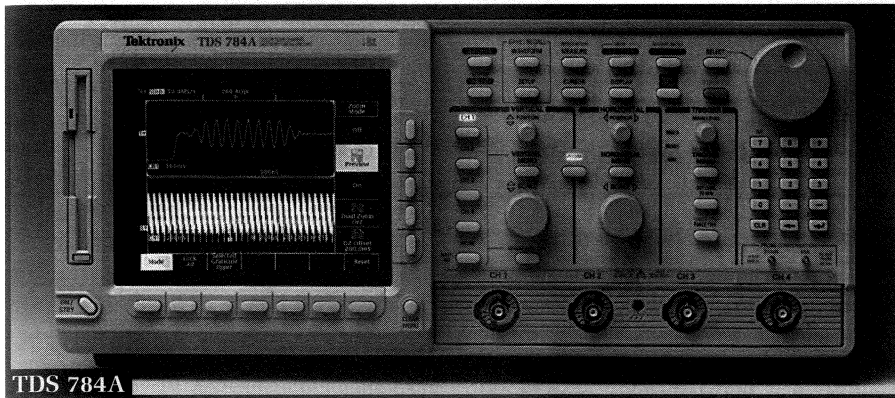


# Digitizing Oscilloscopes

**TDS 784A**  
**TDS 744A**



TDS 784A

## Characteristics

### SIGNAL ACQUISITION SYSTEM

	TDS 744A	TDS 784A
Channels	4	4
Samplers	4	4
Bandwidth	500 MHz	1 GHz
Maximum Sample Rate		
1 Channel	2 GS/s	4 GS/s
2 Channels	1 GS/s	2 GS/s
3, 4 Channels	500 MS/s	1 GS/s

### MAXIMUM RECORD LENGTH

TDS 784A/744A	Standard	Optional
1 Channel	50,000 pts	500,000 pts
2 Channels	50,000 pts	250,000 pts
3, 4 Channels	50,000 pts	130,000 pts

### TIME BASE SYSTEM

**Time Bases** – Main, Delayed.

**Time/Division Range** –

TDS744A: 500 ps to 10 s/div.

TDS784A: 200 ps to 10 s/div.

**Time Base Accuracy** –  $\pm 25$  ppm over any interval  $\geq 1$  ms.

**Pre-Trigger Position** – 0 to 100% of record.

**Delay Between Channels** –  $\leq 50$  ps between any two channels with equal V/div and coupling.

### VERTICAL SYSTEM

**DC Gain Accuracy** –  $\pm 1.0\%$ .

**Vertical Resolution** – 8-bits (256 levels over 10.24 vertical divisions),  $>13$ -bits with Hi-Res, 11-bits with averaging.

**Analog Bandwidth Selections** – 20 MHz, 100 MHz, and full.

**Input Coupling** – AC, DC or GND.

**Input Impedance Selections** – 1 M $\Omega$  in parallel with 10 pF, or 50  $\Omega$  (AC and DC coupling).

### TDS 784A/TDS 744A

- 1 GHz and 500 MHz Bandwidth
- Sample Rates to 4 GS/s
- 4 Input Channels
- InstaVu™ Acquisition Mode
- Pulse Width, 1 ns Glitch, Runt, Pattern and State, Setup & Hold Violation, and Slew Rate Triggering
- HDTV Video Triggering
- 1 mV/div to 10 V/div Sensitivity
- Infinite and Variable Persistence Displays
- Record Lengths to 500,000 Points
- 8-bit Vertical Resolution and up to 13-bit Resolution with Hi-Res Acquisition Mode
- Vertical Accuracy to 1%
- FFT, Integration and Differentiation
- 25 Automatic Measurements
- High Resolution Color Monitor
- 3.5 in. DOS Format Floppy Drive
- VGA-Output to External Monitor
- Waveform Pass/Fail Testing
- 1 ns Peak Detect
- FastFrame™ Acquisition Mode
- 3 Year Warranty

*Featuring the waveform capture rate of the fastest analog oscilloscopes in a state-of-the-art DSO for advanced digital design, analog design, and R&D applications.*

DIGITIZING OSCILLOSCOPES

Product(s) available through your local Tektronix representative (listed in the back of this catalog) or call 1-800-426-2200.



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



ISO 9001

ACCREDITED BY THE DUTCH COUNCIL FOR CERTIFICATION

Tektronix Measurement products are manufactured in ISO registered facilities.

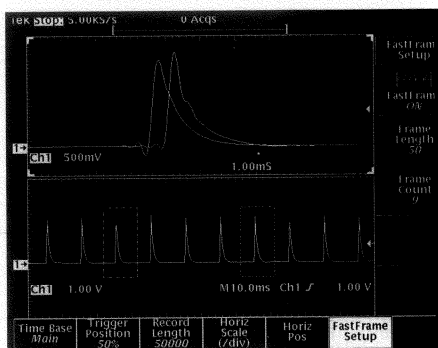
## APPLICATIONS

- Digital Design and Debug
- Analog Design and Debug
- Research and Development

TDS 784A  
TDS 744A

# Digitizing Oscilloscopes

DIGITIZING OSCILLOSCOPES



Dual window zoom is effective for managing the 500 K acquisition memory. FastFrame™ allows you to capture multiple events in a single record.

**Maximum Input Voltage** –  $\pm 400$  V (DC + peak AC). Derate at 20 dB/decade above 1 MHz. 1 M $\Omega$  or GND coupled.

**Channel Isolation** –  $>100:1$  at 100 MHz and  $>30:1$  at bandwidth for any two channels having equal V/div settings.

**AC Coupled Low Frequency Limit** –  $\leq 10$  Hz when AC 1 M $\Omega$  coupled.  $\leq 200$  kHz when AC 50  $\Omega$  coupled.

**Effective Bits** –

TDS 784A: 6.0-bits (1 GHz at 4 GS/s), 9.3-bits with Hi-Res (1 MHz at 25 MS/s).  
TDS 744A: 6.6-bits (500 MHz at 2 GS/s); 9.3-bits with Hi-Res (1 MHz at 25 MS/s).

**Step Response Setting** –  $\leq 0.5\%$  error within 20 ns of a  $\leq 2$  V step.

**Sensitivity** – 1 mV to 10 V/div.

**Position Range** –  $\pm 5$  Divisions.

**Offset** –  $\pm 1$  V from 1 to 100 mV/div.  $\pm 10$  V from 101 mV to 1 V/div.  $\pm 100$  V from 1.01 to 10 V/div.

**ACQUISITION MODES**

1 ns Peak Detect, Sample, Single Sequence, Envelope, Average, Hi-Res, FastFrame™, InstaVu™ acquisition.

**TRIGGERING SYSTEM**

**Triggers** – Edge (main and developed), Pulse (Width, 1 ns Glitch, Runt and Slew Rate), Logic (Pattern, State, and Setup & Hold Time Violation), HDTV Video (optional).

**Main Trigger Modes** – Auto, Normal, Single.

**Delayed Trigger** – Delay by time, events, or events and time.

**DISPLAY**

**Monitor** – 7 in. NuColor™ liquid crystal full-color shutter, 256 levels.

**Waveform Style** – Dots, vectors, variable persistence with color grading, infinite persistence, and intensified real samples.

**Format** – YT, XY, Zoom, Fit-to-Screen, Zoom, Dual Window Zoom.

**Waveform Capture Rate** –

InstaVu™ acquisition:  $>400,000$  wfm/sec.  
Infinite persistence (500 pts): 150 wfm/sec.

**MEASUREMENT SYSTEM**

**Automatic Measurements** – 25 (on entire record or in gated region).

**Measurement Accuracy** – TDS 744A:  $<80$  ps typical @ 2 GS/s single shot, TDS 784A:  $<38$  ps typical @ 4 GS/s single shot.

**Cursors Measurements** – Absolute, Delta; volts, time, frequency. NTSC IRE units and line number with video trigger option.

**WAVEFORM PROCESSING**

**Waveform Functions** – Interpolation (sin(x)/x or linear), Average, Envelope, Autosetup.

**Advanced Waveform Functions** – FFT, Integration, Differentiation, Waveform (math or acquired) Limit Testing.

**Arithmetic Operations** – Add, Subtract, Multiply, Divide, Invert.

# Digitizing Oscilloscopes

**TDS 784A**  
**TDS 744A**

DIGITIZING OSCILLOSCOPES

## HARDCOPY/DESKTOP PUBLISHING

**Hardcopy Ports** – GPIB, RS-232, Centronics.

**Hardcopy Formats** – Epson, ThinkJet, DeskJet, LaserJet, PostScript, TIFF, PCX, BMP, DPU 411/412, RLE, HPGL, Interleaf.

**Floppy Drive** – 3.5 in. 1.44 MB or 730 kB DOS compatible.

## DATA FORMATS

MathCad and spreadsheet.

## COMPUTER INTERFACE

**GPIB (IEEE 488.2)** – Full Programmability.

## AUXILIARY INPUTS/OUTPUTS

Video output (15-Pin VGA, full color); External Trigger input; Main and Delay Trigger outputs; CH 3 Signal output.

## STORAGE

**Waveform Storage** – NVRAM: Four 50 K pt. waveforms. Two full 130 K pt., one full 250 K pt., or one compressed 500 K pt. waveform with Option 1M. 1.44 MB Floppy Disk: 1,436 50 K pt. to 119,008 500 pt. waveforms.

**AutoSave** – Automatic storage of single sequence waveforms to NVRAM.

**Setup Storage** – 10 front panel setups.

## POWER REQUIREMENTS

**Line Voltage Range** – 90 to 250 V RMS.

**Line Frequency** – 45 to 440 Hz.

**Power Consumption** – 300 W.

## PROBES

**Passive P6139A (Standard with TDS 744A)** – 10 X, 8 pF, 500 MHz.



## Accessories

### P6139A

*Passive Probing*

- 500 MHz
- 10X, 8 pF/1 MΩ
- 1.3 m

### P6205

*Active Probing*

- 750 MHz
- 10X, 1 pF/1 MΩ
- 1.35 m

### NEW P6245

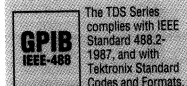
*Active Probing*

- 1 GHz
- 10X, 1 pF/1 MΩ
- 1.5 m

## ORDERING INFORMATION

<b>TDS 784A</b>	
Four-channel Color 1 GHz Digitizing Oscilloscope .....	<b>\$34,495</b>
<b>TDS 744A</b>	
Four-channel Color 500 MHz Digitizing Oscilloscope .....	<b>\$17,750</b>
<b>TDS 700A includes:</b> Four each P6139A Passive Probes (TDS 744A only); Quick Reference Guide (070-8999-01); User Manual (070-8991-01); Programmer's Manual (070-8709-06); Technical Reference Manual (070-8990-02); Front Cover (200-3696-01); Accessory Pouch (016-1268-00); U.S. Power Cord (161-0230-01).	
<b>Opt. 05</b> – Video Trigger, NTSC, PAL, HDTV, FlexFormat™ .....	<b>+\$1,495</b>
<b>Opt. 1K</b> – K420 Scope Cart .....	<b>+\$730</b>
<b>Opt. 1M</b> – 500 K Memory Length	
TDS 784A .....	<b>+\$2,995</b>
TDS 744A .....	<b>+\$2,495</b>
<b>Opt. 1R</b> – Rackmount .....	<b>+\$400</b>
<b>Opt. 2P</b> – Tektronix Phaser™ 200e Thermal Wax Transfer Color Printer .....	<b>+\$2,695</b>
<b>Opt. 23</b> – (TDS 744A only) Additional Two each P6205 Active Probes .....	<b>+\$1,190</b>
<b>Opt. 24</b> – (TDS 784A only) Four each P6139A 10 X Passive Probes .....	<b>+\$1,120</b>
<b>Opt. 26</b> – (TDS 784A only) Four each P6245 Active Probes .....	<b>+\$5,580</b>
<b>Opt. 95</b> – NIST, MIL-STD 45332A, and ISO 9000 Calibration Certification .....	<b>+\$150</b>
<b>Opt. 96</b> – Calibration Data .....	<b>+\$50</b>
<b>RECOMMENDED ACCESSORIES</b>	
See page 446 for complete selection information.	
<b>INTERNATIONAL POWER PLUG OPTIONS</b>	
<b>Opt. A1 – A5</b> .....	<b>NC</b>
See General Customer Information Section for additional description.	
<b>SERVICE ASSURANCE OPTIONS</b>	
<b>Opt. R2</b> – Adds two years of post-warranty Repair Protection .....	<b>+\$590</b>
<b>Opt. C5</b> – Adds five years of Calibration Services .....	<b>+\$1,225</b>
<b>PRODUCT UPGRADES</b>	
<b>HDTV Video Trigger</b> – TDS7F05 .....	<b>\$1,995</b>

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