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## Specifications for DS1000CA Series

All specifications apply to the DS1000CA Series Oscilloscopes unless noted otherwise. To meet these specifications, two conditions must first be met:

- The instrument must have been operating continuously for thirty minutes within the specified operating temperature.
- Must perform the Self Cal operation, accessible through the Utility menu, if the operating temperature changes by more than 5°C.

All specifications are guaranteed unless noted "typical".

## Specifications

<b>Acquisition</b>		
Sampling Modes	Real-Time	Equivalent
Sampling Rate	2GSa/s <sup>[1]</sup> (single channel) 1GSa/s (each channel)	50GSa/s <sup>[2]</sup>
Averages	N time acquisitions, all channels simultaneously, N is selectable from 2, 4, 8, 16, 32, 64, 128 and 256	

<b>Inputs</b>	
Input Coupling	DC, AC, GND
Input Impedance	1M $\Omega$ ±2%, in parallel with 15pF±3pF 50 $\Omega$ ±2% <sup>[3]</sup>
Probe Attenuation Factors	1X, 5X, 10X, 50X, 100X, 500X, 1000X
Maximum Input Voltage	300V (DC+AC Peak, 1M $\Omega$ input impedance, 10X)
	5V (V <sub>RMS</sub> , 50 $\Omega$ input impedance, BNC) <sup>[3]</sup>
Time delay between channel (typical)	500ps

<b>50<math>\Omega</math></b>	
With	DS1302CA, DS1202CA
Without	DS1062CA, DS1102CA

<b>Horizontal</b>	
Sample Rate Range	1Sa/s-2GSa/s (Real-Time), 50GSa/s (Equivalent) <sup>[2]</sup>
Waveform interpolation	Sin(x)/x
Record Length	Up to 10k samples for single channel, at 2GSa/s 5k samples for each channel
Scan speed Range (Sec/div)	1ns/div-50s/div, DS1302CA 2ns/div-50s/div, DS1102CA, DS1202CA 5ns/div-50s/div, DS1060CA 1-2-5 Sequence
Sample Rate and Delay Time Accuracy	±50ppm (over any≥1ms time interval)
Delta Time Measurement Accuracy	Single-shot: ±(1 sample interval + 50ppm × reading + 0.6 ns)

(Full Bandwidth)	>16 averages: $\pm(1\text{sample interval} + 50\text{ppm} \times \text{reading} + 0.4 \text{ ns})$
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Measurements		
Cursor	Manual	Voltage difference between cursors ( $\Delta V$ ) Time difference between cursors ( $\Delta T$ ) Reciprocal of $\Delta T$ in Hertz ( $1/\Delta T$ )
	Track	Voltage value for Y-axis waveform Time value for X-axis waveform
	Auto	Cursors are visible for Automatic Measurement
Auto Measure	Vpp, Vamp, Vmax, Vmin, Vtop, Vbase, Vavg, Vrms, Overshoot, Preshoot, Freq, Period, Rise Time, Fall Time, +Width, -Width, +Duty, -Duty, Delay1→2 $\ddagger$ , Delay1→2 $\ddagger$	

Vertical	
A/D converter	8-bit resolution, each channel samples simultaneously
Volts/div Range	1mV/div-10V/div at input BNC
Offset Range	$\pm 40\text{V}(205\text{mV/div}-10\text{V/div})$ $\pm 800\text{mV}(1\text{mV/div}-200\text{mV/div})$
Analog Bandwidth	60MHz(DS1062CA) 100MHz(DS1102CA) 200MHz(DS1202CA) 300MHz(DS1302CA)
Single-shot Bandwidth	60MHz(DS1062CA) 100MHz(DS1102CA) 200MHz(DS1202CA) 300MHz(DS1302CA)
Selectable Analog Bandwidth Limit (typical)	20MHz
Lower Frequency Limit (AC -3dB)	$\leq 5\text{Hz}$ (at input BNC)
Rise Time at BNC, typical	$<1.2\text{ns}$ , $<1.7\text{ns}$ , $<3.5\text{ns}$ , $<5.8\text{ns}$ , On 300MHz, 200MHz, 100MHz, 60MHz respectively
Dynamic range	$\pm 5\text{div}$
DC Gain Accuracy	1mV/div: $\pm 8\%$ (Normal or Average acquisition mode) 2mV/div-5mV/div: $\pm 4\%$ (Normal or Average acquisition mode)

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	10mV/div-10V/div: $\pm 3\%$ (Normal or Average acquisition mode)
DC Measurement Accuracy, Average Acquisition Mode	Average of $\geq 16$ Waveforms with vertical position at zero: $\pm(\text{DC Gain Accuracy} \times \text{reading} + 0.1\text{div} + 1\text{mV})$ Average of $\geq 16$ Waveforms with vertical position not at zero: $\pm[\text{DC Gain Accuracy} \times (\text{reading} + \text{vertical position}) + (1\% \text{ of vertical position}) + 0.2\text{div}]$ Add 1mV for settings from 1mV/div to 200 mV/div Add 50mV for settings $> 200\text{mV/div}$ to 10V/div
Delta Volts Measurement Accuracy (Average Acquisition Mode)	Delta Volts between any two averages of 16 waveforms acquired under same setup and ambient conditions: $\pm(\text{DC Gain Accuracy} \times \text{reading} + 0.05 \text{ div})$
Overshoot	$< 20\%$

<b>Trigger</b>		
Trigger Sensitivity	0.1div-1.0div (adjustable)	
Trigger Level Range	Internal	$\pm 6$ divisions from center of screen
	EXT	$\pm 1\text{V}$
	EXT/5	$\pm 3\text{V}$
Trigger Level Accuracy (typical) applicable for the signal of rising and falling time $\geq 20\text{ns}$	Internal	$\pm(0.3\text{div} \times \text{V/div})$ ( $\pm 4$ divisions from center of screen)
	EXT	$\pm(6\% \text{ of setting} + 40 \text{ mV})$
	EXT/5	$\pm(6\% \text{ of setting} + 200 \text{ mV})$
Trigger Offset	Normal mode: pre-trigger(262144/ sampling rate), delayed trigger 1s	
	Slow Scan mode: pre-trigger 6div, delayed trigger 6div	
Trigger Holdoff range	500ns-1.5s	
HF reject	100kHz $\pm 50\text{kHz}$	
LF reject	8kHz $\pm 20\%$	
Set Level to 50% (typical)	Input signal frequency $\geq 50\text{Hz}$	
<b>Edge Trigger</b>		
Edge trigger slope	Rising, Falling, Rising + Falling	
<b>Pulse Trigger</b>		
Trigger condition	(>, <, =) Positive pulse, (>, <, =) negative pulse	
Pulse Width range	20ns – 10s	

<b>Video Trigger</b>	
Video standard & line frequency	Support standard NTSC, PAL and SECAM broadcast systems. Line number range: 1-525 (NTSC) and 1-625 (PAL/SECAM)
<b>Slope Trigger</b>	
Trigger condition	(>, <, =) Positive slope, (>, <, =) negative slope
Time setting	20ns – 10s
<b>Alternate Trigger</b>	
Trigger on CH1	Edge, Pulse, Video, Slope
Trigger on CH2	Edge, Pulse, Video, Slope

**NOTES:**

- [1] Only one input channel is available when Sample rate is at 2GSa/s.
- [2] This is the highest specification, the specific specifications are as follows:
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|---------------------|---------|
| DS1302CA:           | 50GSa/s |
| DS1202CA, DS1102CA: | 25GSa/s |
| DS1062CA:           | 10GSa/s |
- [3] For DS1202CA and DS1302CA only.

## General Specifications

<b>Display</b>	
Display Type	5.7 in. (145 mm) diagonal TFT Liquid Crystal Display
Display Resolution	320 horizontal ×RGB×234 vertical pixels
Display Color	64k color
Display Contrast (typical)	150:1
Backlight Brightness (typical)	300 nit

<b>Probe Compensator Output</b>	
Output Voltage (typical)	3 V <sub>pp</sub> into ≥1 MΩ load
Frequency (typical)	1kHz

<b>Power</b>	
Supply Voltage	100 ~ 240 VAC <sub>RMS</sub> , 45-440Hz, CAT II
Power Consumption	Less than 50VA
Fuse	2A, T rating, 250 V

<b>Environmental</b>	
Ambient Temperature	Operating 10°C ~ 40°C
	Non-operating -20°C ~ +60°C
Cooling Method	Fan force air flow
Humidity	+35°C or below: ≤90% relative humidity
	+35°C ~ +40°C: ≤60% relative humidity
Altitude	Operating 3,000 m or below
	Non-operating 15,000 m or below

<b>Mechanical</b>		
Size	Width	303mm
	Height	154mm
	Depth	133 mm
Heavy	Without package	2.4 kg
	Packaged	3.8 kg

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**IP Protection**

IP2X

**Calibration Interval**

The calibration interval is one year