



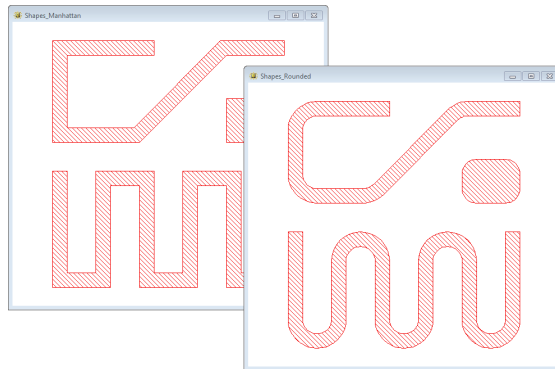
Microwave Design

Design Workshop Technologies offers a fully integrated toolset for the microwave designer, everything from physical layout to verification. The suite is used by design houses, foundries and research institutes taking advantage of dw-2000's unique capability to offer microwave-specific solutions.

Physical Layout

The dw-2000 Layout Editor is a powerful layout creation platform for Manhattan, complex all-angle and curved geometries. The user has full control over multiple editing modes: edit in place, instance-specific and multi-structure editing. The integrated Boolean engine quickly generates new derived layers and resizing operations for even the most complex of shapes.

The full scripting language enables users to customize their work environment, develop their own commands and automate repetitive tasks quickly and easily. There are hundreds of free programs available for specific requirements, for example the automatic rounding of corners on transmission lines or the automatic creation of complete reticles.

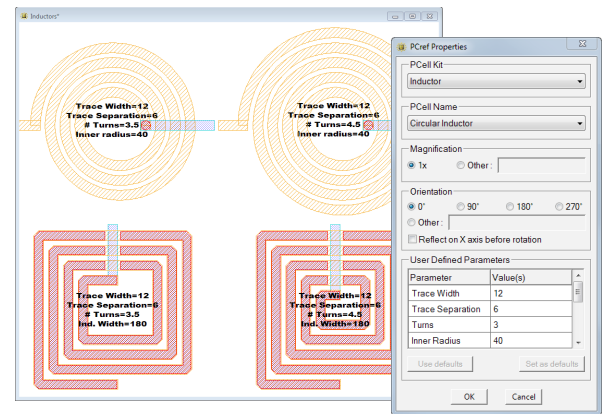


Setup is fast and intuitive, thereby providing for a very short learning curve. End-user source code is typically 20% the size of competing products. This efficiency reduces writing and debugging time, providing important savings in resources along the way.

Parametric Cells

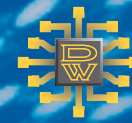
Parametric Cells (P-Cells) are dw-2000 structures used to automatically lay out elements based on high-level, user-assigned parametric values. P-Cells eliminate the repetitive task of recreating the same layout with different parameters. Once incorporated within a layout, the designer has the flexibility to modify the parameters on an instance-specific basis or globally for all instances.

Designers can create their own specific P-Cells or use generators for a variety of pre-made devices such as inductors and transistors. When developing new devices, engineers can use scripts to vary parameters automatically in order to create complete test arrays.



Design Flow Optimization

Our staff has significant experience in optimizing complete design flows. We have succeeded over and over again in automating client-specific tasks, streamlining processes, cutting design time and time-to-market by more than half, and increasing yield through sophisticated checks. Since dw-2000's integrated full scripting language makes the program highly flexible, custom projects can be realized at very competitive costs, thereby guaranteeing excellent return on investment.



Microwave Design

Optimize your yield with high quality verification software

Microwave Highlights

- Fully integrated environment
- Support for all-angle geometries
- Design flow optimization guaranteeing excellent ROI
- Automatic layout generation
- Customizable Inductor P-Cells
- Microwave device extraction such as inductors
- Recommended Microwave modules
 - XDRC
 - HLVS
 - P-Cell Development Kit
- PDK development services available

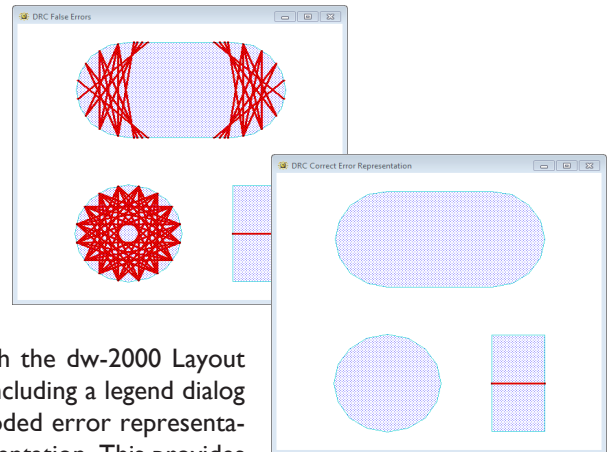
dw-2000 Highlights

- Integrated LVS and DRC
- Native 64bit editions for increased speed and performance
- Hierarchical layout
- All-angle Boolean and resize
- Fully customizable
- Programming language environment
- Automatic layout generation
- Fully-featured
- Unlimited undo/redo
- View at different aspect ratios
- Snapping using Gravity
- Conversion to/from other formats
- Parametric Cells (P-Cells)

Design Rule Checking

The dw-2000 XDRC module provides designers of microwave circuits, MMICs and RFICs with a physical verification tool for design rules required by the most advanced technologies. It can cover the rule sets of all major foundries. Commands include width, spacing, overlap, extension, inclusion, inside, outside, touch, area, density, edge and segment selection, conditional checks (angle, edge length, etc.), property checks (area, ratio, etc.), error filtering (projections, etc.) and connectivity (antenna rules, etc.).

Apart from standard microelectronic checks, the ability to handle all-angle geometries makes the XDRC more flexible and capable of locating errors correctly in microwave designs. For example, checks can be optimized for curves and rounded shapes in order to avoid false positives.



The XDRC is fully integrated with the dw-2000 Layout Editor for easy error navigation, including a legend dialog to facilitate error counts, color-coded error representation and plain-English error representation. This provides designers with close and direct interaction between errors and the layout where they can be corrected.

Extraction and Layout versus Schematic Checking

The dw-2000 HLVS module provides layout designers with both netlist extraction and Layout versus Schematic (LVS) functionality. Users can compare layout to layout and layout to schematics.

This module supports the extraction of traditional devices such as transistors, resistors, capacitors, diodes and nets, in addition to being able to identify microwave-specific devices such as inductors. Design Workshop Technologies' HLVS software also supports the extraction of user-defined devices.

...The power of the dw-2000 Boolean tools has enabled designs that would have been previously too labor intensive to have been cost/time effective to pursue. dw-2000 has provided a platform for Cree to develop DRC scripts to validate our design and process rules and to eliminate almost all errors prior to ordering masks. This is a significant cost/labor/time savings over discovering problems after a device is partially or fully fabricated. Finally, the technical support staff at Design Workshop Technologies is excellent. They are knowledgeable, friendly, and quick to respond to all issues raised. Their manner and expertise are appreciated.

Dan Fritz • Cree Inc.