SDG1000X Plus Series Function/Arbitrary Waveform

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data sheet

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深圳市鼎阳科技股份有限公司

SDG1062X Plus

SDG1032X Plus

SDG1022X Plus

Product Overview

SDG1000X Plus series dual-channel function/arbitrary waveform generator, the maximum bandwidth of 60MHz, with 1GSa/s sampling rate and 16-bit vertical resolution of the excellent sampling system indicators, in the traditional DDS technology based on the use of innovative TrueArb and EasyPulse technology, to overcome the inherent shortcomings of the DDS technology in the output of arbitrary waveforms and square wave/pulse. The innovative TrueArb and EasyPulse technologies, based on traditional DDS technology, overcome the inherent shortcomings of DDS technology in outputting arbitrary waves and square waves/pulses, and provide users with high-fidelity, low-jitter signals. In addition, the SDG1000X Plus also provides PRBS pattern generation, serial waveform output, and double pulse output functions to meet a wider range of application requirements.

Features and Benefits

- Dual channel, maximum output frequency 60 MHz, maximum output amplitude 20 Vpp
- 1 GSa/s digital-to-analog converter sample rate, 16-bit vertical resolution
- Adopts TrueArb technology to output arbitrary waveforms point by point, and can output low-jitter waveforms at variable sampling rates from 1μSa/s to 250MSa/s without losing waveform details.
- Supports serial wave playback with a maximum storage depth of 8 Mpts per channel. adopts EasyPulse technology, which can output low-jitter square waves/pulses, and the pulse width, rising/falling edges can be finely tuned.
  High adjustment resolution and range of adjustments
- Supports dual-pulse output function for measuring switching parameters and evaluating dynamic characteristics of power devices.
- Outputs up to 40 Mbps of PRBS code type
- Rich analog and digital modulation capabilities: AM, DSB-AM, FM,
  PM, FSK, ASK, PSK and PWM
- Sweep and Burst Function Harmonic Generation Function
- Channel Merge Function Hardware Frequency Meter Function
- 196 built-in arbitrary waves
- Abundant communication interfaces: USB Host, USB Device as standard.
  (USBTMC), LAN (VXI-11), Optional GPIB
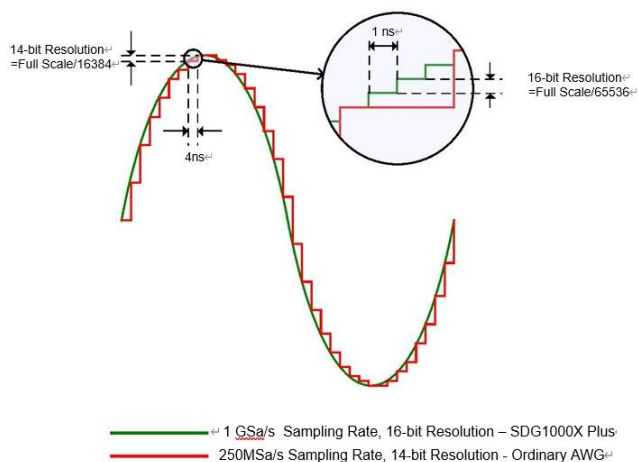- Built-in WebServer for controlling the instrument through a web browser.
- 4.3-inch display

Model and main parameters

model number	SDG1062X Plus	SDG1032X Plus	SDG1022X Plus
conduit	2		
Maximum Output Frequency	60 MHz	30 MHz	25 MHz
sampling rate	1 GSa/s (4X interpolation)		
vertical resolution	16 bits		
Arbitrary waveform length	8 Mpts, provides serial wave output function		
range	±10V		
demonstrate	4.3-inch display		
connector	Standard: USB Host, USB Device, LAN Optional: GPIB (USB-GPIB adapter)		

Design Features

Excellent sampling system metrics

14-bit Resolution
=Full Scale/16384

1 ns

4ns

16-bit Resolution
=Full Scale/65536

1 GSa/s Sampling Rate, 16-bit Resolution – SDG1000X Plus
250MSa/s Sampling Rate, 14-bit Resolution - Ordinary AWG

16-bit, 1 GSa/s sampling system with high resolution in both time and amplitude for maximum waveform detail and distortion avoidance

Innovative EasyPulse technology

period jitter=116ps rms
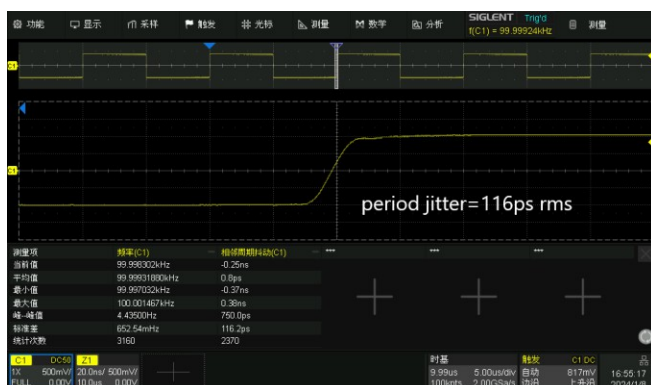
If the sampling rate and output frequency are different when outputting a square wave/pulse by the DDS method, the output frequency can be adjusted to the output frequency of the square wave/pulse.

The SDG1000X Plus uses EasyPulse technology to overcome the shortcomings of DDS and produce a square wave/pulse signal with low jitter.
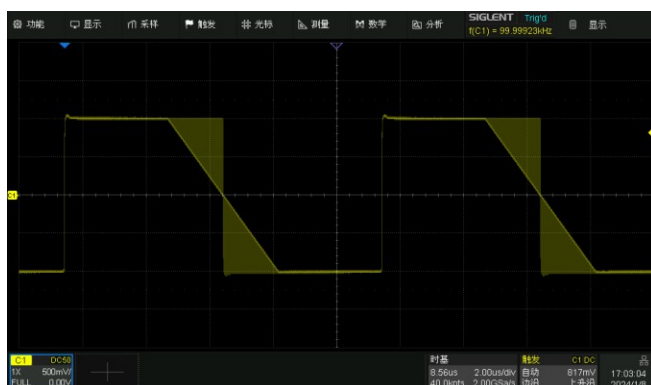
Rising and falling edges can be set separately; adjustable in steps as small as 100ps; minimum value of 10ns can be obtained at any frequency; maximum value up to 22.4s

Minimum pulse width 19.4ns, finely adjustable 100ps pulse width, adjustable in steps down to

⎍ Innovative TrueArb technology

TrueArb not only has all the advantages of traditional DDS technology when outputting arbitrary waveforms, but also overcomes its serious shortcomings that can increase jitter and distortion because TrueArb technology outputs every waveform data point of an arbitrary waveform in memory point by point, without missing any details, and accurately generates arbitrary waveforms with low jitter.

⎍ Powerful Arbitrary Wave Generation and Sequence Playback Functions
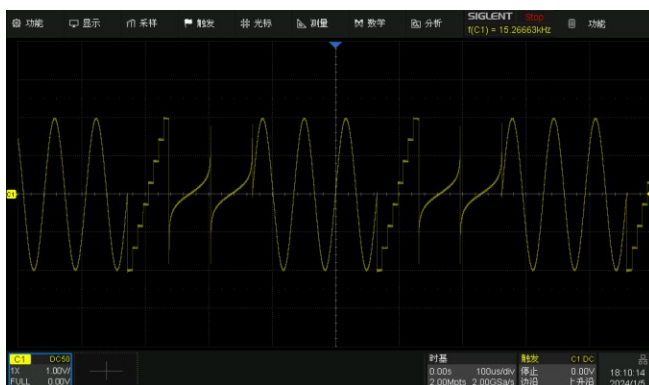
Provides sequence playback function to easily cope with various scenario tests. Maximum per channel

Waveform storage depth up to 8 Mpts
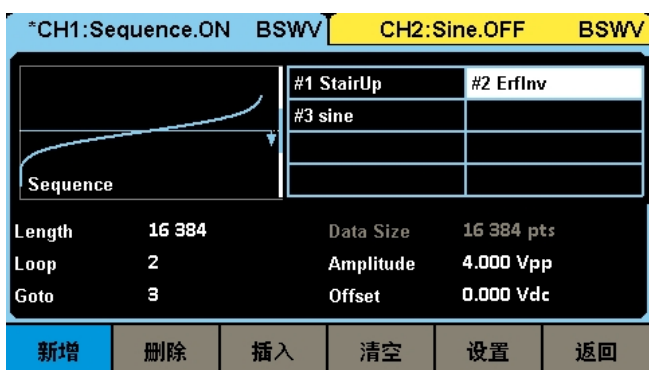
Easily set the number of cycles of each waveform segment and the waveform playback sequence in three modes of operation: continuous, burst, and single.

Selectable "internal","external","manual" trigger sources

⚡ Built-in double pulse output function

Built-in double pulse output function, with DinYang oscilloscope, no need for host computer software. Rapid measurement of switching parameters and dynamic characteristics of power devices.
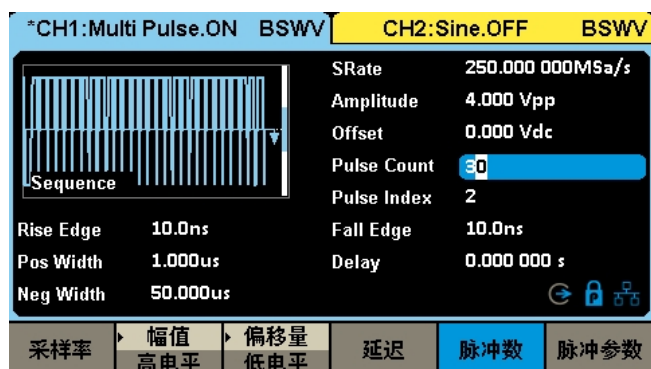
Supports a maximum of 30 pulses, each pulse can be set independently of the pulse edge and positive and negative pulse widths

⚡ PRBS code output
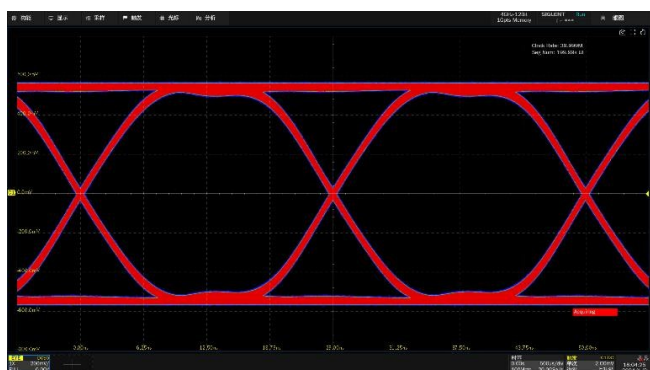
Provides PRBS3 ~ PRBS32 code outputs at 10^{-6} bps. Arbitrarily adjustable from ~ 40 Mbps, arbitrarily adjustable from 10 ns ~ 1us along the edge of the line
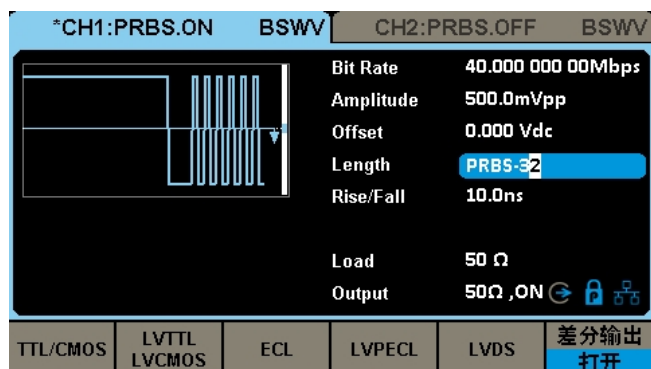
Quickly select preset level logic such as TTL, LVCMOS, LVPECL
Differential mode makes it easy to set up two channels as a differential pair of outputs.

Rich Modulation Function
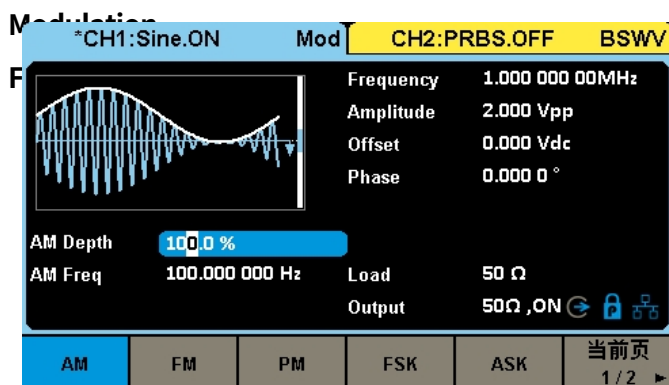
Rich modulation functions, support commonly used AM/DSB-AM/ FM/ PM/ ASK/ FSK/ PSK/ PWM modulation mode

Selectable "internal" and "external" modulation sources

Burst Function
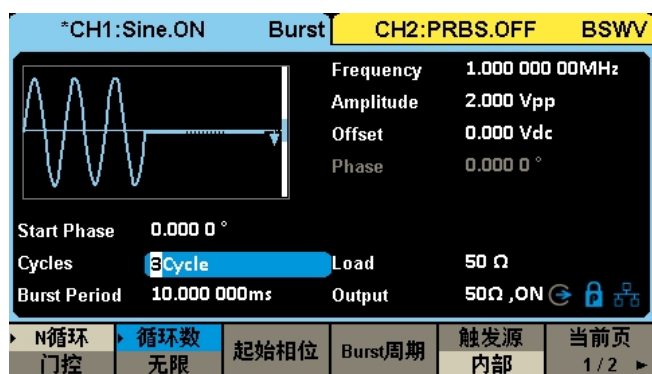
Supports both "N Cycle" and "Gated" Burst methods.

Selectable "internal", "external" and "manual" trigger sources

Sweep Function
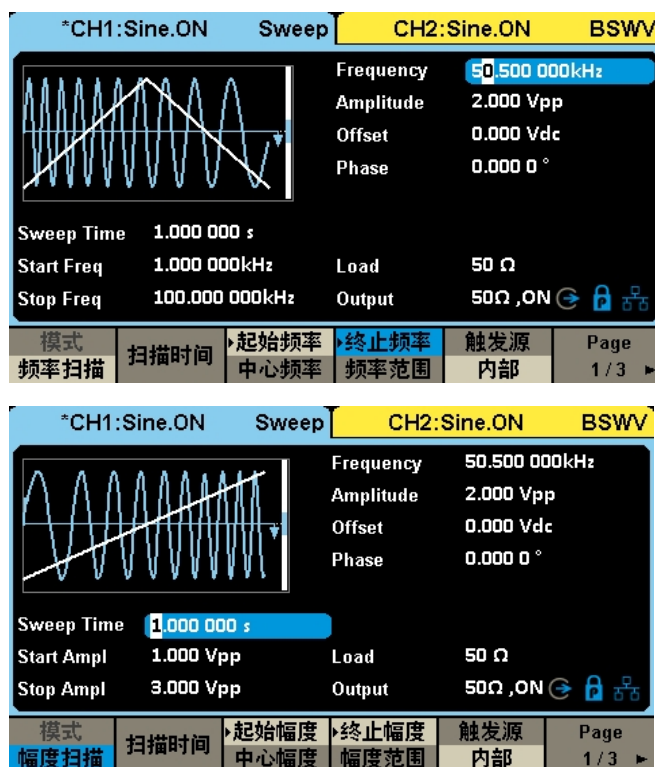
Supports two Sweep modes of frequency and amplitude, easily realizing frequency sweep and amplitude sweep.
beta (software)
Supports "Linear" and "Logarithmic" scanning methods, "Up", "Down" and up", "down" and "up-down" scanning directions.

Selectable "internal", "external" and "manual" trigger sources

⏛ Frequency Meter Function
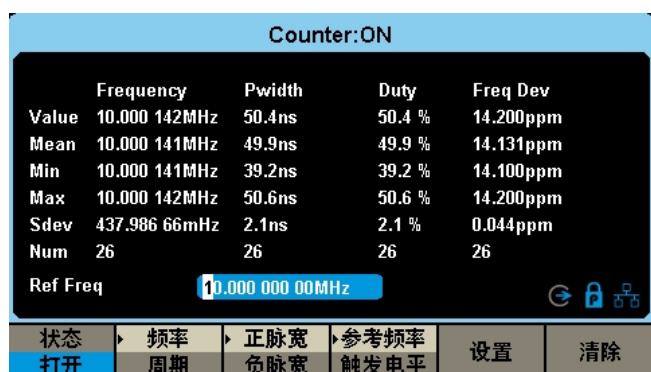
Highly accurate frequency meter with a frequency range of 0.1Hz to 200MHz.

⏛ Built-in WebServer
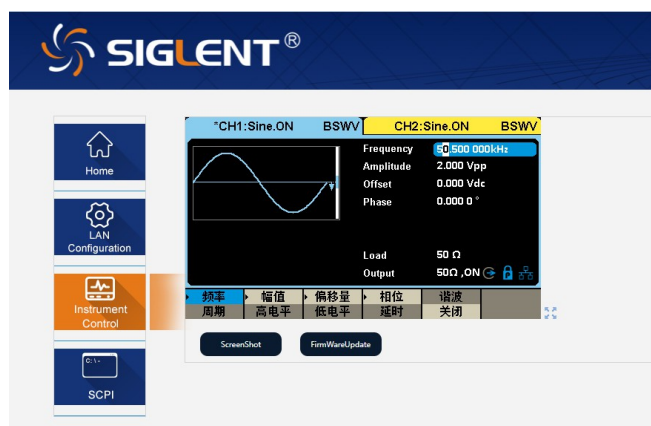
Supports control of the instrument through a Web browser, allowing testing tasks to be accomplished remotely.

Parameter specifications

Unless otherwise stated, all specifications are required when the following conditions are guaranteed to be met:

• Product is within calibration validity

• In the ambient temperature range of 18℃~28℃, and the instrument works continuously for more than 30 minutes.

frequency characteristic					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
resolution (of a photo)			1 μ	Hz	
time base accuracy	-1		+1	ppm	25 °C
	-2		+2		0~40 ℃
Time-based 1-year aging rate	-1		+1	ppm	25 °C
Time-based 10-year aging rate	-3.5		+3.5	ppm	25 °C

| Sine Wave Characteristics					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
frequency	1 μ		60 M	Hz	SDG1062X Plus
	1 μ		30 M		SDG1032X Plus
	1 μ		25 M		SDG1022X Plus
harmonic distortion (0 dBm, 50fi load)			-65	dBc	≤ 10 MHz
			-60		10 MHz to 20 MHz (included)
			-55		20 MHz to 40 MHz (included)
			-50		40 MHz to 60 MHz (included)
THD			0.075	%	0 dBm, 10 Hz to 20 kHz
anharmonic spuriousness (0 dBm, 50fi load)			-70	dBc	≤ 50 MHz
			-65		＞50 MHz

square wave characteristic					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
frequency	1 μ		20 M	Hz	
Rise/fall time			11	ns	10% to 90%, 1Vpp, 50fi Load
overshoot			3	%	100 kHz, 1Vpp, 50fi Load
duty cycle	0.001		99.999	%	This parameter is limited by the frequency setting
Jitter (rms), cycle-cycle			200	ps	1Vpp, 50fi load

Pulse Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
frequency	1 µ		20 M	Hz	
pulse width	19.4			ns	
Pulse Width Accuracy			± (0.01%+0.5ns)		
Rise/fall time	10 n		22.4	s	10% to 90%, 1Vpp, 50fi Load
overshoot			3	%	100 kHz, 1Vpp, 50fi Load
duty cycle	0.001		99.999	%	This parameter is limited by the frequency setting
Jitter (rms), cycle-cycle			200	ps	1Vpp, 10ns edge, 50fi load

noise characteristic

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
-3 dB bandwidth		60		MHz	
Bandwidth Adjustment Range	20		60	MHz	

Triangular Wave Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
frequency	1 µ		2 M	Hz	
symmetry	0		100	%	
linearity			1	%	Percentage of output peak-to-peak, 1kHz, 1Vpp. 100% Symmetry

Arbitrary Wave Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
DDS mode					
frequency	1 µ		20M	Hz	Sampling rate 250 M Sa/s
Waveform length	16 k			pts	
Rise/fall time		6		ns	10% ~ 90%, 1Vpp step signal. 50 Ω load
True Arb mode					
sampling rate	1 µ		250 M	Sa/s	
Waveform length	24		8 M	pts	

judder			200	ps	Cycle-cycle rms value, "010101" code type. 1Vpp, 50Ω load, 250 MSa/s
Interpolation	Zero Order Hold, Linear				
serial wave	Operation modes: Continuous, Single Step, Burst				

PRBS Features

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
bitrate	1 μ		40 M	bps	
sequence length	$2^m -1$, m = 3,4,…,32				
Rise/fall time	10n		1μ	s	10% ~ 90%, 1 Vpp, 50Ω Load

DC Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
realm	-10		+10	V	High Resistance Load
accurate	$\pm$ (1% + 2mV)				

Harmonic Output Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
harmonic number			16	substandard	
Harmonic type	Odd times, even times, all				

Output Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
realm	2m 2m		20 10	Vpp	≤20 MHz, high resistance load >20 MHz, high resistance load (Divide this specification by 2 for a load of 50fi)
accurate	$\pm$ (1% + 1mV)				10 kHz sine, 0 V offset
amplitude flatness	-0.3		+0.3	dB	50fi, 2.5Vpp relative to 10 kHz sine
internal resistance		50		fi	10 kHz sine
Output Current	-200		+200	mA	
Channel Isolation		-60		dBc	

modulation characteristics

AM

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Sine, Square, Ramp, Arb				
modulated wave source	Internal/external				

modulated waveform type (computing)	Sine, Square, Ramp, Noise, Arb				
modulation depth	0		120	%	10 kHz sine
modulated wave frequency	1 m		1 M	Hz	When the modulating wave source is internal
FM					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes

carrier type	Sine, Square, Ramp, Arb				
modulated wave source	Internal/external				
modulated waveform type (computing)	Sine, Square, Ramp, Noise, Arb				
frequency offset	0		0.5*BW		BW represents the maximum output frequency; this parameter is limited by the frequency setting
modulated wave frequency	1 m		1 M	Hz	When the modulating wave source is internal
PM					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Sine, Square, Ramp, Arb				
modulated wave source	Internal/external				
modulated waveform type (computing)	Sine, Square, Ramp, Noise, Arb				
migrate against one another	0		360	°	
modulated wave frequency	1 m		1 M	Hz	When the modulating wave source is internal
ASK					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Sine, Square, Ramp, Arb				
modulated wave source	Internal/external				
modulated waveform type (computing)	Square with 50% duty cycle				
keying frequency	1 m		1 M	Hz	When the modulating wave source is internal
FSK					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Sine, Square, Ramp, Arb				
modulated wave source	Internal/external				
modulated waveform type (computing)	Square with 50% duty cycle				
keying frequency	1 m		1 M	Hz	When the modulating wave source is internal
PSK					
parameters	minimum	typical value	maximum	unit (of	Conditions and Notes

	value		values	measure)	
carrier type	Sine, Square, Ramp, Arb				
modulated wave source	Internal/external				
modulated waveform type (computing)	Square with 50% duty cycle				
keying frequency	1 m		1 M	Hz	When the modulating wave source is internal
PWM					
parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Pulse				
modulated wave source	Internal/external				
modulated waveform type (computing)	Sine, Square, Ramp, Noise, Arb				
modulated wave frequency	1 m		1 M	Hz	When the modulating wave source is internal
Pulse Width Offset Resolution	8			ns	

Burst Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Sine, Square, Ramp, Pulse, Noise, Arb				
typology	Count (1-1000000 Cycles), Infinite, Gated				
carrier frequency	2 m		BW	Hz	BW represents the maximum carrier output frequency
phase (waves)	-360		360	°	10 kHz sine
internal cycle	1μ		1000	s	
trigger source	Internal, External, Manual				
gating source	Internal, external				
Trigger delay			100	s	

Sweep Features

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
carrier type	Sine, Square, Ramp, Arb				
Scan Type	Frequency, Amplitude				
Scanning method	Linear, Logarithmic				
scanning direction	Up, down, up and down				
carrier frequency	1μ		BW	Hz	BW represents the maximum carrier output frequency
scanning time	1 m		500	s	
trigger source	Internal, External, Manual				

Frequency Meter Characteristics

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
measured parameter	Frequency, Period, Positive/Negative Pulse Width, Duty Cycle				
coupled model	AC, DC, High Frequency Suppression				
frequency range	100 m		200 M	Hz	DC coupling
	10		200 M		AC coupling
Input Amplitude	0.1 Vrms		±2.5 V		DC coupling, ≤100 MHz
	0.2 Vrms		±2.5 V		DC coupling, >100 MHz
	0.1 Vrms		5 Vpp		AC coupling, ≤100 MHz
	0.2 Vrms		5 Vpp		AC coupling, >100 MHz
Input Impedance		1M		fi	

Reference Clock Characteristics

10 MHz Input

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
frequency		10		MHz	
amplitude	1.4			Vpp	
Input Impedance	5			kfi	AC coupling

10 MHz output

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
frequency		10		MHz	Synchronization to internal time base
amplitude	2	3.3		Vpp	High Resistance Load
internal resistance		50		fi	

Auxiliary Input/Output Characteristics

Trigger Input

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
VIH	2		5.5	V	
VIL	-0.5		0.8	V	
Input Impedance	100			kfi	10 kHz sine
pulse width	100			ns	
response time			620	ns	

trigger output

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
VOH	3.8			V	IOH = 8 mA
VOL			0.44	V	IOL=8 mA
internal resistance		100		fi	
frequency			1	MHz	

Synchronous output

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
VOH	3.8			V	IOH = 8 mA
VOL			0.44	V	IOL=8 mA
internal resistance		100		fi	
pulse width		100		ns	
frequency			5	MHz	

external modulation input

parameters	minimum	typical value	maximum	unit (of	Conditions and Notes

	value		values	measure)	
frequency	0		50	kHz	
Input Impedance	10			kfi	
Corresponding amplitude at 100% modulation	11	12	13	Vpp	

General Characteristics

power supply

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
input voltage	100 - 240 Vrms (± 10%), 50/60 Hz 100 - 120 Vrms (± 10%), 400 Hz				
power wastage		25	50	W	

demonstrate

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
color		24		Bit	
contrast (balance of black and white in TV screen setup)		350:1			
luminance		300		cd/m2	

matrix

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
Operating Temperature Range	0		40	°C	
Storage temperature range	-20		60	°C	
Operating humidity range	5 5		90 50	%	≤30 °C 40 °C
Non-operating humidity range	5		95	%	
Working altitude			3048	m	≤30 °C
Non-operating altitude			15000	m	
electromagnetic compatibility	Conforms to EMC directive (2014/30/EU), conforms to IEC 61326-1:2021				
safety	Complies with UL 61010-1:2012/R: 2018-11; CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11				
RoHS	Conforms to EU 2015/863				

calibrate

parameters	minimum value	typical value	maximum values	unit (of measure)	Conditions and Notes
calibration period		1		surname Nian	

framework

parameters	minimum	typical value	maximum	unit (of	Conditions and Notes

	value		values	measure)	
sizes	W×H×D = 260.3mm×107.2mm×295.7mm				
net weight		3.48		kg	
gross weight		4.4		kg	

Ordering Information

Product Model	Product Description
SDG1022X Plus	25 MHz, 2 CH, 1 GSa/s, 16-bit, serial wave output
SDG1032X Plus	30 MHz, 2 CH, 1 GSa/s, 16-bit, serial wave output
SDG1062X Plus	60 MHz, 2 CH, 1 GSa/s, 16-bit, serial wave output

Standard Accessories	quantities
Quick Guide	1
Certificate of Conformity	1
power cable (of an appliance etc)	1
Calibration certificates	1
USB cable	1
BNC to Alligator Clip Cable	1

Optional accessories	Specification
20 dB Attenuator	ATT-20 dB
USB-GPIB Adapter	USB-GPIB
BNC Coaxial Cable	SDG-BNC
10W Power Amplifier	SPA1010

About Dingyang

SIGLENT is an industry leader in the field of general electronic test and measurement instruments and a listed company in A-share market.

In 2002, the founders of Tingyang Technology began to focus on oscilloscope research and development, and in 2005, Tingyang successfully developed the first digital oscilloscope. After years of development, Dingyang products have been expanded to digital oscilloscopes, handheld oscilloscopes, function/arbitrary waveform generators, spectrum analyzers, vector network analyzers, RF/microwave signal sources, desktop multimeters, DC power supplies, electronic loads, and other basic test and measurement instruments, is one of the few manufacturers in the world that can simultaneously develop, produce, and sell four major products of general electronic test and measurement instruments, namely, digital oscilloscopes, signal generators, spectrum analyzers and vector network analyzers. It is one of the very few manufacturers in the world that can simultaneously develop, produce and sell digital oscilloscopes, signal generators, spectrum analyzers and vector network analyzers. At the same time, it is also one of the few domestic competitors that owns these four main products at the same time and has entered the high-end field with all four main products. Headquartered in Shenzhen, the company has set up subsidiaries in Cleveland, Germany, Augsburg, Tokyo, Japan, and a branch in Chengdu, and its products are exported to more than 80 countries and regions around the world, SIGLENT has become a globally recognized brand of test and measurement instruments.

Contact Us

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herald

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