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Entry-Level Microcontrollers Reduce System Cost and Complexity in Safety-Critical Applications

Microchip's AVR® SD MCU family enables industry-standard functional safety compliance at a price point under a dollar

CHANDLER, Ariz., March 19, 2025 (GLOBE NEWSWIRE) -- To assist engineers in meeting stringent safety requirements while minimizing design costs and complexity, Microchip Technology **(Nasdaq: MCHP)** has launched the **AVR® SD family of microcontrollers (MCUs)**. The MCUs feature built-in functional safety mechanisms and are designed to support applications requiring rigorous safety assurance. Paired with a dedicated safety software framework, this is the first entry-level MCU of its kind—at this price point—designed to meet Automotive Safety Integrity Level C (ASIL C) and Safety Integrity Level 2 (SIL 2) requirements, which mandate redundant safety checks. Further enhancing the safety credentials of the AVR SD family, the MCUs follow a functional safety management system that has been certified by TÜV Rheinland.

Hardware safety features include a dual-core lockstep CPU, dual Analog-to-Digital Converters (ADCs), Error Correction Code (ECC) on all memories, a dedicated error controller module, error injection mechanisms and voltage and clock monitors. These features reduce fault detection time and software complexity. The AVR SD family has the capability to detect internal faults quickly and deterministically, allowing applications to meet stringent Fault Detection Time Interval (FDTI) targets as low as 1 millisecond, helping prevent hazardous situations and increasing reliability.

The hardware features work with Microchip's safety framework software to manage functional safety diagnostics so the MCUs can detect and handle errors autonomously, initiating a safe state when necessary. The MCUs can be used as the main processor for crucial functions, such as detecting thermal runaways or monitoring sensor data like rotary positions, at minimal power consumption. It is also an excellent candidate for a coprocessor in complex systems to mirror or offload safety-critical functions for applications targeting higher safety integrity levels up to ASIL D and SIL 3.

"When designing safety-critical applications, engineers have typically been limited to using expensive and complicated devices. By integrating specific safety features directly into an entry-level MCU and providing a supporting software framework, we are helping our customers meet stringent safety standards with greater efficiency," said Greg Robinson, corporate vice president of Microchip's MCU business unit. "With the AVR SD family, designers can significantly reduce development time and minimize system and certification costs."

The AVR SD MCUs are designed in compliance with International Organization for Standardization (ISO) 26262 and International Electrotechnical Commission (IEC) 61508

standards. Safety standards are implemented across a variety of industries such as aerospace and defense, industrial automation, automotive and medical sectors. Specific applications include flight control systems, ignition control, robotics safety functions, Advanced Drive Assistance Systems (ADAS) and medical infusion pumps. Visit Microchip's website to learn more about the company's full portfolio of **AVR® MCUs** and **functional safety** offerings.

Development Tools

AVR SD MCUs are compatible with the TÜV SÜD functional safety certified **MPLAB® XC8 Pro** compiler and Microchip's popular **Curiosity Nano development board**. The MCUs are supported by functional safety packages that include safety documentation (Failure Modes, Effects and Diagnostic analysis report, Safety manual, Dependent Fault Analysis report), safety software and compliance reports.

Pricing and Availability

AVR SD MCUs start at $0.93 each in 5,000-unit quantities and with lower pricing available for higher volumes. For additional information and to purchase, contact a Microchip sales representative, authorized worldwide distributor or visit Microchip's Purchasing and Client Services website, **www.microchipdirect.com**.

Resources

High-res images available through Flickr or editorial contact (feel free to publish):

- Application image: **https://www.flickr.com/photos/microchiptechnology/54382054667/sizes/l/**
- Block diagram: **https://www.flickr.com/photos/microchiptechnology/54383137999/sizes/l/**
- Tool photo: **https://www.flickr.com/photos/microchiptechnology/54383173738/sizes/l/**

About Microchip Technology:

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Editorial Contact:
Amber Liptai
480-792-5047
amber.liptai@microchip.com

Reader Inquiries:
1-888-624-7435

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