RENESAS RA

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
RA8	Up to 200MHz*2 (Dual-Core) 1.65-3.6V	200MHz Dual-Core Highest Performance, HMI, Connectivity, Security, Analog	Highest Memory Integration: 2MB Flash, 1MB SRAM	HMI Analog
RA6	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
RA4	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
RA2	Up to 60MHz 1.6V-5.5V	Low Power	Medium memory integration: 512kB Flash, 64kB SRAM	Rich Analog Wireless

High Performance

Power Savings

RENESAS RA FAMILY

Target Markets and Benefits

Industrial Automation

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

Integrated Development Environment (IDE)
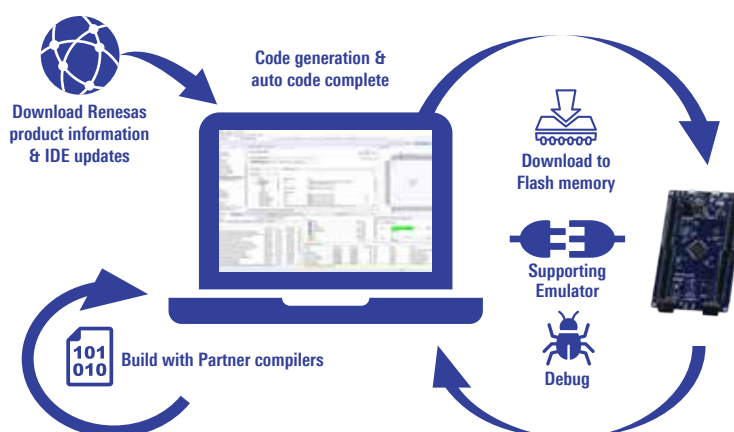
- Renesas e² studio
- Keil MDK

Compiler

- GNU, Arm Compiler version 6

Emulator

- Segger J-Link
- Renesas E2 emulator, E2 Lite emulator

Flash Memory Programmer

- Renesas PG-FP6
- Third party solutions

Download Renesas product information & IDE updates

Code generation & auto code complete

Download to Flash memory

Supporting Emulator

Debug

101 010 Build with Partner compilers

Evaluation Kit

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

EK-RA2A1

For more information about the Renesas RA MCU family, please visit: **www.renesas.com/RA**