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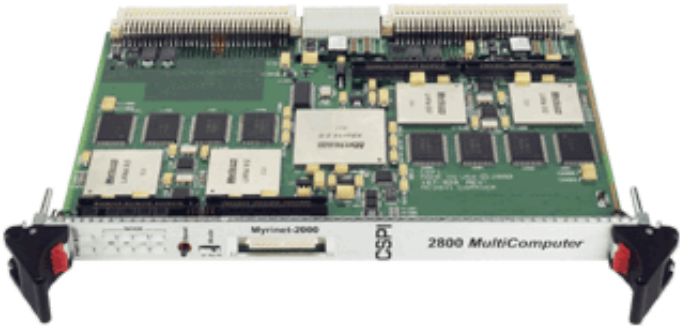
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Find the *CSPI MC2841* at our website: *Click HERE*

2841 MultiComputer

2841 & 2821 MultiComputer

Scalable System Solutions Balancing Space, Power & Price with Next Generation Processor Technology



2841 MultiComputer

Incorporating the latest processor, memory and interconnect technology the 2841 MultiComputer utilizes the AltiVec™ chip and offers 1 GB of ECC SDRAM, while concurrently optimizing I/O bandwidth with the 250/250 MB/s Myrinet network fabric. The MPC7400 processor combined with Myrinet 2.0 gigabit-per-second network technology allows the 2841 MultiComputer to deliver an open and expandable system solution for high performance and signal processing computing applications. Packaged in an industry standard 6U VME form factor, the 2841 MultiComputer delivers over 14 GFLOPS of peak computational power for a variety of applications, including Radar, Sonar and Simulation.

Two-Level MultiComputer

The 2841 MultiComputer uses the same two-level MultiComputer architecture as other processor modules in the 2000 SERIES family. It is designed with a 16 port crossbar switch which interconnects the four processing nodes on the board and allows for additional off-board communication. Each processing node consists of two levels: a first level for managing network communications, and a second level for compute processing. The 64-bit Local Area Network Application Interface (LANai) includes a 32-bit RISC processor, a dedicated 2 MB fast buffer memory (SRAM), the Myrinet-2000™ high-speed network interface and DMA engines for packet control. The second level, for compute processing, consists of a processor interface, a MPC7400

processor with AltiVec™ with 1 MB of L2 Cache, 256 MB of SDRAM and 32 MB of flash memory for fast boot-up and self-test. With this implementation, data transfers minimally impact floating computational speed. The high-performance, scalable two-level MultiComputer design, utilizing the latest processor technology, makes the 2841 MultiComputer the best choice for scalable real-time embedded applications.

Features	Benefits
Four MPC7400 PowerPC Processors with AltiVec Technology per Board	**Offers 14 GFLOPS Peak Computational Power**
Hot Swap Switches	**Enable live insertion so failed nodes may be replaced without disrupting system or network operations**
ISSPL Library Combined with AltiVec Chip Technology	**Delivers Significant Price-Performance Improvements**
29 Microseconds 1K Complex FFT	**Provides Greater Speed for Critical Algorithms**
1 GB ECC Memory	**Provides fast access to memory for applications requiring large data space**
Myrinet-2000 SAN Port	**Provides 500 MB/s (full duplex) of I/O Bandwidth for Network MultiComputing**
Optimized Industry Standard Software: VxWorks RTOS, ISSPL & MPI	**Allows Portable Software Development in a Standard Environment**
Graphical Interfaces Development Tools: Tornado II, GEDAE & RTExpress	**Creates a Flexible, User- Friendly Environment for Set up, Configuration and Debugging of a Multiprocessing Platform**

Software

CSPI provides a total system software solution so users may quickly develop and run complex real-time applications. The foundation for this software is the industry standard VxWorks Real-Time Operating system (RTOS). This efficient RTOS incorporates such features as a scalable run-time kernel to conserve code pace and support for many different Application Programming Interfaces (API's). Integrated communication routines support data transmission over the Myrinet fabric. TCP/IP is supported throughout the Myrinet network. This protocol permits standard services across heterogeneous processors.

The Message Passing Interface (MPI) parallel programming library provides multiprocessor control and interprocessor communication. This library of 128 functions provides a simplified way for the programmer to associate specific data with specific processes. The MPI library provides the functions necessary to create dynamically scalable applications. An application may be written on a few processing nodes for simplicity, and then easily expanded to invoke additional nodes for faster execution. The Industry Standard Signal Processing Library (ISSPL-ALT) is a library of approximately 250 functions for signal and image processing applications that is highly optimized for use on the AltiVec. Compute-intensive functions are hand-coded to speed up execution time. The remainder of the functions use C compiled code optimized for speed. The ISSPL-ALT reduces programming complexity by providing a single calling function for complex mathematical and signal processing routines. Both development and execution times are ignificantly improved. The ISSPL-ALT provides a full complement of routines to take advantage of the floating-point arithmetic capabilities of the AltiVec. All routines are callable from C and C++ complied programs to achieve rapid and efficient program development. This software environment makes it easy to develop portable applications. The code can be developed on a workstation and then retargeted for deployment on the 2000 SERIES system with minimal modifications.

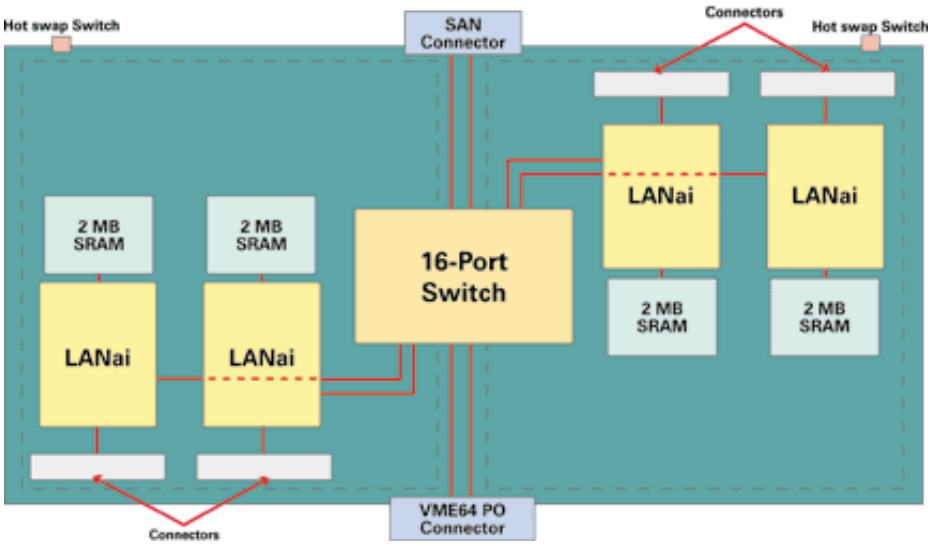
Hardware

Modular Design

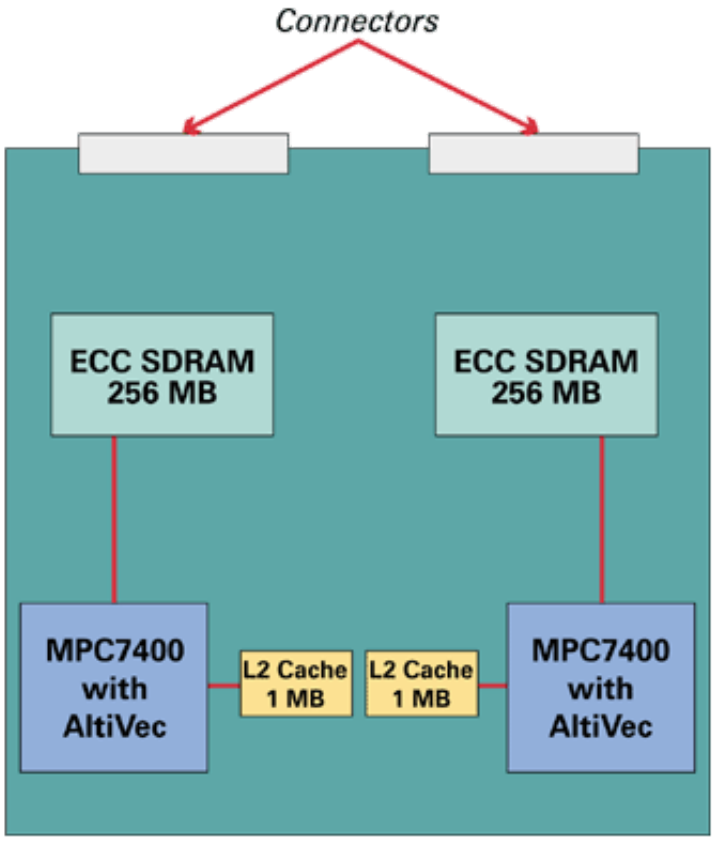
The versatile design of the 2841 MultiComputer provides the flexibility needed for developing a powerful real-time embedded system. The 2841MultiComputer layout consists of a carrier board and two mezzanine modules. The carrier board is based on a Myrinet-2000 interconnect scheme utilizing a 16-port Myrinet switch. Four of the ports interconnect the processing nodes of the board set.

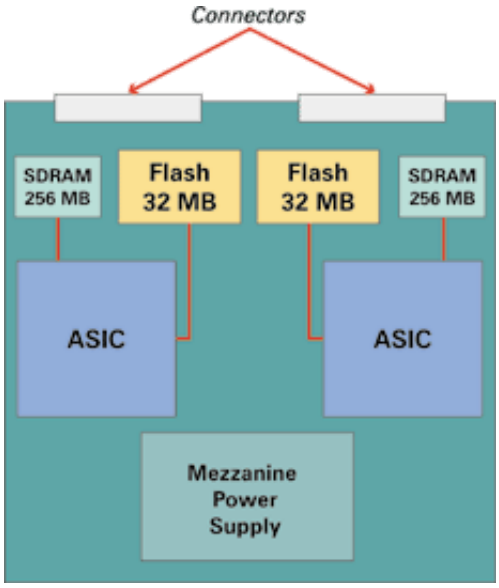
2841 MultiComputer Carrier Board

The additional ports allow for off board communication. For smaller applications involving a less compute-intensive processing environment CSPI offers the lower cost 2821 MultiComputer. Providing the same compute power per processor, the 2821 configuration simplifies your hardware solution with a single mezzanine module and only two processing nodes coupled with the Myrinet interconnect carrier board.



Mezzanine Module





TopBottom

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Specifications

2000 SERIES	***2841 MultiComputer***	***2821 MultiComputer***
Floating Point Compute Power	14 GFLOPS	7 GFLOPS
1K Complex FFT (zero data)	29 Microseconds	29 Microseconds
Processor (MPC7400)	1 per Processing Node 4 per Board	1 per Processing Node 2 per Board
Compute Processor		
Processor		
Processor Model	MPC7400 with AltiVec	MPC7400 with AltiVec
Internal Processor Clock	400 MHz	400 MHz
System Clock	100 MHz	100 MHz
L2 Cache		

Memory Size	4 @ 1 MB (64 bit @ 200 MHz)	2 @ 1 MB (64 bit @ 200 MHz)
Transfer Rate	4 @ 1.6 GB/s	4 @ 1.6 GB/s
SDRAM (ECC)		
Memory Size	4 @ 256/128 MB (up to 1 GB per board)	2 @ 256/128 MB (up to 512 MB per board)
Data Transfer Rate	64 bit @ 100 MHz Reads 640 MB/s Writes 800 MB/s	64 bit @ 100 MHz Reads 640 MB/s Writes 800 MB/s
Flash		
Memory Size	4 @ 32 MB (128 MB per board)	2 @ 32 MB (64 MB per board)

Network Communications (First Level)

Network Standard	Myrinet on VME Specification (ANSI/VITA26-1998)	Myrinet on VME Specification (ANSI/VITA26-1998)
Network Interface Controller		
NIC Model	Myrinet LANai 9	Myrinet LANai 9
RISC Memory	4 @ 2 MB SRAM (64 bit)	4 @ 2 MB SRAM (64 bit)
RISC Clock Rate	66 MHz Processor @ 132 MIPS	66 MHz Processor @ 132 MIPS
Bus Transfer Rate	532 MB/s (peak)	532 MB/s (peak)
Network Switch	1 @ 16 Port (4 internal/4 external)	1 @ 16 Port (4 internal/4 external)
Myrinet Internal Ports	4 SAN Ports 500 MB/s per port (250 MB/s in & 250 MB/s out)	4 SAN Ports 500 MB/s per port (250 MB/s in & 250 MB/s out)
	4 SAN Ports	4 SAN Ports

Myrinet External Ports	500 MB/s per port (250 MB/s in & 250 MB/s out)	500 MB/s per port (250 MB/s in & 250 MB/s out)
	Electrical/Mechanical	
Packaging Standard	6U VME64 Extensions	6U VME64 Extensions
I/O Connectors		
Myrinet on Front Panel	40 Pin, Dual SAN (AMP Microstrip)	40 Pin, Dual SAN (AMP Microstrip)
VME P0 Backplane *(with Myrinet)*	95-Pin P0 IEC 1076-4 101 Type B 19 Position 5 Row 2mm HM	95-pin P0 IEC 1076-4 101 Type B 19 Position 5 Row 2mm HM
Weight	2.6 lb. (1.18 kg)	1.8 lb. (0.82 kg)
	Environmental (Operating)	
Operating Conditions	Level 1	Level 1
Temperature Range	0° C to 40° C @ 12CFM	0° C to 40° C @ 12CFM
Altitude	up to 10,000 ft	up to 10,000 ft
Humidity (noncondensing)	5% to 90%	5% to 90%
Shock	15 gs @ 11 ms, half sine	15 gs @ 11 ms, half sine
Vibration (random)	0.002 G^2/Hz 10-2000 Hz	0.002 G^2/Hz 10-2000 Hz
Vibration (sinusoidal)	2 G 5-500 Hz Swept Sine	2 G 5-500 Hz Swept Sine

For temperature, altitude and air flow trade off, consult CSPIAll specifications are subject to change

Last Update: September 15, 2004

Product Reliability

The high reliability of CSPI Products results from dedicated work in six critical areas: 1) ISO Compliance 2) Adherence to Standards 3) Manufacturing Procedure Standards that Meet the

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Guidelines of IPC-A-600 4) Wide Range of Environmental Acceptance Criteria 5) Life History Database Control 6) Operational Burn-in**Warranty Information**

	Hardware	Software
Basic Warranty (included)	1 Year from Date of Shipment	90 Days from Date of Shipment
Extended Warranty (optional)	2 Years from Date of Shipment	1 Year from Date of Shipment
Maintenance Service Contract (optional)	Renewable	Renewable
Out of Warranty Repair	Maintenance Service Contract Available or Unit Repair Service at Published Price	Maintenance Service Contract Available Only

Warranty Features

	Basic Warranty	Extended Warranty	Maintenance Service
Technical Hot-line	✓	✓	✓
Software			
Patches and Bug Fixes	✓	✓	✓
Version Upgrades	✓	✓	✓
Hardware			
Repair or Replacement	✓	✓	✓
Engineering Change Orders Notification	✓	✓	✓
Exchange Program		✓	✓

For more information on CSPI MultiComputer Warranty Program,contact your Sales Manager or call CSPI Multicomputer

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