

TDS 684A
TDS 644A
TDS 640A
TDS 620A

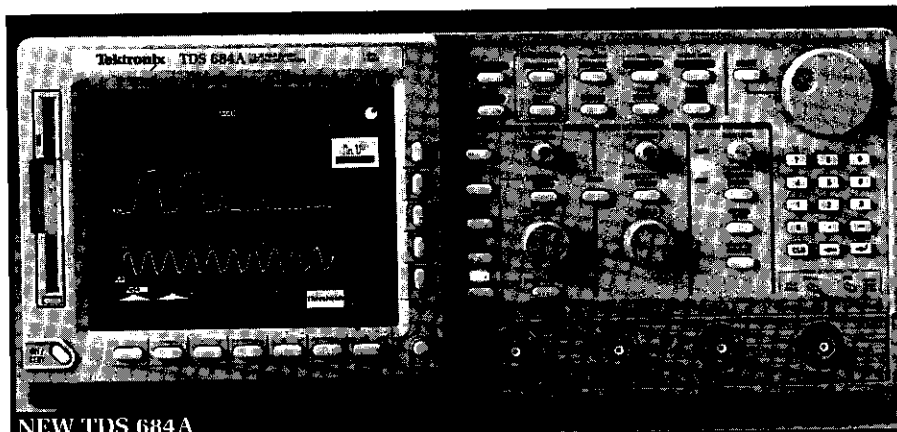
Digitizing Oscilloscopes

DIGITIZING OSCILLOSCOPES

High-performance, digital real-time oscilloscopes combine high bandwidth with ultra fast sampling across all channels to streamline performance verification and debug of high speed digital circuits.

**TDS 684A/TDS 644A/
TDS 640A/TDS 620A**

- 1 GHz and 500 MHz Bandwidth
- 5 GS/s and 2 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
- 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



NEW TDS 684A

The newest addition to the TDS 600A Series is the TDS 684A. The 1 GHz bandwidth is supported by 5 GS/s sampling on all channels making it the fastest 4-channel digital real-time oscilloscope available.

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. The Digital Real-Time architecture of the TDS 600A

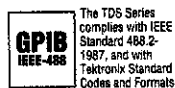
Series simplifies capturing intermittent signals or non-recurring problems like glitches or metastables caused by setup and hold time violations.

Additional features and specifications of the TDS 600A Series are explained in the TDS Reference section beginning on page 50.

CHARACTERISTICS

	TDS 620A	TDS 640A	TDS 644A	TDS 684A
Total Channels	2 + 2 aux.	4	4	4
Sample Rate (all channels simultaneously)	2 GS/s	2 GS/s	2 GS/s	5 GS/s
Real-Time Bandwidth	500 MHz	500 MHz	500 MHz	1 GHz
Maximum Record Length per Channel	2,000 pts	2,000 pts	2,000 pts	15,000 pts
Vertical Resolution	8-bits; >11-bits with averaging			
Time Measurement Accuracy	<110 ps @ 2 GS/s	<110 ps @ 2 GS/s	<110 ps @ 2 GS/s	<50 ps @ 5 GS/s
Advanced Waveform DSP/Math	Opt.	Opt.	Std.	Std.
Standard Probes	2 P6205	4 P6205	4 P6205	None
Display Type	7 in. mono	7 in. mono	7 in. color	7 in. color
Disk Drive	Opt.	Opt.	Std.	Std.
GPIB Port	Std.	Std.	Std.	Std.
RS-232 & Centronics Printer Ports	Opt.	Opt.	Std.	Std.
VGA I/O Port	Std. Mono	Std. Mono	Std. Color	Std. Color

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



Tektronix Measurement products are manufactured in ISO registered facilities.

APPLICATIONS

- Digital Design and Debug
- Transient Event Capture
- Telecommunications
- High Energy Physics

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TDS 684A
TDS 644A
TDS 640A

TRIGGERING TYPES COMPARISON

	TDS 620A	TDS 640A	TDS 644A	TDS 684A
Edge	Yes	Yes	Yes	Yes
Time Qualified Edge (Slew Rate)	-	-	-	Yes
Pulse Width, Runt Pulse, Glitch	Yes	Yes	Yes	Yes
Time Qualified Pattern	Yes	Yes	Yes	Yes
Clock Qualified State	Yes	Yes	Yes	Yes
Setup/Hold Time	-	-	-	Yes
Triggering Conditioning				
HF, LF and Noise Reject	Yes	Yes	Yes	Yes
Triggering Modes				
Main Trigger				
Auto, Normal, Single	Yes	Yes	Yes	Yes
Delay Trigger				
Delay by Time, Delay by Events, Delay by Time and Events	Yes	Yes	Yes	Yes
Delay by Time Range		16 ns to 250 S for t/div setting <10 us 15.1 ns to 250 S for t/div setting >25 us		
Delay by Events Range		1 to 9,999,999 events		
External Trigger Input				
Input Impedance		> 1.5 k Ω		
Maximum Input Voltage		± 20 V (DC plus Peak AC)		

TIME BASE SYSTEM

	TDS 620A/640A/644A	TDS 684A
Time Bases	Main and Delayed	Main and Delayed
Time/div Range	500 ps/div to 5 s/div	200 ps/div to 10 s/div
Time Base Accuracy over any interval >1ms	± 100 ppm	± 100 ppm
Record Length per Channel	500 to 2,000 pts	500 to 15,000 pts
Pre-Trigger Position	20% to 80% of Record	20% to 80% of Record

VERTICAL SYSTEM

Vertical Resolution – 8-bits (<11-bits with averaging).

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

Maximum Input Voltage – ± 400 V (DC + peak AC). Derate at 20 dB/decade above 1 MHz.

DC Gain Accuracy – 1.5%

Position Range – ± 5 divs.

Offset – Primary channels ± 1 V from 1 to 99.5 mV/div, ± 10 V from 100 mV to 99.5 mV/div, ± 100 V from 1 V to 10 V/div. Aux. 1, Aux. 2 (TDS 620A only) ± 10 V from 100 mV to 99.5 mV/div, ± 100 V from 1 V to 10 V/div.

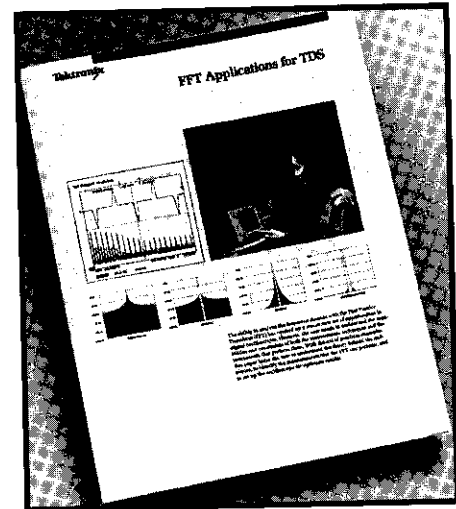
Bandwidth Selections – 20 MHz, 100 MHz (250 MHz TDS 684A), and Full.

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

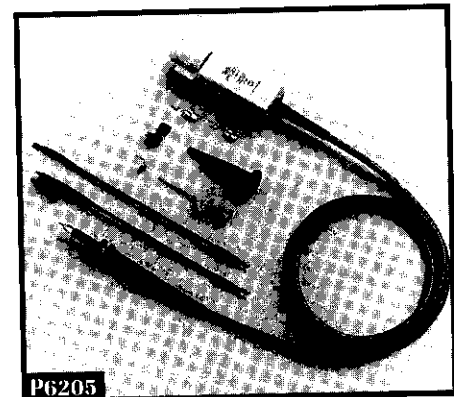
Input Coupling – AC, DC or GND.

AC Coupled Low Frequency Limit – <10 Hz when AC, 1 M Ω 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.



A wide selection of application notes and technical briefs have been written to help ease your understanding and use of specific instrument features. Contact your local sales office for details.



Accessory

P6205

Lower Circuit Under Test Loading

- FET Probe performance at a lower cost
- <2 pF/1 M Ω provides lower circuit loading than conventional passive probes
- Wide bandwidth (DC to 750 MHz)

For complete selection information on all Accessory products, see page 446.

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