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Technology Announcement

NXP Delivers Increased Safety, Reliability and Scalability to Industrial Applications with New i.MX 8X Processors

New i.MX 8X family is the first i.MX offering to feature Error Correcting Code (ECC) on the DDR memory interface, combined with reduced soft-error-rate (SER) and increased latch-up immunity, to support industrial Safety Integrity Level 3 (SIL 3), opening new opportunities for innovative industrial and automotive applications

NUREMBERG, March 14, 2017 (Embedded World 2017) – NXP Semiconductors N.V. (NASDAQ:NXPI) extends the scalable range of the i.MX 8 series of applications processors with the introduction of a new i.MX 8X family. The i.MX 8X family uses common subsystems and architecture from the higher-end i.MX 8 family, establishing an unmatched range of cost-performance scaling with pin-compatible options and the highest level of software reuse. Power efficiency, cooler operation and longer battery life are enhanced by optimizing ARM® Cortex®-A35 and Cortex-M4F CPUs in fully depleted silicon-on-insulator (FD-SOI) technology. Automotive safety certification is supported up to ASIL-B for cameras and displays by leveraging an advanced SafeAssure® display controller with failover safety planes and a real time domain that is independent of the Cortex-A CPUs and 3D graphics accelerators. Industrial safety certification is supported up to SIL 3 by leveraging ECC on the L2 cache and DDR3L memory interfaces, enabled by several popular commercial RTOS solutions from QNX, Green Hills and others.

Built with a high level of integration to support graphics, video, image processing, audio and voice, the i.MX 8X family of processors is ideal for industrial automation, HMI, industrial control, robotics, building control, automotive cluster, display audio infotainment, and telematics applications.

The i.MX 8X family integrates up to four 64-bit ARM®v8-A Cortex-A35 cores, a Cortex-M4F core, a Tensilica® HiFi 4 DSP, Vivante hardware accelerated graphics and video engines, advanced image processing, advanced SafeAssure® display controller, LPDDR4 and DDR3L memory support and rich set of input-output controllers. Capable of driving up to three simultaneous displays – two 1080p screens and one parallel WVGA display – the new devices introduced today include:

- i.MX 8QuadXPlus with four Cortex-A35 cores, a Cortex-M4F core, a 4-shader GPU, a multi-format VPU and a HiFi 4 DSP
- i.MX 8DualXPlus with two Cortex-A35 cores, a Cortex-M4F core, a 4-shader GPU, a multi-format VPU and a HiFi 4 DSP

- i.MX 8DualX with two Cortex-A35 cores, a Cortex-M4F core, a 2-shader GPU, a multi-format VPU and a HiFi 4 DSP

“The new, feature-rich i.MX 8X and 8 families of processors offer the most scalable and trusted solution for innovative industrial and automotive applications,” said Ronald Martino, general manager and vice president of i.MX applications processor products at NXP. “From airline cockpit or in-flight entertainment displays to automotive dashboards and industrial equipment, system reliability is essential to a streamlined, uninterrupted and safe experience in the air, in production or on the road. The latest i.MX 8X family opens a pathway for customers to extend existing systems based on our i.MX 6 series with new capabilities for robust applications, such as audio processing and voice recognition for hands-free operation in environments where connecting to machines has evolved from a simple touch display to touchless interfaces.”

Maximize System Reliability and Optimize System Design

- Industrial control devices – on assembly lines, in buildings and in critical infrastructure – require reliable and safe operation at all times. A single undetected memory bit flip in any industrial human machine interface (HMI), programmable logic controller (PLC) or input/output (I/O) controller can potentially reduce system safety or stop production. The i.MX 8QuadXPlus, 8DualXPlus and 8DualX processors include ECC protection on the L2 cache and DDR3L memory interface to detect and correct memory corruption, greatly increasing the reliability and safety of industrial control systems.
- Industrial and automotive HMI users require constant access to mission-critical information, such as pressure, speed or fuel levels. Applications typically use the i.MX 8X Cortex-A35 application domain to run rich graphical user interface and connectivity software, and the Cortex-M4F domain for fast real-time responsiveness, standby modes and sensor data collection. When the i.MX 8X failover display feature detects an issue with the Cortex-A35 or graphics engine, the Cortex-M4F can take over to display critical information until the Cortex-A35 core recovers. Once recovered, the system can seamlessly switch back to the graphics intense display and the user never loses access to the critical information.
- The i.MX 8X leverages the fully depleted silicon-on-insulator (FD-SOI) process technology’s inherently high immunity to soft errors to dramatically improve mean time before failure (MTBF) and reduce latch-ups.
- Chip count and power consumption are reduced by the i.MX 8X’s thoughtful integration of hardware accelerated graphics, video and DSP engines with the Cortex-A35 applications core, and Cortex-M4F real-time processing core. This integration allows the i.MX 8X to provide high performance with optimized power for cooler operation and longer battery life.

"BlackBerry QNX and NXP have successfully executed on many automotive and industrial production programs based on several generations of i.MX processors," said John Wall, senior vice president and head of BlackBerry QNX. “Now the combination of BlackBerry’s QNX ISO 26262 ASIL D certified OS and toolchain and the i.MX 8X family of processors allows us to continue and extend this collaboration into safety critical applications such as domain controllers, digital instrument clusters and industrial control products where safety and reliability is paramount.”

“As a proven leader for helping our mutual customers deliver safety and security certified systems, we are pleased to collaborate with NXP by expanding our industrial and automotive platform solutions for their new i.MX 8X processor,” said Dan Mender, vice president of Business Development, Green Hills Software. “The Green Hills INTEGRITY RTOS with its optional Multivisor secure virtualization services has been used in many mixed criticality applications as the trusted software foundation for life-critical systems running at the highest certified levels of IEC 61508 and ISO 26262 standards. The combination of INTEGRITY and INTEGRITY Multivisor with the new i.MX 8X delivers to customers the next generation of features and capabilities without compromising safety or security.”

NXP customers rely on its Product Longevity program for stable supply of products for embedded designs. All i.MX products, including the new i.MX 8X family of MPUs, are expected to be included in the program for a minimum of 10 or 15 years from product launch. Participating products are supported by standard end-of-life notification policies.

Availability

The i.MX 8QuadXPlus and 8DualXPlus applications processors will sample to initial customers in Q3 2017. For more information, visit www.nxp.com/iMX8X.

See NXP Technologies in action at Embedded World 2017 in Nuremberg, Germany

Visit NXP during Embedded World in Hall 4A – 220 at the Exhibition Centre Nuremberg. Interact with innovative demonstrations for embedded solutions enabling the IoT from smart cars to smart industry.

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About NXP Semiconductors

NXP Semiconductors N.V. (NASDAQ: NXPI) enables secure connections and infrastructure for a smarter world, advancing solutions that make lives easier, better and safer. As the world leader in secure connectivity solutions for embedded applications, NXP is driving innovation in the secure connected vehicle, end-to-end security & privacy and smart connected solutions markets. Built on more than 60 years of combined experience and expertise, the company has 31,000 employees in more than 33 countries and posted revenue of $9.5 billion in 2016. Find out more at www.nxp.com.

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