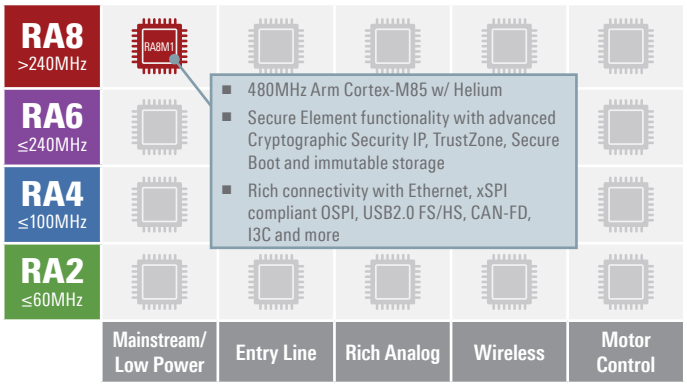
32-bit MCU Family

RENESAS RA8M1 GROUP

480 MHz Arm® Cortex®-M85 Based High-Performance Microcontroller with Helium™ and TrustZone®

The new Renesas RA8M1 group features the industry's first 32-bit MCUs based on the new Arm® Cortex®-M85 core and delivers breakthrough performance of over 3000 Coremark points at 480 MHz to meet the most demanding application needs. RA8M1 MCUs integrate the high performance Cortex-M85 core with large memory, multiple external interfaces and a rich peripheral set optimized to address diverse application requirements and are available in packages from 100 to 224 pins, to enable a broad range of high-performance applications. Secure Element-like functionality is built in with advanced cryptographic Security IP, immutable storage and tamper protection for truly secure IoT.



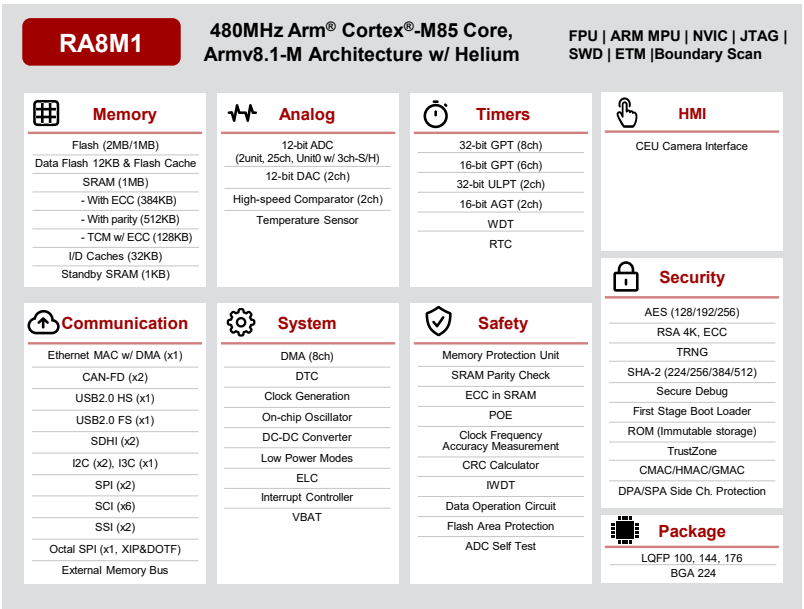
Key Features

- 480MHz Arm Cortex-M85 with Helium™ MVE
- 1MB - 2MB Flash and 1MB SRAM including TCM
- 32KB I/D Caches and 12KB Data Flash
- Renesas Security IP and Armv8-M TrustZone
- Immutable storage for First Stage Bootloader
- xSPI compliant Octal SPI with XIP & DOTF
- 32/16-bit timers, 32-bit ultra-low-power timer
- 12-bit ADC, 12-bit DAC, HS comparator
- Ethernet, USB2.0 HS/FS, CAN-FD, SCI, SPI/I2C/ I3C
- Camera Interface, external memory interfaces (CS/SDRAM)

Target Applications

- Industrial applications
- Consumer products
- Smart Home and Building Automation
- Office Automation
- Medical and Healthcare
- Predictive Maintenance and Voice AI applications

Block Diagram



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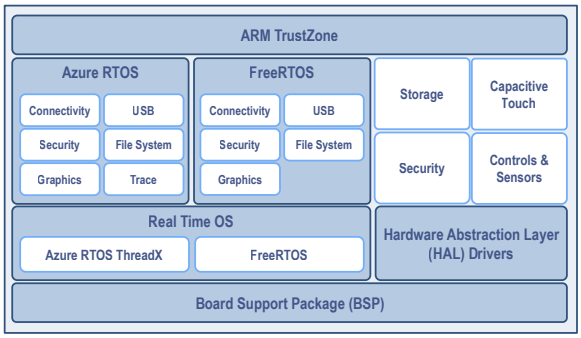
Software Package

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 e² studio 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 (limited support)	• IAR I-jet • SEGGER J-Link • Renesas E2/E2 Lite • CMSIS-DAP (limited support)
Production Programmer	• Renesas PG-FP6 • SEGGER J-Flash • Partner solutions		

* Compiler must be purchased and licensed directly from third party

Evaluation Kit

- Easily evaluate key features of the RA8M1 MCU and develop sophisticated IoT and embedded systems applications
- On-board debugging using SEGGER-J-Link®
- Order the kit and download documentation, design package, development tools and software at: renesas.com/ek-ra8m1
- Orderable part number: **RTK7EKA8M1S00001BE**

Ordering References

Flash/RAM	Tj				
2MB/1MB	-40 to 125 °C	R7FA8M1AHECFP	R7FA8M1AHECFB	R7FA8M1AHECFC	R7FA8M1AHECBD
1MB/1MB	-40 to 125 °C	R7FA8M1AFECFP	R7FA8M1AFECFB	R7FA8M1AFECFC	R7FA8M1AFECBD
Pin Count		100-pin	144-pin	176-pin	224-pin
Package		LQFP	LQFP	LQFP	BGA
Package size (body)		14 x 14 mm	20 x 20 mm	24 x 24 mm	13 x13 mm
Pitch		0.5 mm	0.5 mm	0.5 mm	0.8 mm

For more details, please visit: **renesas.com/ra8m1**

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