Ansys + Andes Technology

"Having an automated tool that can link the documents generated by different analysis tools and consistently update them to the latest versions is important for developing automotive-grade IP. Ansys medinio analyze software provides an integrated environment that not only includes the analysis tools required by standards like ISO 26262, but also automates data transfer. This not only eases the loading on document verification, but also enhances the accuracy of related data. As a result, Andes IP solutions can obtain ISO 26262 certification more quickly."

— **Dr. Alex Chen**
Director of VLSI **/** Andes Technology

Functional Safety Analysis Software from Ansys Boosts Andes' Automotive-grade IP Development

As the trend towards electrification and smart features in automotives continues to evolve, the number of chips in each vehicle is rapidly increasing. This makes automotive chips a crucial pillar supporting the growth of the semiconductor industry. However, the automotive industry has stringent requirements for the security and reliability of chips that must meet the ISO 26262 standard. In the pursuit of developing automotive-grade IP product portfolios, Andes Technology is focused on enhancing the efficiency of product verification operations. To streamline the ISO 26262 verification process and enable chip developers, Andes Technology has decided to abandon traditional verification methods. Instead, they are adopting Ansys medini analyze™ to automate and model the verification processes.

Challenges

In the automotive supply chain, obtaining certifications such as ISO 26262 is a critical factor determining market entry and approving technical strength. For IP suppliers to attain these certifications, two main challenges need to be addressed. The first is to effectively introduce the complicated and rigorous ISO 26262 requirements. The second is to competitively develop and actualize the safety features. The more products are developed for automotive market, the more crucial it is to boost the safety analysis efficiency to speed up design verification.

N25F-SE

World First RISC-V CPU IP with ISO 26262 Full Compliance

The N25F-SE comes with rich configurable options, all of which are fully certified, and thus SoC design teams are not limited by one fixed CPU configuration when offering automotive solutions.

Technology Used

• Ansys medini analyze software

Engineering Solutions

Currently, there are many standalone tools in the market that meet the specific requirements of individual ISO 26262 verification items. However, medini analyze software is one of the few tools widely adopted by original equipment manufacturers (OEMs) that can further achieve data integration and interfacing. This enables comprehensive automation of data generation, consolidation, and maintenance, with the added benefit of data reuse.

The medini analyze software solution provides an optimal development environment for ISO 26262, featuring built-in, comprehensive safety analysis methods such as HARA, FMEA, FTA, FEMDA, DFA, customizable report generation, version control, and a requirement management interface. Additionally, it automates data transfer, alleviating the burden of document verification and significantly improving data accuracy. Consequently, Andes' IP solutions can achieve ISO 26262 certification more quickly.

Benefits

The comprehensive and rich functionality of medini analyze software has greatly assisted Andes in achieving ASIL D product certifications, significantly reducing the development schedule and manpower costs and establishing optimal development process templates. In addition, achieving validation for automotive-grade IPs involves a myriad of tasks. With the increasing number of entrants into the automotive chip market, obtaining validation for one's product is not sufficient. The crucial task for IP companies in the future is to seamlessly integrate their safety analysis results with those of their customers, and medini analyze has laid the best foundation for this important mission.

Technical Safety Requirements

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ID	Description	Kind	ASIL	Related Goals	Contributions	Contributes To	Allocations
👁 TSR-01	CPU shall have safety mechanism to detect error in processing.	TECHNICAL	D	◯ SG01 (ASIL D)	👁 HSR-01 (ASIL D) 👁 HSR-02 (ASIL B) 👁 HSR-03 (ASIL D) 👁 HSR-04 (ASIL B) 👁 HSR-05 (ASIL D) 👁 HSR-06 (ASIL B)	👁 FSR01 (ASIL D)	▦ CPU
👁 TSR-02	CPU shall have safety mechanism to detect error in memory.	TECHNICAL	D	◯ SG01 (ASIL D)	👁 HSR-08 (ASIL D) 👁 HSR-07 (ASIL D)	👁 FSR01 (ASIL D)	▦ CPU
👁 TSR-03	The HW metric target for CPU is as below, Single-point fault metric (SPFM)>=99% and Latent-fault metric (LFM)>=90%	TECHNICAL	D	◯ SG01 (ASIL D)	👁 HSR-01 (ASIL D) 👁 HSR-02 (ASIL B) 👁 HSR-08 (ASIL D) 👁 HSR-03 (ASIL D) 👁 HSR-04 (ASIL B) 👁 HSR-05 (ASIL D) 👁 HSR-06 (ASIL B) 👁 HSR-07 (ASIL D)	👁 FSR01 (ASIL D)	▦ CPU

Andes quickly obtains ISO 26262 certification with the assistance of Ansys' medini analyze software.

/ Company Description

In the field of RISC-V CPU IP for the automotive market, Andes Technology has achieved remarkable milestones. In 2020, Andes became the world's first RISC-V supplier to have its development process certified to the ISO-26262 ASIL D standard. In 2022, Andes became the world's first RISC-V supplier to have its IP fully certified to the ISO-26262 ASIL B standard, with the solution adopted in more than 10 customer projects. Andes is proactively addressing the demands of the automotive market by planning a comprehensive range of automotive IP products, covering RISC-V IP solutions with different functional safety levels from ASIL B to ASIL D, along with varying processor performance levels and feature sets.

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