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## STMicroelectronics Reveals Extreme Low-Power STM32U5 Microcontrollers with Advanced Performance and Cybersecurity

- ❖ *Efficient 40nm process technology and power-saving innovations minimize energy consumption in all modes*
- ❖ *Features Arm® embedded core and advanced cybersecurity, graphics, and peripherals for demanding consumer and industrial applications*

**Geneva, February 25, 2021 – STMicroelectronics (NYSE: STM)**, a global semiconductor leader serving customers across the spectrum of electronics applications, has announced a new generation of extreme power-saving microcontrollers (MCUs), the [STM32U5\\* series](#), to meet the most demanding power/performance requirements for smart applications including wearables, personal medical devices, home automation, and industrial sensors.

The industry-leading STM32 MCUs, built upon the highly energy-efficient Arm® Cortex®-M processors, are already in billions of domestic appliances, industrial controls, computer peripherals, communication devices, and equipment managing smart cities and infrastructure.

The new STM32U5 series teams the efficient [Arm Cortex-M33 core](#) with ST's innovative proprietary power-saving features and on-chip IP cutting down energy demand while pumping up performance. The line also adds new state-of-the-art features needed by today's applications, including advanced cybersecurity with new hardware-based protection targeting PSA and SESIP (Security Evaluation Standard for IoT Platforms) assurance level 3, as well as graphics accelerators for rich user experiences.

*“ST has almost doubled its share of global microcontroller sales in the last five years, shipping more than two billion ultra-low-power STM32 devices to date. With our low-power expertise and focus, we are particularly strong in the ultra-low-power category with about 25% of that market,”* said Ricardo de Sa Earp, Group Vice President, Microcontroller Division General Manager, STMicroelectronics. *“We expect our STM32U5 microcontrollers to be even more popular, enabling our customers to create new smart consumer and industrial products that deliver superior energy rating, performance, and cyberprotection.”*

*“Today’s smart applications need to be power efficient and built on a secure foundation,”* said Mohamed Awad, vice president, IoT Business, Arm. *“ST has incorporated Arm technology into its latest MCUs, taking energy efficiency and security to the next level, while developers can also utilize the Arm Keil® MDK for ultimate energy optimization.”*

ST has also created the [STM32U5 IoT Discovery Kit](#) (B-U585I-IOT02A) that combines the MCU with a Wi-Fi® module, Bluetooth® module, and various sensors. Microsoft has chosen this kit as reference board for the new Azure Certified Device program. “*The STM32U5 provides an excellent platform for delivering Azure IoT services via Azure RTOS leveraging the advanced features of STM32U5 microcontroller,*” said Sam George, Corporate Vice President, Azure IoT at Microsoft Corporation. The kit will be available to order later in the year.

Among lead customers for the STM32U5, Twilio, the leading cloud communications platform, has used the MCUs to create an innovative IoT device-builder platform called Microvisor. Jonathan Williams, Lead Product Manager at Twilio, commented, “*Being among the first developers to start using the STM32U5 has given Twilio Microvisor that unique combination of extreme low power, efficient performance, and advanced cybersecurity that Twilio customers are asking for.*”

STM32U5 MCUs are sampling now to lead customers and will be in full production in September 2021. Budgetary pricing starts at \$3.60. A broad choice of packages including a 4.2mm x 3.95mm WLCSP and 7mm x 7mm UQFN48 and UFBGA169 will be available.

## **Further Technical Information**

### **Power-Saving Features**

The microcontrollers introduce an innovative autonomous mode that lets direct memory access (DMA) and peripherals keep working while most of the device sleeps, to save power. Granular control over operating modes allows part of the MCU’s memory to be turned off, to avoid powering unused cells. In addition, STM32U5 MCUs are manufactured using 40nm process geometry, the most advanced node suitable for MCUs, which saves power in dynamic operating modes as well as power-saving modes.

There are also proven features from the preceding STM32L0, STM32L4, and STM32L5 ultra-low-power MCUs. These include dynamic voltage scaling, which optimizes energy consumption according to the workload, and the ST ART Accelerator™ to read Flash memory efficiently. An update to the ST ART Accelerator now allows reading of off-chip Flash as well as the MCU’s internal memory.

By Integrating an advanced DC/DC converter and low-dropout (LDO) regulator, connected in parallel and selectable on-the-fly, STM32U5 MCUs can cut dynamic power consumption to less than 19µA/MHz.

### **Upgraded Peripherals**

In addition to saving power, designers can tackle demanding applications leveraging new features such as greater Flash density, now with up to 2MB on chip and fast interfaces to off-chip memory for further expansion. Up to 0.5MB of on-chip Flash has increased cycle life, up to 100,000 read/write cycles to assure reliable storage of user data.

An advanced high-speed 14-bit analog-to-digital converter (ADC) is provided, ready for next-generation sensing and tracking applications.

A Multi-function Digital Filter (MDF) and Audio Digital Filter (ADF) upgrade the capabilities of ST’s proven Digital Filter for Sigma-Delta Modulator (DFSDM). By boosting performance in sound-activity detection, these now enable users to infuse AI into low-cost, low-power microcontroller-based use cases. Moreover, with Error Correction Code (ECC) memory as part of the device’s RAM, STM32U5 MCUs can also fulfil safety-centric applications.

## Enhanced Cybersecurity

Building on the cybersecurity focus of the STM32L5, which includes a Cortex-M33 core with Arm TrustZone® technology and an ST-specific security feature set, the STM32U5 series introduces new and state-of-the-art innovations:

- AES encryption and Public Key Authorization (PKA) are now hardware resistant to side-channel attacks by Differential Power Analysis (DPA)
- Secure data storage with a Hardware Unique Key (HUK)
- Active tamper detection
- Internal monitoring that can erase secret data in the event of perturbation attacks helps meet the PCI Security Standards Council (PCI SSC) requirements for Point Of Sales (POS) applications.

## New Ecosystem Resources

Azure RTOS will be integrated in the [STM32Cube software suite](#), with configuration features in STM32CubeMX and STM32CubeIDE tools and addition of examples, bringing additional key benefits to STM32Cube such as fast performance and industry certifications.

The B-U585I-IOT02A Discovery Kit will enable a wide diversity of applications by exploiting low-power communication, multiway sensing and direct connection to cloud servers. It includes Wi-Fi and Bluetooth modules, as well as microphones, temperature and humidity, magnetometer, accelerometer and gyroscope, pressure, Time-of-Flight and gesture-detection sensors.

You can also read our blogpost at <https://blog.st.com/stm32u5-microvisor/>

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## About STMicroelectronics

At ST, we are 46,000 creators and makers of semiconductor technologies mastering the semiconductor supply chain with state-of-the-art manufacturing facilities. An independent device manufacturer, we work with more than 100,000 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 the Internet of Things and 5G technology. Further information can be found at [www.st.com](http://www.st.com).

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