

GENESIS MICROCHIP

Genesis Microchip Implements Enterprise Yield Management System Operational efficiency improved by 50% with significant cost savings

Today's larger and more technologically advanced televisions require display controllers from Genesis® Microchip Inc. to produce vibrant images. As the leading supplier of display image processors in the flat-panel TV and LCD monitor markets, Genesis decided to invest in an Enterprise Yield Management System from Syntricity to improve production efficiency, reduce time to market, and lower costs.

The Company

Genesis Microchip Inc. (Nasdaq: GNSS) is a leading provider of image processing systems enabling superior picture quality in flat-panel TVs and a variety of consumer and PC-display products. Featuring Genesis Display Perfection® technologies and Emmy award-winning Faroudja® video technologies, Genesis system-on-a-chip solutions are used worldwide by display manufacturers to produce visibly better images across a broad array of devices including flat-panel displays, digital TVs, projectors, A/V receivers and DVD players/recorders. The Genesis technology portfolio features analog and mixed signal system-on-a-chip design, DCDi® by Faroudja deinterlacing, TrueLife™ video enhancement, IntelliComb™ video

decoding and includes over 185 patents. Founded in 1987, Genesis supports its leading brand-name customers with offices in the U.S., Canada, India, Taiwan, South Korea, China, Japan and Singapore.

The Challenge

Given that a majority of the growth of the company came through multiple merger and acquisition activities, each additional product line had its own yield challenges that needed to be addressed quickly. The data collection, entry, and reporting processes were cumbersome, costly, and error-prone. Vendors had to send daily yield reports, and each vendor had one person whose sole job was to archive the information. Since data was coming from Asia, managers in the U.S. had to log on at midnight to see the most current data on the server.

Genesis engineers had a difficult time determining problem areas or analyzing the data because there was not one data-set and the information was old before they received it. In addition, they wanted to see parameter and yield trend data more quickly. To meet its forecast and its commitment to maintain high product yields, Genesis management wanted to automate this process.

“Genesis Microchip selected dataConductorEP and AMP because they greatly reduce the chance of errors. The system was designed by a group of Syntricity engineers with a product and test background, enabling them to develop a yield management program that met our engineers’ requirements. Without this system, we would need approximately three times the size of our current organization to achieve the same results.”

—Mohammad Tafazzoli,
Genesis Microchip’s
Senior Vice President
of Operations



Selecting an Enterprise Yield Management (EYM) Solution

Genesis needed a way to aggregate, view, and analyze yield data to enhance productivity and output as well as reduce costs. They also wanted a vehicle to communicate real-time data with all engineers, managers, and suppliers, anywhere in the world, on a 24-hour basis.

After a thorough search and vendor assessment, Genesis chose the dataConductorEP® Enterprise Yield Management system from Syntricity. The company initially selected dataConductorEP for characterization and yield management, then added Syntricity's Advanced Monitoring for Production (AMP™) tools in March 2006. dataConductorEP is offered as a hosted solution, eliminating any additional investment in Genesis's IT infrastructure to use it.

What is dataConductorEP and AMP?

dataConductorEP automatically collects data throughout a manufacturer's supply chain from various manufacturing systems and combines them into a single warehouse to manage yields during characterization, yield ramp, and volume production. Foundry, Sort, Assembly, and Test data are collected from diverse processes and facilities in a wide variety of formats and transformed into usable information that can be charted, graphed, and analyzed. Users seamlessly link from the broad views of data for all devices to specific data points at the individual lot, wafer, or die level, with on-demand access to yield and parametric information.

The system includes Advanced Monitoring for Production (AMP), which allows drill-down, drill-up, and drill-through of the data, sorting of the underlying data, and views for root cause analysis. Its genealogy module provides traceability of material through all the operations, regardless of attribute changes such as lot or device name. This enables automated material matching when correlating wafer sort or final test results to Fab WAT or PCM results. The system can interact with other enterprise management systems, such as Manufacturing Execution Systems (MES), Material Resource Planning (MRP), Enterprise Resource Planning (ERP), and financial reporting systems. All stakeholders in the business can easily access the data through any Internet connection.

"What we like about Syntricity's solution are its cost-effectiveness and easy implementation," said Mohammad Tafazzoli, Genesis Microchip's Senior Vice President of Operations. "Additionally, Syntricity is responsible for warehousing and managing the data while also handling any problems related to the system. Best of all, the system can be accessed from anywhere at anytime by us and all of our vendors, as long as there is Internet access."

Yield Management at Genesis Microchip

Genesis Microchip is a fabless manufacturer with multiple vendors for fabrication, wafer probe, assembly, and test, located throughout the world. Data from these operations automatically feeds into Syntricity's dataConductorEP system every two hours, where it is cleansed and presented for analysis in

a central data warehouse. The combined results are available for Genesis management and engineers to view each morning. Data from each operation can be viewed side by side, analyzed, and compared.

"The factory runs 24 hours a day, but we can't be there 24 hours a day," stated Pradeep Sahu, Genesis Microchip's Director of Product/Test Engineering. "By using Syntricity, we can access the data when we need it and are able to determine if there is a yield issue."

Sahu continued, "For example, if there is a problem in the fab or a problem in an assembly process, it is reflected in the yield number. It also shows us in which area the problem occurred. Then we can determine the root cause of the problem. Usually within 12 hours we have the direction and steps needed to fix the problem."

Using the AMP system, Genesis brings Manufacturing Execution System (MES) data from its Work in Process (WIP) system. Genesis imports that information into AMP in order to track what production control is seeing in terms of quality, both in and out, versus what the test data shows. A visual comparison of the move yield from the MES and the yield data from the engineering systems provides a continuing series of checks and balances.

Data is presented in chart or graphic format, and the entire data warehouse of information can be accessed. Providing one source for the data in a visual representation that everyone can view helps eliminate diverse interpretations of the data. With everyone looking at the same data

and focusing on the same problem, significant gains in efficiency occur.

“With AMP, on any given day we can log on and view the most current data. It is a dynamic system, not static. Our efficiency has improved by 50%. Even though the amount of data has doubled from last year, the amount of work has decreased because of dataConductor’s efficiency in handling the data,” adds Billy Vu, Genesis Microchip’s Product Engineering Manager.

When developing new products, Genesis uses the characterization tool in dataConductorEP to help them analyze the process and identify if any area is more sensitive to a particular product or likely to cause a problem. They can also analyze how the process affects yield. By being able to analyze characterization data, they can determine if the sweet spot is optimized and work with the fab to adjust the process to achieve high yield targets for the long term.

Getting Results

Genesis’s product engineering group is responsible for the yield analysis on a daily basis. This team looks at yield trends for any given product in production, concentrating on lots where the trend is going down. Because the data is dynamic and continually updated, they can react quickly to determine the source of any yield issue.

Pradeep Sahu commented, “With dataConductor and AMP, we can eliminate the need to keep running the process over again. With this system, we run the process once and it automatically and dynamically updates the data. Data is feeding into the system every two hours, so when we arrive the

EYM Process Flow

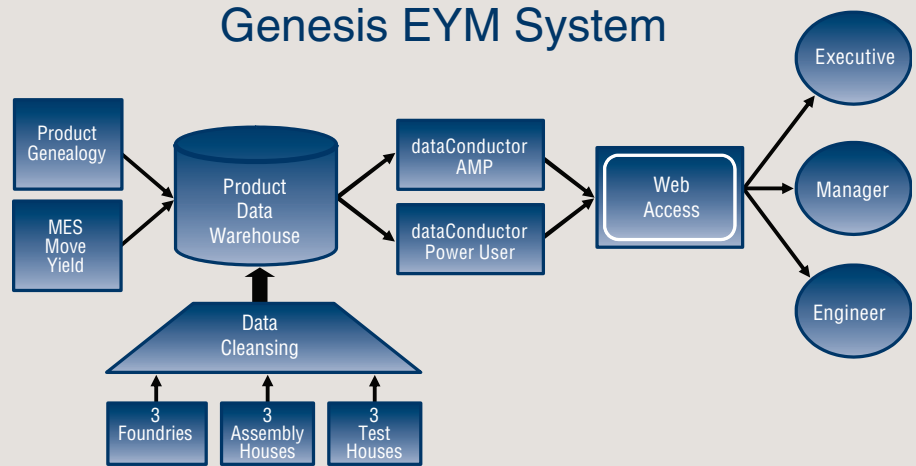


Figure 1 Genesis EYM system process flow

Figure 1 charts the process flow of Genesis Microchip’s enterprise yield management system. Data from foundries, assembly houses, and test houses is cleansed and stored in a product data warehouse. MES move, yield, and productivity data is also entered. Syntricity’s dataConductorEP and AMP tools analyze and chart the data. Complete access to the data, reports, and analysis is readily available on Syntricity’s hosted website to Genesis Microchip engineers, managers, and executives.

data is updated, and the data crunching is already done. All we have to do is start analyzing the issues we need to focus on.”

Genesis Microchip’s Senior Vice President of Operations Mohammad Tafazzoli summarized the results and benefits that have occurred since implementing dataConductorEP and AMP.

“Using this system helped us reach our target yield faster. It improved throughput, quality, and yield—three key areas to help our company be more profitable,” said Tafazzoli.

While managing five or six different subcontractors in Asia, Genesis now has real-time data available on at least 25 different products. They produce several million units each month, so

using dataConductorEP has been a tremendous timesaver for the company’s product engineers. Genesis’s foundry, assembly, and test subcontractors have also improved their efficiency as their data now automatically flows through the dataConductorEP system.

“Genesis Microchip selected dataConductorEP and AMP because they greatly reduce the chance of errors,” concluded Tafazzoli. “The system was designed by a group of Syntricity engineers with a product and test background, enabling them to develop a yield management program that met our engineers’ requirements. Without this system, we would need approximately three times the size of our current organization to achieve the same results.”

Summary of Results

- Eliminates manual data collection and improves efficiency by 50%
- Automatically updates data from fab, assembly, and test houses located throughout the world
- Enables quicker problem identification, reduces the size of the organization needed to solve problems
- Increases visibility into the WIP so that changes can be made to ensure high yield
- Provides a single source for the data that can be accessed by all levels of the organization in a familiar format
- Reduces need to involve Genesis IT as data is managed and hosted by Syntricity.
- Saves time and costs for Genesis and all of its suppliers
- Allows Genesis to meet its target yield quicker and increase profits

About Syntricity, Inc.

Syntricity is the pioneer in enterprise yield management. Its yield management software is used by leading semiconductor companies, test vendors and wafer foundries to gather, manage and analyze data from facilities around the world to improve yield, reduce product development cycle, and increase profits. A privately-held company, Syntricity is headquartered in San Diego, California.

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