

20-MHz 2-CHANNEL OSCILLOSCOPE



LS 8022

The LS 8022 20-MHz 2-Channel Oscilloscope is an economical choice for high stability and reliability. The oscilloscope is equipped with a variety of helpful functions (TV sync separator, variable holdoff, X-Y

- High Sensitivity (1 mV/div)
- Withstands up to 400 V dc + ac Peak Inputs
- Level Lock and Alternate Triggering
- Dedicated TV-V and H Sync Separators
- Variable Holdoff
- X-Y Operation
- CH1 Output
- Z-Axis Input
- 10 ns/div Maximum Sweep Speed
- Meets International Standards for EMI, EMS and Safety

display mode) which makes this oscilloscope an ideal choice for production, field service and educational applications. The LS 8022 also conforms to International Standards for EMI, EMS and Safety.

KEY SPECIFICATIONS

SPECIFICATIONS

VERTICAL DEFLECTION

Bandwidth (-3 dB, 8 div)

dc: 5 mV to 5V/div; dc (ac: 10 Hz) to 20 MHz

dc: 1 mV to 2 mV/div; dc (ac: 10 Hz) to 10 MHz

Rise Time

5 mV to 5V/div, approx. 17.5 ns

1 mV to 2 mV/div, approx. 35 ns

Deflection Coefficients

1 mV to 5V/div

12 steps in 1-2-5 sequence

Accuracy (10° to 35 °C)

5 mV to 5V/div ≤ 3%

1 mV to 2 mV/div ≤ 5%

Input Impedance

1 MΩ ± 2%, approx. 27 pF

Input Coupling

ac, dc, GND

Maximum Input Voltage

400 V (dc + ac peak)

Vernier Vertical Sensitivity

To 1/2.5 or less of panel indicated value

CH1 Signal Output

Approx. 100 mV/div without

termination, 50 mV/div with 50 Ω

termination

CH2 INV BAL

Balanced point variation ≤ 1 div

Vertical Modes

CH1: CH1 single channel

CH2: CH2 single channel

DUAL: CHOP/ALT are auto set by time

div switch

CHOP: 0.5 s approx. 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 ranges.

ADD: CH1 + CH2 algebraic addition

Chop Frequency

Approx. 250 kHz

EXTERNAL HORIZONTAL DEFLECTION

X-Y MODE

Sensitivity

Same as vertical axis

X-axis: CH1 input signal

Y-axis: CH2 input signal

Accuracy

NORM: +4%, X10 MAG: ± 6% (10°C to 35°C)

Bandwidth

dc to 1 MHz (-3 dB)

Phase Shift

≤ 3° at dc - 50 kHz

INTERNAL HORIZONTAL DEFLECTION

SWEEP MODE

Horizontal Axis Display

A

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

Continuously variable

Twice sweep length (time)

at 0.1 μs to 1 ms/div ranges

Sweep Magnification

10 times (max speed time 10 ns/div)

X10 MAG Sweep Time Accuracy

0.1 μs to 50 ms/div ± 5%

10 ns to 50 ns/div ± 8%

(10°C to 35°C)

TRIGGERING

Source

CH1, CH2, LINE, EXT (CH1 & CH2 can be selected only when the vertical mode is dual or ADD.

In ALT mode, if the TRIG ALT switch is pushed in, it can be used for alternate triggering of two different sources.

Modes

Auto: Sweeps run in the free mode when no triggering input signal is applied. (Applicable for repetitive signals of frequency 50 Hz or over).

Normal: When no triggering signal is applied, the trace is in the READY state and not displayed.

Coupling

AC, HF-REJ, TV, DC

TV-V/TV-H are 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

+ or -

Sensitivity

dc to 5 MHz: 0.5 div (EXT 0.1 V)

5 to 20 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 ALTERNATE

TRIGGERING

Satisfies the value of the above trigger sensitivity plus 0.5 div (EXT: 0.05 V) for signal of duty cycle 20:80.

20-MHZ 2-CHANNEL OSCILLOSCOPE

KEY SPECIFICATIONS (LS 8022)

Repetition Frequency

50 Hz to 20 MHz

EXT Triggering Signal Input

EXT HOR input terminal is used in common

Input Impedance

1 M Ω \pm 2%

40 pF approx.

Maximum Input Voltage

100 V (dc + ac peak)

AC: frequency not higher than 1 kHz

Z-AXIS INTENSITY MODULATION

Sensitivity

3 V p-p (trace becomes brighter with negative input)

Frequency Bandwidth

dc to 5 MHz

Input Impedance

5 k Ω approx.

Maximum Input Voltage

50 V (dc + ac peak, ac frequency \leq 1 kHz)

EXTERNAL HORIZONTAL MODE

Sensitivity

0.1 V/div approx. (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 1 MHz (-3 dB)

X-Y Phase Difference

\leq 3° at dc to 50 kHz

CALIBRATION VOLTAGE

Waveform

Positive going squarewave

Frequency

1 kHz \pm 5%

Output Voltage

2 V p-p \pm 2%

Output Impedance

Approx. 2 k Ω

CRT display

Type

6 inch rectangular type, internal graticule

Phosphor

P31

Accelerating Voltage

Approx. 2 kV

Effective Screen Size

8 x 10 div (1 div = 10 mm (0.39 in.))

Graticule

Internal

OPERATING ENVIRONMENT

Max Operating Ranges

0° to 40°C

Relative Humidity

85% RH (max.) non condensing

POWER REQUIREMENTS

100, 120, 220, 230 V ac \pm 10%

50/60 Hz, 70 VA

PHYSICAL

Size (W x H x D)

12¹/₄ x 6 x 18 in.

310 x 150 x 455 mm

Weight

18 lbs.

8.2 kg

ACCESSORIES

2 Probes (LP-051C)

Fuse

OPTIONAL ACCESSORIES

Rackmount Adapter (LR-2423IU)

Probe Pouch (LP-2075)

Front Cover (LC-2074)

RELATED PRODUCTS

LS 8106 100-MHz, 3-CH Dual Time Base Oscilloscope

LS 8105 100-MHz, 3-CH Dual Time Base Oscilloscope

50-MHz 2-CH, Delayed Sweep

Oscilloscope

LBO-310A 4-MHz, Recurrent Sweep

Oscilloscope

