Section 1

Specifications

1-1 GENERAL

The SS-5711 is an oscilloscope with a frequency bandwidth of DC to 100 MHz that can display 8 traces on 4 channels.

The SS-5711 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-5711 are as follows:

- In addition to display of 8 traces on 4 channels, the SS-5711 has an ADD function for measuring the sum of two signals and CH 2 POLAR for measurement of the differnce 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 voltages.
- The horizontal deflection system has sweep rates up to 2 nsec/div (in the x10 MAG function)so that even high-speed phenomena can be measured with accuracy.
- The SS-5711 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 x 10 div (1 div = 10 mm), with internal illuminated graticule of parallax-free type
Phosphor	B31 (Standard)
Accelerating Voltage	Approximately 20 kV

1-2-2 Vertical Deflection System

Modes	CH 1, CH 2, ALT, CHOP, ADD, QUAD (Quadruple) CHOP switching rate: 500 kHz ± 40%
Channels 1 and 2	
Deflection Factor	5 mV/div to 5 V/div, in 10 calibrated steps in a 1-2-5 sequence Accuracy: ±2% (at 10°C to 35°C) ±5% (at −10° C to +50° C) 5 mV/div to 12.5 V/div continously variable with the VARIABLE control x5 MAG: 1 mV/div to 1 V/div, in 10 calibrated steps Accuracy: ±4% (at 10°C to 35°C) ±8% (at −10 °C to +50° C)
Frequency Response	DC to 100 MHz, −3 dB (5 mV/div to 2 V/div) DC to 50 MHz, −3 dB (1 mV/div, 2 mV/div; x5 MAG) DC to 100 MHz, −3.5 dB (5 V/div) Notes • 10°C to 35° C • Bandwidth : The highest usable frequency is 20 MHz. • AC coupling: The lowest usable frequency is 4 Hz.
Rise Time	3.5 nsec (at 10 mV/div) or less

Pulse Response	Overshoot:	3%
	Sag (at 1 kHz):	1%
	Other distortion:	2%
	(10 mV/div, 10°C to 35°C)	
Signal Delay	Delay cable supplied	
Input Coupling	AC, DC, GND	
Input RC	Direct	
	1 MΩ±1.5%//25 pF± 2 pF	
	With probe	
	10 MΩ±2%//14pF ±2 pF	

Maximum Input Voltage

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

Drift: 0.1 div/hour or 2 mV/hour, whichever is larger, 30 minutes after power is turned on (Standard)

Common Mode Rejection Ratio

At 10 mV/div
50 : 1 (1 kHz sine wave)
15 :1 (20 MHz sine wave)

Polarity Inversion: CH 2 only

Channels 3 and 4

Deflection Factor	0.1 V/div, 1V/div, selectable
	Accuracy: ±4% (at 10°C to 35°C)
	±8% (at −10°C to +50°C)
Frequency Response	DC to 100 MHz −3 dB (0.1 V/div)
	DC to 100 MHz −3.5 dB (1V/div)

Notes
- 10°C to 35°C
- Bandwidth: The highest usable frequency is 20 MHz.

AC coupling: The lowest usable frequency is 4 Hz.

Pulse Response: As shown in table 1-1.

Table 1-1 (at 10°C to 35°C)

Waveform Distortion	0.1 V/div	1 V/div
Overshoot	7%	10%
Sag (at 1 kHz)	2%	2%
Other distortion	5%	5%

Input Coupling	AC, DC
Input RC	Direct:
	1 MΩ±1.5%//27 pF±3 pF
	With probe
	10 MΩ±2%//14 pF±2pF

Maximum Input Voltage

Direct:
250 V (DC +peak AC)
With probe:
600 V (DC +peak AC)

1-2-3 Triggering

A-Triggering

Triggering Mode	AUTO, NORM SINGLE/ RESET
Signal Sources	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 1-2

Table 1-2 (at −10° C to 35° C)

Frequency	Sensitivity of CH 1, CH 2, CH 3, CH 4
DC to 10 MHz	0.3 div
10 MHz to 50 MHz	1 div
50 MHz to 100 MHz	1.5 div

Notes
- FIX:
1 div at 100 Hz to 10 MHz
2 div at 10 MHz to 50 MHz
Sine waves only
- TV-V, TV-H synchronizing signal level: 1 div or more on screen amplitude for a composite video signal composed of 7 parts video signal and 3 parts synchronizing signal
- Trigger signals are attenuated in the following frequency ranges depending on coupling
AC: 30 Hz or lower
HF REJ: 10 kHz or higher
LF REJ: 10 kHz or lower
- AUTO sweep mode: The lowest usable frequency is 50 Hz)

B-Triggering

Signal Sources	RUNS AFTER DELAY, CH 1, CH 2, CH 4 (External trigger can be used by selecting CH 4 with SOURCE switch.)
Coupling	AC, DC, HF REJ, FIX (AC)
Slope	Positive-going (+), negative-going (−)

Minimum Trigger Sensitivity

As shown in table 1-2

1-2-4 Horizontal Deflection System

Modes	A, A INTEN, ALT, B (DLY'D), X-Y

A-Sweep

Sweep Rates	20 nsec/div to 0.5 sec/div in 23 calibrated steps in a 1-2-5 sequence 20 nsec/div to 1.25 sec/div , countinuously variable with the VARIABLE control
	Accuracy I (Over center 8 divisions): ± 2% (at 10° C to 35° C) ± 4% (at −10° C to +50° C)
	Accuracy II (Over 2 of the center 8 divisions): ± 5% (at −10° C to +50° C)
Hold-Off Time	Variable with the HOLD OFF control

B-Sweep

Delay	Continuous delay (RUNS AFTER DELAY,) triggered delay
Sweep Rates	20 nsec/div to 50 msec/div, in 20 calibrated steps in a 1-2-5 sequence
	Accuracy I (Over center 8 divisions): ± 2% (at 10° C to 35° C) ±4% (at −10° C to +50° C)
	Accuracy II (Over any 2 of the center 8 divisions): ±5% (−10° C to +50° C)

Time Difference Measurement

0.2μ sec to 5 sec
Accuracy: ±1% of reading ±0.01 graduation (Minimum graduation of DELAY TIME MULT dial)

Delay Jitter	1/20,000 or less
Sweep Magnification	10 times (Maximum sweep rate: 2 nsec/div) Accuracy I of magnified sweep rate (Over center 8 divisions): ±5% at 20 nsec/div, 50 nsec/div ±3% at 0.1 μsec/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): ±10% at 20 nsec/div, 50 nsec/div ±6% at 0.1 μsec/div to 0.5 μsec/div ±5% at 1 μsec/div to 0.5 sec/div (at 10° C to 35 °C) (Except 30 nsec from sweep start point and 40 nsec from sweep end point)

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: ±3% (at 10° C to 35 °C) ±5% (at −10 °C to +50 °C)
Frequency Response	DC to 2 MHz, −3 dB
Y Axis	Same as CH 2
X-Y Phase Defference	3° or less (at DC to 100 kHz)

1-2-6 Z-Axis System

Sensitivity	0.5 Vp-p
Polarity	Positive (decleases intensity), negative (inclease intensity)
Frequency Range	DC to 5 MHz
Input Resistance	4.6 k Ω± 10%
Maximum Input Voltage	50 V (DC + peak AC)

1-2-7 Signal Outputs

Calibrator	
Waveform	Square wave
Repetition Frequency	1 kHz Accuracy: ±1% (at 10 °C to 35 °C) ±2% (at −10 °C to +50 °C)
Duty Ratio	40% to 60%
Output Voltage	0.6 V Accuracy: ±1% (at 10° C to 35 °C) ± 1.5% (at−10° C to +50° C)
Output Current	10 mA Accuracy: ±1% (at 10 °C to 35 °C) ±2% (at −10° C to +50 °C)
CH 1 OUT	
Output Voltage	40 mV ± 20% per div of amplitude on the CRT screen (at 50 Ω terminated)
Frequency Response	DC to 50 MHz, −3 dB
Output Resistance	50 Ω±20%
A Gate Out	
Output Voltage	Approximately +5 V (Base line: Approximately 0 V)
Output Resistance	Approximately 2.7 k Ω
B Gate Out	Same as A gate Out

1-2-8 Power Supply

Voltage Range	100 V (90 to 110 V)/ 115 V (103 to 128 V)/ 220 V (195 to 242 V)/ 230 V, 240 V (207 to 264 V) AC One of these voltage ranges can be selected with voltage selector plug.
Frequency Range	50 to 400 Hz
Power Consumption	Approximately 62 W (at 100 V AC)

1-3 PHYSICAL CHARACTERISTICS

Weight	Approximately 9.5 kg (Without panel cover and accessories bag)
Dimensions	320 ± 2 (W) x160 ± 2 (H) x400 ± 2 (L) (mm) See Figure 1-1.

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 mmHg) Non-operating: 15,000 m maximum (atmospheric pressure 90.4mmHg)
Vabration	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 minutes
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-0012)	2
Fuse (FSA-2)	2
Panel Cover	1
Dust Cover	1
Instruction Manual	1
Accessories Bag	1

For the method of removing the accessories bag, refer to Figure 1-2.

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Figure 1-1. Dimensional Diagram