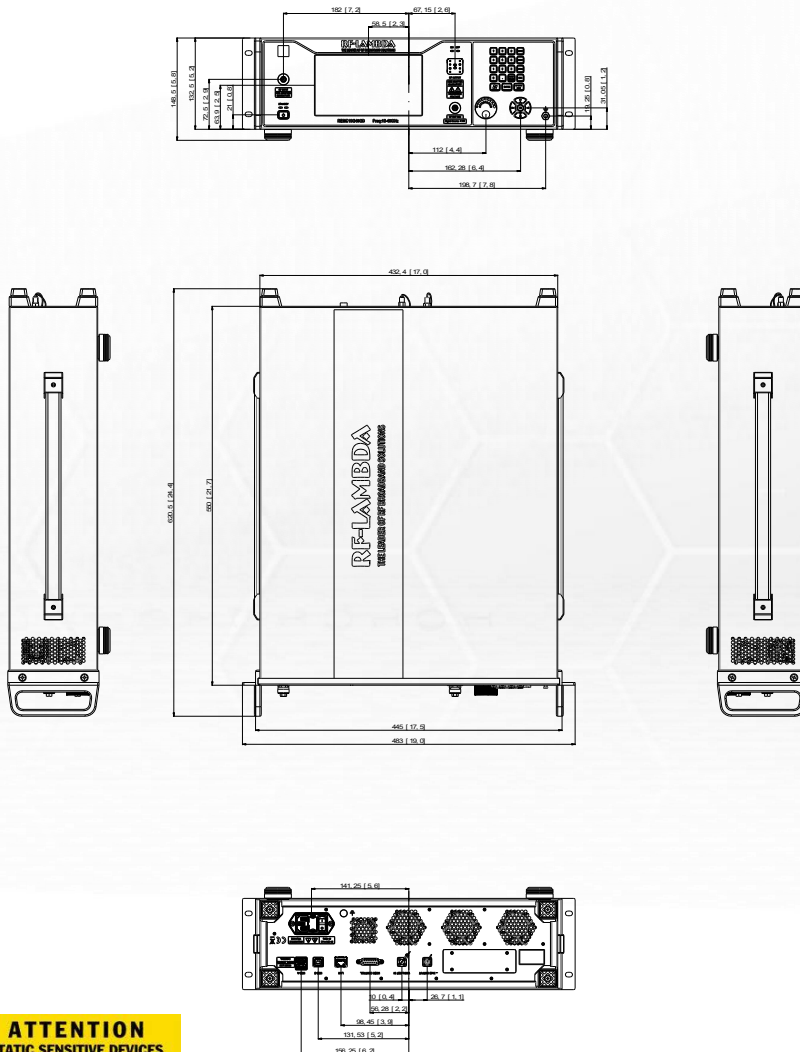
FRONT PANEL



REAR PANEL



OUTLINE DRAWING

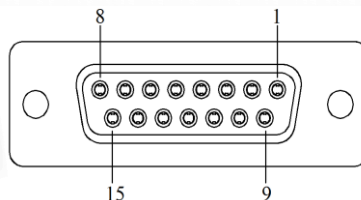


Notes:

1. Package Material: Aluminum
2. Finish: White Paint
3. All dimensions are in millimeters [inches].
4. Standard torque wrench must be used to secure RF connectors.

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	Temperature 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	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 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.

PACKING LIST

ID	Description	QTY
1	Fig a. AC power supply line (Consulting sales)	1
2	Fig b. DB15 cable (RFCBLADB15)	1
3	Fig c. Adapter(RFCARAKFKF)	1
4	Fig d. Waveguide to coaxial adapter(RFWAD180E0COBS) (Consult sales)	0
5	Fig e. Waveguide twist (RFTWWRD180C24) (Consult sales)	0



Fig a.



Fig b.



Fig c.



Fig d.



Fig e.

ORDERING INFORMATION

Part Number	Modification	Description
REMC18G40GD	Input connector 2.92mm-Male and Output connector WRD180C24	18GHz - 40GHz Wideband EMC Benchtop Power Amplifier
REMC18G40GD-SG	Built in Signal Generator	18GHz - 40GHz Wideband EMC Benchtop Power Amplifier With built in Signal Generator

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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