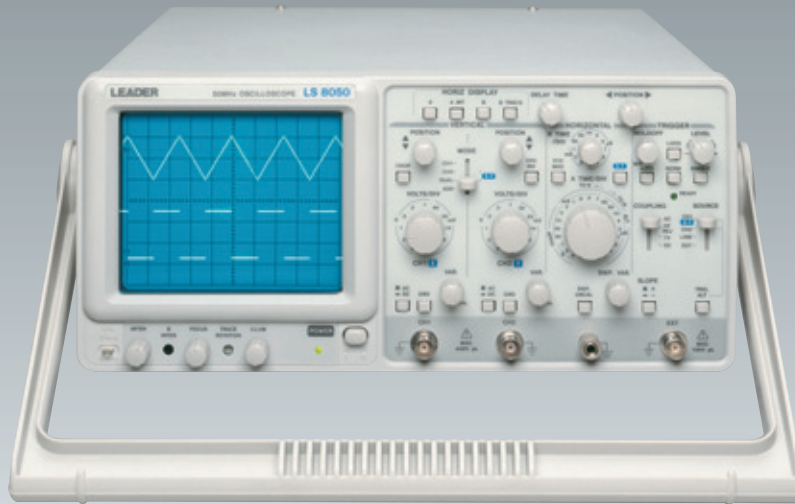


High Sensitivity, Low Drift, 50 MHz Oscilloscope



LS 8050 50 MHz OSCILLOSCOPE

GENERAL

A lab-grade instrument with dual-channel operation, the LS 8050 meets the needs of advanced scope users with bright, sharp traces, superior long-term stability and reliability. Operating features include high sensitivity with band limiting to 15 MHz on the most sensitive ranges, delayed sweep to closely examine small parts of the main time base, a trigger lock function to establish the trigger point within the p-p signal swing and ensure rock-solid triggering despite wide variations in signal excursions and dedicated H and V sync separators for fuss-free video waveforms. Other refinements include variable holdoff to view long, complicated wavetrains, X-Y operation, an internal illuminated scale (a must for waveform photography), and CH1 output to put the scope's CH1 amplifiers to work as a high-gain calibrated preamp. A pair of X1/X10 probes is provided.

FEATURES

- 50 MHz Bandwidth CH1 & CH2
- High Sensitivity: 1 mV/div
- 15 MHz Bandwidth at 1 & 2 mV/div
- Delayed Sweep Capability
- Video, TV-V and TV-H Trigger
- Trigger Level Lock Function
- Variable Holdoff for Complex Wavetrains
- X-Y Operation
- CH1 Output Puts the CH1 Amplifiers to Work as a Calibrated Preamp
- Scale Illuminator Facilitates Waveform Photography
- Meets International Standards for EMI, EMS and Safety

SPECIFICATIONS

LS 8050

CRT

Type:	150 mm rectangular type, internal graticule.
Phosphor:	P 31
Acceleration voltage:	Approx. 12 kV
Effective screen size:	8 x 10 div (1 div = 10 mm)
Graticule:	Internal; continuous adjustable illumination

Vertical Axis

Sensitivity:	1 mV to 5 V/div, 12 steps in 1-2-5 sequence
Sensitivity accuracy	
5 mV to 5 V/div:	≤ 3 % (10 to 35 °C)
1 mV to 2 mV/div:	≤ 5 % (10 to 35 °C)
Frequency bandwidth	
5 mV to 5 V/div:	DC (AC:10Hz) to 50 MHz, -3 dB
1 mV to 2 mV/div:	DC (AC:10Hz) to 15 MHz, -3 dB
Rise time	
5 mV to 5 V/div:	Approx. 7 ns
1 mV to 2 mV/div:	Approx. 23 ns
Input impedance:	1 MΩ ±2 %//Approx. 27 pF
Vertical mode	
CH1:	CH1 single channel.
CH2:	CH2 single channel.
DUAL:	CHOP/ALT are auto-set by TIME/DIV switch. (CHOP:0.5 s to 5 ms/div, ALT : 2 ms to 0.1 μs/div) When CHOP switch is pushed in, the two traces are displayed in the CHOP mode at all range.
ADD:	CH1 + CH2 algebraic addition.
Chopping repetition frequency:	Approx. 250 kHz
Input coupling:	AC, DC, GND
Maximum input voltage:	400 V (DC + AC peak), AC : frequency 1 kHz or lower.
CH1 signal output:	Approx. 100 mV/div without termination, 50 mV/div with 50 Ω termination.
Polarity inversion:	CH2 only

Triggering

Triggering source:	CH1, CH2, LINE, EXT, ALT
Coupling:	AC, HF-REJ, TV, DC (TV-V/TV-H can be auto-set by TIME/DIV range. TV-V : 0.5 s to 0.1 ms/div; TV-H: 50 μs to 0.1 μs/div) +/-
Polarity:	
Sensitivity	
DC to 10 MHz:	0.5 div (EXT : 0.1 V)
10 to 50 MHz:	1.5 div (EXT : 0.2 V)
TV (video signal):	2.0 div (EXT : 0.2 V)
AC coupling:	Attenuate signal components of lower than 10 Hz.
HF-REJ:	Attenuate signal components of higher than 50 kHz.
LEVEL LOCK and ALT triggering:	Satisfies the value of the above trigger sensitivity plus 0.5 div (EXT : 0.05 V) for signal of duty cycle 20 : 80. Repetition frequency: 50 Hz to 40 MHz
Triggering mode	
AUTO:	Sweeps run in the free mode when no triggering input signal is applied. (Applicable for repetitive signals of frequency 50 Hz or over.)
NORM:	When no triggering signal is applied, the trace is in the READY state and not displayed.
SINGLE:	One-shot sweep with triggering signal. Can be reset to the READY state by means of the RESET switch. The READY lamp (LED) turns on when in the READY state or in the sweep operation.
EXT triggering signal input:	EXT HOR input terminal is used in common.
Input impedance:	1 MΩ ±2 %//approx. 40 pF
Maximum input voltage:	100 V (DC + AC peak), 1-AC: frequency 1 kHz or lower
B triggering signal:	The A triggering signal of main sweep is used as the B triggering signal.

Horizontal axis

Horizontal axis display:	A, A INT, B, B TRIG'D
A sweep (main sweep) time:	0.1 μs to 0.5 s/div, 21 steps in 1-2-5 sequence
Sweep time accuracy:	±3 %, (10 to 35 °C)
Vernier sweep time control:	≤ 1/2.5 of panel-indicated value
Holdoff time:	Continuous variable >= twice sweep length (time) at 0.1 μs to 1 ms/div ranges.
B sweep delay system:	Continuous delay and triggered delay
B sweep (delay sweep) time:	0.1 μs to 0.5 ms/div, 12 steps
Sweep time accuracy:	±3 %, (10 to 35 °C)
Delay time:	1 μs to 5 ms
Delay jitter:	≤ 1/10000
Sweep magnification:	10 times (maximum sweep time 10 ns/div) 0.1 μs to 50 ms/div ±5 %, 510 MAG sweep time accuracy: 10 ns to 50 ns/div ±8 % (10 to 35 °C)

X-Y Mode

Sensitivity:	Same as vertical axis. (X-axis: CH1 input signal; Y-axis: CH2 input signal)
Sensitivity accuracy:	NORM:±4 %, x 10 MAG: ±6 % (10 to 35 °C)
Frequency bandwidth:	DC to 2 MHz (-3 dB)
X-Y phase difference:	≤ 3 % at DC to 100 kHz

EXT HOR Mode

Sensitivity:	Approx. 0.1 V/div (Trace swept by an external horizontal signal applied to the EXT TRIG IN terminal. Vertical axis modes are CH1, CH2, DUAL and ADD modes in the CHOP mode.)
Frequency bandwidth:	DC to 2 MHz (-3 dB)
Phase difference between vertical axis:	≤ 3 % at DC to 100 kHz

Z Axis

Sensitivity:	3 V _{P-P} (Trace becomes brighter with negative input.)
Frequency bandwidth:	DC to 5 MHz
Input resistance:	Approx. 5 kΩ
Maximum input voltage:	50 V (DC + AC peak, AC : frequency 1 kHz)

Calibration Voltage

Waveform:	Positive-going square wave
Frequency:	1 kHz ±5 %
Duty ratio:	Within 48 : 52
Output voltage:	2 V _{P-P} ±2 %
Output impedance:	Approx. 2 kΩ

Environmental Conditions

Operating Temperature:	0 to 40 °C
Operating Humidity:	≤ 85 % RH (without condensation)
Spec-Guaranteed Temperature:	5 to 35 °C
Storage Temperature:	-10 to 70 °C
Storage Humidity:	≤ 70 % RH (without condensation)
Operating Environment:	Indoor use
Operating Altitude:	Up to 2000 m
Overvoltage Category:	II
Pollution degree:	2

Power Requirements

100 V, 120 V, 220 V, 230 VAC ±10 % (250 Vmax.), 50 Hz/60 Hz, 70 VA, 60 W (max.)

Dimensions

310 (W) x 150 (H) x 455 (D) mm

Weight

8.2 kg (18 lbs)

Accessories

Power cord	1
Probes (LP-051C)	2
Instruction manual	1