HIS HD 5850 1GB

A DX11-compatible gaming powerhouse that should cost nearer £200

Price £234.66 inc VAT • **Supplier** www.cconline.com • **Manufacturer** www.hisdigital.com/gb • **SKU number** H585F1GDG

With Nvidia's Fermi-based cards still two months away, ATI is pushing hard to get the most out of its DirectX 11 GPU while it has the market to itself. We've already seen what AMD's new design can do with the £300-odd Radeon HD 5870 (see Issue 75, p40). The Radeon HD 5850 has a more palatable £220-odd price, and doesn't sacrifice much in the way of specs. If £220 sounds too much, there are the Radeons HD 5770 and HD 5750 on p48 and p52 to look at too.

Although the average HD 5850 is roughly £70 cheaper than the top-end Radeon HD 5870, there are few differences between the two cards. Both share the same 256-bit memory interface with the same 1GB of GDDR5, although the memory of the HD 5850 runs at only 1GHz (4GHz effective) rather than 1.2GHz (4.8GHz effective). This drops the memory bandwidth of the Radeon HD 5850 to 128GB/sec, rather than the 153.6GB/sec of the HD 5870. That's still twice the bandwidth of the Radeon HD 4850 though.

The HD 5850 is missing two of the cores of the HD 5870, and as such has 1,440 stream processors rather than 1,600. The core clock speed is slower at 725MHz rather than 850MHz. The number of ROPs remains the same at 32, so there's plenty of horsepower at the back-end of the HD 5850 for blend effects (AA and so on). From the differences in processing hardware and clock speeds, we can predict that the HD 5850 should only be between 10 and 17 per cent slower than the HD 5870, while being roughly 30 per cent cheaper.

The HD 5850 is smaller than the HD 5870 at 9in long, although annoyingly, ATI has placed the two 6-pin PCI-E power connectors at the end of the card rather than the side. However, the fan still pushes most of the hot air out of the rear of your case, with a minimal amount of hot air escaping out of the side. The HD 5850 supports EyeFinity, for a three-screen setup, and has two dual-link DVI ports and DisplayPort and HDMI as well; you can use three of these at the same time.

+ 5850

Fast single-GPU card; cool; quiet; DX11 support; only 9in long; Dirt 2 included

– 4830

Power connectors on end of card; could have been faster?

Underneath the cooler, there's still a robust power circuit, even if it is scaled down from that of the HD 5870. There's a three-phase power circuit for the GPU itself, with room for an upgrade to a four-phase unit, should a manufacturer want to make a super-overclocked card. The memory controller has single-phase power delivery, which can't be upgraded.

With two 6-pin PCI-E power inputs and 75W of power available through the PCI-E slot, the HD 5850 has 225W of available power. ATI claims the card will only draw up to 170W (compared to the 188W of the HD 5870) when fully loaded, and the same 27W as the HD 5870 when idle.

PERFORMANCE

The Radeon HD 5850 is no slouch at games, but anyone hoping it would improve on the last-generation cards will be disappointed. The HD 5850 is targeted to hit a price point, rather than to eclipse Nvidia's fastest single-GPU card, the GeForce GTX 285.

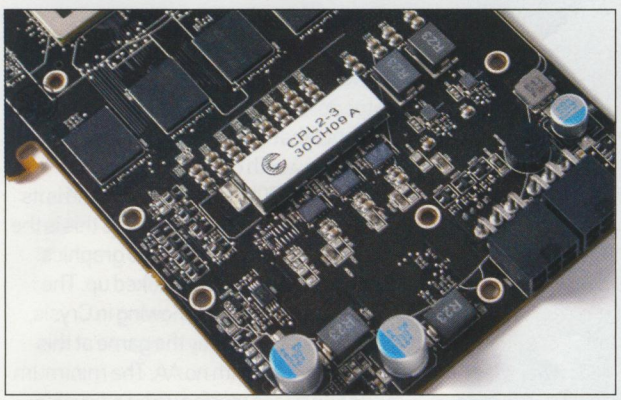
In Fallout 3, the HD 5850 had an advantage over the Nvidia hardware when it came to minimum frame rates, as the Catalyst driver was more consistent. Even so, the GTX 285 was remarkably close to the Radeon HD 5850 in the majority of resolutions and AA settings when it came to average frame rates.

There was no arguing with the 5850's performance advantage in S.T.A.L.K.E.R.: Clear Sky though, with the HD 5850 comfortably ahead of the GTX 285. However, we know that Clear Sky favours ATI hardware, so this was no great surprise – even a HD 4890 can match a GTX 285 in this game.

Dawn of War II performance was excellent too, with the HD 5850 particularly impressive at 1,680 x 1,050. The gap between the HD 5850 and GTX 285 closed at 1,920 x 1,200 however, and at 2,560 x 1,600 the two cards managed similar minimum frame rates of 24fps and 23fps when we dropped the AA. It's interesting to see that the HD 5850 had a superior average frame rate though – 61fps compared to 51fps – suggesting that the HD 5850 is the faster GPU.

When it comes to GPU testing, Crysis is still the daddy and the Radeon HD 5850 wasn't as capable here as its performance in other games suggested. With no AA, the HD 5850 was able to match the GTX 285 at every resolution, but adding 4x AA affected the HD 5850 far more than the GTX 285, which was always a few fps faster.

The Call of Duty graphics engine might run on a tin of beans with a couple of AA batteries duct-taped to it, but it's still a popular game in terms of minimum frame rates. The HD 5850 mostly matched the GTX 285 until 2,560 x 1,600 with 4x AA, where the GTX 285 was 4-5fps faster. At every other setting, the cards were only 1-2fps apart. The Radeon HD 5850 drew a remarkably low amount of power for the performance on offer. A peak system idle power consumption of 134W is the same as with the GTX 285 installed, but the 238W sucked from the wall when running 3DMark06 was much better than the 301W of the GTX 285. The HD 5850 also runs very cool, with an idle delta T temperature of 22°C compared to the 27°C of the GTX 285; under load this rose to just 42°C while the GTX 285 reached a toasty delta T of 56°C. The HD 5850 is also far quieter than the GTX 285. Folding@home still doesn't run on HD 5000-series cards.



The HD 5850 has a fairly robust power circuit, with room for an upgrade

With the HD 5850 using early drivers at the time of testing, we could only use the Overdrive tool of the Catalyst Control Center for overclocking, which only offered a maximum GPU frequency of 775MHz (from the standard 725MHz) and a maximum memory frequency of 1.125GHz (from 1GHz). The HIS easily managed these settings. With the overclock, we saw a boost of 1-3fps in Crysis at every resolution, but we're sure that the card can go even faster.

CONCLUSION

The Radeon HD 5850 is a solid match for the GeForce GTX 285 in terms of performance, with games either running as fast or slightly faster on the new card. It's a shame that ATI didn't turn up the wick a little more on the clock speeds to conclusively out-perform the GTX 285, but this card has other benefits. It's quieter, cooler and does a much better job of venting its heat out of the rear of your case. And with DirectX 11 support to factor in, the HD 5850 is a better buy than a GTX 285 if both cards cost the same. We've seen HD 5850 cards for less than £200, though, making this HIS version overpriced.

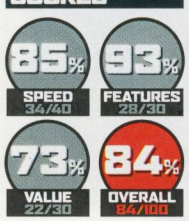
Harry Butler and Clive Webster

IN DETAIL

Graphics processor ATI Radeon HD 5850, 725MHz
Pipeline 1,4400 stream processors (725MHz), 32 ROPs
Memory 1GB GDDR5, 4GHz effective
Bandwidth 128GB/sec, 256-bit interface
PCI-E 16x (PCI-E 2.0)
Compatibility DirectX 11, OpenGL 3.1
Anti-aliasing 2x, 4x, 8x, 16x HQ
Anisotropic filtering 2x, 4x, 8x, 16x
Connections 2 x DVI, HDMI, DisplayPort, 2 x CrossFire, 2 x 6-pin PCI-E power

Test kit: 3.2GHz Intel Core i7-965 Extreme Edition CPU, Asus P6T V2 Deluxe motherboard, 6GB Corsair 1,333MHz DDR3 memory, Corsair X128 SSD, Windows Vista 64-bit SP2, Nvidia ForceWare 190.38 WHQL, ATI Catalyst 9.9 WHQL

SCORES



RESULTS

3D

FALLOUT 3

1,680 x 1,050 0x AA, 16x AF
HD 5870 50fps 82fps
HD 5850 50fps 82fps
GTX 285 47fps 80fps

1,680 x 1,050 4x AA, 16x AF
HD 5870 47fps 82fps
HD 5850 42fps 70fps
GTX 285 28fps 78fps

1,920 x 1,200 0x AA, 16x AF
HD 5870 48fps 83fps
HD 5850 47fps 82fps
GTX 285 41fps 79fps

1,920 x 1,200 4x AA, 16x AF
HD 5870 46fps 81fps
HD 5850 39fps 69fps
GTX 285 27fps 71fps

2,560 x 1,600 0x AA, 16x AF
HD 5870 44fps 79fps
HD 5850 39fps 73fps
GTX 285 36fps 73fps

2,560 x 1,600 4x AA, 16x AF
HD 5870 30fps 77fps BEST PLAYABLE
HD 5850 25fps 65fps BEST PLAYABLE
GTX 285 25fps 59fps BEST PLAYABLE

0 25 50 75 100+

DAWN OF WAR II

1,680 x 1,050 AA off, 16x AF
HD 5870 47fps 82fps
HD 5850 37fps 71fps
GTX 285 30fps 57fps

1,680 x 1,050 AA on, 16x AF
HD 5870 38fps 70fps
HD 5850 36fps 68fps
GTX 285 30fps 56fps

1,920 x 1,200 AA off, 16x AF
HD 5870 35fps 65fps
HD 5850 33fps 63fps
GTX 285 31fps 58fps

1,920 x 1,200 AA on, 16x AF
HD 5870 34fps 65fps
HD 5850 32fps 61fps BEST PLAYABLE
GTX 285 26fps 56fps BEST PLAYABLE

2,560 x 1,600 AA off, 16x AF
HD 5870 32fps 69fps BEST PLAYABLE
HD 5850 24fps 61fps
GTX 285 23fps 51fps

2,560 x 1,600 AA on, 16x AF
HD 5870 23fps 51fps
HD 5850 18fps 53fps
GTX 285 16fps 45fps

0 25 50 75 100+

CRYSIS (DX10, 'HIGH')

1,680 x 1,050 0x AA, 16x AF
HD 5870 35fps 56fps
HD 5850 28fps 47fps BEST PLAYABLE
GTX 285 28fps 47fps BEST PLAYABLE

1,680 x 1,050 4x AA, 16x AF
HD 5870 26fps 47fps
HD 5850 22fps 40fps
GTX 285 24fps 41fps

1,920 x 1,200 0x AA, 16x AF
HD 5870 28fps 47fps BEST PLAYABLE
HD 5850 22fps 38fps
GTX 285 23fps 38fps

1,920 x 1,200 4x AA, 16x AF
HD 5870 21fps 39fps
HD 5850 17fps 32fps
GTX 285 20fps 33fps

2,560 x 1,600 0x AA, 16x AF
HD 5870 16fps 29fps
HD 5850 13fps 24fps
GTX 285 13fps 23fps

2,560 x 1,600 4x AA, 16x AF
HD 5870 12fps 24fps
HD 5850 10fps 20fps
GTX 285 1fps 13fps

0 25 50 75 100+

CALL OF DUTY: WORLD AT WAR

1,680 x 1,050 0x AA, 16x AF
HD 5870 69fps 78fps
HD 5850 66fps 78fps
GTX 285 64fps 84fps

1,680 x 1,050 4x AA, 16x AF
HD 5870 62fps 81fps
HD 5850 52fps 71fps
GTX 285 54fps 70fps

1,920 x 1,200 0x AA, 16x AF
HD 5870 67fps 83fps
HD 5850 56fps 73fps
GTX 285 56fps 76fps

1,920 x 1,200 4x AA, 16x AF
HD 5870 53fps 73fps
HD 5850 43fps 64fps
GTX 285 43fps 62fps

2,560 x 1,600 0x AA, 16x AF
HD 5870 44fps 64fps
HD 5850 36fps 53fps
GTX 285 36fps 56fps

2,560 x 1,600 4x AA, 16x AF
HD 5870 32fps 53fps
HD 5850 27fps 45fps BEST PLAYABLE
GTX 285 33fps 49fps BEST PLAYABLE

0 25 50 75 100+

Minimum Average

S.T.A.L.K.E.R: CLEAR SKY

1,280 x 1,024, 0x AA, 16x AF
HD 5870 53fps 69fps
HD 5850 42fps 59fps
GTX 285 37fps 50fps

1,680 x 1,050, 0x AA, 16x AF
HD 5870 42fps 57fps
HD 5850 36fps 49fps
GTX 285 27fps 38fps BEST PLAYABLE

1,920 x 1,200, 0x AA, 16x AF
HD 5870 39fps 49fps BEST PLAYABLE
HD 5850 28fps 41fps BEST PLAYABLE
GTX 285 21fps 31fps

2,560 x 1,600, 0x AA, 16x AF
HD 5870 24fps 32fps
HD 5850 21fps 27fps
GTX 285 16fps 20fps

0 25 50 75 100+

FOLDING@HOME

HD 5870 Would not run
HD 5850 Would not run
GTX 285 8,970ppd

0 5,000 10,000 15,000 20,000

PEAK TOTAL SYSTEM POWER CONSUMPTION

HD 5870 N/A 223W
HD 5850 N/A 238W
GTX 285 134W 301W

0 200 400 600

Folding Gaming Lower is better

PEAK GPU DELTA T TEMPERATURE

HD 5870 17°C 25°C
HD 5850 22°C 42°C
GTX 285 27°C 56°C

0 25 50 75 100

Idle Gaming Lower is better