

TEKTRONIX

MDO4054-6

The Tektronix MDO4054-6 is a mixed domain oscilloscope integrating 4 analog channels (500 MHz bandwidth), 16 digital channels, and a dedicated RF channel (50 kHz to 6 GHz). It enables time-correlated analog, digital, and RF signal acquisitions for comprehensive system-level debugging and analysis.

SPECIFICATIONS

General

Interfaces	4 x USB 2.0 host (2 front, 2 rear), 1 x USB 2.0 device (rear), 10/100/1000BASE-T Ethernet LAN, Video Out, Auxiliary Out, External Reference In
Display	10.4 in (264 mm) Liquid-crystal TFT color display, XGA (1024 x 768 pixels)

Physical

Power Supply	100 to 240 V $\pm 10\%$ at 50/60 Hz $\pm 10\%$; 115 V $\pm 10\%$ at 400 Hz $\pm 10\%$; 250 W maximum
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	439 × 229 × 147 mm mm
Weight	5 kg kg
Required Cooling Clearance	51 mm (2.0 in) on left, right, and rear

Vertical System - Analog Channels

Number of Analog Channels	4
Analog Bandwidth	500 MHz
Rise Time	700 ps
Hardware Bandwidth Limits	20 MHz or 250 MHz
Input Coupling	AC, DC
Input Impedance	1 M Ω $\pm 1\%$, 50 Ω $\pm 1\%$
Vertical Resolution	8 bits (11 bits with Hi Res)
Maximum Input Voltage	1 M Ω : 300 Vrms CAT II (peaks $\leq \pm 425$ V); 50 Ω : 5 Vrms (peaks $\leq \pm 20$ V)

Horizontal System - Analog Channels

Maximum Duration at Highest Sample Rate	8 ms
Time Base Delay Time Range	-10 divisions to 5000 s
Channel-to-Channel Deskew Range	± 125 ns

Spectrum Analyzer System

Number of RF Channels	1
RF Frequency Range	50 kHz to 6 GHz
Span	1 kHz - 6 GHz, in a 1-2-5 sequence
Resolution Bandwidth (RBW)	20 Hz - 10 MHz in a 1-2-3-5 sequence
Vertical Scale	1 dB/div to 20 dB/div in a 1-2-5 sequence
Vertical Position Range	-10 divs to +10 divs
Vertical Units	dBm, dBmV, dBμV, dBμW, dBmA, dBμA
Displayed Average Noise Level (DANL)	<-130 dBm/Hz (50 kHz - 5 MHz); <-148 dBm/Hz (5 MHz - 3 GHz); <-140 dBm/Hz (3 GHz - 6 GHz)
Residual Response	<-78 dBm
RF to Analog Channel Skew	<5 ns
Frequency Domain Trace Types	Normal, Average, Max Hold, Min Hold
Time Domain Trace Types	Amplitude vs Time, Frequency vs Time, Phase vs Time

Logic Analyzer System - Digital Channels

Number of Digital Channels	16
Input Dynamic Range	30 Vp-p ≤200 MHz; 10 Vp-p >200 MHz

Horizontal System - Digital Channels

Maximum Sample Rate (Digital)	500 MS/s (2 ns resolution) main; MagniVu fine timing resolution 60.6 ps
Maximum Record Length (Digital)	20M points
Minimum Detectable Pulse Width	1 ns (typical)
Channel-to-Channel Skew	500 ps (typical)

Acquisition System

Maximum Sample Rate (Analog)	2.5 GS/s
Maximum Record Length	20 M
Acquisition Modes	Sample, Peak Detect, Averaging, Envelope, Hi Res, Roll

Trigger System

Trigger Modes	Auto, Normal, and Single
Trigger Holdoff Range	20 ns to 8 s
Standard Trigger Types	Edge, Sequence (B-trigger), Pulse Width, Runt, Logic, Setup and Hold, Rise/Fall Time, Video, Parallel

Connectivity and Interfaces

Probe Compensator Output	0 to 2.5 V amplitude; 1 kHz frequency
LAN eXtensions for Instrumentation (LXI)	LXI Class C, Version V1.3

Horizontal System

Time Base Accuracy	±5 ppm over any ≥1 ms interval
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Vertical System

Input Sensitivity Range (1 M Ω)	1 mV/div to 10 V/div
Input Sensitivity Range (50 Ω)	1 mV/div to 1 V/div
DC Gain Accuracy	$\pm 1.5\%$ (derated at 0.10%/°C above 30 °C)

Environmental

Operating Humidity	5% to 90% RH (≤ 30 °C); 5% to 60% RH (> 30 °C to 50 °C)
Operating Altitude	Up to 3,000 meters (9,843 feet)
Non-operating Altitude	Up to 12,000 meters (39,370 feet)

Compliance

Safety Compliance	UL61010-1:2004, CAN/CSA-C22.2 No. 61010.1:2004, EN61010-1:2001, IEC61010-1:2001
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Waveform Math

Standard Math	Add, Subtract, Multiply, Divide
Advanced Math	Integrate, Differentiate, FFT

Acquisition

Maximum Waveform Capture Rate	$> 50,000$ wfms/s
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Digital Channels

Digital Input Impedance	100 k Ω in parallel with 3 pF
Minimum Voltage Swing (Digital)	400 mV p-p
Logic Threshold Selections	TTL, CMOS, ECL, PECL, User-defined

Triggering

Trigger Coupling	DC, AC, HF Reject, LF Reject, Noise Reject
Optional Serial Bus Triggers	I2C, SPI, RS-232/422/485/UART, USB, Ethernet, CAN, LIN, FlexRay, MIL-STD-1553, I2S/LJ/RJ/TDM (requires optional modules)

RF Measurements

Automated RF Measurements	Channel Power, Adjacent Channel Power Ratio (ACPR), Occupied Bandwidth (OBW)
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Measurements & Analysis

Automatic Measurements	29 standard
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TECHNOLOGY

Mixed Domain Oscilloscope (MDO)

APPLICATIONS

Embedded system design, wireless integration, RF troubleshooting, and mixed-signal debugging

