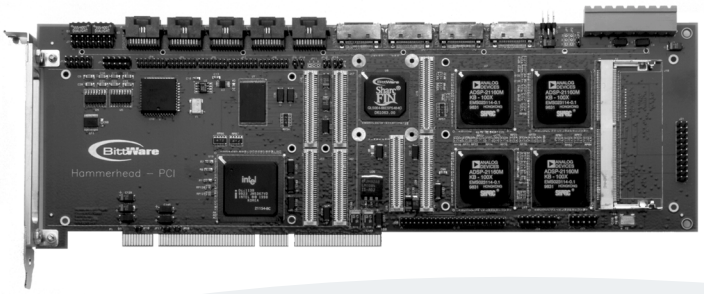
HHPC: Hammerhead-PCI

Quad ADSP-21160 64-bit, 66 MHz PCI Board



Four ADSP-21160 Processors on PCI Card

BittWare's Hammerhead-PCI (HHPC) board matches the lightning-fast processing power of the ADSP-21160 SHARC® processor with a 64-bit, 66 MHz PCI interface. The board features four Analog Devices' ADSP-21160 processors, 64-512 MB of SDRAM, 2 MB of FLASH memory, and two PMC mezzanine sites.

SharcFIN™ ASIC for SHARC DSPs

The HHPC incorporates BittWare's SharcFIN ASIC, which flexibly interfaces the ADSP-21160 DSPs to the 64-bit, 66 MHz PCI bus, the SDRAM, the FLASH memory, and a peripheral bus. It also provides a feature-rich set of DMA functions and interrupt options to support very high-speed, real-time data flow with minimum processor overhead.

ADSP-21160 DSPs

The HHPC board is configured with four 100 MHz ADSP-21160 processors, each with 4 Mb of on-chip, dual-ported SRAM. The ADSP-21160 processors are code-compatible with the ADSP-2106x SHARC DSPs, making it easier to integrate existing code. The four ADSP-21160 processors share a common 50 MHz, 64-bit cluster bus, which gives them access to the board's SDRAM, the PCI bus interface, and the other three SHARC DSPs. For additional I/O, each processor also has four flags, three interrupts, six link ports, and two serial ports.

PMC Sites

The HHPC board is configured with two PMC (PCI Mezzanine Card) sites. One PMC site allows you to attach a standard PMC module to the board, adding I/O or additional processors and memory. The other PMC site has back panel access and functions as both a standard PMC and a proprietary interface for BittWare's PMC+ I/O modules. It features PMC+ extensions that allow you to attach PMC+ modules for low-latency, high-performance I/O via four 100 MB/s link ports and one 50 Mb/s serial port.

Available Development Tools

BittWare offers a complete software development kit that allows you to easily develop application code and integrate the HHPC board into your system. The software tools include a comprehensive host interface library (HIL), a standard I/O library, and diagnostic utilities. The board is fully compatible with Analog Devices' VisualDSP® code development tools and supports in-circuit emulation. It is also compatible with SpeedDSP, BittWare's highly-optimized C-callable runtime libraries, and with SharcLAB, BittWare's interface to MATLAB Simulink® and Real-Time Workshop®.

Features

- Four 100 MHz ADSP-21160 SHARC DSPs (2400 MFLOPS)
- 64-bit, 66 MHz PCI interface
- 64 to 512 MB SDRAM (standard 144-pin SODIMM)
- Two PMC sites, one with PMC+ extensions for BittWare's PMC+ I/O modules
- Four link ports and one serial TDM bus for integrating PMC+ I/O with on-board SHARCs
- Four 100MB/s external link ports
- Four 50 Mb/s external serial ports
- One 50 Mb/s external serial TDM bus
- RS-232 UART
- 2 MB FLASH RAM
- Standalone operation

BittWare

Specifications

BOARD ARCHITECTURE

Processors

- Four Analog Devices ADSP-21160 SHARC DSPs
- 600 MFLOPs per DSP
- 4 Mb of on-chip dual-ported SRAM per DSP
- Integrated I/O processor with fourteen-channel DMA controller, six 100 Mbyte/sec link ports, and two 100 Mbit/sec serial ports

External Memory

- 64-512 MB of SDRAM (standard 144-pin SODIMM) available to ADSP-21160s at 50 MHz
- 2 MB FLASH RAM available on 8-bit peripheral bus

Link Ports

- 4 link ports extend from the ADSP-21160s (1 link from each) to external connectors
- 4 link ports extend from the ADSP-21160s (1 link from each) to the PMC+ site
- 16 link ports dedicated for interprocessor communication (bi-directional ring)
- Entire board is link-bootable via single external link port

Serial Ports

- 4 serial ports extend from ADSP-21160s (1 from each processor) to external connectors
- 1 serial TDM bus is connected between all ADSP-21160s, PMC+ site, and external connector
- RS-232 port available to all processors via Sharc FIN 8-bit peripheral bus

PMC and PMC+ Interfaces

- PMC interface provides connection to standard PMC modules
- PMC+ interface provides connection to standard PMC modules and link and serial port connection to proprietary I/O modules for high-performance, low-latency I/O

SharcFIN ASIC

- 64/66 MHz PCI rev. 2.2 compliant interface (528 burst; 400 MB/s sustained)
- SDRAM controller on SHARC bus; supports up to 512 MB
- SDRAM mapped into PCI memory space
- Programmable interrupt multiplexer: 10 inputs, 7 outputs (supports hardware interrupts in both directions)
- All ADSP-21160 IOP registers and internal SRAM are mapped to PCI memory space
- Supports host- and FLASH-based booting of ADSP-21160 DSPs
- 8-bit, 25 MHz peripheral bus
- Downward compatible with 32-bit, 33 MHz PCI interfaces

PCI Bridge

- Transparent 64-bit, 66 MHz single-load interface from PCI backplane to on-board PCI local bus

Power

- 20W @ 3.3V worst case sustainable
- 1W @ 5V worst case sustainable

Size

- PCI single slot (12.3" × 4.8")

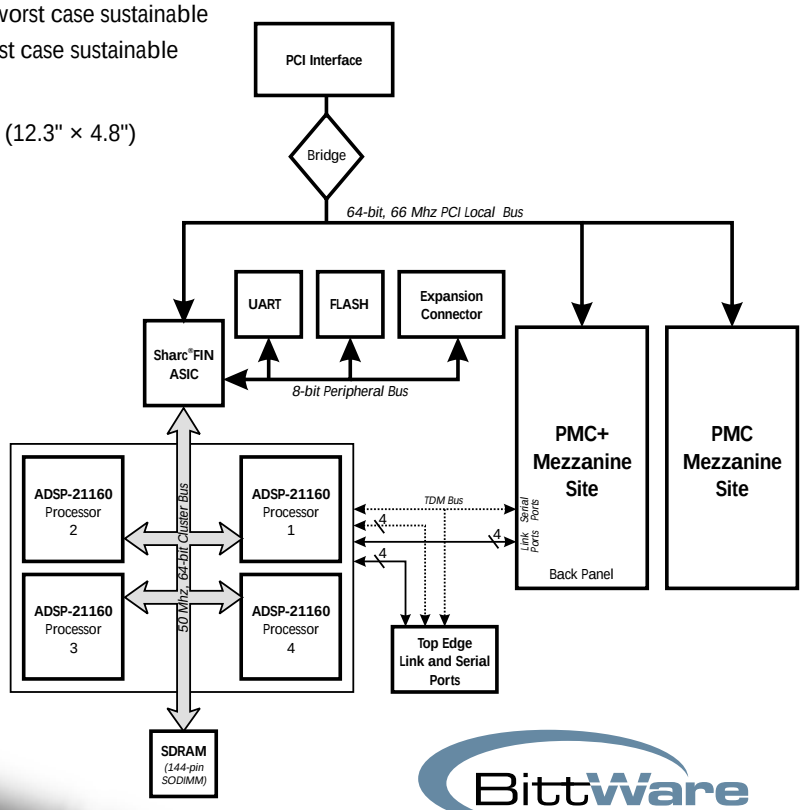
SOFTWARE SUPPORT

Host Interface

- BittWare's software development kit for Windows® 95/98/NT/2000 and Linux contains a C-callable library of board control and communications routines
- Porting kit available for other operating system platforms

Development Tools

- Analog Devices' VisualDSP tools: C compiler, assembler, linker, simulator, and debugger
- BittWare VisualDSP Target for on-board debugging from host without an ICE
- White Mountain DSP ICE emulators
- Eonic Systems' Virtuoso™ operating system
- BittWare SharcLAB interface to MATLAB Simulink® and Real-Time Workshop®
- BittWare SpeedDSP function libraries



Ordering Information

HHPC-XY-ZZ

Processors =X
- 1 DSP =1
- 2 DSPs =2
- 4 DSPs =4

SDRAM =Y
- 64 MB =5
- 128 MB =6
- 256 MB =7
- 512 MB =8

ZZ= Speed*
- 08= 80 MHz
- 10= 100 MHz

* Only available with 80 MHz

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DS-HHPC01-02 (2/01)

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