CAMS9K20G

20GHz RF Analog Signal Generator

AM, FM, ØM, Pulse Modulation

SG003

VER: 26V1.0



26V1.0

Corech Microwave

Chengdu, China

PRODUCT OVERVIEW

Factory calibrated prior to shipment.

Corech CAMS9K20G is a compact, high-performance analog signal generator engineered for professional test and measurement applications. Delivering a wide frequency coverage from 9 kHz to 20 GHz, it combines extended output power ranges (-120 dBm to +17 dBm) with superior signal integrity, making it an ideal solution for characterizing devices from ultra-low sensitivity levels to high-power saturation points.

Designed for versatility, the CAMS9K20G integrates comprehensive analog modulation capabilities—including AM, FM, and ØM—alongside precision Pulse Modulation. This flexibility supports diverse test scenarios, from continuous-wave (CW) component testing to complex modulated signal simulation for radar and receiver evaluation.

Extended Frequency & Power: Covers 9 kHz to 20 GHz with a dynamic output range of -120 to +17dBm, eliminating the need for external amplifiers or attenuators.

Comprehensive Modulation: Built-in AM, FM, ØM, and Pulse modulation modes allow for flexible signal configuration, essential for receiver sensitivity testing and radar system evaluation.

Superior Signal Purity: Features industry-leading low phase noise and low spurious content, ensuring stable and repeatable measurement results across the entire frequency band.

Compact & ATE Ready: The miniaturized form factor saves valuable benchtop space, while standard SCPI-based remote control ensures seamless integration into automated test systems (ATE).

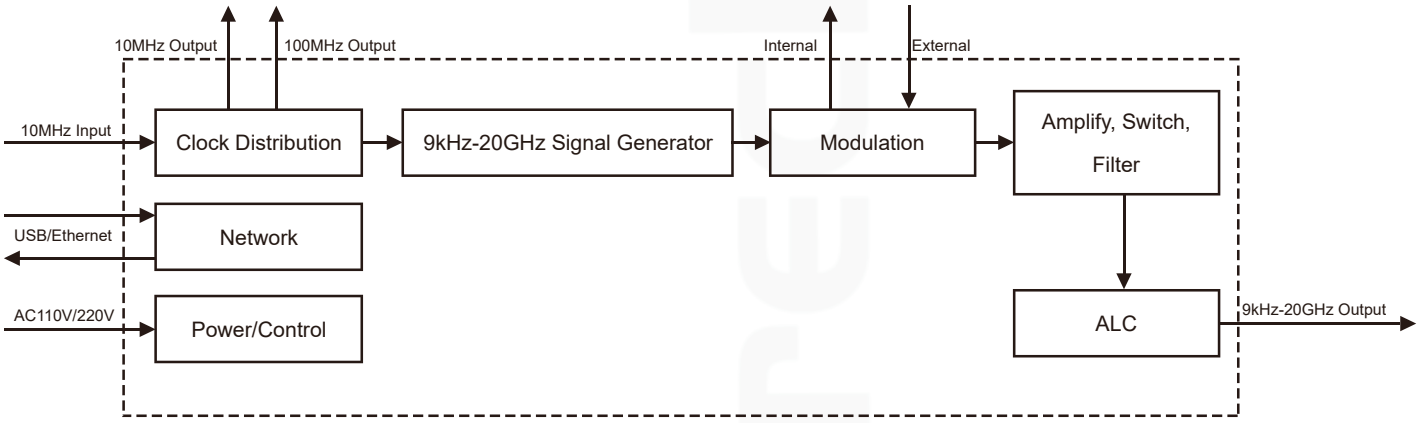


3-Year Warranty



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BLOCK DIAGRAM



PERFORMANCE

Frequency Range

9kHz to 20GHz

Frequency Resolution

0.001Hz

Output Power

-120dBm to +17dBm

Amplitude Resolution

0.1dB

Spurious

-80dBc@10GHz

Harmonics

-50dBc@10GHz

Phase Noise

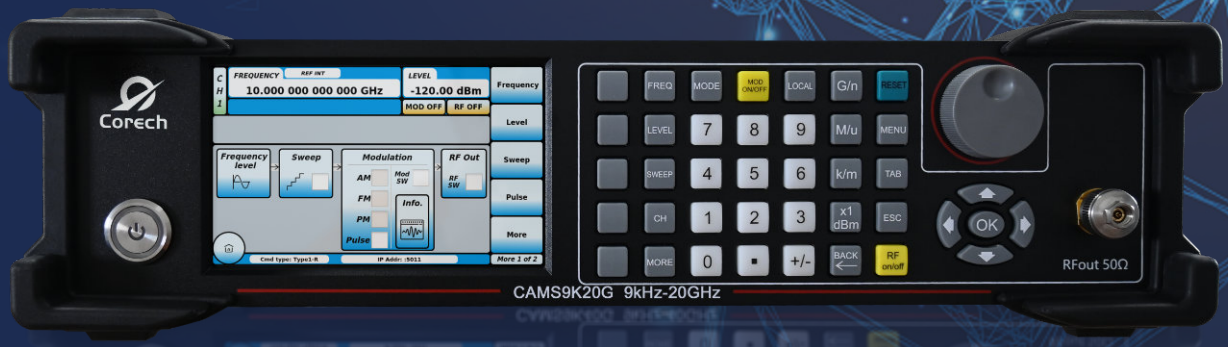
-108dBc/Hz@10kHz(10GHz)

Dimensions

370mm×365mm×89mm

PRODUCT FEATURE

- 9kHz to 20GHz Frequency Range
- –120 to +17dBm Output Power Control
- Low Phase Noise and Low Spurious
- High-Speed Step Frequency Sweep Operation
- AM, FM, ØM, Pulse Modulation
- High Frequency Stability in Compact Architecture



ELECTRICAL SPECIFICATIONS

All specifications apply to a properly calibrated instrument that has been stored at room temperature (approximately 25 °C) for at least 2 hours prior to measurement and powered on with a minimum warm-up time of 30 minutes. Unless otherwise stated, specifications include measurement uncertainty and are guaranteed at room temperature. All specifications in this datasheet apply from 9 kHz to 20 GHz unless otherwise stated.

Parameter	Min.	Typ.	Max.	Note
Part Number		**CAMS9K20G**		
Frequency Range	9kHz		20GHz	
Frequency Resolution		0.001Hz		
Operating Mode		CW, Sweep, FM, ØM, AM		
Internal Pulse Generator		✔		Standard
Pulse Modulation		✔		Standard
FM, PM, AM		✔		Standard
Frequency Reference (Internal)				
Internal Reference Aging Rate		±0.3ppm / year (typical)		
Initial Calibration Accuracy		±0.1 ppm @ +23 ±5 °C		
External Reference				
Input Frequency		10MHz		50 Ω
External Reference Signals (50 Ω)		Sine Wave: +3 to +10dBm		
		Square Wave, CMOS/TTL Compatible (0 to +3.3 V)		
Lock Range		±0.5 ppm relative to 10 MHz reference input		
Internal Reference Output				
Output Frequency		10MHz, 100MHz		
Output Power	+5dBm		+10dBm	10MHz
	+5dBm		+10dBm	100MHz
Output Frequency Stability		±0.1ppm		
SSB Phase Noise		-145dBc/Hz@1kHz		10MHz
		-150dBc/Hz@1kHz		100MHz
Spurious		-70dBc		

ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Note
Switching Speed				
Frequency Switching Time	10ms (Typical, RF Settled, ALC enabled)			
Output Power Range				
9kHz ~ 100kHz	-120dBm		+17dBm	
100kHz ~ 200MHz	-120dBm		+17dBm	
200MHz ~ 20GHz	-120dBm		+17dBm	
	Note: Maximum output power may vary with frequency and temperature			
Output Power Resolution	0.1dB			
VSWR (Level ≤ 0dBm, ALC enabled)				
9kHz ~ 6GHz		1.6		
6GHz ~ 20GHz		2.0		

Absolute Level Accuracy （Typical）

Frequency Range	Pout>0 dBm	-20dBm<Pout≤0dBm	-70dBm<Pout≤-20dBm	Pout≤−70 dBm
9kHz<F≤1GHz	≤±0.5	≤±1.0	≤±2.0	≤±2.0
1GHz<F≤10GHz	≤±0.5	≤±1.0	≤±2.0	≤±2.0
10GHz<F≤20GHz	≤±1.0	≤±1.0	≤±2.0	≤±3.0
Absolute level accuracy applies after a 30-minute warm-up,referenced to a calibrated power meter at 25 °C.				

ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Note
Harmonics (CW Mode, Level ≤ +10dBm)				
10MHz		-45dBc	-40dBc	
500MHz		-46dBc	-40dBc	
1GHz		-50dBc	-40dBc	
10GHz		-58dBc	-40dBc	
20GHz		-43dBc	-40dBc	
Sub-harmonics (CW Mode, Level ≤ +10dBm)				
10MHz		-83dBc	-75dBc	
100MHz		-85dBc	-75dBc	
1GHz		-82dBc	-75dBc	
10GHz		-81dBc	-75dBc	
20GHz		-80dBc	-75dBc	
Non-harmonic Spurious (CW Mode, Offset ≥ 5 kHz)				
10MHz		-80dBc	-60dBc	
100MHz		-80dBc	-60dBc	
1GHz		-78dBc	-60dBc	
10GHz		-72dBc	-60dBc	
20GHz		-65dBc	-60dBc	

ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Note
SSB Phase Noise @ Carrier Freq.: 1 GHz (CW Mode, Level ≤ +10dBm, ALC enabled)				
Freq. Offset 100Hz		-104 dBc/Hz	-100 dBc/Hz	
Freq. Offset 1kHz		-123 dBc/Hz	-122 dBc/Hz	
Freq. Offset 10kHz		-125 dBc/Hz	-124 dBc/Hz	
Freq. Offset 100kHz		-127 dBc/Hz	-125 dBc/Hz	
Freq. Offset 1MHz		-132 dBc/Hz	-129 dBc/Hz	
SSB Phase Noise @ Carrier Freq.: 10 GHz (CW Mode, Level ≤ +10dBm, ALC enabled)				
Freq. Offset 100Hz		-85 dBc/Hz	-84 dBc/Hz	
Freq. Offset 1kHz		-101 dBc/Hz	-100 dBc/Hz	
Freq. Offset 10kHz		-110 dBc/Hz	-109 dBc/Hz	
Freq. Offset 100kHz		-110 dBc/Hz	-109 dBc/Hz	
Freq. Offset 1MHz		-111 dBc/Hz	-109 dBc/Hz	
SSB Phase Noise @ Carrier Freq.: 20 GHz (CW Mode, Level ≤ +10dBm, ALC enabled)				
Freq. Offset 100Hz		-82 dBc/Hz	-79 dBc/Hz	
Freq. Offset 1kHz		-101 dBc/Hz	-97 dBc/Hz	
Freq. Offset 10kHz		-104 dBc/Hz	-103 dBc/Hz	
Freq. Offset 100kHz		-104 dBc/Hz	-103 dBc/Hz	
Freq. Offset 1MHz		-106 dBc/Hz	-103 dBc/Hz	

ELECTRICAL SPECIFICATIONS

Frequency Sweep	
Operating Mode	Step Sweep
Sweep Range	9kHz to 20GHz
Sweep Mode	Single or Continous
Step Spacing	Linear
Number of Points	Step Sweep: 2 to 65,535
Sweep Dwell Time	10 ms to 10 s
Dwell Time Resolution	1 ms (Typical)
Frequency Switching Time	300 µs (Typical, Step-to-step, Internal Frequency Synthesizer, ALC OFF)
Trigger Source	Auto, Keyboard, External, LAN
Trigger Slope	Positive, Negative (External Trigger)

ELECTRICAL SPECIFICATIONS

Internal Modulation Source	
Waveform	Sine Wave, Square Wave, Triangle Wave, Sawtooth Wave
Frequency Range	0.01Hz to 1MHz @ Sine Wave
	0.01Hz to 20kHz @ Square Wave, Triangle Wave, Sawtooth Wave
Frequency Resolution	0.01 Hz
Frequency Error	Same as RF Reference
Frequency Response	0.3dB Max

Analog Modulation				
	AM	FM	ØM	Pulse Modulation
AM		✔	✔	(✔)
FM	✔		**x**	✔
ØM	✔	**x**		✔
Pulse Modulation	(✔)	✔	✔	
✔ compitable, **X** incompitable, (✔) compatible limitations; No specification applies to AM distortion				

Amplitude Modulation (Level ≤ +10dBm)		
Modulation Source	Internal	
Carrier Frequency Range	1MHz to 20GHz	
AM Depth	0% to 99%	
Resolution	1%	
AM Depth Error	fmod =1kHz, Level=0 dBm	< 4% of setting + 1%
AM Distortion	fmod =1kHz, m<30%, Level=0 dBm	<7%
Modulation Frequnecy Response	m<80%, 10kHz - 100kHz	<3dB (nom.)
It should be noted that with AM modulation activated, the peak power will be less than the rated maximum output level.		

ELECTRICAL SPECIFICATIONS

Frequency Segment N for FM and Phase Modulation		
Band	**Frequency Range**	**N**
1	1 MHz ≤ f ≤ 1600 MHz	1/8
2	1600 MHz ≤ f ≤ 3200 MHz	1/4
3	3200 MHz ≤ f ≤ 6400 MHz	1/2
4	6400 MHz ≤ f ≤ 12800 MHz	1
5	12800 MHz ≤ f ≤ 20000 MHz	2

Frequency Modulation (Level ≤ +10dBm)		
Modulation Source	Internal	
Maximum Deviation	N*5MHz	
Resolution	0.1% of set deviation or 1Hz,whichever is larger	
FM Deviation Error	fmod =1kHz Internal Modulation	<2% of setting + 20Hz (nom.)
FM Distortion	fmod =1kHz, Deviation≤ N*2MHz	<0.5% (nom.)
Modulation Frequnecy Response	10Hz to 100kHz	<3.0 dB (nom.)

Phase Modulation (Level ≤ +10dBm)		
Modulation Source	Internal	
Maximum Deviation	5rad	
Resolution	0.1% of set deviation or 0.01 rad ,whichever is larger	
ØM Deviation Error	fmod =1kHz Internal Modulation, Deviation≤ N*5rad	<2% of setting (nom.)
ØM Distortion	fmod =1kHz, Deviation≤ N*5rad	<0.5% (nom.)
Modulation Frequnecy Response	10Hz - 100kHz	<3.0dB (nom.)

ELECTRICAL SPECIFICATIONS

Pulse Modulation (Level ≤ +10dBm)	
Pulse Source	Internal or External
On/Off Ratio	70dBc (Typical)
Fall / Rise Time	50ns (Typical, ≤100MHz)
	15ns (Typical, >100MHz)
Minimum Pulse Width	100 ns
Minimum Pulse Period	110 ns
Pulse Width Accuracy	±10 ns (Typical, for pulse width ≥ 200 ns)
External Pulse Input	LVTTL Compatible (0 to +3.3 V)
Internal Pulse Generator	
Pulse Source	Internal or External
Pulse Modes	Single Pulse or Double Pulse
Pulse Repetition Rate	Setting Range: 0.1Hz to 10MHz
Pulse Period	Setting Range: 20 ns to 100 s
Pulse Width	Setting Range: 10 ns to 99.999 999 s
Resolution	10 ns (Typical)
Delay	20 ns to 100 s
Double Pulse Delay	10 us (Typical)
Trigger Modes	Auto, Keyboard, External Connector
Trigger Slope	Rising Edge, Falling Edge
Trigger Polarity	Positive, negative

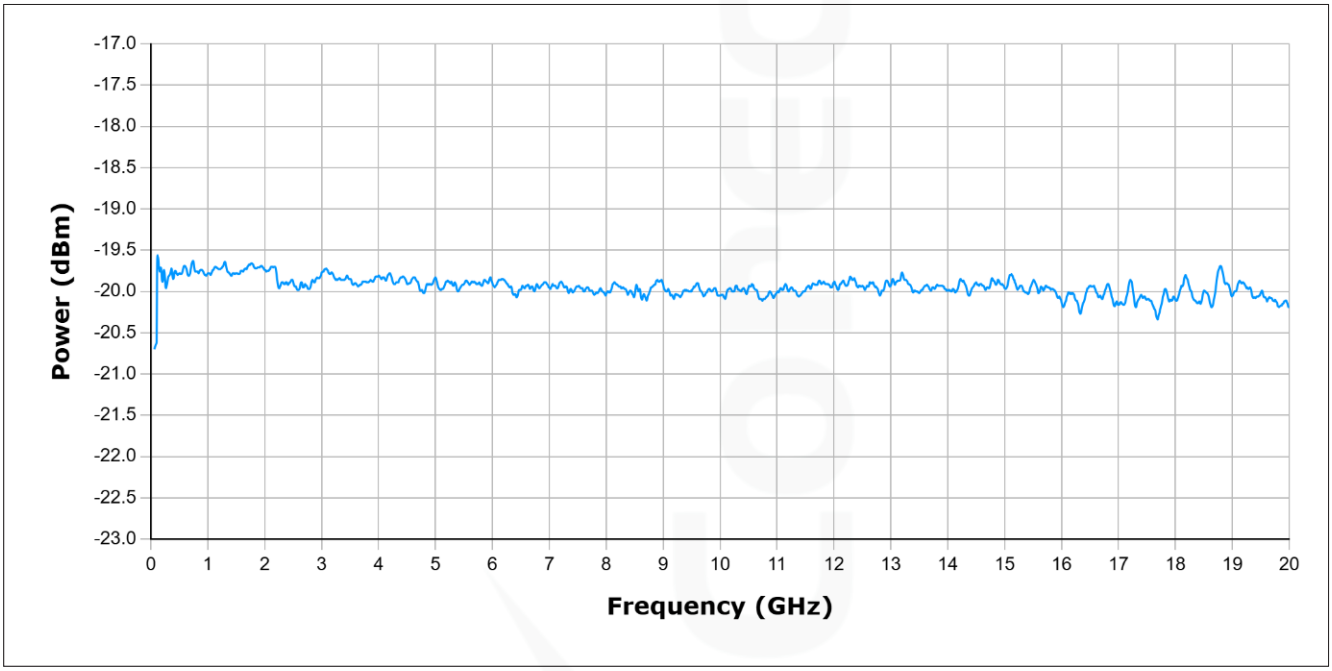
ELECTRICAL SPECIFICATIONS

General Specifications	
Control	Keyboard
	Touch screen
	USB
	SCPI (RS / Keysight)
Screen	5 Inch Touch Screen
Power Requirements	AC110 ~ 240V (±10%)，50/60Hz
Operating Temperature	0 ℃ to +50 ℃
Storage temperature	-20 ℃ to +70 ℃
Weight	10 kg Max
Dimensions	L 370 × W 365 × H 89mm
Safety Compliance	
EN IEC 62368-1:2020+A11:2020	
Electromagnetic Compatibility Directive	
EN 55032:2017+A11:2020	
RoHS	
Self-Declaration of RoHS Compliance	
ReaCH	
Self-Declaration of ReaCH Compliance	

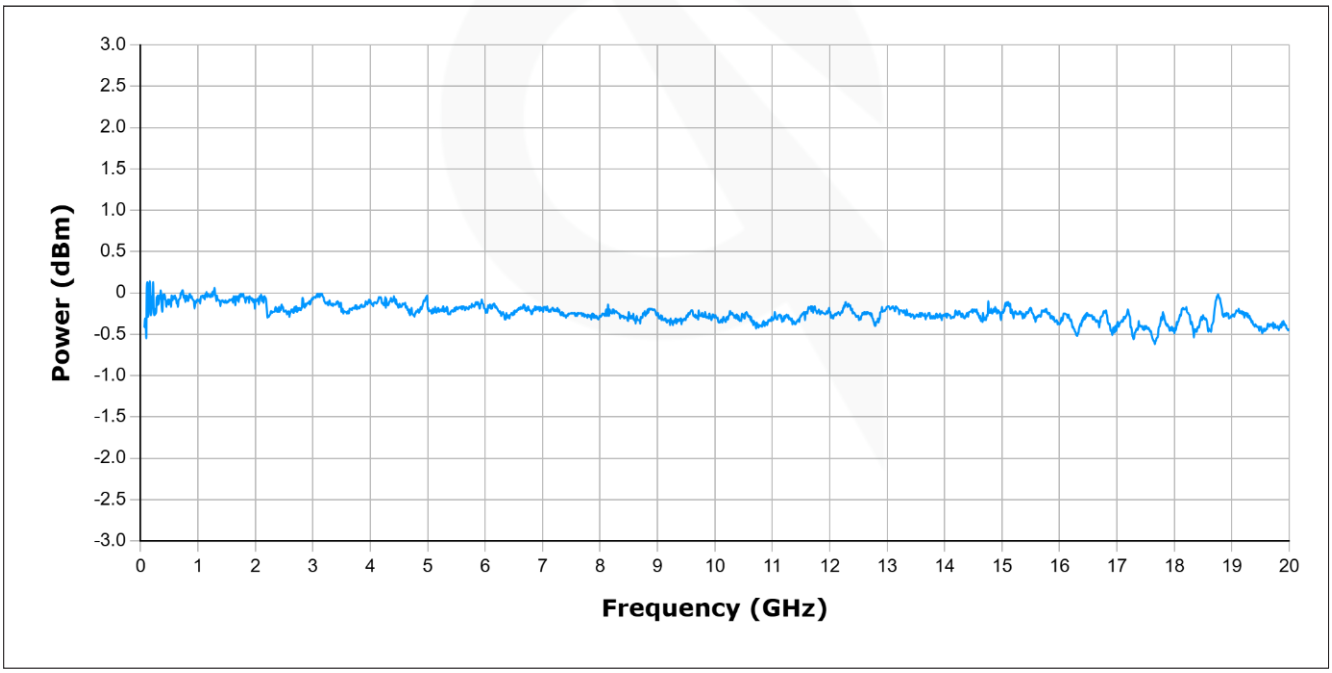
TYPICAL TEST CURVE

OUTPUT POWER

1. Level Error vs. Frequency, Level = -20dBm （Typical）



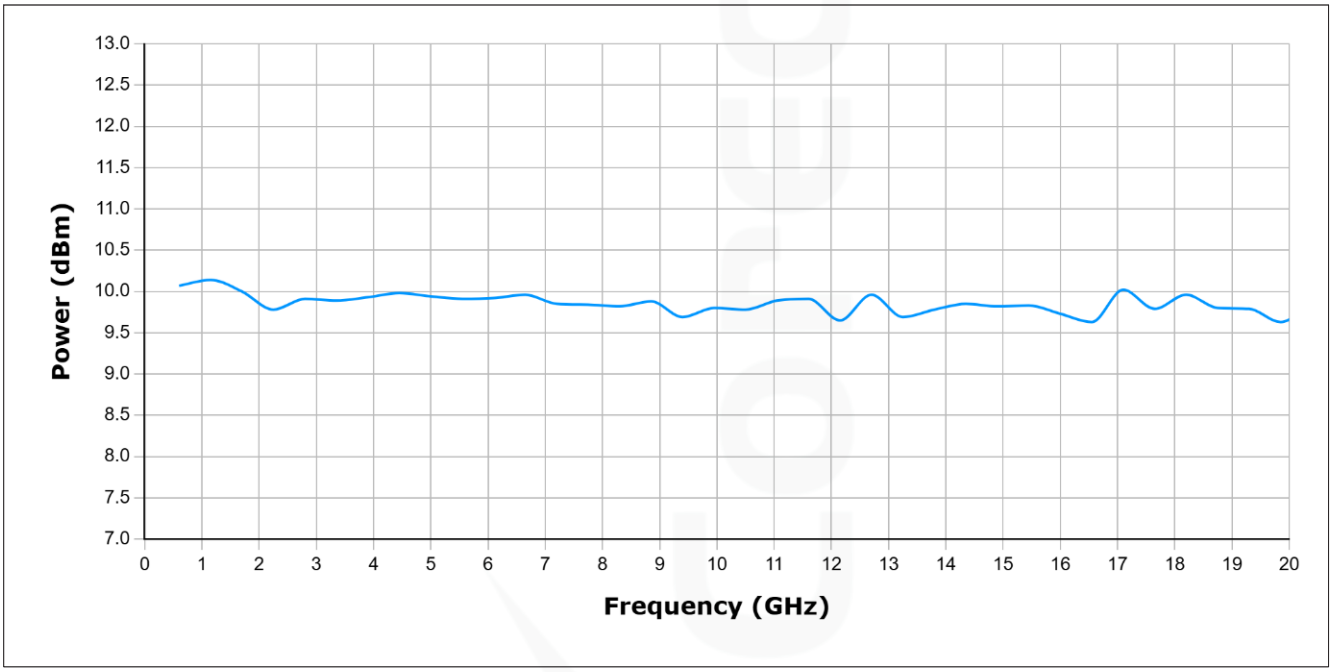
2. Level Error vs. Frequency, Level = 0dBm （Typical）



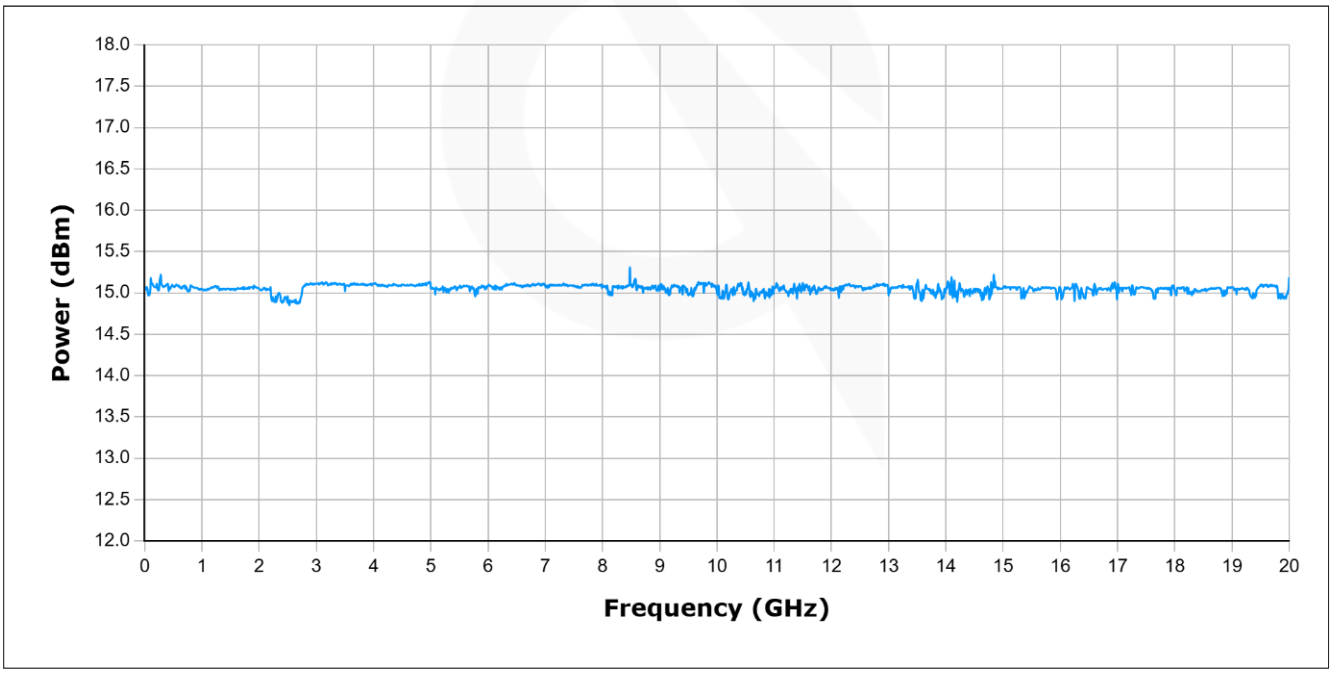
TYPICAL TEST CURVE

OUTPUT POWER

3. Level Error vs. Frequency, Level = +10dBm （Typical）



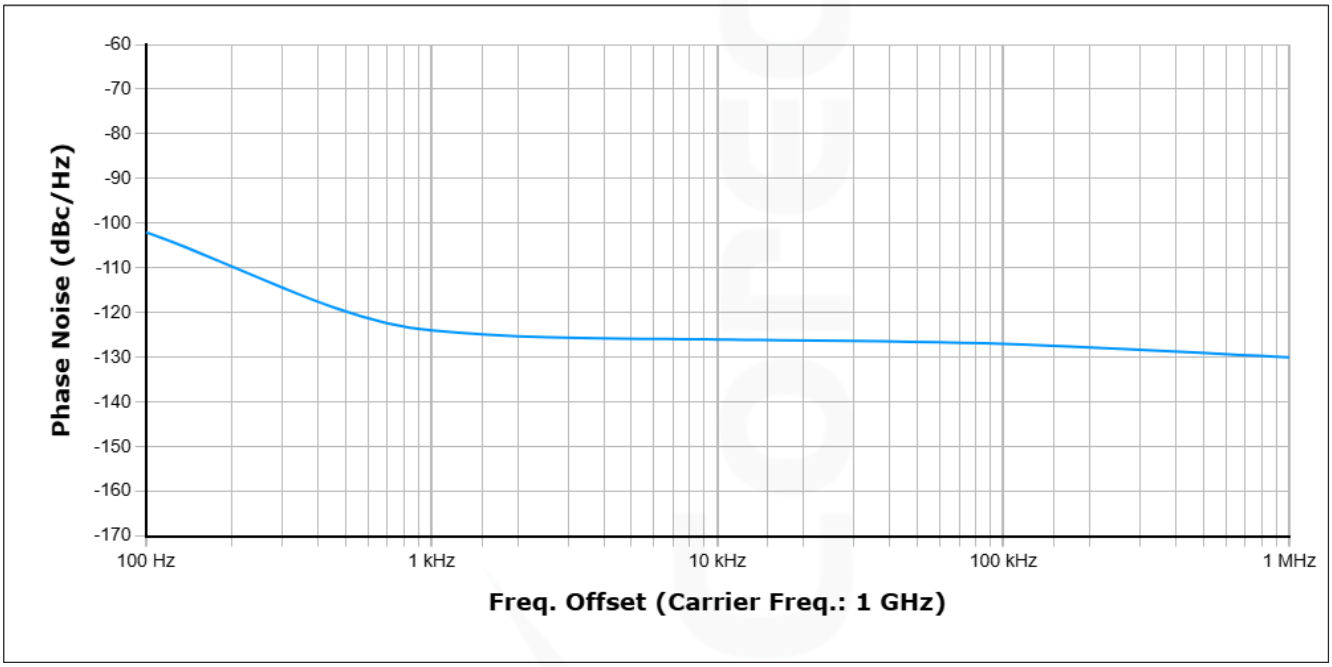
4. Level Error vs. Frequency, Level = +15dBm （Typical）



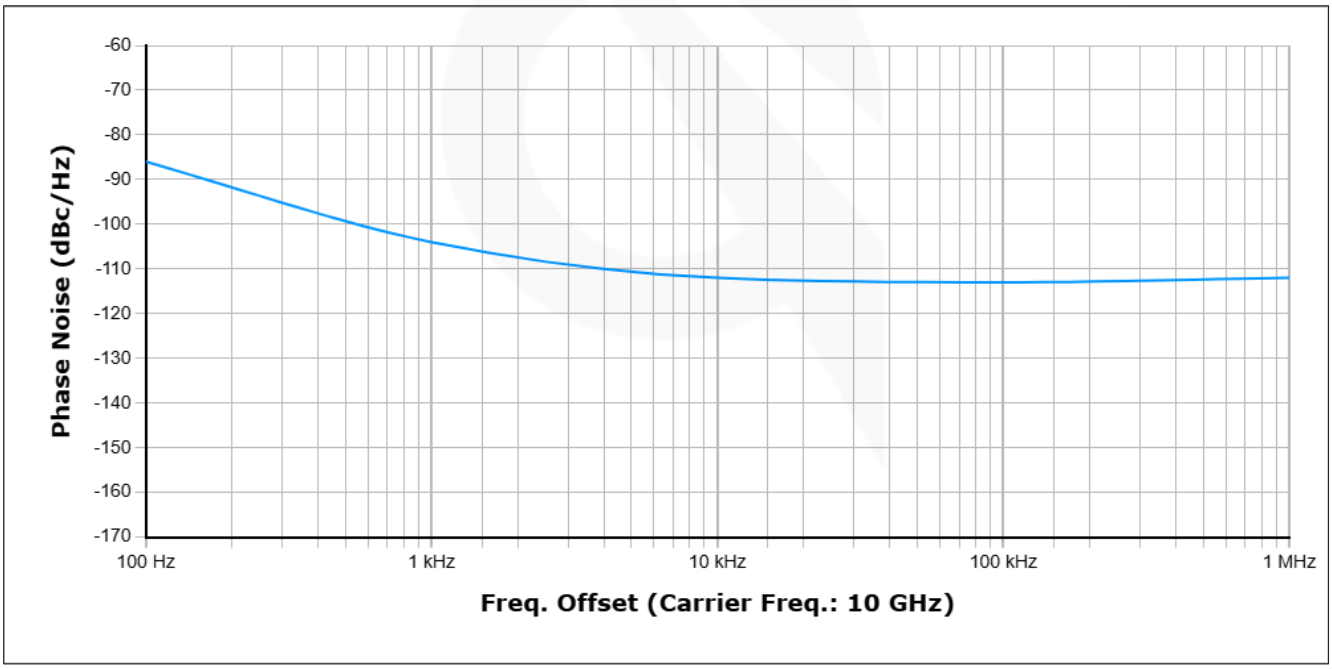
TYPICAL TEST CURVE

SSB Phase Noise

1. Carrier Frequency: 1 GHz, Level: +10dBm （Typical）



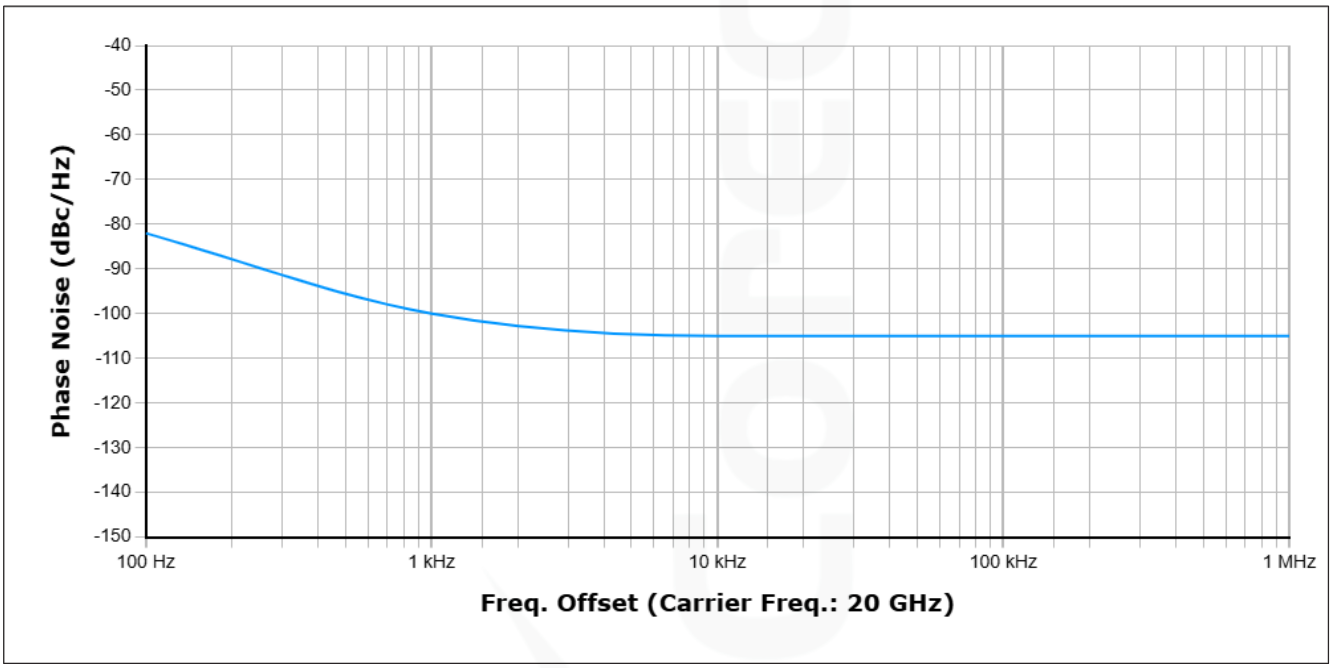
2. Carrier Frequency: 10 GHz, Level: +10dBm （Typical）



TYPICAL TEST CURVE

SSB Phase Noise

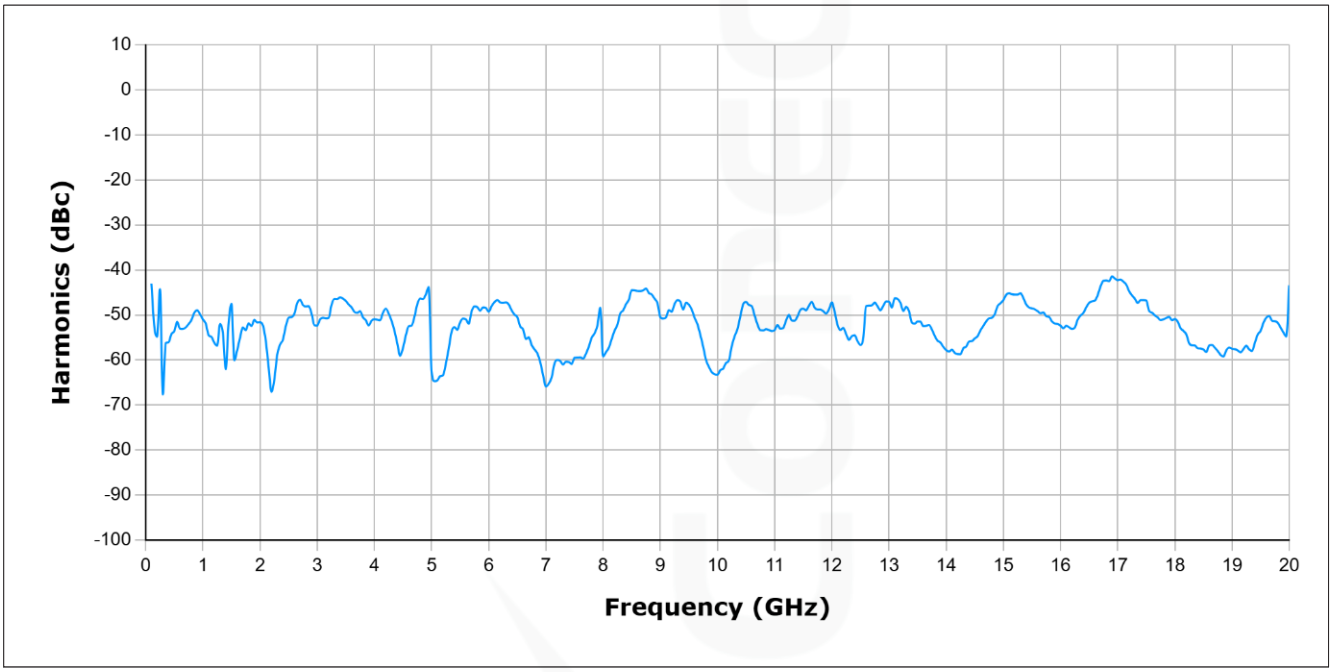
3. Carrier Frequency: 20 GHz, Level: +10dBm （Typical）



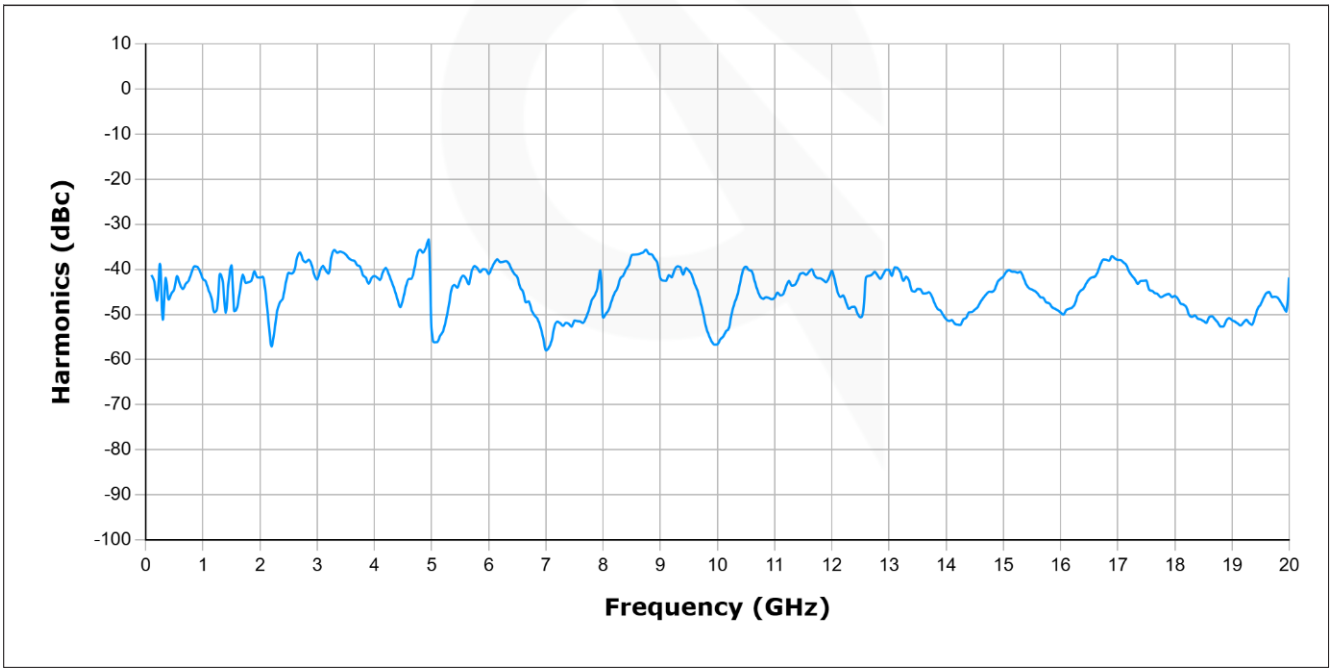
TYPICAL TEST CURVE

2nd Harmonics

1. 2nd Harmonics at Level +10dBm （Typical）

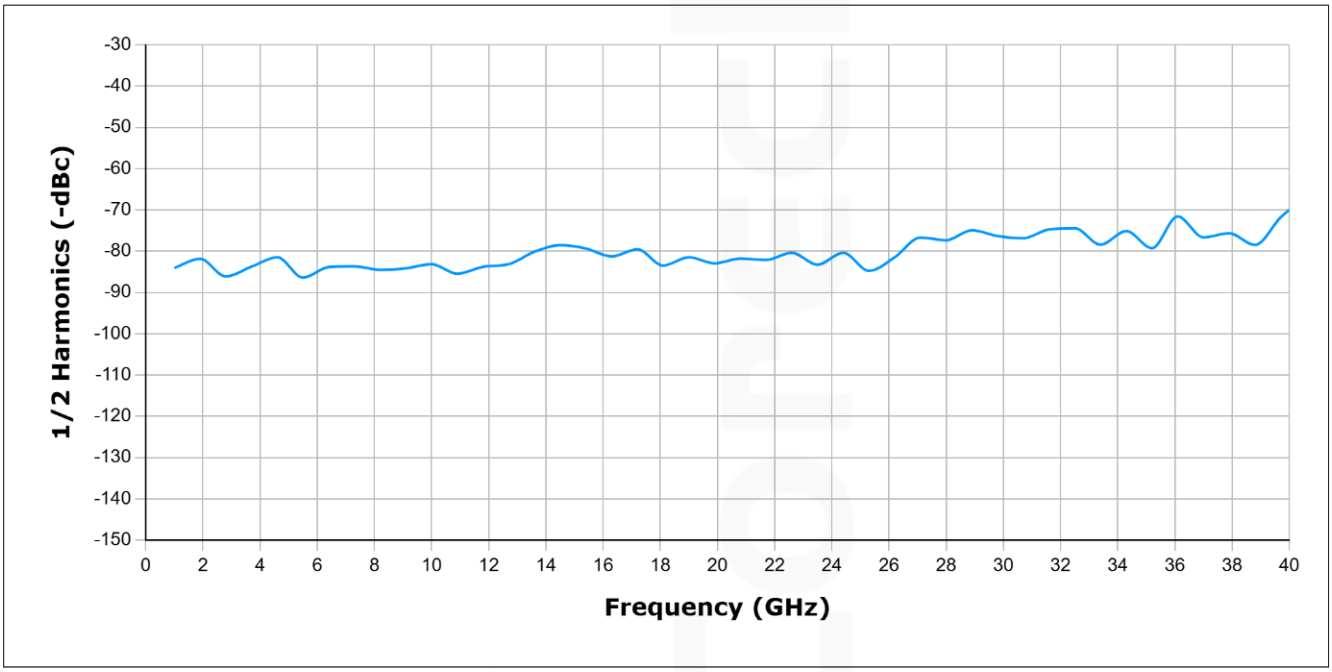


2. 2nd Harmonics at Level +15dBm （Typical）

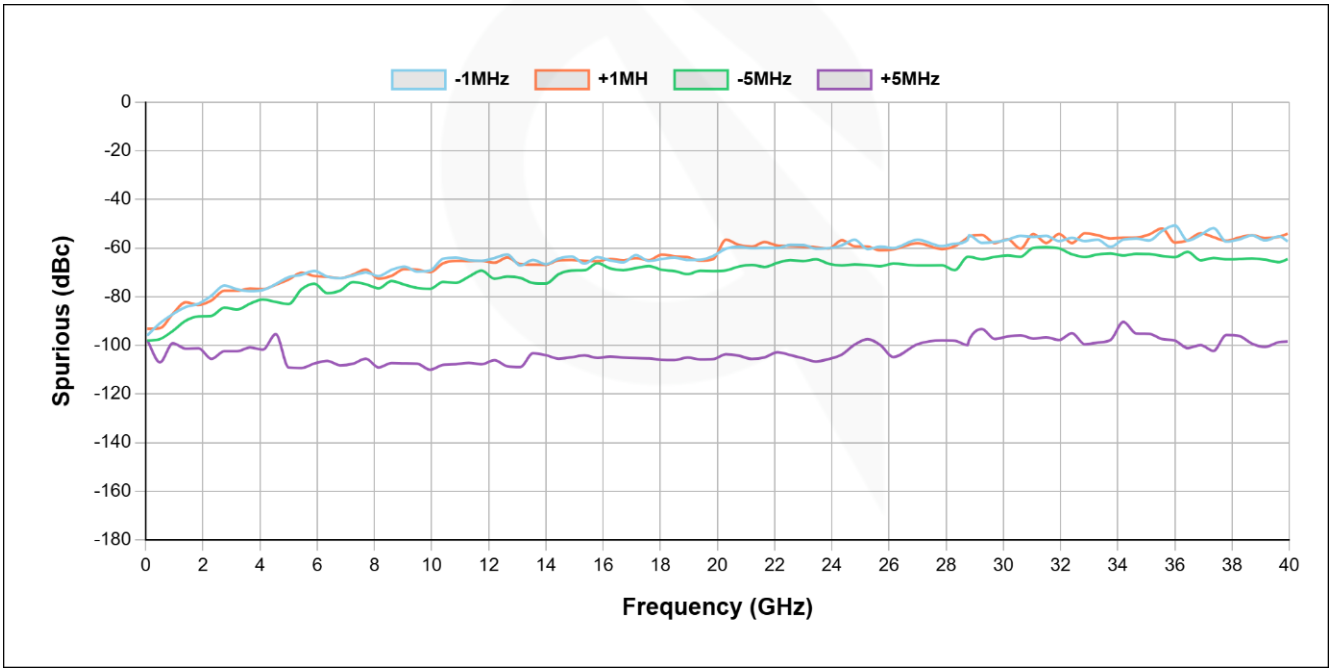


TYPICAL TEST CURVE

Sub-harmonics at Level +10dBm （Typical）



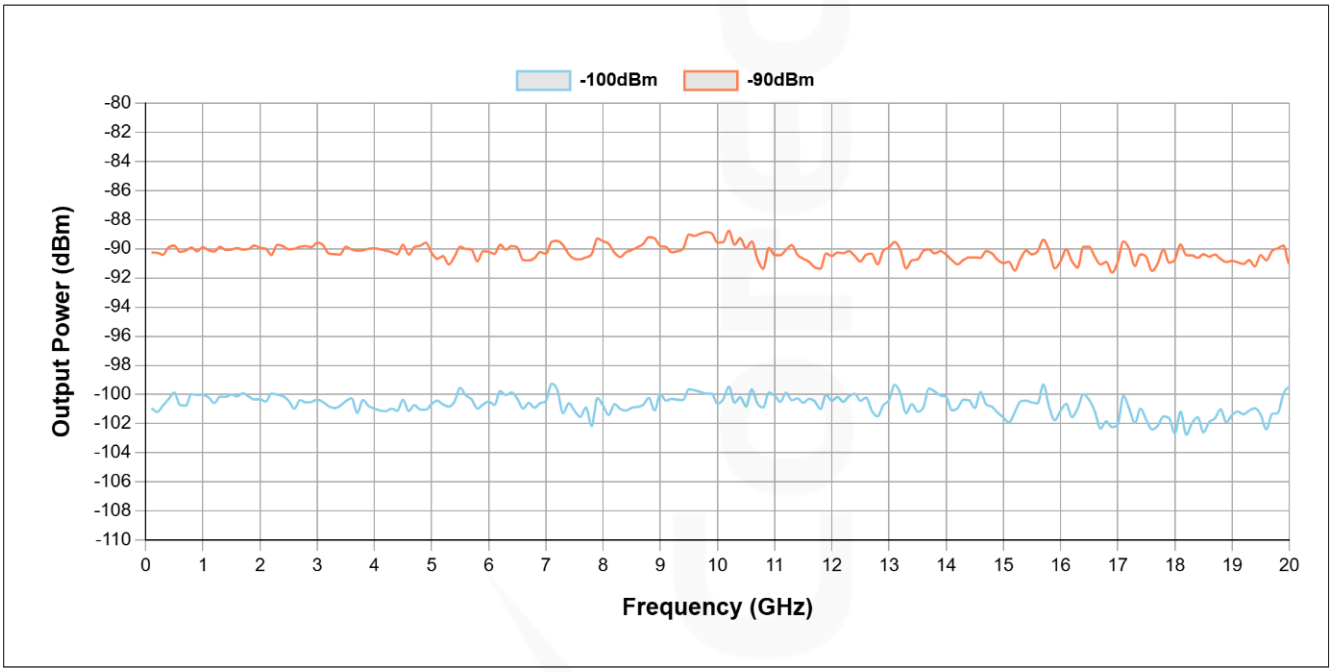
Non-harmonic Spurious （Typical）



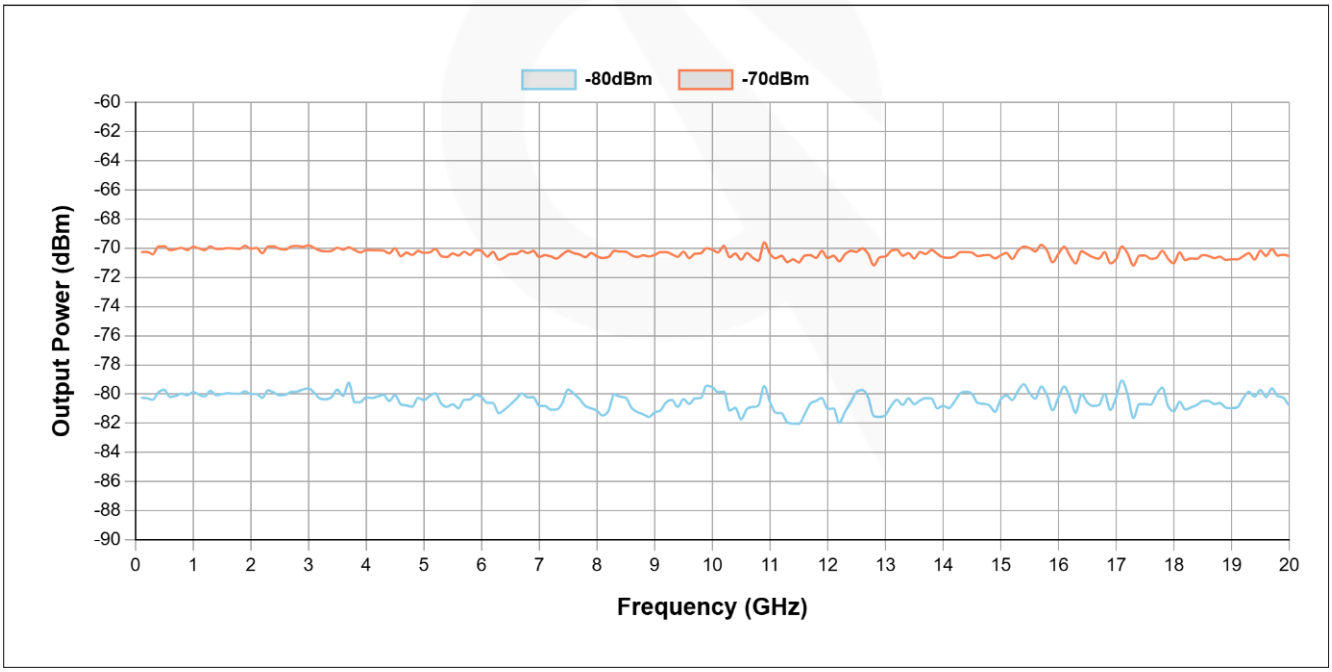
TYPICAL TEST CURVE

Attenuation Accuracy

1. Att. Accuracy at Output Power -100dBm, -90dBm （Typical）



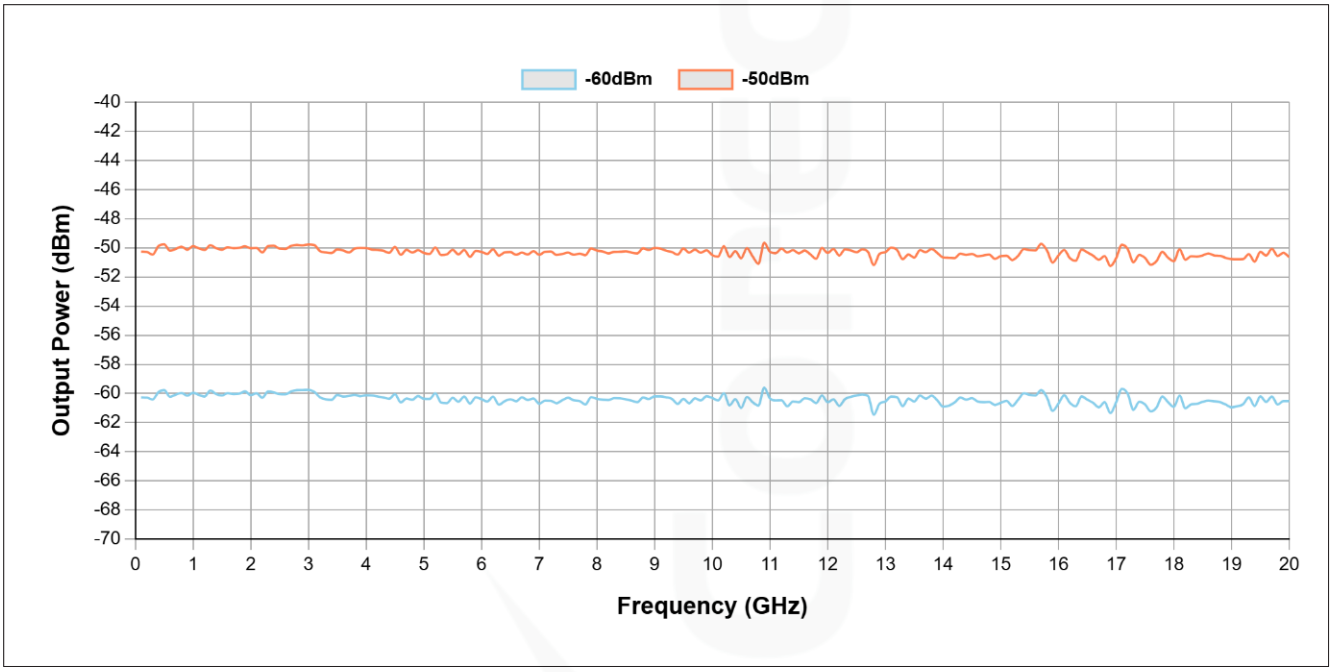
2. Att. Accuracy at Output Power -80dBm, -70dBm （Typical）



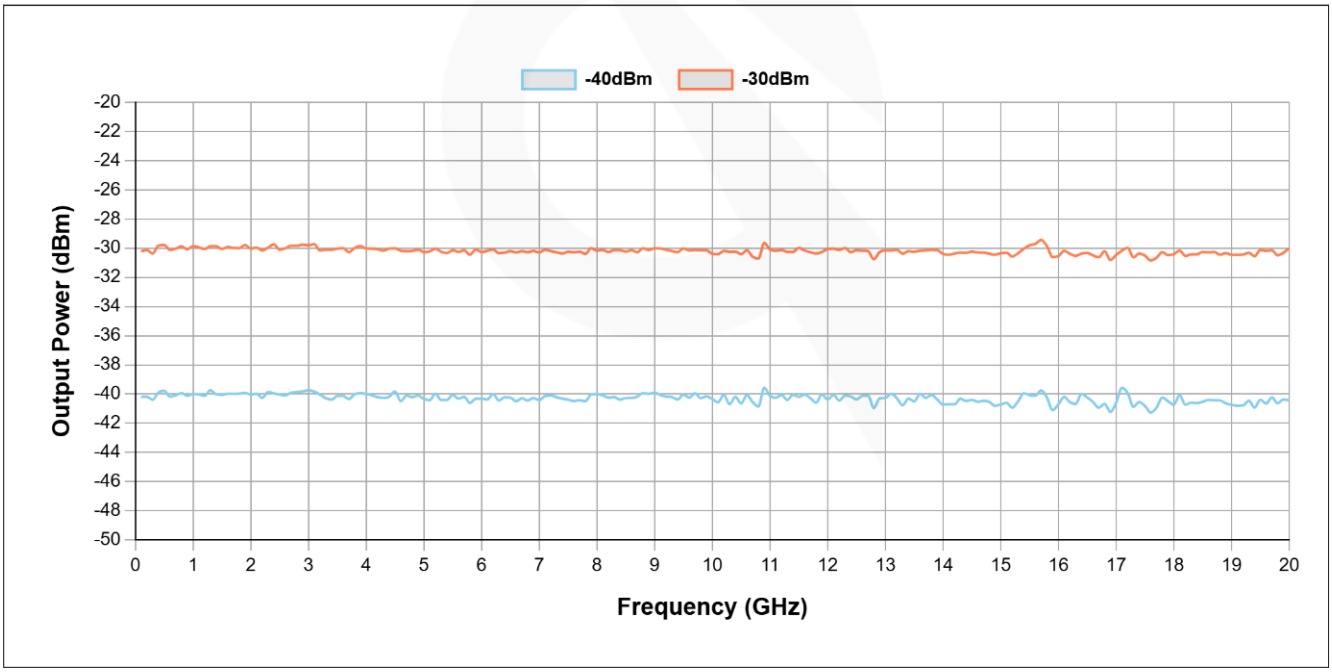
TYPICAL TEST CURVE

Attenuation Accuracy

3. Att. Accuracy at Output Power -60dBm, -50dBm （Typical）



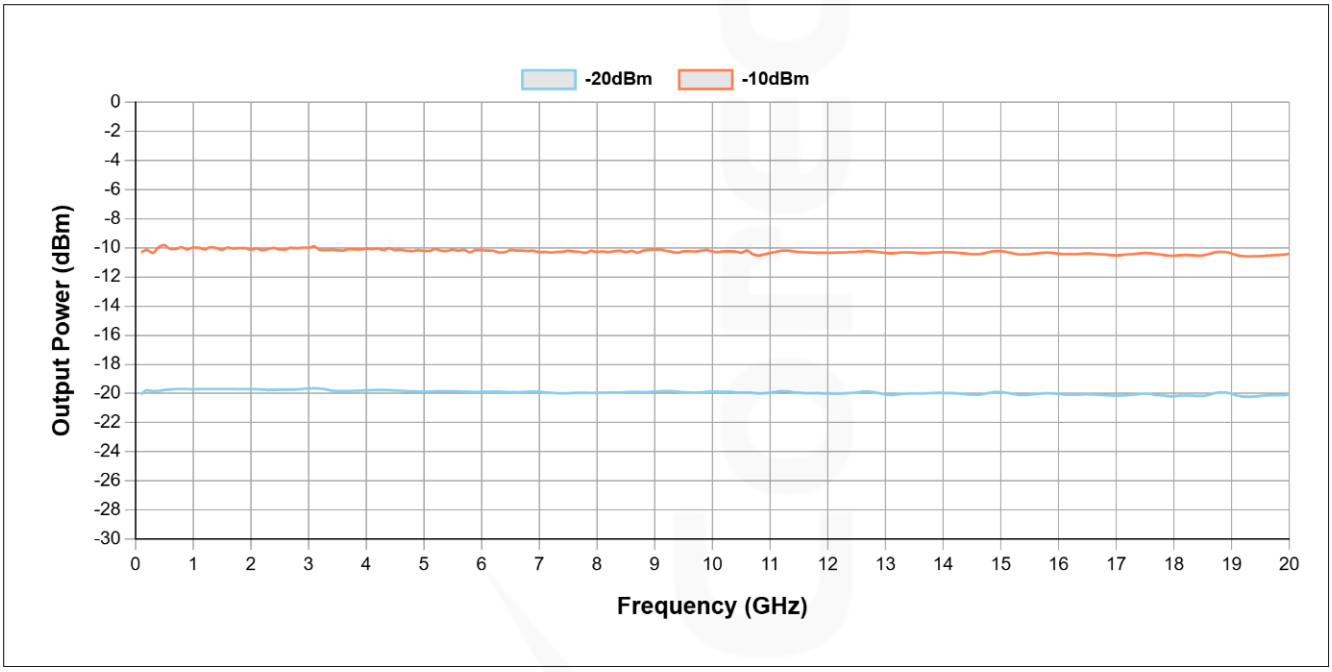
4. Att. Accuracy at Output Power -40dBm, -30dBm （Typical）



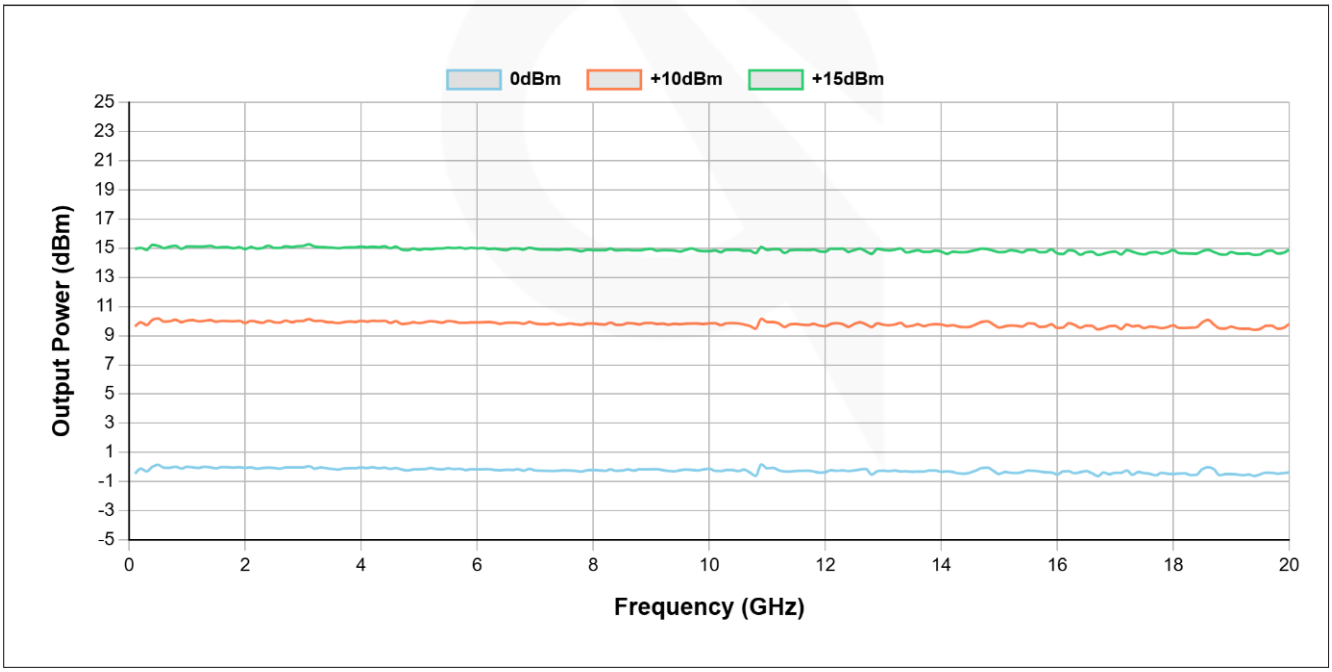
TYPICAL TEST CURVE

Attenuation Accuracy

5. Att. Accuracy at Output Power -20dBm, -10dBm （Typical）

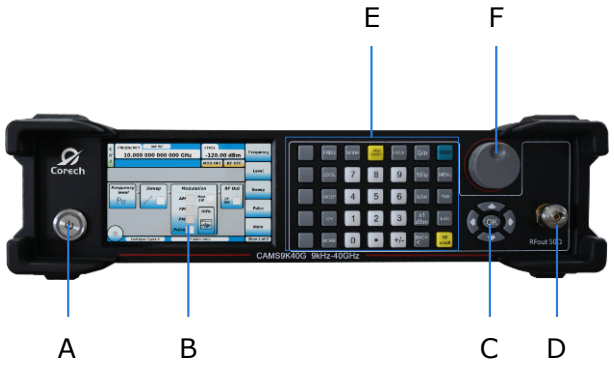


6. Att. Accuracy at Output Power 0dBm, +10dBm, +15dBm （Typical）



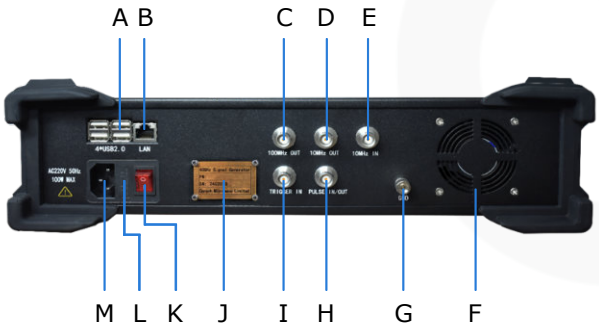
PRODUCT INTERFACE

Front



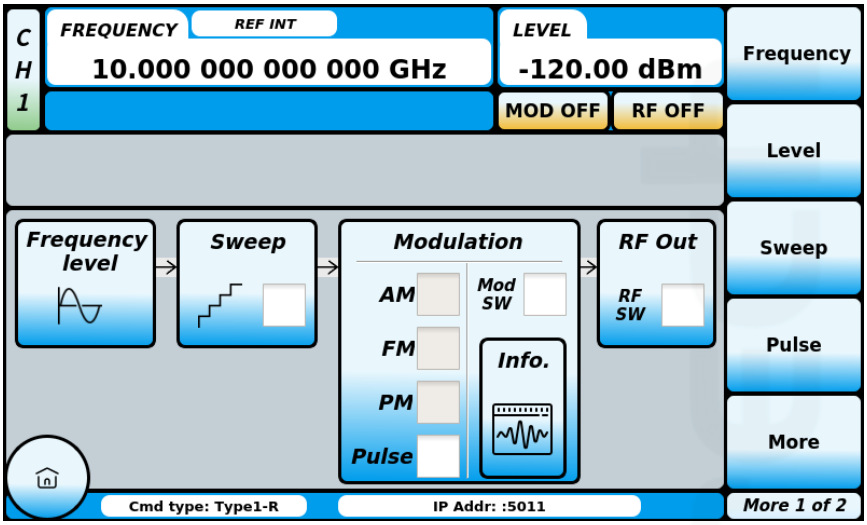
Ref.	Function	Description
A	DC ON/OFF	
B	Screen	5 Inch
C	Direction Key	
D	RF Output	2.9mm-Male
E	Keyboard	
F	Knob	

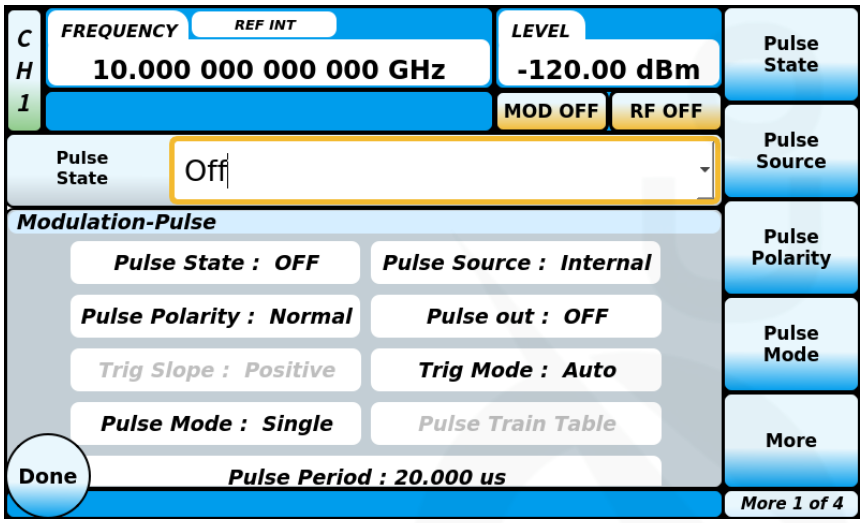
Back

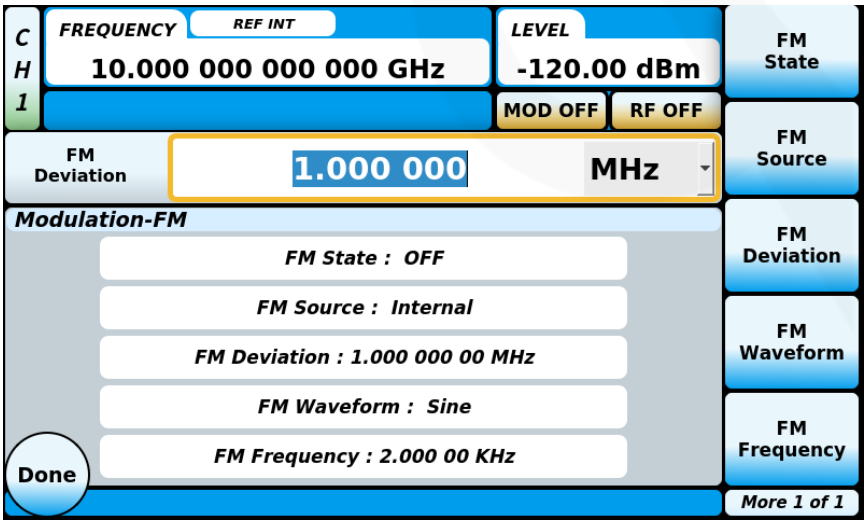


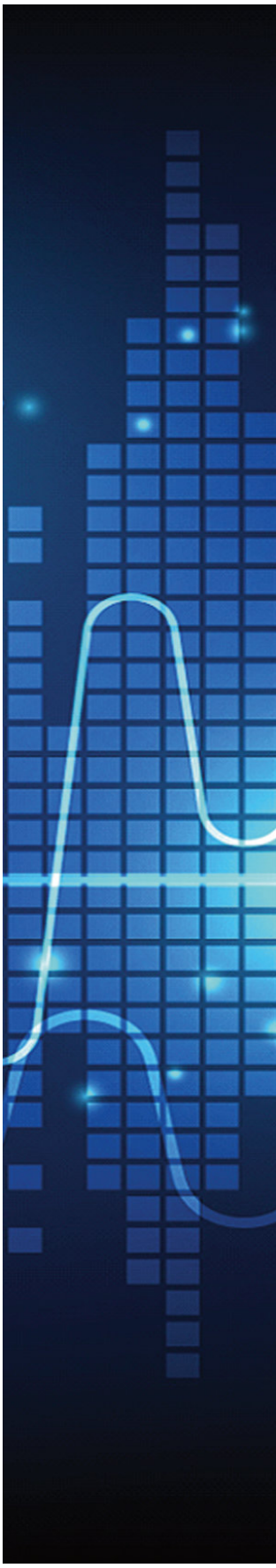
Ref.	Function	Description
A	USB Ports	4×USB2.0
B	Ethernet Port	RJ45
C	100MHz Output	BNC - Female
D	10MHz Output	BNC - Female
E	10MHz Input	BNC - Female
F	Fan	Exhaust
G	GND Terminal	
H	Pulse Signal Input/Output	BNC - Female
I	Trigger Signal In	BNC - Female
J	Name Plate	
K	AC ON/OFF	
L	Fuse Holder	
M	AC Power Port	AC110~240V

SCREEN


CH 1
FREQUENCY
REF INT
10.000 000 000 000 GHz
LEVEL
-120.00 dBm
MOD OFF
RF OFF
Frequency level
Sweep
Modulation
AM
FM
PM
Pulse
Mod SW
Info.
RF Out
RF SW
Cmd type: Type1-R
IP Addr: :5011
Frequency
Level
Sweep
Pulse
More
More 1 of 2


CH 1
FREQUENCY
REF INT
10.000 000 000 000 GHz
LEVEL
-120.00 dBm
MOD OFF
RF OFF
Pulse State
Off
Modulation-Pulse
Pulse State : OFF
Pulse Source : Internal
Pulse Polarity : Normal
Pulse out : OFF
Trig Slope : Positive
Trig Mode : Auto
Pulse Mode : Single
Pulse Train Table
Pulse Period : 20.000 us
Done
Pulse State
Pulse Source
Pulse Polarity
Pulse Mode
More
More 1 of 4


CH 1
FREQUENCY
REF INT
10.000 000 000 000 GHz
LEVEL
-120.00 dBm
MOD OFF
RF OFF
FM Deviation
1.000 000
MHz
Modulation-FM
FM State : OFF
FM Source : Internal
FM Deviation : 1.000 000 00 MHz
FM Waveform : Sine
FM Frequency : 2.000 00 KHz
Done
FM State
FM Source
FM Deviation
FM Waveform
FM Frequency
More 1 of 1



Corech - Your Trusted Source for Reliable Testing

Corech is a technology-driven RF test equipment company specializing in the design, development, and delivery of high-performance RF signal generators and analog modulation signal generators spanning frequencies from 9 kHz up to 43 GHz. Corech products are engineered for demanding applications requiring ultra-agile frequency tuning, low phase noise, fine step resolution, and stable output performance, making them essential tools in modern radar systems, communication test benches, semiconductor validation, and advanced research environments.

Since its establishment in 2010, Corech has grown into a dedicated team of over 120 professionals, including an experienced R&D group of more than 40 engineers, many with decades of expertise in RF test field. The company holds 25 invention patents, reflecting its commitment to innovation and technical differentiation. Corech is certified to GJB9001C-2017 Quality Management System standards and recognized as a Chengdu High-Tech Enterprise, underscoring its adherence to quality and industry excellence.

Corech operates extensive R&D and production facilities, including 3,000 m² of controlled environment workshops and more than 600 advanced microelectronic production, testing, and inspection systems. This infrastructure supports a comprehensive development ecosystem — from conceptual design and prototyping to production, verification, and performance testing. By focusing exclusively on RF and analog signal generation technology, Corech delivers solutions that combine technical rigor, reliability, and performance — empowering engineers and researchers to push the boundaries of RF measurement and system validation.

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