

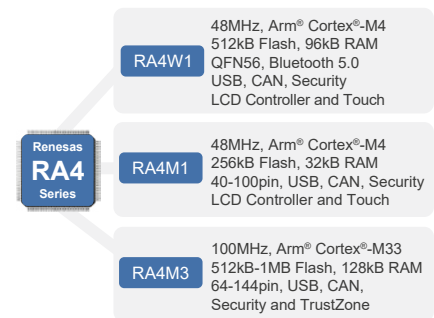
# 32-BIT MCU FAMILY

# RENESAS RA4M3 GROUP

## 100MHz High Integration Arm® Cortex®-M33 with TrustZone®

The Renesas RA4M3 group uses the high-performance Arm® Cortex®-M33 core with TrustZone®. In concert with the Secure Crypto Engine, it offers Secure Element functionality, as well as rich connectivity with USB 2.0 Full-Speed, SDHI, QSPI, and advanced analog.

The RA4M3 is built on a highly efficient 40nm process and is supported by an open and flexible ecosystem concept—the Flexible Software Package (FSP), built on FreeRTOS—and is expandable to use other RTOSes and middleware. The RA4M3 is suitable for IoT applications requiring future proof security, large embedded RAM, and low active power consumption down to 119µA/MHz running the CoreMark® algorithm from Flash.



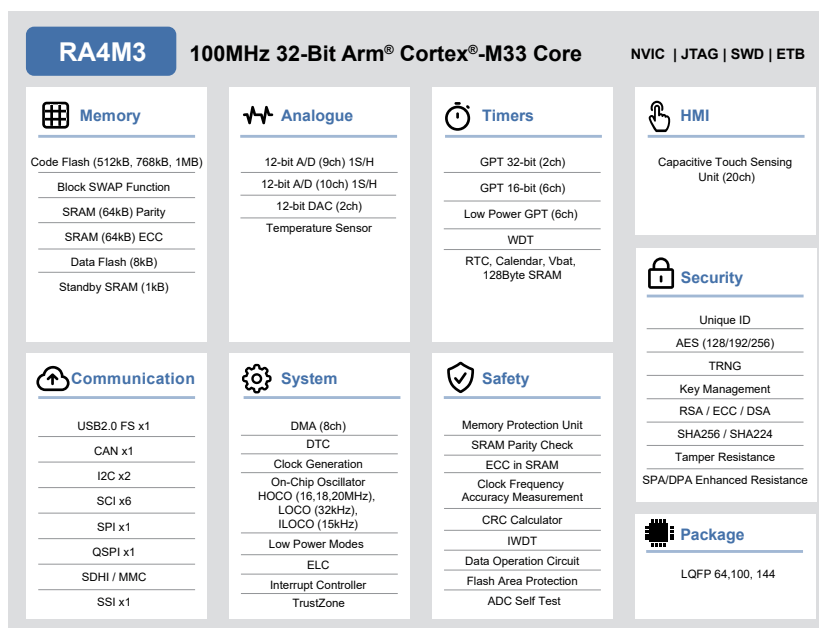
## Target Applications

- Enhanced security (fire detection, burglar detection, panel control)
- Metering (electricity, automated meter reading)
- Industry (robotics, door openers, sewing machines, vending machines, UPS)
- HVAC (heating, air conditioning, boiler control)
- General purpose

## Key Features

- 100MHz Arm® Cortex®-M33 with TrustZone®
- Secure element functionality
- 512kB - 1MB Flash memory and 64kB SRAM with Parity and 64kB SRAM with ECC
- 8kB Data Flash to store data as in EEPROM
- 1kB Stand-by SRAM
- Scalable from 64-pin to 144-pin packages
- Capacitive touch sensing unit
- USB 2.0 Full Speed
- CAN 2.0B
- QuadSPI
- SCI (UART, Simple SPI, Simple I²C)
- SPI/ I²C multimaster interface
- SDHI and MMC

## Block Diagram



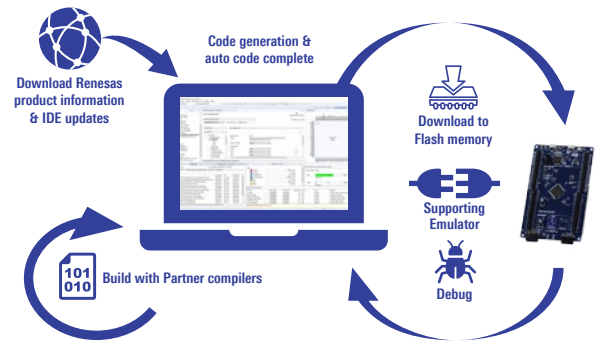
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## Benefits

- Secure element functionality providing better performance, unlimited secure key storage, key management, and lower BOM cost
- High-performance and low-power with 119µA/MHz while running CoreMark from flash at 100 MHz
- High-integration up to 1 MB code flash memory with background operation and SWAP operation, 8 kB Data flash memory, and 128 kB SRAM with Parity/ECC.
- Rich connectivity with USB 2.0 Full-Speed, SDHI, QSPI, and advanced analogue

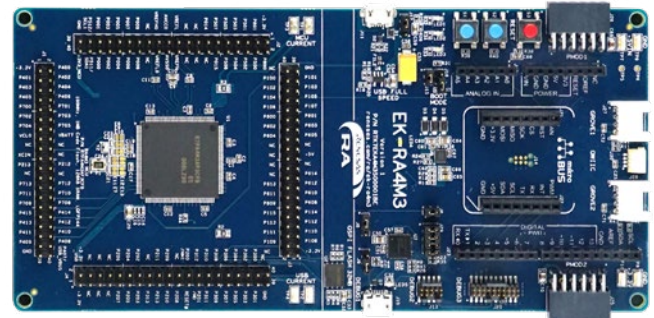
## Tools and Support

IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	<ul style="list-style-type: none"> <li>■ GCC</li> <li>■ Arm Compiler</li> </ul>	<ul style="list-style-type: none"> <li>■ Arm Compiler</li> </ul>	<ul style="list-style-type: none"> <li>■ IAR Arm Compiler</li> </ul>
Debugger	<ul style="list-style-type: none"> <li>■ Renesas E2/E2 Lite</li> <li>■ SEGGER J-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ SEGGER J-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ IAR I-Jet</li> <li>■ SEGGER J-Link</li> </ul>
Programmer	<ul style="list-style-type: none"> <li>■ Renesas PG-FP6</li> <li>■ SEGGER J-Flash</li> <li>■ Third party solutions</li> </ul>		



## Evaluation Kit

- Full MCU evaluation including On-Chip debugger
- Part name: RTK7EKA4M3S00001BE



Evaluation Kit: RTK7EKA4M3S00001BE

## Ordering References

Part name	Flash	RAM	DataFlash	Operating Temperature	Package	Package dimensions	Pin pitch
R7FA4M3AF3CFB	1MB	128KB	8KB	-40/+105°C	LQFP 144 pin	20x20mm body; (22x22mm)	0.5mm
R7FA4M3AF3CFP	1MB	128KB	8KB	-40/+105°C	LQFP 100 pin	14x14mm body; (16x16mm)	0.5mm
R7FA4M3AF3CFM	1MB	128KB	8KB	-40/+105°C	LQFP 64 pin	10x10mm body; (12x12mm)	0.5mm
R7FA4M3AE3CFB	768KB	128KB	8KB	-40/+105°C	LQFP 144 pin	20x20mm body; (22x22mm)	0.5mm
R7FA4M3AE3CFP	768KB	128KB	8KB	-40/+105°C	LQFP 100 pin	14x14mm body; (16x16mm)	0.5mm
R7FA4M3AE3CFM	768KB	128KB	8KB	-40/+105°C	LQFP 64 pin	10x10mm body; (12x12mm)	0.5mm
R7FA4M3AD3CFB	512KB	128KB	8KB	-40/+105°C	LQFP 144 pin	20x20mm body; (22x22mm)	0.5mm

For more details, please visit [www.renesas.com/RA](http://www.renesas.com/RA)

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Corporate Headquarters  
TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

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