

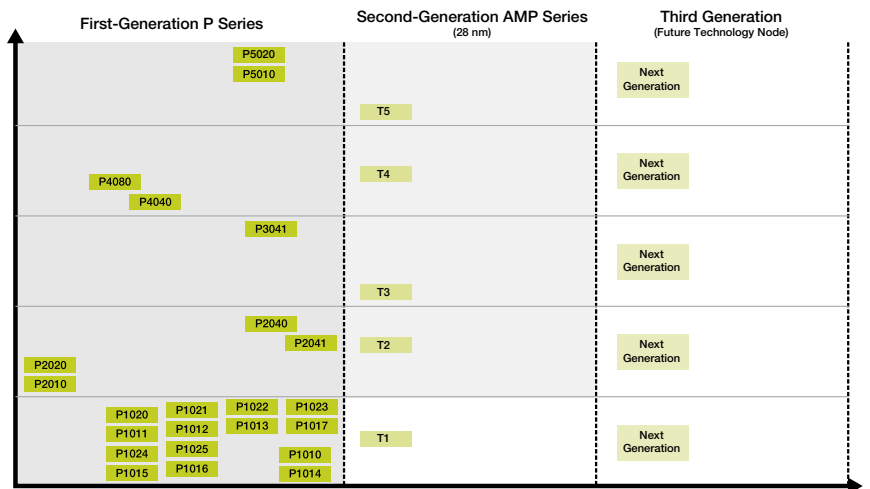
Code-Compatible, Scalable Portfolio

Power Architecture® Portfolio and Scalability

With a large number of solutions available for various applications in embedded systems, the embedded processor market requires scale and expertise. Freescale has a long history of high levels of integration inside the Power Architecture® family. Freescale currently has Power Architecture based offerings that scale from 100 to 30,000 DMIPS with a rich mixture of cores, accelerators and virtualization options. This enables you to design a series of scalable solutions with multiple feature, performance, price and power envelopes within a common architectural platform.

Freescale makes significant investments in R&D, allowing multiple products to be developed in parallel while simultaneously helping to ensure that each new product is code-compatible with the previous one—leading to hardware and software reuse across your next-generation design. With over 200 code-compatible Power Architecture products, Freescale's processors are an unmatched portfolio of embedded communication processors. While scalability makes it extremely easy for users to migrate from low- to high-end devices, code compatibility can save a significant amount of R&D investment and time as you develop future products.

QorIQ Communications Platform Roadmap



A Smarter Approach to Multicore

Freescale introduced the first QorIQ P series products in 2008. Today, we have more than twenty P1–P5 products in the market. The next generation of processors, the Advanced Multiprocessing (AMP) series was recently announced with expected sample product availability in mid-2012. These processors will be designated as T1-T5.

QorIQ platforms are PowerQUICC evolved, meaning Freescale is leveraging our embedded processing heritage into the next era of networking. PowerQUICC and QorIQ product lines will coexist in the marketplace for a long time, offering a cohesive roadmap to the future. This helps Freescale's customers who have billions of dollars invested in previous generations of our Power Architecture CPU-based products to make an easy shift to QorIQ or AMP series products without affecting their roadmaps.

Power Architecture Processing Platforms

QorIQ AMP Series

The QorIQ AMP series will consist of T1–T5 families with processors at varying levels of performance and integration. The series introduces the advanced e6500 multi-threaded 64-bit core at frequencies up to 2.5 GHz. The e6500 incorporates an enhanced version of the proven, high-performance and widely adopted AltiVec vector processing unit. AltiVec technology addresses high-bandwidth data processing and algorithmic-intensive computations, delivering DSP-level performance and distinct performance benefits for Freescale customers.

QorIQ P Series

The QorIQ P series families help enable you to easily move to multicore, starting with pin- and software-compatible P1 and P2 families that offer single- and dual-core options. Applications at this level demand performance and extensive integration at very low power and cost. Together, the two QorIQ families deliver 4.5x aggregate frequency range, scaling from a single core starting at 533 MHz (P1011) to a dual core at 1.2 GHz (P2020).

The P204x, P3 and P4 families are built on the e500mc core and feature four to eight cores running up to 1.5 GHz. The P5 family consists of single and dual e5500 64-bit cores with frequencies up to 2 GHz. These pin-compatible devices have a performance-boosting architecture with a tri-level cache hierarchy and advanced DPAA.

PowerQUICC Series

PowerQUICC platforms scale from 66 MHz to 1.5 GHz dual-core processors with a capacity to deliver up to 2.4 DMIPS to MHz of processing performance at a starting power of <1W. Highly integrated, this system-on-chip offers the broadest range of embedded communication processing options. The latest additions to the PowerQUICC family, the MPC830x portfolio features an array of performance-enhancing features including DDR2 memory controller with ECC, dual Gigabit Ethernet ports with support for IEEE® 1588 time stamping, PCI Express®, FlexCAN ports and a High-Speed USB 2.0 controller.

QorIQ Qonverge Platform

The QorIQ Qonverge platform offers heterogeneous cores consisting of Power Architecture and StarCore DSP technologies. In addition, the QorIQ Qonverge platform integrates wireless acceleration technologies to form base station-on-chip products optimized for next generation femtocell, picocell, metrocell and macrocell base stations.

PX Series Power Architecture Microcontrollers

PX series microcontrollers are designed to meet the needs of real-time, complex industrial control applications, including grid-tied solar inverters, motor drives, motion control, power generation, clinical medical, aerospace and defense, robotics and safety shutdown applications.

Freescale's PX series of MCUs, based on e200 Power Architecture cores, virtually outpaces all other MCU solutions.

High-performance single and multicore offerings with up to 4 MB embedded flash memory make these processors ideal for a variety of complex single-chip industrial applications. The PX Series is comprised of four families: PXS, PXR, PXN and PXR.

Scalable Processing

Power Architecture cores scale from 50 MHz to 2 GHz of performance, with additional scalability in the future with the AMP series of processors based on 28 nm process technology. Freescale's Power Architecture cores are software-compatible and ship with a similar level of ecosystem support from Freescale and our third-party software and tool vendors. This enables you to create a series of products with differentiated feature sets from a single board design.

- e200 32-bit core operates up to 266 MHz for PX series processors
- e300 32-bit core operates up to 800 MHz for MPC83xx processors
- e500 32-bit core operates up to 1.5 GHz for MPC85xx, P1 and P2 processors
- e500mc 32-bit core operates up to 1.5 GHz for P2, P3 and P4 processors
- e5500 64-bit core operates at up to 2 GHz for P5 processors
- e6500 64-bit multi-threaded core with AltiVec technology operates up to 2.5 GHz for the AMP series of processors

With a scalable and powerful product portfolio, Freescale has the potential to remain your long-term partner for embedded communications. Freescale's expertise and ecosystem engagement further help to make your next-generation products a success.

Power Architecture Processing Platforms

QorIQ AMP Series (T1 to T5)

- Advanced multi-threaded e6500 64-bit Power Architecture cores
 - Up to 24 virtual cores
 - AltiVec technology
- CoreNet coherency fabric and enhanced acceleration engines for data path, security, pattern matching and decompress/compress
- Cascading power management
- Hardware virtualization and advanced debug
- 28 nm process technology

QorIQ Qonverge Platform

- One of the industry's first comprehensive portfolio of multimode solutions
- Heterogeneous processing platform
 - e500 Power Architecture core
 - StarCore SC3850 DSP technology
 - MAPLE multimode baseband accelerator
 - Acceleration engines for security and data path
- 45 nm process technologies

QorIQ P Series (P1 to P5)

- Enhanced Power Architecture cores
 - e500 32-bit core (P1-P2 families)
 - e500mc 32-bit core (P2-P4 families)
 - e5500 64-bit core (P5 family)
- CoreNet coherency fabric and acceleration engines for data path, security and pattern matching
- Hardware-assisted hypervisor and on-chip debug
- 45 nm process technology

PX Series Power Architecture Microcontrollers

- Based on Freescale's e200 Power Architecture cores, with high-performance single and multiple cores offering up to 4 MB embedded flash memory
- PXS family: Dual-locking cores, redundant architecture, fault control and collection unit, optional Ethernet
- PXD family: Single core, up to 125 MHz core, single/dual TFT LCD controller, optional segment LCD controller, graphics SRAM
- PXR family: Single core, 264 MHz core frequency, 600 DMIPS, 2x eTPU, 64-ch. quad ADC
- PXN family: Dual core, up to 25 serial communication modules, optional Ethernet

PowerQUICC Series (MPC8xx, MPC82xx, MPC83xx, MPC85xx)

- Scalable processing performance, 100 to 7200 DMIPs
- Power Architecture cores
 - e300 32-bit core MPC83xx series
 - e500 32-bit core MPC85xx series
- QUICC Engine for protocol offload, eliminates the need for an external FPGA or ASIC; reduced BOM cost, simplified design
- On-chip 10/100, 10/100/1000 and 1 Gigabit Ethernet controllers integrated across the range with hardware timestamp features for IEEE 1588 and power profile
- Low heat dissipation (starting at <1W typical power) and extended temperature range (-400°C to +1250°C) for fanless operation

Freescale Solutions Based on Power Architecture® Technology

Core

	PowerPC 601	PowerPC 603E	e200	e300	e500VN	e600 ALTIVEC SIMD	e500MC	e5500	e6500
								QorIQ P4 @ 2 GHz	QorIQ AMP T1-T5 @ 2.5 GHz
							QorIQ P3/P4 @ 1.5 GHz		

Automotive
 Industrial
 Networking

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