

Ultra Low Phase Noise USB Controlled Signal Generator 0.1GHz-40GHz



Product Description

RSGLP0144GA is an ultra low phase noise USB controlled RF signal generator with a frequency range of 0.1 to 40GHz.

The power output of this RF signal generator is +10dBm. The frequency stability is ± 0.5 ppm using the onboard reference.

The RSGLP0144GA is an easy-to-use high frequency signal generator controlled through a standard USB port. Using advanced VCO and DDS based technology along with a temperature compensated crystal reference, it offers ultra-low phase noise (-129dBc/Hz at 1MHz offset 1GHz output) and high frequency resolution.

The unit can also be locked to an external 10MHz reference source.

Features

- Output Frequency Range: 0.1 ~ 40GHz
- Output Power Range: -20dBm to +23dBm
- Frequency Stability: ± 0.5 ppm with internal reference
- Frequency Step Tuning Speed: <100us
- Tuning Step: 0.001Hz
- Phase Noise @10KHz offset -110dBc/Hz (@10GHz Output Frequency)
- Control Interface: USB

Typical Applications

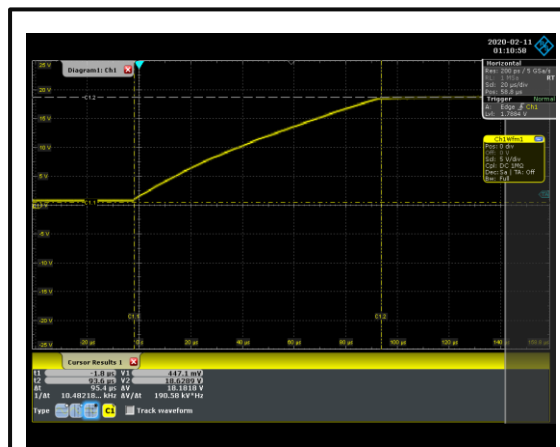
- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

Electrical Specifications ($T_A = +25^\circ\text{C}$)

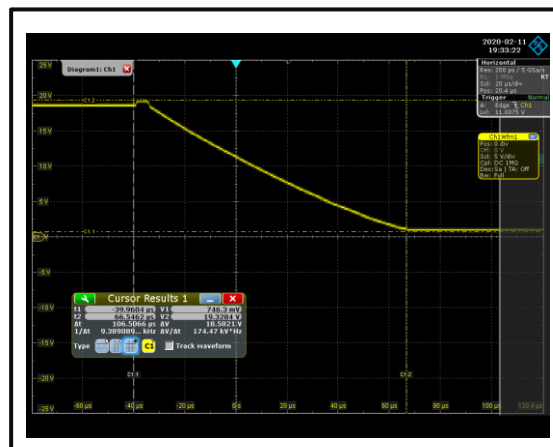
Parameter	Min	Typ	Max	Units
Frequency Range	0.1		40	GHz
Output Power		10		dBm
Output Power Tuning range		31.5dB with 0.5dB step		
Frequency stability		± 0.5		ppm
Frequency Aging(10 years)		± 3		ppm
Tuning Speed (Not including programming time)			110	us
Reference tuning range		± 100		ppm
Tuning Step		0.001		Hz
SFDR 1MHz Tuning Step		60		dBc
Phase Noise @ 10GHz Typical		-116dBc/Hz(@10KH)		
		-117dBc/Hz (@100KHz)		
		-118dBc/Hz (@1MHz)		
		-140dBc/Hz (@10MHz)		
Power Supply Voltage		110 / 240		VAC
Control Interface		USB 2.0		
EXT Reference Input Level(10MHz)	-5		+5	dBm
Weight		5700		g
Output Connector		2.92mm-Female		
External Reference Input Connector		2.92mm-Female		

Typical Performance Plots

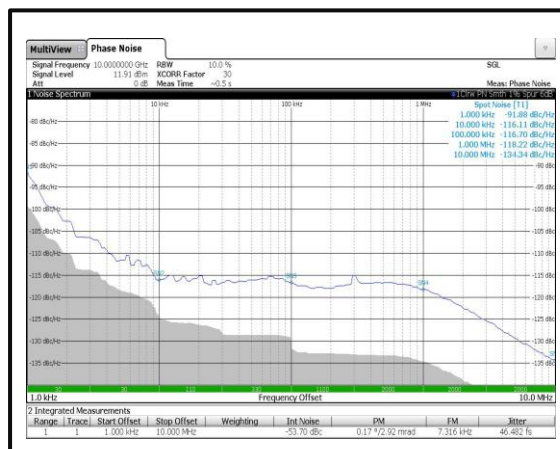
Tuning Speed < 110uS



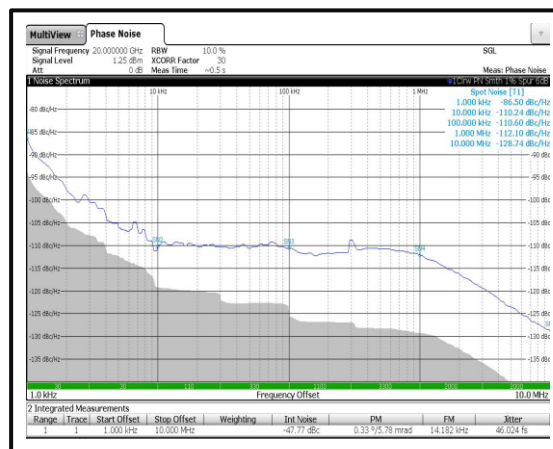
Tuning Speed < 110uS



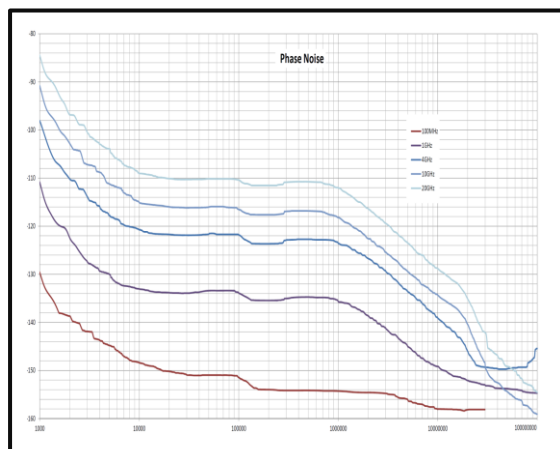
10GHz



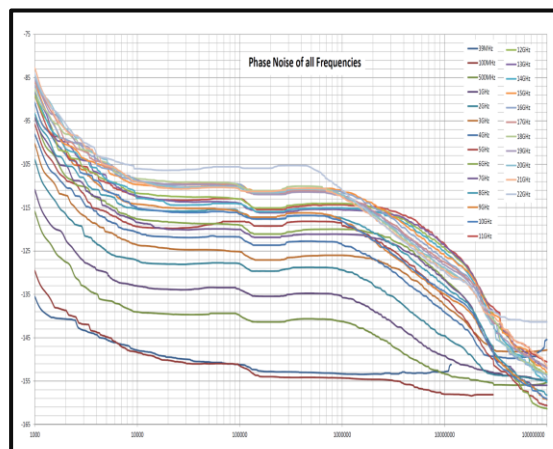
20GHz



Phase Noise

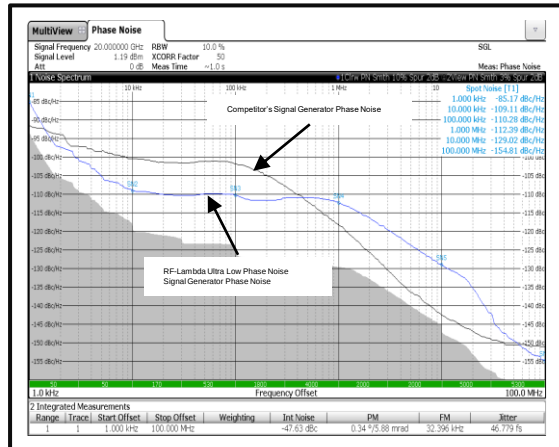


Phase Noise of all Frequencies



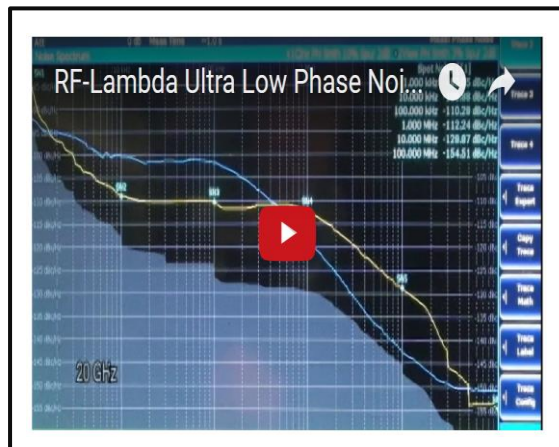
Typical Performance Plots

Phase Noise Comparison



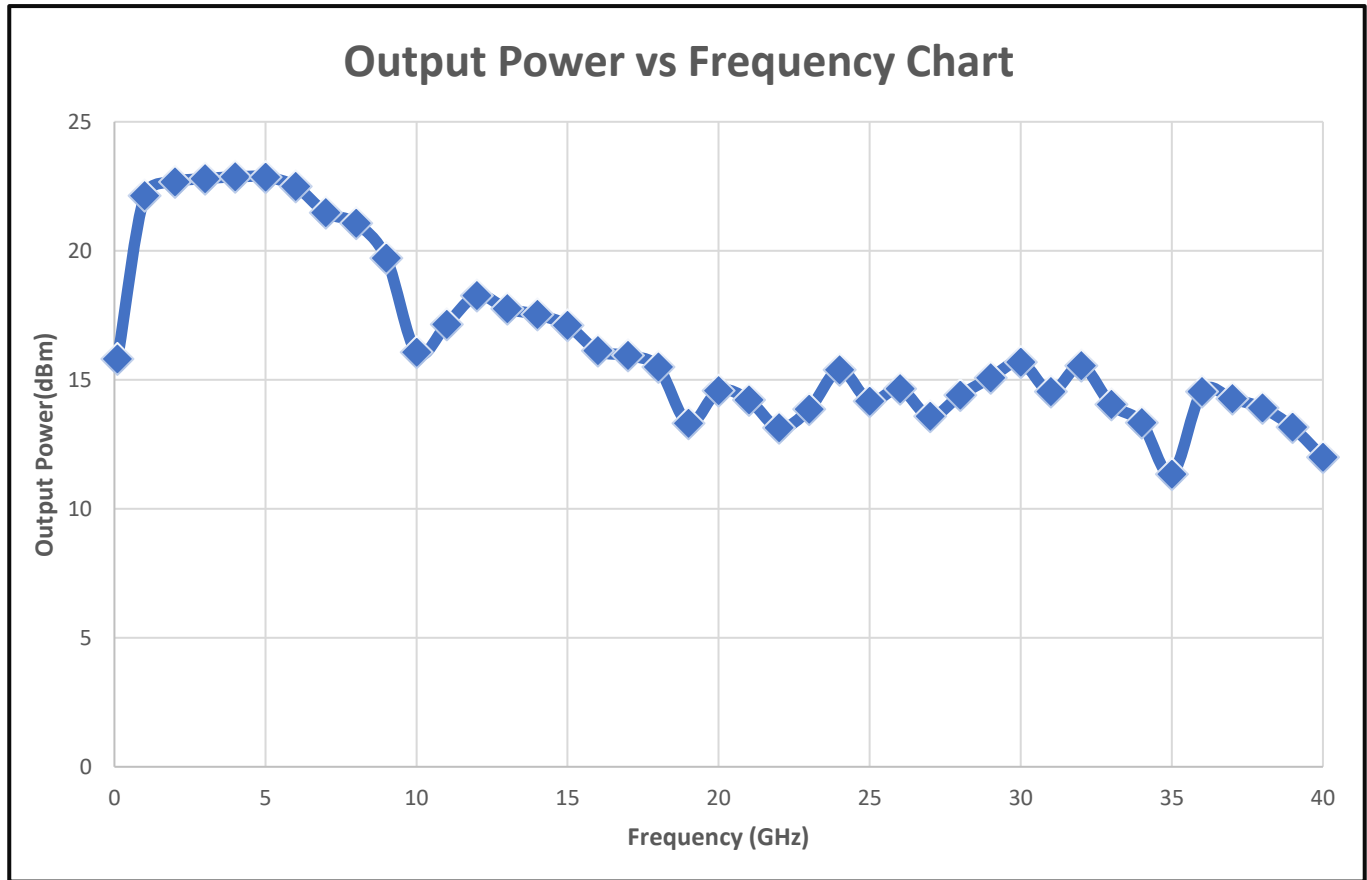
Video Instruction Link:

http://www.rflambda.com/product_signalgenerator.jsp



Typical Performance Plots

Typical Output Power Chart



Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units
Storage Temperature	-40	-	85	°C
Operating Temperature	0	-	70	°C

User Instructions

1. Download the GUI and driver from RF-LAMBDA website.

RF Signal Generator

Frequency Range(GHz): ☒ All



Part Number	Description	Frequency Range (GHz)	Resolution(Hz)	Speed(us)	Max Power(dBm)	10KHz Phase Noise	Spurious(dBc) (V)	Packaging	Inventory	Control Software	PDF	Quote
RSGLP0120GA	USB Control Signal Generator	0.0400~22.0000	0.0010	100	5	-116dBc/Hz @ 10GHz	-60	Coaxial				ADD TO RFQ
RSGLP0144GA	USB Control Signal Generator	0.0100~44.0000	0.0010	100	10	-113dBc/Hz @ 10GHz	-60.00	Coaxial				ADD TO RFQ

2. Driver Installation:

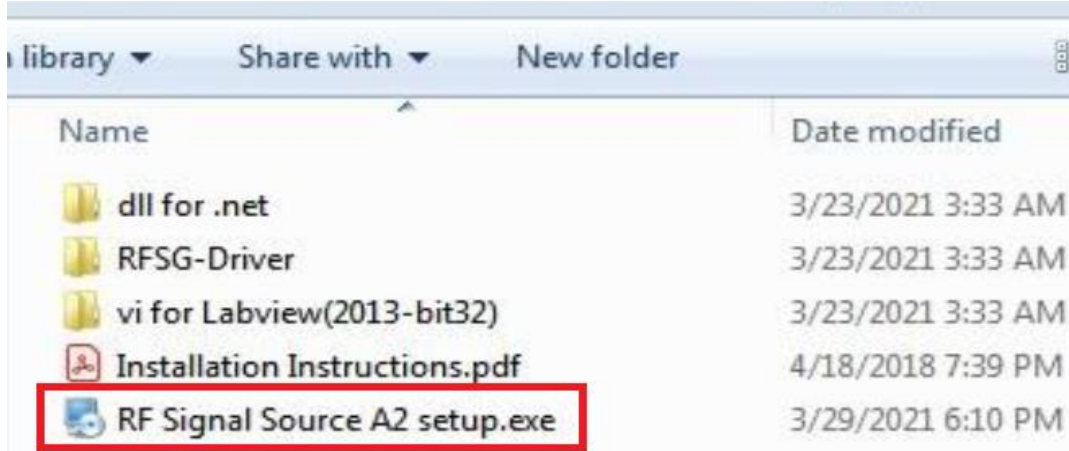
RF Signal Source ▶ RFSG-Driver ▶

library ▼ Share with ▼ New folder

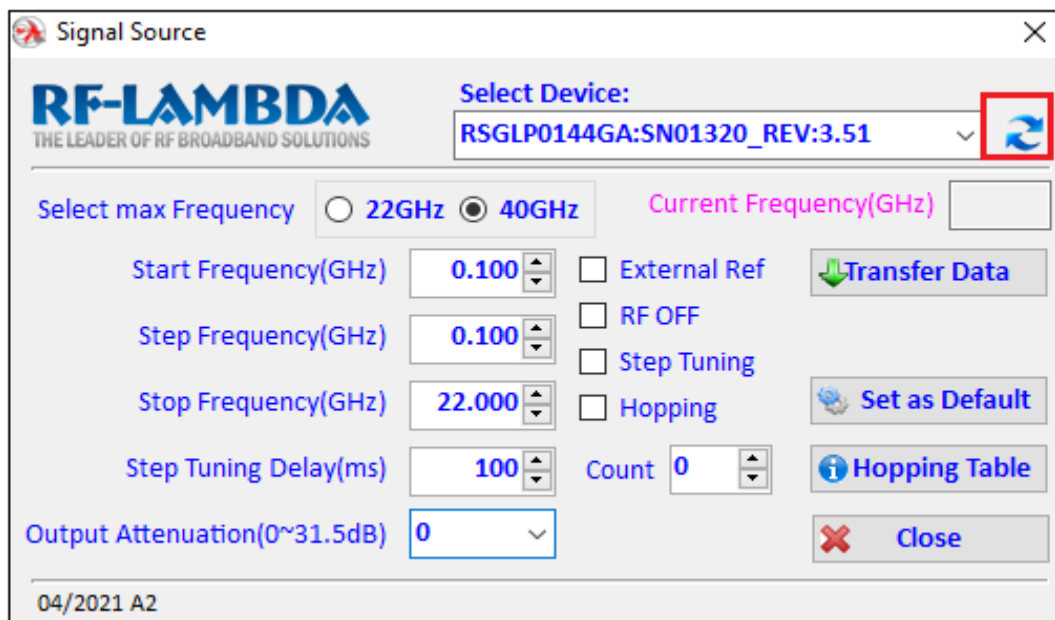
Name	Date modified
x64	3/23/2021 3:33 AM
siusbxp.cat	5/6/2016 12:42 AM
siusbxp.inf	5/6/2016 12:42 AM
USBXpressInstaller_x64.exe	5/6/2016 12:42 AM

User Instructions

3. Install “RF Signal Source A2 Setup.exe”.



4. Connect the USB cable to the device and double click “Signal Source.exe” then turn on the +15V power supply. Right click the refresh button, and then the part number, serial number, and revision number will show up in the top right corner.



Single Frequency Mode

1. Select Max frequency and Start frequency in GHz then click Transfer Data.

Signal Source

RF-LAMBDA
THE LEADER OF RF BROADBAND SOLUTIONS

Select Device: RSGLP0144GA:SN01320_REV:3.51

Select max Frequency: ☐ 22GHz ☒ 40GHz

Current Frequency(GHz)

Start Frequency(GHz): 0.100

Step Frequency(GHz): 0.100

Stop Frequency(GHz): 22.000

Step Tuning Delay(ms): 100

Output Attenuation(0~31.5dB): 0

External Ref ☐

RF OFF ☐

Step Tuning ☐

Hopping ☐

Count: 0

Transfer Data

Set as Default

Hopping Table

Close

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2. External Ref = 10MHz.

3. RF OFF = No output power.

4. Step Tuning = Step Tuning mode

5. Hopping = Hopping mode

Step Tuning Mode

1. Input “Start Frequency”, “Step Frequency”. “Stop Frequency”, and “Step Tuning Delay(ms)”. Check “Step Tuning” mode then click “Transfer Data”. The device will automatically follow the instruction setup to output frequencies and start to looping until the user click stop.

Signal Source

RF-LAMBDA
THE LEADER OF RF BROADBAND SOLUTIONS

Select Device: RSGLP0144GA:SN01320_REV:3.51

Select max Frequency ☐ 22GHz ☒ 40GHz Current Frequency(GHz)

Start Frequency(GHz) 0.100 ☐ External Ref **Transfer Data**

Step Frequency(GHz) 0.100 ☐ RF OFF

Stop Frequency(GHz) 22.000 ☐ Step Tuning

Step Tuning Delay(ms) 100 ☐ Hopping Set as Default

Output Attenuation(0~31.5dB) 0 Count 0 Hopping Table

Close

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A.Start Frequency: The starting frequency in GHz

B.Step Frequency: The difference between each frequency in GHz.

C.Stop Frequency: The last frequency in GHz.

D.Step Tuning Delay(ms): Delay in between each frequency in microseconds.

Hopping Mode

Hopping Mode needs create a file in the installation directory, so please run “Signal Source.exe” as an administrator.

1.Check “Hopping” mode then click Hopping Table.

Signal Source

RF-LAMBDA THE LEADER OF RF BROADBAND SOLUTIONS

Select Device: RSGLP0144GA:SN01320_REV:3.51

Select max Frequency: ☐ 22GHz ☒ 40GHz

Current Frequency(GHz)

Start Frequency(GHz): 0.100

Step Frequency(GHz): 0.100

Stop Frequency(GHz): 22.000

Step Tuning Delay(ms): 100

Output Attenuation(0~31.5dB): 0

☐ External Ref

☐ RF OFF

☐ Step Tuning

☒ Hopping

Count: 0

Transfer Data

Set as Default

Hopping Table

Close

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2. The frequency setup is the same as the “Step Tuning Mode”, after that click “Create Table”. The table give the customer options to manually edit the frequency, attenuation, and delay. After all the modifications click “Save Table Data”. Then click “close”.

Signal Source

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Start Frequency(GHz): 0.039

Step Frequency(GHz): 0.100

Stop Frequency(GHz): 22.000

Step Tuning Delay(ms): 100

Attenuation(0~31.5dB): 0

Create Table

Save Table Data

ID	Frequency(GHz)	Attenuation(dB)	Delay(ms)
1	0.039	0	500
2	1.039	0	500
3	2.039	0	500
4	3.039	0	500
5	4.039	0	500
6	5.039	0	500
7	6.039	0	500
8	7.039	0	500
9	8.039	0	500
10	9.039	0	500
11	10.039	0	500
12	11.039	0	500
13	12.039	0	500
14	13.039	0	500
15	14.039	0	500
16	15.039	0	500

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Close

Hopping Mode

3. Check “Hopping” mode and Click “Transfer Data” to start the hopping function.

The screenshot shows the 'Signal Source' configuration window for the RSGLP0144GA device. The window includes the RF-Lambda logo and the tagline 'THE LEADER OF RF BROADBAND SOLUTIONS'. The 'Select Device' dropdown is set to 'RSGLP0144GA:SN01320_REV:3.51'. Under 'Select max Frequency', the '40GHz' radio button is selected. The 'Current Frequency(GHz)' field is empty. The 'Start Frequency(GHz)' is 0.100, 'Step Frequency(GHz)' is 0.100, and 'Stop Frequency(GHz)' is 22.000. The 'Step Tuning Delay(ms)' is 100. The 'Output Attenuation(0~31.5dB)' is set to 0. On the right, there are checkboxes for 'External Ref', 'RF OFF', 'Step Tuning', and 'Hopping'. The 'Hopping' checkbox is checked and highlighted with a red box. Below these are buttons for 'Transfer Data' (highlighted with a red box), 'Set as Default', 'Hopping Table', and 'Close'. The 'Count' is set to 0. The version '04/2021 A2' is displayed at the bottom left.

Signal Source

RF-LAMBDA
THE LEADER OF RF BROADBAND SOLUTIONS

Select Device: RSGLP0144GA:SN01320_REV:3.51

Select max Frequency ☐ 22GHz ☒ 40GHz

Current Frequency(GHz)

Start Frequency(GHz) 0.100 ☐ External Ref

Step Frequency(GHz) 0.100 ☐ RF OFF

Stop Frequency(GHz) 22.000 ☐ Step Tuning

Step Tuning Delay(ms) 100 ☒ Hopping

Output Attenuation(0~31.5dB) 0

Count 0

Transfer Data

Set as Default

Hopping Table

Close

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Default State

1. Input “Start Frequency”, “Output Attenuation”, and then click “Set as Default”. The device will store the frequency and the attenuation into flash. It will allow the unit automatically output this frequency and attenuation when the device wakes up. If the customer is using external 10MHz reference, please check “External Ref” button and then set the default state into flash.

Signal Source

RF-LAMBDA
THE LEADER OF RF BROADBAND SOLUTIONS

Select Device: **RSGLP0144GA:SN01320_REV:3.51**

Select max Frequency ☐ 22GHz ☒ 40GHz

Current Frequency(GHz)

Start Frequency(GHz) **0.100**

Step Frequency(GHz) **0.100**

Stop Frequency(GHz) **22.000**

Step Tuning Delay(ms) **100**

Output Attenuation(0~31.5dB) **0**

☐ External Ref

☐ RF OFF

☐ Step Tuning

☐ Hopping

Count **0**

Set as Default

Transfer Data

Hopping Table

Close

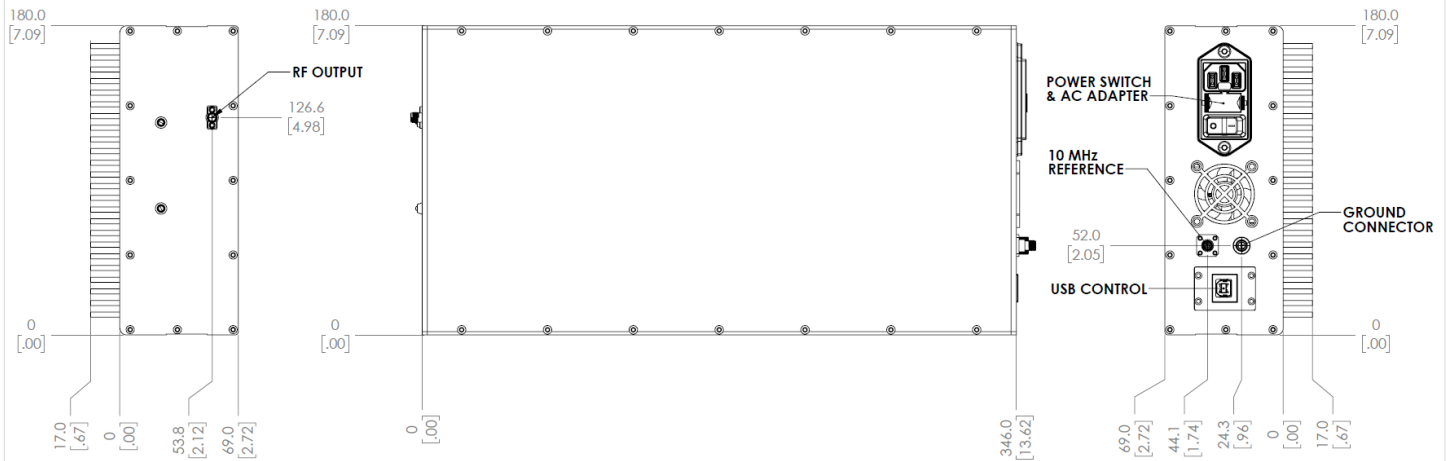
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Remote Control

Please see the detailed instructions in the driver folder.

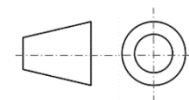
Name	Date modified	Type	Size
 dll(C++ bit-32)	2021-04-12 16:35	File folder	
 e.g-C#-RFSG(VS2013)	2021-04-12 16:35	File folder	
 e.g-Labview(2012bit32)-RFSG	2021-04-12 16:35	File folder	
 e.g-VB-RFSG(VS2013)	2021-04-12 16:35	File folder	
 RFSG-Driver	2021-04-12 16:35	File folder	
 Installation Instructions	2021-03-30 09:54	Adobe Acrobat D...	620 KB
 RF Signal Source A2 setup	2021-04-09 15:06	Application	2,020 KB
 Signal Generator DLL Instructions_Rev(A)	2021-04-12 16:36	Adobe Acrobat D...	201 KB

Outline Drawing



Notes:

1. Package Material: Aluminum or Copper
2. Plating: Black
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ± 0.2 [0.008] 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

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
RSGLP0144GA	connectors USB	0.1-40GHz Ultra Low Phase Noise USB Controlled RF Synthesizer

Important Notice

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