> **Industry**
Semiconductor

> **Application**
Yield Analysis

> **Product**
JWAVE

The Integrated Circuit Solutions, Inc., ICSI, was incorporated in 1990 in the Hsinchu science-based industrial park. They specialize in the design, manufacturing, and sales of a wide range of high performance CMOS ICS as its core businesses. Their products are used mainly in personal computers, peripherals, industrial controls and communications devices. In 1999, ICSI was spun off from its us based parent company ISSI and became an independent entity as an IC design company.

Visual Numerics®
Developers of IMSL and PV-WAVE

> **JWAVE provides Web-based Interactive Yield Analysis for IC Design House Engineering Data Analysis (EDA) System**

" The greatest benefit of JWAVE's Web-based data analysis system is saving time. Now with the new data analysis system, engineers can carry out real time analysis and quickly find the accurate yield parameters and send them to the fabrication plant, saving more than 50% of time with improved work efficiency. "

Mr. Chen
Manager of ICSI

I QUICK FACTS I

Integrated Circuit Solutions, Inc. (ICSI) used JWAVE from Visual Numerics to build a web-based data analysis system to view and analyze wafer manufacturing data in real-time, significantly increasing efficiency and accuracy of the manufacturing process. With the new data analysis system, ICSI engineers can carry out real time analysis and quickly find the most accurate yield parameters to send to the fabrication plant.

I THE PROBLEM I

Usually, IC design companies, which are also know as fabless companies, will contract their IC design products to a wafer foundry for manufacturing. After production, an IC Design House or a test unit will carry out various tests to determine the yield and then package them into chips. In the entire design and production flow, the IC designing company obtains the wafer acceptance test (WAT) data from the foundry and yield data from the packaging and testing plant. Then, the IC designing company will analyze the two types of data and find out the cause for low yield during manufacturing and provide feedback to the foundry for process improvement. While each step in the process is necessary, it was taking much too long to complete.

I THE SOLUTION I

ICSI began to investigate ways in which a new web based engineering data analysis (EDA) system could save time in their procedures. In their search for an engineering data analysis web solution, ICSI turned to JWAVE from Visual Numerics.

JWAVE is Web-based software that supports Java Technology such as Java class, applets and java server pages. It allows users to quickly access and understand what their data means, from

- Built-in statistical methods
- Web-based 3-tier architecture
- Real-time analysis of data
- Quickly identify inefficiencies in manufacturing processes and make corrections Manipulate graphics intuitively
- Java applet technology
- Cross analysis of data
- Improves manufacturing process considerably

anywhere, at anytime. Based on a multi-tiered architecture, JWAVE lets users easily create applications that embrace open standards and will grow as their organization grows.

With JWAVE, engineers have the ability to enter the system via Microsoft IE browser at any time and select the data to be analyzed for a certain timeframe through a Java user interface. The system reads data from the database and carries out calculations, analysis using the built-in JWAVE statistical methods and presents the result in graphic form. Because of the use of a Web-based 3-tier architecture, the new data analysis system was easily integrated into the company's other e-systems.
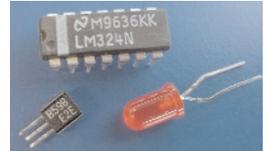
ICSI engineers can now manipulate the graphics in an intuitive and interactive way thanks to the use of Java applet technology. They are able to do a variety of things such as clicking on graphic data points to display related information, selecting an area of the graphic for real time zooming in or out and changing the bin color of the wafer. Interactive graphic analysis has revolutionized traditional static graphic displays, allowing engineers to carry out cross analysis of the data.

The integrated system has consolidated WAT (wafer acceptance tests), yield and FT data analysis into a single environment. This allows engineers to analyze various functions of the modules using maps to analyze yield bin data. By analyzing low yield products and then analyzing the modules using WAT, engineers can obtain the correlation coefficients between different parameters and find the electrical parameters to be used by fabrication plant engineers to improve the manufacturing processes.

l RETURN ON INVESTMENT l

According to Mr. Chen, Manager of ICSI, the greatest benefit of JWAVE's Web-based data analysis system is saving time. Previously, engineers would download the WAT or yield data to their own computers and then analyze individual data using programs such as Excel. Therefore, the procedure was not economical both in terms of time and efficiency. Now, with the new data analysis system, ICSI engineers can carry out real time analysis and quickly find the accurate yield parameters to send to the fabrication plant, saving more than 50% of time with improved work efficiency.

| WORLD CLASS PRODUCTS, SERVICES, AND SUPPORT |

For over 30 years, Visual Numerics, with its PV-WAVE and IMSL product families, has provided trusted visualization and numerical analysis tools to thousands of technical professionals in a broad range of industries around the world. Scientists, researchers, educators, engineers, developers, Intranet managers, testers and analysts use Visual Numerics' development tools to solve problems, identify trends and share results.

The PV-WAVE Family has all of the functionality you need in one tool, including an open software environment allowing for integration with new technologies, and the IMSL Library which delivers over 370 mathematical and statistical routines, creating the most powerful data analysis software available. The IMSL libraries can dramatically accelerate development by reducing programming time by up to 95%.

The PV-WAVE Family provides a broad range of easy to use, high performance solutions for any type of data challenge, while delivering significant return on investment through maximum productivity.

Visual Numerics partners with its customers to provide world-class products, services and support. We have unparalleled technical support that can answer the hard questions fast, and responsive consultants that can provide in-depth expertise and timely delivery of time-critical solutions.