

# MCU increases performance of motor control systems



Figure 1: PSOC Control MCU family is dedicated for motor control and power conversion systems (Source: Infineon, Adobe Stock)

Infineon Technologies has launched the PSOC Control family of Arm Cortex-M33 based microcontroller units (MCUs) featuring CAN FD connectivity. With support of company's system design tools, the solution allows to create efficient and secured motor control and power conversion systems.

PSOC Control C3 features entry-line and main-line products offering a scalable and compatible range of performance, features, and memory options. Dedicated MCUs for motor control (C3M) and power conversion (C3P) address the needs of focus applications, such as home appliances, industrial drives, robots, light electric vehicles (LEVs), solar, and HVAC (heating, ventilation, and air-conditioning) systems.

"Next-generation industrial motors and power conversion applications require increasingly faster control loops, as these designs adopt wide band gap power devices to improve system efficiency," said Steve Tateosian, Senior Vice President for Industrial & IoT MCUs at Infineon. "We are committed to providing developers with best-in-class system solutions and design environments to take full advantage of the innovative analog and digital technologies of our new PSOC Control family."

The MCUs enable real-time control of systems that need to respond to real-time events with minimal delay and low utilization. The units utilizing the Arm Cortex-M33 processor operate at up to 180 MHz and

are supported by a digital signal processor (DSP), a floating-point unit (FPU), and the coordinate rotation digital computer (CORDIC). The latter is a hardware accelerator for mathematical functions to speed up control loop calculations. All MCUs feature a wide range of peripherals, on-chip memory, as well as various interfaces and pulse width modulation (PWM) architectures. For example, the C3M5 MCU provides two CAN FD interfaces supporting up to 8 Mbit/s in the data phase. ▶

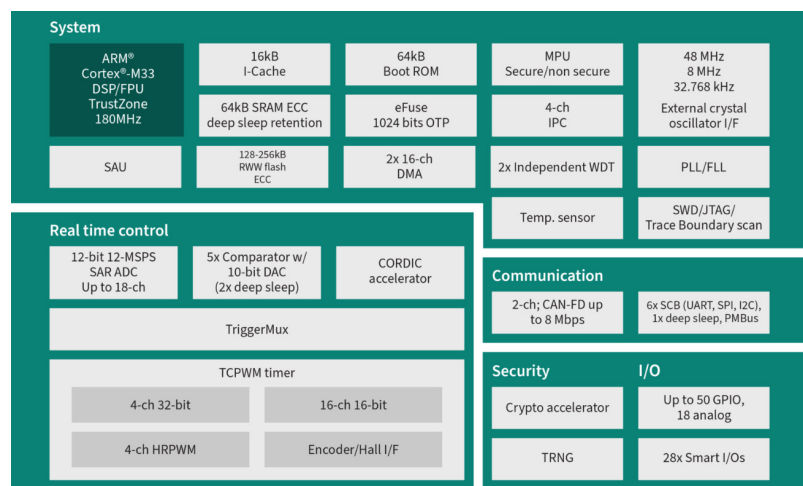


Figure 2: C3M5 main-line MCU block diagram (Source: Infineon Technologies)

The entry-line MCUs C3P2 and C3M2 use high-resolution and high-precision A/D converters and timers. The main-line MCUs C3P5 and C3M5 also offer high-resolution PWMs (HRPWMs), allowing high-performance systems to respond to real-time events with minimal delay. All four series support the execution of power and motor control loops, while the main-line components offer additional features for higher switching frequencies and support for power systems that utilize wide bandgap (WBG) switches.

PSOC Control C3 MCUs are equipped with safety features such as Class B and SIL 2 (safety integrity level) safety libraries as well as PSA Certified Level 2 / EPC2 security. The chips come with crypto accelerator, Trust-zone, and secured key storage, enabling IP protection and device firmware updates.

The MCU family is supported by Modustoolbox, a unified ecosystem platform with tools and software solutions. The toolbox offers dedicated ecosystems and software libraries, Motor Suite and Power Suite, for the focus applications of the MCUs. The suites provide a graphical user interface that streamlines evaluation and training, and provides real-time parameter monitoring for valuable insights into performance, efficiency, and reliability. Specialized application environments enable engineers to identify issues, optimize designs, and enhance overall functionality.

The PSOC Control C3 entry line and main line features 34 devices that are available since January 2025. Infineon will further expand these product lines and is developing a performance line that will sample later this year. Infineon showcases a demo of the launched PSOC Control MCUs at Embedded World Nuremberg 2025 in hall 4A, booth 138.

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