



# Mobile AMD Athlon™ 64 Processor 3400+ Competitive Performance Guide



Publication # **31225B**  
Issue Date: **August 2004**

## About This Document

This document is intended for use by those who are interested in AMD64 performance as demonstrated by the Mobile AMD Athlon™ 64 processor 3400+. The performance of the processor is shown as an average of all of the tests and as averages of compiled data from benchmarks in the following categories:

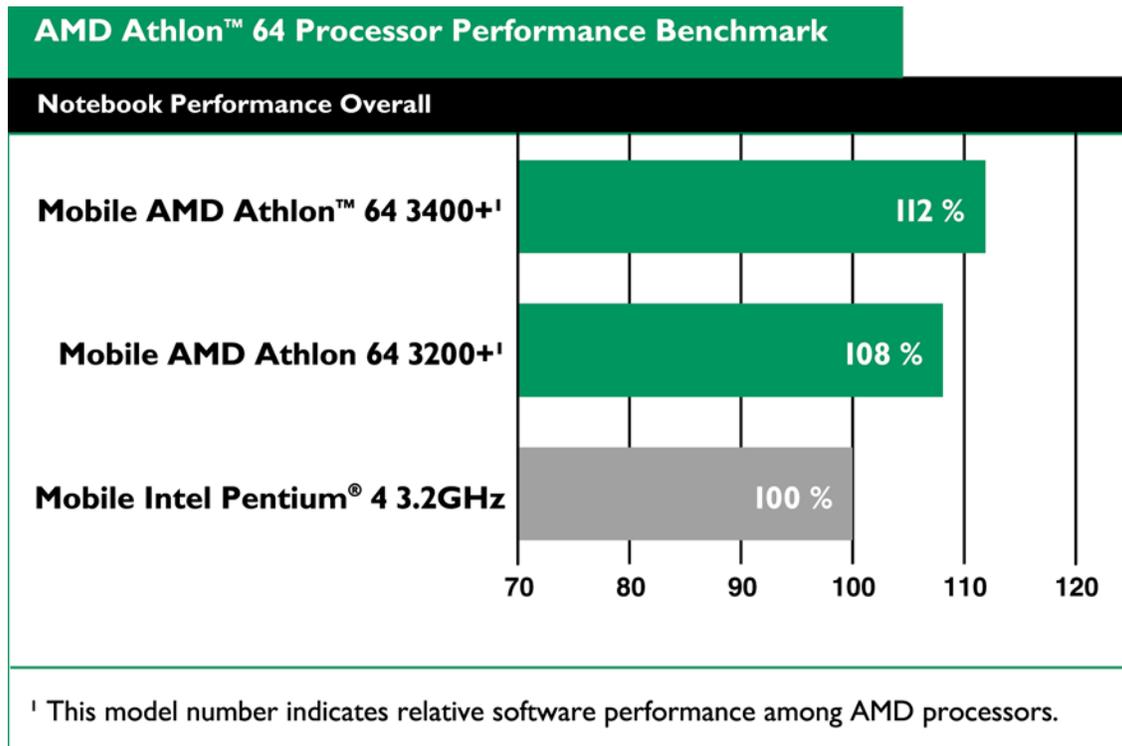
- “Office Productivity Overall” on page 5
- “Digital Media Overall” on page 10
- “3D Gaming Overall” on page 16

The result of each individual benchmark is shown in a graphical format. The system configurations are also listed at the end of this document. For a detailed benchmarking methodology, including step-by-step procedures on how to duplicate these results, refer to *AMD Processor Performance Evaluation Guide*, order# 30579.

## Performance Overall

The Mobile AMD Athlon™ 64 processor delivers the most advanced PC processor available for high-performance notebook PCs. This processor provides leading-edge performance for today's demanding software like digital video, audio, imaging editing, 3D gaming, as well as office applications.

The Mobile AMD Athlon 64 processor features AMD64 technology for the coming wave of 64-bit applications. Plus, AMD PowerNow!™ technology enables extended battery life for your notebook computer and can provide for a quieter user experience.



While there is no simple way to measure performance that covers every user experience, AMD has compiled an average of all the benchmarks listed on page 4. This chart shows how the Mobile AMD Athlon 64 processor performs overall relative to a Mobile Intel Pentium® 4 3.2 GHz processor.

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

Overall processor performance is an average of the compiled data from the list of overall benchmark scores from the following tests:

## Office Productivity

[Ziff Davis Media, Inc. Business Winstone<sup>®</sup> 2004](#)

[Ziff Davis Media, Inc. Business Winstone<sup>®</sup> 2004 Multitasking Tests](#)

[BAPCO<sup>®</sup> SYSmark<sup>®</sup> 2004 Office Productivity](#)

[WinRAR](#)

## Digital Media

[Ziff Davis Media Inc. Multimedia Content Creation Winstone<sup>®</sup> 2004](#)

[BAPCO<sup>®</sup> SYSmark<sup>®</sup> 2004 Internet Content Creation](#)

[AVI to MPEG2 Conversion with bbMPEG and AVI2MPEG2](#)

[MPEG2 to MPEG4 Conversion with Xmpeg and DivX](#)

[RazorLAME MP3 Encoder](#)

## 3D Gaming (all tests performed at 1024x768x32 resolution)

[3DMark<sup>®</sup> 2001SE PRO \(D3D Hardware T&L\) by MadOnion](#)

[3DMark<sup>®</sup> 2001SE PRO \(D3D Software T&L\)](#)

[3DMark<sup>®</sup> 03 Pro \(Software Vertex Shaders\) by Futuremark<sup>®</sup> Corporation](#)

[3DMark<sup>®</sup> 03 Pro \(Hardware Vertex Shaders\) by Futuremark<sup>®</sup> Corporation](#)

[AquaMark3](#)

[Comanche 4 Demo](#)

[Final Fantasy<sup>®</sup> XI Official Benchmark, v1.1](#)

[Final Fantasy<sup>®</sup> XI Official Benchmark 2, v1.01 \(High Resolution\)](#)

[Jedi Knights II Demo](#)

[Quake III Arena Demo2](#)

[Return to Castle Wolfenstein 3D](#)

[Splinter Cell \(1 1 1\)](#)

[Splinter Cell \(1 1 2\)](#)

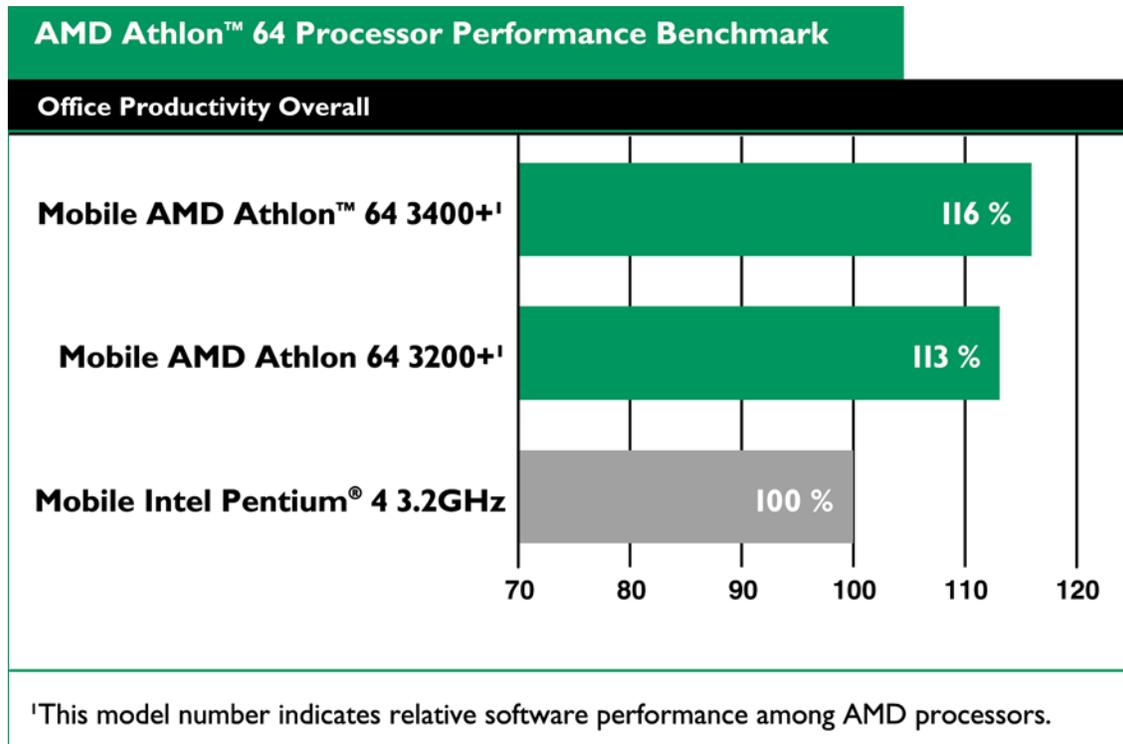
[Unreal Tournament 2003 Demo BotMatch](#)

[Unreal Tournament 2003 Demo Flyby](#)

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Office Productivity Overall

The Mobile AMD Athlon™ 64 processor effortlessly runs multiple applications at the same time which helps to minimize work stoppage and interruptions. It allows you to operate your system more efficiently when multitasking and helps to improve overall productivity in your notebook system.



The score is normalized to a Mobile Intel Pentium® 4 3.2 GHz processor. This benchmark is an average of compiled data from the list of benchmark scores from the tests listed below:

[Ziff Davis Media, Inc. Business Winstone®\\_2004](#)

[BAPCO®\\_SYSmark®\\_2004 Office Productivity](#)

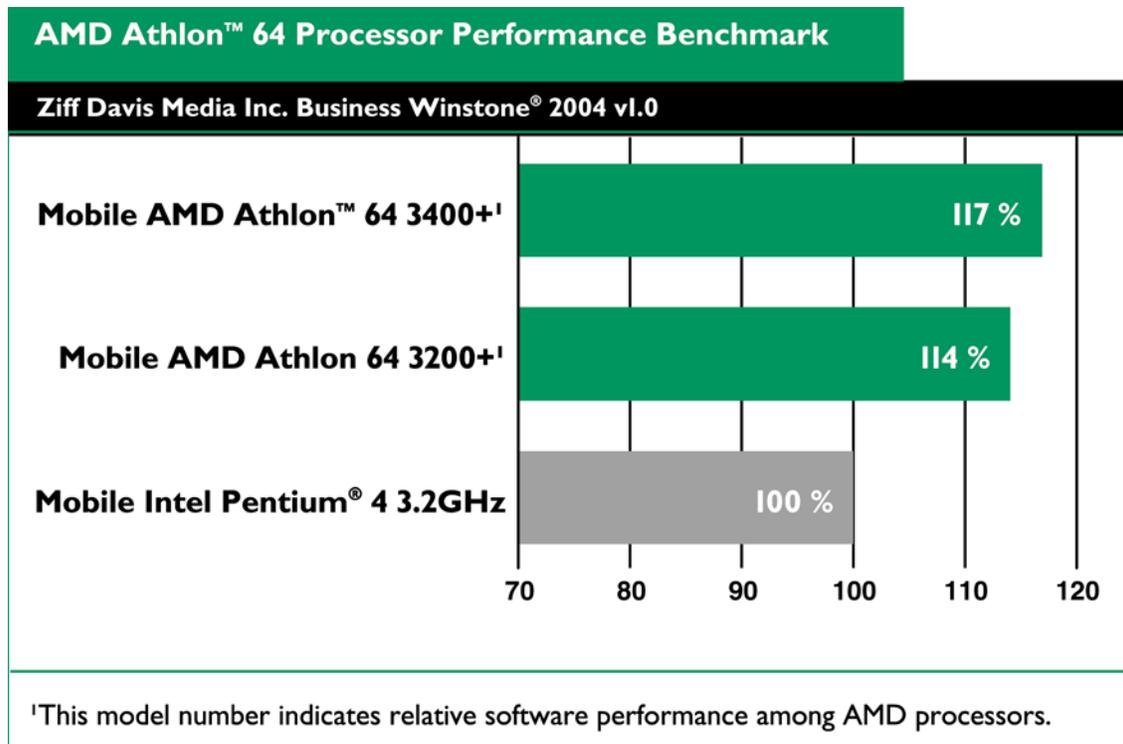
[Ziff Davis Media, Inc. Business Winstone®\\_2004 Multitasking Tests](#)

[WinRAR](#)

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Ziff Davis Media, Inc. Business Winstone® 2004

Business Winstone is a system-level, application-based benchmark that measures a PC's overall performance when running today's top-selling Windows® operating system-based applications. Business Winstone does not mimic what these packages do; it runs real applications through a series of scripted activities and uses the time a PC takes to complete those activities to produce its performance scores.



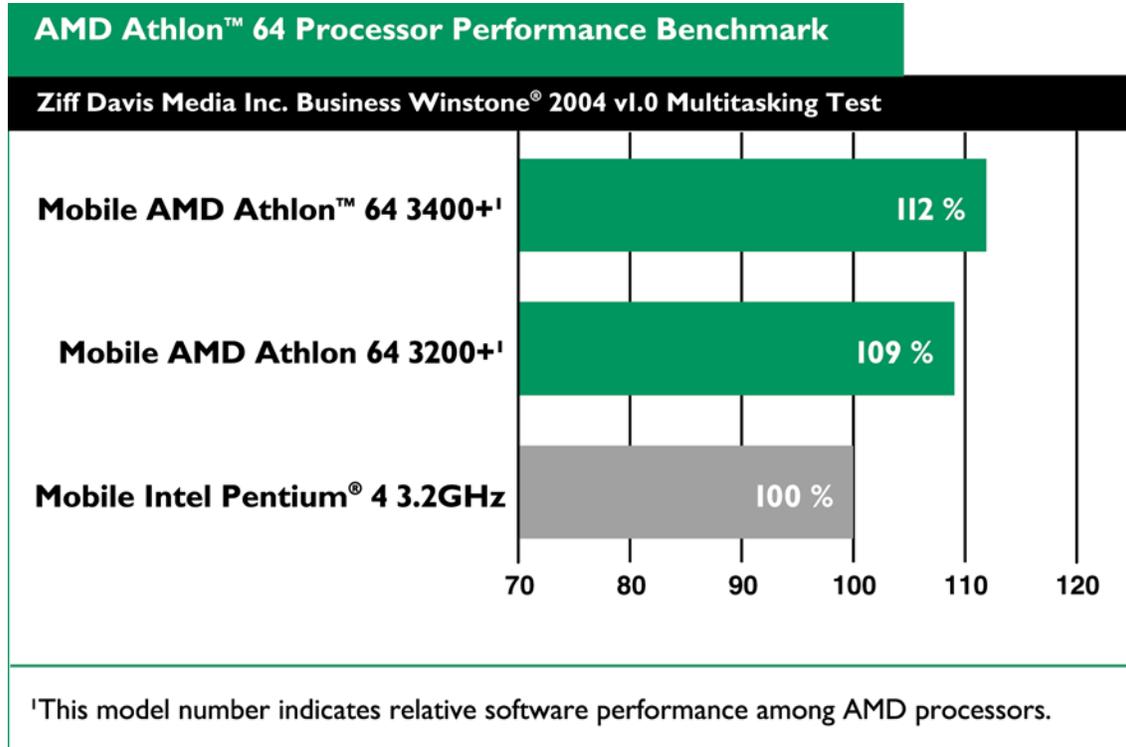
The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. The Business Winstone benchmark uses the following applications.

- Microsoft® Internet Explorer 6
- Microsoft Outlook 2002 SP-2
- Microsoft Project 2002
- Microsoft Access 2002 SP-2
- Microsoft PowerPoint 2002 SP-2
- Microsoft Excel 2002 SP-2
- Microsoft FrontPage 2002 SP-2
- Microsoft Word 2002 SP-2
- Norton AntiVirus Professional Edition 2003
- WinZip 8.1 SR-1

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Ziff Davis Media, Inc. Business Winstone<sup>®</sup> 2004 Multitasking Tests

Business Winstone Multitasking test uses the same applications as Business Winstone, but runs some of the applications in the background while doing work in the foreground. If you're the type of person who runs a virus check in the background while you use Office applications in the foreground, you'll want to check out this test.



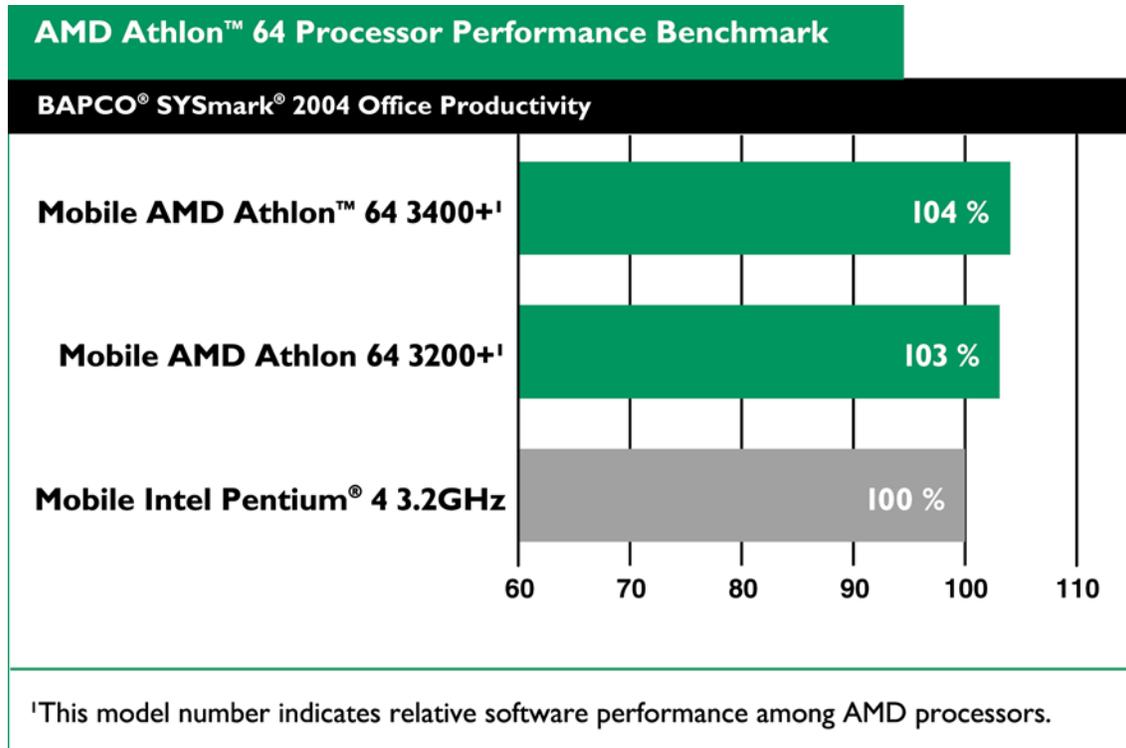
The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. The Business Winstone Multitasking benchmark uses the following applications:

- Microsoft<sup>®</sup> Internet Explorer 6
- Microsoft Outlook 2002 SP-2
- Microsoft Project 2002
- Microsoft Access 2002 SP-2
- Microsoft PowerPoint 2002 SP-2
- Microsoft Excel 2002 SP-2
- Microsoft FrontPage 2002 SP-2
- Microsoft Word 2002 SP-2
- Norton AntiVirus Professional Edition 2003
- WinZip 8.1 SR-1

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## BAPCO<sup>®</sup> SYSmark<sup>®</sup> 2004 Office Productivity

The BAPCO<sup>®</sup> SYSmark<sup>®</sup> 2004 is an application-based benchmark.



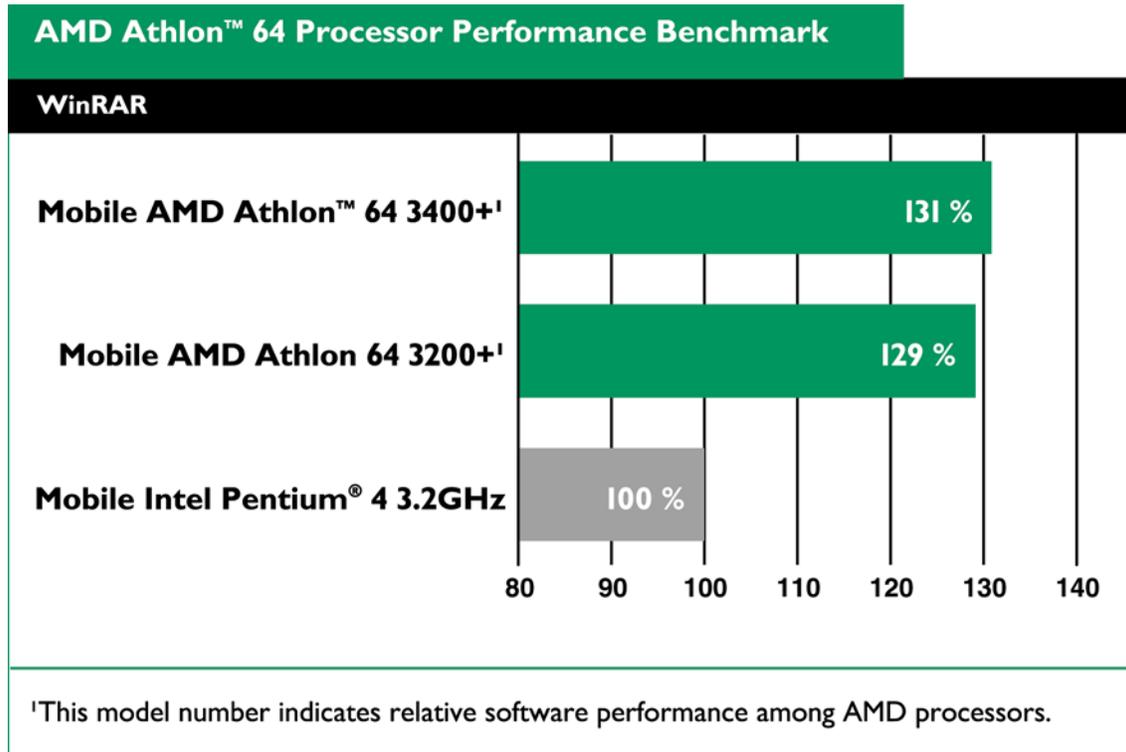
The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. The BAPCO SYSmark benchmark uses the following applications.

- Adobe<sup>®</sup> Acrobat<sup>®</sup> 5.0.5
- Microsoft<sup>®</sup> Access 2002
- Microsoft Excel 2002
- Microsoft Internet Explorer 6
- Microsoft Outlook 2002
- Microsoft PowerPoint 2002
- Microsoft Word 2002
- Network Associates M<sup>c</sup>Afee VirusScan 7.0
- ScanSoft Dragon Naturally Speaking 6 Preferred
- WinZip Computing WinZip 8.1

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## WinRAR

WinRAR is a powerful archive manager. It can backup your data and reduce size of E-mail attachments, decompress RAR, ZIP and other files downloaded from Internet and create new archives in RAR and ZIP file format.



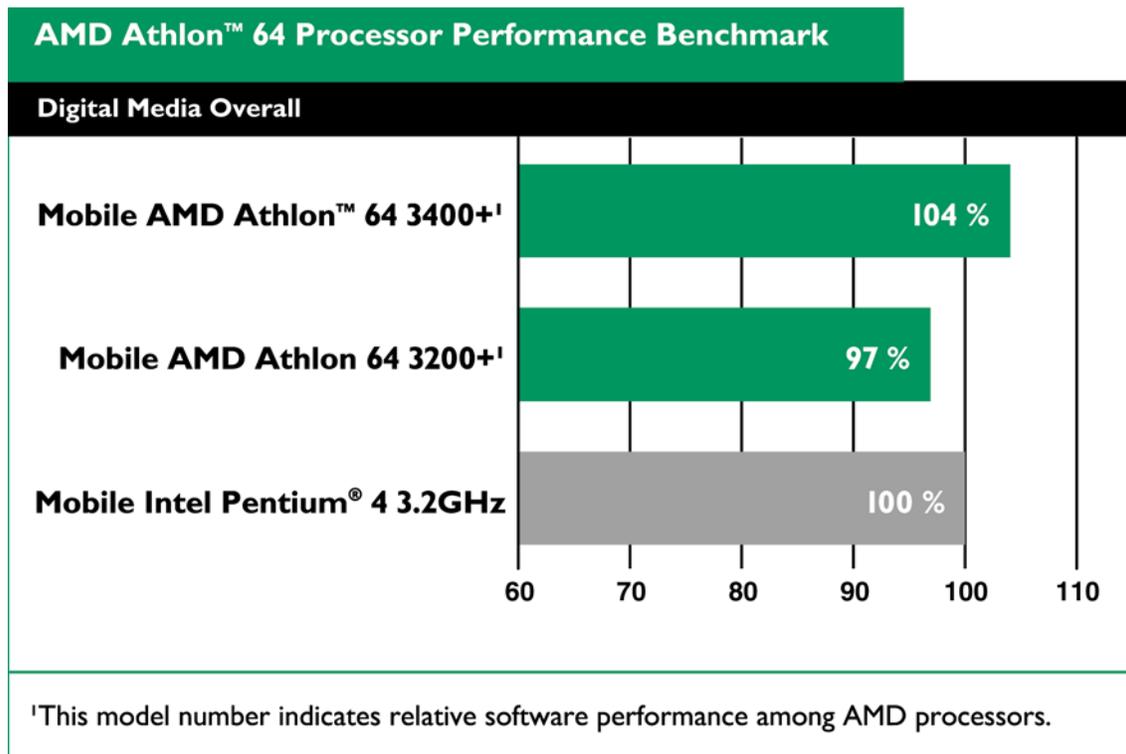
The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. This benchmark is the compiled data from the WinRAR benchmark scores.

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Digital Media Overall

### Digital Media Overall Results

With a revolutionary processor design and support for both 3DNow!™ Professional technology and SSE2 instructions, the Mobile AMD Athlon™ 64 processor provides outstanding performance for multimedia applications in a notebook system. Compose, edit, and encode digital audio, video, and image files quickly and smoothly so you can save time and produce outstanding work.



This benchmark is an average of compiled data from the list of benchmark scores from the tests listed below. The score is normalized to a Mobile Intel Pentium® 4 3.2 GHz processor.

[Ziff Davis Media Inc. Multimedia Content Creation Winstone® 2004](#)

[BAPCO® SYSmark® 2004 Internet Content Creation](#)

[AVI to MPEG2 Conversion with bbMPEG and AVI2MPEG2](#)

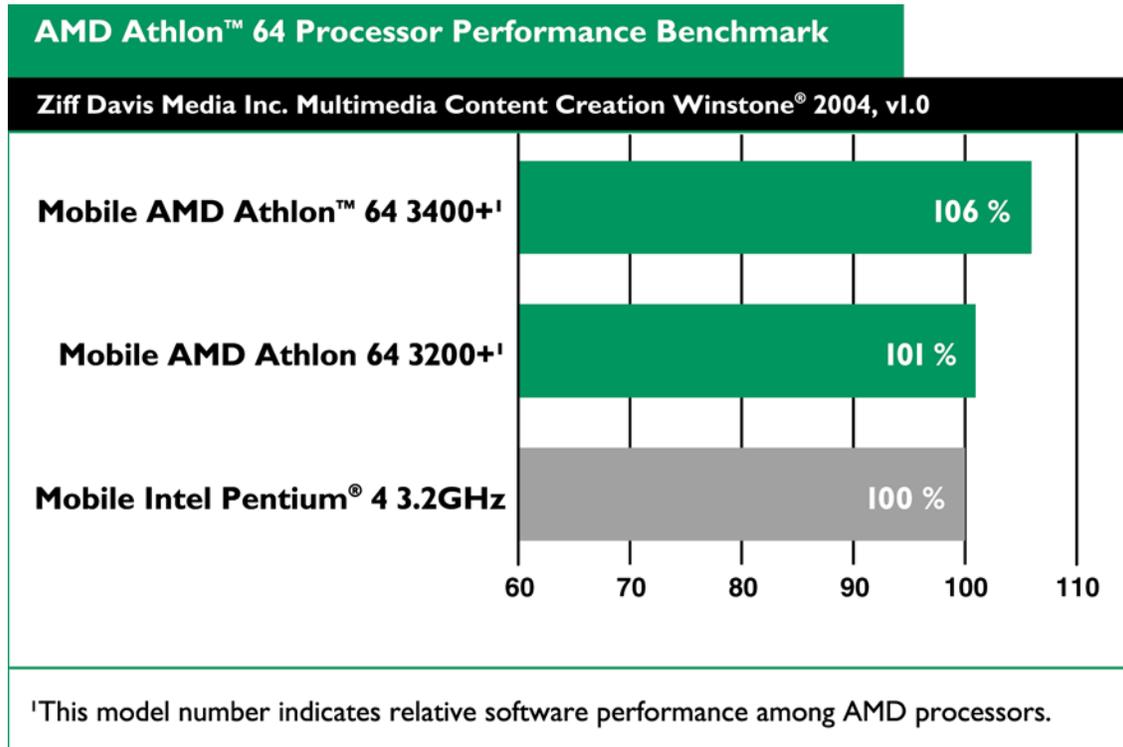
[MPEG2 to MPEG4 Conversion with Xmpeg and DivX](#)

[RazorLAME MP3 Encoder](#)

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Ziff Davis Media Inc. Multimedia Content Creation Winstone<sup>®</sup> 2004

Multimedia Content Creation Winstone<sup>®</sup> is a system-level, application-based benchmark that measures a PC's overall performance when running top, Windows<sup>®</sup> operating system-based multimedia content creation applications.



The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. Multimedia Content Creation Winstone 2004 uses the following applications:

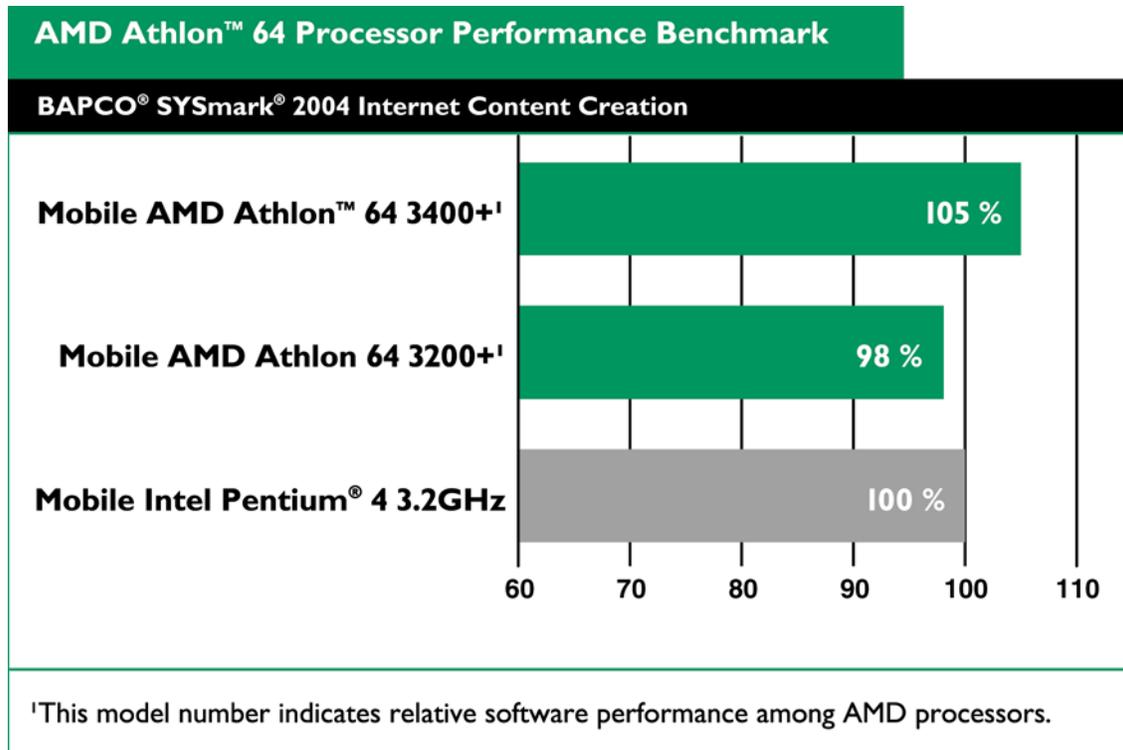
- Adobe<sup>®</sup> Photoshop<sup>®</sup> 7.0.1
- Adobe Premiere 6.50
- Macromedia Director MX 9.0
- Macromedia Dreamweaver MX 6.1
- Microsoft<sup>®</sup> Windows<sup>®</sup> Media Encoder 9 Version 9.00.00.2980
- NewTek's LightWave 3D 7.5b
- Steinberg WaveLab 4.0f

Multimedia Content Creation Winstone 2004 is a single large test that runs the above applications through a series of scripted activities and returns a single score.

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## BAPCO<sup>®</sup> SYSmark<sup>®</sup> 2004 Internet Content Creation

SYSmark<sup>®</sup> 2004 is an application-based benchmark.



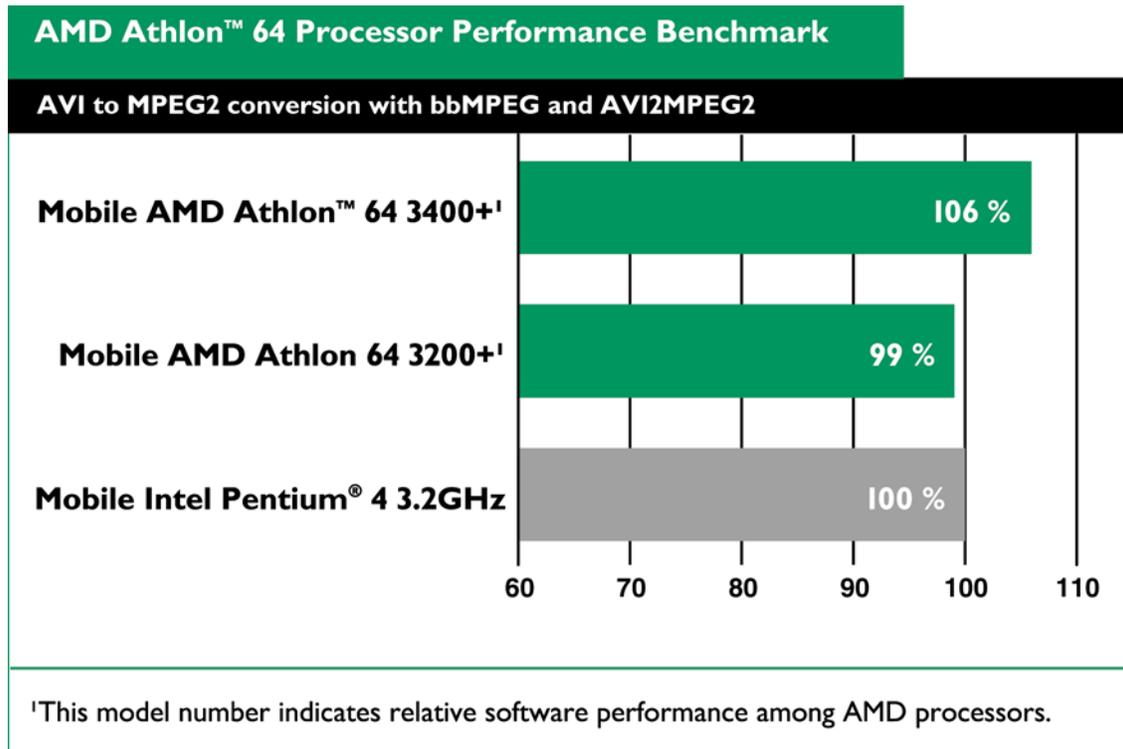
This benchmark incorporates the following Internet Content Creation applications. The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor.

- Adobe<sup>®</sup> After Effects 5.5
- Adobe Photoshop 7.01
- Adobe Premiere 6.5
- Discrete 3ds max 5.1
- Network Associates M<sup>®</sup>Afee VirusScan 7.0
- WinZip Computing WinZip 8.1
- Macromedia Dreamweaver MX
- Macromedia Flash MX
- Windows<sup>®</sup> Media Encoder 9 Series

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## AVI to MPEG2 Conversion with bbMPEG and AVI2MPEG2

This benchmark tests AVI to MPEG2 conversion using bbMPEG and AVI2MPEG2. This benchmark uses bbMPEG and AVI2MPEG2 to convert a 640 MB AVI video file to MPEG2 format.

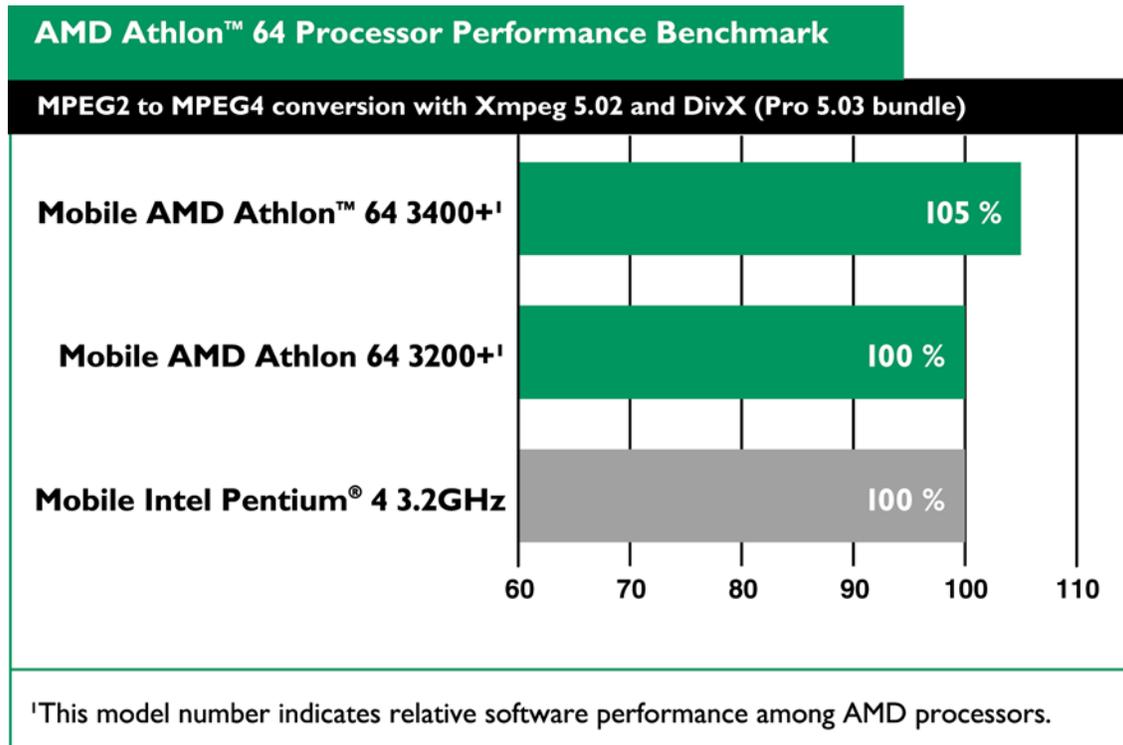


The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. This benchmark is the compiled data from the bbMPEG and AVI2MPEG2 benchmark scores.

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## MPEG2 to MPEG4 Conversion with Xmpeg and DivX

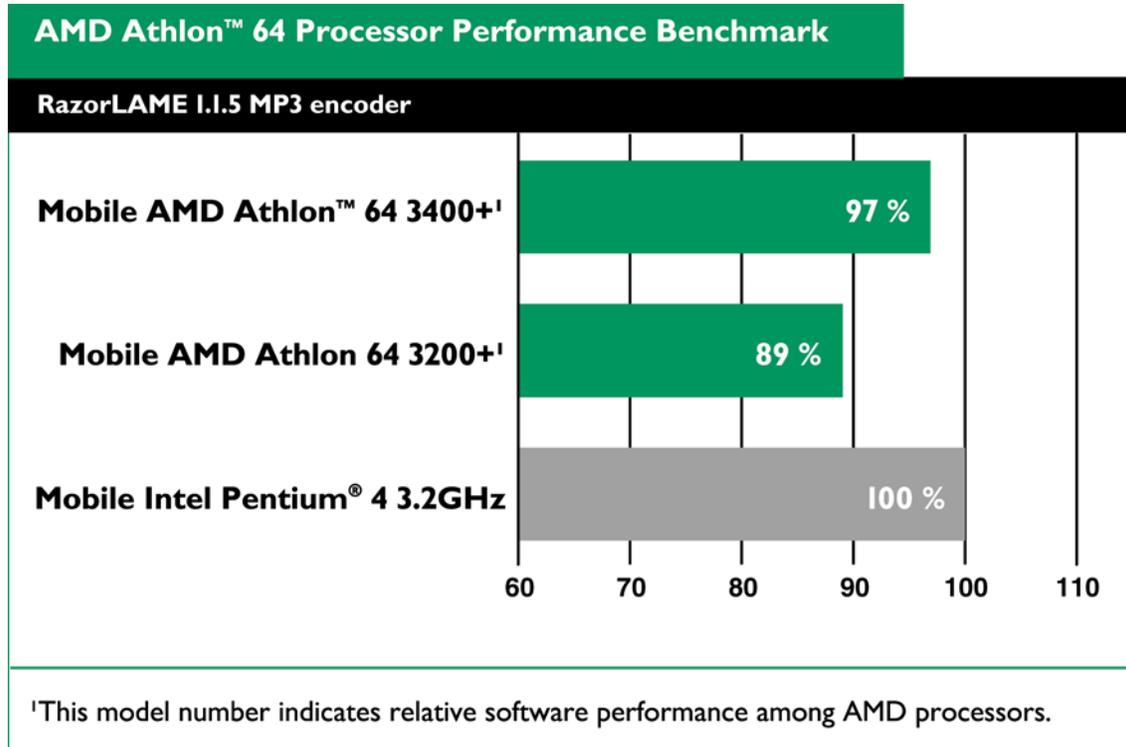
This benchmark uses Xmpeg 5.02 and DivX 5.03 Pro to convert the MPEG2 video file created with the AVI to MPEG2 Conversion with bbMPEG and AVI2MPEG2 benchmark. The benchmark creates an MPEG4 file in the DivX format.



The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. This benchmark is the compiled data from the MPEG2 to MPEG4 benchmark scores.

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## RazorLAME MP3 Encoder

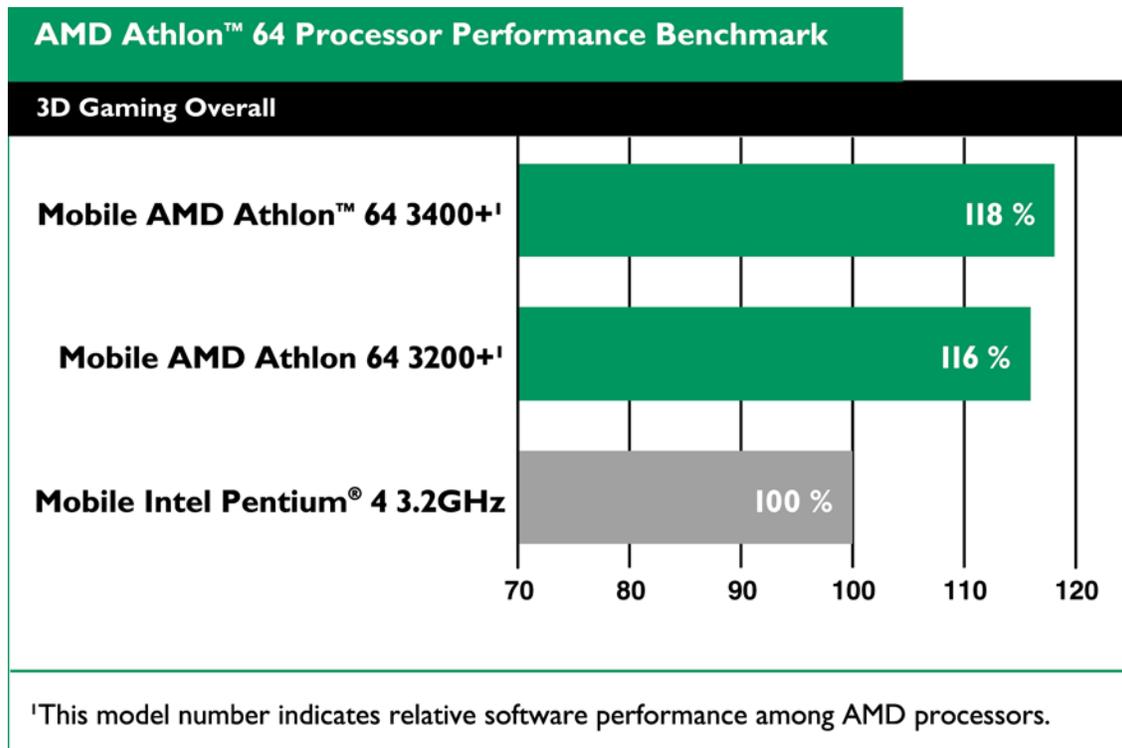


The score is normalized to a Mobile Intel Pentium 4 3.2 GHz processor. This benchmark is the compiled data from the RazorLAME version 1.1.5 MP3 benchmark scores.

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## 3D Gaming Overall

The Mobile AMD Athlon™ 64 processor's innovative technology enables the ultimate gaming experience in a notebook system. The Mobile AMD Athlon 64 processor allows users to escape into a movie-like gaming experience with smooth 3D graphics, rich textures, quick response times, and realistic sound.



This benchmark is an average of compiled data from the list of benchmark scores from the following list of tests. All benchmarks normalize the score to Mobile Intel Pentium® 4 Processor 3.2 GHz for the following tests (all at 1024x768x32):

[3DMark® 2001SE PRO \(D3D Hardware T&L\) by MadOnion](#)

[3DMark® 2001SE PRO \(D3D Software T&L\)](#)

[3DMark® 03 Pro \(Software Vertex Shaders\) by Futuremark® Corporation](#)

[3DMark® 03 Pro \(Hardware Vertex Shaders\) by Futuremark® Corporation](#)

[AquaMark3](#)

[Comanche 4 Demo](#)

[Final Fantasy® XI Official Benchmark, v1.1](#)

[Final Fantasy® XI Official Benchmark 2, v1.01 \(High Resolution\)](#)

[Half-Life Smokin'](#)

[Jedi Knights II Demo](#)

[Quake III Arena Demo2](#)

[Return to Castle Wolfenstein 3D](#)

[Splinter Cell \(1\\_1\\_1\)](#)

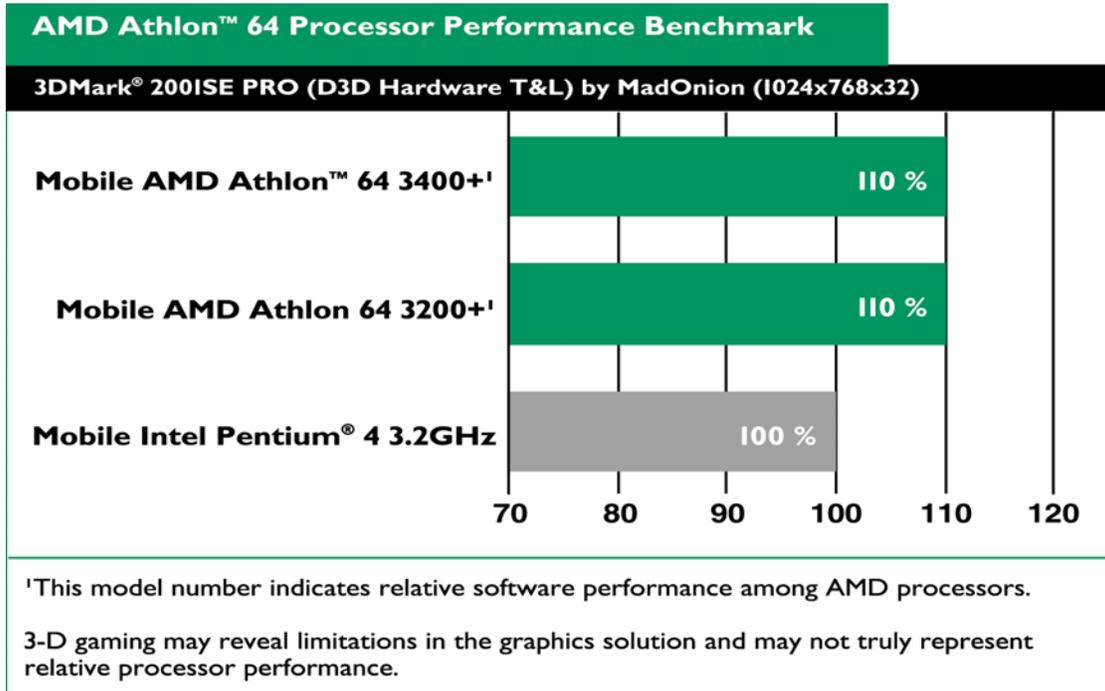
[Splinter Cell \(1\\_1\\_2\)](#)

[Unreal Tournament 2003 Demo BotMatch](#)

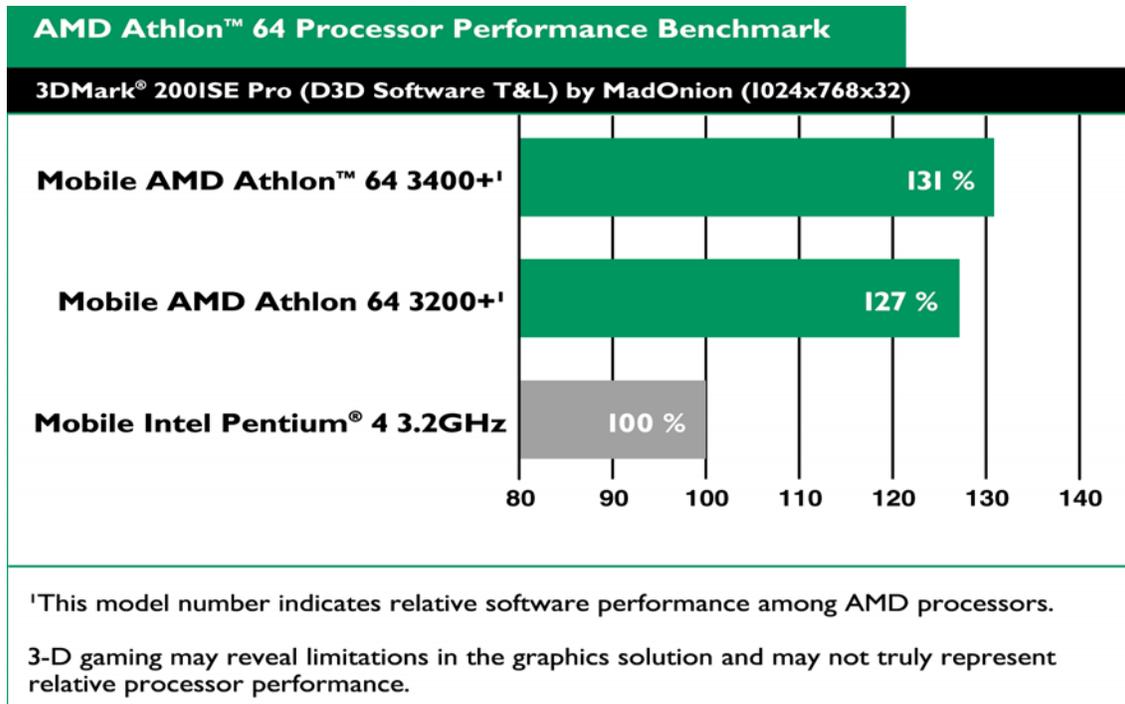
[Unreal Tournament 2003 Demo Flyby](#)

Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## 3DMark® 2001SE PRO (D3D Hardware T&L) by MadOnion

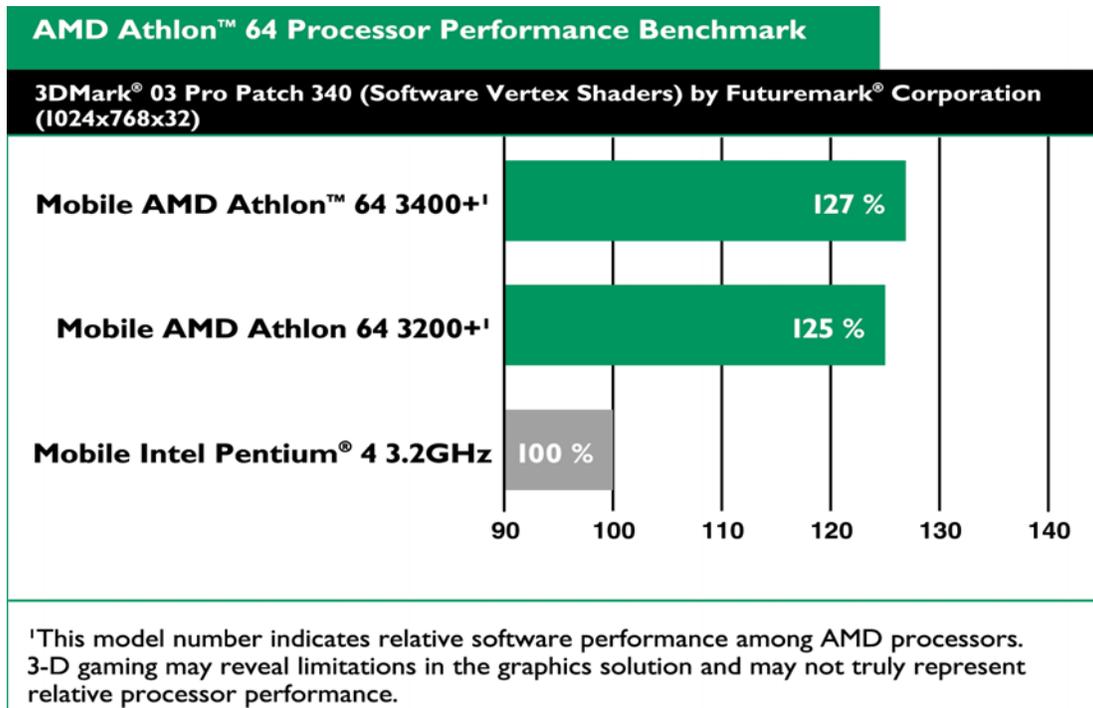


## 3DMark® 2001SE PRO (D3D Software T&L)

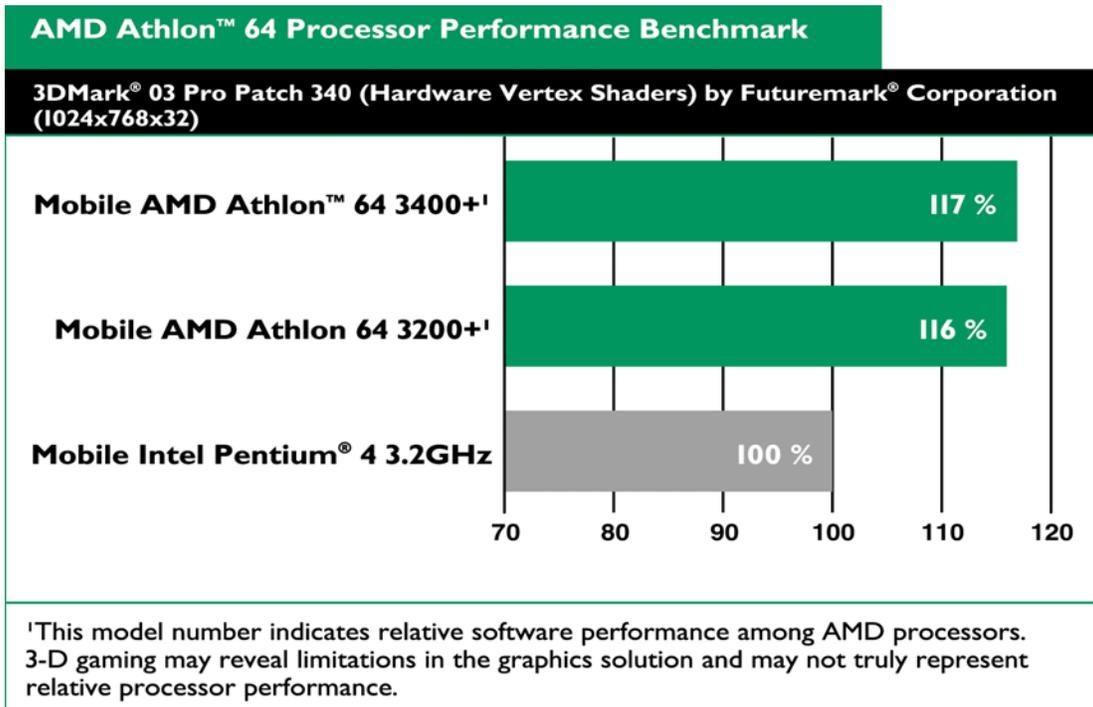


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## 3DMark® 03 Pro (Software Vertex Shaders) by Futuremark® Corporation

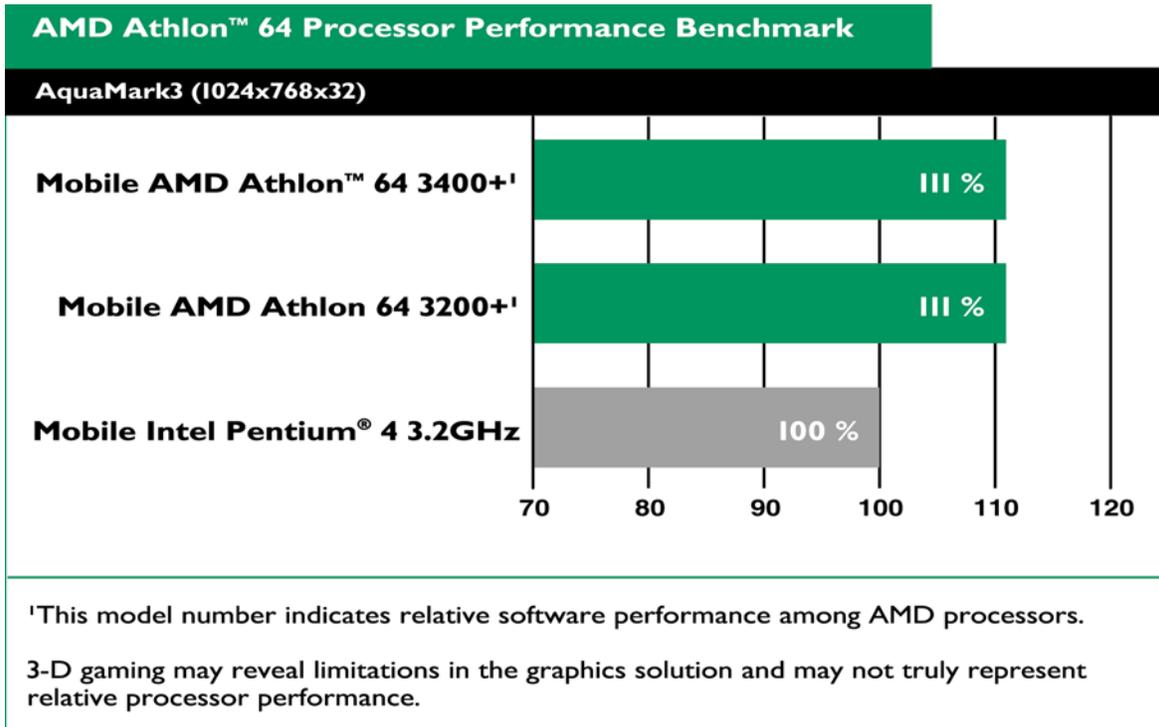


## 3DMark® 03 Pro (Hardware Vertex Shaders) by Futuremark® Corporation

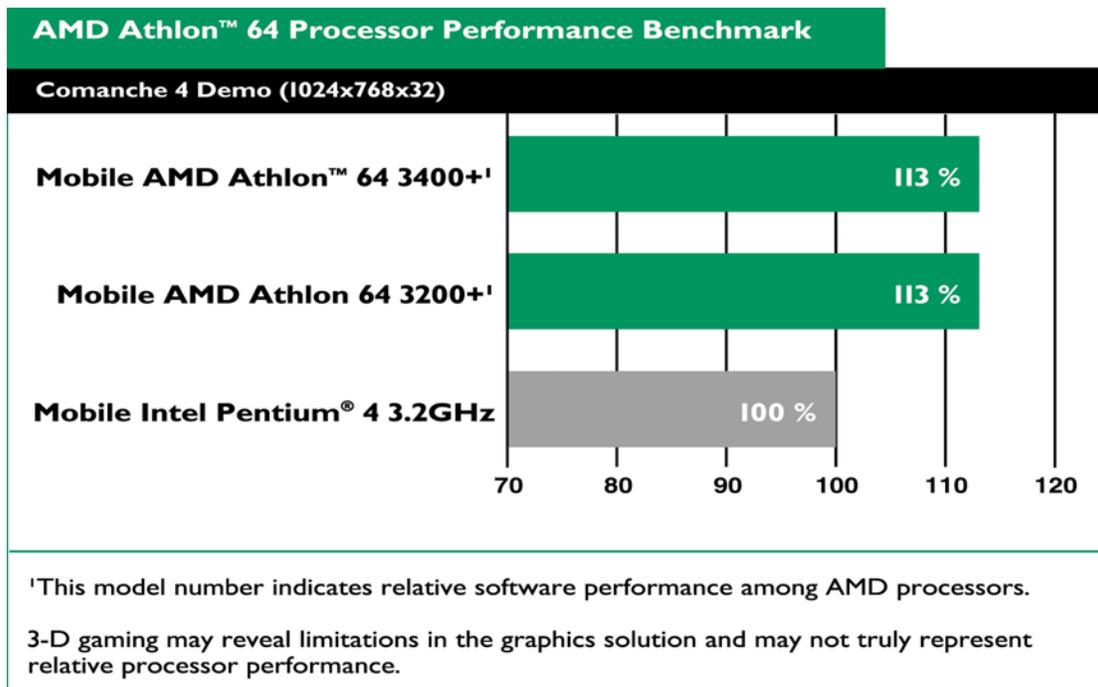


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## AquaMark3

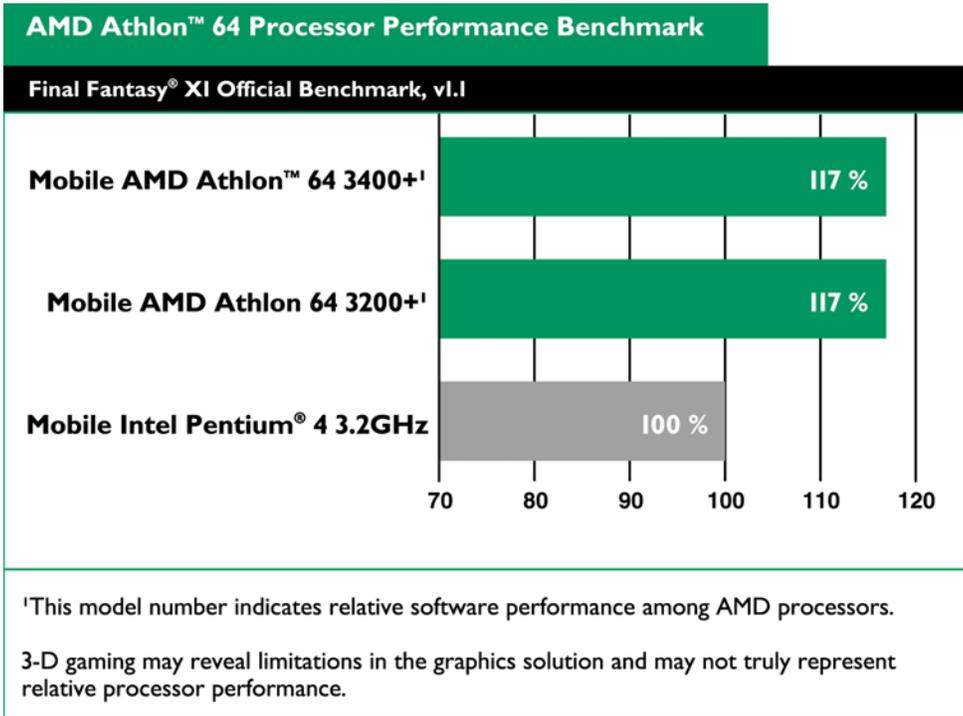


## Comanche 4 Demo

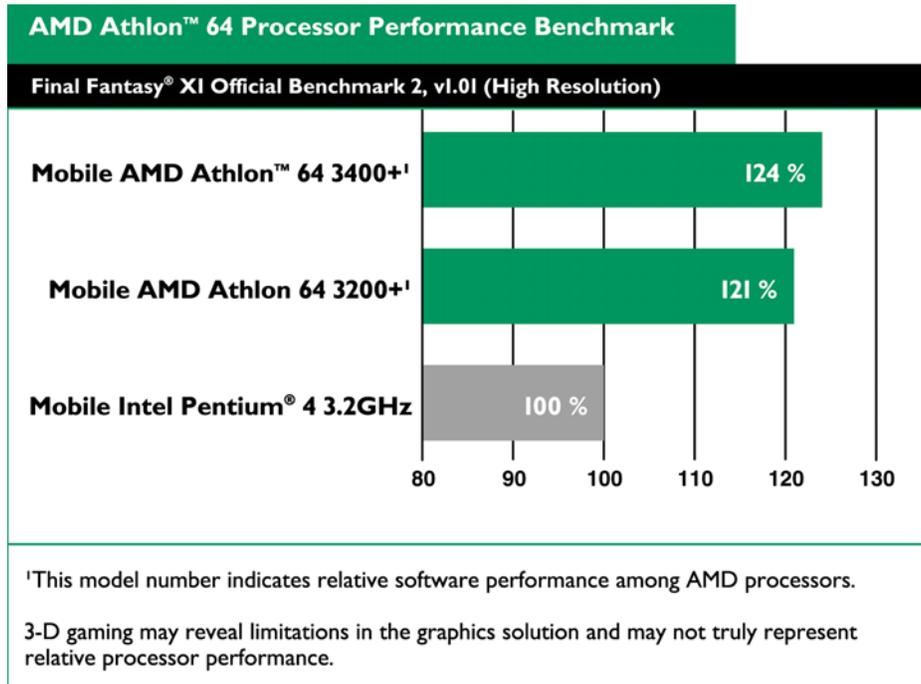


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Final Fantasy® XI Official Benchmark, v1.1

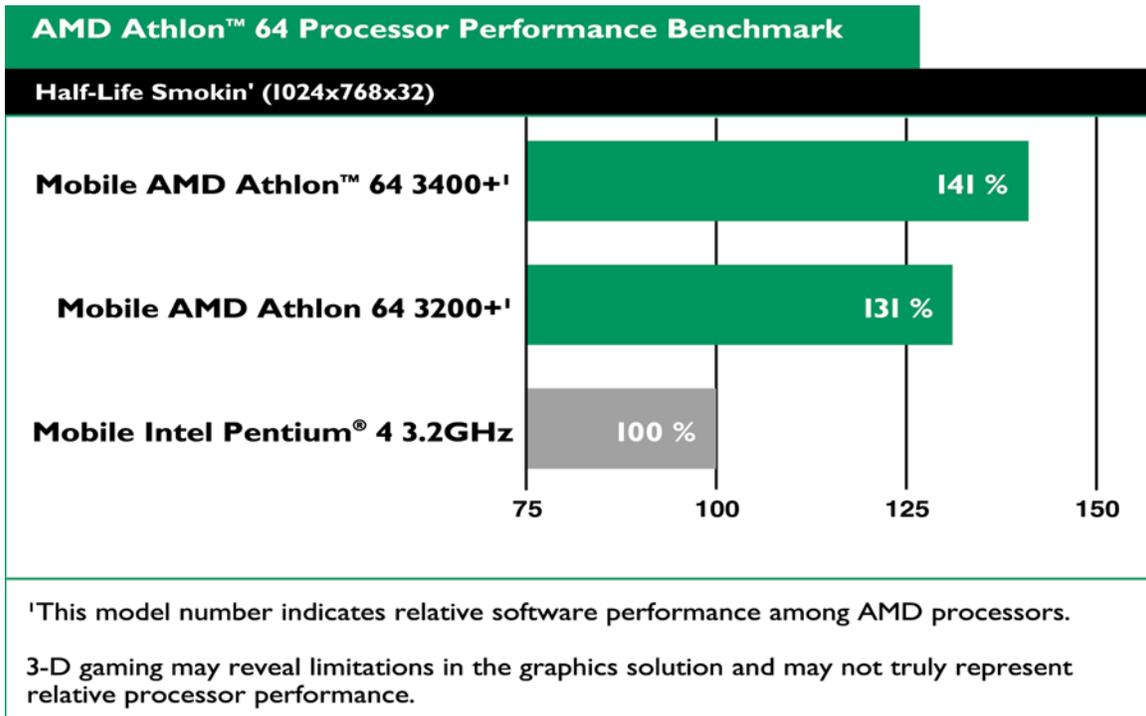


## Final Fantasy® XI Official Benchmark 2, v1.01 (High Resolution)

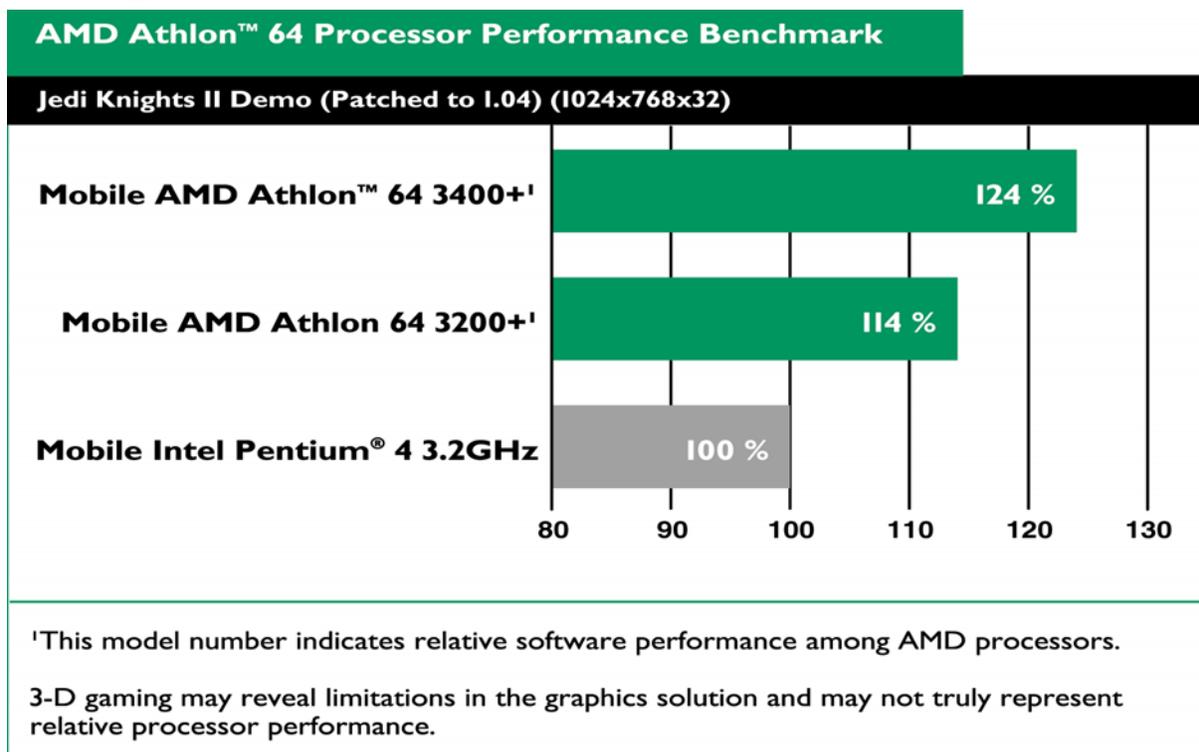


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Half-Life Smokin'

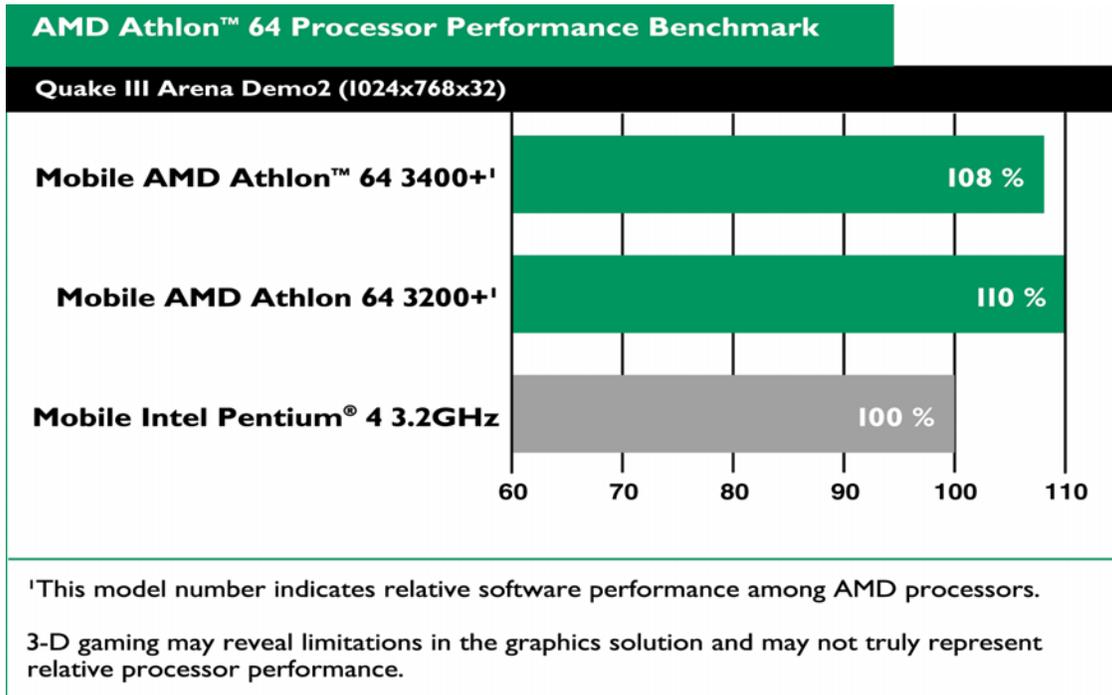


## Jedi Knights II Demo

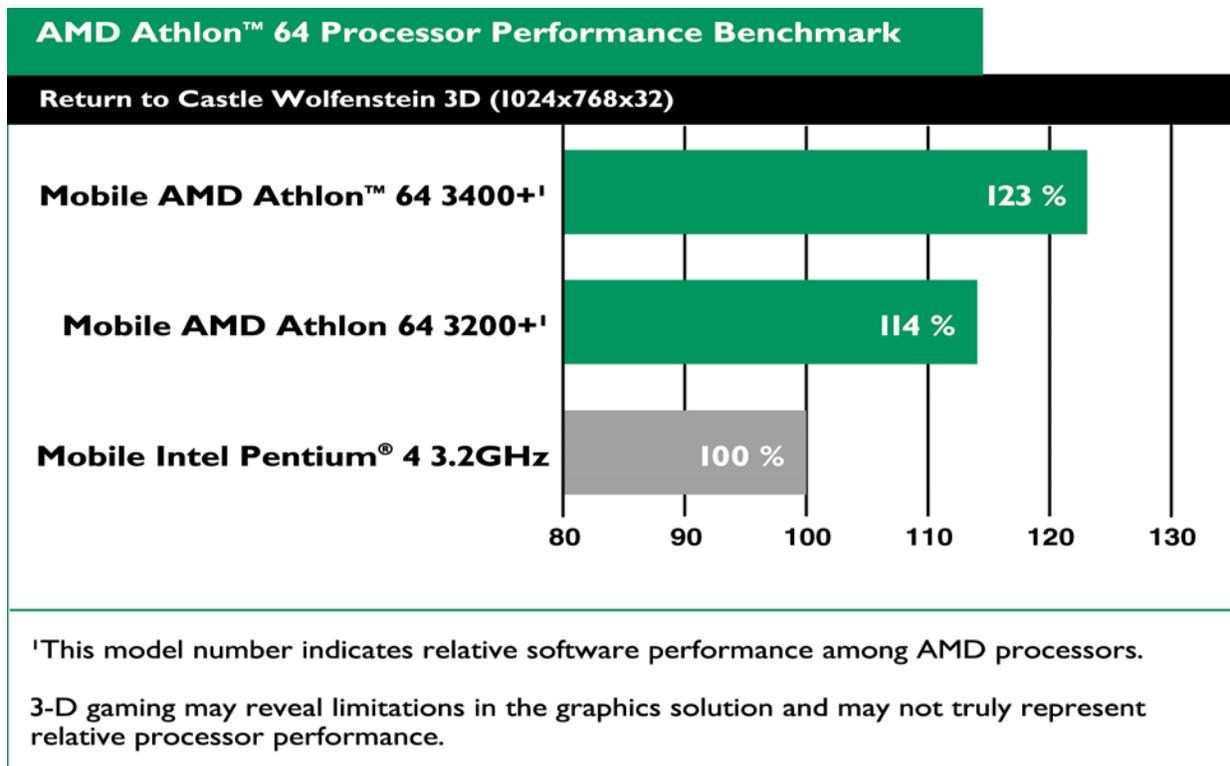


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Quake III Arena Demo2

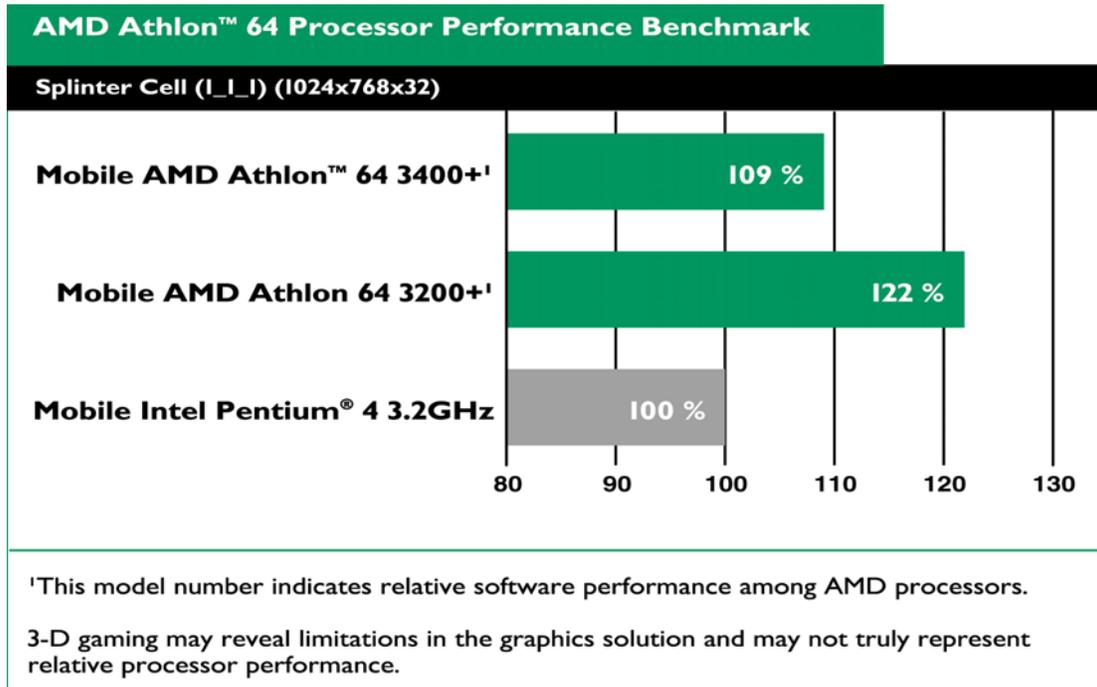


## Return to Castle Wolfenstein 3D

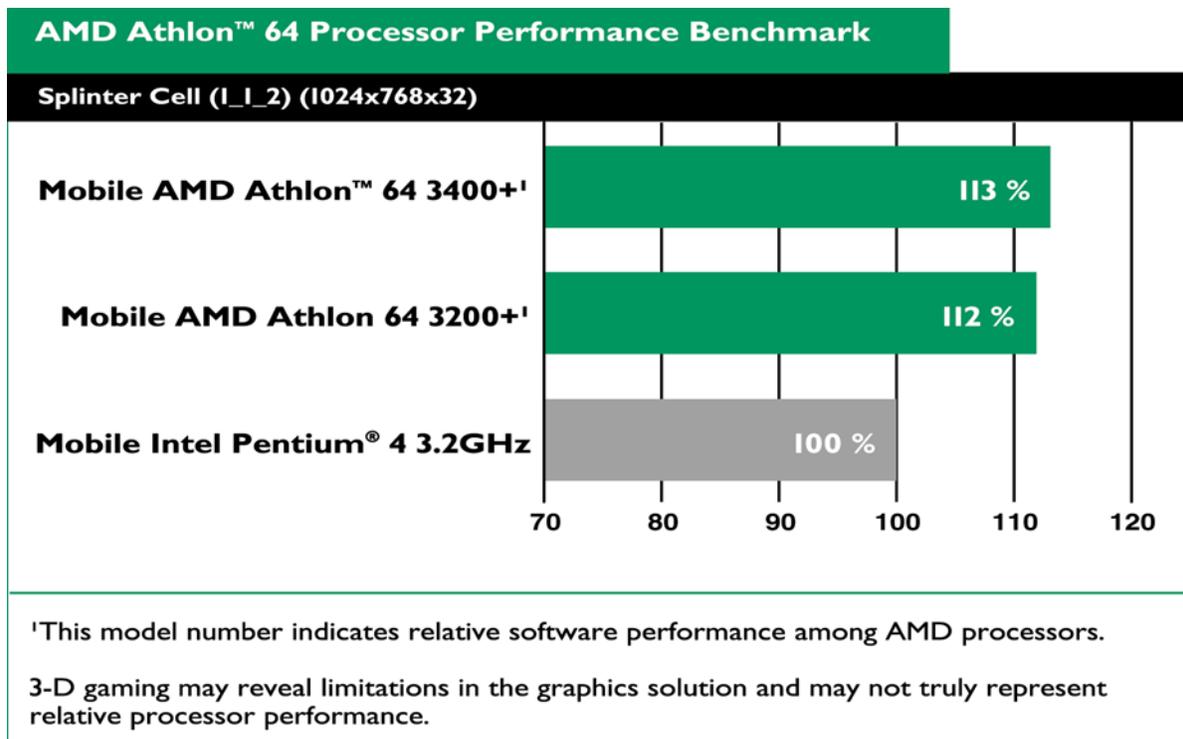


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Splinter Cell (1\_1\_1)

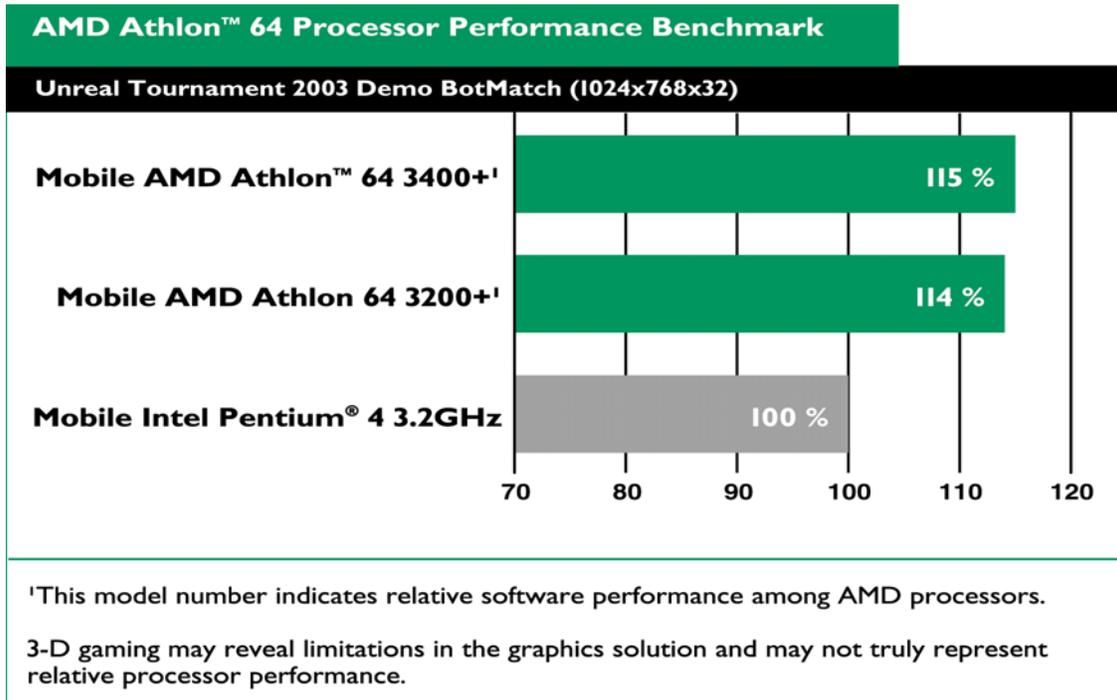


## Splinter Cell (1\_1\_2)

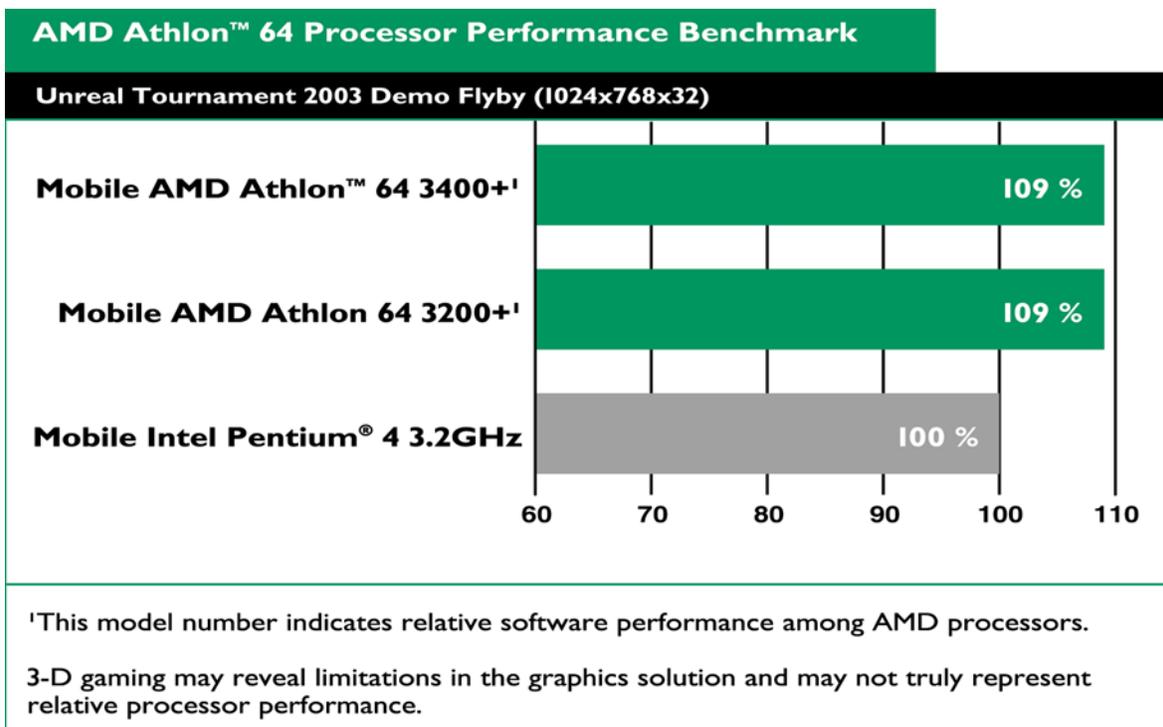


Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Unreal Tournament 2003 Demo BotMatch



## Unreal Tournament 2003 Demo Flyby



Refer to [Table 1 on page 25](#) and [Table 2 on page 26](#) for benchmark system configuration.

## Benchmark System Configuration

This section describes the configurations that AMD used to perform the benchmarks. [Table 1](#) and [Table 2](#), on page [26](#) represent the system configurations used for this document.

**Table 1. Mobile AMD Athlon™ 64 Processor 3400+, 3200+ System Configuration**

Component		Manufacturer and Model Description
<b>Operating System</b>		Microsoft® Windows® XP Professional, RTM, Service Pack 1a, Build 2600, DirectX 9.0a
<b>Hardware</b>	<b>Processor</b>	Mobile AMD Athlon™ 64 Processor 3400+ <sup>1</sup> , 3200+ <sup>1</sup>
	<b>Notebook</b>	Arima A520-K8, BIOS version 0B09.P06
	<b>Chipset</b>	VIA K8T800
	<b>RAM memory</b>	512 MB DDR SDRAM (PC2700/DDR333, CAS Latency 2.5)
	<b>Hard drive</b>	Hitachi IC25N040ATCS05, 40 GB, 5400 RPM, 8 MB buffer, UDMA100 (NTFS used to format the hard disk)
	<b>Video Card</b>	ATI Mobility Radeon 9000, 64 MB video RAM
	<b>Audio</b>	SoundMax Integrated Digital Audio
	<b>LAN</b>	VIA Rhine II (disabled during test)
	<b>Wireless LAN</b>	N/A
<b>Drivers</b>	<b>AGP</b>	VIA version 5.1.0.3442, 7/2/2003
	<b>IDE</b>	Microsoft version 5.1.3597.0, 7/1/2001, DMA enabled
	<b>Video</b>	ATI version 6.14.10.6378, 8/12/2003, 1024x768x32, 85 Hz refresh rate
	<b>Audio</b>	Analog Devices version 5.12.1.3620, 5/27/2003
	<b>LAN</b>	VIA version 3.15.0.351, 1/15/2003
	<b>Wireless Lan</b>	N/A

<sup>1</sup>This model number indicates relative software performance among AMD processors.

**Table 2. Mobile Intel Pentium® 4 System Configuration**

<b>Component</b>		<b>Manufacturer and Model Description</b>
<b>Operating System</b>		Microsoft® Windows® XP Professional, RTM, Service Pack 1a, Build 2600, DirectX 9.0a
<b>Hardware</b>	<b>Processor</b>	Mobile Intel Pentium® 4 3.2 GHz
	<b>Notebook</b>	Dell Inspiron 5150, BIOS version A26
	<b>Chipset</b>	Intel 852PM
	<b>RAM memory</b>	512 MB DDR SDRAM (PC2700/DDR333, CAS Latency 2.5)
	<b>Hard drive</b>	Hitachi IC25N040ATCS05, 40 GB, 5400 RPM, 8 MB buffer, UDMA100 (NTFS used to format the hard disk)
	<b>Video Card</b>	ATI Mobility Radeon 9000, 64 MB video RAM
	<b>Audio</b>	SigmaTel C-Major
	<b>LAN</b>	Broadcom 440X 10/100 (disabled during test)
	<b>Wireless LAN</b>	N/A
<b>Drivers</b>	<b>AGP</b>	Intel version 5.0.1011.0, 3/7/2003
	<b>IDE</b>	Intel version 4.0.1001.0, 7/2/2001
	<b>Video</b>	ATI version 6.14.10.6371, 7/29/2003, 1024x768x32, 85 Hz refresh rate
	<b>Audio</b>	SigmaTel version 6.14.1.3794, 4/25/2003
	<b>LAN</b>	Broadcom version 3.60.0.0, 5/15/2003
	<b>Wireless Lan</b>	N/A

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