

RL78/F2x SERIES

MICROCONTROLLER INTRODUCTION

26/11/2021

AUTOMOTIVE SOLUTION BUSINESS UNIT
RENESAS ELECTRONICS CORPORATION

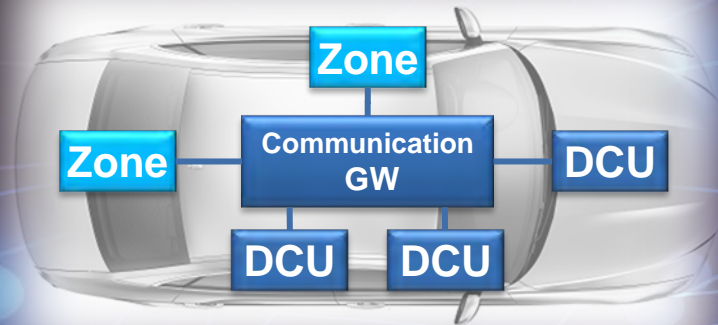
KEY TRENDS

E/E ARCHITECTURE TREND

- CENTRAL UNIT PERFORMANCE GROWTH WITH CENTRALIZATION
- EVOLVED THROUGH DOMAIN ARCHITECTURE TO ZONE ARCHITECTURE
- MANY PARTIAL INTEGRATIONS IN THE MARKET

MIGRATION
2025CY to 2030CY

Domain Architecture



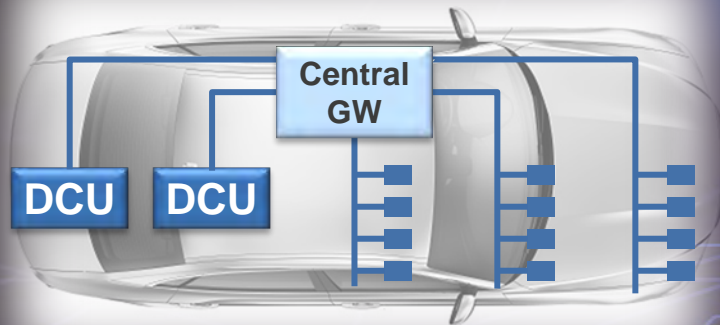
FUTURE
Beyond 2030CY

Zonal Architecture



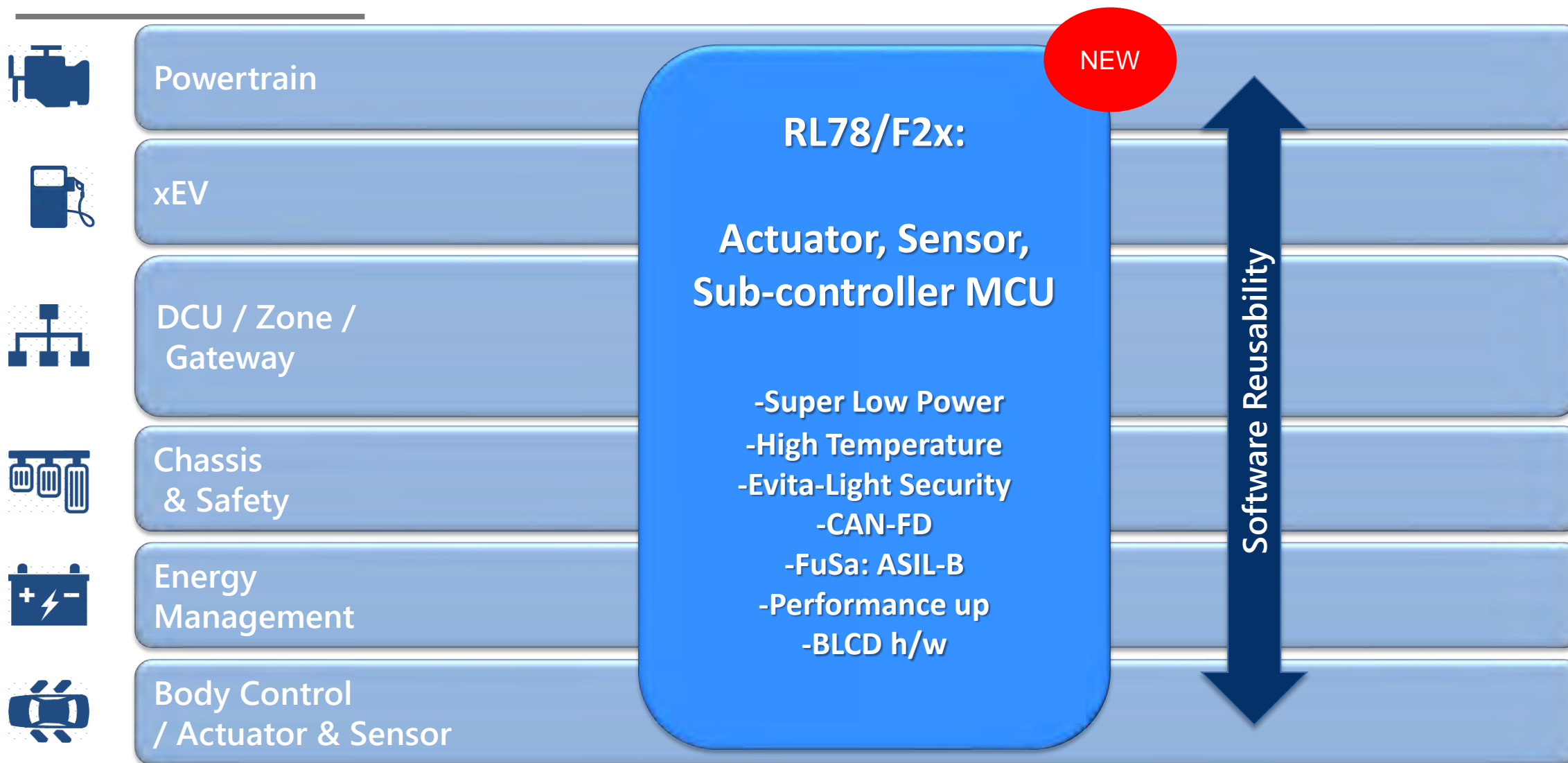
PAST

Central Architecture

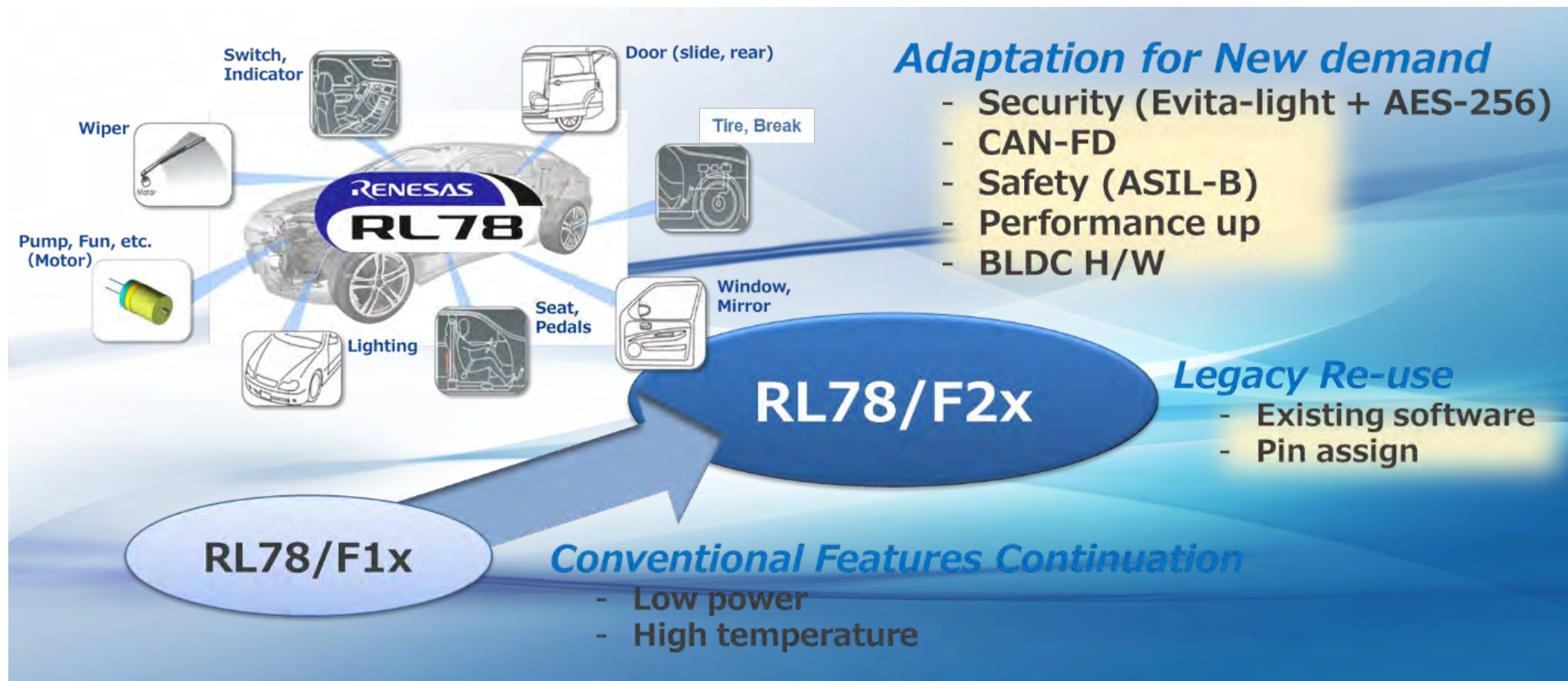


PRODUCT POSITIONING

RL78/F2x: CROSS DOMAIN AUTOMOTIVE USAGE



RL78 EVOLUTION



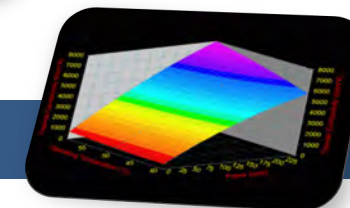
RL78/F2X OVERVIEW

RL78/F2X SERIES – HIGHLIGHTS & KEY FEATURES



Low Power Consumption & Higher Performance

- Super low power consumption
- High temperature operation: Up to $T_a = 150^{\circ}\text{C}$
- RL78 CPU: Performance increase to 40MHz
- Application Accelerator: To further boost performance for complex trigonometric & arithmetic processing



Scalability & Flexibility

- 128kB and 256kB flash memory versions
- Package line-up from 32QFN (5x5mm) up to 100QFP
- Inherit peripheral functions from RL78/F14, F13 → SW re-usability
- Pin compatible to RL78/F14, F13 → reuse of hardware PCBs

Technologies

- CAN FD communication → supported by RL78/F24
- 12bit A/D converter → up to 31 input channel and 2 x simultaneous Sample & Hold
- 32QFN combined with 256kB flash → unique in the market



Safety & Security → ASIL B and Evita-Light

- ISO26262 → support ASIL-B application
- EVITA-Light, with AES-128/192/256 module, authentication, secure boot



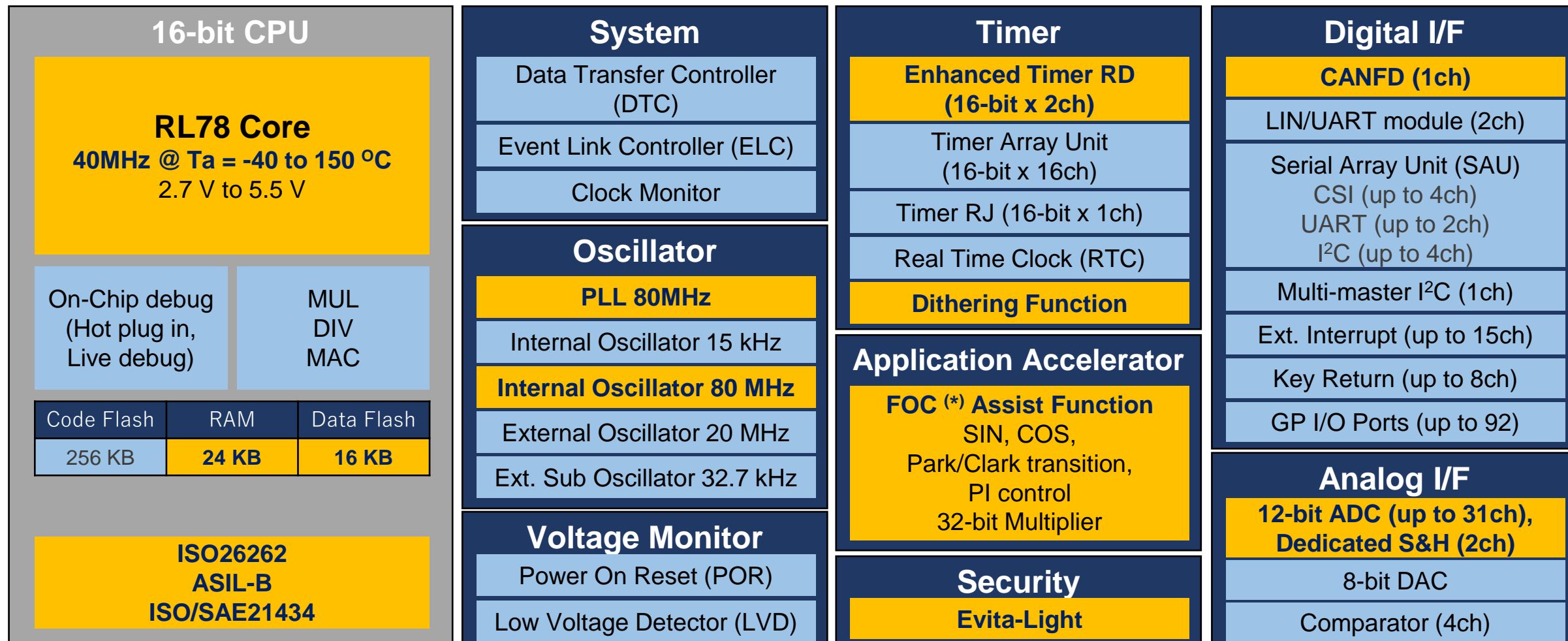
System Development Environment

- Comprehensive Eco-system including starter kits for first evaluation



RL78/F24 Block Diagram

Changing point
from RL78/F14



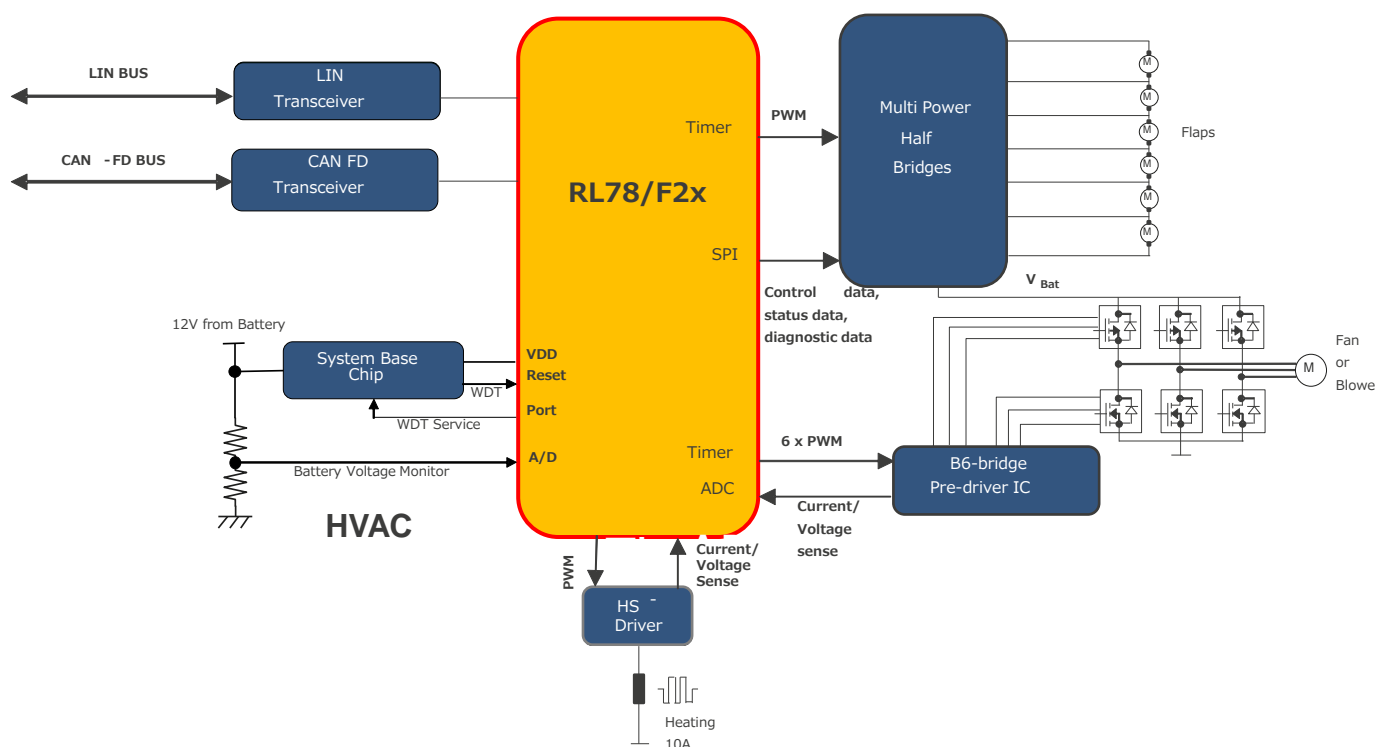
FOC: Field Oriented Control (BLDC motor vector control method)



APPLICATION EXAMPLES

THE VALUE THAT RL78/F2X OFFERS

BENEFITS FOR A HVAC ECU



Super Low Power Consumption

- Super low-power consumption in Standby (STOP, HALT and SNOOZE) and NORMAL mode

Excellent connectivity

- Supports multiple Interfaces (CAN-FD, LIN, SPI, SENT)
- Secure encrypted connectivity to Central ECU

Small package with 256kB flash

- Small 32QFN (5x5mm) package for minimum footprint

Optimized Peripheral Set for BLDC Control

- Application accelerator and 12bit A/D with 2x sample & hold

FUNCTIONAL SAFETY SUPPORT PROGRAM FOR AUTOMOTIVE

FUNCTIONAL SAFETY

SUPPORT PROGRAM FOR AUTOMOTIVE

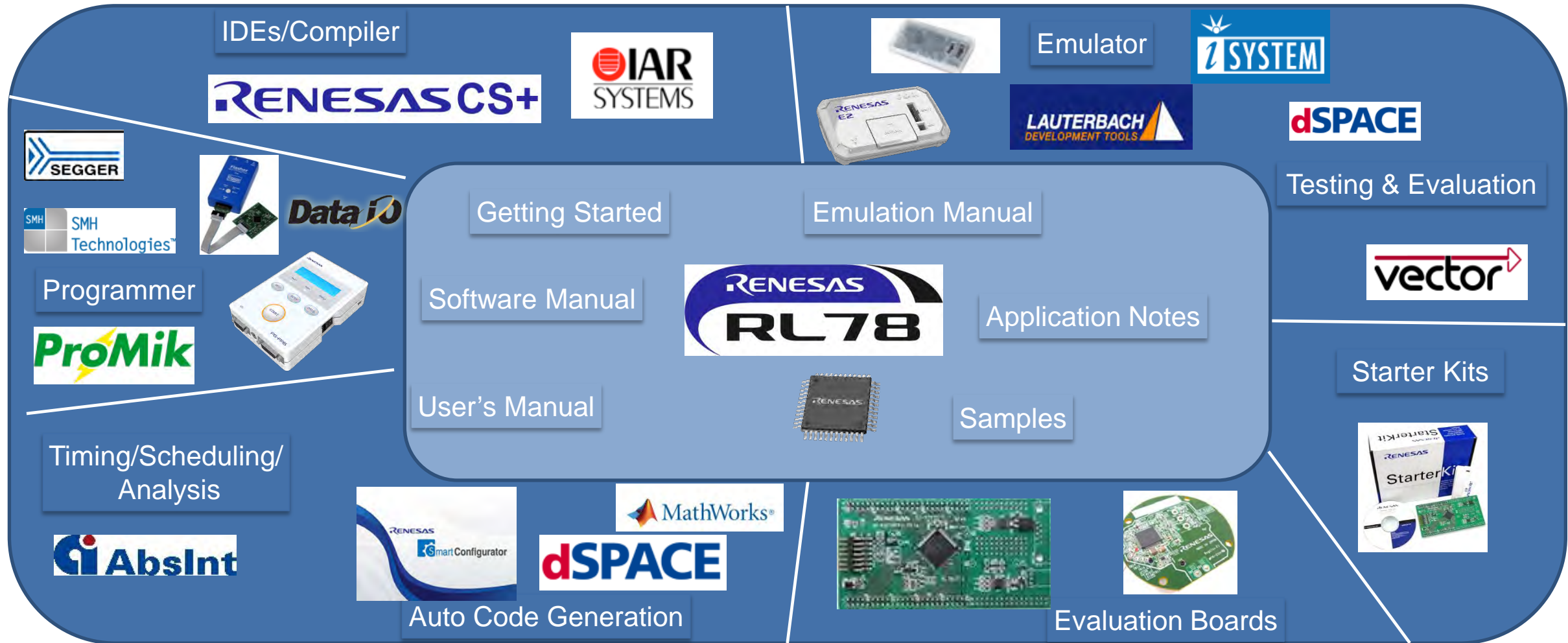
SAFETY **SUPPORT PROGRAM** for AUTOMOTIVE



<h3>Hardware</h3> <p>Safety mechanisms MCU, SoC, A&P</p> 	<h3>Software</h3> <p>CPU Core self-test Safety Software</p> 	<h3>Work Products</h3> <p>Safety analysis tool, Report, etc.</p> 	<h3>Consulting</h3> <p>Workshop Development support</p> 
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RL78/F2X ECOSYSTEM

RL78/F2X TOOLS ECO SYSTEM OVERVIEW



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