Integrated Wafer

WAFER BASED METROLOGY

Wireless SensorWafer™
PhotoResist Bake Plate
Prober Hot Plate
Integrated Wafer

WAFER BASED METROLOGY

LOW PROFILE WIRELESS AND HIGH ACCURACY

- High sampling rate for accurate transient zone
- Low profile design
- Fully embedded components for artifact-free
- 0.1°C accuracy
- Low cost per test due to field replaceable batteries

WIRELESS TEMPERATURE METROLOGY FOR IN SITU MEASUREMENT OF HOTPLATES

Now you can monitor and maintain your semiconductor manufacturing processes without disrupting production. The Integrated Wafer system incorporates a complete temperature metrology system within the wafer, gathering data through the entire process without the limitations of wires and connectors. As a result, you can get both static and dynamic temperature measurements for your critical production processes — from transport, heating, cooling, and steady state operations. Economical and convenient to use, the Integrated Wafer offers the practicality, accuracy, and performance you need to optimize your processes.

Look to it when you want to characterize thermal dose uniformity, or use it to analyze segments of the thermal cycle and relate them to critical dimension uniformity. The Integrated Wafer helps you quickly diagnose and correct process or equipment problems. Many advanced technologies and design techniques have been built into the Integrated Wafer, making it the most convenient tool for production surveys. By integrating all components within the wafer itself, the wafer profile is less than 0.5 mm above the surface, allowing it to be used in almost all equipment without interference.

Due to the fact, all measurement components are embedded into the Integrated Wafer, its thermal mass and dynamic response are equivalent to that of a standard production wafer of equal diameter and thickness. This preserves the accuracy of the measurements, producing artifact free data, and does not alter the hot plate response due to added thermal mass.

AT A GLANCE

| Accuracy | +/- 0.1 °C |
| Sensor-to-Sensor | 0.1 °C |
| Sensor Type | IC Micro die |
| Maximum Process Temperature | 145 °C |
| Sensor Quantity | 65 - 300 mm, 53 - 200 mm |

SPECIFICATIONS

| Measurand | Temperature |
| Sampling Frequency | 4 Hz |
| Operating Range | 15-145°C |
| Substrate Material | Silicon |
| Sensor Coating | Filled Polyimide |
| Additional Height | 0.5 mm |
| Weight | Balanced mechanical and thermal < 20 µm |
| Flatness | Class 100 double bagged |
| Factory Cleaning | Field replaceable battery |
| Power System | Wireless RF or pogo pin recharge and communications |
| Communications | Autonomous |
| Recharge | FOUP Basestation 300 |
| Storage | 1500 thermal cycles or 6 months |
| Calibration Life | $4 US |
BENEFITS OF USING THE INTEGRATED WAFER

- Deliver tighter CD uniformity from the litho cell
- Easy access to narrow gap plates
- Optimize prober recipes and throughput
- Extend time between maintenance cycles
- Improve tool-to-tool and plate-to-plate matching

COMMON USES

- Process visualization
- Tool installation and start up
- Engineering analysis
- Troubleshooting assistance
- Plate matching
- PM qualification
- Process optimization
- Production monitoring

ADVANCED ANALYSIS BUILT-IN

The Integrated Wafer data files are fully compatible with powerful analysis software, providing the intelligence necessary for optimizing the entire process. Static and dynamic temperatures recorded during the thermal survey are stored inside the memory of the Integrated Wafer and later downloaded for analysis. The analysis software leverages graphic data and statistical tools to provide you with a deeper and more comprehensive understanding of your equipment’s thermal data, allowing you to implement long-term optimizations to your processes. The Configuration Setup Software for the Integrated Wafer allows you to take control of your measurements. Depending on the measurement parameters that you set, the wafer offers between four and twenty minutes of continuous operation so that you can thoroughly analyze your process. With 52 kilobytes of on-board memory, the Integrated Wafer has enough capacity for the most comprehensive process surveys.

POWERFUL AND CONVENIENT

With the Integrated Wafer, you get a system that is both powerful and easy to use. It is engineered for convenience: just deploy the wafer robotically from the SensArray Base Station using standard wafer handling equipment and it’s ready to survey the production path. When the process is complete, the Base Station manages downloading and communication of wafer data. The 300 mm Base Station is built into a front opening unified pod (FOUP) to protect and transport the Integrated Wafer throughout the most advanced, automated fabrication facilities, and enables use with a variety of load port variations.

THE RIGHT TOOL FOR PRODUCTION SURVEYS

The innovative Integrated Wafer is ideally suited for production surveys to help you discover when you need to tune your processes and equipment. Once you’ve identified the problem spots, you can utilize advanced software solutions for real-time fine tuning.

Upload the thermal measurement survey requirements to the Integrated Wafer, including sensor selection and scan rate
Download thermal survey data from the Integrated Wafer
Recharge the batteries in less than ten minutes
Transfer survey measurement data immediately to a computer through a USB link
KLA-TENCOR SERVICE and SUPPORT
Customer service is an integral part of KLA-Tencor's portfolio that enables our customers to accelerate yield. Our vast customer service organization collaborates with worldwide customers to achieve the required productivity and performance at the lowest overall cost. K-T Services includes comprehensive contracts, time and materials, spares, asset management, customer training, and yield consulting.