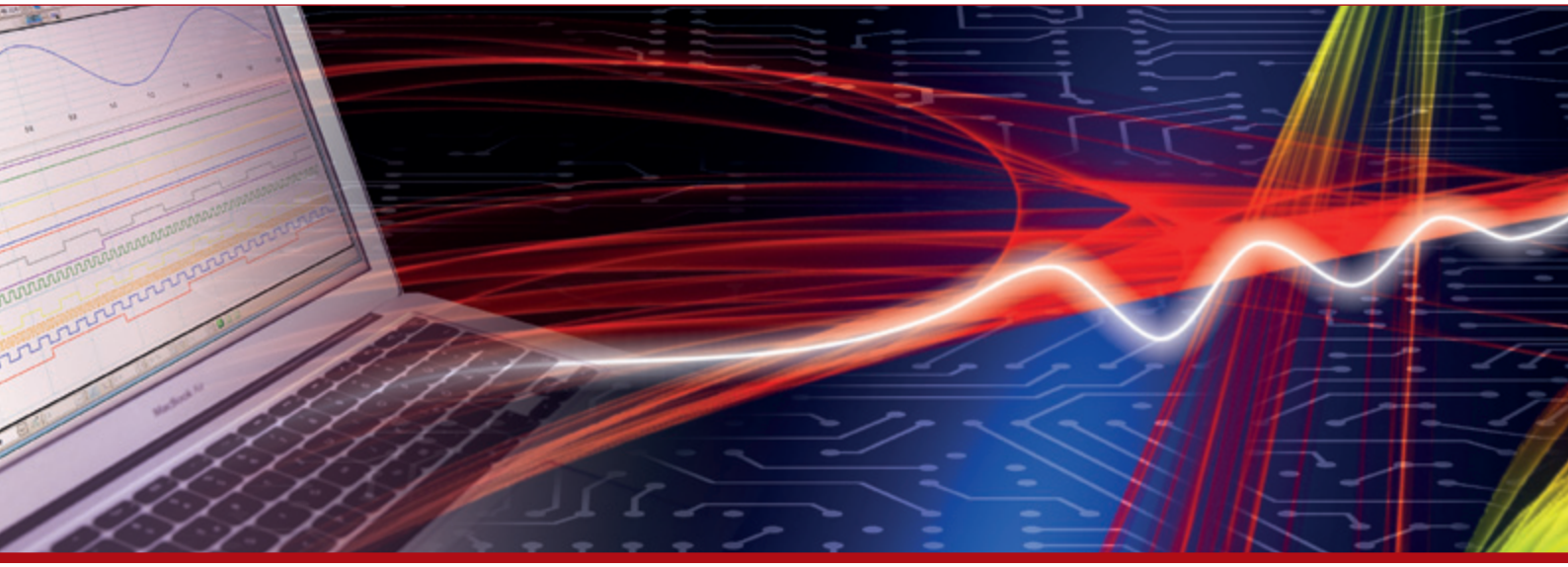
Product Datasheet - Technical Specifications



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High-resolution Table Oscilloscope

STO Series

100MHz *12bit* *1% DC Accuracy* *Large-capacity battery*

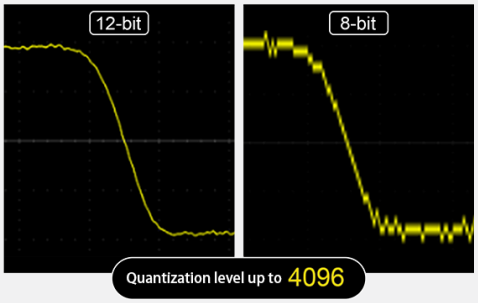
Product Overview

Micsig STO series is an ultra-portable professional-grade high-resolution oscilloscope, equipped with a 12-bit high-precision ADC, featuring a bandwidth of up to 100MHz, 4 analog channels, a real-time sampling rate of 1GSa/s, and a storage depth of 110Mpts. These high-performance parameters ensure that every measurement is accurate and provides a solid foundation for in-depth signal analysis. With a body thickness of only 3.1 cm, it can be easily placed in a backpack for efficient testing anytime, anywhere. It is equipped with an 8-inch high-definition anti-glare touch screen with a resolution of up to 1280*800, offering a delicate and clear picture and responsive touch, bringing users an ultimate operating experience.

Product Features

- 12-bit vertical resolution
- Optional 100MHz bandwidth
- DC gain accuracy ⩽ 1%
- Segmented storage function
- Advanced math and FFT function
- Simultaneous data saving on multi-channel
- Only 3.1cm thickness，small and compact
- Supports power lock for safer carrying
- Supports 6-digit hardware frequency counter
- 8" TFT LCD capacitive touch screen, 1280*800 pixels
- Large-capacity battery
- Support charging with power bank
- Mobile APP, PC remote control, SCPI commands
- Supports images, videos, waveform data, etc
- Standard decodes: RS-232/422/485/UART, CAN, CAN FD, LIN, SPI, I^2C, ARINC-429, MIL-STD-1553B
- Built-in electronic tools, electronic calculator, WPS office, ES file explorer, and other apps

12-bit vertical resolution



- STOseries has 12 bit high-resolution ADC with a quantization level of up to 4096, it's 16 times that of traditional 8-bit ADC, present unmatched waveform details.

Remote control

- STOseries support PC and smartphone remote control, also have HDMI port for demonstration purpose. Support SCPI programming commands control, helping engineers achieve automated measurements more flexibly and efficiently.

Excellent display

- 8-inch touch-integrated screen, 1280*800 resolution, providing a delicate and clear visual experience. Ultra-thin body, only 3.1cm thick, portable and beautiful, making each operation enjoyable.

Complete connectivity

- Standard USB 3.0 Host, Type-C, LAN, HDMI, calibration square wave output interface, Trigger out meet diverse connection needs, enhancing flexibility and convenience of test work. It also supports power lock for safer carrying.

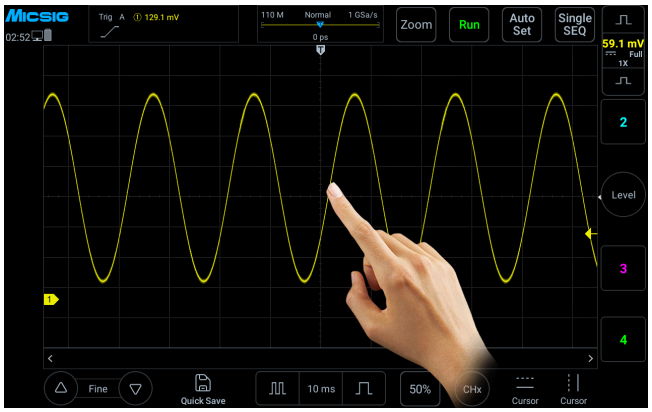
Built-in Battery for Ultimate Portability

- STO series features a soft rubber protective casing that not only offers a comfortable grip but also excellent protective capabilities. Equipped with a high-capacity, long-life lithium-ion battery, it can withstand over 1000 charge-discharge cycles.

Key Specifications

Model	STO1004
Bandwidth	100MHz
Rise Time	⩽ 3.5ns
Analog channels	4
Sampling rate	1GSa/s
Memory Depth	110Mpts
Maximum waveform capture rate	50,000 wfms/s
Vertical Resolution	12bit
Interfaces	USB 3.0 Host、USB Type-C、LAN、HDMI、Trigger out
Display	8" TFT LCD capacitive touch screen, 1280*800 pixels
Battery	3.7 V、16000mAh Lithium-ion battery
Charging	Standard DC 12V adapter, supports Type-C charging
Dimension / Net Weight	265*174*31mm (Width x Height x Thickness) / 1.68kg

Product Features

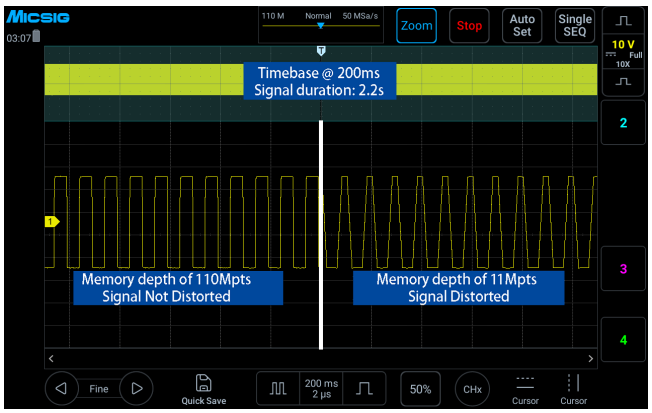


Smooth touch control

8'' full-touch integrated display, all operations can be completed by touch, more intuitive and efficient than ever before.

Diverse file saving

Users can save waveforms and measurement results as binary (BIN) or CSV format files for data analysis using Matlab or Excel. Also support saved as WAV format, direct open & analysis inside the oscilloscope. Additionally, user can save waveforms as images or record videos.

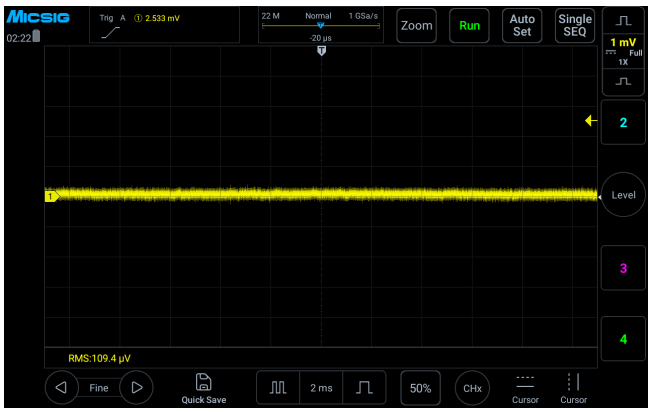


Deep memory

Insufficient memory depth often leads to distortion when long timebase signals were expanded. With memory depth of up to 110Mpts, there is no reduction in performance even with two channels opened at the same time. The signals will still maintain excellent fidelity even at long period of time.

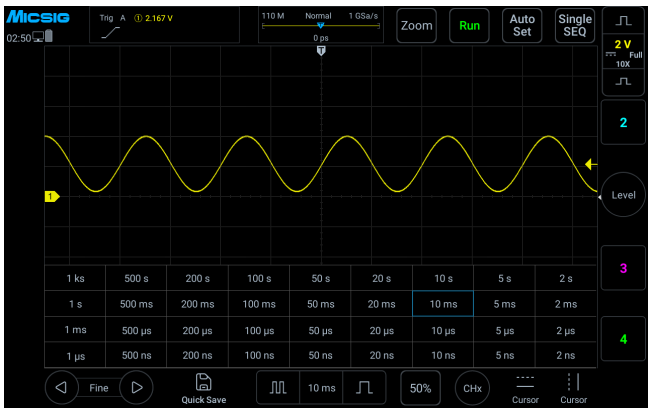
Segmented storage acquisition

Traditional Single acquisitions can only capture signals continuously,wasted storage depth when testing intermittent signals like laser pulses or serial buses, also difficult to trace back captured events. While the segmented storage acquisition can capture the target signal and allows to play back captured ones, effectively captures target signals multiple times over a long period of time.



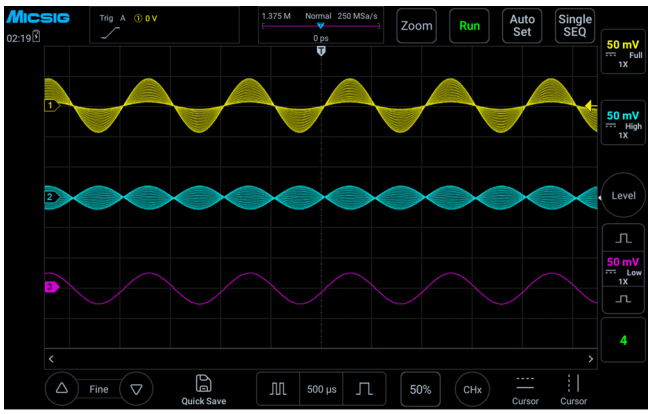
Low noise

Even at its full bandwidth, the noise floor of the STOseries still low, allow engineers accurately capture weak but important signals during daily circuit debugging and signal analysis.



Faster time base adjustment

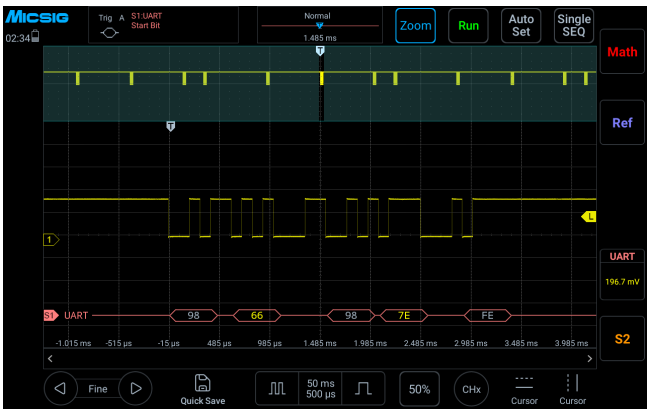
Traditional oscilloscopes need to step in a sequential manner when adjusting the time base. In addition to traditional sequential steps, the STOseries also has a time base matrix, allows user to select any time base in one click.



Full bandwidth High pass Low pass

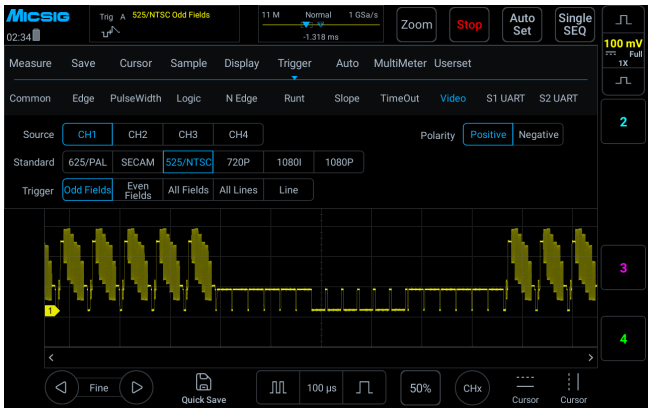
Hardware digital filtering

Digital filtering can selectively allow or block signal components within specific frequency ranges.



Serial bus decoding and analysis

The STOseries standard with 8 serial bus decodes: RS-232/422/485/ UART, CAN, LIN, CAN FD, SPI, I2C, ARINC-429, 1553B. With the TXT decoding text mode, the data can be transferred to CSV format.

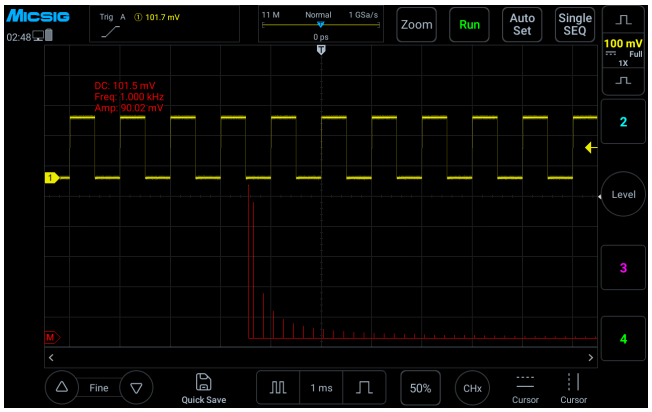


Multiple Trigger Functions

The STOseries provide multiple triggers, including edge, pulse width, logic, Nth edge, Runt, slope, bus decoding, etc. Whether you need to capture specific edge transitions, or observe duration and frequency of the target signal, it meets your requirement at ease.

Statistics Measurement

Simultaneously calculate the average, maximum, minimum, and root mean square of 10 measurement items, with a max count of up to 10,000, every waveform data is accurately recorded, provide more accurate and comprehensive readings.



Advanced Math functions

Support various mathematical calculations: addition, subtraction, multiplication, division, integration, differentiation, etc.
Support custom function formula for advanced signal analysis. Also support FFT (Fast Fourier Transform) for real-time spectral analysis of collected waveform signals.

Product specifications

Vertical system	
DC gain accuracy	⩽ 1%
Bandwidth filter	20MHz、High Pass / Low Pass
Coupling	DC、AC、GND
Input impedance and accuracy	1MΩ±1%
Vertical resolution	12 Bit
Vertical divisons	10div
Vertical scale factor	1mV/div~10V/div
Max. input voltage	CAT I 300Vrms 400Vpk
Channel isolation	＞40dB（⩽ 100MHz），＞35dB（＞100MHz）
Vertical expansion reference	Screen center, channel zero point
Probe Attenuation Ratio	1mX~10kX, 1-2-5 sequence, support customization

Horizontal system	
Horizontal scale	2ns/div~1ks/div
Roll mode range	100ms/div~1ks/div
Time base accuracy	20ppm
Horizontal divisions	11div
Time base delay time range	-11div ~ 11ks, resolution: 1 pixel

Trigger System	
Trigger mode	Auto, Normal, Single
Trigger level range	±5div from screen center, analog channel
Hold off range	200ns~10s
Trigger Types	Edge, Pulse Width, Logic, N Edge, Runt Pulse (Runt), Slope, Time Out, Video, Serial
Bus decoding	RS-232/422/485/UART、CAN、CAN FD、LIN、SPI、I2C、ARINC429、1553B

Sampling System	
Real-time sampling rate(Max.)	1GSa/s (single channel); 500MSa/s (half channel); 250MSa/s (Full channel)
Memory depth (Max.)	110Mpts (single channel); 55Mpts (half channel); 27.5Mpts (Full channel)
Segmented storage function	Support up to 10,000 segments
Average times	2,4,8,16,32,64,128,256
Envelope times	2,4,8,16,32,64,128,256, ∞

Measurements	
Auto measurements	Period, frequency, rise time, fall time, delay, positive duty cycle, negative duty cycle, positive pulse width, negative pulse width, burst pulse width, positive overshoot, negative overshoot, phase, peak-to-peak, Amplitude, High, Low, Maximum, Minimum, RMS, C RMS, Average, C Average, AC RMS, Positive Slope, Negative Slope *C represents the first period, indicating a certain value in the first period of the waveform
Hardware frequency counter	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. 360k; Source: Analog channel; Window: Rectangular, Hamming, Blackman, Hanning
AX+B	A: ±1k, Min. Resolution 1p or 4it B: ±1k, Resolution 1p or 5bit X: Analog channel
Advanced math	Advanced input, including +、-、*、/、<、>、≤、≥、==、!=、&&、||、（、）、!(、sqrt、abs、deg、rad、exp、diff、ln、sin、cos、tan、intg、lg、asin、acos、atan

Display	
Display	8" TFT LCD capacitive touch screen, 1280*800 pixels, 11*10 Divisions
Persistence	Auto, 10ms~10s, ∞
Time base mode	YT、XY、Roll、Zoom
Expand base	center, trigger position
Waveform Display	Dot, line, adjustable brightness
Maximum waveform capture rate	50,000 wfms/s

Storage	
Storage media	Local , USB drive
Storage format	WAV, CSV, BIN
Quantity of stored waveforms	No limit
Stored waveform rename	Chinese, English
REF waveforms display	4
Quick screenshot	Support
Quantity of user setting	10
User setting rename	Support
Flash memory	Industry standard
Screenshot, video recording	Support

System	
Self-calibration	Support
Languages	Support Chinese, English, Spanish, Portuguese, Russian, Turkish, Japanese, Korean, French, Arabic, etc.
Operating System	Android
Built-in app	App Store, Browser, Oscilloscope, Calendar, Clock, Gallery, Calculator, User Guide, Electronic Tools, File Manager
Warranty	Three-year for mainframe. Probes and accessories are not covered. * Please refer to the data sheet of each probe and accessory for the respective warranty terms. (contact us for extended warranty)

Interfaces	
USB3.0	1, read and edit
USB Type-C	1, read and edit, support charging with power bank
LAN	1
DC power socket	1
Probe calibration signal	1kHz、2Vpk-pk
HDMI	HDMI 1.4
PC software	Support
Android/iOSremote control APP	Support
SCPI	Support

Power supply	
Adapter input	100~240V AC, 50/60Hz
Power consumption	60W
Adapter output	12V DC, 5A
Power cord	Local

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

Physical Characteristics	
Dimensions	265*174*31mm（Width x Height x Thickness）
Net Weight	1.68kg

Standard Accessories

Model	Standard Accessories
STO1004	Main Unit *1
	Passive Probe *4
	Power adapter *1
	Power cord *1
	Quick Guide *1
	Calibration Certificate *1
	Battery *1

Professional Hand Carry Bag/ Hard Case Set	
Micsig Handbag set	Black, Nylon, Customized
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

Optional Instruments (Continued from above)	
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

*The final interpretation of this content is vested in Shenzhen Micsig Technologies Co., Ltd.