

DS1000D/E Series Oscilloscope Specifications

All specifications apply to DS1000E, DS1000D Series Oscilloscopes and a probe with the Attenuation switch set to 10X 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.
- Do 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".



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Specifications

Acquisition			
Sampling Modes	Real-Time	Equivalent	
Sampling Rate	1GSa/s, 200MSa/s ^[1]	DS1102X	DS1052X
		25GSa/s	10GSa/s
Averages	N time acquisitions, all channels simultaneously, N is selectable from 2, 4, 8, 16, 32, 64, 128 and 256.		

Inputs	
Input Coupling	DC, AC, GND
Input Impedance	1M Ω ±2%, in parallel with 15pF±3pF
Probe Attenuation Factors	1X, 5X, 10X, 50X, 100X, 500X, 1000X
Maximum Input Voltage	400V (DC+AC Peak, 1M Ω input impedance)
	40V (DC+AC Peak) ^[1]
Time delay between channel (typical)	500ps

Horizontal				
Sample Rate	Real-Time: 13.65Sa/s-1GSa/s			
	Equivalent: 13.65Sa/s-25GSa/s			
Waveform interpolation	Sin(x)/x			
Record Length	Channel Mode	Sample rate	Record Length (normal)	Record Length (long record)
	Single channel	1GSa/s	16Kpts	N.A.
	Single channel	500MSa/s Or lower	16 Kpts	1Mpts
	Double channel	500MSa/s Or lower	8 Kpts	512Kpts
Scan speed Range (Sec/div)	2ns/div~50s/div, DS1102X 5ns/div~50s/div, DS1052X 1-2-5 Sequence			
Sample Rate and Delay Time	±50ppm (over any 1ms time interval)			

Accuracy	
Delta Time Measurement Accuracy (Full Bandwidth)	Single-shot: $\pm(1 \text{ sample interval} + 50\text{ppm} \times \text{reading} + 0.6 \text{ ns})$ >16 averages: $\pm(1\text{sample interval} + 50\text{ppm} \times \text{reading} + 0.4 \text{ ns})$

Vertical	
A/D converter	8-bit resolution, each channel samples simultaneously ^[2]
Volts/div Range	2mV/div~10V/div at input BNC
Maximum Input	Analog channel maximum input voltage CAT I 300Vrms, 1000Vpk; instantaneous voltage 1000Vpk CAT II 100Vrms, 1000Vpk RP2200 10:1: CAT II 300Vrms RP3200 10:1: CAT II 300Vrms RP3300 10:1: CAT II 300Vrms
Offset Range	$\pm 40\text{V}(200\text{mV}-10\text{V})$, $\pm 2\text{V}(2\text{mV}-100\text{mV})$
Analog Bandwidth	100MHz (DS1102D, DS1102E) 50MHz (DS1052D, DS1052E)
Single-shot Bandwidth	80MHz (DS1102D, DS1102E) 50MHz (DS1052D, DS1052E)
Selectable Analog Bandwidth Limit (typical)	20MHz
Lower Frequency Limit (AC -3dB)	$\leq 5\text{Hz}$ (at input BNC)
Rise Time at BNC, typical	$< 3.5\text{ns}$, $< 7\text{ns}$, On (100M, 50M) respectively
DC Gain Accuracy	2mV/div-5mV/div: $\pm 4\%$ (Sample or Average acquisition mode) 10mV/div-10V/div: $\pm 3\%$ (Sample or Average acquisition mode)
DC Measurement Accuracy, Average Acquisition Mode	Average of ≥ 16 Waveforms with vertical position at zero: $\pm(\text{DC Gain Accuracy} \times \text{reading} + 0.1\text{div} + 1\text{mV})$ Average of ≥ 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 2mV for settings from 2mV/div to 200 mV/div

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	Add 50mV for settings from >200mV/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: $\pm(\text{DC Gain Accuracy} \times \text{reading} + 0.05 \text{ div})$

Trigger		
Trigger Sensitivity	0.1div~1.0div (adjustable)	
Trigger Level Range	Internal	±5 divisions from center of screen
	EXT	±1.2V
Trigger Level Accuracy (typical) applicable for the signal of rising and falling time ≥20ns	Internal	±(0.3div × V/div)(±4 divisions from center of screen)
	EXT	±(6% of setting + 200 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	100ns~1.5s	
Set Level to 50% (Typical)	Input signal frequency ≥50Hz	
Edge Trigger		
Edge trigger slope	Rising, Falling, Rising + Falling	
Pulse Trigger		
Trigger condition	(>, $<$, =) Positive pulse, (>, $<$, =) negative pulse	
Pulse Width range	20ns ~10s	
Video Trigger		
Video standard & line frequency	Support standard NTSC, PAL and SECAM broadcast systems. Line number range: 1~525 (NTSC) and 1~625 (PAL/SECAM)	
Slope Trigger		
Trigger condition	(>, $<$, =) Positive slope, (>, $<$, =) negative slope	
Time setting	20ns~10s	
Alternate Trigger		
Trigger on CH1	Edge, Pulse, Video, Slope	
Trigger on CH2	Edge, Pulse, Video, Slope	
Pattern Trigger ^[1]		

Trigger mode	D0~D15 select H, L, X, $\bar{f}$, $\bar{t}$
Duration Trigger ^[1]	
Trigger Type	D0~D15 select H, L, X
Qualifier	>, <, =
Time setup	20ns~10s

Measurements		
Cursor	Manual	Voltage difference between cursors (ΔV) Time difference between cursors (ΔT) Reciprocal of ΔT 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 $\bar{f}$, Delay1→2 $\bar{t}$	

[1] For DS1000D Series;

[2] When sampling is 1GSa/s, only single channel can be used.

General Specifications

Display	
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

Probe Compensator Output	
Output Voltage(typical)	Amplitude ~3Vp-p
Frequency(typical)	1kHz

Power	
Supply Voltage	100 ~ 240 VAC _{RMS} , 45~440Hz, CAT II
Power Consumption	Less than 50W
Fuse	2A, T rating, 250 V

Environmental	
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

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

IP Degree

IP2X

Calibration Interval

The recommended calibration interval is one year
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