

Nvidia Flagship Faceoff

GeForce GTX 570s & 580s Open Fire

We've raved about the GF110 that resides beneath the vapor-cooled copper and aluminum block of both the GeForce GTX 580 and GTX 570; it's all the best parts of Nvidia's Fermi (GF100), with the excess heat (largely) excised and noise all but completely silenced.

Other GF110 tweaks include the capability to filter double the FP16 pixels per clock compared to the GF100, and it has a new Z-culling/rejection engine for improved rendering in games. The transistors that compose the highly complicated GTX 580 and 570 GPUs are also significantly less leaky than those of the GF100. Like Nvidia's latest DX11 graphics cards, these two support Nvidia Surround multidisplay technology and 3D Vision (SLI required for both), as well as PhysX, SLI, and CUDA-based GPGPU computing.

Fermi 2.0 Figures

The GF110 in Nvidia's reference GeForce GTX 580 features a full complement of 16 SMs enabled, which gives it 512 CUDA cores, 64 texture units, and 48 ROPs. The GeForce GTX 570 utilizes the same GF110, but with 15 active SMs, for 480 CUDA cores, 60 texture units, and 40 ROPs. Memory bandwidth on the GTX 580 is 192.4GBps, compared to the GTX

570's 152GBps. The former owes its higher spec to the 384-bit bus and faster 1,536MB GDDR5 frame buffer, clocked at 1,002MHz. The GTX 570's 1,280MB frame buffer runs on a 320-bit bus and is clocked at 950MHz. The reference GTX 580 and 570 feature core clocks of 772MHz and 732MHz, respectively, but as you'll see, there's still room for improvement.

The GTX 580 is currently the fastest single-GPU graphics card you can buy, and, despite a slightly slower memory subsystem, the GTX 570 performs right on par with GTX 480 but costs significantly less. At press time, there weren't a whole lot of nonreference GTX 580s and 570s available, but the few we could get our hands on performed admirably. Read on to see if any of these 800-pound graphics gorillas tackle your fancy.

How We Tested

Our testing platform consists of a 3.33GHz Intel Core i7-980X Extreme Edition, Gigabyte X58-USB3, 6GB Patriot Sector 7 memory, a 128GB Patriot Zephyr SSD, and an Antec TruePower Quattro 1200 PSU. The system runs Windows 7 64-bit. We rated the cards' raw tessellation capabilities using Unigine Heaven; synthetic gaming prowess using 3DMark 11's Extreme setting; and real-world

DirectX 9/10.1/11 gaming capabilities using Left 4 Dead 2, Just Cause 2, and Aliens vs. Predator. We used the latest Nvidia drivers available at the time of this writing, ForceWare version 263.09.

Evga GeForce GTX 570 Superclocked

Evga's GeForce GTX 570 Superclocked doesn't look like much of a contender at first glance, and like Zotac's GTX 580 AMP!, its PCB layout and cooler are based on Nvidia's reference design. That doesn't hold it back, however; the stock GTX 570 is cool, quiet, and a solid performer.

Evga did a little tweaking when it comes to the core and memory clocks, boosting them to 797MHz and 975MHz, respectively. As with the stock models, the backplane features dual DVI ports and a mini HDMI port. A pair of SLI connectors and two 6-pin PCI-E power connectors can be found on the top edge of the card. Evga bundles the GTX 570 Superclocked with a driver disc, Evga Precision overclocking software, a mini-HDMI-to-HDMI adapter, DVI-to-VGA adapter, and two 6-pin PCI-E power adapters. With this card, you also get Evga's 24/7 technical support and a limited lifetime warranty.

In the benchmarks, Evga's 65MHz core bump is enough to show considerable gains on the reference card and also outpace the lower-clocked GTX 570 from MSI. Selling for considerably less than the initial MSRP, Evga's Superclocked 570 is a solid buy for gaming enthusiasts.

MSI N570GTX Twin Frozr II

MSI was able to ship us its Twin Frozr II version of the GTX 570, which uses, as far as we can tell, Nvidia's reference PCB, but MSI saddled it with an impressive nickel-plated copper and aluminum heatsink bristling with five heatpipes and covered with an attractive plate of gunmetal gray aluminum. There are two 80mm fans and a low-profile heatsink for the memory and other components. MSI used all solid capacitors for this card.

**GeForce GTX 570
Superclocked**
\$369.99
Evga
www.evga.com



According to MSI, the advanced cooler is responsible for a 20 degrees Celsius and 8.4 dB noise reduction, compared to the reference GTX 570. From where we're sitting, this card runs as quiet as any enthusiast card we've tested. MSI also tuned the core and memory clocks to 786MHz and 1,050MHz, respectively.

Bundled accessories include a driver disc, mini HDMI adapter, DVI-to-VGA adapter, and dual PCI-E power adapters. The included MSI Afterburner software lets you boost the core and memory clocks even further, and the three-year warranty is a nice bonus.

Although the higher-overclocked GTX 570s from Evga and Palit slightly outperformed MSI's card in 3DMark 11, they both fell to the N570GTX Twin Frozr II in Aliens vs. Predator, at both resolutions. With its beefy cooler and overclocking software, MSI's GTX 570 gives you the tools to crush the competition.

Palit GeForce GTX 570 Sonic Platinum

We've tested a number of Sonic Platinum cards from Palit, and as a result, we had high expectations for the GeForce GTX 570 Sonic Platinum; Palit didn't disappoint. Of all the cards in this roundup, Palit's was the only one with a redesigned PCB. Although a PCB redesign can occasionally signal cost cutting, Palit appears to have been at least partially motivated by the desire to pump more power to the GF110 under the hood; there are 6-pin and 8-pin PCI-E power connectors on the top edge of the card, like those found on the GTX 580.

The cooler on the GTX 570 Sonic Platinum is very similar to MSI's, but there's a less revealing plastic shroud on the card. We also love that Palit saw fit to include



**GeForce GTX 570
Sonic Platinum**
\$369.99
Palit
www.palit.biz

Calibre GTX580
\$579.99
Sparkle
www.sparkle-usa.com



DisplayPort and full-sized HDMI ports. Palit pushed the core clock higher than both Evga and MSI—to 800MHz. The memory clock also saw a bump to 1,000MHz. Palit threw in a driver disc, DVI-to-VGA adapter, and a PCI-E power adapter.

In the benchmarks, Palit topped the rest of the GTX 570s in our suite of synthetic benchmarks, including 3DMark 11 and Unigine Heaven. Real-world results were very close, but Palit's card only broke from the pack in Just Cause 2 at 2,560 x 1,600. Although priced similarly to Evga's offering, we think overclockers will get more bang for their buck with this card.

Sparkle Calibre GTX580

Sparkle's very proud of its take on Nvidia's GeForce GTX 580, and rightfully so. The GeForce GTX580 Calibre is one of the most massive graphics cards we've ever had our hands on. The three-PWM-fan-equipped Accelero Xtreme cooler strapped to the GTX 580 reference PCB is fully three slots thick, and the copper heatpipe/aluminum fin assembly extends another inch beyond the PCB on the end and a quarter of an inch on the top. Interestingly, Sparkle claims that the cooler is capable of effectively cooling up to 240 watts, but the reference GTX 580 is a 244-watt graphics card.

Despite the discrepancy, we didn't notice any performance issues, and the card ran plenty quiet for our tastes. If you plan to SLI a pair of these, use flexible connectors and a motherboard with widely separated PCI-E slots.

Sparkle cranked the core and memory clocks to 810MHz and 1,008MHz, respectively. Bundled accessories include a driver disc, 8-pin PCI-E power adapter, DVI-to-VGA adapter, and HDMI cable.

As you can imagine, the GTX580 Calibre outpaced the reference 580 by a decent margin in all tests and was only bested by the higher-clocked Zotac GTX 580 AMP! card. With such an impressive cooler, we'd be surprised if you couldn't push the clocks even further, which could help justify this card's equally impressive price.

Zotac GeForce GTX 580 AMP! (ZT-50102-10P)

With GeForce GTX 580 AMP!, Zotac argues that much can be accomplished with even Nvidia's reference PCB and the stock cooler. And Zotac's right: This card may not look like much, but the company managed to increase the core and memory clocks more than Sparkle, to 815MHz and 1,025MHz, respectively. All other features, save the fire-breathing dragon sticker, mirror those of the reference design, including the pair of DVI ports and mini HDMI port on the backplane and the 6-pin and 8-pin PCI-E power connectors on the top of the card.



N570GTX Twin Frozr II
\$375
MSI
us.msi.com

Extras include 6-pin and 8-pin PCI-E power adapters, a mini HDMI-to-HDMI adapter, and DVI-to-VGA adapter. The 580 AMP! also ships with Prince Of Persia: The Forgotten Sands and the Zotac Boost Premium software bundle, which includes the Cooliris browser plug-in, XBMC, Kylo browser for HTPCs, and CUDA-accelerated demos of vReveal and Nero Vision Xtra.

In the benchmarks, Zotac's card pushed and shoved its way to the top of the heap, thanks largely to superior core and memory clocks. Although it's priced significantly higher than the stock card, Zotac's impressive overclock and bundled extras make it a worthy option for gaming enthusiasts.



**GeForce GTX 580 AMP!
(ZT-50102-10P)**
\$549.99
Zotac
www.zotacusa.com

Nvidia's Enthusiast Lineup

Having gotten our hands on several overclocked reference boards and even a few overhauls from the PCB-up, we can confidently assert that the graphics cards based on the GF110 are a hardcore gamer's delight. There's a wide price spectrum here, too, so

any serious gamer should be able to find something that works with her budget. The GTX 580 and 570 won't make you better at the games you play, but with any of the above, you really can't lose. ■

BY ANDREW LEIBMAN

Specs & Scores	Nvidia GeForce GTX 570	Nvidia GeForce GTX 580	Evga GeForce GTX 570 Superclocked	MSI N570GTX Twin Frozr II	Palit GeForce GTX 570 Sonic Platinum	Sparkle GTX580 Calibre	Zotac ZT-50102-10P GeForce GTX 580 AMP!
Price	\$399	\$499	\$369.99	\$375	\$369.99	\$579.99	\$549.99
Core Clock	732MHz	772MHz	797MHz	786MHz	800MHz	810MHz	815MHz
Memory Clock	950MHz	1,002MHz	975MHz	1,050MHz	1,000MHz	1,008MHz	1,025MHz
Memory Interface	320-bit	384-bit	320-bit	320-bit	320-bit	384-bit	384-bit
Memory	1,280MB GDDR5	1,536MB GDDR5	1,280MB GDDR5	1,280MB GDDR5	1,280MB GDDR5	1,536MB GDDR5	1,536MB GDDR5
3DMark 11 Extreme*							
3DMark Overall	X1693	X1962	X1822	X1819	X1829	X2045	X2052
Graphics Score	1530	1773	1650	1646	1656	1851	1857
Physics Score	8398	8394	8364	8412	8425	8407	8347
Combined Score	1794	2154	1927	1939	1942	2235	2249
Graphics Test 1	7.84	8.98	8.46	8.44	8.49	9.37	9.38
Graphics Test 2	7.95	9.2	8.59	8.56	8.63	9.6	9.62
Graphics Test 3	7.52	8.8	8.06	8.13	8.07	9.24	9.26
Graphics Test 4	4.66	5.41	5.03	4.99	5.05	5.63	5.66
Physics Test	26.66	26.65	26.55	26.71	26.75	26.69	26.59
Combined Test	8.35	10.02	8.97	9.02	9.03	10.4	10.46
Unigine Heaven							
Frames Per Second	30	35.2	32.2	32.3	32.4	36.3	36.4
Score	757	887	811	813	817	913	916
Games							
1,920 x 1,200							
Left 4 Dead 2 (4XAA, 16XAF)	137.34	156.14	145.73	143.17	143.17	160.84	161.54
Just Cause 2 (4XAA, 16XAF)	78.39	90.28	87.41	86.87	77.44	97.16	97.39
Aliens vs. Predator (4XAA)	36	43	38.1	39.1	38.5	44.5	44.7
2,560 x 1,600							
Left 4 Dead 2 (4XAA, 16XAF)	89.59	104.07	95.46	94.98	94.44	107.97	108.54
Just Cause 2 (4XAA, 16XAF)	51.39	58.33	53.75	48.72	55.55	60	61.46
Aliens vs. Predator (4XAA)	22.3	27.3	23.6	24.3	23.9	28.1	28.3

Driver: ForceWare 263.09

System Specs: Processor: 3.33GHz Intel Core i7-980X Extreme Edition; Gigabyte X58-USB3; RAM: 6GB Patriot Sector 7; Storage: 128GB Patriot Zephyr SSD; PSU: Antec TruePower Quattro 1200

*Graphics, Physics, and Combined tests reported in fps.