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BittWare SIGNAL PROCESSING SYSTEMS

T2-PCI

Quad ADSP-TS201 TigerSHARC PCI-X Board



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Product Overview

ATLANTiS supported (view ATLANTiS framework details)

BittWare's T2-PCI (T2PC) DSP board features the ADSP-TS201 TigerSHARC processor from Analog Devices. To take full advantage of this high-performance DSP, this multiprocessor PCI-X board implements BittWare's ATLANTiS framework, which combines robust TigerSHARC processing with the versatile Virtex-II Pro FPGA from Xilinx to offer ultra high performance and unprecedented I/O bandwidth.

The T2PC matches a cluster of four ADSP-TS201 TigerSHARCs with:

- High-bandwidth, low-latency off-board I/O, reconfigurable for nearly any application
- High-speed interprocessor communication network to facilitate scalability
- SharcFIN PCI-DSP bridge for integrating DSPs with PCI bus and other peripherals
- Comprehensive software for ease-of-use

The board also provides a large on-board bank of SDRAM, flash memory for hostless boot, and a PMC site for adding additional processors or I/O capabilities.

High-Performance TigerSHARC Processing

The T2PC features a cluster of four ADSP-TS201 TigerSHARC DSPs, which are interconnected by a 64-bit, 83.3 MHz cluster bus. The ADSP-TS201 processor operates at up to 600 MHz, providing 3.6 GFLOPS of peak processing power. Because of its superscalar architecture, the ADSPTS201 is also efficient at fixed-point processing, with each DSP supporting 14.4 BOPS of processing. Along with 24 Mbits of on-chip RAM, each DSP also boasts four high-speed LVDS link ports. Each full-duplex link port is comprised of a 4-bit transmit and a 4-bit receive channel, and can

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MBytes/s per channel).

SharcFIN PCI-DSP Bridge

The T2PC features a BittWare SharcFIN PCI-DSP bridge chip that gives the DSPs low-overhead access to the host and PMC site via the 64-bit, 66 MHz PCI interface. The SharcFIN also provides a general purpose peripheral bus that allows the DSPs to access the Flash and the FPGA control registers. It also provides host access to the DSPs, on-board SDRAM, Flash, and FPGA control registers.

High-Bandwidth, Low-Latency Off-Board I/O

The T2PC boasts a tremendous amount of I/O bandwidth and options, including a PMC site with BittWare's PMC+ I/O extensions, high-performance digital I/O headers, and eight RocketIO high-speed serial transceivers. Total potential I/O bandwidth is greater than 4 GBytes/s.

Xilinx Virtex-II Pro FPGA

A Xilinx Virtex-II Pro (XC2VP30) FPGA adds tremendous flexibility to the board and is useful for routing communications, translating protocols, and implementing algorithms. It is used to implement eight on-board TigerSHARC link ports and supports a variety of external digital I/O (DIO), flags, and interrupts. The Virtex-II Pro's eight RocketIO high-speed serial transceivers, which are brought off-board, provide additional external communications.

ATLANTiS: A Superior Framework for a Superior Processor

To facilitate off-board I/O and provide communications routing and processing, the T2PC features BittWare's ATLANTiS framework, which is implemented in the Xilinx Virtex-II Pro FPGA. All off-board I/O for the board, which includes external link ports and digital I/O blocks, is routed through the FPGA, which can support a throughput of 4 GBytes/s. By tightly integrating the DSPs, PCI bridge, PMC interface, and I/O peripherals with the onboard FPGA, ATLANTiS gives designers nearly infinite options for configuring and routing the I/O.

The eight bi-directional TigerSHARC link ports routed to the ATLANTiS FPGA provide 2 GBytes/s of data transfer between the DSP cluster and the FPGA. Using its eight RocketIO high-speed serial transceiver channels and its digital I/O blocks, the FPGA can communicate off-board at greater than 4 GBytes/s. It can be configured to connect I/Os to each other or to the ADSP-TS201 link ports, allowing any combination of inputs and outputs to be routed together. The digital I/O blocks include PMC+ and high-performance off-board connectors. Each digital I/O signal can also be individually configured as single-ended or LVDS.

ATLANTiS adds tremendous flexibility to the DSP subsystem, allowing system designers to route the link ports and digital I/O blocks as their specific applications require.

T2 Board Family

The T2PC is part of BittWare's T2 board family, which features the ADSP-TS201 TigerSHARC DSP on a variety of platforms. The boards all feature a common, scalable architecture - ATLANTiS - and are available in PCI-X plug-in, PMC, VME, and 6U CompactPCI form factors.

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