# Digital Real-Time™ Oscilloscopes

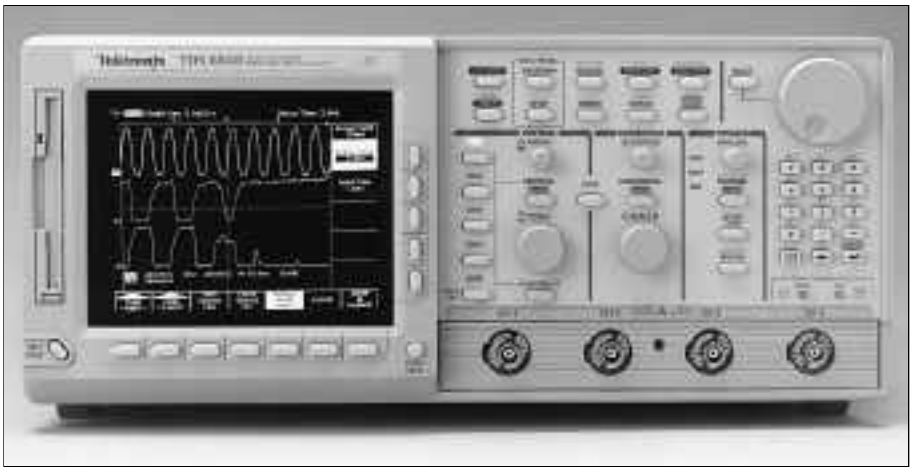
## TDS 684B • TDS 680B • TDS 644B • TDS 620B • TDS 640A

### Features

- 1 GHz and 500 MHz Bandwidth
- 5 GS/s and 2.5 GS/s Sample Rates
- 4 and 2 Input Channels
- 8-Bit Vertical Resolution
- Greater than 11-Bits with Averaging
- Record Length to 15,000 Points
- 1 mV/div to 10 V/div Sensitivity
- 1.5% Vertical Accuracy
- Waveform Math and Advanced Waveform DSP
- 1 ns Peak Detect (not available w/TDS 640A)
- Channel Deskew (not available w/TDS 640A)
- Fully Automated Measurement System
- Waveform Pass/Fail Template Testing
- Color VGA Display
- 3.5 in. DOS Format Floppy Drive
- RS-232, Centronics, GPIB and VGA I/O Ports

### Applications

- Digital Design Characterization and Verification
- Telecommunications/Datacommunications
- Transient Event Capture
- High Energy Physics



TDS 684B

Your designs may be digital but at today's speeds, many of your toughest problems aren't. Crosstalk noise. Transmission effects. Ground bounce. Not to mention sub-nanosecond edges. Today's design problems require high bandwidth oscilloscopes that can measure up to these challenges. The Digital Real-Time™ architecture of the TDS 600 Series simplifies capturing intermittent signals or non-recurring problems like glitches or metastable states caused by setup and hold time violations.

TDS 600 Series provides design engineers excellent single shot accuracy for multi-channel, high speed signal characterization. Additional features and specifications of the TDS 600 Series are explained in the TDS Reference section of the Textronix Test and Measurement Catalog or on the World Wide Web at www.tek.com.

| | TDS 640A | TDS 620B | TDS 644B | TDS 680B | TDS 684B |
|---|---|---|---|---|---|
| Total Channels | 4 | 2 + 2 | 4 | 2 + 2 | 4 |
| Sample Rate (all channels simultaneously) | 2 GS/s | 2.5 GS/s | 2.5 GS/s | 5 GS/s | 5 GS/s |
| Real-time Bandwidth | 500MHz | 500MHz | 500MHz | 1 GHz | 1 GHz |
| Maximum Record Length per Channel | 2,000 pts | 15,000 pts | 15,000 pts | 15,000 pts | 15,000 pts |
| Vertical Resolution | 8-Bits; >11-Bits with averaging | | | | |
| Time Measurement Accuracy | <110 ps @ 2 GS/s | <100 ps @ 2.5 GS/s | <100 ps @ 2.5 GS/s | <50 ps @ 5 GS/s | <50 ps @ 5 GS/s |
| Advanced Waveform DSP/Math | Std. | Std. | Std. | Std. | Std. |
| Standard Probes | 4 P6139A | 2 P6139A | 4 P6243 | None | None |
| Display Type | 7 in. mono | 7 in. mono | 7 in. color | 7 in. mono | 7 in. color |
| Disk Drive | Std. | Std. | Std. | Std. | Std. |
| GPIB Port | Std. | Std. | Std. | Std. | Std. |
| RS-232 & Centronics | Std. | Std. | Std. | Std. | Std. |
| VGA I/O Port Printer Ports | Std. Mono | Std. Mono | Std. Color | Std. Mono | Std. Color |

*See Tektronix on the World Wide Web: http://www.tek.com*

*Tektronix measurement products are manufactured in ISO registered facilities.*

*Product(s) complies with IEEE Standard 488.2-1987, and with Tektronix Standard Codes and Formats.*

# Digital Real-Time™ Oscilloscopes

## TDS 684B • TDS 680B • TDS 644B • TDS 620B • TDS 640A

## CHARACTERISTICS

### TIME BASE SYSTEM

**Time Bases –** Main and Delayed.

**Time/div Range –** 200 ps/div to 10 s/div. Except TDS 640A: 500 ps/div to 5 s/div.

**Time Base Accuracy –** Over Any Interval >1 ms ±100 ppm.

**Record Length per Channel –** 500 to 15,000 pts. Except TDS 640A: 500 to 2,000 pts.

### VERTICAL SYSTEM

**Vertical Resolution –** 8-Bits (>11-Bits with averaging).

**Maximum Input Voltage –** 300 V CAT II ±400 V peak. Derate at 20 dB/decade above 1 MHz.

**DC Gain Accuracy –** 1.50%

**Bandwidth Selections –** 20 MHz, 250 MHz, and Full.

**Input Impedance Selections –** 1 MΩ in parallel with 10 pF, or 50 Ω (AC and DC coupling).

**Input Coupling –** AC, DC or GND.

**Acquisition Modes –** Peak Detect (TDS 620B, TDS 644B: 1 ns; TDS 680B, TDS 684B: <1 ns), Sample, Single Sequence, Envelope, Average.

### TRIGGERING SYSTEM

**Trigger Types –** Edge (main and delayed); Pulse (Width, Glitch, Runt, Slew Rate*[1], Time Out*[1]); Logic (Pattern, State, and Setup & Hold Time Violation*[1]); HDTV Video (optional).

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

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

**Measurement Accuracy –** TDS 680B/684B: <50 ps typical @ 5 GS/s single shot; TDS 620B/644B: <100 ps typical @ 2.5 GS/s single shot.TDS 640A: <110 ps @ 2 GS/s single shot.

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

### RECOMMENDED ACCESSORIES

**K420 –** Instrument Cart.

**P6243 –** 1 GHz Active Probe.

**P6563A –** 500 MHz, 20X SMD Probe.

**SureFoot® –** Surface Mount Device Interconnects.

**P6245 –** 1.5 GHz, FET Probe.

**WaveStar™ –** Software (WSTR31).

*[1] Not available in TDS 640A.

## ORDERING INFORMATION

### TDS 684B

Four-channel Color 1 GHz, 5 GS/s Per Channel Digital Real-Time Oscilloscope.

### TDS 680B

Two-channel Monochrome 1 GHz, 5 GS/s Per Channel Digital Real-Time Oscilloscope.

### TDS 644B

Four-channel Color 500MHz, 2.5 GS/s Per Channel Digital Real-Time Oscilloscope.
**Includes:** Four P6243 FET Probes.

### TDS 640A

Four-channel Monochrome 500MHz, 2.0 GS/s Per Channel Digital Real-Time Oscilloscope.
**Includes:** Four P6139A Passive Probes.

### TDS 620B

Two-channel Monochrome 500MHz, 2.5 GS/s Per Channel Digital Real-Time Oscilloscope.
**Includes:** Two P6139A Passive Probes.

**All Include (except where noted):** User Manual (070-9869-00); Quick Reference Guide (070-9382-00); Programmer's Manual in MS-Help format on floppy disk (063-2773-00); Technical Reference Manual (070-9874-02); Front Cover (200-3696-00); North American Power Cord (161-0230-01); Accessory Pouch (TDS 644B/TDS 684B Only: 016-1268-00).

### OPTIONS AVAILABLE (EXCEPT WHERE NOTED)

**Opt. 05 –** Video Trigger, NTSC, PAL, HDTV, FlexFormat™.

**Opt. 1K –** Model K420 Instrument Cart.

**Opt. 1R –** Rackmount Kit.

**Opt. 2D –** (TDS 620B only) Delete Standard two P6139A Probes.

**Opt. 24 –** Add four P6139A 10X Passive Probes.

**Opt. 26 –** (TDS 684B only) Add four P6245 1.5 GHz, 1pF FET Probes.

**Opt. 27 –** (TDS 680B only) Add two P6245 1.5 GHz, 1 pF FET Probes.

**Opt. 4D –** (TDS 644B only) Delete Standard four P6243 FET Probes.

**Opt. D1 –** Calibration Data Report.

### INTERNATIONAL POWER PLUG OPTIONS

**Opt. A1 – Opt. A5** available.

### MEASUREMENT SERVICE OPTIONS

**Opt. C3 –** Three years of Calibration Services.

**Opt. C5 –** Five years of Calibration Services.

**Opt. D3 –** Test Data (requires Opt. C3).

**Opt. D5 –** Test Data (requires Opt. C5).

**Opt. R5 –** Repair warranty extended to cover five years.


**For further information, contact Tektronix:**

**World Wide Web:** http://www.tek.com; **ASEAN Countries** (65) 356-3900; **Australia & New Zealand** 61 (2) 888-7066; **Austria, Eastern Europe, & Middle East** +43 2236 8092 0; **Belgium** +32 (2) 715.89.70; **Brazil and South America** 55 (11) 3741-8360; **Canada** 1 (800) 661-5625; **Denmark** +45 (44) 850 700; **Finland** +358 (9) 4783 400; **France & North Africa** +33 1 69 86 81 81; **Germany** + 49 (221) 94 77 400; **Hong Kong** (852) 2585-6688; **India** (91) 80-2275577; **Italy** +39 (2) 25086 501; **Japan (Sony/Tektronix Corporation)** 81 (3) 3448-3111; **Mexico, Central America, & Caribbean** 52 (5) 666-6333; **The Netherlands** +31 23 56 95555; **Norway** +47 22 07 07 00; **People's Republic of China** 86 (10) 6235 1230; **Republic of Korea** 82 (2) 528-5299; **South Africa** (27 11)651-5222; **Spain & Portugal** +34 (1) 372 6000; **Sweden** +46 (8) 629 6503; **Switzerland** +41 (41) 729 36 40; **Taiwan** 886 (2) 722-9622; **United Kingdom & Eire** +44(0)1628 403400; **USA** 1 (800) 426-2200.

**From other areas, contact:** Tektronix, Inc. Export Sales, P.O. Box 500, M/S 50-255, Beaverton, Oregon 97077-0001, USA 1 (503) 627-6877.





4/98 HB/XBS 55W-10066-5

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