Agilent Technologies
Oscilloscopes

www.agilent.com/find/scopefamily

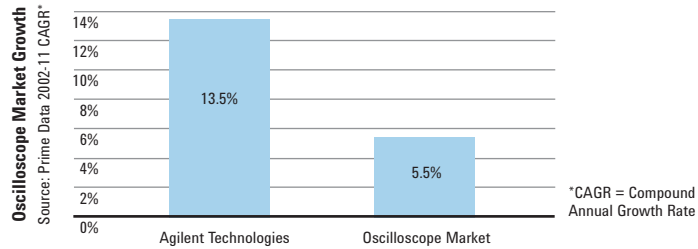*Anticipate* ___ *Accelerate* ___ *Achieve*

Agilent Technologies

Agilent Technologies: We engineer our scopes for you

When you tell us about the test and debug challenges you face, we listen.

We need your input to design scopes that help you master your challenges. We don't build "me-too" products and we don't develop technical solutions in search of a problem to solve. Instead we bring you products with imaginative capabilities that meet your toughest demands.

Oscilloscope Market Growth
Source: Prime Data 2002-11 CAGR*

Agilent Technologies	13.5%
Oscilloscope Market	5.5%

*CAGR = Compound Annual Growth Rate

With our comprehensive portfolio, you'll find a scope that fits your needs perfectly.

Whether your main consideration is price point or performance level, we offer a variety of models that will work for you. Our platforms range from USB-modular units to high-performance real-time and sampling scopes, with bandwidths from 20 MHz to more than 90 GHz. When your requirements change, so can your scope, thanks to the availability of extensive hardware and software upgrades.

Each of our scopes incorporates the innovative technology you expect from Agilent.

As the world's largest test and measurement company, Agilent commands a breadth of engineering knowledge that enables us to deliver unique technology. Our custom MegaZoom IV ASIC powers InfiniiVision's unmatched waveform update rate. The Infiniium multi-chip module supports the industry's lowest noise floor at every bandwidth. And the InfiniiMax probing system provides the flattest frequency response on the market.

Our scopes give you the answers you need, not just measurements.

Technology alone isn't enough – you want fast, accurate answers to your questions. That's why we offer the largest range of application-specific software available anywhere, plus an outstanding selection of probes and accessories. With flexible solutions like these, you can easily customize your instrument as your design environment changes.
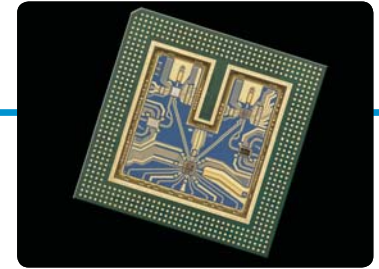
It's no surprise that Agilent is the fastest-growing vendor in the scope market.*

In the past three years, we've completely refreshed our scope lineup, with new entries from InfiniiVision portables to Infiniium powerhouses. We've received numerous industry awards for our breakthroughs. But more importantly, our scopes contribute to your success – and ultimately help you build the products that improve our world.

*Source PrimeData

Here are just a few awards earned by Agilent scopes:

Elektra2010 WINNER	EDN INNOVATION WINNER 2008	Oscilloscope Company of the Year	ELECTRON D'OR 2010
Infiniium 90000 X-Series	Infiniium 90000 Series	Oscilloscope Company of the Year	Infiniium 90000 X-Series
best electronic design 2010	2008 design news GOLDEN MOUSETRAP Finalist	BEST IN TEST	R&D 100 2011
Infiniium 90000 X-Series	Infiniium 90000 Series	InfiniiVision X-Series	Infiniium 90000 X-Series

Infiniium multi-chip module isolates EMI.
To enable our scopes to operate at high frequencies with minimal electromagnetic interference (EMI), we relied on our expertise in radio frequency (RF) technology. Instead of implementing each component of a digital circuit in a separate circuit block, we created a multi-chip module that uses a Faraday cage to isolate EMI. The result? High-bandwidth scopes with the lowest noise floor in the industry.

InfiniiVision ASIC chip enables Mega*Zoom*.
InfiniiVision scopes incorporate acquisition memory, waveform processing, and display memory in an advanced .13m ASIC. This patented 4th generation technology, known as MegaZoom IV, delivers up to 1,000,000 waveforms (acquisitions) per second with responsive deep memory always available.

U1600 Handheld Oscilloscope

U2700 USB Modular Oscilloscopes
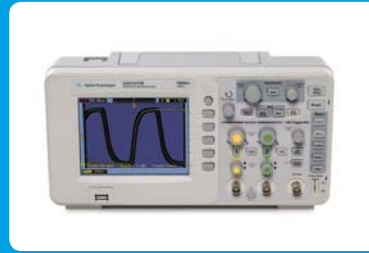
1000 Series Oscilloscopes

2000 X-Series Oscilloscopes

3000 X-Series Oscilloscopes

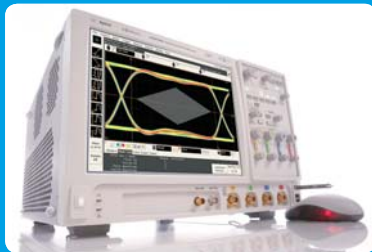
4000 X-Series Oscilloscopes

6000L Series Oscilloscopes

7000B Series Oscilloscopes

9000 Series Oscilloscopes

90000A Series Oscilloscopes

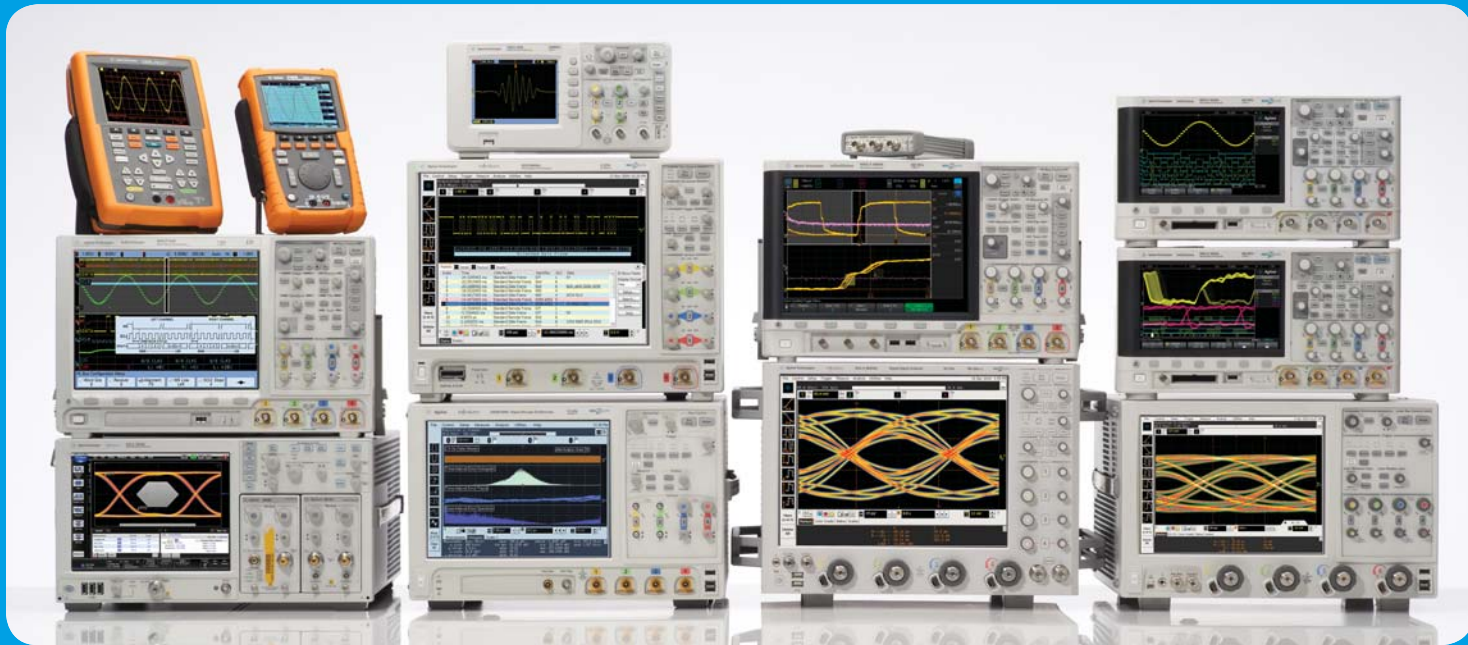**90000 X-Series Oscilloscopes**

90000 Q-Series Oscilloscopes

86100D DCA-X Series Oscilloscopes

Probes and Applications

Model comparison chart

	U1600	2700	1000	2000X	3000X	4000X	6000/7000	9000	90000A	90000X/Q	86100D
Channels	2	2	2, 4	2, 2+8, 4, 4+8	2, 2+16, 4, 4+16	2, 2+16, 4, 4+16	2, 2+16, 4, 4+16	4 , 4+16	4	4	Up to 16
Bandwidth	20 MHz to 200 MHz	100 MHz to 200 MHz	50 MHz to 200 MHz	70 MHz to 200 MHz	100 MHz to 1 GHz	200 MHz to 1.5 GHz	100 MHz to 1 GHz	600 MHz to 4 GHz	2.5 GHz to 13 GHz	16 GHz to 63 GHz	Module dependent to 65 GHz optical, 90 GHz electrical
Sample rate	Up to 2 GSa/s	1 GSa/s	Up to 2 GSa/s	2 GSa/s	Up to 5 GSa/s	Up to 5 GSa/s	4 GSa/s	Up to 20 GSa/s	20 or 40 GSa/s on all 4 channels	Up to 80 GSa/s on 4 channels and 160 GSa/s on 2 channels	40 kSa/s
Memory depth	Up to 2 Mpts	32 Mpts, std.	Up to 10 kpts	100 kpts	2 Mpts, std. Up to 4 Mpts, opt.	4 Mpts, std.	8 Mpts, std.	20 Mpts/channel, std.	10 Mpts, std. Up to 1 Gpts, opt.	Up to 2 Gpts	Limited by hard drive
Connectivity & storage	USB 2.0 host/device port: std (U1610A/20A) USB 2.0 device port: std (U1602B/04B) *USB 2.0 host port - Option 001	USB device: std.	USB 2.0 host (one front, one back) and device	USB host (one front, one back), USB device, LAN: opt., VGA: opt., GPIB: opt.	USB host (one front, one back), USB device, LAN: opt., VGA: opt., GPIB: opt.	USB 2.0 (device and host x3), LAN, VGA out, opt GPIB-LAN adaptor	USB (device and host), LAN, XGA-out: std.	USB 2.0, LAN, I/O ports, RS-232, parallel, dual-monitor video, auxiliary output	USB 2.0 host and device, Gigabit Ethernet: std., GPIB: opt.	USB 2.0 host and device, Gigabit Ethernet: std., GPIB: opt.	USB 2.0, LAN, RS-232, VGA-out, parallel, PS/2, GPIB:out
Waveform math & analysis	Waveform math and FFT. Complimentary PC link software, USB cable can be used to quickly transfer data to a PC for further post-processing and analysis.	Waveform math and FFT. Data can easily be transferred to an external PC for further post-processing and analysis.	Waveform math and FFT. Data can easily be transferred to an external PC for further post-processing and analysis.	Waveform math, InfiniiView offline analysis and FFT. Data can easily be transferred to an external PC for further post-processing and analysis.	Waveform math, InfiniiView offline analysis and FFT. Data can easily be transferred to an external PC for further post-processing and analysis.	Waveform math, InfiniiView offline analysis and FFT. Data can easily be transferred to an external PC for further post-processing and analysis.	Waveform math, InfiniiView offline analysis and FFT. Data can easily be transferred to an external PC for further post-processing and analysis.	Up to four independent/ cascaded math functions, FFT, eye, jitter, standards compliance, InfiniiView offline analysis, Matlab (opt), Windows 7 based-system.	Up to four independent/ cascaded math functions, FFT, eye, jitter, standards compliance, InfiniiView offline analysis, Matlab (opt), Windows 7 based-system.	Up to four independent/ cascaded math functions, FFT, eye, jitter, standards compliance, InfiniiView offline analysis, Matlab (opt), Windows 7 based-system.	TDR, S-Parameters, eye diagram analyzer, advanced jitter and amplitude analysis, de-embed, embed, FFT, phase noise analysis application, MATLAB: opt.
Market	High performance hand-held scope for installation and maintenance in the industrial power, utilities/ facilities, automotive and A/D industries. The scope isolated channels enables floating voltage measurement for industrial customers (for U1610A/ U1620A only).	Portable scope ideal for electronics troubleshooting and functional test as well as educational teaching and research labs. Also suitable for road warriors.	Portable economy oscilloscope for low-speed design and debug, as well as educational and design labs where bench space and budget are limited.	Portable economy oscilloscope for low-speed design and debug, as well as educational and design labs where bench space and budget are limited.	Portable economy oscilloscope with serial protocol analysis, ideal for mixed-signal and embedded designs as well as educational and design labs where bench space and budget are limited.	High-performance portable oscilloscope ideal for debugging applications. Large, capacitive touch screen and fast update rate make it ideal for signal viewing and analysis of infrequent events. Integrated capabilities of five instruments plus a comprehensive list of applications provides the most measurement flexibility.	High-performance portable scope ideal for mixed-signal and embedded designs. Large high-resolution display makes it the best scope for signal viewing and capturing intermittent glitches and signal transients. Comprehensive software suite provides insight into application-specific problems.	High-performance oscilloscope designed for engineers who need to solve a variety of debug issues across analog, digital, and protocol domains. .	High-performance real-time oscilloscope provides superior signal integrity. Addressing the needs for high-speed digital and RF applications. More than 29 applications for compliance, debugging, and analysis.	High-performance, real-time scope provides industry's highest real-time scope measurement accuracy. Supports high-speed digital and RF applications and emerging technologies. More than 25 applications for compliance, debugging, and analysis.	High-performance, high bandwidth multi-function sampling scope for serial bus applications, optical, TDR/TDT and any signal requiring advanced jitter analysis.

CONTENTS

Infiniium 90000 X-Series

Infiniium 90000 Series

Oscilloscope Company of the Year

Infiniium 90000 X-Series

Infiniium 90000 X-Series

Infiniium 90000 Series

InfiniiVision X-Series

Infiniium 90000 X-Series

U1600 Series Oscilloscopes

20 MHz to 200 MHz handheld scopes

Engineered for performance in rugged and portable applications

- See more clearly and differentiate simultaneous signals from both channels more easily with a 5.7 inch VGA TFT LCD display or 4.5″ LCD color display*

- Up to 4 hours battery life and robust package – makes an ideal companion for I&M personnel and those on the go

- Scopes isolated channels enable floating measurements capability on the U1610A/20A

- Up to 1 GSa/s per channel real time sampling rate and 1 Mpts recording length ensure you get high performance, even on a handheld

- Three-in-one solution: Dual-channel scope, true RMS DMM and real time data logger

- High speed USB port for a quick and convenient way to save data into USB flash drive and/or to remote access using the scope**

*5.7 inch VGA TFT LCD display for U1610A/ 20A and 4.5 inch LCD color display for U1602B/04B

**USB host- Opt 001 is optional for U1602B/U1604B only
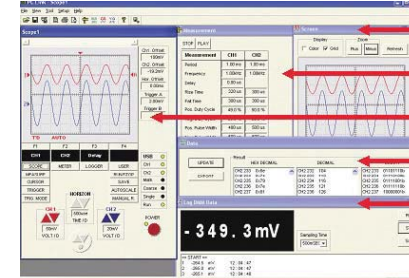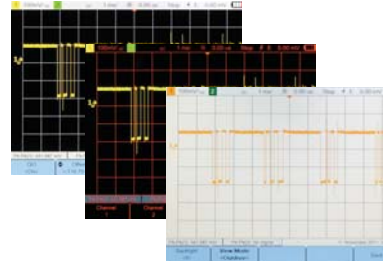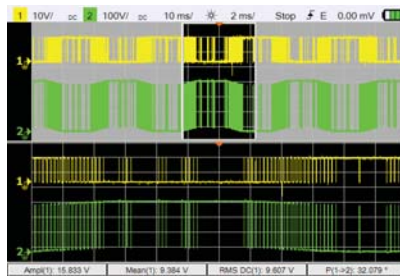
Handheld high performance. In-plant or off-site, take advantage of a fully featured scope with 22 automatic measurement functions, advanced triggering, high sampling rate and deep memory.

High-precision zoom-in capability. Deep memory and a high sampling rate let you capture long time spans and non-repeating signals, then zoom in to the segment of interest to scrutinize subtle details.

VGA display. View waveforms under all lighting conditions, including in indoor, outdoor and dark environments. (U1610A/20A only)

Easy connections. PC Link software handles your data collection, storage and documentation needs – or lets you control the unit remotely – using a USB 2.0 full-speed connection.

Models and specifications

	U1602B	U1604B	U1610A	U1620A
Bandwidth	20 MHz	40 MHz	100 MHz	200 MHz
Sample rate	200 MSa/s*or 100 MSa/s**		1 GSa/s*or 500 MSa/s**	2 GSa/s*or 1 GSa/s**
Record length	Up to 125 Kpts		Up to 120 Kpts	Up to 2 Mpts
Channels	2			
Display	4.5" color CSTN LCD (320x240)		5.7" VGA TFT LCD	
Channel isolation	N/A		Yes	
Vertical resolution	8-bits			
Vertical sensitivity	5 mV/div to 100 V/div		2 mV/div to 50 V/div	
Maximum input	CAT III 300 Vrms (up to 400 Hz) from terminal to ground		CAT III 600 V (with 10:1 probe), CAT III 300 V (direct)	
Input impedance	1 MΩ II < 20 pF		1 MΩ ± 1% ≈ 22 pF ± 3 Pf	
Timebase range	50 ns to 50 s/div	10 ns to 50 s/div	5 ns/div to 50 s/div	2 ns/div to 50 s/div
Triggering	Edge, pattern, pulse width, video		Edge, glitch, TV, nth edge	
Dimensions	24.1 cm high x 13.8 cm wide x 6.6 cm deep		27 cm high x 18.3 cm wide x 6.5 cm deep	
Weight	1.5 kg		< 2.5 kg	
Battery life	Up to 4 hours		Up to 3 hours	

*Single channel operation

**Dual channel operation

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes:

  • All models come with the U1561A CATIII 600V probe
  • See our complete list of compatible probes on pages 34-35

Accessories – Don't forget options that make measurements faster and more convenient, such as the CATIII 600V 100:1 probe, Desktop charger & Li-Ion battery pack, AC current clamp, temperature adapter, carrying case and USB host capability.

U2700 Series Oscilloscopes

100 MHz and 200 MHz USB modular scopes

Engineered for versatility and portability without compromising performance

- Provides up to 1 GSa/s (interleaved) sampling and 32 Mpts of memory to help
  you gain better insight into signal details

- Advanced analysis capabilities built into the bundled AMM (Agilent Measurement Manager) scope software include waveform math and FFT with windowing

- Normal, averaging and peak-detect acquisition modes

- Advanced triggering including edge, pulse width and line-selectable video

- Manual, auto and tracking cursors with ΔT, ΔV and frequency measurements

- Over 25 measurement and math functions

- 1,250-point FFT, Hamming, Blackman-Harris and rectangular windowing

- Dual-screen display with FFT function and keyboard shortcut keys (with AMM software)

- Provides flexibility of standalone or chassis-based operation for dual-play capability
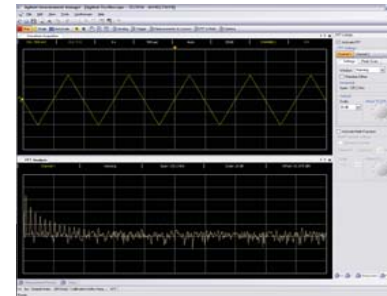
Dual-play capability. Carry powerful test equipment in your bag along with your laptop PC, or use it with other instruments in a chassis.
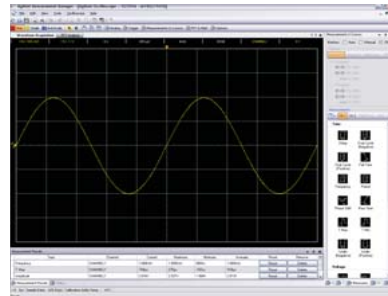
Simplify waveform analysis with automatic measurements such as rise time and duty cycle, and the measurement results panel.

Explore frequency domain characteristics of measured waveforms using FFT analysis (with four windowing functions) and search for peak values of the FFT.
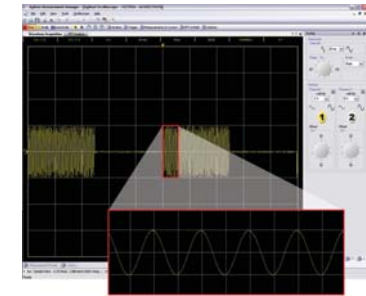
Capture signal details effectively with deep memory.

Models and specifications

	U2701A	U2702A
Bandwidth	100 MHz	200 MHz
Sample rate	1 GSa/s, 500 MSa/s each channel, max	
Channels	2	
Memory	Up to 32 Mpts	
Vertical resolution	8 bits	
Vertical sensitivity	2 mV/div to 5V/div	
Maximum input	CAT 1 30 Vrms, 42 Vpk	
Input impedance	1 MΩ: ≈16 pF	
Timebase range	1 ns/div to 50s/div	
Triggering	Edge, pulse width, TV	
Dimensions	117.00 mm x 180.00 mm x 41.00 mm (with rubber bumper) 105.00 mm x 175.00 mm x 25.00 mm (without rubber bumper)	
Weight	534 g (with rubber bumper) 482 g (without rubber bumper)	

Scope additions and enhancements

Probes – Improve your measurement reliability with our complete selection of probes:

- U2701A comes with the N2862B 10:1, 150 MHz passive probe; U2702A comes with the N2863B 10:1, 300 MHz passive probe
- See the complete list of compatible probes on pages 34-35

Accessories – Don't forget options that make measurements faster and more convenient, such as the six-slot USB MI chassis, BNC cable and USB secure cable.

2000 X-Series Oscilloscopes

70 MHz to 200 MHz economy oscilloscopes

Breakthrough technology delivers more scope for the same budget

• 8.5-inch WVGA display, with 50% more signal viewing than other scopes, is the largest in this class

• 50,000 waveforms per second update rate so you can see more of your signal detail and infrequent anomalies more of the time

• 4 instruments in 1: oscilloscope, mixed-signal oscilloscope, WaveGen function generator, and integrated digital voltmeter

• First fully upgradable oscilloscope: bandwidth, MSO, WaveGen, and measurement applications

• Supports InfiniiView offline analysis software and Agilent Spectrum Visualizer for vector signal analysis
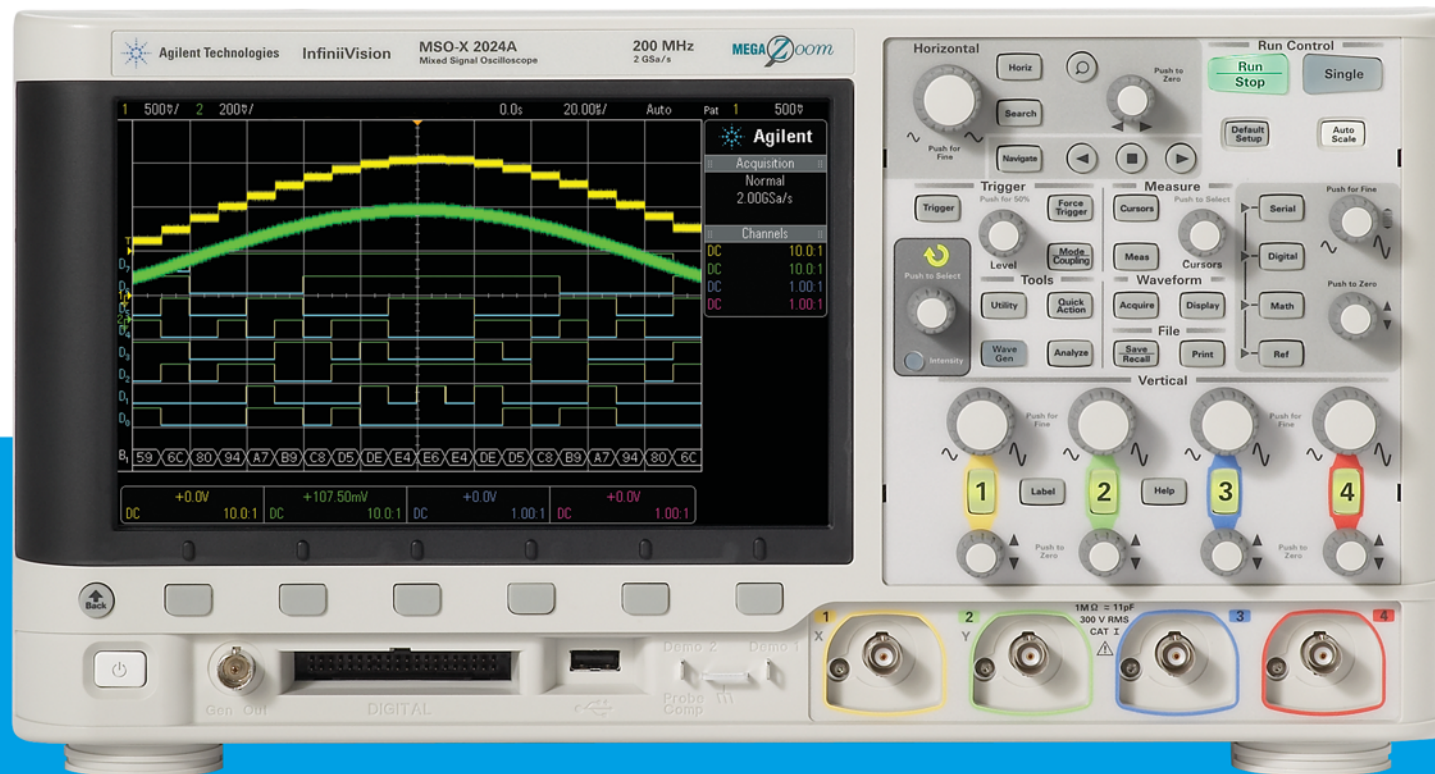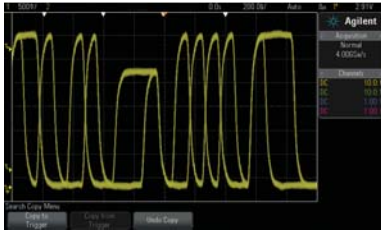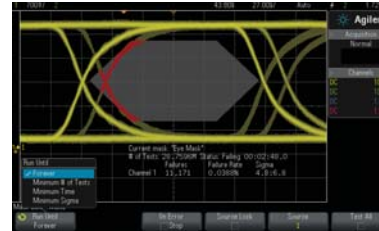
See more of your signal more of the time with the largest screen in its class, the deepest memory and the fastest waveform update rates.
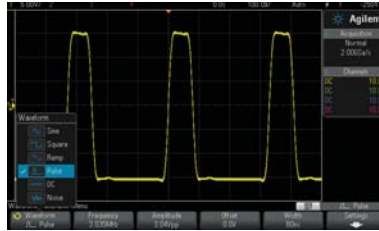
Do more with the power of 4 instruments in 1: oscilloscope, logic timing analyzer (optional), integrated WaveGen arbitrary-function generator (optional), and integrated digital voltmeter (optional).

Get more investment protection with this fully upgradable scope, including bandwidth.

Search and navigate front panel controls make it easy to find and view specific signal activity quickly, play, stop, rewind and fast forward through waveforms.

Models and specifications

		2002A	2004A	2012A	2014A	2022A	2024A
Bandwidth		70 MHz		100 MHz		200 MHz	
Sample rate		2 GS/s half channel, 1 GS/s full channel					
Channels	DSOX	2	4	2	4	2	4
	MSOX	2+16	4+16	2+16	4+16	2+16	4+16
Memory		100 kps					
Display		8.5-inch high definition wide display					
Waveform update rate		50,000 waveforms per second					
Vertical resolution		8 bits					
Vertical sensitivity		1 mV/div ~ 5 V/div					
Bandwidth limit		Approximately 20 MHz					
Maximum input voltage		CAT I 300 Vrms, 400 Vpk, CAT II 300 Vrms, 400 Vpk					
Input impedance		1 MΩ ± 2% (11 pF)					
Timebase range		5 ns/div to 50 s/div				2 ns/div to 50 s/div	
Time scale accuracy		25 ppm ± 5 ppm per year					
Triggering		Edge, Pulse width, Pattern, Video					
Connectivity		Standard USB Device x2, USB Host x 1 , Optional LAN, VGA, GPIB					
Dimensions		381 mm W x 204 mm H x 141 mm D					
Weight		3.85 kg (8.5 lbs)					

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes:

- DSO/MSOX2002A, 2004A, 2012A and 2014A come with the N2862B 150 MHz passive probe, 10:1 attenuation
- DSO/MSOX2022A and 2024A come with the N2863B 300 MHz passive probe, 10:1 attenuation
- See our complete list of compatible probes on pages 34-35

Accessories – Don't forget options that make measurements faster and more convenient, such as the VGA/LAN or GPIB modules, soft carrying case, and rackmount kit.

DSO-to-MSO upgrades – Protect your investment with the flexibility to upgrade to an MSO at any point after purchase

Bandwidth – Increase bandwidth at any time

Applications – Expand your scope's capabilities with our powerful lineup of applications:

- Options include: WaveGen function generator, 3-digit voltmeter, mask testing and segmented memory
- See our list of applications on pages 30-32

3000 X-Series Oscilloscopes

100 MHz to 1 GHz economy oscilloscopes

Breakthrough technology delivers more scope for the same budget

- 8.5-inch WVGA display, with 50% more signal viewing than most other scopes in this class

- 1,000,000 waveforms per second update rate so you can see more of your signal detail and infrequent anomalies more of the time

- Up to 4 Mpts gives you more memory so you can capture long, non-repeating signals while maintaining a high sample rate

- 5 instruments in 1: oscilloscope, mixed-signal oscilloscope, WaveGen function generator, serial protocol analyzer, and integrated digital voltmeter

- First fully upgradable oscilloscope: bandwidth, MSO, WaveGen, DVM, and measurement applications
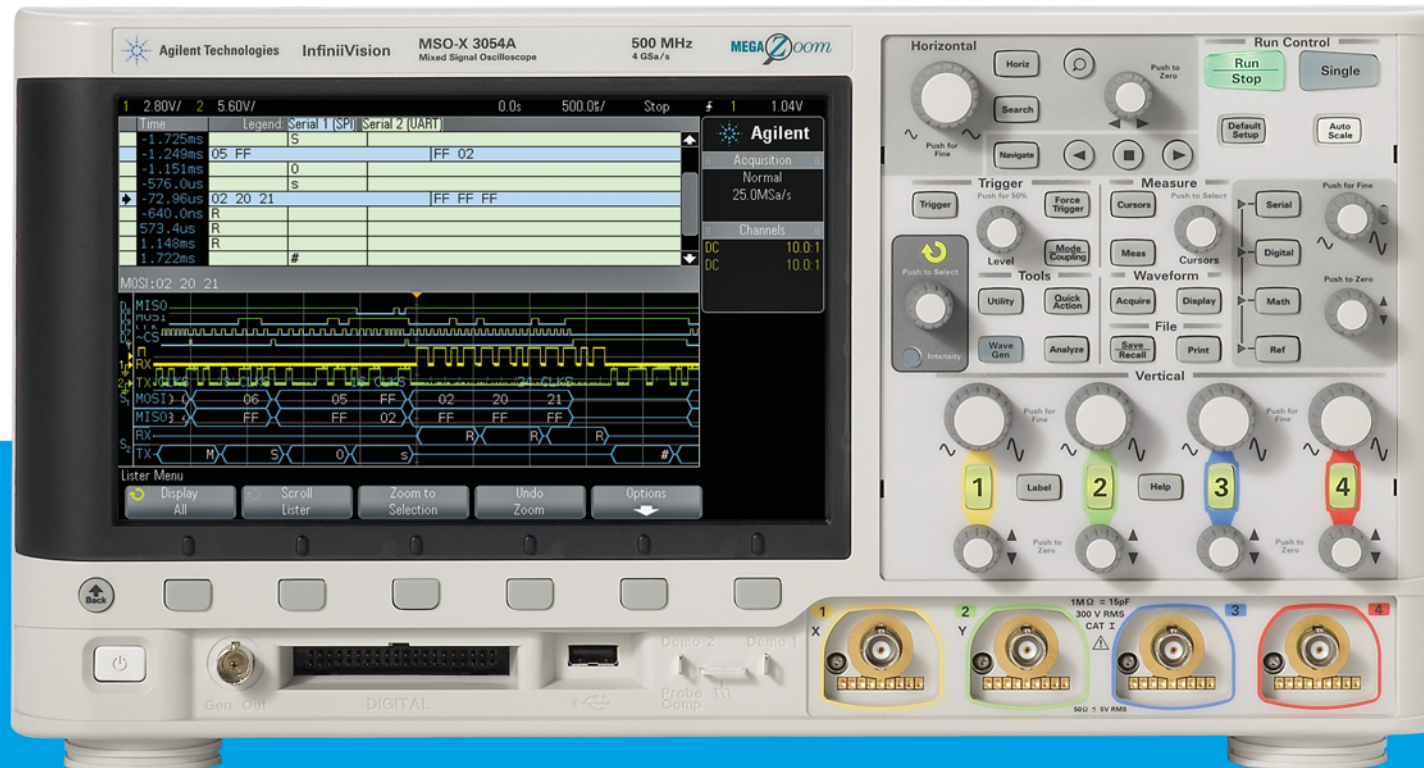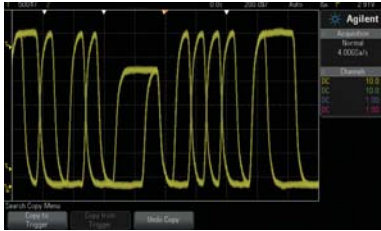
See more of your signal more of the time with the largest screen in its class, the deepest memory and the fastest waveform update rates.
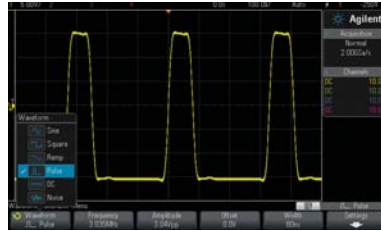
Do more with the power of 5 instruments in 1: oscilloscope, logic timing analyzer (optional), integrated WaveGen arbitrary-function generator (optional), serial protocol analyzer, and integrated digial voltmeter (optional).
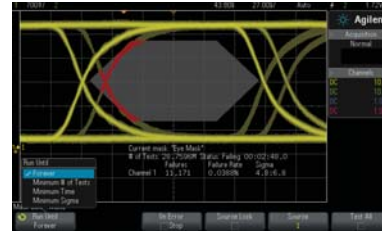
Get more investment protection with the fully upgradable scope, including bandwidth.

Serial bus triggering and hardware-based protocol decoding means you can efficiently debug your embedded designs that include serial bus communication.

Models and specifications

		3012A	3014A	3024A	3032A	3034A	3052A	3054A	3102A	3104A
Bandwidth		100 MHz		200 MHz	350 MHz		500 MHz		1 GHz	
Sample rate		4 GS/s half channel, 2 GS/s full channel							5 GS/s (½), 2.5 GS/s (full)	
Channels	DSOX	2	4	4	2	4	2	4	2	4
	MSOX	2+16	4+16	4+16	2+16	4+16	2+16	4+16	2+16	4+16
Memory		Up to 4 Mpts, optional segment memory								
Display		8.5-inch high definition wide display								
Waveform update rate		1 million waveforms per second								
Vertical resolution		8 bits								
Vertical sensitivity		1 mV/div ~ 5 V/div								
Bandwidth limit		Approximately 20 MHz								
Maximum input voltage		CAT I 300 Vrms, 400 Vpk, CAT II 300 Vrms, 400 Vpk								
Input impedance		Selectable 1 MΩ ± 1% (14 pF), 50Ω ± 1.5%								
Timebase range		5 ns/div to 50 s/div		2 ns/div to 50 s/div			1 ns/div to 50 s/div		500 ps/div to 50 s/div	
Time scale accuracy		25 ppm ± 5 ppm per year								
Triggering		Edge, edge then edge (B trigger), pulse width, pattern, OR, rise/fall time, nth edge burst, runt, setup & hold, video, enhanced video (HDTV), USB, ARINC429, CAN, FlexRay, I²C, I²S, LIN, MIL-STD1553, SPI, UART/RS232/422/485								
Connectivity		Standard USB Device x², USB Host x 1 , Optional LAN, VGA, GPIB								
Dimensions		38.1 cm W x 20.4 cm H x 14.1 cm D								
Weight		3.85 kg (8.5 lbs)								

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes:

- DSO/MSOX3012A and 3014A come with the N2862B 150 MHz passive probe, 10:1 attenuation
- DSO/MSOX3024A comes with the N2863B 300 MHz passive prove, 10:1 attenuation
- DSO/MSOX3032A, 3034A, 3052A and 3054A come with the N2890A 500 MHz passive probe, 10:1 attenuation
- See our complete list of compatible probes on pages 34-35

Accessories – Don't forget options that make measurements faster and more convenient, such as the VGA/LAN or GPIB modules, soft carrying case, and rackmount kit.

DSO-to-MSO upgrades – Protect your investment with the flexibility to upgrade to an MSO at any point after purchase

Bandwidth – Increase bandwidth at any time

Memory – Increase memory depth at any time

Applications – Expand your scope's capabilities with our powerful lineup of applications:

- Options include: WaveGen function generator, DVM, mask testing and segmented memory I²C, SPI, CAN, LIN, RS232/UART, HDTV, FlexRay, ARINC429, MILSTD1553 and I²S
- See our list of applications on pages 30-32

4000 X-Series Oscilloscopes

200 MHz to 1.5 GHz digital storage and mixed signal scopes

Oscilloscope "experience" redefined

- Industry-exclusive 12.1-inch capacitive touch display is the largest display in this class of oscilloscopes

- 1,000,000 waveforms per second update rate means you can see more of your signal more of the time

- Exclusive InfiniiScan Zone touch triggering simplifies complex triggering to a touch of the screen

- Get 5 instruments in 1: oscilloscope, mixed-signal oscilloscope, serial protocol analyzer, WaveGen dual-channel function/arbitrary generator, 3-digit voltmeter

- Full upgradable: bandwidth, MSO WaveGen, DVM and measurement applications
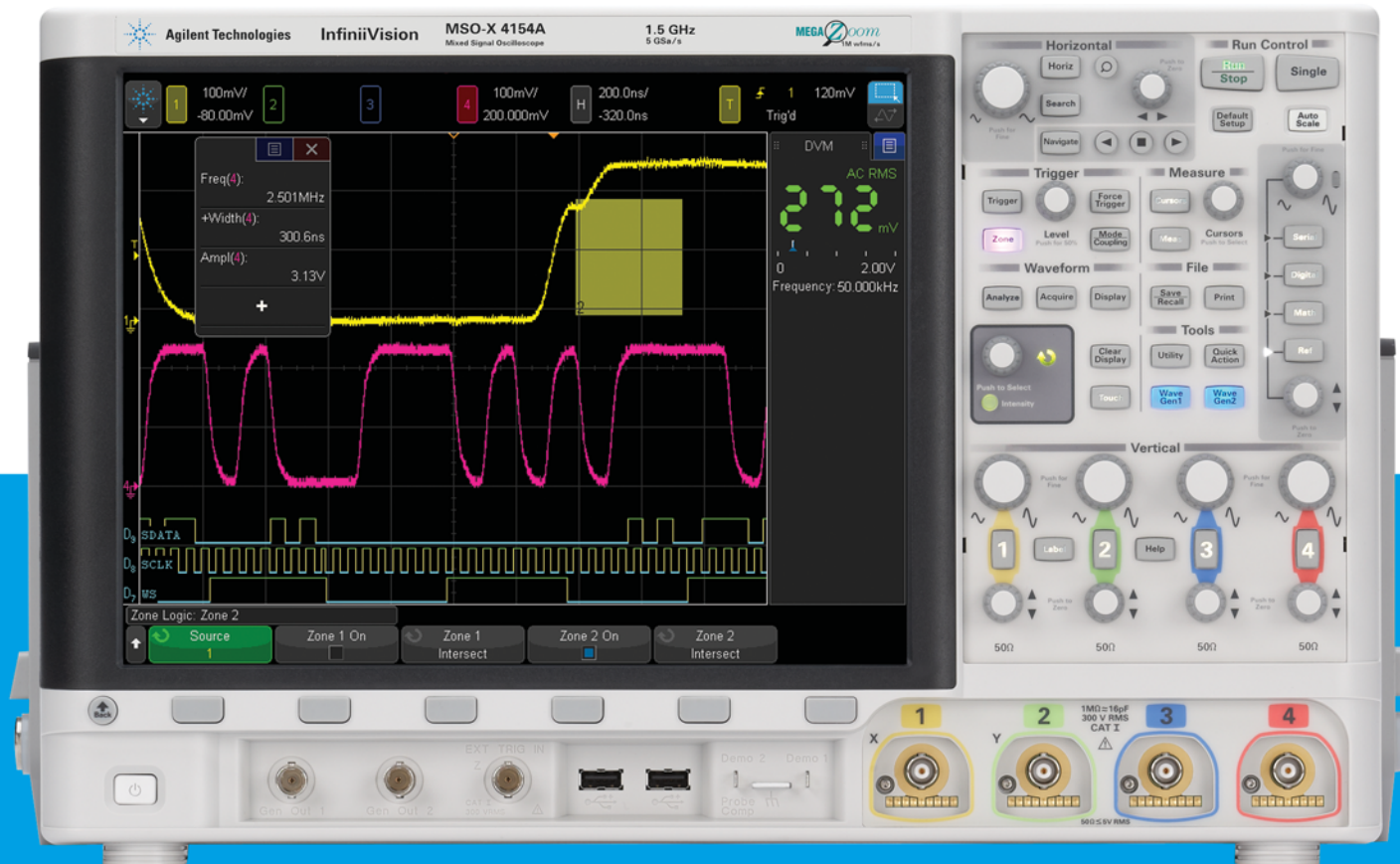
Experience the capacitive 12-inch touch screen. Drag measurements, cursors and side-bar panels, for quick oscilloscope setup. Use the alpha-numeric touch pad for dramatically faster annotation.
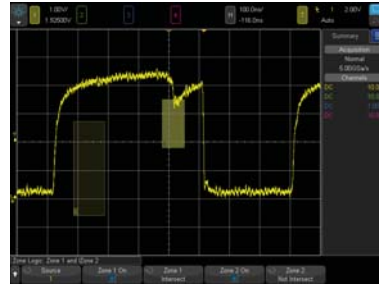
Experience InfiniiScan Zone touch trigger. Triggering never has been this easy before; simply draw a box on your signal of interest for instantaneous triggering.
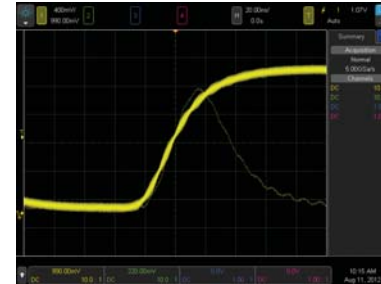
Experience the Speed. Industry's fastest waveform update rate uncovers infrequent anomalies others may miss.

Experience the Integration. Save your bench space and improve your measurement efficiencies with built in protocol analyzer, MSO, dual-channel WaveGen, and DVM.

Models and specifications

		4022A	4024A	4032A	4034A	4052A	4054A	4104A	4154A
Bandwidth		200 MHz		350 MHz		500 MHz		1 GHz	1.5 GHz
Sample rate		5 GS/s half channel, 2.5 GS/s full channel							
Channels	DSOX	2	4	2	4	2	4	4	4
	MSOX	2+16	4+16	2+16	4+16	2+16	4+16	4+16	4+16
Memory		Standard 4 Mpts, Standard segmented memory							
Display		12.1-inch high definition capacitive touch display							
Waveform update rate		1 million waveforms per second							
Vertical resolution		8 bits							
Vertical sensitivity		1 mV/div ~ 5 V/div							
Bandwidth limit		Approximately 20 MHz							
Maximum input voltage		CAT I 300 Vrms, 400 Vpk, CAT II 300 Vrms, 400 Vpk							
Input impedance		Selectable 1 MΩ ± 1% (15 pF), 50Ω ± 1.5%							
Timebase range		2 ns/div to 50 s/div				1 ns/div to 50 s/div		500 ps/div to 50 s/div	
Time scale accuracy		± 10 ppm							
Triggering		InfiniiScan Zone touch trigger, edge, edge then edge (B trigger), pulse width, pattern, OR, rise/fall time, nth edge burst, runt, setup & hold, video, enhanced video (HDTV)*, USB 2.0*, ARINC429*, CAN*, FlexRay*, I²C*, I²S*, LIN*, MIL-STD1553*, SPI*, UART/RS232/422/485*							
Connectivity		Standard LAN, VGA, USB Device x3, USB Host x 1 , Optional GPIB							
Dimensions		45.4 cm W x 29.8 cm H x 15.6 cm D							
Weight		6.3 kg (13.9 lbs)							

*optional

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes. See complete list of compatible probes on pages 34-35

- All DSO/MSO4000 X-models come with standard one per channel N2894A 700-MHz passive probe (10:1 attenuation)

Accessories – Don't forget options that make measurements faster and more convenient, such as the rackmount kit and soft carrying case

Bandwidth & DSO-to-MSO upgrades – Protect your investment with the flexibility to upgrade your bandwidth and MSO channels at any time

Applications – Expand your scope's capabilities with our powerful lineup of applications:

- Integrated feature options: Dual-channel WaveGen, DVM, mask/limit testing, education training kit
- General and serial protocol applications: MIL-STD 1553, ARINC 429, USB 2.0 (low, full, and hi-speed), audio serial (I²S), CAN, LIN, FlexRay, RS232, UART, I²C, SPI, Xilinx, FPGA dynamic probe, power analysis, HDTV

InfiniiVision 6000 & 7000B Series Oscilloscopes

100 MHz to 1 GHz digital storage and mixed signal scopes

Engineered for the best signal visibility

- Captures and compares analog, digital and serial signals

- 100,000 waveforms per second real-time update rate helps you catch the most elusive glitches

- Only high-performance scope with battery-power option - enabling 2+ hours without line power (6000A Series)

- Only high-performance 1U-high rack-mountable scope (6000L Series)

- Serial bus trigger/decode options including I^2C, SPI, CAN, LIN, I^2S, RS-232/UART, MIL-STD 1553 and FlexRay

- DSO models upgradable to MSO whenever you need greater capabilities

- 3-year return-to-Agilent warranty to protect your investment
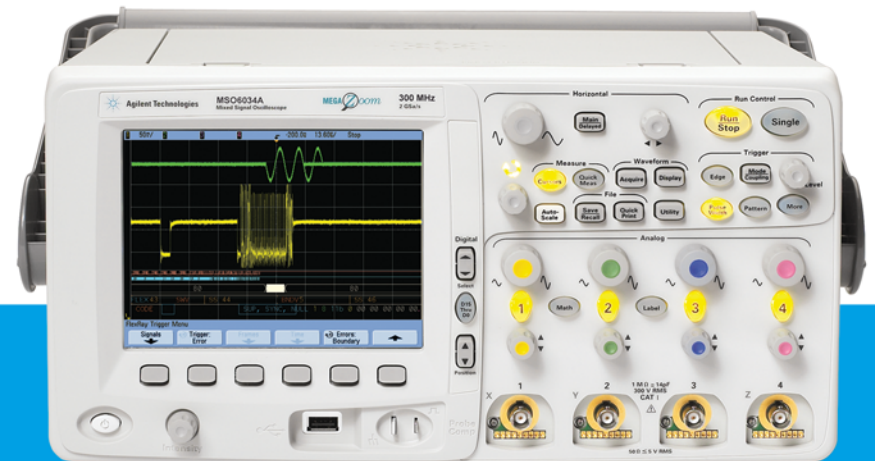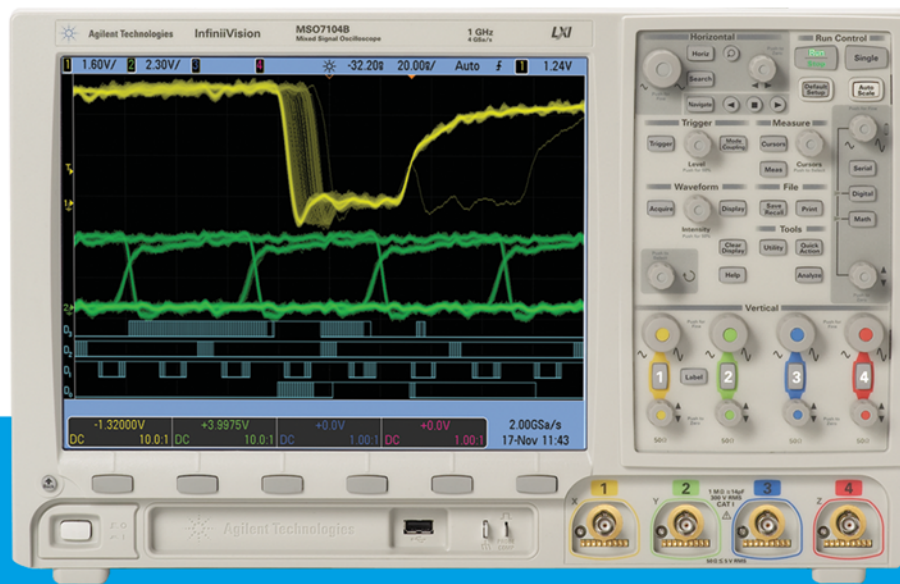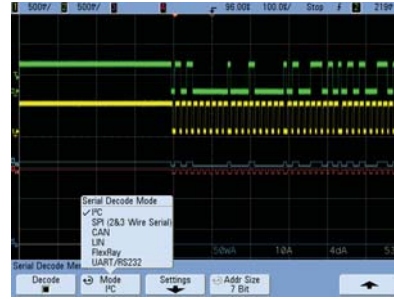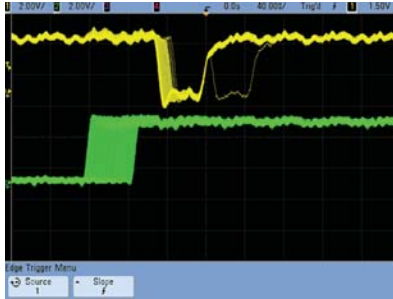
Fast. MegaZoom III technology delivers up to 100,000 waveform acquisitions per second so the scope responds instantly and you won't miss infrequent events and critical signal detail.

Smart. Customize your scope with a wide range of application packages that provide meaningful insight into application-specific problems.

Battery-power option. Make measurements where line power isn't available with an optional, internal, rechargeable lithium ion battery.

Also available in a compact, rack-mountable design. The 6000L is 1U high and 19″ wide to save valuable rack space. Side and rear air vents (no top or bottom air vents) let you mount other instruments directly above or below. Rack mount brackets and rack rails are standard with every unit.

Models and specifications

6000A/L Series	6012A	6014A/L	6032A	6034A	6052A	6054A/L	6102A	6104A/L
7000B Series	7012B	7014B	7032B	7034B	7052B	7054B	7102B	7104B
Bandwidth	200 MHz		350 MHz		500 MHz		1 GHz	
Sample rate	2 GSa/s each channel				4 GSa/s half channel, 2 GSa/s full channel			
Channels DSOX	2	4	2	4	2	4	2	4
Channels MSOX	2+16	4+16	2+16	4+16	2+16	4+16	2+16	4+16
Memory	Standard 8 Mpts, optical segmented memory							
Display	XGA display (6000A: 6.3-inch, 7000B: 12-1-inch)							
Waveform update rate	100,000 waveforms per second							
Vertical resolution	8 bits							
Vertical sensitivity	2 mV/div ~ 5 V/div (except 601xA: 1 mV/div ~ 5 mV/div)							
Bandwidth limit	Approximately 20 MHz							
Maximum input voltage	CAT I 300 Vrms, 400 Vpk, CAT II 300 Vrms, 400 Vpk							
Input impedance	Selectable 1 MΩ ± 1% (14 pF), 50Ω ± 1.5% (except 601xA: 1 MΩ ± 1% (11pF) only)							
Timebase range	5 ns/div to 50 s/div		2 ns/div to 50 s/div		1 ns/div to 50 s/div		500 ps/div to 50 s/div	
Time scale accuracy	≤ ± (15+2* (instrument age in years)) ppm							
Triggering	Edge, pulse width, pattern, TV, duration, sequence, CAN, LIN, USB, I²C, SPI, RS-232, Nth edge burst, MIL-STD 1553, FlexRay							
Connectivity	Standard USB Host x2, USB Device x1, LAN, XGA output, GPIB (option 7000B)							
Battery operation	Option - BAT (6000A Series only)							
Dimensions	6000A: 354 mm wide x 188 mm high x 282 mm deep, 6000L: 435 mm wide x 42 mm high x 270 mm deep, 7000B: 454 mm wide x 277 mm high x 173 mm deep							
Weight	6000A: 4.9 kg (10.8 lbs), 6000L: 2.45 kg (5.4 lbs), 7000B: 5.9 kg (13 lbs)							

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes:

- 603xA, 605xA, 610xA, 703xB, 705xB and 710xB come with the 10073D 10:1, 500 MHz passive probe
- 601xA and 701xB come with the 10074D 10:1, 150 MHz passive probe
- See our complete list of compatible probes on pages 34-35

Accessories – Don't forget options that make measurements faster and more convenient, such as the hard transit case, scope cart, evaluation kit and rackmount kit.

Portable power – Consider the battery option for measurements on the go (6000A Series).

DSO-to-MSO upgrades – Protect your investment with the flexibility to upgrade to MSO after purchase.

Applications – Expand your scope's capabilities with our powerful lineup of applications:

- Options include I²C, SPI, CAN/LIN, RS-232, FPGA, FlexRay, I²S, MIL-STD 1553, power, offline analysis, vector signal analysis, mask testing and segmented memory
- See our complete list of applications on page 30-32

Infiniium 9000 Series Oscilloscopes

## 600 MHz to 4 GHz digital storage and mixed signal scopes

Engineered for the broadest measurement capability

- The combination of powerful Infiniium scope features, the world's fastest integrated MSO and the first multi-tab protocol viewer allows you to quickly debug and test a wide variety of designs, making it the best 3-in-1 instrument
- The large display, thin depth and light weight make using, sharing or moving the scope easy

- Get fast and accurate answers to technology-specific problems with the widest range of applications
- Provides bandwidth, memory, triggering and signal fidelity triggering for debugging, characterizing and analyzing a wide variety of analog, serial, digital, and RF signals
- 15" XGA display, the largest in the industry, makes it easier to view analog, digital and serial signals
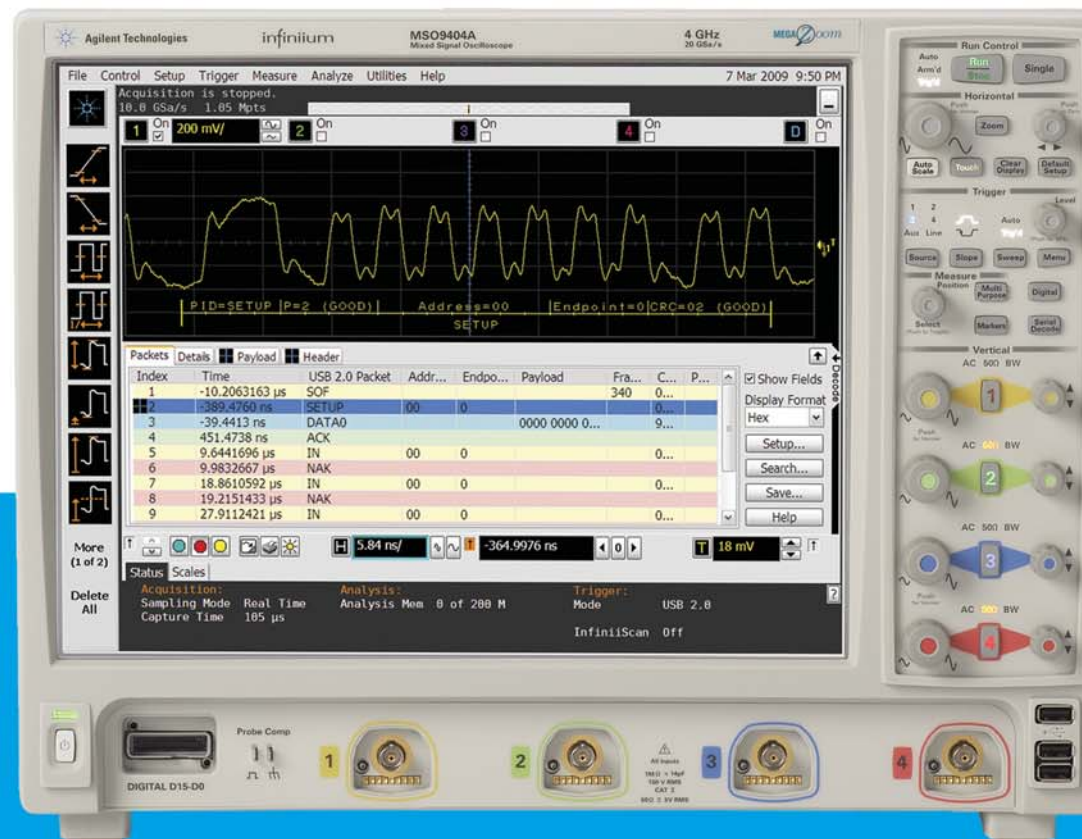
Powerful Infiniium scope. Fast sample and update rates let you see a precise representation of your signal. Use responsive deep memory to see longer periods of time.
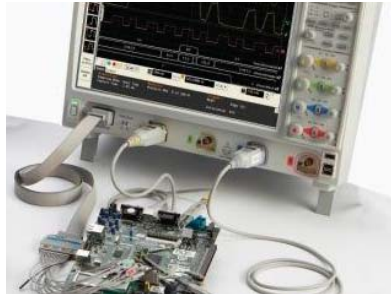
Integrated mixed signal oscilloscope. With sample rates of up to 20 GSa/s, you can see critical timing relationships or use the 16 digital channels to see data values. Or, use the digital channels for protocol analysis. Trigger across the industry's largest range of time-correlated analog and digital channel combinations.

Protocol analysis capability. Extend your scope capability with protocol analysis. Trigger and view packets at the protocol level and drill up or down between the physical and protocol layers. The tracking marker/bar shows precise time alignment between protocol viewer and analog waveforms.

Sized to fit your environment. The Infiniium 9000 offers the largest display in the industry, with a smaller depth and lighter weight than any other scope in its class. It's an engineering feat with a 20 layer board, 27 ASICs and three workhorse FP-GAs designed to deliver maximum performance.

Models and specifications

	DSO9064A MSO9064A		DSO9104A MSO9104A		DSO9254A MSO9254A		DSO9404A MSO9404A	
Bandwidth	600 MHz		1 GHz		2.5 GHz		4 GHz	
Sample rate	5 GSa/s, 10 GSa/s on 2 channels		10 GSa/s, 20 GSa/s on 2 channels					
Channels	4	4+16 logic	4	4+16 logic	4	4+16 logic	4	4+16 logic
Memory	20 Mpts std. Optional up to 1 Gpts							
Vertical resolution	8 bits ≥12 bits with averaging							
Vertical sensitivity	1 MΩ: 1 mV/div to 5 V/div, 50 Ω: 1 mV/div to 1 V/div							
Maximum input	1 MΩ:150V RMS or DC, CAT I ± 250 V (DC + AC) in AC coupling 50MΩ: 5 Vrms, CAT I							
Input impedance	50 MΩ ± 2.5%, 1 MΩ ± 1% (13pF typical)							
Timebase range	5 ps/div to 20 s/div							
Timebase accuracy	± (0.4 + 0.5 * YearsSinceCal) ppm pk							
Triggering	Edge, glitch, runt, timeout, pattern/pulse range, state, pulse width, line, window, setup and hold, video, serial							
Dimensions	42.4 cm W x31.8 cm H x 22.6 cm D							
Weight	13.9 kg							

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes:
 • All models come with four N2873A 10:1, 500 MHz miniature passive probes and MSO models include a flying lead MSO cable set
 • Check out the award-winning InfiniiMax probing system, new N2750A Series InfiniiMode probes and the N2795A/96A single-ended
    active probes
 • See our complete list of compatible probes on pages 34-35

Accessories – Don't forget options that make measurements faster and more consistent, such as the removable hard drive and rackmount kit.

Memory – Increase memory depth to 500 Mpts at any time.

**Applications** – Expand your scope's capabilities with our powerful lineup of applications:
 • Compliance testing: USB 2.0, Ethernet, DDR 1/2/3, MIPI D-PHY
 • Protocol analysis: I²C, SPI, CAN, RS-232/UART, USB, PCI Express, JTAG, 8B/10B, MIPI D-PHY, SVID, DigRF
 • Other: Jitter, InfiniiScan, FPGA debug, VSA, power, comm. mask testing
 • See our complete list of applications on pages 30-32

Infiniium 90000A Series Oscilloscopes

2.5 GHz to 13 GHz high-performance real-time lab scopes

Engineered for superior signal integrity and measurement confidence

- Up to 13 GHz bandwidth and up to 40 GSa/s sample rate on four channels

- 122,000 measurements per second give you amazing measurement update throughput

- Bandwidth upgradeable from 2.5 GHz to 13 GHz

- Industry's largest selection of application software packages, including: USB, PCI Express®, SATA, DDR, HDMI, and more

- Industry's most flexible compliance software with new user-defined application add-in capability

- Low noise for both the oscilloscope and its probing system

- Industry leading MegaZoom ultra deep memory – 1 Gpts at 40 GSa/s on all four channels

- Three level sequence triggering with InfiniiScan Plus trigger system
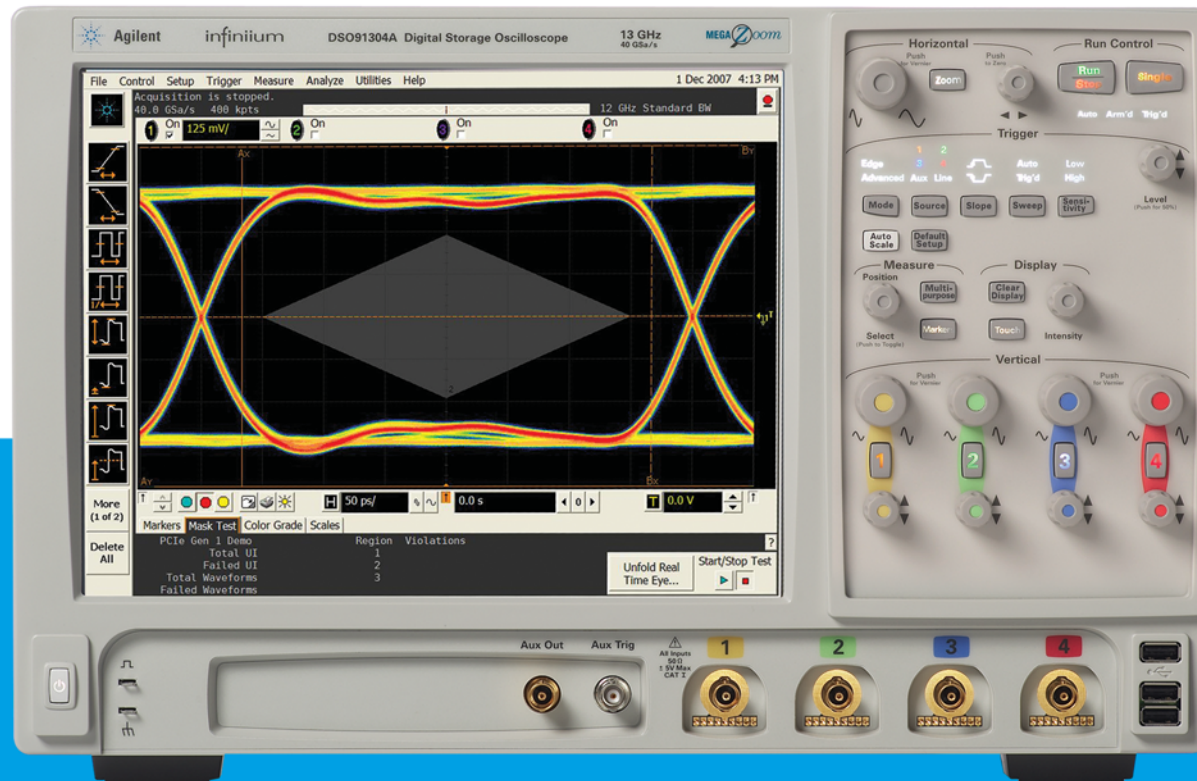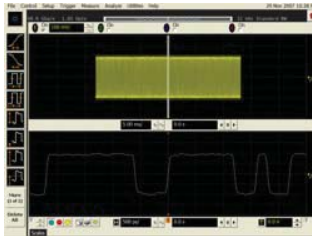
Powerful signal capture. Acquire 25 ms of PCI Express Gen2 data at 40 GSa/s using 1 Gpts of memory to capture your signal of interest.
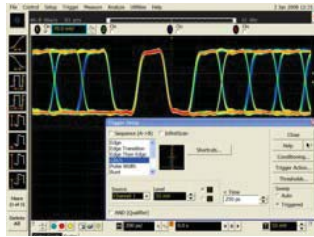
Leading glitch trigger. Consistently trigger on 200 ps single bit (one UI) of PCI EXPRESS Gen2 using industry – leading <250 ps glitch trigger.
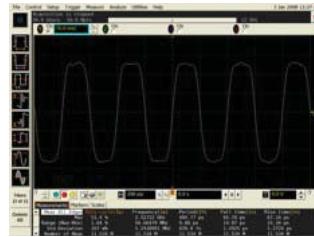
"Measure all edges" mode. Make more than 5 million measurements in less than 1 minute using the "measure all edges" mode and long memory to increase your confidence in the measurement statistics.

Industry's deepest memory (1 Gpts). Reveal low frequency jitter components with deep memory.
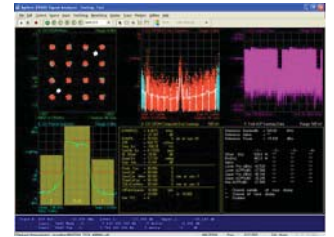
Certified compliance testing. Use VSA (vector signal analysis software) and DSA91204A for Certified Wireless USB compliance testing.

Models and specifications

DSO and DSA	DSO/DSA90254A	DSO/DSA90404A	DSO/DSA90604A	DSO/DSA90804A	DSO/DSA91204A	DSO/DSA91304A
Bandwidth	2.5 GHz	4 GHz	6 GHz	8 GHz	12 GHz	13 GHz
Sample rate	20 GSa/s			40 GSa/s		
Channels	4 channels					
Display	12.1" XGA touch screen					
Display update rate	400,000 waveforms per second (in segmented memory mode)					
Memory	20 Mpts standard, optional up to 1 Gpts (50 Mpts std. on DSA)					
Vertical resolution	8 bits, ≥ 12 bits with averaging					
Vertical sensitivity	1 mV/div to 1 V/div					
Max input voltage	± 5 V					
Input impedance	50 Ω, ±3%					
Timebase range	5 ps/div to 20 s/div real-time					
Time scale accuracy	$\pm (0.4 + 0.5 * YrsSinceCal)$ ppm pk					
Triggering	3-level sequence hardware (2 levels) and InfiniiScan software trigger: edge, edge transition, edge then edge, glitch, line, pulse width, runt, timeout, pattern/pulse range, state, setup/hold, window, HDTV, non-monotonic, measurement, and zone qualify					
Typical noise floor	147 µVrms	186 µVrms	234 µVrms	283 µVrms	365 µVrms	389 µVrms
Max data transfer rate	22 MSa/s					
Dimensions	43.2 cm wide x 28.3 cm high x 50.6cm deep					
Weight	20 kg					
Power	800 watts, max.					

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes, including the award-winning InfiniiMax probing system, new N2750A Series InfiniiMode probes and the N2795A/N2796A/1157A/1158A single-ended active probes. See our complete list of compatible probes on pages 34-35.

Accessories – Don't forget options that make measurements faster and more convenient, such as the rackmount kit, transit case and testmobile.

Memory – Increase memory depth at any time.

Bandwidth – Protect your investment with bandwidth upgrades after purchase.

Applications – Expand your scope's capabilities with our powerful lineup of applications:
  • Analysis options include jitter and eye analysis, user defined function,
    MATLAB, and many more
  • Compliance options include DDR1, 2, and 3, PCI Express, HDMI, DisplayPort, SATA, SAS, XAUI, USB and more
  • Transport your scope application license from one Infiniium to another with the application server license
  • See our complete list of applications on pages 30-32

Infiniium 90000 X-Series Oscilloscopes

## 13 GHz to 33 GHz high-performance real-time lab scopes

Engineered for 33 GHz true analog bandwidth that delivers

- The industry's highest real-time scope measurement accuracy
- High true analog bandwidth at 33 GHz
- Lowest oscilloscope noise floor of 2.04 mV at 50 mV/div

- Lowest jitter measurement floor at 100 fs
- The industry's first and only 30 GHz oscilloscope probing system
- Industry's most comprehensive application-specific measurement software
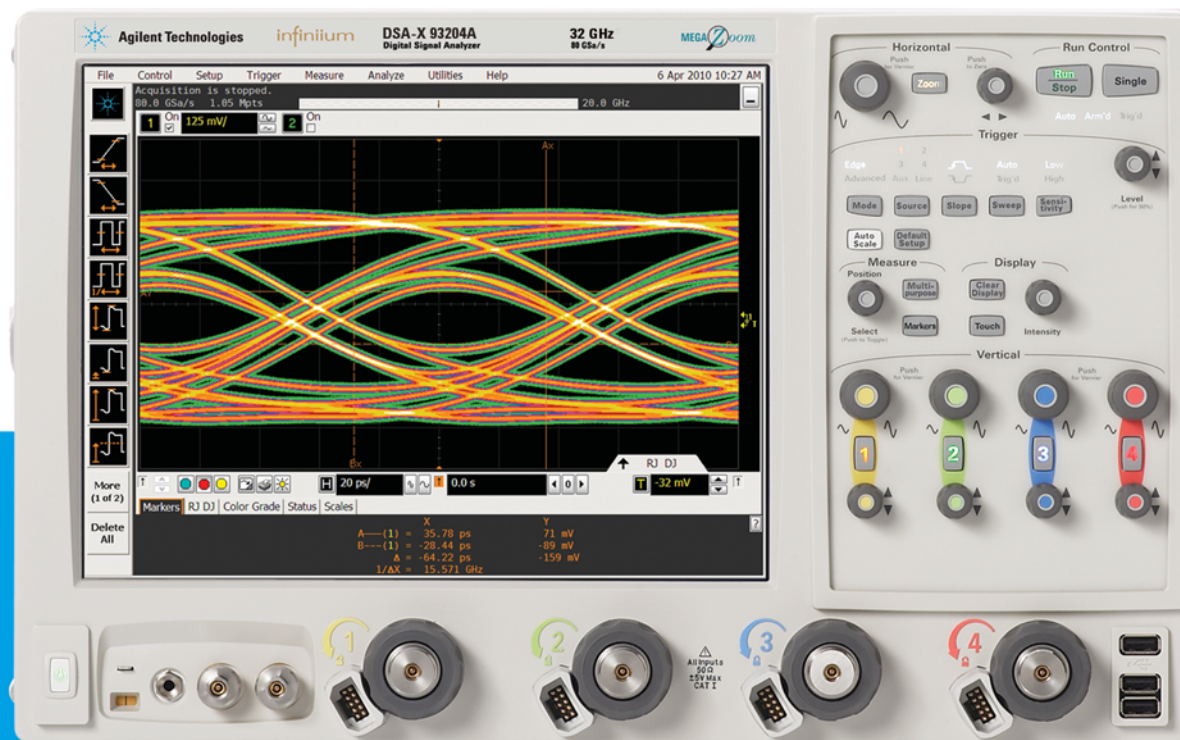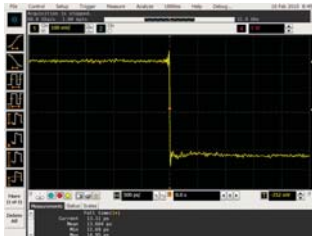
Custom front end technology. The fastest real-time oscilloscope bandwidth available is achieved directly through the scope hardware, without the noise and distortions introduced with boosting techniques used by other vendors. Capture rise times as fast as 12.4 ps with confidence.
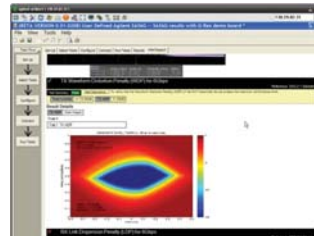
User-defined application software allows automated compliance testing on proprietary buses. Quickly program and automate any set of measurements with an interface similar to Agilent compliance test software while emerging test standards solidify. Applications are available today for: MIPI M-PHY, DDR4, GDDR5, and SAS 12G.
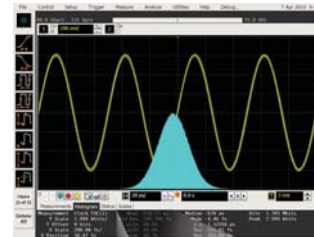
Lowest real-time scope jitter measurement floor. Your signal rise times are more accurately depicted.

Quickly characterize and compensate the frequency response. PrecisionProbe uses its 200 GHz indium phosphide process to create a fast edge for characterization.
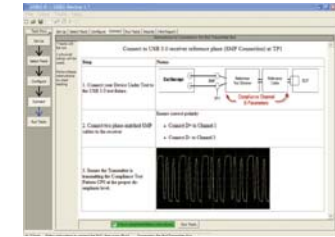
Certified compliance testing. Use one of the many available compliance application software packages, for standards such as USB 3.0, to test.

Models and specifications

DSO and DSA	X91304A	X91604A	X92004A	X92504A	X92804A	X93204A
Bandwidth	13 GHz	16 GHz	20 GHz	25 GHz	28 GHz	33 GHz
Sample rate	80 GSa/s on 2 channels, 40 GSa/s on 4 channels					
Channels	4 channels					
Display	12.1" XGA touch screen					
Display update rate	>400,000 waveforms per second (in segmented memory mode)					
Memory	20 Mpts standard, optional up to 2 Gpts (50 Mpts std. on DSA)					
Vertical resolution	8 bits, ≥ 12 bits with averaging					
Vertical sensitivity	1 mV/div to 1 V/div					
Sample clock jitter	100 fs					
Max input voltage	± 5 V					
Input impedance	50 Ω, ±3%					
Timebase range	2 ps/div to 20 s/div real-time					
Time scale accuracy	± 0.1 ppm (immediately after calibration), ± 0.1 ppm/year (aging)					
Triggering	3-level sequence hardware (2 levels) and InfiniiScan software trigger: edge, edge transition, edge then edge, glitch, line, pulse width, runt, timeout, pattern/pulse range, state, setup/hold, window, HDTV, non-monotonic, measurement, and zone qualify					
Typical noise floor	1.34	1.53	1.76		1.862	2.03
Max data transfer rate	22 MSa/s					
Dimensions	10.5"x16.75"x18.7" (27cm x 43cm x 48cm)					
Weight	45.1 lbs (20.5 kg)					
Power	100 - 240 VAC at 50/60 Hz; maximum input power 800 Watts					

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes, including the industry's first 30 GHz InfiniiMax III probing system. See our complete list of compatible probes on pages 34-35.

Accessories – Don't forget options that make measurements faster and more convenient, such as the rackmount kit and transit case.

Memory – Increase memory depth at any time.

Bandwidth – Protect your investment with bandwidth upgrades after purchase.

Applications – Expand your scope's capabilities with our powerful lineup of applications:

• Analysis options include jitter and eye analysis, user defined function, MATLAB, and many more
• Compliance options include, DDR1,2 and 3, PCI Express, HDMI, DisplayPort, SATA, SAS, MIPI D-PHY, and USB 3.0
• Transport your scope application license from one Infiniium to another with the application server license
• See our complete list of applications on page 30-32

Infiniium 90000 Q-Series Oscilloscopes

20 GHz to 63 GHz high-performance real-time lab scopes

Achieve your real edge with 63 GHz on 2 channels and 33 GHz on 4 channels

- The industry's highest real-time bandwidth in a single frame with 63 GHz
- The industry's highest 4-channel bandwidth with 33 GHz in a single frame

- The industry's lowest noise and jitter measurement floor
- The industry's deepest memory
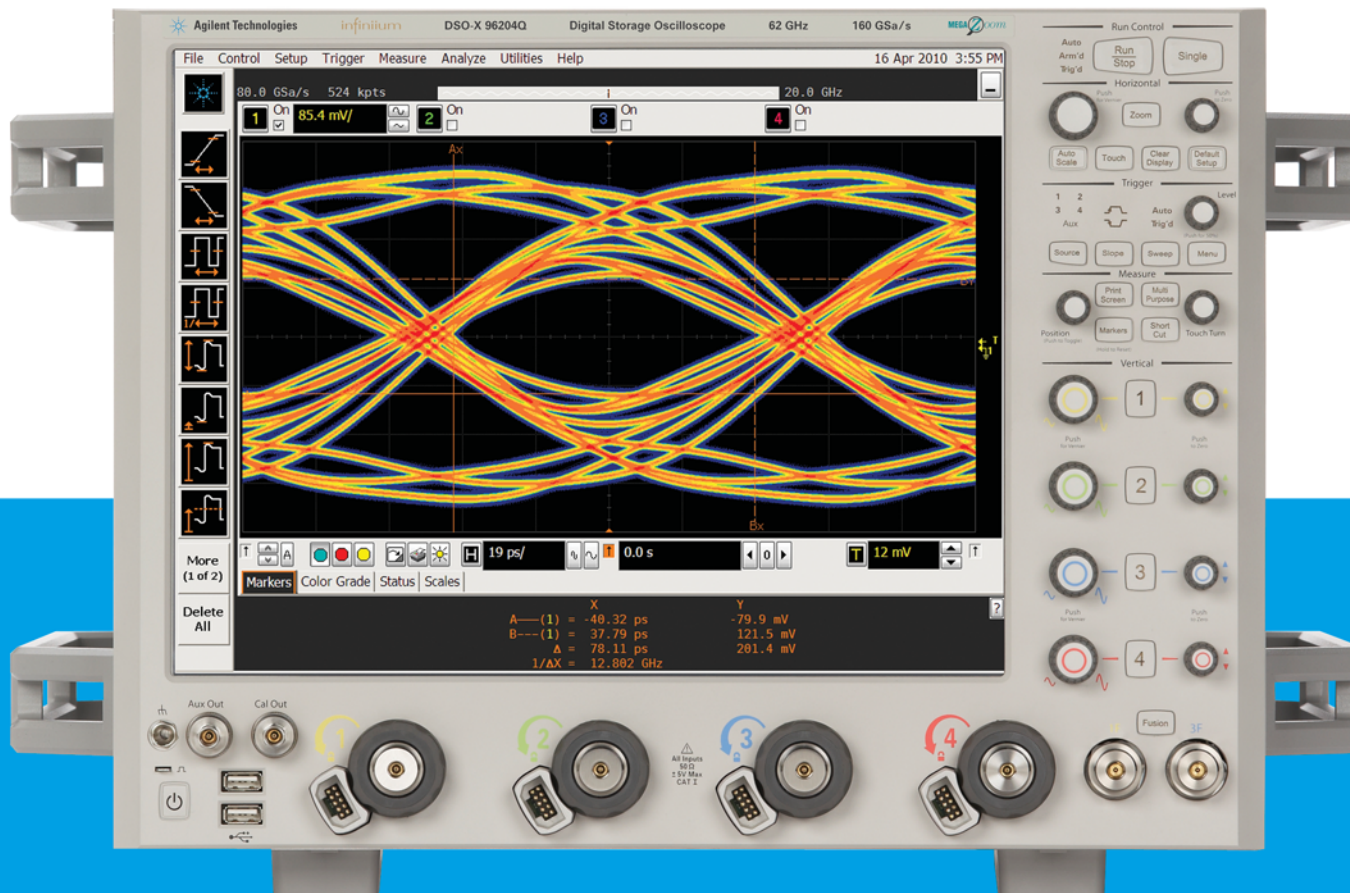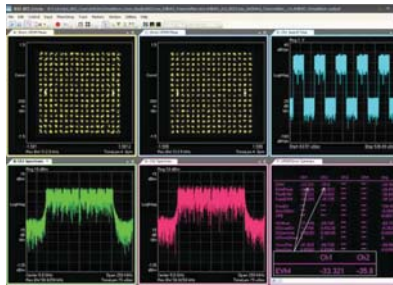
The **90000 Q-Series is fully compatible with Agilent's 89600 VSA software.** It allows you to see the "why" with advanced troubleshooting tools including high-resolution FFT-based spectrum measurements, time-domain tools, and bit-level modulation analysis, all using 63 GHz of real time bandwidth.
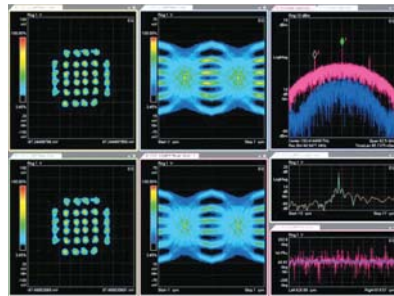
Combine the 90000 Q-Series with Agilent's N4391A software for the most advanced and complex modulation measurements. As your designs move from 100 GbE to 400 GbE and eventually 1 TbE, the 90000 Q-Series is uniquely positioned to give you the most comprehensive modulation suite.

Not only will the 90000 Q-Series take spectrum and complex modulation measurements, but by using PrecisionProbe advanced, you can get full S21 characterization of cables up to 65 GHz. The simple network analysis saves you time and improves measurement accuracy by automatically compensating for both magnitude and phase loss caused by cables.
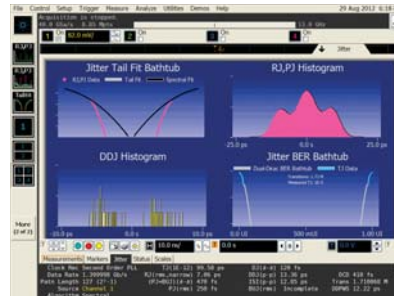
The 90000 Q-Series gives you deep insight into your digital designs. EZJIT Plus features two methods to properly separate the jitter into random and deterministic components. If you have bounded uncorrelated jitter, simply use Agilent's new tail-fit algorithm, otherwise Agilent's spectral method and 75fs of sample clock jitter ensure the most accurate measurement.

Models and specifications

DSO and DSA	X92004Q	X92504Q	X93304Q	X95004Q	X96204Q
Bandwidth	20 GHz	25 GHz	33 GHz	50 GHz	63 GHz
Sample rate	160 GSa/s on 2 channels, 80 GSa/s on 4 channels				
Channels	4 channels				
Display	15.4'' color XGA TFT-LCD with touch screen				
Display update rate	>400,000 waveforms per second (in segmented memory mode)				
Memory	20 Mpts standard, optional up to 2 Gpts (50 Mpts std. on DSA)				
Vertical resolution	8 bits, ≥ 12 bits with averaging				
Vertical sensitivity	1 mV/div to 1 V/div				
Max input voltage	± 5 V				
Input impedance	50 Ω, ±3%				
Timebase range	2 ps/div to 20 s/div real-time				
Time scale accuracy	± 0.1 ppm (immediately after calibration), ± 0.1 ppm/year (aging)				
Triggering	3-level sequence hardware (2 levels) and InfiniiScan software trigger: edge, edge transition, edge then edge, glitch, line, pulse width, runt, timeout, pattern/pulse range, state, setup/hold, window, HDTV, non-monotonic, measurement, and zone qualify				
Typical noise floor	0.39%	0.45%	0.54%	0.75%	0.83%
Sample clock jitter	75 fS				
Dimensions	20" wide, 13.3" tall, and 19.4" deep				
Weight	71 lbs (32.20 kg)				
Power	100 - 240 VAC at 50/60 Hz; maximum input power 1200 Watts				

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes, including the industry's first 30 GHz InfiniiMax III probing system. See our complete list of compatible probes on page 34-35.

Accessories – Don't forget options that make measurements faster and more convenient, such as the rackmount kit and transit case.

Memory – Increase memory depth at any time.

Bandwidth – Protect your investment with bandwidth upgrades after purchase.

Applications – Expand your scope's capabilities with our powerful lineup of applications:
   • Analysis options include jitter and eye analysis, user defined function, MATLAB, and many more
   • Compliance options include, DDR1, 2 and 3, PCI Express, HDMI, DisplayPort, SATA, SAS, MIPI D-PHY, and USB 3.0
   • Transport your scope application license from one Infiniium to another with the application server license
   • See our list of applications on page 30-32

# Infiniium 86100D Series Oscilloscopes

DC to > 90 GHz wideband sampling scope

Engineered for precise, accurate high-speed electrical and optical analysis

- Four powerful instruments in one unit: High-bandwidth scope, digital communications analyzer, time domain reflectometer and jitter analyzer

- Wide bandwidth with the lowest residual jitter and noise for the highest precision waveforms

- The industry standard for analysis of optical communication signals

- Calibrated reference receivers for optical transceiver compliance test

- Modular platform allows optical, electrical, TDR/TDT, and S-parameter measurements

- Advanced jitter and amplitude analysis at the push of a button

- Jitter spectrum, phase noise, and jitter transfer measurements on both electrical and optical signals

- Integrated de-embedding, embedding and equalization capability

- Up to 16 electrical or 8 optical channels per mainframe
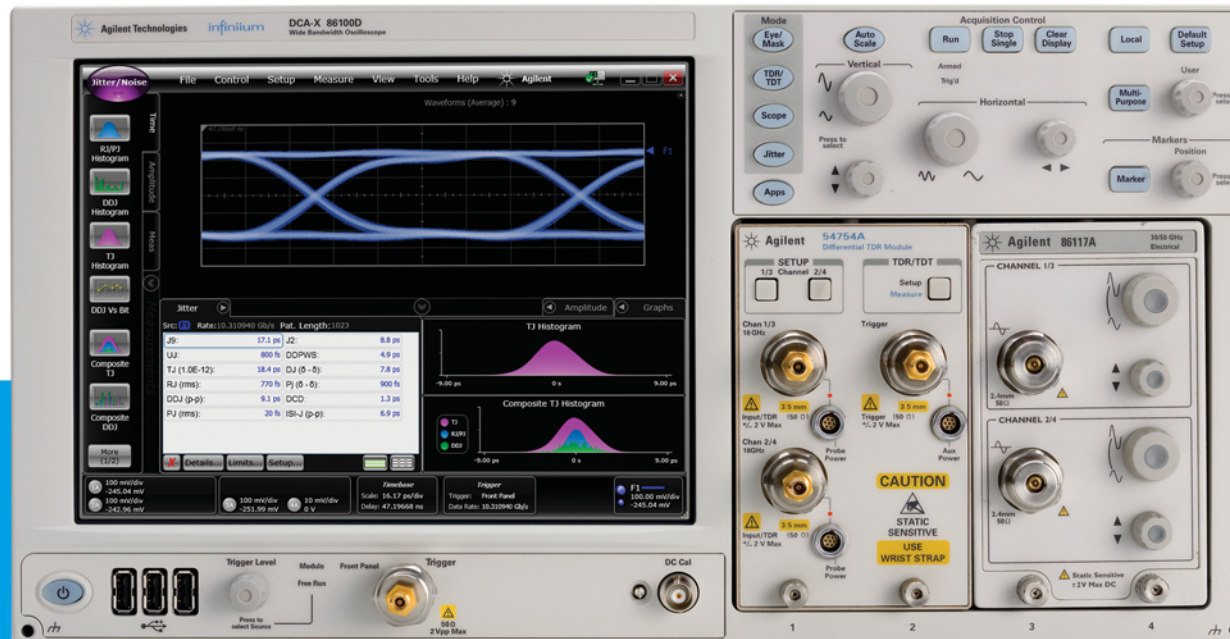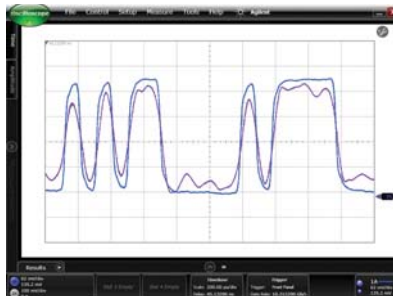
Full-function oscilloscope. Bandwidth of 65 GHz optical and > 90 GHz electrical ensures the most accurate waveform measurements.
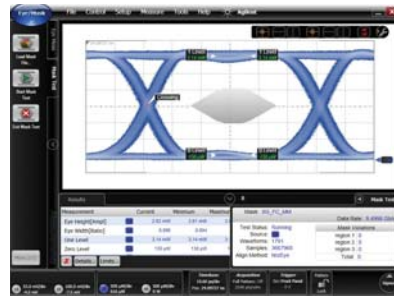
Eye diagram analysis. Fast and accurate transmitter characterization using eye diagram analysis and automated mask margin measurements.

Advanced jitter and amplitude analysis. Accurate decomposition of jitter and amplitude impairments provides compliant total jitter (TJ) results and insight into root cause of eye closure.

Time domain reflectometer. Measure both impedance and S-parameters and verify transmission quality on cables, components and channels.

Models matching your applications

86100D Infiniium DCA-X mainframe

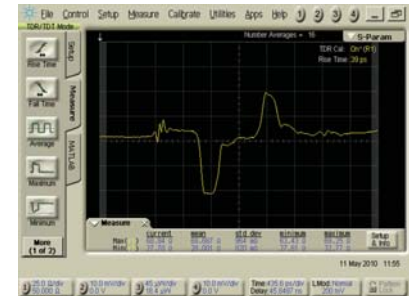|	
Electrical 1 to 14.2 Gb/s	Highest precision view of serial bus waveforms
86112A	Dual channel electrical > 20 GHz
83496B	Electrical clock recovery (and PLL analysis)
86108B	Dual 35 GHz channels, jitter < 50 fs, internal clock recovery
Electrical 10 to > 43 Gb/s	Electrical signals for 40/100G Ethernet, SONET/SDH
86118A	Dual remote heads 70 GHz
86107A	Precision timebase (jitter < 100 fs)
86108B	Dual 50 GHz channels, jitter < 50 fs, internal CR to 32 Gb/s
86117A	Dual channel electrical > 50 GHz
N1045A	Dual/Quad 60 GHz channels, remote heads
Optical 1 to 14.2 Gb/s	Fibre Channel, Ethernet, SONET/SDH, PON
86105C	9 GHz optical channel, 20 GHz electrical channel
83496B	Optical clock recovery (single-mode and multimode)
86105D	20 GHz optical channel, 35 GHz electrical channel
86115D	20 GHz optical, multi-channel
Optical 10 to > 43 Gb/s	40/100G Ethernet, SONET/SDH
86116C	65 GHz optical channel, 90 GHz electrical channel
86107A	Precision timebase (jitter < 100 fs)
TDR	Serial bus standards — PCIe, SATA, SAS, USB, S-parameters
54754A	Differential TDR, dual 18 GHz channels

Scope additions and enhancements

Probes – Improve your measurement reliability with our comprehensive selection of probes.

Options – Mainframe options include an enhanced trigger, GPIB interface, removable hard drive and signal processing capabilities such as equalization, de-embedding and embedding of waveforms.

Modules – Choose from an extensive list of optical, electrical, TDR/TDT, dual/quad electric channel, trigger and clock recovery modules.

Applications: Engineered to turn measurements into answers

You need more than data from your scope – you want fast, accurate answers to your questions.

Many scopes can churn out reams of data. But when you're looking for meaningful insight into designs under development, Agilent offers the broadest selection of oscilloscope solutions in the industry.

We deliver more than 80 powerful applications packages for debug, analysis, compliance and characterization.

Whether you're debugging low-speed serial bus operation or FPGA functionality; focused on signal integrity; or ensuring compliance to industry standards, Agilent has solutions to help you get to accurate answers more quickly.

Speed debug as you deploy FPGAs or debug serial bus designs with our innovative solutions.

Our integrated mixed-signal oscilloscope technology allows us to offer unique solutions like our FPGA dynamic probe to let you see inside your FPGA for faster debug. And our protocol level triggers and displays help you resolve the physical layer root cause of issues you discover at the protocol level.

Take advantage of the expertise Agilent gains by participating in key industry standards bodies.

Our engineers sit on the board of directors of many standards groups, including the JEDEC Solid State Technology Association, the Video Electronics Standards Association (VESA) and the Peripheral Component Interconnect Special Interest Group (PCI-SIG). We help define the test standards so we can give you consistent measurement results and support you as you deploy these emerging technologies for your success.

Make your job simpler with automated setups and one-button compliance testing for more than 25 applications.

We make using our solutions easy so busy engineers can offload tedious characterization and still get accurate results. A test setup wizard guides you through selection, configuration, connection, execution and results reporting. And the results reports include configuration, measurements made, pass/fail status, margin analysis and waveforms.

We also offer user-definable application software that allows automated measurements for compliance testing on proprietary buses or while emerging test standards solidify.

The PCI Express® electrical performance validation and compliance software lets you test devices to ensure compliance with the PCIe 1.1 and PCIe 2.0 electrical specs for add-in cards and motherboards.
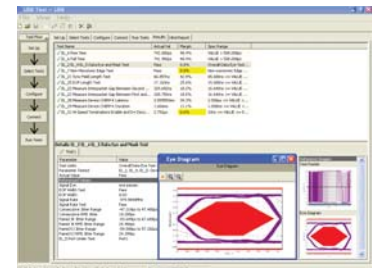
The USB 2.0 compliance test software makes USB signal integrity testing as simple as capturing the signals with your scope, eliminating the need to transfer waveforms to your PC.

Oscilloscope Compliance and Characterization Solutions

|	Industry	Model number	Oscilloscope	Standards organization
10 Gb attachment unit interface (XAUI)	Wireline	N5431A	90000, 90000X Series	www.ieee802.org/3/ and www.ethernetalliance.org
10 Gb BaseT Ethernet	Wireline	U7236A	90000 Series	www.ethernetalliance.org
DDR1 and LPDDR1	Computing and memory	U7233A	9000, 90000, 90000X Series	www.jedec.org
DDR2 and LPDDR2	Computing and memory	N5413B	9000, 90000, 90000X Series	www.jedec.org
DDR4	Computing and memory	N6462A	9000, 90000 Series	www.jedec.org
DisplayPort	Media	U7232B	9000A, 90000X, 90000Q Series	www.displayport.org
DVI	Media	N5394A	90000 Series	www.ddwg.org
Ethernet 1000/100/10BASE-T	Wireline	N5392A	9000, 90000 Series	www.ieee802.org/3/ and www.ethernetalliance.org
Fully buffered DIMM	Computing and memory	N5409A	90000 Series	www.jedec.org
GDDR5	Computing and memory	U7245A	90000, 90000X Series	www.jedec.org
HDMI 1.4	Media	N5399B	90000, 90000X Series	www.hdmi.org
HSIC	Consumer electronics	U7248A	9000, 90000 Series	
MHL	Consumer electronics	N6460A	90000A, 90000X, 90000Q Series	
MIPI D-PHY	Consumer electronics	U7238A	9000, 90000, 90000X Series	www.mipi.org
MIPI M-PHY	Consumer electronics	U7249A	9000, 90000 Series	www.mipi.org
PCI EXPRESS gen 1/2	Computing and memory	N5393A/B	90000, 90000X Series	www.pcisig.org
SD UHS-1	Storage	U7246A	9000, 90000, 90000X Series	www.sdcard.org
SD UHS-II	Storage	N6461A	90000 Series	www.sdcard.org
Serial ATA I/II/III	Storage	N5411B	90000, 90000X Series	www.sata-io.org
Serial attached SCSI (SAS)	Storage	N5412B	90000, 90000X Series	www.scsita.org
Thunderbolt	Consumer electronics	N6463A	90000X Series	www.thunderbolttechnology.net
USB 2.0	Consumer electronics	N5416A	9000, 90000 Series	www.usb.org
USB 3.0	Consumer electronics	U7243A	90000, 90000X Series	www.usb.org
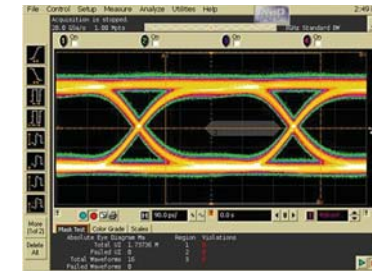
HDMI validation and compliance software gives you a fast way to verify and debug designs for set-top boxes, digital video recorders, DVD players, entertainment systems and motherboards.

The DDR2 compliance test application provides a fast and easy way to test, debug and characterize your DDR2 designs and includes crucial measurements, such as eye-diagram, mask testing and ringing.

Oscilloscope Software Applications

|	Model number	Oscilloscope solutions
64b/66b 10Gbase-KR Ethernet decode	N8815A	90000A, 90000X Series
Advanced EYE analysis	86100DU-401	86100D Series
Advanced math measurement	DSOX3ADVMATH	DSOX 3000, MSOX 3000 Series
Automotive serial data analysis	N5402A	90000, 90000X Series
BenchLink waveform builder pro and basic	33503A	4000X Series
Built-in function and arbitrary waveform generator	DSOX2WAVEGEN, DSOX3WAVEGEN	2000X, 3000X Series
Calibration pulse generator	N2806A	9000, 90000 Series
CAN/LIN trigger and decode	DSOX3AUTO, DSOX4AUTO, N5424A, N8803A, and N8803B	3000X, 4000X, 6000, 7000, 9000, 90000, 90000X Series
Communication mask test kit	E2625A	9000, 90000 Series
DDR3 and LPDDR3 compliance test application	U7231B	9000, 90000 Series
DDR4 compliance test application	N6462A	9000, 90000 Series
DisplayPort 1.2 compliance and validation test	U7232B	90000, 90000X Series
Dual-channel 20-MHz function & arbitrary waveform generator	DSOX4WAVEGEN2	4000X Series
Educators Training Kit	DSOXEDK	2000X, 3000X, 4000X Series
EZJIT and EZJIT Plus jitter analysis	N8813A, E2681A, and N5400A	9000, 90000, 90000A, 90000Q, 90000X Series
FlexDCA	N1010A	86100 Series
FlexRay	N5432A , N8803B	6000, 7000, 9000 Series
FlexRay triggering and decode	DSOX3FLEX, DSOX4FLEX, and N5432C	3000X, 4000X,6000, 7000 Series
FPGA dynamic probe - Xilinx	DSOX4FPGAX, N5406A, and N5397A	4000X, 6000, 7000, 9000 Series
High-speed serial data analysis and clock recovery	E2688A and N5384A	9000, 90000, 90000X Series
HSIC triggering and decode	N5464B and N5464A	9000, 90000, 90000X Series
I²C/SPI serial decode	DSOX3EMBD, DSOX4EMBD, N5423A , N5391A, and N5391B	3000X, 4000X, 6000, 7000, 9000, 90000, 90000X Series
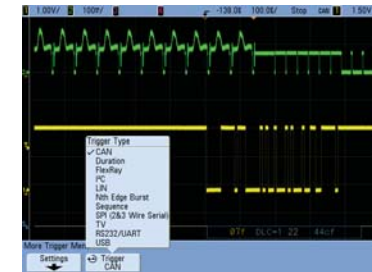
CAN/LIN triggering and hardware-accelerated decode helps you quickly find and debug errors and signal integrity problems on CAN and LIN serial buses.
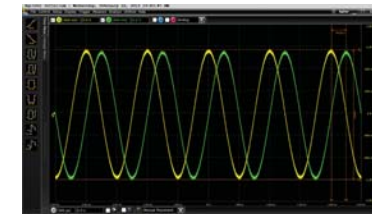
View and analyze waveforms anywhere your PC goes. InfiniiView includes powerful viewing and analysis tools based on Agilent's Infiniium scope user interface.

Oscilloscope Software Applications

	Model number	Oscilloscope solutions
I²S triggering and decode	DSOX3AUDIO, DSOX4AUDIO, and N5468A	3000X, 4000X, 6000, 7000 Series
InfiniiScan	N5414B and N5415B	9000, 90000, 90000X Series
InfiniiSim waveform transformation	N5465A , 86100D-SIM, and N1010A-SIM	9000, 90000, 90000X, 86100 Series
Infiniium user-defined function	N5430A	9000, 90000, 90000X Series
InfiniiView analysis	N8900A	2000X, 3000X, 4000X, 5000, 6000, 7000, 9000 , 90000A, 90000X, 90000Q Series
Integrated digital voltmeter	DSOXDVM	2000X, 3000X, 4000X Series
Jitter and amplitude analysis	86100D-200/300	86100 Series
JTAG triggering and decode	N8817A	9000, 90000, 90000X Series
Mask/waveform limit testing	DSOX2MASK, DSOX3MASK, DSOX4MASK, and N5455A	2000X, 3000X, 4000X, 6000, 7000 Series (standard on Infiniium Series)
MATLAB data analysis	Option-061 or -062	6000, 7000, 9000, 90000, 90000X, 86100 Series
MILSTD 1553 serial triggering and analysis	DSOX3AERO, DSOX4AERO, and N5469A	3000X, 4000X, 6000, 7000 Series
MIPI DigRF v4 (M-PHY) triggering and decode	N8807A	9000, 90000 Series
MIPI D-Phy triggering and decode	N8802A	9000, 90000, 90000X Series
MIPI LLI (M-PHY) triggering and decode	N8809A	9000, 90000 Series
MIPI M-PHY compliance test software	U7249A	9000, 90000 Series
MIPI UniPro (M-PHY) triggering and decode	N8808A	9000, 90000 Series
Mobile high definition link source compliance test software	N6460A	90000A Series
OIF CEI 3.0 compliance test application	N1012A	86100D DCA-X Series
Offline PC-based analysis of acquired data	B4610A	2000X, 3000X, 6000, 7000 Series
PCI Express protocol viewer	N8816A	90000 Series
PCI Express triggering and decode	N5463B and N5463A	9000, 90000X Series
Phase locked loop and jitter spectrum measurement software	86100DU-400	86100D Series
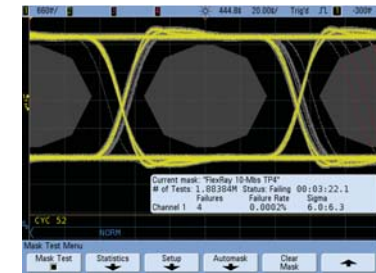
Mask/waveform limit testing provides a fast and easy way to test your signals to specified standards, and uncover unexpected signal anomalies, such as glitches.

USB serial trigger and decode provides powerful time-correlated views of waveforms and symbols to the bit level, making it easy to isolate communication faults to logic or analog sources.

Oscilloscope Software Applications

	Model number	Oscilloscope solutions
Power measurement and analysis	DSOX3PWR, DSOX4PWR, U1881A, and U1882A	3000X, 4000X, 6000, 7000, 9000 Series
PrecisonProbe	N2807A, N2808A, N2809A	9000, 90000X, 90000A, 90000Q Series
RS-232/UART triggering and decode	DSOX3COMP, DSOX4COMP, N5457A , N5464A, and N5462B	2000X, 3000X, 4000X, 6000, 7000, 90000, 90000X Series
SATA triggering and decode	N8801A	9000, 90000, 90000X Series
SD UHS-II card compliance test software application	N6461A	90000 Series
Segmented memory	DSOX2SGM, DSOX3SGM, and N5454A	2000X, 3000X 6000, 7000 Series (standard on Infiniium Series)
Serial data analysis	E2688A and N5384A	90000 9000, 90000, 90000X Series
Serial data equalization	N5461A	9000, 90000 , 90000X Series
Signal analyzer	W2650A	9000, 90000X, 90000A Series
S-parameter measurements	86100D-202	86100D Series
Spectrum visualizer	64997A, 64996A	2000, 3000X, 4000X, 9000, 90000, 90000X Series
SVID triggering and decode	N8812A and N8900A	9000, 90000 Series
TDR/TDT measurements	86100D and 54754A	86100 Series
USB 2.0 full/low speed serial decode and triggering	DSOX4USBFL	4000X Series
USB 2.0 high-speed serial decode and triggering	DSOX4USBH	4000X Series
USB 2.0 triggering and decode	N5464B and N5464A	9000, 90000, 90000X Series
USB 3.0 triggering and decode	N8805A	90000, 90000X Series
User-definable application	N1019A and N5467A	86100D, 9000, 90000, 90000X Series
User-definable function	N8806A and N5430A	9000, 90000, 90000X ,90000A Series
Vector signal analysis	89601A and 89601B (Ver. 15 and higher only)	4000X, 6000, 7000, 9000, 90000, 90000X Series
Video triggering and analysis	DSOX3VID and DSOX4VID	3000X and 4000X Series

Probes & Accessories: Engineered for signal access and measurement accuracy

To get top performance from your scope, you need the right probe for your application.

Selecting the best probe for the job ensures you can access your signals and make reliable measurements. To complement the scopes we sell, Agilent offers a broad family of probes and accessories. Solutions range from simple, inexpensive passive probes to state-of-the-art high-frequency interposers that meet your toughest probing challenges.

Passive probes

When you need to measure high voltages, these are the most durable and economical probes and the most widely used.

Active probes

These single-ended or differential probes handle higher bandwidths with lower signal loading. Single-ended active probes provide the best overall combination of resistive and capacitive loading. With low loading, single-ended probes can be used on high-impedance, high-frequency circuits that would be overloaded with passive probes. Differential active probes are used to look at signals referenced to each other and also at small signals in the presence of large DC offsets or other common-mode signals, such as power line noise.

InfiniiMax Series

These specialized active probes complement the Infiniium Series scopes. The InfiniiMax III Series is the first 30 GHz probing system and gives you the industry's flattest frequency response and widest selection of probe heads and accessories. With capabilities such as 30 GHz bandwidth for differential measurements and bandwidth upgradability to higher performance as your needs evolve, the award-winning InfiniiMax probe system combines maximum performance with excellent usability.

Current probes

These probes sense the current flowing through a conductor and convert it to a voltage that can be viewed and measured on your scope. Agilent's current probes use a hybrid technology that includes a hall effect sensor, which senses the dc current and a current transformer, which senses the ac current, making it unnecessary to make an electrical connection to the circuit.

Innovative probe accessories make connections a snap.

Connecting to components like fine-pitch devices, surface-mount integrated circuits and DDR ball-grid arrays can be challenging. We take the challenge away with accessories that let you connect easily — even hands-free.

InfiniiMax, the world's best high-speed probing system, offers you the highest performance available for measuring differential and single-ended signals, with flexible connectivity solutions for today's high-density ICs and circuit boards.

New N2750A Series probes come with new InfiniiMode technology. InfiniiMode allows convenient measurements of differential, single-ended and common-mode signals with a single probe tip without reconnecting the probe to change the connection.

Recommended probes and accessories for Agilent oscilloscopes

	U1600 Series	U2700 Series		1000 Series	2000 X-Series	3000 X-Series	4000 X-Series
Scope bandwidth	20-200 MHz	100 MHz	200 MHz	60 - 200 MHz	70-200 MHz	100 MHz - 1 GHz	200 MHz - 1.5 GHz
Probe interface	BNC	BNC		BNC	BNC	AutoProbe lite	AutoProbe
Passive probe 1:1	U1560A	10070D					N2870A, 10070D
Passive probe 10:1	U1561A	10074D, N2871A, N2872A		N2862B, N2863B	N2862B, N2863B	N2862B, N2863B, N2890A	N2894A
High-voltage passive probe 100:1	U1562A	10076B					
High-voltage passive probe 1000:1		N2771B					
Low Z						N2874A, N2876A	N2874A (10:1), N2876A (100:1)
Active single-ended probe						N2795A	N2795A/96A or 1130A*
Active differential probe (high speed)						N2750A, 1130A[5]	N2750A, 1130A[5]
Active differential probe (high voltage)		N2791A, N2891A		N2791A, N2891A	N2791A, N2891A	N2790A/91A/ 92A/93A, N2891A	N2790A/91A/92A/93A, N2891A
Current probe	U1583B	1146A, N2893A, N2780B, N2781B, N2782B, N2783B		1146A, N2780B/81A/82A/83A[3]	1146A, N2780B/81A/82A/83A[3]	1146A, 1147B, N2893A N2780B/81A/82A/83A[3]	1146A, 1147B, N2893A, N2780B/81A/82A/83A[3]
Rackmount kit				N2739A	N6456A	N6456A	N2763A
Carrying case	U1591A			N2738A	N6457A	N6457A	N2733A

Notes:
* Needs SE probe accessory
1. Requires 1142A power supply
2. Order one or more InfiniiMax III probe heads -- N5445A, N5439A, N5444A or N5441A.
3. Requires N2779A power supply
4. Includes one 10073D passive probe
5. Order one or more InfiniiMax I probe heads or connectivity kits per amplifier.   a. E2669A InfiniiMax connectivity kit for differential/single-ended measurements, b. E2668A InfiniiMax connectivity kit for single-ended measurements,
c. E2675A InfiniiMax differential browser probe head and accessories, d. E2676A InfiniiMax single-ended browser probe head and accessories, e. E2677A InfiniiMax differential solder-in probe head and accessories, f. E2678A InfiniiMax single-ended/differential socketed probe head and accessories, g. E2679A InfiniiMax single-ended solder-in probe head and accessories, h. E2695A Differential SMA probe head
6. Order one or more 10073D InfiniiMax II probe heads or connectivity kits per amplifier. a. N5380A InfiniiMax II 12 GHz differential SMA adapter, b. N5381A InfiniiMax II differential solder-in probe head and accessories, c. N5382A InfiniiMax II 12 GHz differential browser,
d. N5425A InfiniiMax I and II 12 GHz differential solder-in ZIF probe head. Requires N5426A or N5451Ae. N5426A InfiniiMax I and II 12 GHz ZIF tip, f. N5451A InfiniiMax I and II 9 GHz/5 GHz Long wire ZIF tip.

To see our entire portfolio of award-winning probes, see the probe catalog at www.agilent.com/find/Agilentprobes.

Recommended probes and accessories for Agilent oscilloscopes

	6000/7000 Series		9000 Series	90000A Series	90000 X-Series	90000 Q-Series
Scope bandwidth	100 MHz	300 MHz-1 GHz	1 GHz - 4 GHz	2.5 GHz - 13 GHz	16 GHz - 32 GHz	20 GHz - 63 GHz
Probe interface	BNC	AutoProbe Lite	AutoProbe	AutoProbe	AutoProbe II	AutoProbe II
Passive probe 1:1	10070D		N2870A	10070D with E2697A[4]	N2870A, 10070D with N5449A	N2870A, 10070D with N5449A
Passive probe 10:1	10074D, N2871A	10073D, N2873A	N2873A (10:1), N2875A (20:1)	54006A (6GHz), 10073D or N2873A (500MHz) with E2697A[4]	N2873A with N5449A	N2873A with N5449A
High-voltage passive probe 100:1	10076B		10076B	10076B with E2697A	10076B with N5449A	10076B with N5449A
High-voltage passive probe 1000:1	N2771B			N2771B with E2697A	N2771B with N5449A	N2771B with N5449A
Low Z	N2874A (10:1), N2876A (100:1)				N2874A, N2876A with N5442A	N2874A, N2876A with N5442A
Active single-ended probe	1144A[1]	N2795A/96A or 1130A*	N2795A/96A, 1130A*	N2795A/96A, 1157/8A, 1131/2/4[5]	N2795A,96A,1157/58A with N5442A	N2795A,96A,1157/58A with N5442A
Active differential probe (high speed)		1130A[5] or 1141A[1]	N2750A/51A/52A, 1130A[5]	N2751A/52A, 1131/2/4[5] or 1168/69A[6] with differential probe accessory	N2800A/01A/02A/03A[2]	N2800A/01A/02A/03A[2]
Active differential probe (high voltage)	N2791A/ N2891A	N2790A/91A/ 92A/93A, N2891A	N2795A/96A 1130A*	N2791A, N2790A with E2697A[4]	N2790A,91A,891A with N5449A or N2792A,93A with N5442A	N2790A,91A,891A with N5449A or N2792A,93A with N5442A
Current probe	1146A, N2780B/81A /82A/83A[3]	1146A, 1147B, N2893A, N2780B/81A/82A/83A3		1146A, N2780B/81A/82A/83A[3] with E2697A[4]	1147B, N2893A with N5449A	1147B, N2893A with N5449A
Rackmount kit	N2916B	N2732A	N2902A	N5470A	N5470A	N2759A
Carrying case	N2917B (hard) or N2733A (soft)		N5475A			N2748A

Notes:
* Needs SE probe accessory
1. Requires 1142A power supply
2. Order one or more InfiniiMax III probe heads -- N5445A, N5439A, N5444A or N5441A.
3. Requires N2779A power supply
4. Includes one 10073D passive probe
5. Order one or more InfiniiMax I probe heads or connectivity kits per amplifier.   a. E2669A InfiniiMax connectivity kit for differential/single-ended measurements, b. E2668A InfiniiMax connectivity kit for single-ended measurements,
c. E2675A InfiniiMax differential browser probe head and accessories, d. E2676A InfiniiMax single-ended browser probe head and accessories, e. E2677A InfiniiMax differential solder-in probe head and accessories, f. E2678A InfiniiMax single-ended/differential socketed probe head and accessories, g. E2679A InfiniiMax single-ended solder-in probe head and accessories, h. E2695A Differential SMA probe head
6. Order one or more 10073D InfiniiMax II probe heads or connectivity kits per amplifier. a. N5380A InfiniiMax II 12 GHz differential SMA adapter, b. N5381A InfiniiMax II differential solder-in probe head and accessories, c. N5382A InfiniiMax II 12 GHz differential browser,
d. N5425A InfiniiMax I and II 12 GHz differential solder-in ZIF probe head. Requires N5426A or N5451Ae. N5426A InfiniiMax I and II 12 GHz ZIF tip, f. N5451A InfiniiMax I and II 9 GHz/5 GHz Long wire ZIF tip.

To see our entire portfolio of award-winning probes, see the probe catalog at www.agilent.com/find/Agilentprobes.

Agilent Technologies Oscilloscopes

www.agilent.com/find/scopefamily

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Malaysia	1 800 888 848
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