

# MPC8308 PowerQUICC® II Pro Processor

## Overview

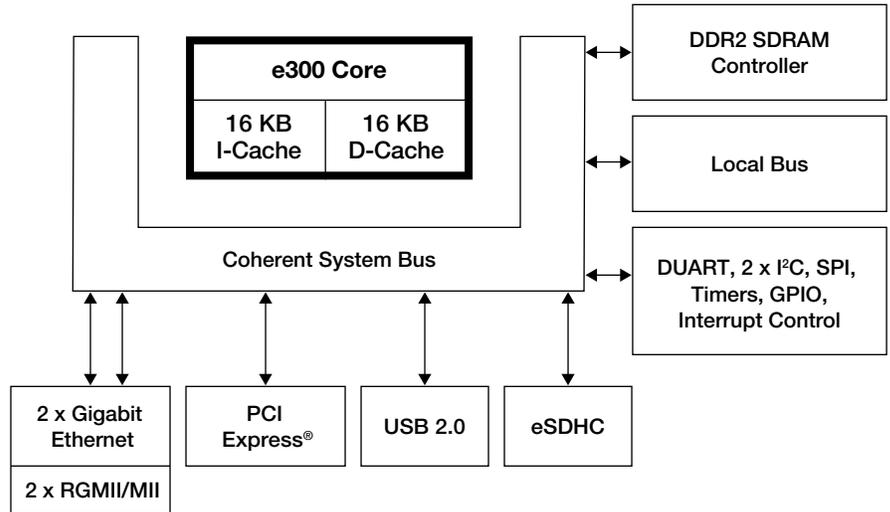
The MPC8308 is a cost-effective, low-power, highly integrated PowerQUICC® II Pro processor designed to address the requirements of networking applications such as smart grid home energy gateways, data concentrators, wireless LAN access points, wireless femto base stations and industrial applications such as industrial control and factory automation. It extends the PowerQUICC II Pro family by balancing the higher MIPS/MHz performance provided by the e300 core with low power consumption at a very aggressive price.

For networking applications, the Gigabit Ethernet MACs support connectivity to the wired network while the PCI Express® and SDIO interfaces can offer connectivity to wireless LAN or 3G and 4G modem devices. The MPC8308 processor features integrated IEEE® 1588 time synchronization for applications such as time-sensitive telecommunications services, industrial network switches, powerline networks and test/measurement devices. All of these applications will be fully enabled with the MPC8308 processor and the low-cost evaluation board with optimized Linux® BSP and drivers. Freescale also works with third-party partners to enable application software for end user interfaces.

## Core Complex

The MPC8308 processor incorporates the e300c3 (603e core compatible) core at 266, 333 and 400 MHz with 1.92 DMIPS/MHz. The core, built on Power Architecture® technology, includes dual integer units as well as a modified multiply instruction.

MPC8308 Block Diagram



## Core

Features	Benefits
High-performance e300 core, built on Power Architecture® technology, at 1.92 DMIPS/MHz	High-efficiency core means less MHz needed to get the job done or extra CPU headroom to perform other tasks
Comprehensive third-party ecosystem	Faster time to market
Migration path	Improved performance/cost migrating from PowerQUICC® or PowerQUICC II. Common architecture eases migration.
Best-in-class power consumption	Enables fanless, "green" and low-cost designs, and improves reliability
Integrated Gigabit Ethernet, USB, SD/MMC controller, IEEE® 1588v2, PCI Express® interfaces	Allows the flexibility to address a wide range of applications and reduced system cost

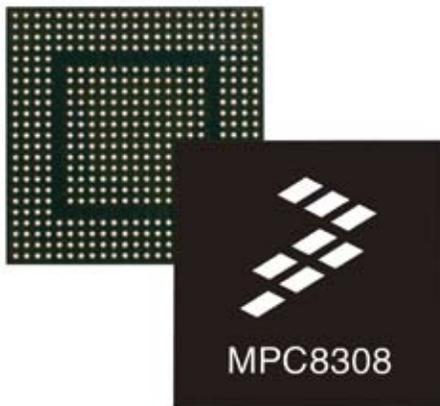
These architectural enhancements enable more efficient operations to be executed in parallel, resulting in a significant performance improvement. The e300 core complex also includes 16 KB each of L1 instruction and data caches and on-chip memory management units (MMUs) with dual integer units and SP/DP FPU.

### Cost-Effective Package

The MPC8308 processor is designed with a very low-cost 473-pin MAPBGA package at 0.8 mm pitch and 19 mm x 19 mm dimension. This smaller package dimension is suitable for small-footprint applications in single-board computing and other embedded networking applications.

### Cost-Effective Reference Design Board

The MPC8308-RDB (reference design board) is available to customers for US\$299. The kit includes Linux® 2.6 BSP with optimized drivers to support all peripherals, along with a free six-month evaluation license for CodeWarrior™ development tools.



### MPC8308 Processor Highlights

Core	e300c3, 2-IU, w/FPU, up to 400 MHz
L1 I/D Cache	16 KI/16 KD
Memory Controller	16/32-bit DDR2-266 with optional 8-bit ECC support
Local Bus Controller	8-bit w/NAND boot support
PCI Express®	x1, PCI Express 1.0a-compatible controller
Ethernet	x2 10/100/1000 MACs, MII, RGMII
USB	1 High-Speed USB 2.0 host/device with ULPI interface to external PHY
eSDHC	SD/MMC/SDIO support up to 50 MHz clock
UART	Dual
I²C	Dual
SPI	1
Boot Options	NOR, NAND, I²C boot sequencer
Interrupt Controller	IPIC
GPIO	Up to 24
DMA	DMAC, multi-channel DMA controller
Estimated Power	< 1.23 Watt at 333 MHz (typical)
IEEE® 1588v2	Time stamping for clock synchronization
Operating Temperature Range	0°C T <sub>A</sub> (ambient temp) to +85°C T <sub>J</sub> (junction temp) 0°C T <sub>A</sub> to +105°C T <sub>J</sub> -40°C T <sub>A</sub> to +105°C T <sub>J</sub>
Package	473-pin MAPBGA package, 19 mm x 19 mm

Application	MPC8308 Values
Smart Metering	<ul style="list-style-type: none"> <li>• Less than 1.23W typical power helps support fanless designs in harsh environments</li> <li>• 10/100 (Ethernet + Powerline connectivity)</li> <li>• PCI Express® interconnect for Wi-Fi/WiMAX</li> <li>• Support for ZigBee® technology connectivity</li> </ul>
Test/Measurement	<ul style="list-style-type: none"> <li>• IEEE® 1588v2 support for nanosecond-level clock accuracy</li> <li>• Double precision floating point unit (FPU)</li> <li>• Integrated serial communications and DDR2 memory controllers reduce system chip count</li> </ul>
Industrial Control	<ul style="list-style-type: none"> <li>• Control and networking processing for factory automation gateways</li> <li>• IEEE® 1588 support for nanosecond-level clock accuracy</li> <li>• Integrated Ethernet controllers support industrial Ethernet protocols for access to networked devices on the factory floor</li> </ul>
Consumer Printing	<ul style="list-style-type: none"> <li>• Integrated PCI Express with Gigabit Ethernet interface enables multiple flexible I/O options</li> <li>• Efficient core: 1.92 DMIPs/MHz</li> <li>• SD/MMC and High-Speed USB 2.0 interface</li> </ul>
Wireless Access Point	<ul style="list-style-type: none"> <li>• Integrated PCI Express to support WLAN connectivity</li> <li>• Cost-effective controller with Gigabit Ethernet and USB integrated</li> <li>• USB port for front-panel code uploads when connecting directly to a PC for maintenance</li> </ul>
Building Automation	<ul style="list-style-type: none"> <li>• With integrated Ethernet and USB, the MPC8308 is engineered to seamlessly communicate across a variety of protocols</li> <li>• &lt;1.23W typical power helps support fanless designs in harsh environments</li> </ul>

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