TEKTRONIX

TDS2002

The Tektronix TDS2002 is a 60 MHz, 2-channel digital storage oscilloscope featuring a maximum real-time sample rate of 1.0 GS/s per channel and a 5.7-inch color active-matrix TFT display. Designed for portable benchtop applications, it combines standard FFT analysis, advanced pulse-width and video triggering, and a fanless, convection-cooled design.

SPECIFICATIONS

General

Interfaces	Expansion slot for optional modules (TDS2CMA: GPIB, RS-232, Centronics; TDS2MEM: CompactFlash, USB, RS-232, Centronics)
Display	5.7 in (144.8 mm) Color Active-Matrix TFT LCD (320 × 240 pixels)

Physical

Power Supply	100 to 240 VAC RMS ±10% (47 to 440 Hz at 115 VAC, 47 to 63 Hz at 230 VAC), < 30 W
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	323.6 mm × 151.4 mm × 124.5 mm mm
Weight	2.0 kg kg

Vertical System

Analog Bandwidth (-3 dB)	60 MHz
Calculated Rise Time (10% to 90%)	5.8 ns
Number of Input Channels	2
Input Coupling	AC, DC, GND
Input Impedance	1 MΩ ±2% in parallel with 20 pF ±3 pF
Input Sensitivity Range	2 mV/div to 5 V/div in a 1-2-5 sequence
Vertical Resolution	8 bits (simultaneous sampling on both channels)
Maximum Input Voltage	300 V RMS CAT II; derated at 20 dB/decade above 100 kHz to 13 V peak AC at 3 MHz and above
DC Gain Accuracy	±3% for 10 mV/div to 5 V/div; ±4% for 2 mV/div to 5 mV/div
Hardware Bandwidth Limits	20 MHz
Channel-to-Channel Isolation	> 100:1 at 60 MHz
Common Mode Rejection Ratio (CMRR)	At least 100:1 at 60 Hz, and at least 20:1 at 50 MHz (with equal Volts/div settings on both channels)
Position Range	2 mV/div to 200 mV/div: ±2 V; >200 mV/div to 5 V/div: ±50 V
Supported Probe Attenuation Factors	1x, 10x, 100x, 1000x

Horizontal System

Timebase Range	5 ns to 50 s/div
Timebase Accuracy	50 ppm
Sample Rate Range	50 S/s to 1.0 GS/s

Acquisition System

Maximum Real-Time Sample Rate	1.0 GS/s
Maximum Record Length	2.5k points per channel
Acquisition Modes	Sample, Peak Detect, Average, Single Sequence
Peak Detect Mode	Captures high frequency and random glitches as narrow as 12 ns
Averaging Mode	Selectable from 4, 16, 64, or 128 waveforms

Trigger System

Trigger Sources	CH1, CH2, Ext, Ext/5, AC Line
Trigger Modes	Auto, Normal, Single Sequence
Trigger Coupling	AC, DC, Noise Reject, HF Reject, LF Reject
Trigger Holdoff Range	500 ns to 10 s
Edge Triggering	Positive or negative slope on any channel
Video Triggering	Triggers on all lines or individual lines, odd/even or all fields from composite video (NTSC, PAL, SECAM)
Pulse Width Triggering	Trigger on pulse width <, >, =, or ≠; duration selectable from 33 ns to 10 s
External Trigger Input Impedance	1 MΩ ±2% in parallel with 20 pF ±3 pF
External Trigger Maximum Input Voltage	300 V RMS CAT II
Trigger Level Range	Internal: ±8 divisions from center of screen; External: ±1.6 V; External/5: ±8 V
Trigger Level Accuracy	Internal: ±(0.2 div + 5 mV) for signals within ±4 divisions from center of screen; External: ±(6% of setting + 40 mV); External/5: ±(6% of setting + 200 mV)
Edge Trigger Sensitivity (Internal)	DC to 10 MHz: 1 div; 10 MHz to 60 MHz: 1.5 div
Edge Trigger Sensitivity (External)	DC to 10 MHz: 100 mV; 10 MHz to 60 MHz: 150 mV
Edge Trigger Sensitivity (External/10)	DC to 10 MHz: 1 V; 10 MHz to 60 MHz: 1.5 V
Video Trigger Sensitivity	Internal: 1.2 div p-p; External: 120 mV p-p; External/10: 1.2 V p-p

Waveform Measurements and Analysis

Automatic Measurements	11 (Period, Frequency, +Width, -Width, Rise Time, Fall Time, Max, Min, Peak-to-Peak, Mean, Cycle RMS)
Waveform Math Operators	CH1 + CH2, CH1 - CH2, CH2 - CH1, FFT
FFT Window Types	Hanning, Flat Top, Rectangular
FFT Resolution	2048 points
Waveform Storage (Internal)	2 reference waveforms, 10 front-panel setups

Environmental and Compliance

Storage Temperature Range	-40 °C to +71 °C
Operating Humidity	Up to 90% RH at or below +30 °C; up to 60% RH up to +50 °C
Operating Altitude	Up to 3,000 m
Electromagnetic Compatibility	Meets Directive 89/336/EEC, EN61326 Class A
Safety Certifications	UL61010-1, CSA61010-1, EN61010-1, IEC61010-1

Physical Characteristics

Cooling	Natural convection (no fan)
Form Factor	Benchtop portable

Storage

Setup Storage	10 front-panel setups (non-volatile)

Inputs & Outputs

Probe Compensator Output	5 V into ≥1 MΩ load @ 1 kHz (typical)

Environmental

Non-operating Altitude	15,240 m (50,000 ft)
Operating Vibration	0.31 g RMS (5 Hz to 500 Hz, 10 minutes on each axis)
Non-operating Vibration	2.46 g RMS (5 Hz to 500 Hz, 10 minutes on each axis)
Operating Shock	Non-operating Shock = 50 g, 11 ms, half-sine

Measurements

Cursor Measurements	Amplitude (ΔV), Time (ΔT), Frequency (1/ΔT)

User Interface & Controls

Autoset Function	Single-button automatic setup of all channels for vertical, horizontal, and trigger systems
User Interface Languages	English, French, German, Italian, Spanish, Portuguese, Japanese, Korean, Simplified Chinese, Traditional Chinese, Russian

TECHNOLOGY

Digital Storage Oscilloscope (DSO)

APPLICATIONS

Electronic Design, Troubleshooting, Education, and Manufacturing Test