

Freescale QorIQ™ communications platforms signal a new way forward for embedded multicore technology

Building on the heritage of PowerQUICC® processors, QorIQ platforms offer new levels of performance, power efficiency and programmability

ORLANDO, Fla. – June 16, 2008 – (Freescale Technology Forum) – Freescale Semiconductor, a pioneer of the communications processor and the world's top supplier of embedded semiconductors, introduces a new brand of communications platforms designed to enable the next era of networking and take embedded multicore to new levels of adoption. The new QorIQ platforms are the next-generation evolution of Freescale's PowerQUICC® processor line and are designed to help developers migrate to multicore with confidence.

QorIQ platforms consist of single, dual and many cores – all based on Freescale's e500 Power Architecture® technology. The platforms start with the P1 and P2 levels, which consist of five package-, pin- and software-compatible processors designed to ease the transition from single- to dual-core processing. The P3 and P4 platforms enable developers to move into the 'many core' arena and address more advanced processing needs. The P5 platform is designed to deliver Freescale's highest-performing embedded processor within a 30W maximum power envelope. All of the QorIQ platforms are equipped with extensive programming support to help developers get the most out of their multicore implementations.

"QorIQ is more than a product portfolio – it's an intelligent and comprehensive approach established to help the embedded community move to multicore with confidence," said Lynelle McKay, senior vice president and general manager of Freescale's Networking and Multimedia Division. "Multicore is an exceptionally complex technology, especially within the strict power, cost and performance requirements of the embedded space. Freescale understands that getting multicore right takes more than advanced silicon – it requires a deep, systems-level understanding of how cores, operating systems and software all work together. With QorIQ, the embedded industry now has second-generation embedded multicore – and a coherent multicore migration solution from a trusted, proven partner in Freescale."

Performance

Freescale's QorIQ platforms are unified in their use of high-performance e500 Power Architecture cores. These cores offer frequencies ranging from 400 MHz to 1.5 GHz. Products at the high end of the QorIQ portfolio also feature breakthrough embedded processing innovations that boost performance, including private backside cache per core, datapath acceleration architecture (DPAA), CoreNet™ coherency fabric and hardw

"Freescale's decision to put the full weight of its embedded leadership behind a new family of multicore products will impact the entire embedded industry," said Linley Gwennap, principal analyst of The Linley Group. "The new QorIQ processors will greatly increase adoption and support for multicore technology, bringing it into a

greater number and variety of embedded applications. This growth will improve the entire multicore ecosystem."are acceleration.

Power-efficiency

QorIQ platforms start at 45-nm geometries and offer a roadmap to 32-nm and beyond. Products based on QorIQ technology are designed to consume significantly less power than other embedded multicore architectures. QorIQ products offered at the 45-nm node include multicore solutions ranging from 30W maximum to under 5W. And the QorIQ P3 and P4 platforms allow system developers to strictly manage device frequency and voltage.

Programmability

By consolidating on an e500 Power Architecture core-based architecture, QorIQ platforms offer customers an easy migration path to multicore processing, from single- to dual- to eight-core devices. The platforms continue to leverage the broad Power Architecture ecosystem, and Freescale has worked closely with its partners to specifically address common multicore development challenges. I

In the high-level QorIQ platforms, on-chip features designed to simplify development include embedded hypervisor technology, code performance monitors, and debug hooks. Freescale has also collaborated with virtualized software development firm Virtutech® to create a hybrid simulation environment offering a controlled, deterministic and fully reversible environment for the development, debugging and benchmarking of software in embedded multicore environments.

Five platforms at 45-nm for a range of requirements

At the 45-nm generation, the QorIQ family introduces five product platforms, each based on Freescale's e500 Power Architecture core. The platforms are software compatible with PowerQUICC processor products and designed to address a broad range of power, performance and price requirements. The platforms include:

- The QorIQ P1 platform series, which consists of dual- and single-core products offering a migration path to dual-core processing and improved performance for PowerQUICC II Pro processor customers. The QorIQ P1 platform series provides solutions ranging from 400 MHz to 800 MHz and featuring dense integration, advanced security enhancements and a rich set of interfaces. The initial products based on the platform series are the P1020, P1011 and P1010 communications processors. The P1 platform series is well-suited for multiservice gateways, Ethernet switch controllers, wireless LAN access points, and high-performance general-purpose control processor applications with tight power and thermal constraints.
- The QorIQ P2 platform series, which includes dual- and single-core devices with frequencies up to 1.2 GHz. Pin-compatible with QorIQ P1 platform products, QorIQ P2 platform series processors offer a migration path for PowerQUICC II and PowerQUICC III processor customers. Devices based on the platform are well-suited for networking and telecom line and channel card applications with tight power and thermal constraints. The initial products based on the P2 platform series are the QorIQ P2020 and P2010 communications processors.

- The QorIQ P3 platform series, which is designed to facilitate migration to ‘many core’ processing. The series features high performance and multiple Power Architecture cores, CoreNet fabric and datapath acceleration architecture. Freescale plans to announce products at this platform level soon.
- The QorIQ P4 platform series, which includes the flagship QorIQ P4080 communications processor. QorIQ P4 platform series processors feature innovative CoreNet™ fabric interconnect technology, a ground-breaking embedded three-tiered cache hierarchy and up to eight 1.5GHz e500-mc cores optimized for embedded multicore environments – all delivered within a 30W maximum power envelope. The series is ideal for applications such as enterprise and service provider routers, switches, base-station controllers, radio network controllers (RNCs), access and media gateways and general-purpose embedded computing systems in the networking, telecom, industrial, military and aerospace markets.
- The QorIQ P5 platform series, built on dual- and single- Power Architecture cores, is designed as Freescale’s highest-performing embedded processor within the 30W power envelope. Freescale plans to announce products at this platform level soon

Freescale’s plans call for PowerQUICC products to continue to serve as valuable, differentiated solutions for the embedded networking marketplace for years to come. The company expects applications to continue leveraging PowerQUICC processor solutions even alongside QorIQ devices.

About Freescale Semiconductor

Freescale Semiconductor is a global leader in the design and manufacture of embedded semiconductors for the automotive, consumer, industrial, networking and wireless markets. The privately held company is based in Austin, Texas, and has design, research and development, manufacturing or sales operations in more than 30 countries. Freescale is one of the world's largest semiconductor companies with 2007 sales of \$5.7 billion (USD). www.freescale.com

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