

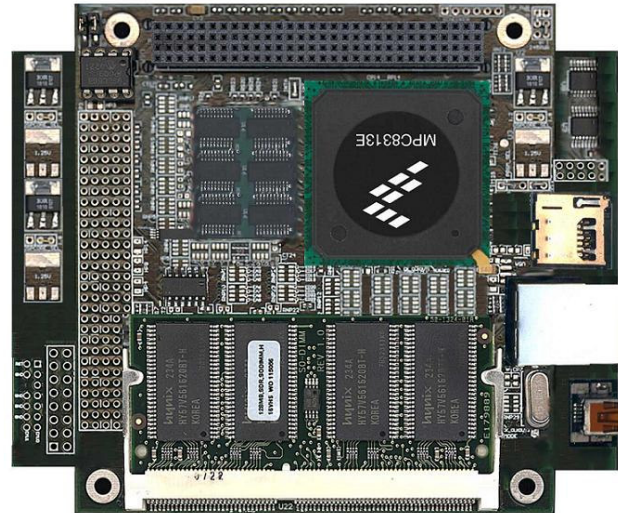


SI-MPC-C6713DSP-PCI104

C6713 DSP Board for PCI-104 with 1Gbit Ethernet/USB

Key Features

- DSP Side:
 - TI TMS320C6713 DSP
300MHz/1800MFLOP, 32 bit floating/fixed point precision.
 - Up to 256MB SDRAM, using conventional PC133 SDRAM SO-DIMM format.
 - Expansion connectors for prototyping, analog & digital I/O daughtercards.
- Communications Controller side:
 - Freescale MPC8313 communications controller, with 333MHz e300 PowerPC core running embedded Linux.
 - Up to 1GB DDR2, using conventional PC2-5300 SO-DIMM format.
 - PCI bus with Host/Arbiter and Agent/Slave modes, 32 bits, DMA chaining bus master, 132MB/sec peak transfer rate.
 - Intelligent tri-speed 10/100/1000 Mb Ethernet port.
 - 400Mb High Speed USB 2.0 port, UTMI interface with Host/Device support.
 - Stand-alone operation with up to 256MB NAND Flash for embedded Linux with file system, expandable with microSD flash card.
 - Open source embedded Linux board support package for the PowerPC controller.
- Development Software:
 - Development tools from Sheldon Instruments include QuVIEW, QuBASE and the SI-DDKs.
 - Comprehensive API/driver for Windows/Linux, including tool projects and related source.



Introduction

The SI-MPC-C6713DSP card from Sheldon Instruments is a powerful dual processor card equipped with a DSP for general purpose development, and a communications controller to service data transfers across a variety of ports. The main 32 bit floating point processor for DSP development is Texas Instruments' 300MHz TMS320C6713, while the controller is Freescale's versatile PowerPC based MPC8313 controller that integrates a 32 bit PCI bus, intelligent 10/100/1000Mb Ethernet port, as well as a 400Mb High Speed USB 2.0 port.



With the Ethernet/USB high speed serial busses, the card can operate in stand-alone mode with a seamless communications link to any system, or be inserted into a PC as an expansion card. A full line of software development tools are available from Sheldon Instruments, TI, and Freescale which include compilers, assemblers, linkers, and debuggers.

PowerPC Ethernet/USB Communications Controller

A PowerPC MPC8313 microcontroller has an onboard e300 PowerPC core, tri-speed 10/100/1000Mb Ethernet, 400Mb USB, RS-232, and PCI ports for communicating with the outside world, as well as a dedicated local bus reserved exclusively for interfacing to the DSP. The e300 PowerPC core runs open-source embedded Linux from a Flash disk and dedicated DDR2 memory, thus freeing the DSP for its intended data processing tasks.

The intelligent tri-speed 10/100/1000Mb ethernet port seamlessly communicates with any Ethernet ready system, coupled with the large onboard Flash, make it ideal for stand-alone operation, internet monitoring, or to simply daisy chain multiple DSP cards together over a remote connection for super high speed data exchange. All major protocols, including TCP/IP and UDP, are supported in embedded Linux. The PowerPC also has sufficient speed to sustain uninterrupted sustained data transfer rates of up to 600Mbit/sec!

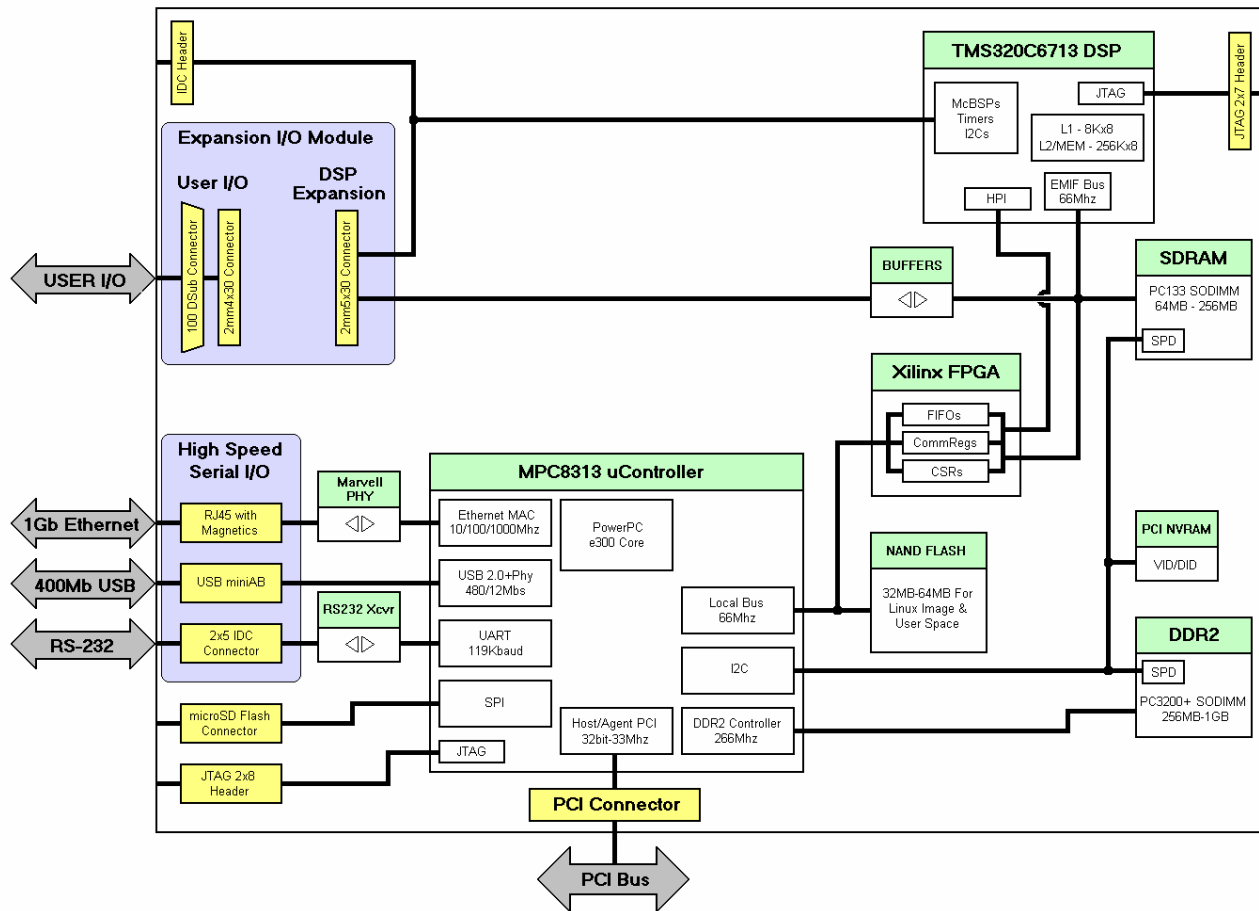
Similarly, also available is a 400Mb High Speed USB 2.0 port with a UTMI interface (USB Transceiver Macrocell Interface) with Host/Device support, as well a legacy RS232 serial port.

Host Interface to DSP

The MPC8313 acts as a bridge device between the DSP, interfaced to the MPC's local bus, and all other onboard ports, namely the PCI bus and Ethernet/USB serial links. As such, the MPC8313 effectively makes the host to DSP interface appear as a transparent link, irrespective of the physical bus connection itself.

The MPC8313 can operate as either an agent/target plugged into a host's PCI bus, or as a standalone unit connected to a host PC over one of the high speed serial links, with its own PCI bus configured as a host/arbiter for further expansion with other PCI adapter cards.

An onboard FPGA arbitrates the appropriate timing between the DSP's EMIF bus and the MPC8313's local bus, with support for a myriad of data transfer schemes involving programmed IO or DMA.



Memory Options

The SI-MPC-C6713DSP is configured with ample memory resources. For the DSP running its EMIF bus at 66Mhz, a conventional 144 pin SO-DIMM socket is used to accommodate standard, 3.3V non-buffered PC100/PC133 DRAM modules, with up to 256MB capacity.

For the MPC running its dedicated DDR2 bus at 266Mhz, a conventional 200 pin SO-DIMM socket is used to accommodate standard, 1.8V non-buffered, minimum speed PC2-5300 DDR2 modules with up to 1GB capacity. An onboard NAND flash with up to 256MB of capacity is used to store embedded Linux, with plenty of storage for any file type making it ideal for stand-alone operation. Storage is further expandable with a microSD socket.

Expansion Hardware Support

The SI-MPC-C6713DSP implements onboard glue logic with a Xilinx Spartan 3E XC3S250E FPGA, which may be upgraded with a pin compatible XC3S1200E with far more resources available for custom development.

Separately, DSP expansion connectors allow for custom designs, or for attaching 'off the shelf' multifunction I/O modules from Sheldon Instruments. Sheldon Instruments offers several expansion I/O modules for multichannel analog and digital I/O, including 4 to 64 channels of 16 bit ADCs and DACs.



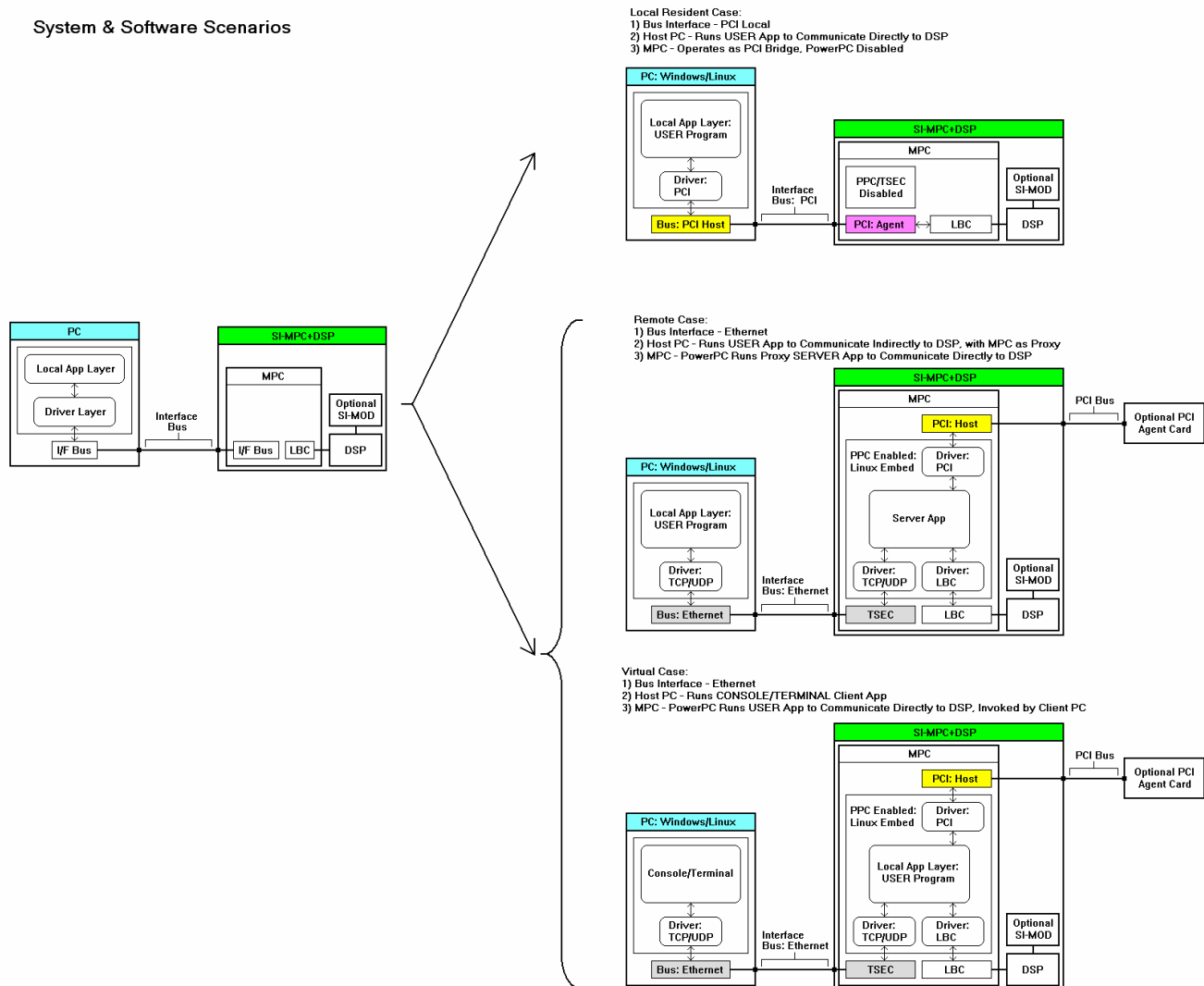
Software Support

The SI-MPC-C6713DSP is available with extensive development tools from Sheldon Instruments, TI, and Freescale.

For quick turnkey development, Sheldon Instruments offers QuVIEW and QuBASE, which are a set of DSP-resident libraries for real time performance that greatly accelerate data acquisition, signal processing, and control applications. QuVIEW is a real time accelerator for LabVIEW, and QuBASE a real time accelerator for Visual Basic. A full range of examples and tutors are provided to demonstrate their ease of use and breadth of functionality and capabilities. QuBASE runs under Windows, while QuVIEW runs under Windows and Linux.

When purchased as a development board, Sheldon Instruments also includes comprehensive support with extensive projects, utilities, and related source for compiling applications and drivers for the host PC under Windows/Linux, TI's CCS, and Freescale's board support package.

System & Software Scenarios





Technical Specifications

DSP Processor for SI-MPC-C6713DSP:

- TI TMS320C6713, 300Mhz/1800MFlop.
- 16 DSP DMA channels, 2 dedicated for host<->DSP transfers.
- 66Mhz EMIF bus, direct link to MPC.
- Up to 256MB, standard 3.3V, PC100/133 SDRAM in SODIMM format.
- One 14 pin header for JTAG port.

Communications Controller for SI-MPC-C6713DSP:

- Freescale MPC8313, integrated 333Mhz e300 PowerPC core.
- 66Mhz Local bus, direct link to DSP.
- Up to 1GB, standard 1.8V, PC2-5300 DDR2 in SODIMM format.
- Up to 256MB onboard Flash for embedded Linux & file system.
- Tri-speed 10/100/1000Mb Ethernet port connectivity, with a maximum 600Mbit/sec uninterrupted sustained transfer rate.
- 32 bit/33Mhz PCI bus:
 - agent/target mode with bus mastering to interface to a host PC.
 - host/arbiter mode to interface to any PCI agent/adaptor cards.
- 400Mb High Speed USB 2.0 port, UTMI interface with Host/Device support.
- Legacy RS-232 port, up to 119kbaud.

Hardware Expansion:

- Xilinx Spartan 3E XC3S250E FPGA, upgradeable to pin compatible XC3S1200E with open resources for custom development.
- One external 2mm pitch, 5x30 (150 contacts) socket connector for interfacing the expansion board to the DSP's bus, or linking to all of the DSP's peripheral ports (McBSP, McASP, Timers).

- DSP Expansion 2mm connector decodes 64Kx32 words, mapped into the DSP's EMIF bus.
- microSD socket for expandable Flash.

Software:

- QuX turnkey software, extensive DSP-resident libraries includes examples for real time acquisition, signal processing, and control:
 - QuVIEW: libraries and examples for LabVIEW.
 - QuBASE: libraries and examples for Visual Basic.
- SI-DDK Development software:
 - Host side: Windows/Linux examples, utilities, and driver support with projects and related source.
 - DSP projects and related source, compatible with separately purchased TI Code Composer Studio.
 - MPC projects and related source compatible with Freescale's board support package.

Physical Dimensions & Electrical Requirements:

- PCI-104 card measuring 4.550"(L) x 3.775"(H).
- 0.31lbs or 140 grams.
- Supply Voltages: 5V and 3V for all circuitry, +/-12V supplies passed on to expansion connector.
- 15 watts typical: 5V@2.5A/3V@1A.

Ordering Information:

- SI-MPC-C6713DSP-PCI104:
 - SI-MPC-C6713DSP-PCI104-64.
 - SI-MPC-C6713DSP-PCI104-256.



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