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Find the *SKY Computers Merlin 500* at our website: *Click HERE*

TECHNOLOGY SOLUTIONS

- VXS Product Family
- InfiniBand Architecture
- VME SKYchannel

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Merlin 500 PowerPC Daughtercard



Based on the advanced MPC7410 PowerPC™ with AltiVec™ technology, the Merlin 500 compute daughtercard delivers up to 16 GFLOPS of processing performance in a single 6" x 6" board for the most demanding applications. With SKY Computers' architecture Merlin 500 is configured on 6U and 9U boards and easily integrated into high performance computing systems.

Merlin 500 capitalizes on the new AltiVec technology-based 500 MHz MPC7410 PowerPC by supporting high-speed processing with both high-speed memory and high-speed communication. SKY has implemented the 250 MHz level 2 cache in the MPC7410 to provide developers with both high performance compute and the I/O power to maximize total computational throughput.

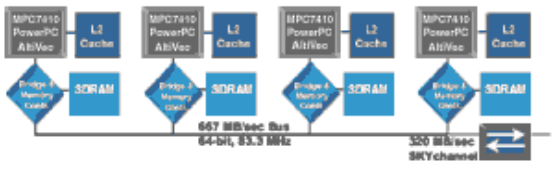
The communication interconnect between Merlin 500 boards, chassis, and systems is provided by the ANSI standard SKYchannel 320 MB/sec packet bus architecture. Multiple simultaneous SKYchannel connections facilitate fast communication throughout the system hierarchy to continually provide maximum throughput. The SKYchannel communications back bone provides high speed communication and fast data transfer performance while maintaining the programming ease of a 16 terabyte shared memory architecture.

The SKYvec® development tools simplify code development for large multiprocessor systems by automating many of the processes which otherwise would have to be designed or managed by the programmer. SKYvec eliminates the need for time consuming and costly software ports, training classes, and on-site vendor support by making development easier than ever before.

Balanced Performance

- 16 GFLOPS per daughtercard
- 16 GFLOPS in a 6U slot, 64 GFLOPS in a 9U VME slot
- 64 to 256 MB SDRAM per processor
- 2 MB of 250 MHz backside L2 cache
- 2.66 GB/sec L2 cache
- 667 MB/sec memory bandwidth on each processor
- 667 MB/sec inter-processor communication
- 320 MB/sec off-board communication via SKYchannel Backplane

More GFLOPS per Watt, per $, or per Square Inch



Merlin is available for SKY Computers' 6U and 9U VME boards and the HPC computer systems. Merlin uses four 500 MHz MPC7410 PowerPC processors configured in a cluster on each daughtercard to provide up to 16 GFLOPS of performance. Each MPC7410 has its own local bank of 64, 128 or 256 MB of SDRAM that is accessed over the processor's 83.3 MHz local memory bus at 667 MB/sec. The memory of other processors on the daughtercard can also be accessed over the 667 MB/sec local bus. Global memory and memory on other daughtercards is accessible through the 320 MB/sec SKYchannel interface.

The MPC7410 processors are directly connected to a 64-bit SKYchannel motherboard interface. A DMA engine in the SKYchannel interface enables computing to occur concurrently with the transfer of data anywhere in the 16 Terabyte memory-mapped SKYchannel address space. The application developer can choose between memory

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mapped access or advanced DMA access to shared memory with equally efficient SKYchannel access.

Multiprocessor Software

The advanced capabilities of the SKYvec® Software Development Environment, make Merlin 100% compatible with earlier generations of SKY products. A simple recompile and run accesses all of the new capabilities of the new Merlin. Migration from other vendors' platforms is nearly as easy.

Merlin makes full use of SKYvec, including intelligent compiler technology that automatically optimizes and vectorizes application code. The SKY Standard Math Library contains several hundred math, image, and signal processing functions. SKY/VSIPL simplifies multiprocessor development and ensures portability across platforms. The TimeTrac Multiprocessor Event Analyzer provides insight into the dynamic interactions between processors for multiprocessor optimization and debugging.

Technical Support and Warranty Programs

SKY's commitment to quality begins with the industry's longest standard hardware warranty. All SKY hardware products, including the Merlin, have a standard one year warranty. Throughout your development and deployment, SKY's experienced technical support engineers follow up with the support you need when you need it.

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Merlin Specifications

Performance 16 GFLOPS

MPC7410 PowerPC Processor
Quantity: 4 per Merlin
Frequency: 500 MHz
L1 Cache: 32k instruction, 32k data
Floating Point Unit: IEEE 754 single- and scalar
Fixed Point Units: Dual 32-bit Integer Units
Vector Instructions: Full 128 bit AltiVec implementation 8, 16, 32 bit integer, single-precision floating point

L2 Cache
Size: 2 MB Backside
Bandwidth: 64-bits wide @ 250 MHz

Memory Architecture
Size: 64, 128, or 256 MB SDRAM per processor
Bandwidth: 64-bits wide @ 83.3 MHz

Daughtercard Interface
Type: SKYchannel Packet Bus (ANSI/VITA 10-1995)
Data Size: 64 bits data per word, Up to 128 data words per packet
Throughput: 320 MB/sec
Addressing: 44-bit addressing, 16 Terabyte address space

Environmental Requirements
Temperature: 0 to 40C, operating, -40 to 85C, non-operating
Humidity: 5%-95%, non-condensing
Air Flow: at least 300 LF/min
Altitude: 0 feet-11,000 feet above sea level

Electrical Requirements
Power Consumption: 40 Watts

Physical
Dimensions: 6" x 6" daughtercard
Slot-to-Slot Spacing: .80 inches (including motherboard)
Net Weight .53 pounds

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