**News Release**

No.: REN2415(A)

**Renesas Introduces New Entry-Level RA0 MCU Series with Best-in-Class Power Consumption**

*Low-Cost Devices Target Consumer Electronics, Small Appliances, Industrial System Control and Building Automation*

**Düsseldorf, April 9, 2024 ―** Renesas Electronics Corporation (TSE:6723), a premier supplier of advanced semiconductor solutions, today introduced the RA0 microcontroller (MCU) Series based on the Arm® Cortex®-M23 processor. The new, low-cost RA0 devices offer the industry’s lowest overall power consumption for general purpose 32-bit MCUs.

The RA0 devices consume only 84.3μA/MHz of current in active mode and only 0.82 mA in sleep mode. In addition, Renesas offers a Software Standby mode in the new MCUs that reduces power consumption by a further 99 percent to a miniscule 0.2 µA. Coupled with a fast wake-up High-speed On-Chip Oscillator (HOCO), these ultra-low power MCUs deliver an ideal solution for applications including battery-operated consumer electronics devices, small appliances, industrial system control, and building automation applications.

**Feature Set Optimized for Low Cost**

Renesas is now shipping the first group in the RA0 Series, the RA0E1 Group. These devices have a feature set optimized for cost-sensitive applications. They offer a wide operating voltage range of 1.6V to 5.5V so customers don’t need a level shifter/regulator in 5V systems. The RA0 MCUs also integrate timers, serial communications, analog functions, safety functions and HMI functionality to reduce customer BOM cost. A wide range of packaging options is also available, including a tiny 3mm x 3mm 16-lead QFN.

In addition, the new MCU’s high-precision (±1.0%) on-chip oscillator (HOCO) improves baud rate accuracy and enables designers to forego a standalone oscillator. Unlike other HOCOs, it maintains this precision in environments from -40°C to 105°C. This wide temperature range enables customers to avoid costly and time-consuming “trimming,” even after the reflow process.

The [RA0E1 MCUs](https://www.renesas.com/products/microcontrollers-microprocessors/ra-cortex-m-mcus/ra0e1-32mhz-arm-cortex-m23-entry-level-ultra-low-power-general-purpose-microcontroller?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=pp) include critical diagnostic safety functions as well as an IEC60730 self-test library. They also offer security features including true random number generator (TRNG) and AES libraries for IoT applications, including encryption.

“As the leader in embedded processing, our customers expect Renesas to provide the best solution for any application,” said **Akihiro Kuroda, Vice President of the Embedded Processing 2nd Division at Renesas**. “The RA0E1 Group MCUs deliver the ultra-low power and low cost needed for price-sensitive systems without sacrificing safety, data security and ease-of-design. Coupled with the recent introduction of the high-performance RA8 Series, Renesas now offers the premier MCU solution for any customer application anywhere in the world.”

"Power-constrained IoT embedded applications addressing markets such as industrial and smart home have specific performance, efficiency and security needs,” **said Paul Williamson, senior vice president and general manager, IoT Line of Business at Arm.** “Renesas’ RA MCU Family, built on Arm technology, now offers solutions ranging from low power RA0 MCUs to the high performance AI-capable RA8 devices, all with a common design environment that enables easy and fast development and migration.”

**Key Features of the RA0E1 Group MCUs**

* **Core**: 32MHz Arm Cortex-M23
* **Memory**: Up to 64KB integrated Code Flash memory and 12KB SRAM
* **Analog Peripherals:** 12-bit ADC, temperature sensor, internal reference voltage
* **Communications Peripherals**: 3 UARTs, 1 Async UART, 3 Simplified SPIs, 1 IIC, 3 Simplified IICs
* **Safety**: SRAM parity check, invalid memory access detection, frequency detection, A/D test, immutable storage, CRC calculator, register write protection
* **Security**: Unique ID, TRNG, Flash read protection
* **Packages**: 16-, 24- and 32-lead QFNs, 20-pin LSSOP, 32-pin LQFP

The new RA0E1 Group MCUs are supported by Renesas’ [Flexible Software Package (FSP)](https://www.renesas.com/software-tool/flexible-software-package-fsp?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=sw). The FSP enables faster application development by providing all the infrastructure software needed, including multiple RTOS, BSP, peripheral drivers, middleware, connectivity, networking, and security stacks as well as reference software to build complex AI, motor control and cloud solutions. It allows customers to integrate their own legacy code and choice of RTOS with FSP, thus providing full flexibility in application development. Using the FSP will ease migration of RA0E1 designs to larger RA devices if customers wish to do so.

**Winning Combinations**

Renesas has combined the new RA0E1 Group MCUs with numerous compatible devices from its portfolio to offer a wide array of Winning Combinations, including the [HVAC Environment Monitor Module for Public Buildings](https://www.renesas.com/application/industrial/building-home-automation/hvac-environment-monitor-module-public-buildings?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=wc). Winning Combinations are technically vetted system architectures from mutually compatible devices that work together seamlessly to bring an optimized, low-risk design for faster time to market. Renesas offers more than 400 Winning Combinations with a wide range of products from the Renesas portfolio to enable customers to speed up the design process and bring their products to market more quickly. They can be found at [renesas.com/win](https://www.renesas.com/applications?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=acp).

**Demonstration at embedded world 2024**

To see a live demonstration of the new RA0 MCUs, join Renesas at embedded world 2024 in Nuremberg, Germany, April 9-11 in Hall 1, Stand 234.

**Availability**

The [RA0E1 Group MCUs](https://www.renesas.com/products/microcontrollers-microprocessors/ra-cortex-m-mcus/ra0e1-32mhz-arm-cortex-m23-entry-level-ultra-low-power-general-purpose-microcontroller?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=pp) are available now, along with the FSP software and the [RA0E1 Fast Prototyping Board](https://www.renesas.com/products/microcontrollers-microprocessors/ra-cortex-m-mcus/fpb-ra0e1-fast-prototyping-board-ra0e1-mcu-group?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=tp). Samples and kits can be ordered either on the Renesas website or through distributors. More information on the new MCUs is available at [renesas.com/RA0E1](https://www.renesas.com/products/microcontrollers-microprocessors/ra-cortex-m-mcus/ra0e1-32mhz-arm-cortex-m23-entry-level-ultra-low-power-general-purpose-microcontroller?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=pp).

**Renesas MCU Leadership**

A world leader in MCUs, Renesas ships more than 3.5 billion units per year, with approximately 50% of shipments serving the automotive industry, and the remainder supporting industrial and Internet of Things applications as well as data center and communications infrastructure. Renesas has the broadest portfolio of 8-, 16- and 32-bit devices, delivering unmatched quality and efficiency with exceptional performance. As a trusted supplier, Renesas has decades of experience designing smart, secure MCUs, backed by a dual-source production model, the industry’s most advanced MCU process technology and a vast network of more than 250 ecosystem partners. For more information about Renesas MCUs, visit [renesas.com/MCUs](https://www.renesas.com/products/microcontrollers-microprocessors?utm_campaign=f-up-mcu_ra0e1-epsg-iotbd-ipm2-null&utm_source=null&utm_medium=pr&utm_content=pcp).

**About Renesas Electronics Corporation**

Renesas Electronics Corporation ([TSE: 6723](http://www.jpx.co.jp/english/)) empowers a safer, smarter and more sustainable future where technology helps make our lives easier. A leading [global](https://www.renesas.com/about/company/profile/global.html) provider of microcontrollers, Renesas combines our expertise in embedded processing, analog, power and connectivity to deliver complete semiconductor solutions. These Winning Combinations accelerate time to market for automotive, industrial, infrastructure and IoT applications, enabling billions of connected, intelligent devices that enhance the way people work and live. Learn more at [renesas.com](http://www.renesas.com/). Follow us on [LinkedIn](https://www.linkedin.com/company/renesas/), [Facebook](https://www.facebook.com/RenesasElectronics/), [X](https://twitter.com/renesasglobal), [YouTube](https://www.youtube.com/user/RenesasPresents) and [Instagram](https://www.instagram.com/renesas_global/)

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