

Sanken Electric has successfully developed a leading-edge microcontroller unit for power electronic controls, utilizing TSMC's 22ULL RRAM specialty process and featuring a RISC-V CPU core, Set for Volume Production in Q4 CY2025.

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Sanken Electric Co., Ltd.

Sanken Electric Co., Ltd. (Headquarters: Niiza City, Saitama Prefecture, President: Hiroshi Takahashi) has successfully developed a leading-edge microcontroller unit (MCU) for power electronics control utilizing TSMC's 22ULL (22nm ultra-low leakage) process and their RRAM (resistive random-access memory, also known as ReRAM) technology, featuring a RISC-V CPU core. Mass production of this product is scheduled to start in Q4 CY2025.

Leveraging a long-standing and robust partnership, Sanken Electric and TSMC have developed and mass-produced MCU-equipped power electronics control devices. This time, combining Sanken Electric's advanced power electronics control technology in both hardware and software with TSMC's 22ULL process, RRAM non-volatile memory technology, and high-quality chip manufacturing capabilities, we have jointly developed an advanced MCU. Going forward, we plan to deploy power electronics control devices equipped with this MCU and provide them to customers developing power electronics systems worldwide.

Mitsunobu Fukuda, Senior Corporate Officer of the Engineering Development Headquarters at Sanken Electric, says "We are actively advancing the provision of leading-edge semiconductor devices that significantly enhance the efficiency and functionality of power control systems. By utilizing TSMC's advanced 22ULL process, RRAM technology, and excellent manufacturing capabilities, we can design and manufacture an MCU that is low-power, high-performance, and high-functionality with an optimized chip size. Utilizing this MCU, we will offer optimal solutions to customers developing advanced power systems worldwide."

"Sanken is a valued, innovative partner to TSMC and a leading customer in adopting our 22RRAM technology in their next-generation MCU," said Chien-Hsin Lee, Senior Director of Specialty Technology Business Development at TSMC. "Our RRAM technology not only offers full logic baseline compatibility but also breaks through the scaling limitations of traditional embedded flash memory, empowering customers to innovate their products. As we expand RRAM to all applications, we look forward to continuing our successful partnership with Sanken for many years to come."

Sanken Electric's advanced power control system-oriented MCU features a heterogeneous multicore with high processing capabilities, comprising a RISC-V CPU core that supports floating-point instructions, an original floating-point DSP core, and an original EPU core (Event Processing Unit) capable of low-latency task switching. This configuration enables high-performance processing of various power control algorithms. Additionally, it incorporates many user-friendly peripherals, including high-resolution PWM timers and high-speed A/D converters, enabling highly efficient and advanced power control systems. Furthermore, RRAM technology facilitates more flexible and convenient management of non-volatile data in application control. Sanken Electric's MCU, utilizing TSMC's 22ULL process and RRAM technology, is scheduled for mass production in Q4 CY2025.

TSMC's industry-leading 22ULL RRAM CMOS process provides good scalability, power reduction and logic migration. The non-volatile RRAM cell, formed between backend metal layers, is an excellent eFlash replacement for general purpose micro-controlling units (MCUs), Internet of Things (IoT) and Automotive applications to support firmware, data storage, and security memory.