



Pentium® Processor with Voltage Reduction Technology: Performance Brief for Mobile Applications



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INTRODUCTION

The Intel Pentium® processor mobile family provides outstanding performance for all mobile applications. The Pentium processor mobile family consists of the following processors:

- Pentium processor at 133 MHz
- Pentium processor at 120 MHz
- Pentium processor at 100 MHz
- Pentium processor at 90 MHz
- Pentium processor at 75 MHz

These Pentium processors are offered in a package developed especially for mobile systems, the Tape Carrier Package (TCP), and incorporate Voltage Reduction Technology and power management SL technology features. Voltage Reduction Technology allows the processor to “talk” to industry standard 3.3 volt components, while its inner core, operating at 2.9 volts, consumes less power to promote a longer battery life. These features allow system manufacturers to offer high-performance, feature-rich notebook computers with extended battery lives.

This report provides test results which illustrate the Pentium processor with voltage reduction technology performance on common benchmarks. The results can be used as one of the predictors of performance on real applications that you can expect to see and use on your mobile system. Details of the system configurations are described in Appendix A.

Benchmark results are intended to give a standard measure of performance that can be used to suggest how well the application code will execute. However, the measured performance is often the combined characteristics of a given computer architecture and many other tightly coupled system software/hardware components rather than just the CPU. Operating system, compilers, libraries, memory design and I/O subsystem characteristics may well dominate the results.

THE INTEL PENTIUM® PROCESSOR MOBILE ADVANTAGE

The Pentium processor incorporates platform features designed for high-performance computing. The result of the Pentium processor’s new architectural features and enhancements over the Intel486™ architecture is performance greater than two times the IntelDX4™ processor.

Such dramatic performance improvements allow the Pentium processor to run today’s most demanding mobile applications. It has the performance to run full-screen, full-motion video, real-time animation, compute intensive 3D modeling graphics applications, and mobile multimedia presentations.

The Intel Pentium processor delivers the world’s best performance for the huge base of PC software. Additionally, the Pentium processor delivers the extra power needed for today’s newest PC capabilities. Pentium processor-based systems offer superior investment protection by providing performance that can handle tomorrow’s more demanding software with upgradability to even higher performance when needed.

Product Feature Highlights

- Fully compatible with an entire library of software based on operating systems such as MS-DOS*, Windows 3.1*, Windows NT*, Windows 95*, NeXTstep*, IBM OS/2*, Sun Solaris*, SCO UNIX*, UnixWare*.
- 75, 90, 100, 120 and 133 MHz Versions
- Superscalar Architecture
- Enhanced Floating Point Unit
- 64-bit External Data Bus
- Branch Prediction Feature
- Separate Code and Data Caches with MESI Protocol
- Performance Monitoring and Execution Tracing
- High-Reliability Error Detection

VOLTAGE REDUCTION TECHNOLOGY

iCOMP® Index Rating

The iCOMP® (Intel Comparative Microprocessor Performance) index provides a simple relative measure of microprocessor performance. It is not a benchmark, but the results from a collection of benchmarks measured on well-designed commercially-available systems. iCOMP ratings are intended to help end users decide which Intel microprocessor best meets their desktop and mobile computing needs.

The iCOMP rating is based on the four major aspects of both 16- and 32-bit CPU performance: integer, floating-point, graphics and video performance. The higher the iCOMP rating, the higher the relative performance of the microprocessor.

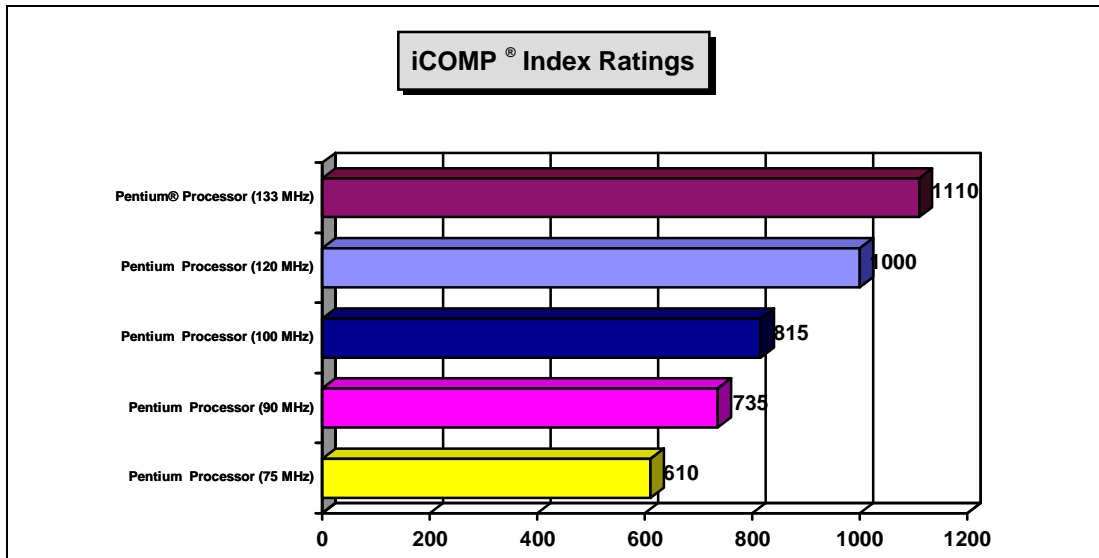


Figure 1. iCOMP® Index Ratings for Intel Processors

DOS*/Windows* Processor Benchmarks

The 32-bit integer Windows performance of the Pentium processor is illustrated by the commonly used Windows benchmarks presented. These benchmarks represent the high performance potential achieved with the mobile Pentium processor for running the immense and expanding base of 32-bit applications without compromising battery life.

The 133-MHz Pentium processor offers processor performance gains of up to 60 percent, when compared to the 75-MHz Pentium processor and up to 10 percent when compared to the 120 MHz. Figures 2 and 3 illustrate the Pentium processor performance when executing Norton SI32* and SI16*. Norton SI32 is a new 32-bit Windows 95 benchmark designed to show the speed of a system (CPU, L2 cache, and memory), compared to the speed of other systems for running common 32-bit applications. This benchmark is part of the SYSINFO* module of the Norton Utilities* for Windows 95 provided by Symantec. This benchmark was run using Windows 95. SI16 is the 16-bit equivalent and was run using Windows 3.11.

For 16-bit and 32-bit application performance potential, the 133-MHz Pentium processor offers performance gains of up to 64 percent when compared to the 75-MHz Pentium processor and up to 10 percent performance gains when compared to the 120-MHz Pentium processor. CPUmark₃₂*, illustrated in Figure 4, is a 32-bit Windows processor benchmark provided by Ziff-Davis Labs designed to measure the performance potential for running future 32-bit applications. CPUmark₁₆*, shown in Figure 5, is the 16-bit equivalent. Ziff-Davis Lab benchmarks were run using Windows 95.

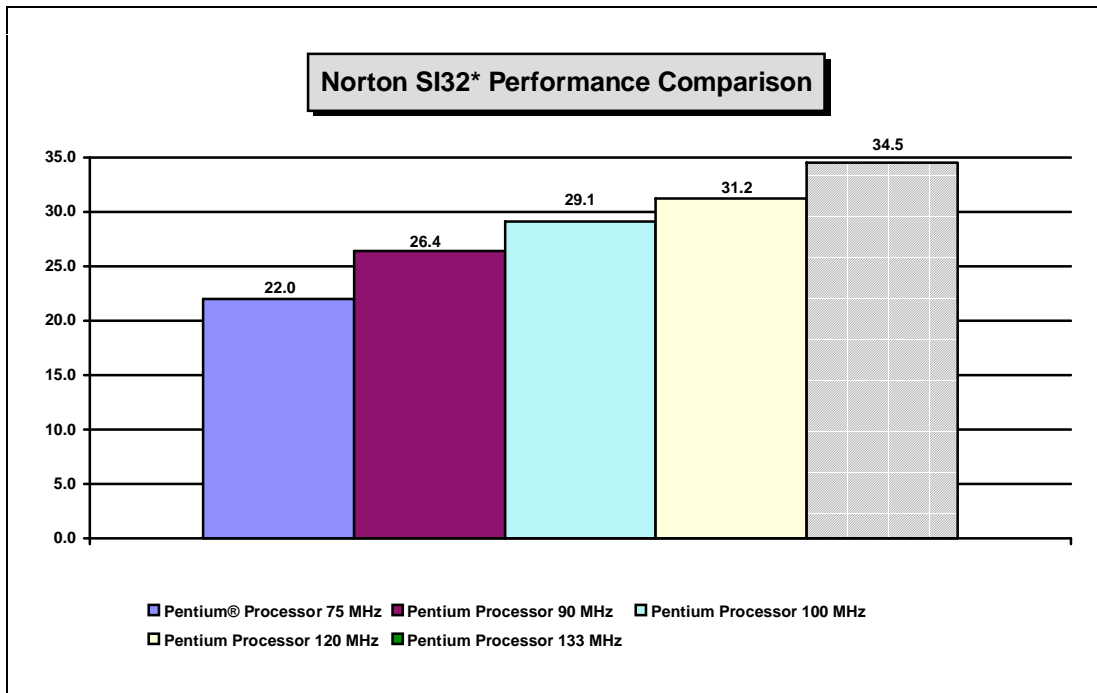


Figure 2. Pentium® Processor Performance for Mobile Applications for the Norton SI32* Benchmark

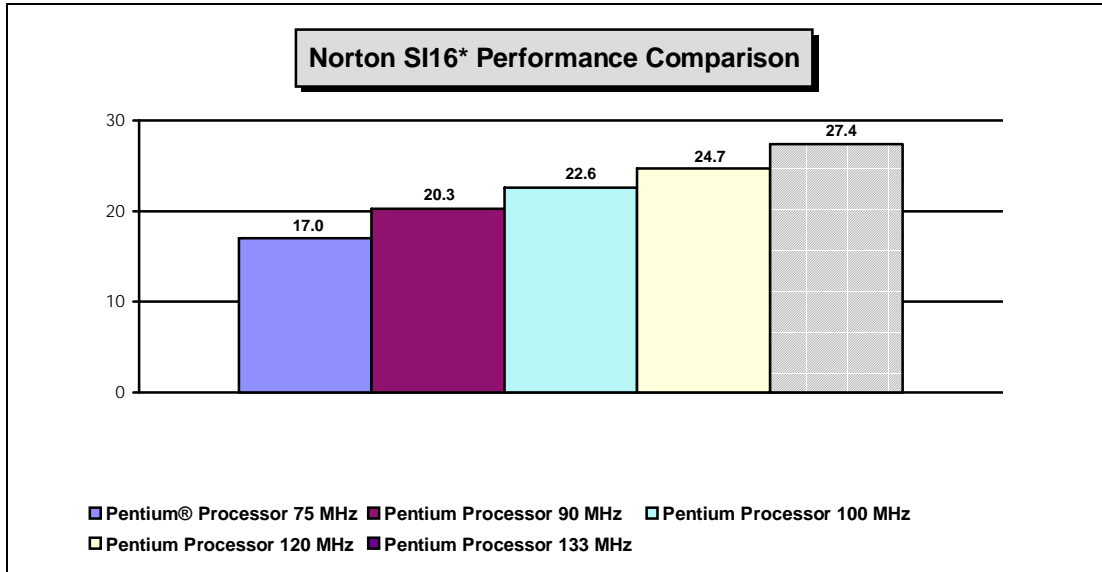


Figure 3. Pentium® Processor Performance for Mobile Applications for the Norton SI16* Benchmark

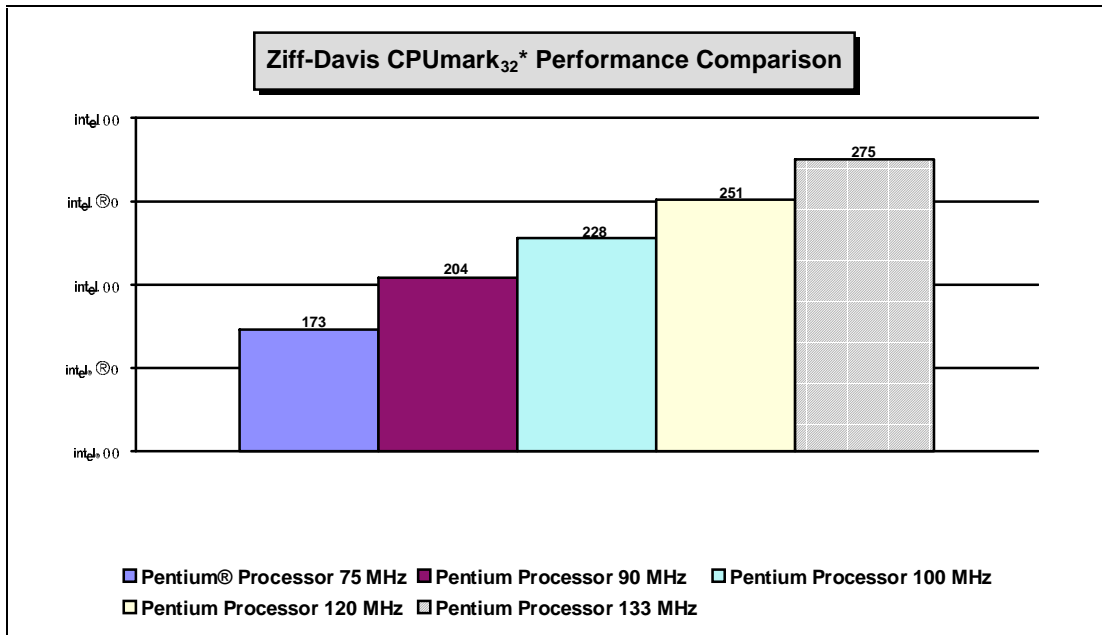


Figure 4. Pentium® Processor Performance for Mobile Applications for the Ziff-Davis CPUmark₃₂* Benchmark

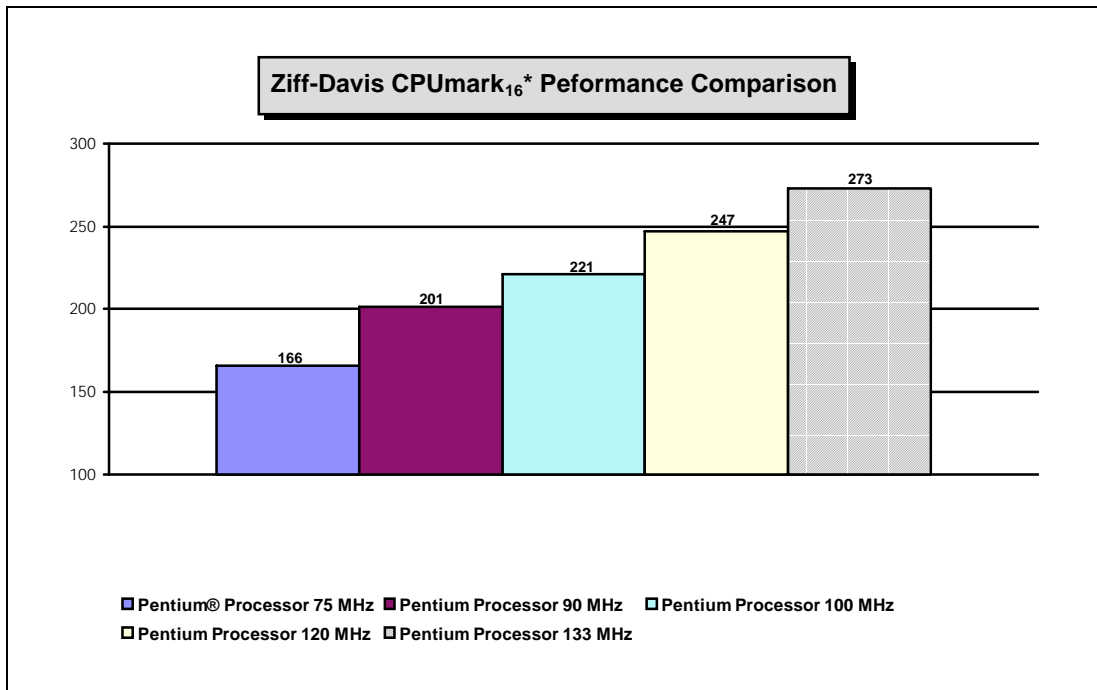


Figure 5. Pentium® Processor Performance for Mobile Applications for the Ziff-Davis CPUmark₁₆* Benchmark

Table 1. Pentium® Processor Benchmark Results for Mobile Applications

		Intel Pentium® Processor			
Processor Benchmarks	Operating System	75 MHz	90 MHz	100 MHz	120 MHz
DOS*/Windows* (256 KB / L2)					
Norton System Index*					
SI32	Windows 95	22.0	26.4	29.1	31.2
SI16	Windows 3.11	17.0	20.3	22.6	24.7
Winbench96*					
CPUmark ₃₂	Windows 95	173	204	228	251
CPUmark ₁₆	Windows 95	166	201	221	247

SUMMARY

The Pentium processor provides outstanding performance for all PC software, with the Pentium processor 133 MHz offering the highest level of processing power for mobile applications. The Pentium processor family brings the latest most advanced design techniques, superscalar technology, and world class floating-point performance. Table 1 summarizes the microprocessor benchmark performance for the Pentium processor mobile family.

APPENDIX A — TEST CONFIGURATIONS FOR MOBILE APPLICATIONS

DOS*/Windows* Configuration

	Mobile Pentium® Processor 75-133 MHz-based Platforms
FPU	Integrated
Integrate Level 1 Cache (internal)	8- Kbyte (Instruction) 8-Kbyte (Data)
Level 2 Cache (external)	256-Kbyte Write-Back
Memory	16-Mbyte EDO DRAM
Operating Systems	DOS* 6.22 Windows* 3.11, Windows 95*
Disk	Seagate Marathon ST9816AG
Video	Chips & Technology* 65548 1-Mbyte VRAM Chips & Technology Driver, V3.20
Graphics	640 x 480 x 256 Colors Resolution
Bus	PCI