

32-BIT MCU FAMILY

RENESAS RA2L1 GROUP

Ultra-Low power 32-bit ARM® Cortex®-M23 General Purpose Microcontroller

The RA2L1 group is based on the Arm® Cortex®-M23 core, the most energy-efficient CPU among Arm® Cortex-M today. The optimized processing and Renesas' low power process technology make it the industry's most energy-efficient Ultra-Low Power. The RA2L1 group supports a wide operating voltage range of 1.6V to 5.5V, and a maximum CPU clock frequency of 48MHz, Lower active mode current and standby mode current. The RA2L1 group also features an enhanced Capacitive touch Sensing Unit (CTSUs), a set of serial communications, high accurate Analogs and Timers. The products are available with pin counts ranging from 48 to 100.

Performance Range	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

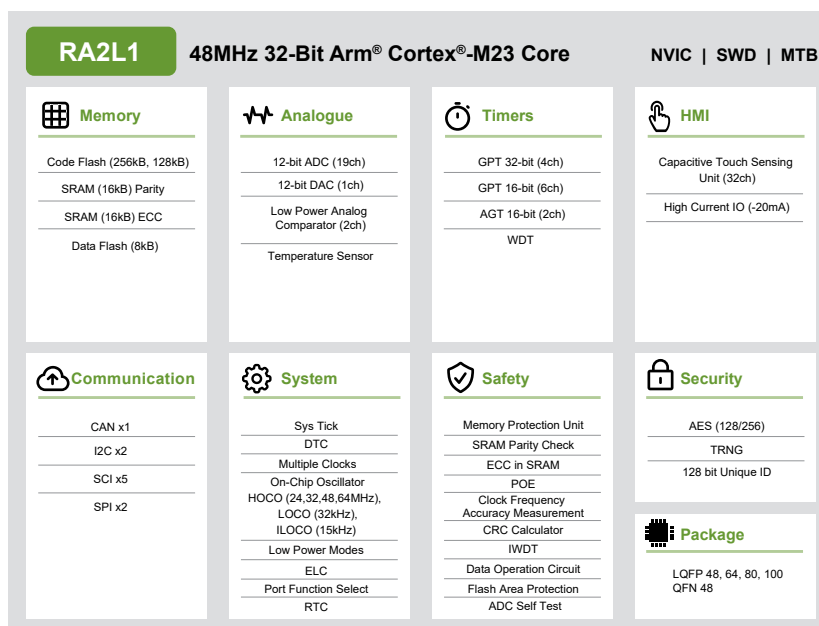
Target Applications

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

Key Features

- 48MHz Arm® Cortex®-M23
- 128kB/ 256kB Flash Memory and 32kB SRAM with ECC
- 8kB Data Flash to store data as in EEPROM
- Scalable from 48pin to 100pin packages
- Internal voltage regulators
- Enhanced Capacitive Touch Sensing Unit (CTSUs)
- 12-bit ADC, 12-bit DAC, LPACMP
- 32-bit General PWM Timer, 16-bit General PWM Timer, Low power Asynchronous General Purpose Timer
- RTC
- SCI (UART, Simple SPI, Simple I2C)
- SPI/ I2C multi-master interface
- CAN
- Safety
- Security and Encryption

Block Diagram



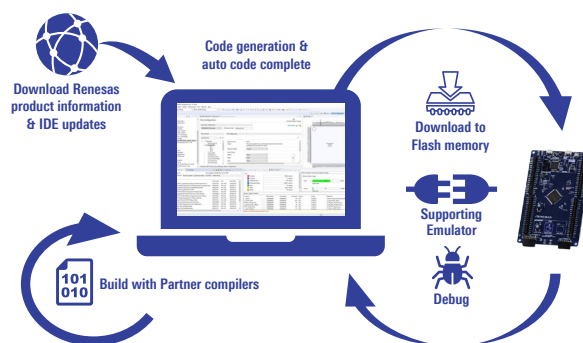
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Benefits

- Low power single chip 32-bit Microcontroller with best balance of price, power and performance
- Excellent Active/Standby power consumption in Arm Cortex®-M23 microcontroller
- Reduce system BOM by eliminating external components
- Single chip solutions for system and robust touch functions (CTSU)
- IEC60730 safety standard for household appliances class B (Fail-safe)
- Easy to be used for any customer doing transition from an original 8/16-bit MCU design

Tools and Support

IDE	Renesas e ² studio	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 Kit

- EK-RA2L1 (Full MCU evaluation including on-chip debugger)
 - Part name: RTK7EKA2L1S00001BE
- RA2L1 Touch RSSK (Capacitive touch evaluation system)
 - Part name: RTK0EG0022S01001BJ



EK-RA2L1



RA2L1 Touch RSSK

Ordering References

Part Name		Flash	RAM	DataFlash	Package		Package Dimensions	Pin Pitch
-40 to +105°C	-40 to +85°C				Type	Pin		
R7FA2L1AB3CFP	R7FA2L1AB2DFP	256kB	32kB	8kB	LQFP	100	14x14mm	0.5mm
R7FA2L1AB3CFN	R7FA2L1AB2DFN	256kB	32kB	8kB	LQFP	80	12x12mm	0.5mm
R7FA2L1AB3CFM	R7FA2L1AB2DFM	256kB	32kB	8kB	LQFP	64	10x10mm	0.5mm
R7FA2L1AB3CFL	R7FA2L1AB2DFL	256kB	32kB	8kB	LQFP	48	7x7mm	0.5mm
R7FA2L1AB3CNE	R7FA2L1AB2DNE	256kB	32kB	8kB	QFN	48	7x7mm	0.5mm
R7FA2L1A93CFP	R7FA2L1A92DFP	128kB	32kB	8kB	LQFP	100	14x14mm	0.5mm
R7FA2L1A93CFN	R7FA2L1A92DFN	128kB	32kB	8kB	LQFP	80	12x12mm	0.5mm
R7FA2L1A93CFM	R7FA2L1A92DFM	128kB	32kB	8kB	LQFP	64	10x10mm	0.5mm
R7FA2L1A93CFL	R7FA2L1A92DFL	128kB	32kB	8kB	LQFP	48	7x7mm	0.5mm
R7FA2L1A93CNE	R7FA2L1A92DNE	128kB	32kB	8kB	QFN	48	7x7mm	0.5mm

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

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