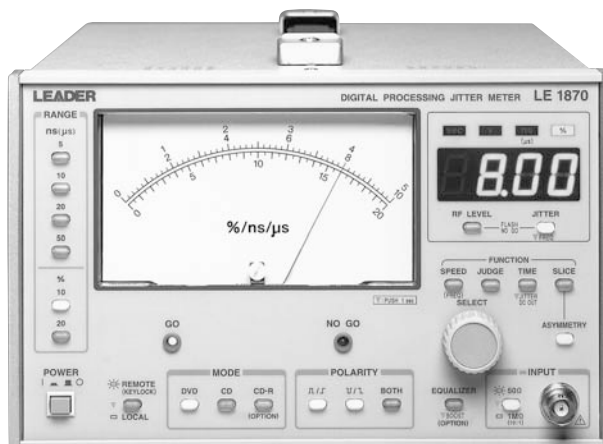


TIA High Speed & Accuracy Jitter Measurement

CE
Upon request



PAT.PEND

LE 1870 DIGITAL PROCESSING JITTER METER

● GENERAL

The LE 1870 Jitter Meter is designed to quickly and accurately measure the jitter of RF (DATA) signals conforming to the DVD Book (DVD Specifications for Read-Only Disc) with respect to the clock signal using digital processing method (i.e., same method as used by TIA).

A large meter and LED panel allow this instrument ideal for production and inspection applications, as well as R&D.

Since CD-R measurement unit to measure jitter of biphasic signal is optionally available, DVD, CD, and CD-R/RW can be measured using this instrument alone.

● FEATURES

[DVD Measurements]

■ High speed and accuracy measurement by the digital operation system

By adopting the same digital operation system of TIA to the rms operation, the LE 1870 deliver the high speed and accuracy measurement.

■ The LE 1870 measures 3T through 11T and 14T in the DATA signal with respect to the clock signal and displays jitter in sigma format, and also offers the measurement of narrow pulse 3T jitter.

■ Jitter in unit of % or sigma value, selectable

Jitter in unit of % or sigma value, selectable Jitter value can be displayed in unit of percentage with respect to the clock signal. The absolute value can also be displayed in sigma format. The Jitter of the DATA signal can accurately be measured even in the percentage display mode.

■ Jitter measurement in three polarities

Jitter at the rise, fall, and both edges of the DATA signal can be measured in signal-signal and two-signal measurement modes.

■ Response up to double speed

Measure the jitter between RF (DATA) signal and regenerated clock signal in inside and display in sigma value.

[For general function]

■ High measurement level sensitivity

DATA signal can be measured for signal whose amplitude is equal to or more than 50 mVp-p.

■ Input impedance can be selected either 50 Ω or 1 MΩ

Both 50 Ω input which is internally terminated, and 1 MΩ input which is used with 10:1 oscilloscope probe lessen the disturbance to the system under test.

■ Simultaneous measurement, jitter and RF signal level

Display the peak level(p-p) of the DATA signal in digital.

■ Analog display for easy adjustment and digital display for parallax free

The LE 1870 is equipped with both large meter and large digital indicators. The result of jitter measurements can be displayed either on meter or on digital indicator.

■ Measurement inhibit

The INHIBIT IN connector is provided. This function inhibits jitter measurement when a disc replay malfunction like kickback occurs.

■ Various monitor output

DATA signal monitor is available and the DC output proportional to the jitter and level indication are provided.

■ Build-in Auto slicer

Auto slicer which has response features conforming to DVD book is built-in.

[On the Production Line]

■ Convenient GO/NO GO judgement for the production line

The GO/NO GO result judgement is based on the comparison between the set standard and measured value of level, and is indicated on the LEDs and outputted.

■ REMOTE CONTROL function

Jitter measurement range and other panel functions can be remotely controlled.

■ RS232C is equipped as standard

RS232C provides you panel operation and lets you transfer the measured level and jitter level to a personal computer.

■ Easy setting

Jog dial system offers you easy setting for judgement standard, response time, slice level. All the setting are stored as last memories on each mode/speed of DVD, CD, CD-R.

[Versatile Options]

■ Available to measure a jitter of CD-R/RW up to x32 speed.

With an option for CD-R/RW, 1T jitter of Bi-phase signal can be measured.

■ Accurate measurement by equalizer conforms to DVD book

Optional RF equalizer allows direct input measurement of the pickup signal at the production line of pickup.

● SPECIFICATIONS

LE 1870

Input Section

EFM SIGNAL

Input couple: AC
 Measurement Voltage Range: 50 mV to 5 Vp-p
 Input Impedance: 1 M Ω / 50 Ω
 Bandwidth: 50 MHz, $\leq$ -3 dB
 Slice Level: VARIABLE ($\pm$ 2.5 V)
 AUTO (ASYMMETRY ON)
 Maximum Input Voltage: $\pm$ 5 V

INHIBIT IN

Input Impedance: 100 k Ω
 Input Signal: 0/ 5 V (Measurement inhibit at 5 V)
 Maximum Input Voltage: -0.7 V/ +5.7 V

Jitter Measurement Section

Corresponding Speed: DVD standard speed (27 MHz $\pm$ 10 %),
 Double speed (54 MHz $\pm$ 10 %)
 CD standard, 2, 4, 6, 8, 10, 12 times speed
 (EFM CLOCK: 4.3218 MHz to 51.8616 MHz)

Measurement Mode

DVD All T: DATA to CLOCK
 DVD 3 T: PULSE WIDTH
 CD 3T: PULSE WIDTH

Scale

DATA to CK Measurement: ns, % (Automatic conversion)
 3T PULSE WIDTH: ns

Accuracy

Meter Display: ($\pm$ 4 % of full scale) $\pm$ 0.15 ns
 Digital Display: ($\pm$ 4 %) $\pm$ 0.15 ns

Polarity

DATA: +, -, BOTH
 CLOCK: -

Indication

SIGMA
 Measurement Time Constant Variable: 0.04 s to 5 s

Level Measurement Section

Measurement Method: Peak to peak level of RF (DATA) signal
 Range
 Input Impedance 50 Ω : 50 mV to 5 Vp-p
 Input Impedance 1 M Ω : 0.5 V to 9.999 Vp-p
 (conversion value for 10:1 probe)
 Display Method: Digital
 Accuracy: $\pm$ 5 %

Clock Frequency Measurement Section

Measurement Range: 27 MHz $\pm$ 10 %, 54 MHz $\pm$ 10 %
 Measurement Accuracy: $\pm$ 0.5 %

Clock Reproducing Section

Reproduce the standard clock from the input EFM plus signal
 Corresponding Speed: DVD standard speed (27 MHz $\pm$ 10 %)
 DVD 2 times speed (54 MHz $\pm$ 10 %)

Judgement Section

Compares the set standard and measurement value of level and jitter to determine GO/NO GO and output the results.
 GO/NO GO LED: Meter (Jitter measurement) judgement.
 RF LEVEL/JITTER LED: Digital display (Jitter and level measurement) judgement.
 Dedicated Remote Terminal: Jitter measurement,
 Level measurement judgement

Output Section

Monitor Output
 Output Signal: Input signal or the signal through the equalizer
 Output Impedance: 50 Ω
 Digitized Output
 Output Signal: DATA signal, CLOCK signal
 Output Impedance: 50 Ω
 DC Output:

Jitter

DATA to CLOCK 3T PULSE WIDTH

DVD: 0.05 V/% or 0.125 V/ns
 DVD: 0.1 V/ns
 CDx1: 0.025 V/ns
 x2: 0.05 V/ns
 x4, x6: 0.1 V/ns
 x8 to 12: 0.25 V/ns
 0.4 V/Vp-p

Level:

Remote Control Section

Designated Remote Terminal: Judgement output and Panel setting
 RS232C: Control, Data output

Environmental Conditions

Operating: Temperature: 0 to 40 $^{\circ}$ C
 Humidity: $\leq$ 85 % RH (without condensation)
 Spec-Guaranteed: Temperature: 10 to 30 $^{\circ}$ C
 Humidity: $\leq$ 85 % RH (without condensation)
 Storage: Temperature: 0 to 50 $^{\circ}$ C

Operating Environment:

Operating Altitude:

Overvoltage Category:

Pollution Degree:

Power Requirements:

Dimensions and Weight:

Accessories:

Indoor use
 Up to 2,000 m
 II
 2
 90 to 250 VAC, 50/ 60 Hz
 55 Wmax.
 213 (W) $\times$ 132 (H) $\times$ 300 (D) mm,
 4.0 kg
 Power cord 1
 Instruction manual 1

Option

OP71 CD-R/RW Measurement (Bi-phase Jitter Measurement)

Corresponding Speed: x1, x2, x4, x6, ... x30, x32 times speed (Bi-phase CLOCK: 6.3 kHz to 201.6 kHz)
 Input Signal: Bi-phase Digitized signal and Digitized Clock signal
 Input Couple: DC
 Measurement Voltage Range: 0.2 V to 5 Vp-p
 Input Impedance: 1 M Ω
 Bandwidth: DC to 1 MHz, $\leq$ -3 dB
 Maximum Input Voltage: $\pm$ 5 V
 Measurement Mode: 1 T (PULSE WIDTH), All T (DATA to CLOCK)
 Scale: μ s, %

OP72 GP-IB (IEEE 488.1)

Function: Data transfer and panel control

OP74 Fixed Equalizer

Corresponding Clock Frequency 27 MHz
 Boost Quantity 3.2 dB $\pm$ 3 % (at 5.16 MHz)
 Group Delay Fluctuation Max. 2.5 ns

OP75 Variable Equalizer

Corresponding Clock Frequency 27 MHz
 Boost Quantity 3.2 to 6.0 dB $\pm$ 3 % (at 5.16 MHz)
 Group Delay Fluctuation Max. 4 ns

OP76 Variable Equalizer

Corresponding Clock Frequency 27 MHz
 Boost Quantity 3.0 to 4.4 dB $\pm$ 3 % (at 5.16 MHz)
 Group Delay Fluctuation Max. 3 ns