

RAGE™ XL

ENABLES BEST OF CLASS ENTRY-LEVEL PCS WITH ON-CHIP DVD DECODING AND OPTIONAL FLAT PANEL SUPPORT. EASILY THE WORLD'S BEST PERFORMING SET-TOP BOX GRAPHICS CHIP.



Other ATI Components

- | | |
|------------------------|--|
| RAGE™ THEATER | • High Quality Integrated Video Encoder/Decoder with Digital Audio Support |
| RAGE™ 128 PRO | • Production-proven high-performance AGP 4X graphics controller with integrated TMDS support |
| RAGE™ MOBILITY™ | • Superior performance with low power for all Notebooks |



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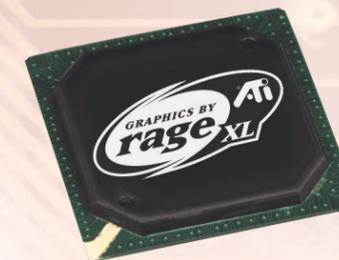
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The ATI RAGE™ XL graphics accelerator brings ATI's best of class 3D, 2D & DVD performance and features to entry-level PCs and advanced Set-Top boxes. In addition, the RAGE™ XL is the first accelerator in the world to offer integrated support for desktop digital flat panel monitors.

At a Glance:

- Best 2D & 3D performance in entry-level class
- Only chip for DVD playback on Celeron™ & K6® family of processors
- First with integrated support for digital flat panel monitors

Outstanding 3D and 2D Performance

The RAGE™ XL delivers superior 3D acceleration and comprehensive 3D support including a 1.2 million triangle/sec set-up engine, single-pass trilinear filtering, six perspective correct texturing modes, video texturing, Gouraud and specular shading and a host of 3D special effects.

Built-in DVD Decoding

ATI's integrated iDCT and Motion Compensation circuitry allow for Hardware DVD playback at full frame rate with Intel® Celeron™ or AMD K6® Processors.

Integrated Flat Panel Support

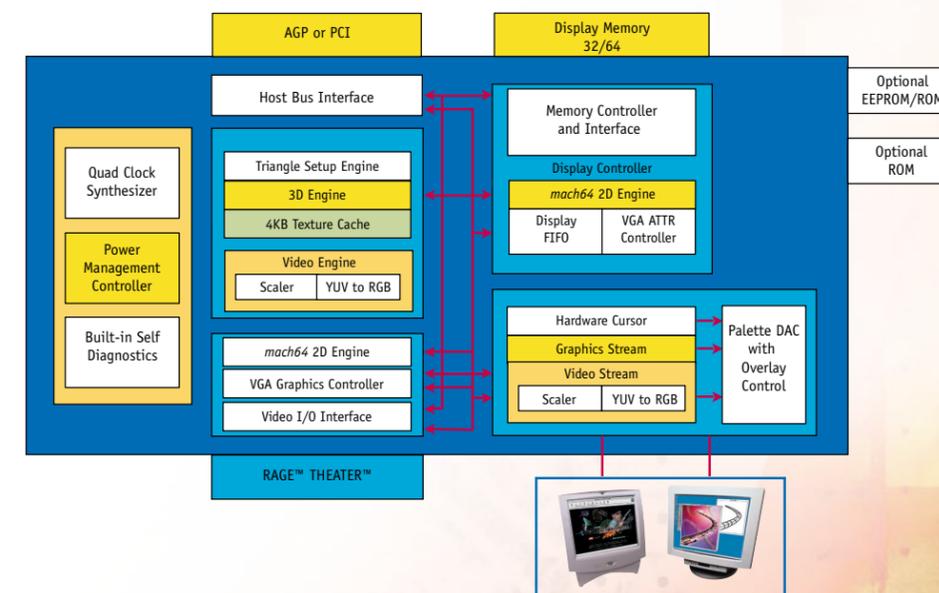
RAGE™ XL incorporates all the required logic to interface seamlessly with Digital Flat Panel monitors. This provides the lowest cost DFP ready implementation through industry standard interfaces, while maintaining support for the existing VGA connector for legacy monitor support. The RAGE™ XL TMDS transmitter meets all VESA & DDWG specifications.

Full AGP 2X Support

RAGE™ XL incorporates comprehensive support for Intel's Accelerated Graphics Port (AGP) including 2X mode, Sideband Addressing and AGP Texturing.



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General Features

- High integration results in a low cost, small footprint graphics subsystem ideal for motherboard designs
- Comprehensive AGP support, including 2X mode, Sideband Addressing and AGP Texturing
- PCI version 2.2 with full bus mastering and scatter/gather support
- Bi-endian support for compliance on a variety of processor platforms
- Fast response to host commands:
 - Deep command FIFO
 - 32-bit wide memory-mapped registers
 - Programmable flat or paged memory model with linear frame buffer access
- Triple 8-bit palette DAC with gamma correction for true WYSIWYG color. Pixel rates up to 230MHz
- Supports 2MB to 8MB SDRAM and SGRAM at up to 125MHz providing bandwidths of up to 1 GByte/sec across a 64-bit interface
- Supports 4MB 1Mx16 SDRAM across a 32-bit interface for lowest cost configurations
- Memory upgrade via industry standard SO-DIMM, for reduced board area and higher memory speeds
- DDC1 and DDC2B+ for plug and play monitors

- Power management for full VESA DPMS and EPA Energy Star compliance
- Integrated hardware diagnostic tests performed automatically upon initialization
- High quality components through built-in SCAN, Iddq, CRC and chip diagnostics
- Single chip solution in 0.25 mm, 2.5V CMOS technology, with multiple package options
- Comprehensive HDKs, SDKs and utilities augmented by full engineering support
- Complete local language support (contact ATI for current list)
- Fully PC 99 compliant
- Fully HDG 3.0 compliant
- Supports Intel® Itanium™ platform designs

Digital Flat Panel Monitor Support

- Integrated TMDS transmitters
- Seamless support for industry standard DVI, DFP (20 pin MDR) or VESA P&D connectors
- Support for TFT panels at resolutions up to 1024x768
- Ratiometric expansion with horizontal and vertical filtering to best fit panel size

2D Acceleration

- Hardware acceleration of Bitblt, Line Draw, Polygon/Rectangle Fill, Bit Masking, Monochrome Expansion, Panning/Scrolling, Scissoring, full ROP support and dual h/w cursors (up to 64x64x2)
- Game acceleration including support for Microsoft's DirectDraw®: Double Buffering, Virtual Sprites, Transparent Blit, Masked Blit and Context Chaining
- Acceleration in 8/16/24/32 bpp modes

3D Acceleration

- Integrated 1.2 million triangle/s set-up engine reduces CPU and bus bandwidth requirements and dramatically improves performance of small 3D primitives
- 4KB on-chip texture cache dramatically improves large triangle performance
- Complete 3D primitive support: points, lines, triangles, lists, strips and quadrilaterals and BLTs with Z compare
- Comprehensive enhanced 3D feature set:
 - Full screen or window double buffering for smooth animation
 - Hidden surface removal via 16-bit Z-buffer
 - Edge anti-aliasing
 - Sub-pixel and sub-texel accuracy
 - Gouraud and specular shaded polygons
 - Perspectively correct mip-mapped texturing with chroma-key support
 - Supports single pass bi- and tri-linear texture filtering
 - Full support of Direct3D® texture lighting
 - Texture compositing
 - Special effects such as complete alpha blending, fog, video textures, texture lighting, reflections, shadows, spotlights, LOD biasing and texture morphing
 - Dithering support in 16bpp for near 24bpp quality in less memory
 - Texture compression of up to 4:1 using vector quantization (VQ)
- Extensive 3D mode support:
 - Draw in RGBA32, RGBA16, & RGB16
 - Texture map modes: RGBA32, RGBA16, RGB16, RGB8, ARGB4444, YUV444
 - Compressed texture modes: YUV422, CLUT4 (CI4), CLUT8 (CI8), VQ

2D Display Modes/Refresh Rates*

	SGRAM					
	256 colors		65k COLORS		16.7M COLORS	
	2MB	2MB	4MB	2MB	4MB	8MB
640x480	200	200	200	200	200	200
800x600	200	200	200	200	200	200
1024x768	150	150	150	150	150	150
1152x864	120	120	120	120	120	120
1280x1024	100	100	100	100	100	100
1600x1200	85		85			75

*Based on 230 MHz internal DAC in RAGE XL.

Software Support

	WINDOWS® 98 SE	WINDOWS® Me	WINDOWS® NT 4.0	WINDOWS® 2000	MAC® OS	WINDOWS® CE	MSTV	WINDOWS® XP
2D Software Support¹								
Accelerated driver support	•	•	•	•	•	•	•	•
Video Software Support								
Microsoft® DirectDraw®	•	•	•	•		•	•	
Microsoft® ActiveMovie®/ DirectShow®	•	•		•		•	•	
MPEG-1 software playback	•	•	•	•				
DVD/MPEG-2 software playback	•	•		•				
QuickTime™ acceleration					•			
3D Software Support								
Microsoft® Direct3D®	•	•		•				
QuickDraw® 3D RAVE					•			
OpenGL® ICD	•	•	•	•				
OS support for AGP Memory	•	•	1	•				

¹ Includes QuickDraw support.

Motion Video Acceleration

- Hardware DVD decode via integrated motion compensation and iDCT circuitry for full frame rate DVD playback
- Smooth video scaling and enhanced YUV to RGB color space conversion for full-screen/ full-speed video playback
- Front and back end scalers support multi-stream video for video conferencing and other applications
- 4-tap horizontal/2-tap vertical filtered upscaling and filtered downscaling enhance playback quality
- Enhanced line buffer allows vertical filtering of native MPEG-2 size (720x480) images

- Special filter circuitry eliminates video artifacts caused by displaying interlaced video on non-interlaced displays
- Bi-directional bus mastering engine with full YUV planar mode support for superior MPEG-2 and video conferencing
- Hardware mirroring for flipping video images in video conferencing systems
- Supports graphics and video keying for effective overlay of video and graphics
- YUV to RGB color space converter with support for both packed and planar YUV:
 - YUV422, YUV410, YUV420
 - RGB32, RGB16/15
- 4-bit video/graphics alpha blending for advanced electronic program guide

Software Features

- Register-compatible with VGA standards, BIOS-compatible with VESA Super VGA
- Full-featured, yet simple Windows® utilities:
 - ATI Desktop supports panning and scrolling across a virtual workspace
 - Calibration utility for WYSIWYG color
- Drivers meet Microsoft Windows® Logo Program requirements for Windows® servers
- Drivers support various alternative OS systems commonly used on servers.

3D Display Modes

FRAME BUFFER MB	SCREEN RESOLUTION PIXELSxPIXELS	COLOR DEPTH BITS/PIXEL	FRONT BUFFER MB	BACK BUFFER MB	Z BUFFER MB	LOCAL TEXTURE MEMORY	
						W Z (MB)	W/O Z (MB)
4	640x480	16	0.59	0.59	0.59	2.24	2.83
4	640x480	32	1.17	1.17	0.59	1.07	1.66
4	800x600	16	0.92	0.92	0.92	1.25	2.17
8	1024x768	32	3.00	3.00	1.50	0.50	2.00
8	1280x1024	16	2.50	2.50	2.50	0.50	3.00

Note: These are the primary display modes supported. Others are also available. AGP configurations can use system memory for additional texture storage