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NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Benchmarks by Michael Larabel. AMD Radeon tests using the AMDGPU-PRO Vulkan driver.Â

Test Systems:

RTX 2060

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 2060 6GB, Audio: NVIDIA TU106 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and

seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RTX 2060 SUPER

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 2060 SUPER 8GB, Audio: NVIDIA TU106 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

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RTX 2070

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: ASUS NVIDIA GeForce RTX 2070 8GB, Audio: NVIDIA TU106 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

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Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
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RTX 2070 SUPER

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 2070 SUPER 8GB, Audio: NVIDIA TU104 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

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RTX 2080

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR

VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: Zotac NVIDIA GeForce RTX 2080 8GB, Audio: NVIDIA TU104 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
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RTX 2080 SUPER

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 2080 SUPER 8GB, Audio: NVIDIA TU104 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

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RTX 2080 Ti

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 2080 Ti 11GB, Audio: NVIDIA TU102 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

TITAN RTX

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA TITAN RTX 24GB, Audio: NVIDIA TU102 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server

1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RTX 3060

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: eVGA NVIDIA GeForce RTX 3060 12GB, Audio: NVIDIA Device 228e, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RTX 3060 Ti

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 3060 Ti 8GB, Audio: NVIDIA GA104 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
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RTX 3070

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 3070 8GB, Audio: NVIDIA GA104 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

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Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and

seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RTX 3080

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 3080 10GB, Audio: NVIDIA GA102 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RTX 3090

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 3090 24GB, Audio: NVIDIA GA102 HD Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.11.0-17-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11, Display Driver: NVIDIA 465.27, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.3.101, Vulkan: 1.2.168, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RX 6700 XT

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: AMD Radeon RX 6700/6700 XT / 6800M 12GB (2855/1000MHz), Audio: AMD Navi 21 HDMI Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.13.0-051300rc3daily20210525-generic (x86_64) 20210524, Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11 + Wayland, OpenGL: 4.6 Mesa 21.0.1 (LLVM 11.0.1), Vulkan: 1.2.169, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

RX 6800

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR

VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: AMD Radeon RX 6800/6800 XT / 6900 16GB (2475/1000MHz), Audio: AMD Navi 21 HDMI Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.13.0-051300rc3daily20210525-generic (x86_64) 20210524, Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11 + Wayland, OpenGL: 4.6 Mesa 21.0.1 (LLVM 11.0.1), Vulkan: 1.2.169, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
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RX 6800 XT

Processor: AMD Ryzen 9 5900X 12-Core @ 3.70GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3402 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: AMD Radeon RX 6800/6800 XT / 6900 16GB (2575/1000MHz), Audio: AMD Navi 21 HDMI Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 21.04, Kernel: 5.13.0-051300rc3daily20210525-generic (x86_64) 20210524, Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.11 + Wayland, OpenGL: 4.6 Mesa 21.0.1 (LLVM 11.0.1), Vulkan: 1.2.169, Compiler: GCC 10.3.0 + CUDA 11.3, File-System: ext4, Screen Resolution: 3840x2160

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	RTX 2060	RTX 2060 SUPER	RTX 2070	RTX 2070 SUPER	RTX 2080	RTX 2080 SUPER	RTX 2080 Ti	TITAN RTX	RTX 3060	RTX 3060 Ti	RTX 3070	RTX 3080	RTX 3090	RX 6700 XT	RX 6800	RX 6800 XT
Quake II RTX - 1920 x 1080 - Low - On - VK_KHR_ray_query (FPS)	15.85 4671	18.74 0901	19.05 0291	21.65 5436	23.07 1109	25.04 2344	32.10 5397	33.90 5235	23.43 4467	32.04 4648	34.43 9547	48.42 8628	**55.71 8841**	**9.946 923**	14.62 9748	14.96 1588
Normalized	28.45%	33.63%	34.19%	38.87%	41.41%	44.94%	57.62%	60.85%	42.06%	57.51%	61.81%	86.92%	100%	17.85%	26.26%	26.85%
Standard Deviation	0.5%	0.8%	0.6%	0.5%	1%	0.5%	0.5%	0.5%	0.3%	0.2%	0.2%	1.3%	0.9%	0.7%	1.4%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 1920 x 1080 - Off - On - VK_KHR_ray_query (FPS)	18.92 2052	22.41 8845	22.75 9590	25.81 8517	27.08 7107	29.55 5904	37.89 2218	39.91 0797	28.22 4087	38.27 1937	40.99 0143	57.14 8544	**65.49 9684**	**13.77 0660**	14.96 3480	14.96 3598
Normalized	28.89%	34.23%	34.75%	39.42%	41.35%	45.12%	57.85%	60.93%	43.09%	58.43%	62.58%	87.25%	100%	21.02%	22.85%	22.85%
Standard Deviation	0%	0.4%	0.5%	0.6%	0.3%	0.5%	0.4%	0.3%	0.4%	0.2%	0.8%	0.6%	0.2%	0.9%	0%	0%
Quake II RTX - 2560 x 1440 - Low - On - VK_KHR_ray_query (FPS)	15.71 7372	18.50 3518	18.80 9060	21.55 7425	22.72 3042	24.81 5450	31.50 3801	33.41 9933	23.49 0724	31.82 6401	34.16 1768	47.92 9450	**54.91 5730**	**9.988 760**	14.72 2989	14.96 3361
Normalized	28.62%	33.69%	34.25%	39.26%	41.38%	45.19%	57.37%	60.86%	42.78%	57.95%	62.21%	87.28%	100%	18.19%	26.81%	27.25%
Standard Deviation	0%	0.1%	0.4%	0.1%	0.3%	0.4%	0.1%	0.8%	0%	0.1%	0.2%	1%	0.7%	0%	0.4%	0%
Quake II RTX - 2560 x 1440 - Off - On - VK_KHR_ray_query (FPS)	18.88 8825	22.32 9016	22.65 3590	25.75 8365	27.09 9098	29.46 1278	37.52 9474	39.73 1925	28.30 9505	38.26 0211	41.05 9397	57.11 0130	**64.72 3419**	**13.83 6907**	14.96 3361	14.96 3243
Normalized	29.18%	34.5%	35%	39.8%	41.87%	45.52%	57.98%	61.39%	43.74%	59.11%	63.44%	88.24%	100%	21.38%	23.12%	23.12%
Standard Deviation	0.1%	0.3%	0.1%	0.5%	0.5%	0.2%	0.4%	0.9%	0%	0.1%	0.1%	0.5%	0.5%	0.6%	0%	0%
Quake II RTX - 3840 x 2160 - Low - On - VK_KHR_ray_query (FPS)	15.69 6478	18.48 0037	18.76 9601	21.54 3726	22.59 2058	24.84 1929	31.40 8221	33.21 9357	23.49 6023	31.84 5641	34.25 2097	47.84 2331	**54.59 9780**	**9.988 971**	14.74 2089	14.96 3480
Normalized	28.75%	33.85%	34.38%	39.46%	41.38%	45.5%	57.52%	60.84%	43.03%	58.33%	62.73%	87.62%	100%	18.29%	27%	27.41%
Standard Deviation	0.3%	0.4%	0.3%	0.2%	0.7%	0.2%	0.2%	0.2%	0.2%	0.1%	0.3%	0.8%	0.8%	0%	0.1%	0%
Quake II RTX - 3840 x 2160 - Off - On - VK_KHR_ray_query (FPS)	18.90 8833	22.30 3936	22.65 4573	25.65 6860	27.00 6357	29.49 1663	37.50 5281	39.67 9004	28.32 3907	38.13 8212	40.96 0421	56.65 4384	**64.62 9768**	**13.67 6997**	14.96 3598	14.96 3361
Normalized	29.26%	34.51%	35.05%	39.7%	41.79%	45.63%	58.03%	61.39%	43.82%	59.01%	63.38%	87.66%	100%	21.16%	23.15%	23.15%
Standard Deviation	0.1%	0.1%	0.4%	0.3%	0.3%	0.3%	0.6%	0.2%	0%	0.5%	0.5%	0.6%	0.7%	0.2%	0%	0%
Quake II RTX - 1920 x 1080 - High - On - VK_KHR_ray_query (FPS)	12.61 1644	14.70 3292	14.96 5537	17.30 5800	18.32 3994	20.09 5222	25.46 0447	26.91 3351	18.97 6788	25.80 8574	27.90 7802	38.96 1505	**44.55 2662**	**9.591 071**	9.989 077	13.02 6906
Normalized	28.31%	33%	33.59%	38.84%	41.13%	45.1%	57.15%	60.41%	42.59%	57.93%	62.64%	87.45%	100%	21.53%	22.42%	29.24%
Standard Deviation	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.5%	0.2%	0.3%	0.2%	0.3%	0.4%	0.8%	0.5%	0%	1.8%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 1920 x 1080 - Low - Off - VK_KHR_ray_query (FPS)	26.958870	31.230467	31.647530	36.053336	38.460453	42.129379	52.067590	54.141251	39.479740	51.989934	54.627431	75.029238	**84.901975**	14.963361	14.963598	**14.963243**
Normalized	31.75%	36.78%	37.28%	42.46%	45.3%	49.62%	61.33%	63.77%	46.5%	61.24%	64.34%	88.37%	100%	17.62%	17.62%	17.62%
Standard Deviation	0.4%	0.2%	0.5%	0.4%	0.7%	0.6%	0.8%	0.9%	0.3%	0.2%	0.2%	1.3%	0.7%	0%	0%	0%
Quake II RTX - 1920 x 1080 - Low - On - VK_NV_ray_tracing (FPS)	15.791057	18.386067	18.709692	21.569176	22.499583	24.464503	30.602717	32.485269	23.149774	31.045441	33.457810	46.031532	**52.764109**	**10.013650**	14.963243	14.963243
Normalized	29.93%	34.85%	35.46%	40.88%	42.64%	46.37%	58%	61.57%	43.87%	58.84%	63.41%	87.24%	100%	18.98%	28.36%	28.36%
Standard Deviation	0.1%	0.3%	0.5%	0.4%	0.1%	0.3%	1.3%	0.3%	0.5%	0.7%	0.3%	0.1%	0.4%	0.1%	0%	0%
Quake II RTX - 1920 x 1080 - Off - Off - VK_KHR_ray_query (FPS)	35.693760	41.242881	41.980193	47.097766	50.171683	54.722460	66.782768	69.827474	49.685172	64.800919	66.554766	92.650711	**105.036275**	**14.963480**	15.872843	21.714991
Normalized	33.98%	39.27%	39.97%	44.84%	47.77%	52.1%	63.58%	66.48%	47.3%	61.69%	63.36%	88.21%	100%	14.25%	15.11%	20.67%
Standard Deviation	0.4%	0.6%	0.3%	0.1%	0.5%	0.3%	0.9%	0.4%	0.2%	0.5%	1.3%	1.3%	1.2%	0%	1.4%	2.2%
Quake II RTX - 1920 x 1080 - Off - On - VK_NV_ray_tracing (FPS)	18.628254	21.898934	22.314778	25.249656	26.152946	28.410488	35.921941	37.718660	27.882977	37.280311	39.743554	54.931860	**61.380434**	**14.730298**	14.963480	14.963243
Normalized	30.35%	35.68%	36.35%	41.14%	42.61%	46.29%	58.52%	61.45%	45.43%	60.74%	64.75%	89.49%	100%	24%	24.38%	24.38%
Standard Deviation	0.2%	0.3%	0.5%	0.4%	0.7%	0.6%	0.6%	0.7%	0.2%	0.4%	0.4%	0.2%	0.5%	0.2%	0%	0%
Quake II RTX - 2560 x 1440 - High - On - VK_KHR_ray_query (FPS)	12.635865	14.707145	14.956064	17.291037	18.322169	20.158532	25.574065	27.006635	19.017494	25.801460	27.951533	39.188835	**44.874329**	**9.599013**	9.988813	13.037235
Normalized	28.16%	32.77%	33.33%	38.53%	40.83%	44.92%	56.99%	60.18%	42.38%	57.5%	62.29%	87.33%	100%	21.39%	22.26%	29.05%
Standard Deviation	0.2%	0.1%	0.2%	0.2%	0.3%	0.2%	0.4%	0.5%	0.1%	0.1%	0.4%	0.7%	0.4%	0.3%	0%	1%
Quake II RTX - 2560 x 1440 - Low - Off - VK_KHR_ray_query (FPS)	27.058033	31.206073	31.662577	36.166064	38.315465	41.941798	52.062575	54.604824	39.638181	51.544001	54.644647	74.819601	**84.151980**	14.963243	**14.962652**	14.963361
Normalized	32.15%	37.08%	37.63%	42.98%	45.53%	49.84%	61.87%	64.89%	47.1%	61.25%	64.94%	88.91%	100%	17.78%	17.78%	17.78%
Standard Deviation	0.2%	0.4%	0.3%	0.2%	0.3%	0.1%	0.6%	0.6%	0.1%	1.1%	0.7%	0.8%	0.8%	0%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - Low - On - VK_NV_ray_tracing (FPS)	15.797914	18.417879	18.718592	21.631317	22.506490	24.514453	30.745213	32.555108	23.127956	31.220655	33.351045	45.693381	**52.552750**	**10.024263**	14.963007	14.963361
Normalized	30.06%	35.05%	35.62%	41.16%	42.83%	46.65%	58.5%	61.95%	44.01%	59.41%	63.46%	86.95%	100%	19.07%	28.47%	28.47%
Standard Deviation	0.1%	0.3%	0.3%	0%	0.6%	0.2%	0.3%	0.3%	0%	0.1%	0.2%	0.5%	0.1%	0.1%	0%	0%
Quake II RTX - 2560 x 1440 - Off - Off - VK_KHR_ray_query (FPS)	35.884470	41.344306	41.800109	46.922823	49.480018	54.198991	66.519552	70.153837	49.728148	65.036463	67.024058	92.791519	**105.521471**	**14.963361**	16.052783	22.001522
Normalized	34.01%	39.18%	39.61%	44.47%	46.89%	51.36%	63.04%	66.48%	47.13%	61.63%	63.52%	87.94%	100%	14.18%	15.21%	20.85%
Standard Deviation	0.3%	1%	0.1%	0.2%	0.2%	0.7%	0.3%	0.9%	0.1%	0.4%	0.9%	0.6%	1.7%	0%	2.5%	0.7%
Quake II RTX - 2560 x 1440 - Off - On - VK_NV_ray_tracing (FPS)	18.573842	21.938934	22.331042	25.193087	26.218549	28.509537	35.880949	38.060445	27.876371	37.353521	39.728896	54.556634	**62.107083**	**14.654633**	14.963361	14.963361
Normalized	29.91%	35.32%	35.96%	40.56%	42.22%	45.9%	57.77%	61.28%	44.88%	60.14%	63.97%	87.84%	100%	23.6%	24.09%	24.09%
Standard Deviation	0.3%	0.1%	0.1%	0.3%	0.5%	0.2%	0.6%	0.3%	0.1%	0.1%	1.1%	1.5%	0.4%	0.3%	0%	0%
Quake II RTX - 3840 x 2160 - High - On - VK_KHR_ray_query (FPS)	12.614032	14.699376	14.942618	17.312823	18.302378	20.124473	25.518393	27.030139	18.996422	25.804674	27.879018	39.039317	**44.579842**	**9.587754**	9.988865	13.042435
Normalized	28.3%	32.97%	33.52%	38.84%	41.06%	45.14%	57.24%	60.63%	42.61%	57.88%	62.54%	87.57%	100%	21.51%	22.41%	29.26%
Standard Deviation	0%	0.1%	0.2%	0.1%	0.3%	0.3%	0.2%	0.5%	0.3%	0.2%	0.3%	0.7%	1.3%	0.5%	0%	0.5%
Quake II RTX - 3840 x 2160 - Low - Off - VK_KHR_ray_query (FPS)	27.065021	31.062521	31.683918	36.117421	38.480535	41.839924	51.640983	54.525198	39.348897	52.101567	54.087448	75.052244	**84.448738**	14.963362	**14.963125**	14.963243
Normalized	32.05%	36.78%	37.52%	42.77%	45.57%	49.54%	61.15%	64.57%	46.6%	61.7%	64.05%	88.87%	100%	17.72%	17.72%	17.72%
Standard Deviation	0.3%	0.3%	0.4%	0.4%	0.3%	0.2%	0.2%	0.2%	1%	0.2%	0.2%	0.6%	0.2%	0%	0%	0%
Quake II RTX - 3840 x 2160 - Low - On - VK_NV_ray_tracing (FPS)	15.786840	18.429467	18.722576	21.575873	22.406839	24.463593	30.586686	32.240532	23.148113	31.164235	33.175765	45.902798	**52.363302**	**10.024270**	14.963361	14.963243
Normalized	30.15%	35.2%	35.76%	41.2%	42.79%	46.72%	58.41%	61.57%	44.21%	59.52%	63.36%	87.66%	100%	19.14%	28.58%	28.58%
Standard Deviation	0%	0.1%	0.1%	0.1%	0.4%	0.6%	1%	0.2%	0.5%	0.3%	0.3%	0.8%	0.8%	0.2%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 3840 x 2160 - Off - Off - VK_KHR_ray_query (FPS)	35.87 1771	41.31 6084	42.13 4004	47.17 1805	49.76 3646	53.92 8654	66.59 1962	70.61 4680	49.68 4302	65.20 6609	66.49 2210	91.98 4998	**104.6 41309**	**14.96 3480**	15.78 1106	21.69 7076
Normalized	34.28%	39.48%	40.27%	45.08%	47.56%	51.54%	63.64%	67.48%	47.48%	62.31%	63.54%	87.91%	100%	14.3%	15.08%	20.73%
Standard Deviation	0.4%	0.4%	1.1%	0.2%	0.7%	0.2%	1.1%	0.9%	0.4%	0.3%	0.5%	1.1%	1.5%	0%	1.7%	2.2%
Quake II RTX - 3840 x 2160 - Off - On - VK_NV_ray_tracing (FPS)	18.60 4995	21.93 8448	22.32 0238	25.14 2150	26.24 0346	28.32 1429	35.75 4055	37.94 0210	27.83 7831	37.41 7796	39.78 5178	54.23 9961	**61.53 5724**	**14.70 7734**	14.96 3361	14.96 3480
Normalized	30.23%	35.65%	36.27%	40.86%	42.64%	46.02%	58.1%	61.66%	45.24%	60.81%	64.65%	88.14%	100%	23.9%	24.32%	24.32%
Standard Deviation	0.1%	0.2%	0.1%	0.2%	0.2%	0.2%	0.5%	0.7%	0.1%	0.2%	0.4%	0.5%	1.3%	0.2%	0%	0%
Quake II RTX - 1920 x 1080 - High - Off - VK_KHR_ray_query (FPS)	19.44 8988	22.31 4250	22.66 9031	26.15 5282	28.01 6640	30.84 2688	38.43 1888	40.41 4508	28.55 4766	38.30 9441	41.22 3732	56.38 7039	**63.49 2294**	**10.13 1573**	14.94 3644	14.96 3361
Normalized	30.63%	35.14%	35.7%	41.19%	44.13%	48.58%	60.53%	63.65%	44.97%	60.34%	64.93%	88.81%	100%	15.96%	23.54%	23.57%
Standard Deviation	0.3%	0.2%	0%	0.3%	0.1%	0.5%	0.1%	0.4%	0.3%	0.4%	0.5%	0.8%	1.5%	0.4%	0.1%	0%
Quake II RTX - 1920 x 1080 - High - On - VK_NV_ray_tracing (FPS)	12.79 9490	14.75 1137	14.99 9928	17.58 6241	18.46 4728	20.25 8787	25.25 4590	26.55 7762	18.83 2837	25.42 1718	27.28 1292	38.05 2291	**42.98 2756**	**9.903 589**	9.992 137	13.74 3062
Normalized	29.78%	34.32%	34.9%	40.91%	42.96%	47.13%	58.76%	61.79%	43.81%	59.14%	63.47%	88.53%	100%	23.04%	23.25%	31.97%
Standard Deviation	0.2%	0.3%	0.2%	0.1%	0.2%	0.1%	0.3%	0.3%	0.1%	0.2%	0.4%	0.4%	0.2%	0.3%	0.1%	0.3%
Quake II RTX - 1920 x 1080 - Low - Off - VK_NV_ray_tracing (FPS)	27.17 4911	30.86 1424	31.15 3882	36.29 5212	38.08 0187	41.38 4803	49.86 4120	52.30 2169	38.62 0084	50.56 0927	52.51 8477	70.97 5876	**80.11 4209**	14.96 3361	**14.96 3125**	15.05 0719
Normalized	33.92%	38.52%	38.89%	45.3%	47.53%	51.66%	62.24%	65.28%	48.21%	63.11%	65.55%	88.59%	100%	18.68%	18.68%	18.79%
Standard Deviation	0.2%	0.3%	0.9%	0.3%	0.2%	0.4%	1.1%	0.4%	0.1%	0.1%	0.5%	1%	1.2%	0%	0%	0.2%
Quake II RTX - 1920 x 1080 - Off - Off - VK_NV_ray_tracing (FPS)	34.54 2763	40.00 1769	40.82 1702	45.35 1748	47.03 1239	50.96 3271	61.53 2171	65.52 0439	48.41 7090	62.38 1364	64.05 3087	85.13 1719	**95.98 1860**	**14.96 3243**	19.67 7382	24.24 5986
Normalized	35.99%	41.68%	42.53%	47.25%	49%	53.1%	64.11%	68.26%	50.44%	64.99%	66.73%	88.7%	100%	15.59%	20.5%	25.26%
Standard Deviation	0.3%	0.6%	0.7%	0.8%	0.2%	1%	0.5%	0.8%	0.3%	0.8%	0.4%	1.1%	0.6%	0%	1.2%	0.5%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - High - Off - VK_KHR_ray_query (FPS)	19.44 5411	22.27 5045	22.63 7509	26.22 1403	27.91 6292	30.87 1814	38.46 9425	40.49 6851	28.71 9244	38.27 9115	40.80 6247	56.75 6729	**63.91 1900**	**10.21 1806**	14.94 3426	14.96 3243
Normalized	30.43%	34.85%	35.42%	41.03%	43.68%	48.3%	60.19%	63.36%	44.94%	59.89%	63.85%	88.8%	100%	15.98%	23.38%	23.41%
Standard Deviation	0.3%	0%	0.4%	0.1%	0.5%	0.7%	1%	0.7%	0.1%	0.7%	0.1%	0.2%	0.7%	0.3%	0.2%	0%
Quake II RTX - 2560 x 1440 - High - On - VK_NV_ray_tracing (FPS)	12.79 5431	14.75 1428	14.98 4720	17.63 3593	18.50 9883	20.21 9702	25.29 3641	26.49 9328	18.87 2821	25.30 9777	27.38 2189	37.96 5047	**43.23 0845**	**9.888 077**	9.995 831	13.79 6893
Normalized	29.6%	34.12%	34.66%	40.79%	42.82%	46.77%	58.51%	61.3%	43.66%	58.55%	63.34%	87.82%	100%	22.87%	23.12%	31.91%
Standard Deviation	0.2%	0.2%	0.2%	0.1%	0.2%	0.5%	0.5%	0.2%	0.1%	0.4%	0.3%	0.3%	0.5%	0.2%	0.1%	0.8%
Quake II RTX - 2560 x 1440 - Low - Off - VK_NV_ray_tracing (FPS)	27.06 0143	30.98 4902	31.30 6592	36.18 2279	37.96 7982	41.18 4008	49.66 0384	52.62 9011	38.58 3221	50.46 2741	52.99 0486	71.41 7012	**80.21 5340**	14.96 3361	**14.96 3243**	15.05 0385
Normalized	33.73%	38.63%	39.03%	45.11%	47.33%	51.34%	61.91%	65.61%	48.1%	62.91%	66.06%	89.03%	100%	18.65%	18.65%	18.76%
Standard Deviation	0.4%	0.7%	0.4%	0.7%	0.6%	0.7%	0.7%	0.3%	0.3%	0.3%	0.5%	0.6%	1.4%	0%	0%	0.2%
Quake II RTX - 2560 x 1440 - Off - Off - VK_NV_ray_tracing (FPS)	34.78 8399	40.06 0617	40.55 9272	45.63 4976	46.99 4442	50.65 4008	61.37 9468	64.86 9733	48.37 9682	62.44 9738	64.23 8276	87.21 4203	**97.18 9214**	**14.96 3480**	19.87 3280	24.89 2603
Normalized	35.79%	41.22%	41.73%	46.95%	48.35%	52.12%	63.15%	66.75%	49.78%	64.26%	66.1%	89.74%	100%	15.4%	20.45%	25.61%
Standard Deviation	0.6%	0.4%	0.4%	0.8%	0.5%	0.9%	0.7%	0.5%	0%	1.1%	0.5%	0.8%	1.1%	0%	1.8%	2.4%
Quake II RTX - 3840 x 2160 - High - Off - VK_KHR_ray_query (FPS)	19.44 6613	22.27 8209	22.67 8680	26.16 3789	28.06 5314	30.96 4816	38.56 0155	40.37 4101	28.68 1010	38.31 4448	40.99 1004	56.25 3278	**63.61 7511**	**10.15 3473**	14.93 9644	14.96 3361
Normalized	30.57%	35.02%	35.65%	41.13%	44.12%	48.67%	60.61%	63.46%	45.08%	60.23%	64.43%	88.42%	100%	15.96%	23.48%	23.52%
Standard Deviation	0.3%	0.1%	0.5%	0.5%	0.5%	0.2%	0.8%	0.4%	0.2%	0.6%	0.2%	0.5%	0.7%	0.4%	0.1%	0%
Quake II RTX - 3840 x 2160 - High - On - VK_NV_ray_tracing (FPS)	12.80 0247	14.75 6259	14.96 4938	17.62 3100	18.48 8695	20.20 5493	25.29 5326	26.58 0776	22.86 1319	25.41 2811	27.40 2695	37.85 4902	**43.31 2865**	**9.871 065**	9.992 401	13.79 6610
Normalized	29.55%	34.07%	34.55%	40.69%	42.69%	46.65%	58.4%	61.37%	52.78%	58.67%	63.27%	87.4%	100%	22.79%	23.07%	31.85%
Standard Deviation	0.2%	0.2%	0.2%	0.2%	0.1%	0.3%	0.5%	0.2%	68.5%	0.1%	0.2%	0.3%	0.5%	0.3%	0.1%	0.5%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 3840 x 2160 - Low - Off - VK_NV_ray_tracing (FPS)	27.18 5451	30.99 2336	31.21 8519	36.18 2164	37.78 4178	41.47 0496	49.56 2403	52.83 3766	38.46 5530	50.26 3909	52.59 2716	71.86 2859	**80.03 8310**	14.96 3361	**14.96 3243**	15.03 4787
Normalized	33.97%	38.72%	39%	45.21%	47.21%	51.81%	61.92%	66.01%	48.06%	62.8%	65.71%	89.79%	100%	18.7%	18.7%	18.78%
Standard Deviation	0.2%	0.3%	0.8%	0.3%	0.7%	0.8%	0.8%	0.5%	0.2%	1.1%	0.4%	0.3%	1.6%	0%	0%	0%
Quake II RTX - 3840 x 2160 - Off - Off - VK_NV_ray_tracing (FPS)	34.43 5022	40.26 2142	40.67 4177	45.48 9550	47.34 8301	50.73 4334	61.60 2423	65.01 1617	48.33 6673	62.36 1808	63.51 5399	86.46 6995	**95.11 1181**	**14.97 1181**	19.42 4290	24.29 8138
Normalized	36.21%	42.33%	42.76%	47.83%	49.78%	53.34%	64.77%	68.35%	50.82%	65.57%	66.78%	90.91%	100%	15.74%	20.42%	25.55%
Standard Deviation	0.7%	0.2%	0.4%	0.6%	0.5%	1.1%	0.9%	0.8%	0.3%	1.4%	1.9%	1.5%	1.5%	0.1%	1.8%	0.6%
Quake II RTX - 1920 x 1080 - High - Off - VK_NV_ray_tracing (FPS)	19.75 9823	22.29 6196	22.65 8729	26.77 7269	28.12 6825	30.95 9117	37.74 6011	39.52 9170	28.06 9385	37.60 2077	39.69 3414	54.61 1903	**61.33 6330**	**10.57 8863**	14.95 9225	14.96 3361
Normalized	32.22%	36.35%	36.94%	43.66%	45.86%	50.47%	61.54%	64.45%	45.76%	61.3%	64.71%	89.04%	100%	17.25%	24.39%	24.4%
Standard Deviation	0.3%	0.3%	0.1%	0.8%	1%	1%	0.8%	0.6%	0.7%	0.1%	0.4%	0.3%	0.8%	0.3%	0%	0%
Quake II RTX - 1920 x 1080 - Medium - On - VK_KHR_ray_query (FPS)	13.94 1161	16.35 1429	16.54 8267	19.19 4523	20.23 2796	22.09 4106	27.98 2077	29.79 1531	21.03 5682	28.39 3137	30.76 6180	43.25 6377	**49.39 4939**	**9.988 918**	11.22 9632	14.90 4510
Normalized	28.22%	33.1%	33.5%	38.86%	40.96%	44.73%	56.65%	60.31%	42.59%	57.48%	62.29%	87.57%	100%	20.22%	22.73%	30.17%
Standard Deviation	0.1%	0.2%	0.4%	0.1%	0.1%	0.1%	0.4%	0.3%	0.1%	0.5%	0.3%	1%	0.3%	0%	0.7%	0.2%
Quake II RTX - 2560 x 1440 - High - Off - VK_NV_ray_tracing (FPS)	19.72 3727	22.35 4891	22.56 2616	26.78 0890	28.09 2365	30.81 4943	37.44 2230	39.34 6334	28.20 2412	37.39 8305	39.75 8392	53.72 6050	**61.08 7921**	**10.63 6270**	14.96 3243	14.96 3361
Normalized	32.29%	36.59%	36.93%	43.84%	45.99%	50.44%	61.29%	64.41%	46.17%	61.22%	65.08%	87.95%	100%	17.41%	24.49%	24.49%
Standard Deviation	0.2%	0.3%	0.2%	0.2%	0.2%	0.4%	0.2%	0.5%	0.1%	0.7%	0.7%	0.5%	1.8%	0.1%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - Medium - On - VK_KHR_ray_query (FPS)	13.97	16.32	16.57	19.15	20.17	22.10	28.09	29.52	20.95	28.47	30.61	43.00	**49.19**	**9.988**	11.22	14.91
	3164	4179	8398	2787	9585	6630	3978	6170	1783	9444	9722	9310	**5083**	**918**	1516	2539
Normalized	28.4%	33.18%	33.7%	38.93%	41.02%	44.94%	57.11%	60.02%	42.59%	57.89%	62.24%	87.43%	100%	20.3%	22.81%	30.31%
Standard Deviation	0.1%	0.1%	0.2%	0.2%	0.5%	0.3%	0.5%	0.6%	0.5%	0%	0.2%	0.7%	0.5%	0%	1.2%	0.3%
Quake II RTX - 3840 x 2160 - High - Off - VK_NV_ray_tracing (FPS)	19.70	22.32	22.58	26.59	28.07	30.65	37.68	39.45	28.13	37.51	39.48	54.12	**61.08**	**10.58**	14.96	14.96
	9329	6273	7392	8002	9163	5158	0654	6041	6216	7354	1182	3104	**9456**	**6730**	3243	3243
Normalized	32.26%	36.55%	36.97%	43.54%	45.96%	50.18%	61.68%	64.59%	46.06%	61.41%	64.63%	88.6%	100%	17.33%	24.49%	24.49%
Standard Deviation	0.1%	0%	0.2%	0.2%	0.6%	0.4%	0.6%	0.9%	0.5%	0.3%	0.2%	1%	1.7%	0.1%	0%	0%
Quake II RTX - 3840 x 2160 - Medium - On - VK_KHR_ray_query (FPS)	13.96	16.31	16.59	19.17	20.19	22.11	28.25	29.56	21.01	28.46	30.66	43.26	**49.97**	**9.989**	11.25	14.93
	3167	2359	3334	1434	4460	7639	0948	6033	2454	1047	1914	8342	**3750**	**024**	6248	5855
Normalized	27.94%	32.64%	33.2%	38.36%	40.41%	44.26%	56.53%	59.16%	42.05%	56.95%	61.36%	86.58%	100%	19.99%	22.52%	29.89%
Standard Deviation	0.1%	0.1%	0.1%	0.2%	0.3%	0.2%	0.3%	0.4%	0.3%	0.1%	0.5%	0.5%	0.9%	0%	0.5%	0%
Quake II RTX - 1920 x 1080 - Medium - Off - VK_KHR_ray_query (FPS)	22.73	26.00	26.49	30.41	32.46	35.63	44.19	46.16	33.47	44.49	47.16	65.25	**74.01**	**13.76**	14.96	14.96
	6057	8685	3723	9433	2976	3207	1849	5409	7854	5148	5616	9608	**7840**	**6415**	3125	3243
Normalized	30.72%	35.14%	35.79%	41.1%	43.86%	48.14%	59.7%	62.37%	45.23%	60.11%	63.72%	88.17%	100%	18.6%	20.22%	20.22%
Standard Deviation	0.2%	0.4%	0.2%	0.5%	0.3%	0.3%	1%	0.7%	0.2%	0.1%	0.6%	1%	0.8%	0.2%	0%	0%
Quake II RTX - 1920 x 1080 - Medium - On - VK_NV_ray_tracing (FPS)	14.07	16.29	16.53	19.42	20.28	22.17	27.52	29.16	20.70	27.93	29.96	41.64	**47.39**	**9.988**	12.59	14.96
	5683	2009	5133	3963	4659	4201	3853	1509	0331	8207	6838	2512	**2123**	**918**	1086	3243
Normalized	29.7%	34.38%	34.89%	40.99%	42.8%	46.79%	58.08%	61.53%	43.68%	58.95%	63.23%	87.87%	100%	21.08%	26.57%	31.57%
Standard Deviation	0.3%	0.1%	0.4%	0.1%	0.2%	0.3%	0.7%	0.4%	0.4%	0.3%	0.2%	0.7%	0.5%	0%	0.2%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - Medium - Off - VK_KHR_ray_query (FPS)	22.64 9869	26.00 4890	26.43 0961	30.59 0113	32.56 2614	35.62 1080	44.27 6766	46.45 8668	33.36 6896	44.52 5467	46.90 4553	65.55 6844	**73.98 0359**	**13.84 7462**	14.96 3243	14.96 3243
Normalized	30.62%	35.15%	35.73%	41.35%	44.02%	48.15%	59.85%	62.8%	45.1%	60.19%	63.4%	88.61%	100%	18.72%	20.23%	20.23%
Standard Deviation	0.7%	0.5%	0.6%	0.3%	0.5%	0.3%	0.9%	0.9%	0.5%	0%	0.4%	0.4%	1.4%	0.8%	0%	0%
Quake II RTX - 2560 x 1440 - Medium - On - VK_NV_ray_tracing (FPS)	14.07 8458	16.28 4176	16.53 3483	19.40 9250	20.17 6327	22.09 9907	27.58 1800	29.07 7207	20.73 7350	27.94 8657	30.01 5519	41.70 1374	**47.38 6973**	**9.988 918**	12.75 8320	14.96 3243
Normalized	29.71%	34.36%	34.89%	40.96%	42.58%	46.64%	58.21%	61.36%	43.76%	58.98%	63.34%	88%	100%	21.08%	26.92%	31.58%
Standard Deviation	0.2%	0.2%	0.1%	0.2%	0.2%	0.3%	0.6%	0.3%	0.3%	0.4%	0.4%	0.8%	0.7%	0%	0.7%	0%
Quake II RTX - 3840 x 2160 - Medium - Off - VK_KHR_ray_query (FPS)	22.73 7574	26.03 1369	26.35 3176	30.49 9570	32.51 7330	35.65 7289	43.88 1611	46.73 1990	33.46 1343	44.33 0439	46.88 0296	65.62 2365	**73.93 1645**	**13.81 3348**	14.96 3125	14.96 3243
Normalized	30.75%	35.21%	35.65%	41.25%	43.98%	48.23%	59.35%	63.21%	45.26%	59.96%	63.41%	88.76%	100%	18.68%	20.24%	20.24%
Standard Deviation	0.4%	0.6%	0.1%	0.4%	0.5%	0.8%	0.3%	0.4%	0.3%	0.8%	0.5%	0.3%	1.2%	0.5%	0%	0%
Quake II RTX - 3840 x 2160 - Medium - On - VK_NV_ray_tracing (FPS)	14.10 0479	16.30 4494	16.53 2640	19.40 9901	20.18 3715	22.16 1913	27.59 1511	29.03 9943	20.74 8195	27.97 0703	30.07 8700	41.70 3772	**47.19 9487**	**9.988 971**	12.72 1427	14.96 3243
Normalized	29.87%	34.54%	35.03%	41.12%	42.76%	46.95%	58.46%	61.53%	43.96%	59.26%	63.73%	88.36%	100%	21.16%	26.95%	31.7%
Standard Deviation	0.2%	0.1%	0.2%	0.3%	0.6%	0.2%	0.7%	0.5%	0.2%	0.1%	0.2%	0.4%	0.5%	0%	0.8%	0%
Quake II RTX - 1920 x 1080 - Medium - Off - VK_NV_ray_tracing (FPS)	22.90 5274	25.80 1867	26.21 2763	30.96 6971	32.51 8434	35.35 1715	42.65 7773	45.11 7450	32.64 1464	43.36 9686	45.49 0622	62.33 2437	**70.27 6207**	**14.83 0555**	14.96 3007	14.96 3243
Normalized	32.59%	36.71%	37.3%	44.06%	46.27%	50.3%	60.7%	64.2%	46.45%	61.71%	64.73%	88.7%	100%	21.1%	21.29%	21.29%
Standard Deviation	0.2%	0.2%	0.2%	0.9%	0.5%	0.3%	0.4%	0.5%	0.3%	0%	0.1%	1.7%	0.5%	0.1%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - Medium - Off - VK_NV_ray_tracing (FPS)	22.92 9058	25.86 4957	26.24 1189	30.95 1161	32.45 3392	35.19 5695	42.69 0052	45.37 9685	32.70 1781	43.44 5346	45.69 9822	62.39 8075	**70.27 5660**	**14.83 8363**	14.96 3007	14.96 3361
Normalized	32.63%	36.81%	37.34%	44.04%	46.18%	50.08%	60.75%	64.57%	46.53%	61.82%	65.03%	88.79%	100%	21.11%	21.29%	21.29%
Standard Deviation	0%	0.2%	0.3%	0.5%	0.2%	1.1%	0.2%	0.3%	0.3%	0.1%	0.4%	0.5%	0.8%	0.2%	0%	0%
Quake II RTX - 3840 x 2160 - Medium - Off - VK_NV_ray_tracing (FPS)	22.88 4523	25.86 4319	26.29 2063	31.05 1489	32.44 2094	35.61 1200	42.90 6095	45.18 2939	32.76 1079	43.30 3322	45.37 2143	61.73 3948	**69.81 2118**	**14.81 4990**	14.96 3125	14.96 3243
Normalized	32.78%	37.05%	37.66%	44.48%	46.47%	51.01%	61.46%	64.72%	46.93%	62.03%	64.99%	88.43%	100%	21.22%	21.43%	21.43%
Standard Deviation	0.2%	0.3%	0.1%	0.4%	0.5%	0.7%	0.4%	0.5%	0.1%	0.2%	0.4%	1%	0.9%	0%	0%	0%
Quake II RTX - 1920 x 1080 - Low - On - VK_KHR_ray_tracing_pipeline (FPS)	15.79 1116	18.38 2768	18.66 3552	21.49 5093	22.54 9124	24.45 9342	30.73 3433	32.50 5385	23.13 3052	31.13 0598	33.38 8231	46.12 6837	**52.17 4535**	**10.01 7200**	14.96 3007	14.96 3243
Normalized	30.27%	35.23%	35.77%	41.2%	43.22%	46.88%	58.91%	62.3%	44.34%	59.67%	63.99%	88.41%	100%	19.2%	28.68%	28.68%
Standard Deviation	0.2%	0.4%	0.2%	0.3%	0.6%	0.7%	0.5%	0.6%	0.1%	0.4%	0.3%	0.6%	0.9%	0.1%	0%	0%
Quake II RTX - 1920 x 1080 - Off - On - VK_KHR_ray_tracing_pipeline (FPS)	18.59 7477	21.93 9720	22.21 7061	25.15 3119	26.17 5097	28.45 6995	35.64 6597	37.79 0845	27.81 9038	37.36 6024	39.86 2306	54.72 7080	**61.30 0618**	**14.67 3374**	14.96 3125	14.96 3361
Normalized	30.34%	35.79%	36.24%	41.03%	42.7%	46.42%	58.15%	61.65%	45.38%	60.96%	65.03%	89.28%	100%	23.94%	24.41%	24.41%
Standard Deviation	0%	0.2%	0.2%	0.4%	0.7%	0.6%	0.3%	0.4%	0.1%	0%	0.4%	0.7%	0.4%	0.3%	0%	0%
Quake II RTX - 2560 x 1440 - Low - On - VK_KHR_ray_tracing_pipeline (FPS)	15.78 9357	18.40 0358	18.67 4765	21.53 3914	22.46 6322	24.46 8640	30.72 8813	32.36 5944	23.13 2814	31.17 0312	33.38 2933	45.71 3707	**52.44 5379**	**10.02 4255**	14.96 3125	14.96 3598
Normalized	30.11%	35.08%	35.61%	41.06%	42.84%	46.66%	58.59%	61.71%	44.11%	59.43%	63.65%	87.16%	100%	19.11%	28.53%	28.53%
Standard Deviation	0.1%	0.5%	0.4%	0.2%	0.8%	0.4%	0.8%	0.4%	0.2%	0.2%	0.8%	0.2%	0.4%	0.1%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - Off - On - VK_KHR_ray_tracing_pipeline (FPS)	18.615773	21.896311	22.161710	25.251485	26.132739	28.484521	35.863469	38.151512	27.803095	37.262754	39.572161	54.650759	**62.416044**	**14.700084**	14.963243	14.963480
Normalized	29.83%	35.08%	35.51%	40.46%	41.87%	45.64%	57.46%	61.12%	44.54%	59.7%	63.4%	87.56%	100%	23.55%	23.97%	23.97%
Standard Deviation	0.1%	0.4%	0.5%	0.2%	0.2%	0.4%	0.4%	0.1%	0.1%	0.4%	0.6%	0.6%	0.4%	0.2%	0%	0%
Quake II RTX - 3840 x 2160 - Low - On - VK_KHR_ray_tracing_pipeline (FPS)	15.805839	18.395802	18.666075	21.561081	22.512324	24.408933	30.582612	32.367025	23.174432	31.140075	33.423475	45.927668	**52.298225**	**10.020674**	14.963243	14.963361
Normalized	30.22%	35.17%	35.69%	41.23%	43.05%	46.67%	58.48%	61.89%	44.31%	59.54%	63.91%	87.82%	100%	19.16%	28.61%	28.61%
Standard Deviation	0.1%	0.1%	0.1%	0.4%	0.4%	0.3%	0.1%	0.4%	0.2%	0.5%	0.2%	0.6%	0.8%	0.2%	0%	0%
Quake II RTX - 3840 x 2160 - Off - On - VK_KHR_ray_tracing_pipeline (FPS)	18.581285	21.872596	22.162659	25.146077	26.119376	28.363398	35.848433	37.991975	27.816241	37.290558	39.600314	54.032278	**61.959341**	**14.722817**	14.963243	14.963361
Normalized	29.99%	35.3%	35.77%	40.58%	42.16%	45.78%	57.86%	61.32%	44.89%	60.19%	63.91%	87.21%	100%	23.76%	24.15%	24.15%
Standard Deviation	0.2%	0.2%	0.1%	0.4%	0.1%	0.5%	0.3%	0.5%	0.2%	0.4%	0.9%	0.4%	0.6%	0.1%	0%	0%
Quake II RTX - 1920 x 1080 - High - On - VK_KHR_ray_tracing_pipeline (FPS)	12.814363	14.742956	14.953907	17.618997	18.543658	20.202068	25.288861	26.639099	18.773211	25.325865	27.394805	37.614235	**43.274442**	**9.884659**	9.992664	13.814658
Normalized	29.61%	34.07%	34.56%	40.71%	42.85%	46.68%	58.44%	61.56%	43.38%	58.52%	63.3%	86.92%	100%	22.84%	23.09%	31.92%
Standard Deviation	0.1%	0.3%	0%	0.1%	0.3%	0.3%	0.4%	0.5%	0.4%	0.2%	0.3%	0.8%	0.8%	0.1%	0.1%	1.3%
Quake II RTX - 1920 x 1080 - Low - Off - VK_KHR_ray_tracing_pipeline (FPS)	27.082119	30.915218	31.354347	36.343057	37.827505	41.196804	49.340986	51.925929	38.548523	50.407519	52.630659	70.330679	**79.835347**	14.963243	**14.963125**	15.050607
Normalized	33.92%	38.72%	39.27%	45.52%	47.38%	51.6%	61.8%	65.04%	48.29%	63.14%	65.92%	88.09%	100%	18.74%	18.74%	18.85%
Standard Deviation	0.3%	0.1%	0.4%	0.1%	0.8%	0.5%	1%	0.3%	0.1%	0.2%	0.4%	0.4%	1.5%	0%	0%	0.4%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 1920 x 1080 - Off - Off - VK_KHR_ray_tracing_pipeline (FPS)	34.618522	39.875980	40.614286	45.541124	47.227037	50.923069	61.747223	64.800883	48.276122	62.562739	63.590681	86.313713	**96.930511**	**14.971299**	19.795310	24.451750
Normalized	35.71%	41.14%	41.9%	46.98%	48.72%	52.54%	63.7%	66.85%	49.8%	64.54%	65.59%	89.05%	100%	15.45%	20.42%	25.23%
Standard Deviation	0.3%	0.5%	0.5%	0.3%	0.1%	0.3%	0.6%	1.3%	0.2%	0.4%	0.6%	0.5%	0.6%	0.1%	2.3%	2.2%
Quake II RTX - 2560 x 1440 - High - On - VK_KHR_ray_tracing_pipeline (FPS)	12.803006	14.752331	14.978885	17.676607	18.513420	20.270593	25.262334	26.723289	18.812585	25.438450	27.475409	37.784549	**43.007500**	**9.889873**	9.996041	13.779993
Normalized	29.77%	34.3%	34.83%	41.1%	43.05%	47.13%	58.74%	62.14%	43.74%	59.15%	63.89%	87.86%	100%	23%	23.24%	32.04%
Standard Deviation	0.1%	0.2%	0.4%	0.2%	0.4%	0.3%	0.2%	0.4%	0.4%	0.1%	0.1%	0.6%	0.4%	0.3%	0.1%	0.7%
Quake II RTX - 2560 x 1440 - Low - Off - VK_KHR_ray_tracing_pipeline (FPS)	27.149693	30.847402	31.236003	36.085394	37.872326	41.073213	49.437749	52.403988	38.557211	50.313864	52.503528	71.568006	**78.816808**	**14.963361**	14.963480	15.018742
Normalized	34.45%	39.14%	39.63%	45.78%	48.05%	52.11%	62.72%	66.49%	48.92%	63.84%	66.61%	90.8%	100%	18.98%	18.99%	19.06%
Standard Deviation	0.6%	0.3%	0.5%	0.8%	0.6%	0.4%	0.4%	0.9%	0.2%	0.7%	0.7%	1.2%	0.4%	0%	0%	0.2%
Quake II RTX - 2560 x 1440 - Off - Off - VK_KHR_ray_tracing_pipeline (FPS)	34.705321	40.110495	40.566659	45.447087	46.847559	50.846998	61.571999	65.278831	48.150799	62.362985	64.209644	86.206571	**95.245735**	**14.963480**	19.420801	24.340574
Normalized	36.44%	42.11%	42.59%	47.72%	49.19%	53.39%	64.65%	68.54%	50.55%	65.48%	67.41%	90.51%	100%	15.71%	20.39%	25.56%
Standard Deviation	0.1%	0.3%	0.6%	0.2%	0.4%	0.5%	0.5%	0.8%	0.1%	0.8%	0.9%	0.3%	0.9%	0%	2.3%	0.8%
Quake II RTX - 3840 x 2160 - High - On - VK_KHR_ray_tracing_pipeline (FPS)	12.808569	14.774338	14.974673	17.663715	18.537617	20.281258	25.299180	26.698156	18.781378	25.429215	27.344099	37.702461	**43.230378**	**9.914007**	9.995989	13.864257
Normalized	29.63%	34.18%	34.64%	40.86%	42.88%	46.91%	58.52%	61.76%	43.44%	58.82%	63.25%	87.21%	100%	22.93%	23.12%	32.07%
Standard Deviation	0.2%	0.2%	0.3%	0.1%	0.2%	0.3%	0.7%	0.5%	0.5%	0.1%	0.5%	0.8%	0.3%	0.1%	0.1%	0.8%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 3840 x 2160 - Low - Off - VK_KHR_ray_tracing_pipeline (FPS)	27.18 1193	31.00 7547	31.27 8097	36.20 7906	37.92 2660	41.21 0900	49.71 8269	52.29 4345	38.49 6400	50.53 6620	52.24 9860	70.60 0583	**78.97 5184**	**14.96 3361**	**14.96 3361**	15.03 4692
Normalized	34.42%	39.26%	39.6%	45.85%	48.02%	52.18%	62.95%	66.22%	48.74%	63.99%	66.16%	89.4%	100%	18.95%	18.95%	19.04%
Standard Deviation	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%	1.3%	0.2%	0.4%	0.1%	2%	0.8%	1.2%	0%	0%	0.2%
Quake II RTX - 3840 x 2160 - Off - Off - VK_KHR_ray_tracing_pipeline (FPS)	34.60 0258	40.30 4119	40.70 1593	45.63 3743	47.29 0823	50.96 1786	61.34 4860	64.18 8208	48.34 7667	62.63 5475	63.82 8907	86.09 5675	**95.43 2574**	**14.96 3243**	19.84 9909	24.41 7303
Normalized	36.26%	42.23%	42.65%	47.82%	49.55%	53.4%	64.28%	67.26%	50.66%	65.63%	66.88%	90.22%	100%	15.68%	20.8%	25.59%
Standard Deviation	0.3%	0.2%	0.5%	0.7%	0.2%	0.8%	0.6%	0.9%	0.2%	0.5%	0.5%	0.8%	0.1%	0%	1.2%	1.6%
Quake II RTX - 1920 x 1080 - High - Off - VK_KHR_ray_tracing_pipeline (FPS)	19.73 7109	22.26 8888	22.63 1423	26.84 0758	28.19 8439	31.01 9336	37.75 1399	39.64 8355	28.17 8455	37.64 3990	40.03 8188	54.06 7412	**61.50 3125**	**10.62 8343**	14.96 3361	14.96 3361
Normalized	32.09%	36.21%	36.8%	43.64%	45.85%	50.44%	61.38%	64.47%	45.82%	61.21%	65.1%	87.91%	100%	17.28%	24.33%	24.33%
Standard Deviation	0.2%	0.3%	0.5%	0.4%	0.8%	0.4%	0.8%	0.3%	0.1%	0.2%	0.2%	0.3%	1.4%	0.2%	0%	0%
Quake II RTX - 2560 x 1440 - High - Off - VK_KHR_ray_tracing_pipeline (FPS)	19.72 3275	22.29 9942	22.63 5710	26.76 7515	28.31 0293	30.77 0585	37.55 8515	39.37 6946	28.22 9763	37.66 4894	39.89 0718	53.91 0486	**60.74 4128**	**10.56 7253**	14.96 3243	14.96 3243
Normalized	32.47%	36.71%	37.26%	44.07%	46.61%	50.66%	61.83%	64.82%	46.47%	62.01%	65.67%	88.75%	100%	17.4%	24.63%	24.63%
Standard Deviation	0.1%	0.4%	0.1%	0.6%	0.4%	0.2%	0.4%	0.6%	0.2%	0%	0.3%	0.3%	0.9%	0.5%	0%	0%
Quake II RTX - 3840 x 2160 - High - Off - VK_KHR_ray_tracing_pipeline (FPS)	19.67 5269	22.25 5730	22.60 0199	26.69 4002	28.21 0103	30.84 7094	37.68 1500	39.67 3102	28.20 1127	37.48 5900	40.07 5970	54.07 6687	**61.10 4566**	**10.61 0779**	14.96 3243	14.96 3480
Normalized	32.2%	36.42%	36.99%	43.69%	46.17%	50.48%	61.67%	64.93%	46.15%	61.35%	65.59%	88.5%	100%	17.36%	24.49%	24.49%
Standard Deviation	0.4%	0.2%	0.4%	0.2%	0.6%	0.4%	0.2%	0.6%	0.1%	0.1%	0.5%	0.3%	0.4%	0.7%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 1920 x 1080 - Medium - On - VK_KHR_ray_tracing_pipeline (FPS)	14.10 5924	16.30 3968	16.54 5065	19.41 0923	20.27 4153	22.08 5102	27.65 3932	29.07 1936	20.74 0460	27.91 1808	30.09 9698	41.52 7753	**47.68 1980**	**9.988 971**	12.68 9822	14.96 3480
Normalized	29.58%	34.19%	34.7%	40.71%	42.52%	46.32%	58%	60.97%	43.5%	58.54%	63.13%	87.09%	100%	20.95%	26.61%	31.38%
Standard Deviation	0.1%	0.2%	0.2%	0.3%	0.4%	0.1%	0.4%	0.6%	0.1%	0.5%	0.5%	0.1%	1%	0%	0.5%	0%
Quake II RTX - 2560 x 1440 - Medium - On - VK_KHR_ray_tracing_pipeline (FPS)	14.08 3991	16.28 1923	16.53 8684	19.42 5756	20.24 5236	22.12 3823	27.53 5842	28.96 7718	20.75 8401	27.95 8705	30.15 0525	41.84 7120	**47.48 5794**	**9.989 024**	12.79 2877	14.96 3361
Normalized	29.66%	34.29%	34.83%	40.91%	42.63%	46.59%	57.99%	61%	43.71%	58.88%	63.49%	88.13%	100%	21.04%	26.94%	31.51%
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.3%	0.4%	0.2%	0.3%	0%	0%	0.1%	0.8%	0.7%	0%	0.6%	0%
Quake II RTX - 3840 x 2160 - Medium - On - VK_KHR_ray_tracing_pipeline (FPS)	14.06 8810	16.24 8451	16.51 4538	19.31 7595	20.25 4235	22.10 7725	27.68 9412	29.10 1522	20.77 0941	27.93 0811	29.94 8294	41.56 6035	**47.51 5369**	**9.988 971**	12.90 3613	14.96 3125
Normalized	29.61%	34.2%	34.76%	40.66%	42.63%	46.53%	58.27%	61.25%	43.71%	58.78%	63.03%	87.48%	100%	21.02%	27.16%	31.49%
Standard Deviation	0.1%	0.3%	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%	0.1%	0.3%	0.1%	0.1%	0.3%	0%	0.8%	0%
Quake II RTX - 1920 x 1080 - Medium - Off - VK_KHR_ray_tracing_pipeline (FPS)	22.85 0174	25.85 9360	26.14 5894	31.00 7964	32.48 9100	35.44 5938	42.73 2730	45.11 6717	32.70 8604	43.36 3748	45.29 1073	62.37 3642	**69.32 9394**	**14.83 4376**	14.96 3125	14.96 3361
Normalized	32.96%	37.3%	37.71%	44.73%	46.86%	51.13%	61.64%	65.08%	47.18%	62.55%	65.33%	89.97%	100%	21.4%	21.58%	21.58%
Standard Deviation	0.4%	0.5%	0.6%	0.2%	0.3%	0.5%	0.7%	0.2%	0.3%	0.1%	0.8%	0.6%	0.6%	0.3%	0%	0%

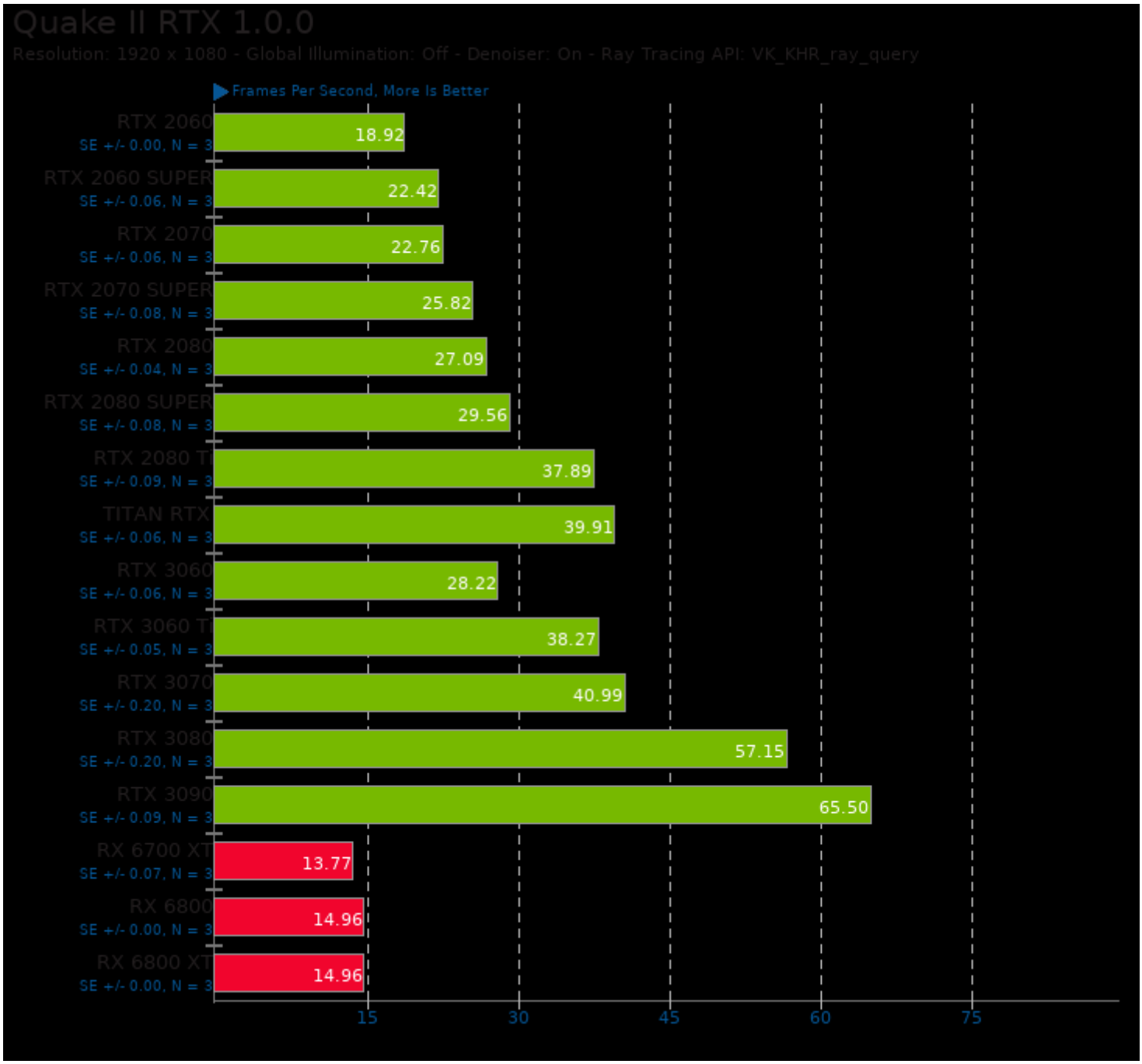
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux

Quake II RTX - 2560 x 1440 - Medium - Off - VK_KHR_ray_tracing_pipeline (FPS)	22.90 4894	25.86 8998	26.17 7960	31.06 2887	32.68 6979	35.41 5989	42.73 4811	44.74 9669	32.65 6055	43.16 3030	45.54 7869	61.74 5899	**69.96 6019**	**14.82 2894**	14.96 3125	14.96 3361
Normalized	32.74%	36.97%	37.42%	44.4%	46.72%	50.62%	61.08%	63.96%	46.67%	61.69%	65.1%	88.25%	100%	21.19%	21.39%	21.39%
Standard Deviation	0.4%	0.4%	0.2%	0.2%	0.1%	0.7%	0.4%	0.1%	0.2%	0.6%	0.7%	0.2%	0.7%	0.1%	0%	0%
Quake II RTX - 3840 x 2160 - Medium - Off - VK_KHR_ray_tracing_pipeline (FPS)	22.91 2673	25.89 9687	26.24 4707	31.03 6933	32.53 6514	35.51 2791	42.97 3241	45.13 9876	32.66 0482	43.34 2875	45.62 1864	62.33 2296	**69.48 0357**	**14.78 8065**	14.96 3125	14.96 3243
Normalized	32.98%	37.28%	37.77%	44.67%	46.83%	51.11%	61.85%	64.97%	47.01%	62.38%	65.66%	89.71%	100%	21.28%	21.54%	21.54%
Standard Deviation	0.4%	0.3%	0.7%	0.2%	0.6%	0.8%	0.3%	0.5%	0.5%	0%	0.5%	0.5%	0.7%	0.2%	0%	0%

NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



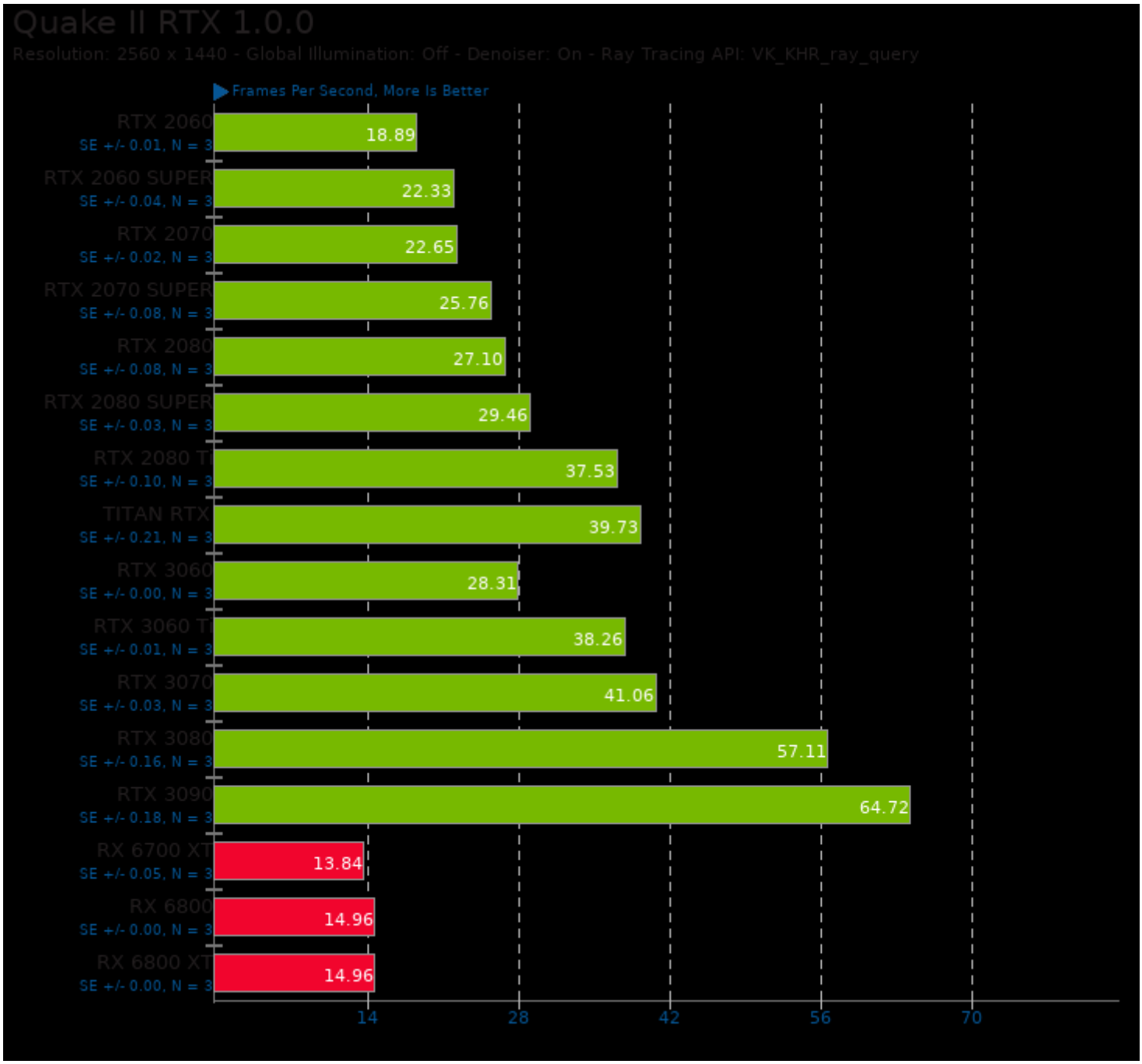
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



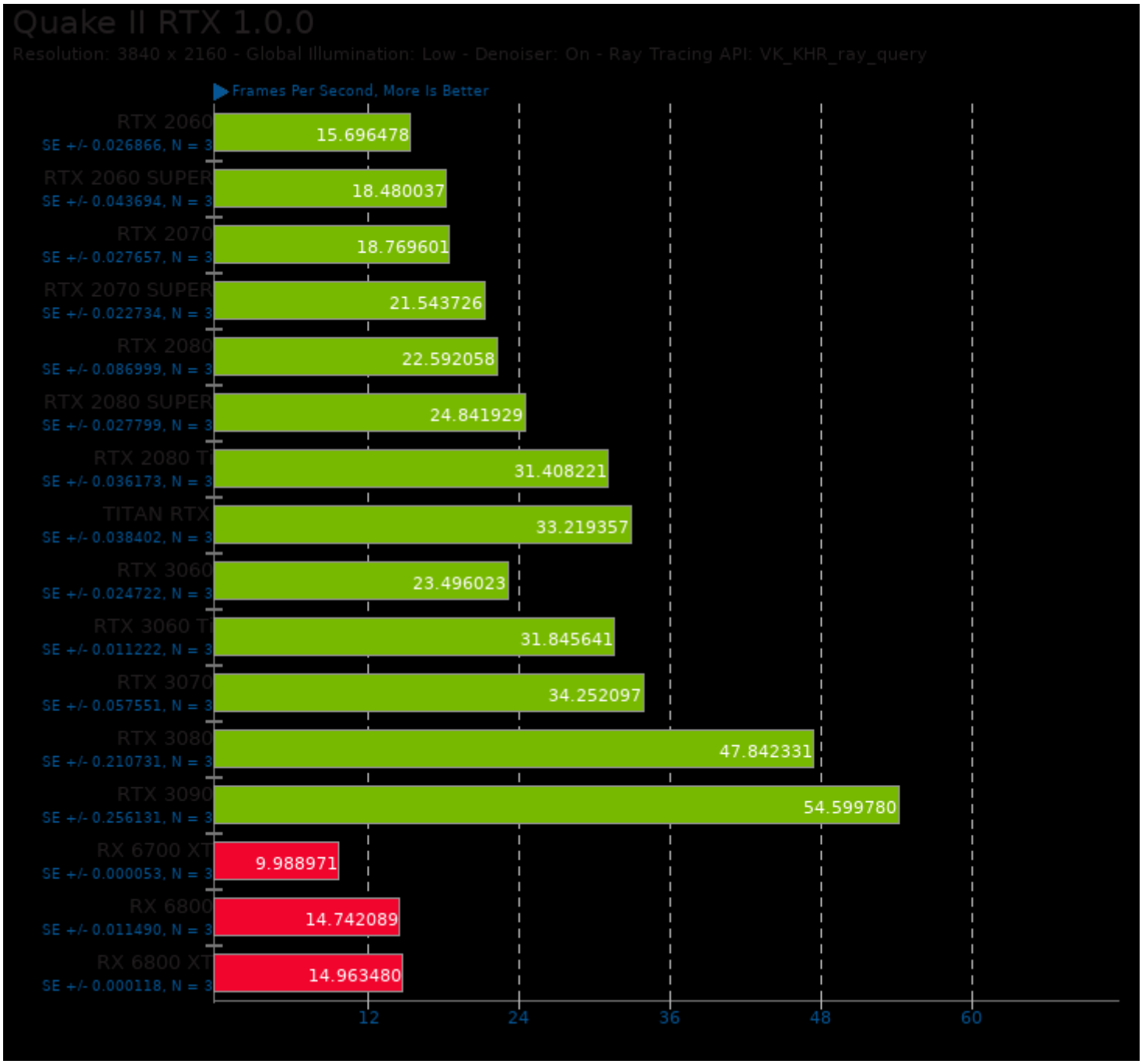
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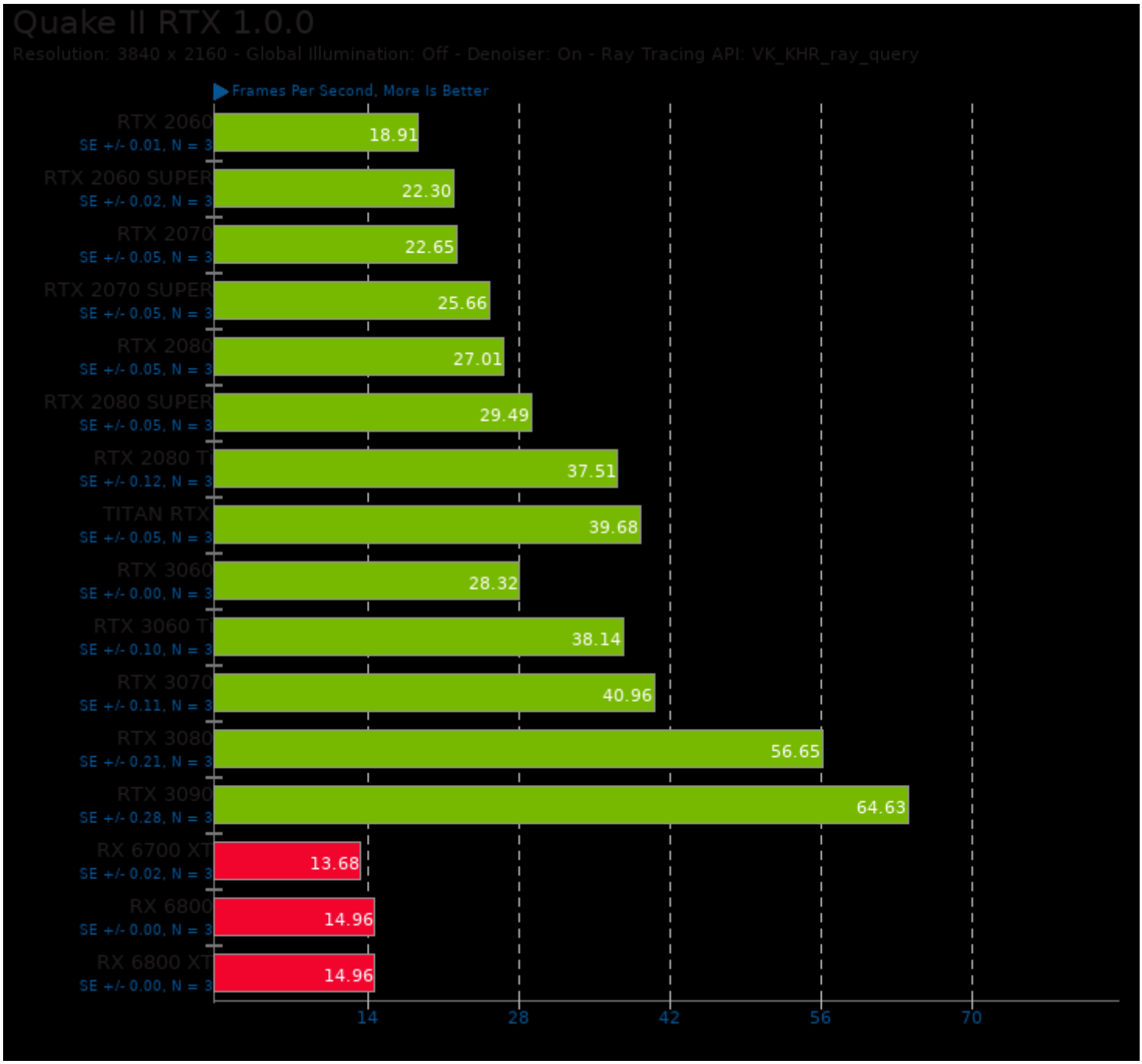
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



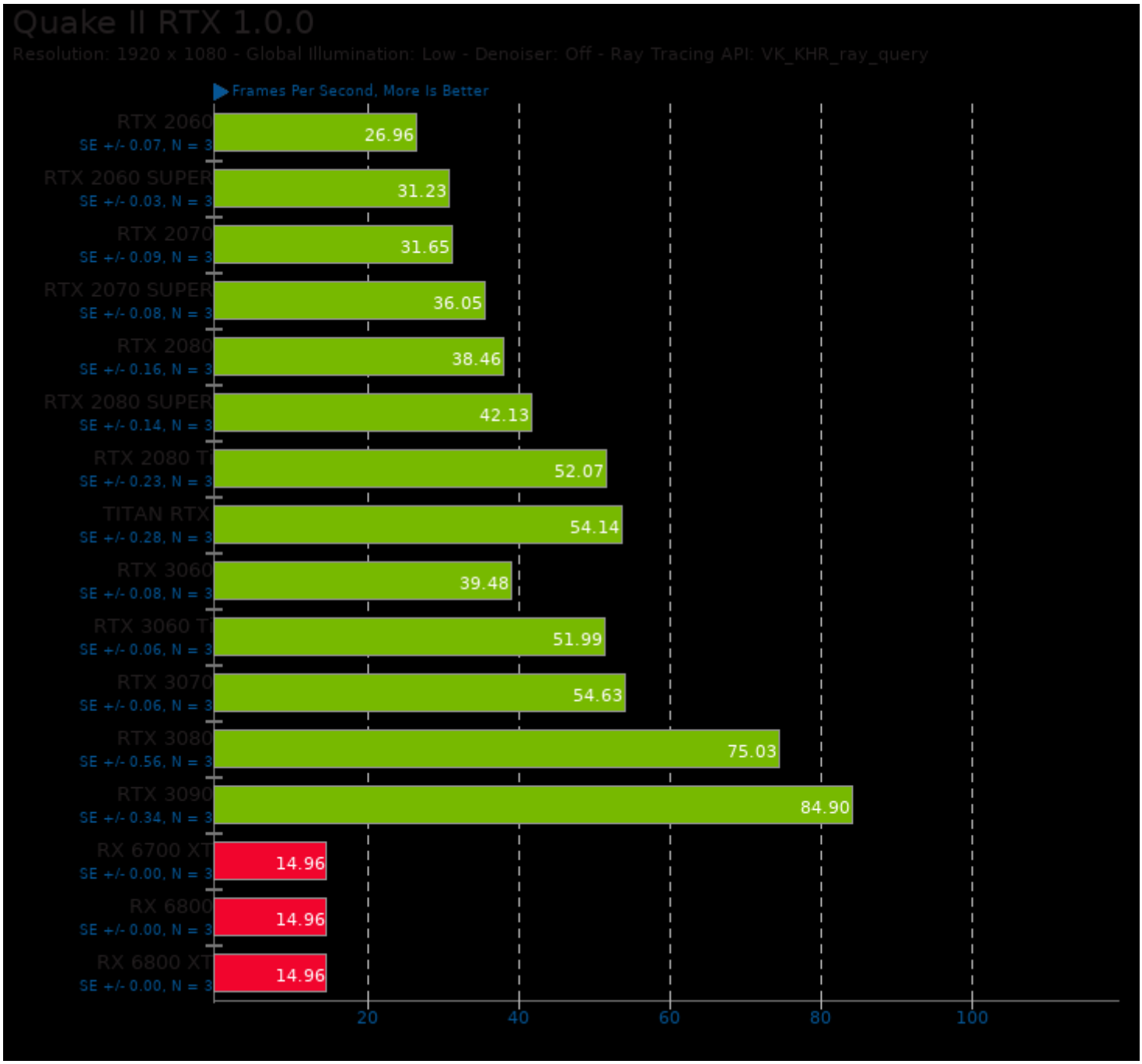
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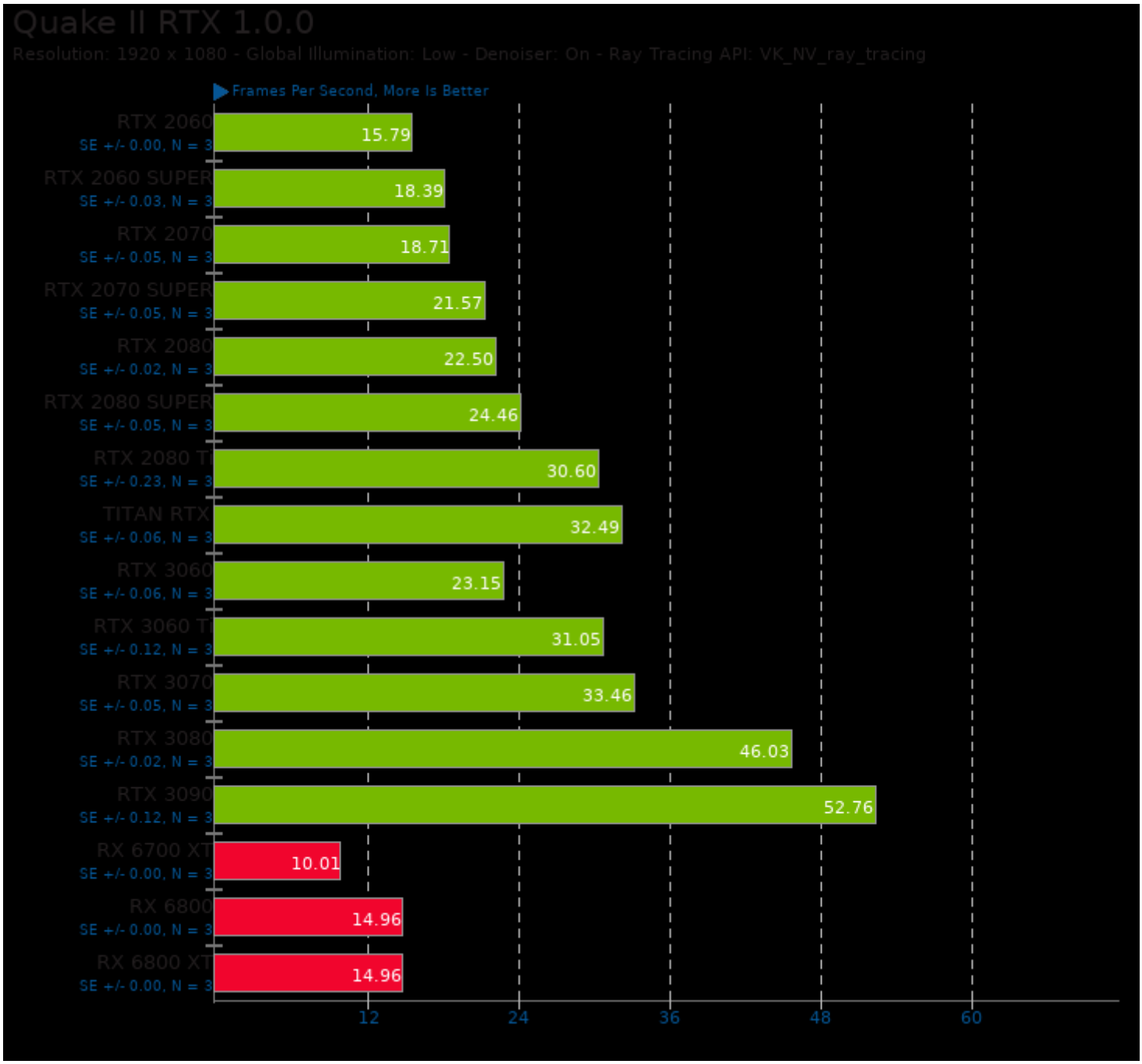
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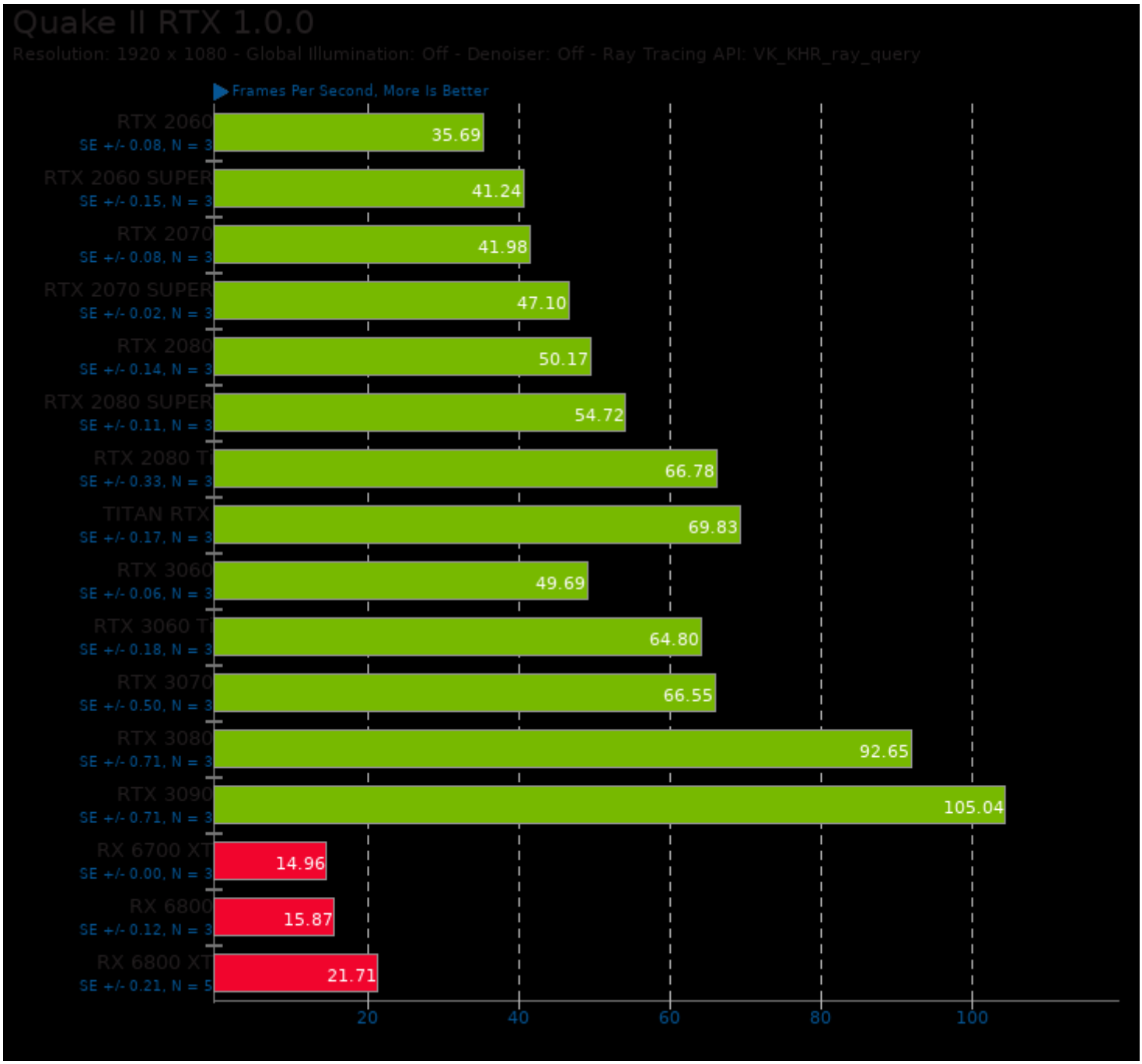
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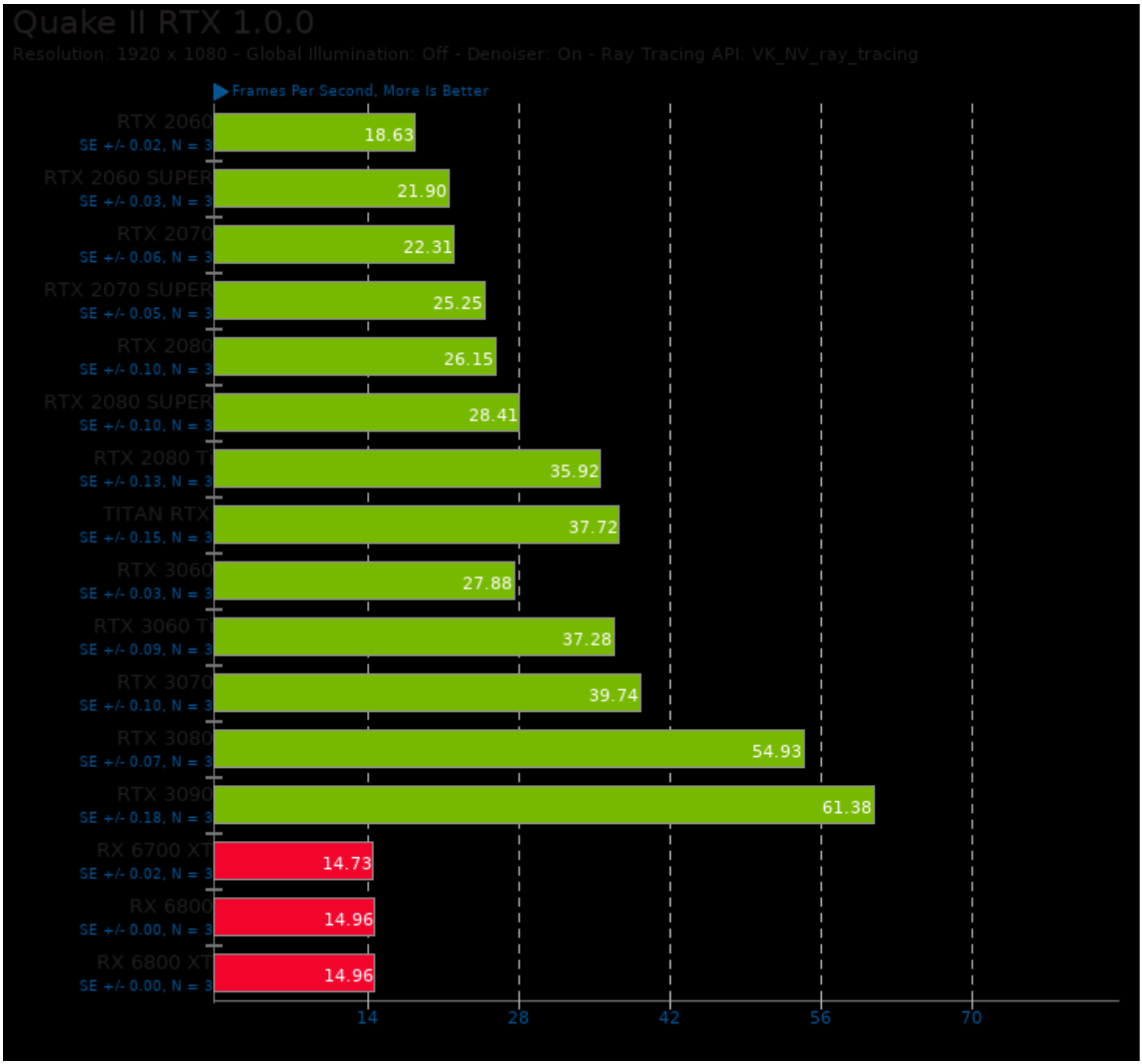
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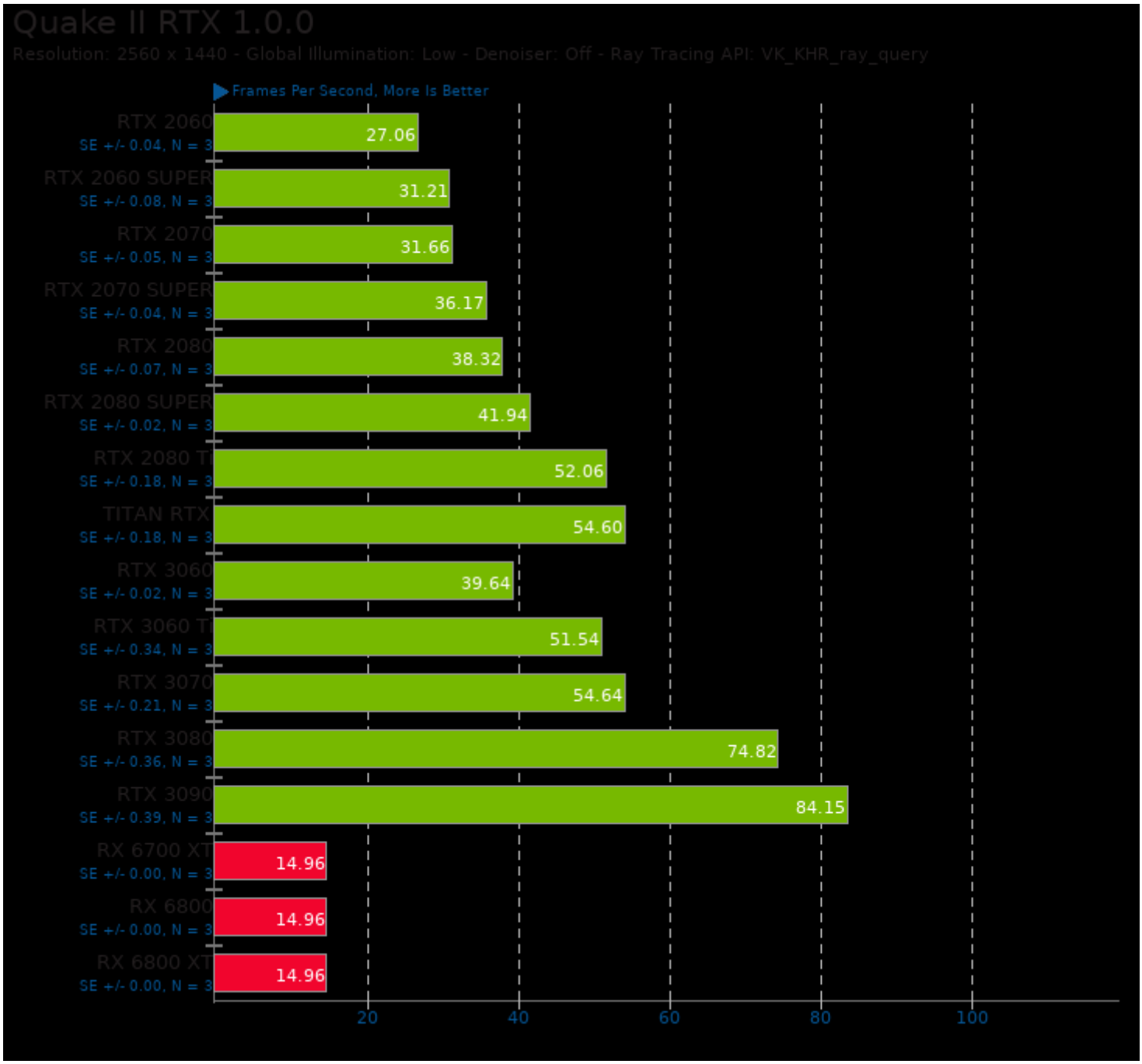
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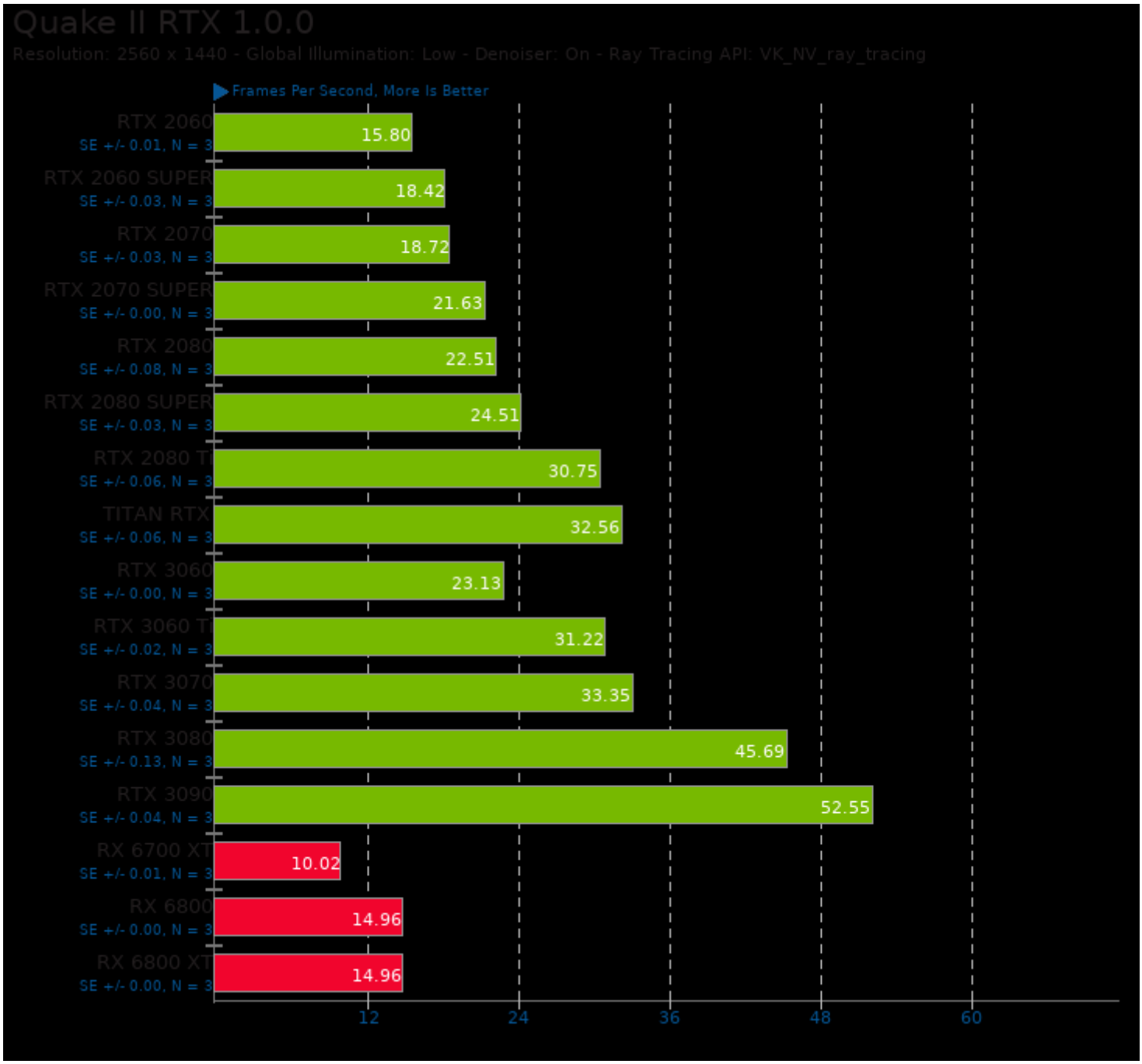
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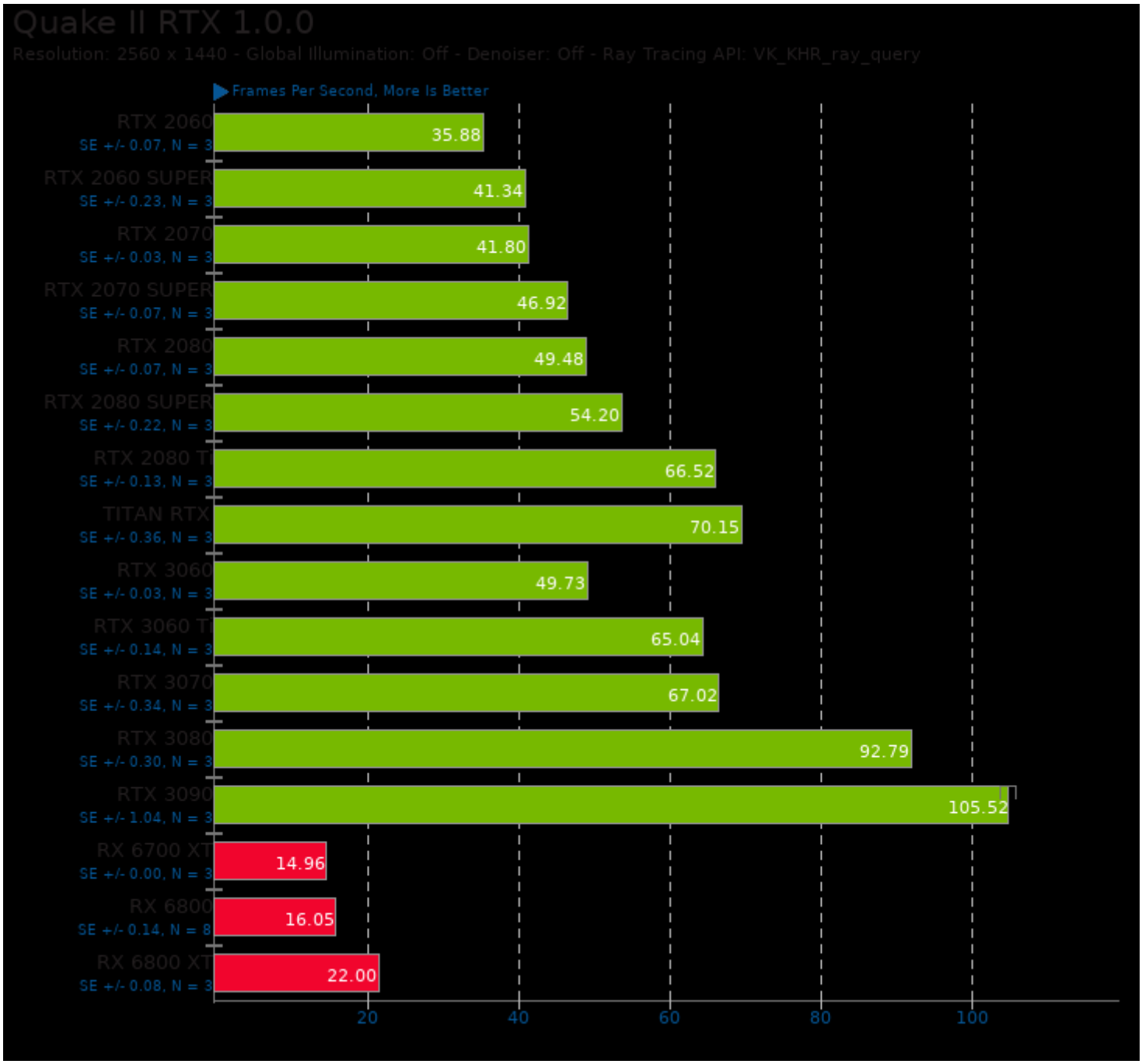
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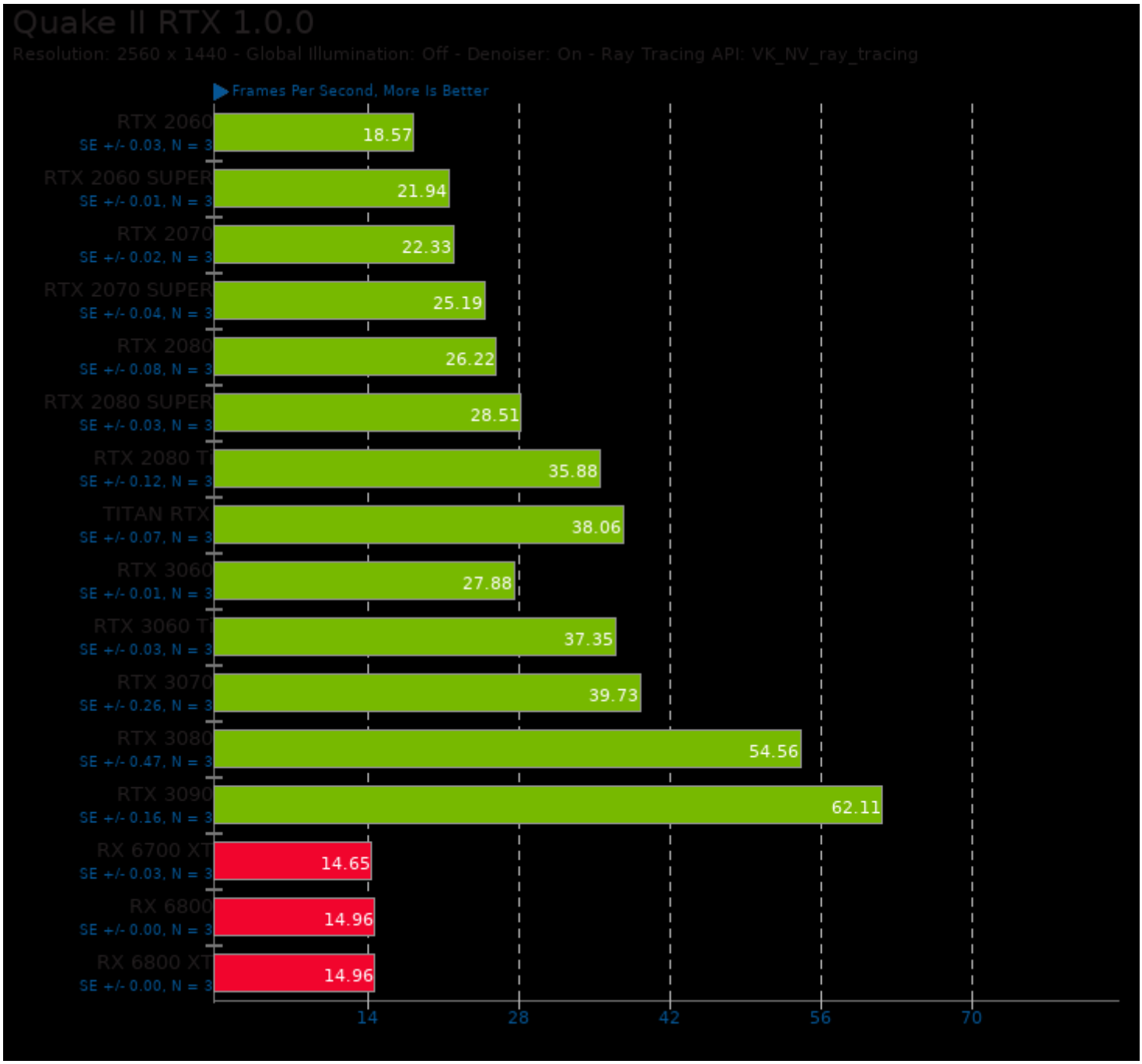
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



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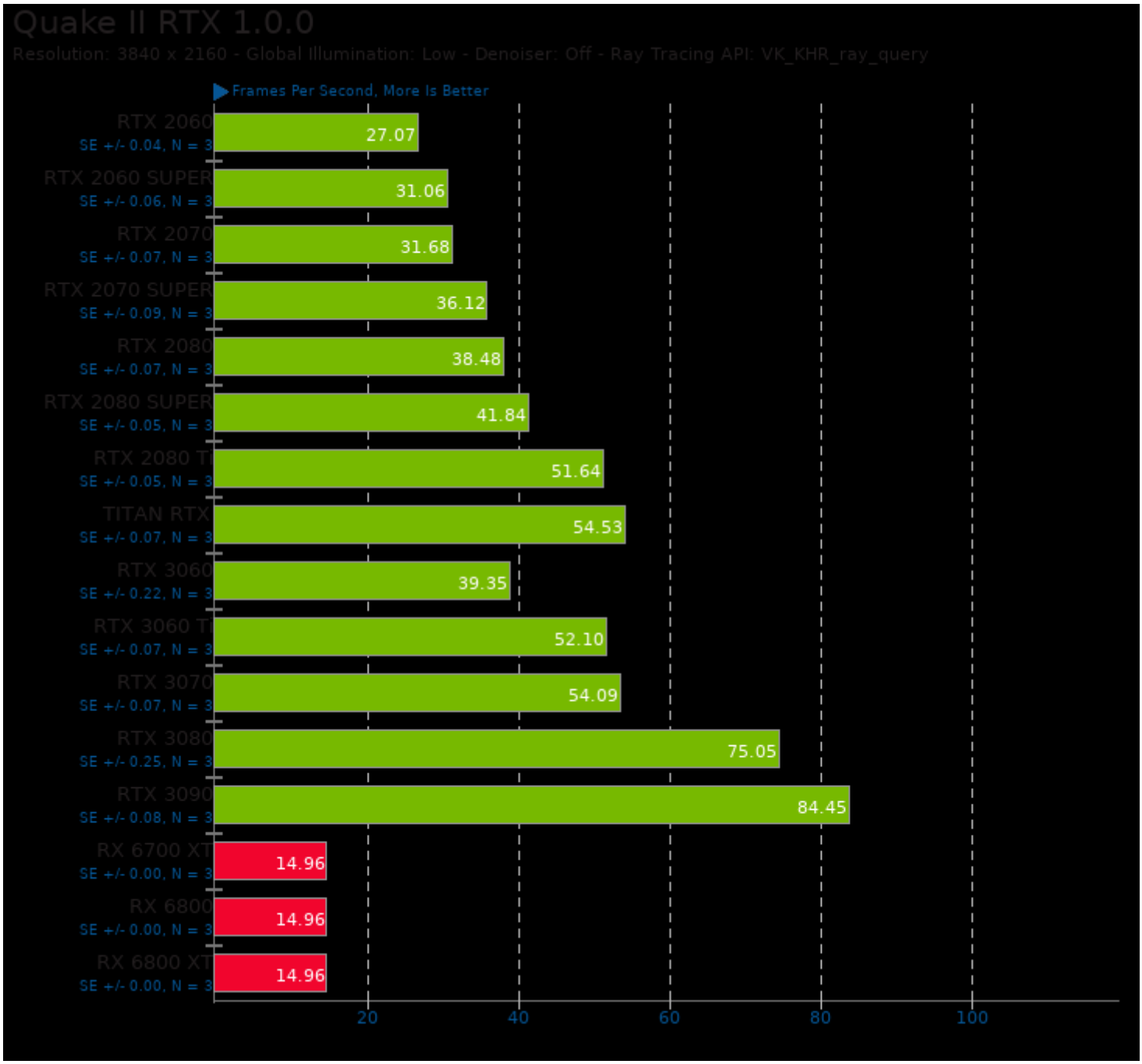
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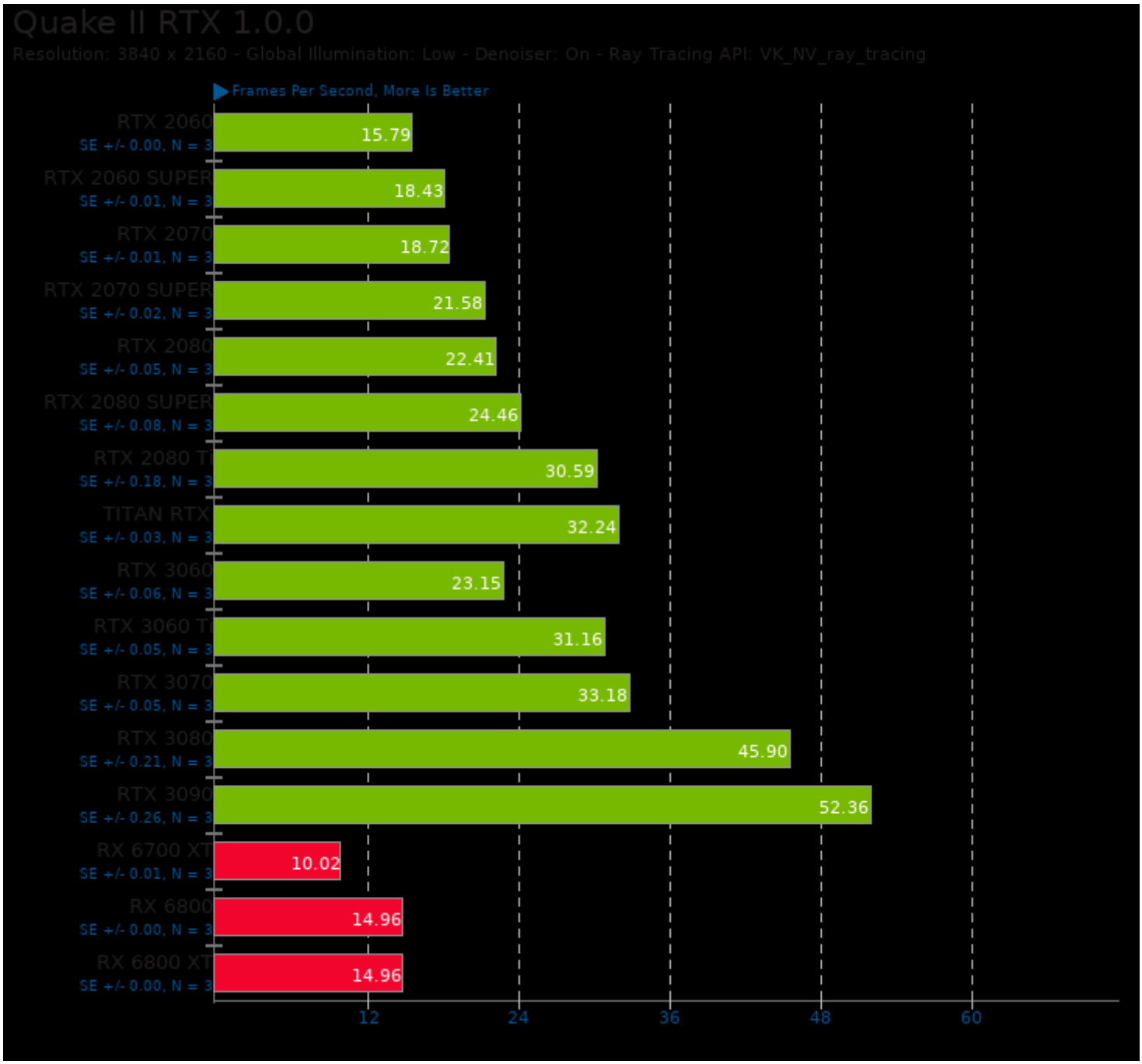
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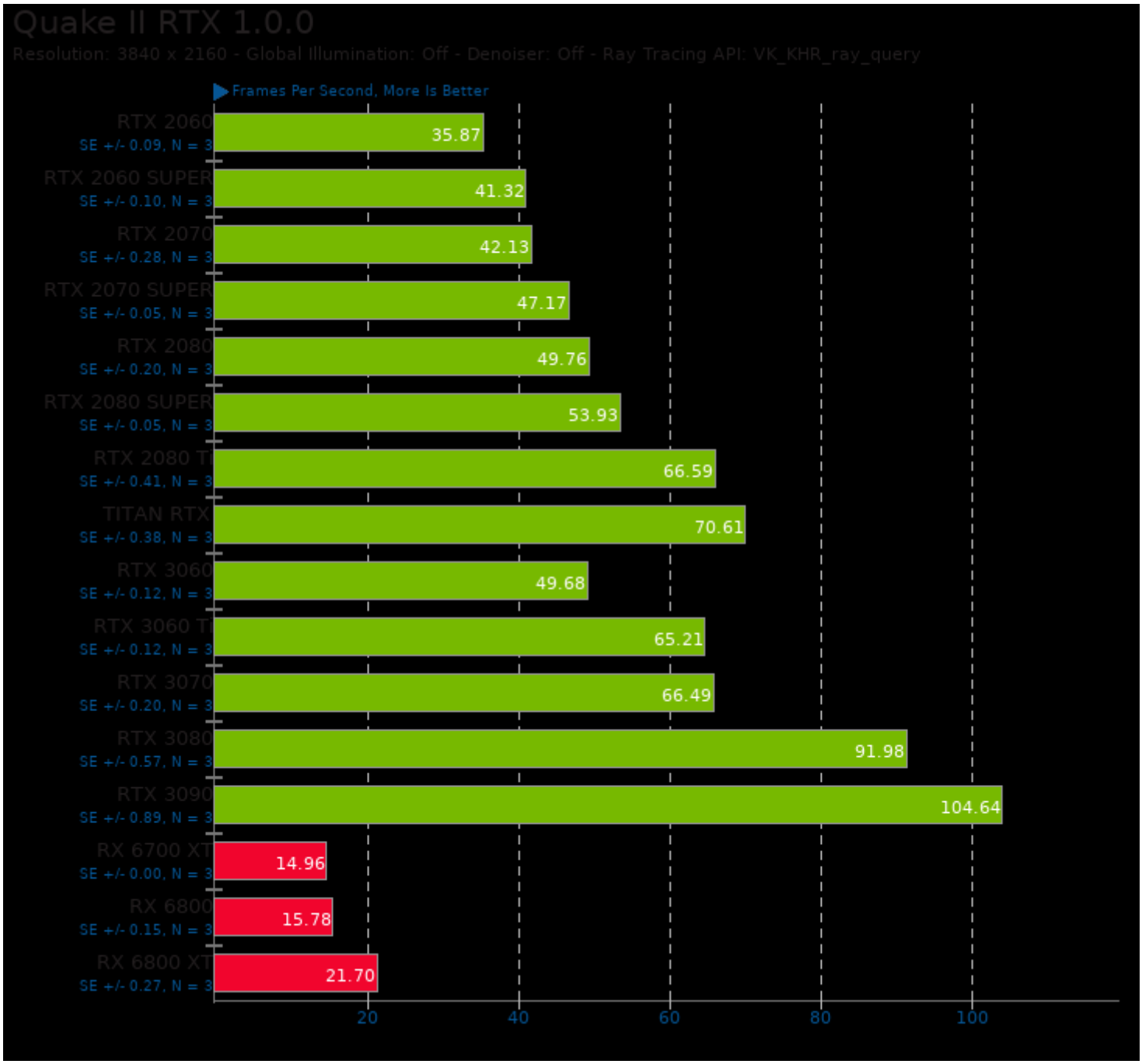
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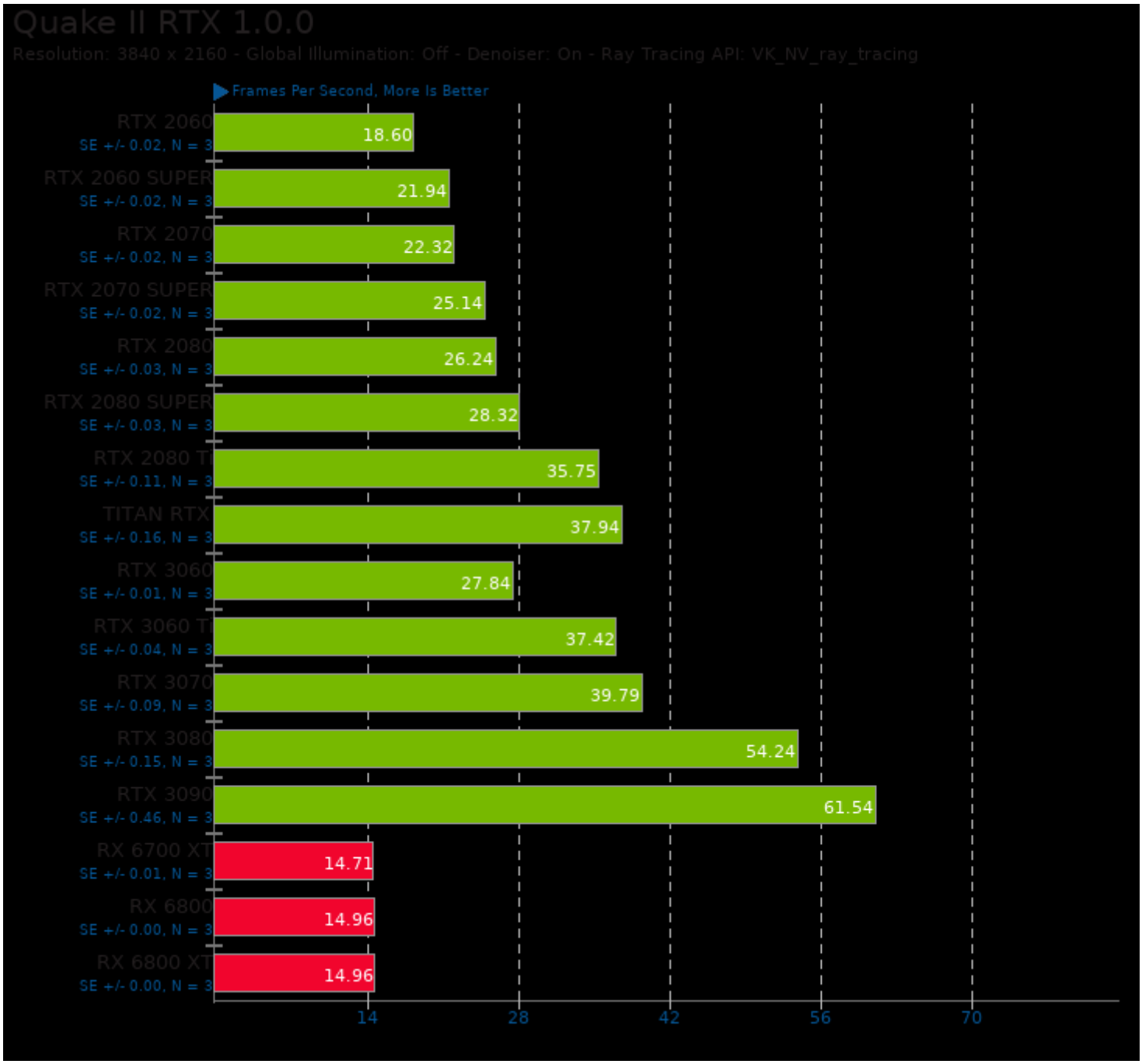
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



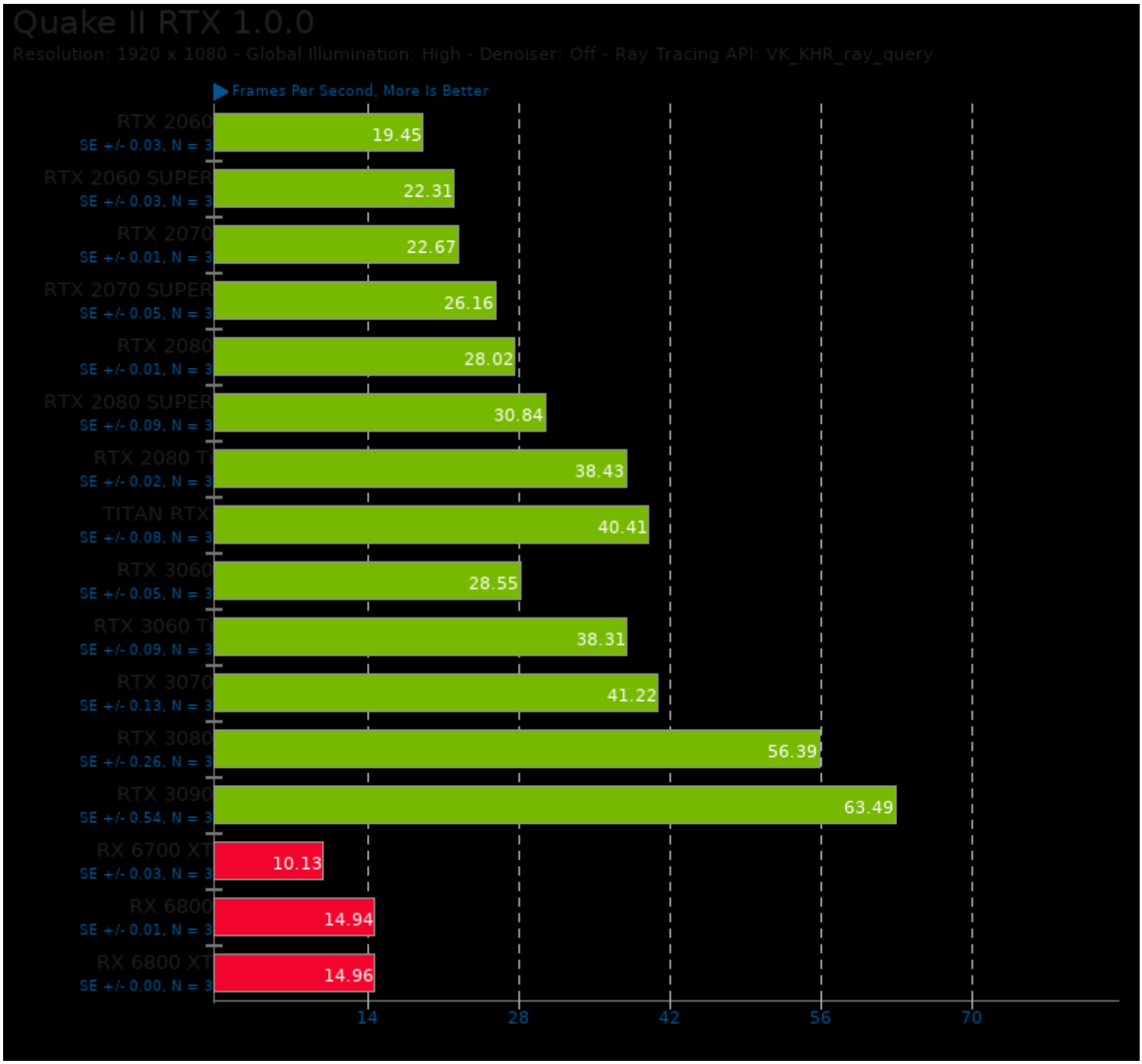
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



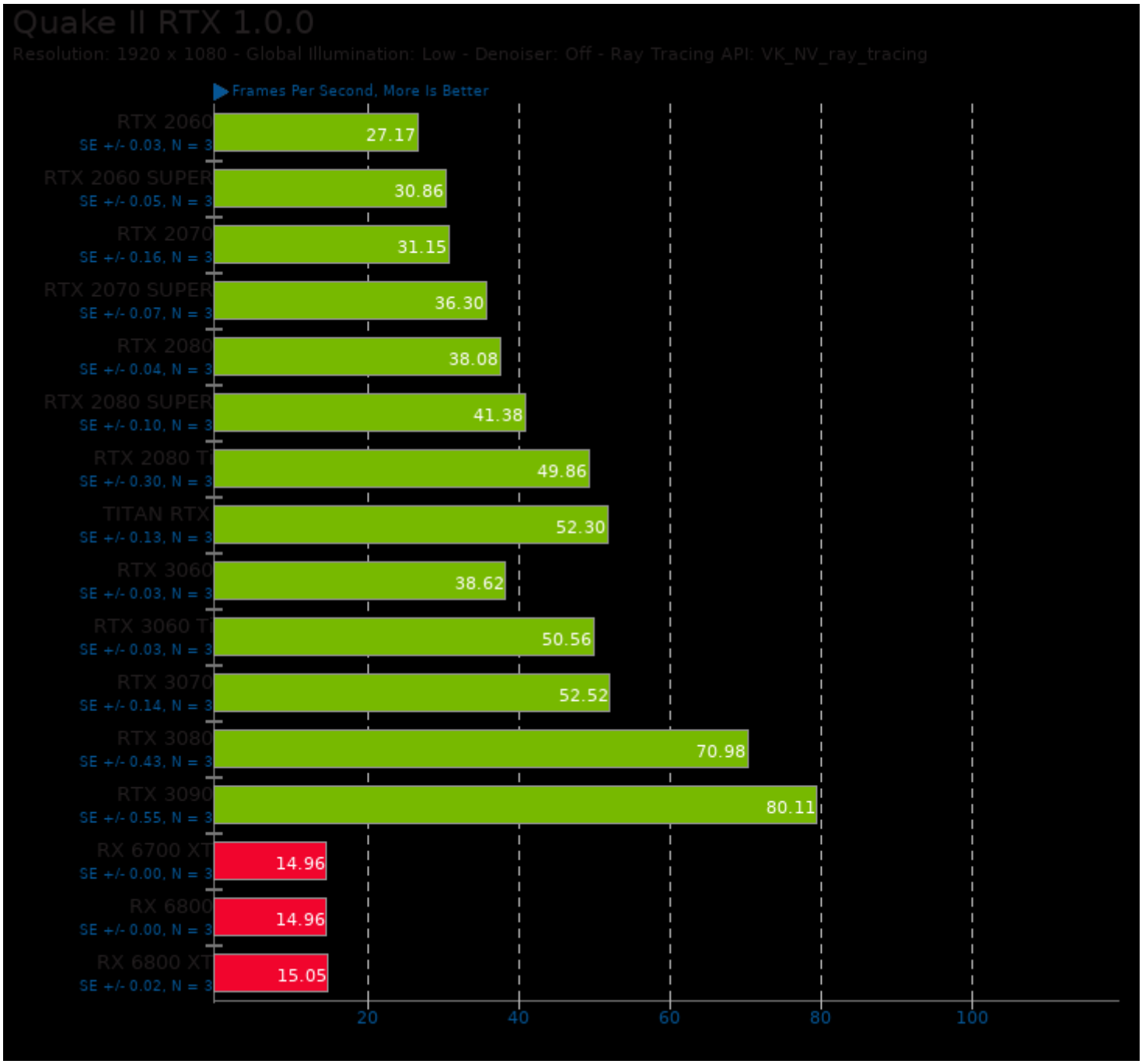
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



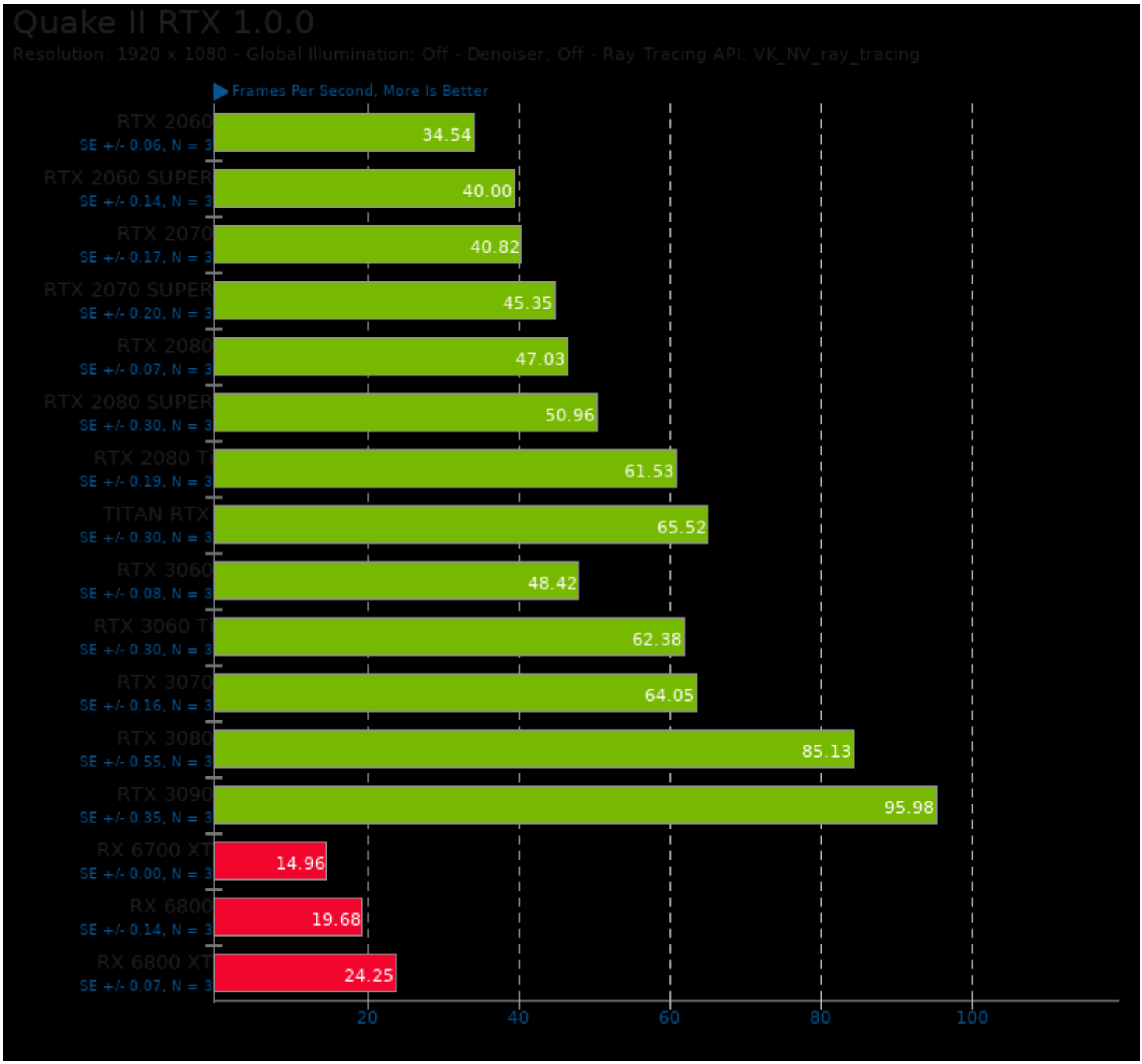
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



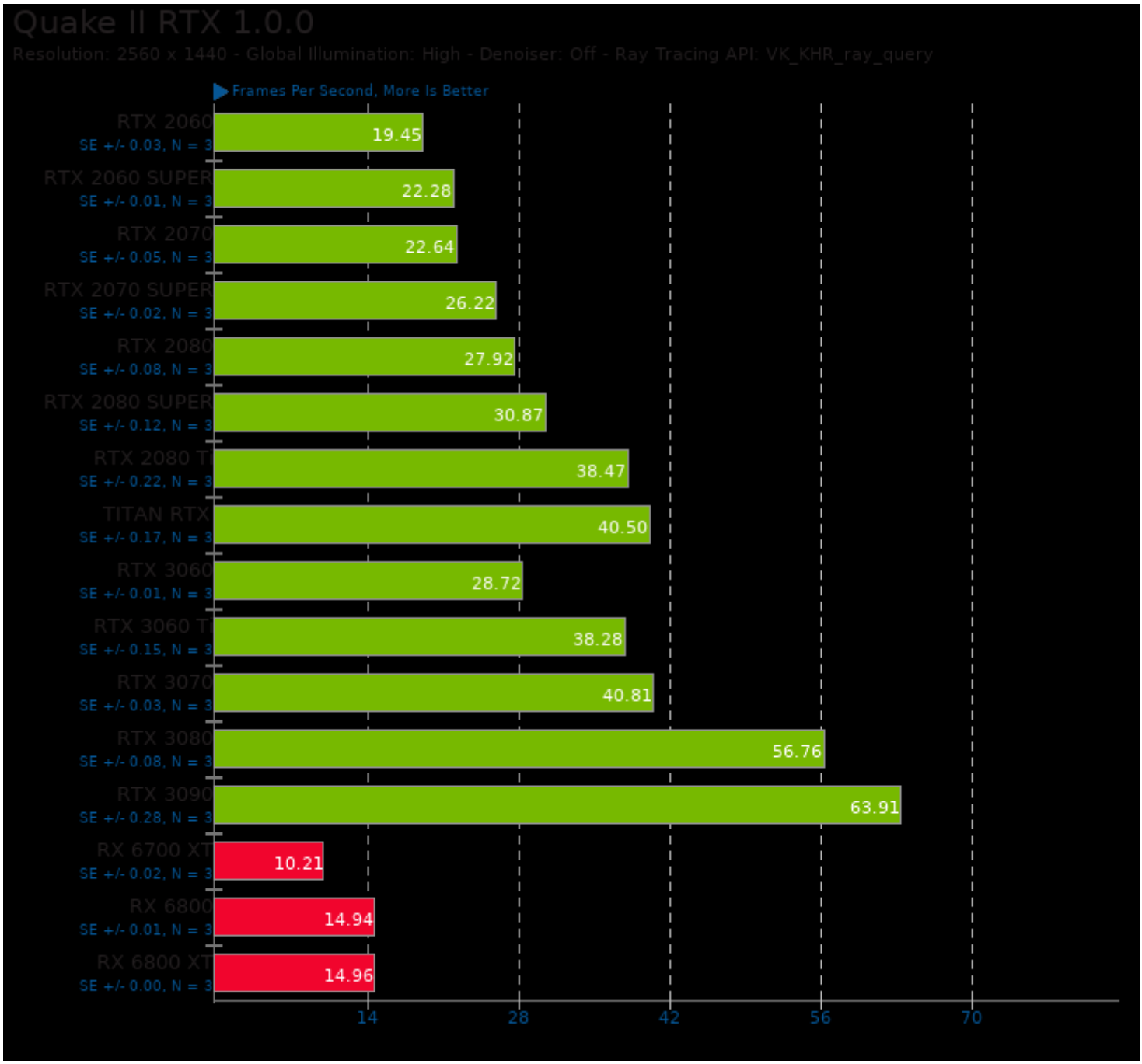
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NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



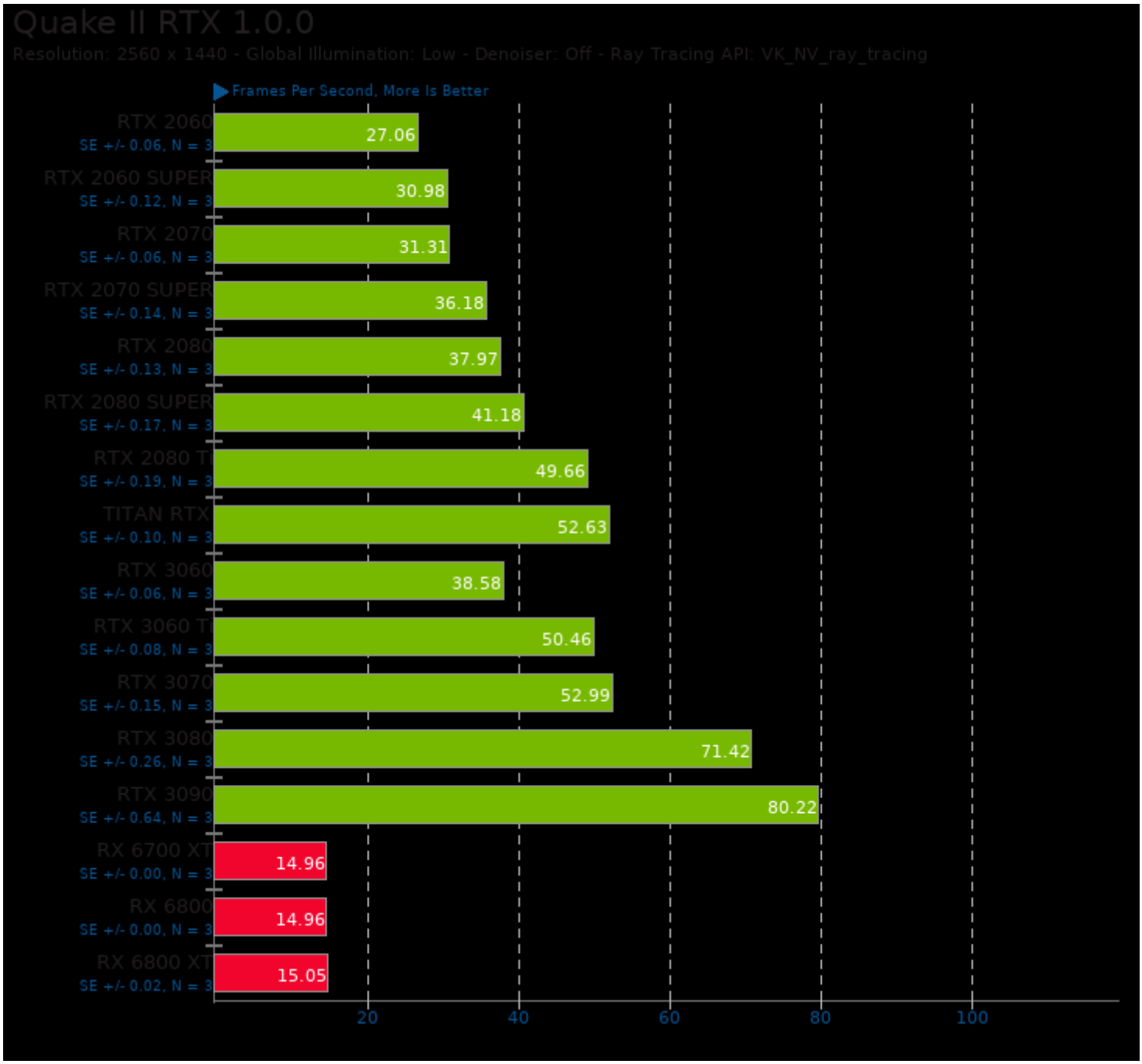
NVIDIA vs. AMD - Quake 2 RTX Benchmarks Linux



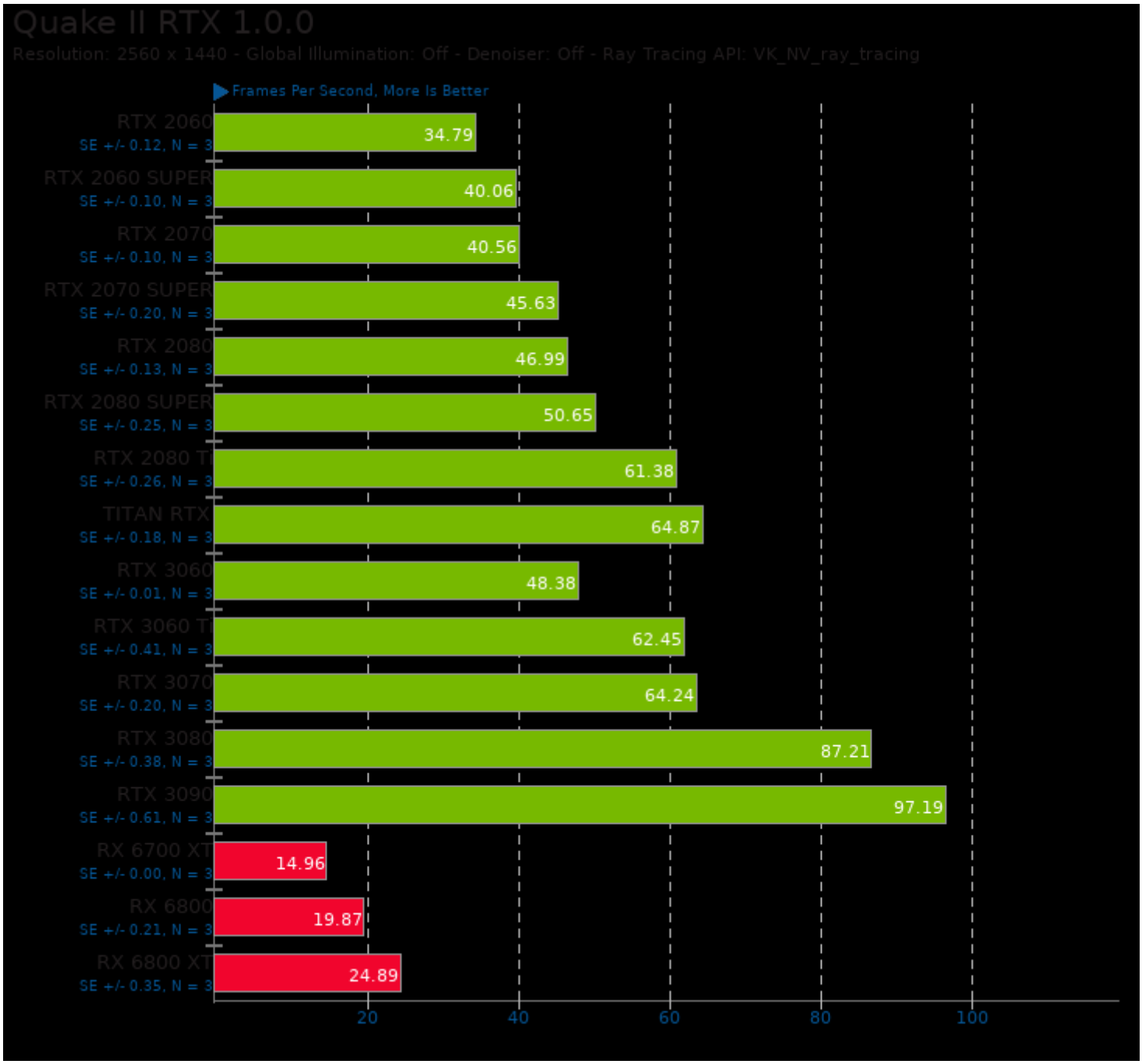
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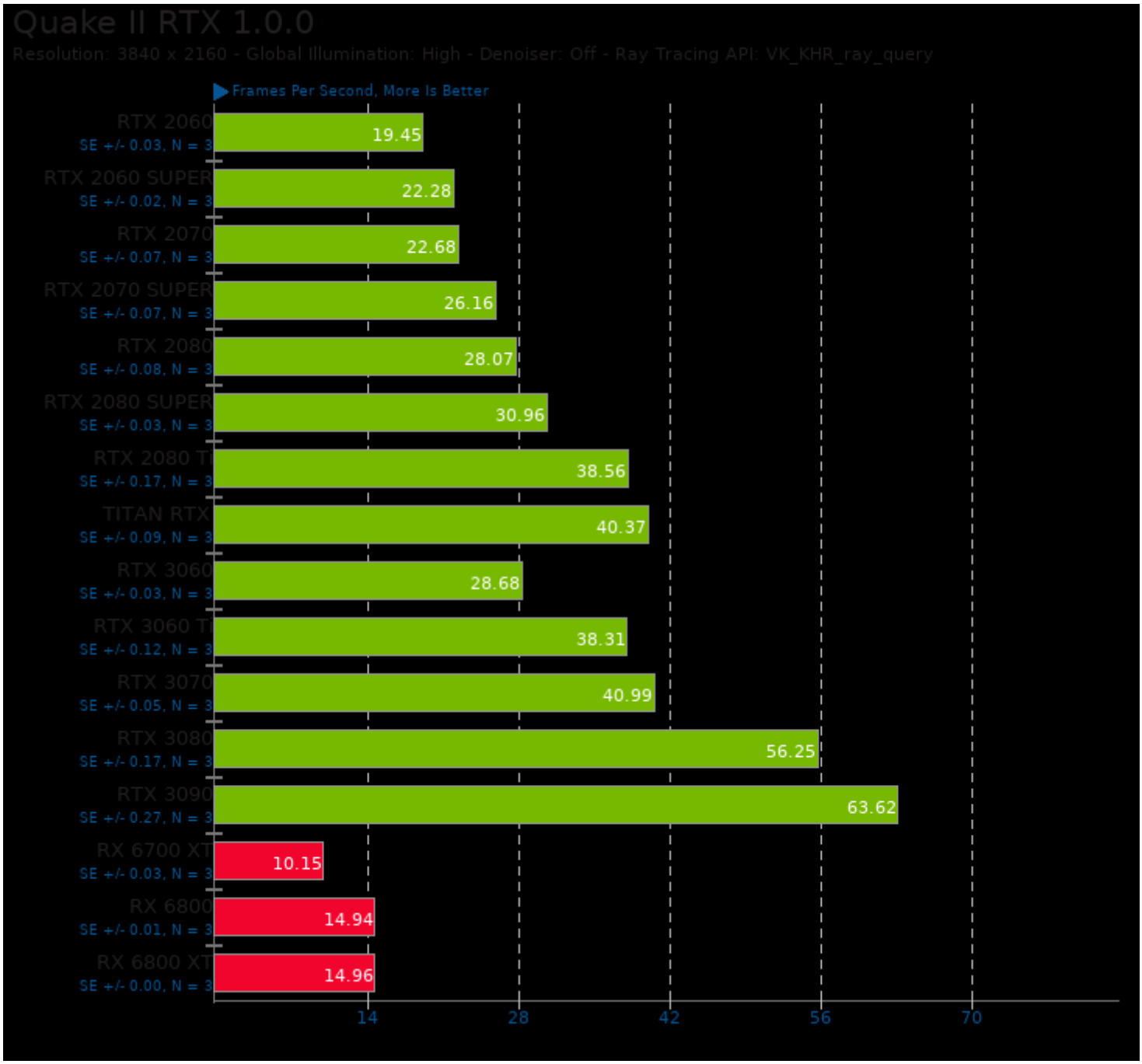
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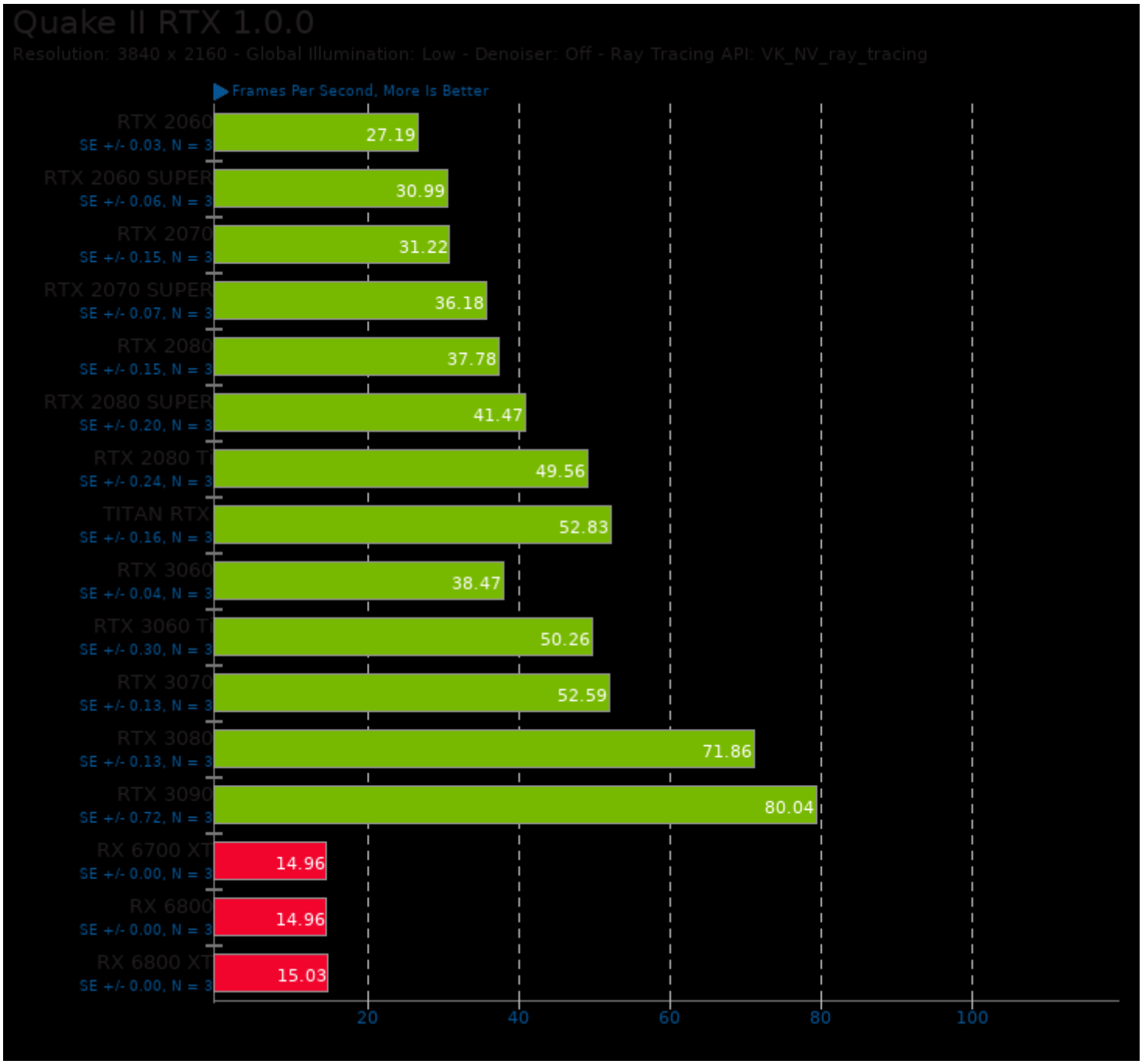
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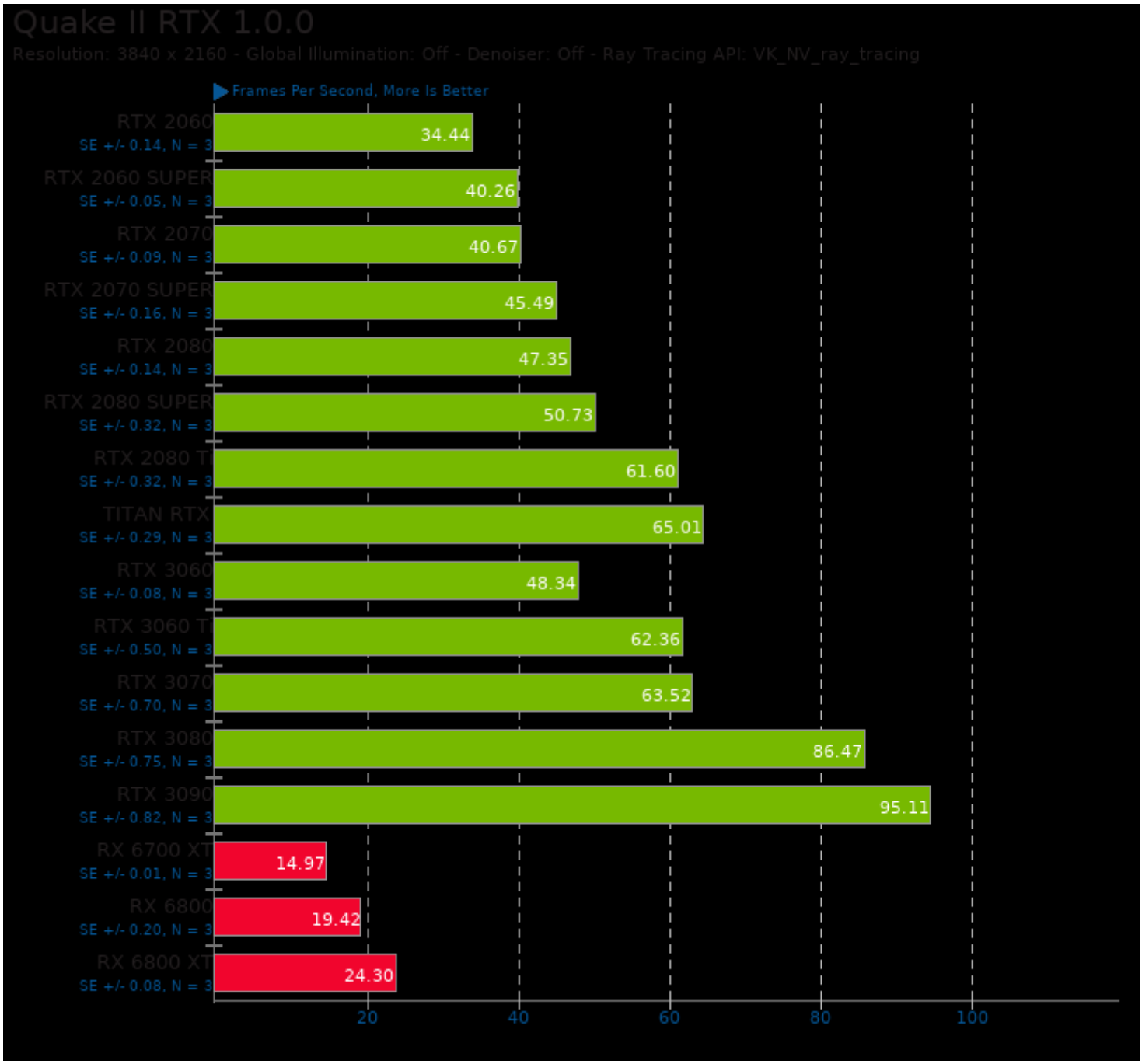
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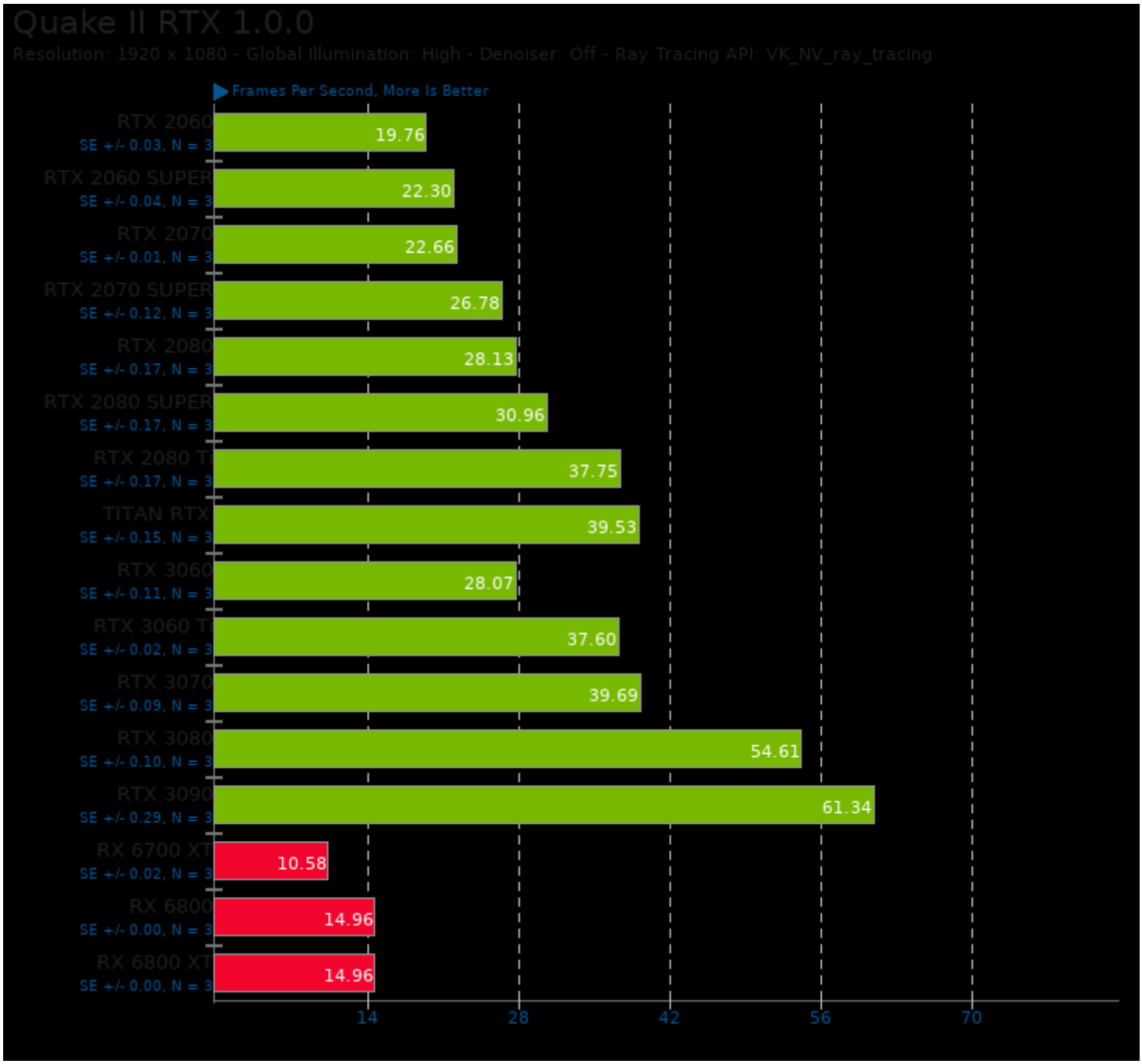
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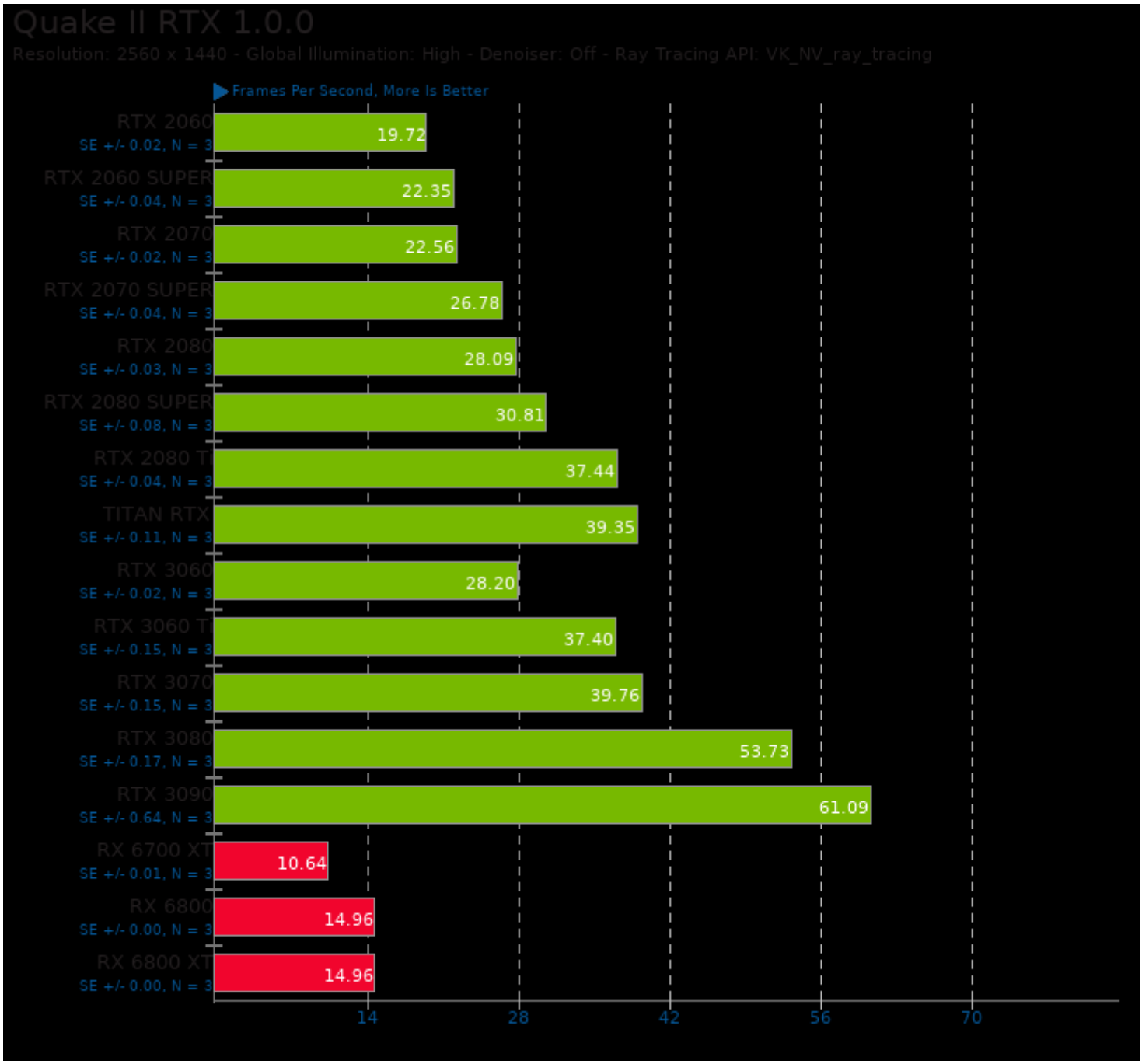
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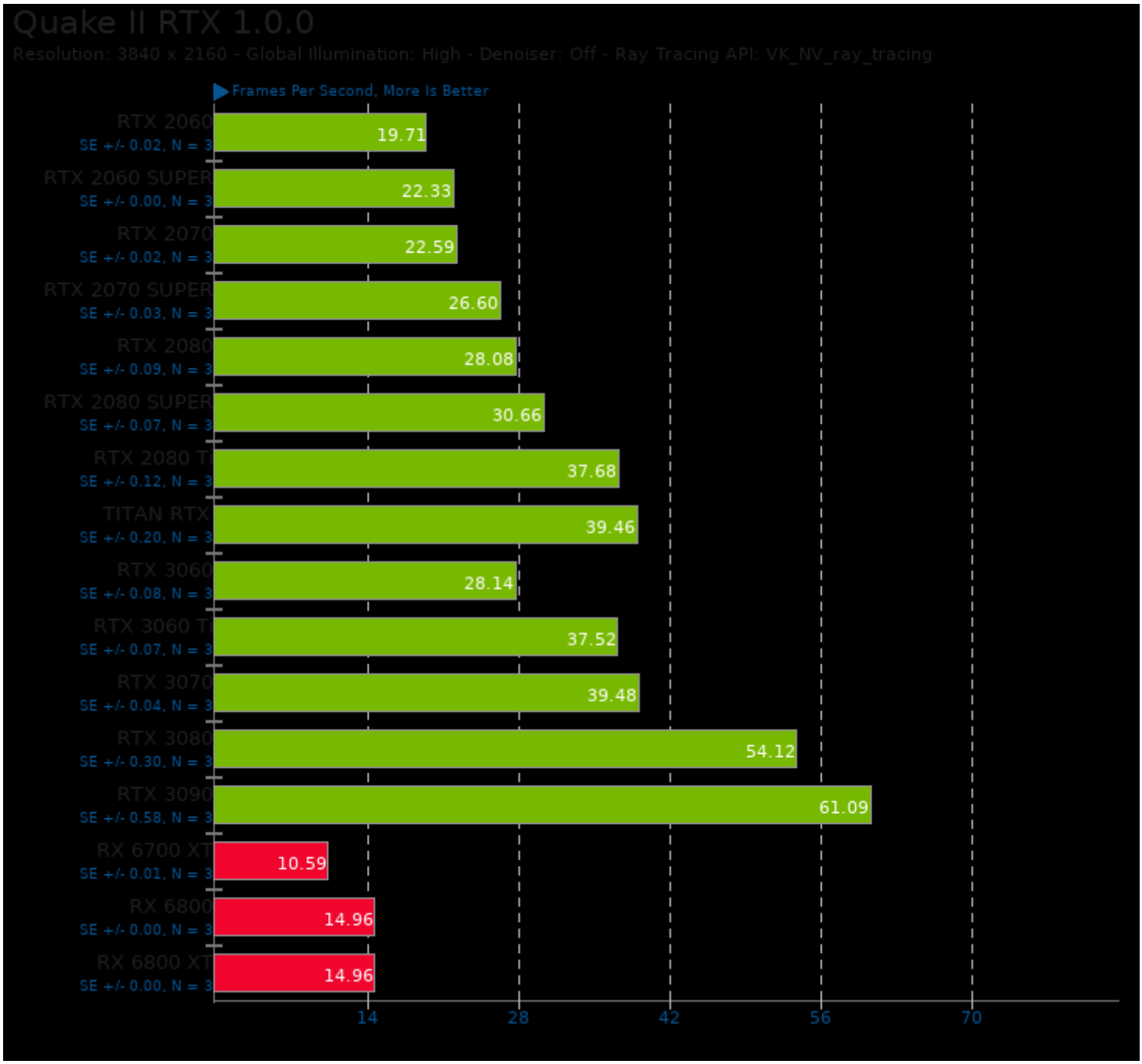
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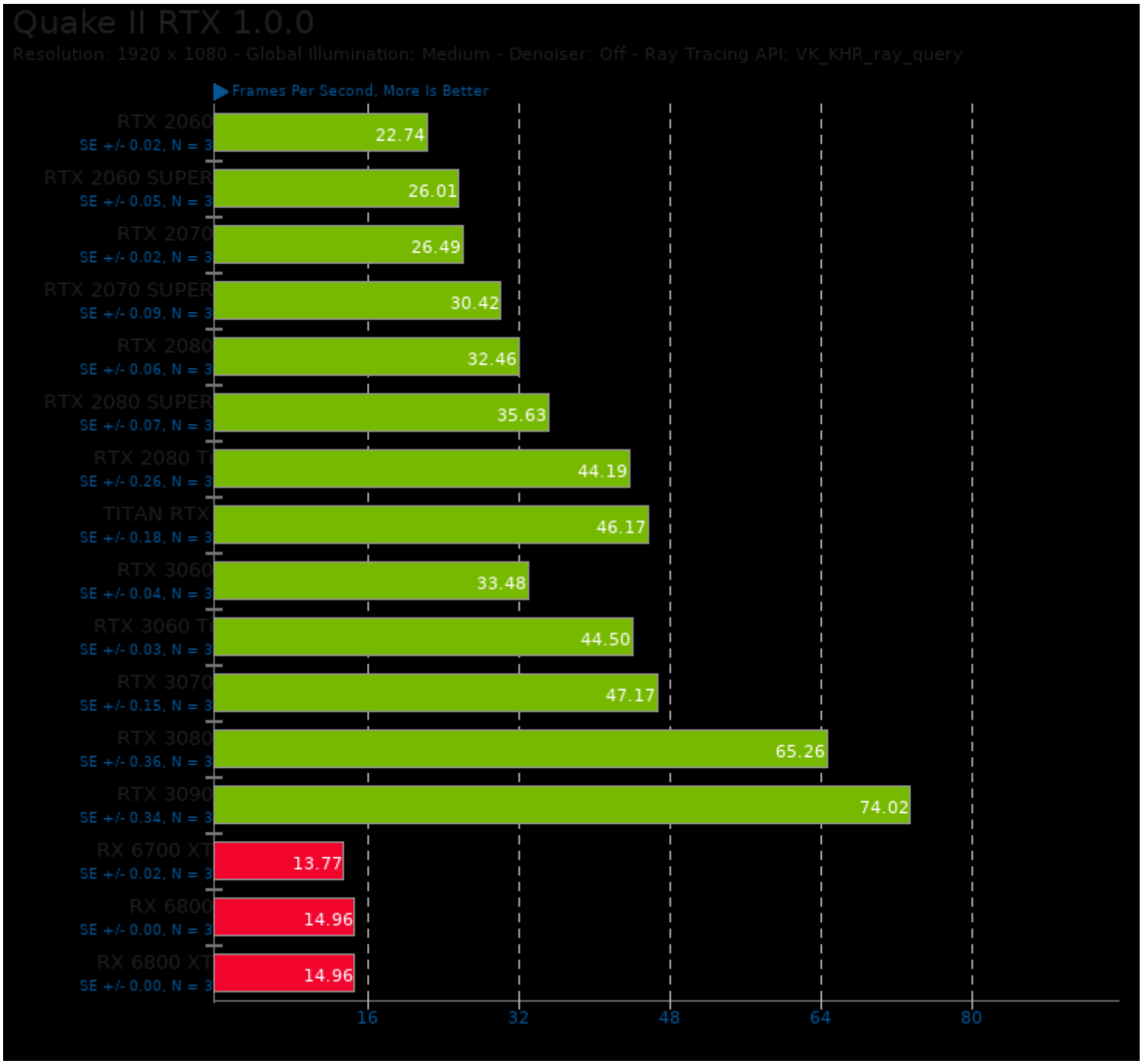
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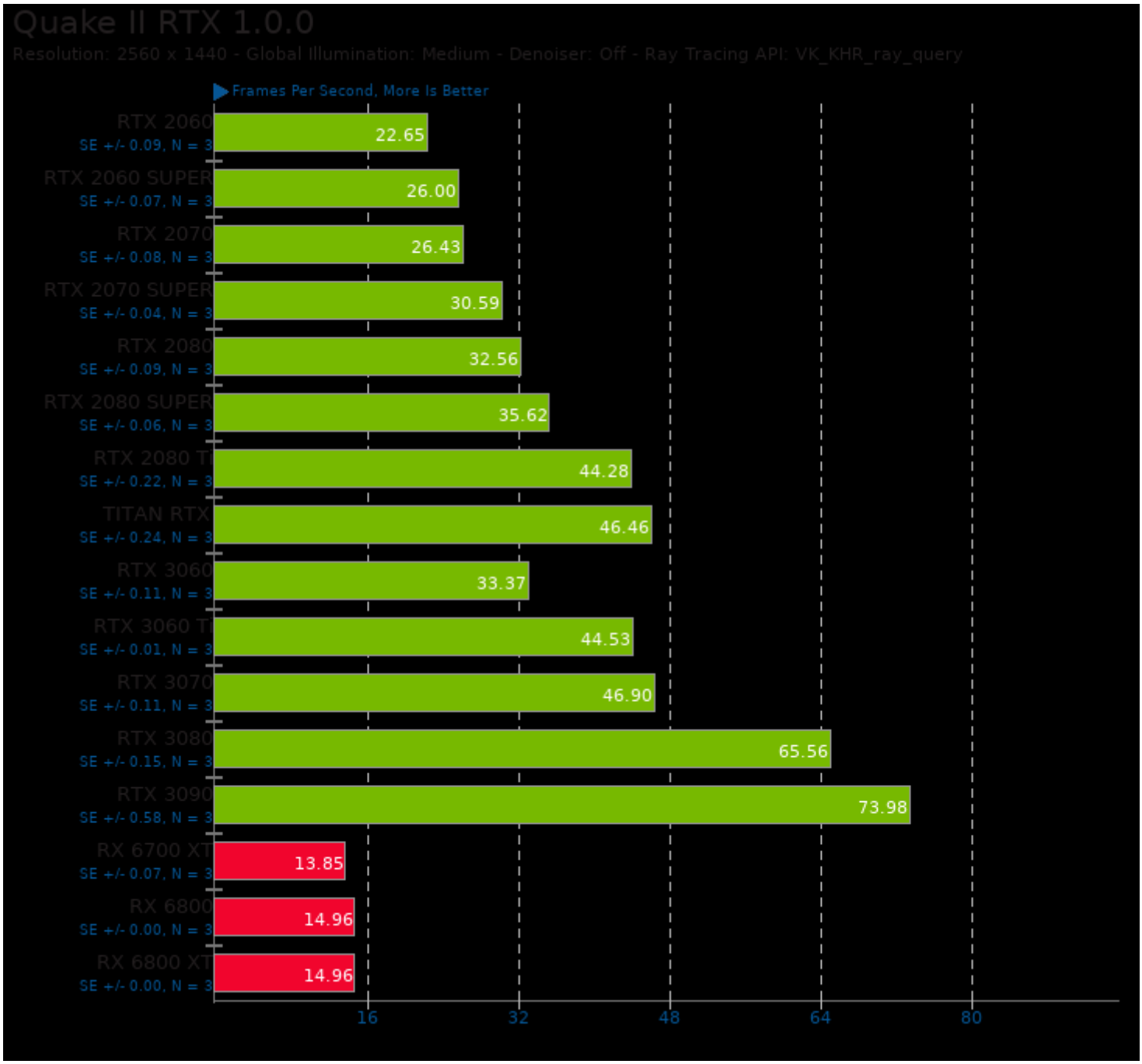
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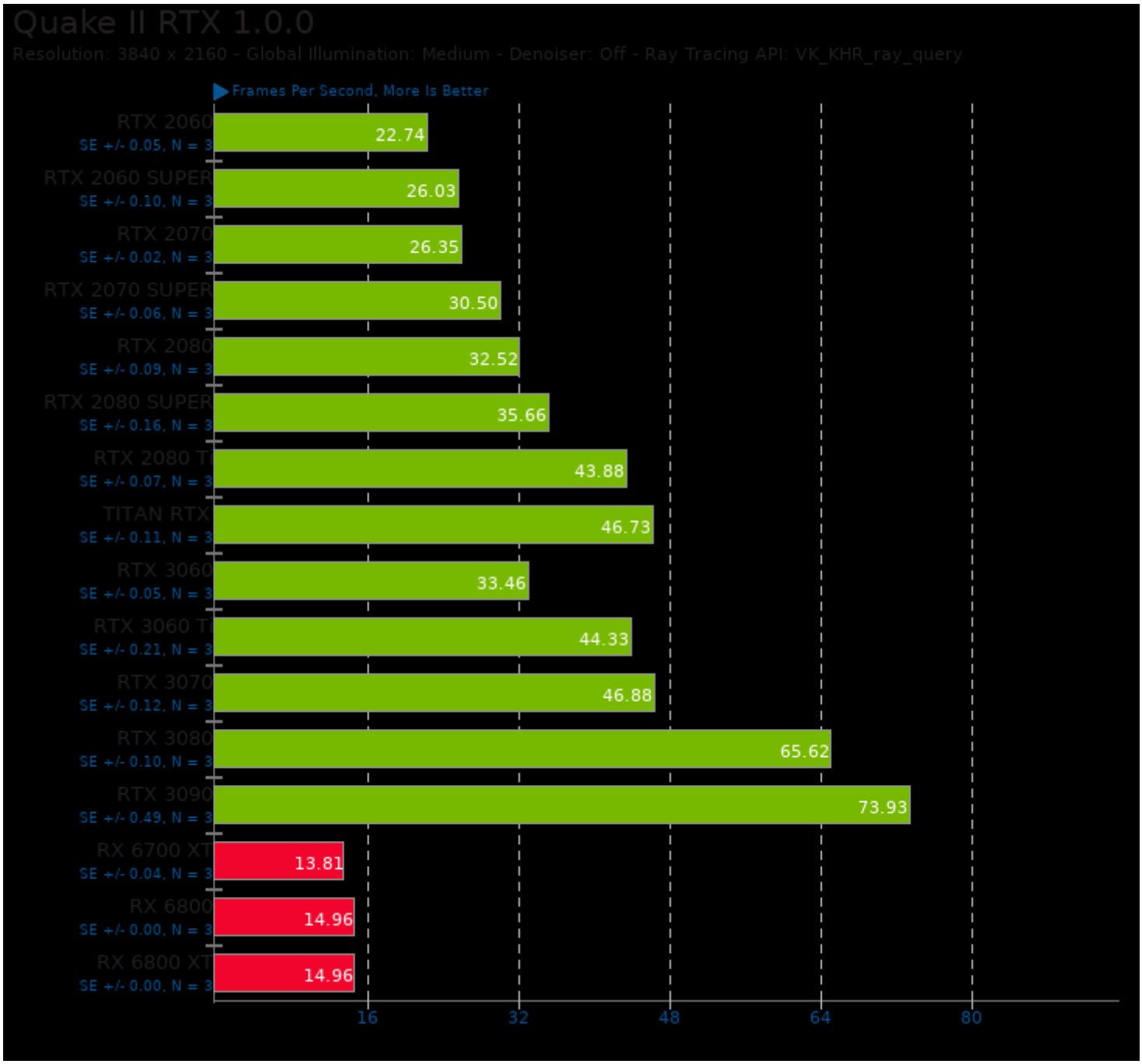
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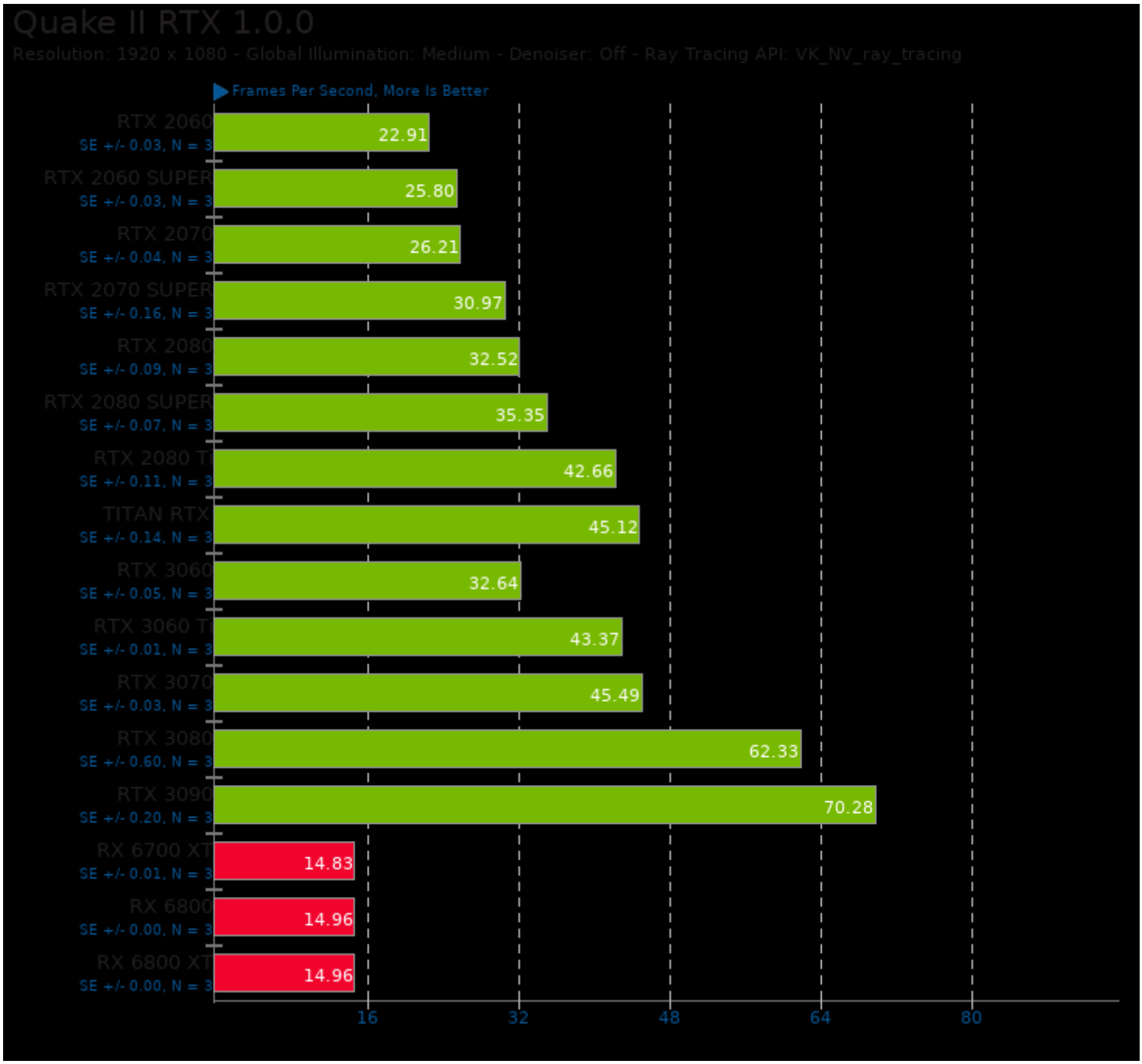
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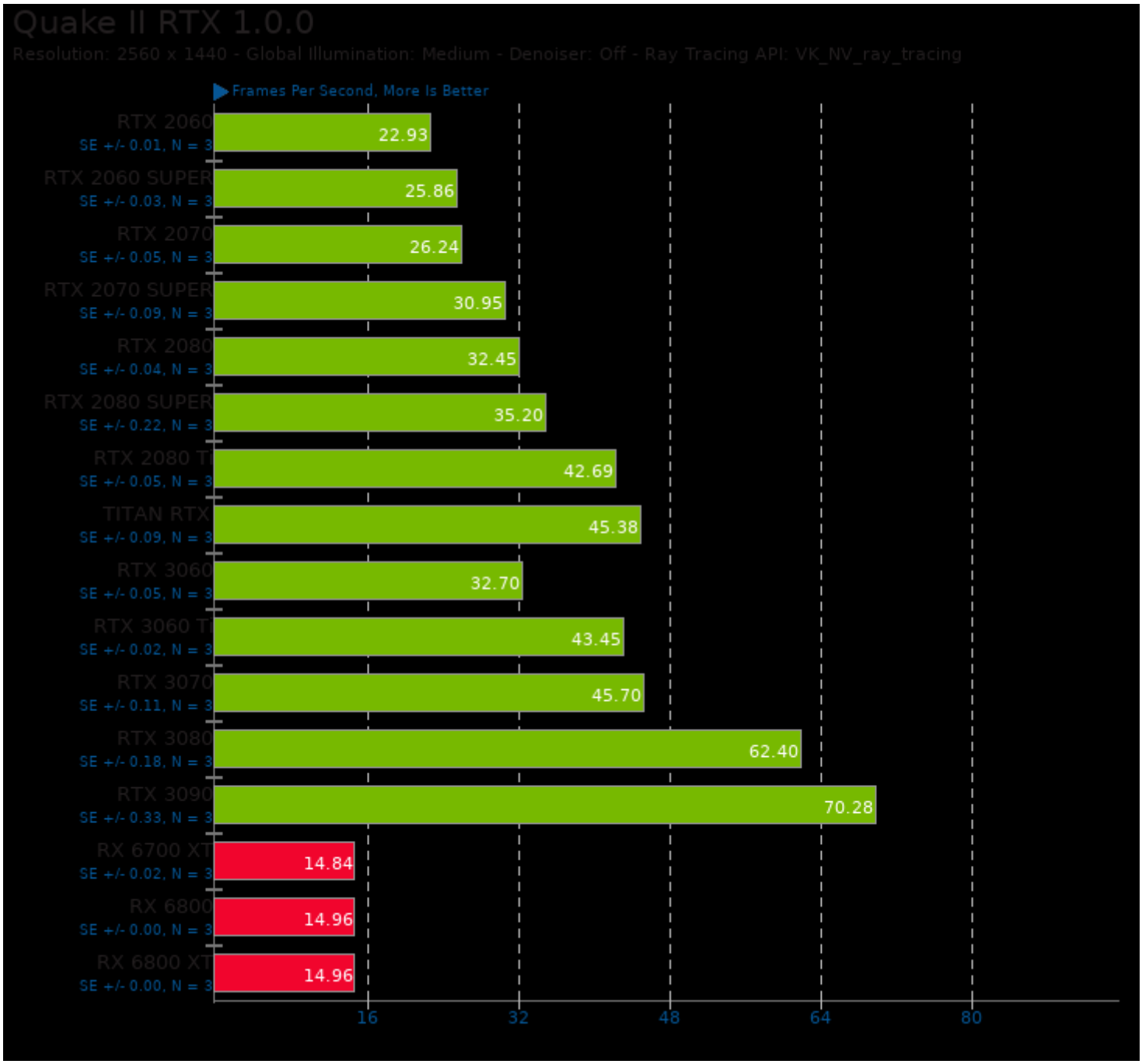
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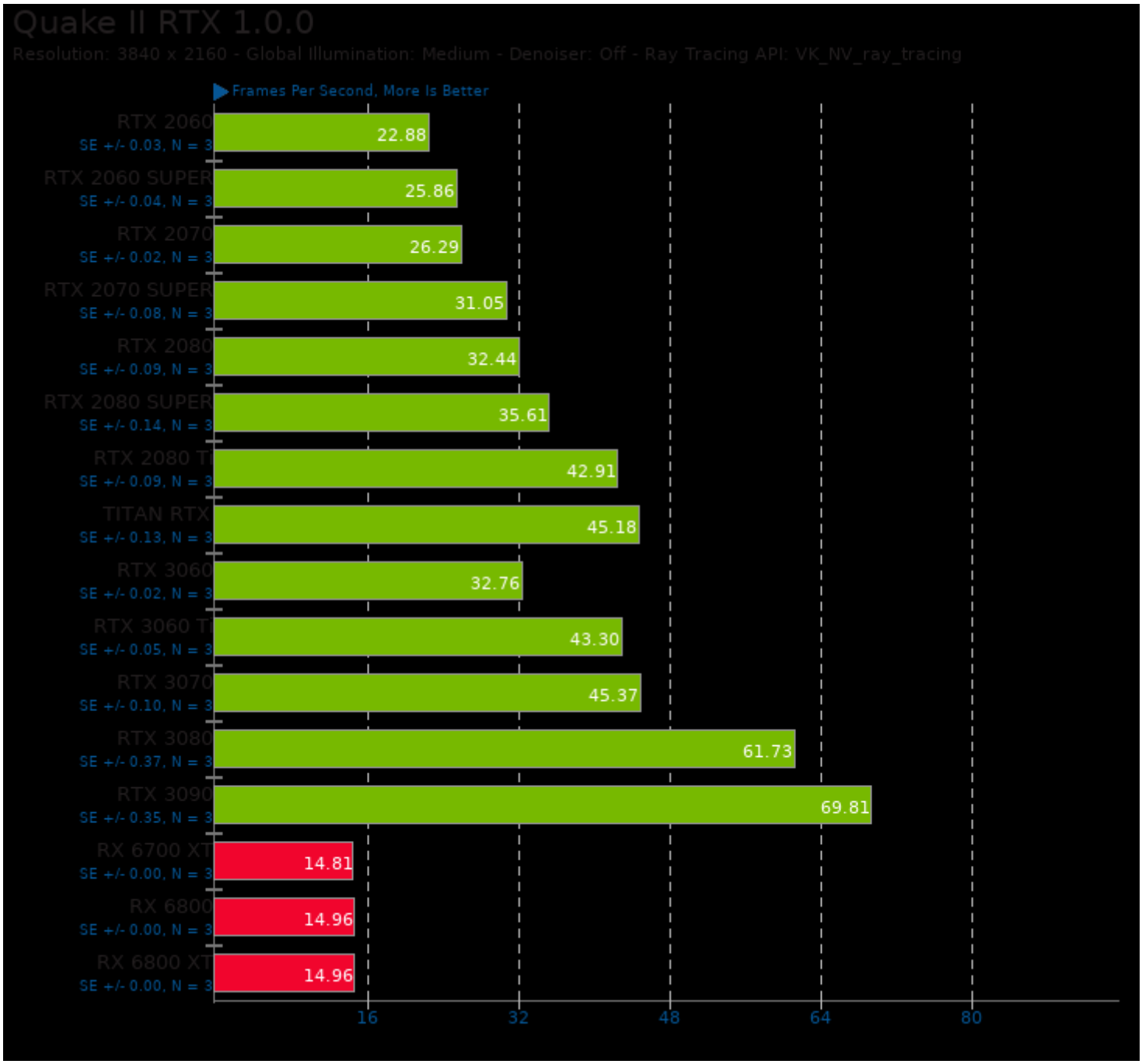
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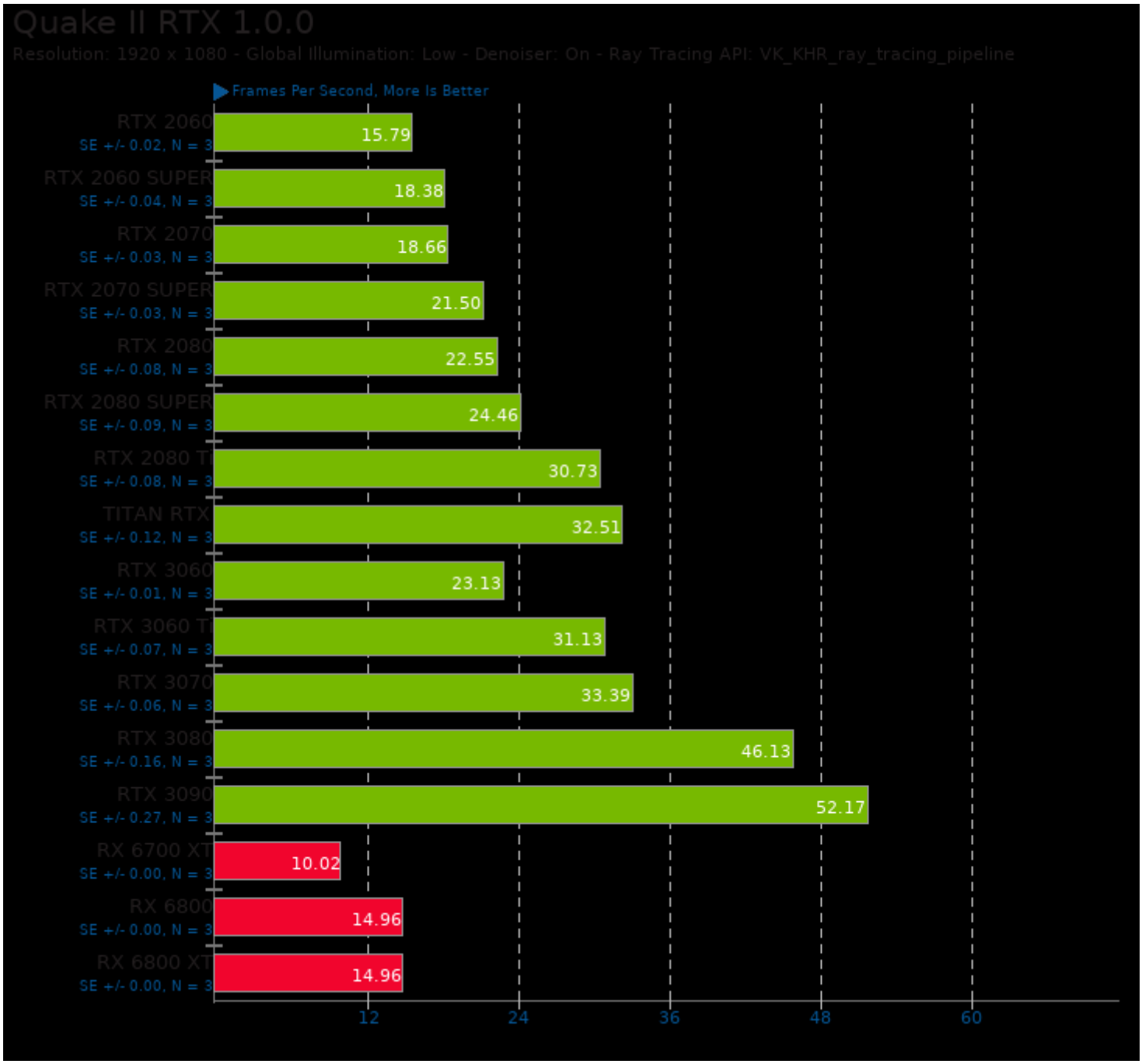
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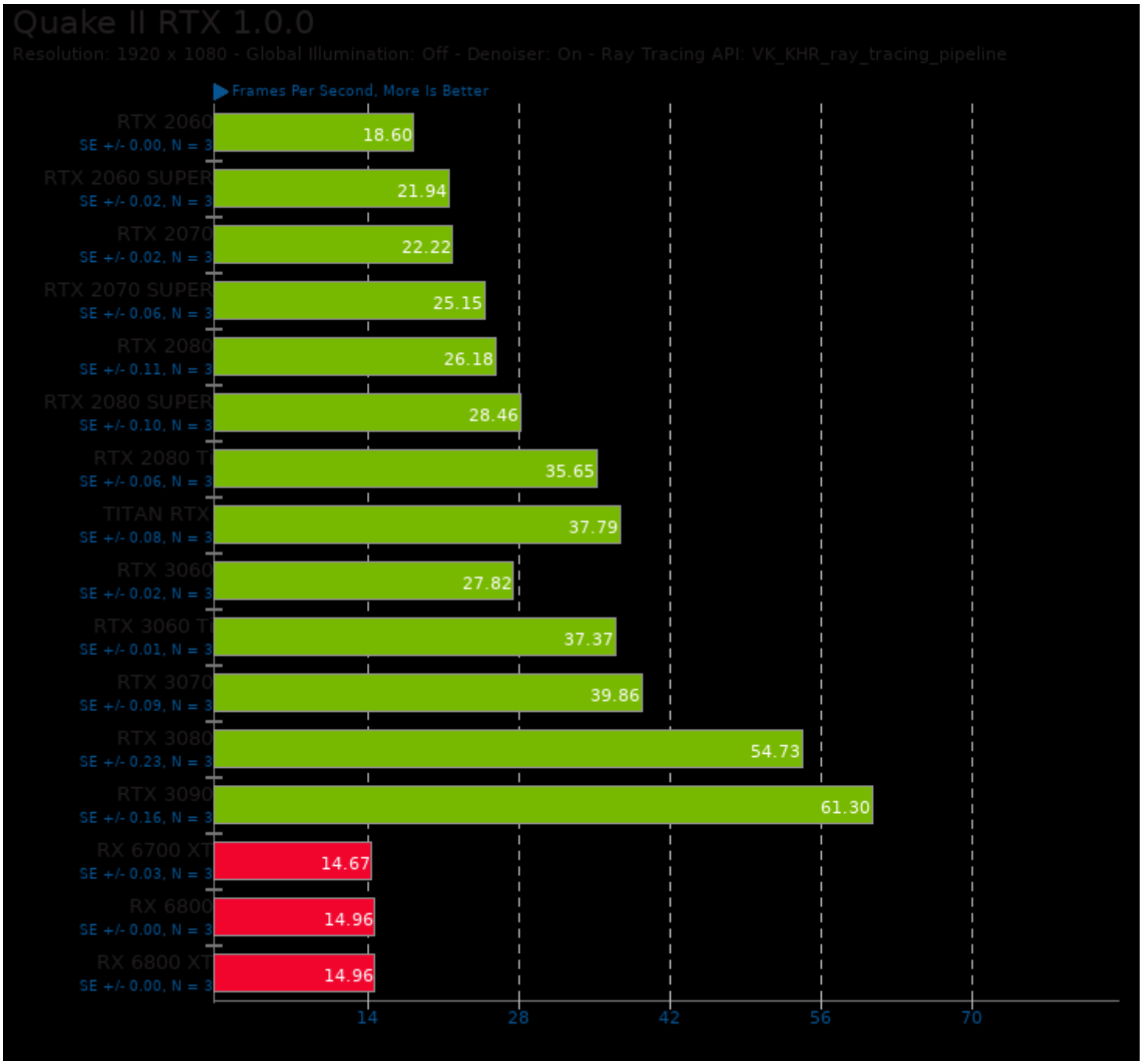
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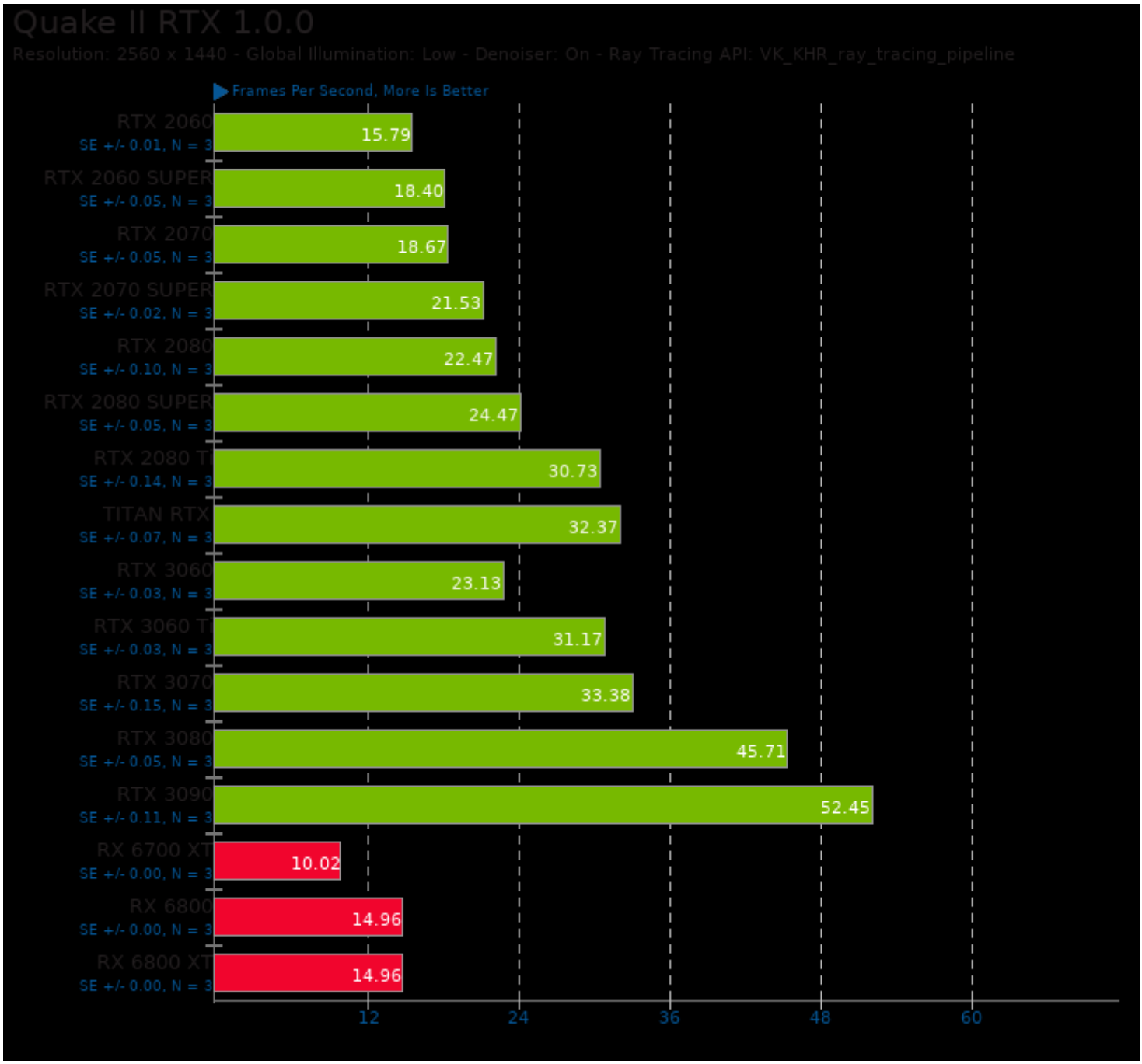
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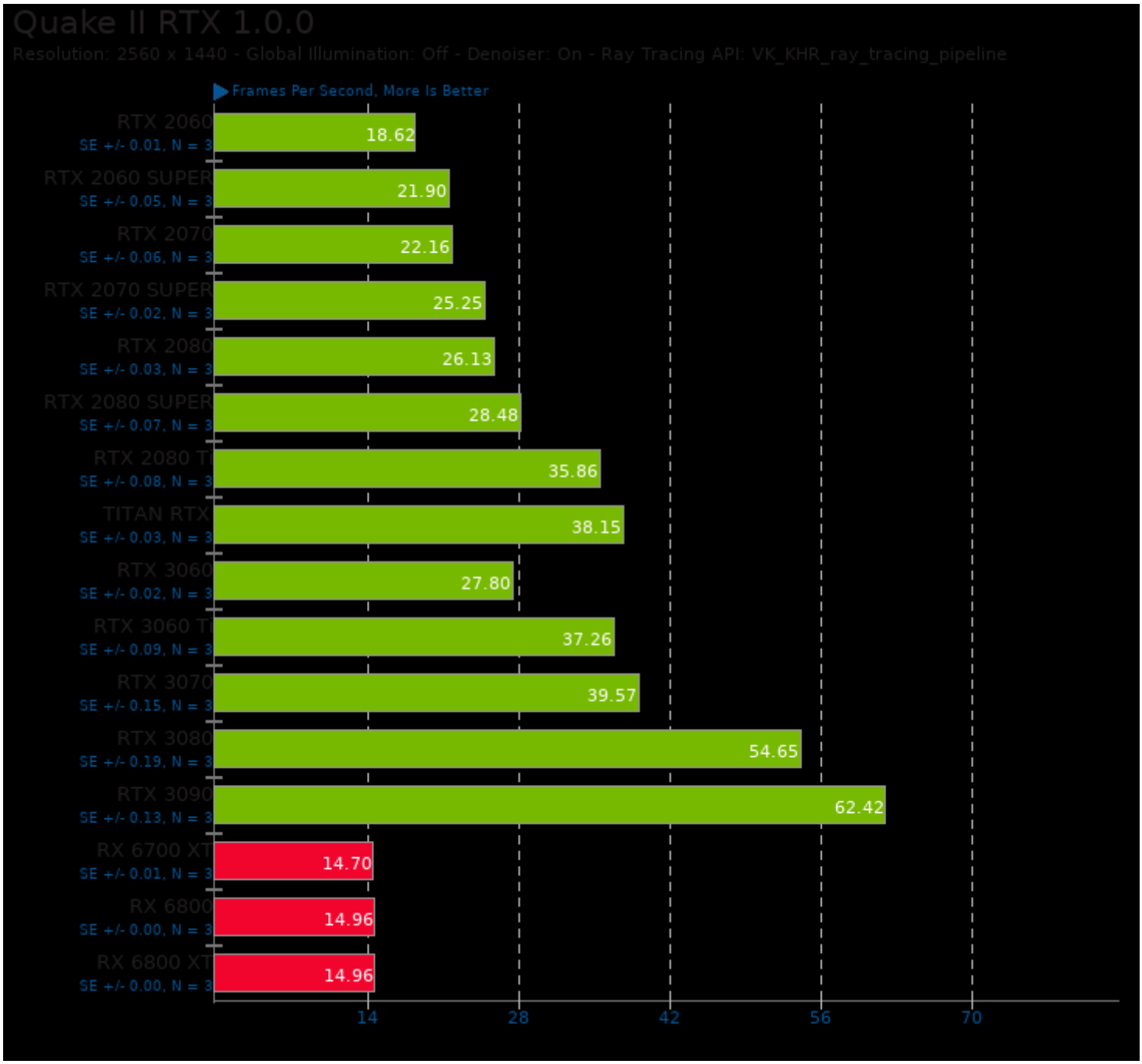
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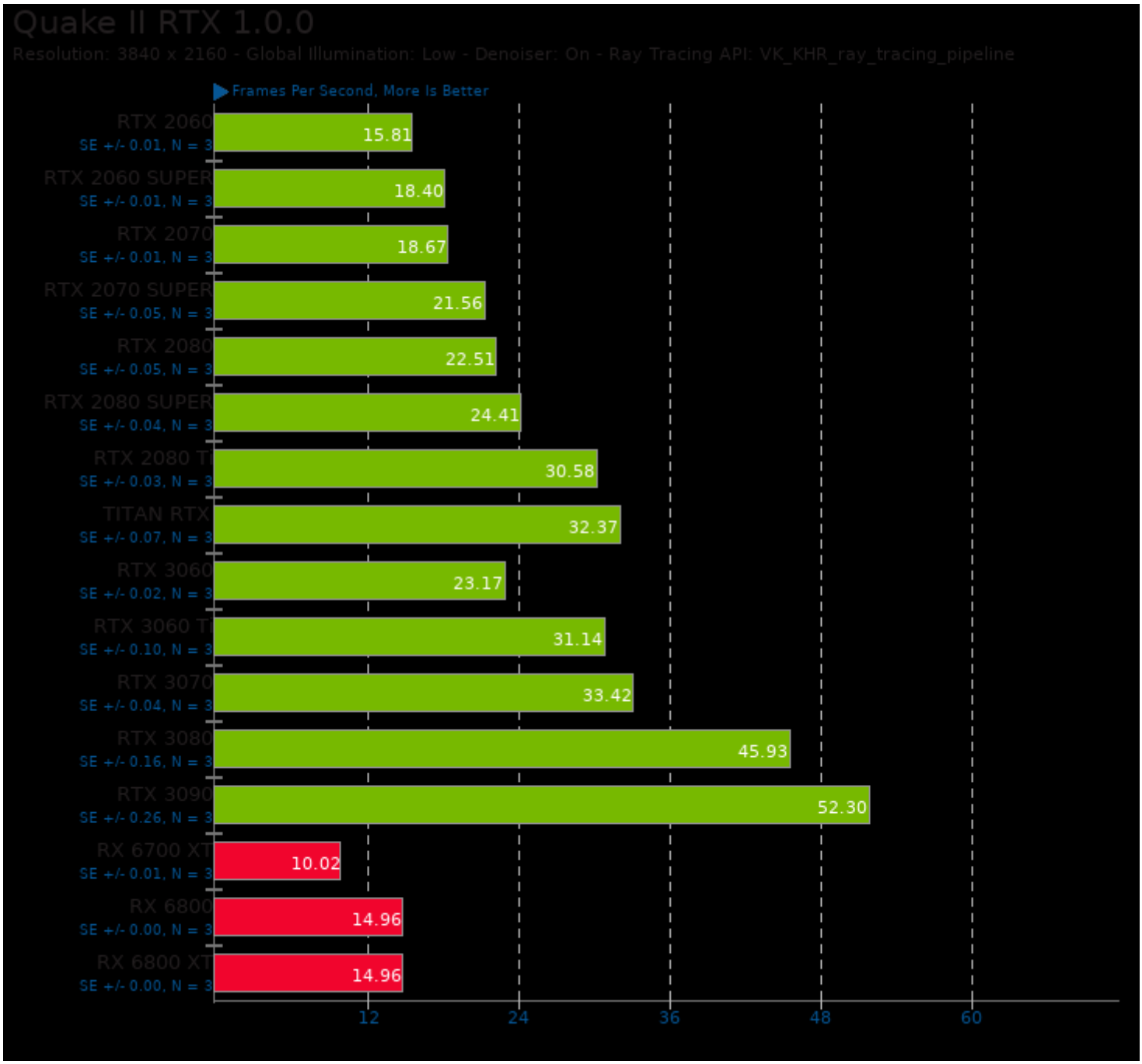
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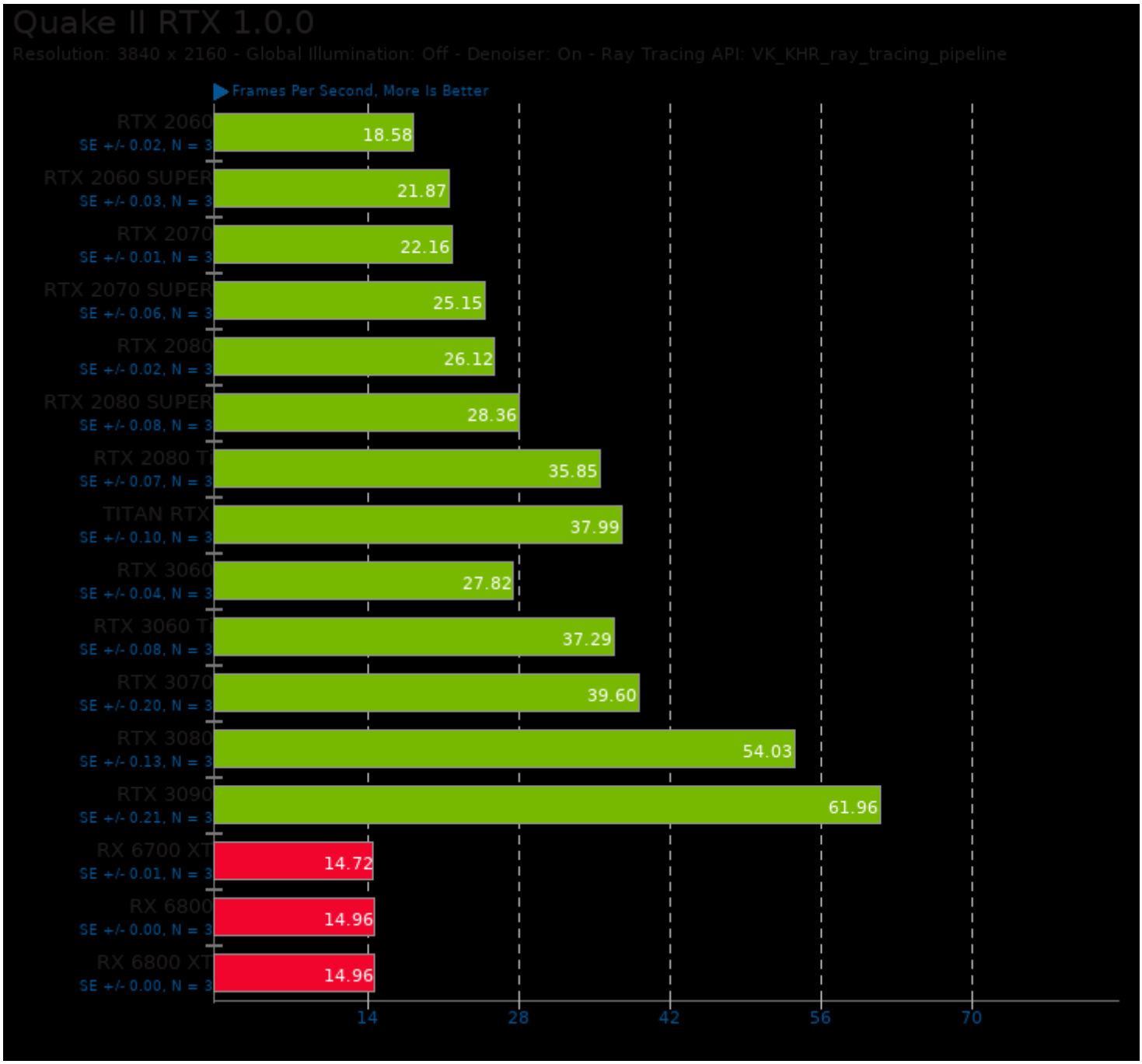
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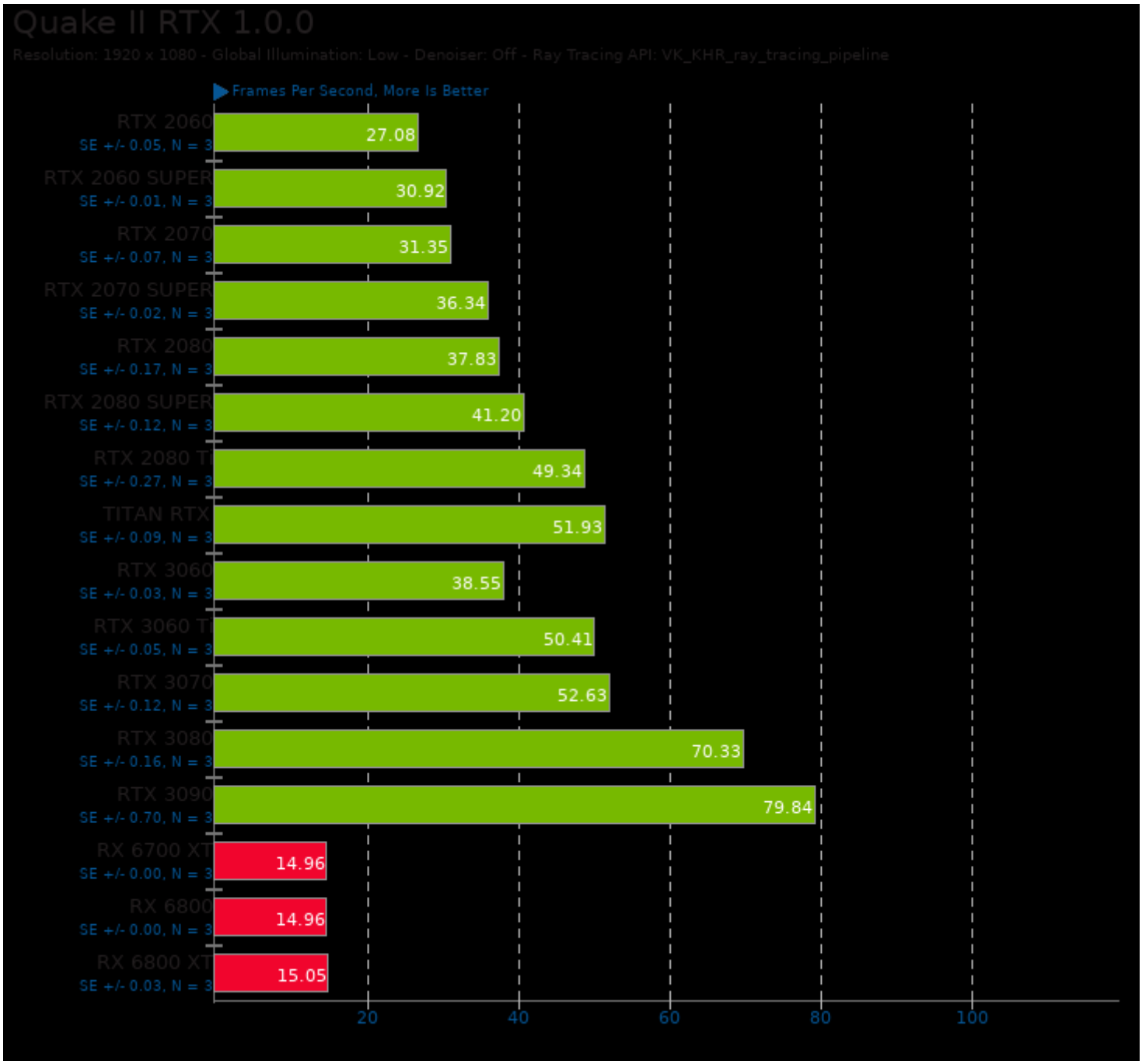
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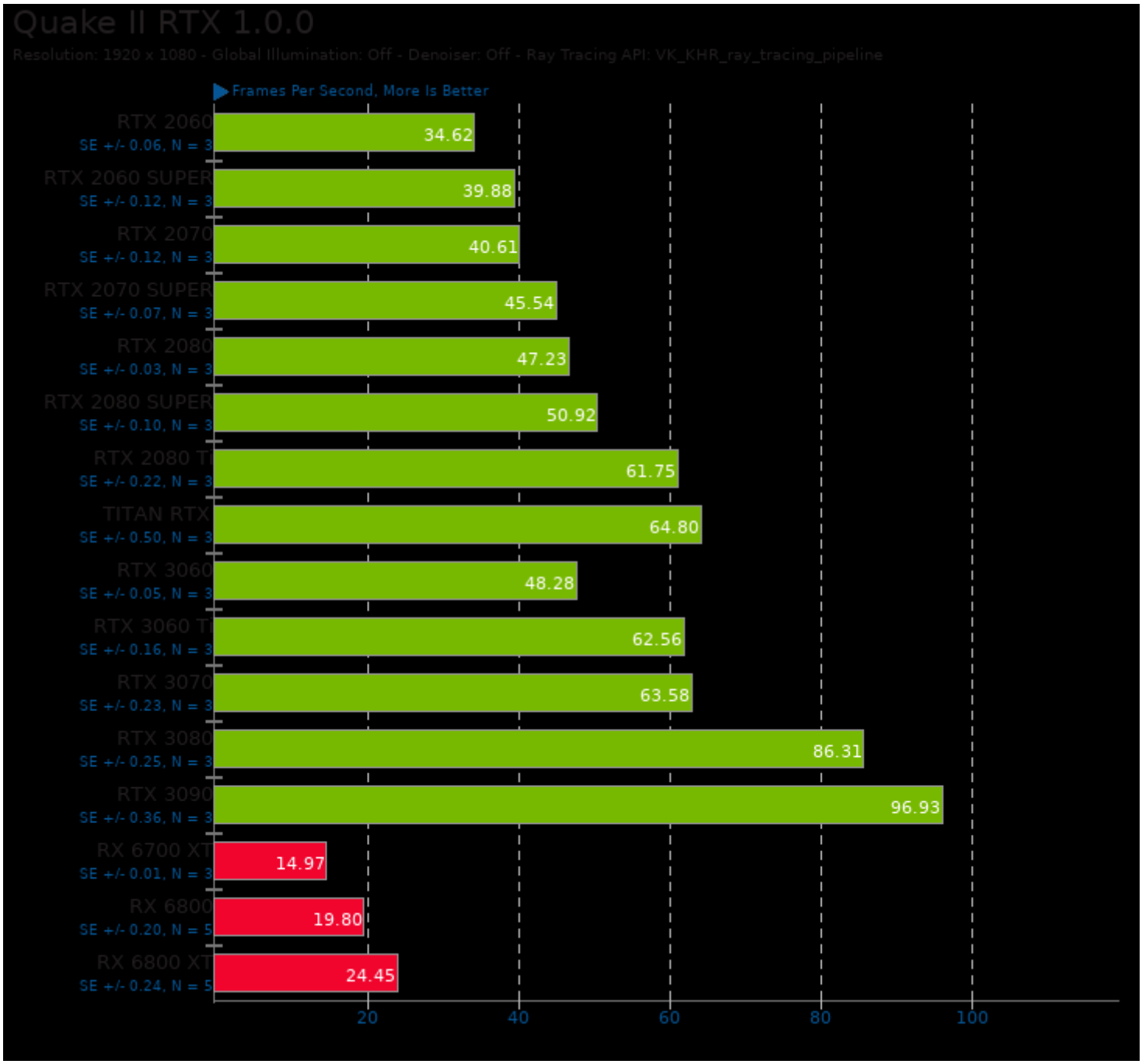
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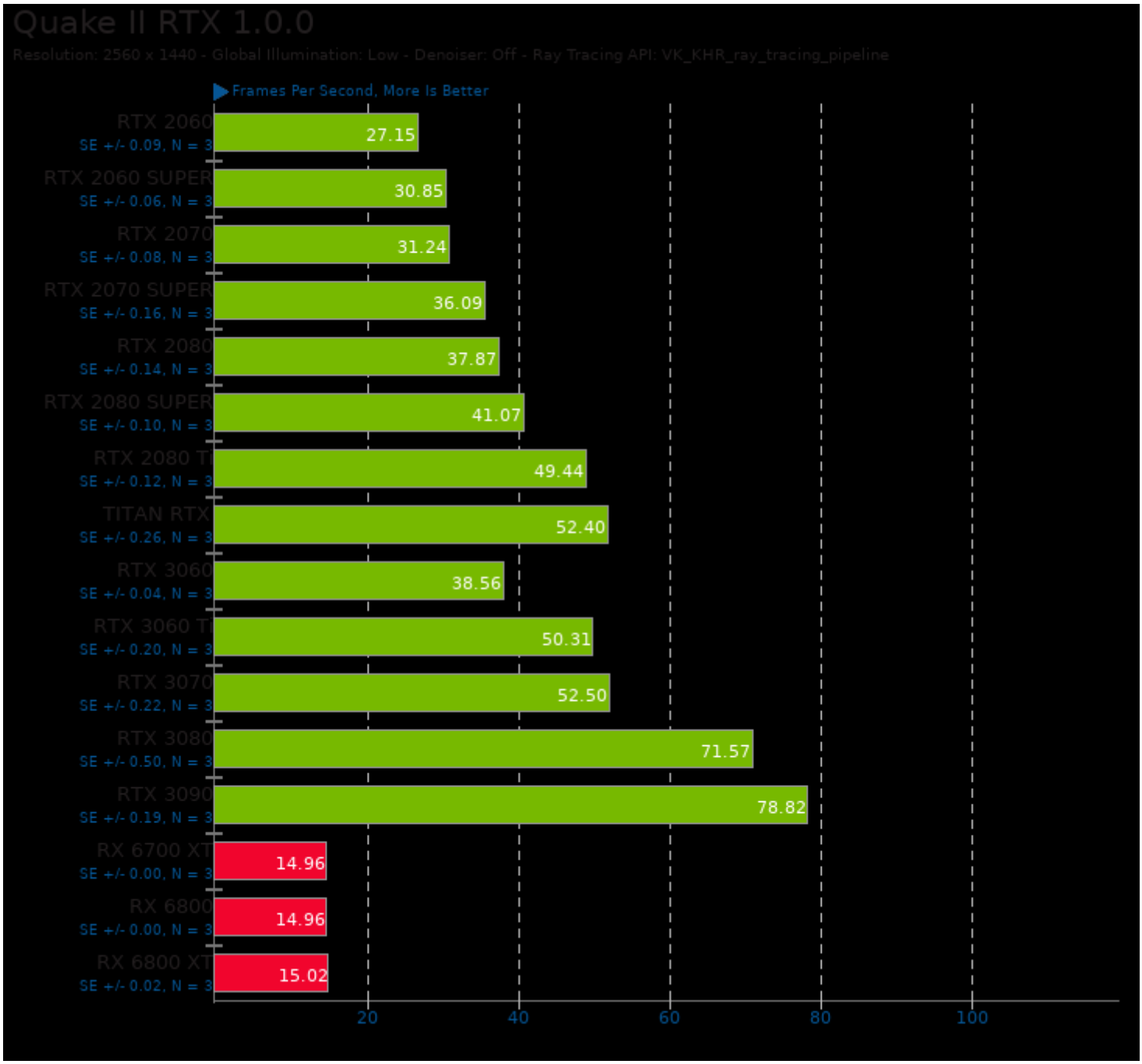
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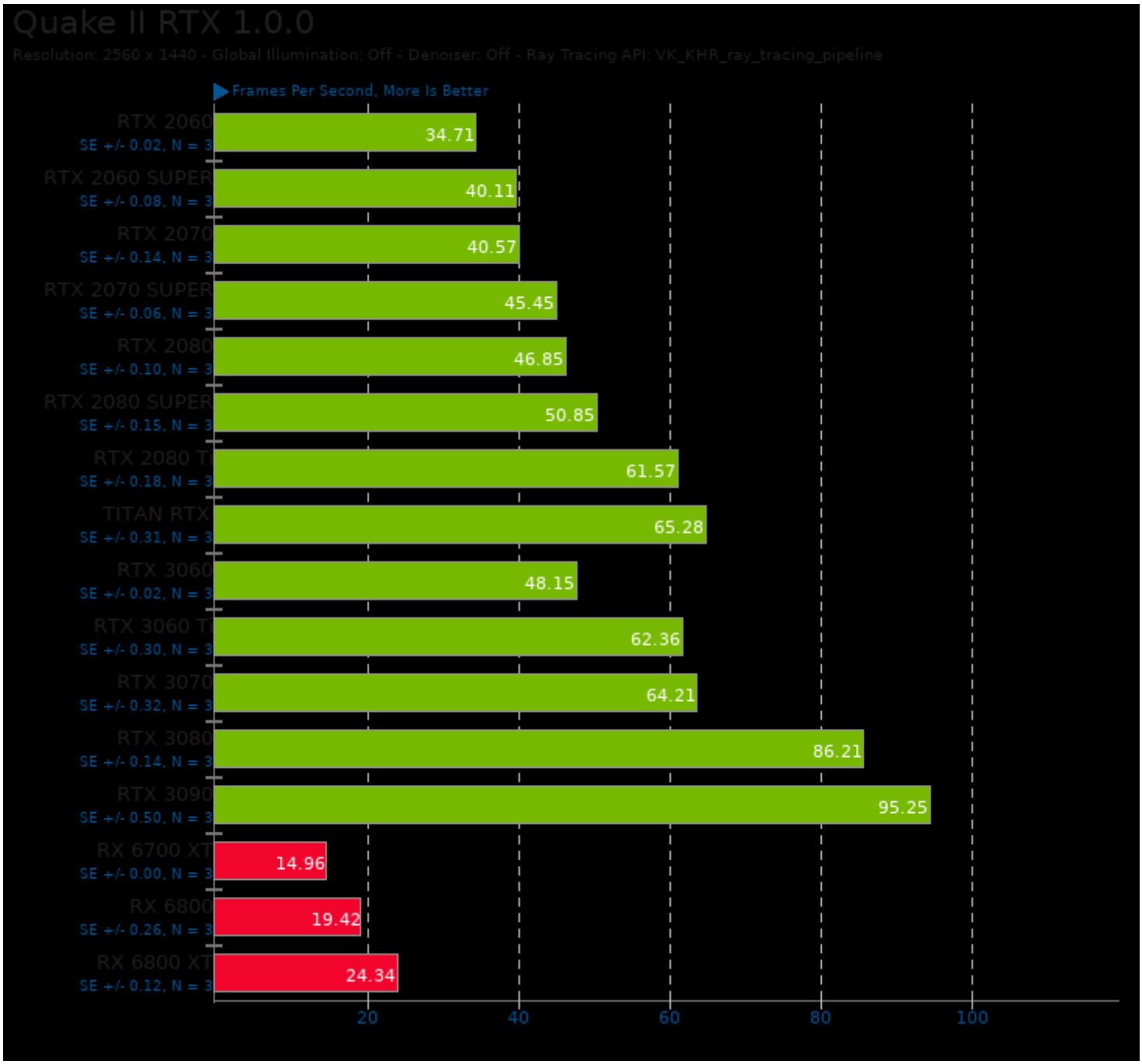
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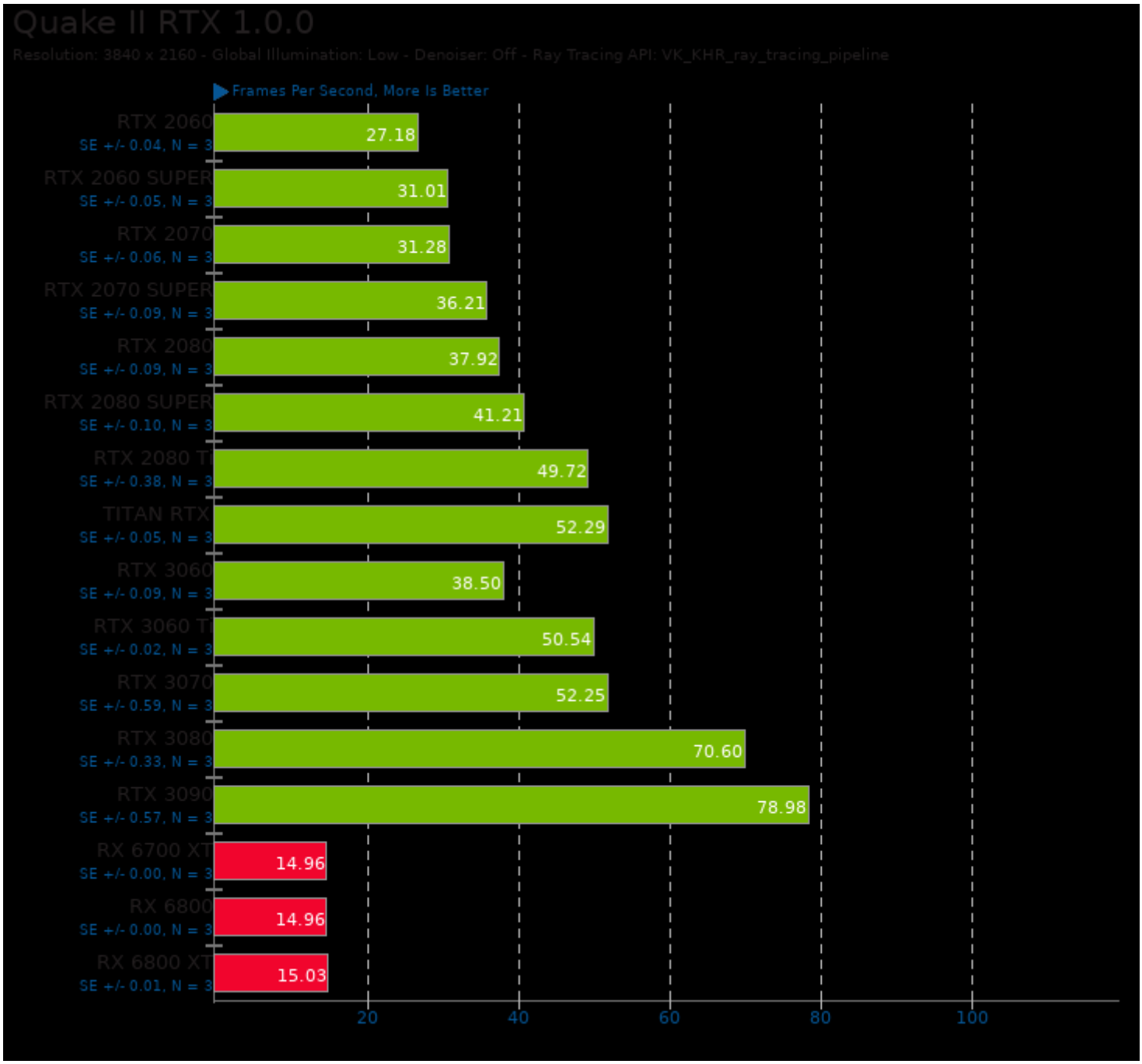
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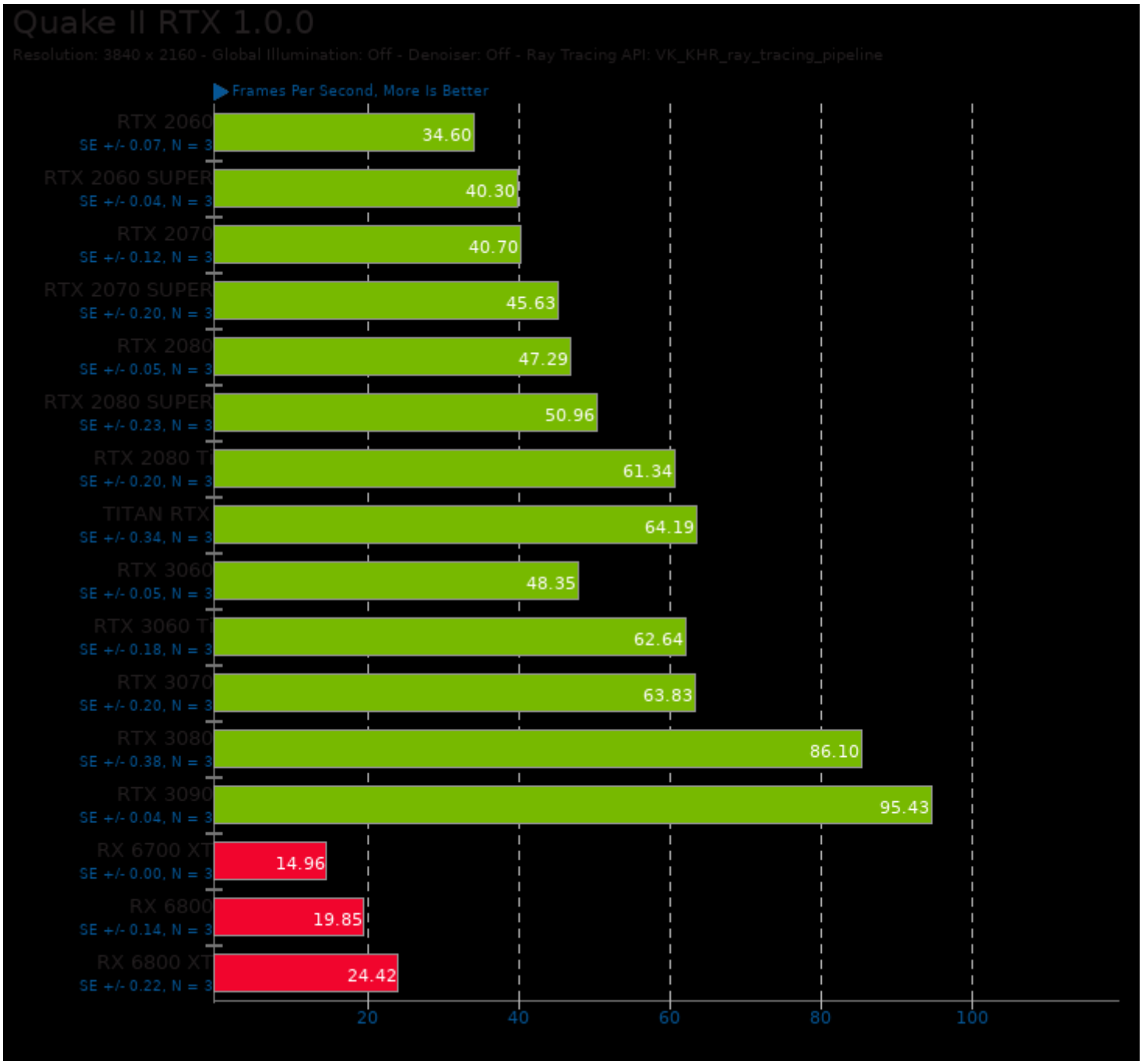
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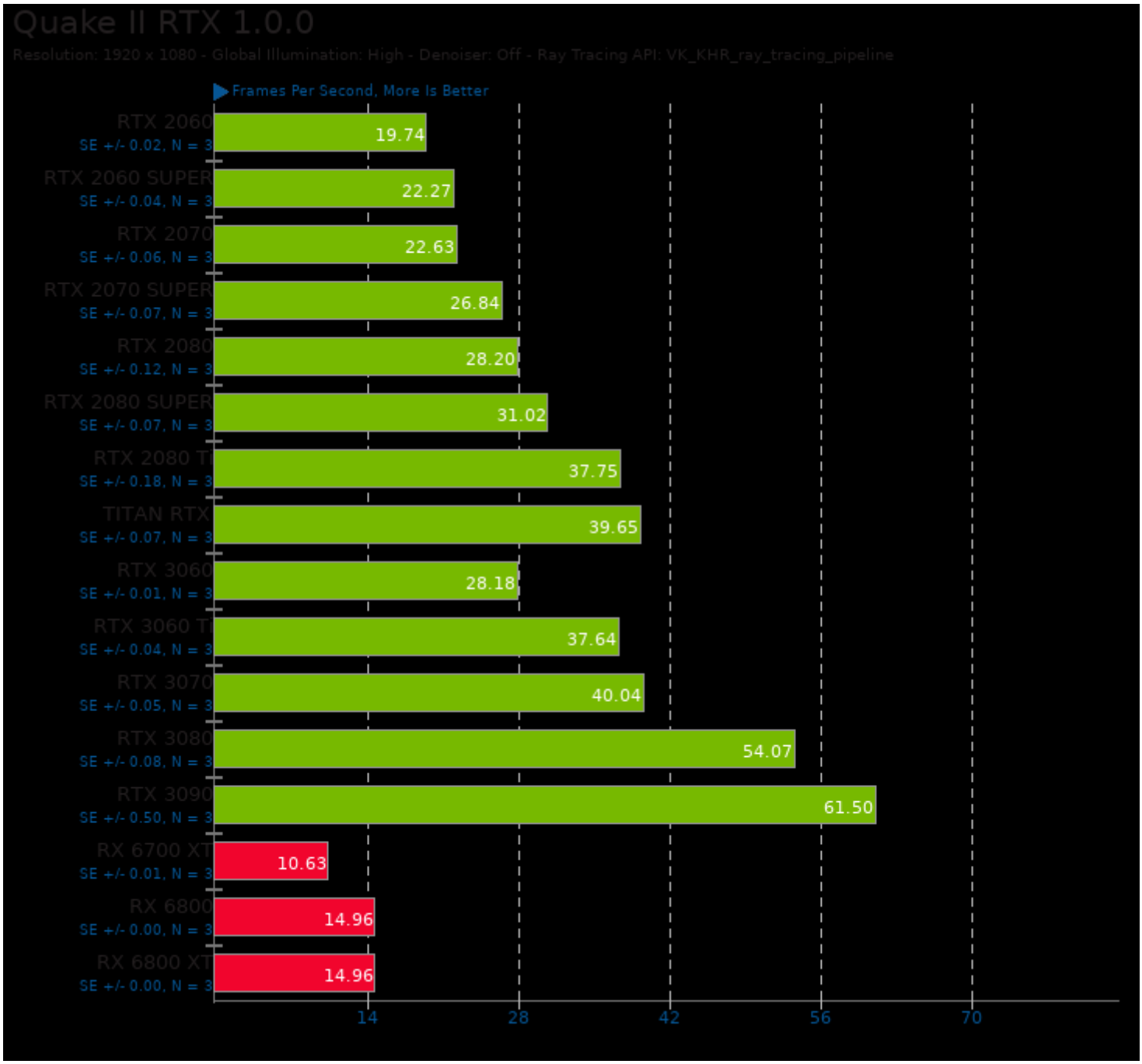
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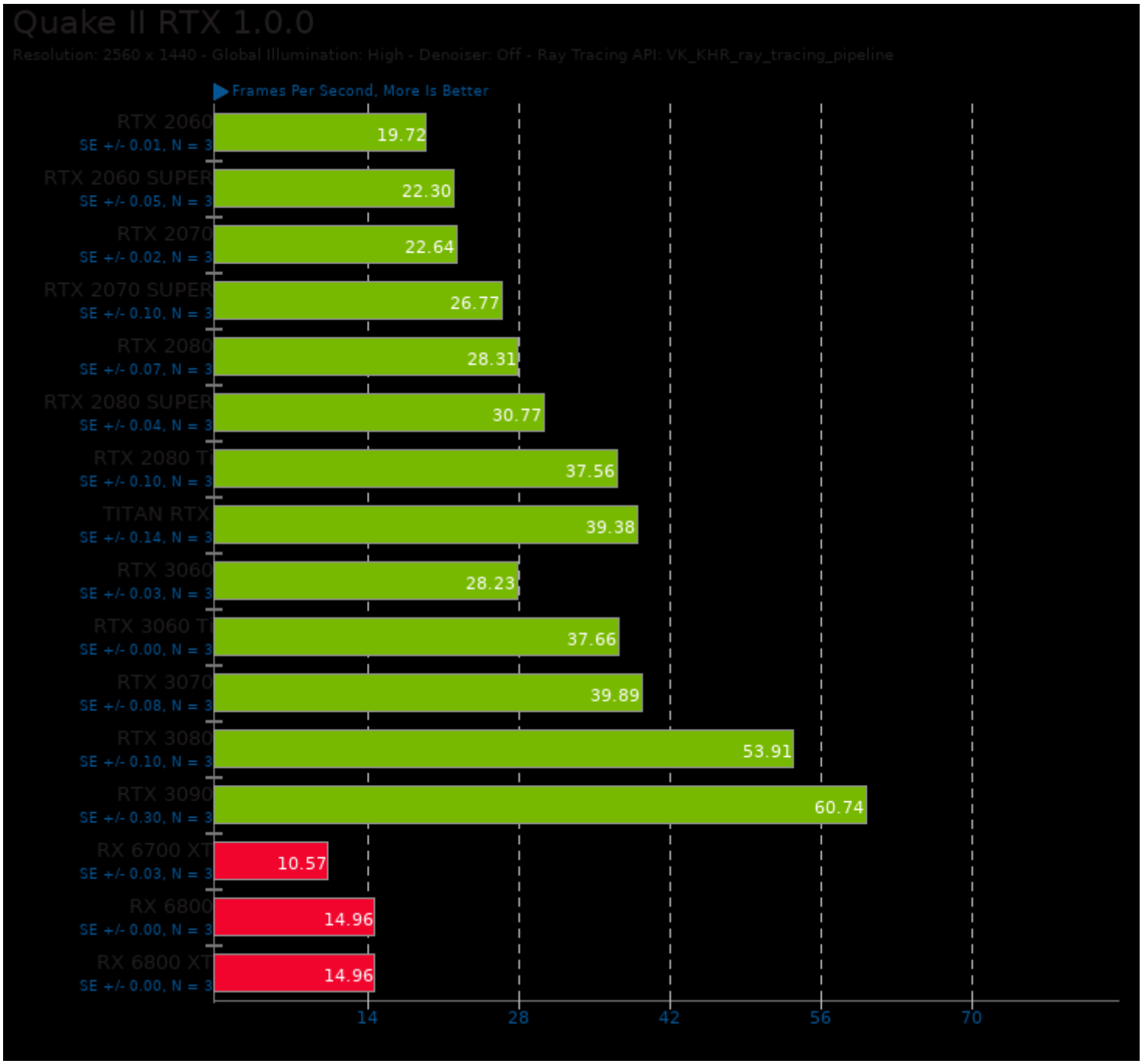
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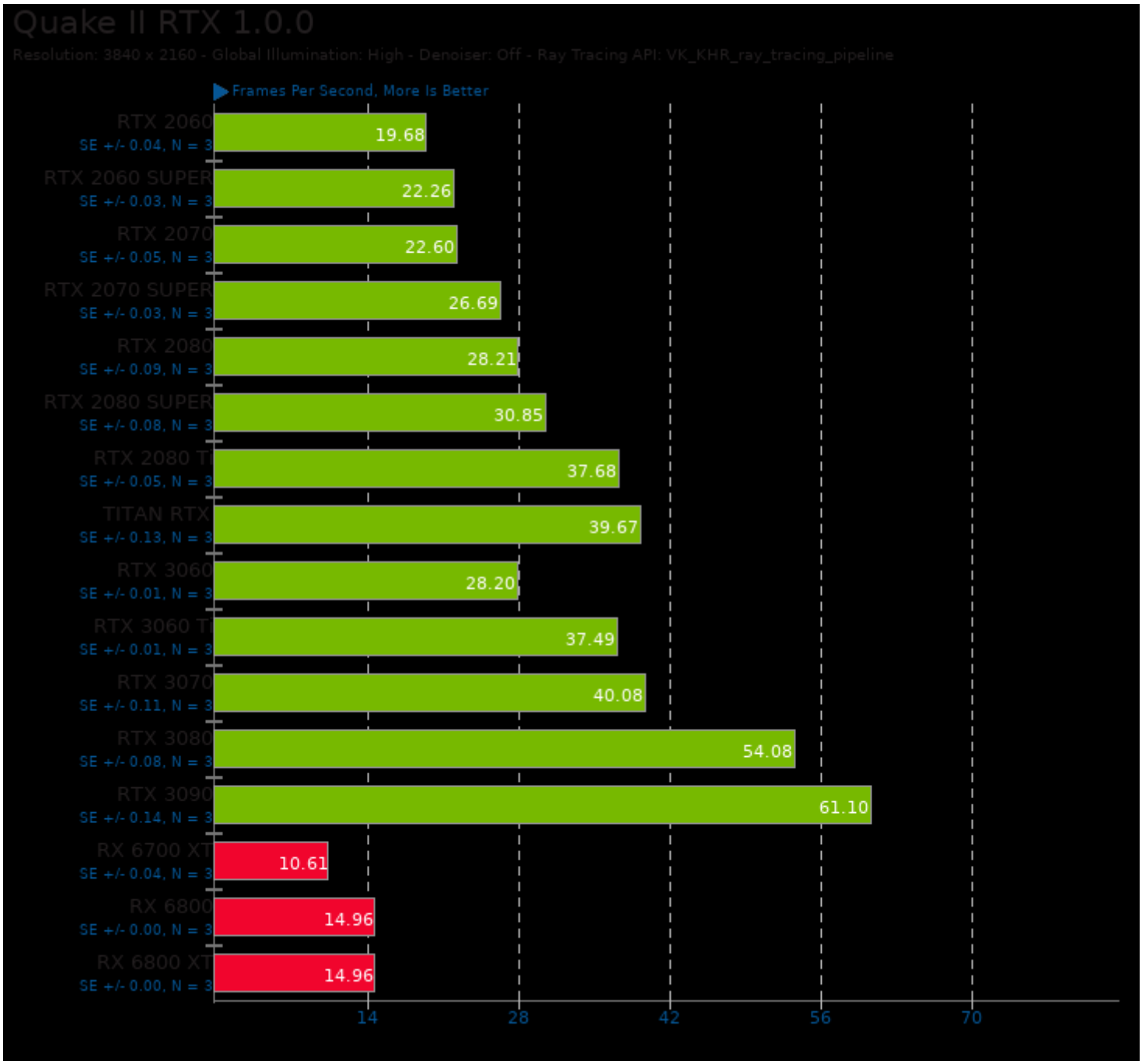
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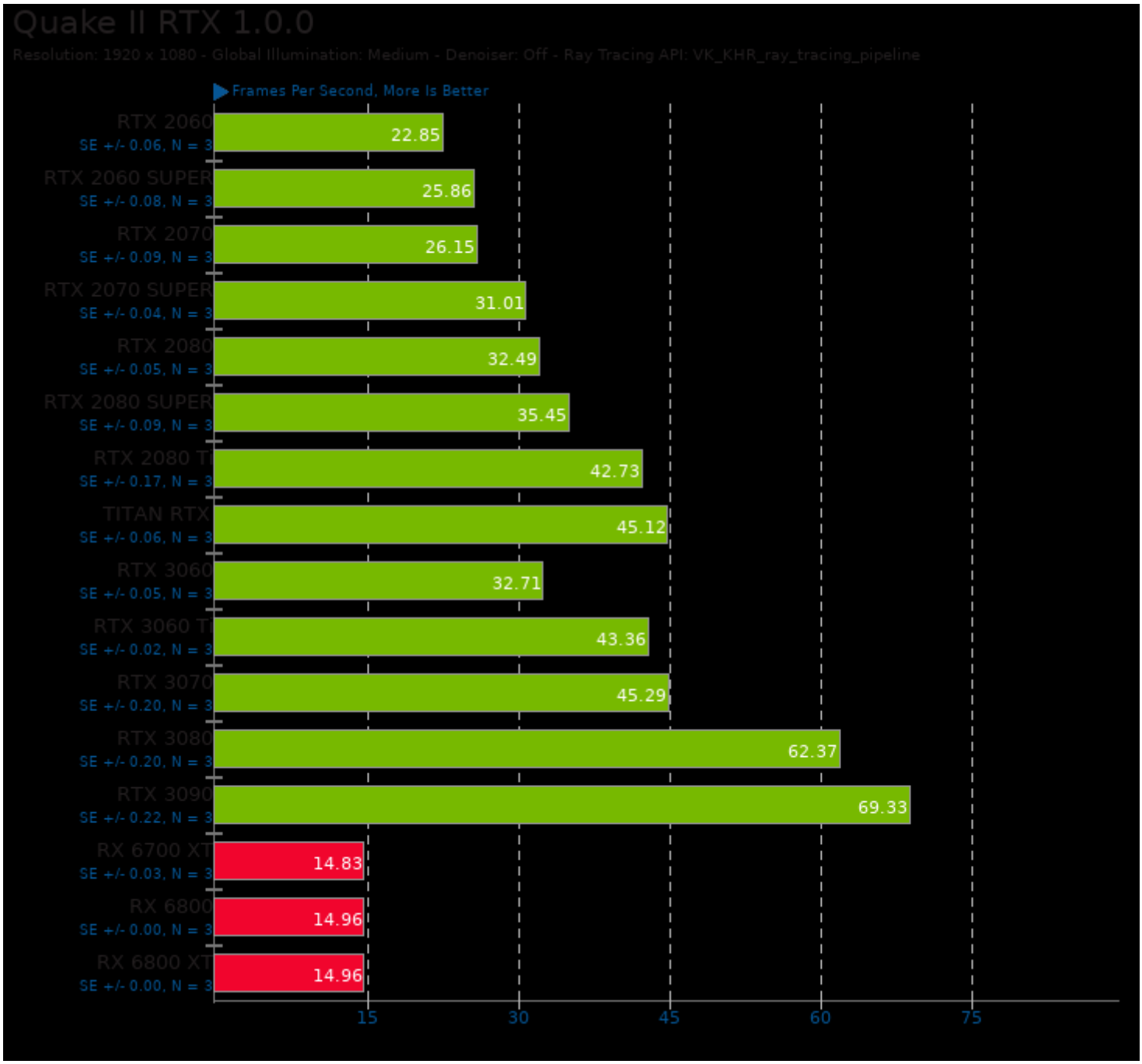
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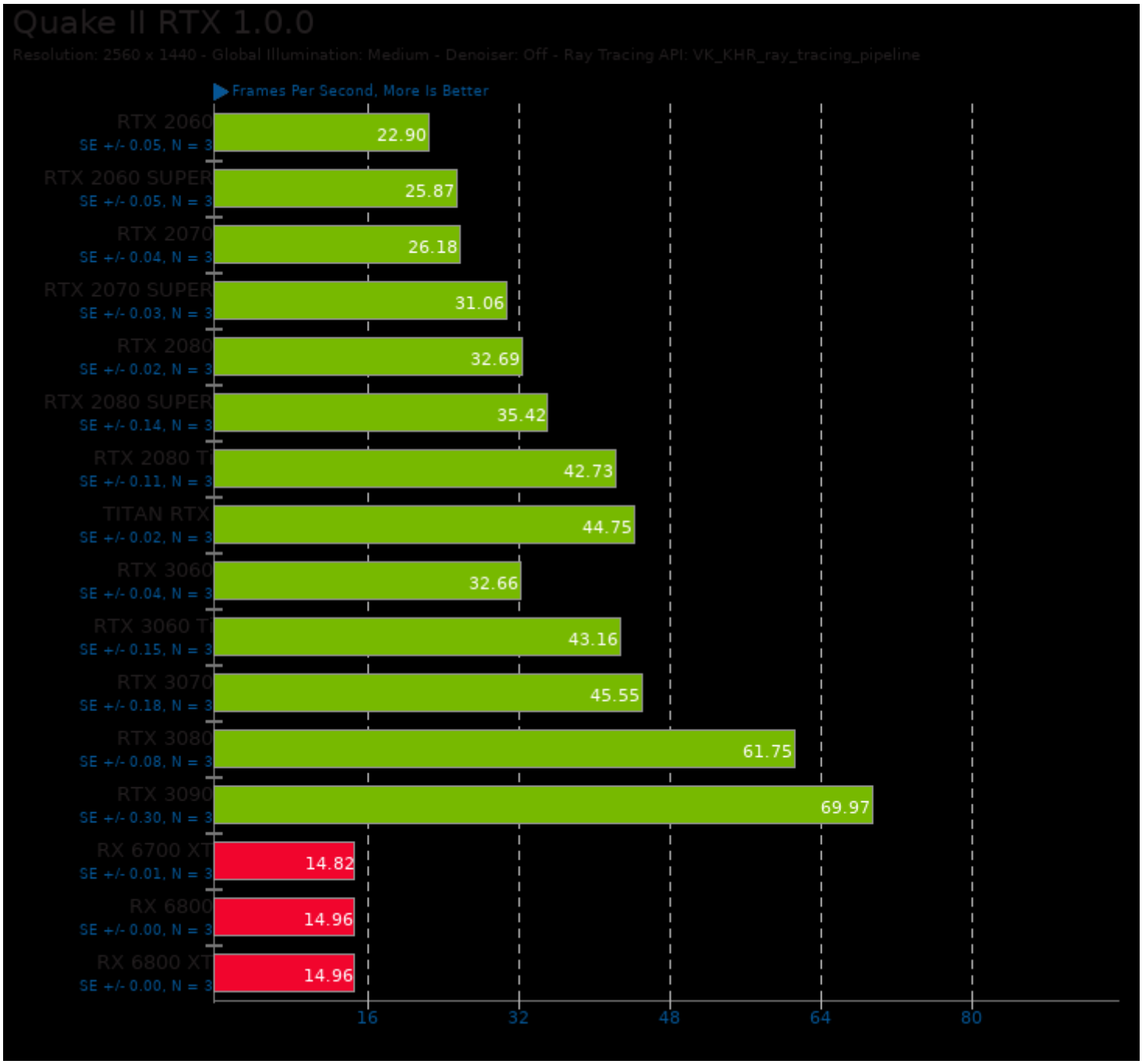
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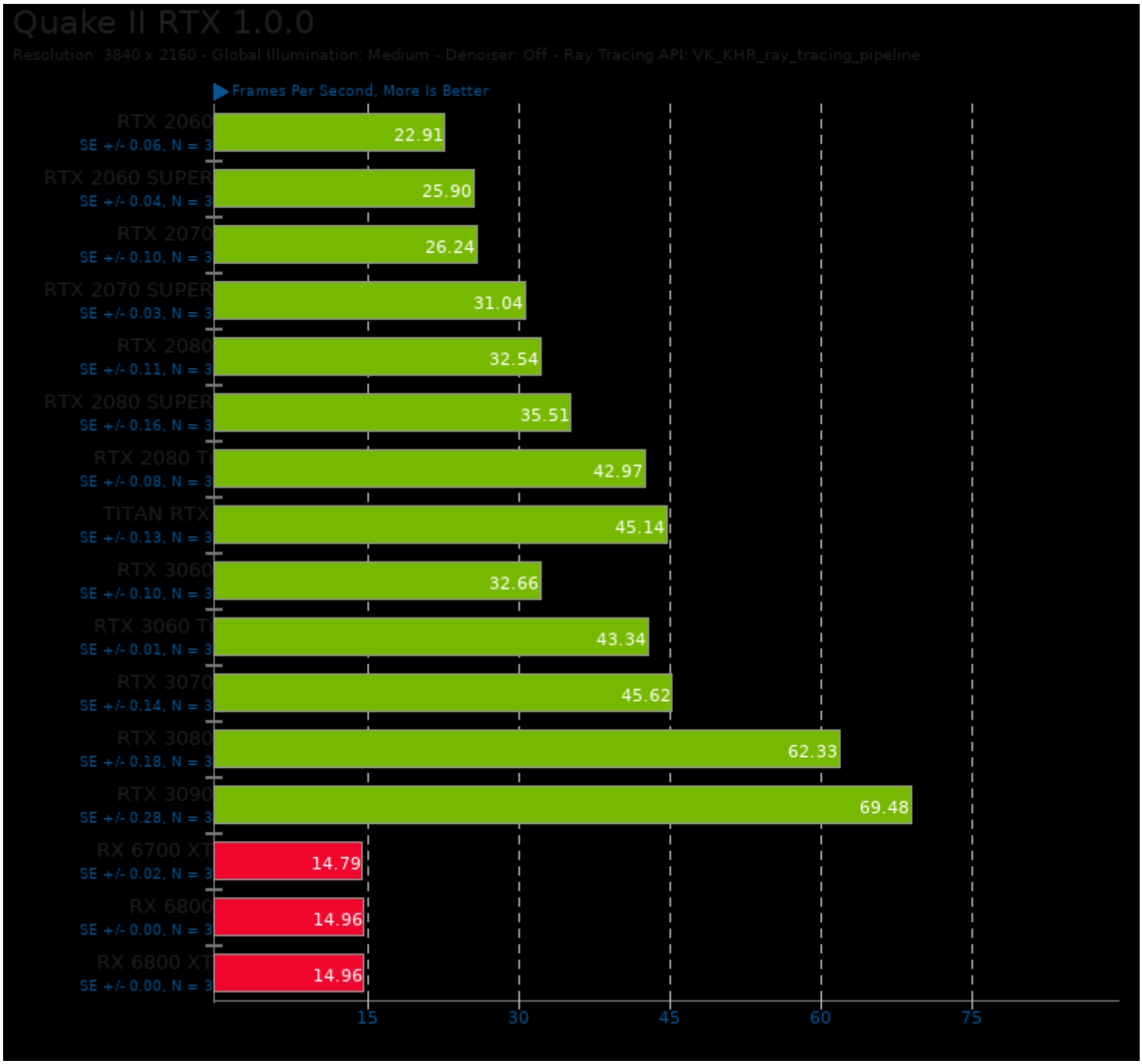


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