TEKTRONIX

MSO3054

The Tektronix MSO3054 is a 500 MHz, 4 analog channel, and 16 digital channel Mixed Signal Oscilloscope in the MSO3000 series. Renowned for its rich debugging feature set, it combines high bandwidth and sample rate with advanced tools like the Wave Inspector® controls, automated serial and parallel bus analysis, and optional power analysis.

SPECIFICATIONS

General

Interfaces	1x USB 2.0 Host (front), 1x USB 2.0 Host (rear), 1x USB 2.0 Device (rear), 1x 10/100 Ethernet (RJ-45), 1x VGA Video Out (DB-15)
Display	9.0 in (229 mm) WVGA widescreen color TFT-LCD, 800 %%% %d7 480 pixels

Physical

Power Supply	100 to 240 V AC %%%%b110%%%% (50/60 Hz), 115 V AC %%% %b110%%%% (400 Hz), 120 W maximum power consumption
Operating Temperature	0 %%%%b0C to +50 %%%%b0C °C
Dimensions (W×H×D)	378.7 mm %%%%d7 203.2 mm %%%%d7 147.3 mm mm
Weight	4.2 kg kg
Kensington Lock Slot	Standard rear-panel security slot

Analog Vertical System

Analog Input Channels	4
Analog Bandwidth (-3 dB)	500 MHz
Calculated Rise Time (10%%%% to 90%%%%)	700 ps (typical)
Input Coupling	AC, DC, GND
Input Impedance	1 MΩ ±1% parallel with 11.5 pF ±2 pF, or 50 Ω ±1%
Input Sensitivity Range (1 M%%%%3a)	1 mV/div to 10 V/div
Input Sensitivity Range (50 %%%%3a)	1 mV/div to 1 V/div
Vertical Resolution	8 bits (11 bits with Hi Res)
Maximum Input Voltage (1 M%%%%3a)	300 Vrms CAT II with peaks ≤ ±425 V
Maximum Input Voltage (50 %%%%3a)	5 Vrms with peaks %%%%224 %%%%b120 V
DC Gain Accuracy	±1.5% for 5 mV/div and above, ±2.0% for 2 mV/div, ±2.5% for 1 mV/div
Offset Range (1 mV/div to 50 mV/div)	%%%%b11 V
Offset Range (50.5 mV/div to 99.5 mV/div)	%%%%b10.5 V
Offset Range (100 mV/div to 500 mV/div)	%%%%b110 V
Offset Range (1 V/div to 5 V/div)	%%%%b1100 V
Offset Range (5.05 V/div to 10 V/div)	%%%%b150 V
Channel-to-Channel Isolation	%%%%225100:1 at %%%%224100 MHz, %%%%22530:1 at %%%%3e100 MHz up to 500 MHz

Digital Vertical System

Digital Channels	16
Threshold Grouping	2 groups of 8 channels (D0-D7, D8-D15)
Threshold Selections	TTL, CMOS, ECL, PECL, User Defined
Threshold Voltage Range	-15 V to +15 V
Threshold Accuracy	%%%%b1(100 mV + 3%%%% of threshold setting)
Input Impedance (Digital Probe)	101 k%%%%3a parallel with 8 pF
Maximum Input Voltage (Digital Probe)	%%%%b115 V non-destructive
Minimum Voltage Swing	500 mV peak-to-peak
Minimum Detectable Pulse Width	2.0 ns

Horizontal System

Maximum Real-time Sample Rate (Analog)	2.5 GS/s on all channels
Maximum Sample Rate (Digital)	500 MS/s
Digital Fine Timing Resolution (MagniVu)	121.2 ps (8.25 GS/s)
Maximum Record Length (Analog)	5 Mpoints on all channels
Maximum Record Length (Digital)	5 Mpoints on all channels
Time Base Range	1 ns/div to 250 s/div
Time Base Accuracy	%%%%b110 ppm
Channel-to-Channel Deskew Range	±125 ns

Trigger System

Trigger Modes	Auto, Normal, Single
Trigger Coupling	DC, AC, HF Reject, LF Reject, Noise Reject
Trigger Holdoff Range	20 ns to 8 s
Edge Triggering	Positive, negative, or either slope on any channel
Pulse Width Triggering	Trigger on width of positive or negative pulses that are %%%%3e, %%%%3c, %%%%3d, or %%%%2260 to a specified period (4 ns to 8 s)
Runt Triggering	Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again
Timeout Triggering	Trigger on an event which remains high, low, or either, for a specified time period (4 ns to 8 s)
Logic Triggering	Trigger when any logical pattern of channels goes false or stays true for specified period (4 ns to 8 s)
Setup and Hold Triggering	Trigger on violations of both setup time and hold time between clock and data present on any of the input channels
Rise/Fall Time Triggering	Trigger on pulse edge rates that are faster or slower than specified (slope can be positive, negative, or either)
Video/Protocol Triggering	Trigger on all lines, specific line number, odd, even, or all fields on NTSC, PAL, and SECAM signals
Serial Bus Triggering (Optional)	I2C, SPI, CAN, LIN, RS-232/422/485/UART, I2S/LJ/RJ/TDM
Trigger Sensitivity (Analog, DC Coupled)	0.5 div from DC to 50 MHz, increasing to 1 div at 500 MHz

Acquisition Modes

Sample Mode	Acquire sampled values
Peak Detect Mode	Captures glitches as narrow as 2.0 ns at all real-time sampling rates
Averaging Mode	From 2 to 512 waveforms
Envelope Mode	Min/Max vertical values over multiple acquisitions
High Resolution Mode	Real-time boxcar averaging reduces random noise and increases vertical resolution
Waveform Capture Rate	%%%%3e50,000 wfm/s maximum
Roll Mode	Scrolls waveforms right to left across screen at sweep speeds slower than or equal to 40 ms/div

Waveform Analysis & Measurements

Total Automated Measurements	29 automated measurements
Automatic Voltage Measurements	Amplitude, High, Low, Max, Min, Peak-to-Peak, Mean, Cycle Mean, RMS, Cycle RMS, Positive Overshoot, Negative Overshoot, Area, Cycle Area
Automatic Time/Frequency Measurements	Period, Frequency, Rise Time, Fall Time, Positive Width, Negative Width, Positive Duty Cycle, Negative Duty Cycle, Burst Width, Phase, Delay
Math Waveform Functions	Add, Subtract, Multiply, FFT
FFT Window Types	Rectangular, Hamming, Hanning, Blackman-Harris
Waveform Navigation	Wave Inspector controls for easy zooming, panning, and searching
Search and Mark Capabilities	Search on edge, pulse width, runt, timeout, logic, setup and hold, rise/fall time, and parallel/serial bus criteria

Display & User Interface

Graticules	Full, Grid, Crosshair, Frame
Waveform Display Formats	YT, XY

Environmental & Compliance

Non-Operating Temperature	-40 %%%%b0C to +71 %%%%b0C
Operating Altitude	Up to 3,000 m (9,843 ft)
Non-Operating Altitude	Up to 12,192 m (40,000 ft)

Physical Characteristics

Weight (Net)	4.2 kg (9.2 lbs)
Weight (Shipping)	8.6 kg (19.0 lbs)
Rackmount Configuration	5U (optional with RM3000 rackmount kit)

Vertical System

Hardware Bandwidth Limits	20 MHz, 250 MHz
Vertical Position Range	±5 divisions

Digital Channels (P6316 Probe)

Digital Probe Input Capacitance	8 pF
Digital Probe Input Resistance	101 kΩ

Waveform Measurements

Waveform Histograms	Horizontal or vertical, with 12 measurements (Waveform Count, Hits in Box, Peak Hits, Median, Max, Min, Peak-to-Peak, Mean, Standard Deviation, Sigma 1, Sigma 2, Sigma 3)

Regulatory & Compliance

Safety Standards	UL61010-1:2004, CAN/CSA-C22.2 No. 61010.1:2004, EN61010-1:2001, IEC61010-1:2001
Electromagnetic Compatibility	2004/108/EC, EN61326-1:2006 Class A, EN61326-2-1:2006

Display

Display Resolution	800 × 480 pixels (WVGA)
Display Size	9 in. (228.6 mm) diagonal widescreen

Probes

Included Analog Probes	Four P6139A (500 MHz, 10X passive probes)
Included Digital Probes	One P6316 16-channel logic probe
Probe Interface	TekVPI Probe Interface

Interfaces & Connectivity

USB Host Ports	3 ports (2 on front panel, 1 on rear panel)
USB Device Port	1 port on rear panel (supports USBTMC)
LAN Port	10/100 Base-T Ethernet (RJ-45)
Video Out Port	DB-15 female connector, SVGA resolution
GPIB Interface	Optional (via TEK-USB-488 adapter)

Performance

Waveform Interpolation	Sin(x)/x

Trigger

Trigger Level Range (Internal)	±8 divisions from center of screen

TECHNOLOGY

Mixed Signal Oscilloscope (MSO)

APPLICATIONS

Embedded design, serial debug, parallel bus analysis, power measurement, and general electronic troubleshooting