SDG7000A Series Arbitrary Waveform Generator

Data Sheet

EN01D



SIGLENT TECHNOLOGIES CO.,LTD

SDG7102A
SDG7052A
SDG7032A

Product Overview

SIGLENT's SDG7000A is a family of dual-channel Arbitrary Waveform Generators that feature up to 1 GHz bandwidth, a maximum sample rate of 5 GSa/s and 14-bit vertical resolution. It can generate arbitrary waveforms point by point with a maximum 2.5 GSa/s sample rate and vector signal with a maximum 500 MS/s. It also has the ability to generate a variety of signals such as continuous wave, Pulse, Noise, PRBS patterns, and a 16-bit digital bus. It supports the generation of complex signals such as modulation, sweeping, bursting and dual channel copying/coupling/tracking and superposition. The output are differential/single-ended and support a maximum output range of ± 24 V. The instrument can ensure a large amplitude under high-frequency which eliminates an external power amplifier in some applications and addresses a wider range of requirements.

Key Features

- Dual channel differential/single-ended output, 16-bit LVDS/LVTTL digital bus output.
- High-performance sampling system with 5GSa/s sample rate and 14 -bit vertical resolution.
- 1 GHz maximum bandwidth.
- Generates arbitrary waveform with sample rates of 0.01 Sa/s ~ 2.5 GSa/s, with maximum memory depth of 512 Mpts, and provides segment editing /playback functions.
- Generates vector signals with up to 500 MS/s symbol rate.
- Generates low jitter pulses with 1 ns minimum pulse width and 500ps minimum edge.
- Up to 1 GHz bandwidth White Gaussian Noise and the bandwidth is adjustable.
- Supports PRBS up to 625 Mbps.
- The digital bus can output digital signals up to 1 Gbps.
- Supports frequency hopping output under sine and AM modulation, providing output list frequency or PRBS random output within a specified range of frequencies
- Supports multi pulse output function
- Supports analog/digital modulation, sweeping and bursting.
- Enhanced dual channel operation functions: inter channel tracking, coupling and copying; Dual channel superposition function; Supports mutual modulation between channels.
- The 24 Vpp analog output is superimposed with ± 12 Vdc offset to provide a maximum output range of ± 24 V (48 V).
- High precision Frequency Counter
- 5-inch capacitive touch screen with resolution of 800x480; Supports external mouse and keyboard operation; Supports WebServer to control the instruments remotely.
- Supports multiple interfaces: 10MHz In, 10MHz Out, Trigger In/Out, Markers etc.
- Supports SCPI command for easy integration into test systems.



Models and Key Specifications

Model	SDG7102A	SDG7052A	SDG7032A
Number of channels	2 Differential/Single-ended		
Bandwidth	1 GHz	500 MHz	350 MHz
Sample rate	5 GSa/s		
Vertical resolution	14-bit		
Arbitrary waveform	0.01 Sa/s ~ 2.5 GSa/s sample rate; 24 pts ~ 512 Mpts/ch memory depth, with segment editing and playback		
Vector signal (Optional)	500 MS/s max symbol rate; Carrier DC ~ 1 GHz settable. Includes modulation modes such as ASK, PSK, FSK and QAM. EasyIQ software provides vector signal creation and editing; SigIQPro software provides waveform generation capabilities for Bluetooth's BR, EDR, BLE, IoT's 802.15.4 O-QPSK, SUN FSK, SUN OFDM, ITU-T G.9959, Custom OFDM, and other protocol waveforms		
Continuous waveform	Up to 1GHz, supports harmonic generation function		
Pulse	Min pulse width 1 ns, min. edge 500 ps pulse with low jitter, the rise/fall edge is independently fine adjustable, and the pulse width is fine adjustable		
Noise	Bandwidth 1 mHz ~ 1 GHz adjustable		
PRBS	Bit rate 2 μbps ~ 625 Mbps, length PRBS3 ~ PRBS32		
Complex signal generation	Supports internal/external modulation, AM, FM, PM, PWM, FSK, PSK, ASK, etc.; Supports sweep; Support burst		
Dual-channel function	Inter channel tracking, coupling, and copying. Dual channel superposition function. Supports mutual modulation between channels		
Output range	24 Vpp analog output superimposed ± 12 V DC offset, supports a maximum output range of ± 24 V (48 V)		
Digital bus(Optional)	16-bit, LVTTL or LVDS output Bit rate: 1 μbps ~ 1 Gbps		
Interface	USB 2.0 Host x3, USB 2.0 Device(USBTMC) LAN 10M/100M (VXI-11/Telnet/Socket/WebServer) EXT MOD/CNT, 10MHz In, 10MHz Out, Marker x2, Trigger In/Out		
Interaction	5” TFT-LCD with capacitive touch screen (800x480) Supports mouse operation Supports Webserver Supports SCPI control		

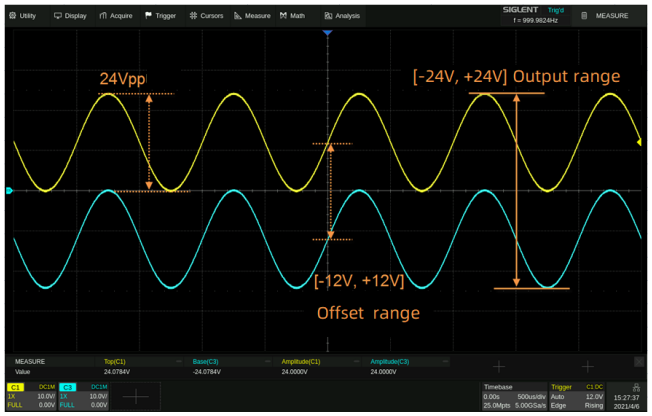
Characteristics

Multi-functional Waveform Generator



The SDG7000A series integrates multiple waveform generator functions from DC to continuous waves up to 1 GHz, which can replace RF signal generators in some applications. It adopts Siglent's TrueArb point-by-point arbitrary waveform generation technology, which enables user-adjustable output sample rates from 0.01 Sa/s to 2.5 GSa/s with excellent jitter performance and the generation of I/Q vector signals with a maximum settable bandwidth greater than 500 MHz. Using the benefits of Siglent's EasyPulse architecture, a low jitter pulse with a minimum pulse width of 1 ns can be generated. The SDG7000A also features a Gaussian noise output with adjustable bandwidth, Pseudo-random code generation, an optional 16 channels of digital signal output for synthesizing digital communications, and much more.

Wide Range Amplitude Output

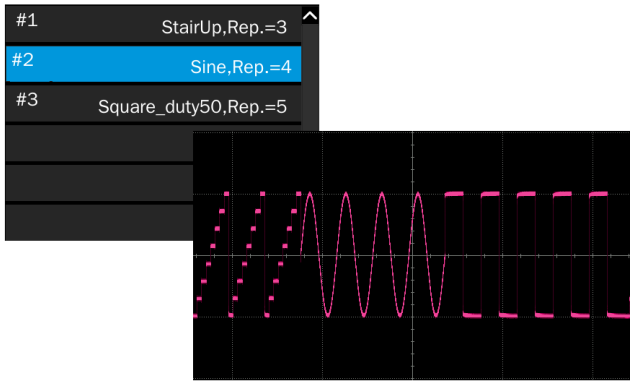


24Vpp analog output superimposed with ± 12 Vdc offset, providing a maximum output range of ± 24 V (48 V).

Excellent Arbitrary Waveform Generation

AFG mode uses traditional DDS technology to generate arbitrary waveforms

AWG mode uses the innovative TrueArb technology, with an adjustable sample rate from 0.01 Sa/s~ 2.5 GSa/s and jitter less than 20 ps. It not only has all the advantages of traditional DDS technology, but also overcomes its intrinsic jitter and distortion defects. The flexible platform also provides zero order hold, linear and sinc interpolation methods for increased flexibility when creating complex waveforms.

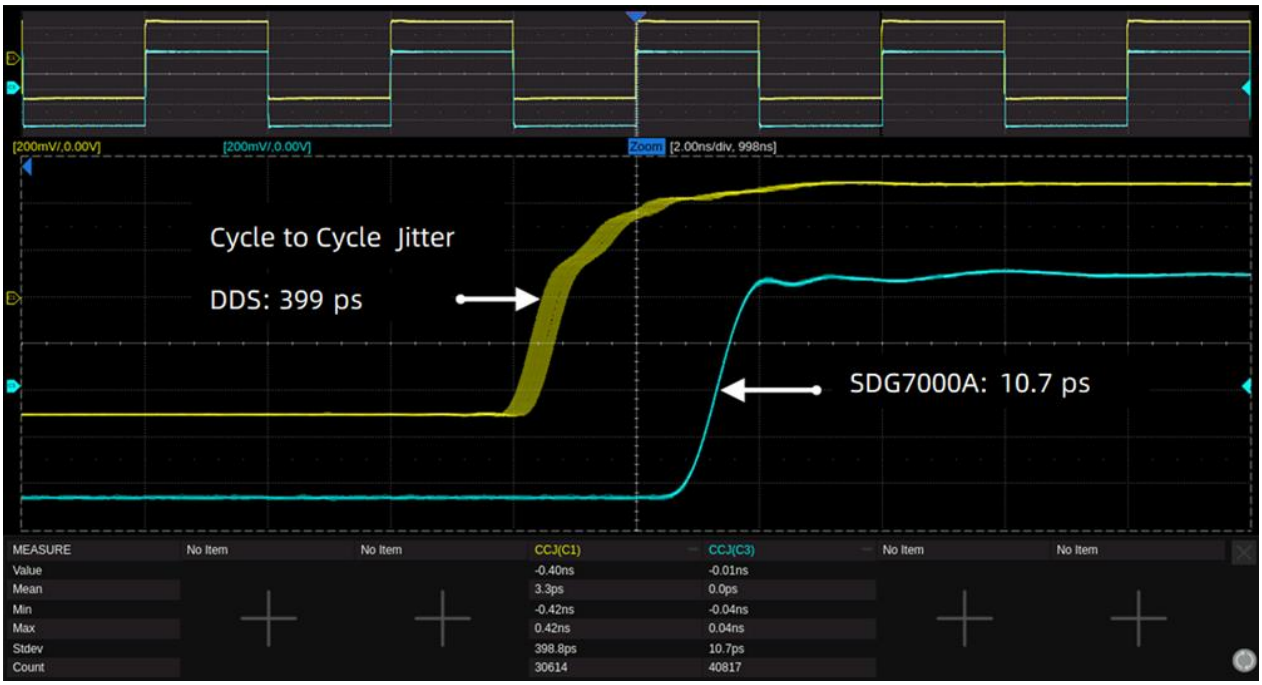




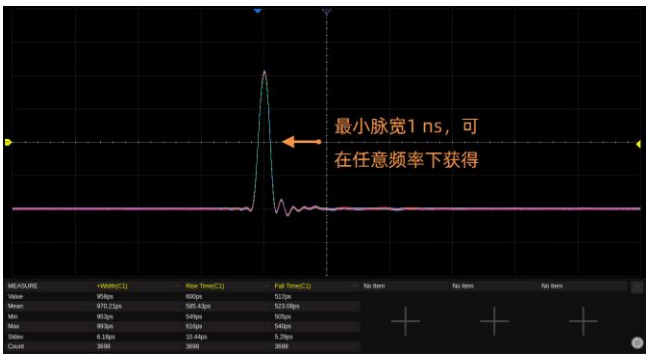
Sequence editing and playback The SDG7000A supports up to 1024 arbitrary wave segments, each of which can be set with a maximum of 65535 repetitions. When switching between segments, the output seamlessly moves from the last point of the previous segment to the first point of the next segment without generating an idle level. It is suitable for applications with high requirements for waveform switching.

EasyWaveX supports extensive arbitrary wave editing functions including manual, linear, coordinate, and equation drawing that facilitate rapid generation of the required waveforms. The EasyWaveX editing software is embedded in the SDG7000A, and can also be installed in a computer, interacting with the SDG7000A over USB or LAN interfaces.

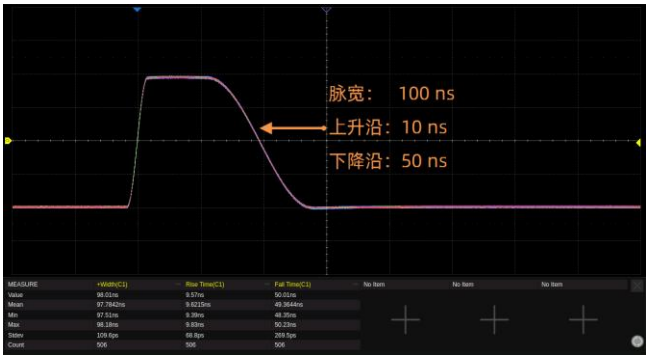
High-Speed Low Jitter Pulse



Low jitter When a Square/Pulse waveform is generated by traditional DDS, there can be additional jitter if the sample rate is not an integer-related multiple of the output frequency. EasyPulse technology successfully overcomes this weakness in DDS designs and helps to produce low jitter Square/Pulse waveforms.

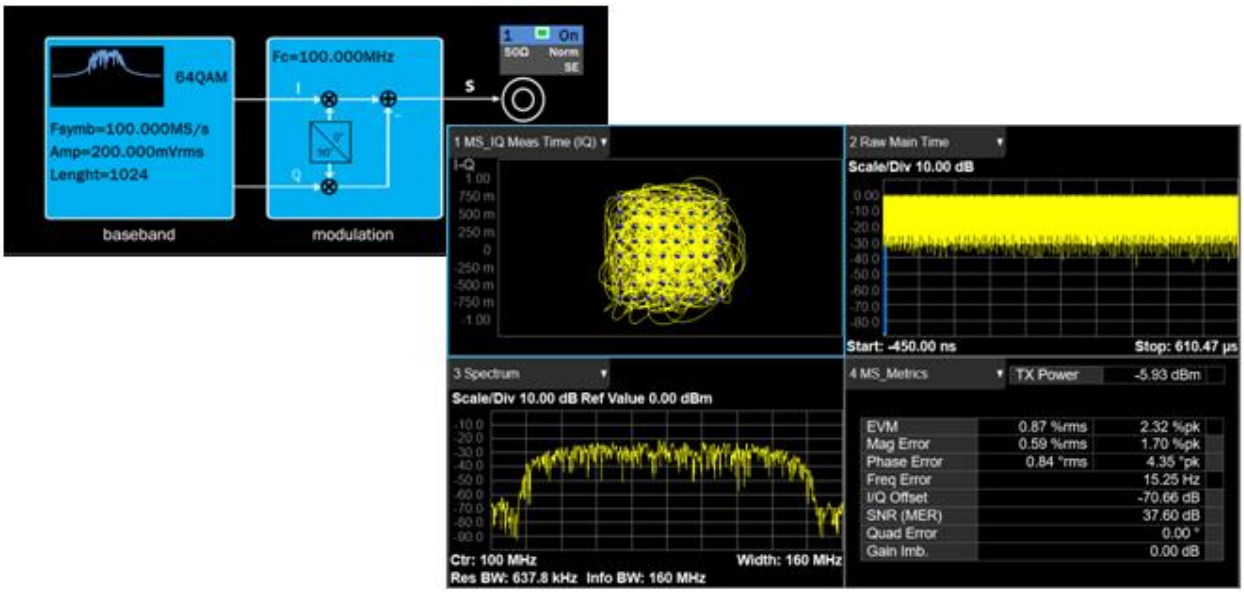


High speed The minimum 1 ns pulse width, can be generated at any frequency. The pulse width can be finely adjusted in steps of 10 ps.



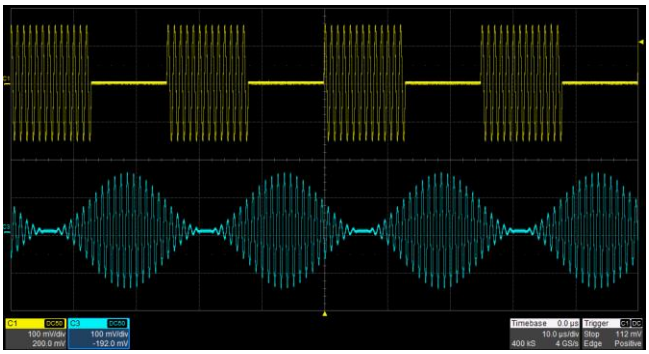
Flexible edge Adjustable fine step resolution to 100 ps. The minimum edge is 500 ps and can be generated at any frequency. The rising/ falling edge can be set respectively and can be used to generate asymmetric pulse.

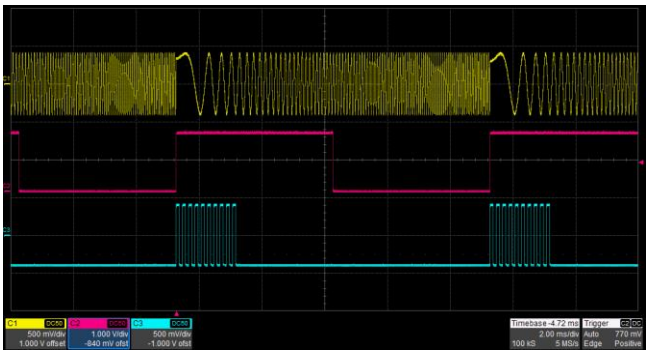
Vector Signal Output (Optional)



The SDG7000A can generate common modulation types of IQ signals, such as ASK, FSK, PSK, QAM. With the innovative resampling technology, excellent EVM performance can be obtained at any symbol rate between 250 S/s ~ 500 MS/s. The built-in digital quadrature modulator can modulate the carrier of the IQ signal to any frequency between 0 Hz~1 GHz. The EasyIQ software can be used to generate and edit various types of IQ signals.

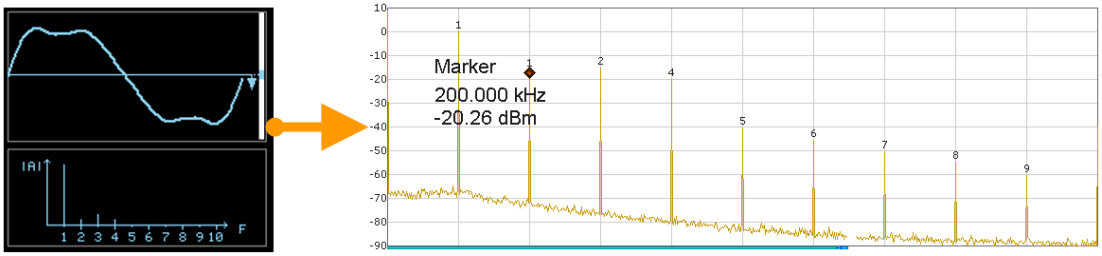
Complex Signal Generator





Modulation A variety of analog and digital modulation modes such as AM, FM, PM, FSK, ASK, PSK, DSB-SC, and PWM are supported. There are three modulation sources: Internal, External, and Channel.

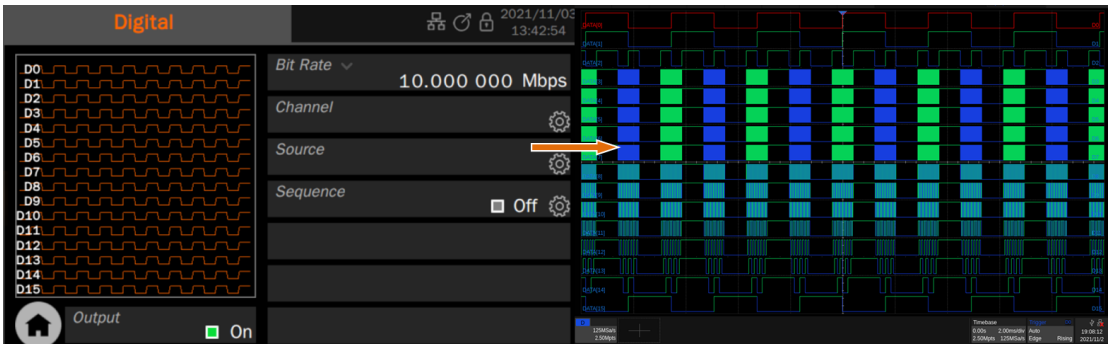
Sweep and Burst Sweep have three types of “Frequency”, ”Amplitude” and ”Freq&Ampl”. Sweep supports "Line", "Log" and “Step” modes, while Burst enables "NCycle" and "Gated" modes. Both Sweep and Burst support trigger sources: Internal, External, and Manual.



Harmonics Function provides the ability to add higher-order elements to your signal.

16 Channel Digital Output (Optional)





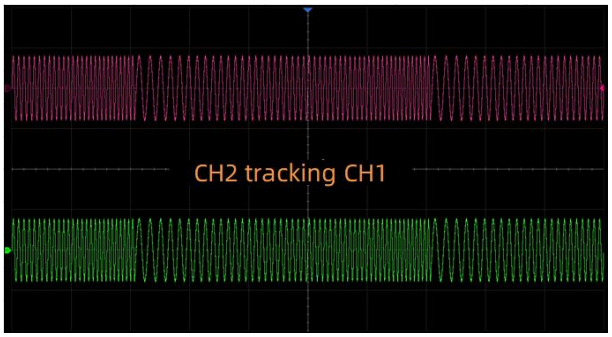
Purchase the corresponding digital bus kit to get 16-channel LVTTL or LVDS output with a bit rate of 1 μbps ~ 1 Gbps. Combine the digital bus with the analog channels to realize mixed-signal outputs.

Enhanced Dual Channel Functionality

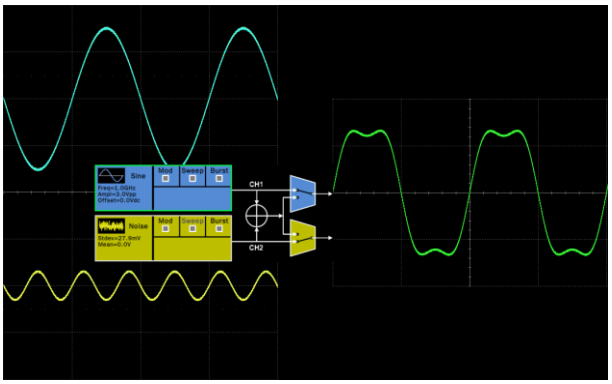
Two Dual-Channel Operation Mode

Independent mode enables the two channels to be used as two independent generators. Independent mode also eliminated the discontinuity on the output when parameters (frequency, amplitude) change.

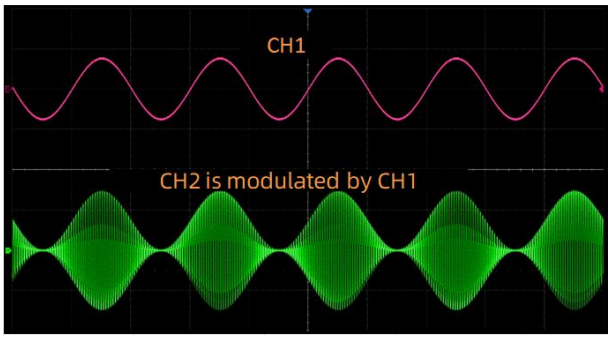
Phase-Locked mode Automatically aligns the phases of each output.



Track/Copy/Coupling The track, copy and coupling functions between the two channels can quickly transfer the parameters of one channel to the other according to the requirements, greatly simplify the operation and meet the requirements of fast and synchronous switching waveforms.

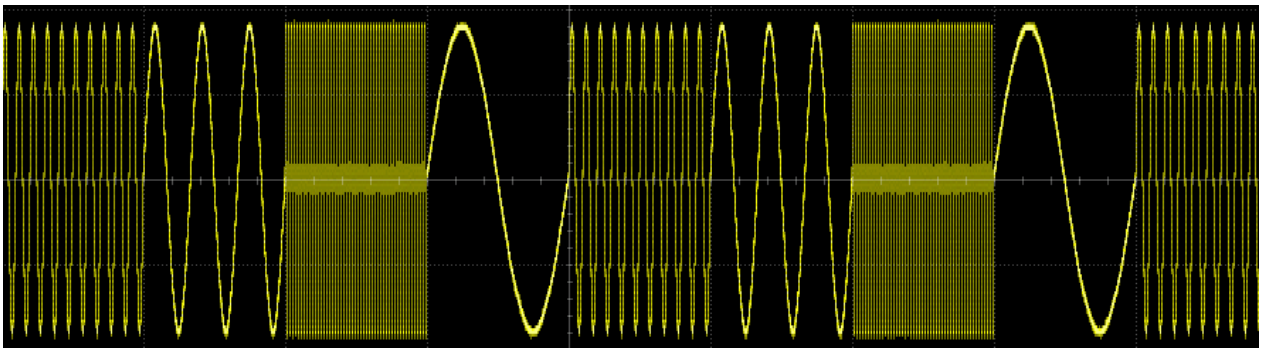


Waveform Combining Superimposes CH1 and CH2 waveforms internally and provides the combined waveform to a user-selected output. It easily combines basic waveforms, random noise, modulation signals, sweep signals, burst signals, EasyPulse waveforms, and TrueArb waveforms without external connections or complex editing.

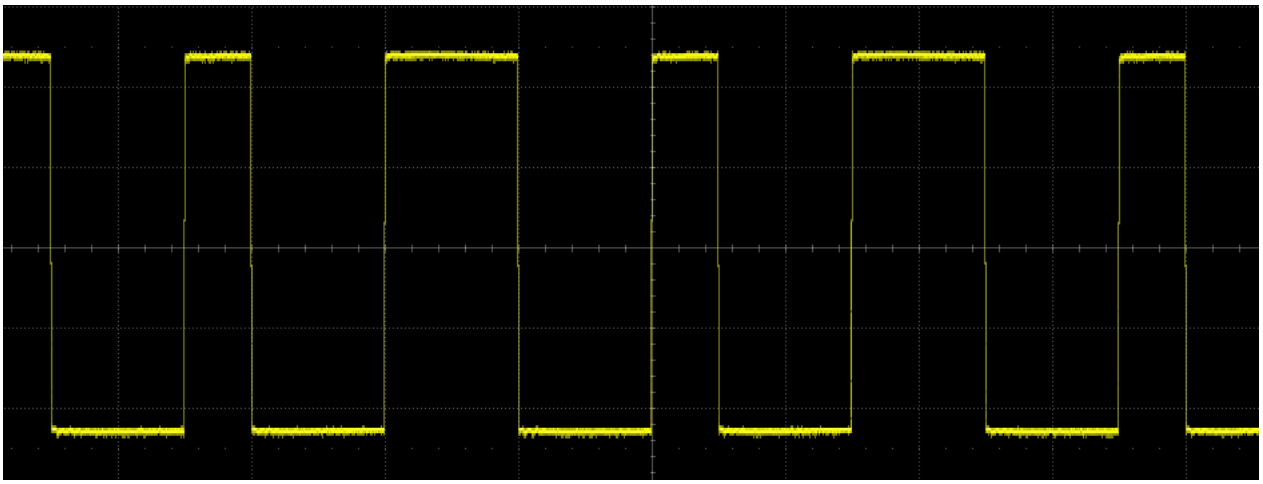


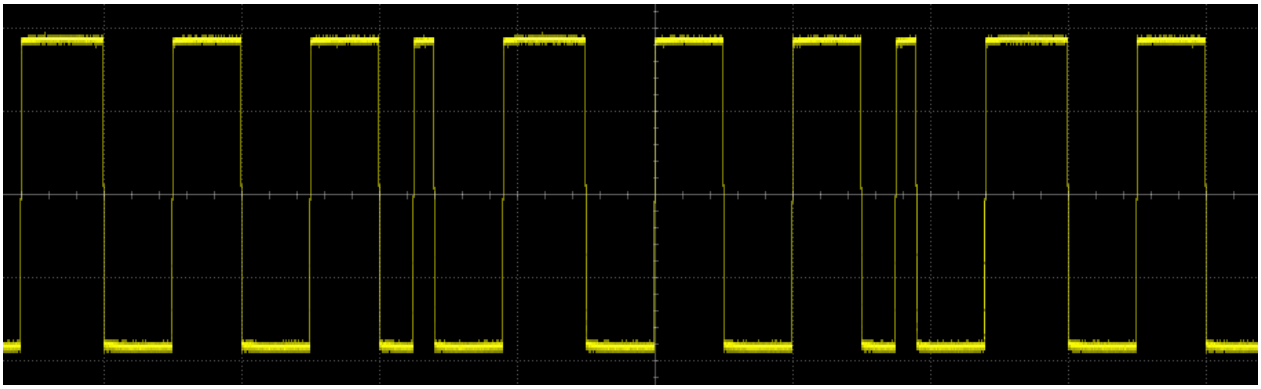
Channel Modulation One channel can modulate the other without external connections. This feature provides an easy method for complex modulation waveform creation. The modulating wave channel can be directly output and compared with the modulated signal.

Hopping Supports three types of frequency hopping output modes: list mode, random mode, and random list mode.



Multi pulse Supports multi pulse output. The positive and negative pulse widths of each pulse can be individually edited and set through EasywaveX tools.





Specifications

Unless otherwise specified, all specifications can be guaranteed to meet the following conditions:

• Within the validity period of product calibration.

• Within the ambient temperature range of 18 ℃ ~ 28 ℃.

• The instrument is powered on and operating for more than 30 minutes.

Frequency					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Resolution	1μ			Hz	
Standard time base					
Initial accuracy	-1		+1	ppm	25 ℃
	-2		+2	ppm	0 ~ 50 ℃
1st-year aging	-0.5		+0.5	ppm	
20-year aging	-3.0		+3.0	ppm	
OCXO option					
Frequency		10M		Hz	
Initial accuracy	-100		+100	ppb	25 ℃
Temperature stability	-1		+1	ppb	0 ~ 50 ℃
1st-year aging	-50		+50	ppb	

Sine					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Frequency	1μ		1G	Hz	SDG7102A
	1μ		500M	Hz	SDG7052A
	1μ		350M	Hz	SDG7032A
Harmonic distortion (Single-ended)			-55	dBc	≤500MHz, 0 dBm, enable nonlinearity compensation
			-40	dBc	> 500MHz, 0 dBm
Total Harmonic (Differential)			-55	dBc	≤500MHz, 0 dBm
			-45	dBc	> 500MHz, 0 dBm
Non-harmonic spurious (Single-ended)			-65	dBc	0 dBm
Non-harmonic spurious (Differential)			-60	dBc	0 dBm
Phase noise		-138		dBc/Hz	10 MHz@10 kHz offset, 0 dBm
Custom harmonic number			16	order	
Custom harmonic type	Even, Odd, All				

Arbitrary Wave					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
AWG Mode					
Sample rate	0.01		2.5 G	Sa/s	
Waveform length	24		512M	pts	In sequence mode, when the segments > 1. The minimum waveform length is 64. When the length is less than 256 points, it must be an integer multiple of 16 points
Vertical resolution	14			bit	The data storage format is 16-bit
Jitter			50	ps	Cycle to Cycle RMS value , ”010101” pattern, 1 Vpp,50 Ω load, 2.5 GSa/S
Interpolation mode	0-order hold, linear, sinc, sinc27, sinc13				
Sequence	Up to 4096 segments. Each segment can be repeated for 1~65535. Run mode: Continuous, Single/Burst, Infinite, Stepped, Advanced Trigger source: Button, Timer, External				
Source	Build-In, From File, EasyWaveX				
AFG Mode					
Sample rate	2.5 G			Sa/s	
Waveform length	32 k			pts	
Frequency range	1 μ		100 M	Hz	SDG7102A
	1 μ		50 M	Hz	SDG7052A
	1 μ		35 M	Hz	SDG7032A
Rise/Fall time	300	345	450	ps	10% ~ 90%, 1 Vpp step signal, 50 Ω load
Source	Build-In, From File, EasyWaveX				

Vector (I/Q) signal (optional)					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Symbol rate	250		500 M	Symbol/s	Limited by oversampling multiple
Waveform length			512 M	pts	
Carrier frequency	0		1 G	Hz	Limited by the bandwidth parameter
Vertical resolution	14			bit	The data storage format is16-bit
Modulation type	2ASK, 4ASK, 8ASK, BPSK, QPSK, 8PSK, DBPSK, DQPSK, OQPSK, D8PSK,8QAM, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 2FSK, 4FSK,8FSK, 16FSK, MSK, MultiTone, Custom				Supported by EasyIQ
Modulation bandwidth			150	MHz	Calibrated and tested specifications
			625	MHz	Determined by the symbol rate and filter settings
EVM			2.5	%	64QAM, Single-ended, the bandwidth is 150MHz

		0.8		%	64QAM, Single-ended, 0.3 Vrms, the bandwidth is 100 MHz,
		0.5		%	64QAM, Single-ended, 0.3 Vrms, the bandwidth is 50 MHz,
		0.3		%	64QAM, Single-ended, 0.3 Vrms, the bandwidth is 10 MHz,
Data type	PN7, PN9, PN15, PN23, User files, Custom constellation				Supported by EasyIQ software
Source	Built-In, external file, EasyIQ				
IQ compensation	Gain Balance, Offset, Angle				

Pulse

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Frequency	1 μ		312.5 M	Hz	SDG7102A
	1 μ		150 M	Hz	SDG7052A
	1 μ		100 M	Hz	SDG7032A
Pulse width	1			ns	10 ps resolution. The maximum pulse width is limited by the frequency setting, and the minimum pulse width is independent of the frequency
Pulse Width accuracy			± (0.01% + 0.3ns)		
Rise time (specified range)	1n		75	s	Amplitude ≤ 3Vpp , | offset | ≤ 3V, 10% ~ 90%, 100 ps resolution. Specifications such as overshoot, jitter, output range, and pulse width accuracy can only be met within this range. The minimum value that can be set is limited by the output amplitude.
Rise time (setting range)	0.5 n		75	s	10% ~ 90%, 100 ps resolution. The minimum value that can be set is limited by the output amplitude.
Fall time (specified range)	1 n		75	s	Amplitude ≤ 3Vpp , | offset | ≤ 3V, 10% ~ 90%, 100 ps resolution. Specifications such as overshoot, jitter, output range, and pulse width accuracy can only be met within this range. The minimum value that can be set is limited by the output amplitude.
Fall time (setting range)	0.5 n		75	s	10% ~ 90%, 100 ps resolution. The minimum value that can be set is limited by the output amplitude.
Overshoot			3	%	100 kHz, 1 Vpp, 50 Ω load, 1 ns edge
Duty cycle	0.001		99.999	%	0.001% resolution. Limited by frequency setting
Jitter		10	20	ps	Cycle to cycle rms. >10 kHz, 1 Vpp, 50 Ω load

Square

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Frequency	1 μ		240 M	Hz	SDG7102A
	1 μ		150 M	Hz	SDG7052A
	1 μ		100 M	Hz	SDG7032A
Rise /fall times	0.85	1.0	1.1	ns	10% ~ 90%, 1 Vpp, 50 Ω load. It varies with the output amplitude.
Overshoot			3	%	100 kHz, 1 Vpp, 50 Ω load, 1 ns edge
Duty cycle	0.001		99.999	%	0.001% resolution. Limited by frequency setting
Jitter		10	20	ps	cycle to cycle rms, >10 kHz,1Vpp, 50 Ω load

Noise

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Bandwidth (-3dB)	1 m		1 G	Hz	SDG7102A
	1 m		500 M	Hz	SDG7052A
	1 m		350 M	Hz	SDG7032A

PRBS

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Bit rate	2 μ		625 M	bps	SDG7102A
	2 μ		625 M	bps	SDG7052A
	2 μ		200 M	bps	SDG7032A
Pattern length	2^{m-1}, m = 3,4,…,32				
Rise/fall time	0.5 n		1 μ	s	10% ~ 90%, 1 Vpp, 50 Ω load

Ramp

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Frequency	1 μ		10 M	Hz	
Symmetry	0		100	%	1% resolution
Linearity			1.5	%	Percentage of peak output, 1 kHz, 1 Vpp, 50% symmetry

DC

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Accuracy			± (1% + 2mV)		HiZ load
Output Range	-6		+6	V	50 Ω load
	-12		+12	V	HiZ load

Output					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Single-ended					
Offset	-12		+12	V	HiZ load, divide by 2 at 50 Ω load
Offset accuracy			± (1% + 2 mV)		
Amplitude flatness	-0.3		+0.3	dB	50 Ω load, 0.32 Vpp, compare to1 MHz Sine
Amplitude accuracy			± (1% + 1 mVpp)		10 kHz sine, 0 V offset
Sine output range (50Ω load) *	1 m		12	Vpp	≤ 40MHz, 0 V offset
	1 m		6	Vpp	40 MHz ~120 MHz (including 120 MHz)
	1 m		3	Vpp	> 120 MHz
Arb output range (50Ω load)*	1 m		12	Vpp	≤ 20 MHz, 0 V offset
	1 m		6	Vpp	> 20 MHz
Pulse/square output range(50Ω load)*	1 m		12	Vpp	≤ 20 MHz, 1 ns edge, ≥ 10 ns pulse width
	1 m		6	Vpp	20 MHz ~ 60 MHz (including 60 MHz), 1 ns edge, ≥ 10 ns pulse width
	1 m		3	Vpp	> 60 MHz, 1 ns edge, ≥ 10 ns width pulse
Noise output range (50Ω load)*	1 m		0.669	Vrms	Mean = 0; Close the bandwidth setting. ≤ l67 mVrms, upper limit of noise bandwidth 1 GHz >167 mVrms, lower noise bandwidth limit
PRBS output range (50Ω load)*	1 m		12	Vpp	≤ 40 Mbps, 0 V offset
	1 m		6	Vpp	40 Mbps ~ 120 Mbps (including 120 Mbps)
	1 m		3	Vpp	> 120 Mbps
Ramp output range (50Ω load)*	1 m		12	Vpp	
Internal resistance	49	50	51	Ω	100 kHz sine wave
Current output	-240		+240	mA	
Protection	Over-current protection, Over voltage protection				
Crosstalk			-60	dBc	CH1=CH2=0 dBm, Sine, 50 Ω load
Skew			20	ps	The same amplitude setting of two channels
Differential					
Amplitude flatness	-0.3		+0.3	dB	100Ω load , 0.5 Vpp, compare to 1 MHz Sine
Output	20 m		2	Vpp	Differential peak to peak, 100 Ω differential load, common offset = 0 V
Offset	-1		+1	V	Differential offset, 100 Ω differential load
Common mode	-1		+1	V	Load = HiZ
Protection	Over voltage protection				
Crosstalk			-60	dBc	CH1=CH2=0 dBm, Sine, 50 Ω load
Skew			20	ps	The same amplitude setting of two channels
Other output characteristics					
Output polarity	Normal, Invert				
Noise superposition	The minimum SNR can be set to 0.1 dBc				
Digital filter	100		BW	MHz	BW is the maximum output frequency

*Note: The specification will be multiplied by 2 while applied to a HiZ load.

Modulation					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
AM					
Carrier	Sine, Square, Ramp, Arb				
Modulation source	Internal, External, Channel				
Modulation wave	Sine, Square, Ramp, Noise, Arb				Source = Internal
Modulation depth	0		120	%	
Modulation frequency	1 m		2 M	Hz	Source = Internal
FM					
Carrier	Sine, Square, Ramp, Arb				
Modulation source	Internal, External, Channel				
Modulation wave	Sine, Square, Ramp, Noise, Arb				Source = Internal
Frequency deviation	0		0.5 x BW	Hz	BW is the max. frequency. Limited by frequency setting
Modulation frequency	1 m		2 M	Hz	Source = Internal
PM					
Carrier	Sine, Square, Ramp, Arb				
Modulation source	Internal, External, Channel				
Modulation wave	Sine, Square, Ramp, Noise, Arb				Source = Internal
Phase deviation	0		360	°	
Modulation frequency	1 m		2 M	Hz	Source = Internal
PWM					
Carrier	Pulse				
Modulation source	Internal, External, Channel				
Modulation wave	Sine, Square, Ramp, Noise, Arb				Source = Internal
Modulation frequency	1 m		2 M	Hz	Source = Internal
ASK					
Carrier	Sine, Square, Ramp, Arb				
Modulation source	Internal, External, Channel				
Modulation wave	Square with 50% duty cycle				Source = Internal
Keying frequency	1 m		2 M	Hz	Source = Internal
FSK					
Carrier	Sine, Square, Ramp, Arb				
Modulation source	Internal, External, Channel				
Modulation wave	Square with 50% duty cycle				Source = Internal
Keying frequency	1 m		2 M	Hz	Source = Internal
PSK					
Carrier	Sine, Square, Ramp, Arb				
Modulation source	Internal, External, Channel				
Modulation wave	Square with 50% duty cycle				Source = Internal
Keying frequency	1 m		2 M	Hz	Source = Internal

Burst					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Carrier	Sine, Square, Ramp, Pulse, Noise, Arb				
Type	Count (1-1000000 periods), Infinite, Gated				
Cycles	1		10^13	periods	Source =External, Manual
Burst Period	1 μ		900k	s	
Carrier frequency	2 m		BW	Hz	BW is the max. output frequency
Start/Stop phase	0		360	°	
Trigger source	Internal, External, Manual				
Gated source	Internal, External				
Trigger delay	2.079 μ		100	s	1 kHz Pulse. The min. delay is limited by waveform and frequency

Sweep					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Carrier	Sine, Square, Ramp, Arb				
Type	Frequency, Amplitude, Freq&Ampl				
Mode	Linear, Logarithmic, Step				
Direction	Linear: Up, Down, Up & Down Logarithmic: Up, Down Step: Up, Down, Up & Down				
Sweep time	10u		1000	s	
Carrier frequency	1 μ		BW	Hz	BW is the max. output frequency
Trigger source	Internal, External, Manual				
Trigger delay	1.963 μ		10	s	

Counter					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Mode	Totalizer, Frequency				
Frequency Parameter	Frequency, Period, Positive/Negative Pulse Width, Duty Cycle				
Coupling mode	AC, DC, FREJ				
Frequency range	100 m		400 M	Hz	DC coupling
	1		400 M	Hz	AC coupling
Input amplitude	100 mVrms		±2.5 V		DC coupling < 100 MHz
	200 mVrms		±2.5 V		DC coupling, 100 MHz ~ 200 MHz
	500 mVrms		±2.5 V		DC coupling, > 200 MHz
	100 mVrms		5 Vpp		AC coupling, < 100 MHz
	200 mVrms		5 Vpp		AC coupling, 100 MHz ~ 200 MHz
	500 mVrms		5 Vpp		AC coupling, > 200 MHz
Input impedance		1 M		Ω	

Digital (optional)

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Bit rate	1 m		1 G	bps	LVDS
	1 m		200 M	bps	LVTTL

Interface

Parameter	Min.	Typ.	Max.	Unit	Condition & Note
10MHzInput					
Frequency	9.9999	10.0000	10.0001	MHz	
Amplitude	1.4			Vpp	
Input impedance		5		kΩ	
10MHz Output					
Frequency		10.000		MHz	
Amplitude	2	3.3		Vpp	Output sine wave
Output impedance		50		Ω	
Modulation Input					
Frequency	0		1 M	Hz	
Input impedance		10		kΩ	
Amplitude @100%modulation depth		±5		Vpp	
Trigger Input					
V_{IH}	2		5.5	V	
V_{IL}	-0.5		0.8	V	
Input impedance		100		kΩ	
Pulse width	100			ns	
Response time			2.28	μs	Sweep
			1.96	μs	Burst, non Pulse/Square
			2.07	μs	Burst mode, Pulse/Square
Trigger output					
V_{OH}	3.8			V	I_{OH} = 8 mA
V_{OL}			0.44	V	I_{OL} = -8 mA
Output impedance		50		Ω	
Frequency			1 M	Hz	
Marker Output					
Frequency		3.3		Vpp	
Pulse width		108		ns	
Rise/fall edge		25.6		ns	
Output impedance		50		Ω	
Jitter			400	ps	Cycle to cycle rms
Trigger delay			3.2	μs	

General					
Parameter	Min.	Typ.	Max.	Unit	Condition & Note
Power					
Voltage	100 - 240 Vrms (± 10%), 50/60 Hz				
Power consumption		90	110	W	
Touch screen					
Dimensions	5.0			inch	
Resolution	800 x 480			pixel	
Color depth		24		bit	
Contrast Ratio	500	600			
Luminance	200	250		cd/m2	
Touch Screen Type	capacitive				
Environment					
Operating temperature	0		50	℃	
Non-operating temperature	-20		60	℃	
Operating humidity	5		90	%RH	30 ℃
	5		50	%RH	50 ℃
Non-operating humidity	5		95	%RH	
Operating altitude			3048	m	254
Non–operating altitude			12192	m	
EMC	Meets EMC directive (2014/30/EU), meets or exceeds IEC 61326-1:2012/EN61326-1:2013 (Basic)				
	Conducted disturbance	CISPR 11/EN 55011	CLASS A group 1, 150 kHz-30 MHz		
	Radiated disturbance	CISPR 11/EN 55011	CLASS A group 1, 30 MHz-1 GHz		
	Electrostatic discharge (ESD)	IEC 61000-4-2/EN 61000-4-2	4.0 kV (Contact), 8.0 kV (Air)		
	Radio-frequency electromagnetic field Immunity	IEC 61000-4-3/EN 61000-4-3	10 V/m (80 MHz to 1 GHz) 3 V/m 00(1.4 GHz to 2 GHz) 1 V/m (2.0 GHz to 2.7 GHz)		
	Electrical fast transients (EFT)	IEC 61000-4-4/EN 61000-4-4	2 kV (Input AC Power Ports)		
	Surges	IEC 61000-4-5/EN 61000-4-5	1 kV（Line to line） 2 kV（Line to ground）		
	Radio-frequency continuous conducted Immunity	IEC 61000-4-6/EN 61000-4-6	3 V, 0.15-80 MHz		
	Voltage dips and interruptions	IEC 61000-4-11/EN 61000-4-11	Voltage Dips: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Voltage interruptions: 0% UT during 250/300 cycles		
Safety	UL 61010-1:2012/R: 2018-11; CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11.				
Mechanical					
Dimensions	338 × 113 × 369			mm	W×H×D
Net weight		4.4		kg	

Ordering Information

Product Model	Description
SDG7102A	1 GHz, 5 GSa/s, 14-bit, 512 Mpts, 5-inch capacitive touch screen
SDG7052A	500 MHz, 5 GSa/s, 14-bit, 512 Mpts, 5-inch capacitive touch screen
SDG7032A	350 MHz, 5 GSa/s, 14-bit, 512 Mpts, 5-inch capacitive touch screen

Standard Configurations	Quantity
USB cable	1
BNCcoaxial cable	2
Quick start	1
Power cord	1
Wireless mouse	1

Optional Configurations	Model
20 dB Attenuator	ATT-20dB
Single Instrument Rack Mount Kit	SSG-RMK
USB-GPIB Adapter	USB-GPIB
High precision OCXO (Installed at the factory, cannot be added after purchase)	10M_OCXO_L
Digital Bus Kit-LVTTL	DIG-LVTTL
Digital Bus Kit-LVDS (Without RF cables)	DIG-LVDS
Digital Bus Kit-LVDS (With 32 RF cables)	DIG-LVDS-2
IQ Signal Generator Function (software)	SDG-7000A-IQ
350 MHz to 500 MHz bandwidth upgrade (software)	SDG-7000A-BW05
500 MHz to 1 GHz bandwidth upgrade (software)	SDG-7000A-BW10
Bluetooth signal generation function (software, SDG-7000A-IQ is required)	SDG7-SigIQPro-BT
IoT signal generation function (software, SDG-7000A-IQ is required)	SDG7-SigIQPro-IOT
OFDM signal generation function (software, SDG-7000A-IQ is required)	SDG7-SigIQPro-OFDM
5G NR signal generation function (software, SDG-7000A-IQ is required)	SDG7-SigIQPro-5G NR
LTE FDD signal generation function (software, SDG-7000A-IQ is required)	SDG7-SigIQPro-LTE FDD
LTE TDD signal generation function (software, SDG-7000A-IQ is required)	SDG7-SigIQPro-LTE TDD

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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