

Chiplet-based Hardware Architectures for Software-defined Vehicles

Building a European ECosystem

Overview – Standard Presentation

27.01.2026

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The automotive compute dilemma, and why we need to transition towards an Open Ecosystem

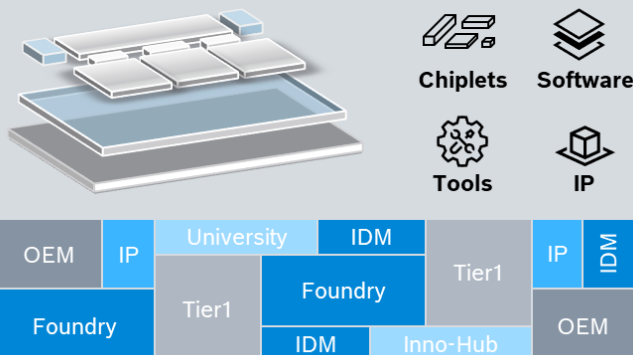
Current automotive SoCs

- Adapted from consumer electronics, lack key automotive features like safety and long-term support
- Fall short of modern vehicle demands for secure, scalable computing
- Complicating integration effort and slowing SDV (Software-Defined Vehicle) development.

Advantages of Chiplets

- ✓ **Modularity:** Mix and match chiplets from various vendors for customized functionality.
- ✓ **Scalability:** adjust designs for performance and cost targets.
- ✓ **Faster Development:** Reuse chiplets to speed up time-to-market.
- ✓ **Cost and Risk Reduction:** Avoid expensive, yield-sensitive monolithic designs.

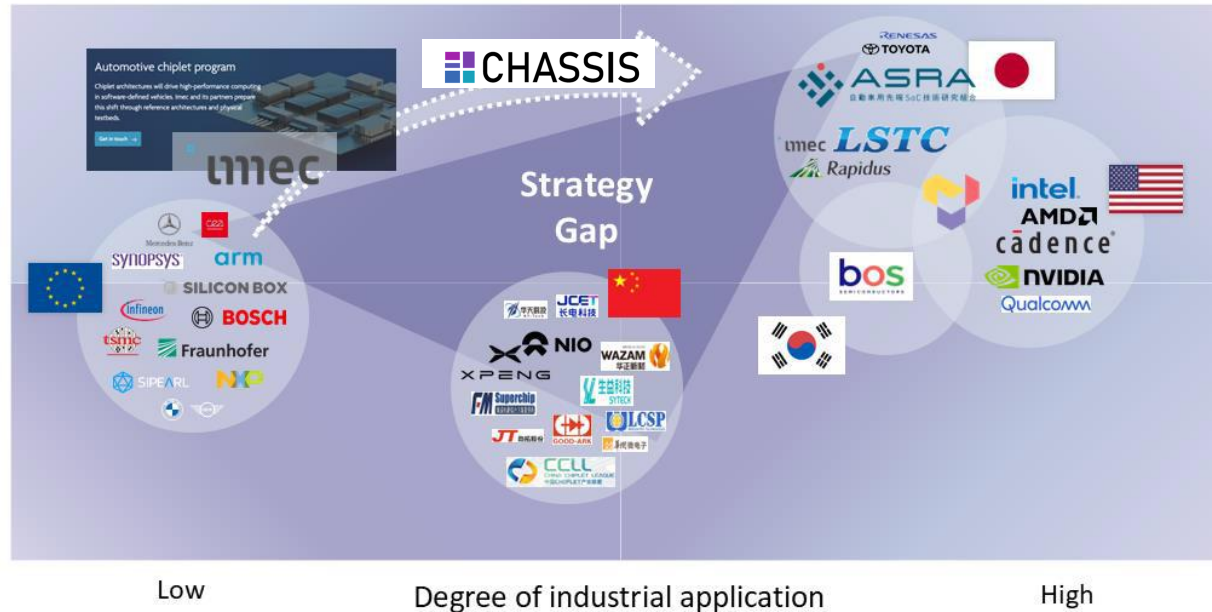
Open ecosystem for automotive chiplet systems



Advantages of an ECOSystem for Chiplets in Automotive

- Enable competition and reduce market barriers – Establish a diverse supplier base across all levels.
- Develop scalable SoCs to simplify software management – Adopt a true scalability approach with heterogeneous computing to meet KPIs for individual vehicle platforms.
- Ensure flexibility in E/E architecture – Select the most suitable E/E architecture based on functional requirements and configure SoCs accordingly.
- Influence on design and maintain stable system performance – Optimize for automotive applications to reduce software adaptation costs and accelerate time-to-market.

Automotive Chiplet: Rational for strategic invest



There are technical solutions available (not necessarily chiplet-based), but these are from **increasingly adversarial regions**.

■ Supply Chain Security:

Tariffs, geopolitical tensions, and economic dependencies underscore the urgency for an open, resilient supply chain within Europe.

■ Technological Independence:

Strategic investments today will dictate capabilities for N+2, ensuring Europe's competitive edge in the global automotive market.

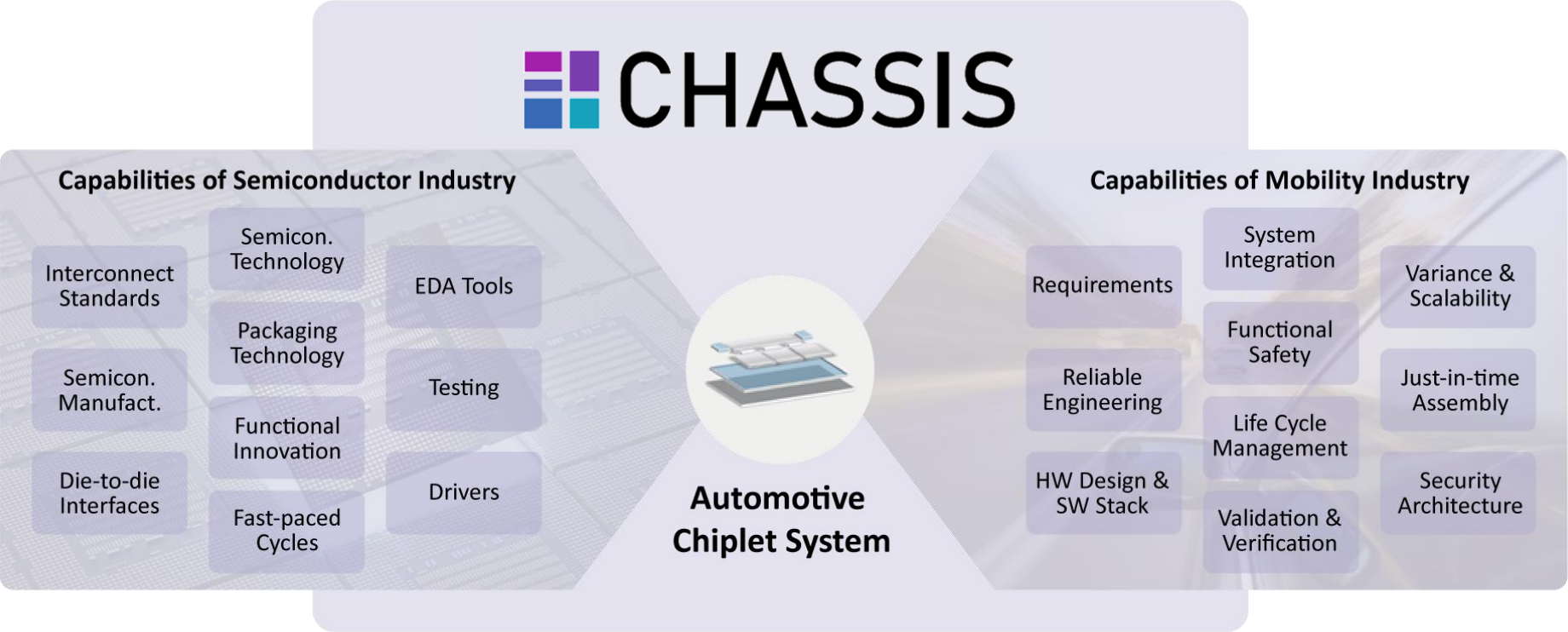
A physical prototype is essential to demonstrate feasibility, attract broader ecosystem partners (OEMs, Tier 1, Tier 2 suppliers), and drive productization efforts.

CHASSIS to enable the market and unite key capabilities



Architectural foundation capable of supporting advanced node designs

Alignment on customer side to generate the market attractiveness

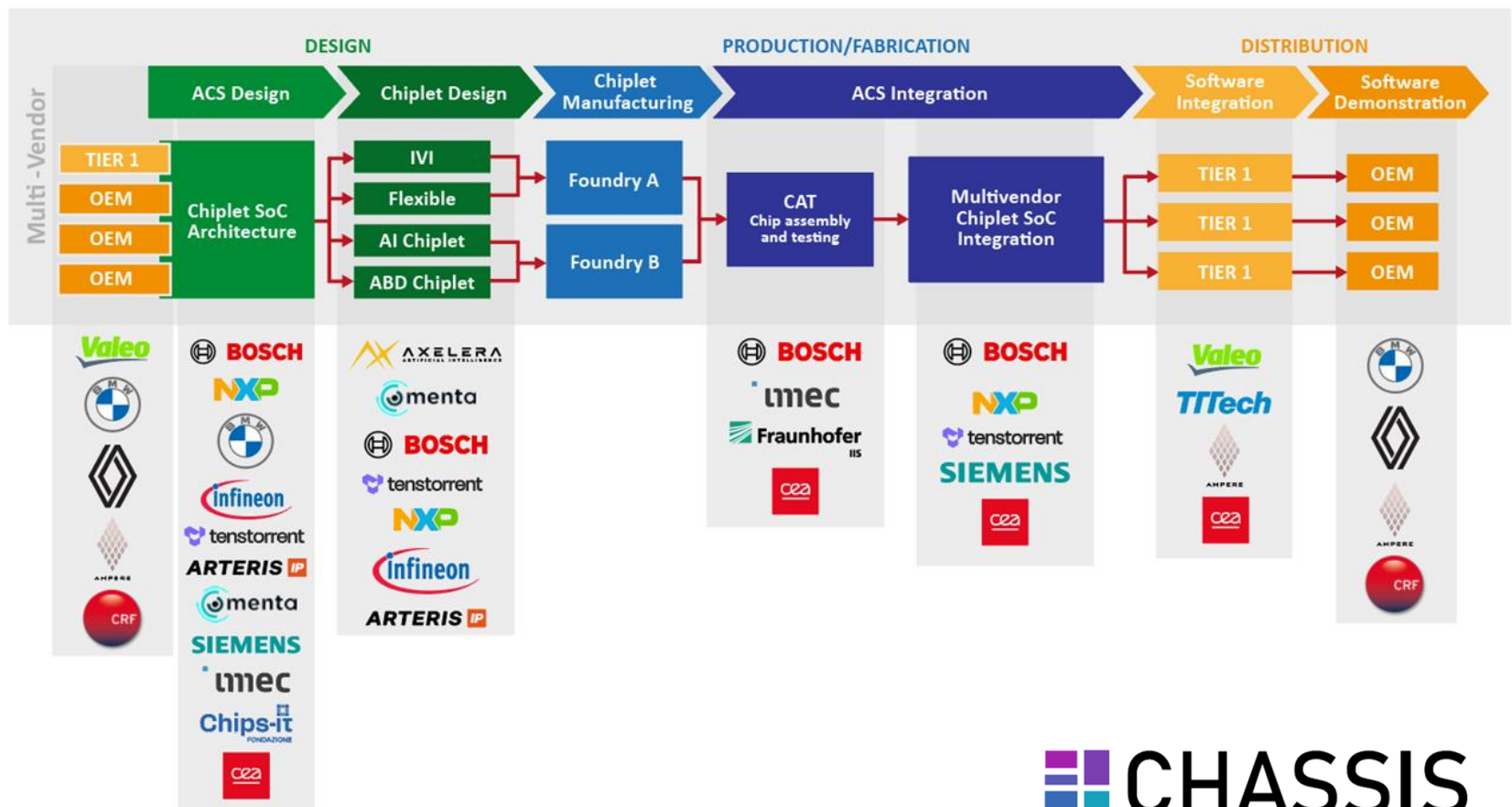


CHASSIS to enable the market and unite key capabilities



Architectural foundation capable of supporting advanced node designs

Alignment on customer side to generate the market attractiveness



With robust participation from **European OEMs and the semiconductor industry**, the **CHASSIS project fosters collaboration** across industry and academia

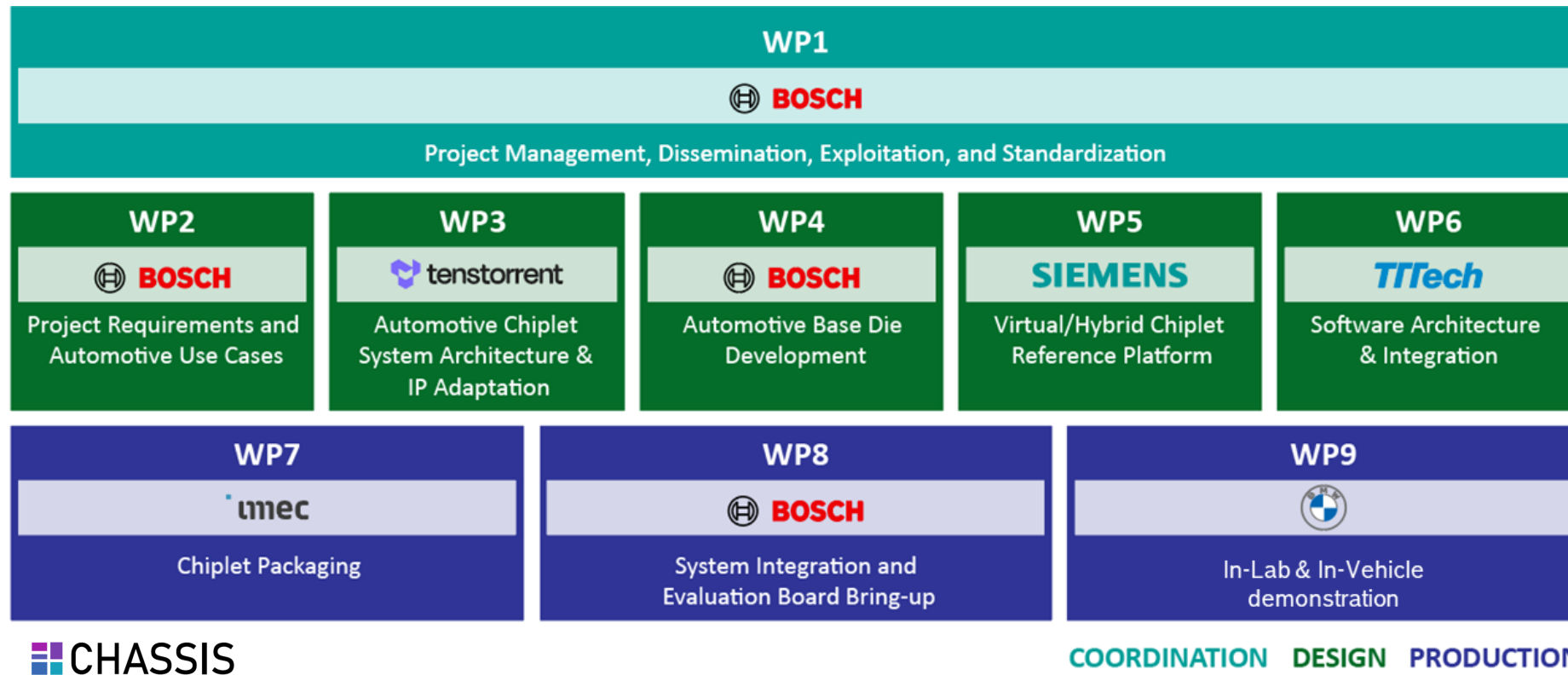
Consortial Lead: BOSCH

EU Approval: Approved in Jul 2025, started Nov 1st, 2025

Timing: 11/25 – 10/28

Project Setup - Workpackages

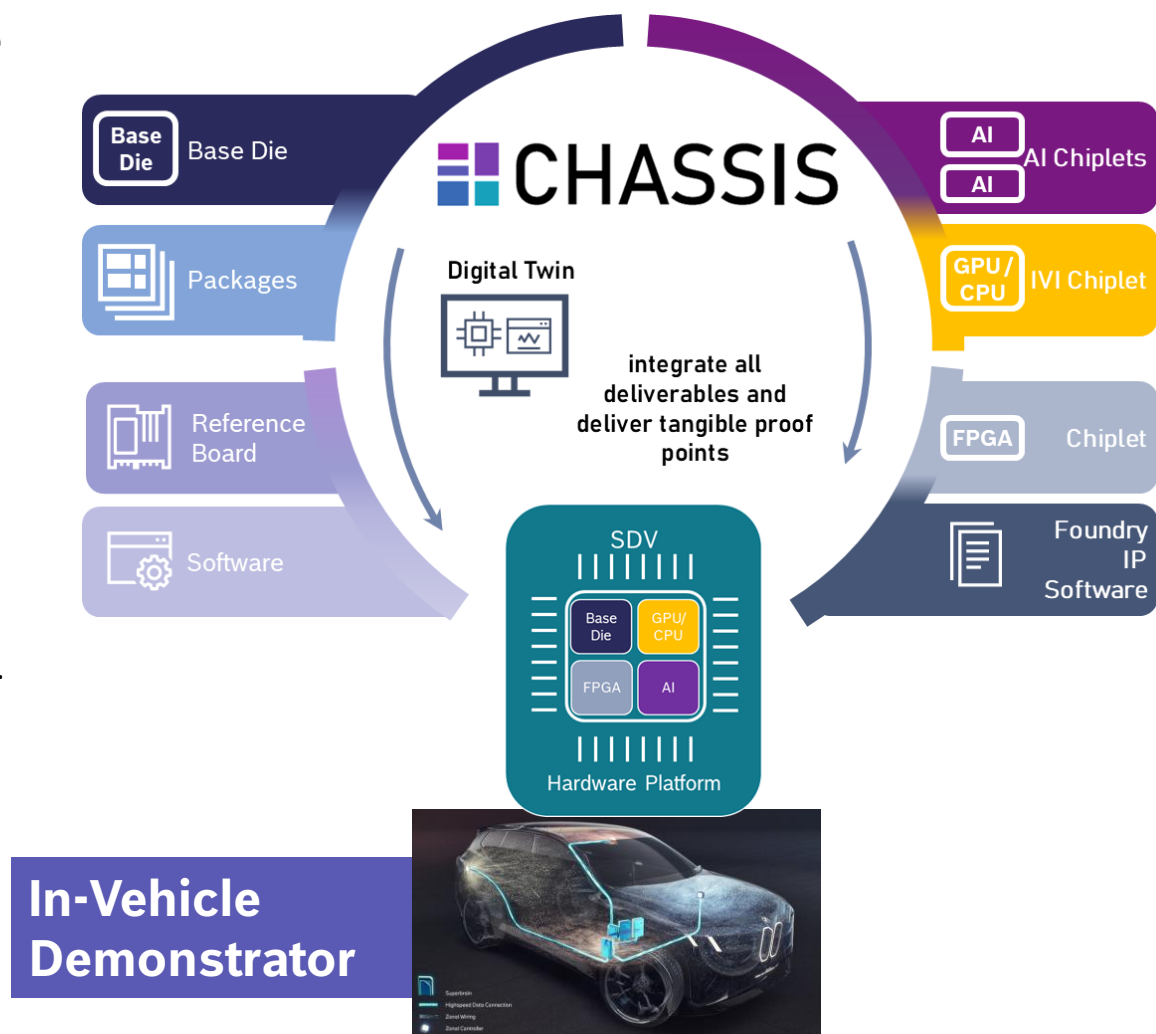
Organized into nine interdependent Work Packages (WPs), the project covers the entire development lifecycle from requirements definition to system validation.



CHASSIS delivers a proof for automotive and enables the ECOSystem

CHASSIS delivers proof points for chiplets in Automotive

- **Base Die (VEGA):** Open chiplet platform for modular, cost-effective automotive systems.
- **Test Chip:** Multi-vendor SoC prototype on Reference Board.
- **Vehicle Demo:** In-vehicle test of board and software for key use cases.
- **Dev Environment:** Virtual/hybrid co-design and validation platform.
- **Standards:** Open interfaces and reference designs for EU-wide interoperability.

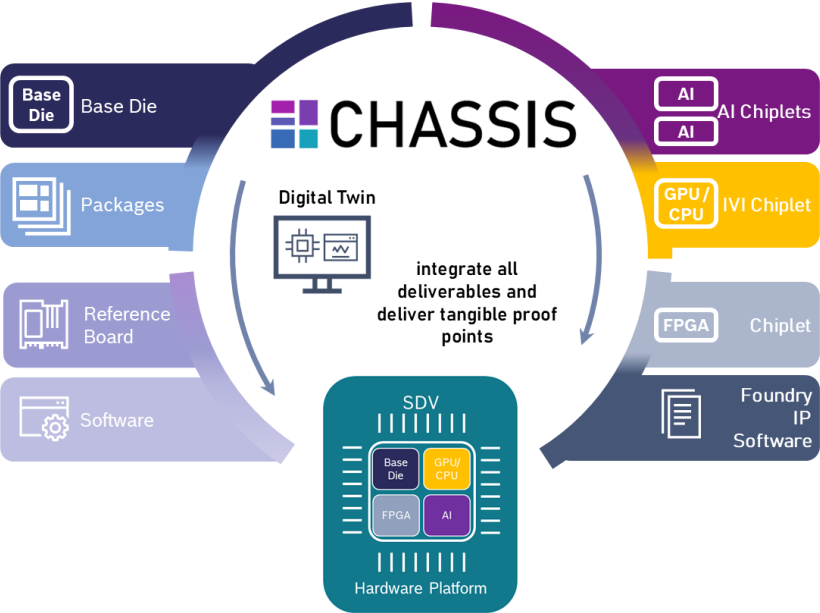


CHASSIS enables a broader Ecosystem

- **Extension Chiplets:** Integration of AI and IVI chiplets into the CHASSIS Test Die showcases modular scalability
- **IP & Foundry process diversity:** Multiple IP & Foundry suppliers contributing, highlighting the openness and collaborative nature of the CHASSIS platform.
- **Architecture Alignment:** CHASSIS supports cross-architecture compatibility and aligns with standards and practices across various industries
- **Software Readiness:** Software adaptation is embedded from the outset, enabling early validation and seamless integration of new chiplet functionalities.

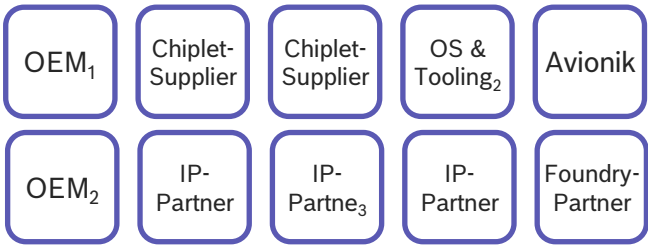
CHASSIS – Founded in Europe with global partners

CHASSIS partner unite the market and key capabilities



CHASSIS enables a broader Ecosystem

- Extension Chiplets (IVI, AI, FPGA)
- IP & Foundry process diversity
- Architecture alignment
- Software readiness



“Automotive Base Die”

- 5nm TSMC-N5A design
- Lead by Bosch, co-financed by BMW & imec

Tapeout: E26

BOSCH

BMW

imec

“TestChip”

- AI Chiplet
- IVI Chiplet
- ABD

Mid: E27

AI

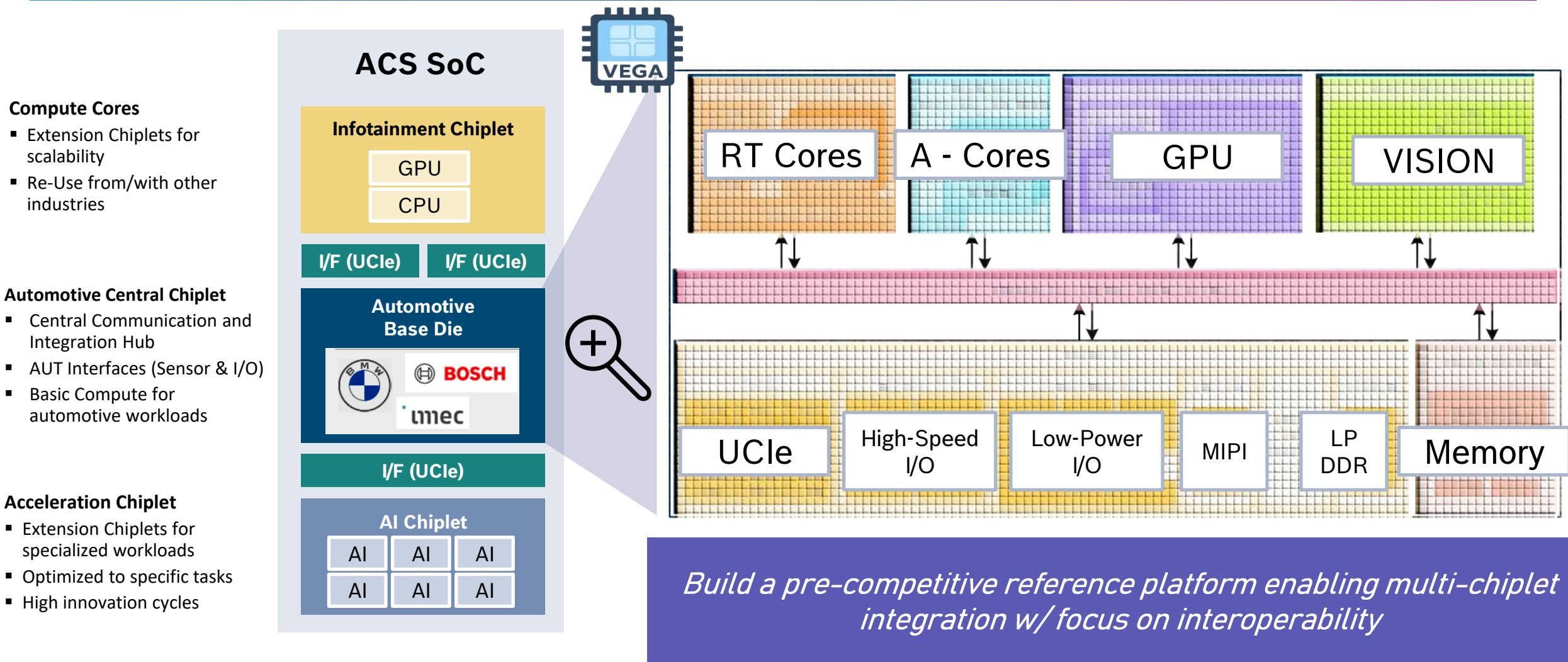
GPU/CPU

VEGA

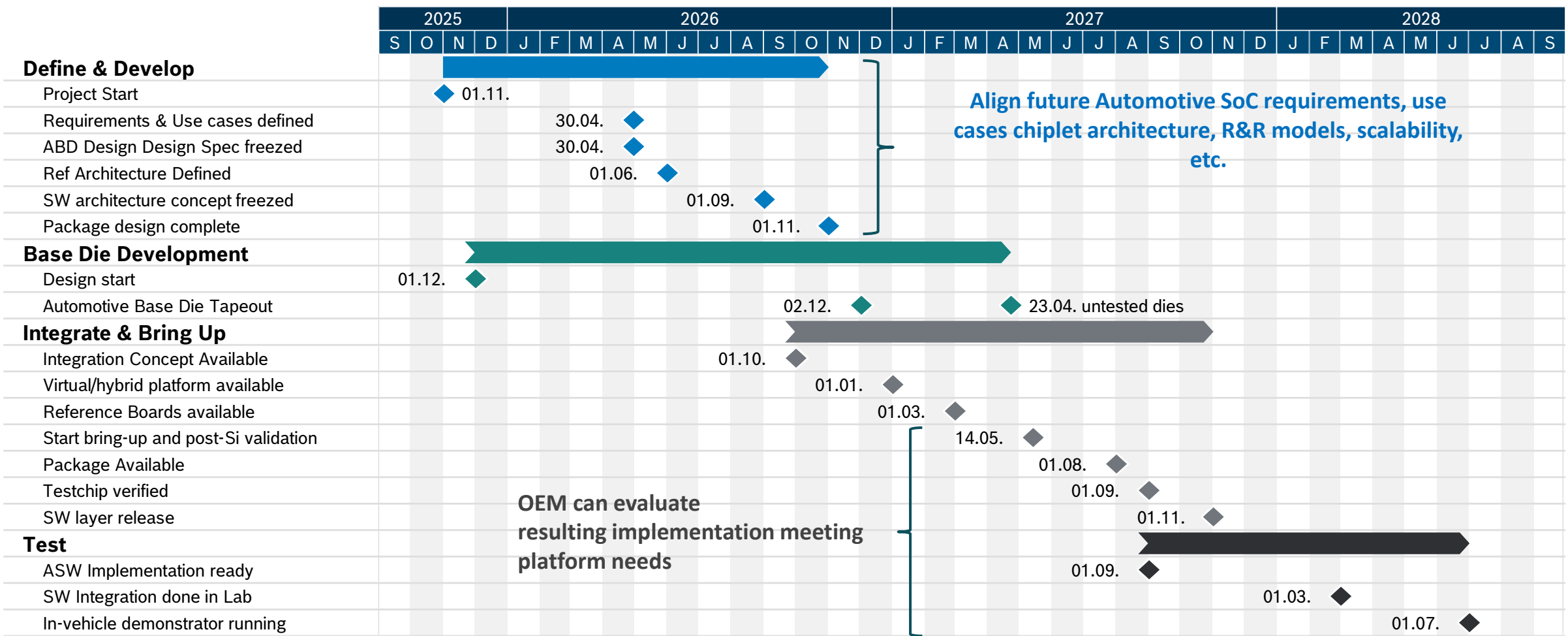
In-Vehicle Demonstrator

CHASSIS delivers proof points for chiplets in automotive: End-to-end, modular HW platform for SDVs

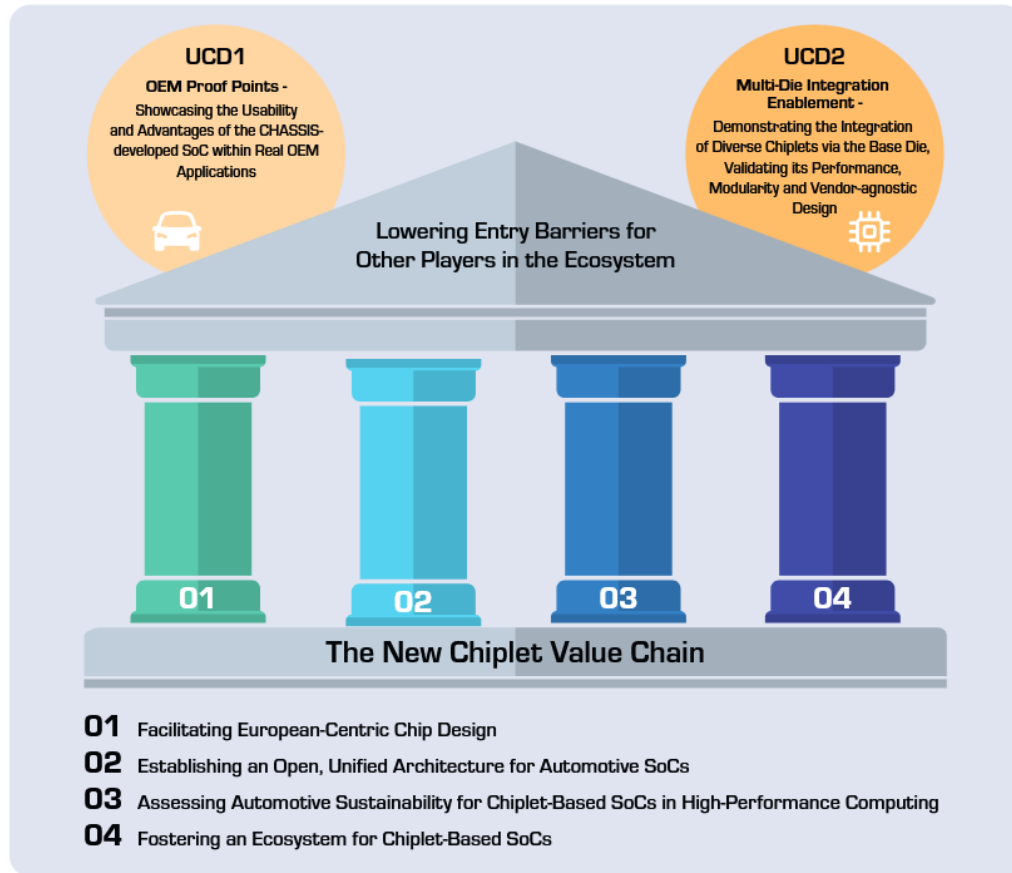
Joint Automotive Base Die between BMW, imec and BOSCH



Timeline



CHASSIS targets real proof points for Chiplets in Automotive



- **Automotive-Grade Validation:** Demonstrate that the chiplet-based architecture meets automotive performance, safety, and reliability standards through proof-of-concept (PoC) and early prototypes.
- **Modular Platform Proof:** Validate that a scalable and modular platform can serve multiple vehicle segments and OEMs by combining reusable chiplets effectively.
- **Cost Efficiency Demonstration:** Prove the economic benefits of chiplets by optimizing development and maximizing reuse across diverse applications and vehicle models.
- **Accelerated Deployment:** Show that pre-validated chiplets and a flexible integration framework enable faster development cycles and reduced time-to-market.
- **Open Ecosystem Enablement:** Establish and validate an open, multi-vendor ecosystem that supports standardized, heterogeneous chiplet integration—avoiding vendor lock-in.

Thank you!

More information:
<https://www.automotive-chiplets.org/>



<https://www.linkedin.com/showcase/automotive-chiplets>