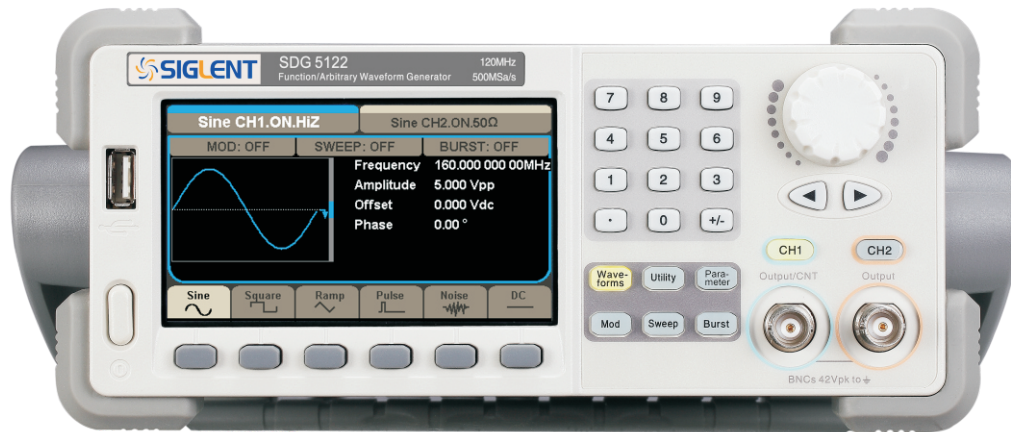


Data Sheet

DS02050-E03A

SDG5000 Series Function/Arbitrary Waveform Generator



The main features

- DDS technology, dual-channel output, 500MSa/s sample rate, 14bits 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, USBHost
- 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 Waveform Generator has high stability time base and 512kpts arbitrary waveforms storage length,can output more complicated and more accurate arbitrary,User can get more fedelity signal by the Function/Arbitrary Waveform Generator.

Edit arbitrary waveform

Enables edition of 14bits,512kpts/16kpts 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 μ Hz		
Vertical resolution	14 bits		
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		
Dimension	Width \times Height \times Depth=261mm \times 105mm \times 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°C.
3. Unless otherwise stated, all specifications apply with a 50 Ω 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 valid only at room temperature (approximately 23°C).

Frequency Specification

Model	SDG5162	SDG5122	SDG5082
Waveform	Sine, Square, Ramp, Triangle, Pulse, Noise, Arb		
Sine	1 μ Hz ~160MHz	1 μ Hz ~120MHz	1 μ Hz ~80MHz
Square	1 μ Hz ~50MHz	1 μ Hz ~40MHz	1 μ Hz ~30MHz
Pulse	1 μ Hz ~40MHz	1 μ Hz ~30MHz	1 μ Hz ~20MHz
Ramp/Triangular	1 μ Hz ~4MHz	1 μ Hz ~3MHz	1 μ Hz ~2MHz
Gaussian white noise	100MHz (-3dB)	100MHz (-3dB)	100MHz (-3dB)
Arbitrary	1 μ Hz ~ 40MHz	1 μ Hz ~ 30MHz	1 μ Hz ~ 20MHz
Resolution	1 μ Hz		
Temperature coefficient	1 year, 18°C ~ 28°C , \pm 1 ppm		
Coefficient	\pm 1ppm, 0°C~55°C		

Sine Spectrum Purity		
Harmonic Distortion	DC-1 MHz	<-56dBc
	1MHz-10MHz	<-46dBc
	10MHz-100MHz	<-35dBc
	100MHz-160MHz	<-26dBc
Total harmonic waveform distortion	DC - 20 kHz, 1Vpp <0.2%	
Spurious signal (non-harmonic)	DC -160MHz < -70 dBc + 20 dB/spectrum phase	
Phase noise	100kHz Offset, -116 dBc / Hz(typical value)	
Square Specification		
Rise/fall time	<6ns (10% ~ 90%)	
Overshoot	< 3%	
Duty Cycle	≤10 MHz	20% - 80%
	10 MHz-40MHz	40% ~ 60%
	40 MHz-50MHz	50%
Asymmetric(50% Duty Cycle)	1% of period+5ns(typical, 1kHz, 1Vpp, 1kHz, 1Vpp)	
Jitter(cycle-to-cycle)	DC-1MHz, ≤ 200ps ± 2ppm	
	1MHz-50MHz, ≤ 500ps	
Ramp/Triangle Specification		
Linearity	<0.1% of Peak value output (typical, 1kHz, 1Vpp, 100% symmetry)	
Symmetry	0% - 100%	
Pulse Specification		
Periods	1000000s, Max. 25ns, Min	
Pulse width	≥12ns, 100ps resolution	
Duty	0.0001% - 99.9999%	
Rise/Fall time (10% ~ 90%)	6ns~6s, 100ps resolution	
Overshoot	< 3%	
Jitter(cycle to cycle)	DC-1MHz, ≤ 200ps ± 2ppm	
	1MHz-50MHz, ≤ 500ps	
Arbitrary Specification		
Output	CH1	Ch2
Waveform length	16 Kpts	16 Kpts /512 Kpts
Vertical resolution	14 bits	14 bits
Sample rate	500 MSa/s	500 MSa/s
Min. Rise/Fall time	6ns	6 ns
Jitter(cycle to cycle)Storage in	DC - 40MHz, ≤2.1ns ± 10ppm	
Non-volatile RAM memory	8 waveforms @ 512Kpts; 24 waveform @ 16Kpts	

Output Specification		
Output	Ch1	Ch2
Amplitude	DC- <40MHz:1mVpp-10Vpp(50Ω)	DC- <40MHz:1mVpp-10Vpp(50Ω)
	40MHz- <100MHz:1mVpp-5Vpp(50Ω)	40MHz- <100MHz:1mVpp-5Vpp(50Ω)
	100MHz-160MHz:1mVpp-1.5Vpp(50Ω)	100MHz-160MHz:1mVpp-1.5Vpp(50Ω)
	DC- <40MHz:1mVpp-20Vpp(Hi Z)	DC- <40MHz:1mVpp-20Vpp(Hi Z)
	40MHz- <100MHz:1mVpp-10Vpp(Hi Z)	40MHz- <100MHz:1mVpp-10Vpp(Hi Z)
	100MHz-160MHz:1mVpp-3Vpp(Hi Z)	100MHz-160MHz:1mVpp-3Vpp(Hi Z)
Vertical accuracy ^{1,2} (spec)	± +11% of setting ± 1mVpp) at 10KHz	± +11% of setting ± 1mVpp) at 10KHz
Amplitude flatness (compared to 100 kHz sine,5Vpp)	≤80MHz ± 0.2 dB	≤80MHz ± 0.2 dB
	≤160MHz ± 0.8 dB	≤160MHz ± 0.8 dB
Output Current Max only	± 200mA	± 200mA
Cross talk	<-60dB	
Output Connector	BNC	

1. Add 1/10th of the output amplitude and offset accuracy specification per °C for operation at temperatures beyond 23°C ± 5°C

DC Offset Specification		
Output	Ch1	Ch2
Range(DC)	± 5 V (50Ω)	± 5 V (50Ω)
	± 10 V (high impedance)	± 10V (high impedance)
Offset accuracy	± (setting offset value *1%+2 mV)	± (setting offset value *1%+2 Mv)
Resolution	1mv	1mv
Waveform Output		
Impedance	50Ω (typical) ,Hz	50Ω (typical) ,Hz
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 ~500s ± 0.1%
Trigger source	Manual, external, internal
Sweep Range @Max Sample Rate	1uHz to Bandwidth frequency 500MSa/s
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 μ s~1000s ± 1%
Trigger delay	280ns~34s
Gated source	External trigger
Trigger source	Manual, External or Internal

External modulation	
Connector	Rear-panel BNC,isolated from chassis
Voltage level	± (4.5~5)V=100%modulation >10k Ω input impedance
Note: The external input voltage can't be over ± 5 Vpk, otherwise instrument gets damaged.	
Trigger Input	
Connector	Rear-panel BNC,chassis-referenced
Voltage Level	CMOS compatible
Slope	Up or down (optional)
Pulse width	> 50 ns
Input impedance	> 5 k Ω , DCcoupling
Reaction time	380ns(typical)
Tigger Input period of external burst	>160ns
Input Latency	CH1~366 ± 30ns CH2~386 ± 30ns
Trigger Output	
Connector	Rear-panel BNC,chassis-referenced
Voltage Level	CMOS compatible
Pulse width	> 60 ns
Output impedance	50 Ω (typical)
Max Frequency	1MHz
Output Connector	Through Rear Panel Ext Trig/Gate/FSK/Burst
SYNC Output	
Connector	Rear-panel BNC,isolated from chassis
Voltage level	VOH(min)>4.5v,VOL(max)<0.5V; (IOL/IOH=8mA)
Pulse width	> 50 ns(typical)
Output impedance	50 Ω (typical)
Max Frequency	10MHz
Frequency reference input	
Connector	Rear-panel BNC,isolated from chassis and all connector.
Frequency range	10MHz ± 1kHz
Min Voltage level	2.3V
Frequency reference output	
Connector	Rear-panel BNC,chassis-referenced
Frequency	10MHz
Voltage level	>1Vpp
Output impedance	50 Ω 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 offset range	± 1.5VDC
Manual	DC coupling	100mHz~100MHz	50mVrms~ ± 2.5V
		100mHz~200MHz	100mVrms~ ± 2.5V
	AC coupling	1Hz ~ 200 MHz	100mVrms ~ 5 Vpp
Pulse width and duty-cycle measurement		1Hz~10MHz(50mVrms~5Vpp)	
Input adjustment		Input impedance	1 MΩ
		Coupling mode	AC、DC
		High-frequency rejection	ON/OFF
Trigger level range		-3~1.8v	

General Specification

Display	
Display type	4.3inch'TFT-LCD
Resolution	480 × 272, (RGB)
Color depth	24bits
Contrast Ratio	500:1(typical)
Luminance	300cd/m ² (typical)
Power	
Voltage	100-240 ACVrms, 50/60Hz, CAT II
Consumption	MAX 50W
Fuse	F1.25AL,250V
Environment	
Temperature	Operation: 0°C~40°C
	Storage: -20°C~60°C
Humidity range	Below +30°C: ≤90%relative humidity
	+30°C~+40°C: ≤60%relative humidity
Altitude	Operation: below 3,000 meters
	Storage: below 15,000 meters
Electromagnetic Compatibility	2004/108/EC Directive, Applicable standards EN 61326-1:2006
	EN 61000-3-2:2006 + A2:2009
	EN 61000-3-3:2008
Safety	2006/95/EC Low Voltage Directive
	UL 61010-1:2012,CAN/CSA-C22.2 No.61010-1:2012,
	UL 61010-2-030:2012,CAN/CSA-C22.2 No.61010-2-030:2012
Others	
Dimension	Width: 261mm
	Height: 105mm
	Depth: 344mm
Weight	N.W: 2.8kg
IP protection	IP20
Calibration Cycle	1year

Purchase Information

Product Name	SIGLENT SDG5000 Function/Arbitrary Waveform Generator	
Models	SDG5162	160MHz
	SDG5162	120MHz
	SDG5082	80MHZ
Standard Accessories	A Quick Start	
	A Calibration Certificate	
	An CD(including EasyWave computer software system)	
	A Power Cord that fits the standard of destination country	
	A USB Cable	
Optional Accessories	BNC cable	
	GPIB-USB Adapter	

Contact SIGLENT

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