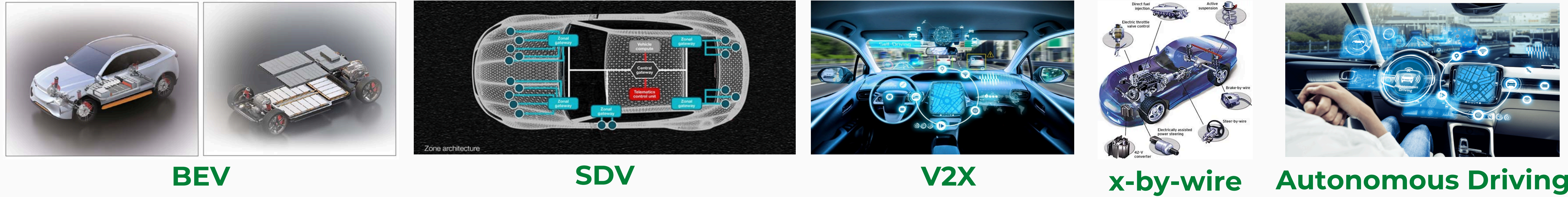


# An Ecosystem Approach to Drive RISC-V Adoption in Automotive Designs

Samuel Chiang  
Andes Technology

**Automotive Vehicle Revolution => new solutions needed**  
Andes RISC-V IP & Ecosystem partners work together to provide the solutions



BEV

SDV

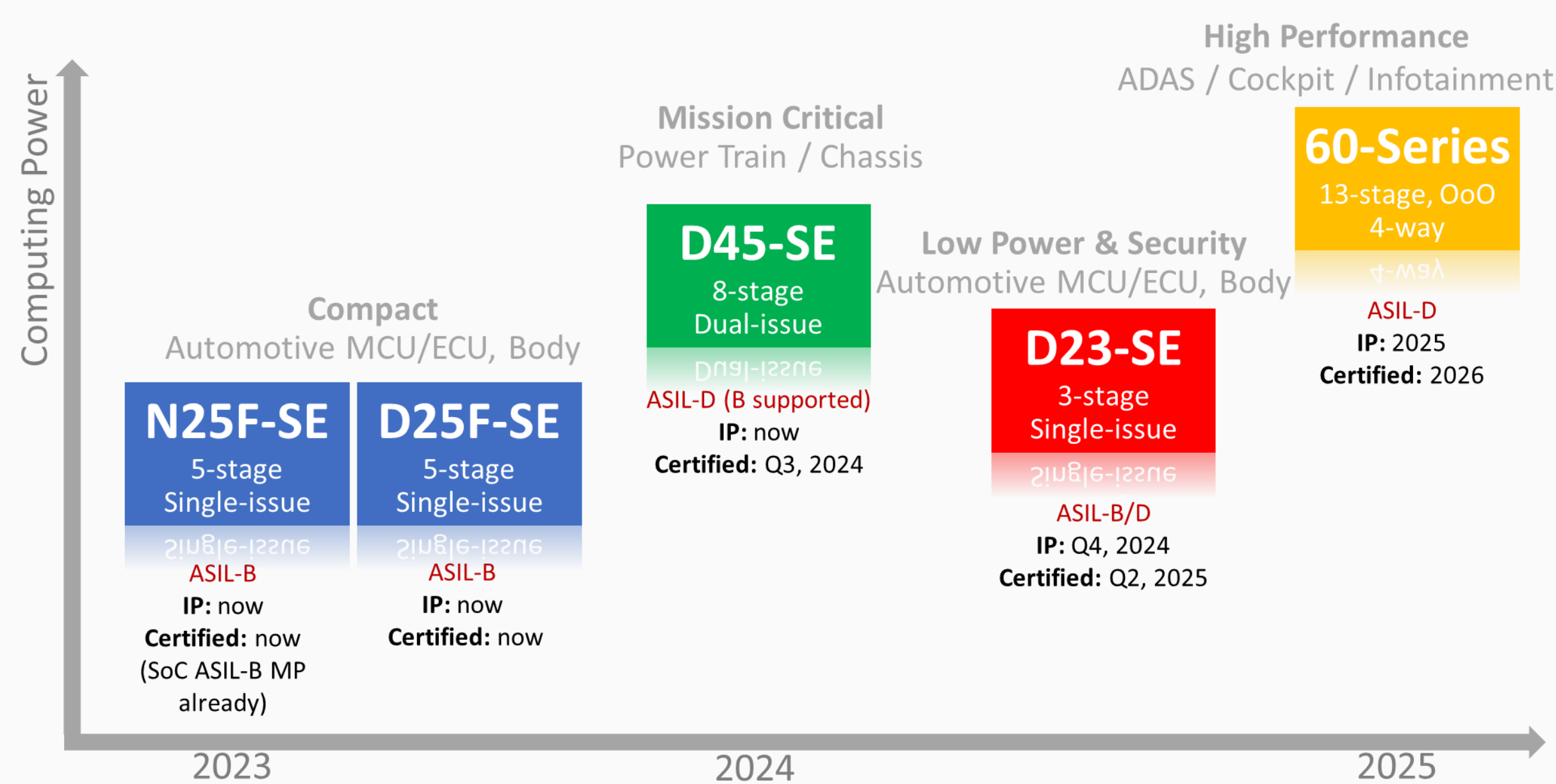
V2X

x-by-wire

Autonomous Driving

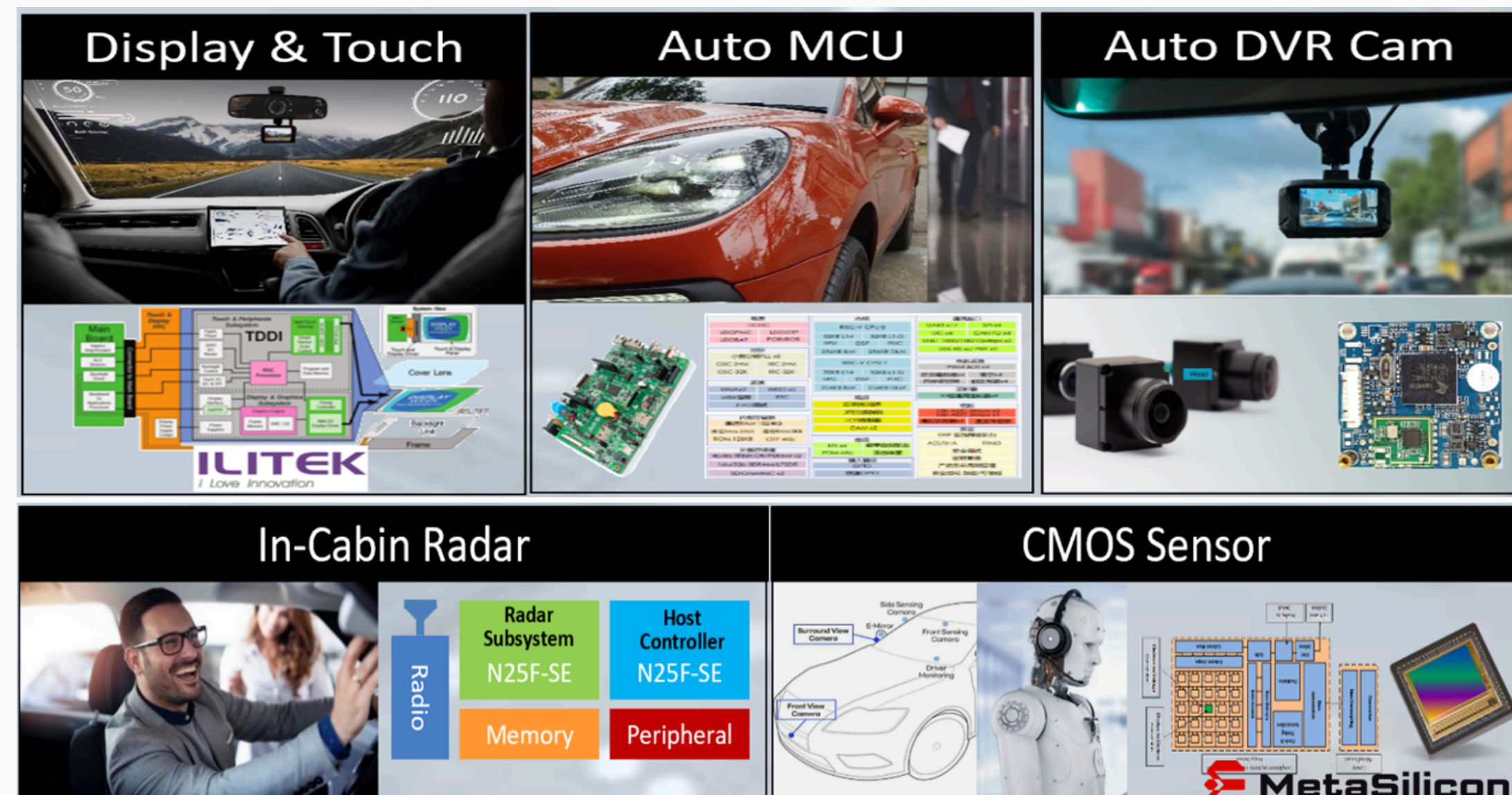
## AndesCore™ RISC-V Functional Safety Cores Line-up

Silicon proven design with wide performance points, safety assurance levels, advanced roadmap



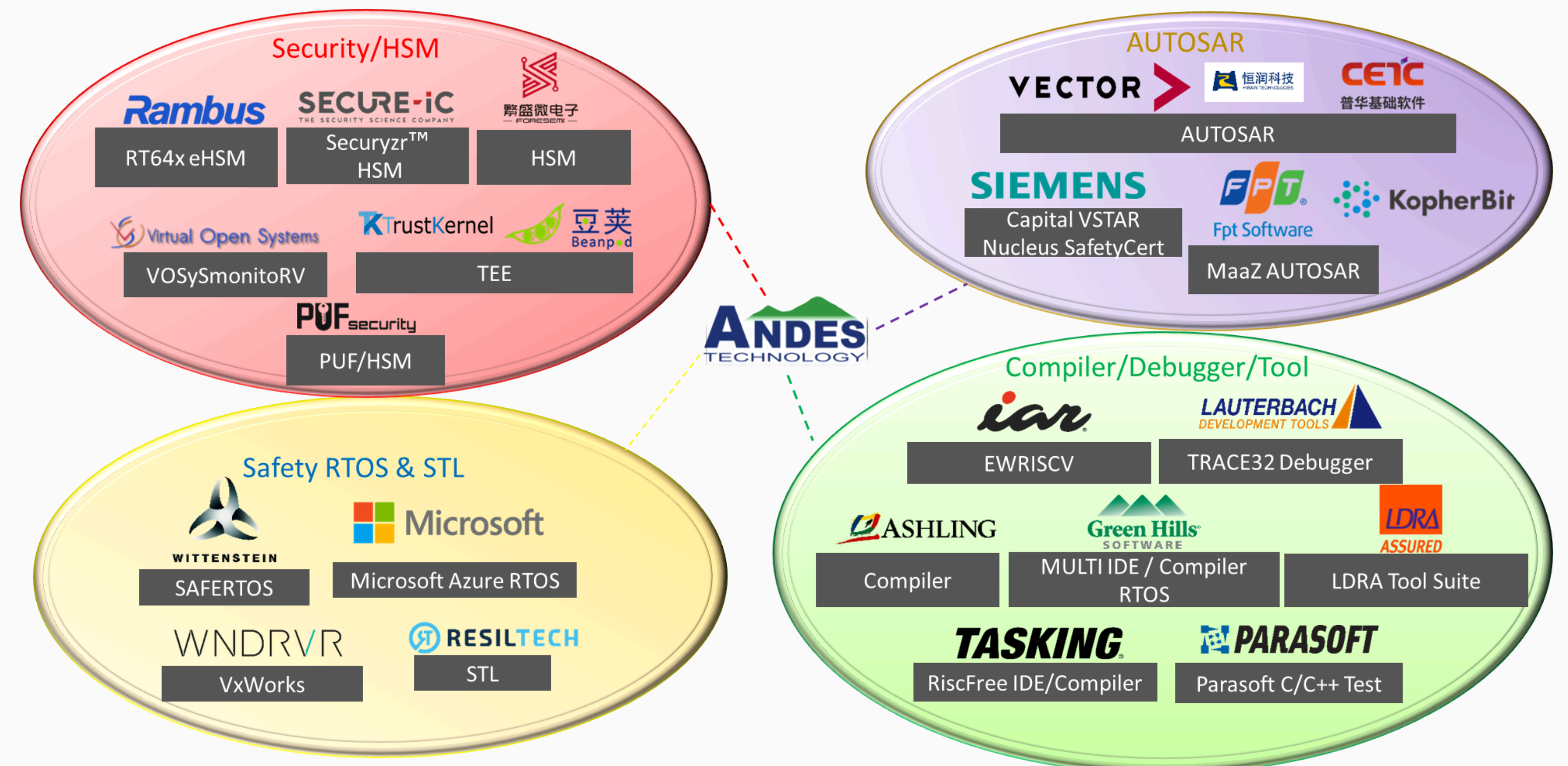
## Andes & Partners are driving automotive chip innovations

- N/D25F-SE achieved ISO-26262 ASIL-B full compliance
- Over a dozen customers' automotive projects based on 25-SE series
- ILITEK (Touch Display Driver IC) and MetaSilicon (CMOS sensor IC) have public PR



## Andes Automotive Ecosystem Partners

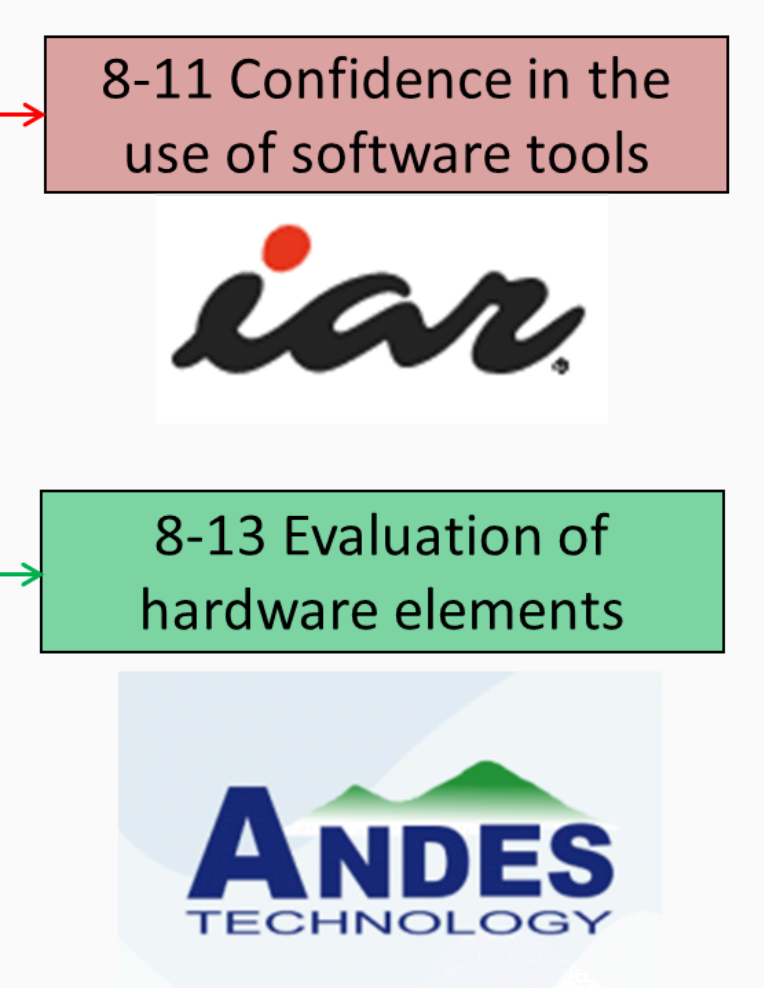
PR with Tasking, WHIS, Vector, HiRain, MachineWare, Ansys, LDRA, IAR, Solid Sands, & Parasoft for automotive collaborations



## Andes + IAR + ILITEK

ILITEK ILI6600A Automotive TDDI  
Leveraging Andes Safety Package  
Work Products to achieve  
ISO26262 ASIL-B Ready by SGS TUV Saar

1. Vocabulary		
2-5 Overall safety management	2-6 Management of functional safety	2-7 Safety management regarding production, operation, service and decommissioning
3-5 Item definition	3-6 Hazard analysis and risk assessment	3-7 Functional safety concept
4-5 General template for the product development at the system level	4-6 Product development at the system level	4-7 System and item integration and testing
5-5 Planning for production, operation, service and decommissioning	5-6 Production	5-7 Operation, service and decommissioning
6-5 Interfaces with distributed developers	6-6 Verification	6-7 Proven to use argument
6-6 Specification and management of safety requirements	6-7 Verification management	6-8 Integration of application that meet of scope of ISO 26262
6-7 Configuration management	6-8 Qualification of software components	6-9 Integration of safety-related system disclosed according to ISO 26262
6-8 Change management	6-9 Substitution of hardware elements	6-10 Safety analysis
7-5 Requirements decomposition with respect to ASIL Colloing	7-6 Analysis of dependent failures	7-7 Safety analysis
7-6 Criteria for coexistence of elements	7-7 Analysis of dependent failures	7-8 Safety analysis
9. Automotive safety integrity level (ASIL)-oriented and safety-oriented analyses		
9-5 Requirements decomposition with respect to ASIL Colloing	9-6 Analysis of dependent failures	9-7 Safety analysis
9-6 Criteria for coexistence of elements	9-7 Analysis of dependent failures	9-8 Safety analysis
10. Guidelines on application of ISO 26262		
11. Guidelines on application of ISO 26262 to semiconductors		



## Safety Mechanisms Implemented in Andes FUSA Cores

## Complete RISC-V automotive solutions with proven AndesCore™ IP

**Mission Critical**

D45-SE  
8-stage  
Dual-issue

**Low Power & Security**

D23-SE  
3-stage  
Single-issue

D45-SE and D23-SE applied:

- Dual-Core Lock-Step (DCLS)
- Bus Protection
- Information Redundancy
- Frame Counter
- Timeout Detection

**Common Safety Features**

- Advanced ECC
  - Address Decoder
  - White Noise Protection
  - Error Status Indication
- Core Trap Status Bus Interface
- Stack Protection
  - StackSafe
- NMI (Non-maskable Interrupt)
- PMP

**External Safety Mechanisms**

- WDT (Watch Dog Timer)
- Software Test Library (STL)
  - Partner: **RESILTECH**
  - Resiltech could provide chip-level STL service

**Andes Embedded™**

- Leading RISC-V CPU IP Vendor
- Andes Embedded Customer SoC Shipping > 14B
- N25F-SE > 12 customers > 4 projects tape out and MP!
- 45-Series licensees > 45
- 23-Series licensees > 9

**ISO 26262**

**RISC-V Automotive solutions for AndesCore™**

- HSM with AndesCore™ embedded, EVITA compliant
- AutoSAR reference porting on AndesCore™ embedded SoC platform
- Safety RTOS porting for AndesCore™
- STL support for complete FUSA portfolio
- Safety-certified development tools support

Visit Andes' website for more info

