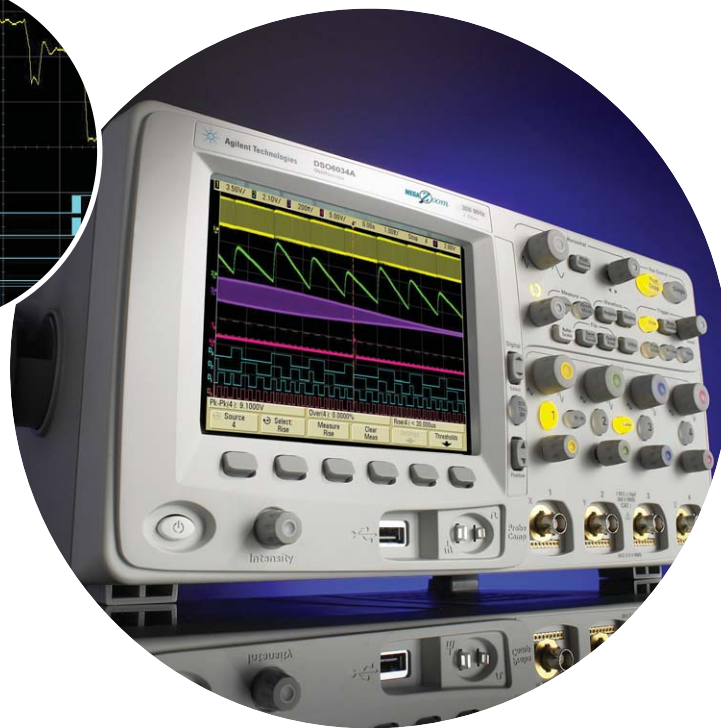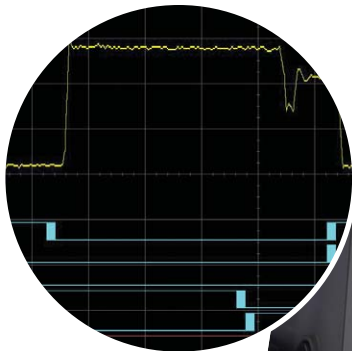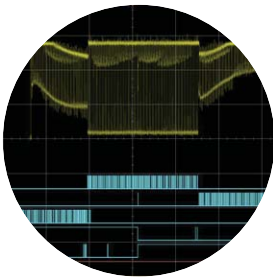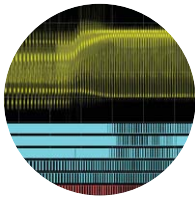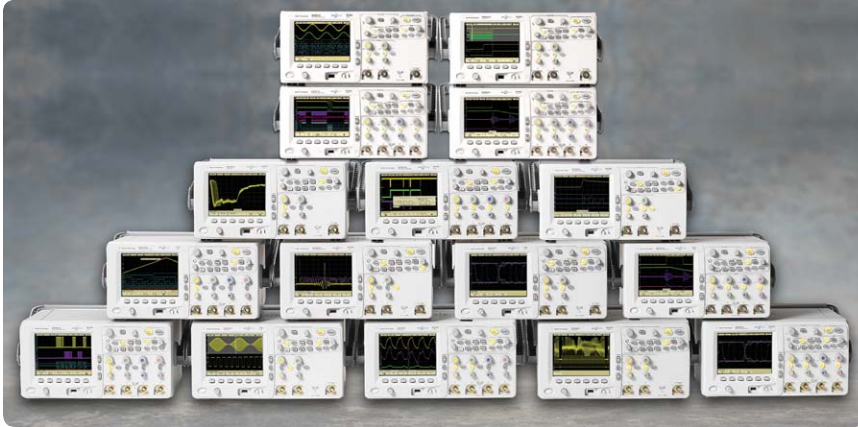# Agilent Technologies
6000 Series Oscilloscopes

Data Sheet

The fastest way to debug your design

Agilent Technologies

The standard for high-performance portable scopes

A wide selection lets you choose the 6000 Series model that best matches your needs.

The performance and problem solving tools you need to more quickly debug your analog, digital and serial design challenges, in a single instrument.

Identify your most elusive problems faster with:

Fast update rate
View infrequent anomalies that most scopes miss with an update rate 5000 times better than the competition.

Fast deep memory
Always on, deep and responsive, Mega*Zoom* III memory so you can see more time with more detail.
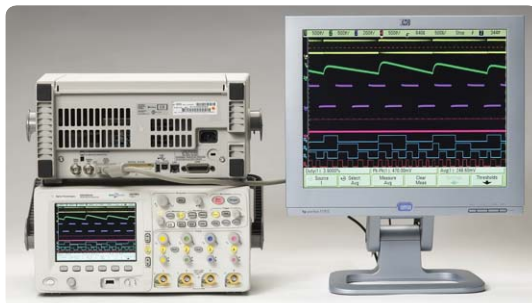
Real-time serial decode
Hardware-based serial decode provides unrivaled real-time update rates to capture infrequent protocol errors.

Fast digital debug
Combine analog channels with 16 time-correlated digital channels for rapid debug.

- 100 MHz, 300 MHz, 500 MHz and 1 GHz bandwidths

- 2 or 4 scope channels

- Optional 16 digital channels

- Mega*Zoom* III memory and display technology
  - Up to 8 Mpts acquisition memory
  - 100,000 waveforms/sec real-time update rate
  - High-definition XGA (1024 x 768) display with 256 levels of intensity grading

- Built-in help system in 11 different languages

- Complete connectivity including USB, LAN, GPIB, XGA display out, LXI Class C compliant – standard

- Battery power option

- Low-profile 1U high models (6000L Series)

- Powerful applications suites available
  - I^2C, SPI and USB triggering and decode
  - CAN, LIN and FlexRay triggering and decode
  - Rapid Xilinx and Altera FPGA debug

6000L Series, the most space efficient and affordable LXI Class C compliant oscilloscope.

View 6000 Series signals on an external monitor using the always-on XGA video output.
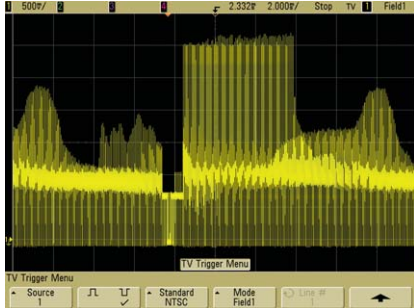
Your design has analog, digital and serial signals, shouldn't your scope?

Analog: Up to 1 GHz bandwidth and up to 4 GSa/s sample rate


The 6000 Series scope channels provide faster identification of the most elusive problems.

- **Revolutionary high-resolution display**. Engineered with a XGA display and 256 levels of intensity (color grading), see a precise representation of the analog characteristics of the signals you're testing. Equipped with the industry's fastest update rate at 100,000 waveforms/sec update rate, you'll capture and see infrequent events.

- **Mega*Zoom* III technology.** Mega*Zoom* III responsive deep memory captures long, non-repeating signals and maintains high sample rates, allowing you to quickly zoom in on areas of interest. Sample rate and memory depth go hand-in-hand. Deep memory in oscilloscopes sustains a high sample rate over longer time spans.

## Digital: 16 digital timing channels with mixed signal triggering
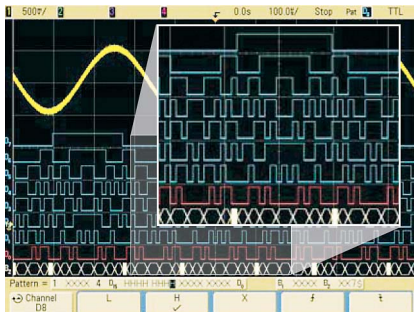
Capture a mix of analog or digital signals. Compare multiple cycles of digital signals with slower analog signals.

- **16 high-speed timing analysis with up to 2 GSa/s deep memory.** Use the timing channels to evaluate control signal relationship. Or capture and view data buses up to 16 bits wide. Display individual signals or bus waveforms in hex or binary.

- **Mixed signal trigger.** Trigger across any combination of analog and digital signals simultaneously. See precise analog measurements timed with exact digital content, all in one box.

- **Applications for digital channels.** Designing with Altera or Xilinx FPGAs? Use FPGA dynamic probe for rapid internal FPGA measurements. Using I^2C or SPI? Use the digital signals from a 4-channel MSO to acquire and decode these serial buses.

Serial: Hardware-accelerated decode and trigger for I^2C, SPI, CAN, LIN and FlexRay
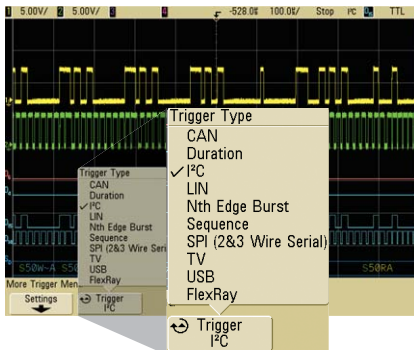
Capture long streams of serial data and gain fast insight into the problem. The Agilent 6000 Series oscilloscopes provide the best serial capabilities in its class.

- **Serial bus triggering and decoding.** Display responsive, on-screen decode of serial bus traffic. Isolate specific events with pinpoint accuracy. Show decode to validate serial bus activity in real-time.

- **Hijack infrequent errors.** Hardware-accelerated decoding increases your probability of capturing elusive events. Agilent oscilloscopes can help you catch that intermittent problem before it becomes an intermittent customer complaint or quality concern.

- **Easily capture enough serial data to see all of the details.** Use deep memory to capture serial data stream over a long period of time.

If you haven't purchased an Agilent oscilloscope lately, why should you consider one now?

Leading-edge technology

The 6000 Series oscilloscopes incorporate third generation Mega*Zoom* III technology blocks — **responsive deep memory**, **fast update rates with minimal "dead time"** and **analog-like display systems** — and deliver them in a compact package.

Industry-leading customer support

As the world's leading Test and Measurement vendor, Agilent maintains the largest network of sales engineers, application engineers, support engineers and technicians. From pre-sales collaboration, to calibration, to training and consulting, to repair and servicing, Agilent stands with you throughout the life of your product. It's no accident that Agilent has such loyal customers.

Don't take our word for it

Compare the 6000 Series with your current bench scope. Or compare it to one of our competitors' newest scopes. You'll see why Agilent has been the **fastest-growing oscilloscope supplier** since 2001 (source: Prime Data 2005 Test Instrument Industry Service Market Share Analysis). See **http://demos.tm.agilent.com/6000/** for a head-to-head competitive comparison.

Model	Bandwidth	Maximum sample rate	Memory depth	Scope channels	Digital channels
DSO6012A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6012A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6014A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6014A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	16
DSO6032A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6032A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6034A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6034A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	16
DSO6052A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6052A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6054A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6054A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	16
DSO6102A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6102A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6104A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6104A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	16

Start with:

- **DSO**
- **2 Mpts standard memory depth**

User installable
Upgrade in 10 minutes

Upgrade to:

- **MSO**
- **8 Mpts deep memory**

Other nice features

High resolution mode
Offers up to 12 bits of vertical resolution in real-time, single-shot mode. This is accomplished by serially filtering sequential data points and mapping the filtered results to the display when operating at base settings greater than 10-µs/div.
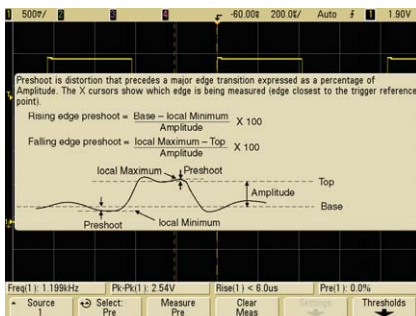
Help is at your fingertips
An embedded help system – available in 11 languages – gives you quick answers if you don't understand a feature. Simply press and hold the corresponding front-panel key, and a screen pops up to explain its function.

Waveform math with FFT
Analysis functions include subtract, multiply, integrate, square root, and differentiate, as well as Fast Fourier Transforms (FFT).

Peak detect
250 ps on 500-MHz and 1-GHz models, 500 ps on 300-MHz models and 1 ns on 100-MHz models helps you find narrow glitches.

AutoProbe interface
Automatically sets probe attenuation factors and provides power for selected Infiniium active probes, including the award-winning 1130A 1.5-GHz InfiniiMax differential active probe and 1156A 1.5-GHz single-ended active probe systems.
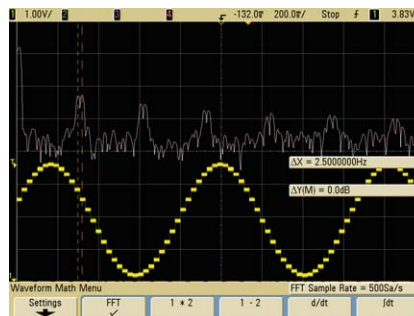
5-digit hardware counter
Measures frequency up to the bandwidth of the scope.

Trig Out
Provides an easy way to synchronize your scope to other instruments. Use the Trig Out port to connect your scope to a frequency counter for more accurate frequency measurements or to cross trigger other instruments.

Autoscale
Displays all active signals, and automatically sets the vertical, horizontal and trigger controls.

23 automatic measurements with QuickMeas
Pressing **[QuickMeas]** brings up the last four automated measurements selected. Cursors automatically track the most recently selected measurement.

Analog HDTV/EDTV trigger
The 6000 Series supports analog HDTV/EDTV triggering for standards like 1080i, 1080p, 720p and 480p as well as standard video triggering on any line within a field, all lines, all fields, odd or even fields for NTSC, SECAM, PAL and PAL-M video signals.

Bus mode display (on MSO models)
Quick and easy read-out of hexadecimal or binary representation of logic signals.

Easy software upgrades
System software is stored in Flash ROM that can be upgraded from the scope's built-in USB port or LAN. You can find the latest system and IntuiLink Data Capture software at **www.agilent.com/find/MSO6000sw**.

Press and hold a key for instant help in any one of 11 languages you choose.

FFT allows you to view the spectral content of this unfiltered sine wave.
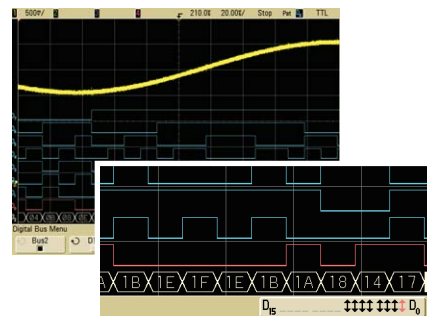
Digital signals can be displayed individually or as overlayed bus values.

Why does deep memory matter?

MEGA*Zoom* III

See more time

This is the most easily understood use of deep memory. The more samples that you acquire, the more time that you can see at a particular sample rate.

Long capture times give you better visibility into cause-effect relationships in your design, which greatly simplifies root-cause debugging. It also allows you to capture start-up events (like the start-up sequence below) in a single acquisition.

You don't have to stitch together multiple acquisitions or set precise triggering conditions. Spend less time finding events, and more time analyzing them.

See more details

The relationship between memory depth and acquisition rate isn't as obvious. All scopes have a "banner" maximum sample rate specification, but many can only sustain these rates at a few timebase settings.

In the case of an oscilloscope with a 5 GSa/s acquisition sample rate and 10,000 points of memory, those 10,000 points can only fill 2 µs of time. Since scopes have 10 time divisions, the sample rate drops at any time setting below 200 ns/div.

As a result, if you look at "slow/fast" events like a modulated signal, you run the risk of aliasing your signal. Or you may simply miss out on important signal details when you zoom in on it.

Deep memory oscilloscopes let you sustain a high sample rate over longer periods of time.

Always fast, always on

Mega*Zoom* III is the third generation of the fast and deep memory architecture that Agilent introduced in 1996. It's not a special mode, unlike other deep-memory oscilloscopes. You have access to your Mega*Zoom* memory at all times. And the display will respond instantly to your commands as you scale the time/div settings or pan and zoom in the Delayed (or "zoom") window.

You can learn more about Mega*Zoom* III deep memory in Application Note 1446 - *Deep Memory Oscilloscopes: The New Tools*

There is no better way to experience the superiority of the new Agilent 6000 Series scopes than seeing one in action on your bench to measure your signals yourself. We can arrange for you to try out a new MSO6000A MSO. Contact your nearest Agilent sales office or visit the MSO6000A home page at **www.agilent. com/find/MSO6000**. Contact Agilent today to request an evaluation.
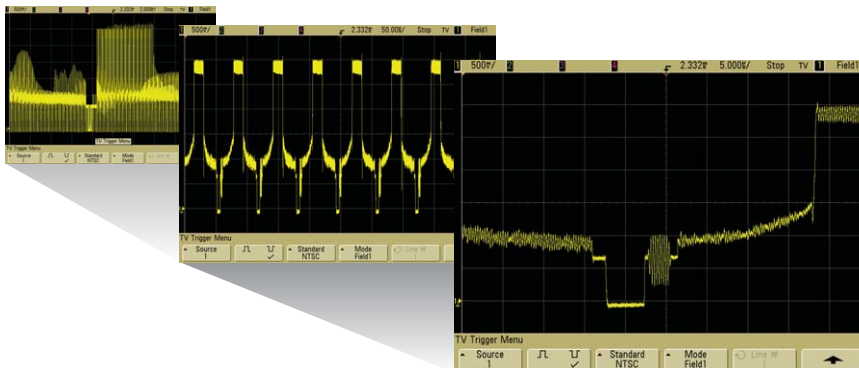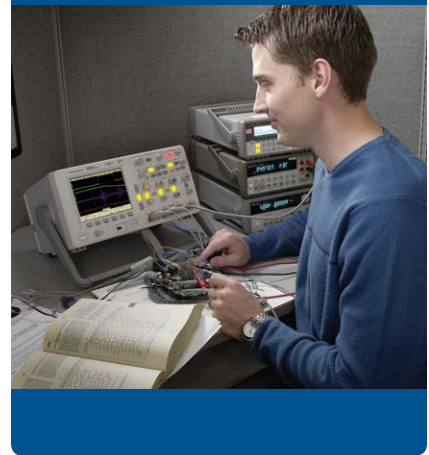
At the heart of Mega*Zoom* technology is a custom ASIC that performs data acceleration from the ADC to display.

Why does a fast update rate matter?

This is a question that we hear frequently. If the human eye has trouble discerning above 30-50 frames per second, **is there really a difference between 3,600 and 100,000 waveforms per second?** If you know what you're looking for the answer is probably "no". However, if you are hunting for unknown signal anomalies or characterizing jitter, the answer is "yes".
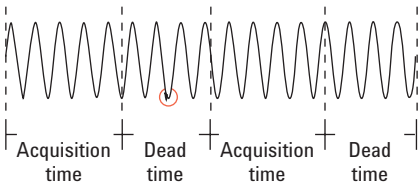
Reducing the dead time between acquisitions ...

If you know that there is a **glitch in your system**, it's easy to capture it using a pulse-width trigger. However, if you are just browsing through your design, your chances of finding a glitch increase as the update rate increases. If a glitch occurs during the "dead time" between sample, you miss it. With Mega*Zoom* III technology, the dead time is much smaller. A scope with a slower update rate will capture the glitch eventually (if it recurs), but most engineers and technicians don't have the time or patience to wait for their tools to catch up.

If you are **characterizing signal jitter**, a fast update rate gives you accurate results sooner. And when the fast update rate is combined with the 6000 Series' XGA high-definition display (1024 x 768, 256 intensity levels),

subtle differences in these acquisitions become obvious.

The Agilent 6000 series fast update rate is truly uncompromised. Even if digital channels are turned on, or serial decode is being utilized the update rate remains constant at 100,000 waveforms/sec and the full memory depth of up to 8 Mpts is always available to you.

And like all other aspects of Mega*Zoom* III technology, this is a real-time acquisition mode. **It's always fast, always on.**

Learn more about the benefits of a fast update rate by reading Application Note 1551 - *Improve Your Ability to Capture Elusive Events: Why Oscilloscope Waveform Update Rates are Important.*
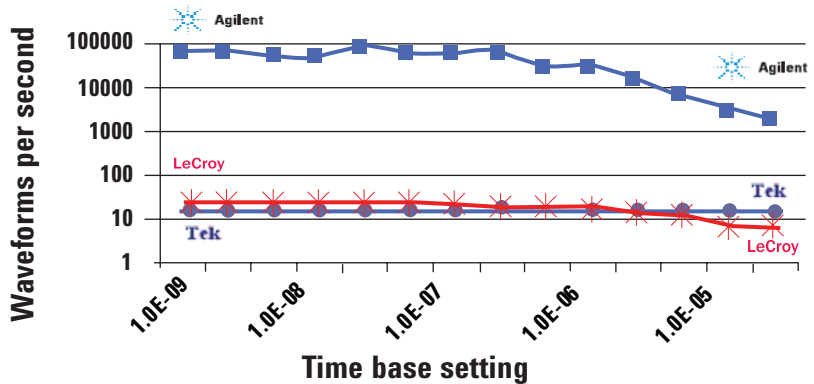
... improves your chances of finding random events like glitches.

Comparison of waveform update rates using each scope's default real-time acquisition mode, digital channels and maximum memory.

Catch problems sooner and cover more of your debug checklist – our 100,000 waveform per second update rate helps you find intermittent problems faster than comparable scopes.

Connectivity

Our customers tell us that oscilloscope connectivity is an increasingly important feature of their test instruments. That's why the 6000 Series scopes come with the most comprehensive hardware and software connectivity tools in their class.

Hardware connectivity

Standard ports include:

- 2 x USB host ports (for external storage and printing devices), one on the front and one on the rear

- 1 x USB device port for high-speed PC connectivity

- 10/100 Mbit LAN for high-speed ethernet connectivity

- GPIB to allow easy migration into existing test systems

- XGA Out for external monitors and projectors
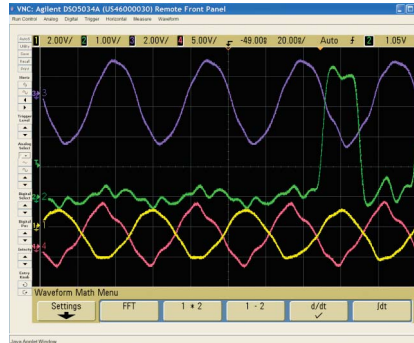

Agilent Remote Front Panel running in a web browser

LXI Class C

LAN eXtensions for Instrumentation (LXI) is a standards-based architecture for test systems. By specifying the interaction of system components, LXI enables fast and efficient test system creation and reconfiguration. The 6000 Series oscilloscopes follow specified LAN protocols, and adhere to LXI requirements such as a built-in Web control server, IVI-COM driver, and easy-to-use SCPI commands. The standard Agilent I/O Library Suite makes it easy to configure and integrate instruments in your system.

IntuiLink toolbars

IntuiLink gives you a quick way to move screen shots and data into Microsoft® Word and Excel. These toolbars can be installed from **www.agilent.com/find/intuilink**.

Scope View logic analyzer and oscilloscope correlation

Scope View enables simple time-correlated measurements between a 6000 Series oscilloscope and an Agilent 1680/90 or 16800/900 logic analyzer. Scope and logic waveforms are integrated into a single logic analyzer waveform display for easy viewing analysis – all with a simple point-to-point LAN connection. You can also cross-trigger the instruments, automatically de-skew the waveforms, and maintain marker tracking between the instruments.

Make time-correlated measurements between an Agilent logic analyzer and 6000 Series oscilloscope.
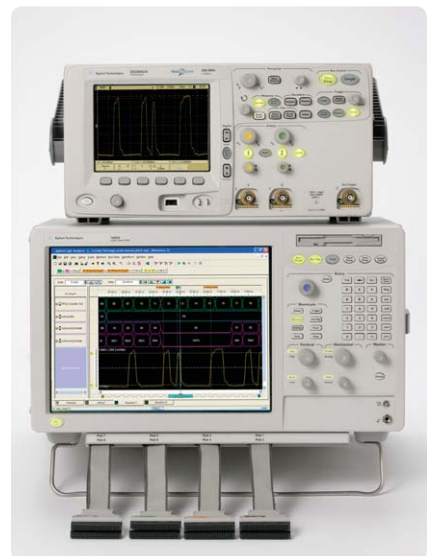
An XGA video output port allows you to connect to a large external monitor.

Standard USB, LAN and GPIB ports provide PC and printer connectivity.

Built-in 10-MHz reference in/out port lets you synchronize multiple measurement instruments in a system.

Trig Out port provides an easy way to synchronize your scope to other instruments.

Rear panel inputs/outputs.

Probes and accessories

Agilent offers a complete family of innovative passive and active probes for the 6000 Series scopes to get your job done easily and accurately. Choosing the correct probe for your application will help to ensure you are acquiring the signals you expect.

Below is a general guide on how to choose the type of probe. For the most up-to-date information about Agilent's accessories, please visit our web site at **www.agilent.com/find/ scope_probes**.
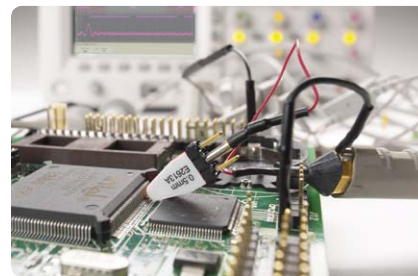
Probe type	Key characteristics	DSO601xA, MSO601xA	DSO603xA, MSO603xA DSO605xA, MSO605xA DSO610xA, MSO610xA
Passive probes: *most common type of probe, rugged and economical with bandwidth generally lower than 600 MHz*			
10070C	1:1 20 MHz with probe ID	Recommended*	Recommended
10073C	10:1 500 MHz with probe ID	Compatible*	Included
10074C	10:1 150 MHz with probe ID	Included*	Compatible
High voltage passive probe: *view up to 30 kVDC + peak AC voltage referenced to earth ground*			
10076A	100:1, 4 kV, 250 MHz probe with ID	Recommended	Recommended
N2771A	1000:1, 30 kV, 50 MHz probe	Recommended	Recommended
Single-ended active probes: *contains small, active amplifier and enables the probe input capacitance to be very low resulting in high input impedance on high frequencies. Least intrusive of all probes.*			
1156A	1.5 GHz AutoProbe interface	Incompatible*	Recommended
1144A	800 MHz (requires 1142A – power supply)	Incompatible	Recommended
1145A	750 MHz 2-ch (requires 1142A – power supply)	Incompatible	Recommended
Active differential probes: *use to look at signals that are referenced to each others instead of earth ground and to look at small signals in the presence of large DC offsets or other common mode signals such as power line noise.*			
1130A	1.5 GHz InfiniiMax amplifier with AutoProbe interface (requires one or more InfiniiMax probe head – E2675A, E2668A, E2669A)	Incompatible	Recommended
N2772A	20 MHz, 1.2 kVDC + peak AC max (requires N2773A power supply)	Recommended	Recommended
1141A	200 MHz, 200 VDC + peak AC max (requires 1142A power supply)	Compatible	Recommended
Current probes: *sense the AC or DC current flowing through a conductor and convert it to a voltage that can be viewed and measured on an oscilloscope. Compatible with 1 MΩ scope input.*			
1146A	100 kHz, 100 A, AC/DC	Recommended	Recommended
1147A	50 MHz, 30 A, AC/DC with AutoProbe interface	Recommended	Recommended
N2780A	2 MHz, 500 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
N2781A	10 MHz, 150 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
N2782A	50 MHz, 30 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
N2783A	100 MHz, 30 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
MSO probes: *offer the best performance and access to the industry's broad range of logic analyzer probing accessories*			
01650-61607**	40-pin, 16-channel logic probe	Recommended with MSO6000 models	Recommended with MSO6000 models
54620-68701	Logic probe with 2x8 flying leads (includes 20 IC clips and five ground leads)	Recommended and included with MSO6000 models	Recommended and included with MSO6000 models

*   **Recommended** is a suggestion from Agilent scope and probing experts that this probe works well with this scope.
    Compatible indicates that the probe and scope will work together but that there are other choices that will work better.
    Included means that this probe ships with this scope.
    Incompatible is a warning that the probe will not work with the indicated scope.
** With the addition of 40-pin logic cable, the Agilent MSO accepts numerous logic analyzer accessories such as Mictor, Samtec, flying leads or soft touch connectorless probe.

For more comprehensive information, refer to the *Agilent 6000 Series Oscilloscopes Probes and Accessories* Data Sheet and Selection Guide (Agilent publication numbers 5968-8153EN/ENUS and 5989-6162EN).

Software applications

Debug and validate your FPGA designs faster and more effectively with FPGA dynamic probe and Agilent MSO.

**FPGA dynamic probe
(N5406A for Xilinx, N5434A for Altera)**
Give your MSO internal FPGA visibility. Agilent's MSO FPGA dynamic probe provides internal FPGA visibility and quick instrument setup using an innovative core-assisted debug approach. Measurement tasks that previously took hours can be done in

a few mouse clicks. In a few seconds, easily measure a different set of internal signals without changing your FPGA design.

For more information:
**www.agilent.com/find/6000-altera
www.agilent.com/find/6000-xilinx**

Expand the capability of the 6000 Series scopes to get up to 2% error vector magnitude measurements.

Vector signal analysis
Expand the measurement capability of your 6000 Series scope with the 89601A vector signal analysis software. This advanced DSP based software takes the digitized signal data provided by the scope and provides FFT based spectrum analysis and wide bandwidth digital modulation analysis. Use these capabilities to demodulate

wireless communication signals like WCDMA and cdma2000, and wireless networking signals like 802.11 WiFi and 802.16 WiMax. Take advantage of the super wide bandwidth of your scope to capture and evaluate radar signals.

For more information:
www.agilent.com/find/6000-vsa
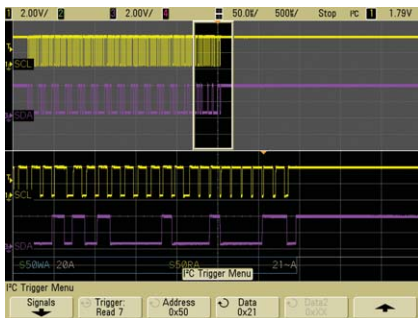
On-screen serial decode of an I²C packet.

I^{2}C/SPI serial trigger and decode (N5423A or Option LSS on new scope purchases)
This application displays real-time time-aligned decode of I^{2}C and SPI serial buses. Hardware-assisted triggering and decode provide the industries fastest throughput and update rate. Hardware-assisted triggering and decode guarantees you will never miss a trigger event or

anomaly — unlike other scopes that have triggering dead time between acquisitions.

This application requires a 4-channel DSO or 4-channel MSO and can use any combination of the scope or logic acquisition channels.

For more information:
www.agilent.com/find/I2C-SPI

Software applications (continued)
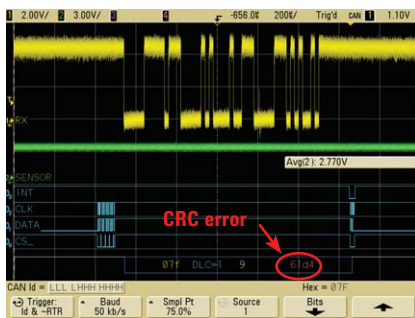
Random errors observed in CAN decode while triggering on data frame ID: 07F$_{HEX}$.

CAN/LIN triggering and decode (N5424A or Option AMS on new scope purchases)

Trigger on and decode serially transmitted data based on CAN and LIN protocols. This application not only provides triggering on complex serial signals, but also provides unique hardware-accelerated decode capabilities. Hardware-assisted triggering and decode guarantees you will never miss a trigger event or anomaly – unlike other scopes that have triggering dead time between acquisitions.

This application requires a 4-channel DSO or 4-channel MSO and can use any combination of scope or logic acquisition channels.

For more information:
www.agilent.com/find/CAN-LIN
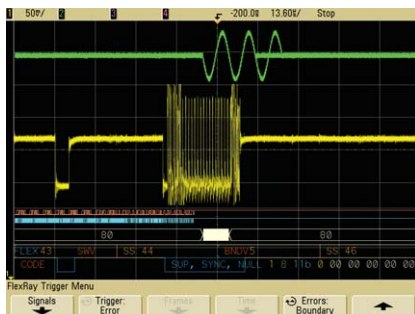
Mixed-signal measurements in a FlexRay system using an MSO.

FlexRay triggering and decode (N5432A or Option FRS on new scope purchases)

FlexRay protocol is based on time-triggered and deterministic architecture. Agilent's FlexRay solution for the 6000 Series mixed signal oscilloscopes offers a robust set of FlexRay frame, slot, and error triggering, including the ability to trigger on specific FlexRay communications qualified on base-cycle and cycle-repetition. This solution combines an Agilent 6000 Series mixed signal oscilloscope (MSO) with a DECOMSYS::BUSDOCTOR 2 protocol analyzer.

For more information:
www.agilent.com/find/flexray

Agilent 6000 Series oscilloscopes: The fastest way to debug your analog, digital and serial designs.

Mega*Zoom* III deep memory helps you determine how your signals are impacting each other. With shallow memory scopes, you have to choose whether you look at a slow analog signal or fast digital content. With up to 8 Mpts deep memory, you don't have to choose – capture all of your data at once.

Revolutionary high-resolution color display with XGA resolution, 256 levels of intensity and unmatched 100,000 waveform per second update rate revealing subtle details that other scopes won't show you.

Built-in USB port makes it easy to save your work and update your system software quickly.

Intensity knob allows you to see the right level of waveform detail, just like an analog scope.

Free IntuiLink PC software makes transferring waveform data or screen image to a PC fast and easy.

12
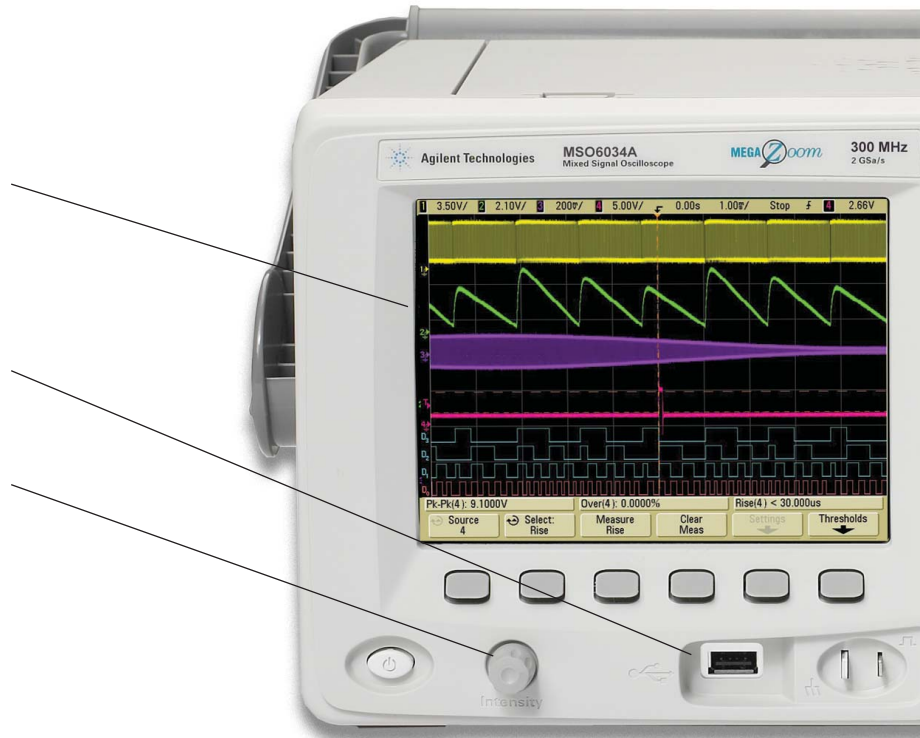
Built-in storage compartment allows you to store probes and power cord for easy access and transportation.

Quickly pan and zoom for analysis with Mega*Zoom* III's instant response and optimum resolution.

QuickMeas shows up to four automated measurements with the push of a button.

QuickPrint automatically prints your screen or saves screen images to a connected USB storage device with automated file names.

Standard serial triggering includes I^2C, SPI, and USB (optional CAN/LIN and FlexRay advanced triggering and decode).

Standard analog HDTV/EDTV triggering supports triggering on 1080i, 1080p, 720p, 480p HDTV/EDTV standards.

AutoProbe interface automatically configures the attenuation ratio of the probe and provides probe power for Agilent's active probes (available on 300 MHz to 1 GHz models only).

Built-in help in 11 languages. Simply press and hold the front-panel key of interest for a few seconds, and a help screen pops up to explain its function.

Maximum sample rate and resolution is achieved on every measurement. The scope automatically adjusts memory depth as you use it, so you get maximum sample rate and resolution on every measurement. You don't even have to think about it.

Autoscale lets you quickly display any active signals, automatically setting the vertical, horizontal and trigger controls for the best display, while optimizing memory.

Two or 4 scope and 16 digital channel MSOs allow you to view and trigger on up to 20 time-aligned signals on your scope screen.

Dedicated front-panel controls make it easy to access the most common scope controls, including vertical and horizontal scaling.

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Accessories

**Battery power option
(Option BAT – factory installed)**
Agilent 6000 Series oscilloscopes provide an optional internal rechargeable lithium ion battery that will enable 2+ hours without line power. Specifically designed for applications where line power is not available or where you need to take your scope with you but you need more power than a handheld scopemeter provides. New oscilloscopes equipped with this option can also be operated off of the N5429A 12-V automotive adapter. The Agilent 6000 Series oscilloscopes offer the only high-performance scope with battery option on the market.

For more information:
www.agilent.com/find/6000_BAT

**Evaluation kit
(N2918A)**
The scope evaluation kit for 6000 Series MSOs provides signals to help you experience the power of Agilent 6000 Series MSOs. The kit includes a variety of signals that demonstrate Mega*Zoom* III technology with its fast deep memory, superior waveform update rate, high definition display and mixed analog, digital and serial signals debugging. Using this scope evaluation kit along with the easy-to-follow user's guide, you can quickly become familiar with how to effectively use an MSO.

The N2918A evaluation helps you experience the power of Agilent 6000 MSO.

**Secure environment mode
(Option SEC or N5427A)**
Option SEC – secure environment mode provides the highest level of security by ensuring internal non-volatile memory is clear of all setup and trace settings in compliance with National Industrial Security Program Operation Manual (NISPOM) Chapter 8 requirements. When this option is installed, it will store setup and trace settings to internal volatile memory only. Volatile memory will be cleared during the power off cycle of the instrument. So you can move the instrument out of a secure area with confidence.

For more information:
Option SEC or N5427A Secure Environment Mode Option for Agilent 6000 Series Oscilloscopes Data Sheet (Agilent publication number 5989-5558EN).

For more information:
www.agilent.com/find/security

Product selection guide

Looking for a lower cost alternative?
Consider the DSO5000 Series. Compare
the two popular oscilloscope families
in the chart below.

Features that are available to all scopes

Channel count; 2 or 4 (scope)
Maximum sample rate: 4 GSa/s
XGA display with 256 intensity levels, 100,000 waveforms/sec
Extensive selection of probes and accessories
USB, LAN, GPIB connectivity, XGA out, LXI Class C compliant

	General pupose	High performance	
Key features	**DSO5000**	**DSO6000**	**MSO6000**
Bandwidth			
100 MHz	√	√	√
300 MHz	√	√	√
500 MHz	√	√	√
1 GHz		√	√
MegaZoom Deep Memory			
1 Mpts - standard	√		
2 Mpts - standard		√	√
8 Mpts - upgrade		√*	√*
Triggering			
Triggering (Edge, Pattern, Pulse, Width, TV, Sequence, HDTV)	√	√	√
I^2C, SPI and USB serial bus triggering		√	√
CAN, LIN and FlexRay serial bus triggering		√*	√*
Mixed signal triggering across both analog and digital content		√*	√
Digital timing channels			
16 digital timing channels with mixed signal triggering and bus display mode		√*	√
Xilinx and Altera FPGA dynamic probe application options		√*	√*
Serial decode			
I^2C/SPI/CAN/LIN/FlexRay serial bus decode		√*	√*
Options			
Battery power option		√*	√*

* Upgrade or pay option available; advanced serial triggering and decode available on 4 channel models

Performance characteristics

Acquisition: scope channels

Sample rate	MSO/DSO601xA/603xA: 2 GSa/sec each channel MSO/DSO605xA/610xA: 4 GSa/sec half channel*, 2 GSa/sec each channel Equivalent-time sample rate: 400 GSa/s (when real-time mode is turned off)

Memory depth
   Standard
   Optional
	2 channels/4 channels
	2 Mpts/1 Mpts
	8 Mpts/4 Mpts

Vertical resolution	8 bits
Peak detection	MSO/DSO601xA: 1-ns peak detect MSO/DSO603xA: 500-ps peak detect MSO/DSO605xA/610xA: 250-ps peak detect
Averaging	Selectable from 2, 4, 8, 16, 32, 64 ... to 65536
High resolution mode	Average mode with avg = 1 12 bits of resolution when ≥10 µs/div @ 4 GSa/s or ≥20-µs/div @ 2 GSa/s
Filter	Sinx/x interpolation (single shot BW = sample rate/4 or bandwidth of scope, whichever is less) with vectors on and in real-time mode

Acquisition: digital channels (MSO6000A or MSO-upgraded DSO6000A only)

Sample rate	2 GSa/sec one pod**, 1 GSa/sec each pod
Maximum input frequency	250 MHz

Memory depth
   Standard
   Optional
 	
   Standard
	one pod/both pods (with scope channels turned off)
	2 Mpts/1 Mpts
	8 Mpts/4 Mpts
	One pod/both pods (with scope channels turned on)
	625 Kpts/ 312 Kpts
	2.5 Mpts/ 1.25 Mpts

Vertical resolution	1 bit
Glitch detection	2 ns (min pulse width)

*   Half channel is when only one of channel 1 or 2 is turned on, and only channel 3 or 4 is turned on.
**   A pod is a group of eight digital channels, either 0-7 or 8-15.

Performance characteristics (continued)

Vertical system: scope channels

Scope channels	MSO/DSO6xx2A: Ch 1 and 2 simultaneous acquisition MSO/DSO6xx4A: Ch 1, 2, 3 and 4 simultaneous acquisition
Bandwidth (–3dB)*	MSO/DSO601xA: DC to 100 MHz MSO/DSO603xA: DC to 300 MHz MSO/DSO605xA: DC to 500 MHz MSO/DSO610xA: DC to 1 GHz
AC coupled	MSO/DSO601xA: 3.5 Hz to 100 MHz MSO/DSO603xA: 3.5 Hz to 300 MHz MSO/DSO605xA: 3.5 Hz to 500 MHz MSO/DSO610xA: 3.5 Hz to 1 GHz
Calculated rise time (=0.35/bandwidth)	MSO/DSO601xA: 3.5 nsec MSO/DSO603xA: 1.17 nsec MSO/DSO605xA: 700 psec MSO/DSO610xA: 350 psec
Single-shot bandwidth	MSO/DSO601xA: 100 MHz MSO/DSO603xA: 300 MHz MSO/DSO605xA: 500 MHz MSO/DSO610xA: 1 GHz (in half-channel mode)
Range[1]	MSO/DSO601xA: 1 mV/div to 5 V/div (1 MΩ) MSO/DSO603xA and MSO/DSO605xA: 2 mV/div to 5 V/div (1 MΩ or 50 Ω) MSO/DSO610xA: 2 mV/div to 5 V/div (1 MΩ), 2 mV/div to 1 V/div (50 Ω)
Maximum input	CAT I 300 Vrms, 400 Vpk; transient overvoltage 1.6 kVpk CAT II 100 Vrms, 400 Vpk With 10073C or 10074C 10:1 probe: CAT I 500 Vpk, CAT II 400 Vpk
Offset range	±5 V on ranges <10 mV/div; ±20 V on ranges 10 mV/div to 200 mV/div; ±75 V on ranges >200 mV/div
Dynamic range	±8 div
Input impedance	MSO/DSO601xA: 1 MΩ ± 1% || 11 pF MSO/DSO603xA/605xA/610xA: 1 MΩ ± 1% || 14 pF or 50 Ω ± 1.5%, selectable
Coupling	AC, DC
BW limit	MSO/DSO601xA: 20 MHz selectable MSO/DSO603xA/605xA/610xA: 25 MHz selectable
Channel-to-channel isolation	DC to max bandwidth >40 dB
Standard probes	MSO/DSO601xA: 10:1 10074C shipped standard for each scope channel MSO/DSO603xA/605xA/610xA: 10:1 10073C shipped standard for each scope channel
Probe ID	MSO/DSO601xA: Auto probe sense MSO/DSO603xA/605xA/610xA: Auto probe sense and AutoProbe interface Agilent- and Tektronix-compatible passive probe sense

* 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 1 mV/div is a magnification of 2 mV/div setting for 100 MHz models and 2 mV/div is a magnification of 4 mV/div setting for 300 MHz to 1 GHz models. For vertical accuracy calculations, use full scale of 16 mV for 1 mV/div sensitivity setting and 32 mV for 2 mV/div sensitivity setting.

Performance characteristics (continued)

Vertical system: scope channels (continued)

ESD tolerance	±2 kV
Noise peak-to-peak	MSO/DSO601xA: 3% full scale or 2 mV, whichever is greater MSO/DSO603xA: 3% full scale or 3 mV, whichever is greater MSO/DSO605xA: 3% full scale or 3.6 mV, whichever is greater MSO/DSO610xA: 3% full scale or 4 mV, whichever is greater
DC vertical gain accuracy*[1]	±2.0% full scale
DC vertical offset accuracy	≤200 mV/div: ±0.1 div ±2.0 mV ±0.5% offset value; >200 mV/div: ±0.1 div ±2.0 mV ±1.5% offset value
Single cursor accuracy[1]	±{DC vertical gain accuracy + DC vertical offset accuracy + 0.2% full scale (~1/2 LSB)} *Example:* for 50 mV signal, scope set to 10 mV/div (80 mV full scale), 5 mV offset, accuracy = ±{2.0% (80 mV) + 0.1 (10 mV) + 2.0 mV + 0.5% (5 mV) + 0.2% (80 mV)} = ± 4.785 mV
Dual cursor accuracy*[1]	±{DC vertical gain accuracy + 0.4% full scale (~1 LSB)} *Example:* for 50 mV signal, scope set to 10 mV/div (80 mV full scale), 5 mV offset, accuracy = ±{2.0% (80 mV) + 0.4% (80 mV)} = ±1.92 mV

* 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 1 mV/div is a magnification of 2 mV/div setting for 100 MHz models and 2 mV/div is a magnification of 4 mV/div setting for 300 MHz to 1 GHz models. For vertical accuracy calculations, use full scale of 16 mV for 1 mV/div sensitivity setting and 32 mV for 2 mV/div sensitivity setting.

Vertical system: digital channels (MSO6000A or MSO-upgraded DSO6000A only)

Number of channels	16 logic timing channels — labeled D15 - D0
Threshold groupings	Pod 1: D7 - D0 Pod 2: D15 - D8
Threshold selections	TTL, CMOS, ECL and user-definable (selectable by pod)
User-defined threshold range	±8.0 V in 10 mV increments
Maximum input voltage	±40 V peak CAT I; transient overvoltage 800 Vpk
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 capacitance	~8 pF
Input resistance	100 kΩ ±2% at probe tip
Channel-to-channel skew	2 ns typical, 3 ns maximum

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

Performance characteristics (continued)

Horizontal

Range	MSO/DSO601xA: 5 nsec/div to 50 sec/div MSO/DSO603xA: 2 nsec/div to 50 sec/div MSO/DSO605xA: 1 nsec/div to 50 sec/div MSO/DSO610xA: 500 psec/div to 50 sec/div
Resolution	2.5 psec
Time base accuracy	15 ppm (±0.0015%)
Vernier	1-2-5 increments when off, ~25 minor increments between major settings when on
Delay range	Pre-trigger (negative delay): Greater of 1 screen width or 1 ms (with 8 Mpts memory option) Greater of 1 screen width or 250 µs (with 2 Mpts memory option) Greater of 1 screen width or 125 µs (with standard memory) Post-trigger (positive delay): 1 s to 500 seconds
Analog delta-t accuracy	Same channel: ±0.0015% reading ±0.1% screen width ±20 ps Channel-to-channel: ±0.0015% reading ±0.1% screen width ±40 ps *Same channel example (MSO/DSO605xA):* For signal with pulse width of 10 µs, scope set to 5 µs/div (50 µs screen width), delta-t accuracy = ±{0.0015% (10 µs) + 0.1% (50 µs) + 20 ps} = 50.17 ns
Logic delta-t accuracy	Same channel: ±0.005% reading ±0.1% screen width ±(1 logic sample period, 1 ns) Channel-to-channel: ±0.005% reading ±0.1% screen width ±(1 logic sample period) ±chan-to-chan skew *Same channel example:* For signal with pulse width of 10 µs, scope set to 5 µs/div (50 µs screen width), delta-t accuracy = ±{0.005% (10 µs) + 0.1% (50 µs) + 1 ns} = 51.5 ns
Modes	Main, delayed, roll, XY
XY	Bandwidth: Max bandwidth Phase error @ 1 MHz: <0.5 degrees Z Blanking: 1.4 V blanks trace (use external trigger on MSO/DSO6xx2A, channel 4 on MSO/DSO6xx4A)
Reference positions	Left, center, right

Trigger system

Sources	MSO6xx2A: Ch 1, 2, line, ext, D15 - D0 DSO6xx2A: Ch 1, 2, line, ext MSO6xx4A: Ch 1, 2, 3, 4, line, ext, D15 - D0 DSO6xx4A: Ch 1, 2, 3, 4, line, ext
Modes	Auto, Normal (triggered), single
Holdoff time	~60 ns to 10 seconds
Trigger jitter	15 ps rms

Performance characteristics (continued)

Trigger system (continued)

Selections		Edge, pulse width, pattern, TV, duration, sequence, CAN, LIN, FlexRay, USB, I^{2}C, SPI, Nth edge burst
	Edge	Trigger on a rising, falling, alternating or either edge of any source
	Pattern	Trigger at the beginning of a pattern of high, low, and don't care levels and/or a rising or falling edge established across any of the analog and digital channels, but only after a pattern has stabilized for a minimum of 2 nsec. The scope channel's high or low level is defined by that channel's trigger level. The logic channel's trigger level is defined by the threshold for the pod, 0 - 7 or 8 - 15.
	Pulse width	Trigger when a positive- or negative-going pulse is less than, greater than, or within a specified range on any of the source channels. Minimum pulse width setting: 5 ns (MSO/DSO601xA/603xA scope channels) 2 ns (MSO/DSO605xA/610xA scope channels) 2 ns (logic channels on MSO6000A or MSO-upgraded DSO6000A) Maximum pulse width setting: 10 s
	TV	Trigger using any scope channel on most analog progressive and interlaced video standards including HDTV/EDTV, NTSC, PAL, PAL-M or SECAM broadcast standards. Select either positive or negative sync pulse polarity. Modes supported include Field 1, Field 2, all fields, all lines, or any line within a field. TV trigger sensitivity: 0.5 division of sync signal. Trigger holdoff time can be adjusted in half field increments.
	Sequence	Arm on event A, trigger on event B, with option to reset on event C or time delay.
	CAN	Trigger on CAN (Controller Area Network) version 2.0A and 2.0B signals. Trigger on the start of frame (SOF) bit (standard). N5424A option supports triggering on remote frame ID (RTR), data frame ID (~RTR), remote or data frame ID, data frame ID and data, error frame, all errors, acknowledge error and overload frame.
	LIN	Trigger on LIN (Local Interconnect Network) sync break at beginning of message frame (standard). N5424A option supports triggering on frame ID.
	FlexRay	N5432A option supports trigger on FlexRay frame ID or time slot or specific error condition, along with cycle-base and repetition-cycle filtering.
	USB	Trigger on USB (Universal Serial Bus) start of packet, end of packet, reset complete, enter suspend, or exit suspend on the differential USB data lines. USB low speed and full speed are supported.
	I^{2}C	Trigger on I^{2}C (Inter-IC bus) serial protocol at a start/stop condition or user defined frame with address and/or data values. Also trigger on missing acknowledge, address with no acq, restart, EEPROM read, and 10-bit write.
	SPI	Trigger on SPI (Serial Protocol Interface) data pattern during a specific framing period. Supports positive and negative Chip Select framing as well as clock Idle framing and user-specified number of bits per frame.
	Duration	Trigger on a multi-channel pattern whose time duration is less than a value, greater than a value, greater than a time value with a timeout, or inside or outside of a set of time values. Minimum duration setting: 2 ns Maximum duration setting: 10 s
	Nth edge burst	Trigger on the Nth edge of a burst that occurs after an idle time that you specify. Max edge count: 65,536.

Performance characteristics (continued)

Trigger system (continued)

Autoscale	Finds and displays all active scope and logic (for MSO6000A series MSO) channels, sets edge trigger mode on highest-numbered channel, sets vertical sensitivity on scope channels and thresholds on logic channels, time base to display ~1.8 periods. Requires minimum voltage >10 mVpp, 0.5% duty cycle and minimum frequency >50 Hz.

Scope channel triggering

Range (internal)	±6 div from center screen
Sensitivity*	<10 mV/div: greater of 1 div or 5 mV; ≥10 mV/div: 0.6 div
Coupling	AC (~3.5 Hz on MSO/DSO601xA, ~10 Hz on MSO/DSO603xA/605xA/610xA), DC, noise reject, HF reject and LF reject (~50 kHz)

Digital (D15 - D0) channel triggering (MSO6000A or MSO-upgraded DSO6000A only)

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, CMOS = 2.5 V, ECL = –1.3 V

External (EXT) triggering	MSO/DSO6xx2A (2-/2+16-ch models)	MSO/DSO6xx4A (4-/4+16-ch models)
Input impedance	MSO/DSO6012A: 1 MΩ ± 3% || 11 pF or 50 Ω MSO/DSO6032A/6052A/6102A: 1 MΩ ± 3% || 14 pF or 50 Ω	MSO/DSO6014A: 1.015 kΩ ±5% MSO/DSO6034A/6054A/6104A: 2.14 kΩ ±5%
Maximum input	CAT I 300 Vrms, 400 Vpk, CAT II 100 Vrms, 400 Vpk With 10073C 10:1 probe: CAT I 500 Vpk, CAT II 400 Vpk 5 Vrms with 50-Ω input	±15 V
Range	DC coupling: trigger level ±1 V and ±8 V	±5 V
Sensitivity	For ±1 V range setting: DC to 100 MHz, 100 mV; MSO/DSO6032A/6052A/6102A: >100 MHz to bandwidth of oscilloscope: 200 mV For ±8 V range setting: DC to 100 MHz, 250 mV; MSO/DSO6032A/6052A/6102A: >100 MHz to bandwidth of oscilloscope: 500 mV	MSO/DSO6014A: DC to 100 MHz: 500 mV MSO/DSO6034A/6054A/6104A: DC to 500 MHz: 500 mV
Coupling	AC (~3.5 Hz), DC, noise reject, HF reject and LF reject (~50 kHz)	
Probe ID	MSO/DSO601xA: Auto probe sense MSO/DSO603xA/605xA/610xA: Auto probe sense and AutoProbe interface Agilent- and Tektronix-compatible passive probe sense	

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

Performance characteristics (continued)

Display system

Display	6.3-inch (161 mm) diagonal color TFT LCD
Throughput of scope channels	Up to 100,000 waveforms/sec in real-time mode
Resolution	XGA – 768 vertical by 1024 horizontal points (screen area); 640 vertical by 1000 horizontal points (waveform area) 256 levels of intensity scale
Controls	Waveform intensity on front panel. Vectors on/off; infinite persistence on/off, 8 x 10 grid with intensity control
Built-in help system	Key-specific help displayed by pressing and holding key or softkey of interest. Language support for 11 languages including English, German, French, Russian, Japanese, Traditional Chinese, Simplified Chinese, Korean, Spanish, Portuguese and Italian.
Real-time clock	Time and date (user adjustable)

Measurement features

Automatic measurements	Measurements are continuously updated. Cursors track last selected measurement. Up to four measurements can be displayed on screen at any one time.
Voltage (scope channels only)	Peak-to-peak, maximum, minimum, average, amplitude, top, base, overshoot, preshoot, RMS, standard deviation (AC RMS)
Time	Frequency, period, + width, – width and duty cycle on any channel. Rise time, fall time, X at max Y (time at max volts), X at min Y (time at min volts), delay, and phase on scope channels only.
Counter	Built-in 5-digit frequency counter on any channel. Counts up to the scope's bandwidth (1 GHz max). The counter resolution can be increased to 8 digits with an external 10-MHz reference.
Threshold definition	Variable by percent and absolute value; 10%, 50%, 90% default for time measurements
Cursors	Manually or automatically placed readout of Horizontal (X, ΔX, 1/ΔX) and Vertical (Y, ΔY). Additionally logic or scope channels can be displayed as binary or hex values.
Waveform math	One function of 1-2, 1x2, FFT, differentiate, integrate, square root. Source of FFT, differentiate, integrate: scope channels 1 or 2, 1-2, 1+2, 1x2.

FFT

Points	Fixed at 1000 points
Source of FFT	Scope channels 1 or 2 (or 3 or 4 on MSO/DSO6xx4A only), 1+2, 1-2, 1*2
Window	Rectangular, flattop, hanning
Noise floor	–50 to –90 dB depending on averaging
Amplitude	Display in dBV, dBm at 50 Ω
Frequency resolution	0.05/time per div
Maximum frequency	50/time per div

Performance characteristics (continued)

Storage

Save/recall (non-volatile)	10 setups and traces can be saved and recalled internally. Optional secure environment mode ensures setups and traces are stored to internal volatile memory so data is erased when power is removed. Compliant to NISPOM Chapter 8 requirements.
Storage type and format	USB 1.1 host ports on front and rear panels Image formats: BMP (8-bit), BMP (24-bit), PNG (24-bit) Data formats: X and Y (time/voltage) values in CSV format, ASCII XY and binary format Trace/setup formats: Recalled

I/O

Standard ports	USB 2.0 high speed device, two USB 1.1 host ports, 10/100-BaseT LAN, IEEE488.2 GPIB, XGA video output
Max transfer rate	IEEE488.2 GPIB: 500 kbytes/sec USB (USBTMC-USB488): 3.5 Mbytes/sec 100 Mbps LAN (TCP/IP): 1 Mbytes/sec
Supported printers via USB	Deskjet 672C, Deskjet 694C, Deskjet 840C, Deskjet 935C, Deskjet 952C, Deskjet 6940, Deskjet 6980, Deskjet 9800 Officejet 7310, Officejet 7410, PhotoSmart C5180, PhotoSmart C6180, PhotoSmart C7100, PhotoSmart D7160, PhotoSmart D7360, PhotoSmart 8750

General characteristics

Physical size	35.4 cm wide x 18.8 cm high x 28.2 cm deep (without handle) 39.9 cm wide x 18.8 cm high x 28.2 cm deep (with handle)
Weight	Net: 4.9 kgs (10.8 lbs) Shipping: 9.4 kgs (20.7 lbs)
Probe comp output	Frequency ~2 kHz; Amplitude ~5 V

Performance characteristics (continued)

General characteristics (continued)

Trigger out	When Triggers is selected (delay ~17 ns)
	  0 to 5 V into high impedance
	  0 to 2.5 V into 50 Ω
	When Source Frequency or Source Frequency/8* is selected
	  0 to 580 mV into high impedance
	  0 to 290 mV into 50 Ω
	Max frequency output: 350 MHz (in source frequency mode when terminated in 50 Ω)
	                              125 MHz (in source frequency/8 mode when terminated in 50 Ω)

10 MHz ref in/out	TTL out, 180 mV to 1 V amplitude with 0 to 2 V offset
Kensington lock	Connection on rear panel for security

Power requirements

Line voltage range	~Line 120 W max, 96-144 V/48-440 Hz, 192-288 V/48-66 Hz, automatic selection
Line frequency	50/60 Hz, 100-240 VAC; 440 Hz, 100-132 VAC
Power usage	110 W max
Battery option – BAT	2+ hours between charges, battery-low indicator at 20% Battery capacity after repeated charging: 80% after 300 cycles Non-operating temperature: –20 °C to 60 °C Operating temperature: –10 °C to 50 °C Power consumption is 67-75 Watts with optional N5429A DC Power adapter

Environmental characteristics

Ambient temperature	Operating –10 °C to +55 °C; non-operating –65 °C to +71 °C
Humidity	Operating 95% RH at 40 °C for 24 hr; non-operating 90% RH at 65 °C for 24 hr
Altitude	Operating to 4,570 m (15,000 ft); non-operating to 15,244 m (50,000 ft)
Vibration	Agilent class B1 and MIL-PRF-28800F; class 3 random
Shock	Agilent class B1 and MIL-PRF-28800F; class 3 random; (operating 30g, 1/2 sine, 11 ms duration, 3 shocks/axis along major axis, total of 18 shocks)
Pollution degree2	Normally only dry non-conductive pollution occurs. Occasionally a temporary conductivity caused by condensation must be expected.
Indoor use	Rated for indoor use only

Other

Measurement categories	CAT I: Mains isolated CAT II: Line voltage in appliance and to wall outlet
Regulatory information	Safety IEC 61010-1:2001 / EN 61010-1:2001 Canada: CSA C22.2 No. 1010.1:1992 UL 61010B-1:2003
Supplementary information	The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC, and carries the CE-marking accordingly. The product was tested in a typical configuration with HP/Agilent test systems.

* Source Frequency/8 is supported on 300 MHz to 1 GHz 6000 Series only.

Ordering information

Model	Bandwidth	Maximum sample rate	Memory depth	Scope channels	Digital channels
DSO6012A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6012A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6014A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6014A	100 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	16
DSO6032A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6032A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6034A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6034A	300 MHz	2 GSa/s	2 Mpts, 8 Mpts optional	4	16
DSO6052A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6052A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6054A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6054A	500 MHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	16
DSO6102A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	
MSO6102A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	2	16
DSO6104A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	
MSO6104A	1 GHz	4 GSa/s	2 Mpts, 8 Mpts optional	4	16

Accessories included:

Model number	DSO60xxA	MSO60xxA
User's guide (localized), Service guide, Programmer's guide	●	●
Localized power cord	●	●
10073C or 10074C 10:1 divider passive probe with readout per scope channel	●	●
Front panel cover	●	●
Agilent I/O libraries suite 14.2	●	●
16 channel flying lead set logic probe (two pods with eight channels each)		●
Standard 1-year warranty	●	●
Choose one of ABA (printed users guide in English), ABJ (printed users guide in Japanese) or AB2 (printed users guide in simplified Chinese)	●	●

Note: IntuiLink Data Capture software available free on web at **www.agilent.com/find/intuilink**

Ordering information (continued)

Product upgrades

	DSO601xA, MSO601xA DSO603xA, MSO603xA	DSO605xA, MSO605xA DSO610xA, MSO610xA
8 Mpts memory upgrade (Factory installed at time of initial scope purchase)	Option 8ML	
		Option 8MH
8 Mpts memory upgrade (User installed, typically ordered after initial scope purchase)	N2911A	
		N2913A
DSO to MSO upgrade kit (User installed, typically ordered after initial scope purchase)	N2914A*	
		N2915A*
Rechargeable battery power option (Factory installed at time of initial scope purchase)	Option BAT	Option Bat
Secure environment mode option (Factory installed at time of initial scope purchase)	Option SEC	Option SEC
Secure environment mode option (User installed, can be installed by Agilent service center for an additional charge)	N5427A	N5427A

* Includes a 54620-68701 logic cable kit, a label and an upgrade license to activate the MSO features

Digital analysis applications

Option number – user installed	Option number – factory installed	Description
N5406A		FPGA dynamic probe for Xilinx (MSO models only)
N5434A		FPGA dynamic probe for Altera (MSO models only)

Serial data analysis applications

Option number – user installed	Option number – factory installed	Description
N5424A	AMS	CAN/LIN automotive triggering and decode (4 and 4+16 channel models only)
N5423A	LSS	I^2C/SPI serial decode option (for 4 and 4+16 channel models only)
N5432A	FRS	FlexRay automotive triggering and decode (4 and 4+16 channel models only)

Ordering information (continued)

Accessories

Options	Description
N2916B	Rackmount Kit
1180CZ	Testmobile scope cart
N2917B	Transit case
N2919A	Testmobile bracket for 1180CZ and 6000
10833A	GPIB cable, 1 m long

N5916A rackmount kit

Related Literature

Publication Title	Publication Type	Publication Number
Agilent Technologies Probes and Accessories	Selection Guide	5989-6162EN
Agilent Technologies 5000 and 6000 Series Oscilloscope Probes and Accessories	Data Sheet	5968-8153EN/EUS
N5433A I^{2}C and SPI Triggering and Hardware-Accelerated Decode Options for Agilent 6000 Series Oscilloscopes	Data Sheet	5989-5126EN
N5434A FPGA Dynamic Probe for Altera with 6000 Series MSOs	Data Sheet	5989-5965EN
N5406A FPGA Dynamic Probe for Xilinx with 6000 Series MSOs	Data Sheet	5989-1848EN
Debugging Embedded Mixed-Signal Designs Using Mixed Signal Oscilloscopes	Application Note 1562	5989-3702EN
Oscilloscope Display Quality Impacts Ability to Uncover Signal Anomalies	Application Note 1552 Application Note 1553	5989-2003EN 5989-2004EN
Deep Memory Oscilloscopes: The New Tools of Choice	Application Note 1446	5988-9106EN
Evaluating Oscilloscope Vertical Noise Characteristics	Application Note 1558	5989-3020EN
Using an Agilent 6000 Series MSO to Debug an Automotive CAN Bus	Application Note 1576	5989-5049EN
CAN/LIN (N5424A) and FlexRay (N5432A) Options for Automotive Applications Using Agilent's 6000 Series Oscilloscopes	DataSheet	5989-6220EN
Choosing an Oscilloscope with the Right Bandwidth for your Application	Application Note 1588	5989-5733EN
Evaluating Oscilloscope Sample Rates vs. Sampling Fidelity: How to Make the Most Accurate Digital Measurements	Application Note 1587	5989-5732EN

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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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