TDS694C.

Features
Specs

Digital Storage Oscilloscopes

TDS694C * TDS684C

Characteristics

Time Base System

Time Bases - Main and delayed.

Time/div Range - 200 ps/div to 10 s/div. except TDS694C: 100 ps/div to 10 s/div.

Time Base Accuracy - Over any interval >1 ms ±100 ppm. Except TDS694C: Over any interval >1 ms ±10 ppm.

Time Interval Measurement Accuracy -
TDS684C: ±[(0.2/sample rate) + (100 ppm x |reading|)] single shot. (approximately 50 ps @ 5 GS/s).
TDS694C: ±[(0.15/sample rate) + (10 ppm x |reading|)] single shot. (approximately 15 ps @ 10 GS/s).

Record Length per Channel - 500 to 15,000 pts. except TDS694C: 500 to 30,000 pts. (optional: 120,000 pts.).

Trigger Jitter - 8 ps_{RMS} (typical).

Pre-trigger Position - 0% to 100% of record.

Channel-to-channel Deskew Range - ±25 ns.

Vertical System

Vertical Resolution - 8-Bit (>11-Bit with averaging).

Vertical Sensitivity - 1 mV/div to 10 V/div. Except TDS694C: 10 mV/div to 1 V/div.

Floppy Disk Drive - Store reference waveforms, setups and image files on 3.5 in. 1.44 MB or 720 K Microsoft DOS-format floppy disk.

Maximum Input Voltage - 300 V CAT II; ±400 V peak. Derate at 20 dB/decade above 1 MHz. Except TDS694C: 5 V_{RMS}.

DC Gain Accuracy - ±1.5%. Except TDS694C: ±1.0%.

Position Range - ±5 divs.

Offset -
±1 V from 1 to 99.5 mV/div, ±10 V from 100 mV to 995 mV/div, ±100 V from 1 V to 10 V/div.
Except TDS694C: ±0.5 V from 10 to 50 mV/div, ±0.25 V from 50.5 to 100 mV/div, ±5 V from 101 mV to 500 mV/div, ±2.5 V from 505 mV to 1 V/div.

Bandwidth Selections - 20 MHz, 250 MHz and full. Except TDS694C: Full only.

Input Impedance Selections - 1 megaohm in parallel with 10 pF, or 50 Ohm (AC and DC coupling). Except TDS694C: 50 Ohm (DC coupled).

Input Coupling - AC, DC or GND. Except TDS694C: DC or GND.

AC Coupled Low Frequency Limit (except TDS694C) -
<10 Hz when AC, 1 megaohm coupled. <200 kHz when AC, 50 Ohm coupled.

Channel Isolation - >100:1 at 100 MHz and >30:1 at BW for any two channels having equal V/div settings.

Acquisition Modes

Peak Detect - High frequency and random glitch capture. Captures glitches of 1 ns using acquisition hardware at all real-time sampling rates. TDS694C captures glitches of 100 ps.

Sample - Sample data only.

Envelope - Max/min values acquired over one or more acquisitions.

Average - Waveform data from 2 to 10,000 waveforms (selectable) is averaged.

Single Sequence - Use RUN/STOP button to capture a single triggered acquisition at a time, which may be automatically saved to NVRAM with AutoSave.

Triggering System

Trigger Types

EDGE (main and delayed) -
Conventional level-driven trigger. Positive or negative slope on any channel or rear panel auxiliary input. Coupling selections: DC, AC, noise reject, HF reject, LF reject.

LOGIC (main) -
PATTERN: Specifies a logical combination (AND, OR, NAND, NOR) of the four input channels (high, low, don't care). Trigger when pattern stays true or false for a specified time.
STATE: Any logical pattern of channels 1, 2 and 3 plus a clock edge on channel 4. Triggerable on rising or falling clock edge.
SETUP/HOLD: Trigger on violations of both setup time and hold time between clock and data which are on two input channels.

PULSE (main) -
GLITCH: Trigger on or reject glitches of positive, negative or

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either polarity. Minimum glitch width is 1.0 ns with 200 ps resolution.
RUNT: Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again.
WIDTH: Trigger on width of positive or negative pulse either within or out of selectable time limits (1 ns to 1 s).
SLEW RATE: Trigger on pulse edge rates that are either faster or slower than a set rate. Edges can be rising, falling or either.
TIMEOUT: Trigger on an event which remains high, low or either, for a specified time period, selectable from 1 ns to 1 s, with 200 ps resolution.

TLA Cross Trigger (TDS694C only) - Utilize a TLA700 logic analyzer to detect a multi-channel event, then trigger the TDS694C. The trigger points on the TLA and TDS will be aligned in time.

VIDEO (optional; not available in TDS694C) -
Trigger on a particular line of individual, odd/even or all fields. Trigger on a specific pixel of a line by using the video trigger with delay by events. Choose positive or negative horizontal sync polarity.
525/NTSC: Choose monochrome or color (studio-quality NTSC) sync formats. 625/PAL: Choose color or monochrome (studio-quality PAL) sync formats. HDTV: Choose from 1125/60, 1050/60, 1250/50 and 787.5/60 HDTV formats.

Trigger Bandwidth (edge type) -
3 GHz (TDS694C).
1 GHz (TDS684C).

Main Trigger Modes - Auto, normal, single.

Delayed Trigger - Delay by time, events, or events and time.

Delay by Time Range - 16 ns to 250 s.

Delay by Events Range - 2 to 9,999,999 events.

External Trigger Input - Input impedance: $\geq$1.5 kilohm; max. input voltage: ±20 V (DC + peak AC).

Display Characteristics

Waveform Style - Dots, vectors, variable persistence from 32 ms to 10 s, infinite persistence and intensified samples.

Color - Standard palettes and user-definable color for waveforms, text, graticules and cursors. Measurement text and cursor colors matched to waveform. Waveform collision areas highlighted with different color. Statistical waveform distribution shown with color grading through variable persistence.

Color Grading - With variable persistence selected, historical timing information is represented by temporal or spectral color scheme.

Graticules - Full, grid, cross-hair, frame and NTSC and PAL (with video trigger option).

Format - YT and XY.

Resolution - 640 horizontal by 480 vertical displayed pixels (VGA).

Color CRT Monitor - 7 in. diagonal NuColor™ liquid crystal full-color shutter, 256 levels.

Measurement System

Automatic Waveform Measurements -
Period, frequency, +width, -width, rise time, fall time, +duty cycle, -duty cycle, delay, phase, burst width, high, low, max, min, peak to peak, amplitude, +overshoot, -overshoot, mean, cycle mean, RMS, cycle RMS, area, cycle area, extinction ratio (ratio, dB, %) and mean optical power. Continuous update of up to four measurements on any combination of waveforms.

Measurement Statistics - Display minimum and maximum or mean and standard deviation on any displayed single-waveform measurements.

Thresholds - Settable in percentage or voltage.

Gating - Any region of the waveform may be isolated for measurement using vertical bars.

Snapshot - Performs all measurements on any one waveform showing results from one instant in time.

Cursor Measurements - Absolute, delta: Volts, time, frequency, and NTSC IRE and line number (with video trigger option).

Cursor Types - Horizontal bars (volts), vertical bars (time); operated independently or in tracking mode.

Histogram Measurements - Mean, median, standard deviation, hits, waveform count, peak hits, peak-to-peak, % mean ±1, 2 and 3 standard deviations.

Waveform Processing

Waveform Functions - Interpolation (sin(x)/x or linear), average, envelope, auto setup.

Advanced Waveform Functions - FFT, integration, differentiation, waveform (math or acquired) limit testing.

Arithmetic Operators - Add, subtract, multiply, divide, invert.

Autoset - Single-button, automatic setup on selected input signal for vertical, horizontal and trigger systems.

Waveform Limit Testing - Compares incoming or math waveform to a reference waveform's upper and lower limits.

Waveform Histograms - Both vertical and horizontal histograms, with periodically updated measurements, allow statistical distributions to be analyzed over any region of the signal.

Power Requirements

Line Voltage Range - 100 to 240 V_{RMS}.

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Line Frequency - 45 to 440 Hz.

Power Consumption -
300 W max. (TDS654C/684C).
450 W max. (TDS694C).

Environmental and Safety

Temperature -
Operating: +4°C to +45°C (floppy not used), +10°C to +45°C (floppy in use). Nonoperating: -22°C to +60°C.
TDS694C: Operating: +5°C to +40°C (floppy not used), +10°C to +40°C (floppy in use). Nonoperating: -22°C to +60°C.

Humidity -
Operating: 20% to 80% RH at or below +32°C.

Altitude -
Operating: 15,000 ft. (hard disk not used), 10,000 ft. (hard disk in use). Nonoperating: 40,000 ft.

Electromagnetic Compatibility - 89/336/EEC.

Safety - UL 3111-1, CSA1010.1, EN61010-1, IEC61010-1.

Physical Characteristics

Dimensions	**mm**	**in.**
Height with feet	193	7.6
Height without feet	178	7
Width with handle	445	17.5
Depth with front cover installed	434	17.1
Weight	**kg**	**lbs.**
Net approximately	14.1	31
Shipping weight approximately	24.0	53

GPIB IEEE-488

The TDS Series complies with IEEE Standard 488.2-1987, and with Tektronix Standard Codes and Formats.

ISO 9001

Tektronix Measurement products are manufactured in ISO registered facilities.

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