Analog feel and digital power for precise, accurate troubleshooting at an affordable price

With many models to choose from, you will be able to pick the oscilloscope that best fits your measurement and troubleshooting needs while meeting your budget.

Displays you can trust
Agilent Technologies 54600-series oscilloscopes feature real-time vector displays that give you a clear and accurate picture of your waveforms. Like analog oscilloscope displays, these enhanced displays give you waveform slew rate information at a glance, with brighter traces representing more slowly changing waveforms and dimmer traces representing more rapidly changing waveforms.

The multiprocessor architecture of Agilent 54600-series oscilloscopes permits a display update rate of up to 3.0 million points per second. This fast display update means the oscilloscope screen reflects changes in the waveform instantaneously, giving you the display responsiveness you need to make adjustments quickly and see complex waveforms accurately.

Powerful digital features
The digital architecture of Agilent 54600-series oscilloscopes gives you a multitude of features that help you get your job done easier and faster:

- Pretrigger viewing capability lets you view events that you’d miss with an analog scope. This feature lets you see what happened before the trigger event, so you can troubleshoot more effectively.
- Autoscale frees you from resetting the scope every time you move the probe from test point to test point. You simply hit the autoscale button and it sets voltage, time and trigger parameters for you.
- With autostore, the waveform displays at full brightness while all previously acquired waveforms remain on the scope’s screen at half brightness. You see a history of waveform activity while simultaneously viewing the live waveform.
- Automatic measurements of voltage, frequency and time, plus user-defined cursor measurements, make waveform characterization fast and easy.
- With peak detect, you won’t have to worry about missing narrow glitches.

Agilent Technologies
Innovating the HP Way

Agilent 54600-Series Oscilloscopes
Data Sheet

- 60/100/150/500 MHz bandwidth models with 2 or 4 channels
- Easy-to-use analog front panel
- Fast, responsive display
- Automatic measurements
- Pretrigger viewing, trace storage
- Optional remote control/hard copy
The Agilent 54600 series includes eight models designed to meet your needs and your budget:

**54600B 100 MHz oscilloscope**
With 100 MHz bandwidth, two input channels, and sweep speeds from 2 ns/div to 5 ns/div, the 54600B is ideal for benchtop troubleshooting, production test, field service, and education—or anywhere else you need a dependable scope with solid performance.

**54645A MegaZoom oscilloscope**
The 54645A is a dual-channel 100 MHz oscilloscope with 200 MSa/s and a full 1 MB of memory behind each of its channels. Through the application of MegaZoom technology, accessing this deep-memory is as easy as turning a knob—pan and zoom through the deep captured waveform to search for other troubleshooting clues.

**54602B 4 (2 + 2)-channel oscilloscope**
When you need more than 100 MHz of bandwidth, take a closer look at the 54602B scope. You get the same capabilities as the 54600B but with the added advantage of a 150 MHz bandwidth, 4 (2+2) channels, and 1 mV/div sensitivity.

**54603B 60 MHz oscilloscope**
The 54603B was designed with the tight budgets of colleges and universities in mind. Students can use the 60 MHz, 2-channel 54603B to understand circuit operation and learn standard measurement techniques on the same type of equipment they are likely to use when they graduate.

**54610B 500 MHz oscilloscope**
This lowest-cost, 2-channel 500 MHz scope offers a viewable external trigger and horizontal accuracy of 0.001%. The 54610B capabilities are well-suited for production test applications as well as general purpose troubleshooting.

**54615B 1 GSa/s oscilloscope**
With the 54615B you can capture narrow glitches and subtle details of your signal. This 2-channel scope combines 500 MHz bandwidth, 1 GSa/s sample rate and 1 nanosecond peak detection on both channels. The 54615B peak detection allows the scope to maintain the 1 GSa/s sample rate at all sweep speeds. A horizontal accuracy of 0.005% means you can make critical timing measurements with confidence.

**54616B/C 2 GSa/s oscilloscope**
The top-of-the-line 54616B offers the same benefits as the 54615B but with twice the sample rate—2 GSa/s sampling rate, 500 MHz bandwidth, and 1 nanosecond peak detection. Plus, if you prefer a color display for waveform viewing, the 54616C color version is available.

**Expandable features to meet your changing needs**
The Agilent 54600-series oscilloscopes can be easily and inexpensively upgraded with add-on modules and software to provide advanced capabilities:

- Interface modules give you remote control and hard-copy output to RS-232, GPIB, and parallel printers and plotters.
- Measurement Storage modules offer interfacing and printing plus advanced features like FFT, mask testing, and additional memory.
- Agilent BenchLink XL 54600 free software captures screen images, gathers waveform data, and stores instrument setups, all from the familiar environment of MS Excel or Word. Ships free with each module.
- Optional Agilent BenchLink Scope is a stand-alone software package for bringing waveform images and points into your PC. Use it when you need Windows 3.1 compatibility, don’t have Excel or Word, or need to access trace memory from your PC.

**Enhanced TV/video trigger**
With Option 005 you gain the ability to trigger and perform highly detailed measurements on the video components of your system. For more information see Agilent publication number 5968-2611. Not available on the 54600B, 54603B, or 54645D scopes.
**Technical Specifications**

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>54603B</th>
<th>54600B</th>
<th>54645A</th>
<th>54602B</th>
<th>54610B</th>
<th>54615B/16B/16C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 1 and 2 ac coupled</td>
<td>dc-60 MHz 10 Hz-60 MHz NA</td>
<td>dc-100 MHz 10 Hz-100 MHz NA</td>
<td>dc-100 MHz 1.5 Hz-100 MHz NA</td>
<td>dc-150 MHz 10 Hz-150 MHz NA</td>
<td>dc-500 MHz 10 Hz-500 MHz NA</td>
<td>dc-500 MHz 10 Hz-500 MHz NA</td>
</tr>
<tr>
<td>CH 3 and 4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>dc-250 MHz NA</td>
<td>NA</td>
<td>54615B 250 MHz 54616B/C 500 MHz</td>
</tr>
<tr>
<td>Single shot bandwidth</td>
<td>dc-2 MHz</td>
<td>dc-2 MHz</td>
<td>dc-50 MHz</td>
<td>dc-2 MHz</td>
<td>dc-2 MHz</td>
<td>54616B/C 500 MHz</td>
</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4 (2+2)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sensitivity CH 1 and 2</td>
<td>2 mV/div to 5 V/div NA</td>
<td>2 mV/div to 5 V/div NA</td>
<td>1 mV/div to 5 V/div NA</td>
<td>1 mV/div to 5 V/div 0.1 and 0.5 V/div NA</td>
<td>2 mV/div to 5 V/div NA</td>
<td>2 mV/div to 5 V/div NA</td>
</tr>
<tr>
<td>CH 3 and 4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>0.1 and 0.5 V/div NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>dc gain accuracy</td>
<td>± 2%</td>
<td>± 1.5%</td>
<td>± 1.5%</td>
<td>± 1.5%</td>
<td>± 2%</td>
<td>± 2%</td>
</tr>
<tr>
<td>Rise time (calculated) CH 1 and 2</td>
<td>&lt;5.83 ns NA</td>
<td>&lt;3.5 ns NA</td>
<td>&lt;3.5 ns NA</td>
<td>&lt;2.33 ns NA</td>
<td>&lt;700 ps NA</td>
<td>&lt;700 ps NA</td>
</tr>
<tr>
<td>CH 3 and 4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>&lt;1.4 ns NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Input impedance</td>
<td>1 MΩ, ~ 13 pF</td>
<td>1 MΩ, ~ 18 pF</td>
<td>1 MΩ, ~ 13 pF</td>
<td>1 MΩ, ~ 13 pF</td>
<td>1 MΩ, ~ 9 pF</td>
<td>1 MΩ, ~ 9 pF or 50 Ω selectable</td>
</tr>
<tr>
<td>Input coupling CH 1 and 2</td>
<td>dc, ac or ground NA</td>
<td>dc, ac or ground NA</td>
<td>dc, ac or ground NA</td>
<td>dc, ac or ground dc or ground NA</td>
<td>dc, ac or ground NA</td>
<td>dc, ac or ground NA</td>
</tr>
<tr>
<td>CH 3 and 4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>dc or ground NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Maximum input (dc + peak ac)</td>
<td>400 V</td>
<td>400 V</td>
<td>400 V</td>
<td>400 V</td>
<td>250 V or 5 Vrms in 50 Ω mode</td>
<td>250 V or 5 Vrms in 50 Ω mode</td>
</tr>
<tr>
<td>Timebase range (main and delayed)</td>
<td>5 s/div to 5 ns/div</td>
<td>5 s/div to 2 ns/div</td>
<td>5 s/div to 2 ns/div</td>
<td>5 s/div to 2 ns/div</td>
<td>5 s/div to 1 ns/div</td>
<td>5 s/div to 1 ns/div</td>
</tr>
<tr>
<td>Trigger sources</td>
<td>CH 1, 2, line, or ext.</td>
<td>CH 1, 2, line, or ext.</td>
<td>CH 1, 2, line, or ext.</td>
<td>CH 1, 2, 3, 4, line</td>
<td>CH 1, 2, line, or ext.</td>
<td>CH 1, 2, line, or ext.</td>
</tr>
<tr>
<td>Horizontal accuracy</td>
<td>± 0.01%</td>
<td>± 0.01%</td>
<td>± 0.01%</td>
<td>± 0.01%</td>
<td>± 0.01%</td>
<td>±0.005%</td>
</tr>
<tr>
<td>Horizontal resolution</td>
<td>100 ps</td>
<td>100 ps</td>
<td>40 ps</td>
<td>100 ps</td>
<td>100 ps</td>
<td>20 ps</td>
</tr>
<tr>
<td>Trigger sensitivity dc to 25 MHz</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.35 div or 3.5 mV 1 div or 2 mV**</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.5 div or 5.0 mV*** 1 div or 10 mV**</td>
</tr>
<tr>
<td>25 MHz to max. bandwidth</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.35 div or 3.5 mV 1 div or 2 mV**</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.35 div or 3.5 mV 1 div or 10 mV</td>
<td>0.5 div or 5.0 mV*** 1 div or 10 mV**</td>
</tr>
<tr>
<td>Maximum sample rate single shot</td>
<td>20 MSa/s</td>
<td>20 MSa/s</td>
<td>200 MSa/s</td>
<td>20 MSa/s</td>
<td>20 MSa/s</td>
<td>54615 1 GSa/s 54616 2 GSa/s</td>
</tr>
<tr>
<td>repetitive</td>
<td>10 GSa/s</td>
<td>10 GSa/s</td>
<td>&gt;10 GSa/s</td>
<td>10 GSa/s</td>
<td>10 GSa/s</td>
<td>&gt;10 GSa/s</td>
</tr>
<tr>
<td>Record length</td>
<td>4,000 points 2,000 points</td>
<td>4,000 points 2,000 points</td>
<td>1M points 1M points</td>
<td>4,000 points 2,000 points</td>
<td>4,000 points 2,000 points</td>
<td>5,000 points 5,000 points</td>
</tr>
<tr>
<td>Max. display update rate</td>
<td>1,500,000 points/sec 3,000,000 points/sec 1,500,000 points/sec 1,500,000 points/sec 500,000 points/sec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>8 bits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>Voltage: 100-240 Vac, 45 to 440 Hz, 220 VA maximum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>Approx. 6.2 kg (14 lbs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (excl. handle)</td>
<td>172 mm H x 322 mm W x 317 mm D (6.8 x 12.7 x 12.5 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty</td>
<td>3 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Maximum bandwidth on CH 1 and 2 is 100 MHz at 1, 2, and 5 mV/div.
** 64002B, for ranges 1, 2, and 5 mV/div, sensitivity between 25 MHz and 100 MHz on CH 1 and 2 is 2 div or 4 mV.
*** Trigger sensitivity from dc to 100 MHz.
† Trigger sensitivity from 100 MHz to max. bandwidth.
†† Maximum bandwidth on CH 1 and 2 is 75 MHz at 1, 2 and 5 mV/div.
**Vertical System (Agilent 54600B, 54646B, 54602B, 54603B)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth Limit</td>
<td>~ 20 MHz</td>
</tr>
<tr>
<td>Inversion</td>
<td>CH 1 and CH 2</td>
</tr>
<tr>
<td>CMRR</td>
<td>~ 20 dB at 50 MHz</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>± 8 div from center screen</td>
</tr>
<tr>
<td>Input R and C</td>
<td>1 MΩ, ~ 13 pf</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>400 V (dc + peak ac)</td>
</tr>
<tr>
<td>Math Functions</td>
<td>CH 1 + or – CH 2</td>
</tr>
<tr>
<td>Single Cursor</td>
<td>Vert. Acc. ± 1.2% of full scale, ± 0.5% of position value</td>
</tr>
<tr>
<td>Dual Cursor</td>
<td>Vert. Acc. ± 0.4% of full scale</td>
</tr>
</tbody>
</table>

**Vertical System (Agilent 54610B, 54615B, 54616B/C)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth Limit</td>
<td>~ 30 MHz</td>
</tr>
<tr>
<td>Inversion</td>
<td>CH 1 and CH 2</td>
</tr>
<tr>
<td>CMRR</td>
<td>~ 20 dB at 50 MHz</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>± 12 div from center screen</td>
</tr>
<tr>
<td>Input R and C</td>
<td>1 MΩ, ~ 9 pf or 50Ω selectable</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>250 V (dc + peak ac) or 5 Vrms in 50Ω mode</td>
</tr>
<tr>
<td>50Ω Protection</td>
<td>Protects 50Ω load from excessive voltage</td>
</tr>
<tr>
<td>Time Skew</td>
<td>Adjustable over a range of ±25ns to remove effects of cabling</td>
</tr>
<tr>
<td>Probe Sense</td>
<td>Automatic readout of 1X, 10X, 20X, 50X and 100X probes</td>
</tr>
<tr>
<td>Math Functions</td>
<td>CH 1 + or – CH 2</td>
</tr>
<tr>
<td>Single Cursor</td>
<td>Vert. Acc. ± 1.2% of full scale, ± 0.5% of position value</td>
</tr>
<tr>
<td>Dual Cursor</td>
<td>Vert. Acc. ± 0.4% of full scale</td>
</tr>
</tbody>
</table>

**Trigger System**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling</td>
<td>ac, dc, LF reject, HF reject, and noise reject. LF and HF: -3db at ~ 50 kHz</td>
</tr>
<tr>
<td>Modes</td>
<td>Auto, Autolevel, Normal, Single, and TV</td>
</tr>
<tr>
<td>54645A Glitch triggering</td>
<td>Minimum width 8 ns, Operators: &lt;, &gt;, or range</td>
</tr>
<tr>
<td>TV Triggering</td>
<td>TV line and field. 0.5 div of composite sync for stable display (Ch 1 and Ch 2)</td>
</tr>
<tr>
<td>TV Functions</td>
<td>Delay time calibrated in NTSC and PAL line numbers</td>
</tr>
<tr>
<td>All Field Trigger</td>
<td>Oscilloscope triggers on the vertical sync pulse in both fields, allowing use with noninterlaced video.</td>
</tr>
<tr>
<td>Holdoff</td>
<td>Adjustable from 200 ns to ~ 13 s</td>
</tr>
</tbody>
</table>

**External Trigger (54600B, 54603B, 54645A)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Sensitivity</td>
<td>±18V</td>
</tr>
<tr>
<td>dc to 25 MHz</td>
<td>&lt; 50mV</td>
</tr>
<tr>
<td>25 MHz to 100 MHz</td>
<td>&lt; 100mV</td>
</tr>
</tbody>
</table>

**External Trigger (54610B, 54615B, 54616B/C)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Sensitivity</td>
<td>±18V</td>
</tr>
<tr>
<td>dc to 100 MHz</td>
<td>&lt; 50mV</td>
</tr>
<tr>
<td>100 MHz to 500 MHz</td>
<td>&lt; 150mV</td>
</tr>
<tr>
<td>dc and ground</td>
<td></td>
</tr>
</tbody>
</table>

**Horizontal System**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cursor Accuracy</td>
<td>± 0.01% ± 0.2% of full scale ± 200 ps</td>
</tr>
<tr>
<td>Delay Jitter</td>
<td>10 ppm ppm (54615B, 54616B/C)</td>
</tr>
<tr>
<td>Pretrigger Delay</td>
<td>≥ 10 div</td>
</tr>
<tr>
<td>Posttrigger Delay</td>
<td>at least 2,560 div or 50 ms.</td>
</tr>
<tr>
<td>(Negative time)</td>
<td></td>
</tr>
<tr>
<td>Posttrigger Delay (Negative time)</td>
<td></td>
</tr>
<tr>
<td>(Trigger to start of sweep)</td>
<td>Not to exceed 100 s.</td>
</tr>
</tbody>
</table>

**Delayed Sweep**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Sweep</td>
<td>Delayed Sweep</td>
</tr>
<tr>
<td>5 s/div to 10 ms/div</td>
<td>up to 200X main</td>
</tr>
<tr>
<td>5 ms/div and faster</td>
<td>up to 2 ns/div</td>
</tr>
<tr>
<td>54610B, 15B/16B/16C</td>
<td>up to 1ns/div</td>
</tr>
</tbody>
</table>

**X-Y Operation**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-Blanking</td>
<td>TTL high blanks trace</td>
</tr>
<tr>
<td>(not available on 54615B, 54616B/C)</td>
<td></td>
</tr>
<tr>
<td>Bandwidth</td>
<td>X and Y same as vertical system</td>
</tr>
<tr>
<td>Phase Difference</td>
<td>± 3 degrees at 100 kHz</td>
</tr>
<tr>
<td></td>
<td>± 3 degrees at 10 MHz (54615B, 54616B/C)</td>
</tr>
</tbody>
</table>

[1] Temperature ± 10°C from calibration
[2] Use full scale at 80mV for 2mV/div and 5 mV/div ranges
[3] Use full scale of 50 ns for 2 ns/div
**Display System**

**Display**
- 7-inch Raster CRT

**Resolution**
- 255 vertical by 500 horizontal points

**Controls**
- Front-panel intensity control

**Graticule**
- 8 X 10 grid or frame

**Autostore**
- Autostore saves previous sweeps in half bright display and the most recent sweep in full bright display.

**Display (54616C)**
- 5.8 inch Active Matrix Color LCD Display

**Acquisition System**

**Simultaneous Channels**
- 54600B/54610B, 54615B, 54616B
- 54602B

**Record Length**
- 54615B, 54616B/C: 5,000 points
- 54645A: 5,000 points

**Max Update Rate**
- Vectors off: 1,500,000 points/sec
- Vectors on: 60 full screens/sec, independent of number of waveforms being displayed

**Usable Single-Shot**
- 2 MHz, single channel
- 500 MHz, dual channel

**Bandwidth**
- 54615B: 250 MHz
- 54616B/C: 500 MHz
- 54645A: 50 MHz

**Peak Detect**
- 54615B, 54616B/C: 50 ns glitch capture (100 ns dual channel) at sweep speeds of 50 µs/div and greater
- 54645A: 5 ns glitch capture

**Average**
- Number of averages selectable at 8, 64, 256

**Advanced Functions**

**Automatic Measurements**
- Measurements are continuously updated
  - Vavg, Vrms, Vpp, Vbase, Vmin, and Vmax
  - Frequency, Period, + Width, – Width, Duty Cycle, Rise Time, and Fall Time

** Cursors**
- Manually or automatically placed

**Setup Functions**
- Autoscale: Sets the vertical and horizontal deflection and the trigger level
- Save/Recall: 10 front-panel setups
- Trace Memory: Two volatile pixel memories

**General**

**Power Line Requirements**
- Line Voltage Range: 100 Vac to 240 Vac
- Line Voltage Selection: Automatic
- Line Frequency: 45 Hz to 440 Hz
- Max Power: 220 VA
- Consumption: 300 VA (54615B, 54616B/C)

**Environmental**
- The instrument meets the requirements of MIL-T-28800D for Type III, Class 3, Style D equipment as described below.

**Ambient Temperature**
- Operating: –10°C to +55°C
- Nonoperating: –51°C to +71°C

**Humidity**
- Operating: 95% RH at 40°C for 24 Hrs
- Nonoperating: 90% RH at 65°C for 24 Hrs

**Altitude**
- Operating: to 4,500 m (15,000 ft)
- Nonoperating: to 15,000 m (50,000 ft)

**EMI (Commercial)**
- Meets FTZ 1046 Class B

**EMI (MIL-T-28800D)**
- Meets requirements in accordance with Paragraph 3.8.3, EMI Type III, and MIL-STD-461C as modified by Table XII.

**CE01, CE03, CS01, CS02, CS06**
- Full limits

**RE01**
- 15 dB relaxation to 20 kHz; exceptioned from 20 kHz to 50 kHz

**RE02 (With Opt 002)**
- Full limits of class A1c and A1f
- (Without Opt 002): 10 dB relaxation from 14 kHz to 100 kHz

**RS02**
- Exceptioned

**RS03 (With Opt 001)**
- Slight trace shift from 80 MHz to 200 MHz

**Vibration**
- Operating: 15 minutes along each of the 3 major axes; 0.025 inch p-p displacement, 10 Hz to 55 Hz in one-minute cycles. Held for 10 minutes at 55 Hz (4 g at 55 Hz).

**Shock**
- Operating: 30 g, 1/2 sine, 11 ms duration, 3 shocks per axis along major axis. Total of 18 shocks

**Size (excluding handle)**
- Height: 172 mm (6.8 in)
- Width: 322 mm (12.7 in)
- Depth: 317 mm (12.5 in)

**Weight**
- 6.2 kg (14 lbs)

**Safety**
- CSA Certification, UL 1244 listed

**Warranty**
- 3 years

[1] Tested to Agilent Environmental Specification Section 758 for Class B-1 products
Optional Add-on Modules

**Agilent 54650A GPIB Interface Module**

*Description*
- Full GPIB remote control
- Direct printing to GPIB printers and plotters
- Converts scope’s 2 trace memories to non-volatile memory
- IEEE-488.2 compatible

*Printer Support*
- HP ThinkJet, HP QuietJet, HP PaintJet, HP LaserJet; HP-GL compatible plotters

**Agilent 54652B RS-232 Parallel Interface Module**

*Description*
- Full RS-232 remote control
- Direct printing to RS-232 and parallel printers
- Converts scope’s 2 trace memories to non-volatile memory

**RS-232 Specifications**
- **Connector Type**: 9 pin (m) DTE Port
- **Cable**: 34398A (provided)
- **Protocols**: X0n/Xoff, hardware
- **Data Bits**: 8
- **Parity**: None
- **Baud Rates**: 1200, 2400, 9600, 19200
- **Printer Support**: HP ThinkJet, HP QuietJet, HP PaintJet, HP LaserJet; HP-GL compatible plotters

**Parallel Specifications**
- **Connector Type**: 25 pin (f)
- **Cable**: C2950A
- **Printer Support**: Epson FX-80 or HP PCL compatible printers

**Agilent 54657A (GPIB) and 54659B (RS-232)**

Measurement Storage Modules

These modules incorporate the relevant GPIB or RS-232 control and printing capabilities specified above, as well as the following features.

**Waveform Math Functions**
- **Function 1**: Addition, subtraction, and multiplication
- **Function 2**: Differentiation, integration, and FFT
- **FFT Windows**: Exponential, flat top, Hanning and rectangular
- **Samples**: 1024 points

**Trace Memory**
- **Memories 1 – 3**: High speed storage without compression.
- **Memories 4 – 100**: Storage with compression. Storage time is approximately 7 seconds. Number of traces that can be stored is a function of complexity, with the minimum being 4 highly complex traces and the maximum being 96.

**Memory Labeling**: An onscreen text editor is provided for creating labels up to 20 characters. Each label contains the date and time it was saved.

**Real Time Clock**: 24-hour format with battery back-up. Can be set from front panel.

**Unattended Waveform Monitoring**
- **Testing Method**: Comparison to waveform mask.
- **Number of Masks**: 2
- **Mask Generation and Operation**: Automask, controlled from the front panel, generates mask from displayed waveform with selectable tolerance. Mask editor function allows pixel-by-pixel editing and line drawing. Smoothing function performs a running average of 3 pixels.
- **Action on Failure**: Save failed trace to memory with date and time of the failure
- **Print failed trace with date and time of the failure**
- **Count the failure and maintain pass/fail statistics while continuing the test**
### Probe Accessories

**10072A SMT Probe tips for 1007X probes**
This accessory kit contains 2 dual-lead adapters and 8 IC clips, so connecting to ICs and standard board headers is easy.

**5081-7705 BNC Adapter for 1007X probes**
This accessory clips on the end of the probe and allows the probe to mate with BNC (f) connectors.

**5081-7690 Replacement Accessory Kit for 1007X probes**
This kit contains replacement Hook Tip, IC Tip, Ground Bayonet, Ground Lead, Adjustment Tool, and Probe Identification Tags.

### Additional Measurement Accessories

**10100C**
50 Ω ± 1% Feedthrough Termination
BNC (f) to BNC (m), Frequency range dc-300 MHz, Max. VSWR 1.1:1

**11094B**
75 Ω ± 0.2% Feedthrough Termination
BNC (f) to BNC (m), maximum power 1 Watt

**E9637A**
Dual Banana (m) to BNC (f) Adapter

**10110B**
Dual Banana (m) to BNC (m) Adapter

### Additional Accessories

**10098A**
Front Panel Cover and Pouch Kit
This kit will add the Option 101 front panel cover and pouch to any 54600-series oscilloscope

**1183A**
Testmobile Scope
Cart for 54600-series scopes

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### Specifications for Agilent 54600-series Scope Probes

<table>
<thead>
<tr>
<th>Probe Model Number</th>
<th>Bandwidth</th>
<th>Division Ratio</th>
<th>Approx. Input R</th>
<th>Approx. Input C</th>
<th>Rise-time</th>
<th>Max input dc + peak ac</th>
<th>Scope Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>10070B</td>
<td>20 MHz</td>
<td>1:1</td>
<td>1.5m</td>
<td>1 MΩ</td>
<td>&lt;17.5 ns</td>
<td>400 V</td>
<td>54600 series</td>
</tr>
<tr>
<td>10071B</td>
<td>150 MHz</td>
<td>10:1</td>
<td>1.5m</td>
<td>10 MΩ</td>
<td>&lt;2.33 ns</td>
<td>500 V</td>
<td>54600/02/03/04B</td>
</tr>
<tr>
<td>10073B</td>
<td>500 MHz</td>
<td>1:1</td>
<td>1.5m</td>
<td>2.2 MΩ</td>
<td>&lt;0.7 ns</td>
<td>500 V</td>
<td>54610/15/16B</td>
</tr>
<tr>
<td>10074B</td>
<td>150 MHz</td>
<td>10:1</td>
<td>1.5m</td>
<td>10 MΩ</td>
<td>&lt;2.33 ns</td>
<td>500 V</td>
<td>54645A</td>
</tr>
<tr>
<td>10442B</td>
<td>1 GHz</td>
<td>10:1</td>
<td>2.0m</td>
<td>500 Ω</td>
<td>&lt;0.35 ns</td>
<td>10 V</td>
<td>scopes with 50 Ω inputs</td>
</tr>
</tbody>
</table>

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**Agilent BenchLink XL 54600 Software**

**PC Connectivity Made Easy**
Receive Agilent BenchLink XL 54600 software FREE with the purchase of any module listed above. Use it to retrieve waveform images, waveform data—even automatic measurements—directly into MicroSoft Excel and Word without programming. Additionally, an ActiveX control simplifies programming in Visual Basic, VBA, Visual C++, Agilent VEE, and National Instruments LabVIEW.
Ordering Information

Agilent 54600-Series Oscilloscopes
54600B Two-channel, 100 MHz Oscilloscope
54602B Four-channel, 150 MHz Oscilloscope
54603B Two-channel, 80 MHz Oscilloscope

Each of the above oscilloscopes comes with two 1.5 meter 10X probes, a user and service guide, and power cord.

54610B Two-channel, 500 MHz, 20 MSa/s Oscilloscope
54615B Two-channel, 500 MHz, 1 GSa/s Oscilloscope
54616B Two-channel, 500 MHz, 2 GSa/s Oscilloscope
54616C Color two-channel, 500 MHz, 2 GSa/s, Oscilloscope
54645A One-channel, 100 MHz, 200 MSa/s Oscilloscope
54645D Two-channel and 16 timing channel
100 MHz MSO Oscilloscope
Each of the above oscilloscopes comes with two 1.5 meter 10X probes, a user and service guide, and power cord.

Options
Opt. 001 RS-03 Magnetic interface shielding added to CR
Opt. 002 RE-02 Display shield added to CRT to reduce radiated interface
Opt. 005 Enhanced TV/video triggering (not 54600/03B/645D)
Opt. 090 Delete probes (for 54600/02/03B)
Opt. 090 Delete probes (for 54610B, 54615B, and 54616B/C)
Opt. 090 Delete probe (for 54645A)
Opt. 101 Accessory pouch and front panel cover (10098A)
Opt. 102 Two additional 10071B probes (54602B only)
Opt. 103 Operator training kit (includes training signal board and lab workbook)
Opt. 104 Carrying case (protects scope for shipping or baggage checking)
Opt. 106 HP BenchLink Scope software for Windows (HP 34810B)
Opt. 1CM Rack Mount Kit (P/N 5062-7345)
Opt. W50 Additional 2-year warranty (5-year total), starting at

Manual options (please specify one)
ABA US English AFB French ABJ Japanese
ABD German ABZ Italian AB1 Korean
ABE Spanish ABD Taiwan Chinese

Agilent 54650-series enhancement modules
(each includes HP BenchLink XL 54600 Software)
54650A GPIB interface module
54652B RS-232 and parallel interface module
(includes RS-232 cable)
54657A GPIB measurement/storage module
54659B RS-232 and parallel measurement/storage module
(includes RS-232 cable)
*E2657A GPIB Connectivity Kit
*E2658A RS-232 Connectivity Kit
* Kit includes Measurement Storage Module,
HP 34810B BenchLink Scope Software and cable

Additional oscilloscope accessories, probes and terminations
10070B 1:1 probe
10071B 10:1 probe
10072B SMT probing kit
10073B 10:1 500 MHz probe with readout
10074B 10:1 150 MHz probe with readout
10442B 1:1 Resistive divider probe for 50 Ω inputs.
10106C 50 Ω feedthrough termination
11094B 75 Ω ±2% Feedthrough Termination
BNC(f) to BNC (m)
5081-7690 100X probe accessory kit
5081-7705 100X probe-to-BNC (m) adapter
34397A Inverter, 12 Volt dc to 115 V ac

HP 34810-Series BenchLink Software
HP 34810B BenchLink Scope Software
Includes software on 3.5” disk, user’s guide (all languages).
GPIB or RS-232 module needed for connection to scope.

Agilent Technologies’ Test and Measurement
Support, Services, and Assistance
Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully.

Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent’s overall support policy: “Our Promise” and “Your Advantage.”

Our Promise
“Our Promise” means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage
“Your Advantage” means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

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