



What is the MityDSP?

The MityDSP is a rapid product development system – a production ready core CPU platform that can be quickly and easily customized to meet all requirements of custom product electronics.

What are the advantages of using MityDSP in a product development?

A MityDSP based product development can significantly reduce product development cost, schedule, and technical risk.

Development cost, schedule, and risk are reduced significantly due to the fact that the MityDSP platform is a mature off-the-shelf module which has been proven in numerous product designs.

Schedule and cost are further reduced due to the use of core interface designs that are already developed and tested and can be “dropped” into new custom designs.

Is the MityDSP hardware or software?

The MityDSP is both hardware and software; the hardware consists of a core CPU module containing a CPU, FPGA, RAM, and Flash. The provided software includes drivers for each of the hardware interfaces available with MityDSP. Also included is utility software such as an on-board bootloader, and PC based application downloader program.

How does MityDSP integrate into a product?

In order to customize the MityDSP into a product, a relatively simple custom I/O board is developed to provide the “last mile” of customization. The custom I/O board contains the physical layer of all interfaces (i.e. line drivers, A/Ds, D/As, signal conditioning, etc). The custom I/O board also customizes the MityDSP to meet mechanical form factor and custom input power requirements.

What are the mechanical dimensions of MityDSP?

The MityDSP measures 1.5” x 2.7”. When integrated with a custom I/O board, the board set is less than 0.7” tall.

What types of interfaces does MityDSP support?

The custom I/O board can implement any custom interface required for a custom design.

In addition, Critical Link has numerous interfaces already designed and tested and ready to be placed into custom I/O board designs. Interfaces readily available for integration into custom I/O board designs include:

- Serial – RS-232 / RS-422
- USB 2.0
- Ethernet - 10/100 BaseT
- Digital I/Os, (TTL, CMOS, Relay, Opto isolated, etc.)
- Counters / Timers
- Analog to Digital Converters (multiple sample rates and sample sizes)
- Digital to Analog Converters (multiple output rates and sample sizes)

Critical Link is continuously adding to the list of readily available interfaces for the MityDSP.



How quickly can a MityDSP based application be developed?

Critical Link can develop a custom I/O board consisting of any combination of pre-existing interface designs in approximately 4 weeks.

Typical custom I/O boards also include one or more custom interfaces which must be developed from scratch. Such an I/O board can typically be developed in 6 to 8 weeks.

How much does a MityDSP based development cost?

A custom I/O board can be developed by Critical Link for as little as \$15,000.

Can I customize the MityDSP into my product myself?

Yes. Critical Link can review your design to provide suggestions for your MityDSP custom I/O board.

Who owns the Intellectual Property of a MityDSP design?

You own the intellectual property for the custom I/O board and any custom software developed specifically to support your application. This includes software and firmware developed to support interfaces which were developed specifically for your product on your custom I/O board. Critical Link retains ownership of the MityDSP module and any software or firmware previously developed by Critical Link.

Is the MityDSP just a prototype platform, or is it production hardware?

The MityDSP is production hardware that can be used for development. Critical Link offers a selection of pre-existing I/O boards that can be used as development platforms until your custom I/O card is available. These I/O boards allow you to begin work on the software portion of your application. With the MityDSP your application will transition to your final custom I/O board quickly and easily.

What CPU does the MityDSP use?

The MityDSP contains a Texas Instruments TMS320C6711. In addition, the 6711 is tightly coupled to an on-board Xilinx Spartan 3 XC3S200 FPGA which can be used as a high speed co-processor.

How does the MityDSP attach to the custom I/O card?

The MityDSP mates to the custom I/O card using an industry standard 144 pin SO DIMM connector. This connector is a commonly used for laptop memory modules.

What are the mechanical shock and vibration specifications of the MityDSP in its mating connector?

The MityDSP uses an AMP 390110-1 SO DIMM connector. AMP has subjected this connector (with a test module installed) to 3.13 G's rms between 5 Hz and 500 Hz for 15 minutes in each of 3 mutually perpendicular planes and to 30G's half-sine shock pulses of 11ms duration with 3 shocks in each direction applied along 3 mutually perpendicular planes (18 total shocks).



What if my application requires more protection for shock and vibration?

Critical Link also provides two additional solutions for addressing applications where shock and vibration is a major requirement. The SO DIMM connector can be supplemented by adding a clip to the rear of the board to securely hold it in place. In addition, Critical Link can provide a single board solution where the MityDSP and the custom I/O card are integrated.

What languages are available for development of MityDSP based applications?

MityDSP application code can be developed in C or C++. MityDSP device driver APIs are provided in C++.

The TI TMS320C6711 is a digital signal processor (DSP), but my application does not require signal processing or floating point capability. Why should I consider the MityDSP?

The TI TMS320C6711 provides a convenient mix of floating point digital signal processing with standard control processing capabilities. The versatility and performance of the 6711 make it a logical choice for a wide variety of applications. Critical Link has successfully used the 6711 in a number of applications that do not require floating point or DSP capabilities, with the additional capability of the CPU providing flexibility for future product upgrades.

Is there a real-time operating system available for the MityDSP?

The MityDSP runs the Texas Instruments DSP/BIOS real-time operating system. This is a robust, royalty free operating system with no cost of entry provided by TI.

Is there a TCP/IP stack available for the MityDSP?

Yes.

What protocols are supported by the MityDSP TCP/IP stack?

TCP, UDP, ICMP, ARP, DHCP, HTTP (server), Telnet, WINS

Is there a royalty for the MityDSP TCP/IP stack or RTOS?

Both the DSP/BIOS operating system and the MityDSP TCP/IP stack are royalty free.

What development tools are available for developing applications on the MityDSP?

Critical Link recommends the Texas Instruments Code Composer Studio IDE and XDS510 USB JTAG Emulator by Spectrum Digital. Both products are conveniently available through Critical Link.

Does the MityDSP have an FPGA?

Yes, the MityDSP has an integrated Xilinx Spartan 3 XC3S200 FPGA. This FPGA is the gateway between the DSP and the edge connector for all the I/O to the custom I/O card. This design provides for maximum I/O flexibility, and also positions the FPGA to perform hardware acceleration for critical processing intensive functions.



Can custom firmware be integrated into the FPGA?

Yes, the FPGA is 100% available for programming to support your application. Some gates will be dedicated to the cores used in the MityDSP to support standard I/O functions (serial, USB, Ethernet). The remainder of the gates (generally the majority) will be available for custom firmware.

How much RAM and Flash does the MityDSP have?

The MityDSP contains 2MB flash and 8 MB RAM.

How much Flash memory is available for application use?

Approximately 1.5MB of flash memory is available for application image and data storage.

How much RAM is available for application use?

The entire 8MB of RAM is available for application use.

Does MityDSP pass FCC Part 15?

The MityDSP has passed FCC radiated emissions testing in numerous products. Since complete products must be submitted for FCC testing, the MityDSP itself does not carry the FCC mark.

How fast does the MityDSP run?

The MityDSP contains an on-board 25MHz oscillator that drives both the DSP and the FPGA. The DSP contains an internal PLL which can drive the DSP at any speed up to 200MHz. The FPGA also contains an internal PLL which can be used to run the FPGA at up to 250MHz.

What kind of performance does the TI TMS320C6711 have?

The TMS320C6711 is capable of 1200MFLOPS at 200MHz.

What happens if a key component on the MityDSP becomes obsolete?

Critical Link has numerous customers who have based their products on the MityDSP. In the event any component on the MityDSP becomes obsolete, Critical Link will redesign the MityDSP with a suitable replacement part. If required, new releases of the common software and firmware libraries will be released.

Does Critical Link have the capability to assist with other portions of my product development?

Yes, Critical Link is a full service engineering services company with a wide range of skills.

What kind of support does MityDSP provide for field upgrades?

The MityDSP contains an onboard bootloader that works in concert with a Windows based MityDSP downloader program. This software allows an end user to quickly and easily update either the FPGA or application image on a fielded MityDSP through either a serial or USB port.