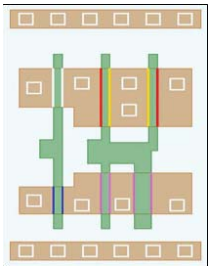
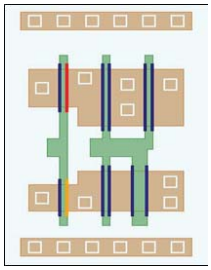
Calibre eqDRC

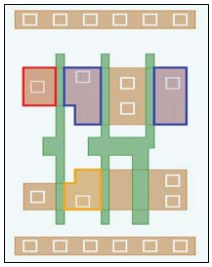
D A T A S H E E T



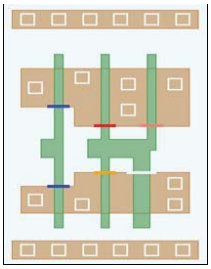
Current Crowding



L-Shape Active to Gate Width



SD Contact Coverage



L-Shape Poly to Gate Length

The Calibre® equation-based DRC language provides designers and foundries a way to characterize and evaluate complex multi-variate checks.

Identifying and prioritizing design layout issues that affect manufacturing success have always created the biggest impacts on turnaround time. With traditional design rules, designers have little understanding of which factors in a design actually create manufacturing failures. Additionally, there have always been some design issues that are simply too complex to capture with traditional measurement techniques.

With the Calibre eqDRC language, foundries can now provide designers with accurate characterizations of complex, multi-variate design issues that have a direct impact on process variation. Armed with this information, designers can now measure the impact of multiple simultaneous variables and make reliable design tradeoffs. They also have better debugging information when failures occur, because they can now use equations to solve for different variables and determine the best fix.

Improving Design Decisions

Foundries can now write rules for situations where the interplay of factors prohibits a simple definition. They can also accurately capture the nature of more complex issues. Both these capabilities lead to simplified rule coding for advanced checks, a smaller rule file size, and a more accurate implementation of the design rule manual.

Product Benefits

- **Define Complex Manufacturing Issues**
  Describe issues that are too complex for traditional design rule definition
- **Improved Variability Control**
  Make reliable design decisions that reduce process variation while preserving design intent and performance
- **Reduced Cell/Design Area**
  Accurate representation of manufacturing limitations eliminates over-constraint
- **Improved Turnaround Time**
  Quickly and accurately verify and debug advanced checks while meeting production timelines
- **Reduced File Size**
  Simplified rule coding for advanced checks

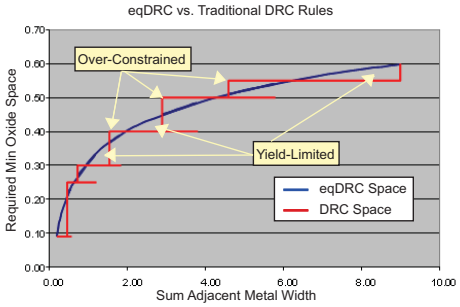
Product Features

- **Capture actual measurement values** and use them within equations or between geometries
- **Characterize any mathematical equation** - Numbers, unary and binary operations, conditionals, algebraic and transcendental functions
- **Characterize multiple interaction types** - Inputs can be polygonal, edge or edge cluster types.
- **Invoke commonly used equations with function support**
- **View equation results on output for debugging**

Mentor Graphics®

Not only can Calibre eqDRC can be used to characterize multiple interaction types (polygonal, edge or edge cluster), but all of these types may be used in equations without limits as to their number. Because Calibre eqDRC captures actual measurement values, such as counts, areas, perimeters, overlaps, lengths, widths, spacings, and more, these values can be used within equations. Calibre eqDRC also provides complete equation characterization — numbers, unary and binary operations, conditionals, and algebraic and transcendental functions are all supported. Commonly used equations may be invoked with function support. Equation results can be associated with and passed from one geometry to another.

Advanced process impacts, such as dishing caused by CMP, are typically difficult to implement with traditional design rules. A common approach is to use width-based spacing checks, where metal layers are "binned" and different spacing rules are applied to each bin. This approach allows for significant inaccuracies, leading to increased area where the design is over-constrained, or reduced yield where the rule does not fully satisfy the process ramifications.

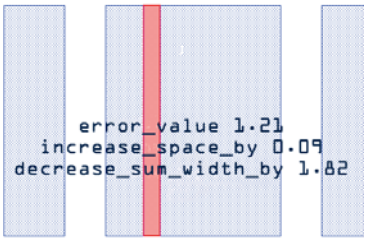


Equation-based DRC efficiently describes and implements an accurate representation based on multiple geometric interactions with a single equation:

$$\frac{0.09}{space*\ln(2)} *\ln\left(\frac{width1+width2}{0.09}\right) > 1$$

With Calibre eqDRC, designers now have a accurate implementation approach for the characterization of advanced manufacturing and process issues. Using this information, they can reduce cell and design areas that were formerly over-constrained, and remain confident that the features are manufacturable.

During debugging, multiple equation results may be viewed on output for debugging. Debugging is faster and more productive, because Calibre eqDRC provides the designer with the measured metrics for each failure. Designers can use eqDRC to solve for the most appropriate fix based on design and production goals.



eqDRC enables faster debugging by providing the designer with a display of measured metrics and calculation of required corrections for each failure.

Overall, Calibre eqDRC improves both design reliability and manufacturability by closing the gaps between design rules and true manufacturing issues.

The Calibre nm Platform

Calibre eqDRC, an extension of SVRF, is included in Calibre nmDRC as part of the Calibre nm platform, the industry's leading physical verification platform, known for delivering best-in-class performance, accuracy, and reliability.

Industry Support

Foundries and library providers are using eqDRC for signoff of the most advanced design checks, making the decision to use Calibre technology the best choice for achieving your performance, yield, reliability and design area goals.

Superior Product Support

Mentor Graphics is a five-time winner of the Software Technical Assistance Recognition (STAR) Award in EDA. No other provider of complex software can match the support offered by Mentor Graphics.

Expert Consulting Services

As a Calibre user, you also have access to Mentor Graphics consulting services. Our consultants can quickly get you up to speed in your environment and on the path to better performance and improved productivity.

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Corporate Headquarters
Mentor Graphics Corporation
8005 S.W. Boeckman Road
Wilsonville, Oregon 97070 USA
Phone: 503-685-7000
North American Support Center
Phone: 800-547-4303
Fax: 800-684-1795

Silicon Valley
Mentor Graphics Corporation
1001 Ridder Park Drive
San Jose, California 95131 USA
Phone: 408-436-1500
Fax: 408-436-1501

Europe
Mentor Graphics
Deutschland GmbH
Arnulfstrasse 201
80634 Munich
Germany
Phone: +49.89.57096.0
Fax: +49.89.57096.400

Pacific Rim
Mentor Graphics Taiwan
Room 1603, 16F,
International Trade Building
No. 333, Section 1, Keelung Road
Taipei, Taiwan, ROC
Phone: 886-2-27576020
Fax: 886-2-27576027

Japan
Mentor Graphics Japan Co., Ltd.
Gotenyama Hills
7-35, Kita-Shinagawa 4-chome
Shinagawa-Ku, Tokyo 140
Japan
Phone: 81-3-5488-3030
Fax: 81-3-5488-3031

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