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CHAMP-AV

High Throughput DSP with Concurrent Multi-Processing Architecture.

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Board Photo

Overview

The CHAMP-AV is the latest in the line of high-performance Digital Signal Processing (DSP) solutions from Ixthos.

The CHAMP-AV provides over 14.4 GFLOPS of floating point performance in a single VMEbus compatible 6U slot. Supporting various high speed/high performance versions of the PowerPC™ G4 (with AltiVec™) and G3 (755) microprocessors from Motorola, the CHAMP-AV is ideal for a diverse range of real-time/hard-deadline digital and signal processing applications. Unique to the CHAMP-AV, the architecture supports two industry standard, PCI-based Mezzanine Cards (PMCs) providing a flexible and powerful I/O architecture that enables very high data flow rates and throughput.

Click here to view diagram full size

Architectural Diagram

The heart of the CHAMP-AV is its advanced, optimized data flow architecture (see Figure 1, pg.2). The CHAMP-AV board is segmented into three isolated 64 bit, 66MHz PCI bus sections allowing the Core Processing Element (CPE) PowerPC processor access to the VMEbus concurrently with I/O data transfer operations between either PMC sites and the four individual DSPs. The internal 64 bit/66 MHz PCI bridges allow concurrent and efficient data transfers between the independent DSP Signal Processing Elements (SPE) and the PCI bus sections which are100% backward compatible with standard 32 bit/33MHz PMC modules. The embedded PowerPC CPE processor has access to the VMEbus, PMC I/O sites, and each SPE's local memory, allowing for flexible, free data flow and real-time control path implementations.

Motorola

Extended temperature, rugged air- and conduction- cooled versions of the PowerPC-based CHAMP-AV - which are ideal for applications in harsh aerospace, ground mobile and industrial environments, including tactical and strategic avionics, Vetronics, naval and space-based applications - are available from DY 4 Systems, Inc.

Features

Processors

Up to four MPC7400® AltiVec PowerPC™ G4 RISC microprocessors at 350-500 MHz (or four PowerPC MPC755® processors at 300-450 MHz)

- Over 14 GFLOPS floating point performance (four G4s at 450 MHz)
- 200 MHz MPC8240 PowerPC core processor provides SmartDMA™ or additional 6.1 SPECint95

Enhanced I/O

- Support for two industry standard 32 bit / 33MHz or 64/66 PMC I/O expansion modules, 3.3 or 5V
- Primary internal PCI bus: 64 bits/66MHz
- Advanced CHAMP (Common Heterogeneous Architecture for Multi-Processing) architecture allows concurrent PMC I/O, internal and VMEbus transfers
- Bridges support up to 500 Mbytes/sec of cumulative, on-board, simultaneous I/O data movement
- Two MPC107 Chaparral memory bridges support dual DMA channels each for local 32 bit wide transfers

- PCI/PMC I/O expansion over P0 or P2 connectors
- Advanced Universe IIb VMEbus host interface
- Multi-channel interrupt multiplexer to control real-time applications

Onboard Memory

- Global SDRAM - 32 to 64 Mbytes, 64 bits wide, 100MHz
- Local SDRAM - 32 to 128 Mbytes per PowerPC pair, 64 bits wide, 100MHz
- L2 cache - 1 to 2 Mbytes SBSRAM per PowerPC
- Flash - Globally accessible 8 to 16 Mbytes onboard IXAtools Software Support
- IOPlus with SmartDMA embedded runtime
- IXAbsp O/S board support libraries
- HostAPI utilities and DSP Math libraries

Multiple Environmental Grades

- Air-cooled commercial versions
- Range of air- and conduction-cooled ruggedization levels, available from DY 4 Systems, Inc.

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