



## ATI Radeon® 9000 Series Video Cards

### Features

- ✦ **Complex, Realistic Lighting Effects**  
Featuring a revolutionary Quad-pipe architecture and up to 128MB of memory, Radeon® 9000 SERIES provides best-of-class performance to accelerate all popular 3D applications. Four parallel, highly optimized rendering pipelines, typically available only for the high-end gaming cards, significantly enhance performance and game-play responsiveness when compared to the standard 2-pipeline architectures found in most mid-range products.
- ✦ **Charisma Engine™ II**  
Having the powerful next generation Transform and Lighting engine with Charisma Engine™ II is an important element to driving the latest 3D games and applications. Charisma Engine™ II takes the work off your system's CPU and accelerates today's demanding 3D graphics effortlessly. Being a next generation Transform and Lighting engine, Charisma Engine™ II is the most efficient and powerful GPU in its class.
- ✦ **SmartShader™**  
A new technology developed by ATI, represents a new generation of visual effects for your personal computer. With SmartShader™, game developers will be able to create immersive, life-like worlds by modelling the surface and material qualities of 3D objects with an unparalleled level of realism.
- ✦ **SmoothVision™**  
Supports a High-Performance anti-aliasing mode and a High-Quality anti-aliasing mode. Both of these modes give users the ability to choose between 2x, 3x, 4x, 5x, and 6x sampling, allowing for a total of 10 different anti-aliasing settings. This allows users to quite easily select both the desired level of visual quality and the corresponding performance level.
- ✦ **FullStream™**  
The latest advancement in video processing technology, is a hardware accelerated filtering method that improves the performance and visual quality of streaming video playback.
- ✦ **Video Immersion™ II**  
ATI's Video Immersion™ II technology integrates industry-leading digital video features, including advanced adaptive de-interlacing algorithm, temporal filtering, and video gamma enhancement for unprecedented video quality and integrated digital TV decode capability. In addition, there is component output support for HDTVs (High Definition Television) at 480i, 480p, 720p and 1080i.
- ✦ **Pixel Tapestry™ II**  
Provides ATI's graphics products with an advanced and flexible texturing system. With four parallel, highly-optimized rendering pipelines each capable of handling two textures simultaneously, it delivers outstanding performance and opens up a whole range of new possibilities for making 3D surfaces look more detailed and realistic.
- ✦ **HyperZ II™ Technology**  
ATI's Radeon chip takes a new approach to the memory bandwidth limitation issue. The innovative HyperZ technology improves memory bandwidth efficiency without the added cost of exotic embedded or proprietary memory technologies. By eliminating this key bottleneck, the final barrier to realistic, real-time 3D is overcome.
- ✦ **Hydravision™**  
Supports dual display configurations with Hydravision™ software

### Specifications

#### System Requirements

- ✦ 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

#### Graphics Technology

- ✦ Radeon 9000 SERIES graphics technology operating at 275MHz for Radeon 9000 PRO
- ✦ 250MHz for Radeon 9000

#### Memory Configuration

- ✦ 64MB or 128MB (PRO only) of DDR memory operating at 550 MHz

#### Operating Systems Support

- ✦ Windows XP
- ✦ Windows 2000
- ✦ Windows Me
- ✦ Windows 98/98SE

#### Monitor Support

- ✦ CRT monitor: 15-pin VGA connector
- ✦ TV and VCR
  - ✦ 64MB version: composite connector
  - ✦ 128MB version: composite or s-video connector
- ✦ DVI-I (flat panel display) connector on PRO version only

#### Display Support

- ✦ Register compatible with VGA
- ✦ Supports VESA PnP compatible displays
- ✦ BIOS compatible with VESA for super VGA
- ✦ DDC1/2b/2b+ monitor support
- ✦ VESA Display Power Management Support
- ✦ Separate horizontal and vertical synchronization at TTL levels

### More Features

#### 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

#### SmartShader technology

- ✦ Full support for DirectX 9.x + 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

#### HYPERZ 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

#### GENERAL FEATURES

- ✦ Comprehensive 2X and 4X AGP support. Compatible with AGP 8X universal motherboards.
- ✦ Fully compliant with PC 2002 requirements
- ✦ 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

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