SSG6000A Series Microwave Signal Generator

SIGLENT®

Data Sheet

EN03A



SIGLENT TECHNOLOGIES CO., LTD.

SSG6083A

SSG6085A

SSG6087A

SSG6089A

Product Overview

SSG6083A / SSG6085A / SSG6087A/ SSG6089A microwave signal generator's output frequency range from 100 kHz to 13.6 / 20 / 40 / 67 GHz, supports AM and pulse modulation, pulse sequence generator, power meter control and other functions. With standard OCXO reference hardware module inside ensures high-precision and high stability signal output. It is designed for communication, aerospace and other fields. And it is suitable for various application scenarios such as R&D and production.

Features and Benefits

- Frequency up to 13.6 GHz/ 20 GHz/ 40 GHz/67 GHz
- 0.001 Hz frequency setting resolution
- Level setting range: -130 dBm ~ 24 dBm
- Phase Noise: -149 dBc / Hz @ 1 GHz, 10 kHz offset (typ.) with Option SSG6080A-LPH2
- Level error ≤ 0.7 dB (typ.)
- Provides AM, FM, PM analog modulation with internal, external or Int + Ext source
- Single pulse, double pulse and pulse train generator (option)
- The power meter control kit can easily use the power meter to measure power, control power output and correct line loss
- 5-inch TFT capacitive touch screen, mouse and keyboard supported
- Web browser remote control on PC and mobile terminals
- Standard interface includes USB Host, USB Device (USB TMC), LAN (VXI-11, Socket, Telnet). Optional interface: GPIB



Models and Main index

model	SSG6083A	SSG6085A	SSG6087A	SSG6089A
Frequency Range	CW MODE 100 kHz-13.6 GHz	CW MODE 100 kHz-20 GHz	CW MODE 100 kHz-40 GHz	CW MODE 100 kHz-67 GHz
Frequency Resolution	0.001 Hz			
Amplitude Resolution	0.01 dB			
Level error	≤ 0.7 dB(typ.)			
Phase noise	-149 dBc/Hz @1 GHz, offset 10 kHz (typ.) with option SSG6080A-LPH2			
Display	5-inch capacitance touch screen, RGB (800*480)			

Specifications

Specifications are valid under the following conditions: The instrument is within the calibration period, has been stored at room temperature (approximately 25℃) at least 2 hours prior to use, and has been powered on and warmed up for at least 40 minutes. The specifications include the measurement uncertainty, unless otherwise noted.

Specifications: All products are guaranteed to meet published specifications when operating at room temperature (approximately 25℃), unless otherwise noted.

Typical (typ.): Performance deemed typical implies that 80 percent of the measurement results will meet the typical published performance with a 95th percentile confidence level at room temperature (approximately 25℃). Typical performance is not warranted and does not include measurement uncertainty.

Nominal (nom.): This value indicates the expected mean or average performance, or an attribute whose performance is by design, such as the 50 Ohm connector.

Frequency characteristics		
Frequency		
Frequency range	SSG6083A	CW MODE 100 kHz-13.6 GHz
	SSG6085A	CW MODE 100 kHz-20 GHz
	SSG6087A	CW MODE 100 kHz-40 GHz
	SSG6089A	CW MODE 100 kHz-67 GHz
Frequency resolution	0.001 Hz[1]	
Setting time	< 10 ms (typ.), ALC ON < 20 ms (typ.), ALC OFF (S&H)	
Frequency band[2]		
Band	Frequency range	N
1	1MHz ≤f≤ 250 MHz	1/8
2	250MHz ≤f≤ 400 MHz	1/32
3	400MHz ≤f≤ 800 MHz	1/16
4	800MHz ≤f≤ 1600 MHz	1/8
5	1600MHz ≤f≤3200 MHz	1/4
6	3200MHz ≤f≤6400 MHz	1/2
7	6400MHz ≤f≤12800 MHz	1
8	12800MHz ≤f≤ 25600 MHz	2
9	25600MHz ≤f≤ 40000 MHz	4
10	40000MHz ≤f≤ 67000 MHz	8
Frequency Reference		
	Standard configuration	Option SSG6080A -LPH2[3]
Reference frequency	10 MHz	10 MHz
Initial calibration accuracy	±100 ppb	±30 ppb

Temperature stability	±1 ppb, 0℃ ~50℃	±1 ppb, 0℃ ~50℃
Frequency aging rate	50 ppb/ 1 year	30 ppb/ 1 year
Frequency sweep		
Sweep type	Frequency step (linear or logarithmic step) arbitrary list	
Sweep range	Full frequency range	
Sweep shape	Triangle, saw-tooth	
Sweep mode	Single, continuous	
Step spacing	Linear, logarithmic	
Number of points	Step sweep	2-65535
	List sweep	1-500
Dwell time range	10 ms - 100 s	
Dwell time setting resolution	0.1 ms	
Trigger source	Auto, keyboard, external connector, bus (GPIB, USB, LAN)	
Trigger slope	Positive, negative (when trigger source is external)	

[1] For serial number of the seventh bit >=3, SSG6AA3XXXXXXX.the frequency resolution can satisfy 0.001Hz，FM，PM modulation.

[2] Frequency modulation related parameter factor.

[3] For serial number of the seventh bit >=7, SSG6AA7XXXXXXX, the device support SSG6080A -LPH2

When choose the option SSG6080A -LPH2, the device will add a better performance OCXO to improve the close-in phase noise .

Level Characteristics

ALC modes

The SSG6000A series offer three ALC modes:

ALC STATE AUTO: The best suited ALC mode is set automatically.

ALC STATE ON: The level control loop is closed. This mode is suitable for CW, FM and PM.

ALC STATE OFF (S&H): At every frequency and level change, the level control loop is closed and the level control voltage is sampled. Then the level control voltage is the clamped. This mode is used internally while in ALC state AUTO for pulse modulation, and AM modulation.

Level characteristics		
Level setting range	SSG6083A/SSG6085A/SSG6087A(standard)	Option SSG6085A-HP20/SSG6087A-HP40
9 kHz ≤ f < 30 kHz	-110 dBm to + 10 dBm	-110 dBm to + 10 dBm
30 kHz ≤ f < 100 kHz	-110 dBm to + 10 dBm	-110 dBm to + 15 dBm
100 kHz ≤ f < 300 kHz	-110 dBm to + 15 dBm	-110 dBm to + 20 dBm
300 kHz ≤ f < 1 MHz	-110 dBm to + 15 dBm	-110 dBm to + 25 dBm
1 MHz ≤ f < 3 MHz	-110 dBm to + 24 dBm	-110 dBm to + 30 dBm
3 MHz ≤ f ≤ 4 GHz	-130 dBm to + 24 dBm	-130 dBm to + 30 dBm
4 GHz < f ≤ 6 GHz	-130 dBm to + 20 dBm	-130 dBm to + 30 dBm
6 GHz < f ≤ 20 GHz	-120 dBm to + 25 dBm	-120 dBm to + 30 dBm
20 GHz < f ≤ 30 GHz	-120 dBm to + 20 dBm	-120 dBm to + 27 dBm
30 GHz < f ≤ 40 GHz	-120 dBm to + 20 dBm	-120 dBm to + 27 dBm
Level setting range	SSG6089A(standard)	Option SSG6089A-HP40
9 kHz ≤ f < 30 kHz	-110 dBm ~ 7 dBm	-110 dBm ~ 10 dBm
30 kHz ≤ f < 100 kHz	-110 dBm ~ 7 dBm	-110 dBm ~ 13 dBm
100 kHz ≤ f < 300 kHz	-110 dBm ~ 15 dBm	-110 dBm ~ 16 dBm
300 kHz ≤ f < 1 MHz	-110 dBm ~ 15 dBm	-110 dBm ~ 25 dBm
1 MHz ≤ f < 3 MHz	-110 dBm ~ 24 dBm	-110 dBm ~ 30 dBm
3 MHz ≤ f ≤ 4 GHz	-110 dBm ~ 24 dBm	-110 dBm ~ 30 dBm
4 GHz < f ≤ 6 GHz	-110 dBm ~ 20 dBm	-110 dBm ~ 26 dBm
6 GHz < f ≤ 20 GHz	-110 dBm ~ 20 dBm	-110 dBm ~ 26 dBm
20 GHz < f ≤ 36 GHz	-110 dBm ~ 20 dBm	-110 dBm ~ 23 dBm
36 GHz < f ≤ 67 GHz	-110 dBm ~ 20 dBm	-110 dBm ~ 20 dBm
Resolution of setting	0.01 dB	
Step attenuator	Range from 0 to 110 dB, 10dB step	

Maximum output power(Specified) [4]	SSG6083A& SSG6085A stand	Option SSG6085A-HP20
9 kHz ≤ f < 15 kHz	3 dBm	9 dBm
15 kHz ≤ f < 50 kHz	6 dBm	10 dBm
50 kHz ≤ f < 100 kHz	10 dBm	12 dBm
100 kHz ≤ f < 300 kHz	13 dBm	15 dBm
300 kHz ≤ f < 3 MHz	13 dBm	20 dBm
3 MHz ≤ f ≤3.4 GHz	22 dBm	27 dBm
3.4 GHz < f ≤ 4.5 GHz	20 dBm	27 dBm
4.5 GHz < f ≤ 6 GHz	18 dBm	25 dBm
6 GHz < f ≤ 12 GHz	22 dBm	25 dBm
12 GHz < f ≤ 18 GHz	22 dBm	24 dBm
18 GHz < f ≤ 20 GHz	20 dBm	25 dBm
Maximum output power(Specified) [4]	**SSG6087A Stand**	**Option SSG6087A-HP40**
9 kHz ≤ f < 15 kHz	0 dBm	7 dBm
15 kHz ≤ f < 50 kHz	4 dBm	8 dBm
50 kHz ≤ f < 100 kHz	7 dBm	12 dBm
100 kHz ≤ f < 300 kHz	10 dBm	15 dBm
300 kHz ≤ f < 1 MHz	10 dBm	20 dBm
1 MHz ≤ f < 3 MHz	10 dBm	28 dBm
3 MHz ≤ f ≤3.4 GHz	20 dBm	26 dBm
3.4 GHz < f ≤ 4.5 GHz	18 dBm	25 dBm
4.5 GHz < f ≤ 6 GHz	16 dBm	23 dBm
6 GHz < f ≤ 10 GHz	18 dBm	25 dBm
10 GHz < f ≤ 16 GHz	18 dBm	22 dBm
16 GHz < f ≤ 18.5 GHz	17 dBm	25 dBm
18.5 GHz < f ≤ 36 GHz	14 dBm	22 dBm
36 GHz < f ≤ 40 GHz	14 dBm	20 dBm
Maximum output power(Specified) 【4】	**SSG6089A 标配**	**选配 SSG6089A-HP40**
9 kHz ≤ f <15 kHz	-1 dBm	4 dBm
15 kHz ≤ f <50 kHz	3 dBm	5 dBm
50 kHz ≤ f <100 kHz	6 dBm	10 dBm

100 kHz ≤ f < 300 kHz	10 dBm	13 dBm
300 kHz ≤ f < 1 MHz	10 dBm	20 dBm
1 MHz ≤ f <3 MHz	10 dBm	26 dBm
3 MHz ≤ f ≤ 3.4 GHz	18 dBm	24 dBm
3.4 GHz < f ≤ 4.5 GHz	16 dBm	23 dBm
4.5 GHz < f ≤ 6 GHz	14 dBm	21 dBm
6 GHz<f ≤ 9 GHz	17 dBm	23 dBm
9 GHz<f ≤ 15 GHz	15 dBm	20 dBm
15 GHz<f ≤ 18.5 GHz	13 dBm	22 dBm
18.5 GHz < f ≤ 26 GHz	12 dBm	19 dBm
26 GHz < f ≤ 36 GHz	10 dBm	18 dBm
36 GHz < f ≤ 40 GHz	9 dBm	16 dBm
40 GHz < f ≤ 45 GHz	18 dBm	18 dBm
45 GHz < f ≤ 50 GHz	15 dBm	15 dBm
50 GHz < f ≤ 67 GHz	10 dBm	10 dBm

Level error (ALC on, temperature is 20 ℃ ~ 30 ℃)					
	Max performance power to 10 dBm	10 dBm to -20dBm	-20 dBm to -90 dBm	-90 dBm to -110 dBm	-110 dBm to -120 dBm
100 kHz ≤ f < 1 MHz		≤ 0.7 dB	≤ 0.7 dB	≤ 1.1 dB	
1 MHz < f ≤ 40 GHz	≤ 1 dB	≤ 0.7 dB	≤ 1 dB	≤ 1.5 dB	≤ 2 dB
40 GHz < f ≤ 67 GHz	≤ 1 dB	≤ 0.7 dB	≤ 1 dB	≤ 2 dB	
Additional level error	ALC State Off (S&H)	< 0.5 dB			

VSWR		
Level ≤ 0 dBm, ALC State ON		
VSWR	1 MHz ≤ f ≤ 6 GHz	≤ 1.6 (nom.)
	6 GHz < f ≤ 67 GHz	≤ 2 (nom.)

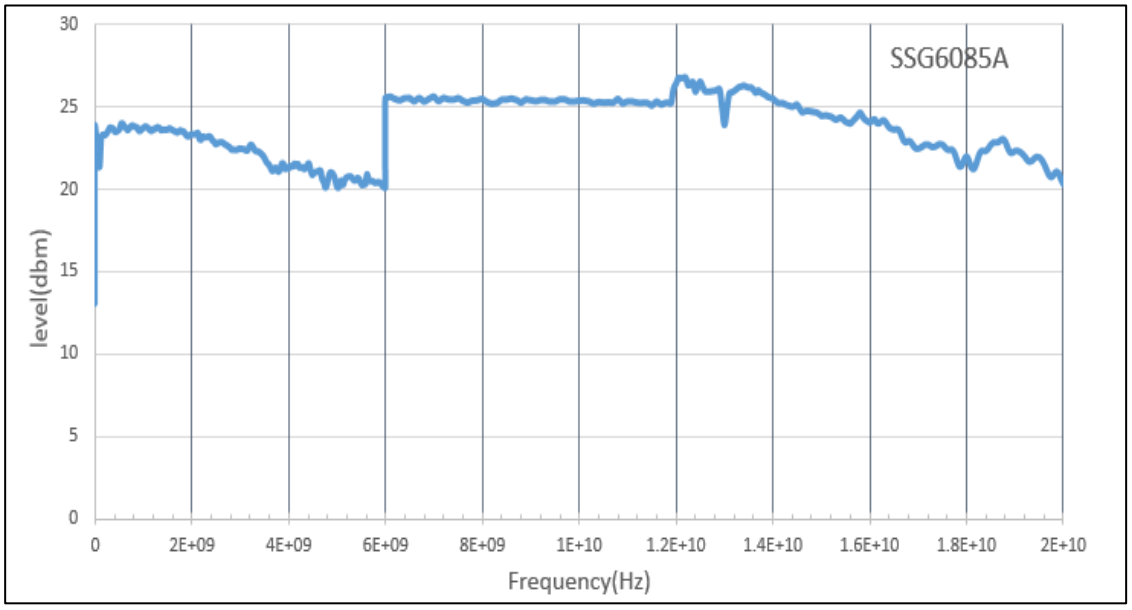
Level setting		
Level setting time	Level deviation < 0.1 dB from final value, with GUI update stopped, temperature range from 20 ℃ - 30 ℃	
	ALC state ON	< 10 ms
	ALC state Off (S&H)	< 20 ms

Reverse power	
Maximum permissible	0 V

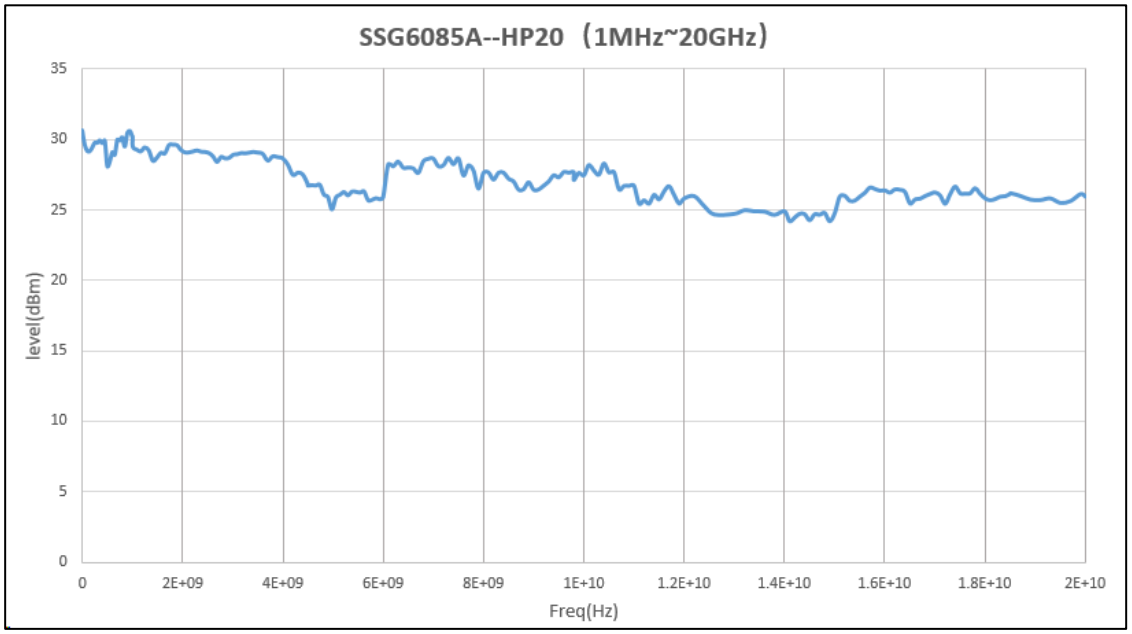
DC voltage		
Maximum reverse input power	1 MHz ≤ f ≤ 6 GHz	+30 dBm
	6 GHz < f ≤ 67 GHz	+25 dBm
Level step sweep		
Sweep type	Amplitude step (linear step), arbitrary list	
Sweep shape	Triangle, saw-tooth	
Sweep range	The device output range	
Trigger mode	Free run, single	
Step spacing	Linear	
Sweep points	Step sweep	2-65535
	List sweep	1-500
Dwell time range	10 ms - 100 s	
Dwell time setting resolution	0.1 ms	
Trigger source	Auto, keyboard, external connector, bus (GPIB, USB, LAN)	
Trigger Slope	Positive, negative (when trigger source is external)	

[4] For serial number of the seventh bit >=7, SSG6AA7XXXXXXX， satisfy the specification

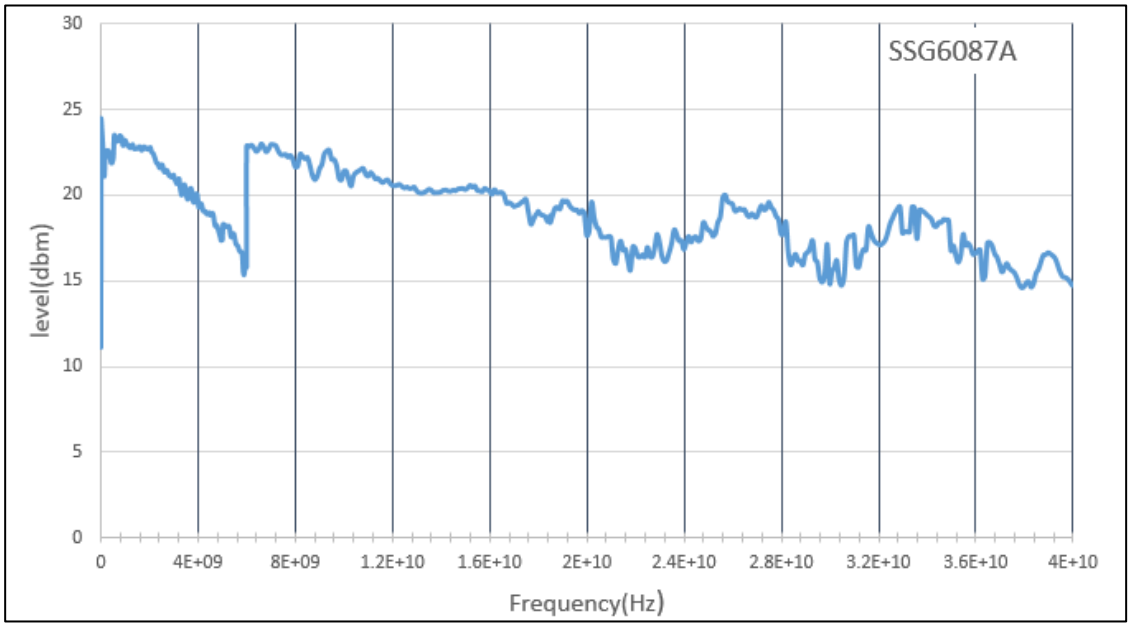
Maxpower, SSG6085A (stand, Specifications not guaranteed)



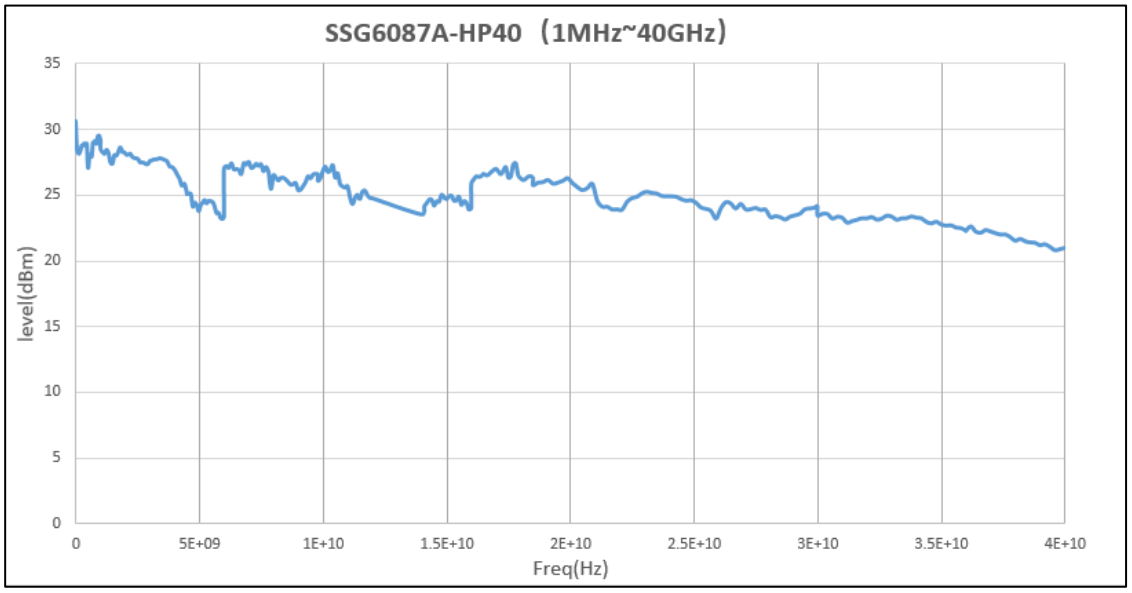
Max power, SSG6085A (Option SSG6085A-HP20, Specifications not guaranteed)



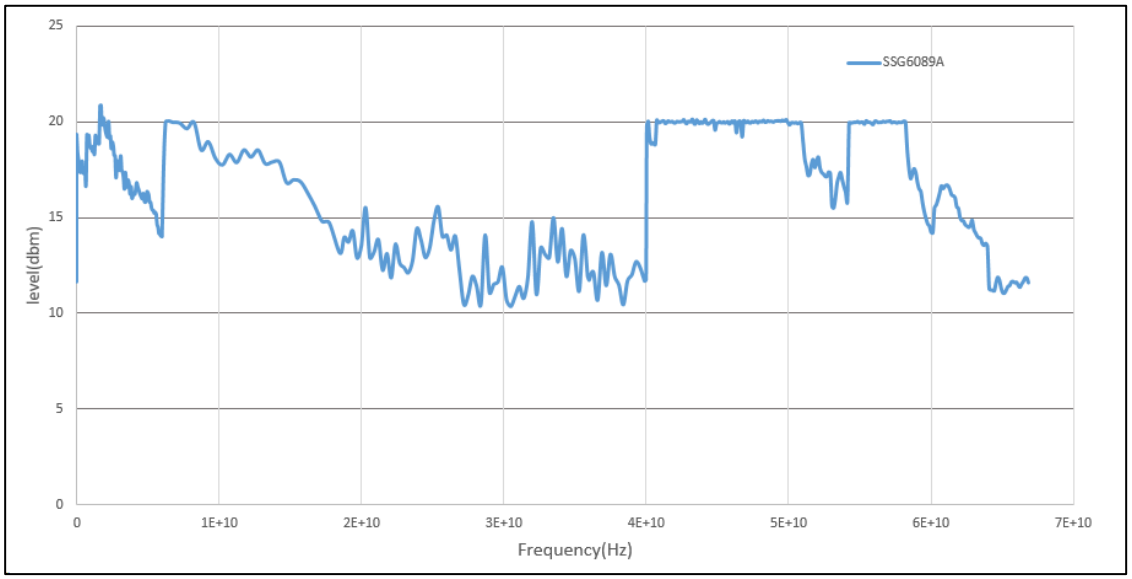
Max power, SSG6087A (stand, Specifications not guaranteed)



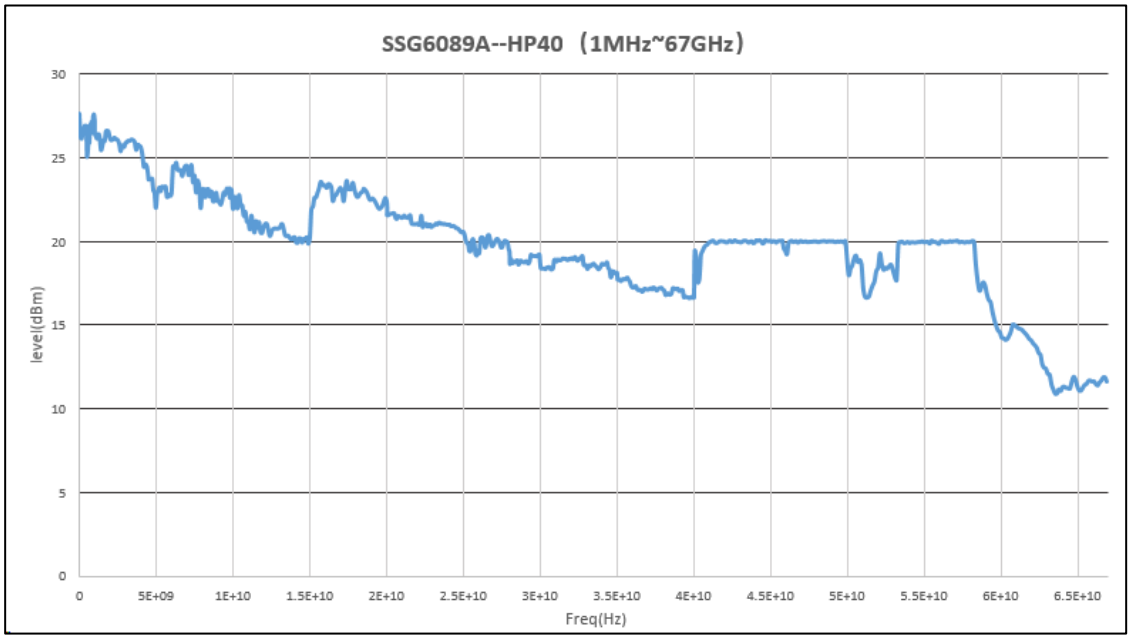
Max power, SSG6087A (Option SSG6087A-HP40, Specifications not guaranteed)



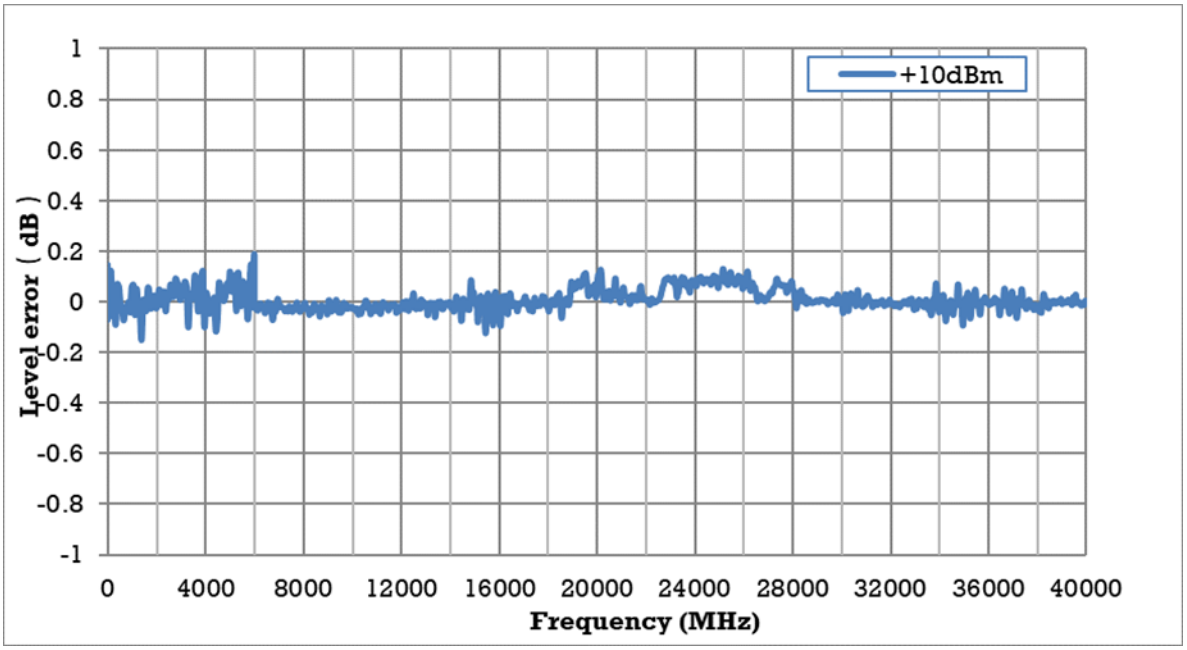
Max power, SSG6089A (stand, Specifications not guaranteed)



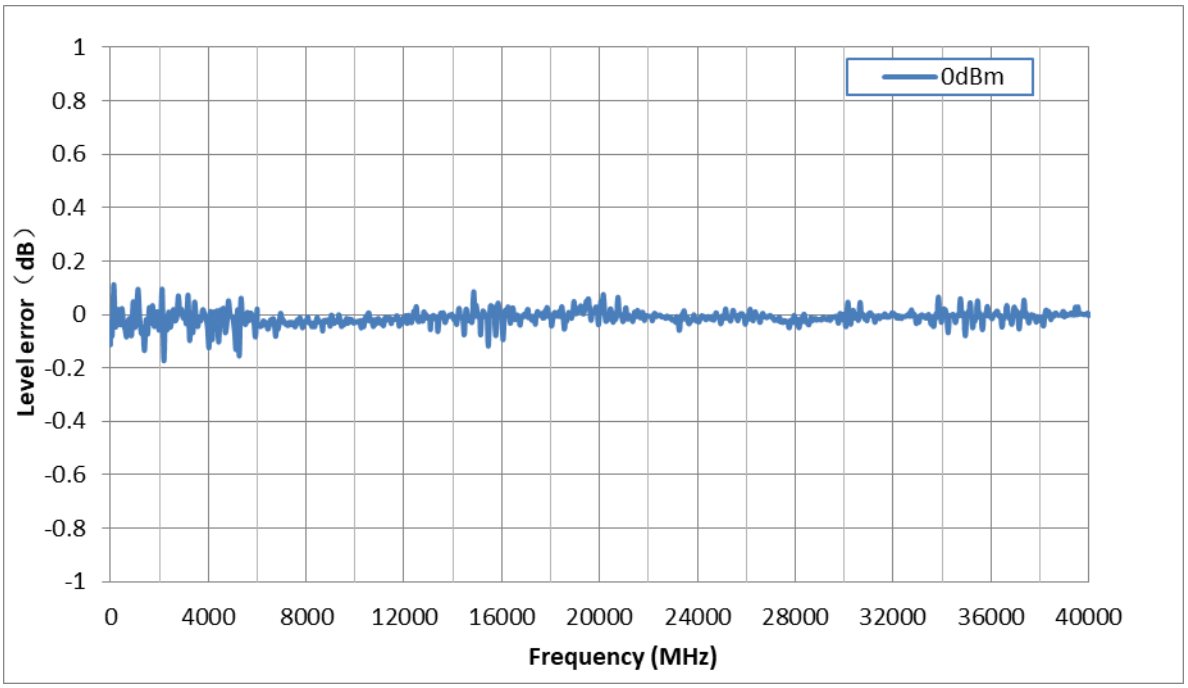
Max power, SSG6089A (Option SSG6089A-HP40, Specifications not guaranteed)



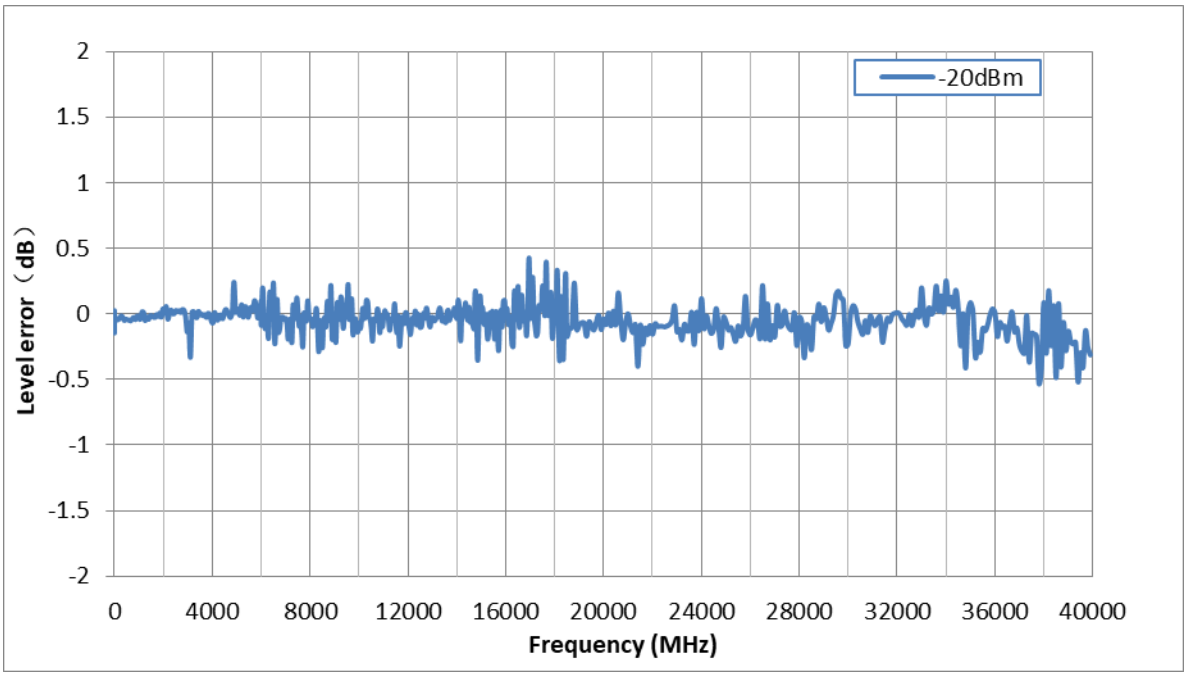
Measured level error versus frequency, Level = 10 dBm



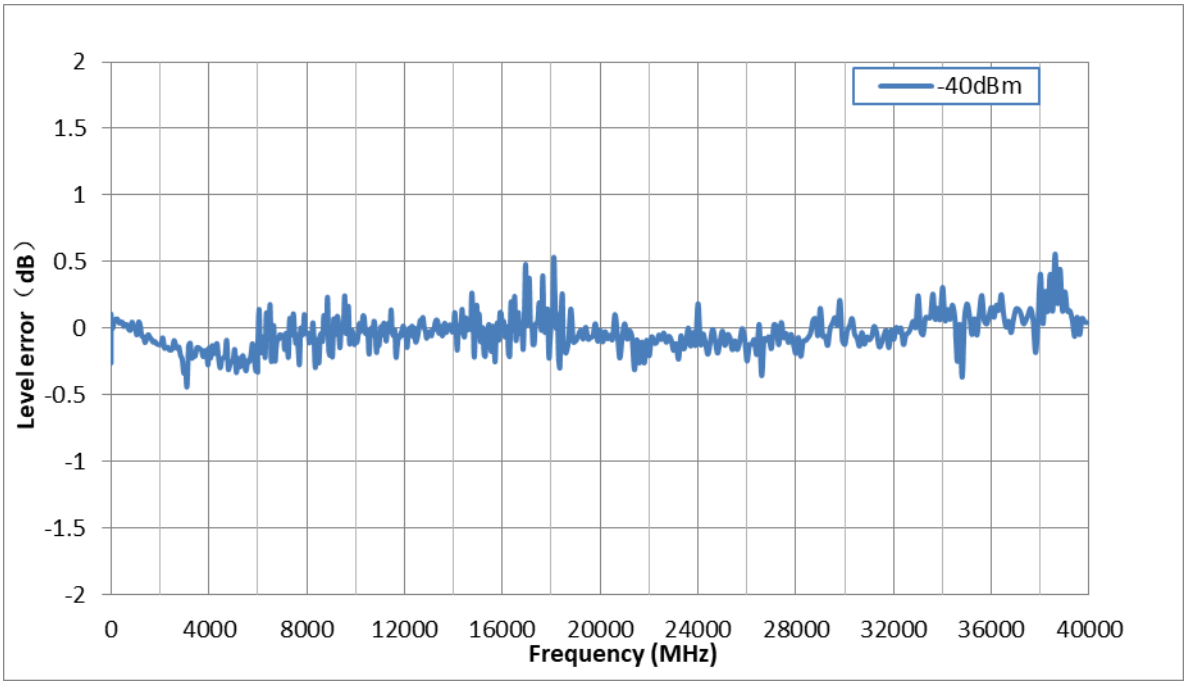
Measured level error versus frequency, Level = 0 dBm


0dBm
Level error（dB）
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
4000
8000
12000
16000
20000
24000
28000
32000
36000
40000
Frequency (MHz)

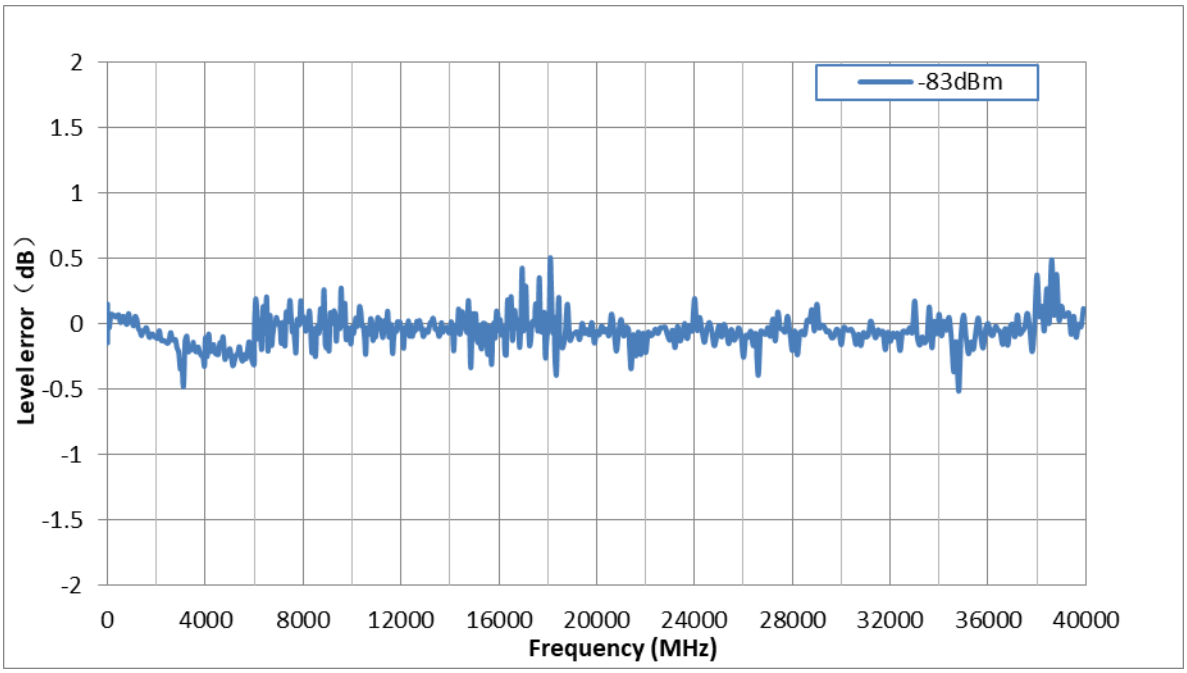
Measured level error versus frequency, Level = – 20 dBm



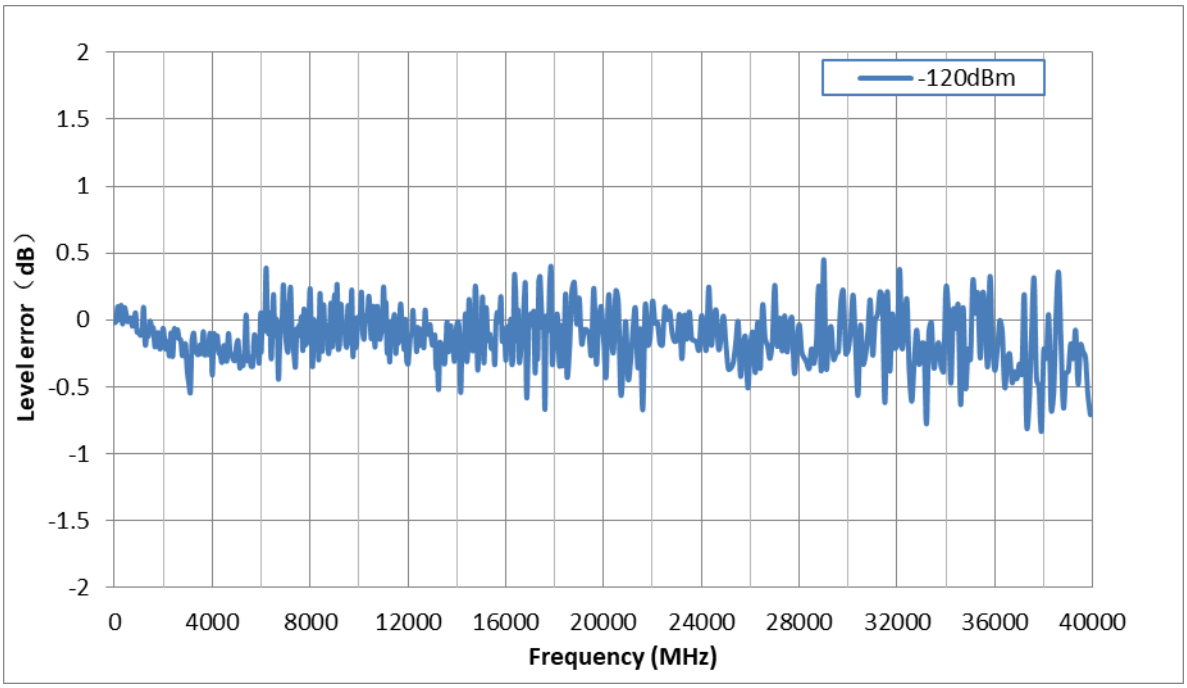
Measured level error versus frequency, Level = – 40 dBm



Measured level error versus frequency, Level = - 83 dBm



Measured level error versus frequency, Level = - 120 dBm



Spectral purity		
Harmonic[4] (SSG6085A) stand	CW mod, 1 MHz < f ≤ 40 MHz, Level ≤ 10 dBm	< -40 dBc
	CW mod, 40 MHz < f ≤ 520 MHz, Level ≤ 8 dBm	< -60 dBc
	CW mod, 520 MHz < f ≤ 6 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 6 GHz < f ≤ 10 GHz, Level ≤ 10 dBm	< -78 dBc
	CW mod, 10 GHz < f ≤ 13.1 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 13.1 GHz < f ≤ 20 GHz, Level ≤ 10 dBm	< -80 dBc
Harmonic[4] (SSG6085A-HP20)	CW mod, 1 MHz < f ≤ 40 MHz, Level ≤ 10 dBm	< -40 dBc
	CW mod, 40 MHz < f ≤ 520 MHz, Level ≤ 5 dBm	< -60 dBc
	CW mod, 520 MHz < f ≤ 6 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 6 GHz < f ≤ 10 GHz, Level ≤ 10 dBm	< -78 dBc
	CW mod, 10 GHz < f ≤ 13.1 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 13.1 GHz < f ≤ 20 GHz, Level ≤ 10 dBm	< -80 dBc
Harmonic[4] (SSG6087A) stand	CW mod, 1 MHz < f ≤ 40 MHz, Level ≤ 10 dBm	< -40 dBc
	CW mod, 40 MHz < f ≤ 520 MHz, Level ≤ 6 dBm	< -60 dBc
	CW mod, 520 MHz < f ≤ 6 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 520 MHz < f ≤ 1.3 GHz, Level ≤ 7 dBm (option SSG6080A-LPH2)	< -70 dBc
	CW mod, 6 GHz < f ≤ 10 GHz, Level ≤ 10 dBm	< -75 dBc
	CW mod, 10 GHz < f ≤ 13.1 GHz, Level ≤ 10 dBm	< -65 dBc
	CW mod, 13.1 GHz < f ≤ 18.5 GHz, Level ≤ 10 dBm	< -80 dBc
	CW mod, 18.5 GHz < f ≤ 25 GHz, Level ≤ 10 dBm	< -55 dBc
Harmonic[4] (SSG6087A-HP40)	CW mod, 1 MHz < f ≤ 40 MHz, Level ≤ 10 dBm	< -40 dBc
	CW mod, 40 MHz < f ≤ 520 MHz, Level ≤ 5 dBm	< -60 dBc
	CW mod, 520 MHz < f ≤ 6 GHz, Level ≤ 8 dBm	< -70 dBc
	CW mod, 6 GHz < f ≤ 10 GHz, Level ≤ 8 dBm	< -70 dBc
	CW mod, 10 GHz < f ≤ 13.1 GHz, Level ≤ 8 dBm	< -65 dBc
	CW mod, 13.1 GHz < f ≤ 16 GHz, Level ≤ 8 dBm	< -70 dBc
	CW mod, 16 GHz < f ≤ 18.5 GHz, Level ≤ 8 dBm	< -70 dBc
	CW mod, 18.5 GHz < f ≤ 25 GHz, Level ≤ 10 dBm	< -50 dBc
Harmonic (SSG6089A) stand	CW mod, 1 MHz < f ≤ 40 MHz, Level ≤ 10 dBm	< -40 dBc
	CW mod, 40 MHz < f ≤ 520 MHz, Level ≤ 5 dBm	< -60 dBc
	CW mod, 520 MHz < f ≤ 6 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 520 MHz < f ≤ 1.3 GHz, Level ≤ 7 dBm (SSG6080A-LPH2)	< -70 dBc
	CW mod, 1.3 GHz < f ≤ 6 GHz, Level ≤ 10 dBm	< -70 dBc

	(SSG6080A-LPH2)	
	CW mod, 6 GHz < f ≤ 10 GHz, Level ≤ 10 dBm	< -70 dBc
	CW mod, 10 GHz < f ≤ 13.1 GHz, Level ≤ 10 dBm	< -65 dBc
	CW mod, 13.1 GHz < f ≤ 16 GHz, Level ≤ 10 dBm	< -75 dBc
	CW mod, 16 GHz < f ≤ 18.5 GHz, Level ≤ 10 dBm	< -75 dBc
	CW mod, 18.5 GHz < f ≤ 25 GHz, Level ≤ 10 dBm	< -50 dBc
Harmonic (SSG6089A-HP40)	CW mod, 1 MHz < f ≤ 40 MHz, Level ≤ 10 dBm	< -40 dBc
	CW mod, 40 MHz < f ≤ 520 MHz, Level ≤ 3 dBm	< -60 dBc
	CW mod, 520 MHz < f ≤ 6 GHz, Level ≤ 5 dBm	< -70 dBc
	CW mod, 6 GHz < f ≤ 10 GHz, Level ≤ 5 dBm	< -70 dBc
	CW mod, 10 GHz < f ≤ 13.1 GHz, Level ≤ 5 dBm	< -65 dBc
	CW mod, 13.1 GHz < f ≤ 16 GHz, Level ≤5 dBm	< -75 dBc
	CW mod, 16 GHz < f ≤ 18.5 GHz, Level ≤ 5 dBm	< -75 dBc
	CW mod, 18.5 GHz < f ≤ 25 GHz, Level ≤ 5 dBm	< -50 dBc
Sub harmonics	CW mod, 1 MHz < f ≤ 40 GHz, Level ≤ 10 dBm	< -80 dBc
	CW mod, 1 MHz < f ≤ 40 GHz, Level ≤ 10 dBm	< -60 dBc
Non-harmonics (stand)	CW mod, offset > 10 kHz, 1 MHz < f ≤ 4 GHz	< -60 dBc
	CW mod, offset > 10 kHz, 4 GHz < f ≤ 40 GHz	< -50 dBc
	CW mod, offset > 10 kHz, 40 GHz < f ≤ 67 GHz	< -48 dBc
Non-harmonics (option SSG6080A-LPH2[4])	CW mod, offset > 10 kHz , 1 MHz <f ≤ 0.25 GHz	<-65 dBc
	CW mod, offset > 10 kHz , 0.25 GHz <f ≤ 8 GHz	<-80 dBc
	CW mod, offset > 10 kHz , 8 GHz <f ≤ 16 GHz	<-80 dBc
	CW mod, offset > 10 kHz , 16 GHz <f ≤ 32 GHz	<-75 dBc
	CW mod, offset > 10 kHz , 32 GHz <f ≤ 64 GHz	<-70 dBc
	CW mod, offset > 10 kHz , 64 GHz <f ≤ 67 GHz	<-67 dBc
Wideband noise Level=10dBm(stand)	CW mod, offset=50 MHz, 1 Hz measure bandwidth	
	1.3 GHz ≤ f ≤3 GHz	< -155 dBc/Hz (-158 dBc/Hz, typ.)
	3 GHz < f ≤ 6GHz	< -152 dBc/Hz (-155 dBc/Hz, typ.)
	6 GHz < f ≤ 8GHz	< -148 dBc/Hz (-152 dBc/Hz, typ.)
	8 GHz < f ≤ 10GHz	< -147 dBc/Hz (-150 dBc/Hz, typ.)
	10 GHz < f ≤ 12GHz	< -145 dBc/Hz (-148 dBc/Hz, typ.)
	12 GHz < f ≤ 18.5 GHz	< -140 dBc/Hz (-142 dBc/Hz, typ.)
	18.5 GHz < f ≤24 GHz	< -137 dBc/Hz (-140 dBc/Hz, typ.)
	24 GHz < f ≤40 GHz	< -130 dBc/Hz (-134 dBc/Hz, typ.)
	40 GHz < f ≤50 GHz	< -126 dBc/Hz (-130 dBc/Hz, typ.)

	50 GHz < f ≤67 GHz	< -120 dBc/Hz （-123 dBc/Hz, typ.）
Wideband noise [4] (SSG6080A-LPH2)	Level=10dBm,CW mod, offset=50 MHz, 1 Hz measure bandwidth	
	1.3 GHz ≤ f ≤3 GHz	< -155 dBc/Hz (-158 dBc/Hz, typ.)
	3 GHz < f ≤ 8GHz	< -152 dBc/Hz (-155 dBc/Hz, typ.)
	8 GHz < f ≤ 14GHz	< -148 dBc/Hz (-151 dBc/Hz, typ.)
	14 GHz < f ≤ 18.5GHz	< -144 dBc/Hz (-147 dBc/Hz, typ.)
	18.56 GHz < f ≤ 30GHz	< -140 dBc/Hz (-145 dBc/Hz, typ.)
	30 GHz < f ≤ 40 GHz	< -138 dBc/Hz (-143 dBc/Hz, typ.)
	40 GHz < f ≤50 GHz	< -135 dBc/Hz （-139 dBc/Hz, typ.）
	50 GHz < f ≤67 GHz	< -127 dBc/Hz （-130 dBc/Hz, typ.）

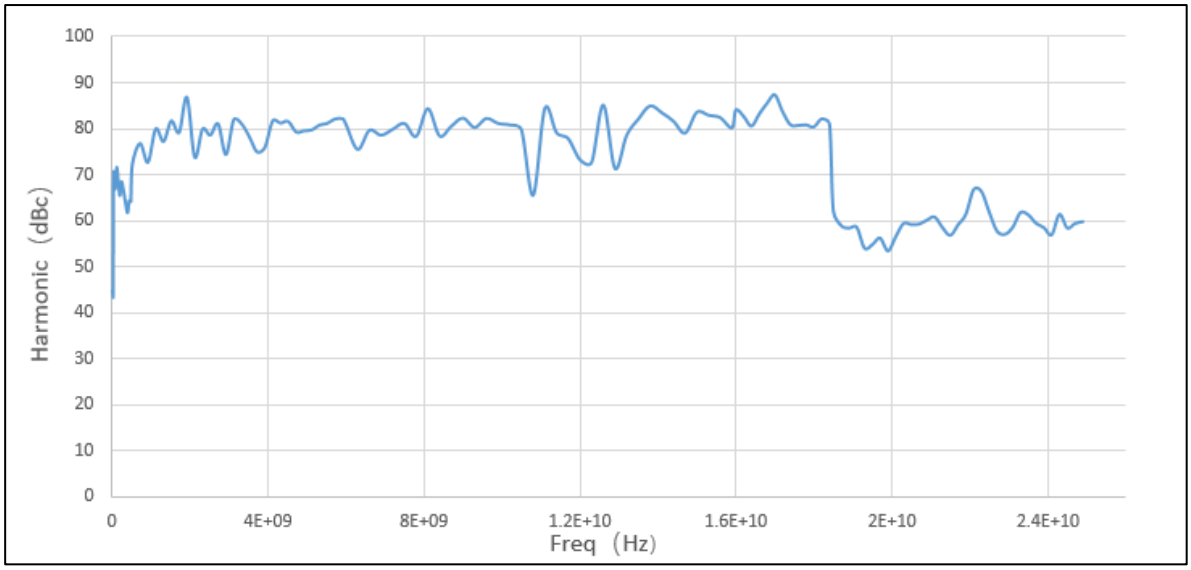
Phase noise (stand)，CW mode，1 Hz measure bandwidth，≤ 10 dBm，25℃±5℃

		Offset (measured dBc/Hz)						
	Carrier frequency	1Hz	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz
SSB Phase Noise	100 MHz	(-75)	(-100)	-125 (-127)	-136 (-140)	-145 (-147)	-145 (-152)	-145 (-153)
	1 GHz	(-55)	(-83)	-107 (-110)	-126 (-131)	-135 (-137)	-135 (-137)	-138 (-153)
	2 GHz	(-49)	(-77)	-101 (-110)	-120 (-125)	-130 (-132)	-130 (-132)	-134 (-138)
	4 GHz	(-43)	(-71)	-95 (-97)	-114 (-119)	-123 (-125)	-123 (-125)	-128 (-132)
	6 GHz	(-40)	(-68)	-91 (-97)	-110 (-115)	-119 (-122)	-119 (-122)	-125 (-127)
	8 GHz	(-37)	(-65)	-88 (-91)	-108 (-112)	-116 (-119)	-116 (-119)	-120 (-126)
	10 GHz	(-36)	(-63)	-86 (-89)	-105 (-110)	-115 (-117)	-115 (-117)	-118 (-123)
	20 GHz	(-30)	(-56)	-78 (-83)	-100 (-103)	-109 (-111)	-109 (-111)	-112 (-116)
	40 GHz	(-24)	(-50)	-74 (-78)	-93 (-99)	-102 (-106)	-102 (-106)	-105 (-111)
	50 GHz	(-22)	(-47)	-72 (-76)	-90 (-96)	-100 (-102)	-100 (-105)	-105 (-110)
	67 GHz	(-20)	(-45)	-67 (-72)	-88 (-94)	-99 (-101)	-99 (-101)	-103 (-107)

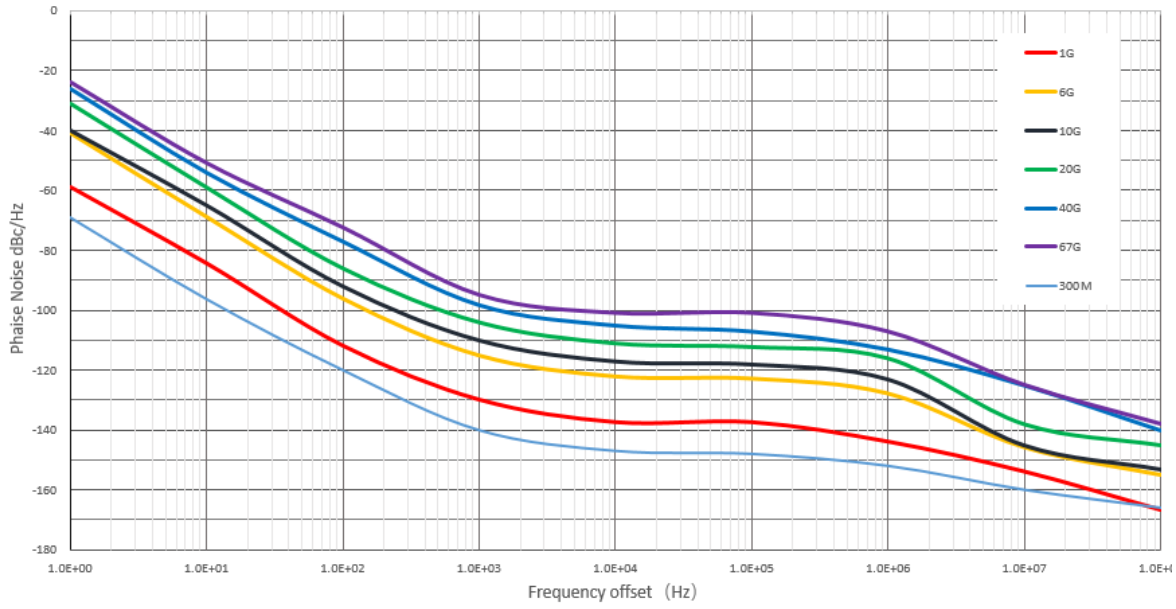
Phase noise (SSG6080A-LPH2[4]), CW mode, 1 Hz measure bandwidth, ≤ 10 dBm, 25℃±5℃

		Offset (measured)						
	Carrier frequency	1Hz	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz
SSB Phase Noise	100 MHz	(-100)	-112 (-116)	-130 (-133)	-141 (-143)	-148 (-149)	-150 (-153)	-150 (-153)
	300 MHz	(-89)	-102 (-107)	-122 (-125)	-142 (-147)	-152 (-153)	-153 (-155)	-153 (-156)
	1 GHz	(-79)	-92 (-97)	-112 (-117)	-136 (-140)	-148 (-149)	-149 (-150)	-150 (-152)
	2 GHz	(-75)	-86 (-91)	-106 (-110)	-131 (-135)	-143 (-145)	-145 (-148)	-149 (-152)
	4 GHz	(-68)	-81 (-86)	-100 (-105)	-123 (-127)	-136 (-138)	-141 (-143)	-145 (-148)
	6 GHz	(-64)	-75 (-81)	-97 (-100)	-120 (-124)	-132 (-135)	-135 (-138)	-140 (-144)
	8 GHz	(-60)	-74 (-78)	-94 (-98)	-115 (-118)	-128 (-130)	-132 (-135)	-139 (-141)
	10 GHz	(-56)	-72 (-77)	-93 (-97)	-115 (-118)	-128 (-129)	-132 (-133)	-138 (-139)
	20 GHz	(-54)	-65 (-71)	-88 (-90)	-107 (-111)	-120 (-122)	-125 (-126)	-125 (-132)
	40 GHz	(-48)	(-68)	-78 (-82)	-99 (-104)	-112 (-116)	-114 (-118)	-118 (-124)
	50 GHz	(-45)	(-65)	-78 (-80)	-97 (-103)	-111 (-114)	-113 (-116)	-118 (-123)
	67 GHz	(-43)	(-63)	-75 (-78)	-97 (-100)	-109 (-111)	-111 (-114)	-115 (-120)

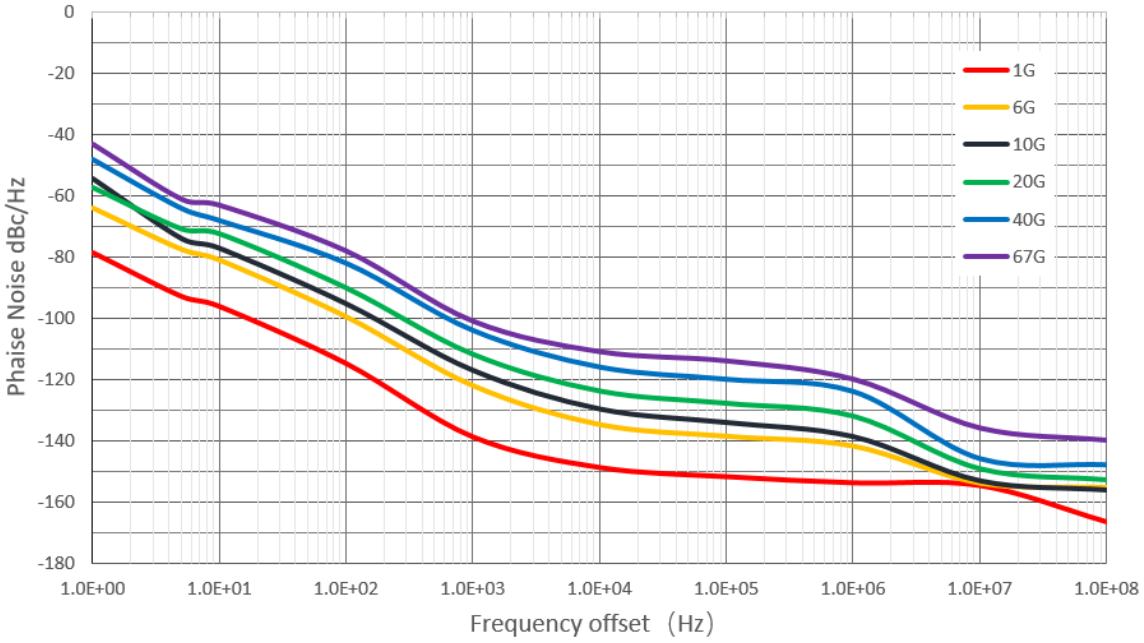
Second harmonic at level 0 dBm&10 dBm except level of 40 MHz<f≤520 MHz


100
90
80
70
60
50
40
30
20
10
0
Harmonic (dBc)
0
4E+09
8E+09
1.2E+10
1.6E+10
2E+10
2.4E+10
Freq (Hz)

SSB phase noise (stand)



SSB phase noise (option SSG6080A-LPH2)



Internal modulation generator (LF)		
Waveforms	Sine wave, square wave, saw-tooth, triangle, DC	
Frequency range	Sine wave	0.01 Hz-1 MHz [1]
	Square wave, triangle, saw-tooth	0.01 Hz-20 kHz
Resolution of frequency setting	0.01 Hz	
Frequency error	Similar with RF source	
Frequency response	Sine wave ≤ 0.3 dB	
Level Offset	Setting range	$\min(2.5V - \frac{1}{2}LEVEL\ ,2V\ )$
	Offset resolution	0.001 V
Output voltage range [2]	Vp at connector	1 mVpp - 3 Vpp
	Resolution of amplitude setting	1 mV
DC voltage error	1% of setting ± 3 mV	
Output impedance	50 Ω (nom.)	

[1] When use modulation and LF simultaneously, the LF frequency range and wave type will be restricted.

[2] The connector's load is 50 Ω.

LF frequency sweep	
Operating mode	Digital sweep in discrete steps
Step spacing	Linear, logarithmic
Sweep shape	Saw-tooth, triangle
Sweep direction	Up, down
Sweep range	0.01 Hz-1 MHz
Trigger mode	Auto, keyboard, external connector, bus
Trigger slope	Positive, negative
Sweep time setting range	1 ms - 500 s
Sweep time setting resolution	0.1 ms

Analog modulation				
Simultaneous modulation				
	Amplitude modulation	Frequency modulation	Phase modulation	Pulse modulation
Amplitude modulation		●	●	(●)
Frequency modulation	●		X	●
Phase modulation	●	X		●
Pulse modulation	(●)	●	●	
●=compatible, ×=incompatible, (●) =compatible limitations; NO specification Applies to AM distortion.				
Amplitude modulation				
Modulation source	Internal, external, internal + external			
AM depth setting range	0%~100%			
Resolution of setting	0.1%			
AM depth error	f-mod=1 kHz, m < 80%, Level ≤ 0 dBm			< 4% of setting + 1%
AM distortion	f-mod=1 kHz, m < 30%, level < 0 dBm			< 3% (typ.)
Modulation frequency response	M < 80%, 10 Hz-100 kHz			< 3 dB (nom.)
FM modulation [3]				
Modulation source	Internal, external, internal+external			
Maximum deviation	N*5 MHz（typ）			
Resolution	0.1% of set deviation or 1Hz,whichever is larger			
FM deviation error	Fmod=1 kHz ， internal			＜(2% of setting +20 Hz) (nom)
FM distortion	Fmod=1 kHz, deviation=N*2 MHz			＜0. (nom.)
Modulation frequency response	10Hz-100 kHz			＜3 dB (nom.)
Phase modulation				
Modulation source	Internal, external, internal + external			
Maximum deviation	N*5 rad			
Resolution	0.1% of set deviation or 0.01 rad ,whichever is larger			
ØM deviation error	Fmod =1 kHz, internal, Deviation≤N*5 rad			<(2% of setting + 0.05 rad)
ØM distortion	Fmod =1 kHz, deviation, deviation≤N*5 rad			<0.5 %（nom.)
Modulation frequency response	10Hz-100 kHz			<3 dB (nom.)

[3] For serial number of the seventh bit >=3, SSG6AA3XXXXXXX. support FM，PM modulation.

Pulse modulation (SSG6080A-PU)		
Modulation source	Internal, external	
On/off ration	1 MHz < f ≤ 6 GHz	> 80 dBc (typ.) [4]
	6 GHz < f ≤ 13.6 GHz	> 80 dBc (typ.)
	13.6 GHz < f ≤ 40 GHz	> 75 dBc (typ.)
	40 GHz < f ≤ 67 GHz	> 80 dBc (typ.)
Rise/fall time (10% / 90%)	10 % to 90 % of RF amplitude	< 15 ns (typ.)
Pulse repetition time	Setting range	40 ns - 300 s
Level accuracy / alc off	± 0.5 dB typ	
Width compression	10 ns	
Video feed-through	< 20 mv	
Video delay	45 ns	
RF delay	45 ns	
Pulse overshoot	< 8%	
Pulse generator		
Pulse modes	Single pulse, double pulse	
Pulse source	Internal, external	
Pulse polarity	Normal, inverse	
Pulse period	Setting range	40 ns - 300 s
	Resolution of setting	10 ns
Pulse width	Setting range	20 ns - 300 s
	Resolution of setting	10 ns
Double pulse Delay	Setting range	20 ns - 300 s
	Resolution of setting	10 ns
#2 Width	Setting range	20 ns - 300 s
	Resolution of setting	10 ns
Trigger modes	Auto, keyboard, external trigger, external gate trigger, bus	
Trig polarity	Normal, inverse (used in external gate trigger mode)	
Trigger Slope	Positive, negative (used in external trigger mode)	
External trigger delay	140 ns - 300 s	
External trigger delay resolution of setting	10 ns	
Pulse train generator (SSG6080A-PT)		
Number of pulses	1 - 2047	
Number of repetitions per pulse	1 - 65535	
Pulse on time and off time setting range	20 ns - 300 s	
Pulse on time and off time setting resolution	10 ns	

Connectors

Front panel connectors		
RF output	Impedance	50 Ω
	Connector	2.92mm male SSG6083A /SSG6085A/SSG6087A 1.85mm male SSG6089A
Modulation generator output (LF)	Impedance	50 Ω
	Connector	BNC-female
Rear panel connectors		
TRIG IN / OUT	Impedance	100 kΩ
	Connector	BNC-female
	Active trigger voltage	5 V TTL
EXT MOD INPUT	Impedance	High impedance
	Connector	BNC-female
PULSE IN / OUT	Impedance	Input: High impedance Output: 50 Ω
	Connector	BNC-female
	Input / output voltage	CMOS 3.3 V
10 MHz IN	Impedance	50 Ω
	Connector	BNC-female
	Input power range	-5 dBm ~ +10 dBm
10 MHz OUT	Impedance	50 Ω
	Connector	BNC-female
	Output power range	> 0 dBm
SIGNAL VALID	Impedance	50 Ω
	Connector	BNC-female
	Output voltage range	CMOS 3.3 V
Communication Interface		
USB host	USB-A 2.0	
USB device	USB-B 2.0	
LAN	LAN (VXI - 11, Socket, Telnet)	

General Specification	
Display	TFT LCD, RGB (800*480), 5-inch capacitive touch screen
Storage	Internal (Flash) 4G Byte, external (USB storage device)
Source	100 V to 240 V(±10%), 50/60 Hz Power consumption 90 W with all function working
Temperature	Working temperature 0 ℃ to 50 ℃, Storage temperature - 20 ℃ to 70 ℃
Humidity	0 ℃ to 30 ℃, ≤ 95 % relative humidity; 30 ℃ to 50 ℃, ≤ 75 % relative humidity
Dimensions	W×H×D=482×104×540 mm
Altitude	Operating: less than 3 km
Weight without package	11.9 kg
Electromagnetic Compatibility and Safety	
EN 61326-1:2013/	Class A
EN 61000-3-2:2014	
EN 61000-3-3:2013	Plt: 0.65 Pst: 1.00, dmax: 4.00 % dc: 3.00 %, dtLim: 3.30 % dt > Lim: 500 ms
IEC 61000-4-2:2008	AD ± 8.0 kV, CD ± 4.0kV
IEC 61000-4-3:2006 + A1: 2007 + A2:2010	80 MHz to 1000 MHz: 10 V/m; 1.4 GHz to 2.0 GHz: 3 V/m; 2.0 GHz to 2.7 GHz: 1 V/m
IEC 61000-4-4:2004 + A1: 2010	AC Line: ± 2100 kV
IEC 61000-4-5:2005	Line to Line: 1.0 kV; Line to Earth: 2.0 kV
IEC 61000-4-6:2008	0.15 - 80 MHz: 3V 1 kHz 80% AM
IEC 61000-4-8:2009	30 A/m, 50/60 Hz
IEC 61000-4-11:2004	Voltage Dips: 0%/0.5P; 40%/10P; 70%/25P; Short Interruptions Test Leve l% UT: 0%/250P
Safety	
IEC 61010-1: 2010 / EN 61010-1: 2010	
Canada: CAN/CSA-C22.2 No.61010-1: 2012	
RoHS	
2011/65/EU	

Ordering Information

Product Description	SSG6000A Signal Generator	Order Number
Product code	Analog Signal Generator 100 kHz~13.6 GHz	SSG6083A
	Analog Signal Generator 100 kHz~20 GHz	SSG6085A
	Analog Signal Generator 100 kHz~40 GHz	SSG6087A
	Analog Signal Generator 100 kHz~67 GHz	SSG6089A
Standard configurations	Quick start, an USB cable, calibration certificate, power cord, 2.92mm female to female adapter	SSG6083A /SSG6085A/SSG6087A
	Quick start, an USB cable, calibration certificate, power cord, 1.85mm female to female adapter	SSG6089A
options	Pulse modulation	SSG6080A-PU
	Pulse train generator	SSG6080A-PT You must install SSG6080A-PU first
	Low phase noise option	SSG6080A-LPH2 This option must install in factory You can install the option in device of SSG6083A ，SSG6085A ，SSG6087A，SSG6089A
	High power option SSG6080A-HP20	SSG6080A-HP20 This option must install in factory You can install the option in device of SSG6083A ，SSG6085A
	High power option SSG6080A-HP40	SSG6080A-HP40 This option must install in factory You can install the option in device of SSG6087A，SSG6089A
	Rack mount kit	SSG6000A-RMK
	USB-GPIB adapter	USB-GPIB
	Upgrade 13.6 GHz to 20 GHz	SSG6080A_F85
Accessory	67GHz-110GHz Waveguide Port Frequency Extension Module	STLSE-067110

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, spectrum analyzers, function/arbitrary waveform generators, RF/MW signal generators, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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