Synopsys Announces Expansion of Liberty Modeling Standard, Paving Way for Ultra Low-Power IC Design

Liberty Technology Advisory Board Approves New Liberty Variation Format Additions

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Highlights:

- Statistical moment-based *Liberty Variation Format* (LVF) extensions added to Liberty library modeling standard
- Models non-Gaussian timing variation due to extreme low-voltage operating conditions
- Applications include mobile and IoT, where low energy consumption is critical
- Synopsys EDA tool support available now

Synopsys, Inc. (Nasdaq: SNPS) today announced ratification of new statistical moment-based extensions to LVF by the Liberty™ Technical Advisory Board (LTAB), an IEEE Industry Standards and Technology Organization (IEEE-ISTO) federation member program. The new extensions provide a more precise static timing model based on non-Gaussian variation observed in designs operating at near sub-threshold voltage conditions. Applications include mobile and IoT IC designs, where low energy consumption is a dominant requirement. Synopsys' Galaxy™ design platform support for these new extensions is available today with PrimeTime® signoff static timing analysis (STA), SiliconSmart® library characterization and Library Compiler™ library checking solutions. Synopsys IC Compiler™ II physical implementation tool will also provide support in its upcoming release.

The LVF modeling standard, first ratified in August 2014, has been adopted by leading semiconductor companies while providing signoff confidence with PrimeTime STA on more than 50 designs manufactured with the latest FinFET processes, including those operating at ultra-low voltages down to 0.45V. However, mobile and IoT chip providers, in their continued drive to further reduce operating voltage levels, are targeting near or sub-threshold voltage operation. This creates an immense challenge for IC designers as non-Gaussian timing variation is more prevalent at ultra-low voltage and poses a bigger impact on design robustness and yield. To help address this emerging challenge, LTAB members proposed and ratified three statistical moment-based extensions to the LVF standard consisting of mean shift, standard deviation and skewness. These additions allow EDA tools to more precisely model the timing variation impact at such low voltages, thus enabling a more robust design.

"It is through the leadership, vision and collaboration of LTAB member companies that the Liberty modeling standard continues to evolve and benefit the industry," said Robert Hoogenstryd, senior director of marketing for design analysis and signoff at Synopsys. "The new LVF extensions lay the foundation for designing ICs that will operate at previously unimaginable low voltages to achieve lower energy consumption."

"It has been gratifying to see industry leaders rally around a common standard that ultimately benefits the entire semiconductor industry," said Marco Migliaro, President and CEO at IEEE-ISTO. "Together, we are succeeding in evolving the Liberty standard in an inclusive manner that serves current and future industry requirements."

About Liberty Library Format Standard and LTAB

The Liberty library format is the semiconductor industry's most widely adopted library standard, used by virtually all EDA implementation, analysis and characterization tools as the library model exchange for timing, noise and power behavior. In May 2006, an industry-wide LTAB was formed to facilitate the evolution of the Liberty library modeling standard. The LTAB functions under the sponsorship of the IEEE Industry Standards and Technology Organization (IEEE-ISTO). Its 20 member companies represent the broad semiconductor industry including the design community, EDA companies, silicon foundries and semiconductor intellectual property (IP) companies. The Liberty format is available to the entire semiconductor industry community for download under standard open-source license terms. Learn more about Liberty at http://www.opensourceliberty.org, and view the full 20 member LTAB list at http://www.opensourceliberty.org/liberty_techadvisory.html.

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