

## 32-BIT AUTOMOTIVE-GRADE MCU FAMILY

# RENESAS RH850/U2B GROUP

### Next-Generation 28nm Cross-Domain Scalable MCUs for Zone/Domain and Vehicle Motion Applications

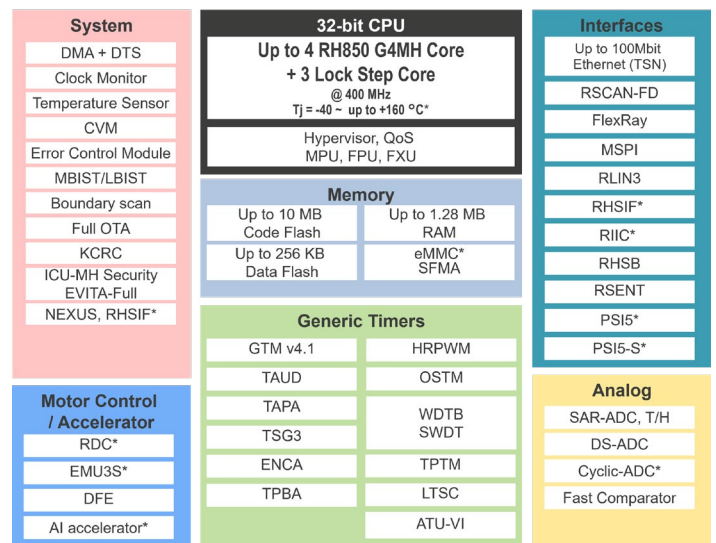
The RH850/U2B MCUs are designed to address the growing need of integrating multiple applications onto a single chip and enabling the development of a unified electronic control unit (ECU) for the evolving electrical-electronic (E/E) architecture. Delivering a combination of high performance, flexibility, 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. Users can also build a scalable solution for E/E architectures by combining the RH850/U2A and U2B MCUs with the R-Car S4 System-on-Chip devices.

	Gen 1	Gen 2
Instrument Cluster	RH850/D1x	
Powertrain/Zone/Domain	RH850/E1x	RH850/E2x RH850/U2B
eXV/Motion	RH850/C1x	
Zone/Domain/Energy Body	RH850/F1x	RH850/U2A
Chassis/Safety	RH850/P1x	

#### Key Features

- 400MHz speed for up to 4 + up to 3 (LockStep) RH850 G4MH CPUs
- Best-in-Class combination of performance and power consumption
- Up to 10 MB Flash, and up to 1.28MB RAM
- Embedded EMU3S (Enhanced Motor control Unit), RDC3X (Position sensor interface) and TSG3 (motor timer) for field-oriented traction motor (inverter) control
- Up to 4 x ADC (12-bit), with a maximum of 96 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  $T_j = 160^{\circ}\text{C}$
- State of the Art Interfaces
- FuSa Support and Robust Security (EVITA Full support, ISO26262 ASIL-D)
- Extensive Eco-System supporting the latest standards concerning Tool, hardware and software

#### RH850/U2B Block Diagram



#### Abbreviations:

ADC: Analog to Digital Converter  
 ATU-VI: Advanced Timer Unit for Powertrain  
 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  
 T/H: Track & Hold

\*dep. on the line-up and packages

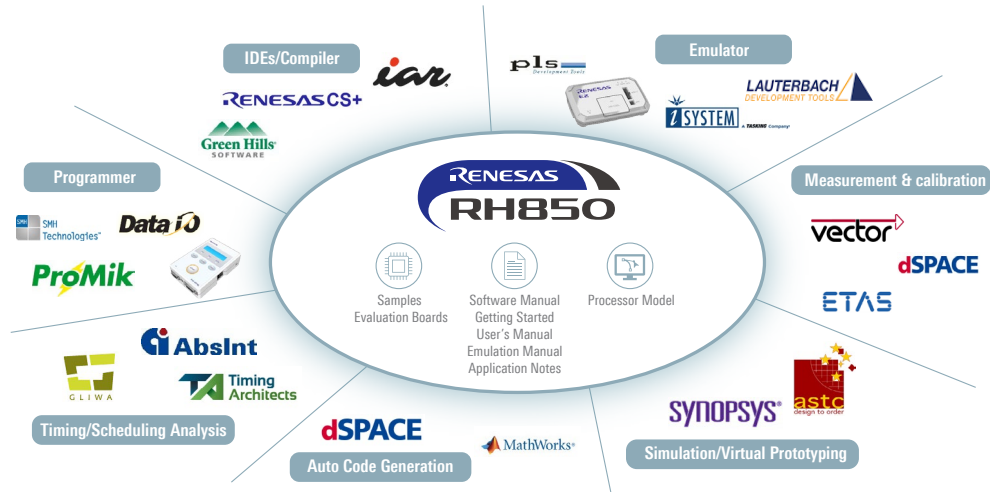
#### Target Applications

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

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## Software Development Tools

Jumpstart your software development with both Renesas' in-house tools and partners' tools.



## Evaluation Boards

Renesas provides Piggyback boards with three different number of pin configurations to accelerate development for different applications.

Learn more about the boards at: <https://www.renesas.com/products/rh850-u2b?tab=boards-kits>

BOARD TYPE	SUPPORTED DEVICES	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
		Y-COMMON-MB-T1-V1		

## Ordering References

Flash/RAM	Tj	Max frequency*	CPU Config	* Indicates max frequency of G4MH2		
10MB/1.28MB	-40 to 160 °C	400MHz	Performance	<a href="#">R7F702546AFABB-C</a>	<a href="#">R7F702546AFABA-C</a>	<a href="#">R7F702546AFABG-C</a>
			FuSa	<a href="#">R7F702547AFABB-C</a>	<a href="#">R7F702547AFABA-C</a>	<a href="#">R7F702547AFABG-C</a>
6MB/576KB	-40 to 160 °C	400MHz	Performance	<a href="#">R7F702556BFABB-C</a>		
Pin Count				292-pin	373-pin	468-pin
Package				FPBGA	FPBGA	FPBGA
Package size (body)				17 x 17 mm	21 x 21 mm	25 x 25 mm
Pitch				0.8 mm	0.8 mm	0.8 mm
Core				Multi (G4MH2)		

For more details, please visit: [renesas.com/rh850u2b](https://www.renesas.com/rh850u2b)



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### Contact Information

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