Infiniium 8000 Series Oscilloscopes

1-GHz and 600-MHz Real-Time Oscilloscopes with Integrated Digital Channels

Superior mixed-signal analysis and debug for your applications

Data Sheet

Specifications

- 1 GHz and 600 MHz bandwidth models
- MSO models with integrated 16 digital channels
- 4 GSa/s sample rate
- Up to 128 Mpts of Mega*Zoom* fastest, most responsive memory
- Standard touch screen with high-definition XGA display
- Extensive application software suite
- Unrivaled InfiniiMax active probes and accessories
- Open Windows® XP Pro operating system
- LXI class C compliant

Key features

- Validate physical and protocol layers of your I^2C, SPI, CAN and FlexRay communications buses quickly
- Validate your DDR, USB, Ethernet applications quickly with automated compliance test software
- Quickly debug your FPGA designs (Xilinx and Altera) with core-based debug software capability
- User-defined function provides seamless gateway to powerful MATLAB® real-time analysis functionality
- Find subtle glitches with 3-dimensional viewing (256-level intensity display)
- Find errors faster using your finger tip with Infiniiscan Zone Qualify feature
- Find signal-integrity-based logic errors with built-in state decoding for serial, parallel and wideband signals
- Analyze single-shot events and wideband RF signals with integrated wireless 89601A vector signal analysis test software
- Apply trend analysis techniques with Chart Mode to see how digital characteristics (i.e. ADC, counter, address lines, etc.) vary over time
- Maximize your tool investment with segmented memory on your analog and digital signals to ensure you can capture events widely spaced in time
- Debug your high-speed designs with advanced jitter, clock recovery and eye-diagram analysis tools

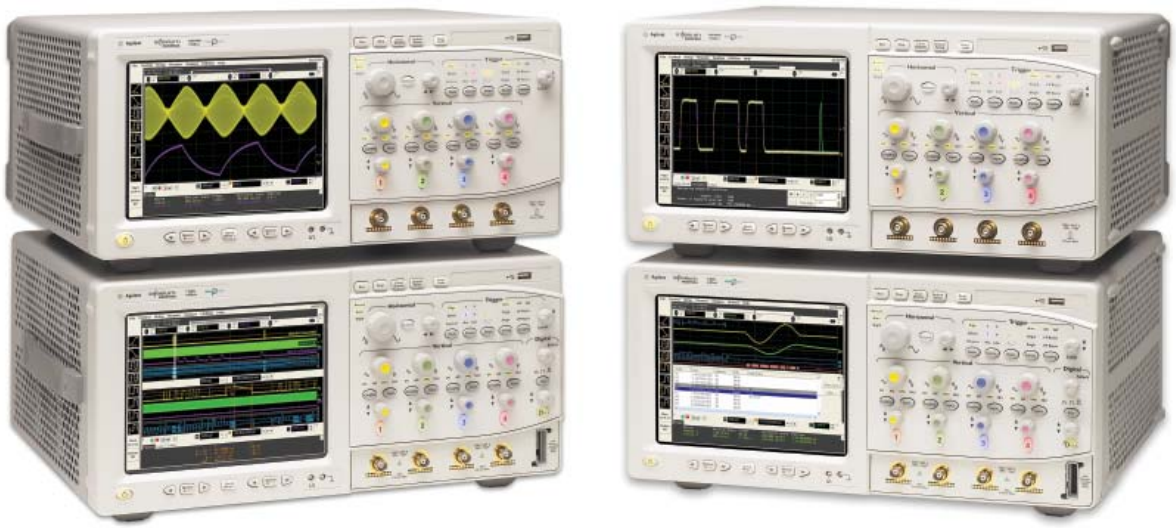
Agilent Technologies

The Standard in General Purpose Lab Scopes

The Infiniium 8000 Series oscilloscopes offer designers the industry's first oscilloscope family with responsive deep memory, superior signal viewing and advanced analysis. The four digital storage oscilloscopes (DSOs) and mixed signal oscilloscopes (MSOs) combine the best in signal viewing with patented next-generation Mega*Zoom* technology that maps the industry's deepest and most responsive memory to a high-definition display system that uncovers even the most subtle details in long, complex waveforms. Next-generation Mega*Zoom* technology helps you capture analog and digital signals over long time spans, easily view critical events, and perform robust signal analysis all with a single instrument. Several memory options are available and are affordably priced to meet your performance needs and fit within your budget.

Infiniium 8000 Series oscilloscopes

Model	Bandwidth	Channels	Sample rate	Standard memory	Maximum memory
DSO8064A	600 MHz	4 analog	4 GSa/s	4 Mpts, 8 Mpts max.	128 Mpts
MSO8064A	600 MHz	4 analog + 16 logic	4 GSa/s	4 Mpts, 8 Mpts max.	128 Mpts
DSO8104A	1 GHz	4 analog	4 GSa/s	4 Mpts, 8 Mpts max.	128 Mpts
MSO8104A	1 GHz	4 analog + 16 logic	4 GSa/s	4 Mpts, 8 Mpts max.	128 Mpts



Infiniium Benefits

Dramatically speed debug time with mixed signal oscilloscope (MSO) models that integrate 16 digital channels

As embedded designs continue to increase in complexity with integration of higher-speed digital buses such as SDRAM and PCI, along with 16- or 32-bit processors, it becomes increasingly important for engineers to have flexible test instrumentation at their fingertips. When you need to isolate events of interest or monitor critical relationships between multiple signals, you need an instrument that is capable of viewing and triggering on more than just two or four signals at a time.

Agilent's Infiniium MSOs tightly integrate 4 channels and 16 digital channels in the same acquisition system to provide time-correlated viewing and triggering across 20 channels.

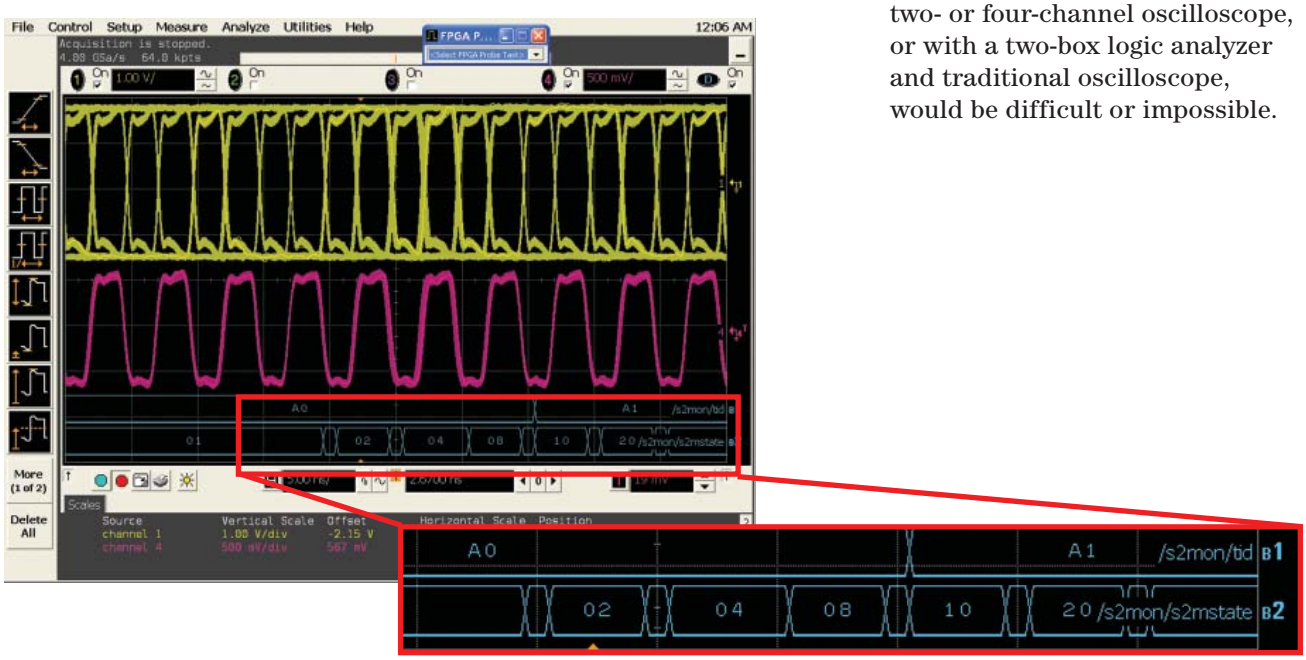
Since an MSO is first and foremost an oscilloscope, no trade-offs in scope functionality are made; the instrument retains the usability and the real time waveform capture of an oscilloscope. MSOs reduce the need for expensive multi-box solutions and can dramatically speed debug time.

MSO viewing and triggering

No matter how complicated the signals you are dealing with, the Infiniium MSO comes with powerful viewing and triggering capabilities to help you untangle them. The Infiniium MSO can trigger across all 16 digital channels and four scope channels. There are no limitations on the combination of analog and digital channels that can be used for a particular pattern or state trigger setting. This enables you to easily isolate and analyze complex interactions between digital signals and analog content in your design. Once your trigger condition is set, seamlessly view the cause-and-effect relationships and make measurements across all 20 channels.

MSO application

With more sophisticated memory buses such as SDRAM being deployed in embedded designs, it is important to be able to isolate a particular cycle of the memory bus that may be causing a problem. Isolating a SDRAM write cycle requires triggering across four digital channels when CS, CAS, and WE signals are low and RAS is high, along with one analog channel on a rising edge of Clk. You need a second analog channel to capture a data bit of the SDRAM bus that you suspect has signal integrity problems. With the write cycle isolated, you can create an eye diagram of the data bit with fast waveform update rates and then you can make worst-case setup and hold time measurements to reveal anomalies or glitches. Doing this type of analysis with a traditional two- or four-channel oscilloscope, or with a two-box logic analyzer and traditional oscilloscope, would be difficult or impossible.

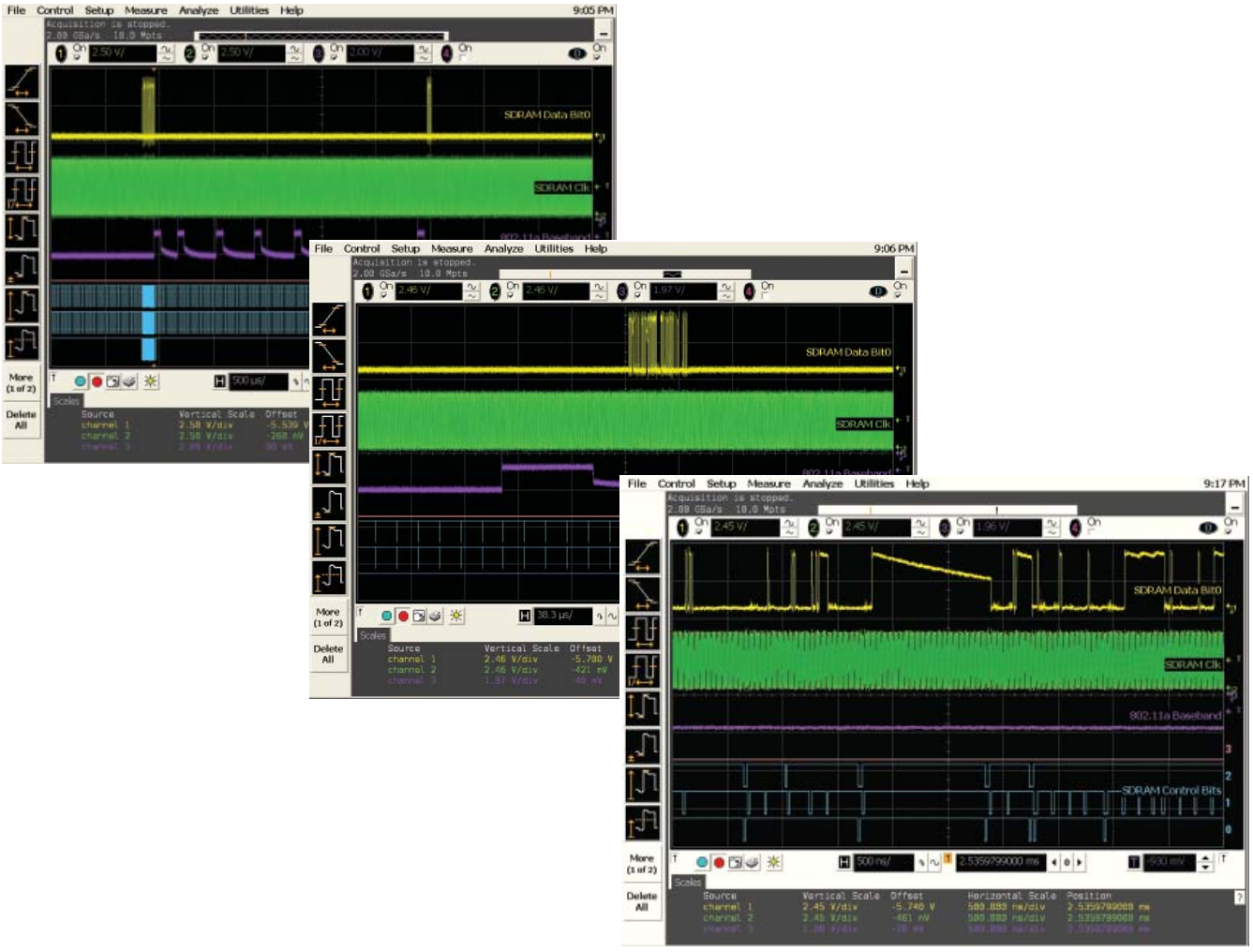


Infiniium Benefits (continued)

Up to 128 Mpts fast deep memory

Sample rate and memory depth go hand in hand. Deep memory in oscilloscopes sustains a high sample rate over longer time spans. With up to 128 Mpts of acquisition memory, the Infiniium 8000 Series offers superior resolution for capturing long, complex waveforms. Deep memory is critically important in embedded designs implementing slow analog with fast digital, serial buses, and RF communication.

Infiniium's segmented memory acquisition mode adds additional capability to deep memory acquisition when you are capturing bursted or packetized signals. With segmented memory, only the packets of interest are captured and stored into acquisition memory for viewing and analysis – no valuable memory is consumed during periods of inactivity between packets. Coupled with 128 Mpts of acquisition memory, thousands of packets can be captured at the oscilloscope's maximum sample rate over seconds or even days. With precise time-tags on each segment, segmented memory acquisition mode effectively provides gigabytes of acquisition memory in a single, high-sample-rate acquisition by efficiently utilizing the real acquisition memory it has.



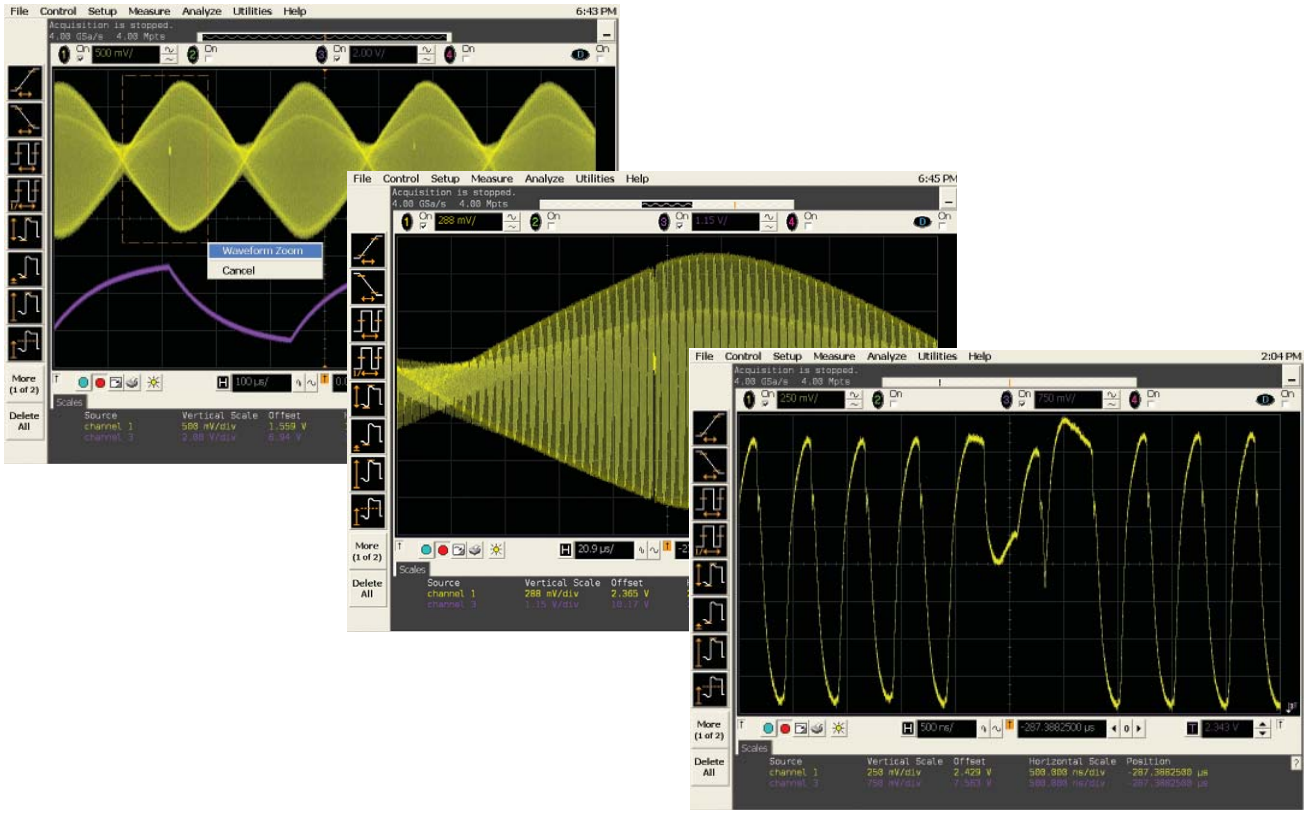
Mega*Zoom* technology enables ultra-fast waveform update rates

Responsiveness and waveform update rate slow down dramatically on traditional deep-memory oscilloscopes when they capture longer memory records, making them difficult and frustrating to use. The Infiniium 8000 Series oscilloscopes feature patented Mega*Zoom* technology that provides the fastest waveform update rates, even when using the deepest memory records up to 128 Mpts. At the heart of Mega*Zoom* technology is a custom ASIC built into the acquisition system that performs data acceleration from the ADC to waveform memory and display. With Mega*Zoom*, deep memory is always available and always fast, so you *never* have to think about manually turning it on and incurring reduced responsiveness.

Next-generation Mega*Zoom* provides best-in-class waveform viewing

In addition to providing the fastest, most-responsive deep memory, the Infiniium 8000 Series oscilloscopes feature best-in-class waveform viewing powered by next-generation Mega*Zoom* technology.

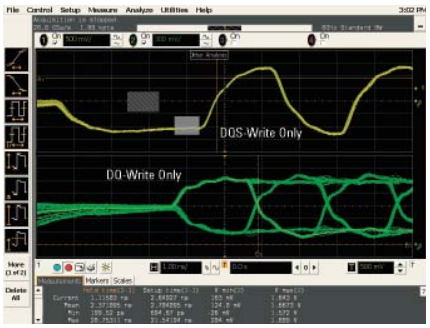
Next-generation Mega*Zoom* supports a high-resolution XGA display system and maps up to 128-Mpts of memory to 256 levels of color intensity grades, delivering unmatched real-time insight into signal details. Next-generation Mega*Zoom*'s dynamic range in the Z-axis provides designers a third-dimensional view of subtle details never before seen in an analysis-based oscilloscope. Up to this point, responsive deep memory capture, waveform analysis, and superior signal viewing have not coexisted.



With the Infiniium 8000 Series, you can have it all — deepest memory acquisition with fast waveform update rates, a high-definition display system, a powerful suite of application solutions, and integrated mixed-signal analysis capabilities.

Infiniium Features
DSO8064A/MSO8064A, DSO8104A/MSO8104A

InfiniiScan – next generation of trigger capability
InfiniiScan makes triggering easy. Just draw boxes with the Zone Qualify trigger to track signal behavior. InfiniiScan scans through thousands of acquired waveforms per second to help you isolate anomalous signal behaviors.



Serial, parallel and wideband signal decode
Whether you are working on serial, parallel or wideband signals, you can use the 8000 Series to decode your waveforms. When you are working on parallel waveforms, you can even customize the bus states to be displayed on the decode table.

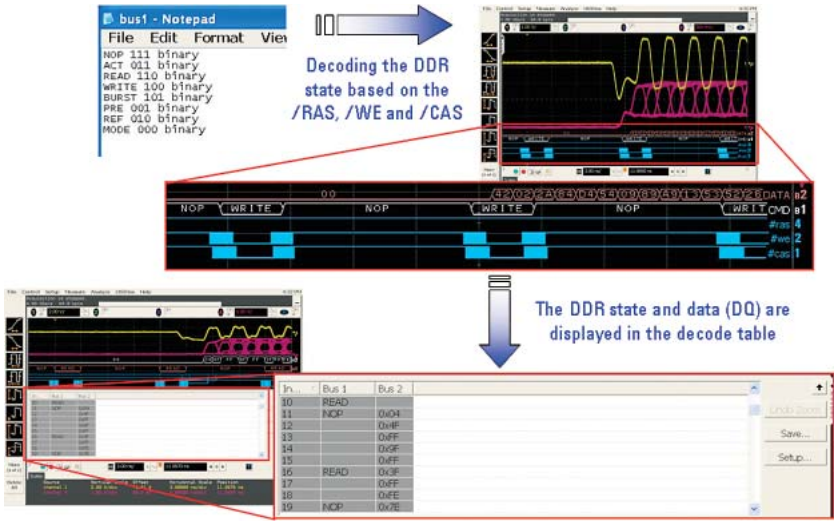
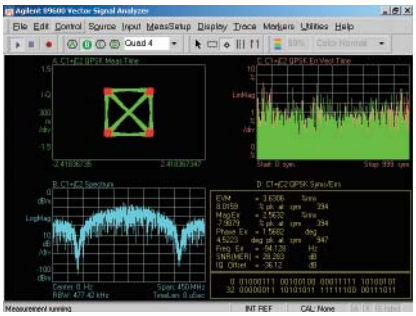
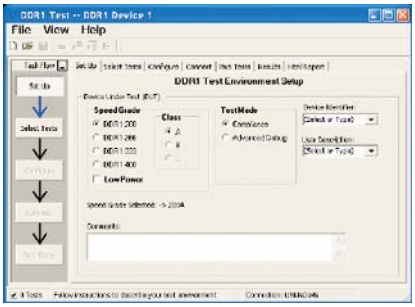


Chart mode feature
Chart mode applies trend analysis techniques to see how the digital output (ADC, counter, address lines, etc.) vary over time. This method is effective to quickly find anomalies of the digital signals. You can also apply math operators such as “FFT” to view the frequency domain of the analog values.

Powerful frequency and modulation analysis
The 8000 Series provides superior frequency domain analysis, RF-signal demodulation and extensive standard-specific analysis coverage including WiMAX™, WLAN, 3GPP, RFID and UWB with the optional 89601A Series VSA software. With digital and wireless applications merging, you can use the 8000 Series one-box solution to validate the time and frequency

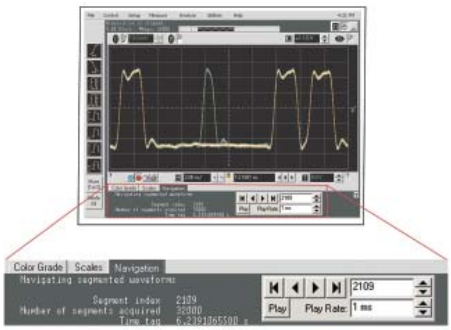


Extensive application software suite
The 8000 Series provides wide application coverage for you to quickly and easily verify your designs. Application packages include DDR, USB, Ethernet, FlexRay, CAN, SPI, I^2C, and FPGA standards.

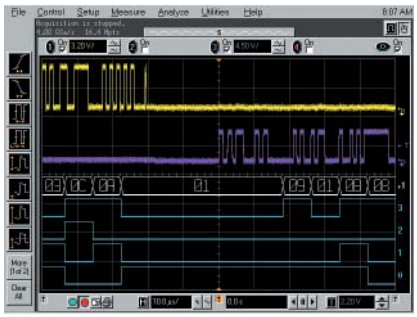


Infiniium Features (continued)
DSO8064A/MSO8064A, DSO8104A/MSO8104A

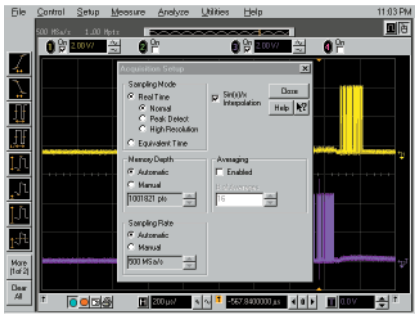
Industry's only segmented memory for both analog and digital channels
The segment memory acquisition mode allows you to capture short bursts at maximum sample rate while not consuming memory during periods of inactivity. The 8000 is the industry's only oscilloscopes that support segmented memory capture on both analog and digital channels so you can obtain critical and correlated timing information between them.



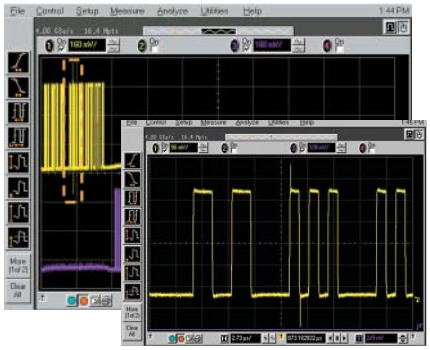
Bus mode display
Bus mode display on MSOs allows quick and easy read-out of hexadecimal representation of logic signals. Bus state mode display allows the bus readout to be updated only upon the edge of the clock source you select. Available only with Infiniium MSO models.



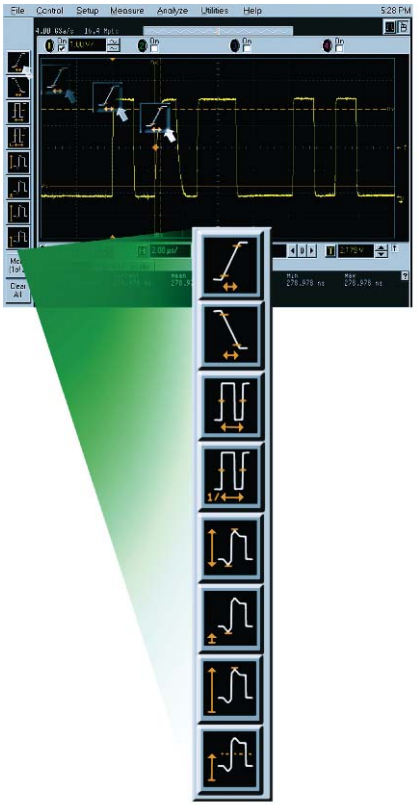
Dialog boxes for easy setup
With Infiniium, you don't need to navigate through annoying softkey menus. Dialog boxes display all the choices you need for measurement setups, all in one place. Help is available for each field, guiding you through each step.



Simple zooming
Zooming with Infiniium's graphical user interface is simple and convenient. Just use the mouse to draw a box around the area of interest and click inside. Zoom uses the full display so you get meaningful vertical as well as horizontal resolution gains. Use multiple zoom boxes to see deep inside your signal. Zooming couldn't be simpler or faster.

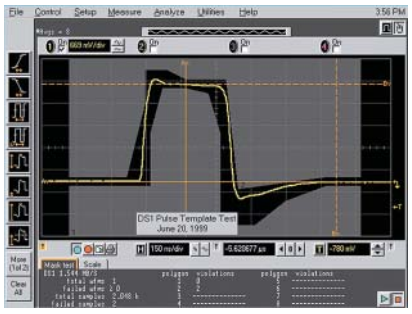


Drag-and-drop measurements
It's simple: drag an icon from the measurement bar and drop it on the cycle you want to measure. You can make up to five measurements on your waveforms, on up to five different cycles. All the measurements appear at the bottom of the display with statistics and are color coded to the channel you are measuring. Scope measurements have never been this powerful or this easy.

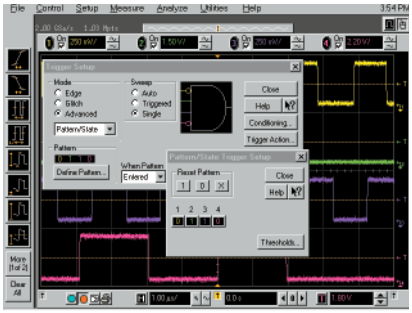


Infiniium Features (continued)
DSO8064A/MSO8064A, DSO8104A/MSO8104A

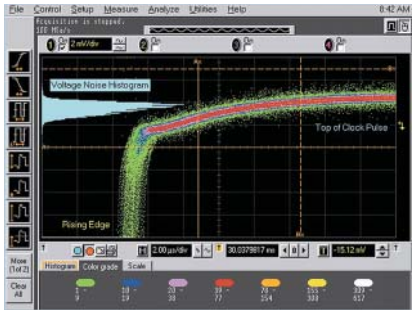
AutoMask and mask test
Mask testing is simplified with AutoMask. Acquire a waveform, define tolerance limits, and create a test envelope. Mask testing provides a pass/fail comparison of an incoming signal to the test envelope. Easily test your design's conformance to industry standards with the communication mask test kit option.



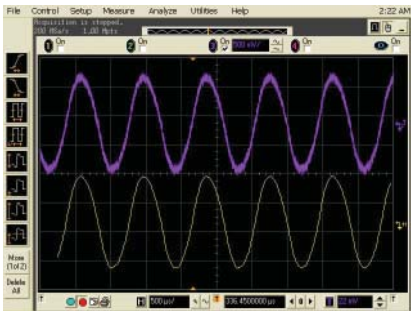
Advanced triggering
Advanced triggers are essential when you are investigating known problems. Infiniium offers a full range of advanced triggers to help you isolate and capture the condition you need to characterize. Advanced trigger setups are simplified by using intuitive dialog boxes with descriptive graphics.



Color-graded persistence with histograms
By providing seven levels of color grades for a visual representation of waveform distribution, color-graded persistence makes it easy to pick out signal anomalies and see how often they occur. Histograms quantify both noise and jitter in your target system.

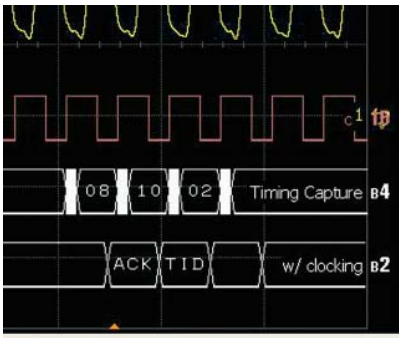


High/low pass filter
This function applies a real-time digital filter to the source waveform that you choose. This filtering feature enhances your ability to examine important signal components by filtering out unwanted frequency components.



QuickMeasure and statistics
Instantly make five common measurements on your signal, with easy-to-read statistics, by pressing the QuickMeas+ button on the front of your Infiniium. The measurements displayed can be easily customized.

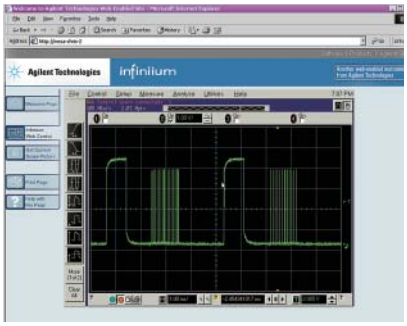
Pseudo state
Convert digital timing waveforms into state waveforms, specifying the clock edge when your data is valid. The MSO filters out all invalid states leaving exclusively valid states in the waveform display.



Infiniium Features (continued)
DSO8064A/MSO8064A, DSO8104A/MSO8104A

E-mail on trigger
Infiniium can automatically send an e-mail with a screen image of the display when the scope triggers. You can have your Infiniium send an e-mail to you or a message to your cell phone then control your scope from any Java™-enabled Web browser with Infiniium's Web-enabled feature.

Web-enabled control
For distributed teams, simply set up Infiniium on your LAN, and up to three users can access it from any Java-enabled Web browser. No special software is required. You can easily grab screen shots for a report, or troubleshoot designs from a remote location.



Infiniium IVI-COM driver
For a higher-level of instrument control, use the Infiniium IVI-COM instrument driver in your application. This IVI-COM driver takes full advantage of industry-accepted standards and is compatible in application development environments such as Visual Studio® as well as in test and measurement development environments such as Agilent VEE Pro and National Instruments LabVIEW®. The Infiniium IVI-COM Instrument driver allows for easier use, higher performance, and instrument interchangeability in your oscilloscope control program. Download the Infiniium IVI-COM driver for free from Agilent Developer's Network at **www.agilent.com/find/adn**.

Microsoft® Windows® xp Professional

Windows XP Pro open system
Want to run Windows applications inside your Infiniium scope? All Infiniium 8000 Series scopes are based on a Windows XP Pro open platform that allows you to run Windows applications inside the Infiniium to add advanced analysis and functionality to the scope.

The N5453A large external touchscreen display
An external 15" touchscreen display with XGA resolution (1024 x 768 pixels) is now available as an option. Make detecting signal anomalies easier with the larger screen size and simple control over the scope functions with the large touchscreen.

Up to 128 Mpts of Mega*Zoom* fast deep memory sustains maximum sample rates for the longest time captures.

Remote access via Web browser or programming environment with GPIB commands over LAN allows you to access your oscilloscope from any networked PC.

E-mail-on-trigger allows you to leave your oscilloscope, and when that intermittent event is captured, Infiniium sends you an e-mail that tells you exactly when it happened with an attached screen image.

10/100/1000 BaseT LAN interface lets you easily print to network printers, save files to network drives, and control the oscilloscope remotely.

Label waveforms and add comments to Infiniium's display for thorough documentation before saving screen images.

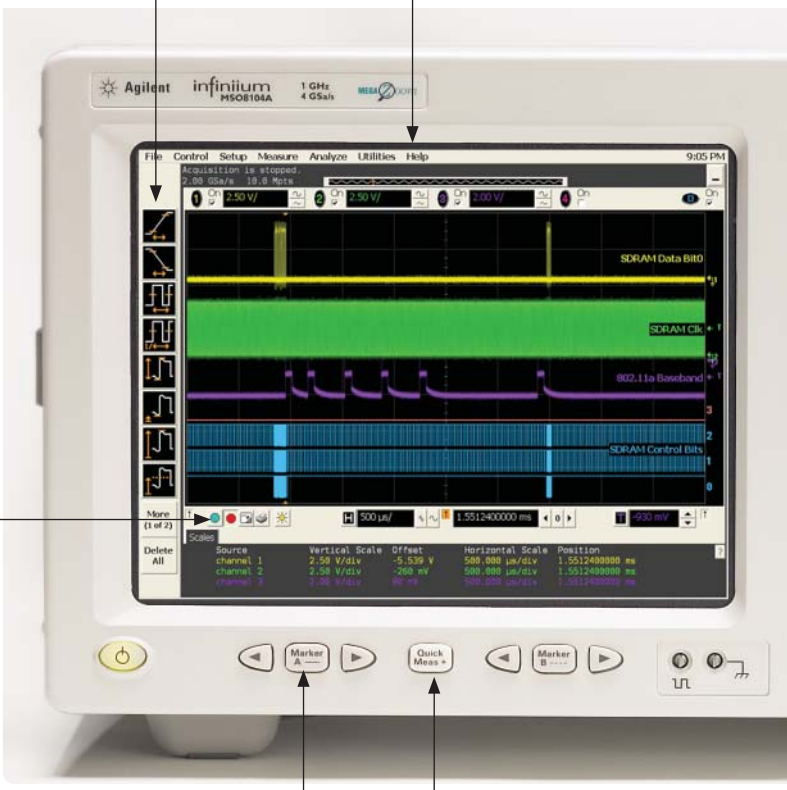
Context-sensitive right-click menus allow quick access to oscilloscope settings, controls, and display properties.

High-definition XGA color display with 256 levels of intensity uncovers subtle signal details that most oscilloscopes won't show you... enabled by next-generation Mega*Zoom* technology.

Drag-and-drop measurements from the measurement bar provide an intuitive way to make a measurement on a particular cycle of your waveform.

Touch screen display comes standard for mouse-free operation.

Get fast answers to your questions with the comprehensive built-in information system. The task-oriented setup guide provides step-by-step instructions for several measurement procedures.



Measurement markers can be easily controlled via front-panel arrow keys or dragging and dropping them with the pointer.

QuickMeas+ key gives you any five automated measurements with the push of a button. You can also configure this key to print/save screen images among other functions.

Infiniium: "The Agilent 8000 Series has already become the most coveted scope in our lab"

Ole Moyer
Application Engineer, On Semiconductor

Next-generation Mega*Zoom* technology enables you to quickly pan and zoom through the deepest waveforms for detailed analysis.

Award-winning ease-of-use is made possible by attention to details like Infiniium's analog-like front panel controls, color-coded to correspond to displayed waveforms.

USB 2.0 port directly on front panel makes it easy to save files to a USB mass storage device.

AutoProbe interface completely configures your oscilloscope and provides power to various current and active probes, including InfiniiMax active probes.

Mixed signal oscilloscope (MSO) models seamlessly integrate four analog scope channels with 16 digital channels that provide full-width viewing and triggering across many embedded signal interactions.

Hands-free operation is available with Infiniium's VoiceControl option.

Internal 40 GB hard drive provides large storage capacity for storing waveforms, screen images, and setup files. An optional removable hard drive is available for operation in secure environments.

Fast 3.2 GHz CPU with 1 GB RAM enables two times faster task processing compared to previous generations.

Optional external DVD-RW drive allows you to conveniently update system software and install third-party application packages.

Open Windows XP Pro platform enables you to install third-party applications such as Excel, LabVIEW, and MATLAB to perform custom analysis and processing, all inside the oscilloscope.

XGA video monitor out provides the ability to run third-party applications on a large external display while the internal display continues to display acquired waveforms.

Easy access to advanced features is enabled by the Windows-based graphical user interface. In addition, graphical equivalents to all front-panel controls are available.

Infiniium Advanced Application Software

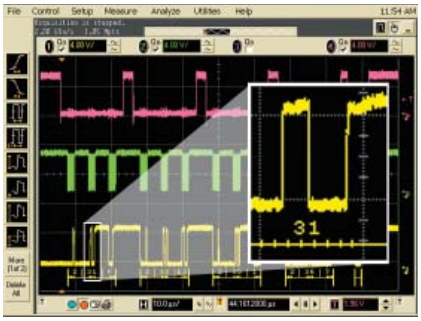
The Agilent 8000 Series Infiniium oscilloscope offers a broad portfolio of add-on applications that enables you to customize your oscilloscope. These applications are available as add-on options at your initial scope purchase or as user-installed options at a later time. For more information about these options and to see if new applications have been added to our portfolio, please visit **www.agilent.com/find/8000scope-apps**.

Xilinx and Altera FPGA dynamic probe for Infiniium MSO (N5397A and N5433A)

Agilent's MSO FPGA dynamic probe provides rapid internal FPGA visibility and quick instrument setup using an innovative core-assisted approach. Measurement tasks that previously took hours can be done in a few mouse clicks. In a few seconds you can easily measure a different set of internal signals without changing your FPGA design. The FPGA dynamic probe also imports signal names from your FPGA design to the MSO digital channel labels.

Low-speed serial data analysis software (Option 007 or N5391A)

The N5391A low-speed serial data analysis software provides a fast and easy way to debug inter-integrated circuit (I^2C) and 2-, 3- or 4-wire serial peripheral interface (SPI) serial communication buses. The low-speed SDA software provides the ability to capture and automatically display decoded serial data in numerical format synchronized with the analog or digital waveform, display decoded packets in a sortable listing window view with automatic click and zoom capability, and perform search functions for a particular packet with navigator controls.



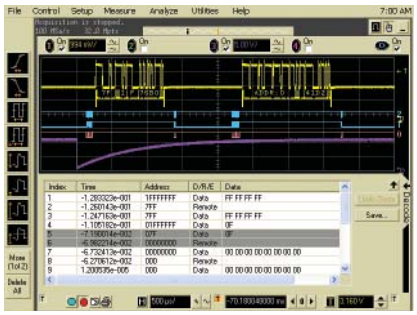
Power measurement application (U1882A)

Agilent's power application provides a full suite of power measurements that run directly on the Infiniium 8000 Series oscilloscope. The power measurement application offers seven modules to help you characterize your devices (power device analysis, input line analysis, output analysis, turn on/off analysis, transient analysis, modulation analysis and deskew analysis) in addition to report generation. Make more accurate power supply efficiency measurements by using a U1880A deskew fixture to deskew your voltage and current probes.

Infiniium Advanced Application Software (continued)

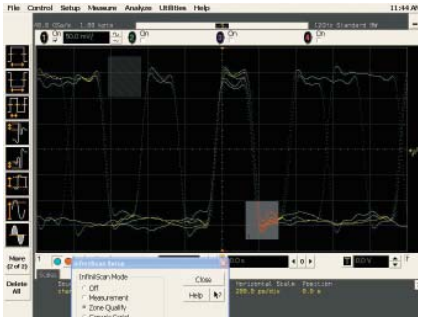
Automotive serial data analysis software (Option 008 or N5402A)

The N5402A automotive serial data analysis software allows engineers to view both protocol layer information and physical layer signal characteristics for CAN and FlexRay buses inside a single instrument, the Infiniium oscilloscope. Numerical decode values are automatically displayed and synchronized below the captured signal's waveform. They can also be viewed in a sortable listing window which allows automatic click and zoom capability to the signal of interest as well as performs search functions for a particular packet. The option also provides software clock recovery and real-time eye diagram measurements.



InfiniiScan event identification software (Option 009 or N5415A)

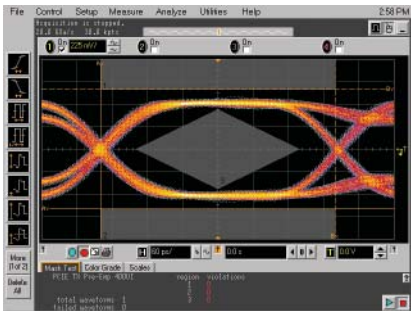
The Agilent InfiniiScan event identification software quickly and easily identifies signal integrity issues. This innovative software scans through thousands of acquired waveforms per second to help isolate anomalous signal behavior. InfiniiScan can scan for multiple events simultaneously with resolution down to 70-ps events plus automated navigation to failure events. InfiniiScan software finders consist of: measurement, zone qualify, generic serial, non-monotonic edge and runt. InfiniiScan goes beyond the classic limitations of hardware triggering and deep memory.



High-speed serial data analysis software (Option 003 or N5384A)

The N5384A high-speed serial data analysis (SDA) software provides an effective way to validate signal integrity for designs employing high-speed serial interfaces with embedded clocks. The high-speed SDA software, when used with Infiniium oscilloscopes, allows you to:

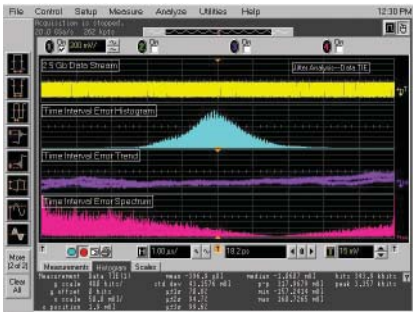
- recover embedded clocks with first-order PLL, second-order PLL, or constant frequency algorithms
- choose an external reference clock input
- display the recovered clock synchronized with the analog waveform view of the serial data stream
- build real-time eye diagrams
- unfold real-time eye diagrams to easily locate failures versus time
- perform custom mask testing
- make TIE jitter measurements relative to the recovered clock or external reference clock



Infiniium Advanced Application Software (continued)

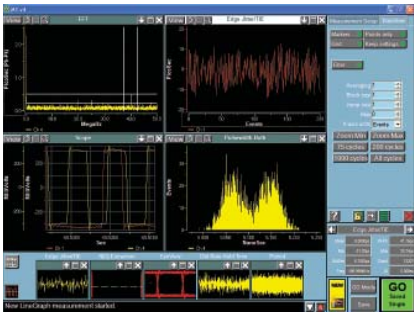
EZJIT jitter analysis software (Option 002 or E2681A)

The E2681A jitter analysis option provides the most commonly needed jitter measurements, including cycle-cycle jitter, N-cycle jitter, period jitter, time interval error, setup and hold time, measurement histograms, measurement trending and jitter spectrum. EZJIT provides a setup wizard that guides you through the setup of the jitter measurement, explains how each jitter measurement works, and tells you when to use it.



Oscilloscope tools (E2690B and N5385B)

The Agilent E2690B (US domestic) and N5385B (international) advanced time interval and jitter analysis software, licensed from Amherst Systems Associates (ASA), offers the most powerful and comprehensive set of tools for exploratory debug of jitter, and is remarkably easy to use. ASA's oscilloscope tools work in tandem with Infiniium MSOs to provide measurements never before possible.

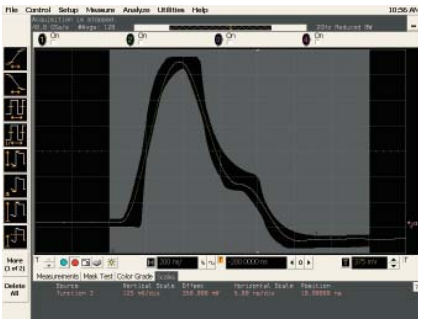


N5392A Ethernet electrical performance validation and compliance software

The Agilent N5392A Ethernet electrical performance validation and compliance software performs a wide range of electrical tests to meet the Ethernet electrical specifications for 1000Base-T, 100Base-TX and 10Base-T systems as documented in the IEEE 802.3-2005 and ANSIX3.263-1995 standards.

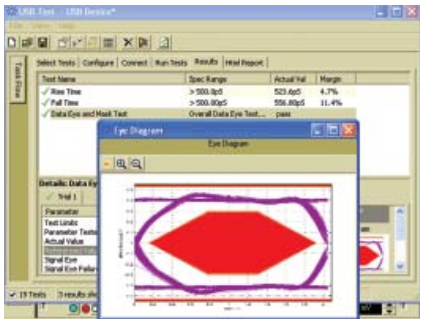
Features:

- Test setup wizard guides you through test selection, configuration, connection, execution and results reporting
- Fixtures available: N5395B Ethernet test fixtures and N5396A jitter test cable
- Supports 1000Base-T disturbing signal measurements with the use of 33250A arbitrary waveform generators
- Supports return loss measurements with most HP/Agilent vector network analyzers



USB 2.0 performance validation and compliance software (N5416A)

The Infiniium USB 2.0 electrical performance validation and compliance option provides a fast and reliable way to verify USB electrical specification compliance for USB 2.0 devices, hosts, and hubs. The Infiniium USB 2.0 test option executes the official USB-IF MATLAB scripts with MATLAB's runtime engine embedded in the oscilloscope. Results are displayed in a flexible report format with margin analysis. The Infiniium 8000 Series with bandwidths of 600-MHz and 1 GHz can appropriately test USB 2.0 low- and full-speed buses. The E2646A SQiDD test fixture is available for making the physical connection between the Infiniium oscilloscope and the device under test.

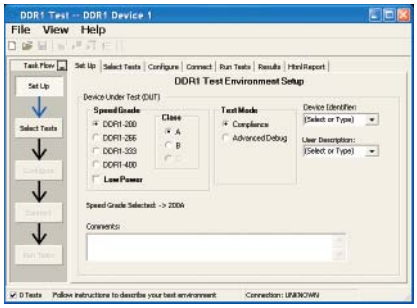


DDR1 compliance test application (U7233A)

The Agilent U7231A DDR1 compliance test application provides you with a fast and easy way to characterize and evaluate the electrical and timing parameters of your DDR1 design. The tests performed by U7231A are based on the JEDEC JESD79E DDR SDRAM Specification.

Features:

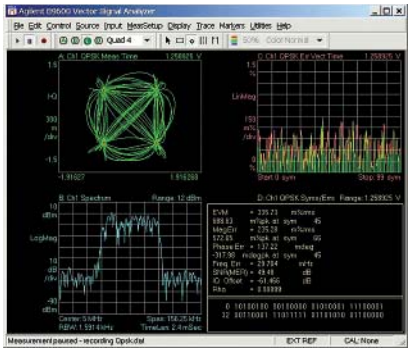
- Setup wizard for quick setup and testing
- Automated measurement and analysis to save you time and effort
- Margin analysis to indicate how close your device comes to passing or failing the test
- Automatic HTML report generation for easy documentation



Vector signal analysis software for Infiniium (89601A)

The 89601A vector signal analyzer (VSA) software, used with the Infiniium 8000 Series, enables flexible signal analysis and demodulation up to 1-GHz bandwidth for troubleshooting wideband modulated signals in radar and communications applications. The solution provides:

- Flexible demodulation for measuring constellation diagrams, carrier offset, and frequency error for QPSK signals, 256-QAM signals and much more
- Display formats including spectrogram, phase vs. time, and frequency vs. time for rapid insight into complex signal behavior
- Error vector magnitude measurements (with 89601A Option AYA)
- Markers to facilitate frequency, amplitude, offset, power, phase, other measurements
- Time gating that allows you to select specific portion of signals for signal analysis
- Variable frequency resolution



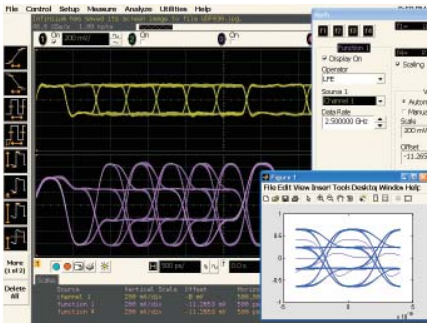
Infiniium Advanced Application Software (continued)

Infiniium user-defined function (Option 010 or N5430A)

The Agilent N5430A Infiniium user-defined function opens up new possibilities for mathematical analysis features of Infiniium by creating a gateway to MATLAB from MathWorks (**www.mathworks.com/**). You can now add your favorite MATLAB .m scripts as "math function operators," and use them just like any other standard functions provided with the Infiniium. The scope passes data to MATLAB and then displays the result back on the screen in real time. Requires MATLAB software separately.

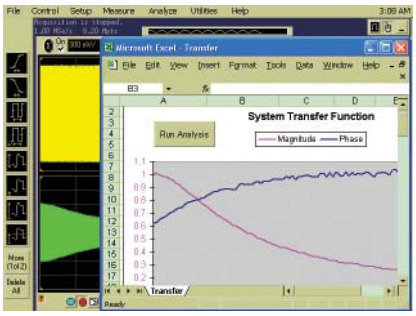
Features:

- Seamless gateway to powerful MATLAB analysis functionality
- Real-time analysis, real-time update
- Requires XML programming and .m script file
- Supports 2 control variables, and 2 sources
- Supports MATLAB version R14 SP1 and later



My Infiniium integration package (Option 006 or E2699A)

The E2699A My Infiniium integration package option allows you to extend the power of your Infiniium oscilloscope by letting you launch your application directly from the oscilloscope's front panel or graphical user interface. Any program that can be run under Windows XP can be launched from the Infiniium scope user interface or front panel, including applications such as Agilent VEE, Microsoft Excel, or MATLAB.



Communication mask test kit (E2625A)

Take the frustration out of communications testing and prove your designs conform to industry standards with the communication mask test kit option. Infiniium's familiar Windows interface makes it easy for you to access the masks you need and configure your tests.

In addition, the communication mask test kit comes with a set of electrical communication adapters to ensure convenient, reliable, and accurate connections to your device under test. Includes more than 20 industry-standard ANSI T1.102, ITU-T G.703, and IEEE 802.3 communication signal mask templates.

Infiniium Advanced Application Software (continued)

VoiceControl software (E2682A)

If you're making measurements on target systems with densely packed ICs, your hands are tied up holding probes, making it difficult to turn knobs and press buttons on the front panel of your scope. Infiniium's award-winning VoiceControl option solves this problem. Just speak into the collar-mounted microphone to operate your Infiniium's front-panel controls without using your hands. Simply tell the scope what you want it to do, using natural English-language commands, such as "set channel one to 1.25 volts per division." The VoiceControl system does not require the scope to be trained to understand a particular user.

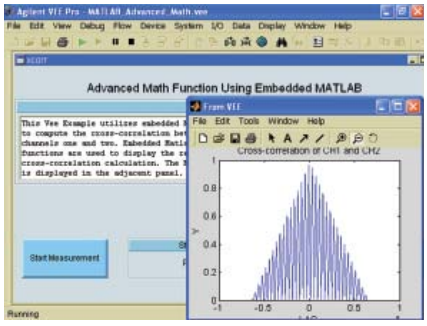
Logic analyzer and oscilloscope time correlation (E5850A optional)

Easily make time correlated measurements between an Agilent 16900 Series logic analysis system or Agilent 16800 Series benchtop logic analyzer and an Infiniium oscilloscope without a correlation fixture. All that is needed are a cross-over LAN cable and two BNC cables. Set the logic analyzer to trigger the oscilloscope or vice versa and immediately view logic timing waveforms aligned with oscilloscope waveforms

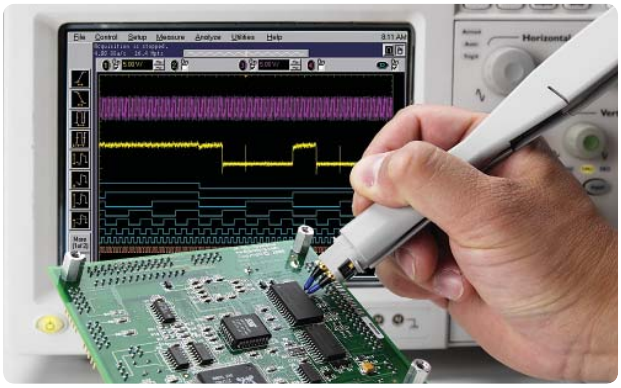
simultaneously on the logic analyzer display. Move global markers on the logic analyzer and watch Infiniium's tracking markers move automatically in synch. Move Infiniium's tracking markers and watch the logic analyzer's global markers move in synch. For the most precise correlation, the optional E5850A time correlation fixture can be used to automatically deskew logic and scope waveforms to the best possible accuracy.

VEE Pro with Infiniium (W1140A)

Agilent VEE Pro is a highly productive, intuitive, graphical programming environment for test-program development. Looking for an alternative to complex programming environments? VEE simplifies the tasks required for test development. VEE comes pre-installed with a 30-day free trial license on all Infiniium oscilloscopes. VEE runs inside Infiniium's open Windows XP Pro operating system and uses the PCI bus for fast data transfer from the oscilloscope acquisition system to the VEE application, much faster than GPIB. Six powerful sample programs are provided on the Infiniium hard drive to get you started with VEE's advanced measurement and analysis capabilities with embedded MATLAB scripts.



Infiniium Active Probing



Probing importance

If you are concerned about accurate reproduction of your signals as they appear on your device under test, you need the best end-to-end measurement system starting at the probe tip. To ensure that you achieve the full bandwidth of your oscilloscope, you need to ensure you are using a probe that shows you the details of the signal. For example, the 1-GHz models (DSO8104A and MSO8104A) will need an active probe with the bandwidth of at least 1-GHz. The 1156A or the 1130A active probes are recommended to achieve the full system bandwidth of your scope. In addition, a selection of probes that specifically enhances or utilizes Infiniium 8000 Series are also listed.

For more complete information on Agilent probing solutions please see the *Oscilloscope Probes and Accessories Selection Guide* (Agilent publication number 5989-6162EN).

Recommended probes

Model	Probe bandwidth	System bandwidth
1156A	1.5-GHz active probe	1 GHz with MSO8104A and DSO8104A 600 MHz with MSO8064A and DSO8064A
1130A	1.5-GHz InfiniiMax probe amplifier *No probe heads included*[1]	1 GHz with MSO8104A and DSO8104A 600 MHz with MSO8064A and DSO8064

Other probe choices

Model	Description
10070C	1:1, 1-MΩ passive probe[2]
1165A	10:1, 10-MΩ 600-MHz passive probe
1147A	50-MHz, 15-A AC/DC current probe
N2780A	2-MHz/500-A AC/DC current probe[3]
N2781A	10-MHz/150-A AC/DC current probe[3]
N2782A	50-MHz/30-A AC/DC current probe[3]
N2783A	100-MHz/30-A AC/DC current probe[3]
1153A	200-MHz differential probe
E5396A	Half-size (17 channel) soft touch connectorless logic probe for MSO models
N5450A	InfiniiMax extreme temperature extension cable for temperature chamber testing

1 For a complete probing solution, also order a connectivity kit or individual probe head(s) (E2675A, E2668A, E2669A)
2 Fine-pitch and IC probing kits available (10072, 10075A)
3 Order N2779A 3-channel power supply for N2780A series current probe

Infiniium Performance Characteristics

Vertical: scope channels	**DSO8064A, MSO8064A, DSO8104A, MSO8104A**
Input channels	DSO8064A/DSO8104A: 4 analog MSO8064A/MSO8104A: 4 analog + 16 digital
Analog bandwidth at 50 Ω (–3 dB)*	DSO8064A/MSO8064A: 600 MHz DSO8104A/MSO8104A: 1 GHz
Calculated rise time[1] at 50 Ω	DSO8064A/MSO8064A: 583 ps DSO8104A/MSO8104A: 350 ps
Input impedance*	1 MΩ ± 1% (13 pF typical), 50 Ω ± 1.5%
Sensitivity[2]	1 mV/div to 5 V/div (1 MΩ) 1 mV/div to 1 V/div (50 Ω)
Input coupling	1 MΩ: AC, DC; 50 Ω:DC
Hardware bandwidth limit	20 MHz
Vertical resolution[3]	8 bits, ≥12 bits with averaging
Channel-to-channel isolation (any two channels with equal V/div settings)	DC to 50 MHz: 50 dB >50 MHz to 500 MHz: 40 dB >500 MHz to 1 GHz: 30 dB
DC gain accuracy*[2,4]	± 1.25% of full scale at full resolution channel scale
Maximum input voltage*	
1 MΩ	150 V RMS or DC, CAT I ± 250 V (DC + AC) in AC coupling
50 Ω	5 Vrms, CAT I
Offset range	**Vertical sensitivity** — **Available offset**
1 MΩ	1 mV to <10 mV/div — ± 2 V 10 mV to <20 mV/div — ± 5 V 20 mV to <100 mV/div — ± 10 V 100 mV to <1 V/div — ± 20 V 1 V to 5 V/div — ± 100 V
50 Ω	1 mV to <5 mV/div — ± 2 V 5 mV to <200 mV/div — ± 5 V 200 mV to 1 V/div — ± 20 V
Offset accuracy*[2]	± (1.25% of channel offset +2% of full scale +1 mV)
Dynamic range	± 8 div from center screen (1 MΩ) ± 12 div from center screen (50 Ω)
DC voltage measurement accuracy*[2,4]	
Dual cursor	± [(DC gain accuracy)+(resolution)]
Single cursor	± [(DC gain accuracy)+(offset accuracy)+(resolution/2)] Example for single cursor accuracy for 70 mV signal, 10 mV/div, 0 offset: Accuracy = ± [1.25% (80 mV) + (1.25% (0) + 2% (80 mV) + 1 mV) + (0.4%/2) (80 mV)] = ±3.8 mV

Infiniium Performance Characteristics (continued)

Vertical: analog noise floor		DSO/MSO8064A				DSO/MSO8104A			
	Volts/div	Vrms 50 Ω	Vrms 1 MΩ	Vp-p 50 Ω	Vp-p 1 MΩ	Vrms 50 Ω	Vrms 1 MΩ	Vp-p 50 Ω	Vp-p 1 MΩ
Full bandwidth	5 mV	204.8 µV	219.8 µV	1.61 mV	1.65 mV	285.4 µV	283.8 µV	2.30 mV	2.22 mV
	10 mV	228.3 µV	243.9 µV	1.67 mV	1.75 mV	315.5 µV	312.7 µV	2.41 mV	2.36 mV
	20 mV	341.9 µV	351.8 µV	2.44 mV	2.48 mV	456.6 µV	454.9 µV	3.45 mV	3.42 mV
	50 mV	957 µV	966.1 µV	6.86 mV	6.91 mV	1.26 mV	1.25 mV	9.51 mV	9.45 mV
	100 mV	1.61 mV	1.64 mV	11.56 mV	11.7 mV	2.13 mV	2.13 mV	16.06 mV	16.13 mV
	200 mV	3.39 mV	3.22 mV	24.3 mV	22.9 mV	4.47 mV	4.19 mV	33.85 mV	31.8 mV
	500 mV	9.59 mV	9.87 mV	69.1 mV	70.6 mV	12.59 mV	11.38 mV	95 mV	86 mV
	1 V	16.2 mV	16.03 mV	116.3 mV	114.6 mV	21.39 mV	21.1 mV	160.9 mV	158.7 mV
20 MHz hardware bandwidth limit	5 mV	210 µV	219 µV	1.53 mV	1.69 mV	126.0 µV	144.1 µV	931 µV	1.06 mV
	10 mV	222 µV	237 µV	1.65 mV	1.72 mV	206.0 µV	212.1 µV	1.55 mV	1.59 mV
	20 mV	365 µV	371 µV	2.67 mV	2.71 mV	378.0 µV	379.4 µV	2.85 mV	2.85 mV
	50 mV	891 µV	897 µV	6.56 mV	6.66 mV	1.084 mV	1.08 mV	8.18 mV	8.16 mV
	100 mV	1.47 mV	1.48 mV	10.65 mV	10.8 mV	1.97 mV	1.97 mV	14.7 mV	14.7 mV
	200 mV	3.62 mV	2.91 mV	26.4 mV	21.0 mV	3.75 mV	3.93 mV	28.2 mV	29.3 mV
	500 mV	8.92 mV	8.19 mV	65.7 mV	59.9 mV	10.9 mV	9.45 mV	82.0 mV	70.8 mV
	1 V	14.68 mV	14.9 mV	106.8 mV	108.2 mV	19.8 mV	19.06 mV	149.5 mV	142.0 mV

Vertical: digital channels	MSO8064A, MSO8104A
Number of channels	16 digital – labeled D15 – D0
Threshold groupings	Pod 1: D7 – D0 Pod 2: D15 – D8
Threshold selections	TTL, 5.0V CMOS, 3.3V CMOS, 2.5V CMOS, ECL, PECL, user defined
User-defined threshold range	±8.00 V in 10 mV increments
Maximum input voltage	±40 V peak CAT I
Threshold accuracy	±(100 mV + 3% of threshold setting)
Input dynamic range	±10 V about threshold
Minimum input voltage swing	500 mV peak-to-peak
Input impedance	100 kΩ ± 2% (~ 8 pF) at probe tip
Channel-to-channel skew	2 ns typical, 3 ns maximum
Glitch detect	≥ 2.5 ns
Resolution	1 bit

Infiniium Performance Characteristics (continued)

Horizontal	DSO8064A, MSO8064A, DSO8104A, MSO8104A	
Main time base range	**DSO8064A/MSO8064A** 500 ps/div to 20 s/div	**DSO8104A/MSO8104A** 200 ps/div to 20 s/div
Horizontal position range	0 to ± 200 s	
Delayed sweep range	1 ps/div to current main time base setting	
Resolution	4 ps	
Time scale accuracy*	±(15 + 2 • (years since manufacture)) ppm	
Delta-time measurement accuracy*	Values apply to period measurements of 0.5 Vpp sine waves with frequencies equal to 1/2 the oscilloscope bandwidth at 100 mV/div using ≥ 2 GSa/s and sinx/x interpolation	
	DSO8064A/MSO8064A	**DSO8104A/MSO8104A**
≥ 256 averages, absolute (ps peak)	4.0	2.0
≥ 256 averages, standard deviation (ps rms)	1.2	0.38
No averaging, absolute (ps peak)	30	27
No averaging, standard deviation (ps rms)	6.8	5.7
Channel-to-channel deskew range	–100 µs to 100 µs	
Modes	Main, delayed, roll	
Reference positions	Left, center, right	
Jitter measurement floor	**DSO8064A/MSO8064A**	**DSO8104A/MSO8104A**
Time interval error	7 ps rms	5 ps rms
Period jitter	10 ps rms	7 ps rms
N-cycle, cycle-cycle jitter	15 ps rms	11 ps rms

Infiniium Performance Characteristics (continued)

Acquisition: scope channels	DSO8064A, MSO8064A, DSO8104A, MSO8104A
Real time sample rate (max)	
2 channels	4 GSa/s
Each channel	2 GSa/s
Equivalent time sample rate (max)	250 GSa/s
Memory depth[5]	**2 channels/4 channels**
Standard	8 Mpts/4 Mpts
Option 080	16 Mpts/8 Mpts
Option 160	32 Mpts/16 Mpts
Option 320	64 Mpts/32 Mpts
Option 640	128 Mpts/64 Mpts
Sampling modes	
Real time	
Normal	Successive single-shot acquisitions
Peak detect	Captures and displays narrow pulses or glitches at all real time sample rates
High resolution	Real-time boxcar averaging reduces random noise and increases resolution
Equivalent time	Random repetitive sampling (higher time resolution at faster sweep speeds)
Segmented memory	Captures bursting signals at maximum sample rate without consuming memory during periods of inactivity. Selectable number of segments up to 32,768 depending on memory option installed. Minimum inter-segment time (or the time between the end of the previous acquisition and the beginning of the next acquisition) of 20 µs.
Averaging	Selectable from 2 to 65,534
Filters	
(Sin[x])/x Interpolation	Filter on/off selectable FIR digital filter. Digital signal processing adds points between acquired data points to enhance measurement accuracy and waveform display quality. BW = sample rate/4

Acquisition: digital channels	MSO8064A, MSO8104A
Maximum input frequency	250 MHz
Maximum real time sample rate	1 GSa/s
Memory depth per channel	32 M
Minimum width glitch detection	2.5 ns

Infiniium Performance Characteristics (continued)

Trigger: scope channels	DSO8064A, MSO8064A, DSO8104A, MSO8104A
Sensitivity	
Internal[6]	DC to 600 MHz: 0.6 div 600 MHz to 1 GHz: 1.5 div (50 Ω)
Auxiliary	DC to 600 MHz: 300 mVp-p
Level range	
Internal	± 8 div from center screen (1 MΩ) ± 8 div from center screen (50 Ω)
Auxiliary	± 5 V
Sweep modes	Auto, triggered, single
Trigger coupling	DC, AC, low frequency reject (50 kHz high pass filter), high frequency reject (50 kHz low pass filter)
Trigger conditioning	Noise reject adds hysteresis to trigger circuitry decreasing sensitivity to noise
Trigger holdoff range	50 ns to 10 s
Trigger jitter	8 ps ± 0.05 ppm x |delay setting| rms
Trigger actions	Specify an action to occur, and the frequency of the action, when a trigger condition occurs. Actions include: e-mail on trigger and QuickMeas+ functions
Trigger modes	
Edge	Triggers on a specified slope and voltage level on any channel, auxiliary trigger or line input.
Glitch	Triggers on glitches narrower than the other pulses in your waveform by specifying a width less than your narrowest pulse and a polarity. Minimum glitch width is 500 ps (scope channels) or 2.5 ns (digital channels). Glitch range settings: <1.5 ns to <10 s (scope channels), <5 ns to <10 s (digital channels).
Line	Triggers on the line voltage powering the oscilloscope.
Pattern	Triggers when a specified logical combination of the channels is entered, exited, is present or absent for a specified period of time or is within a specified time range. Each channel can have a value of high (H), low (L) or don't care (X).
State	Pattern trigger clocked by the rising or falling edge, or both, of one channel. Logic type: AND or NAND.
Delay by time	The trigger is qualified by an edge. After a specified time delay between 5 ns to 10 s, a rising or falling edge on any one selected input will generate the trigger.
Delay by events	The trigger is qualified by an edge. After a specified delay between 1 to 16,000,000 rising or falling edges on any one selected input will generate the trigger.
TV	Trigger on one of the three standard television waveforms: 525 lines/60 Hz (NTSC) 625 lines/50 Hz (PAL), or define a custom waveform.
Violation triggers	
Pulse width	See trigger mode/glitch for performance characteristics. Greater than and less than selections available.
Setup/hold	Triggers on setup, hold or setup and hold violations in your circuit. Requires a clock and data signal on any two input channels as trigger sources. High and low thresholds and setup and/or hold time must then be specified.
Transition	Trigger on pulse rising or falling edges that do not cross two voltage levels in greater than or less than the amount of time specified.

Software trigger (InfiniiScan event identification software (Option 009))

Trigger modes	
Generic serial	Software triggers on NRZ-encoded data up to 80-bit pattern. Supports multiple clock data recovery methods including constant frequency, 1st order PLL, 2nd order PLL, explicit clock, explicit 1st order PLL, 2nd order PLL (requires N5384A except for the constant frequency).
Measurements	Software triggers on the results of the measurement values. For example, when the "pulse width" measurement is turned on, InfiniiScan measurement software triggers on a glitch as narrow as 250 ps.
Non-monotonic	Software triggers on the non-monotonic edge. The non-monotonic edge is specified by setting a hysteresis value.
Runt	Software triggers on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again.
Zone qualify	Software triggers on the user-defined zones on screen. Zones can be specified as either "must intersect" or "must not intersect." Up to four zones can be defined.

Trigger: digital channels	**MSO8064A, MSO8104A**
Threshold range (user defined)	±8.0 V in 10-mV increments
Threshold accuracy*	±(100 mV + 3% of threshold setting)
Predefined thresholds	TTL=1.4 V, 5.0 V CMOS=2.5 V, 3.3 V CMOS=1.65 V, 2.5 V CMOS=1.25 V, ECL=–1.3 V, PECL=3.7 V

Infiniium Performance Characteristics (continued)

Measurements and math	DSO8064A, MSO8064A, DSO8104A, MSO8104A
Waveform measurements	
Voltage (scope channels only)	Peak-to-peak, minimum, maximum, average, RMS, amplitude, base, top, overshoot, preshoot, upper, middle, lower, runt (with InfiniiScan)
Time (all channels)	Period, frequency, positive width, negative width, duty cycle, delta time
Time (scope channels only)	Rise time, fall time, Tmin, Tmax, channel-to-channel phase, setup time, hold time
Mixed (scope channels only)	Area, slew rate
Frequency domain	FFT frequency, FFT magnitude, FFT delta frequency, FFT delta magnitude
Eye pattern	Eye height, eye width, jitter, crossing %, Q-factor, duty cycle distortion
Jitter clock (scope only)	Cycle-cycle jitter, N-cycle jitter, cycle-cycle +width, cycle-cycle –width, cycle-cycle duty cycle (all with EZJIT)
Jitter data (scope only)	Time interval error (TIE), data rate, unit interval (all with EZJIT)
Measurement modes	
Automatic measurements	Measure menu access to all measurements, five measurements can be displayed simultaneously with statistics
QuickMeas+	Front-panel button activates five pre-selected or five user-defined automatic measur ments
Drag and drop measurement toolbar	Measurement toolbar with common measurement icons that can be dragged and dropped onto a particular displayed waveform cycle
Statistics	Displays the mean, standard deviation, minimum, maximum range, and number of measurement values for the displayed automatic measurements
Histograms (scope channels only)	Vertical (for timing and jitter measurements) or horizontal (noise and amplitude change) modes, regions are defined using waveform markers. Measurements included: mean, standard deviation, mode, peak-to-peak, median, total hits, peak (area of most hits), and mean ± 1, 2, and 3 sigma
Mask testing AutoMask	Allows pass/fail testing to user-defined or Agilent-supplied waveform templates. allows user to create a mask template from a captured waveform and define tolerance range in time/voltage or percentage. Test modes include test forever, test to specified time or event limit, and stop on failure. Communications mask test kit option provides a set of ITU-T G.703, ANSI T1.102, and IEEE 802.3 industry-standard masks for compliance testing.
Marker modes	Manual markers, track waveform data, track measurements
Waveform math	Four functions f1-f4. Select from add, average, common mode, differentiate, divide, FFT magnitude, FFT phase, high pass filter, integrate, invert, low-pass filter, magnify, min, max, multiply, smoothing, subtract, versus
FFT	
Frequency range[7]	DC to 2 GHz (2 channels), DC to 1 GHz (each channel)
Frequency resolution	Resolution = sample rate/memory depth
Best resolution at maximum sample rate	4 GSa/s/32 M = 125 Hz
Frequency accuracy	(1/2 frequency resolution)+($5x10^{-5}$)(signal frequency)
Signal-to-noise ratio[8]	80 dB at 1 Mpts memory depth
Window modes	Hanning, flattop, rectangular

Infiniium Performance Characteristics (continued)

Display

Display	
Display	8.4 inch color XGA TFT-LCD with touch screen
Intensity grayscale:	256-level intensity-graded display
Resolution	1024 pixels horizontally x 768 pixels vertically
Annotation	Up to 12 labels, with up to 100 characters each, can be inserted into the waveform area
Grids	Can display 1, 2 or 4 waveform grids
Waveform styles	Connected dots, dots, infinite persistence, color graded infinite persistence. Includes up to 256 levels of intensity-graded waveforms.
Waveform update rate	
Real time mode (fastest)	5,600 waveforms/sec (memory depth: 16 pts, sampling rate: 2 GS/s, time/div: 500 ps, connect dots: off, sin(x)/x: off, color graded: off)
Real time mode (nominal)	2,000 waveforms/sec (memory depth: 64 kpts, sampling rate: 4 GS/s, time/div: 500 ps, connect dots: on, sin(x)/x: on, color graded: off)

Computer system and peripherals, I/O ports

Computer system and peripherals	
Operating system	Windows XP Pro
CPU	Intel® Celeron™ 3.2-GHz microprocessor
PC system memory	1 GB DDR2
Drives	≥ 40-Gb internal hard drive (optional removable hard drive), external DVD-RW drive (optional)
Peripherals	Logitech optical USB mouse, compact keyboard and stylus supplied. All Infiniium models support any Windows-compatible input device with a serial, PS/2 or USB interface.
File types	
Waveforms	Compressed internal format (*.wfm), comma separated values (*.csv), tab separated values (*.tsv) and Y value files (*.txt)
Images	BMP, PCX, TIFF, GIF or JPEG
I/O ports	
LAN	RJ-45 connector, supports 10Base-T, 100Base-T, and 1000Base-T. Enables Web-enabled remote control, e-mail on trigger or demand, data/file transfers and network printing.
GPIB	IEEE 488.2, fully programmable
RS-232 (serial)	COM1, printer and pointing device support
Parallel	Centronics printer port
PS/2	Two ports. Supports PS/2 pointing and input devices.
USB 2.0 Hi-Speed	One port on front panel plus four ports on rear panel. All USB 2.0 Hi-Speed compatible. Allows connection of USB peripherals like storage devices and pointing devices while the oscilloscope is on.
Dual-monitor video output	15 pin XGA, full color output of scope waveform display or dual monitor video output (up to SXGA resolution with a dual monitor use)
Auxiliary output	DC (± 2.4 V); square wave (~715 Hz and 456 MHz); trigger output (255 mV p-p into 50 Ω)
Trigger output	5 V 50 Ω back-terminated
LXI compliance	Functional Class C

Infiniium Performance Characteristics (continued)

General characteristics	DSO8064A, MSO8064A, DSO8104A, MSO8104A
Temperature	
Operating	0 °C to + 50 °C
Non-operating	–40 °C to + 70 °C
Humidity	
Operating	Up to 95% relative humidity (non-condensing) at +40 °C
Non-operating	Up to 90% relative humidity at +65 °C
Altitude	
Operating	Up to 4,600 meters (15,000 feet)
Non-operating	Up to 15,300 meters (50,000 feet)
Vibration	
Operating	Random vibration 5-500 Hz, 10 minutes per axis, 0.3 g (rms)
Non-operating	Random vibration 5-500 Hz, 10 minutes per axis, 2.41 g (rms); resonant search 5-500 Hz, swept sine, 1 octave/minute sweep rate, (0.75 g), 5 minute resonant dwell at 4 resonances per axis
Power	100-240 VAC, ± 10%, Cat II, 47 to 63 Hz; Max power dissipated: 440 W
Weight	Net: 13.9 kg (30.6 lbs.) Shipping: 16.4 kg (36.1 lbs.)
Dimensions (excluding handle)	Height: 216 mm (8.5 in); width: 437 mm (17.19 in); depth: 440 mm (17.34 in)
Safety	Meets IEC1010-1 +A2, CSA certified to C22.2 No.1010.1, Self certified to UL 3111

* Denotes warranted specifications, all others are typical. Specifications are valid after a 30-minute warm-up period and ±10 °C from firmware calibration temperature.

1 Rise time figures are calculated from t r = 0.35/bandwidth.

2 Magnification is used below 5 mV/div range. Below 5 mV/div, full scale is defined as 40 mV. Full scale is defined as the major attenuator setting above an intermediate setting. (Major settings 50 Ω: 10 mV, 20 mV, 50 mV, 100 mV, 200 mV, 500 mV, 1 V, 1 MΩ: all of the above plus 2 V).

3 Vertical resolution for 8 bits = 0.4% of full scale, for 12 bits = 0.024% of full scale.

4 The dc gain accuracy decreases 0.08% of full scale per degree C from the calibration temperature.

5 Maximum 2-channel memory depth only available at maximum 2-channel sample rate. Maximum each channel memory depth available at any selectable sample rate.

6 Valid for vertical ranges > 5 mV/div.

7 FFT amplitude readings are affected by input amplifier roll-off; DSO8064A and MSO8064A: –3 dB at 600 MHz, with amplitude decreasing as frequency increases above 600 MHz; DSO8104A and MSO8104A: –3 dB at 1 GHz, with amplitude decreasing as frequency increases above 1 GHz.

8 Noise floor varies with memory depth and with averaging on or off.

Infiniium Ordering Information

8000 Series oscilloscopes

	DSO8064A	MSO8064A	DSO8104A	MSO8104A
Bandwidth	600 MHz	600 MHz	1 GHz	1 GHz
Input channels	4 analog	4 analog + 16 logic	4 analog	4 analog + 16 logic
Maximum sample rate	4 GSa/s	4 GSa/s	4 GSa/s	4 GSa/s
Maximum memory	128 Mpts	128 Mpts	128 Mpts	128 Mpts
Standard memory	8 Mpts	8 Mpts	8 Mpts	8 Mpts

The above models include: optical USB mouse, condensed keyboard, User's Quick Start Guide in English language (other languages also available), documentation CD (Service Guide, Programmer's Guide), information system in English language, accessory pouch (54810-68701), front panel cover, power cord, one-year warranty, 10073C 10:1 passive probe (qty 4) and with MSO version 54826-68701 logic cable kit.

Recommended probes

Model	Description
1156A	1.5 GHz active probe
1130A	1.5 GHz InfiniiMax probe amplifier – *No probe heads included*[1]

1 For a complete probing solution, also order a connectivity kit or individual probe head(s) (E2675A, E2668A, E2669A)

For more information on selecting the right probe see page 17.

Memory options

Option number - factory installed	Option number - user installed	Description
080	N5407A-080	16 Mpts on 2 channels, 8 Mpts on 4 channels
160	N5407A-160	32 Mpts on 2 channels, 16 Mpts on 4 channels
320	N5407A-320	64 Mpts on 2 channels, 32 Mpts on 4 channels
640	N5407A-640	128 Mpts on 2 channels, 64 Mpts on 4 channels

Memory can be added both at the time of initial purchase and after with a user installed option.

For a comprehensive list and selection criteria, refer to the *Oscilloscopes Probes and Accessories Selection Guide* (Agilent publication number 5989-6162EN). Or visit our Web site at **www.agilent.com/find/scope_probes**.

Infiniium Ordering Information (continued)

Application options

Options	Description
Digital analysis	
N5397A	FPGA dynamic probe for Xilinx
N5433A	FPGA dynamic probe for Altera
Serial data analysis	
Option 007 or N5391A	Low-speed serial data analysis software for I^2C and SPI serial communication buses
Option 008 or N5402A	Automotive serial data analysis software
Option 003 or N5384A	High-speed serial data analysis software for CAN and FlexRay serial communication buses
Jitter analysis	
Option 002 or E2681A	EZJIT jitter analysis software
E2690B	Oscilloscope tools including advanced time interval and jitter analysis software from Amherst Systems Associates
Compliance testing	
E2625A	Communication mask test kit
N5392A	Ethernet performance validation and compliance software
N5416A	USB 2.0 electrical performance validation and compliance software
U7233A	DDR1 compliance test application
Power measurement analysis	
U1882A	Power measurement analysis for Infiniium oscilloscopes
Option 001	Oscilloscope-locked license
Option 002	PC-locked license
Vector signal analysis	
89601A	VSA software for Infiniium
Advanced triggering	
Option 009 or N5415A	InfiniiScan event identification software
User customized analysis software	
Option 010 or N5430A	User-defined function - seamless linkage to MATLAB to support custom functions
Option 006 or E2699A	My Infiniium integration package enabling you to launch and integrate Windows application directly from your scope
Hands free operation	
E2682A	VoiceControl software

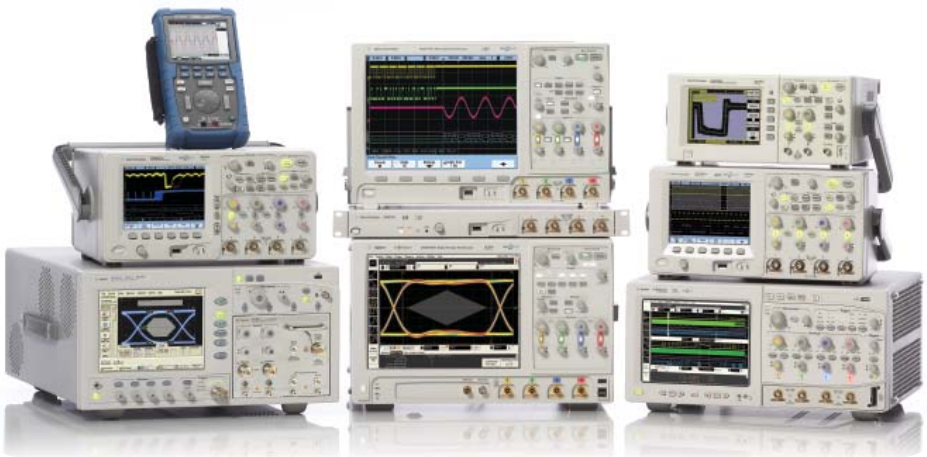
Infiniium Ordering Information (continued)

Other options

Option	Description
Option 017 (factory installed)	≥ 40 GB removable hard disk drive. Replaces ≥ 40 GB internal hard disk with a ≥ 40 GB removable hard disk. Order the N5422A for additional hard disk drive cartridges that contain the full Windows operating system and oscilloscope application.
Option 019 or N5453A	External touchscreen display for Infiniium oscilloscopes
Option 020 or N5437A	External DVD-RW drive
E2609B	Rackmount kit
A6J	ANSI Z540-compliant calibration
R-51B-001-3C	1-year return-to-Agilent warranty extended to 3 years

Related Literature

Publication title	Publication type	Publication number
Infiniium Probes, Accessories and Options	Data sheet	5968-7141EN/ENUS
Agilent Oscilloscope Probes and Accessories	Selection guide	5989-6162EN
Agilent 8000 Series Oscilloscopes	Brochure	5989-5806EN
Industry Compliance and Analysis Applications for Infiniium Oscilloscopes	Brochure	5989-6704EN
N5450A InfiniiMax Extreme Temperature Extension Cable	Data sheet	5989-7542EN
N5397A Xilinx FPGA Dynamic Probe for 8000 Series	Data sheet	5989-1848EN
N5433A Altera FPGA Dynamic Probe for 8000 Series	Data sheet	5989-5940EN
E2681A EZJIT Jitter Analysis Software	Data sheet	5989-0109EN
E2690B Oscilloscope Tools Software with Advanced Jitter Analysis	Data sheet	5989-3525EN
N5384A High-Speed Serial Data Analysis and Clock Recovery Software	Data sheet	5989-0108EN
N5391A Low-Speed Serial Data Analysis Software for I^2C and SPI	Data sheet	5989-1250EN
N5402A Automotive Serial Data Analysis Software	Data sheet	5989-3632EN
89601A Infiniium Oscilloscopes and 89601A Vector Signal Analysis Software	Data sheet	5989-0947EN
N5392A Ethernet Electrical Performance Validation and Compliance Software	Data sheet	5989-1527EN
N5416A USB 2.0 Electrical Performance Validation and Compliance Software	Data sheet	5989-4044EN
U7233A DDR1 Compliance Test Application	Data sheet	5989-7366EN
E2699A My Infiniium Integration Software	Data sheet	5988-9934EN
N5415A InfiniiScan Event Identification Software	Data sheet	5989-4605EN
N5430A Infiniium User-Defined Function Application Software	Data sheet	5989-5632EN
Agilent Mixed Signal Oscilloscopes: 6-Minute Video Demonstration	Video CD	5988-9288EN



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LXI

www.lxistandard.org
LXI is the LAN-based successor to GPIB, providing faster, more efficient connectivity. Agilent is a founding member of the LXI consortium.

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