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NVIDIA RTX 3090 Linux Wayland

AMD Ryzen 9 5950X 16-Core testing with a ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3904 BIOS) and NVIDIA GeForce RTX 3090 24GB on Ubuntu 22.04 via the Phoronix Test Suite.

Automated Executive Summary

3090 had the most wins, coming in first place for 54% of the tests.

Based on the geometric mean of all complete results, the fastest (3090) was 1.004x the speed of the slowest (RTX 3090). NVIDIA RTX 3090 was 0.998x the speed of 3090 and RTX 3090 was 0.998x the speed of NVIDIA RTX 3090.

The results with the greatest spread from best to worst included:

Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: Off - Ray Tracing API: VK_KHR_ray_tracing_pipeline) at 1.026x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing) at 1.016x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: On - Ray Tracing API: VK_KHR_ray_tracing_pipeline) at 1.014x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing) at 1.013x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: Off - Ray Tracing API:

VK_KHR_ray_query) at 1.012x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: Off - Ray Tracing API: VK_KHR_ray_query) at 1.01x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: High - Denoiser: Off - Ray Tracing API: VK_KHR_ray_query) at 1.01x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing) at 1.01x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: High - Denoiser: On - Ray Tracing API: VK_KHR_ray_query) at 1.007x
Quake II RTX (Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: Off - Ray Tracing API: VK_KHR_ray_query) at 1.007x.

Test Systems:

RTX 3090

NVIDIA RTX 3090

3090

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3904 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 2000GB, Graphics: NVIDIA GeForce RTX 3090 24GB, Audio: NVIDIA GA102 HD Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 22.04, Kernel: 5.15.0-18-generic (x86_64), Desktop: GNOME Shell 41.3, Display Server: X Server 1.20.14 + Wayland, Display Driver: NVIDIA 510.47.03, OpenGL: 4.6.0, Vulkan: 1.3.194, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa201016
Graphics Notes: BAR1 / Visible vRAM Size: 32768 MiB
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	NVIDIA RTX 3090	3090
HITMAN 3 - 1920 x 1080 - Low (FPS)	257.52	**256.63**	**257.65**
Normalized	99.95%	99.6%	100%
Standard Deviation	0.1%	0.5%	0.2%
HITMAN 3 - 2560 x 1440 - Low (FPS)	**194.98**	194.80	**194.54**
Normalized	100%	99.91%	99.77%
Standard Deviation	0.1%	0.2%	0.1%

NVIDIA RTX 3090 Linux Wayland

HITMAN 3 - 3840 x 2160 - Low (FPS)	**116.43**	**117.01**	116.49
Normalized	99.5%	100%	99.56%
Standard Deviation	0%	0.5%	0%
HITMAN 3 - 1920 x 1080 - Ultra (FPS)	**243.30**	**243.15**	243.29
Normalized	100%	99.94%	100%
Standard Deviation	0.2%	0.2%	0.1%
HITMAN 3 - 2560 x 1440 - Ultra (FPS)	**184.94**	**185.24**	185.05
Normalized	99.84%	100%	99.9%
Standard Deviation	0.1%	0%	0.1%
HITMAN 3 - 3840 x 2160 - Ultra (FPS)	**111.96**	111.91	**111.87**
Normalized	100%	99.96%	99.92%
Standard Deviation	0.2%	0.1%	0.1%
HITMAN 3 - 1920 x 1080 - Medium (FPS)	253.19	**252.80**	**253.94**
Normalized	99.7%	99.55%	100%
Standard Deviation	0.3%	0.3%	0%
HITMAN 3 - 2560 x 1440 - Medium (FPS)	**191.49**	**192.01**	191.80
Normalized	99.73%	100%	99.89%
Standard Deviation	0.1%	0.1%	0.2%
HITMAN 3 - 3840 x 2160 - Medium (FPS)	**115.02**	**115.01**	**115.01**
Normalized	100%	99.99%	99.99%
Standard Deviation	0%	0.1%	0.1%
Quake II RTX - 3840 x 2160 - Low - On - VK_KHR_ray_query (FPS)	57.758760	**57.987521**	**57.639917**
Normalized	99.61%	100%	99.4%
Standard Deviation	0.6%	0.1%	0.3%
Quake II RTX - 3840 x 2160 - Off - On - VK_KHR_ray_query (FPS)	**68.236163**	68.515869	**68.639229**
Normalized	99.41%	99.82%	100%
Standard Deviation	0.2%	0.4%	0.1%
Quake II RTX - 3840 x 2160 - High - On - VK_KHR_ray_query (FPS)	**48.013381**	**48.341268**	48.198294
Normalized	99.32%	100%	99.7%
Standard Deviation	0.4%	1.1%	0.5%
Quake II RTX - 3840 x 2160 - Low - Off - VK_KHR_ray_query (FPS)	92.256800	**92.157822**	**93.252406**
Normalized	98.93%	98.83%	100%
Standard Deviation	0.4%	0.3%	1.6%
Quake II RTX - 3840 x 2160 - Low - On - VK_NV_ray_tracing (FPS)	58.034097	**57.950601**	**58.298362**
Normalized	99.55%	99.4%	100%
Standard Deviation	0.3%	0.3%	0.2%
Quake II RTX - 3840 x 2160 - Off - Off - VK_KHR_ray_query (FPS)	**113.112192**	112.973335	**112.361666**
Normalized	100%	99.88%	99.34%
Standard Deviation	2.2%	0.9%	0.7%
Quake II RTX - 3840 x 2160 - Off - On - VK_NV_ray_tracing (FPS)	**69.010686**	69.171949	**69.202349**
Normalized	99.72%	99.96%	100%
Standard Deviation	0.5%	0.5%	0.5%
Quake II RTX - 3840 x 2160 - High - Off - VK_KHR_ray_query (FPS)	**70.207510**	70.754412	**70.881081**
Normalized	99.05%	99.82%	100%
Standard Deviation	0.2%	1.6%	1.4%

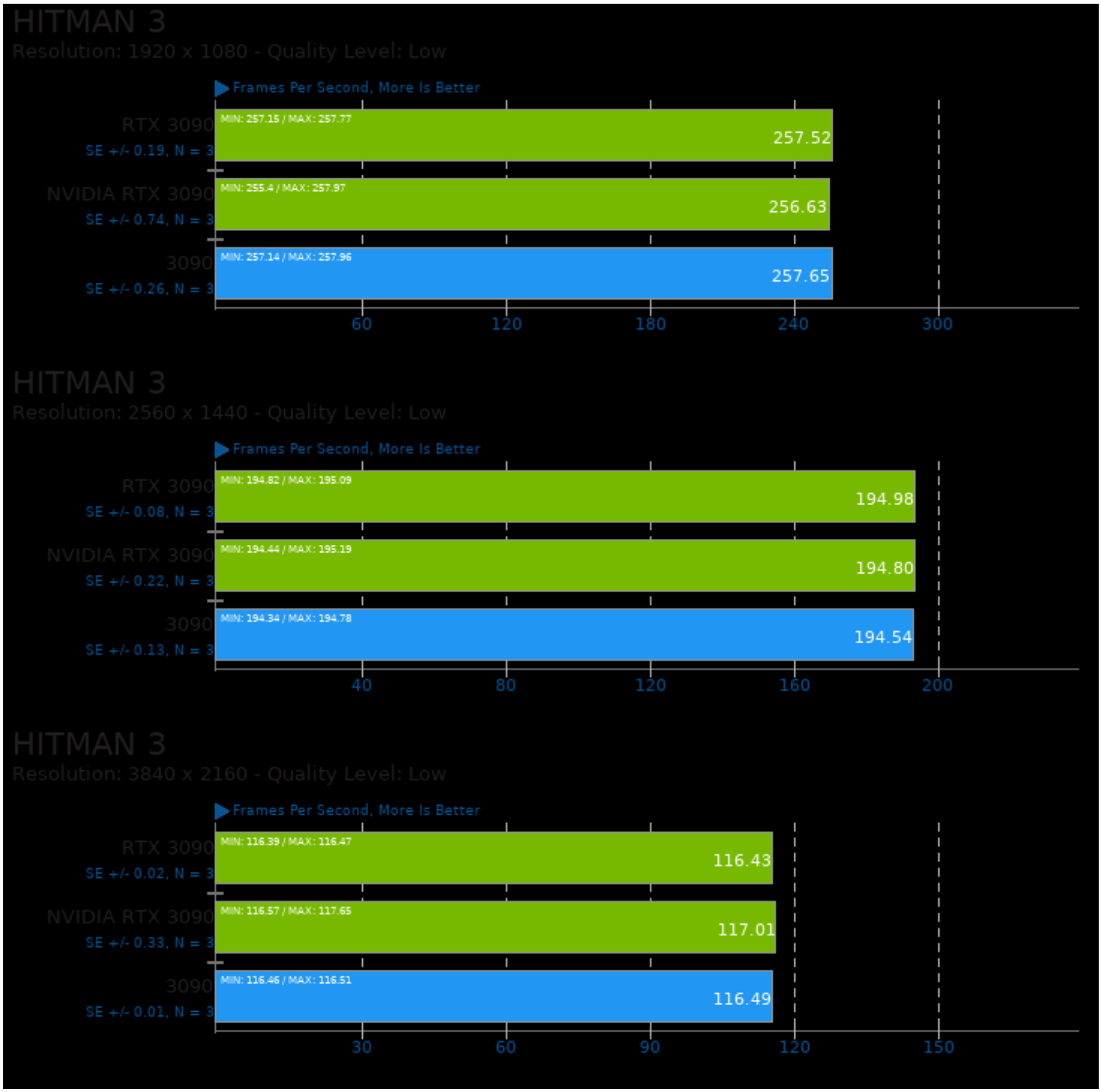
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Quake II RTX - 3840 x 2160 - High - On - VK_NV_ray_tracing (FPS)	**48.293042**	48.320478	**48.468903**
Normalized	99.64%	99.69%	100%
Standard Deviation	0.8%	0.2%	0.1%
Quake II RTX - 3840 x 2160 - Low - Off - VK_NV_ray_tracing (FPS)	91.850128	**91.608602**	**93.118055**
Normalized	98.64%	98.38%	100%
Standard Deviation	0.5%	0%	1.7%
Quake II RTX - 3840 x 2160 - Off - Off - VK_NV_ray_tracing (FPS)	113.225845	**112.586184**	**114.012586**
Normalized	99.31%	98.75%	100%
Standard Deviation	0.4%	0.4%	2.5%
Quake II RTX - 3840 x 2160 - High - Off - VK_NV_ray_tracing (FPS)	70.210907	**70.330686**	**70.161903**
Normalized	99.83%	100%	99.76%
Standard Deviation	0.5%	0.4%	0.9%
Quake II RTX - 3840 x 2160 - Medium - On - VK_KHR_ray_query (FPS)	**52.772475**	**52.677931**	52.770406
Normalized	100%	99.82%	100%
Standard Deviation	0.1%	0.5%	0.8%
Quake II RTX - 3840 x 2160 - Medium - Off - VK_KHR_ray_query (FPS)	**79.580472**	80.280052	**80.392726**
Normalized	98.99%	99.86%	100%
Standard Deviation	0.7%	0.2%	0.2%
Quake II RTX - 3840 x 2160 - Medium - On - VK_NV_ray_tracing (FPS)	**52.694850**	52.646598	**52.580911**
Normalized	100%	99.91%	99.78%
Standard Deviation	0.3%	0.3%	0.7%
Quake II RTX - 3840 x 2160 - Medium - Off - VK_NV_ray_tracing (FPS)	79.974963	**79.683810**	**80.447988**
Normalized	99.41%	99.05%	100%
Standard Deviation	0.2%	0.6%	0.4%
Quake II RTX - 3840 x 2160 - Low - On - VK_KHR_ray_tracing_pipeline (FPS)	**43.483282**	43.497674	**43.500646**
Normalized	99.96%	99.99%	100%
Standard Deviation	0.1%	0.4%	0.4%
Quake II RTX - 3840 x 2160 - Off - On - VK_KHR_ray_tracing_pipeline (FPS)	**56.381367**	57.057079	**57.197511**
Normalized	98.57%	99.75%	100%
Standard Deviation	0.2%	1.5%	0.3%
Quake II RTX - 3840 x 2160 - High - On - VK_KHR_ray_tracing_pipeline (FPS)	34.083654	**34.190459**	**34.014798**
Normalized	99.69%	100%	99.49%
Standard Deviation	0.2%	0.7%	0.7%
Quake II RTX - 3840 x 2160 - Low - Off - VK_KHR_ray_tracing_pipeline (FPS)	**59.767419**	59.779340	**59.878770**
Normalized	99.81%	99.83%	100%
Standard Deviation	0.3%	0.5%	0.7%
Quake II RTX - 3840 x 2160 - Off - Off - VK_KHR_ray_tracing_pipeline (FPS)	**82.247976**	82.784449	**84.365269**
Normalized	97.49%	98.13%	100%
Standard Deviation	0.9%	0.5%	2.2%

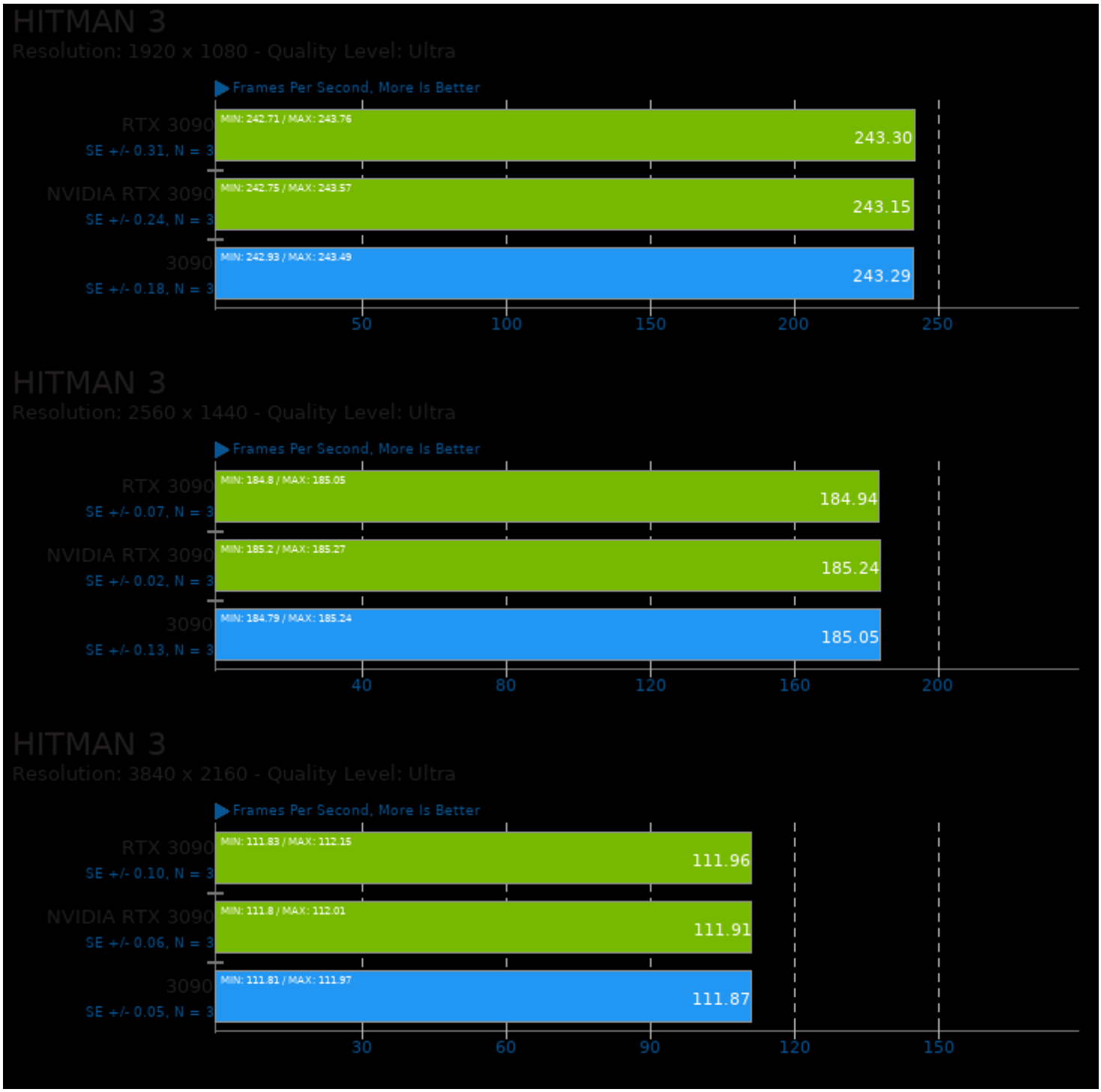
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Quake II RTX - 3840 x 2160 - High - Off - VK_KHR_ray_tracing_pipeline (FPS)	**46.120242**	**46.416778**	46.227664
Normalized	99.36%	100%	99.59%
Standard Deviation	0.2%	1.1%	0.4%
Quake II RTX - 3840 x 2160 - Medium - On - VK_KHR_ray_tracing_pipeline (FPS)	**37.079332**	37.139720	**37.301770**
Normalized	99.4%	99.57%	100%
Standard Deviation	0.3%	0.3%	0.9%
Quake II RTX - 3840 x 2160 - Medium - Off - VK_KHR_ray_tracing_pipeline (FPS)	**51.450078**	51.631181	**51.646669**
Normalized	99.62%	99.97%	100%
Standard Deviation	0.1%	0.2%	0.2%

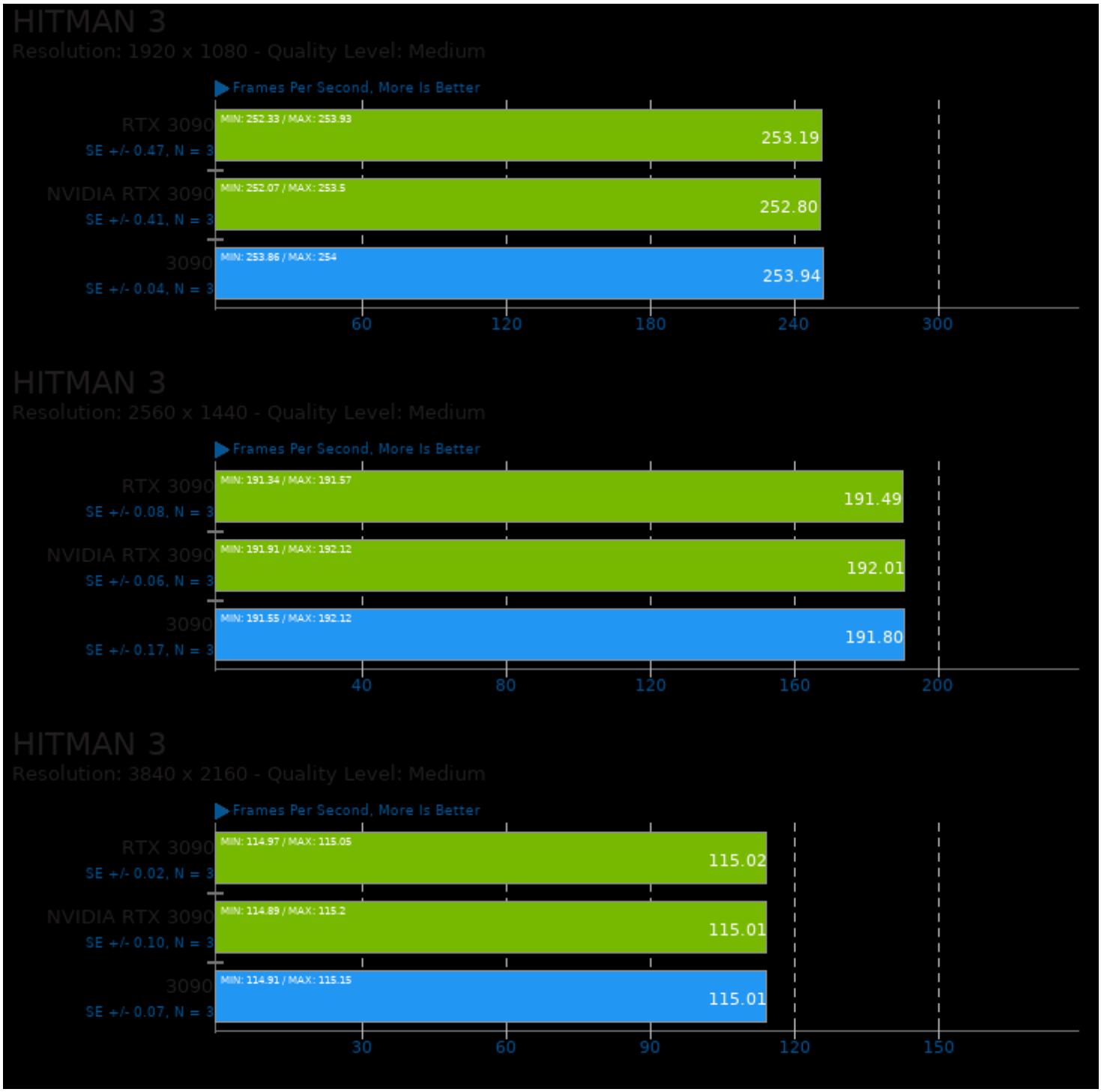
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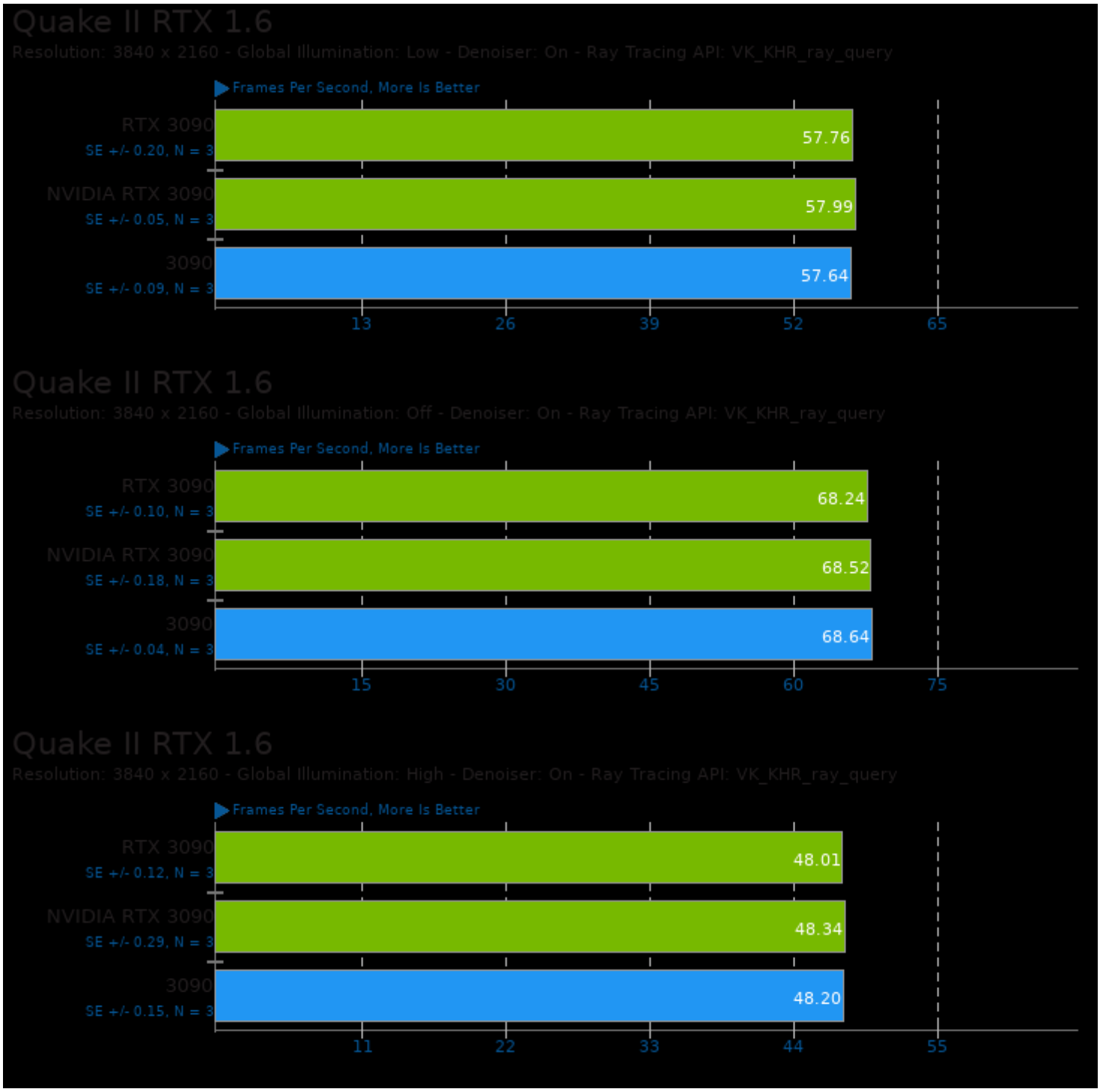


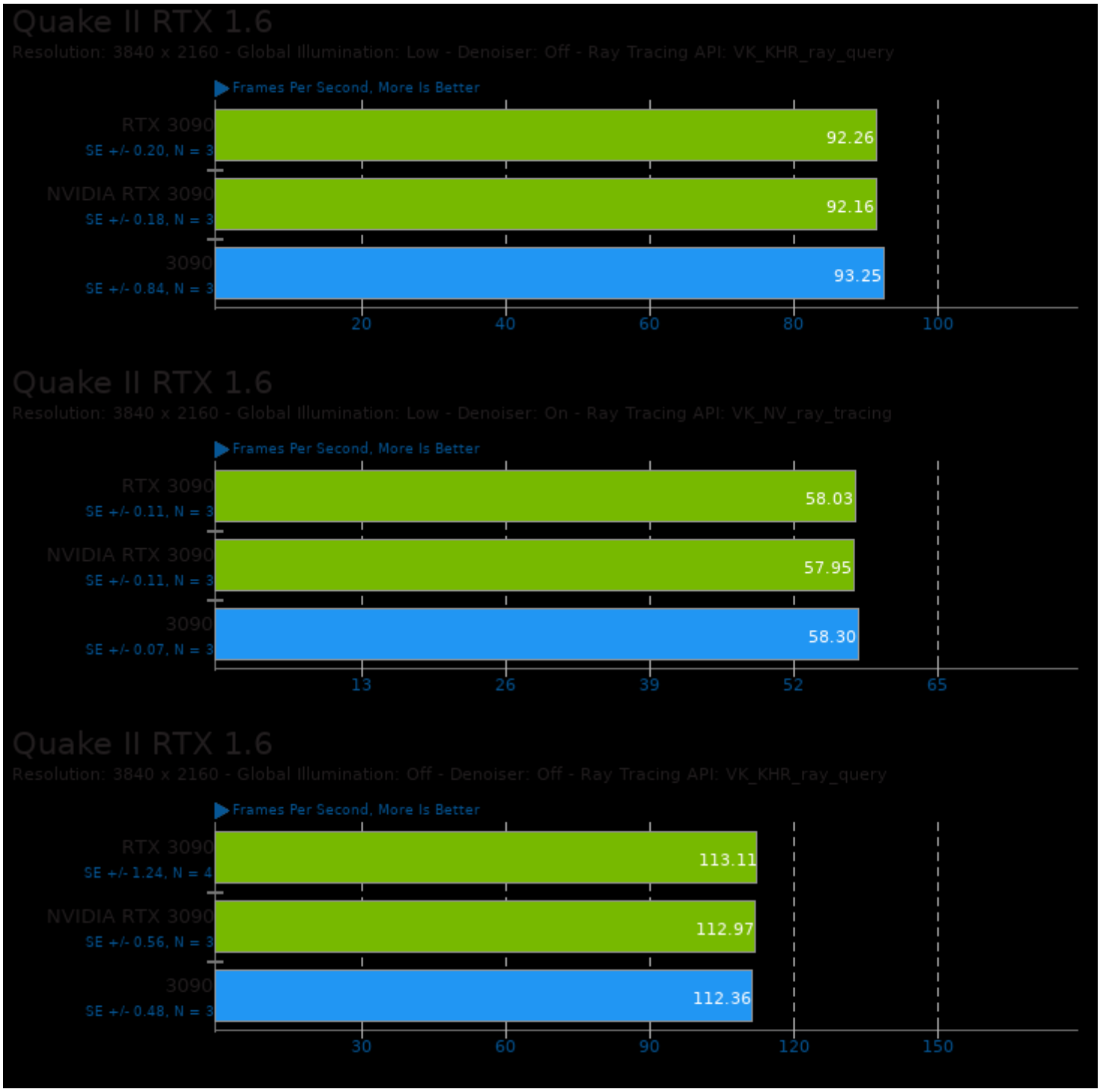
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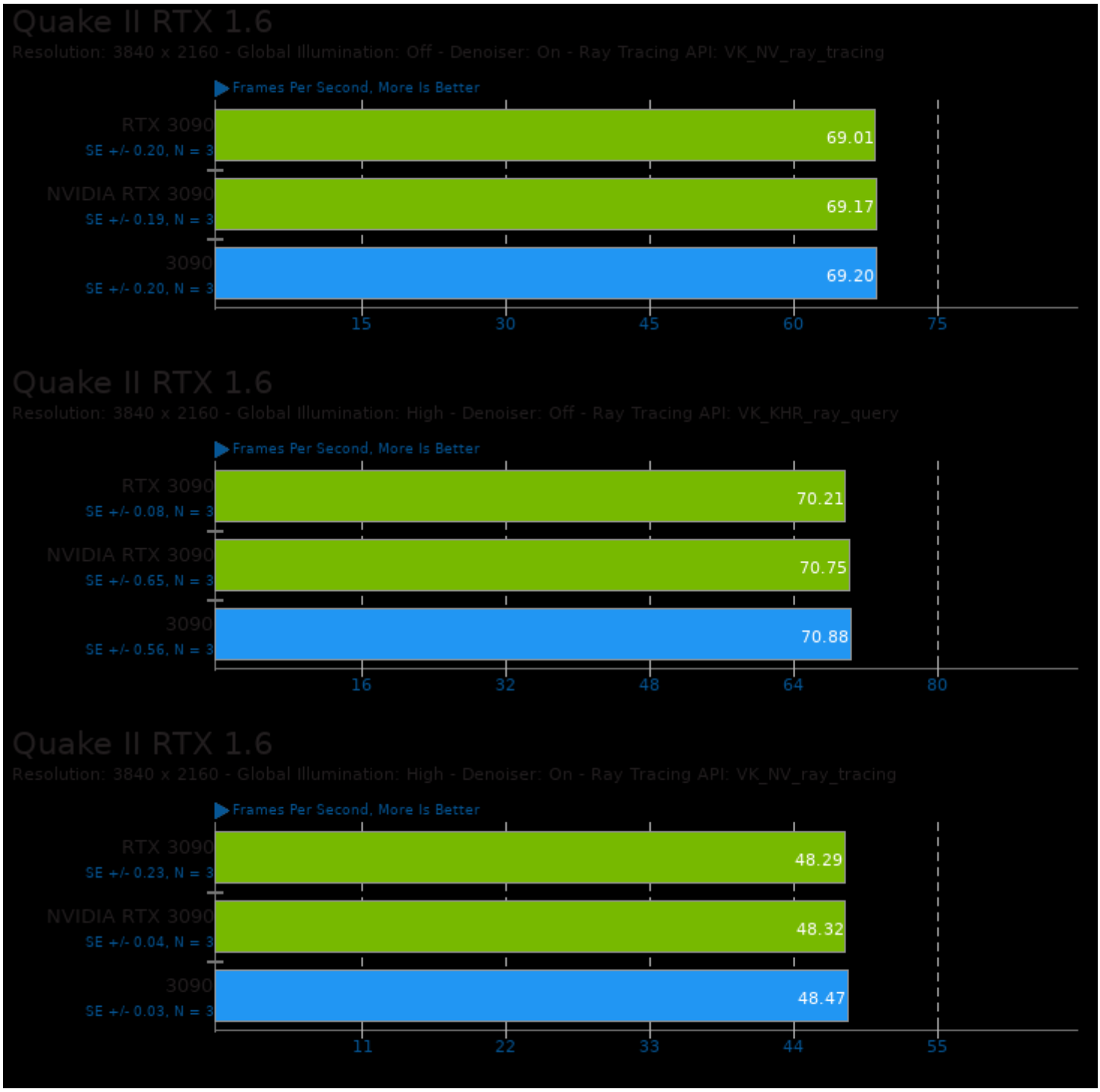
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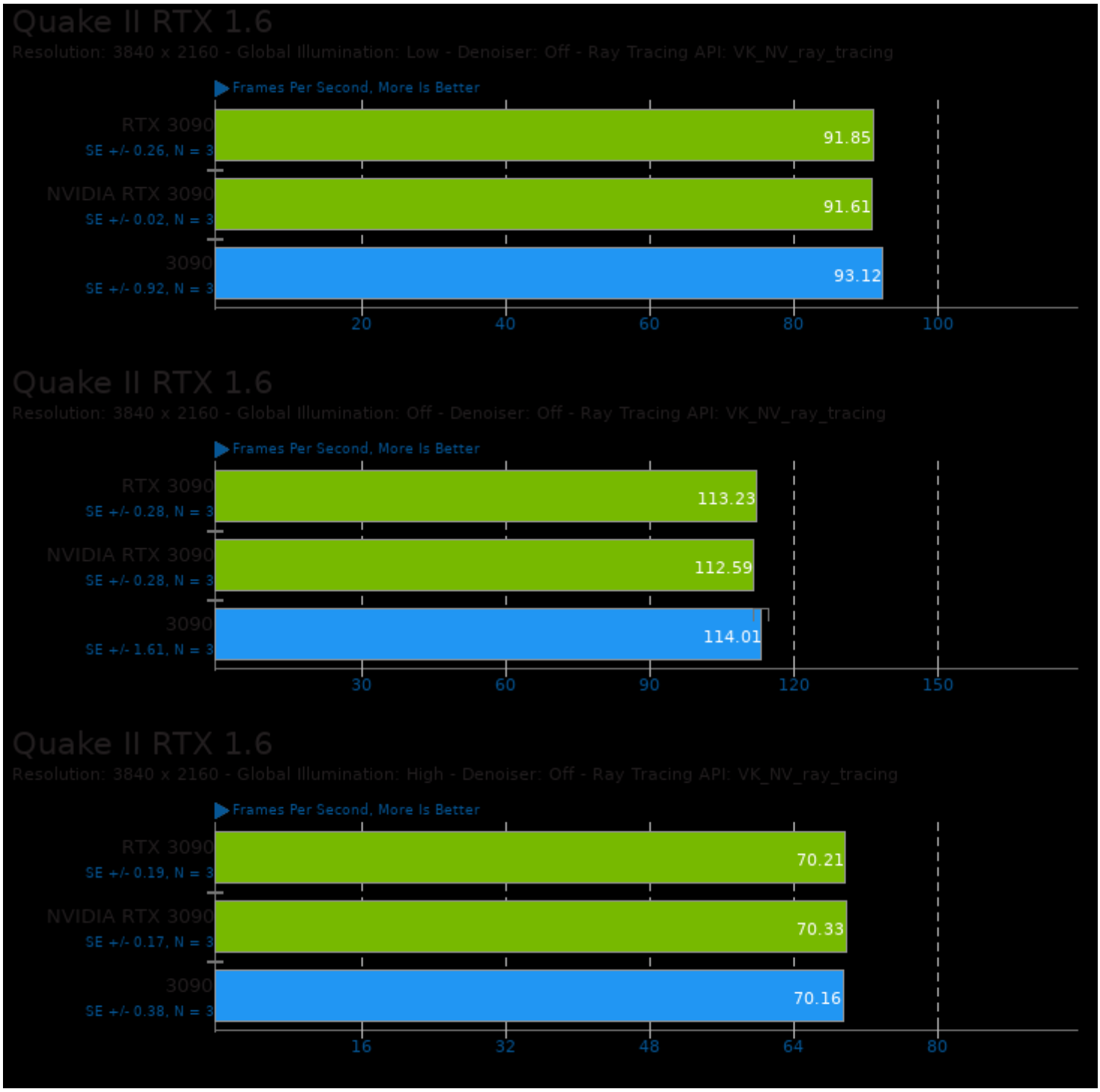


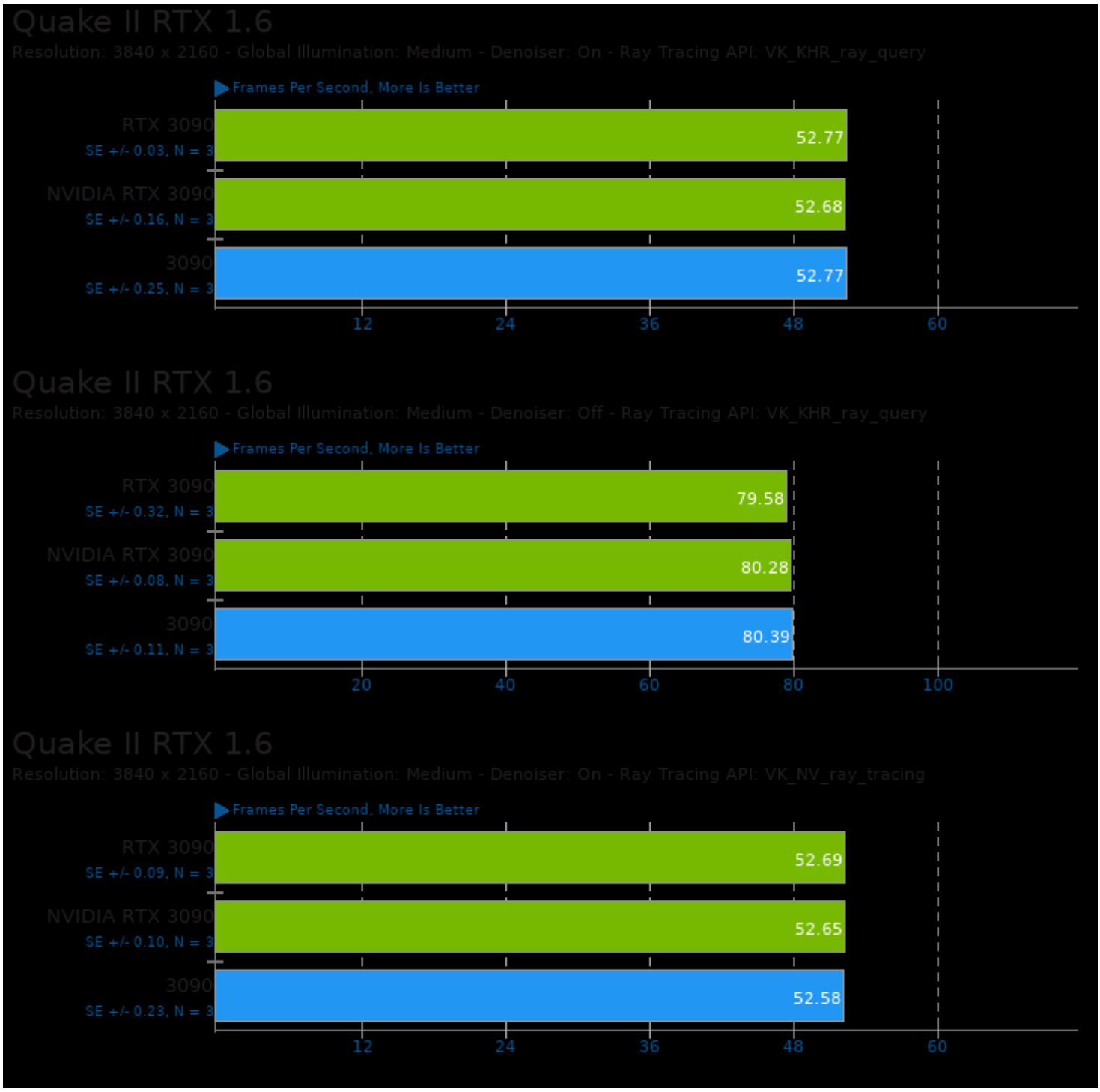

Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: On - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.20, N = 3
57.76
NVIDIA RTX 3090
SE +/- 0.05, N = 3
57.99
3090
SE +/- 0.09, N = 3
57.64
13
26
39
52
65
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: On - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.10, N = 3
68.24
NVIDIA RTX 3090
SE +/- 0.18, N = 3
68.52
3090
SE +/- 0.04, N = 3
68.64
15
30
45
60
75
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: High - Denoiser: On - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.12, N = 3
48.01
NVIDIA RTX 3090
SE +/- 0.29, N = 3
48.34
3090
SE +/- 0.15, N = 3
48.20
11
22
33
44
55

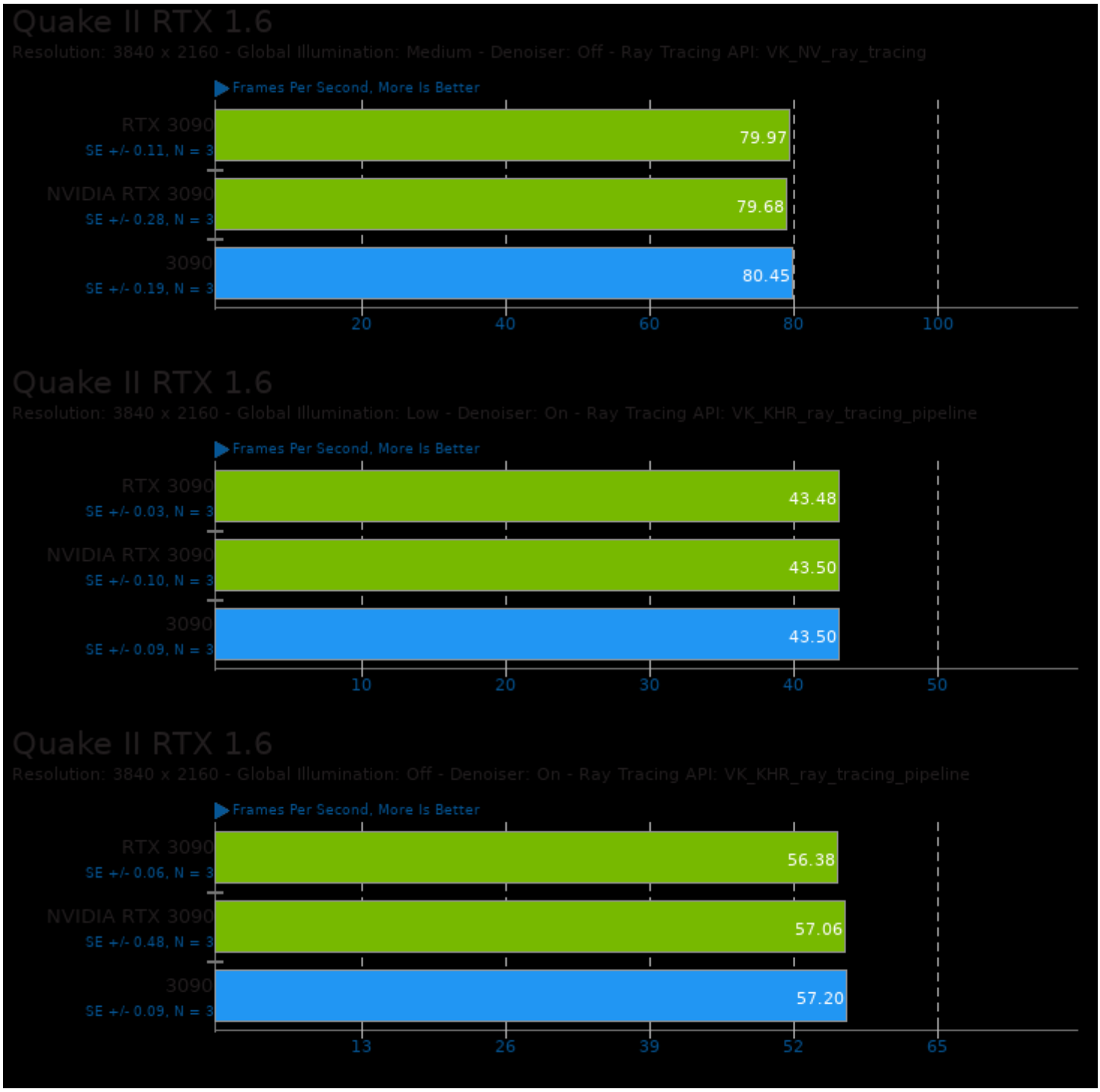

Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: Off - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.20, N = 3
92.26
NVIDIA RTX 3090
SE +/- 0.18, N = 3
92.16
3090
SE +/- 0.84, N = 3
93.25
20
40
60
80
100
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: On - Ray Tracing API: VK_NV_ray_tracing
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.11, N = 3
58.03
NVIDIA RTX 3090
SE +/- 0.11, N = 3
57.95
3090
SE +/- 0.07, N = 3
58.30
13
26
39
52
65
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: Off - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 1.24, N = 4
113.11
NVIDIA RTX 3090
SE +/- 0.56, N = 3
112.97
3090
SE +/- 0.48, N = 3
112.36
30
60
90
120
150

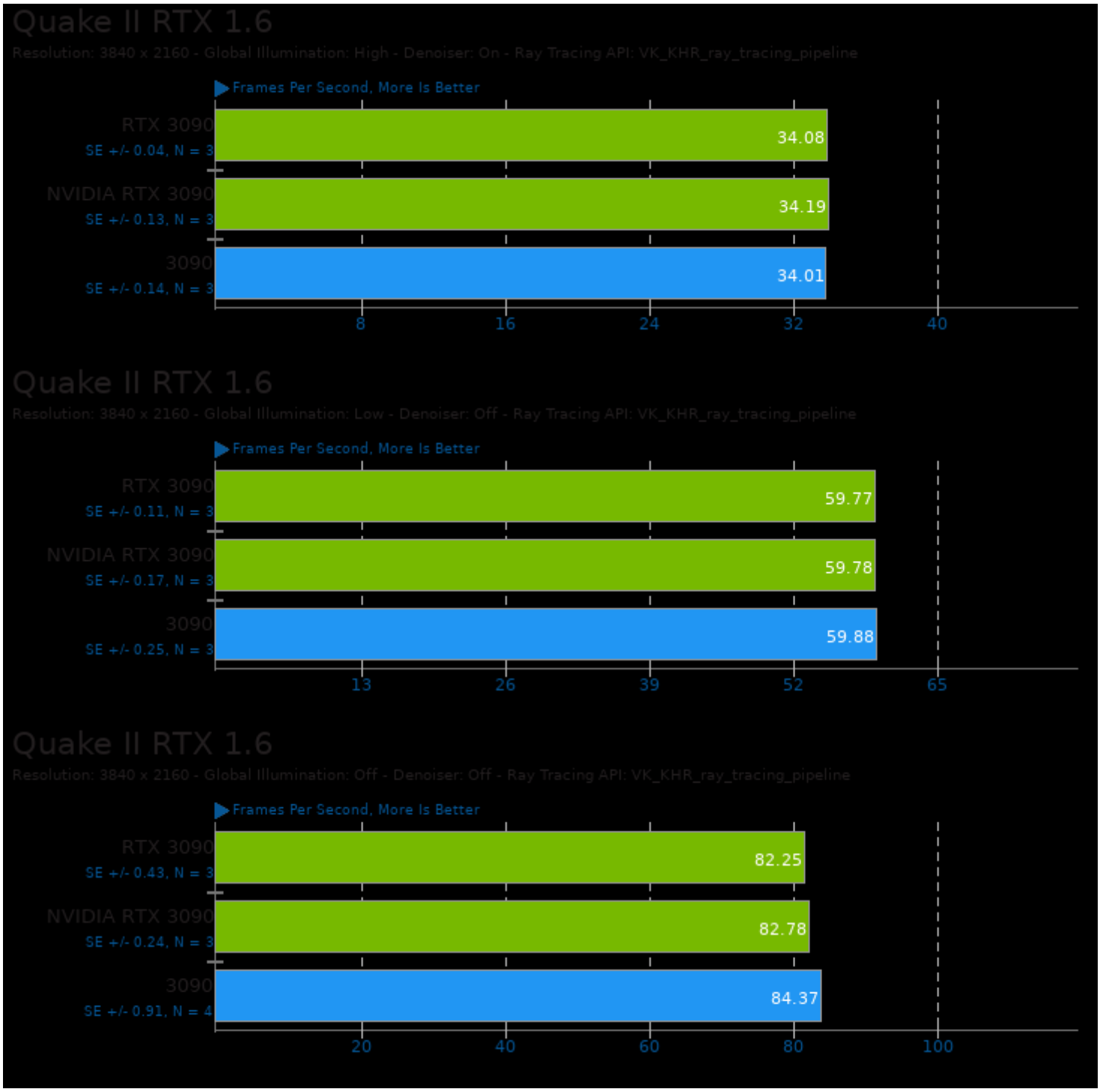
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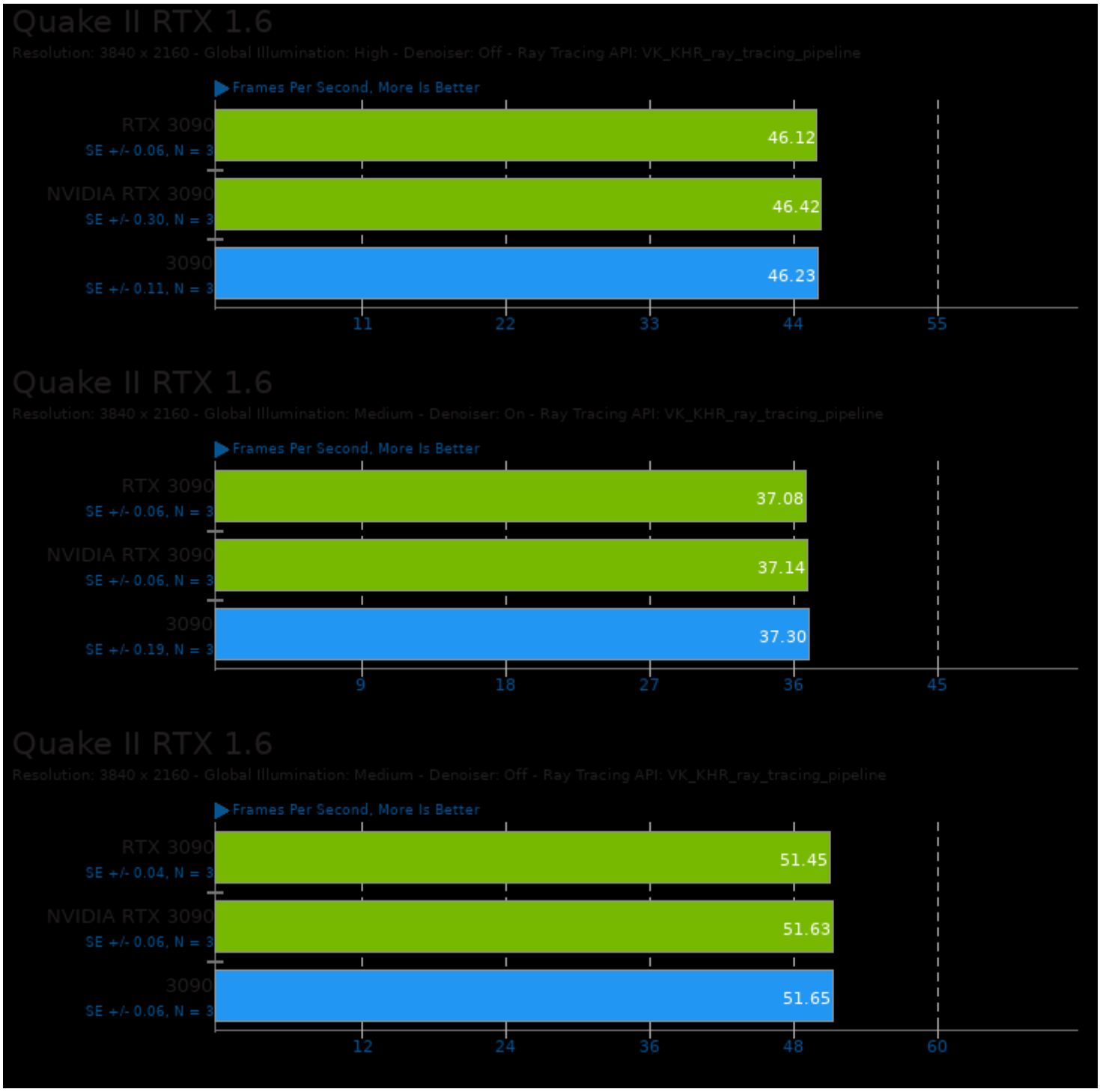



Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.26, N = 3
91.85
NVIDIA RTX 3090
SE +/- 0.02, N = 3
91.61
3090
SE +/- 0.92, N = 3
93.12
20
40
60
80
100
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.28, N = 3
113.23
NVIDIA RTX 3090
SE +/- 0.28, N = 3
112.59
3090
SE +/- 1.61, N = 3
114.01
30
60
90
120
150
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: High - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.19, N = 3
70.21
NVIDIA RTX 3090
SE +/- 0.17, N = 3
70.33
3090
SE +/- 0.38, N = 3
70.16
16
32
48
64
80

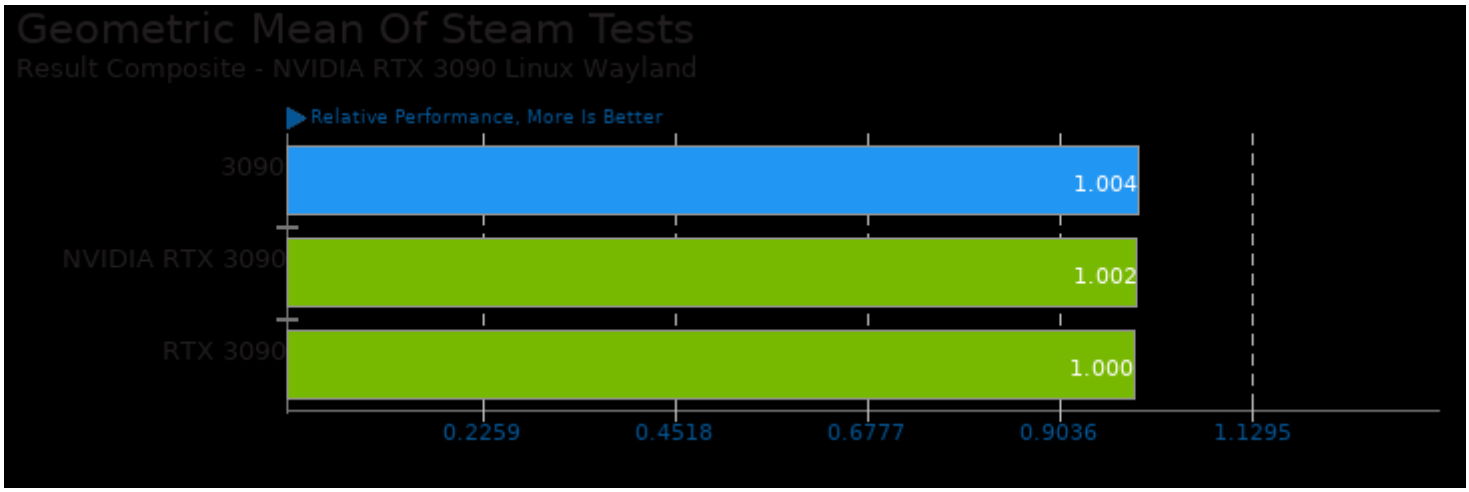

Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: On - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.03, N = 3
52.77
NVIDIA RTX 3090
SE +/- 0.16, N = 3
52.68
3090
SE +/- 0.25, N = 3
52.77
12
24
36
48
60
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: Off - Ray Tracing API: VK_KHR_ray_query
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.32, N = 3
79.58
NVIDIA RTX 3090
SE +/- 0.08, N = 3
80.28
3090
SE +/- 0.11, N = 3
80.39
20
40
60
80
100
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: On - Ray Tracing API: VK_NV_ray_tracing
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.09, N = 3
52.69
NVIDIA RTX 3090
SE +/- 0.10, N = 3
52.65
3090
SE +/- 0.23, N = 3
52.58
12
24
36
48
60


Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: Off - Ray Tracing API: VK_NV_ray_tracing
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.11, N = 3
79.97
NVIDIA RTX 3090
SE +/- 0.28, N = 3
79.68
3090
SE +/- 0.19, N = 3
80.45
20
40
60
80
100
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: On - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.03, N = 3
43.48
NVIDIA RTX 3090
SE +/- 0.10, N = 3
43.50
3090
SE +/- 0.09, N = 3
43.50
10
20
30
40
50
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: On - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.06, N = 3
56.38
NVIDIA RTX 3090
SE +/- 0.48, N = 3
57.06
3090
SE +/- 0.09, N = 3
57.20
13
26
39
52
65


Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: High - Denoiser: On - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.04, N = 3
34.08
NVIDIA RTX 3090
SE +/- 0.13, N = 3
34.19
3090
SE +/- 0.14, N = 3
34.01
8
16
24
32
40
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Low - Denoiser: Off - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.11, N = 3
59.77
NVIDIA RTX 3090
SE +/- 0.17, N = 3
59.78
3090
SE +/- 0.25, N = 3
59.88
13
26
39
52
65
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Off - Denoiser: Off - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.43, N = 3
82.25
NVIDIA RTX 3090
SE +/- 0.24, N = 3
82.78
3090
SE +/- 0.91, N = 4
84.37
20
40
60
80
100


Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: High - Denoiser: Off - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.06, N = 3
46.12
NVIDIA RTX 3090
SE +/- 0.30, N = 3
46.42
3090
SE +/- 0.11, N = 3
46.23
11
22
33
44
55
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: On - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.06, N = 3
37.08
NVIDIA RTX 3090
SE +/- 0.06, N = 3
37.14
3090
SE +/- 0.19, N = 3
37.30
9
18
27
36
45
Quake II RTX 1.6
Resolution: 3840 x 2160 - Global Illumination: Medium - Denoiser: Off - Ray Tracing API: VK_KHR_ray_tracing_pipeline
Frames Per Second, More Is Better
RTX 3090
SE +/- 0.04, N = 3
51.45
NVIDIA RTX 3090
SE +/- 0.06, N = 3
51.63
3090
SE +/- 0.06, N = 3
51.65
12
24
36
48
60

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



Geometric mean based upon tests: pts/hitman3 and pts/quake2rtx

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 09:35.