CSG9K20GA

20GHz RF Signal Generator

Sweep Pulse Modulation

SG005

VER: 26V2.0

Corech Microwave

Chengdu, China

PRODUCT OVERVIEW

Corech Microwave CSG9K20GA is a compact and cost-effective microwave signal generator developed for professional test and measurement applications. It covers a wide frequency range from 9 kHz to 20 GHz and provides an extended output power range from −120 dBm to +20 dBm, enabling accurate signal generation from ultra-low levels to high dynamic output.

The CSG9K20GA supports fast frequency switching, step sweep operation, and true RF pulse modulation, allowing flexible configuration for radar testing, device characterization, and time-domain measurements. Its low phase noise, low spurious content, and high signal purity contribute to stable, repeatable, and reliable measurement results across the full frequency range.

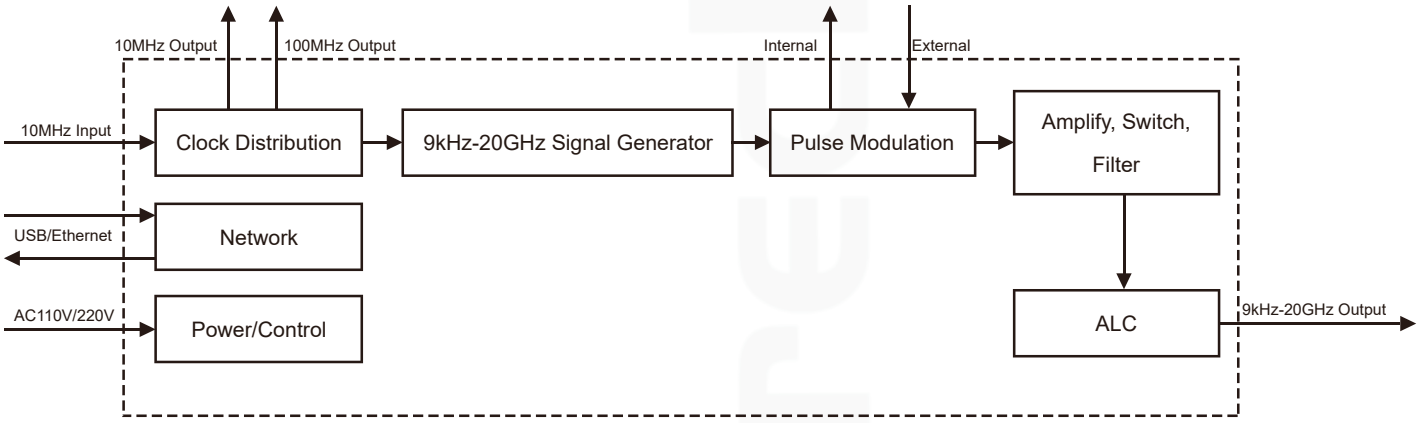
With a compact form factor, SCPI-based remote control, and robust signal integrity, the CSG9K20GA is well suited for use in semiconductor testing, quantum technology research, radar system development, and advanced communication applications, where performance, reliability, and cost efficiency must be carefully balanced.

Factory calibrated prior to shipment.

3-Year Warranty

Your Trusted Source for Reliable Testing

BLOCK DIAGRAM



PERFORMANCE

Frequency Range

9kHz to 20GHz

Frequency Resolution

0.001Hz

Output Power

-120dBm to +20dBm

Amplitude Resolution

0.1dB

Spurious

-80dBc@10GHz

Harmonics

-50dBc@10GHz

Phase Noise

-110dBc/Hz@10kHz(10GHz)

Dimensions

370mm×365mm×89mm

PRODUCT FEATURE

- 9kHz to 20GHz Frequency Range
- –120 to +20dBm Output Power Control
- Low Phase Noise and Low Spurious
- High-Speed Step Frequency Sweep Operation
- Built-in 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	**CSG9K20GA**			
Frequency Range	9kHz		20GHz	
Frequency Resolution		0.001Hz		
Operating Mode	CW / Sweep			
Internal Pulse Generator		✔		Standard
Pulse Modulation		✔		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		+19dBm	
200MHz ~ 20GHz	-120dBm		+20dBm	
	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	≤±2.5
1GHz<F≤10GHz	≤±0.5	≤±1.0	≤±2.0	≤±2.5
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		-108 dBc/Hz	-104 dBc/Hz	
Freq. Offset 1kHz		-127 dBc/Hz	-126 dBc/Hz	
Freq. Offset 10kHz		-131 dBc/Hz	-130 dBc/Hz	
Freq. Offset 100kHz		-132 dBc/Hz	-130 dBc/Hz	
Freq. Offset 1MHz		-133 dBc/Hz	-130 dBc/Hz	
SSB Phase Noise @ Carrier Freq.: 10 GHz (CW Mode, Level ≤ +10dBm, ALC enabled)				
Freq. Offset 100Hz		-86 dBc/Hz	-85 dBc/Hz	
Freq. Offset 1kHz		-107 dBc/Hz	-106 dBc/Hz	
Freq. Offset 10kHz		-112 dBc/Hz	-110 dBc/Hz	
Freq. Offset 100kHz		-111 dBc/Hz	-110 dBc/Hz	
Freq. Offset 1MHz		-113 dBc/Hz	-111 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		-104 dBc/Hz	-100 dBc/Hz	
Freq. Offset 10kHz		-105 dBc/Hz	-104 dBc/Hz	
Freq. Offset 100kHz		-104 dBc/Hz	-104 dBc/Hz	
Freq. Offset 1MHz		-108 dBc/Hz	-105 dBc/Hz	

ELECTRICAL SPECIFICATIONS

Frequency Sweep	
Parameter	**Specifications**
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

Parameter	Specifications	Note
Pulse Modulation		
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	10ns (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	

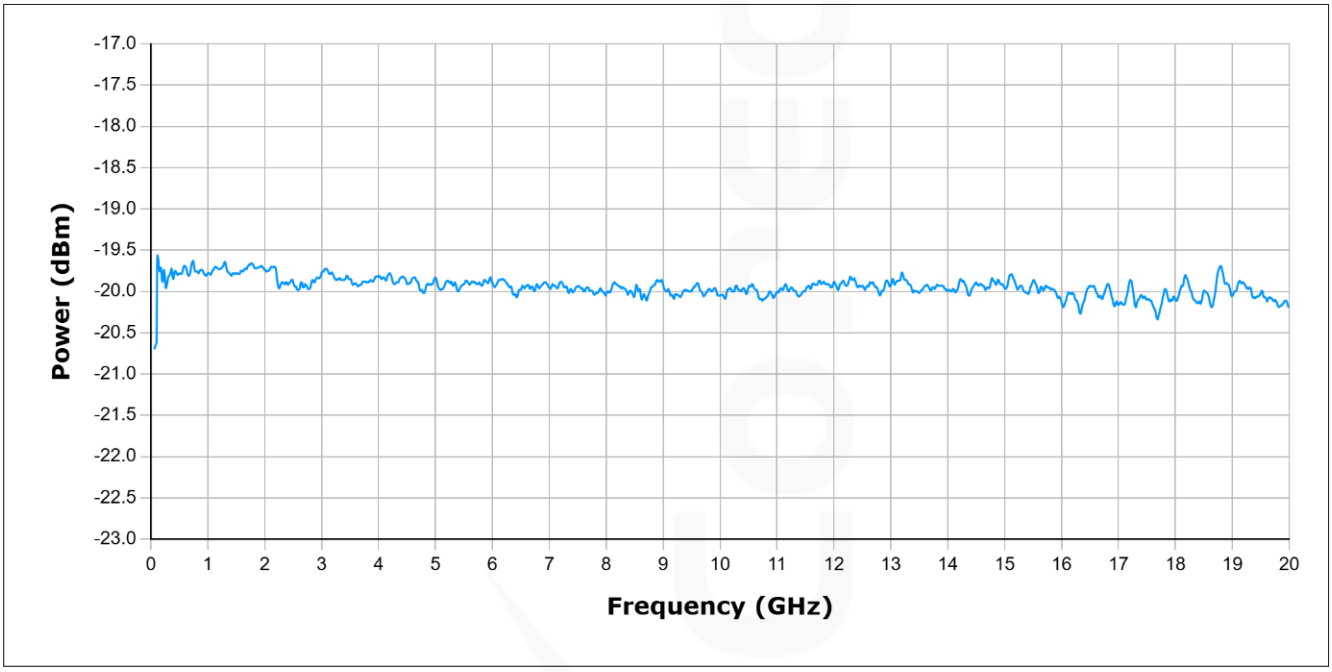
ELECTRICAL SPECIFICATIONS

General Specifications		
Parameter	**Specifications**	**Note**
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		

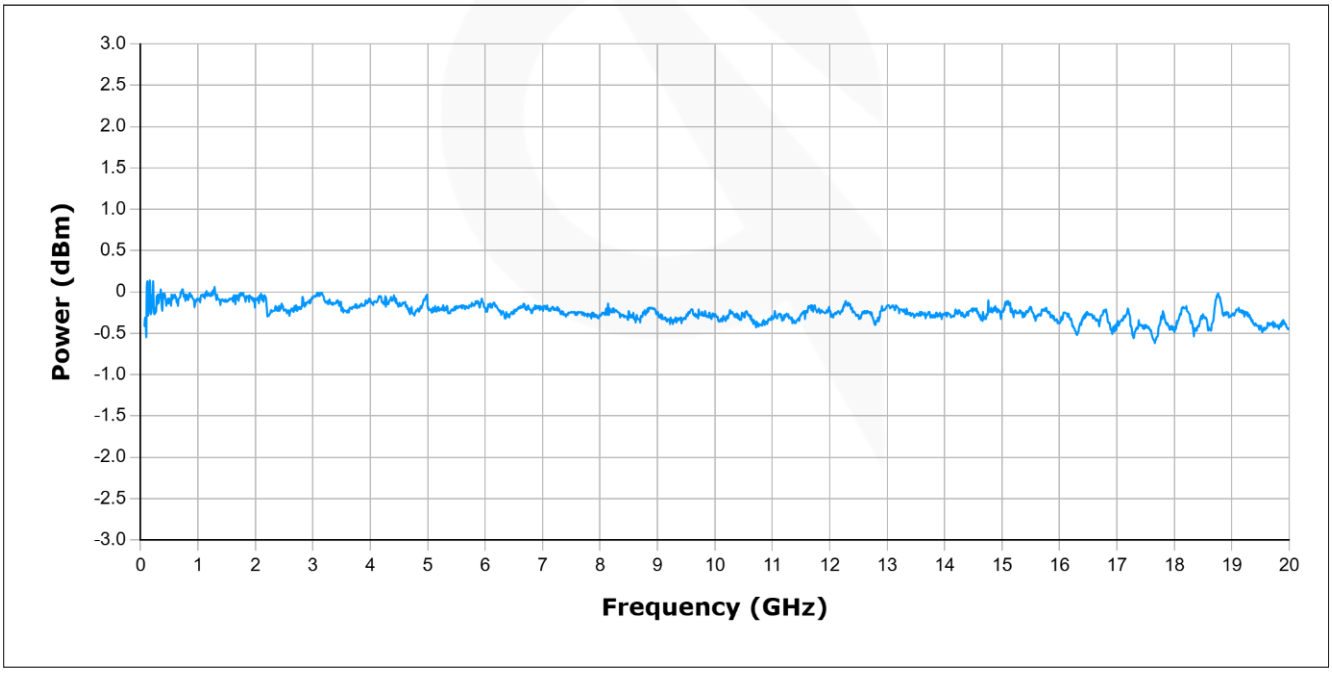
TYPICAL TEST CURVE

OUTPUT POWER

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



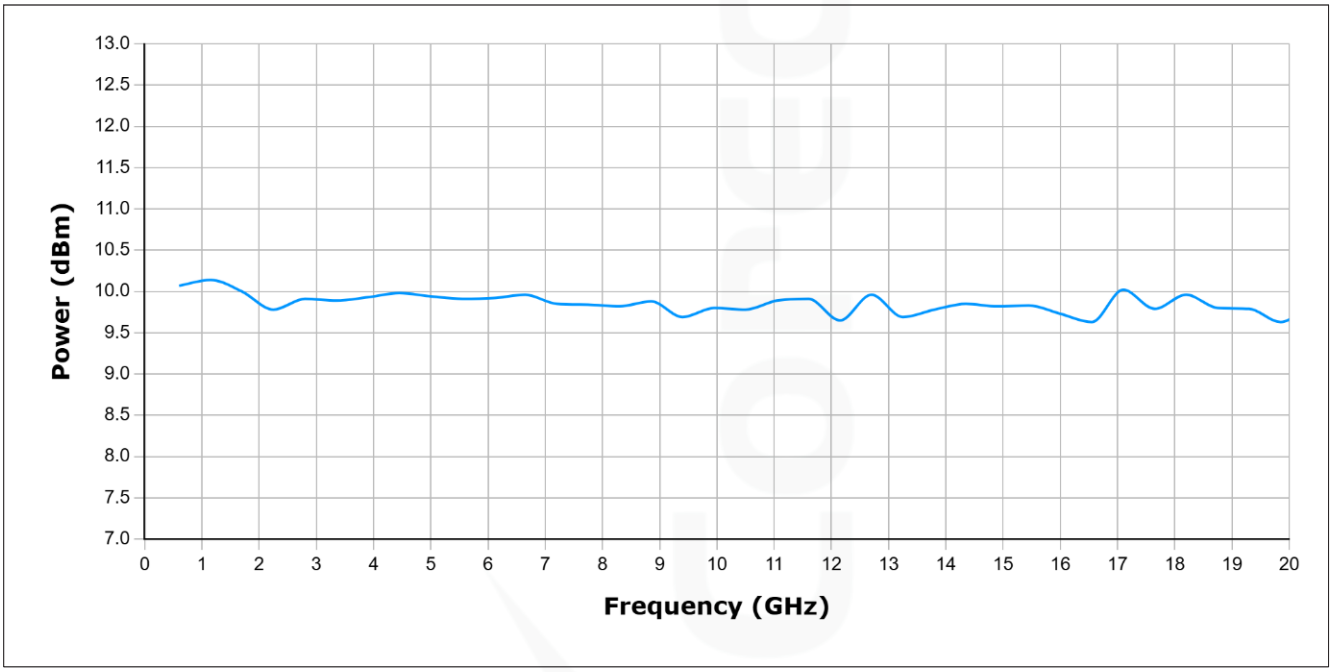
2. Level Error vs. Frequency, Level = 0dBm （Typical）



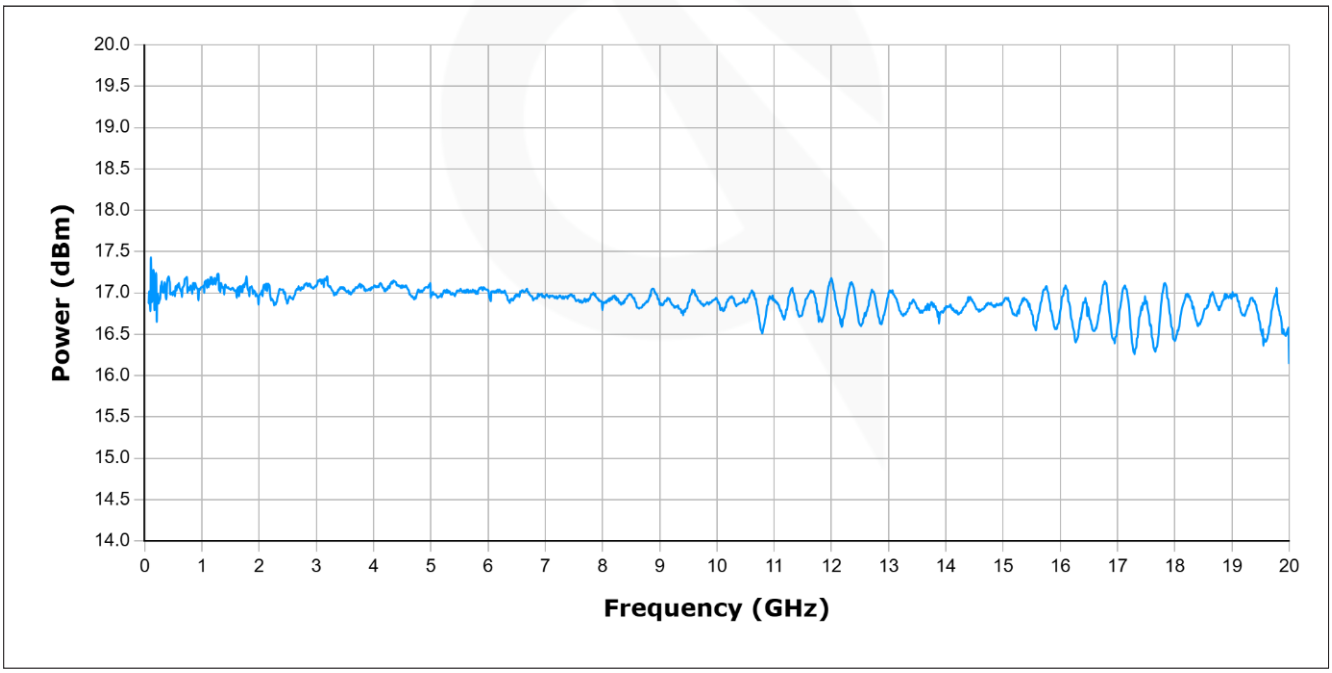
TYPICAL TEST CURVE

OUTPUT POWER

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



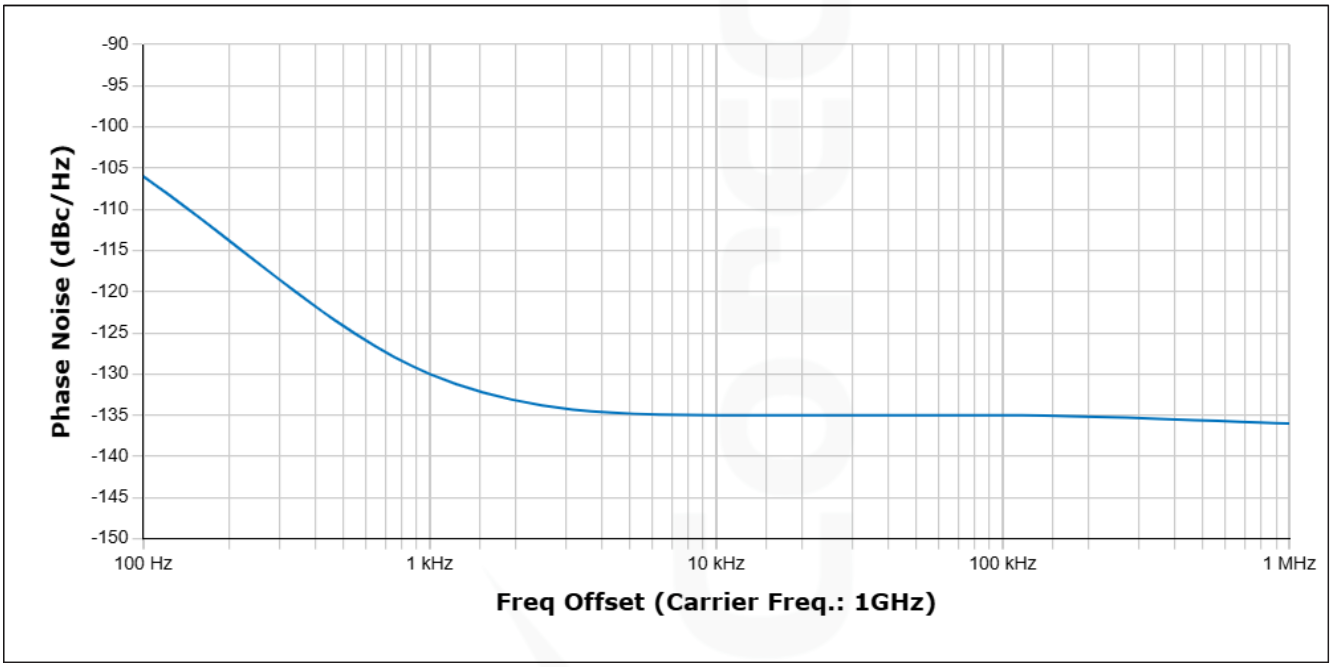
4. Level Error vs. Frequency, Level = +17dBm （Typical）



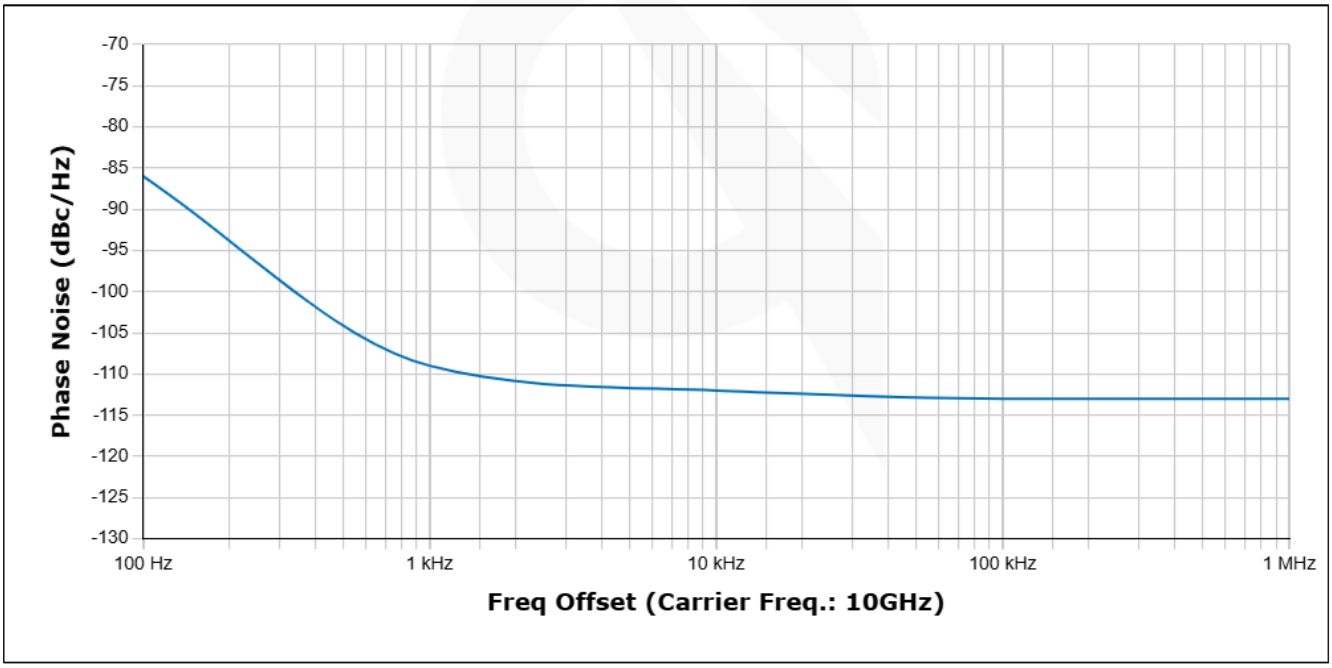
TYPICAL TEST CURVE

SSB Phase Noise

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



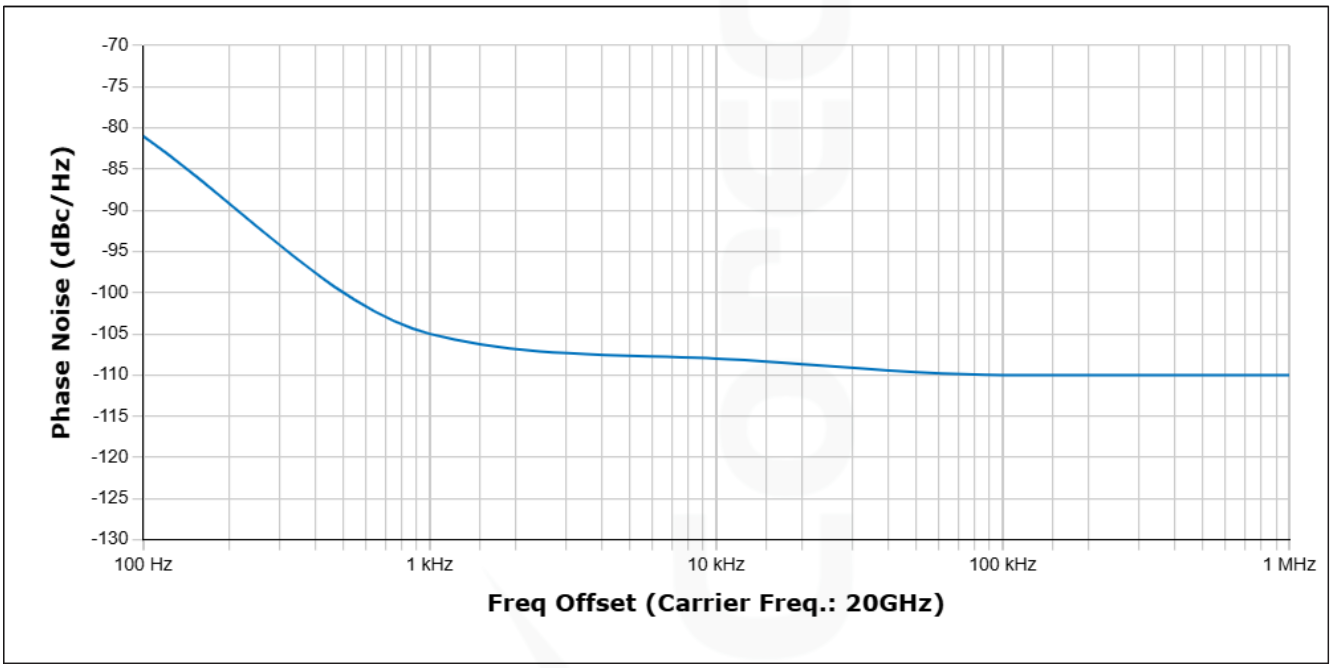
2. Carrier Frequency: 10 GHz, Level: +10dBm （Typical）



TYPICAL TEST CURVE

SSB Phase Noise

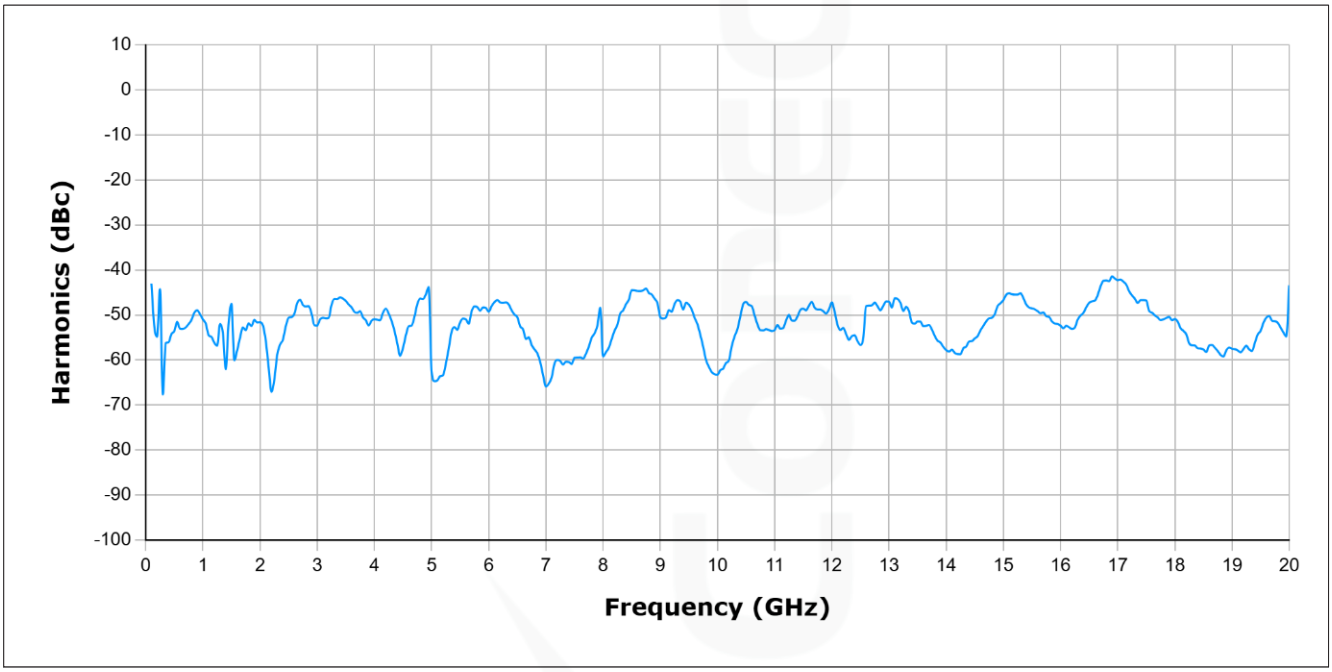
3. Carrier Frequency: 20 GHz, Level: +10dBm （Typical）



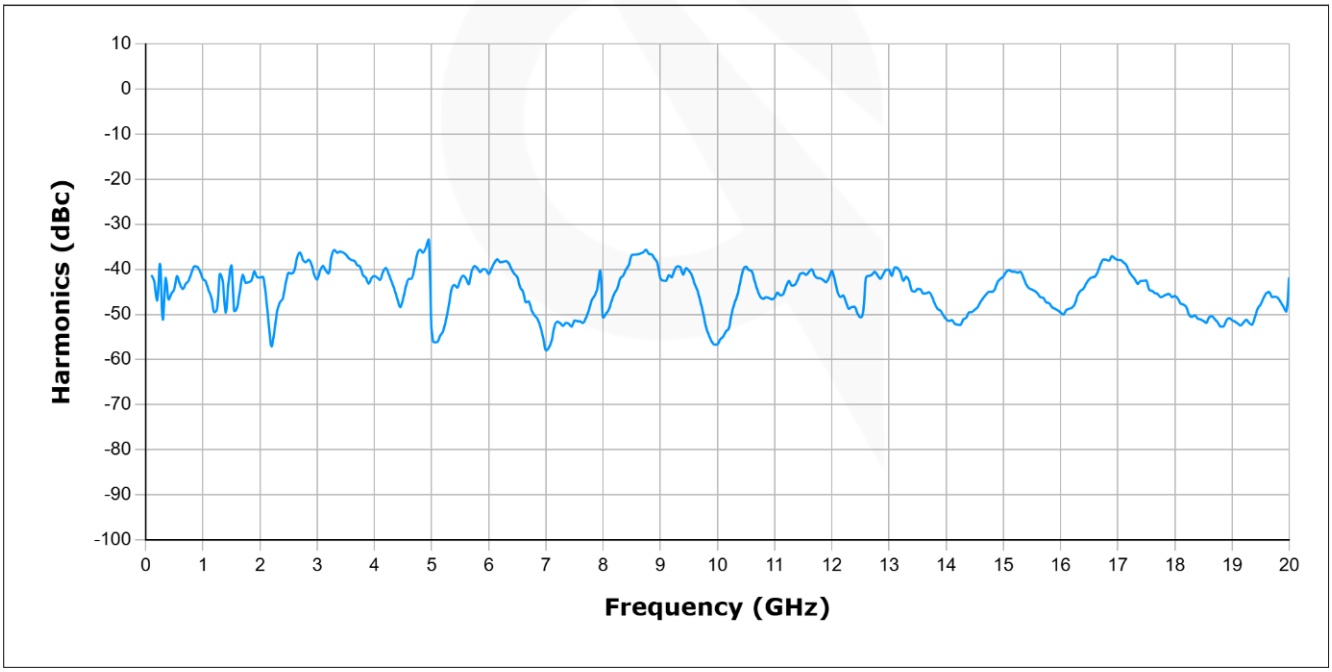
TYPICAL TEST CURVE

2nd Harmonics

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

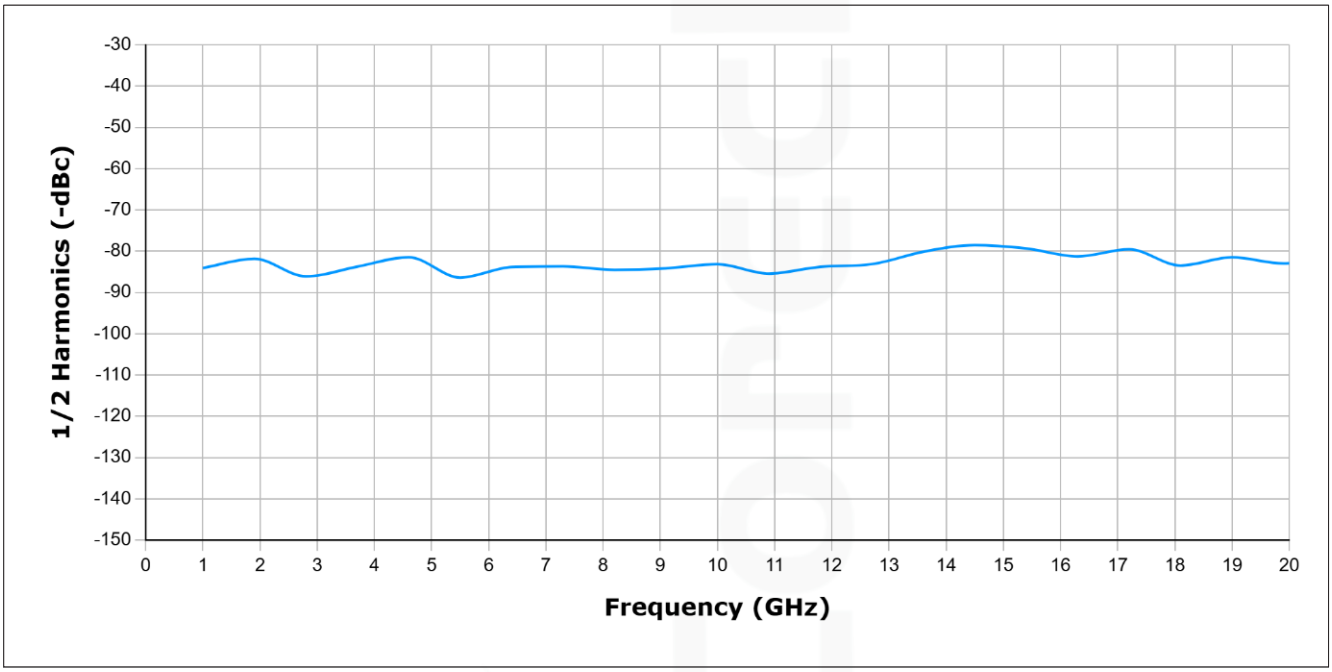


2. 2nd Harmonics at Level +17dBm （Typical）

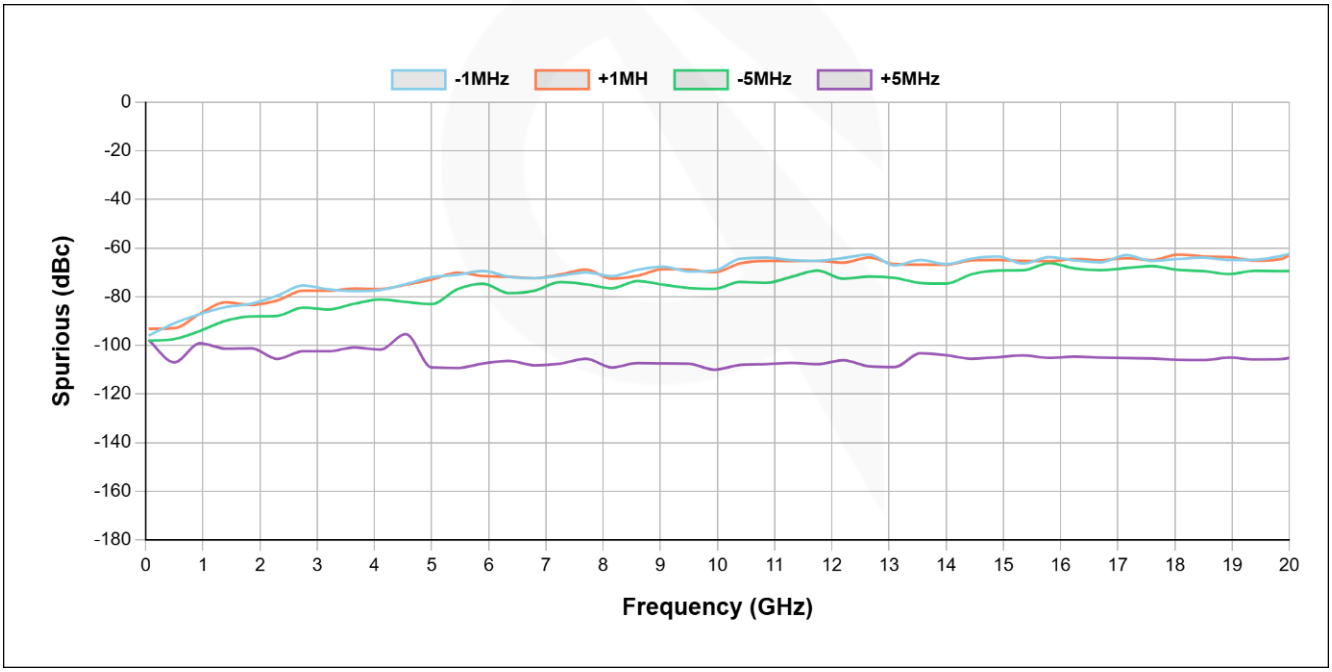


TYPICAL TEST CURVE

Sub-harmonics at Level +17dBm （Typical）



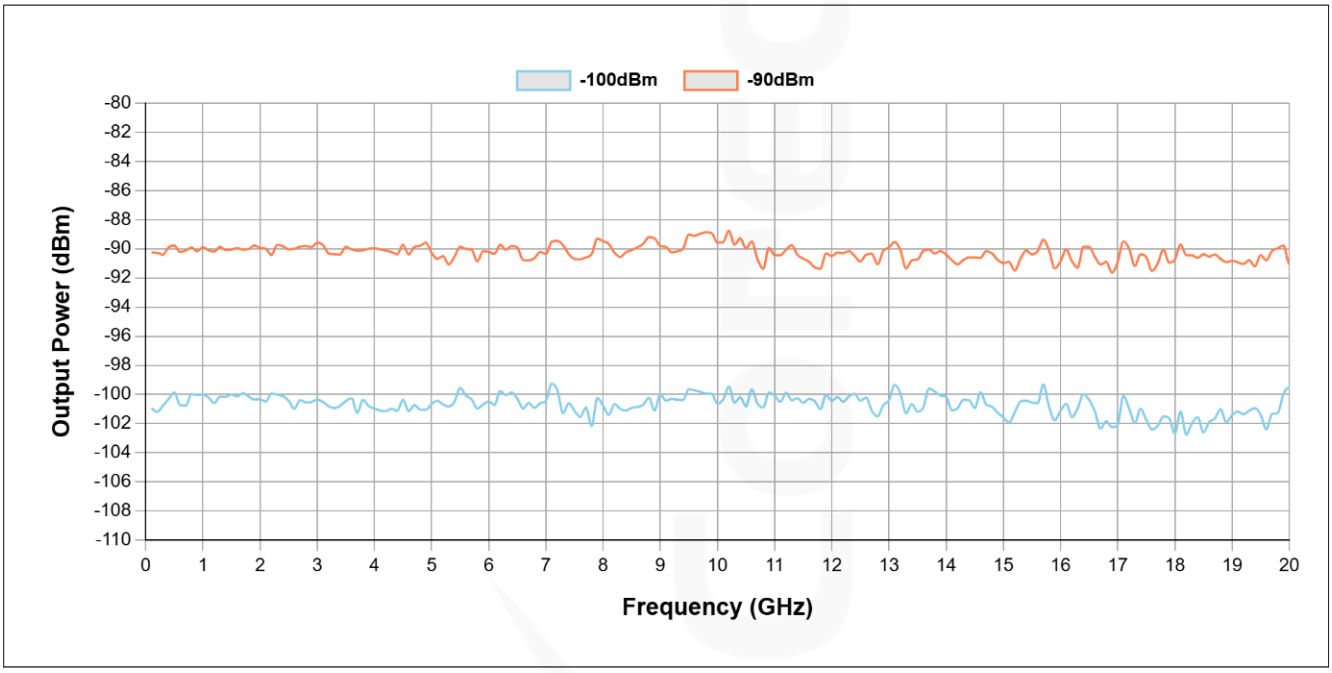
Non-harmonic Spurious （Typical）



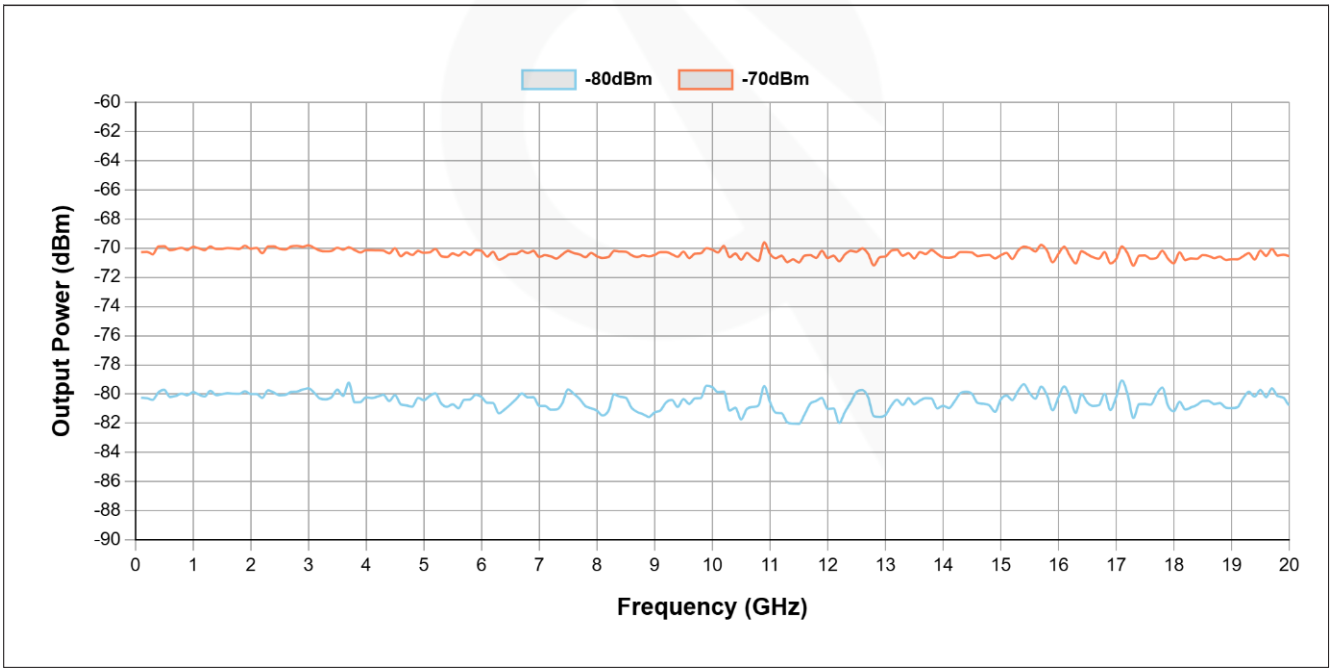
TYPICAL TEST CURVE

Attenuation Accuracy

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



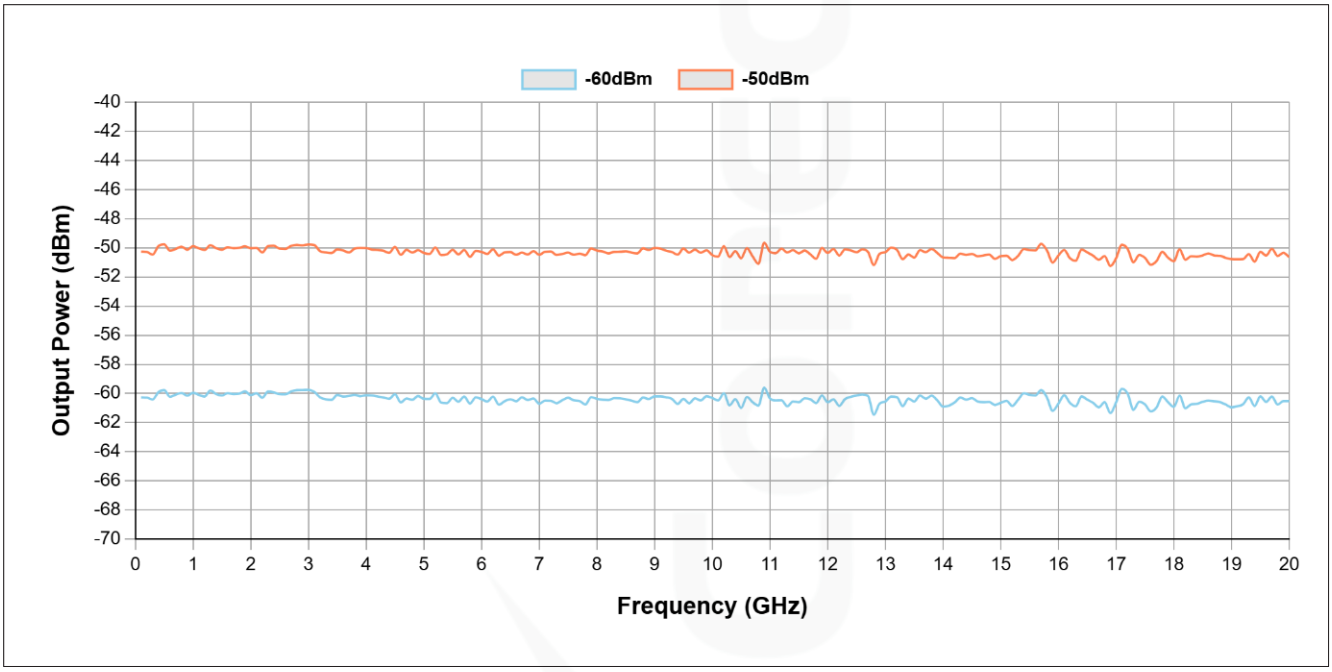
2. Att. Accuracy at Output Power -80dBm, -70dBm （Typical）



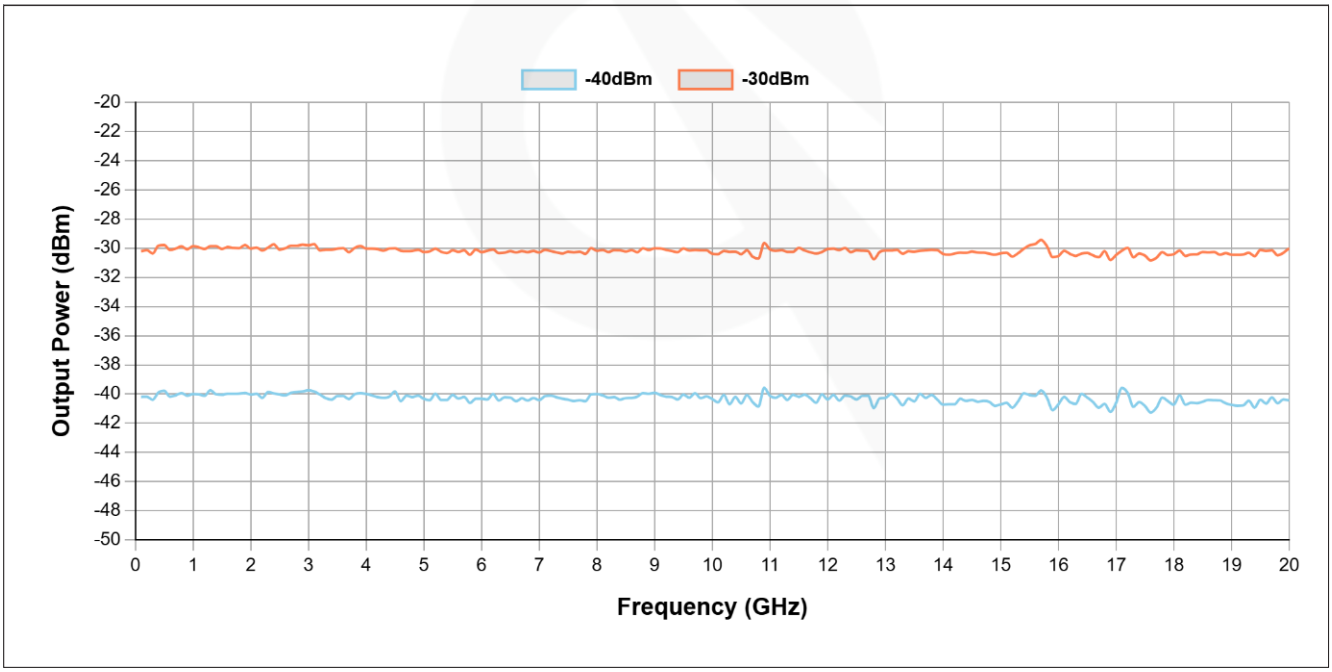
TYPICAL TEST CURVE

Attenuation Accuracy

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



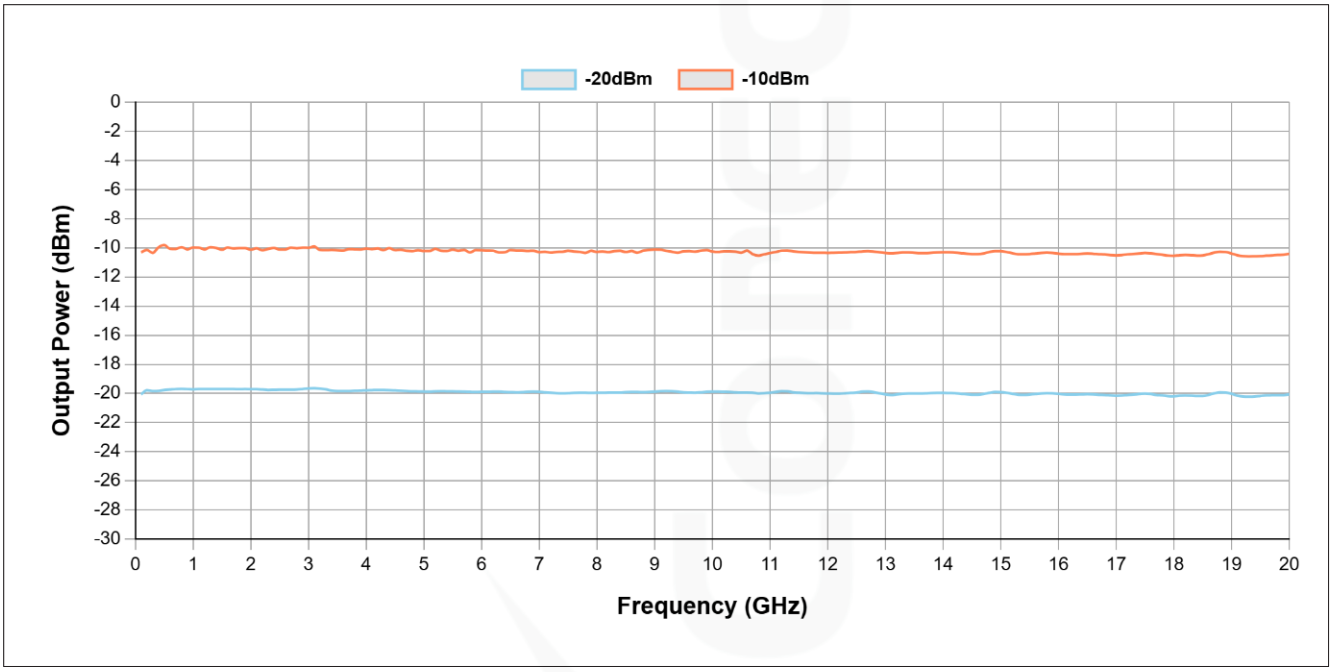
4. Att. Accuracy at Output Power -40dBm, -30dBm （Typical）



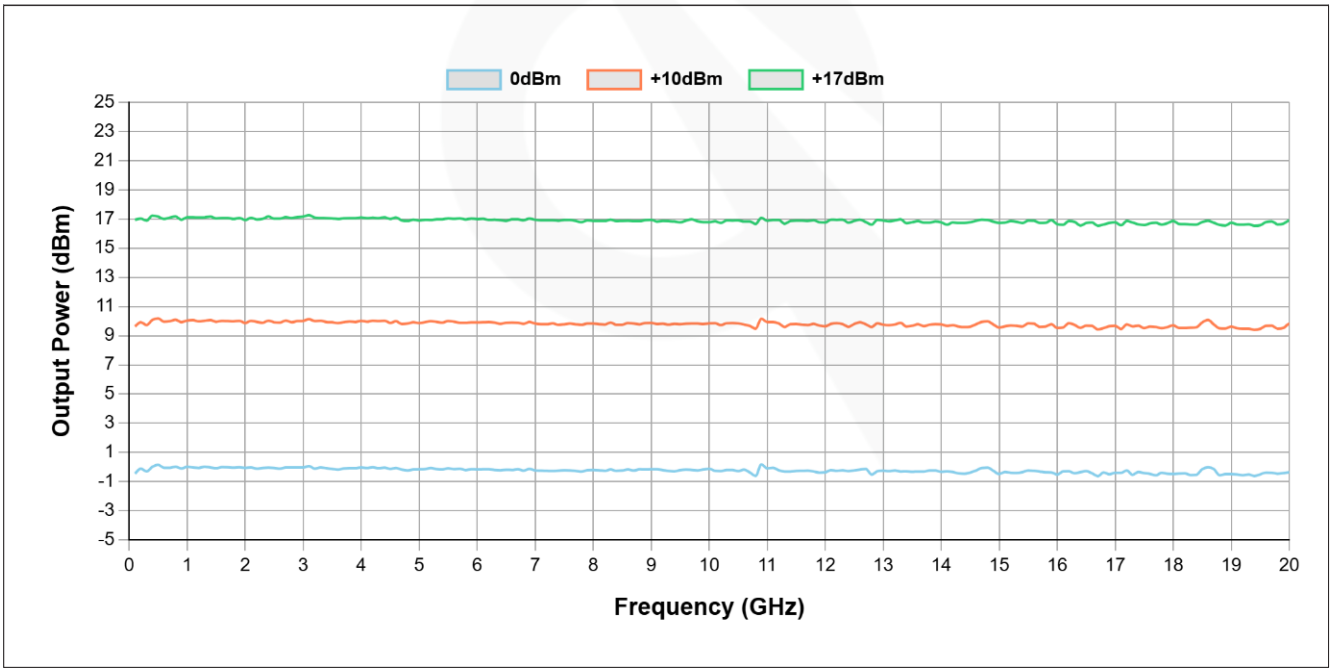
TYPICAL TEST CURVE

Attenuation Accuracy

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

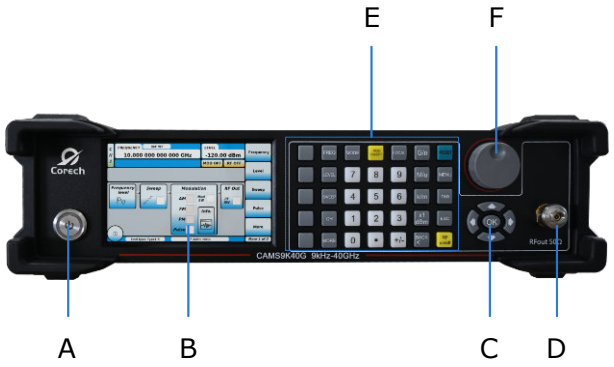


6. Att. Accuracy at Output Power 0dBm, +10dBm, +17dBm （Typical）



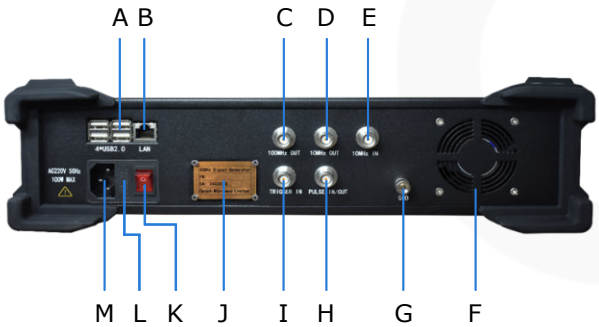
PRODUCT INTERFACE

Front



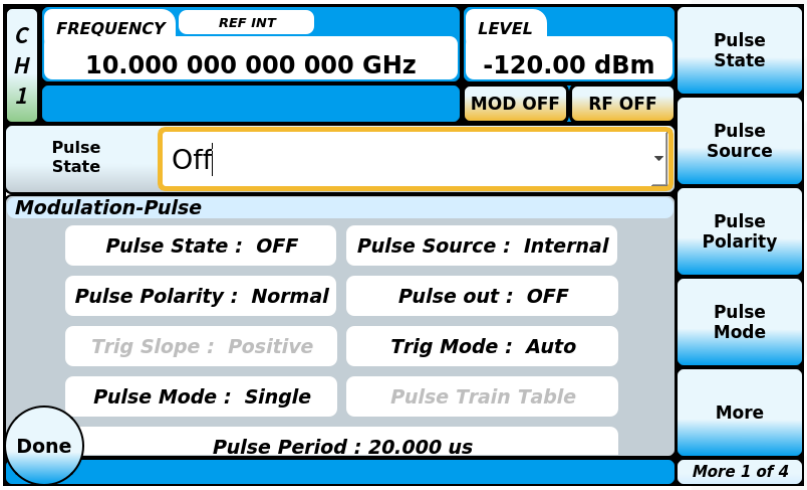
Ref.	Function	Description
A	DC ON/OFF	
B	Screen	5 Inch
C	Direction Key	
D	RF Output	2.9mm-Male
E	Keyboard	
F	Knob	

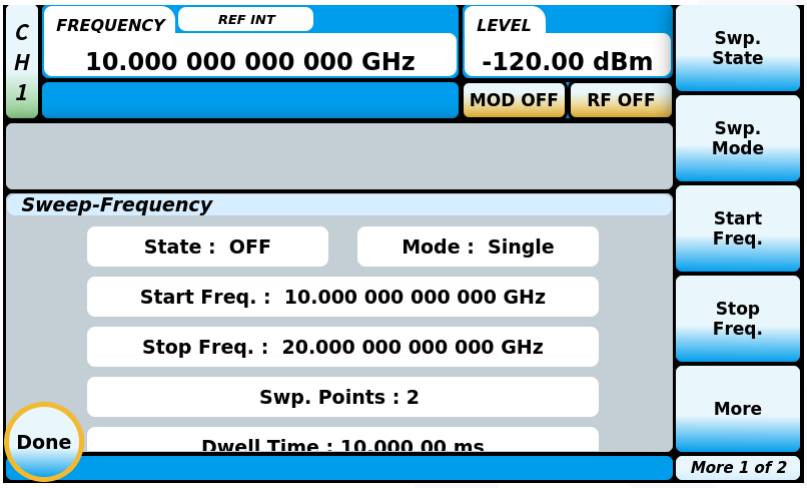
Back

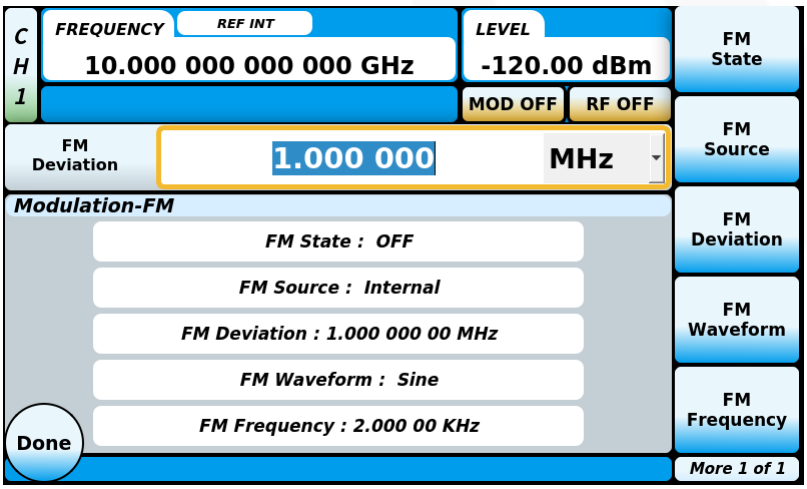


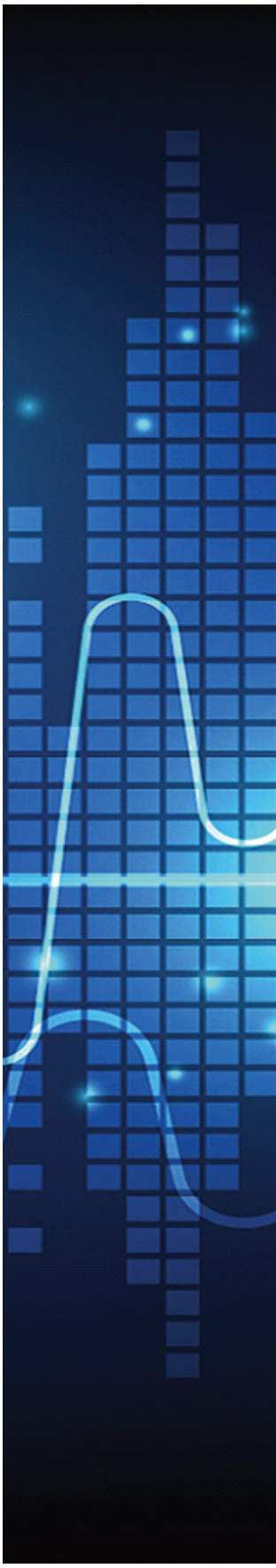
Ref.	Function	Description
A	USB Ports	4×USB2.0
B	Ethernet Port	RJ45
C	100MHz Output	BNC - Female
D	10MHz Output	BNC - Female
E	10MHz Input	BNC - Female
F	Fan	Exhaust
G	GND Terminal	
H	Pulse Signal Input/Output	BNC - Female
I	Trigger Signal In	BNC - Female
J	Name Plate	
K	AC ON/OFF	
L	Fuse Holder	
M	AC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

SCREEN


CH 1
FREQUENCY
REF INT
10.000 000 000 000 GHz
LEVEL
-120.00 dBm
MOD OFF
RF OFF
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
Sweep-Frequency
State : OFF
Mode : Single
Start Freq. : 10.000 000 000 000 GHz
Stop Freq. : 20.000 000 000 000 GHz
Swp. Points : 2
Dwell Time : 10.000 00 ms
Done
Swp. State
Swp. Mode
Start Freq.
Stop Freq.
More
More 1 of 2


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.

Contact us

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