

# EMBEDDED PROCESSING ANALOG & CONNECTIVITY



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SVP AND GM OF ANALOG & CONNECTIVITY AND EMBEDDED PROCESSING  
RENESAS ELECTRONICS CORPORATION

# AT A GLANCE

## EMBEDDED PROCESSING

### Our products / technologies



32bit Arm Cortex-M based MCU  
for intelligent IoT



32bit high-performance,  
high-efficiency MCU

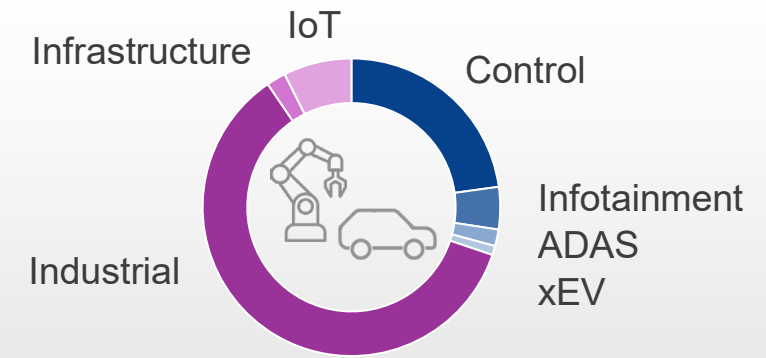
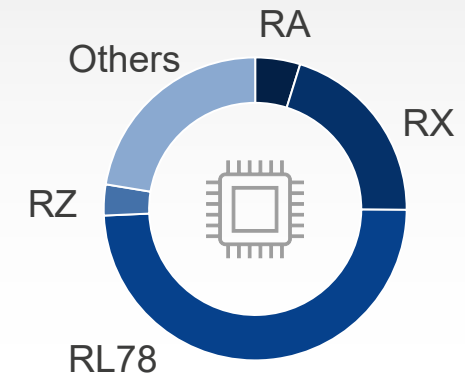


16bit low power consumption MCU



64bit MPU for HMI, e-AI, real-time  
control & industrial networking

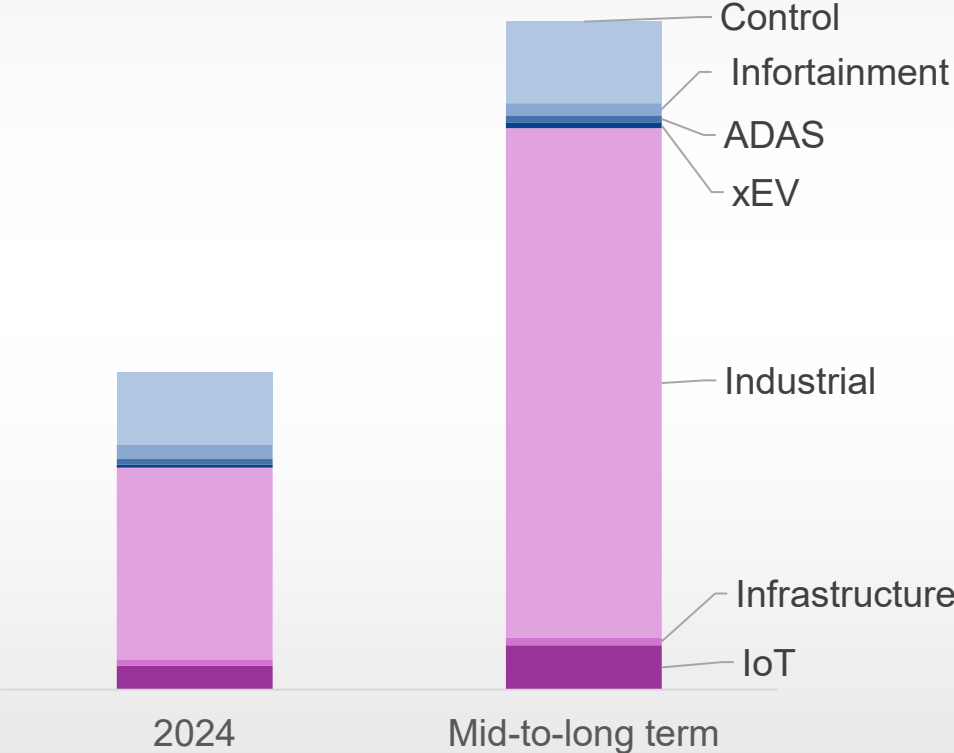
### 2024 Revenue




# GROWTH DRIVERS

## EMBEDDED PROCESSING

### Revenue




### Growth drivers



**Industrial / Mass market**

➤

Scalable embedded platform  
Enablement & ecosystem with digitalization / Renesas 365  
Core technologies to enable growing market, such as robotics



**IoT**

➤

Edge and endpoint intelligence

# EMBEDDED PROCESSING STRATEGY

## Scalable embedded processing



Industrial



Infrastructure



IoT



## Core technology innovation



Motor control



HMI



Security & Safety



AI / ML

## Enablement & Ecosystem



Unified digital experience



Rich product enablement & ecosystem

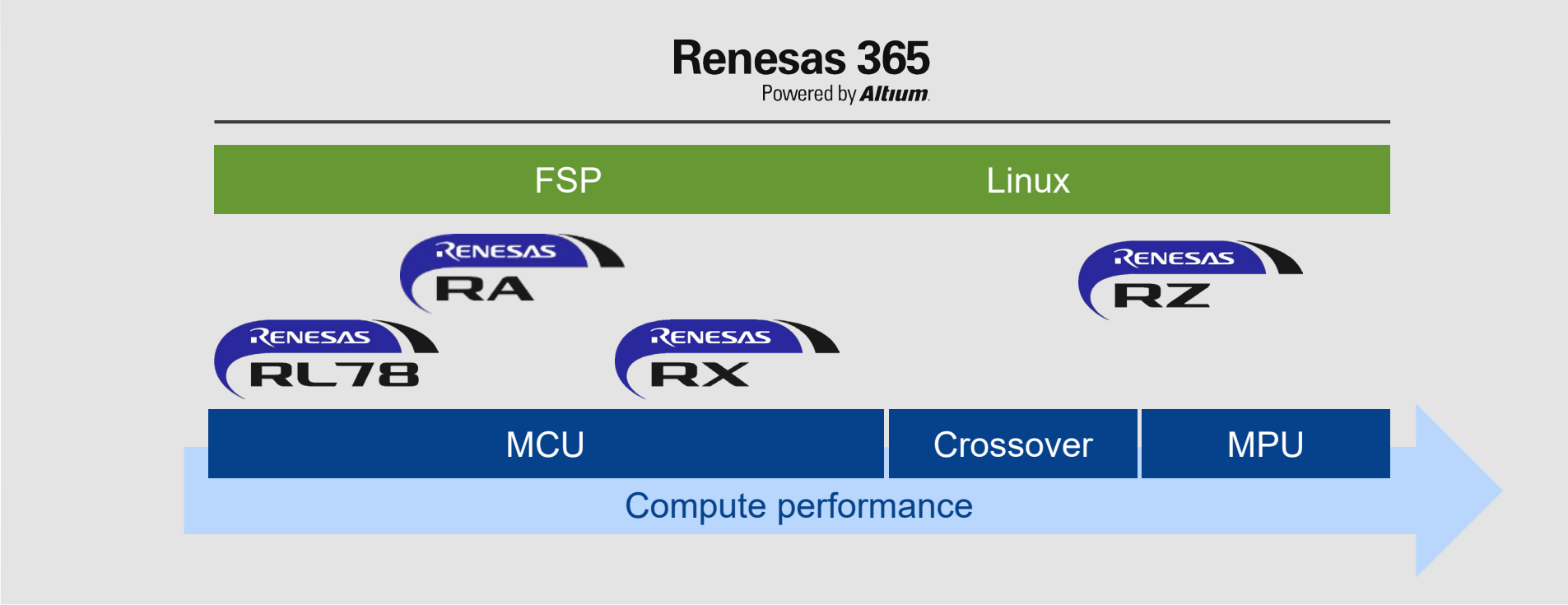


UX: Easy find, buy & develop



Multi-layer developer stack

# SCALABLE EMBEDDED PROCESSING PLATFORM

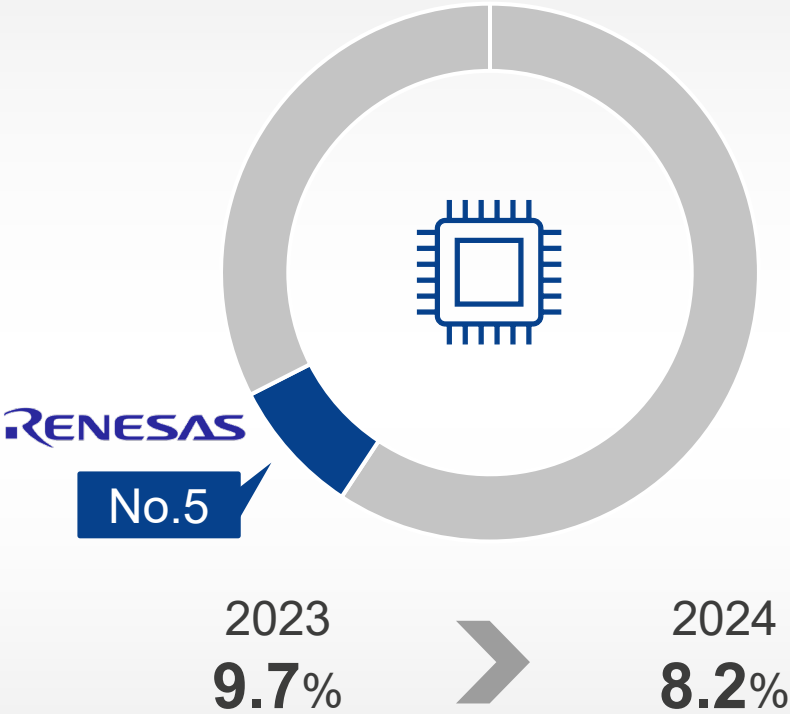


Streamlined **Software, Development Tools and Solutions** for easy migration  
**Common IPs & Compute Cores** used across MCU and MPU families

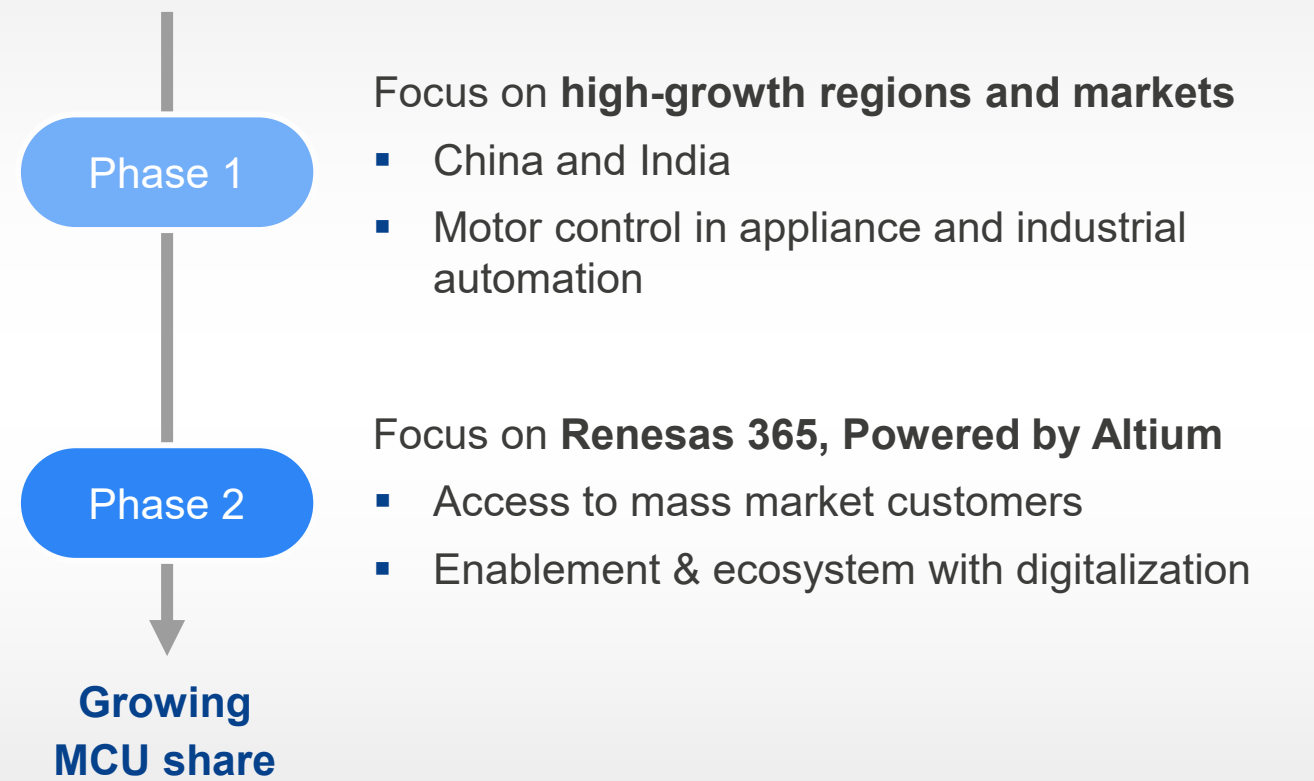
FSP: Flexible Software Package

# MCU SHARE GROWTH

## MCU share for Industrial & IoT



## 2-Phase approach to increasing market share



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 for Industrial & IoT = Total Microcontroller excluded Automotive application 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.

# PHASE 1: ACCELERATING GROWTH IN CHINA & INDIA

## Current presence

Leading market share  
at segment leaders\*<sup>1</sup>



Air conditioner



Washer



Refrigerator



Smart  
power meter



Electronic  
voting machine



AADHAR NID



## Growth vectors

Complete SW stacks to  
enable robust solutions

Industrial automation

Robotics

(Industrial, Enterprise, Cooperative robots)

Green energy applications

Security / Access control systems

Two and three wheelers

## Growth strategy

Enhance local presence



**Localization**



**Developer ecosystem**



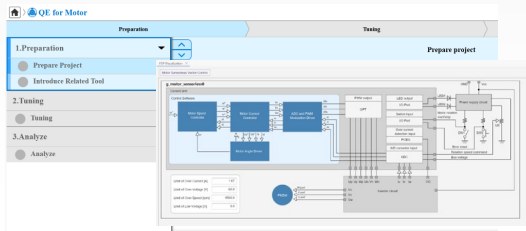
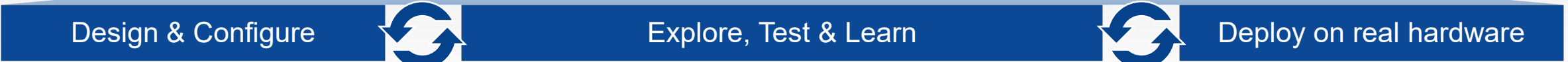
**University program**

\*1: Renesas internal analysis + external market data

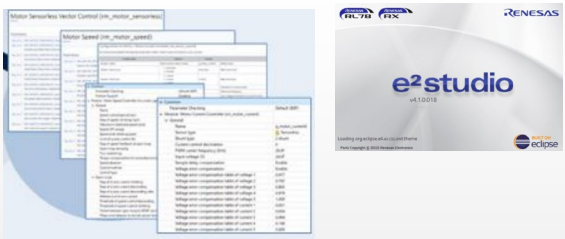


# LEVERAGING CORE TECHNOLOGIES – MOTOR CONTROL

**Renesas 365**  
Powered by **Altium**

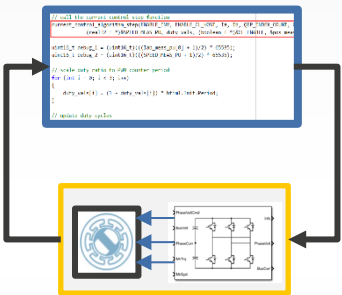


QE for Motor - Next



Renesas advanced motor control platform (FSP based)

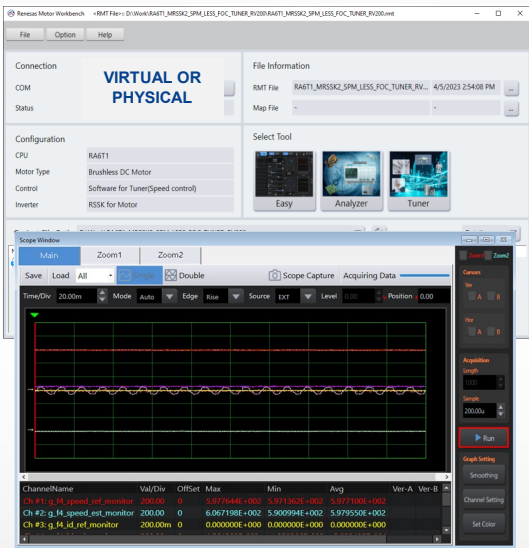
QE: Quick and Effective tool solution



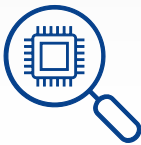
Simulation engine



Smart documentation browser



Renesas Motor Workbench - Next



MCU selection assistance



Smart downloader





# RENESAS REALITY AI PLATFORM

## HIGHLY EFFICIENT AI FOR ANY EDGE APPLICATION

Reality AI Tools®

Leading developer platform powering edge AI  
in industrial IoT & automotive applications

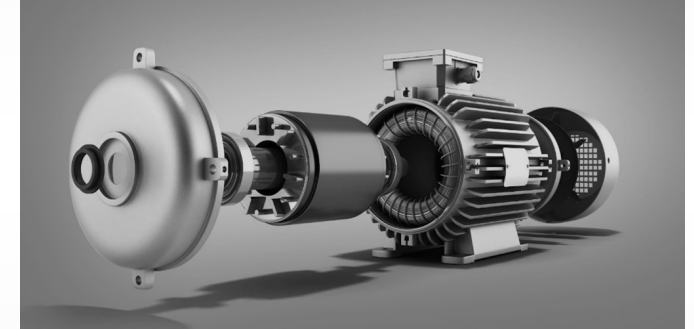
Auto machine  
learning model  
development

Explainable AI +  
hardware analytics

Ultra-low power  
inferences

### Seamless developer experience

Bridging together AI and embedded domains



# REALITY AI - DIVERSE MARKET SUCCESS



## Remote livestock management & virtual fencing

- Ultra-low power for extended battery life (Solar powered wearable)
- High precision behavior monitoring across entire herds
- BOM reduction (sensor components optimization)



## Pump health monitoring

- Prevent costly equipment failure before they occur
- Reduce maintenance costs through precise fault detection in cost-effective hardware
- Improve equipment reliability & uptime

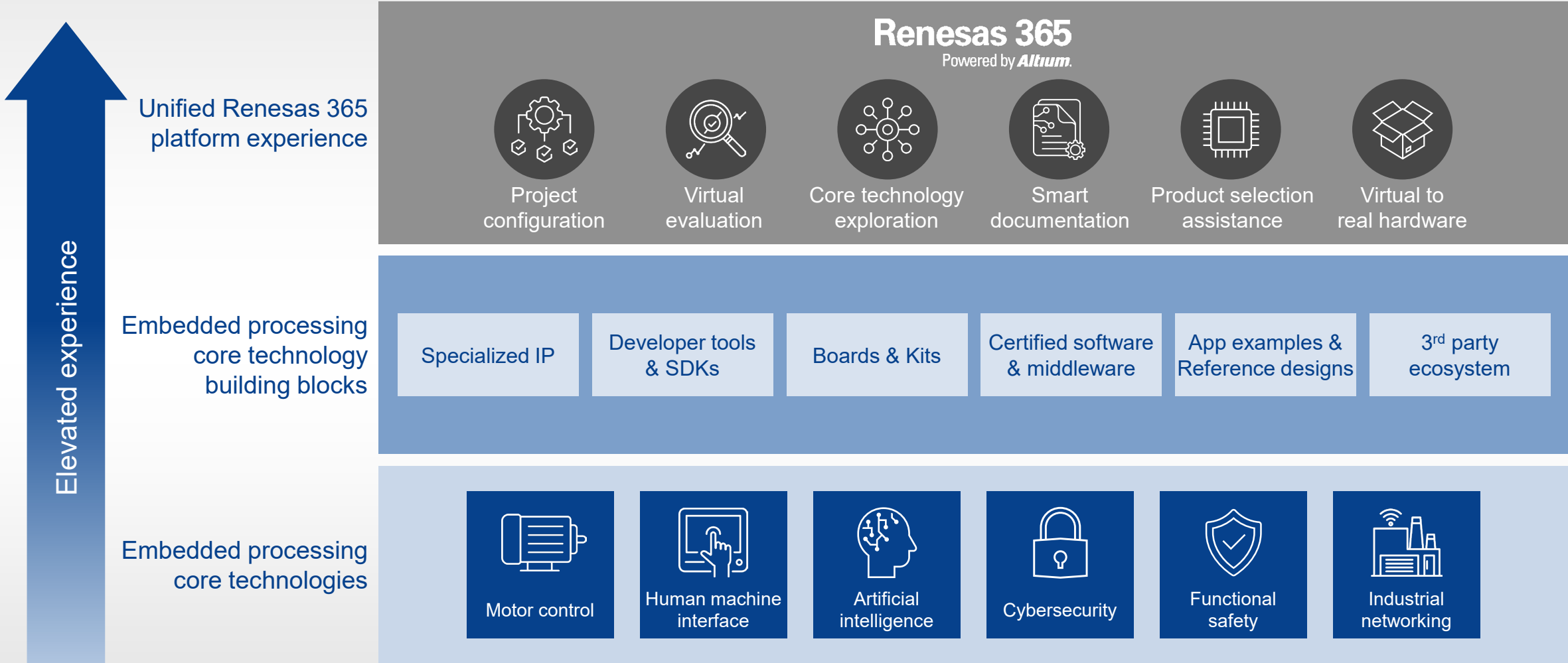


Hisense | HITACHI

## Adaptive energy efficient HVAC systems

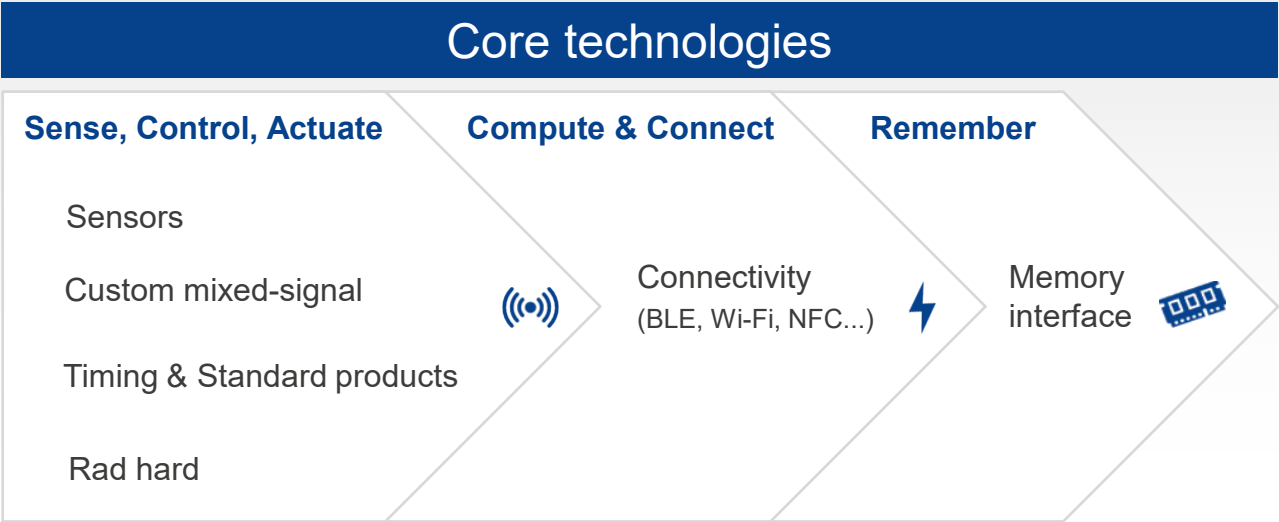
- Smart climate control, automatically fine tunes indoor conditions for comfort
- Remarkable energy efficiency and reduced carbon footprint
- Extended system life through optimized operation

# PHASE 2: ENABLEMENT WITH DIGITALIZATION



# AT A GLANCE

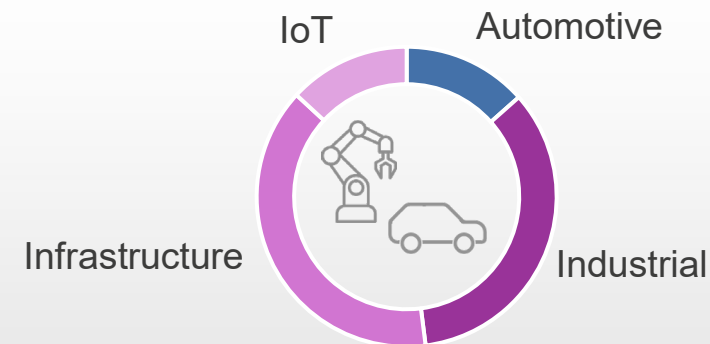
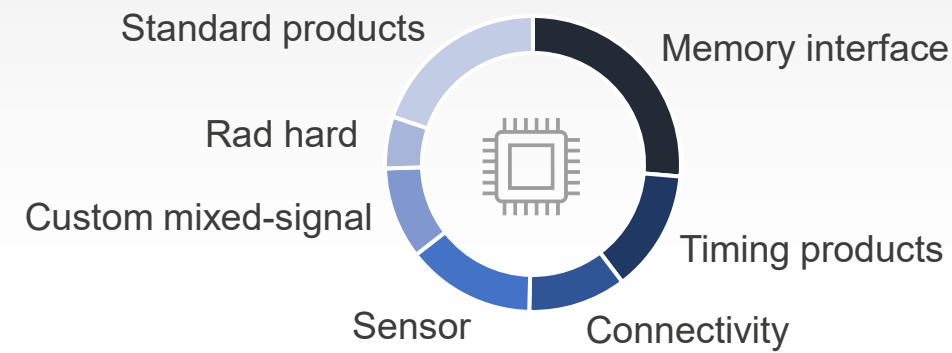
## ANALOG & CONNECTIVITY



### Scalable portfolio for global megatrends



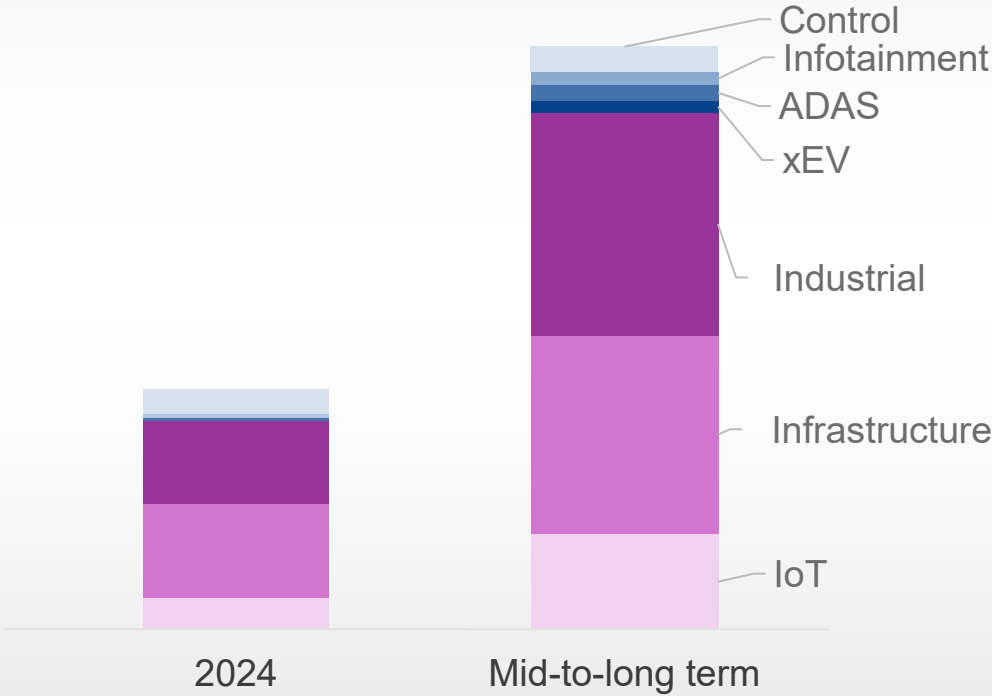
### 2024 Revenue





# GROWTH DRIVERS

## ANALOG & CONNECTIVITY

### Revenue





### Growth drivers





#### Infrastructure

Market leadership and content expansion in **DDR5, MRDIMM, and Precision Timing**



#### Industrial

End-to-end solutions with ultra-low power **Connectivity** and advanced **Analog Solutions**



#### Automotive

Commanding the scalable portfolio for next-gen vehicles with **Sensors + AFE ASSPs**

Note: MRDIMM (Multiplexed Rank DIMM): Highest performance and lowest latency main memory to accelerate data center workloads

# VERTICAL STRATEGY

## INCREASING HIGH VALUE ANALOG CONTENT IN CLOUD AND DATACENTER SERVER MARKET GROWTH

### Renesas products

Memory interface:  
DDR5 data buffer,  
PMIC, Temp sensor



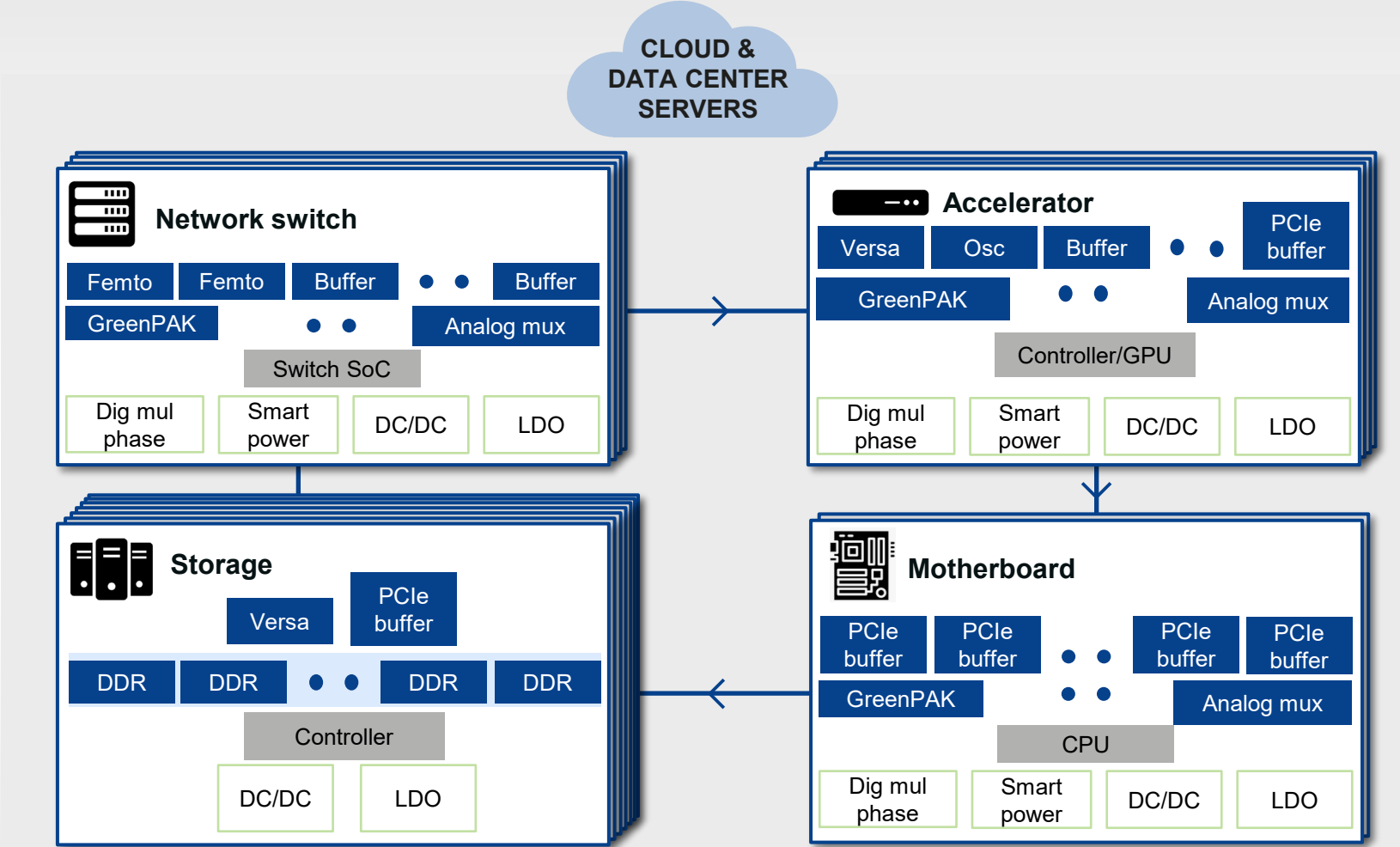
Timing:  
FemtoClock, VersaClock,  
PCIe, Buffers, Osc



Programmable analog:  
GreenPAK, Analog mux



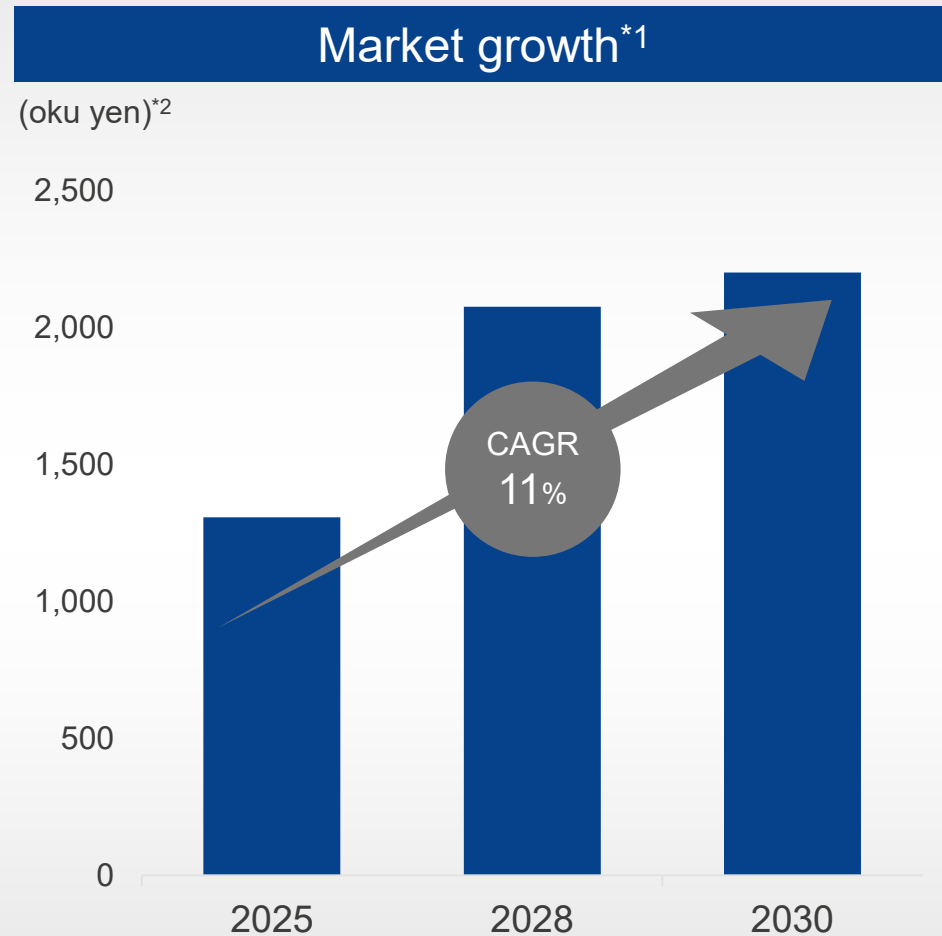
Up to 1K parts / system\*1



\*1 System: Ultra-high throughput of 102.4 Tbps for next-gen data center and AI networking GPAK: GreenPAK Programmable Logic.

# VERTICAL STRATEGY - MEMORY INTERFACE

## MARKET GROWTH AND DDR5 TRANSITION AS AN OPPORTUNITY



- **Complete DDR5 chipset** with PMIC, TS, SPD Hub, RCD, DB
- **DDR5 adoption to reach 90% in 2025**
  - Gen3 ramp begins 2H 2025
  - Multi-gen support sustains ASPs
  - AI server growth drives DDR5 demand for higher bandwidth
  - Technical leadership in Gen4 and Gen5
- **MRDIMMs to boost chipset content**
  - Adoption accelerates in 2025
  - Positioned to lead with 6400 MT/s
  - Leader in Gen1 and Gen2 MRDIMMs
- **DDR6 expected by 2031; DDR5 MRDIMMs bridge the gap**

\*1: Source: Renesas estimates based on Industry reports and Partner information

\*2: FX \$1 = 100yen, €1 = 120yen

TS: Temperature Sensor

SPD: Serial Presence Detect

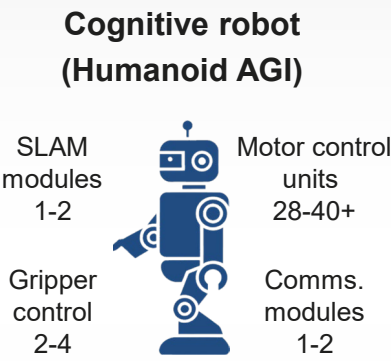
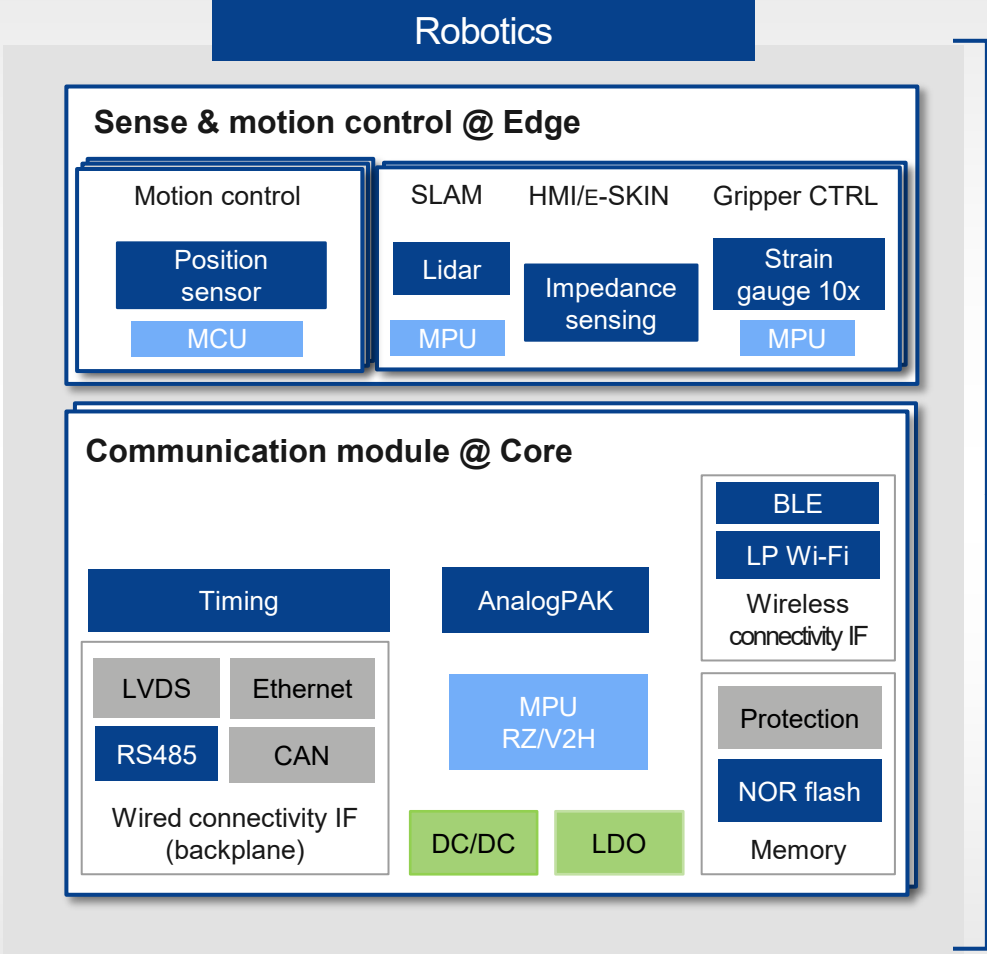
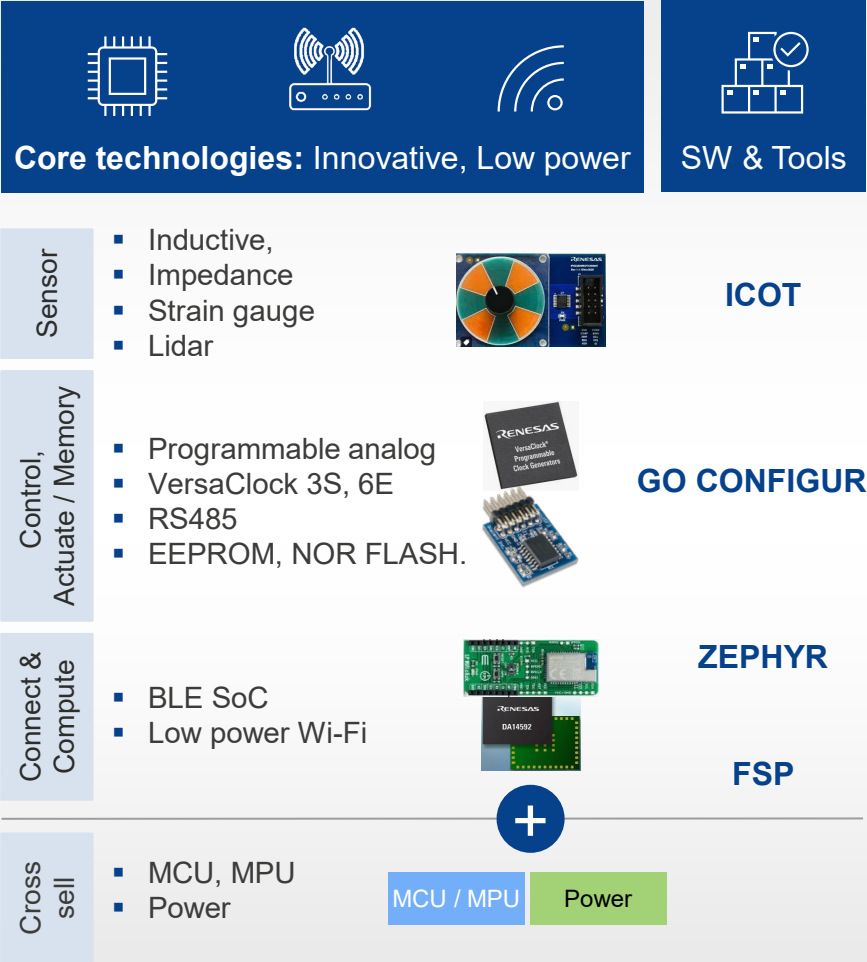
RCD: Register Clock Driver

DB: Data Buffer



# HORIZONTAL STRATEGY

## SCALABLE PORTFOLIO AS BEDROCK OF EDGE-CENTRIC PLATFORMS

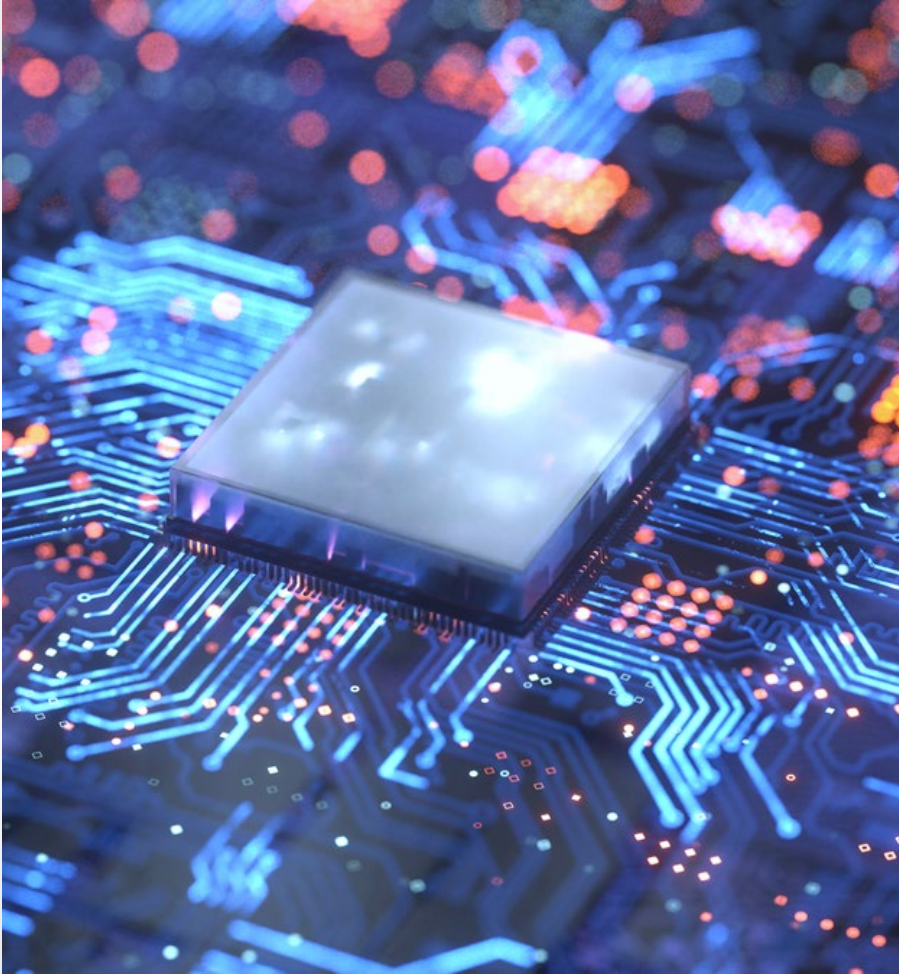


A&C content

Up to 64 parts / Robot

SLAM: Simultaneous Localization And Mapping    HMI: Human Machine Interface    e-SKIN: Electronic Skin    IPS: Inductive Position Sensing    HOD/Impedance Sensing: Hands On Detection

# SUMMARY



Grow MCU share in 2-Phase approach

- Focus on growth regions and markets
- Renesas 365 & core technologies keys to mass market

Total solution set built on our high-value analog strengths and leading MCU portfolio

Continued infrastructure investments leading to DDR5 / MCR & timing growth along with content increases

High performance analog, sensors & connectivity products ideally suited to address market demands as edge expands



THANK YOU