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QorIQ Multicore Processor Development

P1020/P1011 Reference Design Board

Overview

The QorIQ P1020 reference design board (RDB) can help shorten your time to market for networking, wired and wireless access, industrial and medical applications. The cost-effective, highly integrated board is based on the QorIQ P1020 processor and leading-edge external components to help you quickly design and implement your target application.

The P1020RDB leverages the P1020 processor and supports both the dual-core P1020 and single-core P1011 configurations. The P1020 processor family is based on the e500 core, built on Power Architecture® technology, which has a core frequency range of 533–800 MHz, and supports a 32 KB instruction and L1 data cache as well as a shared 256 KB frontside cache. The P1020 also supports three Gigabit Ethernet controllers with IEEE® 1588 v2 support, USB 2.0, up to two PCI Express® 1.0a controllers, up to two SGMII SerDes interfaces, 32-bit DDR2/3 with ECC, SPI controller supporting booting from SPI serial flash memory, SD/MMC card controller supporting booting from flash cards and an integrated security engine. The P1020, built in 45 nm process technology, provides high integration that simplifies board design and offers a cost-effective solution.

The P1020RDB platform features 1 GB unbuffered DDR3 SDRAM, 16 MB NOR flash and 32 MB NAND flash, where the platforms can boot from either NOR or NAND flash memory. It supports six Gigabit-capable ports via an SGMII PHY, an RGMII PHY and an on-board switch with four ports, as well as two ports of USB On-the-Go (OTG), four FXS ports and one FXO port via relay.

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The P1020RDB also supports a PCI Express add-in connector and a MiniPCI Express slot, as well as an SD/MMC card slot. These components, integrated with the P1020, provide an application-specific platform that can help you get a jump start on your next application design. In addition, the P1020RDB provides a simplified migration path for existing PowerQUICC processor customers wishing to migrate to QorIQ multicore processors. Customers can migrate to the single-core P1011 as a stepping stone on their way to multicore processing.

Since the P1020 is pin-compatible with the P2020, the P1020RDB can also be used as a development vehicle for the P2020.

Along with hardware support, the P1020RDB comes with a board support package (BSP) that includes both U-boot and Linux® 2.6 operating system support. The platform is also available with third-party software applications. To see demonstrations or to acquire details of Freescale's third-party applications for this platform, please contact your local Freescale sales office.

P1020RDB Board Features

Memory

- 1 GB DDR3

- 16 MB (128 MB device) NOR flash memory

- 32 MB NAND flash memory

- 16 MB SPI ROM

PCI Express interconnects

- One standard PCI Express connector (x1)

- One mini PCI Express connector (x1)

Ethernet

Six 10/100/1000 ports:

- Four ports from L2 switch connected to eTSEC1

- One SGMII PHY connected to eTSEC2

- One RGMII PHY connected to eTSEC3

IEEE® 1588 v2

- Clock input from DAC/VCXO circuitry

- Accessible via test header

System Integration

- Dual I²C

- SD/MMC card slot

- Dual USB

- Mini AB connectors on I/O panel (default)

- UARTs

- One DB9 connector

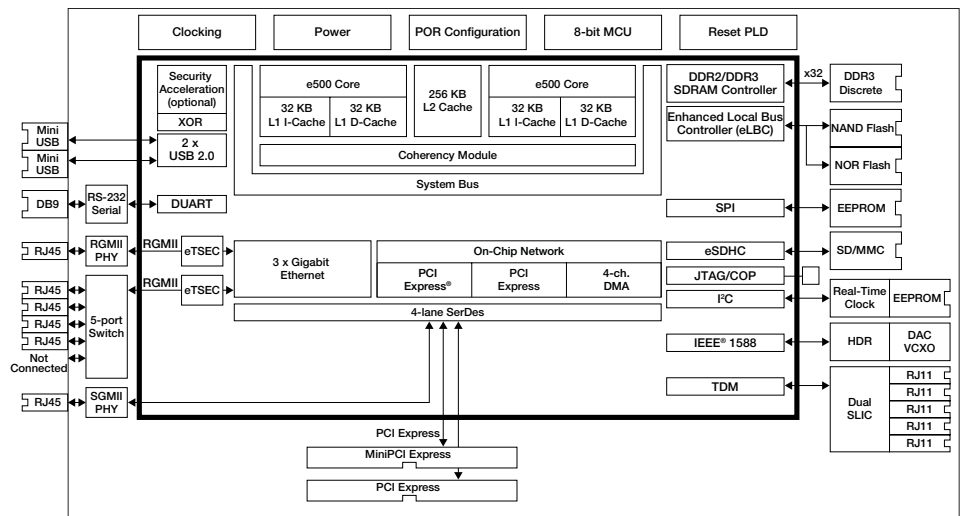- Dual SLIC for FXS/FXO interfaces

Mini-ITX Form Factor

- 170 mm x 170 mm

- 6-layer PCB routing (4-layer signals, 2-layer power and ground)

Lead-Free (ROHS), CE and FCC Certification

Software Tools

- Linux 2.6.x Kernel

- Cross compile and native GNU tool chain

P1020RDB Block Diagram

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