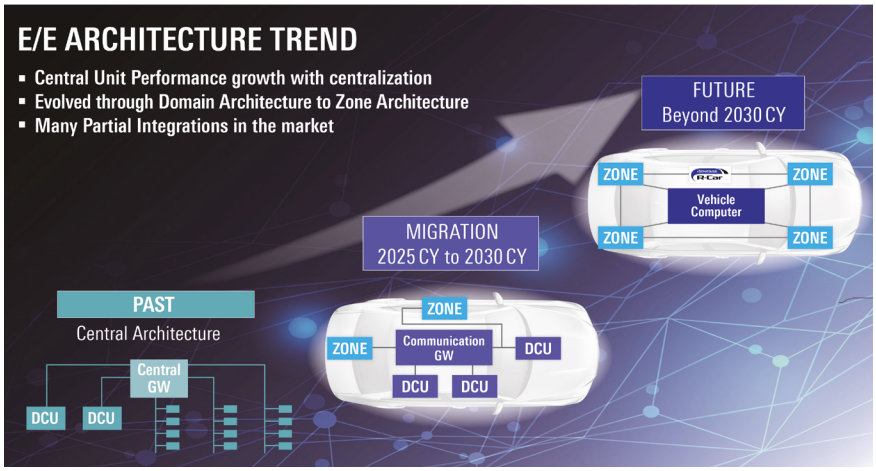
Renesas 32-bit Zone/Domain and Vehicle Motion Microcontroller

RH850/U2B

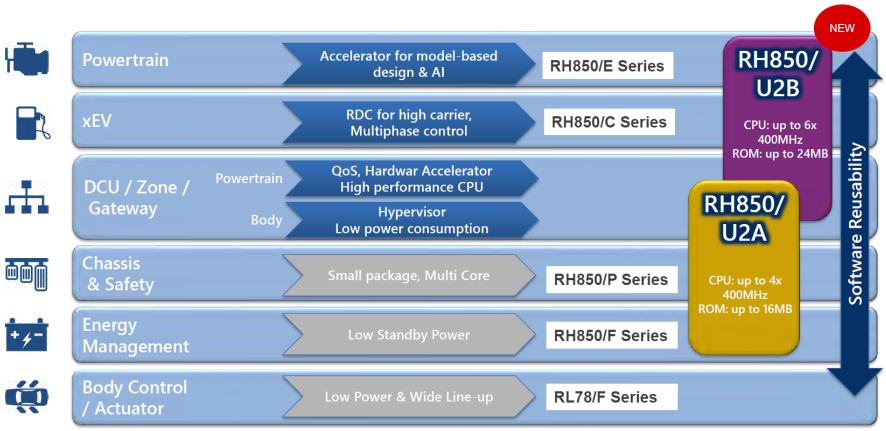
RH850/U2B: next-generation 28nm cross-domain MCU realizes up to 6 cores x 400 MHz

The RH850/U2B MCUs is designed to address the growing need to integrate multiple applications into a single chip and realize a unified electronic control unit (ECU) for the evolving electrical-electronic (E/E) architecture. Delivering a combination of high-performance, flexibility, freedom from interference, and security, the cross-domain RH850/U2B MCUs are built for the rigorous workloads required by vehicle motion in terms of hybrid ICE and xEV traction inverter, high-end zone control, connected gateway, and domain control applications.



With this, Renesas expands its cross-domain MCU portfolio with devices that range from RH850/U2A MCUs for body and chassis control systems up to high-performance RH850/U2B MCUs. Customers can also combine these MCUs with Renesas' R-Car S4 system-on-chip devices for automotive central gateway systems to build a scalable solution for E/E architectures.

RENESAS AUTOMOTIVE MCU LINE UP



Target applications and key features

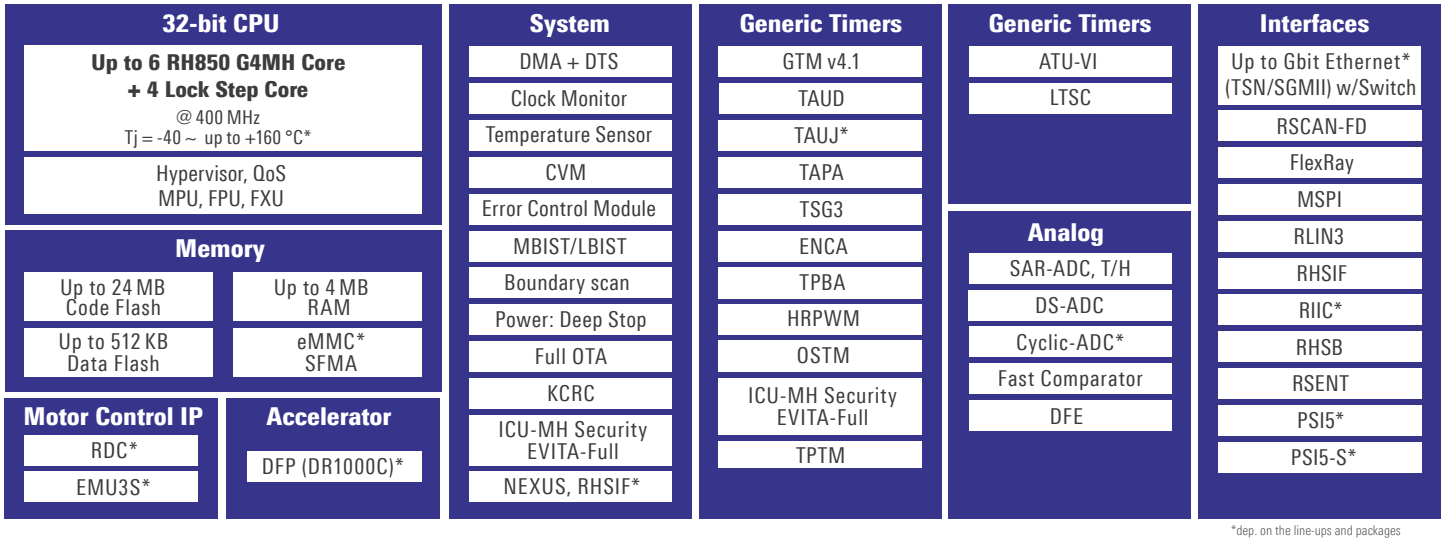
Target Applications

- Zone control ECU
- Domain control ECU
- Communication gateway
- Vehicle motion applications
  - xEV, ICE, TCU

Key Features

- 400 MHz speed for up to 6+4 (LockStep) RH850 G4MH CPUs
- Top-level ratio of performance vs. power consumption
- Up to 24 MB Flash
- Up to 4 MB RAM
- RISC-V based MIMD high-performance embedded vector processor
- Embedded EMU3S (Embedded motor control unit), RDC3X (Position sensor interface) and TSG3 (motor timer) for field-oriented traction motor (inverter) control
- Up to 5 x ADC (12-bit), with a maximum of 158 channels, including 6+6+0+0 Track and Hold inputs
- Up to 10 x DS-ADCs with a Digital Filter Engine
- GTM v4.1 vehicle motion timer
- High temperature support: up to Tj = 160°C
- State of the Art Interfaces
  - Up to 2 x Gigabit Ethernet TSN including a switch function (RSwitch)
  - CAN-FD, SPI, RHSB (MSC), RHSIF, SENT, LIN, UART, I²C, PSI5
  - SFMA (Serial flash memory interface)
  - eMMC
- Support for FuSa and Security High
  - Security module with EVITA Full support
  - ISO26262 ASIL-D
- Extensive Eco-System supporting the latest standards concerning Tool, HW and SW areas

RH850/U2B block diagram

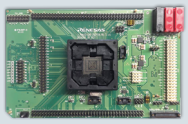
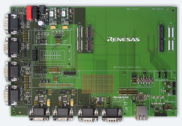
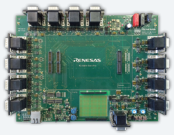
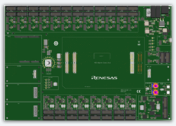


*dep. on the line-ups and packages

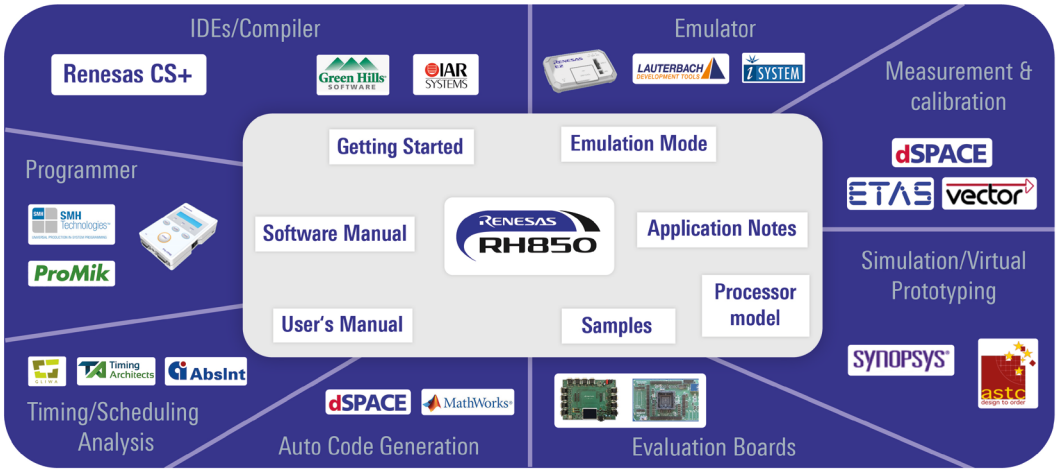
ABBREVIATIONS:

ADC: Analog to Digital Converter
ATU-VI: Advanced Timer Unit for Powertrain
DFP: Data Flow Processor
DFE: Digital Filter Engine
EMU3: Enhanced Motor Control Unit 3
FPU: Floating Point Unit
FXU: Floating-point operation coprocessor
GTM: Generic Timer Module
MPU: Memory Protection Unit
QoS: Quality of Service
RDC: Resolver Digital Converter
TSG3: Motor Control Timer

Evaluation Boards

SUPPORTED DEVICES / BOARD TYPE	RH850/U2Bx Series		
	BGA 292-pin	BGA 373-pin	BGA 468-pin
RH850/U2B Piggyback board with device socket (supports stand-alone operation)	 Y-RH850-U2B-292PIN-PB-T1-V1	 Y-RH850-U2B-373PIN-PB-T1-V1	 Y-RH850-U2B-468PIN-PB-T1-V1
Main board (adds additional functionality, e.g. physical I/F for Ethernet, FlexRay, CAN and LIN)	 Y-RH850-X1X-MB-T1-V1	 Y-RH850-X1X-MB-T2-V1	 Y-RH850-X2X-MB-T1-V1

Software development tools



- Compliers
  - Green Hills Multi® C/C++ Compiler
  - IAR Embedded Workbench for RH850 (under preparation)
  - Renesas CS+ complier
- Emulators
  - Renesas E2 On-Chip Debugging Emulator
  - Lauterbach TRACE32 Emulator support
- Flash Programming Tools
  - PG-FP6 Programmer
  - Renesas Flash Programming Software (RFP)

Hardware Ordering Reference

RH850/U2B Part Name	RH850/U2B Piggyback board
R7F7025x (part name depends on the package and configuration)	**Y-RH850-U2B-292PIN-PB-T1-V1** **Y-RH850-U2B-373PIN-PB-T1-V1** **Y-RH850-U2B-468PIN-PB-T1-V1**

Availability

Samples of the RH850/U2B, Piggyback boards are available for selected customers now.
For more information, please contact regional sales.

For more details, please visit RH850/U2B - Zone/Domain and Vehicle Motion Microcontroller | Renesas

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