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STMicroelectronics reveals STM32U3 microcontrollers extending ultra-low power innovation for remote, smart and sustainable applications

- *Latest MCUs leverage cutting-edge near-threshold chip design to set record performance-per-watt efficiency benchmark*
- *Secret-key protection and in-factory provisioning boost cyber security*
- *Typical applications include utility meters, healthcare devices, and industrial sensors*

Geneva, Switzerland, March 4, 2025 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, has introduced new STM32U3 microcontrollers (MCUs) with cutting-edge power-saving innovations that ease deployment of smart connected tech, especially in remote locations.

The latest MCUs are aimed at IoT devices, which must typically operate for extended periods without maintenance and with limited energy from a coin cell or ambient solar or thermoelectric source. Typical applications that depend on the lowest possible power consumption include utility meters, healthcare devices such as glucose meters and insulin pumps, animal care monitors, forest-fire sensors, and industrial sensors including thermostats and smoke detectors. STM32U3 MCUs are also used in consumer products such as smart watches, wearables, and hearables.

"*The STM32U3 series builds on the heritage of ST-established ultra-low-power general-purpose microcontroller class as it is known today, which opened the door to widespread diffusion of smart technology in diverse environments*," commented Patrick Aidoune, General-Purpose MCU Division General Manager, STMicroelectronics. "*Leveraging innovative techniques such as recent advancements in near-threshold design, the new devices cut dynamic power consumption to the bone, boosting efficiency by a factor of two compared to our previous generation, hence contributing to companies' sustainability goals*."

In addition to its extreme energy efficiency, the STM32U3 series meets the needs of IoT devices by providing robust cyber protection using the latest hardware security techniques. The MCUs are designed to confine secret keys permanently in secure memory, eliminating vulnerable CPU fetches. In addition, attestation credentials for each device are provisioned by ST at manufacture before leaving the factory, which strengthens security and simplifies provisioning. All those security mechanisms, in addition to the SESIP3 and PSA Level3 certifiable security assets, such as cryptographic accelerators, TrustZone® isolation, random generator, and product lifecycle will contribute and enable ST customers to reach compliancy towards the upcoming RED and CRA regulations.

Customer testimonials:

"STM32U3 enables us [smaXtec] to bring our hardware for animal health monitors to the next level. The consumption in active mode is extremely low, only a few µA/MHz, which enables us to reduce the energy needed for current data processing algorithms while at the same time adding new features to our products. In addition, its advanced range of low-power modes lets us put the device into deep sleep if no data is processed. The newly implemented STOP3 mode, including its wakeup capabilities, is a neat way to keep power consumption low," said Manuel Frech, Product Development Engineer, smaXtec.

Technical Notes for Editors

ST has set the pace in ultra-low-power (ULP) MCUs with previous STM32 variants and is now taking ULP performance to a new level with the new STM32U3 series. Leveraging advanced power-saving chip design, fine-tuned with AI-enhanced tools, and the latest Arm® Cortex®-M33 core running at up to 96MHz, the new MCUs achieve the market-leading Coremark-per-milliwatt score of 117. This is almost twice the efficiency of ST's preceding STM32U5 series, and five times that of the STM32L4 series.

- STM32U3 MCUs set new standards in dynamic performance by taking advantage of near-threshold technology that operates IC transistors at extremely low voltage, saving energy proportionately according to a square law
- ST's innovative near-threshold implementation uses AI-driven adaptive voltage scaling at wafer level to compensate for process variations in the foundry
- In addition to dynamic power savings (down to 10µA/MHz), the STM32U3 series achieve extremely low stop current, at 1.6µA
- STM32U3 embeds up to 1MB of Flash memory dual-bank and 256kB of SRAM
- In terms of security, STM32U3 MCUs embed all successful security features of the STM32U5, with additional keystore capabilities. Newly, secret keys are loaded in-factory by ST on the STM32U3 MCUs and are protected by a coupling and chaining bridge (CCB), representing the first use of this technology in the STM32 MCU family
- Two product lines are available, presenting a choice of MCUs either with or without a hardware cryptographic accelerator
- Combined with their low power, the devices integrate efficient and high-performing peripherals including the latest I3C digital connectivity
- MCUs are available in commercial (-40°C to 85°C) and extended industrial (-40°C to 105°C) temperature ranges

The STM32U3 series is in production now and available from $1.93 for orders of 10,000 pieces. For more information, please go to www.st.com/stm32u3

About STMicroelectronics
At ST, we are 50,000 creators and makers of semiconductor technologies mastering the semiconductor supply chain with state-of-the-art manufacturing facilities. An integrated device manufacturer, we work with more than 200,000 customers and thousands of partners to design and build products, solutions, and ecosystems that address their challenges and opportunities, and the need to support a more sustainable world. Our technologies enable smarter mobility, more efficient power and energy management, and the wide-scale deployment of cloud-connected autonomous things. We are on track to be carbon neutral in all direct and indirect emissions (scopes 1 and 2), product transportation, business travel, and employee commuting emissions (our scope 3 focus), and to achieve our 100% renewable electricity sourcing goal by the end of 2027.

Further information can be found at www.st.com.

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