

TEKTRONIX

TDS640A

The Tektronix TDS640A is a professional-grade 4-channel digital oscilloscope designed for high-speed, multi-channel waveform capture. Part of the legacy TDS series, it features an analog bandwidth of 500 MHz and provides a real-time sample rate of 2 GS/s simultaneously on all four channels. Equipped with an 8-bit ADC, a bright NuColor color display, a built-in floppy drive, and diverse interface connectivity, the TDS640A is tailored for demanding electronic design, debug, and characterization tasks.

SPECIFICATIONS

General

Display	7-inch monochrome CRT, 640 x 480 pixels
Warm-Up Time	20 minutes
Cooling	Forced-air circulation
EMC Compliance	Meets FCC Part 15 Class A, EN 55011 Class A

Physical

Power Supply	90 to 250 V AC, 45 to 440 Hz, 300 W maximum
Operating Temperature	0 to +50 °C °C
Dimensions (W×H×D)	445 mm × 193 mm × 434 mm mm
Weight	14.1 kg kg

Vertical System (Analog Channels)

Number of Channels	4
Analog Bandwidth (-3 dB)	500 MHz
Rise Time	≤ 700 ps (calculated)
Vertical Resolution (ADC Bits)	8-Bit
Vertical Sensitivity Range	1 mV/div to 10 V/div
DC Gain Accuracy	±1.5%
Input Impedance	50 Ω
Input Coupling	DC, GND
Maximum Input Voltage	5 V RMS (with peaks ≤ ±25 V)
Hardware Bandwidth Limits	20 MHz, 100 MHz

Horizontal System (Timebase)

Timebase Range	500 ps/div to 5 s/div
Timebase Accuracy	±100 ppm (0.01%)
Standard Record Length	2,000 points per channel

Acquisition System

Real-Time Sample Rate (All Channels)	2 GS/s (simultaneously on all 4 channels)
Acquisition Modes	Sample, Envelope, Average

Trigger System

Trigger Sources	CH1, CH2, CH3, CH4, AC Line, Auxiliary
Trigger Modes	Auto, Normal, Single
Trigger Coupling	DC, AC, Low Frequency Reject, High Frequency Reject, Noise Reject
Trigger Types	Edge, Pulse (Glitch, Width, Runt, Setup/Hold, Pattern, State)
Auxiliary Trigger Input	Yes
Trigger Level Range	±12 divisions from center of screen (internal)
Trigger Sensitivity (Internal)	0.35 div from DC to 50 MHz, 1.0 div at 500 MHz
Trigger Sensitivity (External)	40 mV from DC to 50 MHz, 150 mV at 500 MHz
Trigger Holdoff Range	250 ns to 12 s
Auxiliary Trigger Input Impedance	1 MΩ

Display Characteristics

Display Type	Monochrome CRT
Display Resolution	640 × 480 pixels
Display Size	7 in. (diagonal)
Waveform Display Styles	Vectors, Dots, Infinite Persistence, Variable Persistence
Graticules	Full, Grid, Crosshair, Frame

Measurements & Analysis

Automatic Measurements	25 fully automated measurements (including Amplitude, Period, Frequency, Rise/Fall Time, Width)
Cursor Measurements	Volts, Time, Paired
Waveform Processing (Math)	Add, Subtract, Multiply, Divide, Invert
Advanced Waveform DSP	Optional (Option 2F)
Limit Testing / Mask Testing	Waveform Pass/Fail Template Testing
Automatic Measurements Count	25 automatic measurements

Input / Output Ports & Interfaces

GPIB Interface	IEEE-488.2 standard interface
RS-232 Serial Port	Optional (Option 13)
Centronics Parallel Port	Optional (Option 13)
VGA Output	15-pin D-sub connector for external monitor
Probe Compensation Output	0.5 V into ≥1 MΩ, 1 kHz

Power Requirements

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

Physical Characteristics

Height	193 mm (7.6 in.) with feet
Width	445 mm (17.5 in.) with handle
Depth	434 mm (17.1 in.) with cover
Net Weight	14.1 kg (31 lbs.)
Shipping Weight	20.0 kg (44 lbs.)

Environmental & Reliability

Non-Operating Temperature	-40 to +75 °C
Operating Humidity	Up to 95% RH at or below +30 °C
Operating Altitude	Up to 4,570 m (15,000 ft.)
Non-Operating Altitude	Up to 12,190 m (40,000 ft.)

Standards & Compliance

Safety Certifications	UL 1244, CSA C22.2, EN61010-1
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Options & Accessories

Memory Expansion Option	Option 1M increases record length to 120,000 points per channel
Rackmount Option	Option 1R (Rackmount Kit)

Vertical System

Input Impedance Tolerance	50 Ω $\pm$ 1%
Channel-to-Channel Isolation	$\geq$ 100:1 at 100 MHz, $\geq$ 30:1 at 500 MHz
Number of Digitizers	4 (one per channel)
Offset Range	$\pm$ 1 V (1 mV to 99.5 mV/div), $\pm$ 10 V (100 mV to 995 mV/div), $\pm$ 100 V (1 V to 10 V/div)

Horizontal System

Delay Time Range (Pre-Trigger)	0% to 100% of record
Delay Time Range (Post-Trigger)	0 to 250,000 divisions

Environmental

Operating Shock	15 g (half-sine), 11 ms duration
Operating Vibration	0.31 g RMS, 5 Hz to 500 Hz
Non-Operating Vibration	2.46 g RMS, 5 Hz to 500 Hz

Display

CRT Phosphor Type	P31 Green
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Storage

Reference Waveform Storage	4 internal 2000-point waveforms
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Hardware Options

Option 05 Video Triggering	Adds NTSC, PAL, SECAM, and custom video triggering
Option 13 Interface Expansion	Adds RS-232 serial and Centronics parallel interfaces
Option 1F Storage Expansion	Adds 3.5-inch 1.44 MB floppy disk drive
Option 2F Math Expansion	Adds Advanced DSP Math (FFT, integration, differentiation)
Option 1K Cart	K212 Instrument Cart compatibility

TECHNOLOGY

Digital Storage Oscilloscope (DSO)

APPLICATIONS

High-speed digital design, debugging, power supply characterization, and general electronics testing

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