HIGH PERFORMANCE COMPUTING

JUNE 26, 2025

VIVEK BHAN
SVP AND GM OF HIGH PERFORMANCE COMPUTING
RENESAS ELECTRONICS CORPORATION

AT A GLANCE
HIGH PERFORMANCE COMPUTING

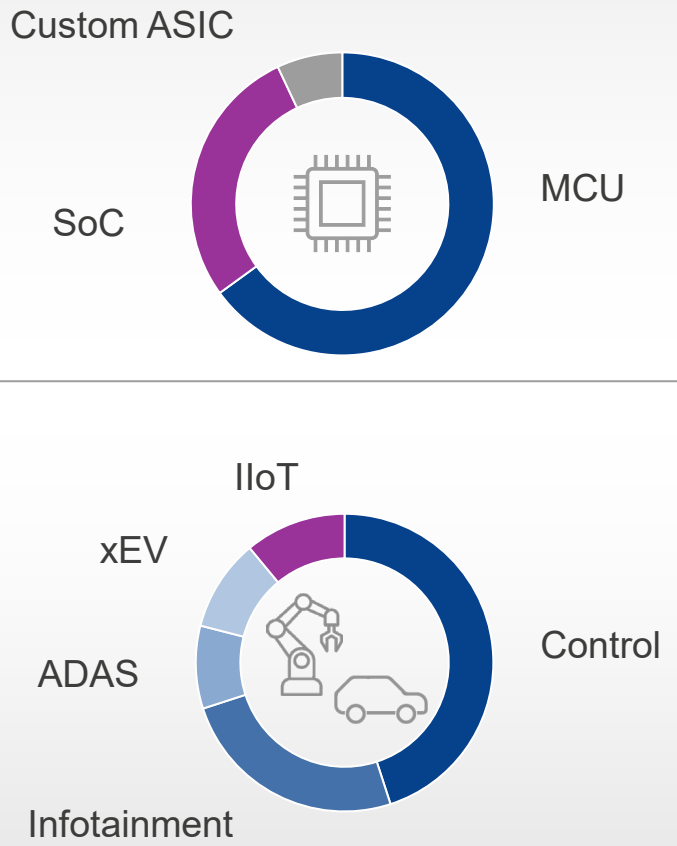
Our products / technologies

High performance, ultra-low power consumption 32bit automotive MCU

High performance, high efficiency SoC for automotive

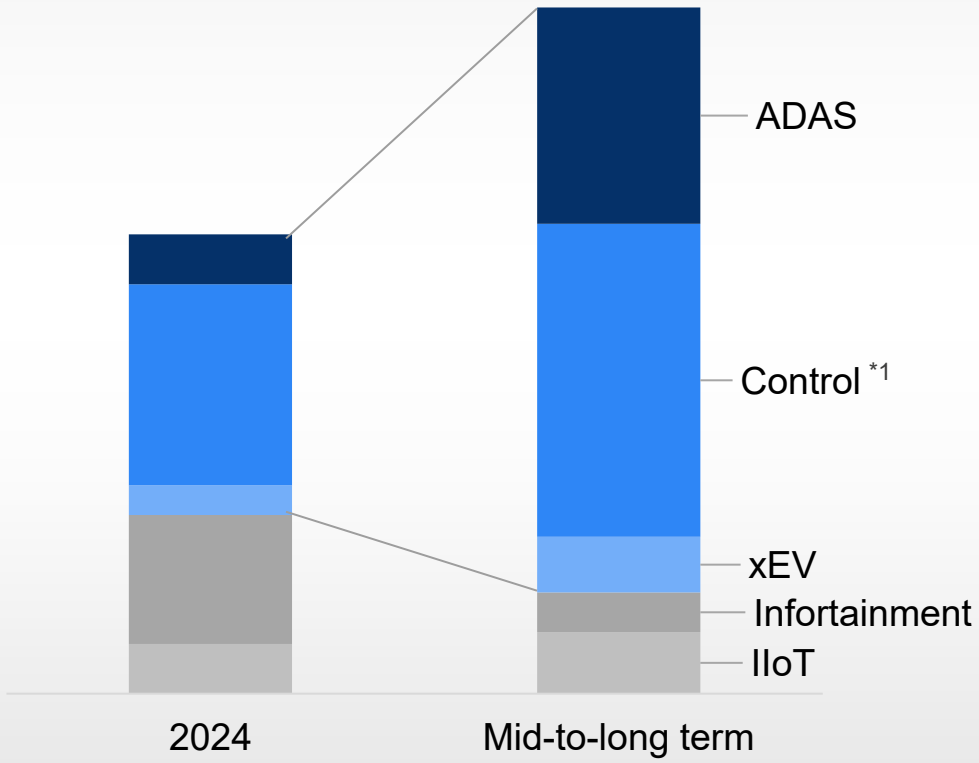
High performance custom ASIC & ASSP

2024 Revenue



GROWTH DRIVERS
HIGH PERFORMANCE COMPUTING

Revenue



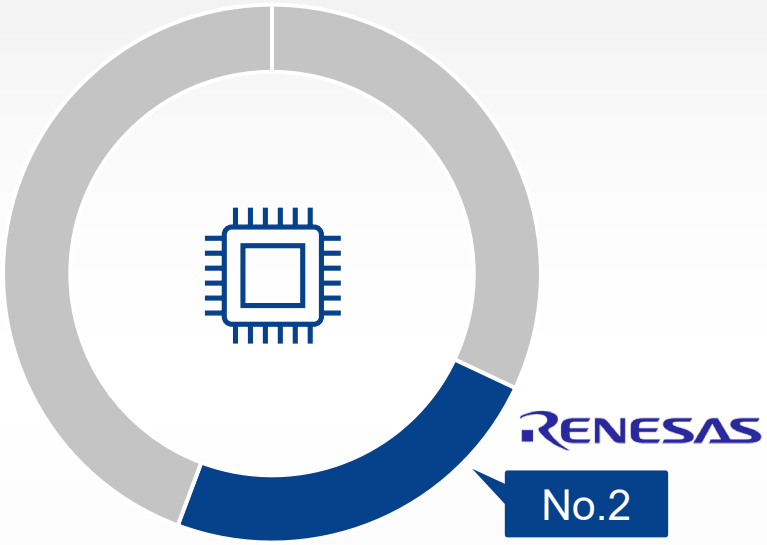
*1: Gateway is included in “Control”

Growth drivers

ADAS	ADAS/AD with AI integration R-Car Gen4/5
Control	Strong MCU/SoC portfolio for E/E architecture
xEV	Motor control MCU with Power and Analog solution

PROCESSOR SHARE AND DESIGN IN

MCU share for automotive



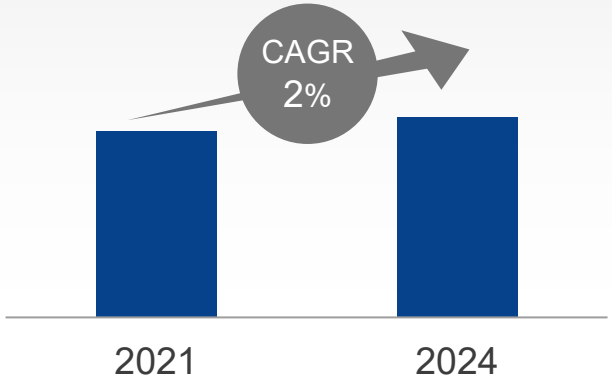
2023
22.4%

2024
23.7%

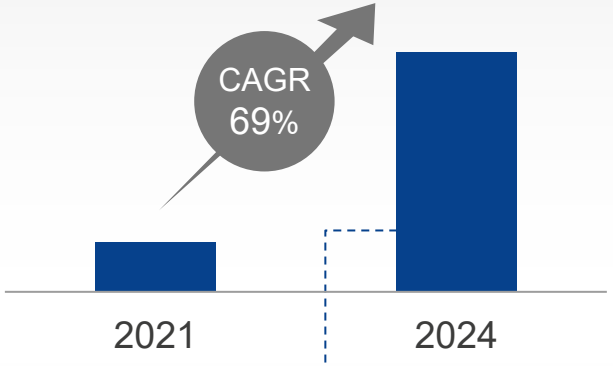
Graphs created by Renesas based on Gartner Research. Calculations performed by Renesas Source: Gartner®, Market Share: Semiconductors by End Market, Worldwide, 2024, Rajeev Rajput et al., 2 April 2025, MCU share for Automotive = Total Microcontroller for Automotive Electronics. GARTNER is a registered trademark and service mark of Gartner, Inc. and/or its affiliates in the U.S. and internationally and is used herein with permission. All rights reserved. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

Design-in

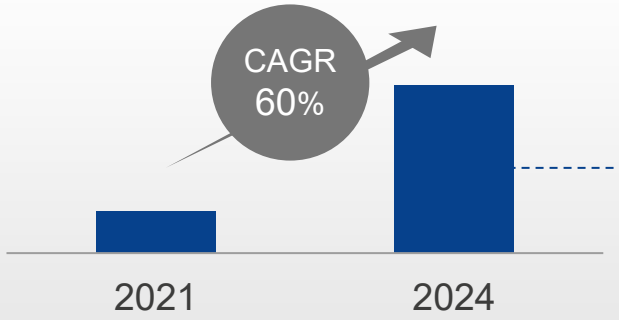
MCU RH850 (40nm)



MCU RH850 (≦28nm)



SoC R-Car (Gen4/5)



Major design-in
RH850 U2A / B for Zone & xEV

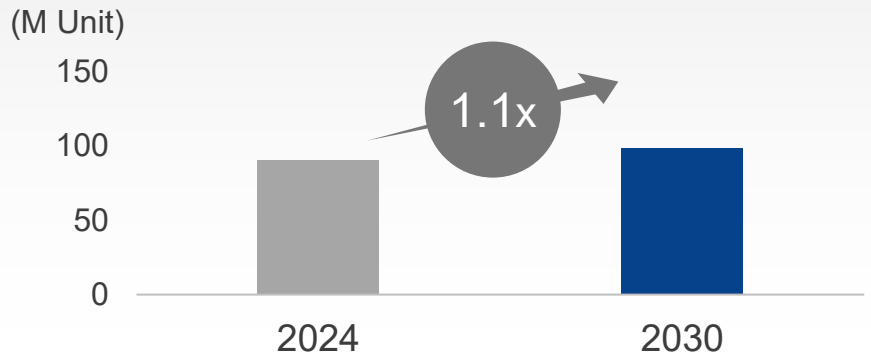
Major design-in
R-Car V4H outside of Japan
R-Car X5H / AI for Honda

Note : Bar heights are scaled independently in each chart

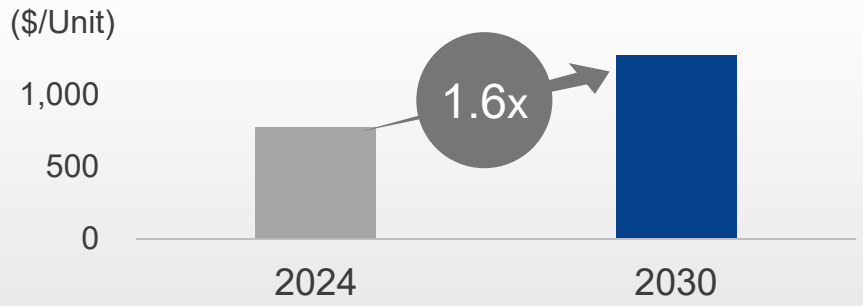
MARKET OUTLOOK (AUTOMOTIVE)

AUTO SEMICONDUCTOR MARKET GROWTH IS DRIVEN BY CONTENT PER VEHICLE

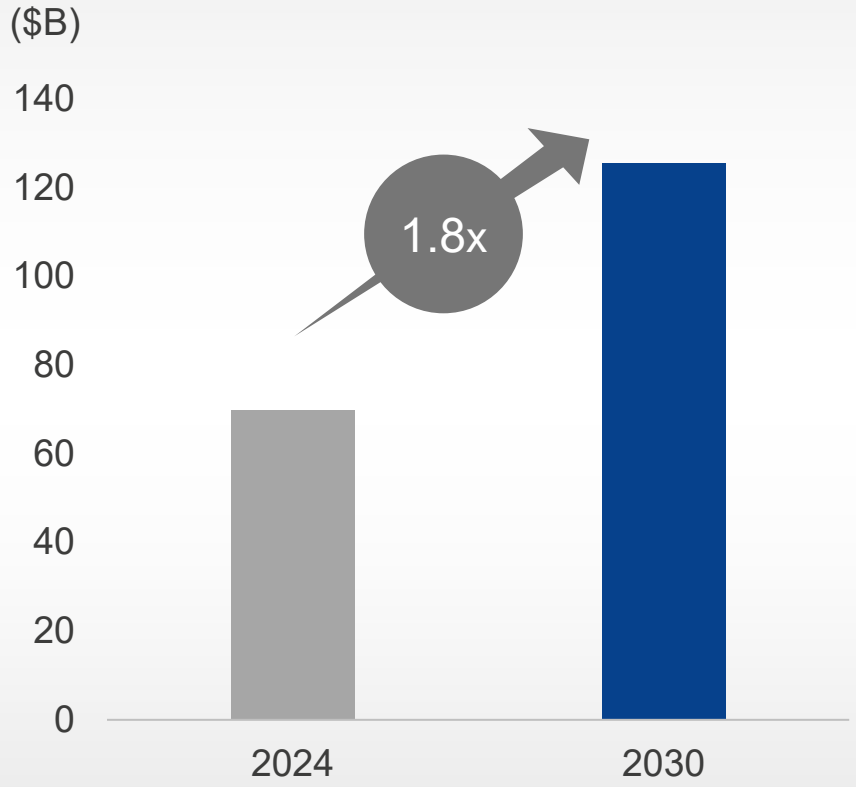
Global light vehicle production*1



Content per vehicle*2



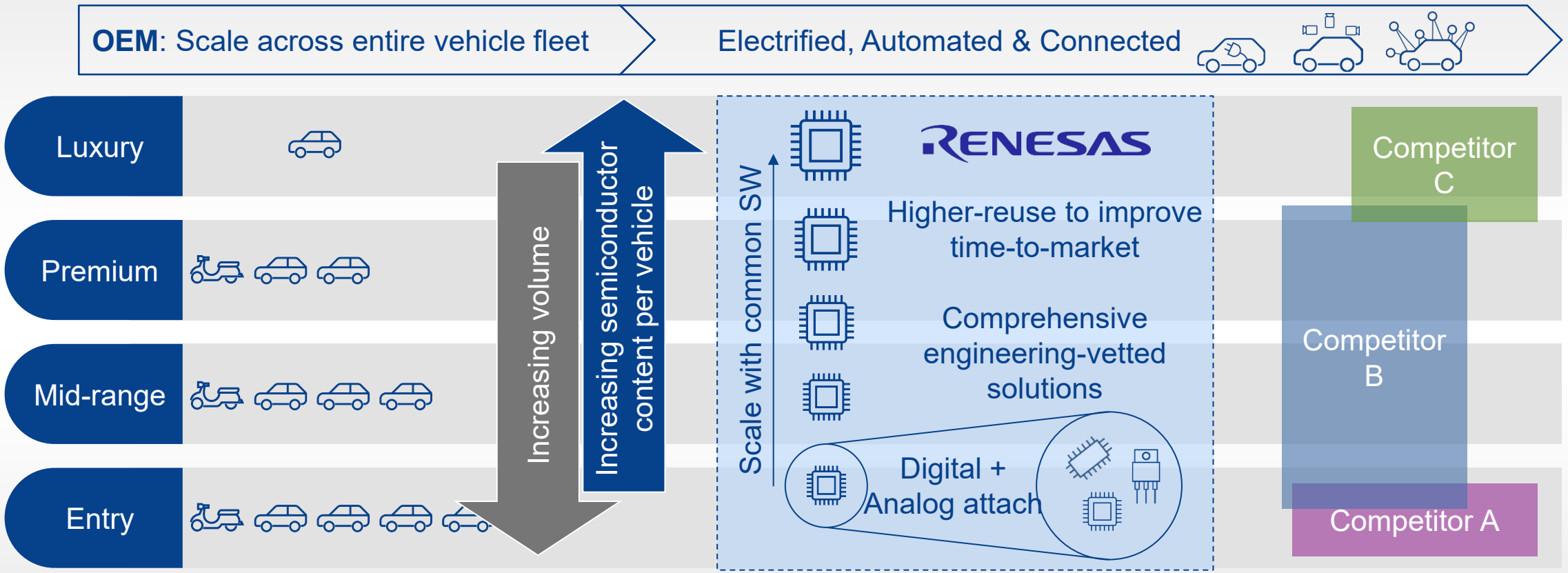
Automotive semiconductor TAM*3



*1: Source: GlobalData Global Light Vehicle Forecast (May 2025) *2: Source: TechInsights Automotive Semiconductor Demand Forecast (2Q25) *3: Source: TechInsights Automotive Semiconductor Demand Forecast (2Q25)

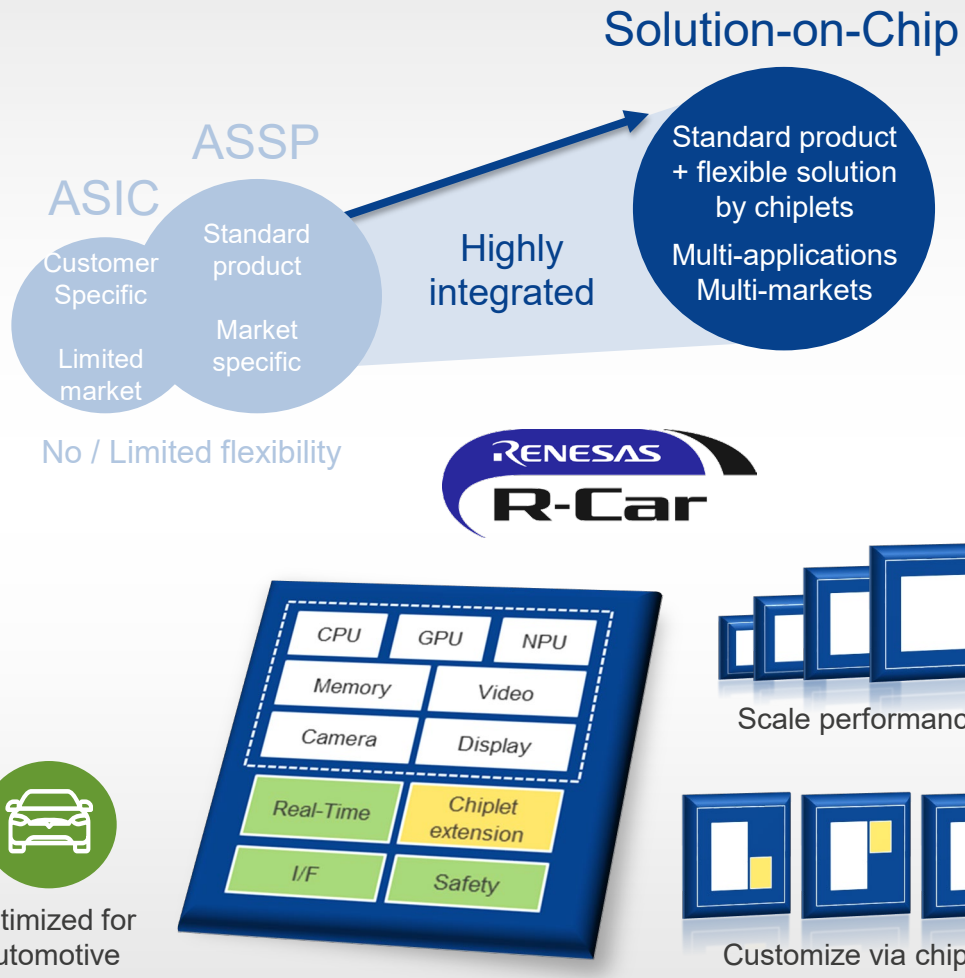
AUTOMOTIVE COMPUTE STRATEGY

FULL PORTFOLIO FROM MCU TO SOC WITH SCALABLE, FLEXIBLE AND CUSTOMIZABLE PLATFORM



RENESAS PLATFORM APPROACH

SCALABLE, FLEXIBLE AND CUSTOMIZABLE PLATFORM TO SUPPORT OEM DIFFERENTIATION & REUSABILITY



Flexible and scalable

Heterogenous and programmable architecture

CPU + GPU + Memory + Vision + NPU

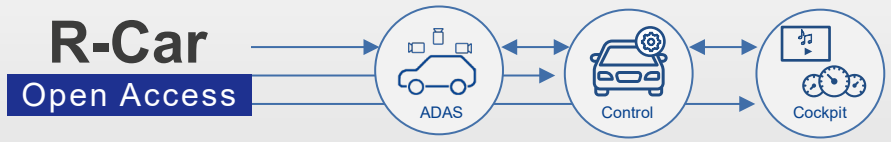
Optimized for automotive processing

Compute platform supporting E/E architecture evolution

Real-time Safety Power efficiency

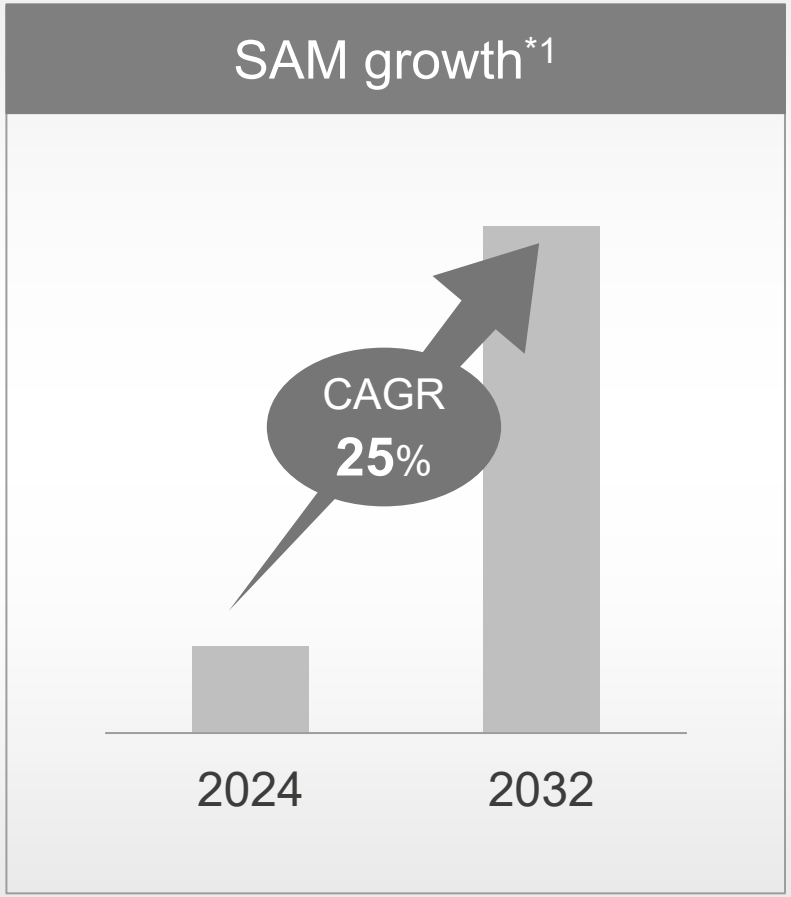
Customizable platform

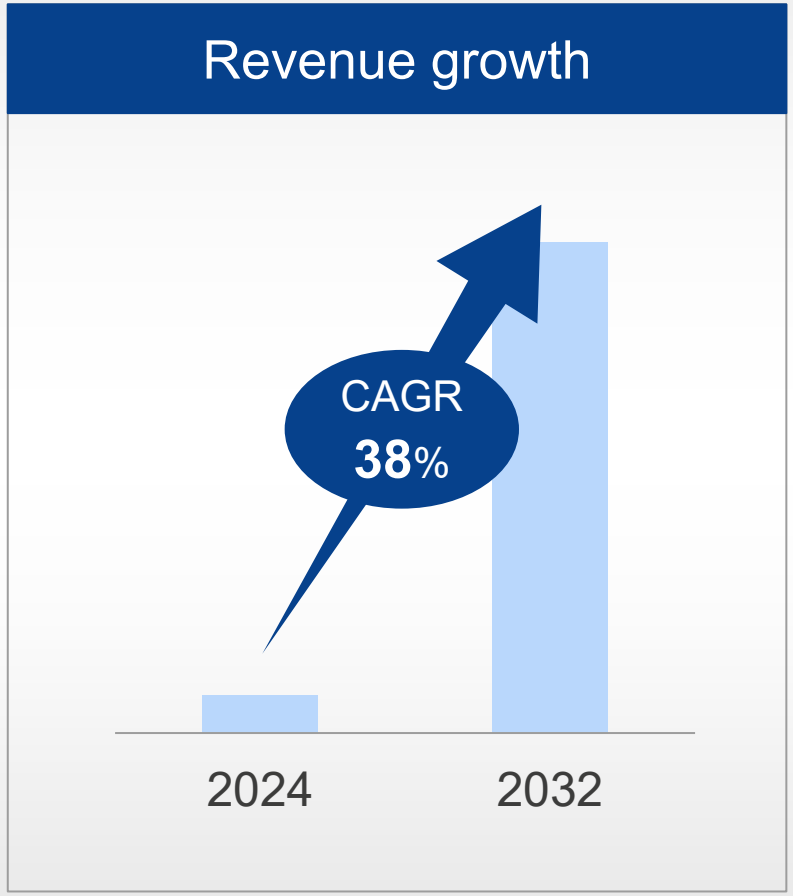
Modular hardware combined with software assets reuse



RENESAS GROWTH IN E/E ARCHITECTURE MARKET

REVENUE GROWTH IS EXPECTED TO OUTPERFORM THE MARKET

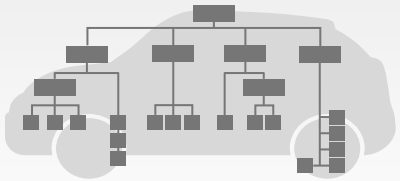


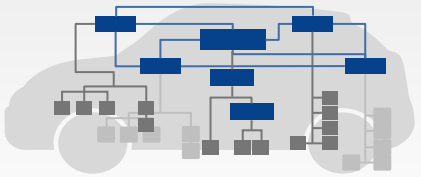


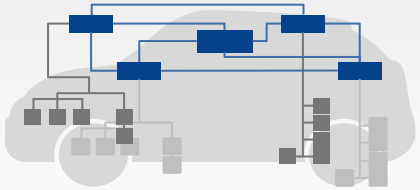
*1: Source: Renesas Estimation based on TechInsights (2Q25) (GW+Zonal)

ZONAL ARCHITECTURE TREND IN VEHICLE CONTROL

OUR FLEXIBLE AND SCALABLE INTEGRATED SOLUTIONS SUPPORT THE NEEDS OF GLOBAL OEMS



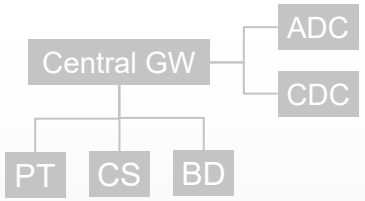


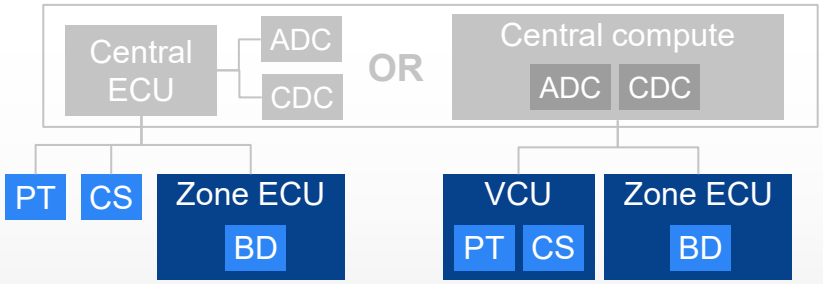


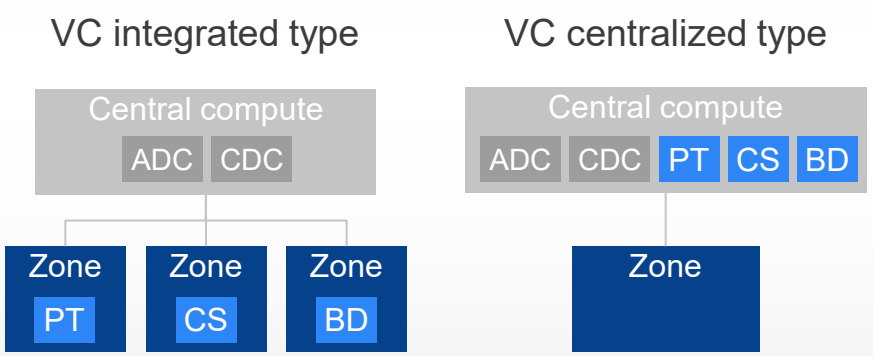
Domain

Hybrid (Domain + Zone)

Zone







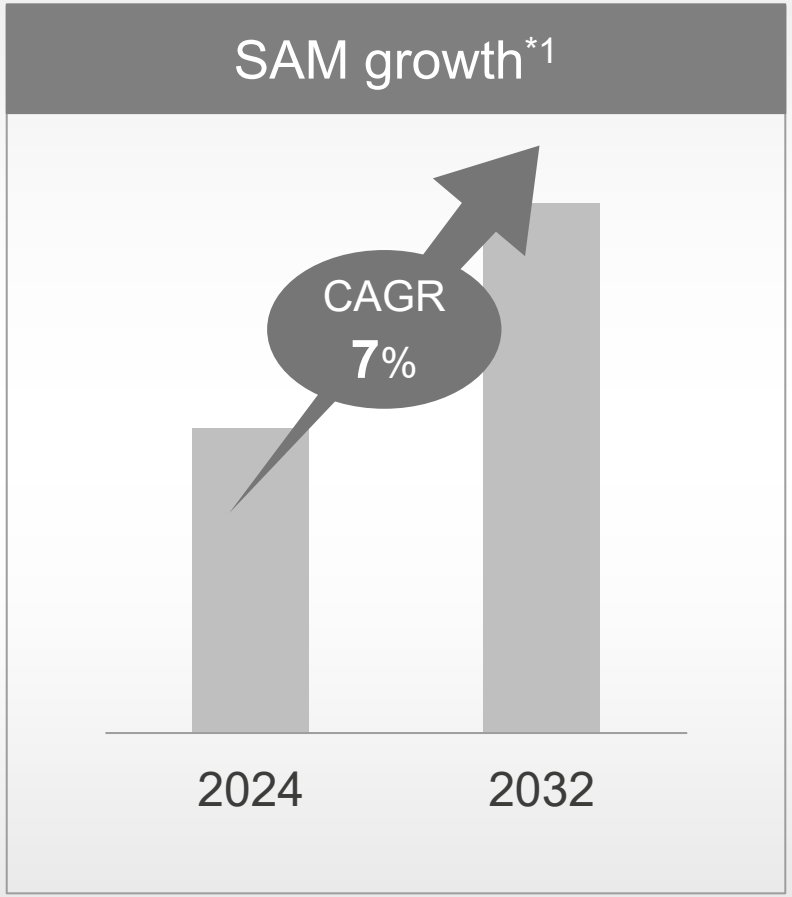
Development cost minimization

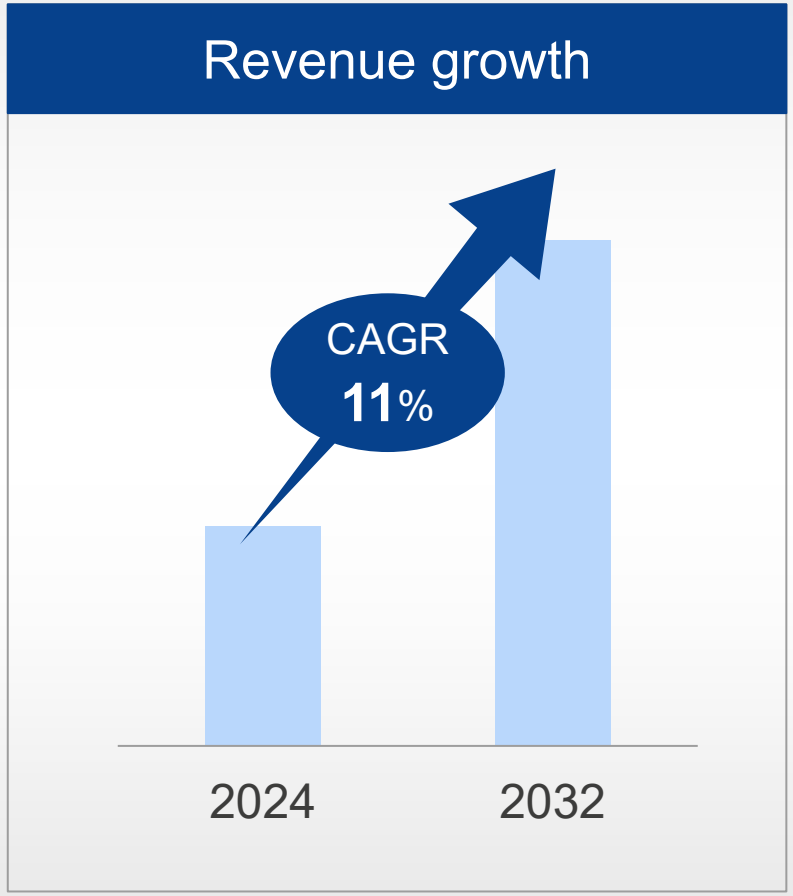
System BOM cost minimization

VCU: Vehicle Control Unit (incl. DCU) PT: Powertrain (xEV) CS: Chassis and Safety BD: Body (BCM) ADC: ADAS Domain Controller CDC: Cockpit Domain Controller

RENESAS GROWTH IN EV MARKET

REVENUE GROWTH IS EXPECTED TO OUTPERFORM THE MARKET





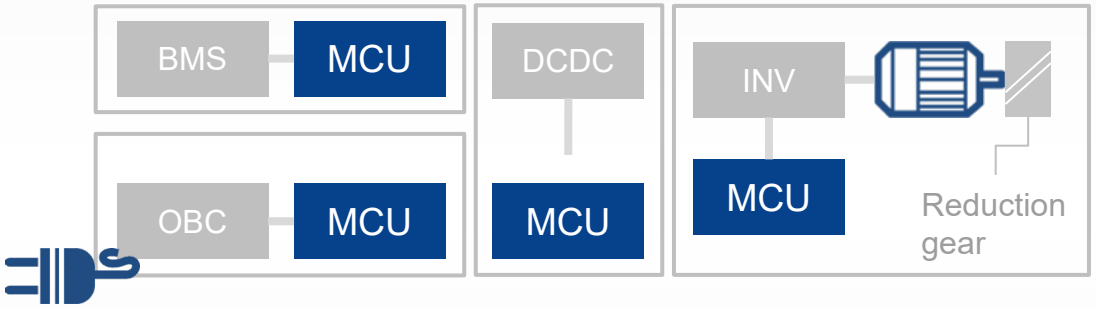
*1: Source: Renesas Estimation based on TechInsights (2Q25)

xEV MARKET TREND FOR INTEGRATION

EXPANDING MCU PORTFOLIO COVERS FROM STAND-ALONE OBC UP TO FULL INTEGRATION OF X-IN-1

xEV system will be integrated into X-in-1 type in the future, but integration level will depend on OEM

Today



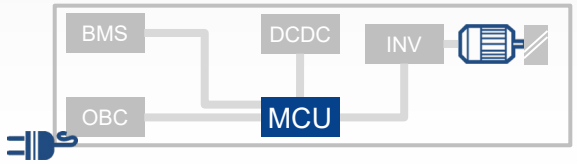
Separated

High system costs & complicated supplier management

Tomorrow

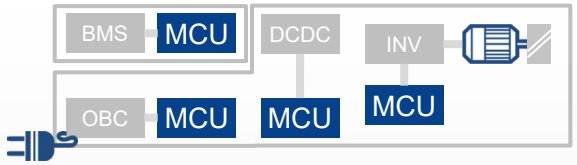
MCU integrated

Integrate control function into one MCU to reduce size and BOM cost



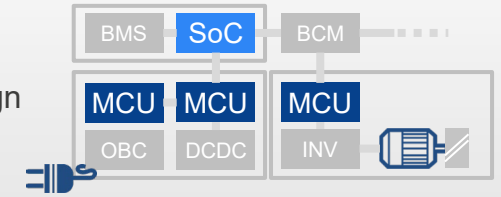
MCU dedicated

Keep dedicated MCU structure because of system complexity, asset reusability & maintainability



Brain centralized

Consolidate brain into SoC and assign MCUs to only control each system

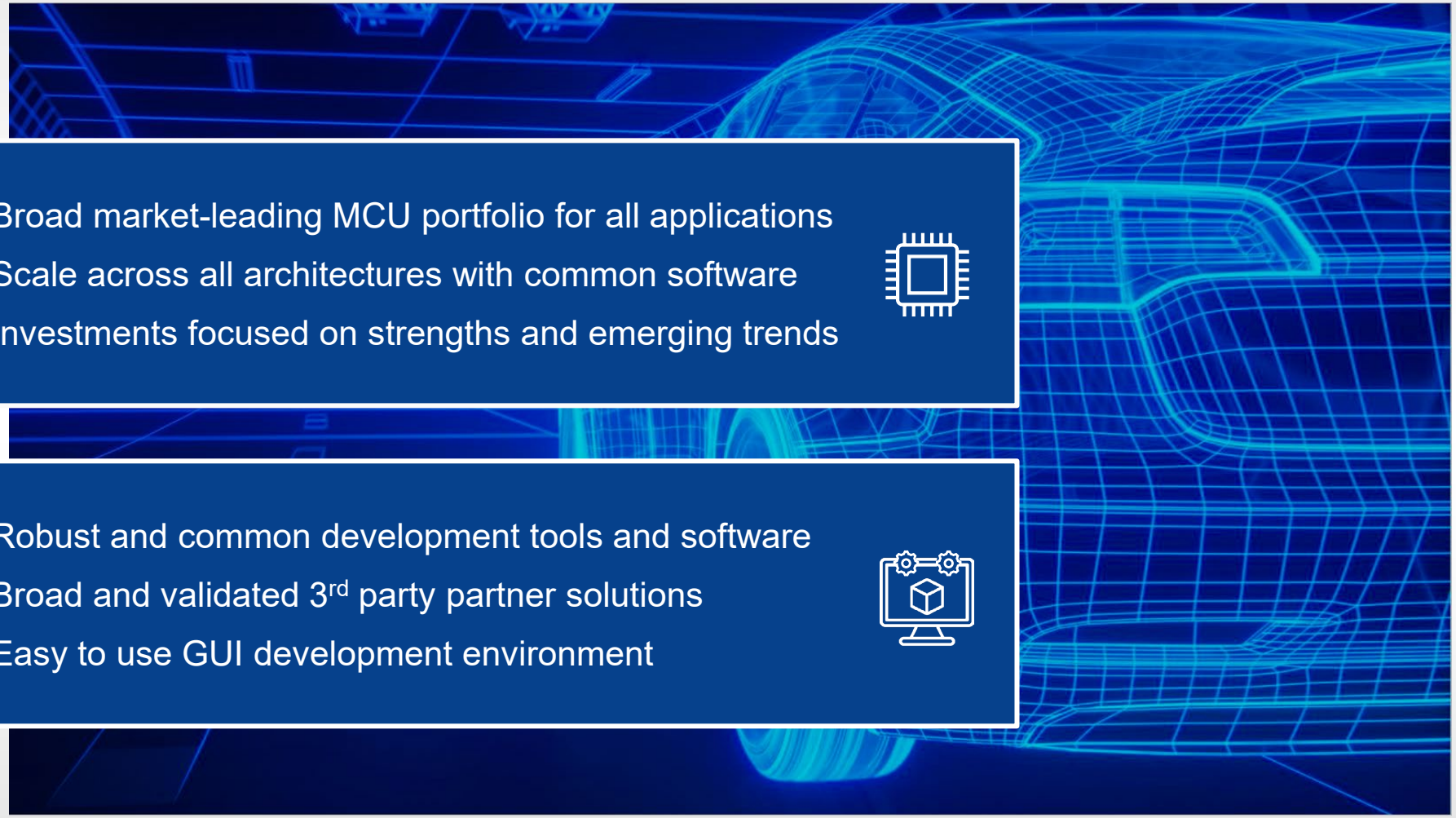


BMS: Battery Management System OBC: On-Board Charger INV: Inverter

HIGH PERFORMANCE COMPUTING MCU PRODUCT STRATEGY

BROAD AND SCALABLE MCUS TO ADDRESS ALL OEM AND TIER 1 APPLICATIONS

RENESAS RH850 RENESAS R-Car



Broad & scalable MCU platform

- Broad market-leading MCU portfolio for all applications
- Scale across all architectures with common software
- Investments focused on strengths and emerging trends

Easy & efficient development

- Robust and common development tools and software
- Broad and validated 3rd party partner solutions
- Easy to use GUI development environment

RENESAS

TARGET MARKETS OF AUTO 32-BIT MCU

PROVIDE A RICH LINE-UP OF AUTOMOTIVE MCUS FOR THE VARIOUS NEEDS OF OUR CUSTOMERS

32-bit MCU

Renesas core

RENESAS RH850

- RH850 / Uxx
- RH850 / U2x
- RH850 / X1x

- Address our classical legacy MCU customer
- High real-time performance with application specific IPs & SW legacy

Arm® core

RENESAS R-Car

- R-Car U series for general purpose

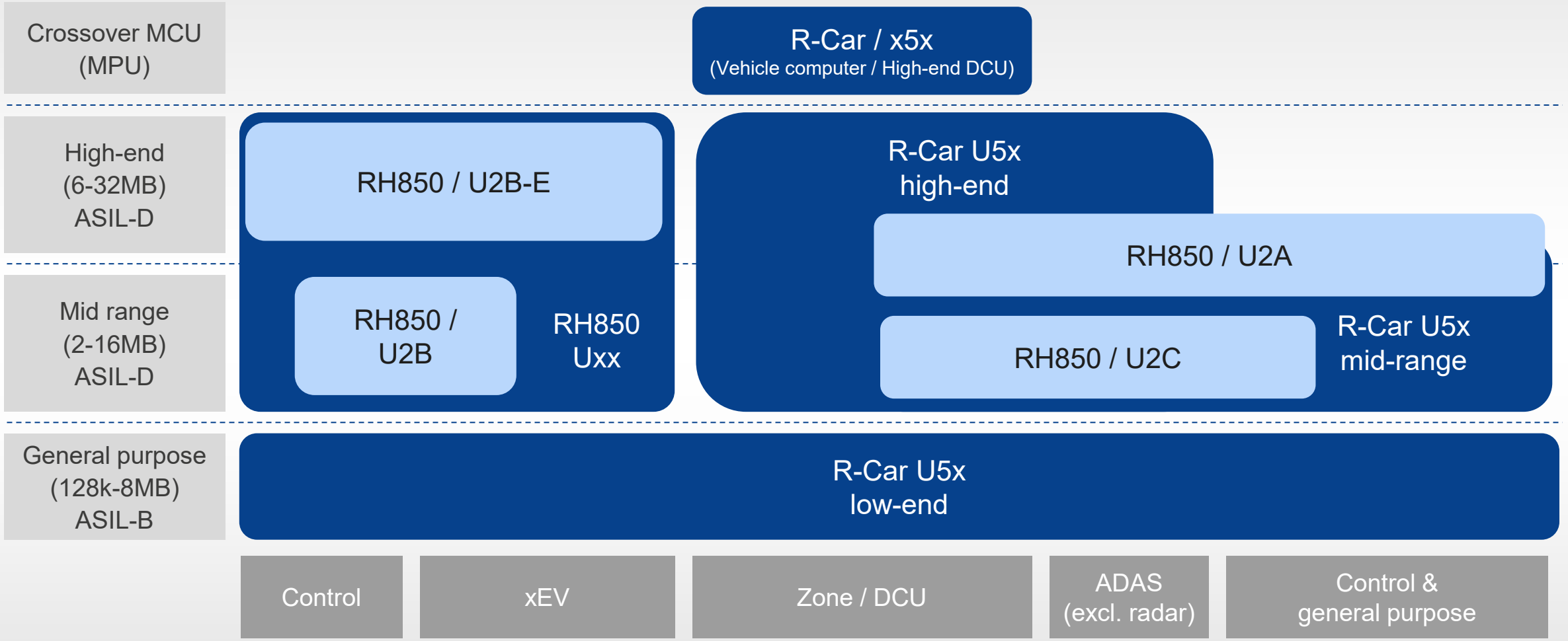
- Address market required standard CPU demand
- Standard spec and wide scalability line-up including SoC R-Car Gen5

Renesas plans investments in RISC-V Core, Sub-system, ISA for future

RENESAS

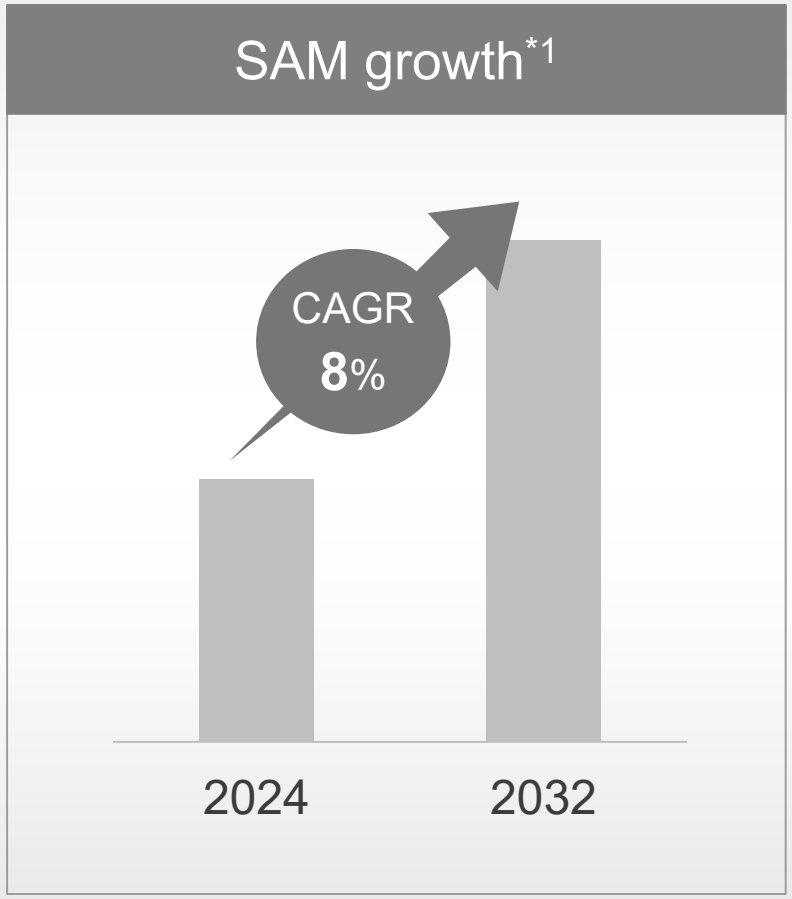
HPC 32-BIT AUTO MCU MARKET COVERAGE

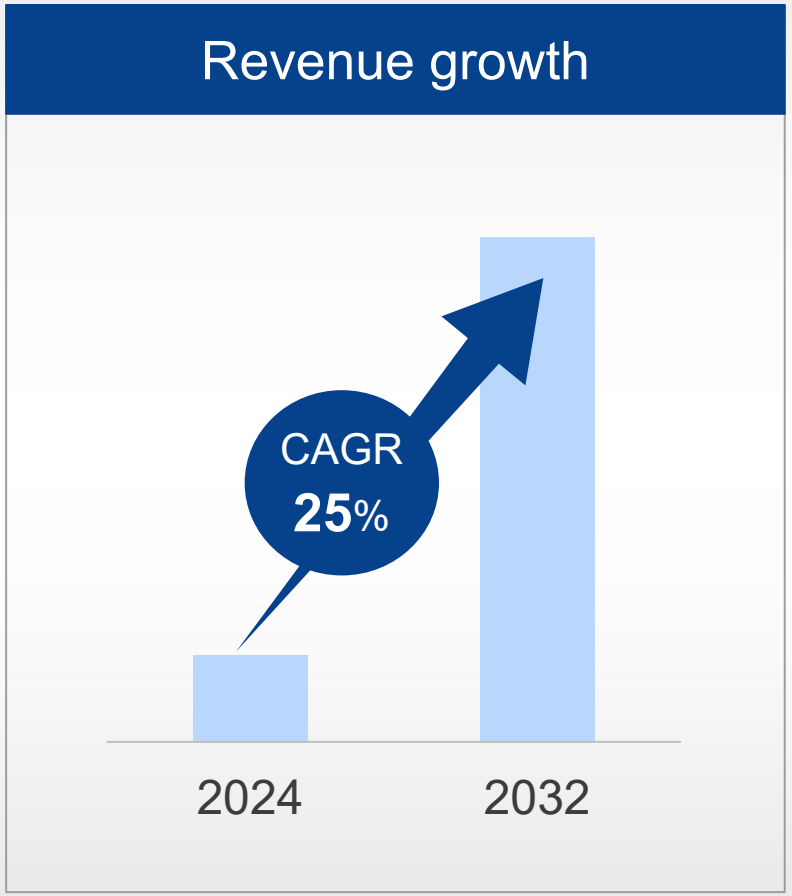
MCU PORTFOLIO WELL COVERS ENTIRE AUTO MARKET REQUIREMENTS



RENESAS GROWTH IN ADAS MARKET

REVENUE GROWTH IS EXPECTED TO OUTPERFORM THE MARKET

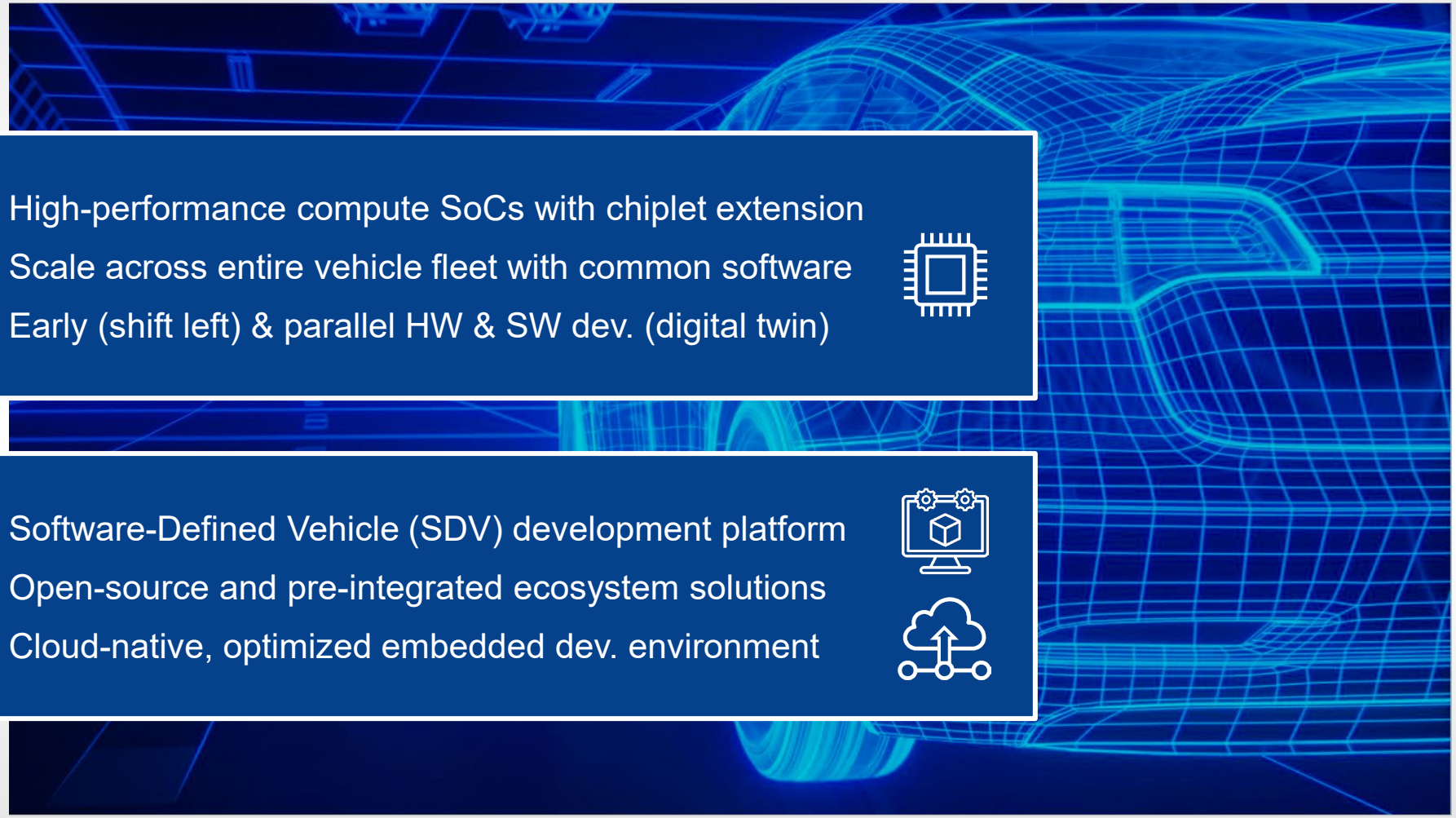




*1: Source: Renesas Estimation based on TechInsights (2Q25) *2: Including X5H

R-CAR SOC PRODUCT STRATEGY

MODULAR HARDWARE AND SYSTEMS TO MEET OEM PROCESSING NEEDS



Scalable compute platform

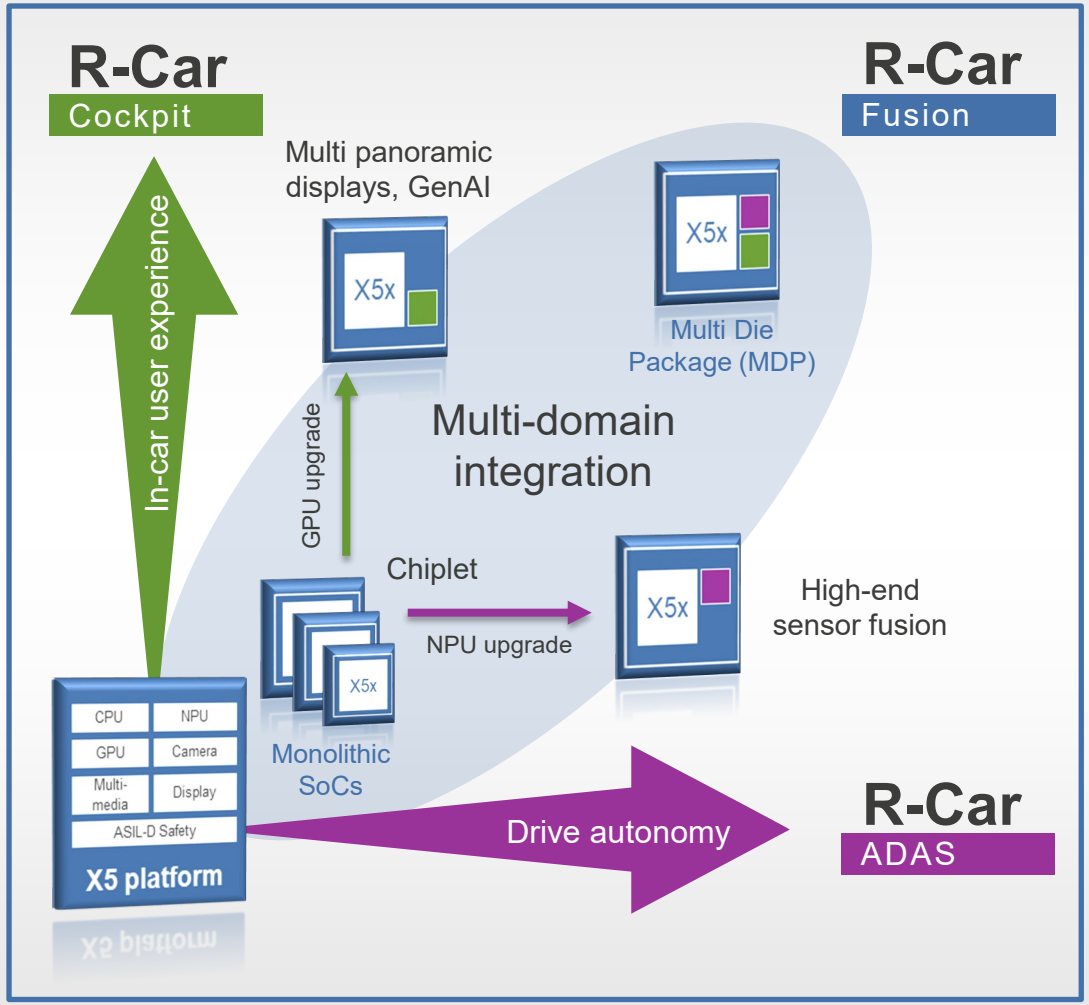
- High-performance compute SoCs with chiplet extension
- Scale across entire vehicle fleet with common software
- Early (shift left) & parallel HW & SW dev. (digital twin)

R-Car Open Access (RoX)

- Software-Defined Vehicle (SDV) development platform
- Open-source and pre-integrated ecosystem solutions
- Cloud-native, optimized embedded dev. environment

5TH GENERATION OF R-CAR AUTOMOTIVE SOC

DESIGNED TO ADDRESS THE SHIFT TO CENTRALIZED ARCHITECTURE



Leading-edge technology

3nm technology process for best-in-class power efficiency

Modular hardware approach

Cost effective heterogenous architecture with chiplet extension

Mix-criticality up to ASIL-D

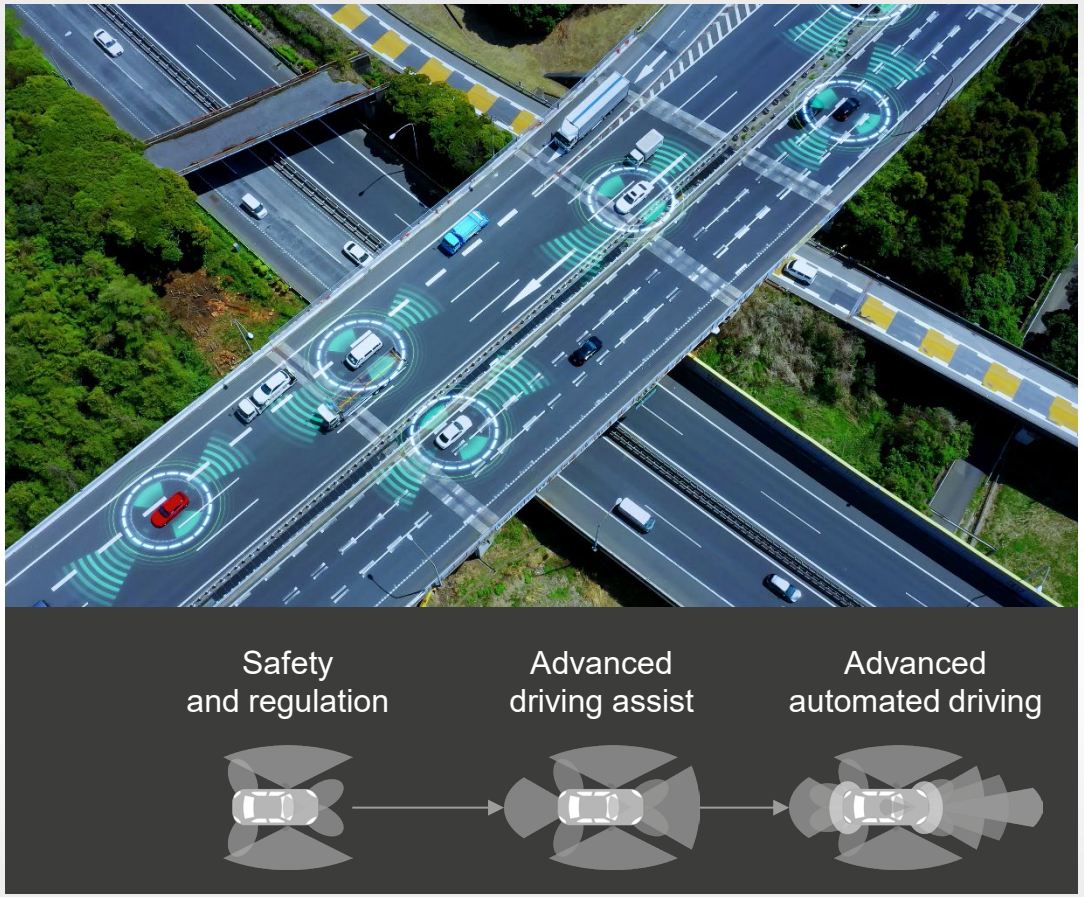
E/E architecture transition to SDV and centralized architecture

Available today

First silicon derivative sampling to early adopters

R-CAR FOR ADAS/AD

MULTI-GENERATION HISTORY WITH DRIVING ASSISTANCE SYSTEMS



LLM: Large Language Model VLM: Vision-Language Model

Japan and global footprint

Gen3 on the road today for ADAS systems (and for cockpit)

New products ramping

Gen4 focused on ADAS ramping in 2H 2025

Core AI technology

Gen5 optimized for advanced automated driving

CNN
Transformer / GenAI
LLM and VLM

From dozen to
2,000 TOPS

Building partner ecosystem

Market-ready software and AI stacks

R-CAR FOR SOFTWARE-DEFINED VEHICLE

ACCELERATE TIME TO MARKET AND MAXIMIZE REUSE OF DEVELOPMENT ASSETS

Central compute & integration

Software oriented architecture

Software first approach

Cloud-native environment

SDV architecture

For centralized and multi-domain compute solution

Control | Fast boot | ADAS | Cockpit | Gateway

Open, flexible platform

Built on open-source, pre-integrated ecosystem solutions

Linux Xen RTOS Commercial stacks

Tooling infrastructure

Integrated tools platform with end-to-end AI toolchain

Simulators
AI compiler

Cloud

AI workbench
Large scale testing

System validation

Test complex central ECU system integration and KPIs

Emulators, HILS, SILS, Performance modelling

HILS: Hardware In the Loop Simulation SILS: Software in the Loop Simulation

SOC JOURNEY BEYOND GEN5: FOUNDATIONAL INVESTMENTS

Our focus: Strengthening our capability and infrastructure for the SoCs of the future

Shift left, SW first development

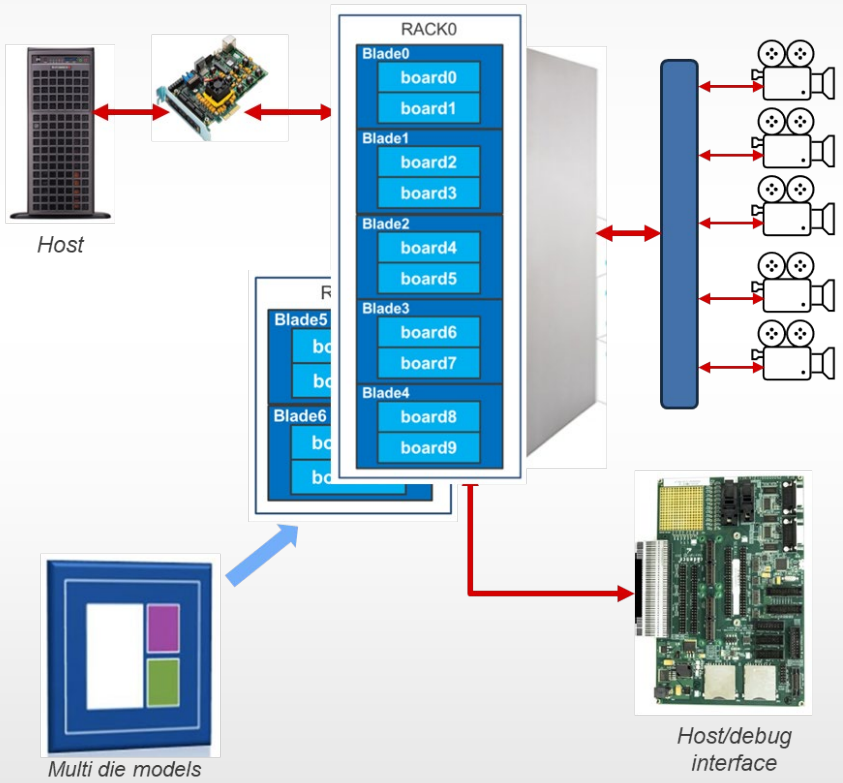
- HW and SW simulators, emulator and models
- Chiplets & advanced packaging

Invest in differentiating IP

- New cores subsystem development and SW
- Seamless AI tool chain

Boost execution efficiency

- Renesas integrated development environment
- Intelligent automation through AI-powered flows



CHINA STRATEGY

- MCU footprint increasing by successful launch of 28nm products (Growing revenue YoY)
- MCU market penetration in high growth segments (Zone, xEV, ADAS)

Our approach under review for China market

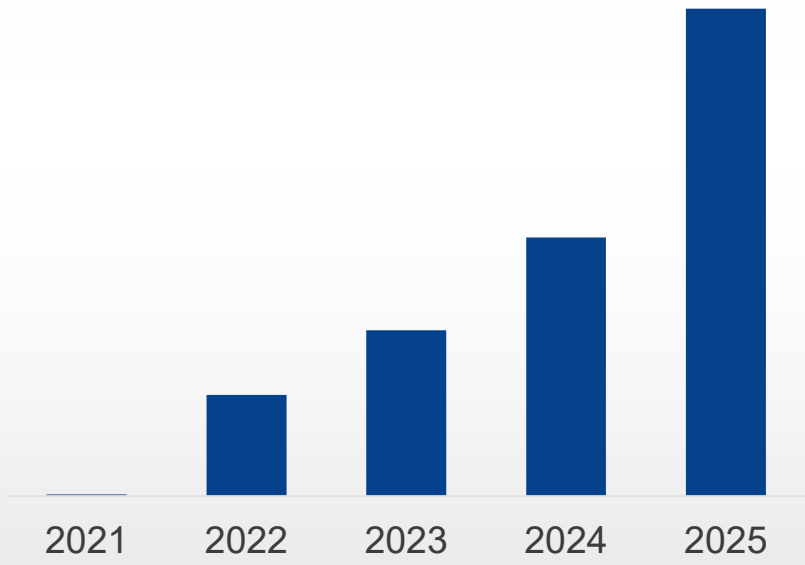
Accelerate “China production”

- Localize manufacturing to align with China’s supply chain
- Ensure compliance with China-specific standards and regulations

Strengthen local partnerships

- Collaborate closely with OEMs/Tier1s via joint labs, on-site teams, and early development engagement
- Partner with local solution providers for fast, high-quality customer development

28nm RH850 revenue for China



SUMMARY

- Comprehensive and scalable portfolio covering ADAS, Zonal, and xEV architectures
- R-Car Gen5 designed to support the shift toward centralized vehicle architectures
- Open development platform accelerating time-to-market with flexibility and reusability
- Scalable MCUs with Renesas and Arm cores for legacy and standard CPU markets
- Strengthening engagement in China through local production and partnerships
- Investing in stronger infrastructure, capability and foundations in preparation for next generation products

THANK YOU