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Model 4292

Quad TMS320C6203 Processor PMC/VIM - VME



General Information

Designed for applications requiring extremely high-speed signal processing and data transfers, the Model 4292 features four Texas Instruments TMS320C6203 DSPs. Operating at 300 MHz, they deliver a combined peak processing capability of 9600 MIPS.

TMS320C6203 DSP

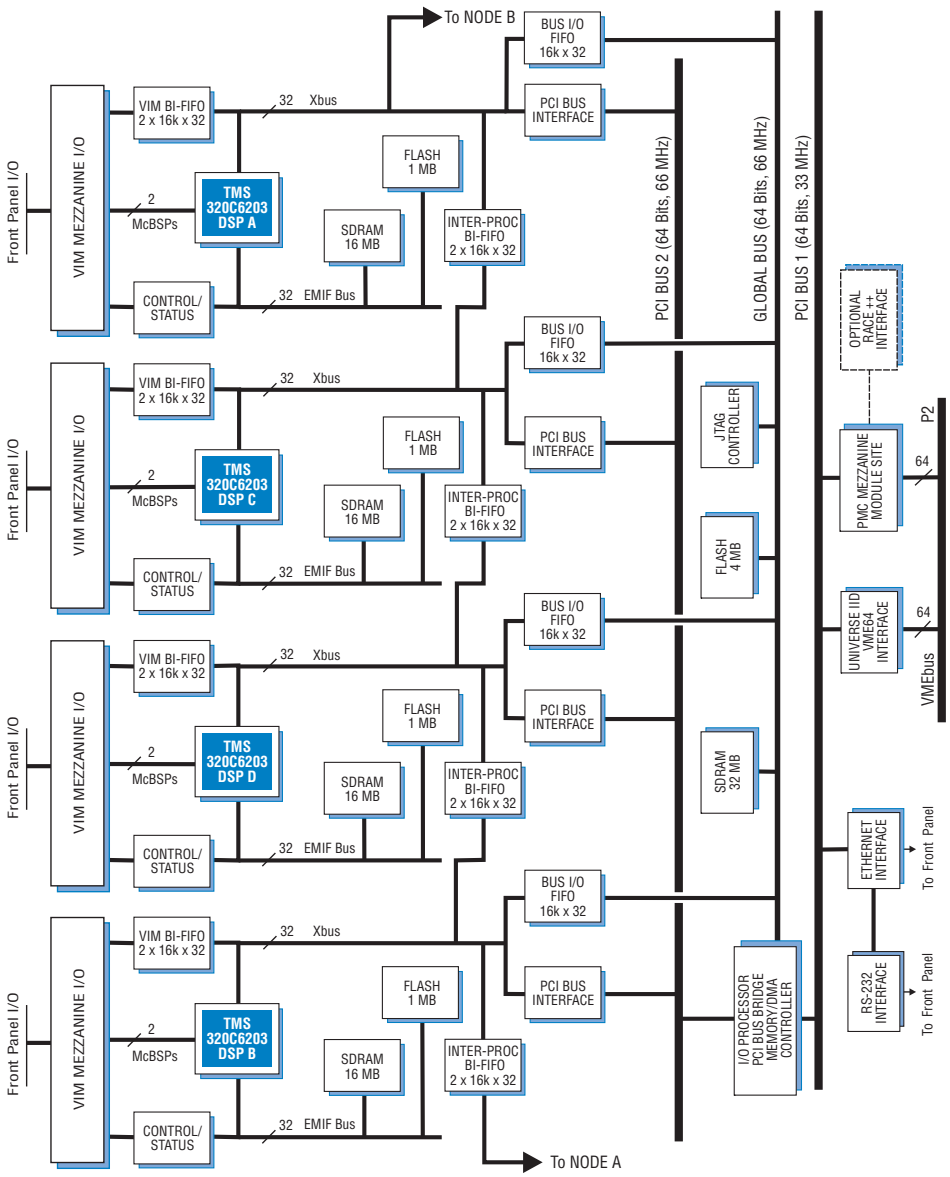
As a member of the C6000 family, the C6203 utilizes TI's 0.15 micron process which delivers 896 kB of on-chip SRAM, 512 kB for data and 384 kB for program, eliminating the need for external memory access in many applications.

The VLIW engine executes up to eight instructions in a single 300 MHz clock cycle, delivering up to 2400 MIPS. The powerful DMA controller transfers data to peripherals over dual 32-bit external data busses at rates as high as 600 MB/sec. Two serial ports easily support popular telecom interfaces.

Overall Circuit Description

Four identical processor nodes contain interface and memory resources ideally matching the I/O capabilities of the C6203 to high-performance system components.

Each node includes local memory, a dedicated high-speed mezzanine interface, interprocessor links, a dedicated bus I/O channel, and connections to powerful shared board resources. ➤



Features

- Four TMS320C6203 DSPs
- 9600 MIPS peak processing power
- High-performance PMC and VIM mezzanine module sites
- Four 300 MB/sec interprocessor BI-FIFOs
- Four 300 MB/sec Bus I/O FIFOs
- Four 8 MB or 16 MB SDRAMs, 600 MB/sec transfer rate
- 32 MB of shared global SDRAM with 528 MB/sec peak transfer rate
- VME64 master/slave interface
- Optional RACE++ interface with transfer rate to 267 MB/sec

PENTEK

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Support Software

Pentek's **SwiftNet** supports a network of distributed VMEbus systems and allows the developer to run development tools on the host, while maintaining remote access to the VMEbus system.

Pentek's **ReadyFlow** Board Support Libraries reduce development time by providing C-language callable functions for hardware initialization, control and operation of board resources.

TI's **Code Composer Studio** provides a comprehensive set of tools for software development including an optimizing C Compiler, an interactive debugger, the DSP/BIOS operating system and an assortment of profiling and optimizing tools.

Ordering Information

Model	Description
4292	Quad C6203 Processor PMC/VIM - VME
Options:	
-005	RACE++ Interface
-320	16 kB VIM and IP BI-FIFO, 16 kB Bus I/O FIFO
-340	16 MB local SDRAM (8 MB std.)

* Contact Pentek for PMC compatibility

VIM Mezzanine

Each processor is equipped with its own VIM (Velocity Interface Mezzanine) connector, providing three types of interfaces. A high-speed synchronous bidirectional FIFO (BI-FIFO) buffers 32-bit parallel data transfers between the mezzanine and the C6203's expansion (EXP) bus at rates up to 300 MB/sec. Two of the C6203's synchronous serial ports are also brought to the mezzanine connector. The External Memory Interface (EMIF) bus of the C6203 provides memory-mapped control and status functions to the mezzanine circuitry.

Local Memory

Two types of local memory resources are provided for each C6203: a 16 MB SDRAM operating with single-wait state access, and a nonvolatile 1 MB flash memory for initialization, self-test and boot code.

Interprocessor BI-FIFOs

Because the C6203 includes no inter-processor communication links, the Model 4292 features four BI-FIFOs joining the EXP busses of each adjacent C6203 in a ring structure. Each C6203 can send and receive interprocessor data blocks at 300 MB/sec without having to arbitrate for a shared resource.

Bus I/O FIFOs

By using a private bus I/O FIFO, each processor can transfer blocks of data to global resources including the VMEbus, global SDRAM, the PMC site, and the optional RACE++ interface. These FIFOs are extremely effective in decoupling the C6203's from these resources and eliminating wait cycles while allowing 300 MB/sec block transfers.

PCI Master Interface

Each C6203 can master the Primary PCI bus for read/write access to RACEway, VMEbus, global SDRAM and the PMC site.

Global SDRAM

Serving as a convenient shared resource for staging data, the 32 MB global SDRAM is accessible from all four processors, the VMEbus, the PMC site and the optional RACE++ interface.

Ethernet/RS-232 Interface

Front Panel 100 BaseT and RS-232 interfaces provide a gateway for debugging during development, and data transfers at run time.

PMC Site

In addition to accommodating Pentek's broad range of VIM I/O peripherals, Model 4292 incorporates a PCI Mezzanine Card (PMC) module site, which accepts industry-standard modules for a wide variety of interface and communication functions. The PMC module is accessible from all four C6203's and from the VMEbus.

Peripheral I/O

Model 4292 may be equipped with two VIM-2 modules, either identical or providing different functions; one VIM-4 module; or one VIM-2 module in the upper position and one PMC module in the lower position. VIM I/O modules include narrowband and wideband digital receivers and upconverters, A/D and D/A converters, FPDP interfaces and many more.

VME64 Interface

All four processors can master the VMEbus using the industry standard Universe II VME64 interface chip. As a VMEbus slave, Model 4292 presents the global SDRAM, the four Bus I/O BI-FIFOs, and the PMC site as memory mapped resources.

Optional RACE++ Interface

Delivering up to 267 MB/sec between VME boards, the optional RACE++ interface occupies the PMC connector and allows all four processors to send and receive RACEway packets using the bus I/O FIFOs as private data buffers. The RACE++ option maintains the board's one VMEbus slot configuration with two VIM modules.

Specifications

Processor Node Resources: 4 total
- **Processor:** TMS320C6203, 300 MHz clock
- **SDRAM:** 2M x 32; 4M x 32 optional
- **FLASH:** 1M x 8
- **Mezzanine:** VIM site
- **Mezzanine and Interprocessor BI-FIFO:** 2 x 1k x 32; 2 x 16k x 32 optional
- **Bus I/O FIFO:** 1k x 32; 16k x 32 optional

Shared Global Resources:
- **Global SDRAM:** 4M x 64
- **FLASH:** 4M x 8
- **VME64 Interface:** Tundra Universe II master/slave, slot 1 controller
- **PMC Module Site:** 64 bit, 33 MHz, 5 V
- **Front Panel Interfaces:** 100 BaseT, RS-232
- **RACE++ Interface:** optional

Size: standard 6U VMEbus board, single slot; board 160 mm (6.3 in.) x 233.5 mm (9.2 in.), panel 0.8 in. wide

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