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r/Amd

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r/Amd • 9 yr. ago
ChiuY



Can someone clarify what GPU Clock speed MHz is?

Question

I thought GPU Clock Speed is that the higher the MHz, the better performance you get, but when looking at leaked previews of the 1060, it says it went up as high as 1900 MHz while the RX 480 was at 1350 MHz:

<http://www.3dmark.com/compare/fs/9202637/fs/9188962#>

But in terms of the leaked real time FPS, it doesn't look like the 1060 is beating the RX 480 even though the clock speed is almost 50% more. So what actually determines the speed or does it vary with different cards?

These are just leaks, so I know some data are probably false, but just curious how Clock speed works.



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7

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Prefix-NA • 9y ago • Edited 9y ago

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Think of the RX 480 being like a 10 core processor running at 200mhz thats 2,000mhz total. Where the 1060 can run like a 5 core processor at 300mhz for 1500 total.

The GTX 1060 has 1280 cores if we assume 1750mhz we get 4,480,000 megaflops

The RX 480 has 2304 cores if we assume 1250mhz we get 5,760,000 megaflops

Now flops are not everything. Nvidia wins in geometry tasks AMD wins in compute.

AMD made huge improvements in geometry on GCN 1.2 even when the cards had less compute than the 1.0 cards and 1.1 cards they performed better in games due to being closer to nvidia in geometry performance.

GCN 4 (prob gonna be called 1.3 or 2.0) has huge improvements to the command processor and we saw benchmarks showing the 470 beating the 290 in games like Dota, Overwatch, League of legends, and we say the RX 480 dominate in Fallout 4.

It seems like GCN 1.0 was raw power, 1.1 added some features + power efficiency and 1.2 worked on memory compression & geometry improvements.

Polaris seems to have reduced CPU bottlenecks. However there was a tradeoff. The new command scheduler took up die space so AMD gave up 4 ace engines which hurts its Async compute a little bit, but helps the rest of the card. I feel this was a great tradeoff for 2 reasons.

1. If async is less of an advantage for AMD nvidia won't block it
2. AMD had too much CPU overhead on DX9 games & many DX11 games.

So even if we assumed the architectures were the same (gaming is kinda hard to pin down to a few things) higher core count + lower frequency can be better.

If you compare similar architectures like the 1060 vs the 1070 u can do the formula I stated above and calculate performance of each card to about 3-5% margin of error (due to memory tasks not scaling perfectly with the rest of the cores)

15



Chiuuy OP • 9y ago •

Awesome explanation. Learning something new everyday.

4

2 more replies



JustJoshinz • 9y ago • Edited 9y ago •

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about their job in a different way you cannot directly compare the speed at which they perform it. Even within the same vendor (amd or nvidia), but different generations, performance cannot be directly compared from a mhz or clock speed perspective alone.

The reason nvidia cards achieve higher clock speeds is in large part because they have a simpler architecture that does not have hardware set aside for asynchronous compute tasks. This allows them to scale the frequency up much higher and somewhat brute force processing.

Conversely, AMD's more dense architecture that has additional compute hardware can do more work per clock (albeit it at a slower clock rate). But this more complex hardware comes at a cost in terms of heat, power, frequency and complexity (DX 12 async compute is really required to fully utilise the hardware that has been set aside for this purpose).

This is a very high level answer that doesn't take into consideration differences in memory interfaces, bus speed / bandwidth, ROPS or the number of compute units and shaders. All of which effect the overall performance.

↑ 5 ↓ ...

⊕ 8 more replies



goldmaste78 • 9y ago •

it varies per gpu and cpu

each gpu has a specific IPC or instructions per cycle (basically how much data it can process per clock cycle)

MHz is a rating of how many clock cycles it can do per unit of time

while the Nvidia card may run at a faster clock. it is doing less work per clock cycle

where the AMD card is doing more

that's the short oversimplification of it

↑ 3 ↓ ...



nwgat • 9y ago •

But the real question is, Can it maintain boost clock at long durations

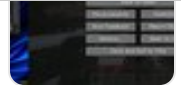
you can see that with rx480 when you undervolt a little it will keep its boost clock for longer

↑ 1 ↓ ...

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is this normal? my GPU MHz is consistently low when playing any game usually 200-700. it sometimes randomly jumps to around 1800 mhz. My mem is also pretty low most of the ti...



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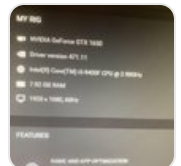
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Low memory clock? On website it says i should have 14000 mhz asus turbo heaven benchmark



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Markets'''

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8 comments



r/Amd · 1 mo. ago

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Why is my GPU clock speed at 1950MHz while gaming while my GPU clock is set to 1365MHz and boost is 1755MHz?

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r/Amd · 26 days ago

Dear 7900xtx, I'm so sorry.

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