



TS-8500 DC – 500 MHz, 4 CH

■ Ultra-high speed storage capability

Newly-developed scan converter tube allows capture of single shot phenomena even at the highest sweep rate. For instance, it can display the leading edge of a 6.25 div amplitude, 1 nsec rise-time pulse or any part of a 3.2 div amplitude, 500 MHz sine wave in a single shot sweep.

■ Maximum writing speed for all ranges and guaranteed wide bandwidth from DC to 500 MHz

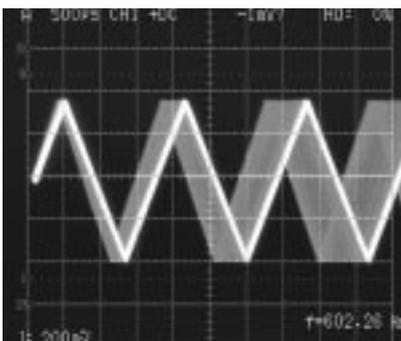
Unlike a digital storage oscilloscope, the TS-8500's waveform display capability and frequency bandwidth are not dependent on the sweep range. As a result, aliasing does not occur.

■ "Burn-free" because waveforms are stored by the CCD

■ NTSC video output

Connect the TS-8500 to a video printer for quick, easy printouts. You can also connect this scope directly to a personal computer via a video board, for waveform processing.

■ Persistence function allows waveforms to be overwritten



Ultra-High Writing Speed Analog Storage Oscilloscope

The TS-8500 ultra-high writing speed analog storage oscilloscope allows precise observation of high-speed single shot phenomena and sporadic noise (glitch). A newly-developed scan converter tube makes it possible for this scope to capture noise which appears in repetitive signals as well as high-speed single shot phenomena.

Featuring the same high levels of operability and basic performance as our popular 470 MHz/400 MHz analog oscilloscopes (SS-7840H/SS-7840), this scope requires no special training or operation, making it an ideal solution to the common problems encountered every day in electronics engineering.

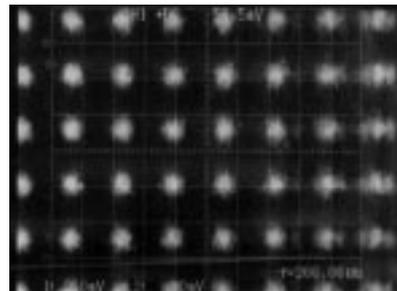
■ Time base dual delay function

Two independent delay time settings are provided for B sweeps, allowing delay magnification of two signals.

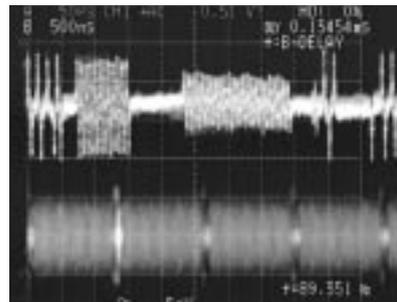
■ Examples of observed waveforms

● Constellation waveform

Shows phase and jitter of a 256QAM signal. This is one of the modem evaluation methods. Jitter can be checked by the size of the spot waveform while the phase can be evaluated by the shape of a square formed by four spots.



● Read-write signal for hard disk driver by using B-trigger



Specifications

■ Display	5.5-inch, TFT color LCD (240 x 320 dots)
■ Storage CRT	CCD scan converter tube (430 x 600 dots)
■ Fastest writing speed	5 div/ns
■ Persistence time	Variable to infinity
■ Vertical deflection system (Y axis)	CH1, CH2, CH3, CH4, ADD (CH1 + CH2), ALT, CHOP
Vertical mode	
● CH1, CH2	
Sensitivity	
Range	2 mV/div – 5 V/div, 11-step (1-2-5)
Variable adjuster	2 mV/div – 12.5 V/div, continuously variable
Accuracy	±2%
Frequency bandwidth	
Bandwidth	DC – 500 MHz, -3 dB
Band limit	DC – 20 MHz or DC – 100 MHz
	Note: The lower limit frequency is 10 Hz with AC coupling.
Rise time	Approx. 700 ps
	Note: Use the following formula.

$$Tr = \frac{350}{\text{Bandwidth [MHz]}} \text{ [ns]}$$

Signal delay time	20 ns or more (delay time on the screen)
Input coupling	AC, DC, GND
Input RC	1 M Ω ± 1.5% // 16 pF ± 2 pF, 50 Ω input: 50 Ω ± 1%
Max. input voltage	
1 M Ω input	±400 V max. (DC + AC peak)
50 Ω input	5 Vrms max.
VSWR	1.35 or less (with DC – 500 MHz, 50 Ω)
Offset voltage	

Vertical range	Offset voltage
2 mV/div – 50 mV/div	±1 V
0.1 V/div – 0.5 V/div	±10 V
1 V/div – 5 V/div	±100 V

Polarity switching	CH2 only
Probe sense	1:1, 10:1, 100:1
● CH3, CH4	
Sensitivity	
Range	100 mV/div, 500 mV/div
Accuracy	±2%
Frequency bandwidth	DC – 500 MHz, -3 dB
Input coupling	AC, DC
Input RC	1 M Ω , ±1.5% // 16 pF ± 3 pF
Max. input voltage	±400 V max. (DC + AC peak)
Probe sense	1:1, 10:1, 100:1
■ Triggering	
● A triggering	
Source	CH1, CH2, CH3, CH4, LINE
Coupling	AC, DC, HF-REJ, LF-REJ
Slope	+, -
Sensitivity	

Frequency	Amplitude
DC – 10 MHz	0.4 div
10 MHz – 100 MHz	1.0 div
100 MHz – 500 MHz	2.0 div

● B triggering	
Source	CH1, CH2, CH3, CH4
Coupling	AC, DC, HF-REJ, LF-REJ
Slope	+, -
Sensitivity	

Frequency	Amplitude
DC – 10 MHz	0.4 div
10 MHz – 100 MHz	1.0 div
100 MHz – 250 MHz	2.0 div

● TV trigger	
Format	NTSC, PAL (SECAM), HDTV
Trigger mode	TV-V (ODD, EVEN, BOTH), TV-H
TV line	ODD, EVEN, BOTH, selectable
NTSC	1 H – 525 H
PAL (SECAM)	1 H – 625 H
HDTV	1 H – 1125 H
TV clamp	
Clamp position	Back porch level
Clamp level	Within ±1 div
Signal amplitude	1.5 div – 8 div
● Event trigger	
Count mode	
Count range	1 – 65535
Max. count frequency	50 MHz
Burst mode	
Burst time range	0.15 μ s – 9.99 s
● AUTO SETUP	
Input channel	CH1, CH2
Frequency range	50 Hz – 100 MHz

■ Horizontal deflection system (X axis)	
Display (HORIZ DISPLAY)	A, ALT, B, X-Y
● A sweep	
Sweep mode	AUTO, NORMAL, SINGLE
Sweep time	
Max. sweep time	500 ps/div
Range	5 ns/div – 500 ms/div, (1-2-5 step) switchable in 25 steps
Hold-off time	Variable
● B sweep	
Delay	TRIG'D DELAY
	RUNS AFTER DELAY
Sweep time	
Max. sweep time	500 ps/div
Range	5 ns/div – 20 ms/div, (1-2-5 step) switchable in 21 steps
Accuracy	±2%
Delay jitter	1/20000 at 1 ms/div for A sweep, 500 ns/div for B sweep
	Possible
Dual delay	
● Sweep magnification	
Magnifier	X10
● X-Y operation	
● X axis (CH1)	
Sensitivity	
Range	Same as CH1
Accuracy	±2%
Frequency response	DC – 10 MHz, -3 dB
● Y axis	CH1, CH2, CH3, CH4, ADD
Phase difference	Within 3° (DC – 5 MHz)
■ CAL (calibration signal)	
Waveform	Square-wave
Frequency	1 kHz, ±0.1%
Duty ratio	49% – 51%
Output voltage	0.6 V, ±1%
■ CH2 OUT	
Output voltage	20 mV/div, ±30% (50 Ω load)
Frequency bandwidth	200 MHz, -3 dB (50 Ω load)
Output resistance	50 Ω , ±20%
■ Probe power	
Connector number	2
Voltage	+12 V, -12 V
■ VIDEO OUT	NTSC, 1 Vp-p ± 0.3 V
■ Z AXIS IN	
Intensity modulation voltage	0.5 Vp-p or more
Polarity	With positive voltage, dark; with negative voltage, bright
Frequency range	DC – 5 MHz
Input resistance	5 k Ω ± 20%
Max. input voltage	±40 V max.
■ Cursor measurement	Time difference (Δ t), voltage difference (Δ V)
■ Counter	
Display digits	5-digit (A trigger source)
Accuracy	±0.01%
Frequency measurement range	2 Hz – 500 MHz
■ Save/Recall	Max. 256 panel settings
Backup time	Approx. 27,000H (at 25°C)
■ Power supply	
Voltage range	AC 100 V – 240 V
Frequency range	50/60 Hz
Power consumption	Max. 140 VA
■ Weight and dimensions	
Weight	Approx. 8.5 kg (without accessories)
Dimensions	Approx. 320W x 160H x 420L mm
■ Environmental conditions	
Performance guaranteed temperature	10°C – 35°C
Operating range	
Temperature	0°C – 40°C
Humidity	90% RH (0°C – 40°C)
Storage range	
Temperature	-20°C – 70°C
Humidity	80% RH (-20°C – 70°C)
■ Accessories	Power cord (x1), probe (SS-101R) (x2), panel cover (1), fuse (x2), operation manual (x1), accessory bag (x1)