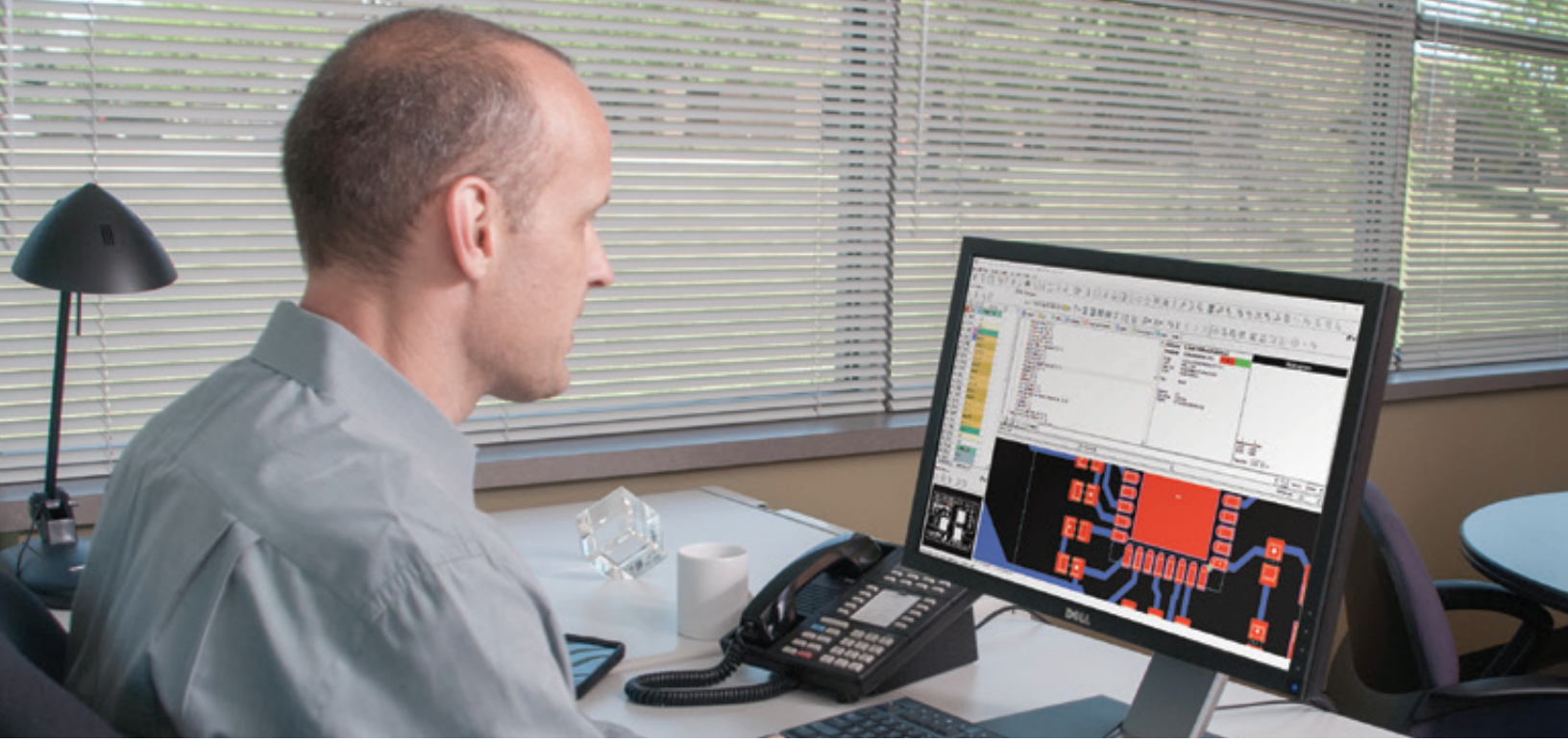

SIEMENS DIGITAL INDUSTRIES SOFTWARE

Valor NPI – designs optimized for manufacturing

Reducing re-spins for rapid, high-quality NPI and ramp-to-volume

Benefits

- Save time and money by identifying and correcting issues early on
- Mitigate risk by helping you to stay on schedule and budget
- Quickly create panels to optimize material use and reduce costs
- Accelerate fabrication and assembly and reduce cost with final validation of PCB data
- Support major PCB EDA flows, enabling users to benefit from DFM with any PCB design tool

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. It has been proven that Valor™ NPI software, which is part of Teamcenter ® portfolio, the comprehensive and integrated portfolio of software and services from Siemens Digital Industries Software, can reduce the number of re-spins by an average of 57 percent using design for manufacturability (DFM) technology. That means manufacturing issues can be identified and corrected early in the process, saving money and time. Valor NPI also works with any major PCB design software.

Valor NPI incorporates expert knowledge about fabrication and assembly processes and makes it accessible to anyone in the new product design flow, shifting the knowledge as far left as possible. 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 product quality.

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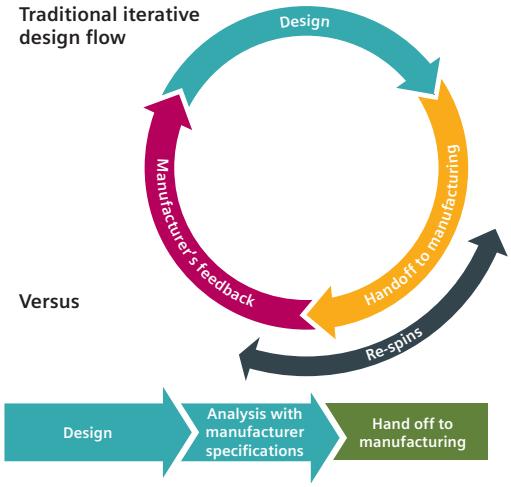


Concurrent DFM with Valor NPI

Concurrent DFM

At each successive step of the new product introduction (NPI) process, the cost of rectifying a problem increases tenfold. You certainly would not want to find that your product has an unacceptable first-pass yield after you have handed it off to manufacturing. Nor would you want to discover the location of DFM problems after you have fully placed and routed a PCB and outputted manufacturing data.

Using Valor DFM technology provides you with a competitive edge by running fabrication and assembly analysis before handoff to your partner in NPI. The DFM rules prepared for you by the customer's NPI experts (DFM engineers) are applied during layout, enabling you to easily identify and fix fabrication-process problems without requiring manufacturing-process expertise.

Intelligent, integrated NPI product model

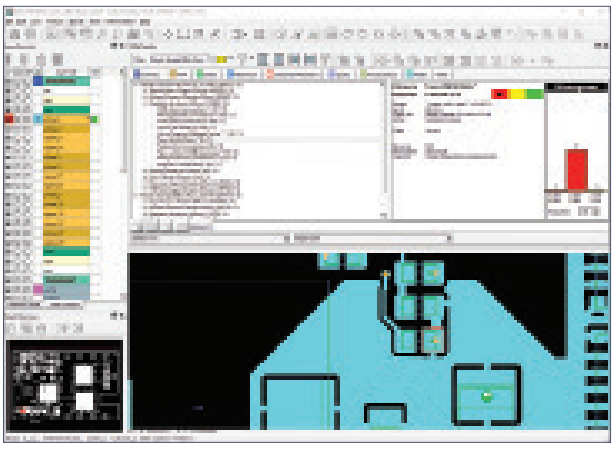
When fabricated, assembled and tested, your PCB will be only as good as the product-model data you deliver to the manufacturing process engineers. For a quality PCB, you need an effective DFM and a comprehensive, intelligent model of the desired product. With Valor NPI, all available data critical for manufacturing is extracted automatically from the PCB computer aided design (CAD), including material zones for rigid-flex circuits, and then entered into Valor NPI for streamlined DFM analysis.

Valor NPI's digital twin capabilities allow for design tracking between individual revisions of a build. This also allows users to check submitted designs against the manufacturing changes made by a fabricator. This comparison is performed between all of the layers in the product model, including the component layers. Any changes detected can be documented and added to a design review list.

Additional content such as supply-chain level parts data from the unique Valor Parts Library (VPL) solution, data to define 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

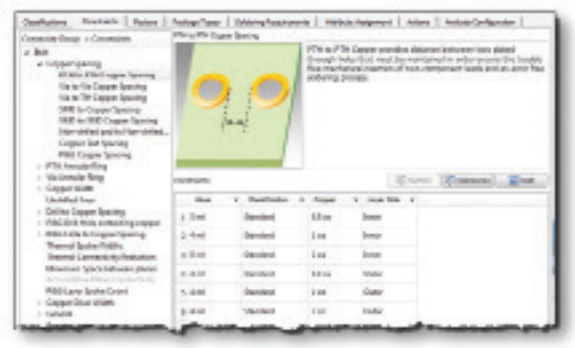
Every manufacturing partner has its own manufacturing process and process capabilities that require a unique set of DFM rules. Unlike traditional DFM systems, Valor NPI can capture the technology inherent in the PCB design. The VPL associates the PCB design with appropriate manufacturing processes to 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, cost and reliability.

Comprehensive DFM analysis

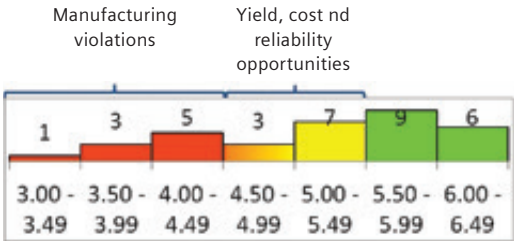
How manufacturable is your design? Your NPI flow depends on the DFM tools you use. Miniaturized, high-layer count designs cannot be reliably reviewed manually, and simple DFM tools do not check all manufacturing process factors.



DFM rule setup has never been easier.

Valor NPI verification software can be used to analyze all of your design technologies – FR4 material grade, rigid/flex, flex and even packaging substrates – with the industry's most comprehensive DFM checks. Each of these checks help you optimize your design for manufacturing during the initial process. Using DFM validation further categorizes and prioritizes the design-change requirements, resolving critical issues by cross-probing between Valor NPI and the PCB CAD. 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. The netlist analysis even understands intentional shorts so no time is wasted reviewing false errors. Valor NPI enables you to verify your manufacturing bill-of-materials (BOM) matches the design and all components on your approved vendors list (AVL) are an acceptable physical match.

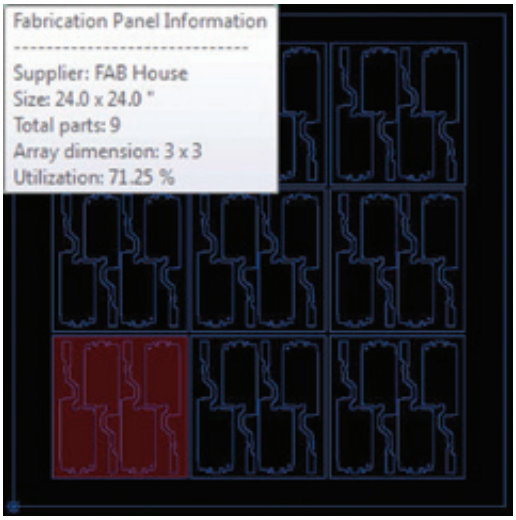


Understand the manufacturing risk

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 stage, accelerating their ramp-to-volume cycle.

Panel design and optimization

Using Valor NPI eliminates the need for additional software tools for creating and optimizing assembly panels regardless of PCB shape. It includes 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 and send it back for approval.

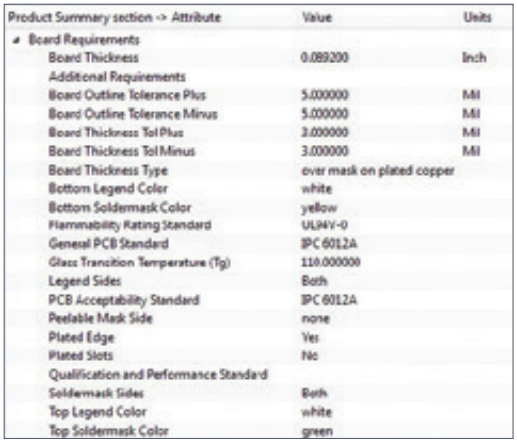


Stackup planning and material selection

Many manufacturing issues arise from problems with the stackup design, particularly with high-speed designs. Valor Z-planner Enterprise solves those issues by guiding your through material selection and providing DFM checks and signal integrity validation. The wizard guides you through the process to produce a manufacturable and cost effective stackup design.

Enhanced PCB product model handoff

Valor NPI is part of the Teamcenter® Share portfolio, enabling you to consolidate and share data and information in the cloud, allowing collaboration across multiple connected products. The PCB CAD 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. Process preparation can proceed quickly and efficiently because the resulting ODB++ 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 entire organization.



Product Summary section -> Attribute	Value	Units
Board Requirements		
Board Thickness	0.089200	Inch
Additional Requirements		
Board Outline Tolerance Plus	5.000000	Mil
Board Outline Tolerance Minus	5.000000	Mil
Board Thickness Tol Plus	3.000000	Mil
Board Thickness Tol Minus	3.000000	Mil
Board Thickness Type	over mask on plated copper	
Bottom Legend Color	white	
Bottom Soldermask Color	yellow	
Flammability Rating Standard	UL94V-0	
General PCB Standard	IPC 6012A	
Glass Transition Temperature (Tg)	110.000000	
Legend Sides	Both	
PCB Acceptability Standard	IPC 6012A	
Peelable Mask Side	none	
Plated Edge	Yes	
Plated Slots	No	
Qualification and Performance Standard		
Soldermask Sides	Both	
Top Legend Color	white	
Top Soldermask Color	green	

Synchronized with your supply chain

Valor NPI DFM technology was developed by the same people who created the DFM verification tools used by leading PCB fabricators and contract assembly companies worldwide. By collaborating with the DFM experts in your manufacturing supply chain, you can shift left the manufacturing-process-constraint rules to your design and NPI operations.

By using the same rules and even the same settings to simulate how your suppliers will review your design, you will minimize callbacks and engineering-change requests from your manufacturers, reducing your new product introduction cycle time and cost.

More information

For more information about how Valor NPI can work in your PCB design flow, visit: https://eda.sw.siemens.com/en-US/pcb/valor/valor-npi/.

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