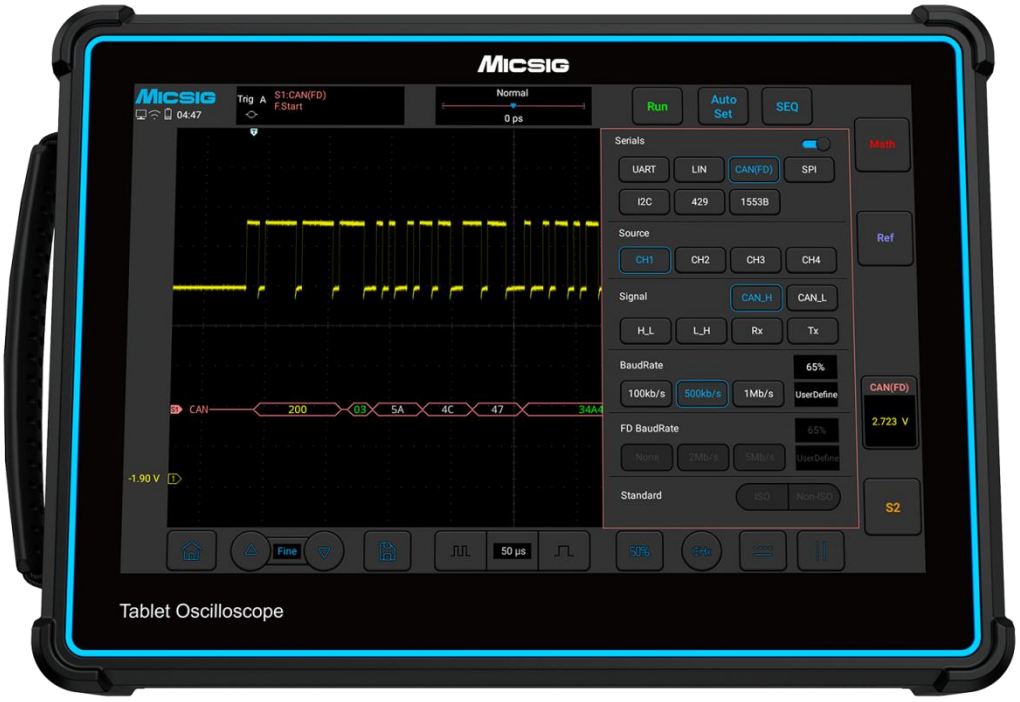
Tablet Oscilloscope TO Series

Data Sheet



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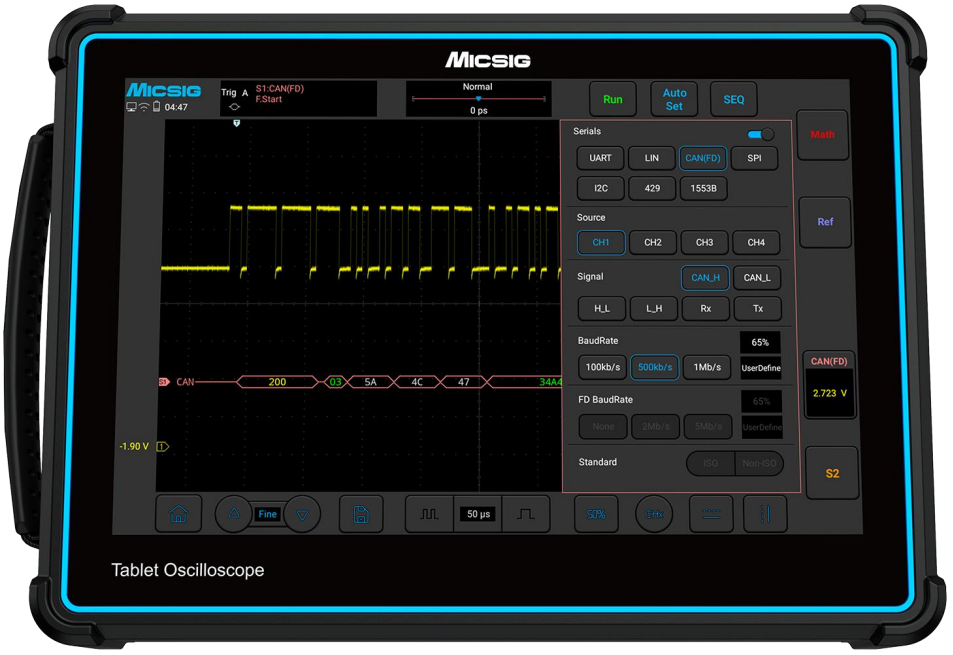
Overview

The TO series Tablet Oscilloscope features 2&4 analog channels, up to 300MHz bandwidth, 2GSa/s sampling rate and max. 220Mpts memory depth, running with Micsig latest SigtestUI™ multitasking system, make sure long-time stable and smooth performance. 10.1-inch integrated full touch screen with 1280 x 800 high resolution, combined with Micsig's over 10 years of experience in touch control algorithms, the TO series brings touch experience to another level.

The TO series Tablet Oscilloscope comes in a compact form factor, making it a go-to oscilloscope for electronic debug and test, integrates comprehensive measurement and mathematical functions, supports serial bus triggering and decoding, also equipped with hardware digital filtering modules and other functions. Powered by built-in battery, it helps engineers work where they work.



Key Specifications

Model	TO3004	TO2004	TO2002	TO1004
Bandwidth	300MHz	200MHz	200MHz	100MHz
Analog channels	4	4	2	4
Rise time	≤1.16ns	≤1.75ns	≤1.75ns	≤3.5ns
Max. Sampling rate	2GSa/s	2GSa/s	1GSa/s	1GSa/s
Max. Memory depth	220Mpts	220Mpts	110Mpts	110Mpts
Waveform capture rate	300,000 wfms/s	300,000 wfms/s	78,000 wfms/s	78,000 wfms/s
Bus decoding	RS-232/422/485/UART, CAN, CAN FD, LIN, SPI, I²C			
Input impedance	1MΩ/50Ω		1MΩ	
Interfaces	Wi-Fi, USB 3.0/2.0 Host, USB Type-C, Grounding, HDMI, Trigger out			
Vertical resolution	8 bits			
Storage	32G			
Display	10.1 Inch LCD capacitive touch display，1280*800 resolution，11*10 grids			
Size/Net weight	265*192*50mm / 1.9kg（with battery）			
Battery	7.4V, 7500mAh Li-Ion battery			

Product Features

Wi-Fi

Rugged & Compact Design
ABS+TPU rubber protector, TPE side handle, weighs only 1.9KG

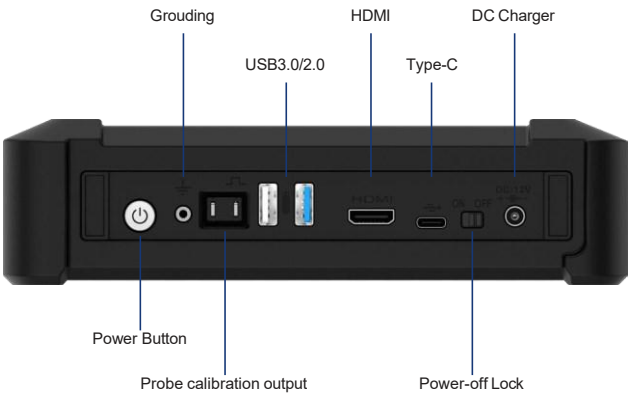
Superior Touch Experience
10.1 inch, 1280 x 800 pixels, upgraded seamless TFT LCD screen

Robust Hardware
Upgraded core hardware, faster CPU, 32GB ROM support video recording and large file storage

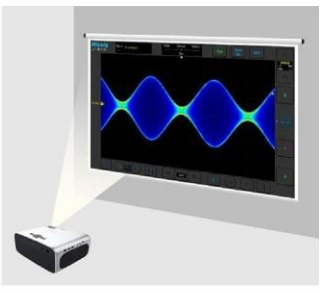
Intuitive User Interfaces
Android-based OS, impressive UI interactions

Standard Protocol Decoding
RS-232/422/485/UART、CAN、CAN FD、LIN、SPI、I²C

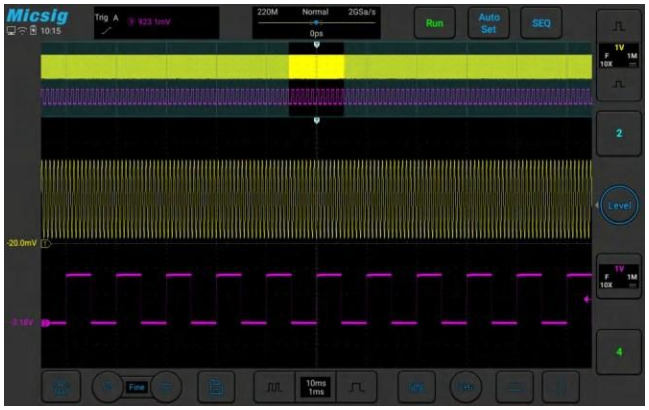
- Built-in 7500mAh Li-ion battery, Support Power-off lock, more secure to travel with.



- Power button, Grounding plug, Probe Calibration Output, USB3.0/2.0, HDMI, Type-C, Power Supply, Power-off Lock (Note: switch to ON for first-time use)

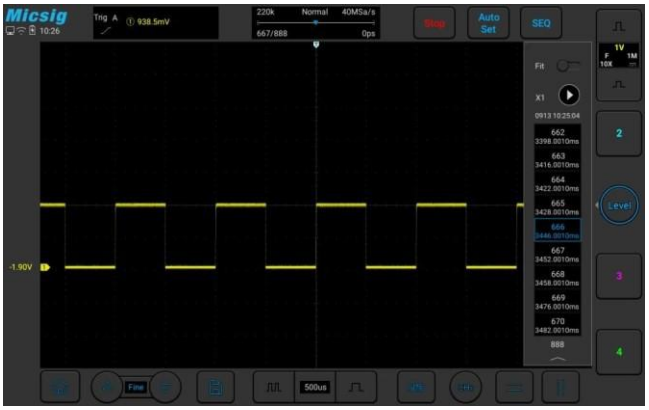


- The TO series supports PC software + Mobile App (Android / iOS) remote control via Wi-Fi, USB, able to access internet for online upgrade, it also can be projected through HDMI port for demonstrations for training and education purpose.



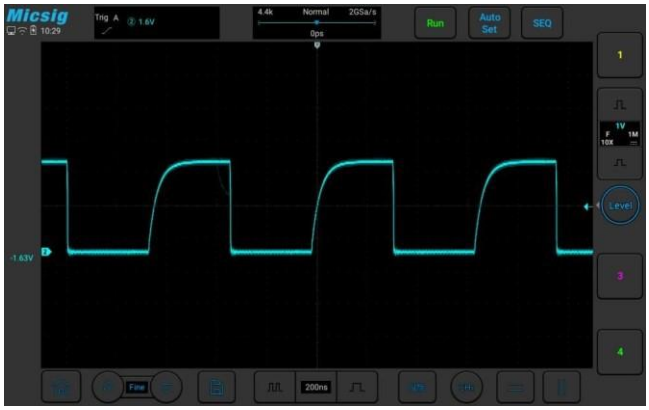
Ultra Memory Depth

Using hardware-based Zoom technique and memory depth of up to 220Mpts, allow users to move and browse waveforms much easier and quickly zoom in/out to interested events.



Segmented Storage Acquisition

Up to 10,000 waveform events can be captured for efficient analysis, helping users to capture occasional signals and more optimally save the data required. (Only available on TO3004/TO2004)

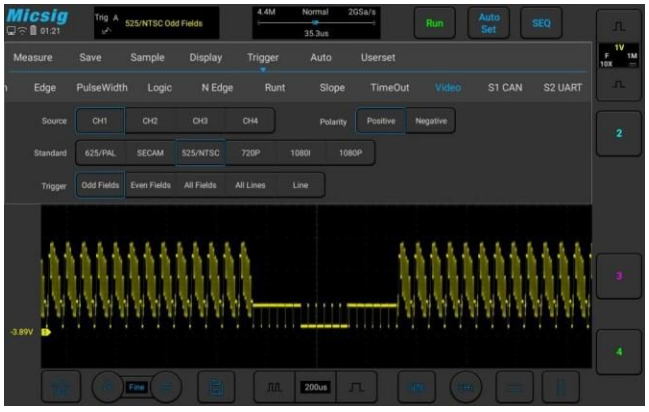


High Waveform Update Rate

Up to 300,000 wfms/s update rate, the TO series can easily capture unusual or low probability events.

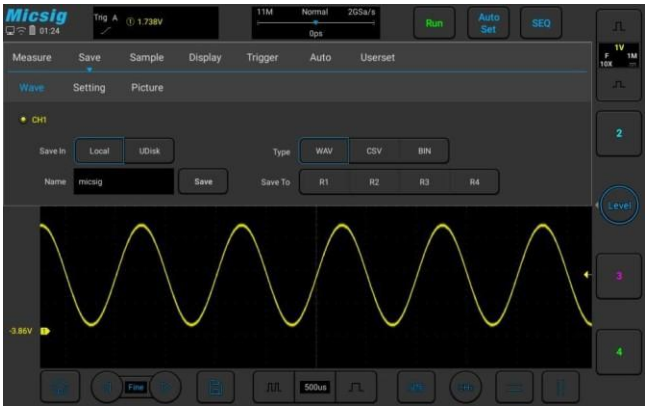
Serial Bus Decoding and Analysis

Support RS-232/422/485/UART, LIN, CAN, CAN FD, I²C, SPI hardware-based serial bus decoding and triggering, display waveform and data at the same time.



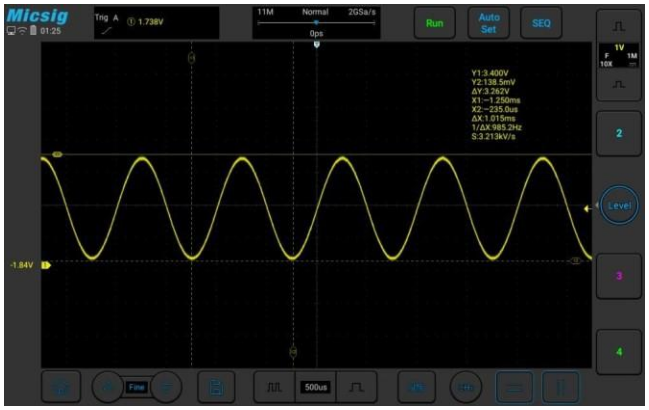
Powerful Trigger Functions

Support Edge, Pulse, Logic, N Edge, Runt, Slope, Timeout, Video and Serial trigger, most intuitive trigger settings, fast and easy trigger source switching.



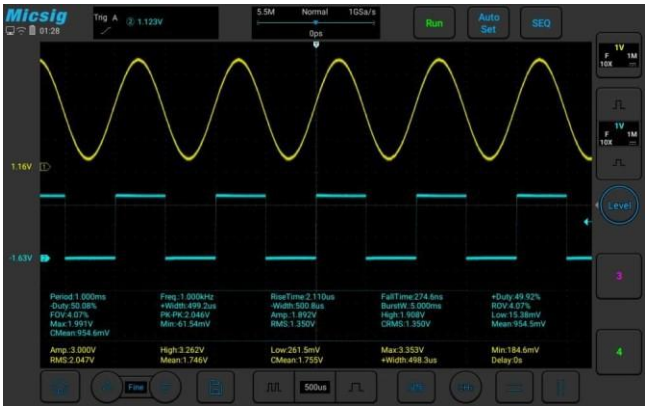
Fast Storage Function

Micsig's unique fast storage function allow users quickly save waveforms with one press, a full screen of 220M waveform data can be completely saved in BIN format. More than 70% faster than traditional oscilloscopes.



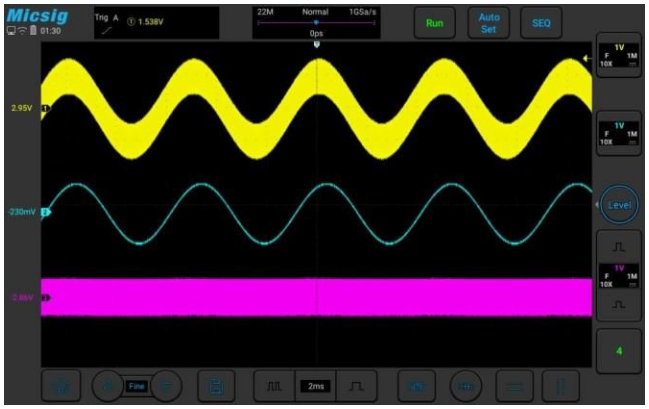
Convenient Cursor Measurements

One touch to open horizontal and vertical cursors, each cursor can be moved separately or simultaneously, brings unmatched user experience.



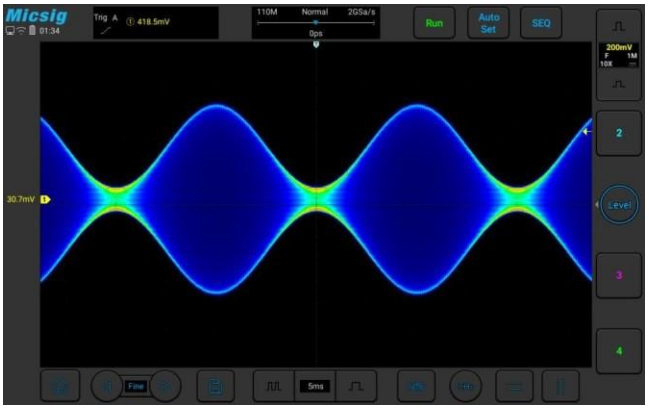
31 Auto Measurements

All 31 types of automatic measurements can be displayed on one screen, one touch to clear, the best auto measurement on the market.



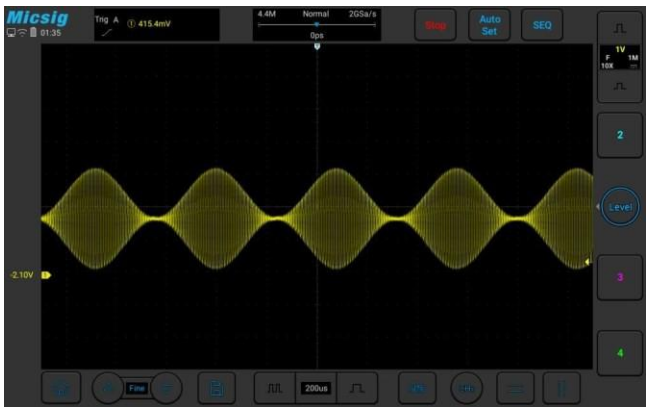
Hardware Digital Filtering

The TO series high pass / low pass filter function helps engineers rule out insignificant frequency so to eliminate interference, and observe the true state of the signal.



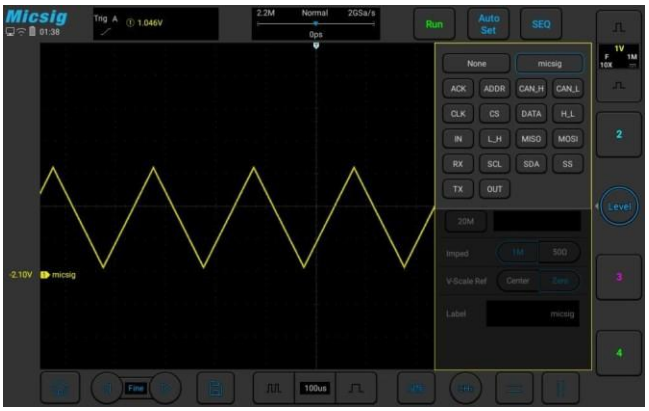
Color Temperature Display

The Color temperature display is similar to the intensity-graded trace function, but the trace occurrence is represented by different colors as opposed to changes in the intensity of one color. Red colors represent more frequently occurred events, while the bule represents less frequently ones.



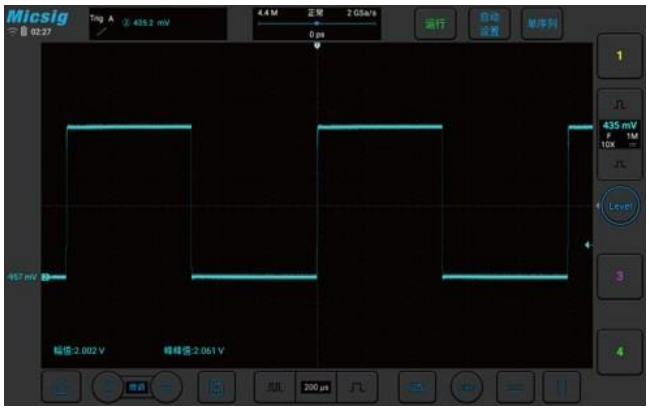
256-Level Intensity Grading

The TO series has digital fluorescent display, the resulting intensity-graded trace is brighter for events that occur with more frequency and dims when the events occur with less frequency.



User Defined Channel Label

Users can set different labels for different sources to facilitate observation and readout.

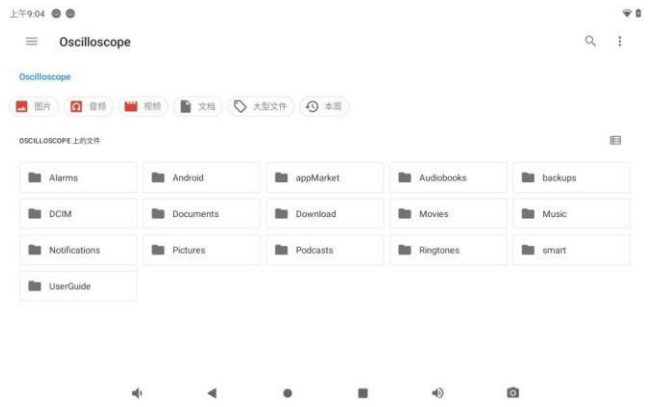


Vertical scale fining

By pinching two fingers apart on the screen, you can adjust the vertical scale as you like, no longer limited by the 1/2/5 step limit.

Statistics Function

Using statistics to read the current measurement item multiple times, monitor the change trend, the maximum number of readings can reach 10,000.



Large 32GB Internal Storage

With 32G large storage, user can wirelessly access/view mass files like pictures, videos via PC or mobile phone.

Android Operation System

With industry-first Android based OS, the TO series provides excellent user experience and promising applications.

Recommended Options

Handbag & Suitcase	
Special Handbag	Black nylon canvas, suitable for all Micsig oscilloscopes
Current Probes	
High Frequency AC/DC Current Probe	Bandwidth: 50 / 100MHz, Range: 6A/30A, Accuracy: ±1%, BNC interface
Rogowski Coil AC Current Probe RCP500	Bandwidth: 15-300KHz, Range: 200mApk-500Apk, Accuracy: 1%, BNC interface
AC Current Probe ACP1000	Bandwidth: 10Hz-100KHz, Range: 0.1Apk-1000Apk, BNC interface
Low Frequency AC/DC Current Probe CP2100B	Bandwidth: DC~2.5MHz, Range: 10A/100A, BNC interface
Low Frequency AC/DC Current Probe CP2100A	Bandwidth: DC~800KHz, Range: 10A/100A, BNC interface
Voltage Probes	
High Voltage Differential Probe DP750-100 (EOL)	Bandwidth: 100MHz, Max. input differential voltage(DC+AC PK): 75V(50X), 750V(500X), Accuracy: ±2%, BNC interface
High Voltage Differential Probe DP series (EOL)	Bandwidth: 100MHz, 700V - 5600Vpk, Accuracy: ±2%, BNC interface
High Voltage Differential Probe MDP series	Bandwidth: 100MHz, 700V - 3000Vpk Accuracy: ±2%, BNC interface
SigOFIT™ optical-fiber isolated probe	Bandwidth: 100MHz - 1GHz, common mode voltage: 60kVpk, CMRR: DC -160dB.

Technical Parameters

Vertical system	
Invert	Support
Bandwidth filter	TO3004 / TO2004: 20MHz, high pass / low pass (to 30Hz) TO2002 / TO1004: 20MHz, high pass / low pass (to 30KHz)
Coupling	DC, AC, GND
Input Impedance and Accuracy	TO3004 / TO2004: 1MΩ±1% || 50Ω±1% TO2002 / TO1004: 1MΩ±1%
Vertical resolution	8 bits
Vertical scale factor	TO3004 / TO2004: 1mV/div~10V/div @ 1MΩ; 1mV/div~1V/div @ 50Ω TO2002 / TO1004: 1mV/div~10V/div @ 1MΩ
DC Gain accuracy	5mV/div ~10V/div: ≤ ±2.0% ≤ 2mV/div: ≤ ±3.0%
Vertical offset range(1MΩ/50Ω)	±2.5V(@probe 1X, ＜500mV/div), ±120V(@probe 1X, ≥ 500mV/div)
Noise floor	≤1.2mVpp (1mV/div, 1MΩ)
Probe Attenuation Ratio	1mX~10kX, 1-2-5 sequence
Max. input voltage	CAT I 300Vrms 400Vpk (1MΩ), 5Vrms (50Ω)
Channel isolation	＞40dB (≤100MHz), ＞35dB (＞100MHz)
Channel label	Support

Sampling System	TO3004 / TO2004	TO2002 / TO1004
Real-time sample rate	2G Sa/s (single CH), 1G Sa/s (all CHs)	1G Sa/s (single CH), 250M Sa/s (all CHs)
Memory depth (Max.)	220Mpts	110Mpts
Segmented storage	Support	Not support
Average	2,4,8,16,32,64,128,256	
Envelope	2,4,8,16,32,64,128,256,∞	

Horizontal system	
Horizontal scale	1ns/div~1ks/div（TO2002 / TO1004：2ns/div-1ks/div）
Time base accuracy	20ppm
Horizontal divisions	11 divs
Time base delay time range	-11 div ~ 11ks, resolution: 1 pixel

Trigger System	
Trigger mode	Auto, Normal, Single
Trigger level range (analog)	±5div from screen center, analog channel
Hold off range	200ns~10s
Trigger coupling and frequency (analog channel)	DC, AC(70Hz), low frequency (40KHz), high frequency (40KHz), noise (10MHz)
Trigger Types	Edge, Pulse Width, Logic, N Edge, Runt Pulse (Runt), Slope, Time Out, Video
Bus decoding	RS-232/422/485/UART, CAN, CAN FD, LIN, SPI, I^2C

Measurements	
Auto measurements	Period, Frequency, Rise Time, Fall Time, Delay, Positive Duty Cycle, Negative Duty Cycle, Positive Pulse Width, Negative Pulse Width, Burst Width, Positive Overshoot, Negative Overshoot, Phase, Peak-to-Peak, Amplitude, High, Low, Maximum, Minimum, RMS, Cycle RMS, Mean, Cycle Mean
Hardware frequency counter and resolution	Support each analog channel, 6bit, 2Hz~max. bandwidth, pk-pk > 0.8div
Cursor	Horizontal, vertical, cross
Cursor resolution	1 pixel

Math	
Dual waveform	+, -, *, /, Analog channel
FFT	Points: max. 275KdBVrms; Source: Analog channel; Resolution: Max 100Kpts Window: Rectangular, Hamming, Blackman, Hanning
AX+B	A: ±1k, Min. Resolution 1p or 4it B: ±1k, Resolution 1p or 5bit X: Analog channel
Advance math	Advanced input, including +, -, *, /, < , > , ≤, ≥, ==, !=, &&, ||, (,), !(, sqrt, abs, deg, rad, exp, diff, ln, sin, cos, tan, intg, lg, asin, acos, atan,

Waveform store	
Source	Analog channel, math channel
Storage location	Local (32G), USB
Waveform format	WAV, CSV, BIN
Storage quantity	Unlimited
Waveform rename	Support
Quick save	Support
Store number of user settings	10
Screen record	Support

Auto	
Auto configuration	Channel switch (threshold level can be set), Trigger source (max. signal, current)
Auto range	Vertical scale, horizontal scale, trigger level

Display	
LCD screen and resolution	10.1 inches, 1280*800 resolution, 11*10 Divisions
Waveform Update Rate	TO3004/TO2004 is 300,000 wfms/s; TO2002/TO1004 is 78,000 wfms/s
Grid Type	Full, Line, None, Cross
Brightness	Adjustable
Waveform Display	Line, Dot
Persistence	Auto, 10ms~10s, ∞
Waveform gray scale	256 Level
Color temperature display	Support

Interfaces	
USB3.0 Port	Support one USB storage device
USB2.0 Port	1, readable & writable
USB Type-C	1, readable & writable
DC Port	1, Supply power to oscillsocope
Probe calibration signal	1KHz, 2Vpk-pk
HDMI	HDMI 1.4
Wi-Fi	Support
Android/iOS Remote control application	Support

Others	
Battery	7.4V, 7500mAh Li-Ion Battery
Self-calibration	Support
Languages	English, Chinese, German, French, Czech, Korean, Spanish, Italian, etc
Factory information	Model, SN, Bandwidth, Serial Number, Version, Factory Date
Operating System	Android
Built-in app	App Store, Browser, Oscilloscope, Calendar, Clock, Gallery, Calculator, User Guide, Electronic Tools, File Manager

Power Supply	
Adapter input	100~240VAC, 50/60Hz
Power consumption	< 60W
Adapter output	12V DC, 5A（TO2002 / TO1004 is 12V DC, 4A）
Battery	7.4V, 7500mAh Li-ion battery

Environment	
Temperature	
Operating	0℃ ~ 45℃
Non-operating	-40℃ ~ 60℃
Humidity	
Operating	5% ~ 85%, 25℃
Non-operating	5% ~ 90%, 25℃
Altitude	
Operating	< 3000m
Non-operating	< 12000m

Physical Characteristics	
Dimensions (W x H x D)	265*192*50mm
Weight	Net: 1.9kg (with battery), Volum Weight: 4.5kg

Product Accessories

Model	Standard Accessories
TO2002 **TO1004** **TO2004** **TO3004**	Passive Probe （2CH: *2; 4CH: *4)
	Power cord *1
	Power adapter *1
	Battery *1
	Calibration Certificate *1
	User Guide *1

*TO2002 is 2CH oscilloscope and TO1004/2004/3004 is 4CH oscilloscope.

Professional Hand Carry Bag/ Hard Case Set	
Micsig Handbag set	Black, Nylon, Custominzed
Micsig Suitcase set	Impact, Vibration, Crush resistant, Dustproof, Moisture-proof, Customized

Optional Instruments	
DP700	High Voltage Differential Probe: 100MHz, 70V (20X) / 700V (200X), Accuracy: ±2% (Customizable 1% accuracy)
DP702	High Voltage Differential Probe: 200MHz, 70V (20X) / 700V (200X), Accuracy: ±2% (Customizable 1% accuracy)
DP1500	High Voltage Differential Probe: 100MHz, 150V (50X) / 1500V (500X), Accuracy: ±2% (Customizable 1% accuracy)
DP1502	High Voltage Differential Probe: 200MHz, 150V (50X) / 1500V (500X), Accuracy: ±2% (Customizable 1% accuracy)
DP3000	High Voltage Differential Probe: 100MHz, 300V (100X) / 3000V (1000X), Accuracy: ±2% (Customizable 1% accuracy)
DP3002	High Voltage Differential Probe: 200MHz, 300V (100X) / 3000V (1000X), Accuracy: ±2% (Customizable 1% accuracy)
DP7000	High Voltage Differential Probe: 100MHz, 700V (100X) / 7000V (1000X), Accuracy: ±2% (Customizable 1% accuracy)
DP7002	High Voltage Differential Probe: 200MHz, 700V (100X) / 7000V (1000X), Accuracy: ±2% (Customizable 1% accuracy)
CP3008	High Frequency AC / DC Current Probe: DC-8MHz, 300Arms, 500Apk, Output Sensitivity: 1V/10A, 1V/100A
CP3005	High Frequency AC / DC Current Probe: DC-5MHz, 300Arms, 500Apk, Output Sensitivity: 1V/10A, 1V/100A
CP1510	High Frequency AC / DC Current Probe: DC-10MHz, 150Arms, 300Apk, Output Sensitivity: 1V/10A, 1V/100A
CP1003B	High Frequency AC / DC Current Probe: DC-100MHz, 30Arms, 50Apk, Output Sensitivity: 1V/1A, 1V/10A
CP503B	High Frequency AC / DC Current Probe: DC-50MHz, 30Arms, 50Apk, Output Sensitivity: 1V/1A, 1V/10A
MOIP200P	SigOFIT Optical-fiber Isolated Probe: DC-200MHz, CMRR 180dB, DC Gain Accuracy 1%, 0dB/20dB Switch, Measure both differential and common-mode voltage
MOIP350P	SigOFIT Optical-fiber Isolated Probe: DC-350MHz, CMRR 180dB, DC Gain Accuracy 1%, 0dB/20dB Switch, Measure both differential and common-mode voltage
MOIP500P	SigOFIT Optical-fiber Isolated Probe: DC-500MHz, CMRR 180dB, DC Gain Accuracy 1%, 0dB/20dB Switch, Measure both differential and common-mode voltage
MOIP1000P	SigOFIT Optical-fiber Isolated Probe: DC-1GHz, CMRR 180dB, DC Gain Accuracy 1%, 0dB/20dB Switch, Measure both differential and common-mode voltage
RCP-XS Series	Rogowski AC Current Probe: Peak current12000Apk, coil cross-section φ1.6mm, coil circumference 80mm/200mm The coil's cross-sectional diameter, circumference, lead length, peak coil isolation voltage, and working temperature are all customizable.
RCP-S Series	Rogowski AC Current Probe: Peak current12000Apk, coil cross-section φ3.0mm, coil circumference 200mm/700mm The coil's cross-sectional diameter, circumference, lead length, peak coil isolation voltage, and working temperature are all customizable.
RCP-M Series	Rogowski AC Current Probe: Peak current12000Apk, coil cross-section φ4.5mm, coil circumference 200mm/700mm The coil's cross-sectional diameter, circumference, lead length, peak coil isolation voltage, and working temperature are all customizable.
RCP-L Series	Rogowski AC Current Probe: Peak current12000Apk, coil cross-section φ8.0mm, coil circumference 700mm The coil's cross-sectional diameter, circumference, lead length, peak coil isolation voltage, and working temperature are all customizable.
CP2100A	Low Frequency AC/DC Current Probe: DC-800kHz, Peak current 100Apk, Max. conductor diameter 13mm
CP2100B	Low Frequency AC/DC Current Probe: DC-2.5MHz, Peak current 100Apk, Max. conductor diameter 13mm

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