Not sold in some area **KJM6235A**

CD/CD-ROM JITTER METER

Supporting a 22T method, standard, double, quad-, and octuple speeds, analog detection system, and GPIB (optional)

Outline

The KJM6235A jitter meter is an instrument that measures the amount of jitter in output signals (EFM* signals) from optical pickups used in compact disk (CD) players.
In addition to the standard CD speed, KJM6235A supports double, quad-, and octuple CD speeds, allowing it to be used for CD-ROM drives and MD drives. The evaluation of jitter is digitally indicated in standard deviation values. The instrument can be used in a wide range of applications such as jitter measurements in production lines of CD players or inspection sections.

*EFM:Eight to Fourteen Modulation

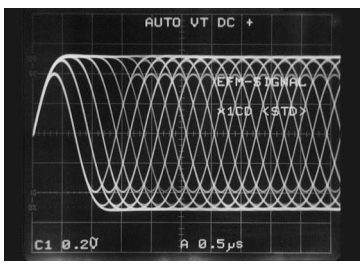
Features

- Supports standard, double, quad-, octuple CD speeds.
- Adopts the 22T delayed sampling method as a measurement system. The 22T method will measure the amount of jitter in a width of 22 clocks. This allows comprehensive measurements not bound by signal periods of 3T to 11T configured randomly. The 22T delayed sampling method is a patent of Sony Corp.
- Uses an analog detection system. This allows the jitter meter to achieve realtime high resolution (10 ps for the ×8 mode) with less quantizing errors in comparison with a counter system.
- Converts measured values into rms values for display. This allows the meter to capture the amount of jitter whose frequency components are distributed over a wide range.
- Has a self-calibration feature, enabling high-precision measurements.
- Has a symmetric adjustment feature that aligns a window with the center of input signals connected to INPUT terminals.
- Has three terminals for monitoring input signals, jitter sampling waveform, and r.m.s signal.
- Can have a GPIB interface (optional) when requested as a factory option.

Data

■ 22T delayed sampling method * Based on data presented by Sony Corp.

To evaluate jitter, a method of measuring the windows' width of eye patterns with an oscilloscope has been generally used. This evaluation method has also been widely used in other digital transmission systems because there is a correlation between jitter and data error rates.
The 22T method was developed to evaluate window measurements of these eye patterns quantitatively. Since it measures jitters in the window (22T periods) directly, there is a correlation between jitter and error rates.
Fig. 1 shows the correlation between the jitter values obtained by the 22T method in the actual evaluation of installed CD pickups and error rates (block error rates). In the figure, defocus, radial skew, and tangential skew were varied as factors for generating jitter. Each factor causes different changes in the geometry of readout beam spots. It is apparent from the figure that the correlation values between the block error rates and jitters do not change much for any of the factors.
In contrast, Fig. 2 shows data measured by a so-called 3T method. The 3T method will extract only 3T data from a number of data groups and measure changes in pulse length only. In this method, defocus, radial skew, and tangential skew, the causes of jitter, will change the correlation values between the block error rates and jitters



significantly. This indicates that there may be cases where a certain type of jitter that worsens the block error rates cannot easily be identified as changes in the pulse length of 3T pulses.

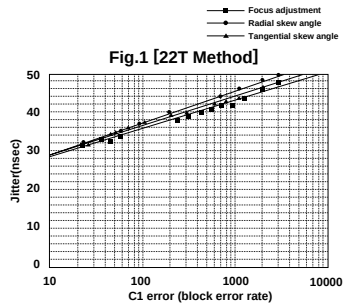


Fig.1 [22T Method]

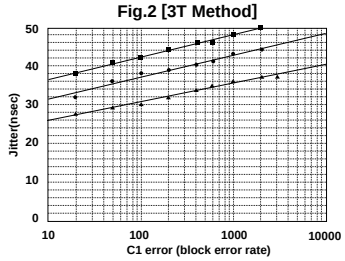


Fig.2 [3T Method]

Specifications

Input	
Input signal	EFM signal(clock 4.3218MHz, 8.6436MHz, 17.2872MHz, 34.5744MHz)
Input signal level	0.4Vp-p to 2Vp-p
Maximum allowable voltage	4V peak (DC+AC peak)
Input impedance	50Ω±2% 1MΩ±2% selectable, Unbalanced
Input terminal	BNC
Jitter measurement	
Measuring range	5.0 to 50.0 ns for × 1 mode 3.5 to 25.0 ns for × 2 mode 2.0 to 12.5 ns for × 4 mode 1.0 to 6.25 ns for × 8 mode
Resolution	0.1 ns for × 1 mode 0.1 ns for × 2 mode *1 0.1 ns for × 4 mode *2 0.01 ns for × 8 mode
Accuracy *3	±0.8 ns for × 1 mode ±0.40 ns for × 2 mode ±0.20 ns for × 4 mode ±0.10 ns for × 8 mode
Time constant for rms conversion (DC-OUT)	100 ms for × 1 mode 50 ms for × 2 mode 25 ms for × 4 mode 12.5 ms for × 8 mode
Display intervals (TIME CONSTANT)	Selectable to 1s or 0.1s
Window	At the center of 22T, 1T width
Residual jitter	5.0 ns or less for × 1 mode 3.5 ns or less for × 2 mode 2.0 ns or less for × 4 mode 1.0 ns or less for × 8 mode
JIT output	
Output signal	Jitter variation waveform
Output impedance	Approx. 600Ω
Output terminals	BNC (rear)
Output voltage	Full scale 3V

Unit conversion table	ns/V	mV/ns
×1	16.67	60
×2	8.33	120
×4	4.17	240
×8	2.08	480

×1, ×2, ×4, and ×8 are read-out rates.

DC output	
Output signal	Jitter value (Note: The time constant of this output signal becomes 100 ms, 50 ms, 25 ms, or 12.5 ms, according to the SPEED switch, regardless of the setting of the TIME CONST switch.)
Output impedance	Approx. 600Ω
Output terminals	BNC
Accuracy	Within ±1% of full scale with respect to an display value
Output voltage	Full scale 3V

Unit conversion table	ns/V	mV/ns
×1	16.67	60
×2	8.33	120
×4	4.17	240
×8	2.08	480

×1, ×2, ×4, and ×8 are read-out rates.

RF output	
Output signal	1/10 of input signal
Output impedance	Approx. 50Ω
Output terminals	BNC
Accuracy	Within ±10% with respect to 1/10 of an input voltage value
Backup	
Items to be backed up	Panel settings, symmetry level, and calibration values
Battery life	Two years (from the date of factory shipment)
Power supply	
Operating voltage range	100: 90 to 110VAC, fuse:250V, 1A 120: 104 to 126VAC, fuse:250V, 1A 220: 194 to 236VAC, fuse:250V, 0.5A 240: 207 to 250VAC, fuse:250V, 0.5A
Frequency	50 or 60Hz
Power consumption	25W or less (40VA or less)
Dimensions (MAX)	200W×80H×292D mm (220W×115H×340D mm)
Weight	Approx. 3kg
Environmental conditions	
Operating temperature and humidity ranges	5 to 35°C, 85% or less
Storage temperature and humidity ranges	-20 to 70°C, 90% or less
Temperature range for guaranteeing specifications	Within ±3°C after self-calibration
Insulation resistance	30MΩ or more (500VDC)
Withstand voltage	1500 VAC (for 1 minute)
GPIB interface	
Allows external equipment to read panel settings and measurement data from a jitter meter.	
Interface standards	Compliant with ANSI / IEEE STD. 488-1978 SH1/AH1/T5/L4/SR1/RL0/PP0/DC1/DT0/C0/E1

*1: For less than 10 ns, it is equivalent to 0.04 ns.
*2: For less than 10 ns, it is equivalent to 0.02 ns.
*3: ±(1.5% full scale + 0.5 digit), modulation frequency of 1kHz

