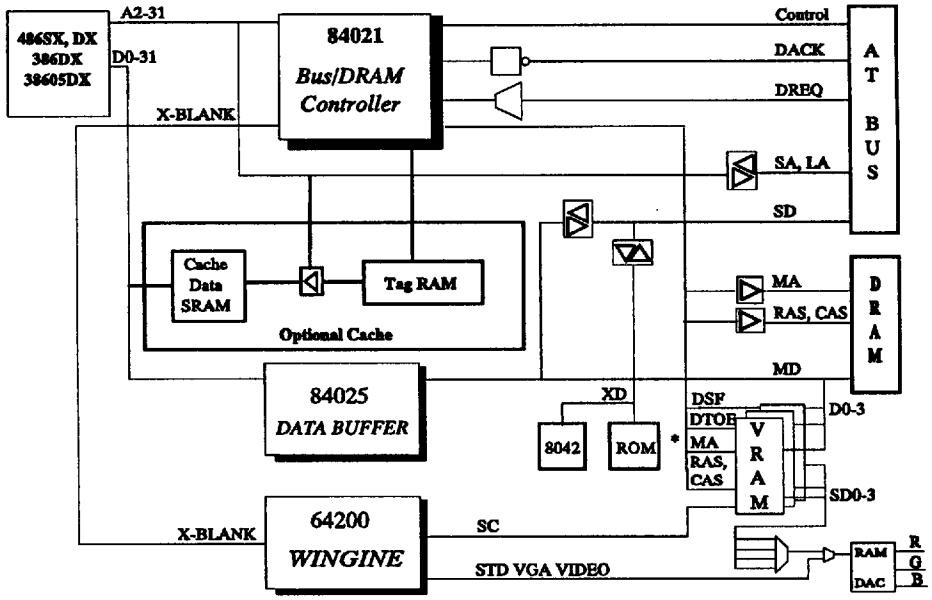
CS4000
WinCHIPS CHIPSet

MICROSOFT® WINDOWS™ COMPATIBLE

The WinCHIPS CHIPSet is a three chip set that includes the 64200 Wingine Windows Accelerator and the CS4021 PC CHIPSet (two chips).

Figure 1-13. *The WinCHIPS CHIPSet Block Diagram*



The WinCHIPS solution is specifically designed to enable systems companies to offer modular PCs that allow the end user to upgrade both microprocessor and graphics performance simultaneously. With WinCHIPS CHIPSet based systems, PC users can easily migrate to more powerful microprocessors and add or upgrade cache memory subsystems to achieve maximum computing performance. Simultaneously, the WinCHIPS system solution provides the ability of Wingine to scale graphics performance in proportion to increasing microprocessor speed.

The two-chip systems logic elements of WinCHIPS support all 32-bit X86 microprocessors, including i80386DX, Am386, Super38600, Super38605, i80486SX, i80468DX, and i80486DX2 microprocessors running at up to 50 MHz clock frequencies.

The WinCHIPS solution memory controller technology is designed to offer the greatest performance for both cache-based and non-cache based designs. Moreover, the flexible WinCHIPS architecture allows end users to add a cache subsystem when upgrading to microprocessors running 25 MHz or faster.

For non-cache 486SX designs, the WinCHIPS' patented page mode and page interleaved memory controller supports DRAM Burst transfer for systems running up to 25 MHz. For cache-based Super38600, Super38605, and 486DX class systems, WinCHIPS supports 64K to 512K of direct mapped, write back cache memory. The WinCHIPS cache architecture integrates a write buffer and zero wait state cache writes for maximum performance.

The WinCHIPS solution is unique in the industry in providing automatic system wide performance benefits as end users upgrade to faster, more powerful microprocessors. This is accomplished with the 64200 Wingine Memory Bus Architecture which can support up to two banks of dual port VRAM video memory on the microprocessor memory bus. Because the required video memory control logic is integrated into the WinCHIPS 4021 Bus/DRAM Controller, video memory can be mapped directly into main memory where it is linearly addressed by the microprocessor.

By allowing the processor to access video memory directly, graphics functions performed by the processor, such as BIT BLTing, scale with overall processor power. Hence, the bottleneck inherent in today's local abus and ISA bus graphics subsystems is removed. With the 64200 Wingine, the performance of the display scales correspondingly with microprocessor power.

WinCHIPS is the industry's first CHIPSet to offer an advanced set of hardware features designed to specifically support the SuperState System Management Architecture found on the Super38605 microprocessors.

CS4021 PC CHIPSet™
64200 Wingine™ Windows™ Accelerator

Flexible Systems Logic

- Supports 486DX™, 486SX™, 386DX and Super386™ CPUs
- Supports 487 and 4167 on 486 CPU mode and 367, 3167 on 386 CPU mode
- Burst Mode support in cache and DRAM modes
- 64K, 128K, 256K, and 512K cache size
- Direct-mapped, write back operation, with pipeline allocate on read miss
- 2-1-1-1 burst for cache reads to the 486 and 486SX
- Interleaved data SRAMs
- 3-1-1-1 burst read with 486SX CPU at 16/20/25 MHz with no cache
- 256K, 1M and 4M deep DRAM support
- Support for 4Mx4 DRAMs with 12/10 or 11/11 addressing
- Page mode DRAM access with option of using page interleaving

- Up to 8 banks of 32-bit DRAMs
- Option of using asynchronous or synchronous AT clock
- Fast 12 MHz AT bus support
- Local bus master and slave support
- Programmable I/O chip select output signals

Designed for Cost Effective Windows Acceleration

- Workstation-like graphics performance achieved via the 64200 Wingine Memory Bus Architecture
- Highly integrated design (non-multiplexed system bus, direct bus drive, minimum external glue logic)
- Direct linear mapping of entire video memory anywhere in system memory space
- Flexible video memory configurations
- Supports high resolution display modes with 2MB VRAM
- Full VGA compatibility in 'VGA' mode
- Interfaces directly with the 82C481 True-Color Graphics Accelerator