

Valor Process Preparation design for assembly analysis

The gold standard in PCB assembly analysis

Benefits

- Reduce manufacturing costs and avoid manufacturing issues by validating the design before production begins
- Improve production efficiency
- Ensure sufficient component spacing for rework
- Highlight insufficient number of fiducial markers
- Reduce solderability issues with accurate pin-to-pad spacing using Valor Parts Library packages

Features

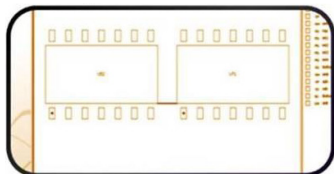
- Hundreds of customizable assembly rules checks
- Use of accurate packages from the Valor Parts Library
- Array analysis on multi-board panels
- Integrated into the Valor Process Preparation complete process engineering solution
- Easy results viewing and filtering, with smart report generator for easy feedback

Summary

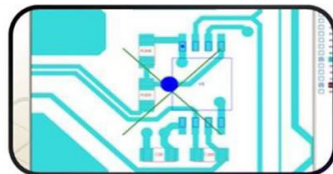
Design for assembly (DFA) is a module of Valor® Process Preparation, the most complete printed circuit board (PCB) assembly management solution available today. Creating a digital twin of the PCB, it provides complete insight into potential manufacturing issues before production begins. Having full confidence that a PCB design is ready for production even before the first component is placed can be critical to the efficiency and profitability of high-mix PCB assembly operations.

It is estimated that around [70 percent](#) of a product's manufacturing costs are derived from early-stage design decisions regarding materials and/or manufacturing method. As more and more PCB manufacturers need to assemble a bigger mix of products, being able to virtually analyze a PCB for issues that could impact production can significantly reduce changeover times. In particular, for prototype runs, being able to analyze the digital twin of a PCB before it enters the production line can prevent downtime by highlighting issues ahead of the run.

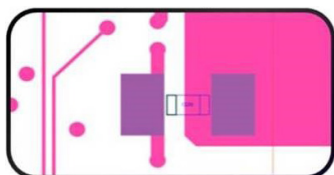
Process Preparation's design for assembly analysis is therefore a critical solution in today's increasingly high-mix, low-volume environments.



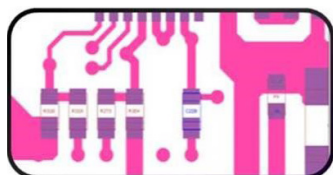
Components too close



Test point under component

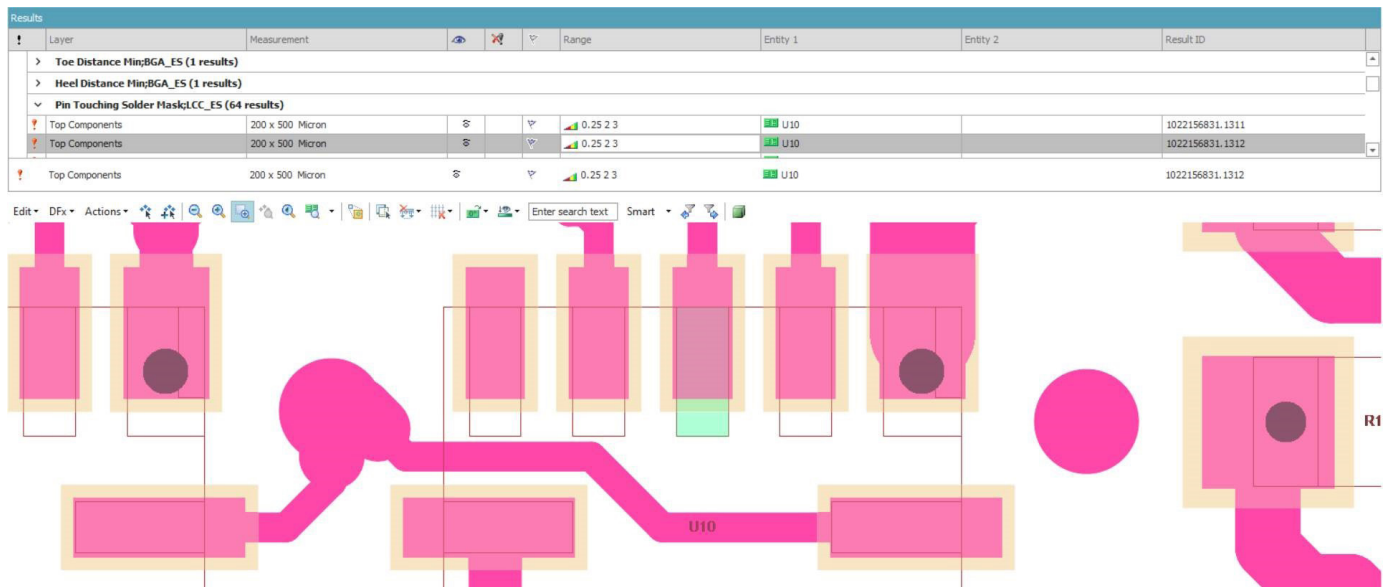


Wrong component



Uneven pads

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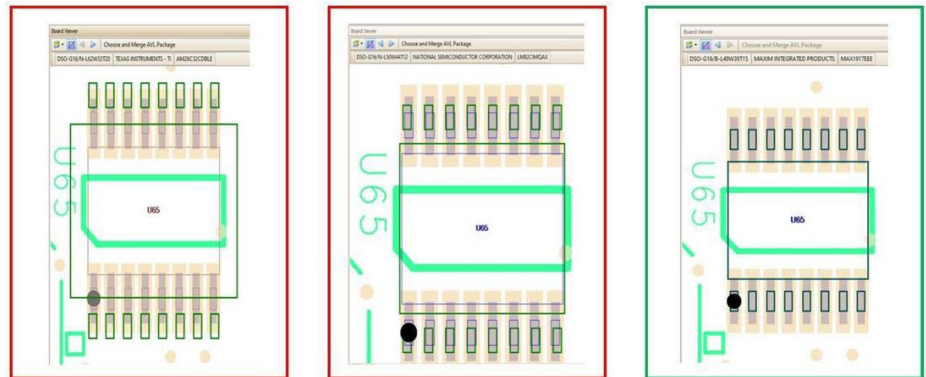
A common data set for all PCB assembly processes

A complete digital twin of the product is created in the DFA module. This includes the board, bill of materials (BOM), physical component packages and panel used to drive all the PCB assembly processes: stencil, solder paste inspection (SPI), pick and place, automated optical inspection (AOI), automated X-ray inspection (AXI), in-circuit test (ICT), flying probe test, assembly documentation and work instructions. As a result, all tasks common to the various processes are performed only once, regardless of the target production line.

This common data set is analyzed by the DFA module to highlight potential issues that, if not dealt with, could impact production. A complete set of rules can be created that focus on the specific issues that could affect the production line. The rules can highlight both critical and marginal issues, providing better feedback than simple pass/fail analysis.

Accurate representation of board components

The common product model within Valor Process Preparation neutralizes the source design data, enabling a consistent set of rules to be performed



Approved vendor packages can each be checked against the board and incompatible parts removed from the AVL.

on the design. The BOM file provides the specific manufacturer part numbers that will later be used to download the accurate parts from the Valor Parts Library. By providing an accurate representation of the board and its component packages, this data avoids the typical oversized keep-out areas usually seen in PCB design files. Knowing exactly what components will be used during production enables electronics manufacturers to virtually validate the digital twin of the product by combining two-dimensional PCB data and three-dimensional component data, to ensure flawless execution.

Avoid the unexpected, with a shift-left design flow

Once the analysis is completed, the results can be quickly filtered to highlight just the issues that need to be addressed. The data can then be exported to files for sharing with the designer, who can then address the critical items in a timely manner. Understanding and pre-empting issues early on, before production begins, is cheaper than fixing them later.

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