2013 Product Catalog
Test & Measurement Solutions

KEITHLEY
A Tektronix Company

Tektronix®

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- Reliable Performance
- Fast Delivery

Downloads

Our library is full of information designed to enhance your understanding and help you solve measurement challenges.

Highlights

SourceMeters
Switch Systems
Semiconductor Test Systems
Digital Multimeters
Data Acquisition
Low-level Instruments
Power Supplies

Tektronix and Keithley - From Nanohertz to Gigahertz.

As part of the Tektronix portfolio, Keithley Instruments brings the DC test tools you need to do your job better and with greater confidence. Take a look inside to see the capabilities we provide. Together Tektronix and Keithley address your measurement needs from low level precision measurements to powerful time domain measurements.

MDO4000 Mixed Domain Oscilloscope - Transforming the way you test.

The world's first oscilloscope with a built-in spectrum analyzer

For the first time ever, you can capture time-correlated analog, digital and RF signals for a complete system view of your device. Solve the most complicated design issues, quickly and efficiently, with an oscilloscope as integrated as your design.

PA4000 Power Analyzer

The PA4000 performs accurate measurements, even when power is distorted or noisy. It's versatile, too, with harmonics analysis, motor measurements, PC interfaces and dual current shunts per channel all standard.

Table of Contents

Choosing Your Oscilloscope

Tektronix offers oscilloscopes for many different applications and uses. To help you choose the right scope for your needs, the most common criteria for selecting a scope are listed below, along with helpful tips for determining your requirements.

❶ Bandwidth

All oscilloscopes have a low-pass frequency response that rolls off at higher frequencies. Oscilloscope bandwidth is specified as being the frequency at which a sinusoidal input signal is attenuated to 70.7% of the signal's true amplitude – the -3 dB point. Your oscilloscope must have sufficient bandwidth to capture all relevant frequency components of your signal. If you regularly work with digital signals, it may be easier to consider bandwidth by comparing signal and oscilloscope rise time specifications. Use an oscilloscope with a rise time specification five times faster than your signal rise time to keep error below 2%.

Rule: Bandwidth > 5 X Highest Signal Frequency
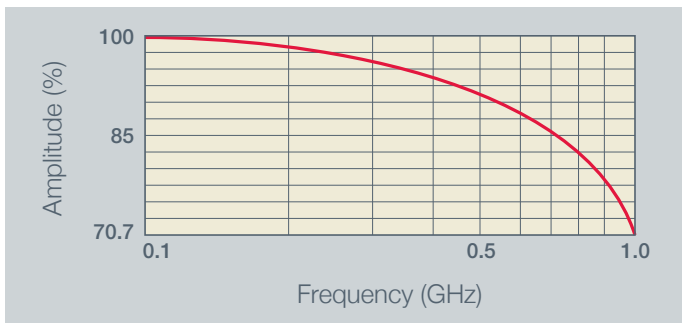
Figure 1: Typical frequency response curve for a general purpose oscilloscope

❷ Sample Rate

The faster an oscilloscope samples, the greater the resolution and detail of the displayed waveform, and the less likely that critical information or events will be lost. Tektronix recommends at least 5X oversampling to ensure signal details are captured and to avoid aliasing.

Rule: Sample Rate > 5 x (Highest Frequency Component)

❸ Record Length

Record length is the number of samples the oscilloscope can digitize and store in a single acquisition. Since an oscilloscope can store only a limited number of samples, the waveform duration – or length of "time" captured – will be inversely proportional to the oscilloscope's sample rate. A longer record length enables a longer time window to be captured with high resolution.

Rule: Captured Time = (Record Length) / (Sample Rate)

❹ Digital Channels and Spectrum Analyzer Input

Today's oscilloscopes offer more than just analog channels for system-level troubleshooting of complex designs.

■ If you need to analyze a parallel bus or multiple serial buses, the Tektronix MSO Series of mixed signal oscilloscopes offers 16 digital channels and up to 4 analog channels for analyzing multiple signals at once.

■ If you are working with RF signals, the Tektronix MDO Series of mixed domain oscilloscopes offers a built-in spectrum analyzer for time-correlated analysis of analog, digital and RF signals.

❺ Features and Analysis Capability

Tektronix oscilloscopes offer a range of features and analysis capabilities. When choosing your scope, you should review available triggers, waveform search tools, automated measurements, and analysis packages such as serial bus analysis, jitter and power analysis to ensure they meet your needs.

Basic Oscilloscopes

To accurately visualize the intricate details of fast changing signals, you need an oscilloscope with uncompromised performance. Tektronix basic oscilloscopes feature Digital Real-Time Sampling with at least x5 over sampling on all channels, all the time, to precisely capture today's complex signals.

	TBS1000	TDS2000C	TPS2000B	THS3000	TDS3000C
Channels	2	2, 4	2, 4 (isolated)	4 (isolated)	2, 4
Bandwidth	25 MHz to 150 MHz	50 MHz to 200 MHz	100 MHz to 200 MHz	100 MHz to 200 MHz	100 MHz to 500 MHz
Sample Rate	500 MS/s to 1 GS/s	500 MS/s to 2 GS/s	1 GS/s to 2 GS/s	2.5 GS/s to 5 GS/s	1.25 GS/s to 5 GS/s
Max Record Length	2.5 k points	2.5 k points	2.5 k points	10 k points	10 k points
Trigger Types	Edge, Pulse (width), Video	Edge, Pulse (width), Video	Edge, Pulse (width), Video	Edge, Pulse (width), Event, Video, Non-interlaced	Edge, Logic (Pattern, State), Pulse (Glitch, Width, Runt, Slew Rate), Video, Extended Video*, Comm* *Optional
Optional Serial Bus Decode and Analysis	--	--	--	--	
Connectivity	USB Host, USB Device, GPIB* *Optional	USB Host, USB Device, GPIB* *Optional	RS-232 (includes RS-232-to-USB Host Serial Cable), Centronics, CompactFlash	USB Host, USB Device	USB Host, LAN (10Base-T Ethernet) Optional TDS3GV Module: GPIB, RS-232, and Video Out
Waveform Math and Analysis	16 Automated Measurements, Arithmetic Waveform Math, FFT	16 Automated Measurements, Arithmetic Waveform Math, FFT, Waveform Limit Testing, Automated Datalogging **Optional:** TPS2PWR1: Power Measurement and Analysis	11 Automated Measurements, Arithmetic Waveform Math, FFT **Optional:** TPS2PWR1: Power Measurement and Analysis	21 Automated Measurements, Arithmetic Waveform Math, FFT	25 Automated Measurements, Arithmetic Waveform Math, FFT TDS3AAM: Advanced Analysis **Optional:** TDS3LIM: Limit Testing TDS3TMT: Telecom Mask Testing TDS3VID: HDTV and Custom Video Triggering
Software	PC Communications Software: OpenChoice® Desktop, Educator Classroom and Lab Resource CD	PC Communications Software: OpenChoice® Desktop, NI LabVIEW SignalExpress™ Tektronix Edition LE	PC Communications Software: OpenChoice® Desktop, NI LabVIEW SignalExpress™ Tektronix Edition LE	PC Communications Software: OpenChoice® Desktop	PC Communications Software: OpenChoice® Desktop, NI LabVIEW SignalExpress™ Tektronix Edition LE
Battery Operation	--	--	One TPSBAT Battery Pack Included Standard	One THSBAT Battery Pack Included Standard	Requires Optional TDS3BATC Battery Pack
Additional Resources					

Bench Oscilloscopes

With the MSO/DPO Series of bench oscilloscopes, you can analyze analog and digital signals with a single instrument. And now, you can analyze your RF signals too with the MDO Series - the World's first and only mixed domain oscilloscope + spectrum analyzer. Combine that with automated serial and parallel bus analysis, innovative Wave Inspector® controls for rapid waveform navigation, and automated power measurements, and the Tektronix bench oscilloscopes provide the feature-rich tools you need to simplify and speed debug of your complex design.

	MSO/DPO2000B	MSO/DPO3000	MSO/DPO4000B	MDO4000
Channels	2, 4 analog channels; 16 digital channels (MSO2000B)	2, 4 analog channels; 16 digital channels (MSO3000)	2, 4 analog channels; 16 digital channels (MSO4000B)	4 analog channels; 16 digital channels; 1 spectrum analyzer input
Bandwidth	70 MHz, 100 MHz and 200 MHz	100 MHz to 500 MHz	100 MHz to 1 GHz	100 MHz to 1 GHz (analog)
Spectrum Analyzer Frequency Range	--	--	--	50 kHz - 3 GHz or 50 kHz - 6 GHz (RF)
Sample Rate	1 GS/s (analog); 1 GS/s (digital, only 1 pod); 500 MS/s (digital, both pods)	2.5 GS/s (analog); 121.2 ps (8.25 GS/s) MagniVu™ (digital)	2.5 GS/s to 5 GS/s (analog); 60.6 ps (16.5 GS/s) MagniVu™ (digital)	2.5 GS/s to 5 GS/s (analog); 60.6 ps (16.5 GS/s) MagniVu™ (digital)
Max Record Length	1 Mpoints	5 Mpoints	Up to 20 Mpoints	20 Mpoints
Trigger Types	Edge, Logic, Pulse Width, Runt, Set-up and Hold, Rise/Fall Time, Video, I²C*, SPI*, CAN*, LIN*, RS-232/422/485/UART*, Parallel (MSO2000B) *Optional	Edge, Sequence, Logic, Pulse Width, Runt, Timeout, Set-up and Hold, Rise/Fall Time, Video, Extended Video*, I²C*, SPI*, CAN*, LIN*, FlexRay*, RS-232/422/485/ UART*, I²S/LJ/RJ/TDM*, MIL-STD-1553*, Parallel (MSO3000) *Optional	Edge, Sequence, Logic, Pulse Width, Runt, Timeout, Set-up and Hold, Rise/Fall Time, Video, Extended Video*,I²C*, SPI*, USB*, Ethernet*,CAN*, LIN*, FlexRay*, RS-232/422/485/UART*, I²S/LJ/ RJ/TDM*, MIL-STD-1553*, Parallel (MSO4000B) *Optional	RF Power Level, Edge, Sequence, Logic, Pulse Width, Runt, Timeout, Set-up and Hold, Rise/Fall Time, Video, Extended Video*, I²C*, SPI*, USB*, Ethernet*, CAN*, LIN*, FlexRay*, RS-232/422/485/UART*, I²S/LJ/ RJ/TDM*, MILSTD-1553*, Parallel *Optional **With optional MDO4TRIG module, RF power level can be used as source for Pulse Width, Timeout, Runt, Logic, Sequence
Optional Serial Bus Decode and Analysis	DPO2AUTO: CAN and LIN DPO2COMP: RS-232/422/485/ UART DPO2EMBD: I²C, SPI	DPO3AERO: MIL-STD-1553 DPO3AUDIO: I²S, LJ, RJ, TDM DPO3AUTO: CAN and LIN DPO3COMP: RS-232/422/485/ UART DPO3EMBD: I²C, SPI DPO3FLEX: FlexRay	DPO4AERO: MIL-STD-1553 DPO4AUDIO: I²S, LJ, RJ, TDM DPO4AUTO: CAN and LIN DPO4AUTOMAX: CAN, LIN and FlexRay DPO4COMP: RS-232/422/485/ UART DPO4EMBD: I²C, SPI DPO4ENET: Ethernet DPO4USB: USB	DPO4AERO: MIL-STD-1553 DPO4AUDIO: I²S, LJ, RJ, TDM DPO4AUTO: CAN and LIN DPO4AUTOMAX: CAN, LIN and FlexRay DPO4COMP: RS-232/422/485/ UART DPO4EMBD: I²C, SPI DPO4ENET: Ethernet DPO4USB: USB
Connectivity	USB Host, USB Device, GPIB* Optional DPO2CONN Module, LAN (10/100 Base-T Ethernet) and Video Out *Optional	USB Host (x2), USB Device, LAN (10/100 Base-T Ethernet), Video Out, GPIB* *Optional	USB Host (x4), USB Device, LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), Video Out, GPIB* *Optional	USB Host (x4), USB Device, LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), Video Out, GPIB* *Optional
Waveform Math and Analysis	29 Automated Measurements, Waveform and Screen Cursors, Arithmetic Waveform Math, FFT	29 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics **Optional:** DPO3PWR: Power Analysis DPO3VID: HDTV and Custom Triggering	41 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, Measurement Statistics, Waveform Histograms **Optional:** DPO4LMT: Limit and Mask Testing DPO4PWR: Power Analysis DPO4VID: HDTV and Custom Triggering	44 Automated Measurements, Waveform and Screen Cursors, Arithmetic Waveform Math, Spectrum Math, FFT, Advanced Math, Measurement Statistics, Waveform Histograms **Optional:** DPO4LMT: Limit and Mask Testing; MDO4TRIG: Adv. RF Power Level Trigger; DPO4PWR: Power Analysis; DPO4VID: HDTV and Custom Triggering
Software	PC communications software: OpenChoice® Desktop	PC Communications Software: OpenChoice® Desktop, NI LabVIEW Signal Express™ Tektronix Edition LE	PC Communications Software: OpenChoice® Desktop, NI LabVIEW Signal Express™ Tektronix Edition LE	PC Communications Software: OpenChoice® Desktop, NI LabVIEW Signal Express™ Tektronix Edition LE. Vector Signal Analysis Software: SignalVu-PC
Battery Operation	--	--	--	--
Additional Resources				

Performance Oscilloscopes

Tektronix performance oscilloscopes give you the cleanest, most trustworthy signal in the world. Discover signal fidelity issues fast with patented DPX® acquisition technology and reliably capture complex events with the advanced Pinpoint® triggering system. Quickly navigate through long record lengths with an intuitive Search and Mark capability and accelerate your design validation efforts with more than 30 different software analysis packages.

	MSO/DPO5000	DPO7000C Series	MSO/DPO/DSA70000 Series
Channels	4 analog channels; 16 digital channels (MSO5000)	4 analog channels	4 analog channels; 16 digital channels (MSO70000)
Bandwidth	350 MHz to 2 GHz	500 MHz to 3.5 GHz	4 GHz to 33 GHz Analog
Sample Rate	5 GS/s to 10 GS/s (analog); 60.6 ps (16.5 GS/s) MagniVu™ (digital)	10 GS/s to 40 GS/s (analog)	25 GS/s to 100 GS/s (analog) 80 ps (12.5 GS/s) (digital, MSO70000)
Max Record Length	Up to 250 Mpoints	Up to 500 Mpoints	Up to 250 Mpoints
Trigger Types	Edge, Sequence, Logic, Pulse Width, Glitch, Runt, Timeout, Transition, Set-up and Hold, Rise/Fall Time, Video, I²C*, SPI*, USB (Low, Full, High)*, RS-232/422/485/UART*, Parallel (MSO5000), Visual Trigger* *Optional	Pinpoint™ Triggering, Edge, Glitch, Pulse Width, Runt, Time-out, Transition. Setup/Hold, Pattern, State, Window, Trigger Delay (by Time and by Event), I²C*, SPI*, USB (Low, Full)*, RS-232/422/485/UART*, Visual Trigger* *Optional	Pinpoint™ Triggering, Edge, Glitch, Pulse Width, Runt, Time-out, Transition, Setup/Hold, Pattern, State, Window, Trigger Delay (by Time and by Event), I²C*, SPI*, USB (Low, Full)*, RS-232/422/485/UART*, Serial Pattern*, Visual Trigger* *Optional
Optional Serial Bus Decode and Analysis	SR-ENET: 10/100Base-T Ethernet SR-AERO: Aerospace (MIL-STD 1553) SR-AUTO: Automotive (CAN/LIN/FlexRay) SR-COMP: RS-232/422/485/UART SR-CUST: Custom Serial Analysis Kit SR-DPHY: MIPI D-PHY SR-EMBD: I²C, SPI SR-PCIE: PCI Express SR-USB: USB VNM: CAN, LIN	SR-ENET: 10/100Base-T Ethernet SR-AERO: Aerospace (MIL-STD 1553) SR-AUTO: Automotive (CAN/LIN/FlexRay) SR-COMP: RS-232/422/485/UART SR-CUST: Custom Serial Analysis Kit SR-DPHY: MIPI D-PHY SR-EMBD: I²C, SPI SR-PCIE: PCI Express SR-USB: USB LSA: CAN, LIN	SR-AERO: MIL-STD 1553 SR-AUTO: CAN/LIN/FlexRay SR-COMP: RS-232/422/485/UART SR-DPHY: MIPI D-PHY SR-EMBD: I2C, SPI SR-ENET: 10/100Base-T Ethernet SR-PCIE: PCI Express SR-USB: USB SR-810B: 8b/10b 10G-KR: 10GBASE-KR/KR4
Connectivity	USB Host (x6), USB Device, LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), Video Out, GPIB* *Optional	USB Host (x5), LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), GPIB, eSATA, DVI	USB Host (x5), LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), GPIB, eSATA, DVI
Waveform Math and Analysis	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms **Optional:** DDRA: DDR Memory Bus Analysis; DJA: DPOJET Advanced Jitter and Eye Diagram Analysis; ET3: Ethernet Compliance Test Solution; LT: Waveform Limit Testing; MTM: Mask Testing; PWR: Power Analysis; SignalVu Vector Signal Analysis; USB: USB Compliance Test Solution; VET: Visual Triggering; MOST: MOST 50/150 Compliance Test Solution	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms **Optional:** DDRA: DDR Memory Bus Analysis; DJA: DPOJET Advanced Jitter and Eye Diagram Analysis; ET3: Ethernet Compliance Test Solution; LT: Waveform Limit Testing; MTM: Mask Testing; PWR: Power Analysis; SignalVu Vector Signal Analysis; USB: USB Compliance Test Solution; VET: Visual Triggering; MOST: MOST 50/150 Compliance Test Solution	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms **Optional:** DDR Memory Bus Analysis; DPOJET Advanced Jitter and Eye Diagram Analysis; Ethernet Compliance; Waveform Limit Testing; Mask Testing; Power Analysis; USB2 and USB3 Compliance and Analysis; MOST 50/150 Compliance Test; SignalVu Vector Signal Analysis; HDMI Compliance Test; HSIC Electrical Validation; MIPI D-PHY and M-PHY Characterization and Analysis; QPI Test; SAS Testing; SFP+ Compliance and Debug; Serial Data Link Analysis; 10G-KR Compliance and Debug; PCIe Compliance and Debug; Thunderbolt Characterization, Compliance and Debug; UHS Measurements
Software	PC Communications Software: NI LabVIEW Signal Express™ Tektronix Edition LE	PC Communications Software: NI LabVIEW Signal Express™ Tektronix Edition LE	--
Battery Operation	--	--	--
Additional Resources	▶ 360° VIEW 📖 📥	▶ 360° VIEW 📖 📥	▶ 360° VIEW 📖 📥

Sampling Oscilloscope

With an industry-leading intrinsic jitter of less than 100 femtoseconds for extremely accurate device characterization, the DSA8300 Series provides comprehensive support for Optical Communications Standards, Time Domain Reflectometry and S-parameters. The DSA8300 Digital Sampling Oscilloscope is a complete high-speed PHY Layer testing platform for data communications from 155Mb/sec to 100G.

	DSA8300
Channels	Six modules support up to 8 single ended or 4 differential channels and/or 2 optical channels
Bandwidth	Up to 70+ GHz Electrical bandwidth and 80+ Optical bandwidth modules available with time base jitter as low as <100 fs RMS
Sample Rate	300 ks/s Maximum sample rate
Max Record Length	50 to 16,000 per channel native record length; with up to 1M points when using available IConnect Signal Integrity Software, 10M samples (100k unit intervals, 100 samples per unit interval) when equipped with available 80SJNB Jitter, Noise and BER Analysis software
Trigger Types	Clock Input/Prescale Trigger, TDR clock (generated internally), Clock Recovery from Optical Sampling modules and Electrical Clock Recovery modules, and Phase Reference time base supports acquisitions Free Run mode and Trigger Direct Input for <100 fs RMS timebase jitter typical
Optional Serial Bus Decode and Analysis	80SJNB Jitter, Noise, BER, and Serial Data Link Analysis Software; IConnect Signal Integrity Software
Connectivity	3 USB 2.0 Port(s) connector on the front panel, 4 USB 2.0 Ports on the rear panel; LAN PORT, RJ-45 connector, supports 10BASE-T, 100BASE-T, 1000BASE-T on rear panel; 1 Serial Port, DB-9 COM1, COM2 ports; 1 DVI IEEE488.2 connector on rear panel; 1 DVI connector, female on rear panel, DVI to VGA 15-pin D-sub connector adapter provided; PS2 Serial Ports Mouse and keyboard inputs; Audio Ports 1/8 in. microphone input and line output
Waveform Math and Analysis	Over 120 automated measurements include RZ,NRZ, and pulse signal types, and the following measurement types, plus 8 math waveforms using the following math functions: Add, Subtract, Multiply, Divide, Average, Differentiate, Exponential, Integrate, Natural Log, Log, Magnitude,Min, Max, Square Root, and Filter. In addition, measurement values can be utilized as scalars in math waveform definitions. Mask support for many applications, standard masks are available as predefined, built-in masks.
Software	Windows® 7 Ultimate (32-bit) Operating System IConnect Signal Integrity Software for frequency domain analysis, S-parameter measurements, and impedance characterization 80SJNB Jitter, Noise, BER, and Serial Link analysis including Cross-Talk aware TJ (BUJ) 80SJARB Jitter Analysis of Arbitrary Data with J2-J9 measurement support
Battery Operation	--
Additional Resources	--

Additional Resources Key

Product Demo	▶
Product Explorer	360° VIEW
Data Sheet	
Technical Content	

Tektronix Reference Library

With over 20,000 items in our premium content library, it is likely you can find answers on our website to whatever questions you have. Here is a list of our most popular downloaded content for oscilloscopes. Visit www.tektronix.com to download your copy.

1. XYZs of Oscilloscopes Primer
2. ABCs of Probes Primer
3. Fundamentals of Signal Integrity Primer
4. Debugging Serial Buses in Embedded Systems Designs Application Note
5. Power Supply Measurement and Analysis Primer

Product Highlights

- Up to 1 GS/s sample rate on all channels
- 16 automated measurements, and FFT analysis
- Built-in waveform limit testing
- Built-in help system and probe check wizard
- Front-panel USB host port and rear-panel USB device port
- Qualifies for Education Discount

Accurately capture signals with at least 10X oversampling on all channels with Digital Real-Time Sampling technology.

Quickly store and transfer your waveforms and settings with the front panel USB port.

TBS1000 Series

Usually, entry-level instruments are as light in features as they are in price. But Tektronix TBS1000 Series aren't usual instruments. Ideal for students, hobbyists or any person or organization on a tight budget, TBS1000 Series oscilloscopes deliver outstanding performance, including best-in-class digital real-time sampling, pass/fail testing, and familiar, easy-to-use controls. All at a price that's equally impressive.

Models	Analog Channels	Analog Bandwidth	Analog Sample Rate
TBS1022	2	25 MHz	500 MS/s
TBS1042	2	40 MHz	500 MS/s
TBS1062	2	60 MHz	1.0 GS/s
TBS1102	2	100 MHz	1.0 GS/s
TBS1152	2	150 MHz	1.0 GS/s

Recommended Probes

Passive Voltage Probes

TPP0201	10X, 200 MHz, 300 V CAT II
TPP0101	10X, 100 MHz, 300 V CAT II
P2220	10X/1X, 200 MHz/6 MHz, 300 V CAT II/150 V CAT II

High Voltage Probes

P5200A	500X/50X, 50 MHz, ± 1300 V/± 130 V
P5100A	100X, 500 MHz, 2500 V Peak
P6015A	1000X, 75 MHz, 20 kV Peak

Recommended Probes

Current Probes

P6021	60 MHz, 10.6 A RMS/250 A Peak/10 mA Min
P6022	120 MHz, 4 A RMS/100 A Peak/1 mA Min
A621	5 Hz to 50 kHz, 1000 A RMS/2000 A Peak/10 mA Min
A622	100 kHz, 100 A DC/71 A RMS/100 A Peak/10 mA Min
TCP2020	50 MHz, 20 A DC/20 A RMS/100 A Peak/10 mA Min

Recommended Accessories

1103	TEKPROBE Power Supply
AC2100	Soft Carrying Case

Recommended Service

SILV200	5-year Extended Warranty

Another Product for Consideration

Need 4 channels? The TDS2000C Series offers the same great performance as the TBS1000 on both 2- and 4-channel models, and includes a Lifetime Warranty.

Ships with Product

- Two TPP0x01 100 MHz or 200 MHz, 10X Passive Probes
- OpenChoice® Desktop Software
- Educator Classroom and Lab Resource CD
- Calibration Certificate, Quick Reference Manual, & Documentation on CD
- Power Cord
- 5-year Warranty

Product Highlights

- 10x oversampling on all channels
- Bright color display
- 16 automated measurements and FFT analysis
- Built-in help system and probe check wizard
- Front-panel USB host port and rear-panel USB device port
- Lifetime Warranty[*2]
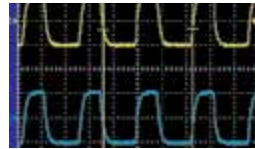
Accurately capture signals with at least 10X over-sampling on all channels with Digital Real-Time Sampling technology.
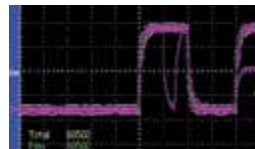
Easily check if your waveforms pass or fail your specifications with built-in waveform limit testing.

TDS2000C Series

Big performance has never been so small. Featuring Digital Real-Time Sampling, you can trust your scope to accurately capture your signal. Add in USB connectivity, 16 automated measurements and even a built-in help system, this compact oscilloscope helps you get more done in less time. It's true: big things do come in small packages.

Models	Analog Channels	Analog Bandwidth	Analog Sample Rate
TDS2001C	2	50 MHz	500 MS/s
TDS2002C	2	70 MHz	1.0 GS/s
TDS2004C	4	70 MHz	1.0 GS/s
TDS2012C	2	100 MHz	2.0 GS/s
TDS2014C	4	100 MHz	2.0 GS/s
TDS2022C	2	200 MHz	2.0 GS/s
TDS2024C	4	200 MHz	2.0 GS/s

Recommended Probes

Passive Voltage Probes

TPP0201	10X, 200 MHz, 300 V CAT II
TPP0101	10X, 100 MHz, 300 V CAT II
P2220	10X/1X, 200 MHz/6 MHz, 300 V CAT II/150 V CAT II

High Voltage Probes

P5200A	500X/50X, 50 MHz, ± 1300 V/± 130 V
P5100A	100X, 500 MHz, 2500 V Peak
P6015A	1000X, 75 MHz, 20 kV Peak

[*1] For complete details visit www.tektronix.com/lifetimewarranty

Recommended Probes

Current Probes

P6021	60 MHz, 10.6 A RMS/250 A Peak/10 mA Min
P6022	120 MHz, 4 A RMS/100 A Peak/1 mA Min
A621	5 Hz to 50 kHz, 1000 A RMS/2000 A Peak/10 mA Min
A622	100 kHz, 100 A DC/71 A RMS/100 A Peak/10 mA Min
TCP2020	50 MHz, 20 A DC/20 A RMS/100 A Peak/10 mA Min

Recommended Accessories

1103	TEKPROBE Power Supply
AC2100	Soft Carrying Case

Recommended Service

SILV200	5-year Extended Warranty

Another Product for Consideration

If you work with serial or parallel buses, the MSO/DPO2000B Series offers trigger, decode and search options for common protocols.

Ships with Product

- One TPP0x01 100 MHz or 200 MHz, 10X Passive Probe Per Analog Channel
- OpenChoice® Desktop and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD
- Power Cord
- Lifetime Warranty[*1]

2011 Winner of the EETimes Annual Creativity in Electronics (ACE) Award

ACE AWARDS

Product Highlights

- 10x oversampling on all channels
- 4 isolated analog channels
- 11 automated measurements and FFT analysis
- Optional power analysis software
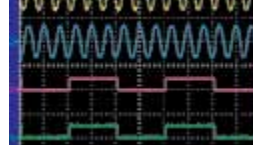
Safely and easily make floating measurements with the four isolated channels.

Battery pack gives you up to 4 hours of portable operation. Hot-swap the pack for 4 more hours!

TPS2000B Series

Great performance goes beyond the lab. This compact, battery-powered oscilloscope packs big-time performance and versatility. Make floating or differential measurements with up to four isolated channels. Tackle tough electronics and power systems in challenging environments with backlit buttons and optional power analysis software. Accurately capture your signals with Digital Real-Time Sampling. Huge performance. Small footprint.

Models	Analog Channels	Analog Bandwidth	Analog Sample Rate
TPS2012B	2	100 MHz	1.0 GS/s
TPS2014B	4	100 MHz	1.0 GS/s
TPS2024B	4	200 MHz	2.0 GS/s

Application Modules

TPS2PBND2	TPS2PWR1 Module and Four P5122 Probes
TPS2PWR1	Power Measurement and Analysis Module

Recommended Accessories

1103	TEKPROBE Power Supply
AC2100	Soft Carrying Case
TPSBAT	Additional Lithium-Ion Battery Pack (one included standard with instrument)
TPSCHG	External Battery Charger

Recommended Service

SILV200	5-year Extended Warranty

Recommended Probes

Passive Voltage Probes

TPP0201	10X, 200 MHz, 300 V CAT II
TPP0101	10X, 100 MHz, 300 V CAT II
P2220	10X/1X, 200 MHz/6 MHz, 300 V CAT II/150 V CAT II

High Voltage Probes

P5150	50X, 500 MHz, 2500 V Peak, 1000 V RMS CAT II
P5122	100X, 200 MHz, 1000 V RMS CAT II

Current Probes

P6021	60 MHz, 10.6 A RMS/250 A Peak/10 mA Min
P6022	120 MHz, 4 A RMS/100 A Peak/1 mA Min
A621	5 Hz to 50 kHz, 1000 A RMS/2000 A Peak/10 mA Min
A622	100 kHz, 100 A DC/71 A RMS/100 A Peak/10 mA Min
TCP2020	50 MHz, 20 A DC/20 A RMS/100 A Peak/10 mA Min

Another Product for Consideration

For very accurate low frequency voltage and current measurements, the DMM Series offers up to 0.0024% basic DC voltage accuracy.

Ships with Product

- One TPP0101 100 MHz, 10X Passive Probe Per Analog Channel (TPS2012B & TPS2014B)
- One TPP0201 200 MHz, 10X Passive Probe Per Analog Channel (TPS2024B)
- OpenChoice® Desktop and NI LabVIEW SignalExpress™ TE (LE version) Software
- RS-232 to USB Adapter Cable
- One Lithium-Ion Battery with 4-hour Battery Life
- Calibration Certificate, Quick Reference Manual, & Documentation on CD
- Front Panel Cover, AC Adapter with Power Cord
- 3-year Warranty

Product Highlights

- 4 fully isolated and floating channels
- 21 automated measurements
- 600 VRMS CAT III, 1000 VRMS CAT II rated inputs
- Measurement data logging with TrendPlot™
- 7 hours of continuous battery operation
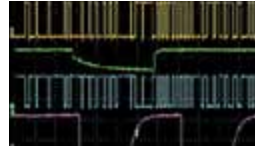
Four isolated input channels easily handle any type of mixed signal inputs.

User-defined limit testing can automatically monitor your signals and output Pass or Fail results.

THS3000 Series

Affordable performance in a rugged, portable design. This handheld, battery-powered oscilloscope is packed with features and analysis tools. With up to 5 GS/s sampling rate and four isolated channels that can measure up to 1000 Volts you can quickly, reliably and accurately evaluate your signal characteristics on the bench or in the field.

Models	Analog Channels	Analog Bandwidth	Analog Sample Rate
THS3014	4	100 MHz	2.5 GS/s
THS3014-TK	4	100 MHz	2.5 GS/s
THS3024	4	200 MHz	5.0 GS/s
THS3024-TK	4	200 MHz	5.0 GS/s

Recommended Probes

Passive Voltage Probes

THP0301 - Y/B/M/G	300 MHz, 10X, 300 V CAT III

High Voltage Probes

P5150[1]	50X, 500 MHz, 2500 V Peak, 1000 V RMS CAT II
P5122	100X, 200 MHz, 1000 V RMS CAT II

Current Probes

P6021	60 MHz, 10.6 A RMS/250 A Peak/10 mA Min
P6022	120 MHz, 4 A RMS/100 A Peak/1 mA Min
A621	5 Hz to 50 kHz, 1000 A RMS/2000 A Peak/10 mA Min
A622	100 kHz, 100 A DC/71 A RMS/100 A Peak/10 mA Min
TCP2020	50 MHz, 20 A DC/20 A RMS/100 A Peak/10 mA Min

[1] The P5150 is compatible with THS oscilloscopes, but 50X vertical scaling is not offered.

Recommended Accessories

THSBAT	Additional Spare Battery
THSCHG[2]	Battery Charger
119-7900-00	AC Power Adapter

[2] Does not include AC power adapter.

Recommended Service

SILV400	5-year Extended Warranty

Another Product for Consideration

For very accurate ripple measurements on high voltage signals, the P5122 probe offers high impedance with minimal capacitive loading.

Ships with Product

- Four THP0301-Y/B/M/G 300 V CAT III, 300 MHz 10X Passive Probes
- OpenChoice® Desktop Software
- USB-A to Mini USB-B Cable for PC Communication
- Lithium-ion Battery with 7 Hour Battery Life
- Calibration Certificate, Installation/Safety Manual, Documentation on CD
- Carrying Handle, Hanging Strap
- ACHHS Soft-sided Carry Case[3], AC Power Adapter with Power Cord
- Hard-sided Travel Case[4]
- Soft-sided Probe Case, Two Probe Replacement Accessory Kits[4]
- 3-year Warranty

[3] Non-TK models only
[4] TK models only

TDS3000C Series

Performance meets portability. Featuring up to 500 MHz bandwidth and optional battery-powered operation, this oscilloscope is as capable as it is convenient. Capture fast-changing signals with Digital Real-Time Sampling. Maximize efficiency with WaveAlert® Anomaly Detection and 25 automated measurements. Performance and versatility. Turns out, you can take it with you.

Product Highlights

- 10 kpoints record length on all channels, all the time
- 3,600 wfm/s max. waveform capture rate with DPO technology
- 25 automated measurements and FFT analysis
- Front-panel USB host port and optional rear-panel Ethernet, GPIB, and RS-232 ports

Optional battery pack gives you up to 3 hours of portable operation.

Accurately capture signals with at least 5X over-sampling on all channels with Digital Real-Time Sampling technology.

Models	Analog Channels	Analog Bandwidth	Analog Sample Rate
TDS3012C	2	100 MHz	1.25 GS/s
TDS3014C	4	100 MHz	1.25 GS/s
TDS3032C	2	300 MHz	2.5 GS/s
TDS3034C	4	300 MHz	2.5 GS/s
TDS3052C	2	500 MHz	5 GS/s
TDS3054C	4	500 MHz	5 GS/s

Application Modules

TDS3LIM	Limit Testing
TDS3TMT	Telecom Mask Test Triggering
TDS3VID	HDTV and Custom Video Triggering

Recommended Accessories

1103	TEKPROBE Power Supply
TDS3GV	GPIB, RS-232, and VGA Communications Module
TDS3BATC	Lithium-ion Battery
TDS3ION	Battery Charger
AC3000	Soft Carrying Case
HCTEK4321	Hard Carrying Case (requires AC3000)

Recommended Service

SILV400	5-year Extended Warranty

Recommended Probes

Passive Voltage Probes

P6139B	10X, 500 MHz, 300 V CAT II

Active Voltage Probes

P6243	10X, 1 GHz, ± 8 V

Differential Voltage Probes

P6246[1]	10X/1X, 400 MHz, ± 8.5 V/± 850 mV

High Voltage Probes

P5205A	500X/50X, 100 MHz, ± 1300 V/± 130 V
P5210A	1000X/100X, 50 MHz, ± 5600 V/± 560 V
P5100A	100X, 500 MHz, 2500 V Peak

Current Voltage Probes

TCP202A	50 MHz, 15 A DC/10.6 A RMS/50 A Peak/10 mA Min

[1] Requires 1103 TEKPROBE Power Supply

Another Product for Consideration

If you work with serial or parallel buses, the MSO/DPO3000 Series offers trigger, decode and search options for common protocols.

Ships with Product

- One P6139B 500 MHz, 10X Passive Probe Per Analog Channel
- OpenChoice® Desktop and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual, & Documentation on CD
- Front Panel Cover, Power Cord
- 3-year Warranty

MSO/DPO2000B Series

Test more, spend less with an oscilloscope that's packed with features and is also light on price. Measure as many as 20 channels of analog and digital signals. Speed debug with automated serial and parallel bus analysis. Search your entire record instantly with Wave Inspector®. Entry level has never been so powerful.

Product Highlights

- 1 Mpoint record length on all channels
- 5,000 wfm/s max. waveform capture rate with DPO technology
- Over 125 available trigger combinations, including setup/hold, serial packet and parallel data
- Automated search and easy waveform navigation with Wave Inspector®
- 29 automated measurements and FFT analysis
- 5-year warranty

Quickly pan/zoom and automatically search your waveforms with Wave Inspector®.

Automatically trigger, decode and search your serial buses with optional analysis modules.

Models	Analog Channels	Digital Channels	Analog Bandwidth	Analog Sample Rate
DPO2002B	2	--	70 MHz	1 GS/s
MSO2002B	2	16	70 MHz	1 GS/s
DPO2004B	4	--	70 MHz	1 GS/s
MSO2004B	4	16	70 MHz	1 GS/s
DPO2012B	2	--	100 MHz	1 GS/s
MSO2012B	2	16	100 MHz	1 GS/s
DPO2014B	4	--	100 MHz	1 GS/s
MSO2014B	4	16	100 MHz	1 GS/s
DPO2022B	2	--	200 MHz	1 GS/s
MSO2022B	2	16	200 MHz	1 GS/s
DPO2024B	4	--	200 MHz	1 GS/s
MSO2024B	4	16	200 MHz	1 GS/s

Application Modules

Serial Bus Triggering and Protocol Analysis

DPO2AUTO	Automotive (CAN, LIN)
DPO2COMP	Computer (RS-232)
DPO2EMBD	Embedded (I²C, SPI)

Recommended Accessories

DPO2CONN	Ethernet and Video Out Connectivity Module
119-7465-xx	TekVPI External Power Supply
ACD2000	Soft Carrying Case

Recommended Service

SILV200	5-year Extended Warranty

Recommended Probes

Passive Voltage Probes

TPP0200	10X, 200 MHz, 300 V CAT II

Active Voltage Probes

TAP1500	10X, 1.5 GHz, ± 8 V

Differential Voltage Probes

TDP0500[1]	50X/5X, 500 MHz, ± 42 V/± 4.25 V

High Voltage Probes

THDP0200[1]	500X/50X, 200 MHz, ± 1500 V/± 150 V
TMDP0200[1]	250X/25X, 200 MHz, ± 750 V/± 75 V
THDP0100[1]	1000X/100X, 100 MHz, ± 6000 V/± 600 V

Current Probes

TCP0020	50 MHz, 20 A DC
TCP0030[1]	120 MHz, 30 A DC
TCP0150[1]	20 MHz, 150 A DC

[1] Requires 119-7465-xx TekVPI External Power Supply

Another Product for Consideration

Need more bandwidth? The MSO/DPO3000 Series offers up to 500 MHz analog bandwidth and additional performance.

Ships with Product

- One TPP0100 100MHz, 10X Passive Probe Per Analog Channel (70 MHz model)
- One TPP0200 200 MHz, 10X Passive Probe Per Analog Channel (100 MHz & 200 MHz models)
- One P6316 16 Channel Logic Probe (MSO only)
- OpenChoice® Desktop Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD, Power Cord
- 5-year Warranty

"It combines scope, logic analyzer, and protocol analyzer features into an easy-to-use, portable package. The mixed signal functionality, serial decode, small-footprint, and affordable price provide compelling value."

Alfred Mora
Electrical Engineer, Datalogic Scanning, Inc.

Product Highlights

- 5 Mpoint record length on all channels
- >50,000 wfm/s max. waveform capture rate with DPO technology
- Over 125 available trigger combinations, including setup/hold, serial packet and parallel data
- Automated search and easy waveform navigation with Wave Inspector®
- 29 automated measurements and FFT analysis

Analyze your digital signals with up to 121.2 ps timing resolution with MagniVu™ (MSO Series).
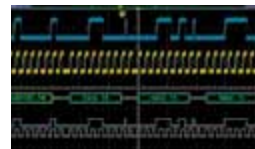
Automatically trigger, decode and search your serial buses with optional analysis modules.

MSO/DPO3000 Series

Looking for an all-purpose oscilloscope? Look no further. Measure up to 20 channels of analog and digital signals with one instrument. Save time with automated measurements, and built-in serial and parallel bus analysis. Instantly search your entire record with Wave Inspector®. Efficiency. Versatility. Performance. One oscilloscope.

Models	Analog Channels	Digital Channels	Analog Bandwidth	Analog Sample Rate	Digital Sample Rate Main/MagniVu™
DPO3012	2	--	100 MHz	2.5 GS/s	--
MSO3012	2	16	100 MHz	2.5 GS/s	500 MS/s / 8.25 GS/s
DPO3014	4	--	100 MHz	2.5 GS/s	--
MSO3014	4	16	100 MHz	2.5 GS/s	500 MS/s / 8.25 GS/s
DPO3032	2	--	300 MHz	2.5 GS/s	--
MSO3032	2	16	300 MHz	2.5 GS/s	500 MS/s / 8.25 GS/s
DPO3034	4	--	300 MHz	2.5 GS/s	--
MSO3034	4	16	300 MHz	2.5 GS/s	500 MS/s / 8.25 GS/s
DPO3052	2	--	500 MHz	2.5 GS/s	--
DPO3054	4	--	500 MHz	2.5 GS/s	--
MSO3054	4	16	500 MHz	2.5 GS/s	500 MS/s / 8.25 GS/s

Application Modules

Serial Bus Triggering and Protocol Analysis

DPO3AERO	Aerospace (MIL-STD-1553)
DPO3AUDIO	Audio (I²S, LJ, RJ and TDM)
DPO3AUTO	Automotive (CAN, LIN)
DPO3COMP	Computer (RS-232)
DPO3EMBD	Embedded (I²C, SPI)
DPO3FLEX	Automotive (FlexRay)

Additional Analysis

DPO3PWR	Power Analysis
DPO3VID	HDTV and Custom Video Triggering

Recommended Accessories

ACD4000	Soft Carrying Case

Recommended Service

SILV400	5-year Extended Warranty

Recommended Probes

Passive Voltage Probes

P6139B	10X, 500 MHz, 300 V CAT II

Differential Voltage Probes

TDP0500	50X/5X, 500 MHz, ± 42 V/± 4.25 V
TDP1000	50X/5X, 1 GHz, ± 42 V/± 4.25 V

High Voltage Probes

TMDP0200	250X/25X, 200 MHz, ± 750 V/± 75 V
THDP0200	500X/50X, 200 MHz, ± 1500 V/± 150 V
THDP0100	1000X/100X, 100 MHz, ± 6000 V/± 600 V
P5100A	100X, 500 MHz, 2500 V Peak

Current Probes

TCP0020	50 MHz, 20 A DC
TCP0030	120 MHz, 30 A DC
TCP0150	20 MHz, 150 A DC

Ships with Product

- One P6139B 500 MHz, 10X TekVPI Passive Probe Per Analog Channel
- One P6316 16 Channel Logic Probe (MSO only)
- OpenChoice® Desktop and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD
- Front Panel Cover, Power Cord
- 3-year Warranty

Upgrade the bandwidth of your MSO/DPO3000 Series any time after your purchase up to 500 MHz, ensuring your scope can grow with your needs.

Test Equipment Depot - 800.517.8431 - 99 Washington Street Melrose, MA 02176
TestEquipmentDepot.com

Product Highlights

- Up to 20 Mpoint record length on all channels
- >50,000 wfm/s max. waveform capture rate with DPO technology
- Over 125 available trigger combinations, including setup/hold, serial packet and parallel data
- Automated search and easy waveform navigation with Wave Inspector®
- 41 automated measurements and FFT analysis

Ships with one passive probe per analog channel, with up to 1 GHz bandwidth and an industry-best 3.9 pF of capacitive loading.

Automatically trigger, decode and search your serial and parallel bus.

MSO/DPO4000B Series

Debug complex designs faster with an oscilloscope that's as versatile as it is powerful. Measure up to 20 channels of analog and digital signals. Analyze serial and parallel buses. Instantly search your entire record with the time-saving Wave Inspector®. Finally, an oscilloscope that multitasks as well as you do.

Models	Analog Channels	Digital Channels	Bandwidth	Record Length (Max)	Analog Sample Rate (Max)	Digital Sample Rate Main/MagniVu™
DPO4014B	4	--	100 MHz	20M	2.5 GS/s	--
MSO4014B	4	16	100 MHz	20M	2.5 GS/s	500 MS/s /16.5 GS/s
DPO4034B	4	--	350 MHz	20M	2.5 GS/s	--
MSO4034B	4	16	350 MHz	20M	2.5 GS/s	500 MS/s /16.5 GS/s
DPO4054B	4	--	500 MHz	20M	2.5 GS/s	--
MSO4054B	4	16	500 MHz	20M	2.5 GS/s	500 MS/s /16.5 GS/s
DPO4102B-L	2	--	1 GHz	5M	5 GS/s	--
DPO4102B	2	--	1 GHz	20M	5 GS/s	--
DPO4104B-L	4	--	1 GHz	5M	5 GS/s	--
DPO4104B	4	--	1 GHz	20M	5 GS/s	--
MSO4102B-L	2	16	1 GHz	5M	5 GS/s	500 MS/s /16.5 GS/s
MSO4102B	2	16	1 GHz	20M	5 GS/s	500 MS/s /16.5 GS/s
MSO4104B-L	4	16	1 GHz	5M	5 GS/s	500 MS/s /16.5 GS/s
MSO4104B	4	16	1 GHz	20M	5 GS/s	500 MS/s /16.5 GS/s

Application Modules

Serial Bus Triggering and Analysis

DPO4AERO	Aerospace (MIL-STD 1553)
DPO4-AUDIO[1]	Audio (I²S, LJ, RJ and TDM)
DPO4AUTO	Automotive (CAN, LIN)
DPO4-AUTOMAX	Automotive (CAN, LIN, FlexRay)
DPO4COMP	Computer (RS-232)
DPO4EMBD[2]	Embedded (I²C, SPI)
DPO4ENET	Ethernet (10Base-T, 100Base-Tx)
DPO4USB[3]	USB 2.0 (LS, FS, HS)
DPO4PWR	Power Analysis
DPO4LMT	Limit and Mask Testing
DPO4VID	HDTV & Custom Video Triggering

Recommended Probes

Passive Voltage Probes

TPP1000	10X, 1 GHz, 300 V CAT II
TPP0502	2X, 500 MHz, 300 V CAT II

Active Voltage Probes

TAP1500	10X, 1.5 GHz, ± 8 V

Differential Voltage Probes

TDP0500	50X/5X, 500 MHz, ± 42 V/± 4.25 V
TDP1000	50X/5X, 1 GHz, ± 42 V/± 4.25 V

High Voltage Probes

TMDP0200	250X/25X, 200 MHz, ± 750 V/± 75 V
TPP0850	50X, 800 MHz, 2500 V Peak

Current Probes

TCP0030	120 MHz, 30 A DC

Another Product for Consideration

Working with RF? The MDO4000 Series is the world's only oscilloscope with a built-in spectrum analyzer for analyzing analog, digital and RF signals.

Ships with Product

- One TPP0500 (≤ 500 MHz models) or TPP1000 (1 GHz models) Passive Voltage Probe Per Analog Channel
- One P6616 16 Channel Logic Probe (MSO only)
- OpenChoice® Desktop and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD
- Front Panel Cover, Power Cord
- 3-year Warranty

[1] Not available on DPO4102B, DPO4102B-L models.
[2] For SPI, only 2-wire support is available on DPO4102B, DPO4102B-L.
[3] USB 2.0 HS only available on 1 GHz analog bandwidth models.

Product Highlights

- The world's first oscilloscope with a built-in spectrum analyzer
- Up to 3 GHz capture bandwidth on the spectrum analyzer input
- Integrated spectral analysis tools: automated and manual markers, spectrogram display, RF vs. time traces
- Advanced RF power level triggers available
- Built on the MSO4000B Series mixed signal oscilloscope platform
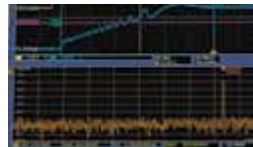
Capture time-correlated analog, digital and RF signals.
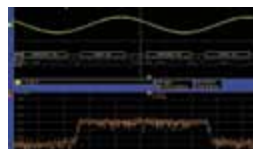
See how your RF spectrum changes over time or device state.

MDO4000 Series

The new revolutionary oscilloscope with a built-in spectrum analyzer. Capture time-correlated analog, digital and RF signals for a complete system view of your device. See both time and frequency domains in one glance. View the RF spectrum at any point in time to see how it changes. Quickly and efficiently solve the most complicated design issues—with an oscilloscope as integrated as your designs.

Models	Analog Channels	Digital Channels	Analog Bandwidth	Analog Sample Rate	Digital Sample Rate Main/MagniVu™	Spectrum Analyzer Input	Spectrum Analyzer Frequency Range
MDO4014-3	4	16	100 MHz	2.5 GS/s	500 MS/s /16.5 GS/s	1	50 kHz – 3 GHz
MDO4034-3	4	16	350 MHz	2.5 GS/s	500 MS/s /16.5 GS/s	1	50 kHz – 3 GHz
MDO4054-3	4	16	500 MHz	2.5 GS/s	500 MS/s /16.5 GS/s	1	50 kHz – 3 GHz
MDO4054-6	4	16	500 MHz	2.5 GS/s	500 MS/s /16.5 GS/s	1	50 kHz – 6 GHz
MDO4104-3	4	16	1 GHz	5 GS/s	500 MS/s /16.5 GS/s	1	50 kHz – 3 GHz
MDO4104-6	4	16	1 GHz	5 GS/s	500 MS/s /16.5 GS/s	1	50 kHz – 6 GHz

Application Modules

Serial Bus Triggering and Protocol Analysis

DPO4AE-RO	Aerospace (MIL-STD 1553)
DPO4 AUDIO	Audio (I^2S, LJ, RJ and TDM)
DPO4AUTO	Automotive (CAN, LIN)
DPO4-AUTOMAX	Automotive (CAN, LIN, FlexRay)
DPO4COMP	Computer (RS-232)
DPO4EMBD	Embedded (I^2C, SPI)
DPO4ENET	Ethernet (10BASE-T, 100BASE-TX)
DPO4USB[1]	USB 2.0 (LS, FS, HS)

Additional Analysis

MDO4TRIG	Adv. RF Power Level Triggering
DPO4PWR	Power Analysis
DPO4LMT	Limit and Mask Testing
DPO4VID	HDTV & Custom Video Triggering

[1] USB 2.0 HS only available on 1 GHz analog bandwidth models.

Recommended Service

SILV900	5-year Extended Warranty

Recommended Probes

Passive Voltage Probes

TPP1000	10X, 1 GHz, 300 V CAT II
TPP0500	10X, 500 MHz, 300 V CAT II
TPP0502	2X, 500 MHz, 300 V CAT II

Active Voltage Probes

TAP1500	10X, 1.5 GHz, ± 8 V

Differential Voltage Probes

TDP0500	50X/5X, 500 MHz, ± 42 V/± 4.2 V
TDP1000	50X/5X, 1 GHz, ± 42 V/± 4.2 V

High Voltage Probes

THDP0200	500X/50X, 200 MHz, ± 1500 V/± 150 V
TPP0850	50X, 800 MHz, 2500 V Peak

Current Probes

TCP0030	120 MHz, 30 A DC

Ships with Product

- Four TPP0500 (≤500 MHz models) or TPP1000 (1 GHz models) Passive Voltage Probes
- One P6616 16 Channel Logic Probe
- N-to-BNC Adapter (103-0045-00)
- OpenChoice® Desktop and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD
- Front Panel Cover, Power Cord
- 3-year Warranty

2012
"Product of the Year"
Award Winner

- Test & Measurement World

Test & Measurement World

BEST IN TEST

2012 AWARD WINNER

Product Highlights

- Windows 7 Ultimate 64-bit operating system and touch-screen display
- >250,000 wfm/s max. waveform capture rate with FastAcq™ technology
- Over 350 available trigger combinations, including setup/hold, serial packet and parallel data
- Automated search on up to 8 waveform events with Wave Inspector®
- 53 automated measurements and FFT analysis

Ships with four passive probes with up to 1 GHz bandwidth and an industry-best 3.9 pF of capacitive loading.
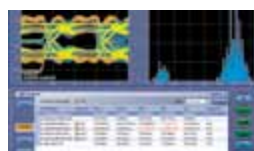
Includes the DPOJET essentials jitter and eye pattern analysis software package - free.

MSO/DPO5000 Series

The performance you've wanted. A price you never thought possible. Measure up to 20 channels of analog and digital signals. Analyze specialty applications with over 10 optional software packages. View up to 16 decoded serial and parallel buses on your display at once. Performance and value. Some engineers have all the luck.

Models	Analog Channels	Digital Channels	Analog Bandwidth	Analog Sample Rate (4 Channels/2 Channels)	Digital Sample Rate Main/MagniVu™
DPO5034	4	--	350 MHz	5 GS/s	--
MSO5034	4	16	350 MHz	5 GS/s	500 MS/s /16.5 GS/s
DPO5054	4	--	500 MHz	5 GS/s	--
MSO5054	4	16	500 MHz	5 GS/s	500 MS/s /16.5 GS/s
DPO5104	4	--	1 GHz	5 GS/s /10 GS/s	--
MSO5104	4	16	1 GHz	5 GS/s /10 GS/s	500 MS/s /16.5 GS/s
DPO5204	4	--	2 GHz	5 GS/s /10 GS/s	--
MSO5204	4	16	2 GHz	5 GS/s /10 GS/s	500 MS/s /16.5 GS/s

Software Packages

Serial Bus Triggering and Protocol Analysis

SR-AERO	MIL-STD-1553B
SR-AUTO	CAN/LIN/FlexRay
SR-COMP	Computer (RS-232)
SR-DPHY	MIPI D-PHY
SR-EMBD	Embedded (I²C, SPI)
SR-ENET	Ethernet
SR-PCIE	PCI Express
SR-USB	USB 2.0 (LS, FS, HS)

Compliance Test

ET3	Ethernet
MOST	MOST50/150
USB	USB 2.0

Additional Analysis

DDRA	DDR Memory
DJA	Advanced Jitter and Eye Diagram
PS1, 2, 3	Power Solution Bundles
PWR	Power Analysis
SVE	SignalVu Essentials - Vector Signal Analysis Software
VET	Visual Trigger/Search

Additional software packages are available.

Recommended Probes

Passive Voltage Probes

TPP1000	10X, 1 GHz, 300 V CAT II
TPP0502	2X, 500 MHz, 300 V CAT II

Active Voltage Probes

TAP1500	10X, 1.5 GHz, ± 8 V
TAP2500	10X, 2.5 GHz, ± 4 V

Differential Voltage Probe

TDP0500	50X/5X, 500 MHz, ± 42 V/± 4.2 V
TDP1000	50X/5X, 1 GHz, ± 42 V/± 4.2 V
TDP1500	10X/1X, 1.5 GHz, ± 8.5 V/± 850 mV

High Voltage Probes

TMDP0200	50X, 800 MHz, 2500 V Peak
THDP0200	500X/50X, 200 MHz, ± 1500 V/± 150 V
THDP0100	1000X/100X, 100 MHz, ± 6000 V/± 600 V
TPP0850	50X, 800 MHz, 2500 V Peak

Current Probes

TCP0020	50 MHz, 20 A DC
TCP0030	120 MHz, 30 A DC
TCP0150	20 MHz, 150 A DC

Ships with Product

- Four TPP0500 (350 MHz and 500 MHz models) or TPP1000 (1 GHz and 2 GHz models) Passive Voltage Probes
- One P6616 16 Channel Logic Probe (MSO only)
- NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD
- Front Panel Cover, Power Cord
- 1-year Warranty

Instrument Options

Record Length

Opt. 2RL	25M/Ch
Opt. 5RL	50M/Ch
Opt. 10RL	125M/Ch

Limitations apply. See data sheet for full details.

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty

Product Highlights

- 500 MHz,1 GHz, 2.5 GHz, and 3.5 GHz models
- Windows 7 Ultimate 64-bit operating system and touch-screen display
- >250,000 wfm/s max. waveform capture rate with FastAcq™ technology
- Over 1400 available trigger combinations with Pinpoint® triggering
- Automated search and mark for waveform events
- 53 automated measurements and FFT analysis
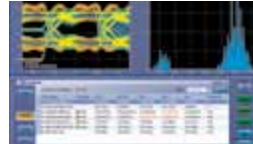
Includes the DPOJET essentials jitter and eye pattern analysis software package - free.

Over 15 optional software packages available for specialized applications.

DPO7000C Series

Complex designs tremble before this oscilloscope. Packed with features like DPX® technology for fast waveform capture rates, advanced Pinpoint® triggering, and over 15 application software packages, it speeds debug and analysis of performance devices. It's a time-strapped engineer's dream come true.

Models	Analog Channels	Bandwidth	Record Length (1/2/4 Channels)	Analog Sample Rate
DPO7054C	4	500 MHz	50/25/12.5 M	20/10/5 GS/s
DPO7104C	4	1 GHz	50/25/12.5 M	20/10/5 GS/s
DPO7254C	4	2.5 GHz	50/25/12.5 M	40/20/10 GS/s
DPO7354C	4	3.5 GHz	50/25/12.5 M	40/20/10 GS/s

Software Packages

Serial Bus Triggering and Protocol Analysis

SR-AERO	MIL-STD-1553B
SR-AUTO	CAN/LIN/FlexRay
SR-COMP	Computer (RS-232)
SR-DPHY	MIPI D-PHY
SR-EMBD	Embedded (I²C, SPI)
SR-ENET	Ethernet
SR-PCIE	PCI Express
SR-USB	USB 2.0 (LS, FS, HS)

Compliance Test

ET3	Ethernet
MOST	MOST50/150
USB	USB 2.0

Additional Analysis

DDRA	DDR memory
DJA	Advanced Jitter and Eye Diagram
PS1, 2, 3	Power Solution Bundles
PWR	Power Analysis
SVE	SignalVu RF Analysis
VET	Visual Trigger/Search

Additional software packages are available. For a complete listing, please visit www.tektronix.com/dpo7000

Recommended Probes

Active Voltage Probes

TAP1500	10X, 1.5 GHz, ± 8 V
TAP2500	10X, 2.5 GHz, ± 4 V
TAP3500	10X, 3.5 GHz, ± 4 V

Differential Voltage Probe

TDP0500	50X/5X, 500 MHz, ± 42 V/± 4.2 V
TDP1000	50X/5X, 1 GHz, ± 42 V/± 4.2 V
TDP1500	10X/1X, 1.5 GHz, ± 8.5 V/± 850 mV
TDP3500	5X, 3.5 GHz, ± 2 V

High Voltage Probes

TMDP0200	50X, 800 MHz, 2500 V Peak
THDP0200	500X/50X, 200 MHz, ± 1500 V/± 150 V
THDP0100	1000X/100X, 100 MHz, ± 6000 V/± 600 V

Current Probes

TCP0020	50 MHz, 20 A DC
TCP0030	120 MHz, 30 A DC
TCP0150	20 MHz, 150 A DC

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty

Ships with Product

- Four P6139B 500 MHz, 10X TekVPI Passive Voltage Probes
- NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate, Quick Reference Manual & Documentation on CD
- Front Panel Cover, Power Cord
- 1-year Warranty

Instrument Options

Record Length

Opt. 2RL	25M/Ch
Opt. 5RL	50M/Ch
Opt. 10RL*1	125M/Ch

Limitations apply. See data sheet for full details.

*1 Not available on DPO7054C, DPO7104C

Product Highlights

- 4 to 33 GHz true analog bandwidth for measurements on the latest high-speed serial standards
- Industry-leading 100 GS/s Sample Rate on 2 Channels
- 16 Logic Channels with 80 ps Timing Resolution for Debug of Digital and Analog Signals (MSO70000 models)
- iCapture – One Connection for both Analog and Digital Signals (MSO70000 models)
- Fastest Waveform Capture Rate with >300,000 wfms/s Maximum
- Up to 250 Mpoints Record Length with MultiView Zoom™ for Quick Navigation
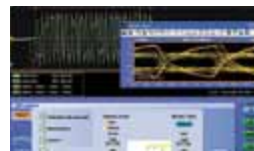- Visual Trigger to Precisely Qualify Triggers and Find Unique Events in Complex Waveforms

MSO/DPO/DSA70000C and D Series

Whether you're at first power-up on your latest design, verifying compliance to the fastest standards, or researching fundamentals of the universe, you have the performance, precision, and tools to get your job done faster.

Nearly 50 Application-specific Solutions Enable Standard-specific Certification, Measurement Automation, and Extended Signal Analysis.

Models	Analog Channels + Digital Channels	Analog Bandwidth	Sample Rate (2/4 Channels)	Record Length (Std/Opt)
DPO/MSO/DSA70404C	4 (DSO/DSA), 4 + 16 (MSO)	4 GHz	25 GS/s	12.5 Mpoints/125 Mpoints
DPO/MSO/DSA70604C	4 (DSO/DSA), 4 + 16 (MSO)	6 GHz	25 GS/s	12.5 Mpoints/125 Mpoints
DPO/MSO/DSA70804C	4 (DSO/DSA), 4 + 16 (MSO)	8 GHz	25 GS/s	12.5 Mpoints/125 Mpoints
DPO/MSO/DSA71254C	4 (DSO/DSA), 4 + 16 (MSO)	12.5 GHz	100/50 GS/s	12.5 Mpoints/250 Mpoints
DPO/MSO/DSA71604C	4 (DSO/DSA), 4 + 16 (MSO)	16 GHz	100/50 GS/s	12.5 Mpoints/250 Mpoints
DPO/MSO/DSA72004C	4 (DSO/DSA), 4 + 16 (MSO)	20 GHz	100/50 GS/s	12.5 Mpoints/250 Mpoints
DPO/DSA72504D	4	25 GHz	100/50 GS/s	12.5 Mpoints/250 Mpoints
DPO/DSA73304D	4	33 GHz	100/50 GS/s	12.5 Mpoints/250 Mpoints

Software Packages

Serial Bus Triggering and Protocol Analysis

SR-AERO	MIL-STD-1553B
SR-AUTO	CAN/LIN/FlexRay
SR-COMP	Computer (RS-232)
SR-DPHY	MIPI D-PHY
SR-EMBD	Embedded (I²C, SPI)
SR-ENET	10/100Base-T Ethernet
SR-PCIE	PCI Express
SR-USB	USB 2.0 (LS, FS, HS)

Compliance Test

DisplayPort, Ethernet, HDMI, HSIC, MDL, MIPI D-PHY/M-PHY, QPI, SATA/SAS, SFP+, Thunderbolt, MOST50/150, USB 2.0/ USB 3.0, 10GBASE-KR/KR4

Additional Analysis

MTH	Communications Mask Testing
DDRA	DDR Memory
DJA	Advanced Jitter and Eye Diagram
PWR	Power Analysis
SVE	SignalVu RF Analysis
VET	Visual Trigger/Search

Recommended Probes

P7630	30 GHz, Low Noise
P7500	4 GHz to 25 GHz
P6780	Differential Input Digital Probe (MSO Models)
P6750	D-Max Technology Digital Probe (MSO Models)
P6717A	General-purpose Digital Probe (MSO Models)
P6250/ P6251	500 MHz/1 GHz 42 V Differential
TCPA300/ TCPA400	Series Current Measurement Systems

Recommended Service

G3	Gold Care 3-year Extended Warranty
G5	Gold Care 5-year Extended Warranty
R3	3-year Extended Warranty
R5	5-year Extended Warranty

Instrument Options

Opt. ERRDT	Frame and Bit Error Rate Detector for High-speed Serial Standards
Opt. ST6G	Protocol Triggering and Decoding for 8b/10b-encoded Serial Signals up to 6.25 Gb/s
Opt. SDLA64	Serial Data Link Analysis Visualizer
Opt. SSD	Solid State Drive
Opt. 2RL	25M/Ch Record Length
Opt. 5RL	50M/Ch Record Length
Opt. 10RL	125M/Ch Record Length
Opt. 2XL	31.25M/Ch Record Length
Opt. 5XL	62.5M/Ch Record Length
Opt. 10XL	125M/Ch Record Length
Opt. 20XL	250M/Ch Record Length

Ships with Product

- Accessory pouch, front cover, mouse, keyboard, quick start user manual, (4) TekConnect® to 2.92 mm adapters and (1) TekConnect-to-BNC adapter, DVI to VGA adapter, static protection wrist strap, DPO/DSA/MSO70000 software/GPIB reference on instrument HDD, performance verification procedure PDF file, calibration certificate documenting NIST traceability, Z 540-1 compliance and ISO9001, power cord, one-year warranty, MSO Models Include: Logic Probe Deskew Fixture

Product Highlights

- High Optical Sensitivity, Low Noise, and Wide Dynamic Range of the Optical Sampling Modules

- Remote Samplers* or Compact Sampling Extender Module Cables allowing the Sampler to be located at the DUT

- Fully Calibrated Clock Recovery Solutions – No need to manually calibrate for data pick-off losses
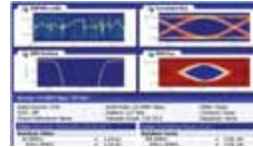
SSC support: Analysis of systems with spread spectrum clocking, with profile and frequency

Easily Analyze Sources of Interconnect Jitter, Losses, Crosstalk

DSA8300 Series

With an industry-leading intrinsic jitter of less than 100 femtoseconds for extremely accurate device characterization, the DSA8300 Series provides comprehensive support for Optical Communications Standards, Time Domain Reflectometry and S-parameters. The DSA8300 Digital Sampling Oscilloscope is a complete high-speed PHY Layer testing platform for data communications from 155Mb/sec to 100G.

Optical Modules	Channels	Bandwidth	Clock Recovery (Min/Max)	Filter Rates Supported (Min/Max)
80C07B	1	2.5 GHz	155 Mb/s - 2.666 Gb/s	155 Mb/s - 2.5 Gb/s
80C08D	1	12.5 GHz	9.8 Gb/s - 12.6 Gb/s	9.953 Gb/s - 12.5 Gb/s
80C10C	1	80+ GHz	Provided by Opt. CRTP and CR286A	25.8 Gb/s - 43.018 Gb/s
80C11B	1	30 GHz	9.8 Gb/s - 12.6 Gb/s	9.953 - 12.5 Gb/s
80C12B	1	12 GHz	Provided by CR125A	155 Mb/s - 11.3 Gb/s
80C14	1	14 GHz	Provided by CR175A or CR286A	8.500 Gb/s - 14.025 Gb/s

TDR / Electrical Modules	Channels	Vertical Resolution	Bandwidth	TDR System Incident Rise Time (10%-90%)	TDR System Reflected Rise Time (10%-90%)	Monolithic or Remote
80E04	2	16 bits	20 GHz	23 ps	28 ps	Monolithic
80E08B	2	16 bits	30 GHz	18 ps	20 ps	Remote (2 meter)
80E10B	2	16 bits	50 GHz	12 ps	15 ps	Remote (2 meter)

Electrical Modules	Channels	Vertical Resolution	Bandwidth	Rise Time (10%-90%)	Monolithic or Remote
80E02	1	16 bits	50 GHz	7 ps	Monolithic
80E03	2	16 bits	20 GHz	17.5 ps	Monolithic
80E06	1	16 bits	70+ GHz	5 ps	Monolithic
80E07B	2	16 bits	30 GHz	11.7 ps	Remote (2 meter)
80E09B	2	16 bits	60 GHz	5.8 ps	Remote (2 meter)
80E11	2	16 bits	70+ GHz	5 ps	Monolithic
80E11X1	1	16 bits	70+ GHz	5 ps	Monolithic

Accessories Modules	Description	Functionality
82A04B	Phase Reference Module	<100 fs RMS timebase jitter
80A02	EOS/ESD Protection Module	EOS/ESD protection
80A03	Probe Adapter Module	Sampling Scope Probe Connectivity
80N01	2 Meter Extender Cable	Position Module Close To DUT
80A05	Clock Recover Module	Trib. Rate and 10G Clock Recovery, Fixed Rates
CR125A, CR175A, CR286A	Clock Recovery Instrument	Continues Clock Recovery, 150 Mb/s to 28.6 Gb/s

Probes and Accessories

Tektronix probes and accessories are perfectly matched to our industry-leading oscilloscopes. With over 100 choices available, you will find the probe you need.

Active Probes

- Bandwidth up to 4 GHz
- True signal reproduction and fidelity
- Low input capacitance: down to < 0.8 pF
- Small compact probe heads for probing small geometry circuit elements

Current Probes

- Easy to use and accurate AC/DC current measurements
- DC up to 2 GHz
- Amplitude measurements from 1 mA to 2,000 A
- Split core and solid core construction

Differential Probes

- Bandwidth up to 30 GHz
- Easily measure differential signals
- Low input capacitance: down to < 0.3 pF
- High common mode rejection ratio (CMRR)
- Wide range of probe tips for easier circuit access

Passive Probes

- DC to 1 GHz
- Wide range of performance to meet the demands of many applications
- Lightweight, ergonomic designs to fit your needs
- Wide range of probe tips for easier circuit access

High Voltage Probes

- Wide range of voltage measurements - Up to 40 kV peak (100 ms pulse)
- Single-ended or differential

Carrying Cases and Accessories

- TekVPI Interface Adapter for TekProbe probes
- Probe holders and positioners
- Probe power supply
- Soft- and hard-sided cases

Interactive Probe Selector Tool

Need help finding the right probe for your application? The online Tektronix Probe Selector Tool will guide you through a few easy questions to match your need to the right probe. Visit us anytime, anywhere at: **www.tektronix.com/probes**

Select your requirements below. The list of matching products will update with each click.

Probe Recommendation Selector (Start by clicking the arrow to the left or clicking inside this box): Use this Selector to find out what are the most commonly used probes.

Select the Instrument Series:

- MSO/DPO2000B
- MSO/DPO3000
- MSO/DPO4000B
- MSO/DPO5000
- DPO7000C
- DPO/DSA/MSO70000
- MDO4000
- MDO4000 [RF]
- TDS1000B
- TDS2000C
- TDS3000C
- THS3000
- TPS2000B
- TBS1000
- RSA5000/6000

Choose the Desired Measurement:

If an option is grayed out a recommended solution is not available.

- High Voltage Differential
- Low Voltage Differential
- High Voltage Single-ended
- Low Voltage Single-ended
- Current
- General Purpose

Probe Compatibility Selector (Start by clicking the arrow to the left or clicking inside this box): Use this Selector to determine if a probe or accessory is compatible with an Instrument Series.

122 Matches | Compare | Start Over

THDP0200	TMDP0200	THDP0100
TCP0030	TCP0020	TCP0150
TPP0850	P5100A	P6015A
TAP1500	TPP0502	TDP1000
TCP2020	TCPA300	TCP312

Images appear for the first 15 matches. The rest of the matches are listed below.

1103	P6243	RM4000
80A03	P6245	RMD2000
A621	P6246	RMD3000

Software to Expand your Tektronix Instrument Capability

The newest wireless, embedded systems technologies, serial data and video designs present you with unprecedented measurement challenges. Our standards expertise and measurement tools help you meet them all. You can shorten your design cycle, gain greater technical insight and improve team productivity to bring new products and services to market much faster.

Application Software

Expanding and customizing the capability of your Tektronix Performance Oscilloscope

Advanced Analysis Applications

Jitter and Eye Diagram Analysis
- DPOJET provides timing measurements, amplitude measurements, jitter decomposition and eyediagrams and plots to speed root cause analysis of timing issues

Serial Data Link Analysis
- SDLA Visualizer provides Channel de-embed, emulation and equilization tools required for next generatiion high speed designs

Vector Signal Analysis
- SignalVu allows users to characterize wideband spectral events and verify designs such as wideband radar, high datarate sattelite links and frequency hopping radios

Power Analysis
- DPOPower provides Automated measurements for analyzing power quality, current harmonics, switching loss, slew rate, modulation and ripple

DDR Memory Bus Analysis
- DDRA provides a comprehensive validation and debug suite for most DDR versions speeding the resolution of complex memory signaling issues

Visual Trigger
- Precisely qualify triggers and find unique events in complex waveforms

Protocol Decode and Triggering
- Observe specific system behavior to isolate specific states or locate invalid bus sequences

Compliance and Debug Applications

TekExpress Automation software provides automated instrument setup, multi-instrument control, test execution, and reporting to characterize Transmitter/Receiver performance and easily verify designs comply to the latest High Speed Seial Standards. Additionally, standard specific DPOJet software allows the user to seamlessly debug designs in the event of compliance failure.

A sample of the supported technologies are:

Computer Peripherals
- PCI Express
- USB
- Thunderbolt

Storage
- SATA
- SAS

Mobile
- MIPI MPhy
- MIPI DPhy

Display
- HDMI
- MHL
- DisplayPort

Data Communications
- 10/100/1000 BaseT
- 10G BaseT
- SFP+,
- 10GKR
- 16G FibreChannel
- QSFP

Jitter/Noise Analysis

Solving Jitter Debug and Analysis Challenges Made Easy

Tektronix offers jitter measurement solutions for signals ranging from low-speed digital to ultra-high speed serial data. DPO/DSA70000 Series real-time oscilloscopes provide electrical measurement and debug capability to support standards up to 20 Gb/s.

For electrical standards above 20 Gb/s, Tektronix offers the DSA8300 Series sampling oscilloscope with optical and electrical capabilities for 40 Gigabit OC-768 and beyond as well as the BERTScope Bit Error Rate Analyzers for speeds up to 26 Gb/sec.

For solving jitter problems on low level and low noise signals, or for measuring the very small amounts of jitter often found on clocks, Tektronix offers Real Time Spectrum Analyzers (RTSA) that enable engineers to measure and characterize jitter over a wide dynamic range.

Recommended Products

Oscilloscopes and Application Software:

- MSO/DPO/DSA70000, DPO7000, MSO/DPO5000 Series Real-time Oscilloscopes
- DPOJET Jitter, Timing and Eye Diagram and Analysis software
- DSA8300 Sampling Oscilloscopes
- 80SJNB Jitter, Noise and BER Analysis software
- IConnect® and MeasureXtractor™ Signal Integrity TDR and S-parameter software

Bit Error Rate Analyzers:

- BSA Series Bit Error Rate Analyzers
- CR Series Clock Recovery Modules

Probing:

- P7313/P7313SMA Differential Probes
- P7500 TriMode Probes

Real-Time Spectrum Analyzers:

- RSA3000 Series

Signal Integrity, Time Domain Reflectometry (TDR) and S-parameter Measurements

Improve Connector and Channel Visibility

Signal integrity measurements are a critical step in the process of developing digital systems. The task of isolating and eliminating signal integrity problems anywhere in the system is challenging. These solutions let you quickly locate and trace faults back to their source, eliminating schedule delays and reliability issues.

Recommended Products:

Oscilloscopes and Application Software:

- DSA8300 Sampling Oscilloscope
  - True-differential TDR up to 50 GHz bandwidth
  - 15 ps reflected rise time and 12 ps incident rise time
  - Up to 4 dual-channel TDR modules for fast, accurate multi-lane impedance and S-parameter characterization
- IConnect® advanced and MeasureXtractor™
- Signal Integrity TDR and S-parameter software
- 80SJNB Jitter, Noise and BER Analysis software

Probing:

- P8018 Single Ended/P80318 Differential Hand-Held TDR Probes
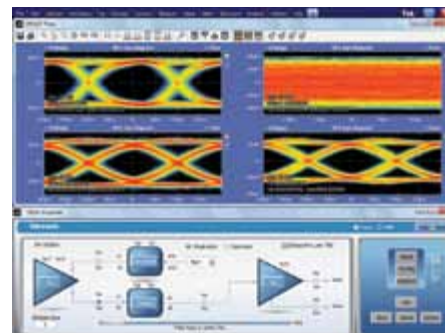
Serial Data Link Analysis Solutions

Unmatched Visibility for Greater Insight into Your Design

Tektronix offers serial data link analysis solutions for high speed serial and memory interfaces for both real-time and sampling oscilloscopes. Reflections, loss, and cross-coupling resulting from the measurement setup can be accurately removed from the acquired signal using Serial Data Link Analysis (SDLA) Visualizer. SDLA Visualizer also provides the functionality to model transmitter equalization, embed channel models, and apply receiver equalization to open closed eyes. Jitter and Eye measurements can be taken at any point in the measurement or simulated link using DPOJET Jitter and Eye Analysis software. SDLA Visualizer and DPOJET are Tektronix' advanced analysis solutions for DPO/DSA/MSO70000 Series real-time oscilloscopes.

For those applications that require a sampling scope, Tektronix offers the DSA8300 sampling oscilloscope with 80SJNB Jitter, Noise, and BER analysis software. 80SJNB provides the capability to specify a de-embed filter, Time Domain Waveform or S-Parameter for channel de-embedding and DFE/FFE Equalization. 80SJNB analysis software also performs timing and noise-based analysis to get a 3-D view of the eye diagram performance for deep, accurate evaluation on signals with speeds up to and beyond 50GHz.

Recommended Products:

Oscilloscopes and Application Software:

- MSO/DPO/DSA70000 Series Real-time Oscilloscopes
- SDLA Visualizer
- DPOJET Jitter and Eye Diagram Analysis Tools
- DSA8300 Sampling Oscilloscopes
- 80SJNB Jitter, Noise and BER Analysis software
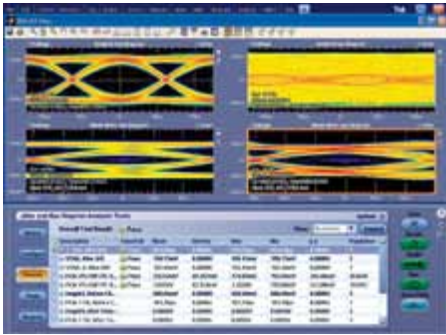
PCI Express®

PCI Express Design Challenges Need Fast, Accurate Answers

PCI Express 3.0 testing requires dual-port acquisition and million unit interval analysis. Tektronix oscilloscopes provide full sample rate and deep record length on all channels required for compliance testing. The DPO/DSA/MSO70000 features channel emulation, equalization and up to 33 GHz Bandwidth which enables accurate measurements on 3rd generation data rates beyond 8 Gb/s.

Recommended Products:

Oscilloscopes and Application Software:
- MSO/DPO5000 Series
- DPO7000C Series
- DPO/DSA/MSO70000 Series Real Time Oscilloscopes
- Opt PCE3 Automated Compliance & Debug Software
- Opt DJA Advanced eye diagram, jitter and timing analysis
- Opt SDLA64 Serial Data Link Analysis
- Opt SLE Serial Data Link Analysis Essentials (no equalization)
- DSA8300 Sampling Oscilloscope with 80E08 module
- IConnect® S-parameters and Z-Line software 80SSPAR

Probing:
- P7300SMA Series SMA Differential Probing System
- P7300 and P7500 Series TriMode Differential Probes
- P80318 TDR hand Probes

Logic/Protocol Analyzers:
- TLA7012/16 Mainframes
- TLA7SAxx Series Logic Protocol Analyzer Modules
- P67SAxxx Series of Slot Interposers, Midbus and Solder Down Probes

Bit Error Rate Analyzers:
- BSA C-Series Models, DPP125C Option ECM, BSAITS125, CR125A Opt PCxIE8G, BSAPCI3 SW

Signal Generators:
- AWG70000 Series, AWG7000 Series, AFG3000 Series

Spectrum Analyzers:
- RSA6000 Series

Serial ATA/SAS

Powerful Serial ATA/SAS Automated Compliance Toolset Saves Time and Effort

Serial ATA/SAS test requirements are some of the most complex among current serial data standards. With a full toolset for characterization you will know how much margin your design really has.

Tektronix'one button SATA solution for device state control and test automation allows you to focus your attention on other priorities. SAS characterization and conformance testing requires voltage, equalization, and jitter analysis across multiple data rates and operating conditions. Tektronix' SAS test solution provides powerful design insight with end to end link analysis including ISI and crosstalk effects.

Recommended Products:

Oscilloscopes and Application Software:
- DSA70000 Series Real Time Oscilloscopes
- TekExpress SATA/SAS Compliance Automation software
- DPOJET Jitter and Eye Analysis software

Signal Generators:
- AWG7000 Series Arbitrary Waveform Generators

Bit Error Rate Analyzers:
- BSA125C
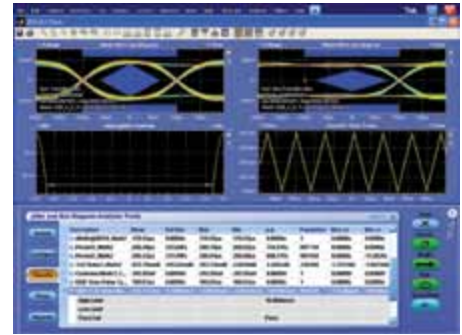
USB

Flexible Tools for Compliance and Debug of USB Hosts and Peripherals

Tektronix provides comprehensive tool sets to serve the validation and compliance needs of engineers designing USB 2.0 and 3.0 based systems, which are compliant to the USB-IF test standards. Integrated triggering, protocol decoding and analysis capabilities help speed the debug of your design.

Recommended Products:

Oscilloscopes and Application Software:
- MSO/DPO4000B Series
- MDO4000 Series
- MSO/DPO5000 Series
- DPO7000C Series
- DSA70000 Series Real time Oscilloscopes
- TekExpress USB Compliance Automation Software
- DPOJET Jitter and Eye Analysis software

Signal Generators:
- AWG7000 Series Arbitrary Waveform Generators

Bit Error Rate Analyzers:
- BSA85C, DPP125, CR125
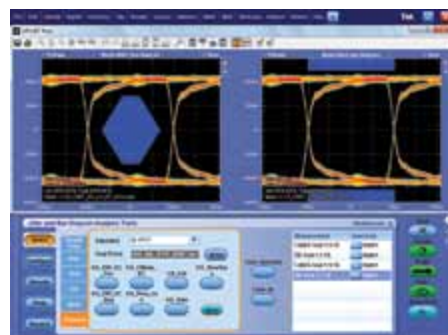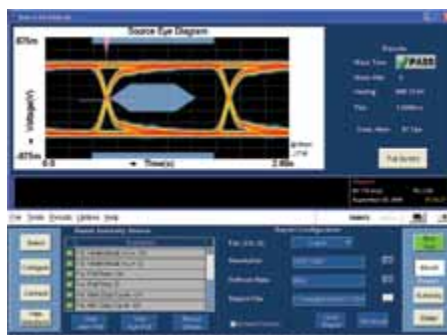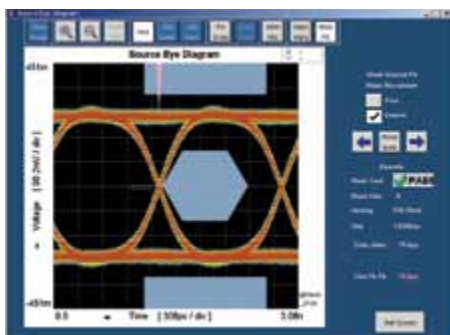
HDMI, MHL and Displayport

Complete HDMI Compliance Test Solution for CTS V1.4b

Tektronix' comprehensive automated sink, source and cable test solution addresses all requirements of the latest revision of the HDMI test specification CTS V1.4b, 1.2/2.0 and Displayport 1.2b and MHL specifications. Four channel testing capability enables faster and more reliable testing with the results easily generated in a consolidated HTML report.

Recommended Products:

Oscilloscopes and Application Software:

- MSO/DPO/DSA70000 Series Real Time Oscilloscope with TDSHT3 Compliance Test software for HDMI, and Option DP12/ Option eDP DPOJET and Option MHD for MHL Compliance testing.
- DSA8300 Sampling Oscilloscope
- TDR and S-Parameter software 80SSPAR
- Pattern Sync Module 80A06
- Jitter Analysis software 80SJNB

Probing:

- P7313SMA for HDMI , MHL and Display Port
- P7240 for MHL clock
- P7380SMA for RBR and HBR Display port testing only
- P7380 for solder-in probing for RBR/HBR Display port testing
- P7313 for solder-in probing for RBR/HBR/HBR2 Display port

Signal Generators:

- AWG7000 Series Arbitrary Waveform Generator for HDMI and MHL
- BERTSCOPE for Displayport

Test Fixtures:

- HDMI:
  - TF-HDMI-TPA-S/STX
  - TF-HDMIC-TPA-S/STX
  - TF-HDMID-TPA-P/R
  - TF-HDMIE-TPA-KIT
  - TF-HEAC-TPA-KSET
- MHL:
  - TF-MHL-TPA-TEK
  - TF-DP-TPA-P/TF-DP-TPA-R

Memory

Comprehensive tools for Memory Interface Verification and Debug

As memory technology continues to evolve to meet the application requirements. Each new generation brings in higher speeds for improved performance, Lower I/O voltage for reduced power consumption with support for various form factors to meet different application needs. These factors result in debug and validation challenges as a number of new, more complex tests are required to validate and debug devices operating with tighter margins, faster edge rates and complex bus protocol.

The sophisticated triggering and software analysis packages available on the DPO Series of Oscilloscopes provides a broad coverage by supporting verification of multiple memory standards all in a single package.

The TLA7000 series of Logic Analyzers with their 20ps high speed timing combined with analog mux and various types of protocol views enable logic debug and protocol validation of memory interfaces.

Easy signal access is provided by a wide variety of probing solutions that support various memory standards and package types with minimal signal loading.

Recommended Products:

Logic Analyzers:

- TLA7000 Series
- TLA7BB4 Logic Analyzer Module
- Memory Support Package
- Memory Compliance Software

Oscilloscopes:

- MSO/DPO5000, DPO7000C, MSO/DPO/DSA70000 Series Real Time Oscilloscope
- Visual Trigger Option (Opt. VET)
- DDR Analysis Option (Opt. DDRA)
- DPOJET Jitter and Eye Diagram Analysis Tool
- SDLA Serial Data Link Analysis ToolKit

Probing Solutions:

- P7500 TriMode Differential Probes
- P6780 Differential Logic Probes
- Oscilloscope and Logic Analyzer Interposers for standard BGA and PoP packages, DIMM's and SODIMM's for all popular memory standards

MIPI®

Simple Setups, with One-Button Automation to Fully-Customizable tools for M-PHY and D-PHY M-PHY characterization and conformance testing requires more than 1000 tests, including Power Spectral Density, PWM measurements and Bit-Error counting, validated in different test configurations.

Tektronix M-PHY Transmitter Automated Solution provides Simple One-box setup, with Power Spectral Density tests integrated on the Oscilloscope itself, along with Seamless Debug Analysis of failing tests. Tektronix M-PHY Receiver Automated Solution provides Simple Two-box setup, based on integrated Bit Error counting on an Oscilloscope itself.

D-PHY characterization and conformance testing requires accurately identifying the low power and high speed test regions, for more than 50 tests across different test modes, multiple-lanes and temperature oven conditions. Tektronix D-PHY One-button unmatched automation allows you test your designs faster and accurately.

Recommended Products:

Oscilloscopes and Application Software:

- MSO/DPO/DSA70000 Series Real Time Oscilloscopes

M-PHY software:

- Opt.M-PHYRX, Opt.M-PHYTX, Opt.M-PHY, PGY-LLI, PGY-UPRO and MPHYVIEW.

D-PHY software:

- Opt.D-PHYTX, Opt.D-PHY, Opt.SR-DPHY.

Probing:

- P7300, and P7500 Series TriMode Differential Probes
P7300SMA Series SMA Differential Probes

Logic Analyzers:

- TLA7000 Series with DPHYPRE, and P6980 or P6982 probe

Signal Generators:

- AWG7000 Series Arbitrary Waveform Generators
- PG3A-B Series Patterns Generators with P338 probe

Data Communications

TWDPc measurement in SFP-TX software Option. Tektronix offers comprehensive, integrated tool sets for validating the physical layer of IEEE 802.3 Ethernet devices, and for developing and debugging Ethernet-based systems from 10BASE-T up to 40/100GB. Tektronix also provides comprehensive Compliance and Debug solution for Technologies which don't fall into IEEE bracket like SFF 8431 SFP+ and FC-16G.

Recommended Products:

Software Solution:

- SR-ENET – Ethernet Decoding and Analysis
- TDSET3 – 10/100/1000BASE-T Ethernet Compliance Testing
- DPO4ENET – Ethernet Triggering and Analysis TekExpress
- 10GBASE-T Automated Compliance Software
- SFP-TX & SFP-WDP - Compliance and Debug solution for SFF 8431 SFP+
- 10G-KR - 10GBASE-KR/KR4 Compliance, Debug & Decode Solution
- FC-16G – Compliance and Debug solution for FC-PI-5 Clause 9 Electrical Physical Layer Testing
- DPOJET Jitter and Eye Diagram Analysis Tool
- SDLA Serial Data Link Analysis ToolKit

Oscilloscopes:

- MSO/DPO/DSA70000 Series Real Time Oscilloscopes
- DPO7000 Series real Time Scopes
- MSO/DPO5000 series oscilloscopes

Test Fixtures:

- TF-GBE-ATP
- TF-GBE-EE
- TF-XGbT
- TF-SFP-TPA-HCB-PK

100G Rx/Tx Technology/ Application Solutions

Tektronix Comprehensive System and Physical layer validation solution for new 25/28 and 100 Gigabit standards.

IEEE802.3ba, 32GFibre Channel and OIF/VSR standards.

- Offers high precision Jitter characterization and Impaired receiver stimulus system, from a leader in the 100G test community. This test solution is effective in silicon, systems and component/transceivers or transponder physical layer validation and debug.
- Critical to this task is sub 100fs Total jitter measurement capabilities on Tx systems as well as key standards specific measurements such as J2/J9.
- The DSA8300's exceptionally high dynamic range makes it a key asset in perform Vertical Eye Closure Penalty (VECP) and low amplitude eye diagrams and mask testing where greater than 50dB of acquisition dynamic range is essential.
- The BSA286C has similarly low jitter noise floor specifications which make it invaluable to generate stressed eyes and performing Bit Error Ratio analysis on 100G designs.

NRZ Chip-To-Chip and Silicon Characterization (Electrical)

- Requires stimulus and impairment capabilities as well as high bandwidth (70+GHz) , ultra low jitter (<100 fs) electrical / TDR acquisition and reference receivers, eye diagram mask testing, precision jitter and noise analysis.
- Ultra low noise BERT Signal Generation and comprehensive impairment capabilities (BUJ, RJ, SJ) at full data rates.
- IConnect provides S-parameters when needed
- All systems can be fully integrated into automation frameworks for PV characterization and test.

Recommended Products:

- BSA286C 28.6Gbps BERTScope
- DSA8300 Sampling Scope with low jitter electrical / TDR moduels
- CR286A 28.6Gbps Clock Recovery Instrument
- IConnect for S-Parameter and Time Domain Network Analysis.
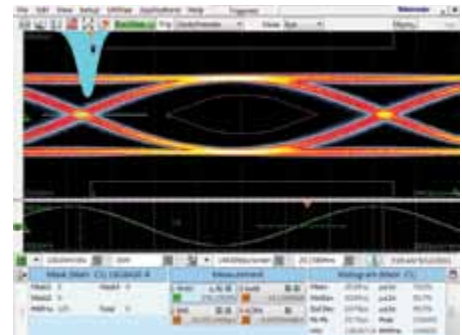
Optical Testing

Tools and Analysis Software for Testing the Latest Short-Haul and Long-Haul Optical Standards and Technologies

The DSA8300 with its highly configurable mainframe and a wide variety of optical modules provide complete optical test solutions with superior system fidelity from 125 Mb/s to 100 Gb/s and beyond. The modules cover a range of wavelengths for both single- and multi-mode fibers. Each module can be optionally configured with a number of selectable Optical Reference Receiver (ORR) filters and/or a full bandwidth path.

Shown below is a brief description of each available optical sampling module as well as a selection guide with the key specifications for each module.

The ever-increasing demand for long-haul network bandwidth has driven network operators from the on-off keying used with today's 10G infrastructure to coherent optical modulation that can support 40G, 100G, 400G, and beyond. Coherent modulation is often achieved using formats such as DP-QPSK and 16QAM. Tektronix has hardware and analysis software to allow receiver, transmitter, and system manufacturers design and debug their next generation long-haul products.

Recommended Products:

Oscilloscopes:

- DSA8300 Series
- 80C10C 80+ GHz Optical Bandwidth Module
- 80C12B 10 Gb/s and Trib Rate Optical Module
- 80C14 14+ GHz Bandwidth Broad Wavelength Optical Module
- 80SJNB Jitter and BER Analysis Software
- 80SJARB Arbitrary Data Jitter Analysis Software

Coherent Optical Modulation Analyzers:

- OM4000 Series
- OM2200 Series
- MSO/DPO/DSA7000 Series

Application Software:

- OM1106 Coherent Lightwave Signal Analyzer Software

Power Measurements

Power Analysis and Compliance Solution with Tektronix Scope and probes will be precise and comprehensive Toolset for all Power measurements

Today's power supplies are driven by a very high level of efficiency due to stringent operational requirements and complex topology designs. This requires design engineers to perform numerous specialized power measurements and various compliance tests that are time-consuming and should be non-erroneous. Tektronix offers an array of power measurement solutions to help you achieve fast, accurate, repeatable results and compliance reports for your specific application.

Recommended Products:

Oscilloscopes and Application Software:

- TPS2000 Series
  - TPS2PWR1 Power Measurement and Analysis software
- MSO/DPO3000 Series
  - DPO3PWR Power Analysis Module
- MSO/DPO4000B Series
  - DPO4PWR Power Analysis Module
- MDO4000 Series
  - DPO4PWR Power Analysis Module
- MSO/DPO5000 Series
  - DPOPWR Power Measurement and Analysis software
- DPO7000, MSO/DPO/DSA70000 Series
  - DPOPWR Power Measurement and Analysis software
  - USBPWR Automated Compliance testing for USBEPS Adapter

Probing:

- TCP0030 / TCP0150 AC/DC Current Probes TCP202 Current Probe
- TCPA300/400 Series Current Probes and Amplifiers
- TMDP0200/THDP0200, THDP0100 High Voltage, P5100 Passive High Voltage Probes
- Differential Probes TDP0500/TDP1000 High Voltage Differential Probes

Signal Generators:

- AFG3000 Series Arbitrary Function Generator

Microprocessor Validation

System-Level Troubleshooting for Fast Design Verification and Test of Microcontrollers and Microprocessors

The number and types of microprocessors and microcontrollers enable powerful embedded system performance but can make design verification and debugging a test challenge. The growing combination of signal processing variables increases the number of communication paths in the design, adding to system complexity. Tektronix instruments provide a better system view of mixed signal performance, enabling you to speed up the design verification and test of microcontrollers and microprocessors in your embedded system.

Recommended Products:

Logic Analyzers:

- TLA6000 Series
- TLA7000 Series
- P6400 & P6800/P6900 Series Probes
- Microprocessor/Bus Support

Oscilloscopes:

- MSO/DPO2000 Series
- MSO/DPO3000 Series
- MDO4000 Series
- MSO/DPO4000B Series
- MSO/DPO5000 Series
- DPO7000 Series
- MSO/DPO/DSA70000 Series

Probing:

- TDP0500/TDP1000/TDP1500/TDP3500/
- TMDP0200/THDP0200/THDP0100 High
- Voltage Differential Probes
- TAP1500/TAP2500/TAP3500 Active Probes

Signal Generators:

- AFG3000 Series Arbitrary/Function Generator
- AWG5000 Series Arbitrary Waveform Generator
- AWG7000 Series Arbitrary Waveform Generator

Application Software:

- DPOJET Jitter and Timing Analysis software
- iLink™ Logic Analyzer/Oscilloscope Integration Package

FPGA Validation

Tools to Optimize Real-Time FPGA Debug

Field Programmable Gate Arrays (FPGAs) continue to grow in performance and flexibility. However, increasing gate counts, advanced logic programming, and increasing signal frequencies with tighter timing margins make debug and design verification a challenging process when implementing an FPGA-based design.

Tektronix mixed signal oscilloscopes (MSOs) and logic analyzers with FPGAView™ enable you to correlate internal FPGA signal activity to board-level signals and instantly move probe points within Altera FPGAs without the need to recompile your design.

Recommended Products:

Logic Analyzers:

- TLA6000 Series
- TLA7000 Series

Mixed Signal Oscilloscopes:

- MSO2000 Series
- MSO3000 Series
- MSO4000B Series
- MDO4000 Series
- MSO5000 Series
- MSO70000 Series
- Application Software:
- FPGAView™ software
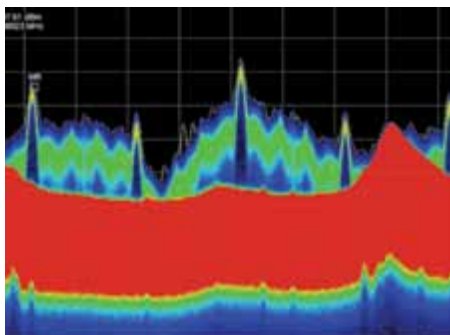
EMI Diagnostics and Precompliance

Reduced time to solution for EMI problems

Time saving solutions for the EMI problems you never planned for. Today's biggest EMI challenges are identifying the location and source of an EMI problem and capturing a transient EMI event. Tektronix Mixed Domain Oscilloscopes combine the functionality of a mixed signal oscilloscope with a spectrum analyzer; capture analog, digital and RF signals, all time correlated for a complete system view of cause/effect in your device. Tektronix Real Time Spectrum Analyzers are able to view, trigger on and analyze the effects of the briefest of signals as they occur in frequency domain and include limit-line scans with pass/fail testing, EMI filter, detectors and averaging for high-confidence precompliance testing.

Recommended Products:

Diagnostics:

- MDO4000 Series Mixed Domain Oscilloscopes + Spectrum Analyzer
- RSA5000 Series Real Time Spectrum Analyzers
- RSA6000 Series Real Time Spectrum Analyzers

Precompliance:

- RSA5000 Series Real Time Spectrum Analyzers
- RSA6000 Series Real Time Spectrum Analyzers
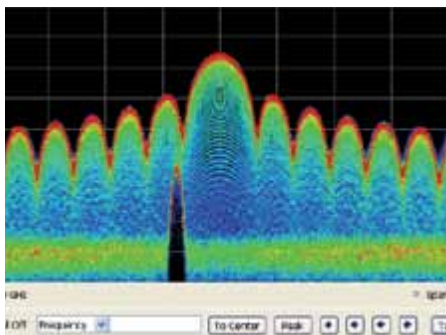
Radar/EW

Performance, Precision and Insight for Your Radar/Electronic Warfare Design

With today's rapid advances in radar/ electronic warfare technology, developing and manufacturing highly specialized and innovative electronic products requires leading-edge technology and tools. Our innovative test equipment reduces uncertainty during the design process and delivers confidence in the integrity of increasingly complex designs.

Recommended Products:

Receiver/Stimulus Test:

- AWG5000 Series Arbitrary Waveform Generator with RFXpress® software
- AWG7000 Series Arbitrary Waveform Generator with RFXpress® software
- AWG70000 Series Arbitrary Waveform Generator with RFXpress® software

Transmitter Analysis:

- RSA6100 Series Spectrum Analyzer
- RSA5000 Series Spectrum Analyzer
- DPO/DSA70000B Series Oscilloscope with SignalVu™ software
- DPO5000/7000 Series Oscilloscope with SignalVu™ software
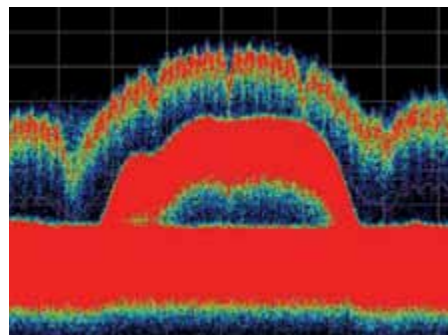
Spectrum Management

Accuracy and Insight All Across the Spectrum

Solve today's demanding signal detection and exploitation challenges with world-class instrumentation for detection, identification, mapping, and hunting down signals or sources of interference. DPX™ Live RF spectrum display will change the way you search and discover elusive signals.

Recommended Products:

Spectrum Management:

- H500/SA2500 Series Handheld Spectrum Analyzer
- RSA5000 Series Spectrum Analyzer
- RSA6000 Series Spectrum Analyzer

Signal Generators

The definition of versatility, Tektronix signal generators create a virtually unlimited range of standard and custom signals, from sine or pulse to ideal or distorted and anything in between.

	AWG70000 Series	AWG7000 Series	AWG5000 Series	AFG3000 Series	AFG2000
Bandwidth	20 GHz	9.6 GHz	480 MHz	240 MHz, 100 MHz, 25 MHz, 10 MHz	20 MHz
Channels	1 or 2	1 or 2	2 or 4	1 or 2 (independent or synchronized)	1
Memory Depth	up to 16 Gs	128 Ms	32 Ms	128 k points	4 x 128 k points
Standard Waveforms	sine, square, DC, triangle, Noise	sine, square, DC, Noise, Triangle, Clock, PRBS	sine, square, DC, Noise, Triangle, Clock, PRBS	Sine, Sine(x)/x, Square, DC, Ramp, Gaussian, Exponential Decay, Pulse, Lorentz, Noise, Arbitrary, Haversine, Exponential Rise	Sine, Sine(x)/x, Square, DC, Ramp, Gaussian, Exponential Decay, Pulse, Lorentz, Noise, Arbitrary, Haversine, Exponential Rise
Modulation	User Definable	User Definable	User Definable	AM, FM, PM, FSK, PWM, External	AM, FM, PM, FSK, PWM, External
Additional Modes	Multi-Unit Synchronization	Sequencing	32 digital outputs, Sequencing	Sweep, Burst, Add Noise Impairment	Sweep, Burst, Add Noise Impairment

Choosing Your Signal Generator

In electronic test and measurement, more often than not, a signal source is required to generate signals that are not available unless externally provided. Below is a list of common features that you may want to consider when choosing a signal generator for your application.

❶ Sample (Clock) Rate

Sample rate, usually specified in terms of megasamples or gigasamples per second, denotes the maximum clock or sample rate at which the instrument can operate. The sample rate affects the frequency of the main output signal. In general, you should choose an instrument where the sampling frequency is twice that of the highest spectral frequency component of the generated signal to ensure accurate signal reproduction. The maximum sample rate also determines the smallest time increment that can be used to create waveforms. Typically this figure is simply the result of the calculation; $T = 1/F$, where T is the timing resolution in seconds and F is the sample rate.

❷ Memory Depth (Record Length)

Memory depth, or record length, plays an important role in signal fidelity because it determines how many points of data can be stored to define a waveform. Deeper memory enables you to store more waveform detail and/or more cycles of the desired waveform.

❸ Vertical (Amplitude) Resolution

Vertical resolution pertains to the binary word size, in bits, of the instrument's DAC, with more bits equating to higher resolution. The vertical resolution of the DAC defines the amplitude accuracy and distortion of the re-produced waveform. While more is better there is a general trade-off for most arbitrary waveform instruments, the higher the resolution the lower the sample rate.

❹ Features and Capabilities

Tektronix signal generators offer a range of features and output capabilities. When choosing your signal generator, you should also evaluate standard waveforms, modulation capabilities, output amplitude and waveform editing software to ensure that the instrument meets your needs.

Product Highlights

- 12 standard waveforms – Sine, Square, Pulse, Ramp, Noise, DC, Sine(x)/x, Gaussian, Lorentz, Exponential Rise, Exponential Decay and Haversine

- Arbitrary waveform capability

- AM, FM, PM, FSK, PWM, sweep and burst modes

- Front-panel USB host port and rear-panel USB device port, optional Ethernet and GPIB ports (Opt. GL)
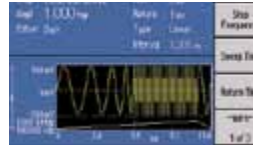
Wide frequency range (1 µHz to 20 MHz) supports amplifier and filter testing applications.

Quickly modify, create and transfer waveforms using the included ArbExpress® software.

AFG2000

Usually, generating a range of signals requires investment in a high-end signal generator. Introducing the Tektronix AFG2000. With 20 MHz bandwidth, 14-bit resolution, and 250 MS/s sample rate, the AFG2021 Arbitrary Function Generator can create simple and complex signals. But perhaps its most impressive feature is its entry-level price.

Models	Analog Channels	Output Bandwidth	Analog Sample Rate	Memory Depth	Amplitude (into 50 Ω)
AFG2021	1	20 MHz	250 MS/s	128 k	10 mV$_{p-p}$ to 10 V$_{p-p}$

Recommended Accessories

Cables

012-0482-00	BNC cable shielded, 3 ft.
012-1256-00	BNC cable shielded, 9 ft.
012-0991-00	GPIB cable, double shielded
011-0049-02	50Ω BNC Terminator

Accessories

RMU2U	Rackmount kit
013-0345-00	Fuse adapter, BNC-P to BNC-R
159-0454-00	Fuse set, 3pcs, 0.125 A

Instrument Options

Opt. GL	GPIB/LAN Interface (configured at time of purchase)

Recommended Service

SILV200	5-year Extended Warranty

Ships with Product

- ArbExpress™ Software and NI LabVIEW SignalExpress™ TE (LE version) Software

- LabView & IVI drivers

- Calibration Certificate, Quick Reference Manual & Documentation on CD

- USB Cable

- Power Cord

- 3-year Warranty

Product Highlights

- 12 standard waveforms - Sine, DC, Pulse, Exponential Decay, Sine(x)/x, Ramp, Lorentz, Haversine, Exponential Rise, Square, Gaussian, Noise

- Arbitrary waveform capability

- AM, FM, PM, FSK, PWM modulation

- Front-panel USB host port and rear-panel Ethernet and GPIB ports
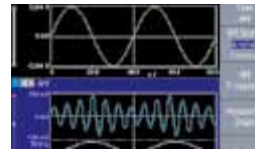
Large color display shows your settings and waveforms at a single glance.
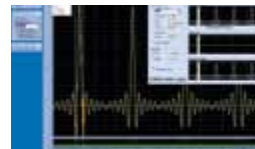
Create and modify waveforms with ease with the included ArbExpress® software.

AFG3000 Series

Test complex designs faster with a fully loaded function generator. Featuring 12 standard waveforms, plus arbitrary capability and many modulation options, this generator supports a wide range of application needs. Add in best-in-class performance and 25 shortcut keys and you have a generator that's loaded with features and light on complexity.

Models	Analog Channels	Output Bandwidth	Analog Sample Rate	Memory Depth	Amplitude (into 50 Ω)
AFG3011C	1	10 MHz	250 MS/s	128 k	20 mV$_{p-p}$ to 20 V$_{p-p}$
AFG3021C	1	25 MHz	250 MS/s	128 k	10 mV$_{p-p}$ to 10 V$_{p-p}$
AFG3022C	2	25 MHz	250 MS/s	128 k	10 mV$_{p-p}$ to 10 V$_{p-p}$
AFG3101C	1	100 MHz	1 GS/s (≤16k) 250 MS/s (>16k)	128 k	20 mV$_{p-p}$ to 10 V$_{p-p}$
AFG3102C	2	100 MHz	1 GS/s (≤16k) 250 MS/s (>16k)	128 k	20 mV$_{p-p}$ to 10 V$_{p-p}$
AFG3251C	1	240 MHz	2 GS/s (≤16k) 250 MS/s (>16k)	128 k	50 mV$_{p-p}$ to 5 V$_{p-p}$
AFG3252C	2	240 MHz	2 GS/s (≤16k) 250 MS/s (>16k)	128 k	50 mV$_{p-p}$ to 5 V$_{p-p}$

Recommended Accessories

Cables

012-0482-xx	BNC cable shielded, 3 ft.
012-1256-xx	BNC cable shielded, 9 ft.
012-0991-xx	GPIB cable, double shielded

Accessories

RM3100	Rackmount kit
013-0345-xx	Fuse adapter, BNC-P to BNC-R
159-0454-xx	Fuse set, 3pcs, 0.125A

Recommended Service

SILV400	5-year Extended Warranty

Ships with Product

- ArbExpress™ Software and NI LabVIEW SignalExpress™ TE (LE version) Software

- LabView & IVI drivers

- Calibration Certificate, Quick Reference Manual & Documentation on CD

- Power Cord

- 3-year Warranty

Product Highlights

- ▪ I/Q modulator test
- ▪ Consumer electronics
- ▪ Serial data
- ▪ RF Baseband Signal Generation

4 synchronized channels in a single instrument.

Quickly modify, create and transfer waveforms using either RFXpress or SerialXpress.
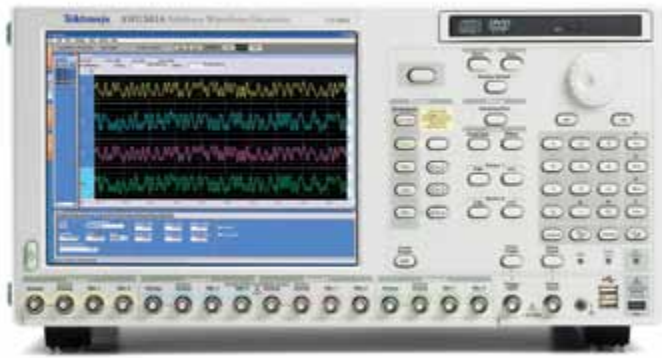
AWG5000 Series

With 14 Bit vertical resolution up to 1.2 GS/s, 4 analog, and 32 digital channel outputs, the AWG5000 Series Arbitrary Waveform Generator is the ideal solution for versatile mixed signal generation. The AWG5000 Series gives you a unique combination of analog and digital output performance allowing you to generate analog and digital IQ, as well as IF signals in a single instrument. With the addition of advance sequencing and dynamic jump capability, extremely complex waveforms can easily be created to more closely simulate real world environments.

Models	Analog Channel	Analog Bandwidth	Digital Channel	Output Frequency	Record Length	Max Sample Rate	Vertical Resolution
AWG5002C	2	Up to 230 MHz	28	240 MHz	16M point per channel (32M optional)	600 MS/s	14 bits
AWG5012C	2	Up to 300 MHz	28	480 MHz	16M point per channel (32M optional)	1.2 GS/s	14 bits
AWG5014C	4	Up to 300 MHz	--	480 MHz	16M point per channel (32M optional)	1.2 GS/s	14 bits

RFXpress® Software for the AWG5000, AWG7000, AWG70000 (RFX100)

If you are doing RF Designs requiring signal modulation, Tektronix' RFXpress software for the AWG series delivers advanced capabilities to synthesize digitally modulated baseband, IF and RF/microwave signals supporting a wide range of modulation schemes. RFXpress simplifies waveform creation. Special options are available for Radar, OFDM, S-Parameter, and UWB signals specifically.

SerialXpress® Software for the AWG5000, AWG7000, AWG70000 (SDX100)

Recreate exact waveforms required for thorough and repeatable design validation, margin/characterization and conformance testing with SerialXpress and AWG Series signal generators. SerialXpress' easy to use graphical user interface allows for a combination of test signals and various impairments including Inter Symbol Interferences (ISI), Duty Cycle Distortion (DCD), Spread Spectrum Clocking (SSC), Pre-emphasis and noise.

Product Highlights

- Serial data validation and compliance testing
- Radar signal generation and environmental simulation
- Wideband analog and digital RF signal generation
- Disk drive validation and test

Radar pulses can be creating created using the AWG7000 and RFXpress.
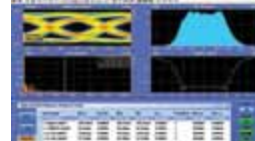
Easily create digital data impairments with the AWG7000 ans SerialXpress.

AWG7000 Series

The AWG7000 Series Arbitrary Waveform Generators, with up to 24 GS/s and 10 Bit vertical resolution, deliver the industry's best signal stimulus solution for ever-increasing measurement challenges. This allows for easy generation of very complex signals, complete with controllable jitter, noise and other signal impairments. The AWG7000 Series Arbitrary Waveform Generator is the ideal solution for wideband signal generation applications, receiver stress testing of high-speed serial data, or any application where complex signal creation is required.

Models	Analog Channel	Analog Bandwidth	Output Frequency	Record Length	Max Sample Rate	Vertical Resolution
AWG7082C	2	Up to 3.2 GHz, 5.6 GHz (optional)	Max = 3.2 GHz, 6.4 GHz (optional)	32M point, 64M point (optional)	10 MS/s - 8 GS/s (16 GS/s optional)	10 bits
AWG7122C	2	Up to 3.2 GHz, 5.6 GHz (optional)	Max = 4.8 GHz, 9.6 GHz (optional)	32M point, 64M point (optional)	10 MS/s - 12 GS/s (24 GS/s optional)	10 bits

RFXpress® Software for the AWG5000, AWG7000, AWG70000 (RFX100)

If you are doing RF Designs requiring signal modulation, Tektronix' RFXpress software for the AWG series delivers advanced capabilities to synthesize digitally modulated baseband, IF and RF/microwave signals supporting a wide range of modulation schemes. RFXpress simplifies waveform creation. Special options are available for Radar, OFDM, S-Parameter, and UWB signals specifically.

SerialXpress® Software for the AWG5000, AWG7000, AWG70000 (SDX100)

Recreate exact waveforms required for thorough and repeatable design validation, margin/characterization and conformance testing with SerialXpress and AWG Series signal generators. SerialXpress' easy to use graphical user interface allows for a combination of test signals and various impairments including Inter Symbol Interferences (ISI), Duty Cycle Distortion (DCD), Spread Spectrum Clocking (SSC), Pre-emphasis and noise.

Product Highlights

- Generate wide bandwidth signals at baseband, IF and RF frequencies with excellent dynamic range

- Accelerate designs and research by generating waveforms that cannot previously be created

- Add impairments to waveforms eliminating the need for additional hardware

- Ability to sync multiple units together to increase transmission bandwidth

Seamlessly import waveforms from Matlab, Excel and other software packages.

Waveforms captured on scopes or spectrum analyzers can be played back on the AWG.

AWG70000A Series

AWG70000A series is the next generation of the industry leading Tektronix AWG portfolio, implementing advanced data rate technologies of up to 50 Gs/s with 10 bit vertical resolution.

	AWG70001A	AWG70002A
Sample Rate	1.5KS/s to 50 GS/s	1.5KS/s to 25 GS/s
Maximum Frequency	20.0 GHz	10.0 GHz
Analog Bandwidth	14 GHz	14 GHz
Rise Time	27 ps	22 ps
Dynamic Range (SFDR)	Up to -80 dBc	Up to -80 dBc
DAC Resolution	10 bits	10 bits
Output Voltage	1.0 Vpp (Differential)	1.0 Vpp (Differential)
Waveform Memory	Standard: 2 GSamples, Optional: 16GSamples	Standard: 2 GSamples, Optional: 8GSamples
Channels	1 (Differential)	2 (Differential)

Recommended Accessories

RFXpress	
SerialXpress	

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Keyboard
- Mouse
- Power Cord

RFXpress® Software for the AWG5000, AWG7000, AWG70000 (RFX100)

If you are doing RF Designs requiring signal modulation, Tektronix' RFXpress software for the AWG series delivers advanced capabilities to synthesize digitally modulated baseband, IF and RF/microwave signals supporting a wide range of modulation schemes. RFXpress simplifies waveform creation. Special options are available for Radar, OFDM, S-Parameter, and UWB signals specifically.

SerialXpress® Software for the AWG5000, AWG7000, AWG70000 (SDX100)

Recreate exact waveforms required for thorough and repeatable design validation, margin/characterization and conformance testing with SerialXpress and AWG Series signal generators. SerialXpress' easy to use graphical user interface allows for a combination of test signals and various impairments including Inter Symbol Interferences (ISI), Duty Cycle Distortion (DCD), Spread Spectrum Clocking (SSC), Pre-emphasis and noise.

Logic Analyzers

With Tektronix Logic Analyzers, you can acquire fast edges with the industry's highest acquisition speed. Support packages tuned to your specific application makes it easier for you to probe, acquire, decode, analyze, and validate the performance of your microprocessor, FPGA or memory design.

	TLA6400	TLA7000
Description	Pre-configured Portable Logic Analyzer	Modular Portable and Benchtop Logic Analyzers
Channels	34, 68, 102, 136	68, 102, 136 modules 2 – 6 modules per frame
Timing	1.6 GHz on all channels 3.2 GHz on ½ channels	500 MHz to 6.4 GHz (dependent on model)
MagniVu™ Timing	25 GHz	8 GHz or 50 GHz (dependent on model)
State Clock Rate	333 MHz (standard) 667 MHz (optional)	235 MHz to 1.4 GHz (dependent on model)
Maximum State Data Rate	1.33 Gb/s	1.25 Gb/s to 3.0 Gb/s (dependent on model)
Record Length	2Mb, 4Mb, 8Mb, 16Mb, 32Mb, 64Mb	2Mb to 128Mb (dependent on model)
Analog Mux	Available	Available

Choosing your Logic Analyzer

To help you choose the right logic analyzer for your needs, the most common selection criteria are listed below, along with helpful tips for determining your requirements.

1 ## Number of Channels

Logic Analyzers are available in both modular and pre-configured forms. A modular logic analyzer allows you to add additional acquisition cards to increase the number of available channels. A pre-configured logic analyzer has a fixed number of channels and can't be changed after purchase.

2 ## Timing Resolution

Timing resolution is simply the inverse of the sample rate of the logic analyzer. Higher timing resolution allows you to more precisely place the edges of signals relative to one another giving more accurate timing measurements

3 ## State Clock Rate

In addition to timing mode, logic analyzers have a second acquisition mode called state mode. In this mode, a clock from your circuit tells the logic analyzer when to sample the date. The state clock specification indicates the maximum frequency of clock that the logic analyzer can use.

4 ## Record Length

Record length, or memory depth, indicates the number of samples that can be stored. Longer record lengths can be helpful in troubleshooting problems whose cause and symptom are widely separated in time.

Product Highlights

- 15 in. Display, with Optional Touch Screen to See More of Your Data and Navigate Efficiently through Your Data
- Drag-and-Drop Triggering – Simply drag any one of eight different trigger types onto the waveform
- Drag-and-Drop Measurements – Simply drag an icon from the measurement toolbar and drop it on your signal of interest

iCapture allows you to use one probe for both your logic analyzer and scope eliminating the need to double-probe.
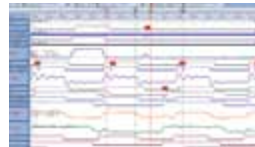
Integrate the display of digital and analog data with iView.

TLA6400 Series

The affordable TLA6400 Series Logic Analyzer offers the performance needed to debug, validate, and optimize the functionality of your digital system. Quickly isolate, identify, and characterize elusive and hard-to-find problems with a comprehensive set of signal integrity debug tools.

Model	Channels	State Clock Rate	MagniVu Timing	Timing	Record Length
TLA6401	34	333 MHz (standard) 667 MHz (optional)	25 GHz	1.6 GHz on all channels 3.2 GHz on ½ channels	2Mb, 4Mb, 8Mb, 16Mb, 32Mb, 64Mb
TLA6402	68	333 MHz (standard) 667 MHz (optional)	25 GHz	1.6 GHz on all channels 3.2 GHz on ½ channels	2Mb, 4Mb, 8Mb, 16Mb, 32Mb, 64Mb
TLA6403	102	333 MHz (standard) 667 MHz (optional)	25 GHz	1.6 GHz on all channels 3.2 GHz on ½ channels	2Mb, 4Mb, 8Mb, 16Mb, 32Mb, 64Mb
TLA6404	136	333 MHz (standard) 667 MHz (optional)	25 GHz	1.6 GHz on all channels 3.2 GHz on ½ channels	2Mb, 4Mb, 8Mb, 16Mb, 32Mb, 64Mb

Recommended Probes

P5910	17-channel General Purpose Probe
P5934	34-channel Mictor Probe
P5960	34-channel DMAX Probe

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Recommended Accessories

PG3L-B	Stand-Alone Digital Pattern Generator
LACART	Accessory Cart
K4000	2 Shelf Accessory Cart
020-2664-xx	Rack Mount Kit

Ships with Product

- Power Cord
- Quick Start Guide
- Keyboard and Mouse
- Front Cover
- Documentation CD
- Calibration Certificate

Product Highlights

- Modular Mainframes provide flexibility and expandability
- Supports up to 6,528 Logic Analyzer Channels, 48 Independent Buses
- Trace Problems from Symptom back to Root Cause in Real Time across Multiple Modules by Viewing Time-correlated Data in a Wide Variety of Display Formats
- Choose from a variety of acquisition and stimulus modules

Debug and validate the latest DDR technology with the TLA7000 Series.

PCI Express Debug from Protocol to Physical Layer.

TLA7000 Series

The modular TLA7000 Logic Analyzer Series provides the speed and flexibility you need to capture logic detail on today's fastest microprocessors and memory designs.

TLA7000 Mainframe Models	Description	Number of Modules	Built-In Computer	Display
TLA7012	Portable Mainframe	2	Yes	15"
TLA7016	Benchtop Mainframe	6	Requires an external computer	none

Acquisition Module Models	Channels	State Clock Rate	MagniVu Timing	Timing
TLA7ACx	68, 102, 136	235 MHz (standard) 450 MHz (optional)	8 GHz	500 MHz on all channels; 1 GHz on ½ channels; 2 GHz on ¼ channels
TLA7BBx	68, 102, 136	750 MHz (standard) 1.4 GHz (optional)	50 GHz	1.6 GHz on all channels; 3.2 GHz on ½ channels; 6.4 GHz on ¼ channels

Pattern Generator Model	Maximum Data Rate	Number of Channels	Memory Depth	Data Models
PG3ACAB-B	300 Mbps 600 Mbps with DDR Option	64 (mergeable to 256 channels)	32M Vectors	Flat or Block Based

Recommended Probes

Acquisition Probes

P6910	34-channel General Purpose Probe
P6960	34-channel Single-Ended DMAX Probe
P6980	34-channel Differential DMAX Probe

Pattern Generator Probes

P370	TTL Output
P373	LVDS Output
P375	Output Programmable from -2V to +6.5V

Recommended Accessories

LACART	Accessory Cart
K4000	2 Shelf Accessory Cart
020-2664-xx	Rack Mount Kit

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Power Cord
- Quick Start Guide
- Keyboard and Mouse
- Front Cover (TLA7012)
- Documentation CD
- Calibration Certificate

PCI Express Logic Protocol Analyzers

The TLA7SAxx Series logic protocol analyzer modules provide an innovative approach to PCI Express validation that spans all layers of the protocol from the physical layer to the transaction layer. View statistical summary and protocol analysis using innovative Transaction and Summary Profile windows.

	TLA7SAxx
Description	PCI Express Logic Protocol Analyzer, Supports Gen3, Gen2, and Gen1 rates
Differential Inputs	8 or 16
Memory	8M/16M

Choosing your PCI Express Logic Protocol Analyzer

To help you choose the right PCI Express Logic Protocol Analyzer for your needs, the most common selection criteria are listed below, along with helpful tips for determining your requirements.

1 Probing

How you will access your PCIe signals is a critical consideration. There are three possible methods of probing your system: slot interposer, solder down probes, and midbus probes. A slot interposer is the most convenient method if you have access to a PCIe slot. A solder-down probe can be used if you are designing an embedded system where a slot is not available. Finally, a midbus probe can be an easy solution if you can design a probe footprint into your system.

2 Number of Lanes

PCI Express Logic Protocol Analyzers are available in different widths to provide cost-effective solutions no matter if you have x1 or a x16 system.

3 Triggering

The ability to trigger on packet details along with other resources like counters and timers can significantly speed your debug and validation effort. Consider also the ability to cross trigger with other events in your system such as a memory bus.

Product Highlights

- Three probing options: solder-down, midbus, and interposer
- Resynchronization time <12 FTS1 (PCIe2) or <4 FTS2 (PCIe3) regardless of the Electrical Idle time for Advanced Power State Management performance
- Quickly build a trigger definition to trigger on the most elusive PCIe events occurring on Link

Quickly gain confidence that your setup is correct by routing any signal directly to a high bandwidth Oscilloscope.

Get visibility of system issues involving flow control with the Unique Bird's EyE View.

TLA7SAxx Series

The TLA7SAxx PCI Express Protocol Analyzer modules provide powerful trigger and filtering capabilities so you can quickly focus on the data of interest. A complete suite of probing solutions targeted for various form factors and applications.

Model	Differential Inputs	Record Length
TLA7SA08	8	4 GB Physical Memory; 160M Symbols per Differential Input
TLA7SA16	16	8 GB Physical Memory; 160M Symbols per Differential Input

Recommended Probes

P67SA01S	x1 Slot Interposer Probe
P67SA04S	x4 Slot Interposer Probe
P67SA08S	x8 Slot Interposer Probe
P67SA16S	x16 Slot Interposer Probe
P67SA08	x4 Midbus Probe
P67SA16	x8 Midbus Probe
P67SA01SD	x1 Solder Down Probe
P67SA08G2	x4 Midbus Probe for TLA7SAxx Modules to Connect to PCIe2 Midbus Footprints
P67SA16G2	x8 Midbus Probe for TLA7SAxx Modules to Connect to PCIe2 Midbus Footprints

Recommended Accessories

P67UHDS-MA	x2 PCI Express Probe Lead Set for P67SA00 probe connections to oscilloscopes

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Statement of Compliance
- Reference Clock Cable (672-6285-xx)
- Reference Clock Jumper Cable (174-5392-xx)

Bit Error Rate Testers

Bridging the Information Gap

Each Tektronix Bit Error Rate Tester delivers unprecedented flexibility and performance to help compress your product development cycles and reduce verification testing costs. Quickly and confidently identify errors in digital bit streams with these highly advanced test and measurement instruments.

	BA Series	BSA Series	PPG/PED Series
Product Series	BA1500, BA1600	BSA85C, BSA125C, BSA175C, BSA286C	PPG3001, PPG3002, PPG3004, PPG3201, PPG3202, PPG3204, PED3201, PED3202
Channels	1	1	1 (PPG3001,PPG3201, PEG3001) 2 (PPG3002,PPG3202,PED3202) 4 (PPG3004, PPG3204)
Maximum Bitrate	1.5-1.6 Gbps	8.5-28.6 Gbps	30-32 Gbps
Maximum Native Error Detector Rate	1.6 Gbps	26 Gbps	32 Gbps
Maximum Patten Length	8Mbits	128Mbits	2Mbits/channel
Stress Impairments	External stressed clock	External stressed clock Internal: (STR) Rj, Sj, Si, Pj, BUJ	External stressed clock Internal: (JIT) Sj, Rj
Output Signal Amplitude	4V Differential	4V Differential	PPG300X 4V Differential PPG320X 1V (Fixed) Differential
Detector Functions	BER, BER Contour, BER Mask, Error Location, Eye Diagram, Jitter Peak	BER, BER Contour, BER Mask, Error Location, Eye Diagram, Jitter Peak, Jitter Map, Jitter Tolerance	BER, Auto Align
Input Sensitivity	40mV Typical	50mV Typical	20mV Typical
Applications	Digital Radio and Satellite test	PCIe, USB, Thunderbolt, SATA, SAS, FC, IEEE802.x , OIF, CEI	FC, IEEE802.x, OIF, CEI
Software		BSAUSB3: USB (Gen3) Automated loopback control, auto impairment calibration and receiver compliance test system; BSAPCI3: PCI Express (Gen3) Automated loopback control, auto impairment calibration and receiver compliance test system.	

BA/BSA/PPG Series, Bit Error Rate Testers

As high performance SERDES receiver validation is now frequently required as part of industrial conformance programs (SATA, PCIe, USB etc) or for the validation and comparison of silicon receiver sensitivity, the BERT is an essential piece of all silicon and system validation labs.

Model	Output Channels	Bit Rate	Maximum User Defined Pattern Length
BA1500	1	1.5 Gbps	8 Mbits
BA1600	1	1.6 Gbps	8 Mbits
BSA85C	1	8.5 Gbps	128 Mbits
BSA125C	1	12.5 Gbps	128 Mbits
BSA175C	1	17.5 Gbps	128 Mbits
BSA286C	1	28.6 Gbps	128 Mbits
PPG3001	1	30 Gbps	2 Mbits
PPG3002	2	30 Gbps	2 Mbits
PPG3004	4	30 Gbps	2 Mbits
PPG3201	1	32 Gbps	2 Mbits
PPG3202	2	32 Gbps	2 Mbits
PPG3204	4	32 Gbps	2 Mbits
PED3201	-	32 Gbps	2 Mbits
PED3202	-	32 Gbps	2 Mbits

Product Highlights

- BA1500/BA1600:

  - 1.6Gbps performance and low entry cost with full featured analysis capabilities key for telecommunications and satellite systems testing

- BSA85C-BSA286C:

  - 8.5 to 28.6Gbps performance and the industry's most comprehensive precision signal impairments, jitter measurement and error location analysis tools make this family of products key to all validation labs

  - Ultra low noise floor (<300fs RMS Rj) coupled with 28.6Gbps performance makes these instruments key for all forms of receiver characterization and debug.

- PPG/PED Series

  - Driving modern 100G communications system links mandate the ability to operate up to 32Gbps coupled with precision controlled alignment of channel phase over 4 outputs

  - The PPG3204 offers 4 synchronous (user controlled) channels with sub 10pSec edge rates for blazing performance
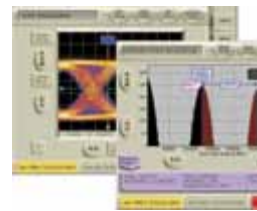
The BSA offers a complete and continuous analysis of any given bit stream, allowing in-depth BER contouring and examinations of very low probability and infrequent errors which others instruments overlook.

System validation for coherent QPSK systems and 100G Ethernet testing require precision four channel capable BERTS and complimentary error detectors.

Ships with Product

- All Models Include:

  - Quick Start user manual, power cord, mouse, three (3) short low-loss SMA cables, DVI adapter

  - Standard 1 year warranty

- Certifications:

  - EU EMC Directive (CE-Marked)

  - LVD Low Voltage Directive

  - US Listed UL61010-1

  - Canada Certified CAN/CSA 61010-1

Recommended Accessories

Digital Pre-Emphasis Processor

DPP125C	1-12.5 Gb/s 3-Tap, opt. 4-Tap

Clock Recovery Instruments

CR125A	1-12.5 Gb/s
CR175A	1-17.5 Gb/s
CR286A	1-28.6 Gb/s

BSA Interference Test System

BSAITS125	Interference Test Set with interference insertion and ISI switching

Software Packages

BSAUSB3	USB3 Instrument switch, cables and automation software for auto calibration and compliance test execution
BSAPCI3	PCI Express (Gen3) Automated loopback control, auto impairment calibration and receiver compliance test system

Recommended Accessories

Adapters

BARACK BA-Rack Mount Kits; BSA12500ISI Differential ISI Board; BSAITS125 Interference Test Set with interference insertion and ISI switching; BSARACK BSA-Rack Mount Kits; BSASATATEE BSA-SATA-Tee for OOB Signaling; BSASWITCH Hardware switch for receiver testing in applications such as USB3 compliance testing allowing attainment of loopback; PMCABLE1M Precision Phase Matched Cable Pair, 1m SMAPOWERDIV SMA Power Dividers

Instrument Options

BA1500/BA1600: ECC: Error Correction and Coding Emulation; MAP: Error Mapping Analysis; PL: Physical Layer Test Suite Software.

BSA85C-BSA286C: F2: F/2 Jitter Generation (requires STR); STR Stressed Signal Generation; XSSC Extended Spread Spectrum Clocking; J-MAP Jitter Decomposition SW; ECC Error Correction Coding; LDA Live Data Analysis SW; MAP Error Mapping SW; PL Physical Layer Test Suite; SF Symbol Filtering SW; SLD Stressed Live Data SW

PPG/PED Series: JIT: 150ps Pk-pk of Sinusoidal and Random jitter

Recommended Service

G3	Gold Care 3-year Extended Warranty
G5	Gold Care 5-year Extended Warranty
R3	3-year Extended Warranty
R5	5-year Extended Warranty

Spectrum Analyzers

Delivering confidence to confront the most challenging microwave and RF designs.

Each Tektronix Spectrum Analyzer is equipped with the DPX™ Live RF spectrum display to effectively characterize time-variant signals and solve unexpected problems.

If you need both an oscilloscope and spectrum analyzer functionality, the new MDO4000 Series Mixed Domain Oscilloscope is the world's only oscilloscope with a built-in spectrum analyzer, you can capture time-correlated analog, digital and RF signals for a complete system view of your device.

	RSA6000 Series	RSA5000 Series	H500/SA2500 Series	SPECMON
Frequency Range	9 kHz to 20 GHz	1 Hz to 26.5 GHz	10 kHz to 6.2 GHz	1 Hz to 3/6.2 GHz
Capture Bandwidth	Up to 110 MHz	Up to 110 MHz	20 MHz	Up to 110 MHz
Minimum Event Duration for 100% Probability of Intercept (POI)	As brief as 3.7 µs	As brief as 3.7 µs	As brief as 125 µs	As brief as 3.7 µs
SFDR at Max. BW (typical)	-75 dBc at 110 MHz	-75 dBc at 110 MHz	-70 dBc at 20 MHz	-78 dBc
DANL (equivalent at 1 Hz RBW)	Down to -170 dBm/Hz	Down to -167 dBm/Hz	Down to -163 dBm/Hz	Down to -167 dBm/Hz
Phase Noise (typical at 10 kHz offset)	≤ -110 dBc/Hz	≤ -112 dBc/Hz	≤ -95 dBc/Hz	≤ -112 dBc/Hz
Third Order Intercept at 2 GHz	+17 dBm	+17 dBm	Not Specified	≤ -139 dBc/Hz
DPX Live RF Spectrum Display	> 292,000 Spectrums/s	> up to 292,000 Spectrums/s	> up to 10,000 Spectrums/s	> 292,000 Spectrums/s

Choosing your Spectrum Analyzer

In electronic test and measurement, more often than not, a signal source is required to generate signals that are not available unless externally provided. Below is a list of common features that you may want to consider when choosing a signal generator for your application.

1 Sample (Clock) Rate

Sample rate, usually specified in terms of megasamples or gigasamples per second, denotes the maximum clock or sample rate at which the instrument can operate. The sample rate affects the frequency of the main output signal. In general, you should choose an instrument where the sampling frequency is twice that of the highest spectral frequency component of the generated signal to ensure accurate signal reproduction. The maximum sample rate also determines the smallest time increment that can be used to create waveforms. Typically this figure is simply the result of the calculation; $T = 1/F$, where T is the timing resolution in seconds and F is the sample rate.

2 Memory Depth (Record Length)

Memory depth, or record length, plays an important role in signal fidelity because it determines how many points of data can be stored to define a waveform. Deeper memory enables you to store more waveform detail and/or more cycles of the desired waveform.

3 Vertical (Amplitude) Resolution

Vertical resolution pertains to the binary word size, in bits, of the instrument's DAC, with more bits equating to higher resolution. The vertical resolution of the DAC defines the amplitude accuracy and distortion of the re-produced waveform. While more is better there is a general trade-off for most arbitrary waveform instruments, the higher the resolution the lower the sample rate.

4 Features and Capabilities

Tektronix signal generators offer a range of features and output capabilities. When choosing your signal generator, you should also evaluate standard waveforms, modulation capabilities, output amplitude and waveform editing software to ensure that the instrument meets your needs.

Product Highlights

- Spectrum Monitoring and Surveillance
- Interference Detection and Troubleshooting
- Signal Hunting
- Signal Identification
- Signals Intelligence (SIGINT)
- Homeland Security

H500/SA2500 Handheld Real-Time Spectrum Analyzer

Interference troubleshooting has never been so easy.

The H500/SA2500 Handheld Spectrum Analyzer Series will help you to easily scan, classify and locate signals of interest in the field environment. Scan the environment to discover spectrum events other analyzers will miss, when using the unique DPX® Live RF spectrum display. Classify signals of interest with the built-in, user-defined signal database. Locate signals quickly using the integrated GPS mapping solution. The ruggedized design, with a hot swappable battery, is optimized to help you in the toughest of environments.

Model	Capture Bandwidth	Frequency Range	Minimum Event Duration for 100% Probability of Intercept (POI)	SFDR at 20 MHz
SA2500	20 MHz	10 kHz - 6.2 GHz	125 µs - 500 µs	-70 dBc
H500	20 MHz	10 kHz - 6.2 GHz	125 µs	-70 dBc

Instrument Options (SA2500)

Option EP1	Enhances SA2500 DPX™ Live RF spectrum display to 10,000 spectrums/sec
Option EP2	Enhances SA2500 by adding signal classification to the Spectrum Notes capability

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Recommended Accessories

Beam Antennas

119-6594-xx	824 to 896 MHz
119-6595-xx	896 to 960 MHz
119-6596-xx	1710 to 1880 MHz
119-6597-xx	1850 to 1990 MHz

Cables

012-0482-xx	50 Ω, BNC (m) 3 foot
174-4977-xx	50 Ω, Straight Type-N (m) and angled Type-N (m) connector, 1.6 foot
174-5002-xx	50 Ω, Type-N (m) to Type-N (m) connector, 3 foot

Accessories

119-6970-xx	Magnetic Mount Antenna, 824 to 2170 MHz
119-7246-xx	Pre-filter, General Purpose, 824 to 2500 MHz, Type-N (f) Connector
119-7426-xx	Pre-filter, General Purpose, 2400 to 6200 MHz, Type-N (f) Connector
119-6030-xx	External Battery Charger (2-slot, external)
119-7755-xx	AC Power Supply
146-0151-xx	Lithium-ion Battery
016-1882-xx	Display Protector Sheets

Ships with Product

- **H500:**
  User Manual (in PDF format), Installation Software, AC Power Adapter, Lithium-ion Battery, GPS Antenna, Flexible monopole antenna, Type-N (m) to BNC (f) adapter, USB A-B cable, Tilt Stand, Soft Carry Case, Audio Jack Mute Plug (mute all audio output from the instrument speaker), One-year Warranty

- **SA2500:**
  User Manual (in PDF format), Installation Software, AC Power Adapter, Lithium-ion Battery, GPS Antenna, Flexible monopole antenna, Type-N (m) to BNC (f) adapter, USB A-B cable, Tilt Stand, Soft Carry Case, Audio Jack Mute Plug (mute all audio output from the instrument speaker), One-year Warranty

Product Highlights

- DPX® Live RF spectrum display
- Triggering expertise
- Seamless data capture
- Multi-domain time correlation
- Automatic pulse measurement and detection

RSA5000 Real-Time Spectrum Analyzer

The RSA5000 Series mid-range Real-Time Spectrum Analyzer combines the best-in-class RF performance up to 110 MHz bandwidth and 3rd Generation DPX® Technology. This provides the measurement confidence and functionality you demand for everyday tasks and gives you the dynamic range you expect for challenging spectrum analysis measurements.

Model	Capture Bandwidth	Frequency Range	Minimum Event Duration for 100% POI	SFDR at 110 MHz BW (typical)
RSA5103A	25 MHz, 40 MHz, 85 MHz, 110 MHz	1 Hz - 3 GHz	3.7 µs	75 dBc
RSA5106A	25 MHz, 40 MHz, 85 MHz, 110 MHz	1 Hz - 6.2 GHz	3.7 µs	75 dBc
RSA5115A	25 MHz, 40 MHz, 85 MHz, 110 MHz	1 Hz - 15 GHz	3.7 µs	75 dBc
RSA5126A	25 MHz, 40 MHz, 85 MHz, 110 MHz	1 Hz - 26.5 GHz	3.7 µs	75 dBc

Instrument Options

Opt. 10	AM/FM/PM Modulation and Audio Measurements
Opt. 11	Phase Noise / Jitter Measurement
Opt. 12	Settling Time (Frequency and Phase)
Opt. 20	Advanced Signal Analysis
Opt. 21	General Purpose Modulation Analysis
Opt. 22	Flexible OFDM Analysis
Opt. 40	40 MHz Acquisition Bandwidth
Opt. 52	Frequency Mask Trigger (no cost option)
Opt. 53	Memory Extension, 4 GB Acquisition Memory Total
Opt. 55	Digital I and Q output
Opt. 85	85 MHz Acquisition Bandwidth
Opt. 110	110 MHz Acquisition Bandwidth
Opt. 200	Advanced Triggers, Swept DPX, and DPX Zero Span

Recommended Accessories

RTPA2A	Spectrum Analyzer Probe Adapter
RSAVu	Software Enables Offline Analysis of Data Captures
SignalVu-PC	Vector Signal Analysis Software for your PC

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Quick-start Manual (Printed), Application Guide, Printable Online Help File, Programmer's manual (on CD), power cord, BNC-N adapter, USB Keyboard, USB Mouse, Front Cover, One-year Warranty

Product Highlights

- DPX® Live RF spectrum display
- Triggering expertise
- Seamless data capture
- Multi-domain time correlation
- Automatic pulse measurement and detection

RSA6000 Real-Time Spectrum Analyzer

The high-performance RSA6000 Real-Time Spectrum Analyzer Series will help you easily discover design issues that other spectrum analyzers will miss. Its industry-leading dynamic range and bandwidth combination, coupled with the unique DPX™ Live RF spectrum display, gives you immediate confidence in the stability of your design, or instantly displaying a fault when it occurs.

Model	Capture Bandwidth	Frequency Range	Minimum Event Duration for 100% POI	SFDR at 110 MHz BW (typical)
RSA6106B	40 MHz - 110 MHz	9 kHz - 6.2 GHz	3.7 µs	75 dBc
RSA6114B	40 MHz - 110 MHz	9 kHz - 14 GHz	3.7 µs	75 dBc
RSA6120B	40 MHz - 110 MHz	9 kHz - 20 GHz	3.7 µs	75 dBc

Instrument Options

Opt. 05	Digital IQ Output and 500 MHz Analog IF Output
Opt. 10	AM/FM/PM Modulation and Audio Measurements
Opt. 11	Phase Noise and Jitter Measurement
Opt. 12	Settling Time Measurements (Frequency and Phase)
Opt. 20	Advanced Signal Analysis
Opt. 21	General Purpose Digital Modulation Analysis
Opt. 22	Flexible OFDM
Opt. 50	Preamp, 1 MHz - 6.2 GHz, 20 dB Gain (RSA6106B only)
Opt. 51	Preamp, 100 kHz - 20 GHz, 30 dB Gain (RSA6114B and RSA6120B only)
Opt. 52	Frequency Mask Trigger
Opt. 53	Memory Extension, 4 GB Total Acquisition Memory

Recommended Accessories

RTPA2A	Spectrum Analyzer Probe Adapter

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Product Documentation CD (Quick-start User Manual, Application Examples Manual, Printable Online Help, Programmer Manual, Service Manual, Specification and Performance Verification Manual, Declassification and Security Instructions), Front Cover, USB Keyboard, USB Mouse, Planar Crown™ RF Input Connector – Type-N (RSA6106B and RSA6114B) / 3.5 mm (RSA6120B only) / SMA (m) to SMA (f) adapter (RSA6120B only), and One-year Warranty

Product Highlights

- Leading real time technologies help to troubleshoot the toughest transient interferences in the field

- Integrated solution design reduces total cost of ownership with lower initial purchase cost and annual maintenance cost

- Open data format improves asset utilization through compatibility with industry-standard products
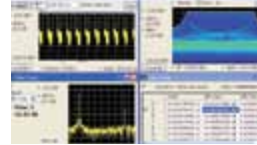
Swept DPX and Advanced Triggering for the SPECMON Series (Option 200).

Built-in Mapping for Interference Hunting in SPECMON Series.

SPECMON Real Time Spectrum Analyzer

Fast and Versatile Solution for Field Interference Hunting.

Discover, capture, locate and analyze elusive events in the field faster than ever before with the SPECMON Spectrum Analyzer.

Model	Capture Bandwidth	Frequency Range	Minimum Event Duration for 100% POI	SFDR at 110 MHz BW (typical)
SPECMON3	25 MHz, 40 MHz, 110 MHz	1 Hz - 3 GHz	3.7 µs	75 dBc
SPECMON6	25 MHz, 40 MHz, 110 MHz	1 Hz - 6.2 GHz	3.7 µs	75 dBc

Recommended Accessories

RTPA2A Spectrum Analyzer Probe Adapter	Supports TekConnect® probes P7225, P7240, P7260, P7330, P7313, P7313SMA, P7340A, P7350, P7350SMA, P7360A, P7380A, P7380SMA, P7500 Series
RSAVu	Software based on the RSA3000 Series platform for analysis supporting 3G wireless standards, WLAN (IEEE802.11a/b/g/n), RFID, Audio Demodulation, and more measurements
119-4146-xx	E and H Near-field Probes for EMI troubleshooting

Recommended Accessories

065-0924-xx	Additional Removable Hard Drive. Windows 7 and instrument SW preinstalled.
016-2026-xx	Transit Case
RSA56KR	Rackmount Retrofit Kit
071-3064-xx	Additional Quick Start User Manual (Paper)

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Quick-start Manual (Printed), Application Guide (Printed), Printable Online Help File (on CD), Programmer's manual (on CD), power cord, BNC-N adapter, USB Keyboard, USB Mouse, Front Cover, 3-year Warranty.

Signal Generators
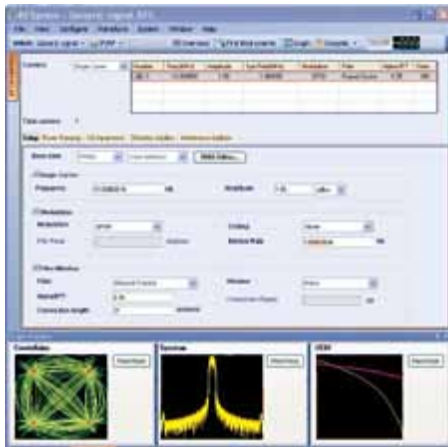
Spectrum Analyzers RSA5000/6000 Series
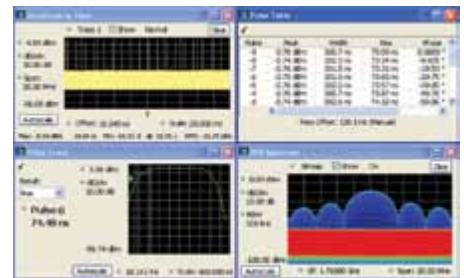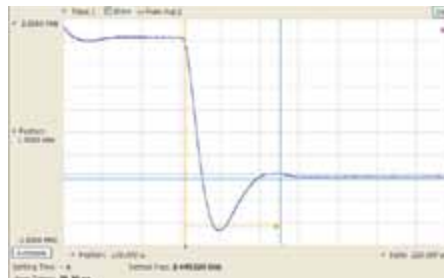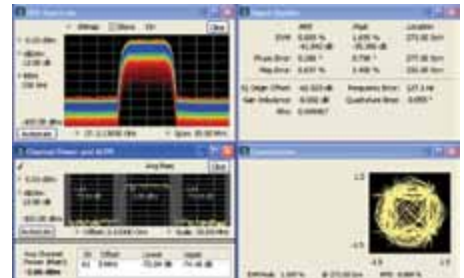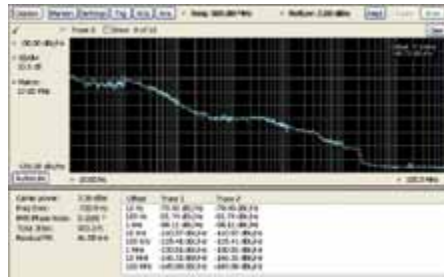
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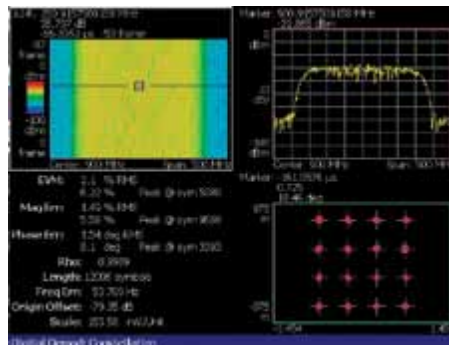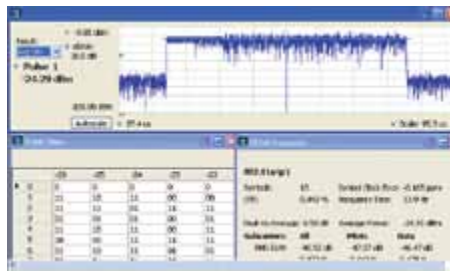
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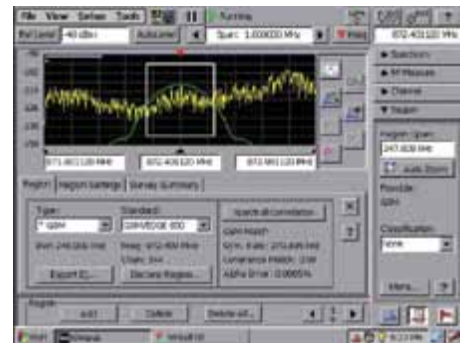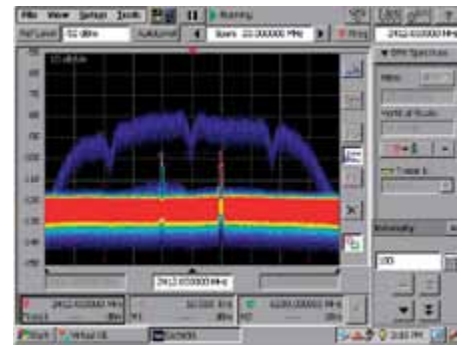
Optical Modulation Analyzers

Instruments to characterize the latest coherent optical standards from 100G to 400G and beyond.

With coherent lightwave analysis capabilities, Tektronix provides the acquisition and display of constellation diagrams, Q plots, polarization analysis, and source laser stability to better understand fiber-based signal quality. The Tektronix Coherent Lightwave Signal Analyzer series are tightly coupled with the DPO70000 performance oscilloscopes series to enable comprehensive analysis and presentation of your data, so you're no longer in the dark.

	OM4006D Coherent Lightwave Signal Analyzer	OM4106D Coherent Lightwave Signal Analyzer	OM2210 Coherent Receiver Calibration Source	OM2012 Tunable Laser Source
Receiver Bandwidth	23 GHz	33 GHz	N/A	N/A
Band Options	C, L, or C+L	C, L, or C+L	C, L, or C+L	C, L, or C+L
Description	Optical modulation analyzer compatible with both real-time and equivalent time oscilloscopes	Optical modulation analyzer compatible with both real-time and equivalent time oscilloscopes	Measures key performance parameters for receiver calibration	Low-noise, single-mode tunable laser source

Choosing your Optical Modulation Analyzer

Tektronix Optical Modulation Analyzer solutions enable efficient and accurate characterization of serial communications in fiber at 100 Gb/s and beyond. With coherent lightwave analysis capabilities, Tektronix provides the acquisition and display of constellation diagrams, Q plots, polarization analysis, and source laser stability to better understand fiber-based signal quality. The Tektronix Coherent Lightwave Signal Analyzer series are tightly coupled with the DPO70000 performance oscilloscopes series to enable comprehensive analysis and presentation of your data, so you're no longer in the dark.

1 Receiver Bandwidth

Receiver bandwidth determines the maximum baud rate that can be accurately measured by the optical modulation analyzer (OMA). A receiver bandwidth of 23GHz can accurately measure signals up to 40GBaud. Using the 33GHz OMA, signals as high as 60GBaud can be measured.

2 Frequency Band

100G communications typically occur in the C-band, however L-band is also supported. The Tektronix coherent optical products support testing in C-band, L-band, or both. Accompanying coherent receiver calibration sources also support flexible choices of frequency band.

3 Homodyne or Heterodyne Measurements

Homodyne measurements can often be conducted with equivalent-time oscilloscopes offering superior oscilloscope bandwidth and very low noise. When used in this mode and externally referenced local oscillator is required (option EXT). Heterodyne measurements do not require an external local oscillator and can utilize the high sample rate offered by real-time oscilloscopes. Tektronix is the only manufacturer that can offer both homodyne and heterodyne measurements with the same optical modulation analyzer.

Product Highlights

- Measure key performance parameters for coherent receivers such as quadrature phase angle, path gains, and channel skew.
- Obtain calibration data over wavelength for use in calibrated optical field measurements.
- Calibrate any sufficiently stable coherent receiver to make it capable of optical field measurements.
- Measure receiver hybrid parameters at any heterodyne frequency within the oscilloscope bandwidth.
- Measure optical hybrid properties in higher-level receiver modules.

OM2210 Coherent Receiver Calibration Source

The OM2210 Coherent Receiver Calibration Source includes the capability and software needed for coherent optical receiver calibration. Equipped with two independent free-running lasers and a precision polarization switch, the OM2210 is able to excite the coherent receiver with a known-polarization signal so that the receiver's linear transfer function can be extracted.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Optical Output Power Adjustment Range (BOL set points)	PcwBOL	+7	--	+13.5	dBm
Operating Frequency Range (50 GHz channel spacing on ITU grid)	ν (C-band)	196.25	--	191.50	THz
	ν (L-band)	190.95	--	186.35	nm
Operating Wavelength Range (50 GHz channel spacing on ITU grid)	λ (C-band)	1527.60	--	1565.50	nm
	λ (L-band)	1570.01	--	1608.76	nm
Wavelength Accuracy EOL	$\Delta\lambda$acc	--	--	±2.5	GHz
Linewidth [FWHM (–3 dB), instantaneous]	$\Delta\lambda$	--	--	100	kHz
Side Mode Suppression Ratio	SMSR	40	55	--	dB
Polarization Extinction Ratio (Unconnectorized)	Er, p	20	--	--	dB

Instrument Options

Opt. C	Single C-band laser with polarization switch
Opt. L	Single L-band laser with polarization switch
Opt. CC	Dual C-band lasers with polarization switch
Opt. LL	Dual L-band lasers with polarization switch
Opt. CL	Coupled C- and L-band lasers with polarization switch
Opt. NL	No lasers, polarization switch only

Recommended Service

|	
R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Coherent Receiver Calibration Source. Contains the laser source(s), polarization switch, optical power meter, power splitter, hardware control drivers, and calibration software needed for optical receiver characterization. It is used together with the OM4000 or OM1106 products to provide calibrated optical signal measurements.

Product Highlights

- Supports both real-time and equivalent-time oscilloscopes for the greatest system flexibility.

- Complete system for polarization-multiplexed QPSK, offset QPSK, QAM, differential BPSK/QPSK, and other advanced modulation formats.

- Displays constellation diagrams, phase eye diagrams, Q-factor, Q-plots, spectral plots, Poincaré sphere, signal vs. time, laser phase characteristics, BER, with additional plots and analyses available through the MATLAB interface

- Supports automated testing of multi-carrier "super-channels" with a user-definable number of carriers, carrier spacing, and modulation formats.

- User access to internal functions and full extensibility with a direct MATLAB interface.

- Coherent Lightwave Signal Analysis software available with the OM4000-series instruments or standalone via OM1106.

OM4000 Coherent Lightwave Signal Analyzer

OM4106D Coherent Lightwave Signal Analyzer, tightly integrated with the DPO70000D Series 33 GHz Oscilloscopes, uses coherent detection to acquire fiber signals carrying up to 240Gb/sec per wavelength, then analyzes both modulation and source properties using the power of optical-industry tested DSP, presenting a rich library of results and graphical plots with the ease of use offered by a dedicated graphical user interface.

Model	Option	Description	Receiver Bandwidth	C-band Lasers Included	L-band Lasers Included	Wavelength Band
OM4006D	CC	23 GHz C-band Coherent Lightwave Signal Analyzer	23 GHz	2	0	1530 to 1570 nm
OM4006D	LL	23 GHz L-band Coherent Lightwave Signal Analyzer	23 GHz	0	2	1570 to 1610 nm
OM4006D	CL	23 GHz C- and L-band Coherent Lightwave Signal Analyzer	23 GHz	1	1	1530 to 1610 nm
OM4106D	CC	33 GHz C-band Coherent Lightwave Signal Analyzer	33 GHz	2	0	1530 to 1570 nm
OM4106D	LL	33 GHz L-band Coherent Lightwave Signal Analyzer	33 GHz	0	2	1570 to 1610 nm
OM4106D	CL	33 GHz C- and L-band Coherent Lightwave Signal Analyzer	33 GHz	1	1	1530 to 1610 nm
OM1106		Coherent Lightwave Signal Analyzer Software, stand-alone (included with OM4000-series instruments)				

Configuration Recommendations	Receiver Bandwidth	Receiver Options	Receiver Bandwidth	Recommended Scope Model	Scope Bandwidth
Real-time Systems	OM4006D	Recommended: Opt. CC, Opt. QAM, Opt. TSI, OMRACK	23 GHz	DPO/DSA72504C	25 GHz
	OM4106D	Recommended: Opt. CC, Opt. QAM, Opt. TSI, OMRACK	33 GHz	DPO/DSA73304D	33 GHz
Equivalent-time Systems	OM4006D	Recommended: Opt. CC, Opt. QAM, Opt. TSI, OMRACK; Required: Opt. EXT	23 GHz	DSA8300 with Opt. ADVTRIG and 2 each 80E07	30 GHz
	OM4106D	Recommended: Opt. CC, Opt. QAM, Opt. TSI, OMRACK; Required: Opt. EXT	33 GHz	DSA8300 with Opt. ADVTRIG and 2 each 80E09	60 GHz

Instrument Options

Opt. CC	C-band lasers (receiver tested over C-band)
Opt. LL	L-band lasers (receiver tested over L-band)
Opt. CL	Coupled C- and L-band lasers (receiver tested over C- and L-band)
Opt. NL	No lasers (receiver tested over C- and L-band)
Opt. EXT	Adds external connection for reference laser
Opt. QAM	Adds QAM and other software demodulators
Opt. MCS	Adds multi-carrier super-channel support

SourceMeter® SMU Instruments

Keithley Instruments SourceMeter® SMU instruments source current or voltage and simultaneously measure current, voltage and resistance with high speed and accuracy. SourceMeter® SMU instruments offer a smart alternative to separate power supplies and DMMs, saving money and limited test bench space.

	Series 2400 SourceMeter® SMU Instruments	Series 2600B System SourceMeter® SMU Instruments	2650A High Power System SourceMeter® SMU Instruments
Channels	1	1-2 (optional expansion to 64 via TSP-Link®)	1 (optional expansion to 32 via TSP-Link®)
Accuracy	6½-digit measurements	6½-digit measurements	6½-digit measurements
Max. Readings / Second	2,000	20,000	38,500 1µSec/pt., 18-bit digitizer
Interface	GPIB, RS-232, Digital I/O	GPIB, LAN (LXI), USB and RS-232, Digital I/O	GPIB, LAN (LXI), RS-232, Digital I/O
Application Features	Convenient DMM-like user interface; 2/4/6 wire resistance with force I or V source modes, V-Force from 1ΩV to 1.1KV, 10pA to 5A cont., 10A pulsed, 2W to 110W	True multi-channel parallel test via TSP-Link. Up to 0.1 fA resolution.	2 pairs of A/D converters for simultaneous V and I measurement and precise characterization, including rapidly changing thermal effects.
Test Sequencing / Scripting	Built-In ramp generator and list sweep modes, 100 point global machine state sequencer for fast test setup and execution	TSP® (Test Script Processing) technology embeds complete test programs inside the instrument for unmatched system-level speed	TSP® (Test Script Processing) technology embeds complete test programs inside the instrument for unmatched system-level speed
Included Software	LabTracer 2.0 I-V curve utility and IVI and LabVIEW drivers included.	Built-in, web browser-based characterization software, IVI and Labview drivers.	Built-in, web browser-based characterization software, IVI and Labview drivers.

Choosing Your Source Measure Unit (SMU) Instrument

A SMU instrument integrates precision power supply and digital multimeter (DMM) capabilities in one instrument while covering a wide dynamic range. SMUs source and measure simultaneously, making them ideal for characterizing and testing semiconductors and other non-linear devices and materials.

1 System-Level Speed or Throughput

The true measure of speed is how quickly a final measurement or set of measurements (such as a suite of current vs. voltage parameters) is returned to the PC controller. This involves not only the number of readings/second, but also range and function change times.

2 Sourcing Resolution and Output Stability

An SMU's usable maximum resolution depends on its overall accuracy and the resolution of its analog-to-digital converter (ADC). In general, the higher the resolution is, the higher the bit count on the ADC and the higher the accuracy will be.

3 Measurement Settling Time, Offset Error, and Noise

When choosing between instruments, compare the time it takes a SMU to settle the specified offset error. This can be seen in the "bumpiness" of the resulting data curve which indicates measurement noise; the smoother the data curve the less measurement noise. SMUs having a fast, flat, and noise-free settling time achieve more consistent results during a series of measurements taken over time.

4 Cabling

Triaxial cables offer significant advantages over coaxial cables when making low current measurements. Triaxial cables have an extra shield that ensures lower leakage, better response, and greater noise immunity.

Product Highlights

- Wide I-V range from 1100V to 100nV and 10.5A pulse to 1pA

- 4-quadrant design simultaneously measures voltage, current, and resistance

- Remote sense on V-source and measure plus guarded ohms mode

- Built-In test sequencer

- Includes LabTracer 2.0 I-V curve utility and IVI and LabVIEW drivers

- Standard GPIB and RS-232 interfaces; Banana (front / rear) Connectors

Model 2400 four-quadrant operation characteristics, a feature of all SourceMeter SMU instruments.

Free LabTracer software for remote control and data sharing for applications ranging from the simple to complex.

Series 2400 SourceMeter® SMU Instruments

Series 2400 SourceMeter® SMU instruments are single-channel models with I-V capability from 1100V to 100nV and 10.5A pulse to 1pA. They offer a smart alternative to separate power supplies and digital multimeters (DMMs) and provide a convenient DMM-like user interface.

Model	Current Max / Min	Voltage Max / Min	Power
2400 / 2401	1.05A /10pA	200V/1µV	22W
2420 / 2425 / 2440	5.25A /100pA	100V/1µV	110W
2410	1.05A /10pA	1100V/1µV	22W
2430	10.5A pulse /100pA	200V/1µV	1100W

Recommended Accessories

C/2400-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Models 2400*
C/2401-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Model 2401*
C/2410-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Models 2410*
C/2420-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Models 2420*
C/2425-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Models 2425*
C/2430-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Models 2430*
C/2440-3Y-17025	(ISO-17025 accredited) calibrations within 3 years of purchase for Models 2440*

*Not available in all countries.

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Model 8605 Test Leads
- LabVIEW Software Driver (downloadable)
- LabTracer Software (downloadable)
- Calibration Certificate (Basic)
- Manual CD
- Power Cord
- Warranty

Product Highlights

- 4-quadrant design simultaneously measures voltage, current, and resistance

- TSP® (embedded Test Script Processor) architecture enables industry-best system-level speed

- Arbitrary waveform generation with 1% to 100% duty cycle

- Built-in software for quick and easy I-V test through web browser

- GPIB, LAN (LXI), USB and RS-232

Built-in, Java-based test software runs directly from any web browser to boost productivity.

TSP technology executes complete test programs from the 2600B's non-volatile memory.

Series 2600B System SourceMeter® SMU Instruments

Series 2600B SourceMeter® SMU instruments are the industry's most powerful, fastest, and highest resolution SMU instruments. Now they're easier than ever to use with USB 2.0 connectivity, Model 2400 software emulation, and Java-based plug & play test software. Series 2600B models offer the industry's widest dynamic range: 10A pulse to 0.1fA and 200V to 100nV.

Model	Current Max / Min	Voltage Max / Min	Max readings / sec	No. of Channels
2601B	3A DC, 10A pulse/100 fA	40V/100nV	20,000	1
2602B	3A DC, 10A pulse/100 fA	40V/100nV	20,000	2
2604B	3A DC, 10A pulse/100 fA	40V/100nV	20,000	2
2611B	1.5A DC, 10A pulse/100 fA	200V/100nV	20,000	1
2612B	1.5A DC, 10A pulse/100 fA	200V/100nV	20,000	2
2614B	1.5A DC, 10A pulse/100 fA	200V/100nV	20,000	2
2634B	1.5A DC, 10A pulse/1fA	200V/100nV	20,000	2
2635B	1.5A DC, 10A pulse/0.1 fA	200V/100nV	20,000	1
2636B	1.5A DC, 10A pulse/0.1 fA	200V/100nV	20,000	2

Recommended Accessories

2600-BAN	Banana Test Leads Adapter
8606	Probe Kit for 2600-BAN
2600-Std-Res	Calibration Standard 1G ohm Resistor

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Operators and Programming Manuals

- 2600-ALG-2: Low Noise Triax Cable with Alligator Clips, 2m (6.6 ft.) (two supplied with 2634B and 2636B, one with 2635B)

- 2600-Kit: Mating Screw Terminal Connectors with strain relief and covers (2601B/2602B/2604B/2611B/2612B/2614B)

- CA-180-3A: TSP-Link/Ethernet Cable (two per unit)

- TSP Express Software Tool (embedded)

- Test Script Builder Software (supplied on CD)

- LabVIEW Driver

- ACS Basic Edition Software (optional)

Product Highlights

- Source and measure up to 3kV or 50A pulse, with best-in-class low current resolution

- Up to 2000W pulse or 200W DC power

- Optimized for characterizing and testing high power semiconductors,electronics, and materials

TSP and TSP-Link technology enables per-pin-testing without power or channel limits of a mainframe-based system.
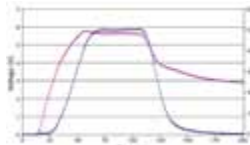
The dual digitizing A/D converters sample at up to 1μs/point, enabling full simultaneous characterization of both current and voltage waveforms.

2650A High Power System SourceMeter® SMU Instruments

The high current Model 2651A and high voltage Model 2657A High Power System SourceMeter SMU instruments address such applications as testing power semiconductor devices, including diodes, FETs, and IGBTs, as well as characterizing newer materials such as gallium nitride, silicon carbide, and other compound semiconductor materials or devices.

Model	Power Characteristics	4 Quadrant Source or Sink Capabilities	Resolution	Applications
2651A	Up to 50A (or 100A with 2 units) and up to 2000W pulse / 200W DC power	Up to ±40V and ±50A	100fA resolution	High Current, High Power Device Testing
2657A	Up to 3,000V and up to 180W of power	Up to 3000V @ 20mA or 1500V @ 120mA	1fA resolution	High Voltage, High Power, Low Current Device Testing

Recommended Accessories

2600-KIT	Low Impedance CAble Assemble, 1m (3.3 ft)
ACS-BASIC	Component Charaterization Software
4299-6	Rack Mount Kit
8011	Test Socket Kit
8010	High Power Device Test Fixture (Model 2657A)
2657A-LIM-3	Low Interconnect Module (Model 2657A)
2657A-PM-200	200V Protection Module (Model 2657A)
SHV-CA-553-2	High Voltage Triax to SHV Cable (1, 2, 3m) (Model 2657A)
HV-CA-554-2	High Voltage Triax to Triax Cable (0.5, 1, 2, 3m) (Model 2657A)
HV-CA-571-3	High Voltage Triax to Unterminated Cable (Model 2657A)
HV-CS-1613	High Voltage Triax Feedthrough Connector (Model 2657A)

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- 7709-308A Digital I/O and Interlock Connector

- CA-180-3A TSP-Link/Ethernet Cable

- Documentation CD

- Software Tools and Drivers CD

- 2651A-KIT-1A: Low Impedance Cable Assembly (1m) (Model 2651)

- CS-1592-2: High Current Phoenix Connector (male) (Model 2651)

- CS-1626-2: High Current Phoenix Connector (female) (Model 2651)

- CA-557-1: Sense Line Cable Assembly (1m) (Model 2651)

Power Analyzers

Fully characterize your power-electronics design from input to output with Tektronix power analyzers. Designed for precision measurement of power-electronics circuits and devices, these analyzers give you what you need to measure conversion efficiency and perform compliance testing on single-phase or 3-phase devices.

	PA4000
Multi-Channel Power Analyzer	PA4000_1CH, PA4000_2CH, PA4000_3CH, PA4000_4CH
Power Input Modules	1 – 4 (factory configured)
Basic Accuracy (V & I)	0.04% of Reading (45-850 Hz)
Measurement Bandwidth	DC, 0.1 Hz - 1 MHz
Voltage Range	2V peak to 2000V peak
Current Range (internal shunts)	0.0025 A to 30 Arms

Choosing Your Power Analyzer

Power analyzers are used for testing a wide range of power-electronics devices, from cell-phone chargers to 1000kW grid-connected inverters. To help you choose the best analyzer for your application, consider the criteria below.

❶ Number of Inputs

Power analyzers are available in both fixed configurations (typically single-channel) and modular configurations. If your application is limited to single-phase devices, a single-channel analyzer may meet your needs. But if you need to measure conversion efficiency on these devices, a two-channel analyzer is required.

Testing of 3-phase devices of course requires a multi-phase analyzer. In many cases, two channels will be all you need for a two-wattmeter measurement on 3-wire inputs or outputs. A four- channel analyzer can measure both input and output simultaneously, to determine conversion efficiency.

❷ Measurement Bandwidth

How much bandwidth is enough? The measurement bandwidth you need is usually determined by the switching speed of the device-under-test, or the highest-order harmonic that your testing requires. Switching speeds of tens or hundreds of kHz are common in today's designs. But new semiconductor technologies promise to increase speeds up to 2x or more in the near future. Choose an analyzer that is capable of measuring your highest frequencies of interest, with some headroom for future-proofing.

❸ Compliance Testing for Regulatory Standards

If your application requires you to know that your device is compliant with regulatory standards such as IEC61000 for harmonics, or EnergySTAR for energy efficiency, you need an analyzer capable of meeting the test requirements specified by the standard. Even better, look for an analyzer supported by software applications that can automate instrument setup and reporting of test results in the exact format required for your application.

❹ Current Shunts: Internal or External?

Will you be measuring milliamperes, or hundreds of amperes? Power analyzers vary in the features they offer for direct current inputs or connection to external current transducers. Ideally, the analyzer should have internal current shunts that allow you to connect your device directly, for best accuracy. If you will be testing a range of devices at different power levels, you may value both high and low-range shunts. Finally, if your application requires external current transducers (usually required for current >30Amps), make sure there are transducers available that are well-matched to the analyzer and offer the accuracy you need.

❺ Remote Communication

Will you have a need to control the analyzer remotely, or transfer measurement data to your PC? If so, you will want to look for an instrument that features the communication ports you need. Depending on the analyzer model, some ports may be standard features or extra-cost options; be careful to choose the right instrument configuration that meets your requirements.

Product Highlights

- 1 to 4 input modules with precision phase-matched V & I inputs, 1000 Vrms, 30 Arms direct input

- Measurement BW: DC to 1 MHz

- 0.04% basic accuracy

- Application specific test modes for Motor Drives, Ballasts, Standby Power and Energy Integration

- Harmonics measurement to 100th harmonic

- Full-color TFT display with waveform graphics, vector, bar chart, trend

Each input module features both high- and low-range current shunts.

USB, Ethernet and RS-232 ports are standard.

PA4000 Power Analyzers

Tektronix PA4000 Power Analyzers provide you with highly accurate power, energy and efficiency measurements. Precisely-matched inputs and advanced signal processing deliver high measurement accuracy, even when power is distorted or noisy. The PA4000 performs all power measurements – and harmonics analysis, application-specific measurements, PC interfaces, and dual current shunts per channel are all standard features.

Model	Description	BasicAccuracy (V & I)	Voltage Input Range	Current Range (internal shunts)
PA4000 1CH	PA4000 Power Analyzer with 1 input module	0.04% (45-850 Hz)	2V peak to 2000V peak	0.0025 A to 30 Arms
PA4000 2CH	PA4000 Power Analyzer with 2 input modules	0.04% (45-850 Hz)	2V peak to 2000V peak	0.0025 A to 30 Arms
PA4000 3CH	PA4000 Power Analyzer with 3 input modules	0.04% (45-850 Hz)	2V peak to 2000V peak	0.0025 A to 30 Arms
PA4000 4CH	PA4000 Power Analyzer with 4 input modules	0.04% (45-850 Hz)	2V peak to 2000V peak	0.0025 A to 30 Arms

Recommended Accessories

CT-60-S	Fixed-Core Current Transducer, High Accuracy, up to 60A
CT-200-S	Fixed-Core Current Transducer, High Accuracy, up to 200A
CT-400-S	Fixed-Core Current Transducer, High Accuracy, up to 400A
CT-1000-S	Fixed-Core Current Transducer, High Accuracy, up to 1000A (requires external power supply)
CT-100-M	Fixed-Core Current Transducer, Hall Effect, up to 100A
CT-200-M	Fixed-Core Current Transducer, Hall Effect, up to 200A
CT-500-M	Fixed-Core Current Transducer, Hall Effect, up to 500A
CT-1000-M	Fixed-Core Current Transducer, Hall Effect, up to 1000A

Recommended Accessories

CL200	Current Clamp, 0.5A - 200A, for Tektronix Power Analyzers
CL1200	Current Clamp, 0.1A - 1000A, for Tektronix Power Analyzers
BB1000	Breakout Box for Single-Phase Device Testing (includes switching for inrush test)
Ballast-CT	Connection Accessory for Fluorescent Lamp Ballast Test
PA-LEADSET	Replacement Lead Set for Tektronix Power Analyzers (One Channel Lead Set)

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Lead set (1 set per input module)

- User Manual

- AC Power Cord

- Certificate of Traceable Calibration

- 3-year Product Warranty

Switch Systems

Keithley provides a wide array of high integrity switch systems to address the need for switching DC, RF, microwave, and digital I/O signals, whether in matrix, multiplexer, or a combination of configurations. Elsewhere in this catalog, you will also find data acquisition systems and digital multimeters with switching options.

	Series 3700*	Models 7001 / 7002	System 46	707B / 708B
Channels / Crosspoints	576 / 2688	80 / 400	32	576 / 96
Card Slots	6	2 / 10	Not applicable	6 / 1
Unique optional card capabilities	High density switching, automatic CJC, long-life switching, FET switching	Hall effect, scanner cards, high/low current and voltage switching	Not applicable	7072-HV provides 1kV and low current
Interface	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus	GPIB, RS-232	GPIB	GPIB, LAN (LXI) ACS software 4200-SCS KTEI software

* Series 3700 Switch Systems are found elsewhere in this catalog under "Data Acquisition".

Choosing Your Switches

To help you choose the appropriate switch mainframe for your application, the most common selection criteria are listed below.

1 ## Multiplex Switching

Multiplex switching can be used to connect one instrument to multiple devices (1:N) or multiple instruments to a single device (N:1). Multiplex switching permits: multiple simultaneous connections, and sequential or non-sequential switch closures.

2 ## Matrix Switching

The matrix switch configuration is the most versatile because it can connect multiple inputs to multiple outputs. A matrix is useful when connections must be made between several signal sources and a multi-pin device, such as an integrated circuit or resistor network.

3 ## Isolated Switch Configurations

The isolated, or independent, switch configuration consists of individual relays, often with multiple poles, with no connections between relays. Isolated relays are not connected to any other circuit, so the addition of external wiring makes them suitable for building very flexible and unique combinations of input/output configurations. Isolated relays are commonly used in power and control applications to open and close different parts of a circuit that are at substantially different voltage levels.

Product Highlights

- Supports more than 30 switch/control cards
- Integrates easily with DMM and SourceMeter® SMU instruments
- Full channel status display
- Supports industry's broadest range of signals

The display of the Model 7001 makes it much easier to configure a test system, make modifications, or debug an existing program.

The interactive front panel display of the Model 7002 helps shorten the time required to configure the switch system and develop test software.

Models 7001 / 7002 Multi-Purpose Switch Systems

The two and ten slot, respectively, Model 7001 and Model 7002 multi-purpose switch systems for precision measurement, switching, and control support a wide range of signals, with more than 15 switch/control cards available. Also, see our Series 2700 and Model 3706A data acquisition and digital multimeter/switch systems.

Model	Max. Channels or Crosspoints per Chassis	Card Slots	Front Panel	Built-in Digital I/O
7001	Up to 80 per mainframe	2	Full status display with programming control	1 input/4 outputs
7002	Up to 400 per mainframe	10	Full status display with programming control	1 input/4 outputs

Recommended Accessories

7011-C	Quad 1x10 Mux w/ Mass-Terminated Connector
7011-S	Quad 1x10 Mux w/ Screw Terminals
7012-C	4x10 Matrix Card w/ Mass-Terminated Connector
7012-S	4x10 Matrix Card w/ Screw Terminals
7013-C	Isolated, 20-Ch Relay Switch w/ Mass-Terminated Connector
7013-S	Isolated, 20-Ch Relay Switch w/ Screw Terminals
7015-C	Quad 1x10 Solid-State Mux Card w/ Mass-Terminated 96-Pin Connector
7015-S	Quad 1x10 Solid-State Mux Card w/ Detachable Screw Terminal Connector
7018-C	Dual 1x14 Mux Card w/ Mass-Terminated 96-Pin Connector

Recommended Accessories

7020	Digital I/O Card w/ 40 Inputs, 40 Outputs and Mass-Terminated 96-Pin Connector
7020-D	Digital I/O Card w/ 40 Inputs, 40 Outputs and Two 50-Pin D Subconnectors
7035	9-Bank, 1x4 Mux Card
7036	Single-Pole Relay Card w/ 40 Independent Switches and a Mass-Terminated 96-Pin Connector
7037-D	Single-Pole Relay Digital I/O Card w/ 30 Independent Switches, 10 Independent Digital Inputs, 10 Independent Digital Outputs and Two 50-Pin D-Subconnectors
7053	High-Current, 10-Ch Scanner Card w/ 5A Contacts
7065	Hall Effect Card
7111-S	40-Ch Form C Switch Card

Recommended Accessories

7152	4x5 Low-Current Matrix Card
7153	4x5 High-Voltage, Low-Current Matrix Card
7154	10-Ch, High-Voltage Scanner Card
7158	10-Ch, Low-Current Scanner Card w/ BNC Connectors
7168	Nanovolt Scanner Card

Ships with Product

- Power Cord
- User Manual

Product Highlights

- Compact RF/microwave switching system only 2U high
- Built-in contact closure counter to monitor switch cycles
- Standard configuration allows up to 32 channels of switching
- Simple control with built-in GPIB/IEEE-488 interface bus
- Channel characterization (S-parameter) data storage

Maximum Configuration: (8) – Unterminated (S46) or Terminated (S46T) SPDT relays.

Maximum Configuration: (4) – Unterminated (S46) or Terminated (S46T) multi-pole relays (SP4T, SP6T).

System 46 RF Microwave Switch Systems

Both terminated and unterminated versions of the Model S46 Switch System are available for testing devices such as cellular and cordless phones, specialized mobile radios, base stations, and RF components, including RFICs. Series 2700 data acquisition systems also offer RF/microwave switch options.

Model	Max. Channels or Crosspoints per Chassis	Frequency Ranges	Relays
S46 (unterminated)	Up to 32 RF/microwave chs	Up to 40GHz	Up to 8 unterminated SPDT coaxial microwave relays and 4 unterminated multi-pole coaxial microwave relays
S46T (terminated)	Up to 32 RF/microwave chs	Up to 26.5GHz	Up to 8 terminated SPDT coaxial microwave relays and 4 terminated multi-pole coaxial microwave relays

Recommended Accessories

S46-SPDT-KIT	Standard Performance 18GHz Unterminated SPDT Relay and Control Cable Assembly
S46-SP4T-KIT	Standard Performance 18GHz Unterminated SP4T Relay and Control Cable Assembly
S46-SP6T-KIT	Standard Performance 18GHz Unterminated SP6T Relay and Control Cable Assembly
S46-SPDT-KIT-R	High Performance 18GHz Unterminated SPDT Relay and Control Cable Assembly
S46-SP4T-KIT-R	High Performance 18GHz Unterminated SP4T Relay and Control Cable Assembly
S46-SP6T-KIT-R	High Performance 18GHz Unterminated SP6T Relay and Control Cable Assembly

Recommended Accessories

S46-SPDT-KIT-26	High Performance 26.5GHz Unterminated SPDT Relay and Control Cable Assembly
S46-SP4T-KIT-26	High Performance 26.5GHz Unterminated SP4T Relay and Control Cable Assembly
S46-SP6T-KIT-26	High Performance 26.5GHz Unterminated SP6T Relay and Control Cable Assembly
S46-SPDT-KIT-40	High Performance 40GHz Unterminated SPDT Relay and Control Cable Assembly
S46-SP4T-KIT-40	High Performance 40GHz Unterminated SP4T Relay and Control Cable Assembly
S46-SP6T-KIT-40	High Performance 40GHz Unterminated SP6T Relay and Control Cable Assembly

Recommended Accessories

S46T-SPDT-KIT	18GHz Unterminated SPDT Relay, Spacer Block, and Control Cable Assembly
S46T-SP-DT-KIT-T	18 GHz Terminated SPDT Relay and Control

Ships with Product

- Power Cord
- Instruction Manual
- Rack Mount Kit

Product Highlights

- Remote and manual programming support
- Integrates seamlessly with the Model 4200-SCS and Series 2600B SourceMeter SMU instruments
- Stores hundreds of switching configurations and channel patterns
- LXI Class C interface supports remote programming and control
- 14 bits of digital I/O

Series 2600B SMUs have an on-board test script processor (TSP) that executes test scripts and controls the switch matrix via the TSPLink.

Models 707B and 708B support a family of matrices designed specifically for low-level semiconductor device testing.

Semiconductor Switch Matrix Mainframes

Models 707B/708B are specifically designed for semiconductor lab and production test environments, delivering ultra low current switching performance using standard triax connectors and cables. For smaller test systems, the Model 708B supports a single 8x12 switch card. For larger systems, the Model 707B can accommodate up to six 8×12 cards.

Model	Max. Voltage/Current	Max. Offset Current	Rec. Frequency	Connection Type
7072	200V / 1A	<1pA	15 MHz	3-lug triax
7072-HV	1300V / 1A	<1pA	4 MHz	3-lug triax
7174A	200V / 2A	<100fA	30 MHz	3-lug triax
7073	200V / 1A	<200pA	30 MHz	BNC
7173-50	30V / 0.5A	<200pA	200 MHz	BNC

Recommended Accessories

CA-126-5A	25-pin Female Digital I/O to 25-pin Male Cable, 3m (10 ft)
2600-TLINK	Digital I/O to Trigger Link Cable, 1m (3.3 ft)
4299-6	Universal Full Rack Mount Kit (for Model 708B)
7007-1	Double-shielded GPIB Cable, 1m (3.3 ft)
7007-2	Double-shielded GPIB Cable, 2m (6.6 ft)
7072	Semiconductor Matrix Card
7072-HV	High Voltage Semiconductor Matrix Card
7072-TRT	Triax Fastening Tool
7079	Slide Rack Mount Kit (for Model 707B)
7173-50	High Frequency, 2-pole, 4×12 Matrix Card
7174A	Low Current Matrix Card

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Product Information CDs (Product Information, Quick Start Guide, Switching and Control Product Information, Test Script Builder User Suite)
- CA-180-4A: CAT 5 Ethernet Crossover Cable, 1m (3.3 ft)
- CA-179-2A: CAT 5 Ethernet Cable, 3m (10 ft)
- CO-7: Line Cord
- Rear Fixed Rack Mount Hardware (707B only)

Semiconductor Test Systems

From lab to fab, Keithley continues to bring the next generation of semiconductors to market with the industry's most cost-effective, fully automatic parametric testers; parameter analyzers that increase test throughput, reduce time to market, and test more device types; and software for semiconductor device testing and analysis.

	4200-SCS	PCT Configurations	S500 & 530 Parametric Test Systems	Automation Characterization Suite (ACS), ACS Basic, Wafer Level Reliability Option
Definition	Parameter Analyzer for semiconductor devices and materials	Parametric Curve Trace configurations for power device characterization	Parametric Test Systems Used in Production and Lab Environments	Automated Semiconductor Device Characterization software
Typical Devices Tested	Devices and materials associated with CMOS, non-volatile memory, MEMS, III-V devices, TFTs, solar cells, nanoscale devices/structures	Semiconductor components including: IGBTs, MOSFETs, BJTs, Triacs/SCRs, diodes, and other power control devices	Wafer-level testing of semiconductor devices associated with CMOS, LDMOS, III-V, MEMS, and TFT process technologies	Semiconductor Devices individually or at wafer level associated with CMOS, non-volatile memory, MEMS, III-V devices, TFTs, and power control devices
Applications	Semiconductor device characterization, materials research, device reliability, and failure analysis	Semiconductor component characterization, inspection, and failure analysis	Semiconductor process control monitoring, automated characterization, wafer level reliability analysis, and die sort testing	Semiconductor device characterization, wafer level reliability analysis, parametric testing, and die sort testing
Measurement Capabilities	I-V, C-V, Ultra-fast I-V, pulse	Low-power I-V, high-power I-V, and C-V	I-V, C-V, frequency, and pulse	Real-time plotting and results associated with Keithley 2600s, 4200, S500, and S530

Choosing Your Semiconductor Test System

The following is a brief overview of key aspects of Semiconductor Characterization Systems.

❶ Parametric Test Systems

Semiconductor Parametric Test Systems are engineered to handle the DC and C-V measurements required in process control monitoring, process reliability monitoring, and device characterization and are used in production and lab environments that entail a broad range of devices and technologies.

❷ Characterization Software

Characterization software automates semiconductor device characterization at the device, wafer, or cassette level, and when combined with source measure instrumentation or integrated test systems, can fill the gap between interactive lab-based set-ups and high-speed production test systems.

❸ Parameter Analyzers

Parameter analyzers support all aspects of parametric testing, from basic DC I-V and C-V sweeps to advanced ultra-fast I-V, transient, waveform capture, and pulsed I-V measurements.

❹ Curve Tracer Solutions

Complete solutions for power device characterization that are configured with a variety of high quality instruments, cables, test fixturing, and software.

Product Highlights

- Modular architecture - configurable and scalable to test needs
- 0.1fA and 1µV SMU/PA measure resolution
- Multi-frequency, Quasistatic and VLF C-V measurement capabilities
- Two-channel, Ultra-Fast Pulse I-V module for transient & self-heating analysis
- Includes software drivers for leading analytical probers

The 4200-SCS software and application tests are designed to let the user understand device behavior quickly.
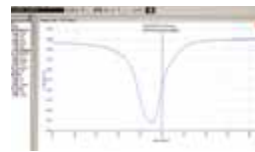
C-V curve from a MOSFET transistor measured with the Model 4210-CVU.

Model 4200-SCS Parameter Analyzer System

The modular, fully integrated 4200-SCS parameter analyzer performs electrical characterization of materials, semiconductor devices and processes. The software guides the user in performing complex characterization tests using I-V and C-V measurement sweeps, ultra-fast pulsed & transient I-V and arbitrary waveform to fully characterize their device under test.

Model	Total # of SMUs	Current range & Resolution	Voltage range & resolution	C – V Module	Ultra-Fast I-V
4200-SCS	Up to 9 high or medium power	1 A / 0.1 fA	± 210 V / 1 µV	Optional	Optional
4200-SCS-PK1	2 medium power	100 mA / 0.1 fA	210 V / 1µV	No	No
4200-SCS-PK2	2 medium power	100 mA / 0.1 fA	210 V / 1µV	Yes	No
4200-SCS-PK3	2 medium power 2 high power	1 A / 0.1 fA	± 210 V / 1 µV	Yes	No

Instrument Modules

4210-CVU	C-V Instrument
4225-PMU	Ultra-Fast I-V Module
4225-RPM	Remote Amplifier/Switch
4220-PGU	High Voltage Pulse Generator
4200-SMU	Medium Power Source Measure Unit
4210-SMU	High Power Source Measure Unit
4200-PA	Remote PreAmp Option for 4200-SMU and 4210-SMU
4210-MMPC/X	Multi-measurement Performance Cables
4200-SCP2	Dual-Channel Oscilloscope Card
4200-SCP2HR	200MS Dual-Channel Oscilloscope Card

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- Reference and User Manual on CD-ROM
- 236-ILC-3 Interlock Cable
- All Cables and Adapters

Product Highlights

- Economical power device characterization that is field upgradeable and reconfigurable
- Highest accuracy and resolution
- DC or fast pulse capability
- High resolution 24-bit A/D converters and high speed 18-bit digitizers
- Trace mode for real-time control and parametric mode for parameter extraction
- Interlocked test fixture with safe access ports

Test libraries supplied for most device types.
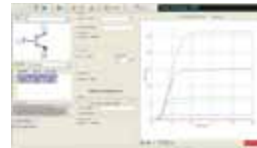
ACS Basic Edition Software quickly captures output characteristics of an IGBT device.

Parametric Curve Tracer (PCT) Configurations

Keithley's Parametric Curve Tracer configurations are complete solutions configured with a variety of high quality instruments, cables, test fixturing, and software for power device characterization. This building block approach offers the advantages of easy upgrading or modification to meet changing test needs.

Model	Type	Collector/Drain Supply High Voltage Mode	Collector/Drain Supply High Current Mode	Step Generator Base/ Gate Supply
2600-PCT-1	Low Power	200 V/10 A	200 V/10 A	200 V/10 A
2600-PCT-2	High Current	200 V/10 A	40 V/50 A	200 V/10 A
4200-PCT-2	High Current	200 V/1 A	40 V/50 A	200 V/1 A
2600-PCT-3	High Voltage	3 kV/120 mA	200 V/10 A	200 V/10 A
4200-PCT-3	High Voltage	3 kV/120 mA	200 V/1 A	200 V/1 A
2600-PCT-4	High Current / High Voltage	3 kV/120 mA	40 V/50 A	200 V/10 A
4200-PCT-4	High Current / High Voltage	3 kV/120 mA	40 V/50 A	200 V/1 A

Recommended Accessories

2651A	High Power System SourceMeter® SMU Instrument
2657A	High Power System SourceMeter® SMU Instrument
8010-CTB	Customizable Test Board
8010-DTB	Device Test Board with TO-247 Socket
70161-MSA	Keyboard/Monitor Arm for K420 and K475 Carts
HV-CA-554-1	High Voltage Triax Cables (three required for Model 2657A)
K475	Workstation Tower Mobile Cart for All PCT Configurations
K420	Workbench Cart Mobile Cart for Smaller PCT Configurations

Recommended Service

R3	3-year Extended Warranty
R5	5-year Extended Warranty
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
R3DW	Repair Service Coverage 3 Years
R5DW	Repair Service Coverage 5 Years

Ships with Product

- ACS-Basic Component Test Software
- 8010 High Power Device Test Fixture (includes 8010-CTB, 8010-DTB, and 8010-DTB-220)
- KUSB-488B USB to GPIB Adapter (2600 configurations only)
- All Cables and Adapters
- Sample Parts
- 4200-CVU-PWR (4200 configurations only)

Product Highlights

- C-V measurements up to 1MHz
- Compatible with fully automatic probers
- 20W SMUs provide up to 1A or 200V
- 1kV SMU to any system pin (S530 High V)
- pA current measurement capability (S530 Low I)
- 24 pins full Kelvin (S530 High V), 48 pins full Kelvin (S530 Low I)
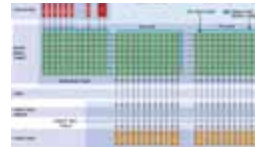
S530 systems five layers: instruments, switch pathways, cable interface, probe card adapter, and probe card.

The Model 9139A Probe Card Adapter combines low current performance and high voltage capability.

S530 Parametric Test Systems and S500 Integrated Test Systems

Keithley's S530 Semiconductor Parametric Test Systems are engineered to handle the DC and C-V measurements required in process control monitoring, process reliability monitoring, and device characterization. These parametric test systems are used in production and lab environments that entail a broad range of devices and technologies. For specialized applications, S500 Integrated Test Systems offer semi-custom configurability.

Model	Wiring & Pin Count	SMU Channels	Max Voltage	Max Current
S530 Low Current Parametric Test System	Up to 48 pins (4-wire or "Kelvin")	2 to 8	200V (2636B SMU)	1A
S530 High Voltage Parametric Test System	Up to 24 pins (4-wire or "Kelvin")	3 to 7	1000V (2410 SMU), 200V (2636B SMU)	1A
S500 Integrated Test System	Up to 60 pins with switch (2-wire), or 32pins (direct wiring from SMU)	1 to 8 with switch, or 1 to 32 without switch	1000V with 7072-HV switch, or Max voltage of SMU with no switch	1A with switch, or Max current of SMU with no switch

S530 Recommended Accessories

Probe Card Adapter

Capacitance-Voltage (C-V) Unit

Pulse Generator Unit

7½-Digit Digital Multimeter (DMM) for use as a sensitive DC-voltmeter

Frequency Measurement Option

Switching Matrix (Standard in S530)

Ships with Product

- System Source Measure Units (SMUs)
- Switching Matrix (optional in S500)
- System Cabinet, Controller, and Integration
- System Software
- High-voltage Safety Interlock

Product Highlights

- ACS is a flexible, interactive software test environment that supports many Keithley instruments and parametric test systems

- Model ACS-2600-RTM option with Series 2600B System SourceMeter® instruments provides a wafer level reliability solution.

- ACS Basic Edition is optimized for component and discrete device testing

ACS' hardware support ranges from bench-top instruments used in a QA lab to automated rack-based parametric testers.

For component and discrete device testing, ACS Basic Edition maximizes research and development productivity.

Automated Characterization Suite (ACS) Software, ACS Basic, ACS Wafer Level Reliability Option

Automated Characterization Suite (ACS) software automates semiconductor device characterization at the device, wafer, or cassette level. Combined with Keithley's wide range of source-measure instrumentation or S500 Integrated Test Systems, ACS-based solutions fill the gap between interactive lab-based set-ups and high-speed production test systems.

Model	Description
ACS	▪ Intuitive GUI simplifies test plan development, test execution, and results analysis ▪ Develop and execute tests at the device, site, wafer and cassette level ▪ Supports a wide range of instruments and system configurations including multi-SMU parallel test systems ▪ Full control of semi-automatic and fully automatic probers ▪ Interactive and real-time data plotting
ACS Basic Edition	▪ Easy-to-use GUI with a wide range of device libraries for characterizing MOSFETs, BJTs, IGBTs, diodes, resistors, etc. ▪ Supports wide range of instruments including 2600B SourceMeter® SMU Instruments and 2650A High Power SourceMeter® SMU instruments ▪ ACS Basic is included in Keithley's Parametric Curve Tracer configurations ▪ Interactive and real-time data plotting ▪ Use unlicensed copies on stand-alone PCs for test development
ACS-2600-RTM	▪ Wafer Level Reliability option for ACS ▪ Configurable from 2 to 44 source-measure channels ▪ Supports both sequential and parallel test ▪ Integrated multi-site capability ▪ Comprehensive JEDEC-compliant test suite ▪ Real-time plotting and wafer mapping

Recommended Accessories

4200-SCS	Semiconductor Characterization System
2602B	Dual-channel System SourceMeter Instrument (3A DC, 10A Pulse)
2612B	Dual-channel System SourceMeter Instrument (200V, 10A Pulse)
2636B	Dual-channel System SourceMeter Instrument (1fA, 10A Pulse)
2657A	Model 2657A High Power System SourceMeter Instrument (High Voltage)
2651A	Model 2651A High Power System SourceMeter Instrument (High Current)
707B	Six-slot Switch Mainframe
7174A	Low-current switch matrix for 707B

Ships with Product

- Software CD
- License Key

Digital Multimeters

Designed to save time and reduce headaches, Tektronix and Keithley Digital Multimeters are built to do more so you don't have to. Each one is loaded with time-saving features like automated measurements, built-in analysis modes and front-panel shortcut buttons. Keithley's highly regarded high performance digital multimeters (DMMs,) include 7½ or 8½-digit solutions as well as flexible broad-purpose DMMs.

	Tektronix Model DMM4020	Tektronix Models DMM4040/4050	Keithley Models 2001, 2010	Keithley Model 2002	Keithley Models 2000, 2100	Keithley Model 2110
Resolution	5½ digit	6½ digit	7½ digit	8½ digit	6½ digit	5½ digit
Basic Accuracy	0.015%	0.0035% (DMM4040) 0.0024% (DMM4050)	0.0018%	0.0006%	0.0038% (Model 2100) 0.0020% (Model 2000)	0.012%
Optional Switch Functions	Not Applicable	Not Applicable	10 Channel	10 Channel	10 Channel (Model 2000)	Not Applicable
Interface	RS-232, RS-232 to USB Device Adapter Included	USB host, RS-232, GPIB, Ethernet, RS-232 to USB Device Adapter Included	GPIB, RS-232 (Model 2010) GPIB (Model 2001)	GPIB	GPIB, RS-232 (Model 2000) USB-TMC (Model 2100)	USB-TMC GPIB Option

Choosing Your Digital Multimeter

To help you choose the right digital multimeter for your needs, the most common selection criteria are listed below, along with helpful tips for determining your requirements.

❶ Resolution

Resolution refers to how fine a measurement a meter can make. By knowing the resolution of a meter, you can determine if it is possible to see a small change in your signal. The terms digits and counts are used to describe a meter's resolution. A 6.5-digit multimeter can display 6 full digits ranging from 0 to 9, and one "half" digit which displays only a 1 or is left blank. A 6.5-digit meter will display up to 1,999,999 counts of resolution.

❷ Accuracy

Accuracy is the largest allowable error that will occur under specific operating conditions. In other words, it is an indication of how close the DMM's displayed measurement is to the actual value of the signal being measured. Accuracy is usually expressed as a percent of reading. An accuracy of one percent of reading means that for a displayed reading of 100 volts, the actual value of the voltage could be anywhere between 99 volts and 101 volts.

❸ Measurements

Digital multimeters are capable of making a variety of different measurements. A basic DMM typically can measure voltage, current and resistance. Other measurements commonly supported are continuity and diode measurements. Continuity is a quick go/no-go resistance test that distinguishes between an open and a closed circuit. A diode test mode measures the actual voltage drop across a junction. Other possible measurement modes are frequency, period, temperature and capacitance.

❹ Extra Channel Capacity

Most of Keithley's DMM's (excluding Models 2100 and 2110) include an option slot located in the rear, to accommodate a scanner card enabling automated multipoint measurements.

DMM4020

Make measurements, not compromises. Measure a variety of parameters— from volts, ohms and amps to frequency—with one instrument. Save time with front-panel shortcut keys and built-in limit testing. Performance. Reliability. Legendary ease-of-use. One instrument. Looks like you can have it all.

Product Highlights

- 5.5 digit resolution
- Basic V dc accuracy of up to 0.015%
- Volts, ohms, amps and frequency measurements
- Dedicated dc leakage current measurement
- CAT I 1000 V, CAT II 600 V

Make accurate 4-wire resistance measurements with only two test leads!

With the unique dual display, you can measure two different parameters of the same signal from one test connection.

Models	Display	Resolution (Digits)	Measurements	Basic V dc accuracy (% Reading + % Range)
DMM4020	Dual; Numeric	5.5	V ac, V dc, I dc, I ac, Ω, Cont, Diode, Freq	0.015 + 0.004 (yr.)

Recommended Test Leads

Test Leads

196-3520-xx	Premium Test Leads (TL710 replacement/ spare)
TL705	2x4 Wire Ohm 1000V Test Lead
TL725	2x4 Wire Ohm SMD Test Tweezers

Recommended Accessories

Accessories

ACD4000	Soft Carrying Case
HCTEK-4321	Hard Carrying Case
RMU2U	Rackmount Kit
013-0369-xx	Calibration Fixture 4-terminal short

Recommended Service

SILV100	5-year Extended Warranty

Another Product for Consideration

If you need greater accuracy, the DMM4050 provides 6.5 digits of resolution and up to 0.0024% basic V dc accuracy.

Ships with Product

- One Set TL710 Test Leads
- RS-232 to USB Adapter Cable
- NI LabVIEW SignalExpress™ TE (LE version) Software
- Statement of Calibration Practices
- User Manual & Documentation on CD
- Power Cord
- 3-year Warranty

Product Highlights

- 6.5 digit resolution
- Basic V dc accuracy of up to 0.0024%
- Volts, ohms, amps, frequency and period measurements
- Capacitance and temperature measurements (DMM4050)
- CAT I 1000 V, CAT II 600 V

Make accurate 4-wire resistance measurements with only two test leads!

See how your device is changing over time with built-in analysis modes – TrendPlot™, histograms and statistics.

DMM4040/4050

Meet the multimeter to rule them all. Make a wide range of measurements—from volts, ohms and amps to frequency, temperature and capacitance—with one instrument. Monitor and record measurements over time, or environmental changes with built-in histogram, TrendPlot™ and statistics analysis modes. Get unparalleled ease-of-use with a dual display and USB connectivity. Hello, efficiency. Goodbye, complexity.

Models	Display	Resolution (Digits)	Measurements	Basic V dc accuracy (% Reading + % Range)
DMM4040	Dual; Numeric & Graphical	6.5	V ac, V dc, I dc, I ac, Ω, Continuity, Diode, Freq, Period	0.0035 + 0.0005
DMM4050	Dual; Numeric & Graphical	6.5	V ac, V dc, I dc, I ac, Ω, Continuity, Diode, Freq, Period, Temp., Capacitance	0.0024 + 0.0005

Recommended Test Leads

Temperature Probes

TP750	100 Ohm RTD Temperature Probe (DMM4050 only)

Test Leads

196-3520-xx	Premium Test Leads (TL710 replacement/ spare)
TL705	2x4 Wire Ohm 1000V Test Lead
TL725	2x4 Wire Ohm SMD Test Tweezers

Recommended Accessories

Accessories

ACD4000	Soft Carrying Case
HCTEK-4321	Hard Carrying Case
RMU2U	Rackmount Kit
013-0369-xx	Calibration Fixture 4-terminal short

Recommended Service

SILV100	5-year Extended Warranty

Another Product for Consideration

The PWS DC Power Supply Series is designed to stack with the DMM Series, saving you bench space.

Ships with Product

- One Set TL710 Test Leads
- RS-232 to USB Adapter Cable
- NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate
- User Manual & Documentation on CD
- Power Cord
- 3-year Warranty

Models 2000, 2100, 2110

These cost effective, high precision instruments offer 5.5- and 6.5-digit accuracy and are ideal for a wide range of manual, semi-automatic, and production test applications. They can be used as stand-alone benchtop instruments and as components in test systems.

Product Highlights

- Exceptional 61/2-digit measurement integrity with high speed throughput (2000)
- Built-in slot for scanner card (2000)
- 12/13 built-in measurement functions including thermocouples (2110/2000)
- Full featured DMMs at a value price (2100/2110)
- USB Test and Measurement Class (USBTMC) interface (2100/2110)
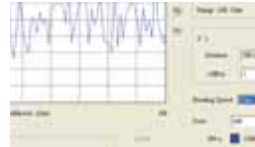
The KI-Tool application for the Model 2100 provides charting and graphing capabilities without programming.

For multipoint measurement, plug a scanner card into the Model 2000.

Model	Resolution	Basic V DC Accuracy, 1 Year (% Reading + % Range)	Measurements	Interface
2000	6½	0.0030 + 0.0005	Vac, Vdc, Idc, Iac, 2WΩ, 4WΩ, Temp, Freq, Period, dB, dBm, Cont., Diode	GPIB, RS-232
2100	6½	0.0038 + 0.0006	Vac, Vdc, Idc, Iac, 2WΩ, 4WΩ, Temp, Freq, Period, Cont., Diode	USB
2110	5½	0.012 + 0.004	Vac, Vdc, Idc, Iac, 2WΩ, 4WΩ, Temp, Freq, Period, dB, dBm, Cont., Diode, Cap., Therm.	USB (GPIB Option)

Recommended Accessories

2000-SCAN	10-channel Scanner Card (Model 2000)
2001-SCAN	10-channel Scanner Card with Two High-speed channels (Model 2000)
2001-TSCAN	9-channel Thermocouple Scanner Card (Model 2000)
5808	Low cost, Single Pin, Kelvin Probes
5805	Kelvin Probes, 0.9m (3ft)
5805-12	Kelvin Probes, 3.6m (12ft)
5809	Low Cost, Kelvin Clip Lead Set

Recommended Accessories

7007-1	Shielded GPIB Cable, 1m (3.3ft)
7007-2	Shielded GPIB Cable, 2m (6.6ft)
KPCI-488LPA	IEEE-488 Interface/ Controller for the PCI Bus
KUSB-488B	IEEE-488 USB to GPIB Interface Adapter
4288-1	Single Fixed Rack Mount Kit (Model 2000, 2100)
4299-3	Single Rack Mount Kit (Model 2100 and 2110)
4299-4	Dual Rack Mount Kit (Model 2100 and 2110)

Ships with Product

- Safety Test Leads
- Product CD (Includes Users Manual, Drivers, Etc.)
- USB Cable (2100/2110)
- KI Tool and KI Link Software (2100/2110)
- Calibration Certificate
- Power Cord
- 1-year Warranty

Product Highlights

- Measurement functions include temperature, 4-wire resistance, peak detection, low ohms, and Agilent 3458A emulation (2002)

- Built-in slot for scanner card

- Multiple measurement display (2001/2002)

- Dry circuit measure function limits test voltage when testing contact or connector resistances (2010)

Add a plug-in scanner card to turn any of these DMMs into a complete scan and measure system.

Use the multiple display capability (Model 2001/2002) to simultaneously display different aspects of one signal.

Models 2001, 2002, 2010

Each Model 2001, 2002, and 2010 digital multimeter (DMM) offers superior measurement precision, sensitivity, and traceability. They also support plug-in scanner cards that allow you to quickly and economically create multi-channel measurement systems.

Model	Resolution	Basic V DC Accuracy, 1 Year (% Reading + % Range)	Measurements	Interface
2001	7½	0.0024 + 0.0004	Vac, Vdc, Idc, Iac, 2WΩ, 4WΩ, Temp, Freq, Period, Crest, Peak	GPIB
2002	8½	0.0010 + 0.00012	Vac, Vdc, Idc, Iac, 2WΩ, 4WΩ, Temp, Freq, Period, Crest, Peak	GPIB
2010	7½	0.0024 + 0.0004	Vac, Vdc, Idc, Iac, 2WΩ, 4WΩ, Temp, Freq, Period, Cont., Diode, Therm., Dry Circ.Ω, Ratio	GPIB, RS-232

Recommended Accessories

2000-SCAN	10-channel Scanner Card
2001-SCAN	10-channel Scanner Card with Two Highspeed Channels
2001-TSCAN	9-channel Thermocouple Scanner Card
5805	Kelvin Probes, 0.9m (3ft)
5805-12	Kelvin Probes, 3.6m (12ft)
5808	Low Cost, Single Pin, Kelvin Probes
5809	Low Cost, Kelvin Clip Lead Set
7007-1	Shielded GPIB Cable, 1m (3.3ft)
7007-2	Shielded GPIB Cable, 2m (6.6ft)
KPCI-488LPA	IEEE-488 Interface/ Controller for the PCI Bus
KUSB-488B	IEEE-488 USB to GPIB Interface Adapter
4288-1	Single Fixed Rack Mount Kit

Ships with Product

- Model 8605 High Performance Modular Test Leads (Models 2001, 2002)

- Model 1751 Safety Test Leads (Model 2010)

- Option Slot Cover (Models 2001, 2002)

- Calibration Data

- User Manual, Service Manual

- Power Cord

- 1-year Warranty

Data Acquisition Systems

Keithley data acquisition systems combine precision measurement, switching, and control into a single, tightly integrated enclosure. They offer affordable alternatives to separate DMMs and switch systems, dataloggers/recorders, plug-in card data acquisition equipment, and VXI/PXI systems.

	Series 2700	Series 3700
DMM Resolution	6½ Digits	7½ Digits
Switching Density	Up to 80, 2-pole channels (2700/2701) Up to 200, 2-pole channels (2750)	Up to 576, 2-pole channels
Special Features	Front panel DMM jacks, Non-volatile memory buffer, Solid State temperature scanning	USB Flash Drive support, 1 Ohm measure range, Solid State temperature scanning
Switch Features	Up to 40, 2-pole Channels and 12 card options	Up to 96, 2-pole Channels and 10 card options
Interface	GPIB, RS-232 (Models 2700 and 2750) LAN, RS-232 (Model 2701)	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus

Choosing Your Data Acquisition System

Designing the switching for an automated test system demands an understanding of the signals to be switched and the tests to be performed. The following is a cursory look at key decision points in the design of a switching system.

❶ Switch Configuration

Multiplex switching can be used to connect one instrument to multiple devices or multiple instruments to a single device. Multiplex switching permits multiple simultaneous connections and sequential or non-sequential switch closures. A matrix switch configuration is the most versatile because it can connect multiple inputs to multiple outputs. The isolated, or independent, switch configuration consists of individual relays, often with multiple poles, with no connections between relays. For scanner (or multiplex) cards, the channel is used as a switched input in measuring circuits or as a switched output in sourcing circuits. For switch cards, each channel's signal paths are independent of other channels.

❷ Relay Types

Three key relay types are used. Electromechanical offer the widest power range and a good life and speed at a relatively low cost. Reed relays cost more but offer less contact wear and bounce for a better life and speed than electromechanical. Solid state cost still more, but offer the best life and speed with no contact wear or bounce.

❸ Systemization

Connection types found on switch cards include both screw terminals and mass-terminated connectors. At the instrument level, TSPLink master/slave connection offers easy system expansion between Series 3700A mainframes and to connect to Series 2600B SourceMeter instruments.

Product Highlights

- 6½-digit measurement engine
- Front panel DMM jacks
- 300 volt isolation between channels and from any channel to ground to maintain signal integrity
- Mass terminated or screw terminal connector options
- Full per-channel card configurability
- Non-volatile memory buffer
- Choice of 12 switch/control plug-in modules

Install up to five switch/control modules in the 2750 mainframe or up to two in the 2700 and 2701 mainframes.

Screw terminals use oversize connectors for easier, mistake-free wiring. Removable terminals available for some models.

Series 2700

The Series 2700 System Switch/Multimeter combines precision measurement, switching, and control in a single, tightly integrated enclosure for either rack-mount or bench-top applications used by data loggers. The 2700 Series offers two- and five-slot models, as well as an Ethernet-based model for high speed and long distance communication.

Model	Mainframe Size	Interfaces	Resolution (Digits), Accuracy	Advance Measure Functions
2700	2U, ½ Rack	GPIB, RS232	6½ Digits, 0.003%	Temperature, 4-Wire Resistance
2701	2U, ½ Rack	Ethernet, RS232	6½ Digits, 0.003%	Temperature, 4-Wire Resistance
2750	2U, Full Rack	GPIB, RS232	6½ Digits, 0.003%	Temperature, 4-Wire Resistance, Low Ohms

Plug-in Cards

7700	Dual 1x10 / Electromechanical Relay
7701	Dual 1x16 / Electromechanical Relay
7702	Dual 1x20 / Electromechanical Relay
7703	Dual 1x16 / Reed Relay
7705	40 Independent Relay / Electromechanical Relay

Recommended Accessories

7007-1	Shielded IEEE-488 Cable, 1m (2700, 2750)
7007-2	Shielded IEEE-488 Cable, 2m (2700, 2750)
7788	50-Pin D-Shell Connector Kit (for 7703 & 7705 Mods.)
7789	50-Pin/25-Pin D-Shell Kit
7790	50-Pin Male/Female, 25-Pin Male IDC D-Shell Con. Kit

Plug-in Cards

7706	16 Digital I/O, 2 Analog Outputs, 1x20 Multiplexer
7707	32 Digital I/O, 1x10 Multiplexer
7708	Dual 1x20 / Electromechanical Relay
7709	6x8 / Electromechanical Relay
7710	Dual 1x10 / Solid State Relay
7711	Dual 1x4, 2GHz / RF Relay
7712	Dual 1x4, 3.5GHz / RF Relay

Ships with Product

- Product CD (Includes Users Manual, Drivers, Etc.)
- Ethernet Crossover Cable (Model 2701 Only)
- Calibration Certificate
- Quick Reference Manual
- ExceLINX Software
- Power Cord
- 1-year Warranty

Product Highlights

- Mainframe variations (DMM and keypad/display optional)
- High performance (1 Ohm resistor, 10µA DCI range) 7.5 Digit multimeter
- High density switching (Up to 720 one-wire multiplexer channels, 2,688 one-wire matrix crosspoints)
- TSP control and TSP-Link for Intelligent distributed control
- Embedded startup/control software

Use the built-in web server interface to configure the system, build and run an automated scan list, and analyze data.

Model 3706A-NFP eliminates keypad and display for automated test rack applications.

Series 3700A

The Series 3700A DMM/switch system offers a scalable, instrument grade switching and multi-channel measurement solution for automated testing of electronic devices. The system includes a high performance DMM with up to six switch/control cards and can support up to 576 two-wire multiplexer channels for unrivaled density and low per channel cost.

Model (Mainframe)	DMM	Front Panel Keypad & Display	Resolution (Digits), Accuracy	Interface
3706A	Yes	Yes	7½ Digits, 0.0025%	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
3706A-S	No	Yes	NA	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
3706A-NFP	Yes	No	7½ Digits, 0.0025%	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
3706A-SNFP	No	No	NA	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus

Plug-in Cards

3720	Dual 1x30 Multiplexer: 300V, 2A, Auto-CJC with 3720-ST accessory
3721	Dual 1x20 Multiplexer: 300V, 3A, Auto-CJC with 3721-ST accessory
3722	Dual 1x48 Multiplexer: 300V, 2A
3723	Dual 1x30 Multiplexer: 200V, 1.25A, Reed Relay
3724	Dual 1x30 Multiplexer: 200V, 0.12A, Solid State Relay, Auto-CJC with 3724-ST accessory

Plug-in Cards

3730	6x16 Matrix: 300V, 2A
3731	6x16 Matrix: 200V, 2A, Reed Relay
3732	Quad 4x28 Matrix: 200V, 1.2A, Reed Relay
3740	Independent Relay: 28 Form C: 300V, 3A; 4 Form A: 250VAC, 7A
3750	Control: 40 Digital I/O 2 Analog Outputs, 4 Counter
KUSB-488B	IEEE-488 USB to GPIB Interface Adapter
4288-1	Single Fixed Rack Mount Kit

Recommended Accessories

3706-BAN	DMM Adapter Cable
3706-TLK	Test Lead Kit

Ships with Product

- Test Script Builder Software Suite CD
- Series 3700A Product CD (Includes LabVIEW, IVI C, and IVI.COM Drivers)
- Ethernet Crossover Cable
- Calibration Certificate
- Quick Reference Manual
- Power Cord
- 1-year Warranty

Low-Level Instruments

Scientists and researchers worldwide rely on Keithley Electrometers, Picoammeters, and Nanovoltmeters for making low-level measurements beyond the capabilities of a typical digital multimeter. Keithley Electrometers and Picoammeters provide low current and high resistance measurements and Keithley Nanovoltmeters measure low voltages.

	2182A Nanovoltmeter	6220 / 6221 Current Sources	6485, 6487 / 6482 Picoammeters / Picoammeter & Voltage Source	6514 / 6517B / 6430 Electrometers
Current Min/Max	--	100fA / 100mA	1fA / 20mA	10aA / 100mA
Voltage Min/Max	1nV / 100V	--	--	1mV / 200V
Resistance Min/Max	10nΩ /1G Ω (with Model 6220 or 6221)	10nΩ/1GΩ (with Model 2182A)	10Ω/1PΩ (with Model 6487)	10mΩ / 10PΩ
Resolution	7½ Digits	4½ Digits	5½ Digits (6485, 6487) 6½ Digits (6482)	5½ Digits (6514, 6517B) 6½ Digits (6430)
Input Connection / Interface	Low Thermal / GPIB, RS-232	3 Slot Triax / GPIB, RS-232 (LAN on 6221)	BNC (6485) 3 Slot Triax (6482, 6487) / GPIB, RS-232	3 Slot Triax / GPIB, RS-232

Choosing Your Specialized Low Level Instrument

To help you choose the appropriate specialized low level instrument for your application, the most common selection criteria are listed below, including helpful tips for determining the correct specialized low level instrument for your requirements.

1 Resolution

Resolution means how fine a meter's measurement is and lets you determine if it's possible to see a small change in the signal. Resolution is described by digits and counts. A 6.5-digit instrument can display six full digits ranging from 0 to 9, and one "half" digit that displays either a 1 or is left blank. A 6.5-digit instrument can display up to 1,999,999 counts of resolution.

2 Accuracy

Accuracy is the largest allowable error that will occur under specific operating conditions and is an indication of how close the instrument's displayed measurement is to the actual value of the signal measured. Accuracy is typically expressed as a percent of reading. For example, an accuracy of 1% of reading means that, for a displayed reading of 100 volts, the actual value of the voltage is between 99 volts and 101 volts.

3 Low Current/High Resistance Measurements

Low current/high resistance measurements evaluate the insulation qualities of materials or components. Typically, a voltage up to 500 or 1000 volts is applied and the resulting current is measured, which can be in the range of picoamperes (10E-12A) or lower. A digital multimeter may seem like the right instrument for these measurements. But if the current is below 1µa or the resistance is above 10MΩ, the correct solution is an Electrometer or Picoammeter.

4 Low Voltage/Low Resistance Measurements

Low resistance/low voltage measurements evaluate the conduction or contact qualities of materials or components. Typically, a current under 100mA but as low as 1µa is applied and the resulting voltage is measured, which can be in the range of microvolts and even nanovolts. For low voltage, choose a Nanovoltmeter or low noise multimeter. For low resistance, a Nanovoltmeter/current source combination or switch/multimeter is the correct solution.

Product Highlights

- Low noise voltage measurements at high speeds

- Delta mode coordinates measurements with a reversing current source at up to 24Hz with 30nV p-p noise (typical) for one reading. Averages multiple readings for greater noise reduction

- Built-in thermocouple linearization and cold junction compensation

- Dual channels

Comparison of the Model 2182A's DC noise performance with a nanovolt/micro-ohmmeter's.

Results from a Model 2182A and Model 6220 using the delta mode to measure a 10mΩ resistor with a 20µA test current.
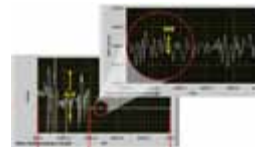
2182A Nanovoltmeter

The two-channel Model 2182A Nanovoltmeter is optimized for making stable, low noise voltage measurements and for characterizing low resistance materials and devices reliably and repeatably. It provides higher measurement speed and significantly better noise performance for voltage meters than alternative low voltage measurement solutions.

Model	Voltage	Temperature	Resistance	Channels	Buffer Size
2182A	1nV – 100V	-200°C – 1820°C	10nΩ to 200MΩ (requires 6220 or 6221)	2	1,024 rdgs

Recommended Accessories

6220	DC Precision Current Source (used with 2182A for low current/voltage measurement)
6221	AC and DC Current Source (used with 2182A for low current/voltage measurement)
4288-1	Single Fixed Rack Mounting Kit
4288-2	Dual Fixed Rack Mounting Kit
KPCI-488LPA	IEEE-488 Interface/Controller for the PCI Bus
KUSB-488B	I EEE-488 USB-to-GPIB Interface Adapter
2107-30	Low Thermal Input Cable with spade lugs, 9.1m (30 ft)
2182-KIT	Low Thermal Connector with strain relief
2187-4	Input Cable with safety banana plugs

Recommended Accessories

2188	Low Thermal Calibration Shorting Plug
7007-1	Shielded GPIB Cable, 1m (3.2 ft)
7007-2	Shielded GPIB Cable, 2m (6.5 ft)
7009-5	Shielded RS-232 Cable, 1.5m (5 ft)
8501-1	Trigger Link Cable, 1m (3.2 ft)
8501-2	Trigger Link Cable, 2m (6.5 ft)
8503	Trigger Link Cable to 2 male BNC connectors

Ships with Product

- 2107-4 Low Thermal Input Cable with Spade Lugs, 1.2m (4 ft)
- User Manual
- Service Manual
- Contact Cleaner
- Power Cord
- Alligator Clips

Product Highlights

- $10E+^{14}$ Ohms output impedance ensures stable current sourcing into variable loads

- 64k-point source memory for comprehensive test current sweeps

- (Model 6221) Source AC currents from 4pA to 210mA peak to peak for AC characterization of components and materials. The 10MHz output update rate generates smooth sine waves up to 100kHz
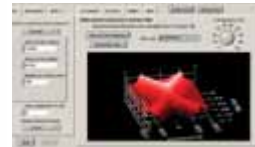
Perform, analyze, and display differential conductance measurements.
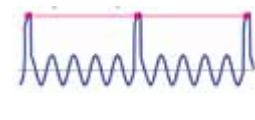
Measurements are line synchronized to minimize 50/60Hz interference.

6220 / 6221 Current Sources

Keithley precision current sources include both broad-purpose Model 6220 and high-performance Model 6221. Their high sourcing accuracy and built-in control functions make them ideal for Hall Effect, resistance (using delta mode), pulsed, and differential conductance measurements. Programmable pulse widths limit power dissipation.

Model	Current	Resistance	Sweep Points	PC Interface
6220	100fA – 100mA	10nΩ to 200MΩ (requires 2182A)	65,536 (64k)	GPIB, RS-232
6221	100fA – 100mA	10nΩ to 200MΩ (requires 2182A)	65,536 (64k)	GPIB, RS-232, Ethernet

Recommended Accessories

|	
2182A	Nanovoltmeter (used with 6220/6221 for low current/voltage measurement)
237-ALG-2	Low Noise Triax Cable, 3-slot triax to alligator clips
7007-1	Shielded GPIB Cable, 1m (3.2 ft)
7007-2	Shielded GPIB Cable, 2m (6.5 ft)
7007-4	Shielded IEEE-488 Cable, 4m (13.1 ft)
7009-5	Shielded RS-232 Cable, 1.5m (5 ft)
7078-TRX-3	Low Noise Triax Cable, 3-Slot Triax Connectors, 0.9m (3 ft)
7078-TRX-5	Low Noise Triax Cable, 3-Slot Triax Connectors, 1.5m (5 ft)
7078-TRX-10	Low Noise Triax Cable, 3-Slot Triax Connectors, 3m (10 ft)
7078-TRX-20	Low Noise Triax Cable, 3-Slot Triax Connectors, 6m (20 ft)

Recommended Accessories

8501-1	Trigger Link Cable with male Micro-DIN connectors at each end, 1m (3.3 ft)
4288-1	Single Fixed Rack Mounting Kit
4288-2	Dual Fixed Rack Mounting Kit
KPCI-488LPA	IEEE-488 Interface/Controller for the PCI Bus
KUSB-488B	I EEE-488 USB-to-GPIB Interface Adapter

Ships with Product

- 6.6 ft (2m), Low Noise, Input Cable with Triax-to-Alligator Clips

- 6.6 ft (2m) Trigger Link Cable to connect 622x to 2182A

- Ethernet Crossover Cable (6221 only)

- Communication Cable between 2182A and 622x

- Safety Interlock Connector

- Instruction manual on CD

- Getting Started manual (hardcopy)

- Software (downloadable)

Product Highlights

- Measure currents down to 1fA
- Voltage and resistance measurement options
- Voltage burden <200µV (most models)
- 5-1/2 to 6-1/2 digit resolution (most models)
- Feedback ammeter design for higher accuracy

Dark current characterization of a photodiode using Picoammeter and voltage source (such as the Model 6482).

MOSFET sub-threshold voltage test using Picoammeters and voltage sources (such as the Model 6482).
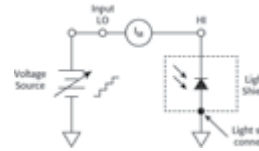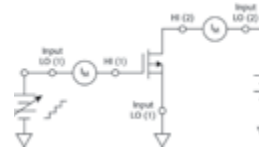
6485, 6487 Picoammeters, 6482 Picoammeter & Voltage Source

Keithley Picoammeters combine sensitive current measurement with high speed. The Model 6485 Picoammeter offers fast, sensitive current measurement. The Model 6487 offers improved measurement capability, and adds a high resolution 500V source. The Model 6482 offers two independent Picoammeter/voltage source channels.

Model	Current	Resistance	Reading Rate	Input Connections
6482	1fA – 20mA	N/A	900 rdgs/s	3-slot triax, BNC (via included adapter)
6487	10fA – 20mA	$10E+^{16}$ Ohms	1000 rdgs/s	3-slot triax
6485	10fA – 20mA	N/A	1000 rdgs/s	BNC

Recommended Accessories

4802-10	Low noise BNC Input Cable, 3m (10ft) (for 6485)
4803	Low Noise Cable Kit (for 6485)
6517-ILC-3	Interlock Cable for 8009 Resistivity Test Fixture (6487 Only)
7007-1	Shielded IEEE-488 Cable, 1m (3.3 ft)
7007-2	Shielded IEEE-488 Cable, 2m (6.6 ft)
7007-4	Shielded IEEE-488 Cable, 4m (13.1 ft)
7009-5	RS-232 Cable
7078-TRX-10	Low Noise Triax Cable, 3.0m (10 ft) (6487 Only)
7078-TRX-20	Low Noise Triax Cable, 6.0m (20 ft) (6487Only)
7754-3	BNC to Alligator Cable (for 6485)
8501-1	Trigger Link Cable with male Micro-DIN connectors at each end, 1m (3.3 ft)

Recommended Accessories

CS-565	BNC Barrel (for 6485)
237-TRX-BAR	Triax Barrel (for 6487)
7078-TRX-BNC	Triax-to-BNC Adapter
8009	Resistivity Test Fixture (for 6487)
4288-1	Single Fixed Rack Mounting Kit
4288-2	Dual Fixed Rack Mounting Kit
KPCI-488LPA	IEEE-488 Interface/ Controller for the PCI Bus
KUSB-488B	IEEE-488 USB-to-GPIB Interface Adapter

Ships with Product

- 7078-TRX-BNCTriax-to-BNC Connector (2×) (Model 6482)
- CA-186-1B Ground Connection Cable, Banana to Screw-Lug (Model 6487)
- CAP-31 Protective Shield/Cap (3-lug) (Model 6487)
- CS-459 Safety Interlock Plug (Model 6487)
- 7078-TRX-3 Low Noise Triax Input Cable, 1m (3 ft) (Model 6487)
- 8607 High Voltage Banana Cable Set for Voltage Source Output (Model 6487)
- CAP-18 Protective Shield/Cap (2-lug) (Model 6485)
- 4801 Low Noise BNC Input (Model 6485)

Product Highlights

- Measure low current & high voltage, resistance, and charge
- Resistance measurements to 10PΩ ohm
- Current sensitivity as low as 10aA (6430)
- Voltage burden as low as 200µV
- Superior accuracy and sensitivity
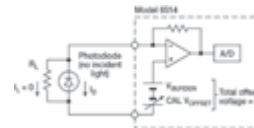
This illustrates how the Model 6514's measurement can be adjusted to reflect the true dark current of the photodiode.

A Model 6517B is well suited for application where the volume resistivity needs to be measured.

6514 / 6517B / 6430 Electrometers

Our high resistance Electrometers provide voltage source and high resistivity measurements for sensitive measurement. They combine flexible interfacing capabilities with current sensitivity, charge measurement capabilities, resolution, and speed. The Model 6430 offers unmatched low current sensitivity.

Model	Current	Voltage	Resistance	Charge	Input Connections
6517B	100aA – 20mA	10mV – 200V	$10E+^{16}$	10fC to 2mC	3-slot triax
6514	100aA – 20mA	10mV – 200V	10mΩ to 200GΩ	10fC to 20mC	3-slot triax
6430	10aA – 100mA	1mV – 200V	1mΩ to >20TΩ	--	3-slot triax

Recommended Accessories

237-ALG-2	Low Noise Triax Cable, 3-slot triax to alligator clips
6517B-ILC-3	Interlock Cable (For 6517B only)
7078-TRX-3	Low Noise Triax Cable, 3-Slot Triax Connectors, 0.9m (3 ft)
7007-1	Shielded IEEE-488 Cable, 1m (3.2 ft)
8501-1	Trigger Link Cable, 1m (3.3 ft)
8503	Trigger Link Cable to 2 male BNCs, 1m (3.3 ft)
8607	1kV Source Banana Cables (for 6517B only)
6517-RH	Humidity Probe with Extension Cable (6517B only)
6517-TP	Temperature Bead Probe (included with 6517B) (6517B only)
8009	Resistivity Test Fixture (for 6517B)

Recommended Accessories

237-BNC-TRX	Male BNC to 3-Lug Female Triax Adapter (for 6517B)
237-TRX-NG	Triax Male-Female Adapter with Guard Disconnected
7078-TRX-BNC	3-Slot Male Triax to BNC Adapter
7078-TRX-GND	3-Slot Male Triax to BNC Adapter with guard removed (for 6517B)
4288-1	Single Fixed Rack Mounting Kit
4288-2	Dual Fixed Rack Mounting Kit
6521	Low Current Scanner Card (for 6517B)
6522	Voltage/Low Current Scanner Card (for 6517B)
KPCI-488LPA	IEEE-488 Interface/ Controller for the PCI Bus
KUSB-488B	IEEE-488 USB-to-GPIB Interface Adapter

Ships with Product

- Low Noise Triax Cable, 3-slot triax to alligator clips (6514, 6517B)
- 6430-322-1B Low noise Triax Cable, 3-slot triax to alligator clips (20cm)
- Dual Test Leads (6430)
- 6517-TP Thermocouple Bead Probe (6517B)
- CS-1305 Interlock Connector (6517B)
- PreAmp Cable 2m (6.6ft)

Power Supplies

Tektronix and Keithley power supplies offer a wide range of performance. Get single channel models with superior accuracy and 0.1mA current measurement resolution. For multiple source needs, select a dual channel or triple channel supply. All channels are isolated and fully programmable. For testing battery-operated devices, consider a battery simulator.

	Tektronix PWS2000 Series (4 models)	Tektronix PWS4000 Series (5 models)	Keithley Models 2200 (5 models)	Keithley Models 2220-30-1 & 2230-30-1	Keithley Models 2302, 2306, 2308	Keithley Models 2303, 2304A
Description	Manual	USB Programmable Single Channel	USB and GPIB Programmable Single Channel	USB Multi-Channel	Battery Simulator	Fast Transient Response
Channels	1	1	1	2 (2220-30-1) 3 (2230-30-1)	1 (2302) 2 (2306, 2308)	Single Output
Max Voltage / Max Current	18V-72V / 1.5A-6A	20V-72V / 1.2A-5A	20V-72V / 1.2A-5A	2-30V / 1.5A (2220-30-1) 2-30V / 1.5A , 1-6V / 5A (2230-30-1)	15V / 5A	15V / 5A (2303) 20V / 5A (2304A)
Resolution	10mV, 10mA	1mV, 0.1mA	1mV, 0.1mA	1mV, 1mA	1mV, 100nA	1mV, 100nA
Voltage Accuracy	0.05%	0.03%	0.03%	0.03%	0.05%	0.05%
Current Accuracy	0.2%	0.05%	0.05%	0.1%	0.2%	0.2%
Interface	Not Applicable	USB	GPIB, USB	USB	GPIB	GPIB

Choosing Your Programmable Power Supply

To help you choose the appropriate power supply for your application, the most common selection criteria are listed below.

1 ## Output Voltage, Current, and Power

Ensure that the power supply has sufficient voltage output and current output to meet your needs. Also ensure that the supply can deliver the required power. Some power supply V-I output characteristics offer a trade-off between maximum voltage and maximum current (hyperbolic V-I output).

2 ## Setting Resolution and Accuracy

Voltage and current settings (sometimes called limits or programmed values) each have resolution and accuracy specifications associated with them. The resolution of these settings determines the minimum increment in which the output may be adjusted. The accuracy describes the extent to which the value of the output matches international standards and is typically expressed as ± (% of reading + offset).

3 ## Ripple and Noise

Spurious AC components on the output of a DC supply are called ripple and noise. The term "ripple" refers to periodic AC on the output. When viewed in the frequency domain, ripple shows up as spurious responses. Unlike ripple, which is periodic, noise is random. A power supply's ripple and noise is specified within a bandwidth, and should be specified for both current and voltage.

4 ## Features and Programmability

When selecting your power supply, select the supply that has the functionality you need. Consider a multiple-channel supply as a cost-effective solution for applications requiring multiple power sources. For maximum accuracy, consider supplies that have remote sensing. When developing and testing battery-operated devices, consider a special purpose battery-simulating supply.

Product Highlights

- Linear regulation
- 0.05% basic DC voltage accuracy
- 0.2% basic DC current accuracy
- Less than 3 mVp-p ripple and noise
- 20 user-defined setup memories

The numeric keypad makes it easy to specify a precise current limit before you start your test.

PWS Series power supplies are designed to be stacked with other Tektronix bench instruments to save you valuable bench space.

PWS2000 Series

More power. More features. More value. Support many different applications with wide output voltage and current ranges, and down to 10 mV/10 mA resolution. Save time with a numeric keypad for fast and accurate voltage/current selection. Strain less with a bright, large readout digital display. All backed by Tektronix reliability.

Models	Output Voltage	Output Current	Programmable
PWS2185	18 V	5 A	No
PWS2323	32 V	3 A	No
PWS2326	32 V	6 A	No
PWS2721	72 V	1.5 A	No

Recommended Accessories

RMU2U	Rackmount Shelf Kit for 1 or 2 Units
386-7598-xx	Rackmount Cosmetic Filler Panel

Recommended Service

SILV100	5-year Extended Warranty

Another Product for Consideration

The PWS4000 Series offers greater accuracy, additional features and programmability.

Ships with Product

- Calibration Certificate
- Technical Reference Manual & Documentation on CD
- Power Cord
- 3-year Warranty

Product Highlights

- Linear regulation
- 0.03% basic DC voltage accuracy; 0.05% basic DC current accuracy
- USB interface for remote programming
- Less than 5 mVp-p ripple and noise
- Remote sense, list mode and 40 user-defined setup memories

The numeric keypad makes it easy to specify a precise current limit before you start your test.

PWS Series power supplies are designed to be stacked with other Tektronix bench instruments to save you valuable bench space.

PWS4000 Series

Precision. Now available at the touch of a button. Generate the power you need with down to 1 mV/0.1 mA resolution and a basic voltage accuracy of 0.03%. Accelerate complex tests with list mode and a USB port for remote programming. Save time with a numeric keypad for fast and accurate voltage/current selection. Performance. Accuracy. Affordability. Meet your new power supply.

Models	Output Voltage	Output Current	Programmable
PWS4205	20 V	5 A	Yes
PWS4305	30 V	5 A	Yes
PWS4323	32 V	3 A	Yes
PWS4602	60 V	2.5 A	Yes
PWS4721	72 V	1.2 A	Yes

Recommended Accessories

RMU2U	Rackmount Shelf Kit for 1 or 2 Units
386-7598-xx	Rackmount Cosmetic Filler Panel

Recommended Service

SILV100	5-year Extended Warranty

Another Product for Consideration

The DMM Series offers accurate voltage, current and resistance measurements for AC and DC signals.

Ships with Product

- NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate
- Technical Reference Manual & Documentation on CD
- Power Cord
- 3-year Warranty

Product Highlights

- Low noise, linear regulation
- 0.03% basic voltage output
- 0.05% basic current accuracy
- 1mV and 0.1mA output and measurement resolution
- Seven programmable output lists with up to 80 steps/list
- GPIB and USB interfaces

Series 2200 rear panel.

Remote sensing compensates for voltage drops in the test leads by extending the power supply feedback loop to the input of the load.

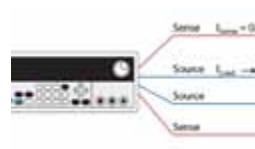# Programmable Single Channel DC Power Supplies with Remote Sensing

Keithley programmable single-channel DC power supplies offer an excellent combination of performance, versatility, and ease of use including 0.03% basic accuracy, 0.1mA measurement resolution, and keypad data entry. Select from a variety of DC power supplies with voltages from 20V to 72V.

Model	Max Output Voltage	Max Output Current	Power	Ripple and Noise
2200-20-5	20V	5A	100W	<1mVRMS, <3mVP-P
2200-30-5	30V	5A	150W	<1mVRMS, <4mVP-P
2200-32-3	32V	3A	96W	<1mVRMS, <4mVP-P
2200-60-2	60V	2.5A	150W	<1mVRMS, <5mVP-P
2200-72-1	72V	1.2A	86W	<1mVRMS, <3mVP-P

Recommended Accessories

CS-1638-12	Rear Panel Mating Connector, Single Channel
USB-B-1	USB Cable
4299-7	Fixed Rack Mount Kit
KPCI-488LPA	IEEE-488 Interface Board for PCI Bus
7007-05	Double Shielded IEEE-488 Cable, 0.5m (1.6ft)
7007-1	Double Shielded IEEE-488 Cable, 1m (3.2 ft)
7007-2	Double Shielded IEEE-488 Cable, 2m (6.5 ft)
7007-3	Double Shielded IEEE-488 Cable, 3m (10 ft)
7007-4	Double Shielded IEEE-488 Cable, 4m (13 ft)

Ships with Product

- User Documentation and Driver CD
- Rear Panel Mating Connector
- Calibration Certificate
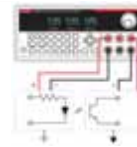- Power Cord
- 3-year Warranty

Product Highlights

- Dual and triple channel models
- Two 30V/1.5A channels
- One 6V/5A channel (on triple channel model)
- All channels are isolated
- All channels are programmable
- USB interface

Model 2230-30-1 rear panel.

Power two isolated circuits with isolated output channels.

Programmable Multiple Channel DC Power Supplies with Remote Sensing

Keithley programmable multi-channel DC power supplies offer an excellent combination of performance, versatility, and ease of use including fully isolated channels, fully programmable channels, and all channel measurements displayed simultaneously. Choose either the dual channel DC power supply or the triple channel DC power supply.

Model	Max Output Voltage	Max Output Current	Power	Ripple and Noise
2220-30-1	Ch 1 : 30V, Ch 2:30V	Ch1: 1.5A, Ch 2: 1.5A	45W/channel; 90W total	<1mVRMS, <3mV P-P
2230-30-1	Ch1: 30V, Ch 2: 30V, Ch 3: 6V	Ch1: 1.5A, Ch 2: 1.5A, Ch 3: 5A	Ch 1 and Ch 2: 45W each Ch 3: 30W, 120W total	<1mVRMS, <3mV P-P

Recommended Accessories

CS-1638-12	Rear Panel Mating Connector, Multi-Channel
USB-B-1	USB Cable
4299-7	Fixed Rack Mount Kit

Ships with Product

- User Documentation and Driver CD
- Rear Panel Mating Connector
- Calibration Certificate
- Power Cord
- 3-year Warranty

Product Highlights

- Optimized for battery-powered device testing
- 100nA current measurement sensitivity
- Load pulse current measurement: 33µs - 833µs
- Variable output resistance: 0 - 1Ω with 10mΩ resolution
- Measure sleep, currents, standby currents, and full load currents to determine power consumption
- Sink current to simulate a discharged battery

Model 2306 Rear Panel.

Simplified schematic of a battery and the 2302/2306.

Portable Device Battery/Charger Simulator

Keithley's battery simulating power supplies can simulate a battery's output characteristics and its discharged state. These supplies can measure low, sleep mode load current and pulsed output load current. Dual channel models facilitate testing portable device, charge control circuitry with a battery channel and a charger simulator channel.

Model	Channels	Max Output Voltage / Current	Power	Transient Response to a 10X Load Current Change	Current Sink Capacity
2302	1	15 V / 5 A	60W	<40µs recovery time and <75mV voltage drop	3A
2306	2	15 V / 5 A	50W	<40µs recovery time and <75 mV voltage drop	3A
2308	2	15 V / 5 A	50W	<35µs recovery time and <90 mV voltage drop	3A

Recommended Accessories

2306-DISP	Remote Display (2302, 2306, 2308)
CS-846	Mating Output Connector
SC-182	Low Inductance Coaxial Cable
4288-1	Single Fixed Rack Mount Kit
4288-2	Dual Fixed Rack Mount Kit
KPCI-488LPA	IEEE-488 Interface Board for PCI Bus
KUSB-488B	IEEE-488 USB-to-GPIB Interface Adapter

Recommended Accessories

7007-05	Double Shielded IEEE-488 Cable, 0.5m (1.6ft)
7007-1	Double Shielded IEEE-488 Cable, 1m (3.2 ft)
7007-2	Double Shielded IEEE-488 Cable, 2m (6.5 ft)
7007-3	Double Shielded IEEE-488 Cable, 3m (10 ft)
7007-4	Double Shielded IEEE-488 Cable, 4m (13 ft)

Ships with Product

- User Documentation
- Rear Panel Mating Connector
- Calibration Certificate
- Power Cord
- 1-year Warranty
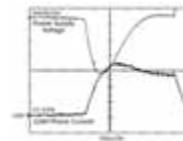
Product Highlights

- Ultra-fast response times to load changes
- Optimized for battery-powered device testing
- 100nA current measurement sensitivity
- Load pulse current measurement: 33µs - 833µs
- Measure sleep, standby currents, and full load currents to determine power consumption
- Sink current to simulate a discharged battery

Model 2303 or 2304A rear panel.

Typical power supply transient response vs. Keithley's high speed power supply transient response.

High Speed Power Supplies

The Model 2303/2304A Power Supplies provide both voltage control and power consumption monitoring for automated testing of portable, battery-operated devices. They are optimized for testing battery-operated, wireless communication devices such as cellular phones that undergo substantial load changes for very short time intervals.

Model	Channels	Max Output Voltage / Current	Power	Transient Response to a 10X Load Current Change	Current Sink Capacity
2303	Single Output	15V/3A or 9V/5A	45W	<40µs recovery time and <100mV voltage drop	2A
2304A	Single Output	20V/5A	100W	<40µs recovery time and <100mV voltage drop	3A

Recommended Accessories

2304-DISP	Remote Display (2303, 2304A)
CS-846	Mating Output Connector
SC-182	Low Inductance Coaxial Cable
4288-1	Single Fixed Rack Mount Kit
4288-2	Dual Fixed Rack Mount Kit
KPCI-488LPA	IEEE-488 Interface Board for PCI Bus
KUSB-488B	IEEE-488 USB-to-GPIB Interface Adapter

Recommended Accessories

7007-05	Double Shielded IEEE-488 Cable, 0.5m (1.6ft)
7007-1	Double Shielded IEEE-488 Cable, 1m (3.2 ft)
7007-2	Double Shielded IEEE-488 Cable, 2m (6.5 ft)
7007-3	Double Shielded IEEE-488 Cable, 3m (10 ft)
7007-4	Double Shielded IEEE-488 Cable, 4m (13 ft)

Ships with Product

- User Documentation
- Rear Panel Mating Connector
- Calibration Certificate
- Power Cord
- 1-year Warranty

Frequency Counter/Timers

Featuring the precision and intuitive operation you've come to expect from our oscilloscopes, Tektronix Timer/Counters are built with performance and convenience in mind. Featuring industry-leading resolution, built-in measurement and analysis modes.

	FCA3000	FCA3100	MCA3000
Frequency Range	400 MHz, 3 GHz, 20 GHz	400 MHz, 3 GHz, 20 GHz	27 GHz, 40 GHz
Resolution	• 100 ps (time) • 12 digits/s (freq)	• 50 ps (time) • 12 digits/s (freq)	• 100 ps (time) • 12 digits/s (freq)
Data Transfer	• 250 k Samples/sec (internal) • 5 k Samples/sec (block)	• 250 k Samples/sec (internal) • 15 k Samples/sec (block)	• 250 k Samples/sec (internal) • 5 k Samples/sec (block)
Measurements	13 Automated Measurements Frequency, Period, Ratio, Time Interval, Time Interval Error, Pulse Width, Rise/Fall Time, Phase Angle, Duty Cycle, Vmax, Vmin, Vp-p	14 Automated Measurements Frequency, Period, Ratio, Time Interval, Time Interval Error, Pulse Width, Rise/Fall Time, Phase Angle, Duty Cycle, Vmax, Vmin, Vp-p, Totalize	13 Automated Measurements Frequency, Period, Ratio, Time Interval, Time Interval Error, Pulse Width, Rise/Fall Time, Phase Angle, Duty Cycle, Vmax, Vmin, Vp-p + An Integrated Power Meter
Analysis Modes	TrendPlot™, Measurement Statistics, Allan Deviation, Histogram	TrendPlot™, Measurement Statistics, Allan Deviation, Histogram	TrendPlot™, Measurement Statistics, Allan Deviation, Histogram
Connectivity	Rear panel: USB device port, GPIB PC communications software: NI LabVIEW SignalExpress™ Tektronix Edition (LE Version)	Rear panel: USB device port, GPIB PC communications software: NI LabVIEW SignalExpress™ Tektronix Edition (LE Version)	Rear panel: USB device port, GPIB PC communications software: NI LabVIEW SignalExpress™ Tektronix Edition (LE Version)

Choosing Your Timer/Counter

To help you choose the right timer/counter for your needs, the most common selection criteria are listed below, along with helpful tips for determining your requirements.

1 Frequency Resolution

The frequency resolution is the smallest change the timer/counter can detect in closely spaced frequencies. The resolution is influenced by the time setting on the instrument, i.e., longer time settings (averaged) will display more digits. In general this feature is expressed as the number of digits per second shown on the instrument's display (e.g. 12 digits/s). More digits indicate a higher frequency resolution.

2 Time Resolution

For timing measurements this feature represents the smallest "time" change that the instrument can detect. Time resolution is sometimes described as "single shot" resolution and is generally measured in pico seconds, e.g. 50 ps. The lower the number the better the time resolution feature.

3 Time Base Stability

The internal time base establishes the reference against which input signals are measured. The better the time base, the more accurate your measurements can be. Most counters employ a quartz crystal as the internal time base element which comes in 3 basic types; Room Temperature (RTXO), Temperature Compensated (TCXO) and Oven Control (OCXO). TCXO and OCXO devices are more stable and when used as the internal time base the instrument will consistently yield accurate and reliable results.

4 Analysis Capability

When choosing your timer/counter, you should review available analysis modes, such as trend plotting, measurement statistics, histograms and modulation domain analysis to ensure your needs are met.

Product Highlights

- 12 digit/sec frequency resolution
- 50 ps (FCA3100) or 100 ps (FCA3000) single-shot time resolution
- 0.001° phase resolution
- 250 k readings/sec data transfer rate to internal memory
- 13 automated frequency, time, phase and voltage measurements
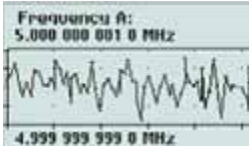
See how your device is changing over time with built-in analysis modes – TrendPlot™, histograms and statistics.

Easily connect to a PC with the USB and GPIB ports.

FCA3100/3000 Series

Looking to capture small frequency and time changes? Look no further than this Timer/Counter/Analyzer. Capture small changes in your signal with industry-leading frequency and time resolution. Quickly and accurately analyze signals with 13 automated measurements and comprehensive built-in analysis modes, including measurement statistics, histograms and TrendPlots. Get unparalleled ease-of-use with intuitive operation and USB connectivity. It's everything you need in a Timer/Counter/Analyzer. And more.

Models	Max. Frequency	Channels	Time Resolution	Frequency Resolution
FCA3000	400 MHz	2	100 ps	12 digit/s
FCA3003	3 GHz	2 – 400 MHz 1 – 3 GHz	100 ps	12 digit/s
FCA3020	20 GHz	2 – 400 MHz 1 – 20 GHz	100 ps	12 digit/s
FCA3100	400 MHz	2	50 ps	12 digit/s
FCA3103	3 GHz	2 – 400 MHz 1 – 3 GHz	50 ps	12 digit/s
FCA3120	20 GHz	2 – 400 MHz 1 – 20 GHz	50 ps	12 digit/s

Recommended Accessories

174-4401-xx	USB Host to Device Cable, 3 Feet
012-0991-xx	GPIB Cable, Double Shielded
012-1256-xx	BNC Male to BNC Male, 9 Feet
ACD4000	Soft Carrying Case
HCTEK-4321	Hard Carrying Case
RMU2U	Rackmount Shelf Kit for 2 Units
TVA3000	TimeView™ Modulation Domain Analysis Software
SIGEXPTE	NI LabVIEW SignalExpress™ Tektronix Edition Software – Full Version

Instrument Options

MS	Medium Stability OCXO Timebase, 2 X 10^{-7}
HS	High Stability OCXO Timebase, 5 X 10^{-8}
RP	Rear-panel Connectors

Recommended Service

SILV200	5-year Extended Warranty (FCA3000, FCA3003, FCA3100, FCA3103)
SILV400	5-year Extended Warranty (FCA3020, FCA3120)

Ships with Product

- Trial Version of TimeView™ Software and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate
- User Manual on CD
- Programmers Guide & Technical Specifications
- Power Cord
- 3-year Warranty

Product Highlights

- 12 digit/sec frequency resolution
- 100 ps single-shot time resolution
- 250 k readings/sec data transfer rate to internal memory
- 13 automated frequency, time, phase and voltage measurements
- Integrated power meter

See how your device is changing over time with built-in analysis modes – TrendPlot™, histograms and statistics.

Easily connect to a PC with the USB and GPIB ports.

MCA3000 Series

Feature-rich. Fully loaded. No matter how you say it, this microwave timer/counter is packed with functionality. Measure up to 40 GHz signals. And, get two extra 300 MHz timer/counter ports for added versatility. Quickly and accurately analyze signals with 13 automated measurements and comprehensive analysis modes, including statistics, histograms and TrendPlots. Get unparalleled ease-of-use with intuitive operation and USB connectivity. Finally, fully-loaded comes standard.

Models	Max. Frequency	Channels	Time Resolution	Frequency Resolution
MCA3027	27 GHz	2 – 300 MHz 1 – 27 GHz	100 ps	12 digit/s
MCA3040	40 GHz	2 – 300 MHz 1 – 40 GHz	100 ps	12 digit/s

Recommended Accessories

174-4401-xx	USB Host to Device Cable, 3 Feet
012-0991-xx	GPIB Cable, Double Shielded
012-1256-xx	BNC Male to BNC Male, 9 Feet
AC4000	Soft Carrying Case
HCTEK-4321	Hard Carrying Case
RMU2U	Rackmount Shelf Kit for 2 Units
TVA3000	TimeView™ Modulation Domain Analysis Software
SIGEXPTE	NI LabVIEW SignalExpress™ Tektronix Edition Software – Full Version

Instrument Options

HS	High Stability OCXO Timebase, 5×10^{-8}
US	Ultra High Stability OCXO Timebase, 1.5×10^{-8}

Recommended Service

SILV600	5-year Extended Warranty

Ships with Product

- Trial Version of TimeView™ Software and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate
- User Manual on CD
- Programmers Guide & Technical Specifications
- Power Cord
- 3-year Warranty

RF Power Meters

Tektronix PSM Power Meter Series delivers the precision accuracy you need and the features you want, including exceptional temperature stability and throughput. Plus, with 13 models to choose from, it also delivers exceptional versatility.

	PSM3000	PSM4000	PSM5000
Description	Power Meter Average Power	Power Meter Average / Peak / Pulse	Power Meter Average / Peak / Pulse + Profiling
Frequency Range	10 MHz - 8 / 18 / 26.5 GHz	10 MHz - 8 / 18.6 / 20 GHz	50 MHz - 8 / 18.6 / 20 GHz
Dynamic Range	-55 to +20 dBm	-60 to +20 dBm	-60 to +20 dBm
Data Transfer Rate	2000 Reads/sec	2000 Reads/sec	2000 Reads/sec
Measurements	True Average Power; Duty Cycle Corrected Pulse Power; Measurement Logging	Average Power (CW); Duty Cycle Corrected Pulse Power; Peak Power, Duty Cycle; Peak and Average Burst Power; Measurement Logging	Average Power (CW); Duty Cycle Corrected Pulse Power; Peak Power, Pulse Power, Duty Cycle; Peak and Average Burst Power; Measurement Logging; Pulse Width, Rise/Fall, Overshoot, Droop, Time Gated Measurements, Pulse Waveform Display with Markers

Choosing Your RF Power Meter

Power measurements are fundamental to the development cycle of any RF or microwave product, from radios to radars. To help you choose the right Power Sensor/Meter combination, the most common selection criteria are listed below, along with helpful tips for determining your requirements.

1 Measurement Integrity

Measurement integrity is a combination of the cumulative measurement uncertainty and instrument stability. While the measurement uncertainty is usually specified, the instrument stability includes several factors. By providing calibration over the entire temperature operating ranges and not requiring zeroing prior to measurement, the improved stability of the power sensor/meter reduces possible human errors and assures the integrity of measured results.

2 Performance and Functionality

Basic power measurements of continuous wave (CW) signals are fundamental to power sensor/meters. However, today's modern signals include modulation, pulses, or other time-varying attributes. Being able to correct for duty cycle, measure peak power, signal statistics, and triggering inputs and outputs increase the utility of the power sensor/meter combination.

3 Speed and Connectivity

Power measurements tend to dominate the test process of wireless device test. The speed of measurement should remain constant over the entire dynamic range of the sensor. USB connectivity and power enable high speed measurement throughput and help reduce system rack space.

4 Analysis

When integrating power measurements into a full system measurement process, you should review the available analysis software and hardware capabilities to determine if equipment redundancies can be eliminated. Advanced measurement analysis, like trend graphing, statistical measurements, measurement logging, and pulse profiling can replace more complex and expensive equipment needs and simplify device test.

Product Highlights

- 8 GHz, 18 GHz, 20 GHz, and 26.5 GHz Models
- Models Available with N and 3.5 mm Connectors
- Dynamic Range as Low as –60 dBm and as High as +20 dBm
- Uncertainty as Low as 2.6%
- Reading Rates up to 2000 Readings/sr

PSM3000, 4000 and 5000 Series

The PSM3000, PSM4000, and PSM5000 Series are compact power sensors/meters that deliver fast, accurate RF and microwave power measurements. A broad range of CW and pulse modulation measurements are available, depending on the series you choose.

Models	Description	Frequency Range	Dynamic Range	Connector Style
PSM3110	True RMS Average	10 MHz - 8 GHz	-55 to +20 dBm	3.5mm male
PSM3120	True RMS Average	10 MHz - 8 GHz	-55 to +20 dBm	N-Male
PSM3310	True RMS Average	10 MHz - 18 GHz	-55 to +20 dBm	3.5mm male
PSM3320	True RMS Average	10 MHz - 18 GHz	-55 to +20 dBm	N-Male
PMS3510	True RMS Average	10 MHz - 26.5 GHz	-55 to +20 dBm	3.5mm male
PSM4110	Power Meter (Avg / Peak / Pulse)	10 MHz - 8 GHz	-60 to +20 dBm	3.5mm male
PSM4120	Power Meter (Avg / Peak / Pulse)	10 MHz - 8 GHz	-60 to +20 dBm	N-Male
PSM4320	Power Meter (Avg / Peak / Pulse)	50 MHz - 18.6 GHz	-40 to +20 dBm	N-Male
PSM4410	Power Meter (Avg / Peak / Pulse)	50 MHz - 20 GHz	-40 to +20 dBm	3.5mm male
PSM5110	Power Meter (Avg / Peak / Pulse + Profiling)	100 MHz - 8 GHz	-60 to +20 dBm	3.5mm male
PSM5120	Power Meter (Avg / Peak / Pulse + Profiling)	100 MHz - 8 GHz	-60 to +20 dBm	N-Male
PSM5320	Power Meter (Avg / Peak / Pulse + Profiling)	50 MHz - 18.6 GHz	-40 to +20 dBm	N-Male
PSM5410	Power Meter (Avg / Peak / Pulse + Profiling)	50 MHz - 20 GHz	-40 to +20 dBm	3.5mm male

Recommended Accessories

174-6150-xx	USB Cable, 2 m, 20 AWG
174-6164-xx	SMB Female to BNC Male, 1 m Trigger Cable
348-2013-xx	Replacement Rubber Boot

Recommended Service

SILV200	5-year Extended Warranty (PSM3110, PSM3120)
SILV400	5-year Extended Warranty (PSM3310, PSM3320)
SILV600	5-year Extended Warranty (PSM3510)

Ships with Product

- 2-meter USB Cable
- Calibration Certificate, USB flash drive with User and Safety Manual, Technical Reference Manual and the Programmer Manual
- 3-year Warranty

The Tektronix Service Advantage

Tektronix offers unequalled expertise, global reach and a customer-centric approach with every service option. From our full suite of service plans for Tektronix equipment to our Multi-Vendor Service (MVS) calibration, we can ensure optimal performance for your entire inventory of test and measurement instruments.

Tektronix Service Highlights

- **Tektronix Factory Experts**
  Access to the engineering expertise that designed and built your products to ensure they are in peak performance. Our support engineers hold an average of 20 years of training and experience.

- **Comprehensive and Thorough Treatment**
  Software updates, safety and reliability modifications, and cosmetic enhancements are included if applicable. Products are returned to you in "like-new" condition. The Tektronix network of service centers offers worldwide support.

- **Efficiency and Convenience**
  Our team of professionals focus on getting your instruments back to you as soon as possible, minimizing your downtime and increasing your operating efficiency.

- **Flexible Repair and Calibration Service**
  Tektronix offers you the choice of a cost effective, flexible service package to meet your specific business needs.

Tektronix Factory-Certified Service Plans

Silver Care	Silver Care Packages	Gold Care
• Choose between a 3 or 5 year extended warranty plan • No purchase orders, quotes, or approval delays – one phone call away starts the repair process • Covers equipment, parts, labor and transportation • Includes applicable software, safety and reliability updates • Faster repair time than without coverage (average is 5 days faster	• All the benefits of our popular Silver Care Plan in a convenient take-home package. • Each package includes a unique activation code to effortlessly initiate and manage your service coverage online. • May be purchased any time during the original warranty period	• Choose between a 3 or 5 year extended warranty plan • Loaner product of equal or higher performance shipped within 24 hours • Priority access to Global Tektronix Customer Call Center for technical support • 30% discount on scheduled Factory-certified calibration • Coverage of user-caused EOS and ESD damage • Typical downtime of 48 hours or less

Platinum Care	Calibration
• Custom-tailored plan with a typical downtime of less than 1 hour. • Identically configured spare products dedicated to your facility • On-site calibration event and repair coverage • Priority access to technical support, and flexible contract duration and payment terms,	• Choose from multi-year contracts and single event calibrations • Accredited and traceable calibration • Adjustments included to restore performance • Applicable software, safety, and reliability updates • Calibration records retention
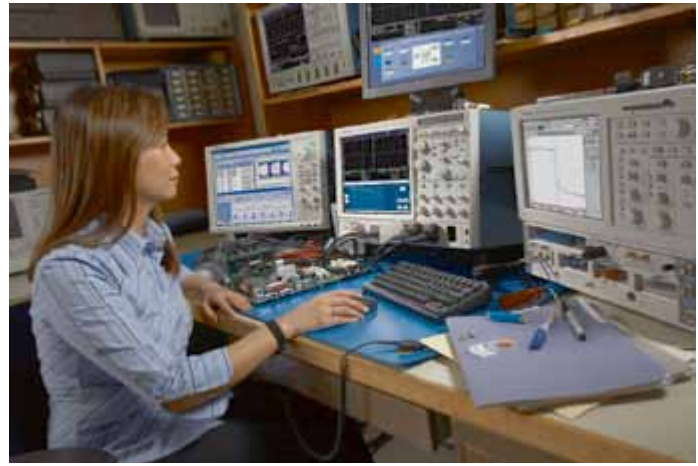
Multi-Vendor Service

Comprehensive Calibration and Repair for All Your Test, Measurement and Control Equipment

- Service for more than 140,000 instruments from over 9,000 manufacturers
- Broadest scope of accreditation; manage 100% of repairs and calibration
- 100+ global points of service
- 1 million calibrations annually

Performance

Calibration is the cornerstone of measurement confidence. Now Tektronix can manage 100% of your calibration and repairs, irrespective of product brand or origin. Our multi-vendor service tools simplify your calibration management program, minimizing downtime and improving operational efficiency.

Optimize Asset Availability & Utilization

Tektronix provides industry-leading calibration and repair turnaround time on more than 140,000 products from over 9,000 manufacturers. The CalWeb® Asset Management System allows you to actively manage any downtime required for regular equipment maintenance and provides you with online, enterprise-wide instrument visibility.

Global Reach with Local Presence

Tektronix has the most extensive global network of resources. With more than 100 points of service and 1,000 highly trained experts, our unmatched suite of capabilities and services are available locally to most of the world's research and manufacturing centers.

Quality & Accuracy

Our comprehensive quality system is unmatched. Choose from multiple NIST traceable certificate options, including ANSI Z540.1, ISO/IEC 17025 and ISO 9001:2008. Our customers have direct access to the quality they expect from Tektronix' 65 years as an industry leader in test, measurement and monitoring solutions.

Industry Leader

Tektronix is the industry leading provider of calibration services for the life science, aerospace, and defense industries. With consistent high quality and comprehensive service, customers have turned to Tektronix, making us their first choice for outsourced calibration needs.

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