

# 32-bit MCU with Arm® Cortex®-M Core

## RENESAS RA FAMILY

### Delivering the Ultimate Promise of IoT with Software Flexibility

The Renesas RA Family is a new 32-bit MCU family built on the Arm® Cortex®-M core architecture. Offering a wide range of performance and features, the Renesas RA Family meet the scalability, power consumption and performance needs of nearly any embedded systems end-product.



#### Strong Security

- Secure Crypto Engine (SCE) IP
- An extra layer of embedded hardware security providing tamper detection and resistance to side-channel attacks
- All built on top of Arm's v8-M TrustZone®



#### Arm Core

- Based on Arm's next-generation Cortex-M23/M33 processor cores, and Cortex-M4 core



#### Flexible Software Solution

- Supported by an open and flexible ecosystem concept, the Flexible Software Package (FSP) uses FreeRTOS as a base
- Can be replaced and expanded by any other RTOS or middleware



#### Best-in-Class Peripheral IP

- Excellent HMI capacitive touch technology
- The industry's highest code flash memory capacity
- Wide range of connectivity solutions

### Renesas RA Product Series

The four Renesas RA Family MCU series are based on 32-bit Arm® Cortex®-M cores. All four Renesas RA Series have been designed on common DNA, making these products feature- and pin-compatible. This allows easy scalability and code reuse from one device to another.

	Performance Range	Feature	Series Memory Ranges	ASSP Extensions
<p>High Performance</p>	More than 200MHz 1.8-3.6V	Highest Performance, HMI, Connectivity, Security, Analog	Highest Memory Integration: 2MB Flash, 1MB SRAM	HMI Analog
	Up to 200MHz 2.7-3.6V	Advanced Performance, Connectivity, Security	High Memory Integration: up to 2MB Flash, 640kB SRAM	Motor/Inverter Control Wireless HMI
	Up to 100MHz 1.6V-5.5V	Excellent Power, High Performance Mix Paired with Security	Medium Memory Integration: up to 1MB Flash, 128kB SRAM	Wireless Sensor
<p>Power Savings</p>	Up to 60MHz 1.6V-5.5V	Low Power	Medium memory integration: 512kB Flash, 64kB SRAM	Rich Analog Wireless

# RENESAS RA FAMILY

## Target Markets and Benefits

### Industrial Automation

- Long product life
- Temperature up to 105°C
- Industrial quality grade
- Strongest robustness
- 24-bit  $\Sigma\Delta$  ADC for sensors

### Security

- Isolated crypto subsystem
- Symmetric/asymmetric hardware acceleration
- True Random Number Generator (TRNG)
- NIST-certified algorithms
- Key isolation and management

### Connectivity

- Large on-chip RAM suitable for stacks
- CAN/USB/Ethernet
- Large amount on serial interfaces
- QSPI interfaces
- Integrated crypto module

### Building Automation

- High Flash/RAM ratio
- Wide range of connectivity
- Rich analog features
- Small packages

### Metering

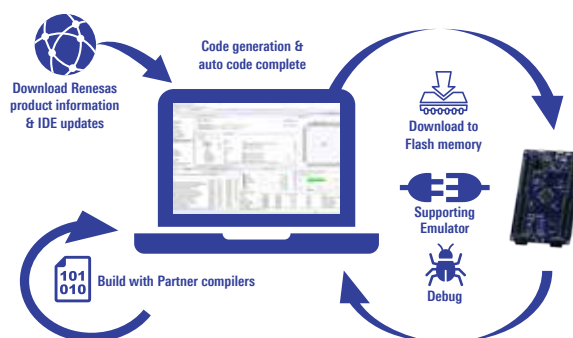
- Scalable lineup
- Industrial quality grade
- Long product life
- Integrated crypto module

### Whitegoods

- Temperature up to 105°C
- Scalable lineup
- Motor control solutions
- Capacitive touch interface
- LCD control

## Tools and Support

IDE	Renesas e <sup>2</sup> studio	Keil MDK	IAR EWARM
Compiler	<ul style="list-style-type: none"> <li>■ GCC</li> <li>■ Arm Compiler</li> </ul>	<ul style="list-style-type: none"> <li>■ Arm Compiler</li> </ul>	<ul style="list-style-type: none"> <li>■ IAR Arm Compiler</li> </ul>
Debugger	<ul style="list-style-type: none"> <li>■ Renesas E2/E2 Lite</li> <li>■ SEGGER J-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ SEGGER J-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ IAR I-Jet</li> <li>■ SEGGER J-Link</li> </ul>
Programmer		<ul style="list-style-type: none"> <li>■ Renesas PG-FP6</li> <li>■ SEGGER J-Flash</li> <li>■ Third party solutions</li> </ul>	



## Evaluation Kit

- Full MCU evaluation including on-chip debugger
- Individual kits for several products of each Renesas RA Series are available



For more information about the Renesas RA MCU family, please visit: [www.renesas.com/RA](http://www.renesas.com/RA)

## renesas.com

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