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# NVIDIA R515 Compute

Intel Core i9-12900K testing with a ASUS ROG STRIX Z690-E GAMING WIFI (1003 BIOS) and NVIDIA GeForce RTX 3090 24GB on Ubuntu 22.04 via the Phoronix Test Suite.

**Automated Executive Summary**

*Proprietary had the most wins, coming in first place for 90% of the tests.*

*Based on the geometric mean of all complete results, the fastest (Proprietary) was 1.021x the speed of the slowest (Open).*

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

*LuxCoreRender (Scene: Rainbow Colors and Prism - Acceleration: GPU) at 1.142x*
*Blender (Blend File: Fishy Cat - Compute: NVIDIA OptiX) at 1.054x*
*Blender (Blend File: Pabellon Barcelona - Compute: NVIDIA OptiX) at 1.044x*
*cl-mem (Benchmark: Read) at 1.038x*
*Blender (Blend File: BMW27 - Compute: NVIDIA OptiX) at 1.035x*
*LeelaChessZero (Backend: OpenCL) at 1.029x*
*OctaneBench (Total Score) at 1.029x*
*Blender (Blend File: Classroom - Compute: NVIDIA OptiX) at 1.029x*
*Hashcat (Benchmark: SHA-512) at 1.028x*

*Blender (Blend File: Barbershop - Compute: NVIDIA OptiX) at 1.026x.*

# Test Systems:

## Open

## Proprietary

Processor: Intel Core i9-12900K @ 5.20GHz (16 Cores / 24 Threads), Motherboard: ASUS ROG STRIX Z690-E GAMING WIFI (1003 BIOS), Chipset: Intel Device 7aa7, Memory: 32GB, Disk: 1000GB Western Digital WDS100T1X0E-00AFY0 + 2000GB, Graphics: NVIDIA GeForce RTX 3090 24GB, Audio: Intel Device 7ad0, Monitor: ASUS VP28U, Network: Intel I225-V + Intel Wi-Fi 6 AX210/AX211/AX411

OS: Ubuntu 22.04, Kernel: 5.15.0-27-generic (x86_64), Desktop: GNOME Shell 42.0, Display Server: X Server 1.21.1.3, Display Driver: NVIDIA 515.43.04, OpenGL: 4.6.0, OpenCL: OpenCL 3.0 CUDA 11.7.57, Vulkan: 1.2.204, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-gBFGDP/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-gBFGDP/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate performance (EPP: performance) - CPU Microcode: 0x18 - Thermald 2.4.9
Graphics Notes: BAR1 / Visible vRAM Size: 32768 MiB - vBIOS Version: 94.02.27.00.02
OpenCL Notes: GPU Compute Cores: 10496
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 Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

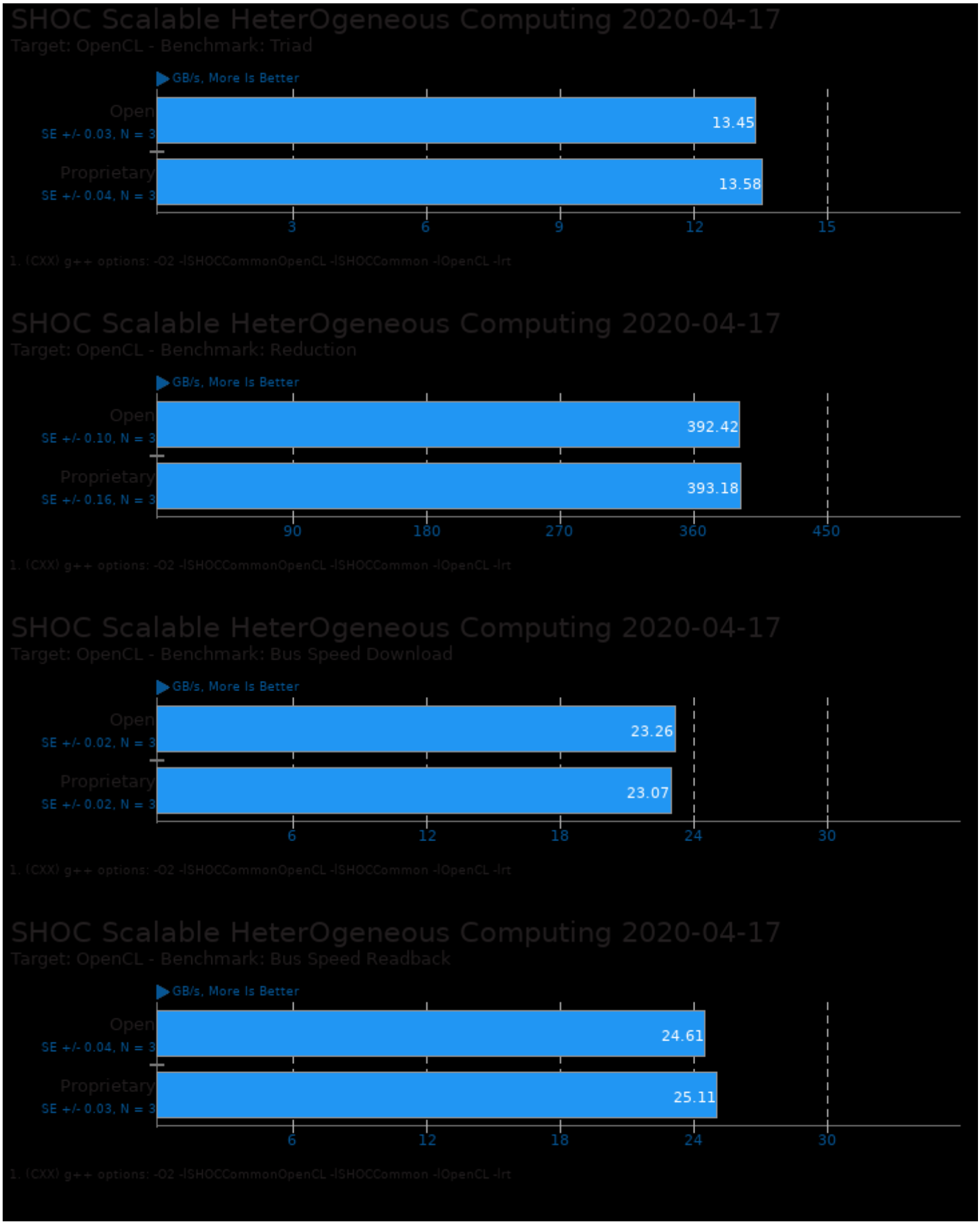
| | Open | Proprietary |
|---|---|---|
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Triad (GB/s)** | **13.4466** | **13.5849** |
| **Normalized** | 98.98% | 100% |
| **Standard Deviation** | 0.3% | 0.5% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Reduction (GB/s)** | **392.418** | **393.180** |
| **Normalized** | 99.81% | 100% |
| **Standard Deviation** | 0% | 0.1% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Download (GB/s)** | **23.2617** | **23.0653** |
| **Normalized** | 100% | 99.16% |
| **Standard Deviation** | 0.2% | 0.2% |

# NVIDIA R515 Compute

| | | |
|---|---|---|
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Readback (GB/s)** | **24.6069** | **25.1096** |
| Normalized | 98% | 100% |
| Standard Deviation | 0.3% | 0.2% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - T.R.B (GB/s)** | **2234** | **2244** |
| Normalized | 99.58% | 100% |
| Standard Deviation | 0.1% | 0.5% |
| **cl-mem - Copy (GB/s)** | **359.8** | **362.8** |
| Normalized | 99.17% | 100% |
| Standard Deviation | 2.7% | 0% |
| **cl-mem - Read (GB/s)** | **784.5** | **814.2** |
| Normalized | 96.35% | 100% |
| Standard Deviation | 2.4% | 0% |
| **cl-mem - Write (GB/s)** | **743.5** | **737.8** |
| Normalized | 100% | 99.23% |
| Standard Deviation | 0.1% | 0.1% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - S3D (GFLOPS)** | **428.267** | **430.126** |
| Normalized | 99.57% | 100% |
| Standard Deviation | 0.1% | 0.1% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - FFT SP (GFLOPS)** | **2102** | **2103** |
| Normalized | 99.93% | 100% |
| Standard Deviation | 0% | 0% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - GEMM SGEMM_N (GFLOPS)** | **8239** | **8118** |
| Normalized | 100% | 98.54% |
| Standard Deviation | 1.1% | 0.6% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - MD5 Hash (GHash/s)** | **44.2194** | **44.5539** |
| Normalized | 99.25% | 100% |
| Standard Deviation | 0.5% | 0.5% |
| **Hashcat - MD5 (H/s)** | **70335800000** | **72124900000** |
| Normalized | 97.52% | 100% |
| Standard Deviation | 0.3% | 0.3% |
| **Hashcat - SHA1 (H/s)** | **22361866667** | **22811433333** |
| Normalized | 98.03% | 100% |
| Standard Deviation | 1.2% | 0.4% |
| **Hashcat - SHA-512 (H/s)** | **2811166667** | **2889833333** |
| Normalized | 97.28% | 100% |
| Standard Deviation | 0.2% | 0.3% |
| **Hashcat - T.R.X (H/s)** | **821733** | **834000** |
| Normalized | 98.53% | 100% |
| Standard Deviation | 2.4% | 0.8% |
| **IndigoBench - OpenCL GPU - Bedroom (M samples/s)** | **20.509** | **20.957** |
| Normalized | 97.86% | 100% |
| Standard Deviation | 0.1% | 0.1% |
| **IndigoBench - OpenCL GPU - Supercar (M samples/s)** | **53.328** | **53.452** |
| Normalized | 99.77% | 100% |
| Standard Deviation | 0.1% | 0% |
| **LuxCoreRender - DLSC - GPU (M samples/sec)** | **11.15** | **11.34** |
| Normalized | 98.32% | 100% |
| Standard Deviation | 0.6% | 0.3% |

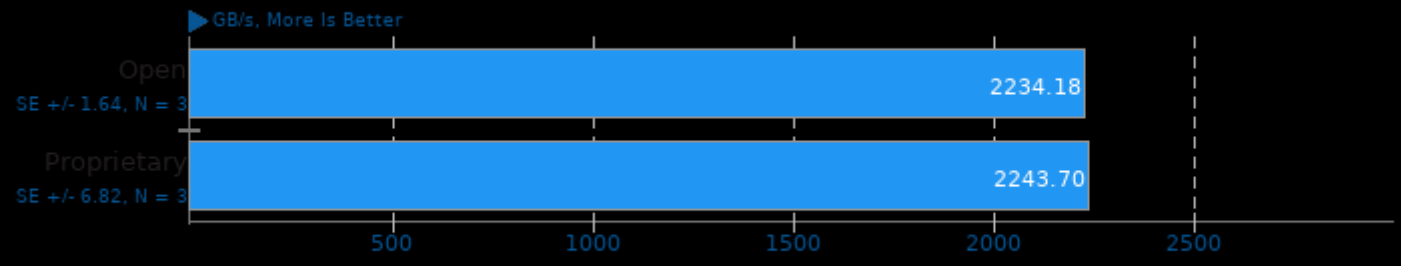
# NVIDIA R515 Compute

| | | |
|---|---|---|
| **LuxCoreRender - Danish Mood - GPU (M samples/sec)** | **8.50** | **8.61** |
| **Normalized** | 98.72% | 100% |
| **Standard Deviation** | 1.1% | 1.4% |
| **LuxCoreRender - Orange Juice - GPU (M samples/sec)** | **9.97** | **10.19** |
| **Normalized** | 97.84% | 100% |
| **Standard Deviation** | 0.2% | 0.3% |
| **LuxCoreRender - LuxCore Benchmark - GPU (M samples/sec)** | **10.69** | **10.94** |
| **Normalized** | 97.71% | 100% |
| **Standard Deviation** | 0.5% | 0.1% |
| **LuxCoreRender - R.C.a.P - GPU (M samples/sec)** | **26.56** | **30.33** |
| **Normalized** | 87.57% | 100% |
| **Standard Deviation** | 2.2% | 1.7% |
| **LeelaChessZero - OpenCL (Nodes/s)** | **63092** | **64939** |
| **Normalized** | 97.16% | 100% |
| **Standard Deviation** | 0.8% | 0.6% |
| **FAHBench (Ns/Day)** | **350.6836** | **357.4955** |
| **Normalized** | 98.09% | 100% |
| **Standard Deviation** | 0.1% | 0% |
| **OctaneBench - Total Score (Score)** | **676.199077** | **695.514975** |
| **Normalized** | 97.22% | 100% |
| **Chaos Group V-RAY - NVIDIA CUDA GPU (vpaths)** | **2085** | **2126** |
| **Normalized** | 98.07% | 100% |
| **Standard Deviation** | 0.2% | 0.1% |
| **Chaos Group V-RAY - NVIDIA RTX GPU (vrays)** | **2841** | **2898** |
| **Normalized** | 98.03% | 100% |
| **Standard Deviation** | 0.2% | 0.4% |
| **Blender - BMW27 - NVIDIA OptiX (sec)** | **7.11** | **6.87** |
| **Normalized** | 96.62% | 100% |
| **Standard Deviation** | 2.9% | 1.5% |
| **Blender - Classroom - NVIDIA OptiX (sec)** | **17.65** | **17.16** |
| **Normalized** | 97.22% | 100% |
| **Standard Deviation** | 0.2% | 0.2% |
| **Blender - Fishy Cat - NVIDIA OptiX (sec)** | **11.54** | **10.95** |
| **Normalized** | 94.89% | 100% |
| **Standard Deviation** | 2.4% | 0.6% |
| **Blender - Barbershop - NVIDIA OptiX (sec)** | **56.29** | **54.87** |
| **Normalized** | 97.48% | 100% |
| **Standard Deviation** | 0.4% | 0.7% |
| **Blender - Pabellon Barcelona - NVIDIA OptiX (sec)** | **18.58** | **17.80** |
| **Normalized** | 95.8% | 100% |
| **Standard Deviation** | 1.4% | 0.1% |


SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Triad
GB/s, More Is Better
Open
SE +/- 0.03, N = 3
13.45
Proprietary
SE +/- 0.04, N = 3
13.58
3
6
9
12
15
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Reduction
GB/s, More Is Better
Open
SE +/- 0.10, N = 3
392.42
Proprietary
SE +/- 0.16, N = 3
393.18
90
180
270
360
450
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Bus Speed Download
GB/s, More Is Better
Open
SE +/- 0.02, N = 3
23.26
Proprietary
SE +/- 0.02, N = 3
23.07
6
12
18
24
30
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Bus Speed Readback
GB/s, More Is Better
Open
SE +/- 0.04, N = 3
24.61
Proprietary
SE +/- 0.03, N = 3
25.11
6
12
18
24
30
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt

## SHOC Scalable HeterOgeneous Computing 2020-04-17

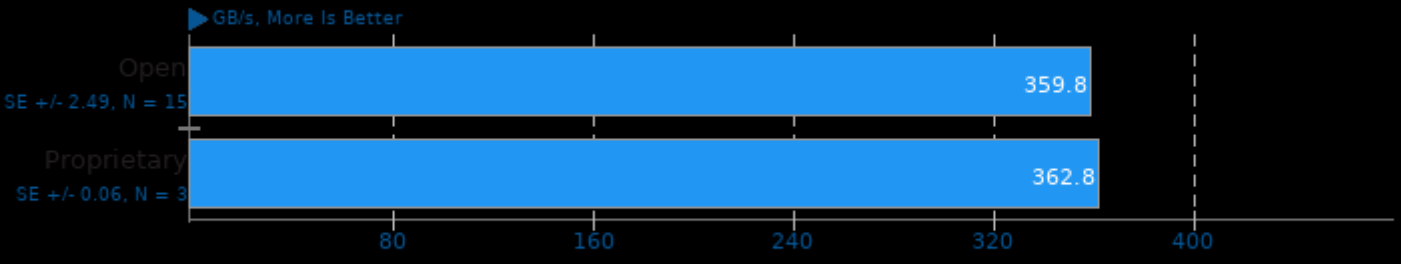
Target: OpenCL - Benchmark: Texture Read Bandwidth




1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt

## cl-mem 2017-01-13

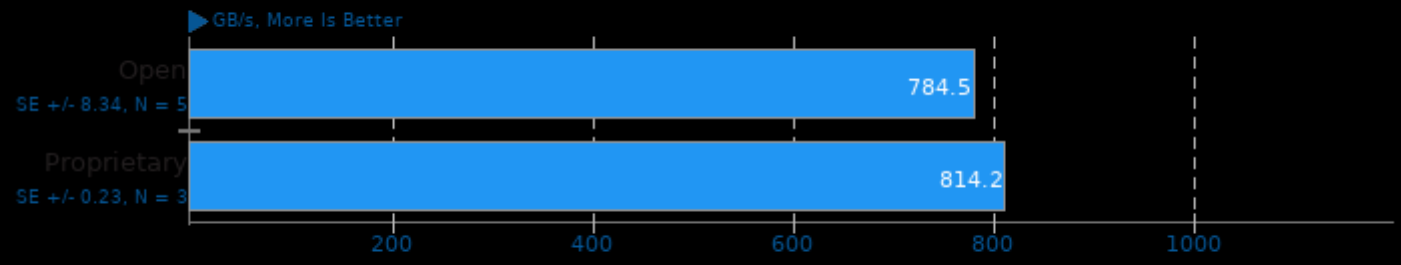
Benchmark: Copy




1. (CC) gcc options: -O2 -flto -lOpenCL

## cl-mem 2017-01-13

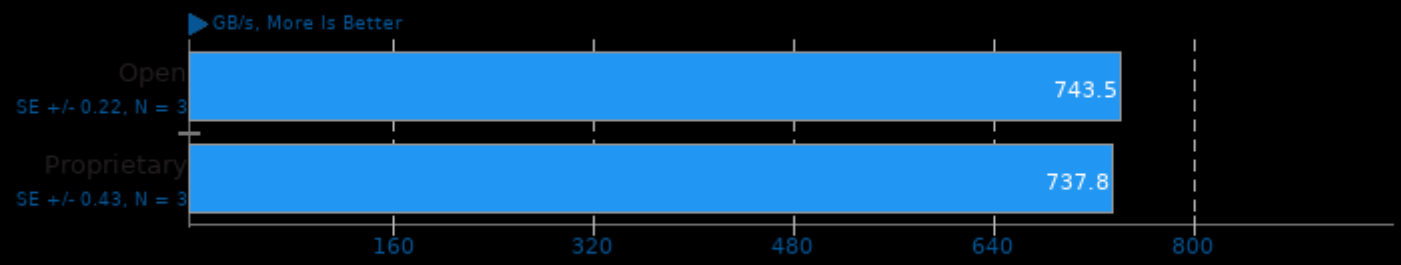
Benchmark: Read



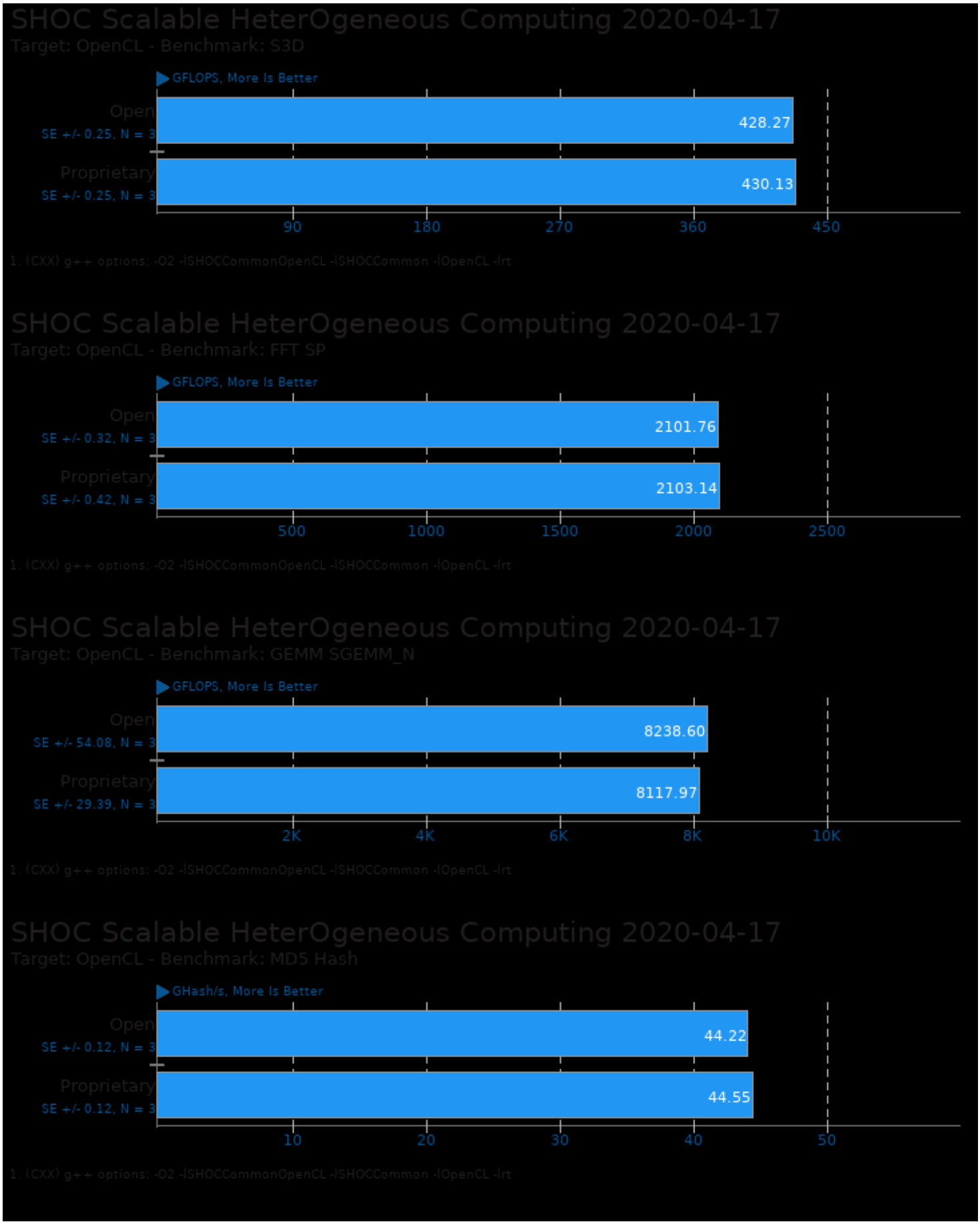

1. (CC) gcc options: -O2 -flto -lOpenCL

## cl-mem 2017-01-13

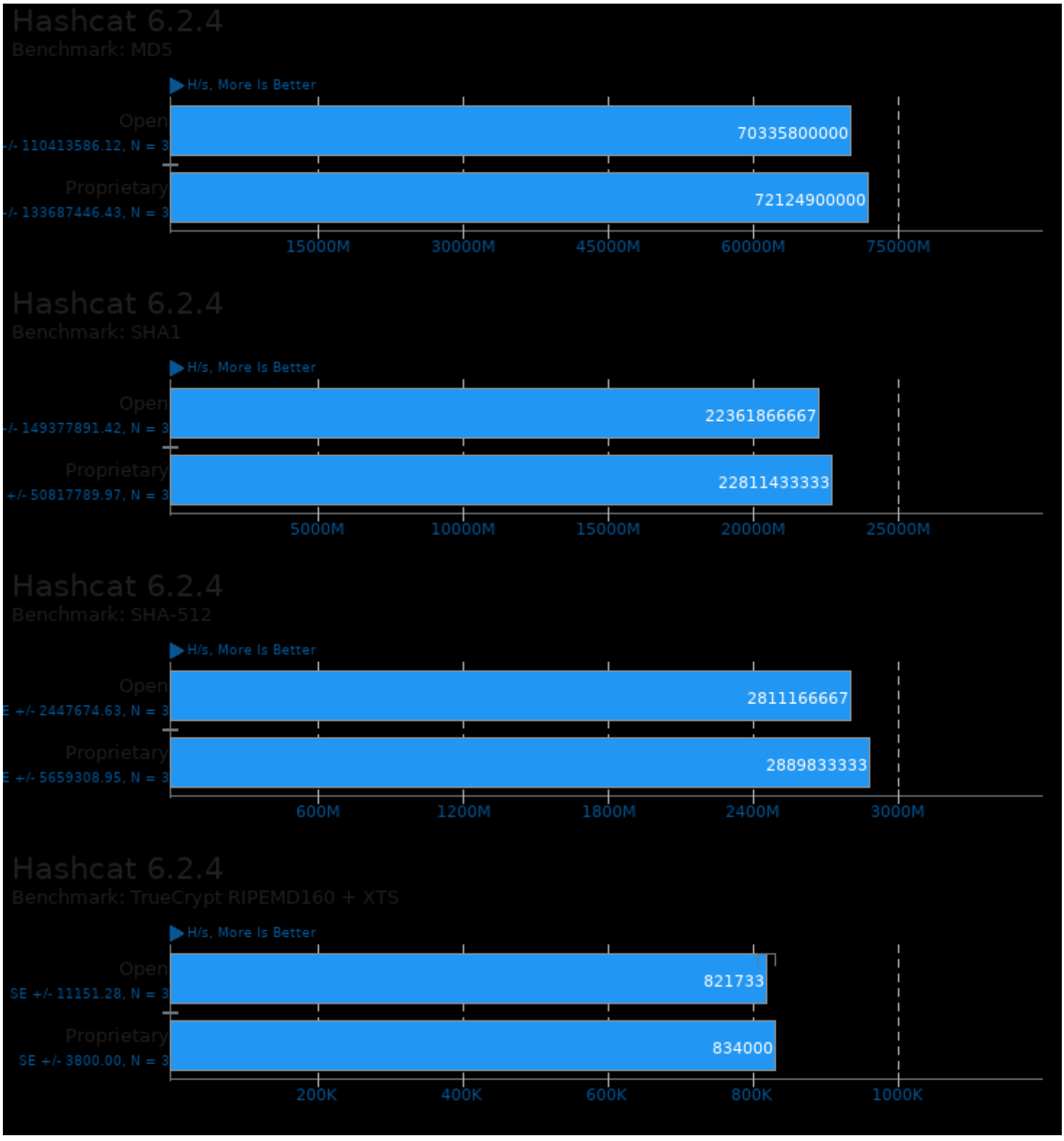
Benchmark: Write



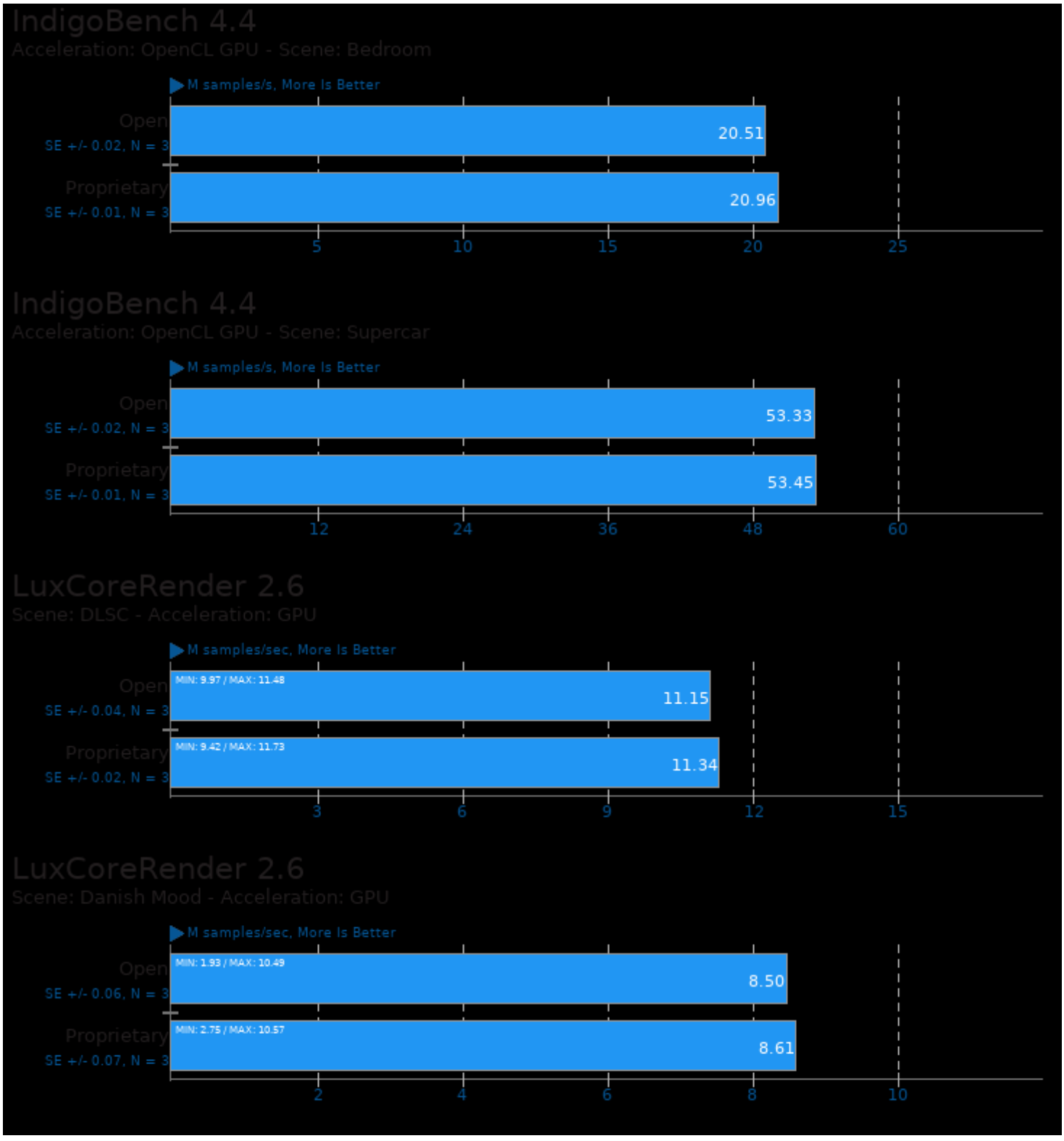

1. (CC) gcc options: -O2 -flto -lOpenCL


SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: S3D
GFLOPS, More Is Better
Open
SE +/- 0.25, N = 3
428.27
Proprietary
SE +/- 0.25, N = 3
430.13
90
180
270
360
450
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: FFT SP
GFLOPS, More Is Better
Open
SE +/- 0.32, N = 3
2101.76
Proprietary
SE +/- 0.42, N = 3
2103.14
500
1000
1500
2000
2500
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: GEMM SGEMM_N
GFLOPS, More Is Better
Open
SE +/- 54.08, N = 3
8238.60
Proprietary
SE +/- 29.39, N = 3
8117.97
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: MD5 Hash
GHash/s, More Is Better
Open
SE +/- 0.12, N = 3
44.22
Proprietary
SE +/- 0.12, N = 3
44.55
10
20
30
40
50
1. (CXX) g++ options: -O2 -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt

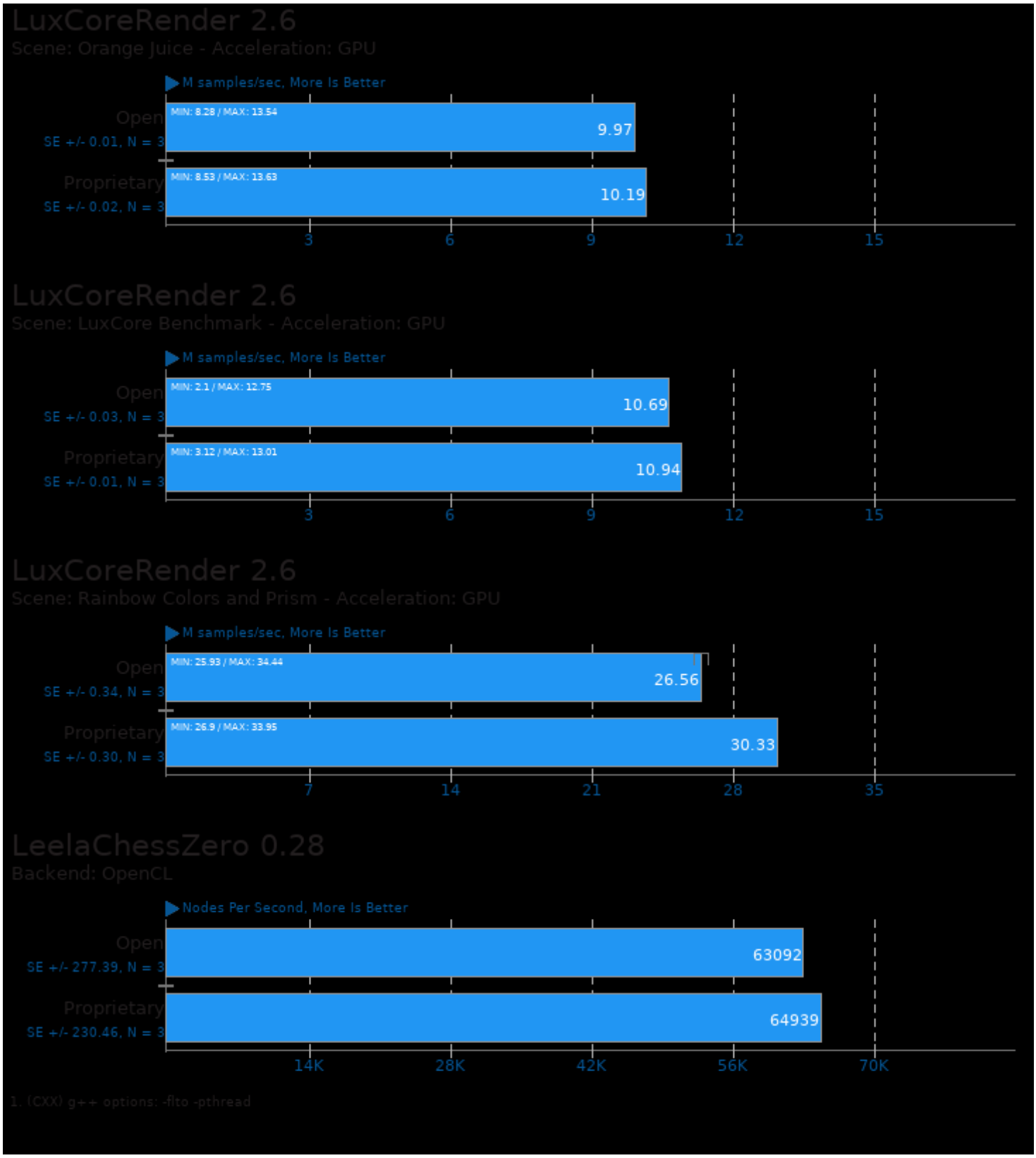
# NVIDIA R515 Compute



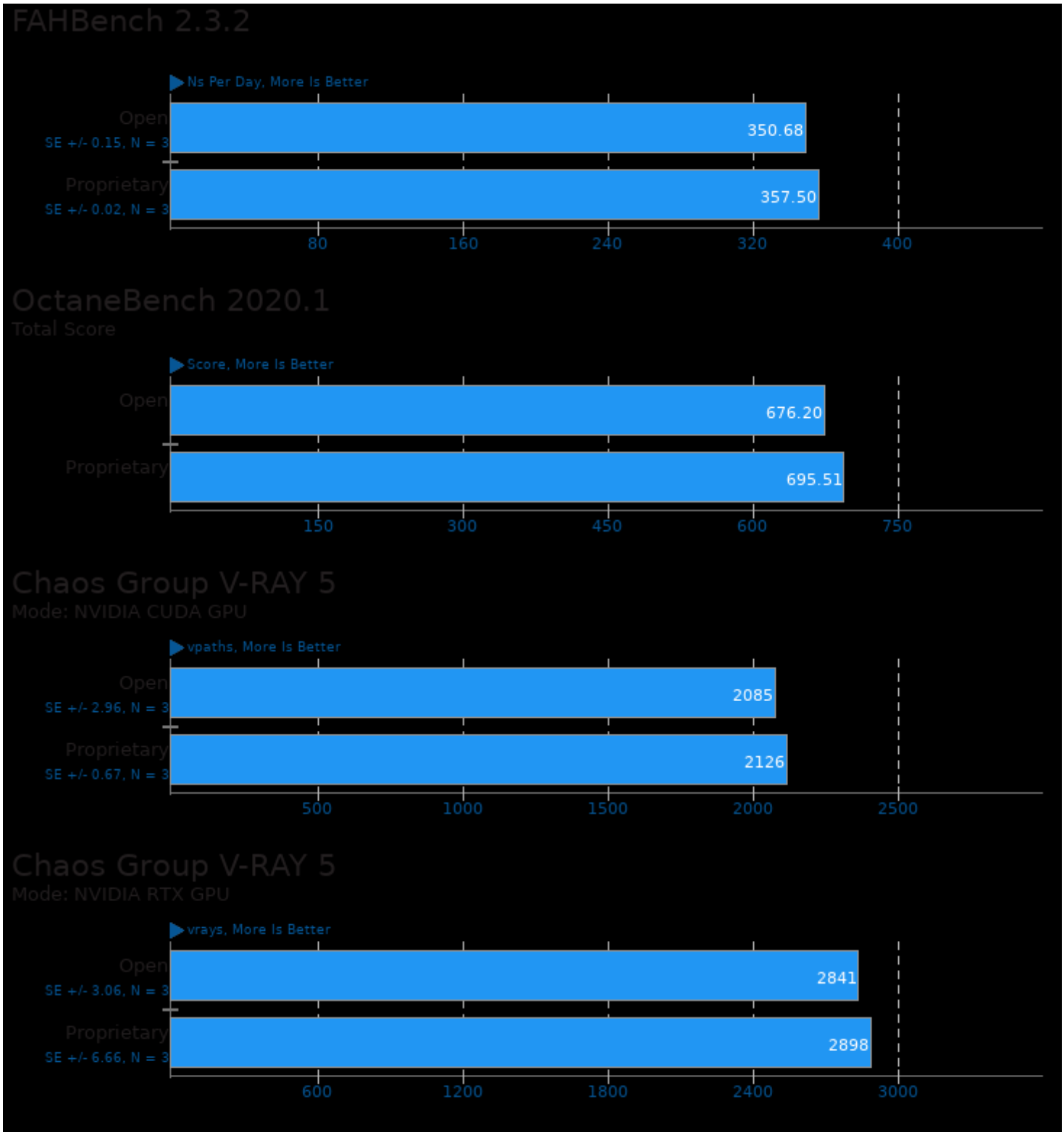
# NVIDIA R515 Compute



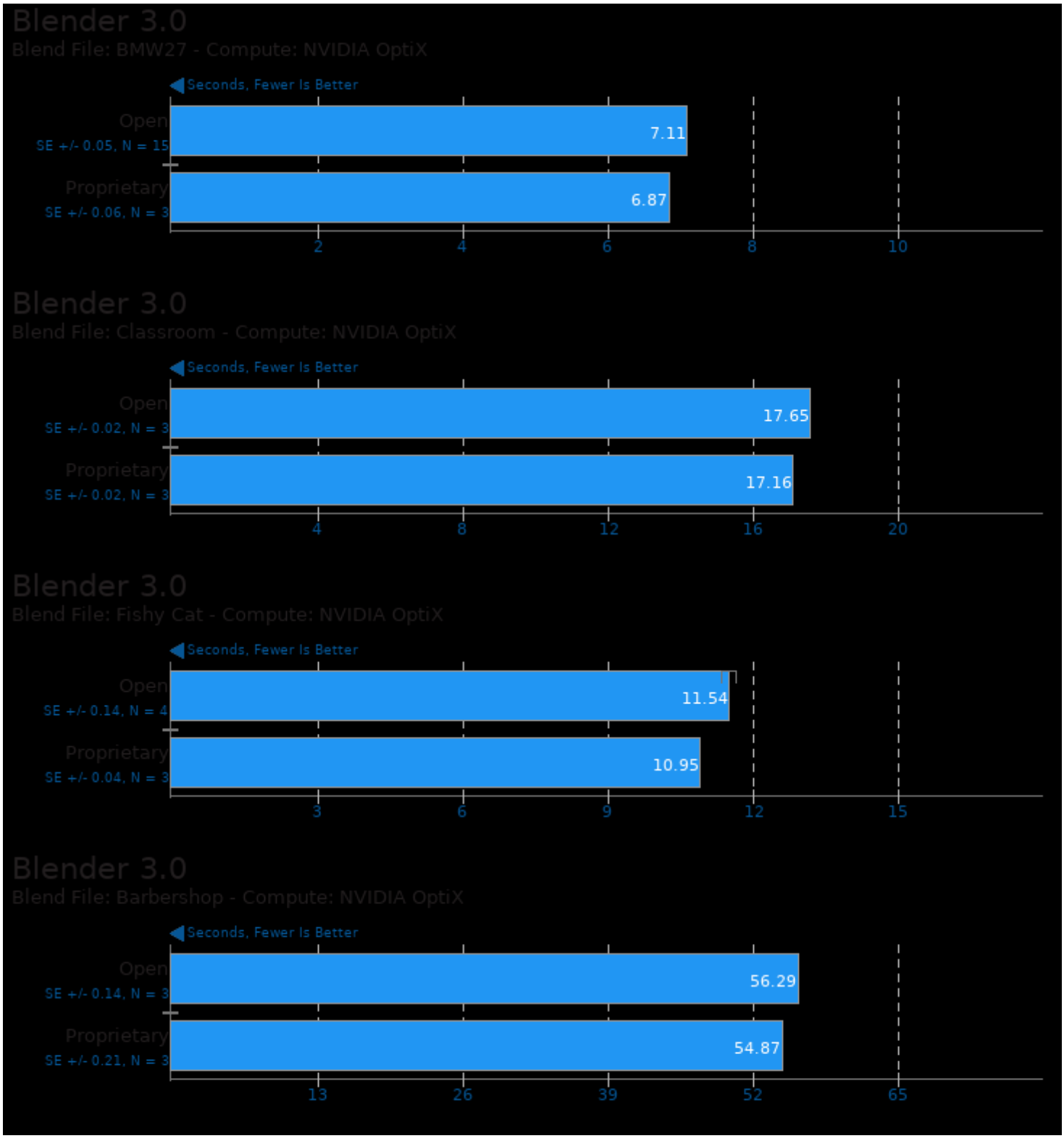
# NVIDIA R515 Compute



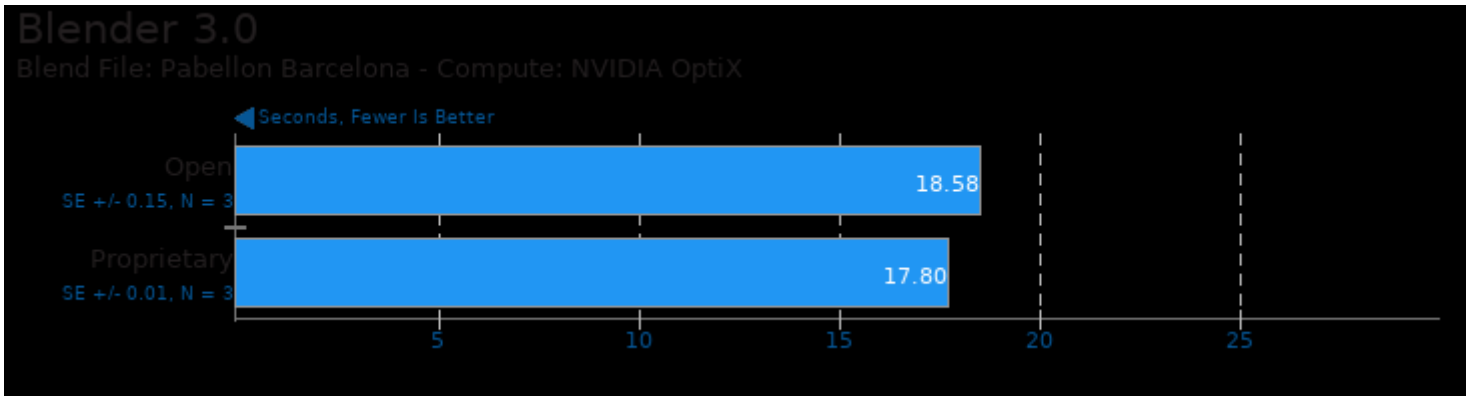
# NVIDIA R515 Compute



# NVIDIA R515 Compute

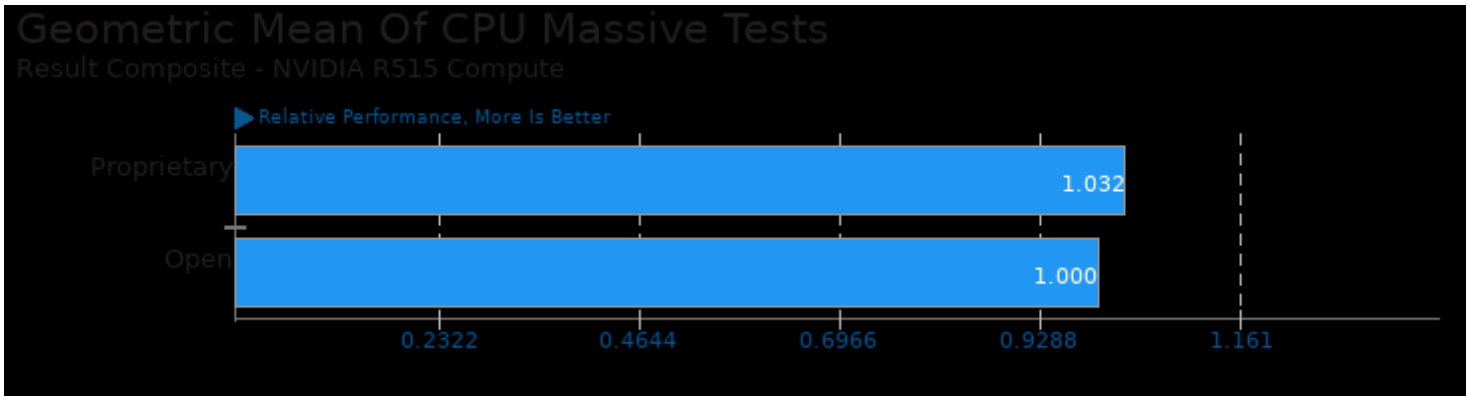


# NVIDIA R515 Compute

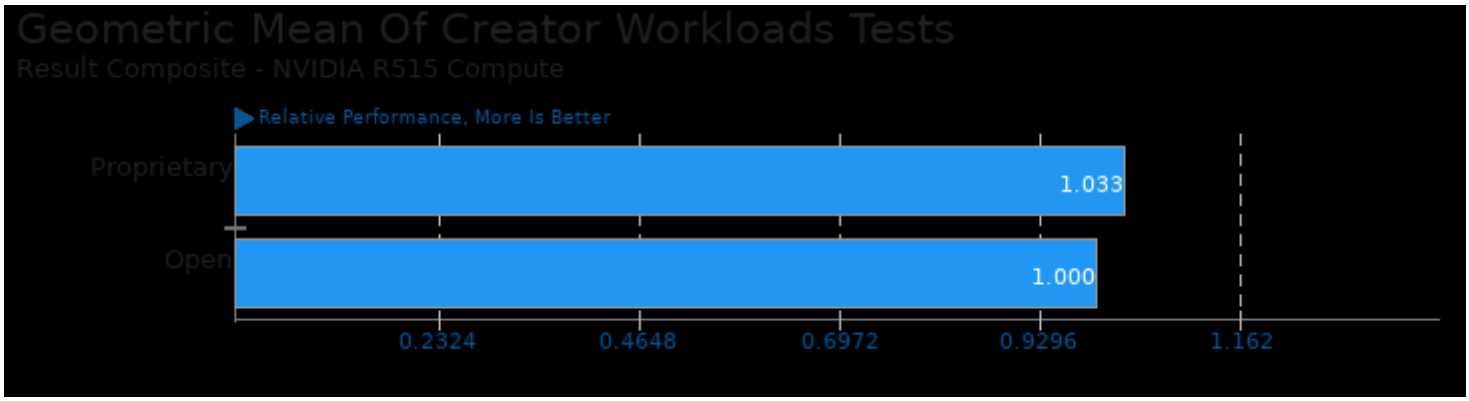


# NVIDIA R515 Compute

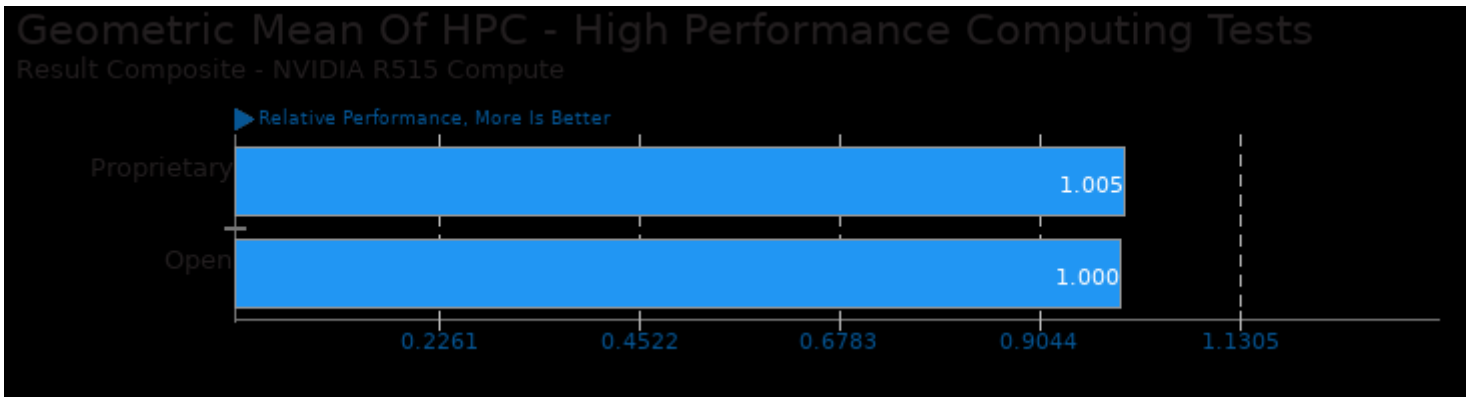
These geometric means are based upon test groupings / test suites for this result file.



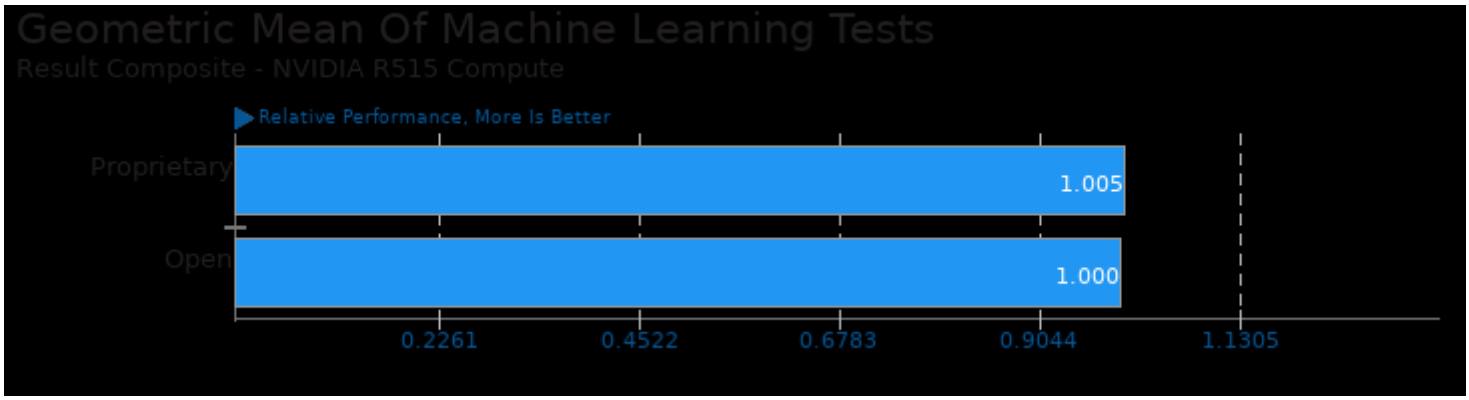

Geometric mean based upon tests: pts/lczero, pts/v-ray and pts/blender



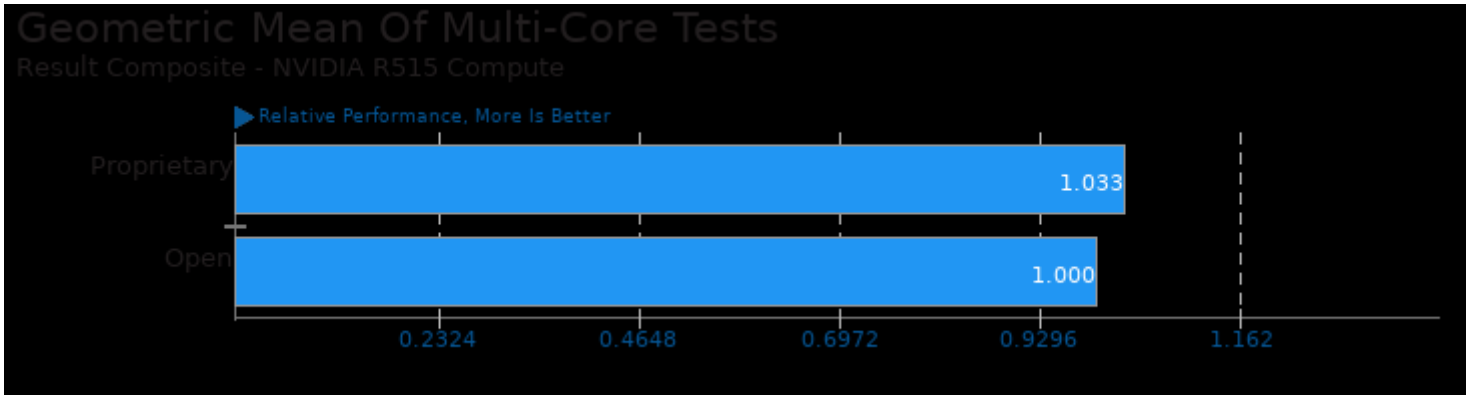

Geometric mean based upon tests: pts/blender, pts/luxcorerender, pts/v-ray and pts/indigobench



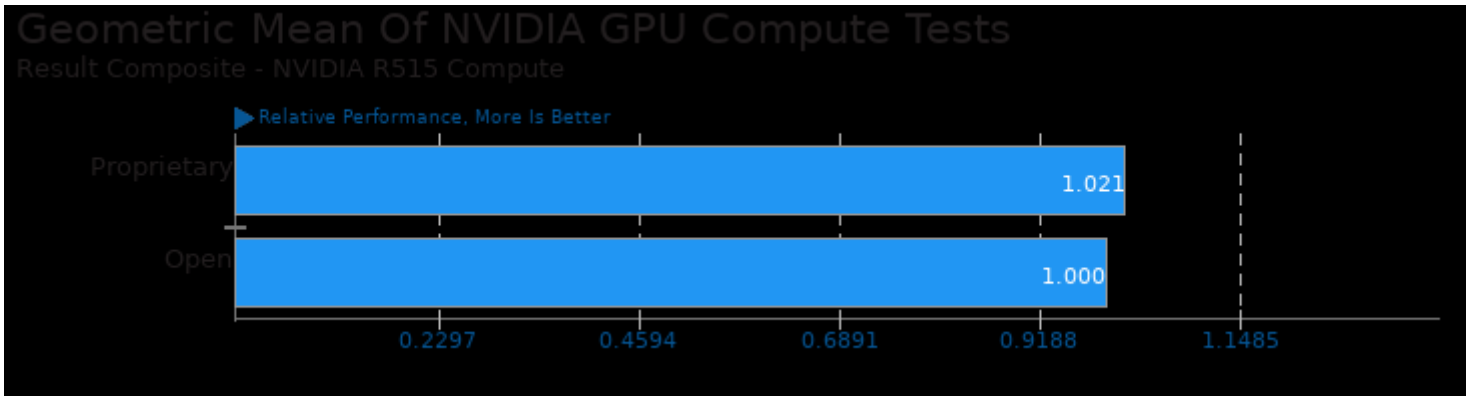

Geometric mean based upon tests: pts/shoc and pts/lczero



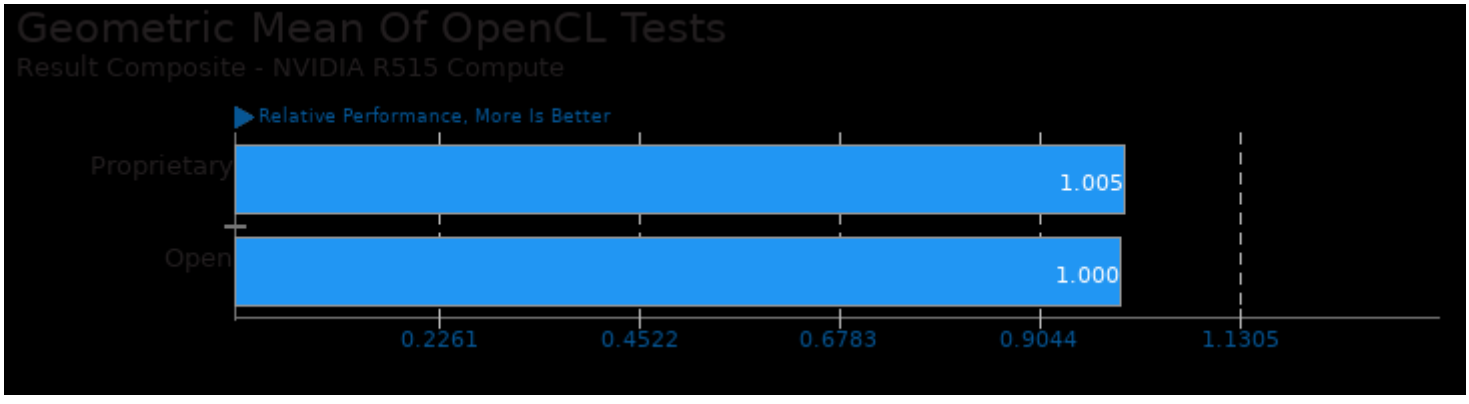

Geometric mean based upon tests: pts/shoc and pts/lczero




Geometric mean based upon tests: pts/blender, pts/luxcorerender, pts/v-ray and pts/indigobench

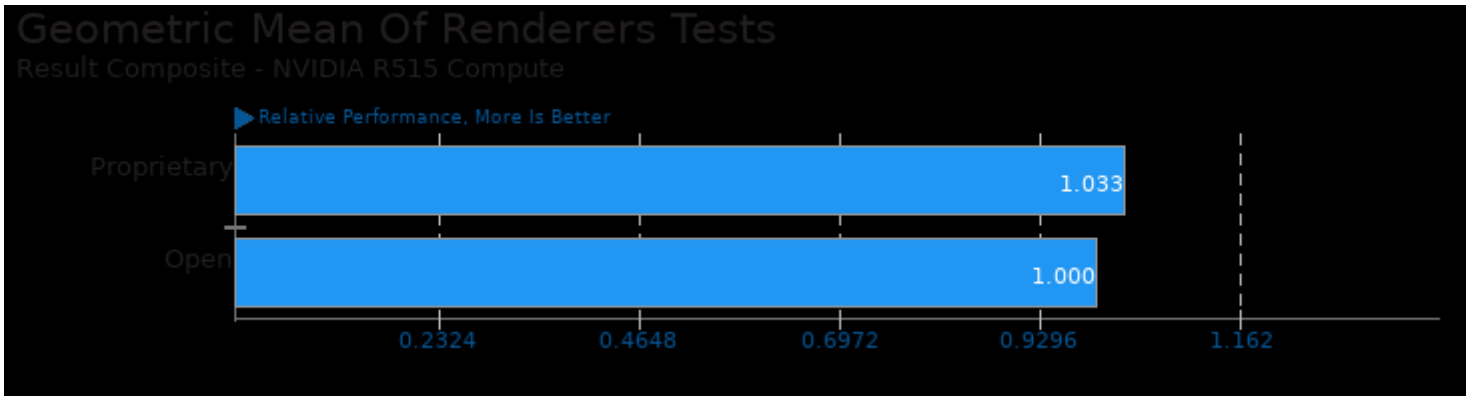



Geometric mean based upon tests: pts/hashcat, pts/fahbench, pts/octanebench, pts/luxcorerender, pts/lczero, pts/cl-mem, pts/shoc, pts/indigobench, pts/v-ray and pts/blender



# NVIDIA R515 Compute

Geometric mean based upon tests: pts/shoc and pts/cl-mem




Geometric mean based upon tests: pts/blender, pts/luxcorerender, pts/v-ray and pts/indigobench

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 10:30.*