



OpenCL 2.0 Intel Beignet CPU Comparison

Intel OpenCL benchmark on Eurocom Q6

Automated Executive Summary

Intel Core i7 8750H had the most wins, coming in first place for 80% of the tests.

Based on the geometric mean of all complete results, the fastest (Intel Core i7 8750H) was 5.085x the speed of the slowest (Pentium G4400). Core i7 7700K was 0.329x the speed of Intel Core i7 8750H, Xeon E3-1245 v5 was 0.948x the speed of Core i7 7700K, Core i5 7600K was 0.997x the speed of Xeon E3-1245 v5, Core i5 6600K was 0.999x the speed of Core i5 7600K, Core i3 7100 was 0.928x the speed of Core i5 6600K, Core i5 6500 was 0.966x the speed of Core i3 7100, Xeon E3-1235L v5 was 0.977x the speed of Core i5 6500, Pentium G4400 was 0.724x the speed of Xeon E3-1235L v5.

Test Systems:

Core i5 6500

Processor: Intel Core i5-6500 @ 3.20GHz (4 Cores), Motherboard: Gigabyte Z170M-D3H-CF, Chipset: Intel Skylake, Memory: 8192MB, Disk: 250GB Samsung SSD 850, Graphics: Intel HD 530 (Skylake GT2) 3072MB (1050MHz), Audio: Realtek ALC892, Monitor: DELL P2415Q, Network: Intel Connection

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Core i5 6600K

Processor: Intel Core i5-6600K @ 3.50GHz (4 Cores), Motherboard: MSI Z170A GAMING PRO (MS-7984) v1.0, Chipset: Intel Skylake, Memory: 15360MB, Disk: 256GB TS256GSSD370S, Graphics: Intel HD 530 (Skylake GT2) 3072MB (1150MHz), Audio: Realtek ALC1150, Monitor: DELL P2415Q, Network: Intel Connection

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Pentium G4400

Processor: Intel Pentium G4400 @ 3.30GHz (2 Cores), Motherboard: MSI B150M MORTAR (MS-7972) v2.0, Chipset: Intel Skylake, Memory: 8192MB, Disk: 120GB Samsung SSD 850, Graphics: Intel HD 510 (Skylake GT1) 3072MB (1000MHz), Audio: Realtek ALC892, Monitor: DELL P2415Q, Network: Realtek RTL8111/8168/8411

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Core i3 7100

Processor: Intel Core i3-7100 @ 3.90GHz (4 Cores), Motherboard: ASUS PRIME Z270-P, Chipset: Intel Device 590f, Memory: 16384MB, Disk: Samsung SSD 950 PRO 256GB, Graphics: Intel Kabylake GT2 3072MB (1100MHz), Audio: Realtek ALC887-VD, Monitor: DELL P2415Q, Network: Realtek RTL8111/8168/8411

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Core i5 7600K

Processor: Intel Core i5-7600K @ 3.80GHz (4 Cores), Motherboard: ASUS PRIME Z270-P, Chipset: Intel Device 591f, Memory: 16384MB, Disk: Samsung SSD 950 PRO 256GB, Graphics: Intel Kabylake GT2 3072MB (1150MHz), Audio: Realtek ALC887-VD, Monitor: DELL P2415Q, Network: Realtek RTL8111/8168/8411

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Core i7 7700K

Processor: Intel Core i7-7700K @ 4.20GHz (8 Cores), Motherboard: ASUS PRIME Z270-P, Chipset: Intel Device 591f, Memory: 16384MB, Disk: Samsung SSD 950 PRO 256GB, Graphics: Intel Kabylake GT2 3072MB (1150MHz), Audio: Realtek ALC887-VD, Monitor: DELL P2415Q, Network: Realtek RTL8111/8168/8411

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Xeon E3-1235L v5

Processor: Intel Xeon E3-1235L v5 @ 2.00GHz (4 Cores), Motherboard: ASRock Rack C236M WS, Chipset: Intel Skylake, Memory: 8192MB, Disk: 120GB OCZ TRION150, Graphics: Intel HD 530 (Skylake GT2) 3072MB (1000MHz), Audio: Realtek ALC1150, Monitor: DELL S2409W, Network: Intel Connection

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Xeon E3-1245 v5

Processor: Intel Xeon E3-1245 v5 @ 3.50GHz (8 Cores), Motherboard: MSI C236A WORKSTATION (MS-7998) v1.0, Chipset: Intel Skylake, Memory: 32768MB, Disk: 120GB Samsung SSD 850, Graphics: Intel HD P530 (Skylake GT2)

3072MB (1150MHz), Audio: Realtek ALC1150, Monitor: DELL P2415Q, Network: Intel Connection

OS: Clear Linux, Kernel: 4.9.5-302.native (x86_64), Desktop: Xfce 4.12, Display Server: X Server 1.19.1, Display Driver: modesetting 1.19.1, OpenGL: 4.5 Mesa 17.0.0-devel, OpenCL: OpenCL 2.0 beignet 1.3, Vulkan: 1.0.37, Compiler: GCC 6.3.0 + Clang 3.9.1 + LLVM 3.9.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-generic-linux --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --enable-__cxa_atexit --enable-bootstrap --enable-clocale=gnu --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-lid=default --enable-libmpx --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Processor Notes: Scaling Governor: acpi-cpufreq performance

Intel Core i7 8750H

Processor: Intel Core i7-8750H @ 4.10GHz (6 Cores / 12 Threads), Motherboard: Eurocom Q6 (7.005 BIOS), Chipset: Intel Cannon Lake PCH Shared SRAM, Memory: 32768MB, Disk: 2050GB Crucial_CT2050MX + 1000GB Samsung SSD 960 EVO 1TB, Graphics: NVIDIA GeForce GTX 1070 with Max-Q Design 8192MB (1101/4006MHz), Audio: Realtek ALC1220, Network: Realtek RTL8111/8168/8411 + Intel Wireless-AC 9260

OS: Ubuntu 18.04, Kernel: 4.17.2 (x86_64), Desktop: GNOME Shell 3.28.1, Display Server: X Server 1.19.6, Display Driver: NVIDIA 396.24.02, OpenGL: 4.6.0, OpenCL: OpenCL 1.2 CUDA 9.2.127 + OpenCL 2.1, Compiler: GCC 7.3.0 + Clang 4.0.1-10 + LLVM 4.0.1 + CUDA 9.2, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: drm.debug=0xe
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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-as=/usr/bin/x86_64-linux-gnu-as --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-ld=/usr/bin/x86_64-linux-gnu-ld --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate performance
OpenCL Notes: GPU Compute Cores: 2048
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW Protection

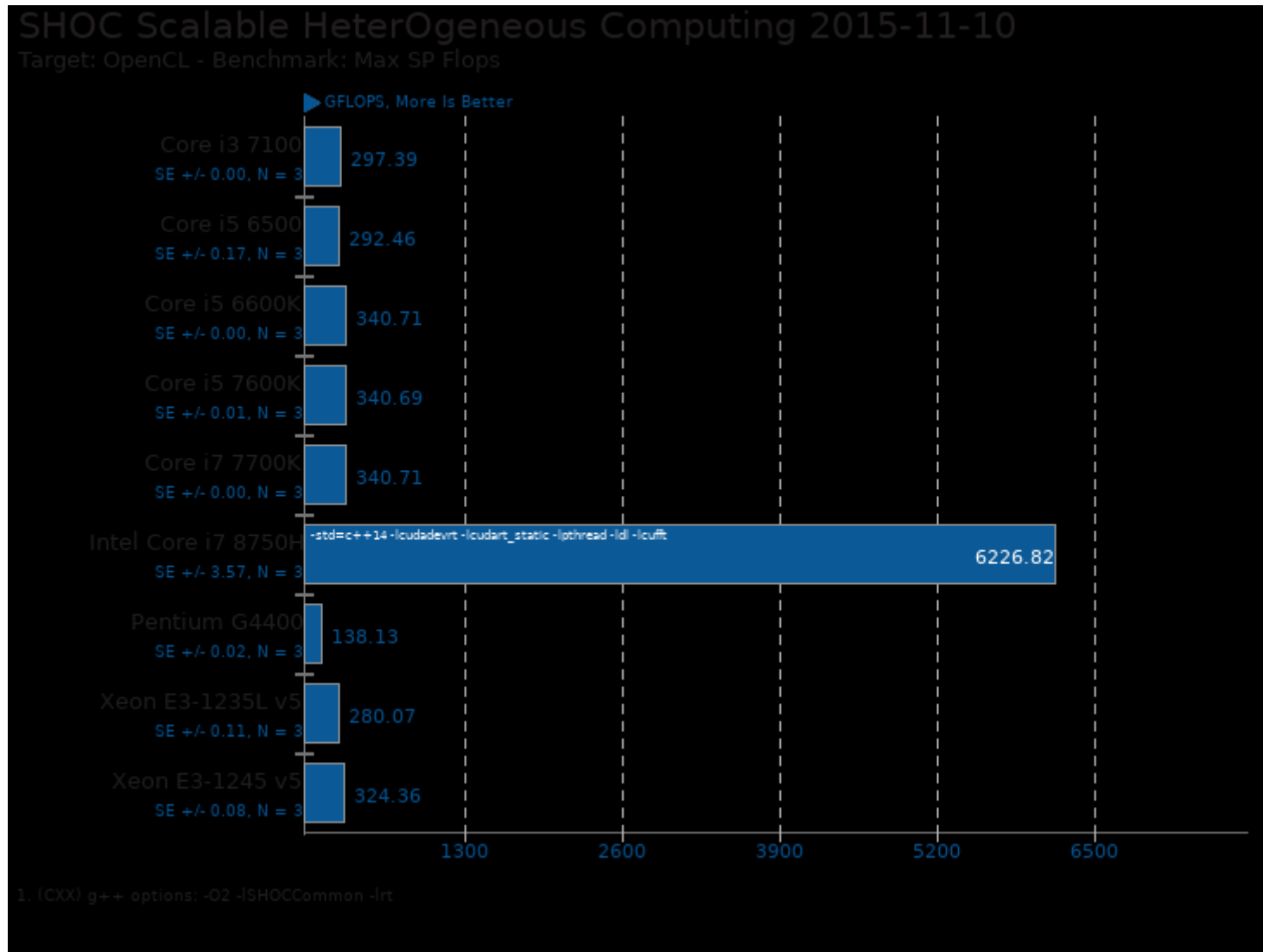
	Core i5 6500	Core i5 6600K	Pentium G4400	Core i3 7100	Core i5 7600K	Core i7 7700K	Xeon E3-1235L v5	Xeon E3-1245 v5	Intel Core i7 8750H
SHOC Scalable Heterogeneous Computing - OpenCL - Max SP Flops (GFLOPS)	292.46	340.71	138.13	297.39	340.69	340.71	280.07	324.36	6227
Normalized	4.7%	5.47%	2.22%	4.78%	5.47%	5.47%	4.5%	5.21%	100%
Standard Deviation	0.1%	0%	0%	0%	0%	0%	0.1%	0%	0.1%
SmallPT GPU - GPU - Caustic3 (Samples/sec)	14856510			14854924	14854625	14855333		14855751	15295626
Normalized	21			83	59	33		56	75
Standard Deviation	97.13%			97.12%	97.12%	97.12%		97.12%	100%
	0%			0%	0%	0%		0%	0%

OpenCL 2.0 Intel Beignet CPU Comparison

SmallIPT GPU - GPU - 14856508									
Cornell 94									
Normalized 97.13%									
Standard Deviation 0%									
SmallIPT GPU - GPU - 14856501									
Complex 08									
(Samples/sec)									
Normalized 97.13%									
Standard Deviation 0%									
SHOC Scalable 49.86 57.60 31.98 51.52 58.11 57.89 47.60 55.52 428.00									
HeterOgeneous									
Computing - OpenCL									
- T.R.B (GB/s)									
Normalized 11.65% 13.46% 7.47% 12.04% 13.58% 13.53% 11.12% 12.97% 100%									
Standard Deviation 1.2% 1.6% 2.2% 0% 0% 0.7% 1.4% 0.2% 0.4%									
JuliaGPU - GPU 31757837 36351872 16211893 31987657 36333557 37085080 29888423 34988792 13248081									
(Samples/sec)									
Normalized 23.97% 27.44% 12.24% 24.15% 27.43% 27.99% 22.56% 26.41% 100%									
Standard Deviation 0% 0% 0% 0.2% 1.8% 2.2% 0% 2.1% 0.3%									
MandelGPU - GPU 7886706 9149327 3613231 8031119 9180692 9186739 7788606 8686154 12672890									
(Samples/sec)									
Normalized 6.22% 7.22% 2.85% 6.34% 7.24% 7.25% 6.15% 6.85% 100%									
Standard Deviation 0% 0.2% 0.1% 0% 0% 0.1% 0.2% 0.1% 0.2%									
cl-mem - Read 45.88 39.92 40.32 44.12 39.72 41.07 39.85 42.18 206.77									
Normalized 22.19% 19.31% 19.5% 21.34% 19.21% 19.86% 19.27% 20.4% 100%									
Standard Deviation 13.5% 11.4% 16.9% 8% 8.5% 14.3% 11.5% 12.7% 0.1%									
cl-mem - Write 40.48 46.02 42.30 47.97 42.92 39.13 44.15 46.68 204.80									
Normalized 19.77% 22.47% 20.65% 23.42% 20.96% 19.11% 21.56% 22.79% 100%									
Standard Deviation 15.1% 6.7% 11.7% 17.1% 11.6% 3.4% 18.6% 3.1% 0%									
MandelbulbGPU - 6852443 7914468 6991142 7893609 7953468 6421850 7523189 74293202									
GPU (Samples/sec)									
Normalized 9.22% 10.65% 9.41% 10.62% 10.71% 8.64% 10.13% 100%									
Standard Deviation 0.4% 0% 0% 0.4% 0.4% 0.6% 0% 1%									
SHOC Scalable 9.32 10.89 9.67 10.90 10.88 8.96 10.33 526.16									
HeterOgeneous									
Computing - OpenCL									
- FFT SP (GFLOPS)									
Normalized 1.77% 2.07% 1.84% 2.07% 2.07% 1.7% 1.96% 100%									
Standard Deviation 0.1% 0% 0.1% 0% 0% 0% 0.3% 1.6%									
SHOC Scalable 0.28 0.32 0.28 0.32 0.32 0.26 0.30 8.68									
HeterOgeneous									
Computing - OpenCL									
- MD5 Hash									
Normalized 3.23% 3.69% 3.23% 3.69% 3.69% 3% 3.46% 100%									
Standard Deviation 0.2% 0% 0% 0% 0% 0.1% 0.1% 0.8%									
SHOC Scalable 7.43 8.27 6.24 6.61 8.37 12.23 9.67 10.49 11.29									
HeterOgeneous									
Computing - OpenCL									
- Triad (GB/s)									
Normalized 60.75% 67.62% 51.02% 54.05% 68.44% 100% 79.07% 85.77% 92.31%									
Standard Deviation 0.5% 0.7% 0.2% 0.2% 0.4% 2.7% 3.6% 1.3% 0.2%									

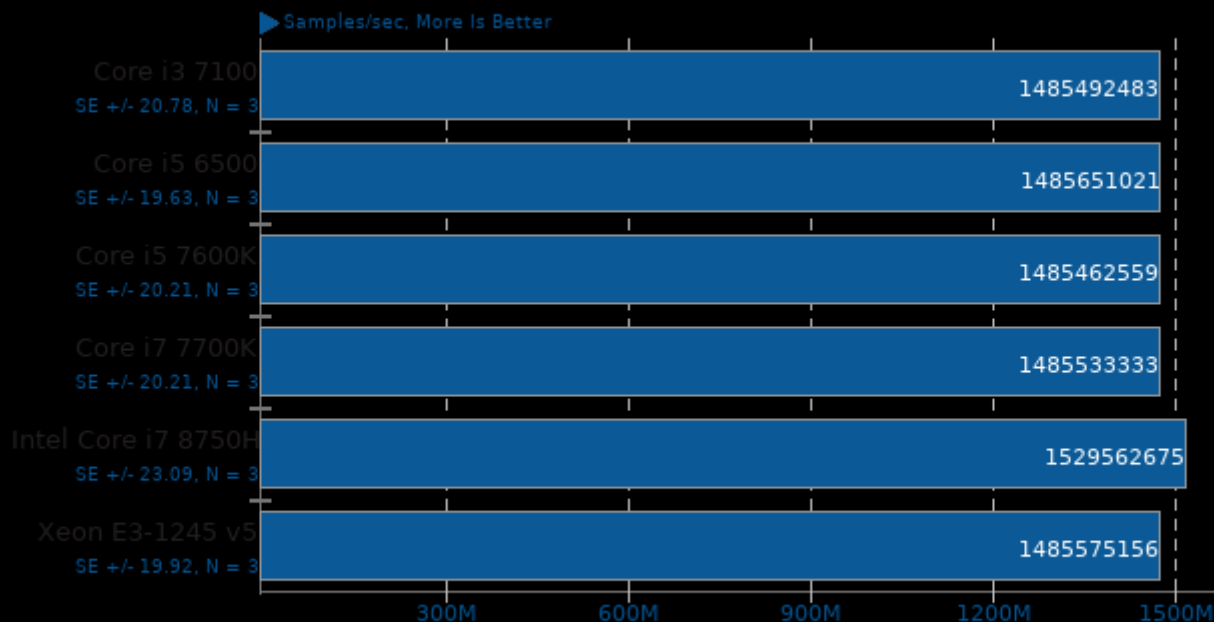
OpenCL 2.0 Intel Beignet CPU Comparison

SHOC Scalable Heterogeneous Computing - OpenCL - Bus Speed Readback (GB/s)	29.57	33.96	24.35	32.08	35.12	38.52	25.60	32.65	12.03
	Normalized	76.77%	88.16%	63.21%	83.28%	91.17%	100%	66.46%	84.76%
	Standard Deviation	1.6%	1.8%	1.8%	1.6%	1.8%	1.4%	1.5%	2.4%
SHOC Scalable Heterogeneous Computing - OpenCL - Bus Speed Download (GB/s)	21.51	25.60	21.07	24.86	26.18	28.39	19.23	24.17	12.48
	Normalized	75.77%	90.17%	74.22%	87.57%	92.22%	100%	67.74%	85.14%
	Standard Deviation	1.2%	0.4%	0.6%	0.2%	1.3%	0.3%	0.3%	1%



SmallPT GPU 1.6pts1

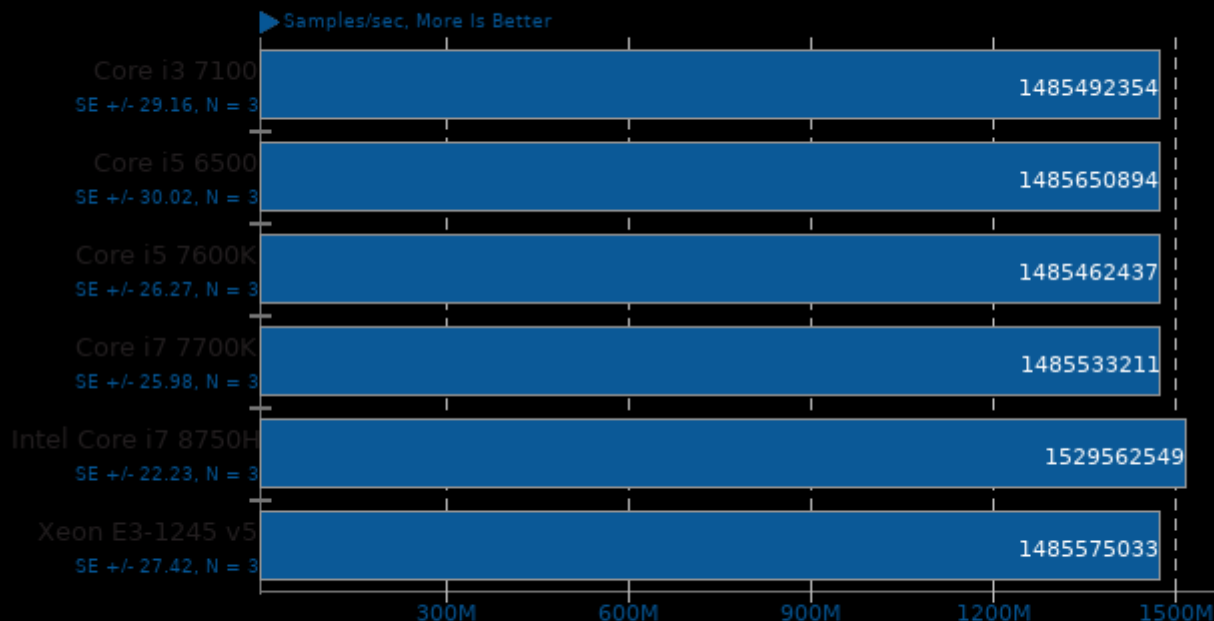
OpenCL Device: GPU - Scene: Caustic3



1. (CC) gcc options: -O3 -lm -ftree-vectorize -funroll-loops -lglut -lOpenCL -lGL

SmallPT GPU 1.6pts1

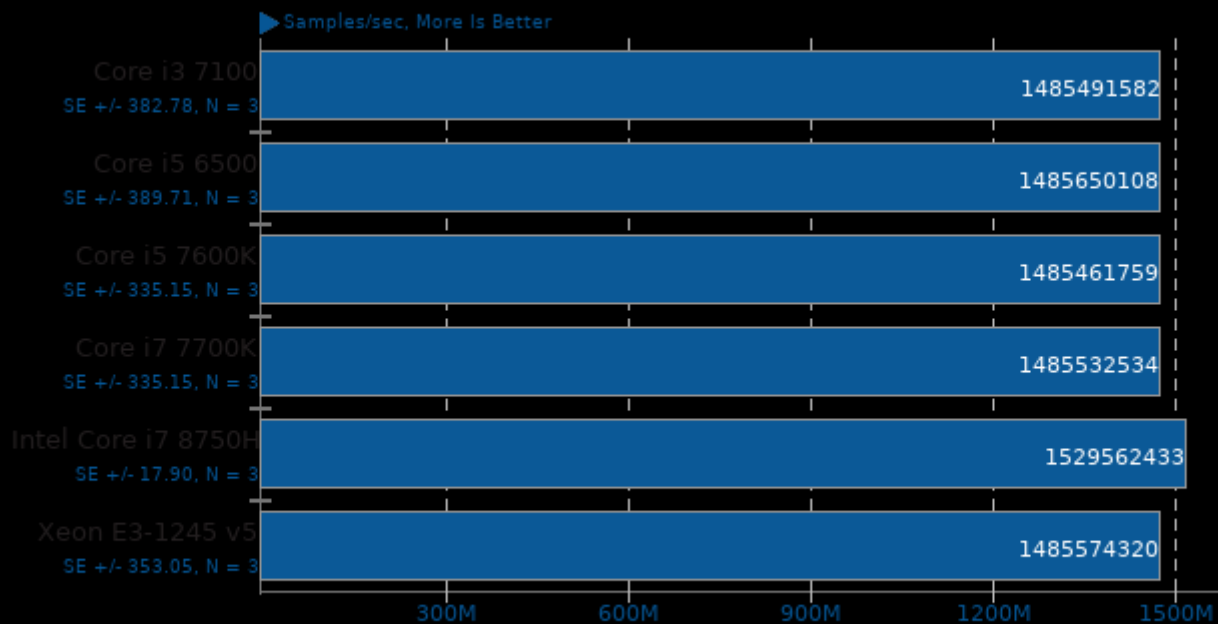
OpenCL Device: GPU - Scene: Cornell



1. (CC) gcc options: -O3 -lm -ftree-vectorize -funroll-loops -lglut -lOpenCL -lGL

SmallPT GPU 1.6pts1

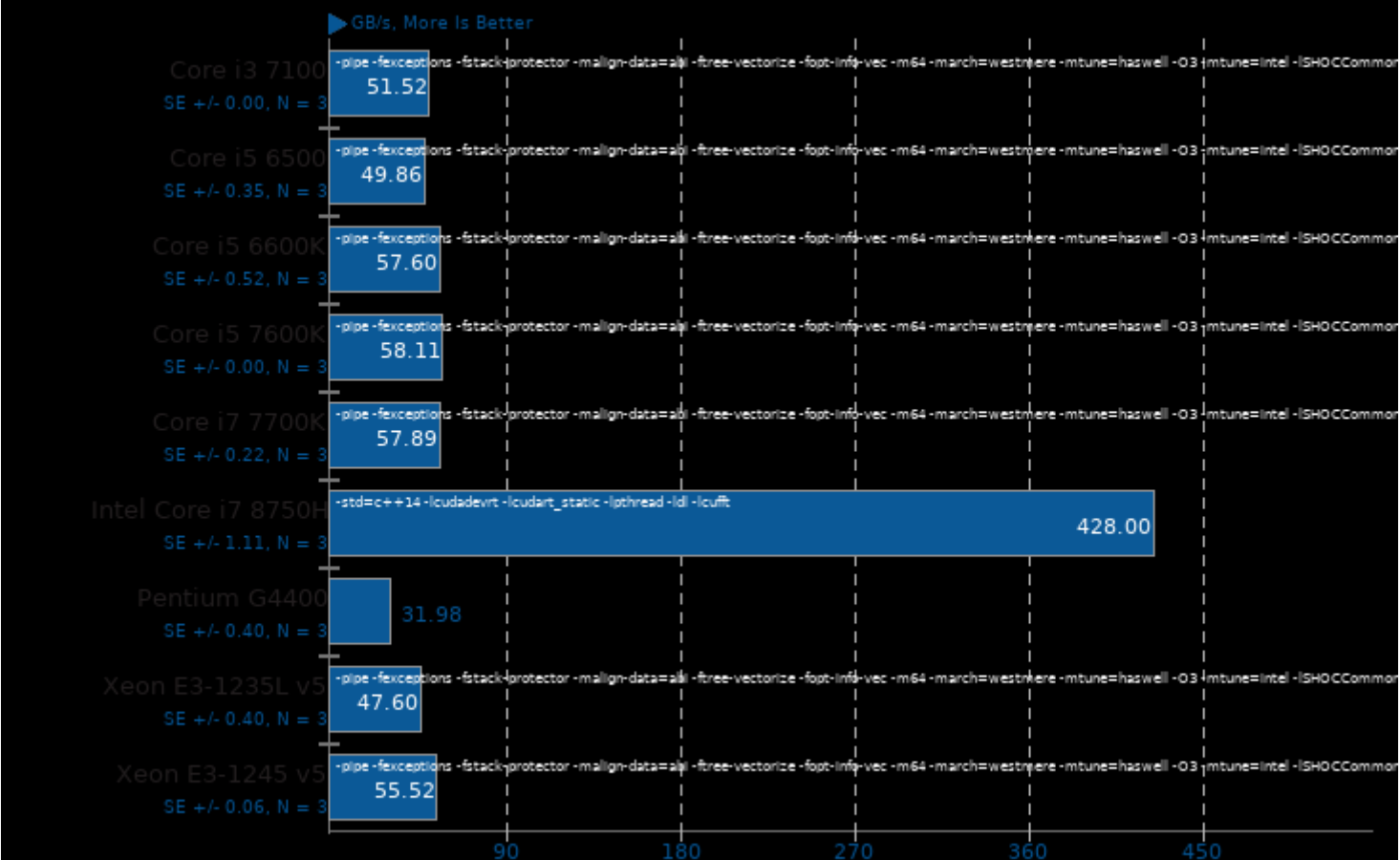
OpenCL Device: GPU - Scene: Complex

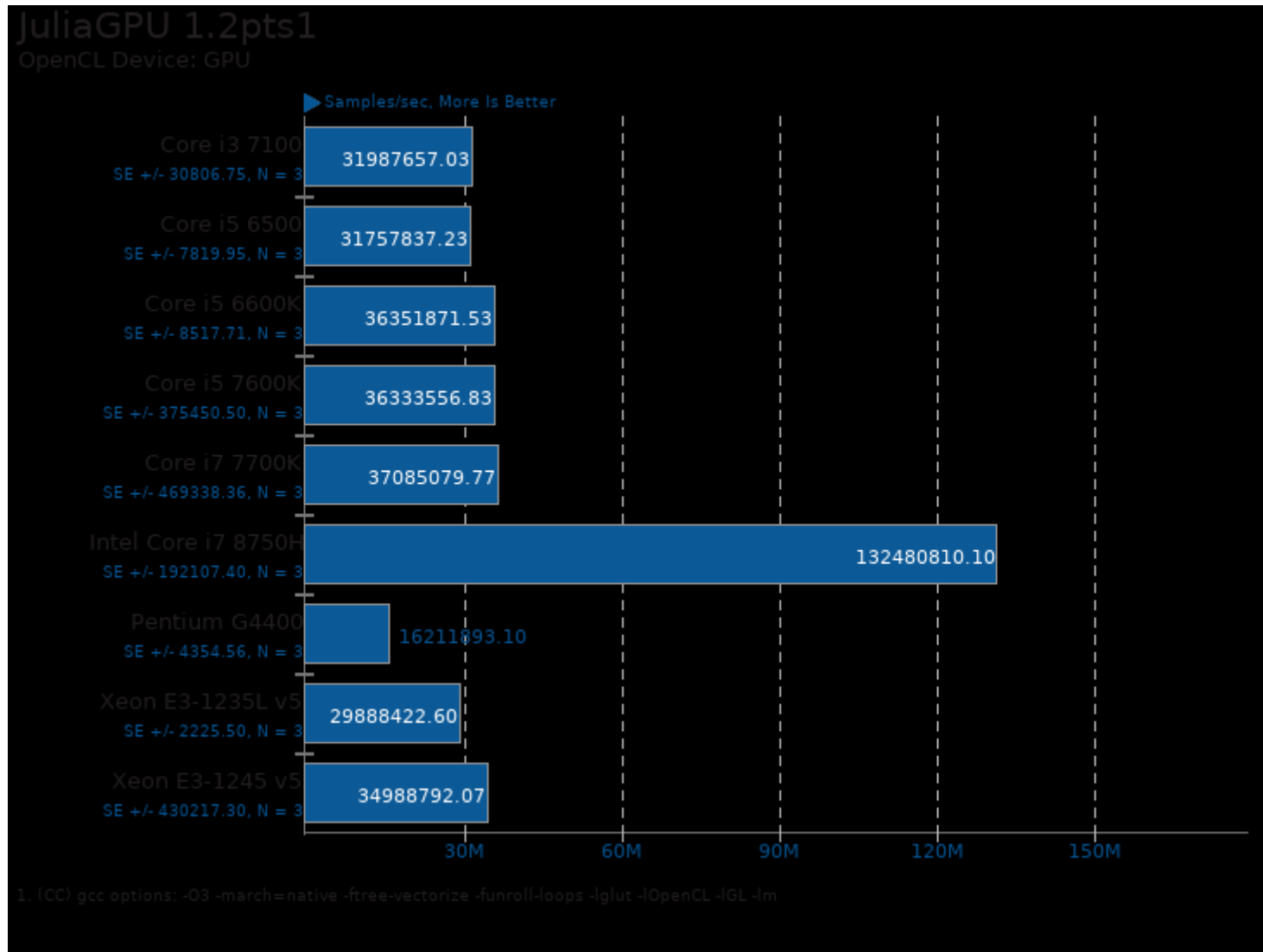


1. (CC) gcc options: -O3 -lm -ftree-vectorize -funroll-loops -lglut -lOpenCL -lGL

SHOC Scalable Heterogeneous Computing 2015-11-10

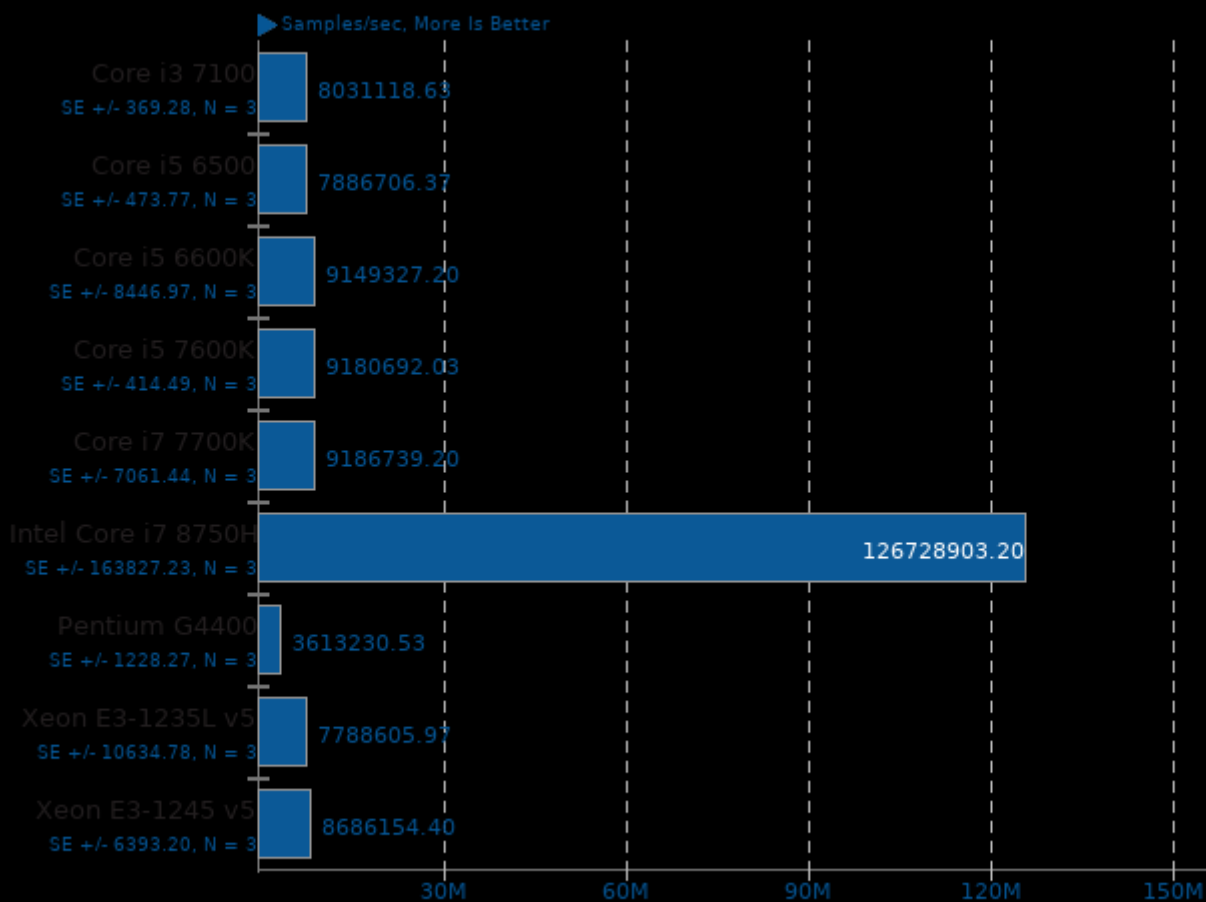
Target: OpenCL - Benchmark: Texture Read Bandwidth





MandelGPU 1.3pts1

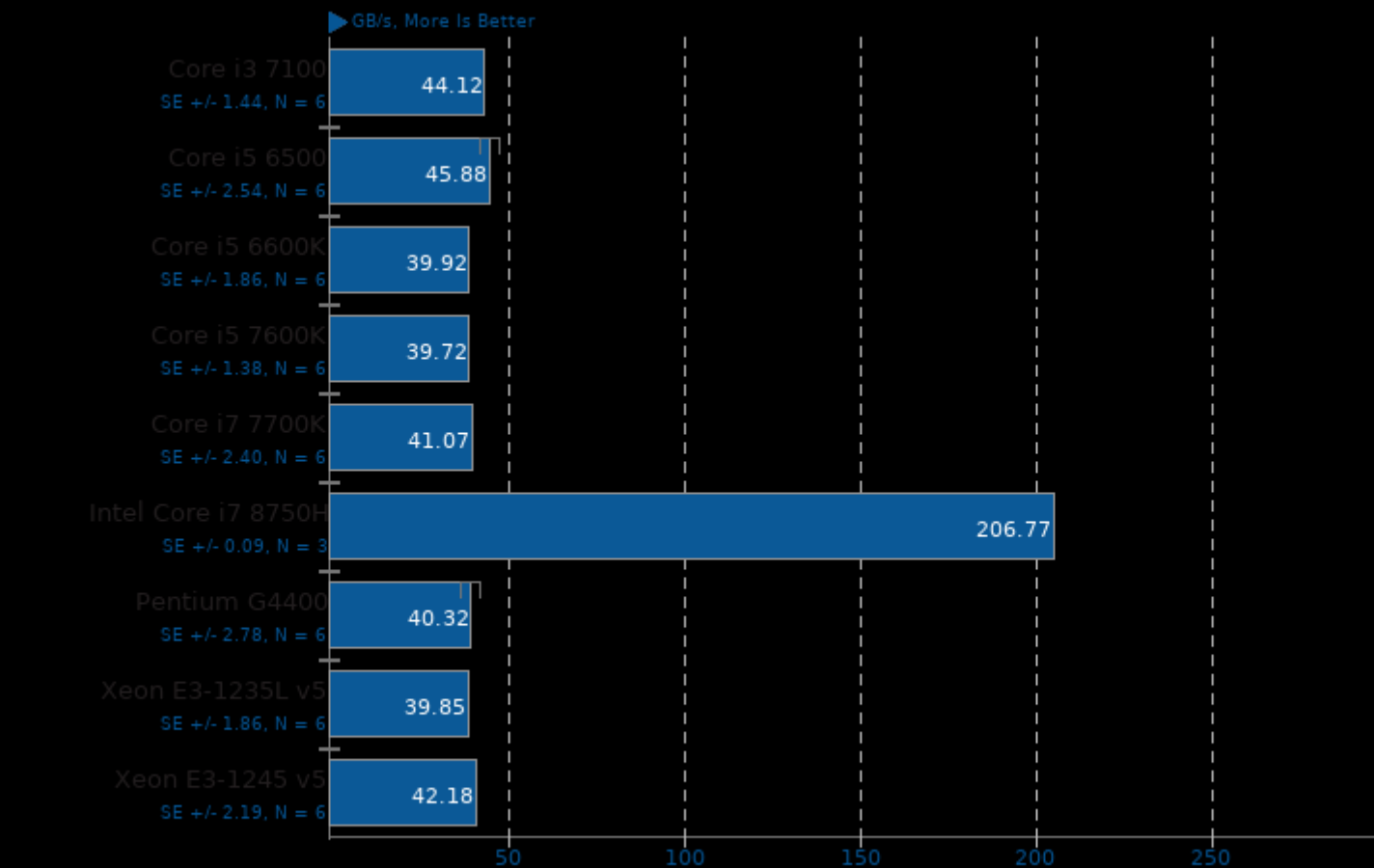
OpenCL Device: GPU



1. (CC) gcc options: -O3 -lm -fsee-vectorize -funroll-loops -lglut -lOpenCL -lGL

cl-mem 2017-01-13

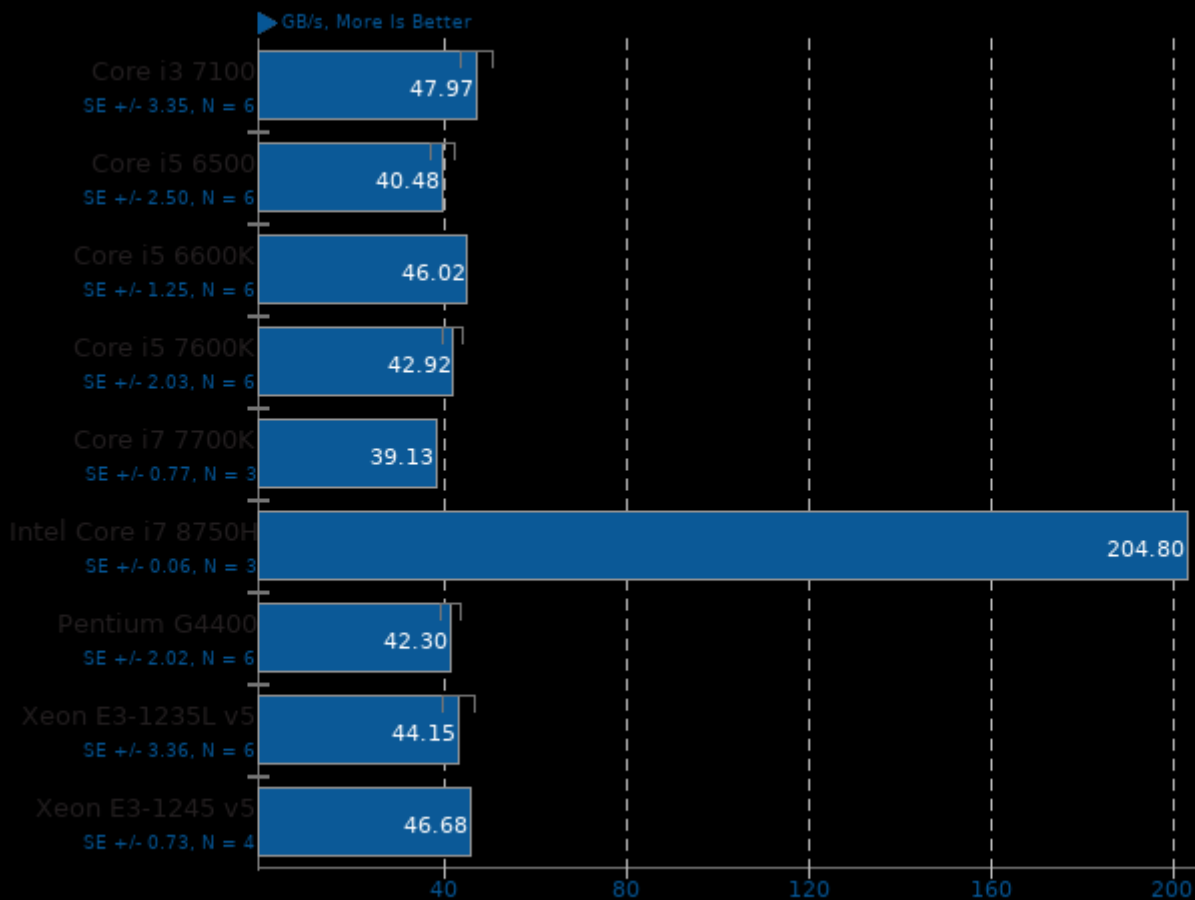
Benchmark: Read



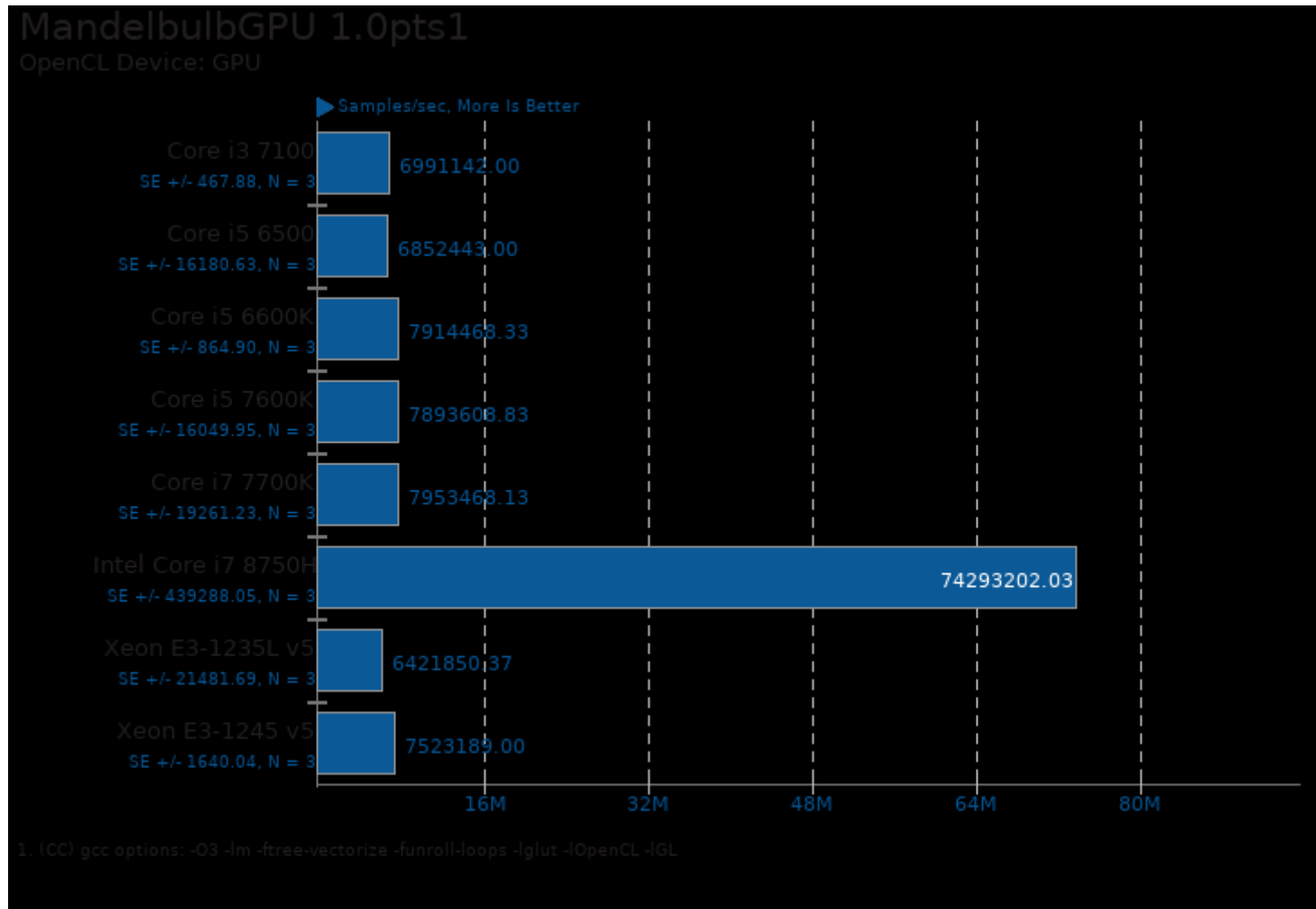
1. (CC) gcc options: -O2 -fno -fOpenCL

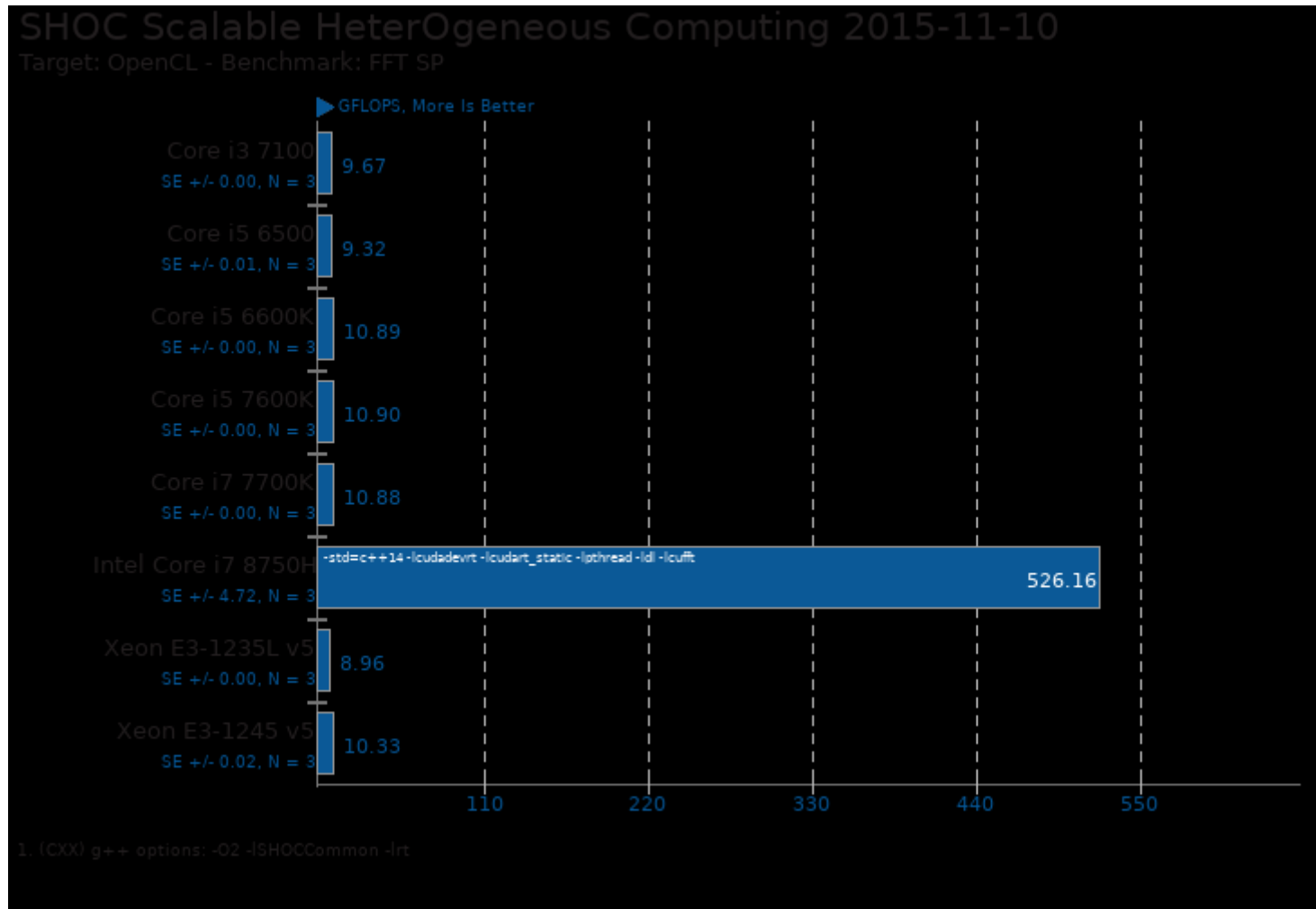
cl-mem 2017-01-13

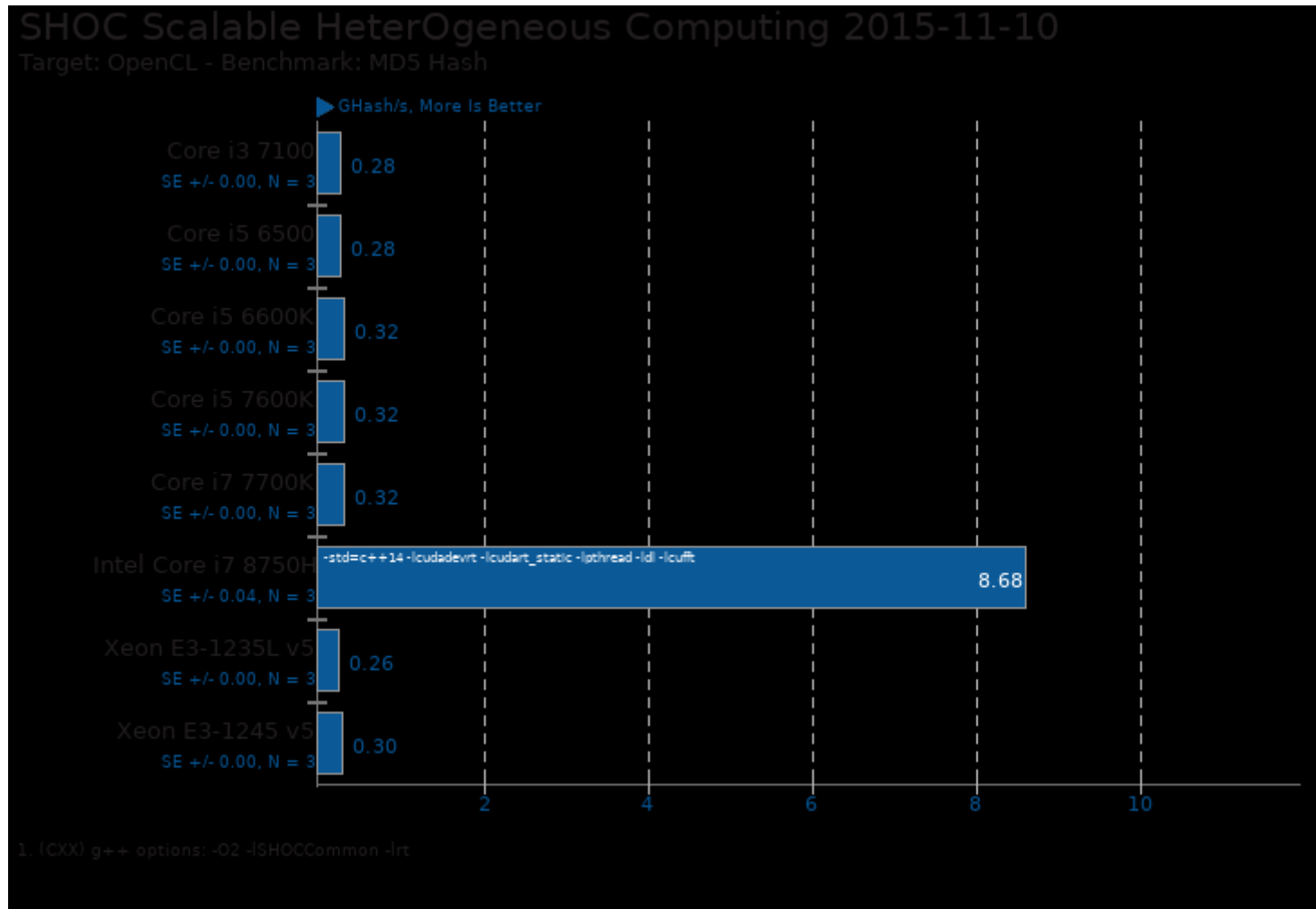
Benchmark: Write



1. (CC) gcc options: -O2 -fno -fOpenCL







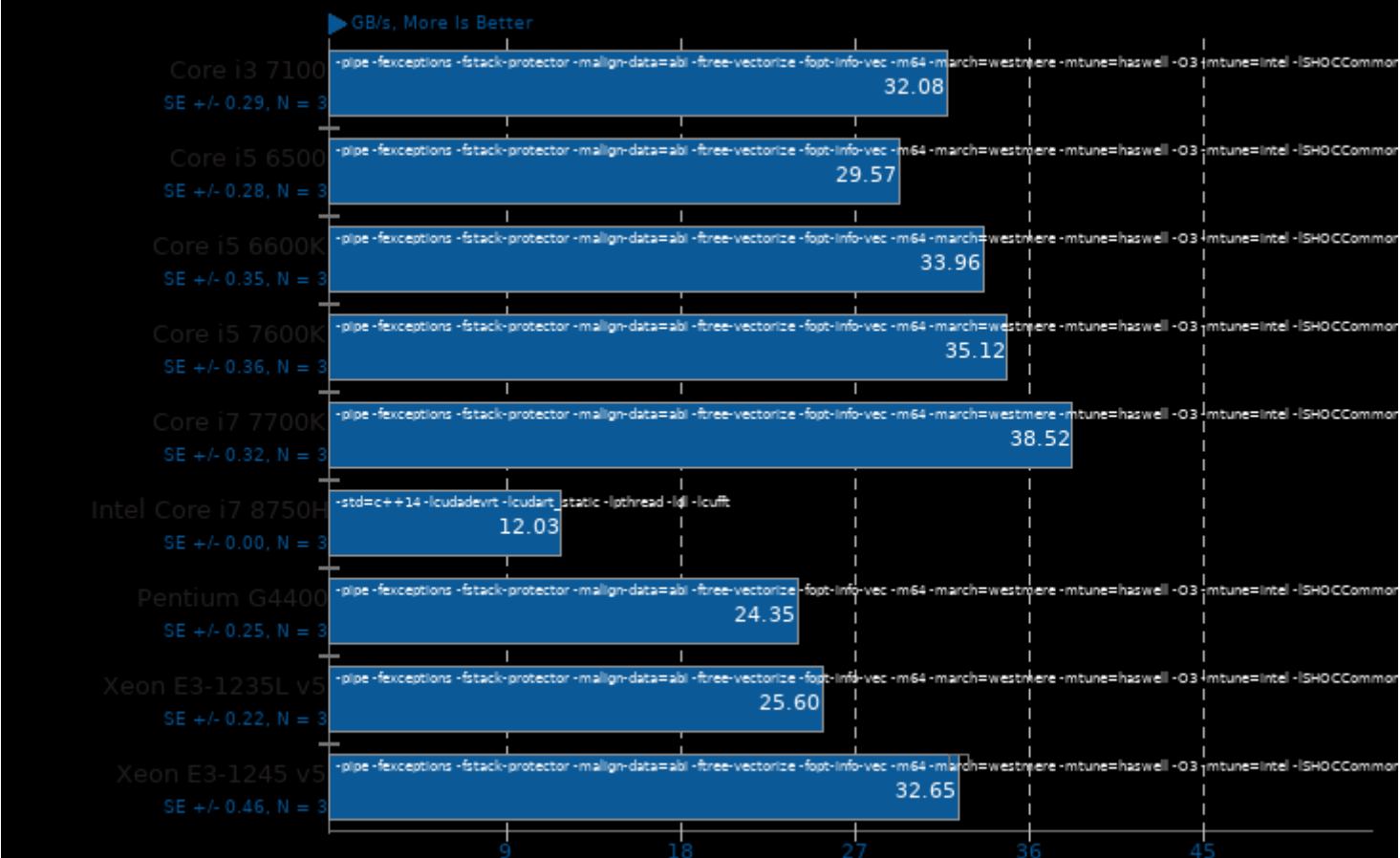
SHOC Scalable Heterogeneous Computing 2015-11-10

Target: OpenCL - Benchmark: Triad



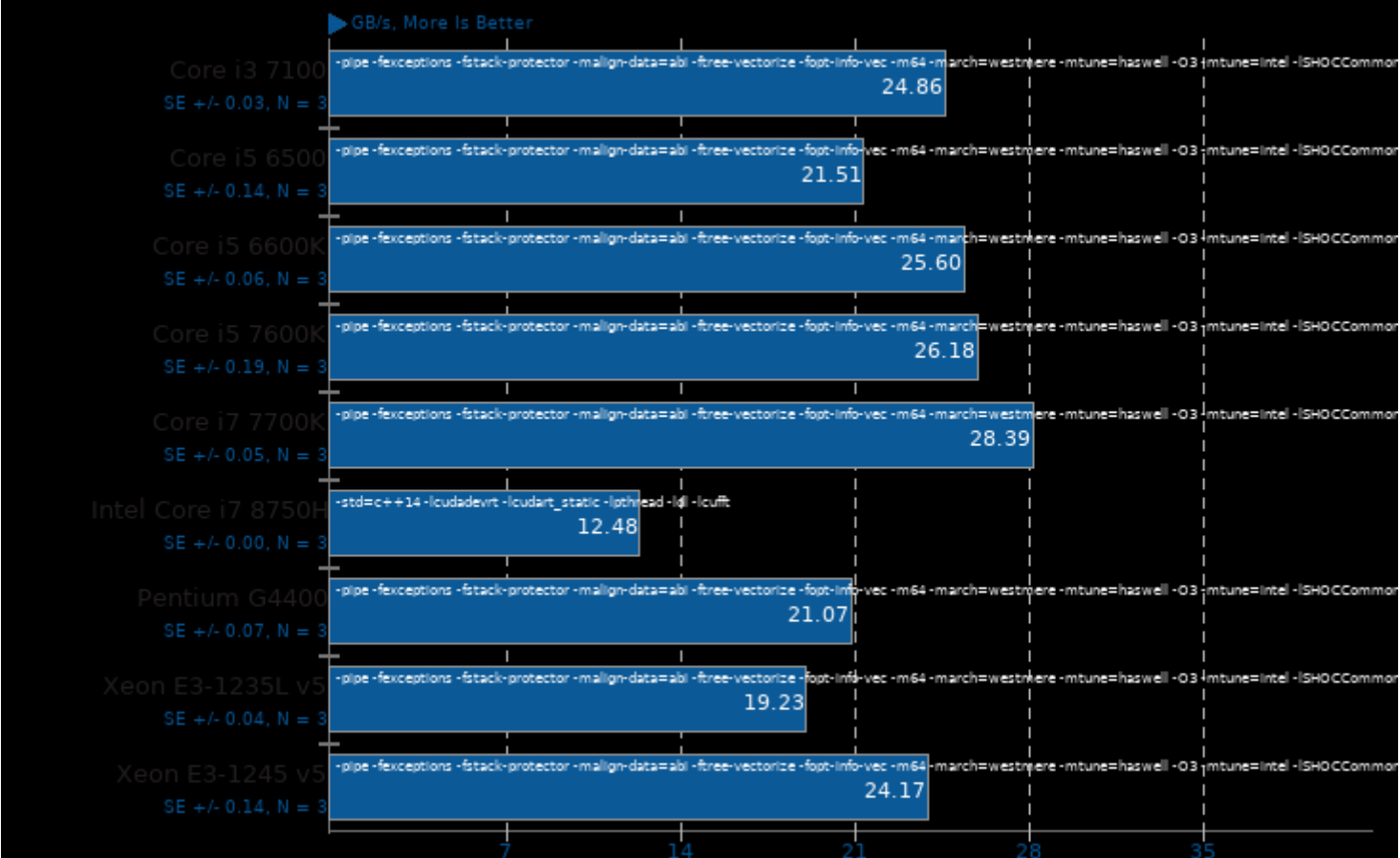
SHOC Scalable Heterogeneous Computing 2015-11-10

Target: OpenCL - Benchmark: Bus Speed Readback

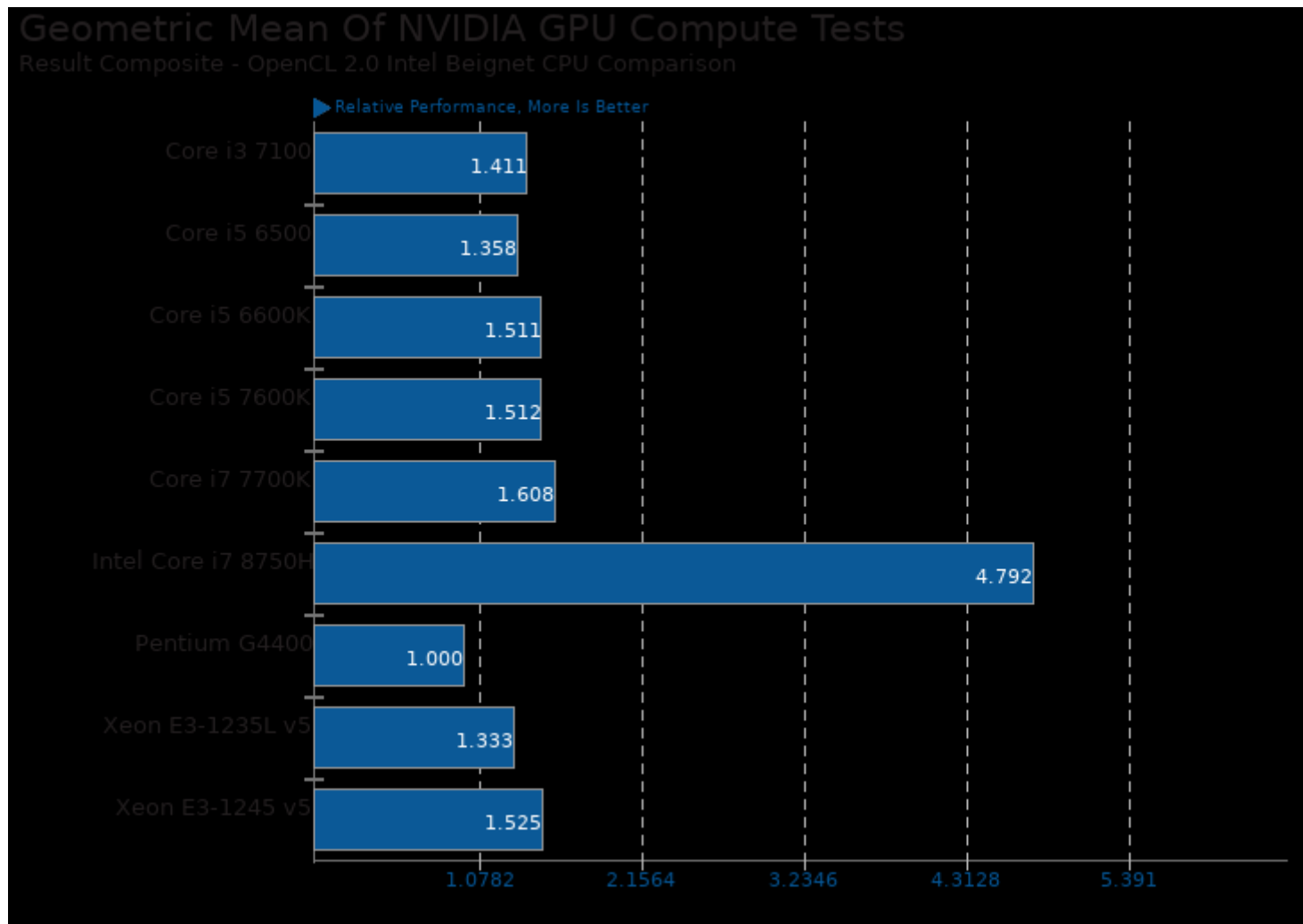


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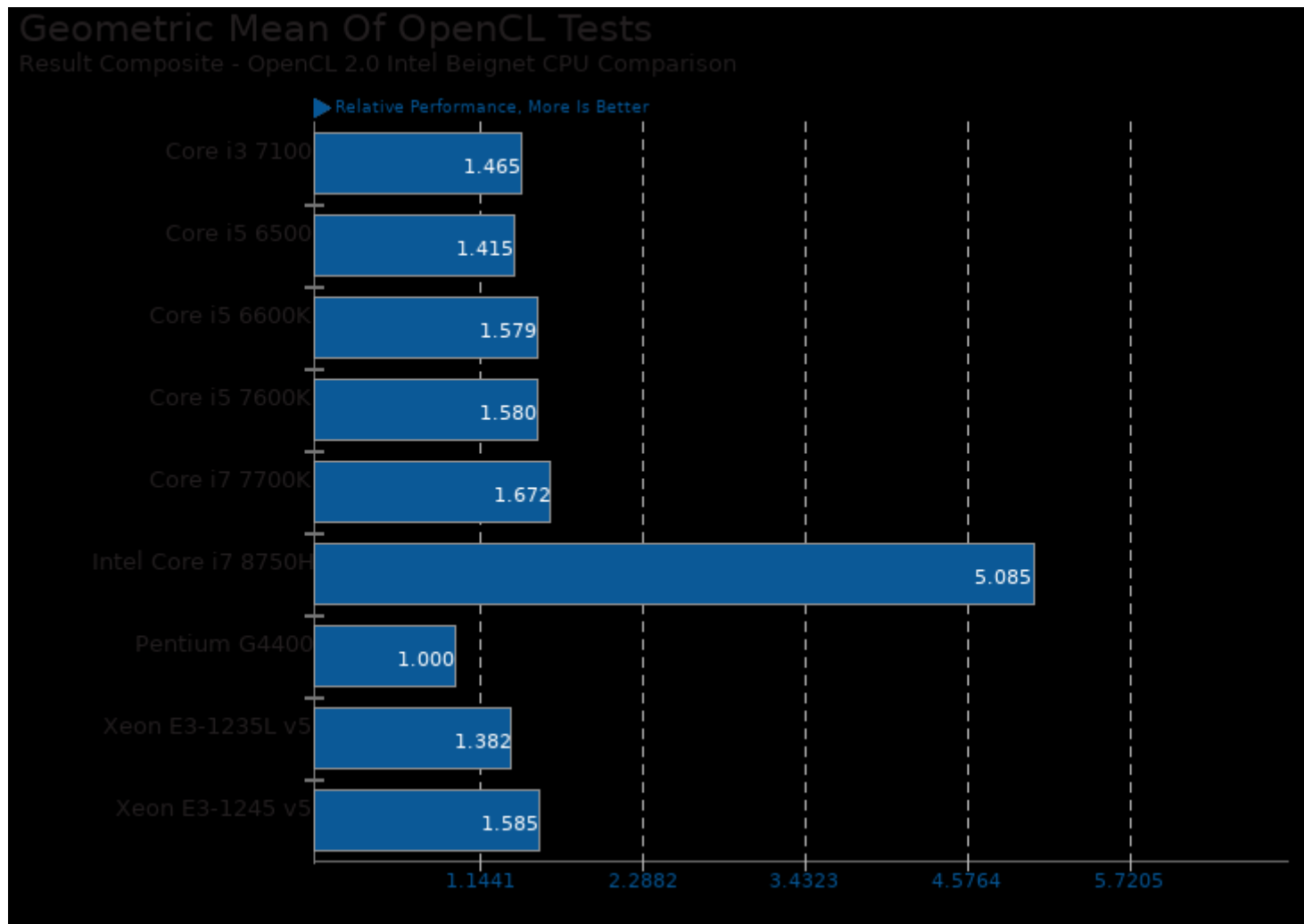
Target: OpenCL - Benchmark: Bus Speed Download



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



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



Geometric mean based upon tests: pts/juliagpu, pts/mandelgpu, pts/smallpt-gpu, pts/mandelbulbgpu, pts/shoc and pts/cl-mem

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 7 February 2025 10:21.