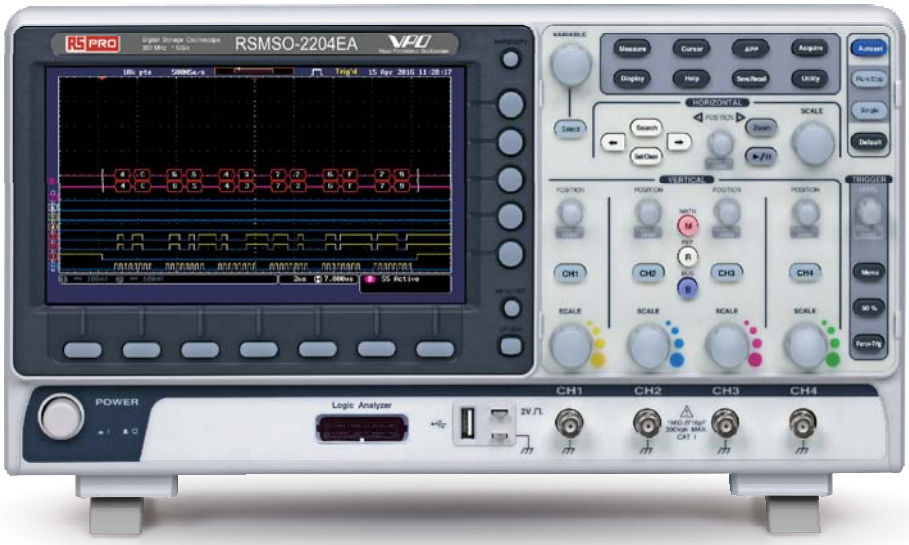
Datasheet

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



CE | USB high Speed | PC Software | Labview Driver | Ethernet | PictBridge Compatible

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
- I^2C/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
- 3 years warranty

Economical and Multi-Functional RSMSO

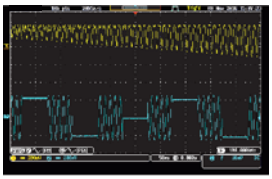
The RSMSO-2000E series is a mixed-signal oscilloscope, which offers dual analog channels + 16 digital channels or 4 analog channels + 16 digital channels. The RSMSO-2000E series includes RSMSO-2000E and RSMSO-2000EA. RSMSO-2000E has a built-in 16-channel logic analyzer and RSMSO-2000EA has a built-in 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 I^2C, 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.

CAN Bus Trigger and Decode

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.

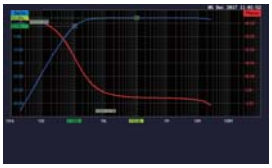


Dual Channel Arbitrary Waveform Generator

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.

FRA of RC high-pass filter

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.



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

SPECIFICATIONS

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

RSMSO-2204E(A)	200MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
RSMSO-2202E(A)	200MHz, 2 + 16 Channel, Mixed-signal Oscilloscope
RSMSO-2104E(A)	100MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
RSMSO-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 Differntial Probe
GTP-033A	Oscilloscope Probe, 35MHz 1:1 Passive Probe, BNC(P/M)	**GDP-050**	Differential Probe, 50M High Voltage Differntial Probe
GCP-020	Current Probe, 40Hz~40kHz, 240A, Current Probe	**GDP-100**	Differential Probe, 100M High Voltage Differntial Probe
GCP-201	Probe Clip, 20PCS		

FREE DOWNLOAD

PC Software	OpenWave software	**Driver**	USB driver ; LabView driver

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