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STMicroelectronics breaks the 20nm barrier for cost-competitive next-generation microcontrollers

- *First STM32 microcontroller based on new technology to sample to selected customers in the second half of 2024.*

- *18nm FD-SOI with embedded phase change memory (ePCM) to deliver a leap in performance and power consumption.*

Geneva, March 19, 2024 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronic applications, announces an advanced process based on 18nm Fully Depleted Silicon On Insulator (FD-SOI) technology with embedded phase change memory (ePCM) to support next-generation embedded processing devices. This new process technology, co-developed by ST and Samsung Foundry, delivers a leap in performance and power consumption for embedded processing applications while allowing larger memory sizes and higher levels of integration of analog and digital peripherals. The first next-generation STM32 microcontroller based on the new technology will start sampling to selected customers in the second half of 2024, with production planned for the second half of 2025.

Remi El-Ouazzane, President of Microcontrollers, Digital ICs and RF products Group at STMicroelectronics, said: "*As a leading innovator in the semiconductor industry, ST has pioneered and brought to our customers FD-SOI and PCM technologies for automotive and aerospace applications. We are now taking the next step to bring the benefits of these technologies to developers of industrial applications starting with our next-generation STM32 microcontrollers*."

Technology benefits

Compared to ST 40nm embedded non-volatile memory (eNVM) technology used today, 18nm FD-SOI with ePCM vastly improves key figures of merit:

- More than 50% better performance-to-power ratio
- 2.5-times higher non-volatile memory (NVM) density enabling larger on-chip memories
- Three times higher digital density for integration of digital peripherals such as AI and graphics accelerators and state-of-the-art security and safety features
- 3dB improvement in noise figure for enhanced RF performance in wireless MCUs

The technology is capable of 3V operation to supply analog features such as power management, reset systems, clock sources and digital/analog converters. It is the only sub-20 nm technology supporting this capability.

The technology also delivers the reliability required for demanding industrial applications thanks to robust high-temperature operation, radiation hardening, and data retention capabilities already proven in automotive applications.

Additional information on FD-SOI and PCM is available on ST.com.

Benefits to STM32 microcontroller developers and customers

Microcontrollers based on this technology will bring developers a new class of high-performance, low-power, and wireless MCUs. The large memory sizes support the growing needs of edge AI processing, multi-protocol RF stacks, over-the-air updates, and advanced security features. The high performance and large memory size capabilities will give developers using microprocessors today the option to use more highly integrated and cost-effective microcontrollers for their designs. And it will allow further steps in power efficiency for ultralow power devices where ST's portfolio is industry-leading today.

The first microcontroller based on this technology will integrate the most advanced ARM® Cortex®-M core, providing enhanced performance for machine learning and digital signal processing applications. It will offer fast and flexible external memory interfaces, advanced graphic capabilities and will integrate numerous analog and digital peripherals. It will also have the advanced, certified security features already introduced on ST's latest MCUs.

About STMicroelectronics

At ST, we are over 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 committed to achieving our goal to become carbon neutral on scope 1 and 2 and partially scope 3 by 2027.

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

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