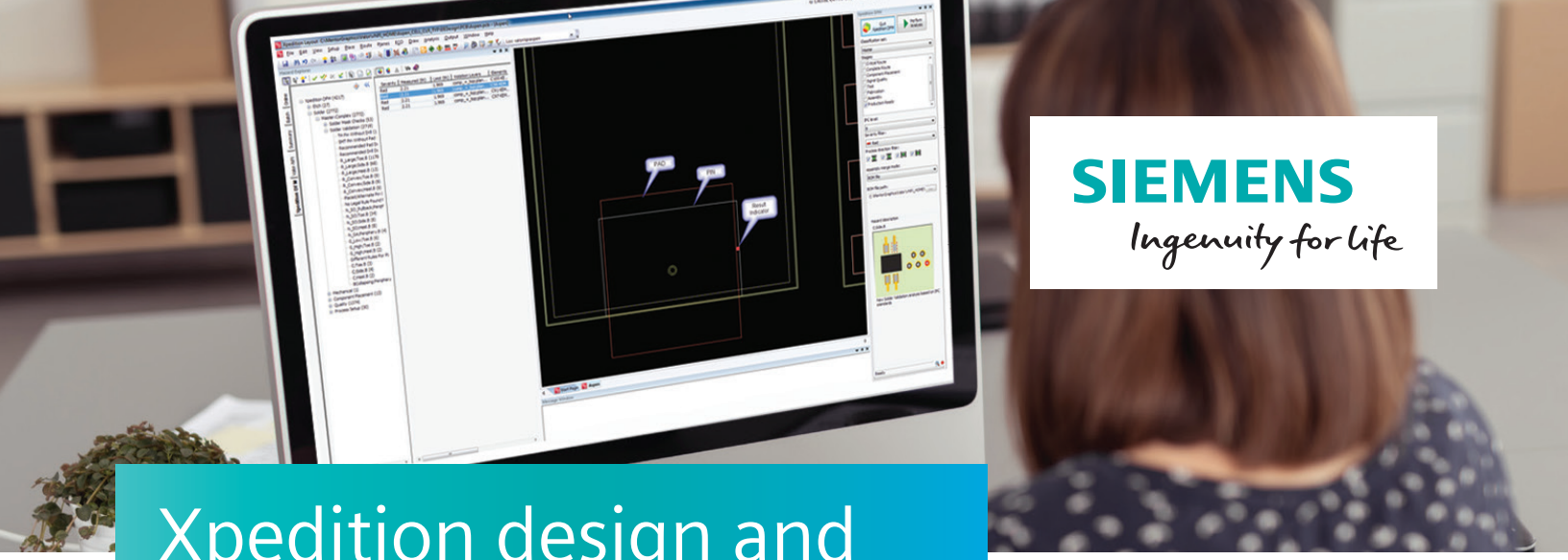


SIEMENS
Ingenuity for life

Xpedition design and manufacturing

Concurrent DFM enables users to optimize designs for manufacturing

Benefits

- Enables you to save time and money by finding and correcting issues early on
- Provides seamless, concurrent DFM without leaving the Xpedition user environment
- Reduces re-spins for the fastest, highest-quality NPI and ramp-to-volume
- Mitigates project risk by helping you stay on schedule and budget
- Allows you to rapidly design panels to optimize material use and reduce costs
- Accelerates fabrication and assembly and reduces costs with intelligent hand-off of PCB design

Summary

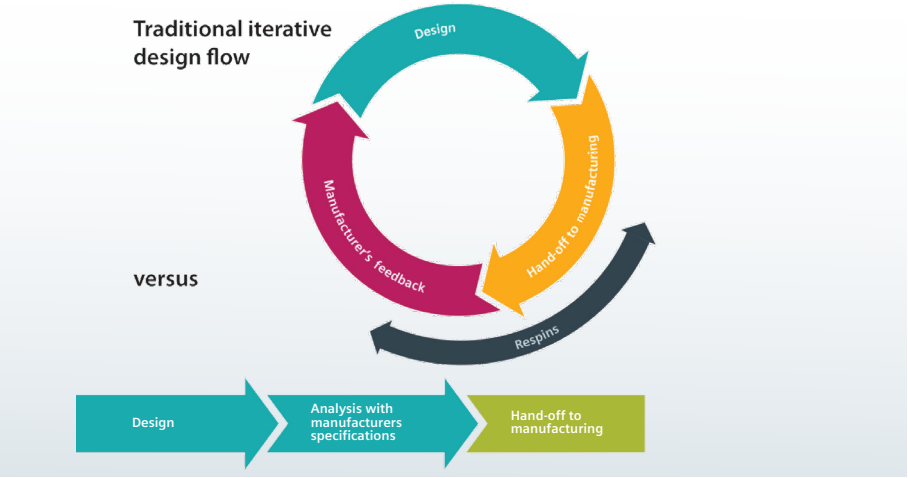
Why is it that printed circuit board (PCB) design re-spins are expected rather than the exception? According to historical data, schedules and budgets typically include several re-spins. Valor™ NPI software, integrated into Xpedition™ software, has proven it can be used to reduce the number of re-spins by an average of 57 percent using design for manufacturability (DFM) technology that enables manufacturing issues to be identified and corrected early in the process, saving money and time.

Valor NPI incorporates expert knowledge about the fabrication and assembly processes and makes that knowledge accessible to anyone in the new product design flow, shifting the manufacturing knowledge into design. As a result, leading electronic design companies have found that incorporating Valor NPI technology into their PCB design process saves expensive re-spins and improves the quality of the product. Valor NPI is part of the Xcelerator™ portfolio, the comprehensive and integrated portfolio of software and services from Siemens Digital Industries Software.

Integrated Xpedition DFM

Xpedition DFM validation gives you a competitive edge by running manufacturing process-driven analysis during layout. You get the benefits of DFM right in the Xpedition environment without needing to be a manufacturing process expert.

Additionally, you can run incremental DFM analysis at any stage of the PCB



Xpedition DFM with Valor NPI

Xpedition design and manufacturing

design process. By analyzing incrementally, you can identify the potential manufacturing issues and areas in the design requiring improvement and correct them before advancing to the next stage. This avoids having to circle back to an earlier stage of the layout process to remedy an issue found in the final DFM review.

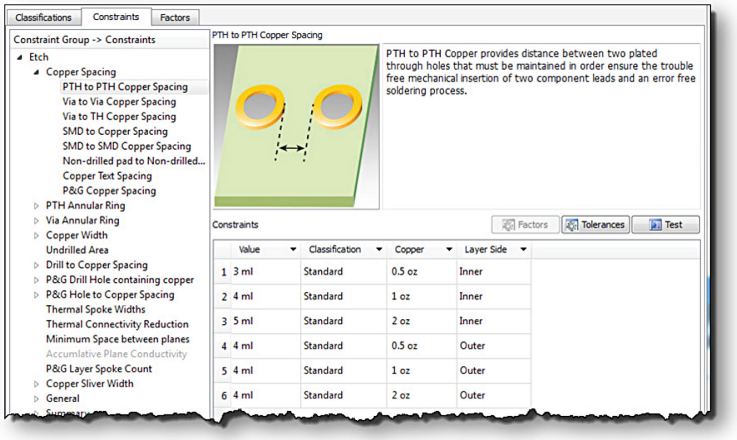
Intelligent, integrated NPI product model

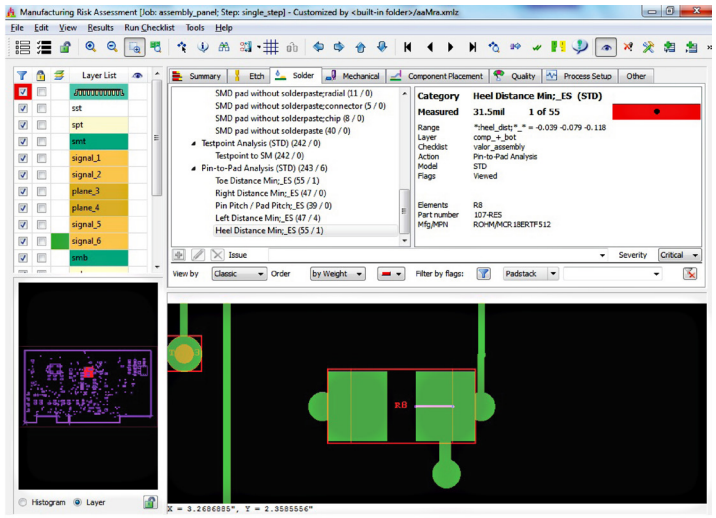
When fabricated, assembled and tested, your PCB will be only as good as the product-model data you deliver to the manufacturing process engineers. For a quality PCB, you need effective DFM and a comprehensive, intelligent hand-off of the PCB design.

All available data that is critical for manufacturing, including material zones for rigid-flex circuits, is extracted automatically from Xpedition. The data is then automatically entered into Valor NPI for streamlined DFM analysis. Additional content, such as supply chain-level parts data from the unique Valor Parts Library (VPL) solution, data-defining surface finishes, the exact assembly panel to be fabricated and all data normally held in disconnected drawings and documentation, is integrated into the single, highly structured Valor NPI model.

Manufacturing process-driven, automated DFM analysis

Every manufacturing partner has its own manufacturing processes and capabilities that require a unique set of DFM rules. Valor NPI is the only DFM system that captures the technology inherent in the PCB design. The VPL associates the PCB design with appropriate manufacturing processes to automatically select which DFM rules and values to apply. The result is an intelligent and automated analysis that provides an extremely efficient and effective DFM process.





Manufacturing risk assessment of yield and product reliability.

Comprehensive DFM analysis

How manufacturable is your design? Your new product introduction (NPI) flow depends on the DFM tools you use. Miniaturized, high-layer count designs cannot be reliably reviewed manually, and simple DFM tools do not check all manufacturing process factors. Valor NPI verification software is used to conduct DFM analysis of all your design technologies – FR4, rigid/flex, flex and even packaging substrates – with more than 1,000 DFM checks (DFF and DFA). Each of these checks help you optimize your design for manufacturing early on during the initial design process.

DFM validation further categorizes and prioritizes the design-change requirements so you can easily resolve the most critical issues, either in Xpedition Hazard Explorer or by cross-probing between Valor NPI and Xpedition. The weight assigned to each check is definable, allowing you to decide how the results should be prioritized.

Beyond the DFM analysis, Valor NPI enables you to check your design netlist against the manufacturing data to ensure there are no connectivity errors. Valor NPI also enables you to verify that your manufacturing bill-of-materials (BOM) matches the design and all components in your approved vendors list (AVL) are an acceptable physical match.

Manufacturing risk analysis

DFM validation not only identifies where your PCB design exceeds your supplier's manufacturing capabilities, it also shows where low yield or field failures may occur by using severity indicators of red, yellow and green. With this visibility, designers can optimize their designs for manufacturing during the initial design stage, accelerating their ramp-to-volume cycle.

Panel design and optimization

Valor NPI is computer-aided design (CAD) tool agnostic, eliminating the need for additional software tools for creating and optimizing assembly panels, regardless of PCB shape. It includes tools to add fiducials, tooling holes, breakaway tabs and v-score features to create a complete assembly panel model. With Valor NPI, you can automatically identify the lowest cost fabrication panel configuration and communicate the panel design as data to your suppliers, eliminating the need for them to recreate the design and send it back for approval. Leaving the design to your suppliers eliminates the opportunity to optimize the panel and take advantage of cost-saving opportunities.

Intelligent hand-off of PCB design

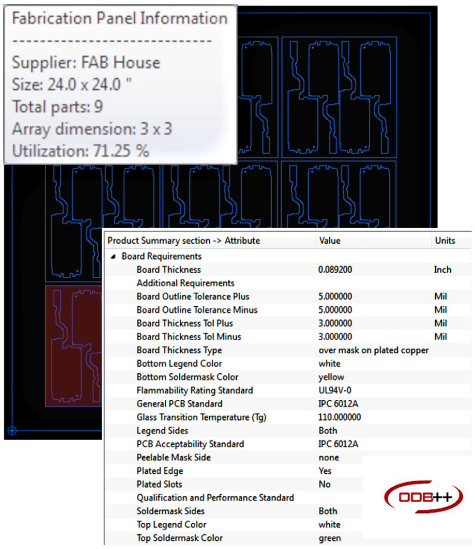
Valor NPI enables you to consolidate all data and information to define the product to be fabricated, assembled and tested by the manufacturers. Xpedition is the original source for the data, but as part of the NPI flow, all other information from your manufacturing documentation team can be directly integrated and verified as structured data, eliminating the need for legacy drawings and documents to be created and validated by your team.

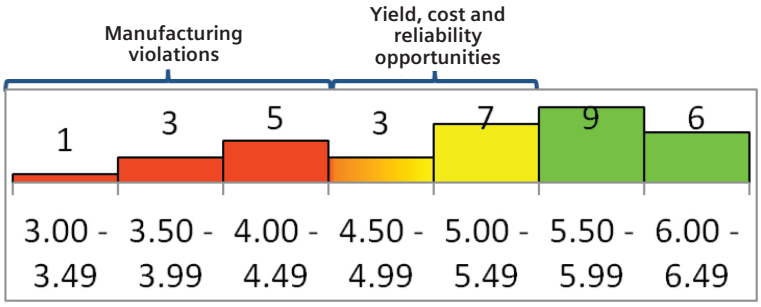
The process preparation can proceed quickly and efficiently because the resulting ODB++™ language design data package has all necessary data for the fabrication, assembly and test software tools. Valor NPI also includes unlimited ODB++ viewing capabilities on your network so you can share and review PCB designs with your team.

Synchronized with your supply chain

The Valor NPI DFM technology was developed by the same people who created the DFM verification tools that are used by more PCB fabricators and contract assembly companies than any other system. By collaborating with the DFM experts in your manufacturing supply chain, you can shift the manufacturing process constraint rules left into your design and NPI operations.

By using the same rules to simulate how your suppliers will review your design, you will minimize callbacks and engineering-change requests from manufacturers, reducing your NPI cycle times and cost while at the same time improving the quality of your products.





Manufacturing risk assessment of yield and product reliability.

More information

For more information on using Xpedition DFM with integrated Valor NPI, visit: https://eda.sw.siemens.com/pcb/valor/dfm-pcb-assembly

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