

QorIQ Multicore Processor Development

## P5020 Development System



### Overview

The P5020DS is a flexible development system that supports the dual-core 32/64-bit moded P5020 device. With its 2 GHz P5020 processor and rich input/output (I/O) mix, the board is intended for development of P5020 in networking, telecom and industrial applications, where its high performance, high-efficiency core and integration make it very well suited as a control plane processor.

The P5020DS can help shorten time to market. The board, which exercises most capabilities of the device, can serve as a reference for system-level hardware development by providing a comparison tool for customer-specific board implementations. It can also be used for customer software development and performance evaluation.

The P5020 processor is based upon the 64-bit e5500 core, built on Power Architecture® technology, offering speeds of 1.6 to 2 GHz. It has a three-level cache hierarchy with 32 KB of instruction and data cache per core, 512 KB of unified backside L2 cache per core, and 2 MB of shared frontside CoreNet platform cache fronting the dual memory controllers. I/Os include 18 SerDes lanes running at up to 5 GHz, multiplexed across four PCI Express® Gen2 controllers, one 10 GE XAUI interface, four 1 GE SGMII interfaces, four 2.5 Gb/s SGMII interfaces, two Serial RapidIO (version 1.3 with features of version 2.1) interfaces, two SATA 2.0 interfaces and the high-speed Aurora debug interface. It has a 64-bit DDR3 and DDR3L (low power) DRAM interface with 8-bit ECC support running at a data rate up to 1333 Mhz. It includes two USB 2.0 interfaces (including PHY), dual universal asynchronous receiver/transmitters (UARTs), an SD/MMC interface, a 32-bit local bus, four I<sup>2</sup>C and SPI. It also includes the accelerator blocks collectively known as the Data Path Acceleration Architecture (DPAA) that offload various tasks from the core, including routine packet handling, security algorithm calculation and pattern matching.

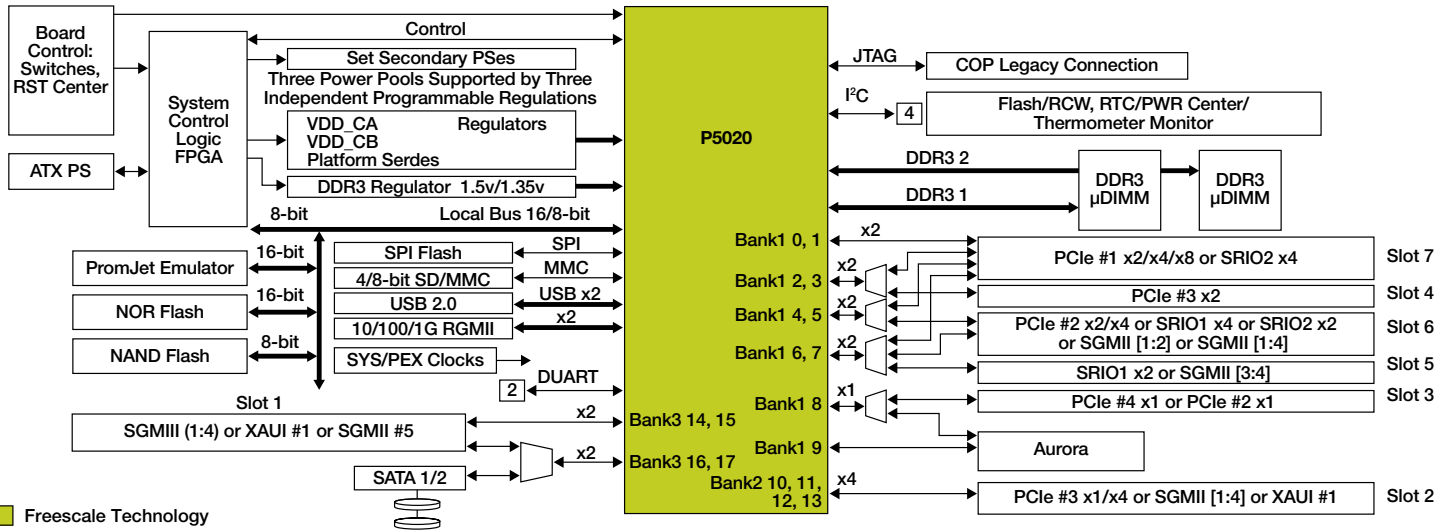
The P5020DS has significant flexibility in allocation its 18 SerDes lanes to various functions. Its base configuration supports two RGMII ports, two PCI Express x4 slots (two lanes per slot), a x4 slot for Freescale's optional SGMII-PEX-RISER, a x4 slot for Freescale's optional XAUI-RISER, the Aurora high-speed debug port and two SATA ports. It can also be configured to support up to four PCI Express slots of widths up to x8.

The P5020DS dual memory controllers support 4 GB of DDR3 at 1333 MHz. It has 128 MB of NOR flash, 1 GB NAND flash, a 256 KB I<sup>2</sup>C EEPROM as well as 16 MB of flash and 128 KB EEPROM of SPI-based memory. It also has two USB 2.0 receptacles and an SD card slot.

The P5020DS is pre-loaded with an Embedded Linux Essentials for QorIQ Processors with Data Path Acceleration development kit. This kit includes a 2.6.x.x SMP Linux kernel, hugetlbfs for applications with a large memory footprint, user space DPAA for high-performance packet handling, u-boot, the GCC tool chain and Mentor System Builder, among many other features.



## P5020DS



■ Freescale Technology

### P5020DS Board Features

#### Processor

- P5020, 2.0 GHz core with 1333 MHz DDR3 data rate
- Multiple SysClk inputs for generating various device frequencies

#### Memory

- Dual unbuffered DDR3 240-pin μDIMM modules with ECC (72-bit bus), 4 GB memory, 1333 MHz data rate
- 128 MB NOR flash
- 1 GB NAND flash
- SPI-based 128 MB flash
- SPI-based 128 KB EEPROM
- SD connector to interface with an SD memory card

#### PCI Express

- Two x4 PCI Express slots
- Can support Freescale's XAUI-RISER and SGMII-PEX-RISER option cards

#### SATA

- Two vertical SATA connectors

#### USB 2.0

- Two High-Speed USB controllers
- One Type A and one MicroAB receptacle

#### Ethernet

- Supports two 10/100/1000 ports with no add-in cards
- dTSEC4 and dTSEC5 as RGMII to Vitesse VSC8244 PHY
- Optional SGMII-PEX-RISER expands 10/100/1000 port count to five
- 10GE supported with optional XAUI-RISER card

#### DUART

- Two DUARTs

#### Debug

- JTAG/COP
- Aurora high-speed connector

#### Other

- IEEE® 1588 connector for Symmetricom option card
- Temperature sensor
- Eight general-purpose I/Os

For more information, visit [freescale.com/QorIQ](http://freescale.com/QorIQ)



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