



QorIQ Qonverge Platform

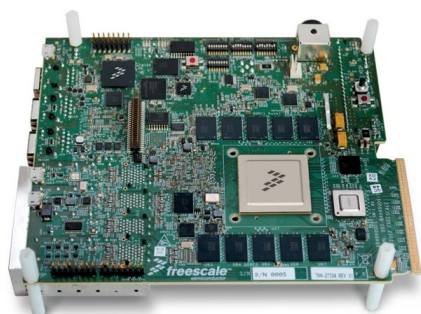
QorIQ Qonverge B4420QDS Application Development System

For applications using the QorIQ Qonverge B4420 baseband SoC

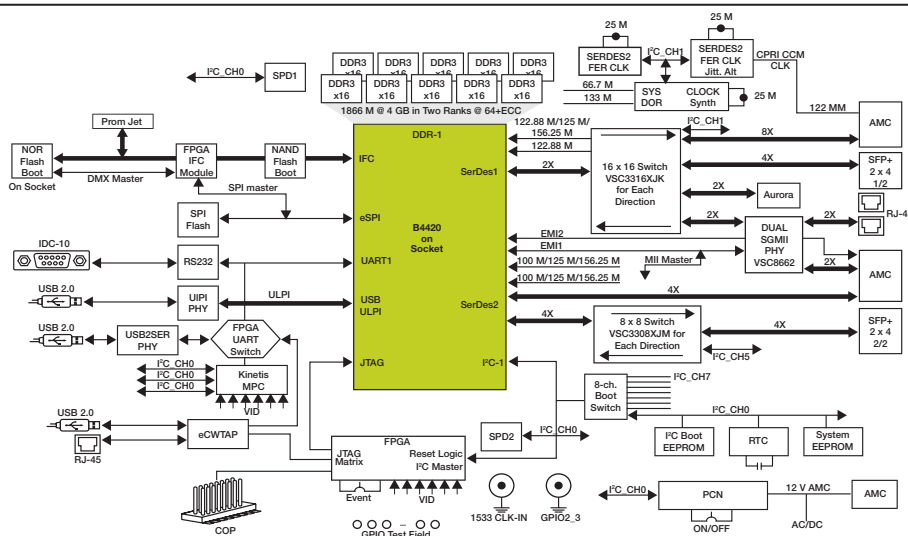
Overview

The QorIQ Qonverge B4420QDS development system is a complete application development environment intended for engineers developing applications for the Freescale B4420 baseband SoC processor. The B4420 processor includes highly integrated MPU and DSP processor cores containing two e6500 dual-thread Power Architecture® cores, including the Altivec 128-bit vector SIMD engine running at up to 1.6 GHz, two StarCore SC3900FP DSPs supporting up to 76.8 GMAC/s of fixed point and up to 38.4 GFLOP/s of floating point with

each DSP core running at up to 1.2 GHz, powerful baseband and transport accelerators and high-speed interfaces pertinent to the device high throughputs. This device targets high-bandwidth, highly computational baseband applications such as multicarrier, multisector LTE (FDD and TDD), LTE-Advanced, WCDMA/HSPA+, TD-SCDMA, GSM and WiMAX base station applications. The B4420QDS is intended to serve as a platform for software and hardware development in an environment using the B4420 processor.



QorIQ Qonverge B4420QDS Board Block Diagram



Onboard resources and the associated tools enable developers to perform a variety of tasks, including:

- Download and run code
- Set breakpoints
- Display memory and registers
- Connect proprietary hardware via an expansion connector
- B4420QDS supports two working modes:
 - Standalone mode: The B4420QDS can run in a standalone mode like other application development systems, with direct connections to debuggers, power supply and other external connections such SFP+ optical transceivers and Ethernet transceivers.
 - AdvancedMC™ mode: The B4420QDS is inserted into a standard MicroTCA® chassis that allows connecting to other B4420QDS or other AMC cards residing in the same chassis, enabling software developers to extend their system beyond a single device system via the CPRI at 9.8G, SGMII or PCI Express® at 5G ports. The AMC edge connector on the B4420QDS carries these high-speed interface signals.

Features

- Size: Dual-AMC form factor
- DDR memory controller supporting:
 - 4 GB dual rank 72-bit memory, 1.6 GHz with ECC
- Multiple configuration over eight SerDes lanes, supporting:
 - Four SGMII ports at 2.5G/1.0G
 - Four lanes of CPRI with available data rates: 1.2288, 2.4576, 3.072, 4.9152, 6.144, 9.8304 Gbaud comply with CPRI specification v4.2, exposed over SFP transceivers or over AMC edge connector
 - PCI Express port complies with the PCI Express base specification, revision 2.0 with x4, x2, and x1 link support running at 2.5 Gbaud or 5.0 Gbaud, exposed over AMC edge connector
- Multiplexing Two SerDes instances, each with four lanes:
 - SerDes 1 multiplexing using two Vitesse cross-point 16 x 16 switch VSC3316
 - SerDes 2 multiplexing using two Vitesse cross-point 8 x 8 switch VSC3308
- SFP+ optical transceivers: Two optical transceivers, expandable to four transceivers
- USB interface: USB specification rev. 2.0, up to 480 Mb/s with USB3315 ULPI PHY
- External Ethernet interfaces: Dual SGMII PHY Vitesse VSC8662 to 2xRJ-45 copper connectors
- IFC controller supporting:
 - NAND flash: 512 MB, 8-bit
 - Parallel NOR flash or PromJet: 128 MB, 16-bit
- B4420 configuration may be loaded from nine-bit coded reset configuration, the RCW source is set by the appropriate DIP switches:
 - 16-bit NOR flash/PROMJet
 - QIXIS 8-bit NOR flash emulator
 - 8-bit NAND flash
 - 24-bit SPI flash
 - I²C EEPROM

- eSPI: Synchronous peripheral serial bus, running up to 80 Mb/s supported by SPI EEPROM
- UART: Available over USB-to-UART translator FTDI FT232R or over RS232 flat cable
- GPIO, IRQ and timer signals are available on test point field
- Available debug interfaces:
 - Onboard eCWTAP controller with ETH and USB I/F (direct connection to host platform, no need for external TAP)
 - JTAG/COP 16-pin header for external TAP controller
 - Aurora debug connector
 - External JTAG source over AMC

Development Tools Support

Freescale supplies a complete set of CodeWarrior tools for the B4420. These tools provide easier and more robust ways for designers to develop optimized systems, giving them everything they need to exploit the advanced capabilities of the B4420 architecture. In addition to the B4420QDS board, the CodeWarrior Eclipse-based integrated development environment includes:

- C and C++ compilers for Power Architecture and StarCore solutions
- Librarian
- Multicore debugger
- Royalty-free DSP RTOS
- Functional and performance-accurate software simulators
- Advanced profiler
- Linux® SDK
- Device drivers for embedded accelerators and peripherals
- High-speed run control

For more information, visit freescale.com/QorIQConverge

Freescale, the Freescale logo, CodeWarrior, Kinetis and StarCore are trademarks or registered trademarks of Freescale Semiconductor, Inc., Reg. U.S. Pat. & Tm. Off. QorIQ Converge is a trademark of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. The Power Architecture and Power.org word marks and the Power and Power.org logos and related marks are trademarks and service marks licensed by Power.org. ©2012, 2013 Freescale Semiconductor, Inc.

Document Number: B4420QDSFS REV 1