# Agilent Technologies
# 3000 Series Oscilloscopes

Data Sheet

## The performance and features you need at the industry's lowest price

**Features:**

- 60 to 200 MHz bandwidths

- 1 GSa/s maximum sample rate

- Large 15-cm (5.7-in) color display

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

- 4 kpts of waveform memory

- 20 automatic measurements plus hardware counter and Measure All

- Four math functions, including FFTs standard

- Mask test standard

- USB, GPIB and RS-232 connectivity available

- Multi-language support

- Sequence mode (segmented memory) standard
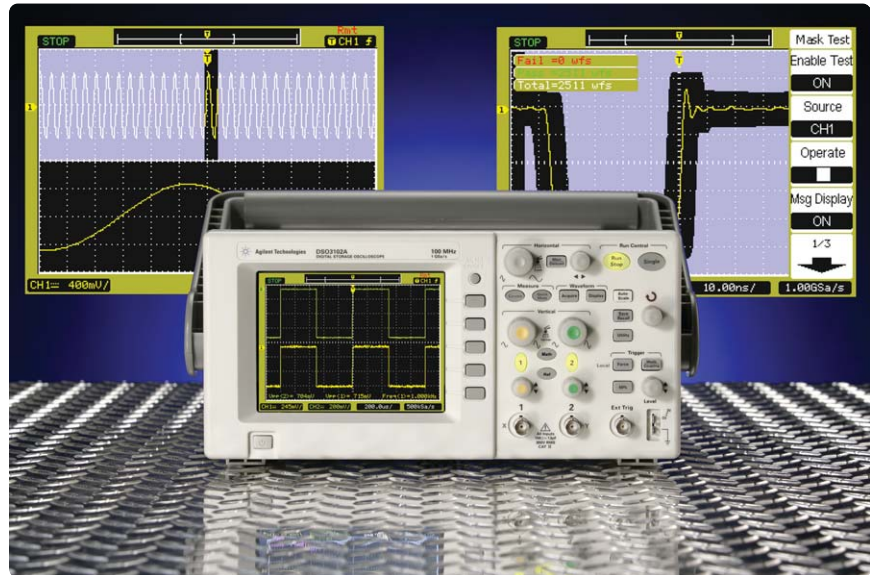


### Get more for your money

Agilent's 3000 Series oscilloscopes give you an affordable way to see what's happening in your designs. Developed with the features you need to make your job easier – including a large LCD color display – the new 3000 Series oscilloscopes cost 20% less than competitive oscilloscopes with comparable performance. Need flexibility? Choose from four models with bandwidths ranging from 60 MHz to 200 MHz. To give you the debugging power you need, each oscilloscope comes standard with advanced features including sophisticated triggering, automatic measurements, digital filtering, sequence mode acquisition, math functions (including FFTs), stored setups and waveforms, mask testing and much more.

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# See your signals more clearly

All 3000 Series models have color displays to allow you to quickly identify your signals, and the large size – 15 cm (5.7 in) with 320 x 240 resolution – makes it easier for you to see more information.

The 3000 Series' delayed sweep also lets you see more details in your design. You can view a long record, then window in on the section of the signal of interest.
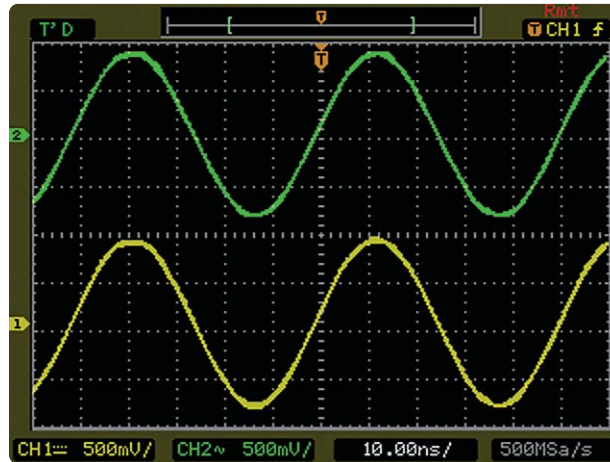


**Figure 1. All 3000 Series oscilloscopes come standard with a color display and cost 20% less than competitive products. The color display allows you to quickly and easily identify your signals and view signal activity.**
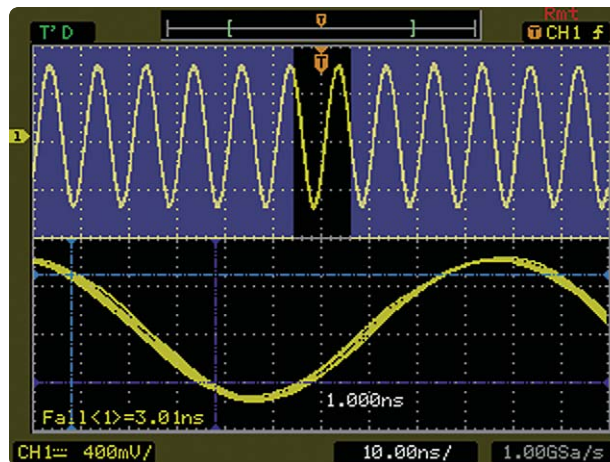


**Figure 2. Want to see the big picture but still get all the details? Use the delayed sweep mode to zoom in on a particular area of interest on your signal while still viewing the entire captured waveform.**

# The features you need

All 3000 Series scopes include the standard features you need to get your job done easier and faster:

**Autoscale** – Autoscale lets you quickly display any active signals, automatically setting the vertical, horizontal and trigger controls for the best signal display.

**More memory** – The 3000 Series oscilloscopes come standard with 4 kpts of memory, nearly twice the memory depth of competitive oscilloscopes in this class.

**Easy connectivity** – The Scope Connect software provides optional connectivity for most data gathering, storage and documentation needs, usable with the 3000 series' standard USB port. GPIB and RS-232 interfaces are also available as options.

**Advanced triggering** – Includes edge, pulse width and line-selectable video, to help you isolate the signals you want to see.

**20 automatic measurements** – To save time, you can make 18 different measurements simultaneously.

**Waveform math with FFTs** – Analysis functions include addition, subtraction, multiplication, and Fast Fourier Transforms with four windows (Hanning, Hamming, Blackman-Harris and rectangular).

**Auto calibration** – Automatically calibrates the oscilloscope's vertical and horizontal systems.

**Multi-language interface** – Operate the oscilloscope in the language of your choice. Language support includes simplified and traditional Chinese, Japanese, Korean, French, German, Italian, Portuguese, Russian and English.
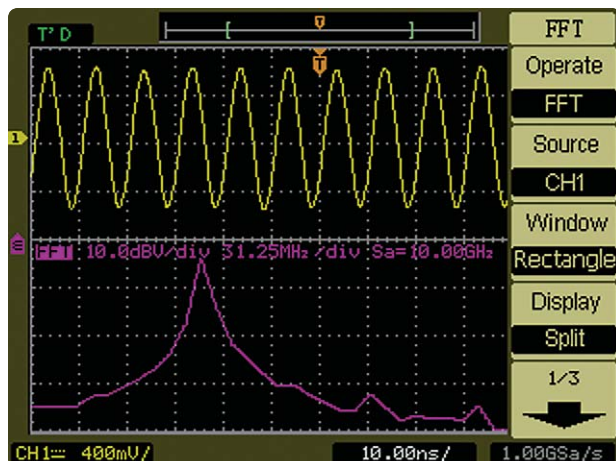


**Figure 3. The 3000 Series comes equipped with a broad set of measurement and math features, including FFTs at no additional cost. You can choose between 4 FFT windows for your specific measurement needs: Hanning, Hamming, Blackman-Harris, and rectangular.**

**Digital filtering** – Digital filtering selections include low pass, high pass, band pass, and band reject filters. Limits are selectable between 1 kHz and the bandwidth of your oscilloscope model.

**Ten waveform and setup memories** – Store waveforms or commonly used setups for future reference and use.

**Mask testing** – Automatically compares incoming signals with a pre-defined mask, clearly highlighting signal changes.

**Sequence mode (segmented memory)** – Frame an area of interest on your signal for acquisition and record up to 1,000 frames for playback.

**Pulse triggering** – Lets you trigger on pulse events.

**1-year warranty** – All 3000 Series scopes include a full 1-year warranty with optional 3-year and 5-year warranty coverage.

**Easy to set up and use** – Dedicated, color-coded knobs for vertical sensitivity, offset, and time base settings make it easy to set up and use. Front-panel keys for triggering functions are also grouped to make your job easier.
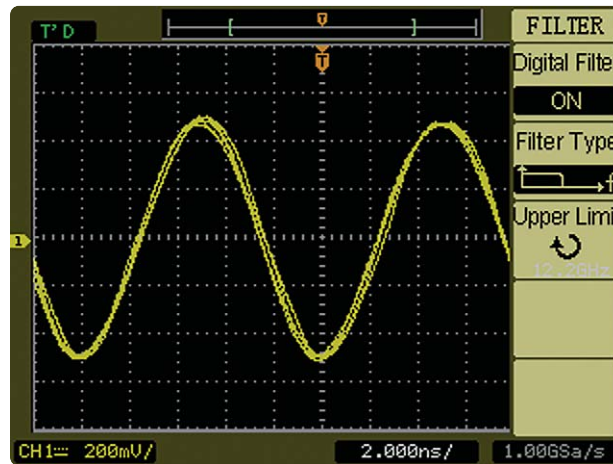


Figure 4. The digital filter capability enhances your ability to examine important signal components by filtering out undesired spectral components such as various types of noise.



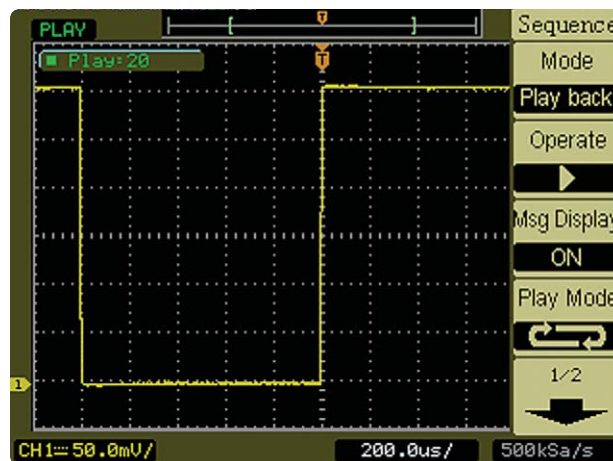Figure 5. Use the sequence mode to frame an area of interest on your signal for acquisition; then, use the playback feature to quickly play through the sequence and easily spot glitches or other signal anomalies.
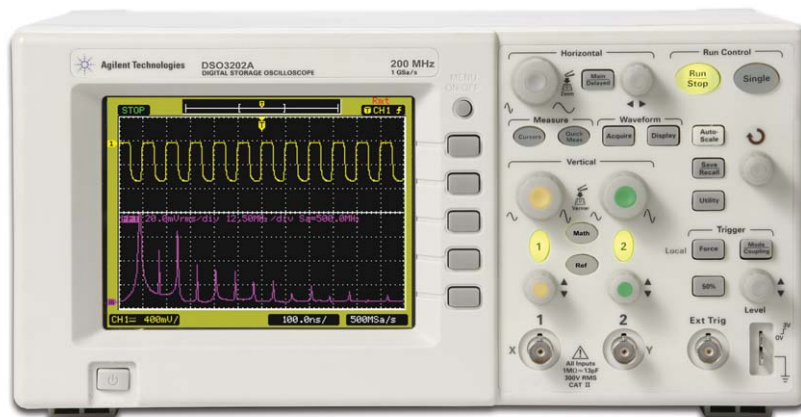


Figure 6. With dedicated, color-coded knobs and front-panel keys grouped by function, it is easy to find and use all of the features of the scope – from the most basic to the more advanced functions.

# Performance characteristics

**Performance characteristics**

| | |
|---|---|
| Bandwidth* | DSO3062A: 60 MHz<br>DSO3102A: 100 MHz<br>DSO3152A: 150 MHz<br>DSO3202A: 200 MHz |
| Real time sample rate<br>  2 channels interleaved<br>  Each channel | <br>1 GSa/s<br>500 MSa/s |
| Channels | 2 |
| Display | Color, 320 x 240 1/4 VGA LCD; H: 88 mm, W: 116 mm |
| Memory | 4 kpts per channel |
| Vertical resolution | 8 bits |
| Vertical sensitivity | 2 mV/div to 5 V/div |
| DC gain accuracy | ± 3% for 10 mV/div to 5 V/div; ± 4% for 2 mV/div to 5 mV/div |
| Vertical zoom | Vertical expand |
| Maximum input voltage | 300 Vrms CAT II; derated at 20 dB/decade above 100 kHz to 13 V p-p AC at 3 MHz and above |
| Time base range | 2 ns/div to 50 s/div |
| BW limit | ~ 20 MHz |
| Input coupling | DC, AC, Ground |
| Input impedance | 1 MΩ: ≈ 13 pF |
| Time base accuracy | 100 ppm |

* 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)

| | |
|---|---|
| **Acquisition modes** | |
| Normal | Displays sampled data directly to the screen in real time |
| Averaging | Selectable from 2, 4, 8, 16, 32, 64, 128 or 256 |
| Peak detect | Captures high-frequency glitches as narrow as 10 ns when viewing signals at slower sweep speeds (slower than 5 µs/div) |
| **Sweep modes** | Auto, Normal, Single |
| **Trigger coupling** | AC, DC, LF reject, HF reject |
| **Trigger modes** | |
| Force | Triggers immediately when front-panel button is pushed |
| Edge | Triggers on the positive or negative slope on any channel |
| Video | Triggers on one of three standard television waveforms: NTSC, PAL, SECAM |
| Pulse triggering | Triggers on a pulse width greater than, equal to, or less than a specified time limit, with time limits ranging from 20 ns to 10 s |
| **Trigger source** | Ch 1, 2, Ext, Ext/5, Line (edge mode only) |
| **Cursors** | |
| Modes | Manual, auto, track |
| Type | Time and voltage |
| Measurements | $\Delta T$, $\Delta V$, frequency |
| **Automatic measurements** | 20 plus 5-digit hardware counter |
| Voltage | Peak-to-peak, maximum, minimum, average, amplitude, top, base, Vrms, overshoot, preshoot |
| Time | Frequency, period, +width, –width, +duty cycle, –duty cycle, rise time, fall time, delay. |
| **Math functions** | Add, subtract, multiply, FFT |
| **FFT** | |
| Window modes | Hanning, Hamming, Blackman-Harris, rectangular |
| Sample size | 1024 points |
| **Autoscale** | Single button automatic setup of all channels |
| **Display** | 1/4 VGA (320 x 240), passive color LCD with adjustable brightness |
| Interpolation | Sin(x)/x |
| Display types | Dots and vectors |
| Persistence | Off, infinite |
| Format | YT and XY |

# Performance characteristics (continued)

## I/O

| | |
|---|---|
| Standard ports | USB (Requires N2860A Scope Connect software for use) |
| Optional ports | GPIB, RS-232 |
| Maximum data transfer rates | GPIB: 500 kbytes/sec |

### General characteristics

| | |
|---|---|
| Physical size | 30 cm wide x 15 cm high x 29 cm deep (without handle)<br>34.6 cm wide x 18.2 cm high x 29 cm deep (with handle) |
| Weight | Net: 4.8 kgs (10.5 lbs)<br>Shipping: 7 kgs (15 lbs) |

### Power requirements

| | |
|---|---|
| Line voltage range | 100-240 VAC, CAT II, automatic selection |
| Line frequency | 47 Hz to 440 Hz |
| Power usage | 50 VA |

### Environmental characteristics

| | |
|---|---|
| Ambient temperature | Operating 0 °C to +55 °C; non-operating –40 °C to +70 °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 |
| Shock | Agilent class B1 |
| Pollution degree2 | Normally only dry non-conductive pollution occurs.<br>Occasionally a temporary conductivity caused by condensation must be expected. |

# Ordering information

| Model number | Description |
| --- | --- |
| DSO3062A | 60 MHz 2-ch DSO |
| DSO3102A | 100 MHz 2-ch DSO |
| DSO3152A | 150 MHz 2-ch DSO |
| DSO3202A | 200 MHz 2-ch DSO |

**Accessories included**
Quick Start manual, CD-ROM with User's Guide and Programmer's Manual, power cord, accessory pouch, two passive probes

**Optional accessories**

| | Description |
| --- | --- |
| N2861A (communication module) | Provides GPIB and RS-232 connectivity and pass/fail output for automatic testing. Includes 3000 Series Scope Connect software (N2860A). |
| N2860A (3000 Series Scope Connect software) | Provides easy communication and control of the Agilent 3000 Series oscilloscopes. Does not require N2861A communication module. USB cable and scope-locked license are included. |

**Warranty options**
All models include a standard 1-year warranty. Contact your local sales office for prices of extended options:

| Option number | Description |
| --- | --- |
| R-51B-001-3C | 1-year return-to-Agilent warranty, extended to 3-years |

# Ordering information (continued)

**Passive probes**

| Product number | Description |
| --- | --- |
| N2862A | 10:1, 150 MHz passive probe (shipped with DSO3062A, DSO3102A, DSO3152A) |
| N2863A | 10:1, 300 MHz passive probe (shipped with DSO3202A) |
| 10070C | 1:1, 20MHz passive probe |

**Current probes**

| Product number | Description |
| --- | --- |
| N2774A | 50 MHz current probe, AC/DC |
| N2775A | Power supply for N2774A |
| 1146A | 100 kHz current probe, AC/DC |

**High-voltage probes**

| Product number | Description |
| --- | --- |
| 10076A | 100:1, 4 kV, 250 MHz high-voltage probe |
| N2771A | 1000:1, 15 kV, 50 MHz high-voltage probe |

**Differential probes**

| Product number | Description |
| --- | --- |
| 1141A | 200 MHz differential probe. Requires 1142A power supply |
| N2772A | 600 V CAT III, 20 MHz differential probe. |

**Cables**

| Product number | Description |
| --- | --- |
| 10833A | GPIB cable, 1 m long |

To get a Quick Quote on Agilent 3000 Series oscilloscopes, go to **www.agilent.com/find/dso3000**

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