

Specifications

1-1 GENERAL

The SS-5710 is an oscilloscope with a frequency bandwidth of DC to 60 MHz that can display 8 traces on 4 channels. The SS-5710 is useful in a wide range of applications for not only production lines and maintenance and service purposes but also for the research and development of a variety of electronic devices. The features of the SS-5710 are as follows:

- In addition to display of 8 traces on 4 channels, the SS-5710 has an ADD function for measuring the sum of two signals and CH 2 POLAR for measurement of the difference between two signals.
 - Both CH 1 and CH 2 have a high deflection factor of 1 mV/div (in the x5 MAG function), which permits accurate measurement of lower voltages.
 - The horizontal deflection system has sweep rates up to 5 nS/div (in the x10 MAG function) so that even high-speed phenomena can be measured with accuracy.
- The SS-5710 has delayed sweep, single sweep, ALT sweep, and X-Y operation functions, and a TV synchronizing signal separator circuit so that television and other composite video signal waveforms can be observed.

1-2 ELECTRICAL SPECIFICATIONS

1-2-1 Cathode-Ray Tube (CRT)

Shape	Rectangular, 6 inches
Display Area	8 div x10 div (1 div = 10 mm), with internal illuminated graticule of parallax-free type
Phosphor	B31 (Standard)
Accelerating Voltage	Approximately 15 kV

1-2-2 Vertical Deflection System

Modes	CH 1, CH 2, ALT, CHOP, ADD, QUAD (Quadruple) CHOP switching rate: 300 kHz $\pm 40\%$
Channels 1 and 2	
Deflection Factor	5 mV/div to 10 V/div, in 11 calibrated steps in a 1-2-5 sequence Accuracy: $\pm 2\%$ (at 10° C to 35° C) $\pm 5\%$ (at -10° C to 50° C) 5 mV/div to 25 V/div, continuously variable with the VARIABLE control x5 MAG: 1 mV/div to 2 V/div in 11 calibrated steps Accuracy: $\pm 4\%$ (at 10° C to 35° C) $\pm 8\%$ (at -10° C to +50° C)
Frequency Response	DC to 60 MHz, -3 dB (5 mV/div to 0.2 V/div) DC to 20 MHz, -3 dB (1 mV/div, 2 mV/div in the x5 MAG mode) Notes • 10° C to 35° C • AC coupling: The lowest useable frequency is 4 Hz.
Rise Time	5.8 nsec (calculated) at 5 mV/div [Note] Rise time calculated from bandwidth x rise time = 0.35

Pulse Response	Overshoot: 5% or less Sag (at 1 kHz): 1.5% or less Other distortions: 5% or less (5 mV/div, 10° C to 35° C)
Signal Delay	Delay cable supplied
Input Coupling	AC, DC, GND
Input RC	Direct: 1 M Ω \pm 2%/32pF \pm 3pF With probe: 10 M Ω \pm 2%/15pF \pm 2pF

Maximum Input Voltage

Direct:
400 V (DC +peak AC)
With probe:
600 V (DC +peak AC)
(Refer to the instruction manual for the probe for the maximum input voltage where probe is used.)

Drift
0.5 div/hour (5 mV/div) or
2 div/hour (1 mV/div)
30 minutes after power is turned on (Standard)

Common Mode Rejection Ratio

5 mV/div
40 : 1 (1 kHz sine wave)
15 : 1 (5 MHz sine wave)

Polarity Inversion

CH 2 only

Channels 3 and 4

Deflection Factor 0.1 V/div, 1 V/div, selectable
Accuracy: \pm 4%
(at 10 °C to 35 °C)

Frequency Response DC to 50 MHz, -3 dB
Notes
• 10 °C to 35 °C
• AC coupling: The lowest usable frequency is 4 Hz.

Pulse Response Overshoot: 10%
Sag (at 1 kHz): 2%
Other Distortions: 10%

Input Coupling	AC, DC
Input RC	Direct: 1 M Ω \pm 3%/32 pF \pm 3 pF With probe: 10 M Ω \pm 2%/15 pF \pm 2 pF
Maximum Input Voltage	Direct: 250 V (DC +peak AC) With probe: 600V (DC +peak AC)

1-2-3 Triggering**A-Triggering**

Triggering Mode	AUTO, NORM, SINGLE/RESET
Signal Source	CH 1, CH 2, CH 3, LINE, NORM (External trigger can be used by selecting CH 3 with SOURCE switch.)
Coupling	AC, DC, HF REJ, LF REJ, FIX, TV-H, TV-V
Slope	Positive-going (+), Negative-going (-)
Minimum Trigger Sensitivity	As shown in Table 1-1

Table 1-1

(at 10 °C to 35 °C)

Frequency Range	Sensitivity	
	CH 1, CH 2	CH 3, CH 4
DC to 1 kHz	1 div	1.5 div
1 kHz to 2 MHz	0.5 div	1 div
2 MHz to 20 MHz	1 div	1.5 div
20 MHz to 60 MHz	1.5 div	2 div

Note

- Fix: 1 div at 10 Hz to 2 MHz
2 div at 2 MHz to 30 MHz
Sine wave only
- TV-V, TV-H synchronizing signal level: 2.3 div or more on screen amplitude for a composite video signal

	composed of 7 parts video signal and 3 parts synchronizing signal		$\pm 4\%$ at 10 msec/div to 0.5 sec/div (at 10°C to 35°C) $\pm 5\%$ (at -10°C to +50°C)
	• Trigger signals are attenuated in the following frequency ranges depending on coupling AC: 10 Hz or less HF REJ: 10 kHz or higher LF REF: 10 kHz or lower	Hold-Off Time	Accuracy II (Over any 2 of the center 8 divisions): $\pm 5\%$ (at -10°C to +50°C) Variable with the HOLDOFF control
	• AUTO sweep mode: The lowest useable frequency is 50 Hz.		
B-Triggering		B-Sweep	
Signal Sources	RUNS AFTER DELAY, CH 1, CH 2, CH 4 (External trigger can be used by selecting CH 4 with SOURCE switch.)	Delay	Continuous delay (RUNS AFTER DELAY), triggered delay
Coupling	AC, DC, HF REJ, TV-H	Sweep Rates	50 nsec/div to 50 nsec/div, in 19 calibrated steps in a 1-2-5 sequence Accuracy I (Over center 8 divisions): $\pm 3\%$ (at 10°C to 35°C) $\pm 5\%$ (at -10°C to +50°C) Accuracy II (Over 2 of the center 8 divisions): $\pm 5\%$ (at -10°C to +50°C)
Slope	Positive-going (+), negative-going (-)		
Minimum Trigger Sensitivity	As shown in Table 1-1 However, Sensitivity of 20 MHz to 60 MHz is 2 div at CH 1, CH 2.	Time Difference Measurement	0.5 μ sec to 5 sec Accuracy: $\pm 2\%$ of reading ± 0.01 graduation (Minimum graduation of DELAY TIME MULT dial)
1-2-4 Horizontal Deflection System		Delay Jitter	1/20,000 or less
Modes	A, A INTEN, ALT, B (DLT'D), X-Y	Sweep Magnification	10 times (Maximum sweep rate: 5 nsec/div) Accuracy I of magnified sweep rate (Over center 8 divisions) $\pm 5\%$ at 50 nsec/div to 0.1 μ sec/div $\pm 4\%$ of 0.2 μ sec/div to 0.5 sec/div (at 10°C to 35°C) Accuracy II of magnified sweep rate (Over any 2 of the center 8 divisions): $\pm 10\%$ at 50 nsec/div to 0.1 μ sec/div
A-Sweep			
Sweep Rates	50 nsec/div to 0.5 sec/div, in 22 calibrated steps in a 1-2-5 sequence 50 nsec/div to 1.25 sec/div, continuously variable with the VARIABLE control Accuracy I (Over center 8 divisions): $\pm 3\%$ at 50 nsec/div to 5 msec/div		

$\pm 6\%$ at 0.2 μ sec/div to 0.5 sec/div (at 10° C to 35° C)
(Except 25 nsec before and after sweep)

Output Current

10 mA

Accuracy: $\pm 2\%$

(at 10° C to 35° C)

 $\pm 3\%$

(at -10° C to 50° C)

1-2-5 X-Y Operation**X Axis**

(Same as CH 1 except for the following)

Deflection Factor

Same as that of CH 1

Accuracy: $\pm 5\%$

(at 10° C to 35° C)

 $\pm 6\%$

(at -10° C to +50° C)

Frequency Response

DC to 2 MHz, -3 dB

Y Axis

same as CH 2

X-Y Phase Difference

3° or less (at DC to 50 kHz)

1-2-8 Power Supply

Voltage Range

100V (90 to 110 V)/

115V (103 to 128 V)/

220V (195 to 242 V)/

230, 240V(207 to 264 V)/

AC

One of these voltage ranges can be selected with voltage selector plug

Frequency Range

50 to 440 Hz

Power Consumption

Approximately 50 W
(at 100 VAC)

1-2-6 Z-Axis System

Sensitivity

0.5 Vp-p

Polarity

Positive decreases intensity,
negative increases intensity

Frequency Range

DC to 3 MHz

Input Resistance

5 k $\Omega \pm 10\%$

Maximum Input Voltage

50 V (DC +peak AC)

1-3 PHYSICAL CHARACTERISTICS

Weight

Approximately 8.5 kg
(without panel cover and accessories bag)

Dimensions

320 ± 2 (W) x 160 ± 2 (H)
x 400 ± 2 (L) (mm)
See Figure 1-1.

1-2-7 Calibrator

Waveform

Square wave

Repetition Frequency

1 kHz

Accuracy: $\pm 30\%$

(at 10° C to 35° C)

Duty Ratio

40% to 60%

Output Voltage

0.3 V

Accuracy: $\pm 1\%$

(at 10° C to 35° C)

 $\pm 2\%$

(at -10° C to +50° C)

1-4 ENVIRONMENTAL CHARACTERISTICS

Operating Temperature -10° C to -50° C

Operating Humidity 40° C, 90% Relative Humidity

Storage Temperature -20° C to 70° C

Storage Humidity 70° C, 80% Relative Humidity

Altitude	Operating: 5,000 m maximum (atmospheric pressure 405 hPa) Non-operating: 15,000 m maximum (atmospheric pressure 90.4 hPa)
Vibration	From 10 Hz to 55 Hz and back in 1 minute; double amplitude 0.63 mm; for 15 minutes each in vertical, horizontal, and longitudinal directions for a total of 45 minute
Impact	One side is raised to an elevation angle of 45° (10 cm maximum), and let fall on a piece of hard wood. Each side is put to this test 3 times.
Drop	A package ready for transportation is dropped from a height of 90 cm.

1-5 ACCESSORIES

Power cord	1
Probe (SS-064)	2
Fuse (FSA-1)	2
Panel cover	1
Dust cover	1
Instruction Manual	1
Accessories bag	1

Figure 1-1. Dimensional Diagram

