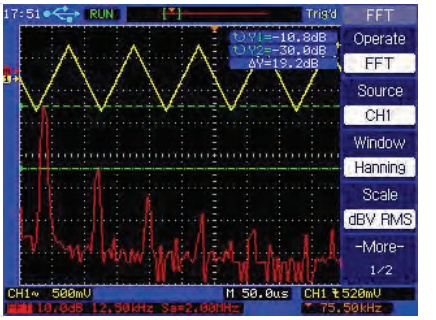
Data Sheet

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.

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

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

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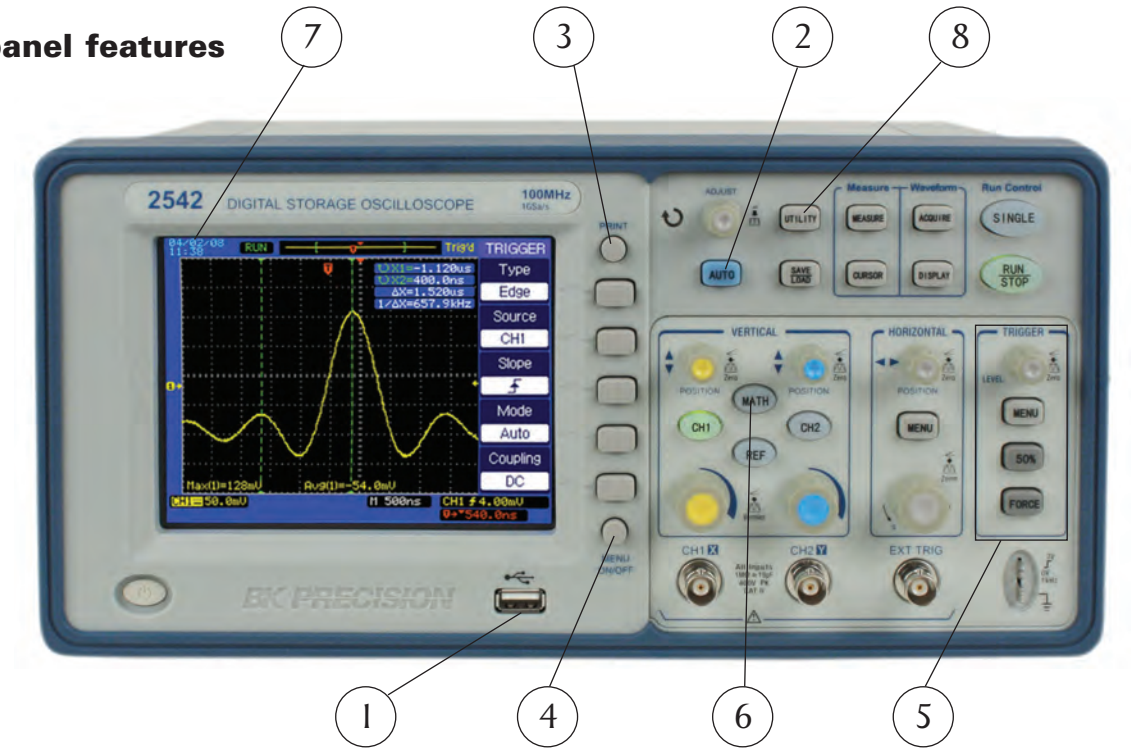
▲ Front panel features



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

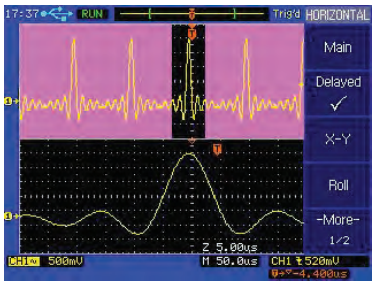
Automatically calibrate the instrument's vertical and horizontal system for optimal measurement accuracy

Convenient Storage Compartment

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

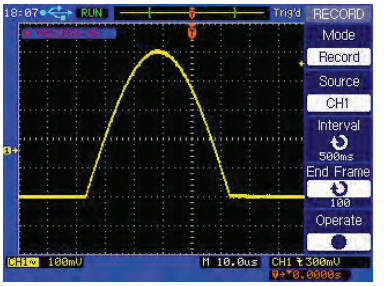
▲ The tools you need

Delayed Sweep/Zoom



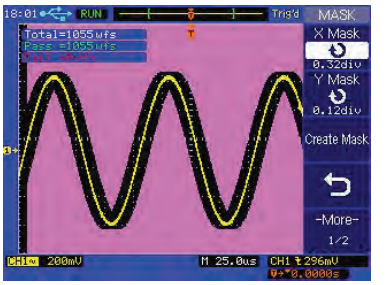
Use the oscilloscope's delayed sweep feature to zoom in on a particular area of a signal in real time while viewing the entire captured waveform simultaneously.

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

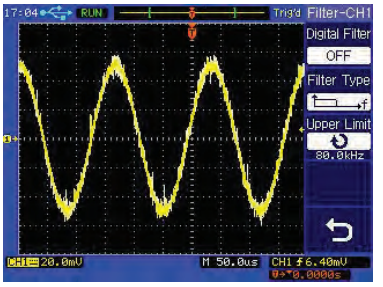


Create a user defined mask (pass/fail limits) and automatically compare it against the input signal from CH1 or CH2. This feature is ideal for manufacturing test applications that require instant go/no go test results.

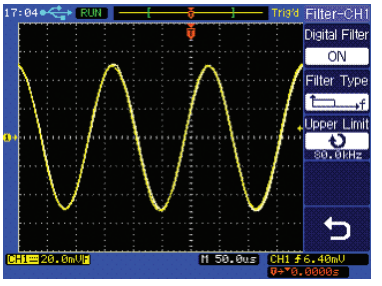
Powerful measurement functions

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).

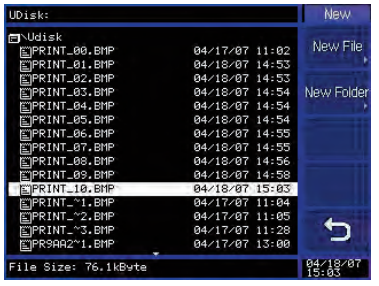
PC connectivity and documentation

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
Performance Characteristics			
Bandwidth	60 MHz	60 MHz	100 MHz
Real time sample rate (2 channels interleaved)	400 MSa/s	1 GSa/s	
Channels	2		
Display	5.7 inch (145 mm) diagonal 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 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) 2 ns/div – 50 s/div (2540 & 2542)		
Timebase accuracy	100 ppm		
Input Coupling	AC, DC, GND		
Input Impedance	1 MΩ in parallel with19 pf		
Vertical and Horizontal Zoom	Vertically or horizontally expand or compress a live or stopped waveform		
I/O interface	USB host port on front panel supports USB flash drives. USB device port for connection to PC (Requires included Comsoft Software for use)		
Acquisition Modes			
Sample	Display sample data only		
Peak Detect			
Average	Waveform averaged, selectable from 2, 4, 16, 32, 64, 128, 256		
Roll Mode	For time base settings 500 ms/div-50 s/div		
Trigger System			
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/5, Alternate		
Cursors			
Types	Amplitude, Time		
Measurements	ΔV, ΔT, 1/ΔT		

*Support formats PAL/SECAM, NTSC. Triggers on odd or even field, all lines or line number

Automatic Waveform Measurement	
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
Waveform Math	
Math function	FFT, add, subtract, multiply
FFT	Windows: Hanning, Hamming, Blackman, Rectangular, Flattop, 2048 sample points
Autoset	Single button automatic setup of both channels for vertical, horizontal and trigger systems
Display	
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
Power Requirements	100-240 VAC, 50 VAmax, 47 Hz to 440 Hz
Environmental	
Temperature	Operating: 0° C to +40° C Nonoperating: -20° C to +55° C
Humidity	Operating: 95 % RH, 40° C Nonoperating: 90 % RH, 55° C
Altitude	Operating to 3000 m
Pollution Degree	Pollution degree 2 for indoor use only.
Electromagnetic compatibility and Safety	
EMC	This oscilloscope is in compliance with council EMC directive 2004/108/EC
Safety	EN61010-1:2001
General	
Dimensions Width x Height x Depth	310 mm (W) x 147 mm (H) x 269 mm (D) 12.2 in x 5.8 in x 10.6 in
Weight	3.6 kg (8 lbs)

Three Year Warranty

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
Optional: PR 32A demodulator probe, PR 55 high voltage probe