

Synopsys and Samsung Foundry Announce Reference Flow for Predictable Execution of ASIL D-Compliant SoC Design for Automotive Applications

Comprehensive Flow Implements Synopsys' Functional Safety Processor IP for Efficient Development of Autonomous Driving and ADAS SoCs

MOUNTAIN VIEW, Calif., Oct. 14, 2020 /PRNewswire/ --

Highlights:

- Samsung Foundry and Synopsys' optimized flow achieves predictable execution of in-system test, implementation, verification, timing and physical signoff for ASIL D-compliant SoC design
- Includes failure modes and effects analysis (FMEA), failure modes effects and diagnostic analysis (FMEDA) and unified fault campaign management coupled with native RTL-to-GDSII functional safety implementation
- Synopsys' automotive-grade IP is ASIL Ready ISO 26262 certified, tested for AEC-Q100 reliability, and supports ISO 9001 automotive quality management system to accelerate SoC-level functional safety qualification

Synopsys, Inc. (Nasdaq: SNPS) and Samsung Foundry today announced the release of a validated [automotive reference flow](#) to streamline SoC hardware design for in-system test, implementation, verification, timing and physical signoff for ISO 26262 compliance. This reference flow is targeted for automotive safety integrity level (ASIL) D autonomous driving and advanced driver-assistance systems (ADAS) applications. In close collaboration with Samsung, the optimized Synopsys automotive reference flow provides SoC architects, designers and verification engineers with complete differentiated design and IP solutions that deliver complex functional safety (FuSa) analysis, implementation, and verification capabilities. The automotive reference flow utilizes Synopsys' comprehensive automotive design flow and ASIL D-compliant [functional safety processor IP](#).

ISO 26262 compliance complicates predictable execution of the automotive SoC project, by necessitating manual time-consuming flows which lack scalability, incur significant work overhead and consume limited machine resources. These challenges drive project managers and designers to adopt new methodologies to reduce resource requirements, minimize manual tasks and improve quality of results (QoR). Through close collaboration, Samsung Foundry and Synopsys delivered a comprehensive automotive reference flow optimized to provide the best possible productivity and QoR.

"In close collaboration with Synopsys, the EDA leader for comprehensive automotive solutions, we have reached a higher standard with a unified automotive reference flow based on our 14LPU process technology," said Sangyun Kim, vice president of Foundry Design Technology Team at Samsung Electronics. "Samsung Foundry's automotive reference flow, enabled using Synopsys' differentiated automotive design flow, will help our customers streamline their safety-critical SoC design projects including ISO 26262 compliance."

Synopsys' comprehensive automotive design flow includes unified functional safety verification and native automotive solutions, enabling designers to prove at the planning and implementation phases that their chip safety architecture can achieve target ASILs. Designers can perform FMEA and FMEDA with best-in-class technologies for unified fault campaign management. As part of the shift-left approach introduced by Synopsys, early functional safety analysis at RTL or gate level can quickly identify candidates for triple-mode redundancy (TMR) and dual-core lock-step (DCLS) redundancy and estimate metrics for target ASIL. Synopsys offers the industry's first self-test solution instantiated directly into the RTL that tolerates indeterminate digital states while rapidly achieving high fault coverage. Synopsys' native automotive solutions based on FuSa intent provide the industry's most comprehensive feature set to implement FuSa mechanisms, such as TMR, DCLS, and Finite State Machine (FSM), perform formal verification, and check and report that safety mechanisms are properly implemented. Comprehensive digital/analog fault injection and simulation can be performed to produce reliable metrics for FMEDA and roll-up. Synopsys solutions are independently ISO 26262 certified to accelerate the deployment and qualification process for ASIL D designs.

The Synopsys functional safety processor integrates hardware safety features, such as redundant processors, error-correcting code (ECC), parity protection, safety monitors, and user-programmable windowed watchdog timers, to detect system errors. Comprehensive documentation related to safety, including enhanced-safety manuals, FMEDA, and design failure modes and effects analysis (DFMEA) reports accelerate SoC-level functional safety assessments. The processor is supported by Synopsys' ASIL D-compliant toolkit, helping software developers accelerate the development of ISO 26262-compliant codes. In addition, Synopsys offers a broad portfolio of automotive-grade interface, processor, and foundation IP that can help designers achieve

high levels of functional safety, security, and reliability.

"Synopsys has deep collaborations with industry leaders, such as Samsung Foundry, driving key innovations in EDA and silicon-proven IP solutions which are leveraged in the design of powerful, efficient high-performance SoCs with a focus on safety, reliability and quality requirements," said Michael Sanie, vice president of marketing and strategy, Design Group at Synopsys. "We look forward to our continued teamwork with Samsung Foundry to fuel further automotive technology innovation for this high-growth market."

Learn more about the comprehensive automotive design flow for autonomous driving and ADAS applications, as Stewart Williams, senior automotive vertical marketing manager at Synopsys, will be presenting on October 28 at the upcoming [Samsung Advanced Foundry Ecosystem \(SAFE\) Forum](#). For more information on the specific solutions within the Synopsys Automotive Design Flow, visit: www.synopsys.com/automotive.html and <https://www.synopsys.com/ip-automotive>.

About Synopsys

Synopsys, Inc. (Nasdaq: SNPS) is the Silicon to Software™ partner for innovative companies developing the electronic products and software applications we rely on every day. As the world's 15th largest software company, Synopsys has a long history of being a global leader in electronic design automation (EDA) and semiconductor IP and is also growing its leadership in software security and quality solutions. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing application that require the highest security and quality, Synopsys has the solutions needed to deliver innovative, high-quality, secure products. Learn more at www.synopsys.com.

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