CA9600 Series 12/24/40 GHz Microwave

Analog Signal Generator

Technical Specification V1.0

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UC INSTRUMENTS CORP.

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CA9600 Series 12/24/40 GHz Microwave Analog Signal Generator

(Ver 1.00)

CA9600 Series Microwave Analog Signal Generator is a cost-effective product that focuses on the targeted market. Design Concept – follow simplicity and highlight focuses. By getting rid of the useless functions on the traditional signal source products which the targeted market is barely using and enhancing the core index of signal source that includes spectral purity, output power, and portability, CA9600 promise you an excellent performance, compact, portable, economical, convenient, and reliable testing assistant.

Applications:

Local Oscillator Replacement
Component Test
Receiver Sensitivity Test

Features & Benefits:

- 1. Compact design
- 2. 88mm high X 320mm wide X 400mm long (2U height)
- 3. Low phase noise, high power output
- 4. Low spur, high signal quality
- 5. Wide frequency cover, narrow pulse modulation

Specification

Technical Specification of Frequency

Range

Frequency Range	CA9600-12A	5MHz to 12GHz
	CA9600-24A	5MHz to 24GHz
	CA9600-40A	5MHz to 40GHz
Resolution	1Hz（Nominal Value）	
CW Switching Speed	≤20ms（Nominal Value）	

Frequency Reference

Accuracy	
Aging Rate（1）	After 30 days <±1ppm/year（Nominal Value）
Initial Achievable Calibration Accuracy	<±0.1ppm（Nominal Value）
Temperature Effects	<±0.05ppm，-20 to +70℃（Nominal Value）
Line Voltage Effects	<10%(Nominal Value)

（1）Aging Rate depends on the design, and have direct relationship with OCXO

Reference Output

Frequency	10MHz
Amplitude	+10dBm ± 1dB（Nominal Value），50 Ω load

External Reference Input

Input Frequency	10MHz
Lock Range	±1ppm（Nominal Value）
Amplitude	5dBm±3dB（Nominal Value）
Input Impedance	50Ω（Nominal Value）
Waveform	Sine Wave or Square Wave

Step (digital) Sweep

Operating Mode	Step sweep (same interval of stepped frequency)
Sweep Range	Within instrument frequenct range
Dwell Time	20ms to 10s
Resolution	100us

Technical Specification of Power

Output

Settable Range（2）	Maximum output power at each frequency point ~ -110dBm
Resolution	0.1dB（Nominal Value）
Step Attenuator	110dB attenuator range, stepping 10dB per unit, mechanical attenuator
Attenuator Hold Range	From -10 dB to maximum specified output power with step attenuator in 0 dB
Connector	Using 2.92mm pannel connector

（2）Chosen step attenuator SLATT-ST110

Maximum Output Power（3）（dBm）

Frequency	Power			
	Standard	SLHS0002	SLHS0224-1	SLHS0224-2
CA9600-12A				
5MHz to 10MHz	+ 15	+ 10	/	/
10MHz to 2GHz	+ 25	+ 20	/	/
2GHz to 12GHz	+ 20	/	+ 13	+ 15
CA9600-24A				
5MHz to 10MHz	+ 15	+ 10	/	/
10MHz to 2GHz	+ 25	+ 20	/	/
2GHz to 12GHz	+ 20	/	/	+ 15
12GHz to 20GHz	+ 20	/	/	+ 15
20GHz to 24GHz	+ 18	/	/	+ 13
CA9600-40A				
5MHz to 10MHz	+ 15	+ 10	/	/
10MHz to 2GHz	+ 25	+ 20	/	/
2GHz to 12GHz	+ 20	/	/	+ 15
12GHz to 20GHz	+ 20	/	/	+ 15
20GHz to 24GHz	+ 18	/	/	+ 13
24GHz to 40GHz	+ 16	/	/	/

（3）The specification measured at a harmonic-free option, between 15 ℃ and 35 ℃

Absolute Level Accuracy

Frequency	> -20dBm	<-20 to -75dBm	<-75dBm
5MHz to 2GHz	±1.3dB	±1.5dB	±3dB
>2GHz to 24GHz	±1.3dB	±1.5dB	±3dB
> 24GHz to 40GHz	±1.3dB	±1.5dB	±3dB

SWR

Frequency	Step Attenuator set to 10dB
≤2GHz	< 1.4:1
> 2 to 24GHz	< 1.5:1
> 24GHz to 40GHz	< 1.6:1

Amplitude Switching Speed

Using Step Attenuator	≤20ms（Nominal Value）
Without Step Attenuator	≤2ms（Typical Value）

Technical Specification of Spectral Purity

Absolute SSB Phase Noise With Standard Configuration（3）（dBc/Hz）

Frequency	Offset				
	100Hz	1kHz	100kHz	1MHz	10MHz
1GHz	<-100	<-112	<-124	<-131	<-140
2GHz	<-100	<-112	<-120	<-125	<-140
5GHz	<-90	<-110	<-115	<-121	<-140
10GHz	<-85	<-107	<-112	<-115	<-133
20GHz	<-78	<-101	<-106	<-108	<-128

40GHz	<-72	<-96	<-100	<-102	<-122

（3）Measured at the room temperature with an output power of 0 dBm

Harmonics

Frequency Range	+10dBm Output Power			
	Standard	SLHS0002	SLHS0224-1	SLHS0224-2
70MHz to 200MHz	<-5dBc	<-40dBc	/	/
200MHz to 2GHz	<-10dBc	/	<-50dBc	<-50dBc
2 to 20GHz	<-16dBc	/	<-50dBc	<-50dBc

Non-harmonics（4）

Frequency Range	> 10KHz Offset
1MHz to 2GHz	<-80dBc
2GHz to 12GHz	<-70dBc
12GHz to 24GHz	<-65dBc
24GHz to 40GHz	<-60dBc

（4）Non-harmonics related to power cable measured between 1MHz to 40GHz<-60dBc

Specification of Pulse Modulation

General Characteristics（4）

On/Off Ratio	> 60dB（Typical Value）
Minimum Pulse Width	100ns（Typical Value）
Minimum Period	200ns（Typical Value）

（4）Selected Pulse Modulation - SLSPT

External Pulse Input

Input Resistance	DC coupling, high impedance
Level Logic	3.3V-CMOS

Internal Pulse Generator（5）

Square Wave Rate	0.1Hz to 5MHz（Typical Value）
Pulse Period	200ns to 10s（Rated Value）
Pulse Width	100ns to 10s（Nominal Value）
Resolution	20ns
Delay	5ns to 10s
Level Logic	3.3V-CMOS

（5）Selected Pulse Generation - SLSG。

General Characteristics

Power Source Requirement	198～242VAC，45～55Hz Maximum Value 100W
Operation Temperature Range	0 to 55℃
Storage Temperature Range	- 40 to 70℃
Weight	Net weight ≤10kg

Size	88mm high X 320mm wide X 400mm long (Without protection cushion) (3.5 in H X 12.6 in W X 15.7 in L)
Suggested Calibration Cycle	12 months
Meet ISO Standards	The instrument is manufactured by ISO-9001 certified factory which also meets the internal quality standards of UC Instruments Corp

Input and Output

Front Panel Connectors	
RF Output	2.4mm or 3.5mm panel connectors with output impedance 50Ω (Nominal Value)
Pulse Input	BNC-K connector receives external pulse signal at 3.3V-CMOS logic level. High impedance, input loss level can be ≤-0.3V or ≥ + 5.3V
Pulse Output	BNC-K connector outputs internal pulse signal at 3.3V-CMOS logic level, low impedance
Rear Panel Connectors	
Reference Input	BNC-K connector receives 10MHz reference signal used in the frequency lock required for the internal time base. Rated input power from 3 to 7dBm, impedance of 50Ω, sine or square wave
Reference Output	BNC-K connector outputs 10MHz reference signal. Rated level of no less than +3 dBm, rated output impedance of 50Ω.
LAN(100 Base T)	RJ45 connector, LAN connector provide long-distance control ability that can also be used to visit internal network server
RS422	DB9 connector，RS422 connector provide the same long-distance control ability as LAN connector
DEBUG	DB15 connector provide functions like power calibration and firmware update through a dedicated connector

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