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Radeon HD 5750 review (Crossfire) - Radeon HD Series 5700 features

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Radeon HD Series 5700 features

So we have just established product positioning and have seen what cards to expect. Today is all about the Radeon HD 5750. Let's have a peek at some of the key features for this product:

- 1GB GDDR5 memory (128-bit)
- ATI Eyefinity technology with support for up to six displays
- ATI Stream technology
- Designed for DirectCompute 5.0 and OpenCL
- Accelerated Video Transcoding (AVT)
- Compliant with DirectX 11 and earlier revisions
- Supports OpenGL 3.1
- ATI CrossFireX multi-GPU support for highly scalable performance
- ATI Avivo HD video and display technology
- Dynamic power management with ATI PowerPlay technology
- DL-DVI, DL-DVI, DisplayPort, HDMI
- PCI Express® 2.0 support

We'll address the majority of features in our article. But first let's focus on the sheer technical specifications. Transistor count for example. The number of transistors always works as an indicator of how powerful a product will be.

Today's tested product will position itself at the Radeon HD 4850 performance. The Radeon HD 4850 which we all know and love for its performance had 956 million transistors embedded onto that die. The new Radeon HD 5700 GPUs have 1040 million transistors. Correct, that is 1+ billion transistors tucked away in a small chip. The fabrication node just like the 5800 series is 40nm for this product.

The Radeon 5750 will be clocked at 700 MHz on the Core and Shader domain and 1150 MHz on the memory (4600 MHz on the memory), with the 5750 having 720 Shader processors. Though that looks a little pale in comparison to the 5800 series, remember .. these are mid-range products at really affordable prices.

The number of ROP units are rocking steady at 16 and sure -- texture units remain at 40 for the 5770 and 36 for the 5750.

But before you get blinded by all the specs in a few lines of text, let's break down the two cards announced today.

	Radeon HD 4870	Radeon HD 5750	Radeon HD 5770	Radeon HD 5870
Process	55nm	40nm	40nm	40nm
Transistors	956M	1.04B	1.04B	2.15B
Die Size	263 mm²	TBA	TBA	334 mm²
Core Clock	750 MHz	700 MHz	850 MHz	850 MHz
Shader Processors	800	720	800	1600
Compute Performance	1.2 TFLOPs	1.008 TFLOPs	1.36 TFLOPs	2.72 TFLOPs
Texture Units	40	36	40	80
Texture Fillrate	30.0 GTexels/s	25.2 GTexels/s	34 GTexels/s	68.0 GTexels/s
ROPs	16	16	16	32
Pixel Fillrate	12.0 GPixels/s	11.2 GPixels/s	13.6 GPixels/s	27.2 GPixels/s
Z/Stencil	48.0 GSamples/s	44.8 GSamples/s	54.4 GSamples/s	108.8 GSamples/s
Memory Type	GDDR5	GDDR5	GDDR5	GDDR5
Memory Clock	900 MHz	1150 MHz	1200	1200 MHz
Memory Data Rate	3.6 Gbps	4.6 Gbps	4.8 Gbps	4.8 Gbps
Memory Bandwidth	115.2 GB/s	73.6 GB/s	76.8 GB/s	153.6GB/s
Maximum Board Power (TDP)	160W	86W	108W	188W
Idle Board Power	90W	16W	18	27W

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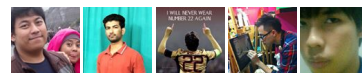
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These numbers are really good, for the money this is going to make an excellent mid-range product series. We have not discussed it just yet, but memory; ATI will stick to DDR5 for both products. On the 5700 they'll crank it down a notch though we have 128-bit memory, cutting the bandwidth in half. However, since it's gDDR5 memory it will still offer sufficient enough bandwidth.

But yes -- the culprit of the 5700 series will be a cut off memory bandwidth, and this is the reason why it's performance will be slightly lower (on average). However, you can expect the Radeon HD 5750 to match any current single-GPU based graphics card in the mid-range segment like the Radeon HD 4850 and GeForce GTS 250. And all that with a single chip utilizing less than 86 Watts.

Power Consumption

One of the biggest accomplishments of the series 5000 graphics cards is the enhancement in the power design, the implementation of voltage and clock regulation is even more dynamic -- power management at a new level.

So we'll look purely at the Radeon HD 5770 now, in IDLE the GPU will clock down and lower its voltages on both GPU and memory. Have a look:

GPU	Radeon HD 4870	Radeon HD 5750	Radeon HD 5770
Max. Board Power (TDP)	160W	86W	108W
Idle Board Power	90W	16W	18W

The 5750 achieves a low 16W IDLE power consumption by clocking down in several power stages. Thus a low engine (core) clock frequency with lowered voltages and lower GDDR5 memory power. It's amazing though as your generic graphics card would normally consume 50~60 Watts when it idles in Windows.

Things get even better though, the performance of the graphics card opposed to the last generation products remains roughly the same yet the 5750 has a TDP (peak wattage) of only 86 Watts. That is just really good. We will test power consumption later on in this article.

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