Chips JU

Heterogeneous integration for high-performance automotive computing

Eric Fribourg-Blanc

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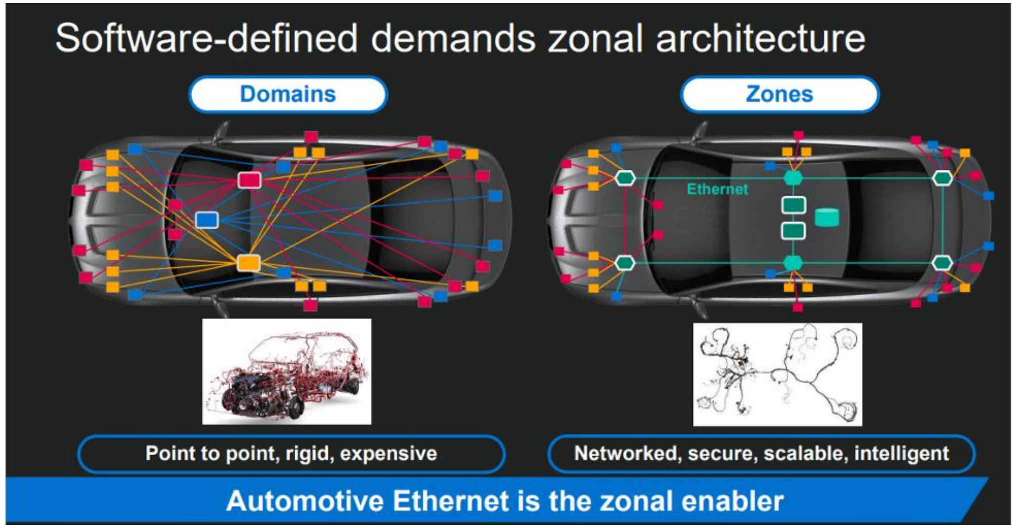
Automotive E/E architecture transformation

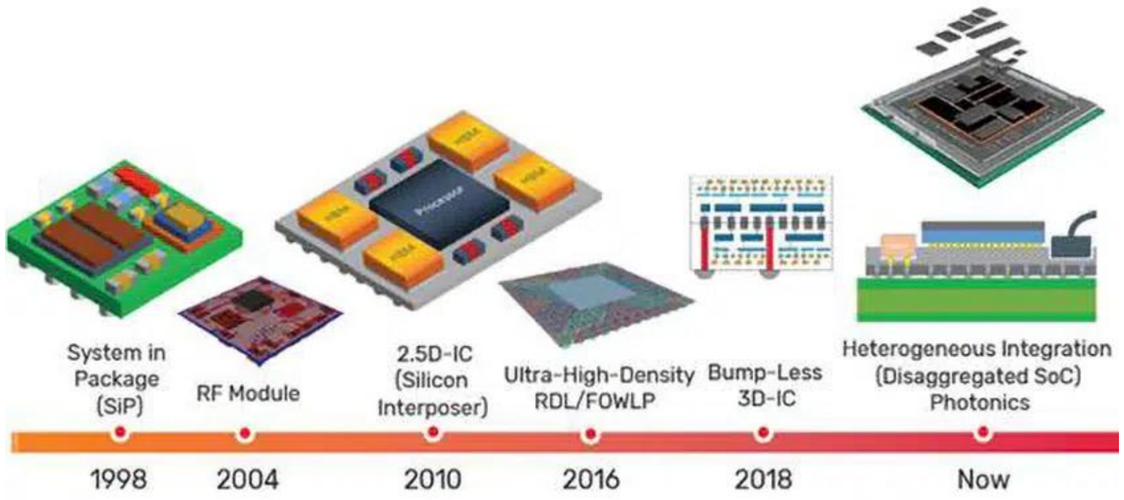
Rising compute demands in the AI-enabled software-defined vehicle, stemming from

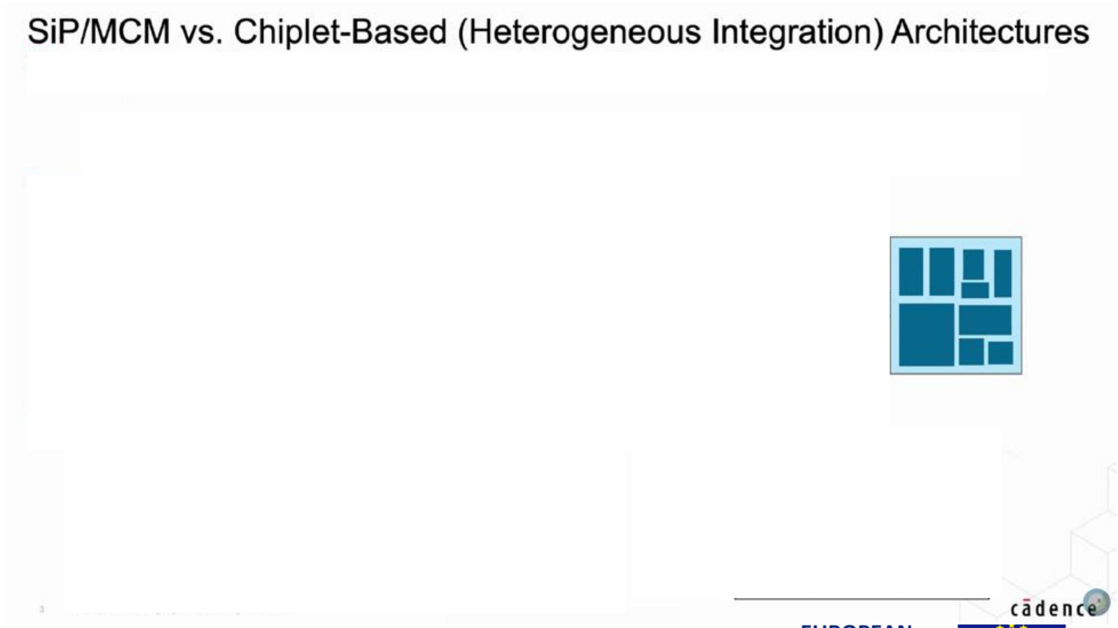
- increasing demand for more autonomy
- advanced in-vehicle experiences
- connectivity as an enabler of a more informed and intelligent mobility infrastructure
- move towards electrification



Modularisation of chip functions

- Monolithic SoCs (leading edge, incorporating all of the necessary IP blocks) ➲ untenable
- Chiplet-based designs enable the integration of dies fabricated at different process nodes, offering a cost-effective approach due to improved yield rates, and faster time-to-market
- Chiplet architectures promote innovation and differentiation through their modular design



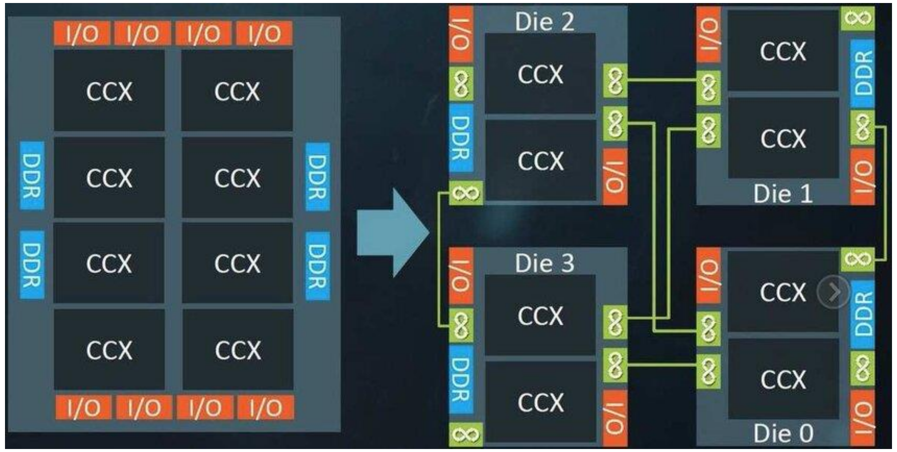


Chiplets – why

Nearly half of the total value of automotive processors from high-performance SoCs by 2031 [TechInsight]

- Chiplet technology overcomes limitations in traditional monolithic System-on-Chip (SoC) designs, such as reticle size, memory access, and issues related to power consumption
- Modularizing chip functions into smaller, discrete components, chiplets benefits
  - Manufacturing yields
  - Cost reduction
  - Greater flexibility in system design
  - Faster developments
- This modular approach facilitates easier customization and upgrades, aligning with software-defined vehicles

Chiplets transforming the automotive industry – how



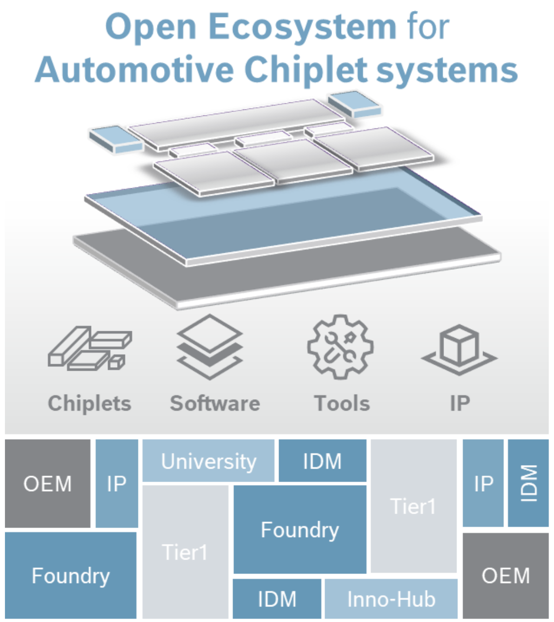
Transition to chiplet-based designs challenging

- Functional safety
- Reliability
- Quality
- Security
- Thermal management
- Mechanical stress

Chiplets transforming the automotive industry – how

Automotive chiplet interoperability

- Standardization
- Interconnect technologies
- Communication protocols
- Power and thermal management
- Security
- Testing
- Ecosystem collaboration



2 of the biggest hurdles

- Ensuring reliable, fast, and high-bandwidth integration between the individual chiplets
- Standardizing across the sector

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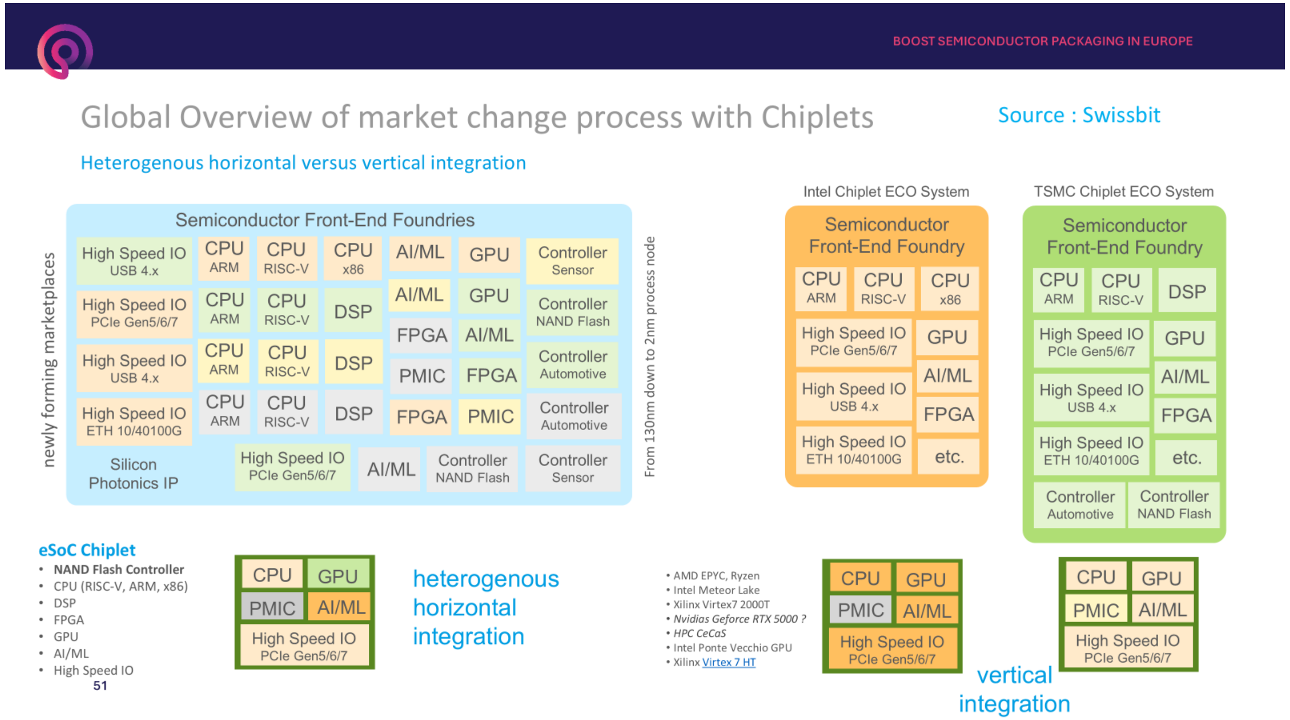
Chiplets – how

- Advanced tools are required
  - System-level modelling languages
  - Chiplet integration tools for 3D integration
  - Accurate electrical, thermal, and mechanical 3D solvers
- Correlation between simulated and measured results is crucial
- Comprehensive toolset to bridge the gaps between chip, package, and PCB interactions for designing complex automotive chiplets



Expected outcomes

1. Automotive chiplet system framework ➲ architectural and design specifications for an automotive chiplet-based computing platform
2. Adaptation of relevant IP ➲ adapt pertinent intellectual property (IP) for seamless automotive chiplet integration
3. Automotive base die development ➲ for the orchestration of in-package computing
4. System Integration and Packaging ➲ develop the automotive-grade package

Implementation of the developed workflows to be integrated in the call on RISC-V hardware platform ➲ require a close collaboration between the two consortia when preparing the grants

Scope

- Focus on automotive with potential applications to other verticals
- Alignment with RISC-V Automotive Hardware Platform on activities, roadmaps, milestones, transfer of results and IP, etc. to realise the required demonstrators
- Heterogeneous integration and interfacing components with special emphasis on 2.5D integration through chiplets
- Tangible silicon demonstrators that can be deployed in an operational environment as qualified devices
- Comprehensive, medium-term implementation roadmap with ambitious milestones for the necessary actions to establish a processor ecosystem targeted towards the automotive industry

Call conditions

- 1 stage IA topic
- 4 March 2025 → 29 April 2025
- 20M€ EU budget
- Size limit = 35 participants
- Recommended SME's share of participants = 1/3
- Participation is limited to legal entities established in EU Member States, Norway, Iceland, Associated Countries, OECD and Mercosur countries

Type of beneficiary	Maximum EU Contribution as % of the Eligible Cost according to HE
For profit organization but not an SME (LE)	25%
SME (for profit SME)	35%
University/Other (not for profit)	35%

Questions

Thank you for your attention