

SGM13X Modular Signal Generator



- Miniaturized Design
- Large Dynamic Range
- Multi-Modulation
- High Performance
- System Integration
- Complete SCPI Command Set

Introduction

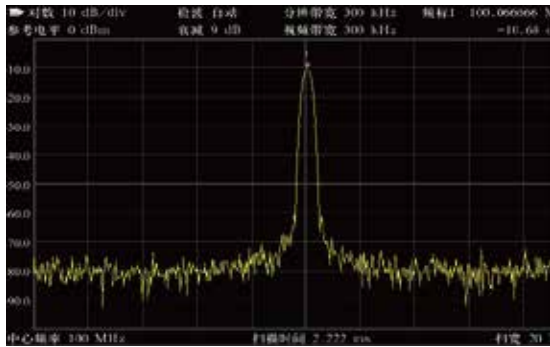
The SGM13X series signal generator module has rich functions and flexible integrated volume. The module has multiple functions such as continuous wave signal, analog modulation, pulse modulation, digital modulation, amplitude frequency scanning, linear frequency modulation and up-conversion, which are suitable for teaching and research, product development, and system integration. The A-type series modules focus on analog modulation, with a maximum modulation rate of up to 1MHz. The B-type modules focus on digital modulation, with built-in IQ modulators that can flexibly support input I/Q modulation of various communication data links, standard public network communication, and limited digital TV broadcasting baseband data. The maximum baseband modulation bandwidth is up to 50MHz, making it convenient for users to build experimental platforms. The complete standard SCPI command set and universal USB and LAN interfaces provide great convenience for remote control and secondary development.

Features

- ▶ SGM13X Frequency range: 9kHz~3.6GHz/7.0GHz
- ▶ Output amplitude range: -120dBm~+13dBm
- ▶ Sweep modes: frequency sweep, amplitude sweep, and frequency+amplitude sweep
- ▶ Standard analog modulation: AM/FM/ΦM
- ▶ General digital modulation: ASK/FSK/PSK/QAM, built-in IQ modulator (Model-B)
- ▶ Pulse modulation with minimum pulse width of 100ns
- ▶ Linear frequency modulation, capable of simulating radar signals
- ▶ Customizable modulation (SSB/DSB/CW) available
- ▶ Function as a RF up-converter
- ▶ Internal modulation sources: sine wave, square wave, triangle wave, sawtooth wave
- ▶ USB/LAN remote control interface, offering a standard SCPI command set
- ▶ Dimensions (LxWxH): 164mm × 101mm × 37mm
- ▶ Weight ≤ 0.6kg (Bare Machine)

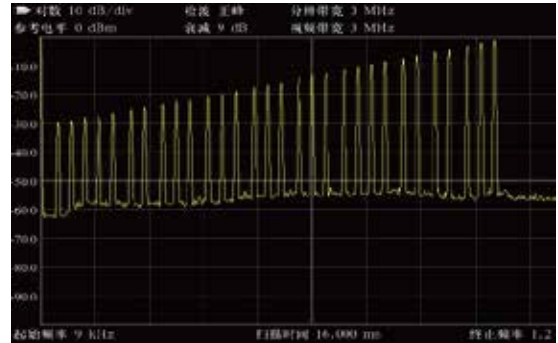
Applications

Pure Continuous Wave



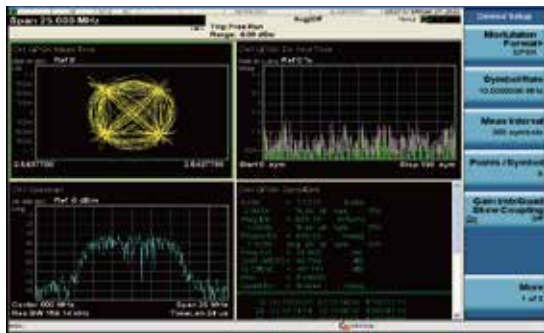
- ✓.Outputting signals at various frequencies and amplitudes.
- ✓.Output dynamic range of up to 130 dBm.

Step Sweep Signal



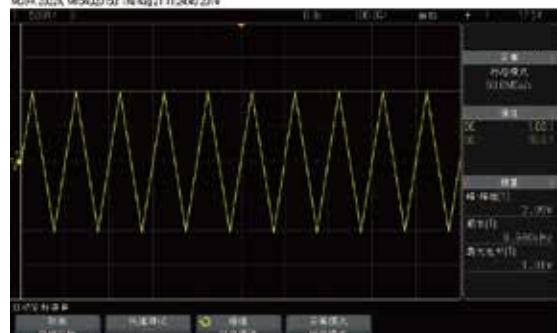
The signal generator is capable of generating sweep signals with equal steps, including three sweep modes: frequency sweep, amplitude sweep, and frequency+amplitude sweep. Sweep type: Step sweep, List sweep.

Digital Modulation



- ✓.ASK/FSK/PSK/QAM,
- ✓.built-in IQ modulator(Model-B)

Low Frequency Output



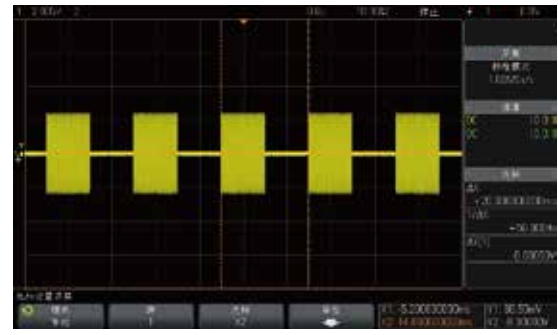
low-frequency output: sine waves, square waves, triangular waves, and sawtooth waves

Analog Modulation



- ✓.AM/FM/ΦM
- ✓.Customizable modulation(SSB/DSB/CW)

Pulse Modulation



Pulse modulation with minimum pulse width of 100ns, supporting Internal/External pulse modulation input, External trigger input.

RF Up-conversion



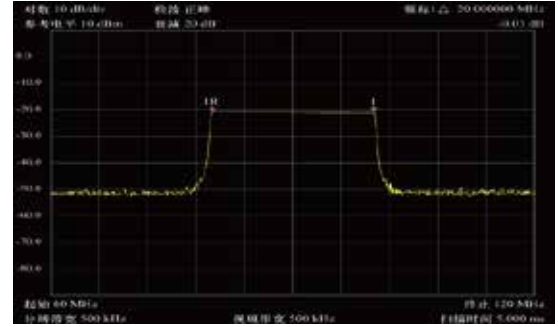
Input frequency range: 190 ± 30 MHz,

Output frequency range: 241 MHz ~ 3.6 GHz / 9 kHz ~ 7.0 GHz

Specifications

Model	SGM131A/B		SGM132A/B	
Frequency				
Frequency range	9 kHz ~ 3.6 GHz		9 kHz ~ 7 GHz	
Frequency	0.1 Hz			
Reference				
Reference frequency	10 MHz			
Temperature stability	± 1.0 ppm		± 1 ppm (Option: ± 100 ppb)	
Internal reference output	Typical	10 MHz, $\geq +2$ dBm	10 MHz, > 0 dBm	
Spectrum Purity				
Harmonics	Typical	≤ -35 dBc	9 kHz ~ 20 kHz ≤ -30 dBc	
			20 kHz ~ 1900 MHz ≤ -35 dBc	
			1900 MHz ~ 3600 MHz ≤ -40 dBc	
			3600 MHz ~ 7000 MHz ≤ -35 dBc	
Nonharmonics	Typical	≤ -55 dBc	≤ -60 dBc	
SSB phase noise	f=1GHz	≤ -100 dBc/Hz@10kHz	≤ -102 dBc/Hz@10kHz	
Amplitude				
Setting range	9 kHz ~ 50 kHz: -120 dBm ~ +10 dBm		Level setting range	-120 dBm ~ +18 dBm
	50 kHz ~ 3 GHz: -120 dBm ~ +13 dBm			
	3 GHz ~ 3.6 GHz: -120 dBm ~ +10 dBm		Index level range	-120 dBm ~ +13 dBm
Accuracy	≤ 1.0 dB (-90 ~ +10 dBm)		Power accuracy	Typical
	≤ 1.5 dB (-110 ~ -90 dBm)			
	≤ 2.0 dB (-120 ~ -110 dBm)			
				≤ 2.0 dB (-120 dBm ~ -90 dBm)
Sweep Mode(Frequency And Amplitude)				
Sweep mode	Frequency, Amplitude, Frequency+Amplitude			
Sweep type	Step sweep, List sweep			
Sweep range	Full frequency and amplitude range			
Step Change	Linear Change			
Number of points	Step sweep	2~65535		
	List sweep	2~16383		
Dwell time	5ms~50s			
Trigger mode	Auto, External trigger			
LF Output				
Wave form	Sine wave, Square wave, Triangle wave, Sawtooth wave			
Frequency range	Sine wave	1 Hz ~ 500 kHz		
	Triangle/Sawtooth wave	1 Hz ~ 100 kHz		
	Square wave	1 Hz ~ 20 kHz		

Linear Frequency Modulation



√. Linear frequency modulation can simultaneously retain the characteristics of continuous signals and pulses.

Modulation					
		SGM131A	SGM131B	SGM132A	SGM132B
Analog modulation (AM/FM/ΦM)					
AM	Modulation depth	0%~100%	0%~100%	0%~100%	0%~100%
	Modulation frequency response	10Hz~1MHz	1Hz~1MHz	10Hz~1MHz	1Hz~1MHz
FM	Maximum deviation	5MHz	5MHz	5MHz	5MHz
	Modulation frequency response	10Hz~1MHz	1Hz~1MHz	10Hz~1MHz	1Hz~1MHz
ΦM	Maximum phase deviation	0°~360°	0°~360°	0°~360°	0°~360°
	Modulation frequency response	10Hz~1MHz	1Hz~1MHz	10Hz~1MHz	1Hz~1MHz
Digital modulation					
IQ modulator		—————	Support	—————	Support
Internal source		ASK/2FSK/4FSK/8FSK /2PSK/4PSK/8PSK	Support general digital modulation(Optional)	ASK/2FSK/4FSK/8FSK /2PSK/4PSK/8PSK	Support general digital modulation(Optional)
External source		Support for External Sequencing	Arb file (IQ data), Sample rate:1ksps~50Msps	Support for External Sequencing	Arb file (IQ data), Sample rate:1ksps~50Msps
Pulse modulation					
On/Off ratio		≥60dB		≥65dB	
Pulse period		200ns~160s			
Pulse width		100ns~85s			
Linear Frequency Modulation (Option)					
Sweep range		Maximum range	50MHz		
Sweep time		1us~2s			
RF up-conversion (Option)					
Input IF range		190MHz±30MHz		200MHz	
Output frequency range		241MHz~3.6GHz		9kHz~7GHz	
Connectors					
RF output		SMA, 50Ω			
LF output		MCX, 50Ω			
Functional connectors	Connectors name	External IF IN, Pulse IN, Tiger IN, EXT MOD, 10MHz REF IN, 10MHz REF OUT		External IF IN(MMCX), Pulse IN, Tiger IN, EXT MOD, Sweep OUT, Pulse Modulation OUT, Tiger OUT, 10MHz REF IN/OUT(MMCX)	
	Connectors type	MCX			
USB		Mini USB			
RS232 Interface		UART Interface			
LAN		10/100 Base-T			
General data					
Operating temperature		Typical	-10°C~+50°C		
Storage temperature		-40°C~+70°C			
Power Supply		DC	Typical+12V±5%, Maximum current 1.5A		
Dimensions(L×W×H)		164mm×101mm×37mm			
Weight		≤0.6kg(Bare Machine)			

Order Information

Product	Description	Order Number	
Host	RF signal generator	SGM131A/B	SGM132A/B
Accessories	CD-ROM(User manual, Programming manual)		
	Power cable		
Options	Baseband generator	SGM132B-BBG	
	Expand the frequency downwards to 4kHz	SGM132-F4K	
	RF up-conversion	SGM132-RFUC	
	Linear frequency modulation	SGM132-LFM	
	Amplitude modulation option(SSB/DSB/CW)	SGM132-AMK	
	Frequency Hopping Capability	SGM132-HOP	
	Pulse train generator (Pulse modulation)	SGM132-PT	