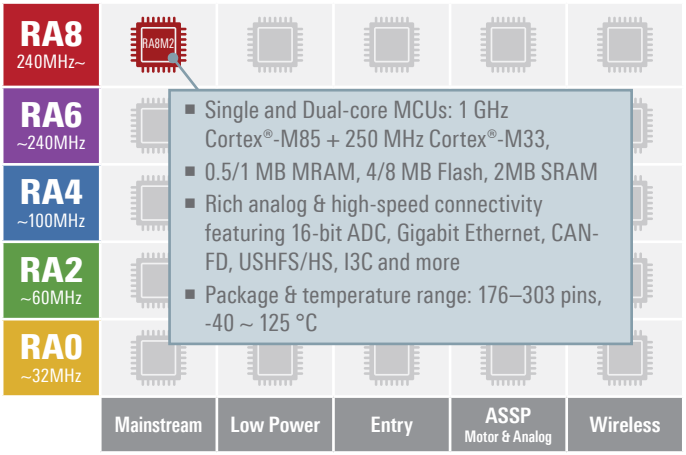
32-BIT MCU FAMILY

RENESAS RA8M2 GROUP

1 GHz Arm® Cortex®-M85 and Cortex-M33 Dual-Core High-Performance MCU

The RA8M2 high-performance MCUs combine 1 GHz Arm® Cortex®-M85 and 250 MHz Cortex-M33 cores, delivering over 7300 CoreMark to meet demanding application needs. RA8M2 MCUs enable compact design and reduce system costs by integrating large on-chip MRAM and SRAM memory, multiple memory interfaces, and a rich peripheral set. MRAM provides non-volatile, high-reliability storage for critical data. Available in packages from 176 to 303 pins and supporting junction temperature up to 125°C, these MCUs are ideal for a wide range of industrial and IoT/consumer applications. Armed with advanced security including new cryptographic Security IP, immutable storage and tamper protection, the RA8M2 MCUs enable truly secure IoT.



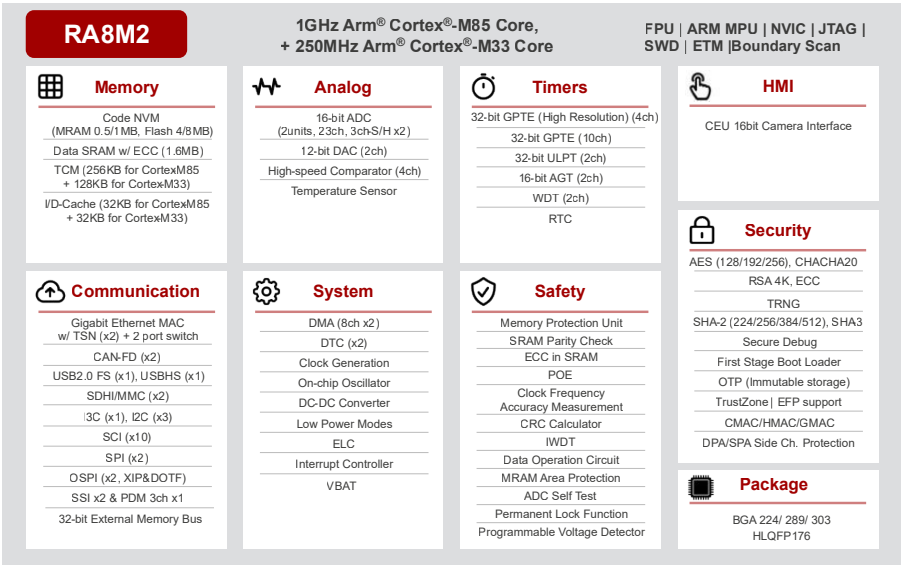
Key Features

- 1 GHz Arm® Cortex®-M85 Core
- 250 MHz Arm® Cortex®-M33 Core
- 0.5/1 MB MRAM and 4/8 MB Flash
- 2 MB SRAM including TCM; 64 KB Caches
- 176 pin HLQFP & 224, 289, 303pin BGA packages
- 32-bit high resolution and ultra-low power timers
- Renesas Security IP, TrustZone, tamper protection
- Secure Boot with Immutable storage for first stage bootloader
- 16-bit ADC, 12-bit DAC, HS comparators
- Gigabit Ethernet, TSN switch, USB2.0 HS/FS, CAN-FD interfaces
- SDHI, SPI, I3C/I2C serial interfaces
- 32-bit external memory interface (CS/SDRAM)
- xSPI compliant Octal SPI with XIP & DOTF

Target Applications

- Industrial Automation, Motor Control
- Machine Vision, Robotics
- Smart Home and Building Automation
- Office Automation
- Medical and Healthcare

Block Diagram



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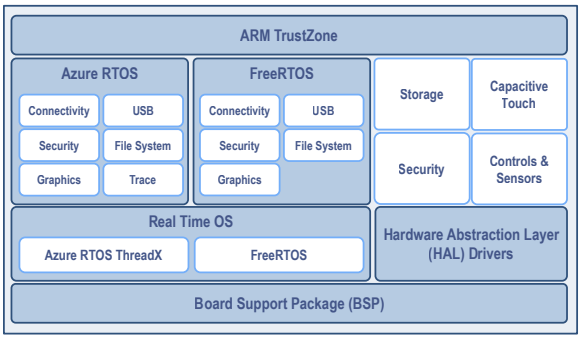
Software Package

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

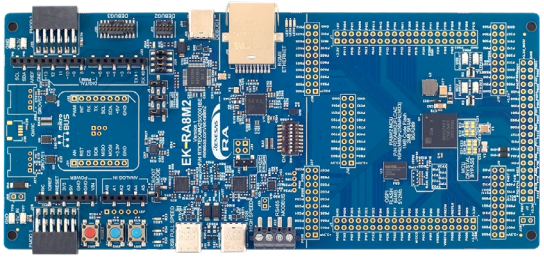
The e²studio IDE provides support with intuitive configurators and intelligent code generation to make programming and debugging easier and faster.

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

- Easily evaluate key features of the RA8M2 MCU and develop sophisticated embedded systems applications
- On-board debugging using SEGGER-J-Link®
- Order the kit and download documentation, design package, development tools and software at www.renesas.com/ek-ra8m2
- Orderable part number: **RTK7EKA8M2S01001BE**



Ordering References

* Indicating max frequency as Cortex-M85/Cortex-M33

Coming Soon

Ext. Flash/ MRAM/RAM	Tj	Max frequency*							
Flash 8MB MRAM 1MB SRAM 2MB	0 to 95 °C	1GHz/250MHz							R7JA8M2JSLSAJ
	-40 to 105 °C	800MHz/200MHz							R7JA8M2JSDSAJ
Flash 4MB MRAM 1MB SRAM 2MB	0 to 95 °C	1GHz/250MHz							R7JA8M2JRLSAJ
	-40 to 105 °C	800MHz/200MHz							R7JA8M2JRDSAJ
MRAM 1MB SRAM 2MB	0 to 95 °C	1GHz/250MHz		R7KA8M2AFLCAB	R7KA8M2AFLCAC		R7KA8M2JFLCAB	R7KA8M2JFLCAC	
	-40 to 105 °C	800MHz/200MHz		R7KA8M2AFDCAB	R7KA8M2AFDCAC		R7KA8M2JFDCAB	R7KA8M2JFDCAC	
	-40 to 125 °C	600MHz/200MHz	R7KA8M2AFECHC	R7KA8M2AFECAB	R7KA8M2AFECAC	R7KA8M2JFECHC	R7KA8M2JFECAB	R7KA8M2JFECAC	
MRAM 512KB SRAM 2MB	0 to 95 °C	1GHz/-		R7KA8M2ADLCAB	R7KA8M2ADLCAC				
	-40 to 105 °C	800MHz/-		R7KA8M2ADDCAB	R7KA8M2ADDCAC				
	-40 to 125 °C	600MHz/-	R7KA8M2ADECHC	R7KA8M2ADECAB	R7KA8M2ADECAC				
Pin Count			176pin	224-pin	289-pin	176pin	224-pin	289-pin	303-pin
Package type			HLQFP	BGA	BGA	HLQFP	BGA	BGA	BGA
Package size (body)			24 x 24mm	11 x 11 mm	12 x 12 mm	24 x 24mm	11 x 11 mm	12 x 12 mm	15 x 15 mm
Pin pitch			0.5 mm	0.65 mm	0.65 mm	0.5 mm	0.65 mm	0.65 mm	0.8 mm
Core			Single (Cortex-M85)			Dual (Cortex-M85/Cortex-M33)			

For more details, please visit: **renesas.com/ra8m2**

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