# Semiconductor news


(Source: Adobe Stock)

## MCU with CAN FD for metering

Renesas has introduced the low-power RA4C1 microcontroller (MCU) family based on an 80-MHz Arm Cortex-M33 processor. The chips provide CAN FD ports and provide cybersecurity functions. They are intended for battery-powered applications that need strict security, including gas, water, and industrial flow meters, as well as smart locks, thermostats, building controls, and industrial user interfaces.

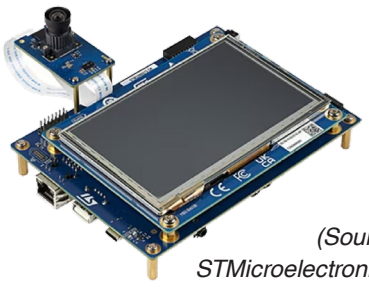
The low-power MCU delivers 168µA/MHz in active mode at 80 MHz and a standby current of less than 1,79 µA with all the SRAM retained. The product also features a real-time clock (RTC) with its own dedicated power domain, supporting battery backup for the time. The input voltages can be as low as 1,6 V. This helps to design battery-powered applications that use smaller batteries or provide higher performance for the existing battery size.

Cybersecurity is an essential requirement for metering systems. The launched MCUs offer an RSIP-300 security engine that provides an isolated subsystem managed and protected by dedicated control logic. The MCUs include support for a 256-bit hardware unique key and True Random Number Generator (TRNG). They provide key-management functionality with the ability to generate wrapped keys, SHA algorithms, hardware acceleration of AES (Advanced Encryption Standard), and ECC (Elliptic Curve Cryptography), supporting NIST and Brainpool curves with a 384-bit key.

The product family features a 512-KiB dual-bank on-chip flash memory, enabling secure software updates with 96-KiB of SRAM and 8-KiB of data flash memory. Peripherals include a low-power analog/digital converter, an on-chip temperature sensor accurate to one percent, and an on-chip LCD controller to drive low-power segment displays.

The MCUs are supported by Renesas' Flexible Software Package (FSP), which enables fast application development by providing a software infrastructure, including RTOS (real-time operating systems), driver software for peripherals, middleware, connectivity, networking, and TrustZone support, as well as AI (artificial intelligence) reference software, motor control, and cloud solutions. *hz*

## Development platform supports CAN FD and TTCAN

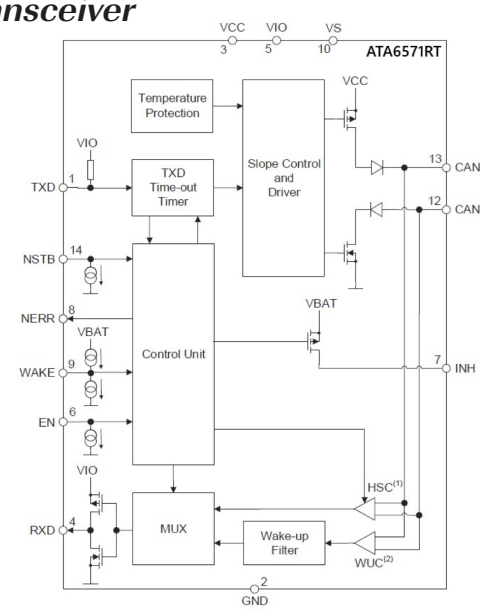

(Source: STMicroelectronics)

The STM32N6570-DK discovery kit by STMicroelectronics is based on an Arm Cortex-M55 microcontroller. It provides various interfaces, including three CAN FD ports supporting TTCAN (time-triggered CAN). Four extension connectors enable expansion capabilities for specific applications such as wireless connectivity, analog applications, and sensors. The kit integrates an embedded in-circuit debugger and programmer for the on-board MCU. *hz*

## AI-MCUs feature CAN FD

Rohm (Japan) has launched the AI-equipped (artificial intelligence) ML63Q253x and ML63Q255x microcontroller families. They enable real-time fault prediction and degradation forecasting using sensing data in devices, including industrial motion controllers and drives. The MCUs are intended for stand-alone embedded AI learning without cloud or web connectivity. These network-independent solutions support early anomaly detection. The products adopt a three-layer neural-network algorithm to implement the company's Solist-AI on-device AI solution. The 48-MHz Arm Cortex M0-based MCUs provide on-chip CAN FD protocol controllers featuring three-phase motor PWM (pulse-width modulation) and dual A/D (analog/digital) converters. According to the Japanese chipmaker, the power consumption is approximately 40 mA. There are 16 versions available. The Axicore-ODL AI accelerator is supported by software development tools, including a simulator, a real-time viewer, and a development environment. *hz*

## Radiation-tolerant CAN FD transceiver




**Notes:**
1. High-Speed Comparator
2. Wake-Up Comparator

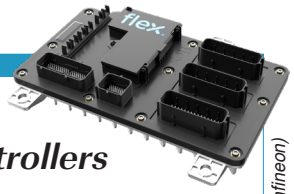
*ATA6571RT simplified block diagram (Source: Microchip)*

The ATA6571RT CAN FD transceiver by Microchip (U.S.A.) supports data phase bit rates up to 5 Mbit/s. The radiation-tolerant components are suitable for outer-space applications in satellites, for example. They support scalable designs and contribute to the redundancy and fault-tolerance requirements of space missions. The product is backward compatible with the company's CAN HS (high-speed) transceiver. For easy integration at the PCB (printed-circuit board) level, the radiation-tolerant transceiver remains pin-compatible with the original COTS (commercial-off-the-shelf) plastic or ceramic versions. The product comes in SOIC14 or CDFP14 packages.

"The ATA6571RT transceiver offers a cost-effective, size-optimized and power-efficient device designed to meet the stringent demands of space environments," said Leon Gross, corporate vice president of Microchip's aerospace and defense business. "As a leading supplier to the aerospace and defense market, Microchip is proud of its space heritage with products embedded in new-space and deep-space missions." The transceiver can be connected to 5-V and 3,3-V powered CAN protocol controllers.

The transceiver is designed to withstand space conditions with its resistance to single-event effects (SEE) and total-ionizing dose (TID). It features a total dose of 300 Gray and a single-event latch-up immunity less than 78 MeV/(mg/cm$^2$) at +125 °C. The temperature range is -55 °C to +125 °C. The transceiver also provides a low-power management with local and remote wake-up support, as well as short-circuit and overtemperature protection. The low-power management is available, even when the internal VIO and VCC supplies are switched off. The product features protection and diagnostic functions including bus line short-circuit and battery-connection detection. *hz*

## Development kit for automotive zone controllers




*(Source: Flex/Infineon)*

At CES 2026, Infineon (Germany) and Flex (U.S.A.) have launched a development kit for zone control units (ZCU), intended for software-defined vehicles (SDV). Software-defined applications are not new, they have been used in industrial automation since decades.

The introduced development kit follows a scalable approach and is based on reusable assets, combining approximately 30 unique building blocks. This allows developers to configure different ZCU implementations flexibly in short development cycles and offers a clear path from concept to series implementation. The kit can be pre-ordered.

One of the building blocks is connectivity. Besides six Ethernet-based interfaces (1000Base-T1, 100Base-T1, and 10Base-T1S), the kit features 18 CAN FD ports and two CAN FD ports with partial networking capability as well as 16 LIN interfaces and one Flexray interface. The CAN FD interfaces support data-phase bit rates up to 5 Mbit/s.

In next-generation automotive E/E architectures, ZCUs connect and power a large number of diverse peripherals. Not all of those peripherals remain consistent across vehicle platforms and models, leading to different ZCU requirements. Current ZCUs, however, are often not optimized for the specific use case or vehicle platform in which they are used.

With the development kit's building block concept, developers can right size their designs for individual implementations while preserving feature headroom for future models. This reduces the bill of materials and shortens development cycles. The design platform allows OEMs (automakers and Tier-1 suppliers) to realize over 50 power distribution, 40 connectivity, and 10 load control channels for rapid evaluation and early application development. A dual MCU (microcontroller unit) plug-on module is available for high-end ZCU implementations, in which high I/O (input/output) density and computational power are paramount. This flexibility enables customers to start with the superset, then optimize to either two cost effective MCUs or a single MCU based on feature and budget requirements.

The development kit enables essential zone control functions, including $I^2t$ (ampere-squared seconds), overcurrent protection, overvoltage protection, capacitive load switching, reverse polarity protection, secure data routing with hardware accelerators, A/B swap for over-the-air software updates, and cybersecurity. The pre-validated hardware combines semiconductors from Infineon, including Aurix microcontrollers, Optireg power supply, Profet and Spoc smart power switches, Motix motor control solutions, and other products with Flex's design, integration, and industrialization expertise. The software stack includes contributions by Vector to leverage tooling and know how in embedded software, testing and integration. *hz*

## CAN FD transceiver for 12-V and 24-V power supplies

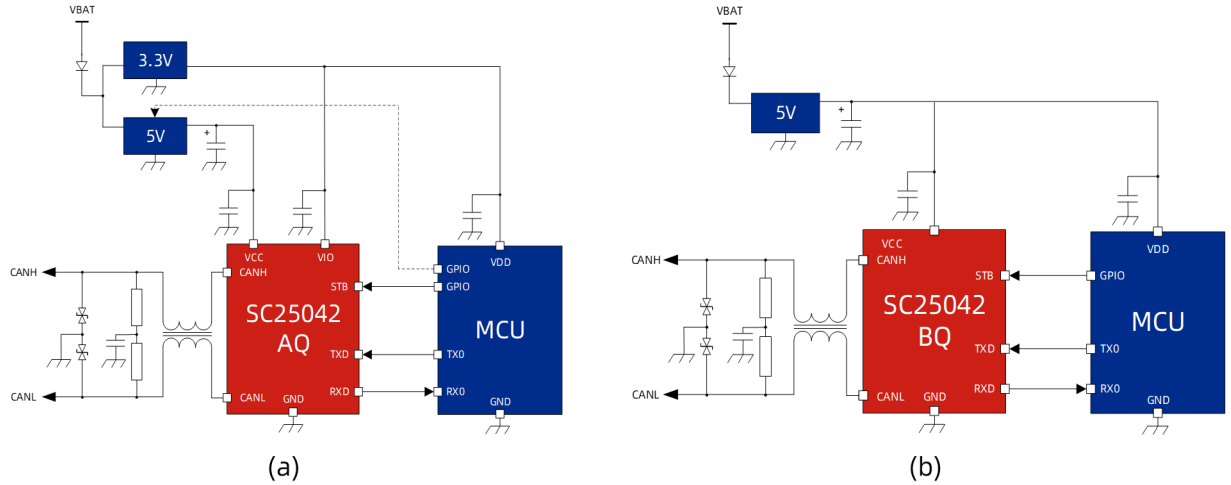



*Figure 1: The CAN SIC transceiver can be connected to 5-V (right) and 3,3-V (left) microcontrollers (Source: Southchip)*

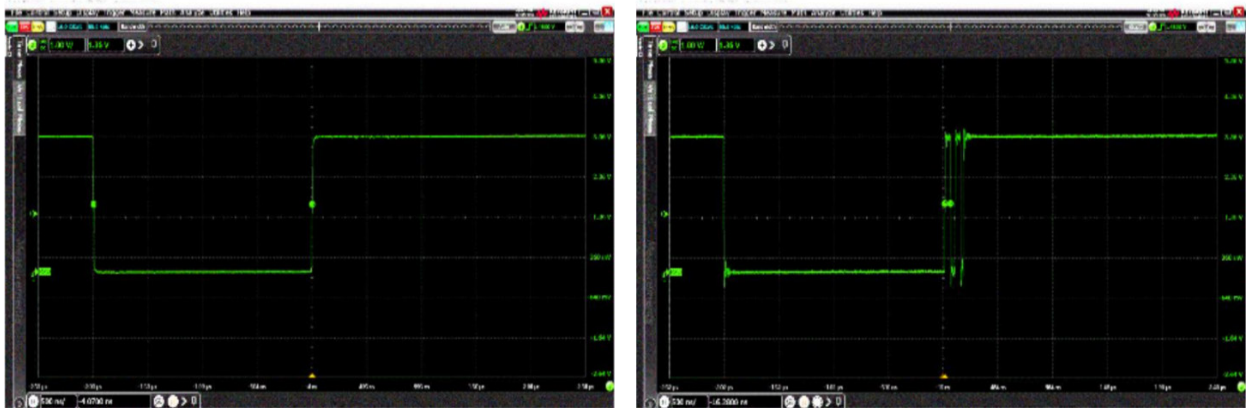


*Figure 2: Bit wave forms of the SC25042Q (left) and of CAN FD transceivers (right) without SIC functionality (Source: Southchip)*

Southchip (China) has launched the SC2542Q CAN SIC (signal improvement capability) transceiver, which can be connected to 5-V and 3,3-V microcontrollers with on-chip CAN protocol controllers.

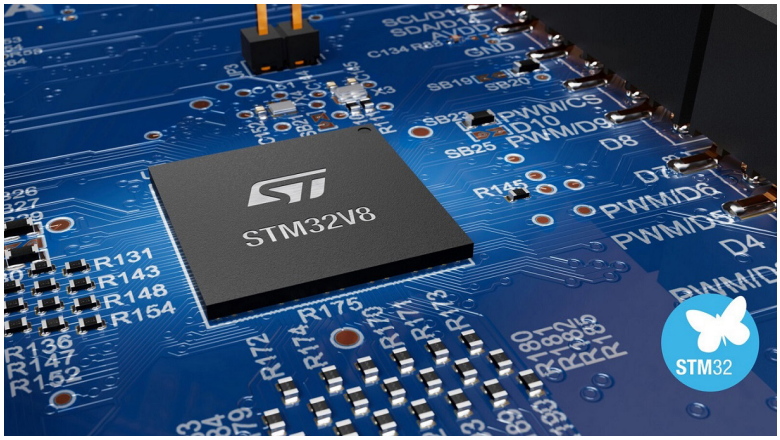
The transceivers are specified for data-phase bit rates up to 5 Mbit/s. The product has passed the AEC-Q100 certification and complies with the ISO 11898-2 standard and SAE J2284-1 to SAE J2284-5 device design recommendations. According to the Chinese chipmaker, the introduced CAN FD transceivers feature ringing suppression and a low-loss signal pulse width. The components are available in SOP8 and lead-free DFN8 package options.

In CAN networks with multiple nodes, when the bus signal transitions from dominant-to-recessive state, impedance mismatch can occur due to the sudden change in differential impedance, causing oscillations at the receiving end, known as ringing. Ringing can prevent the receiving node from correctly identifying the sampling point (SP), leading to data bit misjudgment and increasing signal-noise levels, thereby reducing system reliability. The introduced transceiver is equipped with built-in ringing suppression circuits that can automatically adjust load impedance, enhancing communication reliability and allowing higher data-phase bit rates in complex network topologies (including star topologies).

Practical tests have shown that for the same SIC test signal, the received signal of a typical CAN transceiver (Figure 2, right) exhibits two oscillation peaks, showing obvious ringing phenomena; whereas the received signal of SC25042Q (Figure 2, left) maintains signal consistency and symmetry.

In addition, the SC25042Q can achieve low transmission pulse width loss, ensuring that data sampling at the receiving node is error free and guaranteeing the reliability of signal transmission, while reducing the bit-error rate. Tests have shown that at a communication rate of 5 Mbit/s, the signal period offset of SC25042Q is only 0,5 % (decreasing from 200 ns to 199 ns), which is 1/30th of that of a conventional CAN FD transceiver. Due to the bit-stuffing mechanism, the cumulative time error is small, thereby ensuring the accuracy of the sampling point and reducing the probability of error frames in the network. *hz*

## *18-nm microcontroller for demanding applications*




*(Source: STMicroelectronics)*

STM32V8 from STMicroelectronics (STM) is the first microcontroller designed using the 18-nm FD-SOI technology, with advanced embedded phase-change memory (PCM). It is manufactured in STM's 300-mm fab in Crolles (France) in collaboration with Samsung Foundry. The high-performance MCU is suited for demanding embedded and edge AI applications such as industrial control, sensor fusion, image processing, voice control, and others, states the company. Thanks to its Arm Cortex-M85 core and the 18-nm process, the microcontroller achieves clock speeds of up to 800 MHz. The FD-SOI process technology with embedded PCM provides robustness and reliability in harsh operating environments. One such demanding environment is the high-radiation condition encountered in Low Earth Orbit (LEO). SpaceX has selected the STM32V8 for its Starlink constellation, using it in a mini laser system that connects the satellites traveling at extremely high speeds in LEO.

The MCU integrates special accelerators, including graphic, crypto/hash, and comes with a large selection of IP, including 1-Gbit/s Ethernet, rich digital interfaces (CAN FD, octo/ xSPI, I²C, UART/USART, USB), analog peripherals, and timers. The MCU also incorporates state-of-the-art security features leveraging the STM32 Trust framework as well as the latest cryptographic algorithms and lifecycle management standards.

Targeting PSA Certified Level 3 and SESIP certification, the STM32V8 is ready to accelerate compliance with the incoming Cyber-Resilience Act (CRA). The 3,3-V support enables lower power consumption, better signal integrity, and integration with modern industrial communication standards. *of*