ATI 3D GRAPHIC ACCELERATORS

User Manual

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CARD FEATURES

ATI RADEON 9800/9800PRO

Most visually advanced 3D performer

- 256MB/128MB DDR memory accelerates the latest 3D games
- Eight parallel rendering pipelines
- Four parallel geometry engines
- 256-bit DDR memory interface
- AGP 8X support

SMARTSHADER™ 2.1

- Full support for Microsoft® DirectX® 9.0 programmable vertex and pixel shaders in hardware
- 2.0 Vertex Shaders support vertex programs up to 65,280 instructions with flow control
- 2.0 Pixel Shaders support up to 16 textures per rendering pass
- New F-buffer technology supports pixel shader programs with unlimited instructions
- 128-bit, 64-bit & 32-bit per pixel floating point color formats
- Multiple Render Target (MRT) support
- Shadow volume rendering acceleration
- Complete feature set also supported in OpenGL® via extensions

SMOOTHVISION™ 2.1

- 2x/4x/6x full scene anti-aliasing modes
- Adaptive algorithm with programmable sample patterns
- 2x/4x/8x/16x anisotropic filtering modes
- Adaptive algorithm with bi-linear (performance) and tri-linear (quality) options

HYPER Z™ III+

- 3-level Hierarchical Z-Buffer with early Z test
- Lossless Z-Buffer compression (up to 24:1)
- Fast Z-Buffer Clear
- Z cache optimized for real-time shadow rendering

TRUFORM™ 2.0

- 2nd generation N-Patch higher order surface support
- Discrete and continuous tessellation levels per polygon
- Displacement mapping

VIDEOSHADER™

- Seamless integration of pixel shaders with video
- FULLSTREAM™ video de-blocking technology
- Noise removal filtering for captured video

- MPEG-2 decoding with motion compensation, iDCT and color space conversion
- All-format DTV/HDTV decoding
- YPrPb component output
- Adaptive de-interlacing and frame rate conversion
- Dual integrated display controllers
- Dual integrated 10-bit per channel 400 MHz DACs
- Integrated 165 MHz TMDS transmitter (DVI 1.0 compliant and HDCP ready)
- Integrated TV Output support up to 1024x768 resolution
- Optimized for Pentium® 4 SSE2 and AMD Athlon™ 3Dnow!

ATI RADEON 9700/9700PRO

Fastest 3D Gaming Performance

- 128MB DDR memory accelerates the latest 3D games
- 256-bit memory interface removes hardware performance bottleneck and provides end users with faster 3D graphics
- Industry's first 8-pixel pipeline architecture, providing twice the rendering power of any currently competing product.

- Supports the new AGP 8X standard, providing a high-speed link between the graphics board and the rest of the PC (2.0 GB/sec)
- Eight parallel rendering pipelines
- Four parallel geometry engines
- 256-bit DDR memory interface
- AGP 8X support
- SMARTSHADER™ 2.0
- Programmable pixel and vertex shaders
- 16 textures per pass
- Pixel shaders up to 160 instructions with 128-bit floating point precision
- Vertex shaders up to 1024 instructions with flow control
- Multiple render target support
- Shadow volume rendering acceleration
- High precision 10-bit per channel frame buffer support
- Supports DirectX® 9.0 and the latest version of OpenGL
- SMOOTHVISION™ 2.0
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- PC 2002 compliant

ATI RADEON 9600/9600PRO

- 256MB/128MB DDR memory accelerates the latest 3D games
- 4 parallel rendering pipelines
- 2 parallel geometry engines
- 128-bit DDR memory interface
- AGP 8X support

SMARTSHADER™ 2.0

- Programmable pixel and vertex shaders
- 16 textures per pass
- Pixel shaders up to 160 instructions with 128-bit floating point precision
- Vertex shaders up to 1024 instructions with flow control
- Multiple render target support
- Shadow volume rendering acceleration
- High precision 10-bit per channel frame buffer support
- Supports DirectX® 9.0 and the latest version of OpenGL®

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- PC 2002 compliant

ATI RADEON 9200/ 9200PRO

- Comprehensive 4X and 8X AGP support
- Windows® Logo Program compliant
- Optimized for Pentium ® 4 SSE2 and AMD Athlon™ 3Dnow! processor instructions
- Highly optimized 128-bit 2D engine with support for new Windows® XP GDI extensions

CHARISMA ENGINE™ II

- Four parallel rendering pipelines process up to 1.1 billion pixels per second
- High performance 2nd generation hardware transform & lighting engine
- Advanced vertex shader support for the latest programmable effects

SMARTSHADER™ technology

- Full support for DirectX ® 8.1 programmable pixel and vertex shaders in hardware
- 1.4 pixel shaders support up to 22 instructions and up to 6 textures per rendering pass
- 1.1 vertex shaders support vertex programs up to 128 instructions
- Complete feature set also supported in OpenGL ® via extensions
- Programmable shaders provide enhanced 3D effects in over 100 existing and upcoming game titles

SMOOTHVISION™

- Image quality enhancement features for Direct3D™ and OpenGL ® applications
- Programmable full-scene anti-aliasing supports 2 to 6 samples with user selectable performance and quality modes
- Advanced anisotropic filtering supports 2 to 16 samples for high quality texture rendering with minimal performance impact

HYPER Z™ II

- Lossless Z-Buffer Compression and Fast Z-Buffer Clear reduce memory bandwidth by up to 25%

VIDEO FEATURES

- FULLSTREAM™ Hardware accelerated de-blocking of Internet video streams
- VIDEO IMMERSION™ II delivers industry-leading DVD playback
- Integrated MPEG-2 decode including iDCT and motion compensation for top quality DVD with lowest CPU usage
- Unique Adaptive per-pixel de-interlacing feature combines the best elements of the "bob" and "add-field" (weave) techniques
- YUV to RGB color space conversion
- Back-end scaler delivers top quality playback
- 4-tap horizontal and vertical filtering
- Upscaling and downscaling
- Filtered display of images up to 1920 pixels wide
- Hardware mirroring for flipping video images in video conferencing systems
- Supports 8-bit alpha blending and video keying for effective overlay of video and graphics

DISPLAY FEATURES

- Dual integrated display controllers to drive two displays simultaneously with independent resolutions and refresh rates
- HYDRAVISION™ software provides complete control over multi-display configurations with a user-friendly interface
- 400MHz Dual integrated DACs with 10-bit per channel palette
- Integrated DVI-compliant 165MHz TMDS transmitter
- Integrated TV-Out support up to 1024x768 resolution

ATI RADEON 9000/9000PRO

CHARISMA ENGINE™ II

- Four parallel rendering pipelines process up to 1.1 billion pixels per second
- High performance 2nd generation hardware transform & lighting engine
- 43 million triangles per second peak throughput
- Advanced vertex shader support for the latest programmable effects

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- Integrated TV-Out support up to 1024x768 resolution

ATI RADEON 9100/8500

Powerful graphics performance

- Powered by the RADEON™ 9100 (8500) GPU and 128MB DDR memory for fast and advanced 3D graphics
- Features TRUFORM™ technology to make characters more life-like
- High-resolution 32-bit 3D gaming up to 2048x1536
- HYPER Z™ II technology conserves memory bandwidth for improved performance in demanding applications
- SMOOTHVISION™, ATI' s advanced anti-aliasing feature to date, eliminates distracting visual artifacts for smoother-looking images

Advanced visual effects

- SMARTSHADER™ technology takes advantage of the DirectX® 8.1 features to enable more complex and realistic lighting effects
- Support for OpenGL® 1.3 applications
- CHARISMA ENGINE™ II supports full Transformation, Clipping and Lighting (T&L) at 62.5 million triangles/second peak processing capability
- PIXEL TAPESTRY™ II, the rendering engine, powers an incredible 2.4 gigatexels/second for high fill rates in 32-bit at high resolutions

TV Out support and DVD playback

- ATI's VIDEO IMMERSION™ II technology enables integration of industry-leading digital video features, including advanced de-interlacing algorithms for unprecedented video quality
- Use video-out to connect your PC to TV or VCR for recording

ATI RADEON 7500/ 7500LE

General

- Powerful 3D graphics performance
- Powered by the RADEON 7500 GPU and 64MB DDR memory for advanced 3Dgraphics
- Delivers immersive, realistic 32-bit color graphics without PC performance decline
- High-resolution 32-bit 3D gaming up to 2048x1536
- Full support of DirectX® and OpenGL® applications
- PIXEL TAPESTRY™, the RADEON 7500 rendering engine, powers an incredible 1.74 gigatexels/second for the highest fill rates in 32-bit at high resolutions
- Outstanding visual experience
- CHARISMA ENGINE supports full Transformation, Clipping and Lighting (T&L) at up to 45.0 million triangles/second peak processing capability.
- Features HYPER Z technology to boost effective memory bandwidth by over 20%
- PIXEL TAPESTRY, the RADEON 7500 3D rendering engine for unsurpassed graphics performance.

3D FEATURE

- CHARISMA ENGINE
- HYPER Z technology
- PIXEL TAPESTRY architecture
- VIDEO IMMERSION technology
- Integrated Transformation, Clipping and Lighting.
- Twin Cache Architecture.
- SuperScalar Rendering.
- Single-Pass Multi-Texturing / True Color Rendering.
- Triangle Setup Engine.
- Texture Cache.
- Bilinear/Trilinear Filtering.
- Line & Edge Anti-Aliasing.
- Full-Screen Anti-Aliasing.
- Texture Compositing / Texture Decompression.
- Specular Highlights.
- Perspectively Correct Texture.
- Mapping / Mip-Mapping.
- Z-Buffering and Double-Buffering.
- Emboss, Dot Product 3 and Environment bump mapping.
- Spherical, Dual-Paraboloid and Cubic environment mapping.
- Fog effects, texture lighting, video textures, reflections, shadows, spotlights, LOD biasing and texture morphing

ATI RADEON VE (7000)

- ATI HYPER Z™ technology reduces memory bandwidth consumption resulting in improved 3D performance
- Incredible 3D graphics performance with ATI PIXEL TAPESTRY™ 3D rendering engine
- Supports DirectX® 7.0, DirectX® 8.0 and OpenGL®
- Flexible multi-display support enabling any combination of VGA, DVI and TV
- DVD playback with integrated motion compensation and iDCT

Excellent 3D quality

- RADEON 7000, with powerful double data rate memory, delivers enhanced 3D and 2D performance
- HYPER Z™ technology increase effective memory bandwidth resulting in improved performance
- PIXEL TAPESTRY™, the RADEON 7000 rendering engine, powers an incredible 1.6 gigatexels/ second for high fill rates in 32-bit at high resolutions.
- RADEON 7000 supports DirectX® and OpenGL® allowing for superior graphics and 3D textures that add a more natural look to game environments

High resolution 2D graphics

- 32-bit 2D resolutions up to 2048x1536
- Enjoy sharper, crisper images within 2D applications
- Maximize 2D viewing capabilities with RADEON 7000 - see more of the page on screen
- RADEON 7000 uses award-winning technology from ATI's successful graphics accelerators for consistent, stable performance

ATI RAGE 128 PRO

- 128-bit 3D & 2D Graphics Acceleration
- 32-bit color enhance your 3D experience millions of colors and richer details like reflections and shadows
- Full 3D acceleration in all modes and color depths in resolutions up to 1920x1200@32bpp
- Support for DirectX ® and OpenGL ®
- 8 million triangles/second set-up engine improves your 3D graphics experience

COMPATIBILITY

MODEL:

- **ATI RADEON 9800/9800PRO**
- **ATI RADEON 9700/9700PRO**
- **ATI RADEON 9600/9600PRO**
- **ATI RADEON 9500/9500PRO**
- **ATI RADEON 9200/9200PRO**
- **ATI RADEON 9000/9000PRO**
- **ATI RADEON 9100/8500**
- **ATI RADEON 7500/ 7500LE**
- **ATI RADEON VE (7000)**
- **ATI RAGE 128 PRO**

- Windows ® 98, ME, 2000, NT and XP Display Drivers
- Linux ® compatible
- Mac ® OS compatible

SYSTEM REQUIREMENT

MODEL:

- **ATI RADEON 9800/9800PRO**
- **ATI RADEON 9700/9700PRO**
- **ATI RADEON 9600/9600PRO**
- **ATI RADEON 9500/9500PRO**
- **ATI RADEON 9200/9200PRO**

- Intel® Pentium® 4/III/II/Celeron®, AMD® K6/Duron®/Athlon®/Athlon XP® or compatible with AGP 2X (3.3v), 4X (1.5V), 8X (0.8v) or Universal AGP 3.0 bus configuration (2X/4X/8X).
- 64MB of system memory
- Installation software requires CD-ROM drive
- DVD playback requires DVD drive

MODEL:

- **ATI RADEON 7500/ 7500LE**
- **ATI RADEON VE (7000)**
- **ATI RAGE 128 PRO**

- Intel ® Pentium ® 4/III/II/Celeron, AMD® K6/Duron/Athlon®/Athlon XP® or compatible with AGP 2X (3.3v), 4X (1.5V) or AGP2X/4X based systems
- 32MB of system memory
- Installation software requires CD-ROM drive
- DVD playback requires DVD drive

HARDWARE INSTALLATION

Follow the steps below to install the VGA cards:

1. Turn off your computer
2. Remove the computer case
3. Insert the card directly over the AGP slot on the motherboard
4. Secure the card with a bracket screw
5. Replace the cover

SOFTWARE INSTALLATION FOR ATI RADEON SERIES

For Windows® 95/ 98/ ME:

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Radeon folder and then select the R69x folder
4. Execute the set up file on E:/ATI/Radeon/R69x/setup.exe
5. Follow the on screen instructions to complete the installation

6. After finishing the installation, restart the computer as instructed

For Windows® 2000

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Radeon folder and then select the R62k folder
4. Execute the set up file on E:/ATI/Radeon/R62k/setup.exe
5. Follow the on screen instructions to complete the installation
6. After finishing the installation, restart the computer as instructed

For Windows® XP

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Radeon folder and then select the R6xp folder
4. Execute the set up file on E:/ATI/Radeon/R6xp/setup.exe
5. Follow the on screen instructions to complete the installation
6. After finishing the installation, restart the computer as instructed

For Windows® NT:

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Radeon folder and then click the R6nt folder
4. Execute the set up file on E:/ATI/Radeon/R6nt/setup.exe
5. Follow the on screen instructions to complete the installation
6. After finishing the installation, restart the computer as instructed

SOFTWARE INSTALLATION FOR ATI RAGE 128PRO SERIES

For Windows® 95/98/ME

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Rage 128 Pro folder and then click the Win98_ME folder
4. Execute the set up file on E:/ATI/Rage 128 Pro/Win98_ME/setup.exe
5. Follow the on screen instructions to complete the installation

6. After finishing the installation, restart the computer as instructed

For Windows® 2K

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Rage 128 Pro folder and then click the Win2K folder
4. Execute the set up file on E:/ATI/Rage 128 Pro/Win2K/setup.exe
5. Follow the on screen instructions to complete the installation
6. After finishing the installation, restart the computer as instructed

For Windows® XP

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Rage 128 Pro folder and then click the WinXP folder
4. Execute the set up file on E:/ATI/Rage 128 Pro/WinXP/setup.exe
5. Follow the on screen instructions to complete the installation
6. After finishing the installation, restart the computer as instructed

For Windows® NT

1. Turn on the computer
2. Insert the CD Driver into the CD-ROM drive
3. Click the ATI Rage 128 Pro folder and then click the WinNT folder
4. Execute the set up file on E:/ATI/Rage 128 Pro/WinNT/setup.exe
5. Follow the on screen instructions to complete the installation
6. After finishing the installation, restart the computer as instructed

INSTALLATION OF DIRECT® X

The installation of Direct X can accelerate hardware performance of the VGA cards. We suggest you to install it after installing the relevant driver.

1. Insert the CD Driver into the CD-ROM drive
2. Execute the set up file on E:/DIRECTX/dxsetup.exe
3. Follow the on screen instructions to complete the installation
4. After finishing the installation, restart the computer as instructed