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Linux Gaming 1080p Feb 2021

Tests for a future article by Michael Larabel.

Automated Executive Summary

RX 6800 XT had the most wins, coming in first place for 66% of the tests.

Based on the geometric mean of all complete results, the fastest (RX 6800 XT) was 1.565x the speed of the slowest (RTX 2070 SUPER). RX 6800 was 0.907x the speed of RX 6800 XT, RTX 3080 was 0.967x the speed of RX 6800, RTX 2080 Ti was 0.929x the speed of RTX 3080, RTX 3060 Ti was 0.918x the speed of RTX 2080 Ti, Radeon VII was 0.937x the speed of RTX 3060 Ti, RTX 2080 SUPER was 0.975x the speed of Radeon VII, RX 5700 XT was 0.965x the speed of RTX 2080 SUPER, RTX 2070 SUPER was 0.97x the speed of RX 5700 XT.

Test Systems:

RTX 2070 SUPER

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR

VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: NVIDIA GeForce RTX 2070 SUPER 8GB (495/810MHz), Audio: NVIDIA TU104 HD Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: NVIDIA 460.39, OpenGL: 4.6.0, OpenCL: OpenCL 1.2 CUDA 11.2.136, Vulkan: 1.2.155, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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 2080 SUPER

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: NVIDIA GeForce RTX 2080 SUPER 8GB (495/810MHz), Audio: NVIDIA TU104 HD Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: NVIDIA 460.39, OpenGL: 4.6.0, OpenCL: OpenCL 1.2 CUDA 11.2.136, Vulkan: 1.2.155, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: NVIDIA GeForce RTX 2080 Ti 11GB (420/405MHz), Audio: NVIDIA TU102 HD Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: NVIDIA 460.39, OpenGL: 4.6.0, OpenCL: OpenCL 1.2 CUDA 11.2.136, Vulkan: 1.2.155, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: NVIDIA GeForce RTX 3060 Ti 8GB (1665/7000MHz), Audio: NVIDIA Device 228b, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9,

Display Driver: NVIDIA 460.39, OpenGL: 4.6.0, OpenCL: OpenCL 1.2 CUDA 11.2.136, Vulkan: 1.2.155, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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 3080

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: NVIDIA GeForce RTX 3080 10GB (1710/9501MHz), Audio: NVIDIA Device 1aef, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: NVIDIA 460.39, OpenGL: 4.6.0, OpenCL: OpenCL 1.2 CUDA 11.2.136, Vulkan: 1.2.155, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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 5700 XT

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 8GB (2100/875MHz), Audio: AMD Navi 10 HDMI Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.11.0-051100rc5daily20210129-generic (x86_64) 20210128, Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: amd, OpenGL: 4.6 Mesa 21.1.0-devel (git-824ae64 2021-02-01 groovy-oibaf-ppa) (LLVM 11.0.1), Vulkan: 1.2.145, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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

Radeon VII

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: AMD Radeon VII 16GB (1801/1000MHz), Audio: AMD Vega 20 HDMI Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.11.0-051100rc5daily20210129-generic (x86_64) 20210128, Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: amd, OpenGL: 4.6 Mesa 21.1.0-devel (git-824ae64 2021-02-01 groovy-oibaf-ppa) (LLVM 11.0.1), Vulkan: 1.2.145, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201009
Graphics Notes: GLAMOR
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 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: AMD SIENNA_CICHLID 16GB (2475/1000MHz), Audio: AMD Device ab28, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.10, Kernel: 5.11.0-051100rc5daily20210129-generic (x86_64) 20210128, Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: amd, OpenGL: 4.6 Mesa 21.1.0-devel (git-824ae64 2021-02-01 groovy-oibaf-ppa) (LLVM 11.0.1), Vulkan: 1.2.145, Compiler: GCC 10.2.0 + Clang 11.0.1-1~oibaf~g, File-System: ext4, Screen Resolution: 1920x1080

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

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	RTX 2070 SUPER	RTX 2080 SUPER	RTX 2080 Ti	RTX 3060 Ti	RTX 3080	RX 5700 XT	Radeon VII	RX 6800	RX 6800 XT
Basemark GPU - Vulkan - 1920 x 1080 - High (FPS)	219.66	242.75	317.48	272.00	**388.07**	**205.13**	217.13	251.90	309.49
Normalized	56.6%	62.55%	81.81%	70.09%	100%	52.86%	55.95%	64.91%	79.75%
Standard Deviation	0%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%	0.7%	0.1%

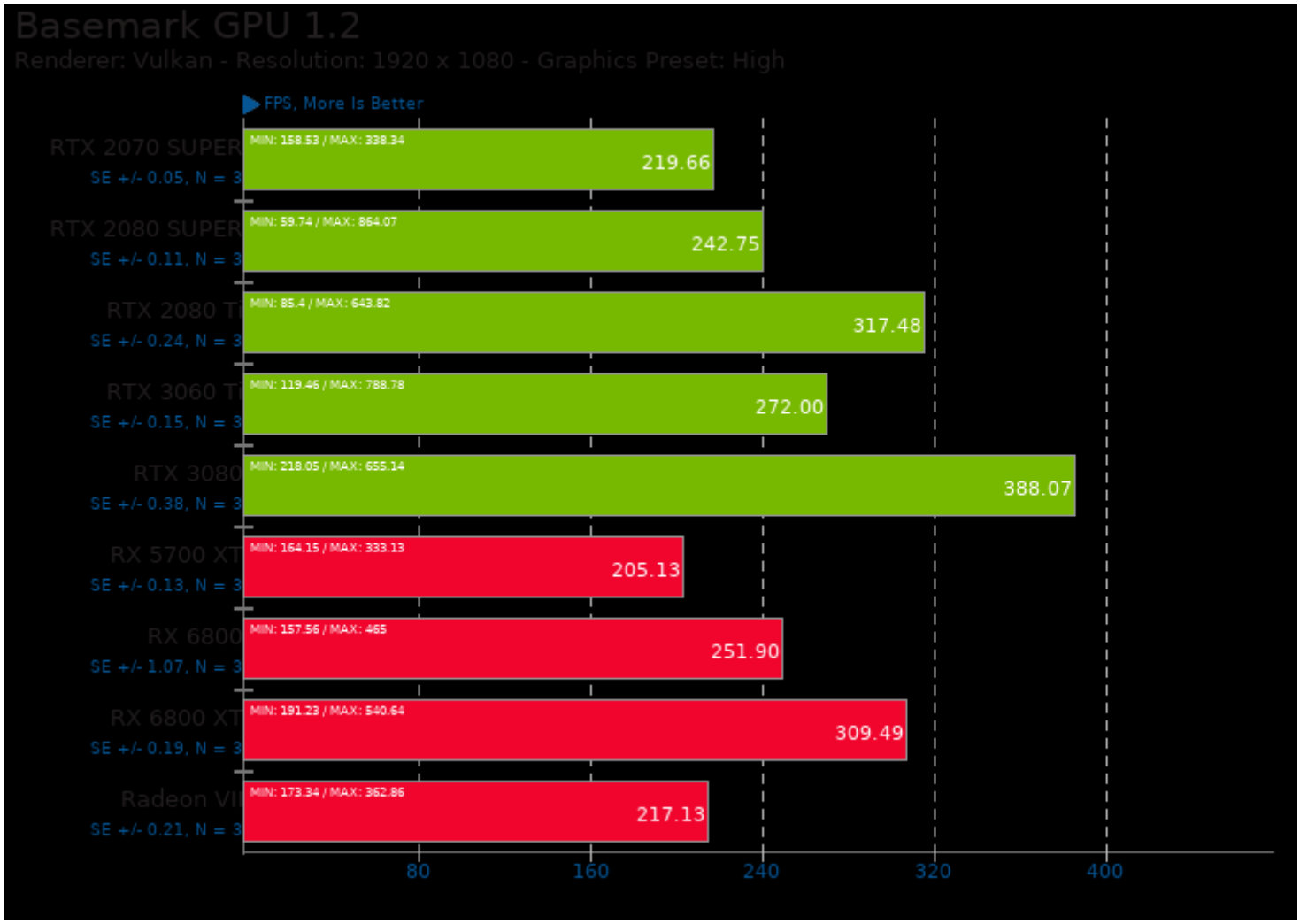
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Batman: Arkham Knight - 1920 x 1080 - High (FPS)	192.77	200.44	232.85	224.12	230.86	203.94	229.58	247.12	255.36
Normalized	75.49%	78.49%	91.18%	87.77%	90.41%	79.86%	89.9%	96.77%	100%
Standard Deviation	0.8%	0.9%	2.2%	1.2%	1.6%	1.9%	1.9%	2.4%	2.5%
HITMAN - 1920 x 1080 - Ultra (FPS)	91.92	95.73	105.02	111.35	101.29	115.46	118.47	119.22	118.65
Normalized	77.1%	80.3%	88.09%	93.4%	84.96%	96.85%	99.37%	100%	99.52%
Standard Deviation	0.2%	0.4%	0.6%	0.9%	0.2%	0.8%	0.5%	2.2%	1.1%
HITMAN 2 - 1920 x 1080 - Ultra (FPS)	110.76	115.54	126.16	126.83	117.92	124.01	126.74	124.25	126.67
Normalized	87.33%	91.1%	99.47%	100%	92.97%	97.78%	99.93%	97.97%	99.87%
Standard Deviation	0.1%	0.3%	0.1%	1%	1.4%	0.4%	1.2%	1.4%	1.3%
Shadow of the Tomb Raider - 1920 x 1080 - Highest - TAA	128.4	144.8	177.7	156.4	196.1	131.5	139.7	199.7	230.7
Normalized	55.66%	62.77%	77.03%	67.79%	85%	57%	60.55%	86.56%	100%
Standard Deviation	0.2%	0%	0.1%	0%	0.2%	0.1%	0.1%	0.1%	0.5%
Shadow of the Tomb Raider - 1920 x 1080 - Highest - SMAA	128.8	144.4	178.1	156.3	196.1	131.5	139.7	200.2	230.1
Normalized	55.98%	62.76%	77.4%	67.93%	85.22%	57.15%	60.71%	87.01%	100%
Standard Deviation	0.3%	0.6%	0.1%	0.1%	0.4%	0%	0.1%	0%	0.4%
The Talos Principle - Vulkan - 1920 x 1080 (FPS)	241.1	261.9	301.8	287.2	339.1	255.9	269.4	365.9	376.7
Normalized	64%	69.52%	80.12%	76.24%	90.02%	67.93%	71.52%	97.13%	100%
Standard Deviation	1.2%	0.4%	0.9%	0.2%	0.1%	0.3%	0.2%	0.3%	0.2%
Total War: Three Kingdoms - 1920 x 1080 - Ultra - Battle Benchmark (FPS)	61.6	65.6	80.5	65.1	74.4	73.8	79.5	117.5	136.4
Normalized	45.16%	48.09%	59.02%	47.73%	54.55%	54.11%	58.28%	86.14%	100%
Standard Deviation	1.3%	0.7%	0.2%	0.8%	0.8%	1.1%	0.3%	1.1%	1.2%
Unigine Heaven - 1920 x 1080 - Fullscreen - OpenGL (FPS)	197.278	214.069	240.548	214.991	269.812	168.385	183.569	281.826	312.617
Normalized	63.11%	68.48%	76.95%	68.77%	86.31%	53.86%	58.72%	90.15%	100%
Standard Deviation	0.3%	1.2%	4.9%	0.3%	2.4%	0.3%	0%	0.3%	0.1%
Unigine Superposition - 1920 x 1080 - Fullscreen - High - OpenGL (FPS)	90.1	99.5	122.9	104.0	141.4	83	86.0	139.7	165.5
Normalized	54.44%	60.12%	74.26%	62.84%	85.44%	50.15%	51.96%	84.41%	100%
Standard Deviation	0.1%	0.1%	0.2%	0.1%	0.8%		0.1%	0%	0.1%

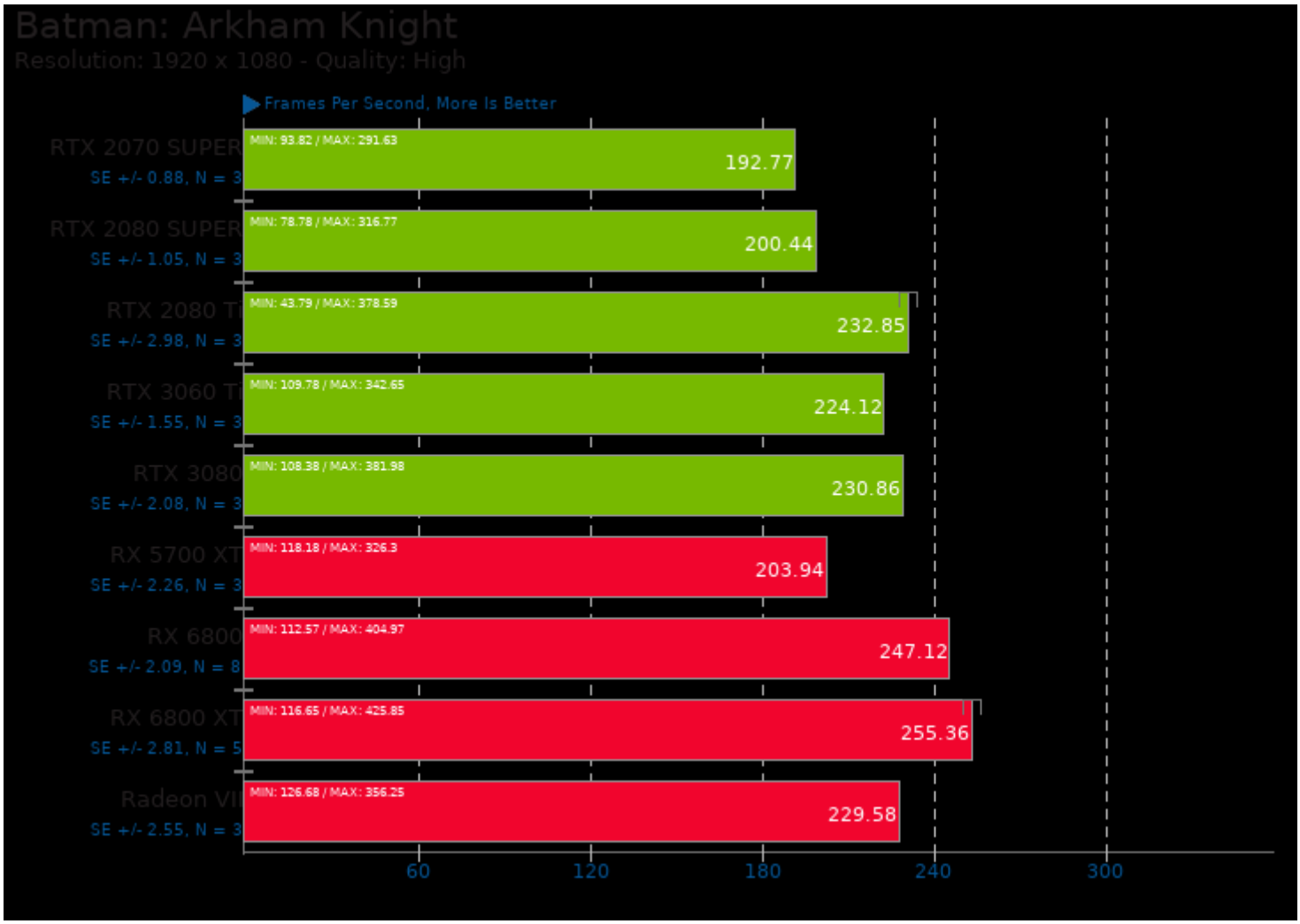
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Unigine Superposition - 1920 x 1080 - Fullscreen - Ultra - OpenGL (FPS)	38.1	41.6	55.2	48.0	67.7	**34.6**	37.8	57.9	**70.3**
Normalized	54.2%	59.17%	78.52%	68.28%	96.3%	49.22%	53.77%	82.36%	100%
Standard Deviation	0.2%	0.1%	0.1%	0.1%	0.1%	0%	0.3%	0%	0%
Unigine Valley - 1920 x 1080 - Fullscreen - OpenGL (FPS)	168.426	**155.953**	179.317	185.880	199.933	184.145	192.859	**222.769**	221.008
Normalized	75.61%	70.01%	80.49%	83.44%	89.75%	82.66%	86.57%	100%	99.21%
Standard Deviation	1%	1.2%	10.1%	0.2%	2.3%	0.1%	0.4%	0.6%	0.8%

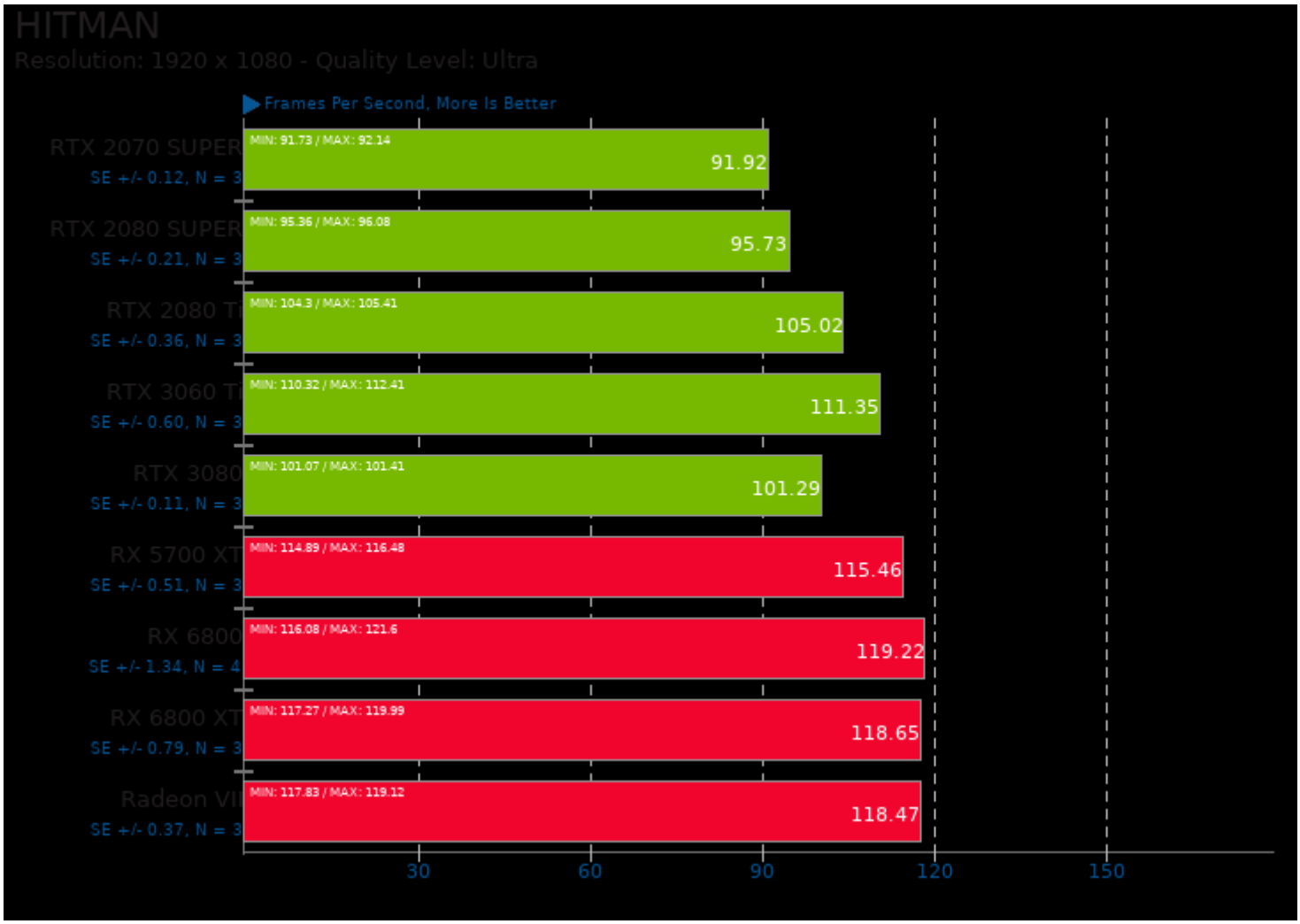
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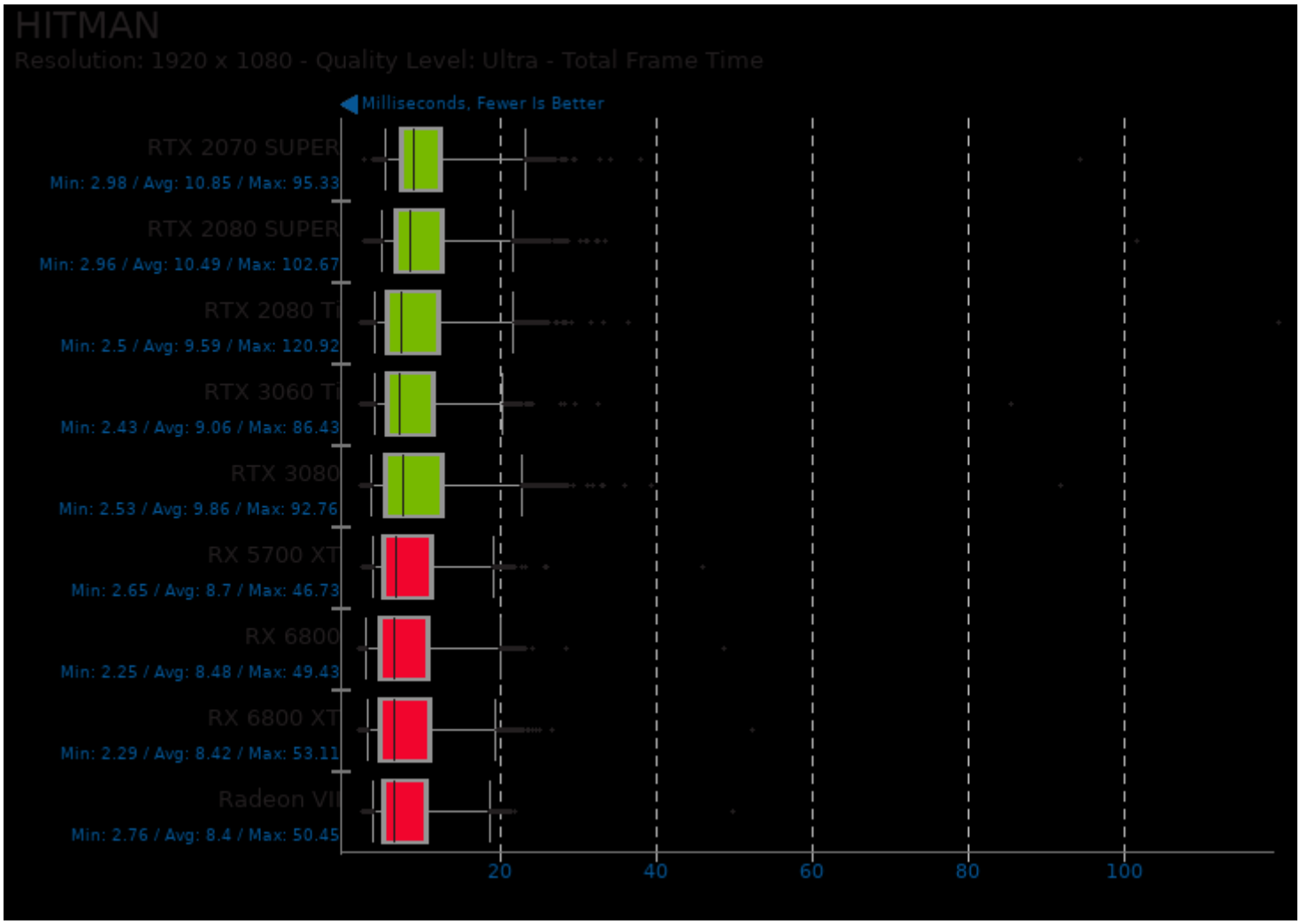
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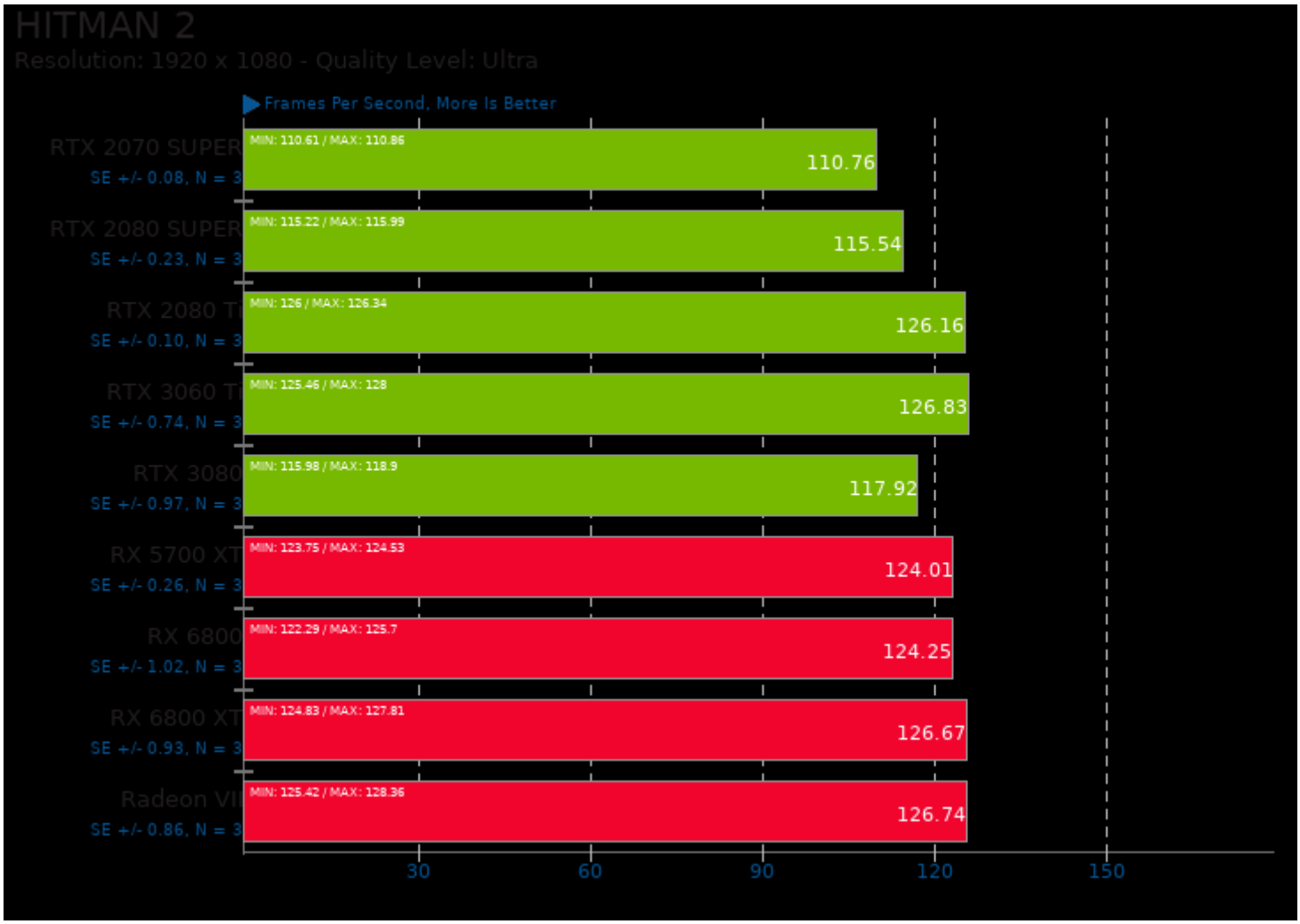
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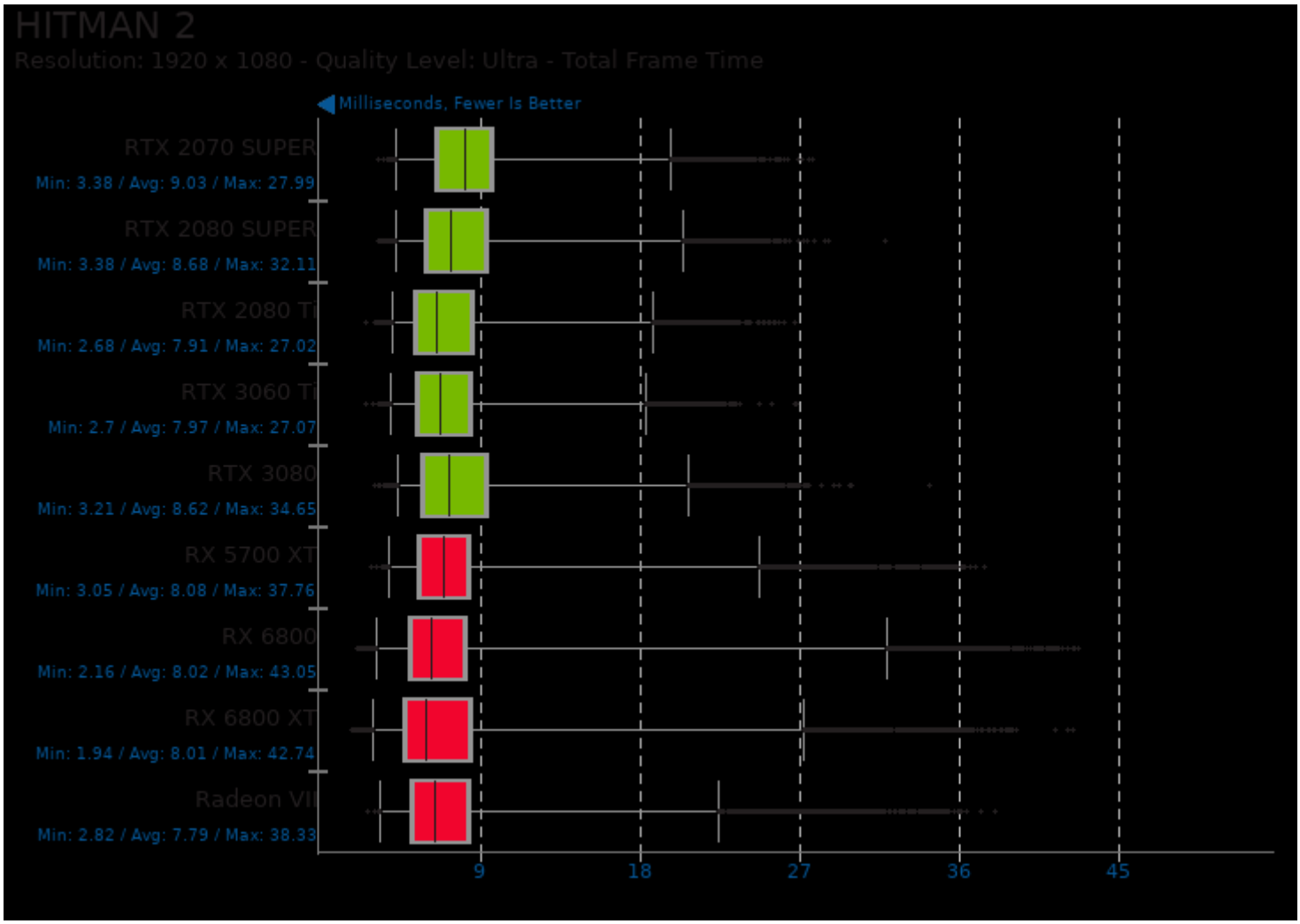
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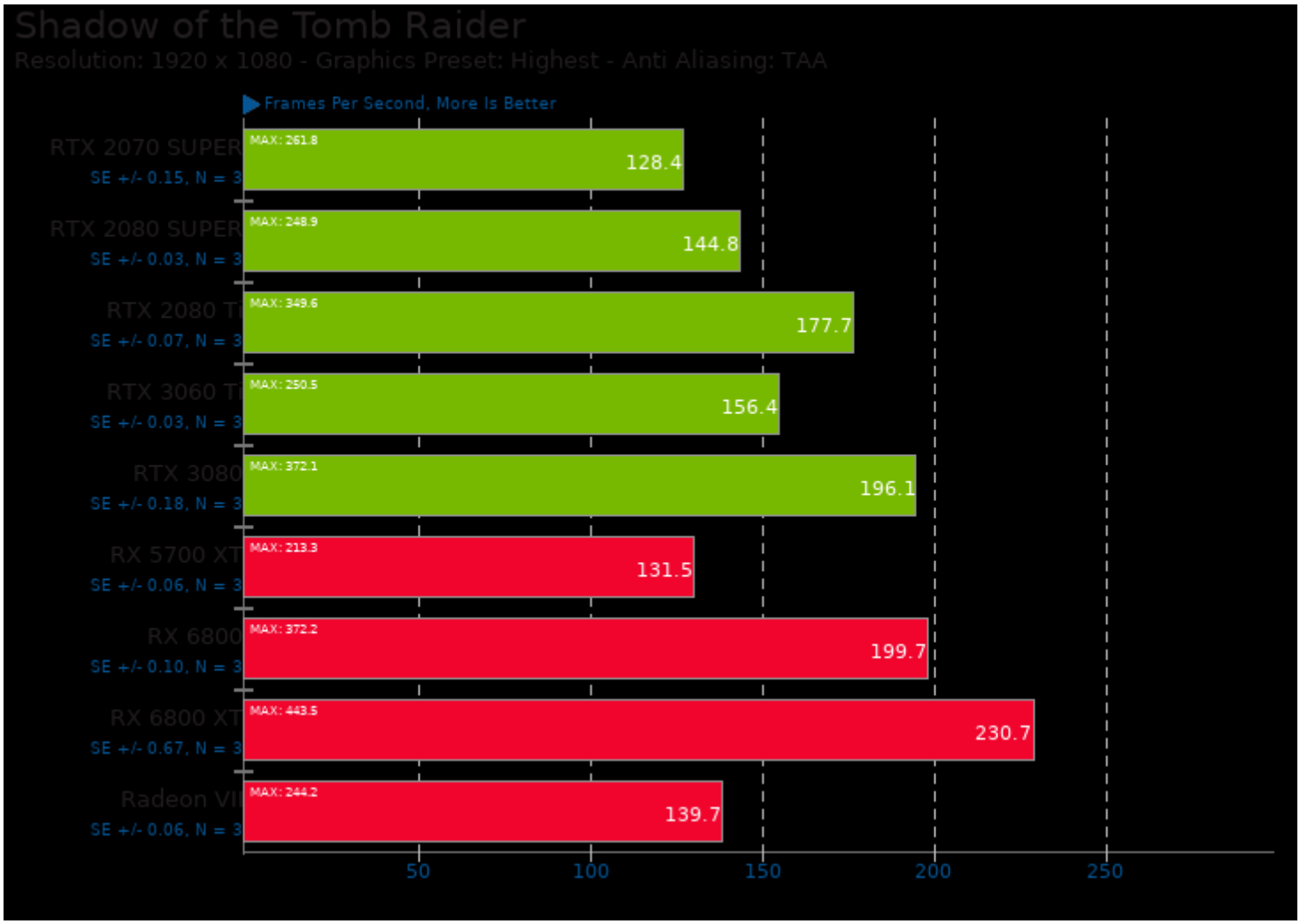
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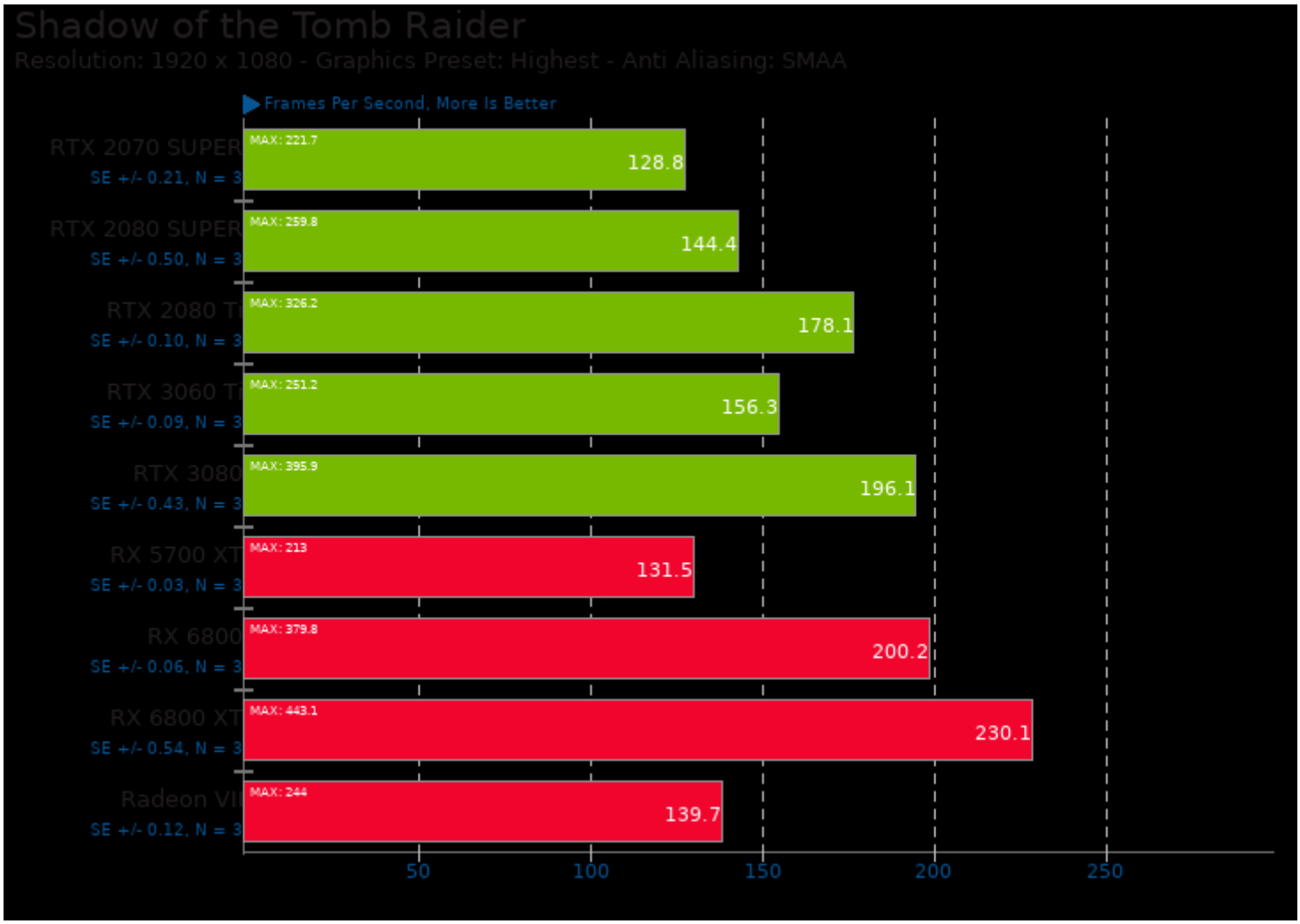
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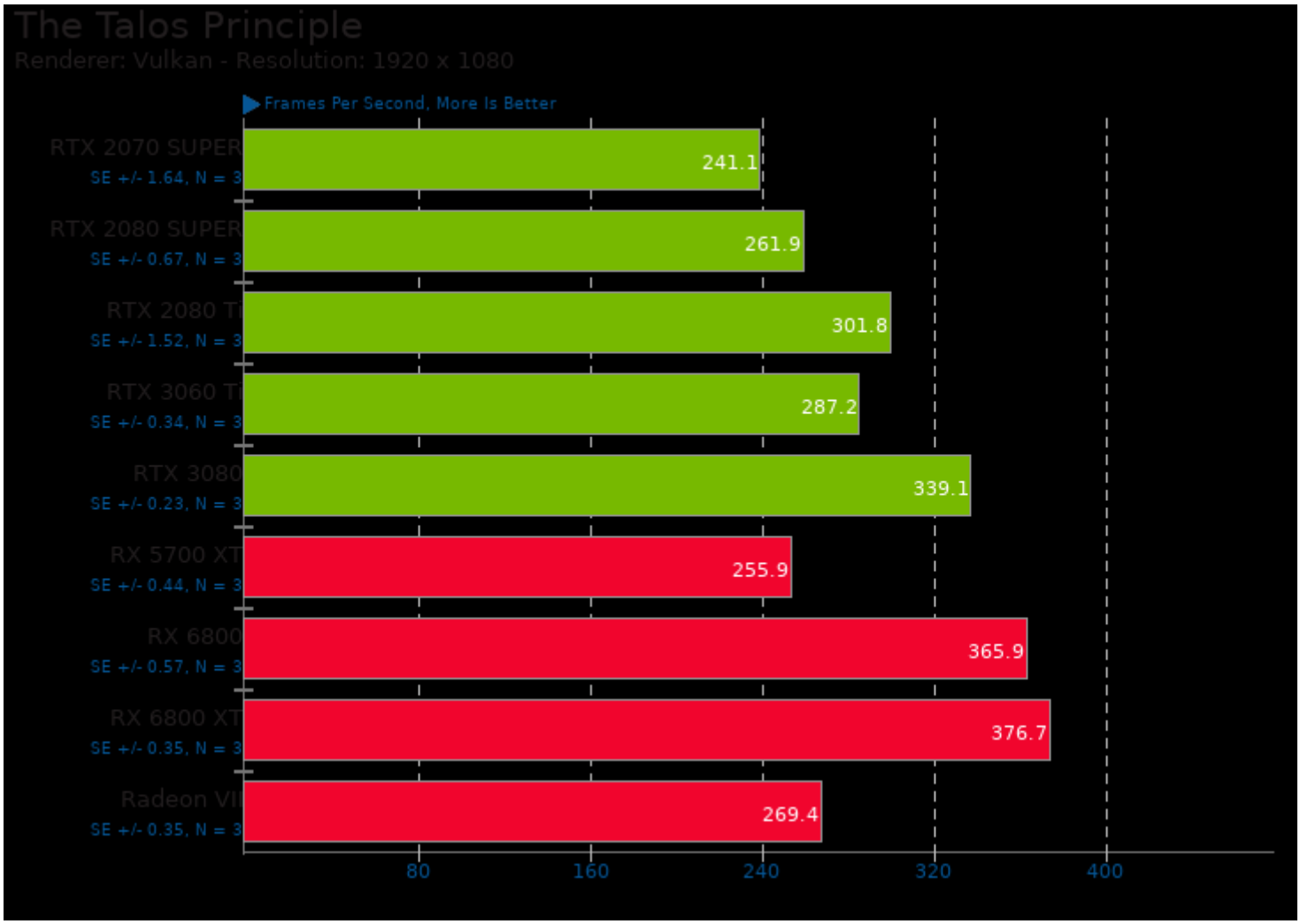
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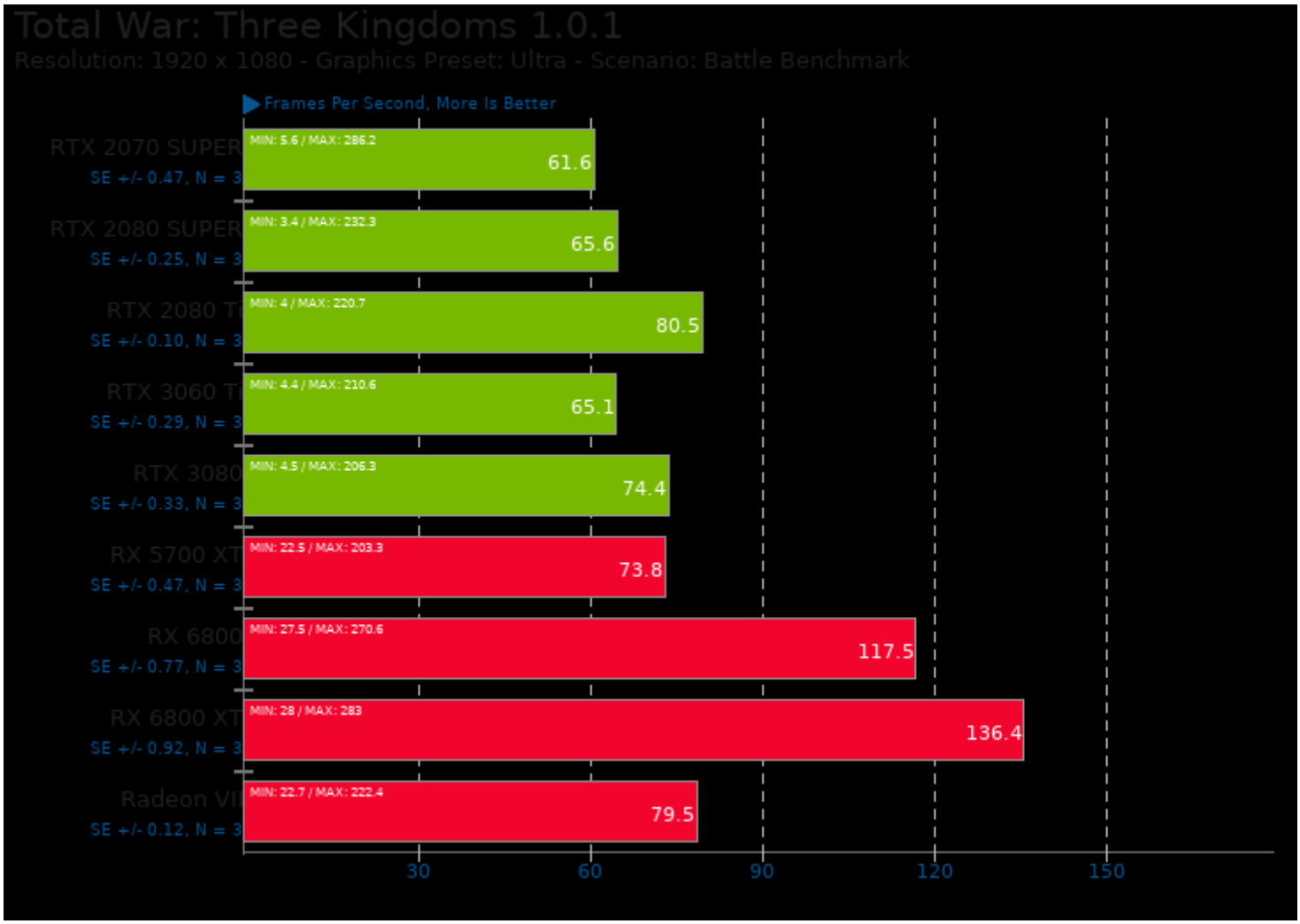
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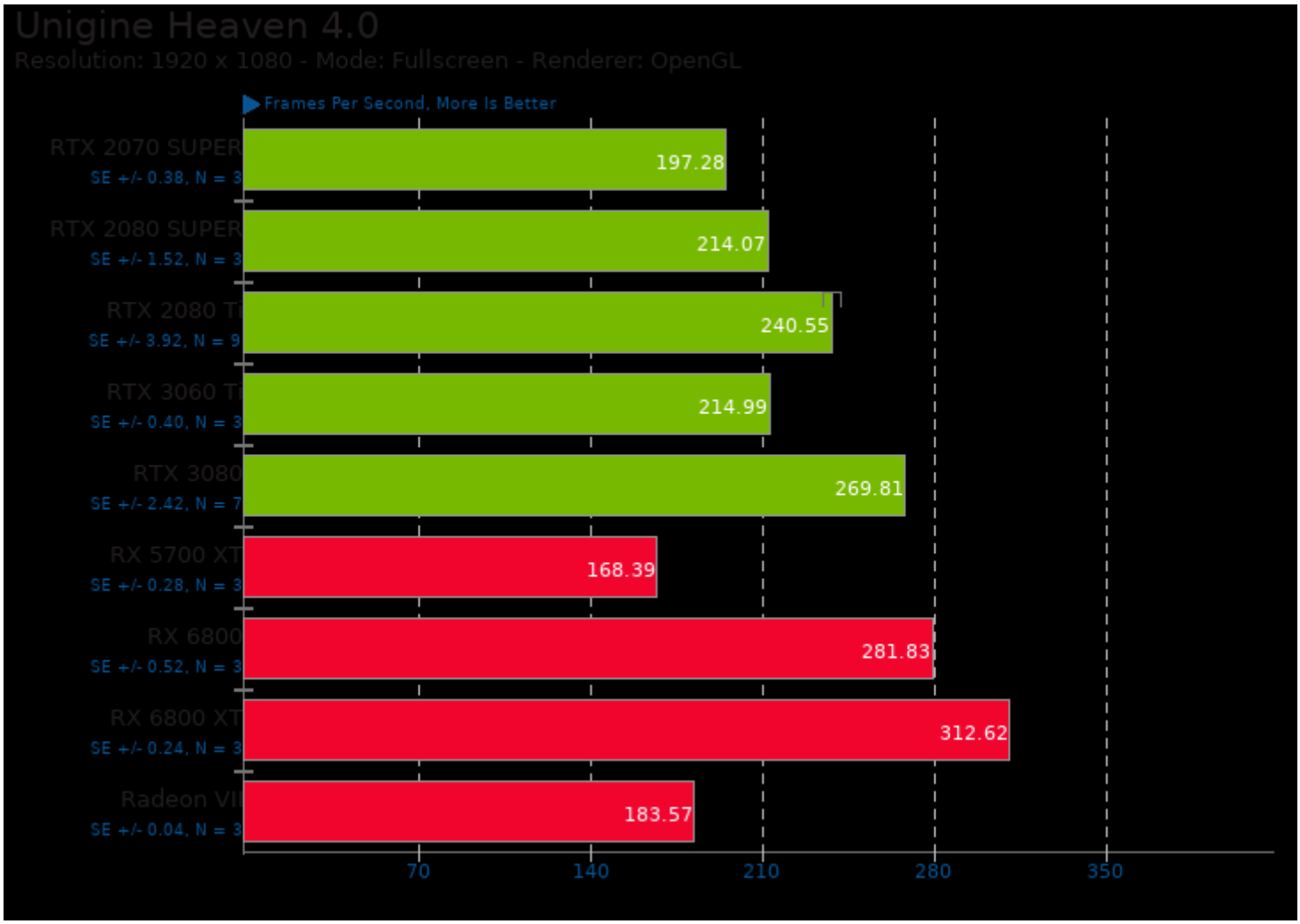
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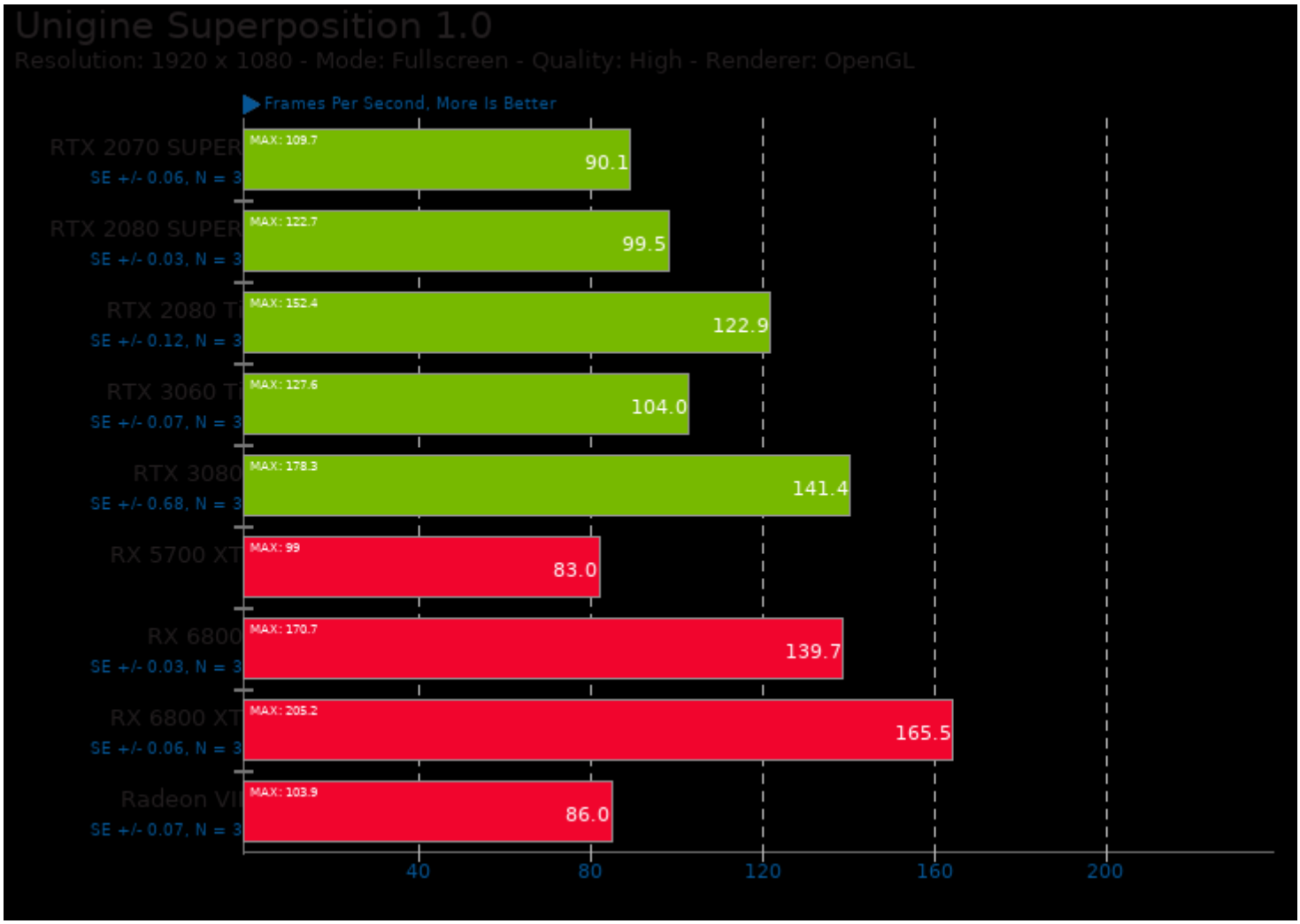
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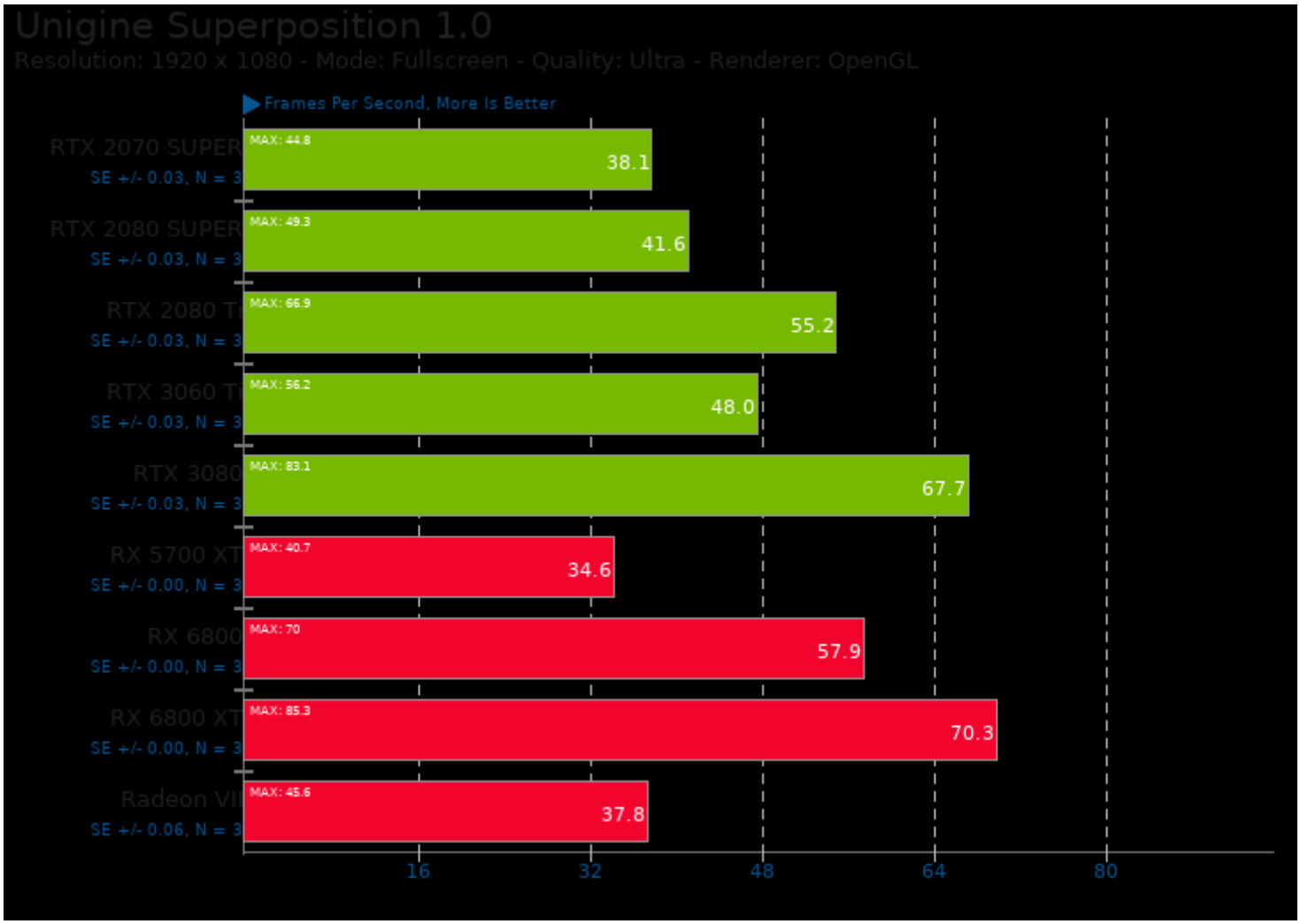
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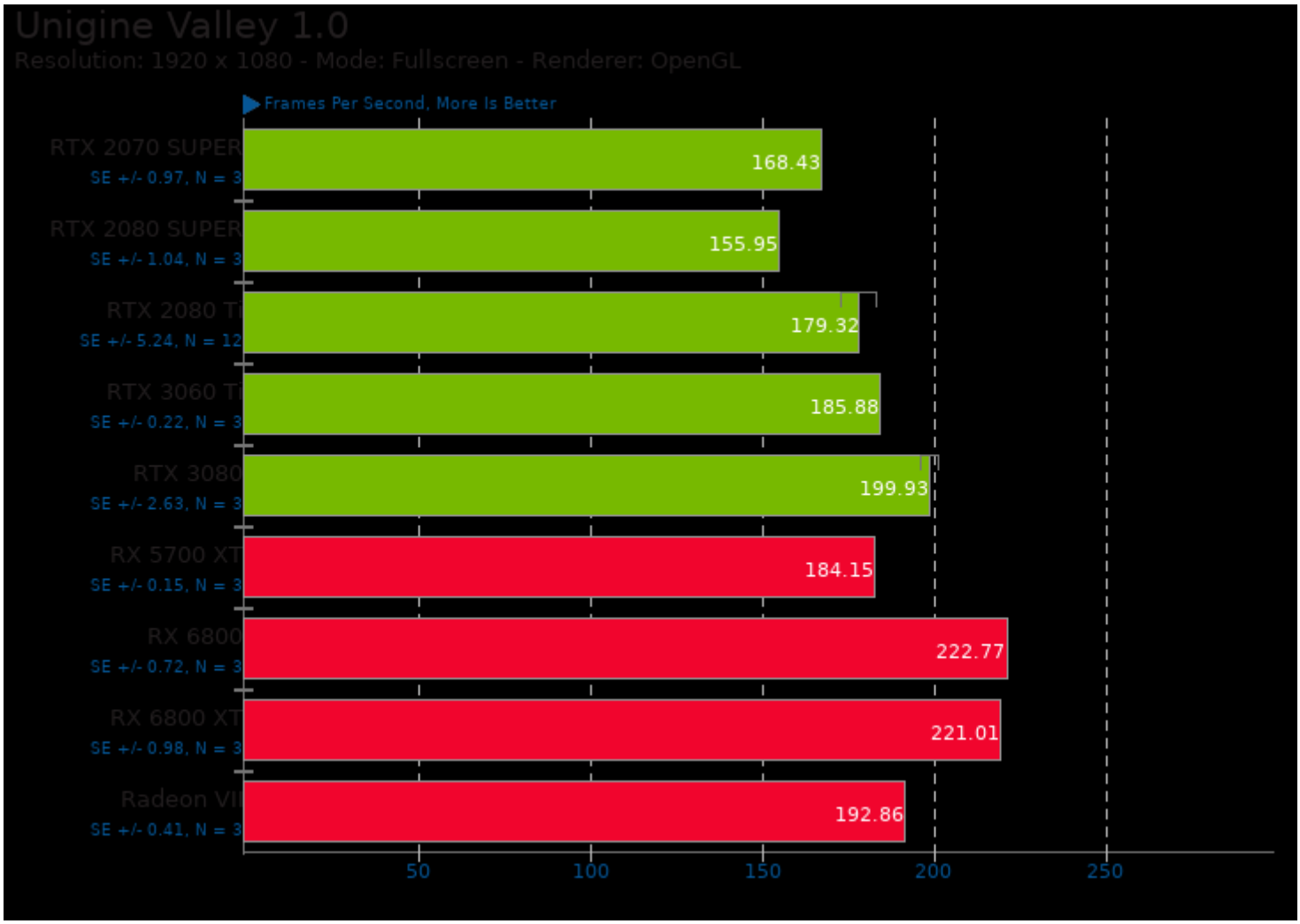
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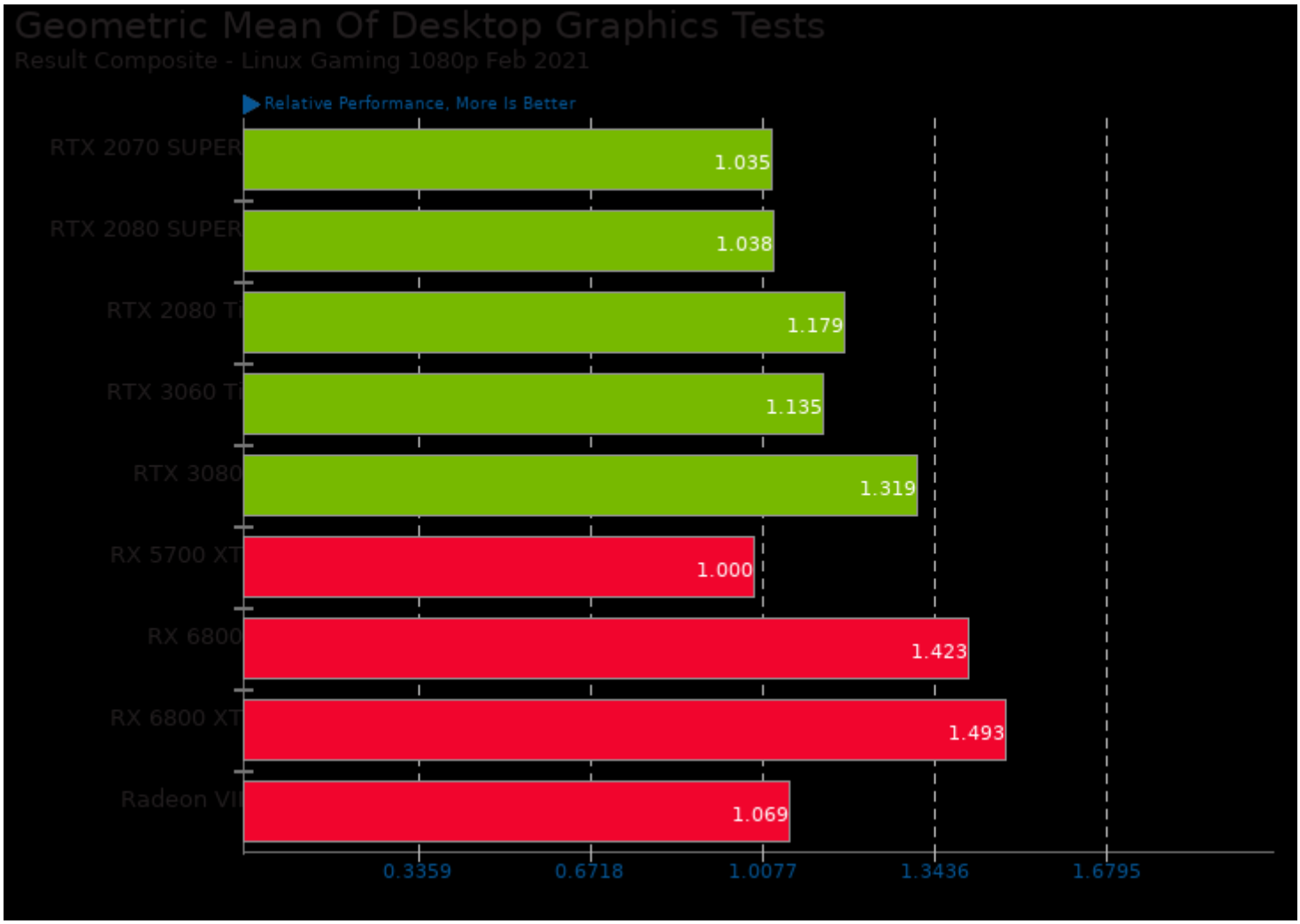
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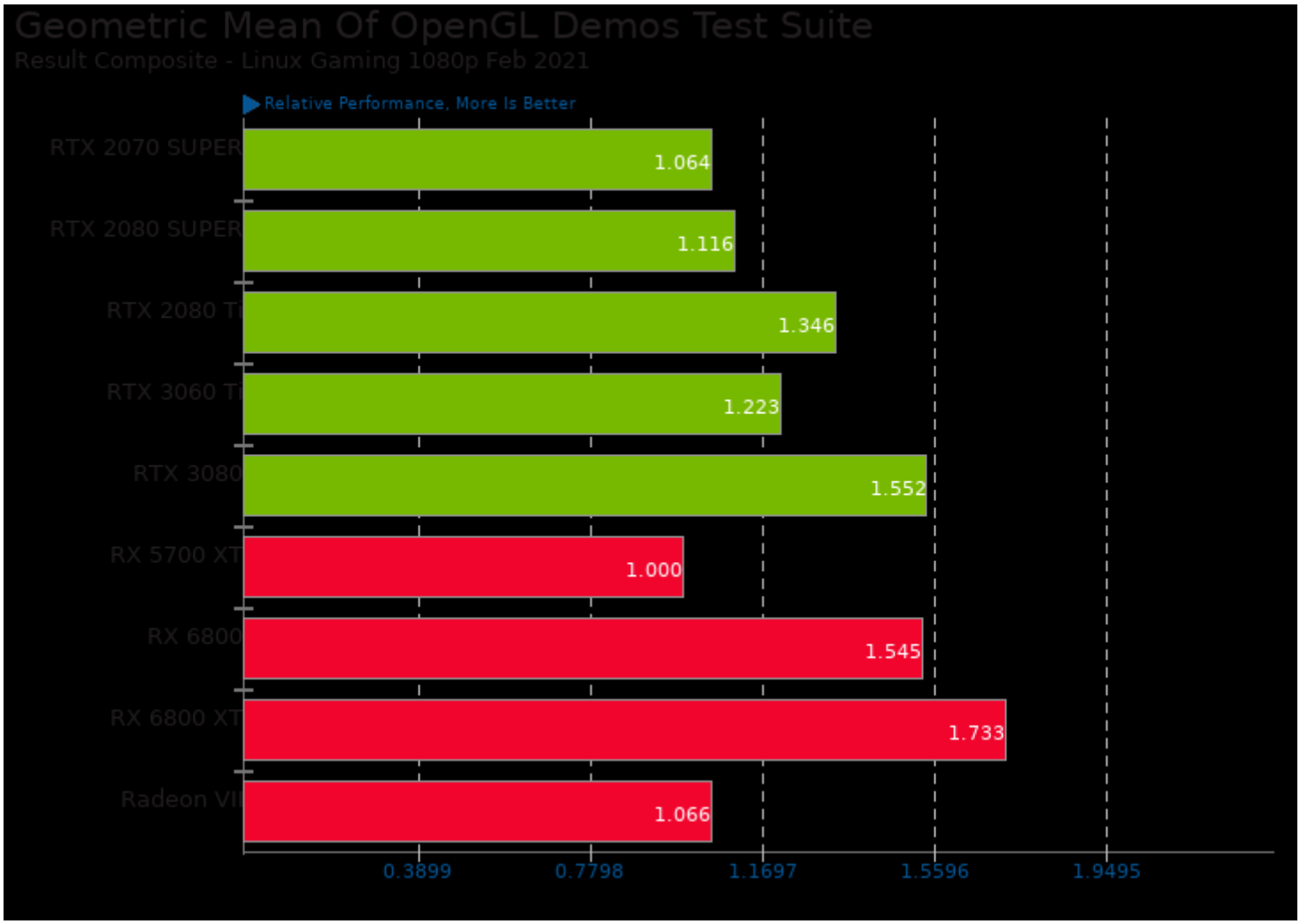
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These geometric means are based upon test groupings / test suites for this result file.

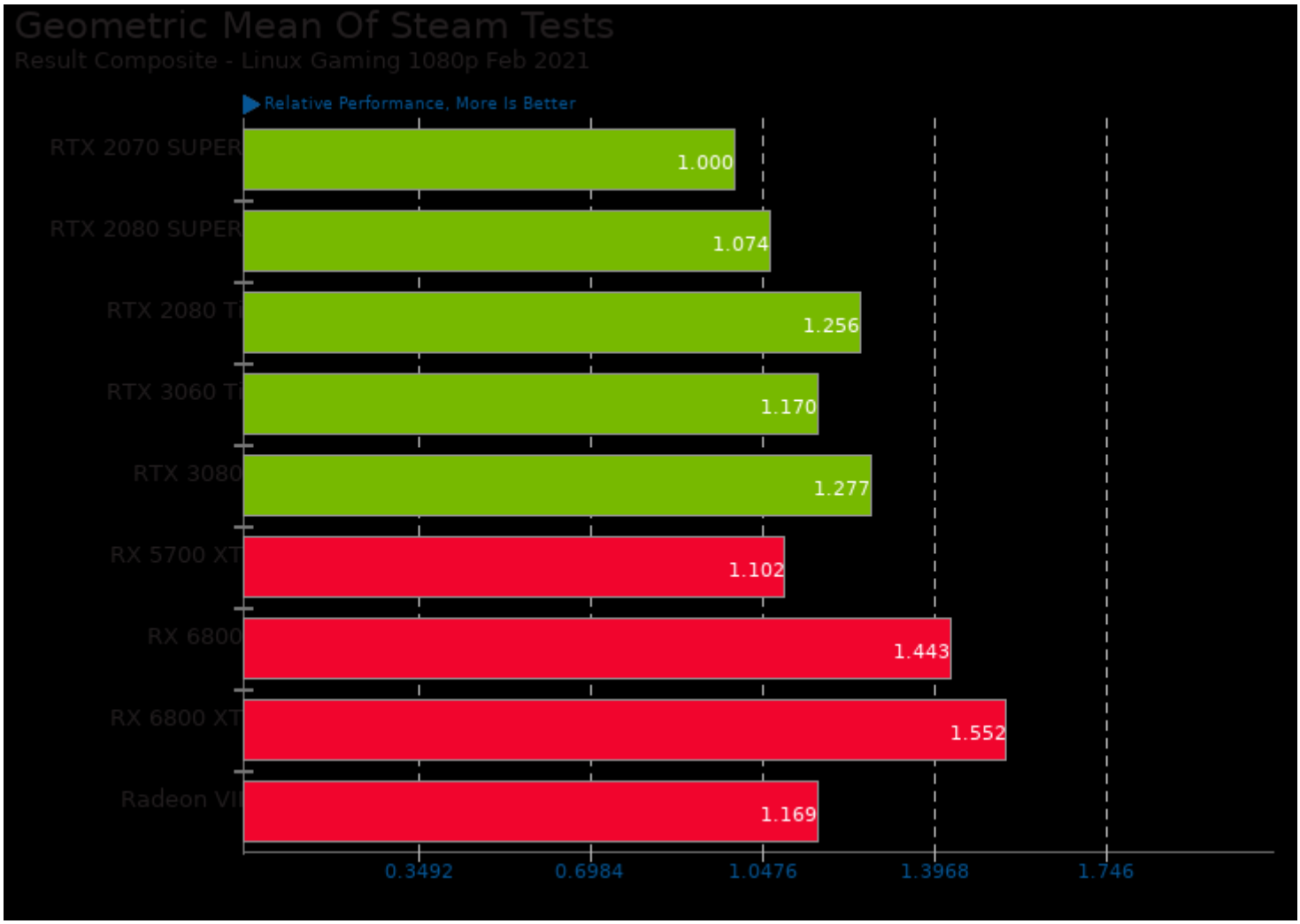


Geometric mean based upon tests: pts/unigine-valley and pts/unigine-heaven



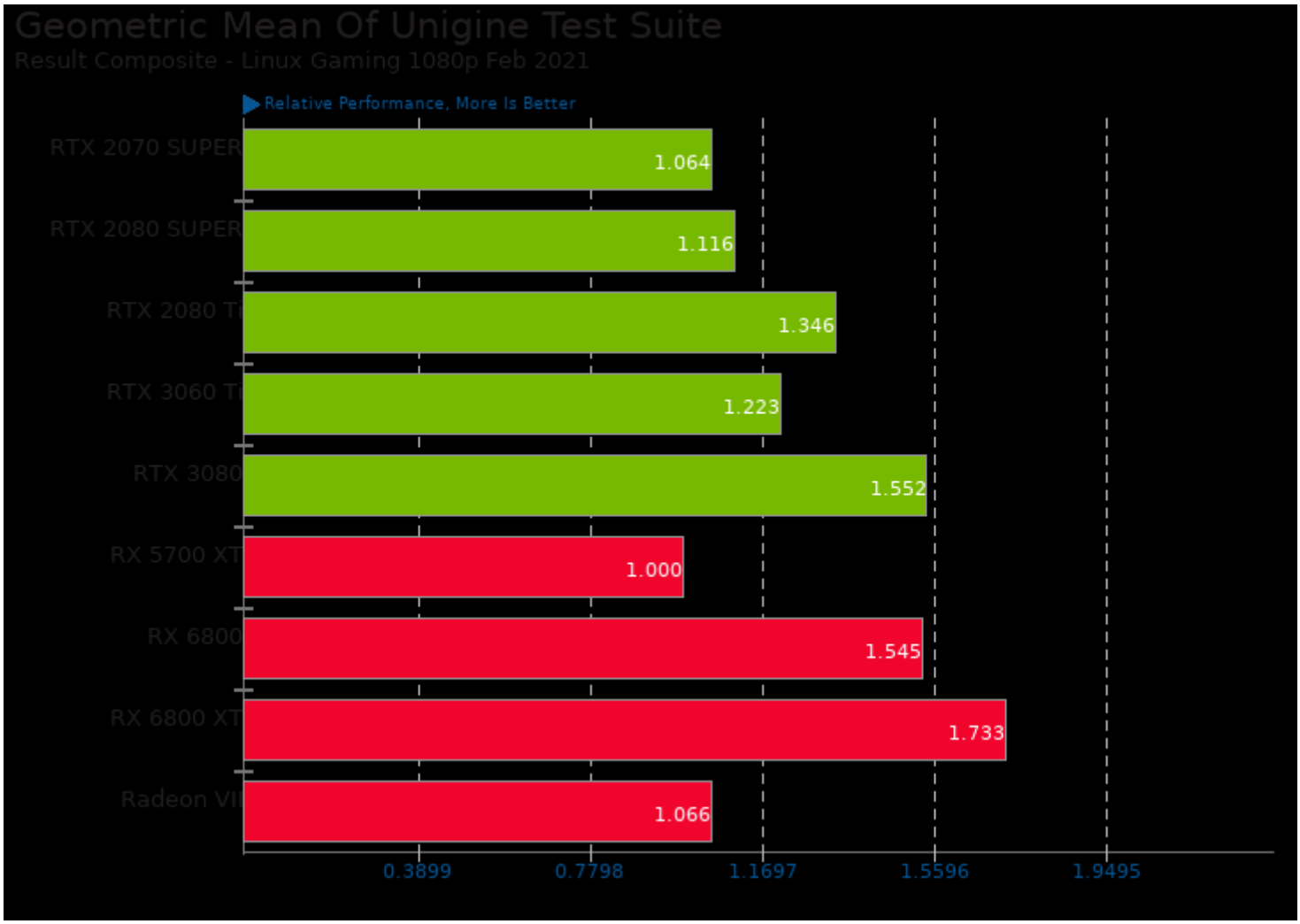
Geometric mean based upon tests: pts/unigine-valley, pts/unigine-heaven and pts/unigine-super

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Geometric mean based upon tests: pts/batman-knight, pts/hitman, pts/hitman2, pts/shadowofthetombraider, pts/talos-principle and pts/twtk

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Geometric mean based upon tests: pts/unigine-valley, pts/unigine-heaven and pts/unigine-super

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 15:52.