

# RTX 3050 vs GTX 1060 6GB Game Performance Benchmarks (Core i9-10900K vs i7-6700K)

The RTX 3060 might be the mid-range flagship of the latest Ampere set of graphics cards, but their prices keep them out of the reach of most entry-level PC gamers. On the other hand, the RTX 3050 is closer to being reasonably affordable at a price tag of \$ 200. The good news is, with the release of the RTX 3050 Ti, the RTX 3050 's price is getting more discount.

NVIDIA 's xx50 cards have always been defined by entry-level prices with performance that knocks on the door of mid-range graphics cards – especially when overclocked. After taking the time to fully test the Ampere graphics card inside the RTX 3050, we can say without a doubt that it continues the trend. The RTX 3050 is much more expensive than the GTX 1650 as it costs a whopping \$ 200. Compare this to the GTX 1650, which came originally at a price of \$ 149. Meanwhile, the AMD closest equivalent card is the RX 5500 XT 4GB which costs \$ 169.

Spec for spec, this RTX 3050 leapfrogs its direct predecessor, the GTX 1650, by boasting 2 % more fps. In our synthetic benchmarks, the RTX 3050 blows past the GTX 1650 and, amazingly, even the GTX 1660 as well.

Fortunately, gaming performance was quite impressive. The RTX 3050 consistently delivers great frame rate increases over the GTX 1650 and it really justifies an upgrade. For 1080p Full HD, we were able to play Borderlands 3, Anthem, Need For Speed: Heat, Just Cause 4, Battlefield 2042 at 61 fps to 75 fps and kept frame rates hovering around 69 fps.

For 1440p Quad HD, we were able to play World War Z, GreedFall, Hitman 2, Call of Duty: Black Ops 4, F1 2019 at 63 fps to 68 fps and kept frame rates hovering around 65 fps. For 2160p 4K, we were able to play Overwatch 2, Valorant at 64 fps to 138 fps and kept frame rates hovering around 101 fps.

The GTX 1070 might be the mid-range flagship of the latest Pascal set of graphics cards, but their prices keep them out of the reach of most entry-level PC gamers. On the other hand, the GTX 1060 6GB is closer to being reasonably affordable at a price tag of \$ 254. NVIDIA 's xx60 cards have always been defined by entry-level prices with performance that knocks on the door of mid-range graphics cards – especially when overclocked. After taking the time to fully test the Pascal graphics card inside the GTX 1060 6GB, we can say without a doubt that it continues the trend.

The GTX 1060 6GB is much more expensive than the GTX 960 as it costs a whopping \$ 254. Compare this to the GTX 960, which came originally at a price of \$ 199. Meanwhile, the AMD closest equivalent card is the RX 580 which costs \$ 229. Spec for spec, this GTX 1060 6GB leapfrogs its direct predecessor, the GTX 960, by boasting 2 % more fps.

The GTX 1060 6GB has 6 GB RAM compared to the GTX 960 's 2 GB video memory. In our synthetic benchmarks, the GTX 1060 6GB blows past the GTX 960 and, amazingly, even the GTX 970 as well.

Fortunately, gaming performance was quite impressive. The GTX 1060 6GB consistently delivers great frame rate increases over the GTX 960 and it really justifies an upgrade. For 1080p Full HD, we were able to play Hitman 2, Apex Legends, F1 2019, Overwatch 2, World War Z at 61 fps to 68 fps and kept frame rates hovering around 65 fps.

For 1440p Quad HD, we were able to play Valorant at 105 fps to 105 fps and kept frame rates hovering around 105 fps. For 2160p 4K, we were able to play Valorant at 91 fps to 91 fps and kept frame rates hovering around 91 fps.

## Nvidia GeForce GTX 1060 vs Nvidia GeForce RTX 3050: What is the difference?

Nvidia GeForce GTX 1060

Nvidia GeForce RTX 3050

### Why is Nvidia GeForce GTX 1060 better than Nvidia GeForce RTX 3050?

- 10W lower TDP?120Wvs130W
- 252MHz faster memory clock speed?2002MHzvs1750MHz
- 64bit wider memory bus width?192bitvs128bit
- 1 more DisplayPort outputs?3vs2
- 1 more DVI outputs?1vs0

### Why is Nvidia GeForce RTX 3050 better than Nvidia GeForce GTX 1060?

- 5.24 TFLOPS higher floating-point performance?9.1 TFLOPSvs3.85 TFLOPS
- 13 GPixel/s higher pixel rate?85.3 GPixel/svs72.3 GPixel/s
- 33.33% more VRAM?8GBvs6GB
- 5992MHz higher effective memory clock speed?14000MHzvs8008MHz
- 21.7 GTexels/s higher texture rate?142.2 GTexels/svs120.5 GTexels/s
- 31.8GB/s more memory bandwidth?224GB/svs192.2GB/s
- 1280 more shading units?2560vs1280
- 7600million more transistors?12000 millionvs4400 million

## Price comparison

## User reviews

### Overall Rating

Nvidia GeForce GTX 1060

5 User reviews

Nvidia GeForce GTX 1060

Nvidia GeForce RTX 3050

5 User reviews

Nvidia GeForce RTX 3050

## Features

## Performance

The graphics processing unit (GPU) has a higher clock speed.

When the GPU is running below its limitations, it can boost to a higher clock speed in order to give increased performance.

The number of pixels that can be rendered to the screen every second.

Floating-point performance is a measurement of the raw processing power of the GPU.

The number of textured pixels that can be rendered to the screen every second.

The memory clock speed is one aspect that determines the memory bandwidth.

Shading units (or stream processors) are small processors within the graphics card that are responsible for processing different aspects of the image.

TMUs take textures and map them to the geometry of a 3D scene. More TMUs will typically mean that texture information is processed faster.

The ROPs are responsible for some of the final steps of the rendering process, writing the final pixel data to memory and carrying out other tasks such as anti-aliasing to improve the look of graphics.

## Memory

The effective memory clock speed is calculated from the size and data rate of the memory. Higher clock speeds can give increased performance in games and other apps.

This is the maximum rate that data can be read from or stored into memory.

VRAM (video RAM) is the dedicated memory of a graphics card. More VRAM generally allows you to run games at higher settings, especially for things like texture resolution.

A wider bus width means that it can carry more data per cycle. It is an important factor of memory performance, and therefore the general performance of the graphics card.

Newer versions of GDDR memory offer improvements such as higher transfer rates that give increased performance.

Error-correcting code memory can detect and correct data corruption. It is used when it is essential to avoid corruption, such as scientific

computing or when running a server.

## Features

DirectX is used in games, with newer versions supporting better graphics.

OpenGL is used in games, with newer versions supporting better graphics.

Some apps use OpenCL to apply the power of the graphics processing unit (GPU) for non-graphical computing. Newer versions introduce more functionality and better performance.

The graphics card supports multi-display technology. This allows you to configure multiple monitors in order to create a more immersive gaming experience, such as having a wider field of view.

A lower load temperature means that the card produces less heat and its cooling system performs better.

Ray tracing is an advanced light rendering technique that provides more realistic lighting, shadows, and reflections in games.

Allows you to view in 3D (if you have a 3D display and glasses).

DLSS (Deep Learning Super Sampling) is an upscaling technology powered by AI. It allows the graphics card to render games at a lower resolution and upscale them to a higher resolution with near-native visual quality and increased performance. DLSS is only available on select games.

This benchmark measures the graphics performance of a video card. Source: PassMark.

## Ports

Devices with a HDMI or mini HDMI port can transfer high definition video and audio to a display.

More HDMI ports mean that you can simultaneously connect numerous devices, such as video game consoles and set-top boxes.

Newer versions of HDMI support higher bandwidth, which allows for higher resolutions and frame rates.

Allows you to connect to a display using DisplayPort.

Allows you to connect to a display using DVI.

Allows you to connect to a display using mini-DisplayPort.

## General info

The thermal design power (TDP) is the maximum amount of power the cooling system needs to dissipate. A lower TDP typically means that it consumes less power.

A higher transistor count generally indicates a newer, more powerful processor.

Small semiconductors provide better performance and reduced power consumption. Chipsets with a higher number of transistors, semiconductor components of electronic devices, offer more computational power. A small form factor allows more transistors to fit on a chip, therefore increasing its performance.

Peripheral Component Interconnect Express (PCIe) is a high-speed interface standard for connecting components, such as graphics cards and SSDs, to a motherboard. Newer versions can support more bandwidth and deliver better performance.

warranty period

Unknown. Help us by suggesting a value. (Nvidia GeForce GTX 1060)

When covered under the manufacturer's warranty it is possible to get a replacement in the case of a malfunction. Note: This may vary by region.

The graphics card uses a combination of water and air to reduce the temperature of the card. This allows it to be overclocked more, increasing performance.

The width represents the horizontal dimension of the product.

The height represents the vertical dimension of the product.

## Price comparison

## Which are the best graphics cards?

Asus ROG Strix GeForce RTX 4090 OC

Asus TUF GeForce RTX 4090 OC

Asus TUF GeForce RTX 4090

Asus ROG Strix GeForce RTX 4090

Colorful iGame GeForce RTX 4090 Neptune OC

MSI GeForce RTX 4090 Suprim Liquid X

MSI GeForce RTX 4090 Suprim X

Colorful iGame GeForce RTX 4090 Vulcan OC

Gainward GeForce RTX 4090 Phantom

Palit GeForce RTX 4090 GameRock OC

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## Nvidia GTX 1060-3GB vs RTX 3050

- CPU
- GPU
- SSD
- HDD
- RAM
- USB

### Real World Speed

Performance profile from 613,542 user samples

Effective 3D Speed Effective 3D Gaming GPU Speed 71.7 % Much faster effective speed.+36% 52.7 %  
Lighting Avg. Locally-deformable PRT (Bat) 101 fps Much better lighting effects.+57% 64.3 fps Reflection Avg. High dynamic range lighting (Teapot) 86 fps Better reflection handling.+22% 70.6 fps MRender Avg. Render target array GShader (Sphere) 83.3 fps Faster multi rendering.+26% 65.9 fps Gravity Avg. NBody particle system (Galaxy) 72.4 fps Slightly faster NBody calculation.+9% 66.5 fps  
Lighting Locally-deformable PRT (Bat) 107 fps Much better peak lighting effects.+56% 68.6 fps Reflection High dynamic range lighting (Teapot) 112 fps Better peak reflection handling.+12% 99.9 fps MRender Render target array GShader (Sphere) 86.1 fps Faster peak multi rendering.+26% 68.5 fps Gravity NBody particle system (Galaxy) 76 fps Slightly faster peak NBody calculation.+9% 70 fps

### Market Share

Based on 57,421,632 GPUs tested.

Market Share Market Share (trailing 30 days) 0.81 % 0.81 % Value Value For Money 41.2 % 449 % Hugely better value.+988% User Rating UBM User Rating 96 % Much more popular.+45% 66 % Price Price (score) €354 €24 Hugely cheaper.+93%  
Age Newest 10 Months Hugely more recent.+87% 76 Months Parallax Parallax occlusion mapping (Stones) 98.8 fps Much better peak texture detail.+47% 67.2 fps Splatting Force Splatted Flocking (Swarm) 68.1 fps Slightly faster peak complex splatting.+5% 64.8 fps Parallax Avg. Parallax occlusion mapping (Stones) 89.1 fps Much better texture detail.+45% 61.3 fps Splatting Avg. Force Splatted Flocking (Swarm) 64.4 fps Slightly faster complex splatting.+7% 60.2 fps

The RTX 3050 is built on NVIDIA's Ampere architecture. It marks the first time that ray-tracing has been available on an entry level (50-series) card. Second generation ray tracing cores can be switched on for more realistic light simulation, albeit at a hit to performance. The 3050 features 2560 CUDA cores, a boost clock frequency of 1.78 GHz, 8 GB of the latest GDDR6 memory and NVIDIA's DLSS. DLSS technology uses the 3050's tensor cores to scale up resolutions whilst maintaining high frame rates and without losing significant image quality. The 3050 also includes an encoder (NVENC) for sharper images and smoother capture whilst recording/streaming. The MRSP of entry models is \$249 USD, however, street prices are closer to \$600 USD. Early benchmarks show that the 3050 only headlines around 35% faster than AMD's 6500 XT whilst street prices for the 3050 are 100% higher. Many experienced users simply have no interest in buying AMD cards, regardless of price. AMD's neanderthal marketing tactics seem to have come back to haunt them. Their brazen domination of social media platforms including youtube and reddit resulted in millions of users purchasing sub standard products. Experienced gamers know all too well that high average fps are worthless when they are accompanied with stutters, random crashes, excessive noise and a limited feature set. [Jan '22 GPUPro]

## MORE DETAILS

The 3GB GTX 1060 follows last month's release of the 6GB GTX 1060. The 3GB variant not only has reduced memory but Nvidia have also disabled 10 percent of the processing cores from 1,280 down to 1,152. There is no reference edition of the 3GB 1060 but the partner cards are already available (at launch). Comparing the GTX 6GB 1060 and 3GB 1060 shows that the 6GB 1060 leads, on average, by 7% but it is also currently 15% more expensive. The GTX 1060 is Nvidia's answer to AMD's new Polaris based RX 470. Comparing the RX 470 and 3GB 1060 shows that for pre DX12 games the 1060 edges ahead by 11%. The RX 470 is able to match the 3GB 1060 in DX12 games but this will remain a corner case until most games are optimized for DX12 (likely to take several years). The 3GB 1060 has the potential to become a hugely successful card, especially if prices drop below \$200. [Sep '16 GPUPro]

## MORE DETAILS



## Group Test Results

- Best user rated - User sentiment trumps benchmarks for this comparison.
- Best value for money - Value for money is based on real world performance.
- Fastest real world speed - Real World Speed measures performance for typical consumers.

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## Frequently Asked Questions

### Best User Rated

## Nvidia GTX 1060 (Mobile Max-Q) vs RTX 3050

- CPU
- GPU
- SSD
- HDD
- RAM
- USB

## Real World Speed

Performance profile from 64,673 user samples

Effective 3D Speed Effective 3D Gaming GPU Speed 71.7 % Much faster effective speed.+64% 43.7 %  
Lighting Avg. Locally-deformable PRT (Bat) 101 fps Hugely better lighting effects.+92% 52.5 fps Reflection Avg. High dynamic range lighting (Teapot) 86 fps Better reflection handling.+30% 66.3 fps MRender Avg. Render target array GShader (Sphere) 83.3 fps Much faster multi rendering.+34% 62.3 fps Gravity Avg. NBody particle system (Galaxy) 72.4 fps Much faster NBody calculation.+32% 54.9 fps  
Lighting Locally-deformable PRT (Bat) 107 fps Hugely better peak lighting effects.+83% 58.4 fps Reflection High dynamic range lighting (Teapot) 112 fps Better peak reflection handling.+18% 95.1 fps MRender Render target array GShader (Sphere) 86.1 fps Faster peak multi rendering.+28% 67.4 fps Gravity NBody particle system (Galaxy) 76 fps Faster peak NBody calculation.+27% 60 fps

## Market Share

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Market Share Market Share (trailing 30 days) 0.81 % Hugely higher market share.+636% 0.11 % User Rating UBM User Rating 96 % Much more popular.+75% 55 %

Age Newest 10 Months Hugely more recent.+85% 65+ Months Parallax Parallax occlusion mapping (Stones) 98.8 fps Much better peak texture detail.+62% 61.1 fps Splatting Force Splatted Flocking (Swarm) 68.1 fps Faster peak complex splatting.+14% 59.5 fps Parallax Avg. Parallax occlusion mapping (Stones) 89.1 fps Much better texture detail.+60% 55.6 fps Splatting Avg. Force Splatted Flocking (Swarm) 64.4 fps Faster complex splatting.+17% 55 fps

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## Frequently Asked Questions

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# Nvidia GTX 1060-6GB vs RTX 3050

- CPU
- GPU
- SSD
- HDD
- RAM
- USB

### Real World Speed

Performance profile from 1,414,734 user samples

Effective 3D Speed Effective 3D Gaming GPU Speed 71.7 % Faster effective speed.+26% 57 %

Lighting Avg. Locally-deformable PRT (Bat) 101 fps Much better lighting effects.+43% 70.6 fps Reflection Avg. High dynamic range lighting (Teapot) 86 fps Slightly better reflection handling.+9% 78.9 fps MRender Avg. Render target array GShader (Sphere) 83.3 fps Faster multi rendering.+24% 67.1 fps Gravity Avg. NBody particle system (Galaxy) 72.4 fps +2% 71.2 fps

Lighting Locally-deformable PRT (Bat) 107 fps Much better peak lighting effects.+40% 76.6 fps Reflection High dynamic range lighting (Teapot) 112 fps 112 fps MRender Render target array GShader (Sphere) 86.1 fps Faster peak multi rendering.+21% 70.9 fps Gravity NBody particle system (Galaxy) 76 fps +0% 75.9 fps

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### MORE DETAILS

The GTX 1060 is Nvidia's third 16 nm Pascal based GPU. It follows last month's release of the higher end GTX 1070 and 1080. The 1060 has a TDP of 120 Watts and its aftermarket variants are available right away alongside the reference Founders edition. Comparing the GTX 1060 and 970 shows that although the 1060 leads by 12% it is also currently more expensive. Nvidia rushed the release of the GTX 1060 to help retain market share that may otherwise have gone to AMD's new Polaris based RX 480. Comparing the RX 480 and GTX 1060 shows that for pre DX12 games the 1060 edges ahead by 12%. Due to better hardware compa dl hong the RX 4t i lab ue r t b mes the 106d

will remain a corner case until most games are optimized for DX12 (likely to take several years). The 1060 has the potential to become a hugely successful card provided prices settle appropriately. [Jul '16 GPUPro]

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- CPU
- GPU
- SSD
- HDD
- RAM
- USB

Real World Speed

Performance profile from 1,402,682 user samples

Effective 3D Speed Effective 3D Gaming GPU Speed 58.5 % +3% 57 %

Lighting Avg. Locally-deformable PRT (Bat) 79.3 fps Better lighting effects. +12% 70.6 fps Reflection Avg. High dynamic range lighting (Teapot)



81.6 fps +3% 78.9 fps MRender Avg. Render target array GShader (Sphere) 71.9 fps Slightly faster multi rendering. +7% 67.1 fps Gravity Avg. NBody particle system (Galaxy) 62.9 fps 71.2 fps Faster NBody calculation. +13%  
Lighting Locally-deformable PRT (Bat) 99.7 fps Much better peak lighting effects. +30% 76.6 fps Reflection High dynamic range lighting (Teapot) 113 fps +1% 112 fps MRender Render target array GShader (Sphere) 78.4 fps Faster peak multi rendering. +11% 70.9 fps Gravity NBody particle system (Galaxy) 72.3 fps 75.9 fps +5%

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Age Newest 19+ Months Much more recent. +75% 77 Months Parallax Parallax occlusion mapping (Stones) 89.5 fps Better peak texture detail. +18% 75.8 fps Splating Force Splatted Flocking (Swarm) 67 fps 71.8 fps Slightly faster peak complex splatting. +7% Parallax Avg. Parallax occlusion mapping (Stones) 73.2 fps Slightly better texture detail. +7% 68.4 fps Splating Avg. Force Splatted Flocking (Swarm) 59.9 fps 66.4 fps Faster complex splatting. +11%

With this price, with this benchmark, with GDDR6 4gb? You should also consider 2060, which is 20 series, but at least have 6gb VRAM and 15% better performance. [Oct '21 Gamejang]

## MORE DETAILS

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