

WaferSense™ AGS (Automatic Gapping System)



Precision Wireless Gap Measurement

WaferSense™ AGS measures gaps that are critical to the outcome of semiconductor processes such as thin-film deposition, sputtering and etch. It uses a capacitive sensing technique (patent pending) that consists of three sensors and responds to the proximity of a conductive electrode, such as a shower head, to return live gap measurements that display on your laptop or PC in numerical and graphical form. Since AGS is wireless and wafer-like, it can be handled automatically to speed equipment setup and maintenance.

Improve uniformity and yield with wireless gap measurement system for accurate and reproducible setups

Measures gaps at three points to allow you to achieve the ideal setup for your equipment.

Whether you need to set a gap that is perfectly level or slightly tilted to achieve the best uniformity, the three AGS sensors each report separate readings in numerical and graphical form to let you achieve exactly what you need.

Objective and reproducible gap adjustments result in better tool-to-tool process uniformity.

Take the human variable out of adjusting your equipment with objective (numerical) measurements. Numerical and graphical displays make it easy for you to make the right adjustment time after time. That not only lets you set the right gap, it lets anyone set the same gap across all of your tools for better tool-to-tool process uniformity.

Reduce equipment calibration time through live feedback.

GapView™, the graphical user interface provided with AGS, displays numerical and graphical measurements in either millimeters or inches from inside a sealed process chamber, letting you see the effect of your adjustments in real time. Graphical indicator gauges clearly indicate when equipment settings are within your tolerance.

Wireless technology eliminates broken wires and vacuum leaks.

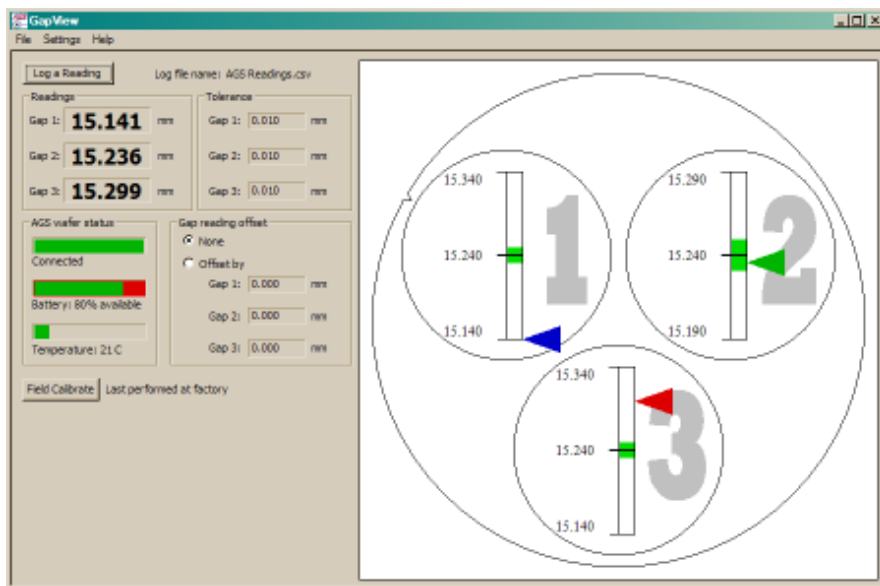
Wireless technology means WaferSense AGS has no wires that can break after repeated use, will not misalign as a result of the vacuum pulling on wires and a better range of mobility while making adjustments.

Automatic handling speeds setups, maintenance and troubleshooting.

Since the AGS wafer is wireless and has a wafer-like shape at a height of only 7.5 mm, it can be handled automatically by some tools while the chambers are closed to speed setups, maintenance and troubleshooting.

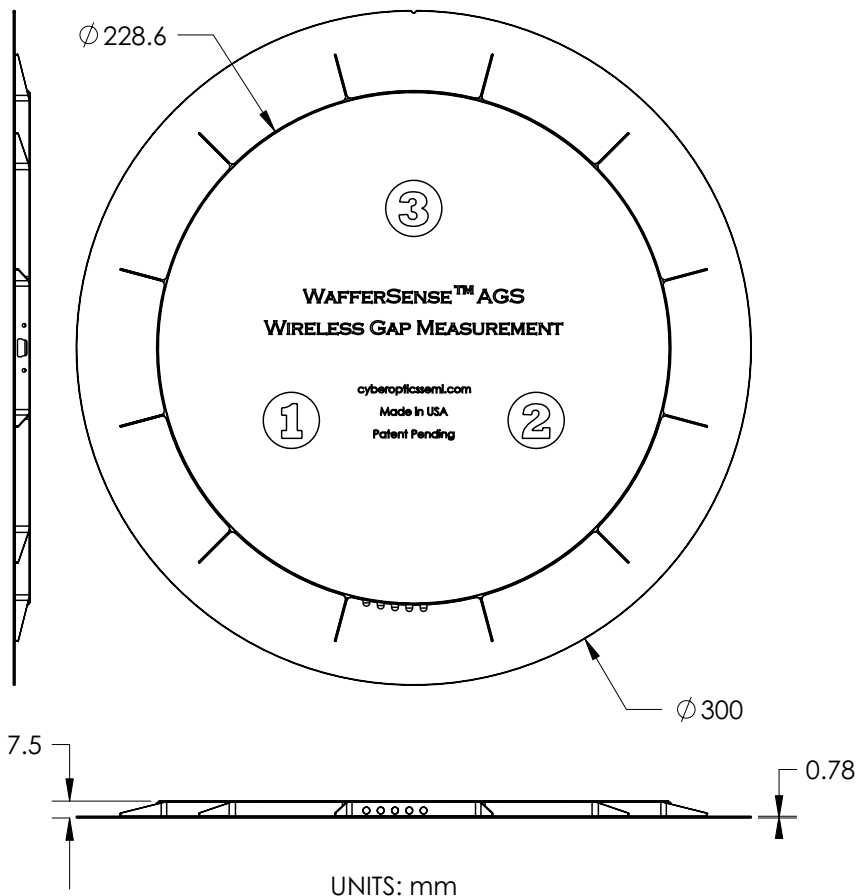
Preliminary

GapView™



GapView's live display includes three intuitive graphics (one for each capacitive sensor inside AGS) as well as a digital readout to make adjustments a snap.

Dimensions



Features

Wireless, wafer-like. The gap measurement wafer can be handled and placed automatically as a process wafer inside a sealed chamber (depending on clearance).

Package materials. Anodized aluminum.

Form factor. Diameter 300mm. Height 7.5mm (0.295"). Weight 400 grams.

Working distance. Measures gaps from 9mm to 20mm (0.35" to 0.79").

Parallelism accuracy. $\pm 0.025\text{mm}$ (0.001") with gap of 15mm (0.6").

Gap accuracy. $\pm 0.25\text{mm}$ (0.01") with gap of 15mm (0.6").

Operating temperature. 20°C to 80°C.

Operating pressure. 760 to less than 10^{-6} Torr.

Battery operation. Operates for 4 hours without recharging (achieves full charge in 2 hours).

Charging. The gapping wafer draws power from an electrical outlet to charge its battery while not in use.

Bluetooth wireless communications. Uses the 2.4 GHz radio frequency band to communicate with communications link that connects to host computer USB port.

GapView™ application software. Displays numerical and graphical gap information. Each graphic is color-coded to make it easy to see whether it is above, below, or within the selected target gap range.

Data logging. GapView can log time-stamped measurements to a CSV (comma separated values) file for documentation and/or analysis.

Operating systems. Windows 2000, XP and Vista.

Product components. Gapping wafer, charging clean box, USB communications link and GapView application software.

Options:

- **Calibration tool.** Precision gap allows gapping calibration in clean room.
- **Novellus Vector® adaptor ring.** Allows robotic transfers in chamber.



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