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Intel Core i9-10980XE Linux Benchmarks

Tests for a future article, currently under embargo.

Automated Executive Summary

Core i9 10980XE had the most wins, coming in first place for 55% of the tests.

Based on the geometric mean of all complete results, the fastest (Core i9 10980XE) was 1.163x the speed of the slowest (Threadripper 2970WX). Threadripper 2990WX was 0.916x the speed of Core i9 10980XE, Core i9 7980XE was 0.98x the speed of Threadripper 2990WX, Threadripper 2970WX was 0.958x the speed of Core i9 7980XE.

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

MKL-DNN DNNL (Performance / Cost - Harness: Convolution Batch conv_all - Data Type: u8s8f32) at 10.29x
ctx_clock (Performance / Cost - Context Switch Time) at 8.697x
MKL-DNN DNNL (Harness: Convolution Batch conv_all - Data Type: u8s8f32) at 5.994x
ASKAP (Performance / Cost - Test: tConvolve OpenMP - Gridding) at 5.845x
ctx_clock (Context Switch Time) at 5.583x
ASKAP (Performance / Cost - Test: tConvolve OpenMP - Degridding) at 4.648x
MKL-DNN DNNL (System Power Consumption Monitor) at 4.015x
SVT-VP9 (Performance / Cost - Tuning: VMAF Optimized - Input: Bosphorus 1080p) at 3.875x
SVT-VP9 (Performance / Cost - Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p) at 3.875x

BRL-CAD (System Power Consumption Monitor) at 3.744x.

Test Systems:

Core i9 7980XE

Processor: Intel Core i9-7980XE @ 4.20GHz (18 Cores / 36 Threads), Motherboard: ASUS PRIME X299-A (1704 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 64512MB, Disk: Samsung SSD 970 PRO 512GB, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1366/2000MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V

OS: Ubuntu 19.10, Kernel: 5.4.0-999-generic (x86_64) 20191114, Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --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-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 powersave - CPU Microcode: 0x2000065
Graphics Notes: GLAMOR
Java Notes: OpenJDK Runtime Environment (build 11.0.5-ea+10-post-Ubuntu-0ubuntu1)
Python Notes: Python 2.7.17rc1 + Python 3.7.5rc1
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + 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 generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + tsx_async_abort: Mitigation of Clear buffers; SMT vulnerable

Core i9 10980XE

Processor: Intel Core i9-10980XE @ 4.60GHz (18 Cores / 36 Threads), Motherboard: Gigabyte X299X DESIGNARE 10G (F1 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 64512MB, Disk: Samsung SSD 970 PRO 512GB, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1366/2000MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: 2 x Intel 10G X550T + Intel Device 2723

OS: Ubuntu 19.10, Kernel: 5.4.0-999-generic (x86_64) 20191114, Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --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-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 powersave - CPU Microcode: 0x500002c
Graphics Notes: GLAMOR
Java Notes: OpenJDK Runtime Environment (build 11.0.5-ea+10-post-Ubuntu-0ubuntu1)
Python Notes: Python 2.7.17rc1 + Python 3.7.5rc1
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + 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 + tsx_async_abort: Mitigation of TSX disabled

Threadripper 2970WX

Intel Core i9-10980XE Linux Benchmarks

Processor: AMD Ryzen Threadripper 2970WX 24-Core @ 3.00GHz (24 Cores / 48 Threads), Motherboard: Gigabyte X399 AORUS Gaming 7 (F11e BIOS), Chipset: AMD 17h, Memory: 64512MB, Disk: Samsung SSD 970 PRO 512GB, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1366/2000MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Qualcomm Atheros Killer E2500 + 2 x QLogic cLOM8214 1/10GbE + Intel 8265 / 8275

OS: Ubuntu 19.10, Kernel: 5.4.0-999-generic (x86_64) 20191114, Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --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-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: acpi-cpufreq ondemand - CPU Microcode: 0x800820b
Java Notes: OpenJDK Runtime Environment (build 11.0.5-ea+10-post-Ubuntu-0ubuntu1)
Python Notes: Python 2.7.17rc1 + Python 3.7.5rc1
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 STIBP: disabled RSB filling + tsx_async_abort: Not affected

Threadripper 2990WX

Processor: AMD Ryzen Threadripper 2990WX 32-Core @ 3.00GHz (32 Cores / 64 Threads), Motherboard: ASUS ROG ZENITH EXTREME (1701 BIOS), Chipset: AMD 17h, Memory: 64512MB, Disk: Samsung SSD 970 PRO 512GB, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1366/2000MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I211 + Qualcomm Atheros QCA6174 802.11ac + Wilocity Wil6200 802.11ad

OS: Ubuntu 19.10, Kernel: 5.4.0-999-generic (x86_64) 20191114, Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --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-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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x800820b
Graphics Notes: GLAMOR
Java Notes: OpenJDK Runtime Environment (build 11.0.5-ea+10-post-Ubuntu-0ubuntu1)
Python Notes: Python 2.7.17rc1 + Python 3.7.5rc1
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 STIBP: disabled RSB filling + tsx_async_abort: Not affected

	Core i9 7980XE	Core i9 10980XE	Threadripper 2970WX	Threadripper 2990WX
NAS Parallel Benchmarks - EP.C (Mop/s)	2203	**2452**	**1356**	1739
Normalized	89.83%	100%	55.28%	70.91%
Standard Deviation	1.5%	1.8%	0.3%	0.1%
Rodinia - OpenMP LavaMD (sec)	**17.152**	15.303	12.658	**9.916**
Normalized	57.81%	64.8%	78.34%	100%
Standard Deviation	0.8%	0.6%	6.2%	0.4%

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Rodinia - OpenMP CFD Solver (sec)	12.037	11.699	10.060	9.342
Normalized	77.61%	79.85%	92.86%	100%
Standard Deviation	0.4%	1.1%	3%	2.6%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	0.98299	0.97064	0.98746	0.76407
Normalized	77.73%	78.72%	77.38%	100%
Standard Deviation	0.2%	0.4%	0.4%	0.4%
FFTW - Float + SSE - 1D FFT Size 4096 (Mflops)	56137	60404	35454	36828
Normalized	92.94%	100%	58.69%	60.97%
Standard Deviation	1%	1.7%	1.3%	1.1%
QMCPACK (Execution Time - sec)	2453	1508	1440	1923
Normalized	58.72%	95.54%	100%	74.91%
Go Benchmarks - json (ns/op)	3107840	2811887	2743554	2217231
Normalized	71.34%	78.85%	80.82%	100%
Standard Deviation	0.4%	0.6%	0.5%	0.4%
Renaissance - A.U.C.T (ms)	12265	12059	20431	20369
Normalized	98.31%	100%	59.02%	59.2%
Standard Deviation	2%	2.5%	5.1%	1.4%
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	8.232	7.379	17.652	12.488
Normalized	89.64%	100%	41.8%	59.09%
Standard Deviation	0.2%	0.1%	0.4%	1%
R Benchmark (sec)	0.2505	0.2502	0.3058	0.3308
Normalized	99.88%	100%	81.82%	75.63%
Standard Deviation	0.3%	0.6%	1.5%	0.8%
PyBench - T.F.A.T.T (Milliseconds)	988	907	1138	1134
Normalized	91.8%	100%	79.7%	79.98%
Standard Deviation	0.3%	0.3%		0.4%
Perl Benchmarks - Pod2html (sec)	0.10481316	0.09494226	0.14430767	0.14296796
Normalized	90.58%	100%	65.79%	66.41%
Standard Deviation	0.4%	0.2%	0.4%	0.9%
Perl Benchmarks - Interpreter (sec)	0.00300332	0.00297081	0.00137327	0.00137205
Normalized	45.68%	46.18%	99.91%	100%
Standard Deviation	0.3%	0.3%	1.8%	1.8%
Sudokut - Total Time (sec)	10.339	9.929	15.193	15.150
Normalized	96.03%	100%	65.35%	65.54%
Standard Deviation	1.3%	2.1%	0.1%	0.3%
LuaJIT - Composite (Mflops)	1613	1707	1469	1508
Normalized	94.49%	100%	86.07%	88.34%
Standard Deviation	0.2%	1.3%	0.6%	0.1%
John The Ripper - Blowfish (Real C/S)	29196	32745	31695	51206
Normalized	57.02%	63.95%	61.9%	100%
Standard Deviation	0%	0.1%	0.4%	3.7%
GraphicsMagick - Swirl	629	699	959	1144
Normalized	54.98%	61.1%	83.83%	100%
Standard Deviation		0.1%	0.5%	1%
GraphicsMagick - Sharpen (Iterations/min)	205	238	296	375
Normalized	54.67%	63.47%	78.93%	100%
Standard Deviation	0.6%		0.3%	1%
GraphicsMagick - Enhanced (Iterations/min)	326	368	404	513
Normalized	63.55%	71.73%	78.75%	100%

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Standard Deviation				1.3%
GraphicsMagick - Resizing (Iterations/min)	1463	**1520**	1385	**1281**
Normalized	96.25%	100%	91.12%	84.28%
Standard Deviation			2.8%	4.1%
GraphicsMagick - Noise-Gaussian (Iterations/min)	**331**	365	467	**536**
Normalized	61.75%	68.1%	87.13%	100%
Standard Deviation		0.5%		0.9%
GraphicsMagick - HWB Color Space (Iterations/min)	**913**	962	**1248**	1224
Normalized	73.16%	77.08%	100%	98.08%
Standard Deviation	0.2%	0.2%	2.8%	3%
MKL-DNN DNNL - C.B.c - f32 (ms)	**1088**	1166	**2637**	2118
Normalized	100%	93.3%	41.27%	51.37%
Standard Deviation	0%	0%	0.4%	0.4%
MKL-DNN DNNL - C.B.c - u8s8f32 (ms)	4503	**3799**	**22774**	21275
Normalized	84.37%	100%	16.68%	17.86%
Standard Deviation	0.2%	0.2%	0.2%	0.6%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	707.965	**709.273**	**528.106**	536.755
Normalized	99.82%	100%	74.46%	75.68%
Standard Deviation	0.1%	0.2%	1.5%	1.5%
C-Ray - Total Time - 4.1.R.P.P (sec)	**42.019**	37.615	26.296	**20.100**
Normalized	47.84%	53.44%	76.44%	100%
Standard Deviation	0.1%	0.2%	1%	0.2%
Smallpt - G.I.R.1.S (sec)	**7.443**	5.818	4.640	**3.719**
Normalized	49.97%	63.92%	80.15%	100%
Standard Deviation	16.4%	0.4%	1%	1.3%
AOBench - 2048 x 2048 - Total Time (sec)	32.315	**29.786**	**35.757**	35.216
Normalized	92.17%	100%	83.3%	84.58%
Standard Deviation	1.2%	2.4%	0.3%	0%
IndigoBench - Bedroom (M samples/s)	2.524	2.637	**2.823**	**1.918**
Normalized	89.41%	93.41%	100%	67.94%
Standard Deviation	0.2%	0.2%	1.5%	2.4%
IndigoBench - Supercar (M samples/s)	6.010	**6.209**	5.845	**4.999**
Normalized	96.79%	100%	94.14%	80.51%
Standard Deviation	0.1%	0.2%	1%	0.9%
Blender - BMW27 - CPU-Only (sec)	**96.25**	93.89	84.00	**66.17**
Normalized	68.75%	70.48%	78.77%	100%
Standard Deviation	0.2%	0.2%	0.3%	0.5%
Blender - Classroom - CPU-Only (sec)	**263.84**	262.72	213.50	**160.84**
Normalized	60.96%	61.22%	75.33%	100%
Standard Deviation	0%	0.2%	0.6%	0.2%
Blender - Pabellon Barcelona - CPU-Only (sec)	**335.03**	331.08	304.07	**232.51**
Normalized	69.4%	70.23%	76.47%	100%
Standard Deviation	0%	0.1%	0.5%	0.3%
Appleseed - Disney Material (sec)	**133.803585**	121.617496	110.415196	**85.630733**
Normalized	64%	70.41%	77.55%	100%
Appleseed - Material Tester (sec)	138.639066	**129.721735**	**214.666947**	209.889394
Normalized	93.57%	100%	60.43%	61.8%
Tungsten Renderer - Hair (sec)	**16.4218**	14.7466	12.8504	**10.3971**

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Normalized	63.31%	70.51%	80.91%	100%
Standard Deviation	0.4%	0.1%	0.5%	0.4%
Tungsten Renderer - Water Caustic (sec)	22.0772	**21.7794**	**24.9080**	23.7085
Normalized	98.65%	100%	87.44%	91.86%
Standard Deviation	0.2%	0.4%	2.9%	2.8%
Tungsten Renderer - Volumetric Caustic (sec)	**7.78466**	7.28113	6.00221	**5.82963**
Normalized	74.89%	80.06%	97.12%	100%
Standard Deviation	0.4%	0.9%	2.7%	0.6%
LuxCoreRender - DLSC (M	2.83	**2.95**	**1.69**	1.70
Normalized	95.93%	100%	57.29%	57.63%
Standard Deviation	2.5%	0.3%	23.9%	20.5%
LuxCoreRender - R.C.a.P (M samples/sec)	2.57	**2.76**	1.87	**1.78**
Normalized	93.12%	100%	67.75%	64.49%
Standard Deviation	2.6%	3.3%	0.9%	25.5%
dav1d - Summer Nature 4K (FPS)	170.43	169.46	**167.90**	**180.78**
Normalized	94.27%	93.74%	92.88%	100%
Standard Deviation	0.6%	0.4%	0.9%	1.6%
dav1d - S.N.1 (FPS)	305.17	**300.39**	450.01	**480.57**
Normalized	63.5%	62.51%	93.64%	100%
Standard Deviation	0.6%	0.4%	1.1%	0.4%
dav1d - C.1.1.b (FPS)	48.32	**48.05**	70.39	**77.19**
Normalized	62.6%	62.25%	91.19%	100%
Standard Deviation	0.4%	0.3%	0.2%	0.2%
SVT-AV1 - Enc Mode 4 - 1080p (FPS)	5.131	**5.189**	4.711	**4.121**
Normalized	98.88%	100%	90.79%	79.42%
Standard Deviation	0.6%	1%	2.2%	5.6%
SVT-AV1 - Enc Mode 8 - 1080p (FPS)	45.069	**47.519**	47.081	**41.550**
Normalized	94.84%	100%	99.08%	87.44%
Standard Deviation	0.6%	1%	1.1%	0.4%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	**311.12**	300.63	144.30	**139.26**
Normalized	100%	96.63%	46.38%	44.76%
Standard Deviation	2.2%	2.2%	7.3%	6.6%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	**316.20**	306.48	146.01	**139.08**
Normalized	100%	96.93%	46.18%	43.98%
Standard Deviation	0.5%	0.7%	7%	7.2%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	**252.28**	251.60	136.26	**131.68**
Normalized	100%	99.73%	54.01%	52.2%
Standard Deviation	0.7%	0.6%	7.4%	6.3%
x264 - H.2.V.E (FPS)	**130.11**	131.62	135.66	**145.41**
Normalized	89.48%	90.52%	93.29%	100%
Standard Deviation	1.8%	1.4%	1%	2.1%
x265 - H.2.1.V.E (FPS)	41.54	**41.84**	**38.70**	39.95
Normalized	99.28%	100%	92.5%	95.48%
Standard Deviation	1%	0.6%	0.2%	0.1%
FLAC Audio Encoding - WAV To FLAC (sec)	**10.207**	9.503	9.278	**9.122**
Normalized	89.37%	95.99%	98.32%	100%
Standard Deviation	0.2%	0.6%	0.5%	0.2%

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LAME MP3 Encoding - WAV To MP3 (sec)	**9.750**	9.035	8.383	**8.203**
Normalized	84.13%	90.79%	97.85%	100%
Standard Deviation	0.1%	0.4%	2.3%	0.5%
ACES DGEMM - S.F.P.R (GFLOP/s)	6.913080	**7.276394**	2.079914	**1.773654**
Normalized	95.01%	100%	28.58%	24.38%
Standard Deviation	0.9%	1.4%	6.7%	4.3%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**590673**	635905	892332	**1138042**
Normalized	51.9%	55.88%	78.41%	100%
Standard Deviation	0.5%	0.4%	0%	0.4%
Stockfish - Total Time (Nodes/s)	**44409769**	48953322	53836578	**65266445**
Normalized	68.04%	75.01%	82.49%	100%
Standard Deviation	1.3%	1.6%	2.4%	1.2%
asmFish - 1.H.M.2.D (Nodes/s)	**49955376**	53688196	57235939	**72722451**
Normalized	68.69%	73.83%	78.7%	100%
Standard Deviation	1.2%	2.5%	2.2%	0.8%
TSCP - A.C.P (Nodes/s)	1291908	**1412861**	**1102960**	1120678
Normalized	91.44%	100%	78.07%	79.32%
Standard Deviation	0.3%	0.2%	1%	0.8%
Crafty - Elapsed Time (Nodes/s)	8506449	**9173582**	**7400292**	7594277
Normalized	92.73%	100%	80.67%	82.78%
Standard Deviation	0.2%	0.3%	0.3%	0.1%
Primesieve - 1.P.N.G (sec)	**12.796**	11.539	10.159	**8.331**
Normalized	65.11%	72.2%	82.01%	100%
Standard Deviation	0.2%	0.2%	0.7%	0.4%
Swet - Average (Operations/sec)	782056056	**812681533**	**728197656**	745294030
Normalized	96.23%	100%	89.6%	91.71%
Standard Deviation	1.7%	1.3%	2.2%	1.8%
Timed Linux Kernel Compilation - Time To Compile (sec)	**46.715**	43.319	41.399	**37.177**
Normalized	79.58%	85.82%	89.8%	100%
Standard Deviation	2.9%	3%	2.4%	2.8%
Timed LLVM Compilation - Time To Compile (sec)	**220.479**	216.489	212.562	**212.442**
Normalized	96.35%	98.13%	99.94%	100%
Timed PHP Compilation - Time To Compile (sec)	50.704	**48.306**	**52.183**	51.502
Normalized	95.27%	100%	92.57%	93.79%
Standard Deviation	0.1%	0.5%	0.4%	1.1%
7-Zip Compression - C.S.T (MIPS)	93020	**96796**	80919	**80731**
Normalized	96.1%	100%	83.6%	83.4%
Standard Deviation	0.4%	0.1%	2.9%	0.2%
Radiance Benchmark - Serial (sec)	676.027	**614.616**	**749.466**	739.376
Normalized	90.92%	100%	82.01%	83.13%
Radiance Benchmark - SMP Parallel (sec)	225.744	**200.917**	**232.23**	220.28
Normalized	89%	100%	86.52%	91.21%
glibc bench - exp (nanoseconds)	**5.49633**	**4.69863**	5.43029	5.31401
Normalized	85.49%	100%	86.53%	88.42%
Standard Deviation	0.1%	0.2%	0.1%	0.1%
glibc bench - ffs (nanoseconds)	1.75392	**1.38999**	**1.85618**	1.84556
Normalized	79.25%	100%	74.88%	75.32%
Standard Deviation	0.1%	0%	0.3%	0.1%

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glibc bench - modf (nanoseconds)	2.21225	**1.81466**	**2.33735**	2.32077
Normalized	82.03%	100%	77.64%	78.19%
Standard Deviation	0.1%	0%	0.1%	0%
glibc bench - sqrt (nanoseconds)	1.98087	**1.59984**	**2.13681**	2.09896
Normalized	80.76%	100%	74.87%	76.22%
Standard Deviation	0.1%	0.1%	4.7%	2.9%
glibc bench - ffsll (nanoseconds)	1.75439	**1.39061**	1.84795	**1.85451**
Normalized	79.26%	100%	75.25%	74.99%
Standard Deviation	0.1%	0.1%	0.1%	0.3%
glibc bench - sincos (nanoseconds)	14.3562	**12.8958**	**14.4201**	14.2054
Normalized	89.83%	100%	89.43%	90.78%
Standard Deviation	0.3%	0%	0%	0%
glibc bench - pthread_once (nanoseconds)	1.75618	**1.40504**	**1.85529**	1.84401
Normalized	80.01%	100%	75.73%	76.19%
Standard Deviation	0.1%	0.1%	0.1%	0.1%
ASKAP - tConvolve OpenMP - Gridding (Million Grid Points/sec)	2832	**3318**	**1031**	1048
Normalized	85.35%	100%	31.08%	31.57%
Standard Deviation	5.8%	0.6%	3%	2%
ASKAP - tConvolve OpenMP - Degridding (Million Grid Points/sec)	4156	**4776**	2230	**1885**
Normalized	87.01%	100%	46.69%	39.46%
Standard Deviation	0.4%	0.9%	29.6%	9.7%
libjpeg-turbo tjbench - D.T (Megapixels/sec)	197.023671	**212.537408**	**174.832452**	176.997312
Normalized	92.7%	100%	82.26%	83.28%
Standard Deviation	0.5%	0.6%	0.2%	0.1%
GNU Octave Benchmark (sec)	**20.567**	17.918	18.817	**17.363**
Normalized	84.42%	96.9%	92.27%	100%
Standard Deviation	1.2%	0.4%	2%	2.4%
ctx_clock - C.S.T (Clocks)	**670**	**120**	150	150
Normalized	17.91%	100%	80%	80%
Standard Deviation	0.2%	0.9%		
Sysbench - CPU (Events/sec)	**33784**	37463	44327	**56647**
Normalized	59.64%	66.13%	78.25%	100%
Standard Deviation	0%	0%	0%	0.2%
OpenSSL - R.4.b.P (Signs/sec)	4661	5216	**4556**	**5825**
Normalized	80.01%	89.54%	78.22%	100%
Standard Deviation	0.2%	0.2%	0.1%	0.3%
PHPBench - P.B.S (Score)	712100	**773661**	**545115**	550615
Normalized	92.04%	100%	70.46%	71.17%
Standard Deviation	0.2%	0.6%	0.2%	0.2%
Redis - GET (Reqs/sec)	2716237	**2769912**	**2293873**	2332911
Normalized	98.06%	100%	82.81%	84.22%
Standard Deviation	2.9%	4.8%	1.4%	2.9%
Redis - SET (Reqs/sec)	1972972	**2105815**	**1481588**	1629319
Normalized	93.69%	100%	70.36%	77.37%
Standard Deviation	3.3%	1.8%	1%	1%
Facebook RocksDB - Rand Read	**86994392**	97278179	117496727	**146536951**
Normalized	59.37%	66.38%	80.18%	100%
Standard Deviation	0.3%	0.3%	2.5%	5%

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Hierarchical INTegration - DOUBLE (QUIPs)	971773643	**1030706309**	**782866523**	837474491
Normalized	94.28%	100%	75.95%	81.25%
Standard Deviation	0.1%	0.5%	1.3%	2.8%
Tesseract OCR - T.T.O.7.I (sec)	25.803	**23.847**	**30.343**	30.054
Normalized	92.42%	100%	78.59%	79.35%
Standard Deviation	0.3%	0.5%	0.6%	0.4%
BRL-CAD - V.P.M (VGR Performance Metric)	**203406**	205406	219068	**293249**
Normalized	69.36%	70.04%	74.7%	100%
GNU GMP GMPbench - Total Time (GMPbench Score)	5537	**6030**	**5141**	5182
Normalized	91.82%	100%	85.26%	85.93%
dcraw - R.T.P.I.C (sec)	38.410	**35.202**	**45.350**	44.909
Normalized	91.65%	100%	77.62%	78.39%
Standard Deviation	0.2%	0.3%	0.4%	0.2%
Selenium - ARES-6 - Google Chrome (ms)	**30.49**	**21.32**	24.94	24.80
Normalized	69.92%	100%	85.49%	85.97%
Standard Deviation	1.1%	1.6%	0.5%	0.6%
Selenium - Octane - Google Chrome (Geometric Mean)	**34935**	**46197**	39466	40238
Normalized	75.62%	100%	85.43%	87.1%
Standard Deviation	0.4%	1%	1.1%	0.8%
Selenium - PSPDFKit WASM - Firefox (Score)	**1750**	**1594**	1692	1659
Normalized	91.09%	100%	94.21%	96.08%
Standard Deviation	1.7%	1.1%	1%	0.6%
Selenium - Jetstream - Google Chrome (Score)	**157.70**	**204.58**	181.31	181.53
Normalized	77.08%	100%	88.63%	88.73%
Standard Deviation	1%	0.7%	0.4%	0.2%
Selenium - StyleBench - Google Chrome (Runs / Minute)	31.1	**35.1**	**29.4**	29.44
Normalized	88.6%	100%	83.76%	83.87%
Standard Deviation	0.9%	0.9%	0.2%	1.2%
Selenium - Speedometer - Google Chrome (Runs/min)	**91.9**	**113**	101.6	101
Normalized	81.33%	100%	89.91%	89.38%
Standard Deviation	0.4%		1.6%	
Selenium - PSPDFKit WASM - Google Chrome (Score)	**2700**	1873	1878	**1856**
Normalized	68.74%	99.09%	98.83%	100%
Standard Deviation	0.5%	2.4%	2.8%	0.7%
NAS Parallel Benchmarks - EP.C (Mop/s/Watt)	11.03	**13.12**		**6.17**
Normalized	84.07%	100%		47.03%
FFTW - Float + SSE - 1D FFT Size 4096 (Mflops/Watt)	441.78	**459.70**		**261.28**
Normalized	96.1%	100%		56.84%
LuaJIT - Composite (Mflops/Watt)	12.12	**12.19**		**9.70**
Normalized	99.43%	100%		79.57%

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John The Ripper - Blowfish (Real C/S/Watt)	100.77	117.27	146.16
Normalized	68.94%	80.23%	100%
GraphicsMagick - Swirl (Iterations/min/Watt)	2.07	2.36	3.05
Normalized	67.87%	77.38%	100%
GraphicsMagick - Sharpen (Iterations/min/Watt)	0.75	0.82	1.07
Normalized	70.09%	76.64%	100%
GraphicsMagick - Enhanced (Iterations/min/Watt)	1.09	1.24	1.42
Normalized	76.76%	87.32%	100%
GraphicsMagick - Resizing (Iterations/min/Watt)	4.84	5.46	3.67
Normalized	88.64%	100%	67.22%
GraphicsMagick - Noise-Gaussian (Iterations/min/Watt)	1.25	1.39	1.70
Normalized	73.53%	81.76%	100%
GraphicsMagick - HWB Color Space (Iterations/min/Watt)	5.11	5.71	5.63
Normalized	89.49%	100%	98.6%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS/Watt)	3.01	3.28	2.51
Normalized	91.77%	100%	76.52%
IndigoBench - Bedroom (M samples/s/Watt)	0.01	0.01	0.01
IndigoBench - Supercar (M samples/s/Watt)	0.02	0.02	0.02
LuxCoreRender - DLSC (M samples/sec/Watt)	0.01	0.01	0.00
Normalized	100%	100%	0%
LuxCoreRender - R.C.a.P (M samples/sec/Watt)	0.01	0.01	0.00
Normalized	100%	100%	0%
dav1d - Summer Nature 4K (FPS/Watt)	0.93	0.95	0.86
Normalized	97.89%	100%	90.53%
dav1d - S.N.1 (FPS/Watt)	2.15	2.07	2.67
Normalized	80.52%	77.53%	100%
dav1d - C.1.1.b (FPS/Watt)	0.34	0.32	0.43
Normalized	79.07%	74.42%	100%
SVT-AV1 - Enc Mode 4 - 1080p (FPS/Watt)	0.02	0.02	0.01
Normalized	100%	100%	50%
SVT-AV1 - Enc Mode 8 - 1080p (FPS/Watt)	0.22	0.24	0.19
Normalized	91.67%	100%	79.17%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS/Watt)	2.37	1.86	0.68
Normalized	100%	78.48%	28.69%

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SVT-VP9 - P.S.O - Bosphorus 1080p (FPS/Watt)	**2.50**	1.94	**0.67**
Normalized	100%	77.6%	26.8%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS/Watt)	1.47	**1.57**	**0.63**
Normalized	93.63%	100%	40.13%
x264 - H.2.V.E (FPS/Watt)	**0.71**	**0.81**	0.74
Normalized	87.65%	100%	91.36%
x265 - H.2.1.V.E (FPS/Watt)	0.26	**0.27**	**0.22**
Normalized	96.3%	100%	81.48%
ACES DGEMM - S.F.P.R (GFLOP/s/Watt)	**0.03**	**0.03**	**0.01**
Normalized	100%	100%	33.33%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec/Watt)	**2349**	2479	**3833**
Normalized	61.27%	64.66%	100%
Stockfish - Total Time (Nodes/s/Watt)	**137491**	155907	**165427**
Normalized	83.11%	94.25%	100%
asmFish - 1.H.M.2.D (Nodes/s/Watt)	**152502**	170319	**179983**
Normalized	84.73%	94.63%	100%
TSCP - A.C.P (Nodes/s/Watt)	10465	**11571**	**8414**
Normalized	90.44%	100%	72.72%
Crafty - Elapsed Time (Nodes/s/Watt)	63789	**64139**	**48448**
Normalized	99.45%	100%	75.54%
Swet - Average (Operations/sec/Watt)	5975595	**6242230**	**5078232**
Normalized	95.73%	100%	81.35%
7-Zip Compression - C.S.T	352.69	**381.32**	**256.19**
Normalized	92.49%	100%	67.19%
ASKAP - tConvolve OpenMP - Degridding (Million Grid	30.38	**34.18**	**11.63**
Normalized	88.88%	100%	34.03%
libjpeg-turbo tjbench - D.T (Megapixels/sec/Watt)	1.54	**1.65**	**1.21**
Normalized	93.33%	100%	73.33%
Sysbench - CPU (Events/sec/Watt)	**152.74**	177.76	**241.78**
Normalized	63.17%	73.52%	100%
OpenSSL - R.4.b.P (Signs/sec/Watt)	**16.83**	**19.38**	17.86
Normalized	86.84%	100%	92.16%
PHPBench - P.B.S (Score/Watt)	5370	**5744**	**3810**
Normalized	93.5%	100%	66.33%
Redis - GET (Reqs/sec/Watt)	22534	**24695**	**19421**
Normalized	91.25%	100%	78.64%
Redis - SET (Reqs/sec/Watt)	16437	**18645**	**13632**
Normalized	88.16%	100%	73.11%
Facebook RocksDB - Rand Read (Op/s/Watt)	**268112**	301179	**395018**
Normalized	67.87%	76.24%	100%
Hierarchical INTegration - DOUBLE (QUIPs/Watt)	**7204701**	7145784	**5184196**
Normalized	100%	99.18%	71.96%

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BRL-CAD - V.P.M (VGR Performance Metric/Watt)	583.76	680.62		724.21
Normalized	80.61%	93.98%		100%
GNU GMP GMPbench - Total Time (GMPbench Score/Watt)	41.21	41.93		32.66
Normalized	98.28%	100%		77.89%
Selenium - Octane - Google Chrome (Geometric Mean/Watt)	260.25	336.81		255.86
Normalized	77.27%	100%		75.97%
Selenium - Jetstream - Google Chrome (Score/Watt)	1.16	1.45		1.14
Normalized	80%	100%		78.62%
Selenium - StyleBench - Google Chrome (Runs / Minute/Watt)	0.21	0.22		0.17
Normalized	95.45%	100%		77.27%
Selenium - Speedometer - Google Chrome (Runs/min/Watt)	0.62	0.77		0.62
Normalized	80.52%	100%		80.52%
Meta Performance Per Watts - P.P.W (Performance/Watts)	1988	2019		1754
Normalized	98.45%	100%		86.9%
NAS Parallel Benchmarks - Performance / Cost - EP.C	1.44	2.50	1.06	0.97
Normalized	57.6%	100%	42.4%	38.8%
Rodinia - Performance / Cost - OpenMP LavaMD (sec x Dollar)	26157	14982	16139	17839
Normalized	57.28%	100%	92.83%	83.98%
Rodinia - Performance / Cost - OpenMP CFD Solver (sec x Dollar)	18356	11453	12827	16806
Normalized	62.39%	100%	89.29%	68.15%
NAMD - Performance / Cost - ATPase Simulation - 327,506 Atoms (days/ns x Dollar)	1499	950.26	1259	1375
Normalized	63.39%	100%	75.48%	69.13%
FFTW - Performance / Cost - Float + SSE - 1D FFT Size 4096	36.81	61.70	27.81	20.47
Normalized	59.66%	100%	45.07%	33.18%
QMCPACK - Performance / Cost - (Execution Time - sec x Dollar)	3740673	1476038	1836510	3459297
Normalized	39.46%	100%	80.37%	42.67%
Go Benchmarks - Performance / Cost - json (ns/op x Dollar)	4739456000	2752837373	3498031350	3988798569
Normalized	58.08%	100%	78.7%	69.01%
Renaissance - Performance / Cost - A.U.C.T (ms x Dollar)	18704425	11805279	26049063	36643442
Normalized	63.11%	100%	45.32%	32.22%
Rust Prime Benchmark - Performance / Cost - P.N.T.T.2.0.0 (sec x Dollar)	12554	7224	22506	22466
Normalized	57.54%	100%	32.1%	32.16%

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R Benchmark - Performance / Cost - (sec x Dollar)	382.01	**244.95**	389.90	**595.11**
Normalized	64.12%	100%	62.82%	41.16%
PyBench - Performance / Cost - T.F.A.T.T (Milliseconds x Dollar)	1506700	**887953**	1450950	**2040066**
Normalized	58.93%	100%	61.2%	43.53%
Perl Benchmarks - Performance / Cost - Pod2html (sec x Dollar)	159.84	**92.95**	183.99	**257.20**
Normalized	58.15%	100%	50.52%	36.14%
Perl Benchmarks - Performance / Cost - Interpreter (sec x Dollar)	**4.58**	2.91	**1.75**	2.47
Normalized	38.21%	60.14%	100%	70.85%
Sudokut - Performance / Cost - Total Time (sec x Dollar)	15767	**9720**	19371	**27255**
Normalized	61.65%	100%	50.18%	35.67%
LuaJIT - Performance / Cost - Composite (Mflops/Dollar)	1.06	**1.74**	1.15	**0.84**
Normalized	60.92%	100%	66.09%	48.28%
John The Ripper - Performance / Cost - Blowfish (Real C/S/Dollar)	**19.14**	**33.45**	24.86	28.46
Normalized	57.22%	100%	74.32%	85.08%
GraphicsMagick - Performance / Cost - Swirl (Iterations/min/Dollar)	**0.41**	0.71	**0.75**	0.64
Normalized	54.67%	94.67%	100%	85.33%
GraphicsMagick - Performance / Cost - Sharpen (Iterations/min/Dollar)	**0.13**	**0.24**	0.23	0.21
Normalized	54.17%	100%	95.83%	87.5%
GraphicsMagick - Performance / Cost - Enhanced (Iterations/min/Dollar)	**0.21**	**0.38**	0.32	0.29
Normalized	55.26%	100%	84.21%	76.32%
GraphicsMagick - Performance / Cost - Resizing (Iterations/min/Dollar)	0.96	**1.55**	1.09	**0.71**
Normalized	61.94%	100%	70.32%	45.81%
GraphicsMagick - Performance / Cost - Noise-Gaussian	**0.22**	**0.37**	**0.37**	0.30
Normalized	59.46%	100%	100%	81.08%
GraphicsMagick - Performance / Cost - HWB Color Space	**0.60**	**0.98**	**0.98**	0.68
Normalized	61.22%	100%	100%	69.39%
MKL-DNN DNNL - Performance / Cost - C.B.c - f32 (ms x Dollar)	1659414	**1141798**	3361882	**3810876**
Normalized	68.81%	100%	33.96%	29.96%
MKL-DNN DNNL - Performance / Cost - C.B.c - u8s8f32 (ms x Dollar)	6866862	**3719476**	29036850	**38273545**
Normalized	54.17%	100%	12.81%	9.72%
TTSIOD 3D Renderer - Performance / Cost - P.R.W.S.S.M (FPS/Dollar)	0.46	**0.72**	0.41	**0.30**
Normalized	63.89%	100%	56.94%	41.67%
C-Ray - Performance / Cost - Total Time - 4.1.R.P.P (sec x Dollar)	**64079**	36825	**33527**	36160
Normalized	52.32%	91.04%	100%	92.72%

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Smallpt - Performance / Cost - G.I.R.1.S (sec x Dollar)	**11351**	**5696**	5916	6690
Normalized	50.18%	100%	96.28%	85.13%
AOBench - Performance / Cost - 2048 x 2048 - Total Time (sec x Dollar)	49280	**29160**	45590	**63354**
Normalized	59.17%	100%	63.96%	46.03%
Blender - Performance / Cost - BMW27 - CPU-Only (sec x Dollar)	**146781**	**91918**	107100	119040
Normalized	62.62%	100%	85.82%	77.22%
Blender - Performance / Cost - Classroom - CPU-Only (sec x Dollar)	**402356**	**257203**	272213	289351
Normalized	63.92%	100%	94.49%	88.89%
Blender - Performance / Cost - Pabellon Barcelona - CPU-Only (sec x	**510921**	**324127**	387689	418285
Normalized	63.44%	100%	83.6%	77.49%
Appleseed - Performance / Cost - Disney Material (sec x Dollar)	**204050**	**119064**	140779	154050
Normalized	58.35%	100%	84.57%	77.29%
Appleseed - Performance / Cost - Material Tester (sec x Dollar)	211425	**126998**	273700	**377591**
Normalized	60.07%	100%	46.4%	33.63%
Tungsten Renderer - Performance / Cost - Hair (sec x Dollar)	**25043**	**14437**	16384	18704
Normalized	57.65%	100%	88.11%	77.18%
Tungsten Renderer - Performance / Cost - Water Caustic (sec x Dollar)	33668	**21322**	31758	**42652**
Normalized	63.33%	100%	67.14%	49.99%
Tungsten Renderer - Performance / Cost - Volumetric Caustic (sec x	**11872**	**7128**	7653	10488
Normalized	60.04%	100%	93.15%	67.97%
dav1d - Performance / Cost - Summer Nature 4K (FPS/Dollar)	0.11	**0.17**	0.13	**0.10**
Normalized	64.71%	100%	76.47%	58.82%
dav1d - Performance / Cost - S.N.1 (FPS/Dollar)	**0.20**	0.31	**0.35**	0.27
Normalized	57.14%	88.57%	100%	77.14%
dav1d - Performance / Cost - C.1.1.b (FPS/Dollar)	**0.03**	0.05	**0.06**	0.04
Normalized	50%	83.33%	100%	66.67%
SVT-AV1 - Performance / Cost - Enc Mode 8 - 1080p (FPS/Dollar)	0.03	**0.05**	0.04	**0.02**
Normalized	60%	100%	80%	40%
SVT-VP9 - Performance / Cost - VMAF Optimized - Bosphorus 1080p (FPS/Dollar)	0.20	**0.31**	0.11	**0.08**
Normalized	64.52%	100%	35.48%	25.81%
SVT-VP9 - Performance / Cost - P.S.O - Bosphorus 1080p (FPS/Dollar)	0.21	**0.31**	0.11	**0.08**
Normalized	67.74%	100%	35.48%	25.81%

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SVT-VP9 - Performance / Cost - V.Q.O - Bosphorus 1080p (FPS/Dollar)	0.17	**0.26**	0.11	**0.07**
Normalized	65.38%	100%	42.31%	26.92%
x264 - Performance / Cost - H.2.V.E (FPS/Dollar)	0.09	**0.13**	0.11	**0.08**
Normalized	69.23%	100%	84.62%	61.54%
x265 - Performance / Cost - H.2.1.V.E (FPS/Dollar)	0.03	**0.04**	0.03	**0.02**
Normalized	75%	100%	75%	50%
FLAC Audio Encoding - Performance / Cost - WAV To FLAC (sec x Dollar)	15566	**9303**	11829	**16410**
Normalized	59.77%	100%	78.65%	56.69%
LAME MP3 Encoding - Performance / Cost - WAV To MP3 (sec x Dollar)	**14869**	**8845**	10688	14757
Normalized	59.49%	100%	82.76%	59.94%
Coremark - Performance / Cost - CoreMark Size 666 - I.P.S (Iterations/Sec/Dollar)	**387.33**	649.55	**699.87**	632.60
Normalized	55.34%	92.81%	100%	90.39%
Stockfish - Performance / Cost - Total Time (Nodes/s/Dollar)	**29121**	**50003**	42225	36279
Normalized	58.24%	100%	84.44%	72.55%
asmFish - Performance / Cost - 1.H.M.2.D (Nodes/s/Dollar)	**32758**	**54840**	44891	40424
Normalized	59.73%	100%	81.86%	73.71%
TSCP - Performance / Cost - A.C.P (Nodes/s/Dollar)	847.15	**1443**	865.07	**622.94**
Normalized	58.7%	100%	59.94%	43.16%
Crafty - Performance / Cost - Elapsed Time (Nodes/s/Dollar)	5578	**9370**	5804	**4221**
Normalized	59.53%	100%	61.94%	45.05%
Primesieve - Performance / Cost - 1.P.N.G (sec x Dollar)	**19514**	**11297**	12953	14987
Normalized	57.89%	100%	87.21%	75.37%
Swet - Performance / Cost - Average (Operations/sec/Dollar)	512824	**830114**	571135	**414282**
Normalized	61.78%	100%	68.8%	49.91%
Timed Linux Kernel Compilation - Performance / Cost - Time To Compile (sec x Dollar)	**71240**	**42409**	52784	66881
Normalized	59.53%	100%	80.35%	63.41%
Timed LLVM Compilation - Performance / Cost - Time To Compile	336230	**211943**	271017	**382183**
Normalized	63.03%	100%	78.2%	55.46%
Timed PHP Compilation - Performance / Cost - Time To Compile	77324	**47292**	66533	**92652**
Normalized	61.16%	100%	71.08%	51.04%
7-Zip Compression - Performance / Cost - C.S.T (MIPS/Dollar)	61.00	**98.87**	63.47	**44.88**
Normalized	61.7%	100%	64.2%	45.39%

Intel Core i9-10980XE Linux Benchmarks

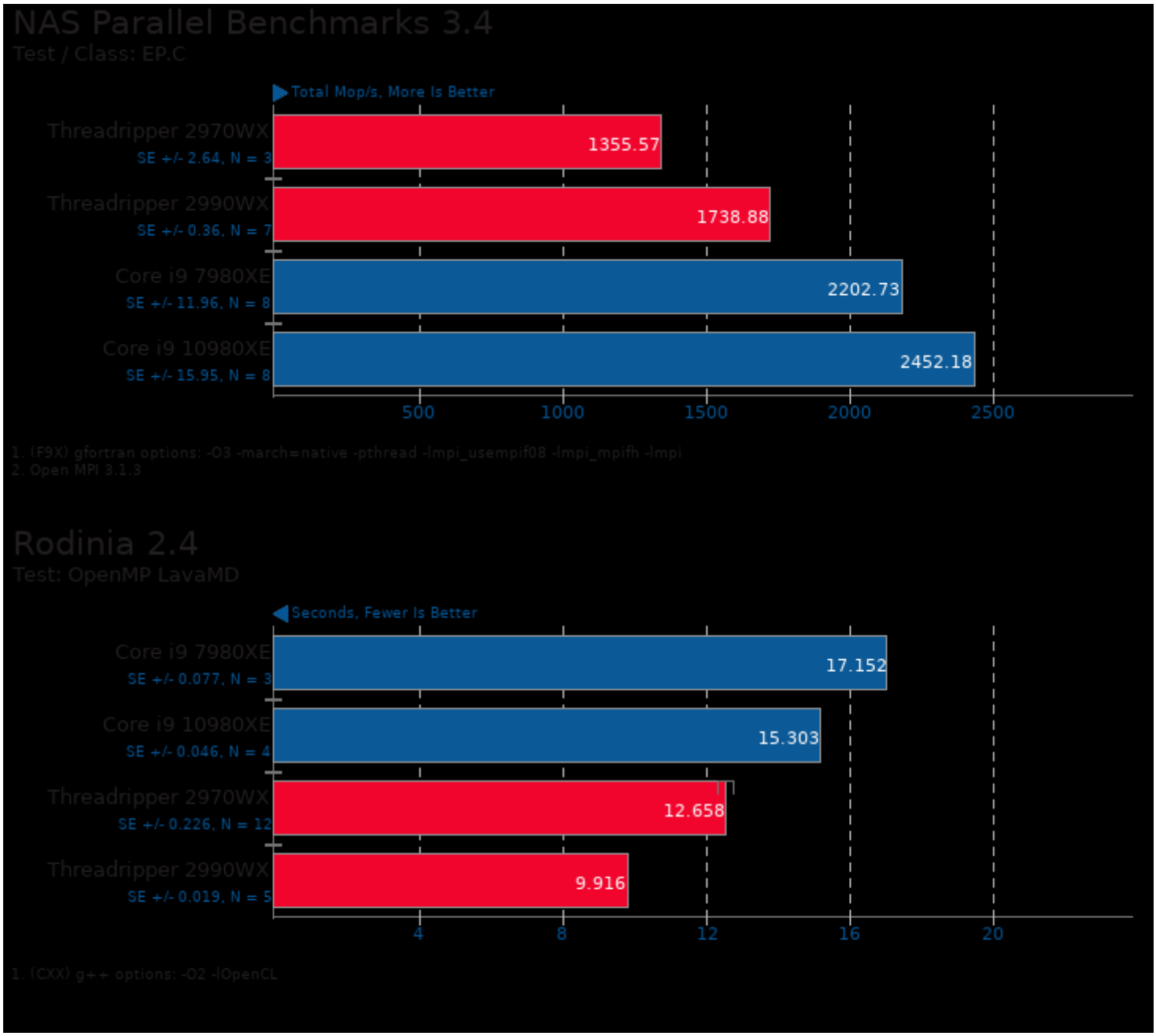
Radiance Benchmark - Performance / Cost - Serial (sec x Dollar)	1030941	**601709**	955569	**1330137**
Normalized	58.37%	100%	62.97%	45.24%
Radiance Benchmark - Performance / Cost - SMP Parallel (sec x Dollar)	344260	**196698**	296093	**396284**
Normalized	57.14%	100%	66.43%	49.64%
glibc bench - Performance / Cost - exp (nanoseconds x Dollar)	8382	**4600**	6924	**9560**
Normalized	54.88%	100%	66.44%	48.12%
glibc bench - Performance / Cost - ffs (nanoseconds x Dollar)	2675	**1361**	2367	**3320**
Normalized	50.88%	100%	57.5%	40.99%
glibc bench - Performance / Cost - modf (nanoseconds x Dollar)	3374	**1777**	2980	**4175**
Normalized	52.66%	100%	59.61%	42.55%
glibc bench - Performance / Cost - sqrt (nanoseconds x Dollar)	3021	**1566**	2724	**3776**
Normalized	51.85%	100%	57.49%	41.48%
glibc bench - Performance / Cost - ffsll (nanoseconds x Dollar)	2675	**1361**	2356	**3336**
Normalized	50.89%	100%	57.78%	40.81%
glibc bench - Performance / Cost - sincos (nanoseconds x Dollar)	21893	**12625**	18386	**25556**
Normalized	57.67%	100%	68.67%	49.4%
glibc bench - Performance / Cost - pthread_once (nanoseconds x Dollar)	2678	**1376**	2365	**3317**
Normalized	51.36%	100%	58.15%	41.46%
ASKAP - Performance / Cost - tConvolve OpenMP - Gridding (Million Grid Points/sec/Dollar)	1.86	**3.39**	0.81	**0.58**
Normalized	54.87%	100%	23.89%	17.11%
ASKAP - Performance / Cost - tConvolve OpenMP - Degridding (Million Grid Points/sec/Dollar)	2.73	**4.88**	1.75	**1.05**
Normalized	55.94%	100%	35.86%	21.52%
libjpeg-turbo tjbench - Performance / Cost - D.T (Megapixels/sec/Dollar)	0.13	**0.22**	0.14	**0.10**
Normalized	59.09%	100%	63.64%	45.45%
GNU Octave Benchmark - Performance / Cost - (sec x Dollar)	**31365**	**17542**	23992	31236
Normalized	55.93%	100%	73.12%	56.16%
ctx_clock - Performance / Cost - C.S.T (Clocks x Dollar)	**1021750**	**117480**	191250	269850
Normalized	11.5%	100%	61.43%	43.54%
Sysbench - Performance / Cost - CPU (Events/sec/Dollar)	**22.15**	**38.27**	34.77	31.49
Normalized	57.88%	100%	90.85%	82.28%
OpenSSL - Performance / Cost - R.4.b.P (Signs/sec/Dollar)	**3.06**	**5.33**	3.57	3.24
Normalized	57.41%	100%	66.98%	60.79%

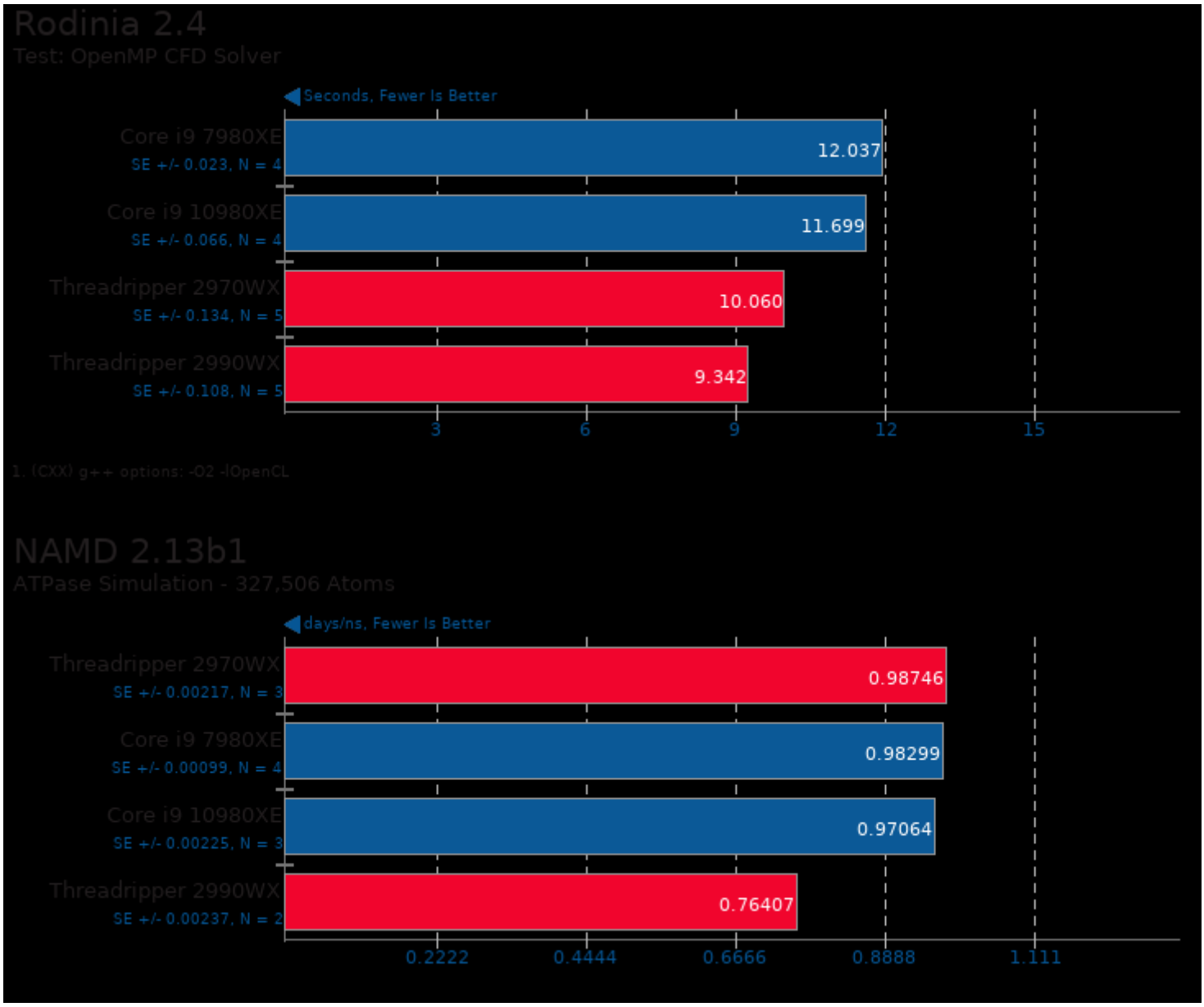
Intel Core i9-10980XE Linux Benchmarks

PHPBench - Performance / Cost - P.B.S (Score/Dollar)	466.95	**790.26**	427.54	**306.07**
Normalized	59.09%	100%	54.1%	38.73%
Redis - Performance / Cost - GET (Reqs/sec/Dollar)	1781	**2829**	1799	**1297**
Normalized	62.95%	100%	63.59%	45.83%
Redis - Performance / Cost - SET (Reqs/sec/Dollar)	1294	**2151**	1162	**905.68**
Normalized	60.15%	100%	54.02%	42.11%
Facebook RocksDB - Performance / Cost - Rand Read (Op/s/Dollar)	**57046**	**99365**	92154	81455
Normalized	57.41%	100%	92.74%	81.98%
Hierarchical INTegration - Performance / Cost - DOUBLE	637229	**1052815**	614013	**465522**
Normalized	60.53%	100%	58.32%	44.22%
Tesseract OCR - Performance / Cost - T.T.O.7.I (sec x Dollar)	39350	**23346**	38687	**54067**
Normalized	59.33%	100%	60.35%	43.18%
BRL-CAD - Performance / Cost - V.P.M (VGR Performance Metric/Dollar)	**133.38**	**209.81**	171.82	163.01
Normalized	63.57%	100%	81.89%	77.69%
GNU GMP GMPbench - Performance / Cost - Total Time (GMPbench Score/Dollar)	3.63	**6.16**	4.03	**2.88**
Normalized	58.93%	100%	65.42%	46.75%
dcraw - Performance / Cost - R.T.P.I.C (sec x Dollar)	58575	**34463**	57821	**80791**
Normalized	58.84%	100%	59.6%	42.66%
Selenium - Performance / Cost - ARES-6 - Google Chrome (ms x	**46497**	**20872**	31799	44615
Normalized	44.89%	100%	65.64%	46.78%
Selenium - Performance / Cost - Octane - Google Chrome (Geometric Mean/Dollar)	22.91	**47.19**	30.95	**22.37**
Normalized	48.55%	100%	65.59%	47.4%
Selenium - Performance / Cost - PSPDFKit WASM - Firefox (Score x Dollar)	2668750	**1560526**	2157300	**2984541**
Normalized	58.47%	100%	72.34%	52.29%
Selenium - Performance / Cost - Jetstream - Google Chrome (Score/Dollar)	**0.10**	**0.21**	0.14	**0.10**
Normalized	47.62%	100%	66.67%	47.62%
Selenium - Performance / Cost - StyleBench - Google Chrome (Runs / Minute/Dollar)	**0.02**	**0.04**	**0.02**	**0.02**
Normalized	50%	100%	50%	50%

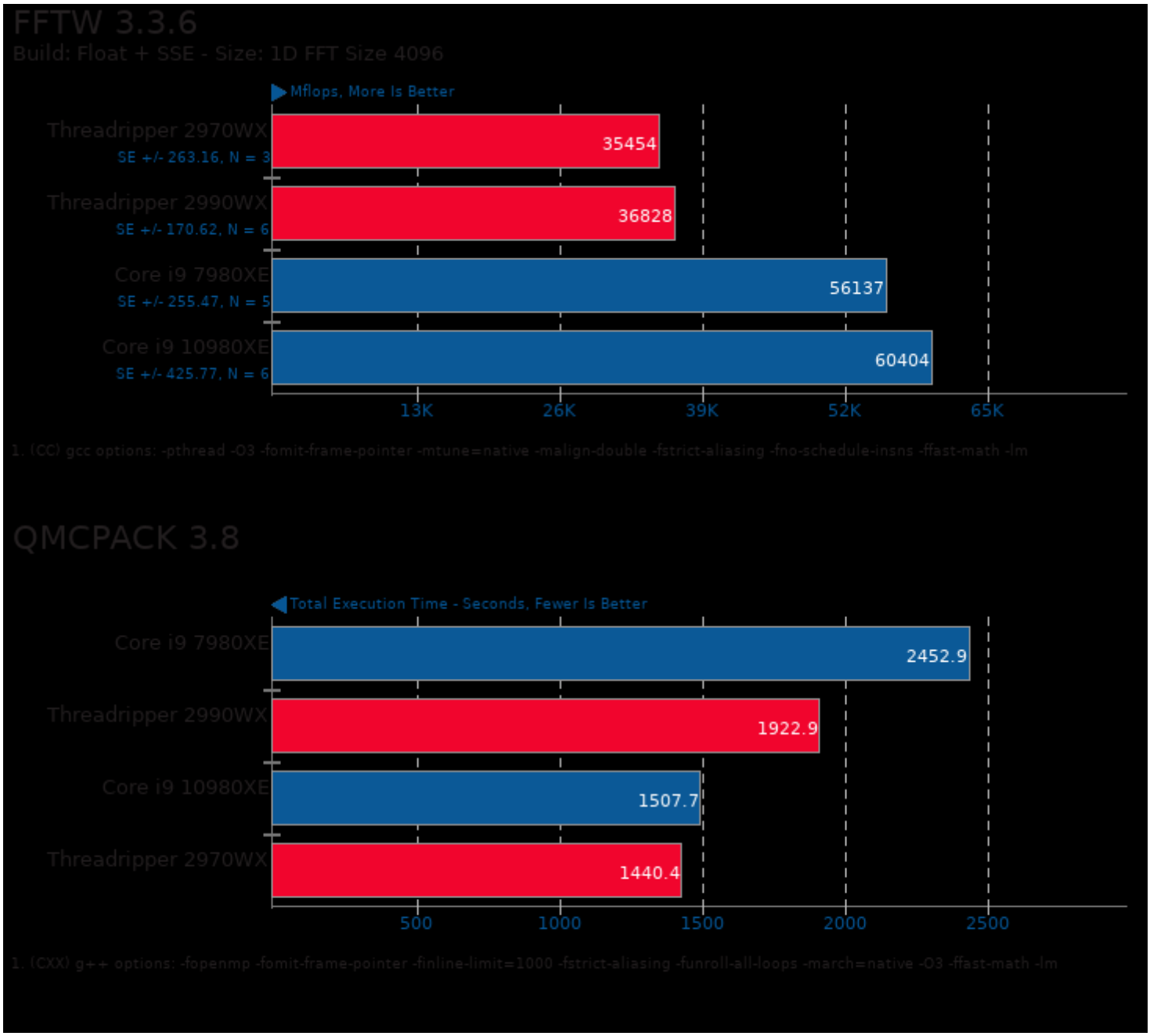
Intel Core i9-10980XE Linux Benchmarks

Selenium - Performance / Cost - Speedometer - Google Chrome (Runs/min/Dollar)	**0.06**	**0.12**	0.08	**0.06**
Normalized	50%	100%	66.67%	50%
Selenium - Performance / Cost - PSPDFKit WASM - Google Chrome (Score x Dollar)	**4117500**	**1833667**	2394450	3338944
Normalized	44.53%	100%	76.58%	54.92%
IndigoBench - Performance / Cost - Supercar (M samples/s/Dollar)		0.01		
SVT-AV1 - Performance / Cost - Enc Mode 4 - 1080p (FPS/Dollar)		0.01		
ACES DGEMM - Performance / Cost - S.F.P.R (GFLOP/s/Dollar)		0.01		


NAS Parallel Benchmarks 3.4
Test / Class: EP.C
Total Mop/s, More Is Better
Threadripper 2970WX
SE +/- 2.64, N = 3
1355.57
Threadripper 2990WX
SE +/- 0.36, N = 7
1738.88
Core i9 7980XE
SE +/- 11.96, N = 8
2202.73
Core i9 10980XE
SE +/- 15.95, N = 8
2452.18
500
1000
1500
2000
2500
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 3.1.3
Rodinia 2.4
Test: OpenMP LavaMD
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.077, N = 3
17.152
Core i9 10980XE
SE +/- 0.046, N = 4
15.303
Threadripper 2970WX
SE +/- 0.226, N = 12
12.658
Threadripper 2990WX
SE +/- 0.019, N = 5
9.916
4
8
12
16
20
1. (CXX) g++ options: -O2 -lOpenCL


Rodinia 2.4
Test: OpenMP CFD Solver
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.023, N = 4
12.037
Core i9 10980XE
SE +/- 0.066, N = 4
11.699
Threadripper 2970WX
SE +/- 0.134, N = 5
10.060
Threadripper 2990WX
SE +/- 0.108, N = 5
9.342
3
6
9
12
15
1. (CXX) g++ options: -O2 -lOpenCL
NAMD 2.13b1
ATPase Simulation - 327,506 Atoms
days/ns, Fewer Is Better
Threadripper 2970WX
SE +/- 0.00217, N = 3
0.98746
Core i9 7980XE
SE +/- 0.00099, N = 4
0.98299
Core i9 10980XE
SE +/- 0.00225, N = 3
0.97064
Threadripper 2990WX
SE +/- 0.00237, N = 2
0.76407
0.2222
0.4444
0.6666
0.8888
1.111

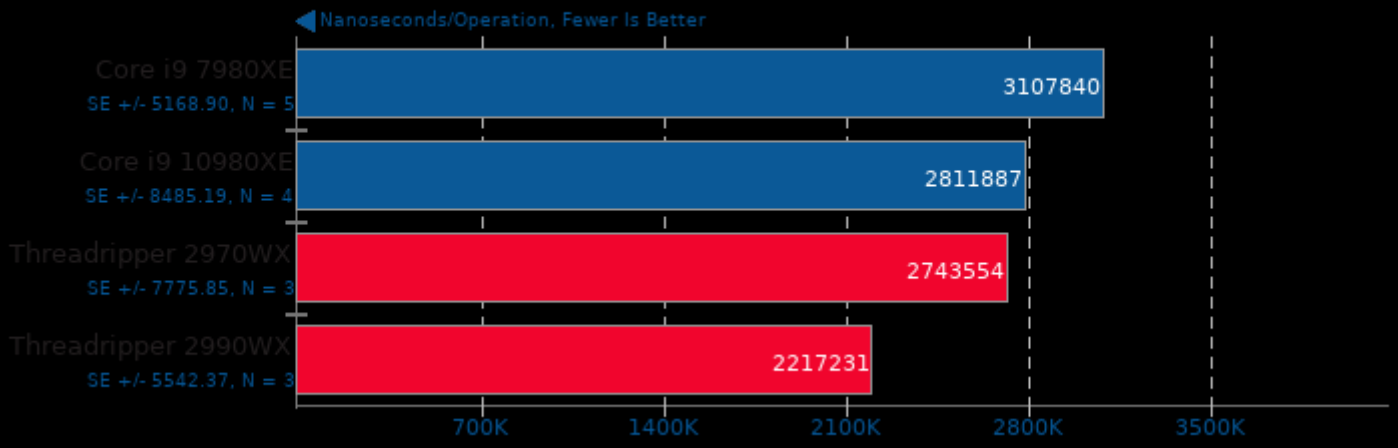
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

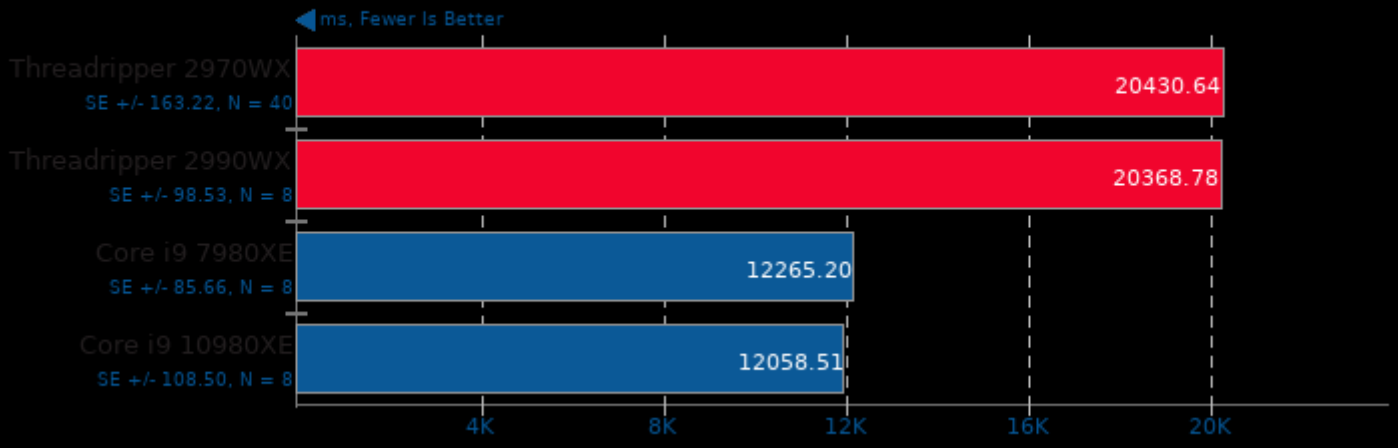
Go Benchmarks

Test: json



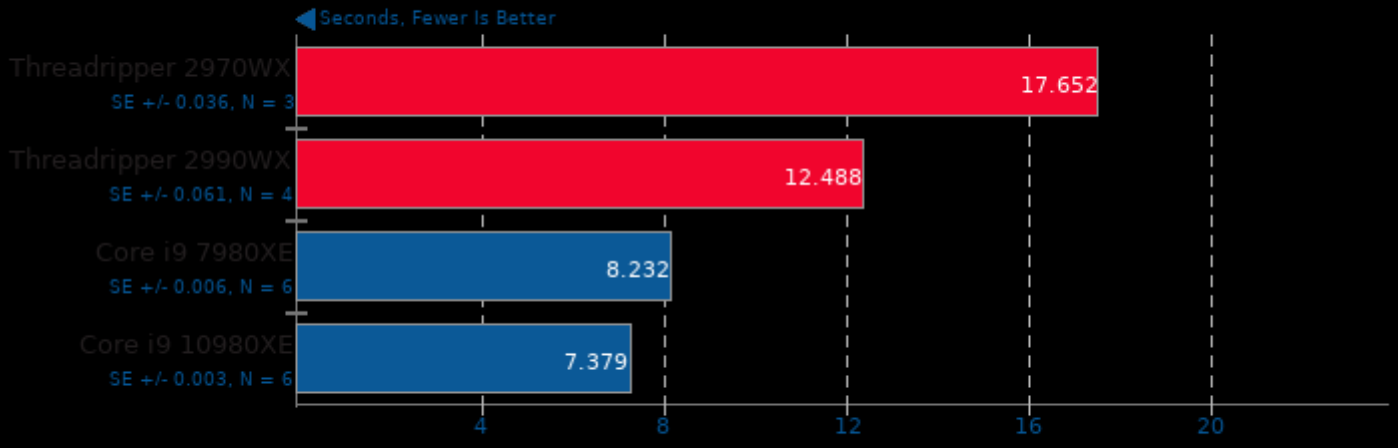
Renaissance 0.9.0

Test: Akka Unbalanced Cobwebbed Tree



Rust Prime Benchmark

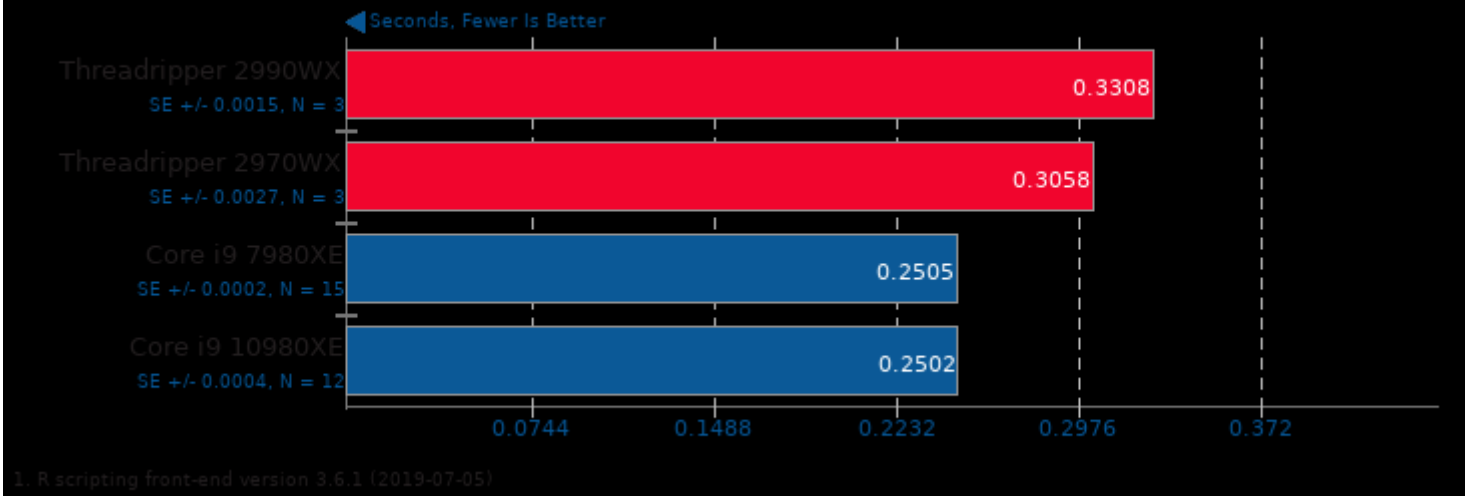
Prime Number Test To 200,000,000



1. (CC) gcc options: -m64 -pie -nodefaultlibs -ldl -lrt -lpthread -lgcc_s -lc -lm -lutil

Intel Core i9-10980XE Linux Benchmarks

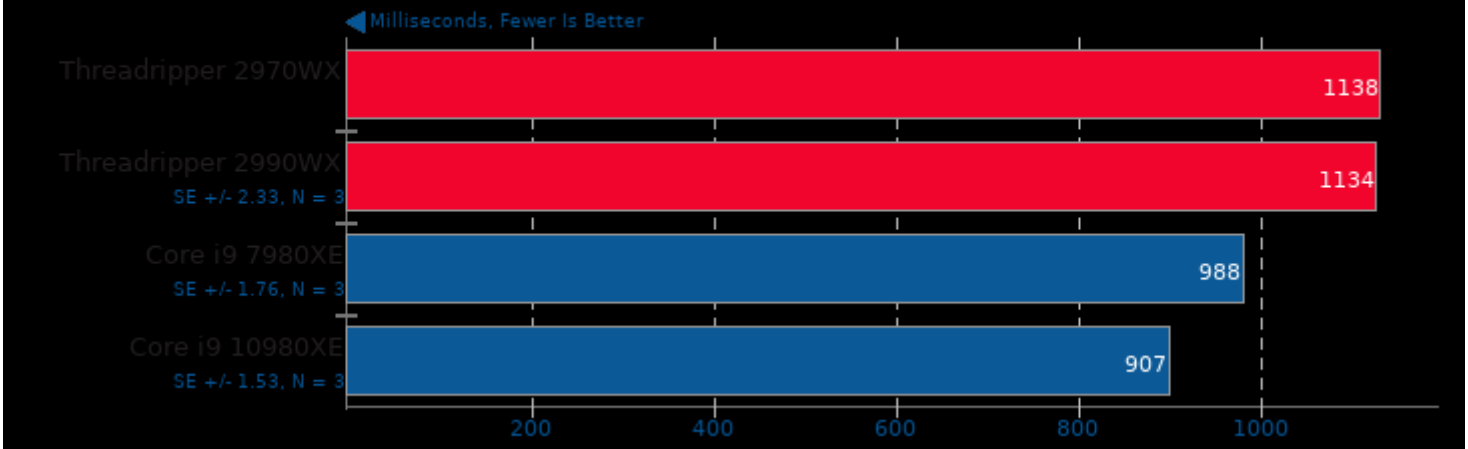
R Benchmark



1. R scripting front-end version 3.6.1 (2019-07-05)

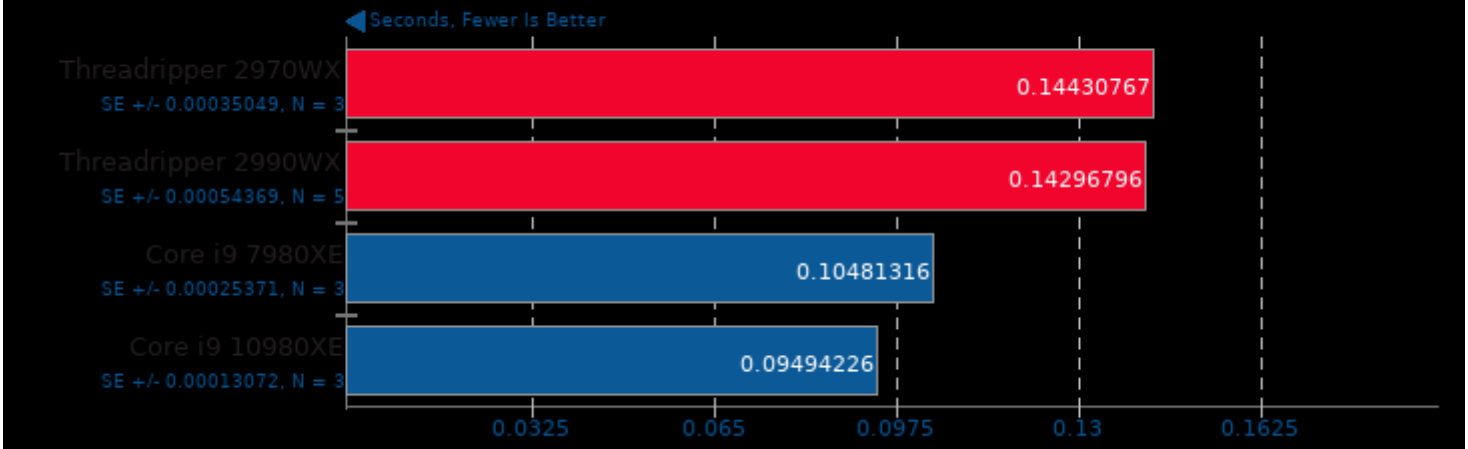
PyBench 2018-02-16

Total For Average Test Times



Perl Benchmarks

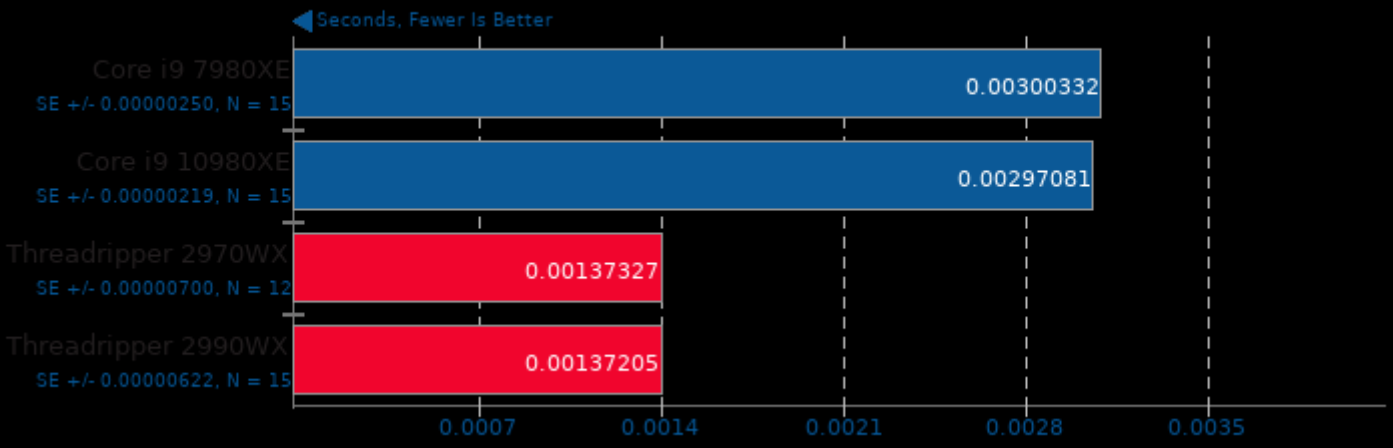
Test: Pod2html



Intel Core i9-10980XE Linux Benchmarks

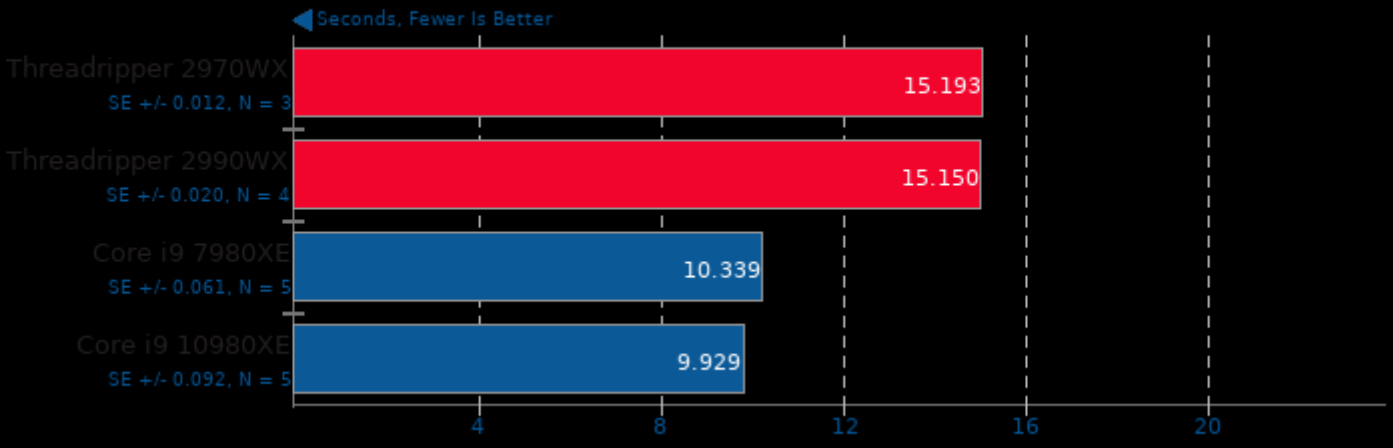
Perl Benchmarks

Test: Interpreter



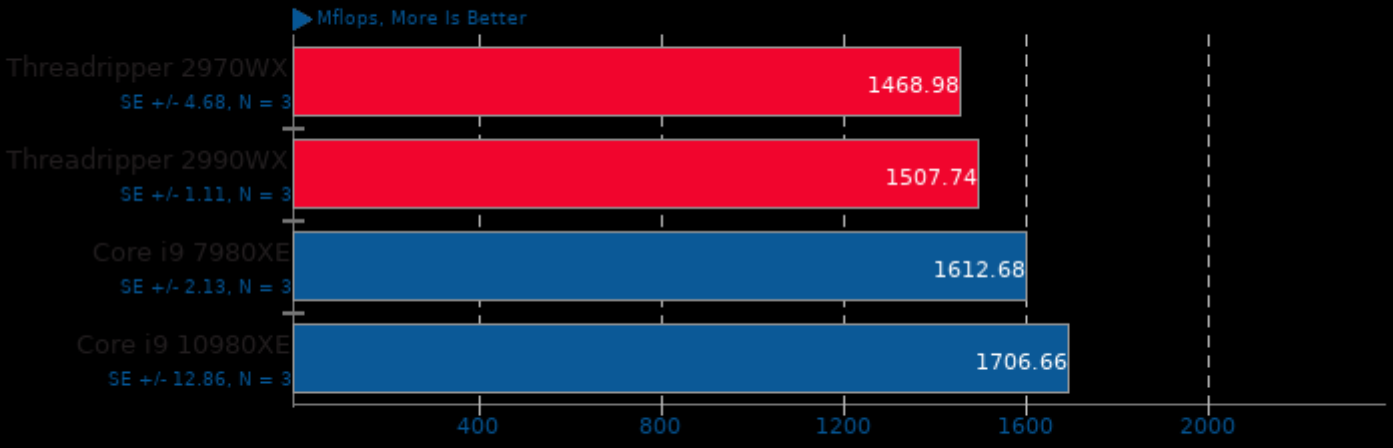
Sudokut 0.4

Total Time

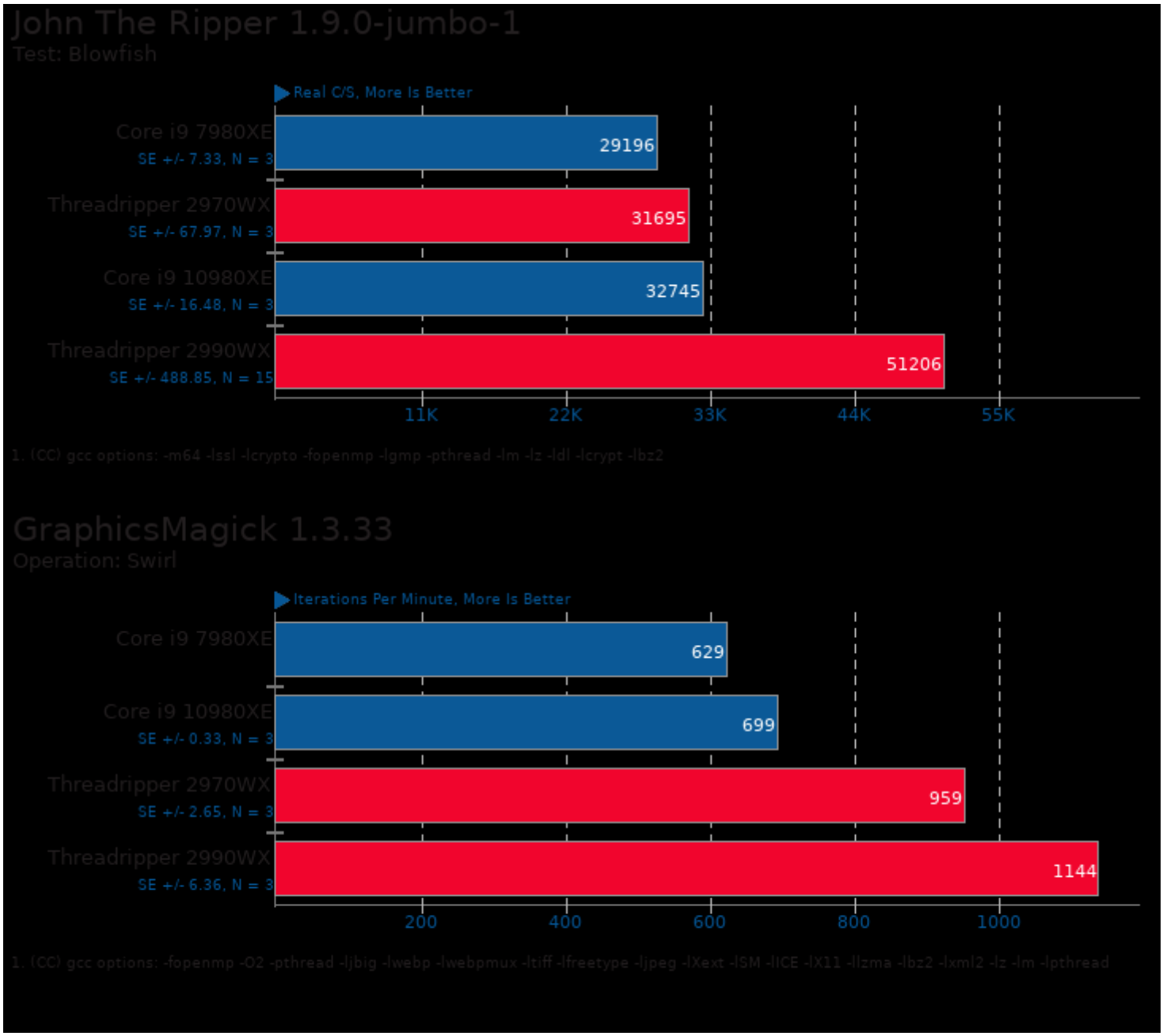


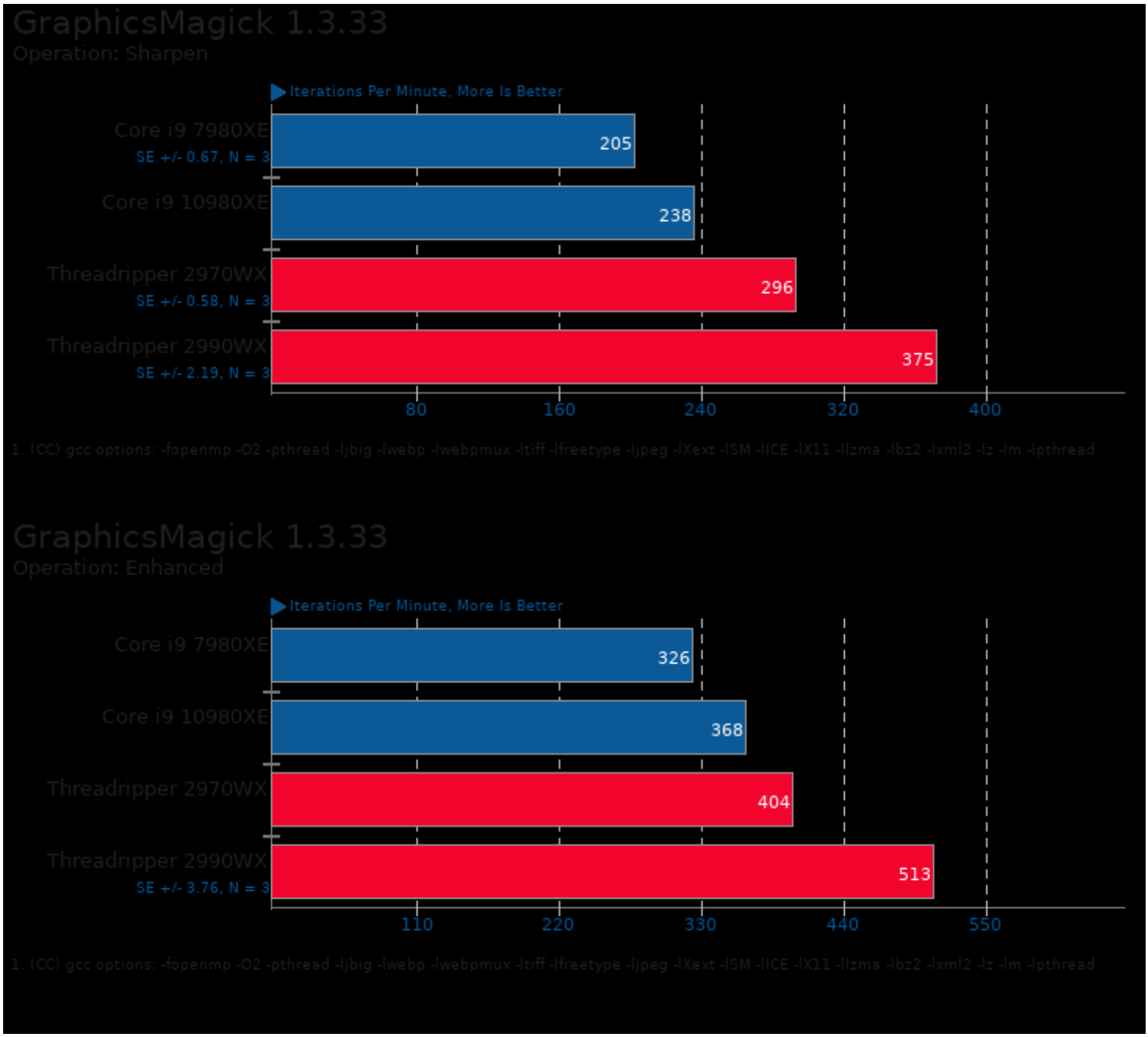
LuaJIT 2.1-git

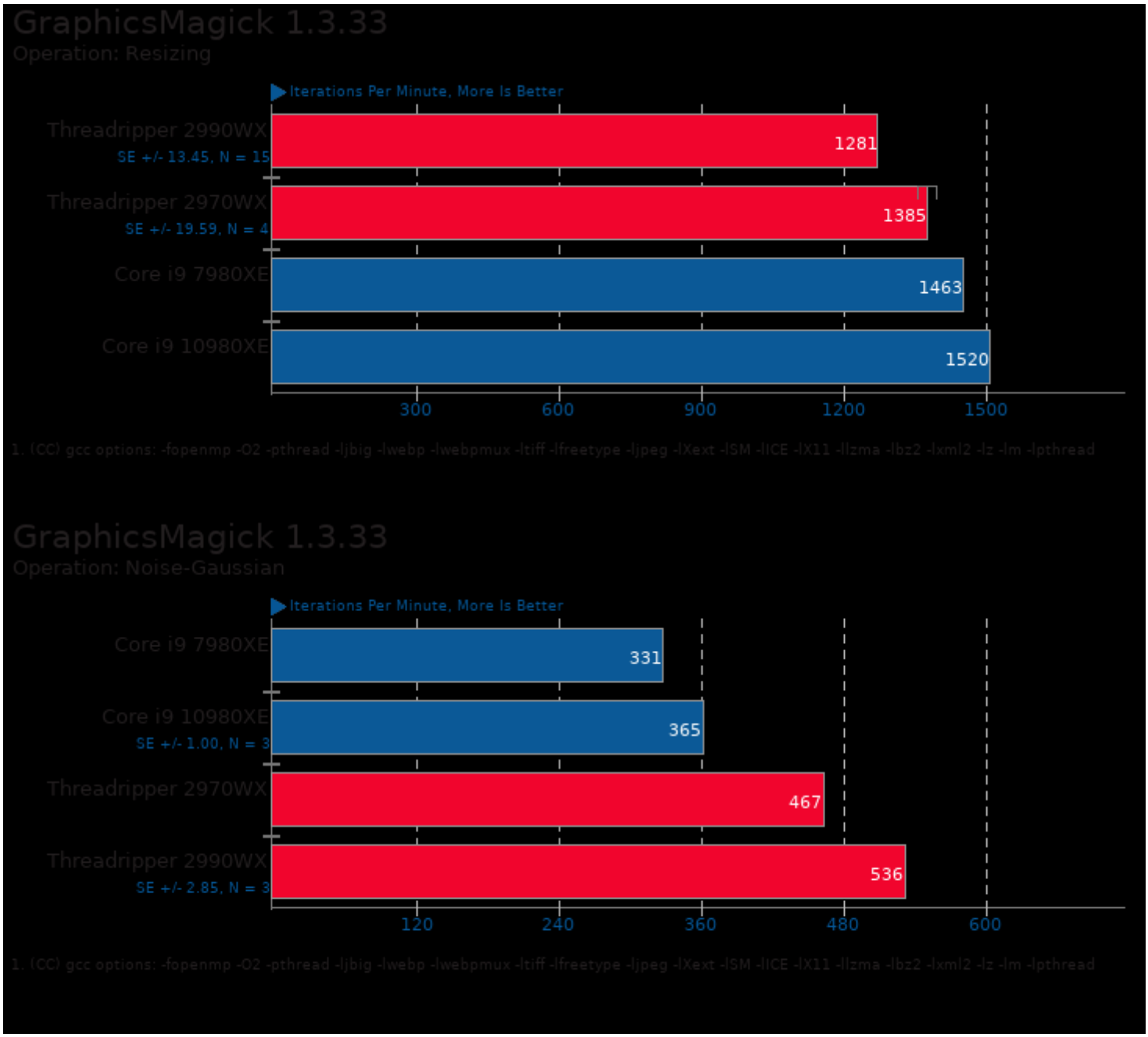
Test: Composite

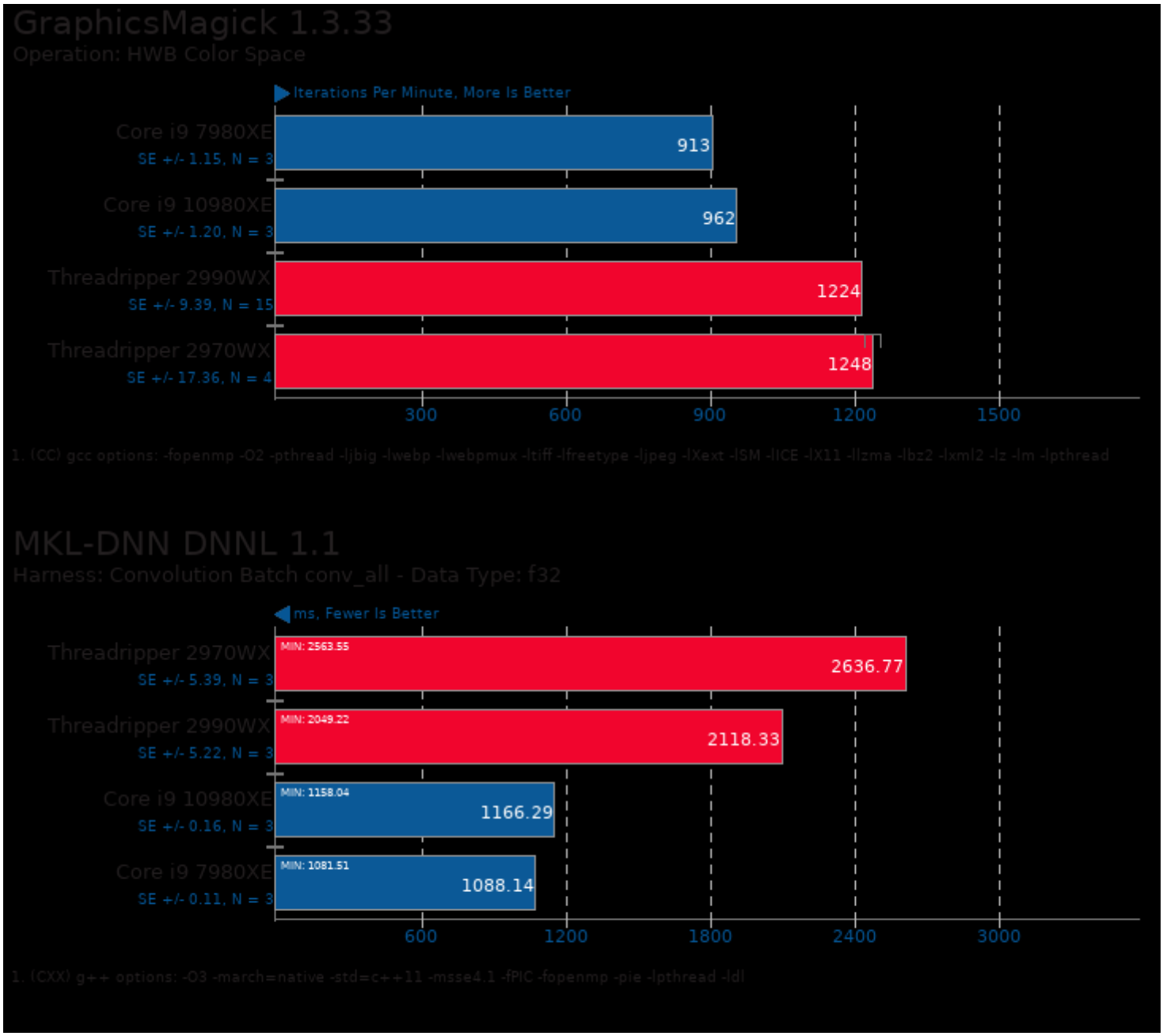


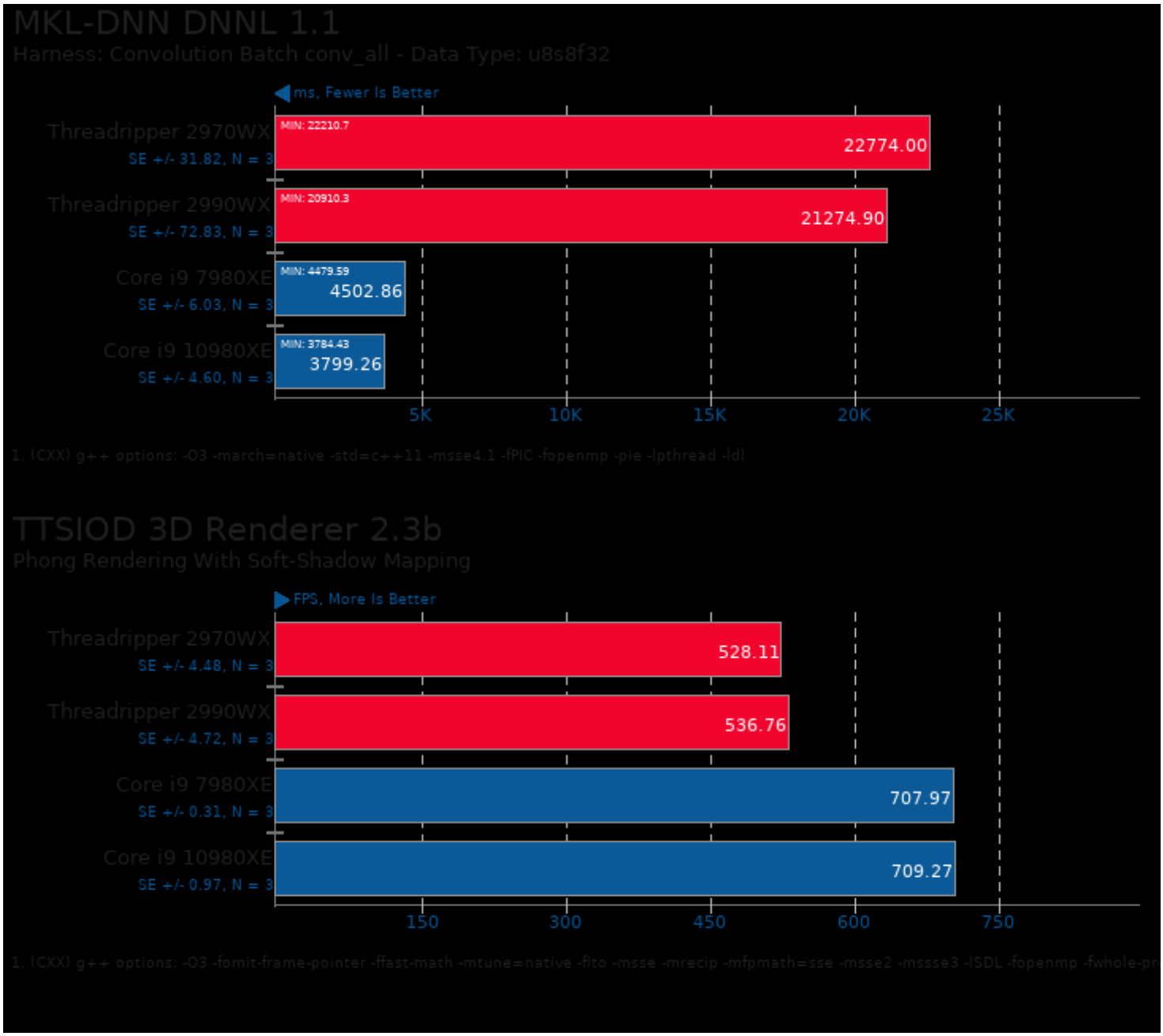
1. (CC) gcc options: -lm -ldl -O2 -fomit-frame-pointer -U_FORTIFY_SOURCE -fno-stack-protector

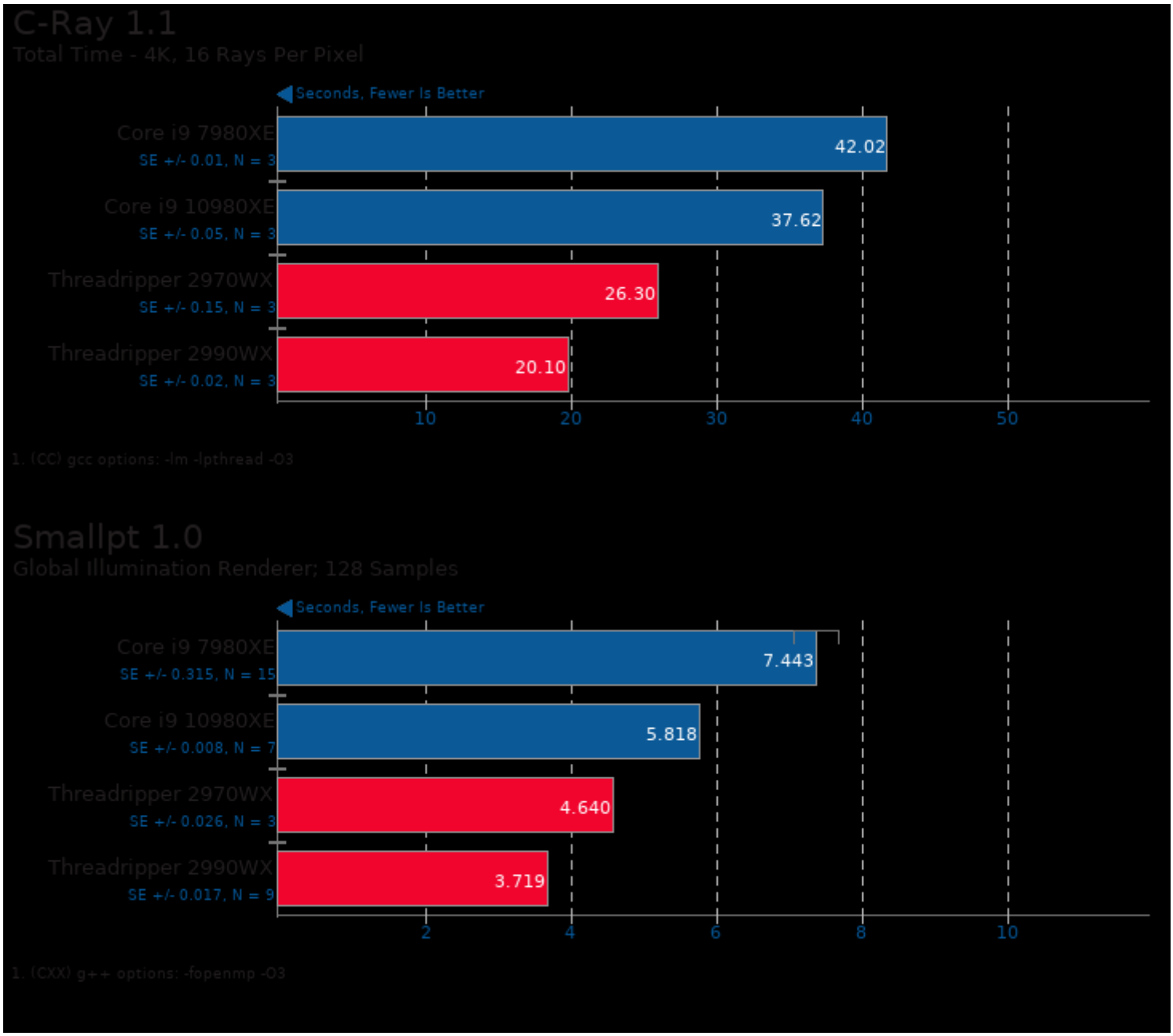

John The Ripper 1.9.0-jumbo-1
Test: Blowfish
Real C/S, More Is Better
Core i9 7980XE
SE +/- 7.33, N = 3
29196
Threadripper 2970WX
SE +/- 67.97, N = 3
31695
Core i9 10980XE
SE +/- 16.48, N = 3
32745
Threadripper 2990WX
SE +/- 488.85, N = 15
51206
11K
22K
33K
44K
55K
1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2
GraphicsMagick 1.3.33
Operation: Swirl
Iterations Per Minute, More Is Better
Core i9 7980XE
629
Core i9 10980XE
SE +/- 0.33, N = 3
699
Threadripper 2970WX
SE +/- 2.65, N = 3
959
Threadripper 2990WX
SE +/- 6.36, N = 3
1144
200
400
600
800
1000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread


GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Core i9 7980XE
SE +/- 0.67, N = 3
205
Core i9 10980XE
238
Threadripper 2970WX
SE +/- 0.58, N = 3
296
Threadripper 2990WX
SE +/- 2.19, N = 3
375
80
160
240
320
400
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute, More Is Better
Core i9 7980XE
326
Core i9 10980XE
368
Threadripper 2970WX
404
Threadripper 2990WX
SE +/- 3.76, N = 3
513
110
220
330
440
550
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread


GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Threadripper 2990WX
SE +/- 13.45, N = 15
1281
Threadripper 2970WX
SE +/- 19.59, N = 4
1385
Core i9 7980XE
1463
Core i9 10980XE
1520
300
600
900
1200
1500
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Noise-Gaussian
Iterations Per Minute, More Is Better
Core i9 7980XE
331
Core i9 10980XE
SE +/- 1.00, N = 3
365
Threadripper 2970WX
467
Threadripper 2990WX
SE +/- 2.85, N = 3
536
120
240
360
480
600
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread

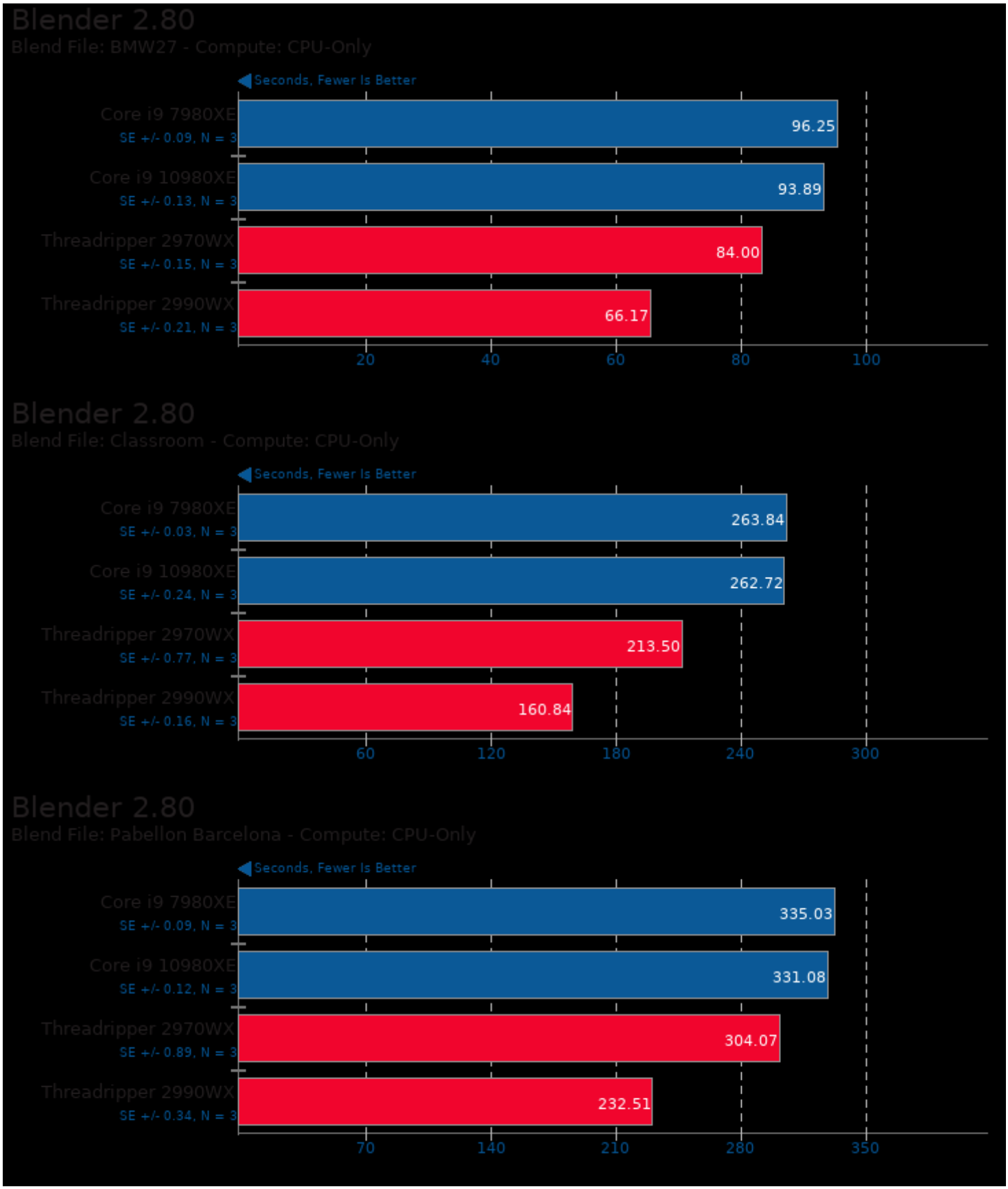

GraphicsMagick 1.3.33
Operation: HWB Color Space
Iterations Per Minute, More Is Better
Core i9 7980XE
SE +/- 1.15, N = 3
913
Core i9 10980XE
SE +/- 1.20, N = 3
962
Threadripper 2990WX
SE +/- 9.39, N = 15
1224
Threadripper 2970WX
SE +/- 17.36, N = 4
1248
300
600
900
1200
1500
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_all - Data Type: f32
ms, Fewer Is Better
Threadripper 2970WX
SE +/- 5.39, N = 3
MIN: 2563.55
2636.77
Threadripper 2990WX
SE +/- 5.22, N = 3
MIN: 2049.22
2118.33
Core i9 10980XE
SE +/- 0.16, N = 3
MIN: 1158.04
1166.29
Core i9 7980XE
SE +/- 0.11, N = 3
MIN: 1081.51
1088.14
600
1200
1800
2400
3000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl


MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_all - Data Type: u8s8f32
ms, Fewer Is Better
Threadripper 2970WX
SE +/- 31.82, N = 3
MIN: 22210.7
22774.00
Threadripper 2990WX
SE +/- 72.83, N = 3
MIN: 20910.3
21274.90
Core i9 7980XE
SE +/- 6.03, N = 3
MIN: 4479.59
4502.86
Core i9 10980XE
SE +/- 4.60, N = 3
MIN: 3784.43
3799.26
5K
10K
15K
20K
25K
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl
TTSIOD 3D Renderer 2.3b
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
Threadripper 2970WX
SE +/- 4.48, N = 3
528.11
Threadripper 2990WX
SE +/- 4.72, N = 3
536.76
Core i9 7980XE
SE +/- 0.31, N = 3
707.97
Core i9 10980XE
SE +/- 0.97, N = 3
709.27
150
300
450
600
750
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -msse -mrecip -mfpmath=sse -msse2 -mssse3 -lSDL -fopenmp -fwhole-pr


C-Ray 1.1
Total Time - 4K, 16 Rays Per Pixel
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.01, N = 3
42.02
Core i9 10980XE
SE +/- 0.05, N = 3
37.62
Threadripper 2970WX
SE +/- 0.15, N = 3
26.30
Threadripper 2990WX
SE +/- 0.02, N = 3
20.10
10
20
30
40
50
1. (CC) gcc options: -lm -lpthread -O3
Smallpt 1.0
Global Illumination Renderer; 128 Samples
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.315, N = 15
7.443
Core i9 10980XE
SE +/- 0.008, N = 7
5.818
Threadripper 2970WX
SE +/- 0.026, N = 3
4.640
Threadripper 2990WX
SE +/- 0.017, N = 9
3.719
2
4
6
8
10
1. (CXX) g++ options: -fopenmp -O3

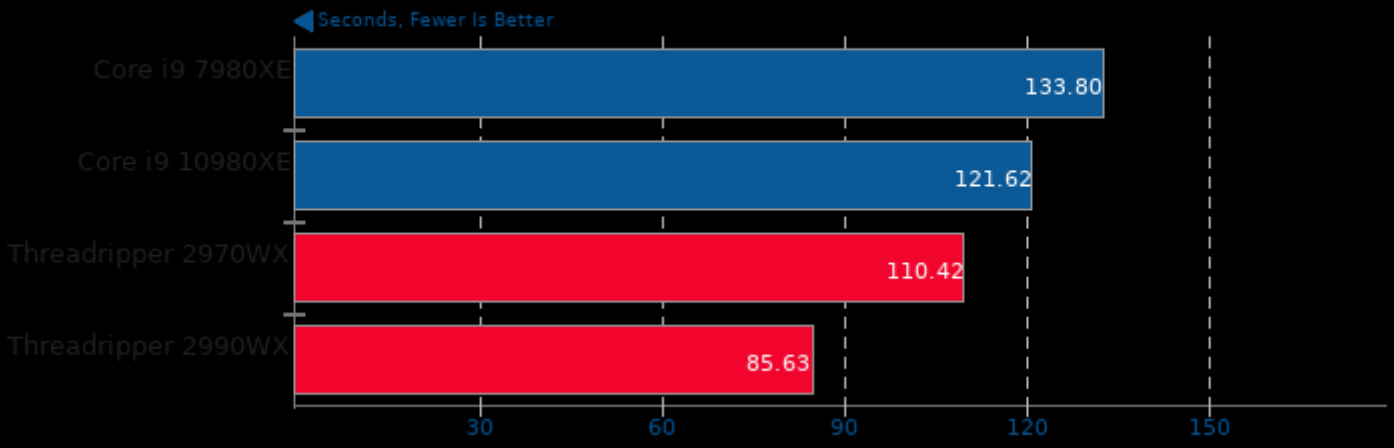

AOBench
Size: 2048 x 2048 - Total Time
Seconds, Fewer Is Better
Threadripper 2970WX
SE +/- 0.06, N = 3
35.76
Threadripper 2990WX
SE +/- 0.01, N = 3
35.22
Core i9 7980XE
SE +/- 0.22, N = 3
32.32
Core i9 10980XE
SE +/- 0.41, N = 3
29.79
8
16
24
32
40
1. (CC) gcc options: -lm -O3
IndigoBench 4.0.64
Scene: Bedroom
M samples/s, More Is Better
Threadripper 2990WX
SE +/- 0.027, N = 3
1.918
Core i9 7980XE
SE +/- 0.002, N = 3
2.524
Core i9 10980XE
SE +/- 0.003, N = 3
2.637
Threadripper 2970WX
SE +/- 0.025, N = 3
2.823
0.6352
1.2704
1.9056
2.5408
3.176
IndigoBench 4.0.64
Scene: Supercar
M samples/s, More Is Better
Threadripper 2990WX
SE +/- 0.026, N = 3
4.999
Threadripper 2970WX
SE +/- 0.035, N = 3
5.845
Core i9 7980XE
SE +/- 0.003, N = 3
6.010
Core i9 10980XE
SE +/- 0.008, N = 3
6.209
2
4
6
8
10

Intel Core i9-10980XE Linux Benchmarks



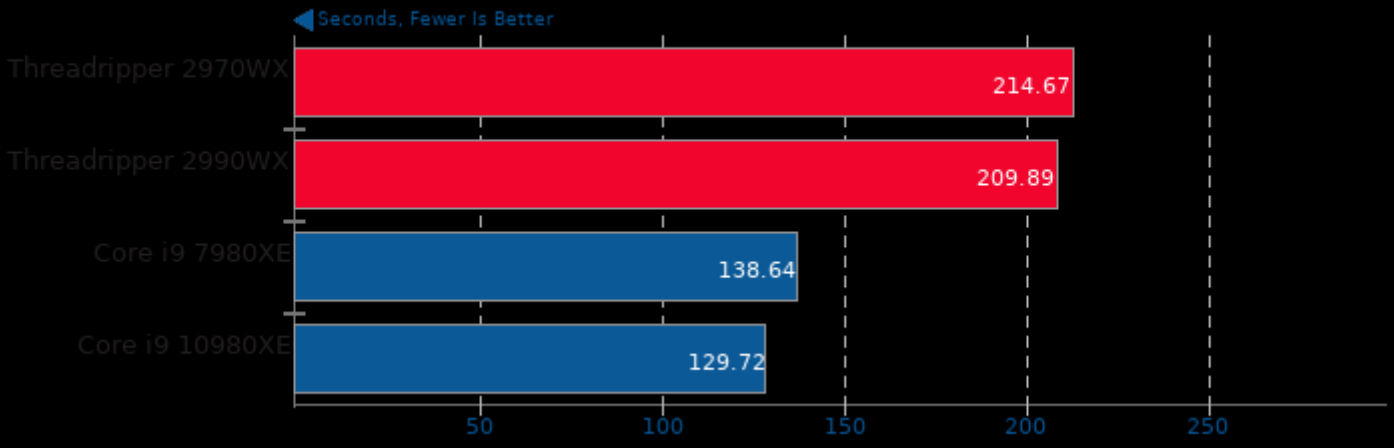
Appleseed 2.0 Beta

Scene: Disney Material



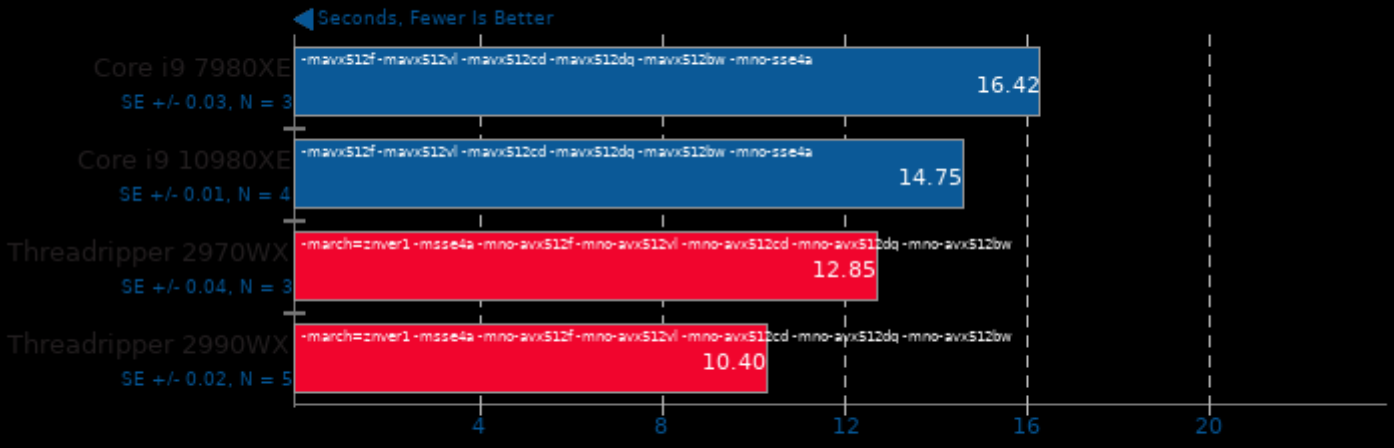
Appleseed 2.0 Beta

Scene: Material Tester

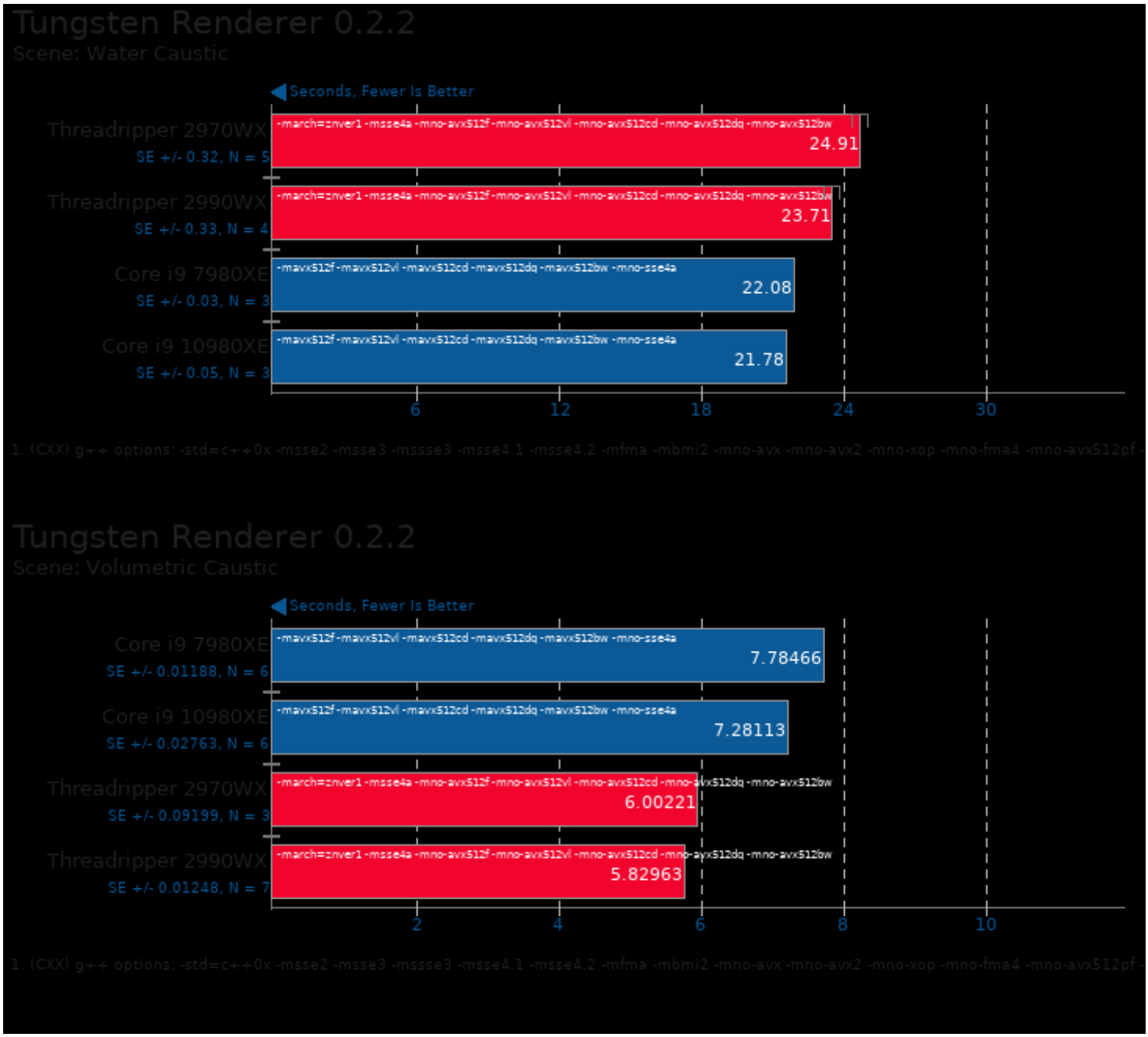


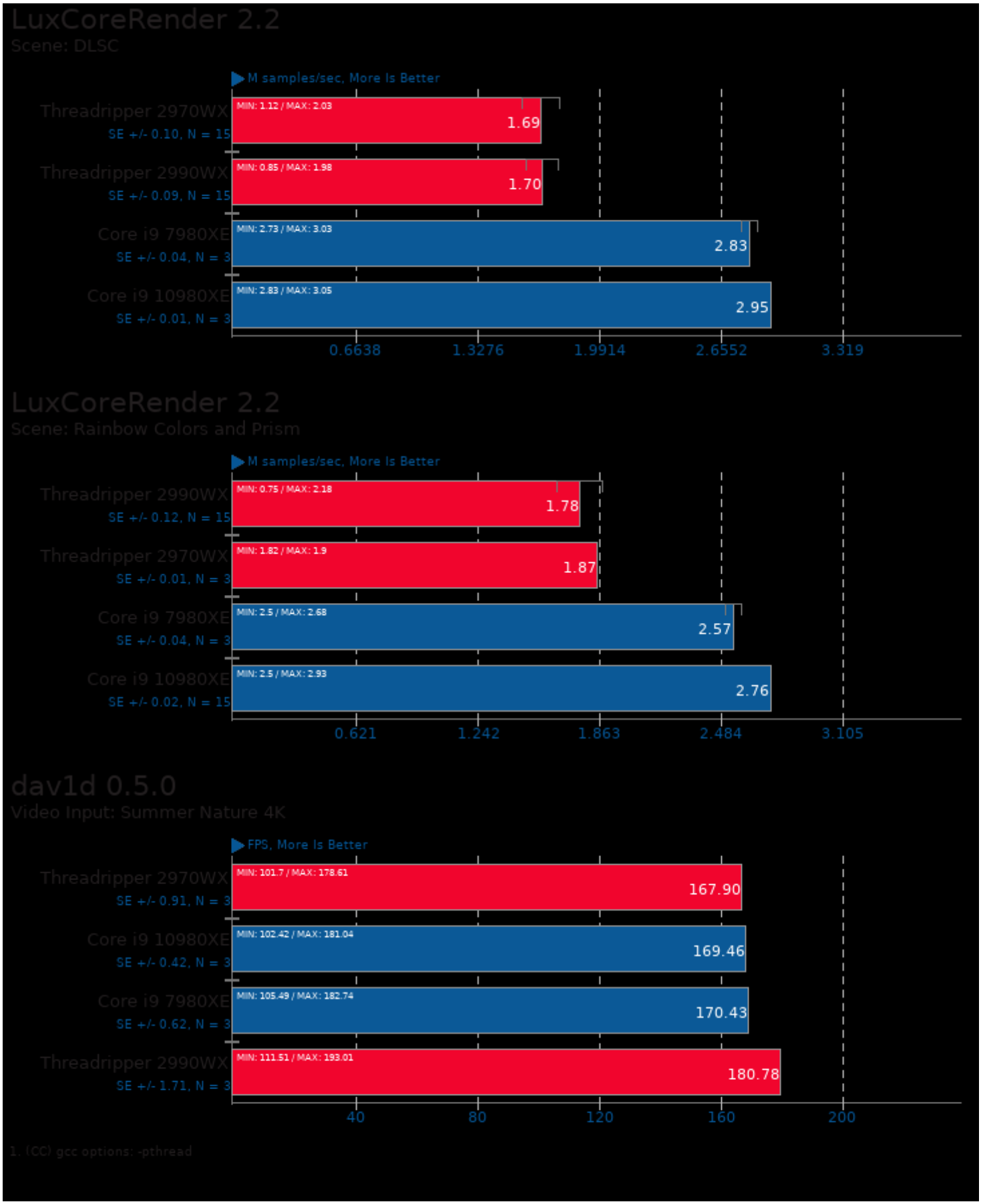
Tungsten Renderer 0.2.2

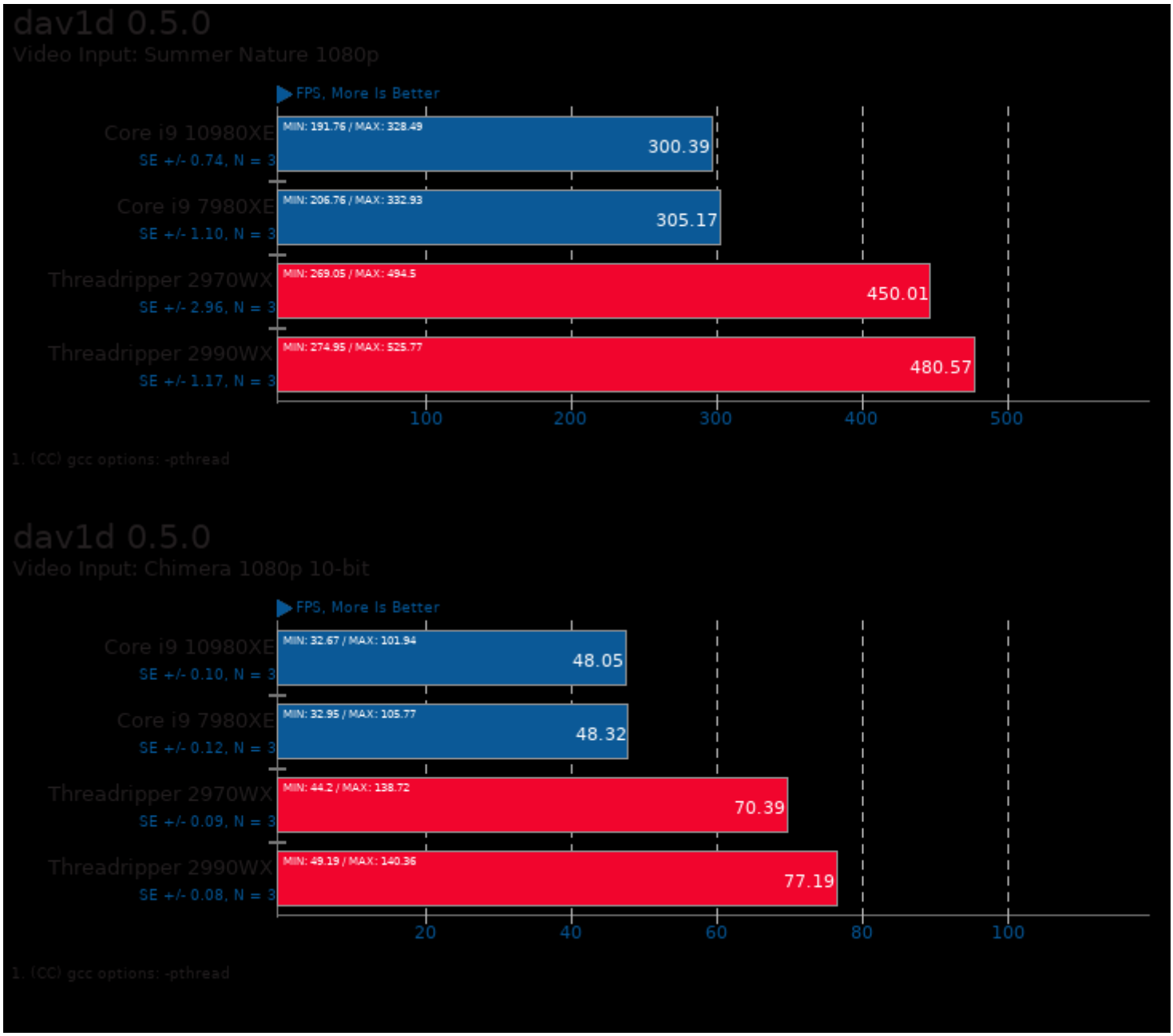
Scene: Hair

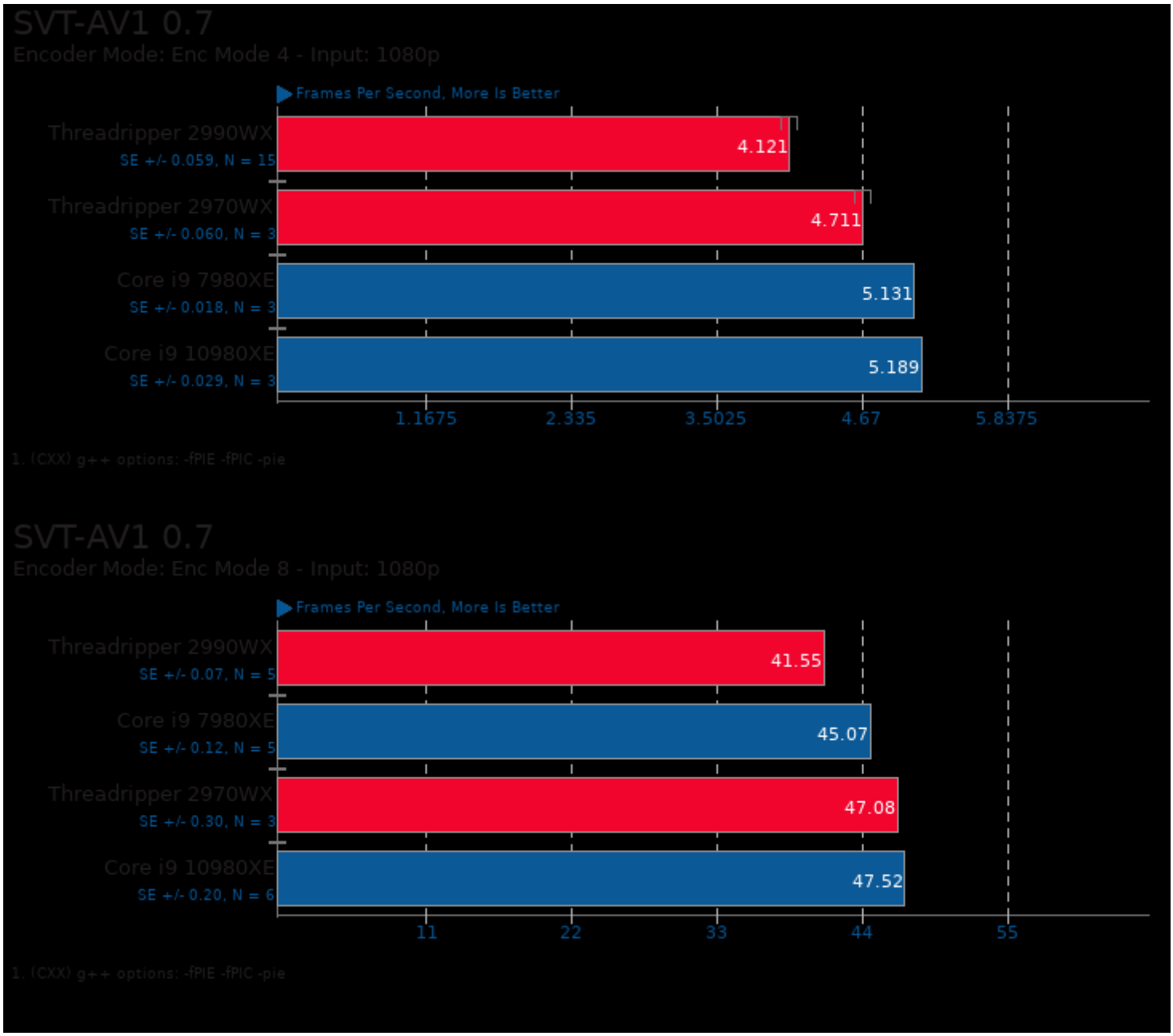


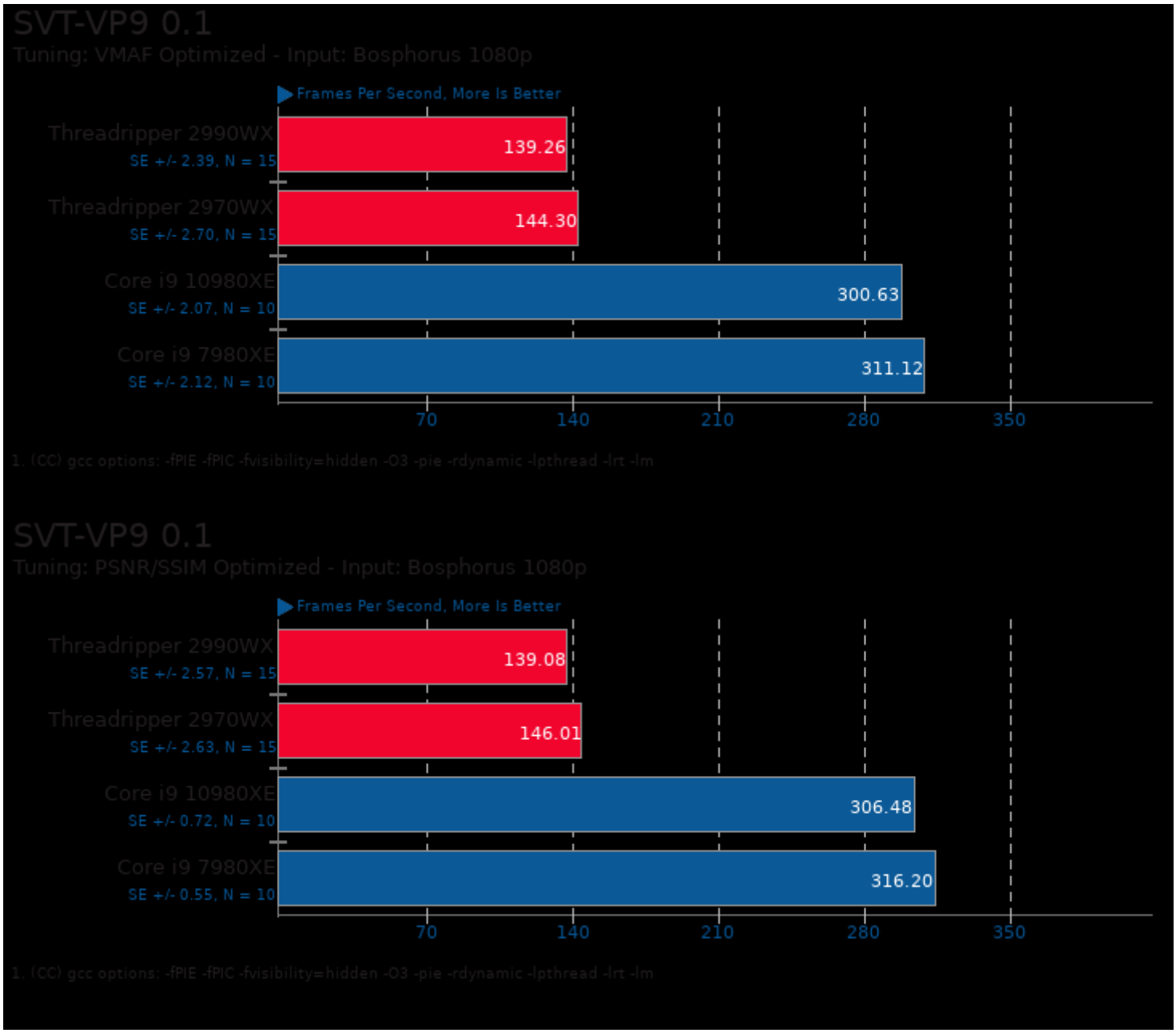
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -mfma -mbmi2 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf

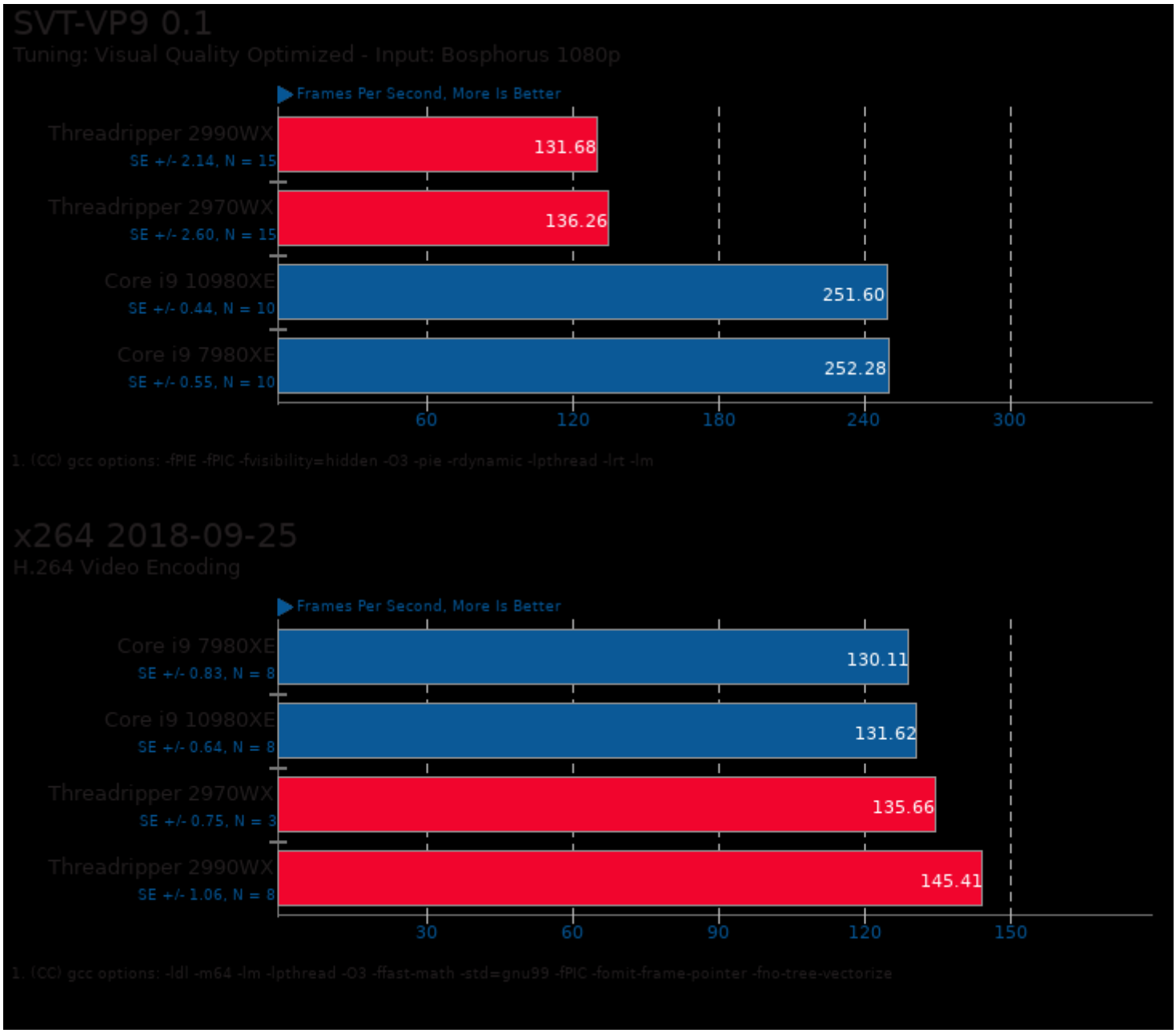

Tungsten Renderer 0.2.2
Scene: Water Caustic
Seconds, Fewer Is Better
Threadripper 2970WX
SE +/- 0.32, N = 5
-march=znver1 -msse4a -mno-avx512f -mno-avx512vl -mno-avx512cd -mno-avx512dq -mno-avx512bw
24.91
Threadripper 2990WX
SE +/- 0.33, N = 4
-march=znver1 -msse4a -mno-avx512f -mno-avx512vl -mno-avx512cd -mno-avx512dq -mno-avx512bw
23.71
Core i9 7980XE
SE +/- 0.03, N = 3
-mavx512f -mavx512vl -mavx512cd -mavx512dq -mavx512bw -mno-sse4a
22.08
Core i9 10980XE
SE +/- 0.05, N = 3
-mavx512f -mavx512vl -mavx512cd -mavx512dq -mavx512bw -mno-sse4a
21.78
6
12
18
24
30
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -mfma -mbmi2 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf
Tungsten Renderer 0.2.2
Scene: Volumetric Caustic
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.01188, N = 6
-mavx512f -mavx512vl -mavx512cd -mavx512dq -mavx512bw -mno-sse4a
7.78466
Core i9 10980XE
SE +/- 0.02763, N = 6
-mavx512f -mavx512vl -mavx512cd -mavx512dq -mavx512bw -mno-sse4a
7.28113
Threadripper 2970WX
SE +/- 0.09199, N = 3
-march=znver1 -msse4a -mno-avx512f -mno-avx512vl -mno-avx512cd -mno-avx512dq -mno-avx512bw
6.00221
Threadripper 2990WX
SE +/- 0.01248, N = 7
-march=znver1 -msse4a -mno-avx512f -mno-avx512vl -mno-avx512cd -mno-avx512dq -mno-avx512bw
5.82963
2
4
6
8
10
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -mfma -mbmi2 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf

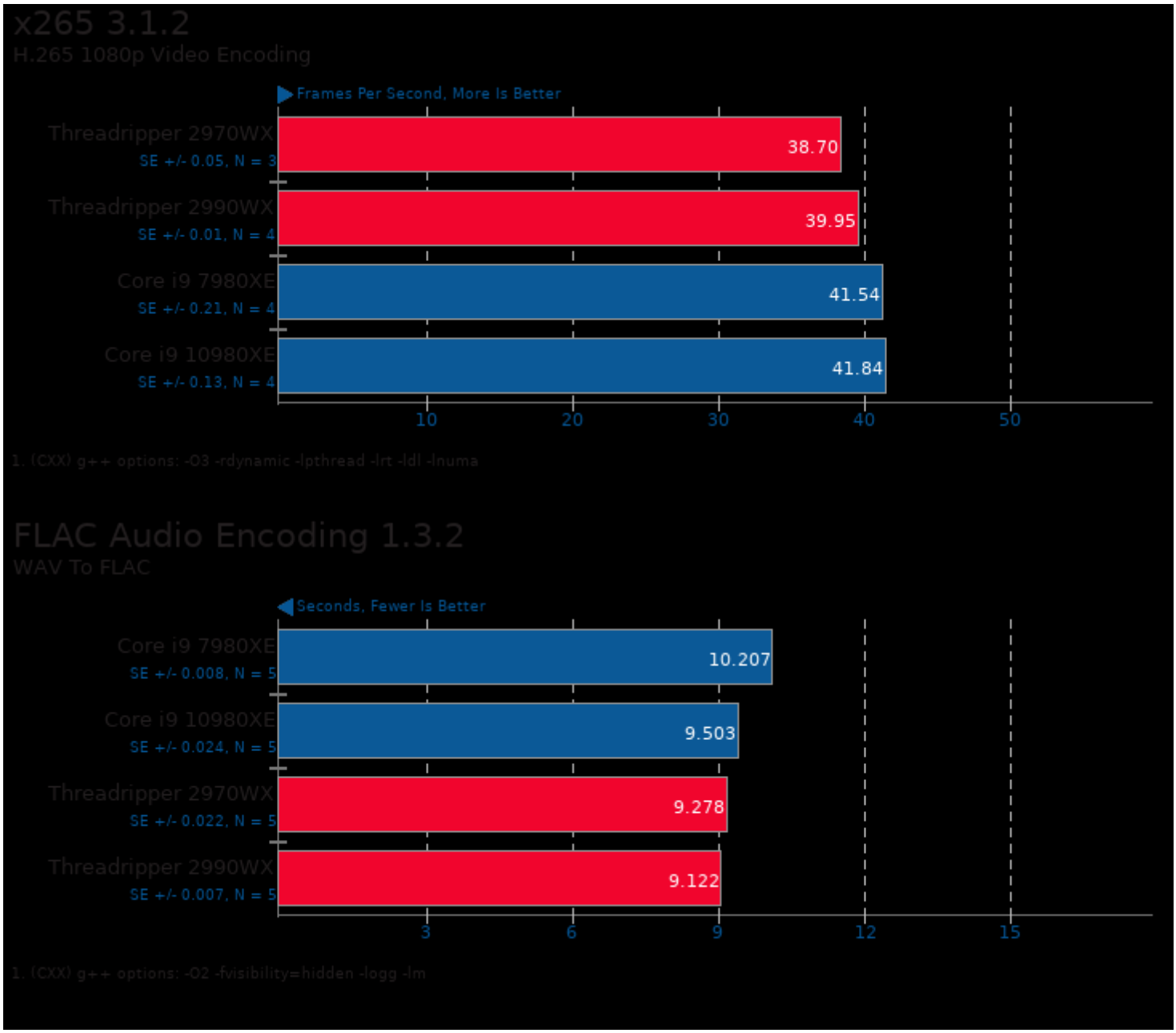

LuxCoreRender 2.2
Scene: DLSC
M samples/sec, More Is Better
Threadripper 2970WX
SE +/- 0.10, N = 15
MIN: 1.12 / MAX: 2.03
1.69
Threadripper 2990WX
SE +/- 0.09, N = 15
MIN: 0.85 / MAX: 1.98
1.70
Core i9 7980XE
SE +/- 0.04, N = 3
MIN: 2.73 / MAX: 3.03
2.83
Core i9 10980XE
SE +/- 0.01, N = 3
MIN: 2.83 / MAX: 3.05
2.95
0.6638
1.3276
1.9914
2.6552
3.319
LuxCoreRender 2.2
Scene: Rainbow Colors and Prism
M samples/sec, More Is Better
Threadripper 2990WX
SE +/- 0.12, N = 15
MIN: 0.75 / MAX: 2.18
1.78
Threadripper 2970WX
SE +/- 0.01, N = 3
MIN: 1.82 / MAX: 1.9
1.87
Core i9 7980XE
SE +/- 0.04, N = 3
MIN: 2.5 / MAX: 2.68
2.57
Core i9 10980XE
SE +/- 0.02, N = 15
MIN: 2.5 / MAX: 2.93
2.76
0.621
1.242
1.863
2.484
3.105
dav1d 0.5.0
Video Input: Summer Nature 4K
FPS, More Is Better
Threadripper 2970WX
SE +/- 0.91, N = 3
MIN: 101.7 / MAX: 178.61
167.90
Core i9 10980XE
SE +/- 0.42, N = 3
MIN: 102.42 / MAX: 181.04
169.46
Core i9 7980XE
SE +/- 0.62, N = 3
MIN: 105.49 / MAX: 182.74
170.43
Threadripper 2990WX
SE +/- 1.71, N = 3
MIN: 111.51 / MAX: 193.01
180.78
40
80
120
160
200
1. (CC) gcc options: -pthread


dav1d 0.5.0
Video Input: Summer Nature 1080p
FPS, More Is Better
Core i9 10980XE
SE +/- 0.74, N = 3
MIN: 191.76 / MAX: 328.49
300.39
Core i9 7980XE
SE +/- 1.10, N = 3
MIN: 206.76 / MAX: 332.93
305.17
Threadripper 2970WX
SE +/- 2.96, N = 3
MIN: 269.05 / MAX: 494.5
450.01
Threadripper 2990WX
SE +/- 1.17, N = 3
MIN: 274.95 / MAX: 525.77
480.57
100
200
300
400
500
1. (CC) gcc options: -pthread
dav1d 0.5.0
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
Core i9 10980XE
SE +/- 0.10, N = 3
MIN: 32.67 / MAX: 101.94
48.05
Core i9 7980XE
SE +/- 0.12, N = 3
MIN: 32.95 / MAX: 105.77
48.32
Threadripper 2970WX
SE +/- 0.09, N = 3
MIN: 44.2 / MAX: 138.72
70.39
Threadripper 2990WX
SE +/- 0.08, N = 3
MIN: 49.19 / MAX: 140.36
77.19
20
40
60
80
100
1. (CC) gcc options: -pthread


SVT-AV1 0.7
Encoder Mode: Enc Mode 4 - Input: 1080p
Frames Per Second, More Is Better
Threadripper 2990WX
SE +/- 0.059, N = 15
4.121
Threadripper 2970WX
SE +/- 0.060, N = 3
4.711
Core i9 7980XE
SE +/- 0.018, N = 3
5.131
Core i9 10980XE
SE +/- 0.029, N = 3
5.189
1.1675
2.335
3.5025
4.67
5.8375
1. (CXX) g++ options: -fPIE -fPIC -pie
SVT-AV1 0.7
Encoder Mode: Enc Mode 8 - Input: 1080p
Frames Per Second, More Is Better
Threadripper 2990WX
SE +/- 0.07, N = 5
41.55
Core i9 7980XE
SE +/- 0.12, N = 5
45.07
Threadripper 2970WX
SE +/- 0.30, N = 3
47.08
Core i9 10980XE
SE +/- 0.20, N = 6
47.52
11
22
33
44
55
1. (CXX) g++ options: -fPIE -fPIC -pie


SVT-VP9 0.1
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Threadripper 2990WX
SE +/- 2.39, N = 15
139.26
Threadripper 2970WX
SE +/- 2.70, N = 15
144.30
Core i9 10980XE
SE +/- 2.07, N = 10
300.63
Core i9 7980XE
SE +/- 2.12, N = 10
311.12
70
140
210
280
350
1. (CC) gcc options: -fPIE -fPIC -fvisibility=hidden -O3 -pie -rdynamic -lpthread -lrt -lm
SVT-VP9 0.1
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Threadripper 2990WX
SE +/- 2.57, N = 15
139.08
Threadripper 2970WX
SE +/- 2.63, N = 15
146.01
Core i9 10980XE
SE +/- 0.72, N = 10
306.48
Core i9 7980XE
SE +/- 0.55, N = 10
316.20
70
140
210
280
350
1. (CC) gcc options: -fPIE -fPIC -fvisibility=hidden -O3 -pie -rdynamic -lpthread -lrt -lm


SVT-VP9 0.1
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Threadripper 2990WX
SE +/- 2.14, N = 15
131.68
Threadripper 2970WX
SE +/- 2.60, N = 15
136.26
Core i9 10980XE
SE +/- 0.44, N = 10
251.60
Core i9 7980XE
SE +/- 0.55, N = 10
252.28
60
120
180
240
300
1. (CC) gcc options: -fPIE -fPIC -fvisibility=hidden -O3 -pie -rdynamic -lpthread -lrt -lm
x264 2018-09-25
H.264 Video Encoding
Frames Per Second, More Is Better
Core i9 7980XE
SE +/- 0.83, N = 8
130.11
Core i9 10980XE
SE +/- 0.64, N = 8
131.62
Threadripper 2970WX
SE +/- 0.75, N = 3
135.66
Threadripper 2990WX
SE +/- 1.06, N = 8
145.41
30
60
90
120
150
1. (CC) gcc options: -ldl -m64 -lm -lpthread -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize


x265 3.1.2
H.265 1080p Video Encoding
Frames Per Second, More Is Better
Threadripper 2970WX
SE +/- 0.05, N = 3
38.70
Threadripper 2990WX
SE +/- 0.01, N = 4
39.95
Core i9 7980XE
SE +/- 0.21, N = 4
41.54
Core i9 10980XE
SE +/- 0.13, N = 4
41.84
10
20
30
40
50
1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -lnuma
FLAC Audio Encoding 1.3.2
WAV To FLAC
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.008, N = 5
10.207
Core i9 10980XE
SE +/- 0.024, N = 5
9.503
Threadripper 2970WX
SE +/- 0.022, N = 5
9.278
Threadripper 2990WX
SE +/- 0.007, N = 5
9.122
3
6
9
12
15
1. (CXX) g++ options: -O2 -fvisibility=hidden -logg -lm

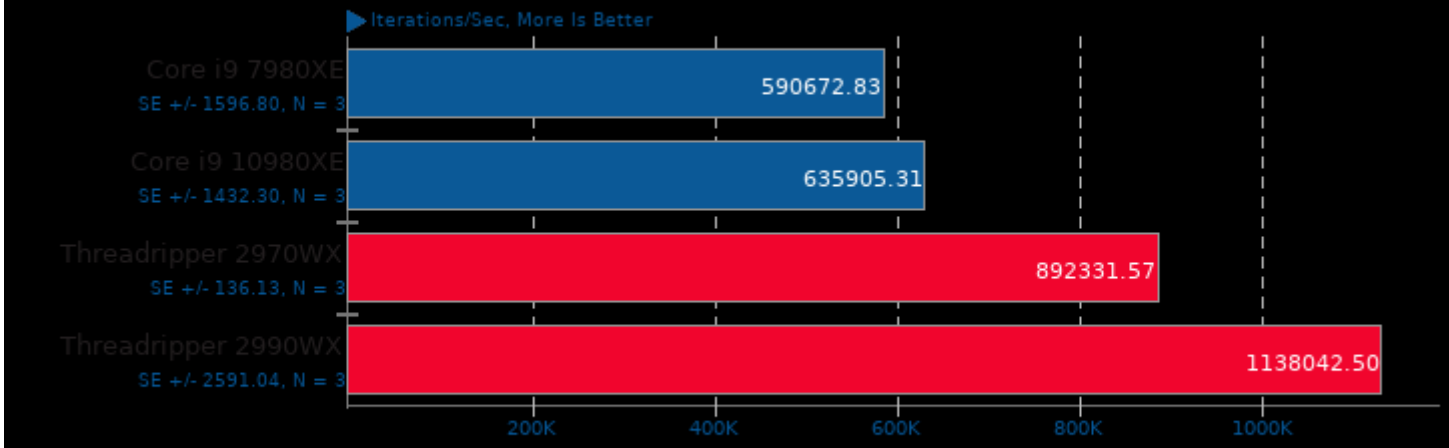
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

Coremark 1.0

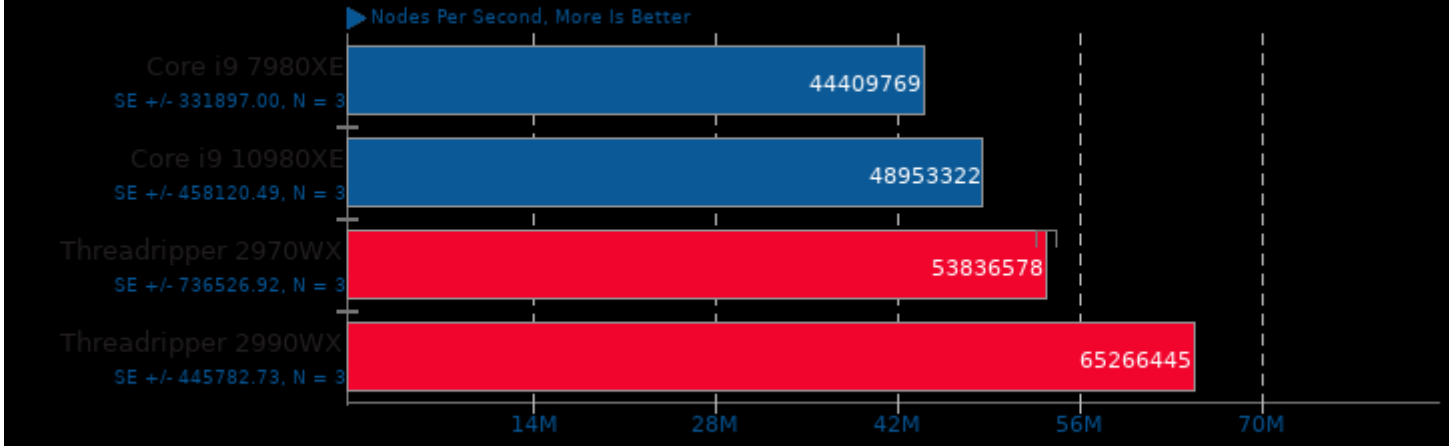
CoreMark Size 666 - Iterations Per Second



1. (CC) gcc options: -O2 -lrt" -lrt

Stockfish 9

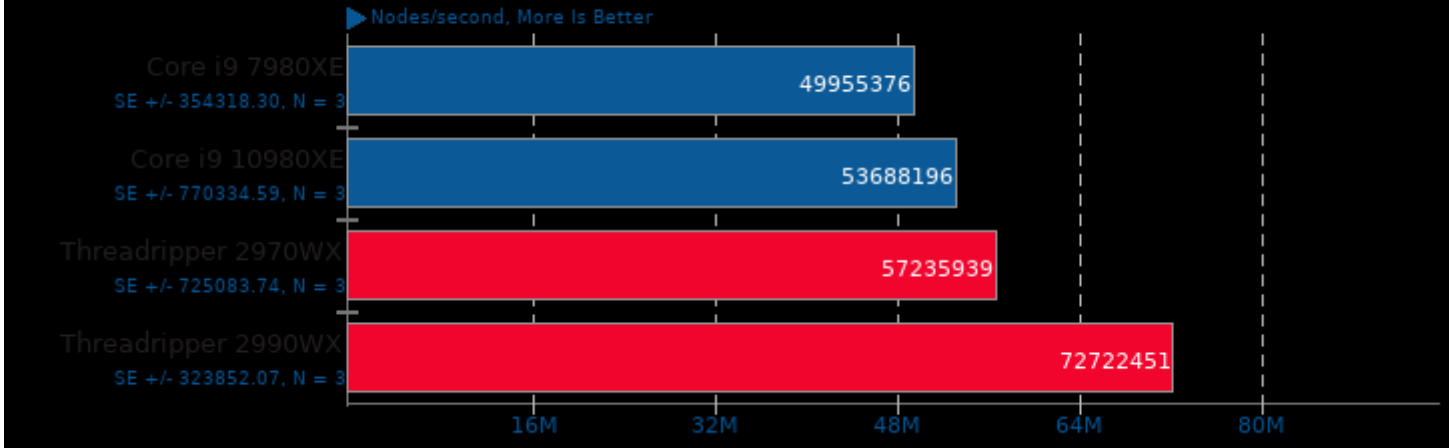
Total Time



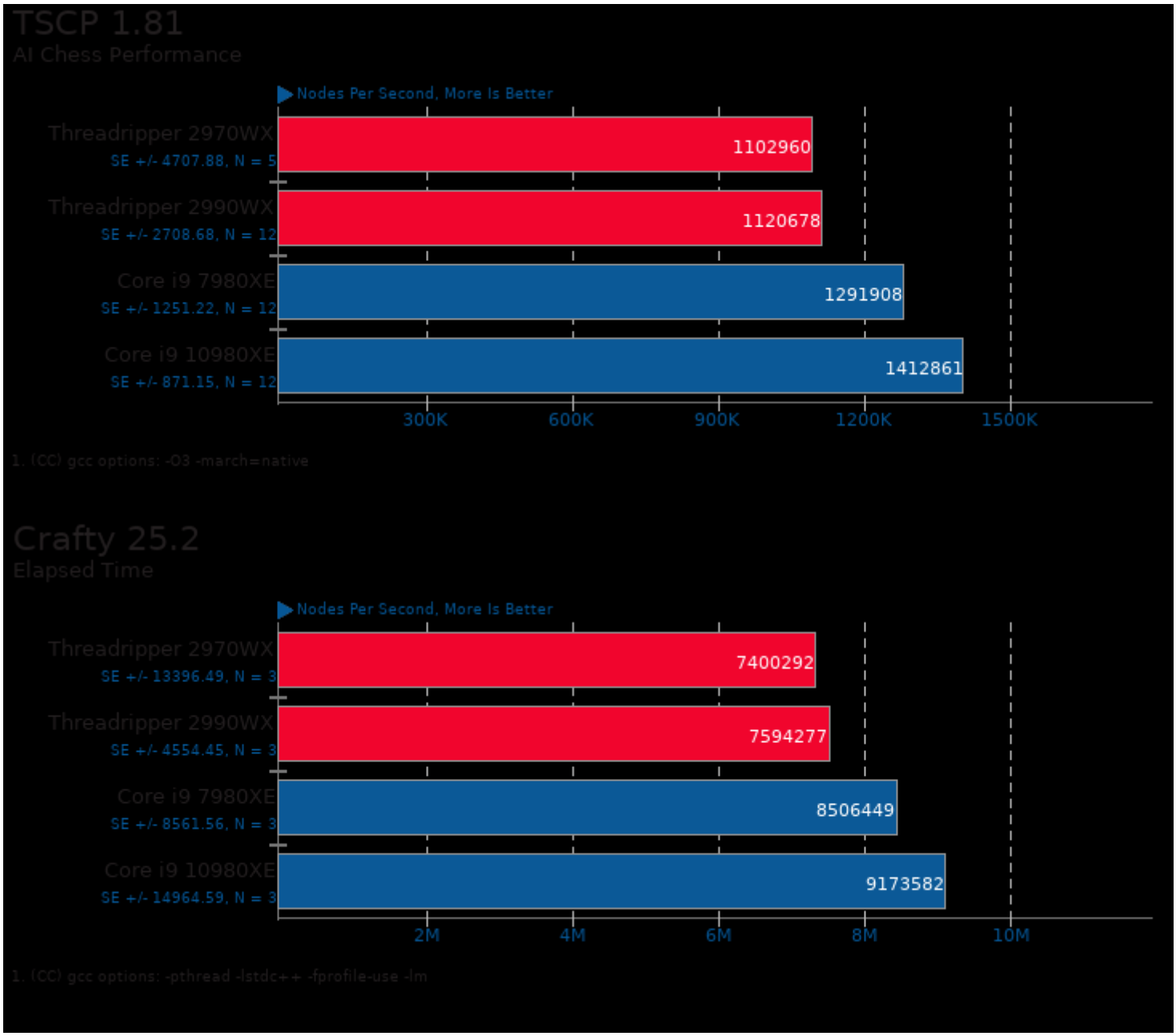
1. (CXX) g++ options: -m64 -lpthread -fno-exceptions -std=c++11 -pedantic -O3 -msse -msse3 -mpopcnt -flto

asmFish 2018-07-23

1024 Hash Memory, 26 Depth

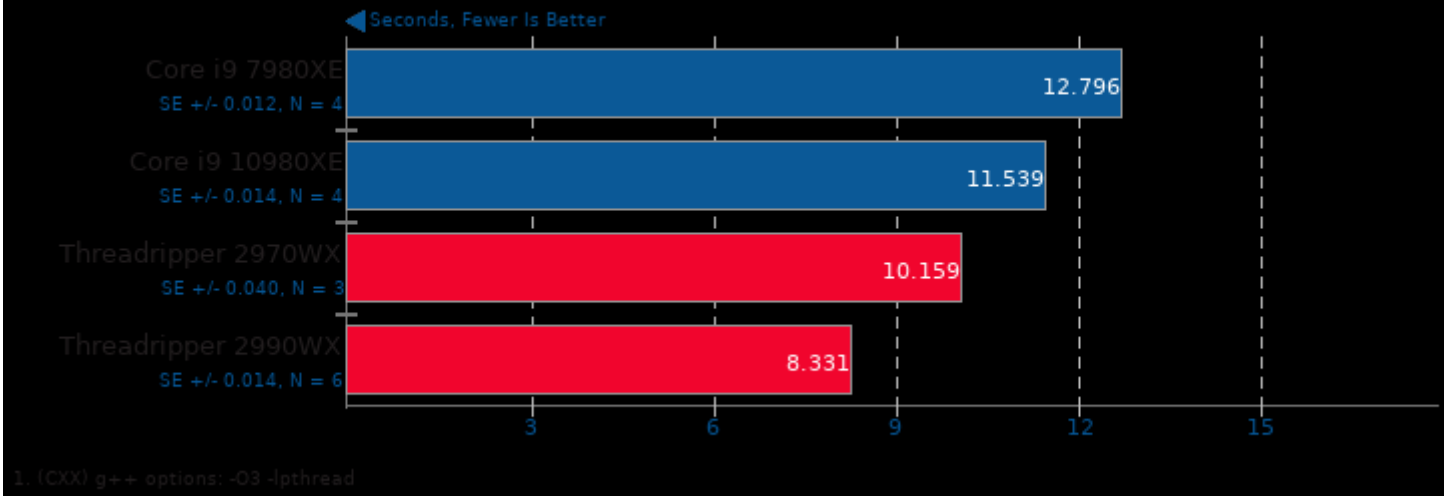


Intel Core i9-10980XE Linux Benchmarks



Primesieve 7.4

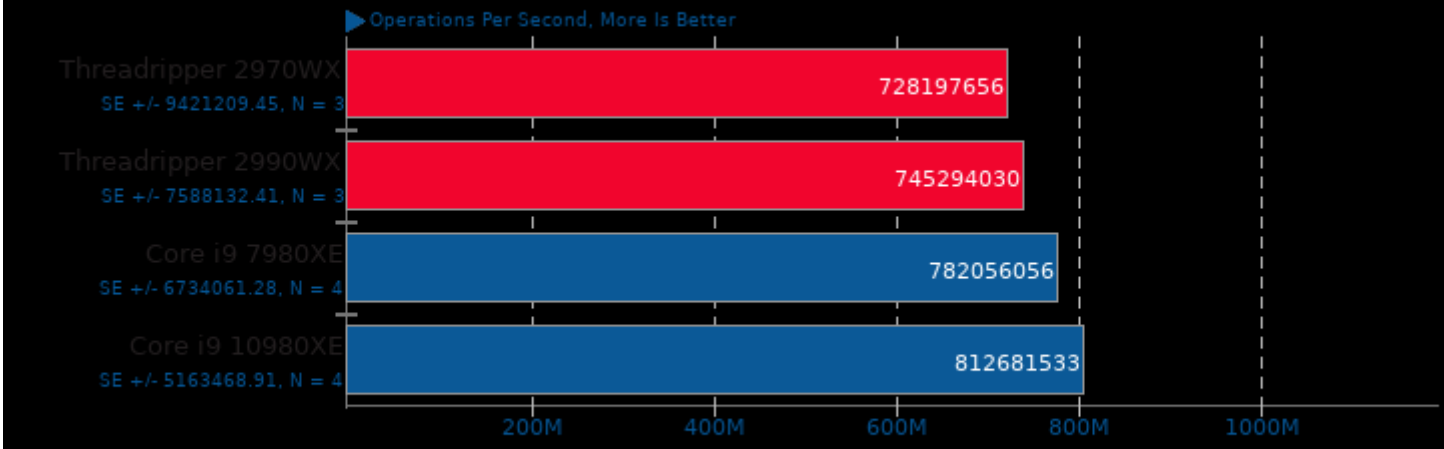
1e12 Prime Number Generation



1. (CXX) g++ options: -O3 -lpthread

Swet 1.5.16

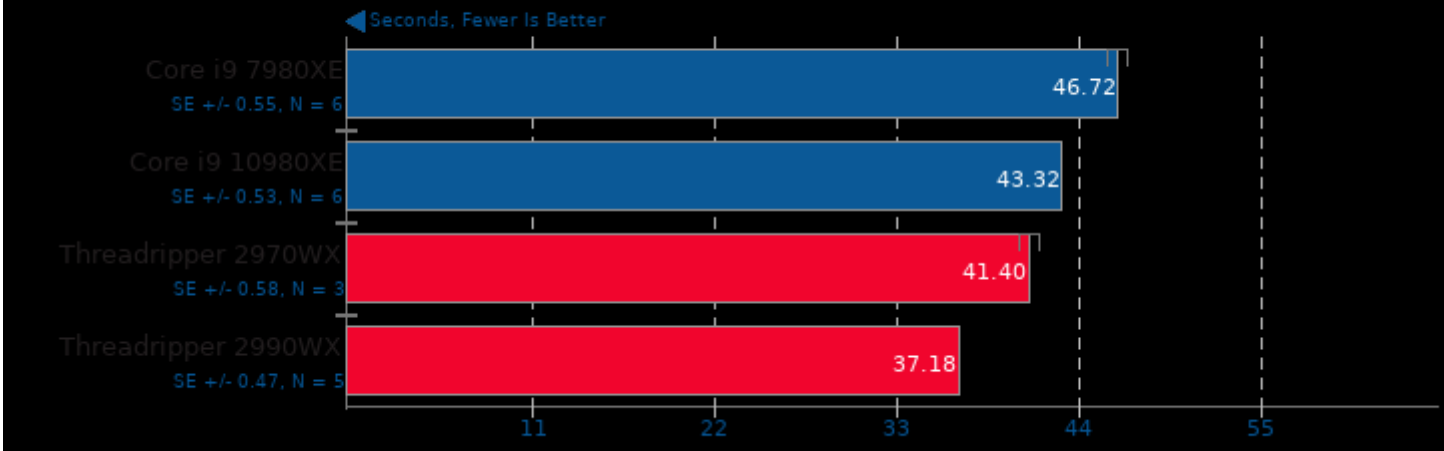
Average



1. (CC) gcc options: -lm -lpthread -lcurses -lrt

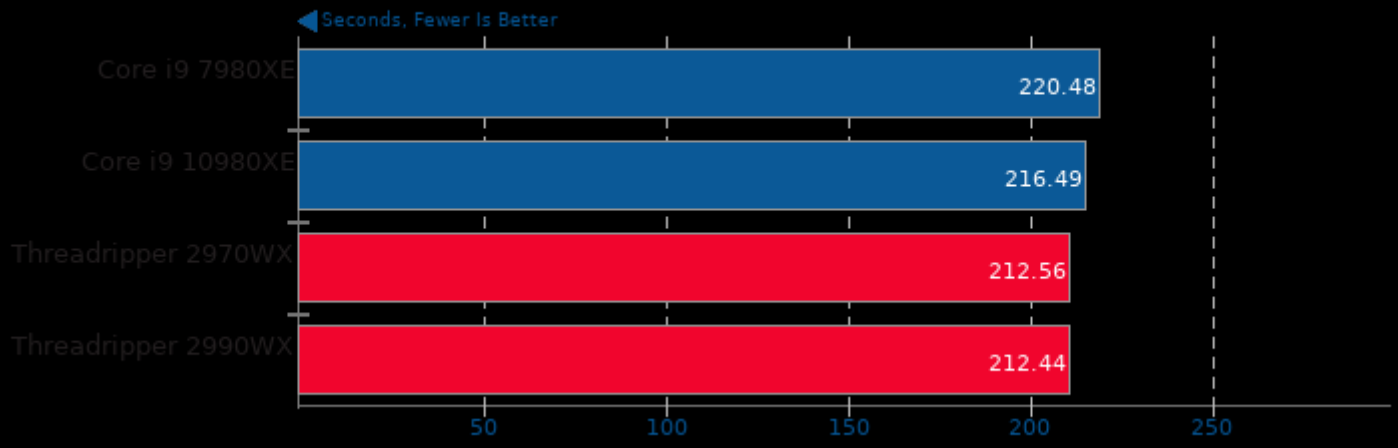
Timed Linux Kernel Compilation 5.4

Time To Compile



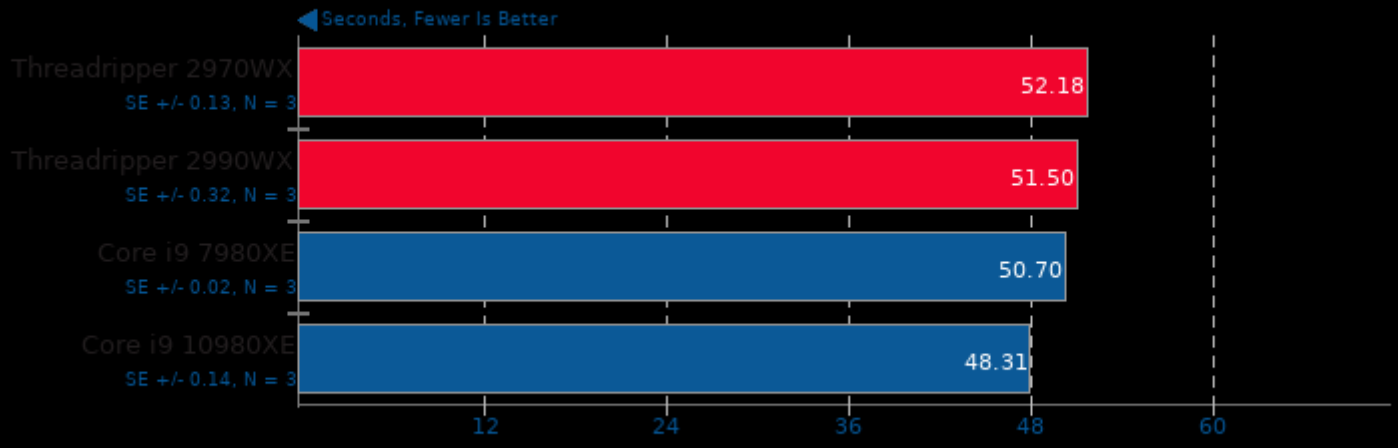
Timed LLVM Compilation 6.0.1

Time To Compile



Timed PHP Compilation 7.1.9

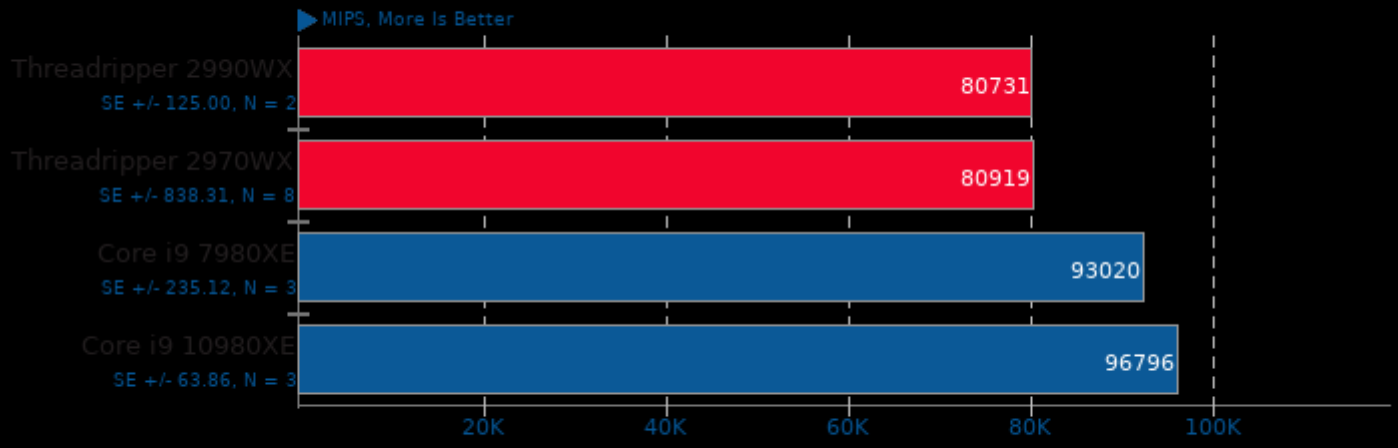
Time To Compile



1. (CC) gcc options: -O2 -pedantic -ldl -lz -lm

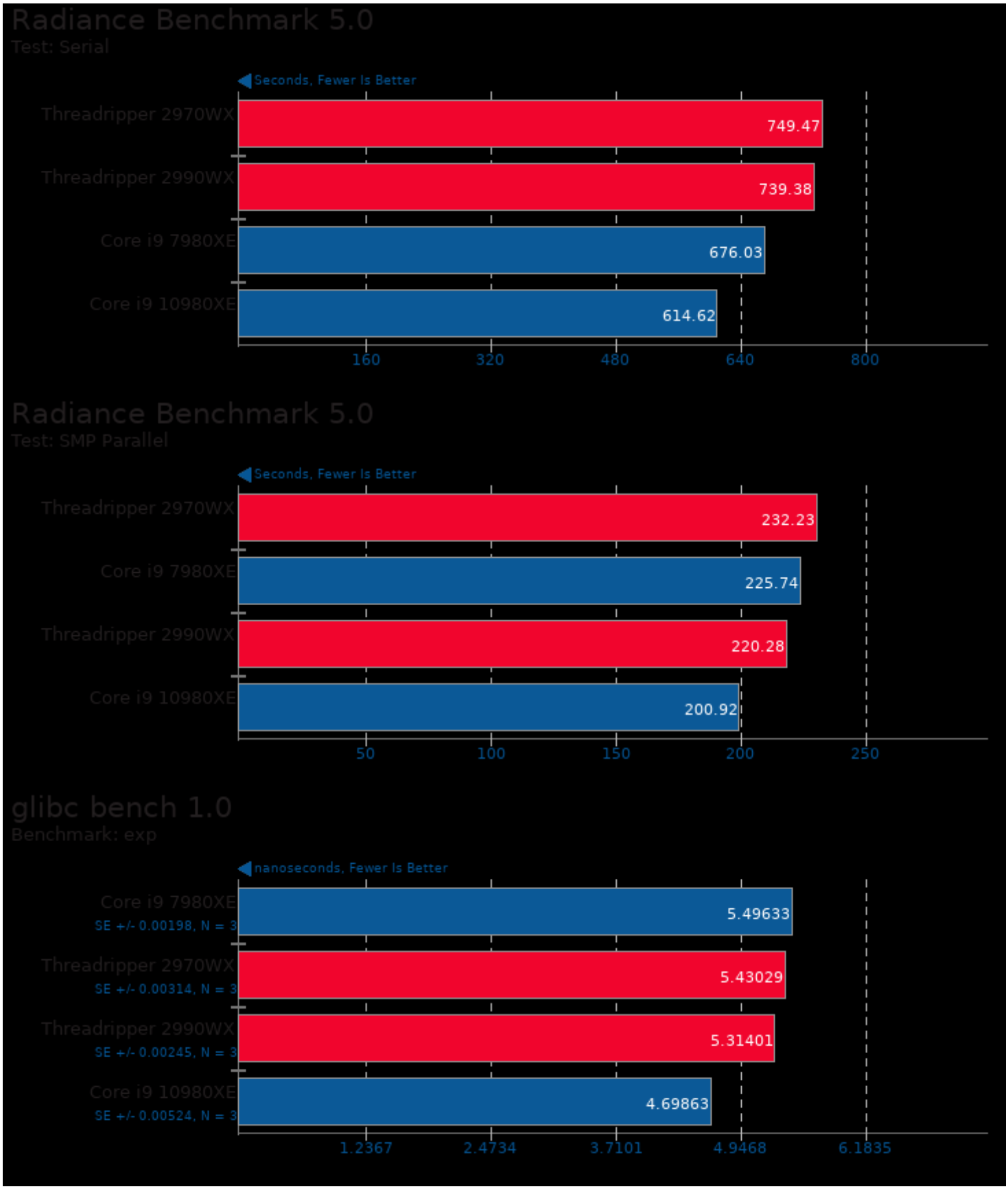
7-Zip Compression 16.02

Compress Speed Test

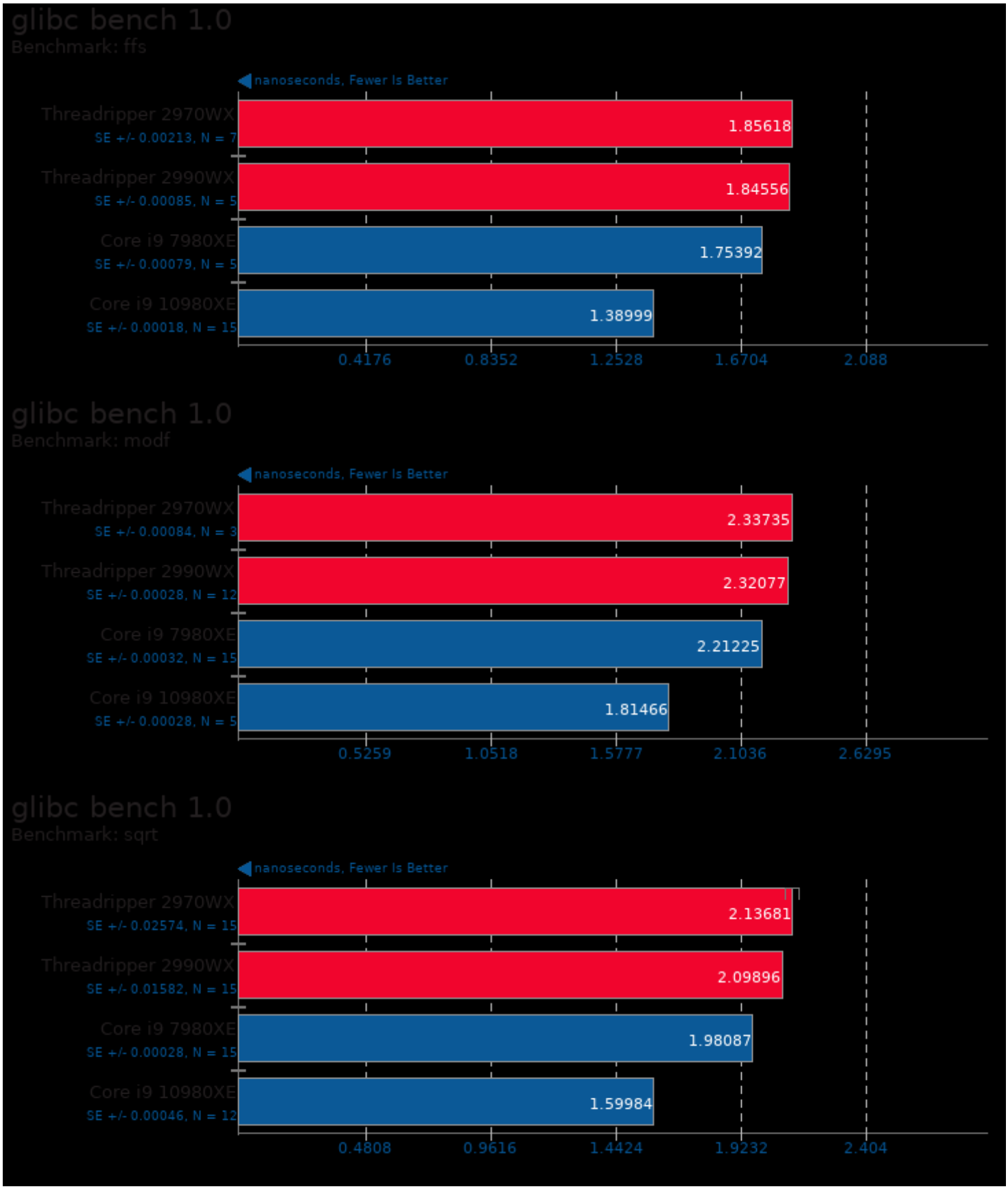


1. (CXX) g++ options: -pipe -lpthread

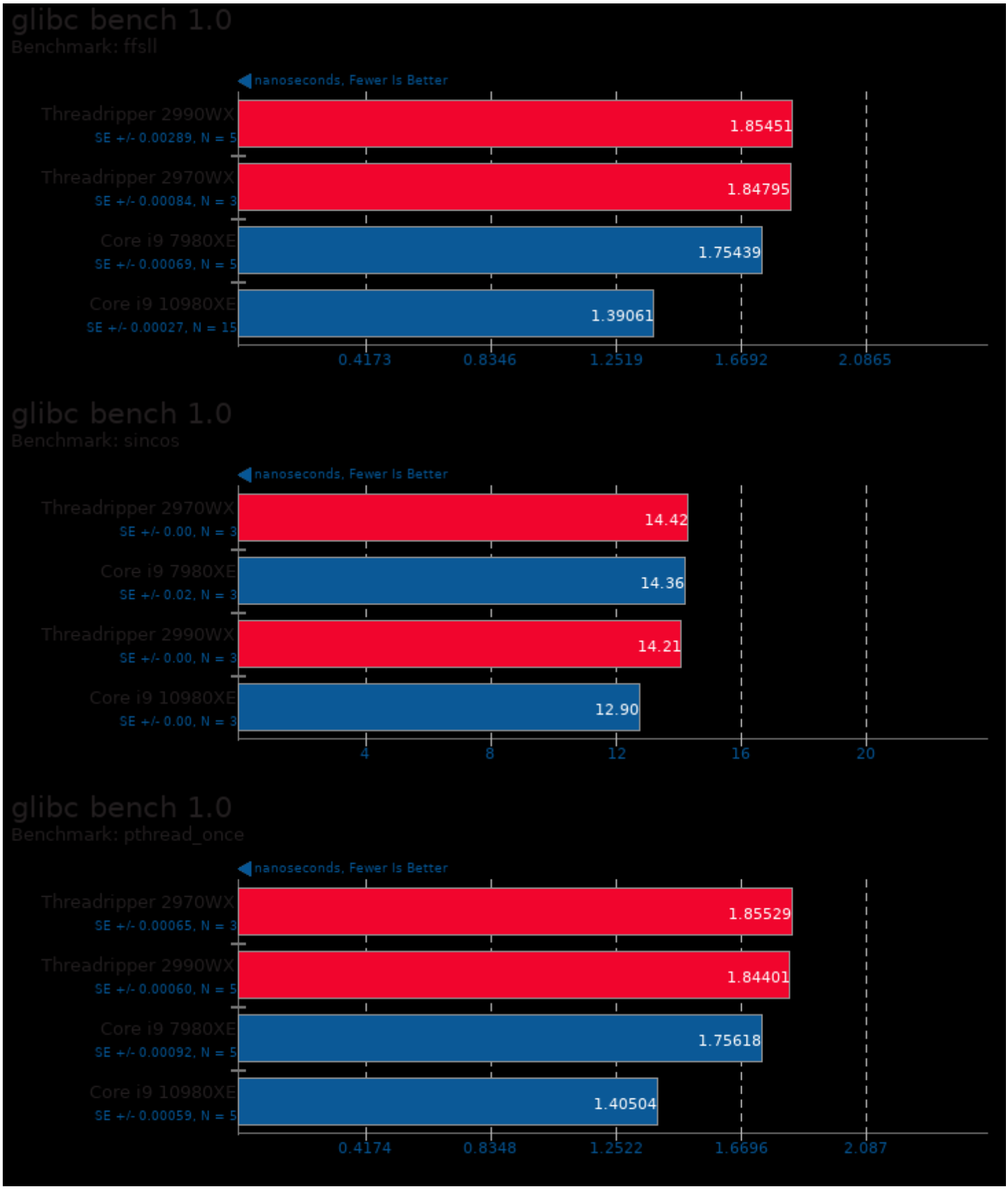
Intel Core i9-10980XE Linux Benchmarks



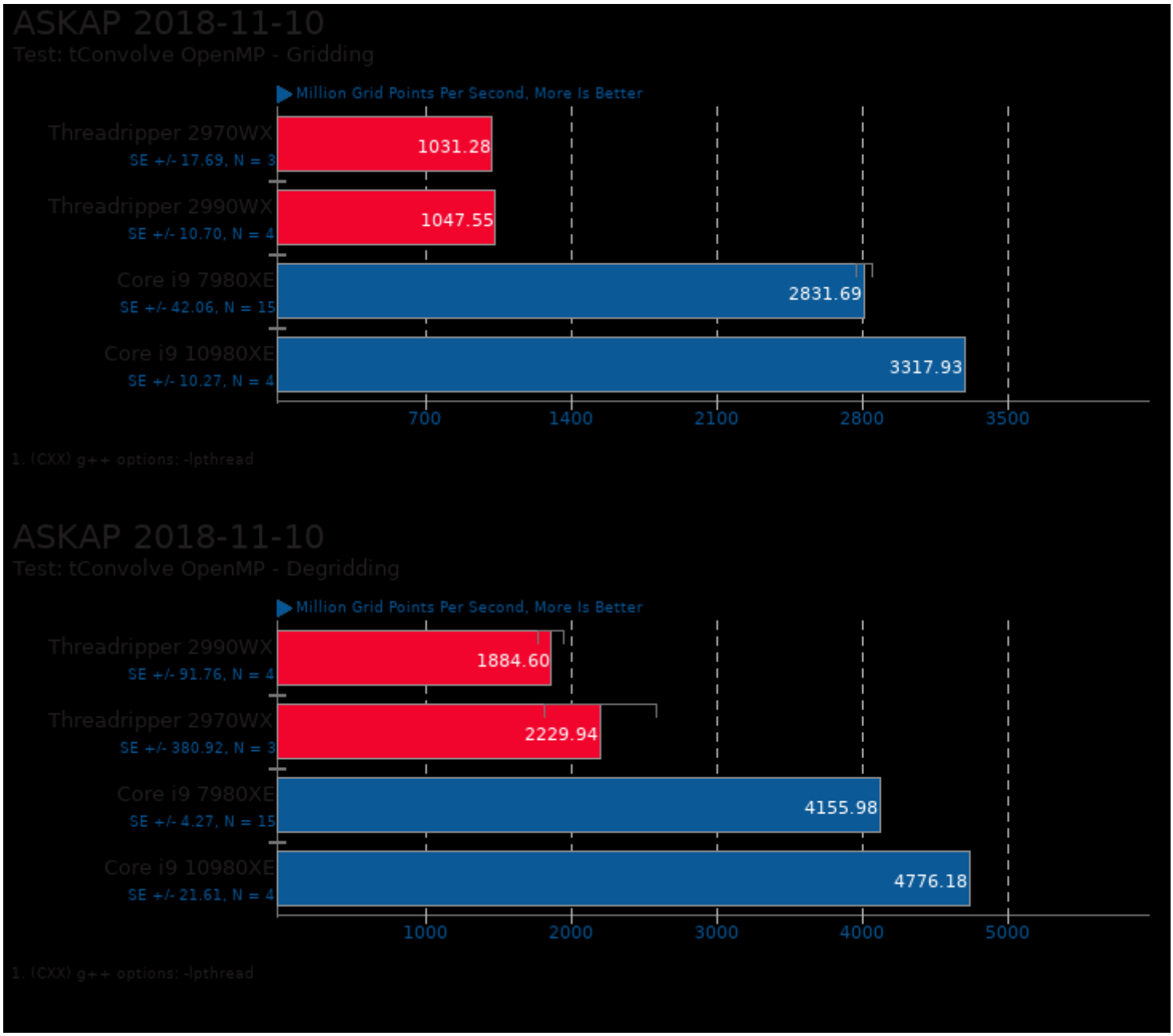
Intel Core i9-10980XE Linux Benchmarks

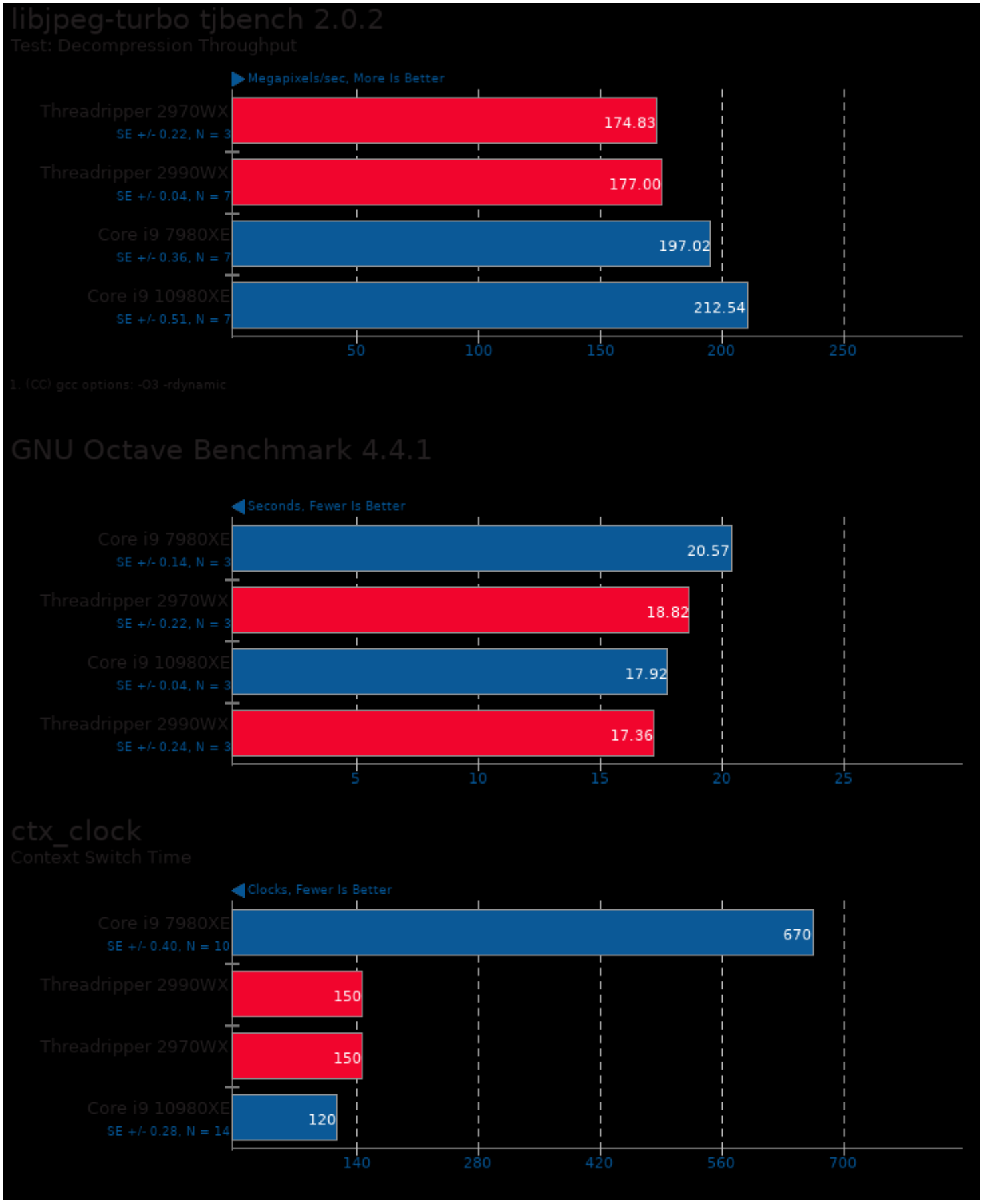


Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

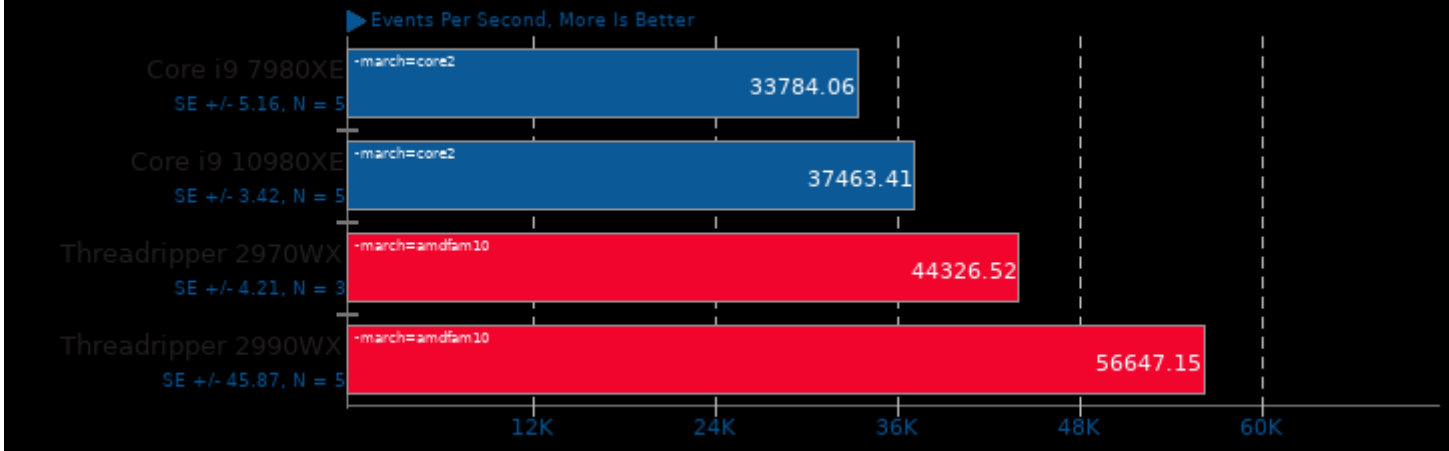



libjpeg-turbo tjbench 2.0.2
Test: Decompression Throughput
Megapixels/sec, More Is Better
Threadripper 2970WX
SE +/- 0.22, N = 3
174.83
Threadripper 2990WX
SE +/- 0.04, N = 7
177.00
Core i9 7980XE
SE +/- 0.36, N = 7
197.02
Core i9 10980XE
SE +/- 0.51, N = 7
212.54
50
100
150
200
250
1. (CC) gcc options: -O3 -rdynamic
GNU Octave Benchmark 4.4.1
Seconds, Fewer Is Better
Core i9 7980XE
SE +/- 0.14, N = 3
20.57
Threadripper 2970WX
SE +/- 0.22, N = 3
18.82
Core i9 10980XE
SE +/- 0.04, N = 3
17.92
Threadripper 2990WX
SE +/- 0.24, N = 3
17.36
5
10
15
20
25
ctx_clock
Context Switch Time
Clocks, Fewer Is Better
Core i9 7980XE
SE +/- 0.40, N = 10
670
Threadripper 2990WX
150
Threadripper 2970WX
150
Core i9 10980XE
SE +/- 0.28, N = 14
120
140
280
420
560
700

Intel Core i9-10980XE Linux Benchmarks

Sysbench 2018-07-28

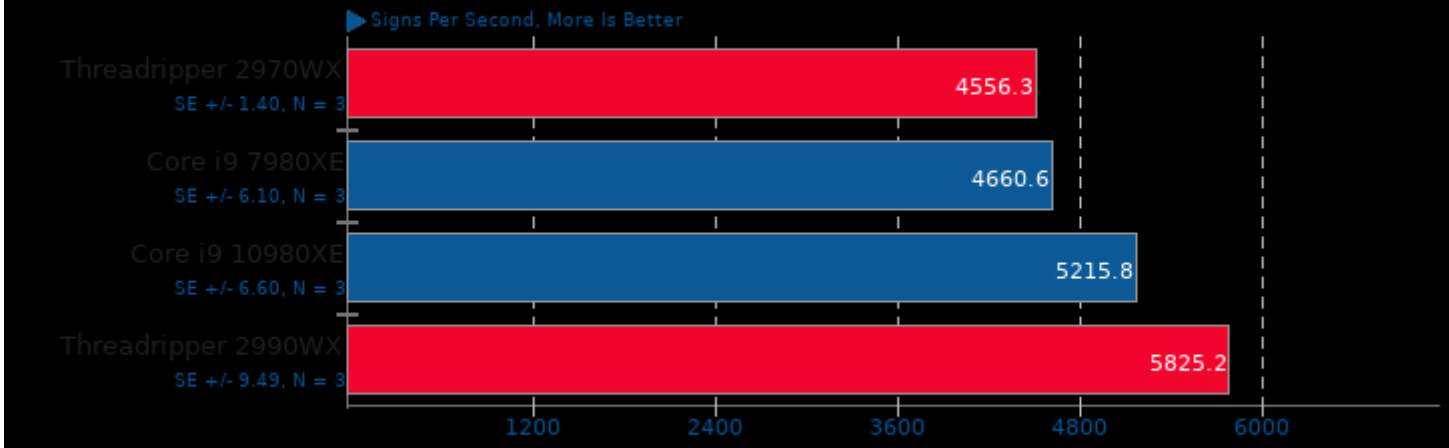
Test: CPU



1. (CC) gcc options: -pthread -O3 -funroll-loops -ggdb3 -rdynamic -ldl -laio -lm

OpenSSL 1.1.1

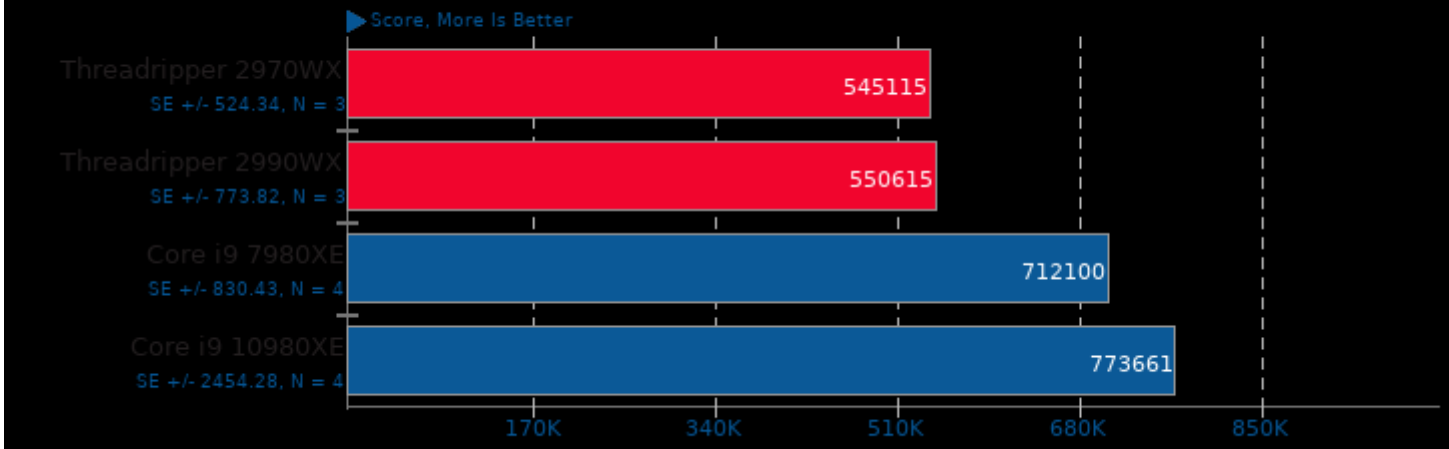
RSA 4096-bit Performance

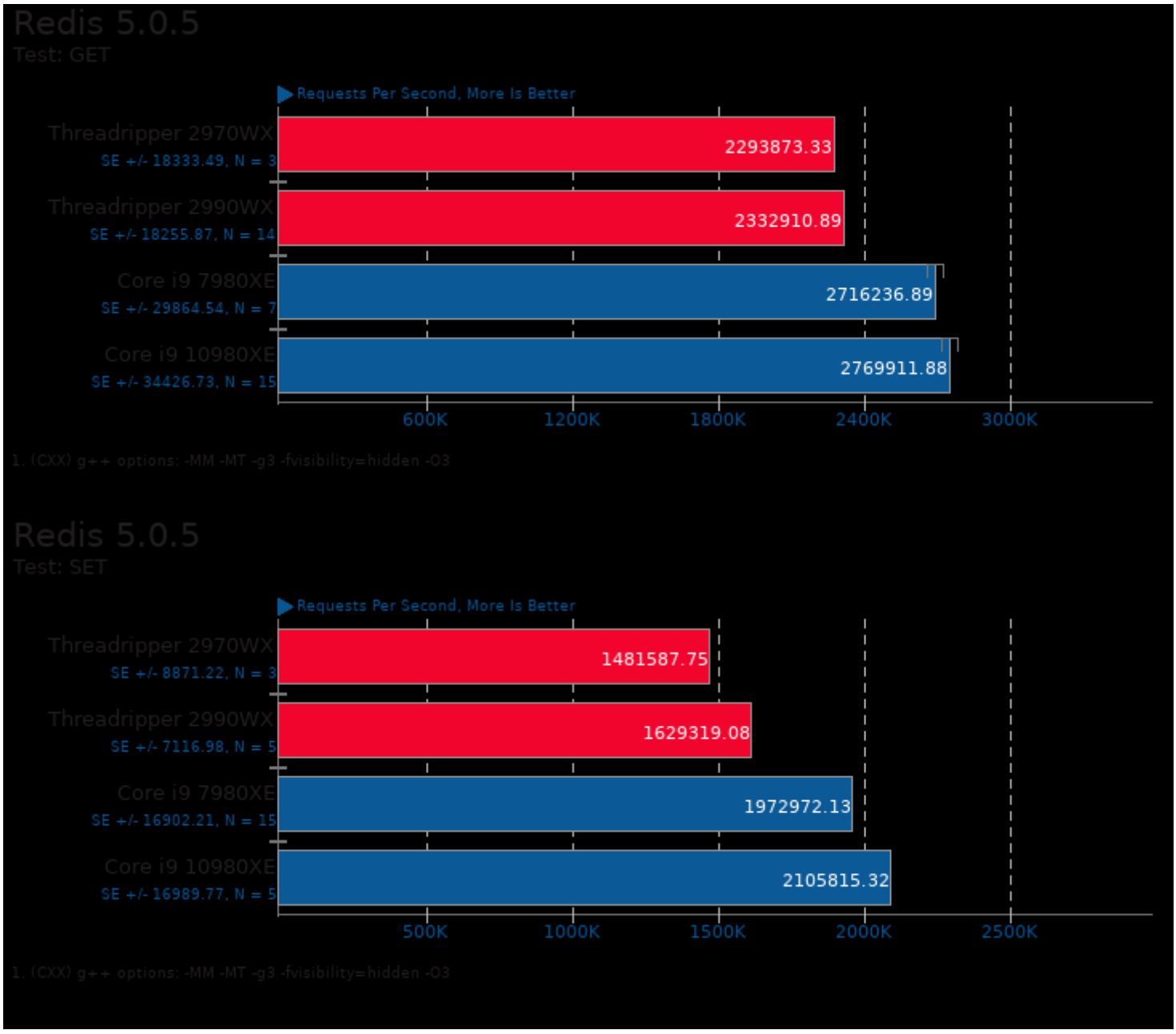


1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

PHPBench 0.8.1

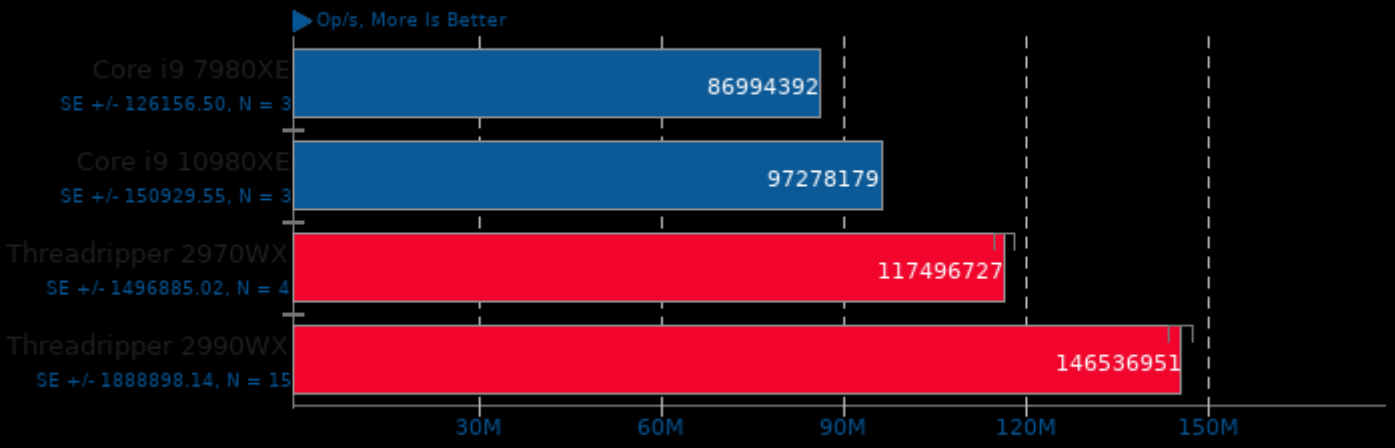
PHP Benchmark Suite




Redis 5.0.5
Test: GET
Requests Per Second, More Is Better
Threadripper 2970WX
SE +/- 18333.49, N = 3
2293873.33
Threadripper 2990WX
SE +/- 18255.87, N = 14
2332910.89
Core i9 7980XE
SE +/- 29864.54, N = 7
2716236.89
Core i9 10980XE
SE +/- 34426.73, N = 15
2769911.88
600K
1200K
1800K
2400K
3000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Redis 5.0.5
Test: SET
Requests Per Second, More Is Better
Threadripper 2970WX
SE +/- 8871.22, N = 3
1481587.75
Threadripper 2990WX
SE +/- 7116.98, N = 5
1629319.08
Core i9 7980XE
SE +/- 16902.21, N = 15
1972972.13
Core i9 10980XE
SE +/- 16989.77, N = 5
2105815.32
500K
1000K
1500K
2000K
2500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3

Facebook RocksDB 6.3.6

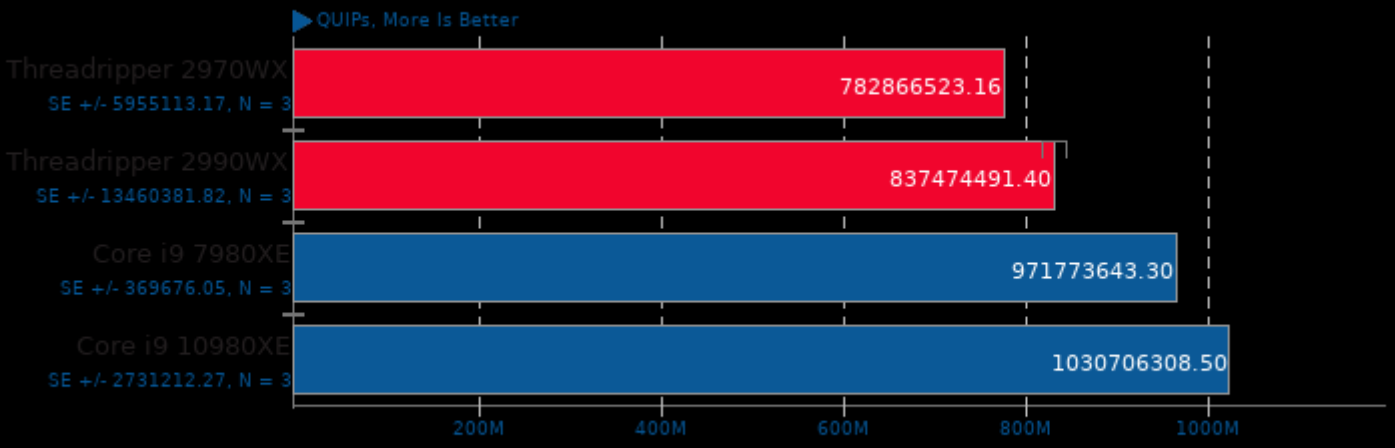
Test: Random Read



1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread

Hierarchical INTegration 1.0

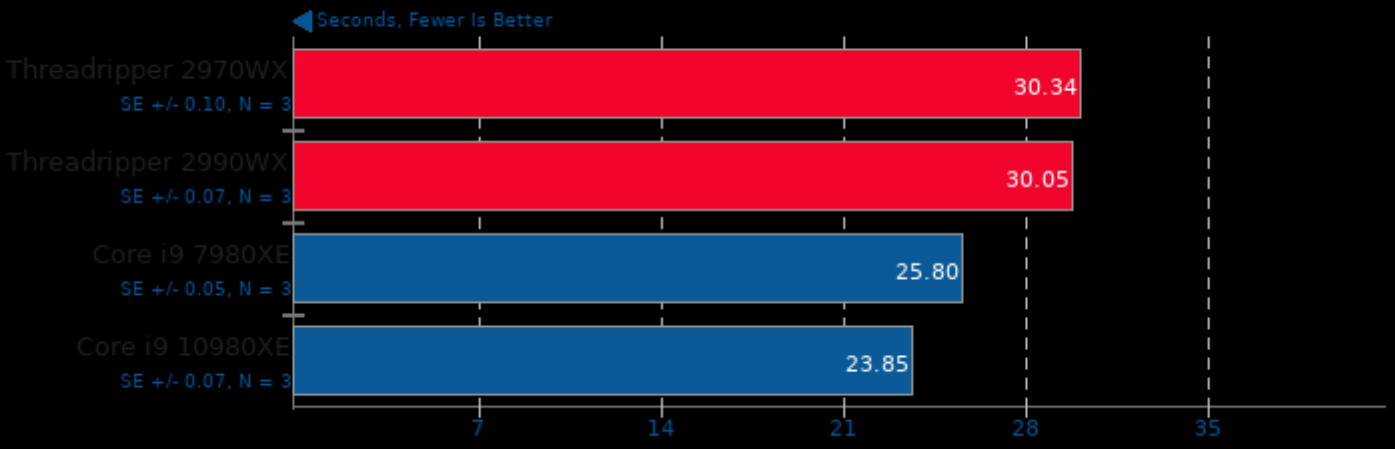
Test: DOUBLE

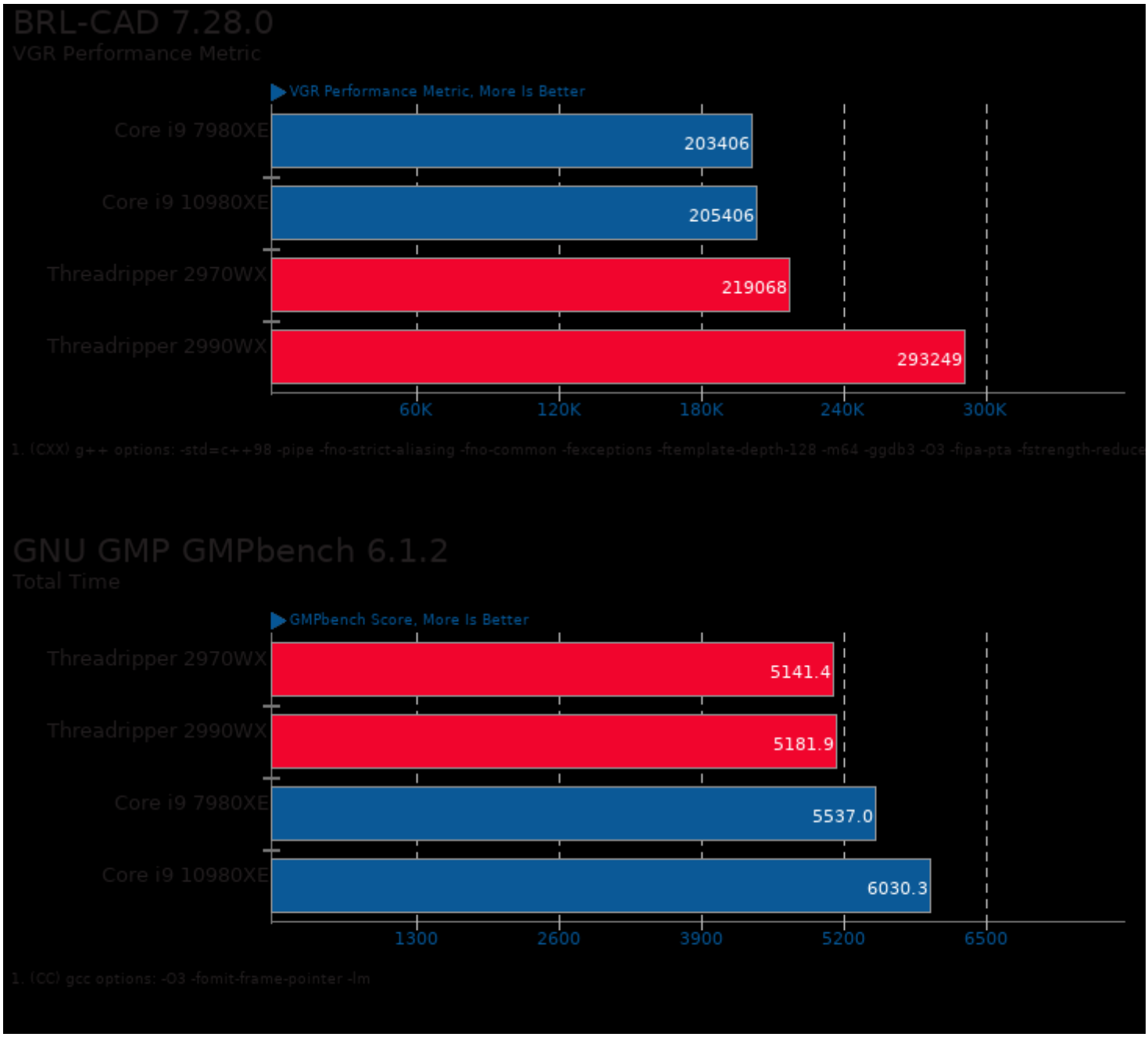


1. (CC) gcc options: -O3 -march=native -lm

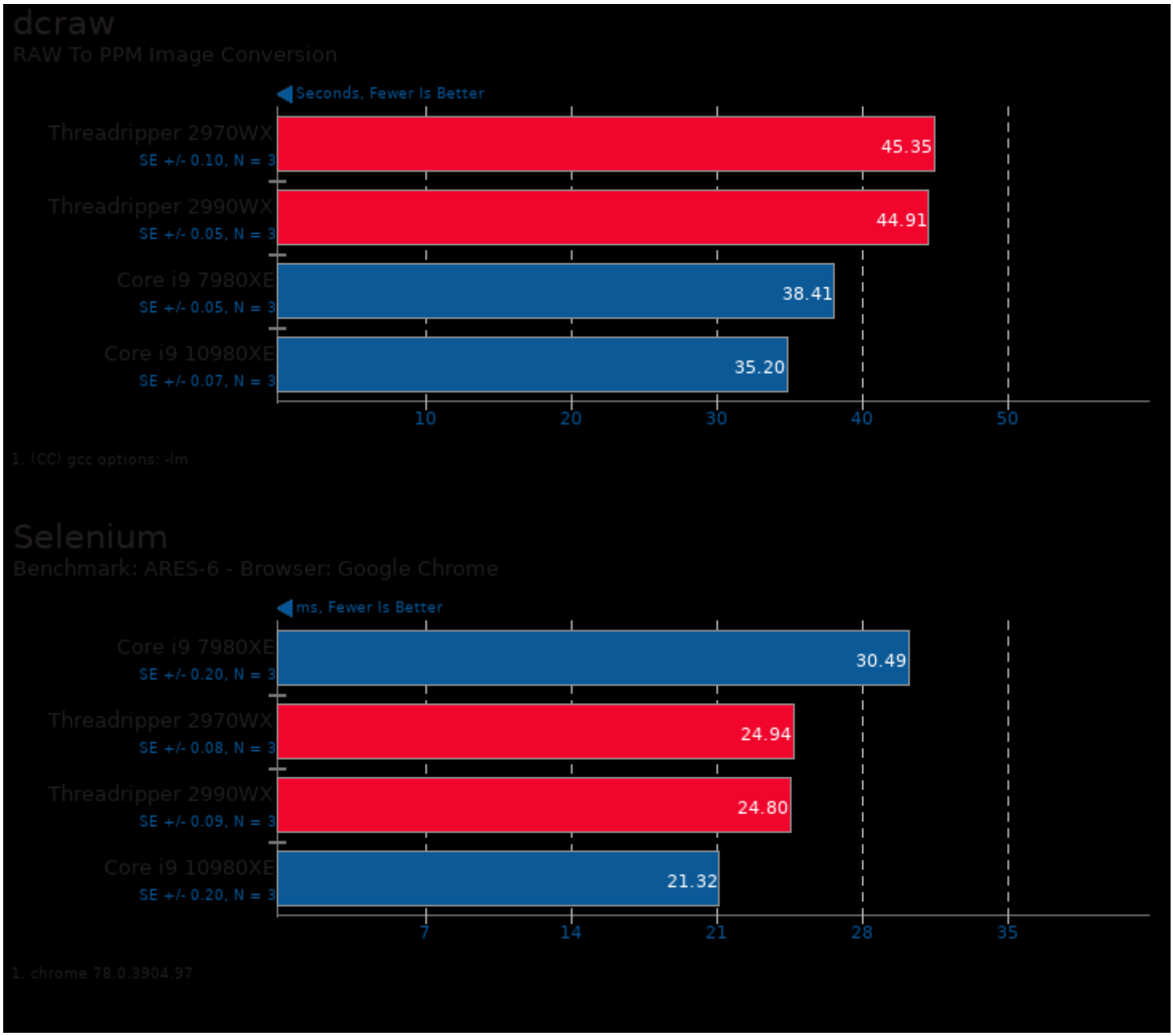
Tesseract OCR 4.1.0

Time To OCR 7 Images

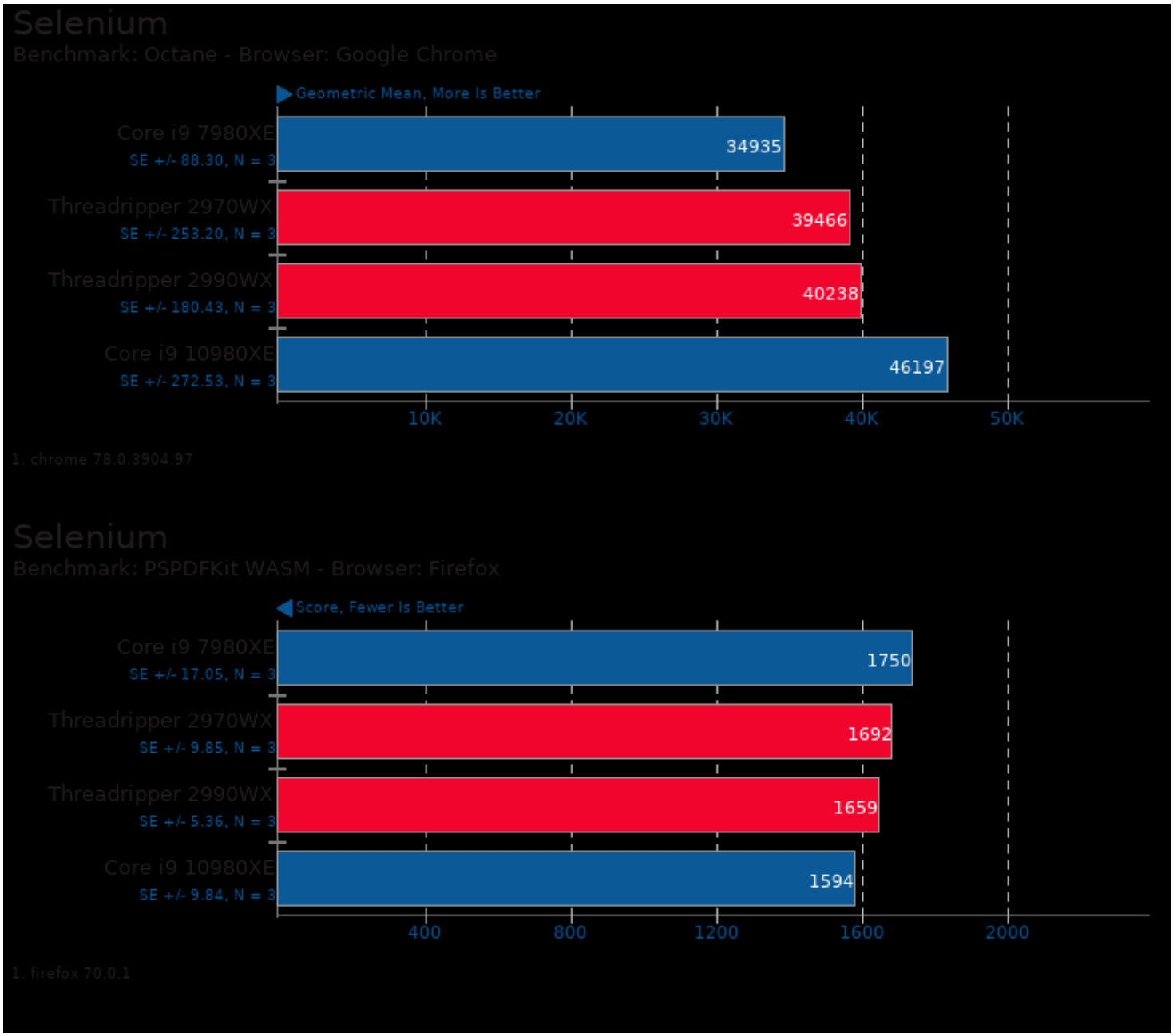


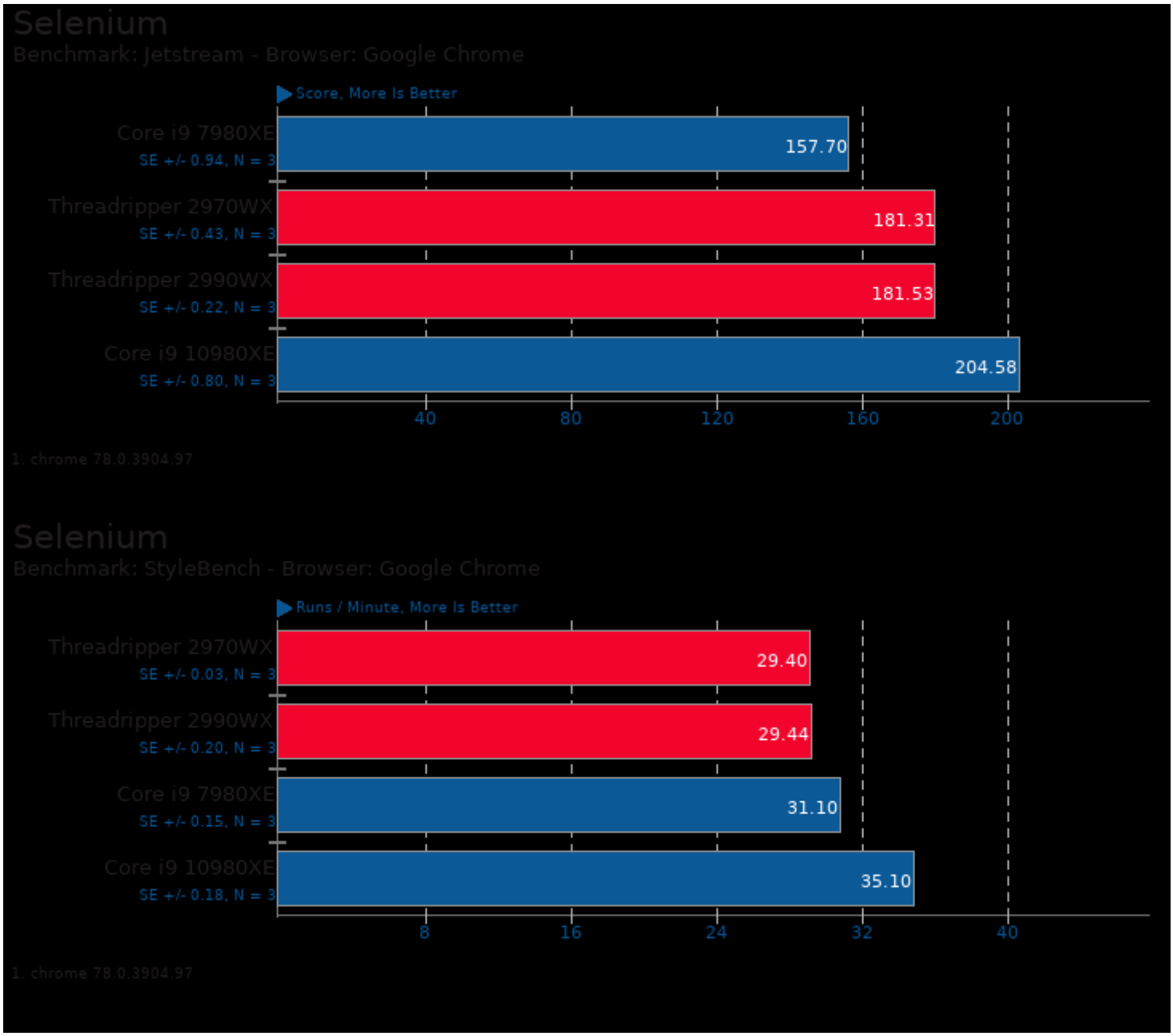

BRL-CAD 7.28.0
VGR Performance Metric
VGR Performance Metric, More Is Better
Core i9 7980XE
203406
Core i9 10980XE
205406
Threadripper 2970WX
219068
Threadripper 2990WX
293249
60K
120K
180K
240K
300K
1. (CXX) g++ options: -std=c++98 -pipe -fno-strict-aliasing -fno-common -fexceptions -ftemplate-depth-128 -m64 -ggdb3 -O3 -fipa-pta -fstrength-reduce
GNU GMP GMPbench 6.1.2
Total Time
GMPbench Score, More Is Better
Threadripper 2970WX
5141.4
Threadripper 2990WX
5181.9
Core i9 7980XE
5537.0
Core i9 10980XE
6030.3
1300
2600
3900
5200
6500
1. (CC) gcc options: -O3 -fomit-frame-pointer -lm

Intel Core i9-10980XE Linux Benchmarks



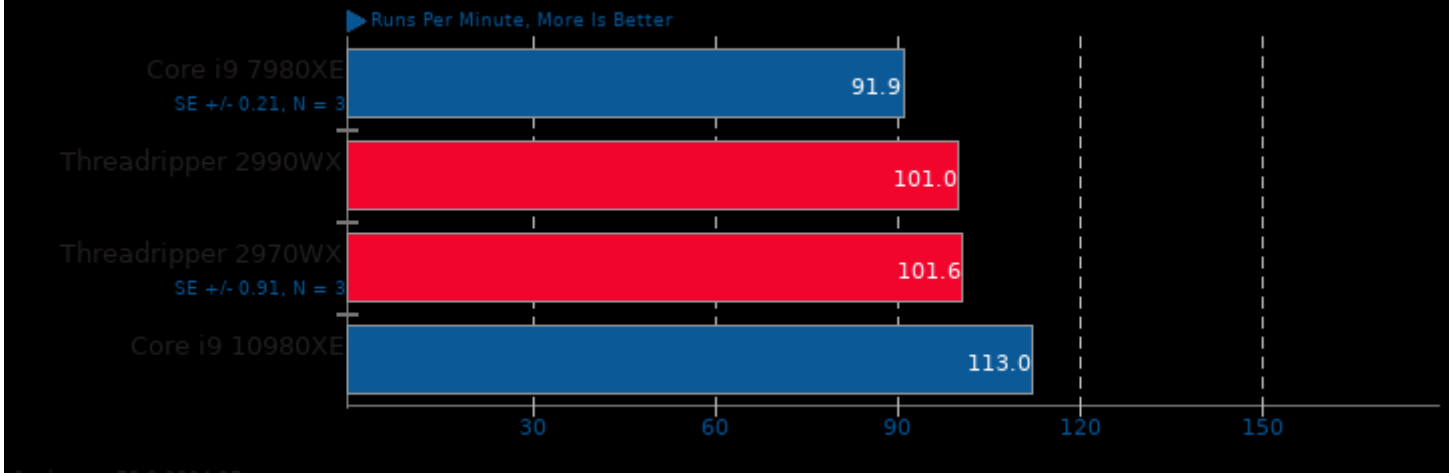
Intel Core i9-10980XE Linux Benchmarks




Selenium
Benchmark: Jetstream - Browser: Google Chrome
Score, More Is Better
Core i9 7980XE
SE +/- 0.94, N = 3
157.70
Threadripper 2970WX
SE +/- 0.43, N = 3
181.31
Threadripper 2990WX
SE +/- 0.22, N = 3
181.53
Core i9 10980XE
SE +/- 0.80, N = 3
204.58
40
80
120
160
200
1. chrome 78.0.3904.97
Selenium
Benchmark: StyleBench - Browser: Google Chrome
Runs / Minute, More Is Better
Threadripper 2970WX
SE +/- 0.03, N = 3
29.40
Threadripper 2990WX
SE +/- 0.20, N = 3
29.44
Core i9 7980XE
SE +/- 0.15, N = 3
31.10
Core i9 10980XE
SE +/- 0.18, N = 3
35.10
8
16
24
32
40
1. chrome 78.0.3904.97

Selenium

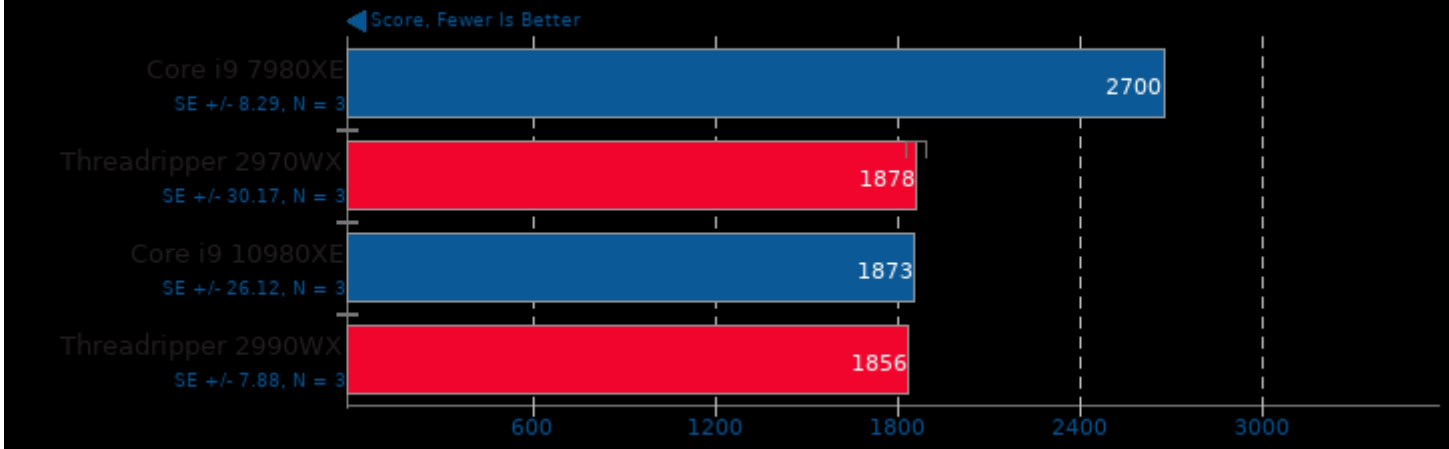
Benchmark: Speedometer - Browser: Google Chrome



1. chrome 78.0.3904.97

Selenium

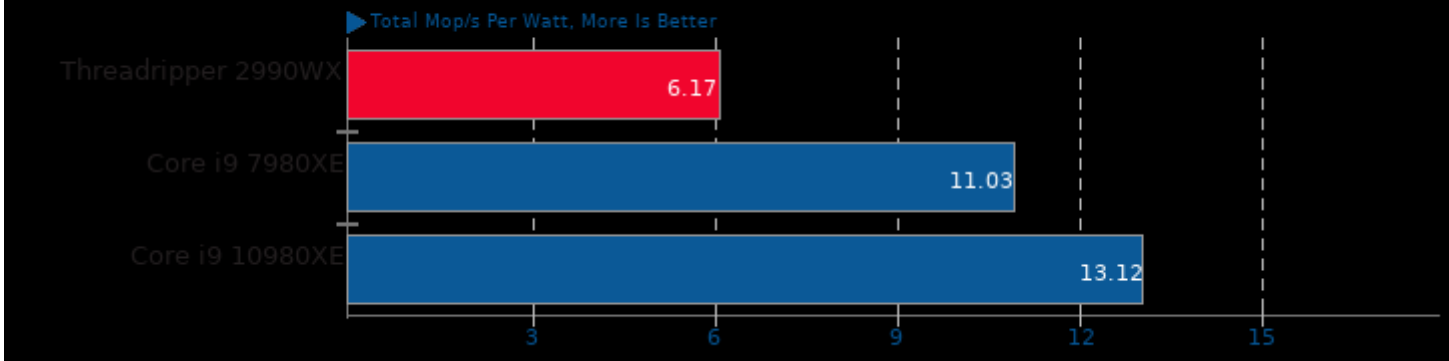
Benchmark: PSPDFKit WASM - Browser: Google Chrome



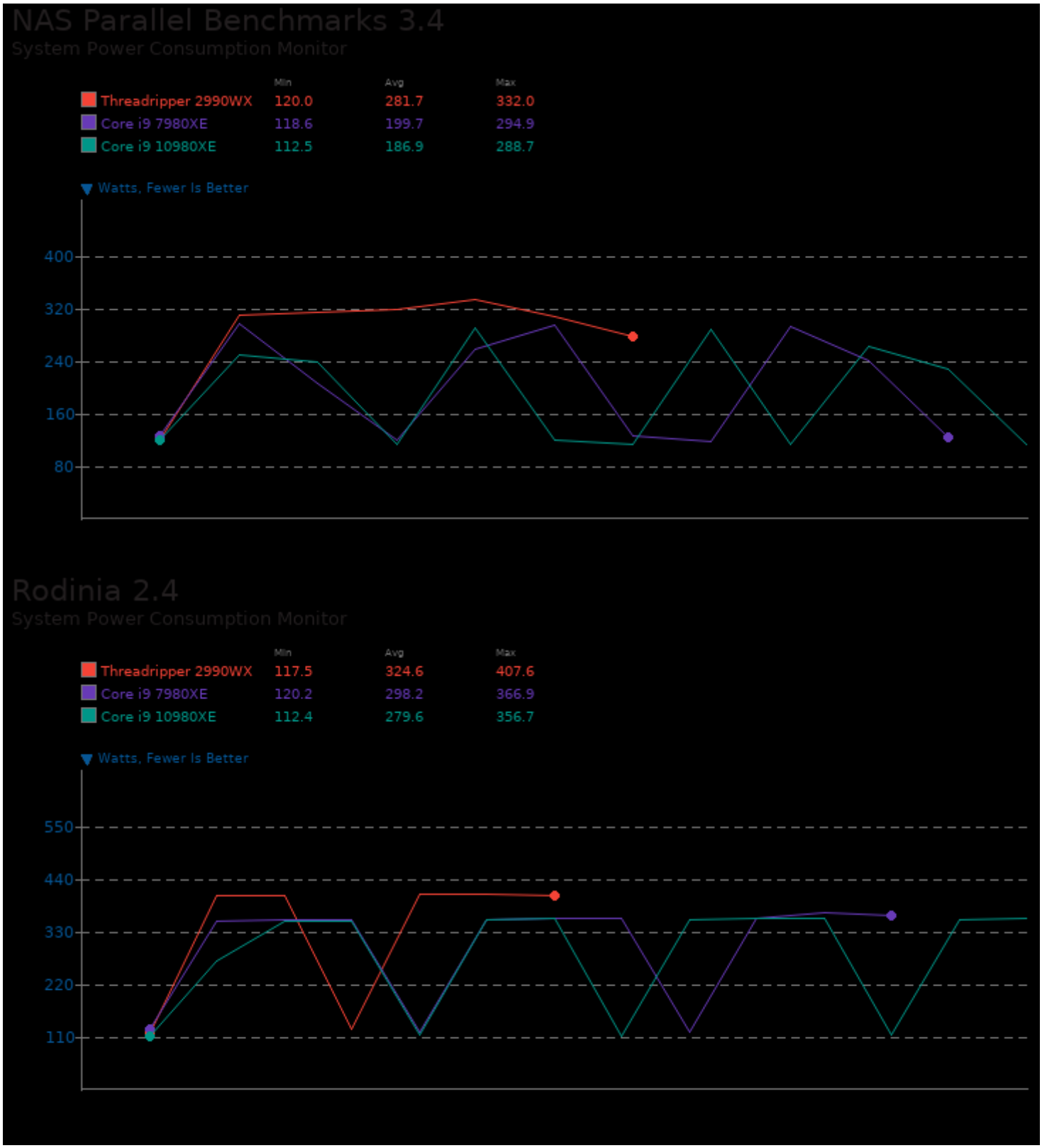
1. chrome 78.0.3904.97

NAS Parallel Benchmarks 3.4

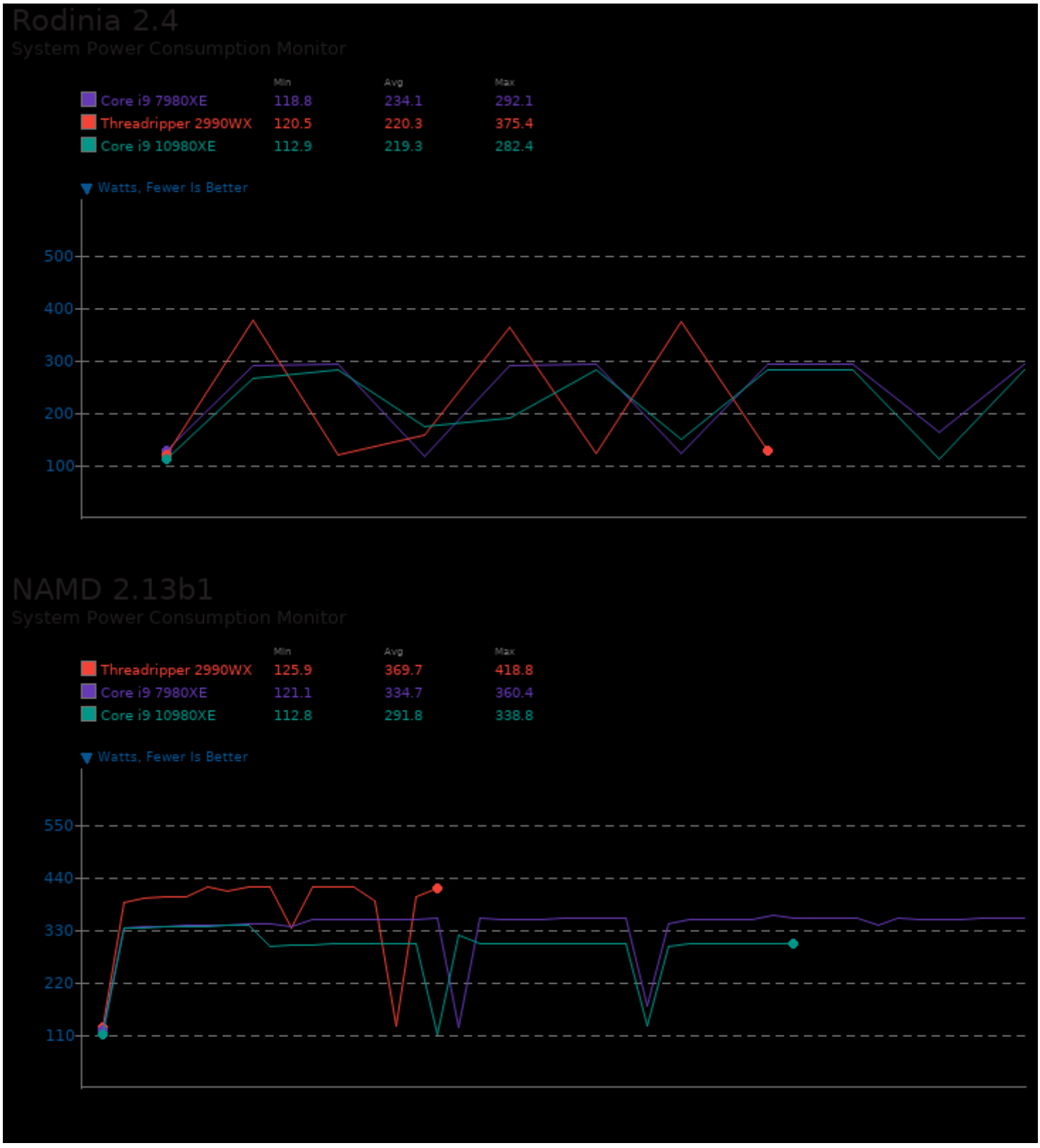
Test / Class: EP.C



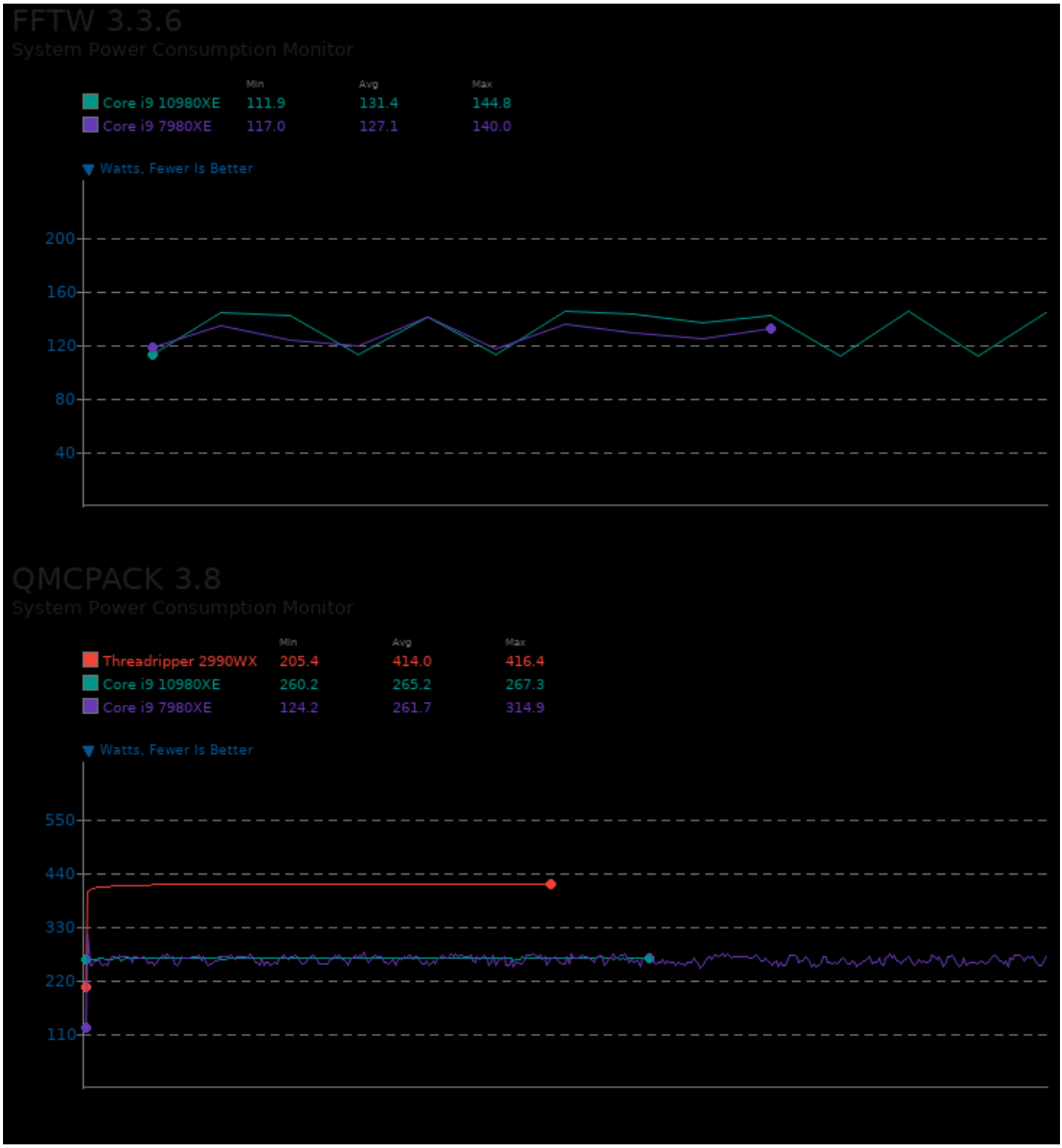
Intel Core i9-10980XE Linux Benchmarks

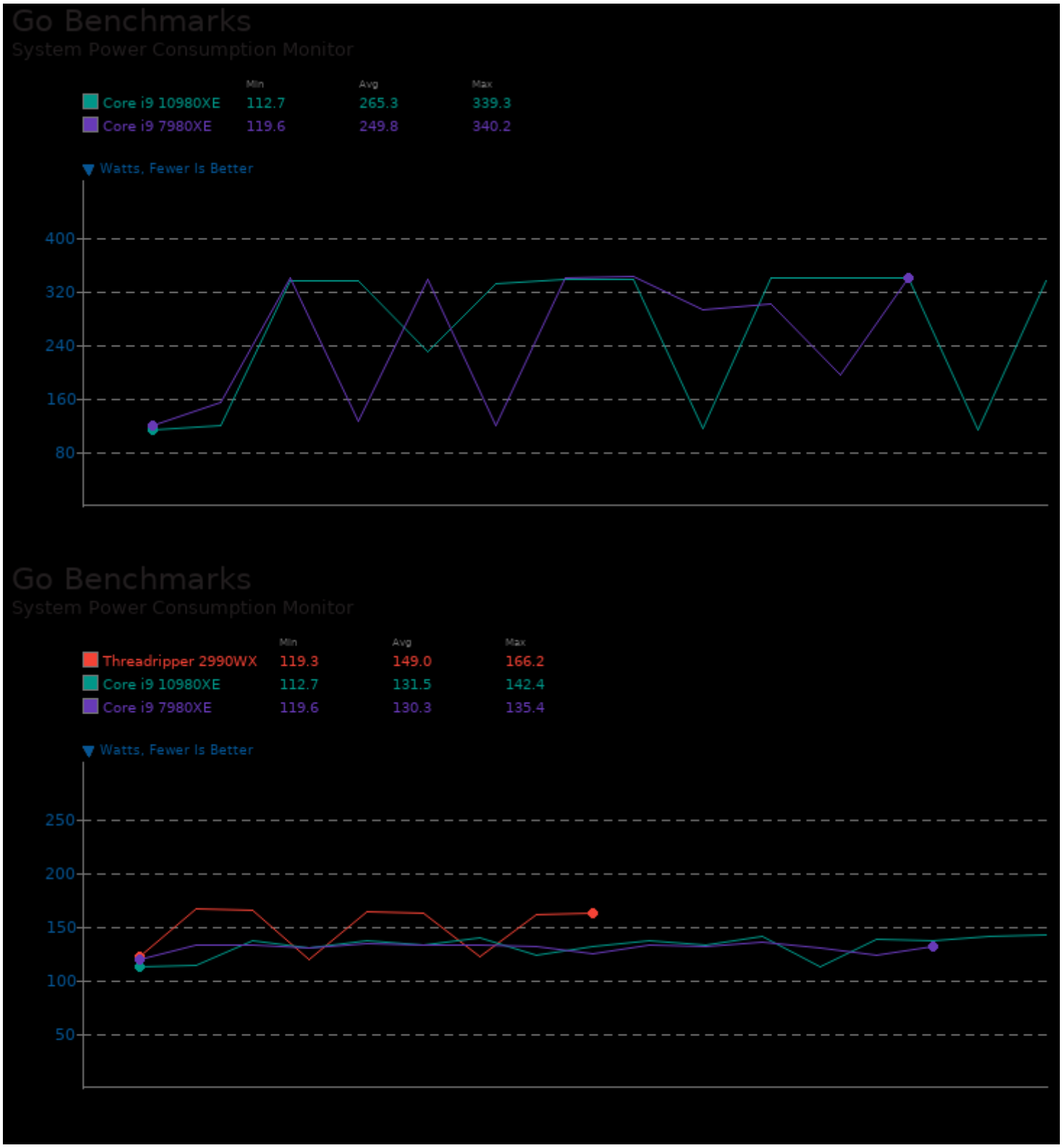


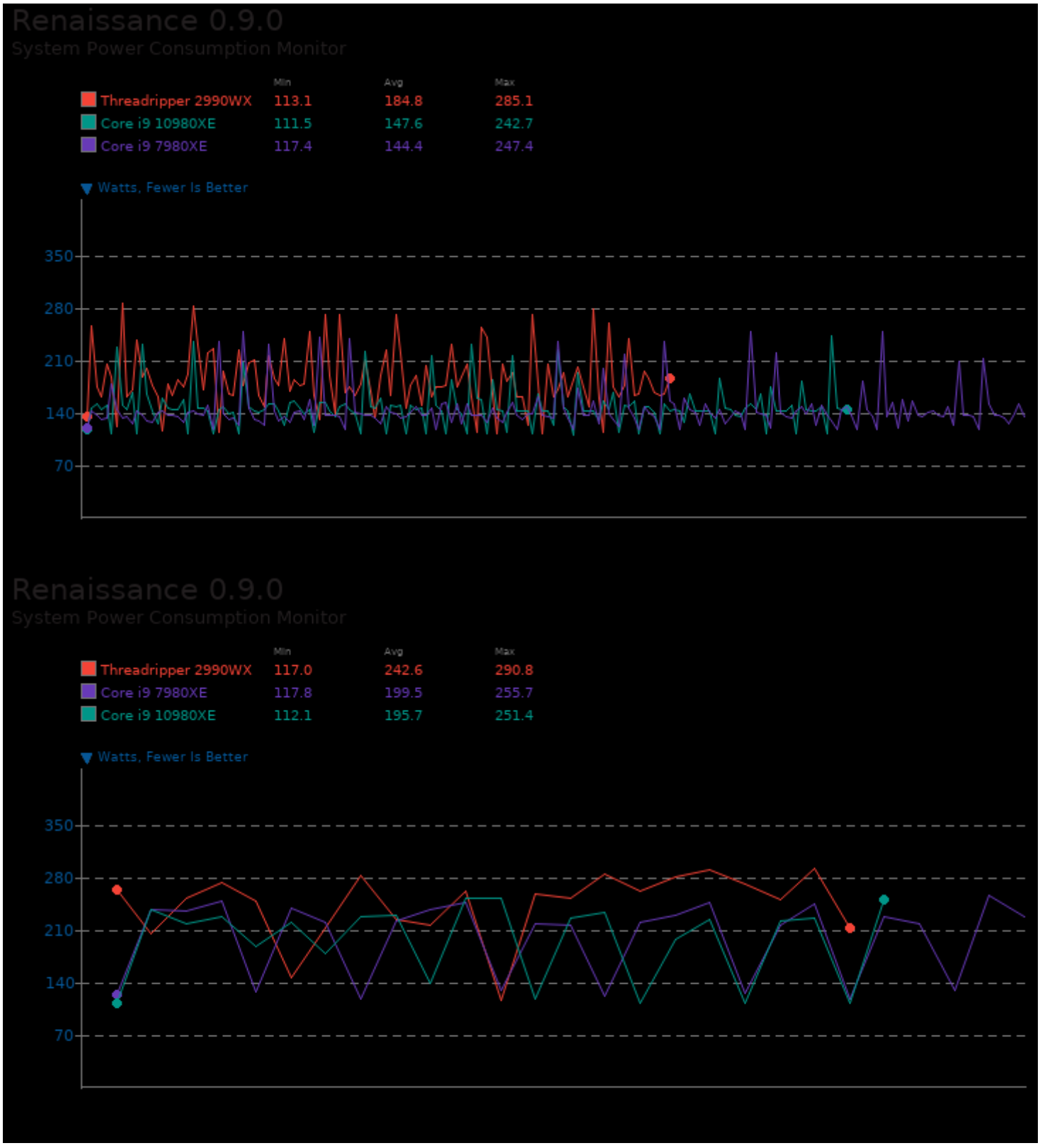
Intel Core i9-10980XE Linux Benchmarks



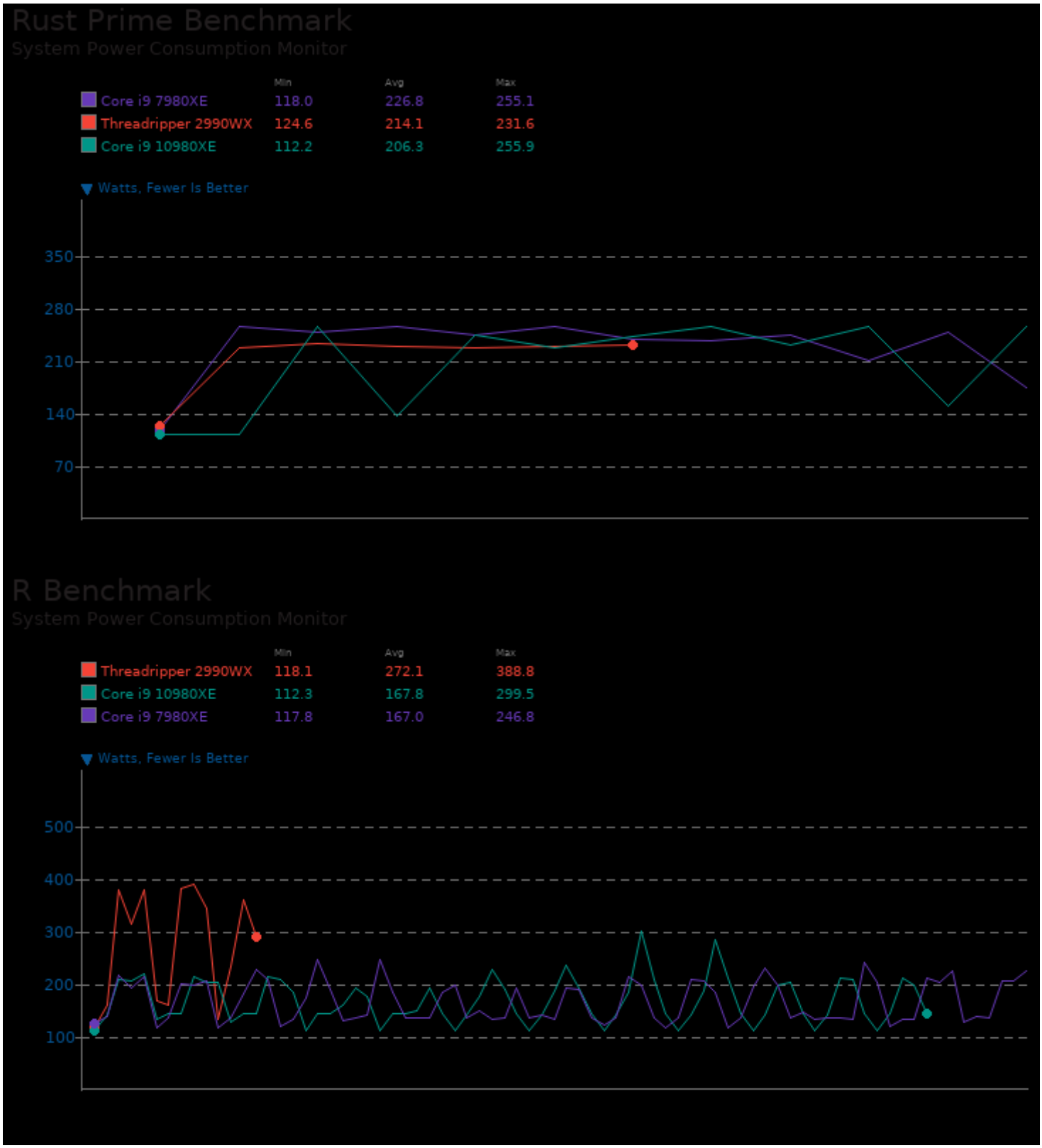

FFTW 3.3.6
System Power Consumption Monitor
Min
Avg
Max
Core i9 10980XE
112.1
131.0
149.8
Core i9 7980XE
117.6
127.6
139.5
Watts, Fewer Is Better
200
160
120
80
40
FFTW 3.3.6
Build: Float + SSE - Size: 1D FFT Size 4096
Mflops Per Watt, More Is Better
Threadripper 2990WX
261.28
Core i9 7980XE
441.78
Core i9 10980XE
459.70
100
200
300
400
500


FFTW 3.3.6
System Power Consumption Monitor
Min
Avg
Max
Core i9 10980XE 111.9 131.4 144.8
Core i9 7980XE 117.0 127.1 140.0
Watts, Fewer Is Better
200
160
120
80
40
QMCPACK 3.8
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 205.4 414.0 416.4
Core i9 10980XE 260.2 265.2 267.3
Core i9 7980XE 124.2 261.7 314.9
Watts, Fewer Is Better
550
440
330
220
110

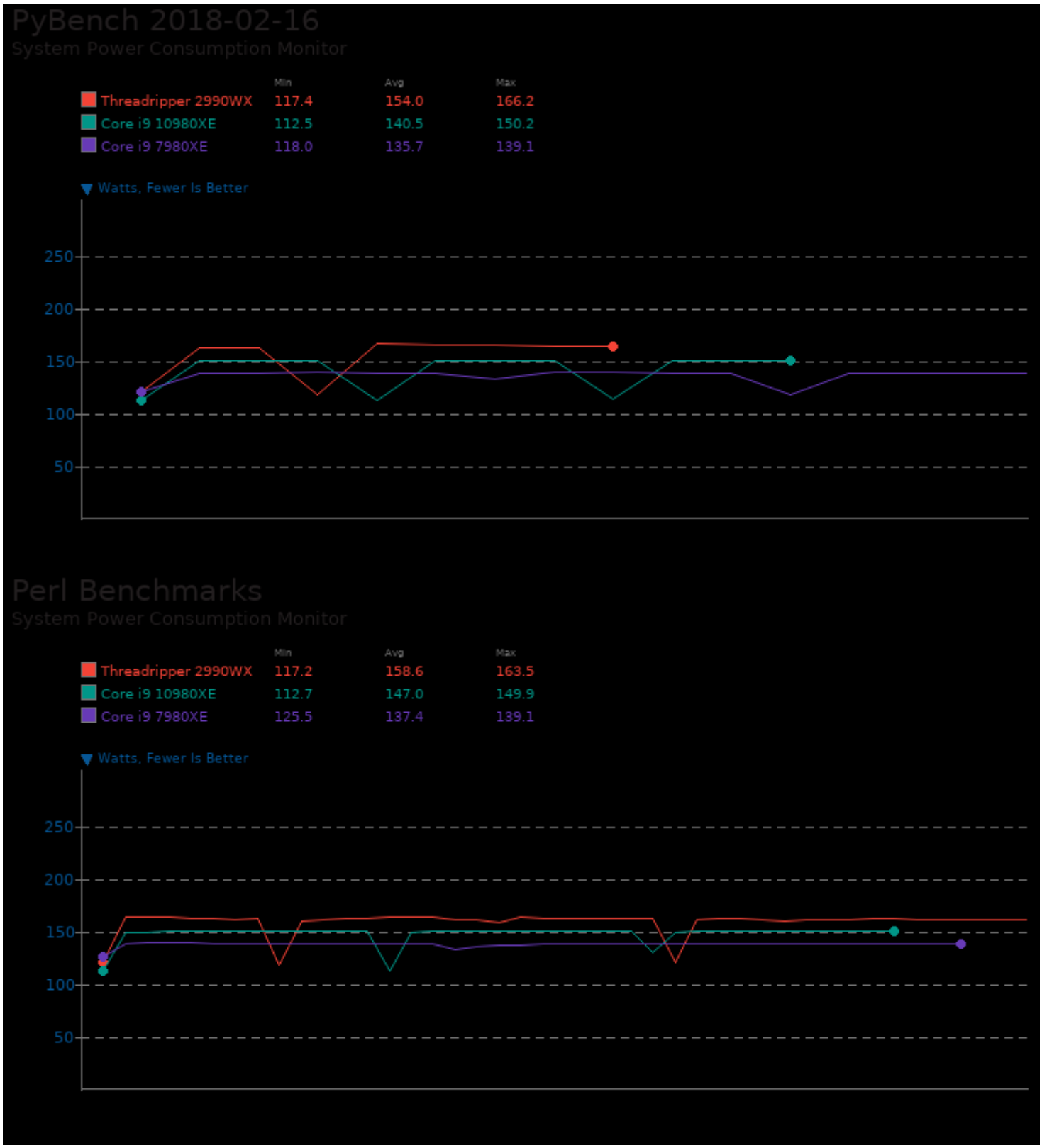

Go Benchmarks
System Power Consumption Monitor
Min
Avg
Max
Core i9 10980XE 112.7 265.3 339.3
Core i9 7980XE 119.6 249.8 340.2
Watts, Fewer Is Better
400
320
240
160
80
Go Benchmarks
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 119.3 149.0 166.2
Core i9 10980XE 112.7 131.5 142.4
Core i9 7980XE 119.6 130.3 135.4
Watts, Fewer Is Better
250
200
150
100
50


Renaissance 0.9.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 113.1 184.8 285.1
Core i9 10980XE 111.5 147.6 242.7
Core i9 7980XE 117.4 144.4 247.4
Watts, Fewer Is Better
350
280
210
140
70
Renaissance 0.9.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 117.0 242.6 290.8
Core i9 7980XE 117.8 199.5 255.7
Core i9 10980XE 112.1 195.7 251.4
Watts, Fewer Is Better
350
280
210
140
70

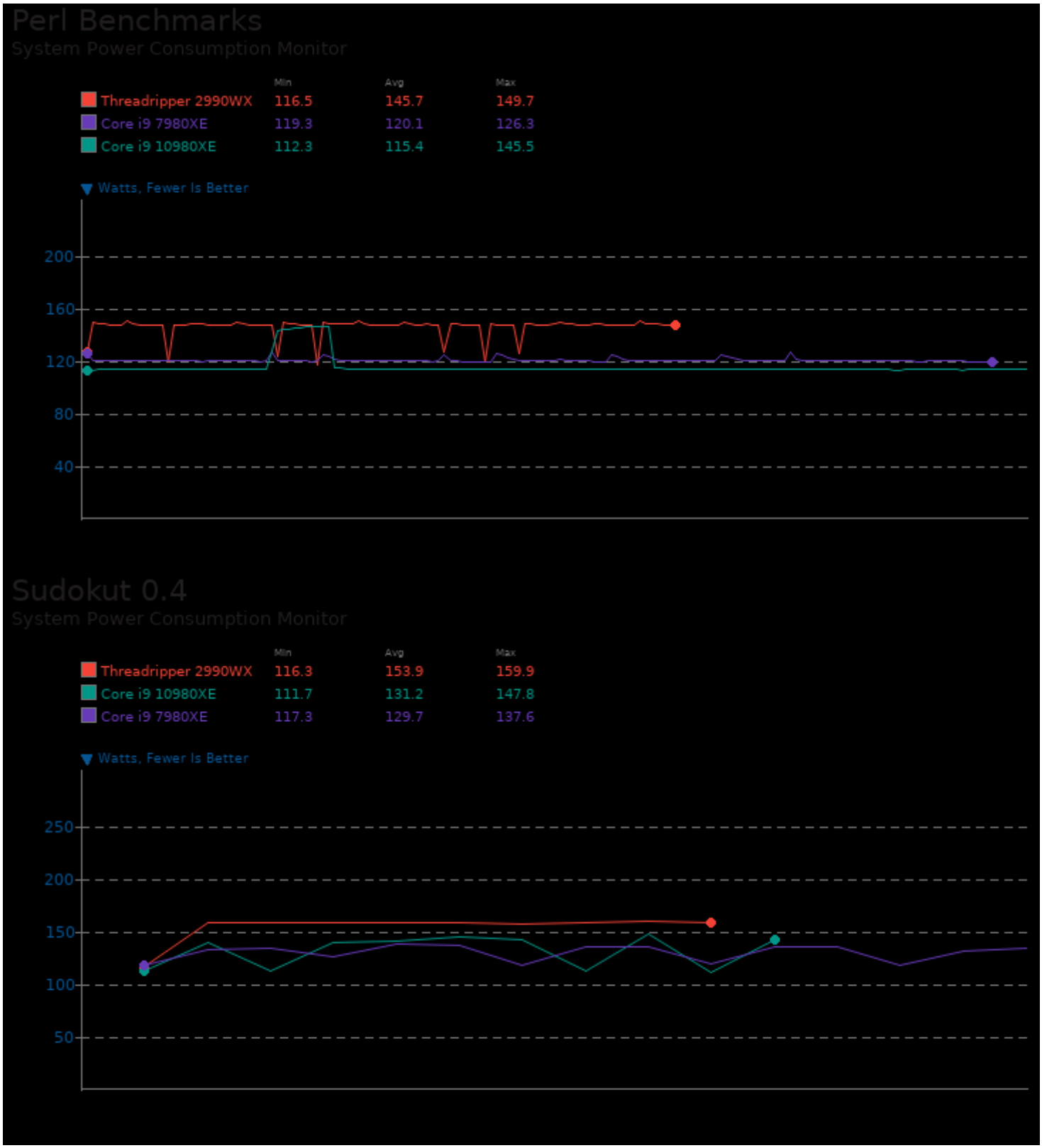
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks



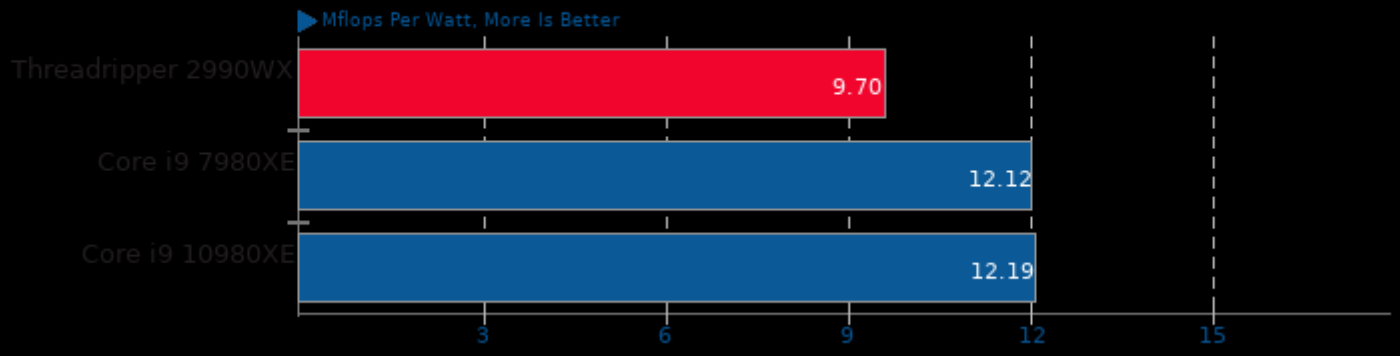
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

LuaJIT 2.1-git

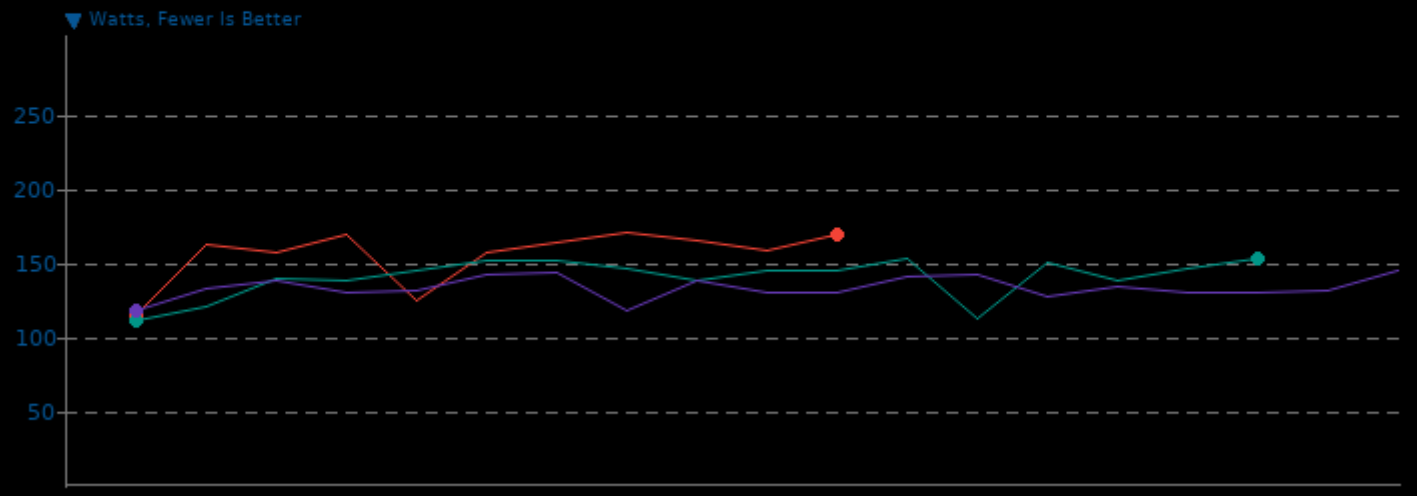
Test: Composite



LuaJIT 2.1-git

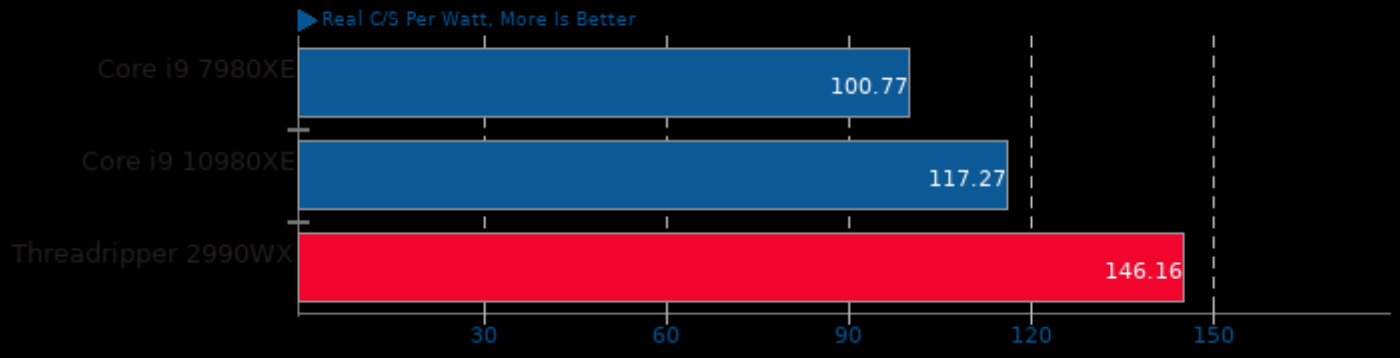
System Power Consumption Monitor

	Min	Avg	Max
Threadripper 2990WX	115.8	155.4	170.1
Core i9 10980XE	111.6	140.0	152.4
Core i9 7980XE	117.4	133.1	145.1

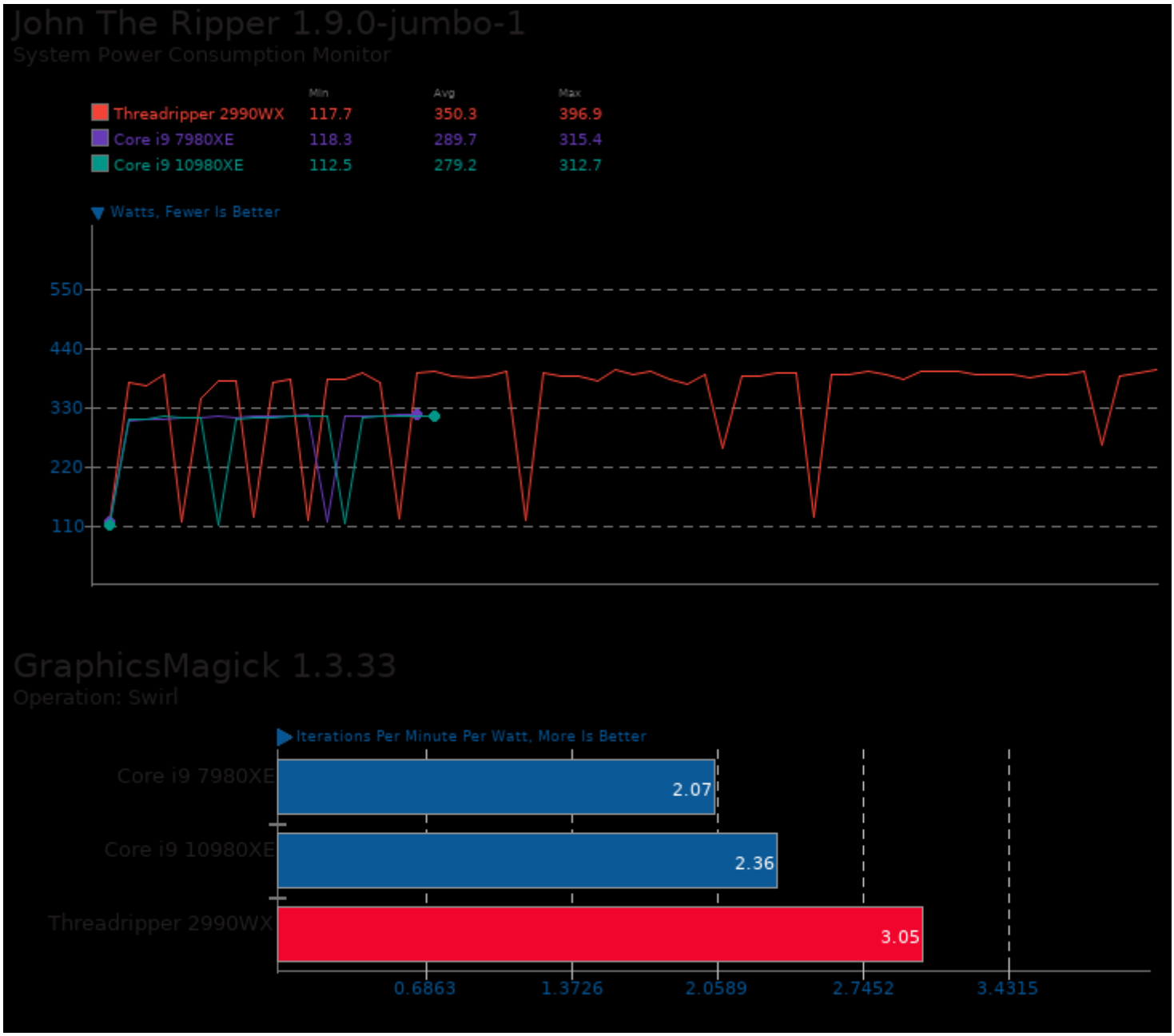


John The Ripper 1.9.0-jumbo-1

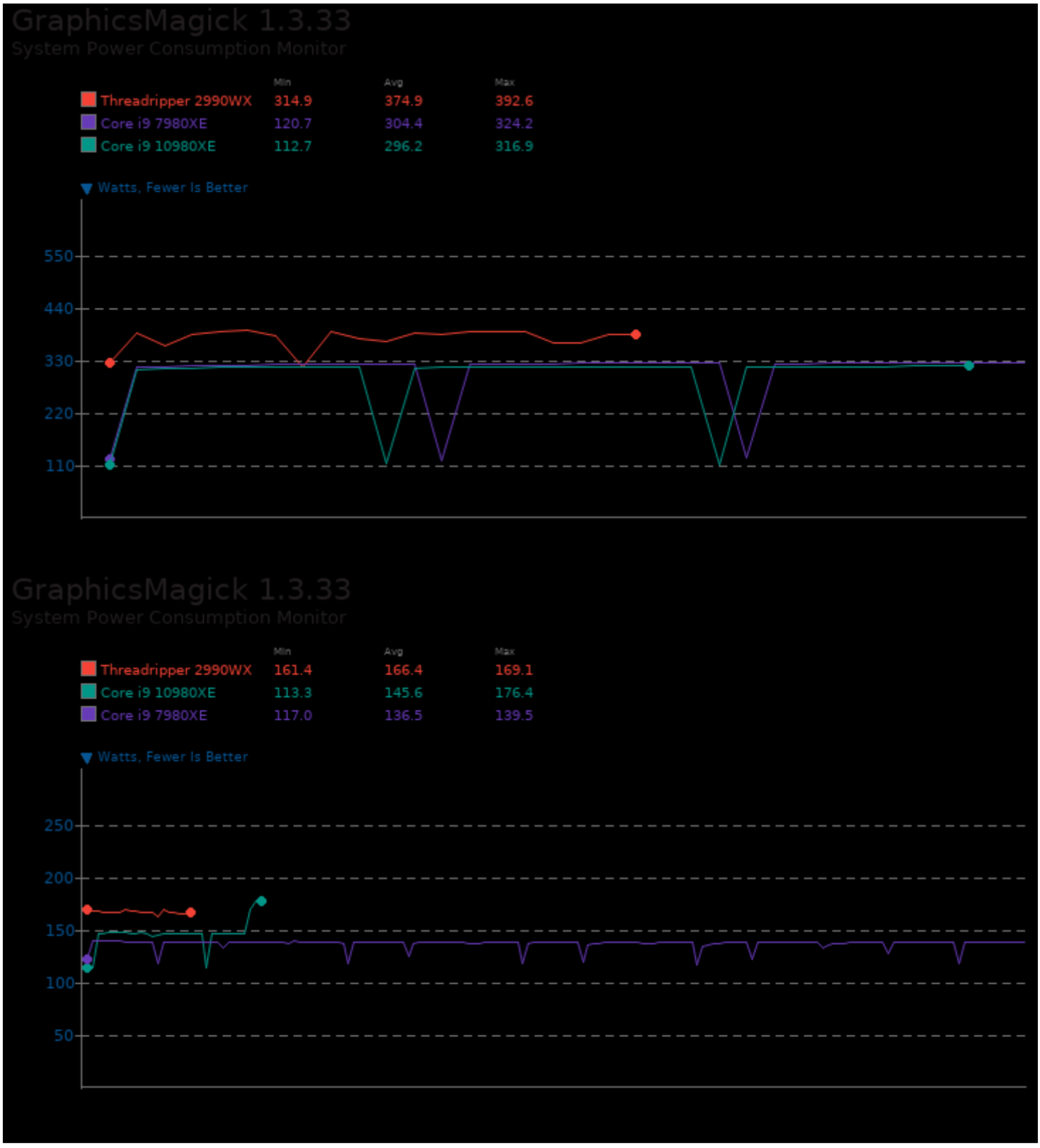
Test: Blowfish



Intel Core i9-10980XE Linux Benchmarks

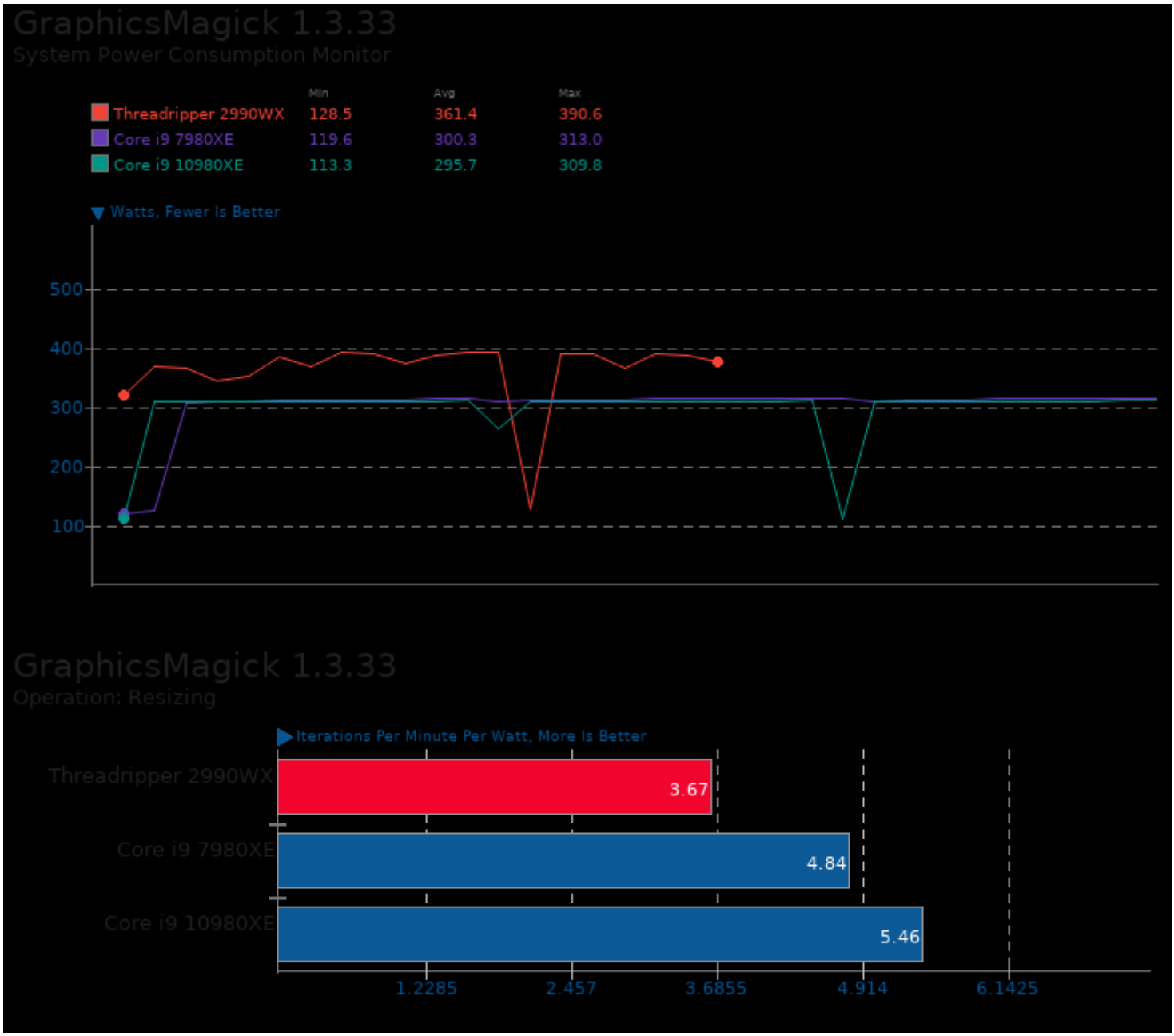


Intel Core i9-10980XE Linux Benchmarks

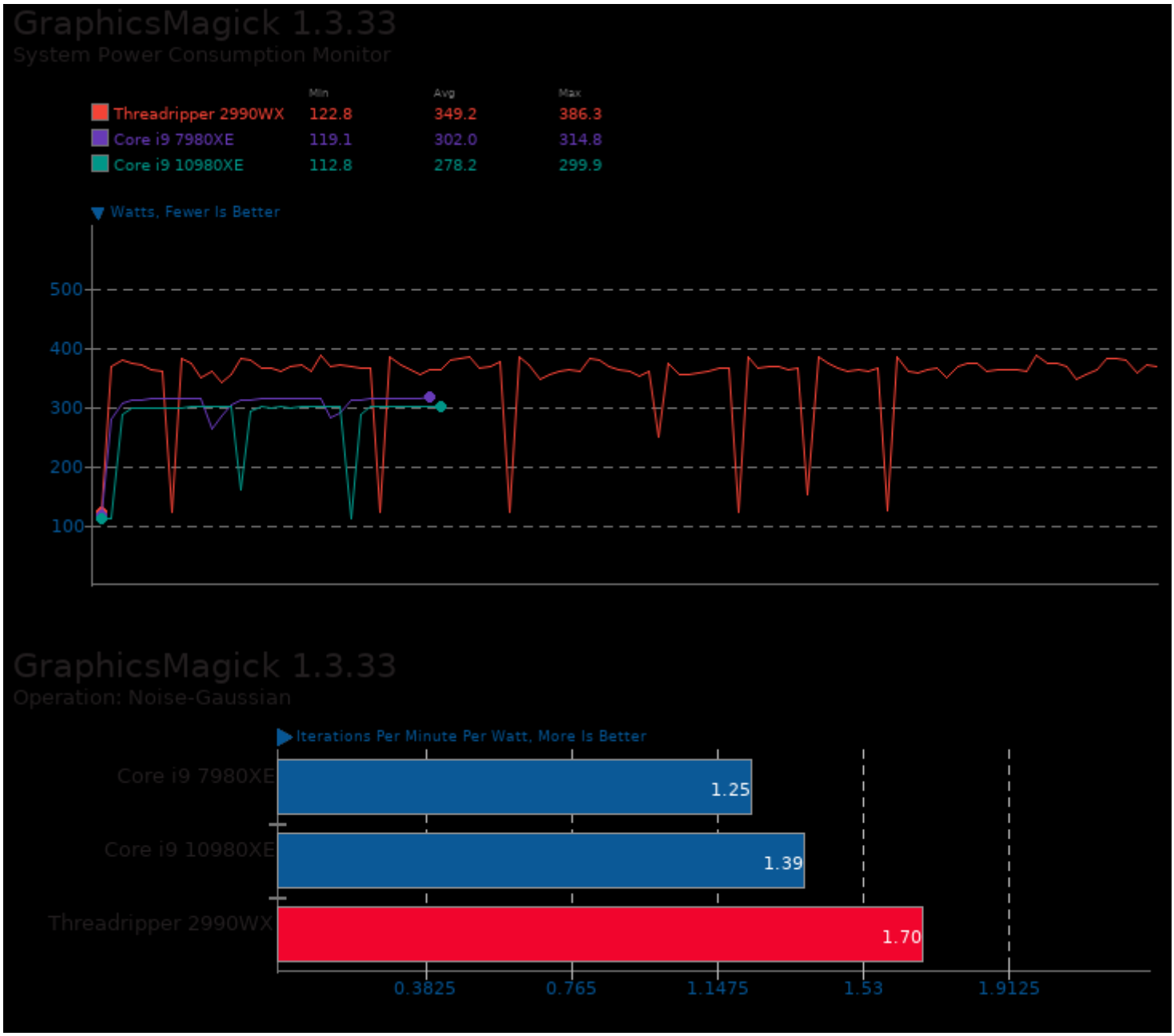



GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute Per Watt, More Is Better
Core i9 7980XE
0.75
Core i9 10980XE
0.82
Threadripper 2990WX
1.07
0.2408
0.4816
0.7224
0.9632
1.204
GraphicsMagick 1.3.33
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 123.4 350.2 385.5
Core i9 10980XE 112.6 288.8 307.3
Core i9 7980XE 119.0 274.5 295.2
Watts, Fewer Is Better
500
400
300
200
100
GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute Per Watt, More Is Better
Core i9 7980XE
1.09
Core i9 10980XE
1.24
Threadripper 2990WX
1.42
0.3195
0.639
0.9585
1.278
1.5975

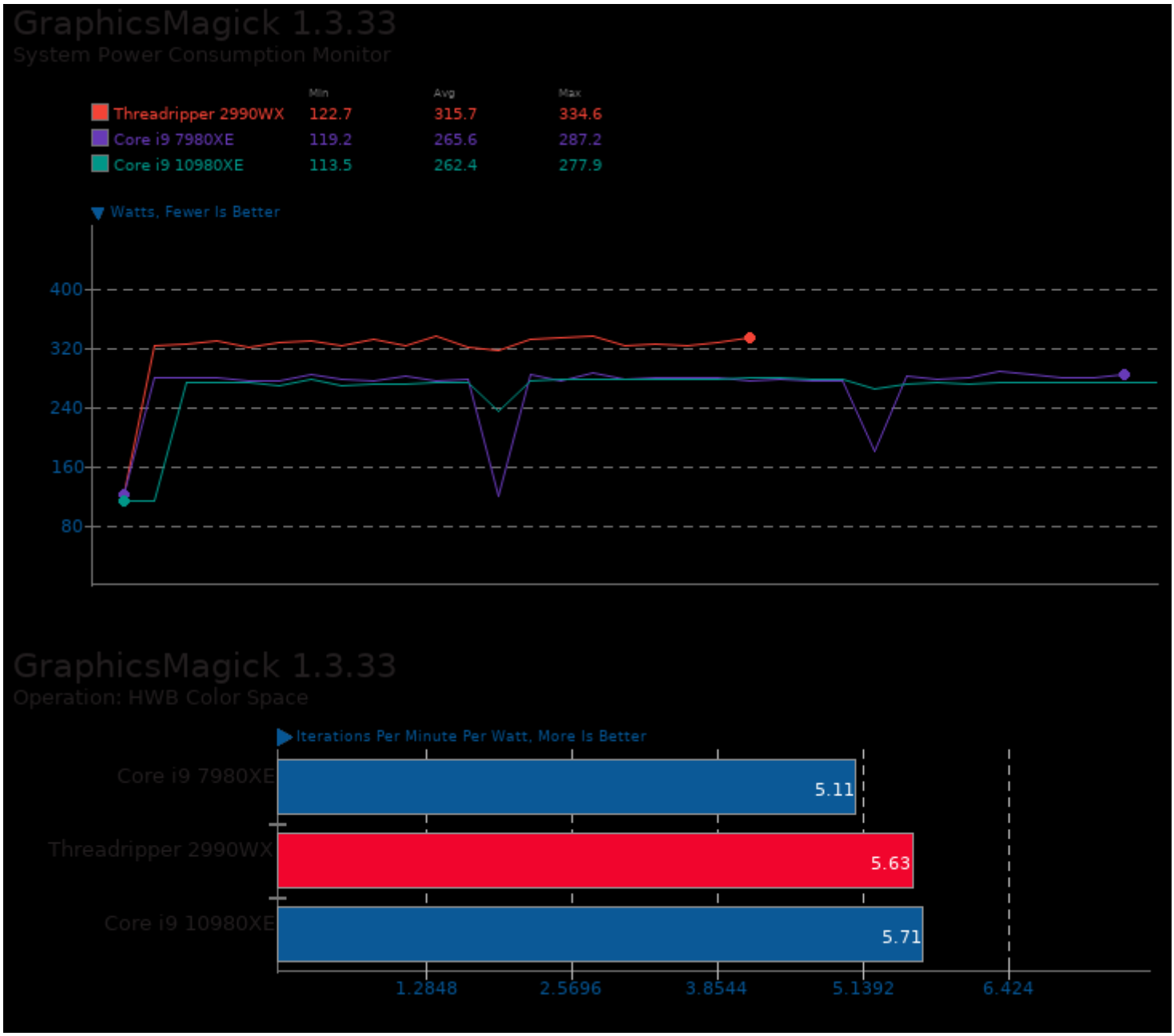
Intel Core i9-10980XE Linux Benchmarks

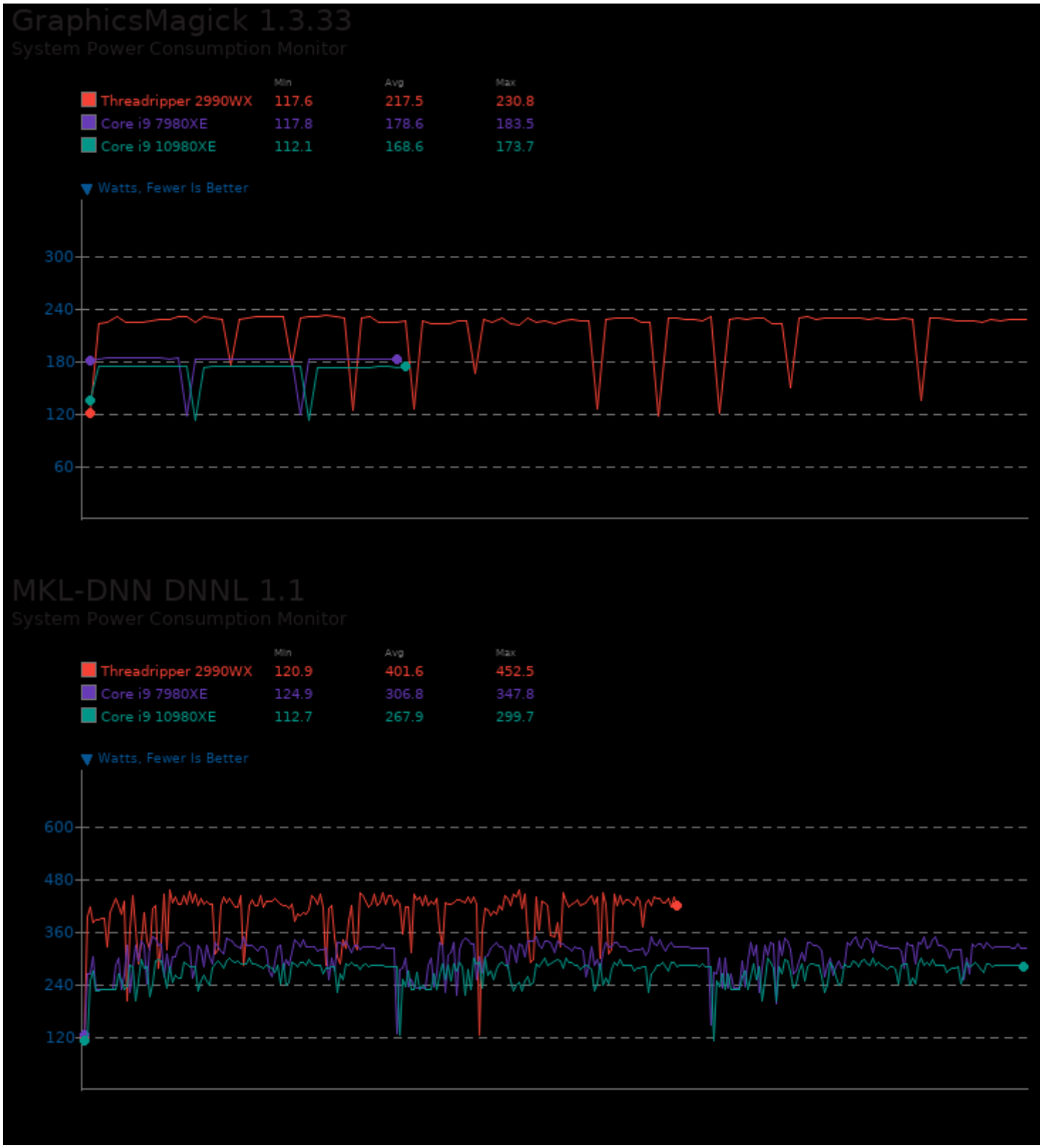


Intel Core i9-10980XE Linux Benchmarks



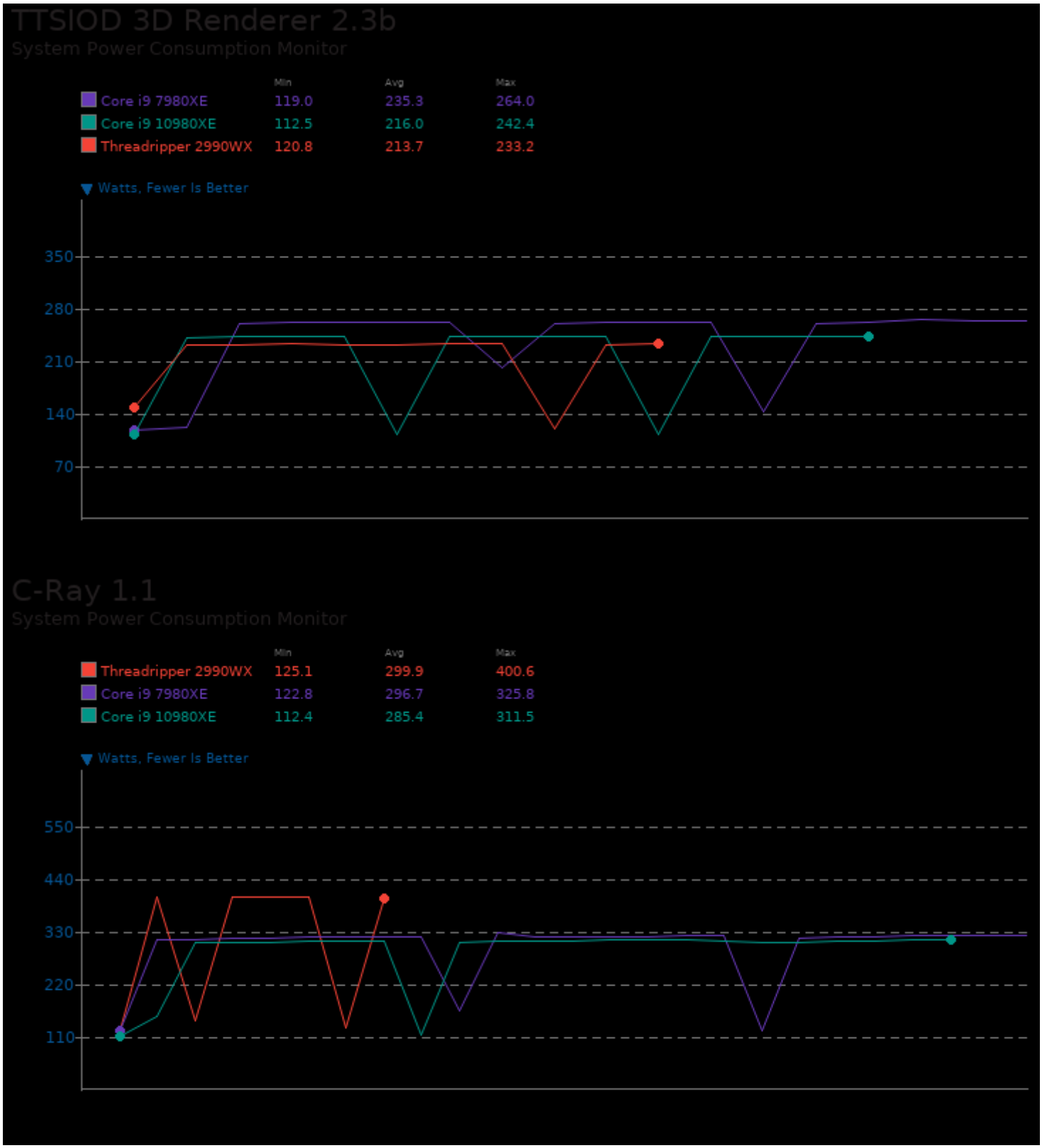
Intel Core i9-10980XE Linux Benchmarks



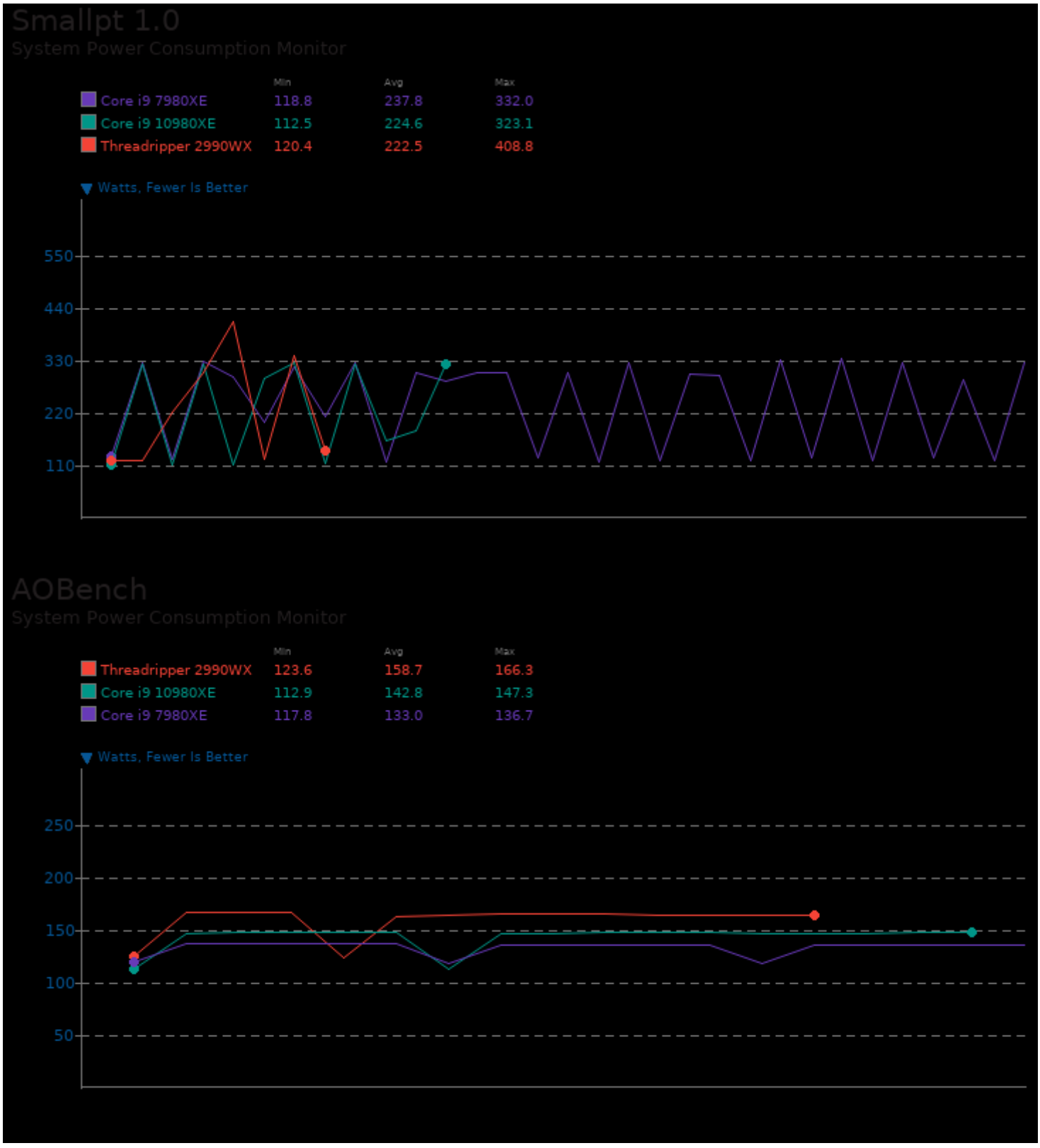

GraphicsMagick 1.3.33
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 117.6 217.5 230.8
Core i9 7980XE 117.8 178.6 183.5
Core i9 10980XE 112.1 168.6 173.7
Watts, Fewer Is Better
300
240
180
120
60
MKL-DNN DNNL 1.1
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 120.9 401.6 452.5
Core i9 7980XE 124.9 306.8 347.8
Core i9 10980XE 112.7 267.9 299.7
Watts, Fewer Is Better
600
480
360
240
120


MKL-DNN DNNL 1.1
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 127.5 362.0 413.3
Core i9 7980XE 119.6 270.2 335.0
Core i9 10980XE 112.9 266.0 322.2
Watts, Fewer Is Better
550
440
330
220
110
TTSIOD 3D Renderer 2.3b
Phong Rendering With Soft-Shadow Mapping
FPS Per Watt, More Is Better
Threadripper 2990WX
2.51
Core i9 7980XE
3.01
Core i9 10980XE
3.28
0.738
1.476
2.214
2.952
3.69

Intel Core i9-10980XE Linux Benchmarks



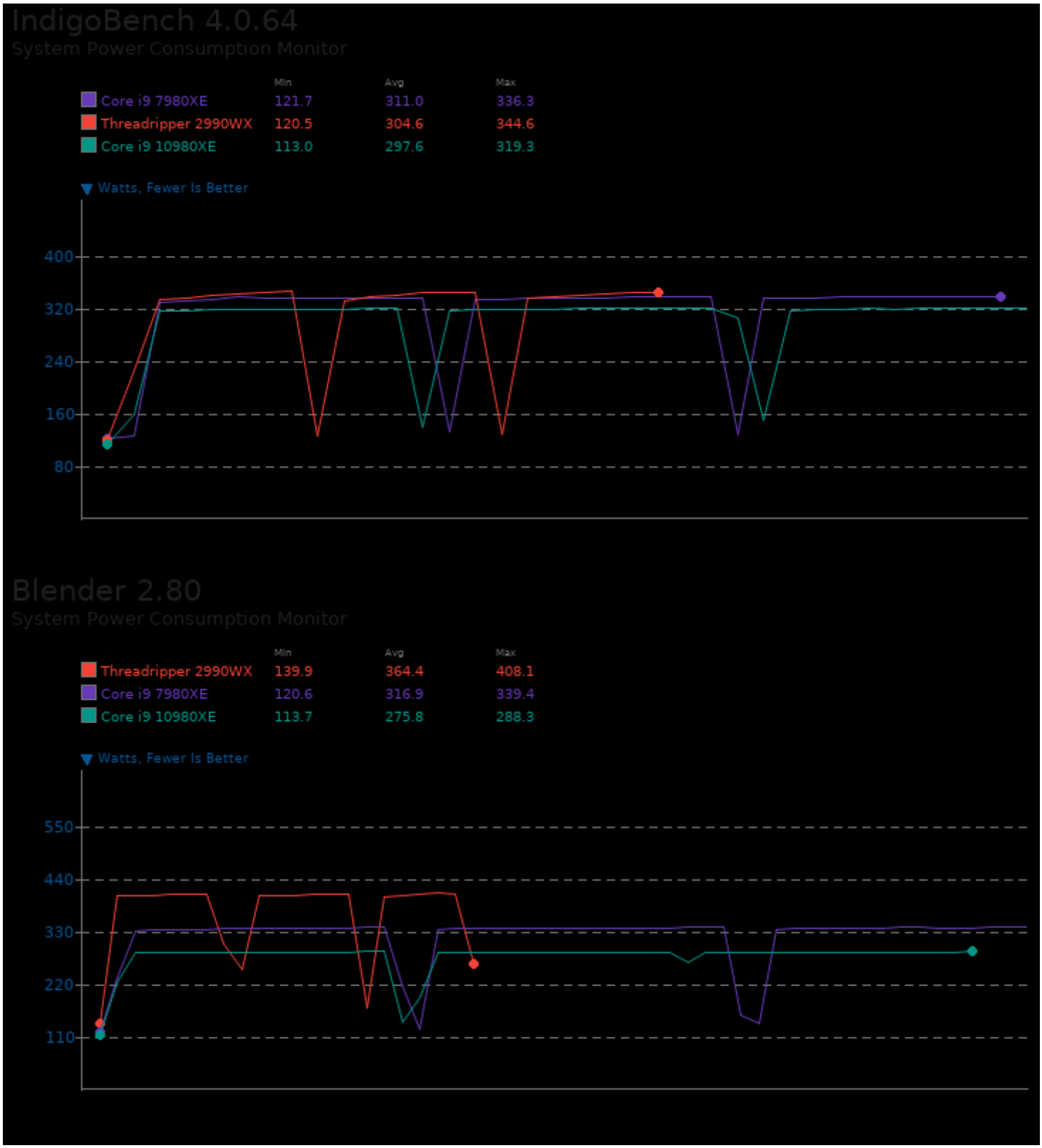
Intel Core i9-10980XE Linux Benchmarks

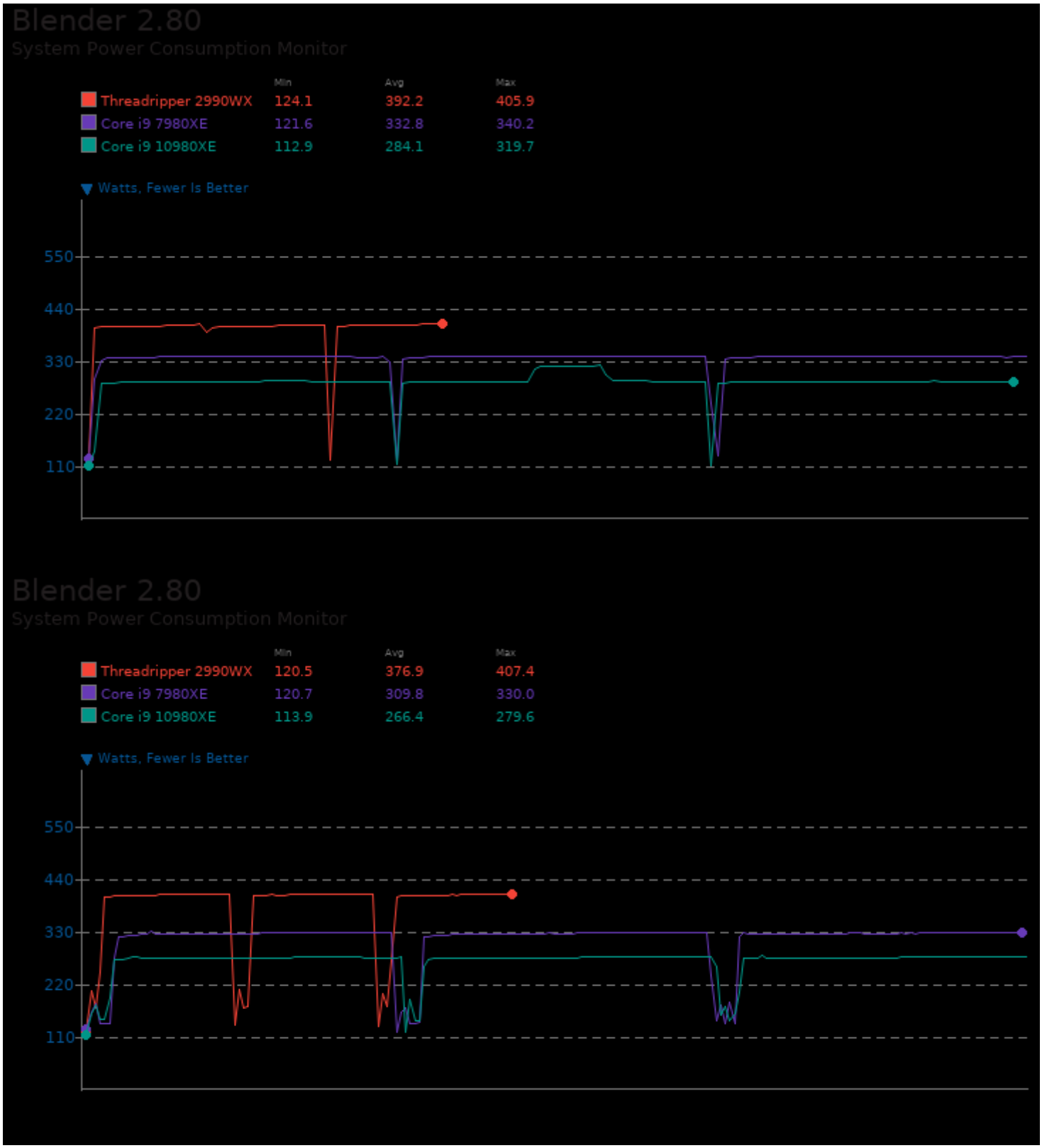


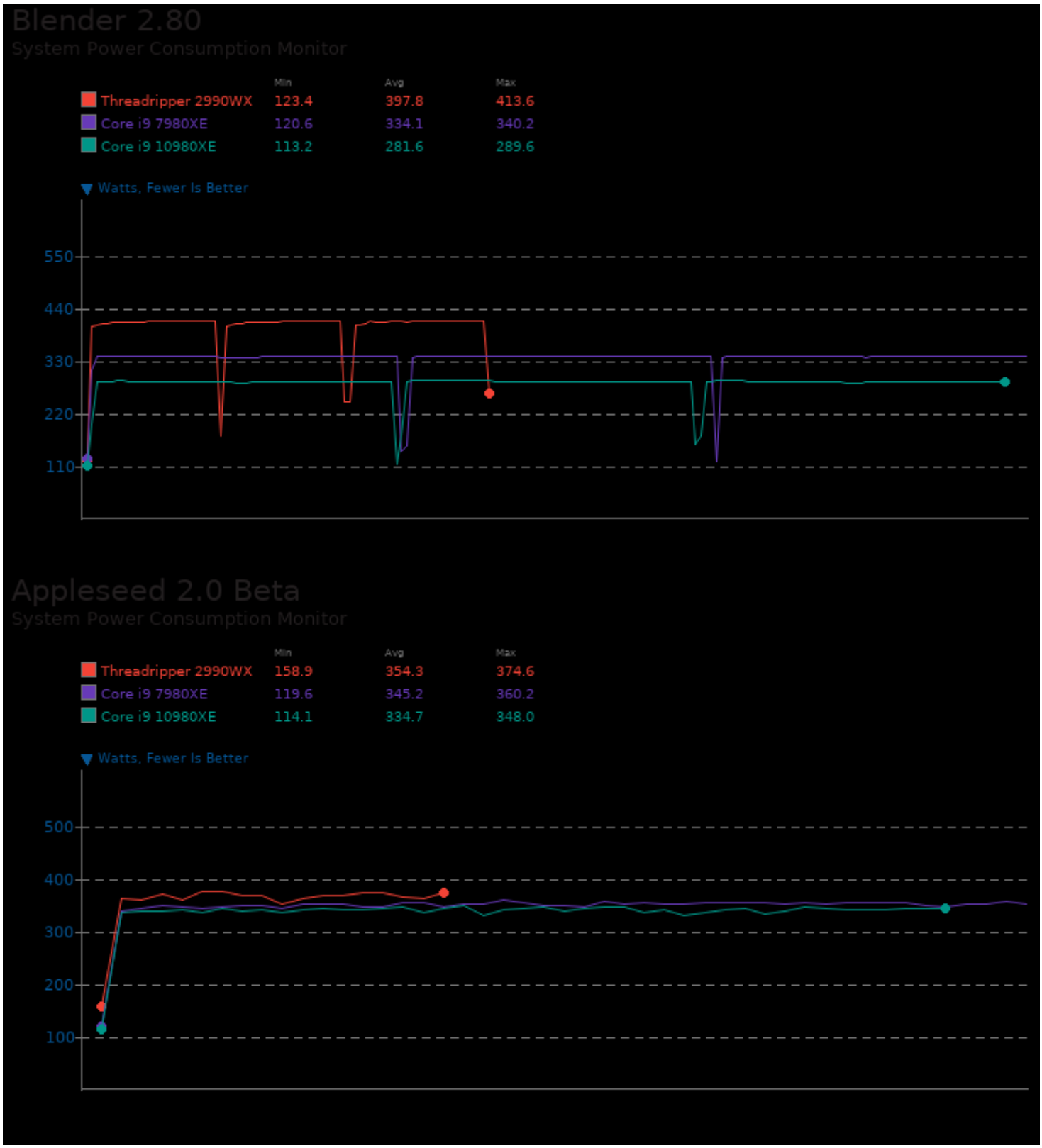
Intel Core i9-10980XE Linux Benchmarks



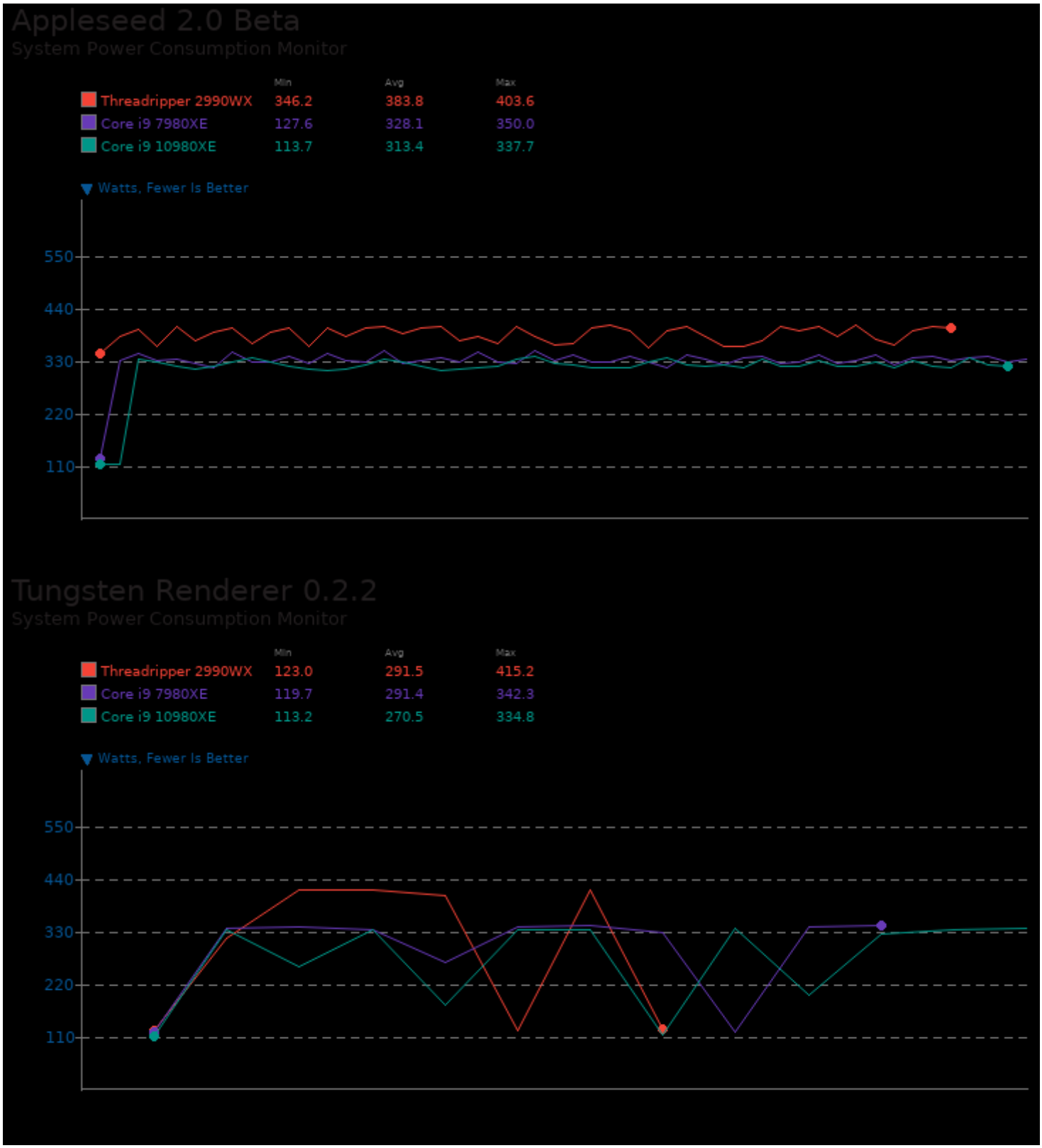
Intel Core i9-10980XE Linux Benchmarks

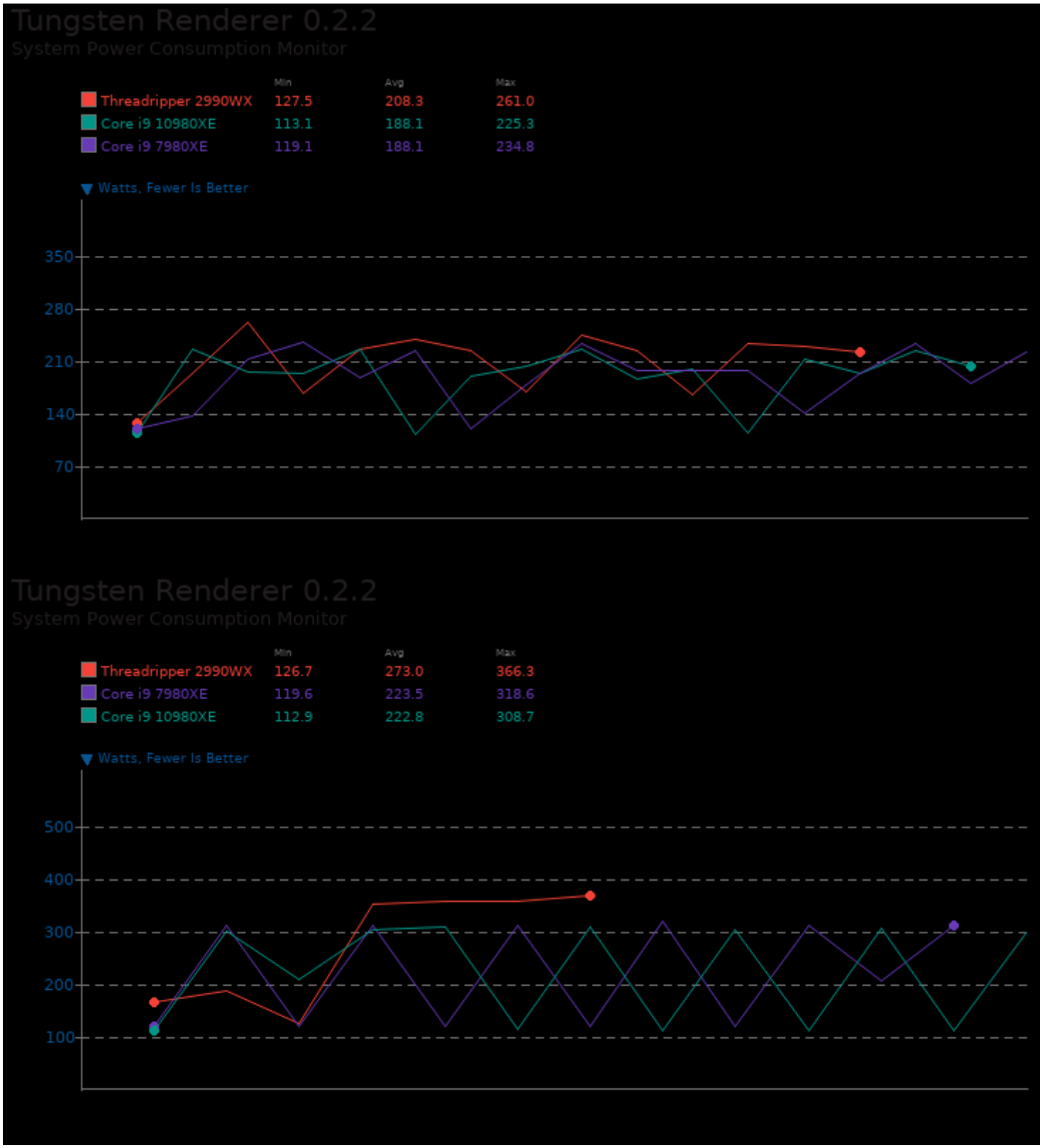



Blender 2.80
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 124.1 392.2 405.9
Core i9 7980XE 121.6 332.8 340.2
Core i9 10980XE 112.9 284.1 319.7
Watts, Fewer Is Better
550
440
330
220
110
Blender 2.80
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 120.5 376.9 407.4
Core i9 7980XE 120.7 309.8 330.0
Core i9 10980XE 113.9 266.4 279.6
Watts, Fewer Is Better
550
440
330
220
110


Blender 2.80
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 123.4 397.8 413.6
Core i9 7980XE 120.6 334.1 340.2
Core i9 10980XE 113.2 281.6 289.6
Watts, Fewer Is Better
550
440
330
220
110
Appleseed 2.0 Beta
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 158.9 354.3 374.6
Core i9 7980XE 119.6 345.2 360.2
Core i9 10980XE 114.1 334.7 348.0
Watts, Fewer Is Better
500
400
300
200
100

Intel Core i9-10980XE Linux Benchmarks




Tungsten Renderer 0.2.2
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 127.5 208.3 261.0
Core i9 10980XE 113.1 188.1 225.3
Core i9 7980XE 119.1 188.1 234.8
Watts, Fewer Is Better
350
280
210
140
70
Tungsten Renderer 0.2.2
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 126.7 273.0 366.3
Core i9 7980XE 119.6 223.5 318.6
Core i9 10980XE 112.9 222.8 308.7
Watts, Fewer Is Better
500
400
300
200
100

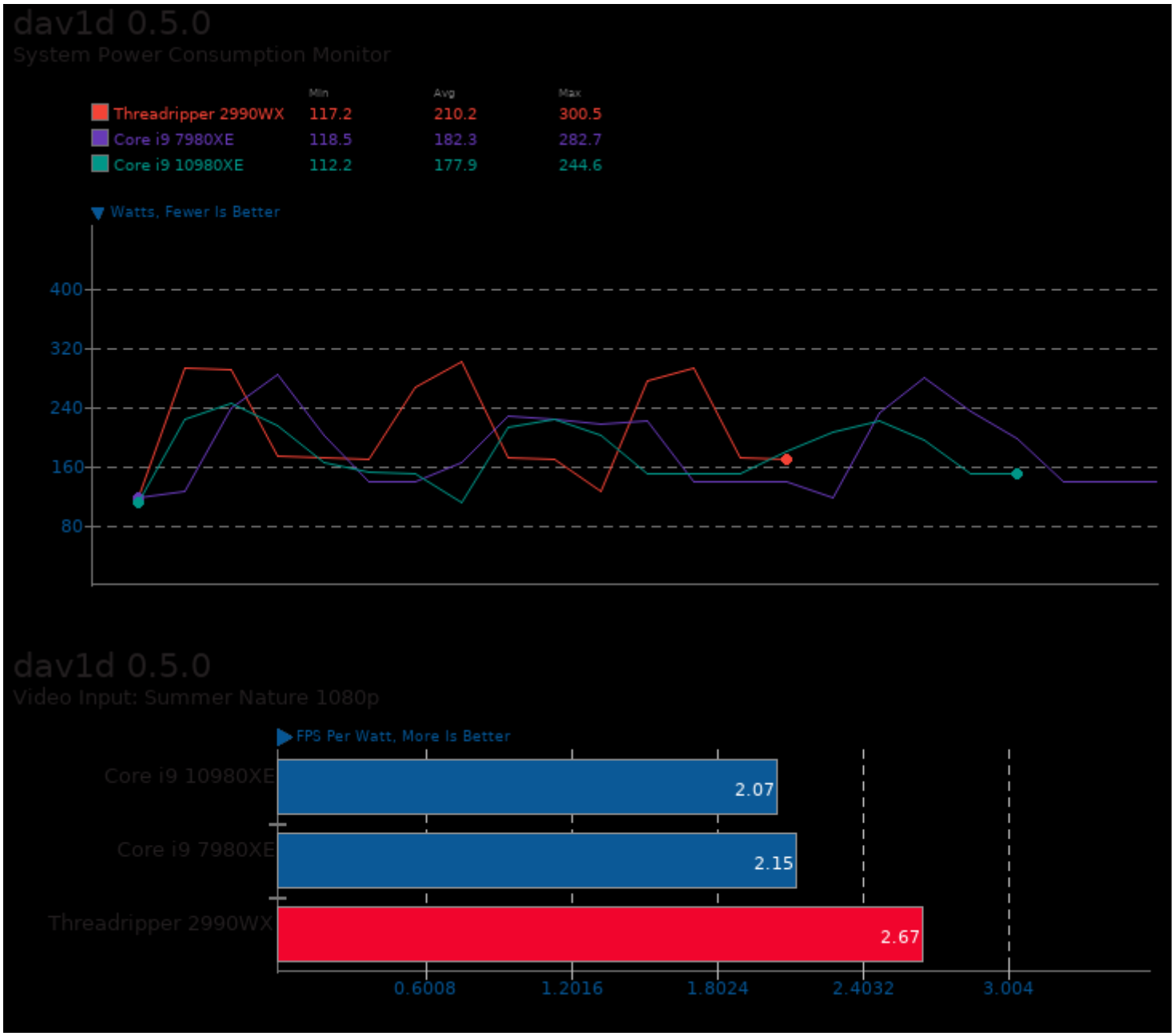
Intel Core i9-10980XE Linux Benchmarks



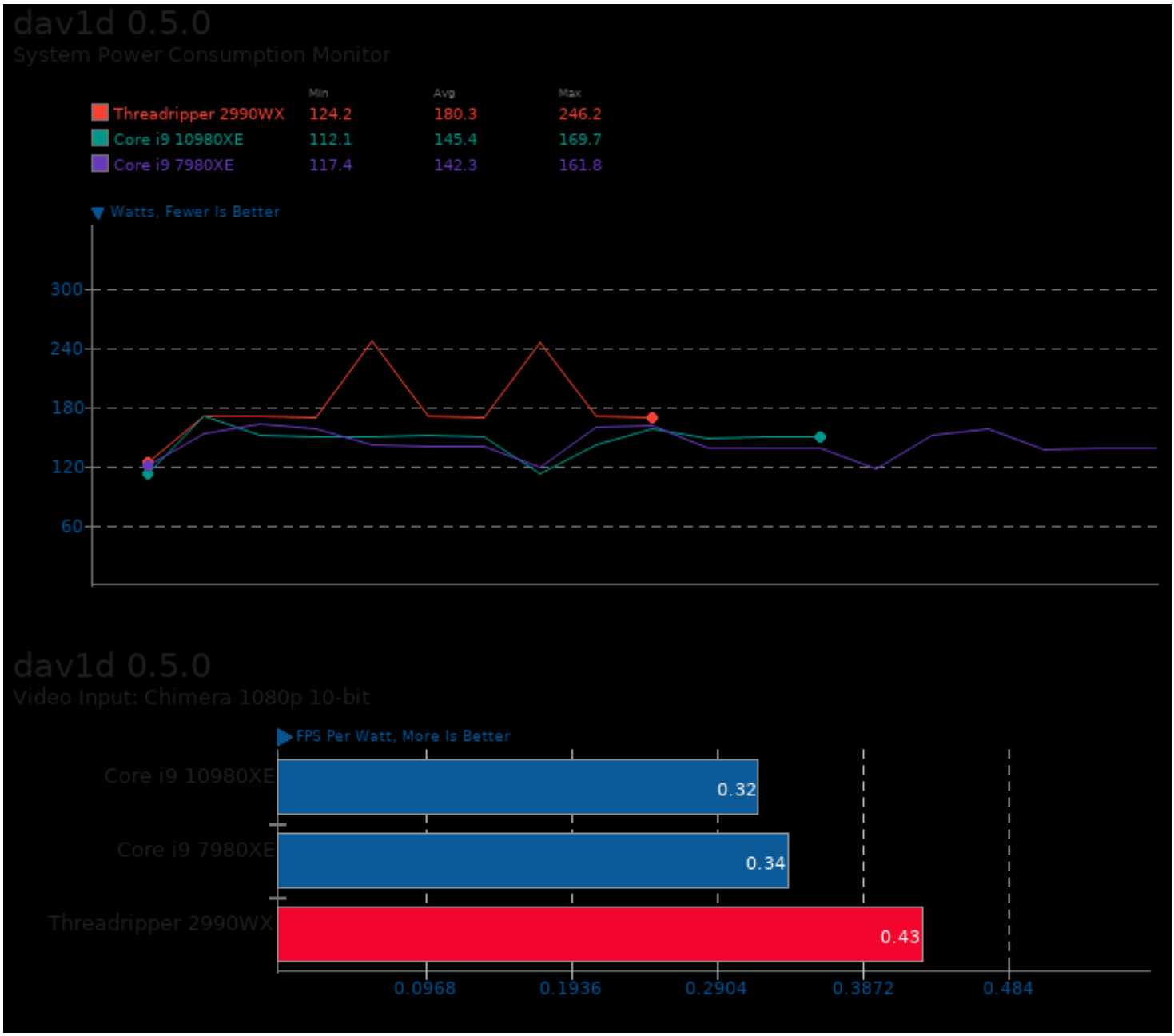
Intel Core i9-10980XE Linux Benchmarks

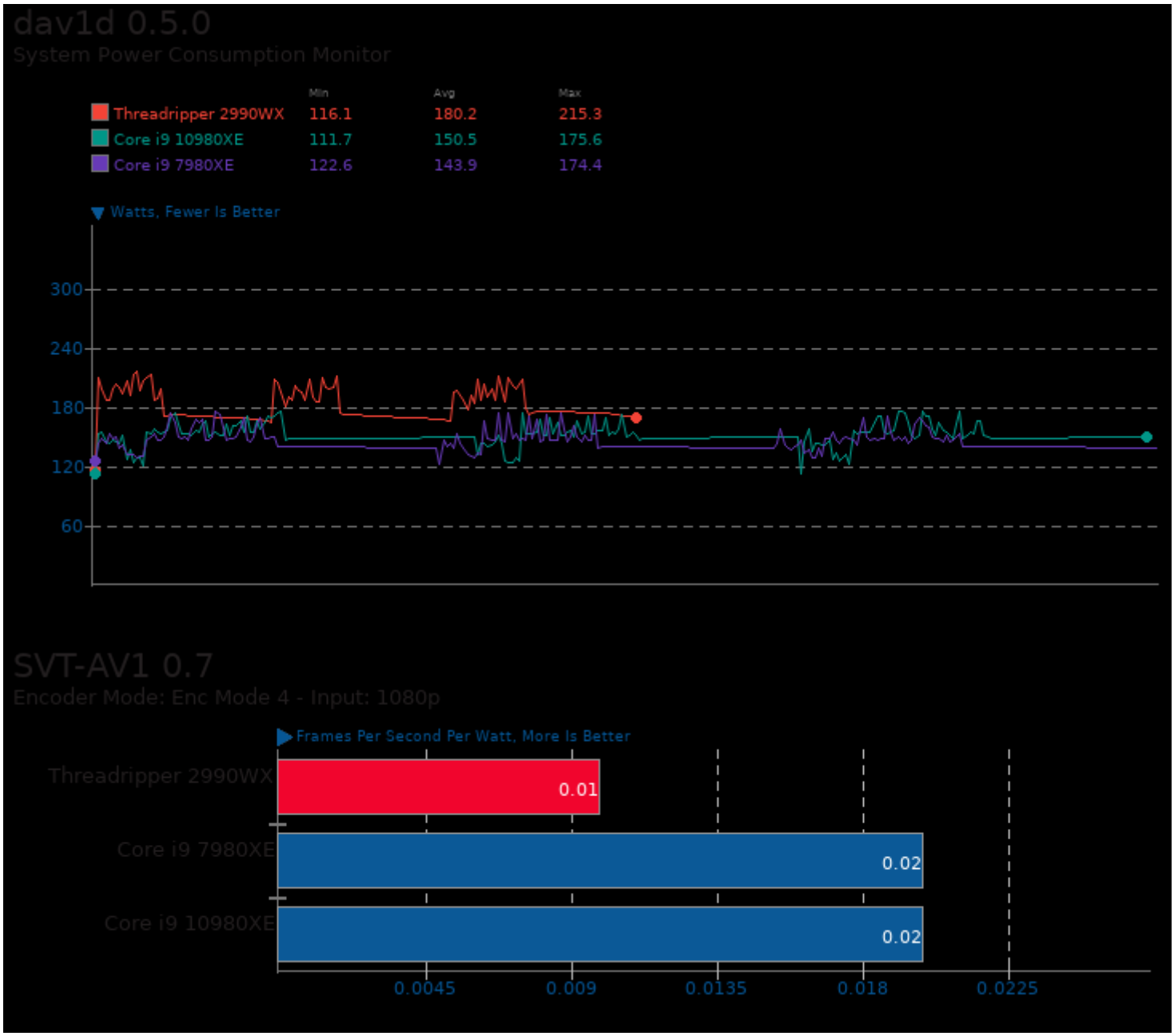


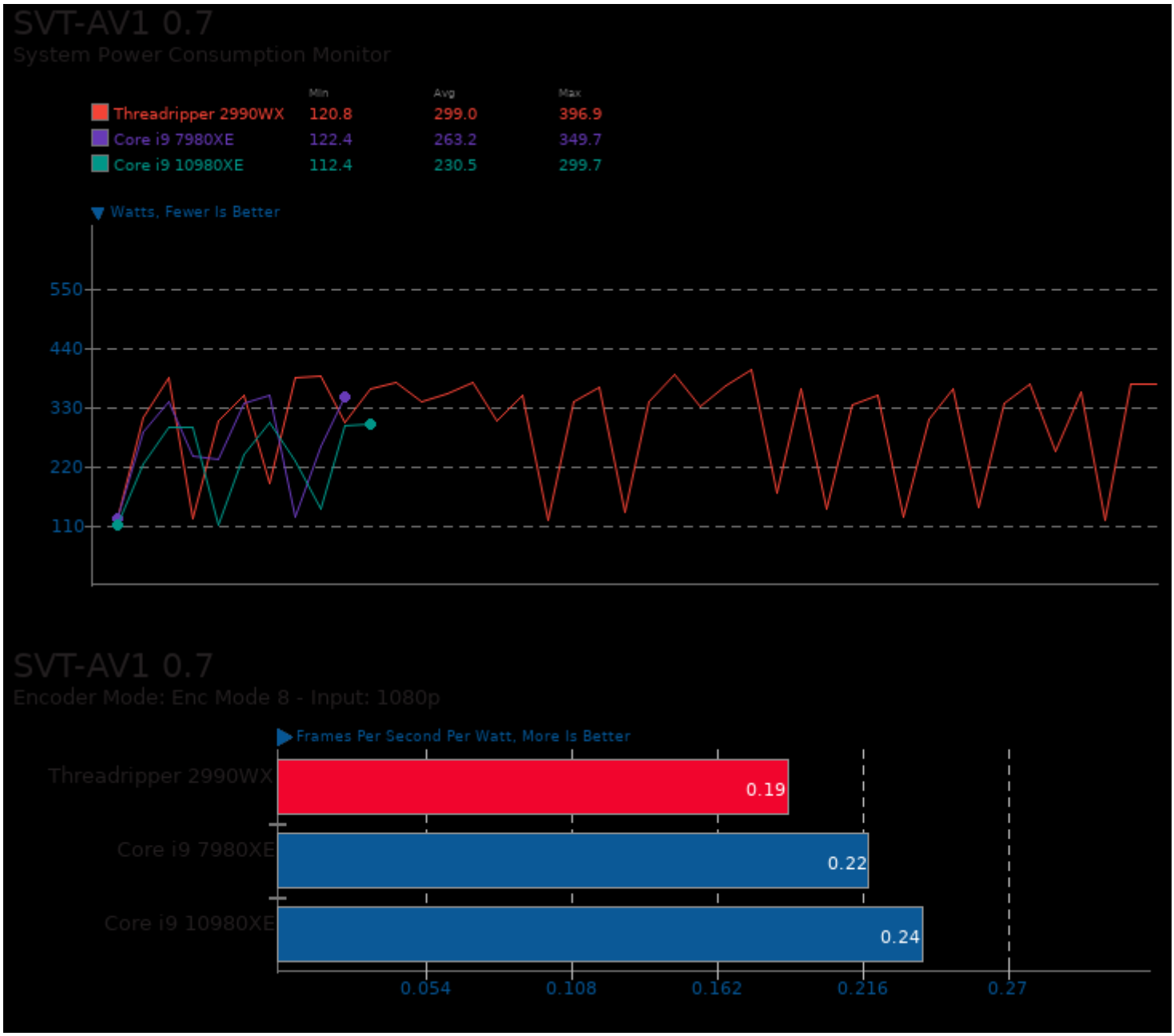
Intel Core i9-10980XE Linux Benchmarks



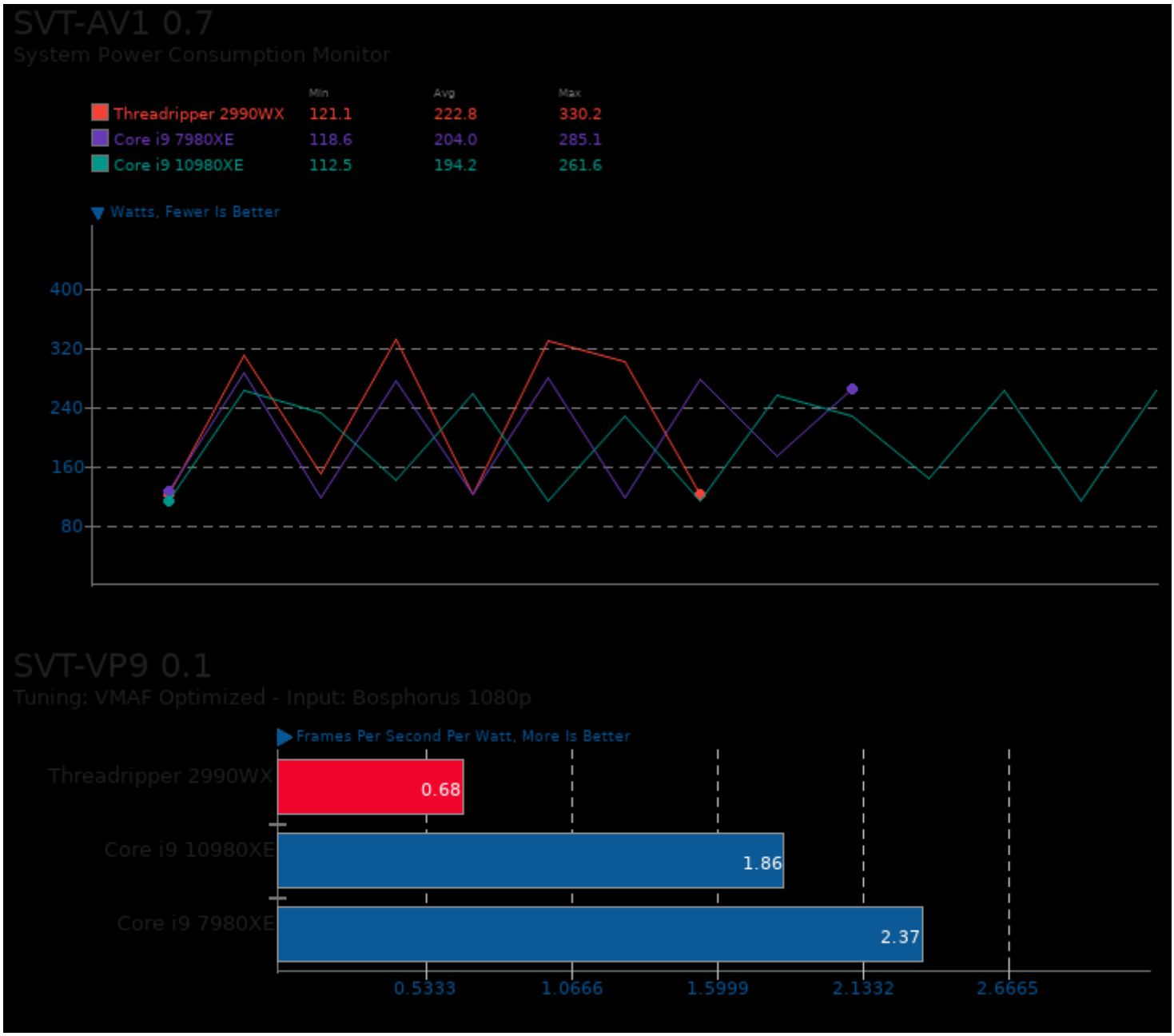
Intel Core i9-10980XE Linux Benchmarks



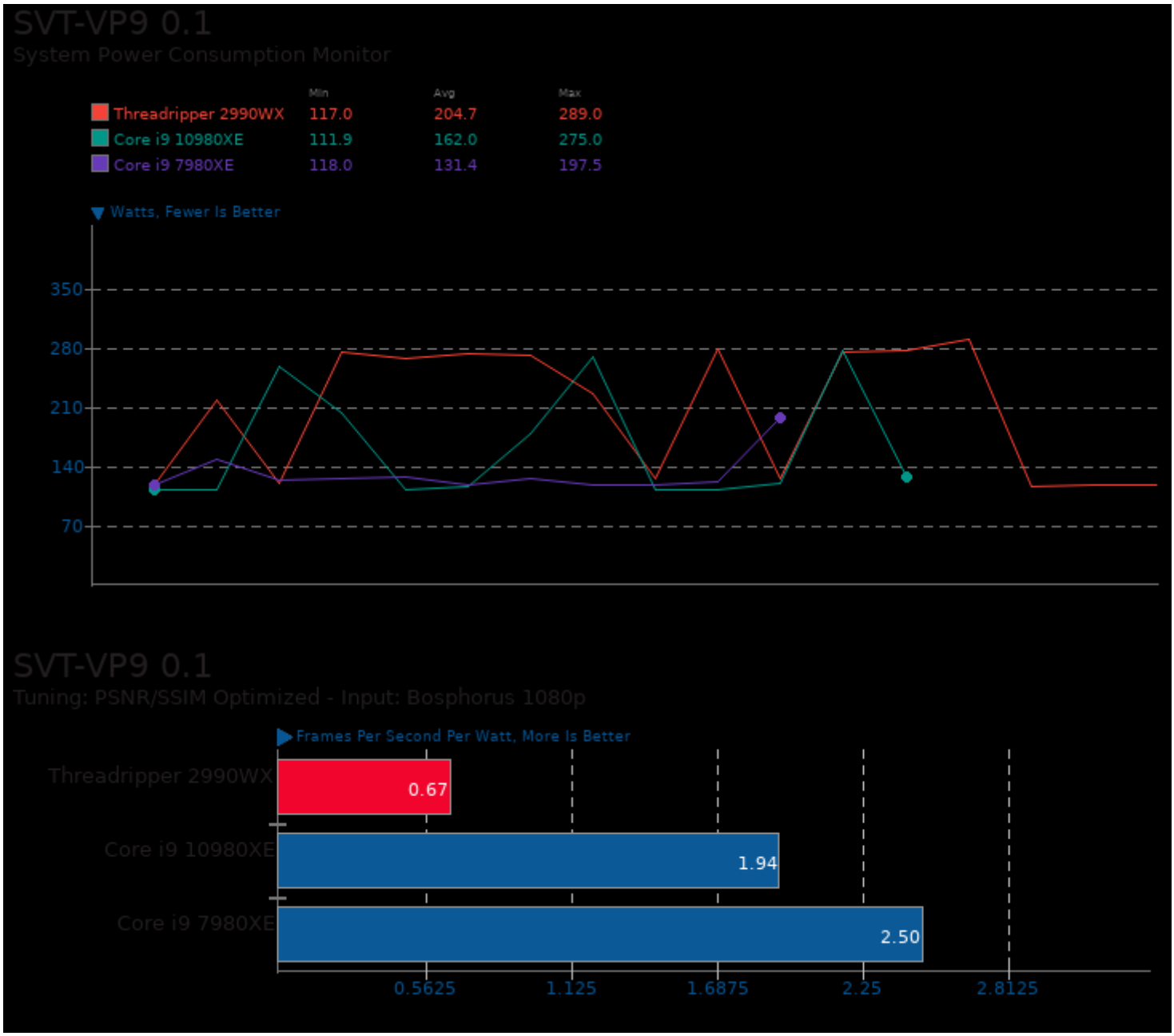

dav1d 0.5.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 116.1 180.2 215.3
Core i9 10980XE 111.7 150.5 175.6
Core i9 7980XE 122.6 143.9 174.4
Watts, Fewer Is Better
300
240
180
120
60
SVT-AV1 0.7
Encoder Mode: Enc Mode 4 - Input: 1080p
Frames Per Second Per Watt, More Is Better
Threadripper 2990WX
0.01
Core i9 7980XE
0.02
Core i9 10980XE
0.02
0.0045
0.009
0.0135
0.018
0.0225


SVT-AV1 0.7
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 120.8 299.0 396.9
Core i9 7980XE 122.4 263.2 349.7
Core i9 10980XE 112.4 230.5 299.7
Watts, Fewer Is Better
550
440
330
220
110
SVT-AV1 0.7
Encoder Mode: Enc Mode 8 - Input: 1080p
Frames Per Second Per Watt, More Is Better
Threadripper 2990WX
0.19
Core i9 7980XE
0.22
Core i9 10980XE
0.24
0.054
0.108
0.162
0.216
0.27

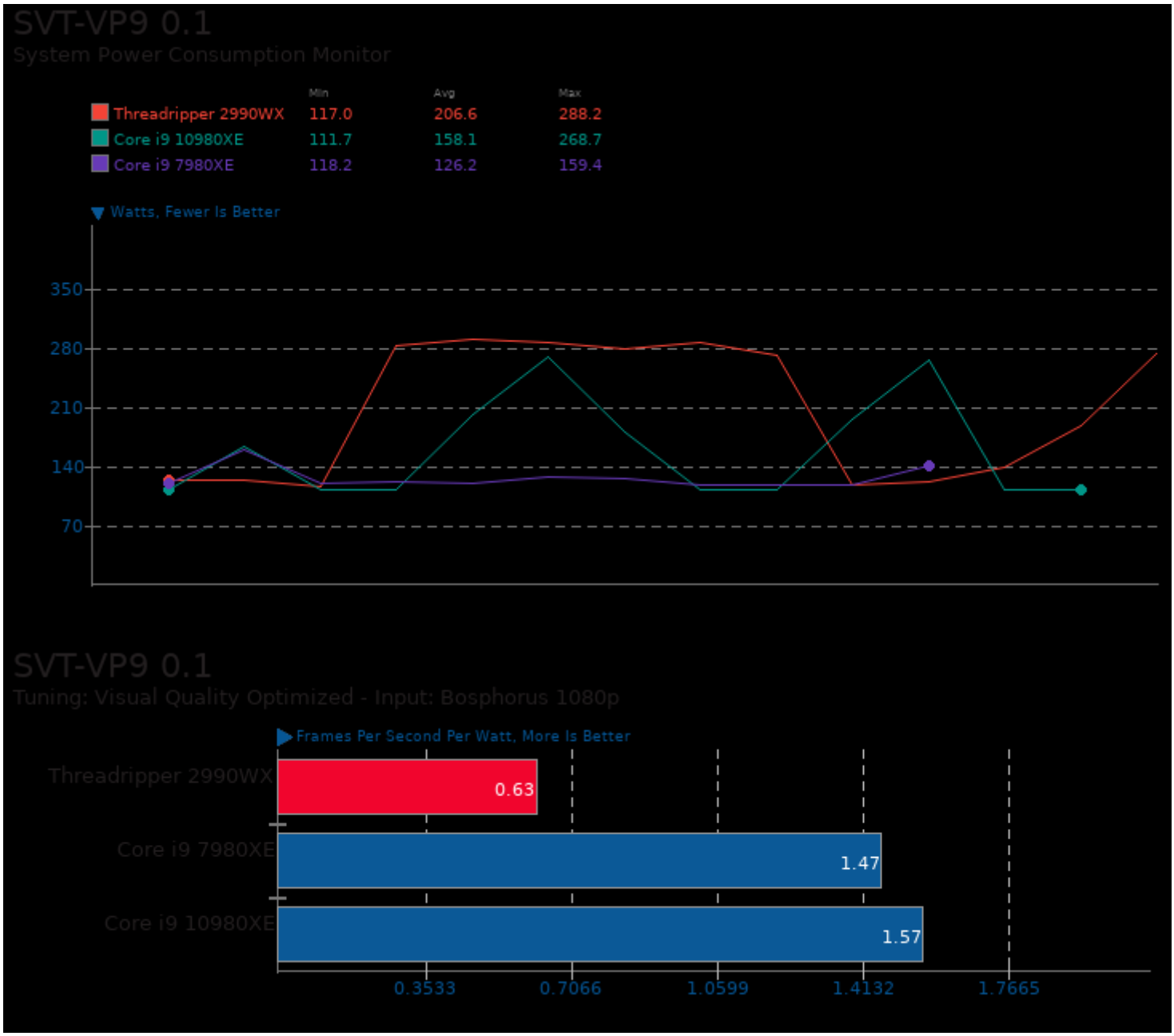
Intel Core i9-10980XE Linux Benchmarks



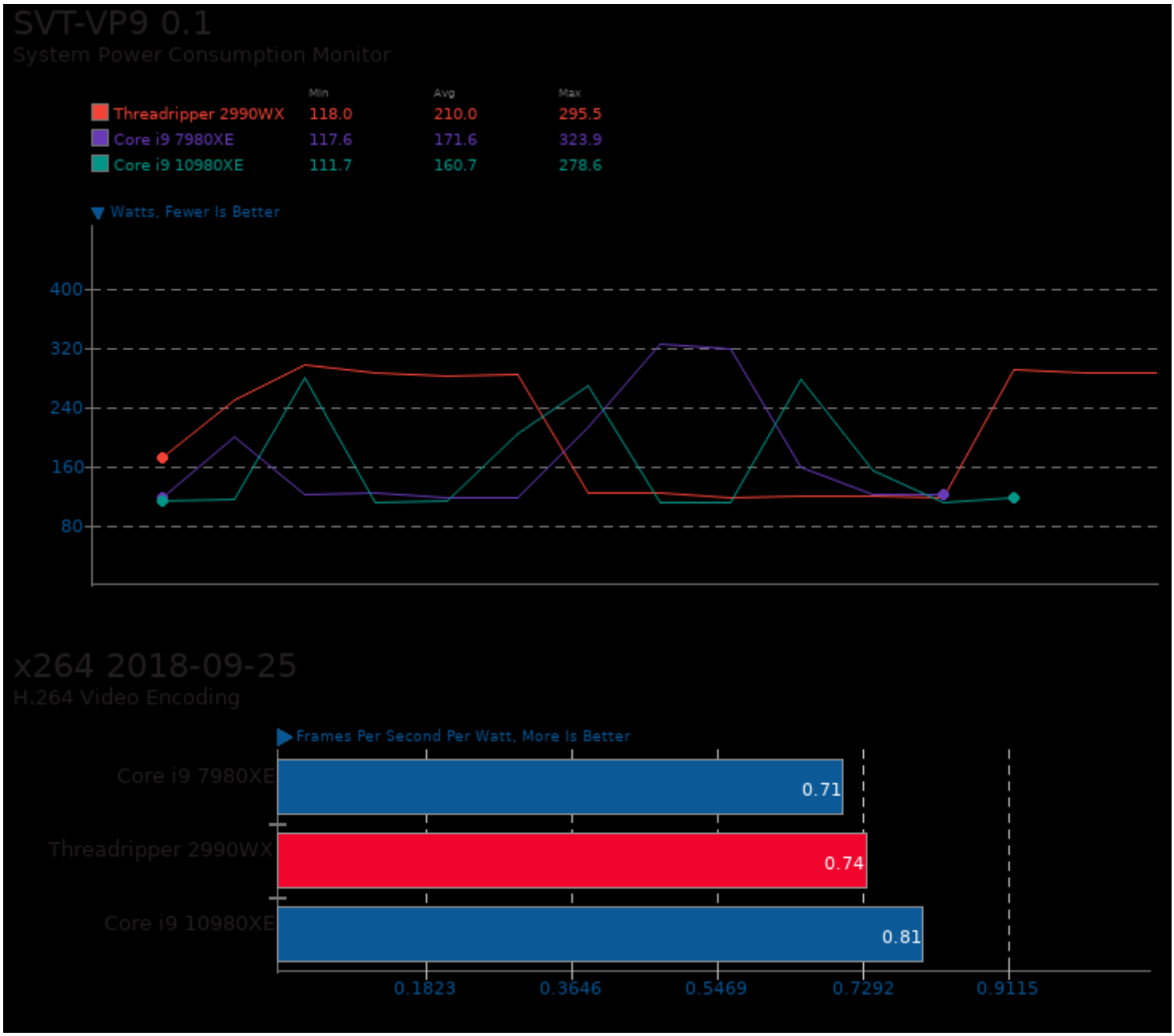
Intel Core i9-10980XE Linux Benchmarks



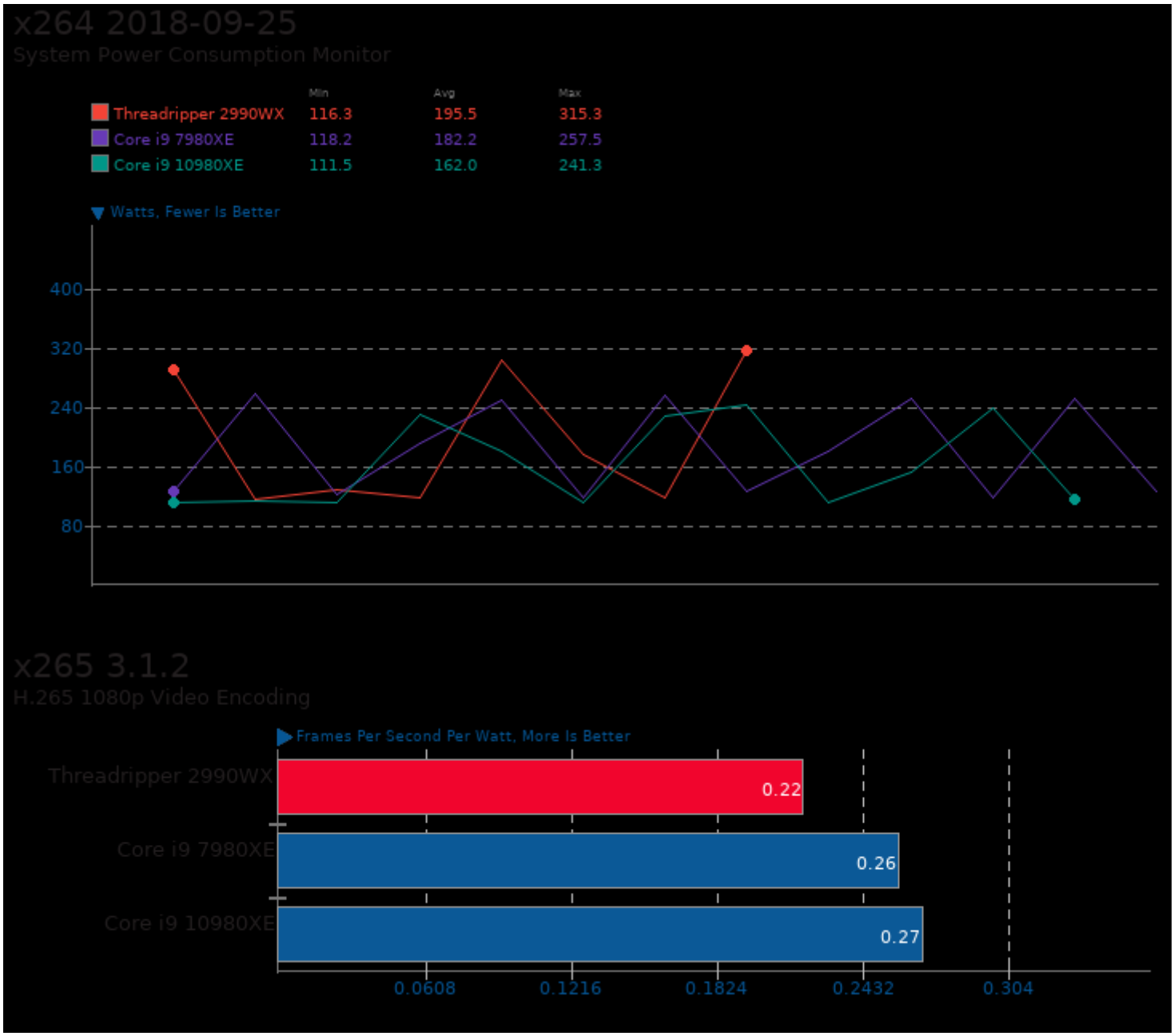
Intel Core i9-10980XE Linux Benchmarks



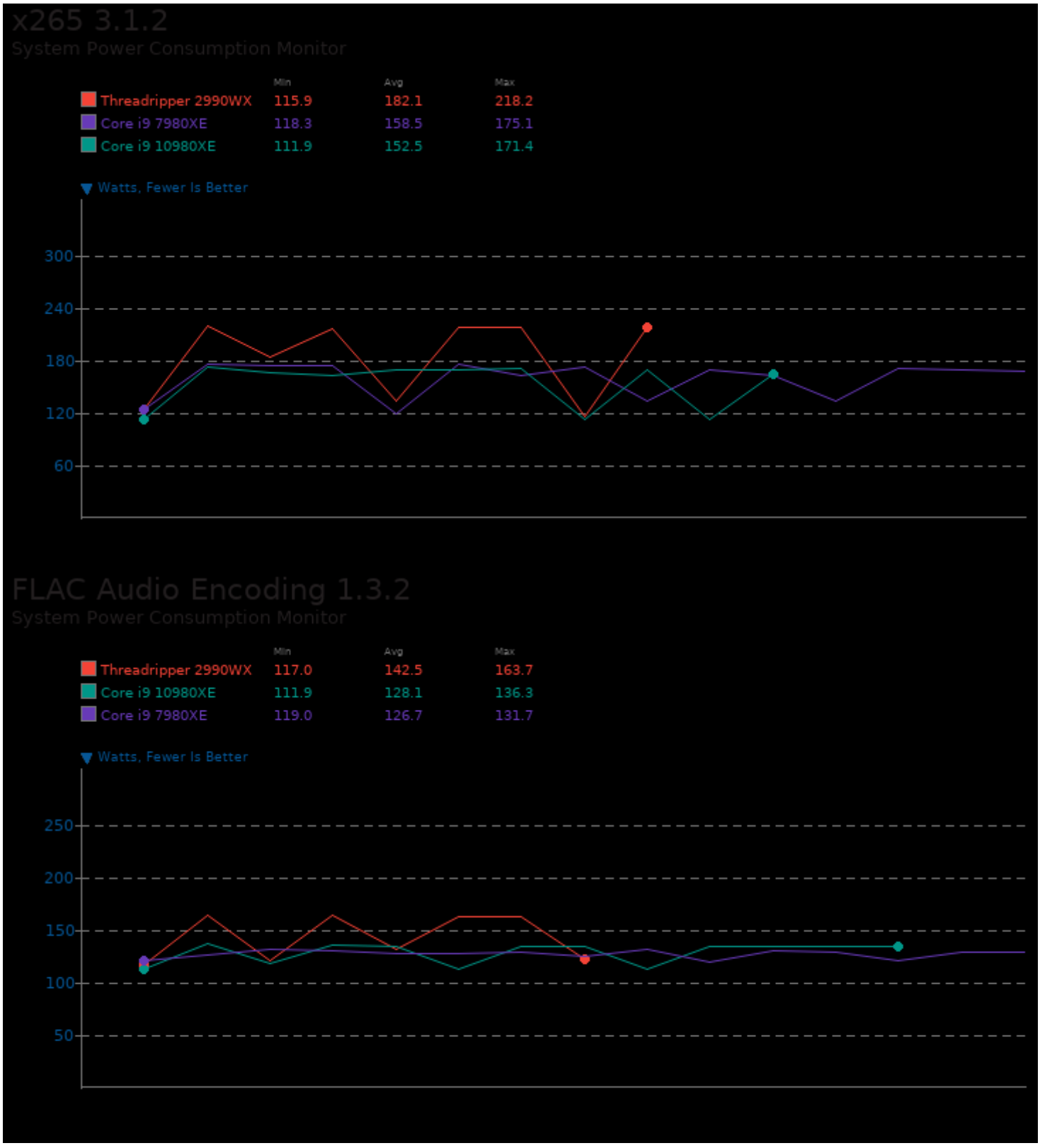
Intel Core i9-10980XE Linux Benchmarks



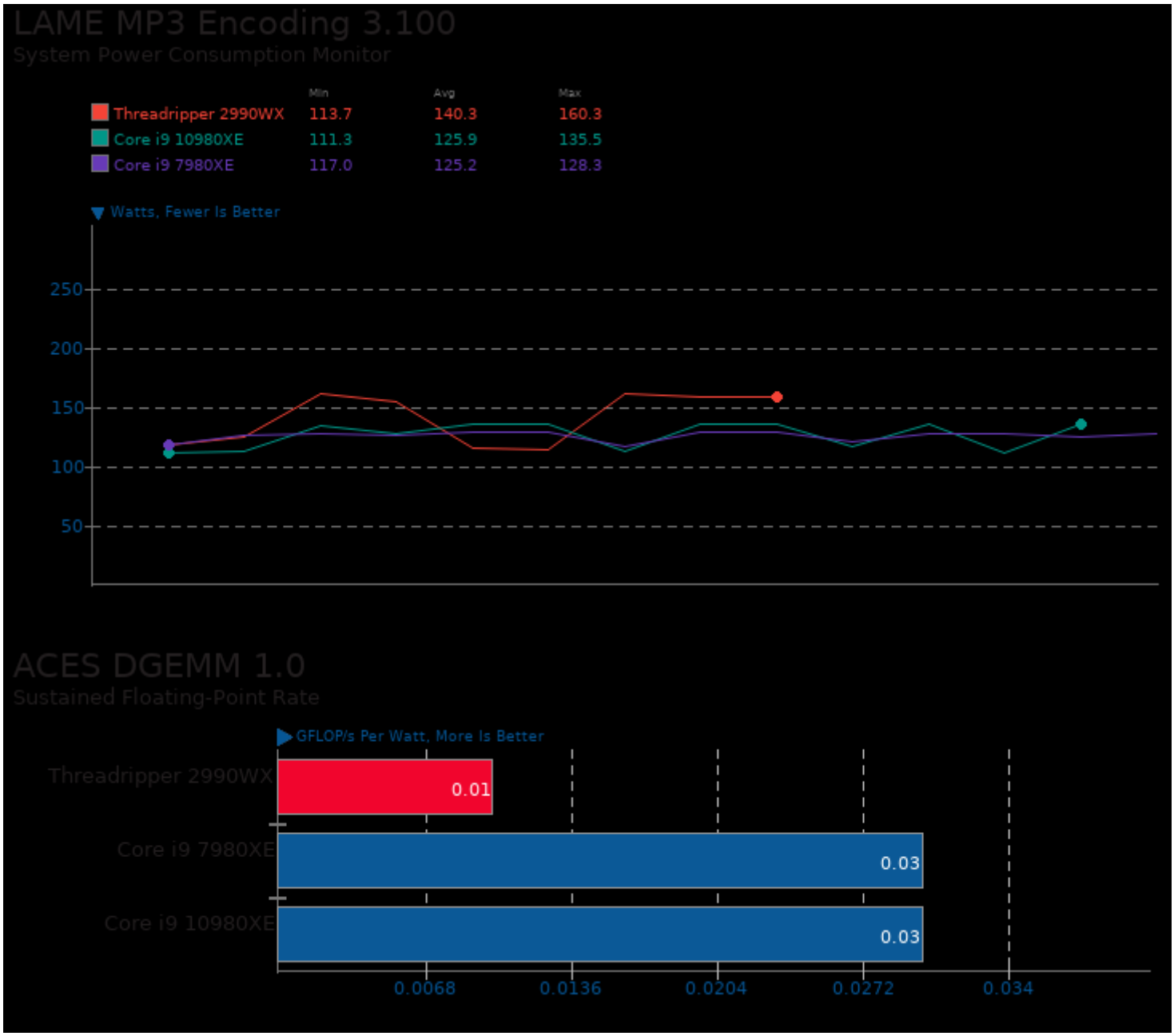
Intel Core i9-10980XE Linux Benchmarks



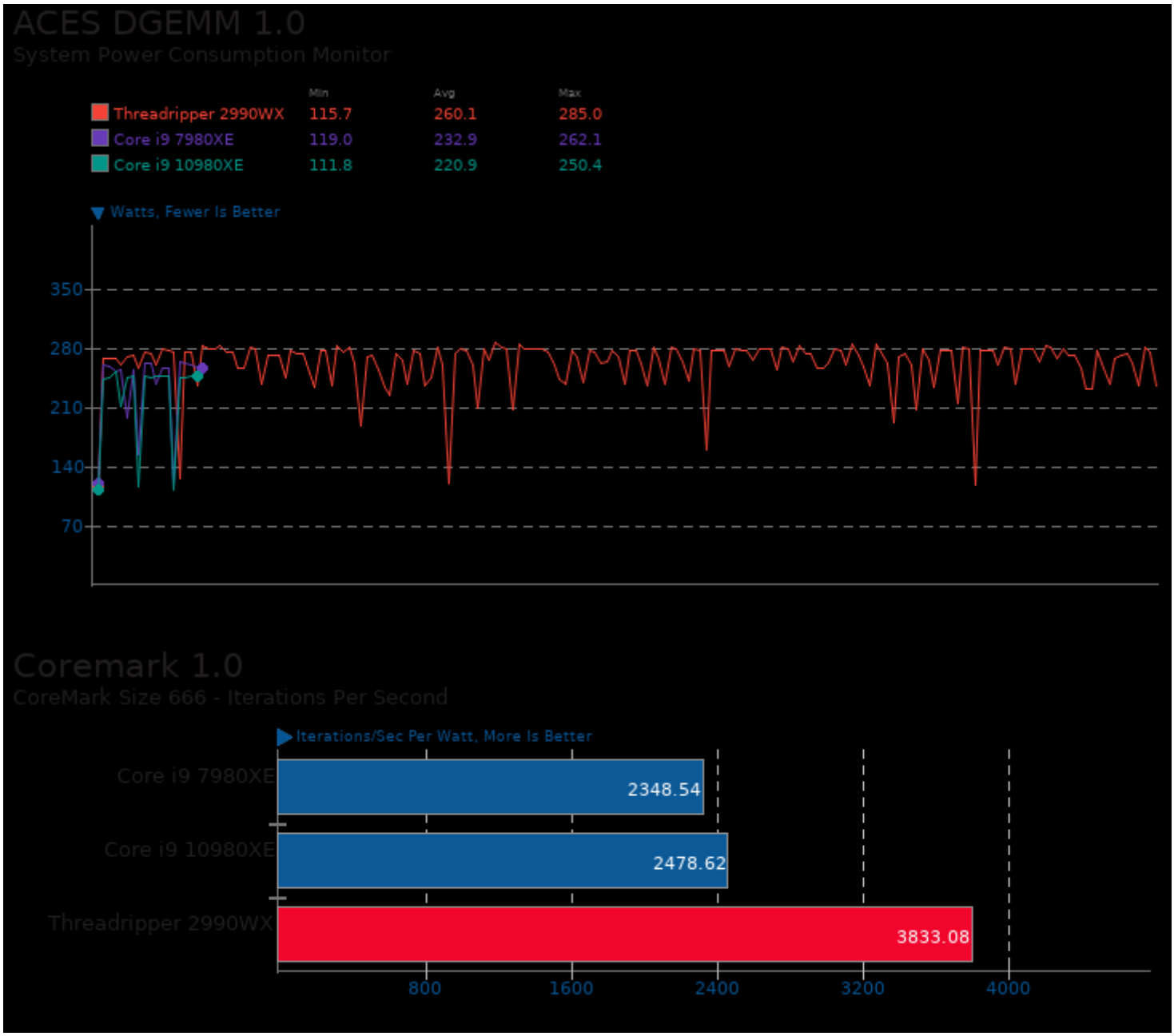
Intel Core i9-10980XE Linux Benchmarks



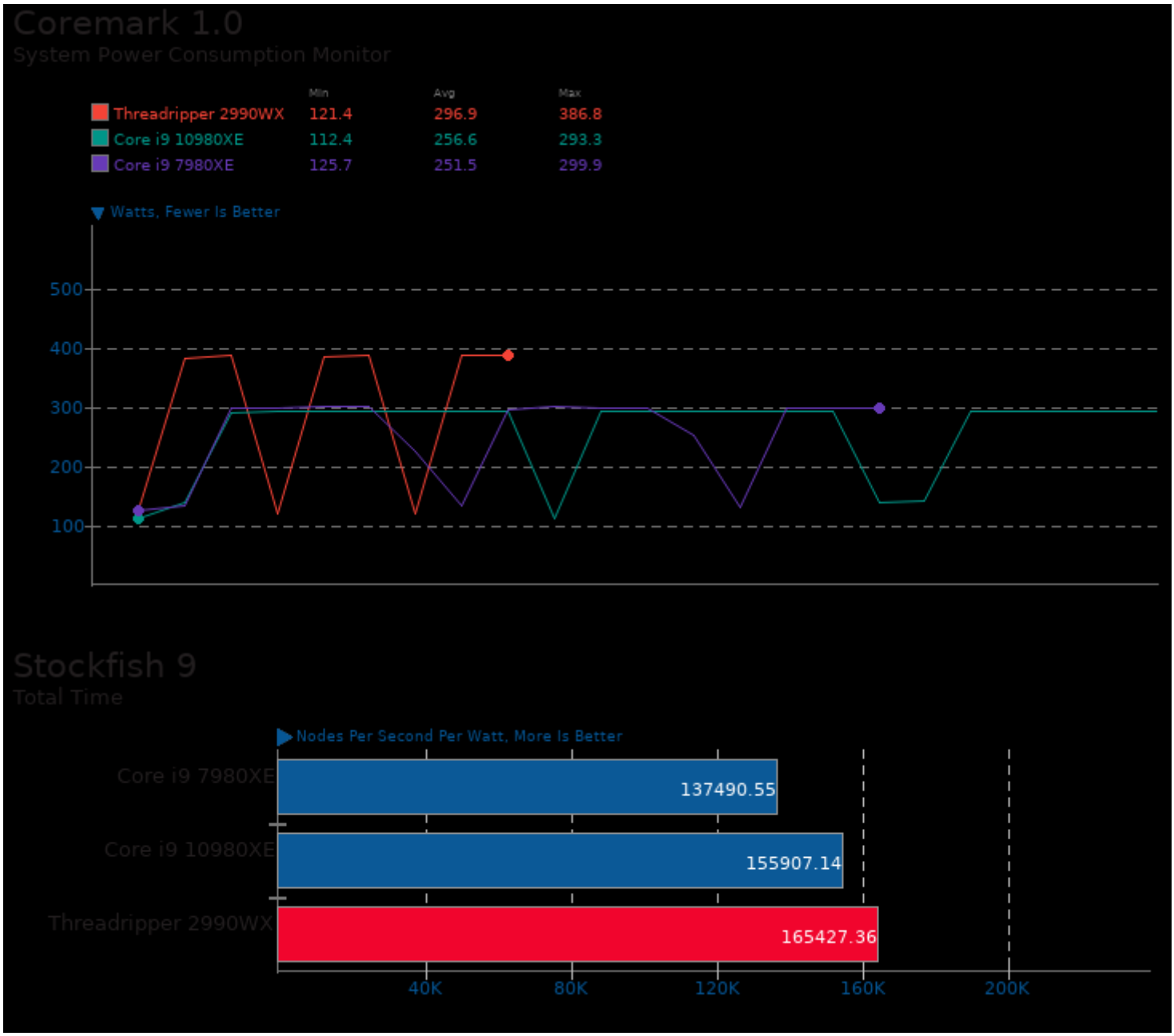
Intel Core i9-10980XE Linux Benchmarks



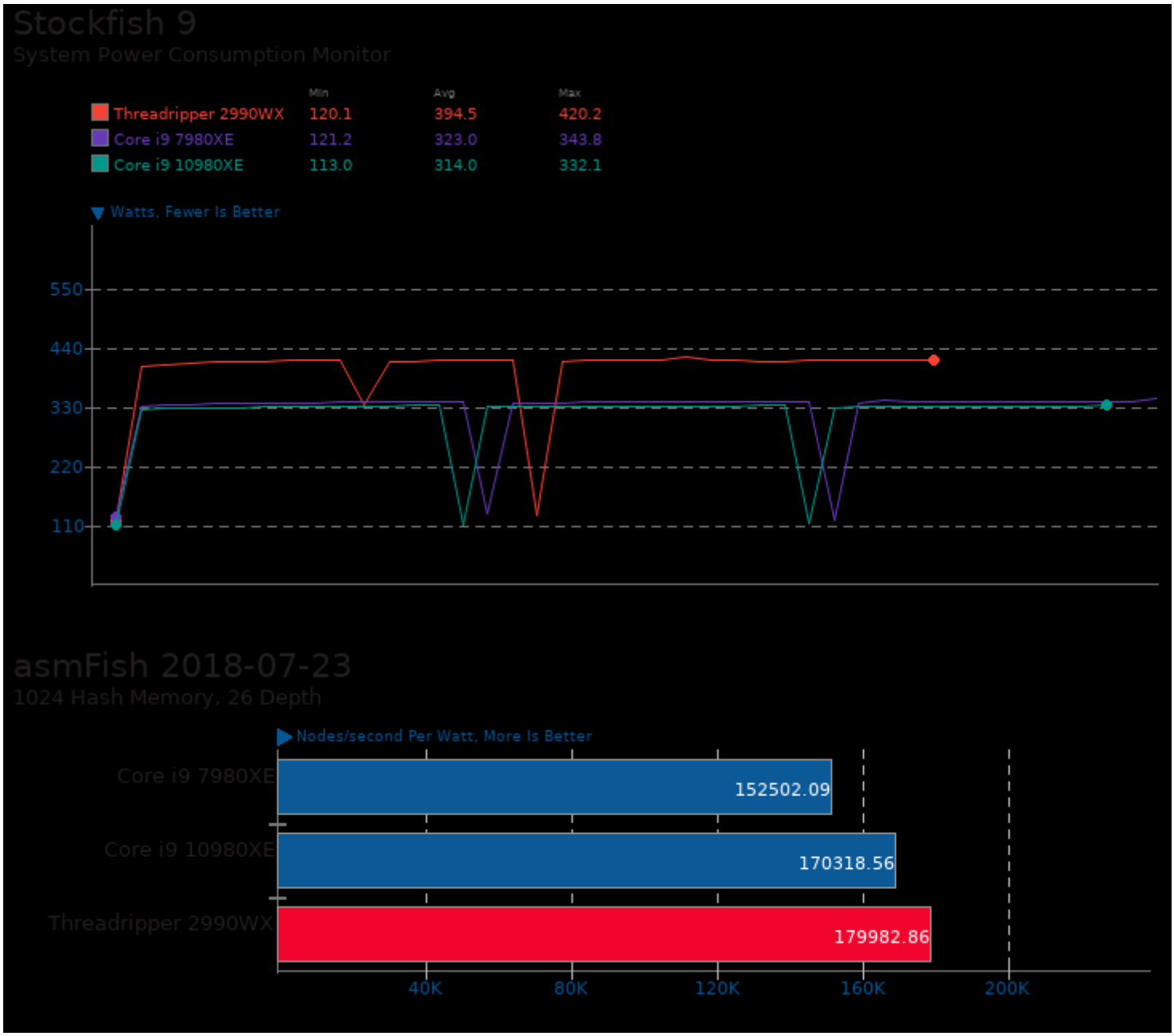
Intel Core i9-10980XE Linux Benchmarks



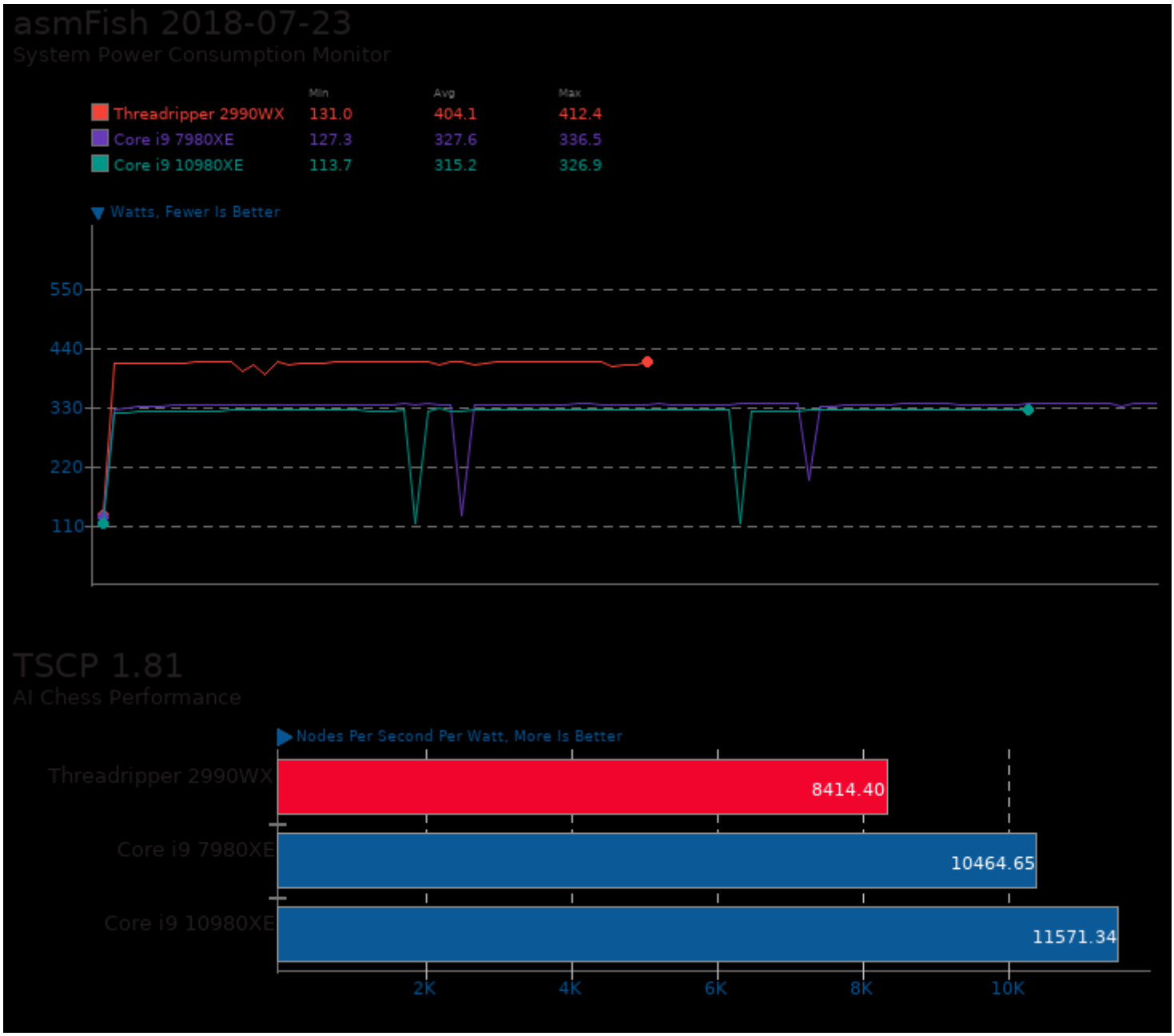
Intel Core i9-10980XE Linux Benchmarks



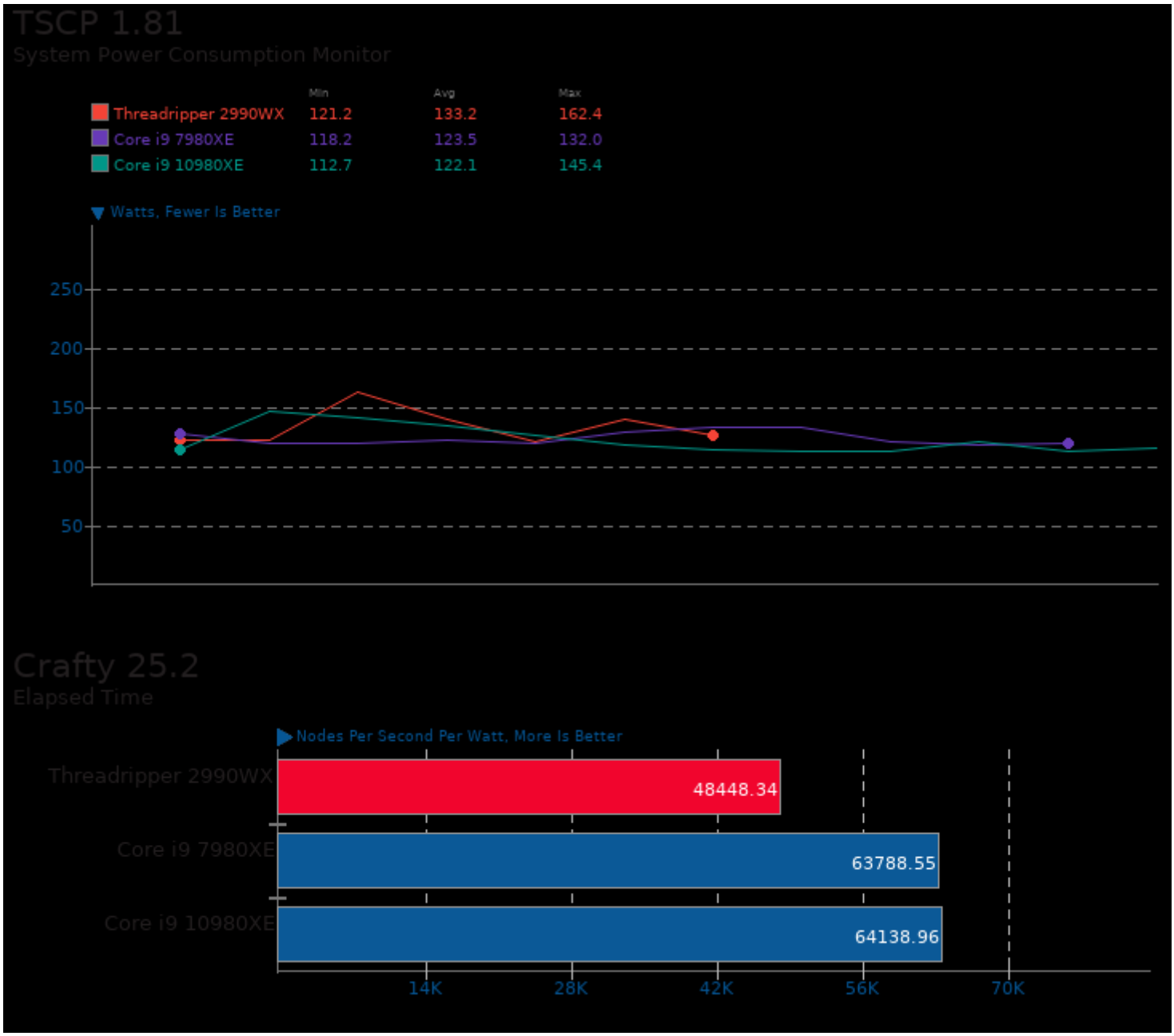
Intel Core i9-10980XE Linux Benchmarks



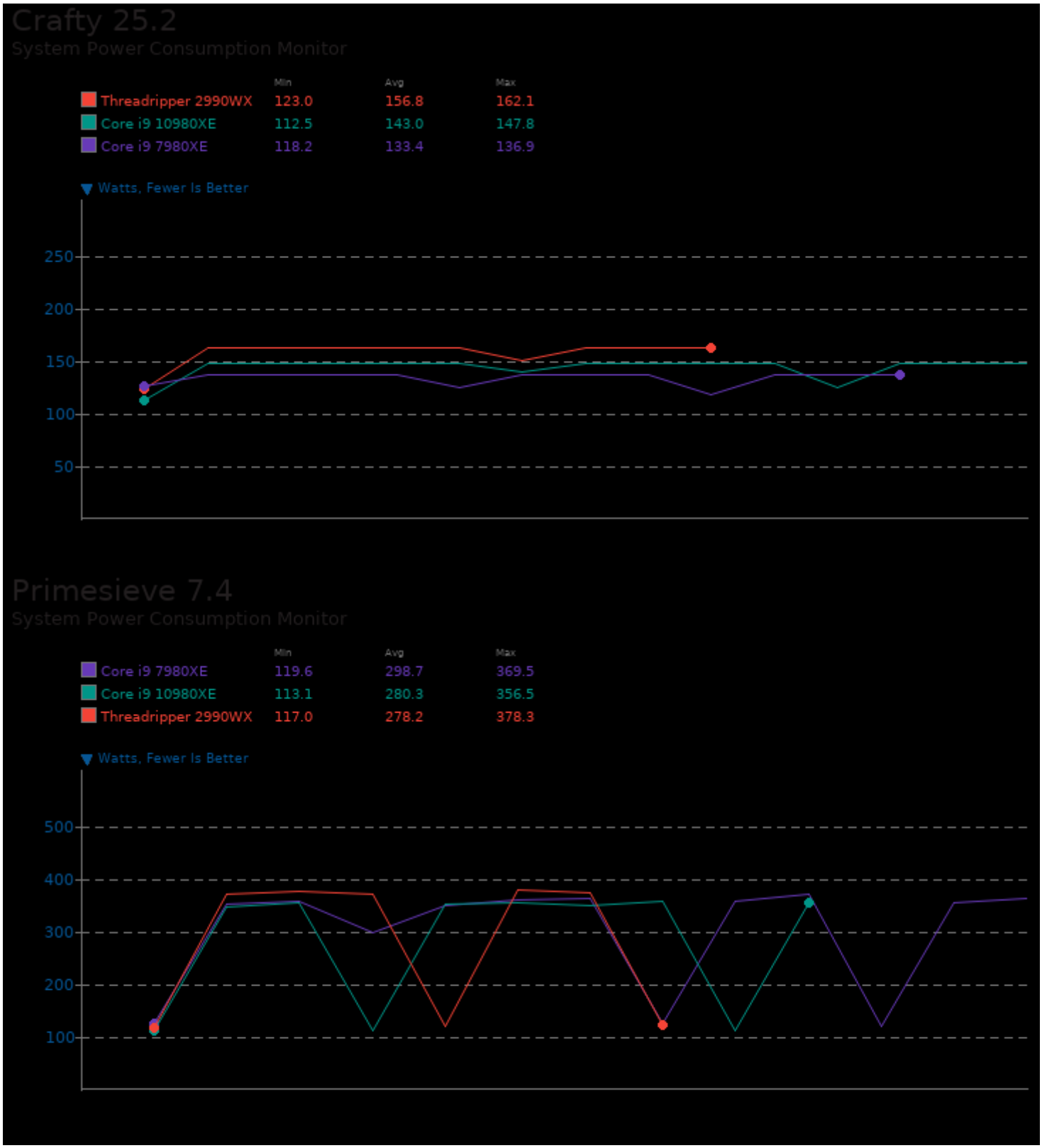
Intel Core i9-10980XE Linux Benchmarks



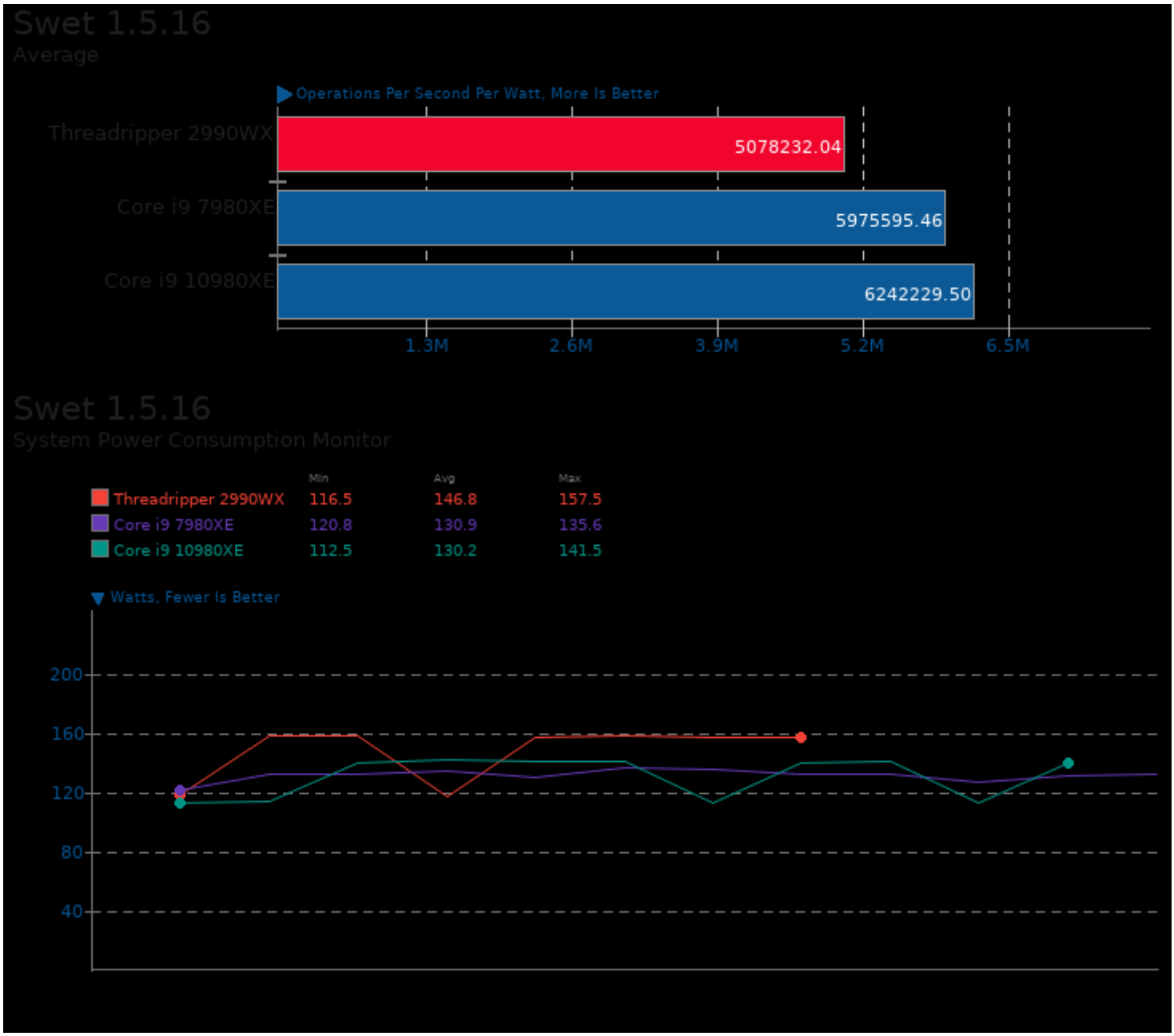
Intel Core i9-10980XE Linux Benchmarks



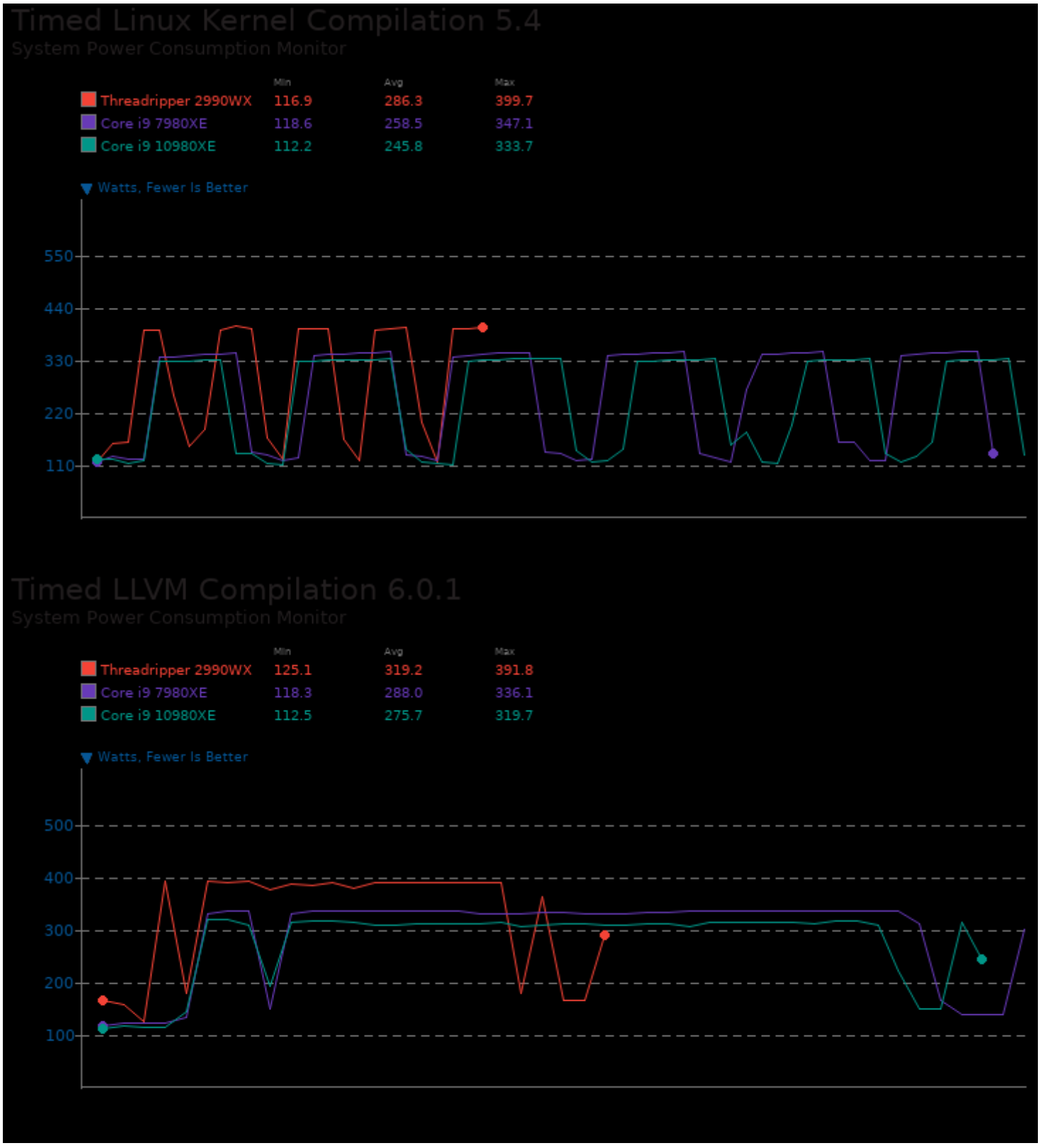
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

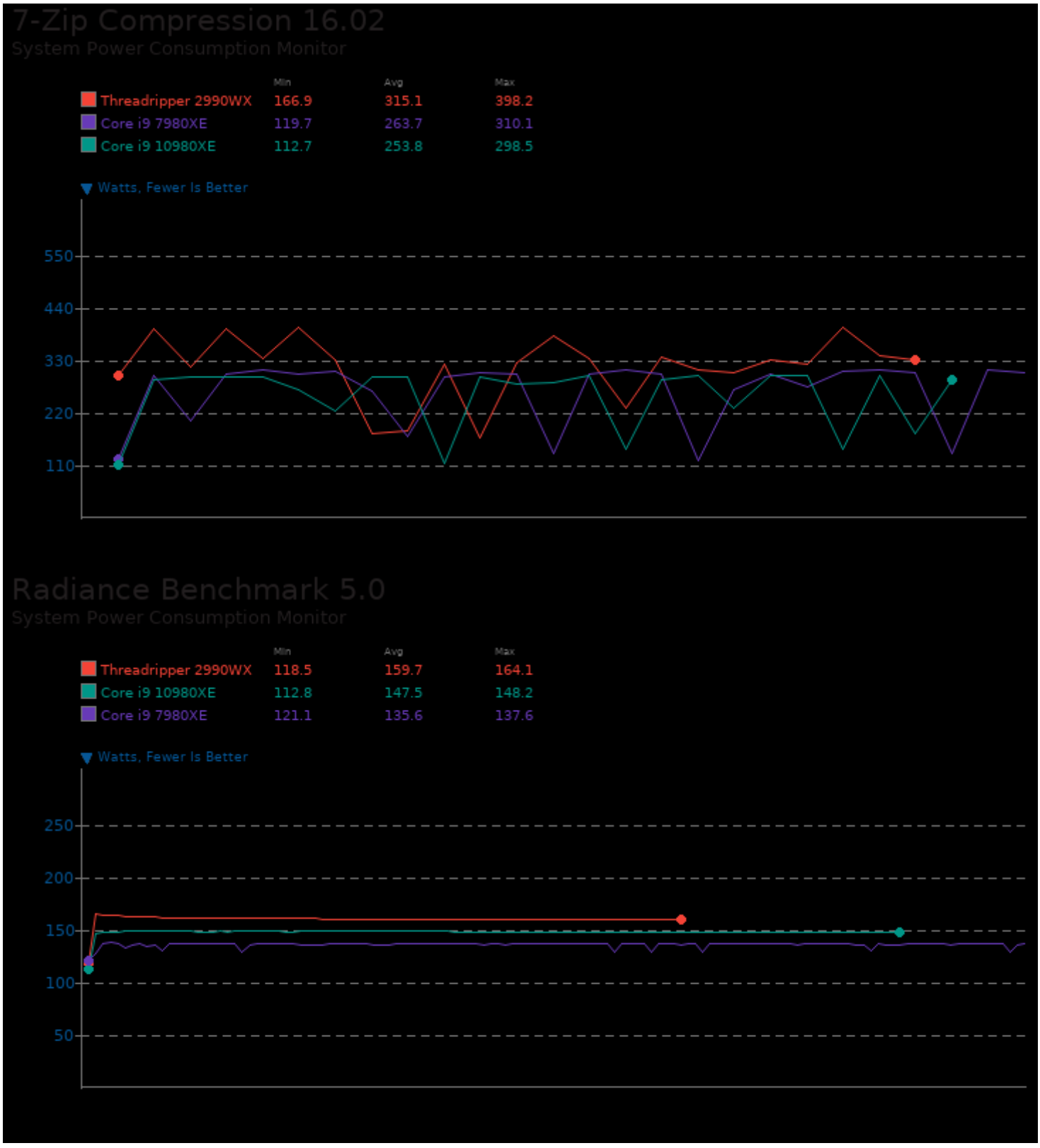


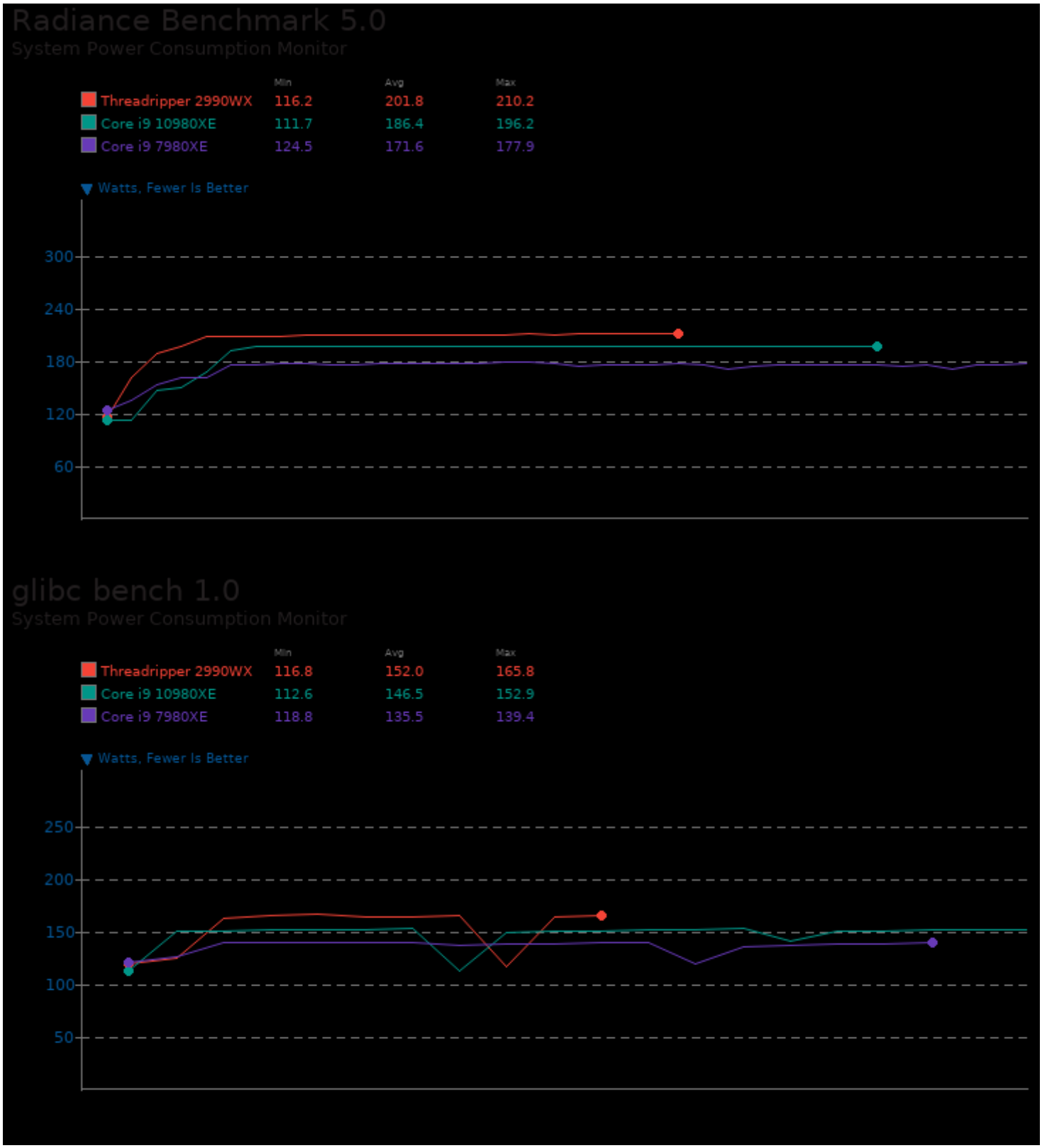
Intel Core i9-10980XE Linux Benchmarks



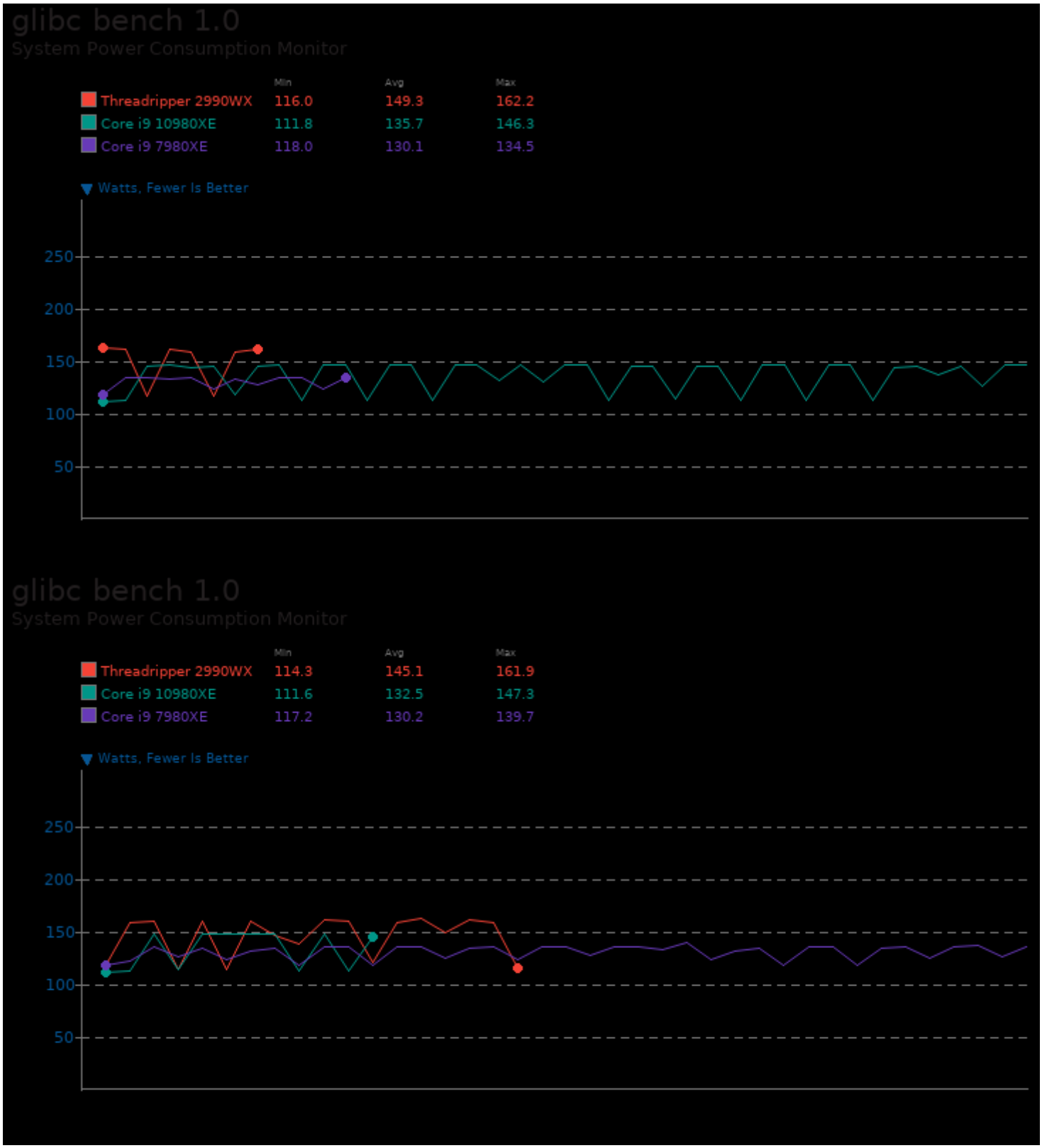

Timed PHP Compilation 7.1.9
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 121.3 211.2 394.5
Core i9 7980XE 118.8 179.2 342.8
Core i9 10980XE 112.5 178.0 325.8
Watts, Fewer Is Better
550
440
330
220
110
7-Zip Compression 16.02
Compress Speed Test
MIPS Per Watt, More Is Better
Threadripper 2990WX
256.19
Core i9 7980XE
352.69
Core i9 10980XE
381.32
80
160
240
320
400

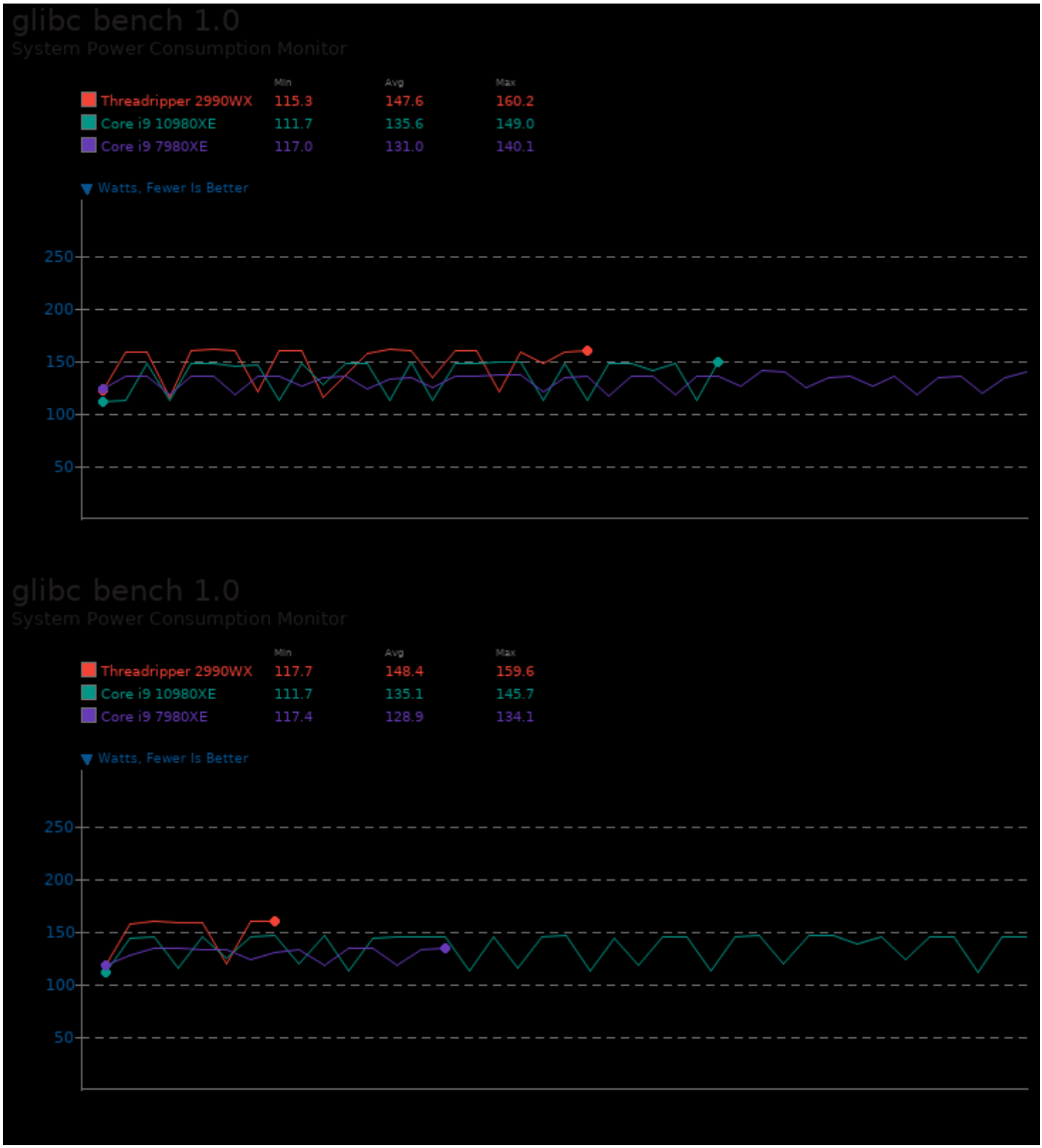
Intel Core i9-10980XE Linux Benchmarks



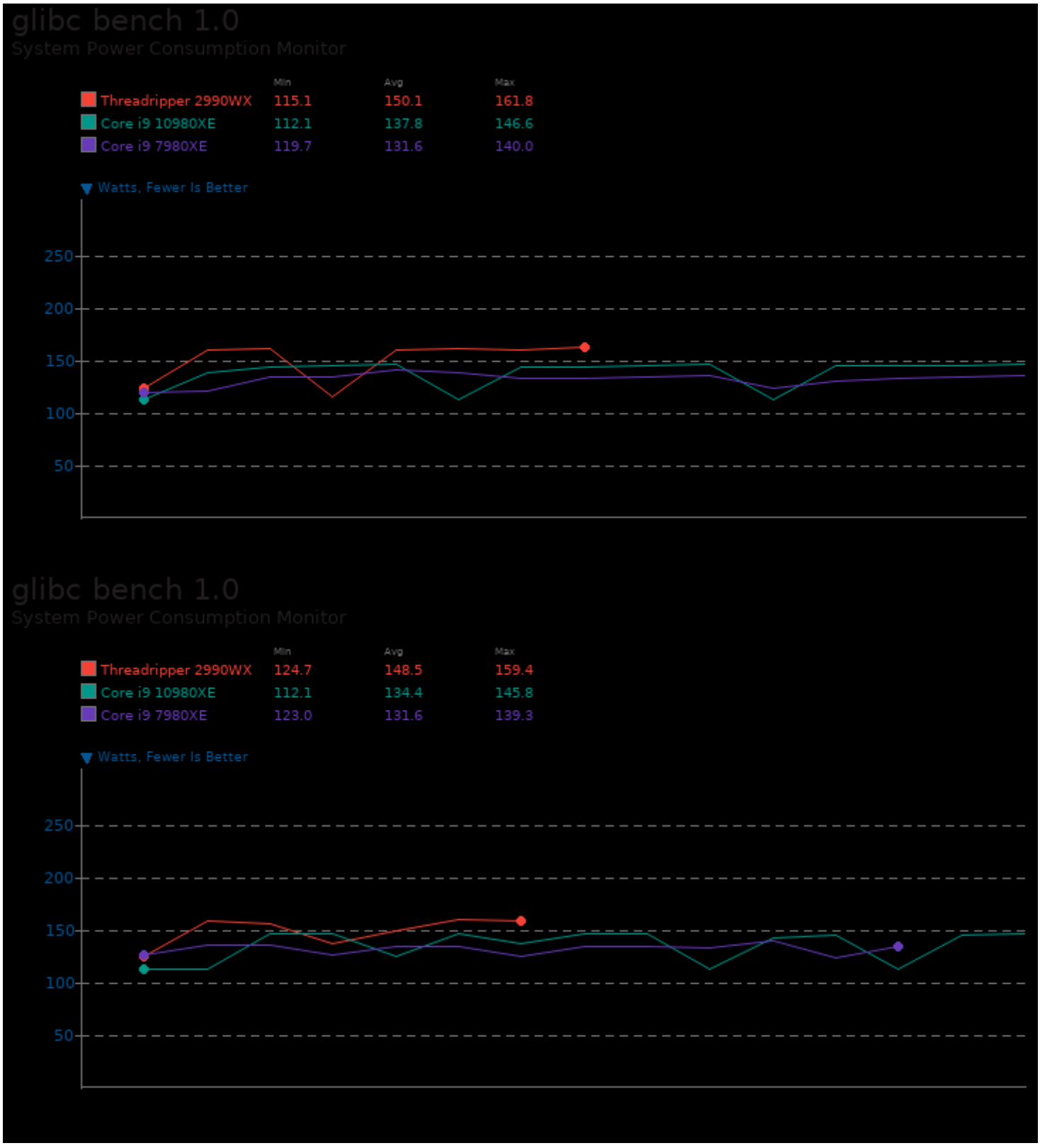

Radiance Benchmark 5.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 116.2 201.8 210.2
Core i9 10980XE 111.7 186.4 196.2
Core i9 7980XE 124.5 171.6 177.9
Watts, Fewer Is Better
300
240
180
120
60
glibc bench 1.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 116.8 152.0 165.8
Core i9 10980XE 112.6 146.5 152.9
Core i9 7980XE 118.8 135.5 139.4
Watts, Fewer Is Better
250
200
150
100
50

Intel Core i9-10980XE Linux Benchmarks




glibc bench 1.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 115.3 147.6 160.2
Core i9 10980XE 111.7 135.6 149.0
Core i9 7980XE 117.0 131.0 140.1
Watts, Fewer Is Better
250
200
150
100
50
glibc bench 1.0
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 117.7 148.4 159.6
Core i9 10980XE 111.7 135.1 145.7
Core i9 7980XE 117.4 128.9 134.1
Watts, Fewer Is Better
250
200
150
100
50

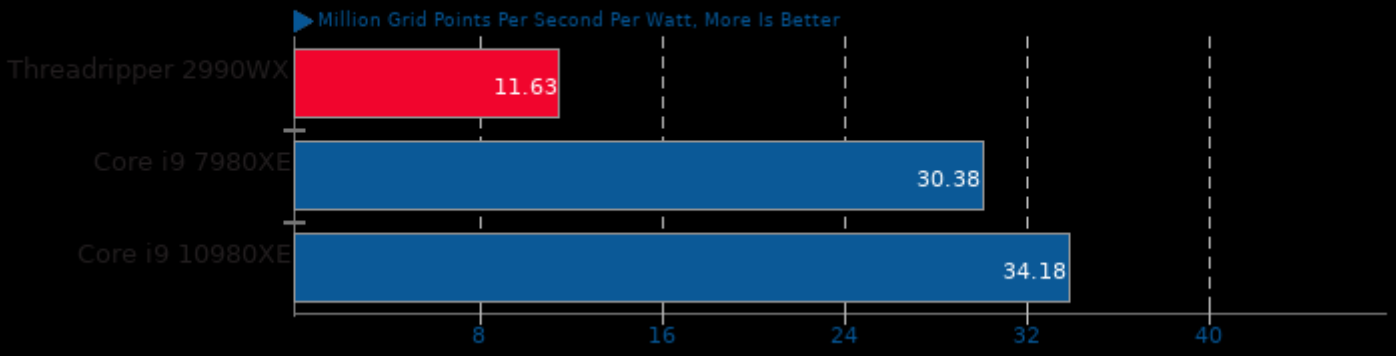
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

ASKAP 2018-11-10

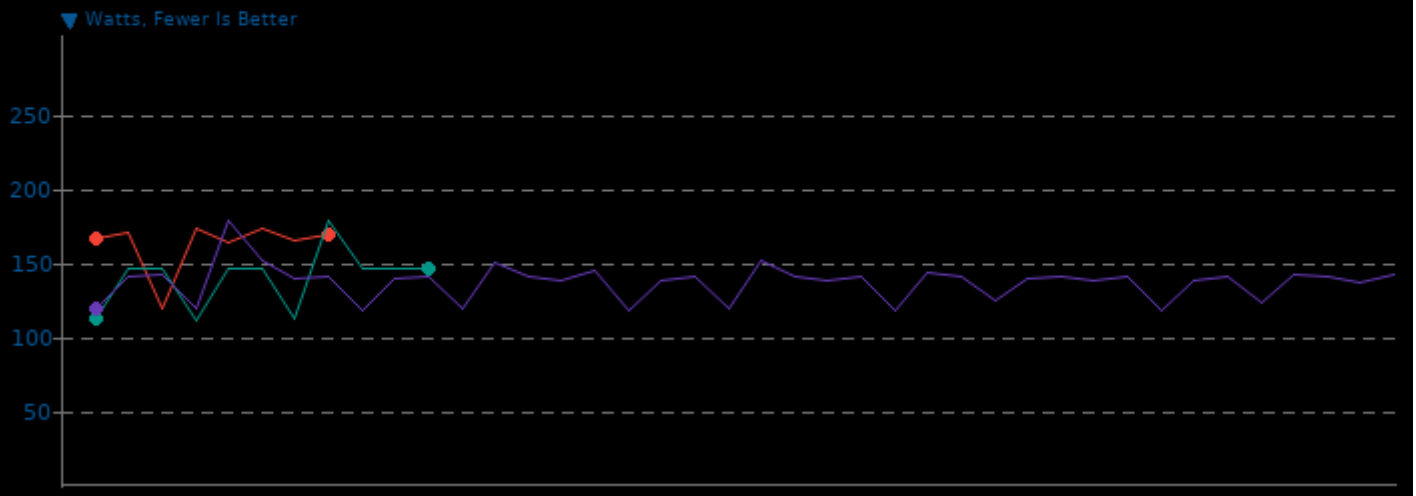
Test: tConvolve OpenMP - Degridding



ASKAP 2018-11-10

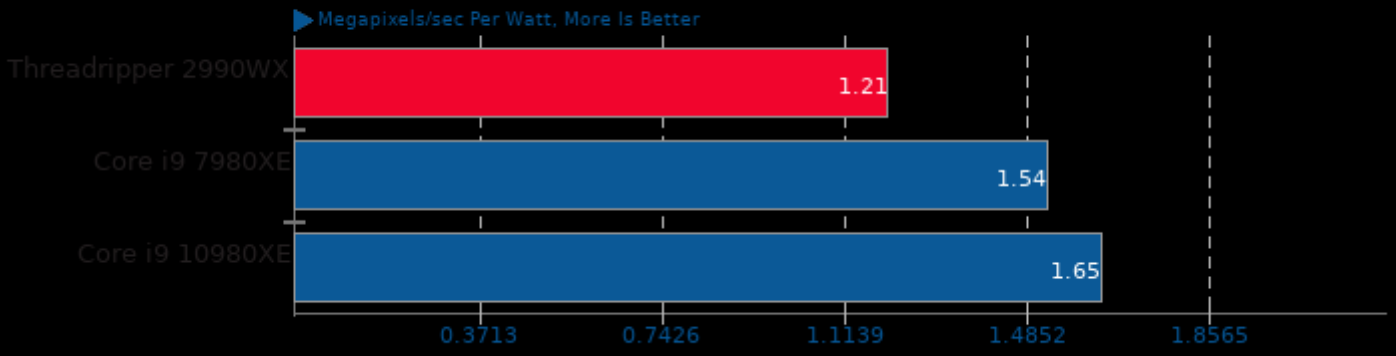
System Power Consumption Monitor

	Min	Avg	Max
Threadripper 2990WX	118.7	162.1	173.2
Core i9 10980XE	111.7	139.7	177.6
Core i9 7980XE	117.8	136.8	178.6

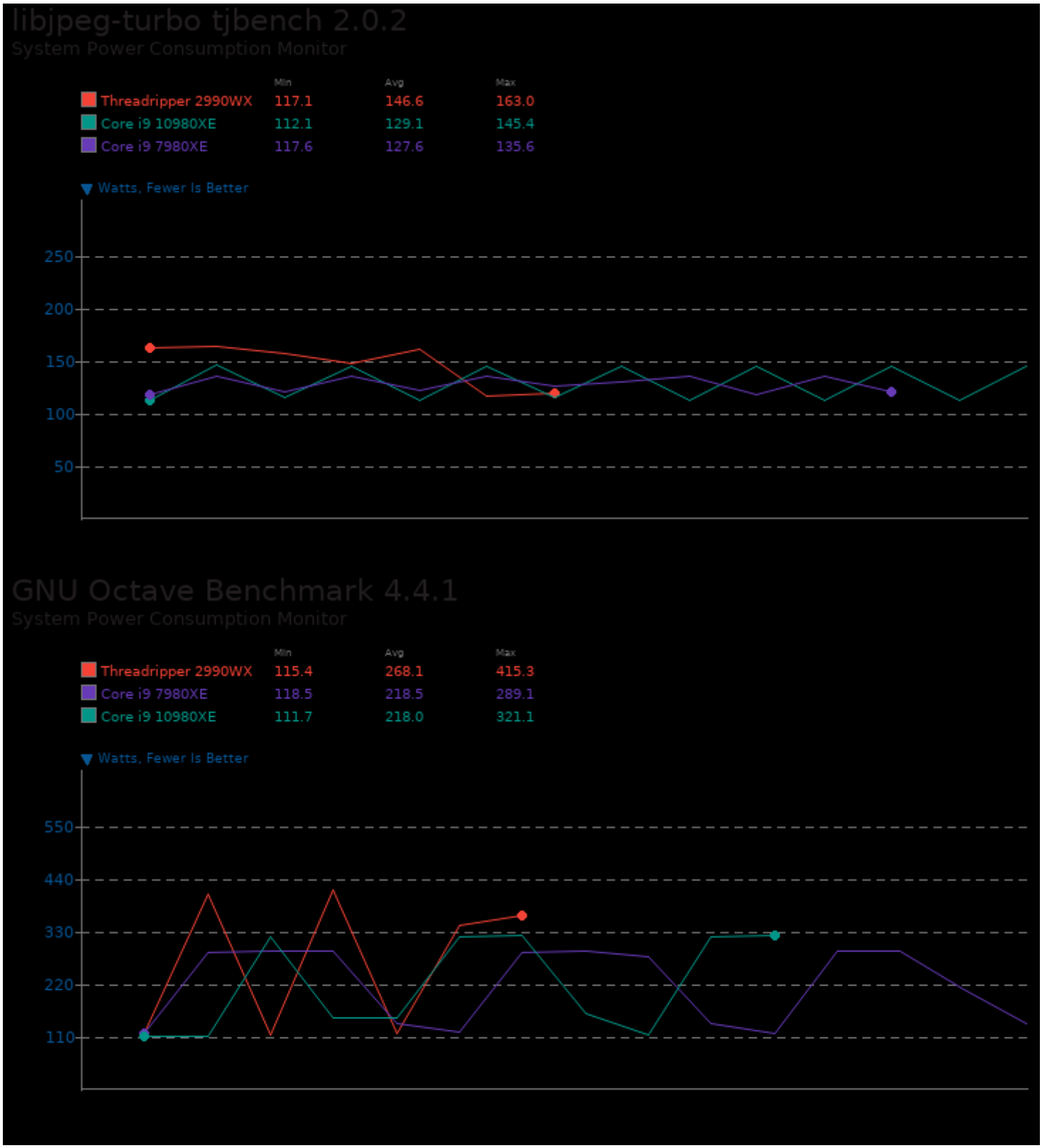


libjpeg-turbo tjbench 2.0.2

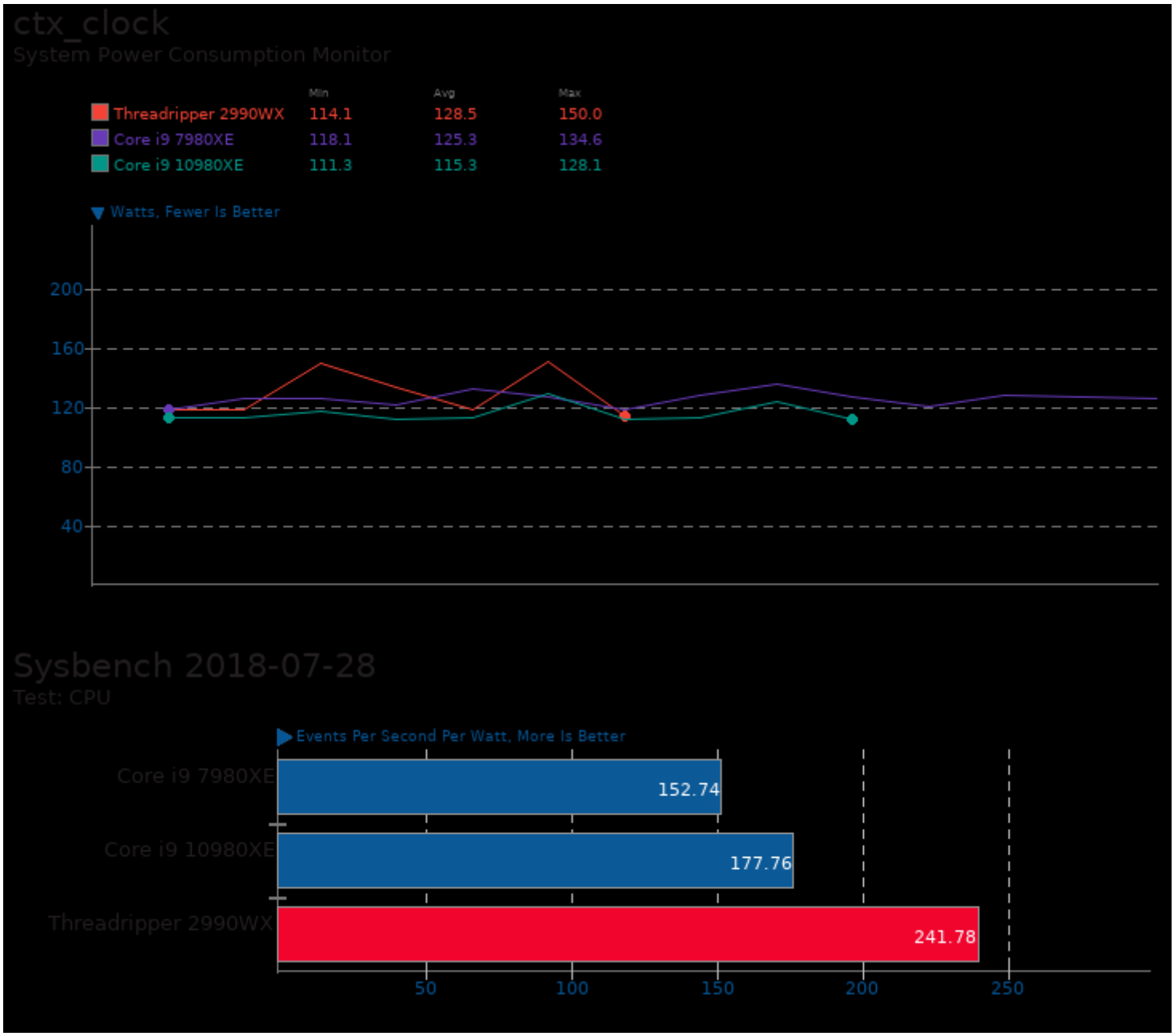
Test: Decompression Throughput

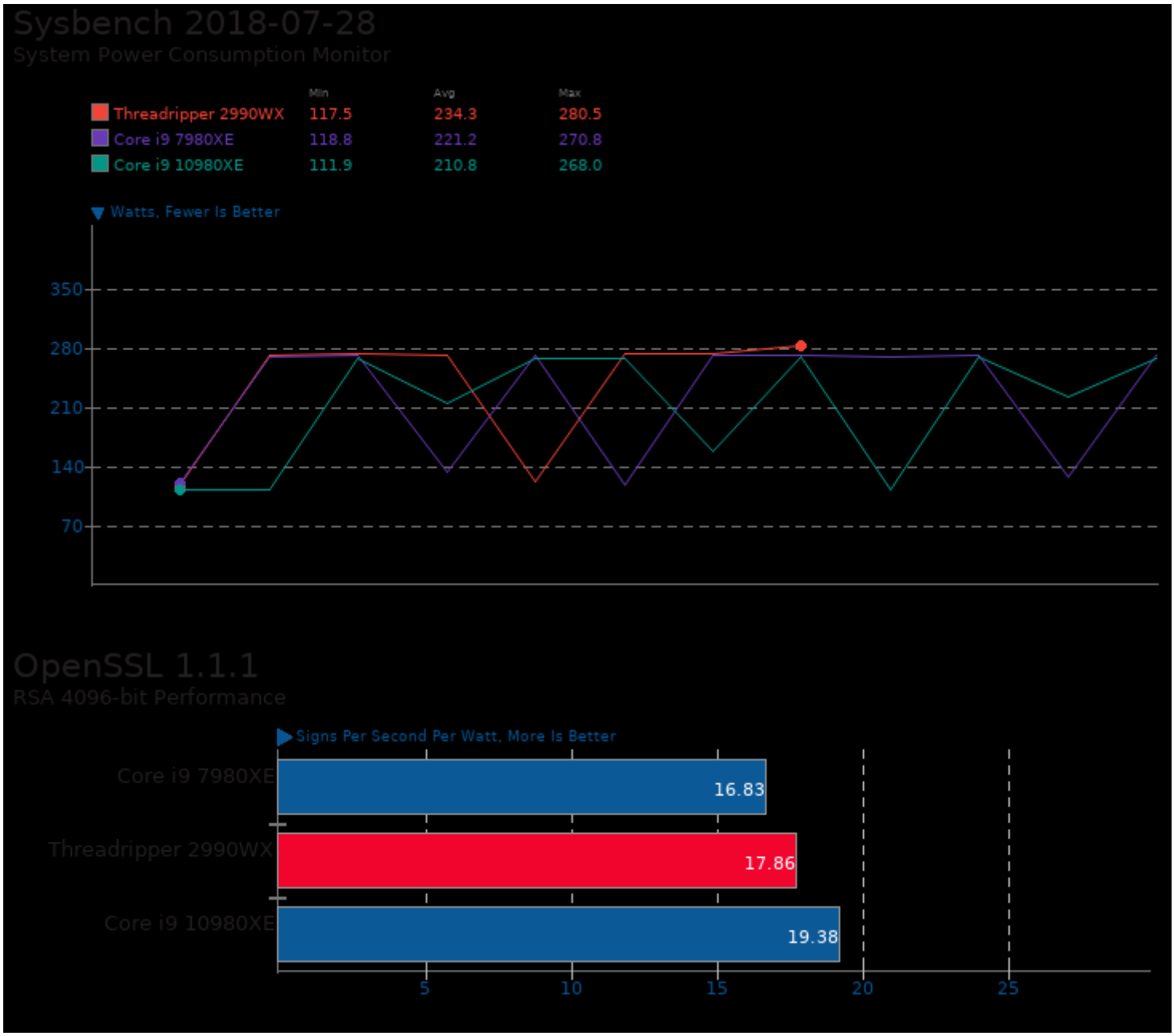


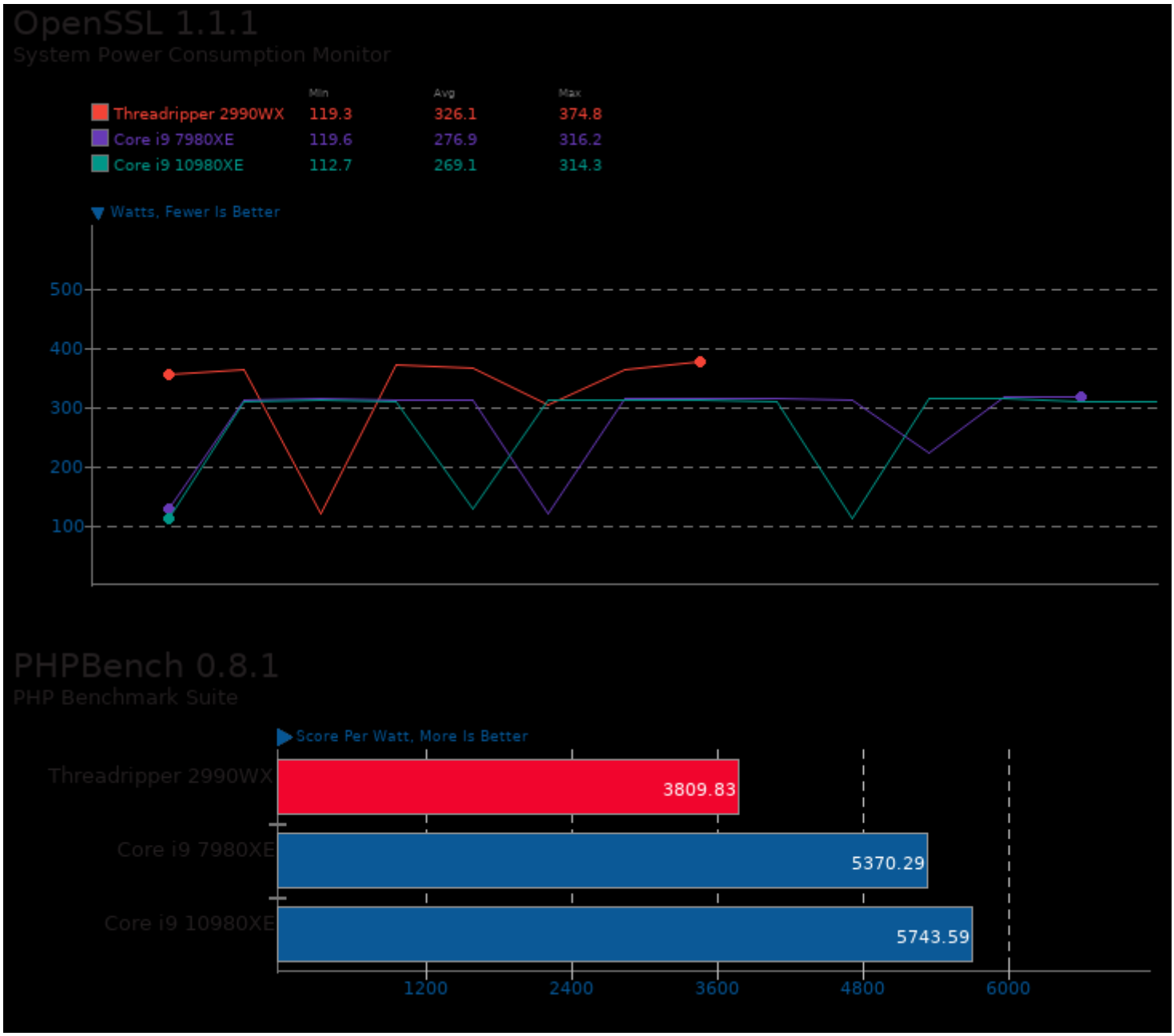
Intel Core i9-10980XE Linux Benchmarks



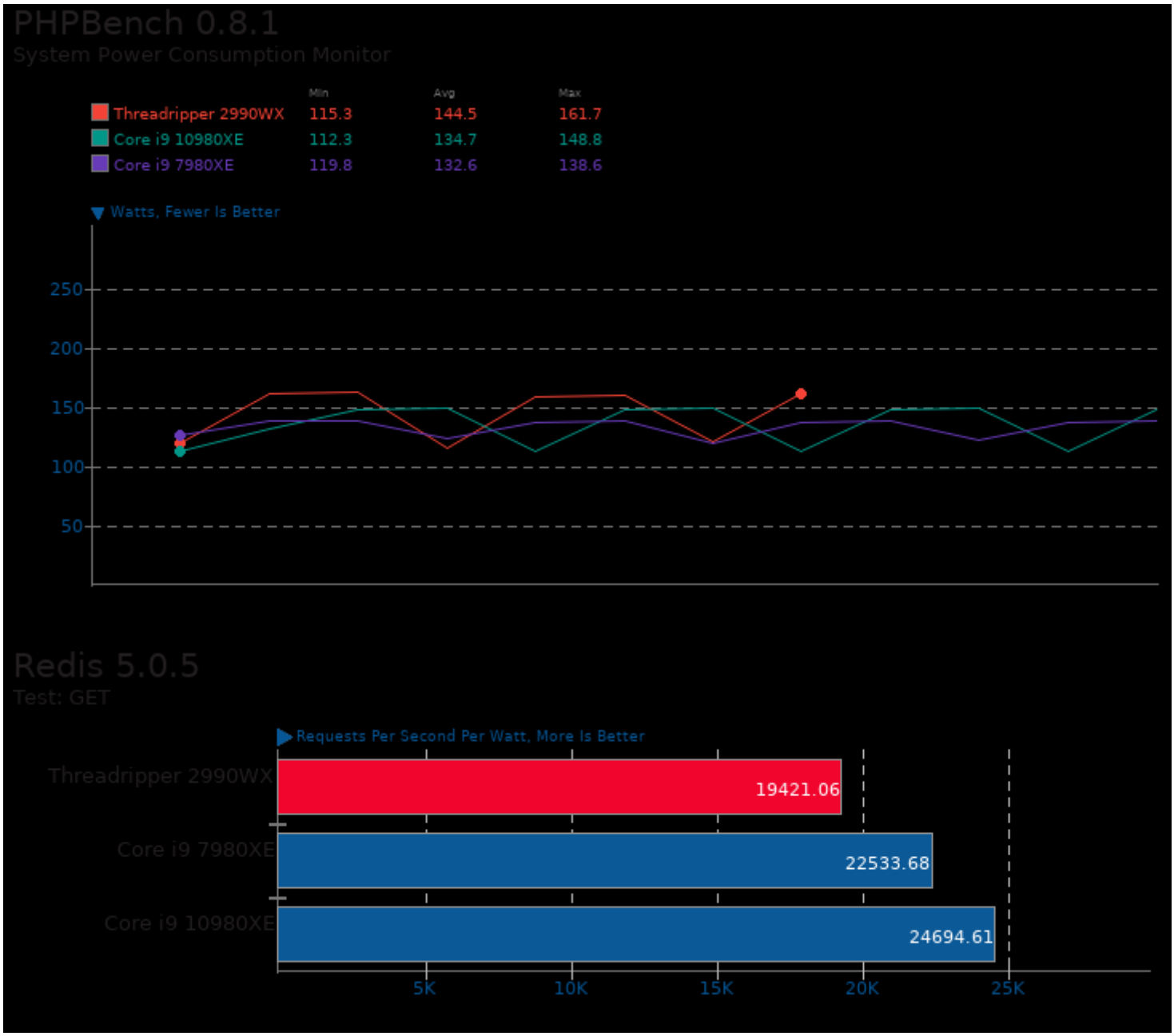
Intel Core i9-10980XE Linux Benchmarks

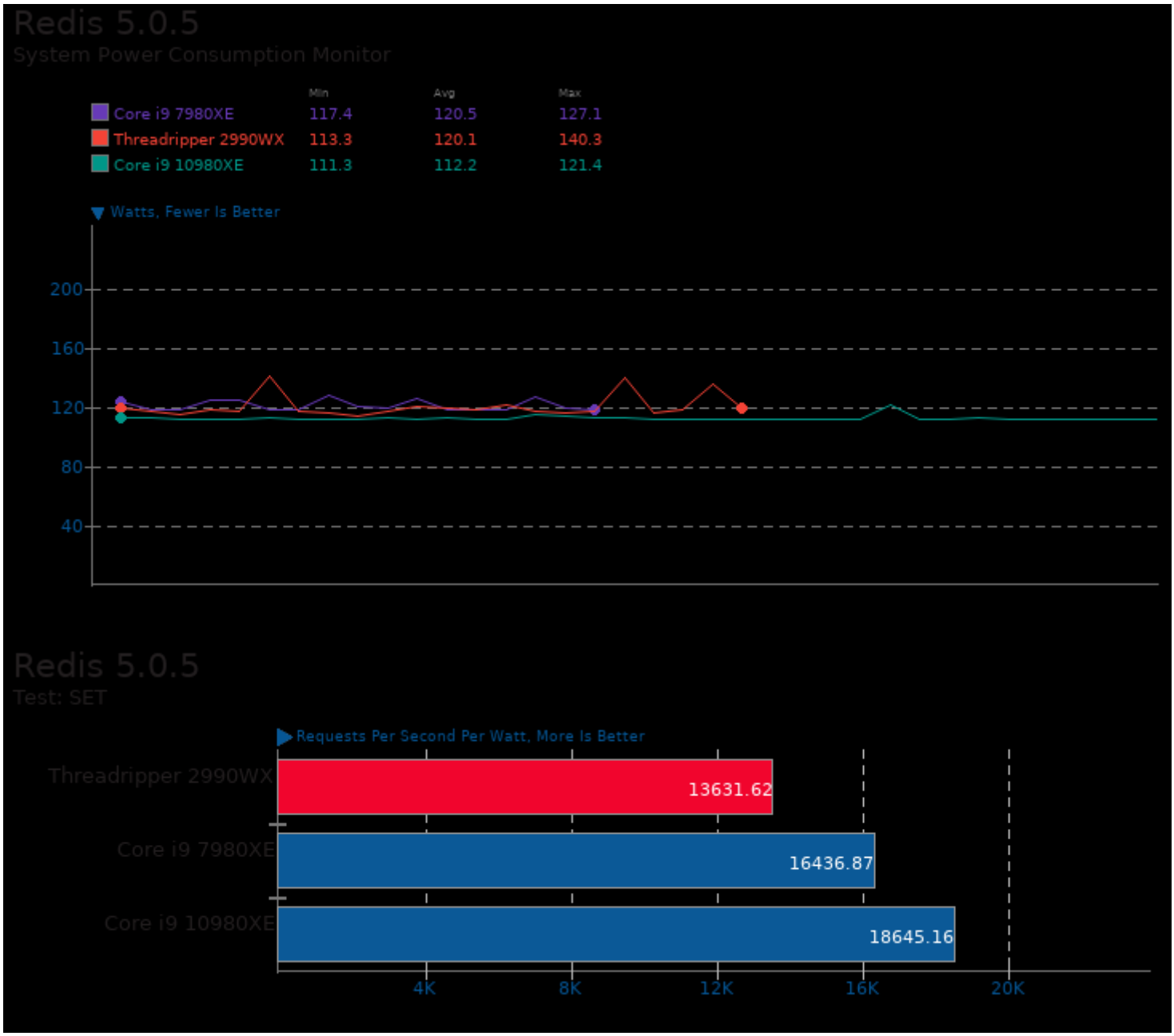


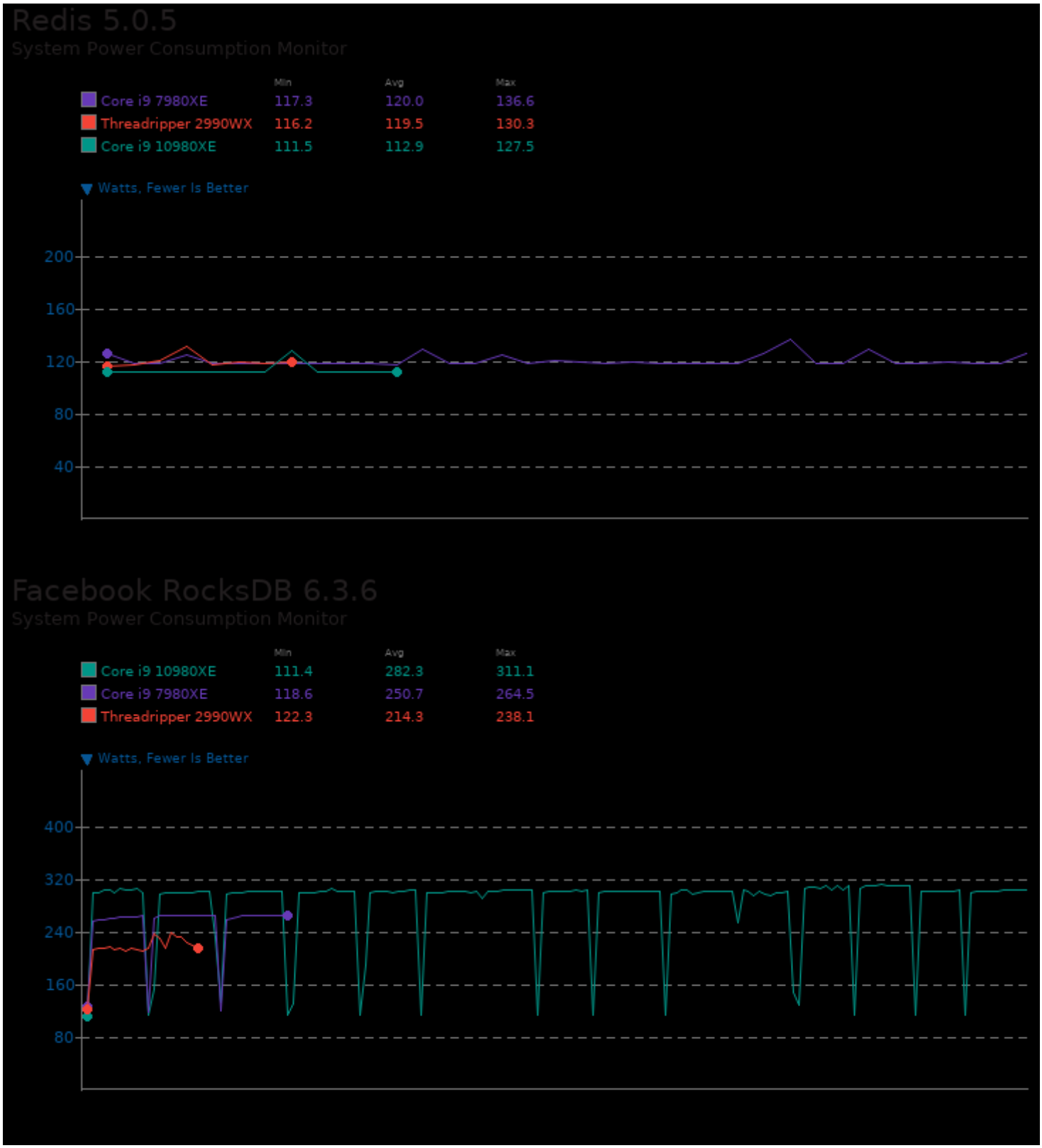

Sysbench 2018-07-28
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 117.5 234.3 280.5
Core i9 7980XE 118.8 221.2 270.8
Core i9 10980XE 111.9 210.8 268.0
Watts, Fewer Is Better
350
280
210
140
70
OpenSSL 1.1.1
RSA 4096-bit Performance
Signs Per Second Per Watt, More Is Better
Core i9 7980XE
16.83
Threadripper 2990WX
17.86
Core i9 10980XE
19.38
5
10
15
20
25


OpenSSL 1.1.1
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 119.3 326.1 374.8
Core i9 7980XE 119.6 276.9 316.2
Core i9 10980XE 112.7 269.1 314.3
Watts, Fewer Is Better
500
400
300
200
100
PHPBench 0.8.1
PHP Benchmark Suite
Score Per Watt, More Is Better
Threadripper 2990WX
3809.83
Core i9 7980XE
5370.29
Core i9 10980XE
5743.59
1200
2400
3600
4800
6000

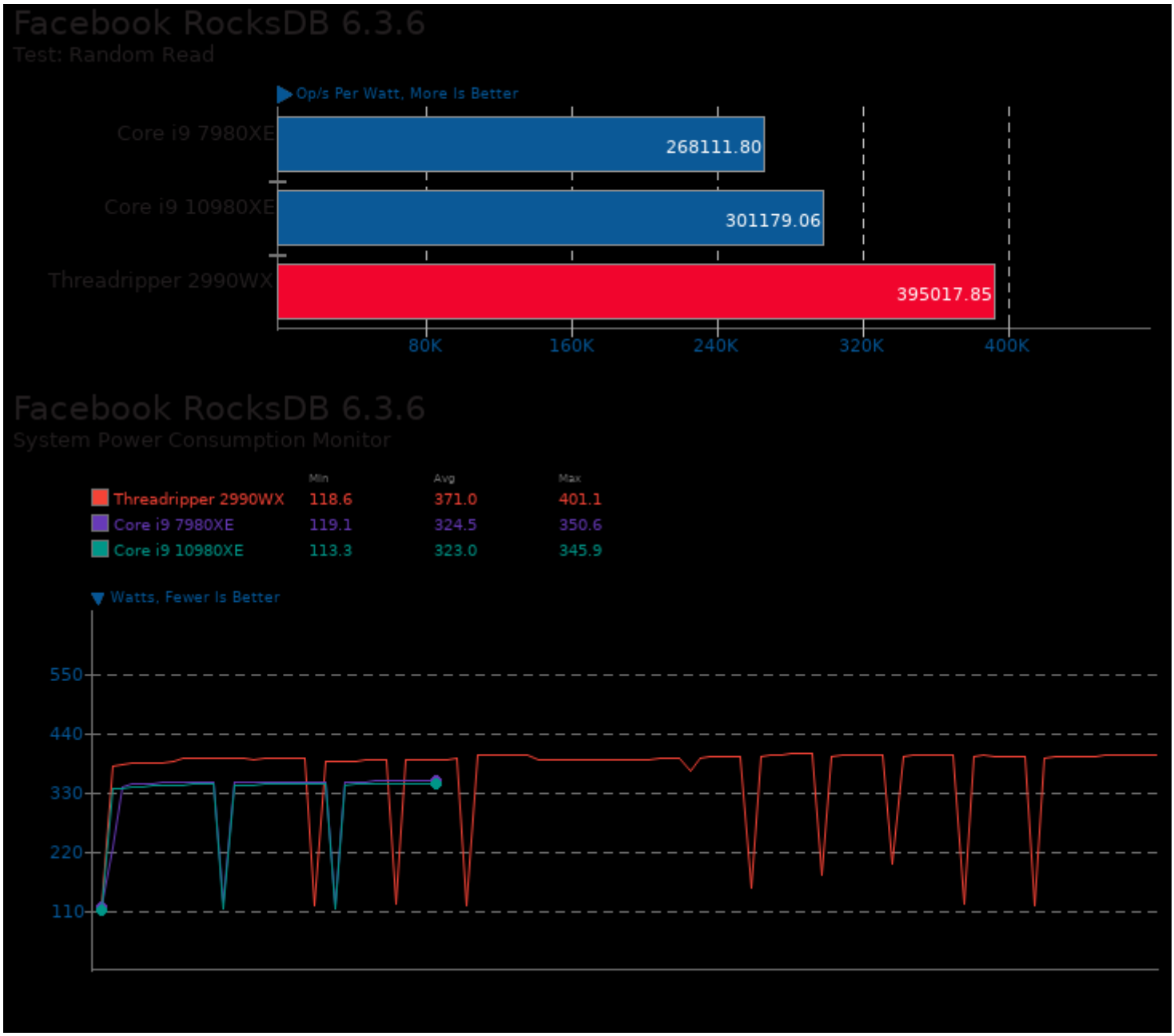
Intel Core i9-10980XE Linux Benchmarks




Redis 5.0.5
System Power Consumption Monitor
Min
Avg
Max
Core i9 7980XE 117.4 120.5 127.1
Threadripper 2990WX 113.3 120.1 140.3
Core i9 10980XE 111.3 112.2 121.4
Watts, Fewer Is Better
200
160
120
80
40
Redis 5.0.5
Test: SET
Requests Per Second Per Watt, More Is Better
Threadripper 2990WX
13631.62
Core i9 7980XE
16436.87
Core i9 10980XE
18645.16
4K
8K
12K
16K
20K

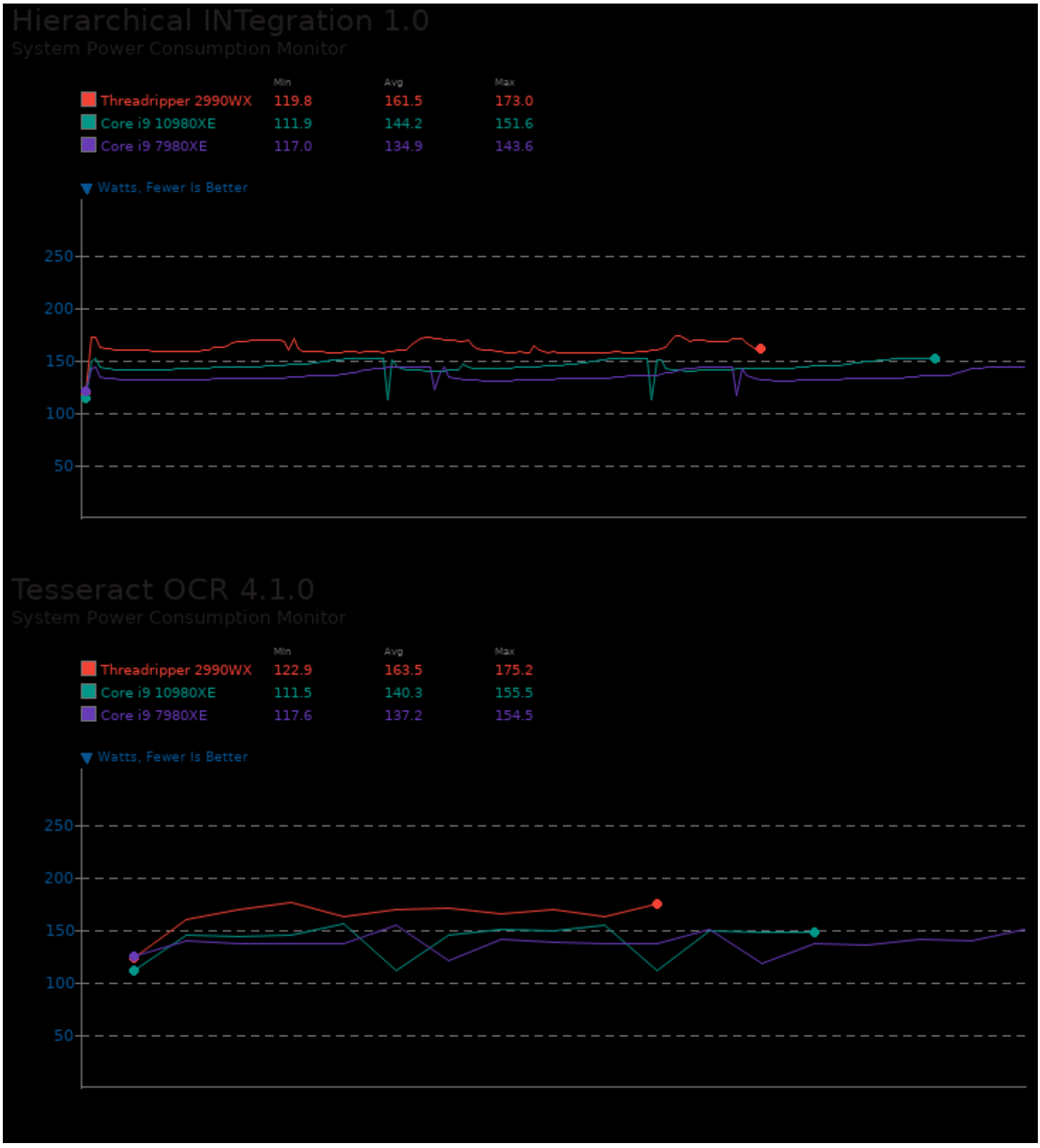

Redis 5.0.5
System Power Consumption Monitor
Min
Avg
Max
Core i9 7980XE 117.3 120.0 136.6
Threadripper 2990WX 116.2 119.5 130.3
Core i9 10980XE 111.5 112.9 127.5
Watts, Fewer Is Better
200
160
120
80
40
Facebook RocksDB 6.3.6
System Power Consumption Monitor
Min
Avg
Max
Core i9 10980XE 111.4 282.3 311.1
Core i9 7980XE 118.6 250.7 264.5
Threadripper 2990WX 122.3 214.3 238.1
Watts, Fewer Is Better
400
320
240
160
80

Intel Core i9-10980XE Linux Benchmarks



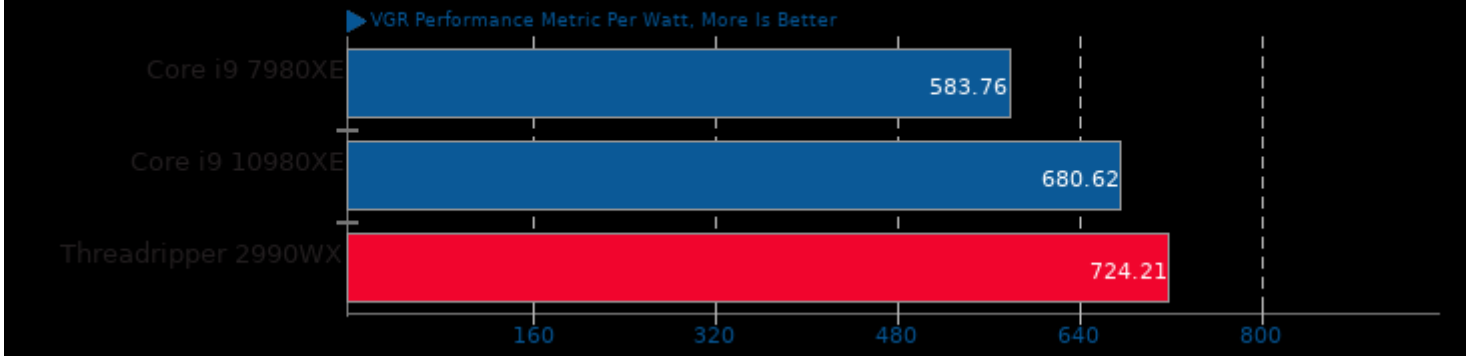

Facebook RocksDB 6.3.6
System Power Consumption Monitor
Min
Avg
Max
Core i9 10980XE
113.3
262.5
302.6
Core i9 7980XE
120.6
233.3
262.9
Threadripper 2990WX
118.6
207.7
219.8
Watts, Fewer Is Better
400
320
240
160
80
Hierarchical INTegration 1.0
Test: DOUBLE
QUIPs Per Watt, More Is Better
Threadripper 2990WX
5184196.18
Core i9 10980XE
7145784.02
Core i9 7980XE
7204700.78
1.5M
3M
4.5M
6M
7.5M

Intel Core i9-10980XE Linux Benchmarks



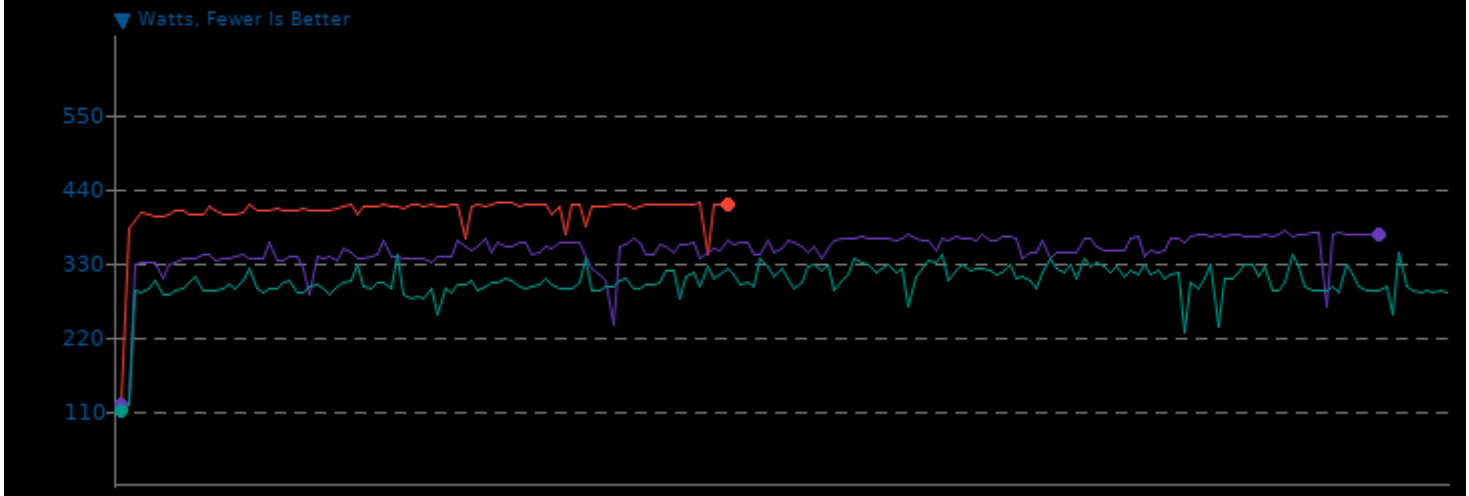
Intel Core i9-10980XE Linux Benchmarks

BRL-CAD 7.28.0
VGR Performance Metric

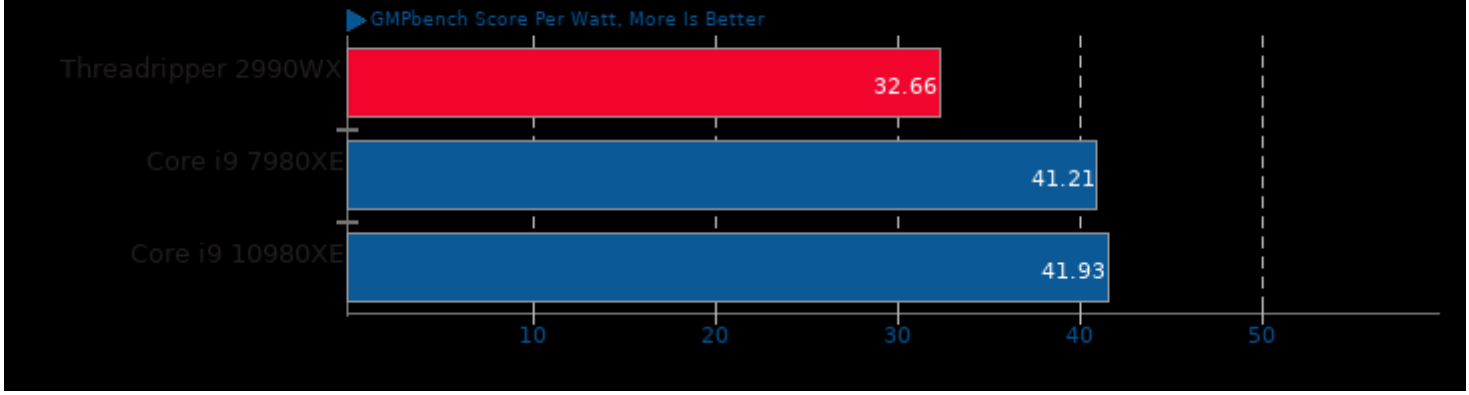


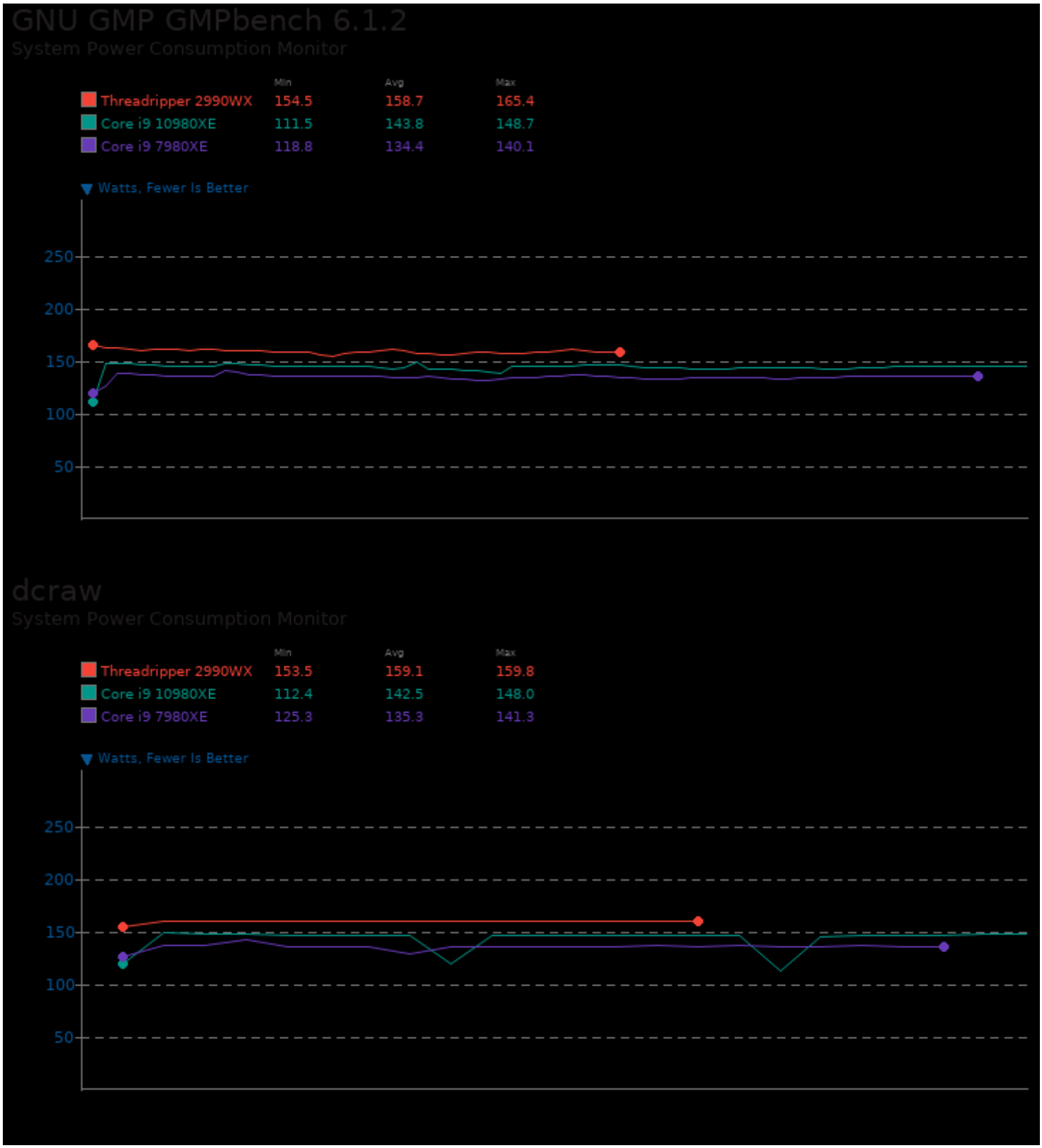
BRL-CAD 7.28.0
System Power Consumption Monitor

	Min	Avg	Max
Threadripper 2990WX	116.5	404.9	418.2
Core i9 7980XE	120.6	348.4	376.5
Core i9 10980XE	111.7	301.8	344.1

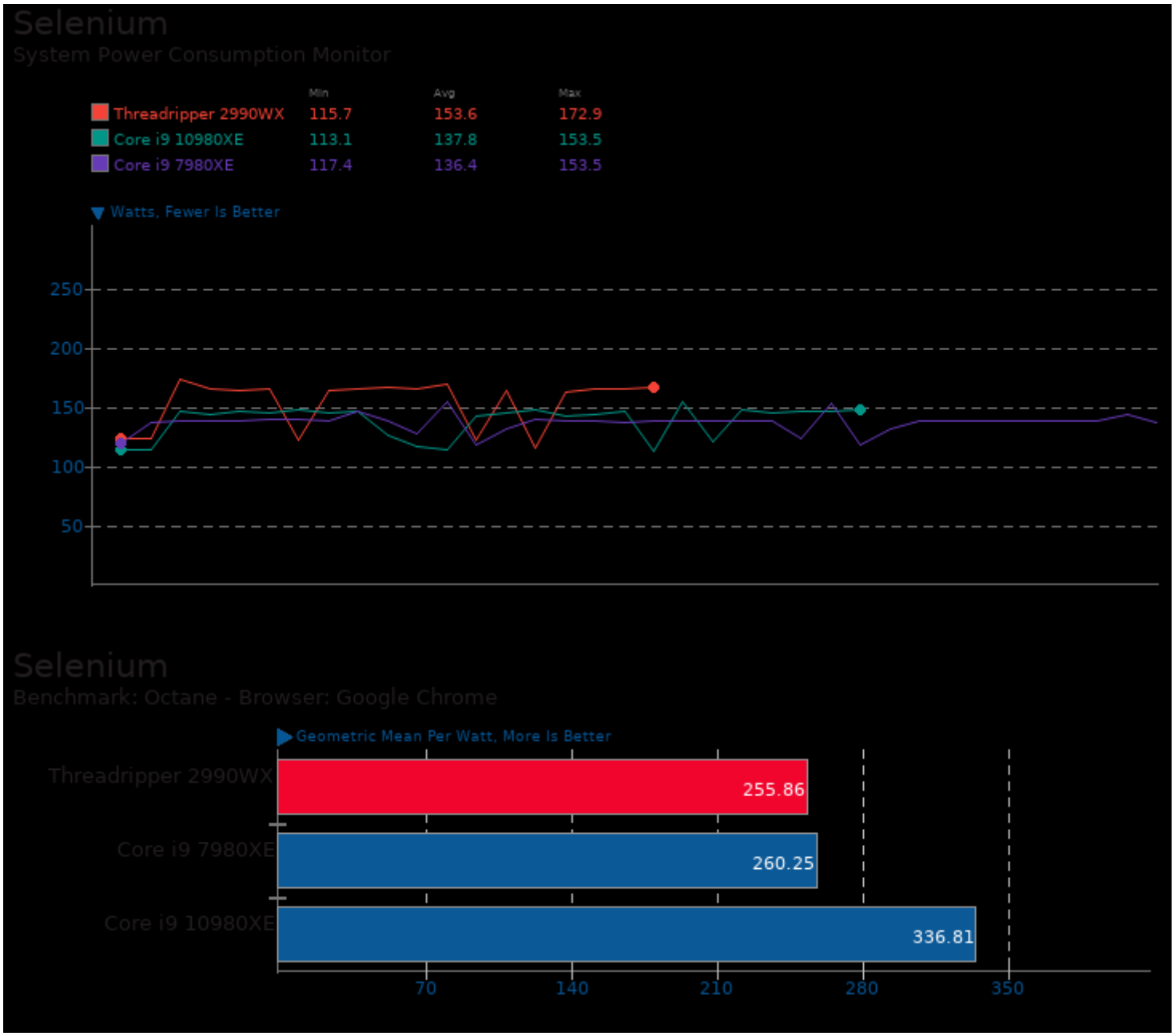


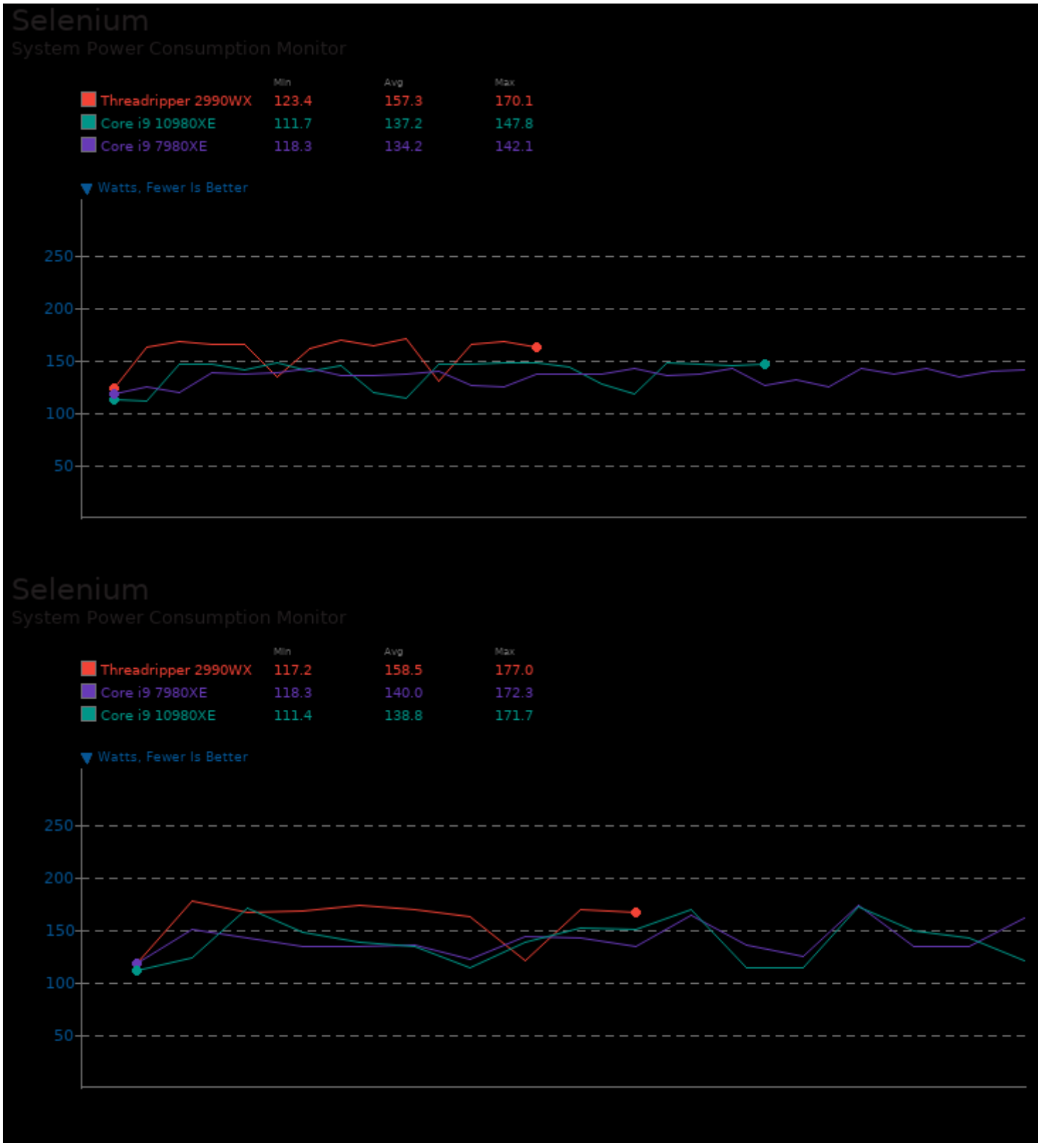
GNU GMP GMPbench 6.1.2
Total Time




GNU GMP GMPbench 6.1.2
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 154.5 158.7 165.4
Core i9 10980XE 111.5 143.8 148.7
Core i9 7980XE 118.8 134.4 140.1
Watts, Fewer Is Better
250
200
150
100
50
dcraw
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 153.5 159.1 159.8
Core i9 10980XE 112.4 142.5 148.0
Core i9 7980XE 125.3 135.3 141.3
Watts, Fewer Is Better
250
200
150
100
50

Intel Core i9-10980XE Linux Benchmarks

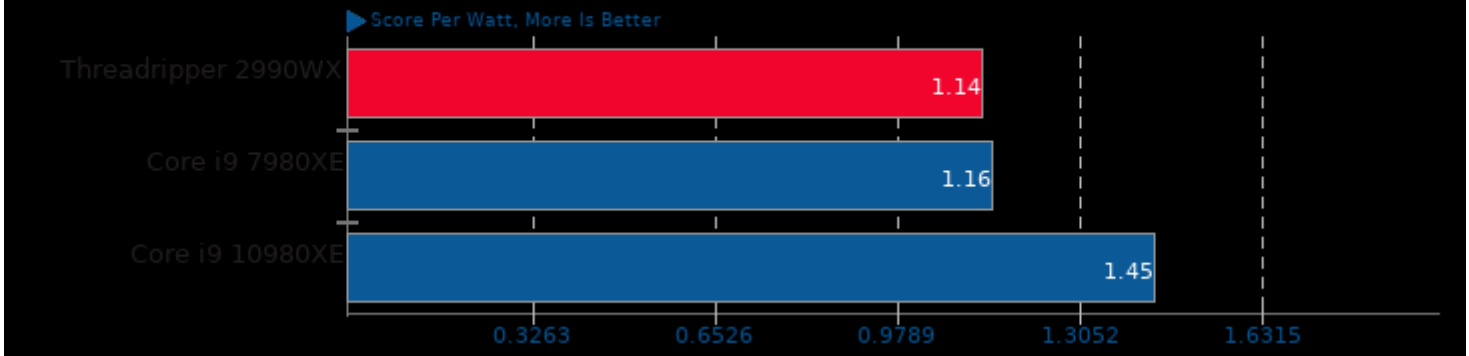



Selenium
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 123.4 157.3 170.1
Core i9 10980XE 111.7 137.2 147.8
Core i9 7980XE 118.3 134.2 142.1
Watts, Fewer Is Better
250
200
150
100
50

Selenium
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 117.2 158.5 177.0
Core i9 7980XE 118.3 140.0 172.3
Core i9 10980XE 111.4 138.8 171.7
Watts, Fewer Is Better
250
200
150
100
50

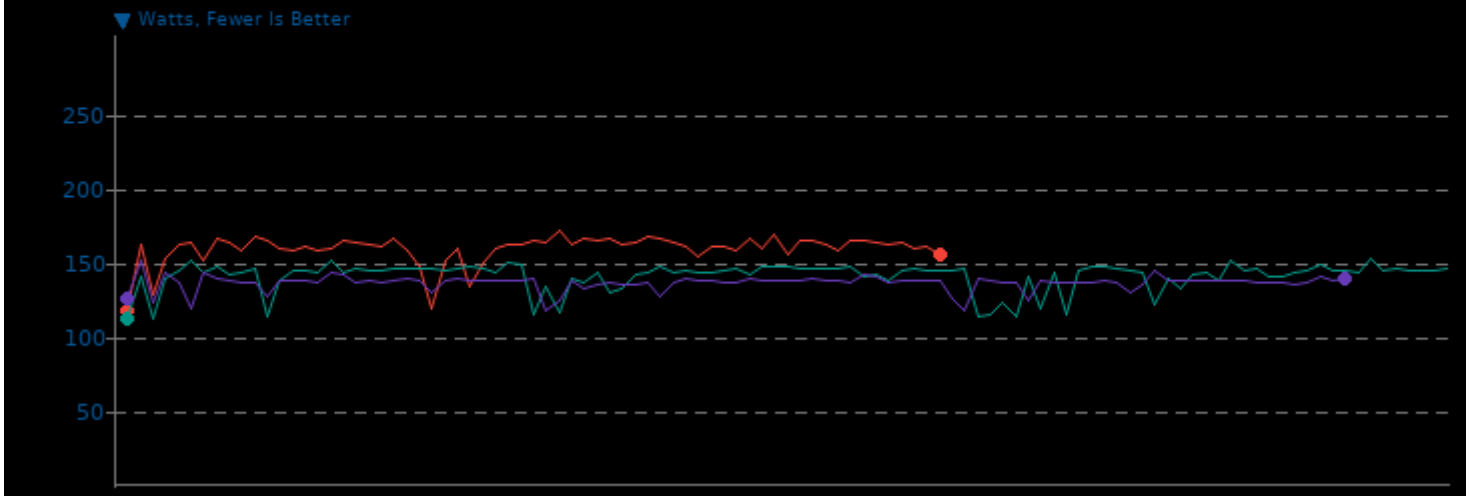
Intel Core i9-10980XE Linux Benchmarks

Selenium
Benchmark: Jetstream - Browser: Google Chrome

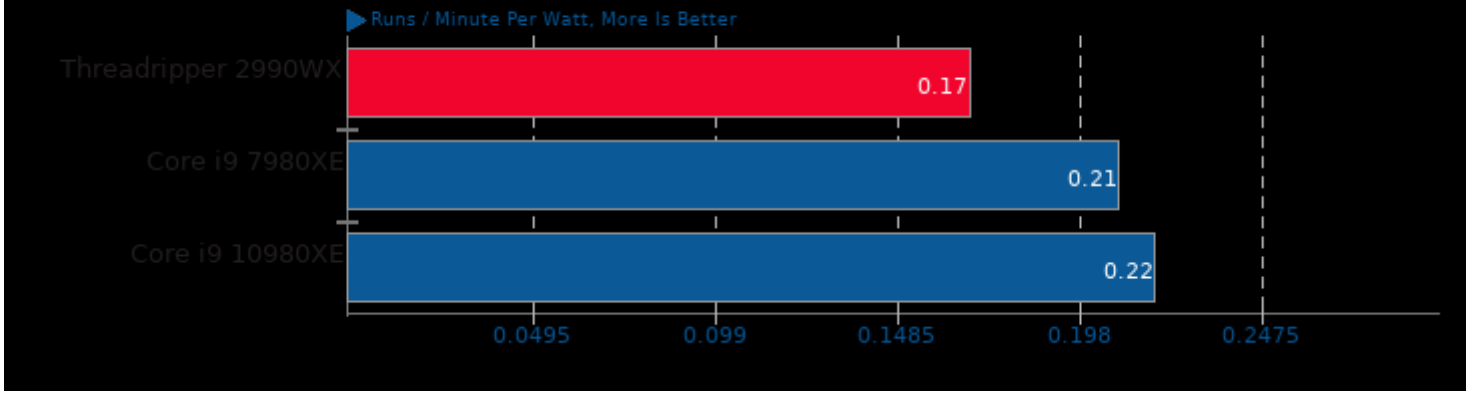


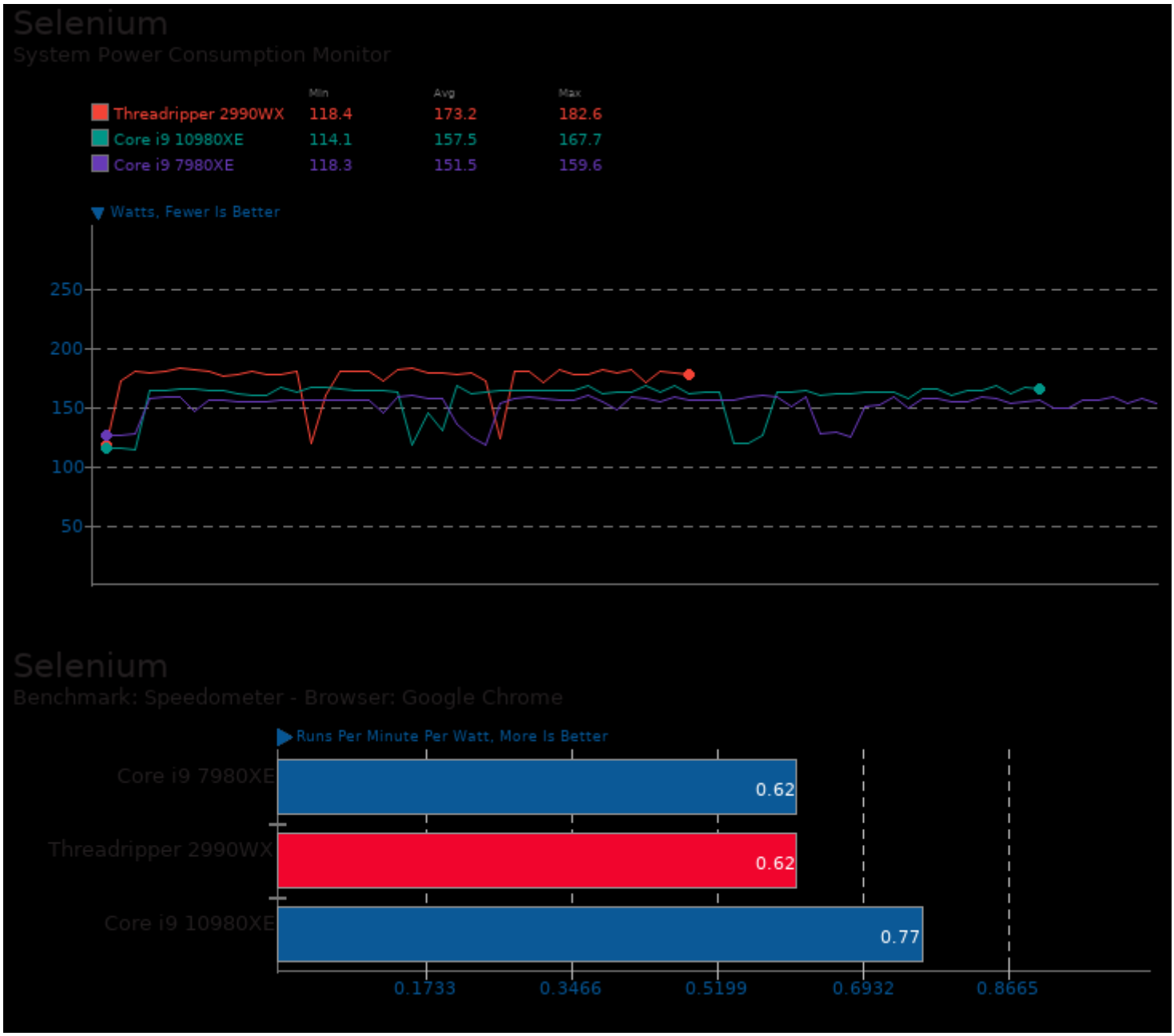
Selenium
System Power Consumption Monitor

	Min	Avg	Max
Threadripper 2990WX	117.5	159.0	171.3
Core i9 10980XE	112.3	140.9	152.7
Core i9 7980XE	117.6	136.3	152.0

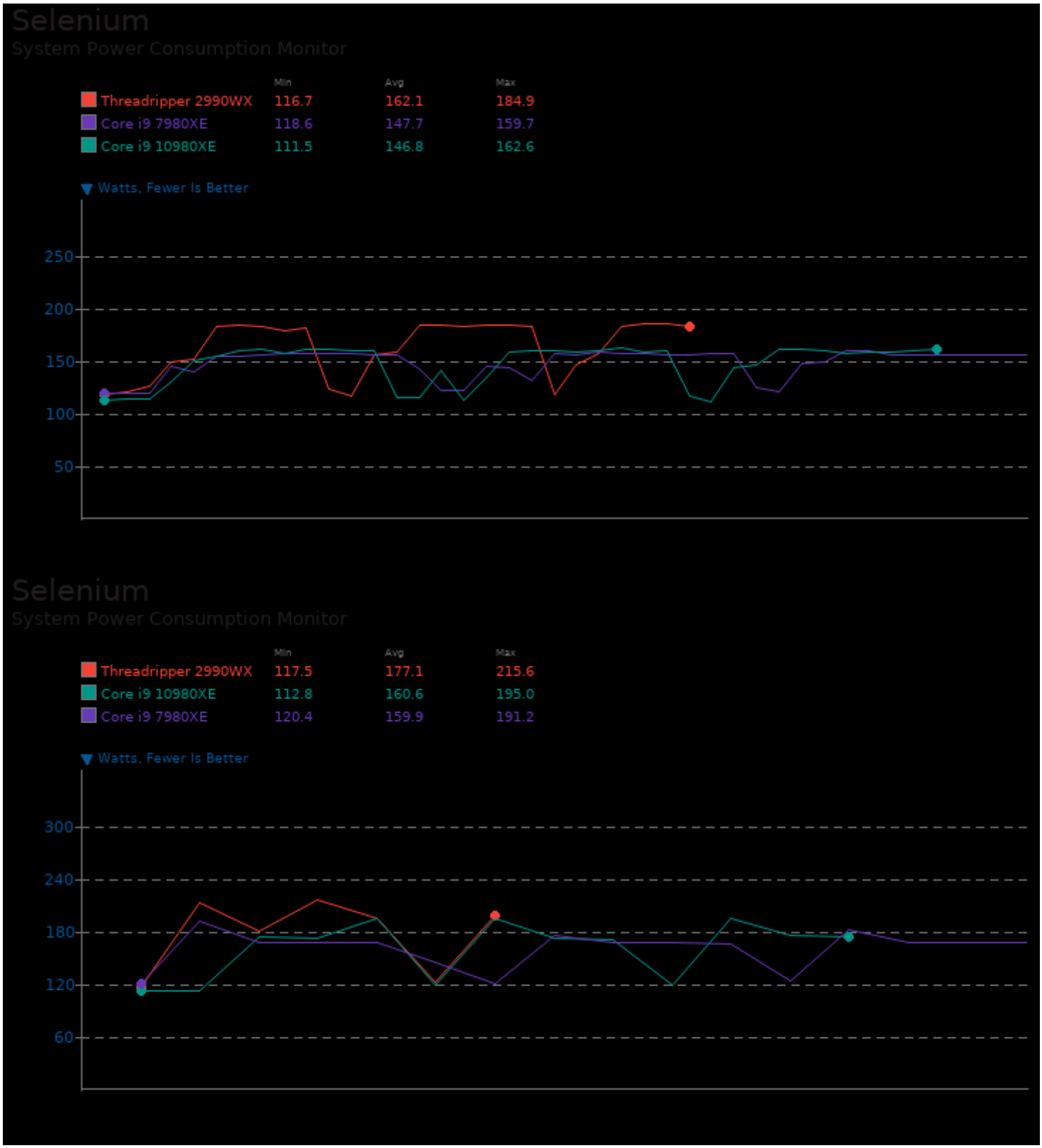


Selenium
Benchmark: StyleBench - Browser: Google Chrome




Selenium
System Power Consumption Monitor
Min
Avg
Max
Threadripper 2990WX 118.4 173.2 182.6
Core i9 10980XE 114.1 157.5 167.7
Core i9 7980XE 118.3 151.5 159.6
Watts, Fewer Is Better
250
200
150
100
50
Selenium
Benchmark: Speedometer - Browser: Google Chrome
Runs Per Minute Per Watt, More Is Better
Core i9 7980XE
Threadripper 2990WX
Core i9 10980XE
0.62
0.62
0.77
0.1733
0.3466
0.5199
0.6932
0.8665

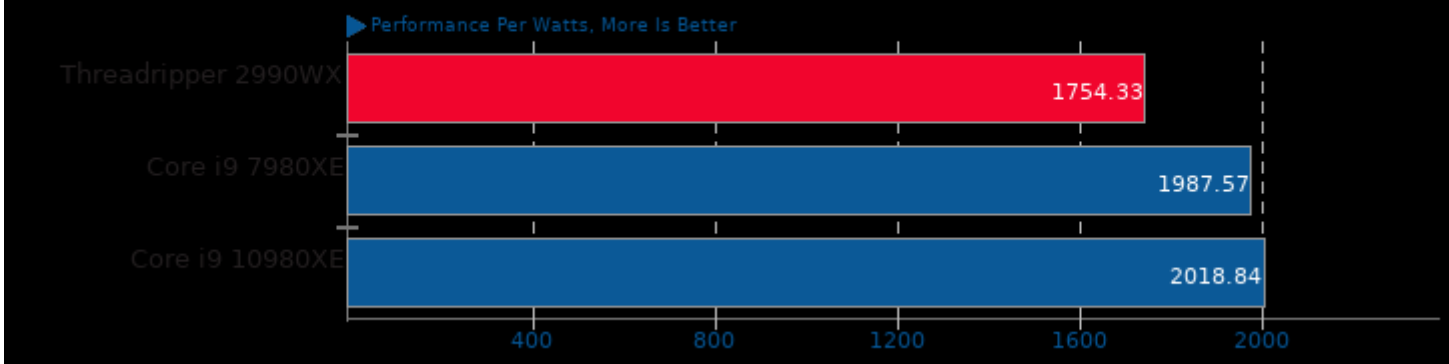
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

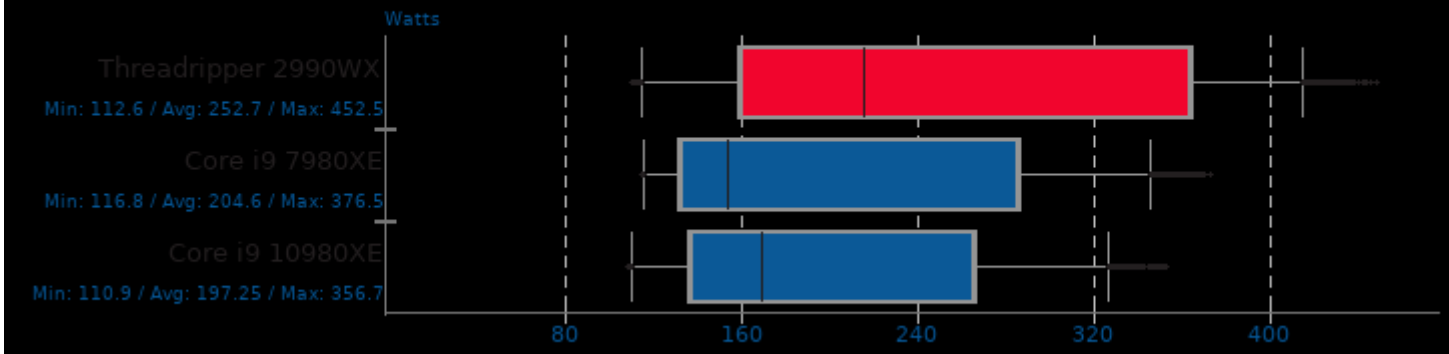
Meta Performance Per Watts

Performance Per Watts



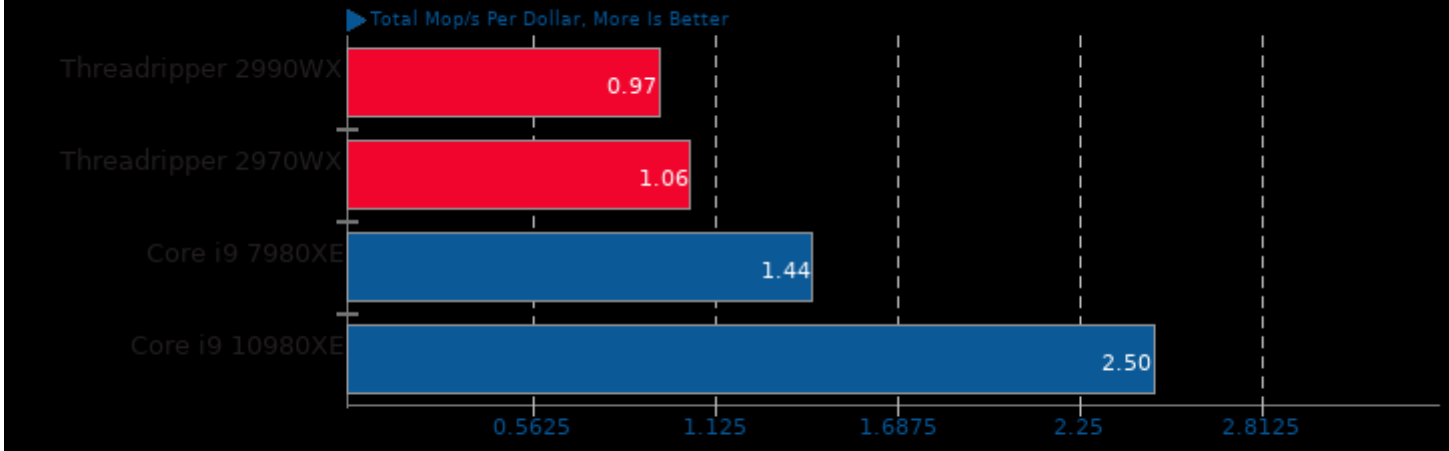
System Power Consumption Monitor

Phoronix Test Suite System Monitoring

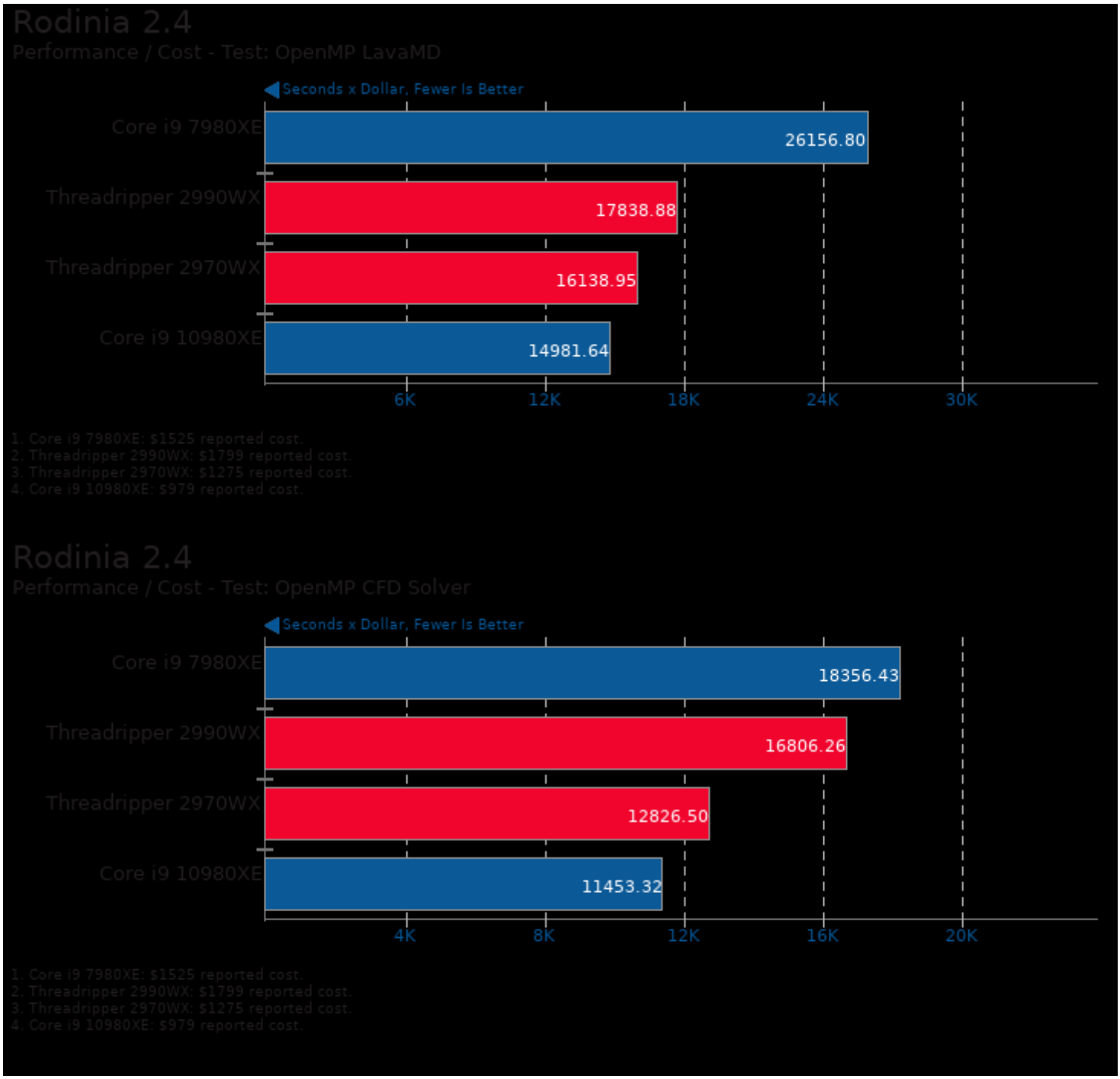


NAS Parallel Benchmarks 3.4

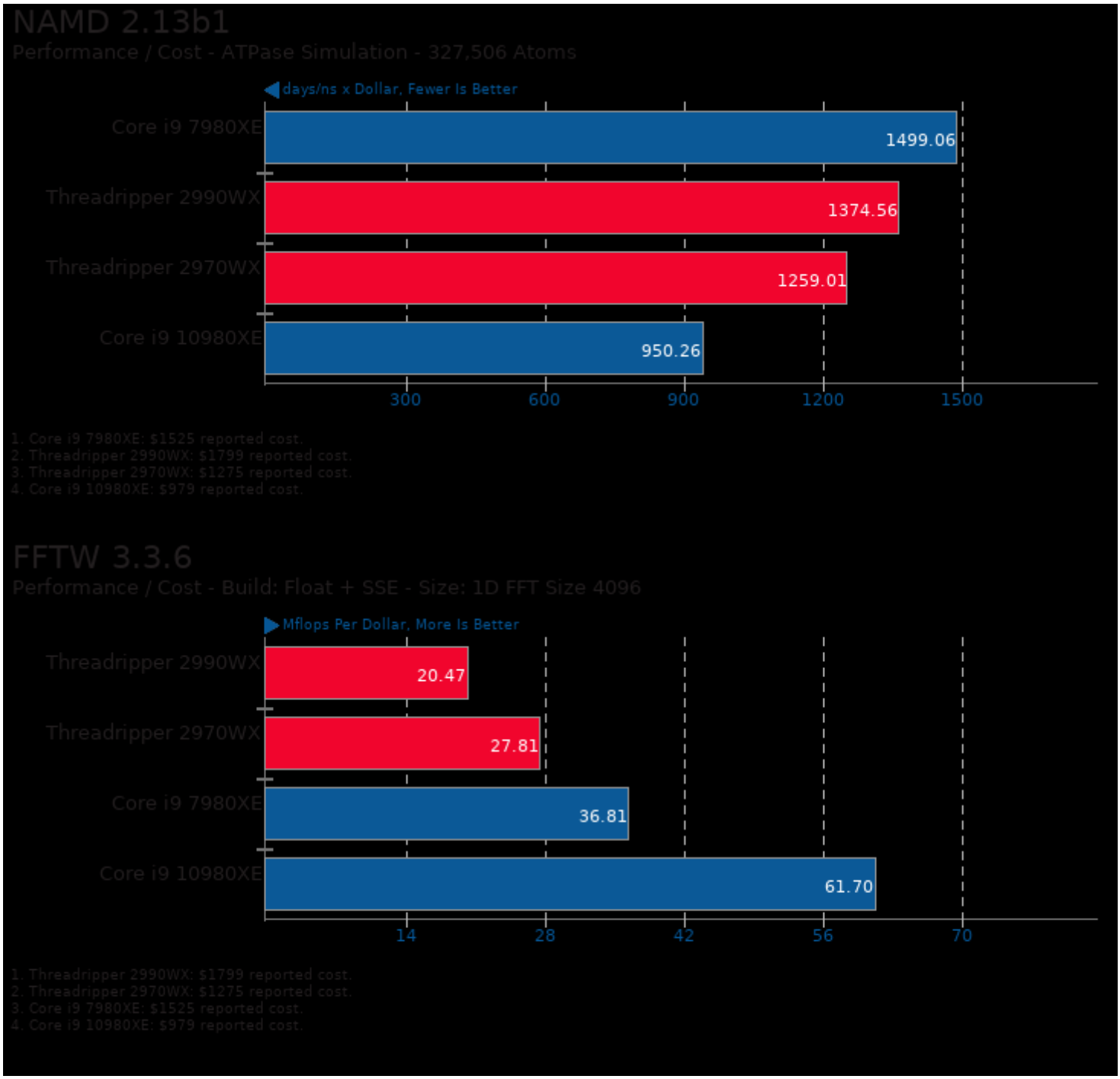
Performance / Cost - Test / Class: EP.C



1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.


Rodinia 2.4
Performance / Cost - Test: OpenMP LavaMD
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
26156.80
Threadripper 2990WX
17838.88
Threadripper 2970WX
16138.95
Core i9 10980XE
14981.64
6K
12K
18K
24K
30K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
Rodinia 2.4
Performance / Cost - Test: OpenMP CFD Solver
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
18356.43
Threadripper 2990WX
16806.26
Threadripper 2970WX
12826.50
Core i9 10980XE
11453.32
4K
8K
12K
16K
20K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

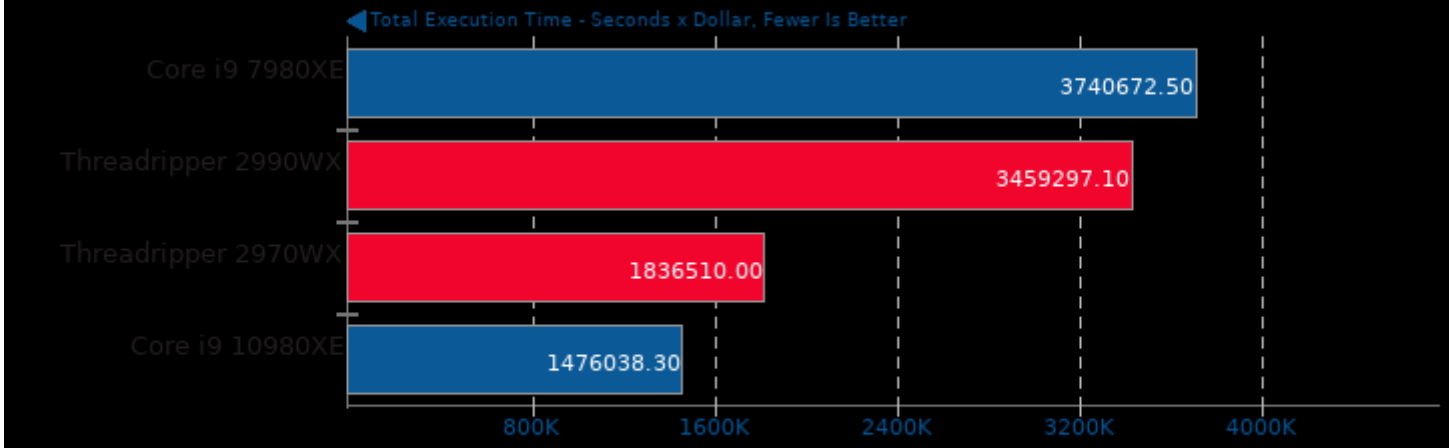
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

QMCPACK 3.8

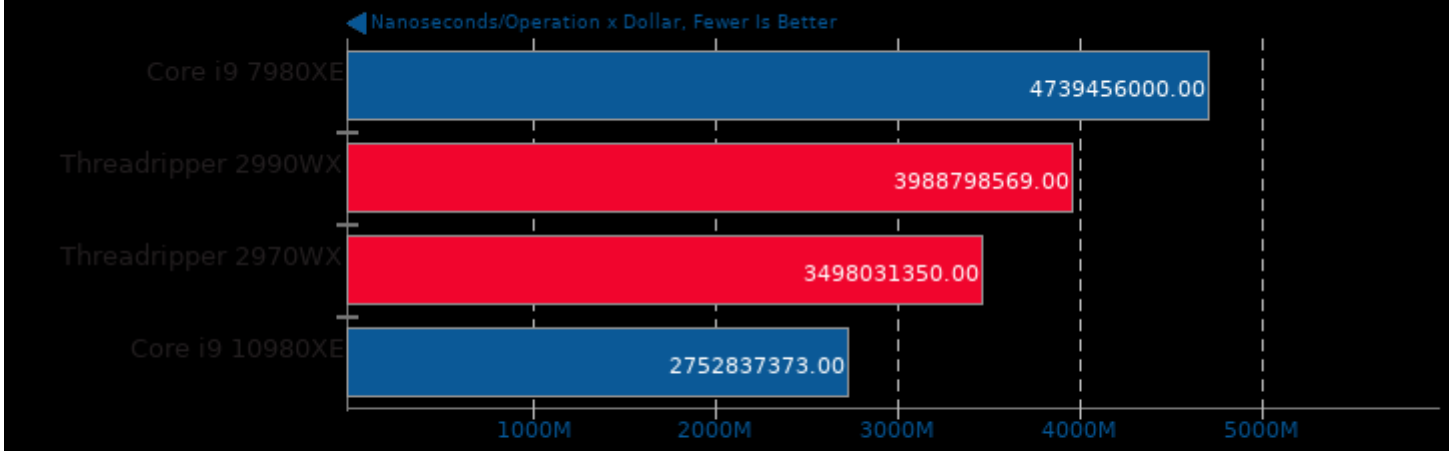
Performance / Cost -



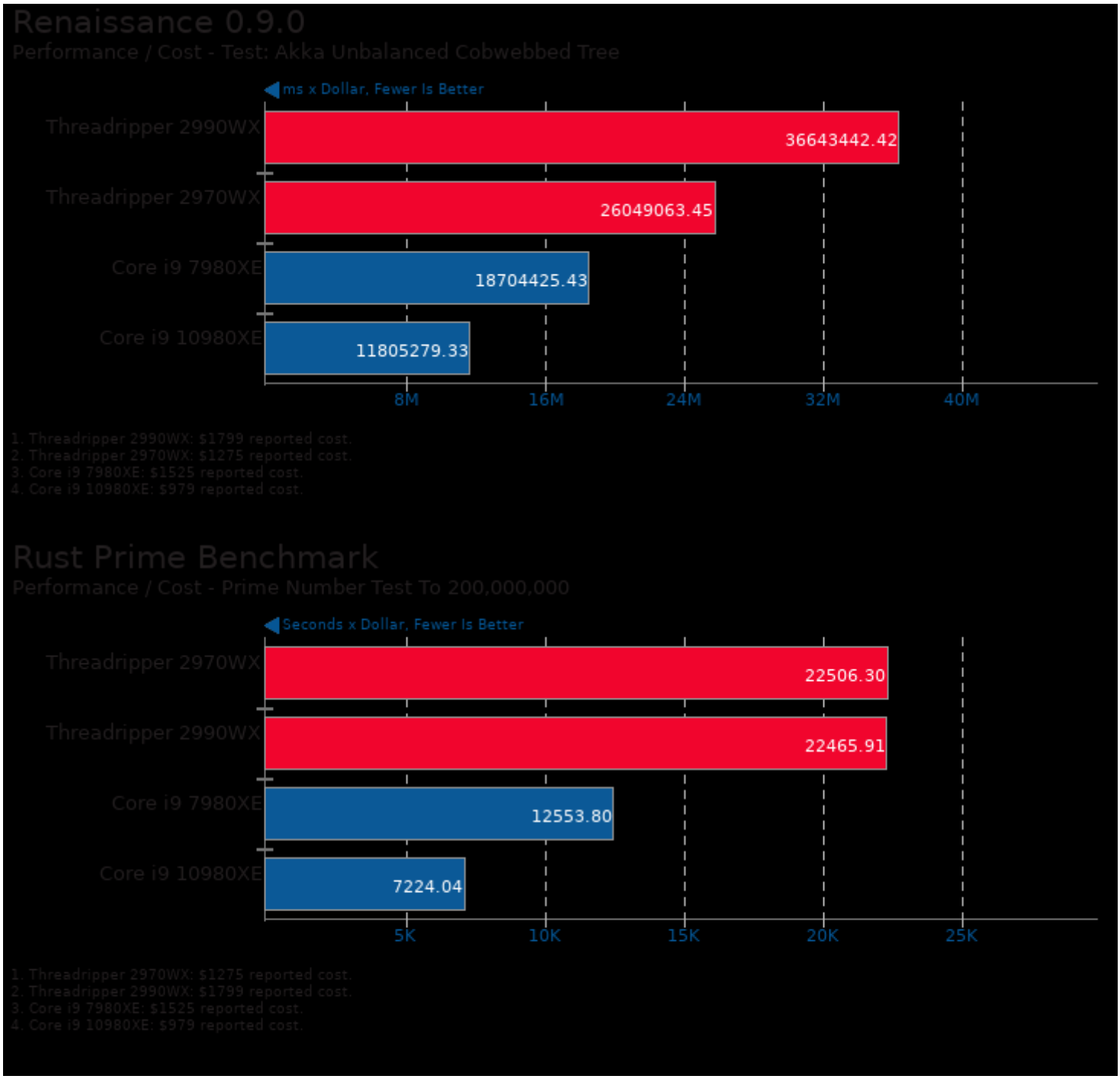
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

Go Benchmarks

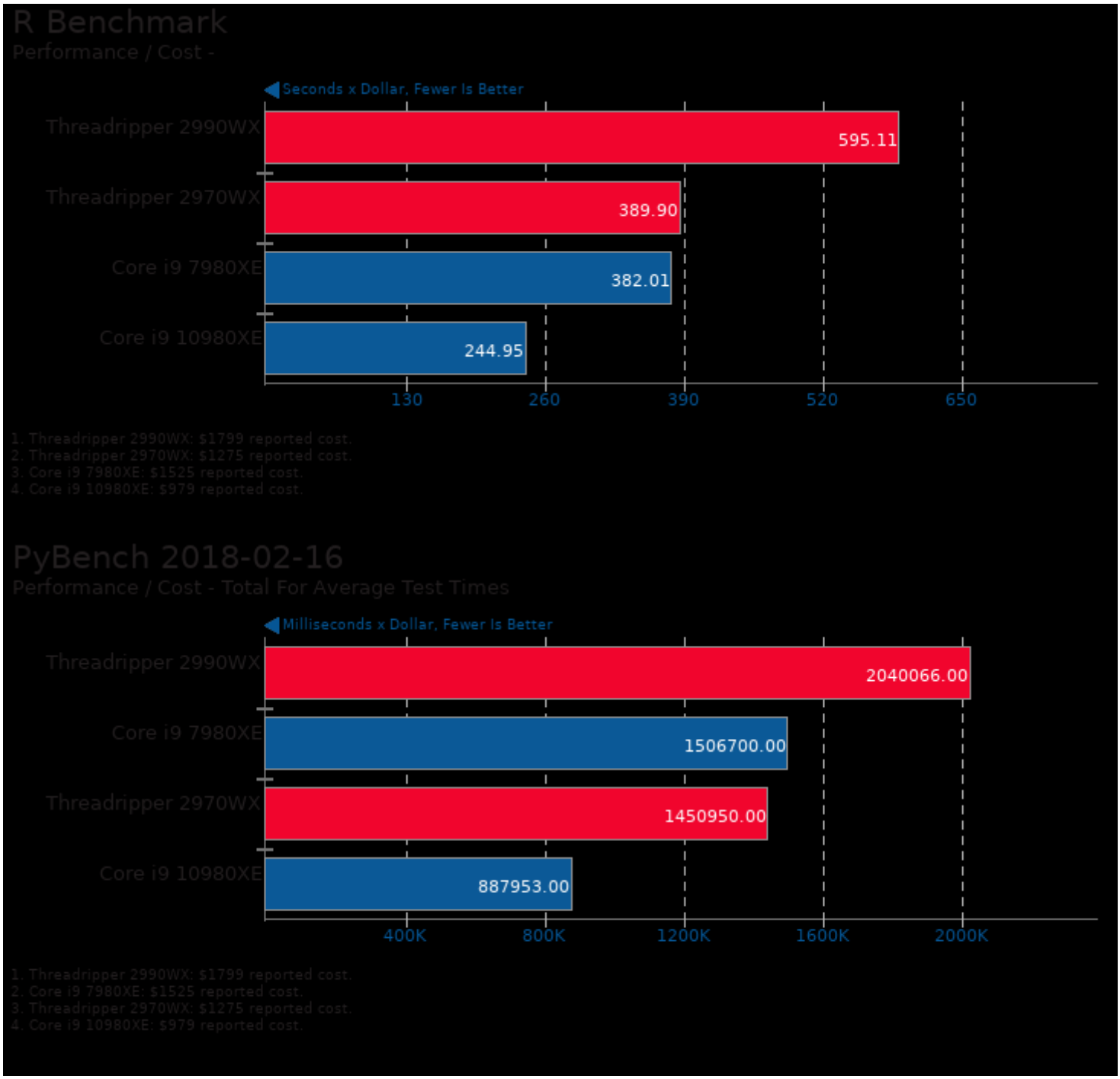
Performance / Cost - Test: json

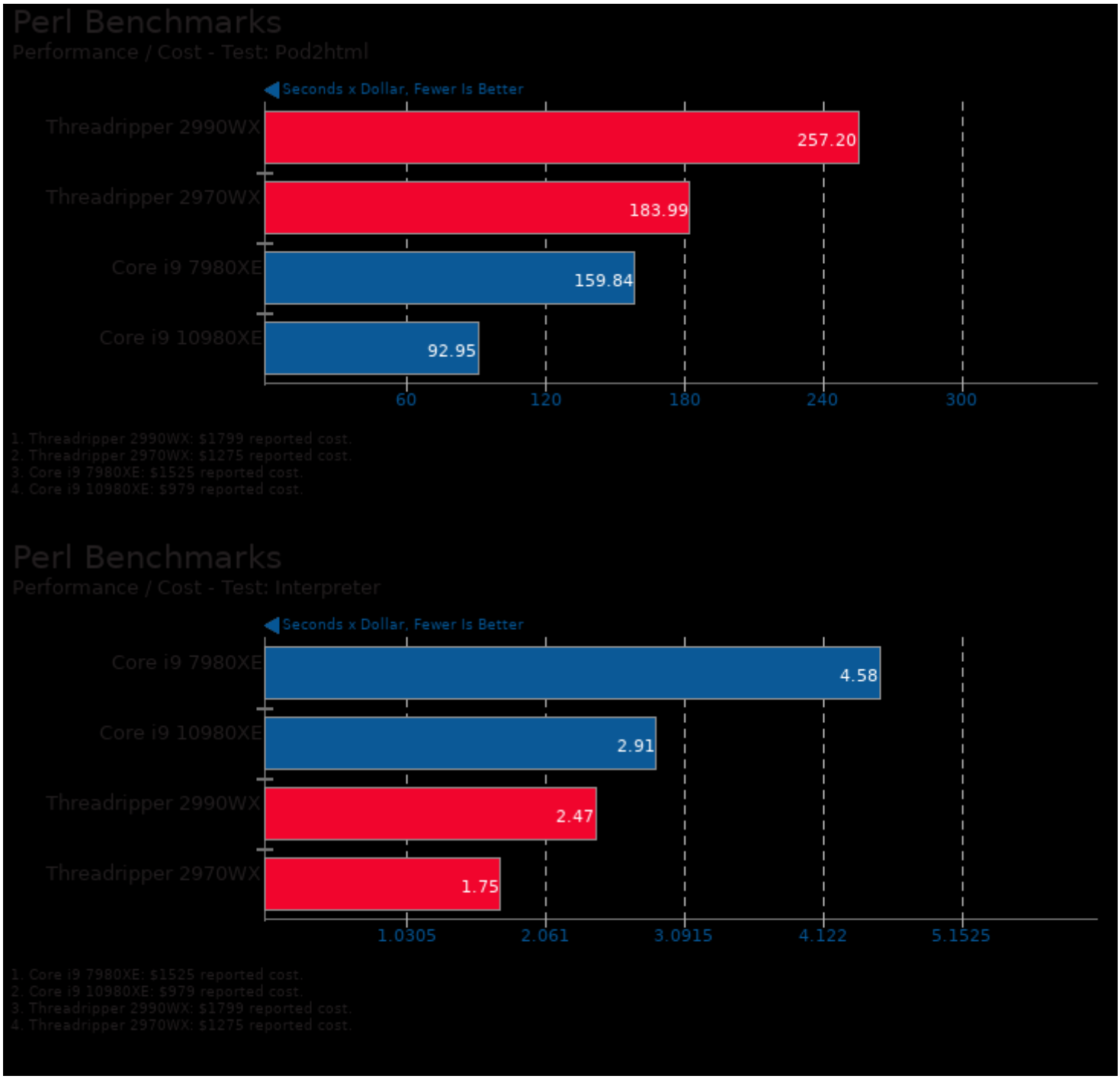


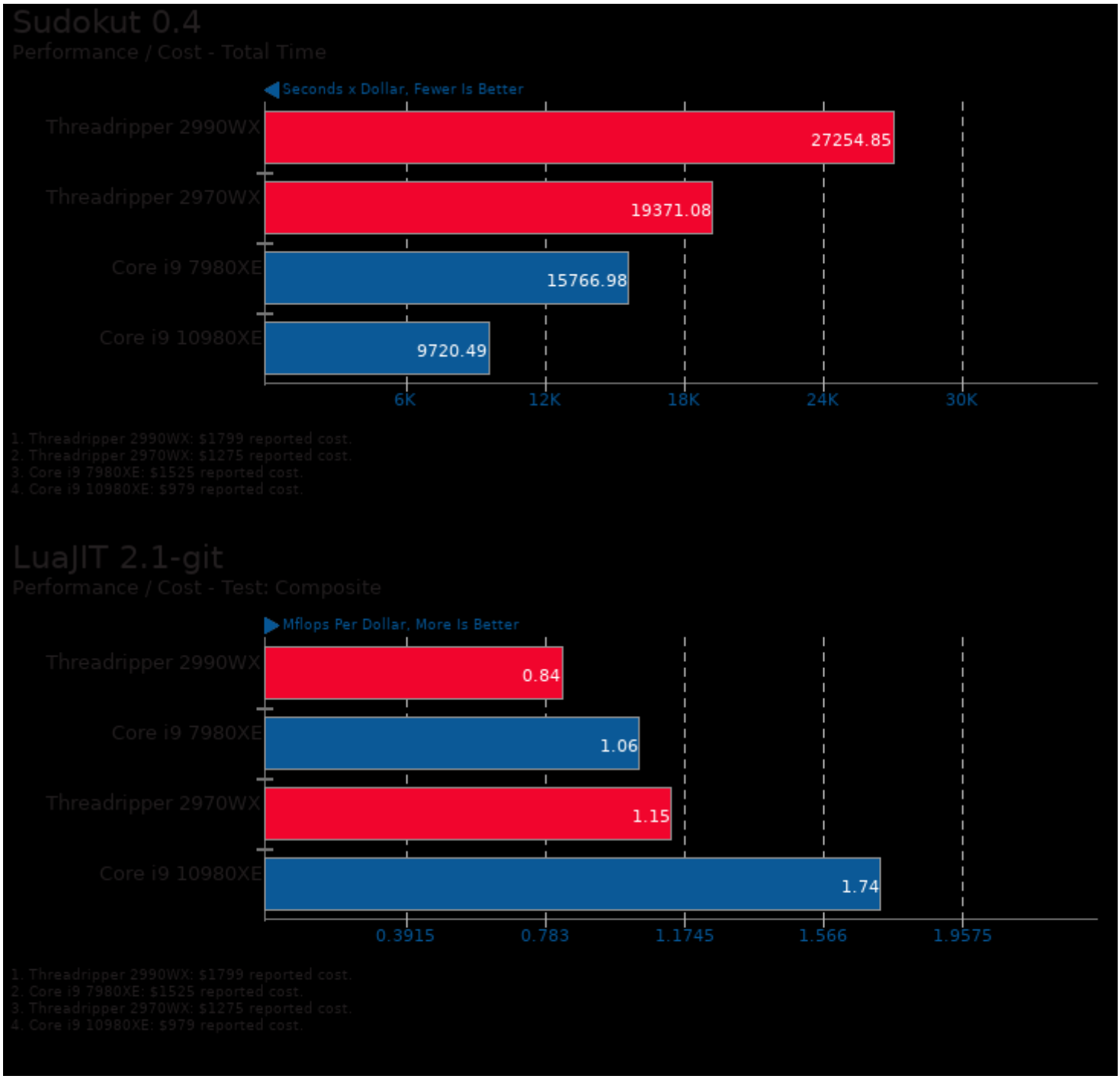
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.


Renaissance 0.9.0
Performance / Cost - Test: Akka Unbalanced Cobwebbed Tree
ms x Dollar, Fewer Is Better
Threadripper 2990WX
36643442.42
Threadripper 2970WX
26049063.45
Core i9 7980XE
18704425.43
Core i9 10980XE
11805279.33
8M
16M
24M
32M
40M
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.
Rust Prime Benchmark
Performance / Cost - Prime Number Test To 200,000,000
Seconds x Dollar, Fewer Is Better
Threadripper 2970WX
22506.30
Threadripper 2990WX
22465.91
Core i9 7980XE
12553.80
Core i9 10980XE
7224.04
5K
10K
15K
20K
25K
1. Threadripper 2970WX: $1275 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.

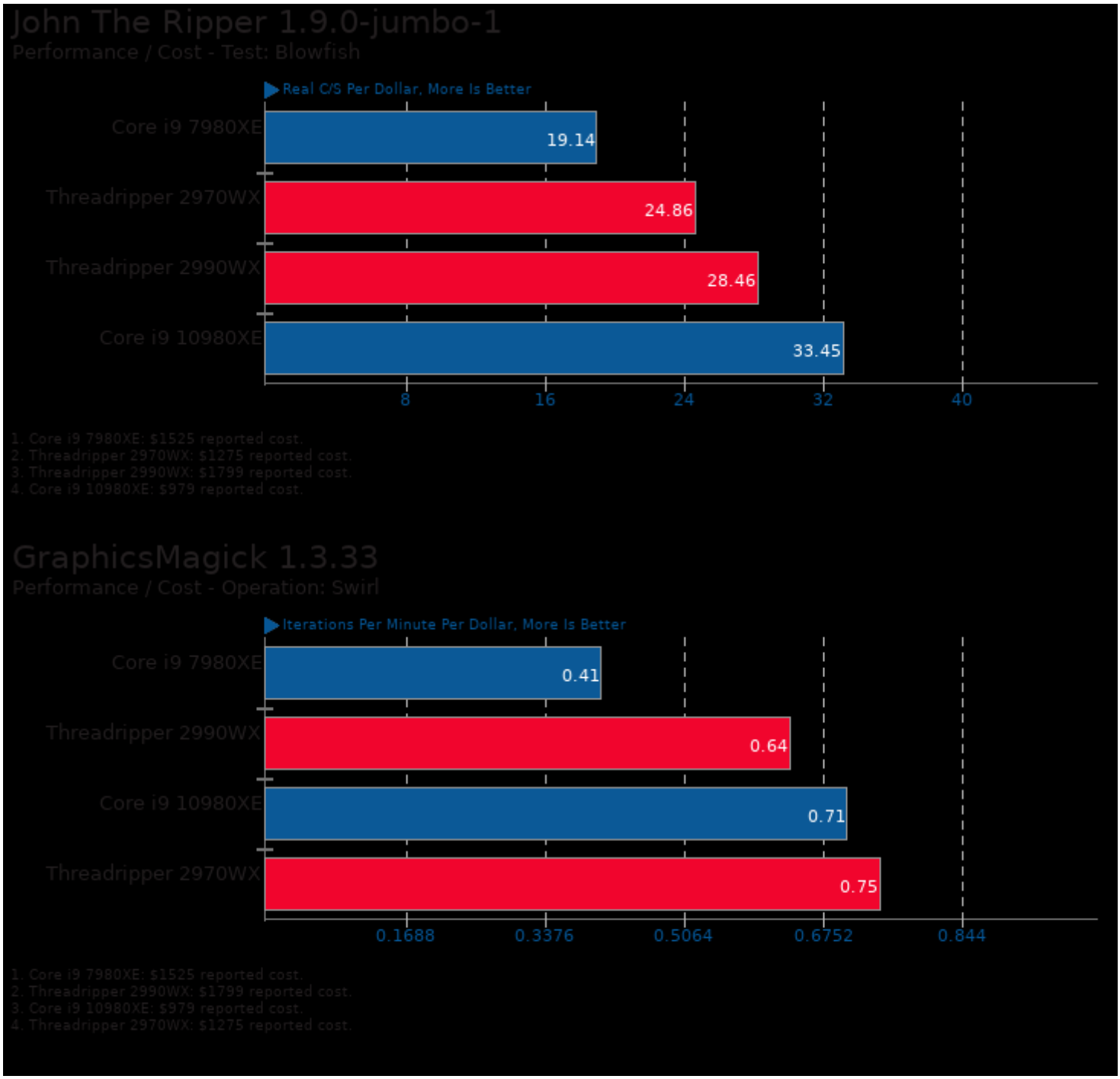
Intel Core i9-10980XE Linux Benchmarks

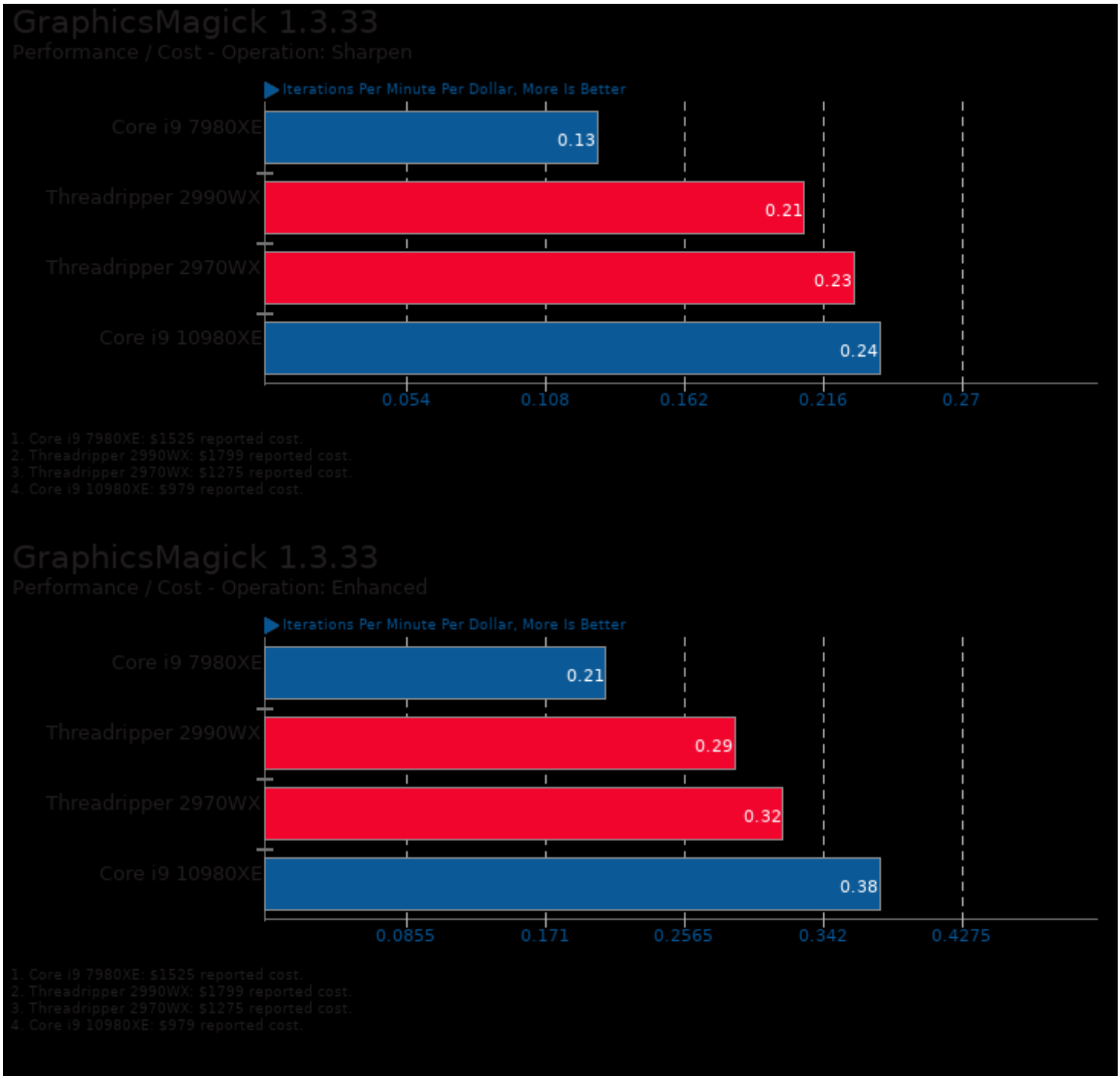


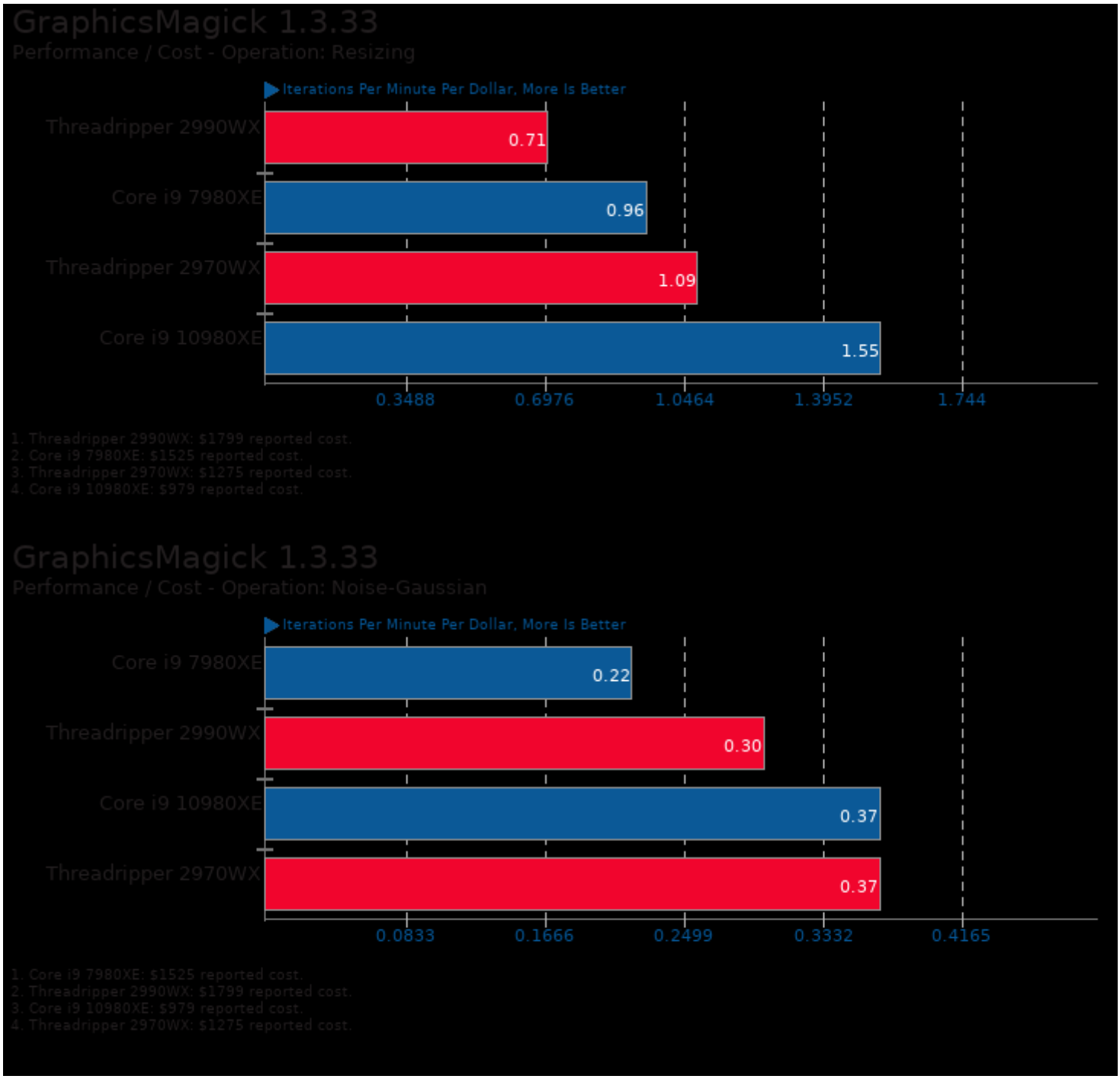

Perl Benchmarks
Performance / Cost - Test: Pod2html
Seconds x Dollar, Fewer Is Better
Threadripper 2990WX
257.20
Threadripper 2970WX
183.99
Core i9 7980XE
159.84
Core i9 10980XE
92.95
60
120
180
240
300
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.
Perl Benchmarks
Performance / Cost - Test: Interpreter
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
4.58
Core i9 10980XE
2.91
Threadripper 2990WX
2.47
Threadripper 2970WX
1.75
1.0305
2.061
3.0915
4.122
5.1525
1. Core i9 7980XE: $1525 reported cost.
2. Core i9 10980XE: $979 reported cost.
3. Threadripper 2990WX: $1799 reported cost.
4. Threadripper 2970WX: $1275 reported cost.

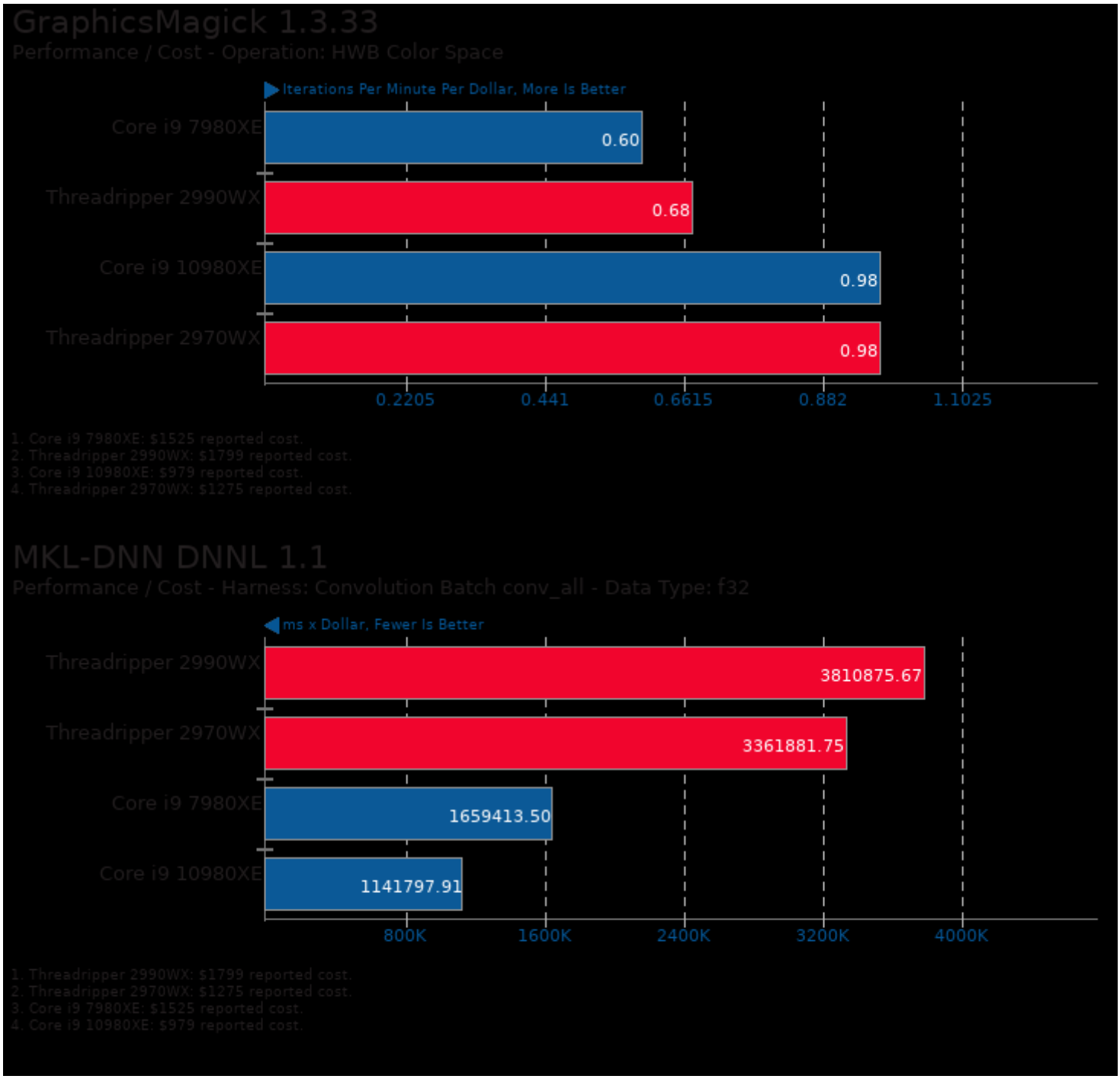

Sudokut 0.4
Performance / Cost - Total Time
Seconds x Dollar, Fewer Is Better
Threadripper 2990WX
27254.85
Threadripper 2970WX
19371.08
Core i9 7980XE
15766.98
Core i9 10980XE
9720.49
6K
12K
18K
24K
30K
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.
LuaJIT 2.1-git
Performance / Cost - Test: Composite
Mflops Per Dollar, More Is Better
Threadripper 2990WX
0.84
Core i9 7980XE
1.06
Threadripper 2970WX
1.15
Core i9 10980XE
1.74
0.3915
0.783
1.1745
1.566
1.9575
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

Intel Core i9-10980XE Linux Benchmarks

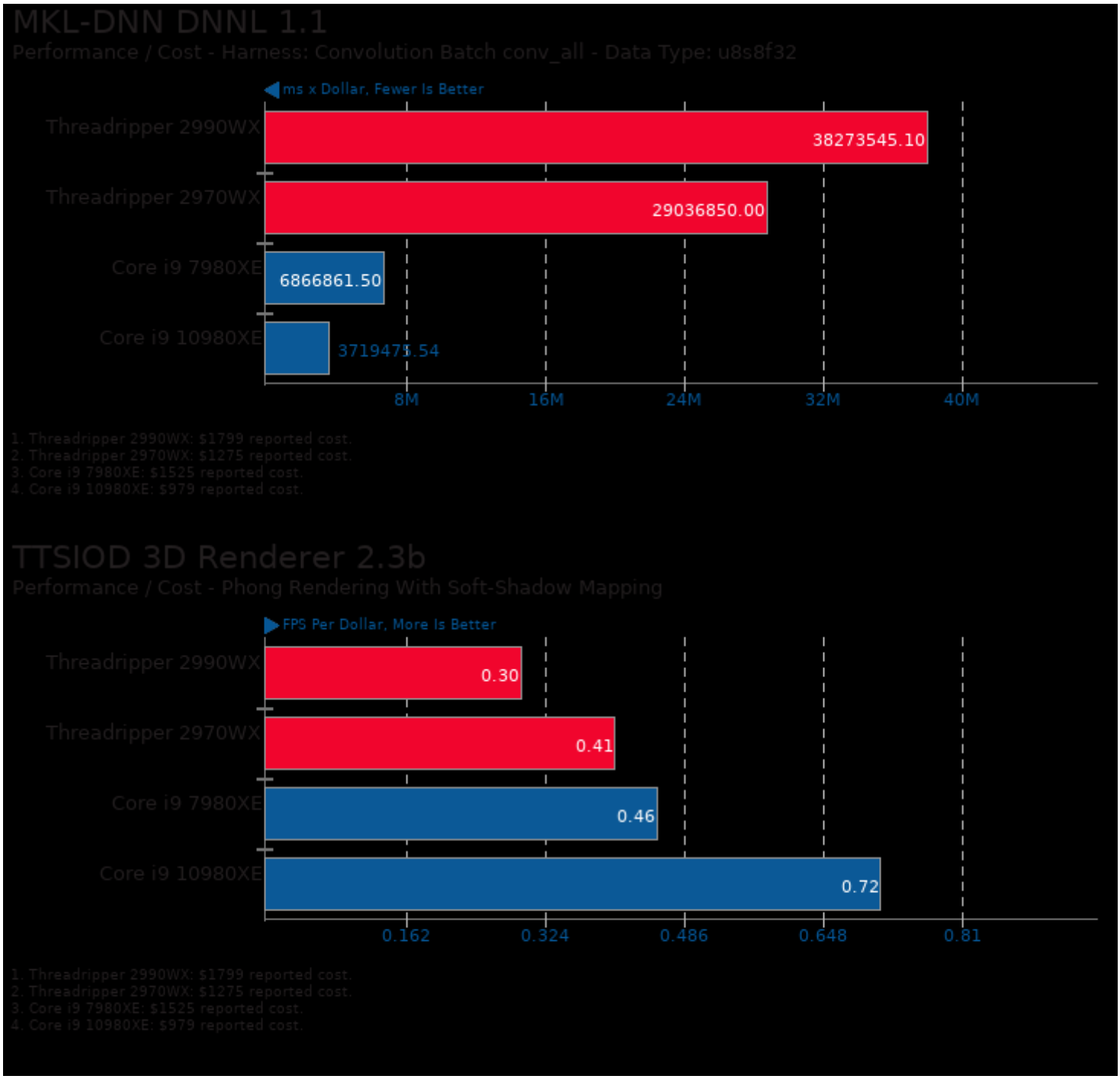



GraphicsMagick 1.3.33
Performance / Cost - Operation: Sharpen
Iterations Per Minute Per Dollar, More Is Better
Core i9 7980XE
Threadripper 2990WX
Threadripper 2970WX
Core i9 10980XE
0.13
0.21
0.23
0.24
0.054
0.108
0.162
0.216
0.27
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
GraphicsMagick 1.3.33
Performance / Cost - Operation: Enhanced
Iterations Per Minute Per Dollar, More Is Better
Core i9 7980XE
Threadripper 2990WX
Threadripper 2970WX
Core i9 10980XE
0.21
0.29
0.32
0.38
0.0855
0.171
0.2565
0.342
0.4275
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.


GraphicsMagick 1.3.33
Performance / Cost - Operation: Resizing
Iterations Per Minute Per Dollar, More Is Better
Threadripper 2990WX
0.71
Core i9 7980XE
0.96
Threadripper 2970WX
1.09
Core i9 10980XE
1.55
0.3488
0.6976
1.0464
1.3952
1.744
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
GraphicsMagick 1.3.33
Performance / Cost - Operation: Noise-Gaussian
Iterations Per Minute Per Dollar, More Is Better
Core i9 7980XE
0.22
Threadripper 2990WX
0.30
Core i9 10980XE
0.37
Threadripper 2970WX
0.37
0.0833
0.1666
0.2499
0.3332
0.4165
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Core i9 10980XE: $979 reported cost.
4. Threadripper 2970WX: $1275 reported cost.


GraphicsMagick 1.3.33
Performance / Cost - Operation: HWB Color Space
Iterations Per Minute Per Dollar, More Is Better
Core i9 7980XE
0.60
Threadripper 2990WX
0.68
Core i9 10980XE
0.98
Threadripper 2970WX
0.98
0.2205
0.441
0.6615
0.882
1.1025
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Core i9 10980XE: $979 reported cost.
4. Threadripper 2970WX: $1275 reported cost.
MKL-DNN DNNL 1.1
Performance / Cost - Harness: Convolution Batch conv_all - Data Type: f32
ms x Dollar, Fewer Is Better
Threadripper 2990WX
3810875.67
Threadripper 2970WX
3361881.75
Core i9 7980XE
1659413.50
Core i9 10980XE
1141797.91
800K
1600K
2400K
3200K
4000K
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.

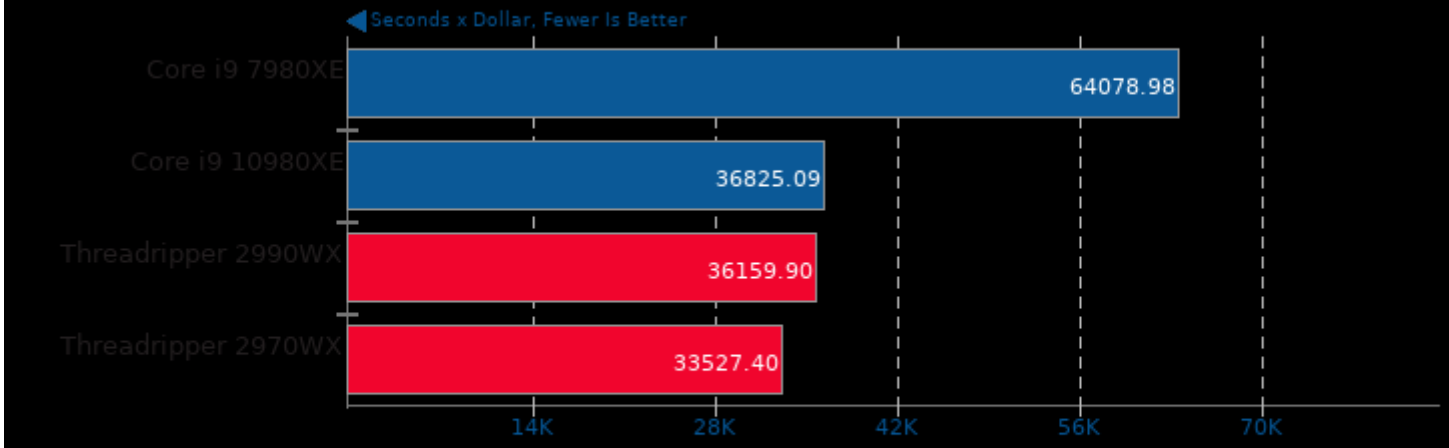
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

C-Ray 1.1

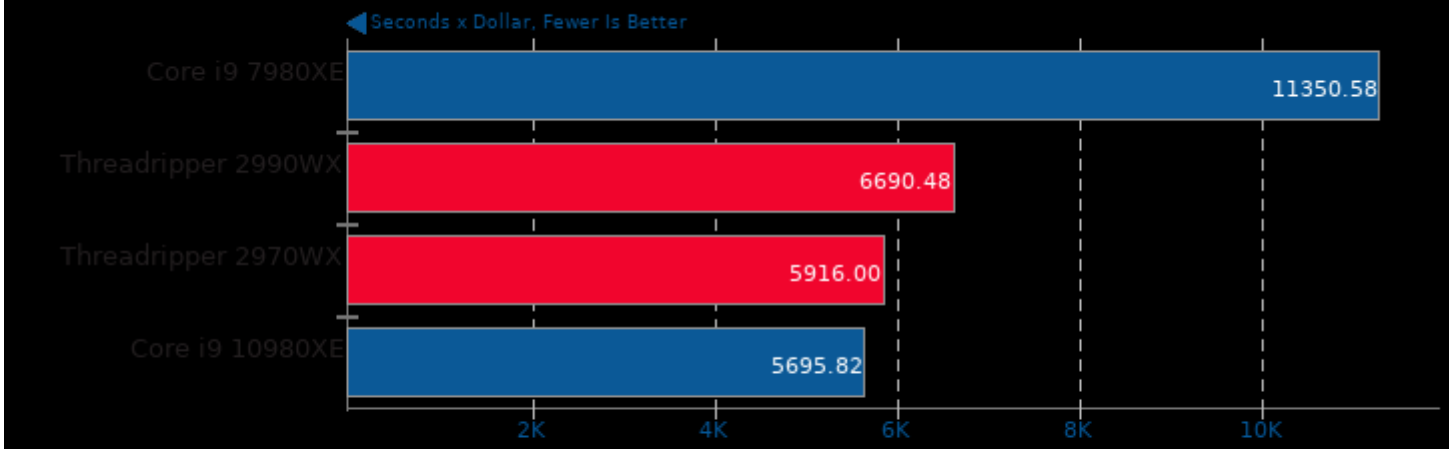
Performance / Cost - Total Time - 4K, 16 Rays Per Pixel



1. Core i9 7980XE: $1525 reported cost.
2. Core i9 10980XE: $979 reported cost.
3. Threadripper 2990WX: $1799 reported cost.
4. Threadripper 2970WX: $1275 reported cost.

Smallpt 1.0

Performance / Cost - Global Illumination Renderer; 128 Samples

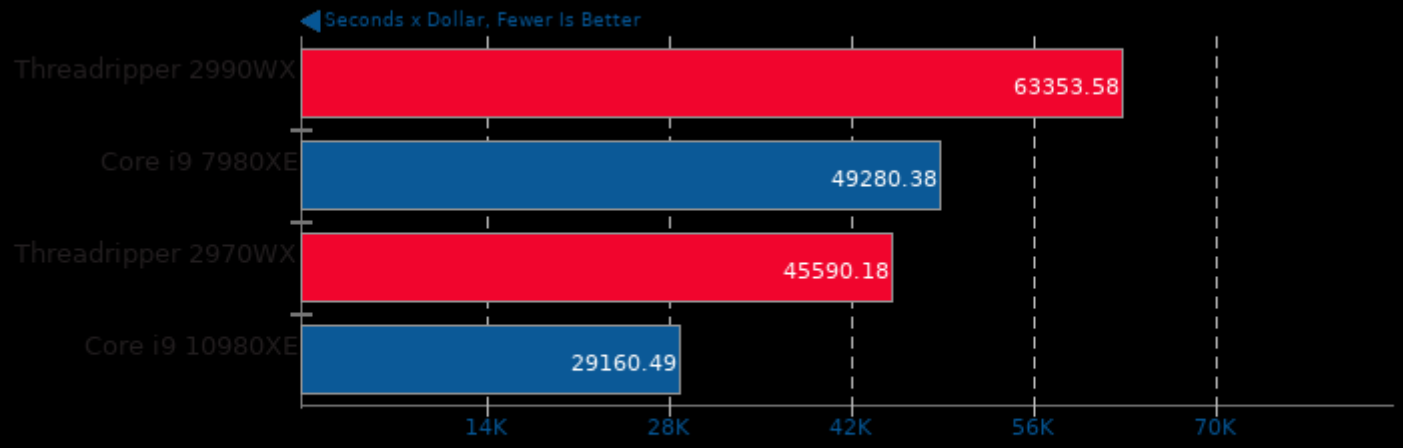


1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

Intel Core i9-10980XE Linux Benchmarks

AOBench

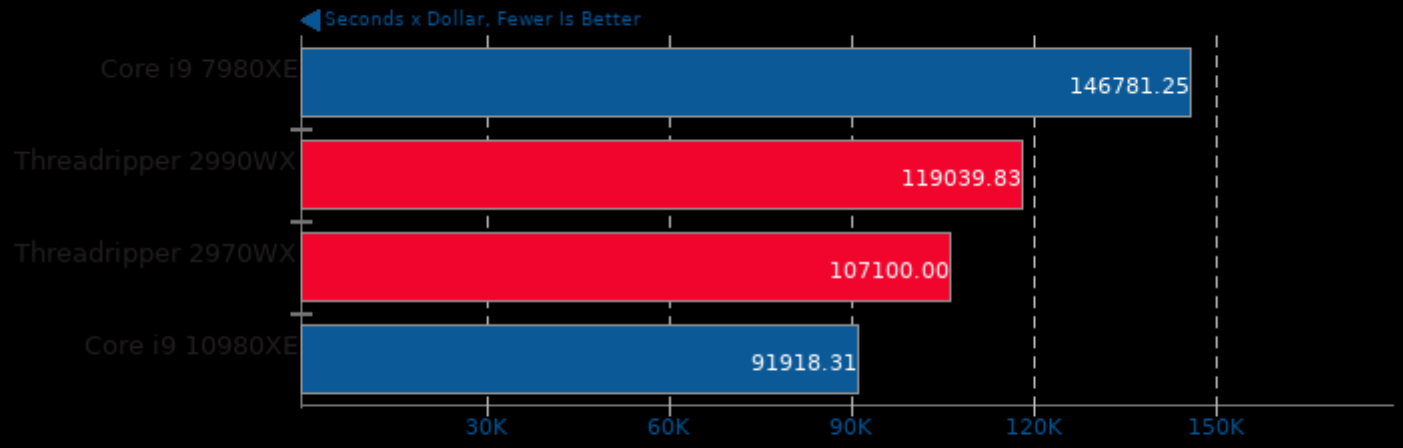
Performance / Cost - Size: 2048 x 2048 - Total Time



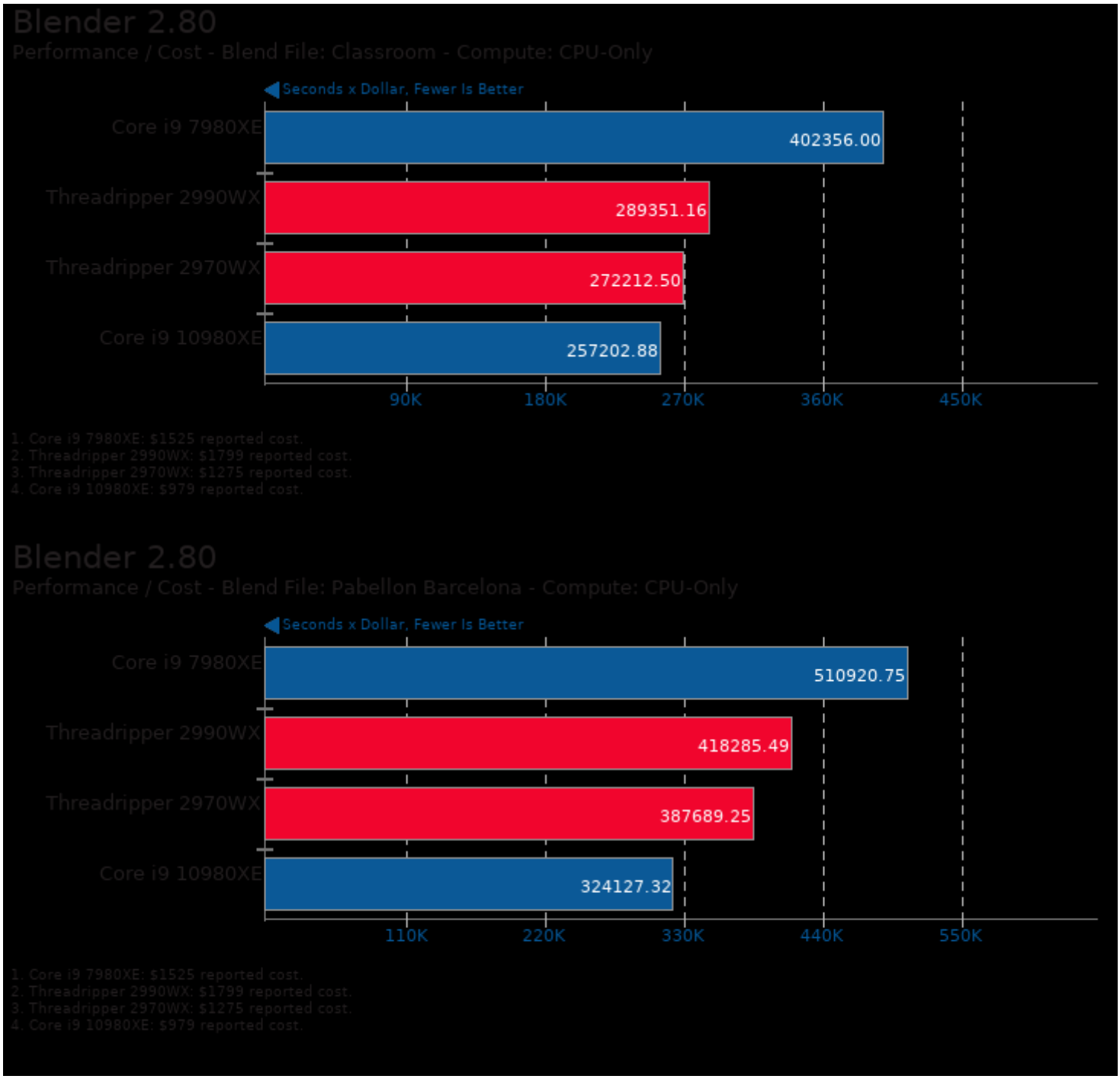
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

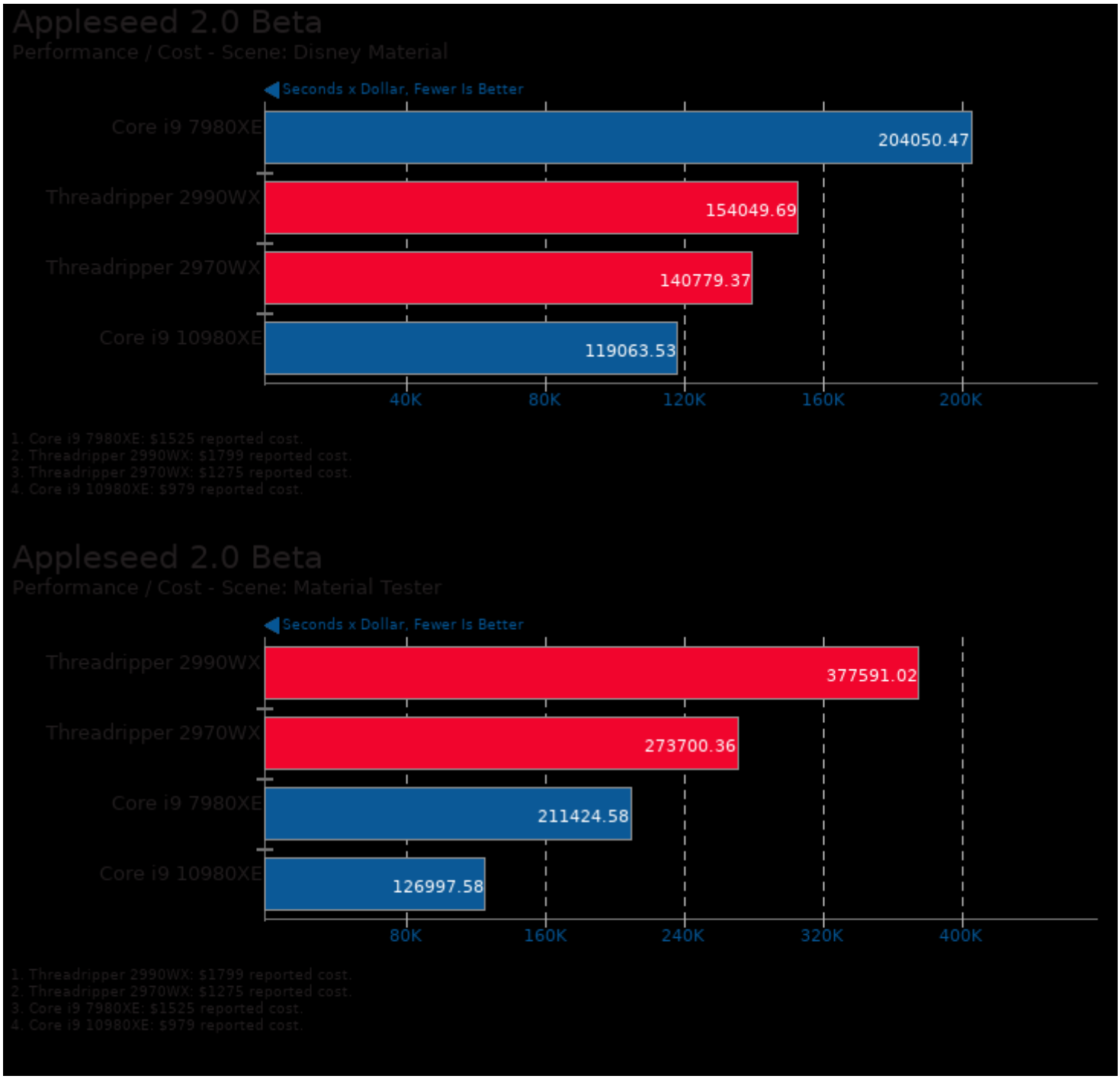
Blender 2.80

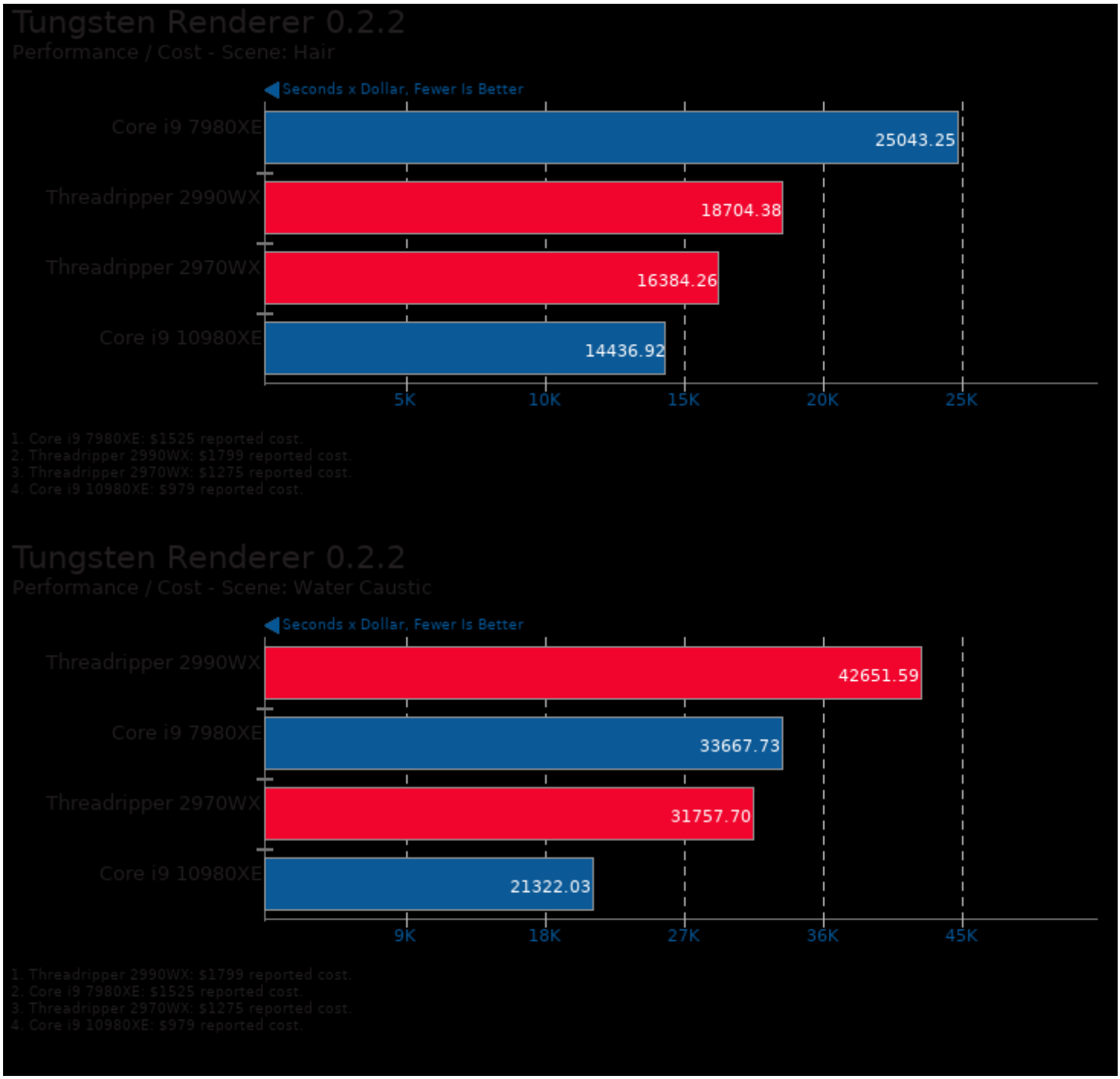
Performance / Cost - Blend File: BMW27 - Compute: CPU-Only

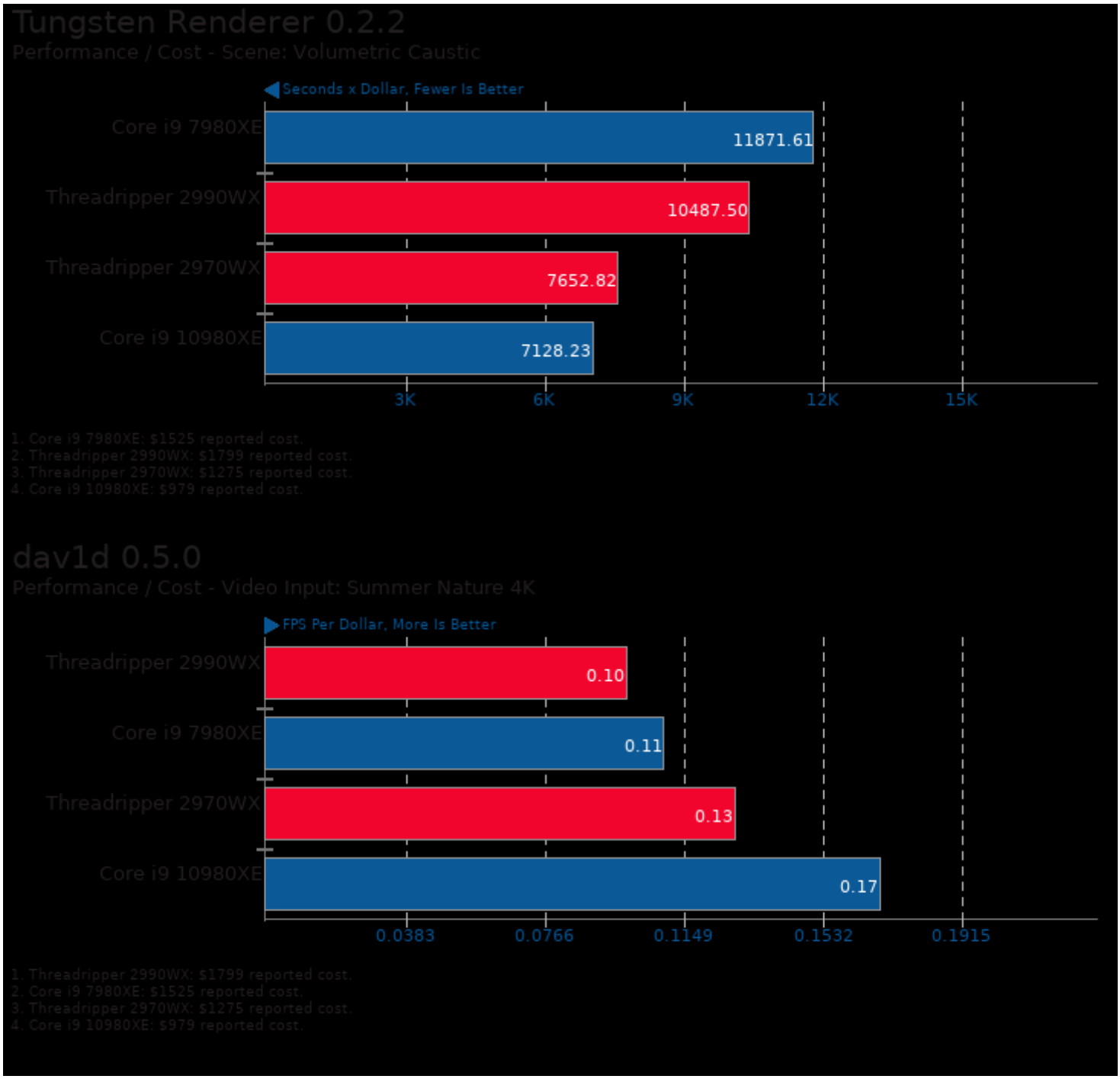


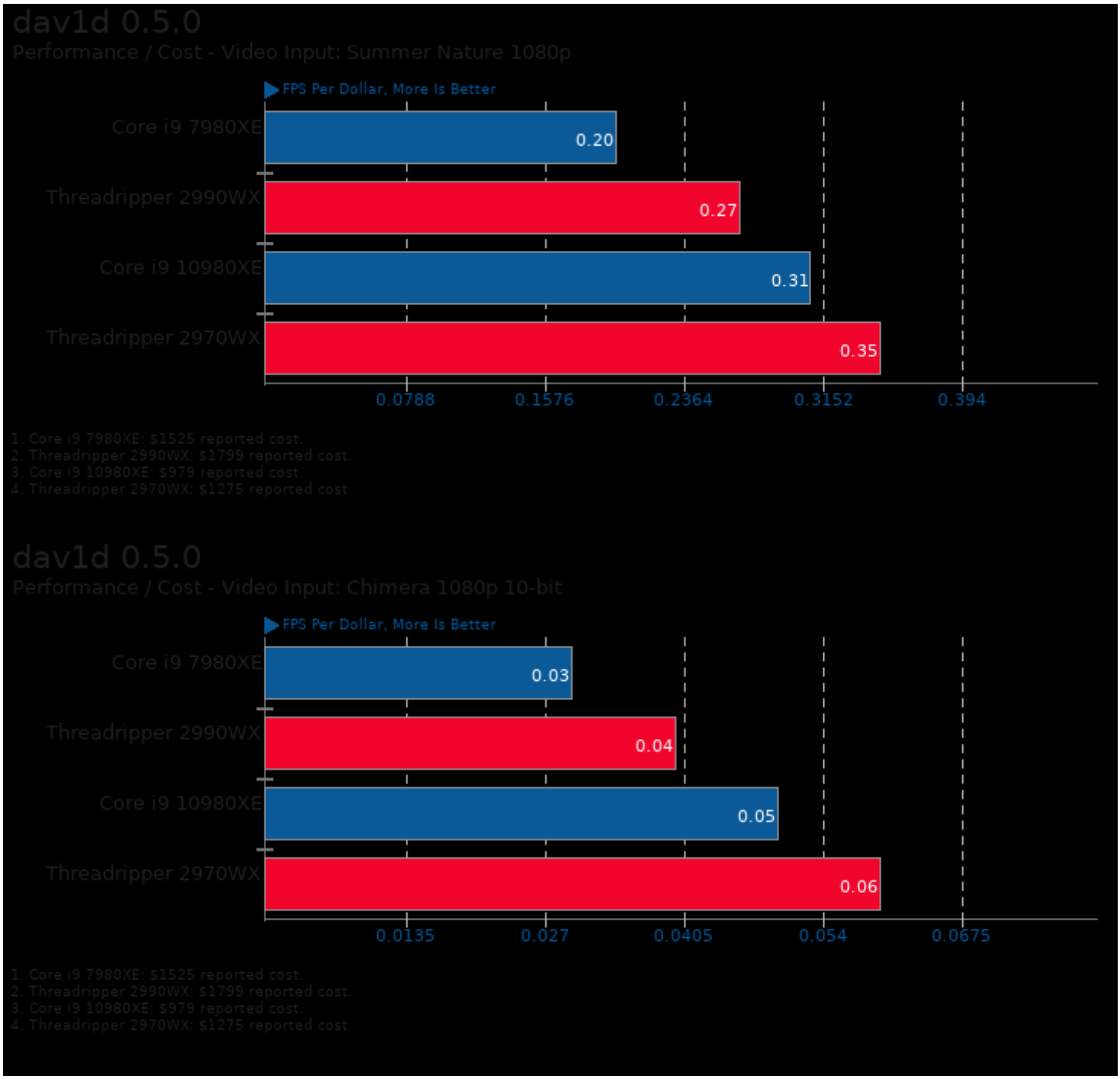
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.


Blender 2.80
Performance / Cost - Blend File: Classroom - Compute: CPU-Only
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
Threadripper 2990WX
Threadripper 2970WX
Core i9 10980XE
402356.00
289351.16
272212.50
257202.88
90K
180K
270K
360K
450K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
Blender 2.80
Performance / Cost - Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
Threadripper 2990WX
Threadripper 2970WX
Core i9 10980XE
510920.75
418285.49
387689.25
324127.32
110K
220K
330K
440K
550K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.


Appleseed 2.0 Beta
Performance / Cost - Scene: Disney Material
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
204050.47
Threadripper 2990WX
154049.69
Threadripper 2970WX
140779.37
Core i9 10980XE
119063.53
40K
80K
120K
160K
200K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
Appleseed 2.0 Beta
Performance / Cost - Scene: Material Tester
Seconds x Dollar, Fewer Is Better
Threadripper 2990WX
377591.02
Threadripper 2970WX
273700.36
Core i9 7980XE
211424.58
Core i9 10980XE
126997.58
80K
160K
240K
320K
400K
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.

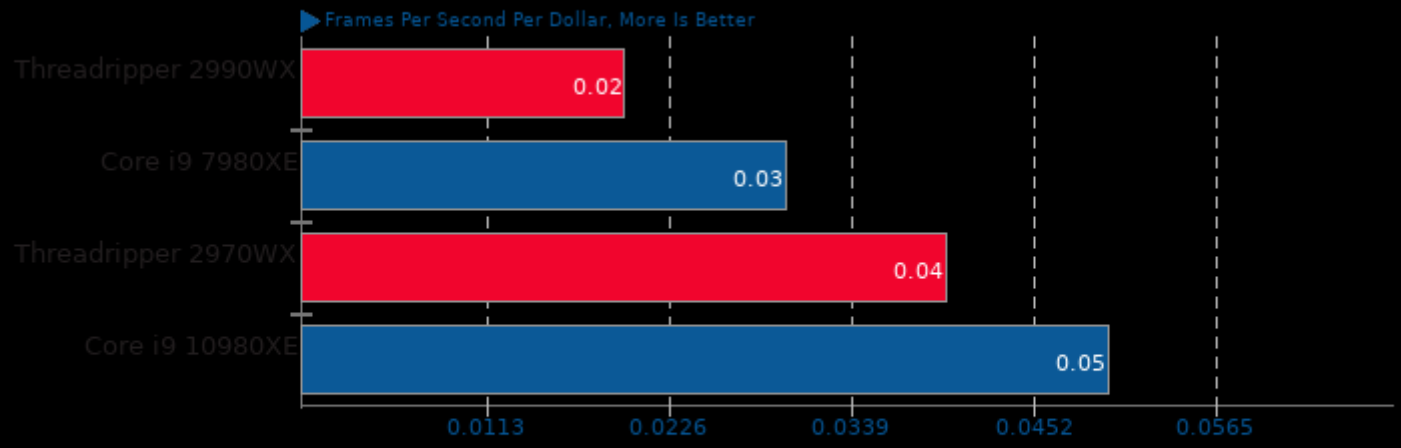

Tungsten Renderer 0.2.2
Performance / Cost - Scene: Hair
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
25043.25
Threadripper 2990WX
18704.38
Threadripper 2970WX
16384.26
Core i9 10980XE
14436.92
5K
10K
15K
20K
25K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
Tungsten Renderer 0.2.2
Performance / Cost - Scene: Water Caustic
Seconds x Dollar, Fewer Is Better
Threadripper 2990WX
42651.59
Core i9 7980XE
33667.73
Threadripper 2970WX
31757.70
Core i9 10980XE
21322.03
9K
18K
27K
36K
45K
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.


Tungsten Renderer 0.2.2
Performance / Cost - Scene: Volumetric Caustic
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
11871.61
Threadripper 2990WX
10487.50
Threadripper 2970WX
7652.82
Core i9 10980XE
7128.23
3K
6K
9K
12K
15K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
dav1d 0.5.0
Performance / Cost - Video Input: Summer Nature 4K
FPS Per Dollar, More Is Better
Threadripper 2990WX
0.10
Core i9 7980XE
0.11
Threadripper 2970WX
0.13
Core i9 10980XE
0.17
0.0383
0.0766
0.1149
0.1532
0.1915
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.


dav1d 0.5.0
Performance / Cost - Video Input: Summer Nature 1080p
FPS Per Dollar, More Is Better
Core i9 7980XE
Threadripper 2990WX
Core i9 10980XE
Threadripper 2970WX
0.20
0.27
0.31
0.35
0.0788
0.1576
0.2364
0.3152
0.394
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Core i9 10980XE: $979 reported cost.
4. Threadripper 2970WX: $1275 reported cost.
dav1d 0.5.0
Performance / Cost - Video Input: Chimera 1080p 10-bit
FPS Per Dollar, More Is Better
Core i9 7980XE
Threadripper 2990WX
Core i9 10980XE
Threadripper 2970WX
0.03
0.04
0.05
0.06
0.0135
0.027
0.0405
0.054
0.0675
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Core i9 10980XE: $979 reported cost.
4. Threadripper 2970WX: $1275 reported cost.

SVT-AV1 0.7

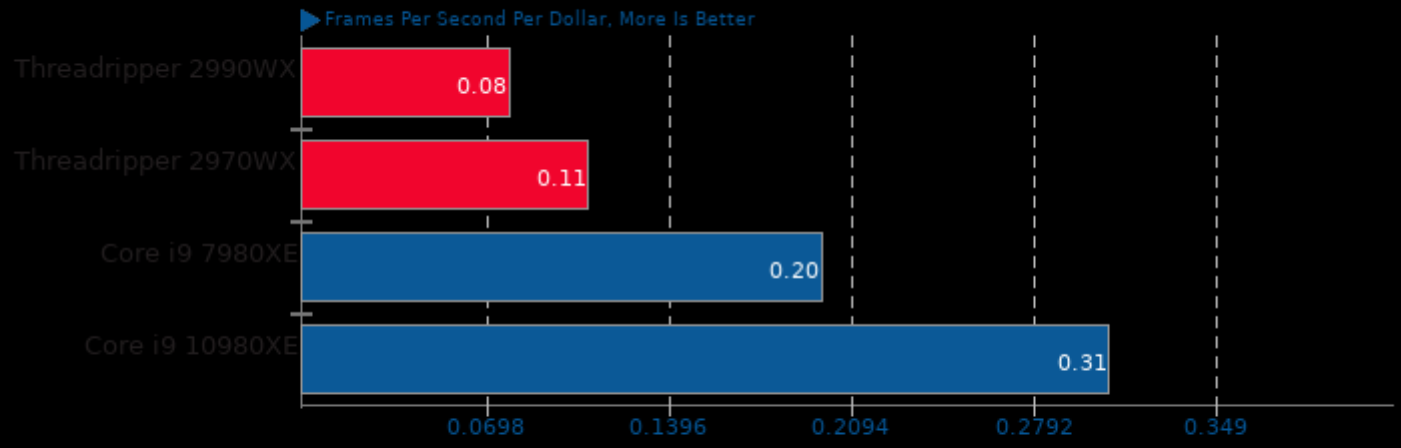
Performance / Cost - Encoder Mode: Enc Mode 8 - Input: 1080p



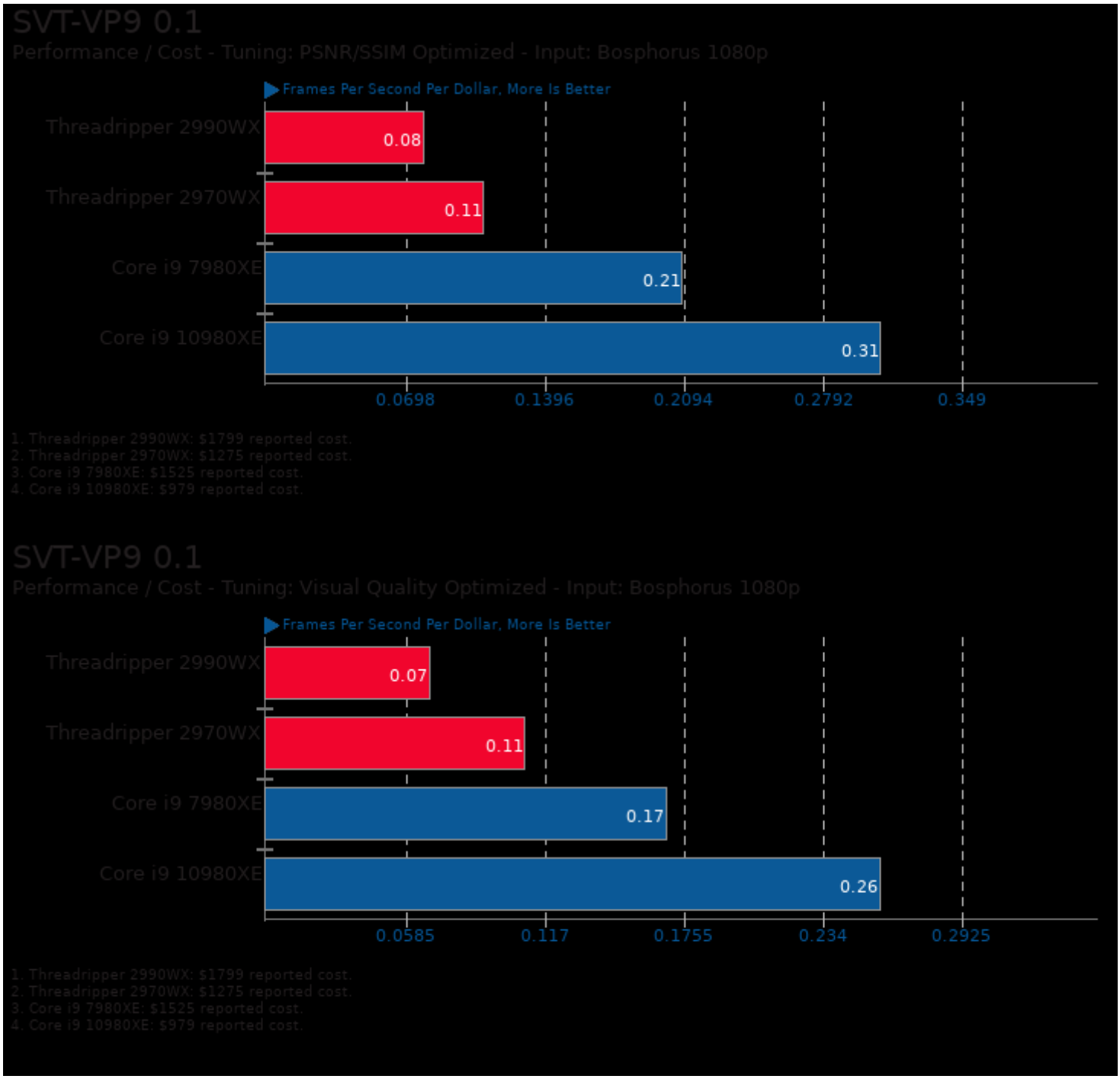
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

SVT-VP9 0.1

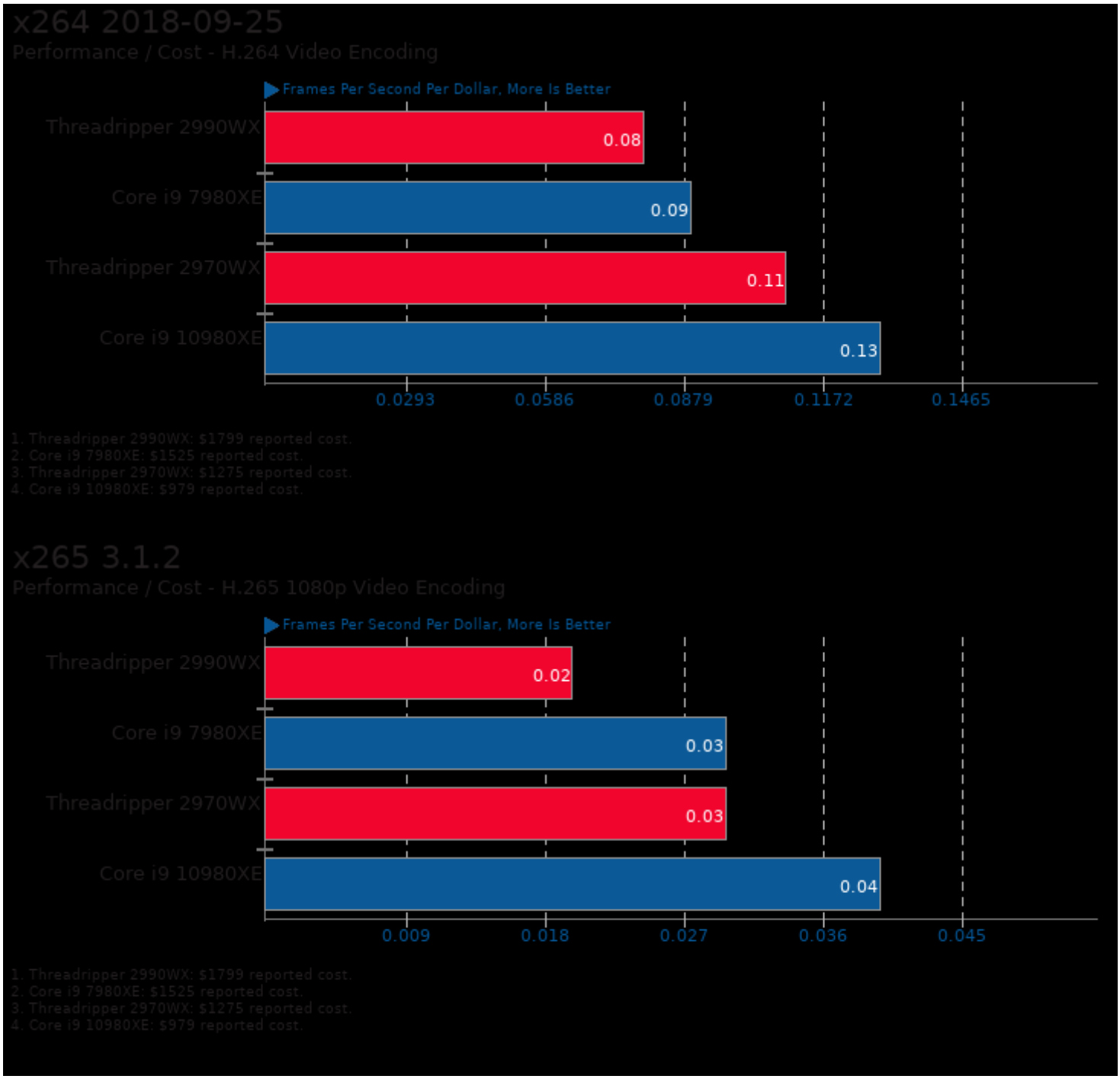
Performance / Cost - Tuning: VMAF Optimized - Input: Bosphorus 1080p



1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.


SVT-VP9 0.1
Performance / Cost - Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second Per Dollar, More Is Better
Threadripper 2990WX
0.08
Threadripper 2970WX
0.11
Core i9 7980XE
0.21
Core i9 10980XE
0.31
0.0698
0.1396
0.2094
0.2792
0.349
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.
SVT-VP9 0.1
Performance / Cost - Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second Per Dollar, More Is Better
Threadripper 2990WX
0.07
Threadripper 2970WX
0.11
Core i9 7980XE
0.17
Core i9 10980XE
0.26
0.0585
0.117
0.1755
0.234
0.2925
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.

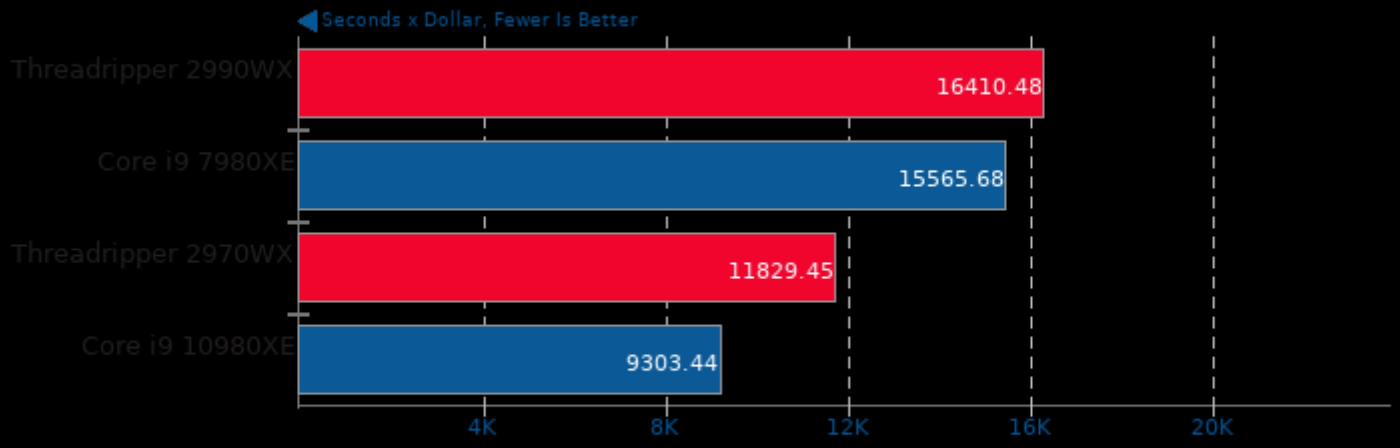
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

FLAC Audio Encoding 1.3.2

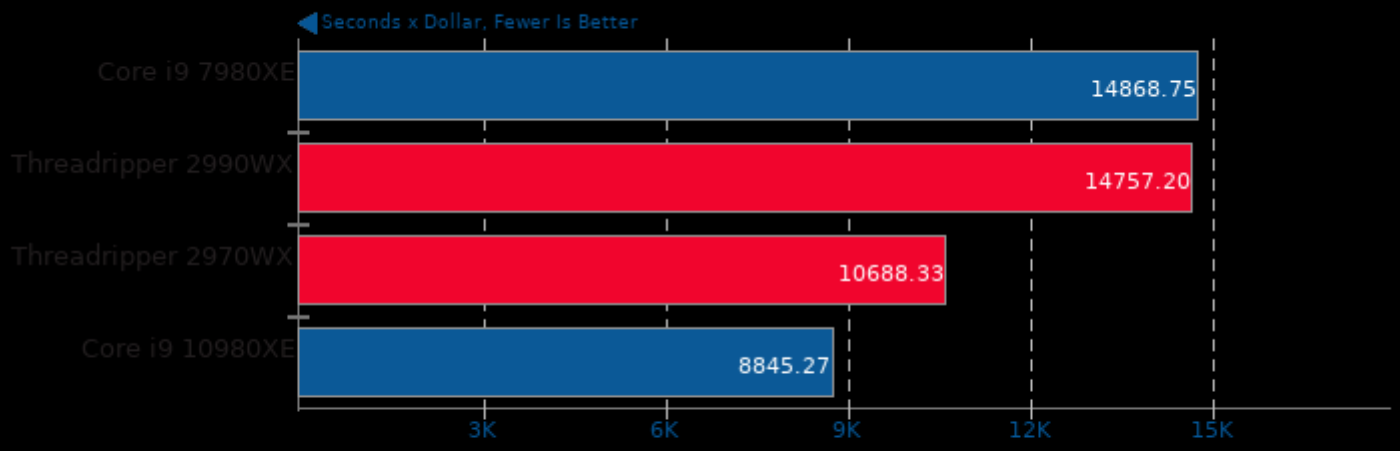
Performance / Cost - WAV To FLAC



1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

LAME MP3 Encoding 3.100

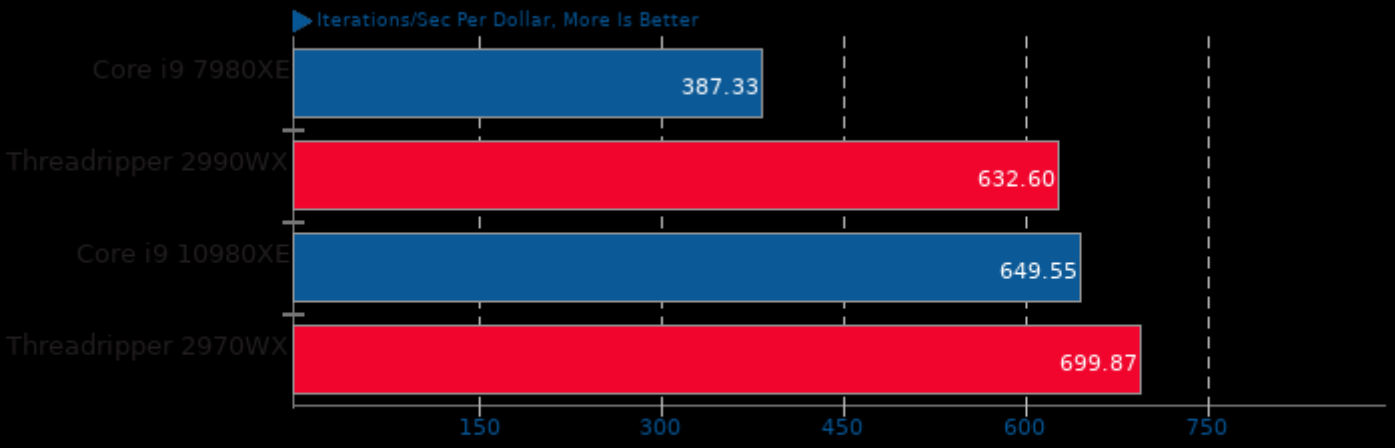
Performance / Cost - WAV To MP3



1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

Coremark 1.0

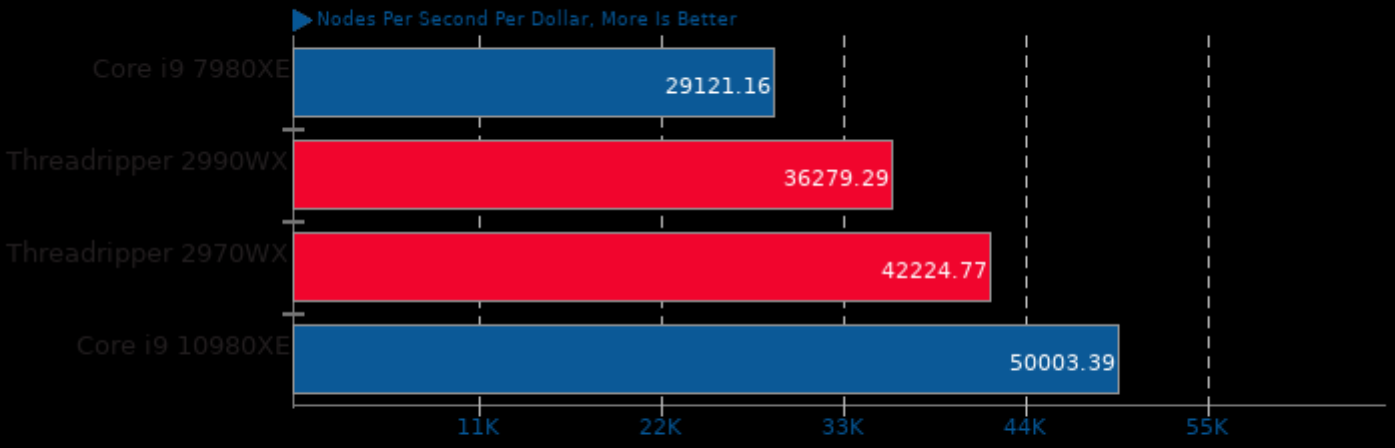
Performance / Cost - CoreMark Size 666 - Iterations Per Second



1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Core i9 10980XE: $979 reported cost.
4. Threadripper 2970WX: $1275 reported cost.

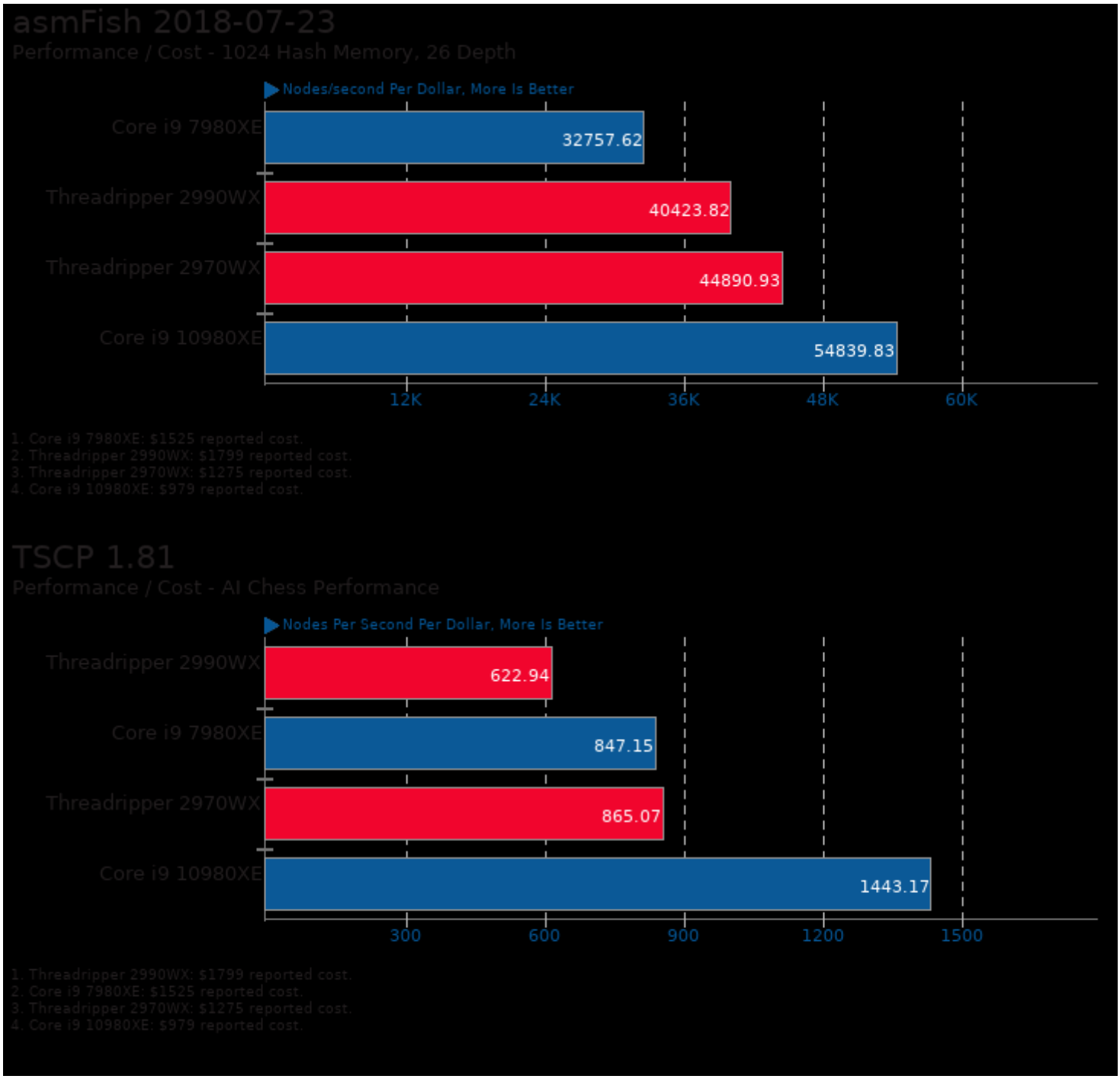
Stockfish 9

Performance / Cost - Total Time

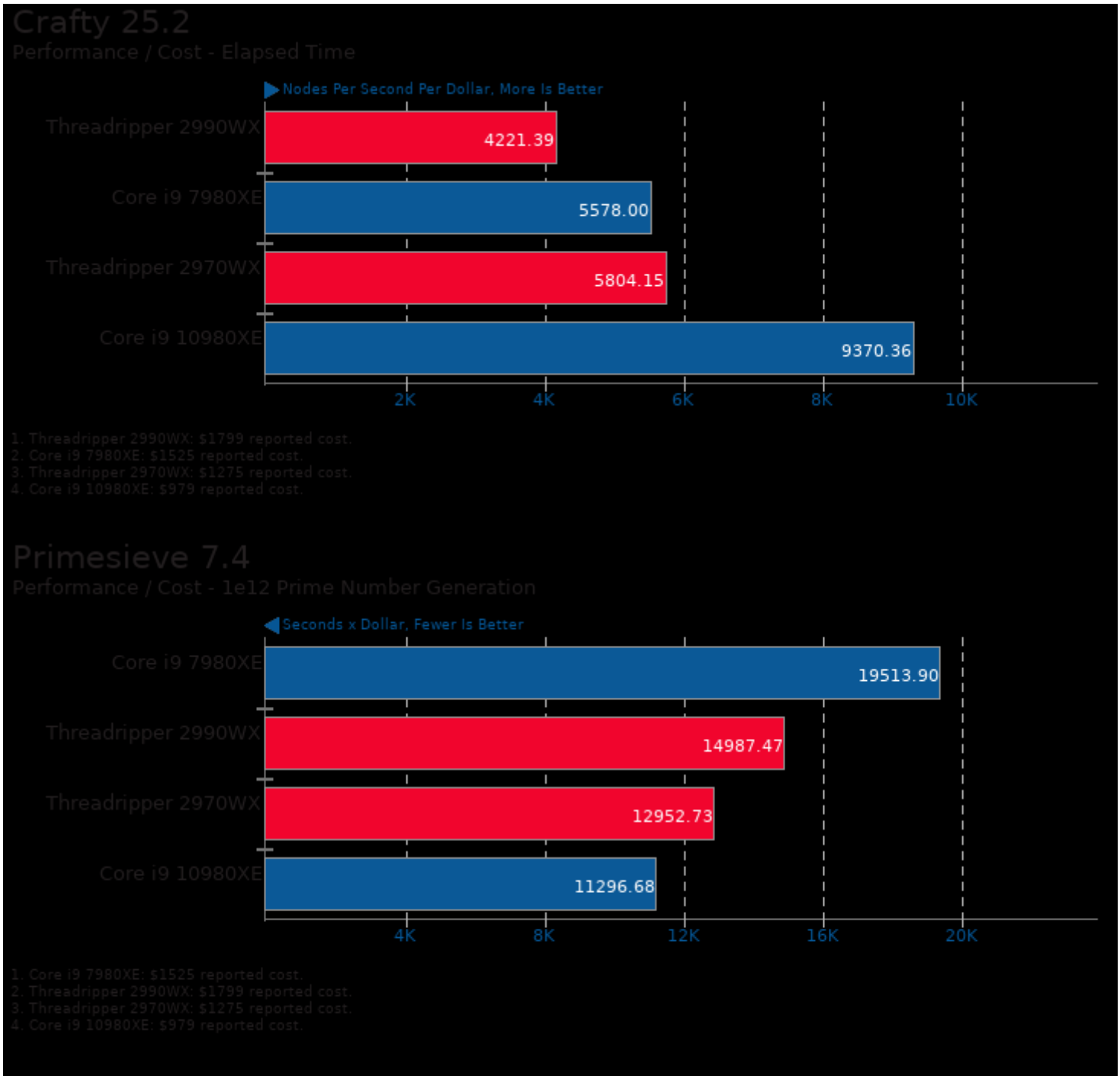


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2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

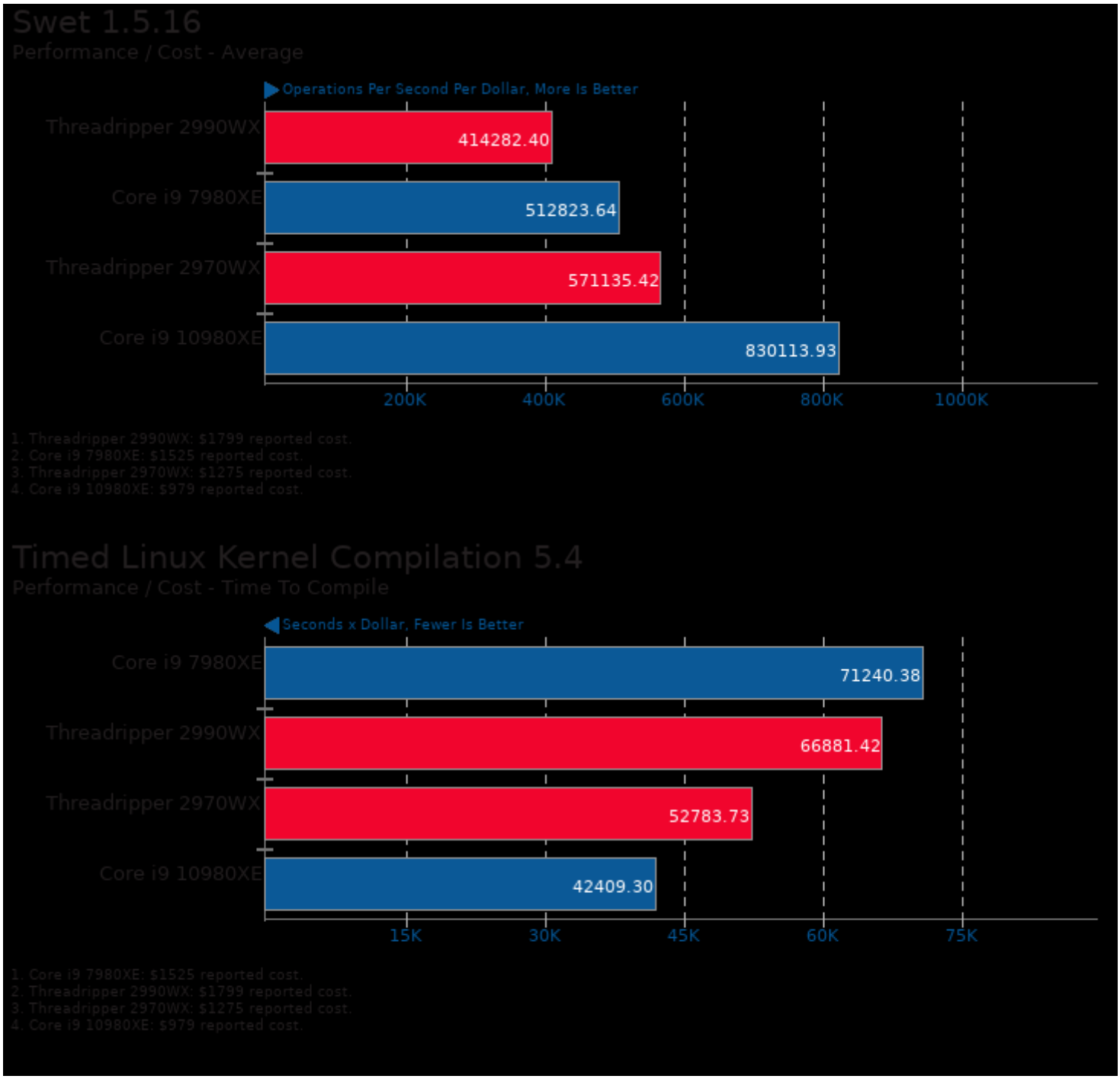
Intel Core i9-10980XE Linux Benchmarks



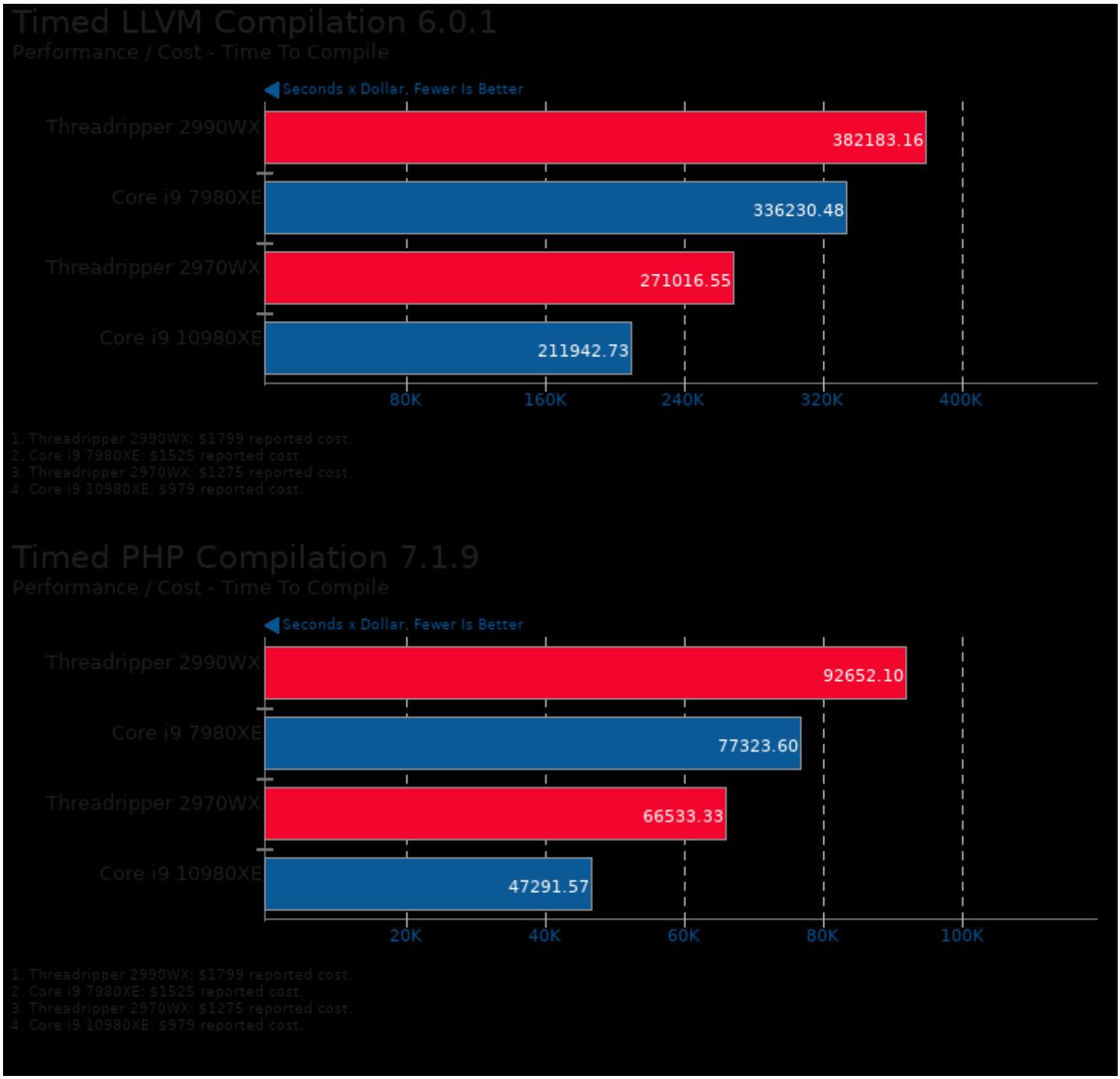
Intel Core i9-10980XE Linux Benchmarks



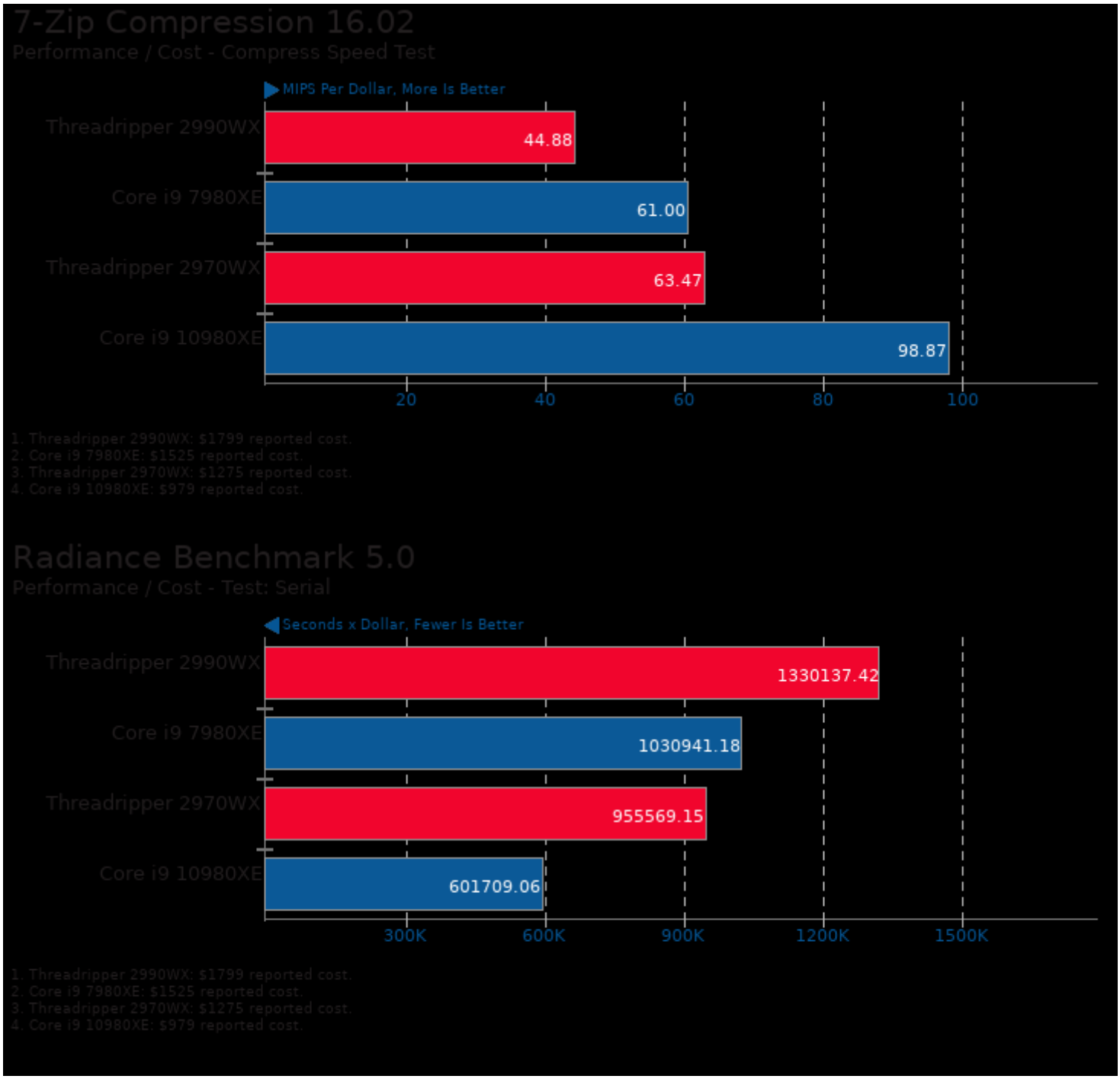
Intel Core i9-10980XE Linux Benchmarks



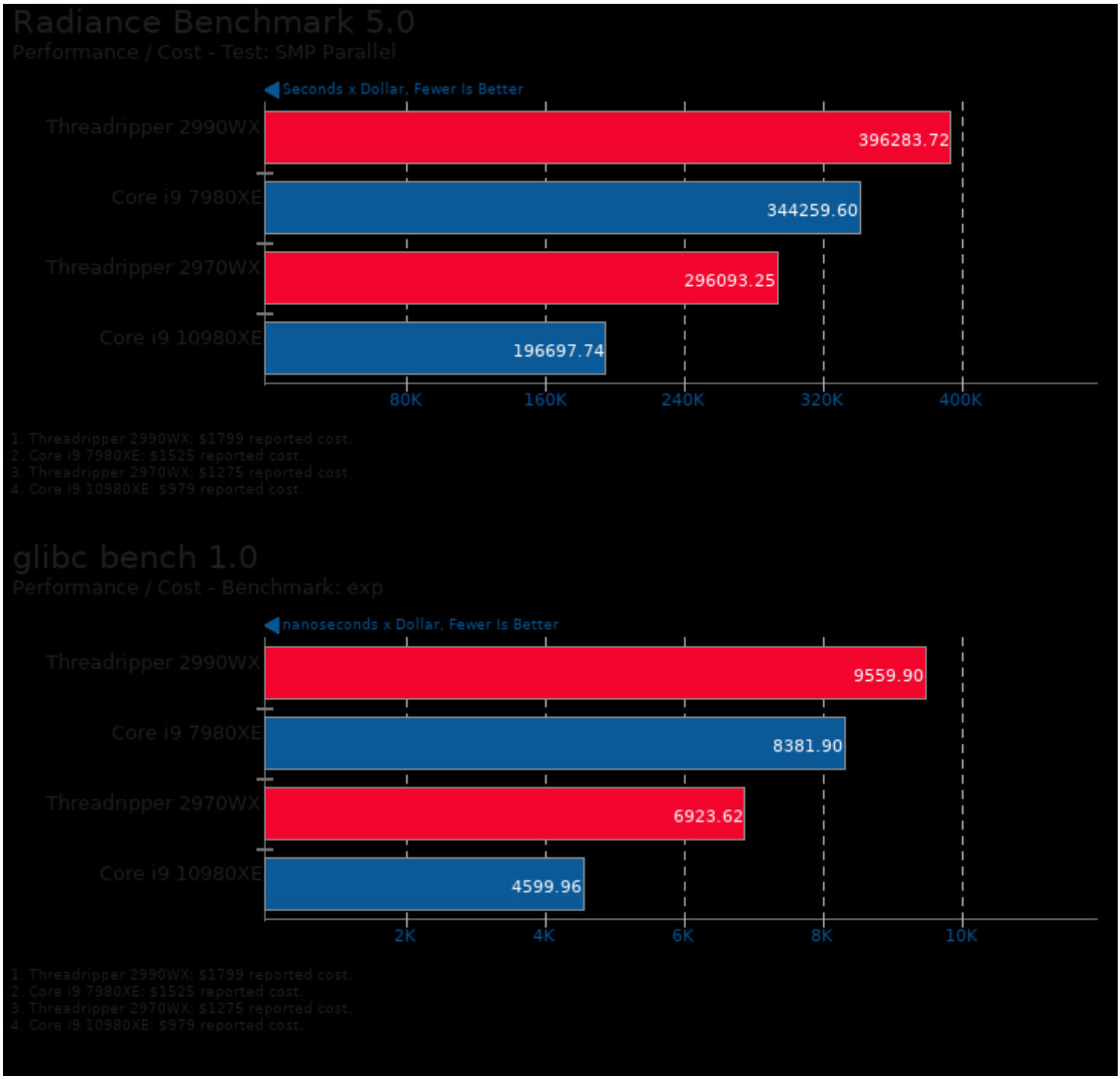
Intel Core i9-10980XE Linux Benchmarks



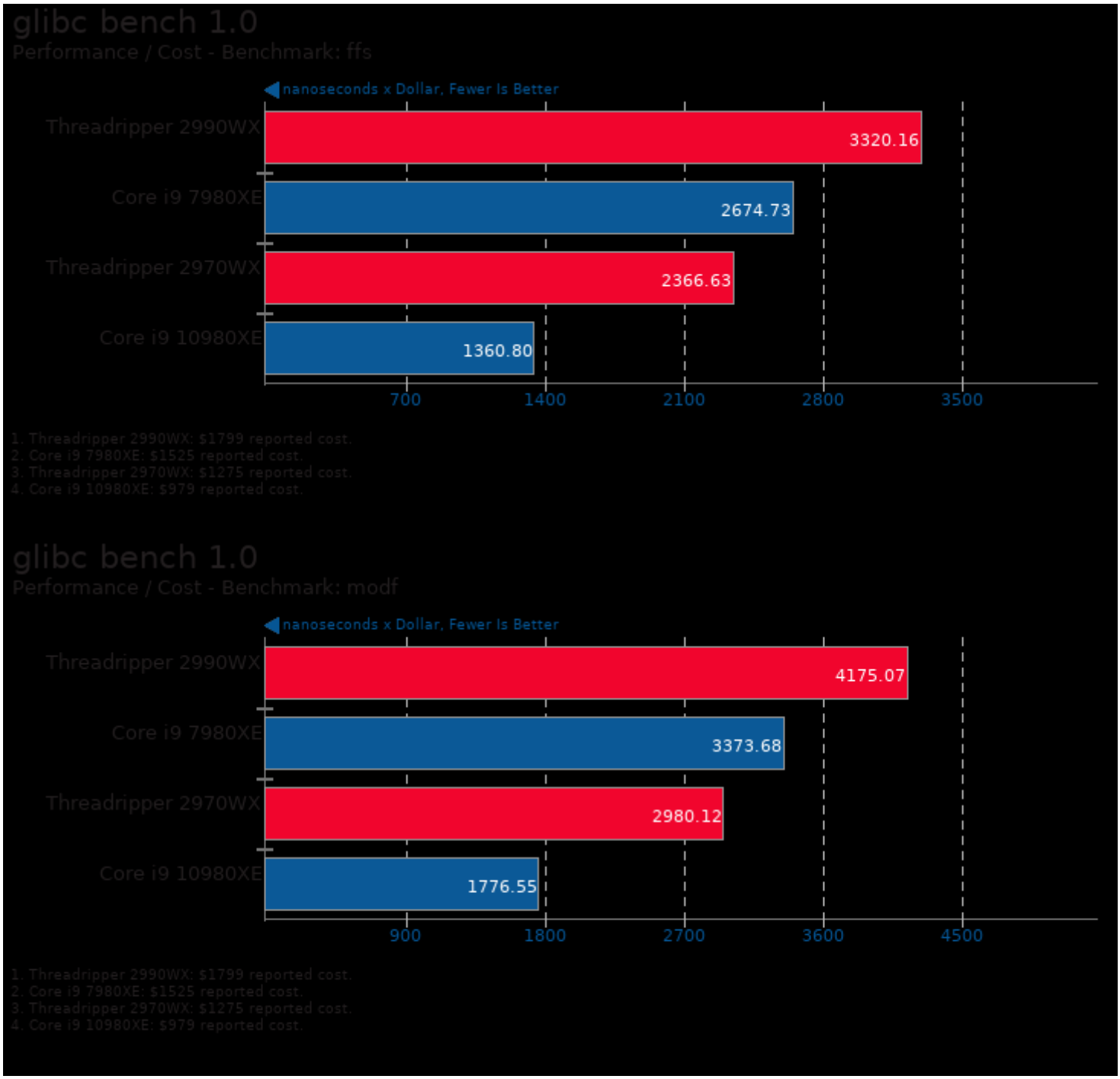
Intel Core i9-10980XE Linux Benchmarks



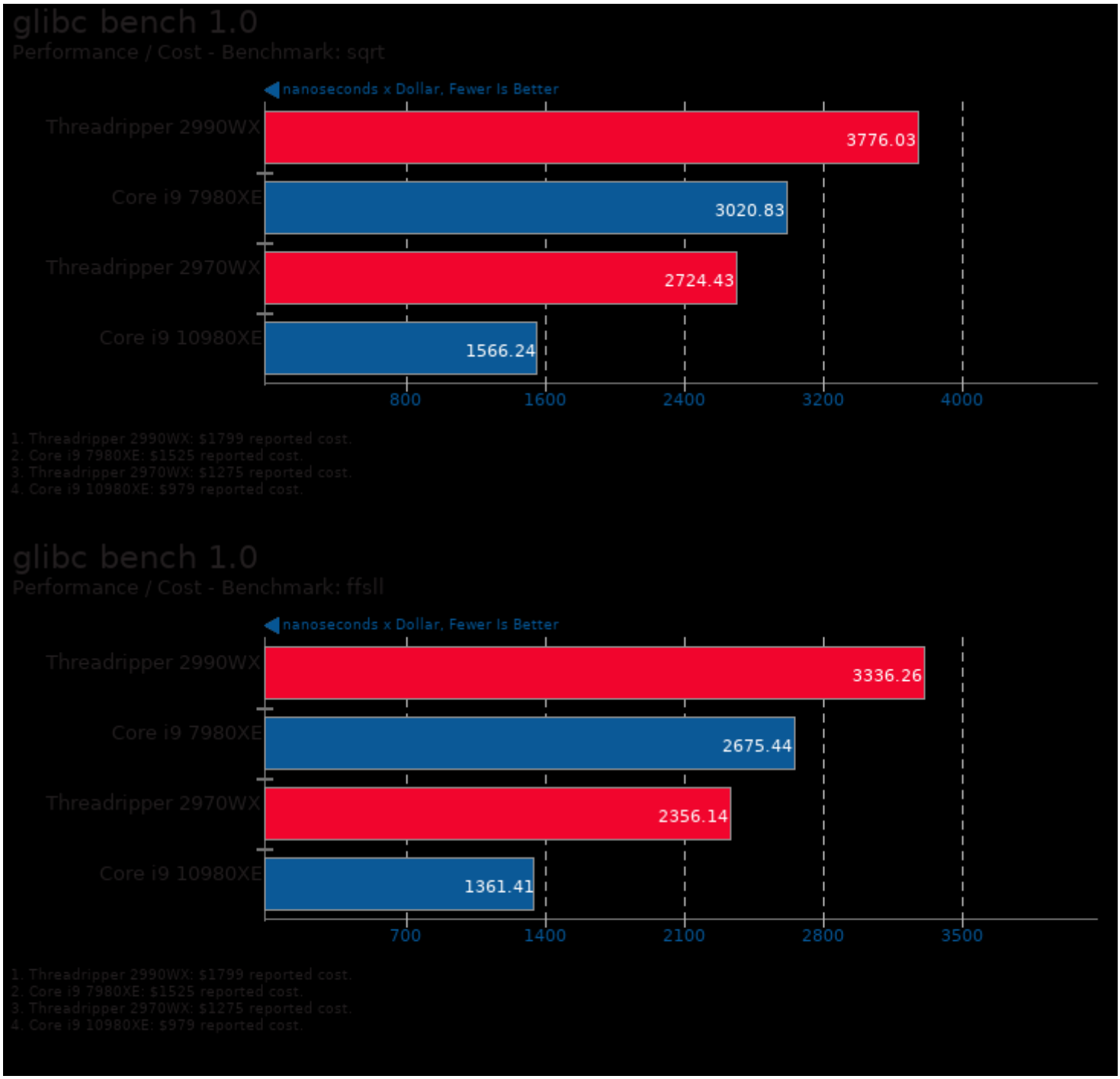
Intel Core i9-10980XE Linux Benchmarks



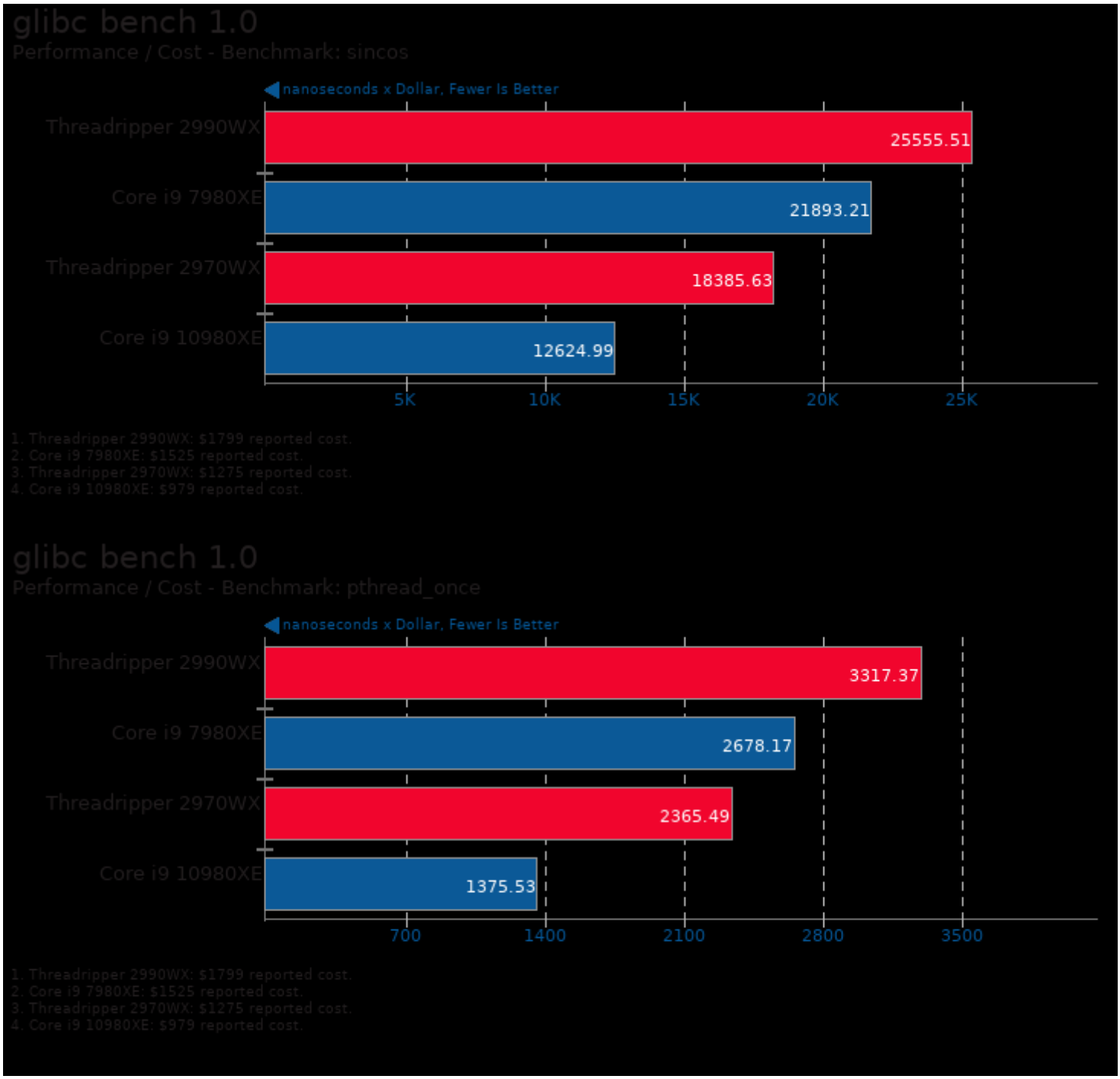
Intel Core i9-10980XE Linux Benchmarks



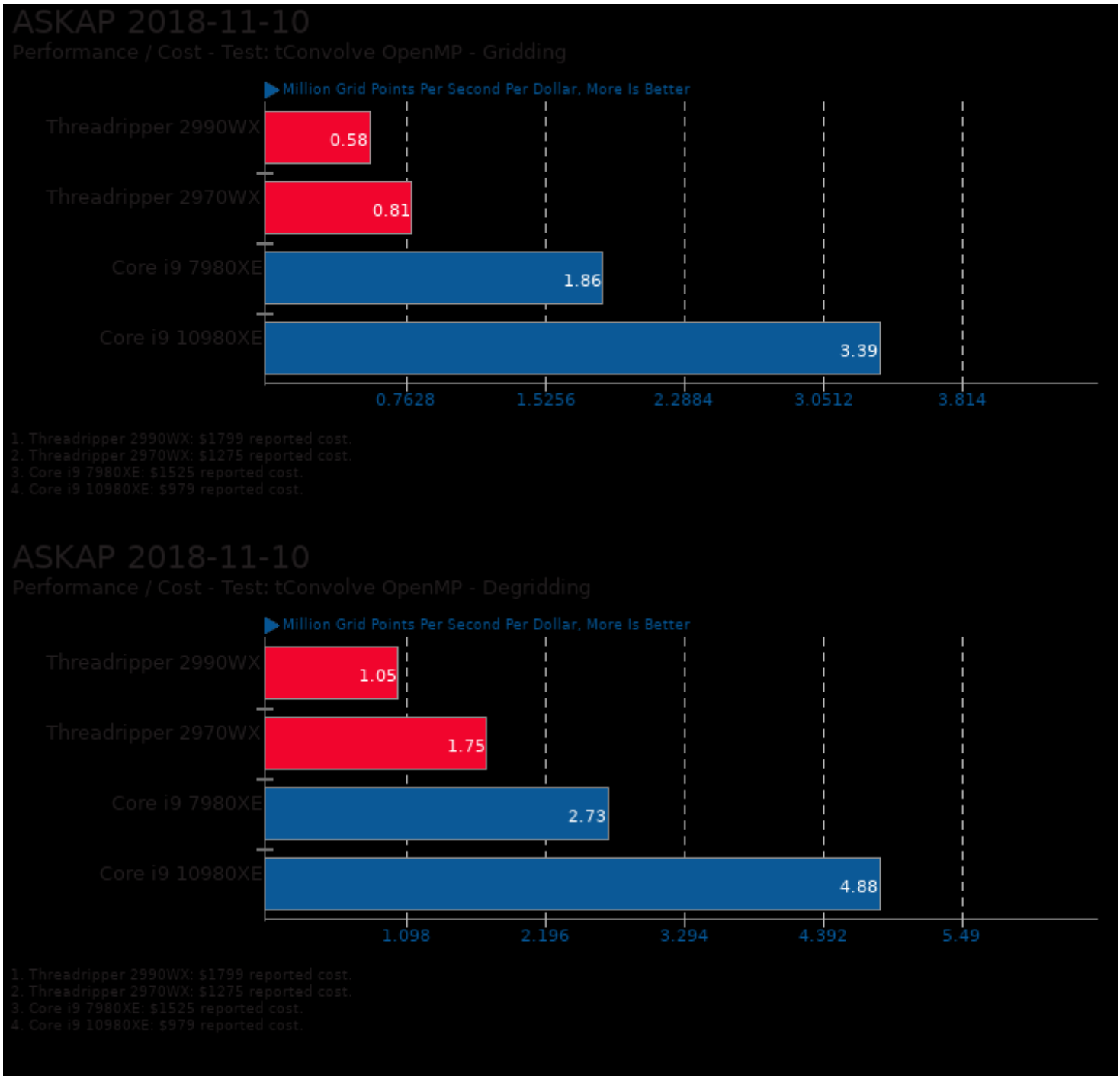
Intel Core i9-10980XE Linux Benchmarks

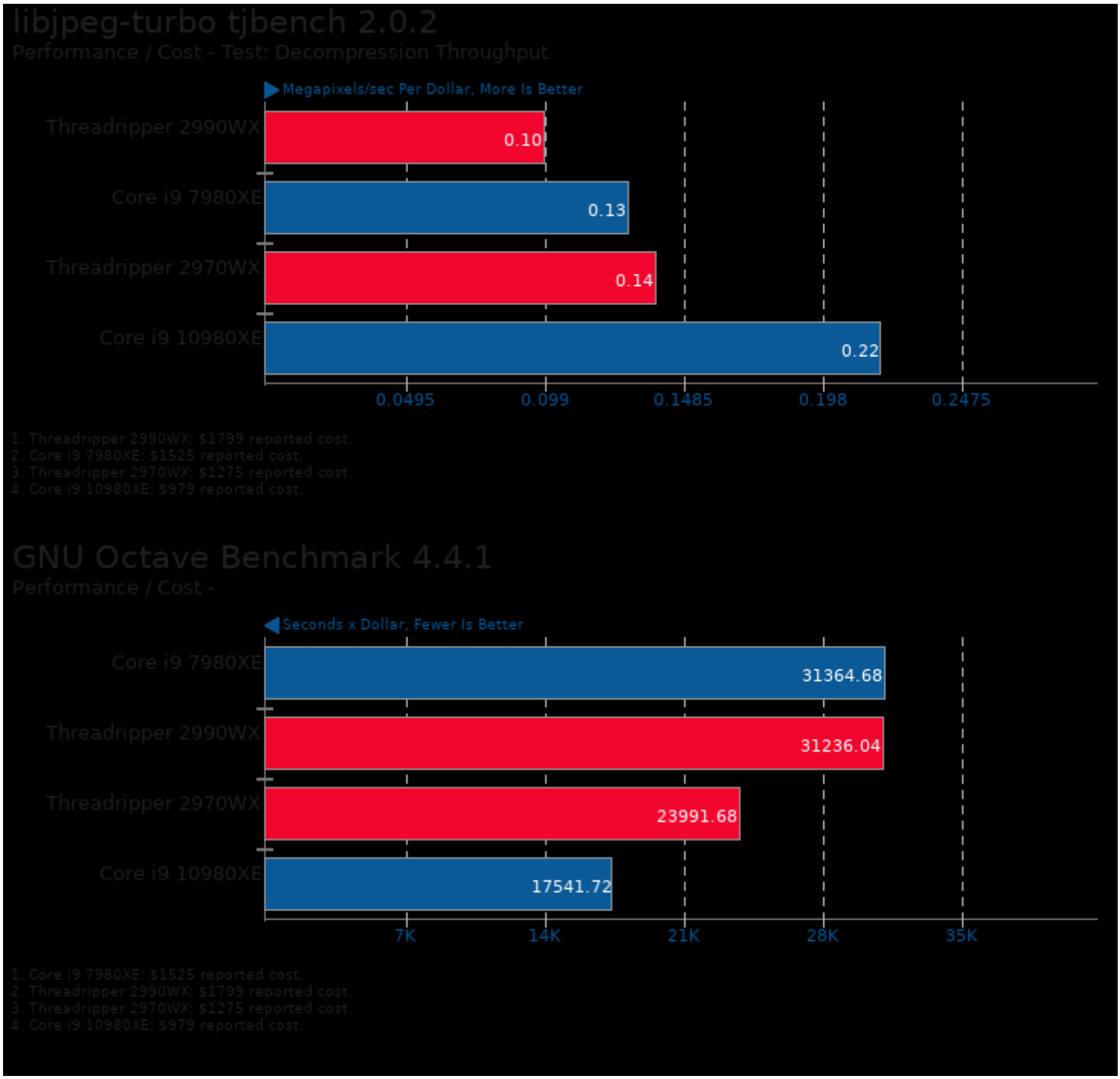


Intel Core i9-10980XE Linux Benchmarks

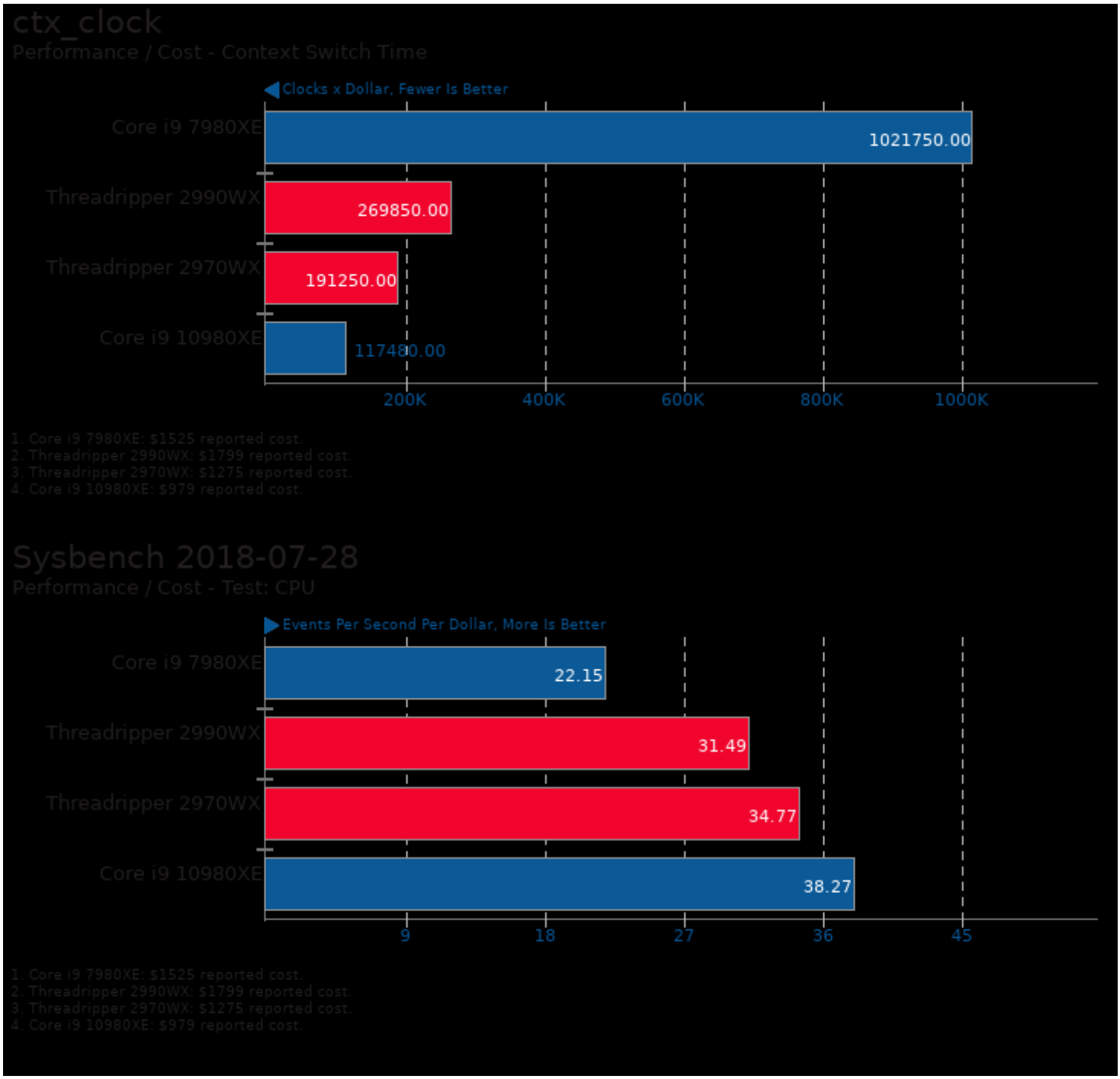


Intel Core i9-10980XE Linux Benchmarks




libjpeg-turbo tjbench 2.0.2
Performance / Cost - Test: Decompression Throughput
Megapixels/sec Per Dollar, More Is Better
Threadripper 2990WX
0.10
Core i9 7980XE
0.13
Threadripper 2970WX
0.14
Core i9 10980XE
0.22
0.0495
0.099
0.1485
0.198
0.2475
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
GNU Octave Benchmark 4.4.1
Performance / Cost -
Seconds x Dollar, Fewer Is Better
Core i9 7980XE
31364.68
Threadripper 2990WX
31236.04
Threadripper 2970WX
23991.68
Core i9 10980XE
17541.72
7K
14K
21K
28K
35K
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

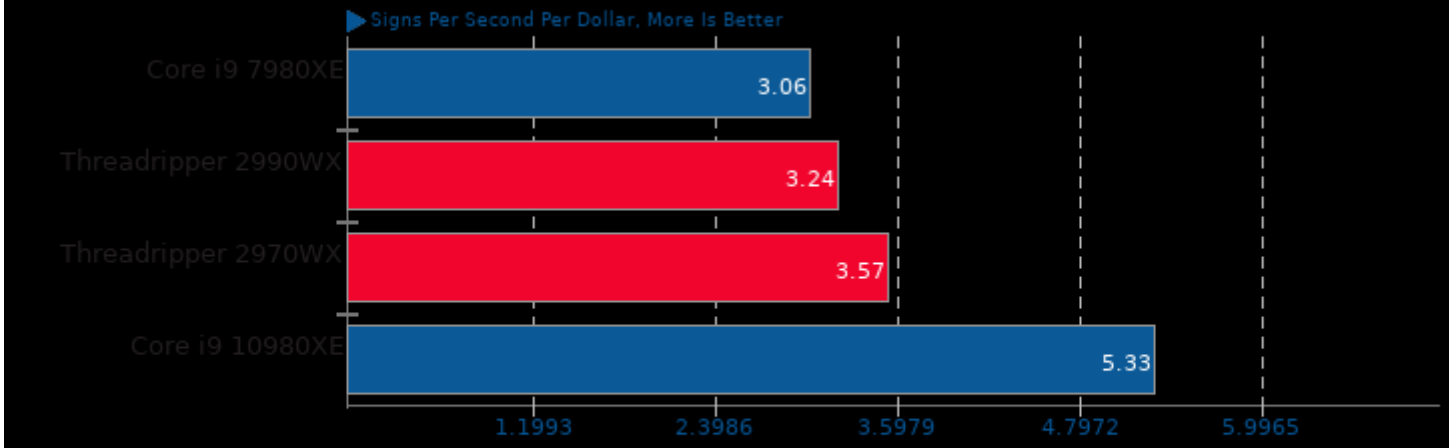
Intel Core i9-10980XE Linux Benchmarks



Intel Core i9-10980XE Linux Benchmarks

OpenSSL 1.1.1

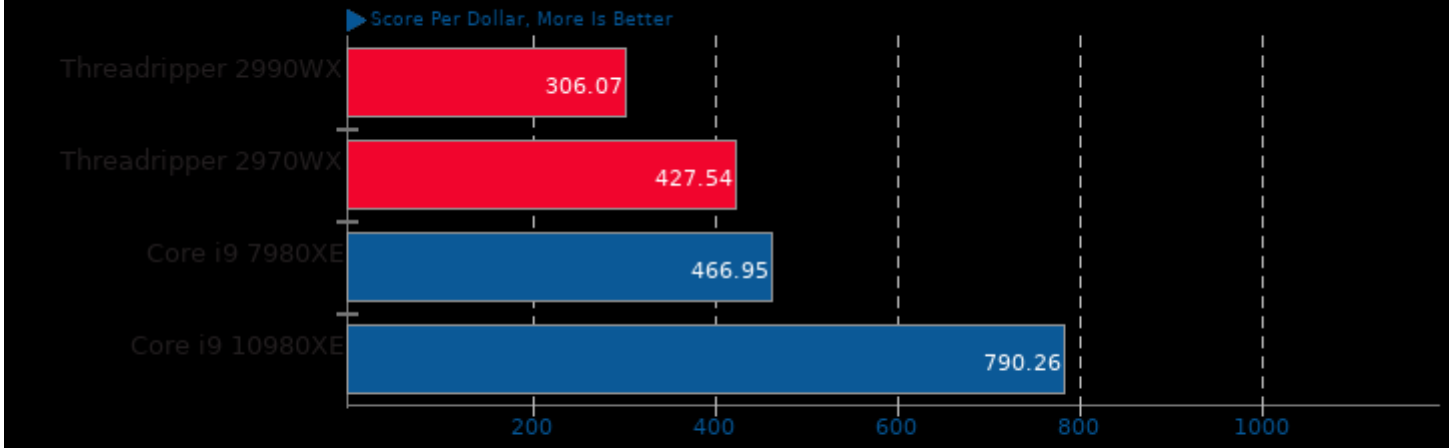
Performance / Cost - RSA 4096-bit Performance



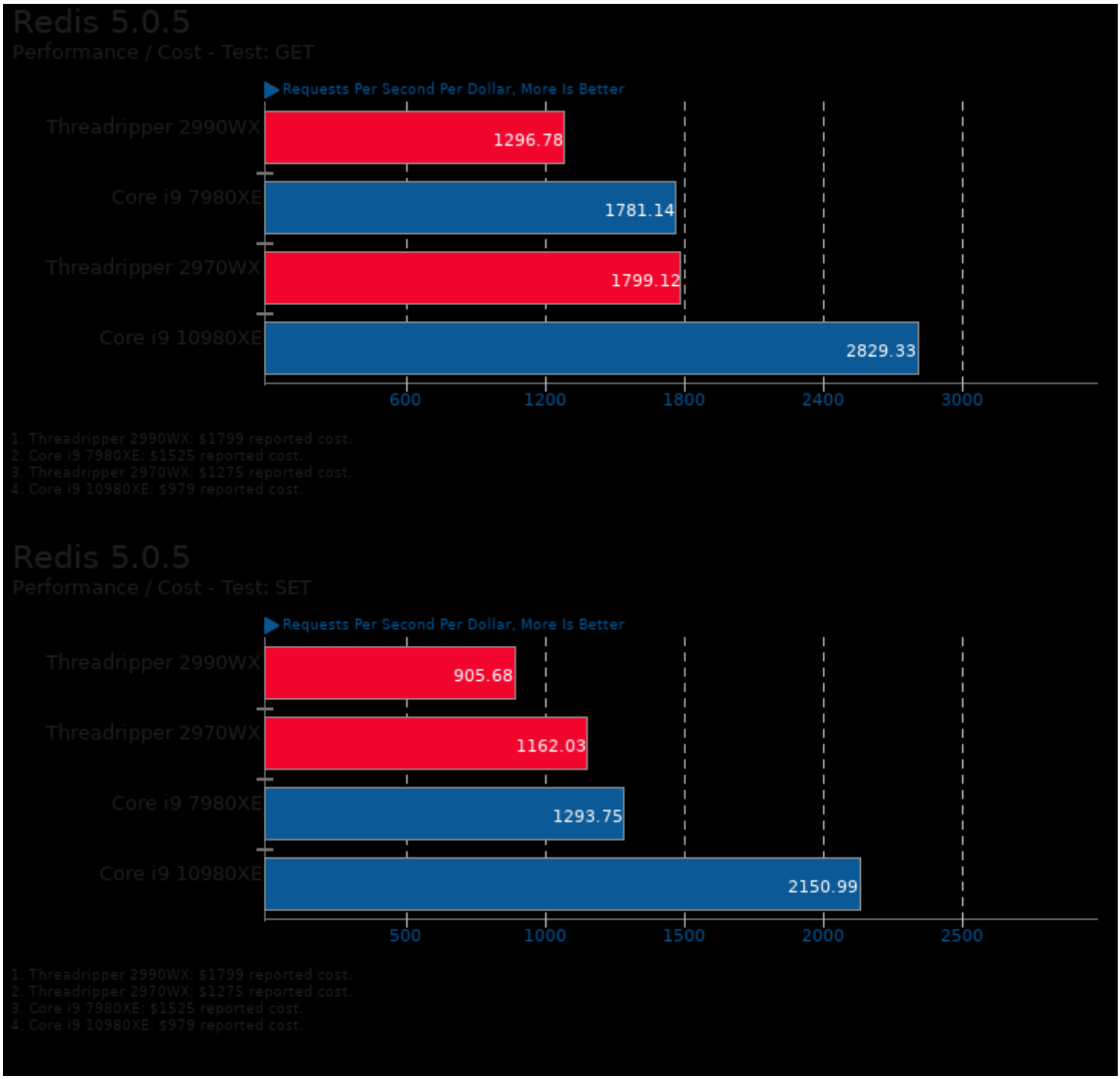
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

PHPBench 0.8.1

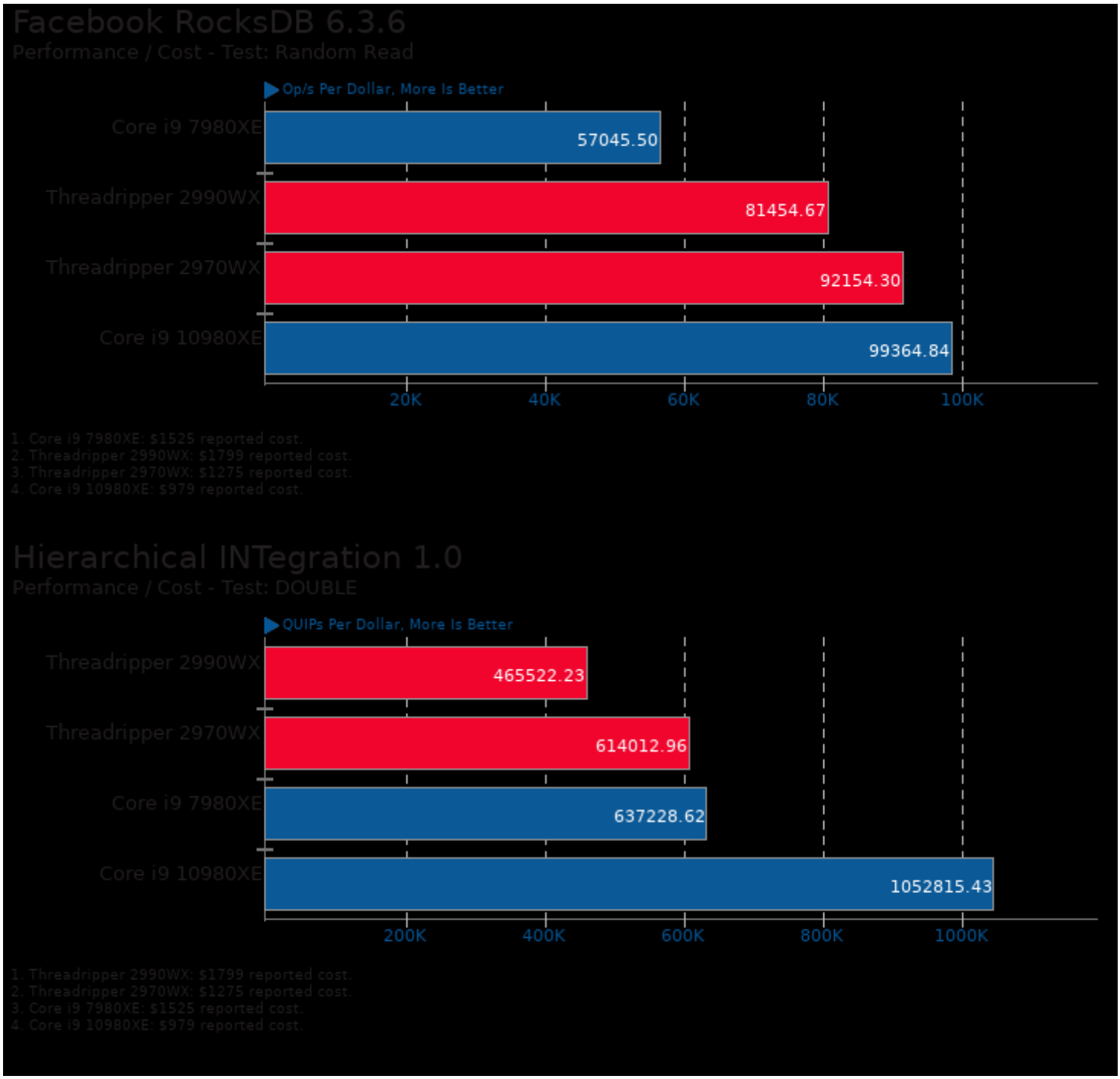
Performance / Cost - PHP Benchmark Suite



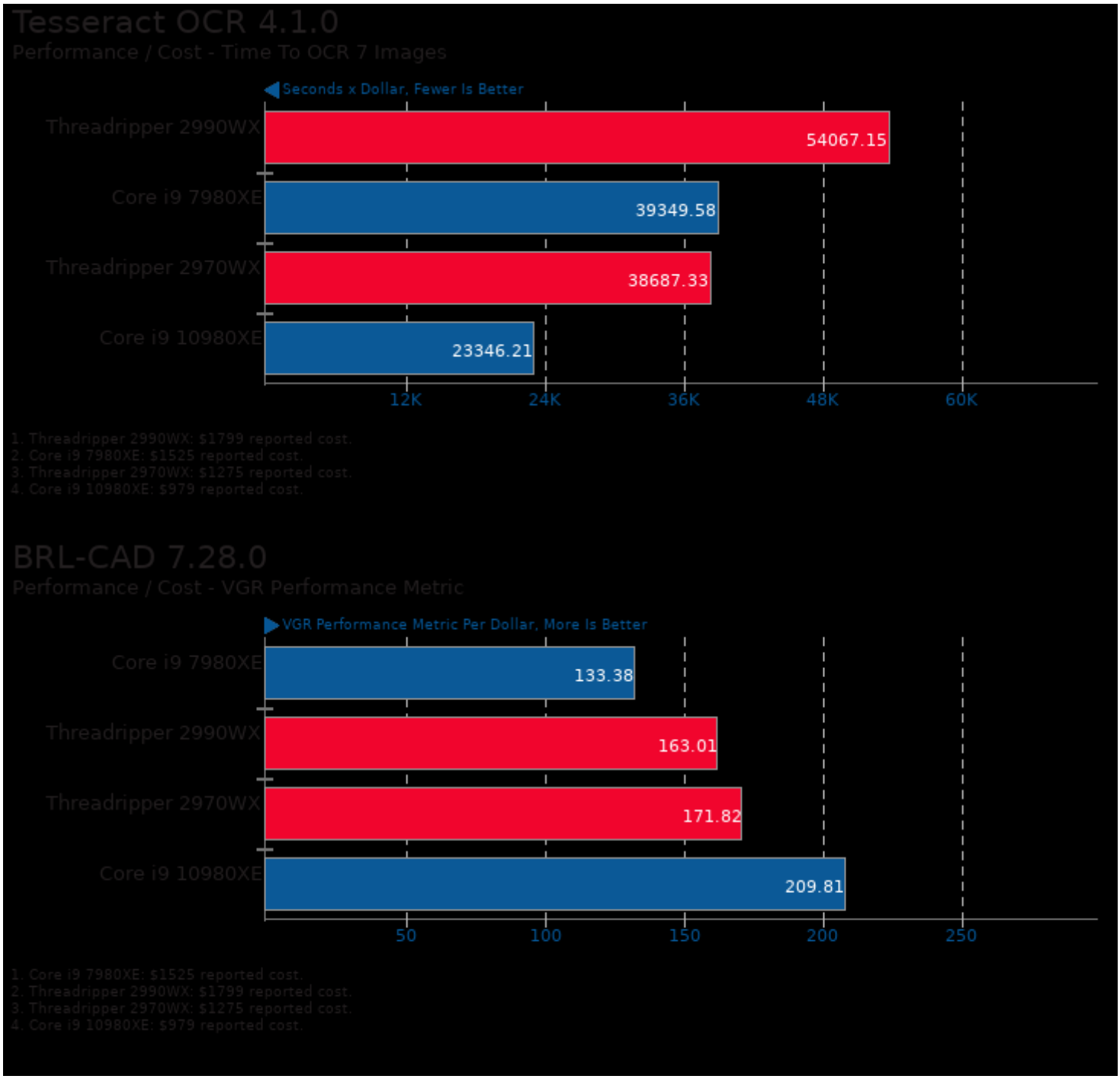
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.

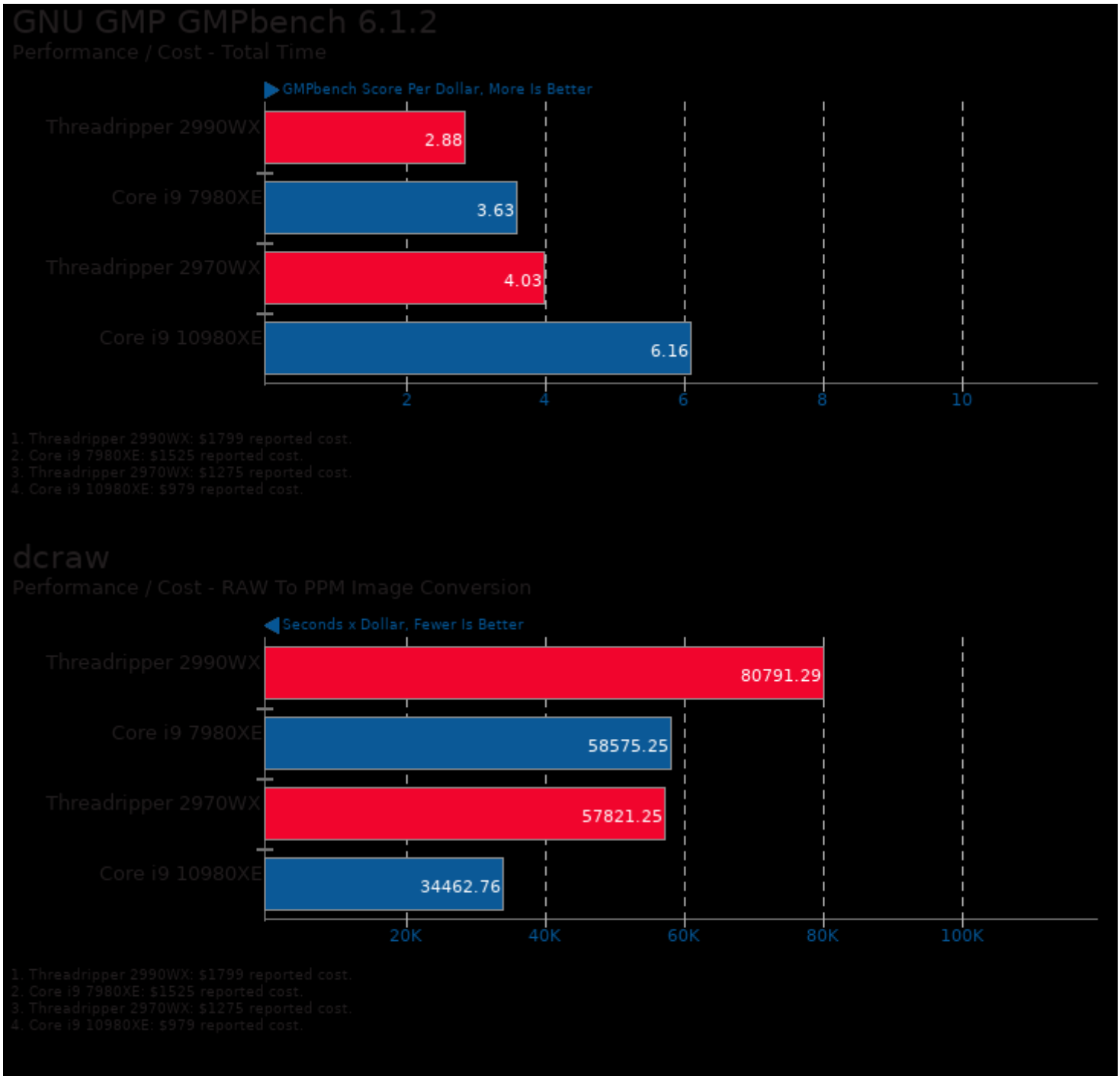

Redis 5.0.5
Performance / Cost - Test: GET
Requests Per Second Per Dollar, More Is Better
Threadripper 2990WX
1296.78
Core i9 7980XE
1781.14
Threadripper 2970WX
1799.12
Core i9 10980XE
2829.33
600
1200
1800
2400
3000
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
Redis 5.0.5
Performance / Cost - Test: SET
Requests Per Second Per Dollar, More Is Better
Threadripper 2990WX
905.68
Threadripper 2970WX
1162.03
Core i9 7980XE
1293.75
Core i9 10980XE
2150.99
500
1000
1500
2000
2500
1. Threadripper 2990WX: $1799 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Core i9 7980XE: $1525 reported cost.
4. Core i9 10980XE: $979 reported cost.

Intel Core i9-10980XE Linux Benchmarks

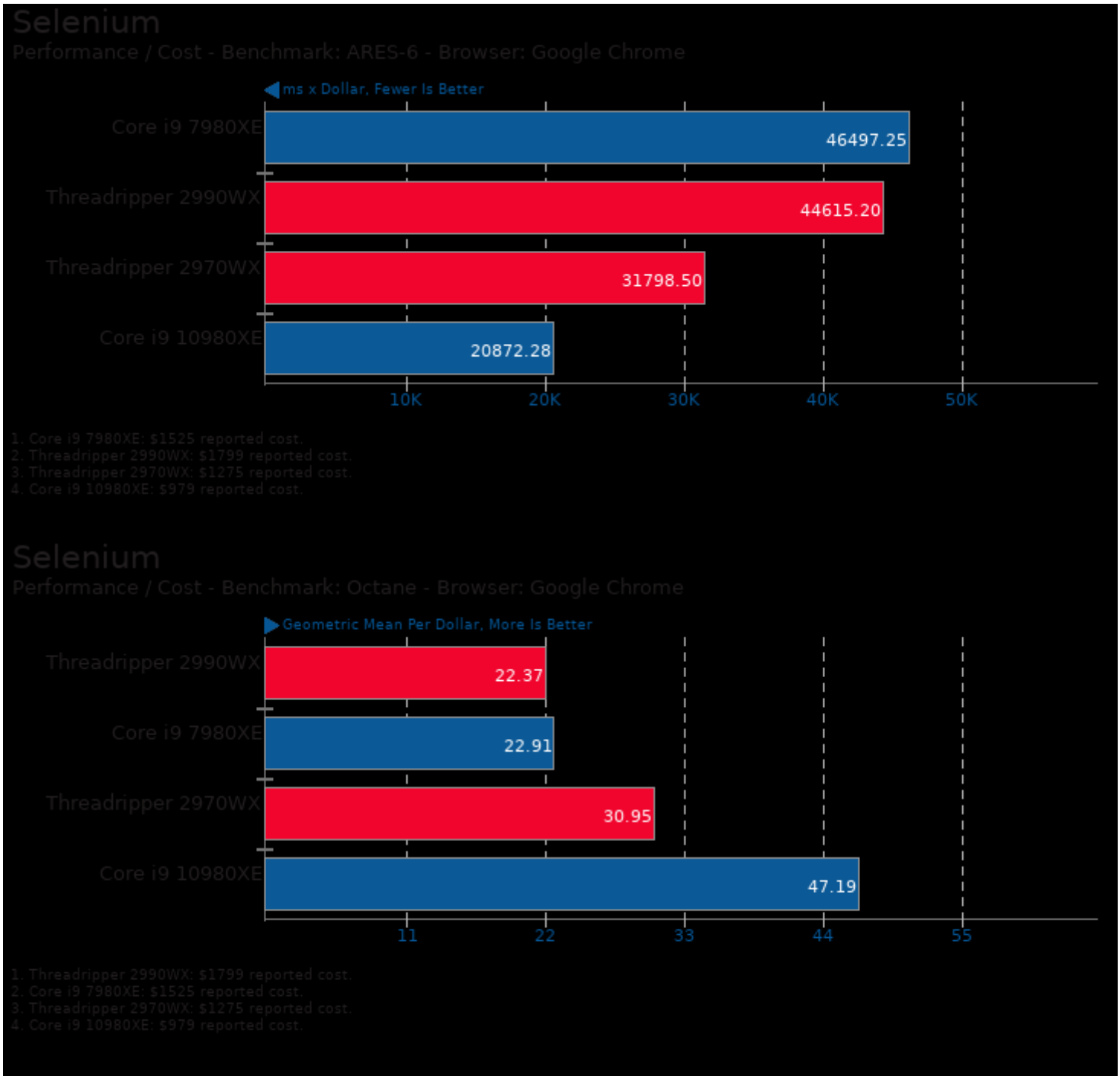


Intel Core i9-10980XE Linux Benchmarks

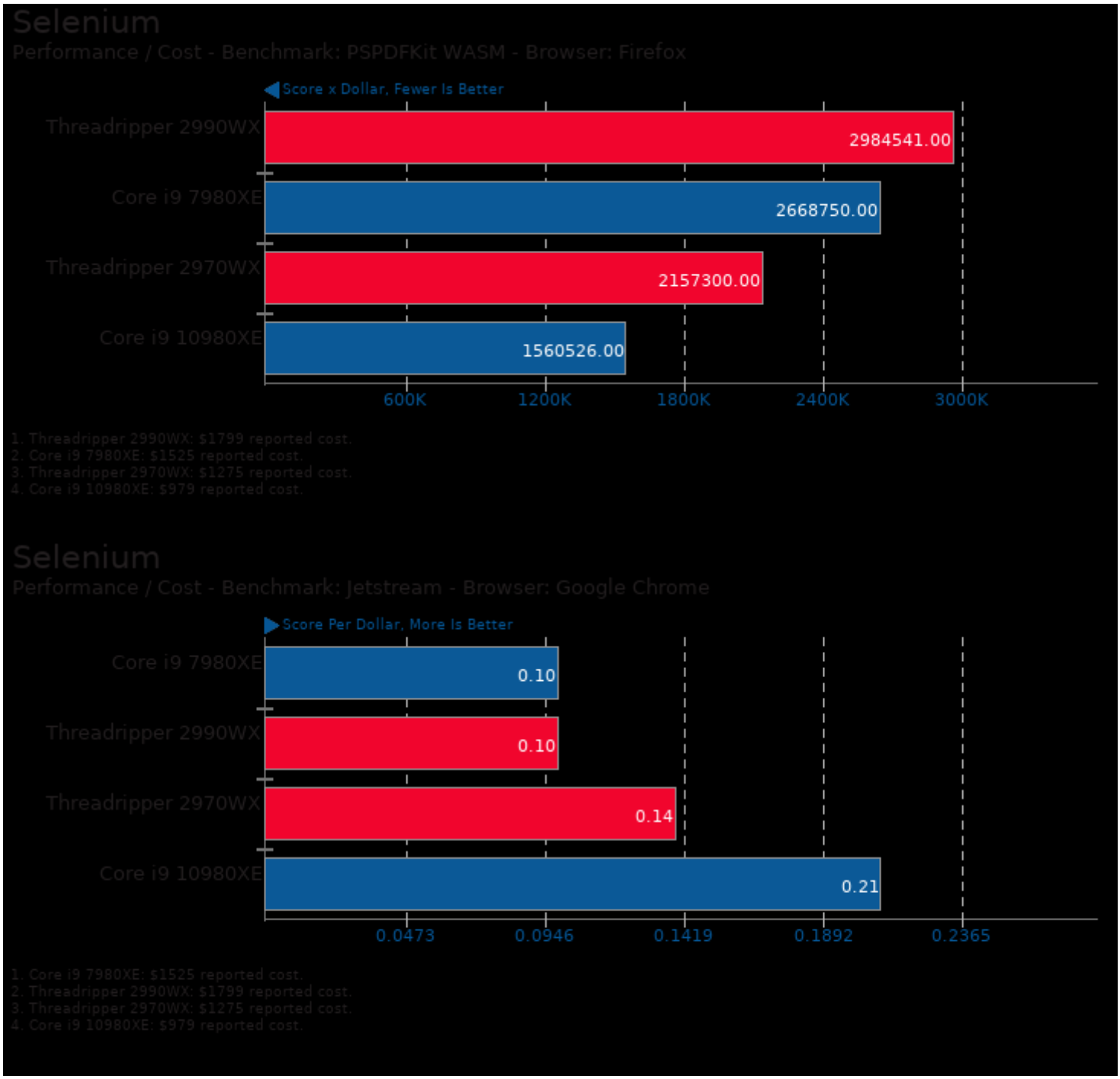


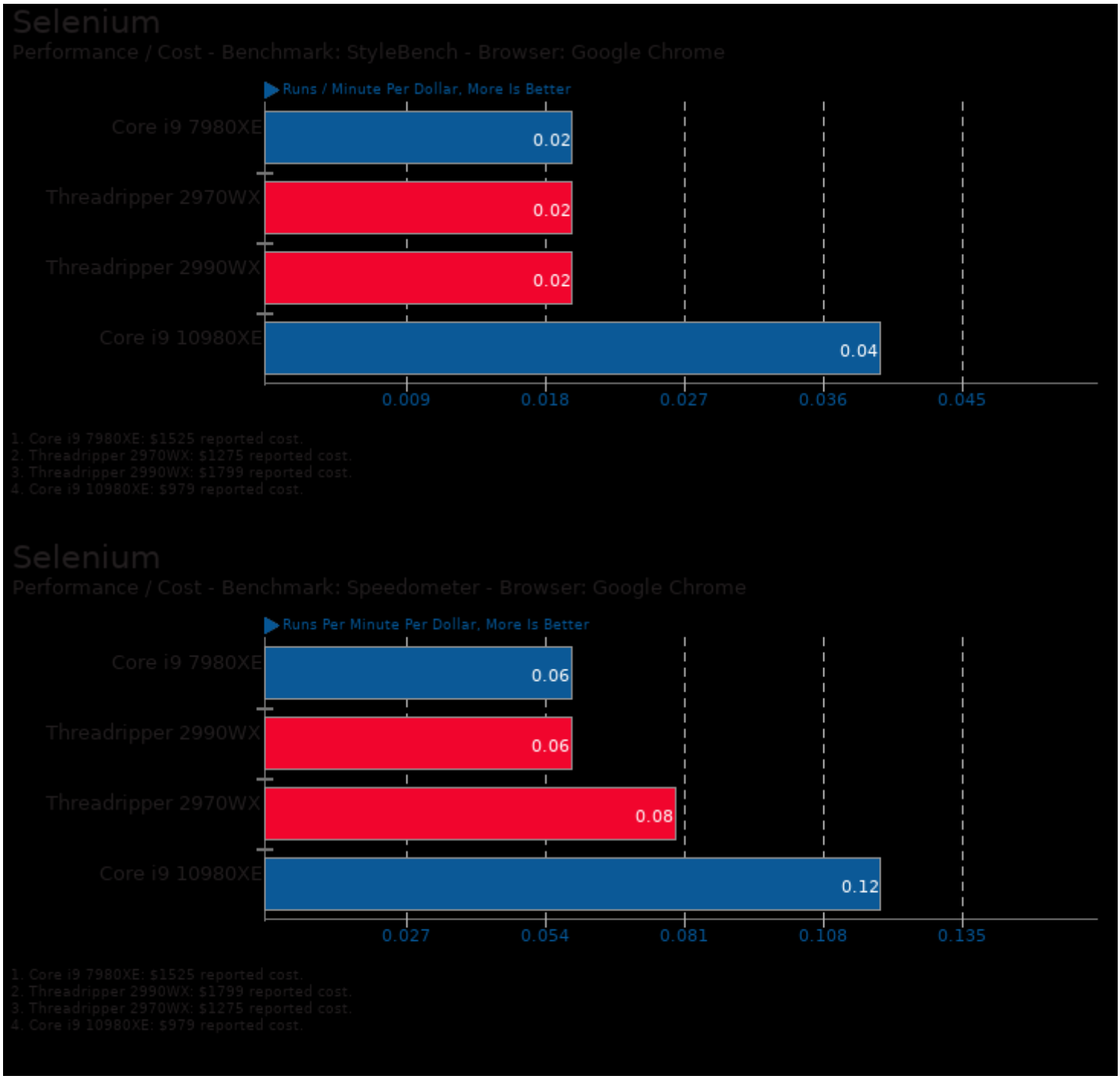

GNU GMP GMPbench 6.1.2
Performance / Cost - Total Time
GMPbench Score Per Dollar, More Is Better
Threadripper 2990WX
2.88
Core i9 7980XE
3.63
Threadripper 2970WX
4.03
Core i9 10980XE
6.16
2
4
6
8
10
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.
dcraw
Performance / Cost - RAW To PPM Image Conversion
Seconds x Dollar, Fewer Is Better
Threadripper 2990WX
80791.29
Core i9 7980XE
58575.25
Threadripper 2970WX
57821.25
Core i9 10980XE
34462.76
20K
40K
60K
80K
100K
1. Threadripper 2990WX: $1799 reported cost.
2. Core i9 7980XE: $1525 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

Intel Core i9-10980XE Linux Benchmarks



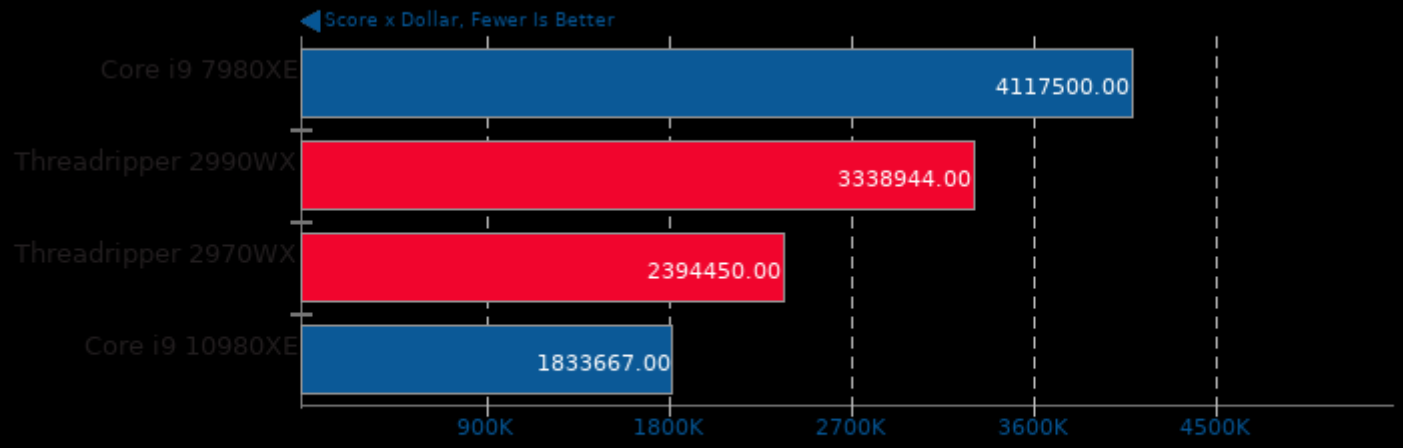
Intel Core i9-10980XE Linux Benchmarks




Selenium
Performance / Cost - Benchmark: StyleBench - Browser: Google Chrome
Runs / Minute Per Dollar, More Is Better
Core i9 7980XE
0.02
Threadripper 2970WX
0.02
Threadripper 2990WX
0.02
Core i9 10980XE
0.04
0.009
0.018
0.027
0.036
0.045
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2970WX: $1275 reported cost.
3. Threadripper 2990WX: $1799 reported cost.
4. Core i9 10980XE: $979 reported cost.
Selenium
Performance / Cost - Benchmark: Speedometer - Browser: Google Chrome
Runs Per Minute Per Dollar, More Is Better
Core i9 7980XE
0.06
Threadripper 2990WX
0.06
Threadripper 2970WX
0.08
Core i9 10980XE
0.12
0.027
0.054
0.081
0.108
0.135
1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

Selenium

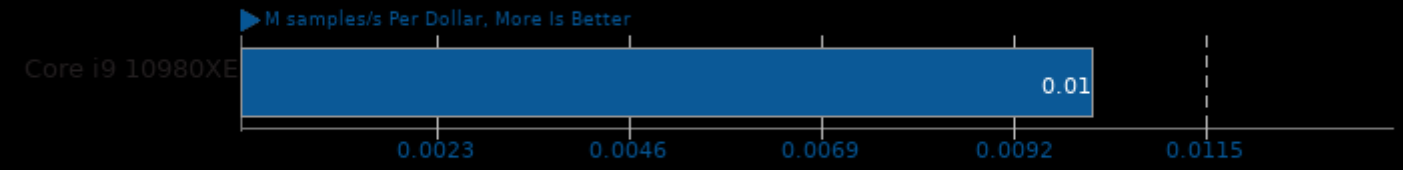
Performance / Cost - Benchmark: PSPDFKit WASM - Browser: Google Chrome



1. Core i9 7980XE: $1525 reported cost.
2. Threadripper 2990WX: $1799 reported cost.
3. Threadripper 2970WX: $1275 reported cost.
4. Core i9 10980XE: $979 reported cost.

IndigoBench 4.0.64

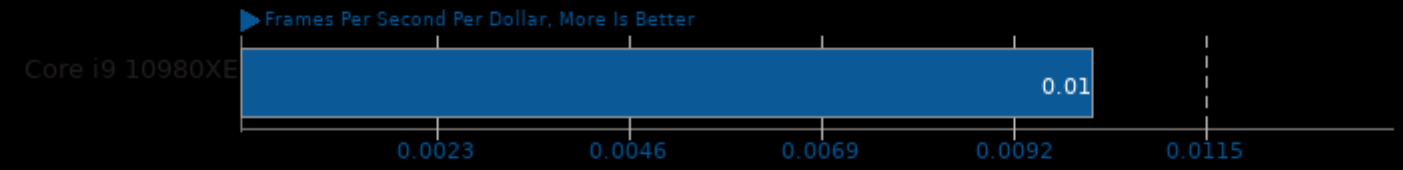
Performance / Cost - Scene: Supercar



1. $979 reported cost.

SVT-AV1 0.7

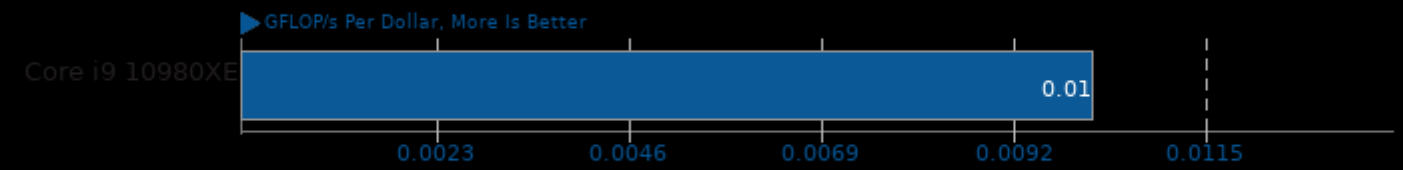
Performance / Cost - Encoder Mode: Enc Mode 4 - Input: 1080p



1. $979 reported cost.

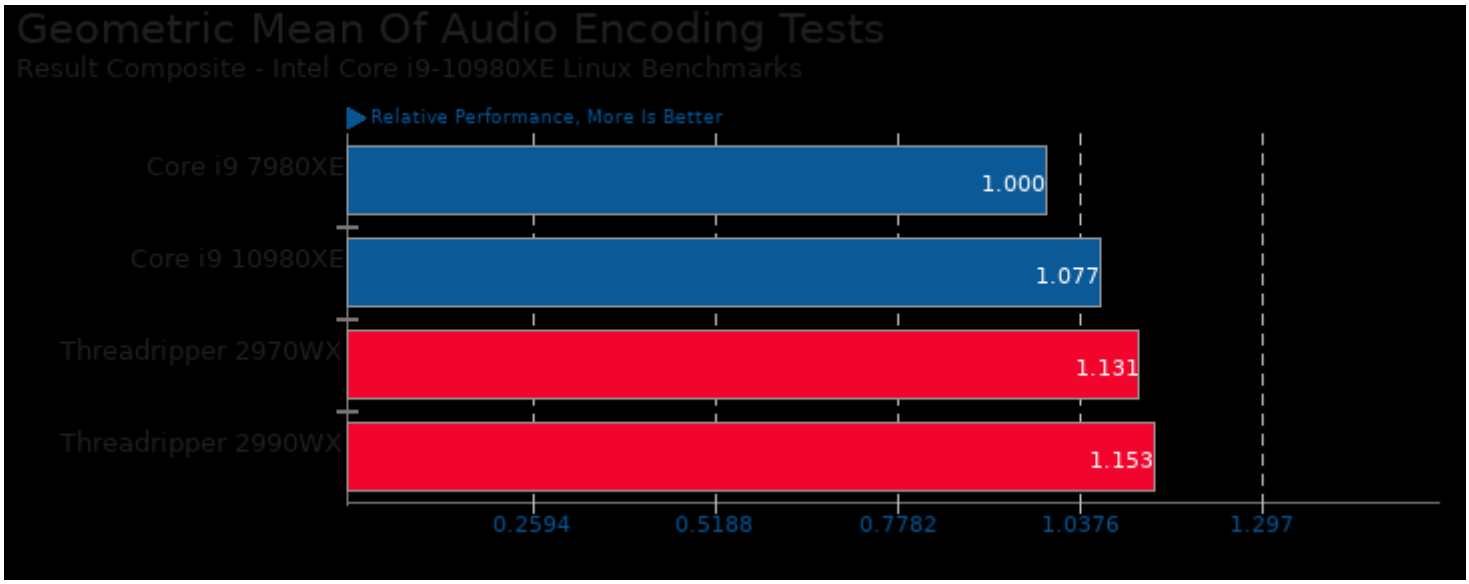
ACES DGEMM 1.0

Performance / Cost - Sustained Floating-Point Rate

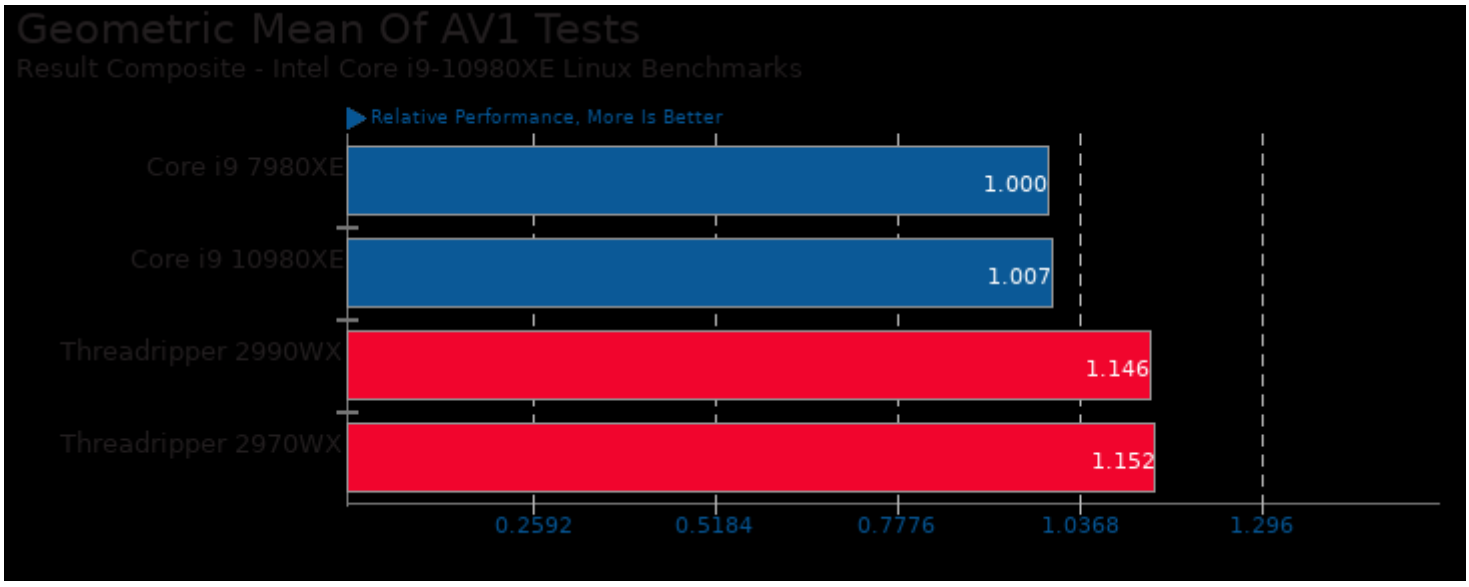


1. $979 reported cost.

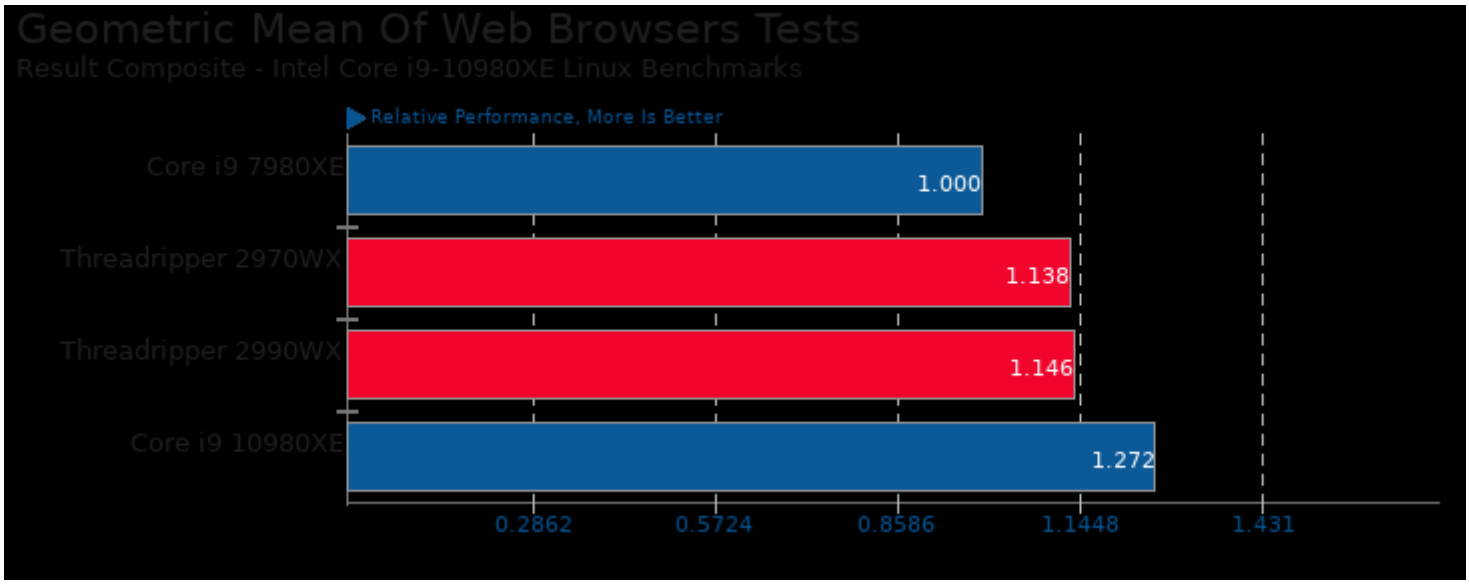
These geometric means are based upon test groupings / test suites for this result file.



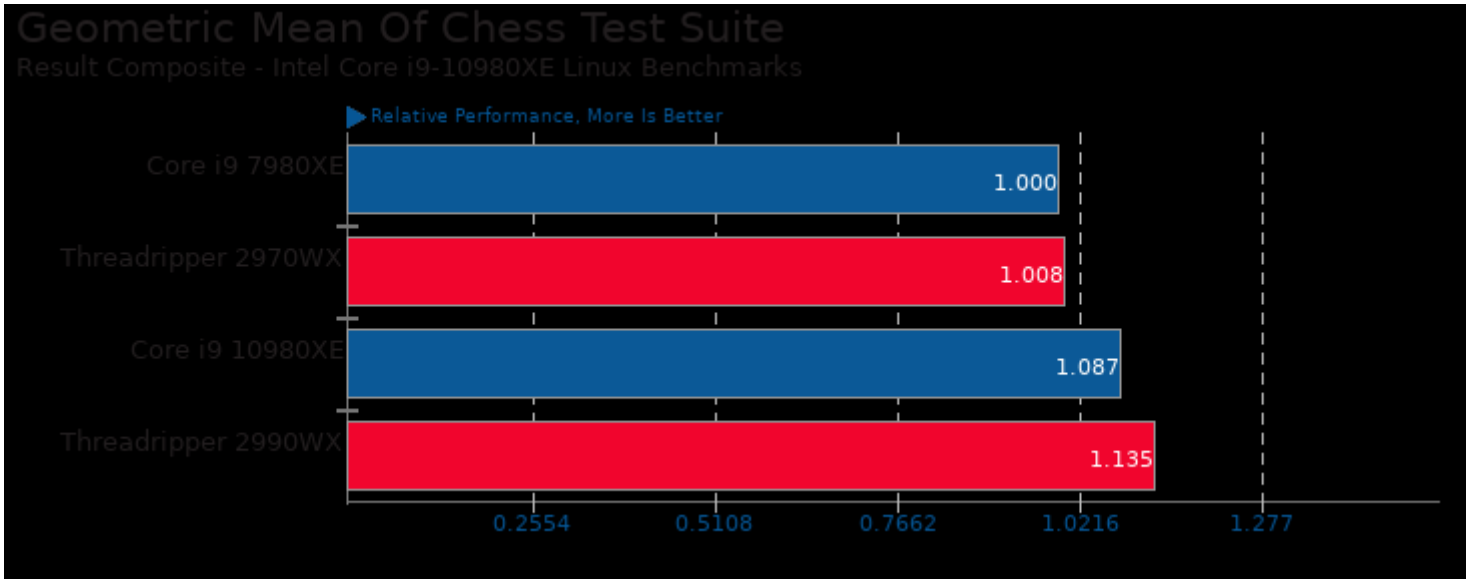
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



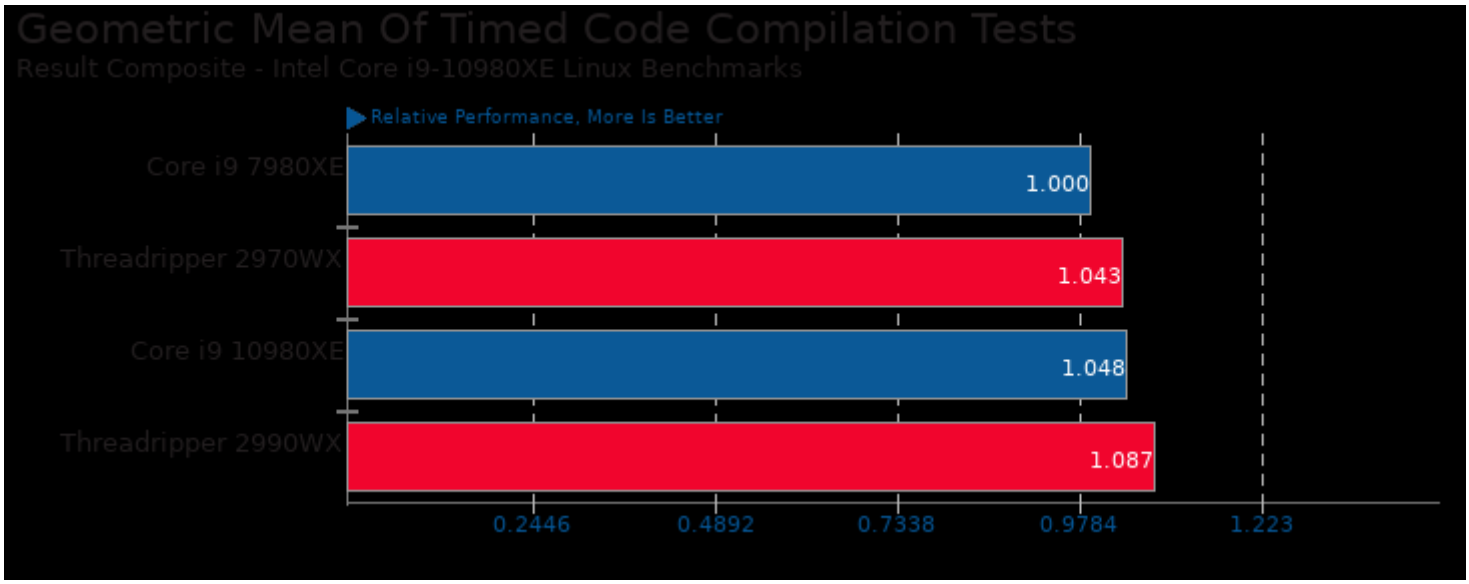
Geometric mean based upon tests: pts/dav1d and pts/svt-av1



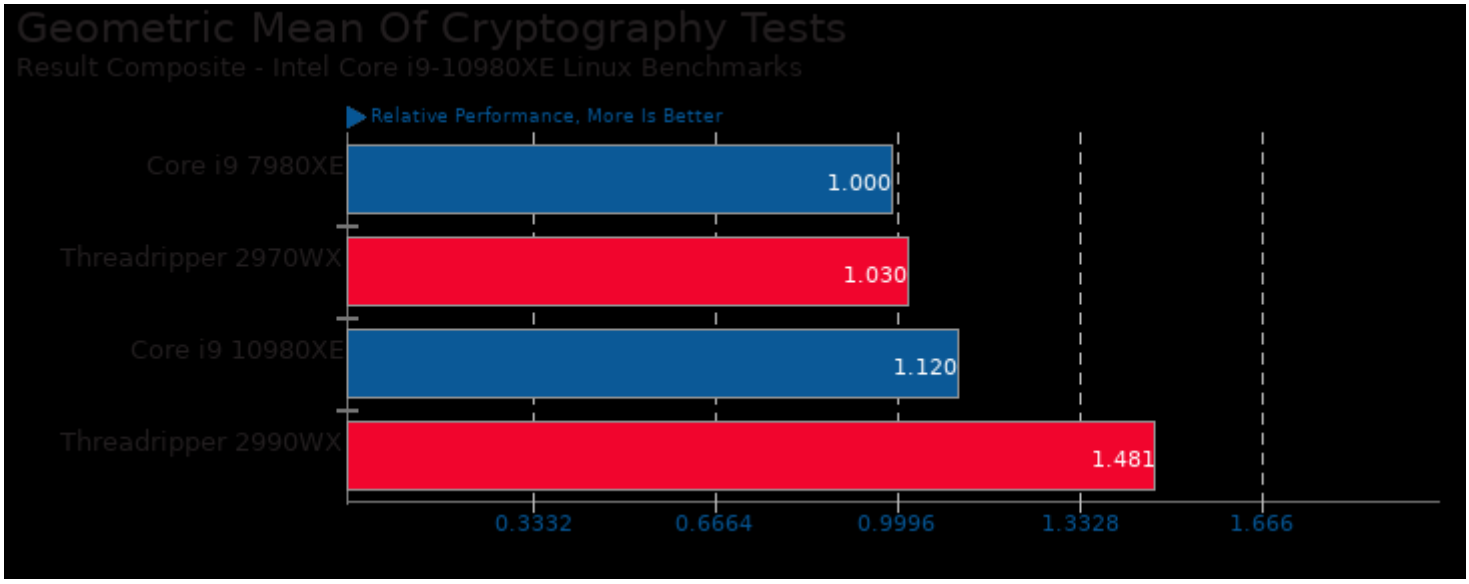
Geometric mean based upon tests: system/selenium



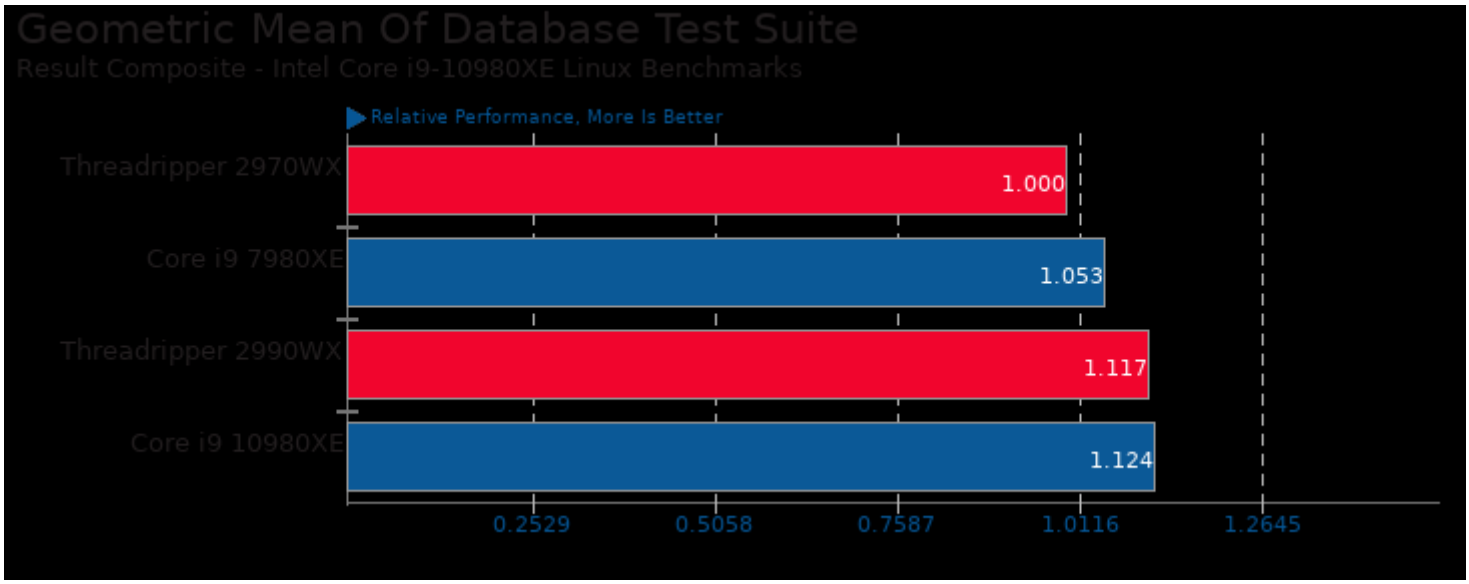
Geometric mean based upon tests: pts/crafty, pts/tscp, pts/stockfish and pts/asmfish



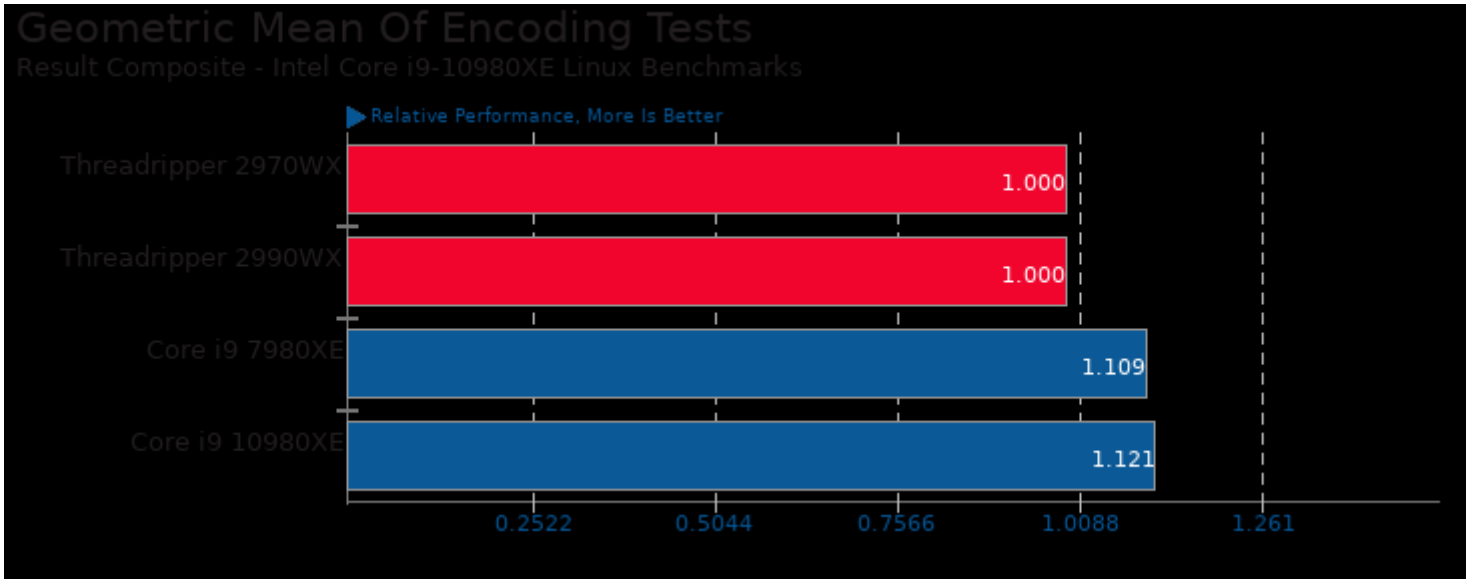
Geometric mean based upon tests: pts/build-php, pts/build-linux-kernel and pts/build-llvm



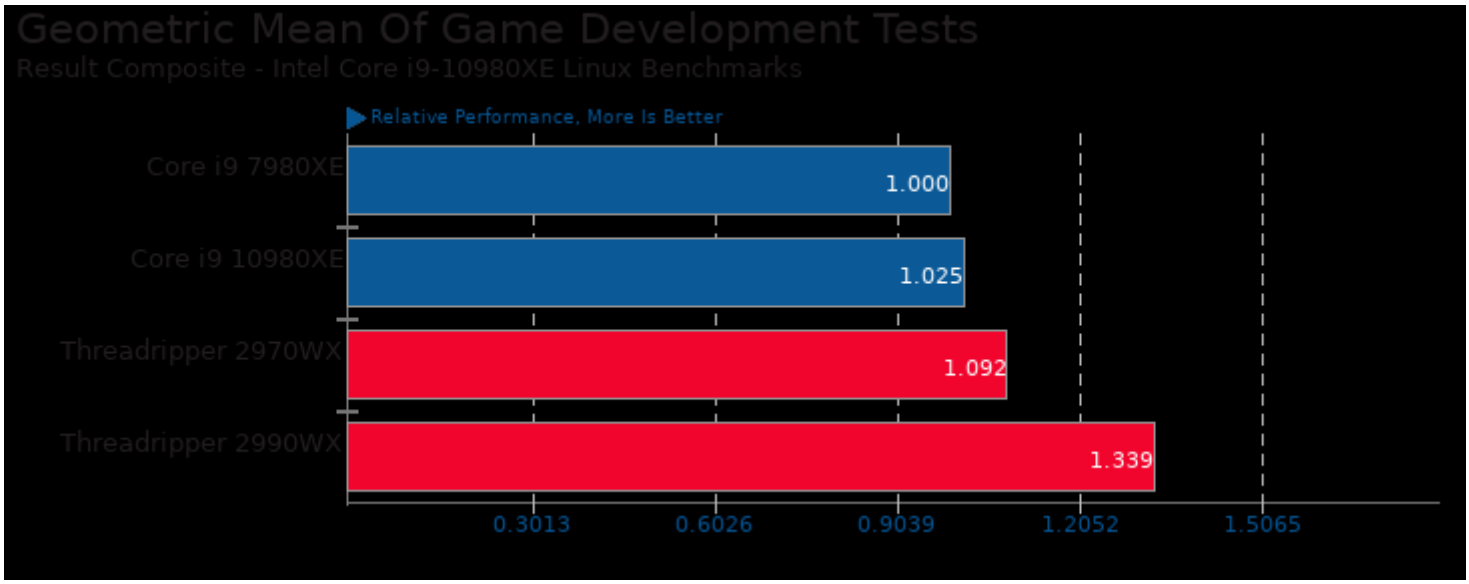
Geometric mean based upon tests: pts/openssl and pts/john-the-ripper



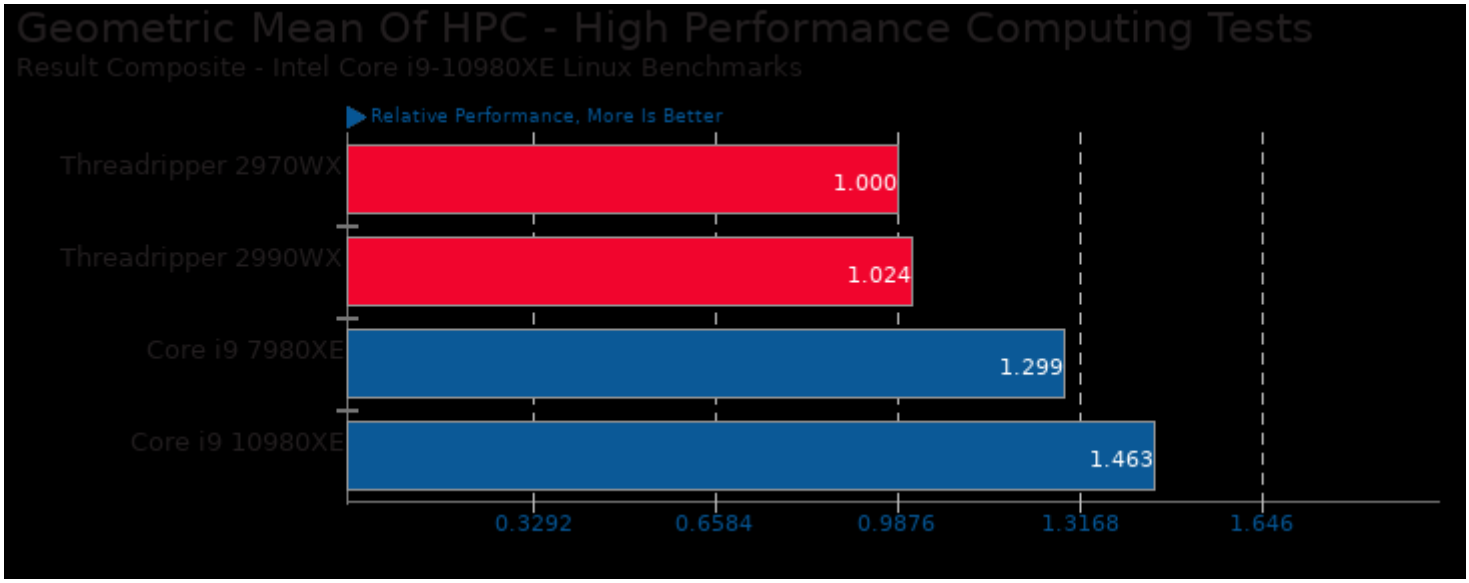
Geometric mean based upon tests: pts/redis and pts/rocksdb



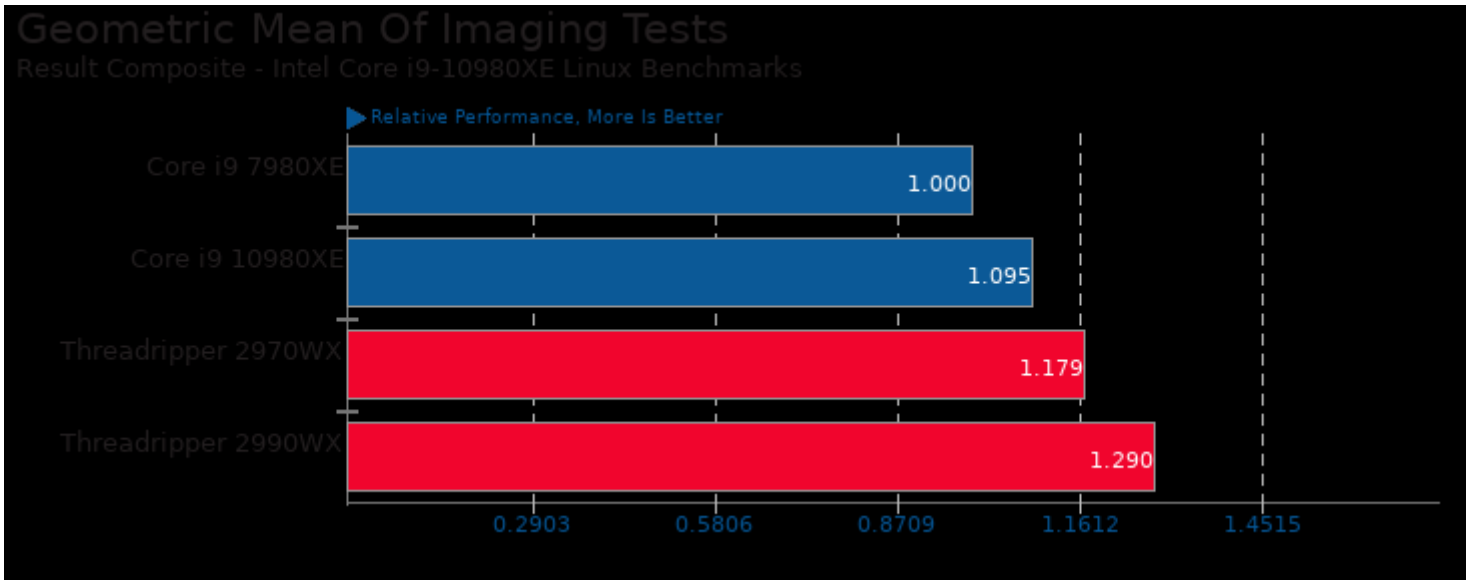
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac, pts/svt-vp9, pts/x264, pts/x265, pts/dav1d and pts/svt-av1



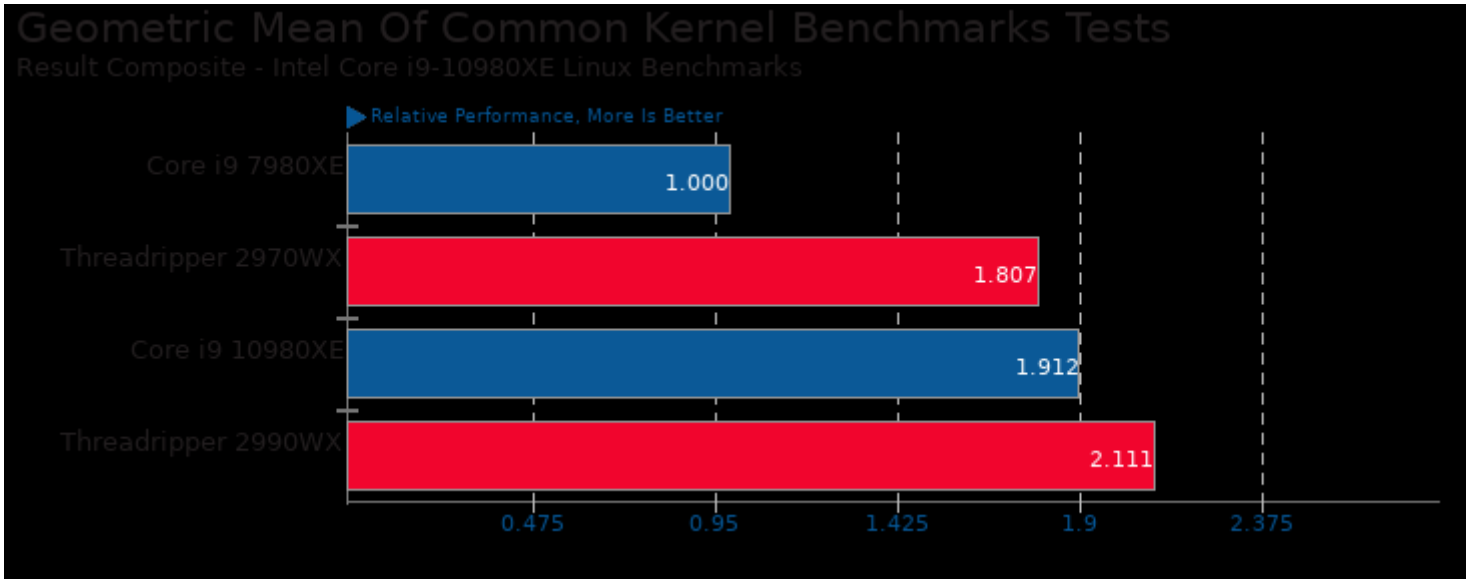
Geometric mean based upon tests: pts/luajit and pts/blender



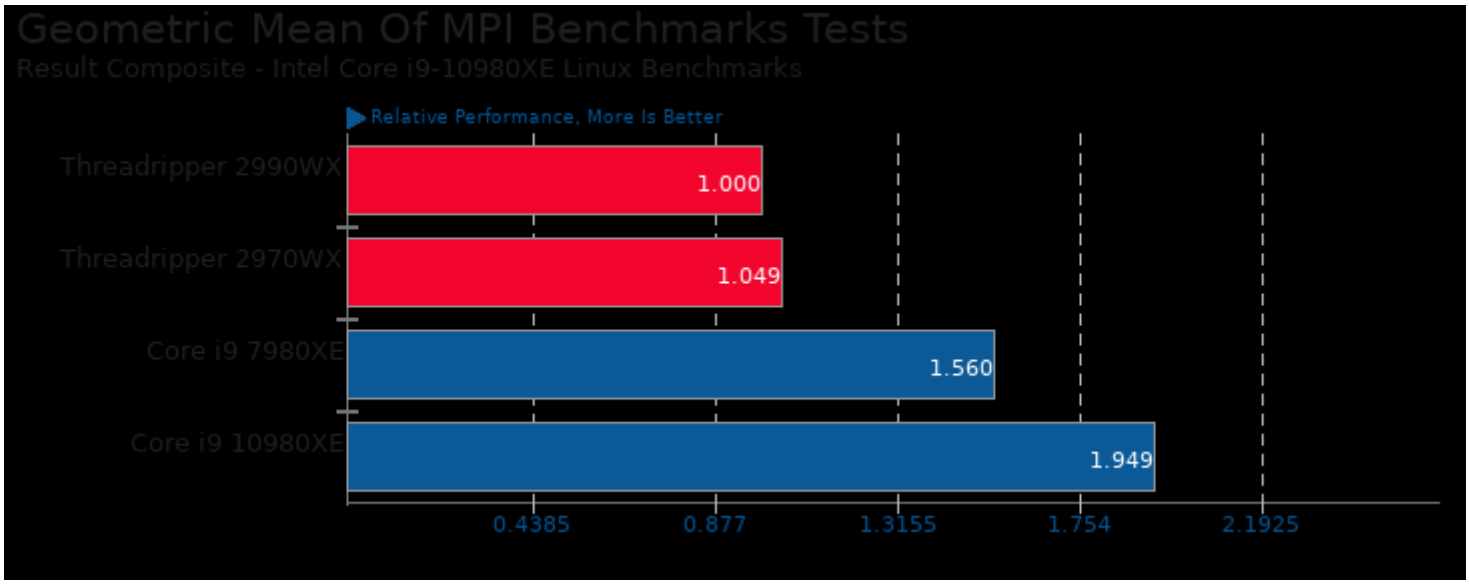
Geometric mean based upon tests: pts/npb, pts/rodinia, pts/askap, pts/fftw, system/octave-benchmark, pts/mt-dgemm, pts/namd, pts/qmcpack and pts/rbenchmark



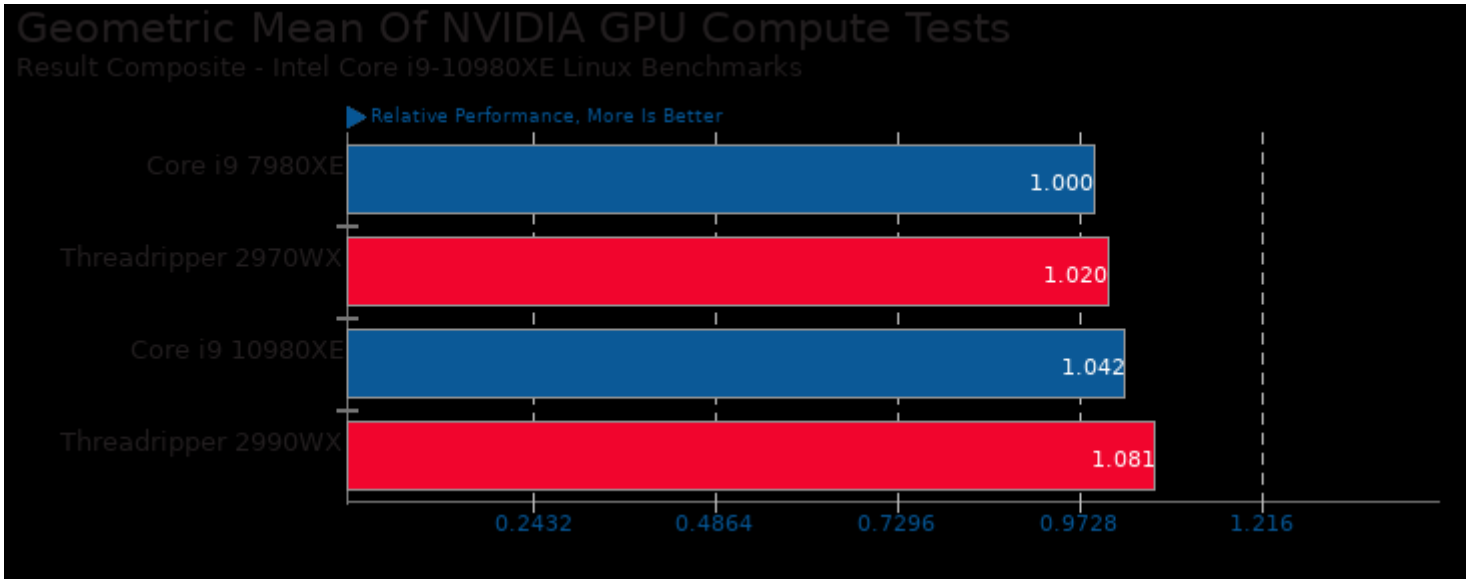
Geometric mean based upon tests: pts/graphics-magick, pts/tjbench and pts/dcraw



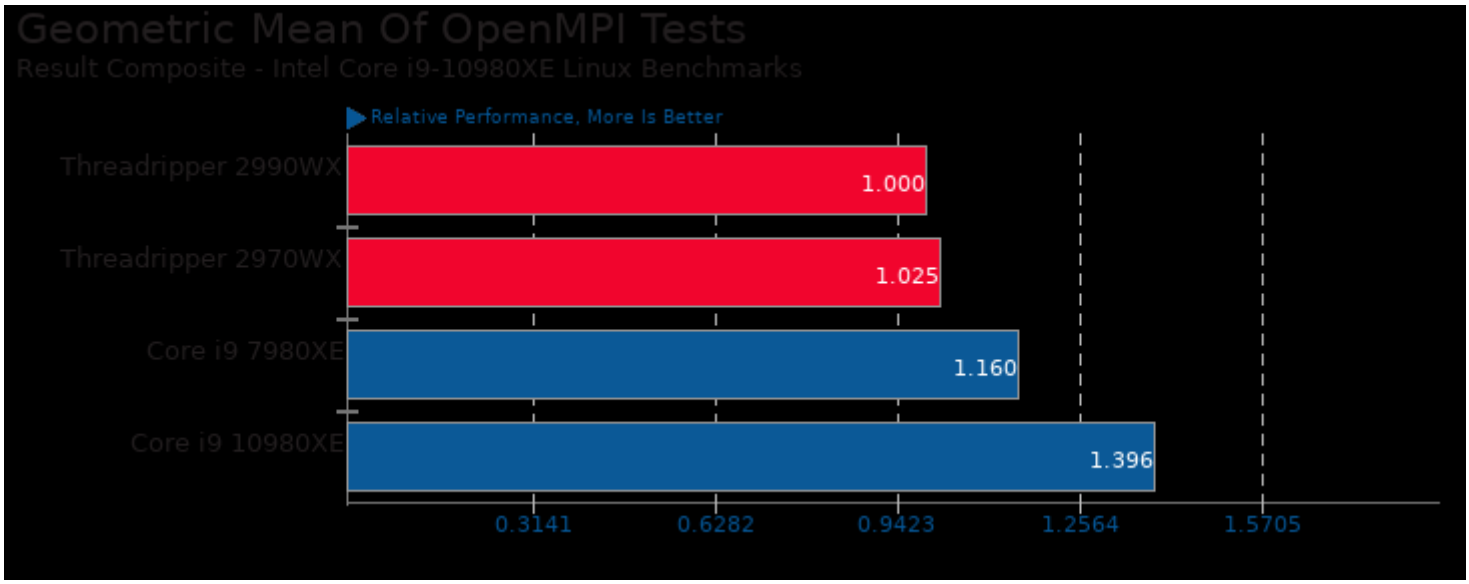
Geometric mean based upon tests: pts/openssl, pts/ctx-clock and pts/rocksdb



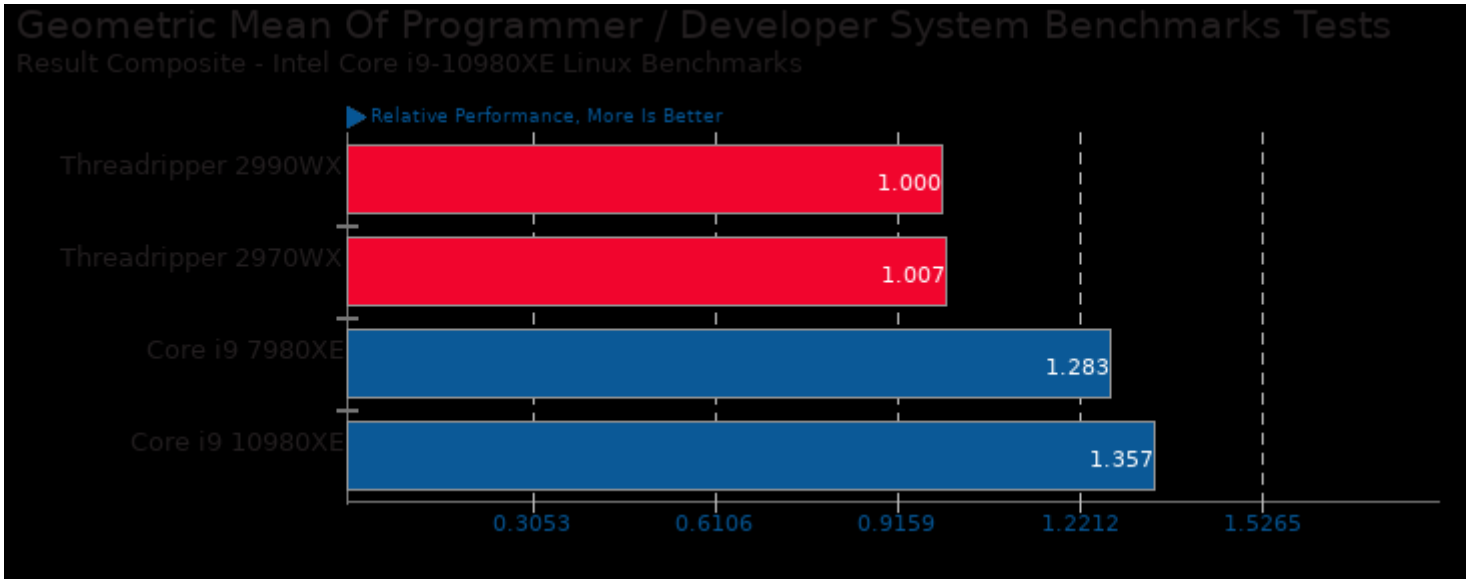
Geometric mean based upon tests: pts/askap, pts/qmcpack and pts/npb



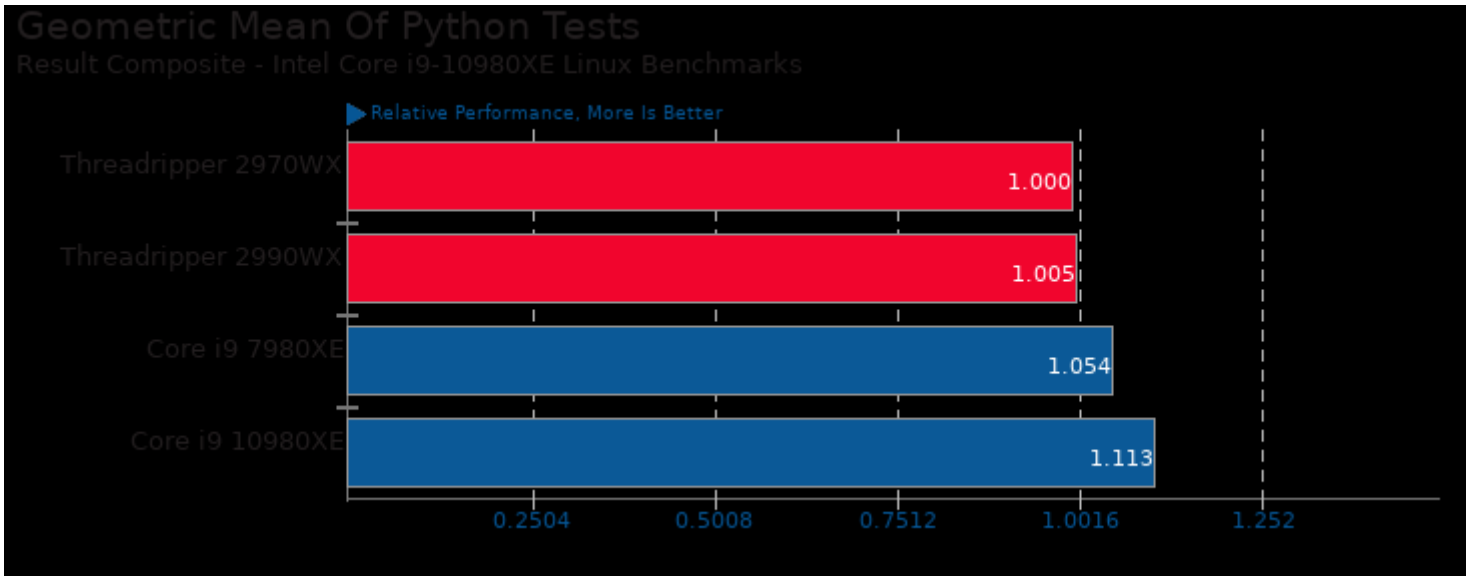
Geometric mean based upon tests: pts/luxcorerender, pts/rodinia, pts/indigobench and pts/blender



Geometric mean based upon tests: pts/rodinia, pts/qmcpack and pts/askap



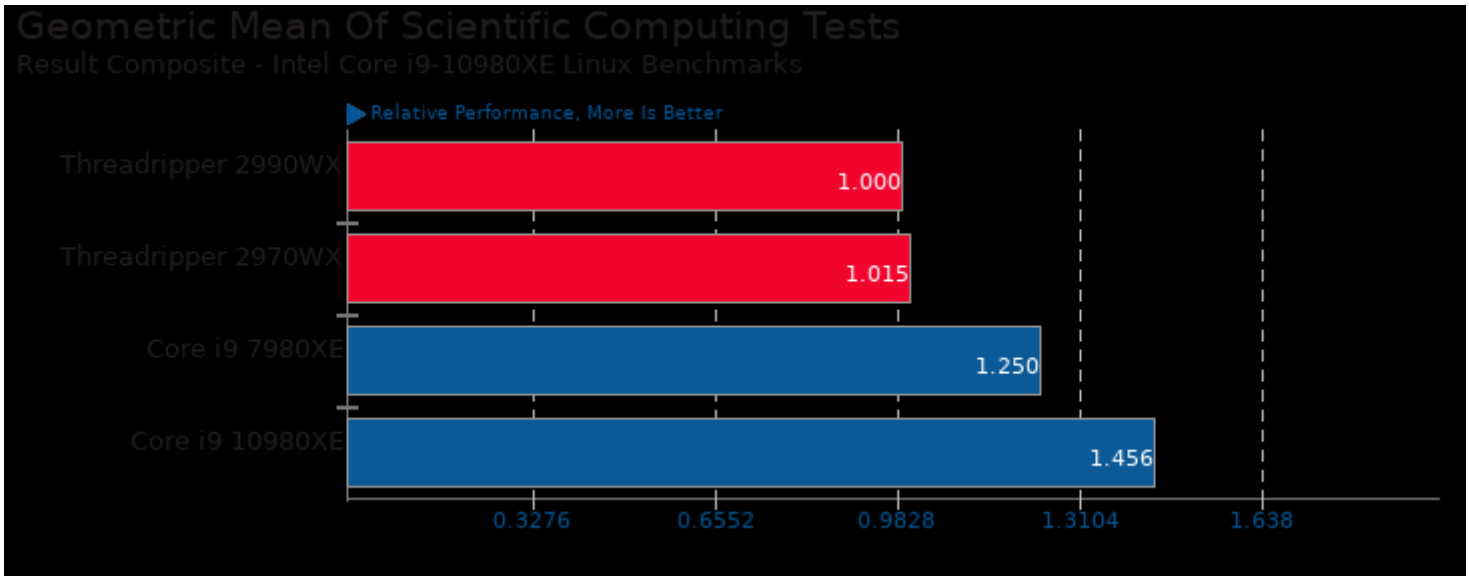
Geometric mean based upon tests: pts/pybench, pts/build-php, pts/build-linux-kernel, pts/build-llvm and pts/mt-dgemm



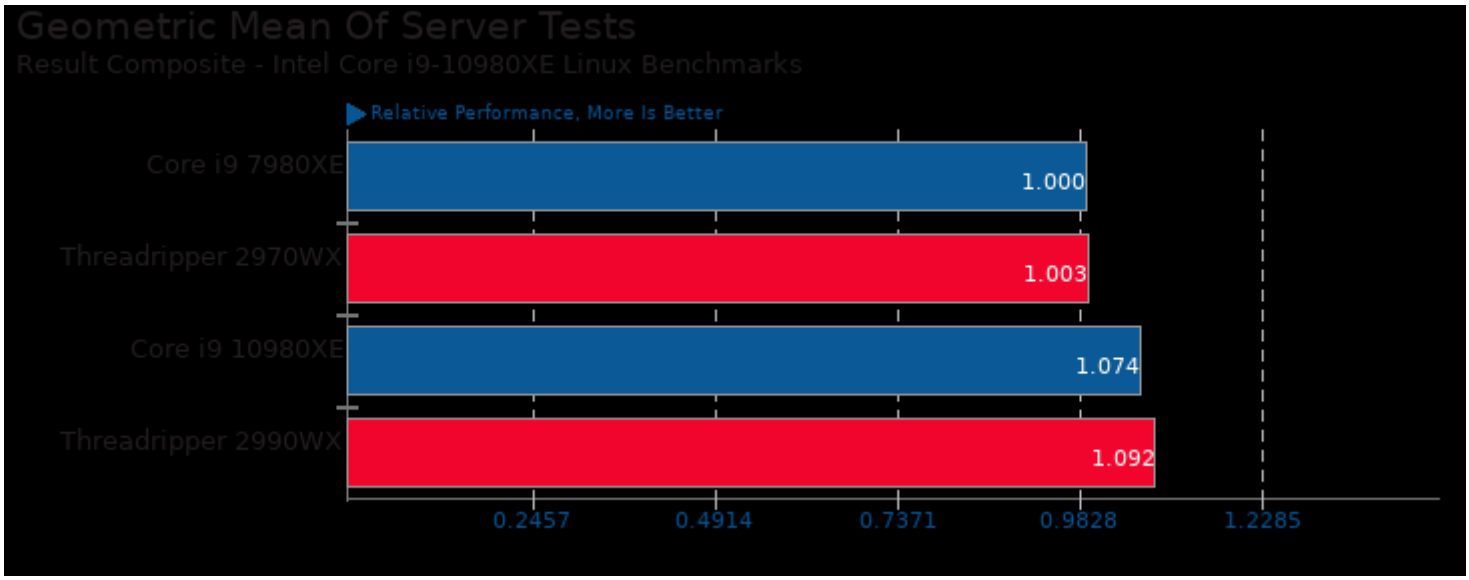
Geometric mean based upon tests: pts/pybench and pts/build-llvm



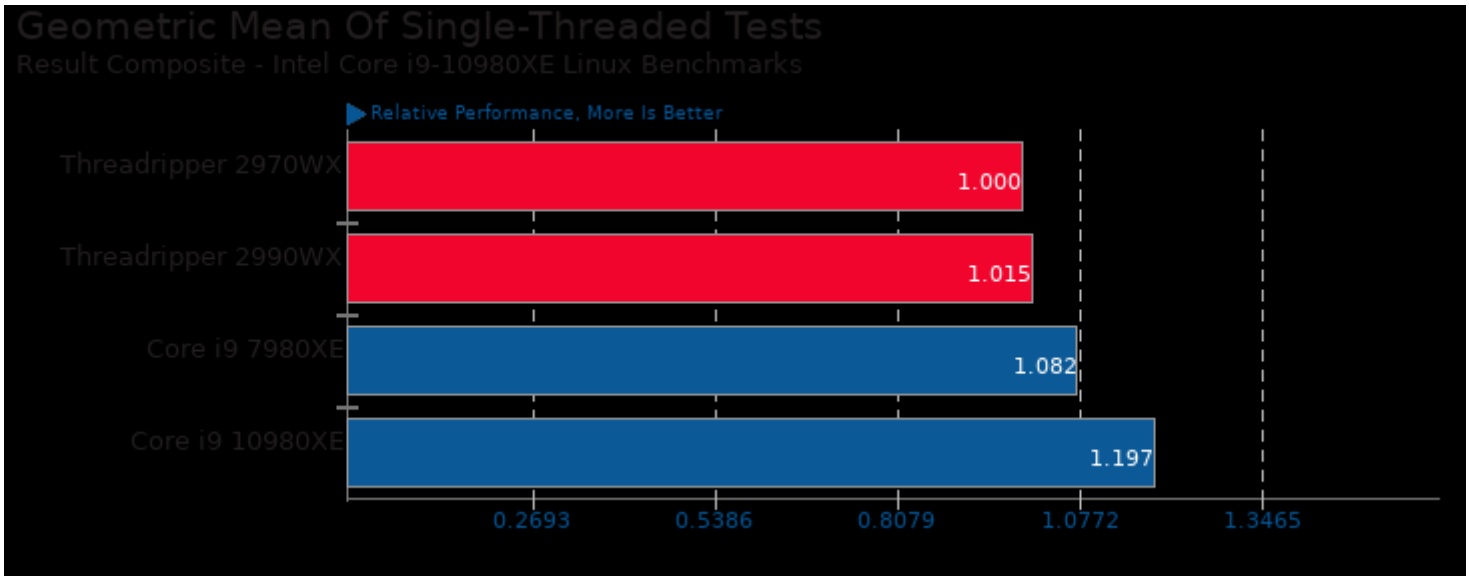
Geometric mean based upon tests: pts/c-ray, pts/blender, pts/tungsten, pts/appleseed, pts/radiance, pts/aobench, pts/luxcorerender, pts/smallpt, pts/ttsiod-renderer and pts/indigobench



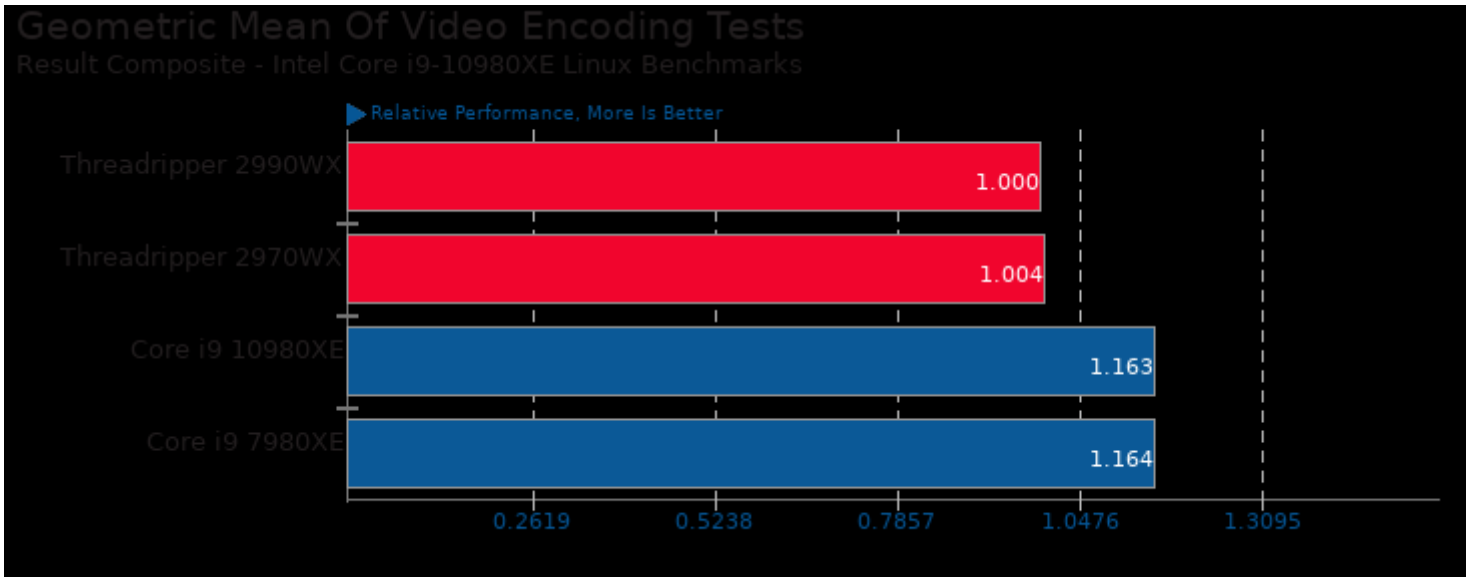
Geometric mean based upon tests: pts/fftw, system/octave-benchmark, pts/mt-dgemm, pts/namd and pts/qmcpack



Geometric mean based upon tests: pts/redis, pts/rocksdb, pts/phpbench, pts/openssl and pts/perl-benchmark

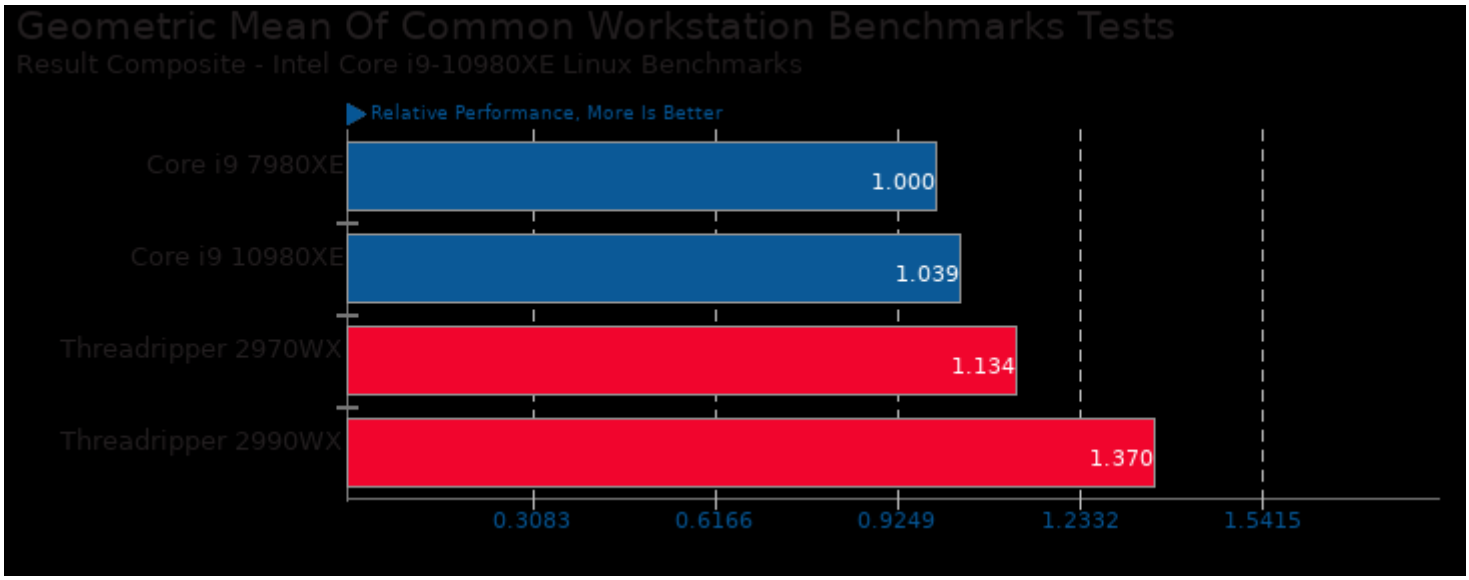


Geometric mean based upon tests: pts/gmpbench, pts/luajit, pts/swet, pts/dcraw, pts/encode-flac, pts/encode-mp3, pts/perl-benchmark, pts/radiance, pts/rbenchmark, pts/sudokut, pts/glibc-bench, pts/tjbench, pts/redis, pts/pybench, pts/phpbench, pts/hint and system/tesseract-ocr



Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/x265, pts/dav1d and pts/svt-av1

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Geometric mean based upon tests: pts/blender, pts/rodinia, pts/brl-cad, pts/x265, pts/swet and pts/sysbench

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