New!

Model 4207

MPC8641 PowerPC I/O Processor with Virtex-4 FPGA - VME/VXS

General Information

The Pentek Model 4207 PowerPC® VME/VXS I/O Processor board targets embedded applications that require high performance I/O and processing. With two PMC/XMC module sites, the 4207 offers powerful one-slot solutions with nearly unlimited high-speed connectivity.

Uniquely Designed for Connectivity

Utilizing a unique crossbar switch architecture, the 4207 allows you to make the connections you want between board resources and high-speed interfaces. You don't need hard-wiring or FPGA space to define your I/O data flow and resource assignment. The 4207 supports numerous interfaces including VME64x, gigabit Ethernet, RS-232 and, optionally, dual 4-Gbit Fibre Channel. All interfaces can be included without exceeding the one-slot configuration.

The Processing Power You Need

The Freescale® MPC8641 utilizes the AltiVec® engine to perform parallel processing of multiple data elements (SIMD) with 128-bit operations. The AltiVec processor executes both fixed- and floating-point instructions. It is available with either a single or dual e600 PowerPC core with maximum clock frequency of 1.5 GHz.

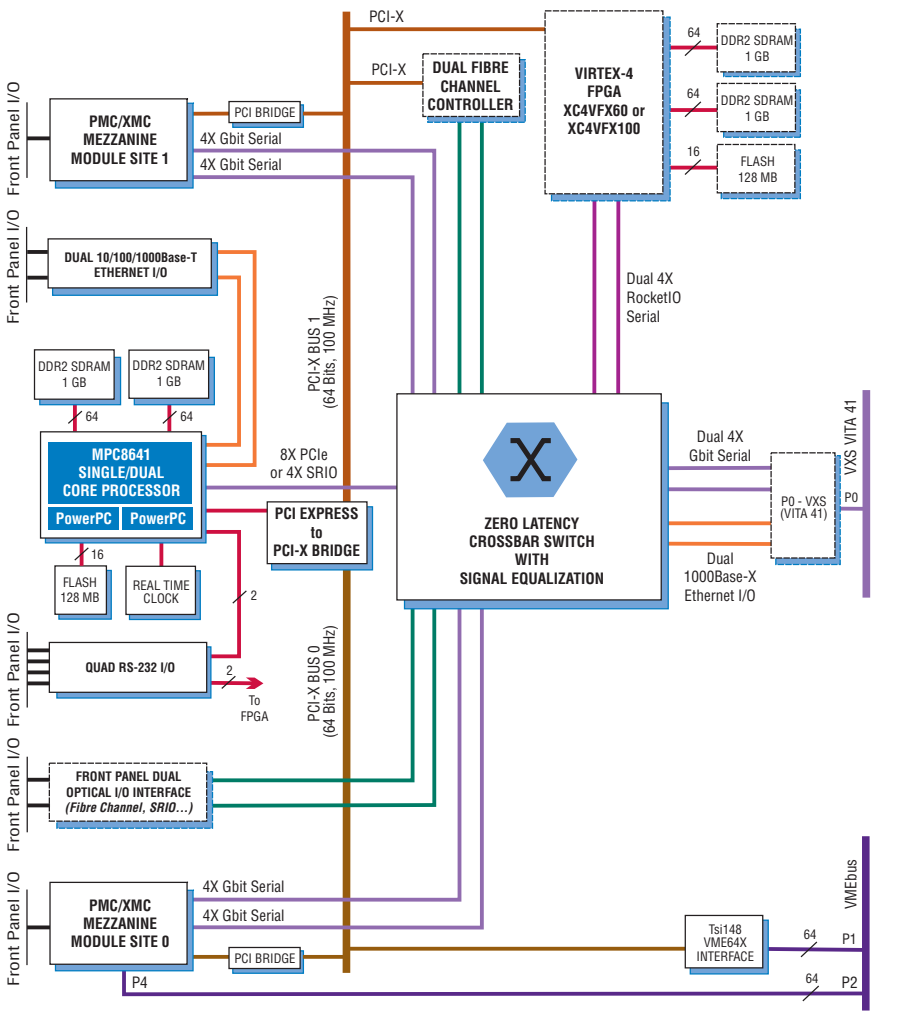
Zero Latency Crossbar Switch

The 4207 features a zero-latency high-speed crossbar switch architecture that bridges the various board interfaces and resources via gigabit serial data paths. Programmable input equalization and output preemphasis enable optimization for each application. Gigabit serial paths include links to the processor that can be used for 8X PCI Express or 4X Serial RapidIO.

Other gigabit paths, not restricted to any protocol, include two 4X links to each XMC module site, two 4X links (or four 2X links) to the FPGA RocketIO ports, and another pair of 4X links to the optional P0-VXS connector. The switch also provides high-speed connectivity to the optional Fibre Channel controller and front panel optical gigabit serial interface. ➤

Features

- Freescale MPC8641 single or dual core PowerPC processor to 1.5 GHz
- Xilinx Virtex-4 FX Series FPGA
- Hosts two PMC or XMC modules
- On-board dual gigabit Ethernet interfaces
- Optional on-board 4-Gbit dual optical Fibre Channel controller
- Optional dual optical gigabit serial / Fibre Channel interface
- Up to 4 GB DDR2 SDRAM
- Two 64-bit PCI-X buses
- VME64x master/slave interface
- Optional VXS interface
- ***Ruggedized and conduction-cooled versions***



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World-Class Software Support

The Model 4207 is supported by world-class software for initialization, control and optimization.

Pentek **VxWorks® BSPs** provide software developers with a complete library of hardware initialization, control and application functions. Used in conjunction with Wind River's **Workbench** software development environment, it speeds application development.

Pentek **Linux BSPs** provide software developers with a complete open-source library of hardware initialization, control and application functions to be used in a real-time Linux operating environment.

Pentek **GateFlow® Design Kits** allow the onboard FPGA to be configured by the user for implementation of custom preprocessing functions. The kit is used in conjunction with the Xilinx ISE *Foundation™* design tools.

Verari Systems' **VSI/Pro** is an implementation of VSIPL scientific and engineering functions optimized for the PowerPC.

WIND RIVER PARTNER Linux

Ordering Information

Model	Description
4207	MPC8641 PowerPC I/O Processor with Virtex-4 FPGA - VME/VXS
Options:	
-001	Front Panel Optical Connectors/Transceivers
-006	Dual Fibre Channel interface, 4 Gbit/sec
-013	Single core 1.33 GHz MPC8641 w/1 GB DDR2
-023	Dual core 1.33 GHz MPC8641D w/1 GB DDR2
-123	Dual core 1.33 GHz MPC8641D w/2 GB DDR2
-061	XC4VFX60-11 FPGA
-101	XC4VXF100-11 FPGA
-360	1 GB FPGA DDR2 SDRAM + 128 MB FLASH
-361	2 GB FPGA DDR2 SDRAM + 128 MB FLASH
-5xx	VXS interface
-70x	Ruggedized & conduction-cooled versions

➤ PMC/XMC Mezzanine Sites

Model 4207 includes two 64-bit PMC module sites which accept industry-standard modules up to 133 MHz for a wide variety of functions. The PMC modules are accessible from the MPC8641 processor and the VMEbus. A PCI bridge at each PMC site allows operation of slower 33 or 66 MHz modules while running the attached PCI-X bus at a higher speed.

The 4207 PMC sites are also equipped to accept XMC (switched-fabric PMC) modules. Gigabit switched-fabric connectors are optionally provided to support two 4X full-duplex serial ports. Each port allows high-speed data transfer to the crossbar switch using gigabit fabrics such as Xilinx Aurora, serial RapidIO, or PCI Express.

FPGAs to Suit Your Application

The 4207 may be optionally equipped with a Xilinx Virtex-4 FX FPGA, either the XC4VFX60 or the XC4VFX100. The FPGA is optionally equipped with 1 GB or 2 GB of DDR2 SDRAM memory along with 128 MB FLASH. Two 4X RocketIO ports provide a high-speed serial data path to and from the FPGA. These ports can also be configured as four 2X paths.

Unused FPGA resources are available for the user to implement custom signal-processing configurations and algorithms using Pentek's GateFlow® FPGA Design Kit and the high-performance IP Core Library.

Local Memory

The MPC8641 is equipped with 1 MB on-chip L2 cache per processor core. 1 GB or 2 GB DDR2 SDRAM is also provided for program and data memory, along with a nonvolatile 128 MB FLASH memory for initialization, self-test and boot code.

Two PCI-X Buses

The Model 4207 architecture includes two 64-bit PCI-X buses. PCI-X bus 0 provides access to the VMEbus and its associated PMC/XMC mezzanine site. PCI-X bus 1 provides access to its associated PMC/XMC mezzanine site and the optional dual Fibre Channel interfaces.

Dual Fibre Channel Interface

The 4207 features an optional dual Fibre Channel controller with optical front panel interface for high-speed data transfer to and from Fibre Channel storage devices. When installed, both optical interfaces are located on the 4207 front panel, along with the dual 10/100/1000Base-T Ethernet and the quad RS-232 interfaces. This maintains a single VMEbus slot configuration and allows Fibre Channel data transfer without sacrificing a PMC/XMC site.

VXS Interface

The 4207 provides two optional 4X full-duplex VITA-41 VXS links to the P0-VXS connector, each capable of peak rates up to 1.25 GB/sec. Each link is attached to the crossbar switch that's compatible with gigabit fabrics such as Xilinx Aurora, Serial RapidIO, and PCI Express. The P0-VXS connector also features a dual 1000Base-X Ethernet interface per the VITA 41.6 draft standard.

Specifications

Processor Resources
- **Processor:** Freescale MPC8641 (Single Core) or MPC8641D (Dual Core)
- **Processor clock:** 1.33 GHz (-013 or -023) *Contact factory for options from 1 - 1.5 GHz*
- **Level 2 cache:** 1 MB for MPC8641, 2MB for MPC8641D
- **DDR2 SDRAM:** 1 GB or 2 GB (optional, one or two 1 GB banks, each 64 bits wide)
- **FLASH:** 256 MB, 16 bits wide
- **Node Control:** Built into MPC8641

Mezzanines
- Two PMC/XMC sites

Optional FPGA
- **Type:** Xilinx Virtex-4 Series (-11 speed) XC4VFX60 (-061) or FX100 (-101)
- **DDR2 SDRAM:** 1 GB or 2 GB (optional, one or two 1 GB banks, each 64 bits wide)
- **FLASH:** 128 MB, 16 bits wide (optional)

PCI-X Bus #0
- **Width:** 64 bits, **Speed:** 100 MHz

PCI-X Bus #1
- **Width:** 64 bits, **Speed:** 100 MHz

Global Resources
- **VME64x:** Tundra Tsi148 master/slave, slot 1 controller, D64, A32
- **Serial I/O:** Four RS232 front panel ports
- **Ethernet:** Two 10/100/1000Base-T front panel ports, two 1000Base-X ports on rear P0-VXS connector
- **Optional Fibre Channel Controller:** Dual Optical, 4 Gbit (Option -006)

Size: standard 6U VMEbus board, single slot; board 160 mm (6.3 in.) x 233.5 mm (9.2 in.), panel 0.8 in. wide

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