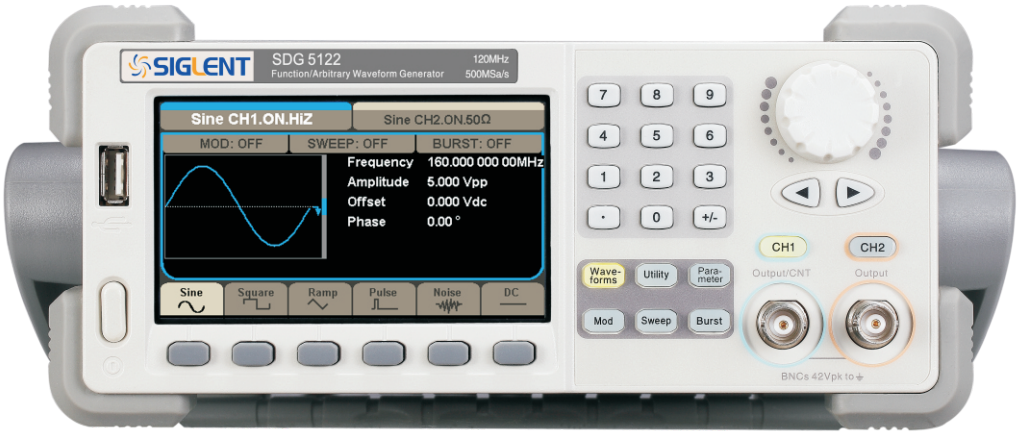
Data Sheet

DS02050-E03B

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 Wavefom 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 Wavefom 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 × 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℃).
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	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℃ ~ 28℃ ， ±1 ppm		
Coefficient	±1ppm，0℃~55℃		

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–volatle 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)	± 1% of setting ± 1mVpp) at 10KHz	± 1% 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 ℃ for operation at temperatures beyond 23℃ ±5℃

DC Offset Specification		
Output	Ch1	Ch2
Range(DC)	±5 V (50Ω)	±5 V (50Ω)
	±10 V (high impedance)	±10V (high impedance)
Offset accuracy	± (Isetting offset valuel*1%+2 mV)	± (Isetting offset valuel*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
	>10kΩ 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 kΩ， 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
Input Voltage range	1Vpp～4Vpp
Input impedance	>1MΩ
Frequency reference output	
Connector	Rear–panel BNC,chassis–referenced
Frequency	10MHz
Voltage level	>3Vpp (Load=Hiz)

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 x 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℃~40℃
	Storage：-20℃~60℃
Humidity range	Below +30℃：≤90%relative humidity
	+30℃~+40℃：≤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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