Ultra Low Phase Noise USB Controlled RF Synthesizer 0.039GHz - 22GHz

Product Description

RSYN01G20GA is an ultra low phase noise USB controlled RF synthesizer with a frequency range of 0.039 to 22GHz.

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

The RSYN01G20GA 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 and high frequency resolution.

Features

- DDS Driven RF Synthesizer
- TCXO Reference
- External Reference 10MHz.
- Low Phase Noise.
- DLL programming supported.
- USB2.0 Interface

Typical Applications

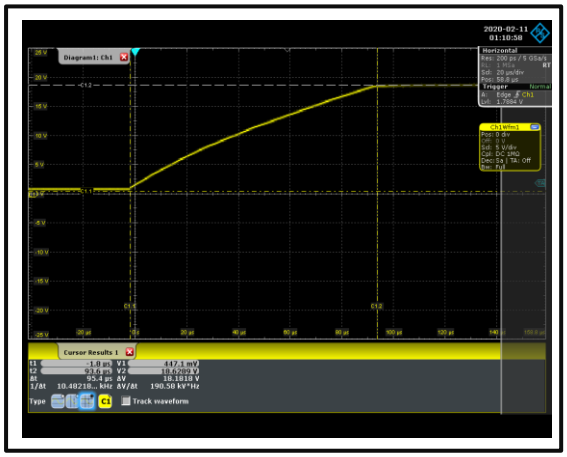
- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

Electrical Specifications (T_A=+25ºC)

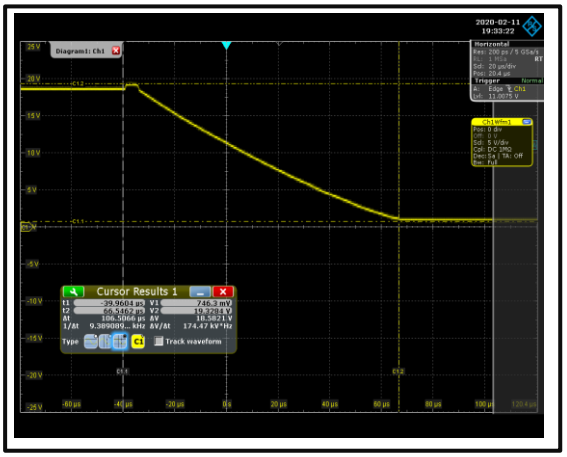
Parameter	Min	Typ	Max	Units
Frequency Range	0.039		22	GHz
Output Power		10		dBm
Output Power Tuning range		31.5dB with 0.5dB step		dB
Frequency stability		±0.5		ppm
Frequency Aging(10 years)		±3		ppm
Tuning Speed (Not including programming time)			110	us
Reference tuning range		±100		ppm
Tuning Step		0.001		Hz
SFDR 1MHz Tuning Step		65		dBc
Phase Noise @ 10GHz Typical		-116dBc/Hz(@10KH)		
		-117dBc/Hz (@100KHz)		
		-118dBc/Hz (@1MHz)		
		-140dBc/Hz (@10MHz)		
Power Supply Voltage		+15		V
Power Supply current		900 - 1500		mA
Control Interface		USB 2.0		
EXT Reference Input Level (10MHz)	-5		+5	dBm
Weight		700		g
Output Connector		2.92mm-Female		
External Reference Input Connector		SMA-Female		

Typical Performance Plots

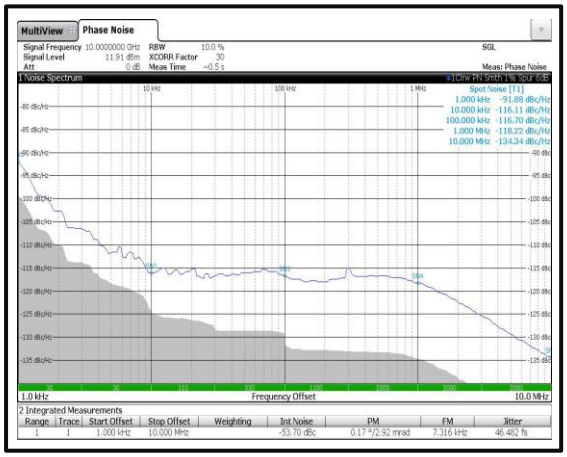
Tuning Speed < 110uS



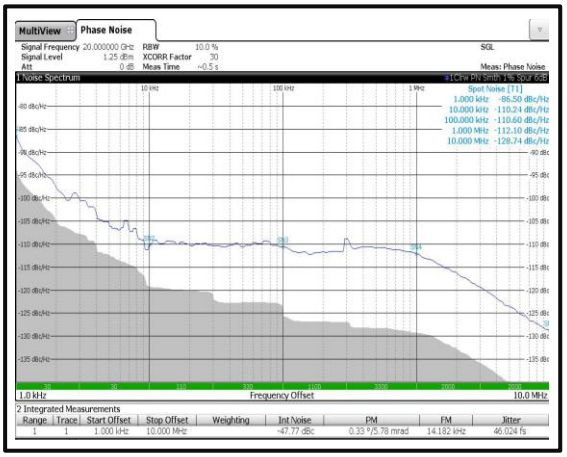
Tuning Speed < 110uS



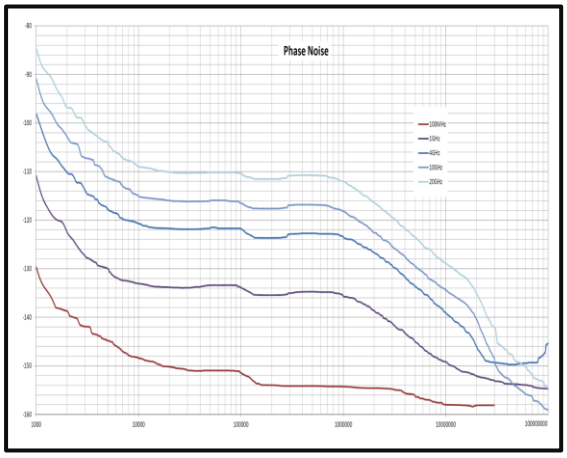
10GHz



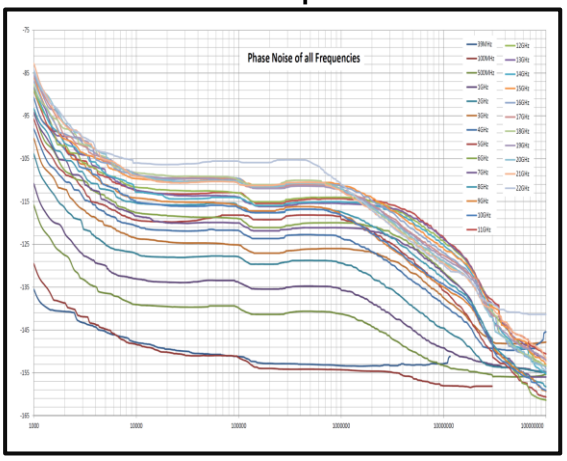
20GHz



Phase Noise

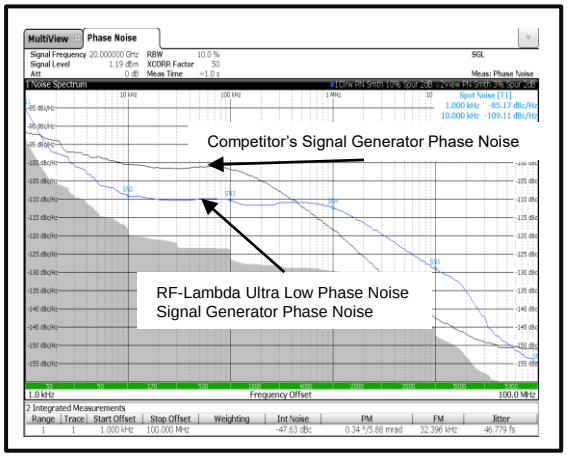


Phase Noise of all Frequencies

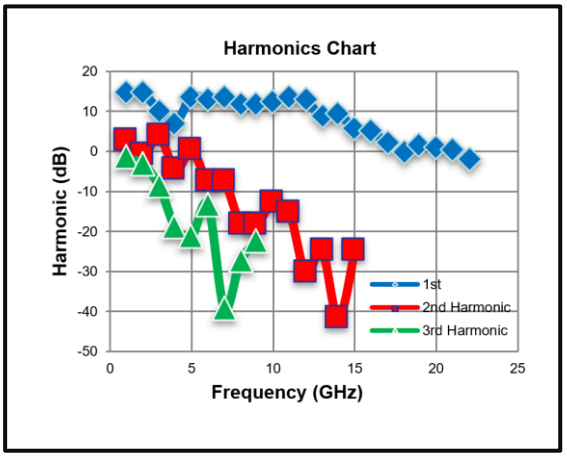


Typical Performance Plots

Phase Noise Comparison

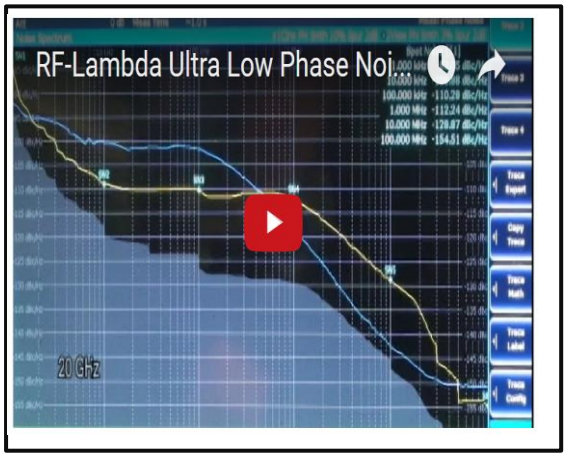


Harmonics Chart



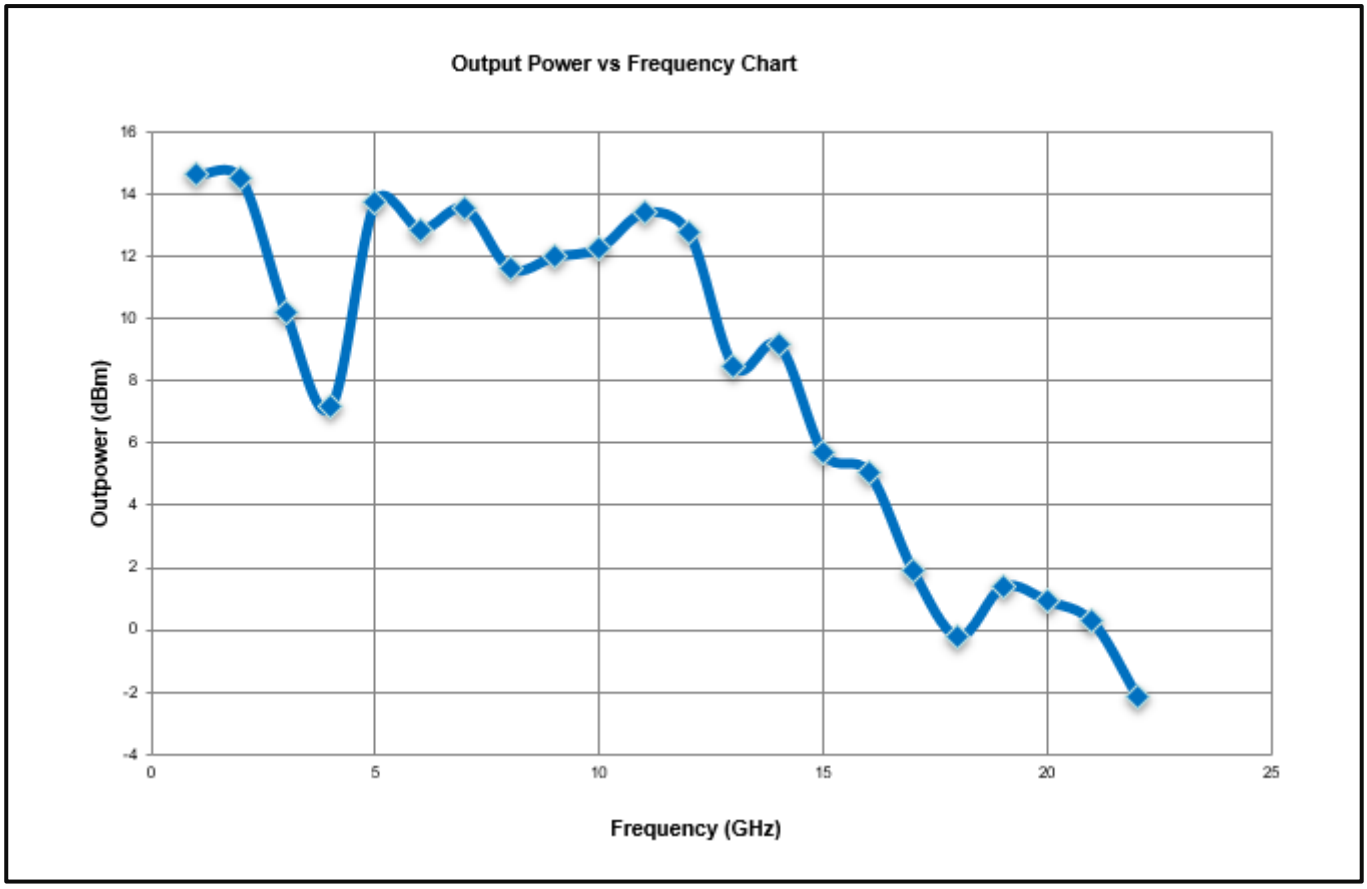
Video Instruction Link:

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

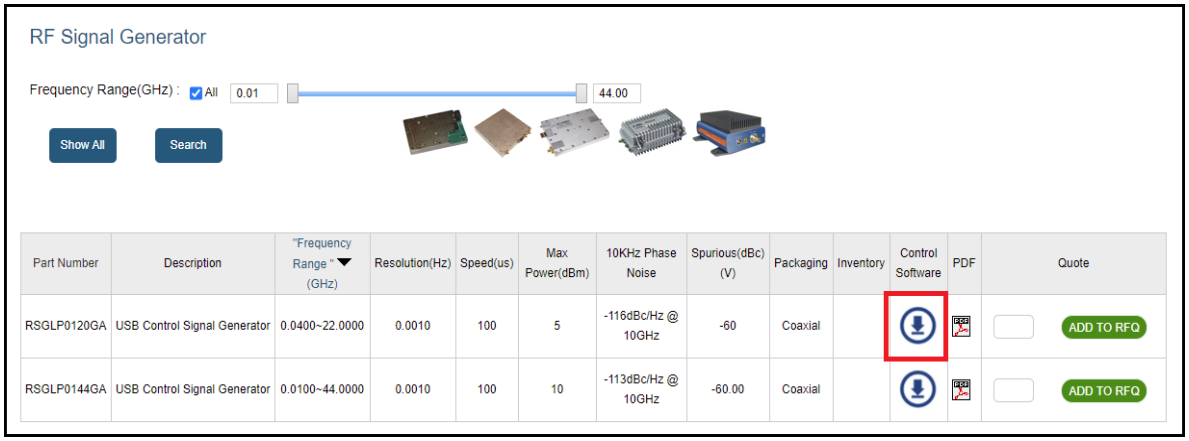


Typical Performance Plots

Typical Output Power Chart

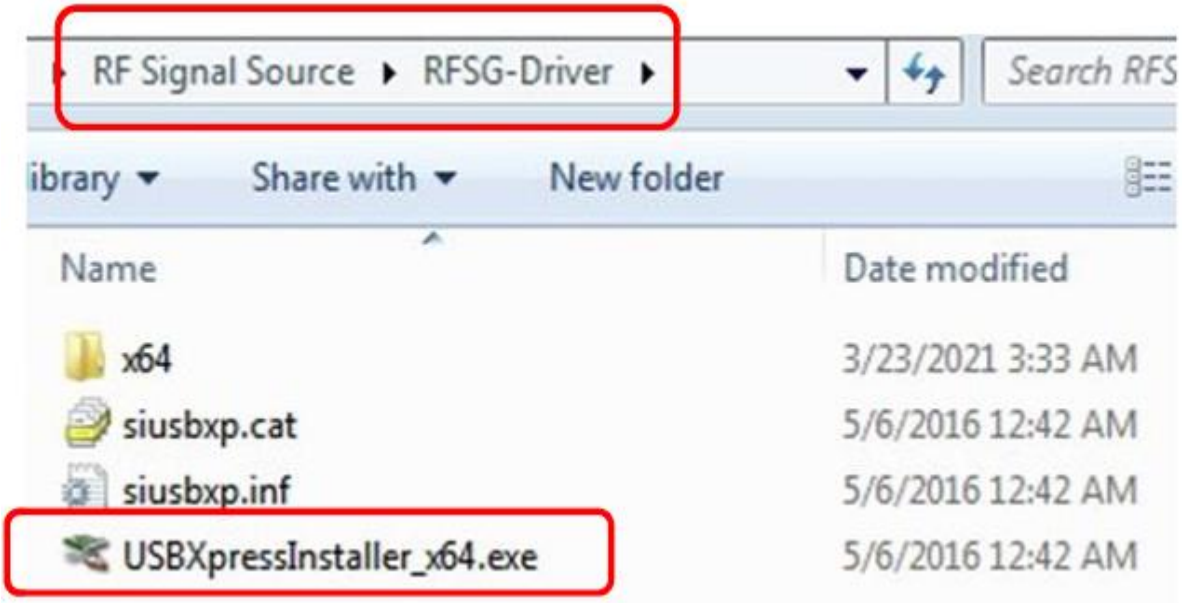


1.Download the GUI and diver from RF-LAMBDA website.

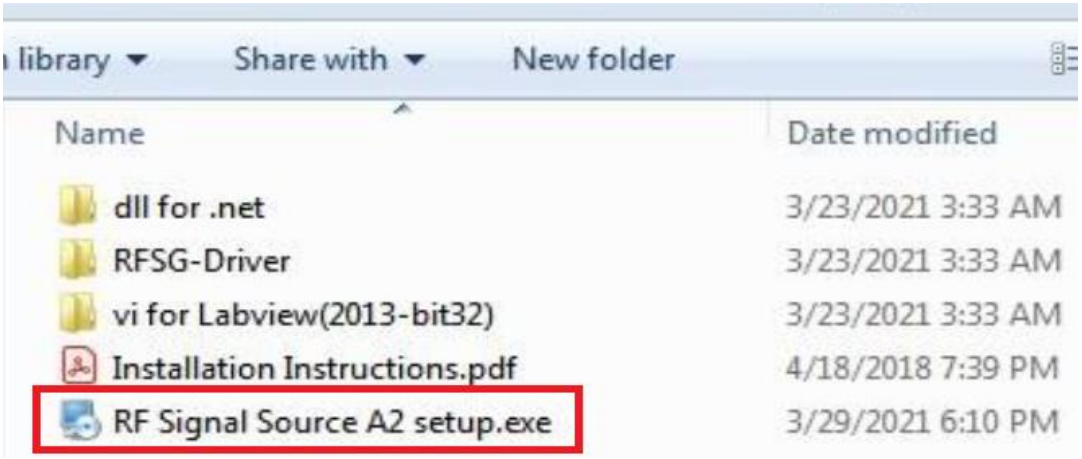


Part Number	Description	"Frequency Range" (GHz)	Resolution(Hz)	Speed(us)	Max Power(dBm)	10KHz Phase Noise	Spurious(dBc) (V)	Packaging	Inventory	Control Software	PDF	Quote
RSGLP0120GA	USB Control Signal Generator	0.0400~22.0000	0.0010	100	5	-116dBc/Hz @ 10GHz	-60	Coaxial				ADD TO RFQ
RSGLP0144GA	USB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

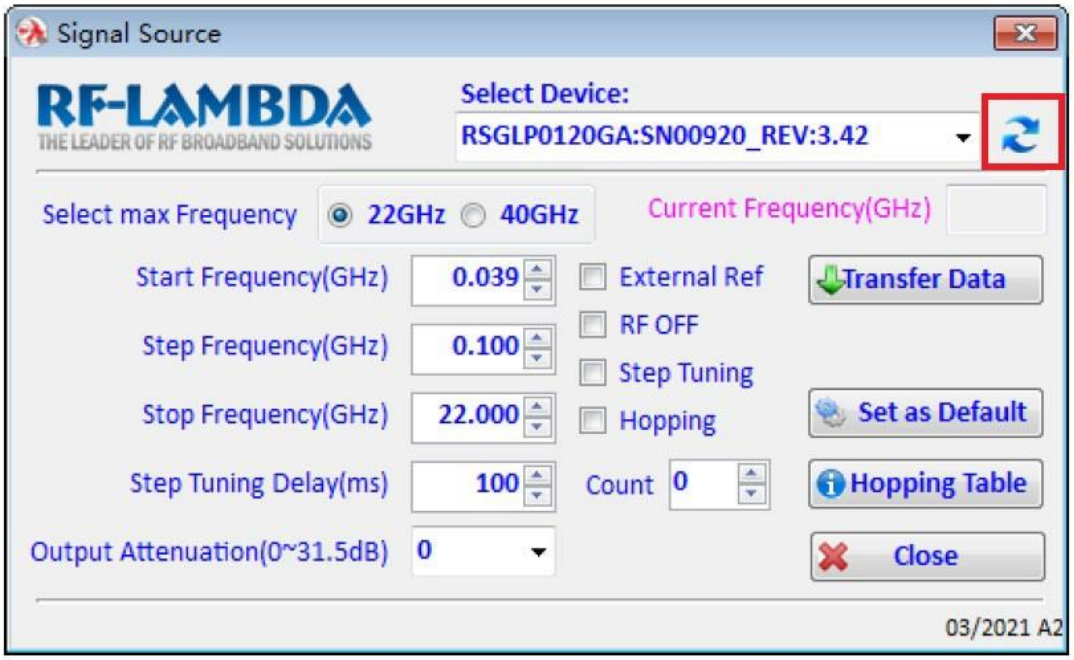
2.Driver Installation:



3. Install "RF Signal Source A2 Setup.exe".

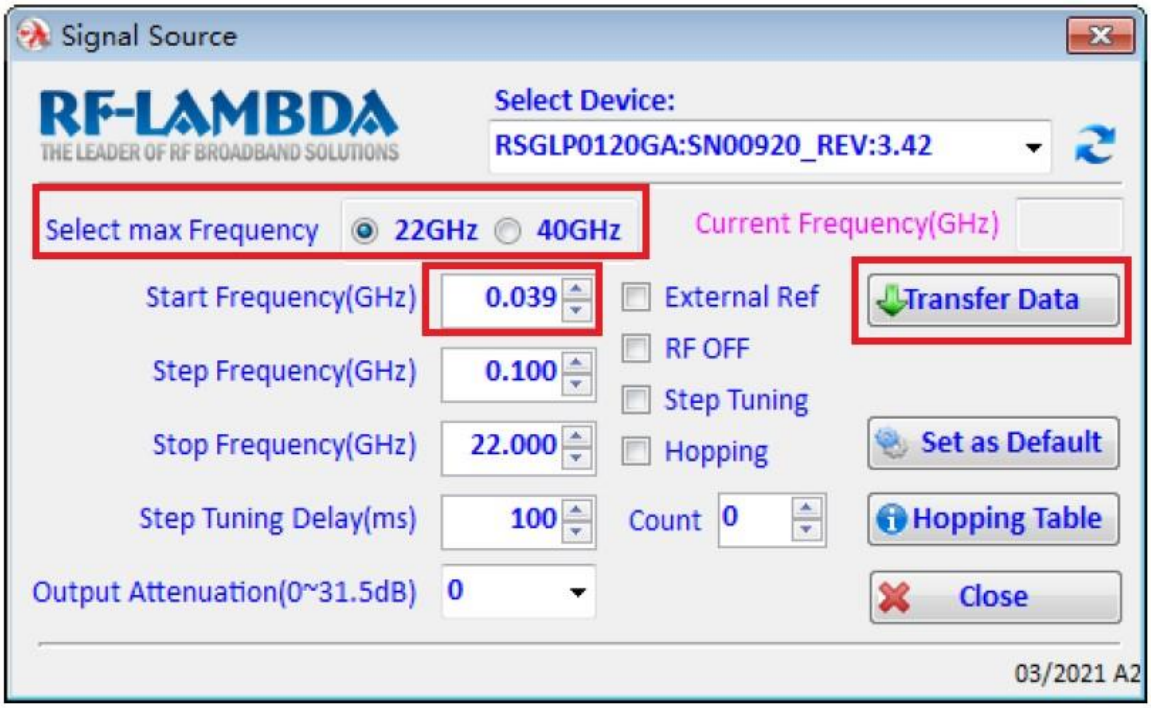


4.Connect the USB cable to the device and double click "Signal Source.exe" then turn on the +15V power supply. Right click the refresh button, and then the part number, serial number, and revision number will show up in the top right corner.



Single Frequency Mode

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



2.External Ref = 10MHz.

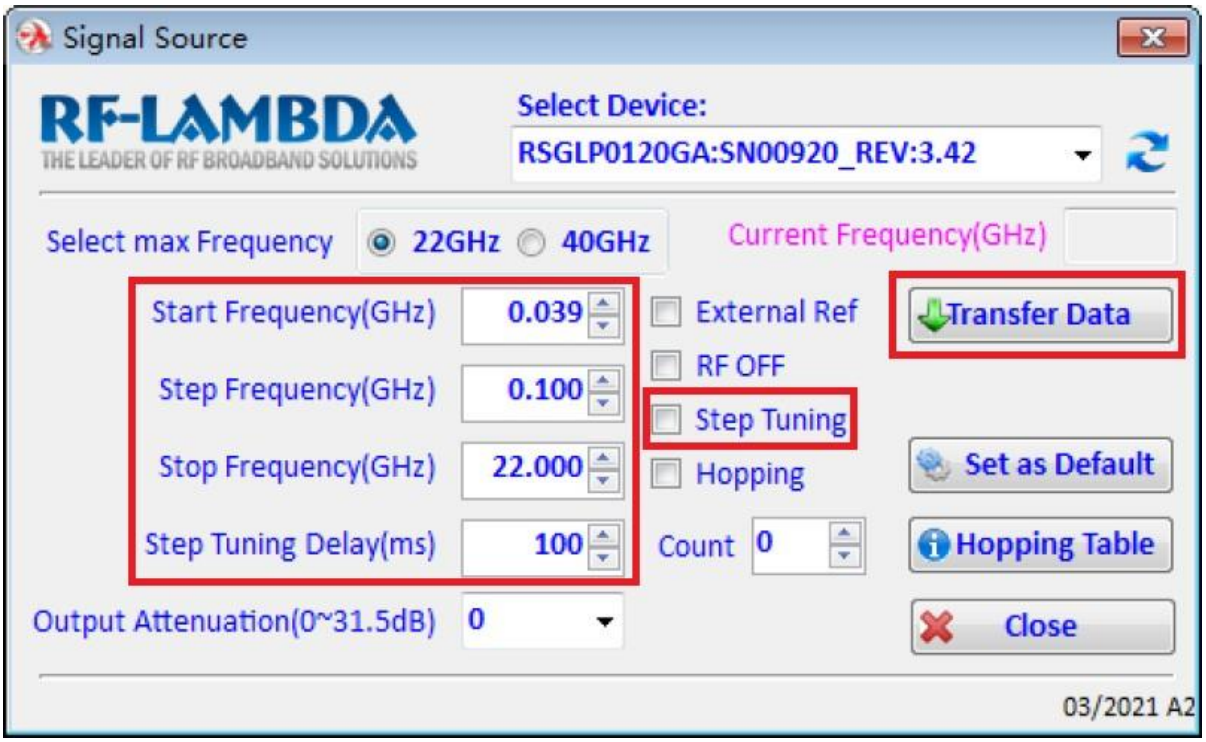
3.RF OFF = No output power.

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.



A.Start Frequency: The starting frequency in GHz

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

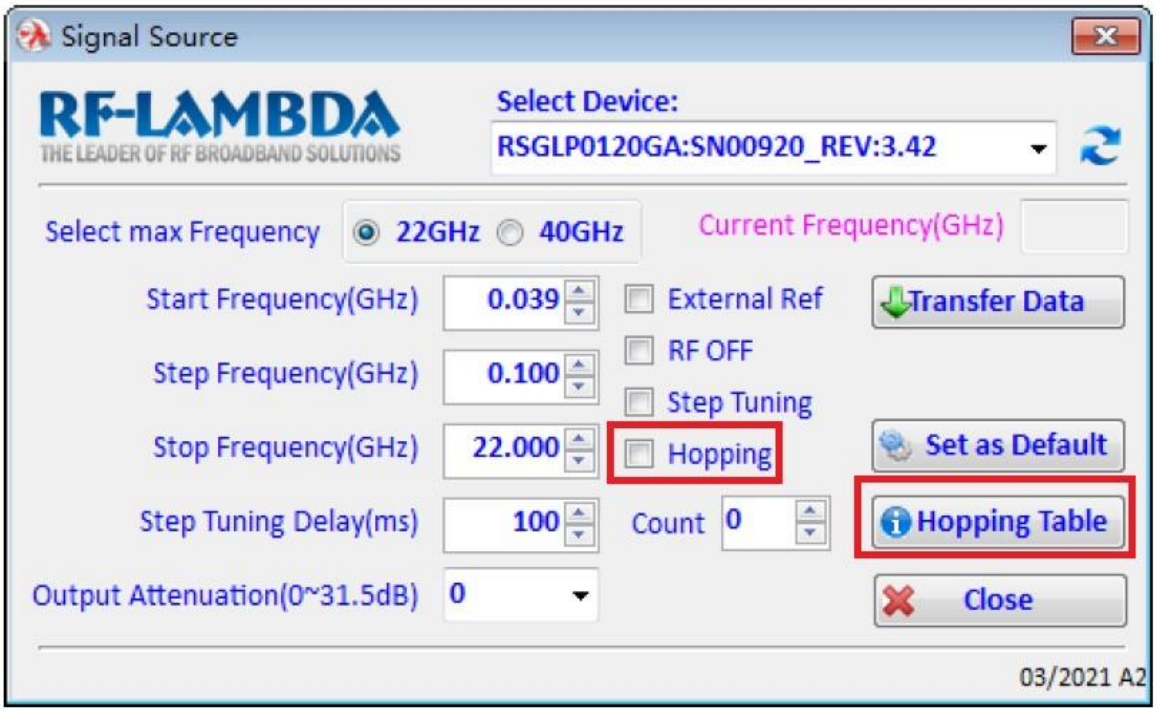
C.Stop Frequency: The last frequency in GHz.

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

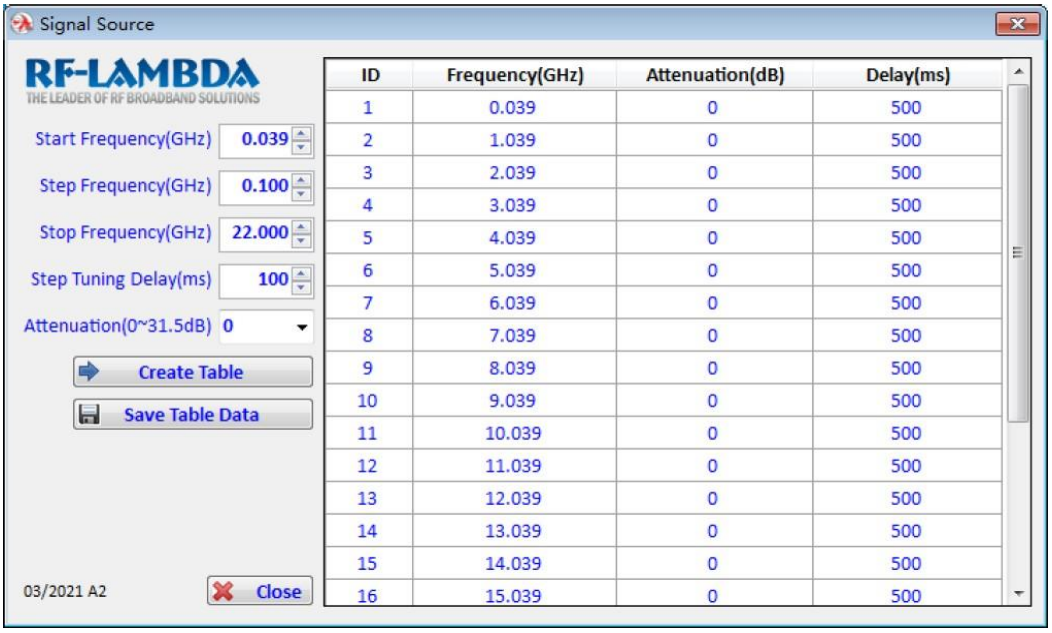
Hopping Mode

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.



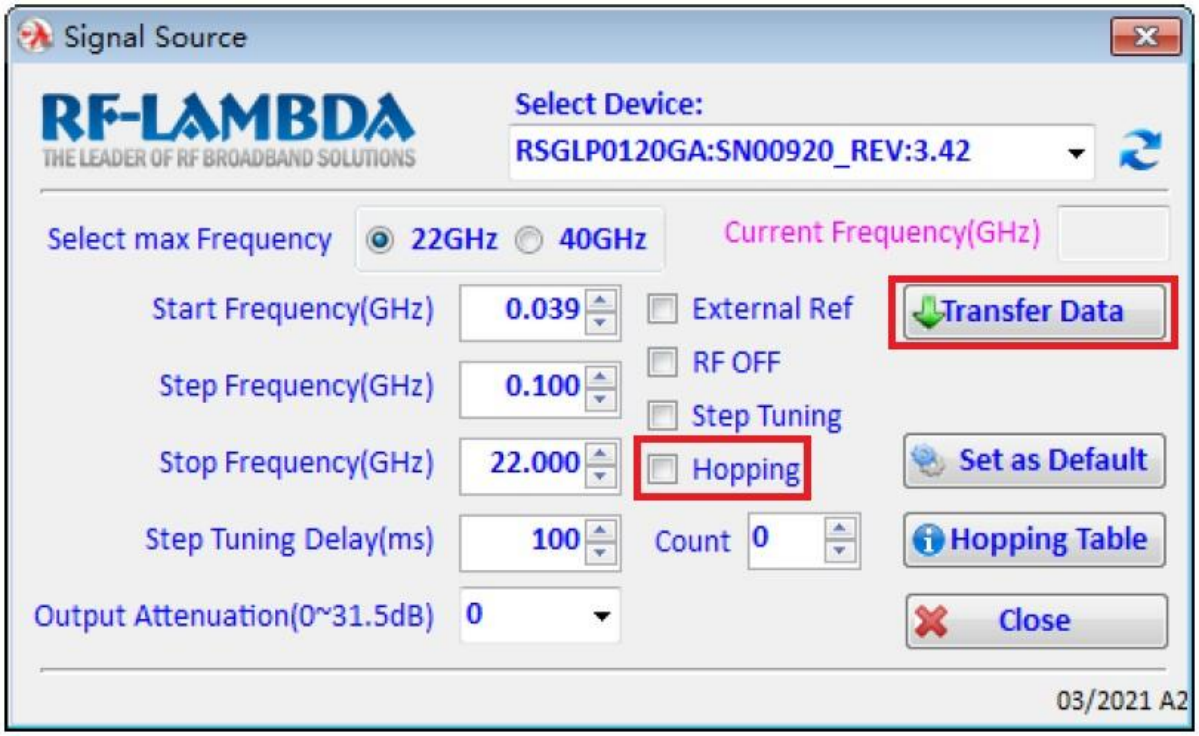
2. The frequency setup is the same as the "Step Tuning Mode", after that click "Create Table". The table give the customer options to manually edit the frequency, attenuation, and delay. After all the modifications click "Save Table Data". Then click "close".



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

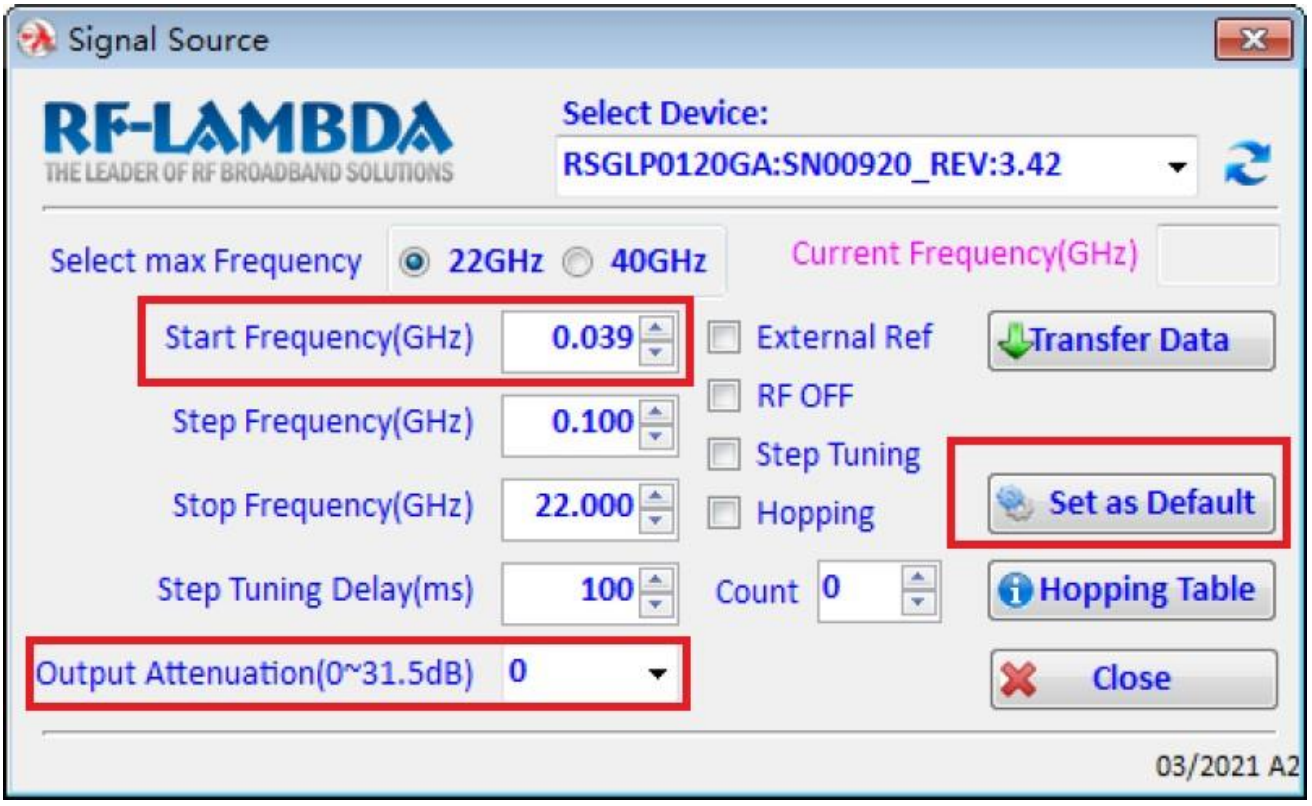
Hopping Mode

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



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 automatedly 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.

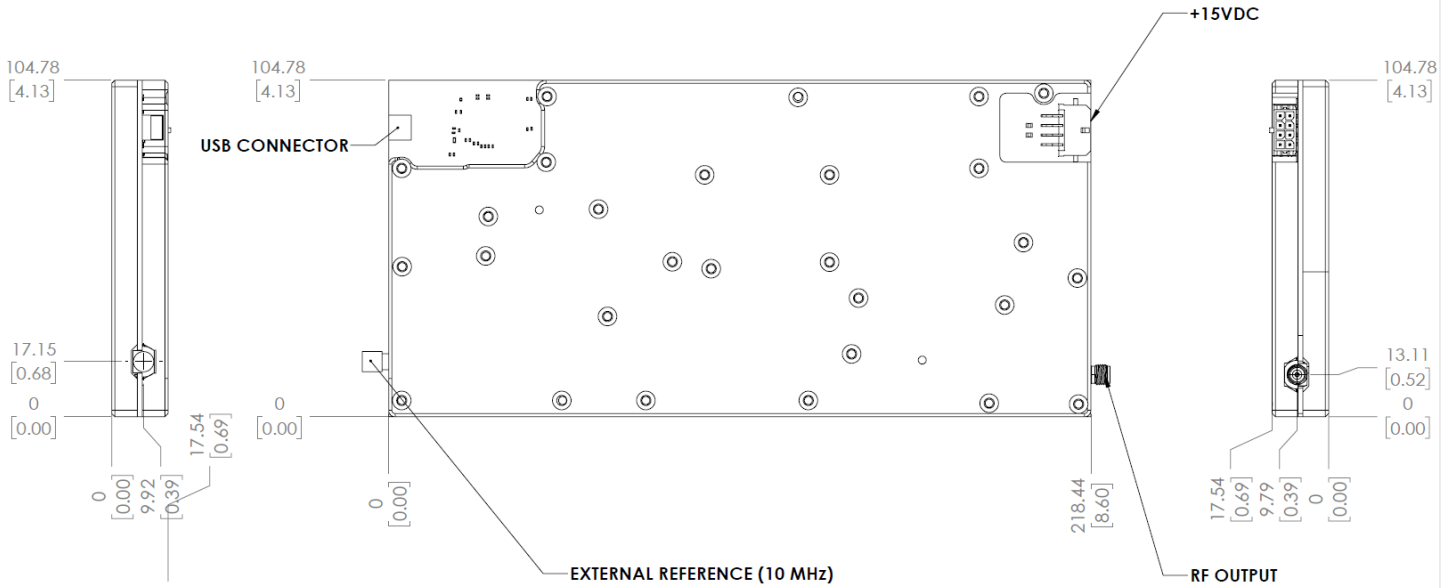


Remote Control

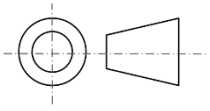
Please see the detailed instructions in the driver folder.

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: Aluminium 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
RSYN01G20GA	Input connector SMA-Female and Output connector 2.92mm-Female	0.039GHz-22GHz Ultra Low Phase Noise USB Controlled RF Synthesizer

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