

The FT-2106x-DC cards are members of Alacron's family of high performance computing subsystems based on Analog Devices' ADSP-2106x SHARC (Super Harvard Architecture Computer) processor. The FT-2106x-DC incorporates an array of up to eight SHARC processors and a unique architecture resulting in a low power, low cost, high performance compute accelerator. GFLOP performance is now available on a single board.



Alacron's FT-2106x-DC deliver high levels of performance for imaging, graphics, simulation, DSP, document processing and pattern recognition applications. The FT-2106x-DC is ideal for adding scaleable compute capability to existing systems, or for developing new systems from the ground up.

Features

- 1, 2, 4, or 8 SHARC processor array
- 960 MFLOPS peak performance
- 640 MFLOPS sustained
- 640 MB/sec peak local memory I/O
- Dedicated dual ported RAM
- Up to 256 MB global RAM
- FastTrack® connection to I/O and processor daughter-cards
- VME64 master/slave interface

ADSP-2106x SHARC Processor Array

The FT-2106x employs a buffered DMA local memory architecture which allows up to 8 processors in the SHARC array to run at "full throttle." Each SHARC processor has 1 MB of private dual-ported DRAM, and the SHARC array is isolated from the system bus by a 160 MB/sec DMA engine. The SHARC array is thus shielded from the impact of bus traffic and data movement. A separate Intel i960 control processor provides operating system functions, services interrupts, and controls bus traffic and data I/O, off-loading the SHARC array for data processing functions.

Alacron's FT-2106x-VME, FT-2106x-PCI and FT-2106x-DC computing subsystems use an innovative dual-ported memory interface between the control processor and a bank of Analog

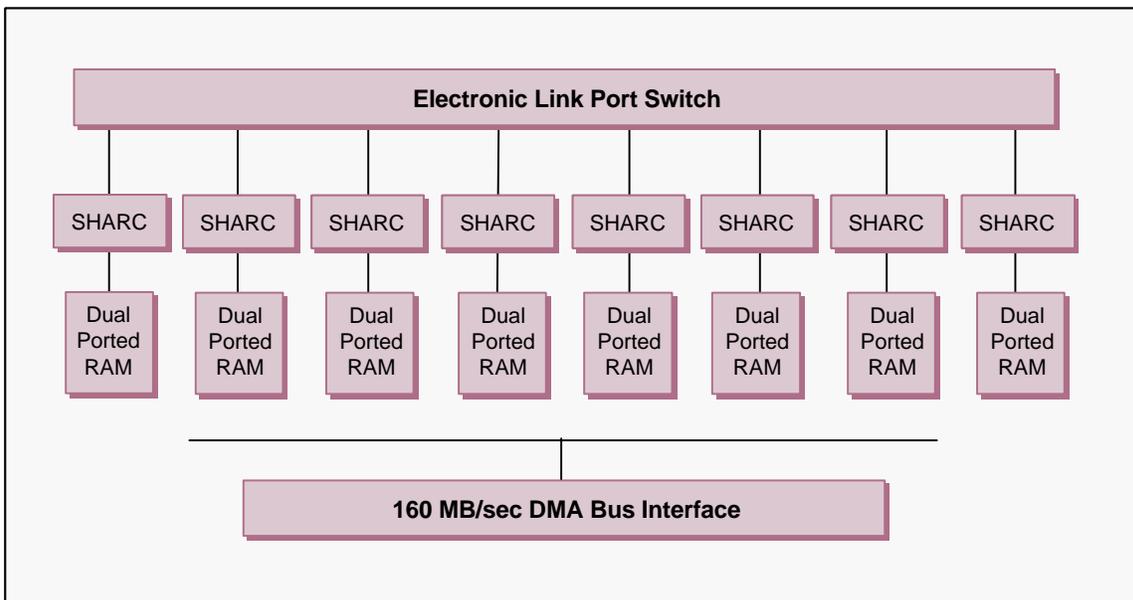
Devices ADSP-2106x processors to minimize the impact of data movement on processing by both the SHARCs and the host. In the SIMD mode, Alacron's application libraries distribute problems over several processors. All SHARC processors can access their private RAM banks at 80 MB/sec simultaneously. In MIMD processing mode, tasks are distributed to individual SHARC processors with Alacron's RT Operating Environment controlling multiple threads.

Performance

The FT-2106x series offers excellent performance of compute intensive algorithms. The FT-2106x daughter-card provides a SHARC processor array identical to those on the FT-2106x-PCI and FT-2106x-VME boards. It connects to a FastTrack interface on either the FT-2106x-PCI or FT-2106x-VME board. Several FT-2106x-DC daughter cards can be stacked, providing GFLOPS in a single VME slot. Representative performance measurement for specific SIMD algorithms from Alacron's libraries are shown.

Number of ADSP-2106x	1DCFFT (1K) (msec)	2DCFFT (1Kx1K) (msec)	CONV3 (512x512) (msec)	CONV5 (512x512) (msec)
1	0.457	1045	72	205
2	0.260	527	36	103
4	0.130	272	18	52
8	0.072	138	9	23.5
16	0.046	74	4.5	11.8

*16 SHARC performance is obtained by using one, eight-processor FT-2106x-PCI or FT-2106x-VME board -- along with one, eight-processor FT-2106x-DC daughter-card. Alacron's FT-2106x bus boards can support several FT-2106x-DC daughter-cards for multiple GFLOP-per-slot performance.



Specifications

Multiprocessors

Processor	Analog Devices ADSP-2106x
Number of	1, 2, 4, 8 ADSP-2106x
Clock Speed	33 or 40 MHz
Global DRAM	2 to 256 MBs
Dual Ported	1 MB/processor DRAM
External I/O	240 MB/sec peak 160 MB/sec sustained
Link Ports	Six per ADSP-21060/2
Topology	Software selectable
Data Bus	128 bit internal 32/48 bit external
Cache	32 x 48
DMA	10 channels 240 MB/sec External ports (4) Serial ports (4) Link ports (2, 4 shared)
Precision	IEEE floating point 32/40 bit precision

On Chip SRAM..... 4 Mbits ADSP-21060
 2 Mbits ADSP-21062

Each ADSP-2106x SHARC processor provides:

- 40 MIPS
- 120 MFLOPS (A+B, A-B)
- 48/32 bit data bus
- 1, 2, or 4 MBit on chip SRAM
- DMA controller
- 2 serial ports (40 Mbits/sec)
- 6 link ports (240 MB/sec)
- SIMD and MIMD operation
- Concurrent DMA and computation

Software Support

Processing Environments

Alacron's RT operating environment provides several processing models. Applications can run as simple attached processes on the FT-2106x and as stand alone tasks on the host, or interactively, with separate tasks on the

host and on the FT-2106x. Alacron's RT supports MS/ DOS, Windows 3.1, 95/98, NT, Solaris/Unix, LynxOS, and VxWorks.

Software Libraries

Alacron's FT-2106x computing subsystems are supported by an extensive suite of application specific libraries for image processing, DSP and graphics applications:

- Vector Numerical Library (VLIB)
- Real-time Image Processing Library (RIPL)
- Parallel Application Developer's Toolset (PARTOOL/PARLIB)

Development Tools

A full suite of ANSI development tools for the C language is available. Compilers support general purpose and numerically intensive applications. Both a JTAG and software GUI based debugger and profiler are available.