

32-BIT MCU FAMILY

RENESAS RA2A1 GROUP

48MHz ARM Cortex M23 with Integration of 24-bit Sigma Delta ADC

The RA2A1 group uses the high-performance Arm® Cortex®-M23 core and offers highly integrated, high-accuracy analog capabilities and therefore offers complete MCU with analog solution for signal conditioning and measurement. The RA2A1 Group supports a wide operating voltage range of 1.6V to 5.5V. It includes 16-bit SAR ADC, 24-bit Sigma Delta ADC, comparators, operational amplifiers, and DACs. The RA2A1 MCU targets cost sensitive and low power Industrial sensor applications where high resolution analog will become a cost benefit.

RENESAS RA2 Series	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

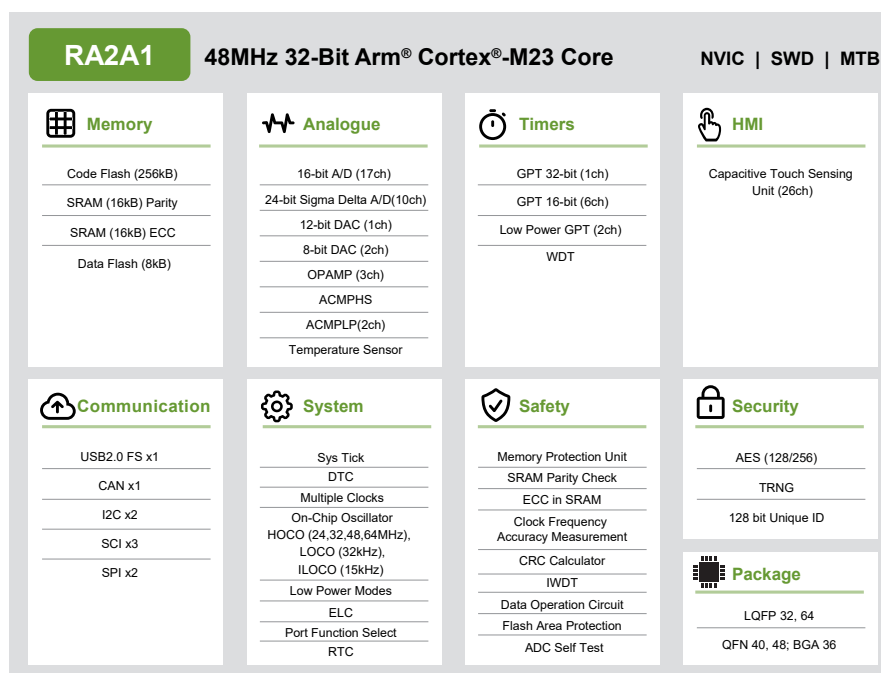
Target Applications

- Industrial Automation (Photoelectric Sensor, Fiber Sensor, Temperature Sensor)
- Process Automation (Pressure Sensor, Flow control meter, Single Phase Meter)
- Building Automation/Home Appliance (Smoke Detector)
- Healthcare (Pulse Oximeters, Body Composition Measurement)
- General Purpose

Key Features

- 48MHz Arm® Cortex®-M23
- 256kB Flash Memory and 32kB SRAM
- 8kB DataFlash to store data as in EEPROM
- Scalable from 32pin to 64pin Packages
- Capacitive Touch Sensing Unit
- 16bit-SAR A/D, 24bit-SD A/D
- 12bit-D/A, 8bit-D/A
- OPAMP (3ch), ACMP-HS/LP
- USB2.0 Full Speed
- CAN 2.0
- SCI (UART, Simple SPI, Simple I²C)

Block Diagram



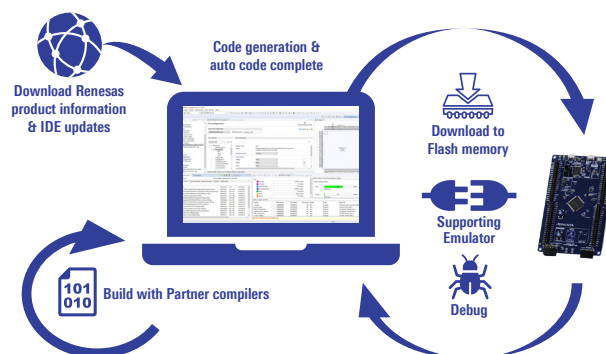
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Benefits

- Integrated best-in-class programmable analog for high-accuracy sensor signal acquisition and conditioning.
- Reduce BOM cost and PCB size by eliminating several external analog components.
- Ultra-low power extends battery life for battery-operated portable and battery backup applications.

Tools and Support

IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	■ GCC ■ Arm Compiler	■ Arm Compiler	■ IAR Arm Compiler
Debugger	■ Renesas E2/E2 Lite ■ SEGGER J-Link	■ SEGGER J-Link	■ IAR I-Jet ■ SEGGER J-Link
Programmer	■ Renesas PG-FP6 ■ SEGGER J-Flash ■ Third party solutions		



Evaluation Kit

- Full MCU evaluation including On-Chip debugger
 - Part name: **RTK7EKA2A1S00001BU**



Ordering References

Part name	Flash	RAM	DataFlash	Operating Temperature	Package	Package Dimensions	Pin Pitch
R7FA2A1AB3CFM	256kB	32kB	8kB	-40/+105°C	LQFP 64pin	10x10mm body	0.5mm
R7FA2A1AB3CNE	256kB	32kB	8kB	-40/+105°C	QFN 48pin	7x7mm body	0.5mm
R7FA2A1AB3CNF	256kB	32kB	8kB	-40/+105°C	QFN 40pin	6x6mm body	0.5mm
R7FA2A1AB2CBT	256kB	32kB	8kB	-40/+85°C	BGA 36pin	5x5mm body	0.8mm
R7FA2A1AB3CFJ	256kB	32kB	8kB	-40/+105°C	LQFP 32pin	7x7mm body	0.8mm

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

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