

SUCCESS STORY

Development of a LiDAR-based SoC

SoC ARCHITECTURE





INTRODUCTION

A US based Automotive sensor chip company approached Ignitarium for a strategic partnership to help them develop an SoC for LiDAR. The team is tasked with the entire SoC Architecture Integration and verification. The new SoC is aimed to enable Autonomous Driver Assist systems in cars. The SoC is intended to be ASIL-B certified.

Service in Focus

SEMICONDUCTOR DESIGN SERVICES



Industry

Semiconductor



Challenge

SoC development for LiDAR based chip for use in Automotive applications



Scope

- Architecture Integration & Verification
- IP designs

THE CHALLENGE

Ignitarium was chosen as the architect and implementation partner for application subsystem based on Quad Core A78, Safety manager based on Cortex R5 DCLS and Scan Control Subsystem based on Cortex R5 DCLS. Safety design implementation, SoC Integration & Verification, Support for Palladium Emulation and IP designs for Boot State machine, OTP Wrapper, Clock and reset blocks and other glue logic were some of the activities that were performed by Ignitarium.





IGNITARIUM'S APPROACH

8 CPUs supported

4 Cortex A series cores and 4 Cortex R series cores



Complex SoC design using an Arteris NoC interconnect optimizing latency & bandwidth requirements



ASIL-B compliance readiness built-in

- A senior architect with expertise in SoC architecture and Functional Safety, architected the processing subsystem which consisted of 8 Cortex cores by assessing the performance, power, area & functional safety requirements
- The evaluation of suitable IPs and their eventual selection was undertaken
- The test environment was architected and built from scratch by the verification team
- IP level test benches were created for all custom IPs. Critical subsystems where performance was critical had subsystem level testbenches. SoC level test bench was created for testing integration aspects of the various IPs
- Jasper Gold based connectivity checks and assertion-based checks were used to check temporal requirements
- Performance validation frameworks were deployed
- Lint, Clock domain crossing, reset domain crossing, constraint checks and synthesizability checks were done using formal verification tools
- Cross-team collaboration with DFT, PD & emulation experts was done throughout project execution
- The chip now has all features tested, and all desired functionalities are working in silicon

BUSINESS IMPACT

- Ignitarium was the sole SoC development partner with front-end chip design ownership of key subsystems like application subsystem, safety island and scan control subsystem
- Enabled customer to take their first chip to market

Looking for SoC Design and Verification services?

Drop us a line to get in touch with our experts.