Freescale announces powerful 32-bit microcontrollers for automotive applications

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New Qorivva microcontroller families, based on Power Architecture technology, designed to increase performance, safety and energy efficiency for a new generation of smart vehicles.

To meet the automotive industry's ever-increasing need for processing performance and integration, Freescale Semiconductor today announced its next-generation 32-bit MCUs designed specifically for automotive applications. The new Qorivva microcontroller (MCU) families, based on Power Architecture technology, are built using a unique 55 nanometer (nm) non-volatile memory (NVM) process for improved power efficiency and cost effectiveness.

With more than 200 million 32-bit Power Architecture MCUs shipped to date, Freescale is a proven, trusted supplier of solutions for the automotive electronics market. Freescale Qorivva MCUs are built on Power Architecture cores configured to meet the rigorous demands of the automotive environment. The new 55 nm Qorivva MCU families address key challenges for the automotive market, including the need for increased performance, new safety requirements and enhanced security features.

"Freescale Qorivva MCUs are built on the industry's most powerful automotive architecture and offer exceptional scalability across hundreds of devices," said Reza Kazerounian, senior vice president and general manager of Freescale's Microcontroller Solutions Group. "Our new 55 nm Qorivva MCU product families range from simple, low-cost, single-

core controllers up to the latest triple- and quad-core variants, providing increased performance, security and safety for the latest vehicle applications."

Helping to enable a new generation of smarter, safer, more connected vehicles

Automakers are continually exploring new options to satisfy evolving consumer demands. Technology trends in the automotive industry include active vehicle safety (in addition to the traditional passive safety systems) and electrification of the powertrain.

The increasing complexity of new automotive electronic systems is leading to rapidly increasing requirements for MCU performance, making multicore processing a necessity for both safety and performance. Safety mandates around the world continue to increase, with many requiring fault-recognition systems and even fault tolerance, for braking, steering, powertrain and some of the latest advanced driver assistance systems. At the same time, as complexity continues to grow, reducing power consumption is quickly becoming critical, as up to 100+ electronic control units require current to function within the vehicle. Now more than ever, Freescale is a technology partner and supplier the auto industry can turn to for innovative solutions that meet their performance, efficiency, reliability, quality and cost objectives.

In addition to improving the overall performance of its latest product families, Freescale has taken extra steps to help automakers build the safest cars on the road. MCUs with multiple cores help build redundancy into the system for the fault monitoring and distributed control required by safety-critical applications. Freescale's unique design process documents features and functions of the MCU so automotive manufacturers have all of the necessary, detailed information during the

required safety certification processes.

Key benefits of Qorivva MCUs

Qorivva MCUs feature leading-edge integration and performance capabilities, including configurable peripheral sets such as flexible timers and motor control systems. Digital signal processing capabilities provide additional functionality. With these features, Qorivva MCUs provide the freedom to architect the ideal solution for a particular application.

Benefits and features of the new 55 nm Qorivva MCUs include:

• Increased processing speeds that allow more complex control algorithms and features
• Increased on-chip memory content (flash and RAM) to significantly reduce the need for off-chip memory
• Intelligent peripheral sets to drive complex control systems, such as transmission solenoids, complex injectors and electric motors, with minimal overhead from the microprocessor core
• Improved, embedded sensor interfaces to allow simple connection to next-generation automotive sensors
• High-speed analog-to-digital converters designed to meet the differing needs of the latest interfaces.

Solutions tailored for specific applications

The new 55nm Qorivva MCU families build upon Freescale's strong foundation of automotive innovation and are targeted for specific automotive applications:

• *Body and Security family* – features low power consumption for

"always on" systems; advanced vehicle networking with full connectivity offerings (LIN, CAN, MOST, FlexRay and Ethernet); and encryption for advanced vehicle network security
• *Safety and Chassis family* – includes multicore advanced safety architecture with fault monitoring and event recording, as well as correction systems, for maximum protection, building toward the future fault-tolerant systems needed for fully autonomous vehicles
• *Powertrain and Hybrid family* – created for maximum computing, it features high-performance multicore MCUs with advanced motor control peripherals for hybrid vehicles and high-precision analog interfaces and digital communications links to analog sensors. To meet the requirements of next-generation powertrain systems, many devices in this family will also feature Freescale's advanced safety architecture.

The strength and value of Qorivva microcontrollers extend beyond the silicon. Each 55 nm Qorivva MCU comes with a full run-time software solution, including AUTOSAR MCAL driver suites and AUTOSAR real-time operating system for single-core and multicore MCUs. Qorivva MCUs also are supported by development tools, including high-performance compiler support and multicore debuggers from Freescale development partners and Freescale's own CodeWarrior tool set.

Freescale's deep roots in the automotive electronics industry are apparent in its involvement with industry consortia. Freescale is a founding member of the DSI, FlexRay and LIN consortia, a premium member of AUTOSAR and an active member of the PSI5, JASPAR and GENIVI consortia. Freescale's Power Architecture products are also supported by its global system labs and software customization services.

The new Qorivva MCU families built on 55nm process technology are planned for availability in early 2012.

Source: Freescale Semiconductor