Infiniium 80000 Series Oscilloscopes
InfiniiMax II Series Probes

13, 12, 10, and 8 GHz Oscilloscope Measurement Systems

Data Sheet

- 13, 12, 10, and 8 GHz bandwidth real-time oscilloscopes with up to 40 GSa/s sample rate

- Up to 2 Mpts MegaZoom deep memory at 40 GSa/s sample rates and 64 Mpts MegaZoom deep memory at 4 GSa/s

- InfiniiMax II probing system with up to 13 GHz bandwidth

- Trigger jitter less than 500 fs rms

- Lowest vertical noise floor and lowest jitter measurement floor in the industry

- After-Burner upgrade program protects your Infiniium 80000 Series investment

- Electronic attenuators eliminate the reliability and ESD discharge concerns associated with mechanical attenuator relays

- Unrivaled InfiniiMax probing accessories support browsing, solder-in, socket use, and SMA use models all at 12 GHz or greater bandwidth

- Award-winning user interface based on Microsoft Windows® XP Pro supports CD-RW, dual-monitor, and third-party software packages

The highest signal integrity measurement system available

An oscilloscope and probing system with bandwidths up to 13 GHz and a maximum sample rate of 40 GSa/s is required to meet the performance needs of engineers designing state of the art high-speed serial communication links and other ultra-high-speed electronic systems. Modern industry bus standards such as Fibre Channel, Fully Buffered DIMM, Serial ATA, Serial Attached SCSI, and PCI-Express have performance points in the 4 to 8.5 Gb/s range. Proprietary high-speed serial buses can also have clock rates in the 4 to 8.5 Gb/s range as well as rise times faster than 50 ps. Scopes with bandwidths of 8, 10, 12, or 13 GHz are required to capture

Agilent DSOs

Breaking the 10 GHz Performance Barrier

Agilent Technologies

Benefits

the frequency harmonics of such high-speed signals and make accurate and repeatable measurements on them.

Agilent's award-winning InfiniiMax probing system set the standard for probing systems and the rest of the oscilloscope industry is now following this trend-setting architecture. Agilent's InfiniiMax II probing system takes this innovation to an unmatched level of performance and usability.

80000 Series Infiniium oscilloscopes

Model	Bandwidth	Channels	Maximum sample rate
DSO81304A	13 GHz real-time DSP enhanced	on 2 channels	40 GSa/s
	12 GHz real-time	on 2 channels	40 GSa/s
	13 GHz equivalent-time	on 4 channels	500 fs point spacing
	8 GHz real-time	on 4 channels	20 GSa/s
DSO81204A	12 GHz real-time	on 2 channels	40 GSa/s
	12 GHz equivalent-time	on 4 channels	500 fs point spacing
	8 GHz real-time	on 4 channels	20 GSa/s
DSO81004A	10 GHz real-time	on 2 channels	40 GSa/s
	10 GHz equivalent-time	on 4 channels	500 fs point spacing
	8 GHz real-time	on 4 channels	20 GSa/s
DSO80804A	8 GHz real-time	on 2 channels	40 GSa/s
	8 GHz equivalent-time	on 4 channels	500 fs point spacing
	8 GHz real-time	on 4 channels	20 GSa/s

Maximum memory depth for all DSO 80000 Series

Standard acquisition memory	0.5 Mpts on 2 channels, 0.25 Mpts on 4 channels
Optional acquisition memory this option also enables	2 Mpts on 2 channels, 1 Mpts on 4 channels 64 Mpts on 2 channels at 4 GSa/s, 32 Mpts on 4 channels $\leq$ 2 GSa/s
Maximum memory in equivalent-time modes	always 0.25 Mpts per channel

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Benefits (continued)

InfiniiMax II Series probe amplifiers

Model	Bandwidth	Description
1169A	12 GHz (spec) 13 GHz (typical)	InfiniiMax II probe amplifier – order one or more probe heads
1168A	10 GHz	InfiniiMax II probe amplifier – order one or more probe heads

InfiniiMax probe amplifier specifications: Dynamic range = 3.3 V, DC offset range = ± 16 V, maximum voltage = ± 30 V

InfiniiMax II Series probe heads

InfiniiMax II Series probe heads are recommended for 1169A/68A probe amplifiers. When used with a DSO81304A, the N5380A, N5381A, and N5382A will typically achieve 13 GHz bandwidth.

Probe head	Model number	Differential measurement (BW, input C, input R)	Single-ended measurement (BW, input C, input R)
Hi-BW differential SMA	N5380A	12 GHz	12 GHz
Hi-BW differential solder-in	N5381A	12 GHz, 0.21 pF, 50 kΩ	12 GHz, 0.35 pF, 25 kΩ
Hi-BW differential browser	N5382A	12 GHz, 0.21 pF, 50 kΩ	12 GHz, 0.35 pF, 25 kΩ

InfiniiMax I Series probe heads can be used with 1169A/68A probe amplifiers with limitations.

Probe head	Model number	Differential measurement (BW, input C, input R)	Single-ended measurement (BW, input C, input R)
Differential solder-in (Higher loading, high frequency response variation)	E2677A	12 GHz, 0.27 pF, 50 kΩ	12 GHz, 0.44 pF, 25 kΩ
Differential socket (Higher loading)	E2678A	12 GHz, 0.34 pF, 50 kΩ	12 GHz, 0.56 pF, 25 kΩ
Differential browser – wide span	E2675A	6 GHz, 0.32 pF, 50 kΩ	6 GHz, 0.57 pF, 25 kΩ
Differential SMA	E2695A	8 GHz	8 GHz
Single-ended solder-in (must bandlimit input to ≤ 6 GHz)	E2679A	N/A	6 GHz, 0.50 pF, 25 kΩ
Single-ended browser	E2676A	N/A	6 GHz, 0.67 pF, 25 kΩ

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Benefits (continued)

Example 1: How much bandwidth do I need to measure a given rise/fall time accurately?

Rise/fall time (20 - 80%)	3% accuracy	10% accuracy	20% accuracy
100 ps	5.6 GHz	4.8 GHz	4.0 GHz
75 ps	7.5 GHz	6.4 GHz	5.3 GHz
60 ps	9.3 GHz	8.0 GHz	6.7 GHz
50 ps	11.2 GHz	9.6 GHz	8.0 GHz
40 ps	14.0 GHz	12.0 GHz	10.0 GHz
30 ps	18.7 GHz	16.0 GHz	13.3 GHz

Notes:
    Maximum signal frequency content = 0.4/rise time (20 - 80%)
    Scope bandwidth required = 1.4 x maximum signal frequency for 3% accuracy measurements
    Scope bandwidth required = 1.2 x maximum signal frequency for 5% accuracy measurements
    Scope bandwidth required = 1.0 x maximum signal frequency for 10% accuracy measurements

Example 2: How much bandwidth do I need for a given high-speed serial bus clock rate?

Serial bus clock rate	Fundamental frequency of data signal	3rd harmonic frequency of data signal	5th harmonic frequency of data signal
2.5 Gb/s	1.25 GHz	3.75 GHz	6.25 GHz
4.25 Gb/s	2.125 GHz	6.375 GHz	10.625 GHz
5.0 Gb/s	2.5 GHz	7.5 GHz	12.5 GHz
6.0 Gb/s	3.0 GHz	9.0 GHz	15.0 GHz
7.0 Gb/s	3.5 GHz	10.5 GHz	17.5 GHz
8.5 Gb/s	4.25 GHz	12.75 GHz	21.25 GHz

Benefits (continued)

## Key trends in the electronics market

- Technologies with dramatically increased clock speeds and edge rates have emerged.

- Very fast serial differential buses are being used to save board space, reduce power and provide better noise immunity.

- Densely packed circuit boards, often with stacked daughter boards, increase the need to probe in very hard-to-reach places.

Key benefits of the 80000 and InfiniiMax II Series

- Up to 13 GHz bandwidth can track even the fastest signal speeds.

- A sample rate of up to 40 GSa/s can measure high-speed differential buses reliably and repeatedly.

- The innovative InfiniiMax II probing system supports even the most demanding mechanical access requirements without sacrificing performance.

The DSO 80000 Series Produces Accurate and Repeatable Measurements
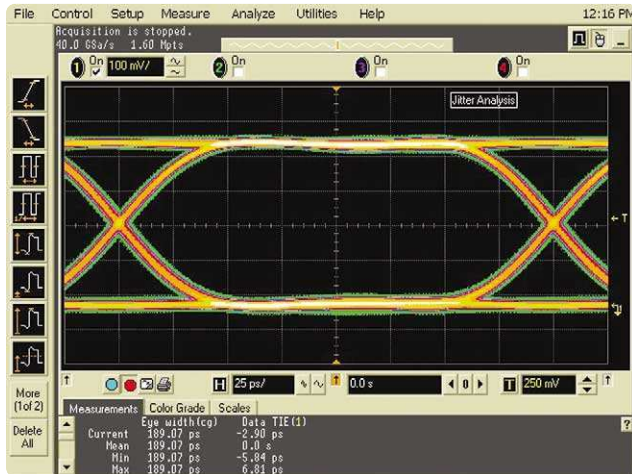
5 Gb/s real-time eye diagram with DSO81004A
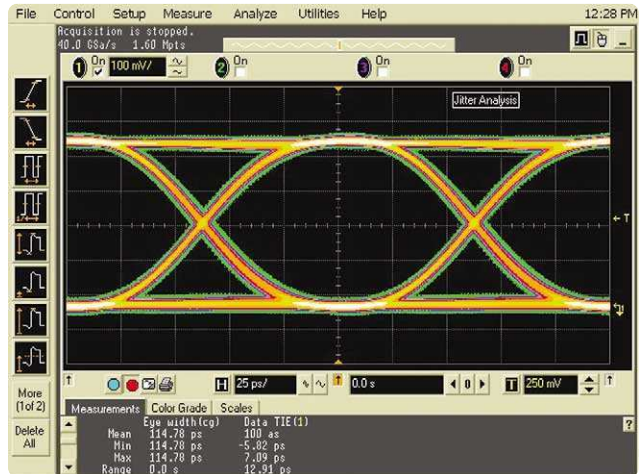
8 Gb/s real-time eye diagram with DSO81204A

- The full real-time bandwidth of the oscilloscope is supported by up to a 40 GSa/s sample rate.

- This industry-leading sample rate produces more accurate and repeatable measurements, avoiding measurement error and signal aliasing due to under sampling, as shown above. This is especially important for high-quality jitter measurements.

- The combination of up to 13 GHz bandwidth and 40 GSa/s sample rate makes the 80000 Series ideal for designs that include: PCI-Express II, Serial ATA II/III, 6 Gbs SAS, 4.25 and 8.5 Gbs Fibre Channel, 4.8 Gbs Fully Buffered DIMM, or other high-speed electronic signals.

DSO 80000 Series measurements

Serial clock rate	Eye width	Data TIE pk-pk	Data TIE rms
5 Gb/s (DSO81004A)	189 ps	12.6 ps	1.3 ps
8 Gb/s (DSO81204A)	115 ps	12.9 ps	1.3 ps

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# Jitter Application Software Packages

E2681A EZJIT Jitter analysis software

Includes the following key measurements: cycle-to-cycle jitter, n-cycle jitter, period jitter, time interval error, setup and hold time, measurement histograms, measurement trending, and jitter frequency spectrum.
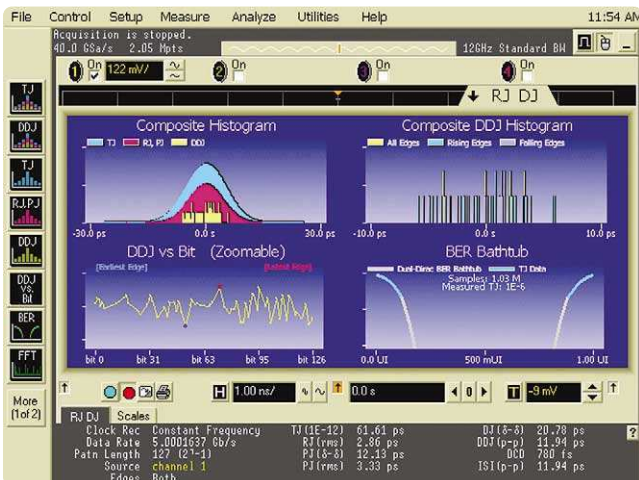
N5400A EZJIT Plus Jitter analysis software

Quickly separate random and deterministic jitter components and estimate total jitter at low BER for standards compliance. Automatic clock recovery and pattern detection, an easy-to-use setup wizard and graphical display views integrated into the Infiniium oscilloscope software further simplify navigation and RJ/DJ analysis.
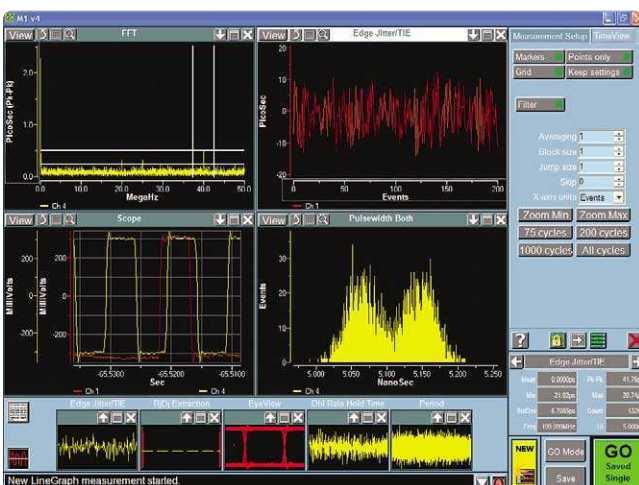
E2690A Timing Interval and Jitter Analysis software

The Agilent E2690A 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 it is remarkably easy to use. The E2692A Basic Time Interval and Jitter Analysis Software offers the basic tools you need for jitter debug with the same precision you get with the advanced version. Both advanced and basic software versions provide complete jitter decomposition into its components – including deterministic, random, and total jitter – as well as AutoMeasure to provide quick insight.

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Infiniium: "It's like someone who sits down and actually uses a scope designed this one."
Steve Montgomery, Director of Engineering, Linx Technologies

Up to 40 GSa/s sample rate on two channels significantly reduces the chances of aliasing, increases measurement accuracy, and delivers the full real-time bandwidth of the oscilloscope on two channels simultaneously.

Four channels at 20 GSa/s with 8 GHz real-time bandwidth or full bandwidth equivalent time modes are also available.

Get fast answers to your questions with the built-in information system. Infiniium's task-oriented Setup Guide provides step-by-step instructions for several advanced measurements and procedures.

See your signal more clearly with a large (8.4-inch) high-resolution color display. Infiniium's bright TFT display with anti-glare coating lets you see the details of your signal from all angles.

20 Gb hard drive, 3.5" 1.44 MB floppy drive and rear USB port make it easy to save setup files, data files, screen shots, etc.

Identify anomalies easily with color-graded persistence, a colorful visual representation of waveform distribution.

Label waveforms and add notes to your screen captures — Infiniium's keyboard makes it easy.

**Drag and drop markers with your mouse** or use the arrow keys.

Easy access to advanced features like math functions and FFTs, is provided by the Windows-based graphical user interface. This GUI also gives you unique capabilities like drag-and-drop measurements and zooming, and offers a graphical equivalent to all front panel controls.

Remote access with Web-enabled connectivity, e-mail on trigger, and GPIB over LAN allows you to access your scope from remote locations.

64 Mpts acquisition memory at 4 GSa/s sample rate on two channels allows you to capture long time windows at high resolution – such as identifying glitches due to a power supply start-up from reset.
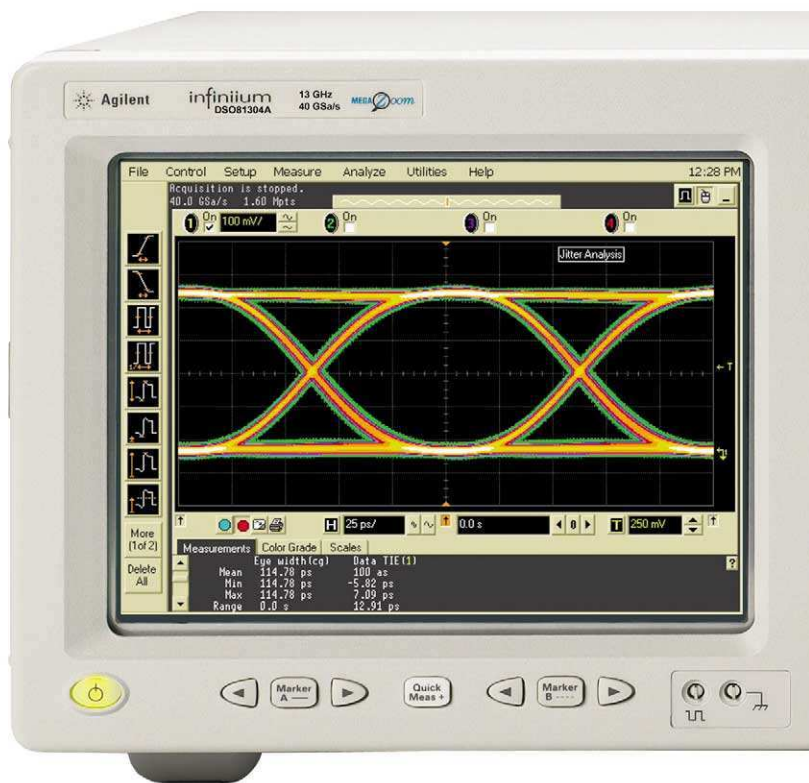
QuickMeas+ key gives you any five automated measurements with a push of a button. You can also configure this key to print/save screen shots, save waveforms, or load a favorite setup.

Zoom and search with instant response. Zoom into your signal using the horizontal scale knob and search through your waveform with the position knob. MegaZoom technology allows you to find your area of interest quickly and easily – even with 64 Mpts waveforms.

Built-in CD-R drive on rear panel allows you to update the system software conveniently and can be used to install third-party application packages.
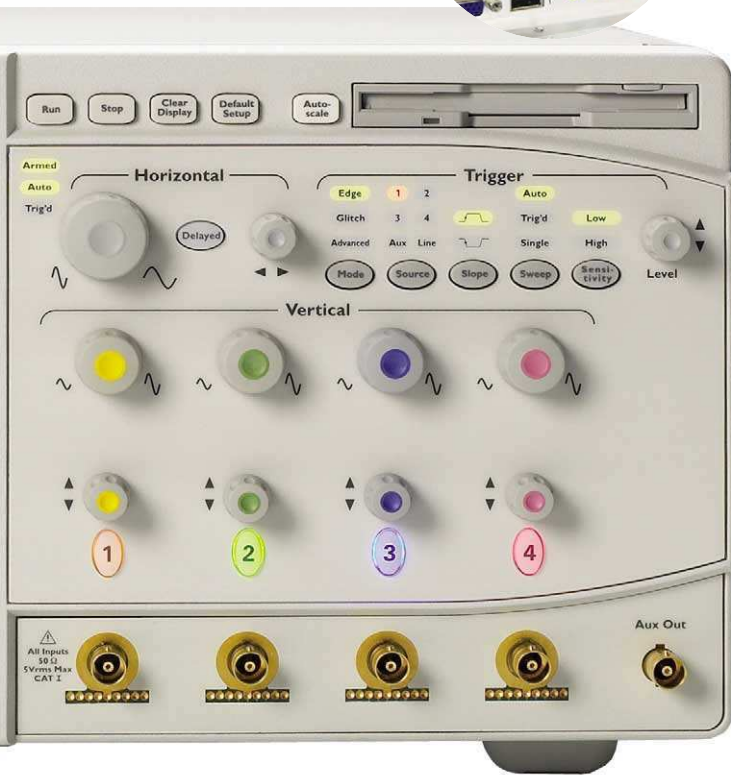
Hands-free operation with the Infiniium VoiceControl option. Just speak into the microphone to operate front-panel controls.

Segmented memory acquisition mode captures bursting signals at maximum sample rate without consuming memory during periods of inactivity.

Removable hard disk drive option is available for added data security.

Install third-party software packages such as Excel, LabView, Agilent Vee, MATLAB®, anti-virus software, and more to perform customized processing and automation of your oscilloscope or to make the scope compliant to the network environment of your company.

An external monitor allows you to run third-party applications on a large, high-resolution display while using the scope's built-in monitor for high-speed waveform display.

Windows® XP Pro operating system.

A familiar interface makes simple tasks simple. Infiniium's analog-like front panel has a full set of controls color coded to the waveforms and measurements, making simple tasks simple.

One-year standard warranty and a variety of Agilent support options protect your investment for the long term.

10 MHz reference clock can be input (optional) to or output (standard) from the scope to allow precise timebase synchronization with RF instruments or logic analyzers.

A new 18 GHz, BNC-compatible connector provides a high signal fidelity connection to Agilent active probes, SMA adapters, and standard BNCs.

AutoProbe interface completely configures your scope for use with the InfiniiMax probing system and previous generation Agilent active probes.

10/100 Mbps LAN interface lets you easily print waveforms on networked printers, save your results on your office PC, share information with others, and control the scope over the Web.

InfiniiMax II: The World's Best High-Speed Probing System Just Got Better

InfiniiMax 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.

InfiniiMax probes have fully characterized performance for all of their various probe heads. This includes:
- Swept frequency response plot
- Common mode rejection vs. frequency plot
- Impedance vs. frequency plot
- Time-domain probe loading plot
- Time-domain probe tracking plot

One-year standard warranty on active probes and a variety of Agilent support options to choose from.

Controlled impedance transmission lines in every probe head deliver full performance versus the performance limitations produced by traditional wire accessories.

Probe interface software allows you to save the calibration information for up to 10 different probe heads per channel and will automatically retrieve calibration data for a probe amplifier as it is attached to the scope.

High-input impedance active probes minimize loading, support differential measurements and DC offset, and can compensate for cable loss.

Probe calibration software delivers the most accurate probe measurements, linear phase response and allows various probe combinations to be deskewed to the same reference time.
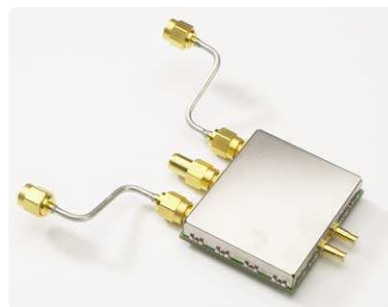
InfiniiMax II probe heads

12 GHz Hi-BW solder-in differential probe head provides maximum bandwidth and minimizes capacitive loading to $\leq$ 210 fF. Variable spacing from 0.2 to 3.3 mm (8 to 130 mills).

12 GHz Hi-BW differential browser provides maximum bandwidth for hand-held or probe holder use. Variable spacing from 0.2 to 3.3 mm (8 to 130 mills).

12 GHz Hi-BW differential SMA probe head provides maximum bandwidth for SMA fixtured differential pairs.

Two new high-bandwidth InfiniiMax II Series probe amplifiers have been added to the InfiniiMax product line. InfiniiMax I probe amplifiers and probe heads can also be used with DSO 80000 Series scopes for lower performance applications.

InfiniMax I probe heads

6 GHz differential browser is the best choice for general-purpose trouble-shooting of differential or single-ended signals with z-axis compliance and variable spacing from 0.25 - 5.80 mm (10 - 230 mills).

12 GHz solder-in differential probe head can be attached to very small geometry circuits for measuring both single-ended and differential signals.

12 GHz differential socket probe head can be used to measure either differential or single-ended signals.

Extremely small single-ended, solder-in probe heads support 6 GHz measurements of even the hardest-to-reach single-ended signals.

Single-ended browser is the best choice for general purpose probing of single-ended signals when small size of the probe head is the primary consideration. Bandwidths up to 6 GHz can be obtained in this configuration.

8 GHz differential SMA probe head allows you to connect two SMA cables to make a differential measurement on a single scope channel.

The 54006A 7.5 GHz resistive divider probe is available as a low-cost probing alternative for casual inspection of signals.

A flat frequency response over the entire probe bandwidth eliminates the distortion and frequency-dependent loading effects that are present in probes that have an in-band resonance.

Probe Performance Plots Available
The InfiniiMax II probe manuals contain an extensive set of performance plots (bandwidth, probe tracking, CMRR, step response, impedance) for various probe configurations. See the following web site for this information **www.cos.agilent.com/manuals/scopes/01169-9700_man.pdf**

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Infiniium 80000 Series Performance Characteristics

Vertical

Input channels	4
Analog bandwidth (–3 dB)*	81304A: 12 GHz 81204A: 12 GHz 81004A: 10 GHz 80804A: 8 GHz
DSP enhanced bandwidth[9]	81304A: 13 GHz using DSP enhanced bandwidth mode
Rise time/fall time	(20 - 80%) 81304A: 23 ps 81204A: 25 ps 81004A: 30 ps 80804A: 38 ps (10 - 90%) 81304A: 33 ps 81204A: 36 ps 81004A: 42 ps 80804A: 54 ps
Input impedance	50 Ω ± 3%
Sensitivity[1]	1 mV/div to 1 V/div
Input coupling	DC
Vertical resolution[2]	8 bits, ≥ 12 bits with averaging
Channel to channel isolation (any two channels with equal V/div settings)	DC to 3 GHz: 60 dB 3 GHz to 8 GHz: 40 dB 8 GHz to BW: 35 dB
DC gain accuracy*[1]	± 2% of full scale at full resolution channel scale
Maximum input voltage*	± 5 V
Offset range	Vertical sensitivity: Available offset: 0 mV/div to ≤ 40 mV/div ± 0.4 V > 40 mV/div to ≤ 75 mV/div ± 0.9 V > 75 mV/div to ≤ 130 mV/div ± 1.6 V > 130 mV/div to ≤ 240 mV/div ± 3.0 V > 240 mV/div ± 4.0 V
Offset accuracy*[1]	≤ 3.5 V: ± (2% of channel offset + 1% of full scale) +1 mV > 3.5 V: ± (2% of channel offset + 1% of full scale)
Dynamic range	± 4 div from center screen

DC voltage measurement accuracy*[1]
   Dual cursor
   Single cursor
	
	± [(DC gain accuracy)+(resolution)]
	± [(DC gain accuracy)+(offset accuracy)+(resolution/2)]

RMS noise floor (scope only)	Volts/div	DSO80804A	DSO81004A	DSO81204A	DSO81304A
	5 mV	280 µV	340 µV	390 µV	420 µV
	10 mV	310 µV	380 µV	440 µV	490 µV
	20 mV	470 µV	530 µV	610 µV	730 µV
	50 mV	1.1 mV	1.2 mV	1.4 mV	1.7 mV
	100 mV	2.1 mV	2.3 mV	2.7 mV	3.3 mV
	200 mV	4.1 mV	4.7 mV	5.3 mV	6.6 mV
	500 mV	11 mV	12 mV	14 mV	17 mV
	1 V	21 mV	24 mV	27 mV	34 mV

RMS noise floor (scope with probe)	Volts/div	DSO80804A + 1168A	DSO81004A + 1168A	DSO81204A + 1169A	DSO81304A + 1169A
	20 mV	2.7 mV	2.7 mV	2.9 mV	3.0 mV
	50 mV	2.8 mV	2.9 mV	3.1 mV	3.4 mV
	100 mV	3.3 mV	3.5 mV	3.8 mV	4.6 mV
	200 mV	5.2 mV	5.6 mV	6.2 mV	7.8 mV
	500 mV	12 mV	13 mV	14 mV	17 mV
	1 V	22 mV	24 mV	27 mV	34 mV

Infiniium 80000 Series Performance Characteristics (continued)

Horizontal

Main timebase range	5 ps/div to 20 s/div real-time, 5 ps/div to 500 ns/div equivalent-time
Main timebase delay range	−200 s to 200 s real-time, −25 µs to 200 s equivalent-time
Delayed timebase range	1 ps/div to current main time scale setting
Channel deskew	± 25 µs range, 100 fs resolution
Time scale accuracy[3]	± 1 ppm pk

Delta-time measurement accuracy[6,7]

≥ 256 Averages, rms	81304A: 45 fs rms	81204A: 35 fs rms	81004A: 35 fs rms	80804A: 55 fs rms
≥ 256 Averages, peak	500 fs peak			
Averaging disabled, rms	81304A: 0.9 ps rms	81204A: 0.8 ps rms	81004A: 0.8 ps rms	80804A: 0.9 ps rms
Averaging disabled, peak	5 ps peak			

Jitter measurement floor[6]

Time interval error	81304A: 0.7 ps rms	81204A: 0.65 ps rms	81004A: 0.65 ps rms	80804A: 0.7 ps rms
Period jitter	81304A: 0.9 ps rms	81204A: 0.8 ps rms	81004A: 0.8 ps rms	80804A: 0.9 ps rms
N-cycle, cycle-cycle jitter	81304A: 1.4 ps rms	81204A: 1.3 ps rms	81004A: 1.3 ps rms	80804A: 1.4 ps rms

Acquisition

Maximum real-time sample rate	40 GSa/s (2 channels simultaneously) 20 GSa/s (4 channels simultaneously)

Memory depth per channel

Standard	524,288 (2 channels)	262,144 (4 channels)
Option 001	2,050,000 (2 channels)	1,025,000 (4 channels)
	65,600,000 at 4 GSa/s (2 channels)	32,800,000 ≤ 2 GSa/s (4 channels)

Sampling modes

Real-time	Successive single-shot acquisitions
Real-time with averaging	Selectable from 2 to 4096
Real-time with peak detect	2 GSa/s peak detect (4 channels), 4 GSa/s peak detect (2 channels)
Real-time with hi resolution	Real-time boxcar averaging reduces random noise and increases resolution
Equivalent-time (alternating real-time)	Full bandwidth on all 4 channels, 262,144 sample points maximum memory. Acquires channels 1 and 3 simultaneously, followed by channels 2 and 4 simultaneously on subsequent triggers at 40 GSa/s each. High sample rate delivers excellent signal fidelity and throughput.
Segmented memory	Captures bursting signals at maximum sample rate without consuming memory during periods of inactivity. Selectable number of segments up to 16,384 with Option 001 deep memory installed. Minimum intersegment time (the time between the end of the previous acquisition and the beginning of the next acquisition) of 20 µs. See on-line help for various performance points.

Filters

Sin(x)/x Interpolation	On/off selectable FIR digital filter. Digital signal processing adds points between acquired data points to enhance measurement accuracy and waveform display quality.

Infiniium 80000 Series Performance Characteristics (continued)

Trigger

Sensitivity[1]	
Internal Low[1]	2.0 div p-p 0 to 5 GHz
Internal High[1]	0.3 div p-p 0 to 4 GHz, 1.0 div p-p 4 to 7.5 GHz
Auxiliary	DC to 1 GHz: 200 mV p-p into 50 Ω
Level range	
Internal	± 4 div from center screen or ± 4 Volts, whichever is smallest
Auxiliary	± 5 V, also limit input signal to ± 5 V
Sweep modes	Auto, triggered, single
Trigger jitter[6,8]	500 fs rms
Trigger holdoff range	100 ns to 320 ms
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+.
Trigger modes	
Edge	Triggers on a specified slope (rising, falling or alternating between rising and falling) and voltage level on any channel or auxiliary trigger.
Glitch	Triggers on glitches narrower than the other pulses in your waveform by specifying a width less than your narrowest pulse and a polarity. Triggers on glitches as narrow as 500 ps. Glitch range settings: < 1.5 ns to < 160 ms.
Line	Triggers on the line voltage powering the oscilloscope.
Pattern	Triggers when a specified logical combination of the channels is entered, exited, present 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). Triggers on patterns as narrow as 500 ps.
State	Pattern trigger clocked by the rising, falling or alternating between rising and falling edge of one channel.
Delay by time	The trigger is qualified by an edge. After a specified time delay between 30 ns to 160 ms, 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, another rising or falling edge on any one selected input will generate the trigger.
Violation triggers	
Pulse width	Trigger on a pulse that is wider or narrower than the other pulses in your waveform by specifying a pulse width and a polarity. Triggers on pulse widths as narrow as 500 ps. Pulse width range settings: 1.5 ns to 160 ms.
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 > or < the amount of time specified.

Measurements and math

Waveform measurements	
Voltage	Peak to peak, minimum, maximum, average, RMS, amplitude, base, top, overshoot, preshoot, upper, middle, lower, area.
Time	Period, frequency, positive width, negative width, duty cycle, delta time, rise time, fall time, Tmin, Tmax, channel-to-channel phase.
Frequency domain	FFT frequency, FFT magnitude, FFT delta frequency, FFT delta magnitude, FFT phase.
Statistics	Displays the mean, standard deviation, minimum, maximum and number of measurements value for the displayed automatic measurements.
Histograms	Vertical (for timing and jitter measurements) or horizontal (noise and amplitude change) modes, regions are defined using waveform markers. Measurements included: mean, standard deviation, peak-to-peak value, median, min, max, total hits, peak (area of most hits), and mean $\pm$ 1, 2, and 3 sigma.
Eye-diagram measurements	Eye-diagram measurements include eye height, eye width, eye jitter, crossing percentage, Q factor, and duty-cycle distortion.
Jitter analysis measurements (E2681A EZJIT or N5400A EZJIT Plus Jitter Analysis software)	Cycle-cycle jitter, N-cycle jitter, cycle-cycle + width, cycle-cycle – width, cycle-cycle duty cycle, data rate, unit interval, time interval error data, time interval error clock, setup time, hold time, phase, period, frequency, + width, – width, duty cycle, rise time, fall time.
Mask testing	Allows pass/fail testing to user-defined or Agilent-supplied waveform templates. AutoMask lets you create a mask template from a captured waveform and define a 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.
Waveform math	Four functions, select from add, average, differentiate, divide, FFT magnitude, FFT phase, integrate, invert, magnify, min, max, multiply, subtract, versus, common mode, smoothing, high pass filter, low pass filter.
FFT	
Frequency range[4]	DC up to 20 GHz (at 40 GSa/s) or 10 GHz (at 20 GSa/s)
Frequency resolution	Sample rate/memory depth = Resolution
Best resolution at maximum sample rate	20 kHz
Frequency accuracy	(1/2 frequency resolution)+(1×10^{-6})(signal frequency)
Signal-to-noise ratio[5]	60 dB to > 100 dB depending on settings
Window modes	Hanning, flattop, rectangular
Measurement modes	
Automatic measurements	Measure menu access to all measurements, five measurements can be displayed simultaneously.
QuickMeas+	Front-panel button activates five pre-selected or five user-defined automatic measurements.
Drag-and-drop measurement toolbar	Measurement toolbar with common measurement icons that can be dragged and dropped onto the displayed waveforms.
Marker modes	Manual markers, track waveform data, track measurements

Infiniium 80000 Series Performance Characteristics (continued)

Display

Display	
Display	8.4 inch diagonal color TFT-LCD
Resolution	640 pixels horizontally x 480 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, persistence (minimum, variable, infinite), color-graded infinite persistence.

Computer system and peripherals, I/O ports

Computer system and peripherals	
Operating system	Windows® XP Pro
CPU	Intel® Pentium® III 1 GHz microprocessor
PC system memory	512 MB
Drives	$\geq$ 20 Gb internal hard drive (optional removable hard drive), CD-R drive on rear panel, standard 3.5 inch 1.44 MB floppy drive
Peripherals	Logitech optical USB mouse and compact keyboard supplied. All Infiniium models support any Windows-compatible input device with a serial, PS/2 or USB interface.
File types	
Waveforms	Compressed internal format, comma and tab separated X and Y pairs or voltage values
Images	BMP, PCX, TIFF, GIF or JPEG
I/O ports	
LAN	RJ-45 connector, supports 10Base-T and 100Base-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	2 ports. Supports PS/2 pointing and input devices.
USB	2 ports. Allows connection of USB peripherals like storage devices and pointing devices while the oscilloscope is on.
Video output	15 pin VGA, full color output of scope waveform display.
Dual-monitor video output	15 pin XGA, full color output for using third-party applications.
Auxiliary output	DC ($\pm$ 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.
Time base reference output	10 MHz filtered sine wave with all harmonics $\leq$ –40 dBc. Amplitude into 50 Ω: 800 mV p-p to 1.26 V p-p (4 dBm $\pm$ 2 dB) if derived from internal reference. Tracks external reference input amplitude $\pm$ 1 dB if applied and selected.
Time base reference input	Must be 10 MHz, input Z_0 = 50 Ω. Minimum 360 mV p-p (–5 dBm), maximum 2.0 V p-p (+10 dBm).

Infiniium 80000 Series Performance Characteristics (continued)

General characteristics

Temperature	Operating: 5° C to +35° 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, (0.75g), 5 minute resonant dwell at 4 resonances per axis.
Power	100 - 240 VAC @ 50/60 Hz; maximum input power 550 Watts
Weight	Net: 13 kg (28.5 lbs.)　　　Shipping: 16 kg (35.2 lbs.)
Dimensions (excluding handle)	Height: 216 mm (8.5 in) Width: 437 mm (17.19 in) Depth: 440 mm (17.34 in)
Safety	Meets IEC 61010-1 +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 ± 5°C from annual calibration temperature.

1   Full scale is defined as 8 vertical divisions. Magnification is used below 5 mV/div. Below 5 mV/div, full-scale is defined as 40 mV. The major scale settings are 5 mV, 10 mV, 20 mV, 50 mV, 100 mV, 200 mV, 500 mV, 1 V.

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

3   Within one year of previous calibration.

4   FFT amplitude readings are affected by scope and probe bandwidth limitations and input amplifiers roll-off (e.g. –3 dB roll-off at specified bandwidth of scope/probe).

5   The FFT signal to noise ratio varies with volts/division setting, memory depth and use of time or frequency averaging.

6   Test signal amplitude ≥ 5 divisions peak-to-peak, test signal rise time ≤ 2 times scope rise time, vertical scale ≥ 20 mV/div, sample rate = 40 GSa/s; sin(x)/x interpolation enabled, measurement threshold = fixed voltage at 50 % level.

7   Between two edges on a single channel. Rms value refers to the standard deviation of 256 consecutive measurements performed using an individual instrument.

8   Internal trigger. Trigger level contained within full scale display range of trigger channel.

9   13 GHz DSP enhanced bandwidth not applicable at 5 mV/div.

InfiniiMax II Series Performance Characteristics

	1169A, 1168A	
Bandwidth*	1169A: > 12 GHz (13 GHz typical)	1168A: > 10 GHz

Rise and fall time
• Probe only
• When phase compensated by
   80000 Series oscilloscope
	Probe only, 1169A:
	   28 ps (20 - 80%), 40 ps (10 - 90%)
	1169A with DSO81204A:
	   25 ps (20 - 80%), 36 ps (10 - 90%)
	1169A with DSO81304A:
	   23 ps (20 - 80%), 33 ps (10 - 90%)
		Probe only, 1168A:
		   34 ps (20 - 80%), 48 ps (10 - 90%)
		1168A with DSO81004A:
		   30 ps (20 - 80%), 42 ps (10 - 90%)
		1168A with DSO80804A:
		   38 ps (20 - 80%), 54 ps (10 - 90%)

System bandwidth (–3 dB)	1169A with DSO81304A: 13 GHz (typical) 1169A with DSO81204A: 12 GHz	1168A with DSO81004A: 10 GHz 1168A with DSO80804A: 8 GHz
Input capacitance[1]	C_m = 0.09 pF C_m is between tips C_g = 0.26 pF C_g is to ground for each tip C_{diff} = 0.21 pF Differential mode capacitance = $C_m + C_g/2$ C_{se} = 0.35 pF Single-ended mode capacitance = $C_m + C_g$	
Input resistance*	Differential mode resistance = 50 kΩ ± 2% Single-ended mode resistance = 25 kΩ ± 2%	
Input dynamic range	3.3 V peak to peak, ± 1.65 V	
Input common mode range	6.75 V peak to peak dc to 100 Hz; 1.25 V peak to peak > 100 Hz	
Maximum signal slew rate	25 V/ns when probing a single-ended signal 40 V/ns when probing a differential signal	
DC attenuation	3.45:1	
Zero offset error referred to input	± 1.5 mV	
Offset range	± 16.0 V when probing single-ended	
Offset gain accuracy	< ± 1% of setting when probing single-ended	
Noise referred to input	2.5 mV rms, probe only	
Propagation delay	~6 ns (this delay can be deskewed relative to other signals)	
Maximum input voltage	30 V peak, CAT I	
ESD tolerance	> 8 kV from 100 pF, 300 Ω HBM	

* Denotes warranted specifications, all others are typical.
1 Measured using the probe amplifier and N5381A solder-in differential probe head.

Ordering Information

80000 Series Infiniium oscilloscopes

Model	Bandwidth	Channels	Sample rate	Standard acquisition memory	U.S. list
DSO81304A	12 - 13 GHz	4	40 GSa/s (2 channels) 20 GSa/s (4 channels)	524 kpts (2 channels) 262 kpts (4 channels)	$115,000
DSO81204A	12 GHz	4	40 GSa/s (2 channels) 20 GSa/s (4 channels)	524 kpts (2 channels) 262 kpts (4 channels)	$105,000
DSO81004A	10 GHz	4	40 GSa/s (2 channels) 20 GSa/s (4 channels)	524 kpts (2 channels) 262 kpts (4 channels)	$90,000
DSO80804A	8 GHz	4	40 GSa/s (2 channels) 20 GSa/s (4 channels)	524 kpts (2 channels) 262 kpts (4 channels)	$75,000

Note:
The DSO81304A uses DSP boost software to achieve 13 GHz bandwidth. It also adds a valuable DSP noise reduction feature to reduce noise at bandwidths of 10, 8, 6, 4, 2, and 1 GHz. The non-DSP boosted bandwidth of the DSO81304A is 12 GHz. The DSO81204A, DSO81004A, and DSO80804A have non-DSP boosted bandwidth specifications.

The above models include:
- Optical USB mouse
- Compact keyboard
- User's quick-start guide
- Documentation CD (service guide, programmer's guide, programmer's quick reference guide)
- Accessory pouch
- Power cord
- High-performance calibration cable
- E2655B probe deskew and performance verification kit
- Two 54855-67604 BNC-compatible to precision 3.5 mm (f) adapters
- One-year warranty.

Note: No probes are included with the 80000 Series oscilloscopes. The InfiniiMax II Series probes must be purchased separately.

After-Burner Upgrade program

If you find you need a little more speed after you purchase your Infiniium 80000 Series oscilloscope, the After-Burner Upgrade program is available. This upgrade program allows you to upgrade any 80000 Series scope to a higher bandwidth model, protecting your valuable Infiniium oscilloscope and probing system investment over the long term.

Upgrade	Description	Return to service center required	U.S. List
N5398A	DSO81204A to DSO81304A upgrade (12 GHz to 13 GHz)	No	$10,000
N5398B	DSO81004A to DSO81204A upgrade (10 GHz to 12 GHz)	Yes	$17,000
N5398C	DSO80804A to DSO81004A upgrade (8 GHz to 10 GHz)	Yes	$17,000

Note: Order as many upgrades as needed to reach the desired final bandwidth of the instrument. For example, to upgrade from a DSO80804A to DSO81304A, order N5398C, N5398B, and N5398A.

Ordering Information (continued)

80000 Series Infiniium oscilloscope options and accessories

Options	Description	U.S. list
001	2 M (2 channels), 1 M (4 channels) memory upgrade 64 M (2 channels at 4 GSa/s) or 32 M (4 channels ≤ 2 GSa/s)	$6,000
002	EZJIT jitter analysis software (installed at the factory).	$3,995
003	High-Speed Serial Data Analysis/Mask Testing with clock recovery and 8b/10b decoding (installed at the factory).	$7,995
004	EZJIT Plus jitter analysis software (installed at the factory).	$8,000
005	Noise reduction software (installed at the factory). This software is included standard for DSO81304A.	$2,000
006	My Infiniium Integration Package (installed at the factory).	$795
017	20 Gb removable hard disk drive. Replaces internal hard disk with a removable hard disk. Order the N5390A for additional hard disk drive cartridges.	$1,695
021	Low-Speed Serial Data Analysis (installed at the factory).	$1,495

Instrument options	Description	U.S. list
1CM (E2609B)	Rack-mount kit.	$440

Service options	Description	
A6J	ANSI Z540-compliant calibration.	

Accessories	Description	U.S. list
N5404A	After-purchase memory upgrade. Order option 001 when purchasing a new Infiniium oscilloscope. The N5404A is for customers who own an oscilloscope and wish to upgrade the acquisition memory.	$6,000
E2681A	After-purchase EZJIT jitter analysis software for Infiniium oscilloscopes. Order option 002 when purchasing a new Infiniium oscilloscope. The E2681A is for customers who own an oscilloscope and wish to upgrade to add the EZJIT software.	$3,995
N5400A	After-purchase EZJIT Plus jitter analysis software for Infiniium oscilloscopes. The N5400A is for customers who own a 54850 or DSO80000 Series oscilloscope and wish to upgrade to add the EZJIT Plus software.	$8,000
N5401A	After-purchase EZJIT Plus jitter analysis software for existing installations of E2681A EZJIT on Infiniium 54850 and DSO80000 Series Infiniium oscilloscopes. Adds RJ/DJ separation displays and analysis capability.	$5,000
E2690A	After-purchase Advanced Timing Interval and Jitter Analysis software for Infiniium oscilloscopes. Available in one scope license and four scope license versions.	Contact Agilent
N5398A	DSO81204A to DSO81304A upgrade software. Also includes DSP noise reduction feature to reduce noise at bandwidths of 10, 8, 6, 4, 2, and 1 GHz.	$7,500
N5403A	Noise reduction software only. DSP noise reduction feature to reduce noise at bandwidths of 10, 8, 6, 4, 2, and 1 GHz. Included standard for DSO81304A. Example of rms noise reduction capability at 100 mV/div: 13 GHz = 3.3 mV, 12 GHz = 2.7 mV, 10 GHz = 2.3 mV, 8 GHz = 2.1 mV, 6 GHz = 1.9 mV, 4 GHz = 1.5 mV, 2 GHz = 1.1 mV, 1 GHz = 0.66 mV.	$2,000
N5390A	Additional 20 Gb hard disk drive cartridge for Infiniium option 017.	$695

Ordering Information (continued)

80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
E2654A	EZ Probe Positioner®: includes base, joystick, and articulating arm.	$2,178
E2655B	Additional probe deskew/performance verification kit for InfiniiMax probes.	$300
54855-67604	18 GHz BNC-compatible to precision 3.5 mm (f) adapter. Allows highest fidelity connection of 3.5 mm or SMA cables.	$154
E2688A	High-Speed Serial Data Analysis/Mask Testing with Clock Recovery.	$7,995
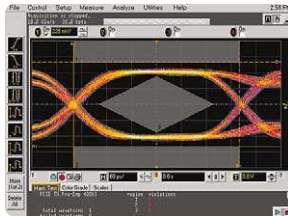
Easily perform mask testing and characterize serial data streams that employ embedded clocks. The E2688A provides mask templates and clock recovery for verifying compliance to computer, communication and datacom standards. You can even characterize proprietary serial buses with the built-in, general purpose golden PLL clock recovery.

Features include:
- Golden PLL clock recovery
- Set up wizard to configure the clock recovery
- Real-time eye diagram display with eye-mask unfolding
- Recovered clock display
- Time interval error (TIE) jitter measurement with statistics on the data stream
- Mask template loading
- 8b/10b decode with symbol trigger and search

Standard masks include:
- PCI Express (2.5 Gbps)
- Serial ATA (1.5 Gbps)
- Fibre Channel Electrical (1.0625, 2.125, 4.25 Gbps)
- Ethernet IEEE 802.3 (10/100/1000Base-T)
- Serial Attached SCSI, XAUI

89601A	Vector Signal Analysis Software.	starting from $7,000
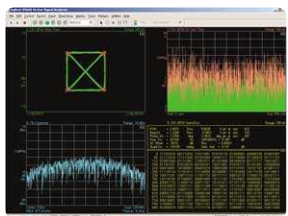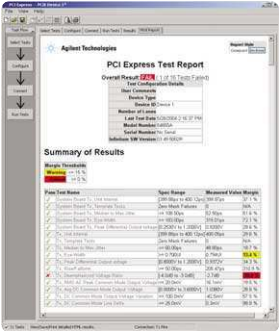
Agilent Infiniium oscilloscopes team up with the 89601A Vector Signal Analysis software to provide powerful, flexible, wideband signal analysis with up to 13 GHz bandwidth for applications including wideband communications and modulated radar.

Features include:
- Measurement bandwidth up to 13 GHz
- Flexible analog and digital demodulation supports the most advanced, complex modulation formats
- Deep memory in the Infiniium oscilloscopes allows excellent dynamic range and frequency resolution
- Flexible, powerful displays including spectrogram provide rapid insight into dynamic signal behavior
- For signal integrity and jitter measurements up to 13-GHz bandwidth the high performance Infiniium DSO 80000 Series digital oscilloscopes offer InfiniiMax active probes, MegaZoom deep memory, and 40 GSa/s sample rates

Ordering Information (continued)

## 80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
N5393A	PCI Express Electrical Performance Validation and Compliance Software.	$2,000

The Agilent Technologies N5393A PCI Express electrical performance validation and compliance software provides you with a fast and easy way to verify and debug your PCI Express designs. The PCI Express electrical test software allows you to automatically execute PCI Express electrical checklist tests, and it displays the results in a flexible report format.

The N5393A PCI Express electrical test software utilizes the clock recovery method used in the official PCI-SIG Signal Quality Test Methodology ("SigTest") application, ensuring that your test results are consistent with results from the SigTest application.

The PCI Express electrical performance validation and compliance software performs a wide range of electrical tests as per the PCI Express 1.0a electrical specifications for add-in cards and motherboard systems as documented in section 4 of the base specification and section 4 of the card electromechanical specification.

Requires the E2688A serial data analysis software and one of the PCI-SIG approved compliance test fixtures (CBB or CLB).

Features:
- Test setup wizard guides you through test selection, configuration, connection, execution, and results reporting.
- Wide-range of electrical tests are performed, significantly more than SigTest.
- PCI-SIG SigTest clock recovery algorithm is used to ensure consistency with SigTest.
- Measurement connection setups are displayed when you must change the test setup.
- Oscilloscope setup is automatically configured for each test.
- Test results report formally documents your test configuration, measurements made, pass/fail status, and waveforms.
- Pass/fail margin analysis provides an indication of how close your device is to meeting a test specification.

N5392A	Ethernet Electrical Performance Validation and Compliance Software for Infiniium 54830, 54850, and 80000 Series Oscilloscopes.	$2,995

The Agilent Technologies N5392A Ethernet electrical performance validation and compliance software for Infiniium 54830 and 54850 Series oscilloscopes provides you with a fast and easy way to verify and debug your 1000Base-T, 100Base-TX and 10Base-T Ethernet designs. The Ethernet electrical test software allows you to automatically execute Ethernet physical-layer (PHY) electrical tests, and it displays the results in a flexible report format. In addition to the measurement data, the report provides a margin analysis that shows how closely your device passed or failed each test.

The 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 802.3-2002 and ANSI X3.263-1995 standards.
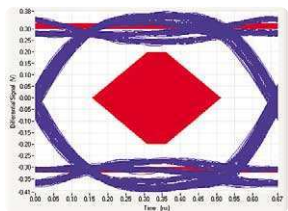
Features:
- Test setup wizard guides you through test selection, configuration, connection, execution, and results reporting.
- Wide-range of electrical tests are performed for 1000Base-T, 100Base-TX and 10Base-T standards.
- Measurement connection setups are displayed when you must change the test setup.
- Oscilloscope setup is automatically configured for each test.
- Test results report formally documents your test configuration, measurements made, pass/fail status, and waveforms.
- Pass/fail margin analysis provides an indication of how close your device is to meeting a test specification.

www.valuetronics.com

Ordering Information (continued)

80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
N5394A	DVI Electrical Performance Validation and Compliance Software for Infiniium 54850 and 80000 Series Oscilloscope.	$3,995
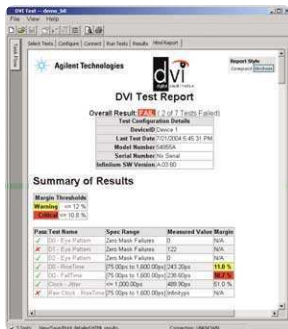
The Agilent Technologies N5394A DVI electrical performance validation and compliance software provides you with a fast and easy way to verify and debug your digital visual interface (DVI) designs for add-in cards, cables and motherboard systems. The DVI electrical test software allows you to automatically execute DVI electrical checklist tests, and it displays the results in a flexible report format. In addition to the measurement data, the report provides a margin analysis that shows how closely your device passed or failed each test.

The N5394A DVI electrical performance validation and compliance software offers the four fundamental DVI electrical tests. The software automatically configures the oscilloscope for each test, and it provides an informative results report that includes margin analysis indicating how close your product is to passing or failing that specification.

Features:
- Test setup wizard guides you through test selection, configuration, connection, execution, and results reporting.
- Wide-range of electrical tests are performed.
- Uses the Silicon Graphics DVI Compliance test fixtures for measurements and hardware clock recovery.
- Measurement connection setups are displayed when you must change the test setup.
- Oscilloscope setup is automatically configured for each test.
- Test results report formally documents your test configuration, measurements made, pass/fail status, and waveforms.
- Pass/fail margin analysis provides an indication of how close your device is to meeting a test specification.

Download	Serial ATA Signal Quality Compliance Test.	No Charge

If you develop Serial ATA host bus adapters or devices and would like to perform compliance testing to the standard, the sigtest program provides the following features:
- program runs inside Infiniium and tests host bus adapters and devices for compliance to Serial ATA standard, as issued by Serial ATA working group
- written test procedure for Agilent Infiniium 81004A and Agilent 81134A pulse/pattern generator
- software automatically sets up the oscilloscope, allows user to transfer setups to pattern generator, acquires waveform data and launches eye measurement (sigtest)
- includes support for OOB (out of band) signal testing
- solution has been evaluated and proven at Serial ATA plugfests

Program can be downloaded for free from the following URL:
http://www.cos.agilent.com/scope-apps/sata.html

Ordering Information (continued)

80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
Partner Product	IEEE-1394 Pre-Compliance Test Option.	Contact manufacturer
	A pre-compliance test solution is available from Quantum Parametrics for use in conjunction with Agilent 80000 Series oscilloscopes. This test solution automates the compliance test process for the IEEE-1394 standard.	
	See http://www.quantumparametrics.com for additional information.	
E2683A	USB 2.0 Compliance Test Option.	$2,000

The Agilent USB 2.0 compliance test option makes USB signal integrity testing as simple as capturing the signals with your oscilloscope. Infiniium has significantly reduced the work associated with USB compliance testing by eliminating the need to transfer scope waveforms to a PC. The Infiniium USB 2.0 test option features run-time MATLAB embedded in the scope for use with the USB signal integrity scripts, providing a one-box solution. The USB-IF compliance program recognizes Infiniium as a recommended scope for use in pre-compliance testing. In addition, all MATLAB scripts used with the USB 2.0 test option come from the USB-IF organization.

This option works with all Infiniium 80000 Series oscilloscopes. Included with the E2683A are USB-IF MATLAB scripts and Signal Quality Inrush Droop/Drop (SqiDD) test fixture, needed for low/full speed testing. Additional SqiDD test fixtures can be purchased as the E2646A.

For USB 2.0 High Speed testing, order the E2683A test option as well as the E2649A for a complete set of six fixtures and power supply.

For USB 2.0 High Speed testing, a differential probe is required. Please order an InfiniiMax probe amplifier, along with the E2678A differential socketed probe head.

The USB 2.0 Compliance Test Procedure is located at http://www.usb.org/developers/docs

80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
E2697A	High Impedance Adapter (Includes 500 MHz Passive Probe)	$1,300

The E2697A high impedance adapter allows connection of probes that require a high impedance input (e.g., passive probes, current probes) to the Infiniium 80000 Series of high-performance oscilloscopes. The E2697A high impedance adapter extends the capability of Agilent Infiniium high-performance oscilloscopes, making them ideal for a variety of general-purpose measurements such as power supplies, inverters, semiconductor measurements, etc. The E2697A provides switchable ac/dc coupling, as well as 10:1 and 1:1 attenuation settings.

Specifications/Characteristics

Bandwidth	Analog BW (–3 dB) System Bandwidth	500 MHz (with supplied 10073C passive probe) 500 MHz (with 10073C passive probe and 80000 Series oscilloscope)
DC attenuation	1.16:1 11.6:1	E2697A internal attenuator at 1:1 (at scale settings > 200 mV/div signal size limited by input dynamic range) E2697A internal attenuator at 10:1 (at scale settings > 200 mV/div signal size limited by input dynamic range)
Input Dynamic Range	E2697A internal attenuator setting of 1:1 E2697A internal attenuator setting of 10:1	± 0.8 V ± 8 V
Input Dynamic Range with 10073C passive probe	E2697A internal attenuator setting of 1:1 E2697A internal attenuator setting of 10:1	± 8 V ± 80 V
Input Impedance*	1 MΩ ± 1% (~12 pF)	
Input Coupling	dc, ac (7 Hz)	
Maximum Input Voltage	± 100V [dc + ac] [ac < 10 kHz], CAT I	
Offset Range	E2697A internal attenuator setting of 1:1 E2697A internal attenuator setting of 10:1	± 5 V ± 50 V
Dc Gain Accuracy[1]	± 1.5% of full scale	
Offset Accuracy[1]	± (1.5% of channel offset + 1.5% of full scale)	

* Denotes warranted specifications, all others typical. Specifications are valid after a 30 minute warm-up period and ± 5 °C from calibration temperature.

1 Full scale is defined as 8 vertical divisions.

Ordering Information (continued)

## 80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
E2625A	Communication Mask Test Kit.	$3,093

Take the frustration out of communications testing and prove your designs conform to industry standards with the E2625A Communications 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 E2625A Communication Mask Test Kit comes with a set of electrical communication adapters to ensure convenient, reliable and accurate connections to your device under test. Included are more than 20 industry standard ANSI T1.102 and ITU-T G.703 communication signal mask templates.

E5850A	Logic Analyzer/Oscilloscope Time-Correlation Fixture.	$2,064
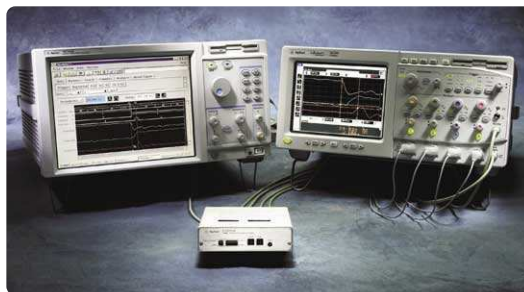
Now you can more effectively verify and track down problems between the analog and digital portions of a design. Easily make time-correlated measurements between an Agilent 16900 Series logic analysis system and an Infiniium Series oscilloscope. With the E5850A Time-Correlation Fixture, you can trigger the Infiniium from the logic analyzer (or vice versa), and automatically deskew the waveforms. The Infiniium time markers and the 16900 series time markers are time-Correlated and track each others. You can relate information on the oscilloscope and the logic analyzer precisely.
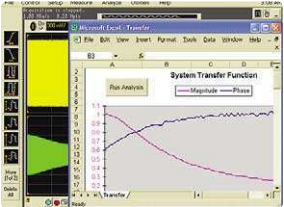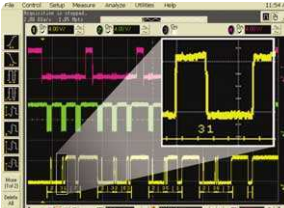
Foot Switch	Kinesis Savant 3-Action Programmable Foot Switch P/N FS004PS2.	Contact manufacturer

Allows you to easily program the 3-action foot pedals to perform the following scope functions: run, stop, toggle between run and stop, save waveform, save screenshot, measure any five waveform parameters and recall an instrument setup.

See http://www.kinesis-ergo.com/ for additional information and ordering instructions.

www.valuetronics.com

Ordering Information (continued)

80000 Series Infiniium oscilloscope options and accessories (continued)

Accessories (continued)	Description	U.S. list
1184A	**Testmobile.** Agilent's 1184A testmobile provides a convenient solution for your portability and storage needs. The 1184A includes a drawer for accessories and a keyboard tray with a mouse extension for either right- or left-handed operation.	$996
E2682A	**VoiceControl Option.** 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 volt per division." The VoiceControl system does not require the scope to be trained to understand a particular user.	$500
E2699A	**My Infiniium Integration Package** My Infiniium allows you to extend the power of your Windows XP-based Infiniium oscilloscope by letting you launch customized applications, such as those written for Agilent VEE Pro, NI LabVIEW, MATLAB$^{®}$ or Microsoft Excel, directly from the oscilloscope's front panel or graphical user interface. For more detailed information, please request Agilent publication number 5988-9934EN.	$795
N5391A	**Low-Speed Serial Data Analysis Software.** Provides a fast and easy way to debug Inter-Integrated Circuit (I^2C) and 2-wire or 3-wire Serial Peripheral Interface (SPI) serial communication busses. The Low-Speed SDA software, when used with the Agilent 54830 Series, 54850 Series, or 80000 Series Infiniium oscilloscopes, provides the ability to capture and automatically display decoded serial data in numerical format synchronized with the analog or digital waveform view of I^2C or SPI serial data streams.	$1,495

Ordering Information (continued)

InfiniiMax II Series probing system

InfiniiMax II probe amplifiers	Description	U.S. list
1169A	12 GHz InfiniiMax probe amp – order one or more probe heads.	$9,000
1168A	10 GHz InfiniiMax probe amp – order one or more probe heads.	$6,500

InfiniiMax II probe heads	Recommended for use with InfiniiMax II probe amplifiers	U.S. list
N5380A	InfiniiMax II 12 GHz differential SMA adapter. Includes semi-rigid coax to change span between SMA connectors.	$2,500
N5381A	InfiniiMax II 12 GHz differential solder-in probe head and accessories. Includes wire for replacement leads. Order 01169-21306 for 0.005 inch or 01169-81301 for 0.007 inch replacement nickel wire.	$400
N5382A	InfiniiMax II 12 GHz differential browser. Includes wire for replacement leads. Order 01169-21304 for 0.007 inch replacement steel wire.	$600

InfiniiMax I probe heads*	Can be used with InfiniiMax II probe amplifiers with limitations	U.S. list
E2675A	InfiniiMax differential browser probe head and accessories. Includes 20 replaceable tips and ergonomic handle. Order E2658A for replacement accessories.	$1,400
E2676A	InfiniiMax single-ended browser probe head and accessories. Includes 2 ground collar assemblies, 10 replaceable tips, a ground lead socket and ergonomic browser handle. Order E2663A for replacement accessories.	$900
E2677A	InfiniiMax differential solder-in probe head and accessories. Includes 20 full bandwidth and 10 medium bandwidth damping resistors. Order E2670A for replacement accessories.	$400
E2678A	InfiniiMax single-ended/differential socketed probe head and accessories. Includes 48 full bandwidth damping resistors, 6 damped wire accessories, 4 square pin sockets and socket heatshrink. Order E2671A for replacement accessories. Order E5381-82103 for 34 damped wire accessories only.	$425
E2679A	InfiniiMax single-ended solder-in probe head and accessories. Includes 16 full bandwidth and 8 medium bandwidth damping resistors and 24 zero ohm ground resistors. Order E2672A for replacement accessories.	$300
E2695A	Differential SMA probe head. Includes semi-rigid coax to change span between SMA connectors.	$1,495

*   (See page 3 for specifications and limitations when used with InfiniiMax II Series probe amplifiers.)

Adapters	Description	U.S. list
N1022A	Adapts 113x/115x/116x active probes to 86100 Infiniium DCA.	$1,403

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Ordering Information (continued)

InfiniiMax II Series probing system (continued)

Other compatible probes	Description	U.S. list
1144A	800 MHz active probe. Requires 1142A probe power supply when used with Infiniium scopes. Requires 01144-61604 probe power extender when using two or more 1144A active probes.	$745
1145A	2-channel, 750 MHz active probe. Requires 1142A power supply when used with Infiniium oscilloscopes.	$1,023
1156A	1.5 GHz single-ended active probe for Infiniium scopes.	$2,275
1157A	2.5 GHz single-ended active probe for Infiniium scopes.	$3,100
1158A	4 GHz single-ended active probe for Infiniium scopes.	$4,700
54006A	7.5 GHz passive resistive divider probe – 10:1 (500 ohms) or 20:1 (1 kohms).	$2,083

Ordering Information (continued)
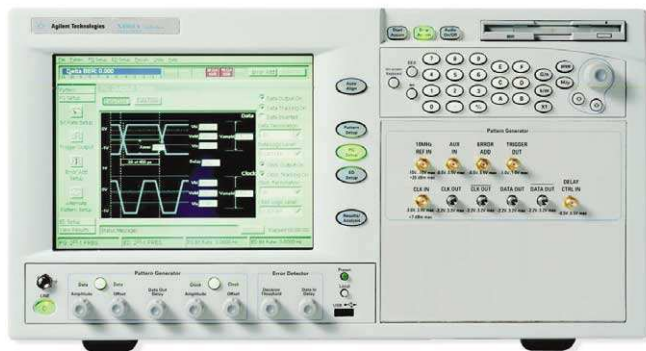
The Agilent Serial BERT generator N4901B (N4902B) option 200 provides high speed digital stimulus to your device with PRBS or memory based pattern from 150 Mb/s up to 13.5 Gb/s (7 Gb/s). For mor information, see www.agilent.com/find/pulse-generators.

Related Literature

Publication Title	Publication Type	Publication Number
Infiniium 54850 Series Oscilloscopes	Data Sheet	5988-7976ENUS
Infiniium 54830 Series Oscilloscopes	Data Sheet	5988-3788ENUS
N5400 EZJIT Plus Jitter Analysis Software	Data Sheet	5989-0109EN
E2681A EZJIT Jitter Analysis Software	Data Sheet	5989-0109EN
E2690A Advanced Time Interval & JItter Analysis Software	Data Sheet	5989-2700EN
E2692A Basic Time Interval & JItter Analysis Software	Data Sheet	5989-2700EN
E2688A High-Speed Serial Data Analysis Software	Data Sheet	5989-0108EN
Using Agilent InfiniiMax Probes with Test Equipment other than Agilent Infiniium Oscilloscopes	Configuration Guide	5989-1869EN
PCI-Express Test Package	Data Sheet	5989-1240EN
Ethernet Compliance Test Package	Data Sheet	5989-1527EN
E2683A USB 2.0 Compliance Test Software	Data Sheet	5989-0236EN
Infiniium 54800 Series Oscilloscope Probes, Accessories and Options	Selection Guide	5968-7141EUS
Advantages and Disadvantages of Using DSP Filtering on Oscilloscope Waveforms	Application Note 1494	5989-1145EN
Understanding and Using Offset in InfiniiMax Active Probes	Application Note 1451	5988-9264EN
Finding Sources of Jitter with Real-Time Jitter Analysis	Application Note 1448-2	5988-9740EN

Product Web site

For the most up-to-date and complete application and product information, please visit our product Web site at:

www.agilent.com/find/infiniimaxII

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