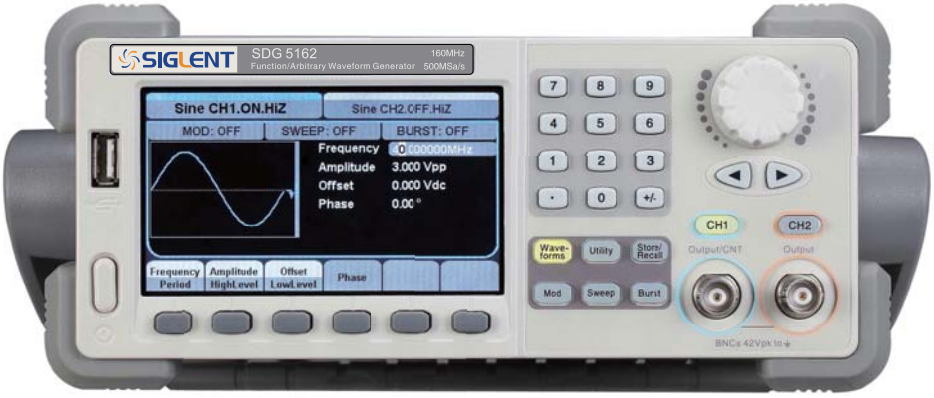
Data Sheet

SDG5000 Series Function/Arbitrary Waveform Generator



Main features

- DDS technology, dual-channel output, 500MSa/s sample rate, 14bit vertical resolution;
- The 2ppm high-frequency stability, -116dBc/Hz low phase noise(SSB) signal output;
- Has the outstanding signal fidelity,512k waveform length,can output complicated signals,can display signals user define more accurately;
- Adopt unipue EasyPulse technology,can output the pulse signal which is low jitter and very small duty cycle,the edge and pulse width can adjust a wide rang and fine;
- Complete set of modulation functions: AM, DSB-AM,FM, PM, FSK, ASK, PWM, linear/logarithmic sweep and burst;
- Built-in accurate frequency counter enables to measure ranges 100mHz-200MHz (single channel);
- Standard interfaces: USB Device, USB Host, Optional interface: GPIB and LAN interface;
- The TFT graphics of big screen,higher-resolution and high brightness,support the intuitionistic operations and setting parameters;
- Supplied with powerful arbitrary editing software, remote control support.

Signal fidelity

SDG5000 series Function/Arbitrary Wavefom Generator has high stability time base and 512 kpts arbitrary waveforms storage length,can output more complicated and more accurate arbitrary,User can get more fedelity signal by the Function/Arbitrary Wavefom Generator.

Edit arbitrary waveform

Enables edition of 14-bit 512kpts arbitrary output waveforms, Arbitrary editing software EasyWave provides 9 standard waveforms: Sine, Square, Ramp, Pulse, ExRise, ExpFall, Sinc, Noise and DC, which meets all engineers' basic needs; In addition, it provides plenty of ways of manual drawing, point-to-point line drawing and arbitrary point drawing. It facilitates to create complex waveforms; Multi-file screen management helps users to edit multiple-waveform simultaneously. It provides 10 Storage in non-volatile RAM. You can edit and store more waveforms by EasyWave.

outstanding performance

SDG5000 series Function/Arbitrary Waveform Generator is a new family member of SIGLENT with friendly design: 4.3 inch TFT-LCD display; Built-in Chinese/English language; Online help function; Support USB and internal storage, facilitate files management; Special connection terminal for grounding.

Specification

Model	SDG5162	SDG5122	SDG5082
Max. output frequency	160MHz	120MHz	80MHz
Output channels	2		
Sample rate	500 MSa/s		
Arbitrary waveform length	CH1:16 kpts CH2:512 kpts		
Frequency resolution	1 μHz		
vertical resolution	14 bit		
Waveform	Sine, Square, Ramp, Pulse, Gaussian Noise, DC, Built-in arbitrary waveforms		
Modulation	AM、DSB-AM、FM、PM、FSK、ASK、PWM、Sweep、Burst		
Frequency counter	Frequency range:100mHz~200MHz		
Standard interface	USB Host & Device		
Optional interfaces	GPIB(IEEE-488)，LAN		
Dimension	Width×Heigth×Depth=261mm×105mm×344mm		

Attention

All these specifications apply to the SDG5000 Series Function/Arbitrary Waveform Generator unless otherwise explanation. To satisfy these specifications, the following conditions must be met first:

1.The instrument has been operating continuously for more than 30 minutes within specified operating temperature range (18°C~28°C).

2.The temperature variation does not exceed 5℃.

3.Unless otherwise stated,all specifications apply with a 50Ω resistive load and auto range ON.

Note: all specifications are guaranteed unless where noted 'typical'.

Typical:The characteristic performance,which 80% or more of manufactured instruments will meet,This data is not warranted,does not include measurement uncertainty,and is vaild only at room temperature (approximately 23°C)

Frequency Specification

Model	SDG5162	SDG5122	SDG5082
Waveform	Sine, Square, Ramp, Triangle, Pulse, Noise, Arb		
Sine	1μHz ~ 160MHz	1μHz ~ 120MHz	1μHz ~ 80MHz
Square	1μHz ~ 50MHz	1μHz ~ 40MHz	1μHz ~ 30MHz
Pulse	1μHz ~ 40MHz	1μHz ~ 30MHz	1μHz ~ 20MHz
Ramp/Triangular	1μHz ~ 4MHz	1μHz ~ 3MHz	1μHz ~ 2MHz
Gaussianwhite noise	100MHz（-3dB）	100MHz（-3dB）	100MHz（-3dB）
Arbitrary	1μHz ~ 40MHz	1μHz ~ 30MHz	1μHz ~ 20MHz
Resolution	1 μHz		
Temperature coefficient	1 year，0°C ~ 55°C，±2 ppm		

Sine Spectrum Purity

Harmonic Distortion	DC-1 MHz	<-54 dBc
	1 MHz - 10 MHz	<-46dBc
	10 MHz - 100 MHz	<-36dBc
	100 MHz - 160 MHz	<-30 dBc
Totalharmonic waveform distortion	DC~20kHz,1Vpp<0.2%	
Spurious signal (non-harmonic)	DC~1MHz<-70dBc 1MHz~10MHz<-70dBc+6dB/spectrum phase	
Phase noise	100kHz Offset,–116dBc/Hz(typical value)	

Square Specification

Rise/fall time(10% ~ 90%)过冲		< 8ns
Overshoot		< 3% (typical,1kHz,1Vpp)
Duty Cycle	1 μHz ~ 10 MHz	20% ~ 80%
	10 MHz(exclude)~ 40MHz	40% ~ 60%
	40 MHz(exclude)~ 50MHz	50%
Asymmetric(50% Duty Cycle)		1% of period+5ns(typical,1kHz,1Vpp)
Jitter(cycle-to-cycle)		100ps(typical,rms)

Ramp/Triangle Specification

Linearity	<0.1% of Peak valu output (typical,1kHz,1Vpp,100% symmetric)
Symmetry	0%~100%

Pulse Specification

Periods	1000000s,Max. 25ns, Min.
Pulse width	≥12ns
duty	0.0001% to 99.9999%
Rise/Fall time (10% ~ 90%)	6ns~6s,100ps resolution
Overshoot	< 3%
Jitter(cycle to cycle)	<100ps(typical,rms)

Arbitrary Specification

Output	CH1	CH2
Waveform length	16k points	512k points
Vertical resolution	14 bit	14 bit
Sample rate	500 MSa/s	500 MSa/s
Min. Rise/Fall time	10ns(typical)	10 ns(typical)
Jitter(cycle to cycle)	2 ns(max)	2 ns(max)

Output Specification

Output	CH1	CH2
Amplitude (into 50Ω)	1 mVpp ~ 10 Vpp（≤40MHz）	1 mVpp ~ 10 Vpp（≤40MHz）
	1 mVpp ~ 5 Vpp （40MHz~100MHz）	1 mVpp ~ 5 Vpp （40MHz~100MHz）
	1 mVpp ~ 2.5Vpp（100MHz~130MHz）	1 mVpp ~ 2.5Vpp（100MHz~130MHz）
	1 mVpp ~ 1.5Vpp（130MHz~160MHz）	1 mVpp ~ 1.5Vpp（130MHz~160MHz）
Vertical accuracy (100 kHz sine)	±(1%+1mVpp of setting value)	±(1%+1mVpp of setting value)
Amplitude flatness(compare to100 kHz sine,1Vpp)	≤10MHz ±0.1 dB	≤10MHz ±0.1 dB
	≤60MHz ±0.2 dB	≤60MHz ±0.2 dB
	≤100MHz ±0.4 dB	≤100MHz ±0.4 dB
	≤160MHz ±0.8 dB	≤160MHz ±0.8 dB
Cross talk	<-80dB	
Channel Delay	<1ns	

DC Offset Specification

Output	CH1	CH2
Range(DC)	±5V(50Ω)	±5V(50Ω)
	±10V(high impedance)	±10V(high impedance)
Offset accuracy	±(|setting offset value|*1%+1mV)	±(|setting offset value|*1%+1mV)

Waveform Output

Impedance	50Ω(typical)	50Ω(typical)
Protection	short-circuit protection	short-circuit protection
Isolation	Connector shells for channel output(s),Sync,and Mod In are connected together but isolated from	
	the instrument's chassis,Maximum allowable voltage on isolated connector shells is ±42Vpk.	

AM / DSB-AM Modulation (CH1/CH2)

Carrier	Sine, Square, Ramp, Arbitrary(except DC)
Source	Internal/External
Modulation waveform	Sine, Square, Ramp, Noise, Arbitrary
Modulation depth	0%~120%
Modulation Frequency	1mHz~50kHz

FM Modulation (CH1/CH2)

Carrier	Sine, Square, Ramp, Arbitrary(except DC)
Source	Internal/External
Modulation waveform	Sine, Square, Ramp, Noise, Arbitrary
Modulation Frequency	1mHz~50kHz

PM Modulation (CH1/CH2)

Carrier	Sine, Square, Ramp, Arbitrary(except DC)
Source	Internal/External
Modulation waveform	Sine, Square, Ramp, Noise, Arbitrary
Phase Deviation	0~360° ,0.1°Resolution
Modulation Frequency	1mHz~50kHz

FSK Modulation (CH1/CH2)

Carrier	Sine, Square, Ramp, Arbitrary(except DC)
Source	Internal/External
Modulation waveform	50% duty-cycle square waveform
Modulation Frequency	1mHz~1MHz

ASK Modulation (CH1/CH2)

Carrier	Sine, Square, Ramp, Arbitrary(except DC)
Source	Internal/External
Modulation waveform	50% duty-cycle square waveform
Modulation Frequency	1mHz~1MHz

PWM Modulation (CH1/CH2)

Carrier	Pulse
Source	Internal/External
Modulation waveform	Sine, Square, Ramp, Arbitrary(except DC)
Modulation Frequency	1mHz~50kHz

Sweep (CH1/CH2)

Carrier	Sine, Square, Ramp, Arbitrary(except DC)
Type	linear/logarithmic
Direct	Up/down
Sweep time	1 ms ~ 500 s ± 0.1%
Trigger source	Manual, external, internal

Burst (CH1/CH2)

Waveform	Sine, Square, Ramp, Pulse, Arbitrary(except DC)
Carrier Frequency	2mHz~100MHz
Type	Count(1 ~ 1,000,000 periods),infinite, Gated
Start/Stop phrase	0° ~360°
Internal period	1 μs ~ 1000 s ± 1%
Trigger delay	232ns~34s
Gated source	External trigger
Trigger source	Manual, External or Internal

External modulation

Connector	Rear-panel BNC,isolated from chassis
Voltage level	±4.5Vpk= 100% modulation >5kΩ input impedance
Note: The external input voltage can't be over ±5Vpk, otherwise instrument gets damaged.	

Trigger Input

Connector	Rear-panel BNC,chassis-referenced
Input Level	TTL compatible
Slope	Up or down (optional)
Pulse width	> 50 ns
Input impedance	>5kΩ,DC coupling
Reaction time	380ns(typical)

Trigger Output

Connector	Rear-panel BNC,chassis-referenced
Voltage level	TTL compatible
Pulse width	> 60 ns(typical)
Output impedance	50Ω(typical)
Max Frequency	1 MHz

SYNC Output

Connector	Rear-panel BNC,isolated from chassis
Voltage level	TTL compatible
Pulse width	> 50 ns(typical)
Output impedance	50Ω(typical)
Max Frequency	2 MHz

Frequency reference input

Connector	Rear-panel BNC,isolated from chassis and all connector.
Frequency range	10MHz±50Hz
Voltage level	2.3Vpp ~3.3Vpp
Lock time	< 2 s
Input impedance	1KΩ AC-coupled

Frequency reference output

Connector	Rear-panel BNC,chassis-referenced
Frequency	10MHz
Voltage level	>1Vpp
Output impedance	50Ω AC-coupled

Frequency Counter

Measurement	Frequency, Period, Positive/negative pulse width, duty cycle	
Frequency range	Single Channel:100mHz~200MHz	
Frequency resolution	6bit/s	
Voltage range (non-modulated signal)		
DC coupling	DC offset range	±1.5VDC
	100mHz~100MHz	50mVrms~±2.5V
	100MHz~200MHz	100mVrms~±2.5V
AC coupling	1Hz~200MHz	100mVrms~5Vpp
Pulse width and duty-cycle measurement	1Hz~10MHz(50mVrms~5Vpp)	
Input adjustment	Input impedance	1MΩ
	Coupling mode	AC,DC
	High-frequency rejection	ON/OFF
Trigger level range	-3V~ 1.8V	

General Specification

Display	
Display type	4.3inch'TFT-LCD
Resolution	480(RGB)×272
Color depth	24bit
Contrast Ratio	500:1(typical)
Luminance	300cd/m2(typical)
Power	
Voltage	100~240 VACRMS, 45~66Hz,CATII
	100~127 VACRMS, 45~440Hz,CATII
Consumption	<30W
Fuse	1.25A,250V

Environment	
Temperature	Operation:0°C~40°C
	Storage:-20°C~60°C
Humidity range	Below +35℃:≤90% relative humidity
	+35℃~+40℃:≤60% relative humidity
Altitude	Operation: below 3,000 meters
	Storage: below 15,000 meters
Others	
Dimension	Width:261mm
	Height:105mm
	Depth:344mm
Weight	N.W: G.W:
IP protection	
IP2X	
Calibration Cycle	
1year	

Purchase Information

Product Name	SIGLENT SDG5000 Function/Arbitrary Waveform Generator
Models	SDG5162 160MHz
	SDG5122 120MHz
	SDG5082 80MHZ
Standard Accessories	A User Manual
	A Certification
	A Guaranty Card
	An CD(including EasyWave2.0 computer software system)
	A Power Cord that fits the standard of destination country
Optional Accessories	A USB Cable
	BNC cable, GPIB-USB Adapter

SHENZHEN SIGLENT TECHNOLOGIES CO., LTD

Address: 3/f, no.4 buliding, 3rd liuxian rd, antongda industry garden, bao'an District, shenzhen, 518101 , china.

Email: sales@siglent.com Tel: +86-755-36615186 Fax: +86-755-33591582