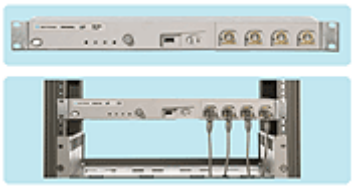

DSO6014L Low Profile Oscilloscope: 100 MHz, 4 channels

Product Status: Currently Orderable | Currently Supported

Product Upgrades: Hardware, Software & Firmware Upgrades

Key Specifications

100-MHz Bandwidth - 4 scope channels (upgradeable to MSO with 16 digital channels)

- LXI class C compliant
- Optimized for automated and manufacturing test
- Rack-mountable 1U (43.66 mm) high form factor
- Lowest cost ATE focused scope on the market

Connectivity

- Standard full-scale connectivity: LAN, USB, GPIB and XGA video
- Built-in Web browser control
- Software drivers for most common programming environment

Powerful Signal Acquisition

- Up to 2 GSa/s sample rate, 2 Mpts stand memory
- 8 bit vertical resolution (extensible to 12 bits with high-resolution mode)
- 16 logic timing channels, time correlated with MSO upgrade option

Easy System Integration

- Standard rack mount hardware
- 100% software compatible with 6000A Series portable oscilloscopes
- Optional secure environment mode for high level of data security
- IVI-com drivers included standard

Description

The Agilent 6014L Series digital storage oscilloscopes (DSOs) offer four channels of measurements in a compact, rack-mountable 1U-high form factor, giving engineers a space-efficient way to integrate oscilloscopes into their test systems. The unit's remote capabilities and graphical Web interface reduce setup and troubleshooting time for engineers building design-verification and functional-test systems.

Additional links:

- Check out the large selection of probes
- Check out the large selection of accessories
- See detailed information and specifications on rack mounting
- I^2C and SPI Serial Data Decode Option details
- CAN, LIN and FlexRay automotive triggering and decode option details
- FPGA options details

Performance characteristics

Scope input

Channels	Ch 1, 2, 3 and 4 simultaneous acquisition
Bandwidth (–3 dB)*	DSO6014L: DC to 100 MHz DSO6054L: DC to 500 MHz DSO6104L: DC to 1 GHz
Maximum input	CAT I 300 Vrms, 400 Vpk, CAT II 100 Vrms, 400 Vpk With 10073C/10074C 10:1 probe: CAT I 500 Vpk, CAT II 400 Vpk 5 Vrms with 50 Ω input
Full Scale range[1]	DSO6014L: 1 mV/div to 5 V/div (1 MΩ) DSO6054L: 2 mV/div to 5 V/div (1 MΩ or 50 Ω) DSO6104L: 2 mV/div to 5 V/div (1 MΩ), 2 mV/div to 1 V/div (50 Ω)
Input impedance	DSO6014L[2]: 1 MΩ ± 1% || 11pF DSO6054L/6104L: 1 MΩ ± 1% || 14pF or 50 Ω ± 1.5%, selectable
Coupling	AC, DC
Offset range	±5 V on ranges < 10 mV/div ±25 V on ranges 10 mV/div to 200 mV/div ±75 V on ranges ≥ 200 mV/div
Connector	BNC
BW limit	DSO6014L: 20MHz DSO6054L/6104L: 25 MHz selectable
Noise peak-to-peak	DSO6014L: 3% full scale or 2 mV, whichever is greater DSO6054L: 3% full scale or 3.6 mV, whichever is greater DSO6104L: 3% full scale or 4.5 mV, whichever is greater

* 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. 2 mV/div is a magnification of 4 mV/div setting. 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.

2 Four 50 Ω termination adapters are supplied with DSO6014L.

Logic channels (with MSO option)

Number of channels	16 logic timing channels – labeled D15 - D0
Maximum input frequency	250 MHz
Sample rate	2 GSa/sec one pod*, 1 GSa/sec each pod
Memory depth Standard memory	1 pod /both pod 8 Mpts/4 Mpts
Vertical resolution	1 bit
Threshold selections	TTL, CMOS, ECL, user-definable (selectable by pod)
Maximum input voltage	±40 V peak CAT I
Glitch detection	2 ns (min pulse width)

* A pod is a group of 8 digital channels. either 0-8 or 9-16

Performance characteristics (continued)

Analog to digital conversion

Vertical resolution	8 bits
Sample rate	DSO6014L: 2 GSa/sec DSO6054L/6104L: 4 GSa/sec half channel, 2 GSa/sec each channel Equivalent-time sample rate: 400 GSa/s (when realtime mode is turned off)
Memory depth Standard	2 channels/4 channels 8 Mpts/4 Mpts
Time range	5 nsec/div to 50 sec/div (DSO6014L) 1 nsec/div to 50 sec/div (DSO6054L) 500 psec/div to 50 sec/div (DSO6104L)

Acquisition

Acquisition mode	Normal, Peak Detect, Averaging, High Resolution
Peak detection	DSO6014L: 1 nsec peak detect DSO6054L/6104L: 250 psec peak detect
Averaging	Selectable from 2,4,8,16,32,64... to 65536
High resolution mode	Time base — Bits of resolution < 100 nsec/div — 8 500 nsec/div — 9 2 µsec/div — 10 10 µsec/div — 11 ≥ 50 µsec/div — 12
Filter	Sinx/x interpolation

Trigger system

Sources	DSO6xx4L: Ch 1, 2, 3, 4, line, ext and D0 - D15 for MSO enabled DSO
Modes	Auto, Normal, Single
Holdoff time range	~60 ns to 10 seconds
Trigger jitter	15 psec rms
Selections	Edge, pulse width, pattern, TV, duration, sequence, CAN, LIN, USB, I^2C, SPI, Nth edge burst

Scope channel triggering

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

* 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)

Logic (D15 - D0) channel triggering (with MSO option)

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

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

External (EXT) triggering

Input resistance	1.015 kΩ ± 5% (DSO6014L) 2.14 kΩ ± 5% (DSO6054L/6104L)
Maximum input	±15 V
Range	±5 V
Sensitivity	DC to 100 MHz: 500 mV (DSO6014L) DC to 500 MHz: 500 mV (DSO6054L/6104L)
Coupling	AC (~ 3.5 Hz), DC, noise reject, HF reject and LF reject (~ 50 kHz)
Probe ID	Auto probe sense (DSO6014L) Auto probe sense and AutoProbe interface (DSO6054L/6104L)

Measurement features

Automatic measurements	Measurements are continuously updated. Cursors track last selected measurement.
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 channels 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 scope 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). Tracking cursors provide an additional mode for cursor positioning beyond the current manual method. When cursor tracking is enabled, changing a cursor's x-axis position results in the y-axis cursor tracking the corresponding y-axis (voltage, current, etc.) value. 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
Measurement statistics	Statistical data for enabled measurements such as mean, min,max, standard deviation and count.

Performance characteristics (continued)

FFT

Points	Fixed at 1000 points
Source of FFT	Scope channels 1, 2, 3 or 4, 1+2, 1-2, 1x2
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)

Storage

Save/recall (non-volatile)	10 setups and traces can be saved and recalled internally. Secure environment mode (-SEC) ensures setups and traces are stored to volatile memory.
Storage type and format	USB 1.1 drive on front (/drive0) and rear (/drive5) panels Image formats: BMP (8 bit), BMP (24 bit) and PNG (24 bit) Data formats: X and Y (time/voltage) values in CSV, ASCII XY and binary format Trace/setup formats: Recalled

I/O

Standard ports	USB 2.0 high speed, 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
Remote front panel	
Built-in help	language support for English, German, French, Russian, Japanese, Traditional Chinese, Simplified Chines, Korean, Spanish, Portuguese and Italian
Throughput of scope channels	100,000 waveforms/sec in real-time mode to remote monitor
Resolution of video output	XGA
Waveform controls	Waveform intensity of 256 levels, vectors on/off, infinite persistence on/off

General characteristics

Rack mounting	Supplied with all necessary hardware (except tools) for installation into a standard EIA 19-inch rack
Physical size	43.5 cm W x 27 cm D x 4.2 cm H (without brackets)
Weight	Net: 2.45 kg (5.4 lbs.) Shipping: 6.2 kg (13.6 lbs.)
Probe comp output	Frequency ~1.2 kHz Amplitude ~2.5 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 within 0 to 2 V offset

Power requirements

Line voltage range	100-240 V, 50/60 Hz auto ranging
Line frequency	50/60 Hz
Power usage	80 W max

Environmental characteristics

Ambient temperature	Operating -10 °C to +50 °C; non-operating -40 °C to +70 °C
Humidity	Operating 95% RH at 40 °C for 24 hours; Non-operating 90% RH at 65 °C for 24 hours
Altitude	Operating to 4,570 m (15,000 ft); non-operating to 15,244 m (50,000 ft)
Vibration	Agilent class GP and MIL-PRF-28800F; Class 3 random
Shock axis	Agilent class GP and MIL-PRF-28800F; (operating 30 g, 1/2 sine, 11-ms duration, 3 shocks/ along major axis. Total of 18 shocks)
Pollution degree	Normally only dry non-conductive pollution occurs. Occasionally a temporary conductivity caused by condensation must be expected.
Indoor use	This instrument is rated for indoor use only

Other

Installation categories	CAT I
EMC	IEC 61326-1:1997, EN 61326-1:1997
Safety	IEC 61010-1:2001, EN 61010-1:2001 Canada: CSA-C22.2 No. 1010.1:1992 UL 61010-1:2003
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.