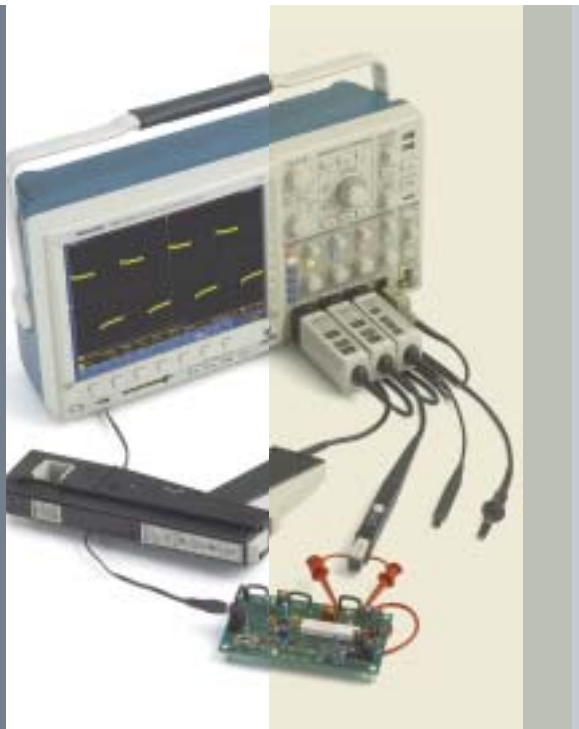


# Distributor Direct 19

Your source for innovative Tektronix test and measurement solutions



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# Literature Support Materials



## Primers

If you need a better understanding of the fundamentals of your oscilloscope, logic analyzer, signal source or probe, then we have the support materials for you. Choose from our XYZs Series—XYZs of Oscilloscopes, XYZs of Logic Analyzers and XYZs of Signal Sources—or our ABCs of Probes.



## Product Demos

Take an oscilloscope, logic analyzer or signal generator for a ride. Demonstrations include overviews of key features and benefits along with information on product applications and recommended accessories.



## Technical Literature

To help keep you up-to-date with the latest technology and application information from Tektronix, we offer a range of technical literature. Available free of charge, our technical briefs, application notes and troubleshooting guides will help ensure you get the most out of your equipment.



## Operator Training Kit

Our affordable Operator Training Kit can help simplify oscilloscope instruction and learning with extensive instructions and step-by-step lab exercises.

## SPECIAL INSERTS IN THIS ISSUE!

- Mid-Range Oscilloscopes
- Mid-Range Logic Analyzers
- High-Performance Oscilloscopes
- High-Performance Logic Analyzers
- High-Performance Signal Sources
- RF and Wireless Products



## Posters

Our posters provide useful quick reference guides and demonstrations. For example, our Guide to Oscilloscopes and Probes Poster contains a complete glossary of electronic terms and acronyms, including definitions of unfamiliar terms, all in an easily accessible full-sized poster format.

Contact your local Tektronix representative today for all the latest support materials!

# Literature Support Materials



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Contact your local Tektronix representative today for all the latest support materials!

## ■ Oscilloscope Selection Made Easy

	MSO4000/DPO4000	DPO3000	MSO2000/DPO2000	TDS3000C	TDS2000B/TDS1000B	TPS2000
<b>Channels</b>	2, 4	2, 4	2, 4	2, 4	2, 4	2, 4 <sup>1</sup>
<b>Bandwidth</b>	350 MHz to 1 GHz	100 MHz to 500 MHz	100 MHz to 200 MHz	100 MHz to 500 MHz	40 MHz to 200 MHz	100 MHz to 200 MHz
<b>Sample Rate</b>	2.5 GS/s to 5 GS/s	2.5 GS/s	1 GS/s	1.25 GS/s to 5 GS/s	500 MS/s to 2 GS/s	1 GS/s to 2 GS/s
<b>Record Length</b>	10 M	5 M	1 M	10 k	2.5 k	2.5 k
<b>Trigger Type</b>	Edge, Sequence, Pulse Width, Runt, Logic, Set-up and Hold, Rise/Fall Time, Video, Extended Video <sup>2</sup> , SPI, CAN, LIN, FlexRay, RS-232/422/485/UART	Edge, Sequence, Logic, Pulse Width, Runt, Set-up and Hold, Rise/Fall Time, Video, Extended Video <sup>2</sup> , SPI, CAN, LIN, RS-232/422/485/UART	Edge, Logic, Pulse (Width, Runt), Set-up and Hold, Rise/Fall Time, Video, Extended Video <sup>2</sup> , SPI, CAN, LIN, RS-232/422/485/UART	Edge, Logic (Pattern, State), Pulse (Glitch, Width, Runt, Slew Rate), Video, Extended Video <sup>2</sup> , SPI, CAN, LIN, RS-232/422/485/UART	Edge, Pulse (Width), Video	Edge, Pulse (Width), Video
<b>Serial Decode and Analysis</b>	2C, SPI, CAN, LIN, FlexRay, RS-232/422/485/UART	2C, SPI, CAN, LIN, RS-232/422/485/UART	2C, SPI, CAN, LIN, RS-232/422/485/UART	–	–	–
<b>Battery Operation</b>	–	–	–	Optional 3 hours with one Li-ion battery	–	Standard 4 hours with one Li-ion battery; optional additional 4 hours with 2nd Li-ion battery; continuous battery operation with hot-swappable batteries
<b>Connectivity</b>	3X USB Host, USB Device, CompactFlash, LAN (10/100 Base-T Ethernet), GPIB	2X USB Host, USB Device, LAN (10/100 Base-T Ethernet), GPIB	(1) USB host port, (1) USB device, LAN (10 Base-T Ethernet), Video out, GPIB	RS-232, USB host for storage, USB device for PC connectivity or direct print, GPIB	RS-232, USB device for PC, CompactFlash	Centronics, CompactFlash
<b>Waveform Math and Analysis</b>	Waveform Math, FFT, Arbitrary Expression Math	Waveform Math, FFT, Arbitrary Expression Math	Waveform Math	Waveform Math, FFT, Arbitrary Expression Math	Waveform Math, FFT	Waveform Math, FFT
<b>Applications</b>	Embedded Design and Debug, Investigation of Transient Phenomena, Power Measurements, Video Design and Debug, Automotive Electronics, Industrial Control, Manufacturing Test and Quality Control	Embedded Design and Debug, Investigation of Transient Phenomena, Power Measurements, Video Design and Debug, Automotive Electronics, Industrial Control, Manufacturing Test and Quality Control	Embedded Design and Debug, Mixed Signal Design and Debug, Education and Training, Power Measurement and Automotive Electronics	Digital Design and Troubleshooting, Video Design and Service, Power Supply Design, Telecomm Mask Testing and Manufacturing	Design and Debug, Service and Installation, Education and Training, Manufacturing Test and Quality Control	Industrial Power Design, Troubleshooting and Maintenance, Automotive Design and Test, Education
<b>See Page</b>	Special Insert	4	6	8	10	12

<sup>\*1</sup> Isolated Channel <sup>\*2</sup> Optional

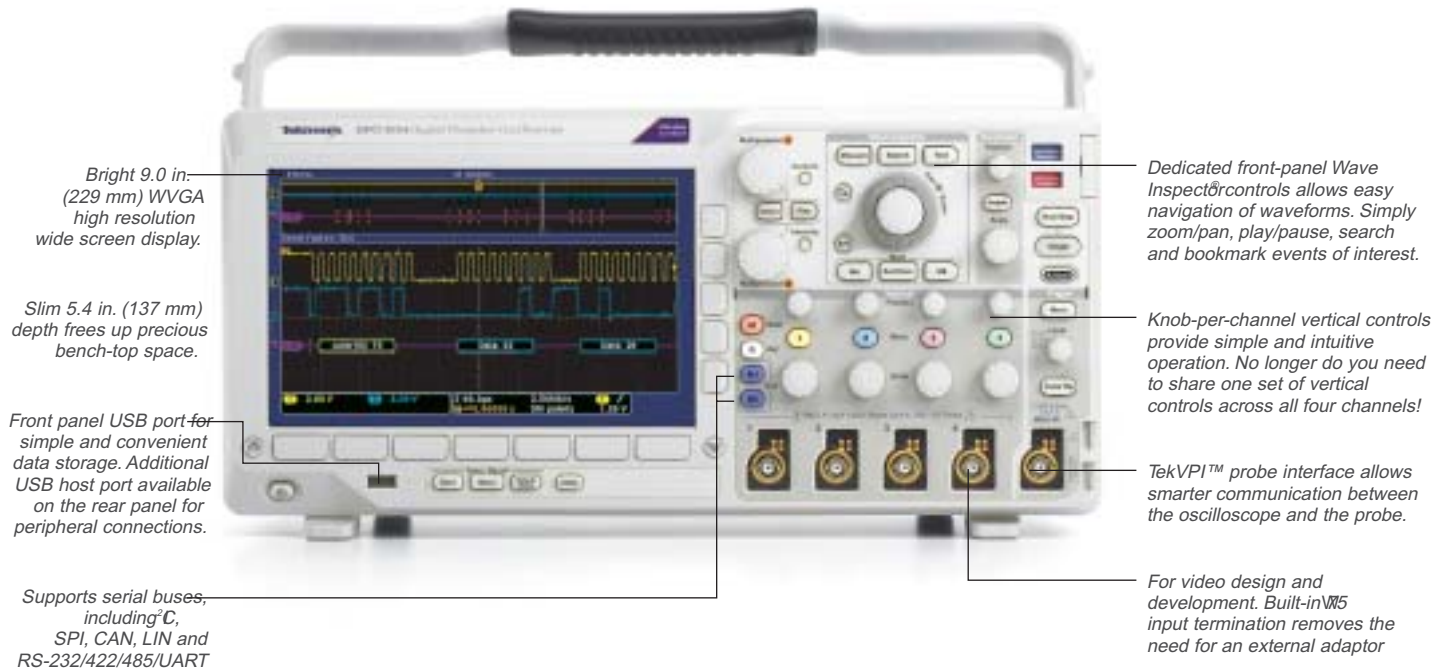
## ■ Signal Source Selection Made Easy

	AFG3011	AFG3021B	AFG3022B	AFG3101	AFG3102	AFG3251	AFG3252
<b>Channels</b>	1	1	2	1	2	1	2
<b>Waveforms</b>	Sine, Square, Pulse, Arb, Ramp, Sin(x)/x, Gaussian, Lorenz, Exponential Rise/Decay, Haversine, Noise						
<b>Sine</b>	1 µHz to 10 MHz	µHz to 25 MHz		µHz to 100 MHz		µHz to 240 MHz	
<b>Square</b>	1 µHz to 5 MHz	µHz to 12.5 MHz		µHz to 50 MHz		µHz to 120 MHz	
<b>Pulse/Arb</b>	1 mHz to 5 MHz	1 mHz to 12.5 MHz		1 mHz to 50 MHz		1 mHz to 120 MHz	
<b>Other waveforms</b>	1 µHz to 100 kHz	µHz to 250 kHz		µHz to 1 MHz		µHz to 2.4 MHz	
<b>Noise bandwidth</b>	10 MHz	25 MHz		100 MHz		240 MHz	
<b>Arb sample rate (waveform length)</b>	250 MS/s	250 MS/s		1 GS/s (16K) 250 MS/s (>16K)		2 GS/s (16K) 250 MS/s (>16K)	
<b>Waveform memory</b>	4 x 2 to 128K						
<b>Modulation</b>	AM, FM, PM, FSK, PWM						
<b>Frequency resolution</b>	1 µHz or 12 digits						
<b>Timebase stability</b>	± 1 ppm per year						
<b>Vertical resolution</b>	14 bits						
<b>Sweep</b>	lin, log						
<b>Amplitude into 50 ohms</b>	20 mV to 20 V	10 mV to 10 V		20 mV to 10 V		200 MHz: 50 mV to 5 V >200 MHz: 50 mV to 4 V	
<b>Amplitude resolution</b>	0.1 mV or 4 digits						
<b>Add input</b>	No	No		Yes		Yes	
<b>Interface</b>	USB, LAN, GPIB						
<b>See Page</b>	14						

■ Probe Selection Made Easy See pages 16-17 for our full range of oscilloscope probes.

# DPO3000 Series Digital Phosphor Oscilloscopes

## Feature-Rich Tools for Debugging Mixed Signal Designs



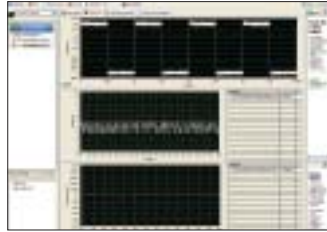
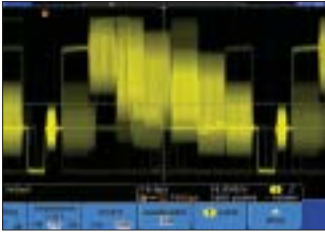
Unit Size: 16.5 in. (419 mm) wide x 9.0 in. (229.0 mm) high x 5.4 in. (137.0 mm) deep; Weight: 9.2 lbs. (4.17 kg).

### ■ Applications

- Embedded Design and Debug
- Investigation of Transient Phenomena
- Video Design and Debug
- Design and Debug
- Power Measurements
- Manufacturing Test and Quality Control

The DPO3000 Series delivers the performance you need to visualize even your most demanding signals. With Wave Inspector's unique ability to zoom/pan, play/pause and set search marks, you can efficiently navigate and manage long record lengths with ease. Combine this with standard 5M record length on all channels, 50,000 wfms/s waveform capture rate, and minimum 5X over-sampling on all channels, you can be confident that even the fastest transient events will be captured and displayed accurately.

Contact your local Tektronix representative today for all the latest support materials!



■ Learn More

- DPO3000 Datasheet, 3GW-21364-xx
- Troubleshoot Your Design with Tektronix DPO and MSO Series Oscilloscopes (Troubleshooting Guide), 3GW-21588-xx

Viewing an NTSC video signal. The NI LabVIEW SignalExpress Tektronix DPO3000 Series fast waveform capture rate, coupled with its intensity-graded acquisition and analysis software information-rich display as an analog oscilloscope, but with much more detail and all the benefits of digital scopes.

■ The DPO3000 Series redefines expectations for working with long record lengths with innovative Wave Inspector controls:



■ **Zoom/Pan**

A dedicated, two-tier front-panel knob provides intuitive control of both zooming and panning.

■ **Play/Pause**

A dedicated play/pause button on the front panel scrolls the waveform across the display automatically while you look for anomalies or an event of interest.

■ **User Marks**

See something interesting on your waveform? Press the Set Mark button on the front panel to leave one or more "bookmarks" on the waveform.

■ **Search Marks**

Allows you to search through your long acquisition based on user-defined criteria. All occurrences of the event are highlighted with search marks and are easily navigated to.

Specifications	DPO3012	DPO3014	DPO3032	DPO3034	DPO3052	DPO3054
Channels	2	4	2	4	2	4
Display	Large 9.0 in. (229 mm) WVGA screen					
Bandwidth	100 MHz	100 MHz	300 MHz	300 MHz	500 MHz	500 MHz
Sample Rate per Channel (GS/s)	Up to 2.5 GS/s on every channel					
Record Length (Maximum)	5 M points					
Trigger Types	Edge, Logic, Pulse Width, runt, Set-up and Hold, Rise/Fall Time, Video, External, Custom, RS-232/422/485/UART					
Serial Decode and Analysis	PC, SPI, CAN, LIN, RS-232/422/485/UART					
Connectivity and Storage	(2) USB hosts, LAN (10/100 Base-T Ethernet), (1) USB device, VGA out					
Waveform Math and Analysis	Waveform Math - Arithmetic, FFT and Advanced Math					

\*Optional

■ **Recommended Accessories**

**DPO3AUTO** Automotive Serial Triggering and Analysis Module (CAN, LIN).

**DPO3VID** HDTV and Custom Video Triggering and Analysis Module.

**DPO3EMBED** Embedded Serial Triggering and Analysis Module (I2S/I2C).

**DPO3COMP** Computer Serial Triggering and Analysis Module (RS-232/422/485/UART).

**SIGEXPTEN** LabVIEW SignalExpress™ TE Software - Full Version.

**TEK-USB-488** GPIB to USB adapter.

**ACD4000** Soft Transit Case.

**HC-TEK4321** Hard Transit Case (requires ACD4000).

**RMD3000** Rackmount Kit.

■ **Probes** Please refer to pages 16-17 for recommended probes for the DPO3000 Series.

Contact your local Tektronix representative today for all the latest support materials!

# MSO2000 Series Mixed Signal Oscilloscopes

## DPO2000 Series Digital Phosphor Oscilloscopes

Feature-rich tools for debugging mixed signal designs.

Slim 5.3 in. (134 mm) depth frees up precious bench-top space.

Bright 7 in. (180 mm) Wide-format display for easy visualization of your signals.

Front-panel USB ports for simple and convenient data storage.

16 fully-integrated digital channels. (MSO models only).

TekVPI probe interface allows smarter communications between the oscilloscope and probe.

2 or 4 analog channels.



Find and mark all occurrences of an event with the powerful automated search feature.

Navigating your analog and digital waveforms has never been easier with dedicated frontpanel Wave Inspector controls. Use the inner knob to zoom and the outer knob to pan.

Filter out the unwanted noise from your signal while still capturing glitches and other signal details up to the full bandwidth of your oscilloscope with FilterVu Variable Low-Pass Filter.

Supports serial buses, including I<sup>2</sup>C, SPI, RS-232/422/485/UART, CAN, LIN, Serial Triggering and automated decode. MSO models support parallel buses.

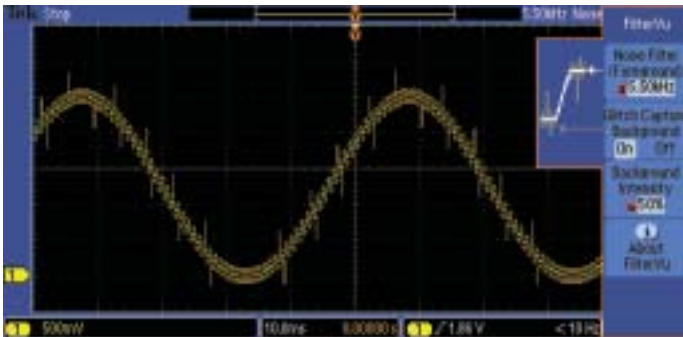
Unit Size: 14.9 in. (377 mm) wide x 7.1 in. (180 mm) high x 5.3 in. (134 mm) deep, Weight: 7.9 lbs. (3.6 kg).

### Applications

- Embedded Design and Debug
- Mixed Signal Design and Debug
- Power Measurement
- Automotive Electronics
- Education and Training

The Power to Solve Problems Quickly at an Entry Level Price. The MSO2000 and DPO2000 Series digital phosphor oscilloscopes (DPOs) deliver the performance and tools you need to visualize your signals and answers quickly. The DPO2000 Series are the first oscilloscope to provide 1 M points of usable record length on all channels, serial trigger and decode analysis options, a variable low-pass filter that also allow you to signal details to the oscilloscope's full bandwidth, and all this in a compact form factor.

The MSO2000 Series adds 16 integrated digital channels, enabling you to visualize and time correlate analog and digital signals on a single instrument. This integration extends triggering functionality across all 20 channels – which is ideal for debugging mixed analog and digital designs.

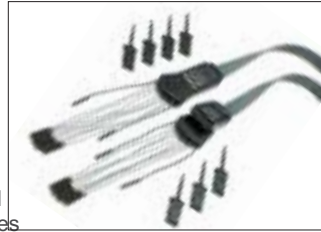
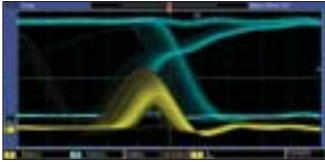


#### FilterVu Variable Low Pass Filter

Tired of being limited to 20 MHz bandwidth filter in your oscilloscope? Simply turn on FilterVu and adjust the variable low pass filter.

Unlike other variable low pass filters, FilterVu filters out the unwanted noise from your signal while still capturing glitches and other signal details up to the full bandwidth of the oscilloscope.

Contact your local Tektronix representative today for all the latest support materials!



Digital phosphor technology enables 5,000 waveforms/second waveform capture rate and real-time intensity grading. This provides you with unmatched insight into complex behavior, such as metastable events.

No more counting clock edges and 1s and 0s. A Bus waveform provides decoded packet content including Start, Address, Read/Write, Data and Stop.

The P6316 digital probe – standard with the MSO2000 Series – has two eight-channel color-coded pods and easily connects to the front on the instrument. This probe was designed to simplify the process of connecting to the device-under-test.

■ Learn More

- See the MSO/DPO20000 Product Demo (CD), 3GW-22057-XX
- Learn more about Debugging Low-Speed Serial Buses (Application Note), 48W-19040-XX
- Learn more about FilterVu Variable Low Pass (Application Note), 3GW-22049-XX

■ The MSO2000 and DPO2000 Series redefines expectations for working with long record lengths with innovative Wave Inspector® controls:



■ Zoom/Pan

A dedicated, two-tier front-panel knob provides intuitive control of both zooming and panning.

■ Play/Pause

A dedicated play/pause button on the front panel scrolls the waveform across the display automatically while you look for anomalies or an event of interest.

■ User Marks

See something interesting on your waveform? Press the Set Mark button on the front panel to leave one or more “bookmarks” on the waveform.

■ Search Marks

Don't want to take the time to inspect the entire acquisition to find the event you are looking for? The MSO/DPO2000 Series features a robust waveform search feature that allows you to search through your long acquisition based on user-defined criteria. All occurrences of the event are automatically highlighted with search marks and are easily navigated to.

Specifications	DPO2012	DPO2014	DPO2024	MSO2012	MSO2014	MSO2024
Channels	2 analog	4 analog	4 analog	2 analog + 16 digital	4 analog + 16 digital	4 analog + 16 digital
Display	Bright 7.0 in. (180 mm) Wide QVGA screen					
Bandwidth	100 MHz	100 MHz	200 MHz	100 MHz	100 MHz	200 MHz
Sample Rate per Analog Channel	1 GS/s					
Record Length	1 M points					
Trigger Types	Edge, Logic, Pulse (Width, Runt), Set-up and Hold, Rise/Fall Time, Glitch, LIN, RS-232/422/485/UART					
Serial Decode and Analysis	PC, SPI, CAN, LIN, RS-232/422/485/UART, Parallel					
Connectivity and Storage	(1) USB host port, (1) USB device, LAN (10/100 Base-T Ethernet), GPIB					
Minimum Detectable Pulse Width (Digital Channels)	5 ns					

\*Optional MSO2000 models only

■ Recommended Accessories

**DPO2AUTO** Automotive Serial Triggering and Analysis Module (CAN, LIN).

**DPO2EMBED** Embedded Serial Triggering and Analysis Module (I2C, SPI).

**DPO2COMP** Computer Serial Triggering and Analysis Module (RS-232/422/485/UART).

**SIGEXPTEN** LabVIEW SignalExpress Edition software - Full Version.

**DPO2CONN** Adds Ethernet (10/100 Base-T) and Video Out Port.

**TEK-USB-488** GPIB to USB adapter.

**ACD2000** Soft Transit Case with Protective Front Panel Cover.

**HCTEK4321** Hard Transit Case (requires ACD2000).

**RMD2000** Rackmount Kit.

**TekVPI External Power Supply** Required to power TekVPI Probes and Adaptors - Order 119-7465-xx.

**Tek-DGP** TekVPI Deskew Generator Signal Source.

**Deskew and Calibration Fixture** - Order 067-1686-xx.

■ Probes Please refer to pages 16-17 for recommended probes for the MSO/DPO2000 Series.

# TDS3000C Series Digital Phosphor Oscilloscopes

Powerful. Portable. Affordable.

Oscilloscopes

Choice of 100 to 500 MHz bandwidths to meet the needs of your most demanding projects

Be sure to capture a complete view of your signal with digital real-time (DRT) sampling technology and sin(x)/x interpolation

WaveAlert automatic waveform anomaly detection provides instant 3-D recognition of transients

Compact, lightweight, battery-capable design to take you anywhere the job requires

Capture glitches and infrequent events with 3,600 waveforms per second continuous waveform capture rate

QuickMenu graphical user interface, 11 languages built in, to make setup and operation simple and fast

Plug-in application and communication modules extend the application-specific features needed for the job at hand

Real-time intensity-graded color display to locate and analyze waveform anomalies that can be elusive or invisible on comparable oscilloscopes

Easily store, document and analyze your measurement results with OpenChoice solutions built-in Ethernet, front panel USB port, OpenChoice and NI LabVIEW Signal Express, Tektronix Edition software, and more

Unit Size: 14.8" (375.0 mm) wide x 6.9" (176.0 mm) high x 5.9" (149.0 mm) deep; Weight: 7.0 lbs (3.2 kg)

## ■ Applications

- Digital Design and Troubleshooting
- Video Design and Service
- Power Supply Design
- Telecomm Mask Testing and Manufacturing
- Manufacturing Test and Quality Control
- Industrial Control

The TDS3000C Series packs the power of a DPO, digital real-time (DRT) sampling technology, WaveAlert automatic waveform anomaly detection, OpenChoice documentation and analysis solutions, National Instruments LabVIEW Signal Express, Tektronix Edition Software provides advanced analysis, data logging, remote instrument control, live waveform analysis and five application-specific modules into a lightweight, battery-capable design - all backed by a 3 year standard warranty.

Precision measurements start at the probe tip. The right probes matched to your oscilloscope are vital to achieving the greatest signal fidelity and measurement accuracy. See pages 20-21 for the probes designed for this instrument.

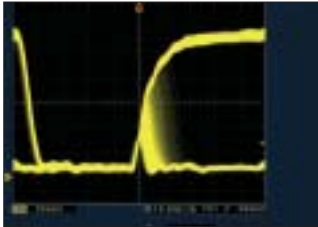
	TDS3012C	TDS3014C	TDS3032C	TDS3034C	TDS3052C	TDS3054C
<b>Channels</b>	2	4	2	4	2	4
<b>Bandwidth (MHz)</b>	100	100	300	300	500	500
<b>Sample Rate per Channel (GS/s)</b>	1.25	1.25	2.5	2.5	5	5
<b>Oscilloscope Type</b>	Digital Phosphor Oscilloscope (DPO)					
<b>Record Length (Maximum)</b>	10 k					
<b>Display</b>	Color VGA LCD					
<b>Trigger Types</b>	Edge, Logic (Pattern, State), Pulse (Glitch, Width, Runt, Slew Rate), Video, Correlated Video*					
<b>Battery Operation</b>	Optional 3 hours with one Li-ion battery					
<b>Connectivity and Storage</b>	RS-232*, GPIB*, Centronics, USB, LAN (10Base-T Ethernet)					
<b>Waveform Math and Analysis</b>	Waveform Math, FFT, Arbitrary Expression Math*					

\*1 Optional

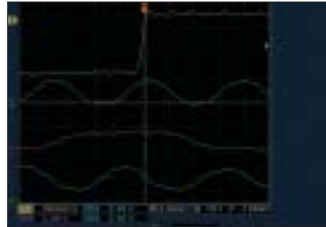
Contact your local Tektronix representative today for all the latest support materials!

"We've used a variety of test tools, but we prefer Tektronix instruments because of their straightforward operation, high performance and accuracy, and advanced functionality."

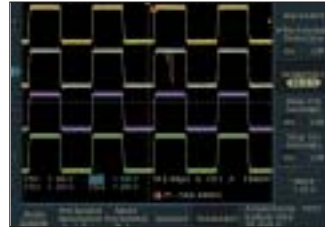
- Dr. Guozhu Chen, Professor of Power Electronics, U.C. Irvine



High waveform capture rate provides unmatched insight into complex signal behavior, such as metastable events.



DRT sampling technology captures WaveAlert waveform anomaly high-frequency information, such as detection provides instant 3-D glitches and edge anomalies, that recognition of transients. eludes other oscilloscopes in its class.



**P6139A**  
10X, 500 MHz Modular Passive Voltage Probe.

■ TDS3000C Series Recommended Accessories

**TDS3GV Communications Module -**

GPIB, VGA and RS-232 interfaces

**TDS3AAM Advanced Analysis Module -**

Adds extended math capability, arbitrary math expressions, measurement statistics and additional automated measurements

**TDS3LIM Limit Testing Module -**

Adds custom waveform limit testing capabilities

**TDS3TMT Telecommunications Mask**

**Testing Module -**

Adds pass/fail compliance testing of ITU-T G.703 and ANSI T1.102 standards, custom mask editing, and more

**TDS3VID Extended Video Analysis Module -**

Adds Video QuickMenu, Autoset, Video Picture mode, Vectorscope mode, HDTV and custom format triggering, graticules and more

**TDS3SDI 601 Serial/Digital Video Module -**

Adds 601 serial digital video to analog video conversion, picture mode with bright line select, vectorscope mode, HDTV format triggering and more

**SIGEXPTE -**

NI LabVIEW SignalExpress Software - Full Version

**TDS3BATC Battery Pack -**

Up to 3 hours of continuous operation without line power

**TDS3CHG -**

Battery charger

**AC3000 -**

Soft carrying case

**HC TEK4321 -**

Hard carrying case (requires AC3000)

**RM3000 -**

Rackmount kit

**TNGTDS01 -**

Operator training kit

■ Learn More

- Troubleshoot Your Design with the TDS3000C Series Oscilloscopes (Troubleshooting Tips), 3GW-16158-xx
- Be Sure to Capture the Complete Picture with Digital Real-Time (DRT) Sampling Technology (Technical Brief), 3GW-17741-xx
- TDS3000C Troubleshooting Solutions Kit CD, 3GW-18005-xx

■ Probes Please refer to pages 16-17 for recommended probes for the TDS3000C Series.

Contact your local Tektronix representative today for all the latest support materials!

# TDS1000B and TDS2000B Series

## Digital Storage Oscilloscopes

Instantly Productive. Incredibly Easy.



Unit Size: 12.85 in. (326.3 mm) wide x 6.22 in. (158.0 mm) high x 4.89 in. (124.2 mm) deep, Weight: 4.4 lbs.(2.0 kg).

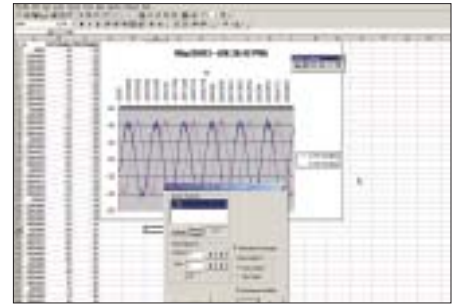
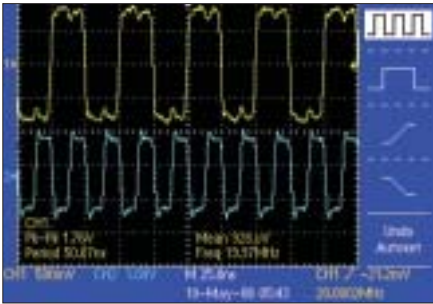
### ■ Applications

- Design and Debug
- Education and Training
- Manufacturing Test and Quality Control
- Service and Repair

The TDS1000B and TDS2000B Series oscilloscopes help you get more done, in less time. With bandwidths up to 200 MHz, the Series comes packed with features to make your work easier - including USB connectivity, simple user interface, context-sensitive help, probe check wizard and a Lifetime Warranty\*, all as standard.

\*Limitations apply. For terms and conditions, visit [www.tektronix.com/lifetimewarranty](http://www.tektronix.com/lifetimewarranty)

Contact your local Tektronix representative today for all the latest support materials!



Quickly and easily capture waveforms.

Conveniently use your USB flash drive to store and transfer waveforms. Easily capture, save, and analyse measurement results with OpenChoice Communications Software.

Specifications	TDS1001B	TDS1002B	TDS1012B	TDS2002B/ TDS2004B	TDS2012B/ TDS2014B	TDS2022B/ TDS2024B
<b>Channels</b>	2	2	2	2, 4	2, 4	2, 4
<b>Bandwidth</b>	40 MHz	60 MHz	100 MHz	60 MHz	100 MHz	200 MHz
<b>Sample Rate per Channel (GS/s)</b>	500 MS/s	1 GS/s	1 GS/s	1 GS/s	1 GS/s	2 GS/s
<b>Oscilloscope Type</b>	Digital Storage Oscilloscope (DSO)					
<b>Record Length</b>	2.5 K points at all time-bases, on all models					
<b>Display</b>	Mono	Mono	Mono	Color	Color	Color
<b>Trigger Types</b>	Edge, Pulse, Video					
<b>Connectivity and Storage</b>	USB host for storage, USB device for PC connectivity or direct print, GPIB					
<b>Waveform Math and Analysis</b>	Waveform math, FFT, Connect to a PC for extended analysis on OpenChoice or NI LabVIEW SignalExpress software					

\*1 Optional

### ■ TDS1000B and TDS2000B Series Recommended Accessories

**TEK-USB-488** –  
GPIB-to-USB converter.

**RM2000B** -  
Rackmount kit

**SIGEXPT** –  
NI LabVIEW SignalExpress Software – Full Version.

**TNGTDS01** –  
Operator Training Kit – Extensive instructions and step-by-step lab exercises provide education about the operation of TDS1000B and TDS2000B Series oscilloscopes. Kit includes self-paced CD-ROM based manual

**AC2100** -  
Soft carrying case

**HCTEK4321** -  
Hard carrying case (requires AC2100) and signal source board.

**■ Learn More**

Take the TDS2000B for a spin with the TDS1000B/2000B Product Demo, with interactive 360 degree product views (CD), 3GW-19697-xx



P2220 passive probe.

■ **Probes** Please refer to pages 16-17 for recommended probes for the TDS1000B/2000B Series.

Contact your local Tektronix representative today for all the latest support materials!

# TPS2000 Series

Powerful productivity from bench to field.

Digital real-time (DRT) sampling technology with up to 2 GS/s real-time sample rate to capture elusive glitches—the first time

8+ hours of continuous battery operation with hot-swappable batteries for virtually unlimited freedom from an AC power source

OpenChoice software and integrated CompactFlash data storage to speed storage, documentation and analysis of your measurements



Features such as autoset menu, autorange, automatic measurements, 10X to 1000X vertical position control and more to boost your productivity

Traditional user interface with analog-style knobs makes easy work of your most demanding tasks

4 Isolated Channel inputs and external trigger input to make multi-channel floating measurements quick, accurate and affordable

Power measurement and analysis software offers the broadest range of power measurements at its price point

Unit Size: 13.24" (336.0 mm) wide x 6.33" (161.0 mm) high x 5.10" (130.0 mm) deep;  
Weight: 7.0 lbs. (3.2 kg) with one battery installed

## ■ Applications

- Industrial Power Design, Troubleshooting, Installation and Maintenance
- Advanced Electronics Design, Troubleshooting, Installation and Maintenance
- Automotive Design and Test
- Education

The TPS2000 Series allows you to tackle the escalating challenges that you face in industrial power design, troubleshooting, installation and maintenance. Make floating, or differential, measurements accurately, quickly and affordably. Confidently confront high voltages and currents. Quickly debug and characterize signals and document your measurement results. Correlate your measurements between bench, lab and field. Test your products in a variety of challenging environments that demand versatility.

All this is possible with the TPS2000 Series—the world's first 4-isolated-channel, full-featured, battery-powered oscilloscope.

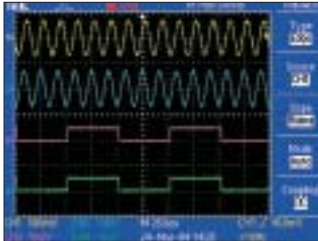
Features	TPS2012	TPS2014	TPS2024
Channels (Isolated) Rate	2	4	4
Bandwidth (MHz)	100	100	200
Sample Rate per Channel (GS/s)	1.0	1.0	2.0
Oscilloscope Type	Digital Storage Oscilloscope (DSO), with isolated channels		
Record Length	2.5 K		
Display	Color QVGA LCD		
Trigger Types	Edge, Pulse, Video		
Battery Operation	8 hours of continuous battery operation with 2 batteries installed, hot-swappable for virtually unlimited freedom from an AC power source		
Connectivity and Storage	RS-232, Centronics, CompactFlash		
Waveform Math and Analysis	Waveform math, FFT, Easy connection to TDSProCS1* OpenChoice™ PS2PW1		

\*1 Optional

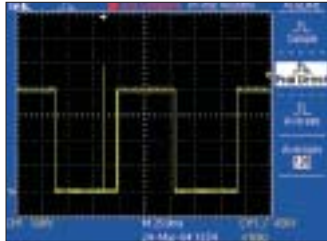
Contact your local Tektronix representative today for all the latest support materials!

“The TPS2000 Series scope [puts] all the features that a power electronics engineer would want in one instrument [to] make our job much easier. The instrument is very flexible and improves productivity overall.”

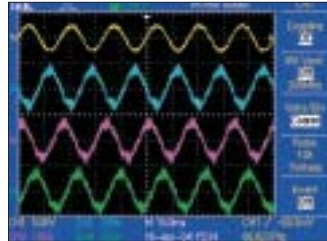
- Viren Gavadekar, Engineering Manager, Schneider Electric



4 Isolated Channel inputs and isolated external trigger input to make floating and differential measurements accurately and quickly.



Capture elusive glitches—the first time—with digital real-time (DRT) sampling technology.



Perform 3-phase power measurements of variable frequency drives using TPS2PWR1 software.



Quickly correlate your measurements between bench, lab and field with the TPS2000 Series' portability.

■ **TPS2000 Series Recommended Accessories**

**TPS2PBND -**

Power bundle. Includes (4) P5120 probes and TPS2PWR1 power measurement and analysis software.

**TPSBAT -**

Additional Lithium-Ion battery

**TPS2PWR1 -**

Power measurement and analysis software. Instantaneous power waveform analysis, harmonics analysis, switching loss, phase angles, dv/dt and di/dt cursors.

**TPSCHG -**

Battery charger

**AC2100 -**

Soft carrying case

**CTEK4321 -**

Hard carrying case (requires AC2100)

■ **Learn More**

- Fundamentals of Floating Measurements (Application Note), 3AW-19134-xx
- A New Approach to Quick, Accurate, Affordable Floating Measurements (Technical Brief), 3MW-17773-xx
- TPS2000 Series Oscilloscopes Product Demo (CD), 3MW-17784-xx

■ **Probes** Please refer to pages 16-17 for recommended probes for the TPS2000 Series.



P2220 passive probe allows you to make quick, accurate floating measurements for differential voltages, up to 30V<sub>pk</sub> floating.

Contact your local Tektronix representative today for all the latest support materials!

# AFG3000 Series Arbitrary Function Generators

The next generation of signal generation.



Unit Size: 13.0" (329.6 mm) wide x 6.2" (156.3 mm) high x 6.6" (168.0 mm) deep; Weight: 9.9 lbs. (4.5 kg)

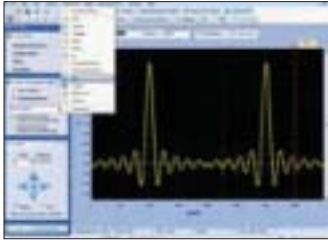
## Applications

- Electronic Test and Design
- Sensor Simulation
- Functional Test
- Education and Training

Unmatched performance, versatility, intuitive operation, and affordability make the AFG3000 Series of Function Arbitrary Waveform, and Pulse Generators the most useful instruments in the industry. With the large color display and intuitive user interface, you have complete confidence that you are generating the signal you need.

	AFG3011	AFG3021B	AFG3022B	AFG3101	AFG3102	AFG3251	AFG3252
<b>Channels</b>	1	1	2	1	2	1	2
<b>Waveforms</b>	Sine, Square, Pulse, Arb, Ramp, Sin(x)/x, Gaussian, Lorenz, Exponential Rise/Decay, Haversine, Noise						
<b>Sine</b>	1 $\mu$ Hz to 10 MHz	$\mu$ Hz to 25 MHz		$\mu$ Hz to 100 MHz		$\mu$ Hz to 240 MHz	
<b>Square</b>	1 $\mu$ Hz to 5 MHz	$\mu$ Hz to 12.5 MHz		$\mu$ Hz to 50 MHz		$\mu$ Hz to 120 MHz	
<b>Pulse/Arb</b>	1 MHz to 5 MHz	1 MHz to 12.5 MHz		1 MHz to 50 MHz		1 MHz to 120 MHz	
<b>Other waveforms</b>	1 $\mu$ Hz to 100 kHz	$\mu$ Hz to 250 kHz		$\mu$ Hz to 1 MHz		$\mu$ Hz to 2.4 MHz	
<b>Noise bandwidth</b>	10 MHz	25 MHz		100 MHz		240 MHz	
<b>Arb sample rate (waveform length)</b>	250 MS/s	250 MS/s		1 GS/s (16K) 250 MS/s (>16K)		2 GS/s (16K) 250 MS/s (>16K)	
<b>Waveform memory</b>	4 x 2 to 128K						
<b>Modulation</b>	AM, FM, PM, FSK, PWM						
<b>Frequency resolution</b>	1 $\mu$ Hz or 12 digits						
<b>Timebase stability</b>	$\pm$ 1 ppm per year						
<b>Vertical resolution</b>	14 bits						
<b>Sweep</b>	lin, log						
<b>Amplitude into 50 ohms</b>	20 mV <sub>r</sub> to 20 V <sub>r</sub>	10 mV <sub>r</sub> to 10 V <sub>r</sub>		20 mV <sub>r</sub> to 10 V <sub>r</sub>		200 MHz: 50 mV <sub>r</sub> to 5 V <sub>r</sub> >200 MHz: 50 mV <sub>r</sub> to 4 V <sub>r</sub>	
<b>Amplitude resolution</b>	0.1 mV <sub>r</sub> or 4 digits						
<b>Add input</b>	No	No		Yes		Yes	
<b>Interface</b>	USB, LAN, GPIB						

Contact your local Tektronix representative today for all the latest support materials!



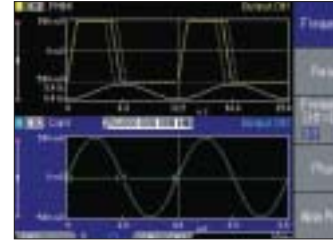
**ArbExpress™ Software**

With this PC software, custom waveforms can be created and modified with ease, imported seamlessly from any Tektronix oscilloscope or defined via equation editor, free hand, point draw and waveform math.



**Waveform Parameters**

View waveform parameters of channel 1 and 2 simultaneously (dual channel models).



**Waveform Graph**

View waveforms of channel 1 and 2 simultaneously.

■ **Features & Benefits**

- Up to 240 MHz sine waves
- Up to 120 MHz pulse waves
- Up to 2 GS/s arbitrary waveforms
- Amplitudes up to 20 V<sub>pp</sub> into 50 Ohm (40 V<sub>pp</sub> into open circuit)
- Modulation, Sweep and Burst Modes
- Large color display provides all the relevant settings at a single glance (monochrome on AFG3021B)
- Detailed display of waveform shape, modulation, and trigger signal with time and amplitude scale gives full confidence in signal settings
- USB storage devices plug in the front panel to extend storage capacity and save waveforms and instrument settings
- Shortcut keys provide direct access to frequently used functions and parameters
- Context-sensitive help allows the user to learn about various features and functions
- Dual-channel models save cost and bench space
- Pulse Generator, with variable edge times as short as 2.5 ns
- Noise generator to add variable noise in each channel
- Trigger/Sync Inputs and Outputs
- Sum-input to add external signal to output
- Selectable User Interface Language

■ **AFG3000 Series Recommended Accessories**

- RM3100 -**  
Rackmount kit
- 013-0345-00 -**  
Fuse adapter, BNC-P to BNC-R
- 159-0454-00 -**  
Fuse set, 3pcs, 0.125A
- 012-0482-00 -**  
BNC cable shielded, 3 ft
- 012-1256-00 -**  
BNC cable shielded, 9 ft

■ **Learn More**

- XYZs of Signal Sources (Primer), 76W-16672-xx
- Replicating Real World Signals with an Arbitrary / Function Generator (Application Note), 76W-18661-xx
- Semiconductor Characterization Counts on Flexible Stimulus Signals (Application Note), 76W-18660-xx
- Characterization of IQ Modulators Counts on Flexible Signal Generator Stimulus (Application Note), 75W-20744-xx
- High Amplitude Arbitrary/Function Generator Simplifies Measurement in Automotive, Semiconductor, Scientific and Industrial Applications (Application Note), 75W-21998-xx
- AFG3000 Series (Datasheet), 76W-18656-xx

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# Probes

Probes



## Perfect vision begins at the probe tip.

Precision measurements start at the probe tip. The right probes matched to your oscilloscope are vital to achieving the greatest signal fidelity and measurement accuracy.

As the leader of probing technology, Tektronix offers the world's largest and most respected line. Their ruggedness, reliability and long life add up to the best probe value on the market. And they're complemented by an amazingly wide array of probe accessories for virtually every need.



### Passive Probes

Passive probes provide ease-of-use and a wide range of measurement capabilities at an affordable price.

**Model Numbers:**

- P2220/P2224** 1/10X, 7 MHz/200 MHz passive probe
- P3010** 10X, 100 MHz passive probe
- P6101B** 1X, 15 MHz passive probe
- P6139A** 10X, 500 MHz passive probe

### Low Capacitance Probes

Low capacitance probes, also called  $Z_0$  probes or controlled impedance probes, are passive probes that offer very low input capacitance.

**Model Numbers:**

- P6158** 20X, 3 GHz low-capacitance probe

### Active Probes

Active probes offer excellent versatility and accuracy when measuring high-frequency signals from today's complex circuits.

**Model Numbers:**

- P6205** 10X, 750 MHz active probe
- P6243** 10X, 1 GHz active probe
- TAP1500** TekVPI (R) 10X, 1.5 GHz active probe



### Differential Probes

Differential probes provide the highest CMRR, broad frequency range and minimal time skew between inputs, making them the best choice for accurate measurements on differential signals.

**Model Numbers:**

- ADA400A** 100X/10X/1X/0.1X, 1 MHz differential preamplifier
- P6246** 1X/10X, 400 MHz differential probe
- P6247** 1X/10X, 1 GHz differential probe
- TDP0500** TekVPI (R) 500 MHz, 42V differential probe
- TDP1000** TekVPI 1 GHz, 42V differential probe
- TDP1500** TekVPI 1 GHz > 1pF input capacitance, differential probe

### Current Probes

Current measurement systems make current measurements and calculations simple and easy.

**Model Numbers:**

- See also High-voltage probes.
- A621-** 1000 A<sub>RMS</sub> 50 kHz current probe
- A622-** 70 A<sub>RMS</sub> 100 kHz current probe
- P6021-** 7 A<sub>RMS</sub> 60 MHz current probe
- P6022-** 3 A<sub>RMS</sub> 120 MHz current probe
- TCP0030** 30A, DC to 120 MHz current probe
- TCP0150-** 150A, DC to 20 MHz current probe
- TCP202** 15 A, DC to 50 MHz current probe
- TCP312** 30 A, DC to 100 MHz current probe
- TCP305** 50 A, DC to 50 MHz current probe
- TCP303** 150 A, DC to 15 MHz current probe
- TCP404XL** 750 A, DC to 2 MHz current probe

### High Voltage Probes

High-voltage measurement solutions extend your oscilloscope's ability to safely accurately capture real-time signal information from "elevated" or "floating" voltage systems.

**Model Numbers:**

- P5100** 100X, 250 MHz, passive high-voltage probe
- P5120** 20X, 200 MHz, passive high-voltage probe
- P6015A** 1000X, 75 MHz, passive high-voltage probe
- P6250** 1000X, 75 MHz, passive high-voltage probe
- P5200** 50X/500X, 25 MHz high-voltage differential probe
- P5205** 50X/500X, 100 MHz, high-voltage differential probe
- P5210** 100X/1000X, 50 MHz high-voltage differential probe

\*1 Used with TCPA300 amplifier. \*2 Used with TCPA400 amplifier.

To select the right probe for your specific application, contact your local Tektronix representative, or visit [www.tek.com/Measurement/programs/advisor/](http://www.tek.com/Measurement/programs/advisor/)

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Accessory Type	TDS1000B/ TDS2000B	TPS2000	TDS3000C	MSO2000/DPO2000	DPO3000 MSO4000/DPO4000
<b>Passive Probe</b> (1 Meg ohm termination)	P6101B (1X) P2220 (1X/10X)	P2220 (1X/10X)	P6139A (10X) P3010 (10X) P6101B (1X)	P6101B (1X) P2221 (1X/10X)	P6139A (10X) P6101B (1X)
<b>Passive Probe</b> (50 ohm termination)			P6158 (20X)	P6158 (20X)	P6158 (20X)
<b>High Voltage Probe</b> (1 Meg termination)	P5100 (100X) P6015A (1000X)	P5120 (20X)	P5100 (100X) P6015A (1000X)	P5100 (100X) P6015A (1000X)	P5100 (100X) P6015A (1000X)
<b>High Voltage Differential Probe</b>	P5200 P5205 P5210	P5205 P5210	P5205 P5210, P5200	P5200 P5205 P5210 <sup>*5</sup>	TDP0500, TDP1000 P5205 <sup>*5</sup> , P5210 <sup>*5</sup> P6250 <sup>*5</sup> , P6257 <sup>*5</sup>
<b>Active Probe</b> (Single-ended)	P6205 P6243	P6205 P6243	P6243 P6205	P6205 <sup>*5</sup> P6243 <sup>*5</sup> TAP1500	TAP1500
<b>Differential Probe</b>	P6246	P6246	P6246	TDP0500 TDP1000 TDP1500 P6246 <sup>*5</sup> P6247 <sup>*5</sup>	TDP0500 TDP1000 TDP1500 TDP3500 P6330 P6248 P6247 <sup>*5</sup> P6246 <sup>*5</sup>
<b>Micro-Volt Differential Probe</b>			ADA400A	ADA400A	ADA400A <sup>*5</sup>
<b>Current Probe AC/DC</b>	A622 TCP300 TCP400	A622 TCP300 TCP400	TCP202 A622 TCP300 TCP400	TCP0030 TCP0150 A622 TCP300 TCP400	TCP0030 TCP202 TCP0150 A622 TCP300 <sup>4</sup> TCP400 <sup>4</sup>
<b>Current Probe AC only</b>	A621, P6021, P6022	A621, P6021, P6022	A621, P6021, P6022	A621, P6021, P6022	CT6, A621, P6021, P6022
<b>Electro-Optical Converter</b> (50 ohm term.)			P6701B, P6702B		P6701B
<b>Software</b>		TPS2PWRI			
<b>Case(Soft)</b>	<b>AC2100</b>	<b>AC2100</b>	<b>AC3000</b>	<b>ACD2000</b>	<b>ACD4000</b>
<b>Case(Hard)</b>	<b>HCTEK4321</b>	<b>HCTEK4321</b>	<b>HCTEK4321</b>	<b>HCTEK4321</b>	<b>HCTEK4321</b>
<b>Rackmount Kit</b>	RM2000B		RM3000	RMD2000	RMD3000

\*1 Requires 1103 TEKPROBE Power Supply

\*2 Requires TPA-BNC Adapter for DPO2000, DPO3000, DPO4000, MSO2000 or MSO4000 Series

\*2B MSO/DPO4000 Series only

\*2C DPO3000 Series only

\*3 TCP300 (TCPA300 Amplifier used with TCP305 or TCP312 or TCP303), TCP400 (TCPA400 Amplifier used with TCP404XL).

\*4 May be used with TPA-BNC Adapter for proper readout or direct BNC connection without readout.

\*5 MSO2000 and DPO2000 Series Oscilloscopes require TekVPI external power supply 119-7465-XX. DPO3000 Series Oscilloscopes require TekVPI external power supply 119-7465-XX when total oscilloscope probe power usage exceeds 20W.

Find the best probe for your needs at: [www.tektronix.com/probes](http://www.tektronix.com/probes)

To select the right probe for your specific application, contact your local Tektronix representative, or visit [www.tek.com/Masurement/programs/advisor/](http://www.tek.com/Masurement/programs/advisor/)

■ Learn More

- ABCs of Probes (Primer), 60W-6053-xx
- Z-Active Differential Probes: Best Practices (Technical Brief), 51W-17892-xx
- Probe Bandwidth Calculations (Technical Brief), 60W-18324-xx

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## Your Tektronix Service Advantage

You can trust Tektronix to offer unequalled engineering expertise and a customer-centric approach to ensure the optimal performance of your Tektronix products and maximize the lifetime value of your Tektronix investment.

### Summary of Service Plans

Repair Service Extended Coverage	Calibration Service Coverage	Multi-Vendor Calibration Services
<ul style="list-style-type: none"> <li>■ Save money with multi-year coverage</li> <li>■ Priority service</li> <li>■ Covers equipment, parts, labor and transportation</li> <li>■ Applicable software, safety and reliability updates</li> </ul>	<ul style="list-style-type: none"> <li>■ Accredited calibration</li> <li>■ Traceable calibration</li> <li>■ Functional verification</li> <li>■ Applicable software, safety and reliability updates</li> <li>■ Calibration records retention</li> </ul>	<ul style="list-style-type: none"> <li>■ Single point of contact for all of your calibration needs</li> <li>■ Simplify your operations and reduce administrative costs</li> <li>■ On-site delivery for convenience and reduced downtime</li> </ul>

- **Tektronix Factory Experts**  
Access to the engineering expertise that designed and built your products to ensure they are in peak performance. Over 20 years of training per support engineer.
- **Comprehensive and Thorough Treatment**  
Software updates, safety and reliability modifications, and cosmetic enhancements are included if applicable. Products are returned to you in a "like new" condition. Worldwide support is available through the Tektronix network.
- **Efficiency and Convenience**  
Team of professionals focused on getting your instruments back to you as soon as possible to keep your downtime to a minimum and your service management easy.
- **Flexible Repair and Calibration Service**  
Choice of cost effective, flexible options and service packages to meet your needs.

For further details visit:  
[www.tektronix.com/service](http://www.tektronix.com/service)

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### For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit [www.tektronix.com](http://www.tektronix.com)



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