

32-BIT MCU FAMILY

RENESAS RA2E2 GROUP

Entry Line 32-bit Arm® Cortex®-M23 General Purpose Microcontroller

The RA2E2 group is RA Family's entry line single-chip microcontroller based on the 48-MHz Arm® Cortex®-M23 core with Renesas innovative on-chip peripheral functions. RA2E2 group offers the ultra-low power operation and high speed serial communication with smallest package options of 20pin, 24pin QFN and 16pin wafer-level CSP package, satisfying the needs of cost-sensitive and space-constrained applications. These RA2E2 group enable extremely cost-effective designs for IoT sensor nodes, portable devices, industrial control, and any battery-operated application that requires developers to cut power consumption, cost and space.

	RA2A1	RA2L1	RA2E1	RA2E2
Performance Range	48MHz, Arm® Cortex®-M23	48MHz, Arm® Cortex®-M23	48MHz, Arm® Cortex®-M23	48MHz, Arm® Cortex®-M23
Memory Range	256kB Flash, 32kB RAM	128-256kB Flash, 32kB RAM	Up to 128kB Flash, 16kB RAM	Up to 64kB Flash, 8kB RAM
Package	32-64pin	48-100pin	25-64pin	16-24pin
USB, CAN	•	CAN	-	-
Security	•	•	•	•
HMI	-	32ch Cap Touch	30ch Cap Touch	-
Other Features	24bit Sigma Delta ADC, 16bit ADC			I3C Interface

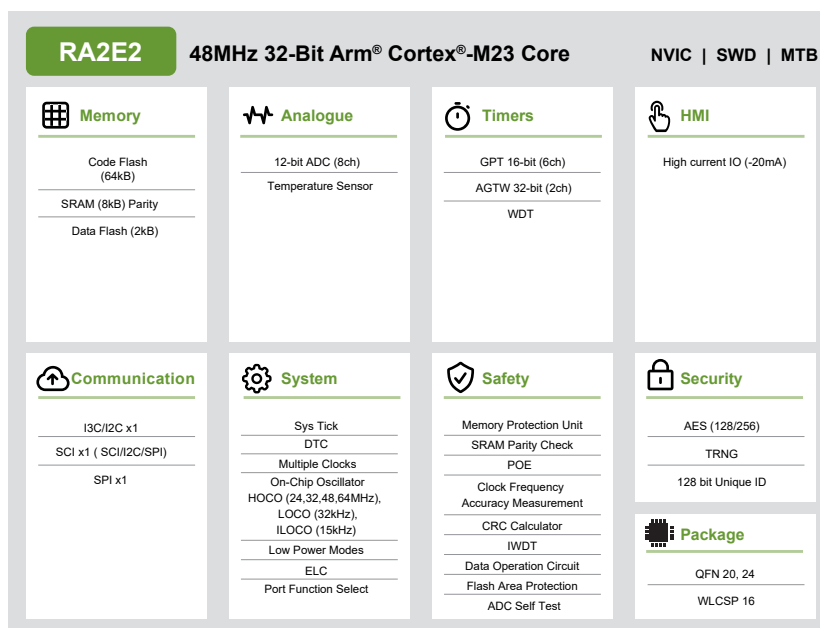
Target Applications

- General Purpose
- Consumer Applications
- Home Appliances
- Industrial Automation
- Building Automation
- Medical & Healthcare

Key Features

- 48MHz Arm® Cortex®-M23
- Up to 64kB Flash Memory and 8kB SRAM
- 2kB Data Flash to store data as in EEPROM
- Scalable from 16pin to 24pin packages
- Wide operating voltage range of 1.6V to 5.5V
- Best-in class Active/Standby power consumption in Arm® Cortex®-M23 microcontroller
- 12-bit ADC, Temperature Sensor
- 16-bit General PWM Timer, 32-bit Low power Asynchronous General Purpose Timer
- I3C bus interface
- SCI (UART, Simple SPI, Simple I2C)
- SPI interface
- Safety
- Security and Encryption
- 125°C operating temperature support
- Smallest package options (16pin WLCSP, 20, 24pin HWQFN)

Block Diagram



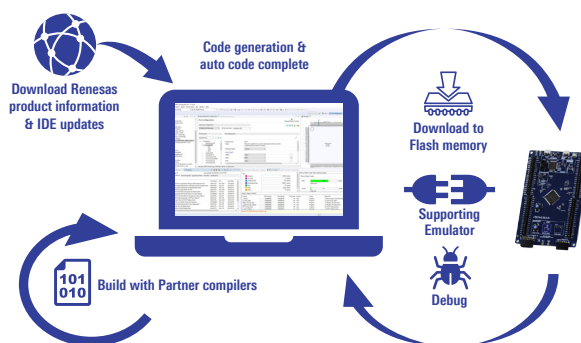
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Benefits

- Entry line Single chip 32-bit Microcontroller enables to build energy-efficient systems at lower cost
- The smallest package options with 20, 24pin QFN and 16pin Wafer-Level CSP package
- Pin and peripheral compatibility with RA2L1 group and RA2E1group
- Wide operating voltage range of 1.6V to 5.5V
- Best-in class Active/Standby power consumption in Arm Cortex®-M23 Microcontroller
- Reduce system BOM by eliminating external components
- IEC60730 Safety Standard for Household Appliances class B(Fail-safe)
- I3C Bus interface to realize higher communication speed, while significantly reducing power consumption
- Easy to be used for any customer doing transition from an original 8/16-bit MCU design

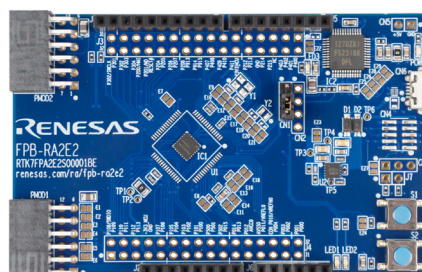
Tools and Support

IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	<ul style="list-style-type: none"> ■ GCC ■ Arm Compiler 	<ul style="list-style-type: none"> ■ Arm Compiler 	<ul style="list-style-type: none"> ■ IAR Arm Compiler
Debugger	<ul style="list-style-type: none"> ■ Renesas E2/E2 Lite ■ SEGGER J-Link 	<ul style="list-style-type: none"> ■ SEGGER J-Link 	<ul style="list-style-type: none"> ■ IAR I-Jet ■ SEGGER J-Link
Programmer	<ul style="list-style-type: none"> ■ Renesas PG-FP6 ■ Renesas Flash Programmer 	<ul style="list-style-type: none"> ■ SEGGER J-Flash ■ Third party solutions 	



Evaluation Kits

- EK-RA2E2 (Full MCU evaluation including on-chip debugger)
 - Part name: RTK7EKA2E2S00001BE
- Fast Prototyping Board including on-chip debugger (FPB-RA2E2)
 - Part name: RTK7FPA2E2S00001BE



Ordering References

Part name	Flash	64kb	R7FA2E2A7xxBY	R7FA2E2A7xxNJ	R7FA2E2A7xxNK
		32kb	R7FA2E2A5xxBY	R7FA2E2A7xxNJ	R7FA2E2A5xxNK
		16kb	R7FA2E2A3xxBY	R7FA2E2A3xxNJ	R7FA2E2A3xxNK
RAM			8kB	8kB	8kB
DataFlash			2kB	2kB	2kB
Package			16 WLCSP	20 HWQFN	24 HWQFN
Package dimensions (mm)			1.87 x 1.84	4 x 4	4 x 4
Pin pitch (mm)			0.4	0.5	0.5

- xx = 4C for -40 to 125°C
- xx = 3C for -40 to 105°C
- xx = 2D for -40 to 85°C

For more details, please visit www.renesas.com/ra2e2

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