

## **New Wireless 450 mm WaferSense® Auto Vibration System (AVS)**

*The 450 mm AVS reduces wafer defects and improves die yield. It is available by special order.*

The R&D group at CyberOptics Semiconductor has developed a new 450 mm form sensor in conjunction with industry standards. The tool is designed to help fabs develop and qualify next-generation processing equipment via real-time tracking of the acceleration and vibration experienced by wafers. The WaferSense® Auto Vibration System (AVS) travels through process areas as a wafer does. It reports real-time acceleration data in all three axes (x, y, z) for engineers to identify vibration sources before they impact yield.

CyberOptics worked with representatives of the International Sematech Manufacturing Initiative (ISMI) to develop the 450 mm AVS. The sensor is designed for inclusion in ISMI's 450 mm Interoperability Test Bed where industry researchers have begun studying 450 mm wafers and handling equipment. ISMI's 450 mm roadmap calls for three International SEMATECH manufacturers -- Intel Corp., Samsung Electronics and Taiwan Semiconductor Manufacturing Co. (TSMC) -- to build 450 mm pilot lines capable of 22 nm processing by approx. 2012. Volume production may begin as early as 2014 or 2015, according to Semiconductor International.

“There's a direct relationship between yield and the speed and vibration of equipment across the fab, which is supported by the metrology data,” said Craig C. Ramsey, Ph.D., general manager and CTO of CyberOptics Semiconductor. “And with level of automation at 450 fabs and shrinking tolerances, establishing controls for vibration and acceleration will be even more vital to optimizing production.”

Ramsey added that the AVS' companion software, VibeReview™ helps process engineers establish yield-based vibration standards for process equipment and technicians. The software allows engineers to identify links between vibration frequency and likely sources. With the software the user can set acceptable acceleration parameters for equipment.

Engineers use the VibeReview™ software to analyze stored log-file data. With this feature they can compare different run-times, tools and trigger values for acceleration during wafer transfer in x, y and z directions. Users establish ongoing, real-time spec limits or go, no-go values, including RMS. They can also pause and resume data recording, create log-file titles and export data to Excel and MATLAB.

WaferSense AVS' key specifications and features include range of +/- 2G, resolution of +/- 0.01G, frequency response of 0-200Hz, -3dB, operating pressure of 760 to less than 10<sup>-6</sup> Torr, operating temperature of 20 to 70 degrees Celsius, wireless Bluetooth link, four hour run-time per battery charge and use with Windows 2000, XP and Vista. The AVS is also available in 300 mm and 200 mm for factors.

The WaferSense AVS package includes the vibration-sensing wafer, USB-compatible link, VibeView and VibeReview graphical software CD, charging case and suitcase.

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