

ANALOG OSCILLOSCOPES

100MHz Dual Trace Model S-1390
60MHz Dual Trace Model S-1360
Delayed Sweep & Dual Trace



S-1390 Shown

- 1mV/div sensitivity.
- Sweep to 2ns/div (S-1390), 10ns/div (S-1360).
- Component Tester (S-1360 only).
- Z axis input.
- Single sweep.
- Beam finder (S-1360).
- Dust cover included.
- 2 free x1, x10 probes.

SPECIFICATIONS

VERTICAL AMPLIFIERS (CH 1 and CH 2)

Sensitivity: 1mV/div - 5V/div.
Attenuator: 10 cal. steps in 1-2-5 sequence, plus vernier.
Accuracy: $\pm 3\%$, 5mV to 5V/div; $\pm 5\%$, 1mV, 2mV/div.
Input Impedance: 1M Ω $\pm 2\%$, 25pF $\pm 10\text{pF}$.
Rise Time: 5.8ns or less.
Operating Modes: CH 1, CH 2, DUAL (ALT/CHOP, ADD).
Chop Frequency: Approximately 500kHz.
Polarity Reversal: CH 2 only.
Max. Input Voltage: 400V (DC + AC peak).
Over Shoot: 5% or less.
SWEEP SYSTEM
Operating Modes: Main, Mix (main sweep: delayed sweep), Delay (only delayed sweep), X-Y.
S-1390 Main Time Base: 0.2 μs /div to 0.5s/div in 1-2-5 sequence, 23 steps plus variable vernier control.
S-1360 Main Time Base: 0.1 μs /div to 0.25s/div in 1-2-5 sequence, 20 steps plus variable vernier control.

Delayed Time Base: Same as main.

Accuracy: $\pm 3\%$. **Sweep Magnification:** x10 $\pm 5\%$.

Linearity: (Center 8 divisions): $\pm 3\%$.

Holdoff: Con. adjustable from NORM to 5x.

TRIGGERING

Trigger Modes: AUTO, NORM, SINGLE.

Source: CH 1, CH 2, ALT (V MODE), EXT, LINE.

TRIGGER SENSITIVITY

COUPLING	BANDWIDTH	INT	EXT
TV-V (DC)	DC - 1kHz	1.0 div	0.1Vpp
TV-H	1kHz - 100kHz	1.0 div	0.1Vpp
AUTO	100Hz - 100MHz (S-1390)	2.0 div	0.1Vpp
NORM	100Hz - 25MHz (S-1390)	2.0 div	0.1Vpp

HORIZONTAL AMPLIFIER (input through CH 2 input)

X-Y Mode: CH 1: Y axis. CH 2: X axis.

Sensitivity: Same as vertical channel 2.

Accuracy: $\pm 3\%$, Y axis; $\pm 5\%$ X axis.

Input Impedance: Same as vertical channel 2.

X-Y Phase Difference: 3° or less at 50kHz.

Maximum Input Voltage: Same as vertical channel 2.

CH 1 Output: 50mV/div (nominal, 50 Ω load), 100mV (no load)

Output Impedance: Approximately 50 Ω .

Frequency Response: 20Hz to 20MHz, -3dB, 50 Ω .

CRT

Display Area: 8 x 10 div (1 div = 1cm).

Accelerating Voltage: 2kV (S-1360), 14kV (S-1390)

Scale Illumination: Continuously variable.

Trace Rotation: Electrical, front panel adjustable.

COMPONENT TESTER

Test Voltage: 6V rms max (open).

Test Current: 11mA max (shorted).

Test Frequency: Line frequency (60Hz in USA).

OTHER SPECIFICATIONS

Probe Calibration: 0.5Vpp $\pm 3\%$, 1kHz square wave.

Z Modulation: Positive TTL signal, low level blank intensity, high level unblank any intensity.

Environment: Within Specified Accuracy: +10° to +35°C, 85% maximum relative humidity.

Full Operation: 0° to +40°C, 85% max. relative humidity.

Storage: -20° to +70°C.

Power Requirements: 120V/220V $\pm 10\%$, 50/60Hz.

Dimensions: 13" (W) x 16" (D) x 5.3" (H)
(324 x 132 x 398)

Net Weight: S-1390: 8.5kg (18.7 lbs.)

S-1360: 7.8kg (17.2 lbs.)

ACCESSORIES SUPPLIED:

Two x1, x10 probes, instruction manual, AC power cord.

STORAGE OSCILLOSCOPES



DS-303 Shown

20MHz, 10MS/s Model DS-203
30MHz, 20MS/s Model DS-303
60MHz, 20MS/s Model DS-603
 Digital Storage / Analog Oscilloscopes



2-Channel, 2K Memory Per Channel
1mV Sensitivity, Internally Backed-up
Memory (DS-603 & DS-303)
RS-232 Output (DS-603 & DS-303), and
much more

FREE DUST COVER & PROBES

SPECIFICATIONS

VERTICAL AXIS

Sensitivity: 5mV-5V/Div $\pm 3\%$
Magnification: 10 Steps in 1-2-5 seq w/ variable control
Bandwidth: DC: DC to 60MHz (30MHz DS-303) within -3dB
 AC: 10Hz to 60MHz (30MHz DS-303) within -3dB
Rise Time: 6ns or less DS-603
 12ns or less DS-303 (18ns or less DS-203)
Overshoot: 3% or less (DS-303)
Input Impedance: 1M Ω shunted by 25pF $\pm 10\text{pF}$
Max. Input Voltage: 400V (DC + AC Peak)
Operation Mode: CH1, CH2, Dual (ALT or CHOP) and ADD
Chop Frequency: Approximately 500kHz
Polarity Selection: Possible only in CH2
Sweep Time: .1 μs to .5s/div

HORIZONTAL AXIS

(normal): 21 steps in 1-2-5 seq. w/ variable control
Magnification: x10 to 10ns/div
Linearity: Less than 3%
Accuracy: $\pm 3\%$
Hold off time: Variable up to 5 times sweep
Trigger Signal Source: CH-1, CH2, Alt, Line, Ext

TRIGGER

Trigger Sensitivity Auto:

30Hz to 60MHz: 1.5 div (INT); $\geq 0.5\text{Vpp}$ (EXT) (DS-603)
 30Hz to 40MHz: 1.5 div (INT); $\geq 0.5\text{Vpp}$ (EXT) (DS-303)

1000Hz to 30MHz: 1.5 div (INT); $\geq 0.5\text{Vpp}$ (EXT) (DS-203)

(norm): DC - 30MHz: 1.5 div (INT); $\geq 1\text{Vpp}$ (EXT)

(TV-V): 20Hz - 1kHz: .5 div (INT); $\geq 0.05\text{Vpp}$ (EXT)

(TV-H): 1kHz-100kHz: .5 div (INT); $\geq 0.05\text{Vpp}$ (EXT)

Coupling: Auto, Norm, TV-V, TV-H

Sensitivity: X-Axis: same as CH2, Y-axis: same as CH1

X - Y OPERATION

X-axis Bandwidth: DC to 2MHz (at -3dB)

Phase Shift: Less than 3° at DC to approximately 50kHz

Memory: 2K words per channel (internally backed up DS-603 & DS-303 only)

DIGITAL STORAGE FACILITIES

Maximum Sampling Rate: 20M samples/sec

Vertical Resolution: 8-bit (25 levels/div)

Horizontal Resolution: 2,048 points for 10 div

Operating Mode: Roll, Save, All, Save CH2, X-Y, Single
 Pre-trig (0%, 25%, 50%, 75%) RS-232
Frequency Response: DC-60MHz (-3dB) (DS-603)
 DC-30MHz (-3dB) (DS-303)
 DC-20MHz (-3dB) (DS-203)
Output: RS-232: 4800, no parity, 8-bit, 1 stop bit
Plot: Epson (24-pin) Compatible printer
Calibration Signal: 0.5Vpp $\pm 3\%$ 1kHz square wave

GENERAL

CRT: 6 inch screen with lighted internal graticule (DS-603 & DS-303 only); P31 phosphor: 8 x 10 divisions; 12V-V (DS-603)

Acceleration Potential: Approximately 2.1kV (DS-303)

Approximately 2kV (DS-203)

Power Requirements: 90-137VAC or 198-264VAC

50/60Hz, 60W consumption

Dimensions: 12.8" W x 5.2" H x 15.6" D

Weight: 19 lbs. (DS-603 & DS-303); 22 lbs. (DS-203)

Standard Accessories: Operation manual, power cord, spare fuse, 2 switchable x1, x10 probes