Mobile Pentium® II Processor 366/333/300PE/266PE MHz Performance Brief

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1. INTRODUCTION

The 266PE-, 300PE-, 333- and 366-MHz mobile Pentium® II processors are the newest members of the family of Intel processors that provide outstanding performance for all mobile applications. Manufactured from Intel's latest state-of-the-art 0.25 micron process technology, the 366-, 333-, 300PE- and 266PE-MHz mobile Pentium II processors, with their new on die 256 Kbyte L2 cache enables higher levels of performance for new mobile PCs.

The mobile Pentium® II processor family now consists of the total of following six products:

- Mobile Pentium® II Processor at 366 MHz
- Mobile Pentium® II Processor at 333 MHz
- Mobile Pentium® II Processor at 300PE MHz
- Mobile Pentium® II Processor at 300 MHz
- Mobile Pentium® II Processor at 266PE MHz
- Mobile Pentium® II Processor at 266 MHz

Today's microprocessor performance can be best assessed using three different vectors of performance:

- **Integer Benchmarks** simulate the activities of end users working in typical productivity applications such as word processing, spreadsheets, presentation applications and personal finance programs.
- **Multimedia Benchmarks** are designed specifically to simulate the activities of end users utilizing video, digital sound, PC imaging or Video Conferencing, and other similar media-rich applications.
- **Floating-Point Benchmarks** measure the performance of three-dimensional visualization techniques such as those used in games to support richer textures and enhanced lighting effects.

Representative integer benchmarks include: Processor Level Benchmarks- SPECint*95; System Level Benchmarks- SYSmark*98, Winstone*99, and the processor component of WinBench*99 from Ziff-Davis*

Representative multimedia benchmarks include: MultimediaMark* 99 from FutureMark* Corp., Intel MMX™ Technology Applications as well as Intel Media Benchmark.

Representative floating-point benchmarks include: the FPU component of WinBench99* from Ziff-Davis*, 3DMarkCPU* from 3Dmark, and SPECfp base*95.

This report provides test results on the three vectors of performance on Intel's 366-, 333-, 300PE- and 266PE- MHz mobile Pentium II processors with performance normalized to the mobile Pentium II processor at 233 MHz. We selected the following benchmarks to represent the three vectors of performance:

- Integer: Processor level benchmark- SPECint*95, system level benchmark- Winstone*99
- Multimedia: MultimediaMark* 99
- Floating-Point: SPECfp_base*95 and 3DMarkCPU*

Details of the system configurations used for all the benchmarks throughout this brief are described in Appendix A.

1.1 The Intel® Mobile Pentium® II Processor at 366, 333, 300PE, and 266PE MHz

The Intel's 366-, 333-, 300PE- and 266PE- MHz mobile Pentium® II processors deliver excellent performance for all IA architecture based PC software. They are fully compatible with the existing base of IA architecture based PC software written for the Pentium II processor, Pentium processor, Intel486™ processor, and Intel386™ processor. Additionally, this new generation of processors enables higher levels of multimedia and communication performance. It has immediate responsiveness for the latest, most demanding software with powerful, realistic graphics and the ability to run full-screen, full-motion video.

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2. MOBILE PENTIUM® II PROCESSOR FEATURE HIGHLIGHTS

The new line of mobile Pentium® II processor allows high-performance notebooks to be designed for today's mobile applications by providing the following features:

- 366, 333, 300PE, and 266PE MHz Core CPU
- Integrated 16 Kbytes of Data and 16Kbytes of Instruction Level-One Cache
- Integrated on-die 256 Kbytes Level Two Cache
- Low Power GTL+ Processor System Bus Interface operating at 66 MHz
- Integrated Floating-Point Unit
- 64-bit External Data Bus
- Supports the Intel Architecture MMX™ Technology
- Supports the Intel Architecture with Dynamic Execution
- Quick Start Mode for low power , fast exit (low latency) clock "throttling"
- Deep Sleep mode for extremely low power dissipation
- High-Reliability Error Detection

3. MICROPROCESSOR PERFORMANCE SUMMARY

3.1 Three Vectors of Performance

3.1.1 Integer Benchmarks

The 32-bit Integer Windows performance of the Intel® mobile Pentium® II processor is illustrated by the following benchmarks:

Processor level benchmark: SPECint*95

The SPECint*95 benchmark test provides a comparison point for the performance of the microprocessor, memory architecture and compiler of a computer system on compute-intensive, 32-bit applications. SPEC benchmark test results for Intel microprocessors are determined using particular, well-configured systems. These results may or may not reflect the relative performance of Intel microprocessor in systems with different hardware or software designs or configurations (including compilers). Buyers should consult other sources of information, including system benchmarks, to evaluate the performance of systems they are considering purchasing.

System level benchmark: Business Winstone* 99

Winstone* 99 is a system-level, application-based benchmark developed by Ziff-Davis*. Winstone* 99 measures a PC's overall performance when running Windows-based 32-bit applications on Windows* 98 or Windows* NT 4.0. It runs real 32-bit business suites through a series of scripted activities and uses the time a PC takes to complete those activities to produce its performance scores.

Business Winstone* 99 incorporates the following popular office software suites: Corel WordPerfect* Suite 8, Lotus SmartSuite*, and Microsoft Office* 97. To mirror the typical usage patterns of today¹s PC users, the benchmark keeps multiple applications open within each suite, and switches tasks between these applications and the Netscape Navigator* Internet browser. (source: Ziff-Davis*)

Figures 1 and 2 illustrate the performance of the Intel® mobile Pentium® II processor when executing integer part of the benchmarks for CPU and system level performance comparison.

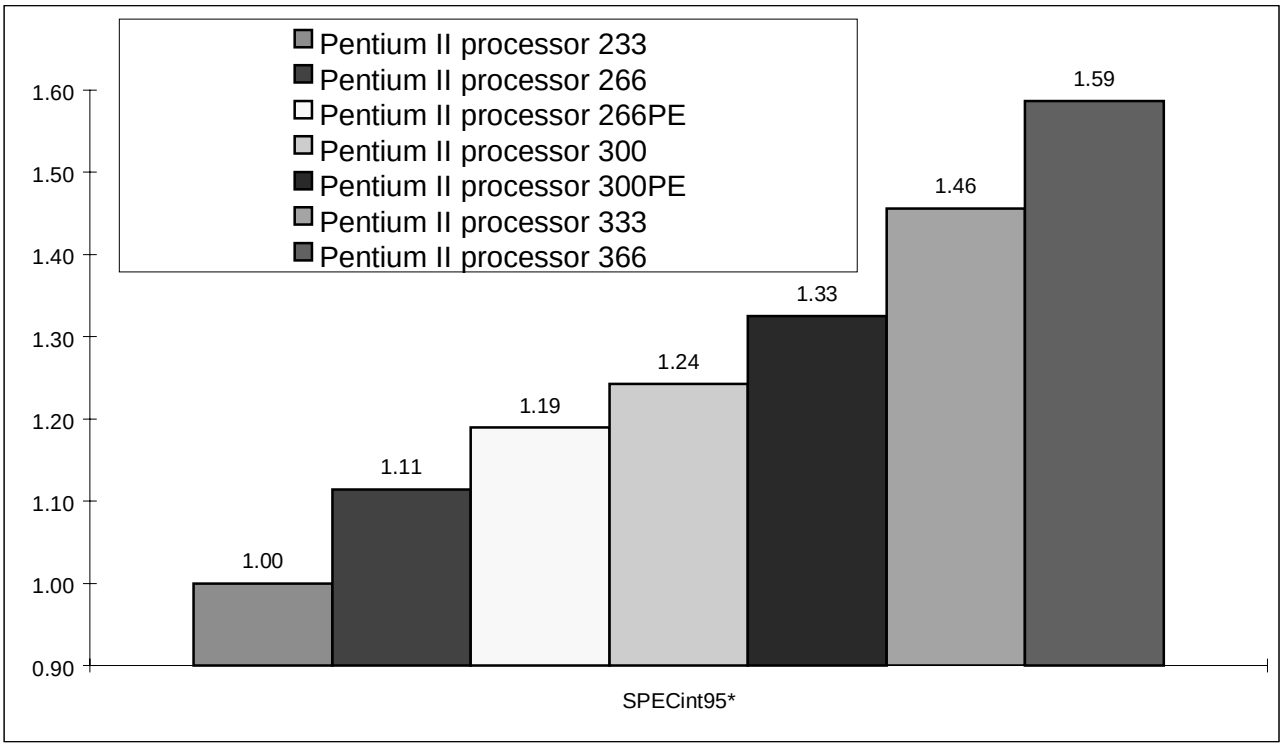

Figure 1. Mobile Pentium® II Processor Relative Performance for SPECint*95

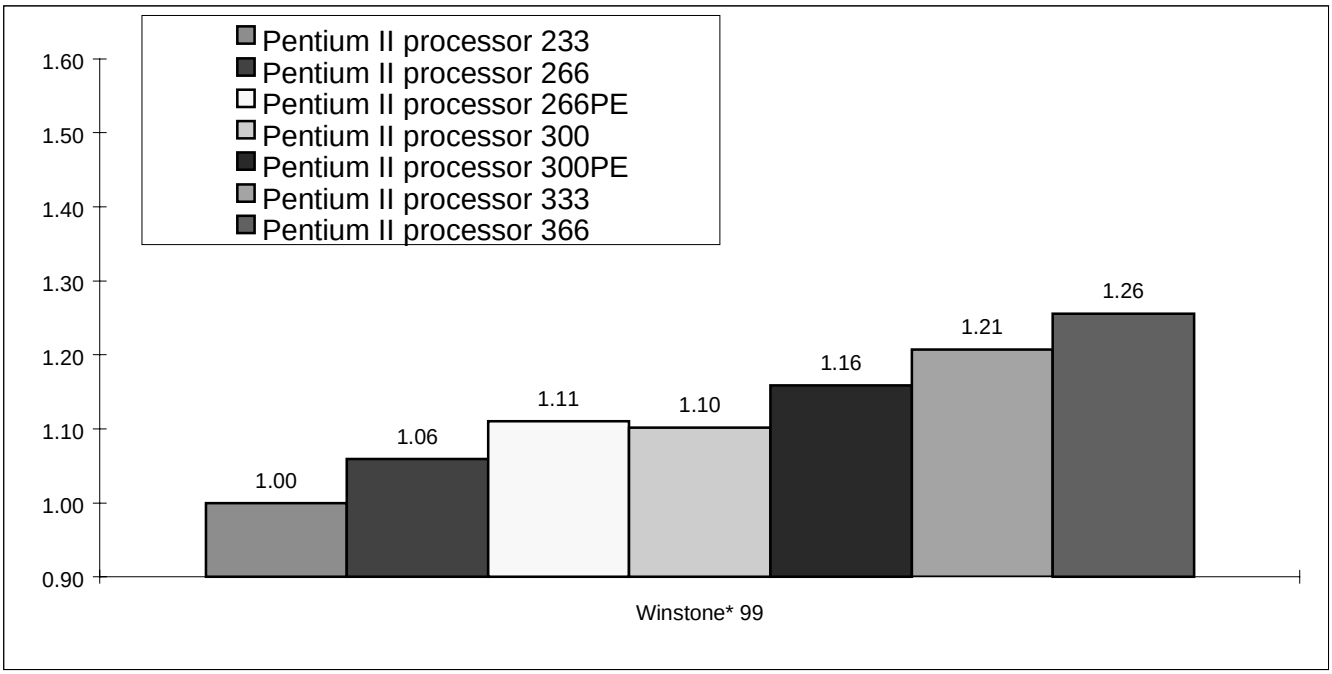

Figure 2. Mobile Pentium® II Processor Relative Performance for Ziff-Davis* Winstone* 99

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3.1.2 Multimedia Benchmark

The MultimediaMark* 99 is a system level benchmark from FutureMark* Corp. that measures audio, video, and imaging performance. MultimediaMark* 99 is a benchmark that focuses on testing multimedia performance of modern PC in a "real world" environment.

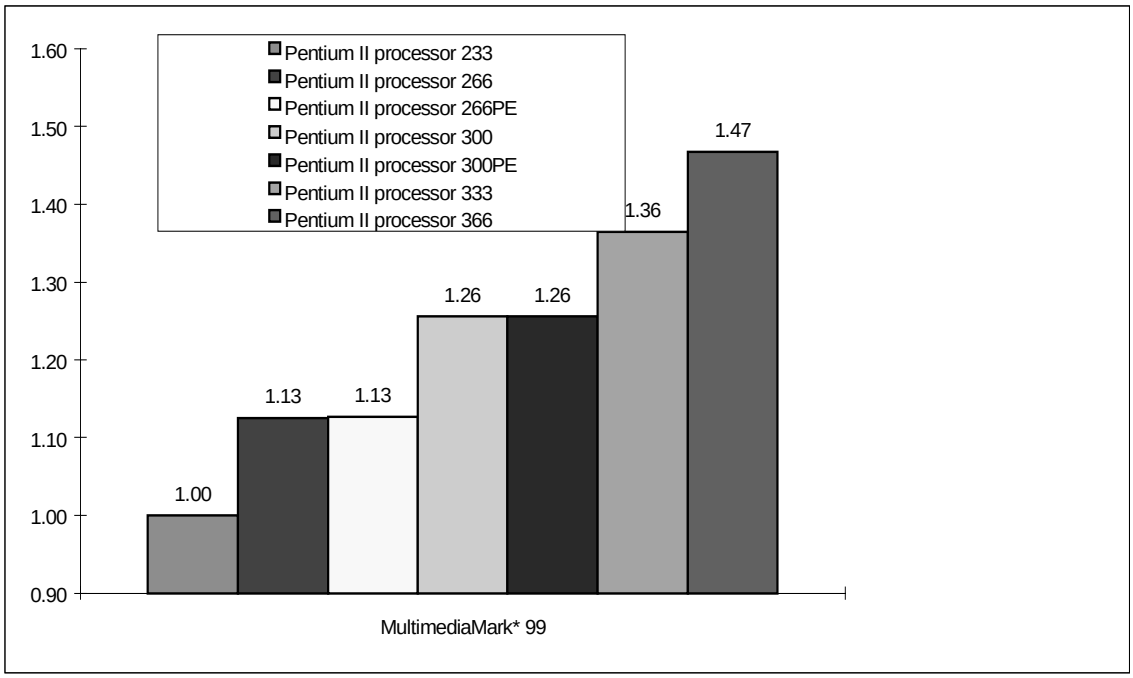

Figure 3. Mobile Pentium® II Processor Relative Performance for MultimediaMark* 99 Benchmark

Figures 3 illustrates the relative performance comparison of the Intel® mobile Pentium® II processors when executing MultimediaMark* 99 benchmark.

3.1.3 Floating-point Benchmarks

The floating-point performance of the Intel® mobile Pentium® II processor is illustrated by the following benchmarks:

SPECfp*95

The SPECfp*95 benchmark test provides a comparison point for the performance of the microprocessor, memory architecture, and compiler of a computer system on compute-intensive, 32-bit applications. SPEC benchmark test results for Intel microprocessors are determined using particular, well-configured systems. These results may or may not reflect the relative performance of Intel microprocessor in systems with different hardware or software designs or configurations (including compilers). Buyers should consult other sources of information, including system benchmarks, to evaluate the performance of systems they are considering purchasing.

3DMark* 99

3DMark* 99 from Futuremark* - is a diagnostic suite of benchmarks based on current 3D Games and high end applications that analyzes, tests and reports on a system's 3D performance. For processor comparisons, 3DMark* 99 includes the CPU Processing Speed test. This test focuses on the floating-point intensive 3D-geometry portion of the graphics pipeline.

Figures 3 and 4 illustrate the relative performance comparison of the Intel® mobile Pentium® II processors when executing SPECfp*95 and 3Dmark* 99 benchmark.

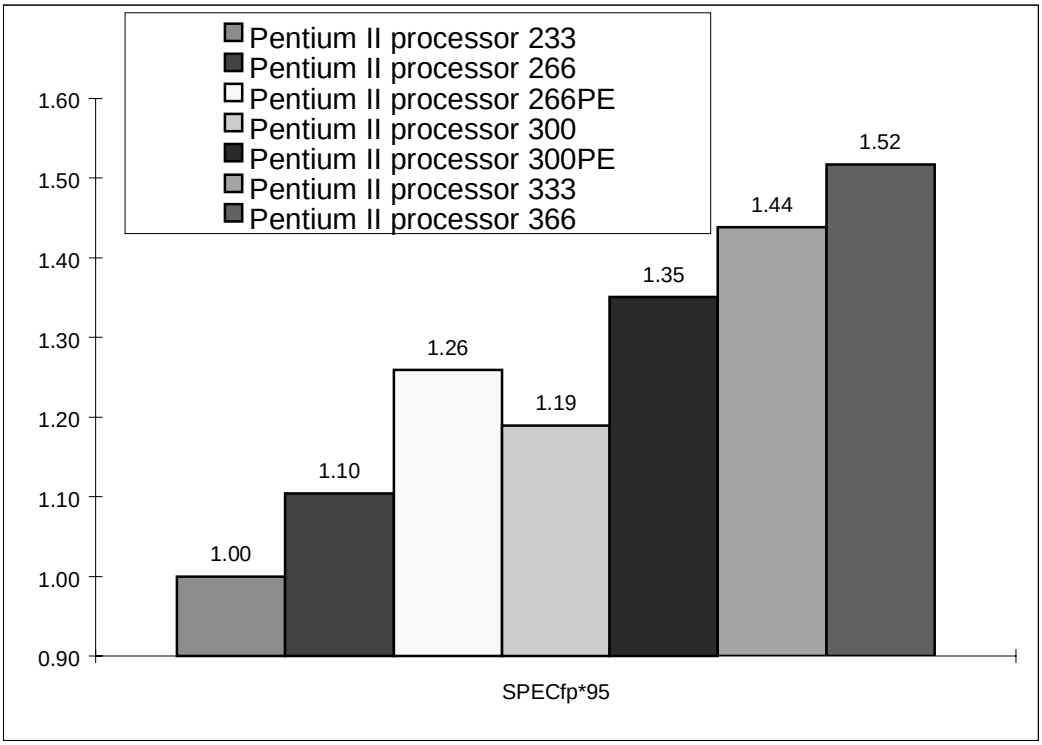

Figure 4. Mobile Pentium® II Processor Relative Performance for SPECfp*95

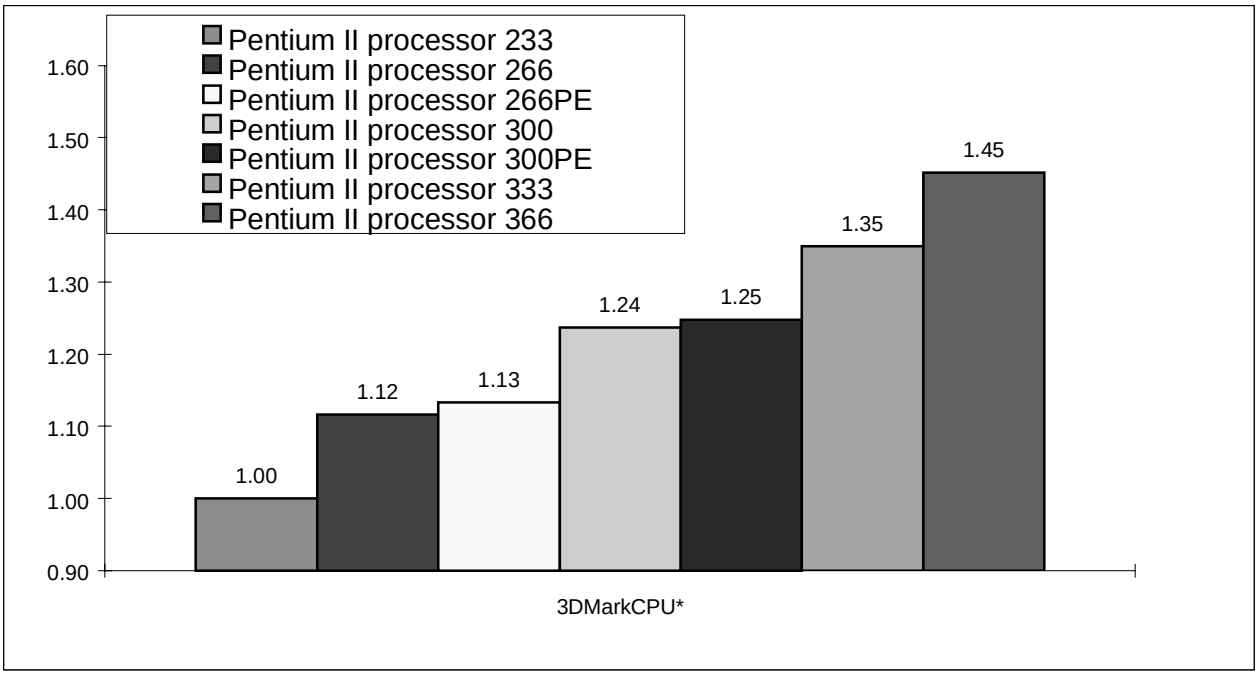

Figure 5. Mobile Pentium® II Processor Relative Performance for 3DMarkCPU*

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4. SUMMARY

Table 1 summarizes the microprocessor benchmark relative performance results for the mobile Pentium® II processors discussed in this performance brief.

Table 1. Mobile Pentium® II Processor Benchmark Results

Processor	Winstone* 99	MultimediaMark* 99	3DMarkCPU*	SPECint*95	SPECfp95*
Mobile Pentium® II Processor 233 MHz	1.00	1.00	1.00	1.00	1.00
Mobile Pentium® II Processor 266 MHz	1.06	1.13	1.12	1.11	1.10
Mobile Pentium® II Processor 266PE MHz	1.11	1.13	1.13	1.19	1.26
Mobile Pentium® II Processor 300 MHz	1.10	1.26	1.24	1.24	1.19
Mobile Pentium® II Processor 300PE MHz	1.16	1.26	1.25	1.33	1.35
Mobile Pentium® II Processor 333 MHz	1.21	1.36	1.35	1.46	1.44
Mobile Pentium® II Processor 366 MHz	1.26	1.47	1.45	1.59	1.52

Appendix A — System Configurations

Table A-1 shows the systems and their configurations used for evaluating the benchmark performances discussed in this brief.

Table A-1. System Configurations

Processor	Mobile Pentium® II Processor at 233/266/266PE/300/300PE/333/366 MHz
OEM's System	ThinkPad* IBM* 770 with Pentium® II processor Mobile Module with Intel®440BX Chip Set
Primary Cache	16-Kbyte (Instruction) 16-Kbyte (Data)
Secondary Cache	512 Kbytes PBSRAM for Mobile Pentium® II Processor at 233/266//300 MHz On-die 256 Kbytes for Mobile Pentium® II Processor at 266PE/300PE/333/366 MHz
System Memory Size/Speed	64 Mbytes SDRAM
Motherboard Chip Set	Intel® 82440BX
Hard Disk	8.1 GB
Media	2X DVD-ROM
Operating System	Windows* 98 for Winstone* 99, MutlimediaMark **and 3DMarkCPU**, Windows NT* 4.0 (OSR3) for SPECint95* and SPECfp95*
Sound	Crystal* (SoundBlaster* Pro compatible)
Video Controller	Trident*9385DVD graphics controller

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