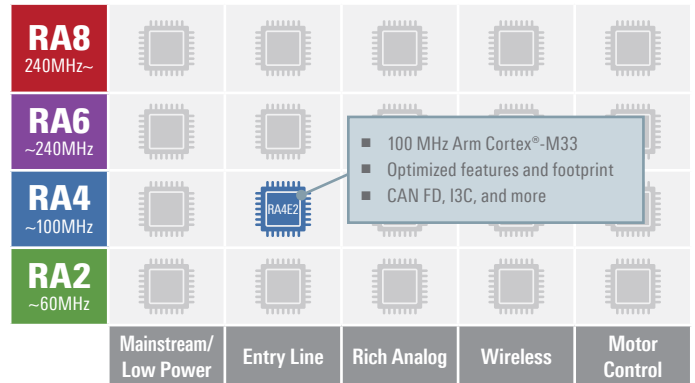# RENESAS

RA

32-BIT MCU FAMILY
RENESAS RA4E2 GROUP

Entry-Line 100MHz Arm® Cortex®-M33 General Purpose Microcontroller

The RA4E2 group is the newest entry-line microcontroller in the RA4 series based on the 100 MHz Arm® Cortex®-M33 core with TrustZone.

RA4E2 MCUs offer high-performance and optimized peripheral functions along with the smallest package options including space saving 36-pin BGA and 32-pin QFN packages. These satisfy the needs of both cost-sensitive and space-constrained applications.

The RA4E2 provides an entry point to the wider RA family due to its well-balanced performance, advanced peripheral functions, and scalability.

- 100 MHz Arm Cortex-M33
- Optimized features and footprint
- CAN FD, I3C, and more

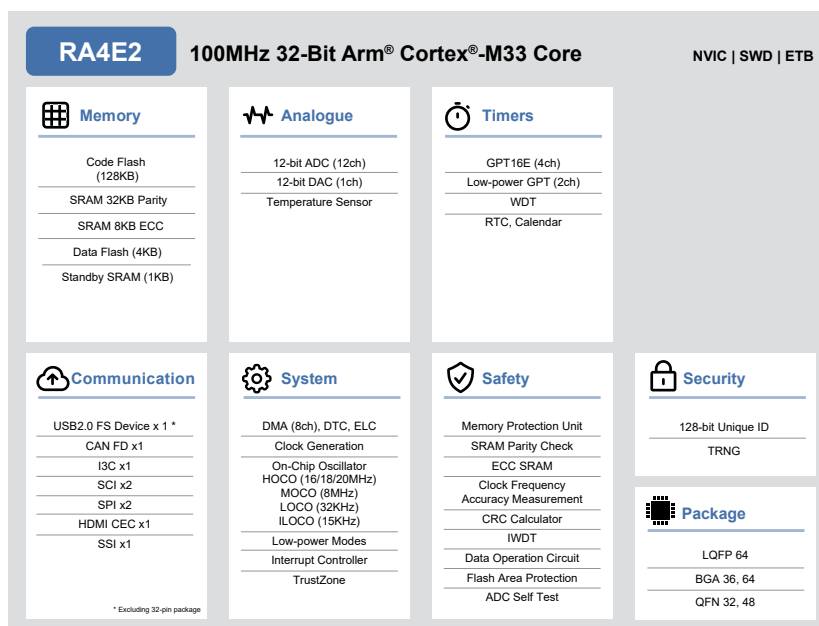| RA8 240MHz~ | | | | | |
RA6 ~240MHz					
RA4 ~100MHz		RA4E2			
RA2 ~60MHz					
	Mainstream/Low Power	Entry Line	Rich Analog	Wireless	Motor Control

Target Applications

- General purpose
- Sensor applications (Healthcare, Industrial, Wearable)
- Home appliances
- Entertainment systems
- Gaming, Headset control

Key Features

- 100MHz Arm Cortex-M33 with TrustZone
- 128KB Flash memory and 40KB SRAM
- 4KB Data Flash to store data as in EEPROM
- 1KB Standby SRAM
- Scalable from 32-pin to 64-pin packages
- USB 2.0 Full Speed
- CAN FD, I3C
- HDMI CEC, SSI
- 12-bit A/D Converter
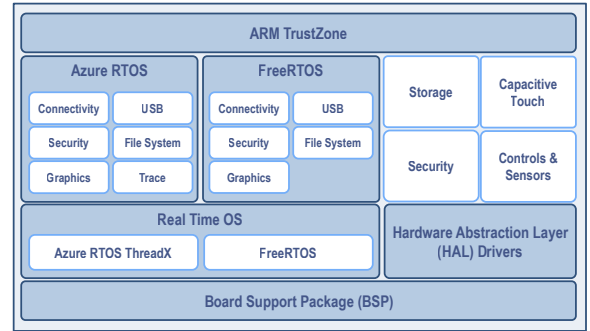- 12-bit D/A Converter
- General PWM Timer

Block Diagram

RA4E2 — 100MHz 32-Bit Arm® Cortex®-M33 Core
NVIC | SWD | ETB

Memory
- Code Flash (128KB)
- SRAM 32KB Parity
- SRAM 8KB ECC
- Data Flash (4KB)
- Standby SRAM (1KB)

Analogue
- 12-bit ADC (12ch)
- 12-bit DAC (1ch)
- Temperature Sensor

Timers
- GPT16E (4ch)
- Low-power GPT (2ch)
- WDT
- RTC, Calendar

Communication
- USB2.0 FS Device x 1 *
- CAN FD x1
- I3C x1
- SCI x2
- SPI x2
- HDMI CEC x1
- SSI x1

* Excluding 32-pin package

System
- DMA (8ch), DTC, ELC
- Clock Generation
- On-Chip Oscillator HOCO (16/18/20MHz) MOCO (8MHz) LOCO (32KHz) ILOCO (15KHz)
- Low-power Modes
- Interrupt Controller
- TrustZone

Safety
- Memory Protection Unit
- SRAM Parity Check
- ECC SRAM
- Clock Frequency Accuracy Measurement
- CRC Calculator
- IWDT
- Data Operation Circuit
- Flash Area Protection
- ADC Self Test

Security
- 128-bit Unique ID
- TRNG

Package
- LQFP 64
- BGA 36, 64
- QFN 32, 48

RENESAS RA4E2 GROUP

Software Package

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

| IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	• GCC • Arm Compiler • IAR Arm Compiler	• Arm Compiler	• IAR Arm Compiler
Debug Probe	• Renesas E2/E2 Lite • SEGGER J-Link	• SEGGER J-Link • Keil ULINK	• IAR I-Jet • SEGGER J-Link
Production Programmer	• Renesas PG-FP6 • SEGGER J-Flash • Partner solutions		

Tools and Support

The e² studio IDE provides support with intuitive configurators and intelligent code generation to make programming and debugging easier and faster.

Evaluation Kit

- Effortlessly evaluate key features of RA4E2 MCU group 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-ra4e2
- Orderable part number: **RTK7EKA4E2S00001BE**
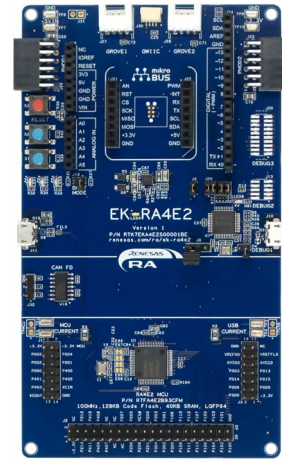
Evaluation Kit: RTK7EKA4E2S00001BE

Ordering References

Flash	128KB	**R7FA4E2B93CNH**	**R7FA4E2B92CBC**	**R7FA4E2B93CNE**	**R7FA4E2B93CFM**	**R7FA4E2B92CBB**
RAM	40KB					
DataFlash	4KB					
Pin Count		32pin	36pin	48pin	64pin	64pin
Package		QFN	BGA	QFN	LQFP	BGA
Size (body)		5x5mm	4x4mm	7x7mm	10x10mm	5x5mm
Pitch		0.5mm	0.5mm	0.5mm	0.5mm	0.5mm
Operating Temperature		-40 to +105°C	-40 to +85°C	-40 to +105°C	-40 to +105°C	-40 to +85°C

For more details, please visit: renesas.com/ra4e2