

VIA REVEALS ATHLON ALTERNATIVE

Apollo KX133 Chip Set Brings PC133 SDRAM, AGP 4× to Athlon Systems

By Peter N. Glaskowsky {1/17/00-02}

The new Apollo KX133 Athlon chip set from VIA will help strengthen AMD's position as a high-end processor vendor. No PC processor exceeds Athlon's potential bandwidth to main memory through its 200-MHz front-side bus, but AMD's current AMD-750 chip set

(see *MPR 8/23/99-02*, "AMD Irongate Leads to Slot A") achieves less than half of this potential, due to its use of PC100 SDRAM. VIA's KX133 supports PC133 memory as well as PC100 and further increases available bandwidth with NEC's virtual-channel memory (VCM) technology (see *MPR 10/26/98-msb*, "Virtual Channel SDRAM Supported, Attacked").

The KX133, built in a 0.35-micron, three-layer-metal process, also supports more memory than the AMD-750 (2G vs. 768M) and offers a 4× AGP graphics-chip interface that is up to twice as fast as AMD's 2× AGP interface (though few applications benefit from the faster AGP speed).

As Figure 1 shows, the KX133 chip set comes with VIA's latest "Super South Bridge" chip, which includes a four-port USB controller instead of the AMD-750's dual-port USB interface, an integrated AC-Link interface to external AC'97 audio and soft-modem codecs, and integrated Super-I/O functions. The AMD-750 chip set needs a discrete Super-I/O chip to provide these functions.

Point for point, the KX133 matches VIA's best chip set for Pentium III systems, the Apollo Pro133A. Both sets support the same types and amounts of memory and include the same south bridge. Among Tier 1 OEMs—including HP, IBM, and Micron—the Pro133A has become a very popular alternative to Intel's 810E and 820 chip sets because of its support for the fastest Intel CPUs as well as for the fastest commodity-priced memory. With the KX133, VIA (www.via.com.tw) brings the same advantages to Athlon-based systems

and should help AMD achieve additional design wins among PC makers.

Features and Performance Favor VIA

The feature set of the KX133 clearly outstrips that of the AMD-750, and VIA says its new chip set will also be faster than the 750 or any other desktop PC chip set. PC133 SDRAM is now available with a two-clock CAS latency,

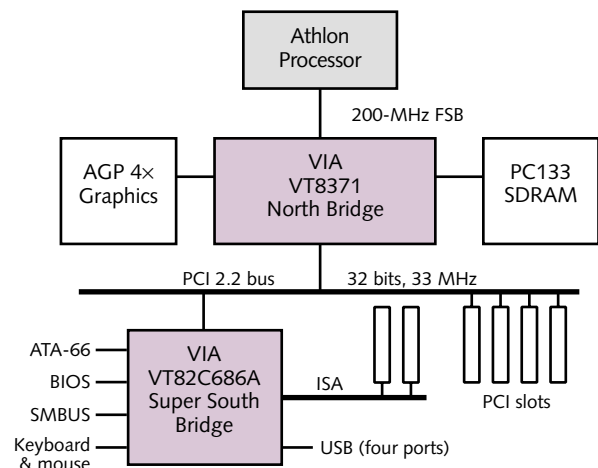



Figure 1. The VIA Apollo KX133 consists of the VT8371 north-bridge chip with a 200-MHz Slot A interface and VIA's VT82C686A Super South Bridge with integrated Super-I/O features.

yielding the full 33% speed advantage promised by the faster clock speed. Virtual channel technology improves the efficiency of memory transactions by increasing the percentage of page hits. Though VCM memory chips are currently available only from NEC, Infineon and Hyundai are developing compatible chips.

Where the PC100 SDRAM used on Intel's 810E might deliver about 500 MB/s of sustained throughput, PC133 VCM SDRAM should be as much as 50% faster, due to the combination of increased clock rate and improved efficiency.

Intel's 820 chip set can be used with Direct RDRAM memory that offers even more bandwidth, but the 133-MHz front-side-bus speed of the Pentium III means that most of this extra bandwidth is not available to the CPU. The 820 offers better I/O bandwidth, however. With about twice the sustained memory throughput of the VIA chip set and a more advanced hub-oriented architecture, the 820's ATA-66 hard-disk interface, PCI bus, and CPU can transfer data to or from main memory simultaneously, at full speed.

This capability for simultaneous CPU and I/O transactions is not widely used in desktop PC applications, nor does it influence most benchmarks, but it can benefit file-server operations such as peer-to-peer file sharing and personal Web hosting. VIA says it is designing Pentium III and Athlon chip sets featuring a similar hub architecture, using a proprietary interface dubbed "Vlink" between the north-bridge and south-bridge chips. These chip sets will use double-data-rate (DDR) DRAM to match the combined CPU and I/O bandwidth requirements.

The Apollo KX133, which is available now and priced at \$34 in quantity, should allow Athlon to maintain its position at or near the top of the PC performance ladder, in spite of Intel's Pentium III and 820 chip set. We expect to see future chip sets from AMD, VIA, and Alpha Processor (API) with support for even more advanced memory technology, such as double-data-rate (DDR) SDRAM and Direct RDRAM, but for now the KX133 is the best desktop PC chip set on the market. 

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