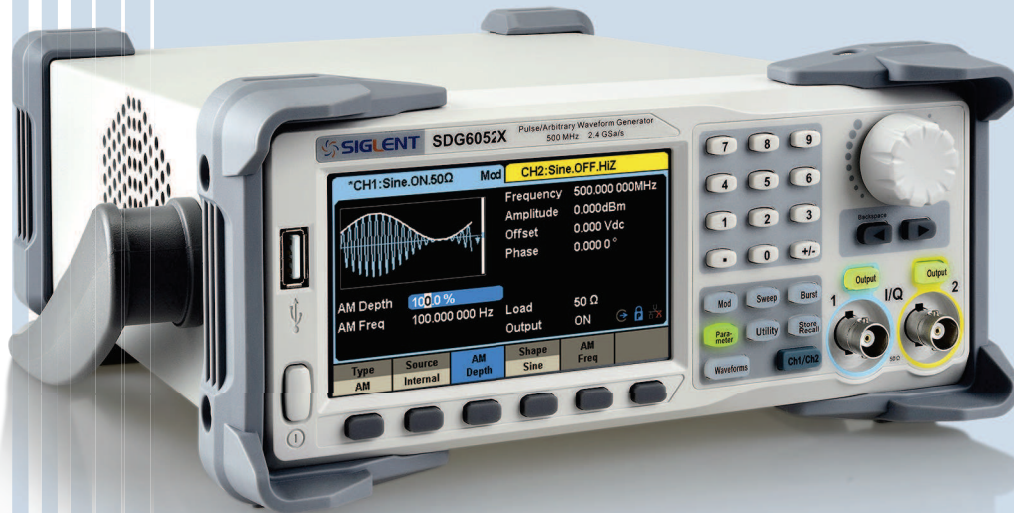


SDG6000X Series Pulse/Arbitrary Waveform Generator

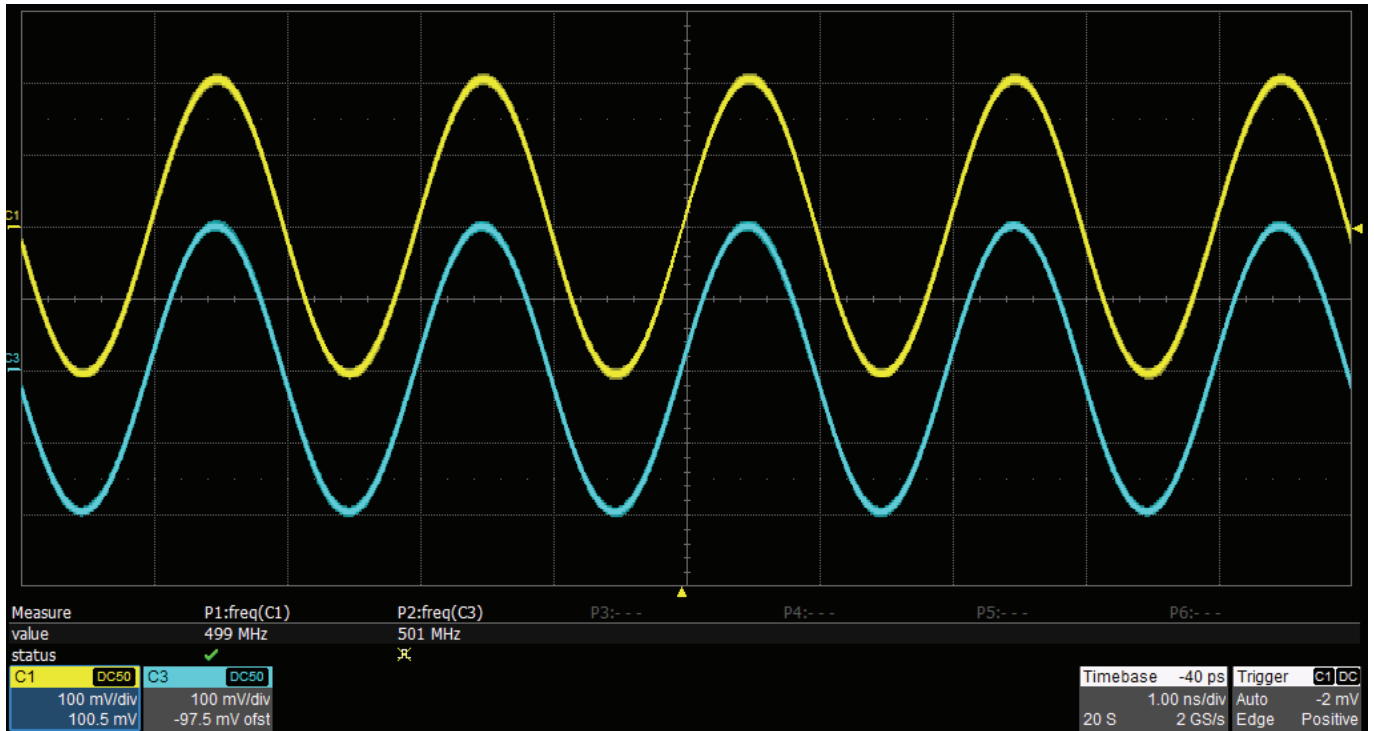


Key Features

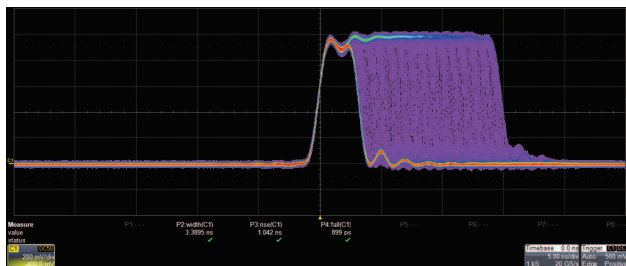
- Dual-Channel, 500 MHz maximum bandwidth, 20 Vpp maximum output amplitude, high fidelity output with 80 dB dynamic range
- High-performance sampling system with 2.4 GSa/s sampling rate and 16-bit vertical resolution
- Multi-function signal generator, meeting requirements in wide range, Continuous Wave Generator, Pulse Generator, Function Arbitrary Waveform Generator, IQ Signal Generator (optional), Noise Generator, PRBS Generator
- Sweep and Burst function
- Harmonics function
- Waveform Combining function
- Channel Coupling, Copy and Tracking function
- 196 built-in arbitrary waveforms
- High precision Frequency Counter
- Standard interfaces include: USB Host, USB Device (USBTMC), LAN (VXI-11, Socket, Telnet), GPIB (Optional)
- 4.3" touch screen display for easier operation

Characteristics

• Continuous Wave



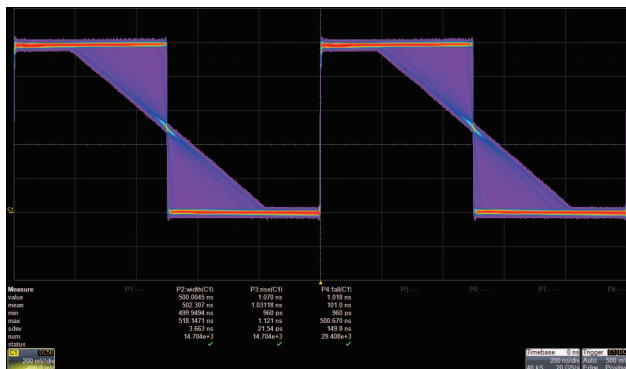
Up to 500 MHz continuous sine wave.



• Pulse

◀ Adjustable Pulse Width

The pulse width can be fine-tuned to the minimum of 3.3 ns with an adjustment step as small as 100 ps, at any frequency.



◀ Adjustable Edge

The rise/fall times can be set independently to the minimum of 1 ns at any frequency with a minimum adjustment step as small as 100 ps.



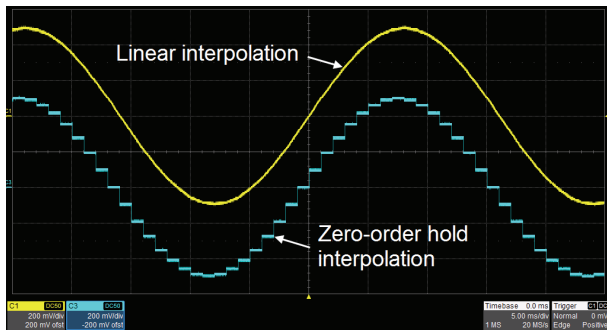
◀ Low Jitter

When a Square/Pulse waveform is generated by traditional DDS, there can be additional jitter if the sampling 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.

Waveform Generator

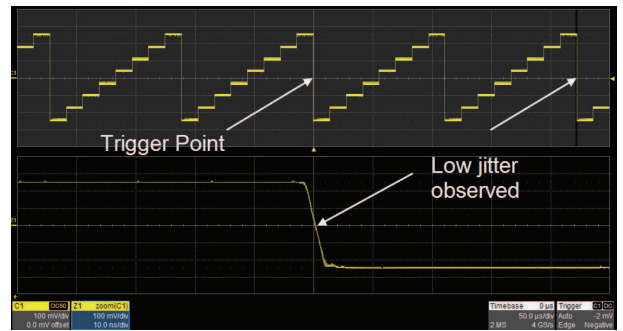
• Arbitrary Waveform

Traditional DDS designs can lead to additional jitter and distortion when sourcing arbitrary waveforms. The SIGLENT TrueArb design minimizes jitter and distortion to help deliver high fidelity arbitrary waveforms.



Point by Point Output

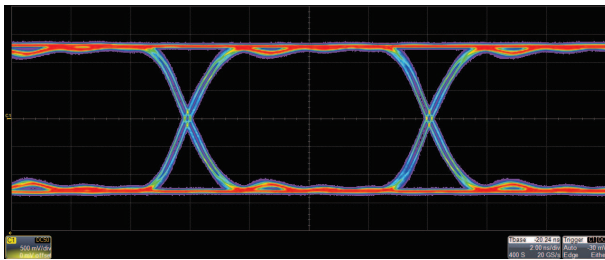
TrueArb generates arbitrary waveforms point-by-point. It never skips any point so that it can reconstruct all the details of the waveform, as defined. Two interpolation modes are available: linear and zero-order hold.



Low Jitter

As with EasyPulse, TrueArb effectively overcomes the clock jitter that can affect traditional DDS generators.

• PRBS



PRBS3 ~ PRBS32 with finely adjustable 10^6 bps ~ 300 Mbps bit rate and 1 ns ~ 1us edge.

*CH1:PRBS.ON.50Ω
CH2:PRBS.ON.50Ω

Bit Rate 122.880 000Mbps

Amplitude 800.0mVpp

Offset 850.0mVdc

Length **PRBS-30**

Rise/Fall 2.0ns

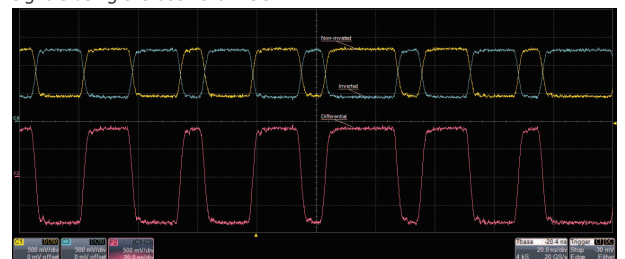
Load 50 Ω

Output ON

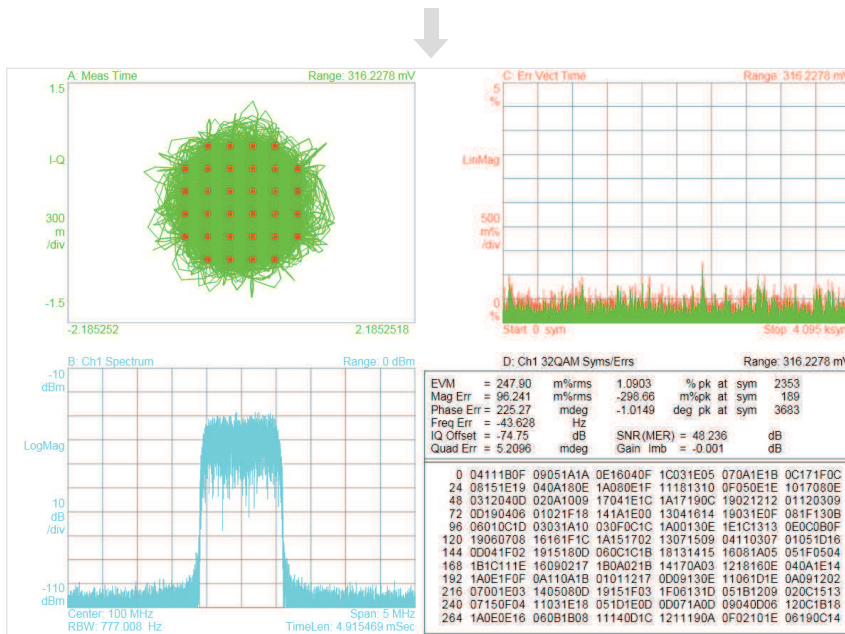
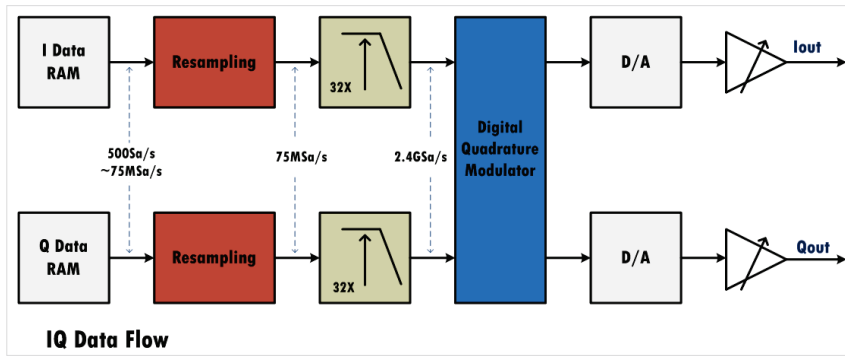
TTL/CMOS
LVTTTL
LVCOMS
ECL
LVPECL
LVDS

Differential
ON

Preset common logic levels such as TTL, LVCMOS, LVPECL and LVDS. An added differential mode provides an easy way to generate differential signals using the both channels.



• IQ (optional)



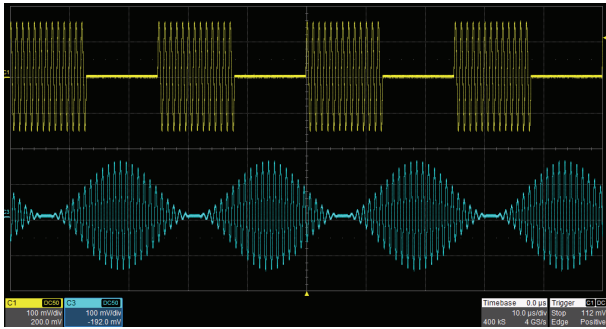
The SDG6000X supports popular modulation types such as ASK, FSK, PSK, and QAM. Proprietary resampling technology provides excellent EVM performance at arbitrary symbol rates between 250 Symb/s ~ 37.5 MSymb/s. Built-in digital quadrature modulator provides the possibility to generate IQ signals from baseband to 500 MHz intermediate frequency.



IQ waveforms can be generated by the PC software EasyIQ.

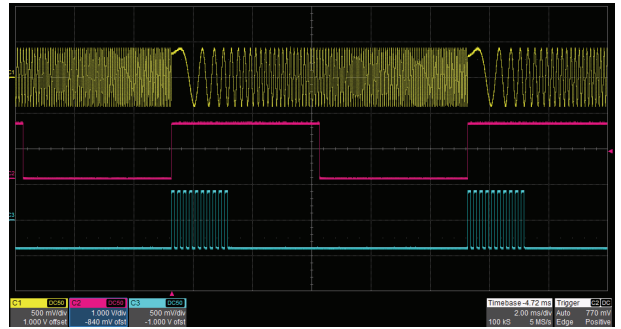
Waveform Generator

• Complex Signals Generation



Modulation

Plenty of modulation types, such as AM, FM, PM, FSK, ASK, PSK, DSB-AM, PWM are supported. The modulation source can be configured as "Internal" or "External".

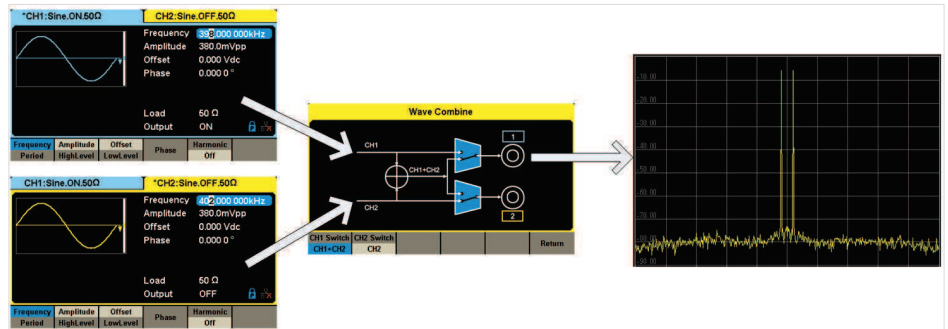


Sweep and Burst

Sweep modes include "Linear" and "Log". Burst modes includes "N cycle" and "Gated". Both Sweep and Burst can be triggered by "Internal", "External" or "Manual" source.

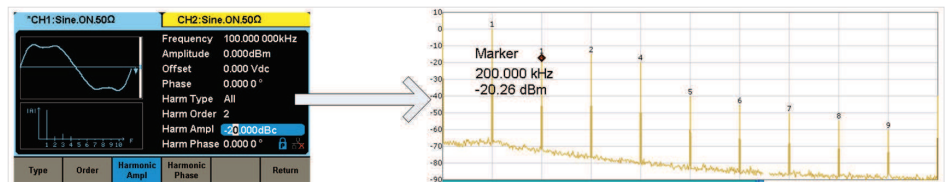
Waveform Combining

The waveform combining function superimposes CH1 and CH2 waveforms internally and provides the combined waveform to a user-selected output. Easily combine basic waveforms, random noise, modulation signals, sweep signals, burst signals, EasyPulse waveforms and TrueArb waveforms.

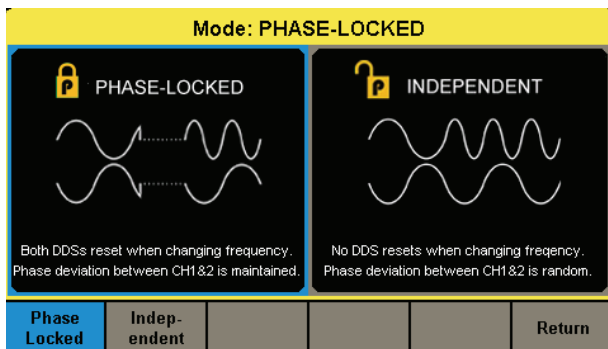


Harmonics Function

Harmonics function gives you the ability to add higher-order elements to your signal.

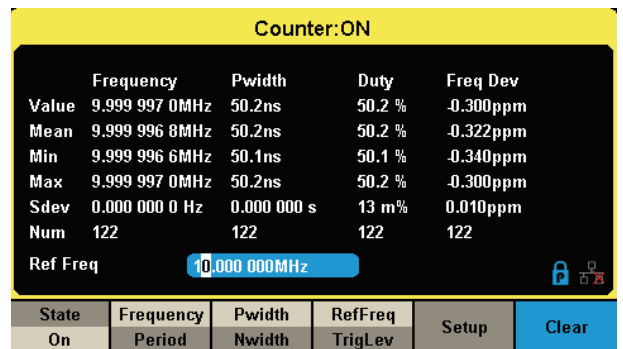


• Two Dual-channel Operation Mode



"Phase-Locked" mode automatically aligns the phases of each output. While "Independent" mode permit the two channels to be used as two independent generators. Independent mode also smoothes parameter (frequency, amplitude) changes made to an active channel.

• Frequency Counter



8-digit hardware frequency counter with statistics function and input range of 0.1 Hz ~ 400 MHz.

Specifications

Model	SDG6022X	SDG6032X	SDG6052X
Bandwidth	200 MHz	350 MHz	500 MHz
Number of channels	2		
Sampling rate	2.4 GSa/s (2X Interpolation)		
Vertical resolution	16 bit		
Arbitrary waveform length	2 ~ 20 Mpts		
Display	4.3" touch screen display, 480 x 272 x RGB		
Interface	Standard: USB Host, USB Device, LAN Optional: GPIB (USB-GPIB adaptor)		

Frequency

Resolution	±1 ppm (25°C)
	±2 ppm (0-40°C)
1st-year aging	±1 ppm (25°C)
10-year aging	±3.5 ppm (25°C)

Sine

Harmonic distortion	0~1 MHz (included) < -65 dBc
	1~60 MHz (included) < -60 dBc
	60~100 MHz (included) < -50 dBc
	100~200 MHz (included) < -40 dBc
	200~300 MHz (included) < -30 dBc
	300 MHz (included) < -28 dBc
Total Harmonic Distortion	10 Hz ~ 20 kHz < 0.075%
Non-harmonic spurious	≤350 MHz < -60 dBc
	>350 MHz < -55 dBc

Pulse

Frequency	1 μHz ~ 150 MHz (SDG6052X, SDG6032X) 1 μHz ~ 80 MHz (SDG6022X)
Pulse Width	≥3.3 ns
Pulse width accuracy	±(0.01%+0.3 ns)
Rise time (setting range)	1 ns (10% ~ 90%) SDG6052X, SDG6032X 2 ns (10% ~ 90%) SDG6022X
Overshoot	3%, 100 kHz, 1 Vpp, 50 Ω load , 2 ns edge
Duty cycle	0.001% ~ 99.999% Limited by frequency setting
Duty cycle resolution	0.001%
Jitter (rms) cycle to cycle	<100 ps, 1 Vpp, 50 Ω load

Arbitrary Wave

Frequency setting range	1 μHz ~ 50 MHz
Waveform length	2 pts ~ 20 Mpts
Sampling rate	1 uSa/s ~ 300 MSa/s (TrueArb mode)
	1.2 GSa/s (DDS mode)
Vertical resolution	16 bit
Jitter (rms) cycle to cycle	≤100 ps (1 Vpp, 50 Ω load , TrueArb mode)

Square	
Frequency	1 μ Hz~ 120 MHz (SDG6052X, SDG6032X) 1 μ Hz~ 80 MHz (SDG6022X)
Rise /fall times	2 ns~2.4 ns (10% ~ 90%, 1 Vpp, 50 Ω load)
Overshoot	\leq 3% (100 kHz, 1 Vpp, 50 Ω load)
Duty cycle	10% ~ 90% (Limited by frequency setting)
Jitter (rms) cycle to cycle	<100 ps (1 Vpp, 50 Ω load)

Output	
Accuracy	\pm (1%+1 mVpp) (10 kHz sine, 0 V offset)
Amplitude flatness	\pm 0.3 dB (50 Ω load, 0.5 Vpp, compare to 1 MHz Sine)
Output impedance	50 \pm 0.5 Ω (100 kHz sine)
Output current	-200 ~ 200 mA
Crosstalk	< -60 dBc (CH1=CH2=0 dBm, Sine, 50 Ω load)

IQ (optional)	
Symbol rate	250 Symb/s ~ 37.5 MSymb/s (Limited by the oversampling factor)
Vertical resolution	16 bit
Modulation type	2ASK, 4ASK, 8ASK, BPSK, QPSK, 8PSK, DBPSK, DQPSK, D8PSK, 8QAM, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 2FSK, 4FSK, 8FSK, 16FSK, MSK, MultiTone, custom (Supported by EasyIQ software)
Pattern	PN7, PN9, PN15, PN23, User file, Custom (Supported by EasyIQ software)
Output Range	1 mVrms ~ 0.5 Vrms ($\sqrt{I^2 + Q^2}$, 50 Ω load)
Carrier frequency	500 MHz (IF Output)

PRBS	
Bit rate	1 ubps~ 300 Mbps (SDG6052X, SDG6032X) 1 ubps~ 160 Mbps (SDG6022X)
Sequence length	2 ^{m-1} , m = 3, 4, ... , 32
Rise/fall times	1 ns ~ 1 us (SDG6052X, SDG6032X. 10% ~ 90%, 1 Vpp, 50 Ω load) 2 ns ~ 1 us (SDG6022X. 10% ~ 90%, 1 Vpp, 50 Ω load)
Output Range (Note)	2 mVpp ~ 20 Vpp \leq (40 Mbps, HiZ load)
	2 mVpp ~ 10 Vpp (40 ~ 240 Mbps (included), HiZ load)
	2 mVpp ~ 5 Vpp (240 Mbps, HiZ load)

Ordering Information

Product Description	
SDG6052X	500 MHz, 2-CH, 2.4 GSa/s, 16-bit
SDG6032X	350 MHz, 2-CH, 2.4 GSa/s, 16-bit
SDG6022X	200 MHz, 2-CH, 2.4 GSa/s, 16-bit
Standard Configurations	
Quick start \times 1	
Power cord \times 1	
Calibration certificate \times 1	
USB cable \times 1	
BNC coaxial cable \times 2	
Optional Configurations	
SPA1010	10 W Power Amplifier
ATT-20dB	20 dB Attenuator
USB-GPIB	USB-GPIB Adapter
SDG-6000X-IQ	IQ Signal Generator Function