TELEDYNE TEST TOOLS
Everywhereyoulook™

T3DSO3000HD Data Sheet

Digital Oscilloscope

Debug with Confidence

200 MHz – 1 GHz

12-bit High Resolution



Tools for Improved Debugging

• **12-bit ADC** – combined with low noise front end provides excellent noise performance.	✓ Get better insight on the signal being measured with minimal noise interference.
• **Long Capture** – up to 400 Mpts/Ch	✓ Capture more time and show more waveform detail.
• **Math and Measure** – 9 basic math functions plus FFT and 50+ automatic measurement parameters.	✓ Extract results from waveforms and measurements.
• **Built-in web server** – supports remote control over LAN port.	✓ Save data for external analysis and screen images for reports.
• **History** – record function, the maximum recorded waveform length is 80,000 frames.	✓ Replay the changing waveform history.
• **Includes Bode Plot and Power Analysis applications as standard.**	✓ Common applications coverage as standard.
• **MSO** – Optional 16 Digital Channel Probe available.	✓ Add mixed signal debugging to your Oscilloscope.

PRODUCT OVERVIEW

T3DSO3024HD 4 Channel 200 MHz
T3DSO3034HD 4 Channel 350 MHz
T3DSO3054HD 4 Channel 500 MHz
T3DSO3104HD 4 Channel 1 GHz

Teledyne Test Tools T3DSO3000HD Digital Oscilloscopes are available in bandwidths of 200 MHz, 350 MHz, 500 MHz and 1 GHz, have maximum record length of 400 Mpts/ch, and display 4 analog channels + optional 16 digital channels mixed signal analysis ability.

The T3DSO3000HD series employs the latest technology which features a maximum waveform capture rate of up to 200,000 wfm/s in normal mode and 890,000 wfm/s in Sequence mode, 256-level intensity grading display function plus a color temperature display mode. It also employs an innovative digital trigger system with high sensitivity and low jitter. The trigger system supports multiple powerful triggering modes including serial bus triggering. Tools such as History waveform recording, Search and Navigate functions, Mask Test, Bode Plot, and Power Analysis allow for extended waveform records captured, stored, and analyzed. An impressive array of measurement and math capabilities, options for a 50 MHz arbitrary waveform generator, as well as serial decoding are also features of the T3DSO3000HD.

The large 10.1" display capacitive touch screen supports multi-touch gestures, with the addition of user-friendly UI design, can greatly improve the operation efficiency. It also supports mouse control, and remote web control over LAN.

Key Features

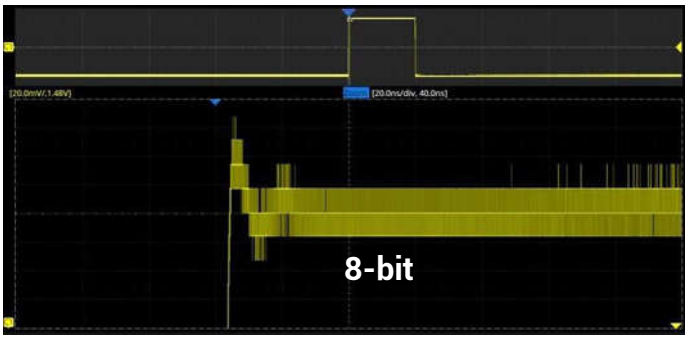
- 12-bit Analog-Digital Convertors with sample rate up to 4 GS/s
- Front ends with 125 µVrms noise floor @ 1 GHz bandwidth and 0.5 % DC gain accuracy
- Four analog channels, up to 1 GHz bandwidth
- Waveform capture rate up to 200,000 wfm/s (normal mode), and 890,000 wfm/s (sequence mode)
- Supports 256-level intensity grading and color temperature display modes
- Up to 400 Mpts/ch record length
- Serial bus triggering and decoder, supports protocols I²C, SPI, UART, CAN, LIN, CAN FD, FlexRay, I²S, MILSTD-1553B, SENT, Manchester and ARINC429
- MSO – Optional 16 Digital Channel Logic Probe available
- History waveform record (History) function, the maximum recorded waveform length is 80,000 frames
- Automatic measurements on 50+ parameters, supports statistics with histogram, track, trend, Gating measurement, and measurements on Math, History and Ref
- 4 Math traces (4 Mpts FFT, Filter, addition, subtraction, multiplication, division, integration, differential, square root, etc.), supports formula editor
- High Speed hardware-based Average, ERES; High Speed hardware-based Mask Test function, with Mask Editor tool for creating user-defined masks
- Optional 50 MHz waveform generator
- Interfaces include: 2x USB 3.0 Host, 1x USB 2.0 Host, USB 3.0 Device (USBTMC), 1000M LAN ((VXI-11/ Telnet/Socket/LXI)), External Trigger In, Aux Out (Pass/Fail, Trigger Out)
- Built-in web server supports remote control over the LAN port using a web browser. Supports SCPI remote control commands. Supports external mouse and keyboard

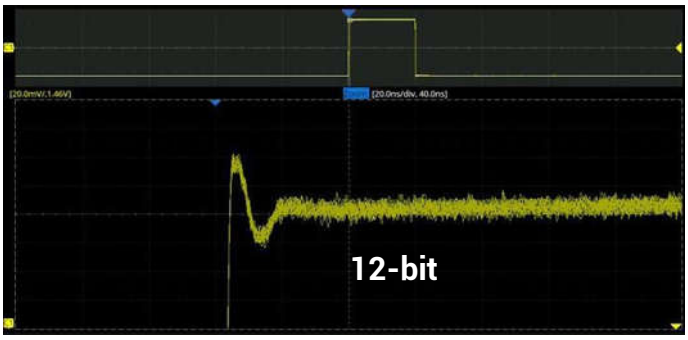
Models and Key Specification

Model	T3DSO3024HD	T3DSO3034HD	T3DSO3054HD	T3DSO3104HD
Analog channels	4 + EXT			
Bandwidth	200 MHz	350 MHz	500 MHz	1 GHz (800 MHz in non-interleaving mode)
Sample rate (Max.)	4 GS/s (interleaving mode), 2 GS/s (non-interleaving mode)			
Memory depth (Max.)	400 Mpts/ch (interleaving mode: single-channel), 200 Mpts/ch (interleaving mode: dual-channel), 100 Mpts/ch (non-interleaving mode)			
Waveform capture rate (Max.)	Normal mode: 200,000 wfm/s; Sequence mode: 890,000 wfm/s			
Vertical resolution	12-bit. Up to 16-bit in ERES mode			
Trigger type	Edge, Slope, Pulse width, Window, Runt, Interval, Dropout, Pattern, Video, Qualified, Nth edge, Setup/hold, Delay, Serial			
Serial trigger and decode	I²C, SPI, UART, CAN, LIN, CAN FD, FlexRay, I²S, MIL-STD-1553B, SENT, Manchester (decode only), ARINC429			
Measurement	50+ parameters, statistics, histogram, trend, and track supported			
Math	4 traces 4 Mpts FFT, +, -, x, ÷, ∫dt, d/dt, √, Identity, Negation, Absolute, Sign, ex, 10x, ln, lg, Interpolation, MaxHold, MinHold, ERES, Average, Filter. Supports formula editor			
Data analysis	Search, Navigate, History, Mask Test, Digital Voltmeter, Counter, Waveform Histogram, Bode plot, and Power Analysis			
Digital channel (optional)	16-channel; maximum sample rate up to 1 GS/s; record length up to 100 Mpts			
USB AWG module (optional)	One channel, 50 MHz, sample rate of 125 MHz, wavelength of 16 kpts, isolated output			
I/O	USB 3.0 Host x2, USB 2.0 Host x1, USB 3.0 Device, 10M/100M/1000M LAN, External trigger, Auxiliary output (TRIG OUT, PASS/FAIL)			
Probe	Four 500 MHz passive probes			
Display	10.1 TFT-LCD with capacitive touch screen (1024*600)			

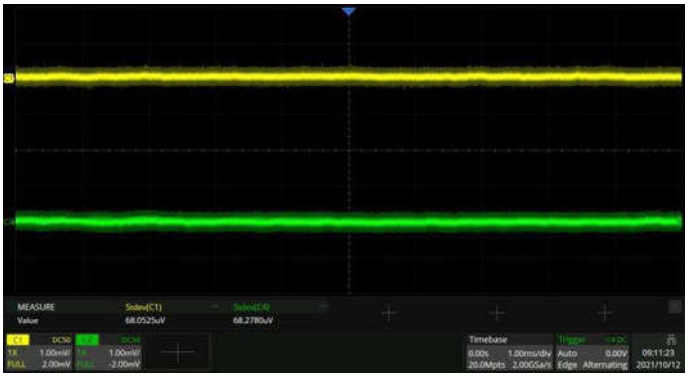
FUNCTIONS & CHARACTERISTICS

12-bit High Resolution

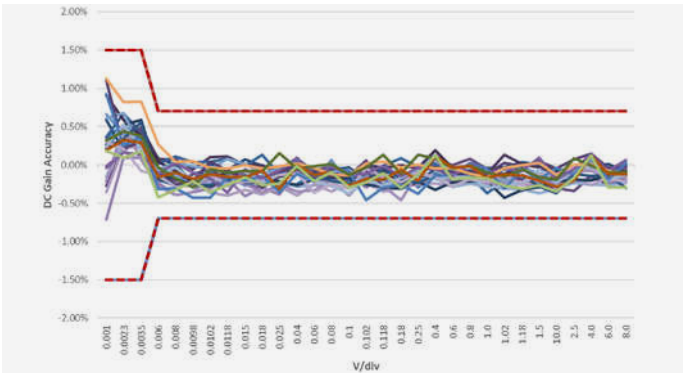




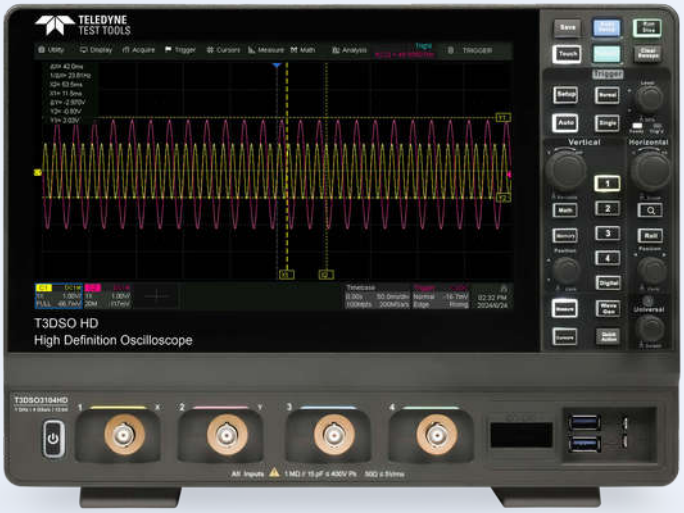
12-bit resolution shows you more details and less noise on the waveform.



Low noise floor: Only 125 µVrms at 1 GHz bandwidth



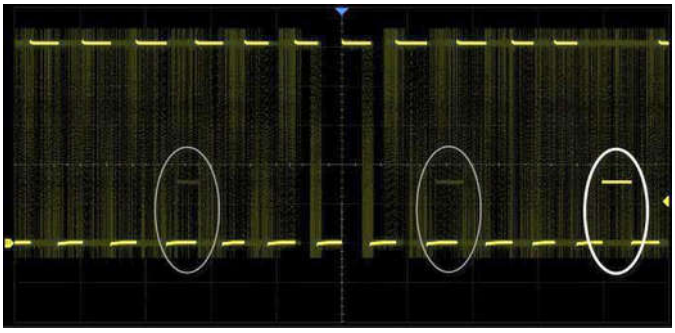
0.5 % DC gain accuracy



Excellent User Interface and User Experience

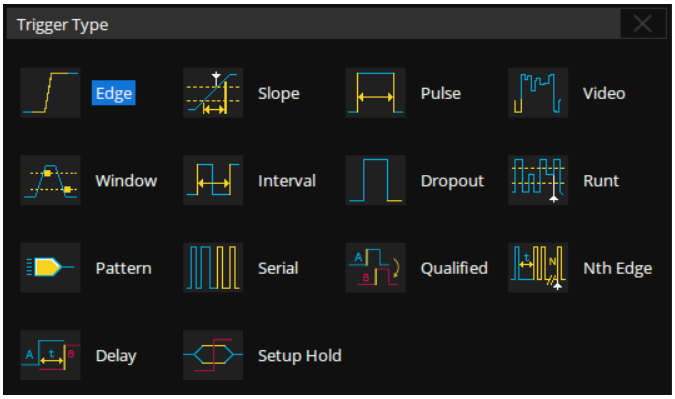
- 10.1" display with 1024 x 600 resolution
- Capacitive touch screen, supporting multi-touch gestures, can move or scale the waveform traces quickly by fingertouch movements, which greatly improves the operation efficiency
- Built-in WebServer supports remote control on a web page over LAN
- Supports external mouse and keyboard

High Waveform Update Rate



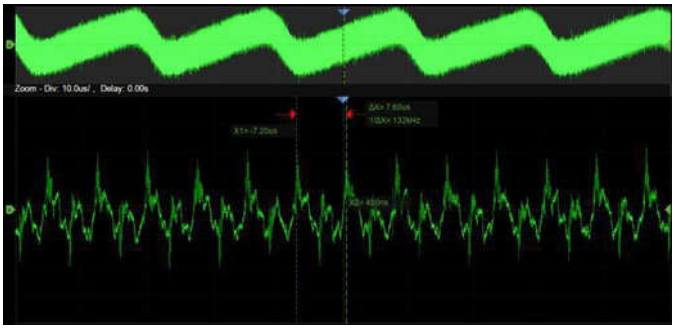
With a waveform update rate of up to 200,000 wfm/s, the oscilloscope can easily capture unusual or low probability events. In Sequence mode, the waveform capture rate can reach 890,000 wfm/s.

Multiple Trigger Functions



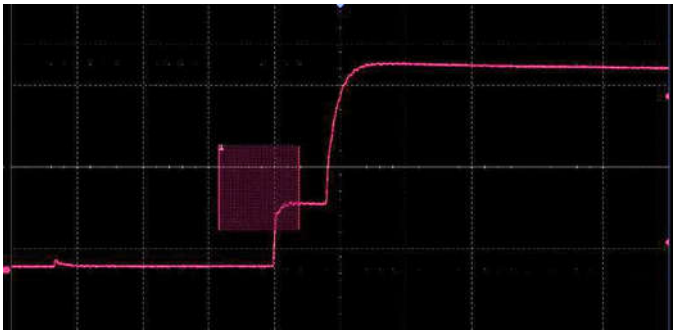
Edge, Slope, Pulse, Video, Windows, Runt, Interval, Dropout, Pattern, Qualified, Nth edge, Setup/hold, Delay, and serial trigger.

Deep Record Length



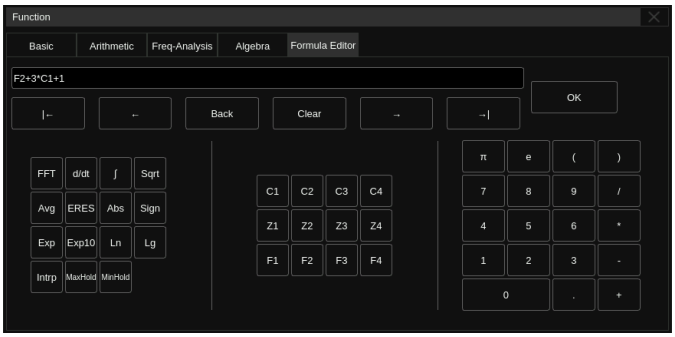
Using hardware-based Zoom technique and record length of up to 400 Mpts, users can select a slower time-base without compromising the sample rate, and then quickly zoom in to focus on the area of interest.

Trigger Zone



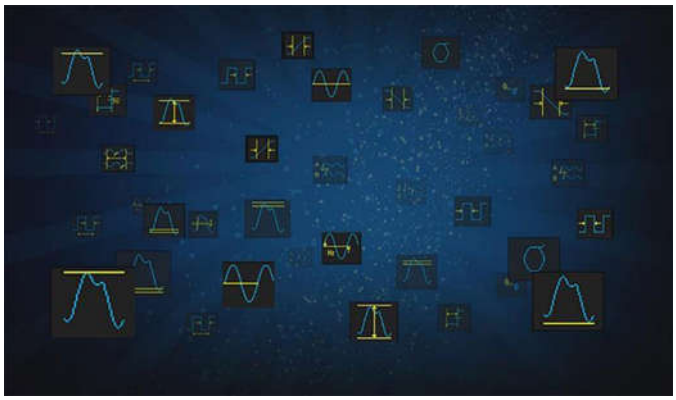
Trigger Zone is available for advanced triggering. Combine spatial triggering with common trigger mode to isolate signals of interest.

Advanced Math Function



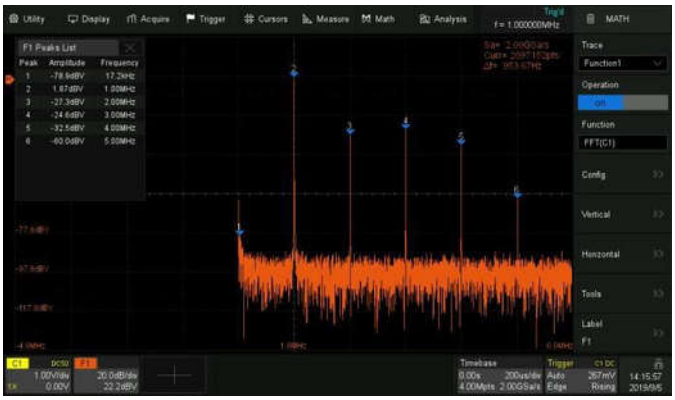
In addition to the traditional (+, -, X, /) operations, FFT, integration, differential, square root, and more are supported. Formula Editor is available for more complex operations. 4 math traces are available.

Measurements of a Variety of Parameters



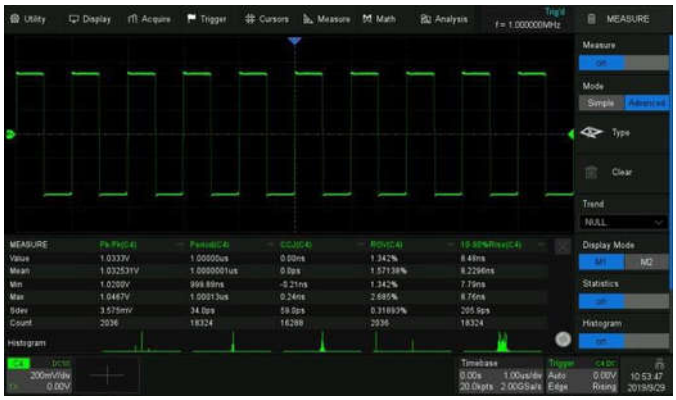
Parameter measurements include 4 categories: horizontal, vertical, miscellaneous, and CH delay providing a total of 50+ different types of measurements. Measurements can be performed within a specified gate period. Measurements on Math, Reference, and History frames are supported.

Deep Memory FFT



Hardware-accelerated FFT supports up to 4 Mpts operation. This provides high-frequency resolution with a fast refresh rate. The FFT function also supports a variety of window functions so that it can adapt to different spectrum measurement needs. Three modes (Normal, Average, and Max hold) can satisfy different requirements for observing the power spectrum. Auto peak detection and markers are supported.

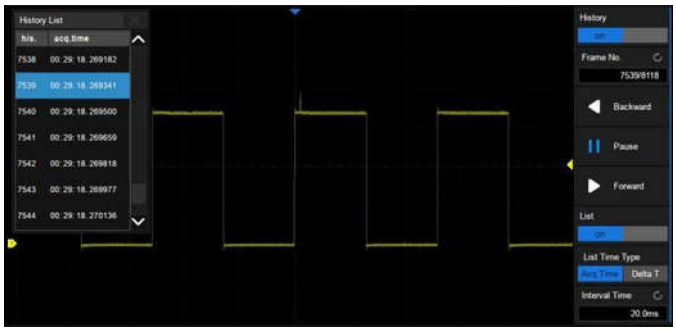
Parameter Statistics Function



Statistics show the current value, maximum value, minimum value, standard deviation, and mean value of up to 12 parameters simultaneously. A histogram is available to show the probability distribution of a parameter. Trend and Track are available to show the parameter value vs. time.

For horizontal parameters such as period, all results are extracted from a frame, instead of just calculating the first one. This accelerates statistics on horizontal measurements much more and enables distribution observation in a frame using Histogram and Track.

History Mode



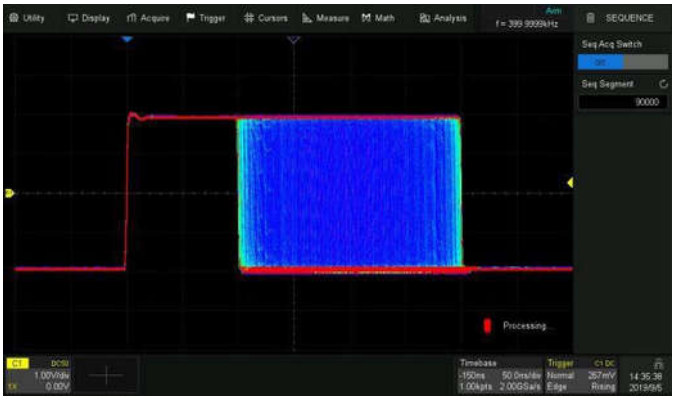
History function can record up to 80,000 frames of waveforms. The recording is executed automatically so that the customer can playback the history waveforms at any time to observe unusual events and quickly locate the area of interest using the cursors or measurements. The failed frames of the Mask Test can be stored as history.

Search and Navigate



The oscilloscope can search events specified by the user in a frame. Events flagged by the Search can be recalled automatically using Navigate. It can also navigate by time (delay position) and history frames.

Sequence Mode



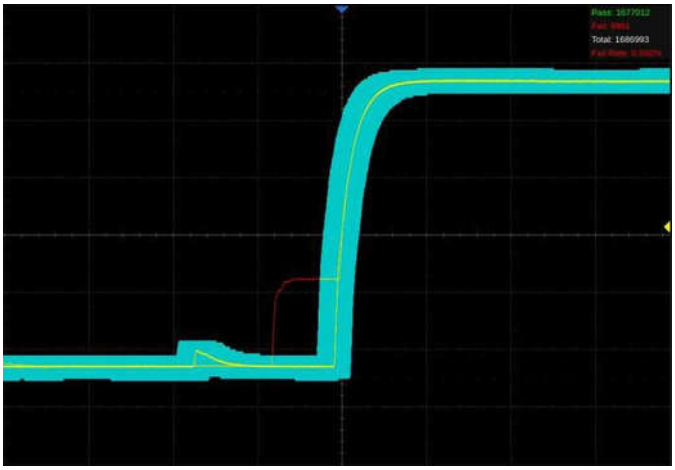
Segmented memory collection will store the waveform into multiple memory segments (up to 80,000) and each segment will store a triggered waveform as well the dead time information. The interval between segments can be as small as 2 µs. All of the segments can be played back using the History function.

Serial Bus Decode

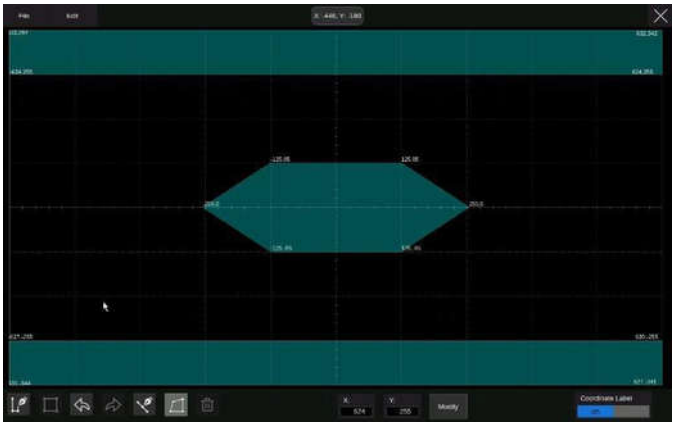


Display the decoded characters through the events list. Bus protocol information can be quickly and intuitively displayed in tabular form. I²C, SPI, UART, CAN, LIN, CAN FD, FlexRay, I²S, MIL-STD-1553B, SENT, and Manchester are supported.

Hardware-based High-Speed Mask Test Function

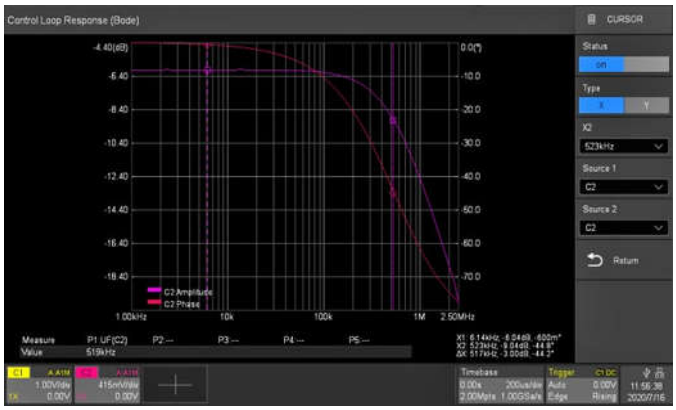


The oscilloscope utilizes a hardware-based Mask Test function, performing up to 28,000 Pass/Fail decisions each second. It is easy to generate user-defined test templates to provide trace mask comparisons, making it suitable for long-term signal monitoring or automated production line testing.



Built-in Mask Editor application helps to create custom masks.

Bode Plot



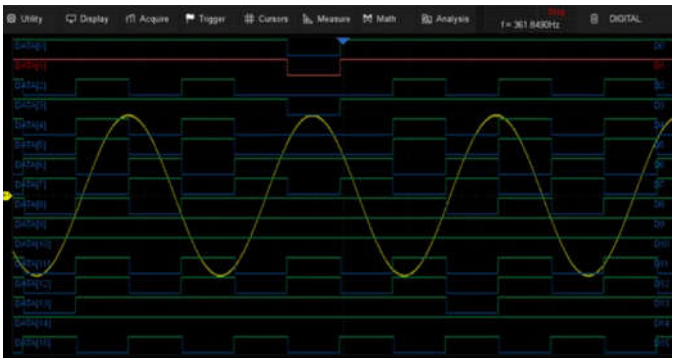
The oscilloscope can control the built-in waveform generator or a stand-alone Teledyne Test Tool generator, to scan the amplitude and phase-frequency response of the DUT, and display the data as a Bode Plot. This makes it possible to replace expensive network analyzers in some applications.

Power Analysis



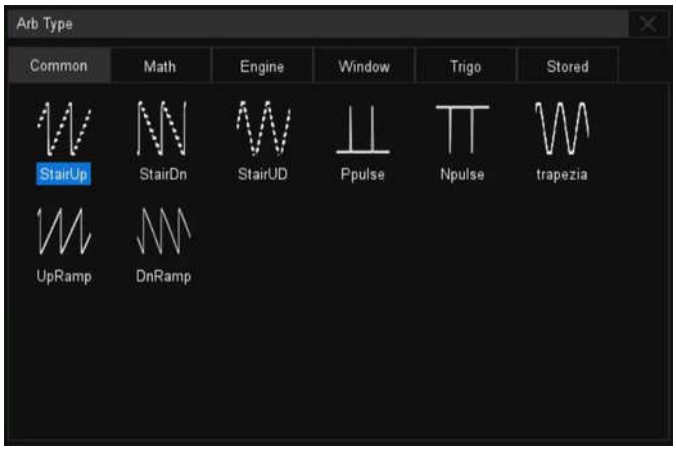
The Power Analysis option provides a full suite of power measurements and analysis, which greatly improve the measurement efficiency in switching power supplies and power devices design.

Digital Channels (T3DSO2000-LS)



Four analog channels plus 16 digital channels enable users to acquire and trigger the waveforms then analyze the pattern, simultaneously with one instrument.

50 MHz Waveform Generator (optional)



The 50 MHz waveform generator can output waveforms with up to 50 MHz frequency and ±3 V amplitude.
Six basic waveforms plus multiple types of arbitrary waveforms are built-in.



1x USB 2.0 Host, USB 3.0 Device (USBTMC), 1000M LAN ((VXI-11/Telnet/Socket/LXI)), External Triger In, Aux Out (Pass/Fail, Trigger Out)

9

SPECIFICATIONS

All specifications are not guaranteed unless the following conditions are met:

- The oscilloscope calibration period is current
- The oscilloscope has been working continuously for at least 30 minutes at the specified temperature (18 °C ~ 28 °C)

Acquire (analog)

Sample rate	4 GS/s (interleaving mode[1]), 2 GS/s (non-interleaving mode[2])
Memory depth[3] [4]	400 Mpts/ch (interleaving mode, single-channel), 200 Mpts/ch (interleaving mode, dual-channel), 100 Mpts/ch (non-interleaving mode)
Memory management mode	Auto, Fixed sample rate, Fixed memory length
Waveform update rate	Normal mode: up to 200,000 wfm/s Sequence mode: up to 890,000 wfm/s
Intensity grading	256-level
Peak detect	0.5 ns
Average	4, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192
ERES	Enhanced bit: 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4 bits
Sequence	Up to 80,000 segments, interval between triggers = 1.12 µs min.
History	Up to 80,000 frames
Interpolation	sinx/x, x

[1] Interleaving mode: only one of C1/C2 and/or only one of C3/C4 activated
[2] Non-interleaving mode: both C1/C2 and/or both C3/C4 activated
[3] In Average and ERES modes, the memory depth is 20 Mpts/ch (interleaving mode), 10 Mpts/ch (non-interleaving mode)
[4] single-channel: only one channel is active; dual-channel: one of C1/C2 and one of C3/C4 activated

Model	T3DSO3024HD	T3DSO3034HD	T3DSO3054HD	T3DSO3104HD
Vertical (analog)				
Channel	4 + EXT			
Bandwidth (-3 dB) @ 50 Ω	200 MHz	350 MHz	500 MHz	Interleaving mode: 1 GHz Non-interleaving mode: 800 MHz
Rise time @ 50 Ω (typical)	1.7 ns	830 ps	610 ps	Interleaving mode: 450 ps Non-interleaving mode: 570 ps
Bandwidth (-3 dB) @ 1 MΩ	200 MHz	350 MHz	500 MHz	500 MHz
Bandwidth limit	Hardware Bandwidth limit: 20 MHz: 20 MHz (±20 %) 200 MHz: 200 MHz (±20 %)			
Resolution	12-bit			
ENOB[5] (typical)	8.7-bit	8.5-bit	8.4-bit	8.2-bit
Noise floor[6] (rms, @ 50 Ω, typical, 1 mV/div)	56 µV	70 µV	90 µV	125 µV
Range	8 divisions			

[5] 50 Ω input impedance, 50 mV/div, 4 GS/s, 24.9943 MHz/-1 dBFS input
[6] Use the Stdev (also known as ACrms) measurement

SPECIFICATIONS

Model	T3DSO3024HD	T3DSO3034HD	T3DSO3054HD	T3DSO3104HD
Vertical scale (probe 1X)	1 MΩ: 0.5 mV/div – 10 V/div 50 Ω: 0.5 mV/div – 1 V/div 1 MΩ: 0.5 mV/div – 10 V/div 2 µV/div – 10 V/div (Zoom mode) 50 Ω: 0.5 mV/div – 1 V/div 2 µV/div – 1 V/div (Zoom mode)			
DC gain accuracy	0.5 mV/div ~ 4.95 mV/div: ±1.5 %; 5 mV/div ~ 10 V/div: ±0.5 % typical, ±1.0 % maximum			
Offset accuracy	± (1 % of the offset setting + 0.5 % of full scale + 0.02 % maximum offset + 1 mV)			
Offset range (probe 1X)	**1 MΩ:** 0.5 mV/div ~ 5 mV/div: ±1.6 V; 5.1 mV/div ~ 10 mV/div: ±4 V; 10.2 mV/div ~ 20 mV/div: ±8 V; 20.5 mV/div ~ 100 mV/div: ±16 V; 102 mV/div ~ 200 mV/div: ±80 V; 205 mV/div ~ 1 V/div: ±160 V; 1.02 V/div ~ 10 V/div: ±400 V		**50 Ω:** 0.5 mV/div ~ 5 mV/div: ±1.6 V; 5.1 mV/div ~ 10 mV/div: ±4 V; 10.2 mV/div ~ 20 mV/div: ±8 V; 20.5 mV/div ~ 1 V/div: ±10 V;	
Low frequency response (AC coupling -3 dB)	6 Hz (typical)			
Overshoot (100 mV/div, 150 ps edge @ 50 Ω, typical)	3 %	7 %	10 %	18 %
Coupling	DC, AC, GND			
Impedance	1 MΩ: (1 MΩ ±2 %) || (15 pF ±3 pF) 50 Ω: 50 Ω ±1 %			
Max. input voltage	1 MΩ ≤ 400 Vpk (DC + AC), DC ~ 10 kHz 50 Ω ≤ 5 Vrms			
SFDR	≥ 45 dBc			
CH to CH Isolation (@ 50 Ω)	60 dB up to 200 MHz	60 dB up to 200 MHz 50 dB up to 350 MHz	60 dB up to 200 MHz 50 dB up to 500 MHz	60 dB up to 200 MHz 50 dB up to 500 MHz 40 dB up to 1 GHz
Probe Attenuation	1X, 10X, 100X, custom			

Horizontal

Time scale	1 ns/div – 1000 s/div	1 ns/div – 1000 s/div	500 ps/div – 1000s/div	200 ps/div – 1000s/div
Range	10 divisions			
Display mode	Y-T, X-Y, Roll			
Roll mode	≥ 50 ms/div			
Skew (C1 ~ C4)	< 100 ps			
Time base Accuracy	±2 ppm initial (0 ~ 50 °C); ±0.5 ppm 1st year aging; ±3 ppm 20-year aging			

Trigger

Mode	Auto, Normal, Single
Level	Internal: ±4.1 div from the center of the screen EXT: ± 0.61 V EXT/5: ± 3.05 V
Ext Trigger input voltage	1 MΩ ≤ 42 Vpk 50 Ω ≤ 5 Vrms
Hold off range	By time: 8 ns ~ 30 s (8 ns step) By event: 1 ~ 10^8
Coupling	**C1 ~ C4** DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 15 Hz LFRJ: Attenuates the frequency components below 2.4 MHz HFRJ: Attenuates the frequency components above 1.3 MHz Noise RJ: Increases the trigger hysteresis **EXT** DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 18 Hz LFRJ: Attenuates the frequency components below 7.5 kHz HFRJ: Attenuates the frequency components above 250 kHz
Accuracy (typical)	C1 ~ C4: ±0.2 div EXT: ±0.3 div

Sensitivity		**Noise RJ = OFF**	**Noise RJ = ON**
	CH1 ~ CH4: >10 mV/div:	±0.26 div	±0.33 div
	5 mV/div ~ 10 mV/div:	±0.26 div	±0.33 div
	≤ 2 mV/div:	±0.5 div	±0.5 div
	EXT: 200 mVpp, DC ~ 10 MHz 300 mVpp, 10 MHz ~ bandwidth (300 MHz)		
	EXT/5: 1 Vpp, DC ~ 10 MHz 1.5 Vpp, 10 MHz ~ bandwidth (300 MHz)		

Jitter	C1 ~ C4: < 10 ps rms (typical), ≥ 6 div Vpp sine, 2.5 mV/div ~ 10 V/div EXT: < 200 ps rms
Displacement	Pre-Trigger: 0 ~ 100 % memory Delay-Trigger: 0 ~ 10,000 div
Zone	Up to 2 zones Source: C1~C4 Property: Intersect, Not Intersect
Edge Trigger	
Source	C1 ~ C4 / EXT / (EXT/5) / AC Line / D0 ~ D15
Slope	Rising, Falling, Rising & Falling
Slope Trigger	
Source	C1 ~ C4
Slope	Rising, Falling
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Pulse Width Trigger	
Source	C1 ~ C4 / D0 ~ D15
Polarity	+width, -width
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns

Video Trigger	
Source	C1 ~ C4
Standard	NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, 1080i/60, Custom
Synchronization	Any, Select
Trigger Condition	Line, Field
Window Trigger	
Source	C1 ~ C4
Window type	Absolute, Relative
Interval Trigger	
Source	C1 ~ C4 / D0 ~ D15
Slope	Rising, Falling
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Dropout Trigger	
Source	C1 ~ C4 / D0 ~ D15
Timeout type	Edge, State
Slope	Rising, Falling
Time range	2 ns ~ 20 s, Resolution = 1 ns
Runt Trigger	
Source	C1 ~ C4
Polarity	Positive, Negative
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Pattern Trigger	
Source	C1 ~ C4 / D0 ~ D15
Pattern Setting	Don't Care, Low, High
Logic	AND, OR, NAND, NOR
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Qualified Trigger	
Type	State, State with Delay, Edge, Edge with Delay
Qualified Source	C1 ~ C4 / D0 ~ D15
Edge Trigger Source	C1 ~ C4 / D0 ~ D15
Nth Edge Trigger	
Source	C1 ~ C4 / D0 ~ D15
Slope	Rising, Falling
Idle time	8 ns ~ 20 s, Resolution = 1 ns
Edge Number	1 ~ 65535
Delay Trigger	
Source A	C1 ~ C4 / D0 ~ D15
Source B	C1 ~ C4 / D0 ~ D15
Slope	Rising, Falling
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns

Serial Trigger	
Source	C1 ~ C4 / D0 ~ D15
Protocol	I²C, SPI, UART, CAN, LIN, CAN FD, FlexRay, I²S, MIL-STD-1553B, SENT, ARINC429
I²C	Type: Start, Stop, Restart, No Ack, EEPROM, Address & Data, Data Length
SPI	Type: Data
UART	Type: Start, Stop, Data, Parity Error
CAN	Type: All, Remote, ID, ID+Data, Error
LIN	Type: Break, Frame ID, ID+Data, Error
CAN FD	Type: Start, Remote, ID, ID+Data, Error
FlexRay	Type: TSS, Frame, Symbol, Errors
I²S	Type: Data, Mute, Clip, Glitch, Rising Edge, Falling Edge
MIL-STD-1553B	Type: Transfer, Word, Error, Timing
SENT	Type: Start, Slow channel, Fast channel, Error
ARINC429	Type: Word Start, Word End, Label, Label + Data, Error, Any Bit, Any Bit of 0, Any Bit of 1

Serial Decoder

Decoders	2
Threshold	-4.1 ~ 4.1 div
List	1 ~ 7 lines
Decoder type	Full duplex
I²C	
Source	C1 ~ C4 / D0 ~ D15
Signal	SCL, SDA
Address	7-bit, 10-bit
SPI	
Source	C1 ~ C4 / D0 ~ D15
Signal	CLK, MISO, MOSI, CS
Edge Select	Rising, Falling
Chip select	Active high, Active low, Clock timeout
Bit Order	LSB, MSB
UART	
Source	C1 ~ C4 / D0 ~ D15
Signal	RX, TX
Data Width	5-bit, 6-bit, 7-bit, 8-bit
Parity Check	None, Odd, Even, Mark, Space
Stop Bit	1-bit, 1.5-bit, 2-bit
Idle Level	Low, High
Bit Order	LSB, MSB
CAN	
Source	C1 ~ C4 / D0 ~ D15
LIN	
LIN Version	Ver 1.3, Ver 2.0
Source	C1 ~ C4 / D0 ~ D15
Baud Rate	600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, Custom

CAN FD	
Source	C1 ~ C4 / D0 ~ D15
Nominal Baud Rate	10 kbps, 25 kbps, 50 kbps, 100 kbps, 250 kbps, 1 Mbps, Custom
Data Baud Rate	500 kbps, 1 Mbps, 2 Mbps, 5 Mbps, 8 Mbps, 10 Mbps, Custom
FlexRay	
Source	C1 ~ C4 / D0 ~ D15
Baud Rate	2.5 Mbps, 5 Mbps, 10 Mbps, Custom
I²S	
Source	C1 ~ C4 / D0 ~ D15
Signal	BCLK, WS, DATA
Audio Variant	Audio-I²S, Audio-LJ, Audio-RJ
Start Bits	0 ~ 31
Data Bits	1 ~ 32
MIL-STD-1553B	
Source	C1 ~ C4
SENT	
Source	C1 ~ C4 / D0 ~ D15
Manchester	
Source	C1 ~ C4
Baud Rate	500 bps ~ 5 Mbps
ARINC429	
Source	C1 ~ C4
Baud Rate	12.5 kbps ~ 100 kbps, tolerance 1 % ~ 20 %
Word format	L/SDI/D/SSM, L/D/SSM, L/D

Math

Trace	F1 ~ F4
Source	C1 ~ C4, M1 ~ M4, F1 ~ F4, Zoom traces
Operation	FFT, +, -, x, ÷, ∫dt, d/dt, √, Identity, Negation, |x|, Sign, ex, 10x, ln, lg, Interpolation, Max hold, Min hold, ERES, Average, Filter, Formula Editor
FFT	Length: 4 Mpts, 2 Mpts, 1 Mpts, 512 kpts, 256 kpts, 128 kpts, 64 kpts, 32 kpts, 16 kpts, 8 kpts, 4 kpts, 2 kpts Window: Rectangular, Blackman, Hanning, Hamming, Flattop Display: Full Screen, Split, Exclusive Mode: Normal, Max hold, Average Tools: Peaks, Markers

Analysis

Search	
Source	C1 ~ C4, History
Mode	Edge, Slope, Pulse, Interval, Runt
Copy setting	Copy from trigger, Copy to trigger
Navigate	
Type	Search event, Time, History frame
Mask Test	
Source	C1 ~ C4, Z1 ~ Z4
Mask creating	Auto (Create mask), Customized (Mask Editor)
Mask test speed	Up to 28,000 frames/s

DVM	
Source	C1 ~ C4
Mode	DC mean, DC RMS, AC RMS, Peak-peak, Amplitude
Plot	Bar, Histogram, Trend
Gate	20 ms
Bode Plot	
Source	C1 ~ C4
Supported signal sources	SAG1021I (Connection: USB), SDG series waveform generators (Connection: USB, LAN)
Sweep type	Simple, Vari-level
Frequency	Mode: Linear, Logarithmic Range: 10 Hz ~ 120 MHz
Measure	Upper cutoff frequency, Lower cutoff frequency, Bandwidth, Gain margin, Phase margin
Power Analysis	
Measure	Power quality, Current Harmonics, Inrush current, Switching loss, Slew rate, Modulation, Output ripple, Turn on/turn off, Transient response, PSRR, Efficiency, SOA
Histogram	
Source	C1 ~ C4
Type	Horizontal, Vertical, Both
Counter	
Source	C1 ~ C4
Frequency resolution	7 digits
Totalizer	Counter on edges, supports Gate and Trigger

Digital Channels (optional)

Max. Sampling Rate	1 GS/s
Memory Depth	100 Mpts/ch
Min. Detectable Pulse Width	3.3 ns
Level Group	D0 ~ D7, D8 ~ D15
Level Range	-10 V ~ 10 V
Logic Type	TTL, CMOS, LVCMOS3.3, LVCMOS2.5, Custom
Skew	D0 ~ D15: ±1 sampling interval Digital to Analog: ± (1 sampling interval +1 ns)

USB AWG Module (optional)

Channels	1
Max. Output Frequency	50 MHz
Sampling Rate	125 MS/s
Frequency Resolution	1 μHz
Frequency Accuracy	±50 ppm
Vertical Resolution	14 bit
Amplitude Range	-1.5 V ~ +1.5 V (into 50 Ω) -3 V ~ +3 V (into High-Z)
Waveforms	Sine, Square, Ramp, Pulse, DC, Noise, 45 Arbitrary
Output Impedance	50 Ω ± 2 %
Protection	Over voltage protection, Current limit
Isolated voltage	±42 Vpk

Sine	
Frequency	1 μHz ~ 50 MHz
Offset accuracy (10 kHz)	±(1 % * offset setting value +3 mVpp)
Amplitude flatness	±0.3 dB, compare to 10 kHz, 2.5 Vpp into 50 Ω
SFDR	DC ~ 1 MHz -60 dBc 1 MHz ~ 5 MHz -55 dBc 5 MHz ~ 25 MHz -50 dBc
Harmonic distortion	DC ~ 5 MHz -50 dBc 5 MHz ~ 25 MHz -45 dBc
Square/Pulse	
Frequency	1 μHz ~ 10 MHz
Duty cycle	1 % ~ 99 %
Edge	< 24 ns (10 % ~ 90 %)
Overshoot	< 3 % (typical, 1 kHz, 1 Vpp)
Pulse width	> 50 ns
Jitter (cycle-cycle)	< 500 ps + 10 ppm
Ramp	
Frequency	1 μHz ~ 300 kHz
Linearity	< 0.1 % of Pk-Pk (typical, 1 kHz, 1 Vpp, 50 % symmetry)
Channels	0 % ~ 100 %
DC	
Offset range	±1.5 V (into 50 Ω)
Accuracy	±3 V (into Hi-Z)
Noise	
Bandwidth (-3 dB)	>50 MHz
Arbitrary Wave	
Frequency	1 μHz ~ 5 MHz
Waveform memory	16 kpts
Sample rate	125 MS/s
Wave import	From EasyWaveX, from U-disk, directly from waveform data of analog channels

I/O

Front	USB 3.0 Host x2, Calibration Signal: 1 kHz, 3 V Square
Rear	USB 2.0 Host, USB 3.0 Device, LAN: 10/100/1000M (RJ45), External Trigger, EXT: ≤1.5 Vrms, EXT/5: ≤ 7.5 Vrms, Auxiliary Output: TRIG OUT(3.3 V LVCMOS), PASS/FAIL OUT(3.3 V TTL)

Display

Display Type	10.1 TFT LCD with capacitive touch screen
Resolution	1024 × 600
Contrast (typical)	500:1
Backlight (typical)	500 nit

SPECIFICATIONS

Display Setting

Range	8 x 10 grid
Display Type	Dot, Vector
Persistence Time	OFF, 0.1 s, 0.2 s, 0.5 s, 1 s, 5 s, 10 s, 30 s, infinite
Color Display	Normal, Color; Supports customer trace color
Language	Simplified Chinese, Traditional Chinese, English, French, Japanese, German, Spanish, Russian, Italian, Portuguese
Built-in Help System	Simplified Chinese, English

Environmental

Temperature	Operating: 0 °C ~ 50 °C Non-operating: -30 °C ~ 70 °C		
Humidity	Operating: 5 % ~ 90 % RH up to 30 °C, derates linearly to 50 % RH at 50 °C Non-operating: 5 % ~ 95 %		
Altitude	Operating: ≤ 3,000 m, 25 °C Non-operating: ≤15,000 m		
Electromagnetic Compatibility	Meets EMC directive (2014/30/EU), meets or exceeds EN IEC 61326-1:2021, EN IEC 61326-2-1:2021 (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 (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	TUV Certified. Conforms to: UL 61010-1:2012/R: 2018-11; UL 61010-2-030:2018 CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11; CAN/CSA-C22.2 No. 61010-2-030:2018 Meets Low Voltage Directive (2014/35/EU). Conforms to: EN 61010-1:2010+A1:2019; EN IEC 61010-2-030:2021		
RoHS	EU 2015/863		

Power Supply

Input Voltage & Frequency	100 ~ 240 Vrms 50/60 Hz
Power consumption	120 W max., 80 W typical, 4 W typical in standby mode

Mechanical

Dimensions	Length × Height × Width = 317.2 mm × 236.0 mm × 149.0 mm (including knobs and supporting legs)
Weight	Net Weight 4.1 kg, Gross Weight 5.6 kg

All T3DSO3000HD Series Oscilloscopes come with a 3 year Teledyne LeCroy warranty.

ORDERING INFORMATION

T3DSO3000HD Series Probes

Probe type	Model	Picture	Description
Passive	**PP026-1**		500 MHz bandwidth, 10 MΩ, 10X Probe, 1 supplied per channel. Replacement probe for the T3DS3000HD Series Oscilloscope.
Logic Probe	**T3DSO2000-LS**		Optional 16 Channel Logic Probe.
USB AWG Module	**T3DSO-FGMOD**		Output Sine, Square, Ramp, pulse, Noise, DC and 45 built-in waveforms. The arbitrary waveforms can be accessed and edited by the EasyScope PC software
Rackmount	**T3DSOHD-RACK**		The rackmount occupies a height of 5U. Support the oscilloscope for rack installation.
Soft Case	**WS4KHD-SOFTCASE**		Oscilloscope Soft Carrying Case.

Ordering information

Description	12-bit, 200 MHz, 4 GS/s, 4-CH, 400 Mpts/ch memory depth, 10.1" capacitive touch screen	**T3DSO3024HD**
	12-bit, 350 MHz, 4 GS/s, 4-CH, 400 Mpts/ch memory depth, 10.1" capacitive touch screen	**T3DSO3034HD**
	12-bit, 500 MHz, 4 GS/s, 4-CH, 400 Mpts/ch memory depth, 10.1" capacitive touch screen	**T3DSO3054HD**
	12-bit, 1 GHz, 4 GS/s, 4-CH, 400 Mpts/ch memory depth, 10.1" capacitive touch screen	**T3DSO3104HD**
Standard Accessories	Passive Probe x 4	
	USB Cable	
	Power Cord	
	Wireless mouse	
	Quick Start Guide	
	Certificate of Calibration	
Optional Accessories	16 Channel MSO Probe	**T3DSO2000-LS**
	500 MHz Passive Probe, 10:1, 10 MΩ	**PP026-1**
	USB AWG Module	**T3DSO-FGMOD**
	Rackmount	**T3DSOHD-RACK**
	Soft Case	**WS4KHD-SOFTCASE**

ABOUT TELEDYNE TEST TOOLS

TELEDYNE TEST TOOLS
Everywhereyoulook™

Company Profile

Teledyne LeCroy is a leading provider of oscilloscopes, protocol analyzers and related test and measurement solutions that enable companies across a wide range of industries to design and test electronic devices of all types. Since our founding in 1964, we have focused on creating products that improve productivity by helping engineers resolve design issues faster and more effectively. Oscilloscopes are tools used by designers and engineers to measure and analyze complex electronic signals in order to develop high-performance systems and to validate electronic designs in order to improve time to market.

The Teledyne Test Tools brand extends the Teledyne LeCroy product portfolio with a comprehensive range of test equipment solutions. This new range of products delivers a broad range of quality test solutions that enable engineers to rapidly validate product and design and reduce time-to-market. Designers, engineers and educators rely on Teledyne Test Tools solutions to meet their most challenging needs for testing, education and electronics validation.

Location and Facilities

Headquartered in Chestnut Ridge, New York, Teledyne Test Tools and Teledyne LeCroy has sales, service and development subsidiaries in the US and throughout Europe and Asia. Teledyne Test Tools and Teledyne LeCroy products are employed across a wide variety of industries, including semiconductor, computer, consumer electronics, education, military/aerospace, automotive/industrial, and telecommunications.

Distributed by:

Teledyne LeCroy (US Headquarters)

700 Chestnut Ridge Road
Chestnut Ridge, NY. USA 10977-6499

Phone: 800-553-2769 or 845-425-2000
Fax Sales: 845-578-5985
Phone Support: 1-800-553-2769
Email Sales: contact.corp@teledynelecroy.com
Email Support: support@teledynelecroy.com
Web Site: http://teledynelecroy.com/

Teledyne LeCroy (European Headquarters)

Teledyne GmbH
Im Breitspiel 11c
D-69126 Heidelberg, Germany

Phone: +49 6221 82700
Fax: +49 6221 834655
Phone Service: +49 6221 8270 85
Phone Support: +49 6221 8270 28
Email Sales: contact.gmbh@teledynelecroy.com
Email Service: service.gmbh@teledynelecroy.com
Email Support: support@teledynelecroy.com
Web Site: http://teledynelecroy.com/germany

World wide support contacts can be found at:
https://teledynelecroy.com/support/contact/#

© 2024 Teledyne Test Tools is a brand and trademark of Teledyne LeCroy Inc. All rights reserved. Specifications, prices, availability and delivery subject to change without notice. Product brand or brand names are trademarks or requested trademarks of their respective holders.

T3 stands for Teledyne Test Tools.

23oct24