ATI Radeon™ HD 3800 Series

UNDER EMBARGO UNTIL 12:01 a.m., Nov. 15, 2007
ATI Radeon™ HD 3800 Series
AMD Spider Platform Innovation Firsts

HD Technology Leadership

DirectX® 10.1 & PCIe® Generation 2.0
HD video and display leadership

Energy Efficient Design

Power-efficient 55nm design
ATI PowerPlay™ Technology

Scalable Platform Performance

Enhanced Multi-GPU support with ATI CrossFireX™
ATI OverDrive™ for Multi-GPU*

*AMD warranty does not cover damages caused by overclocking.
# ATI Radeon™ HD Product Line

<table>
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<th>Summer</th>
<th>Winter</th>
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<tbody>
<tr>
<td><strong>Enthusiast</strong></td>
<td><strong>Enthusiast</strong></td>
</tr>
<tr>
<td>ATI Radeon™ HD 2900 XT</td>
<td>ATI Radeon™ HD 3870 X2</td>
</tr>
<tr>
<td><strong>Mainstream Performance</strong></td>
<td><strong>Mainstream Performance</strong></td>
</tr>
<tr>
<td>ATI Radeon™ HD 2600 XT</td>
<td>ATI Radeon™ HD 3800 Series</td>
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<tr>
<td>ATI Radeon™ HD 2400 XT</td>
<td><strong>Enthusiast Gaming at a Performance price!</strong></td>
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<tr>
<td><strong>Value</strong></td>
<td><strong>Value</strong></td>
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<tr>
<td>ATI Radeon™ HD 2400 PRO</td>
<td><strong>DirectX® 10.1</strong></td>
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**DirectX® 10.1 Enthusiast Gaming at a Performance price!**
Introducing ATI Radeon™ HD 3800 Series

- Significant new technologies and features
  - DirectX® 10.1, PCIe® 2.0, 55nm
  - ATI CrossFireX™, ATI PowerPlay™, UVD

- New model number taxonomy denotes end-user value proposition

- Two variants: 3870 and 3850

**ATI Radeon HD 3870**

Higher number indicates higher GPU engine performance

Currently xx50 equivalent to PRO, xx70 equivalent to XT
Leading GPU Architecture

DirectX® 10.1 Unified Shader Core

- Superset of ATI Radeon™ HD 2900 features
- 320 Stream Processing Units
- 16 Texture Units
- 16 Render Back-Ends
- Programmable Tessellator Unit

Optimized Memory Controller

- Efficient use of bandwidth
- 256-bit Memory Interface with 512-bit Ring Bus
- Equivalent performance per clock to ATI Radeon HD 2900
New and improved update to DirectX 10

*Scheduled to ship with Windows Vista SP1 (1H2008)*

Enhanced Features
- Programmability
- Pipeline precision
- HDR lighting
- Anti-aliasing

Image Quality Benefits
- Real-time global illumination
- Frees restrictions on AA support

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<tr>
<th>Feature</th>
<th>DirectX® 10</th>
<th>DirectX® 10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shader Model</td>
<td>4.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Separate per-MRT blend modes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Pixel coverage mask</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sample Pattern Selection</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Cube Map Arrays</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Min 4x MSAA Required</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>VS Inputs</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Blending</td>
<td>INT8,FP16/32</td>
<td>INT8/16,FP16/32</td>
</tr>
<tr>
<td>Filtering</td>
<td>FP16</td>
<td>FP32</td>
</tr>
</tbody>
</table>
DX10.1 Benefits

• DX10.1 demo explanation
• How DX10.1 enables realistic global illumination

DirectX® 10.1 Global Illumination
**PCI Express® 2.0**

**PC Graphics Interconnect Evolution**

Doubles the bus data rate

Up to 16GB/sec on two x16 links
PCI Express® 2.0 Performance Benefit

ATI Radeon HD 3850 256MB PCI Express 2.0 Performance Difference

- Modern titles have high frame buffer demands
- Game data (textures, vertex caches, etc.) spills to system RAM
- Higher PCI Express 2.0 bandwidth equates to higher performance in these instances

*Phenom @ 2.1 GHz, RD790, 2GB RAM, Windows Vista 64-bit
• UVD Implemented in ATI Radeon HD 3800 Series GPU’s
• Provides full HD decode for H.264 and VC-1
• Offloading HD decode from CPU for a smooth video playback
• High quality HD video with low system noise and power
Providing Superior HD Playback Performance

- VC-1 is the dominant HD codec
- UVD offloads CPU for both H.264 and VC-1

Some recent VC-1 releases

Deja vu (Ch.10) VC-1
King Kong (Ch.30) VC-1

VC-1 H.264
87% 10%
26% 30%

Codecs used in HD titles
Source: http://www.highdefdigest.com
HD Video Quality Beyond 1080p

- Video playback on displays beyond 1080p
  - Protected content playback on 2560x1600 panels
- Video post processing algorithms for best quality: advanced de-interlacing inverse telecine, color vibrance, edge enhancement and noise reduction
- Achieving perfect score on HQV HD including noise reduction test, without ghosting artifacts
Truly Integrated HD Solution

- Integrated audio for HDMI video and digital surround sound output → no cables required
- AMD certified active HDMI dongle for maximum configurability
- Integrated HDCP
- Protected content playback at dual-link DVI rates (full panel resolution playback)
Energy-Efficient Design
Industry’s First **55nm** GPU

**Smaller Die Size**
Over 2x the transistor density

**More Energy Efficient**
Less than half the power draw

**Full Performance - Less Power**

*AMD Athlon 6400+, RD790, 2GB RAM, Windows Vista 64-bit*
Introducing ATI PowerPlay™
Dynamic Power Management for the Desktop

• Embedded power state controller
  • Monitors command buffer to assess level of GPU utilization
    • GPU % utilization shown on Overdrive CCC panel
  • Automatic state adjustment based on activity
  • Engine and Memory clocks, voltages, clock gating and other parameters can be altered

• Benefits
  • More efficient than previous desktop GPUs
  • Cooler and Quieter
  • Not dependant on application state
    • No more 2D / 3D performance issues; intensive 3D applications run at full performance in windowed mode
Performance on Demand
Introducing ATI PowerPlay™ for the Desktop

- ATI Radeon™ HD 3800 power draw halved from ATI Radeon HD 2900 XT levels
- Automatic power state adjustment based on GPU activity
- Light gaming mode offers big power savings at medium GPU utilization levels

*AMD Athlon 6400+, RD790, 2GB RAM, Windows Vista 64-bit
Breakthrough Processing Efficiency

GigaFLOPS per Watt
GigaFLOPS per $

ATI Radeon X1800 XT
ATI Radeon X1900 XTX
ATI Radeon X1950 PRO
ATI Radeon HD 2900 XT
ATI Radeon™ HD 3870

2x

*AMD Athlon 6400+, RD790, 2GB RAM, Windows Vista 64-bit
Scalable Platform Performance
Introducing ATI CrossFireX™

Industry’s First Quad DirectX® 10.1 GPUs

1. Quad Scalability for Performance Leadership
2. Overclockability* on Multi-GPU
3. New Display modes, up to 8 monitors supported

*AMD’s warranty does not cover damages caused by overclocking
ATI CrossFireX™ with ATI OverDrive™

Push the Envelope with Multi-GPU Overclocking*

- ‘Unlock’ the GPU clocks through ATI Catalyst™ software
- Temperature display and VPU recover safety features
- Manually set engine and memory clocks, or...
- ...use the auto-configure utility option for stable overclocking*

*AMD warranty does not cover damages caused by overclocking.
ATI Radeon™ HD 3800
Multi Display support

• Seamless “Extended Desktop” and CrossfireX support
  – Driver support coming Jan ‘08

• Support up to 8 monitors with RD790
  – See 8 display rendering Flight Simulator demo on You Tube online
ATI CrossFireX™: Great Scaling

- With ATI Catalyst™ 7.10, “Compatible AFR” mode is the default for both DirectX9 and DirectX10 applications
- Provides high scaling in the latest games

*AMD Athlon 6400+, MSI K9A (RD580), 2GB RAM, Windows Vista 64-bit
ATI Radeon™ HD 3800 Specifications
# The Most Feature-Rich GPU

<table>
<thead>
<tr>
<th></th>
<th><strong>ATI Radeon™ HD 3870</strong></th>
<th><strong>ATI Radeon™ HD 3850</strong></th>
<th><strong>ATI Radeon™ HD 2900 XT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transistors</td>
<td>666 million</td>
<td>666 million</td>
<td>700 million</td>
</tr>
<tr>
<td>Manufacturing Process</td>
<td>55nm</td>
<td>55nm</td>
<td>80nm</td>
</tr>
<tr>
<td>Stream Processors</td>
<td>320</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>Texture Units</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Render Back-Ends</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Core Clock Speed</td>
<td>775+ MHz</td>
<td>670 MHz</td>
<td>740 MHz</td>
</tr>
<tr>
<td>Memory Clock Speed</td>
<td>2.25 GHz</td>
<td>1.66 GHz</td>
<td>1.65 GHz</td>
</tr>
<tr>
<td>Math Processing Rate</td>
<td>497+ GigaFLOPS</td>
<td>428 GigaFLOPS</td>
<td>475 GigaFLOPS</td>
</tr>
<tr>
<td>(Multiply-Add)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Bus Support</td>
<td>PCI Express 2.0 x16</td>
<td>PCI Express 2.0 x16</td>
<td>PCI Express x16</td>
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<tr>
<td>DirectX Support</td>
<td>10.1</td>
<td>10.1</td>
<td>10</td>
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<tr>
<td>Tessellation Unit</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UVD</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>ATI PowerPlay</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Leading Price Performance

<table>
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<tr>
<th></th>
<th>ATI Radeon™ HD 3870</th>
<th>ATI Radeon™ HD 3850</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Interface</td>
<td>256-bit</td>
<td></td>
</tr>
<tr>
<td>Memory Type</td>
<td>1.2 GHz GDDR4</td>
<td>900 MHz GDDR3</td>
</tr>
<tr>
<td>Frame Buffer</td>
<td>512MB</td>
<td>256MB</td>
</tr>
<tr>
<td>Form Factor</td>
<td>Dual slot</td>
<td>Single slot</td>
</tr>
<tr>
<td>Power Connector</td>
<td>6-pin PCIe</td>
<td>6-pin PCIe</td>
</tr>
<tr>
<td>Peak Board Power</td>
<td>~105W</td>
<td>~95W</td>
</tr>
<tr>
<td>Acoustics</td>
<td>34 dBA</td>
<td>31 dBA</td>
</tr>
<tr>
<td>Display Interfaces</td>
<td>2x Dual-link DVI with HDCP (HDMI+Audio with adapter) + HDTV Out</td>
<td></td>
</tr>
<tr>
<td>ATI PowerPlay</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>ATI CrossFireX</td>
<td>Dual interconnects (2, 3, or 4 boards)</td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td>November 15</td>
<td></td>
</tr>
</tbody>
</table>

* Not all features may be implemented by third party manufacturers. HDMI and HDCP are integrated into the processor itself; availability in consumer products is determined by the specific solution provider (board partner or PC manufacturer)
ATI Radeon™ HD 3800 Series

HD Gaming
Next-Gen Performance & Quality
• DirectX® 10.1
• PCI Express® 2.0
• ATI CrossFireX™

HD Video
HD Beyond 1080p
• UVD @ full 1080p
• Upscale to 2560x1600
• HDMI & HD Audio

Efficiency
Break-Through Efficiency
• First 55nm GPU
• Performance per Watt
• Performance per $

4  DirectX® 10.1 Enthusiast Gaming at a Performance price!
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