

1. TLSG9K20G-A Signal Generator

1.1 Product Introduction

The TLSG9K20G-A is a cost-effective, compact microwave signal generator that delivers high dynamic output power (-120 dBm to +17 dBm), excellent spurious signal suppression, low phase noise, outstanding signal purity, and frequency stability across the 9 kHz to 20 GHz frequency range. It is ideal for debugging and testing devices, modules, components, and systems in fields such as semiconductors, radar, quantum technology, and communications.



1.2 Main Performance

Frequency Range	9kHz~20GHz
Frequency Resolution	0.001Hz
Output Power	-120dBm ~ +17dBm
Amplitude Resolution	0.1dB
Spurious	-80dBc @ 10GHz
Harmonic	-50dBc @ 10GHz
Phase Noise	-110dBc/Hz@10kHz,10GHz
Dimension	370 mm × 365 mm × 89 mm (excluding protective corners)

1.3 Performance Parameters

Parameter	Min.	Typ.	Max.	Note
Frequency range	9kHz		20GHz	
Frequency resolution	0.001Hz			
Operating mode	CW / Sweep			
Frequency Reference				
Internal reference aging rate	±0.3 ppm/year			
Initial calibration accuracy	±0.1 ppm			
External reference input (50Ω)				
Input frequency		10MHz		
Input power	+3dBm	+5dBm	+10dBm	
Lock range	±0.5ppm			
Wave form	Sine wave or square wave			
Internal Reference Output				
Output frequency	10MHz , 100MHz			
Output power	+5dBm		+10dBm	10MHz
	+5dBm		+10dBm	100MHz
Output frequency stability	±0.1 ppm			

(Continued from the table above)

Parameter	Min.	Typ.	Max.	Note
SSB Phase noise	-145dBc/Hz@ 1kHz			10MHz
	-150dBc/Hz@ 1kHz			100MHz
Spurious	-70dBc			
Switching speed				
Sweep frequency	10ms			
Impulse	50ns			≥ 100 MHz
	120ns			< 100 MHz
Output power range				
9 kHz ~ 100 kHz	-120dBm		+13dBm	
100kHz~20GHz	-120dBm		+17dBm	
Output power resolution	0.1dB			
Impedance	50Ω			
Harmonic				
1 GHz		-45dBc	-30dBc	
10 GHz		-50dBc	-30dBc	
20 GHz		-40dBc	-30dBc	
Sub - harmonic				
1 GHz		-85dBc	-75dBc	
10GHz		-85dBc	-75dBc	
20GHz		-85dBc	-75dBc	
Spurious (offset ≥ 5 kHz)				
1 GHz		-80dBc	-70dBc	
10 GHz		-80dBc	-70dBc	
20 GHz		-70dBc	-67dBc	
Pulse modulation				
On / off ratio	-70dBc			
Minimum pulse width	100ns			
Minimum period	110ns			
Pulse width accuracy	± 10 ns			
External pulse input				
LVTTL	+3.3V			
Internal pulse generator				
Square wave frequency	0.1Hz		100MHz	
Pulse period	20 ns		100s	
Pulse width	10ns		99.999 999s	

(Continued from the table above)

Parameter	Min.	Typ.	Max.	Note
Rising edge			10ns	
Falling edge			10ns	
Resolution			10ns	
Adjustable trigger delay	20ns		100s	
Scanning Property				
Operating pattern			Step Sweep	
Sweep range			9kHz~20GHz	
Dwell time			10ms~10s	
Time resolution			1us	
General Parameter				
Control			Keyboard, Touch Screen, SCPI	
Parameter			AC110V ~AC220V	
Operating Temperature			0 °C~+50 °C	
Weight			10kg	
Dimension			370 mm × 365 mm × 89 mm	Tolerance: ±5 mm

SSB Phase Noise

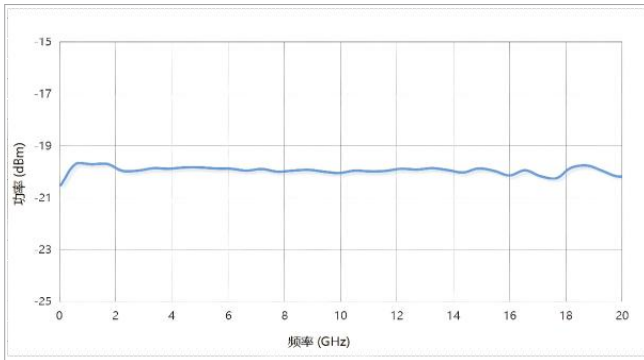
Carrier frequency	100Hz	1kHz	10kHz	100kHz	1MHz
dBc/Hz@1 GHz	-100	-129	-129	-126	-131
dBc/Hz@10 GHz	-84	-106	-110	-110	-112
dBc/Hz@20 GHz	-79	-100	-105	-105	-105

Absolute level accuracy (typical)

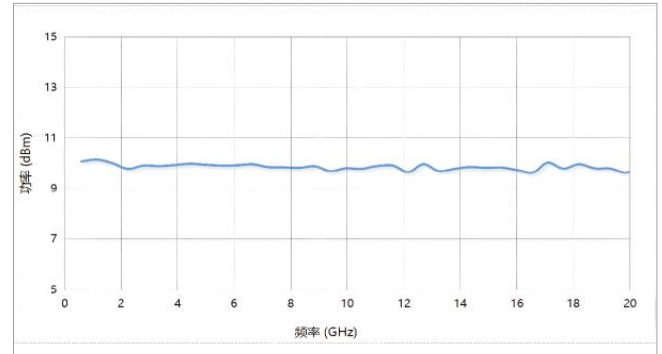
Frequency range (F)	0dBm < Pout	-20dBm < Pout ≤ 0dBm	-70dBm < Pout ≤ -20dBm	-70dBm ≥ Pout
9 kHz < F ≤ 1 GHz	≤ ± 0.5	≤ ± 1.0	≤ ± 2.5	≤ ± 2.5
1 GHz < F ≤ 10 GHz	≤ ± 0.5	≤ ± 1.0	≤ ± 2.5	≤ ± 2.5
10GHz < F ≤ 20GHz	≤ ± 1.0	≤ ± 1.0	≤ ± 2.5	≤ ± 3.0

1.4 Typical Test Curve

■ output power

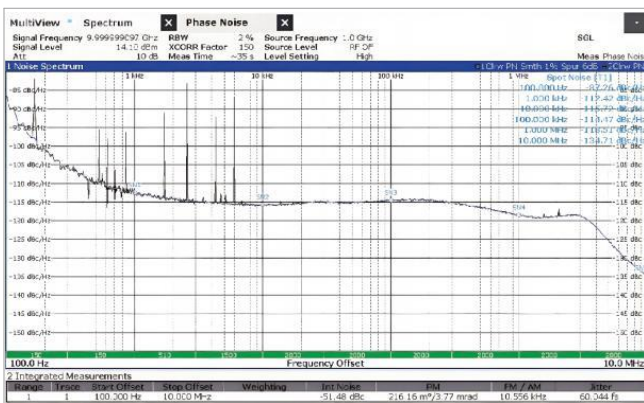


Output power: -20 dBm

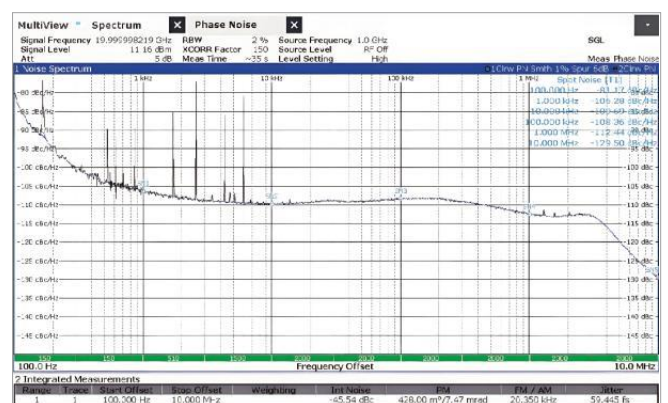


Output power: +10 dBm

■ phase noise

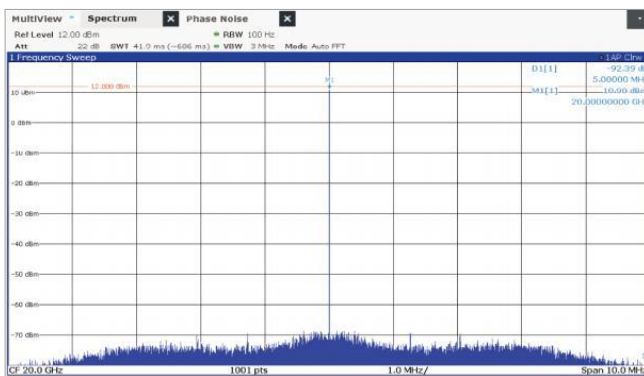


Output frequency: 10 GHz

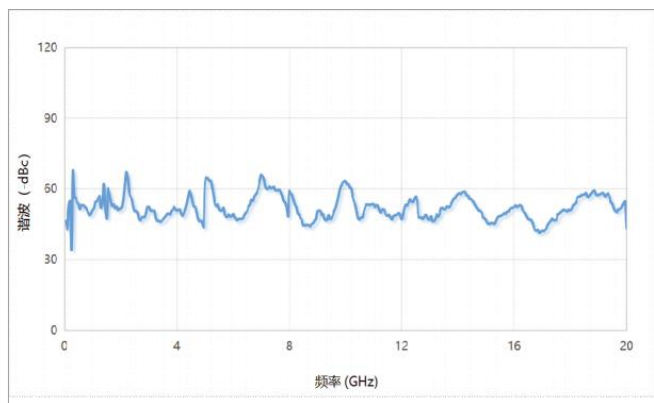


Output frequency: 20 GHz

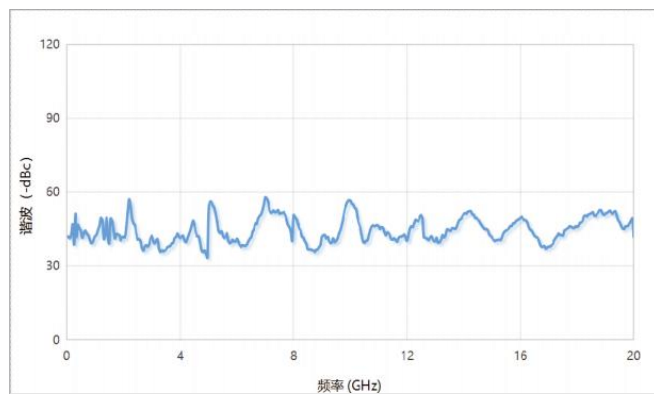
■ Spurious



■ harmonic

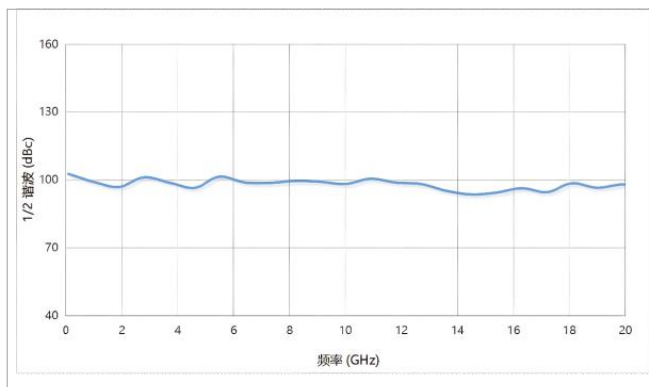


Output power: +10 dBm



Output power: +17 dBm

■ Sub-harmonic



■ attenuation accuracy

