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Find the *Alacron FT-21060* at our website: ***Click HERE***



Boards

SHARC-Based Processor Boards

FT-2106x-VME

VME bus multi-processor boards

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

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

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- Features
- Applications
- ADSP-2106x SHARC Processor Array
- Performance
- Growth Path
- Block Diagram
- Fast/Track Interface
- Software Support
- Specifications

Features

- 1, 2, 4, or 8 SHARC processor array
- Intel i960 control processor
- 960 MFLOPS peak performance
- 640 MFLOPS sustained
- 640 MB/sec peak I/O
- Dedicated dual ported RAM
- Up to 256 MB global RAM
- FastTrack^{tm} connection to I/O and processor daughter-cards
- VME64 master/slave interface

Applications

- Radar/Sonar
- Laser radar
- Signal intelligence
- Machine vision
- Seismology Neural networks
- Document processing
- Medical imaging
- Real-time inspection
- 3D image generation

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 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-VME series offers excellent performance of compute intensive algorithms. Representative performance measurement for specific SIMD algorithms from Alacron's libraries are shown:

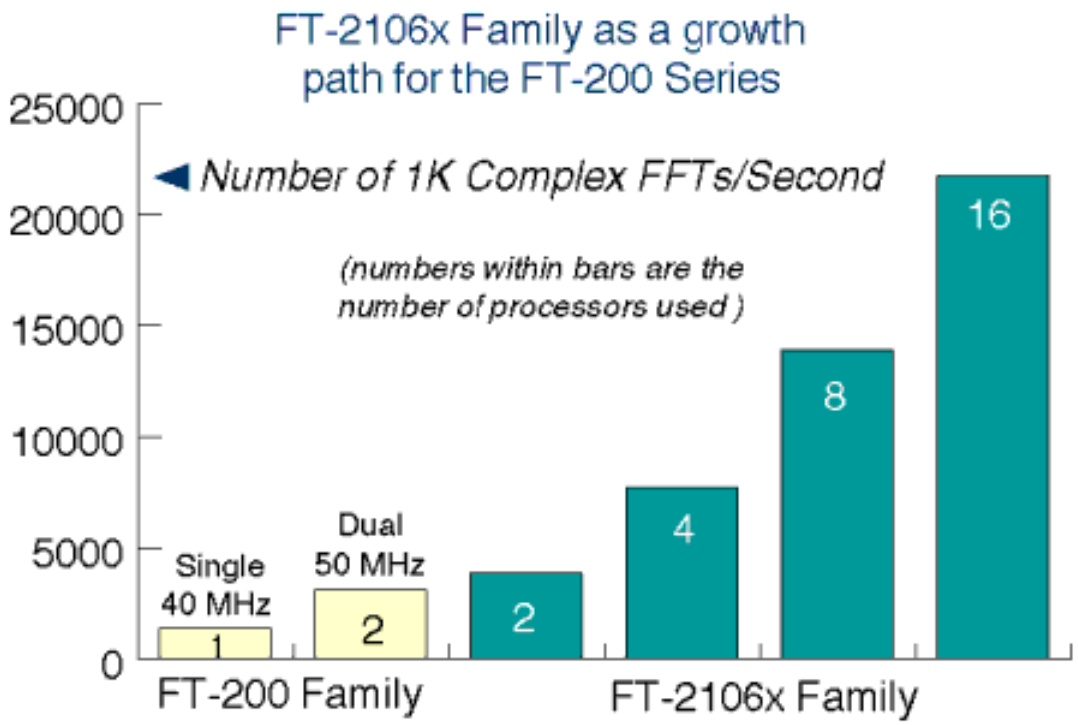
Ft-2106x Performance

Number of Processors	1DCFFT (1K) (msec)	2DCFFT (1Kx1K) (msec)	CONV3 (512x512) (msec)	CONV5 (512x512) (msec)
1 SHARC	0.457	1045	72	205
2 SHARC	0.260	527	36	103
4 SHARC	0.130	272	18	52

8 SHARC	0.072	138	9	23.5
16 SHARC*	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.				

Growth Path

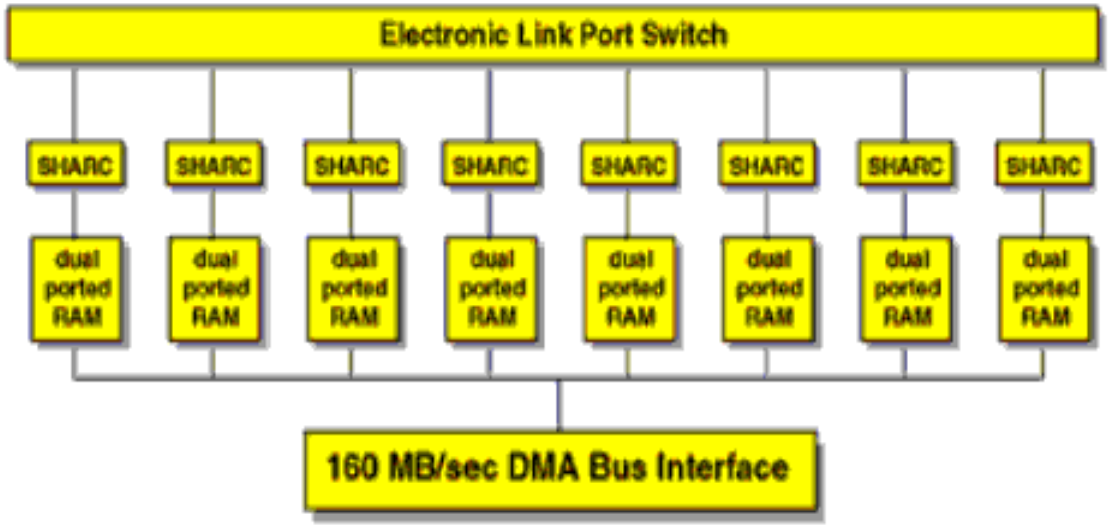
The FT-2106x boards provide a growth path for applications developed on the AL-860 and FT-200 subsystems.



Block Diagrams

Example showing 8 ADSP-2106x processor SHARC array.

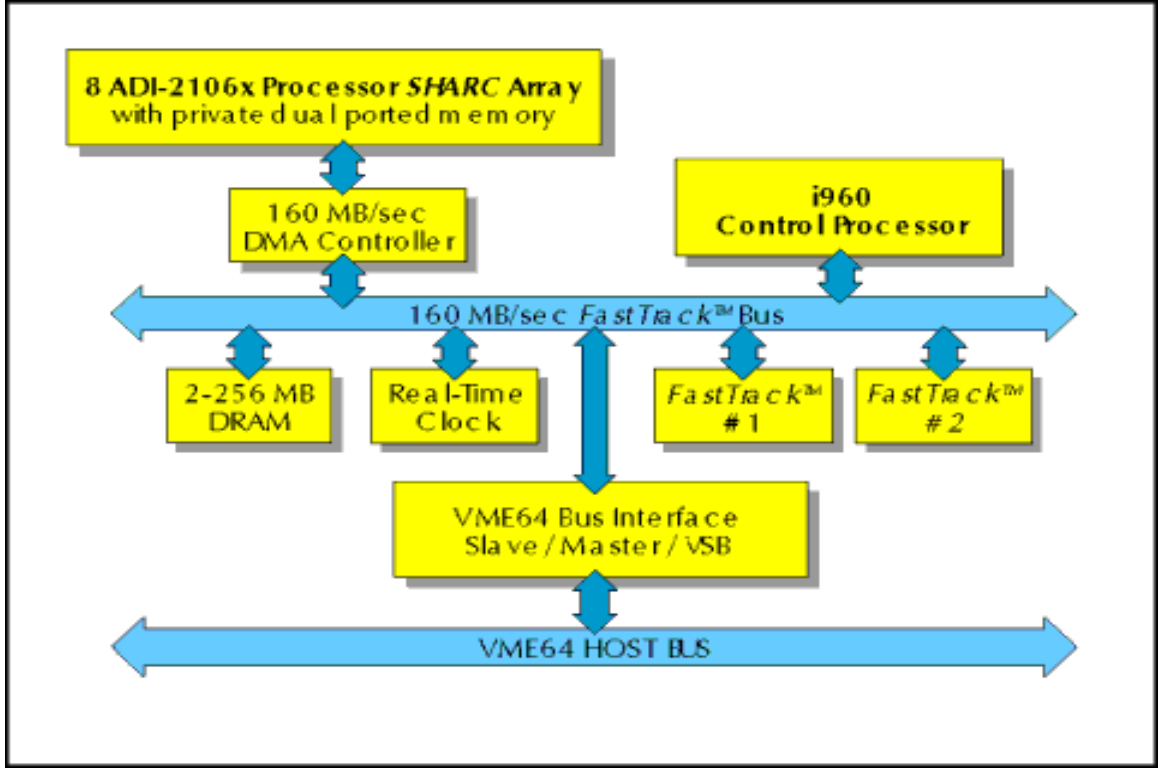
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Each ADSP-2106x SHARC processor provides:

- 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

FT-2106x SHARC Array Processors for the VME Bus



FT-2106x Daughter Card

Alacron's FT-2106x-DC 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 daughter cards can be stacked, providing GFLOPS in a single VME slot

FastTrack Interface

The FT-2106x-VME's two 160 MB/sec FastTrack connectors provide tremendous I/O and expansion flexibility. These connectors implement Alacron's stackable daughter protocol and together can support a combination of up to six I/O and processor daughter-cards.

FT-2106x-DC
The FT-2106x daughter-card provides an array of up to 8 SHARC processors.

FT-I/O Expansion Boards
Alacron provides a family of I/O expansion boards for the FT-2106x-VME's FastTrack interfaces. Software drivers are available for all expansion boards.

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- High Performance Digital (Camera) Interface
- Analog Framegrabber
- High Performance Digital I/O Interface
- DT-Connect Interface
- SCSI Interface
- VISIONbus Interface
- Video Display Adapter
- VSB Interface

Software Support

Software Libraries
Alacron's FT-2106x-VME 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 Execution Library (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.

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 Microsoft DOS, Windows 3.1, Windows NT, Windows 95, Solaris/Unix, LynxOS and VxWorks.

Specifications

Multiprocessors	
Processor	Analog Devices ADSP-2106x

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Number of ADSP-2106x	1, 2, 4, 8
Clock Speed	33 or 40 MHz
Global DRAM	2 to 256 MBs
Dual Ported DRAM	1 MB/processor
External I/O	240 MB/sec peak 160 MB/sec sustained
Link Ports	Six per ADSP-21060/2
Link Port 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

VME	
Non-Volatile Memory	512k-2 MBs
VSB Support	Optional

ADSP-2106x SHARC CPU Performance

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	40 MHz	33 MHz
Single	80/120 MFLOPS 40 MIPS	66/100 MFLOPS 33MIPS
Dual	160/200 MFLOPS 80 MIPS	132/200 MFLOPS 66 MIPS
Quad	320/480 MFLOPS 160 MIPS	264/100 MFLOPS 132 MIPS
Octal	640/960 MFLOPS 320 MIPS	528/800 MFLOPS 264 MIPS

VME Interface	
Bus Specification	Full VME 64 implementation
Control Registers	I/O mapped
Global Memory	Memory mapped
Global Memory	80 MB/sec burst
Global Memory	40 MB/sec sustained
Global Memory	20 MB/sec random

Daughter Card Interface	
Interface	FastTrack bus

Electrical and Environmental

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Power	+5 volts at 5A
Dimensions	107 mm x 312 mm x 12.06 mm
Operating Temperature	0 - 50 degrees centigrade
Relative Humidity	95% non-condensing

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