

MESA Series Magnetic Measurement System

Hysteresis (BH) Loop Tracer
Magnetoresistance (MR/GMR)
Magnetostriction

NEW
ALL DIGITAL
SEMI / CE
APPROVED



Jhb
instruments, inc.

Setting the Standard in Magnetic Measurement Since 1976

Shb Instruments has been producing a line of industry-leading Magnetic Measurement Systems since 1976. Unlike competing instruments, the **MESA** Series uses the latest all digital circuitry and signal processing technology to measure *BH loops, magnetoresistance and magnetostriction on full, uncut wafers in real time* (10 loops per second), for faster, more convenient measurements in both R&D and production environments.

The **MESA** is fully certified to both SEMI and CE safety standards.

Higher field and 300 mm capability make the **MESA** perfectly suited for GMR, MRAM and other head and sensor applications.

The **MESA** combines unprecedented sensitivity and repeatability with *high field strength, in a new smaller and more cost-effective instrument*. It is designed for a wide range of sample sizes—from 2 to 300 mm in diameter.

This latest generation instrument features our easy

to use shbWin control software. The AutoTest point and click interface provides unprecedented ease of use as well as a production-ready recipe database.

The patented pickup assemblies (U.S. Patent No. 6,538,432) are available in models for various sample sizes, as well as those optimized for magnetostriction and other special purpose measurements. Wafer autoloading and autorotation are also available as options.

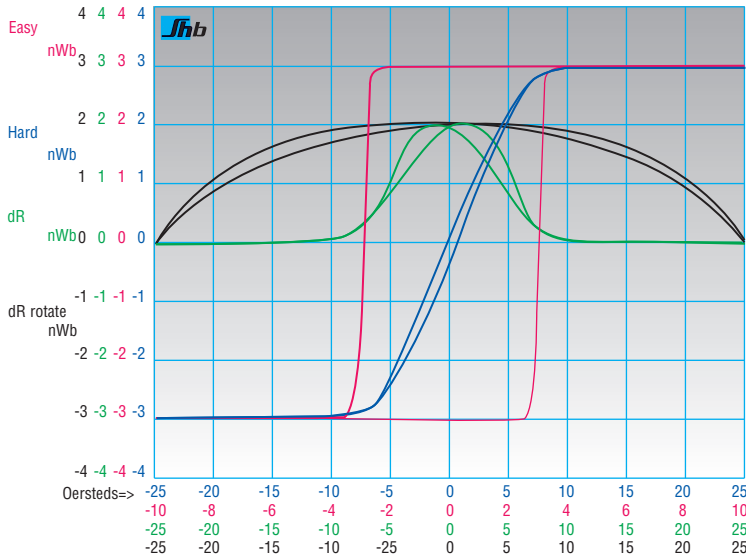
The **MESA** is the only instrument of its type that can make measurements in the frequency range of 10 Hz and below for maximum accuracy.

All instruments are equipped with a background subtraction feature, to digitally cancel ambient magnetic fields and allow for operation at extremely high sensitivities, even in relatively noisy magnetic environments. Any remaining noise is dramatically reduced by sophisticated new digital signal processing algorithms.

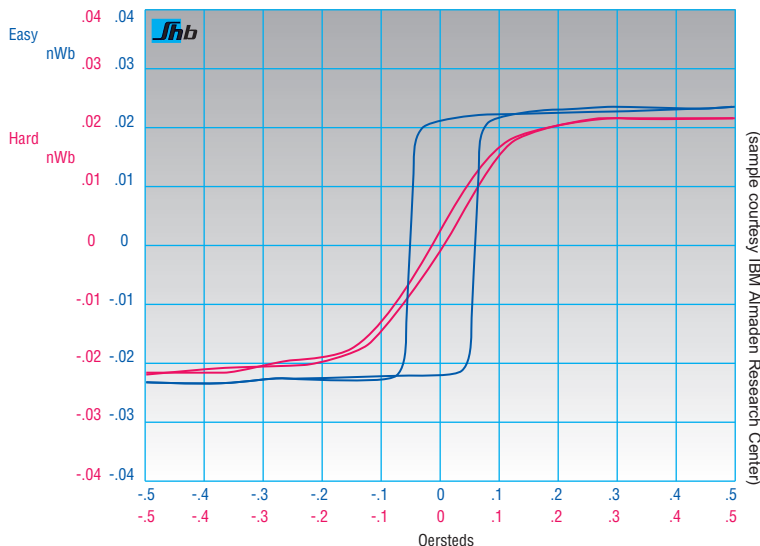


MESA-300

Shb Instruments MESA Series



14:07:07 Procedure: [Demo] Seq #: 1 Sweep averaging (15 sweeps)						
TEST	MEASUREMENT	CONSTANT	DRIVE	AVERAGES	FREQ	SIGMA
Bs h	2.996 nWb		25.00 Oe	10	10 Hz	.0042 nWb
Hk	6.764 Oe		3.513 Oe	10	10 Hz	
Hc h	.4843 Oe		25.00 Oe	10	10 Hz	.0228 Oe
Br h	.2136 nWb		25.00 Oe	10	10 Hz	.0106 nWb
Bs e	2.985 nWb		10.00 Oe	10	10 Hz	.0061 nWb
Thick e	387.9 A		10.00 Oe	10	10 Hz	
He e	.0023 Oe		10.00 Oe	10	10 Hz	.0076 Oe
Br e	2.974 nWb		10.00 Oe	10	2 Hz	.0096 nWb
Hc e	2.993 Oe		10.00 Oe	10	2 Hz	.0113 Oe
Dispk 50	1.773 deg		.2094 Oe	1	10 Hz	
Disps 50	1.753 deg		.7654 Oe	1	10 Hz	
Skew	0.774 deg		.3378 Oe	1	10 Hz	
R raw	1.278 Ohms			1		
R sheet	4.992 Ohms	*3.904		1		
Dr	2.055 %		25.00 Oe	10	2 Hz	
Dr rot	2.093 %		25.00 Oe	10	2 Hz	



The above waveform is from a 3Å thick sample, only 18 mm in diameter. On other hysteresis loop tracers, a sample with this tiny amount of magnetic material would show only noise, but the **MESA** is capable of producing quality hysteresis loops.

FEATURES:

- **Real time** measurements (ten loops per second)
- No need to cut wafers
- High sensitivity for measuring very small samples
- Excellent accuracy and repeatability
- Advanced DSP signal processing
- Optional autoloader and autorotation
- Accommodates wide range of sample sizes and thicknesses
- Magnetoresistance (MR/GMR)
- Magnetostriction
- Measurements (partial list)
 - Br
 - Bs
 - R
 - ØR
 - Hc
 - He
 - Hk
 - Magnetostriction
 - Dispersion
 - Skew
- Low-frequency sinewave sweeps (1 to 10 Hz)
- Field strength to 1000 Oe
- 0.01 to 10,000 nWb/division vertical sensitivity range
- Digital background subtraction to cancel ambient fields
- Earth's field cancellation
- Two-axis drive coils
- R and ØR probing without moving wafer
- Electronically reconfigurable probes with optional R/ΔR wafer mapping
- Cursor for detailed waveform measurements
- shbWin control software provides flexible and friendly instrument operation
- AutoTest point and click interface for R&D and production recipe management
- Supports user-written program control of all instrument functions and measurements
- Digitize multiple hysteresis loops; display on PC and save to disk
- Remote instrument operation and troubleshooting via modem or internet
- GEM/SECS support available

OPTIONAL PICKUP ASSEMBLIES

- Magnetostriction
- R/ Δ R Wafer Mapping
- Autorotation
- Autoloading
- Custom sample shape (e.g. bulk materials)



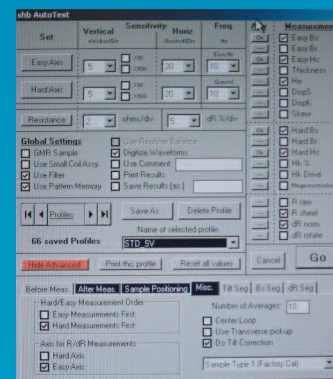
Pickup Assemblies



Solenoid Coil



shbWin Software



AutoTest Point & Click Recipe Interface

SPECIFICATIONS:

Substrate diameter:

2 to 300mm, depending on instrument model and pickup size

Models:

MESA-200:

200 mm (8 inches) maximum sample diameter

MESA-300:

300 mm (12 inches) maximum sample diameter

Maximum Magnetizing (H) Field:

MESA-200:

1000 Oersteds Normal axis; 100 Oersteds Transverse axis

MESA-300:

750 Oersteds Normal axis; 75 Oersteds Transverse axis

Induction (B) Field Range:

0.01 to 10,000 nanoWeber/division

Autoloader/Autorotator:

Optional

Repeatability:

<0.25%; <0.5% for 20Å films

Accuracy:

1% or better (can be calibrated to customer standard)

Resolution:

0.008% of full scale

Sweep Frequency Range:

1 to 10 Hz

Drive Amplifiers:

High-reliability amplifiers producing precision sinewave drive fields

Computer System:

CPU with LCD flat-panel monitor and color inkjet printer

Computer Software:

Microsoft Windows XP; *Shb Instruments shbWin* control and programming package; *Shb AutoTest* recipe database management; Remote control and diagnostic software; GEM/SECS support available

Dimensions:

50 in. (127 cm) H x 48 in. (122 cm) W x 33 in. (84 cm) D

Drive Coil Diameters:

MESA-200:

15 in. diameter Normal axis solenoid; 18 in. Transverse axis

MESA-300:

20 in. diameter Normal axis solenoid; 25 in. Transverse axis

Power Requirements:

115/220 Volts AC, 20 amps, 50/60 Hz