



## Features

- 50 MHz to 40 GHz synthesizer
- USB Type-C interface
- Low phase noise
- GUI and API control

## Applications

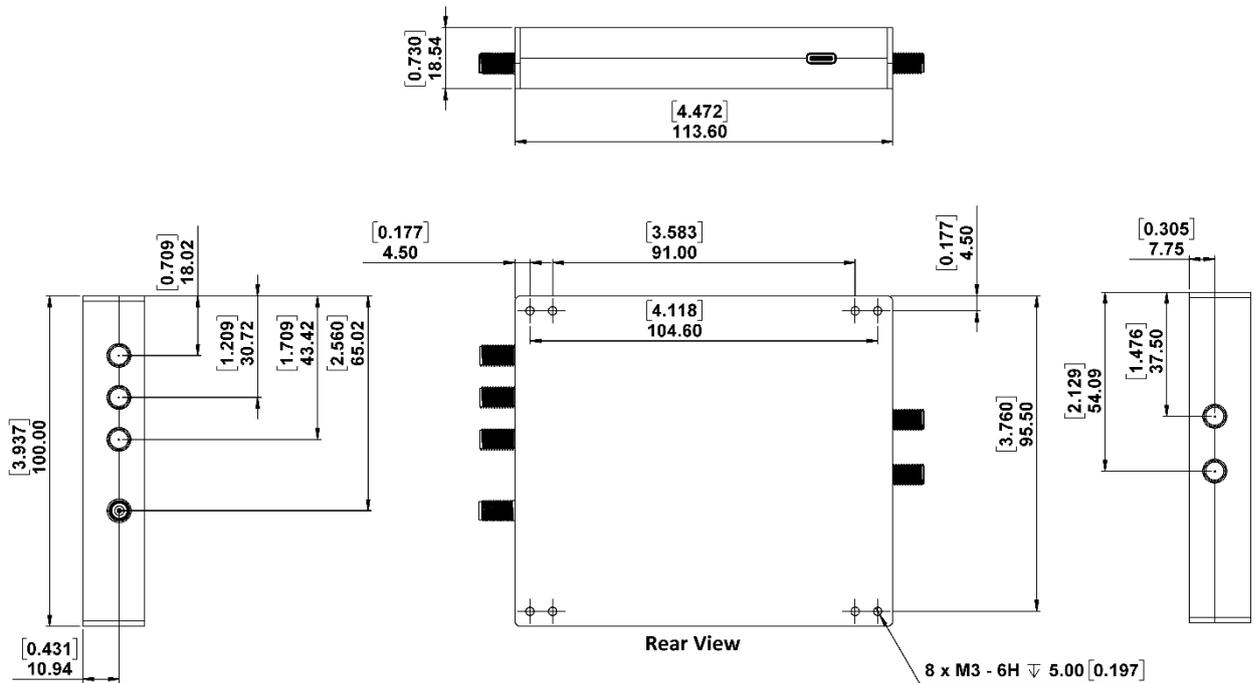
- Wireless infrastructure design
- Up-converting and down-converting
- Educational / university lab use
- Production verification and test setups
- Automated Test Equipment (ATE)
- General RF lab use
- Flexible and portable LO sourcing
- Ka-band development
- 5G testing

## Electrical Specifications (Preliminary)

Parameter	Min	Typical	Max
Frequency Range	50 MHz		40 GHz
Frequency Resolution		1 Hz	
Frequency Stability <sup>1</sup>		± 0.1 ppm	

<sup>1</sup> Measured after 10 minutes of operation.

## Outline Drawing



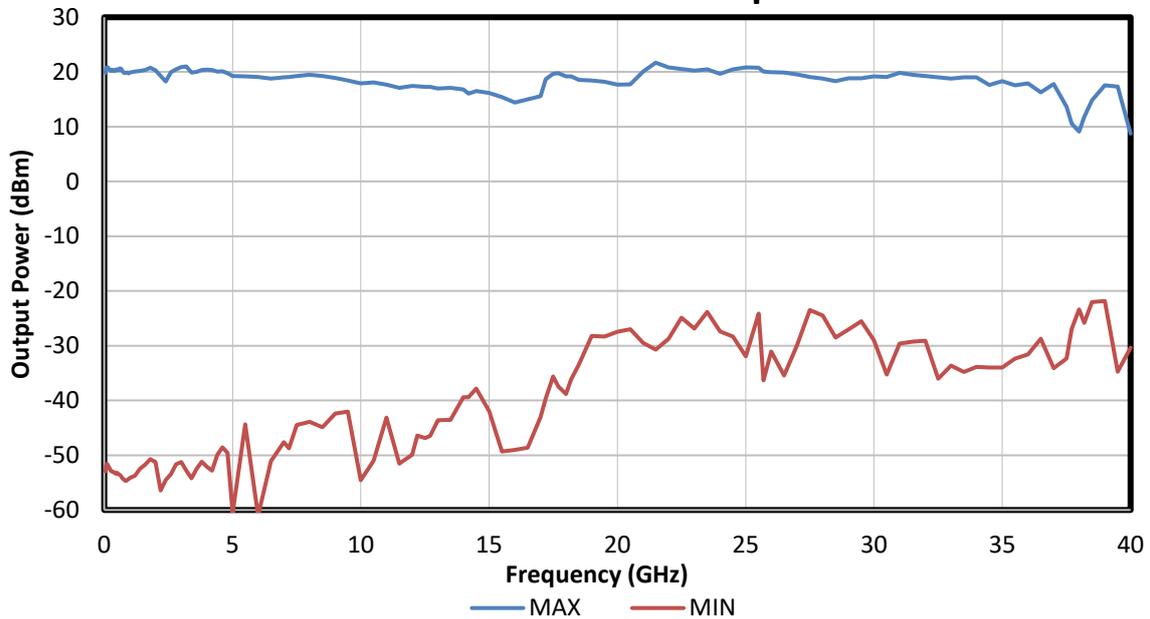
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## Output Power Level <sup>2</sup>

Parameter	Typical
RF Maximum Output Power	
50 MHz - 10 GHz	19 dBm
10 GHz - 17 GHz	15 dBm
17 GHz - 34 GHz	18 dBm
34 GHz - 36 GHz	16 dBm
36 GHz - 40 GHz	10 dBm
RF Minimum Output Power	
50 MHz -17 GHz	-40 dBm
17 GHz - 40 GHz	-25 dBm
RF Off Output Power	-80 dBm
RF Output Power Resolution	0.5 dB
RF Output Power Accuracy (Pout ≥ -15 dBm)	± 2 dBm

<sup>2</sup> Measured at room temperature and after 10 minutes of operation.

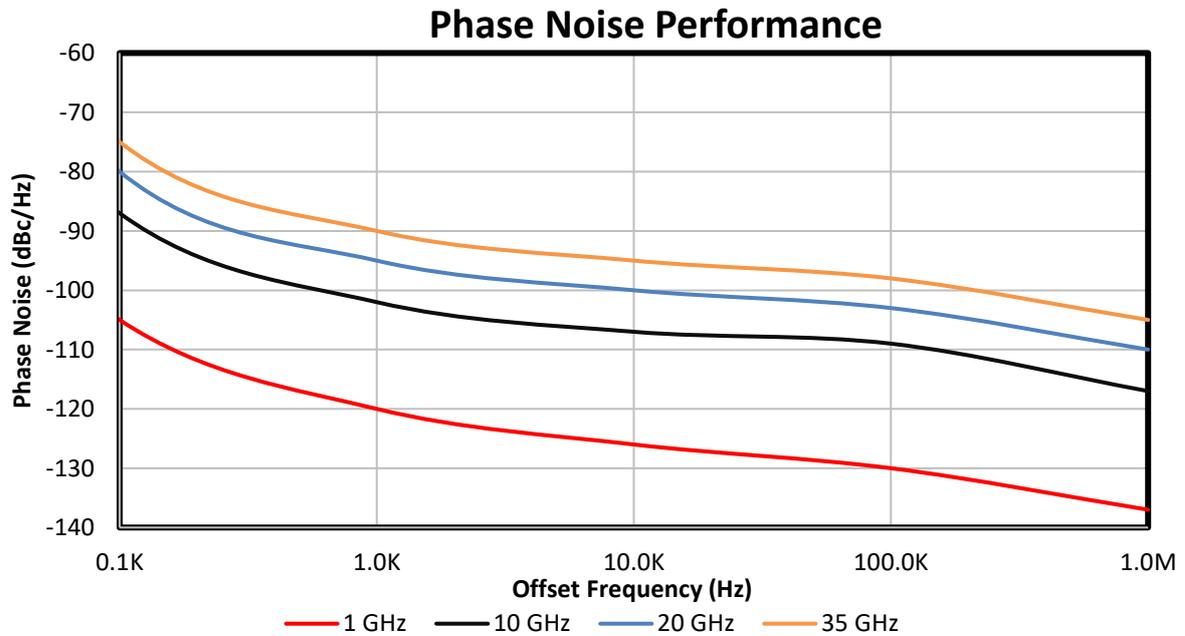
## Maximum and Minimum Output Power



## Phase Noise

Frequency	Typical
1 GHz	
Offest 10 Hz	-63 dBc/Hz
Offest 100 Hz	-105 dBc/Hz
Offest 1 kHz	-120 dBc/Hz
Offset 10 kHz	-126 dBc/Hz
Offset 100 kHz	-130 dBc/Hz
Offset 1 MHz	-137 dBc/Hz
10 GHz	
Offest 10 Hz	-39 dBc/Hz
Offest 100 Hz	-87 dBc/Hz
Offest 1 kHz	-102 dBc/Hz
Offset 10 kHz	-107 dBc/Hz
Offset 100 kHz	-109 dBc/Hz
Offset 1 MHz	-117 dBc/Hz
20 GHz	
Offest 10 Hz	-25 dBc/Hz
Offest 100 Hz	-80 dBc/Hz

Offset 1 kHz	-95 dBc/Hz
Offset 10 kHz	-100 dBc/Hz
Offset 100 kHz	-103 dBc/Hz
Offset 1 MHz	-110 dBc/Hz
35 GHz	
Offset 10 Hz	-23 dBc/Hz
Offset 100 Hz	-75 dBc/Hz
Offset 1 kHz	-90 dBc/Hz
Offset 10 kHz	-95 dBc/Hz
Offset 100 kHz	-98 dBc/Hz
Offset 1 MHz	-105 dBc/Hz



## Spectral Purity<sup>3</sup>

Parameter	Fundamental Frequency	Typical
1/2 Harmonic	50 MHz - 11 GHz	-70 dBc
	11 GHz - 30 GHz	-40 dBc
	30 GHz - 34 GHz	-25 dBc
	34 GHz - 40 GHz	-30 dBc
3/4 Harmonic	25 GHz - 32 GHz	-40 dBc
	32 GHz - 34 GHz	-25 dBc
	34 GHz - 40 GHz	-20 dBc
2nd Harmonic	50 MHz - 4 GHz	-20 dBc
	4 GHz - 20 GHz	-16 dBc
3rd Harmonic	50 MHz - 1 GHz	-10 dBc
	1 GHz - 7 GHz	-13 dBc
	7 GHz - 9 GHz	-20 dBc
	9 - 14 GHz	-30 dBc
Non-Harmonic Spurious Close-in <sup>3</sup> at output step size 5 MHz <sup>4</sup> Close-in at output step size 1 MHz <sup>5</sup> Close-in at output step size 100 KHz <sup>6</sup> Far-out <sup>7</sup>	50 MHz - 40 GHz	-50 dBc
		-35 dBc
		-35 dBc
		-50 dBc

<sup>3</sup>The harmonic values in the table were measured at the maximum output power

<sup>4</sup>Close-in spurious is measured within  $\pm 10$  MHz of the output center frequency.

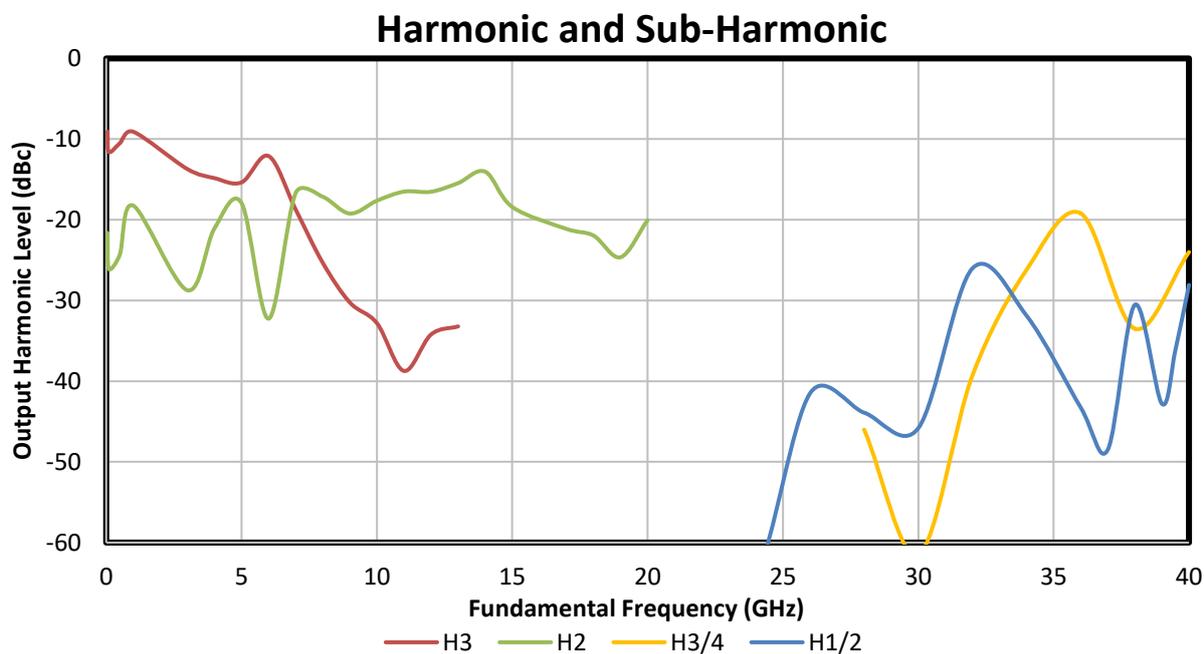
<sup>5</sup>At output frequency ranges from 50 MHz to 40 GHz in 5 MHz increments.

Ex. Output frequency = 50 ,55, 60 MHz ... 40 GHz.

<sup>6</sup>Ex. Output frequency = 50 ,51, 52 MHz ... 40 GHz.

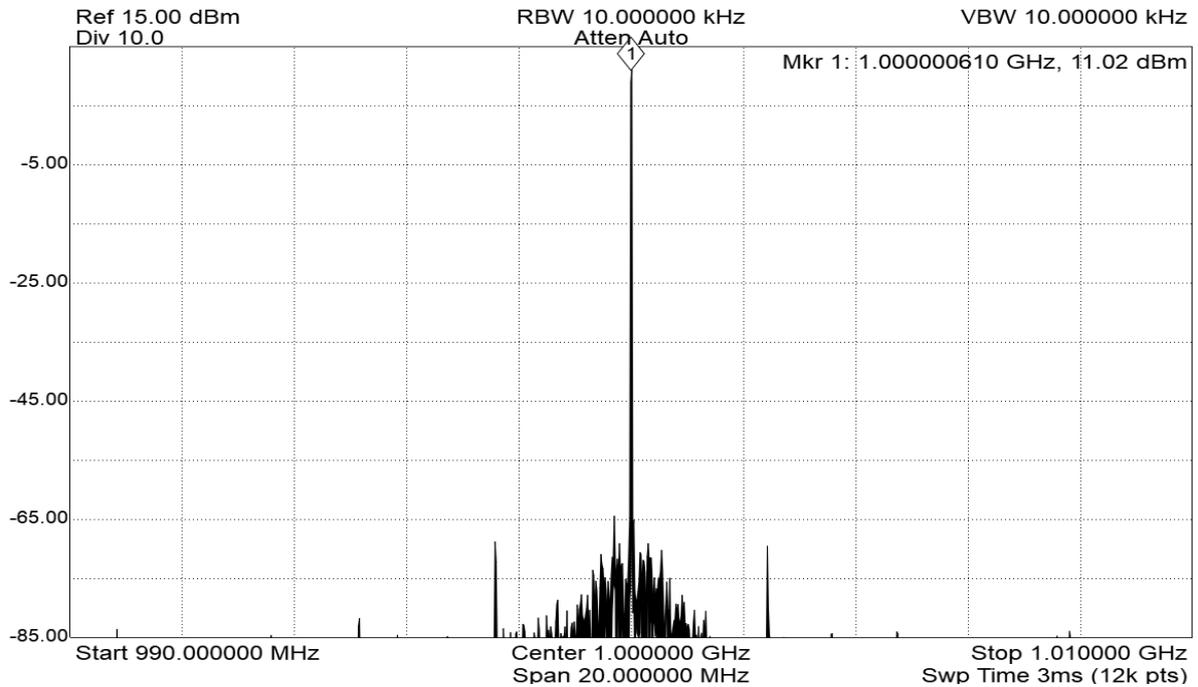
<sup>7</sup>Ex. Output frequency = 50 ,50.1, 50.2 MHz ... 40 GHz.

<sup>8</sup>Far-out spurious is measured from 50 MHz to 40 GHz, excluding close-in spurious.

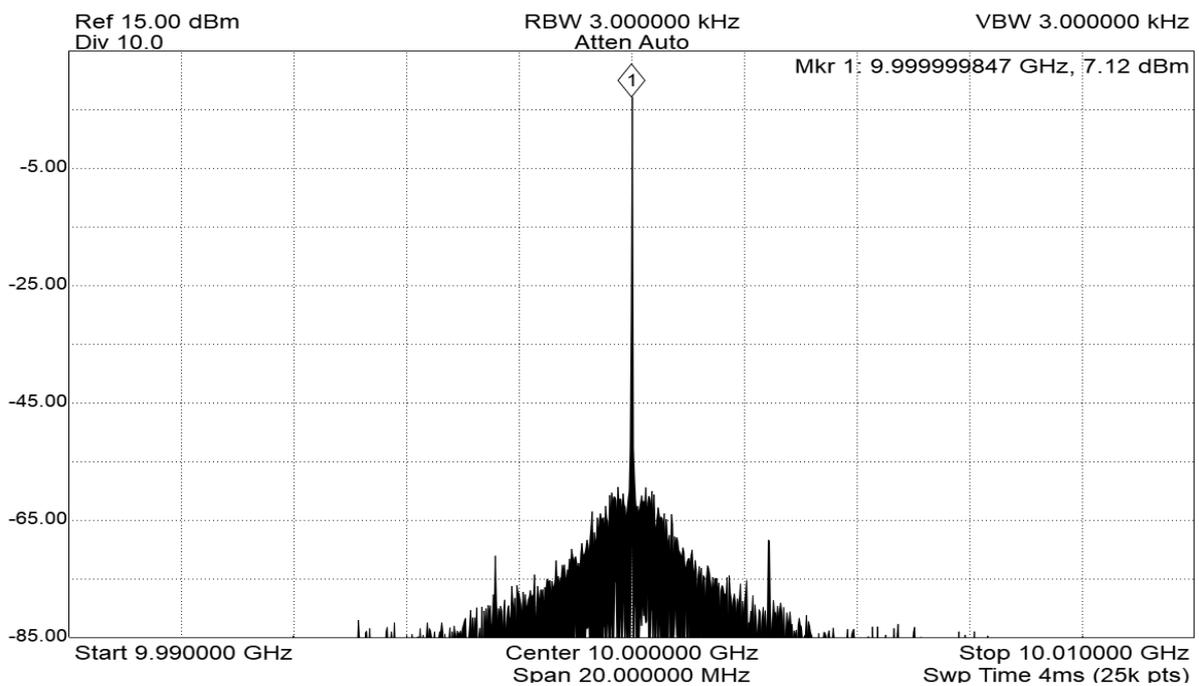


## Frequency Spectrum

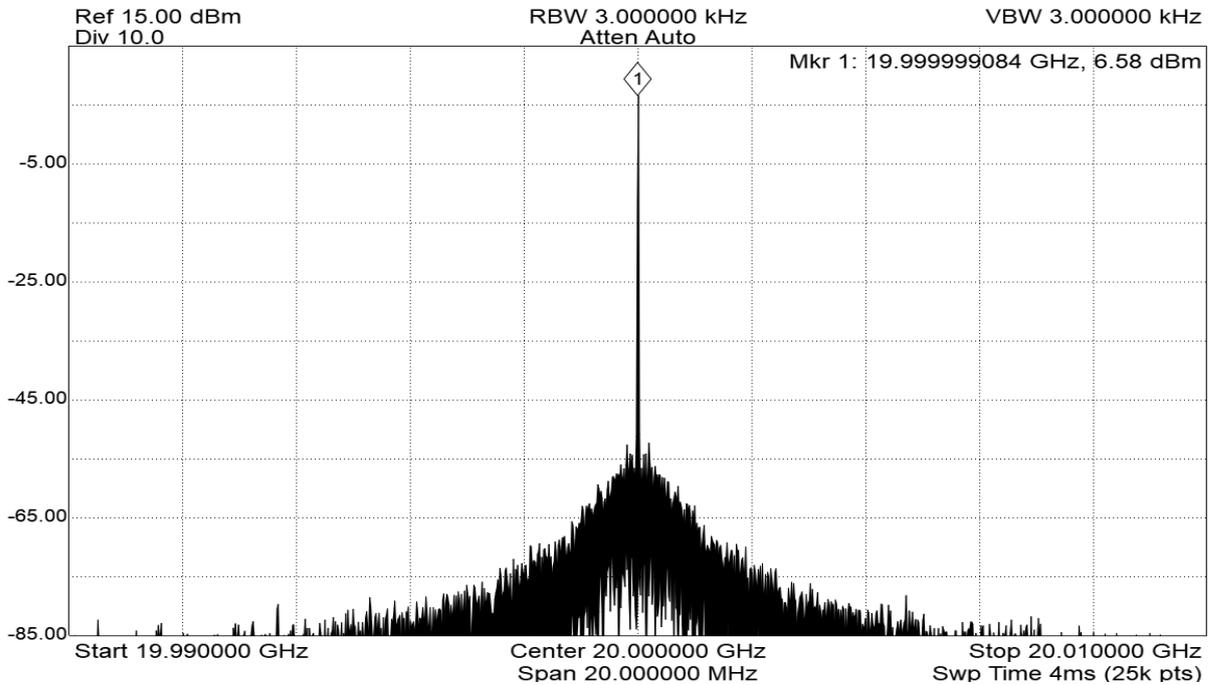
Measurement results of spurious, output frequency is 1 GHz, span is 20 MHz.



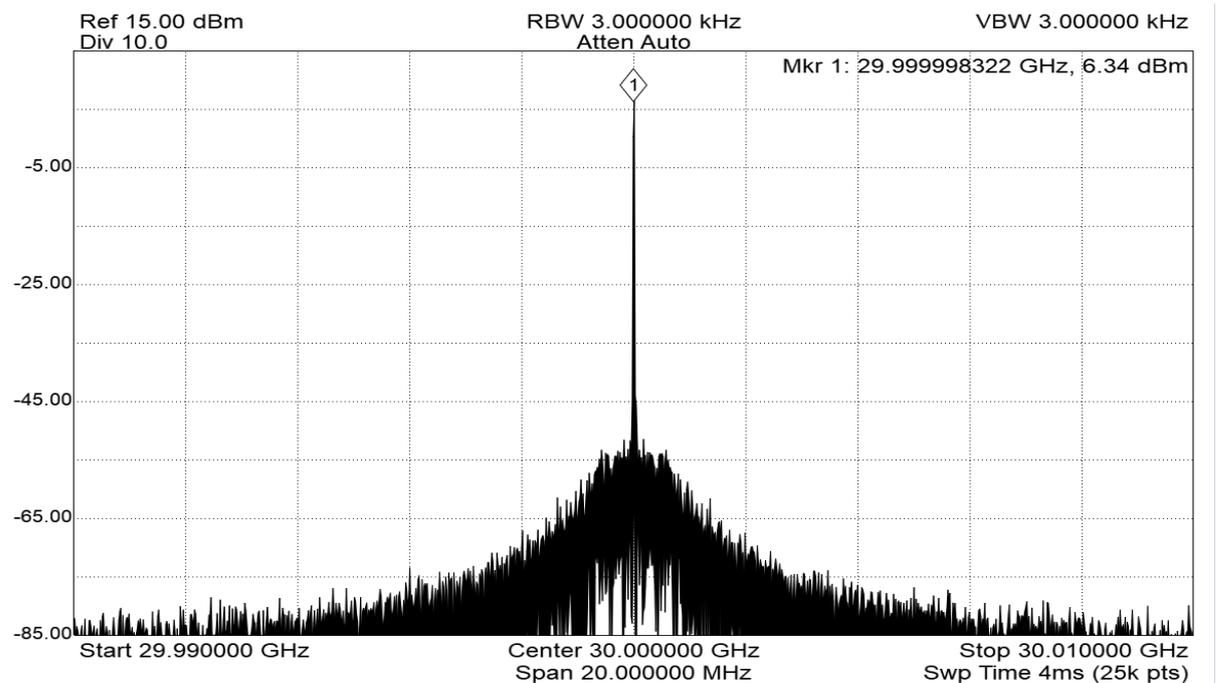
Measurement results of spurious, output frequency is 10 GHz, span is 20 MHz.



Measurement results of spurious, output frequency is 20 GHz, span is 20 MHz.



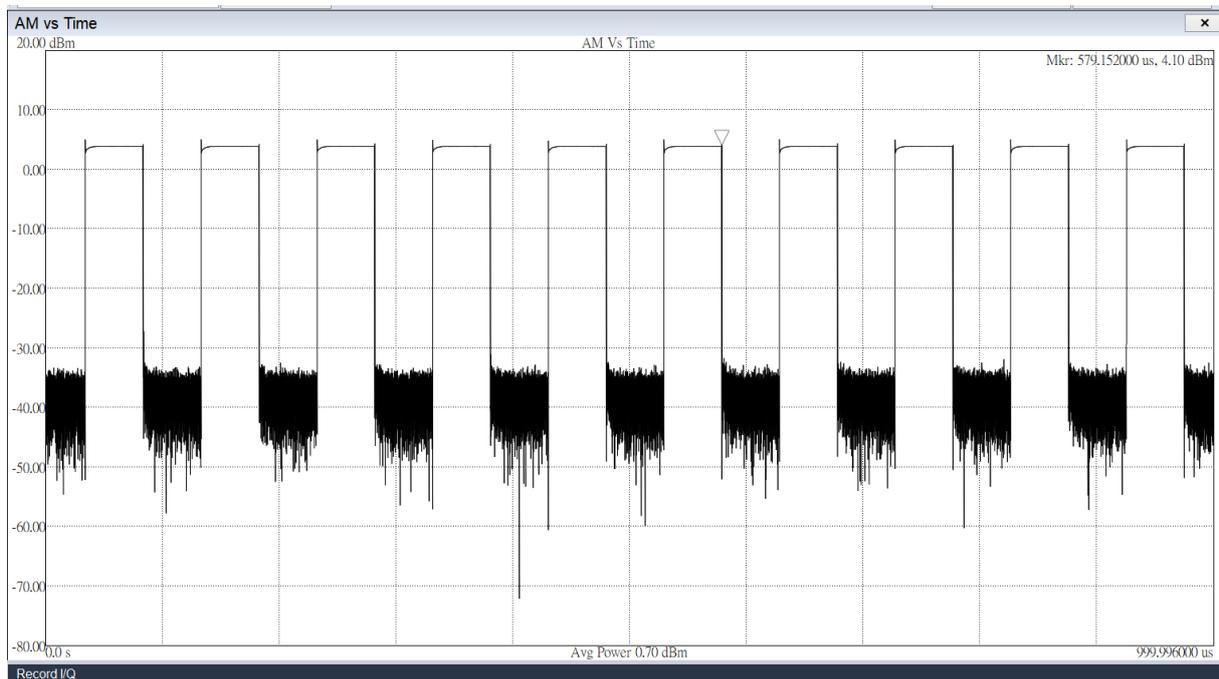
Measurement results of spurious, output frequency is 30 GHz, span is 20 MHz.



## Pulse Modulation

Parameter	Min	Typical	Max
Pulse Modulation Source		Internal/External	
On/Off Ratio		35 dB	
Rise/fall time		30 ns	
Minimum Pulse Width		100 ns	
Repetition frequency (Internal source)	2 kHz		5 MHz
Trigger Voltage (External source)		High-Enable	
High-Level	1.7 V		3.3 V
Low-Level	0 V		0.7 V

## Pulse Modulation



Pulse width 50  $\mu$ s and Repetition Frequency 10 kHz when Output Frequency is 17 GHz.

## List Mode (Frequency/Power List)

Parameter	Min	Typical	Max
Frequency List Switching Time <sup>8</sup>		2 ms	
Power List Switching Time <sup>8</sup>		0.5 ms	
Dwell Time	1 ms		

<sup>8</sup> The switching time is defined as the time interval from the previous output signal falling to 10% to the next output signal rising to 90%.

## CW/List Trigger Mode<sup>10</sup>

Parameter	Min	Typical	Max
Trigger Pulse Width	60 ns		
Trigger-ON Latency <sup>11</sup>		300 $\mu$ s	
Trigger-OFF Latency <sup>12</sup>		1 $\mu$ s	
Trigger Level	2.7 V	3.3 V	3.6 V

<sup>10</sup> RF output in CW or List mode can be toggled via external trigger pulse applied to the trigger ports.

<sup>11</sup> Trigger-On latency is defined as the time interval from trigger detection at the Trigger-On port to RF output turn-on in CW mode or to the next frequency/power advancement step in List mode.

<sup>12</sup> The signal output is disabled within 1  $\mu$ s upon receiving a trigger pulse at the Trigger-Off port.

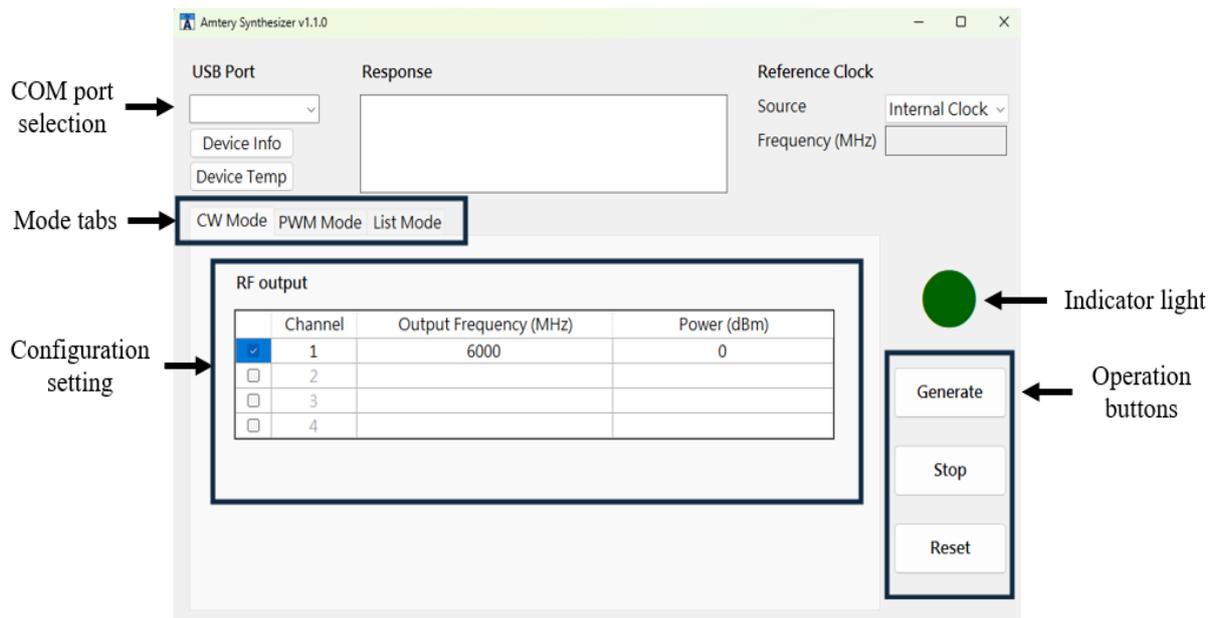
## External Input Reference Clock

Parameter	Min	Typical	Max
Frequency	10 MHz	100 MHz	110 MHz
Single-ended Input Power	0 dBm	10 dBm	15 dBm
Single-ended Input Voltage	0.6 Vpp	2 Vpp	3.6 Vpp

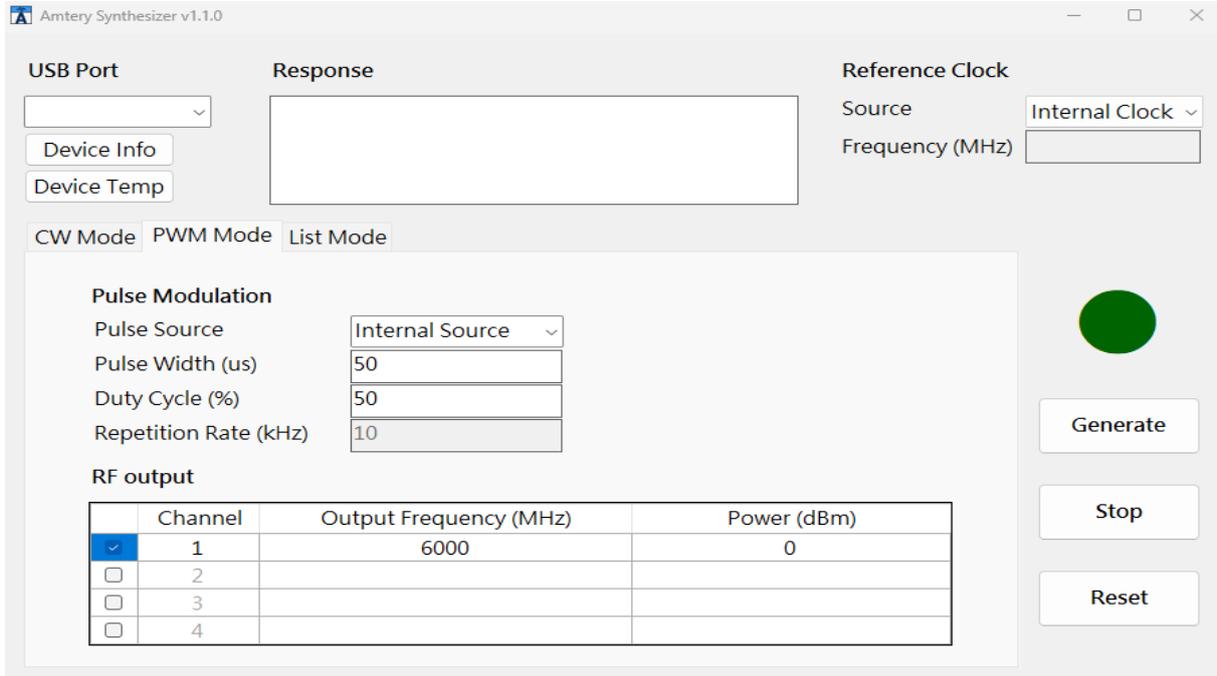
## Connector

Parameter	Description
RF Output	2.92 mm female
External Pulse In	SMA female
Reference Clock In	SMA female
Control & Power Interface	USB 3.2 Gen1, Type-C connector. (Recommendation: Connect to the host via Type-C port.)

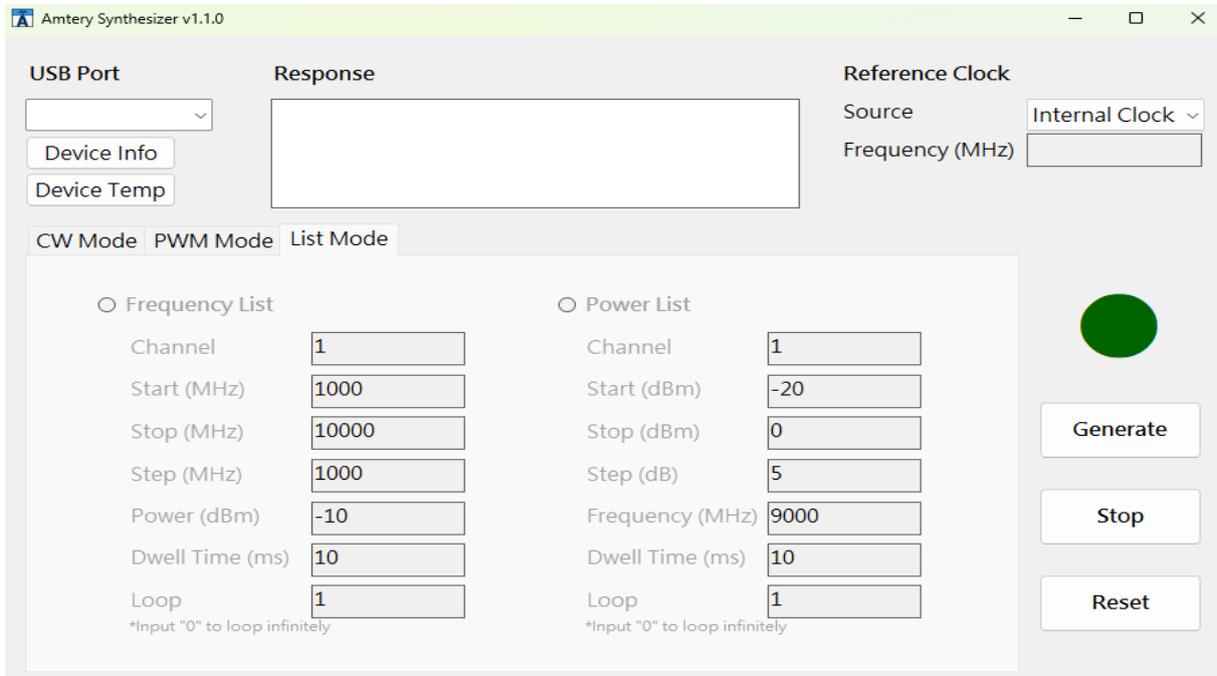
## Graphical User Interface (GUI)



GUI - Continuous Wave (CW) Mode



GUI - Pulse Width Modulation (PWM) Mode



GUI - Frequency/Power List Mode

Typical performance file: <https://www.amtery.com/en/goods-96>

Note: Specifications are subject to change without notice.