PVA TePla

Wafer Metrology System TWIN™ A200 / A300

- Monitoring System for Implant processing
- For monitor and product wafers up to 300 mm

Metrology Systems

PVA TePla

Advanced Wafer Metrology

The TWIN A200/300 is a fully automatic photothermal measurement tool for the semiconductor industry to monitor ion implantation dose as well as metal film thickness. Using a focused laser beam, it operates contactless and non-destructive. It is suitable for measurement on product wafers and delivers high resolution measurement data, especially in the low dose range.

Applications

- Control of implantation dose & energy
- Measurement before as well as after anneal
- General characterization of radiation damage to semiconductor
- Characterization of thin non-transparent layers

Software

- Graphical user interface based on a 32 bit Windows platform for controlling the system
- Wide range of user-defined measurement procedures
  - Mapping with up to 500 points
  - Micro-uniformity
  - Micro-scan
  - Time depending measurement
  - Line scan up to 300 mm
- Various options for monitoring and visualizing measurement results (1D, 2D, 3D, coloured)
- Measurement data calibration (dose, metal layer thickness, oxide thickness)
- Pattern recognition for measurement on product wafer
- Accumulating trend information
- Output options (printing graphics, numerical data files)
- SECS/GEM interface for host communication
- Software support for diagnostic and maintenance

Technical Data

Measurement Module	
Measurement principle	Single beam technology, double modulation
Scanning unit	X–Y 300 mm stage with vacuum chuck
Control unit	Industrial PC (P4, OS WIN)
Handling Module	
Handling unit	Robot with prealigner and slot scanner
Load port	Open cassette load port (bridge), SMIF/FOUP-load port optional Filter Fan Unit
Clean Room compatibility	
Housing	Stainless steel, clean room class 1 compatible
Filter Fan Unit	H14 or U16
Operation Conditions and Parameters	
Wafer Diameter	150 mm, 200 mm, 300 mm
Wafer support	Vacuum wafer chuck
Ion Implantation Process Control	
Species	B, P, Si, BF_2, Ar, As, Ga, In, He, Sb, H_2
Dose range	10^{10}– $5x10^{16}$ ions/cm^2
Energy range	1 keV–100 MeV
Layer Thickness Measurement	
Metal	Al, Ti, TiN, TiW
Thickness	40 nm–1,2 µm
Resolution	1 nm
General Performance	
Short term repeatability K	0.5% (1s) for ion implantation process control
Long term repeatability K	1.0% (1s) for ion implantation process control
Throughput	8 wafers/h, 12"-wafer, 96 points map
Laser Diodes	
Laser wavelength	785 nm
Laser power in spot	4-16 mW
Effective spot radius	3 µm
Modulation frequency	5 kHz–15 MHz
Laser Safety Class 1	
Dimensions	
Foot print	1350 x 1400 mm (53" x 55")
Total weight	700 kg (1540 lbs)
Media supply	
Electricity	230 VAC, 50 Hz standard, power <1.5 kVA
Compressed air	6 mm Festo QS, input pressure 4-6 bar
Vacuum	Pressure <20 kPa, flow 4 m^3/h
Environmental Conditions	
Temperature	22°C ± 1°C
Relative humidity	<60%

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