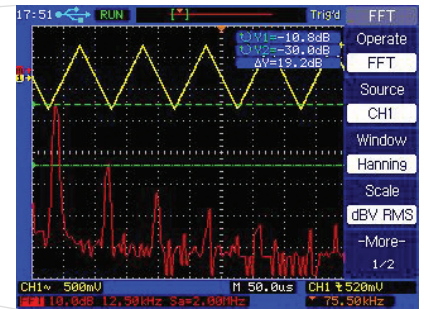


# Data sheet

## Digital Storage Oscilloscopes Models 2534, 2540 & 2542



FFT spectrum analysis screen

### FULL FEATURED OSCILLOSCOPES THAT WON'T BREAK YOUR BUDGET

Models 2534, 2540 & 2542 dual channel Digital Storage Oscilloscopes deliver an unmatched combination of performance and value. Analog style controls combined with an Auto measurement function make these oscilloscopes easy to use. Advanced features such as FFT function, digital filtering, waveform recorder, delayed sweep/zoom, mask testing and automatic measurements provide you with powerful tools to debug your circuits.

The oscilloscopes come with PC Software that lets you easily capture, save and analyze waveforms and measurement results. Unlike other DSOs in this price category, each model includes two 150 MHz high performance passive probes that will not limit the bandwidth of your measurement system.

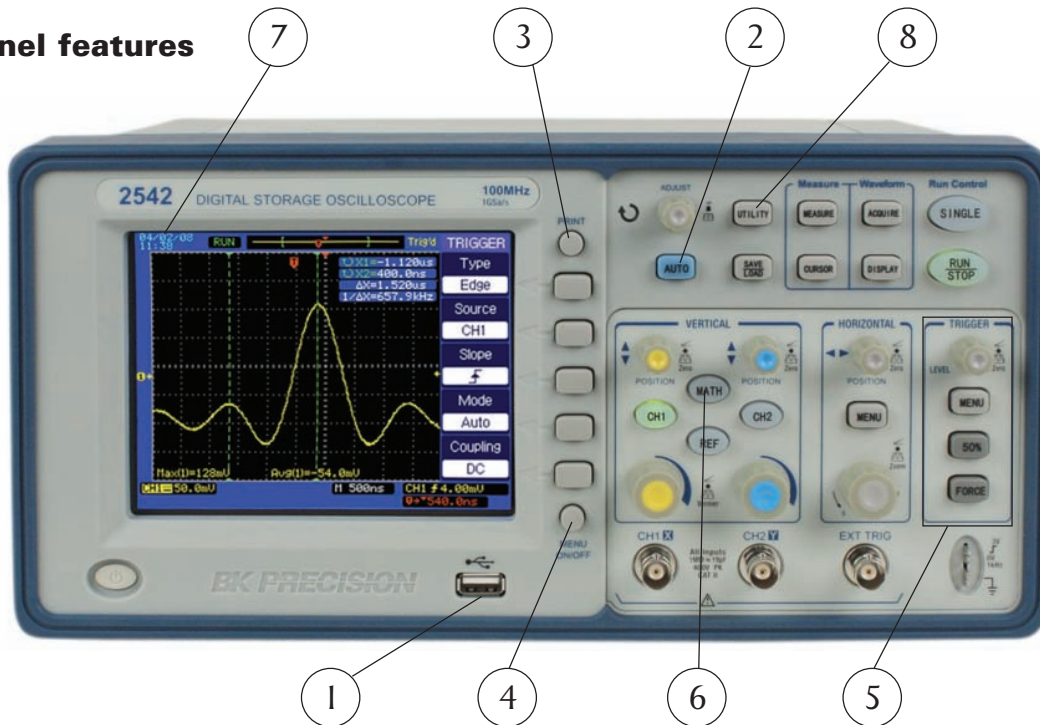
The 2534, 2540 & 2542 are ideal oscilloscopes for use in education and training, design and debug, service and repair.

| Model | Bandwidth | Sample Rate |
|-------|-----------|-------------|
| 2534  | 60 MHz    | 400 MSa/s   |
| 2540  | 60 MHz    | 1 GSa/s     |
| 2542  | 100 MHz   | 1 GSa/s     |

### Features

- 60 MHz & 100 MHz bandwidth, 1 GSa/s real time sample rate
- 4000 point record length for each channel
- Color LCD display
- USB front panel host port for USB flash drives standard
- USB device interface standard
- Advanced features include digital filter with adjustable limits, mask testing and waveform recorder/replay mode
- 24 automatic measurements
- FFT standard plus 3 additional math functions
- Extensive Trigger capabilities including pulse width and line-selectable video trigger
- Multiple language interface
- PC Software that lets you remotely control the oscilloscope and capture, save and analyze waveform data

▲ Front panel features



**1) USB host port**

Connect your USB flash drive to conveniently store and recall waveform data (binary or csv), setups and screen shots (bmp format). You can also update the oscilloscope's firmware from this port.

**2) Easy setup and use**

The Auto button identifies the input signal and automatically sets up the vertical, horizontal and trigger controls to produce a useable display.

You can automatically adjust the timebase to view the waveform as single cycle or multiple cycle.

**3) Print button**

Simply press the Print button to save a screen shot in bitmap format to a USB flash drive

**4) Menu On/Off button**

Configure the menu parameters and hide the menu with the push of a button to view your signal in full screen (12 divisions).

**5) Advanced triggering**

Isolate the signal with advanced triggering including pulse width and selectable video trigger. Use the alternate trigger function, typically only found in analog oscilloscopes, for a stable display of signals unrelated in time.

**6) Waveform analysis with math and FFT**

Analyze your signals with add, subtract and multiply functions. View the signal's frequency spectrum and perform harmonic distortion analysis.

**7) Time and date stamp**

Save files to external memory complete with time and date stamp to help you stay organized.

**8) Auto calibration**

Automatically calibrate the instrument's vertical and horizontal system for optimal measurement accuracy

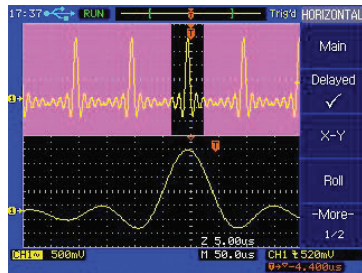
**Convenient Storage Compartment**



Store accessories in the oscilloscope's storage compartment and keep your work bench clutter free

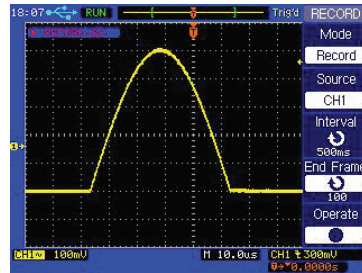
## ▲ The tools you need

### Delayed Sweep/Zoom



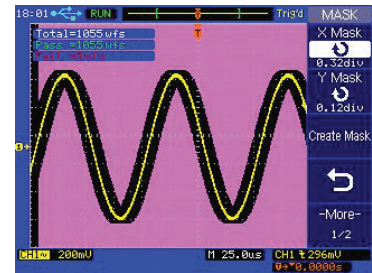
Use the oscilloscope's delayed sweep feature to zoom in on a particular area of a signal in real time while viewing the entire captured waveform simultaneously.

### Waveform Recorder



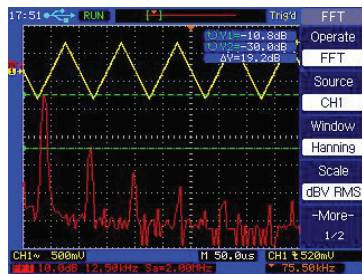
Monitor and analyze long term signal behavior by recording data continuously over an extensive period of time and playing it back for post acquisition analysis. Data is recorded in a sequence of up to 1000 frames of 4 k data points each and the time interval between each frame is adjustable from 1 ms – 100 s. The data can be saved in a single file to internal memory or USB flash drive.

### Mask testing



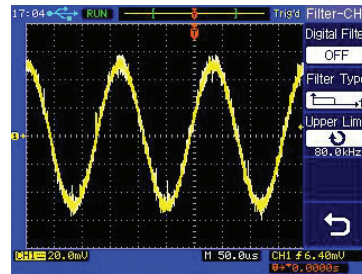
Create a user defined mask (pass/fail limits) and automatically compare it against the input signal from CH1 or CH2. This feature is ideal for manufacturing test applications that require instant go/no go test results.

### Powerful measurement functions

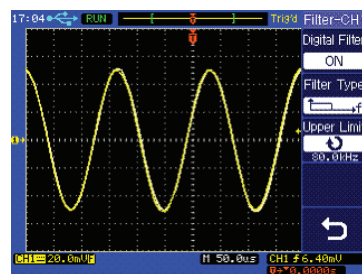


Display and measure the input signal's frequency spectrum. Select one of the 5 FFT windows: Rectangular, Hanning, Hamming, Blackman and Flattop. Use cursors to measure the spectral component's magnitude and frequency.

### Digital filtering



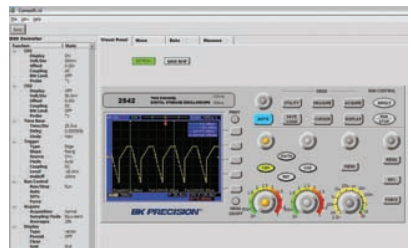
Noisy signal



Noise free signal after applying digital lowpass filter

Filter out unwanted signal components, such as various types of noise, with the built in digital filter. Select from lowpass, highpass, bandpass or notch filter. The limits are adjustable over a wide range. The available range varies with each timebase settings. (e.g. the lowpass filter corner frequency can be set as low as 40 Hz when selecting a timebase of 5 ms/div).

### PC connectivity and documentation

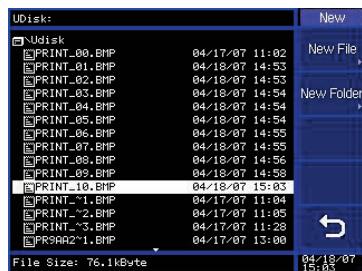


The included Comsoft PC software provides full access to the oscilloscope's display, measurements waveform data and front panel controls through the rear panel USB device port.

The software provides a seamless synchronization between the oscilloscope and PC, effortlessly allowing quick imports of captured waveform data and measurement results into Microsoft Excel for further analysis.

All oscilloscope parameters can be easily controlled via a PC without the need for programming. Front panel knobs can be emulated via a virtual panel. Alternatively, parameters can be selected from a menu.

### User friendly interface for file handling



Navigate your USB flash drive directory and files with ease. Store and retrieve waveform data, screen shots and setups complete with time and date stamp and user defined names.



| Specifications  | model   |          |          |
|---|---|----------|----------|
|   | 2534  | 2540     | 2542     |
| <b>Performance Characteristics</b>  |   |          |          |
| Bandwidth   | 60 MHz  | 60 MHz   | 100 MHz  |
| Real time sample rate<br>(2 channels interleaved)   | 400 MSa/s   | 1 GSa/s  |          |
| Channels  | 2   |          |          |
| Display   | 5.7 inch (145 mm) diagonal<br>Color LCD   |          |          |
| Rise Time   | <5.83 ns  | <5.83 ns | <3.50 ns |
| Record Length   | 4000 points   |          |          |
| Vertical Resolution   | 8 bits  |          |          |
| Vertical Sensitivity  | 2 mV - 5 V/div  |          |          |
| DC gain accuracy  | ± 3.0 %   |          |          |
| Maximum Input Voltage   | 400 Vpk, CAT II (between signal and reference<br>BNC connector)   |          |          |
| Position Range  | ± 8 divisions from center of screen   |          |          |
| Bandwidth Limit   | 20 MHz  |          |          |
| Time Base range   | 2.5 ns/div – 50 s/div (2534)<br>2 ns/div – 50 s/div (2540 & 2542)   |          |          |
| Timebase accuracy   | 100 ppm   |          |          |
| Input Coupling  | AC, DC, GND   |          |          |
| Input Impedance   | 1 MΩ in parallel with 19 pf   |          |          |
| Vertical and Horizontal Zoom  | Vertically or horizontally expand or compress a live<br>or stopped waveform   |          |          |
| I/O interface   | USB host port on front panel supports USB flash<br>drives. USB device port for connection to PC<br>(Requires included Comsoft Software for use) |          |          |
| <b>Acquisition Modes</b>  |   |          |          |
| Sample  | Display sample data only  |          |          |
| Peak Detect   |   |          |          |
| Average   | Waveform averaged, selectable from<br>2, 4, 16, 32, 64, 128, 256  |          |          |
| Roll Mode   | For time base settings 500 ms/div-50 s/div  |          |          |
| <b>Trigger System</b>   |   |          |          |
| Trigger Types   | Edge, Pulse Width, Video*   |          |          |
| Trigger Modes   | Auto, Normal, Single  |          |          |
| Trigger Coupling  | AC, DC, LF reject, HF reject  |          |          |
| Trigger Source  | CH1, CH2, AC line, Ext, Ext/S, Alternate  |          |          |
| *Support formats PAL/SECAM, NTSC. Triggers on odd or even field, all lines or line number |   |          |          |
| <b>Cursors</b>  |   |          |          |
| Types   | Amplitude, Time   |          |          |
| Measurements  | ΔV, ΔT, 1/ΔT  |          |          |

|  |   |
|--|---|
| <b>Automatic Waveform Measurement</b>  |   |
| Time   | Rise time, Fall Time, Cycle Frequency, Period, Positive Pulse Width, Negative Pulse width, Delay, Phase, X at Min, X at Max |
| Voltage  | MAX, MIN, Peak-Peak, Average, Vrms, High, Low, Amplitude, Cycle RMS, Cycle Average, Overshoot, Preshoot                     |
| Frequency  | Hardware counter provides frequency readout of trigger source with 5 digit resolution                                       |
| <b>Waveform Math</b>   |   |
| Math function  | FFT, add, subtract, multiply  |
| FFT  | Windows: Hanning, Hamming, Blackman, Rectangular, Flattop,<br>2048 sample points  |
| <b>Autoset</b>   |   |
|  | Single button automatic setup of both channels for vertical, horizontal and trigger systems                                 |
| <b>Display</b>   |   |
| Display Mode   | 1/4 VGA (5.7") 256 color LCD (320x240) with adjustable contrast and inverse video   |
| Display Types  | Point, Vector   |
| Persistence  | Off, infinite   |
| Waveform Interpolation   | Sin(x)/x, Linear  |
| Format   | YT and XY   |
| <b>Power Requirements</b>  |   |
|  | 100-240 VAC, 50 VAmx, 47 Hz to 440 Hz   |
| <b>Environmental</b>   |   |
| Temperature  | Operating: 0° C to +40° C<br>Nonoperating: -20° C to +55° C   |
| Humidity   | Operating: 95 % RH, 40° C<br>Nonoperating: 90 % RH, 55° C   |
| Altitude   | Operating to 3000 m   |
| Pollution Degree   | Pollution degree 2 for indoor use only.   |
| <b>Electromagnetic compatibility and Safety</b>  |   |
| EMC  | This oscilloscope is in compliance with council EMC directive 2004/108/EC   |
| Safety   | EN61010-1:2001  |
| <b>General</b>   |   |
| Dimensions   | 310 mm (W) x 147 mm (H) x 269 mm (D)  |
| Width x Height x Depth   | 12.2 in x 5.8 in x 10.6 in  |
| Weight   | 3.6 kg (8 lbs)  |
| <b>Two Year Warranty</b>   |   |
| Included Accessories: User manual, two 150 MHz 10:1 passive probes (model PR 37A), power cord, USB interface cable, Comsoft software installation disk, and certificate of calibration<br>Optional: PR 32A demodulator probe, PR 55 high voltage probe |   |