MicroSense

UltraMap C200L

Wafer Flatness Measurement System

Precise Automated Measurement for High Volume Silicon Wafer Manufacturing

High Repeatablity, Industry Standard Measurement of:

- Wafer Global Flatness and Site Flatness
- Wafer Thickness
- Wafer Shape – Bow, Warp, SORI
- Wafer Resistivity and Wafer P/N Type

High Throughput System

- Measure 32% more wafers per shift compared to ADE 9600

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Flexible Wafer Characterization System for In Process Control and Outgoing Quality Assurance

MicroSense UltraMap - A Better Approach to Silicon Wafer Measurement

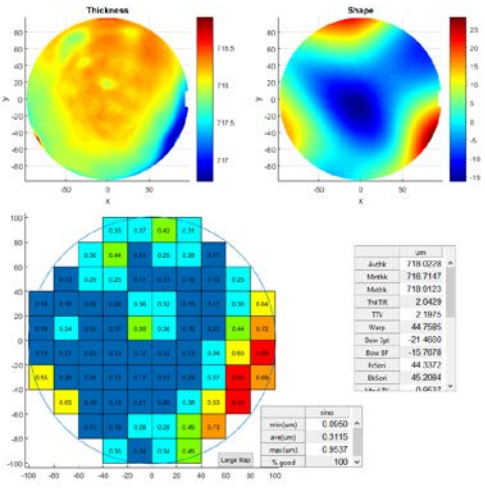
- Reduce 200mm wafer measurement time – industry leading 1.25x higher throughput – 56 wafers per hour in E++ equivalent mode, with full wafer mapping and 2mm edge exclusion
- 90+ wafers per hour in E emulation mode, with 3mm edge exclusion
- Nanometer resolution, dual probe MicroSense capacitive measurement system for high sensitivity and high repeatability measurements in compliance with SEMI standards
- Measures over 200,000 data points per 200mm wafer
- Fully automated in machine Auto-Calibration – more wafers measured each shift
- Designed for reliability and long term support - UltraMap has a modern, high reliability system design with direct drive precision air bearing r-theta wafer stage and software running on Windows computer.

Sorting after Inspection

The UltraMap system sorts wafers after wafer measurement based on based on pre-defined quality criteria. The system includes a high speed dual paddle robot, pre-aligner and 5 cassette stations (2 in, 3 out) for sorting flexibility.

MicroSense UltraMap – System Configuration

- Non-contact 200 mm precision air bearing r-theta stage
- Dual arm Robot and pre-aligner
- Kinematic 3 point wafer holder
- Cassette sorting; 5 cassettes (2 in, 3 out)
- Integrated light curtain safety system
- Optional SECS/GEM interface
- Optional Resistivity, Low or High or both
- Optional P/N type sensor
- Dual sided SEMI standard capacitance measurement
- 2mm edge exclusion
- Completely programmable measurement path, including legacy system emulation. 1.9mm standard measurement ring spacing.



- UltraMap software has 2D and 3D mapping - save and export wafer maps

UltraMap C200L

Silicon Wafer Flatness Measurement System

Specifications

	Accuracy	Repeatability (1 sigma)	Absolute Range
Thickness	±0.25 µm	0.06 µm	Nominal ±150 µm
Global Flatness	±0.06 µm	0.02 µm	
Site Flatness	±0.06 µm	90% of sites: 0.011 µm	
		10% of sites: 0.025 µm	
Shape (Bow/Warp)	±(1.5 + 3% of reading) µm	±(0.5 + 1% of reading) µm	±150 µm

All accuracy and repeatability specifications reported for a 200mm diameter wafer of nominal 725 micron thickness with 0.1µm STIR and 0.9 ohm-cm resistivity.

Wafer Properties	
Material	Silicon wafer - etched, lapped or polished
Wafer diameters	200mm diameter (option for 150mm)
Wafer thickness	300µm to 1200µm
Notches, Flats (Primary/Secondary	Up to 2 notch or flat per SEMI standard
Edge Exclusion	Adjustable; up to 2mm from wafer edge
Data Density and Throughput	
Number of data points, full wafer map	>200,000 for 200mm wafer
System throughput – 2mm edge exclusion	**56** 200mm wafers per hour with full wafer mapping
System throughput – E emulation mode, 3mm edge exclusion	**90+** 200mm wafers per hour with full wafer mapping
Option – Resistivity Measurement	
Low range module – measurement range	0.001 – 0.999 ohm-cm
High range module – measurement range	0.2 – 199.9 ohm-cm
Resistivity Gage configuration – low, high or both	
P/N Type sensor - optional	Non-contact detection of wafer P type or N type
Wafer Sorting and Cassettes	
Sorting criteria	Configurable sorting, numerous binning options
Number of Cassettes	5 cassettes standard - 2 in, 3 out typical
Wafer Measurements	
Wafer Thickness	Full wafer scan, 5 point or center point
Shape	Bow/Warp/SORI using 3-Point or Best Fit references
Global Flatness	SEMI GBIR, TIR, FPD, FPD%, 5 Point TTV
Site Flatness	SFQR/SFQD, SBIR/SBID and all SEMI M1 standards with 8-30mm sites size and variable offsets
Options	
Resistivity gage (low high or both), P/N type sensor, edge grip end effectors and edge grip pre-aligner, SECS/GEM Interface, optical annealing for very high res wafers	
Machine Certifications	SEMI S2, CE

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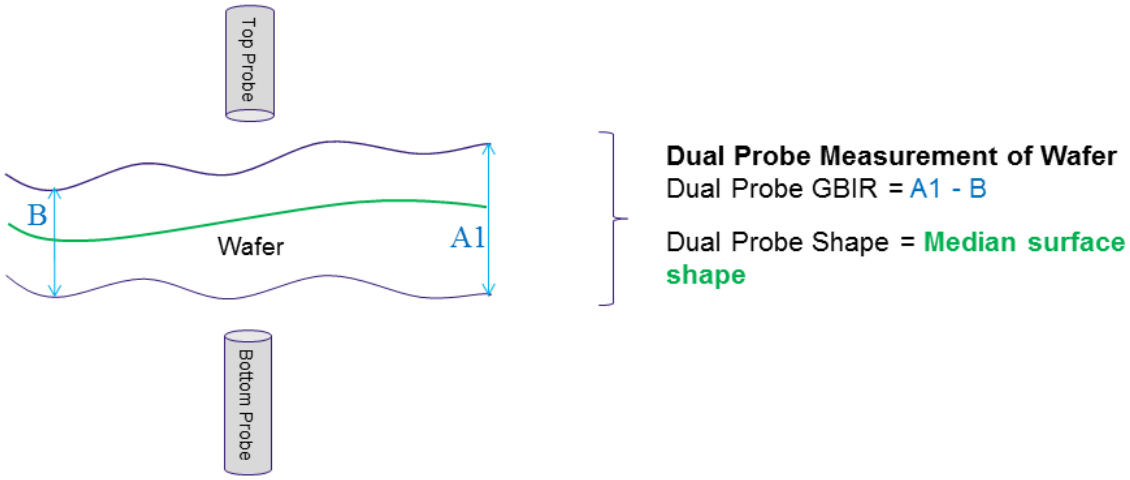
Silicon Wafer Flatness Measurement System

Accurate Dual Sided Wafer Measurement

The MicroSense dual probe capacitance measurement system directly and accurately measures the true Thickness and Shape of the wafer in compliance with SEMI standards. Data for all wafer measurements is taken at the same time - no second measurement is ever required.



- The SEMI standard GBIR metric by definition is the difference between the thickest point on the wafer minus the thinnest point on the wafer.
- Bow and warp measured with the median surface per SEMI standard

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