

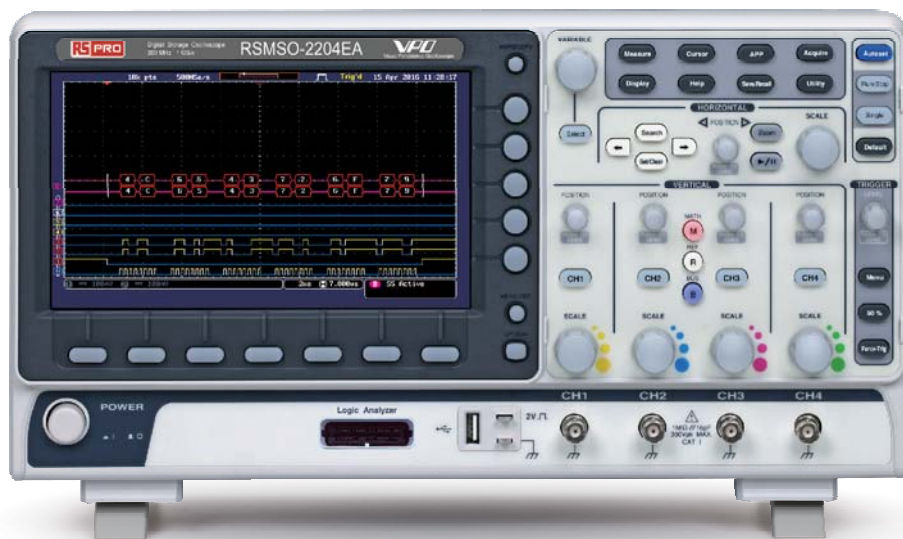


Datasheet

200 MHz/100 MHz Mixed-signal Oscilloscope

Stock number : 180-4793 **RSMSO-2204EA** 180-4791 **RSMSO-2104EA**
180-4792 **RSMSO-2202EA** 180-4790 **RSMSO-2102EA**
180-4789 **RSMSO-2204E** 180-4787 **RSMSO-2104E**
180-4788 **RSMSO-2202E** 180-4786 **RSMSO-2102E**

EN



FEATURES

- 200 MHz/100 MHz Bandwidth Selections : 2 or 4 Channels
- Real Time Sample Rate Per Channel : 1GSa/s (2 Channel Models); Maximum Real Time Sample Rate : 1 GSa/s (4 Channel Models)
- RSMSO-2000E Equips with a 16 Channel Logic Analyzer
- RSMSO-2000EA Equips with a 16 Channel Logic Analyzer and a Dual Channel 25 MHz Arbitrary Waveform Generator
- Free Frequency Response Analyzer Software for RSMSO-2000EA
- Per Channel 10M Memory Depth and VPO Waveform Display Technology
- Waveform Update Rate up to 120,000 wfm/s
- 8 " WVGA TFT LCD
- Maximum 1M FFT Provides Higher Frequency Domain Resolution Measurements
- High Pass, Low Pass and Band Pass Filter Functions
- 29,000 Segmented Memory Sections and Waveform Search Function
- I²C/SPI/UART/CAN/LIN Serial Bus Trigger and Decoding Functions
- Data Log Function is Able to Track Signal Changes up to 1000 Hours
- Mask Test Function & Network Storage Function

Economical and Multi-Functional RSMSO

The RSMSO-2000E series is a mixed-signal oscilloscope, which offers dual analog channels + 16 digital channels or 4 analog channels + 16 digital channels. The RSMSO-2000E series includes RSMSO-2000E and RSMSO-2000EA. RSMSO-2000E has a built-in 16-channel logic analyzer and RSMSO-2000EA has a built-in 16-channel logic analyzer and a dual channel 25MHz arbitrary waveform generator. The entire series features bandwidth selections of 200 MHz, 100 MHz, and 70 MHz. Dual analog channel models provide 1GSa/s real-time sampling rate per channel; four analog channel models provide 1GSa/s maximum real-time sampling rate. The 8-inch 800*480 TFT LCD and the minimum 1 mV/div vertical range allow the RSMSO-2000E series to measure complex feeble signals and clearly display measurement results.

For analog channels, the RSMSO-2000E series provides 10M long memory for users to completely retrieve and analyze waveforms. Users, based upon the application requirements, can select 1 k, 10 k, 100 k, 1 M or 10 M memory depth. Short memory depth collocating with the high sampling rate allows users to observe fast-changing waveforms and, on the other hand, long memory depth aims for continuously changing waveforms. The RSMSO-2000E series is equipped with waveform search and segmented memory functions to expand the flexible applications of 10 M long memory. The segmented memory can be divided the maximum into 29,000 sections for users to bypass any unimportant waveforms so as to swiftly search all required waveforms. With the segmented memory function, more meaningful waveforms can be saved and target waveforms can be displayed rapidly. Users, by using the waveform search function, can rapidly search desired waveforms according to the required trigger conditions.

16-channel logic analyzer has a memory depth of 10 Mpts per channel, which can retrieve more and longer digital signals as well as clearly display digital signals to obtain sufficient information for analysis. The minimum input swing of logic analyzer represents the minimum operating voltage of ± 250 mV, which demonstrates that digital channels are highly sensitive with respect to input. The standard bus trigger and decoding functions include serial and parallel bus such as I²C, SPI, UART (RS232/422/485) and CAN/LIN bus for automotive communications. The parallel bus function is only for digital channels. Bus waveforms can be triggered and decoded in real time. The RSMSO-2000E series offers complete analysis and debugging capabilities with the economical pricing.

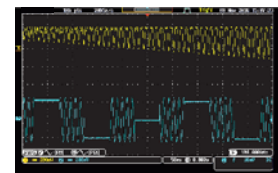
In addition to a 16-channel logic analyzer, RSMSO-2000EA has a built-in dual channel 25 MHz arbitrary waveform generator with the modulation capability and also features 14 bits vertical resolution; sample rate of 200 MSa/s; 13 standard output waveforms Sine, Square, Pulse, Ramp, DC, Noise, Sinc, Gaussian, Lorentz, Exponential Rise, Exponential Fall, Haversine, Cardiac; AM/FM/FSK modulation and sweep function. The user friendly interface is the ideal choice for applications such as circuit simulation and education tests.

RSMSO-2000EA also provide the frequency response analysis function (Bode plot). The FRA software can be directly downloaded from RS PRO website. Via arbitrary waveform generator, oscilloscope, and FRA software, users can obtain DUT's FRA characteristic curve plot. FRA has a very wide application range, including product circuit and component performance verification and analysis such as Feedback of Circuit Design, Filter Design, Amplifier Design, Resonant Circuit Design, Cable Frequency Response, and Signal Transformer Performance. Via FRA, users can preliminarily verify product and analyze component's characteristics without the expensive instrument.

The frequency range of FRA is from 20 Hz to 25 MHz; the number of test point can be selected from 10 to 90 points per decade. After completing the Bode plot, users can select measurement curve by Cursor so as to retrieve each point's amplitude and phase on the curve.



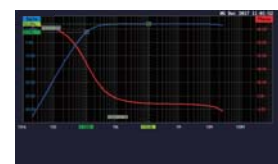
CAN Bus Trigger and Decode



Dual Channel Arbitrary Waveform Generator



FRA of RC high-pass filter



Cursor measurement for the determination at 3dB cut-off frequency of the high-pass filter.

SPECIFICATIONS

		RSMSO-2102E(A)	RSMSO-2104E(A)	RSMSO-2202E(A)	RSMSO-2204E(A)
VERTICAL SENSITIVITY	Channels	2Ch+EXT	4Ch	2Ch+EXT	4Ch
	Bandwidth	DC~100MHz(-3dB)		DC~200MHz(-3dB)	
	Rise Time	3.5ns		1.75ns	
	Bandwidth Limit	20MHz		20M/100MHz	
	Vertical Resolution	8 bits : 1mV ~ 10V/div			
	Input Coupling	AC, DC, GND			
	Input Impedance	1M Ω // 16pF approx.			
	DC Gain Accuracy	\pm (3% when 2mV/div or greater is selected ; \pm (5% when 1mV/div is selected			
	Polarity	Normal & Invert			
	Maximum Input Voltage	300Vrms , CAT I (300Vrms CAT II with 100B-4/200B-4, 10 : 1 probe)			
	Offset Position Range	1mV/div ~ 20mV/div : \pm 0.5V ; 50mV/div ~ 200mV/div : \pm 5V ; 500mV/div ~ 2V/div : \pm 25V ; 5V/div~10V/div : \pm 250V			
	Waveform Signal Process	+ , - , \times , \div , FFT, Uesr Defined Expression FFT : 1 Mpts ; FFT : Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS ; FFT Window Displays : Rectangular, Hamming , Hanning, Blackman-Harris			



SPECIFICATIONS

TRIGGER	Source Trigger Mode Trigger Type Trigger Holdoff Range Coupling Sensitivity	CH1 ,CH2, CH3, CH4, Line, EXT* ; *dual channel models only. Auto (Supports Roll Mode for 100 ms/div and slower), Normal, Single Sequence Edge, Pulse Width(Glitch), Video, Pulse Runt, Rise & Fall(Slope), Alternate, Time out, Event-Delay(1~65,535 events),Time-Delay(Duration;4ns~10s), Bus 4ns ~ 10s AC, DC, LF rej. , Hf rej. , Noise rej. 1div
EXT TRIGGER	Range Sensitivity Input Impedance	±15V DC ~ 100MHz Approx. 100mV; 100MHz ~ 200MHz Approx. 150mV 1MΩ±3%, ~16pF
HORIZONTAL	Time Base Range Pre-trigger Post-trigger Time Base Accuracy Real Time Sample Rate Record Length Acquisition Mode Peak Detection Average	1ns/div ~ 100s/div (1-2-5 increments); ROLL : 100ms/div ~ 100s/div 10 div maximum 2,000,000 div maximum ±50 ppm over any ≥ 1 ms time interval Max. : 1GSa/s (4ch model); Per channel 1GSa/s (2ch model) 10Mpts/CH Normal, Average, Peak Detect, Single 2ns (typical) Selectable from 2 to 256
X-Y MODE	X-Axis Input Y-Axis Input Phase Shift	Channel 1 ; Channel 3* (* : four channel models only) Channel 2 ; Channel 4* (* : four channel models only) ±3° at 100kHz
Cursors AND MEASUREMENT	Cursors Automatic Measurement Control Panel Function Auto Counter Autoset Save Setup Save Waveform	Amplitude, Time, Gating Available; Unit : Seconds (S), Hz(1/S), Phase (Degrees), Ratio(%) 38 sets : Pk-Pk, Max, Min, Amplitude, High, Low, Mean, Cycle Mean, RMS, Cycle RMS, Area, Cycle Area, ROVShoot, FOVShoot, RPREShoot, FPREShoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, %Flicker, Flicker Idx., FRR, FRR, FFR, FFF, LRR, LRF, LFR, LFF, Phase Cursors measurement Cursors measurement 6 digits, range from 2Hz minimum to the rated bandwidth Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with undo Autoset 20set 24set
DISPLAY SYSTEM	TFT LCD Type Display Resolution Interpolation Waveform Display Waveform Update Rate Display mode Display Graticule	8" TFT LCD WVGA color display 800 horizontal x 480 vertical pixels (WVGA) Sin(x)/x Dots, Vectors, Variable persistence(16ms~10s), Infinite persistence 120,000 waveforms per second, maximum YT ; XY 8 x 10 divisions
INTERFACE	USB Port Ethernet Port (LAN) Go/NoGo BNC Kensington Style Lock	USB 2.0 High-speed host port x 1, USB 2.0 High-speed device port x 1 RJ-45 connector, 10/100Mbps with HP Auto-MDIX 5V Max/10mA TTL open collector output Rear-panel security slot connects to standard Kensington-style lock
LOGIC ANALYSER SPECIFICATIONS	Sample Rate Bandwidth Record Length Input Channels Trigger Type Thresholds Quad Threshold Selections User-defined Threshold Range Maximum Input Voltage Minimum Voltage Swing Input Impedance Vertical Resolution	Per Channel 1GSa/s 200MHz Per Channel 10M pts (max) 16 Digital (D15 - D0) Edge, Pattern, Pulse Width, Serial bus (I2C, SPI, UART(RS232/422/485), CAN, LIN), Parallel Bus D0~D3, D4~D7,D8~D11 ,D12~D15 Thresholds TTL, CMOS(5V,3.3V,2.5V), ECL, PECL,0V ,User Defined ±5V ±40 V ±250 mV 101KΩ probe loading 8pF 1 bit
AWG SPECIFICATIONS (RSMOS-2000EA only)	Channels Sample Rate Vertical Resolution Max. Frequency Waveforms Output Range Output Resolution Output Accuracy Offset Range Offset Resolution	2 200 Msa/s 14 bits 25 MHz Sine, Square, Pulse, Ramp, DC, Noise, Sinc, Gaussian, Lorentz, Exponential Rise, Exponential Fall, Haversine, Cardiac 20 mVpp to 5 Vpp, HighZ;10 mVpp to 2.5 Vpp, 50 Ω 1mV 2% (1 kHz) ±2.5 V, HighZ;±1.25 V, 50 Ω 1mV
FREQUENCY RESPONSE ANALYSIS	Dynamic Range Input and Output Sources Frequency Range Number of Test Points Test Amplitude Test Results Manual Measurements Plot Scaling	> 80 dB (typical) Channel 1 or 2 (3 or 4 for four channel model) 20 Hz to 25 MHz 10 to 90 points per decade 20 mVpp to 5 Vpp into High-Z Fixed amplitude across entire sweep Logarithmic overlaid gain and phase plot Two pairs of tracking gain and phase markers Auto-scaled during test
POWER SOURCE MISCELLANEOUS	Line Voltage Range Multi-Language Menu On-Line Help Time clock Operation Environment	AC 100V ~ 240V, 48Hz ~ 63Hz, auto selection Available Available Time and date, provide the date/time for saved data Temperature: 0°C to 50°C. Relative Humidity: ≤ 80%, 40°C or below; ≤ 45%, 41°C ~ 50°C
DIMENSIONS & WEIGHT	384(W) X 208(H) X 127.3(D)mm, Approx. 2.8 kg	

Note : Three-year warranty, excluding probes & LCD display panel.

Specifications subject to change without notice.

ORDERING INFORMATION

RSMOS-2204E(A)	200MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
RSMOS-2202E(A)	200MHz, 2 + 16 Channel, Mixed-signal Oscilloscope
RSMOS-2104E(A)	100MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
RSMOS-2102E(A)	100MHz, 2 + 16 Channel, Mixed-signal Oscilloscope

"(A)" have built-in a Dual Channel 25MHz Arbitrary Waveform Generator

ACCESSORIES

Quick start guide, User manual CD x 1, Power cord x 1, **GTL-16E** :16-Channel Logic Analyzer Probe
GTP-100B-4:100MHz(10:1/1:1)Switchable passive probe for RSMOS-2102E(A)/2104E(A) (one per channel)
GTP-200B-4:200MHz(10:1/1:1)Switchable passive probe for RSMOS-2202E(A)/2204E(A) (one per channel)

OPTIONAL ACCESSORIES

GTL-16E	16-Channel Logic Analyzer Probe	GCP-100	Current Probe, DC-100kHz, 100A, Current Probe
GRA-426	Rack Adapter Panel	GCP-1030	Current Probe, DC-100MHz, 30Arms, Current Probe
GAK-003	50Ω Impedance Adapter	GCP-206P	Current Probe - Power Supply, 2 Channel Power Supply for GCP-530/1030
GSC-008	Soft Carrying Case	GCP-425P	Current Probe - Power Supply, 4 Channel Power Supply for GCP-530/1030
GTL-246	USB Cable, USB 2.0, A-B Type, 1200mm	GCP-530	Current Probe, DC-50MHz, 30Arms, Current Probe
GDB-03	Oscilloscope Education & Training Kit	GDP-025	Differential Probe, 25M High Voltage Differential Probe
GTP-033A	Oscilloscope Probe, 35MHz 1:1 Passive Probe, BNC(P/M)	GDP-050	Differential Probe, 50M High Voltage Differential Probe
GCP-020	Current Probe, 40Hz-40kHz, 240A, Current Probe	GDP-100	Differential Probe, 100M High Voltage Differential Probe
GCP-201	Probe Clip, 20PCS		

FREE DOWNLOAD

PC Software	OpenWave software	Driver	USB driver ; LabView driver
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