Intel® Mobile Celeron™ Processor 300/266 MHz Performance Brief

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1. INTRODUCTION

The Intel® 266 and 366-MHz mobile Celeron™ processors are the newest members of the family of Intel processors that provide outstanding performance for all mobile applications at an exceptional value. Manufactured from Intel's latest state-of-the-art 0.25 micron process technology, the 300- and 266-MHz mobile Celeron processors, with their new on die 128 Kbyte L2 cache enables higher levels of performance for new mobile PCs.

The mobile Celeron processor family consists of the following products:

- Mobile Celeron™ Processor at 300 MHz
- Mobile Celeron™ 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 WinBench*99 from Ziff-Davis*, 3DMarkCPU from 3Dmark, WinBench*98 FPU 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 WinBench*98 FPU

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

1.1 The Intel® Mobile Celeron™ Processor at 300 and 266 MHz

The Intel's® 300- and 266- MHz mobile Celeron™ processors deliver excellent performance for all IA architecture based PC software. They are fully compatible with the existing base of PC software written for the Pentium® II processor, Celeron 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.

2. MOBILE CELERON™ PROCESSOR FEATURE HIGHLIGHTS

The mobile Celeron™ processor allows exceptional value notebooks to be designed for today's mobile applications by providing the following features:

- 300 and 266 MHz Core CPU
- Integrated 16 Kbytes of Data and 16Kbytes of Instruction Level-One Cache
- Integrated on-die 128 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
- Integrated Thermal Diode
- 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 Celeron™ 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 real32-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 Celeron™ processor when executing integer part of the benchmarks for CPU and system level performance comparison.

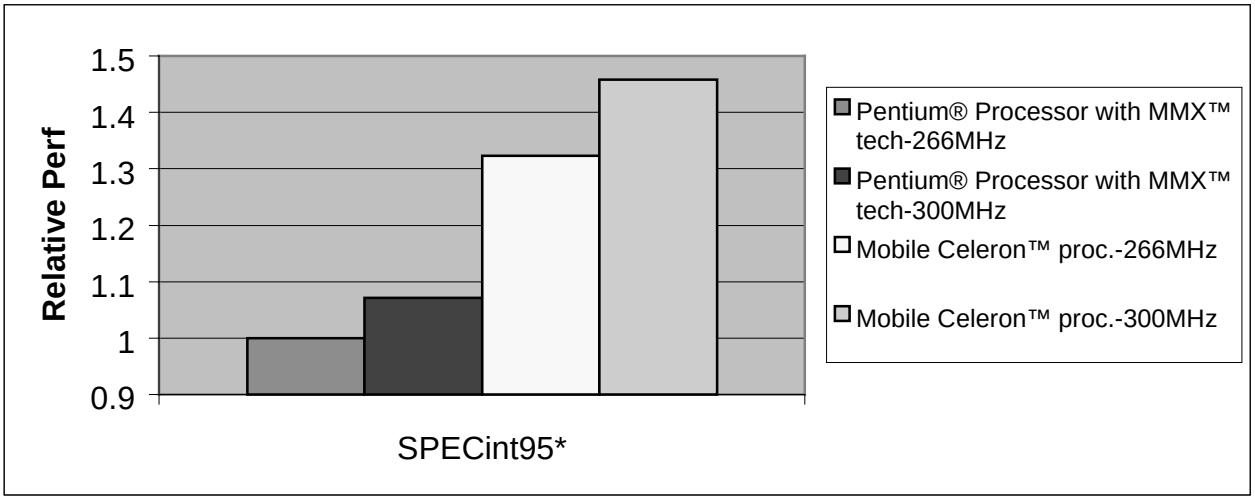

Figure 1. Mobile Celeron™ Processor Relative Performance for SPECint*95

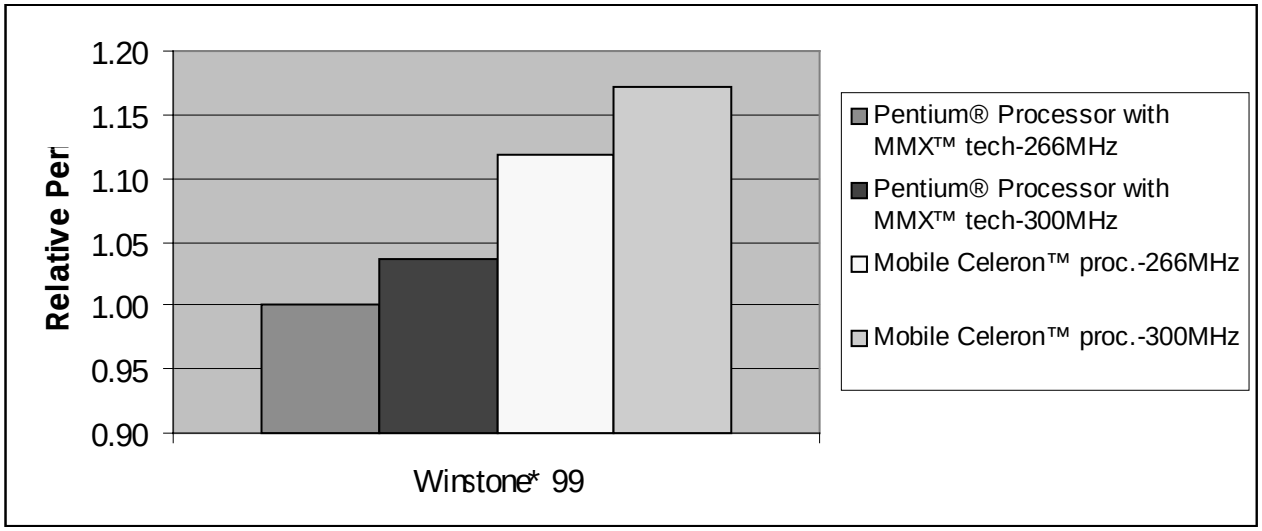

Figure 2. Mobile Celeron™ Processor Relative Performance for Ziff-Davis* Winstone* 99

3.1.2 Multimedia Benchmarks

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.

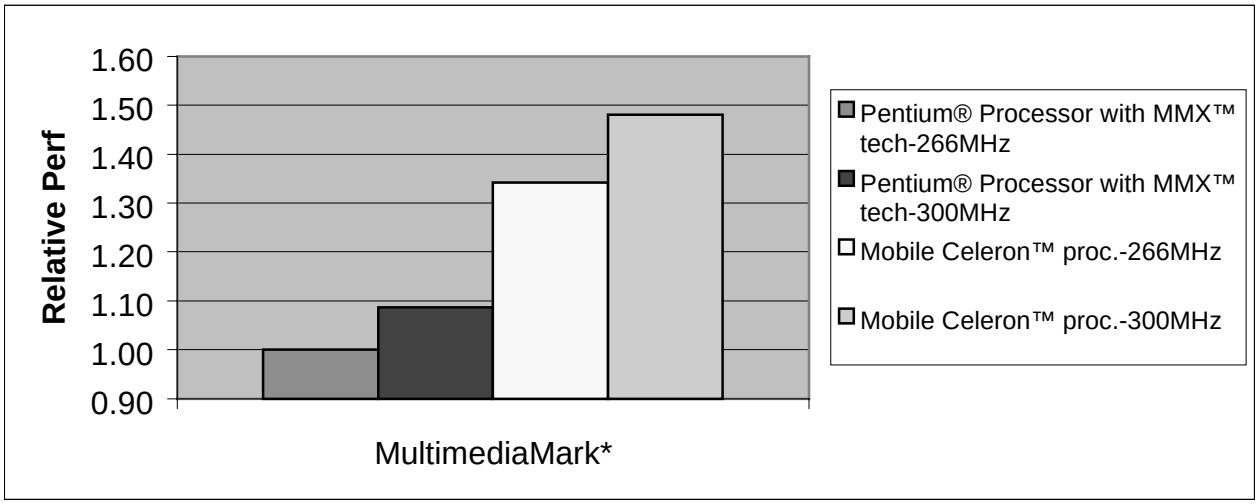

Figure 3. Mobile Celeron™ Processor Relative Performance for MultimediaMark* 99 Benchmark

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

3.1.3 Floating-point Benchmarks

The floating-point performance of the Intel® mobile Celeron™ 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.

WinBench*98 FPU

Business WinBench*98 is a subsystem-level benchmark that measures the performance of a PC's graphics, disk, processor, video, and CD-ROM subsystems in a Windows*-based environment. WinBench 98's tests are all 32-bit and can only run on Windows*95 and Windows*NT systems.

We used the FPU WinMark* components of this benchmark for comparing floating-point performance in this report.

The Business applications and the categories in which the benchmark groups them are:
· Business Browsers: Netscape Navigator*
· Business Publishing: Corel DRAW!* 7, Microsoft PowerPoint*98
· Business Spreadsheet/Database: Microsoft Access*98, Microsoft Excel*98, Lotus 1-2-3* 98, Corel Quattro Pro*7
· Business Word Processing: Microsoft Word* 98, Corel WordPerfect* 7 (source Ziff-Davis*)

Figures 3 and 4 illustrate the relative performance comparison of the Intel mobile Celeron processors when executing SPECfp*95 and WinBench98 FPU* benchmark.

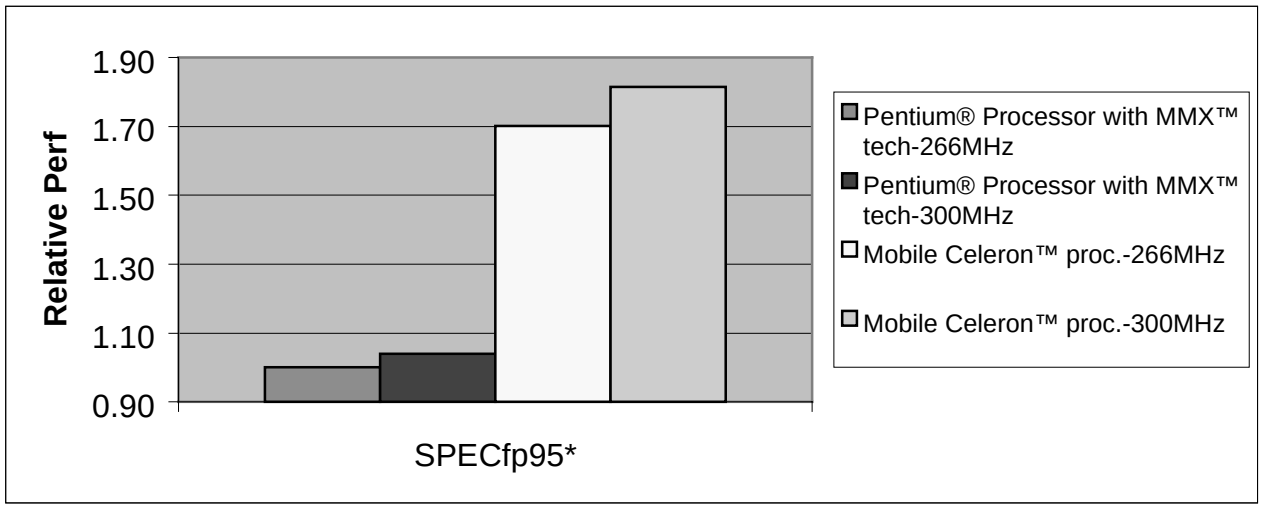

Figure 4. Mobile Celeron™ Processor Relative Performance for SPECfp*95

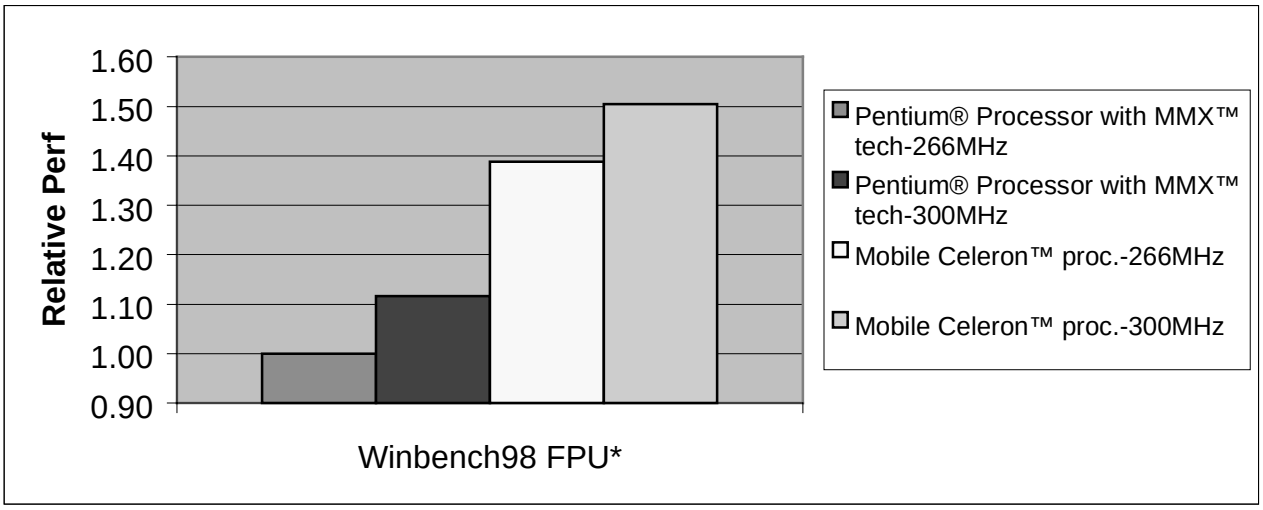

Figure 5. Mobile Celeron™ Processor Relative Performance for Winbench98 FPU*

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4. SUMMARY

Table 1 summarizes the microprocessor benchmark relative performance results for the mobile Celeron™ processors discussed in this performance brief.

Table 1. Mobile Celeron™ Processor Benchmark Results

Processor	Winstone* 99	MultimediaMark* 99	Winbench98 FPU**	SPECint*95	SPECfp*95
Mobile Pentium® Processor With MMX™ Technology 266 MHz	1.00	1.00	1.00	1.00	1.00
Mobile Pentium® Processor With MMX™ Technology 300 MHz	1.04	1.09	1.12	1.07	1.04
Mobile Celeron™ Processor 266 MHz	1.12	1.34	1.39	1.32	1.70
Mobile Celeron ™ Processor 300 MHz	1.17	1.48	1.50	1.46	1.82

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 Celeron™ Processor at 266/300 MHz	Mobile Pentium® Processor With MMX™ Technology at 266/300 MHz
OEM's System	Gateway* Solo* 2500 with Celeron™ processor with Intel 440BX Chip Set	Gateway* Solo* 2000 with Pentium® processor with MMX™ technology with Intel 430TX Chip Set
Primary Cache	16-Kbyte (Instruction) 16-Kbyte (Data)	16-Kbyte (Instruction) 16-Kbyte (Data)
Secondary Cache	On-die 128 Kbytes for Mobile Celeron ™ Processor at 266/300 MHz	External 512 Kbytes
System Memory Size/Speed	64 Mbytes SDRAM	64 Mbytes SDRAM
Motherboard Chip Set	Intel ®82440BX	Intel ®82440BX
Hard Disk	2.1 GB	2.1 GB
Media	20X CD-ROM	8X CD-ROM
Operating System	Windows* 98 for Winstone* 99, MutlimediaMark* and Winbench98 FPU*, Windows* NT 4.0 (OSR3) for SPECint95* and SPECfp95*	Windows* 98 for Winstone* 99, MutlimediaMark* and Winbench98 FPU*, Windows* NT 4.0 (OSR3) for SPECint95* and SPECfp95*
Sound	NeoMagic* Magicwave* 3DX	Yamaha* OPLSaX3
Video Controller	MagicGraph 128XD* graphics controller	Chips & Tech* CT65554 graphics controller

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