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.

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

100MHz 32-Bit Arm® Cortex®-M33 Core

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

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

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

System
- DMA (4ch), DTC, DLC
- 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

Security
- 128-bit Unique ID
- TRNG

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

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

Ordering References

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<th>Flash</th>
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<td>RAM</td>
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<tr>
<td>Package</td>
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<td>Operating Temperature</td>
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<td>-40 to +85°C</td>
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For more details, please visit: renesas.com/ra4e2

Evaluation Kit: RTK7EKA4E2S00001BE

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