

DfMExpress is a fully integrated solution that enables designers and electronic manufacturers to validate layout designs, prior to fabrication.

During PCB layout, designers place components and route circuitry for the shortest possible paths and the best possible circuit performance.

Often, the requirements of Design For Manufacturing will force designers to change that "perfect" placement or tight routing pattern to get the correct spacing and clearances.

But those frustrating spacings are there for a reason; to make sure that the bare board (PCB) and assembled board (PCBA) can be manufactured without any errors.

Design for Manufacturing (DfM) is the process of qualifying if PCB and PCBA are manufacturable and reliable at the best price.

The ultimate targets of DfM are:

- Eliminate the need for multiple board respins due to manufacturing-specific details that were missed in the design process.
- Design and produce boards that follow a set of best practices.
- Reduce time spent on design revisions and ultimately meet time to market deadlines.

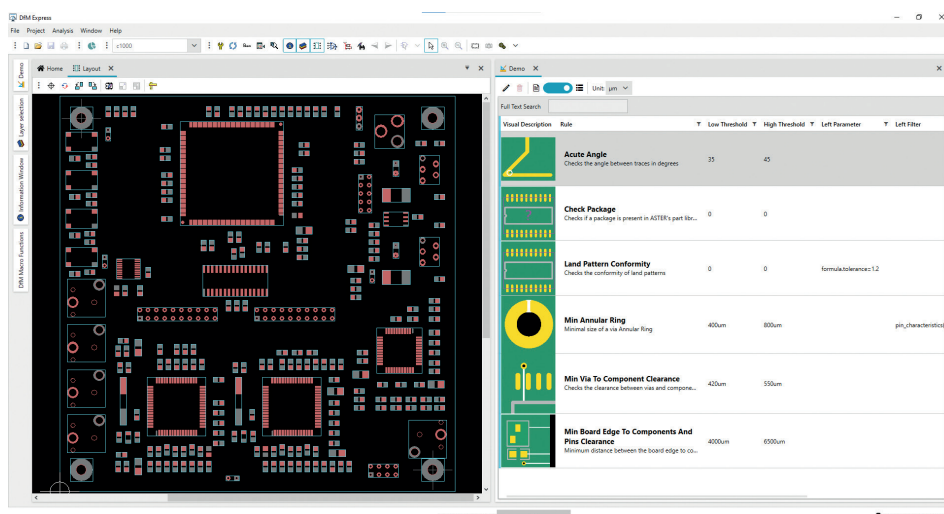
Design for MANUFACTURING

PCB fabrication is a complex operation, subject to a number of restrictions linked with copper, etching, drilling, solder mask...

- Small detail in copper might not be possible due to physical etching restrictions. A chosen technology e.g. IPC Class I should be applied everywhere on the board, as a single violation will force the PCB supplier to switch to more accurate parameters (e.g. IPC Class II) for the whole board. The finer the structures are, the more expensive the board fabrication will be.
- Copper and solder mask slivers: Narrow wedges of isolated copper or solder mask can sometimes float from their locations and reattach elsewhere on the board. If this happens with copper, it may end up shorting other nets together, while floating solder mask may expose copper that should normally be covered masked.
- As there will always be a slight displacement between the solder resist and the conductive pattern, the surrounding copper should have a clearance equal to the allowed displacement from the solder resist opening. If not, there is a risk that the surrounding copper will also be exposed, which can lead to short circuits.

Key product benefits

- **Ease of Use** - Simple and intuitive are keywords that guide the design of the most innovative DfM analysis tool.
- **Layout from native CAD formats** Import layout data from standard CAD formats such as ODB++, IPC-2581, GENCAD, FATF, or direct from native CAD layout data.
- **DRC, DfM and DfA analysis** - Support Design Rules Checks, Design for Manufacturability and Design for Assembly within an agnostic environment.
- **Library of standard checks** - Classic checks, recommended by IPC standards, are already configured. Use it as it is, or copy & paste to adapt thresholds to local manufacturer constraints.
- **Mechanical DfT analysis** - Place probes aligned to priority rules for top or bottom side access using test points, connectors, vias, THT, SMD, bead probes and generate detailed accessibility reports.
- **Fully programmable** - Instead of basic configurable checks, the solution is fully programmable. It allows implementation of thousands of checks using the programming language. Use visual graphical programming to drag & drop hundreds of macro functions, populate filters, thresholds and objects, to be taken into consideration. Alternatively, an experienced programmer, may edit rule codes. The color coding makes it easier for programmers to write, read, and understand the rule codes.
- **Powerful cockpit** - After analysis, navigate through the cockpit to review, sort, classify and comment on the violations. Fully interactive with the layout view. Filter for the top or bottom. Filter with a specific value or value range. Advanced filtering with logical expressions.
- **Standard report based on template** - Use standard templates to generate MS-Word, MS-Excel and Adobe PDF documents. Customize or create templates that adhere to your corporate presentation rules.



Design for ASSEMBLY

The automated assembly process will combine THT and SMD components to be placed and soldered on the bare board.

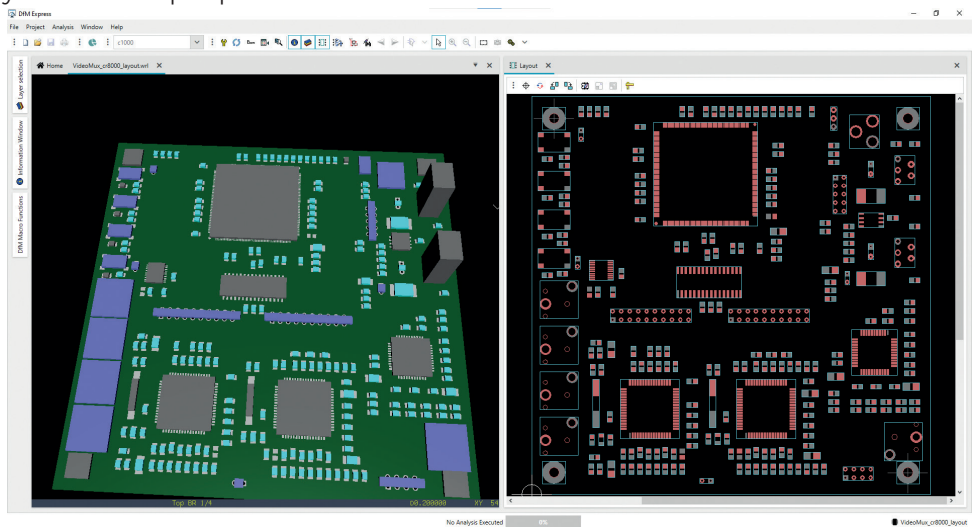
Here are a few examples of the kinds of errors that can be avoided by a Design for Assembly analysis:

- Insufficient clearance between parts, mechanical objects, and the board edge.
- Component placement errors: Components that are placed too close to each other, or at the wrong rotation or location in relation to each other, can cause problems during the soldering process.
- Incorrect land pattern pad sizes: Pads that are the wrong size, or not placed correctly for the part that will be soldered to it, can cause manufacturing problems. For small, two-pin passive components, this could cause unequal heating during soldering, resulting in the part pulling and standing up in a condition called "tombstoning."

BOARD VISUALIZATION

DfMExpress is powered by QuadView® visualizer. Key features are:

- Create Layout views from standard formats such as ODB++, IPC-2581, FATF, GenCAD, or direct from native CAD layout data. No pre-processor needed.
- Import schematic from standard formats such as HPGL, PDF, EDIF etc.
- Search components, pins and nets throughout hierarchical designs and multiple sheets.
- Cross-probe between layout, schematic, and reports
- Capture snapshots of layout or schematic for cut & paste into your personal reports.
- Convert 2D layout view to 3D view and navigate through the board.

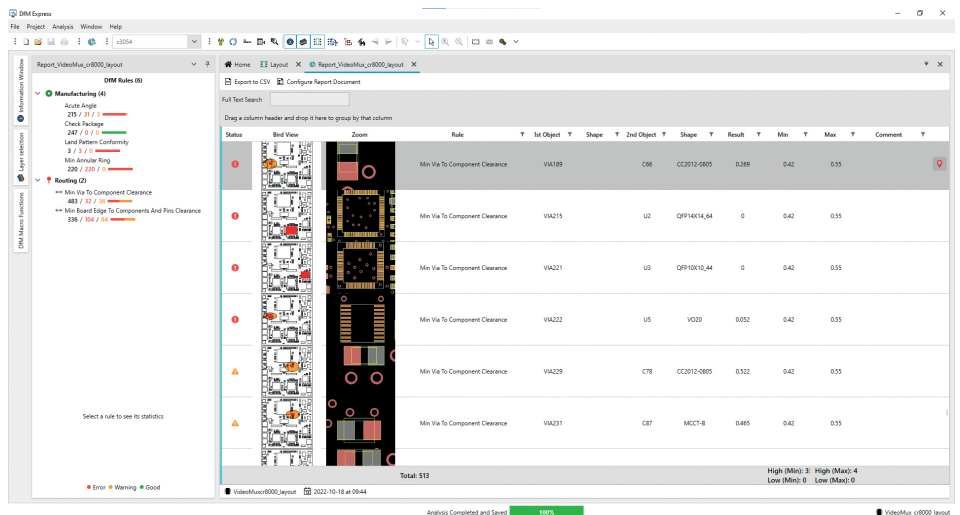


ADVANCED REPORTING

DfMExpress analysis data can be exported in variety of formats such as Microsoft Word, Excel, PowerPoint or Adobe PDF.



The report structure is defined by a template, which could be easily edited with the free Standalone Report Designer, to fit with your corporate requirements.



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