Silicon Lifecycle Management Platform

Optimizing each stage of the silicon lifecycle from design to in-field

www.synopsys.com/slm
Vision

Silicon Lifecycle Management (SLM) is an emerging paradigm within the industry that is making product development and deployment more deterministic.

In-silicon observability and insight are key when it comes to SLM and as an industry we can no longer afford to be blind to what is happening inside the chip. SLM is starting to close the loop between design and in-field.

Synopsys SLM Platform

The Synopsys integrated Silicon Lifecycle Management platform is designed to improve silicon health and operational metrics at every phase of the device lifecycle. The platform is built on a foundation of enriched in-chip observability, analytics and integration automation. Embedded in-chip environmental, structural and functional monitors enable deep insights from silicon to system. Meaningful data is gathered at every opportunity for continuous analysis and actionable feedback.

Actionable Insights Through Silicon Lifecycle Monitoring and Analytics
True End-to-End Visibility

The silicon monitor data is gathered and stored in a unified database allowing analytics engines to generate actionable insights across each phase of the silicon lifecycle.

Analytics opportunities lie within each of these phases. In the design phase, silicon parametric data can be fed back for better design tuning. During the ramp phase precise assessments can be made to speed up yield ramp, to reduce cost and greatly improve device screening to increase quality and reliability. The production phase is where analytics data from previous phases can help align different silicon within multi chip modules for more reliable performance and more in-situ test and monitor data can be gathered and analyzed. The in-field phase is where the collection and analysis of in-chip monitor data can spot trends, allowing the prediction of not only chip longevity but also the longevity across entire product ranges.

To enable SLM, monitors and structures need to be added into the design which will produce interesting, meaningful data. This data tends to be either parametric (e.g., process) or dynamic (e.g., environment conditions in the chip such as voltage supply or temperature). With this data being stored in one location, analysis and analytics can be performed across the lifecycle stages.
In-Chip Monitoring
The Synopsys Silicon Lifecycle Management platform is built on a foundation of monitors and structures embedded within silicon designs to gain insight on how devices are made and how they then perform in-field. These embedded environmental, structural and functional monitors gather relevant data enabling actionable insights from silicon to system with continuous analysis.

Environmental Monitoring
Embedded Process, Voltage and Temperature (PVT) monitoring is critical to achieve successful operation and compelling performance of advanced node and FinFET semiconductor devices.

Features:
• Temperature sensor accuracy +/-1C (calibrated)
• Voltage Monitor +/-1mV accuracy for IR drop analysis
• Process Detector offers multiple internal delay chains

Benefits:
• Maximizes performance, power and reliability
• Highly accurate, distributed monitoring throughout the die
• Multi-site, in-core monitoring for HPC applications

Structural Monitoring
Path Margin Monitors and analytics enable silicon structural health by measuring timing margin for critical paths in-test or in-field.

Features:
• Granular delay elements for accurate measurement
• Distributed architecture with low overhead for scan
• Automated EDA flow

Benefits:
• Real time reporting for analytics
• Monitor test or functional paths
• Optimize silicon performance based on actual margins available
Silicon Lifecycle Management Analytics

Chip infrastructure enables monitor data to be routed to an in-chip analytics engine sent off chip to a tester directed into the system or delivered into the cloud during in-field operation for more detailed analysis.

Data across a fleet of systems is sent off chip and maintained within a unified database throughout the life of each chip and system.

Cloud based analytics target each of the lifecycle phases and interact with embedded silicon backed AI engines to continuously optimize all operational metrics.

Synopsys SLM Availability

SLM is an increasingly important element of the production, manufacturing and deployment flow for SoCs and other advanced semiconductors. Synopsys has emerged as a key player in SLM with its Silicon Lifecycle Management platform, a solution that meets all the requirements and provides multiple benefits.

Synopsys SLM has unique capabilities that position Synopsys as an industry thought leader. The key components of this end-to-end solution are highlighted below:

For more information visit: synopsys.com/SLM