TEKTRONIX

MSO2024

The Tektronix MSO2024 is a 200 MHz, 4-channel mixed signal oscilloscope equipped with 16 integrated digital channels. It features a 1 GS/s sample rate, 1 Mpoint record length across all channels, and advanced waveform analysis tools including the Wave Inspector navigation system and FilterVu variable low-pass filter.

SPECIFICATIONS

General

Interfaces	USB 2.0 Host (front), USB 2.0 Device (rear), LAN (optional via DPO2CONN), VGA (optional via DPO2CONN)
Display	7 in. (180 mm) widescreen TFT-LCD, 480 × 234 pixels
Standard Warranty	5 years

Physical

Power Supply	100 to 240 V ±10% (50/60 Hz at 100-240 V, 400 Hz ±10% at 100-120 V), Max 80 W
Operating Temperature	0 to +50 °C °C
Dimensions (W×H×D)	377 mm × 180 mm × 134 mm mm
Weight	3.6 kg

Analog Vertical System

Analog Input Channels	4
Analog Bandwidth (-3 dB)	200 MHz
Calculated Rise Time (10% to 90%)	2.1 ns
Input Coupling	AC, DC, GND
Input Impedance	1 MΩ ± 2% in parallel with 11.5 pF ± 2 pF
Input Sensitivity Range	2 mV/div to 5 V/div
Vertical Resolution	8 bits
Max Input Voltage (1 MΩ)	300 Vrms CAT II with peaks ≤ ±450 V
DC Gain Accuracy	±3% for 10 mV/div to 5 V/div, ±4% for 2 mV/div to 5 mV/div
Channel-to-Channel Isolation	≥ 100:1 at ≤ 200 MHz
Offset Range (2 mV/div to 200 mV/div)	±1 V
Offset Range (206 mV/div to 5 V/div)	±10 V

Digital Vertical System

Digital Channels	16
Threshold Grouping	Pod 1 (D7-D0) and Pod 2 (D15-D8)
Threshold Selections	TTL, CMOS, ECL, PECL, User Defined
Threshold Voltage Range	-15 V to +15 V
Threshold Accuracy	±(100 mV + 3% of threshold setting)
Input Impedance (Digital Probe)	101 kΩ in parallel with 8 pF (P6316)
Max Input Voltage (Digital Probe)	±40 V
Minimum Voltage Swing	500 mVp-p
Minimum Detectable Pulse Width	5 ns
Maximum Toggle Rate	250 MHz

Horizontal System

Maximum Real-time Sample Rate (Analog)	1 GS/s
Maximum Sample Rate (Digital)	1 GS/s (pod-independent)
Maximum Record Length (Analog Channels)	1 Mpoint
Maximum Record Length (Digital Channels)	1 Mpoint
Time Base Range	2 ns/div to 100 s/div
Time Base Delay Range	-10 divisions to 5000 s
Channel-to-Channel Deskew Range	±100 ns
Time Base Accuracy	±25 ppm

Trigger System

Trigger Modes	Auto, Normal, Single
Trigger Coupling	AC, DC, HF Reject, LF Reject, Noise Reject
Trigger Holdoff Range	20 ns to 8 s
Edge Triggering	Rising, falling, or either slope on any channel
Runt Triggering	Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again
Logic Triggering	Trigger when any logical pattern of channels goes false or stays true for specified time
Setup and Hold Triggering	Trigger on violations of both setup time and hold time between clock and data on any input channels
Rise/Fall Time Triggering	Trigger on pulse edge rates that are faster or slower than specified
Video Triggering	Trigger on all lines, odd, even, or all fields on NTSC, PAL, and SECAM video signals
Serial Bus Triggering Options	I2C, SPI, CAN, LIN, RS-232/422/485/UART (with appropriate hardware modules)
Trigger Level Range	±4.96 divisions from center of screen

Acquisition Modes

Sample Mode	Acquire sampled values
Peak Detect Mode	Acquire narrow glitches down to 3.6 ns (analog) at all sweep speeds
Averaging Mode	Average 2 to 512 waveforms
Roll Mode	Scrolls waveforms right to left at sweep speeds slower than or equal to 40 ms/div

Waveform Analysis & Measurements

Automatic Measurements	29 automatic measurements
Math Functions	Arithmetic (Add, Subtract, Multiply) and FFT
FFT Window Types	Hanning, Rectangular, Hamming, Blackman-Harris
Search and Mark Capabilities	Wave Inspector® automatic search, marking, and navigation

Display & User Interface

Display Type	Widescreen TFT-LCD color
Display Size (Diagonal)	7 in (180 mm)
Display Resolution	480 × 234 pixels (WQVGA)
Graticules	Full, Grid, Crosshair, Frame
Waveform Update Rate	5,000 wfm/s

Optional Integrated Instruments

Frequency Counter Resolution	6-digit trigger frequency counter

Connectivity and Interfaces

USB Host Ports (Front)	1x USB 2.0 Host
USB Device Port (Rear)	1x USB 2.0 Device
LAN Port (Ethernet)	Optional (via DPO2CONN connectivity module)
External Video Output Port	Optional (via DPO2CONN connectivity module)
Probe Interface	TekVPI Probe Interface

Power Specifications

Power Source Voltage	100 to 240 V ±10%
Power Source Frequency	45 Hz to 440 Hz (100 to 120 V), 45 Hz to 66 Hz (120 to 240 V)
Power Consumption	80 W maximum

Environmental & Compliance

Non-Operating Temperature Range	-40 to +71 °C
Operating Humidity Range	High: 5% to 60% RH (at +40 to +50 °C); Low: 5% to 90% RH (at 0 to +40 °C)
Operating Altitude	Up to 3,000 m (9,843 ft)
Non-Operating Altitude	Up to 12,000 m (39,370 ft)
Electromagnetic Compatibility (EMC)	EC Council Directive 2004/108/EC
Safety Certifications	UL61010-1:2004, CAN/CSA-C22.2 No. 61010-1:2004, EN61010-1:2001

Physical Characteristics

Width	377 mm (14.9 in)
Height	180 mm (7.1 in)
Depth	134 mm (5.3 in)
Weight (Net)	3.6 kg (7.9 lbs)
Weight (Shipping)	6.2 kg (13.7 lbs)
Kensington Lock Slot	Standard rear-panel slot

Vertical System

Analog Bandwidth Limit	20 MHz

Interfaces

GPIB Interface	Optional (via TEK-USB-488 adapter)
Ethernet and Video Out Ports	Optional (via DPO2CONN connectivity module)

Waveform Measurements

Measurement Statistics	Mean, Minimum, Maximum, Standard Deviation
Measurement Gating	Screen or Waveform Cursor

Waveform Math

Math Operators	Add, Subtract, Multiply

Probes

Standard Digital Probe	P6316 16-channel digital probe and accessory kit

Included Accessories

Standard Analog Probes	4x P2221 (200 MHz, 1x/10x passive probes)

Wave Inspector

Wave Inspector Controls	Dedicated front-panel controls for zoom, pan, play/pause, active search, and user marks

Expansion Slots

Application Module Slots	2 slots on the side of the instrument for optional application modules

Acquisition System

Envelope Mode	Min/max envelope of 2 to 512 or infinite acquisitions

TECHNOLOGY

Digital Phosphor (DPO/MSO)

APPLICATIONS

Mixed-Signal Debug, Embedded Design, Power Measurement, Serial Troubleshooting

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