

➤ **9344C Series, 9350C Series, 9354C Series**

Signal Capture

Acquisition System



Bandwidth (-3 dB):

- **9344C Series**
 - @ 50 Ω: DC to 500 MHz
 - 100 mV/div: 400 MHz
 - 50 mV/div and below: 350 MHz
 - @ 1 MΩ: DC to 500 MHz typical at tip of optional FET probe AP020
- **9350C/9354C Series:**
 - @ 50 Ω: DC to 500 MHz
 - 100 mV/div: 400 MHz
 - 50 mV/div and below: 350 MHz
 - @ 1 MΩ: DC to 500 MHz typical at tip of optional FET probe AP020

Number of Channels:

- **9344C/9354C Series:** four
- **9350C Series:** two

Number of Digitizers:

- **9344C/9354C Series:** four
- 9350C Series:** two

9344C Series					
CHANNELS USED (PEAK DETECT ON/OFF)	MAX SAMPLE RATE	MEMORY PER CHANNEL (IN POINTS) PER MODEL			ACTIVE CHANNELS
		C	CM	CL	
All (Peak Detect Off)	250 MS/s	50k	250k	2M	All
All (Peak Detect ON)	100 MS/s data	25k data	100k data	1M data	All
	200 MS/s peak	25k peak	100k peak	1M peak	
Two Channels Paired (Peak Detect OFF)	500 MS/s	100k	500k	4M	CH 2 and CH 3
Four Channels Combined (Peak Detect OFF)	1000 MS/s	250k	500k	4M	CH 2



Specifications

9350C/9354C Series						
CHANNELS USED (PEAK DETECT ON/OFF)	MAX SAMPLE RATE	MEMORY PER CHANNEL (IN POINTS) PER MODEL			ACTIVE CHANNELS	
		C	CM	CL		
All (Peak Detect OFF)	500 MS/s	50k	250k	2M	All	
All (Peak Detect ON)	100 MS/s data	25k data	100k data	1M data	All	
	400 MS/s peak	25k peak	100k peak	1M peak	2.5 ns peak detect	
Two Channels Paired (Peak Detect OFF)	1 GS/s	100k	500k	4M	9350C/M/L	9354C/M/L
					CH 1	CH 2 + CH 3
FOUR-CHANNEL MODELS ONLY						
Four Channels Combined by PP092 Adapter (Peak Detect OFF)	2 GS/s	250k	1M	8M	CH 2 (PP092 input)	
9354CTM						
All (Peak Detect OFF)	500 MS/s	500 000			All	
Two Channels Paired (Peak Detect OFF)	1 GS/s	1M			CH 2 and CH 3	
All Peak Detect ON	100 MS/s data	250k data			All	
	400 MS/s peak	250k peak			2.5 ns peak detect	
Four Channels Combined by PP092 Adapter (Peak Detect OFF)	2 GS/s	2M			CH 2 (PP092 input)	

Sensitivity: 2 mV/div to 5 V/div, fully variable

Scale Factors: Wide range of probe attenuation factors

Offset Range:

- 2.00–9.9 mV/div: ±120 mV
- 10.0–199 mV/div: ±1.2 V
- 0.2–5.0 V/div: ±24 V

DC Accuracy: typically 1%

Vertical Resolution: 8 bits

Bandwidth Limiter: 30 MHz

Input Coupling: AC, DC, GND

9344C Series, 9350C Series, 9354C Series



Input Impedance: 50 Ω \pm 1 % or 1 M Ω //15 pF (system capacitance using PP002)

Max. Input:

- 50 Ω : \pm 5 V DC (500 mW) or 5 V rms
- 1 M Ω : 250 V max (DC + peak AC \leq 10 kHz)

Acquisition Modes

Random Interleaved Sampling (RIS): For repetitive signals from 1 ns/div to 2 μ s/div

- **9344C Series, 9350CM/CL, 9354CM/CL/CTM:** For repetitive signals from 1 ns/div to 5 μ s/div

Single shot:

- **9344C Series:** For transient and repetitive signals from 20 ns/div (all channels active)
- **9350C, 9354C Series:** For transient and repetitive signals from 10 ns/div (all channels active)

Peak Detect:

- **9344C Series:** Captures and displays 5 ns glitches and other high-speed events
- **9350C, 9354C Series:** Captures and displays 2.5 ns glitches and other high-speed events

Sequence: Stores multiple events in segmented acquisition memories

Deadtime Between Segments: \approx 80 μ s

Number of Segments Available:

Model				Segments
9344C	9350C	9354C		2–200
9344CM	9350CM	9354CM	9354CTM	2–500
9344CL	9350CL	9354CL		2–2000

Timebase System

Timebases: Main and up to four Zoom Traces

Time/Div Range: 1 ns/div to 1000 s/div

Clock Accuracy: \approx 10 ppm

Interpolator resolution: 10 ps

Roll Mode:

- **9344C:** Ranges 500 ms–1000 s/div
- **9350C, 9354C Series:** Ranges 500 ms–1000 s/div; >50 000 points: 10–1000 s/div

External Clock: \approx 100 MHz on EXT input with ECL, TTL or zero crossing levels



Triggering System

Modes: Normal, Auto, Single, and Stop
Sources: CH1, CH2 (plus CH3 and CH4 on four-channel models), Line, Ext, Ext/10; Slope, Level and Coupling able to be set independently
Slope: Positive, Negative
Coupling: AC, DC, HF (up to 500 MHz), LFREJ, HFREJ
Pre-trigger Recording: 0–100 % of full scale adjustable in 1 % increments
Post-trigger Delay: 0–10 000 divisions adjustable in 0.1 div increments
Holdoff by Time: 10 ns–20 s
Holdoff by Events: 0–99 999 999 events
Internal Trigger Range: ± 5 div
EXT Trigger Max Input:
➤ 50 Ω ± 1 %: ± 5 V DC (500 mW) or 5 V rms
➤ 1 M Ω /15 pF: 250 V max. (DC + peak AC ≤ 10 kHz)
EXT Trigger Range: ± 0.5 V (± 5 V with Ext/10)
Trigger Timing: Trigger Date and Time listed in “Memory Status” menu



SMART Trigger Types

Signal or Pattern Width: Triggers on width between two limits of between 2.5 ns and 20 s
Signal or Pattern Interval: Triggers on interval between two limits of between 10 ns and 20 s
Dropout: Triggers if the input signal drops out for a time-out longer than 25 ns–20 s
State/Edge Qualified: Triggers on any source only if a given state or transition — number of events, time interval — on another source
TV: Selection of both line (up to 1500) and field number (up to 8) for PAL, SECAM, NTSC or nonstandard video
Exclusion Trigger: Triggers only on shorter-than-normal (defined) aberrations
Pattern Trigger:
➤ **Two-channel models:** Triggers on the logic combination of the three inputs CH 1, CH 2 and EXT Trigger, where each source can be defined as High, Low or Don't Know and the trigger as the pattern's beginning or end
➤ **Four-channel models:** Triggers on the logic combination of the five inputs CH 1, CH 2, CH 3, CH 4 and EXT Trigger,

9344C Series, 9350C Series, 9354C Series

where each source can be defined as High, Low or Don't Know and the trigger as the pattern's beginning or end

Autosetup

AUTOSETUP button: Sets timebase, trigger and sensitivity to display wide range of repetitive signals — amplitude 2 mV to 40 V; frequency above 50 Hz; duty cycle greater than 0.1%

Autosetup Time: Around two seconds

Vertical Find: Automatically sets sensitivity and offset



Probes

Probe Model: One PP002 probe supplied per channel, DC to 250 MHz typical at probe tip, 600 V max.; FET probes, purchased separately, fully compatible with entire scope series

Probe calibration: Max 1 V into 1 MΩ, 500 mV into 50 Ω, frequency and amplitude programmable, pulse or square wave able to be selected, rise and fall time 1 ns typical (calibrator also offers trigger or Pass/Fail output)

Signal Viewing

Display

CRT: 12.5 x 17.5 cm (9" diagonal) raster

Resolution: 810 x 696 points

Grids: 1, 2, or 4 grids.

Formats: YT, XY and both together

Graticules: Internally generated; separate intensity control for grids and waveforms

Waveform Style: Vectors, which can be switched on and off, connect individual sample points highlighted as dots

Modes: Normal, XY, Variable or Infinite Persistence

Real-time Clock: Date, hours, minutes, seconds

Vertical Zoom: Up to 5x Vertical Expansion (50x with averaging, up to 40 μV sensitivity, with optional WP01 Advanced Waveform Math Package)

Horizontal Zoom: Waveforms can be expanded to give 2–2.5 points/div



Model			Zoom Factor
9344C	9350C	9354C	2000x
9344CM	9350CM	9354CM	10 000x

9344C Series, 9350C Series, 9354C Series

9344CL	9350CL	9354CTM	50 000x
		9354CL	100 000x



Signal Analysis

Waveform Processing

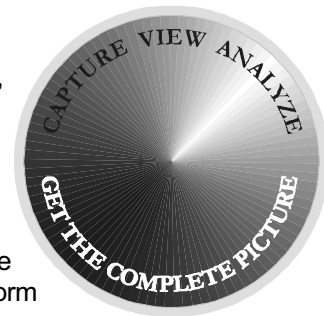
Processing functions: Add, Subtract, Multiply, Divide, Negate, Identity, Summation Averaging, and Sine x/x; four functions performable at one time **Average:** Summed averaging of up to 1000 waveforms in the basic instrument; up to 10^6 averages possible with optional WP01 Advanced Waveform Math Package

Extrema: Roof, Floor or Envelope values of from 1 to 10^6 waveforms with optional WP01 Advanced Waveform Math Package

ERES: Low-Pass digital filter provides up to 11 bits vertical resolution; sampled data always available, even when trace turned off; any of above modes usable without destroying data — with WP01 Option

FFT: Spectral Analysis with five windowing functions and FFT averaging, with optional WP02 Spectrum Analysis Package

Histogramming and Trending: With optional WP03 Parameter Analysis Package, in-depth diagnostics on waveform parameters



Internal Memory

Waveform Memory: Up to four 16-bit Memories (M1, M2, M3, M4)

Processing Memory: Up to four 16-bit Waveform Processing Memories (A, B, C, D)

Setup Memory: Four non-volatile memories; optional cards or disks for high-capacity waveform and setup storage

Cursor Measurements

Relative Time: Arrow cursors measure time and voltage differences relative to each other

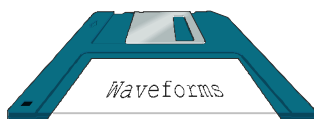
Relative Voltage: Horizontal bars measure voltage differences up to $\pm 0.2\%$ full-scale in single-grid mode

Absolute Time: Cross-hair marker measures time relative to trigger and voltage with respect to ground

Absolute Voltage: Reference bar measures voltage with respect to ground

9344C Series, 9350C Series, 9354C Series

Interfacing



Remote Control: By GPIB and RS-232-C for all front-panel controls, internal functions

RS-232-C Port: Asynchronous up to 115.2 Kb/s for computer or terminal control, or printer or plotter connection

GPIB Port: (IEEE-488.1) Configurable as talker/listener for computer control and fast data transfer; command language compliant with IEEE-488.2

Centronics Port: Hardcopy interface

PC Card (PCMCIA II/III Ports): Optional for memory cards, flash cards and removable hard disks

Floppy Disk: High density 3.5-inch floppy disk drive (DOS format)

Hardcopy: TIFF and BMP formats

available for import to Desktop

Publishing programs; printers and

plotters: HP DeskJet, HP ThinkJet,

QuietJet, LaserJet, PaintJet, and

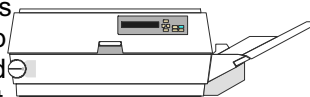
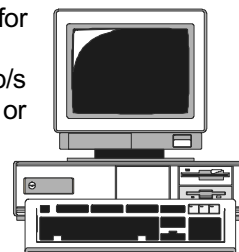
EPSON printers;

HP 7400 and 7500 series, or HPGL compatible plotters

➤ Optional internal, high-resolution graphics printer

Output Formats: Binary, or ASCII waveform output compatible

with spreadsheets, MATLAB, Mathcad



General

Auto-calibration: Ensures specified DC and timing accuracy

Temperature: 5 to 40 °C (41 to 104 °F) rated

Humidity: 80 % for temperatures up to 31 °C, decreasing linearly to 50 % relative humidity at 40 °C

Altitude: Up to 2000 m (6560 ft) operating, 40 °C max

Power: 90–250 V AC, 45–66 Hz, 230 W

Battery Backup: Front-panel settings maintained for two years

Dimensions: (HWD) 8.5 x 14.5 x 16.25 inches / 264 x 397 x 453 mm

Weight: 13 kg (28.6 lb.) net, 18.5 kg (40.7 lb.) shipping

Warranty: Three years

Conformity

EMC: EN 50082-1 conformity

Safety: Designed to comply with EN 61010-1; UL and cUL listed, File E 170588: Protection Category I, Installation (Over-Voltage) Category II, Pollution Degree 2

See Declaration of Conformity for further details.