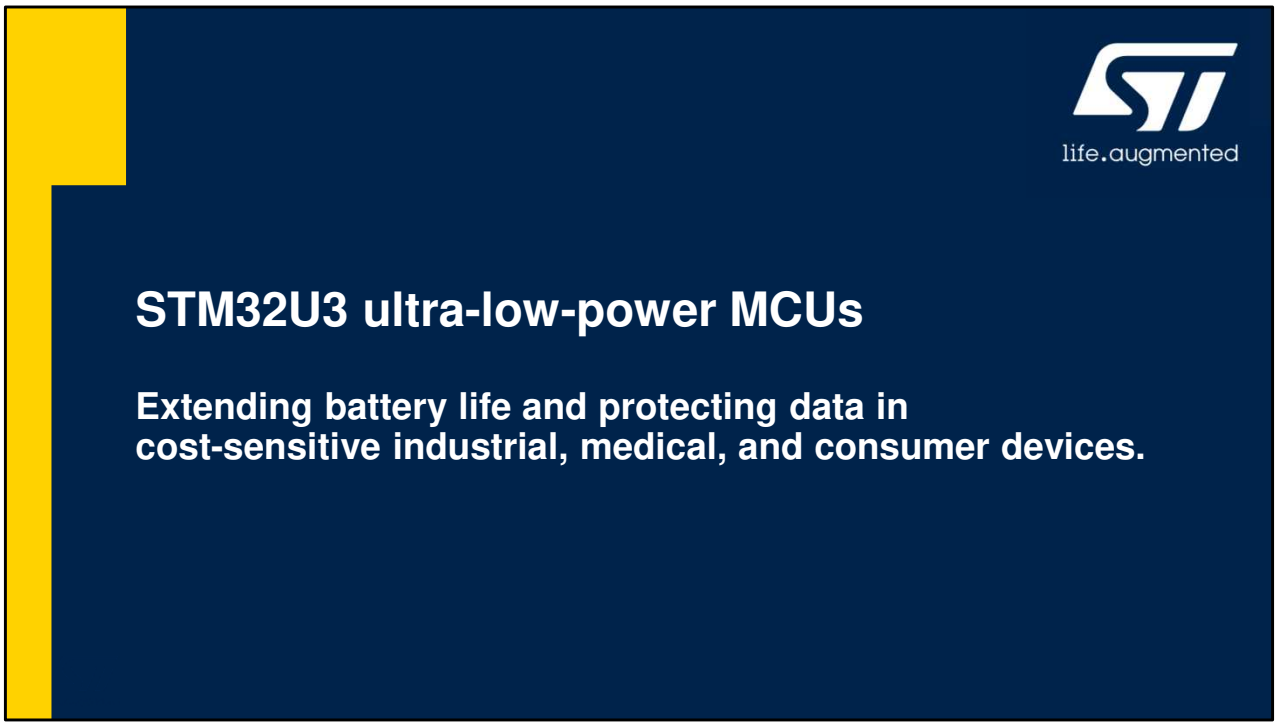
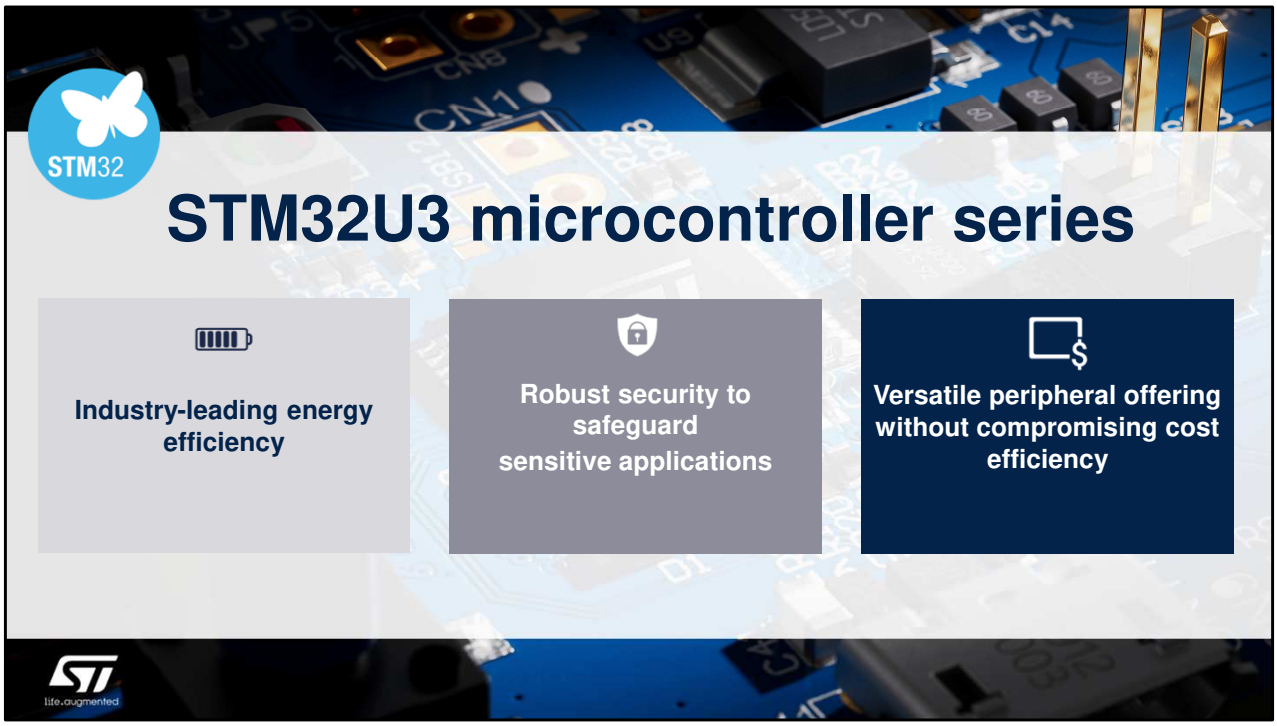


A warm welcome to this online training! You may have heard about the name STM32U3, which already gives you some hints as to its nature: it is an ultra-low-power STM32 microcontroller series offering the most advanced power-savings in multiple applications.

What if I told you that the STM32U3 can expand battery lifetime by seven times in activity tracking devices and by four times in gas and water metering devices? In this short overview presentation, you will understand how the STM32U3 contributes to making applications more sustainable.

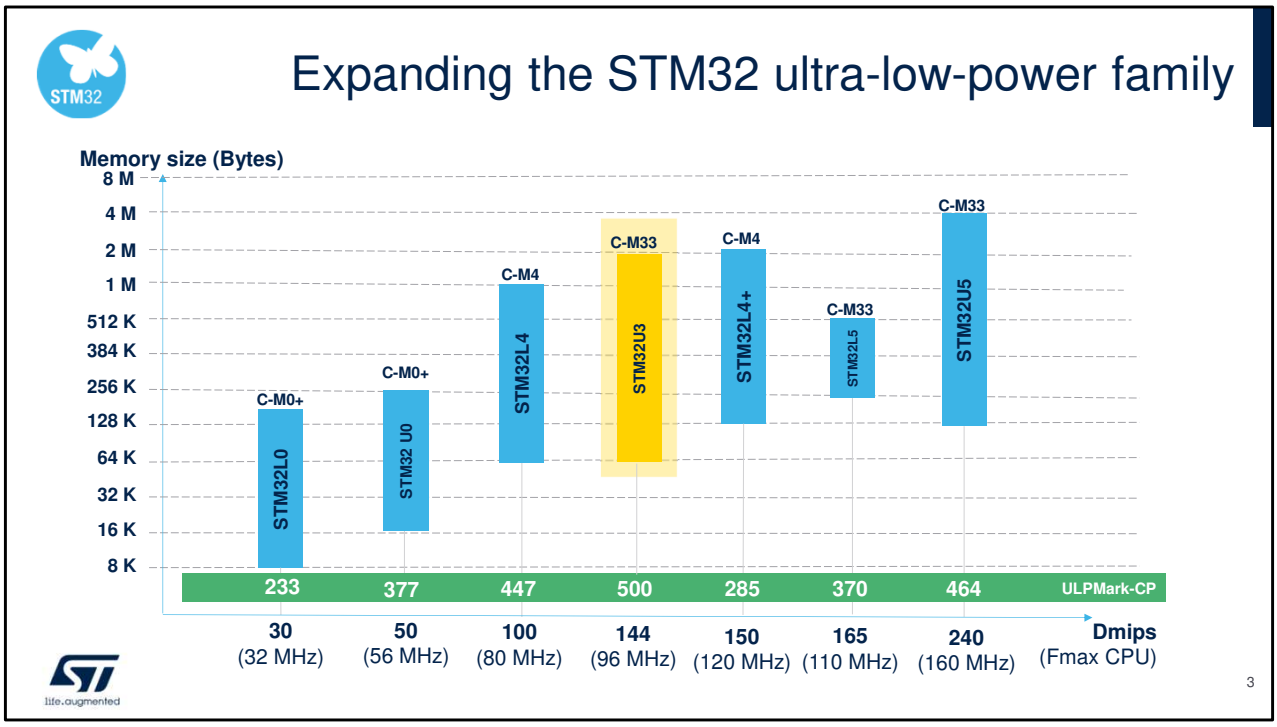
Based on the Arm® Cortex®-M33 core, the microcontroller meets the most demanding power/performance requirements for smart applications, including wearables, personal medical devices, home automation, and industrial sensors



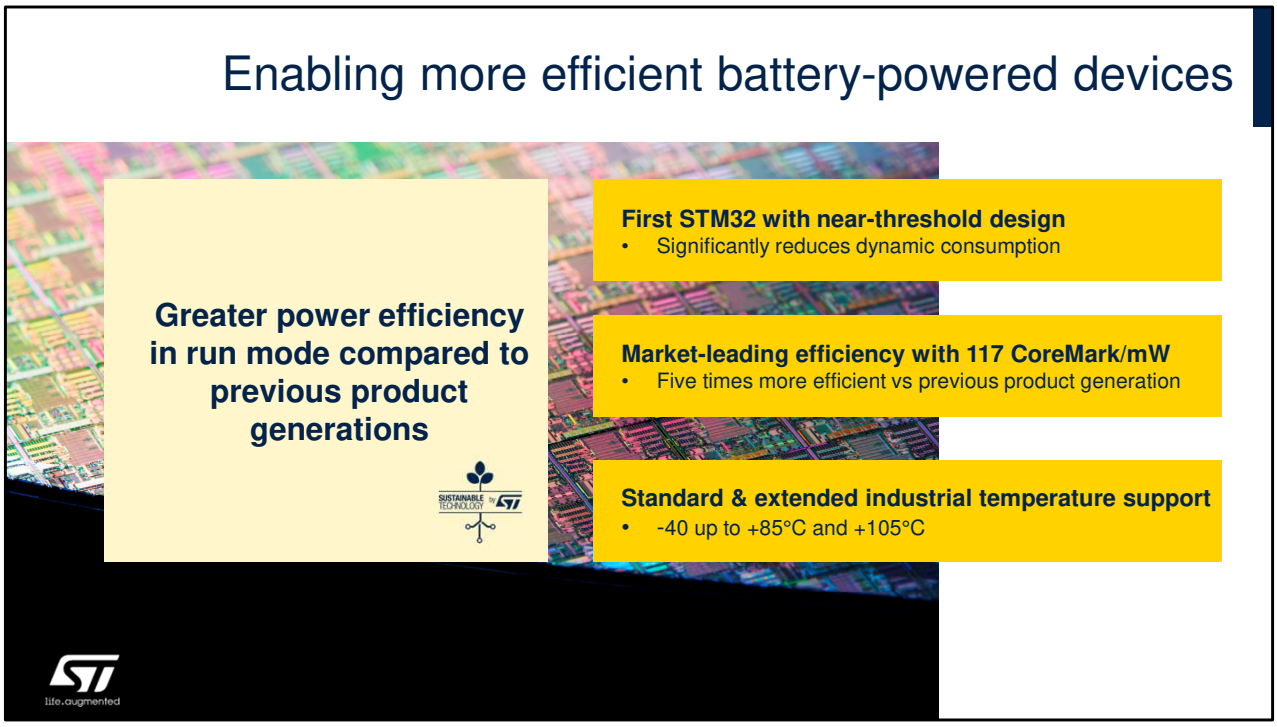
STM32U3 is our most power-efficient MCU to date, increasing battery lifetime and decreasing power consumption.

Security has also been improved versus our previous product generation, the STM32L4. We continue to target PSA Certified Level3 and SESIP Level3 certifications.

These features are built into a cost-effective solution and come in variety of packages.



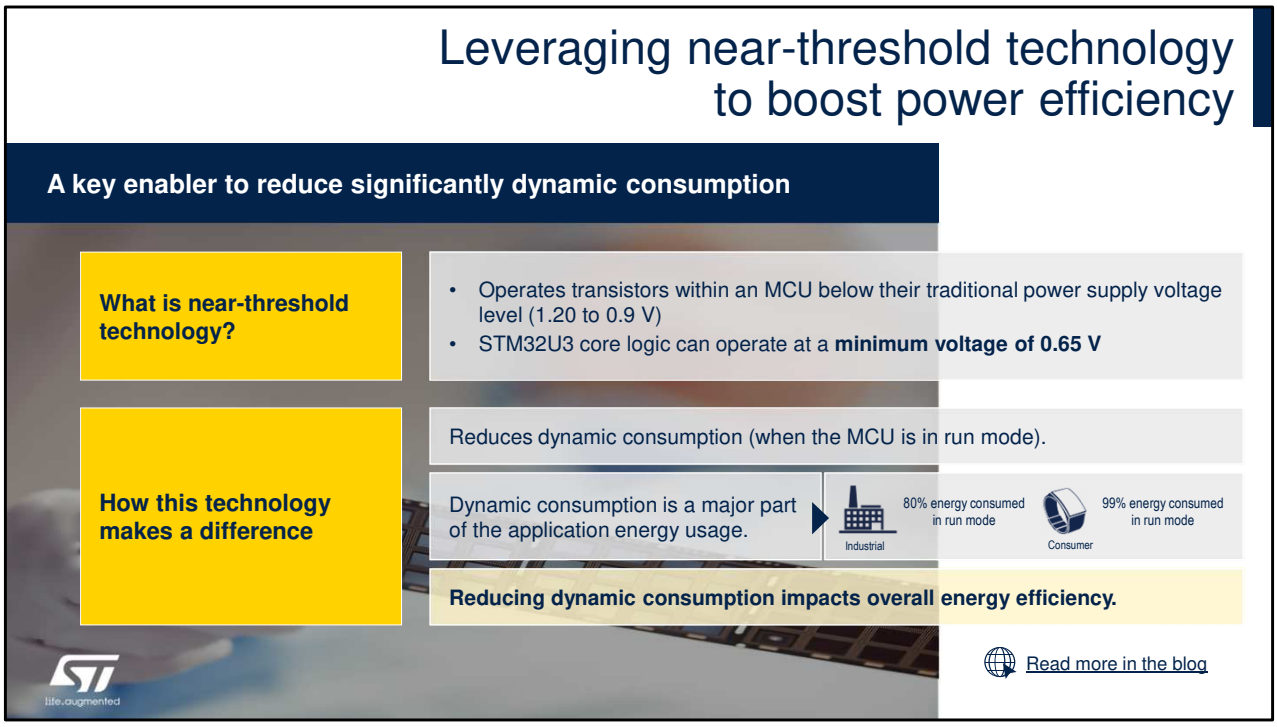
The STM32U3 uses the same Cortex-M33 core as our previous STM32U5 series. It is manufactured using the same 40nm process as the STM32U5. In terms of performance, it is at the same level as the STM32L4+ with 144 DMIPS. However, in terms of efficiency, it will be our leading product.



The STM32U3 is the first STM32 with a near-threshold design. This design allows us to significantly reduce dynamic consumption, which is the consumption while the product is in RUN mode. Dynamic consumption is a major part of the application energy usage, which is why reducing it impacts overall energy efficiency.

The near-threshold design allows the STM32U3 series to reach up to 117 CoreMark/mW, which is the metric used to measure and evaluate energy efficiency. It measures the CoreMark score, demonstrating the performance of a product while measuring its consumption. It is a good metric to evaluate energy efficiency.

Despite being based on a near-threshold design, the STM32U3 doesn’t compromise on voltage range and temperature range.

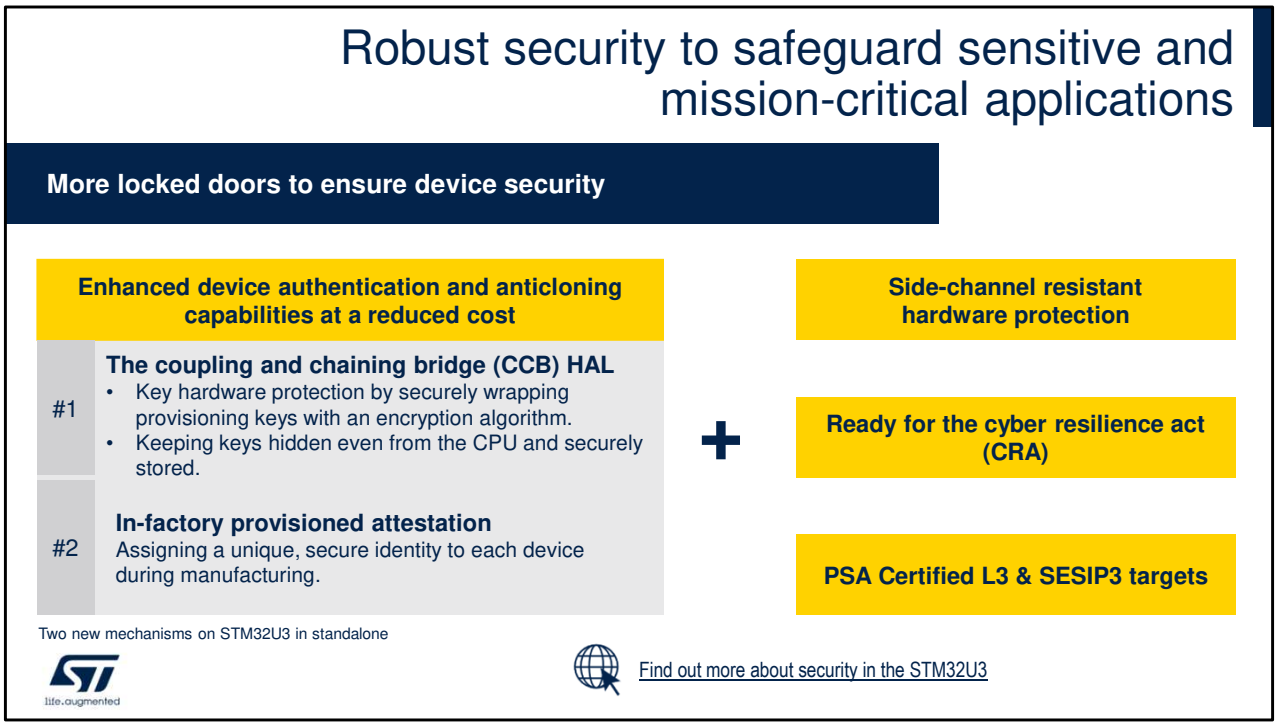


The near-threshold design techniques allow the transistors inside the product to operate below their traditional threshold. For a standard 40nm MCU like the STM32U5, the traditional threshold is between 1.2V and 0.9V, depending on the range voltage scaling. In the STM32U3, the voltage applied to the core logic can go down to 0.65V.

Since power is proportional to the square of the voltage, reducing the voltage applied to the core logic drastically reduces power consumption.

In ultra-low-power applications, dynamic consumption is a major part of the overall energy usage. In consumer applications, it represents 99% of the global energy, while in industrial applications such as metering, it represents 80% of the global energy.

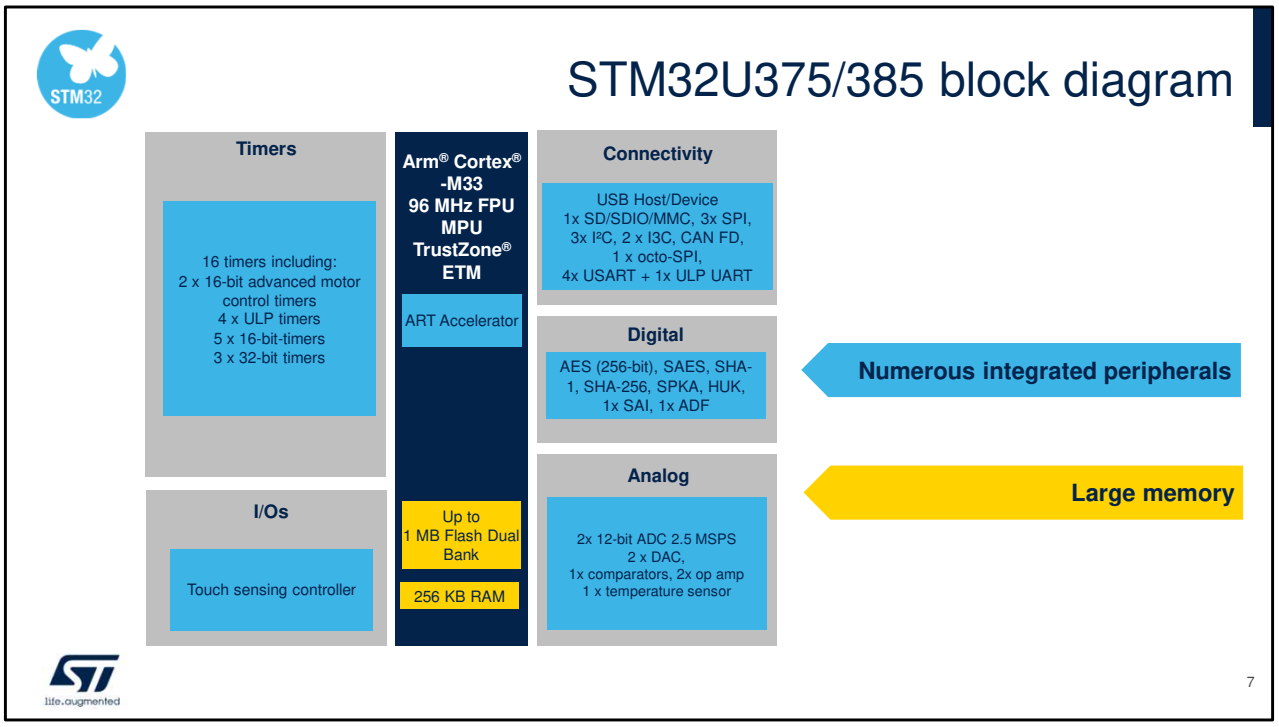
If you wish to find out more about this technology, you can refer to our dedicated blog and read our Application Note AN6195 that shows the percentage of RUN and STOP modes in different application use cases.



The security on STM32U3 has been increased by adding more locked doors, enhancing device authentication and anticloning capabilities.

Two new mechanisms are available in standalone on the STM32U3:
•First, the coupling chaining bridge (CCB) that offers a key hardware protection by keeping the keys hidden even from the CPU and securely stored.
•Next, the in-factory provisioned attestation, which allows the product to be assigned a unique and secure identity during production, resulting in cost savings for customers.

The cryptography inside the STM32U3 is side-channel resistant, allowing for PSA Level 3 certification and readiness for CRA.



Let's look into the block diagram of STM32U3.
It embeds many digital and analog peripherals with a new IP such as I3C and CCB (coupling chaining bridge).

The first product in the family comes with 1 Mbyte of flash memory with dual bank capabilities and 256 Kbytes of SRAM.

Many options available to streamline costs

100% pin to pin compatible with STM32U5
(Except WLCSP)

9 different packages per line

LQFP48 (7 × 7 mm)
LQFP64 (10 × 10 mm)
LQFP100 (14 × 14 mm)
UFBGA64 (5 × 5 mm)
UFBGA100 (7 × 7 mm)

UFQFPN32 (5 x 5 mm)
UFQFPN48 (7 x 7 mm)
WLCSP52 (3.17 x 3.11 mm)
WLCSP68 (3.11 x 3.17 mm)

Product types	Flash memory (Kbytes)	RAM (Kbytes)	ULP Comparators	ULP timers	I3C	Coupling and chaining bridge (CCB)	Secure data storage with hardware unique key (HUK)	Public key accelerator (PKA)	AES 128/256 + S-AES
STM32U375	512 to 1024	256	2	4	2				
STM32U385	1024	256	2	4	2	•	•	•	•

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The STM32U3 series offers a large portfolio: nine different packages from 32 to 100 pins, two Flash memory options (512 KB or 1 MB), and optional hardware crypto acceleration.
The plastic packages (QFN, LQFP & BGA) are 100% pin-to-pin compatible with STM32U5 series.
You are offered a variety of choices to select the best configuration for your application!

Our technology starts with You

Find out more at www.st.com/STM32U3

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