SYNOPSYS®
Accelerating Innovation

IC WorkBench Plus

High Speed Layout Visualization and Lithography Analysis

Overview

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IC WorkBench Plus (ICWB+) is a powerful, hierarchical layout visualization and analysis tool. It provides GDSII/OASIS viewing and editing and high-speed lithography simulation and analysis. ICWB+ is designed to address a variety of lithographic applications, including mask synthesis flow development, optical proximity correction (OPC), model development and calibration, lithography verification error analysis, design rule creation and validation, yield and printability optimization of critical cells, and new process development.

ICWB+ provides qualitative and quantitative information on wafer imaging characteristics under varying parameter and process conditions.

Common Manufacturing Viewing and Analysis Tool for Lithography Simulation

ICWB+ loads gigabytes of data in minutes and has unlimited file size capacity on 64-bit platforms. Fast zooming and panning ease exploration and analysis of the largest layout patterns. ICWB+ ensures lithography simulation accuracy by using the same highly accurate ProGen models and simulator as all of the Synopsys Manufacturing tools. As shown in Figures 1 and 2, ICWB+ supports contour, pseudo-color aerial image, slice, and numerous quantitative simulation functions. It can also read in, overlay, and align SEM images to compare simulation results to silicon data.

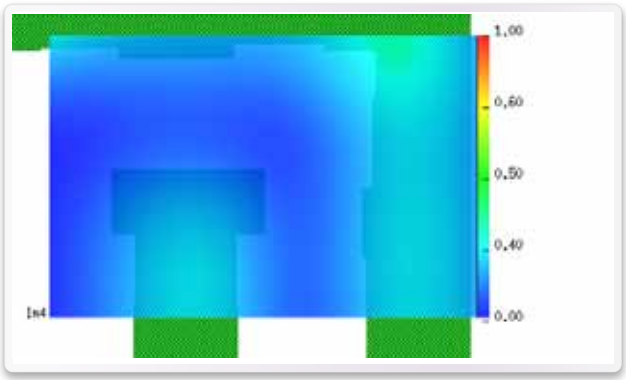


Figure 1: Pseudo-color aerial image of exposure intensity

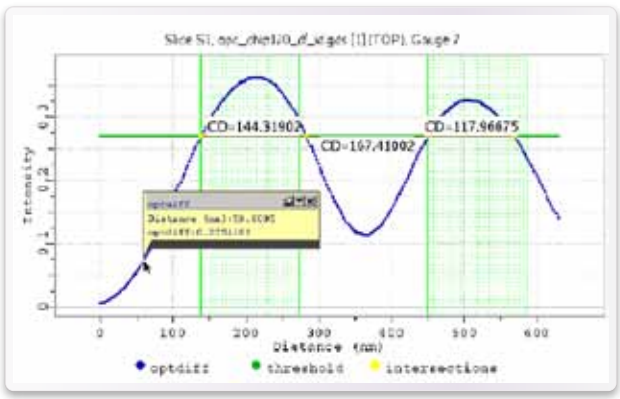


Figure 2: Slice image

The capabilities in ICWB+ allow users to:

- Interactively create and manipulate layout patterns to explore advanced OPC techniques
- Compare OPC performance under different model conditions
- Evaluate the effectiveness of different RET strategies

Proteus Error Analyzer

Lithography error review and analysis is supported using the Proteus Error Analyzer Module (PEAM), as shown in Figure 3. Errors can be sorted and filtered, classified, plot, and lithography simulations performed at those locations.

Hierarchy Selection, Editing and Debug

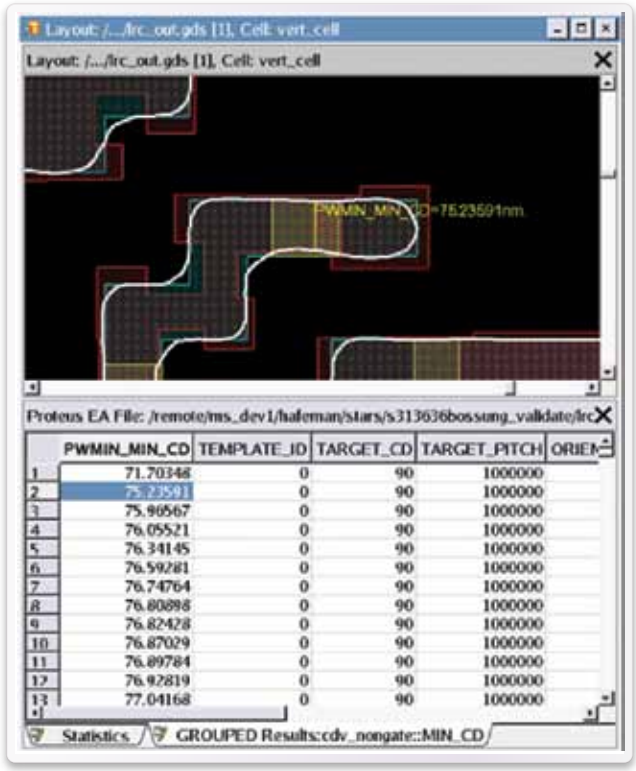
Hierarchical selection and editing allow ICWB+ to select and edit shapes deep in the hierarchy without requiring the sub-cell to be opened, as indicated in Figure 4. Edit operations have undo and redo support. In addition, ICWB+ can overlay two or more layouts in a single view without merging the underlying layout files.

Debugging layouts and their hierarchy is critical for the final design of large chips and ICWB+ provides a number of tools to do this.

Advanced Features

ICWB+ implements the latest in user interface technology and is architected to make the powerful ICWB+ capabilities easy and intuitive to use. Key features include:

- Support for user and site level customization
- Hierarchical folder representation of all objects including layouts, rulers and other markups such as SEM images
- Browser-like forward and back view history



	PWMIN_MIN_CD	TEMPLATE_ID	TARGET_CD	TARGET_PITCH	ORIEN
1	71.70346	0	90	1000000	
2	75.23501	0	90	1000000	
3	75.96567	0	90	1000000	
4	76.05521	0	90	1000000	
5	76.34145	0	90	1000000	
6	76.59281	0	90	1000000	
7	76.74764	0	90	1000000	
8	76.80898	0	90	1000000	
9	76.82428	0	90	1000000	
10	76.87029	0	90	1000000	
11	76.89784	0	90	1000000	
12	76.92819	0	90	1000000	
13	77.04168	0	90	1000000	

Figure 3: PEAM allows zooming to a location in the layout from the filtered error results. Contour simulations can then be performed for each error of interest

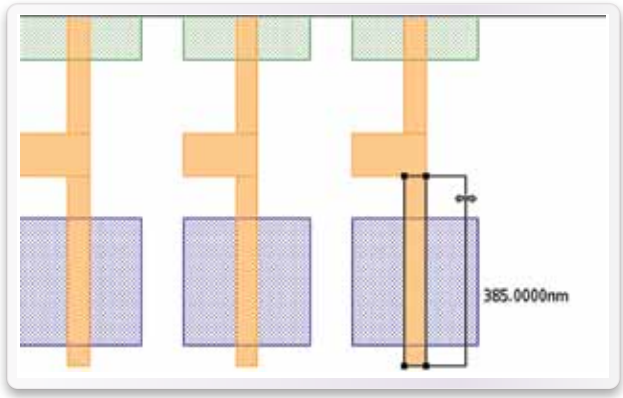


Figure 4: Selecting and editing shapes in the hierarchy can be done easily

- User customizable hot keys for menus and commands
- User customizable window and toolbar positions
- Custom buttons to run user-created macros

Interfaces

- Inputs and Outputs
  - GDSII
  - OASIS
  - User Interfaces
  - GUI-based user interface
  - TCL-based user interface with TK widgets available
  - Socket communication
- Supported platforms
  - AMD64, Win64, Suse 64

For more information about Synopsys products, support services or training, visit us on the web at: www.synopsys.com, contact your local sales representative or call 650.584.5000.

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