



Modena-VME Twelve ADSP-21160 SHARC® VME Master Board

The Modena-VME board is the highest performance parallel processing DSP system available for 6U VME platforms. Based on twelve Analog Devices, 600 MFLOP, ADSP-21160 SHARC® DSP processors, the Modena-VME combines 7.2 GFLOPS of processing performance with 7.2 GB/s of low latency inter-processor communications bandwidth. Each ADSP-21160 DSP is capable of 600 MFLOPS peak performance and contains a bank of 4 Mbits on-chip SRAM. This internal memory is dual ported with 14 DMA engines which concurrently support the six 100 MB/s link ports and a 400 MB/s external port.

Architecture

The Modena-VME's 64-bit PCI bus has the ability to transfer data at 264 MB/s between two industry standard PMC sites, two 64-bit master/slave PCI interfaces, and the Universe II VME64 to PCI64 bus bridge. Each PCI interface is connected to 64 MB of SDRAM and the external port of one root ADSP-21160. Each root ADSP-21160 passes data to the other ADSP-21160's using six low latency 100 MB/s link ports. The onboard PCI bus has complete access to the internal memory of each root SHARC providing a simple mechanism for program downloads and small data transfers from the PCI bus. Large blocks of data can stream into one SDRAM block from the VME64 bus or the PMC module sites to be distributed to the other SHARC's on the board. Upon completion of the signal processing, data is put into the other SDRAM block to be output through the VME64 bus or the PMC sites.

To maximize system performance all interprocessor communication takes place via the ADSP-21160 six 100 MB/s link ports, removing the bottleneck of using non-deterministic shared busses or the PCI bus. The on-board link ports are connected in a 3D Hypercube architecture maximizing DSP interconnection. A total of 10 SHARC links are taken off-board, 4 out the front panel and 6 out the VME64x P0 backplane connector providing maximum interconnectivity to adjacent DSP hardware. The external low latency link ports are used to integrate large, multiple board networks with a total board-to-board bandwidth of 1 GB/s. Link Port 4 is daisy-chained from one root DSP to all the other on board DSP's to provide a board level booting mechanism.

I/O Methods

The PMC sites are used to host a wide variety of off-the-shelf I/O or to extend the processing capabilities of the Modena-VME with the Modena-PMC product suite. PMC I/O modules on the market include high-speed fiber optic networks, analog I/O, serial/parallel busses and many more. To extend the processing or low latency I/O capabilities of the Modena-VME four 100 MB/s link ports are routed to each PMC site, interfacing with ADSP-21160's on the PMC. Contact Spectrum for a list of recommended PMC I/O vendors.

Software

Spectrum's complete line of SHARC hardware products are supported by the APEX software tool suite (APEX-Lite, APEX-Pro, and APEX-Debug), providing advanced software support for parallel application development, system wide debugging, parallel algorithm optimization, and MATLAB® simulation capabilities.

Spectrum SHARC hardware products are also fully compatible with the Analog Devices VisualDSP development tools and a number of other third-party products. Device drivers are available for VME operating systems such as WinNT, VxWorks, Solaris, and LynxOS.

Environmental

RoHS 0 of 6. For other RoHS options, please contact Spectrum Sales.

- ▶ **Up to Twelve 100 MHz ADSP-21160 DSPs**
- ▶ **7200 MFLOPS (Peak) in a single 6U VME slot**
- ▶ **7200 MB/s of low latency inter-processor communications bandwidth**
- ▶ **Two banks of 64 MB SDRAM**
- ▶ **Two IEEE P1386 standard PCI PMC sites for off-the-shelf I/O**
- ▶ **Link-port-enhanced PMC sites for 400 MB/s low latency I/O**
- ▶ **1000 MB/s system expansion via 10 SHARC link ports**
- ▶ **On-board 64-bit master/slave PCI local bus**
- ▶ **64-bit VME64 to PCI64 bridge chip**
- ▶ **Advanced software support from APEX tool suite**
- ▶ **Fully compatible with Analog Devices VisualDSP software development tools**

