

## XDS4000 Series Oscilloscopes Technical Specifications

Unless otherwise specified, the technical specifications applied are for the oscilloscopes only, and Probes attenuation set as 10X. Only if the oscilloscope fulfills the following two conditions at first, these specification standards can be reached.

- This instrument should run for at least 30 minutes continuously under the specified operating temperature.
- If change of the operating temperature is up to or exceeds 5 °C , do a "Self-calibration" procedure.

All specification standards can be fulfilled, except one(s) marked with the word "Typical".

## Oscilloscope

Performance Characteristics		Instruction	
Bandwidth	XDS4504 XDS4502	500 MHz	
	XDS4354 XDS4352	350 MHz	
Vertical Resolution (A/D)		8 bits	
Channel	XDS4502 XDS4352	2	
	XDS4504 XDS4354	4	
Waveform Capture Rate		600,000 wfms/s	
Multi-level Gray Scale Display & Color Temperature Display (Use gray scale to indicate frequency of occurrence, where frequently occurring waveform are bright.)		Support	
Acquisition	Mode	Normal, Peak detect, Averaging	
	Sample rate (real time)	Four CH	1 GSa/s
		Dual CH*	2.5 GSa/s
		Single CH	5 GSa/s
Input	Input coupling	DC, AC , Ground	
	Input impedance	1 MΩ±2%, in parallel with 15 pF±5 pF, 50Ω±2%	
	Input coupling	0.001X - 1000X, step by 1 – 2 - 5	
	Max input voltage	400 V (DC + AC Peak)	
	Bandwidth limit	20 MHz, full bandwidth	
	Channel –channel isolation	50 Hz: 100 : 1 10 MHz: 40 : 1 500 MHz: 20 : 1	
	Time delay between channel(typical)	150ps	

Performance Characteristics		Instruction	
Horizontal System	Sampling rate range	Four CH	0.05 Sa/s - 1 GSa/s
		Dual CH*	0.05 Sa/s – 2.5 GSa/s
		Single CH	0.05 Sa/s - 5 GSa/s
	Interpolation	(Sinx)/x, x	
	Max Record length	When four channels are turned on, the max record length is 100M; and max 200M for two channels; max 400M for one channel.	
	Scanning speed (S/div)	500ps/div - 1000s/div, step by 1 – 2 - 5	
	Sampling rate / relay time accuracy	±2.5 ppm max (Ta = +25°C±5°C)	
Interval(ΔT) accuracy (DC - 100MHz)	Single: ±(1 interval time+1 ppm×reading+0.6 ns); Average>16: ±(1 interval time +1 ppm×reading+0.4 ns)		
Vertical system	Sensitivity	1 mV/div - 10 V/div	
	Displacement	±1V(1mV/div); ±2V(2mV/div~50mV/div); ±20V(100mV/div~500mV/div); ±200V(1V/div~5V/div); ±100V(10V/div);	
	Analog bandwidth	XDS4504 XDS4502	500 MHz
		XDS4354 XDS4352	350 MHz
	Single bandwidth	XDS4504 XDS4502	DC to 500 MHz
		XDS4354 XDS4352	DC to 350 MHz
	Low Frequency	≥10 Hz (On the BNC )	
	Rise time (at input, Typical)	XDS4504 XDS4502	≤0.7 ns
		XDS4354 XDS4352	≤ 1 ns
	DC gain accuracy	1 mV	±3%
≥2 mV		±2%	

Performance Characteristics		Instruction
	DC accuracy (average)	Delta Volts between any two averages of $\geq 16$ waveforms acquired with the same scope setup and ambient conditions ( $\Delta V$ ): $\pm(3\% \text{ rdg} + 0.05 \text{ div})$
	Waveform inverted ON/OFF	
Measurement	Cursor	$\Delta V$ , $\Delta T$ , $\Delta T \& \Delta V$ between cursors, auto cursor
	Automatic	Period, Frequency, Mean, PK-PK, RMS, Max, Min, Top, Base, Amplitude, Overshoot, Preshoot, Rise Time, Fall Time, +Pulse Width, -Pulse Width, +Duty Cycle, -Duty Cycle, Delay A→B $\mu$ s, Delay A→B $\mu$ s, Cycle RMS, Cursor RMS, Screen Duty, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase A→B $\mu$ s, Phase A→B $\mu$ s, +Pulse Count, -Pulse Count, Rise Edge Count, Fall Edge Count, Area, and Cycle Area.
	Waveform Math	+, -, *, /, FFT, FFTrms, Intg, Diff, Sqrt, User Defined Function, digital filter (low pass, high pass, band pass, band reject)
	Decoding Type (optional)	UART/RS232, I <sup>2</sup> C, SPI, CAN
	Waveform storage	100 waveforms
	Lissajous figure	Bandwidth Phase difference
Communication port	Standard	USB Host, USB Device; Trig Out(Pass/Fail); LAN port; VGA port; EXT Trig In
Printer Compatibility	PictBridge	
Counter	Support	

**\*(Only applicable to 4-channel models)**

Max Sample rate (real time) for Dual CH should meet either following condition:

- CH1&CH3 on, CH2&CH4 off;
- CH2&CH4 on, CH1&CH3 off.

## Trigger

Performance Characteristics		Instruction
Trigger level	Internal	$\pm 5$ div from the screen center

range	EXT	±2V
	EXT/5	±10V
Trigger level Accuracy (typical)	Internal	±0.3 div
	EXT	±(10mV+6% * value)
	EXT/5	±(50mV+6% * value)
Trigger displacement	According to Record length and time base	
Trigger Holdoff range	100 ns – 10 s	
50% level setting (typical)	Input signal frequency ≥ 50 Hz	
Edge trigger	slope	Rising, Falling
Video Trigger	Modulation	Support standard NTSC, PAL and SECAM broadcast systems
	Line number range	1-525 (NTSC) and 1-625 (PAL/SECAM)
Pulse trigger	Trigger condition	Positive pulse: >, <, = Negative pulse: >, <, =
	Pulse Width range	30 ns to 10 s
Slope Trigger	Trigger condition	Positive pulse: >, <, = Negative pulse: >, <, =
	Time setting	30 ns to 10 s
Runt Trigger	Polarity	Positive, Negative
	Pulse Width Condition	>, =, <
	Pulse Width	30 ns to 10 s
Windows Trigger	Polarity	Positive, Negative
	Trigger Position	Enter, Exit, Time
	Windows Time	30 ns to 10 s
Timeout Trigger	Edge Type	Rising, Falling
	Idle Time	30 ns to 10 s
Nth Edge Trigger	Edge Type	Rise, Fall
	Idle Time	30 ns to 10 s
	Edge Number	1 to 128
Logic Trigger	Logic Mode	AND, OR, XNOR, XOR
	Input Mode	H, L, X, Rise, Fall
	Output Mode	Goes True, Goes False, Is True >, Is True <, Is True =
Pattern Trigger	Logic Mode	AND
	Input Mode	H, L, X, Rise, Fall

	Pattern Time	30 ns to 10 s
Duration Trigger	Logic Mode	AND
	Input Mode	H, L, X
	Trigger Condition	>, =, <
	Duration Time	30 ns to 10 s
Delay Trigger	Input Mode	Rise, Fall
	Trigger Condition	>, =, <
	Delay Time	30 ns to 10 s
Setup/Hold Trigger	Input Mode	Rise, Fall
	Output Mode	Setup, Hold, Setup&Hold
	Setup Time	30 ns to 10 s
	Hold Time	30 ns to 10 s
UART/RS232 Trigger	Polarity	Normal, Inverted
	Trigger Condition	Start, Error, Check Error, Data
	Baud Rate	Common, Custom
	Data Bits	5 bit, 6 bit, 7 bit, 8 bit
I2C Trigger	Trigger Condition	Start, Restart, Stop, ACK Lost, Address, Data, Addr/Data
	Address Bits	7 bit, 8 bit, 10 bit
	Address Range	0 to 127, 0 to 255, 0 to 1023
	Byte Length	1 to 5
SPI Trigger	Trigger Condition	Timeout
	Timeout Value	30 ns to 10 s
	Data Bits	4 bit to 32 bit
	Data Line Setting	H, L, X
CAN Trigger (optional)	Signal Type	CAN_H, CAN_L, TX, RX
	Trigger Condition	Start of Frame, Type of Frame, Identifier, Data, ID & Data, End of Frame, Missing Ack, Bit Stuffing Error
	Baud Rate	Common, Custom
	Sample Point	5% to 95%
	Frame Type	Data, Remote, Error, Overload

## Waveform Generator

Performance Characteristics	Instruction
Max Frequency Output	50 MHz
Sample Rate	250 MSa/s
Channel	1
Vertical Resolution	14 bits
Amplitude Range	2mVpp - 5Vpp( $\cong$ 50MHz)

Performance Characteristics	Instruction
	2mVpp - 20Vpp( $\cong$ 25MHz)
Waveform length	16K
Output DC and offset	offset $\leq \pm 2.5V$ ( $V_{pp} \leq 5V$ ) ,offset $< \pm 7.5V$ ( $V_{pp} > 5V$ )
Standard Waveforms	Sine, Square, Ramp, and Pulse
Arbitrary Waveforms	Exponential Rise, Exponential Fall, Sin(x)/x, Step Wave, Noise, and others, total 46 built-in waveforms, and user-defined arbitrary waveform

## Multimeter (Optional)

Performance Characteristics	Instruction
Full scale reading	4½ digits (Max 20000 – count)
Diode	0 V - 2 V
Input impedance	≥10 MΩ
On/Off measurement	<50 beeping
Capacitance	2nF – 20mF: ±(4%±10 digit)
Voltage	DCV: 20mV, 200mV: ±(0.5%±10digit), 2V, 20V, 200V: ±(0.3%±5digit), 1000V: ±(0.5%±5digit) ACV: 200mV, 2V, 20V, 200V: ±(0.8%±10digit) 750V: ±(1%±10digit) Frequency: 40Hz - 400Hz
Current	DCA: 20A: ±(2%±10digit) ACA: 20A: ±(2.5%±10digit)
Impedance	200Ω~2MΩ: ±(0.8%±10digit), 20MΩ: ±(1%±10digit) 100MΩ: ±(5%±10digit)

## General Technical Specifications

### Display

Display Type	10.4" Colored LCD (Liquid Crystal Display)
Display Resolution	800 (Horizontal) × 600 (Vertical) Pixels
Display Colors	65536 colors, TFT screen

### Output of the Probe Compensator

Output Voltage (Typical)	About 3.3 V, with the Peak-to-Peak voltage ≥1 MΩ.
Frequency (Typical)	Square wave of 1 KHz

### Power

Mains Voltage	100V – 240 VACRMS, 50/60 Hz, CAT II
Power Consumption	<65 W
Fuse	2 A, T class, 250 V

### Environment

Temperature	Working temperature: 0 °C - 40 °C Storage temperature: -20 °C - 60 °C
Relative Humidity	≤ 90%
Height	Operating: 3,000 m Non-operating: 15,000 m

Cooling Method	Fan cooling
----------------	-------------

**Mechanical Specifications**

Dimension	422 mm × 226 mm × 135 mm (L*H*W)
Weight	Approx. 5 kg (without accessories)

**Interval Period of Adjustment:**

One year is recommended for the calibration interval period.

V1.0.1

