Making Cars Safer and More Reliable

The automotive industry is working toward autonomous driving vehicles. As a result, future cars will be equipped with sensor clusters, more computing power, car-to-car and in-vehicle communication technology, high-bandwidth Ethernet networks, and multiple high-definition displays. These changes create new design challenges for automotive suppliers such as more complex electronic systems, functional safety, lack of space, reduction of power and weight (emissions), and cost savings.

These additional challenges will push suppliers to:

- Integrate much more functionality on a chip rather than on a PCB
- Leverage new advanced semiconductor process technologies in combination with dedicated design IP and packaging technology
- Create a new class of automotive SoCs and SiPs that enable new architectures of high-integration Electronic Control Units (ECUs)
- Address functional safety (ISO 26262) throughout the automotive development process

Overall, these changes will greatly enhance future vehicle performance, efficiency, reliability, and safety. Learn how Cadence® automotive products can help you to address your automotive design challenges.

Cadence Automotive Products

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Key Automotive Applications

ADAS
Take advantage of the Cadence Tensilica® Vision image/video and ConnX baseband processors and software partner ecosystem to speed your Advanced Driver Assistance System (ADAS) design.

• Support real-time data processing for sensors and cameras to enable sensor fusion for safety-critical systems with high-performance, low-power Tensilica processors
• Enable automated parking, lane departure, Car2X, communications, and many more ADAS applications

Automotive Ethernet
Design high-speed Ethernet communication links between ADAS, infotainment, cameras, and other ECUs leveraging Ethernet IP, system verification, and physical Ethernet channel simulation.

• Enable deterministic real-time data transfer for safety-critical applications such as reliable anti-lock braking with our Ethernet MAC design and verification IP
• Synchronize and transmit high-bandwidth data streams accurately using audio/video bridging (AVB) for camera-based driver assistance systems
• Ensure protocol compliance and simplify digital simulation with Ethernet verification IP
• Implement automotive Ethernet networks and analyze the ECU-to-ECU communication performance via the physical Ethernet channel with Cadence Sigrity™ SystemSI™ automated chip-to-chip signal integrity analysis

Infotainment
Add flexibility and critical capabilities for voice recognition, immersive surround sound, active noise control, engine sound design, navigation systems, and digital radios with our analog, interface, and memory IP as well as Tensilica HiFi DSPs.

• Add audio, speech, and voice functions quickly with Tensilica HiFi DSPs and the extensive software partner network
• Future-proof designs while reducing silicon area and cost through significant post-silicon flexibility with Tensilica DSPs
• Provide clear, crisp image processing with Tensilica Vision image/video DSPs

ECU Design
Collaborate across the design chain, optimize your module and PCB design, develop and integrate your mixed-signal subsystems, and ensure robust design margin as well as EMI analysis and optimization.

• Leverage automated techniques that verify modules across analog operating ranges and digital modes with Cadence Virtuoso® design tools and Spectre® and Incisive® verification
• Improve signal integrity and ensure electrical design intent with Cadence Sigrity constraint-driven design methodology
• Optimize device and system performance with Cadence OrbitIO™ system planner
• Minimize work and manage new vehicle/platform development by designing concurrently through Cadence Allegro® Design Workbench
• Reduce new vehicle or subsystem integration time with Allegro ECAD-MCAD collaboration

Functional Safety
Reduce the automotive ISO 26262 functional safety compliance effort 50% by automating fault injection and result analysis for IP, SoC, and system designs.

• Accelerate time to develop safety verification using Cadence Incisive verification platform
• Deliver 10X runtime performance versus traditional solutions
• Highlight potential and undetected fault runs for further debugging