

# P2020E/P2010E Reference Design Board

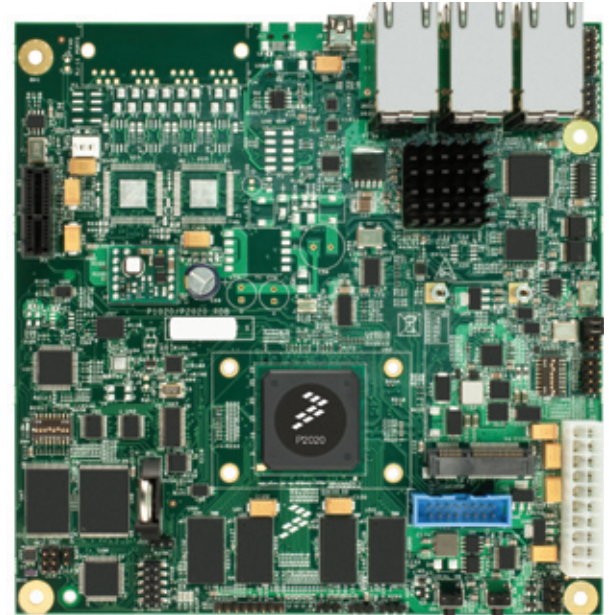
The P2020RDB is a highly integrated reference design board that can help shorten your time to market. The reference design is aimed at networking, wired and wireless access, industrial and medical applications. This cost-effective board is based on the QorIQ™ P2020E processor family, along with leading-edge external components to help you quickly design and implement your target application.

The P2020RDB leverages the P2020E processor and supports both the dual-core P2020E and single-core P2010E configurations. The P2020E processor family is based on the e500 core, built on Power Architecture® technology, which has a core frequency range of 800–1200 MHz, and supports a 32 KB instruction and L1 data cache and a shared 512 KB frontside cache. The P2020E also supports three Gigabit Ethernet controllers with IEEE® 1588 v2 support, USB 2.0, up to three PCI Express® 1.0a controllers, up to two Serial RapidIO® controllers, up to two SGMII SerDes interfaces, 32-/64-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 new P2020E family, built in 45 nm process technology, provides high integration that simplifies board design and offers a cost-effective solution.

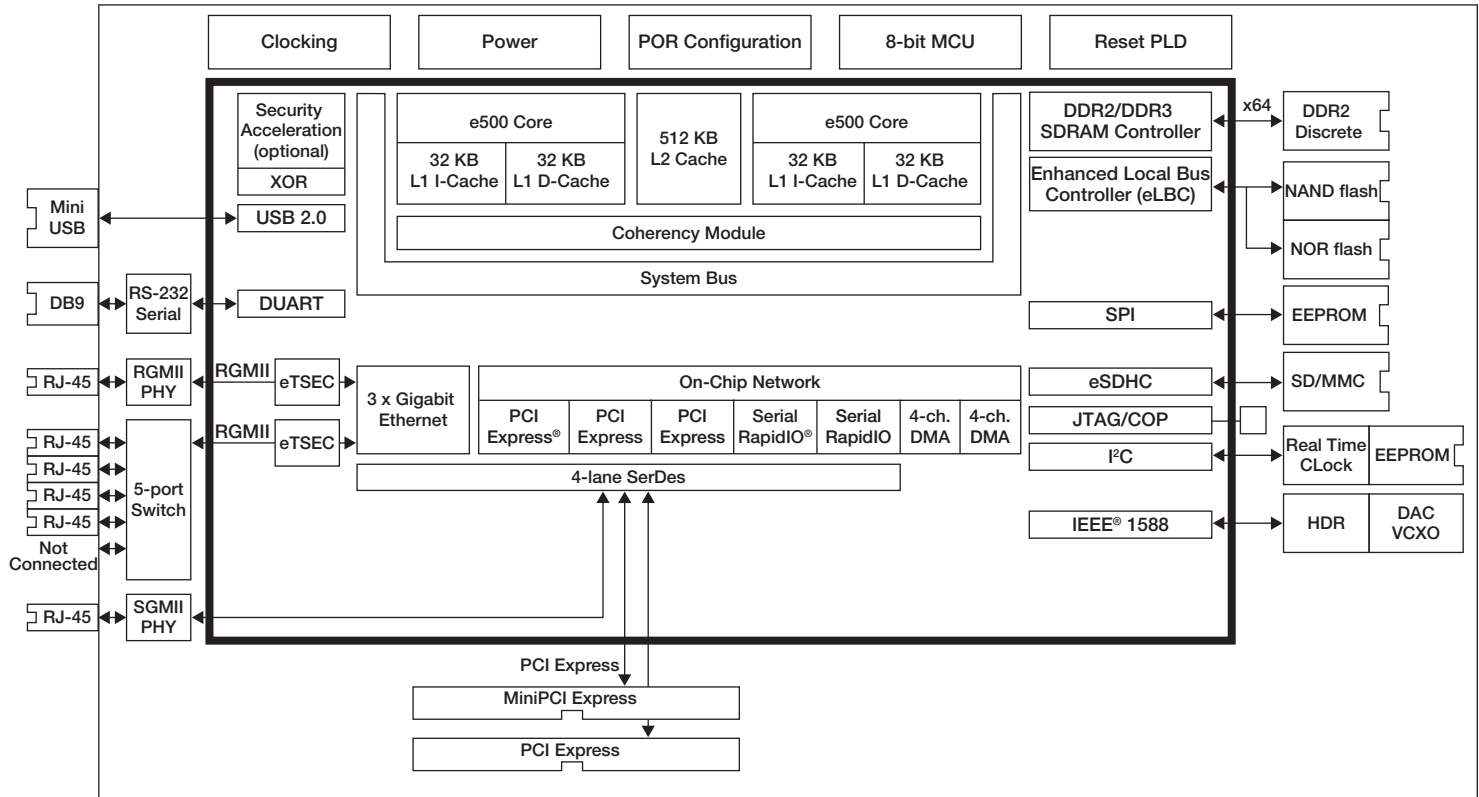
The P2020RDB platform features 1 GB unbuffered DDR2 SDRAM, 16 MB NOR flash and 32 MB NAND flash, where the platforms can boot from either NOR or NAND flash memory. It supports six Gigabit-capable ports via an SGMII PHY, an RGMII PHY and an on-board switch with four ports, as well as a single-port USB on-the-go (OTG). The P2020RDB 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 P2020E family, provide an application-specific platform that can help you get a jump start on your next application design. In addition, the P2020RDB provides a simplified migration path for existing PowerQUICC® processor customers wishing to migrate to QorIQ multicore processors. Customers can migrate to the single-core P2010E initially, as a stepping stone, on their way to dual multicore processing.

Since the P2020E family is pin-compatible with the P1020E family, the P2020RDB can also be used as a development vehicle for the P1020E family.

Along with the hardware support, the P2020RDB 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.



## P2020RDB Block Diagram



### P2020RDB Board Features

#### Memory

- 1 GB DDR2
- 16 MB (128 MB device) NOR flash memory
- 32 MB NAND flash memory
- 16 MB SPI ROM

#### PCI Express

- One standard PCI Express connector (x1)
- One mini PCI Express connector (x1)

#### Ethernet

Six 10/100/1000 ports as follows:

- 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 I<sup>2</sup>C
- SD/MMC card slot
- USB
  - Mini AB connectors on IO panel (default)
- UARTs
  - One DB9 connector

#### 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<sup>®</sup> 2.6.x Kernel
- Cross compile and native GNU tool chain
- CodeWarrior<sup>™</sup> USB TAP

### Learn More:

For current information about Freescale products and documentation, please visit [www.freescale.com/QorIQ](http://www.freescale.com/QorIQ).



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