

TEKTRONIX

TDS520A

The Tektronix TDS520A is a professional-grade 500 MHz, 2-channel digital storage oscilloscope designed for high-performance waveform acquisition and analysis. Featuring a maximum sample rate of 500 MS/s, high vertical resolution up to 12 bits in HiRes mode, and an array of advanced triggering capabilities, it serves as a highly reliable tool for electronic design, debug, and compliance testing.

SPECIFICATIONS

General

Interfaces	GPIB (standard); RS-232 and Centronics Parallel (with Option 13)
Display	7-inch monochrome CRT with high resolution
Warm-up Time	20 minutes

Physical

Power Supply	90 to 250 V AC RMS, 45 to 440 Hz, < 300 W maximum
Operating Temperature	4 to 50 °C
Dimensions (W×H×D)	422 × 193 × 511 mm
Weight	12.3 kg
Cooling Clearance	2 in (51 mm) left side and rear

Vertical System

Number of Channels	2
Auxiliary Channels	2 (Aux 1 and Aux 2)
Analog Bandwidth (-3 dB)	500 MHz
Bandwidth Limit Filters	20 MHz, 100 MHz, and Full (500 MHz)
Calculated Rise Time	700 ps
Vertical Resolution	8 bits (up to 12 bits with HiRes or averaging)
Input Sensitivity Range	1 mV/div to 10 V/div
DC Gain Accuracy	±1.5%
Input Impedance	1 M Ω in parallel with 10 pF, or 50 Ω (selectable)
Input Coupling	AC, DC, GND
Maximum Input Voltage (1 M Ω)	±400 V (DC + peak AC); derate at 20 dB/decade above 1 MHz
Maximum Input Voltage (50 Ω)	5 V RMS
Channel-to-Channel Isolation	≥ 100:1 at 100 MHz; ≥ 30:1 at 500 MHz
Offset Range	±1 V (1 mV/div to 99.5 mV/div), ±10 V (100 mV/div to 995 mV/div), ±100 V (1 V/div to 10 V/div)
Position Range	±5 divisions
Vertical Offset Range	±1 V (1 mV to 99.5 mV/div), ±10 V (100 mV to 995 mV/div), ±100 V (1 V to 10 V/div)

Horizontal System

Timebase Range	500 ps/div to 10 s/div
Timebase Modes	Main, Delayed
Timebase Accuracy	±25 ppm (0.0025%) over any interval ≥ 1 ms
Channel Deskew Range	±50 ns
Delay Jitter	< 10 ps + 1 ppm of delay time
Pre-trigger Delay Range	0% to 100% of record
Post-trigger Delay Range	0 to 250 seconds

Acquisition System

Maximum Real-Time Sample Rate	500 MS/s
Maximum Equivalent-Time Sample Rate	25 GS/s
Maximum Record Length	50,000 points (Option 1M increases to 130,000 points)
Acquisition Modes	Sample, Envelope, Average, Peak Detect, High Resolution (HiRes)
Peak Detect Glitch Width	4 ns minimum
HiRes Resolution Improvement	Up to 12 bits at 50 μ s/div and slower

Trigger System

Trigger Sources	Ch 1, Ch 2, Aux 1, Aux 2, AC Line
Trigger Modes	Auto, Normal, Single Sequence
Trigger Coupling	DC, AC, Low Frequency Reject (LF Rej), High Frequency Reject (HF Rej), Noise Reject
Trigger Holdoff Range	250 ns to 12 seconds
Edge Trigger Sensitivity	0.35 div from DC to 50 MHz, increasing to 1.0 div at 500 MHz
Video Triggering Formats	NTSC, PAL, SECAM, and Custom formats (Option 05)
Glitch Triggering	Triggers on glitches < 2.5 ns to 1 s
Width Triggering	Triggers on width from 2.5 ns to 1 s
Pattern Triggering	AND, OR, NAND, NOR logic on 4 channels
State Triggering	Clocked logic state on 4 channels
Setup/Hold Triggering	Triggers on setup/hold violations
Trigger Level Range (Internal)	±12 divisions from center of screen
Trigger Level Range (External)	±5 V

Waveform Measurements & Analysis

Automatic Measurements	25 measurements (including Period, Frequency, Rise Time, Fall Time, Width, Duty Cycle, Amplitude, PK-PK, Mean, RMS)
Measurement Gating	Gate waveforms using cursors
Waveform Math Operations	Add, Subtract, Multiply, Invert
FFT Analysis	Optional (with Option 2F)
Limit Testing	Compares live waveforms to a template

I/O Ports & Connectivity

GPIB Interface	IEEE-488.2 compatible (standard)
RS-232 Port	9-pin D-sub (with Option 13)
Centronics Parallel Port	25-pin D-sub (with Option 13)
Auxiliary Output	CH 1 Signal Output, Main Trigger Output, Delayed Trigger Output
External Trigger Input	Front-panel BNC input

Storage & Documentation

Internal Waveform Storage	4 reference memory locations (Ref1 - Ref4)
Internal Setup Storage	10 front-panel setup locations
Removable Storage Media	3.5-inch floppy drive (standard on late production / Option 1F)
Hardcopy Output Formats	PostScript, HPGL, Interleaf, EPS, TIFF, BMP, PCX

Power Specifications

Line Voltage Range	90 to 250 V AC RMS
Line Frequency Range	45 to 440 Hz
Power Consumption	< 300 W

Environmental & Safety

Operating Temperature Range	4 °C to 50 °C
Non-Operating Temperature Range	-22 °C to 60 °C
Operating Humidity	Up to 95% RH at or below 30 °C, up to 45% RH from 30 °C to 50 °C
Operating Altitude	Up to 4,570 meters (15,000 feet)
Non-Operating Altitude	Up to 15,240 meters (50,000 feet)
Safety Standards	UL 1244, CSA C22.2, EN 61010-1
EMC Compatibility	EN 55011, EN 50082-1
Calibration Cycle	1 year

Physical Specifications

Height	193 mm
Width	422 mm
Depth	511 mm

Display

Display Type	7-inch monochrome CRT (magnetic deflection)
Display Resolution	640 × 480 pixels
Display Graticule	8 × 10 divisions (1 division = 1 cm)
Display Diagonal Size	7 in (178 mm)
Display Color	Monochrome

Options

Option 05	Video Trigger (NTSC, PAL, SECAM, and custom formats)
Option 1F	File System (adds 3.5" floppy disk drive)
Option 1M	Extended record length (adds 50,000 points per channel)
Option 2F	Advanced DSP Math (adds integration, differentiation, and FFT)
Option 13	Hardcopy Interface (adds RS-232 and Centronics parallel ports)
Option 1R	Rackmount Kit (adds slide rails and rackmounting hardware)
Option 95	Calibration Test Data Report
Option 96	Certificate of Traceable Calibration

Accessories

Included Probes	Two P6139A 10X Passive Probes
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Inputs & Outputs

Probe Compensator Output Voltage	0.5 V into $\geq 1\text{ M}\Omega$
Probe Compensator Output Frequency	1 kHz

Acquisition

Autosetup Execution Time	< 5 seconds
Dual Window Zoom	Displays zoomed and unzoomed waveforms simultaneously in split screen
Horizontal Zoom Expansion	Up to 1000X
Vertical Zoom Expansion	Up to 10X

Storage

Floppy Disk Format (Option 1F)	3.5-inch MS-DOS format (1.44 MB or 720 KB)
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Connectivity

GPIO Compliance	IEEE Std 488.2-1987 compatible
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TECHNOLOGY

Digital Storage Oscilloscope (DSO)

APPLICATIONS

Electronic circuit design, signal integrity debugging, power analysis, and general-purpose laboratory test and measurement

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