



# Building a Media PC

## NVIDIA GPU Motherboard Solutions

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### Introduction

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This paper provides guidelines, recommendations, and additional resources for system builders, OEMs, ODMs, and others who want to design and deploy innovative media PCs based on NVIDIA GPU Motherboard Solutions. NVIDIA's latest media PC designs reduce expense, chassis size, and noise, while improving video quality and performance. System manufacturers can deliver an exciting digital entertainment experience at affordable prices by using NVIDIA GPU Motherboard Solutions and the recommendations in this paper.

### **NVIDIA GPU Motherboard Solutions: Featuring NVIDIA GeForce 6 Series GPUs and NVIDIA nForce4 MCPs**

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If you are looking to build a great media PC in a small form factor or for a low price, consider NVIDIA GPU Motherboard Solutions featuring an NVIDIA® GeForce® 6 Series graphics processing units (GPU), NVIDIA® PureVideo™ HD video processing, and an NVIDIA nForce®4 media and communications processor (MCP). This unique combination creates a single motherboard featuring a world-class Microsoft® DirectX® 9.0 Shader Model 3.0 GPU, a high-definition video processing engine, and the industry's most highly demanded core logic solution.

The NVIDIA GeForce 6 Series GPUs provide a groundbreaking feature set for computing, including full support for Microsoft DirectX 9.0 Shader Model 3.0 that provides unparalleled graphics effects. Delivering a revolutionary superscalar architecture, and an advanced on-chip video processor, GeForce 6 Series GPUs power the ultimate PC experiences.

NVIDIA PureVideo technology is a combination of the GeForce 6 Series GPUs high-definition video processor and NVIDIA PureVideo decoder software that delivers unprecedented picture clarity, smooth video, accurate color, and precise image scaling for all video content on any display.

NVIDIA nForce4 MCPs include cutting-edge technology featuring; NVIDIA® ActiveArmor™ secure networking, NVIDIA® MediaShield™ storage, NVIDIA native Gigabit Ethernet, SATA 3Gb/s drive support, and more. NVIDIA nForce4 MCPs are designed to deliver world-class system performance.

## **Advantages of NVIDIA GPU Motherboard Solutions**

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NVIDIA GPU Motherboard Solution for media PCs is an all-in-one digital media center for home entertainment and gaming that maintains the familiar PC form factor.

### **Industry's First Motherboard Featuring High Definition Video—Experience Crisp, Vibrant Video**

NVIDIA PureVideo technology allows you to experience lifelike HD playback on your PC or HDTV without the expense of additional home theater devices. With dedicated hardware to accelerate MPEG-2/DVD as well as the new Microsoft® Windows Media® HD Video (WMV HD) standard, your DVDs come to life! Using NVIDIA PureVideo technology, the GPU offloads video decoding from the CPU, resulting in smooth, stutter-free, high-definition video playback. And, since PureVideo supports most current and future HD formats, you can be assured that a PC powered by PureVideo technology will keep up with the pace of tomorrow's video technologies and continue to deliver HD content well into the future.

### **Award Winning GeForce 6 Series GPUs—Play the Latest Games with Microsoft DirectX 9.0 Shader Model 3.0**

The NVIDIA GeForce 6150 and 6100 GPUs feature a revolutionary design that delivers best-in-class performance on today's digital media and graphics applications. The only GPUs available on a motherboard to support Microsoft DirectX 9.0 Shader Model 3.0, the GeForce 6150 and 6100 GPUs power cutting-edge effects without compromising performance.

### **NVIDIA ActiveArmor—Unmatched PC Security**

NVIDIA ActiveArmor firewall protects your PC from malicious spyware and hacker attacks with 'instant on' protection for network connections.

### **NVIDIA MediaShield—Confidently Store Your Digital Assets**

Through a simple user interface, NVIDIA MediaShield storage allows you to easily manage multiple hard disk drives so you can safely store your digital assets. With support for a variety of hard disk drive configurations, including the latest SATA 3Gb/s hard drives, MediaShield offers one of the most advanced storage solutions available for desktop PCs. MediaShield's unique interface allows you to easily configure or modify your multidisk arrays.

## **Designing for the NVIDIA Media Center PC Experience—System Configurations**

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### **CPU and Memory**

NVIDIA GPU Motherboard Solutions support AMD64 processors including AMD Athlon 64 processor which deliver powerful desktop performance for a unique digital experience. The AMD Athlon 64 processor's advanced HyperTransport™ technology, integrated DDR memory controller, and Cool'n'Quiet™ technology are capable of handling various multimedia tasks with efficient power consumption.

NVIDIA recommends using the combination of an AMD Athlon 64 3500+ and 1GB PC-3200 DDR RAM for media center PC.

### **Motherboard Form Factor**

NVIDIA recommends using the standard micro-ATX form factor to build compact or slim media PCs.

## **Noise and Heat Management**

As the primary device for home entertainment, media PCs should run quietly and remain cool, just like any other consumer electronics device. Acoustic levels should be estimated early in the design process to ensure a high-quality user experience.

NVIDIA recommends 20 decibels of emitted sound power in idle mode and fewer than 26 decibels when the PC is in active mode.

## **Home Theater Quality Video**

Movie and video display quality is one of the most compelling features of the media PC. NVIDIA GPU Motherboard Solutions provide unique features: PureVideo technology and NVIDIA Media Center software.

- **PureVideo Technology**

NVIDIA GeForce GPUs, featuring hardware dedicated to video processing deliver high-definition video, superb picture clarity, and full-resolution video enhancement to the media center PC. PureVideo eliminates the stuttering, double images, blurring, and "noise" commonly associated with playing movies on a PC, while delivering precise, vivid colors on any display.

- **NVIDIA Media Center Software**

NVIDIA provides a host of software designed to enhance the video and TV experience for Microsoft Media Center Edition 2005. Custom settings for media center systems allow you to control the color scheme, brightness, contrast, hue, saturation, gamma, and digital vibrance of live TV and DVD movies—all from the simple-to-use Microsoft Media Center remote control. The NVIDIA PureVideo Decoder delivers rich Dolby® Digital surround sound audio and crisp TV and video playback. Additionally, an easy-to-use wizard makes setting up a high-definition or digital TV a breeze, bringing a truly cinematic experience to your home PC.

## **NVIDIA DualTV Tuner**

NVIDIA brings hardware MPEG-2 encoding to media center PC through the "Designed for Media Center Edition" certified NVIDIA DualTV tuner card. Unlike software encode-based solutions that rely on the CPU, NVIDIA's DualTV delivers superior quality TV and PVR on a PC with hardware MPEG-2 encode, advanced 3D comb filter, and 3D noise reduction technology. DualTV allows flexible TV viewing and recording options. With dual tuner support, you can record two different shows at once or watch one show while recording another without sacrificing PC performance.

## **Photo Display**

Built on the award-winning GeForce display architecture, NVIDIA GPU Motherboard Solutions bring high-quality RAMDACs to media PCs for crisp image quality and high-resolution photo presentations. NVIDIA Digital Vibrance Control® (DVC) technology provides color control settings so you can easily adjust the levels of digital vibrance, brightness, contrast, and gamma in your photos.

## **Audio**

NVIDIA GPU Motherboard Solutions support all the major multichannel audio (5.1, 7.1) solutions, including high-definition audio (HDA), to deliver a Dolby-quality surround sound entertainment experience into a media center PC.

## **NVIDIA MediaShield Storage**

NVIDIA GPU Motherboard Solutions provide MediaShield storage technology to address the security issue of consumers' digital media assets. MediaShield offers a unique management interface that lets consumers easily configure or change their multidisk arrays under RAID technology's protection. MediaShield can supply four different models of RAID protection—including RAID 0, RAID 1, RAID 0+1 or RAID 5—to meet different consumer's requirements. NVIDIA recommends using high-performance hard drives with generous storage space and fast data transfer rates in media center PCs.

For the entry level systems, NVIDIA recommends using two 160GB 7200rpm SATA hard disks.

## **NVIDIA PureVideo Decoder—Optical Storage**

A recordable DVD drive helps consumers transfer personal photos, recorded TV shows, and other multimedia files onto DVD. DVD writing capability is supported through the addition of third-party software. NVIDIA GPU Motherboard Solution provide the NVIDIA PureVideo Decoder, the first software decoder to receive the "Designed for Media Center Edition" certification. The NVIDIA PureVideo Decoder delivers unmatched color fidelity and smooth DVD, video, and TV viewing and is the best way to experience PureVideo on a media center PC.

## **Secure Networking**

NVIDIA GPU Motherboard Solutions provide Gigabit Ethernet technology for high-speed internet connection and ActiveArmor Firewall technology for optimized protection.

### **Gigabit Ethernet**

By providing a dedicated Gigabit Ethernet port and integrating the Media Access Control (MAC) technology into the high-performance NVIDIA nForce media and communications processors (MCPs), NVIDIA delivers the industry's fastest Gigabit Ethernet desktop solution. Gigabit Ethernet handles the increasingly large files of today's demanding media applications, and speeds up any operation that involves moving data over a network. Consumers can take advantage of it to share and transfer multimedia files much faster than before.

### **NVIDIA ActiveArmor Firewall**

NVIDIA ActiveArmor firewall protects your PC from malicious spyware and hacker attacks with 'instant on' protection for network connections.

## **Input Devices**

NVIDIA recommends using a wireless keyboard and mouse to control the media PC, with an MCE remote control as an option.

### **Keyboard and Mouse**

A good wireless keyboard and mouse are important for media PC users. The wireless range, the size, compact form factors, ergonomic consideration, and customized features are key to choosing the right product.

## Software Applications

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The software application package is important for demonstrating the multimedia power of media center PCs. A customized software and control interfaces improve the efficiency and differentiate the media PCs. NVIDIA recommends system builders to include the following software categories as a basic software package and exact combination will depend on the different price point.

<b>Operation System:</b>	Microsoft Windows XP SP2 version
<b>Office Productivity:</b>	Microsoft Works 8 Adobe Acrobat Reader
<b>Finance:</b>	Microsoft Money 2005
<b>Media:</b>	Microsoft Media Player 10 RealPlayer Apple iTunes
<b>Game:</b>	WildTangent Game Channel Selected 2D/3D game
<b>NVIDIA Software:</b>	NVIDIA nView multi-display software NVIDIA nTune V3 NVIDIA NVMixer 5 NVIDIA PureVideo Decoder NVIDIA ActiveArmor Firewall NVIDIA MediaShield
<b>Antivirus:</b>	Symantec Norton Antivirus 2005
<b>Premium Application:</b>	Adobe Premiere Standard Edition Adobe Photoshop Album Starter Edition Adobe Photoshop Elements 2.0 Greeting Card Factory Deluxe DigitalMedia Plus:Burn,Copy CD ,Backup,Label Microsoft Plus! Digital Media Edition Roxio - Easy Media Creator 7 Symantec Ghost Norton System Works 2005

## Summary of Hardware Specifications for Media Center PCs

The following table lists the recommended hardware configurations and options. NVIDIA strongly encourages system builders to differentiate Media PCs at the chassis design, noise and heat controls, and hardware configurations.

	Recommends	Other Choice
<b>Processor</b>	AMD Athlon 64 3500+ 2.2GHz	AMD Athlon 64 3000+ ~ 3800+
<b>Core logic</b>	NVIDIA nForce 430	NVIDIA nForce 430
<b>Memory</b>	1GB (2X512M) PC-3200 RAM 2 DIMMS; 128-bit Interface	512MB ~ 2GB PC-3200 RAM 2 DIMMS; 128-bit Interface
<b>Memory expansion</b>	4 DIMM, up to 4GB	4 DIMM, up to 4GB
<b>Graphics card</b>	Integrated NVIDIA GeForce 6150	NVIDIA GeForce 6600 Passive
<b>TV Tuner*</b>	Optional	NVIDIA DualTV Tuner with PVR and FM Tuner
<b>Display</b>	17" LCD	17" CRT or 15"/17" LCD
<b>Hard disk</b>	320 GB RAID 1(2 X160GB)	2X120GB ~ 2X250GB 7200rpm (RAID 1)
<b>Optical driver</b>	DL 16X DVD+/-R/RW	8X or 16X DVD+/-R/RW
<b>Sound</b>	HD 7.1 audio	HD 7.1 audio
<b>Speakers</b>	5.1 system	Other 5.1 or 7.1 audio system
<b>Mouse and keyboard</b>	PS/2 Keyboard + Mouse	Other PS/2 Keyboard + Mouse
<b>Chassis</b>	Micro ATX	Micro ATX
<b>Power</b>	300W	300W
<b>Expansion slots</b>	(2) PCI x1 (1) PCI Express x16	(2) PCI x1 (1) PCI Express x16
<b>Front</b>	2USB 2.0,	2USB 2.0,
<b>Productivity</b>	9-in-1 card reader	9-in-1 card reader
	audio connector	audio connector
<b>Network</b>	10/100/1000M	10/100/1000M

\*Choose TV standard appropriate to your region