



**Mobile Pentium® II Processor 300/266/233 MHz
Performance Brief**

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1. INTRODUCTION

The 233-, 266-, and 300-MHz Mobile Pentium® II processors are members of the newest 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 266-, 233-, and 300-MHz mobile Pentium II processors, with their new Dual Independent Bus (DIB) enables higher levels of performance for new mobile PCs.

The Mobile Pentium® II processor family consists of the following three products:

- Mobile Pentium® II Processor at 300 MHz
- Mobile Pentium® II Processor at 266 MHz
- Mobile Pentium® II Processor at 233 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, CPUmark*32, Norton*SI32; System Level Benchmarks- SYSmark*32 for Windows*95, SYSmark*32 for Windows*NT 4.0, SYSmark*NT , Winstone*98 and the processor component of WinBench*98 from Ziff-Davis*

Representative multimedia benchmarks include: Norton* Multimedia Benchmark 3.0 from Norton* Utilities, Intel MMX™ Technology Applications as well as Intel Media Benchmark.

Representative floating-point benchmarks include: the FPU component of WinBench*98 from Ziff-Davis*, 3D geometry portion of the Intel Media Benchmark, 3D graphics portion of the Norton Multimedia Benchmark*.

This report provides test results on the three vectors of performance on Intel's 300-, 266- and 233- MHz mobile Pentium® II processors with performance normalized to the Mobile Pentium processor with MMX™ technology at 166 MHz. We selected the following benchmarks to represent the three vectors of performance:

- Integer: WinBench*98 CPU 32 for Processor and Winstone*98 as a system level benchmark
- Multimedia: Norton* Multimedia Benchmark 3.0
- Floating-Point: FPU component of WinBench*98

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 300, 266 and 233 MHz

The Intel® Mobile Pentium® II processor delivers excellent performance for all PC software. It is fully compatible with the existing base of PC software written for the 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 Mobile Pentium® II processor allows high-performance notebooks to be designed for today's mobile applications by providing the following features:

- 300, 266 and 233 MHz Core CPU
- Integrated 16 Kbytes of Data and 16Kbytes of Instruction Level-One Cache
- Integrated 512 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 and Sensor
- 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 available from Ziff-Davis* Publications:

Processor level benchmark: Business WinBench*98 CPU32

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 CPUmark*32 and the FPU WinMark* components of this benchmark for comparing integer and floating-point performance throughout 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*)

System level benchmark: Business Winstone*98

Winstone*98 is a system-level application-based benchmark that measures a PC's overall performance when running today's top-selling Windows*-based 32-bit applications. It runs real 32-bit business applications through a series of scripted activities and uses the time a PC takes to complete those activities to produce its performance scores. Winstone's test suites don't mimic what these applications do, rather they run actual applications.. At the end of a test, Winstone 98 produces a measure of a PC's performance as it runs 32-bit applications under Window 95. Winstone 98 uses no 16-bit



applications for its tests. One can compare a PC's score with the scores of other PCs — higher scores mean faster overall performance.

The Business Winstone 98 tests are "market-centered" tests. Business applications are the popular applications employed by most users everyday. The Business applications and the categories in which the benchmark groups them are:

- Business Browsers: Netscape Navigator*
- Business Publishing: Corel DRAW!* 7, Microsoft PowerPoint*97
- Business Spreadsheet/Database: Microsoft Access *97, Microsoft Excel*
- Lotus 1-2-3* 97, Corel Quattro Pro* 7
- Business Word Processing: Microsoft Word* 97, Corel WordPerfect* 7

(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 Ziff-Davis* WinBench*98 CPU32

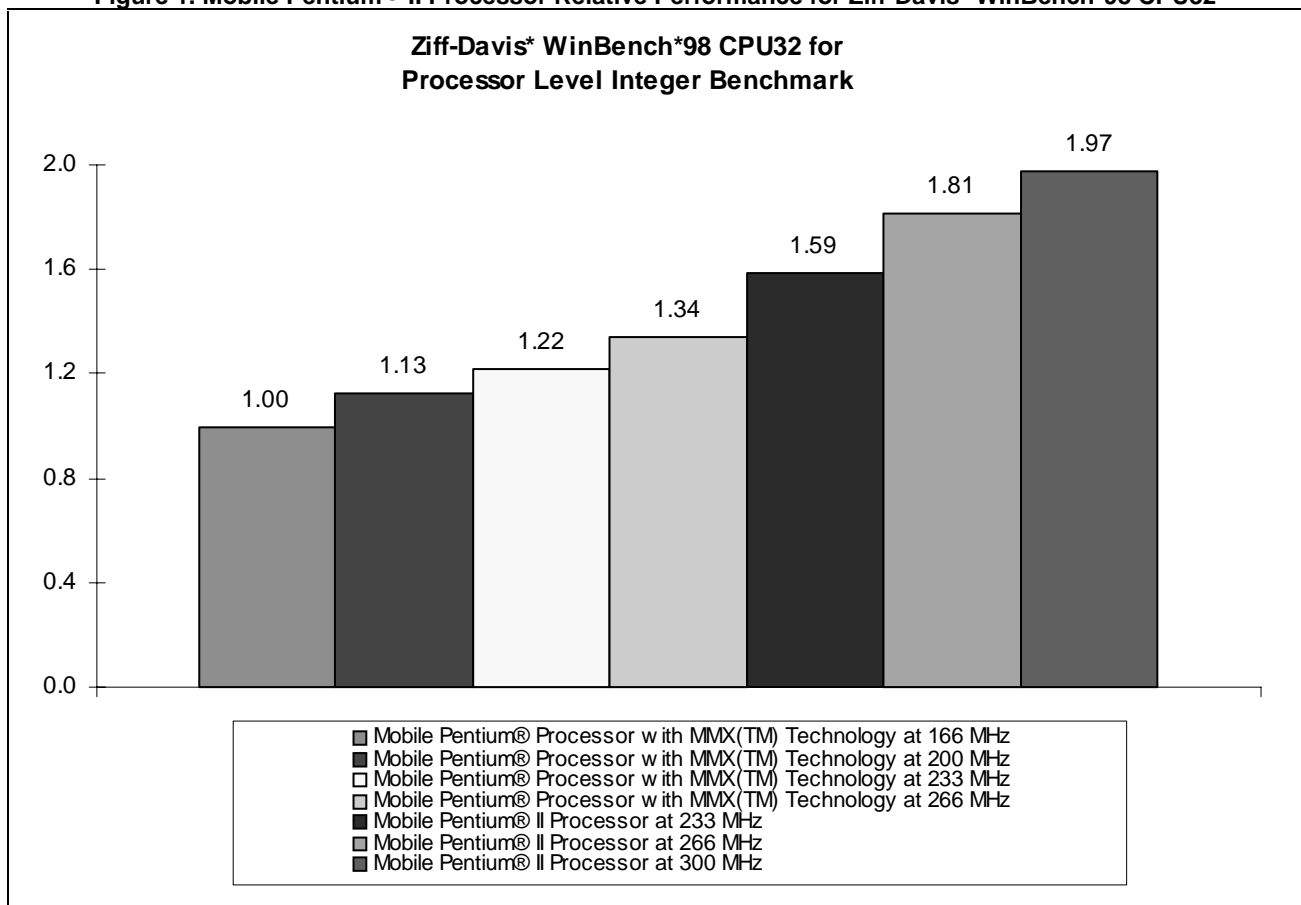
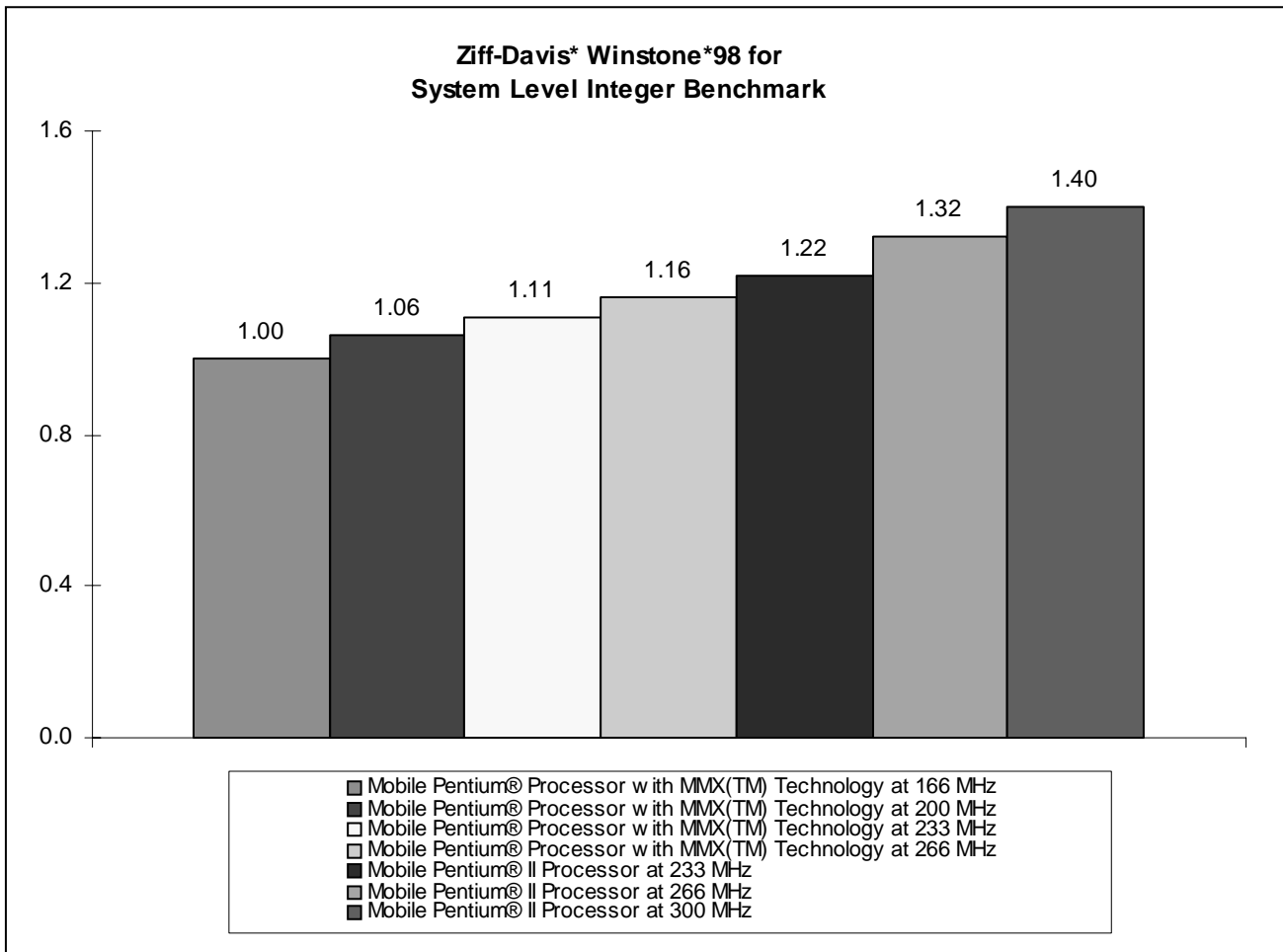


Figure 2. Mobile Pentium® II Processor Relative Performance for Ziff-Davis* Winstone*98



3.1.2 MULTIMEDIA BENCHMARK

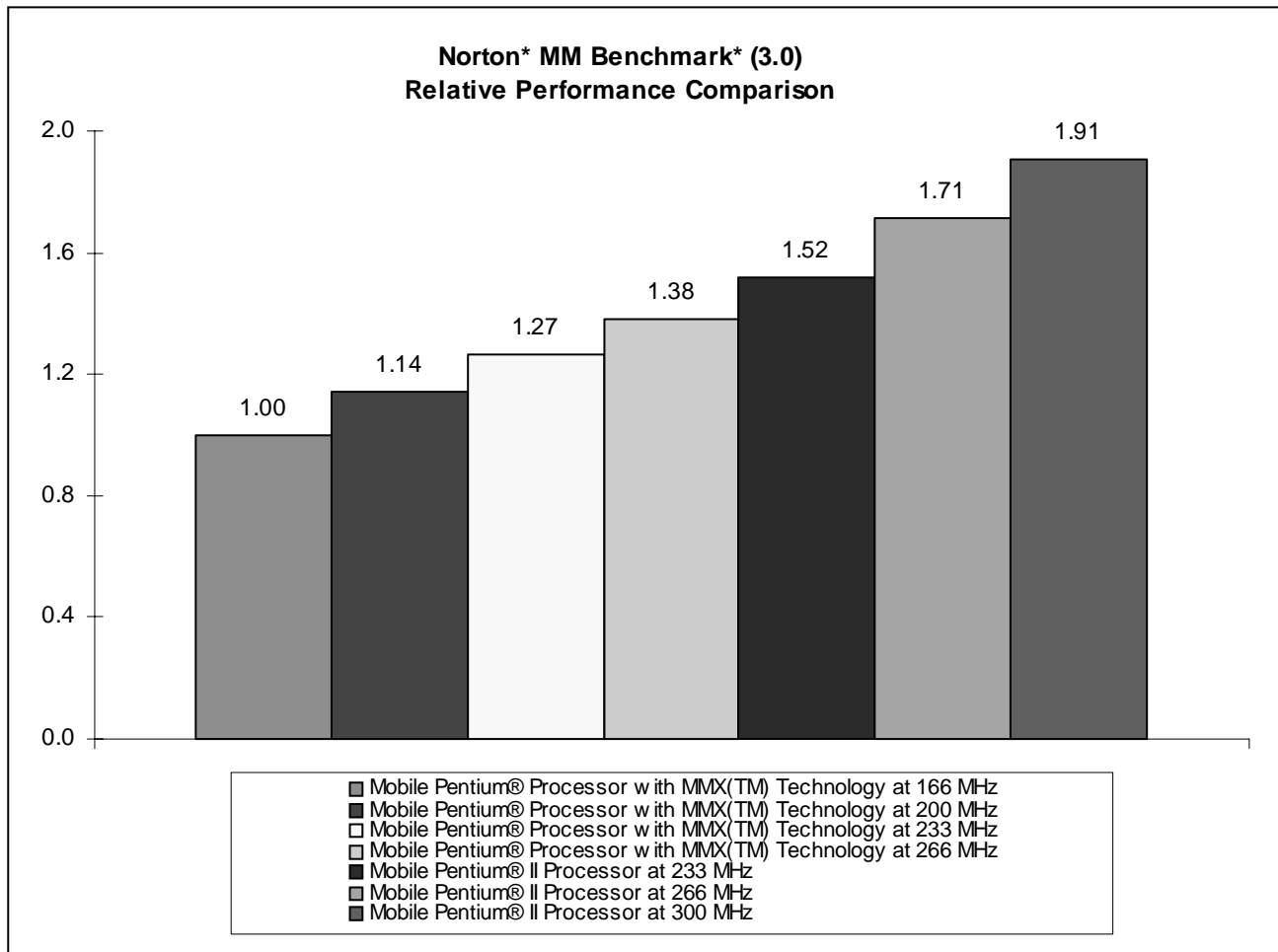
The Norton* Multimedia Benchmark* version 3.0 is a system level benchmark which tests multimedia capabilities of a system and compares its performance to a system conforming to the basic Multimedia PC (MPC) Level 2 specification. The benchmark reports performance for five multimedia categories:

- Video benchmarks video performance. It measures MPEG* video decompression and AVI video frame rates.
- 3D tests rendering capabilities.
- Audio measures audio mixing and MPEG* audio performance.
- CD-ROM measures the CD-ROM drive's maximum seek and transfer rates.
- Imaging tests image processing manipulations.

The Norton* Multimedia Benchmark* (3.0) score shows a system's overall multimedia performance rating compared to a standard MPC2 system.



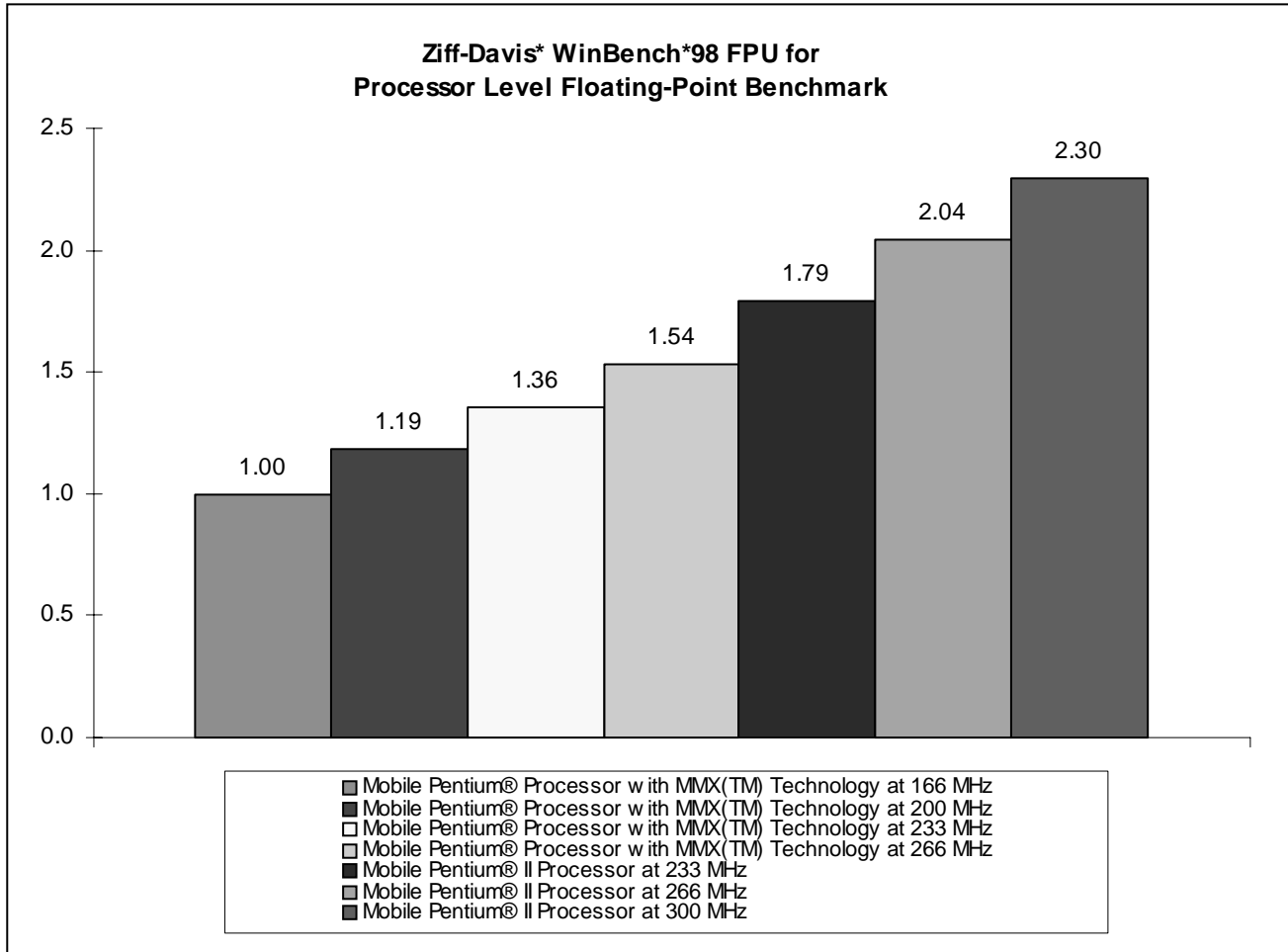
Figure 3. Mobile Pentium® II Processor Relative Performance for Norton* Multimedia Benchmark* Rev. 3.0



3.1.3 Floating-Point Benchmark

The WinBench*98 FPU is another component of the WinBench 98 Suite from Ziff-Davis* that measures the Floating-Point Unit's performance of a system. Please Refer to the Winbench 98 theory of operation in the processor level benchmark section of this report on page 2.

Figure 4. Mobile Pentium® II Processor Relative Performance for Ziff-Davis* WinBench*98 FPU





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	WinBench*98 CPU32 on Windows * 95	Winstone*98 on Windows* 95	Norton* MM on Windows* 95	WinBench*98 FPU
Mobile Pentium® Processor with MMX™ Technology 166 MHz	1.0	1.0	1.0	1.0
Mobile Pentium® Processor with MMX™ Technology 200 MHz	1.13	1.06	1.14	1.19
Mobile Pentium® Processor with MMX™ Technology 233 MHz	1.21	1.11	1.27	1.36
Mobile Pentium® Processor with MMX™ Technology 266 MHz	1.34	1.16	1.38	1.54
Mobile Pentium® II Processor 233 MHz	1.59	1.22	1.52	1.79
Mobile Pentium® II Processor 266 MHz	1.82	1.32	1.71	2.04
Mobile Pentium® II Processor 300 MHz	1.97	1.40	1.91	2.30



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® Processor with MMX™ Technology at 166/ 200 / 233 /266 MHz	Mobile Pentium® II Processor at 233/266/300 MHz
OEM's System	Gateway* Solo9100* with Inte® 82430TX / PCIset-based mobile module	Gateway* Pentium® II processor Mobile Module platform with Intel® 440BX Chip Set
Primary Cache	16-Kbyte (Instruction) 16-Kbyte (Data)	16-Kbyte (Instruction) 16-Kbyte (Data)
Secondary Cache	512 Kbytes PBSRAM	512 Kbytes PBSRAM
System Memory Size/Speed	32 Mbytes SDRAM	32 Mbytes SDRAM
APM	Off	Off
Motherboard Chip Set	Intel® 82430TX	Intel® 82440BX
BIOS	Phoenix* BIOS V4.0 Rel. 5.1	Phoenix* BIOS V4.0 Rel. 10.01.01
Hard Disk	Fujitsu* 2.1 GB	Hitachi* 2.16 GB
Media	8Xmin. - 20Xmax. CDROM	8Xmin. - 20Xmax. CDROM
Operating System	Windows* 95 OSR2 / w USB	Windows* 95 OSR2 / w USB
Sound	Yamaha* OPLSAX*	NeoMagic* Magicwave* 3DX
Video Controller/Bus	Chips & Technology* 65554/PCI	NeoMagic* Magicgraph* 128XD/PCI
Graphics	800 x 600 Resolution, 64K Colors	800 x 600 Resolution, 64K Colors



UNITED STATES, Intel Corporation
2200 Mission College Blvd., P.O. Box 58119, Santa Clara, CA 95052-8119
Tel: +1 408 765-8080

JAPAN, Intel Japan K.K.
5-6 Tokodai, Tsukuba-shi, Ibaraki-ken 300-26
Tel: + 81-29847-8522

FRANCE, Intel Corporation S.A.R.L.
1, Quai de Grenelle, 75015 Paris
Tel: +33 1-45717171

UNITED KINGDOM, Intel Corporation (U.K.) Ltd.
Pipers Way, Swindon, Wiltshire, England SN3 1RJ
Tel: +44 1-793-641440

GERMANY, Intel GmbH
Dornacher Strasse 1
85622 Feldkirchen/ Muenchen
Tel: +49 89/99143-0

HONG KONG, Intel Semiconductor Ltd.
32/F Two Pacific Place, 88 Queensway, Central
Tel: +852 2844-4555

CANADA, Intel Semiconductor of Canada, Ltd.
190 Attwell Drive, Suite 500
Rexdale, Ontario M9W 6H8
Tel: +416 675-2438