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Model 4205

PMC/VIM Carrier MPC7457 PowerPC Processor - VME



General Information

Model 4205 Single PowerPC VIM/PMC Carrier board targets embedded applications requiring high performance I/O and processing. The board maintains the lower cost of a single-processor baseboard and features a Freescale MPC7457 and two Xilinx Virtex-II FPGAs. The Model 4205 offers one-slot solutions with two VIM-2 modules, one VIM-4 module, or one VIM-2 and one PMC module.

In addition to its mezzanine I/O capabilities, the 4205 supports numerous interfaces including VME64, Ethernet, RS-232 and, optionally, Fibre Channel and Gigabit Ethernet.

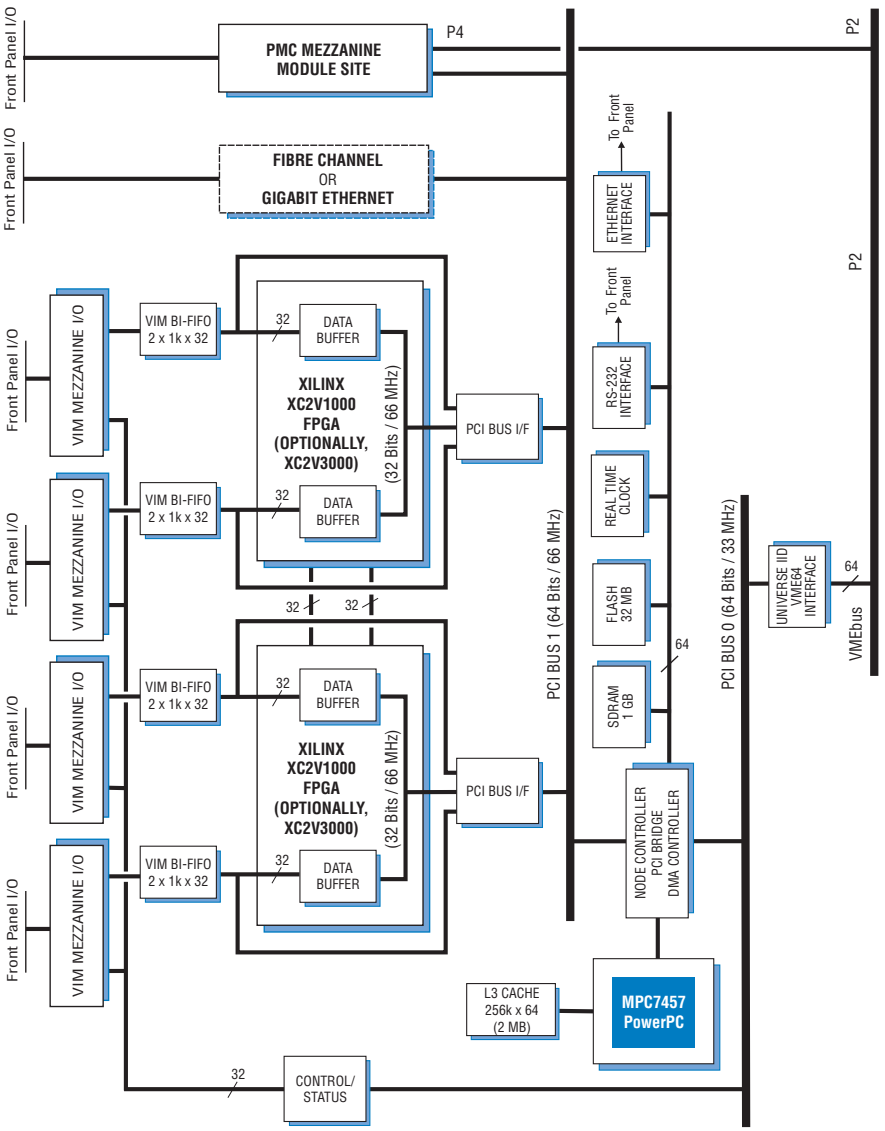
All interfaces can be included without exceeding the one-slot configuration.

MPC7457 AltiVec Processor

The Freescale MPC7457 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, augmenting the separate integer and floating point units also on the chip.

FPGA Devices

The 4205 also includes two on-board Xilinx Virtex-II XC2V1000 FPGAs that provide a high-speed synchronous bidirectional streaming data interface for each VIM mezzanine connector. This allows buffering of 32-bit parallel data transfers between VIM mezzanine modules, the MPC7457 and global resources. An interconnect path is provided between the FPGAs for additional flexibility. To optimize ➤



Features

- Freescale 1.267 GHz MPC7457 PowerPC processor
- Xilinx Virtex-II FPGAs
- Selectable FPGA data flow architecture
- Hosts one PMC plus one VIM-2 module, two VIM-2 modules, or one VIM-4 module
- Optional onboard Fibre Channel interface
- Optional onboard Gigabit Ethernet interface
- 2 MB L3 cache
- Up to 1 GB SDRAM
- Two 64-bit PCI buses
- VME64 master/slave interface

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Support Software

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.

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

Pentek **ReadyFlow** Board Support Libraries provide support for VIM and PMC mezzanines. They consist of C-callable libraries for board-specific functions.

In addition, ReadyFlow for PowerPC-based processor boards includes a complete distribution of **eCos**, an open source, royalty-free, real-time operating system intended for embedded applications. eCos-based applications can be developed with the included GNU development tools: the GCC C-language compiler, GDB debugger and Insight GUI interface for GDB.

WIND RIVER PARTNER Linux

Ordering Information

Model	Description
4205	PMC/VIM Carrier MPC7457 PowerPC Processor - VME
Options:	
-006	Front panel Fibre Channel interface, 1 or 2 Gbit/sec
-007	Front panel Gigabit Ethernet interface (1000Base-T)
-057	1 GHz MPC7457
-058	1.267 GHz MPC7457
-300	XC2V3000 FPGAs replace XC2V1000
-322	16 kB VIM BI-FIFO
-340	1 GB SDRAM

➤ performance for specific applications, different data flow and control architectures for the FPGAs can be selected from a menu of built-in configurations. For example, a dual-port RAM structure is available for applications that require random access I/O.

A large percentage of the 4205 FPGA resources is available to users to implement custom signal processing configurations and algorithms. Available resources can be increased with the optional XC2V3000 FPGAs.

VIM Mezzanine

The 4205 is equipped with four VIM (Velocity Interface Mezzanine) connectors. Each of these connectors is attached to one of the two on-board Xilinx Virtex-II Series FPGAs.

The VIM architecture allows simultaneous I/O data transfer from all four VIM mezzanine interfaces with no contention for shared resources. Data can then be transferred to global resources, front or rear panel I/O, or between VIM modules. Control and status registers on the VIM modules can be read and written to as memory mapped resources of the MPC7457 or the VMEbus.

PMC Mezzanine Site

In addition to accommodating Pentek's broad range of VIM I/O peripherals, Model 4205 incorporates a 64-bit 66 MHz PCI Mezzanine Card (PMC) module site which accepts industry-standard modules for a wide variety of interface and communication functions. The PMC module is accessible from the MPC7457 processor and the VMEbus.

Memory

The MPC7457 is equipped with 256 kB on-chip L2 cache. This is supplemented by 2 MB of L3 cache. A 512 MB SDRAM, which may be optionally increased to 1 GB, is provided for program and data memory, along with a nonvolatile 32 MB FLASH memory for initialization, self-test and boot code.

Dual PCI Buses

The Model 4205 architecture includes dual 64-bit PCI buses. PCI Bus 0 provides access to the VMEbus and optional RACEway interface, as well as VIM mezzanine address and data control.

PCI Bus 1 provides a high-speed path to both VIM and PMC mezzanine sites, as well as optional front panel I/O such as Fibre Channel, Gigabit Ethernet or Serial FPDP.

Optional Fibre Channel Interface

The 4205 features an optional front panel copper Fibre Channel interface for high speed data transfer to and from Fibre Channel storage devices. When installed, this interface is located on the 4205 front panel along with 10/100Base-T Ethernet and RS232. This allows Fibre Channel data transfer without taking up a VIM or PMC site, maintaining a single VMEbus slot.

Optional Gigabit Ethernet Interface

The 4205 features an optional Gigabit Ethernet interface for high speed communications with other devices. This interface is also located on the front panel along with 10/100Base-T Ethernet and RS232. It provides a bidirectional port capable of 10, 100 or 1000Base-T data transfer speeds. This interface does not take up a VIM or PMC site, thus maintaining a single VMEbus slot.

Specifications

Processor Resources
- **Processor:** Freescale MPC7457
- **Processor clock:** 1 GHz, 1.267 GHz
- **Level 3 cache:** 256k x 64 (2 MB)
- **Node Control:** Marvell GT-64260

Mezzanines
- Two VIM-2 sites, one PMC site

FPGAs
- Xilinx XC2V1000 std; XC2V3000 optional

PCI Bus #0
- **Width:** 64 bits
- **Speed:** 33 MHz

PCI Bus #1
- **Width:** 64 bits
- **Speed:** 33/66 MHz

Global Resources
- **VME64:** Tundra Universe IID master/slave, slot 1 controller, D64, A32
- **Serial I/O:** RS-232 front panel port
- **Ethernet:** 10/100Base-T front panel port
- **SDRAM:** 512 MB, 1 GB (optional)
- **FLASH:** 8M x 32 (32 MB)
- **Fibre Channel:** Copper, 2 Gbit (optional)

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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