



Intel® Centrino™ Mobile Technology Performance Brief



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Wireless connectivity and some features may require you to purchase additional software, services or external hardware. Availability of public wireless LAN access points limited and some hotspots may not support Linux-based Intel Centrino mobile technology systems. System performance measured by MobileMark* 2005. System performance, battery life, wireless performance and functionality will vary depending on your specific operating system, hardware and software configurations. See http://www.intel.com/products/centrino/more_info for more information.

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Executive Summary:

The Next Generation of Intel® Centrino™ Mobile Technology

On January 19th 2005, Intel Corporation introduced the next generation Intel® Centrino™ mobile technology platform (formerly codenamed “Sonoma”). With the new platform, Intel continues to deliver new notebook PC capabilities designed specifically for the mobile world. Intel® Centrino™ Mobile Technology allows users to work, play and connect without wires and choose from a whole new generation of thin and light notebook PCs that are designed to enable great battery life.

With the new generation of Intel Centrino mobile technology, three components work together to deliver a breakthrough in freedom and capability— to work, learn and play on the go. These components include:

- Intel® Pentium® M Processor based on 90nm process technology featuring 2MB L2 cache and 533MHz front side bus
- Mobile Intel® 915 Express chipset family
- Intel® PRO/Wireless 2915ABG or 2200BG Network Connection

The Intel Pentium M processor with 90nm process technology is based on a high performance, low power micro-architecture and includes several innovative features like a high performance, power optimized System Bus which supports speeds up to 533MHz, 32KB Level 1 instruction and data caches, 2MB Level 2 Advanced Transfer Cache, advanced branch prediction and data prefetching, Streaming SIMD Extensions 2 support, Enhanced Intel SpeedStep® Technology support, Intel MMX™ media enhancement technology support, and advanced thermal monitoring capabilities. These features are offered in Micro-FCPGA and Micro-FCBGA package form factors.

The Intel Pentium M processor is the next step towards achieving high mobile performance at low power. This exciting new processor supports Enhanced Intel SpeedStep® technology at multiple operating points instead of two points support on the previous generation of mobile processors. Real-time dynamic switching of the voltage and frequency between multiple performance modes is based on CPU demand. This occurs by switching the bus ratios, core operating voltage, and core processor speeds without resetting the system. Multiple Enhanced Intel SpeedStep® technology operating points enable optimal performance at the lowest power.

The mobile Intel® chipset family offers higher performance for flexible and scalable platforms based on integrated graphics (915GM/GMS) or discrete graphics (915PM). The Intel 915GM chipset with Intel Graphics Media Accelerator 900 delivers a 2x improvement in graphics performance over the previous generation chipset, the Intel® 855GME. The 915GM is the first Intel mobile chipset with a DirectX* 9 integrated graphics solution for high definition playback and 3D games. The Intel 915GM chipset also supports wide aspect ratio display modes and integrated TV Out functionality. The Mobile Intel® 915 Express chipset family also supports dual channel DDR2 memory which enables system performance gains on applications that benefit from increased memory bandwidth. Graphics intensive applications, gaming applications, and scientific / technical computing applications all benefit from the 60% improvement in peak bandwidth going from DDR333 to DDR2-533 memory.

With the introduction of the 915 chipset family, Intel will make the first major bus architecture change in 10 years with support for PCI Express*. The PCI Express bus architecture delivers up to a 4x increase in discrete graphics bandwidth and a 2x increase in I/O bandwidth for improved system, application, and multimedia performance. The newly introduced chipset family also supports Intel High Definition Audio which enables high quality audio and a premium home theater experience. Intel High Definition Audio supports many Dolby technologies including Dolby Digital* 5.1, Dolby Pro Logic* II, and Dolby Pro Logic* IIx, which makes it possible to enjoy older stereo content in 7.1 channel surround sound.

The Intel PRO/Wireless 2915ABG and 2200BG Network Connection supports greater flexibility in connecting to standard Wi-Fi* networks and, based on PC manufacturer's implementation, can enable enhanced wireless LAN security by supporting the latest industry security standards. Intel Centrino mobile technology with Intel



PRO/Wireless 2915ABG and 2200BG Network Connection provides increased industry standard security support for Wi-Fi Protected Access* 2 (WPA2), 802.11i and AES as well as support for WPA and WEP security. Intel Centrino mobile technology with Intel PRO/Wireless 2915ABG and 2200BG Network Connection is WPA2 certified. The products support industry standards-based encryption aimed at the enterprise market segment. With the optional Intel® PROSet/Wireless software version 9, enterprise users can also employ the single sign-on feature to seamlessly authenticate a user on the wireless network during login. Advanced auto-detection and auto-select security capabilities make it easy for users to employ the highest available security settings.

Notebook PCs based on Intel Centrino mobile technology include the latest features to simplify system management, decrease power consumption, and lower the total cost of ownership for large and small business environments. Notebook PCs with Intel Centrino mobile technology offer great performance for today's and tomorrow's applications, as well as the quality, reliability, and compatibility that is expected from the world's leading microprocessor company.

This performance brief introduces the next generation of Intel Centrino mobile technology, explains the technologies that make it work, examines the purpose and methods behind some industry standard performance benchmarks, and shows how Intel Centrino mobile technology currently performs on each of the respective benchmarks. When new benchmarks are introduced, this performance brief will be updated as appropriate.

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1. Introduction

On January 19th 2005, Intel Corporation introduced the next generation Intel® Centrino™ mobile technology platform (formerly codenamed “Sonoma”). With the new platform, Intel continues to deliver new notebook PC capabilities designed specifically for the mobile world. Intel® Centrino™ Mobile Technology allows users to work, play and connect without wires and choose from a whole new generation of thin and light notebook PCs that are designed to enable great battery life.

With the new generation of Intel Centrino mobile technology, three components work together to deliver a breakthrough in freedom and capability— to work, learn and play on the go. These components include:

- Intel® Pentium® M Processor based on 90nm process technology featuring 2MB L2 cache and 533MHz front side bus
- Mobile Intel® 915 Express chipset family
- Intel® PRO/Wireless 2915ABG or 2200BG Network Connection

In the Highest Frequency Mode (HFM), the notebook PC can achieve high performance on the most complex business and Internet applications. In the Lowest Frequency Mode (LFM), the processor’s power consumption is reduced further to enable great battery life. The on-demand performance switches between HFM, LFM and intermediate Enhanced Intel SpeedStep® technology operating points based on user needs, optimizing application performance and enabling great battery life.

When an Intel Pentium M processor is used in conjunction with the Mobile Intel® 915 chipset family, the resulting platform provides outstanding performance for today’s mainstream notebook PCs, with headroom to improve productivity as new applications emerge. The Mobile Intel® 915 chipset family offers support for DDR2 memory technology and system bus frequencies up to 533 MHz.

The Intel PRO/Wireless 2915ABG and 2200BG Network Connection supports greater flexibility in connecting to standard Wi-Fi* networks and, based on PC manufacturer’s implementation, can enable enhanced wireless LAN security by supporting the latest industry security standards. Intel Centrino mobile technology with Intel PRO/Wireless 2915ABG and 2200BG Network Connection provides increased industry standard security support for Wi-Fi Protected Access* 2 (WPA2), 802.11i and AES as well as support for WPA and WEP security. Intel Centrino mobile technology with Intel PRO/Wireless 2915ABG and 2200BG Network Connection is WPA2 certified.

Notebook PC performance does not depend on the microprocessor alone. Hardware and software system components—such as the operating system, the graphics and I/O subsystems, application software, and memory—may significantly affect performance results. For this reason, this Performance Brief illustrates Intel Centrino mobile technology performance on a consistent notebook PC configuration. Details of the notebook PC configuration used for the performance scores throughout this brief can be found in Appendix A.

2. The Intel® Pentium® M Processor

The Intel® Pentium® M processor is designed with a mobile optimized architecture that delivers outstanding mobile performance at low power.

Key features of the new Intel® Pentium® M Processors 780, 770, 760, 750, 740, 730, the Intel® Pentium® M Processor Low Voltage 778, 758, and the Intel® Pentium® M Processors Ultra Low Voltage 753, 733J^o

- 90-nm Process Technology
- Strained Silicon Process Technology
- 2-MB Power Optimized L2 Cache
- Enhanced Register Access Manager
- Enhanced Data Pre-fetcher
- 27-W TDP that fits into existing Intel Pentium® M processor designs
- Micro-Ops Fusion
- Advanced Instruction Prediction
- Dedicated Stack Manager
- Power-Optimized 533-MHz Processor System Bus for Standard Voltage SKU's;
- Intelligent Power Distribution
- Deeper Sleep Alert State
- Support for Enhanced Intel SpeedStep® Technology with Multiple Voltage / Frequency Operating Points
- Latest packaging technology
- Support for Streaming SIMD Extensions 2 (SSE2)
- Power Management Features
- Optional Execute Disable Bit support

^o The letter J indicates a processor has Execute Disable Bit capability. Enabling Execute Disable Bit functionality requires a PC with a processor with Execute Disable Bit capability and a supporting operating system. Check with your PC manufacturer on whether your system delivers Execute Disable Bit functionality.

3. Intel® Pentium® M Processor Product Feature Highlights

The Intel® Pentium® M processor micro-architecture is optimized for high performance and low power. It includes a number of features including Enhanced Intel SpeedStep® technology support, a high performance power optimized system bus with speeds up to 533MHz, 32KB Level 1 instruction and data caches, 2MB Level 2 Advanced Transfer Cache, Streaming SIMD Extensions 2 support and advanced thermal monitoring capabilities. These features and resulting benefits are described in more detail below:

- High Performance and Low Power Core

The Intel Pentium M processor features a high performance core architecture that uses techniques like micro-op fusion and Advanced Stack Management to maximize performance. Micro-op fusion combines micro-ops derived from the same macro-op. Advanced Stack Management reduces the number of micro-ops in stack related operations by tracking relative stack pointer changes locally. Reduction in number of micro-ops results in more efficient scheduling and better performance at lower power. The Intel Pentium M processor core can operate at very low voltages and uses advanced techniques to minimize clock and signal switching, resulting in low power dissipation in the active state. The processor features dynamic power management states that consist of Stop Grant, Sleep, Deep Sleep, and Deeper Sleep Alert states that allow the processor to quickly enter and exit from these states to provide fast responsiveness and significant power savings.

- Enhanced Intel SpeedStep® Technology Support

The Intel Pentium M processor features Enhanced Intel SpeedStep® Technology support at multiple voltage and frequency operating points. Highlights of this technology include:

- Multiple performance modes ranging from the Lowest Frequency Mode (LFM) to Highest Frequency Mode (HFM) enable optimum performance at the lowest power
- Real-time dynamic switching of the voltage and frequency between multiple performance modes based on CPU demand. This occurs by switching the bus ratios, core operating voltage, and core processor speeds without resetting the notebook PC
- Software control of voltage and frequency operating points
- Very low transition latency

- 533 MHz System Bus with enhanced low power features

The Intel® Pentium® M processor micro-architecture has a Power-Optimized 533-MHz Processor System Bus for Standard Voltage SKU's whereas the Low Voltage and Ultra Low Voltage SKU's use 400-MHz Processor System Bus. This bus remains powered down until it senses incoming data from the chipset, allowing to the processor to consume less power. In a typical microarchitecture, a processor has its bus turned on even when it is not in use. With Intel Pentium M processor, portions of the bus are turned on only when they are needed. Architectural and circuit innovations enabled this power-optimized processor system bus technology which lowers power through reduced voltage swing and tighter buffer management.

- 32KB Level 1 Instruction and Data Caches

Both Instruction and Data Caches on the Intel Pentium M processor are 32KB in size. Large L1 caches provide fast access to critical instructions and data, resulting in very high performance.

- 2MB Level 2 Advanced Transfer Cache

The Level 2 Advanced Transfer Cache (ATC) is 2MB in size and delivers an extremely high data throughput channel between the Level 2 cache and the processor core. The power-aware cache implements several features to reduce cache power consumption. Traditional microprocessors run the cache as fast as possible. The processor cache on the Intel® Pentium® M processor runs slightly slower to save energy, cut down on electricity leakage, and enables longer battery life. Special circuit and micro-architectural innovations were implemented in order to reduce power consumption. For example the cache unit keeps track of the last entry that was accessed such that repeating accesses to the same location will not have to lookup the array, thus eliminating a high power operation.

- Advanced Branch Prediction and Data Prefetching

The Intel® Pentium® M processor features an advanced branch prediction architecture that combines three types of predictors – Global, Bi-Modal and Loop Detector. The processor automatically selects the most optimal algorithm to use, significantly reducing the number of mis-predicted branches. The processor also features an advanced data prefetcher that can track up to 8 upstream and 4 downstream operations simultaneously. Data is prefetched from main memory to the L2 cache in advance, resulting in higher performance by reducing the need to access system memory.

- Streaming SIMD Extensions 2 (SSE2)

The Intel Pentium M processor supports the complete SSE2 instruction set. These instructions include 128-bit SIMD integer arithmetic and 128-bit SIMD double-precision floating-point operations. These instructions reduce the overall number of instructions required to execute a particular program task and as a result can contribute to an overall performance increase.

- Execute Disable Bit Support

Can help prevent certain classes of malicious “buffer overflow” attacks when combined with supporting operating system. This is an optional feature and is available on the latest Intel® Pentium® M Processors.

- Support for Intel® Mobile Voltage Positioning (Intel® MVP IV)

Dynamically lowers voltage based on processor activity to lower thermal design power enabling smaller notebooks.

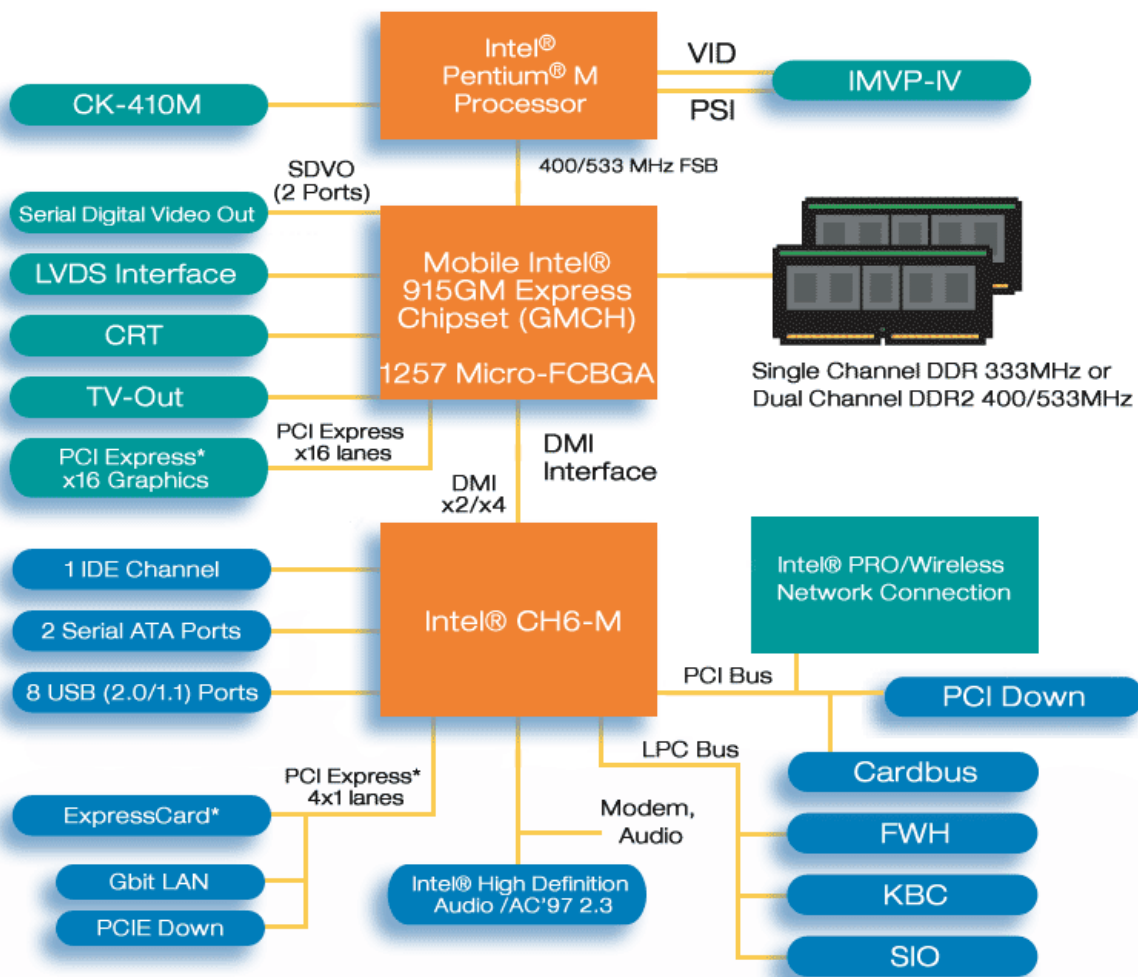
- Micro FCPGA & FCBGA packaging technology

Optimized for a range of thinner, lighter designs including <1” thick that deliver outstanding performance.

4. Mobile Intel® 915 Express Chipset Family Feature Highlights

The Mobile Intel® 915 Express Chipset Family was designed as the next step in the evolution of the Intel Hub Architecture for the notebook PCs using Intel® Centrino™ mobile technology.

The Mobile Intel® 915 chipset family offers higher performance for flexible and scalable platforms based on integrated graphics (915GM/GMS) or discrete graphics (915PM). The Mobile Intel® 915GM chipset with Intel Graphics Media Accelerator 900 delivers a 2.04x improvement in graphics performance over the previous generation chipset, the Intel® 855GME. The Mobile Intel® 915 Express chipset family also supports dual channel DDR2 memory which enables system performance gains on applications that benefit from increased memory bandwidth. Graphics intensive applications, gaming applications, and scientific / technical computing applications all benefit from the improvement in peak memory bandwidth.



In addition to advanced application support, the Mobile Intel® 915GM chipset was designed with the following features to enhance the end-user experience:

- 533 MHz system bus delivers a high bandwidth connection between the Intel Pentium M processor and the platform.
- Support for Dual Channel DDR2 400/533-MHz Memory Technology with peak bandwidth up to 8.5GB/s, a 60% improvement in peak bandwidth over DDR333
- PCI Express Bus Architecture delivers a 4x increase in discrete graphics bandwidth and a 2x increase in I/O bandwidth
- Intel® High Definition Audio with increased bandwidth that enables 32-bit output and 192-kHz multi-channel audio (while AC'97 specification supports 20-bit output and 48-kHz stereo audio). Multi-streaming capabilities enable support for separate audio channels with independent audio streams to different devices.
- Integrated high speed USB 2.0 enables up to 15x faster data transfer rate of USB 1.1 and backward compatibility to support for USB 1.1 devices. The Mobile Intel® 915 Express chipset family provides support for 8 USB 2.0 peripherals.
- Direct Media Interface (DMI) with up to 2-GB/sec concurrent bandwidth. DMI provides up to 4x faster I/O bandwidth compared to previous Intel proprietary Hub link I/O interface.
- Integrated low voltage differential signal (LVDS) interface that enables the notebook display panel to connect directly to the chipset and eliminates the need for a video controller hub component. The result is higher integration for savings in mother board space and reduced bill of materials cost for OEMs.
- Dual Independent Display allows viewing two independent video sources when an external monitor or panel is connected to the notebook.
- Intel® Stable Image Technology is a capability built into the chipset and enabled in the BIOS. This silicon technology provides greater IT software image stability by enabling simple chipset hardware changes without triggering the "new hardware found" message—eliminating automatic and unnecessary re-qualification.
- Serial ATA is a storage interface technology that provides up to 150-MB/Sec transfer rate for disk traffic and provides aggressive link power management functionality.
- Intel® Display Power Saving Technology 2.0 (Intel® DPST 2) reduces display backlight power by up to 400-mW with minimal visual impact to the end user (depending on Intel DPST settings and system use).
- DDR2 Memory self-refresh provides chipset and DIMM power savings by putting memory into a reduced power state when display is still active on DDR2 based platforms.
- Integrated TV Out functionality provides the ability to use a TV as an output device for movie playback, digital images, and gaming.
- DirectX® 9 integrated graphics solution for high definition playback and 3D games.
- Support for wide aspect ratio display modes.

5. Intel® PRO/Wireless 2915ABG and 2200BG Network Connection Product Feature Highlights

The Intel PRO/Wireless 2915ABG and 2200BG Network Connection supports greater flexibility in connecting to standard Wi-Fi* networks and, based on PC manufacturer's availability, enables enhanced wireless LAN security by supporting the latest industry security standards. Intel Centrino mobile technology with Intel PRO/Wireless 2915ABG and 2200BG Network Connection provides increased industry standard security support for Wi-Fi Protected Access* 2 (WPA2), 802.11i and AES as well as support for WPA and WEP security. Intel Centrino mobile technology with Intel PRO/Wireless 2915ABG and 2200BG Network Connection is WPA2 CERTIFIED. The products support industry standards-based encryption aimed at the enterprise market segment. . With the optional Intel® PROSet/Wireless software version 9, enterprise users can also employ the single sign-on feature to seamlessly authenticate a user on the wireless network during login. Advanced auto-detection and auto-select security capabilities make it easy for users to employ the highest available security settings.

- **Security**
Industry-standard Wireless LAN security support is available. Authentication - LEAP,2 WPA,2 802.1X, EAP-TLS, EAP-FAST, and PEAP. Encryption - CKIP, TKIP, 128-bit and 64-bit WEP, and Hardware AES.
- **Performance**
Intel® Wireless Coexistence System Phase 2 capability enables Bluetooth* co-existence including Bluetooth Priority Signaling. For systems designed with two antennas, real-time antenna selection enables optimized WLAN performance.
- **Ease-of-use**
With the optional Intel® PROSet/Wireless software version 9, Intel Smart Wireless Solutions support including: Wireless Network Configuration Wizard allows secure, easy AP/client setup; Security Assistant automates WLAN security configuration; Wireless Troubleshooter assists user with WLAN connectivity.
- **Power management**
With the optional Intel® PROSet/Wireless software version 9, Intel® Intelligent Scanning Technology reduces power by controlling the frequency of scanning for access points. A user selectable feature with five different power states, which allows the user to make their own power vs. performance choices when in battery mode.

In addition to the core benefits of Intel Centrino mobile technology, additional highlights of the Intel® PRO/Wireless 2915ABG Network Connection include:

- Dual mode (supporting 802.11b/g) and Tri mode (supporting 802.11 a/b/g)5 product
- Industry-standard Wireless LAN security support is available (802.1X, 802.11i, WEP, WPA*, WPA2*, Hardware AES)
- Cisco Compatible Extensions (including LEAP, CKIP, EAP-FAST) support available
- Support for antenna diversity enables optimized WLAN performance for multi-antenna systems.

- Intel® Wireless Coexistence System v2 capability enables Bluetooth* co-existence including Bluetooth Priority Signaling1
 - Support for Wi-Fi Multimedia (WMM*)
 - Optional Intel® PROSet/Wireless software version 9 enables a superior mobile experience with:
 - New, easy-to-use user interface
 - Intel Smart Wireless Solutions support including:
 - Wireless Network Configuration Wizard allows secure, easy AP/client setup
 - Security Assistant automates WLAN security configuration
 - Wireless Troubleshooter assists user with WLAN connectivity
 - IT Configuration Utility enabling administrators to remotely manage notebooks
 - Single Sign On support enabling a single set of credentials to authenticate the user to both WLAN network and the machine/domain
 - Centralized Profile Management simplifies IT profile distribution
-

6. Performance Summary

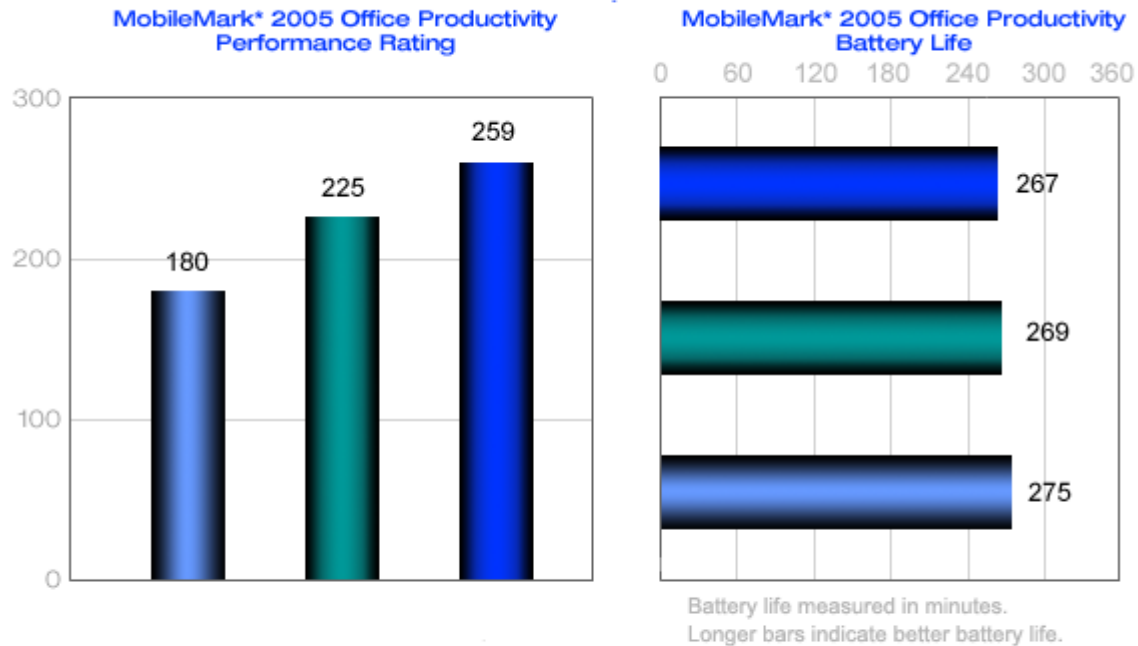
Mobile Experience - MobileMark* 2005

MobileMark*2005 is used to evaluate notebook PC user experience by measuring both performance and battery life at the same time on the same workload. MobileMark 2005 is a tool that measures notebook PC performance on popular business-oriented applications in the Microsoft Windows* operating environment. The productivity usage model provides computations representing today's business users using popular office productivity and content creation applications. This usage model reports a performance score and a battery life score.

The productivity workload of MobileMark 2005 consists of emerging usage models and popular productivity applications including:

- Adobe* Photoshop* 6.0.1
- Macromedia* Flash* 5.0
- McAfee* VirusScan* 5.13
- Microsoft* Excel* 2002
- Microsoft* Outlook* 2002
- Microsoft* PowerPoint* 2002
- Microsoft* Word* 2002
- Netscape* Communicator* 6.0
- WinZip* 8.0

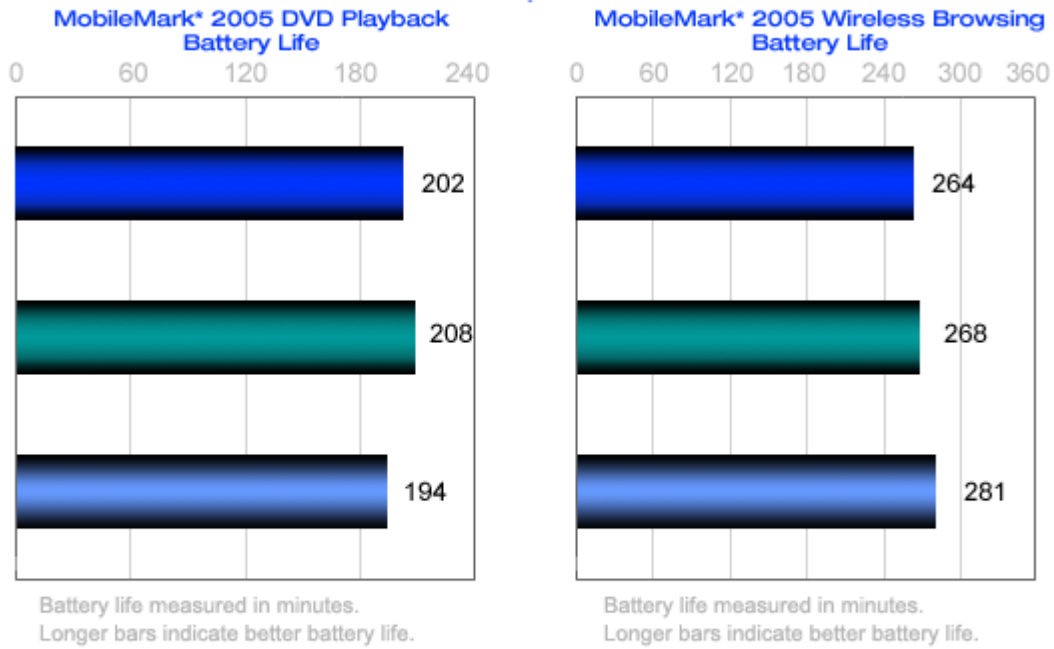
Mobile Experience



- Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M Processor 780 (2.26 GHz, 2 MB L2, 533 MHz FSB), Mobile Intel® 915GM Express Chipset
- Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M Processor 730 (1.60 GHz, 2 MB L2, 533 MHz FSB), Mobile Intel® 915GM Express Chipset
- Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M Processor 1.60 GHz (130nm, 1 MB L2, 400 MHz FSB), Intel® 855GME Chipset

Figure 1. Intel® Centrino™ Mobile Technology Performance and Battery Life on MobileMark* 2005 Office Productivity

Mobile Experience



- Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M Processor 780 (2.26 GHz, 2 MB L2, 533 MHz FSB), Mobile Intel® 915GM Express Chipset
- Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M Processor 730 (1.60 GHz, 2 MB L2, 533 MHz FSB), Mobile Intel® 915GM Express Chipset
- Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M Processor 1.60 GHz (130nm, 1 MB L2, 400 MHz FSB), Intel® 855GME Chipset

Figure 2. Intel® Centrino™ Mobile Technology Battery Life on MobileMark* 2005 DVD Playback and Wireless Browsing

Internet Experience - WebMark* 2004

WebMark* 2004 measures Internet Client performance based on the latest web technologies and internet usage models. WebMark 2004 enables comparison of PC performance based upon Information Processing and Commercial Transaction workloads. Featuring two modes of operation, the Offline mode enables users to measure the Internet client performance of a PC using content stored locally while the On-line mode requires an additional server to host test content.

Figure 3 below shows WebMark* 2004 - Offline Mode

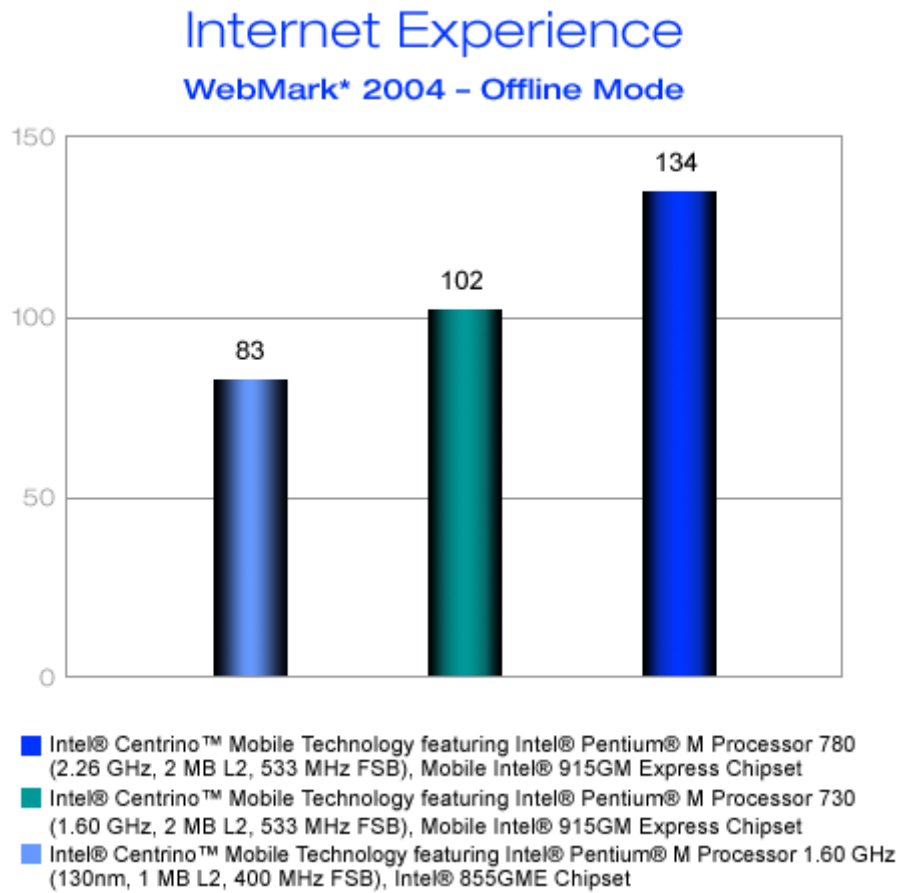


Figure 3. Intel® Centrino™ Mobile Technology Performance on WebMark* 2004 – Offline Mode

3D Experience – 3DMark* 2001 SE Pro

3DMark*2001 SE Pro is an installment of the popular 3DMark series that supports DirectX* 8.1. The game tests, texturing tests, filtering tests, image quality tests, and others give you an overview of your system’s current performance.

Figure 4 below shows 3DMark* 2001 SE Pro – Overall Result

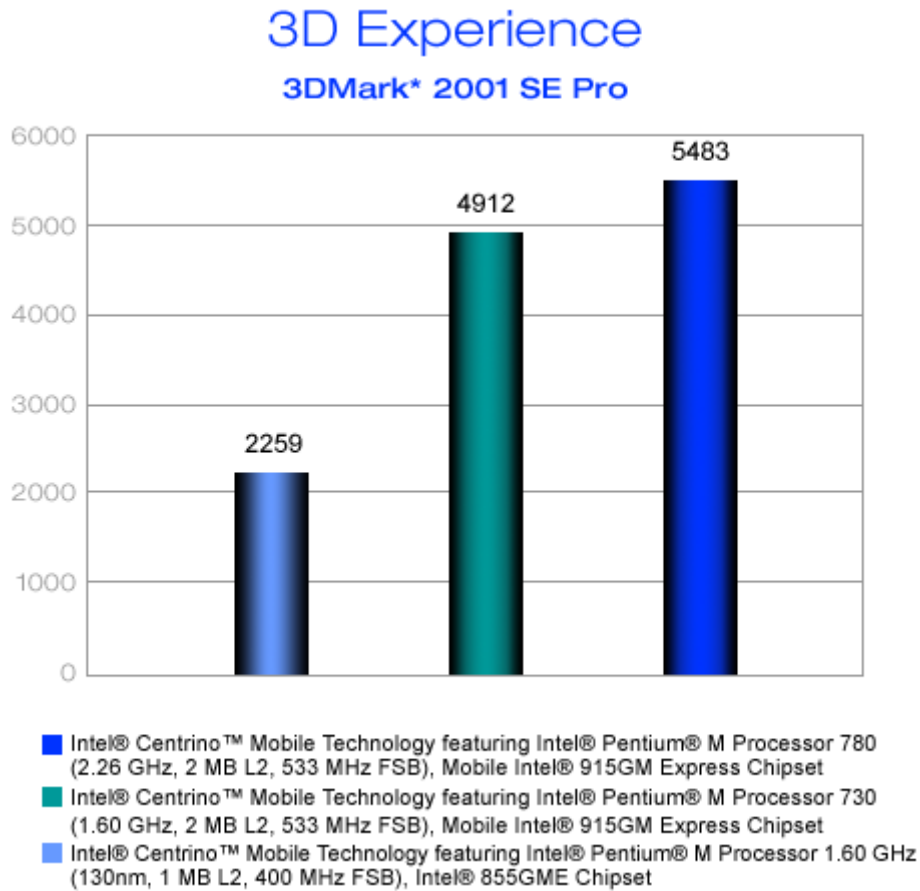


Figure 4. Intel® Centrino™ Mobile Technology Performance on 3DMark* 2001 SE Pro

7. Summary of Results

Table 1 summarizes the benchmark performance of Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M processor 1.60 GHz, Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M processor 730, Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M processor 780.

Table 1. Performance Data

| Benchmarks | Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M processor 1.60GHz | Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M processor 730 | Intel® Centrino™ Mobile Technology featuring Intel® Pentium® M processor 780 |
|-------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| MobileMark* 2005 – Office Productivity Performance | 180 | 225 | 259 |
| MobileMark* 2005 – OP Battery Life (minutes) | 275 | 269 | 267 |
| MobileMark* 2005 – DVD Playback Battery Life (minutes) | 194 | 208 | 202 |
| MobileMark* 2005 – Wireless Browsing Battery Life (minutes) | 281 | 268 | 264 |
| WebMark* 2004 – Offline Mode | 83 | 102 | 134 |
| 3DMark* 2001 SE Pro – Overall Result | 2259 | 4912 | 5483 |

Appendix A: Notebook PC Configuration

Table 2. Notebook PC Configuration Used for Performance Measurement

| Intel® Mobile System | Intel® Centrino™ Mobile Technology | | |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------|
| Processor Name | Intel® Pentium® M processor 1.60 GHz | Intel® Pentium® M processor 730 | Intel® Pentium® M Processor 780 |
| Processor Speed | 1.60 GHz | 1.60 GHz | 2.26 GHz |
| Front Side Bus | 400 MHz | 533 MHz | |
| Processor Secondary Cache | 1MB Full-Speed On-Die Level 2 Cache | 2MB Full-Speed On-Die Level 2 Cache | |
| Motherboard Chipset | Mobile Intel® 855GME | Mobile Intel® 915GM | |
| Wireless Network Card | Intel® Pro/Wireless LAN 2915ABG mini-PCI Adapter (Wireless transmitter enabled and associated with an Access Point for MobileMark* 2005) | | |
| Vendor and Model | AOpen* 1556 | AOpen* 1558 | |
| Motherboard BIOS | Phoenix* 4.0 Release 6 Ver. R01-A0T | Phoenix* 4.0 Release 6 Ver. R0-A2R | |
| Memory Size | USI* U30512AAUIQ6520 DDR333 CL 2.5-3-3-7 1024MB (2x512MB) | Elpida* PC4200 DDR2 533 Dual Channel 4-4-4-12 1024MB (2x512MB) | |
| Chipset INF File | Windows XP*: Intel INF 5.0.2.1002 | Windows XP*: Intel INF 6.1.0.1008 | |
| Hard Disk | Fujitsu* MHT2080AH Ultra ATA-100 80GB 5400rpm | Fujitsu* MTH2080BH SATA 80GB 5400rpm | |
| Hard Disk Driver | Microsoft* Default UDMA-5 | | |
| DirectX* Version | DirectX* 9.0c | | |
| Video Controller | Intel® 855GME Extreme Graphics 2 technology | Intel® Graphics Media Accelerator (GMA) 900 | |
| Video Memory Size/Type | 64MB Dynamic Video Memory Technology | 128MB Dynamic Video Memory Technology | |
| Video Driver Revision | 6.14.10.3606 | 6.14.10.3943 | |
| Operating System | Microsoft Windows XP* Professional, Build 2600, Service Pack 2 on NTFS | | |
| Graphics | 1024x768 resolution, 32-bit color XGA | | |



| Intel® Mobile System | Intel® Centrino™ Mobile Technology | |
|-------------------------------------------------------------|------------------------------------|------------------------------------|
| Sound Card | Crystal* WDM AC97 | Realtek* AC97 Audio |
| Network Card | Broadcom* 440x 10/100 BaseT | Realtek* RTL8139/810x 10/100 BaseT |
| Battery Capacity | 65 WHr | |
| Weight | 5.1 lbs | 6.2 lbs |
| Screen Size | 15" | |
| Screen Brightness | ~67 nits | ~62 nits |
| Power Management Mode for MobileMark* 2005 | Portable/laptop | |
| Power Management Mode for WebMark* 2004/3DMark* 2001 SE Pro | Always On | |

* Other names and brands may be claimed as the property of others.