

ENOVIA Semiconductor Accelerator™ **for Design to Manufacturing**

Over the years chip makers have seen tremendous advancement in the value and sophistication of design automation tools that make it possible to continue to push the bounds of technology. While significant development and technology milestones are being achieved—such as <math>< .90\text{nm}</math> and SOCs—chip makers find themselves faced with an entirely new class of business challenges:

- A global marketplace that is forcing companies to adopt global partnering, manufacturing and selling strategies.
- A general industry trend moving towards “platforms” of integrated circuits and more embedded software.
- Disaggregation and outsourcing of design and manufacturing operations, such as mask preparation, assembly and test.
- Increasing synchronization and integration requirements among software, electronic and chip architecture.
- Pressure to achieve first pass silicon through reducing design iterations and the number of handoffs between design and manufacturing.
- Increasing product options and configurations to meet customer and market applications.

These challenges place an enormous amount of pressure on semiconductor companies while facing stiff competition, time to market, and slim margins. No one company can do it all. Today, it is those companies who can best integrate and optimize their design chains who are winning in the marketplace.

The key to meeting these challenges is to create a singular, secure platform for supporting the product development process. The ENOVIA Semiconductor Accelerator for Design to Manufacturing (D2M) allows organizations to align Marketing Requirements to Design Outputs and assure the efficient flow of the right information at the right time across Product Design, Manufacturing, Assembly and Test. This single repository to store data, documents, product configurations, change information and the associated business “best practices” gives semiconductor companies and their design chain partners the competitive advantage of a single version of the truth and with it, the ability to capitalize on emerging market opportunities.

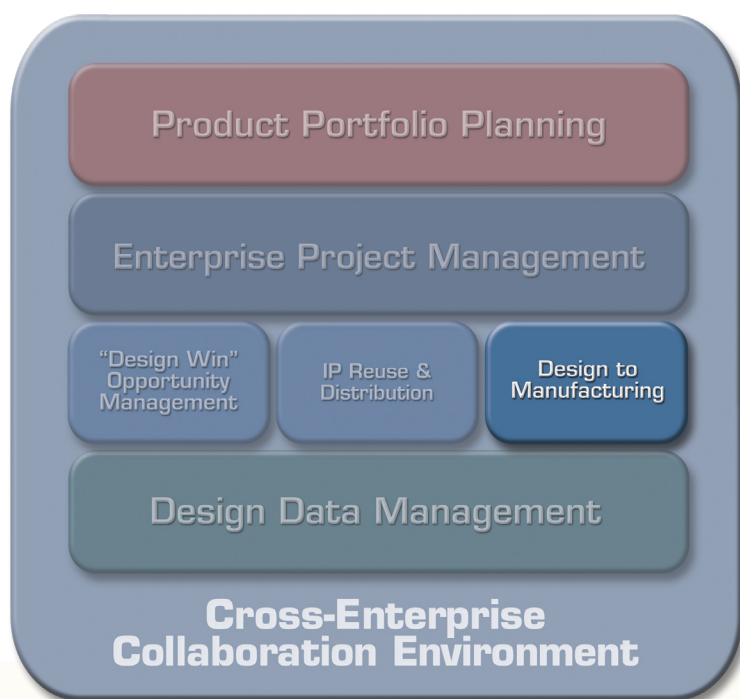
Is the ENOVIA Semiconductor Accelerator for Design to Manufacturing what you need?

- Do your Designers struggle having to access multiple, disparate data sources to find and re-use relevant and up-to-date information?
- Do your Product Engineers create invalid product configurations because manually defining product requirements and bills of material can be error prone? How much time does this take to discover and correct?
- Have you had invalid product configurations that were discovered in manufacturing or after product release? How much do these mistakes cost?
- Do you feel that improving collaboration between Marketing, Engineering and Manufacturing can be a competitive advantage for your company?

The ENOVIA Answer

The suite of business process applications, combined with the Semiconductor Accelerator for D2M, offers a powerful solution for managing the complex, data-intensive processes required by semiconductor manufacturers to bring new designs to market. This innovative solution from ENOVIA enables semiconductor companies to implement industry-specific best practices rapidly—with lower risk and faster return on investment—than other Product Lifecycle Management (PLM) solutions that have not been closely tailored to the specific needs of semiconductor designers and manufacturers.

The ENOVIA Semiconductor Solution Architecture



Features and Capabilities

Control Complex Product Configurations Marketing Product Managers and Designers can validate configurations before driving downstream processes in development or manufacturing for a new product or variant. IP re-use capabilities are greatly enhanced across new products or product variants. Ensuring that only correct products are built using the right components dramatically reduces late charges and increases product margins.

Automate the Creation of the Multi-level IC BOM Product Marketing and Engineering need the ability to automatically create multi-level Bills of Material (BOMs) from re-usable product features and options, using pre-defined product configuration rules. Existing design IP can be automatically attached to the BOM for re-use, while unrealized or new BOM items are assigned placeholders for design, review and release to production. Both consumable as well as non-consumable items are supported in the context of the product process lifecycle. Being able to determine exactly what goes into making the product—including hardware, software, materials and resources—increases quality, reduces warranty costs and improves design to manufacturing efficiency.

Access to Time-phased Yield Data to Support Key Product Decisions On-line access to estimated and actual yield data for configured products allows for product planning of similar products or variants. This capability also helps to track manufacturing performance to identify areas of improvement.

Repeatable Engineering Change Process All updates to the BOM and its designs can be managed with a formal change process, enforcing consistent business rules for review and approval. Suppliers and Design Partners can be included for notification, input and review in a controlled, real-time environment.

Issues in Managing the Product Configuration and IC BOM

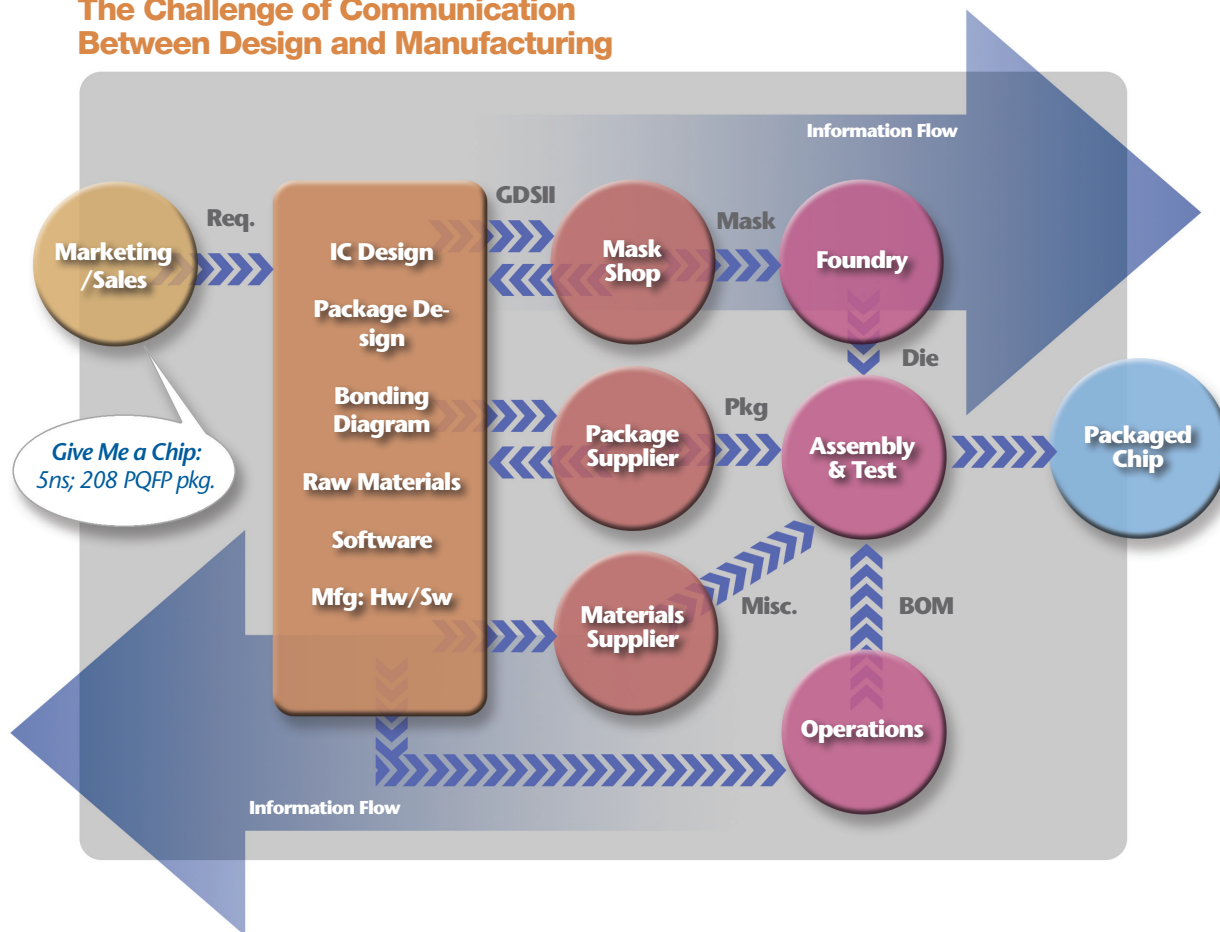
The ability to capture product and customer requirements is essential for driving both the development and manufacturing of good products.

It is imperative that those defining products for the market or customers have the ability to create only valid and available product configurations—especially when making customer commitments. Additionally, the ability to capture product configurations that are not available is equally important as to drive downstream development or manufacturing for the need of a particular product.

As an IC moves through its process lifecycle (iFab>Sort>Assembly>Test>Mark>Finished Good), the IC BOM grows, pulling together parts and information from many different processes. The ability to build an accurate IC BOM is dependant on the knowledge/expertise of the person/application assembling the BOM, as well as the ability to access information from disparate systems, both of which can lead to inaccuracies, errors and delays.

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The Challenge of Communication Between Design and Manufacturing



Centralized Information Sharing Along the Design Chain Information that is vital to make product decisions that get the correct product out of the door is shared in real-time among all stakeholders, including:

- the design database sent from Design to Mask Prep
- pattern layout data and mask layout instructions sent to the Mask Supplier
- pricing, quality and schedule information between the Customer and Supplier
- compliance information to the Wafer Fab
- parametric data, design rules and process data from Manufacturing back to Design

Ease of Coordination Between Marketing, Design and Manufacturing for Sellable Part Processes

The ability to support Marketing ID part numbers for any level in the BOM increases flexibility to react to customer and market requirements with maximum efficiency and control.

Approved Vendor Lists (AVL) and Approved Manufacturer Lists (AML) Management Easy access to preferred and qualified manufacturing location status makes supports optimization of supplier selection results. Consistent processes for rating and improving supplier performance provide capabilities for continuous supply chain improvements.

Secure and Robust Supplier Collaboration Use of secure collaboration workspaces allows for easy transfer of design and manufacturing IP to fabs, assembly and test partners and sites. Granular access control assures that external partners see only the right information at the right time.

Support for Product End-of-Life (EOL) Processes Product EOL lifecycle support allows for consistent business processes to retire products, coordinating communication between design, manufacturing and customers.

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