The standard of B-H Analyzer. The top model of IWATSU B-H Analyzers.

SY-8232:10 Hz (1Hz Option) to 10 MHz with SY-924 (Option)

The SY-8232 high-frequency B-H analyzer is the flagship of IWATSU's line of B-H analyzers. It has a high-frequency B-H curve tracing capability over an ultrawide-range measurement frequency from 10 Hz (optionally 1 Hz) to 10 MHz.
The SY-8232's compact design makes it ideal for desktop use. It incorporates features required for measuring high-frequency magnetic characteristics, including an oscillation circuit, power amplifier circuit, high-speed digitizer, operation control circuit and a printer.
The built-in 25 VA power amplifier allows direct measurement of small specimens such as magnetic heads, while use of an external power amplifier enables measurement of large amplitude characteristics and saturation characteristics of power ferrite or ultrathin amorphous materials. The lower limit frequency is as low as 10 Hz (optionally 1 Hz), permitting the measurement of near DC magnetic characteristics of soft magnetic materials. As the analyzer allows both near DC and AC, the measurements of coercive force (Hc) related to magnetic wall production, migration and extinction can be more effective and research and testing in materials development can be performed more quickly.

■ Ultrawide measurement frequency bandwidth

The frequency range for measurement is exceptionally wide, from 10 Hz (optionally 1 Hz) to 10 MHz.

■ Desktop size, all-in-one construction

A compact design incorporating an oscillation circuit, power amplifier circuit, high-speed digitizer, operation control circuit and printer. Magnetic head material can be directly measured by the built-in power amplifier (25 VA) for excitation. (An optional external power amplifier can also be used.)

■ Continuous measurement function and an extensive selection of other measuring functions

Continuous measurement with up to 12 steps, and various measurements including a B-H curve, core loss curve, μ-characteristics and L-characteristics, are available.

■ High-speed, high-precision measurement

High-speed measurement in approx. 3 seconds can be performed. In addition, an FFT arithmetic circuit permits automatic compensation and calibration of frequency characteristics, enabling high-precision measurements.

■ Printer provided as standard (built-in)

Measurement results can be printed out immediately. Convenient for data sorting.

■ GP-IB interface provided as standard

An automated measurement system in combination with a PC can be configured.

■ Easy operation with pop-up menu system

Pop-up menus are displayed on the CRT to facilitate operation. Results are displayed as graphs or lists.

■ Enhanced measurement efficiency with a wide range of options

Options include an external power amplifier and sample connection pod for various use.

■ Compliance with JIS C2514, JIS H7153 and EMAS 5003.

Ideal for estimation of everything from yoke materials for compact motors to the materials for high-frequency transformers.
JIS C2514 : E-shaped ferrite core.
JIS H7153 : High-frequency core loss test method for amorphous metallic cores.
EMAS 5003 : Test method for ferrite cores of power applications.
IEC 62044-3 : Cross-power method

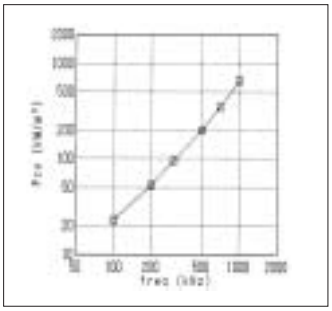
Major Applications

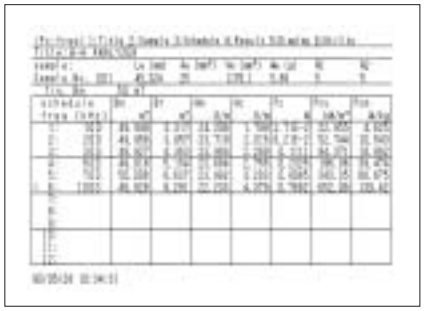
R&D of magnetic heads, power ferrite, ultrathin amorphous materials, etc.

Example of Combination

■ Core loss measurement of transformers for high-frequency power supplies

By combining the SY-8232 B-H analyzer with the IE-1125 power amplifier (optional), core loss up to 3 MHz can be measured.





When an EI core FEI 22 is measured with the above combination, the following measurements are available.
At 1 MHz, max. 100 mT (millitesla): Windings = 5.
At 3 MHz, max. 50 mT (millitesla): Windings = 3.

Specifications

Measurement modes
Core loss measurement: Frequency (f) or maximum magnetic flux density (Bm) can be varied.
B-H curve measurement: Frequency (f) or maximum magnetic field (Hm) can be varied.
Permeability measurement: Frequency (f) can be varied.

Measured items
Core loss measurement: Max. magnetic flux density (Bm), residual magnetic flux density (Br), max. magnetic field (Hm), coercive force (Hc), core loss (Pc, Pcv, Pcm), phase (δ), amplitude permeability (μa), hysteresis loss (Ph), eddy-current loss (Pe).
B-H curve measurement: Max. magnetic flux density (Bm), residual magnetic flux density (Br), max. magnetic field (Hm), coercive force (Hc), core loss (Pc, Pcv, Pcm), phase (δ), amplitude permeability (μa), differential permeability (μdiff), square ratio (Br/Bm), total magnetic flux change (2φm)
Permeability measurement: Max. magnetic flux density (Bm), max. magnetic field (Hm), core loss (Pc), phase (δ), amplitude permeability (μa), inductance (L), complex permeability (μ', μ").

Operation modes
Single: One measurement step with one operation.
Continuous: Up to 12-step preset schedules (frequencies or amplitudes) can be measured continuously with one operation.

Set frequency
10 Hz (optionally 1 Hz) to 10 MHz, 2 digits effective
Accuracy: ±0.1% for the set value.

Measurement accuracy (23°C ±5°C)*
H amplitude measurement (dH): $\pm(2\% + 0.2\% \times (\frac{I_F}{I_r} - 1))$**
B amplitude measurement (dB): $\pm(2\% + 0.2\% \times (\frac{V_F}{V_r} - 1))$**
Phase accuracy (dδ): $\pm(0.15° + 0.07° \times (\frac{V_F}{V_r} + \frac{I_F}{I_r} - 2) + 0.02°)$**

Measurement time
Approx. 3 sec./step (when the measured frequency is 1 kHz or more)

Oscillating section
Oscillation frequency: 10 Hz to 10 MHz, sine wave
Output voltage/resistance: 0 to ±2.5 V/50Ω
Built-in excitation control in 3 steps of approximate value, asymptotic and demagnetization.

* Defined as the basic accuracy. The measurement accuracy may differ depending on the D.U.T. and the measuring condition. For details, please contact to Iwatsu.

** · V_F, I_F : Amplitude of Full scale
· V_r, I_r : Amplitude of Reading

Excitation section
Output voltage ±50 V max., output current ±1 A max. (≦ 1.1 kHz) or ±4 A max. (10 Hz (optionally 1 Hz) to 1 kHz).
Output impedance 1Ω + 0.1 μH, output power 25 VA.

Detection section (standard)
Excitation current detection
System: Voltage drop across two ends of non-inductive resistance.
Detection sensitivity: ±50 mA to ±5 A (1-2-5 steps)
Frequency bandwidth: DC to 100 MHz
Magnetic flux detection
System: Detection of voltage (induced voltage) across two ends of detection coil.
Detection sensitivity: ±50 mV to ±50 V (1-2-5 steps)
Frequency bandwidth: DC to 100 MHz

Storage section
Sampling rate: 512 times the set frequency (synchronized with the built-in oscillator).
Resolution: 16 bits

Display section
System: 9-inch color CRT
Contents: Measuring condition, characteristic values, B-H curve, characteristic graphs

Printer (Built-in)
Heat-sensitive dot line system. Paper width approx. 112 mm, printing time no more than approx. 5 sec.

External interface
GP-IB interface

Power supply
100 V AC (90 ~ 132 V) or 200 V AC (180 ~ 250 V)
Approx. 800 W (100 V AC)

Dimensions & weight
Main unit: Approx. 420W x 350H x 520L mm (excluding the pod),
Approx. 34 kg (SY-8232 mainframe + SY-301 measurement unit)

Environment
Operating temperatures +5°C to +35°C (+10°C to +30°C when the printer is used)

Performance guaranteed temperatures
+18°C to +28°C (after power on 60min.)

Provided accessories
SY-921 measurement pod (1 set), power cords (2), connection cables (1 set), estimation samples (1 set), adapters for calibration (1 set), Thermal paper (2 rolls), fuses (4), instruction manual (1), dust cover (1), accessory case (1).