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N-Detection and Tuple-Detection: Fault Models for Improved Defect Coverage in VLSI Circuits

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Abstract

State-of-the-art technologies for VLSI circuits exhibit various defect mechanisms that are not modeled by existing fault models. It was recently observed that the defect coverage of a test set for stuck-at faults can be improved if each stuck-at fault is detected multiple times, by different tests. A stuck-at test set that detects each stuck-at fault n times (by n different tests) is referred to as an n-detection stuck-at test set. We report on several aspects of n-detection stuck-at test sets. We report on the effects that test set compaction has on the defect coverage of n-detection test sets, and show that it is possible to generate an n-detection test set of minimal size while still maintaining the defect coverage of a larger n-detection test set. We describe an extension of the n-detection model, called the m-tuple, n-detection model. This model attempts to ensure that the n tests included in the n-detection test set for a fault f are sufficiently different from each other. In this way, the ability of the test set to detect defects is increased. When considering sequential circuits, there are different ways to define an n-detection test sequence. We describe several definitions, and compare the defect coverages their test sequences achieve. We present experimental results to support the various observations made in this talk.

Gastgeber: Prof. Dr. Bernd Becker

Alle Interessenten sind recht herzlich eingeladen.

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