

# VX6-200CC Dual Dual-Core Xeon® VXS Conduction-Cooled Single-Board Computer

State-of-the-Art Performance Levels for Compute-Intensive Applications

- Brings server-level performance to a single VME slot
- 4-way SMP configuration eases porting from existing configurations
- Abundant I/O interfaces with easy connectivity
- Single PMC-X/XMC expansion site for added versatility
- Bridges the gap from legacy to industry-standard I/O
- Conduction-cooled versions

The VX6-200CC Dual Dual-Core Xeon® VXS Conduction-Cooled Single-Board Computer (SBC) from Mercury Computer Systems delivers unprecedented levels of performance with dual dual-core Intel® Xeon® processors in an air-cooled format. The architecture supports 4-way symmetric multiprocessing (SMP), which provides significant performance advantages for compute-intensive applications in harsh environments, while requiring minimal software porting.

The numerous I/O interfaces include quad Gigabit Ethernet, RS-232 serial I/O, high-speed serial ATA-150 (SATA), USB 2.0. For added versatility and flexibility, the VX6-200CC features a single-wide PMC-X/XMC expansion site that supports rear I/O.

## Processor Circuit

The dual-core Intel® Xeon® processors coupled with the Intel® E7520 Memory Controller Hub (MCH) and Intel® 6300ESB I/O Controller Hub (ICH), provide the processing power for even the most demanding embedded computer environments.

The MCH supports three PCI Express® x8 links, each capable of bandwidths of up to 2 GB/s, a 667-MHz front side bus with parity, and dual DDR2-400 ECC memory interfaces that can access up to 4 GB of memory.

The ICH provides a wealth of I/O functionality, including a SATA-150 host controller, 16550-compatible UARTs, EHCI USB 2.0 host controllers, and an IDE Ultra ATA-100 controller. The ICH supports a wide range of system configurations and system management functions, including advanced programmable interrupt controller, an enhanced four-channel DMA controller for moving large blocks of data efficiently, and an LPC interface for connecting to a firmware hub and IPMI BMC controller.

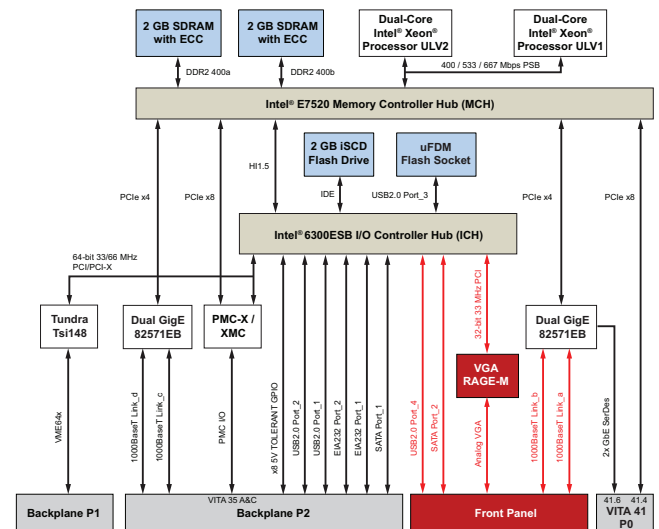
## Gigabit Ethernet

A dual Gigabit Ethernet controller provides two ports to the backplane on the VME P2 connector. The Gigabit Ethernet controller is connected directly to the MCH via PCI Express®, allowing maximum bandwidth potential.

## Serial, USB, and Mass Storage Interfaces

Serial I/O technology is changing, and the VX6-200CC helps bridge from legacy asynchronous RS-232 serial I/O to industry standard USB 2.0 connectivity. Legacy asynchronous RS-232 serial I/O is supported via two dedicated serial ports at the backplane. For high-speed USB connections, the VX6-200CC includes two additional USB ports at the backplane.

One SATA port from the ICH is routed to the VME P2 connector. The IDE iSCD is an embedded single-chip flash drive with a 2-GB capacity.



Red components are depopulated on conduction-cooled board.

Figure 1: VX6-200CC functional block diagram

## Conduction-Cooled for Harsh Environments

The VX6-200CC is among the most powerful commercial off-the-shelf (COTS) multiprocessing systems available for deployment in extreme environments. Designers now have the ability to position high-performance signal processing solutions alongside system sensors in the harshest environments, including excessive heat or cold, humidity, shock and vibration, little or no airflow, as well as dirty or corrosive atmospheres.

## Software Support

The VX6-200CC supports the following operating systems:

- Linux® 2.6 Fedora Core 7
- Windows® XP Professional
- Windows Server 2003

## PMC-X/XMC Site

The face of expansion I/O cards is changing, and the VX6-200CC is bridging the gap by supporting, in one single-wide PMC-X/XMC site, both traditional IEEE 1386/1386.1 64-bit PCI mezzanine cards (PMC-X) and the latest VITA 42.3 switched mezzanine cards (XMC) with PCI Express.

Switch fabric solutions are quickly increasing throughout the embedded computer industry, and the VX6-200CC allows the system integrator to take advantage of this emerging technology today. XMC modules can more than double the bandwidth (2 GB/s each direction with 8 lanes) of traditional PMC modules (1 GB/s with PCI-X), while maintaining the flexibility of modular expansion. The PMC-X site supports both PCI-X and PCI running at up to 66 MHz.

## Specifications

### Dual-Core Intel® Xeon® Processors

Two Dual-Core Intel® Xeon® processors ULV at 1.66 GHz

### Intel® E7520 Memory Controller Hub

PCI Express (PCIe) Three x8 links  
Dual-channel memory interface 2 GB or 4 GB DDR2-400  
Processor system bus interface 667 MHz

### Intel® 6300ESB I/O Controller Hub

16550-compatible UARTs  
Two USB 2.0 ports  
IDE port with 2-GB flash drive

### Firmware Hub

BIOS™ storage (write-protected)

### Gigabit Ethernet

One Intel® 82571EB dual-port Gigabit Ethernet MAC/PHY chips  
Two link ports available at the P2 backplane

### Serial RS-232 I/O

Two asynchronous serial RS-232 port interfaces at P2 backplane

### USB 2.0

Two USB interfaces at P2 backplane

### SATA

SATA port at P2 backplane

### GPIO

8 GPIO pins available on the J2 backplane (5V tolerant)

### PMC-X/XMC Site

IEEE 1386/1386.1 PCI mezzanine card  
VITA 39 PMC with PCI-X running at up to 66 MHz  
VITA 42.3 XMC switched mezzanine card with PCI Express  
User I/O pins routed to J2 per VITA 35

Note: Only hybrid PMC-X/XMCs with single J15 populated are supported. PMC-X/XMCs or XMCs with J16 populated are not compatible.

### Backplane Interface

Backplane Interface  
System controller or peripheral card operation through the backplane bridge  
VME64 Tundra® Tsi148™ PCI-to-VME bridge

Note: The VX6-200CC brings SATA signals to connector P1 and is not compliant with ANSI/VITA 1-1994(R2002), possibly requiring the use of a special backplane.

### Dimensions

Form factor 6U VME per VITA 41  
Height 9.2 in (233 mm)  
Depth 6.3 in (160 mm)

### Weight

1.2 lb (0.544 kg) air-cooled

### Power Requirements

5V, 3.3V Required from backplane  
±12V As required by PMC module

## Specifications

### Power Consumption\*

Dual processor, dual memory configuration

5V	34W
3.3V	42W
Total	76W

\* Power consumption values are estimates of worst-case conditions.

### Environmental Specifications

Temperature

Operating	-40°C to +71°C, conduction-cooled
Storage	-40°C to +71°C, conduction-cooled

Humidity (air cooled) 0-100%, conduction-cooled (conformal coat)

Shock 50 z-axis; 80g x/y axis; 11 ms half-sine

Vibration 0.1g<sup>2</sup>/Hz at 5-2000 Hz, 1 hr/axis, conduction-cooled

Airflow 270 LFM minimum, air-cooled

Altitude

Operating	0-70,000 ft, Level 3 conduction-cooled
Storage	0-100,000 ft, conduction-cooled

### Standards Compliance\*

Safety Designed to meet standard UL1950/60950

Emissions Designed to meet FCC Part15, Sub-Part A

\* VX6-200CC SBC is designed to be certified within a system environment.

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