

DATENBLATT

SDG5000-Serie

HABEN SIE FRAGEN ODER WÜNSCHEN SIE EIN INDIVIDUELLES ANGEBOT?

Unser Team berät Sie gerne persönlich.

TELEFON + 49 (0) 81 41/36 97-0

TELEFAX + 49 (0) 81 41/36 97-30

E-MAIL info@plug-in.de

WWW.PLUG-IN.DE

ADRESSE

Am Sonnenlicht 5

D-82239 Alling bei München



Data Sheet

Function/Arbitrary Waveform Generator SDG5000 Series

- ◆ 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 unique 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 range 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
- ◆ The TFT graphics of big screen, higher-resolution and high brightness
- ◆ Supplied with powerful arbitrary editing software, remote control support



Edit arbitrary waveform

Enables edition of 14-bit,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

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 fidelity signal by the Function/Arbitrary Waveform Generator.

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 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		
Dimension	Width×Height×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°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 noise	white 100MHz (-3dB)	100MHz (-3dB)	100MHz (-3dB)
Arbitrary	1 μ Hz ~ 40MHz	1 μ Hz ~ 30MHz	1 μ Hz ~ 20MHz
Resolution	1 μ Hz	1 μ Hz	1 μ Hz
Accuracy	1 year, 18°C ~ 28°C, \pm 1ppm		
Temperature coefficient	0°C ~ 55°C, \pm 1ppm		

● Sine Spectrum Purity

Harmonic Distortion	DC-1 MHz	<-56dBc
	1 MHz - 10 MHz	<-46 dBc
	10 MHz - 100 MHz	<-35 dBc
	100 MHz - 160 MHz	<-26 dBc
Total harmonic distortion	waveform DC - 20kHz, 1Vpp	<0.2%
Spurious (non-harmonic)	signal DC-160MHz	<-70dBc+20dB/spectrum phase
Phase noise	100kHz Offset, -116dBc/Hz(typical)	

● Square Specification

Rise/fall time	6ns(10% ~ 90%)	
Overshoot	< 3%	
Duty Cycle	\leq 10 MHz	20% ~ 80%
	10 MHz- 40MHz 40 MHz-50MHz	40% ~ 60% 50%
Asymmetric(50% Duty Cycle)	1% of period+5ns(typical, 1kHz, 1Vpp)	
Jitter(cycle-to-cycle)	DC-1MHz, \leq 200ps+2ppm	
	1MHz-50MHz, \leq 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	16Kpts	16Kpts /512Kpts
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)	DC - 40MHz, ≤2.1ns ± 10ppm	
Storage in Non-volatile RAM memory	8 waveforms @ 512Kpts; 24 waveform @ 16Kpts	

● Output Specification

Output	CH1	CH2
Amplitude	DC - < 40MHz: 1mVpp-10Vpp(50Ω) 40MHz - <100MHz: 1 mVpp - 5 Vpp(50Ω) 100MHz - 160MHz: 1 mVpp -1.5 Vpp(50Ω)	DC - < 40MHz: 1mVpp-10Vpp(50Ω) 40MHz - <100MHz: 1 mVpp - 5 Vpp(50Ω) 100MHz - 160MHz: 1 mVpp -1.5 Vpp(50Ω)
Vertical accuracy 1,2 (spec)	DC - < 40MHz: 1mVpp-20Vpp(Hi Z) 40MHz - <100MHz: 1 mVpp - 10 Vpp(Hi Z) 100MHz - 160MHz: 1 mVpp -3 Vpp(Hi Z)	DC - < 40MHz: 1mVpp-20Vpp(Hi Z) 40MHz - <100MHz: 1 mVpp - 10 Vpp(Hi Z) 100MHz - 160MHz: 1 mVpp -3Vpp(Hi Z)
Amplitude flatness (compared to 100 kHz sine, 5Vpp)	≤80MHz ±0.2 dB ≤160MHz ±0.8dB	≤80MHz ±0.2 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)	±5V(50Ω) ±10V(high impedance)	±5V(50Ω) ±10V(high impedance)
Offset accuracy	±(setting offset value *1%+1mV)	±(setting offset value *1%+1mV)
Resolution	1mV	1mV

● Waveform Output

Impedance	50Ω(typical) , HiZ	50Ω(typical) , HiZ
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 \pm 0.1%
Trigger source	Manual, external, internal
Sweep Range@Max Sample Rate	1uHz to Bandwidth frequency @ 500 MSa/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 ~ 1000 s \pm 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	\pm (4.5~5)V= 100% modulation >10k Ω input impedance

Note: The external input voltage can't be over $\pm 5V_{pk}$, 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	>5k Ω ,DC coupling
Reaction time	380ns(typical)
Trigger Input period of external burst	>160ns
Input Latency	CH1 -366 \pm 30nS CH2 -386 \pm 30nS

● Trigger Output

Connector	Rear-panel BNC, chassis-referenced
Voltage level	CMOS compatible
Pulse width	> 60 ns(typical)
Output impedance	50 Ω (typical)
Max Frequency	1 MHz
Output Connector	Through Rear Panel Ext Trig/Gate/FSK/Burst

● SYNC Output

Connector	Rear-panel BNC, isolated from chassis
Voltage level	$V_{OH}(\min) > 4.5V, V_{OL}(\max) < 0.5V; (I_{OL}/I_{OH} = 8mA)$
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 \pm 1kHz
Min Voltage level	2.3V

● Frequency reference output

Connector	Rear-panel BNC, chassis-referenced
Frequency	10MHz
Voltage level	>1V _{pp}
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~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	480x272, (RGB)
Color depth	24bit
Contrast Ratio	500:1(typical)
Luminance	300cd/m ² (typical)

Power

Voltage	100-240 Vrms(± 10%), 50/60 Hz
	100-120 Vrms(± 10%), 400 Hz
Consumption	MAX 50W
Fuse	1.25A,250V

Environment

Temperature	Operation:0°C~40°C
	Storage:-20°C~60°C
Humidity range	Below +35°C:≤90% relative humidity
	+30°C~+40°C:≤60% relative humidity
Altitude	Operation: below 3,048 meters
	Storage: below 15,000 meters
Electromagnetic Compatibility	2004/108/EC Directive Applicable standards EN 61326-1:2006

Safety EN 61000-3-2:2006 + A2:2009
EN 61000-3-3:2008
2006/95/EC Low Voltage Directive
EN 61010-1:2010/

Others

Dimension Width:261mm
Height:105mm
Depth:344mm
Weight N.W: 2.8kg

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 Quick Start
- A Calibration Certificate
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- A Power Cord that fits the standard of destination country
- A USB Cable

Optional Accessories

- BNC cable