AMD-K5™ Processor Performance Brief

This document contains information on measuring the performance of the AMD-K5™ processor. The methodology described here demonstrates that the AMD-K5 processor attains comparable performance to the Pentium processor. A description of the benchmark, the methodology used to rate processor performance, and tips to ensure optimal performance when evaluating processors are included.

What is the P-Rating?

In order to more clearly report processor performance, AMD, Cyrix, IBM Microelectronics, and SGS-Thomson jointly developed the P-Rating system. The P-Rating system reports a processor's equivalent Pentium-level performance using a combination of actual applications for the Microsoft® Windows® operating system (Winstone 96 running under the Windows 95 operating system). Winstone 96 is a system-level benchmark that consists of 13 of the most widely used Windows applications from the following four major categories: business graphics, database management, spreadsheets, and word processing. The results obtained using Winstone 96 are more representative of the performance a typical user will see, and therefore better define the delivered performance than the synthetic benchmarks used in the past.

How to Assign a P-Rating

A brief overview of P-Rating testing is as follows:

1. Select a configuration that is representative of your target system and that supports both the Pentium and AMD-K5 processors.

2. Run the Winstone 96 benchmark using the Pentium processor and record the scores for the various processor frequencies. To ensure optimal performance, defragment the hard disk between each run of Winstone 96.

Document #: **20084** Rev. **B**   Amendment/0
Issue Date: **June 1996**

3. Replace the Pentium processor with the AMD-K5 processor. Run Winstone 96 and record the score for this processor.

4. Compare the Winstone 96 score for the AMD-K5 processor with those of the Pentium processor at the frequencies recorded. The P-Rating that the AMD-K5 processor receives will be based on the highest frequency of the Pentium processor that the AMD-K5 processor's Winstone score surpasses.

Optimization Tips

When benchmarking to determine the P-Rating of the AMD-K5 processor, use of a single system for both processors is the best method to generate performance results. If the AMD-K5 processor does not achieve equivalent performance to the Pentium processor in your testing, an outdated BIOS could be the cause. An older BIOS might not fully support the AMD-K5 processor, causing less than optimal system performance. One of the effects might be the addition of unnecessary memory wait states for the AMD-K5 processor. Updated BIOS files can be obtained from the system or motherboard supplier.

If the same platform cannot be used for both processors, the hardware should be kept the same as much as possible. Again, an up-to-date BIOS with full processor support is important for providing optimal performance when using different systems. Different systems may also have different memory wait state values. The BIOS setup utility can be used to check these values and, if possible, modify the values to bring both systems in line with each other.

DRAM size and type plays a major part in determining the benchmark results. Increasing DRAM size enhances system performance, as does selecting EDO over Fast Page DRAM. Level 2 cache size and type differences can also affect the results. Pipeline burst L2 cache provides higher bandwidth, and therefore higher performance, than asynchronous L2 cache. Having any one of the above memory differences between the two systems can cause a performance difference of anywhere from 3% to 10%.

Some components that might have a less obvious effect on performance are hard disks and device drivers. Hard disk access time and rotational speed have a noticeable effect on Winstone 96 due to the benchmark's system-level nature. It is possible to see a 5% performance difference among various hard drives. Device drivers need to be the most recent versions from the respective vendor to ensure optimal device performance.

Conclusion

The AMD-K5 processor delivers comparable performance to a Pentium processor, as specified by the P-Rating marked on the AMD-K5 processor. This rating can be verified by using the P-Rating system in any number of PC systems. Following the P-Rating methodology and using the same or similar systems for a "apples-to-apples" comparison is important for achieving accurate benchmark results.

Trademarks:

AMD, the AMD logo, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

AMD-K5 is a trademark of Advanced Micro Devices, Inc.

Microsoft and Windows are registered trademarks of Microsoft Corporation.

Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies.