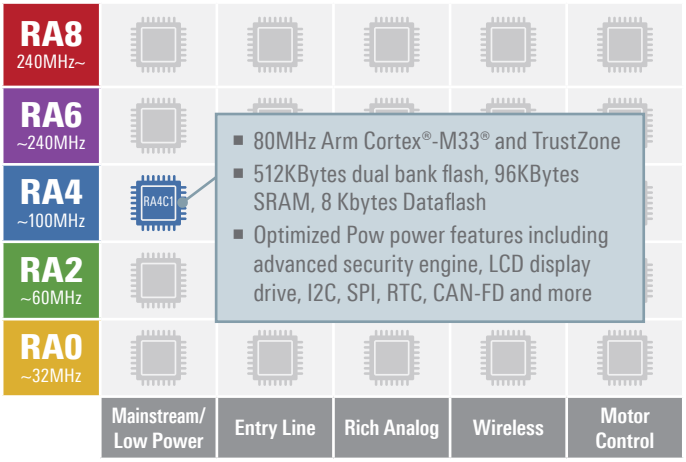
32-BIT MCU FAMILY

RENESAS RA4C1 GROUP

80 MHz Arm® Cortex®-M33 Microcontroller Optimized for Metering & IoT

Renesas RA4C1 MCU group features low-power 32-bit microcontrollers based on the Arm® Cortex®-M33 (CM33) core with TrustZone®. This MCU group combines low voltage operation, minimal standby current, and high performance in one chip. The integrated security engine protects applications from cybersecurity threats and complies to latest security regulations. The built-in rich peripherals include communication interfaces and low-power UARTs, making them ideal for industrial automation, security, smart home, consumer, and building/home automation applications.



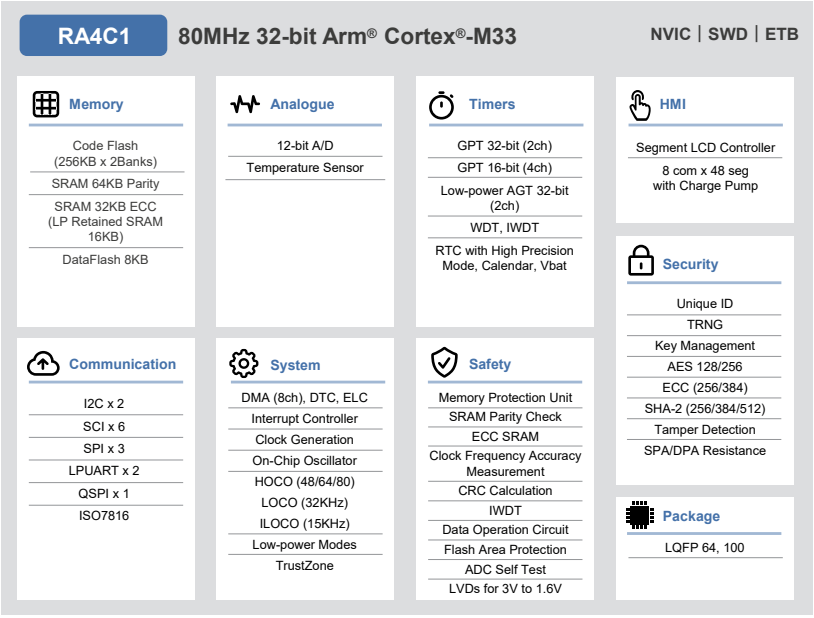
Key Features

- 80MHz Arm® Cortex®-M33 with Trustzone
- 512KB dual bank Flash supporting BGO
- 96 Kbyte SRAM with 64kB parity and 32 Kbyte ECC
- 8 Kbytes Dataflash
- 168µA/ MHz active current, 1.79µA standby current
- Fast wake-up <3.5µS (from MOCO)
- 6 SCI (UART, Simple SPI, Simple I2C, 1 x LIN)
- 2 low power UARTs with 32 kHz support
- 2 x I2C multi-master interface
- CAN FD
- 3 x SPI interface with instruction sequencer
- Quad SPI with XIP
- 32-bit & 16-bit Timers, 32-bit Ultra-Low-Power Timers
- 2 x Watchdog timer
- Real Time Clock with high precision mode
- 12-bit ADC
- 1 % accurate temperature sensor
- 8 x 44 segment LCD drive
- Advanced security engine with support for TRNG, Unique Id, AES, ECC, SHA

Target Applications

- Utility Meters
- Consumer
- Smart Home and Building Automation
- Office Automation
- Voice AI applications

Block Diagram



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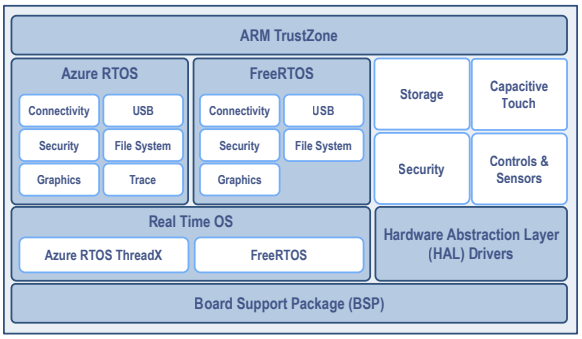
Software Package

The Renesas Flexible Software Package (FSP) is designed to provide easy-to-use, scalable, high-quality software for embedded system designs using RA MCUs.



The FSP is based on an open software ecosystem of production-ready drivers, supporting Azure® RTOS, FreeRTOS™ or bare-metal programming. It also includes a selection of other middleware stacks, providing great flexibility for migrating code from older systems or developing new applications from scratch.

Tools and Support

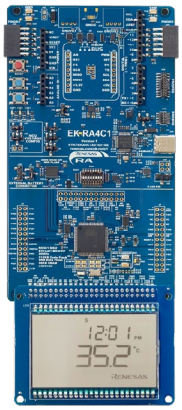
The e²studio IDE provides support with intuitive configurators and intelligent code generation to make programming and debugging easier and faster.

IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	■ GCC ■ LLVM ■ Arm Compiler* ■ IAR Arm Compiler*	■ Arm Compiler*	■ IAR Arm Compiler*
Debug Probe	■ Renesas E2/E2 Lite ■ SEGGER J-Link	■ SEGGER J-Link ■ Keil ULINK / CMSIS-DAP**	■ IAR I-jet ■ SEGGER J-Link ■ Renesas E2/E2 Lite ■ CMSIS-DAP**
Production Programmer	■ Renesas PG-FP6 ■ SEGGER J-Flash ■ Partner solutions		

* Compiler must be purchased and licensed directly from third party
** limited support

Evaluation Kit

- The evaluation kit enables users to evaluate the features of the RA4C1 MCU Group by utilizing rich on-board features, including onboard debugger (Segger J-Link®) along with popular ecosystem expansion connectors.
- Download documentation and learn more at renesas.com/ek-ra4c1



Ordering References

Flash/RAM	512KB/96KB	R7FA4C1BD3CFM	R7FA4C1BD3CFP
	256KB/96KB	R7FA4C1BB3CFM	R7FA4C1BB3CFP
Pin Count		64-pin	100-pin
Package		LQFP	LQFP
Package size (body)		10 x 10 mm	14 x 14 mm
Pitch		0.5 mm	0.5 mm
Temperature range		-40 to +105°C	-40 to +105°C

For more details, please visit: **renesas.com/ra4c1**

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Contact Information
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