C6-P12

Dual C6x PCI card with PMC site

The C6-P12 is a full length PCI plug in card that provides a complete dual DSP processing system. Each DSP node is based around the Texas Instruments TMS320C6201/6701 processor providing 1600mips peak (at 200MHz). I/O can be added directly to each processor by plugging-in an I/O expansion module. These expansion modules are directly connected to the C6x's external memory interface (EMIF). A PMC module site is also provided which can carry either a third party PMC I/O module. The internal PCI bus allows high speed inter-processor communications, unaffected by system bus traffic, and also has access to the system bus via the PCI bridge. The C6x's multi-channel serial ports (McBSP) are connected to allow further inter DSP communications and to provide direct connection to a range of I/O devices that can be mounted on the I/O expansion module sites.

Full Length PCI Format	**16M Bytes SDRAM (per node)**
TMS320C6201B or C6701	**512K Bytes SBSRAM (per node)**
2 Multichannel Serial Ports	**PMC site**
512K Bytes FLASH	**Dual I/O expansion sites**
1M Byte Shared SRAM	**JTAG Debug Chain**

Overview

Processor

The board can be fitted with either the C6201B fixed point processor, or the C6701 floating point processor. The C6201B is available at 200MHz. The C6701 is available at 167MHz. With the ability to execute 8 instructions per clock cycle, up to 1864MIPS peak processing power is on hand with each processor.

The C6x core voltage is provided by the motherboard with power supply sequencing protection.

Local RAM

The C6x's External Memory InterFace (EMIF) provides direct connection to local memory. Each node has 2 banks of memory partitioned for 16Mbytes of SDRAM and up to 512Kbytes of SBSRAM.

FLASH

512K bytes of 8 bit FLASH is provided to boot the C6x. The FLASH memory is programmed via the PCI interface.

Shared Memory

1M byte of SRAM, shared between the processors and the PCI bus. This provides a convenient resource for inter-processor communications.

Serial Ports (McBSP)

The C6x provides two multi-channel multi-protocol serial ports. One of these is used for additional inter-C6x communications. The other provides a glueless connection to a multitude of I/O chips for functions such as audio codecs, A/D, D/A etc. that can be fitted on the I/O expansion module.

A range of I/O modules will be available to fit in place of the PMC. These modules are compatible with Transtech DSP's ADSP-21060 and ADSP-21160 based products. Each TRANSPAC IIS uses the PMC's user I/O connector and picks up the serial I/O ports. Using TRANSPAC modules ensures a low cost I/O module format ideal for telecommunications applications.

PMC Site

The board supports one industry standard PMC site that can be used to enable the sophisticated I/O modules available from a number of third party suppliers. This allows for an integrated single slot solution.

The PMC site support a 32-bit PCI interface capable of attaining xxxMbytes/sec data transfers.

I/O Expansion Module

Each node has a direct bus connection to an I/O expansion module site. The sites for the two nodes are arranged so that, if required, a double size module can be fitted. This modules could then be accessed from one, or both DSPs. Example modules could include FPDP or H.100 interfaces.

The module site is also connected to a C6x McBSP allowing easy mounting of I/O capability using peripheral chips that support a serial interface.

JTAG

All C6x's are linked to a debugger JTAG chain. A PCI slave provides an XDS510 compatible interface for TI's debugger tools. This includes Go-DSP's Code Composer. The JTAG chain can be extended to other boards via, automatically configuring in/out connectors.
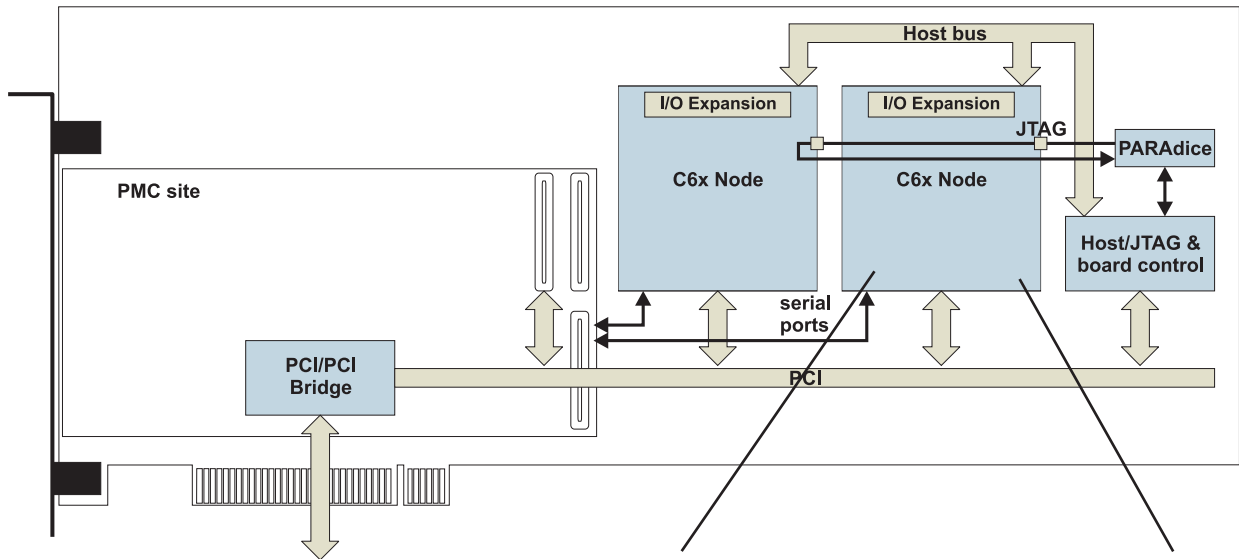
Host Port

The C6x's 16bit Host port is brought to a common PCI slave interface. This provides a back door into the entire C6x memory map, including internal peripherals. This interface is also taken to the PMC site and is compatible with the AG enhanced C6x PMC module. This port is ideal for programme booting and PCI access to C6x resources.
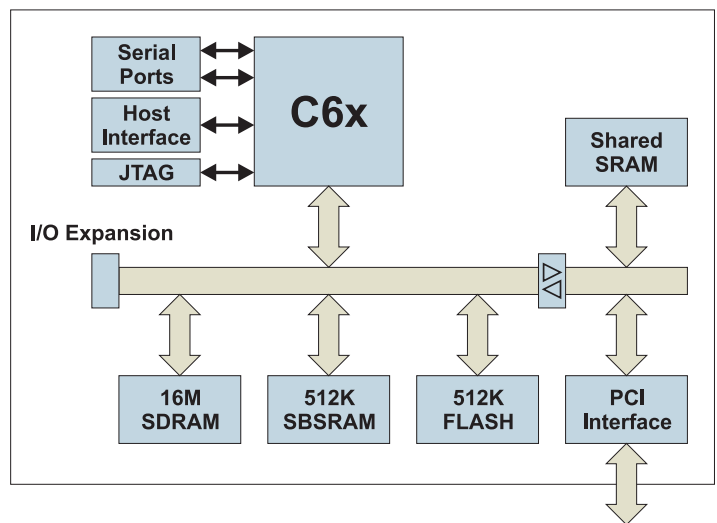
Development Tools

The C6-P12 is fully compatible with the Texas Instruments toolset and the Code Composer suite from GO-DSP.

Block Diagram

The diagram shows the composition of the C6x nodes, each of which is identical. There is choice of either a TMS320C6201 fixed point DSP or a TMS320C6701 floating point DSP for each node. (Note: a build option for having a C6201 for one node and a C6701 for there other is not available).

Host bus

I/O Expansion — C6x Node

I/O Expansion — C6x Node — JTAG — PARAdice

Host/JTAG & board control

PMC site

serial ports

PCI/PCI Bridge — PCI

I/O Expansion

Serial Ports — C6x

Host Interface — C6x

JTAG — C6x

Shared SRAM

16M SDRAM · 512K SBSRAM · 512K FLASH · PCI Interface

Technical Specification

Overview
DSP Processor — TMS320C6201B or TMS320C6701
Clock Speed — 200MHz (C6201B)
167MHz (C6701)

I/O
PMC site
Dual Expansion Module sites
(direct C6x EMIF interface)

Serial Ports (McBSP)
Total per Processor — 2 Multi-channel, multi-protocol, buffered serial ports.
Motorola SPI, AC97 compatible.
Direct interface to T1/E1, MVIP & SCSA framers.

Memory (per node)
SRAM (DSP on-chip) — 1Mbit:
16Kbyte 32-bit cache/program
64Kbyte data
SDRAM — 16Mbytes
SBSRAM — 512Kbytes
FLASH — 512kbytes
Shared SRAM — 1Mbyte

PCI Interface
Bridge — 32-bit, 33MHz
Internal — 32-bit, 33MHz

JTAG Debug
Interface — XDS510 compatible

Software
Development tools — Texas Instruments C compiler + assembler tools. Code Composer Studio™ debugging via JTAG interface.

Ordering Information

C6-P12-x   where   x : processor type - 2 = TMS320C6201B, 7 = TMS320C6701

Example: C6-P12-7   Dual C6701 card

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