Digital Real-Time™ Oscilloscopes

TDS 684C • TDS 680C • TDS 654C • TDS 620B • TDS 640A

Features and Benefits

TDS 684C/TDS 680C/TDS 654C/TDS 620B/ TDS 640A

- 1 GHz and 500 MHz Bandwidth Performance to Work with Fast Signals in Today's Digital Designs
- 5 GS/s Sample Rates*
- Record Length to 15,000 Points
- 1 mV/div to 10 V/div Sensitivity
- 1.5% Vertical Accuracy
- Histograms and Measurement Statistics to More Fully Characterize Design Performance
- Support for Java Applications Packages
- Hard Disk Drive Storage (option)
- Support for External Zip Drive
- Waveform Math and Advanced Waveform DSP
- 1 ns Peak Detect (not available w/TDS640A)
- Channel Deskew (not available w/TDS640A)
- Fully Automated Measurement System
- Waveform Pass/Fail Template Testing
- Color Display (TDS654C, TDS684C)
- RS-232, Centronics, and GPIB

Applications

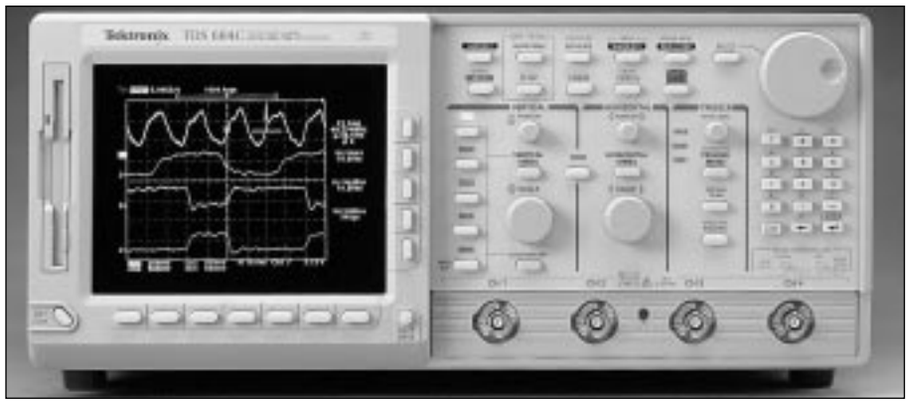
- Digital Design and Charactarization
- Telecommunications/Datacommunications
- Transient Event Capture
- High Energy Physics

** Not available with TDS620B or TDS640A*

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

ISO 9001 *Tektronix measurement products are manufactured in ISO registered facilities.*

GPIB IEEE-488 *Product(s) complies with IEEE Standard 488.2-1987, and with Tektronix Standard Codes and Formats.*



TDS 684C

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 available at http://www.tek.com/Measurement/Products/catalog/scopes/tds_series.

	TDS 640A	TDS 620B	TDS 654C	TDS 680C	TDS 684C
Total Channels	4	2 + 2	4	2 + 2	4
Sample Rate (all channels simultaneously)	2 GS/s	2.5 GS/s	5 GS/s	5 GS/s	5 GS/s
Real-time Bandwidth	500 MHz	500 MHz	500 MHz	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	<50 ps @ 5 GS/s	<50 ps @ 5 GS/s	<50 ps @ 5 GS/s
Advanced Waveform DSP/Math	Std.	Std.	Std.	Std.	Std.
Histograms and Measurement Statistics	N/A	N/A	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
Floppy 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
Hard Disk Drive	N/A	N/A	Opt.	Opt.	Opt.

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 >1ms ±100 ppm.

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

Pre-Trigger Position – 0% to 100% of Record.

VERTICAL SYSTEM

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

Vertical Sensitivity – 1 mV/div to 10 V/div.

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

DC Gain Accuracy – 1.50%.

Position Range – ±5 divs.

Offset – Primary channels: ±1 V from 1 to 99.5 mV/div, ±10 V from 100 mV to

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CHARACTERISTICS

995 mV/div, ±100 V from 1 V to 10 V/div. Aux. 1, Aux. 2 (TDS 620B, TDS 680C only): same as primary channels.

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.

AC Coupled Low Frequency Limit – <10 Hz when AC , 1 MΩ coupled. <200 kHz when AC, 50 Ω 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*[1], Sample, Single Sequence, Envelope, Average.

TRIGGERING SYSTEM
Triggers – 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).

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. Except TDS 640A: 16 ns to 250 s for t/div setting <10 µs; 15.1 to 250 s for t/div setting >25 µs.

Delay by Events Range – 1 to 9,999,999 events.

External Trigger Input – Input Impedance: ≥1.5 kΩ; Max. Input Voltage: ±20 V (DC + peak AC).

DISPLAY
Color CRT Monitor (TDS 654C/684C) – 7 in. diagonal NuColor™ liquid crystal full-color shutter, 256 levels.

Monochrome CRT Monitor (TDS 620B/680C/640A) – 7 in. diagonal, magnetic deflection. Horizontal raster-scan. P4 white phosphor.

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

Measurement Accuracy – TDS 654C/680C/684C: <50 ps typical @ 5 GS/s single shot; TDS 620B: <100 ps typical @ 2.5 GS/s single shot. TDS 640A: <110 ps @ 2 GS/s single shot.

Cursors Measurement – 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, Auto Setup.

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

[1] Not available in TDS 640A

ORDERING INFORMATION

TDS 684C
Four-channel Color 1 GHz, 5 GS/s Per Channel Digital Real-Time Oscilloscope.

TDS 680C
Two-channel Monochrome 1 GHz, 5 GS/s Per Channel Digital Real-Time Oscilloscope.

TDS 654C
Four-channel Color 500 MHz, 5 GS/s Per Channel Digital Real-Time Oscilloscope. **Includes:** four P6243 FET Probes.

TDS 684C, TDS 680C, TDS 654C INCLUDE
User Manual (070-0130-00); User Supplement (071-0273-00); Quick Reference Guide (020-2235-00); Programmer's Manual in MS-Help format on floppy disk (063-3120-00); Technical Reference Manual (071-0272-00).

TDS 640A
Four-channel Monochrome 500 MHz, 2.0 GS/s Per Channel Digital Real-Time Oscilloscope.

Includes: Four P6139A Passive Probes. User Manual (070-8715-04); Quick Reference Guide (070-8711-02); Programmer's Manual in MS-Help format on floppy disk (070-8709-07); Technical Reference Manual (070-8717-02).

TDS 620B

Two-channel Monochrome 500 MHz, 2.5 GS/s Per Channel Digital Real-Time Oscilloscope.

Includes: Two P6139A Passive Probes. User Manual (071-0130-00); Quick Reference Guide (020-2235-00); Programmer's Manual in MS-Help format on floppy disk (063-3002-00); Technical Reference Manual (071-0135-00).

ALL INCLUDE
Front Cover (200-3696-00); North American Power Cord (161-0230-01); Accessory Pouch (TDS 654C/TDS 684C 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 33 – (TDS684C/TDS680C only) Add 1 ea. P6158 Low Capacitance Probe.

Opt 34 – (TDS684C/680C/654C Only) Add 1 ea. P6247 differential Probe.

Opt 35 – (TDS654C Only) Add 1 ea. P6243 Active Probe.

Opt 36 – (TDS684C/680C/654C Only) Add 1ea. P6139A Passive Probe.

Opt 37 – (TDS684C/680C Only) add 1 ea. P6245 Active Probe.

Opt HD – (TDS684C/680C/654C Only) Internal Hard Disk Drive.

Opt. D1 – Calibration Data Report.

INTERNATIONAL POWER PLUG OPTIONS
Opt. A1 – Universal Euro 220 V, 50 Hz.

Opt. A2 – UK 240 V, 50 Hz.

Opt. A3 – Australian 240 V, 50 Hz.

Opt. A4 – North American 240 V, 60 Hz.

Opt. A5 – Switzerland 220 V, 50 Hz.

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.

RECOMMENDED ACCESSORIES
WSTRO – WaveStar™ software for Oscilloscopes, Windows 95/NT application for waveform capture, analysis, documentation and control from your PC.

P6563A – 500 MHz, 20X SMD Probe

SureFoot – Surface Mount Device Interconnects.

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) 2722-9622; **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.

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