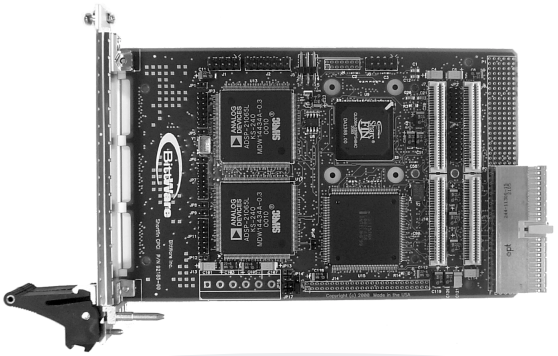
Shortfin-3U-cPCI

Dual ADSP-21065L 3U CompactPCI DSP Board



SHARC Power, 3U CompactPCI Platform

The Shortfin-3U-cPCI is a 3U CompactPCI DSP board based on Analog Devices' low-cost ADSP-21065L SHARC DSP. Combining two SHARC® DSPs, which provide 400 MFLOPS of processing power, with 16 MB of SDRAM, 2 MB FLASH memory for hostless booting, and a 32-bit 33 MHz PCI interface, the Shortfin-3U-cPCI is ideal for embedded computing applications.

ADSP-21065L Processors

The Shortfin-3U-cPCI is configured with two 66 MHz ADSP-21065L processors, each providing 200 MFLOPS. Each SHARC processor also has 544 Kbits of internal dual-ported SRAM, two programmable timers, two serial ports, an integrated I/O Processor (IOP), and twelve flags. The ADSP-21065L processors share a common 32-bit processor bus, which gives them access to the 4M×32 (16MB) bank of SDRAM, 2M×8 (2MB) bank of FLASH memory, and PCI bus interface.

SharcFIN™ ASIC for SHARC DSPs

The Shortfin-3U-cPCI incorporates BittWare's SharcFIN ASIC, which flexibly interfaces the ADSP-21065L DSPs to the 32-bit, 33 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.

I/O Support

The Shortfin-3U-cPCI offers a variety of user I/O options in addition to the 32-bit, 33 MHz PCI interface. It features a PMC+ site, external serial ports, an RS-232 interface, and a digital I/O port. The PMC+ site has front-panel access and allows you to attach a standard PMC module to the board. The PMC+ site also functions as a proprietary interface that allows you to attach BittWare's PMC+ I/O modules for low-latency, high-performance I/O.

One serial port on each SHARC processor is dedicated as an external, 4-channel (2 in/ 2 out) serial port. The remaining serial port on each SHARC DSP connects to a global serial bus that can be configured as either TDM or I²S. All serial ports are brought to connectors at either the back or front panel. The board's UART allows the ADSP-21065L processors to communicate with external serial devices via an RS-232 port, facilitating remote debugging, command, and control. The digital I/O port provides 24 bits of digital I/O to the PMC+ site, 22 bits of digital I/O to back panel user I/O, and one interrupt to each processor. A timer I/O port provides two general-purpose timers per DSP to the back panel and the PMC+ interface.

Available Development Tools

BittWare offers a complete software development kit that allows you to easily develop application code and integrate the Shortfin-3U-cPCI 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® software development tools. 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

- Dual ADSP-21065L SHARC DSPs (200 MFLOPS each)
- Low cost, high performance (400 MFLOPS total processing power)
- 16 MB of SDRAM
- 2 MB of FLASH memory with optional boot loading
- 2 external serial ports @ 133Mbits/s each
- External global TDM/I²S serial bus
- RS-232 UART
- Digital I/O port (24 bits to PMC+, 22 bits to back panel I/O, and 1 interrupt per processor)
- 4 general purpose timers (2 per DSP) to back panel and PMC+
- 3U CompactPCI interface (32-bit, 33 MHz) or standalone operation
- PMC+ mezzanine site for standard PMC modules or for PMC+ low-latency, tightly coupled I/O modules

BittWare

Specifications

BOARD ARCHITECTURE

Processors

- Two 66 MHz Analog Devices ADSP-21065L SHARC DSPs (200 MFLOPS per SHARC)

On-Board Memory

- 4M words × 32 SDRAM (16 MB total) available to the ADSP-21065L at 66 MHz (264 MB/s)
- 2M words × 8 (2MB) FLASH RAM for hostless boot or non-volatile storage
- 544 Kbits of dual-ported SRAM on each DSP

Serial Ports

- Two external serial ports, one per processor; each SHARC serial port has 4 channels (2 in/2 out) @ 33 MHz (either at back or front panel)
- Global serial bus to external connector at 66 Mbits/s; can be configured as either TDM or I^2S (either at back or front panel)
- Global UART provides RS-232 port (10-pin IDC header)

Digital I/O Interface

- 12 bits of digital I/O from each DSP (24 total) to the PMC+
- 11 bits of digital I/O from each DSP (22 total) to back panel I/O
- 1 interrupt from each DSP to back panel I/O
- 4 timers (2 per DSP) to back panel and PMC+

PMC+ Interface

- Provides connection to standard PMC modules
- Provides TDM serial bus and digital I/O connection to BittWare's PMC+ I/O modules for high-performance low-latency I/O

SharcFIN ASIC

- 32/33 MHz PCI rev. 2.2 compliant interface (528 burst; 400 MB/s sustained)
- Programmable interrupt multiplexer: 10 inputs, 7 outputs (supports hardware interrupts in both directions)
- All ADSP-21065L IOP registers are mapped to PCI memory space
- Supports host- and FLASH-based booting of ADSP-21065L DSPs
- 8-bit, 25 MHz peripheral bus

Power

- 6W @ 3.3V worst case sustainable
- 1W @ 5V worst case sustainable

Size

- 3U single slot (160mm × 100mm)

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

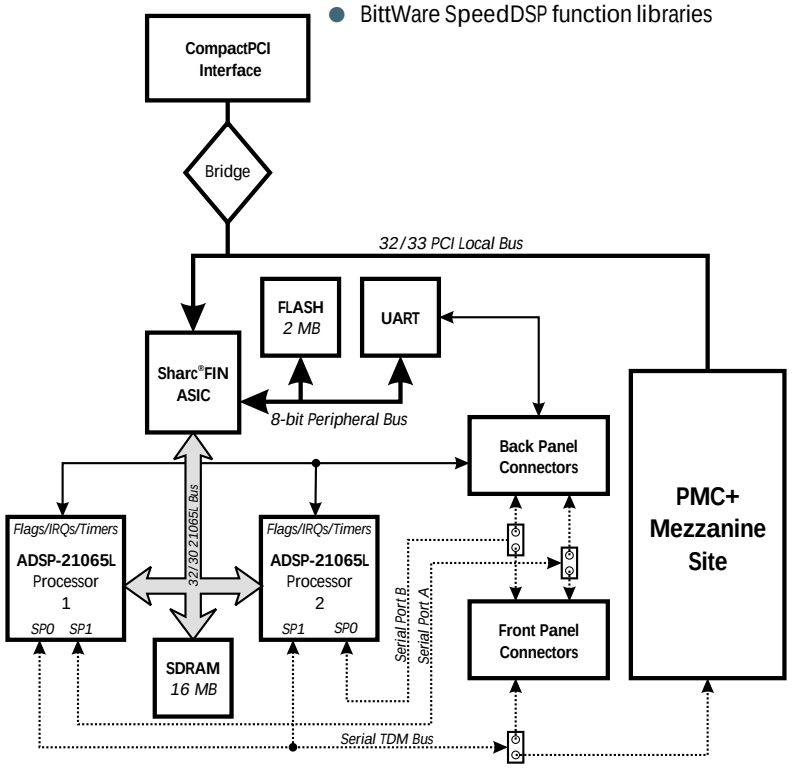
Development Tools

- Analog Devices' VisualDSP tools: C compiler, assembler, linker, simulator, and debugger
- 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

SF3U-23-XYAB

- Processors =2
  - 2 DSPs =2
- SDRAM =3
  - 16 MB =3
- B= Serial Port B Connection
  - F= Front Panel
  - B= Back Panel
  - N= No serial connectors
- A= Serial Port A Connection
  - F= Front Panel
  - B= Back Panel
  - N= No serial connectors
- Y= Power Configuration
  - S= Standalone
  - C= cPCI
- X= Processor Speed
  - 0= 60 MHz (180 MFLOPs/DSP)
  - 6= 66 MHz (200 MFLOPs/DSP)



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