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Alder Lake Intel Linux Tests

Intel Core i5-12400 testing with a ASUS PRIME Z690-P WIFI D4 (0605 BIOS) and ASUS Intel ADL-S GT1 3GB on Ubuntu 21.10 via the Phoronix Test Suite.

Automated Executive Summary

Core i9 12900K had the most wins, coming in first place for 82% of the tests.

Based on the geometric mean of all complete results, the fastest (Core i9 12900K) was 1.367x the speed of the slowest (Core i5 12400). Core i5 12600K was 0.837x the speed of Core i9 12900K and Core i5 12400 was 0.875x the speed of Core i5 12600K.

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

OpenSSL (Algorithm: SHA256) at 2.761x
TensorFlow Lite (Model: Inception ResNet V2) at 2.572x
TensorFlow Lite (Model: Mobilenet Quant) at 2.559x
TensorFlow Lite (Model: Inception V4) at 2.556x
TensorFlow Lite (Model: Mobilenet Float) at 2.55x
TensorFlow Lite (Model: SqueezeNet) at 2.515x
TensorFlow Lite (Model: NASNet Mobile) at 2.485x
Coremark (CoreMark Size 666 - Iterations Per Second) at 2.468x

7-Zip Compression (Test: Decompression Rating) at 2.345x
Stockfish (Total Time) at 2.291x.

Test Systems:

Core i9 12900K

Processor: Intel Core i9-12900K @ 6.50GHz (16 Cores / 24 Threads), Motherboard: ASUS ROG STRIX Z690-E GAMING WIFI (0811 BIOS), Chipset: Intel Device 7aa7, Memory: 64GB, Disk: 1000GB Generic, Graphics: ASUS Intel ADL-S GT1 3GB (1550MHz), Audio: Intel Device 7ad0, Monitor: ASUS VP28U, Network: Intel I225-V + Intel Wi-Fi 6 AX210/AX211/AX411

OS: Ubuntu 21.10, Kernel: 5.16.0-051600rc8-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server 1.20.13 + Wayland, OpenGL: 4.6 Mesa 21.2.2, Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: MQ-DEADLINE / errors=remount-ro,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave (EPP: balance_performance) - CPU Microcode: 0x15 - Thermald 2.4.6
Java Notes: OpenJDK Runtime Environment (build 11.0.13+8-Ubuntu-0ubuntu1.21.10)
Python Notes: Python 3.9.7
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Core i5 12600K

Processor: Intel Core i5-12600K @ 6.30GHz (10 Cores / 16 Threads), Motherboard: ASUS PRIME Z690-P WIFI D4 (0605 BIOS), Chipset: Intel Device 7aa7, Memory: 16GB, Disk: 1000GB Western Digital WDS100T1X0E-00AFY0 + 1000GB Generic, Graphics: ASUS Intel ADL-S GT1 3GB (1450MHz), Audio: Realtek ALC897, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel Device 7af0

OS: Ubuntu 21.10, Kernel: 5.16.0-051600rc8-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server 1.20.13 + Wayland, OpenGL: 4.6 Mesa 21.2.2, Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: MQ-DEADLINE / errors=remount-ro,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave (EPP: balance_performance) - CPU Microcode: 0x12 - Thermald 2.4.6
Java Notes: OpenJDK Runtime Environment (build 11.0.13+8-Ubuntu-0ubuntu1.21.10)
Python Notes: Python 3.9.7
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not

affected + tsx_async_abort: Not affected

Core i5 12400

Processor: Intel Core i5-12400 @ 5.60GHz (6 Cores / 12 Threads), Motherboard: ASUS PRIME Z690-P WIFI D4 (0605 BIOS), Chipset: Intel Device 7aa7, Memory: 16GB, Disk: 1000GB Western Digital WDS100T1X0E-00AFY0 + 1000GB Generic, Graphics: ASUS Intel ADL-S GT1 3GB (1450MHz), Audio: Realtek ALC897, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel Device 7af0

OS: Ubuntu 21.10, Kernel: 5.16.0-051600rc8-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server 1.20.13 + Wayland, OpenGL: 4.6 Mesa 21.2.2, Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: MQ-DEADLINE / errors=remount-ro,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave (EPP: balance_performance) - CPU Microcode: 0x12 - Thermald 2.4.6
Java Notes: OpenJDK Runtime Environment (build 11.0.13+8-Ubuntu-0ubuntu1.21.10)
Python Notes: Python 3.9.7
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	Core i9 12900K	Core i5 12600K	Core i5 12400
Unpacking The Linux Kernel - linux-4.15.tar.xz (sec)	**3.827**	3.967	**4.441**
Normalized	100%	96.47%	86.17%
Standard Deviation	0.4%	0.5%	0.8%
WireGuard + Linux Networking Stack Stress Test (sec)	**109.513**	118.606	**129.840**
Normalized	100%	92.33%	84.34%
Standard Deviation	2.3%	0.8%	0.5%
Etcpak - DXT1 (Mpx/s)	**1655**	1556	**1387**
Normalized	100%	94%	83.78%
Standard Deviation	6.5%	5.7%	6.5%
Etcpak - ETC2 (Mpx/s)	**238.429**	225.211	**201.763**
Normalized	100%	94.46%	84.62%
Standard Deviation	0%	0%	0%
LeelaChessZero - BLAS (Nodes/s)	**1135**	959	**754**
Normalized	100%	84.49%	66.43%
Standard Deviation	2.5%	1.6%	1%
LeelaChessZero - Eigen (Nodes/s)	**1841**	1449	**1415**
Normalized	100%	78.71%	76.86%
Standard Deviation	1.1%	2.4%	1.9%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	**9.564**	**5.867**	6.730
Normalized	100%	61.34%	70.37%
Standard Deviation	1.3%	1.8%	0.6%

Alder Lake Intel Linux Tests

WebP Image Encode - Q.1.L (Encode Time - sec)	**12.517**	13.183	**14.655**
Normalized	100%	94.95%	85.41%
Standard Deviation	0%	0.1%	0.3%
WebP Image Encode - Q.1.H.C (Encode Time - sec)	**5.235**	5.539	**6.190**
Normalized	100%	94.51%	84.57%
Standard Deviation	0.4%	0.1%	0.1%
simdjson - Kostya (GB/s)	**4.75**	4.56	**4.1**
Normalized	100%	96%	86.32%
Standard Deviation	0.2%	0%	0%
simdjson - LargeRand (GB/s)	**1.73**	1.62	**1.46**
Normalized	100%	93.64%	84.39%
Standard Deviation	0.3%	0%	0.4%
simdjson - PartialTweets (GB/s)	**6.61**	6.23	**5.57**
Normalized	100%	94.25%	84.27%
Standard Deviation	0.1%	0.2%	0.5%
simdjson - DistinctUserID (GB/s)	**7.64**	7.30	**6.56**
Normalized	100%	95.55%	85.86%
Standard Deviation	2.5%	0.4%	0%
Xmrig - Monero - 1M (H/s)	**6126**	**3411**	3808
Normalized	100%	55.68%	62.16%
Standard Deviation	1.4%	0.1%	0.2%
Xmrig - Wownero - 1M (H/s)	**10429**	7376	**6231**
Normalized	100%	70.73%	59.74%
Standard Deviation	1.6%	1.1%	1%
Chia Blockchain VDF - Square Plain C++	**225167**	213133	**190733**
Normalized	100%	94.66%	84.71%
Standard Deviation	0.5%	0%	0.1%
Chia Blockchain VDF - S.A.O (IPS)	**255567**	245533	**221167**
Normalized	100%	96.07%	86.54%
Standard Deviation	0.8%	1.6%	1.9%
DaCapo Benchmark - Jython (msec)	**1900**	2184	**2344**
Normalized	100%	87%	81.06%
Standard Deviation	2.5%	3.7%	1.6%
LZ4 Compression - 3 - Compression Speed (MB/s)	**77.95**	74.01	**66.28**
Normalized	100%	94.95%	85.03%
Standard Deviation	1%	0.1%	0.1%
LZ4 Compression - 3 - D.S (MB/s)	**12008**	**13431**	12951
Normalized	89.4%	100%	96.42%
Standard Deviation	4%	0.2%	0.2%
LZ4 Compression - 9 - Compression Speed (MB/s)	**76.47**	72.30	**64.74**
Normalized	100%	94.55%	84.66%
Standard Deviation	0.3%	0.1%	0%
LZ4 Compression - 9 - D.S (MB/s)	**11991**	**13476**	12983
Normalized	88.99%	100%	96.34%
Standard Deviation	3.7%	0.2%	0.3%
Zstd Compression - 19 - Compression Speed (MB/s)	**43.7**	35.9	**35.8**
Normalized	100%	82.15%	81.92%
Standard Deviation	2.4%	0.6%	0.8%
Zstd Compression - 19 - D.S (MB/s)	**4550**	4483	**4096**

Alder Lake Intel Linux Tests

Normalized	100%	98.53%	90.02%
Standard Deviation	0.1%	0.1%	0.1%
Zstd Compression - 19, Long Mode - Compression Speed (MB/s)	**39.0**	32.9	**27.0**
Normalized	100%	84.36%	69.23%
Standard Deviation	1.4%	0.4%	0.2%
Zstd Compression - 19, Long Mode - D.S (MB/s)	**4680**	4604	**4218**
Normalized	100%	98.38%	90.13%
Standard Deviation	0.1%	0.1%	0.1%
JPEG XL libjxl - PNG - 8 (MP/s)	**1.09**	1.06	**0.95**
Normalized	100%	97.25%	87.16%
Standard Deviation	2.1%	0.9%	0%
JPEG XL libjxl - JPEG - 8 (MP/s)	**42.66**	41.15	**35.77**
Normalized	100%	96.46%	83.85%
Standard Deviation	1.6%	1.4%	0.7%
srsRAN - OFDM_Test (Samples / Second)	**195700000**	184100000	**152760000**
Normalized	100%	94.07%	78.06%
Standard Deviation	0.8%	1.1%	5.2%
srsRAN - 4.P.1.P.M.6.Q (eNb Mb/s)	**551.0**	523.5	**470.9**
Normalized	100%	95.01%	85.46%
Standard Deviation	0.4%	2.2%	0.4%
srsRAN - 4.P.1.P.M.6.Q (UE Mb/s)	**161.9**	152.3	**136.5**
Normalized	100%	94.07%	84.31%
Standard Deviation	0.2%	0.6%	0.2%
srsRAN - 4.P.1.P.S.6.Q (eNb Mb/s)	**568.1**	538.4	**478.8**
Normalized	100%	94.77%	84.28%
Standard Deviation	1.7%	0.8%	1.3%
srsRAN - 4.P.1.P.S.6.Q (UE Mb/s)	**206.3**	194.5	**172.4**
Normalized	100%	94.28%	83.57%
Standard Deviation	1.1%	0.2%	0.8%
srsRAN - 4.P.1.P.M.2.Q (eNb Mb/s)	**621.1**	587.8	**522.5**
Normalized	100%	94.64%	84.12%
Standard Deviation	0.9%	1.1%	0.3%
srsRAN - 4.P.1.P.M.2.Q (UE Mb/s)	**182.3**	173.5	**154.7**
Normalized	100%	95.17%	84.86%
Standard Deviation	0.7%	0.4%	0.6%
srsRAN - 4.P.1.P.S.2.Q (eNb Mb/s)	**623.1**	593.2	**534.0**
Normalized	100%	95.2%	85.7%
Standard Deviation	1.2%	0.5%	0.4%
srsRAN - 4.P.1.P.S.2.Q (UE Mb/s)	**225.2**	213.7	**190.2**
Normalized	100%	94.89%	84.46%
Standard Deviation	0.9%	0.6%	0.6%
srsRAN - 5.P.T.5.P.S.6.Q (eNb Mb/s)	**201.8**	188.6	**169.0**
Normalized	100%	93.46%	83.75%
Standard Deviation	0.3%	1%	0.3%
srsRAN - 5.P.T.5.P.S.6.Q (UE Mb/s)	**92.4**	86.5	**78.4**
Normalized	100%	93.61%	84.85%
Standard Deviation	0.1%	0.4%	0.5%
LibRaw - P.P.B (Mpix/sec)	**57.73**	52.79	**45.27**
Normalized	100%	91.44%	78.42%
Standard Deviation	1.3%	0.2%	0.2%
Crafty - Elapsed Time (Nodes/s)	**12633117**	11890651	**10631427**
Normalized	100%	94.12%	84.16%
Standard Deviation	0.5%	0.2%	0.2%

Alder Lake Intel Linux Tests

OSPray - San Miguel - SciVis (FPS)	**28.57**	18.87	**15.79**
Normalized	100%	66.05%	55.27%
Standard Deviation	0%	0%	0.9%
OSPray - NASA Streamlines - SciVis (FPS)	**34.48**	23.26	**18.27**
Normalized	100%	67.46%	52.99%
Standard Deviation	0%	0%	0.9%
AOM AV1 - Speed 6 Realtime - Bosphorus 4K (FPS)	**14.54**	13.15	**11.15**
Normalized	100%	90.44%	76.69%
Standard Deviation	1.7%	0.9%	2.3%
AOM AV1 - Speed 6 Two-Pass - Bosphorus 4K (FPS)	**12.07**	10.56	**8.76**
Normalized	100%	87.49%	72.58%
Standard Deviation	1%	0.2%	0.2%
AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS)	49.61	**51.20**	**43.60**
Normalized	96.89%	100%	85.16%
Standard Deviation	1.5%	0.5%	0.1%
AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS)	68.37	**68.40**	**60.36**
Normalized	99.96%	100%	88.25%
Standard Deviation	1%	0.7%	0.2%
AOM AV1 - Speed 10 Realtime - Bosphorus 4K (FPS)	76.65	**76.88**	**66.61**
Normalized	99.7%	100%	86.64%
Standard Deviation	1.5%	0.4%	0.1%
Embree - Pathtracer - Crown (FPS)	**18.8273**	12.6227	**9.6674**
Normalized	100%	67.04%	51.35%
Standard Deviation	0.7%	0.6%	0.2%
Embree - Pathtracer ISPC - Crown (FPS)	**20.1572**	13.9300	**11.4885**
Normalized	100%	69.11%	56.99%
Standard Deviation	1%	0.2%	0.5%
rav1e - 10 (FPS)	**12.024**	10.361	**9.496**
Normalized	100%	86.17%	78.98%
Standard Deviation	2.4%	3.1%	2.5%
SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)	**23.631**	19.212	**16.594**
Normalized	100%	81.3%	70.22%
Standard Deviation	2.4%	1.8%	0.7%
SVT-AV1 - Preset 8 - Bosphorus 1080p (FPS)	**93.448**	75.545	**51.575**
Normalized	100%	80.84%	55.19%
Standard Deviation	0.7%	1.1%	1%
SVT-HEVC - 7 - Bosphorus 1080p (FPS)	**233.21**	158.97	**116.78**
Normalized	100%	68.17%	50.08%
Standard Deviation	2.5%	1.7%	1.3%
SVT-HEVC - 10 - Bosphorus 1080p (FPS)	**475.92**	330.12	**250.22**
Normalized	100%	69.36%	52.58%
Standard Deviation	0.4%	0.3%	0.2%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	**366.29**	220.86	**197.40**
Normalized	100%	60.3%	53.89%
Standard Deviation	11%	2.7%	2.3%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	**381.57**	229.13	**201.16**
Normalized	100%	60.05%	52.72%
Standard Deviation	0.5%	0.3%	0.2%

Alder Lake Intel Linux Tests

Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**752116**	460323	**304747**
Normalized	100%	61.2%	40.52%
Standard Deviation	0.1%	0.5%	0.8%
7-Zip Compression - Compression Rating (MIPS)	**119413**	77975	**65237**
Normalized	100%	65.3%	54.63%
Standard Deviation	0.9%	0.5%	0.7%
7-Zip Compression - D.R (MIPS)	**96602**	61848	**41194**
Normalized	100%	64.02%	42.64%
Standard Deviation	0.9%	0.7%	0.6%
Stockfish - Total Time (Nodes/s)	**47524146**	30847674	**20746943**
Normalized	100%	64.91%	43.66%
Standard Deviation	2.5%	0.6%	0.4%
Stargate Digital Audio Workstation - 480000 - 512 (Render Ratio)	**6.366737**	4.641808	**2.950076**
Normalized	100%	72.91%	46.34%
Standard Deviation	0.2%	0%	0.2%
Stargate Digital Audio Workstation - 480000 - 1024 (Render Ratio)	**6.871543**	4.799675	**3.012189**
Normalized	100%	69.85%	43.84%
Standard Deviation	0.5%	0.3%	0.1%
libavif avifenc - 6 (sec)	**8.247**	9.867	**12.332**
Normalized	100%	83.58%	66.87%
Standard Deviation	0.8%	0.7%	0.5%
libavif avifenc - 6, Lossless (sec)	**29.362**	42.772	**65.457**
Normalized	100%	68.65%	44.86%
Standard Deviation	1%	0.2%	0.4%
Timed GDB GNU Debugger Compilation - Time To Compile (sec)	**44.788**	52.288	**61.599**
Normalized	100%	85.66%	72.71%
Standard Deviation	0.3%	2%	0.4%
Timed Linux Kernel Compilation - Time To Compile (sec)	**47.845**	68.586	**92.075**
Normalized	100%	69.76%	51.96%
Standard Deviation	1.7%	2.1%	1%
Timed LLVM Compilation - Ninja (sec)	**358.467**	517.312	**664.574**
Normalized	100%	69.29%	53.94%
Standard Deviation	0.3%	0.2%	0.1%
Timed Mesa Compilation - Time To Compile (sec)	**25.857**	35.847	**46.557**
Normalized	100%	72.13%	55.54%
Standard Deviation	0.8%	0.3%	0%
Timed MPlayer Compilation - Time To Compile (sec)	**17.975**	26.551	**37.172**
Normalized	100%	67.7%	48.36%
Standard Deviation	0.9%	0%	0.1%
Timed Node.js Compilation - Time To Compile (sec)	**316.866**	451.831	**567.761**
Normalized	100%	70.13%	55.81%
Standard Deviation	0%	0.4%	0.1%
Primesieve - 1.P.N.G (sec)	**16.342**	24.250	**29.807**
Normalized	100%	67.39%	54.83%
Standard Deviation	0.6%	0.1%	0.2%

Alder Lake Intel Linux Tests

Tungsten Renderer - Hair (sec)	**14.3871**	21.8720	**31.3260**
Normalized	100%	65.78%	45.93%
Standard Deviation	0.9%	0.2%	0.1%
Tungsten Renderer - Water Caustic (sec)	**18.2872**	21.7021	**25.8301**
Normalized	100%	84.26%	70.8%
Standard Deviation	0.8%	0.5%	0.2%
Tungsten Renderer - Non-Exponential (sec)	**3.72173**	5.89450	**7.79702**
Normalized	100%	63.14%	47.73%
Standard Deviation	3%	0.6%	1.8%
Tungsten Renderer - Volumetric Caustic	**4.98045**	7.05919	**9.93768**
Normalized	100%	70.55%	50.12%
Standard Deviation	2.4%	0.7%	0.4%
Timed Wasmer Compilation - Time To Compile (sec)	**32.818**	43.374	**54.830**
Normalized	100%	75.66%	59.85%
Standard Deviation	0.8%	0.2%	0.9%
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	**21.710**	25.767	**33.013**
Normalized	100%	84.26%	65.76%
Standard Deviation	0.6%	0%	0.5%
Cython Benchmark - N-Queens (sec)	**14.072**	14.897	**16.540**
Normalized	100%	94.46%	85.08%
Standard Deviation	0.2%	0.1%	0.1%
Helsing - 12 digit (sec)	**3.070**	4.664	**6.156**
Normalized	100%	65.82%	49.87%
Standard Deviation	1.1%	0.8%	0.6%
Aircrack-ng (k/s)	**50984**	32917	**22305**
Normalized	100%	64.56%	43.75%
Standard Deviation	0.7%	1.8%	4.2%
SecureMark - SecureMark-TLS (marks)	**389601**	367882	**329402**
Normalized	100%	94.43%	84.55%
Standard Deviation	0.2%	0.2%	0.1%
OpenSSL - SHA256 (byte/s)	**24194561627**	14784567497	**8761398953**
Normalized	100%	61.11%	36.21%
Standard Deviation	0.1%	0.2%	0.3%
OpenSSL - RSA4096 (sign/s)	**4284**	2786	**2092**
Normalized	100%	65.02%	48.84%
Standard Deviation	0.7%	0.1%	0%
OpenSSL - RSA4096 (verify/s)	**279362**	180864	**135401**
Normalized	100%	64.74%	48.47%
Standard Deviation	0%	0.1%	0%
Node.js V8 Web Tooling Benchmark (runs/s)	**21.61**	19.90	**17.64**
Normalized	100%	92.09%	81.63%
Standard Deviation	0.7%	0.2%	1.4%
libjpeg-turbo tjbench - D.T (Megapixels/sec)	**277.503339**	261.903989	**234.388308**
Normalized	100%	94.38%	84.46%
Standard Deviation	0.5%	0.1%	0.1%
TensorFlow Lite - SqueezeNet (us)	**87910**	140924	**221127**
Normalized	100%	62.38%	39.76%
Standard Deviation	0.1%	0.1%	0%
TensorFlow Lite - Inception V4 (us)	**1263303**	2027390	**3229520**
Normalized	100%	62.31%	39.12%
Standard Deviation	0.1%	0%	0%
TensorFlow Lite - NASNet Mobile (us)	**73445**	108980	**182521**
Normalized	100%	67.39%	40.24%
Standard Deviation	2.2%	0.3%	0.1%

Alder Lake Intel Linux Tests

TensorFlow Lite - Mobilenet Float (us)	**58896**	95136	**150209**
Normalized	100%	61.91%	39.21%
Standard Deviation	0.1%	0.1%	0%
TensorFlow Lite - Mobilenet Quant (us)	**62049**	101071	**158767**
Normalized	100%	61.39%	39.08%
Standard Deviation	0.1%	0.1%	0%
TensorFlow Lite - I.R.V (us)	**1135970**	1816837	**2921880**
Normalized	100%	62.52%	38.88%
Standard Deviation	0.2%	0.1%	0%
ASTC Encoder - Thorough (sec)	**6.9266**	**8.9876**	7.0855
Normalized	100%	77.07%	97.76%
Standard Deviation	0.3%	0.1%	0%
ASTC Encoder - Exhaustive (sec)	**33.4717**	50.9614	**67.2062**
Normalized	100%	65.68%	49.8%
Standard Deviation	0.3%	0%	0%
Darktable - Boat - CPU-only (sec)	**2.690**	3.880	**5.283**
Normalized	100%	69.33%	50.92%
Standard Deviation	1%	1%	0.3%
Darktable - Masskrug - CPU-only (sec)	**2.894**	3.912	**4.468**
Normalized	100%	73.98%	64.77%
Standard Deviation	0.7%	0.6%	0.2%
Darktable - Server Room - CPU-only (sec)	**2.019**	2.781	**3.361**
Normalized	100%	72.6%	60.07%
Standard Deviation	0.7%	0.3%	0.1%
GIMP - resize (sec)	**5.208**	5.403	**5.990**
Normalized	100%	96.39%	86.94%
Standard Deviation	2.4%	2.4%	2.4%
GIMP - rotate (sec)	**7.479**	7.718	**8.518**
Normalized	100%	96.9%	87.8%
Standard Deviation	0.1%	0.1%	0.4%
GIMP - auto-levels (sec)	**8.007**	8.236	**8.902**
Normalized	100%	97.22%	89.95%
Standard Deviation	0.5%	0.8%	0.4%
GIMP - unsharp-mask (sec)	**9.906**	10.015	**10.426**
Normalized	100%	98.91%	95.01%
Standard Deviation	0.5%	0.3%	0.2%
Hugin - P.P.A.S.T (sec)	**31.209**	34.249	**40.041**
Normalized	100%	91.12%	77.94%
Standard Deviation	0.2%	0.3%	0.8%
GNU Octave Benchmark (sec)	**4.895**	4.932	**5.452**
Normalized	100%	99.25%	89.78%
Standard Deviation	1.3%	1.1%	0.8%
RawTherapee - T.B.T (sec)	**36.657**	45.699	**51.282**
Normalized	100%	80.21%	71.48%
Standard Deviation	0.3%	0.2%	0%
Mobile Neural Network - mobilenetV3 (ms)	1.162	**1.199**	**1.103**
Normalized	94.92%	91.99%	100%
Standard Deviation	1.1%	2.4%	1.1%
Mobile Neural Network - squeezenetv1.1	**2.843**	2.577	**2.354**
Normalized	82.8%	91.35%	100%
Standard Deviation	16.2%	11.6%	0.5%
Mobile Neural Network - resnet-v2-50 (ms)	**20.006**	**18.756**	19.889
Normalized	93.75%	100%	94.3%
Standard Deviation	9.4%	11%	0.1%
Mobile Neural Network - SqueezeNetV1.0 (ms)	4.255	**4.546**	**3.530**

Alder Lake Intel Linux Tests

Normalized	82.96%	77.65%	100%
Standard Deviation	6%	7.7%	0.4%
Mobile Neural Network - MobileNetV2_224	**2.442**	2.259	**2.020**
Normalized	82.72%	89.42%	100%
Standard Deviation	0.9%	2.2%	0.3%
Mobile Neural Network - mobilenet-v1-1.0	**2.887**	**2.365**	2.830
Normalized	81.92%	100%	83.57%
Standard Deviation	1%	0.5%	0.1%
Mobile Neural Network - inception-v3 (ms)	23.695	**28.898**	**23.097**
Normalized	97.48%	79.93%	100%
Standard Deviation	4.3%	8.6%	0.4%
NCNN - CPU - mobilenet (ms)	10.90	**12.63**	**9.96**
Normalized	91.38%	78.86%	100%
Standard Deviation	10.1%	9.6%	0.1%
NCNN - CPU-v2-v2 - mobilenet-v2 (ms)	3.30	**3.89**	**2.65**
Normalized	80.3%	68.12%	100%
Standard Deviation	12.1%	10.7%	0.2%
NCNN - CPU-v3-v3 - mobilenet-v3 (ms)	2.78	**3.20**	**2.42**
Normalized	87.05%	75.63%	100%
Standard Deviation	10.5%	8.9%	0%
NCNN - CPU - shufflenet-v2 (ms)	2.96	**3.19**	**2.87**
Normalized	96.96%	89.97%	100%
Standard Deviation	13.3%	9.2%	0.2%
NCNN - CPU - mnasnet (ms)	3.00	**3.45**	**2.41**
Normalized	80.33%	69.86%	100%
Standard Deviation	10.4%	9.5%	0%
NCNN - CPU - efficientnet-b0 (ms)	5.08	**6.08**	**3.71**
Normalized	73.03%	61.02%	100%
Standard Deviation	11.6%	10%	0.2%
NCNN - CPU - blazeface (ms)	1.37	**1.43**	**1.08**
Normalized	78.83%	75.52%	100%
Standard Deviation	15.6%	10.6%	0%
NCNN - CPU - googlenet (ms)	9.77	**11.10**	**9.14**
Normalized	93.55%	82.34%	100%
Standard Deviation	12.8%	7.8%	0.9%
NCNN - CPU - vgg16 (ms)	**32.63**	**35.55**	35.18
Normalized	100%	91.79%	92.75%
Standard Deviation	4.3%	3.2%	0%
NCNN - CPU - resnet18 (ms)	10.83	**10.97**	**9.68**
Normalized	89.38%	88.24%	100%
Standard Deviation	1.4%	6.1%	0.9%
NCNN - CPU - alexnet (ms)	8.97	**9.20**	**8.21**
Normalized	91.53%	89.24%	100%
Standard Deviation	1.8%	1.9%	0.1%
NCNN - CPU - resnet50 (ms)	18.23	**19.54**	**16.74**
Normalized	91.83%	85.67%	100%
Standard Deviation	0.9%	2.8%	0.5%
NCNN - CPU - yolov4-tiny (ms)	**16.24**	**17.02**	16.68
Normalized	100%	95.42%	97.36%
Standard Deviation	5.8%	6.1%	0.2%
NCNN - CPU - squeezenet_ssd (ms)	**13.35**	**17.09**	14.93
Normalized	100%	78.12%	89.42%
Standard Deviation	2.8%	17.1%	0.1%
NCNN - CPU - regnety_400m (ms)	6.87	**7.39**	**5.97**
Normalized	86.9%	80.78%	100%

Alder Lake Intel Linux Tests

Standard Deviation	14.3%	12%	0.1%
TNN - CPU - DenseNet (ms)	**1734**	1974	**2369**
Normalized	100%	87.83%	73.17%
Standard Deviation	0.3%	0.5%	0.1%
TNN - CPU - MobileNet v2 (ms)	**178.684**	193.888	**211.286**
Normalized	100%	92.16%	84.57%
Standard Deviation	0.4%	1.2%	0.3%
TNN - CPU - SqueezeNet v2 (ms)	**40.812**	43.174	**48.183**
Normalized	100%	94.53%	84.7%
Standard Deviation	0.7%	0.2%	0.2%
TNN - CPU - SqueezeNet v1.1 (ms)	**153.146**	161.006	**180.981**
Normalized	100%	95.12%	84.62%
Standard Deviation	0.7%	0.3%	0.1%
PlaidML - No - Inference - VGG16 - CPU	**24.66**	18.61	**15.83**
Normalized	100%	75.47%	64.19%
Standard Deviation	0.3%	0.5%	0.2%
PlaidML - No - Inference - VGG19 - CPU	**20.44**	15.31	**12.93**
Normalized	100%	74.9%	63.26%
Standard Deviation	0.1%	0.4%	0.2%
PlaidML - No - Inference - ResNet 50 - CPU (FPS)	**9.32**	8.80	**8.16**
Normalized	100%	94.42%	87.55%
Standard Deviation	0.5%	1%	0.6%
Blender - BMW27 - CPU-Only (sec)	**74.66**	116.27	**165.46**
Normalized	100%	64.21%	45.12%
Standard Deviation	0.4%	0.2%	0.2%
Blender - Fishy Cat - CPU-Only (sec)	**110.24**	170.37	**238.65**
Normalized	100%	64.71%	46.19%
Standard Deviation	0.2%	0.2%	0%
IndigoBench - CPU - Bedroom (M samples/s)	**3.044**	2.010	**1.491**
Normalized	100%	66.03%	48.98%
Standard Deviation	0.7%	0.3%	0.2%
IndigoBench - CPU - Supercar (M samples/s)	**8.378**	5.241	**3.659**
Normalized	100%	62.56%	43.67%
Standard Deviation	0.7%	1.3%	0.2%
PyBench - T.F.A.T.T (Milliseconds)	**499**	528	**590**
Normalized	100%	94.51%	84.58%
Standard Deviation	0.3%	0.2%	0.3%
ONNX Runtime - yolov4 - CPU	**672**	458	**302**
Normalized	100%	68.15%	44.94%
Standard Deviation	0.5%	0.1%	0%
ONNX Runtime - fcn-resnet101-11 - CPU (Inferences/min)	**98**	67	**43**
Normalized	100%	68.37%	43.88%
Standard Deviation	0%	0.4%	0%
ONNX Runtime - shufflenet-v2-10 - CPU (Inferences/min)	**46690**	39771	**29274**
Normalized	100%	85.18%	62.7%
Standard Deviation	0.7%	0.2%	0.6%
ONNX Runtime - super-resolution-10 - CPU (Inferences/min)	**4677**	4215	**2986**
Normalized	100%	90.12%	63.84%
Standard Deviation	0%	0.1%	0.4%
Appleseed - Disney Material (sec)	**109.014926**	161.780317	**223.180792**
Normalized	100%	67.38%	48.85%

Alder Lake Intel Linux Tests

Appleseed - Material Tester (sec)	**115.034474**	171.899397	**231.889641**
Normalized	100%	66.92%	49.61%
PHPBench - P.B.S (Score)	**1422068**	1345390	**1211698**
Normalized	100%	94.61%	85.21%
Standard Deviation	0.8%	0.4%	0.2%
Selenium - Kraken - Google Chrome (ms)	**429.1**	456.6	**507.1**
Normalized	100%	93.98%	84.62%
Standard Deviation	0.6%	0.2%	0.6%
Selenium - Octane - Google Chrome (Geometric Mean)	**99096**	94330	**83897**
Normalized	100%	95.19%	84.66%
Standard Deviation	1.1%	0.3%	0.6%
Selenium - StyleBench - Google Chrome (Runs / Minute)	**64.3**	62.6	**56.20**
Normalized	100%	97.36%	87.4%
Standard Deviation	0.3%	0.9%	0.5%
Selenium - Jetstream 2 - Google Chrome (Score)	**261.804**	250.652	**225.260**
Normalized	100%	95.74%	86.04%
Standard Deviation	1.5%	0.9%	0.7%
Selenium - Speedometer - Google Chrome (Runs/min)	**303**	290	**262**
Normalized	100%	95.71%	86.47%
Standard Deviation	1%	1.2%	0.9%
Selenium - PSPDFKit WASM - Google Chrome (Score)	**2595**	2617	**2700**
Normalized	100%	99.16%	96.11%
Standard Deviation	1.9%	0.7%	2.1%
Selenium - W.i - Google Chrome (ms)	**17.97**	18.97	**21.01**
Normalized	100%	94.73%	85.53%
Standard Deviation	0.7%	1.2%	0.4%
PyHPC Benchmarks - CPU - Numba - 4194304 - Equation of State (sec)	**0.137**	0.144	**0.159**
Normalized	100%	95.14%	86.16%
Standard Deviation	0%	0%	0%
PyHPC Benchmarks - CPU - Numba - 4194304 - Isoneutral Mixing (sec)	**0.797**	0.829	**0.928**
Normalized	100%	96.14%	85.88%
Standard Deviation	0.1%	0.1%	0.1%
PyHPC Benchmarks - CPU - Numpy - 4194304 - Equation of State (sec)	1.296	**1.216**	**1.319**
Normalized	93.83%	100%	92.19%
Standard Deviation	0.2%	0%	2.4%
PyHPC Benchmarks - CPU - Numpy - 4194304 - Isoneutral Mixing (sec)	**1.953**	1.879	**1.861**
Normalized	95.29%	99.04%	100%
Standard Deviation	0.2%	0.1%	0.1%
PyHPC Benchmarks - CPU - Aesara - 4194304 - Equation of State (sec)	**0.174**	0.184	**0.195**
Normalized	100%	94.57%	89.23%
Standard Deviation	0%	0.3%	0.3%

Alder Lake Intel Linux Tests

PyHPC Benchmarks - CPU - Aesara - 4194304 - Isoneutral Mixing (sec)	1.225	**1.209**	**1.338**
Normalized	98.69%	100%	90.36%
Standard Deviation	0.3%	0.1%	3.8%
PyHPC Benchmarks - CPU - PyTorch - 4194304 - Isoneutral Mixing (sec)	1.217	**1.193**	**1.324**
Normalized	98.03%	100%	90.11%
Standard Deviation	2.3%	1%	1%
PyHPC Benchmarks - CPU - TensorFlow - 4194304 - Equation of State (sec)	**0.092**	0.094	**0.105**
Normalized	100%	97.87%	87.62%
Standard Deviation	0%	0.6%	2.2%
Unpacking Firefox - firefox-84.0.source.tar.xz (sec)	**13.239**	13.855	**15.611**
Normalized	100%	95.55%	84.81%
Standard Deviation	0.8%	0.6%	1%
Chaos Group V-RAY - CPU (vsamples)	**20161**	13114	**9657**
Normalized	100%	65.05%	47.9%
Standard Deviation	0.4%	0.1%	0.2%
OpenCV - Object Detection (ms)	50173	**52105**	**31560**
Normalized	62.9%	60.57%	100%
Standard Deviation	8.1%	4.2%	2.4%
OpenCV - DNN - D.N.N (ms)	**8841**	10012	**10349**
Normalized	100%	88.3%	85.43%
Standard Deviation	7.2%	11.2%	9.6%
Etcpak - DXT1 (Mpx/s/Watt)	**121.728**	**90.169**	113.264
Normalized	100%	74.07%	93.05%
Etcpak - ETC2 (Mpx/s/Watt)	10.639	**8.114**	**10.906**
Normalized	97.55%	74.4%	100%
LeelaChessZero - BLAS (Nodes/s/Watt)	**6.064**	8.277	**10.504**
Normalized	57.73%	78.8%	100%
LeelaChessZero - Eigen (Nodes/s/Watt)	**10.408**	13.783	**20.36**
Normalized	51.12%	67.7%	100%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day/Watt)	0.192	**0.14**	**0.239**
Normalized	80.33%	58.58%	100%
simdjson - Kostya (GB/s/Watt)	0.137	**0.119**	**0.168**
Normalized	81.55%	70.83%	100%
simdjson - LargeRand (GB/s/Watt)	0.051	**0.042**	**0.061**
Normalized	83.61%	68.85%	100%
simdjson - PartialTweets (GB/s/Watt)	0.205	**0.173**	**0.24**
Normalized	85.42%	72.08%	100%
simdjson - DistinctUserID (GB/s/Watt)	0.235	**0.203**	**0.283**
Normalized	83.04%	71.73%	100%
Xmrig - Monero - 1M (H/s/Watt)	40.423	**38.237**	**59.704**
Normalized	67.71%	64.04%	100%
Xmrig - Wownero - 1M (H/s/Watt)	**59.226**	67.011	**88.204**
Normalized	67.15%	75.97%	100%
Chia Blockchain VDF - Square Plain C++ (IPS/Watt)	8527	**7145**	**9802**
Normalized	86.99%	72.89%	100%
Chia Blockchain VDF - S.A.O (IPS/Watt)	7373	**6324**	**8599**
Normalized	85.74%	73.54%	100%

Alder Lake Intel Linux Tests

LZ4 Compression - 3 - D.S (MB/s/Watt)	408.854	**389.12**	**606.661**
Normalized	67.39%	64.14%	100%
LZ4 Compression - 9 - D.S (MB/s/Watt)	399.611	**385.597**	**597.32**
Normalized	66.9%	64.55%	100%
Zstd Compression - 19 - D.S (MB/s/Watt)	**70.069**	80.496	**110.938**
Normalized	63.16%	72.56%	100%
Zstd Compression - 19, Long Mode - D.S (MB/s/Watt)	**68.248**	77.538	**116.599**
Normalized	58.53%	66.5%	100%
JPEG XL libjxl - PNG - 8 (MP/s/Watt)	0.033	**0.028**	**0.038**
Normalized	86.84%	73.68%	100%
JPEG XL libjxl - JPEG - 8 (MP/s/Watt)	1.842	**1.508**	**1.955**
Normalized	94.22%	77.14%	100%
srsRAN - OFDM_Test (Samples /	6348464	**5179285**	**6755688**
Normalized	93.97%	76.67%	100%
srsRAN - 4.P.1.P.M.6.Q (UE Mb/s/Watt)	6.27	**4.927**	**6.809**
Normalized	92.08%	72.36%	100%
srsRAN - 4.P.1.P.S.6.Q (UE Mb/s/Watt)	9.115	**7.151**	**9.681**
Normalized	94.15%	73.87%	100%
srsRAN - 4.P.1.P.M.2.Q (UE Mb/s/Watt)	6.628	**5.49**	**7.63**
Normalized	86.87%	71.95%	100%
srsRAN - 4.P.1.P.S.2.Q (UE Mb/s/Watt)	9.701	**7.577**	**9.988**
Normalized	97.13%	75.86%	100%
srsRAN - 5.P.T.5.P.S.6.Q (UE Mb/s/Watt)	4.091	**3.043**	**4.298**
Normalized	95.18%	70.8%	100%
LibRaw - P.P.B (Mpix/sec/Watt)	**0.955**	0.974	**1.238**
Normalized	77.14%	78.68%	100%
Crafty - Elapsed Time (Nodes/s/Watt)	479442	**394163**	**528401**
Normalized	90.73%	74.6%	100%
OSPray - San Miguel - SciVis (FPS/Watt)	0.355	**0.28**	**0.358**
Normalized	99.16%	78.21%	100%
OSPray - NASA Streamlines - SciVis (FPS/Watt)	0.295	**0.274**	**0.324**
Normalized	91.05%	84.57%	100%
AOM AV1 - Speed 6 Realtime - Bosphorus 4K (FPS/Watt)	0.189	**0.182**	**0.214**
Normalized	88.32%	85.05%	100%
AOM AV1 - Speed 6 Two-Pass - Bosphorus 4K (FPS/Watt)	0.114	**0.113**	**0.131**
Normalized	87.02%	86.26%	100%
AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS/Watt)	**0.967**	**0.803**	0.842
Normalized	100%	83.04%	87.07%
AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS/Watt)	**1.439**	**1.216**	1.349
Normalized	100%	84.5%	93.75%
AOM AV1 - Speed 10 Realtime - Bosphorus 4K (FPS/Watt)	**1.628**	**1.432**	1.57
Normalized	100%	87.96%	96.44%
Embree - Pathtracer - Crown (FPS/Watt)	**0.108**	0.115	**0.133**
Normalized	81.2%	86.47%	100%
Embree - Pathtracer ISPC - Crown (FPS/Watt)	**0.116**	0.125	**0.155**

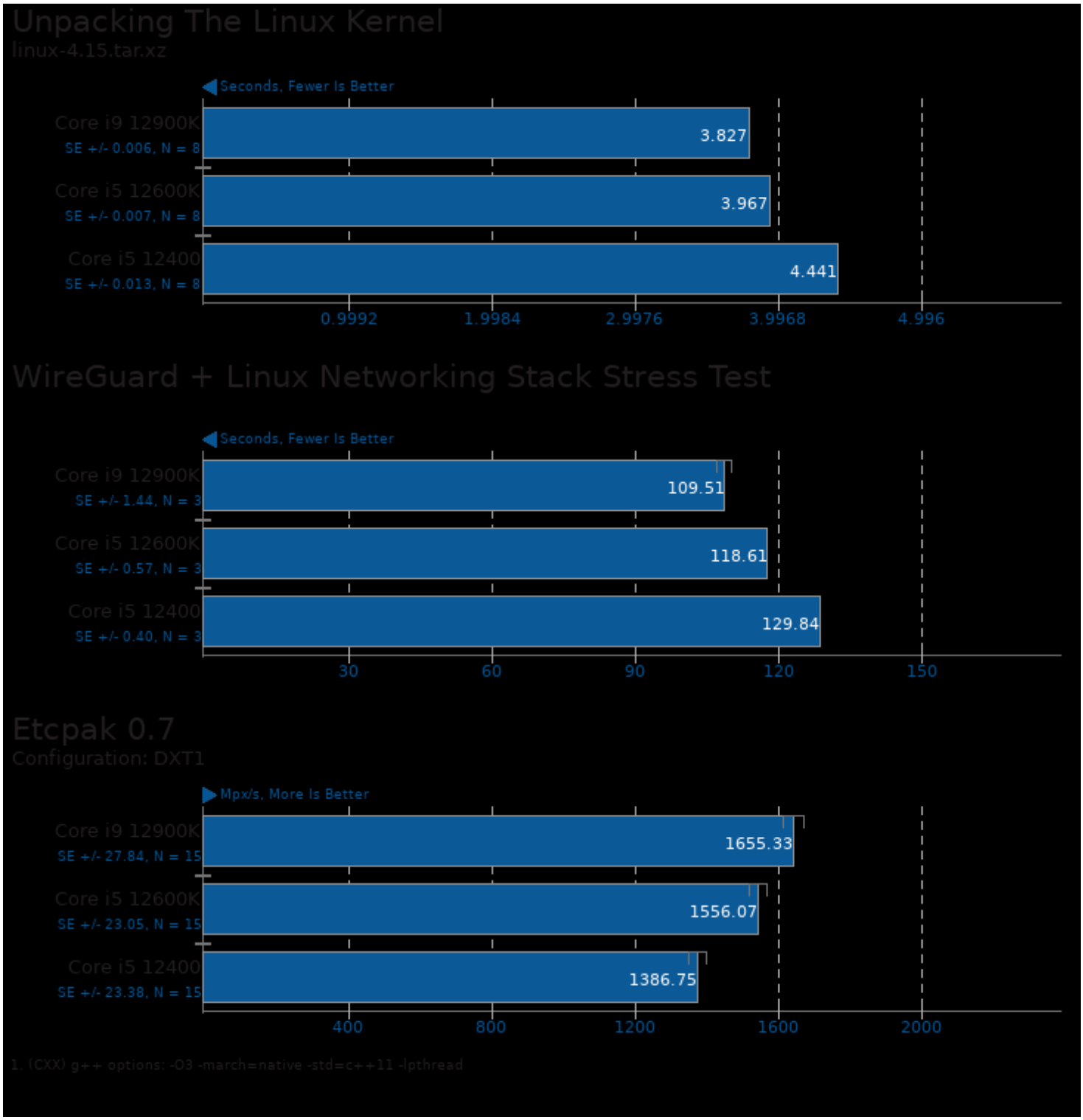
Alder Lake Intel Linux Tests

Normalized	74.84%	80.65%	100%
rav1e - 10 (FPS/Watt)	0.232	0.245	0.271
Normalized	85.61%	90.41%	100%
SVT-AV1 - Preset 8 - Bosphorus 4K	0.225	0.226	0.265
Normalized	84.91%	85.28%	100%
SVT-AV1 - Preset 8 - Bosphorus 1080p (FPS/Watt)	1.161	1.138	1.149
Normalized	100%	98.02%	98.97%
SVT-HEVC - 7 - Bosphorus 1080p (FPS/Watt)	2.876	2.439	2.459
Normalized	100%	84.81%	85.5%
SVT-HEVC - 10 - Bosphorus 1080p	10.326	7.982	7.845
Normalized	100%	77.3%	75.97%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS/Watt)	7.341	5.182	5.853
Normalized	100%	70.59%	79.73%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS/Watt)	7.456	5.195	6.089
Normalized	100%	69.68%	81.67%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec/Watt)	5648	5286	5433
Normalized	100%	93.59%	96.19%
7-Zip Compression - D.R (MIPS/Watt)	722.868	735.964	791.582
Normalized	91.32%	92.97%	100%
Stockfish - Total Time (Nodes/s/Watt)	267726	280214	301181
Normalized	88.89%	93.04%	100%
Stargate Digital Audio Workstation - 480000 - 512 (Render Ratio/Watt)	0.045	0.049	0.05
Normalized	90%	98%	100%
Stargate Digital Audio Workstation - 480000 - 1024 (Render Ratio/Watt)	0.045	0.05	0.051
Normalized	88.24%	98.04%	100%
Aircrack-ng (k/s/Watt)	293.728	325.112	359.254
Normalized	81.76%	90.5%	100%
SecureMark - SecureMark-TLS (marks/Watt)	13119	10737	15550
Normalized	84.36%	69.05%	100%
OpenSSL - SHA256 (byte/s/Watt)	133049156	139993126	137540135
Normalized	95.04%	100%	98.25%
OpenSSL - RSA4096 (verify/s/Watt)	1644	1826	2187
Normalized	75.17%	83.51%	100%
Node.js V8 Web Tooling Benchmark (runs/s/Watt)	0.533	0.47	0.63
Normalized	84.6%	74.6%	100%
libjpeg-turbo tjbench - D.T (Megapixels/sec/Watt)	10.954	8.852	11.876
Normalized	92.24%	74.54%	100%
PlaidML - No - Inference - VGG16 - CPU (FPS/Watt)	0.153	0.17	0.251
Normalized	60.96%	67.73%	100%
PlaidML - No - Inference - VGG19 - CPU (FPS/Watt)	0.125	0.135	0.2
Normalized	62.5%	67.5%	100%

Alder Lake Intel Linux Tests

PlaidML - No - Inference - ResNet 50 - CPU (FPS/Watt)	0.228	**0.2**	**0.29**
Normalized	78.62%	68.97%	100%
IndigoBench - CPU - Bedroom (M samples/s/Watt)	**0.017**	0.019	**0.023**
Normalized	73.91%	82.61%	100%
IndigoBench - CPU - Supercar (M samples/s/Watt)	**0.045**	0.047	**0.054**
Normalized	83.33%	87.04%	100%
ONNX Runtime - yolov4 - CPU (Inferences/min/Watt)	**4.095**	5.086	**6.288**
Normalized	65.12%	80.88%	100%
ONNX Runtime - fcn-resnet101-11 - CPU (Inferences/min/Watt)	**0.591**	0.727	**0.932**
Normalized	63.41%	78%	100%
ONNX Runtime - shufflenet-v2-10 - CPU (Inferences/min/Watt)	**372.519**	552.867	**670.131**
Normalized	55.59%	82.5%	100%
ONNX Runtime - super-resolution-10 - CPU (Inferences/min/Watt)	**31.003**	45.468	**59.914**
Normalized	51.75%	75.89%	100%
PHPBench - P.B.S (Score/Watt)	50940	**43678**	**63527**
Normalized	80.19%	68.75%	100%
Selenium - Octane - Google Chrome (Geometric Mean/Watt)	3944	**3322**	**4382**
Normalized	90%	75.82%	100%
Selenium - StyleBench - Google Chrome (Runs / Minute/Watt)	**2.6**	**2.073**	2.583
Normalized	100%	79.73%	99.35%
Selenium - Jetstream 2 - Google Chrome (Score/Watt)	8.998	**7.371**	**49.268**
Normalized	18.26%	14.96%	100%
Selenium - Speedometer - Google Chrome (Runs/min/Watt)	**15.258**	**12.481**	14.376
Normalized	100%	81.8%	94.22%
Chaos Group V-RAY - CPU (vsamples/Watt)	**119.257**	127.42	**153.07**
Normalized	77.91%	83.24%	100%
Meta Performance Per Watts - P.P.W (Performance/Watts)	**736.1526**	605.1202	**502.8800**
Normalized	100%	82.2%	68.31%

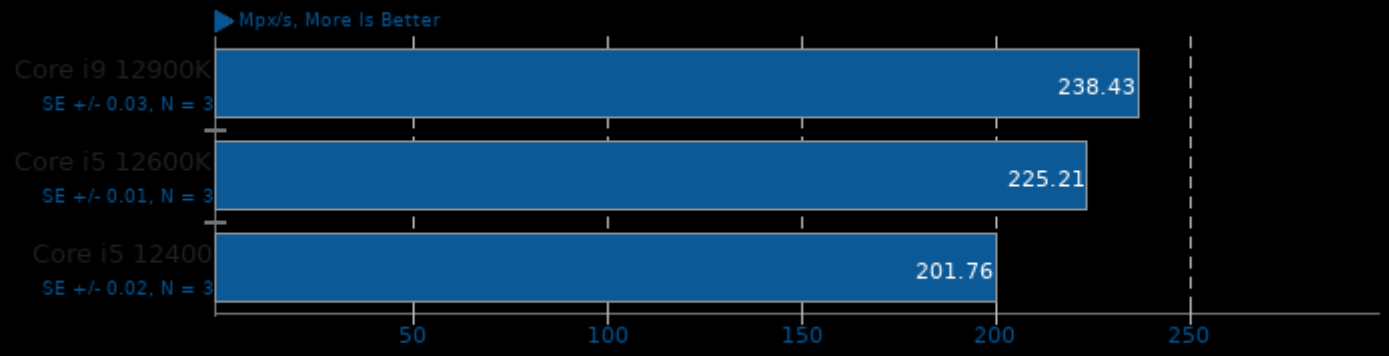
Alder Lake Intel Linux Tests



Alder Lake Intel Linux Tests

Etcpak 0.7

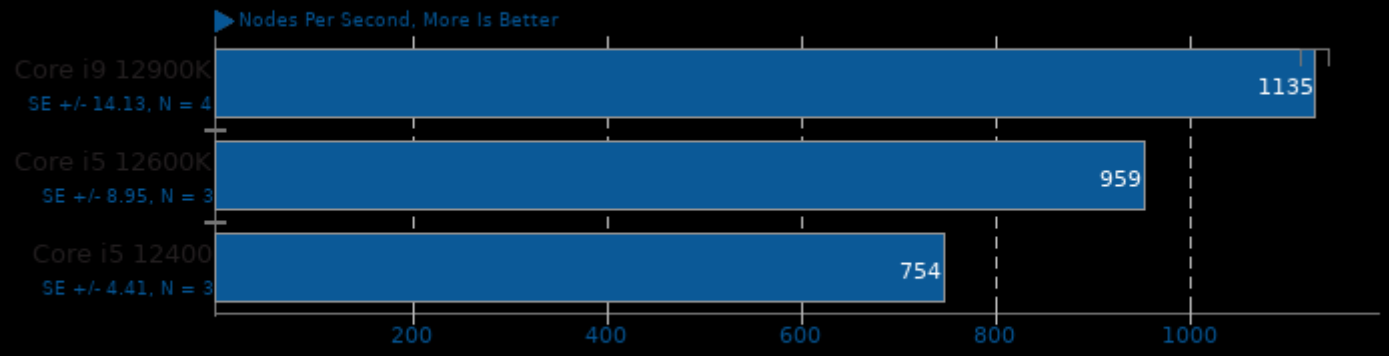
Configuration: ETC2



1. (CXX) g++ options: -O3 -march=native -std=c++11 -lpthread

LeelaChessZero 0.28

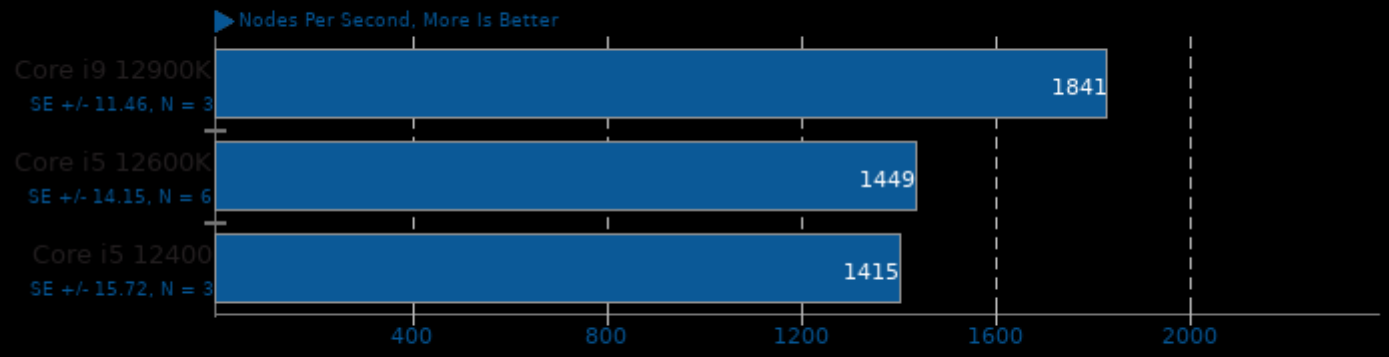
Backend: BLAS



1. (CXX) g++ options: -flto -pthread

LeelaChessZero 0.28

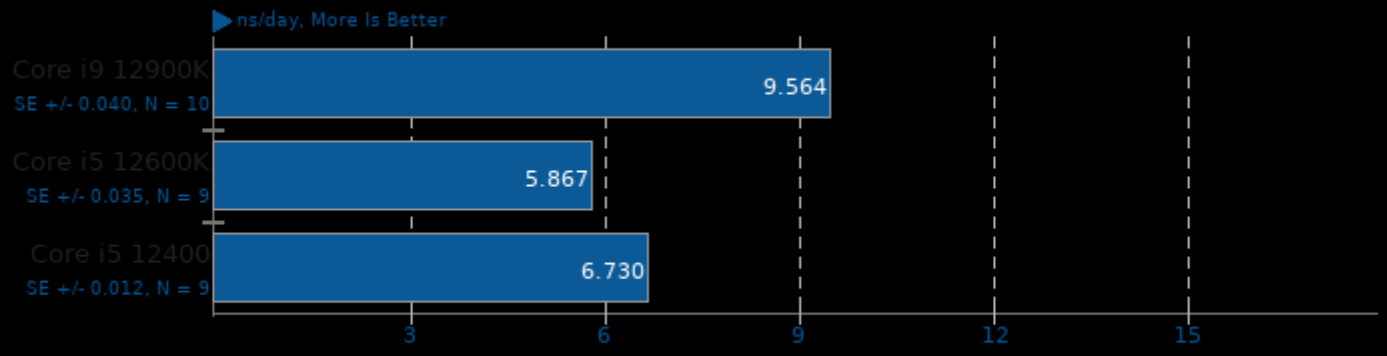
Backend: Eigen



1. (CXX) g++ options: -flto -pthread

LAMMPS Molecular Dynamics Simulator 29Oct2020

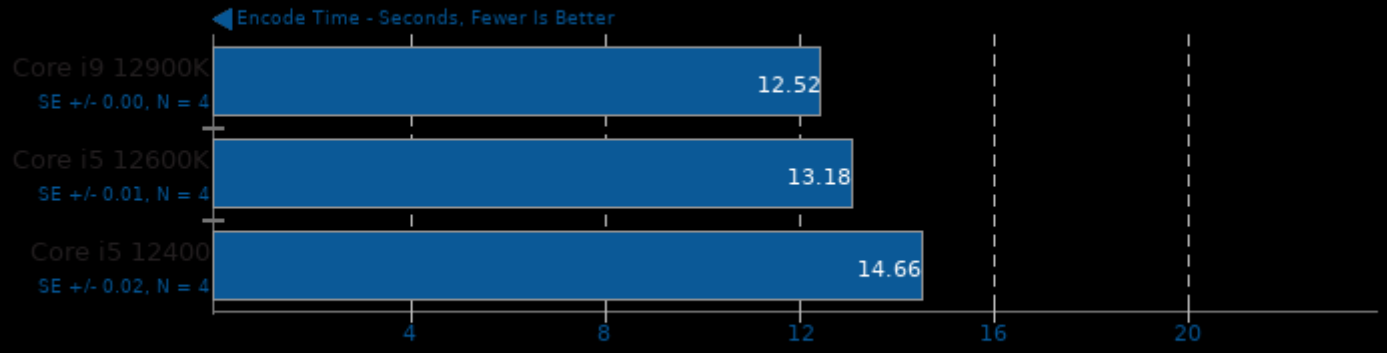
Model: Rhodopsin Protein



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

WebP Image Encode 1.1

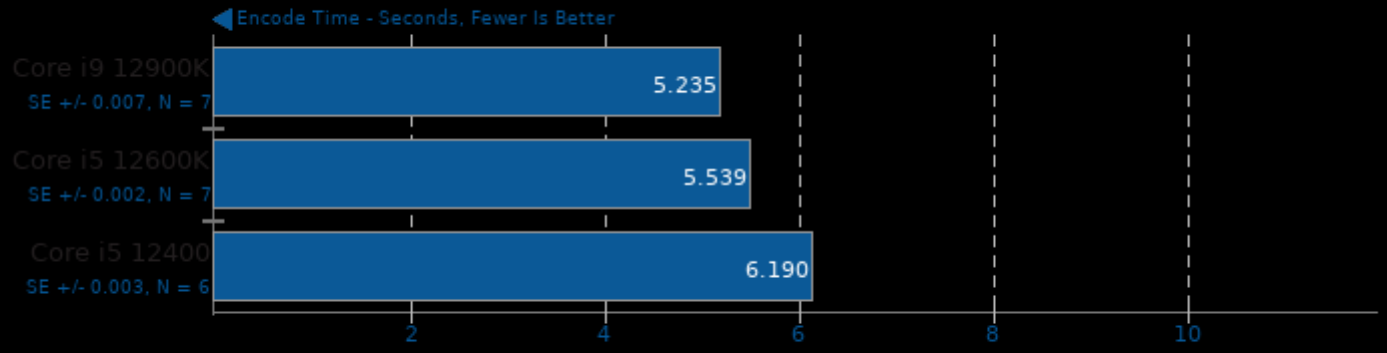
Encode Settings: Quality 100, Lossless



1. (CC) gcc options: -fvisibility=hidden -O2 -lm -ljpeg -lpng16 -ltiff

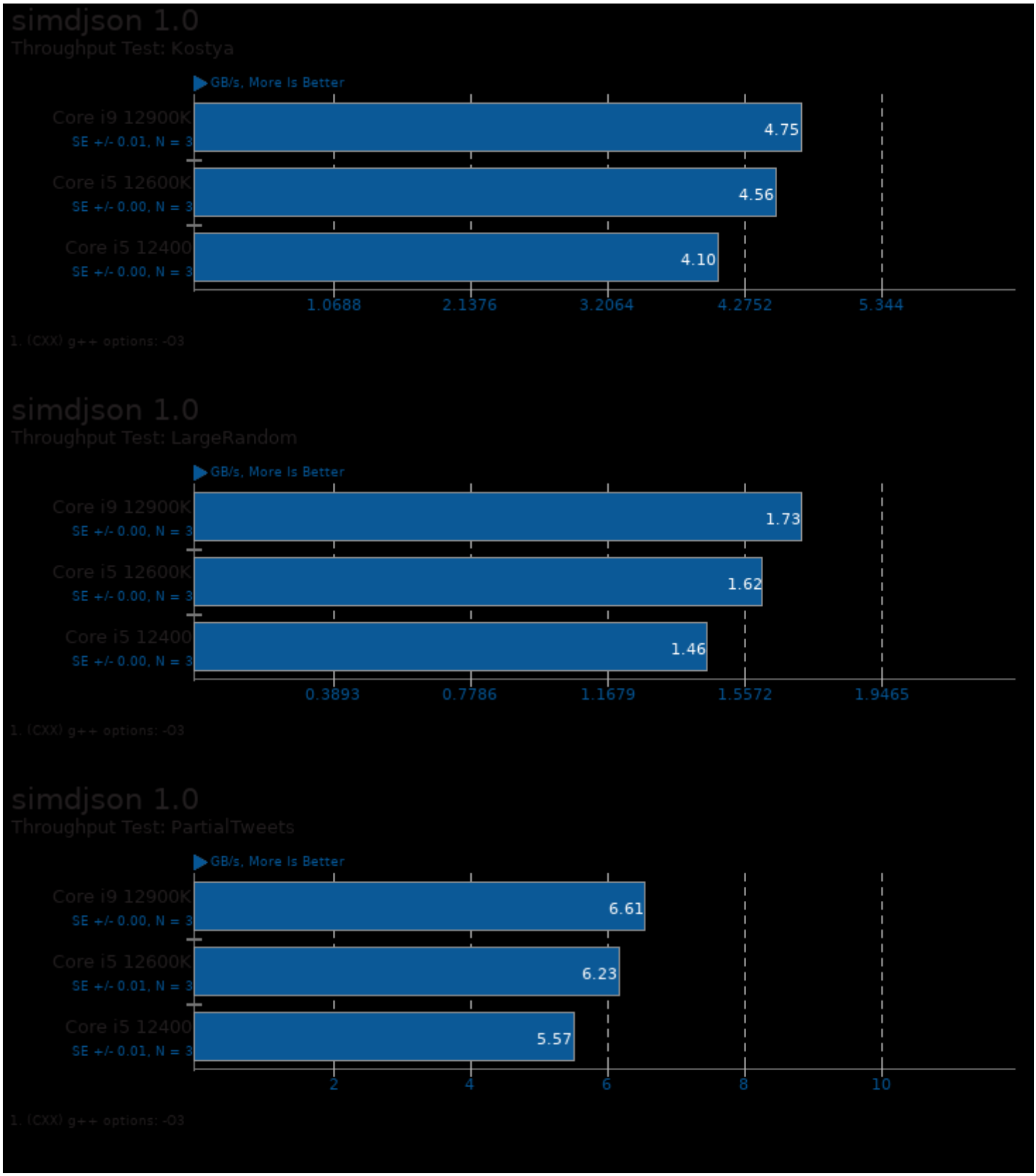
WebP Image Encode 1.1

Encode Settings: Quality 100, Highest Compression



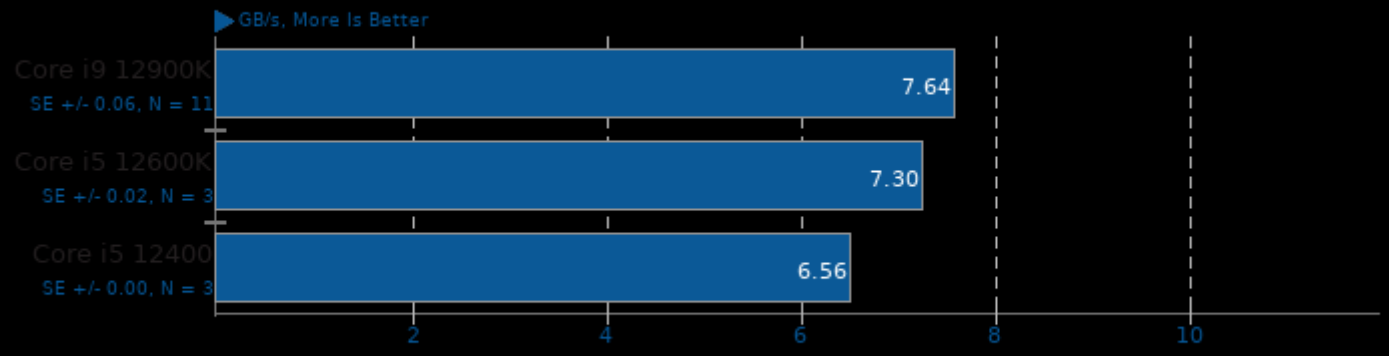
1. (CC) gcc options: -fvisibility=hidden -O2 -lm -ljpeg -lpng16 -ltiff

Alder Lake Intel Linux Tests



simdjson 1.0

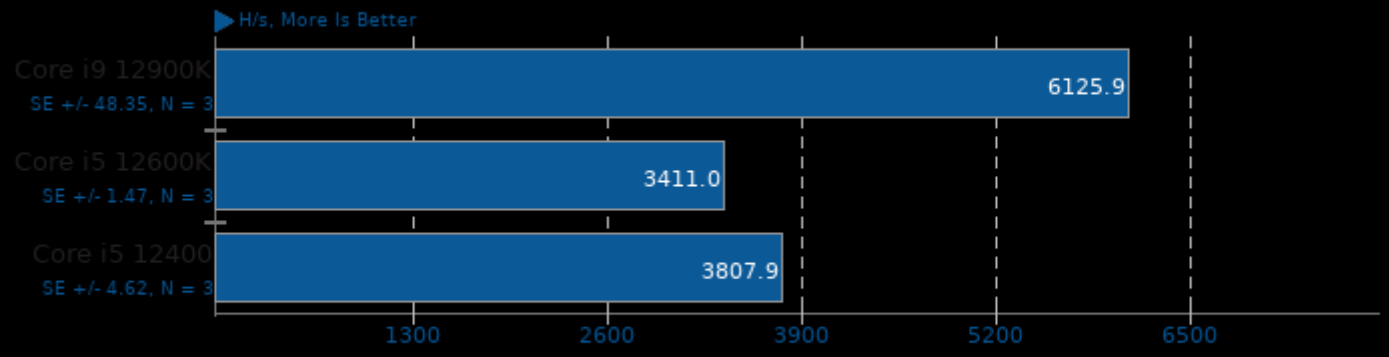
Throughput Test: DistinctUserID



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

Xmrig 6.12.1

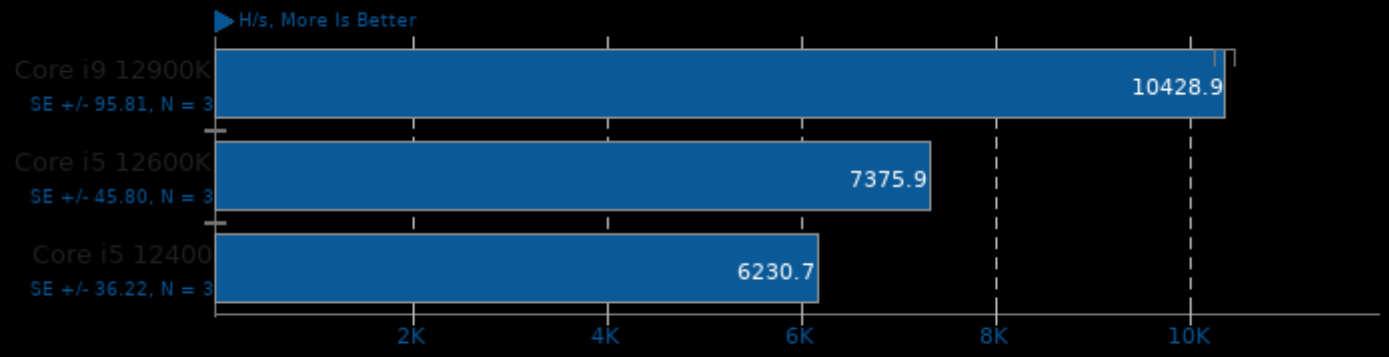
Variant: Monero - Hash Count: 1M



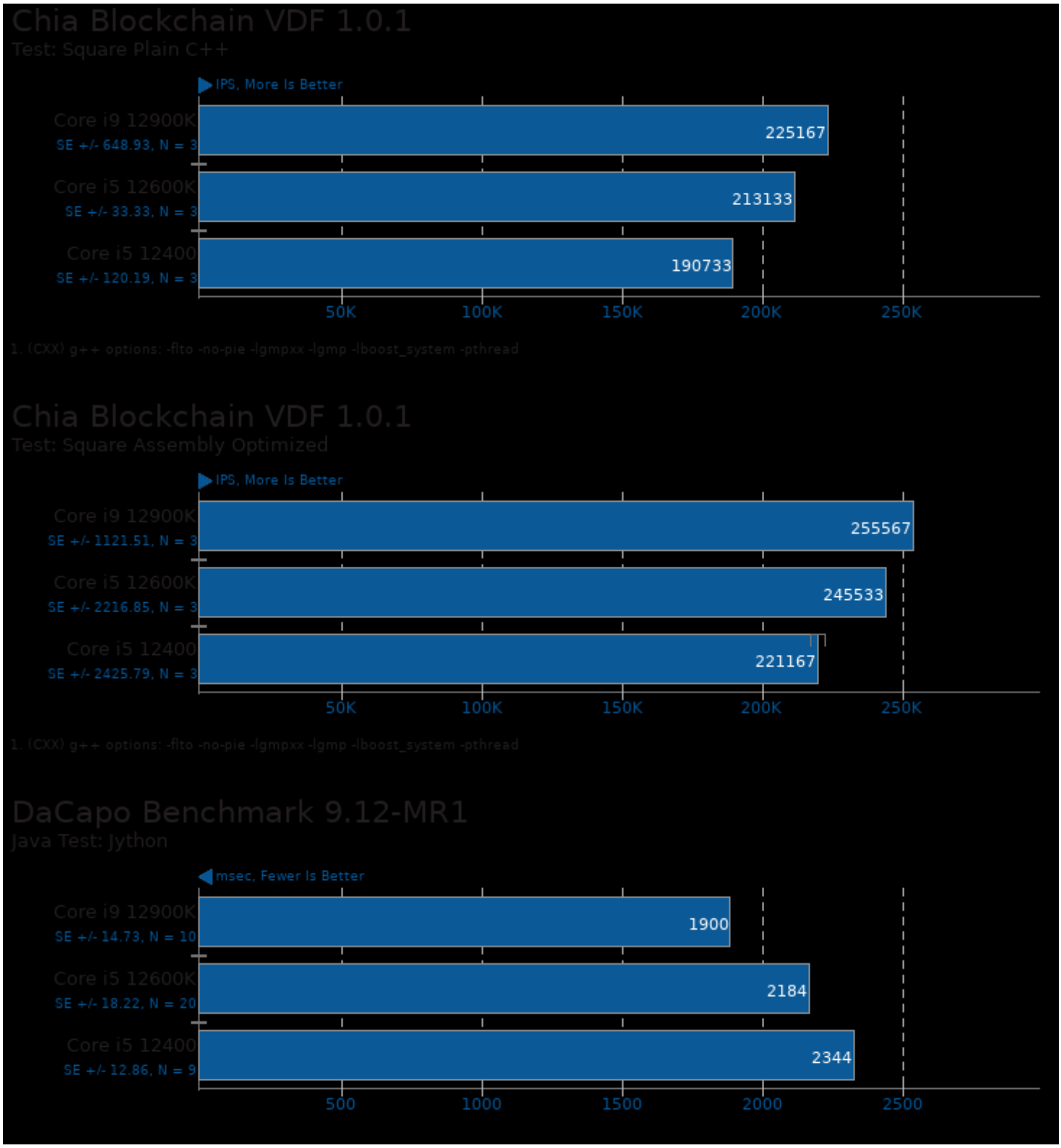
1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc

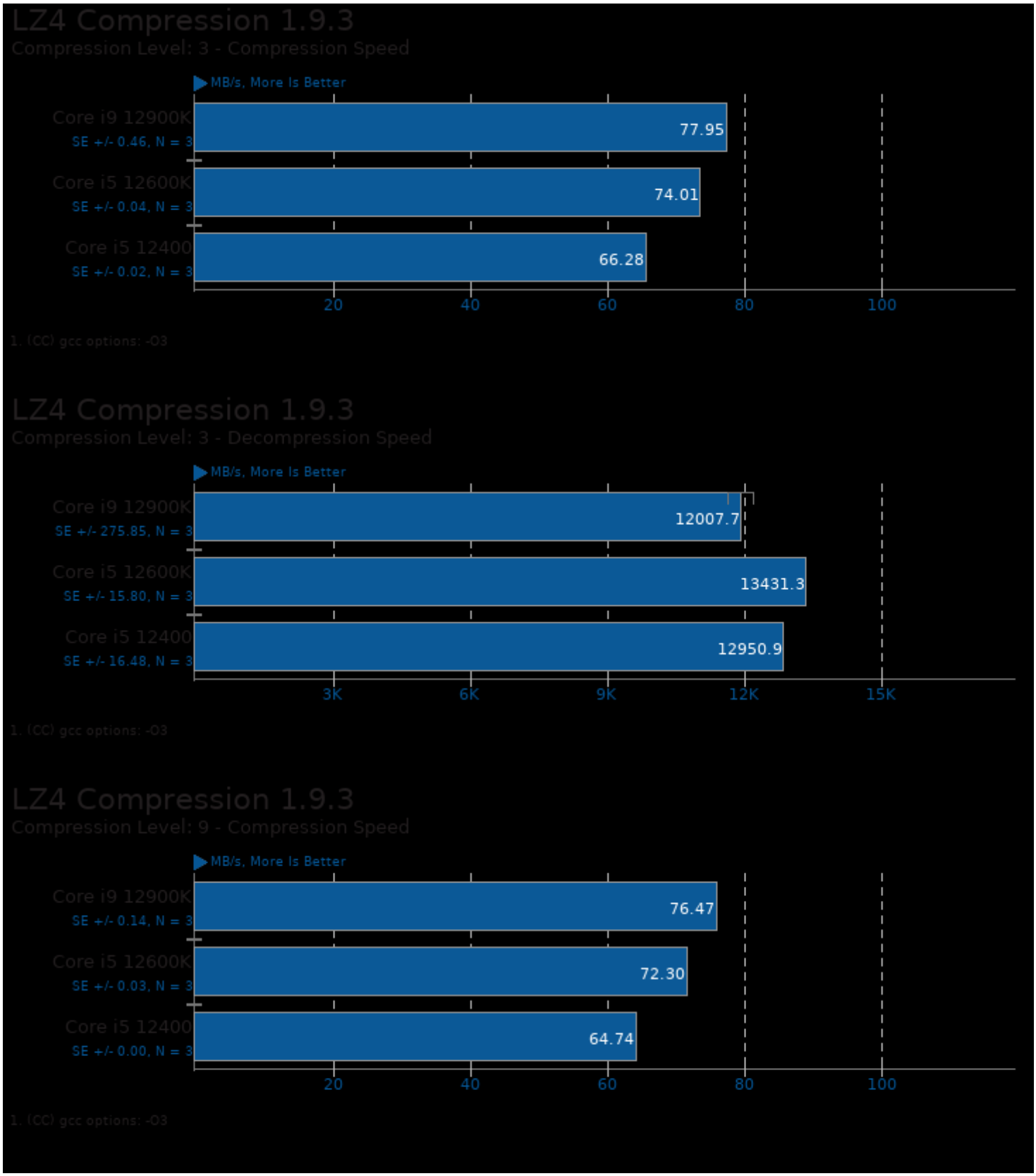
Xmrig 6.12.1

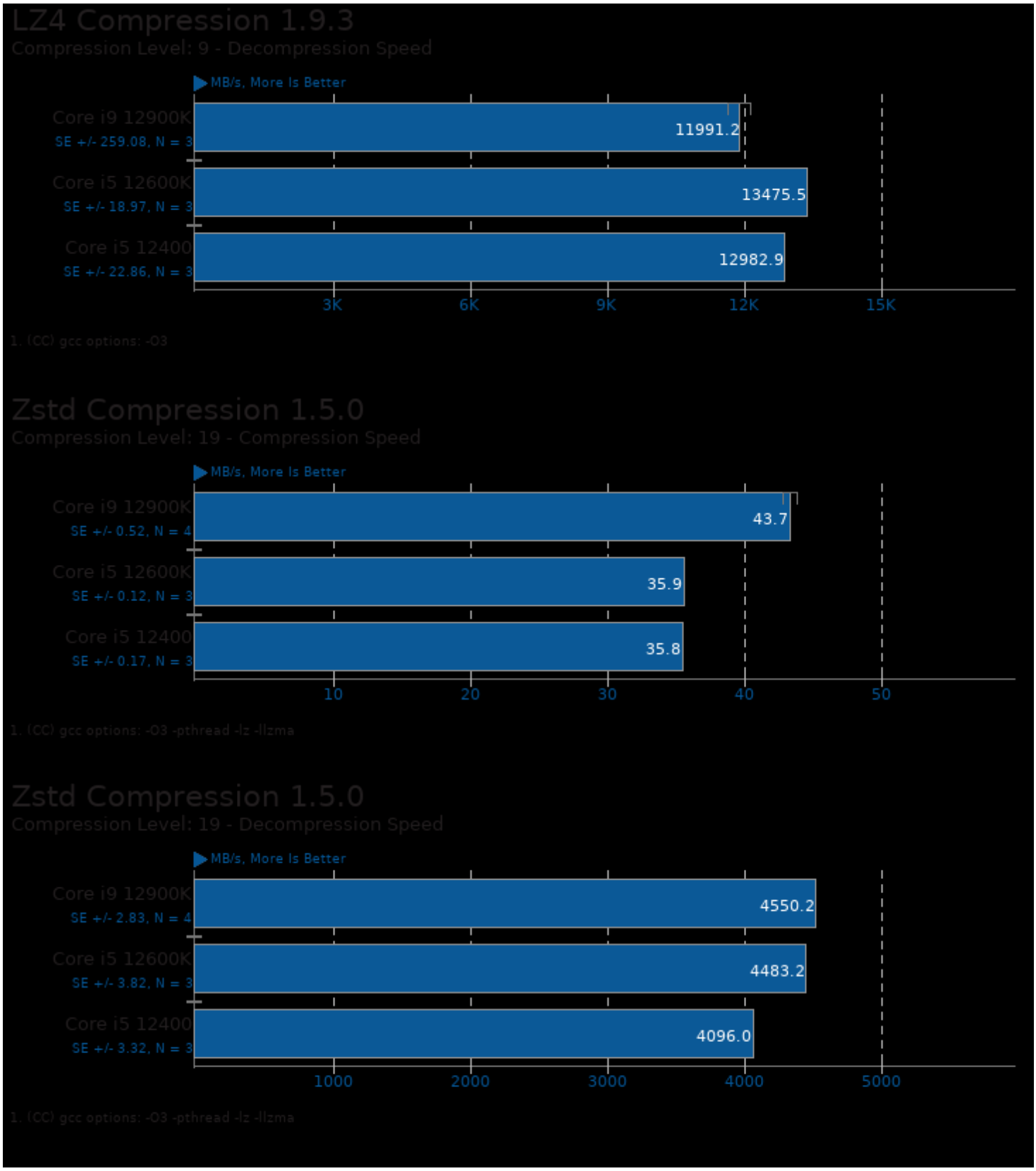
Variant: Wownero - Hash Count: 1M

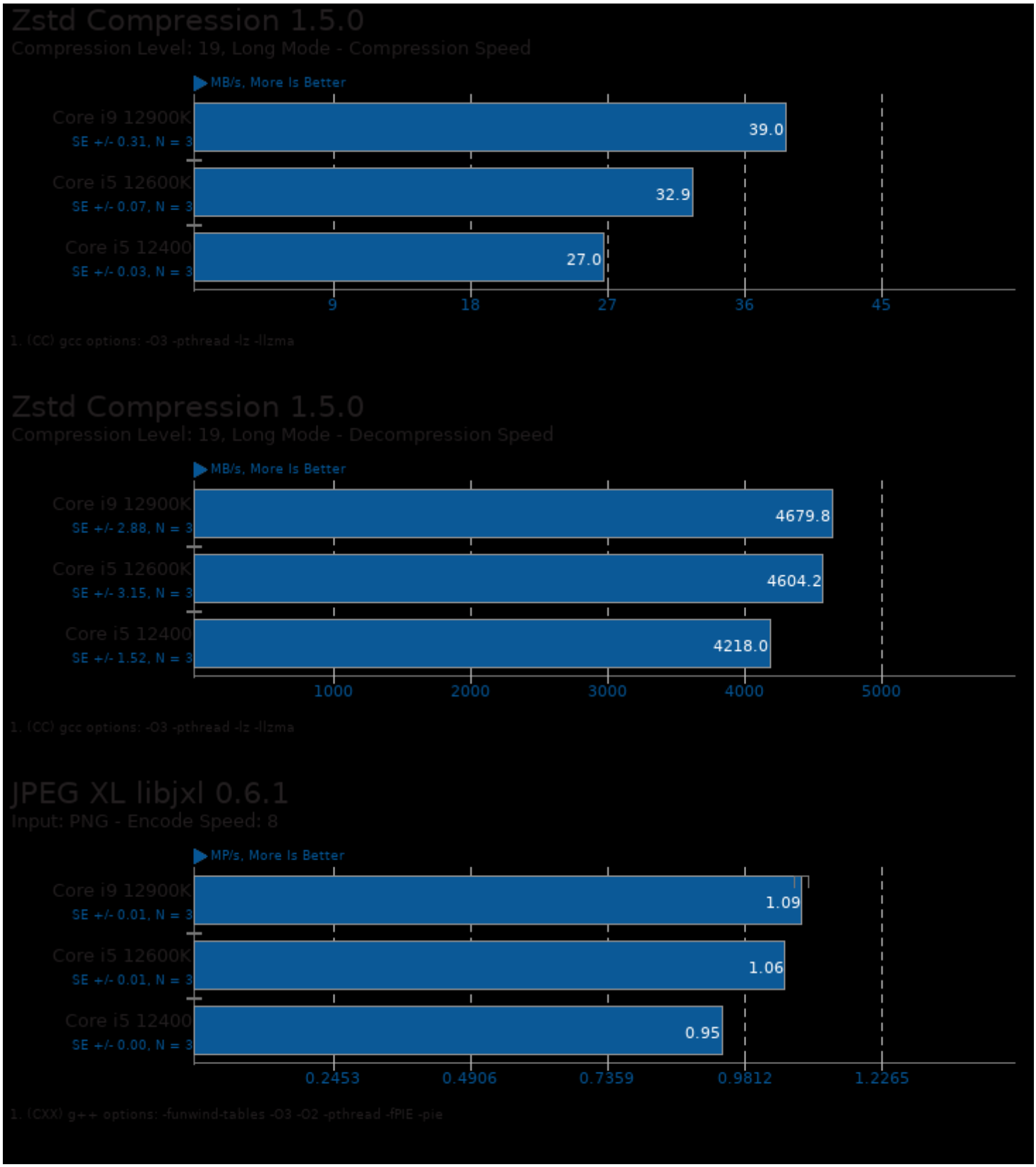


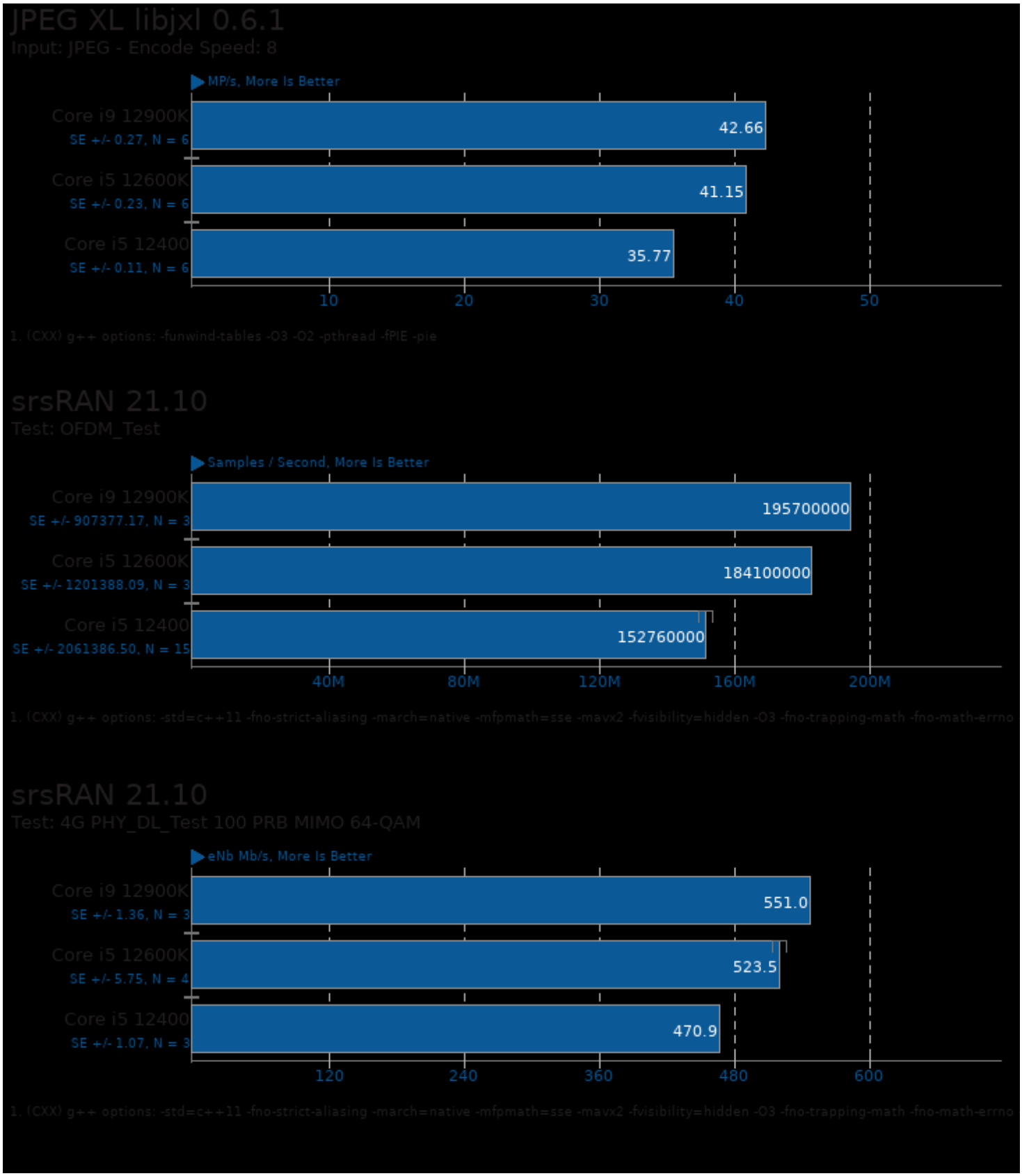
1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc

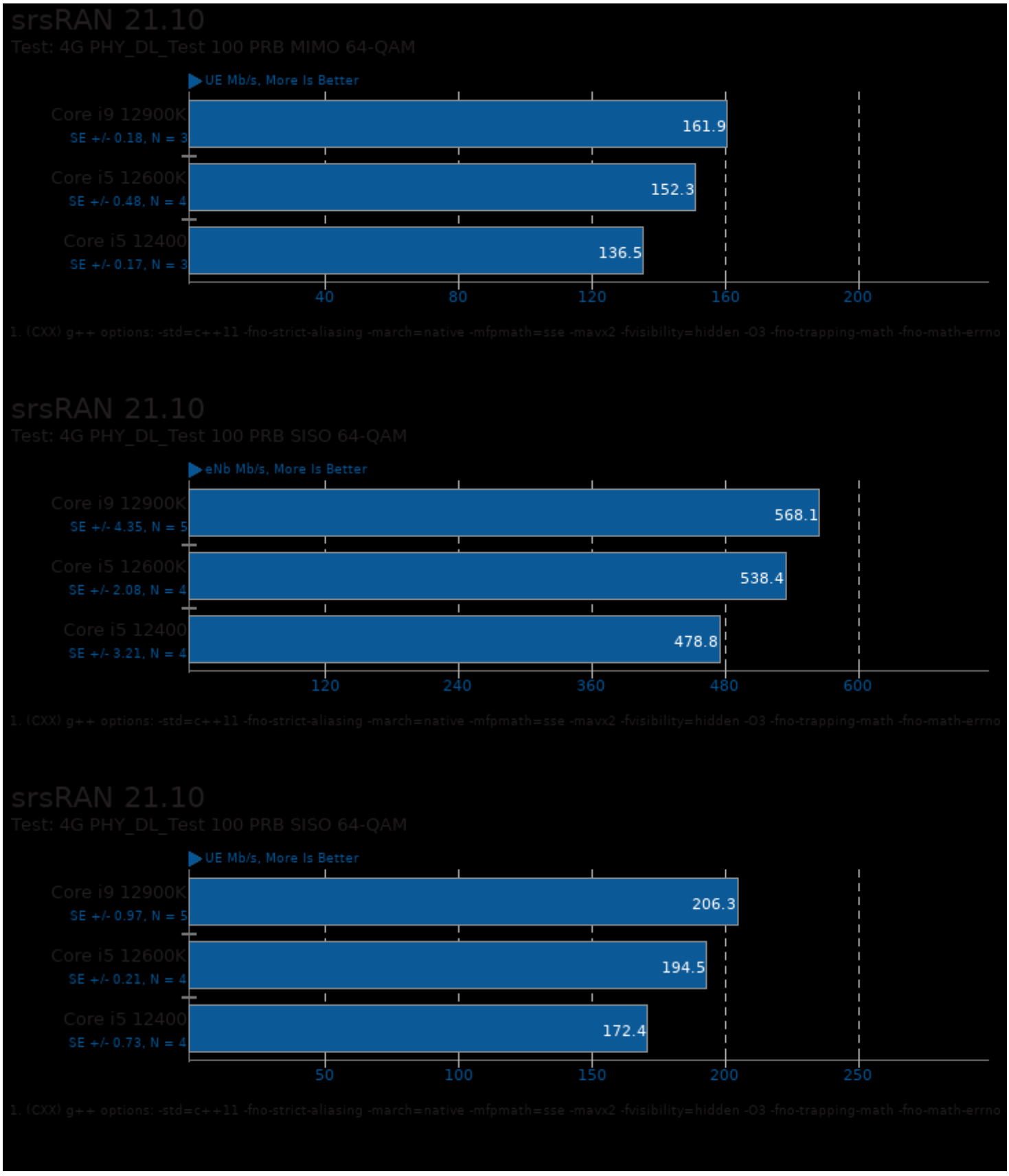

Chia Blockchain VDF 1.0.1
Test: Square Plain C++
IPS, More Is Better
Core i9 12900K
SE +/- 648.93, N = 3
225167
Core i5 12600K
SE +/- 33.33, N = 3
213133
Core i5 12400
SE +/- 120.19, N = 3
190733
50K
100K
150K
200K
250K
1. (CXX) g++ options: -flto -no-pie -lgmpxx -lgmp -lboost_system -pthread
Chia Blockchain VDF 1.0.1
Test: Square Assembly Optimized
IPS, More Is Better
Core i9 12900K
SE +/- 1121.51, N = 3
255567
Core i5 12600K
SE +/- 2216.85, N = 3
245533
Core i5 12400
SE +/- 2425.79, N = 3
221167
50K
100K
150K
200K
250K
1. (CXX) g++ options: -flto -no-pie -lgmpxx -lgmp -lboost_system -pthread
DaCapo Benchmark 9.12-MR1
Java Test: Jython
msec, Fewer Is Better
Core i9 12900K
SE +/- 14.73, N = 10
1900
Core i5 12600K
SE +/- 18.22, N = 20
2184
Core i5 12400
SE +/- 12.86, N = 9
2344
500
1000
1500
2000
2500

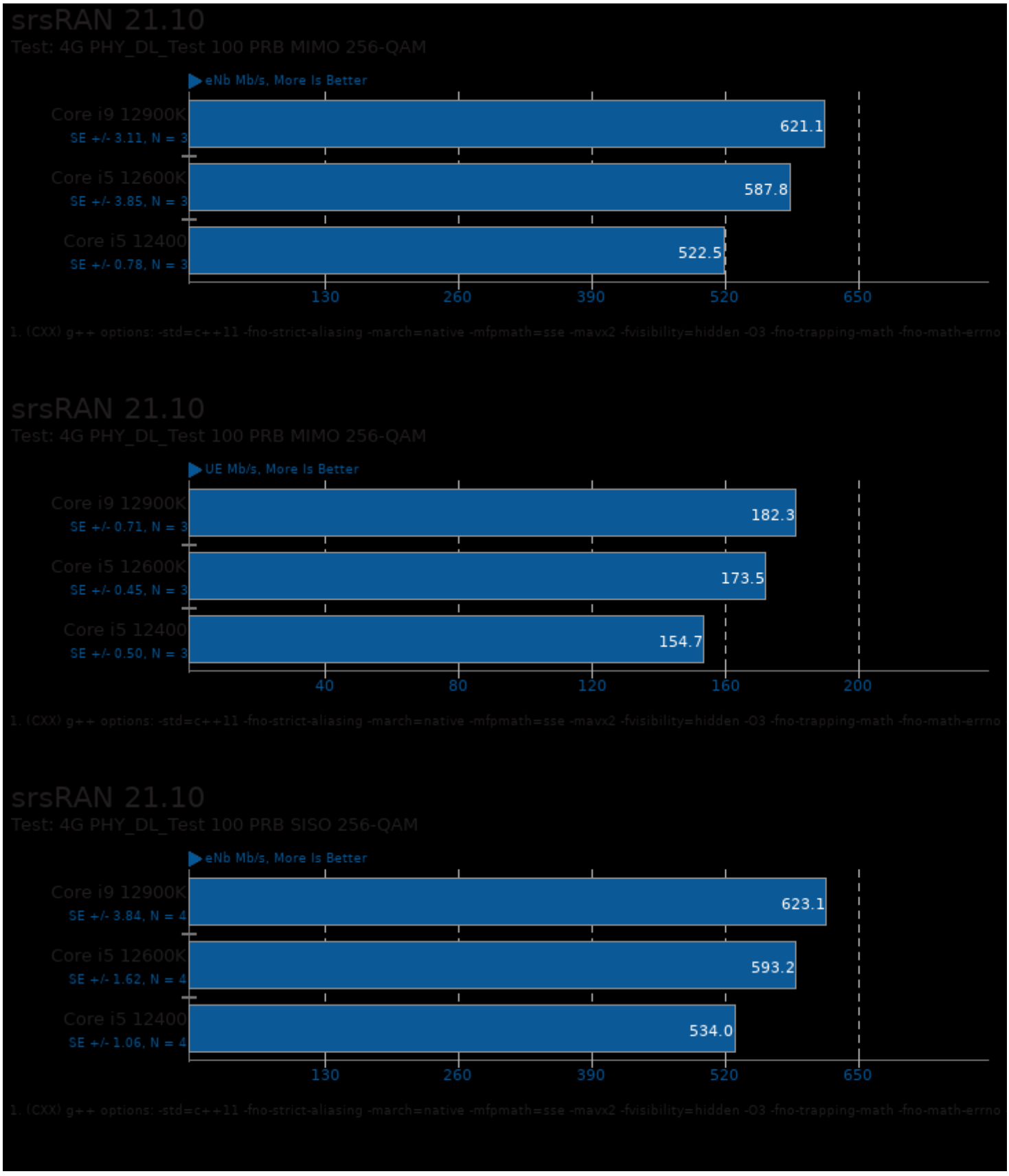

LZ4 Compression 1.9.3
Compression Level: 3 - Compression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 0.46, N = 3
77.95
Core i5 12600K
SE +/- 0.04, N = 3
74.01
Core i5 12400
SE +/- 0.02, N = 3
66.28
20
40
60
80
100
1. (CC) gcc options: -O3
LZ4 Compression 1.9.3
Compression Level: 3 - Decompression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 275.85, N = 3
12007.7
Core i5 12600K
SE +/- 15.80, N = 3
13431.3
Core i5 12400
SE +/- 16.48, N = 3
12950.9
3K
6K
9K
12K
15K
1. (CC) gcc options: -O3
LZ4 Compression 1.9.3
Compression Level: 9 - Compression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 0.14, N = 3
76.47
Core i5 12600K
SE +/- 0.03, N = 3
72.30
Core i5 12400
SE +/- 0.00, N = 3
64.74
20
40
60
80
100
1. (CC) gcc options: -O3

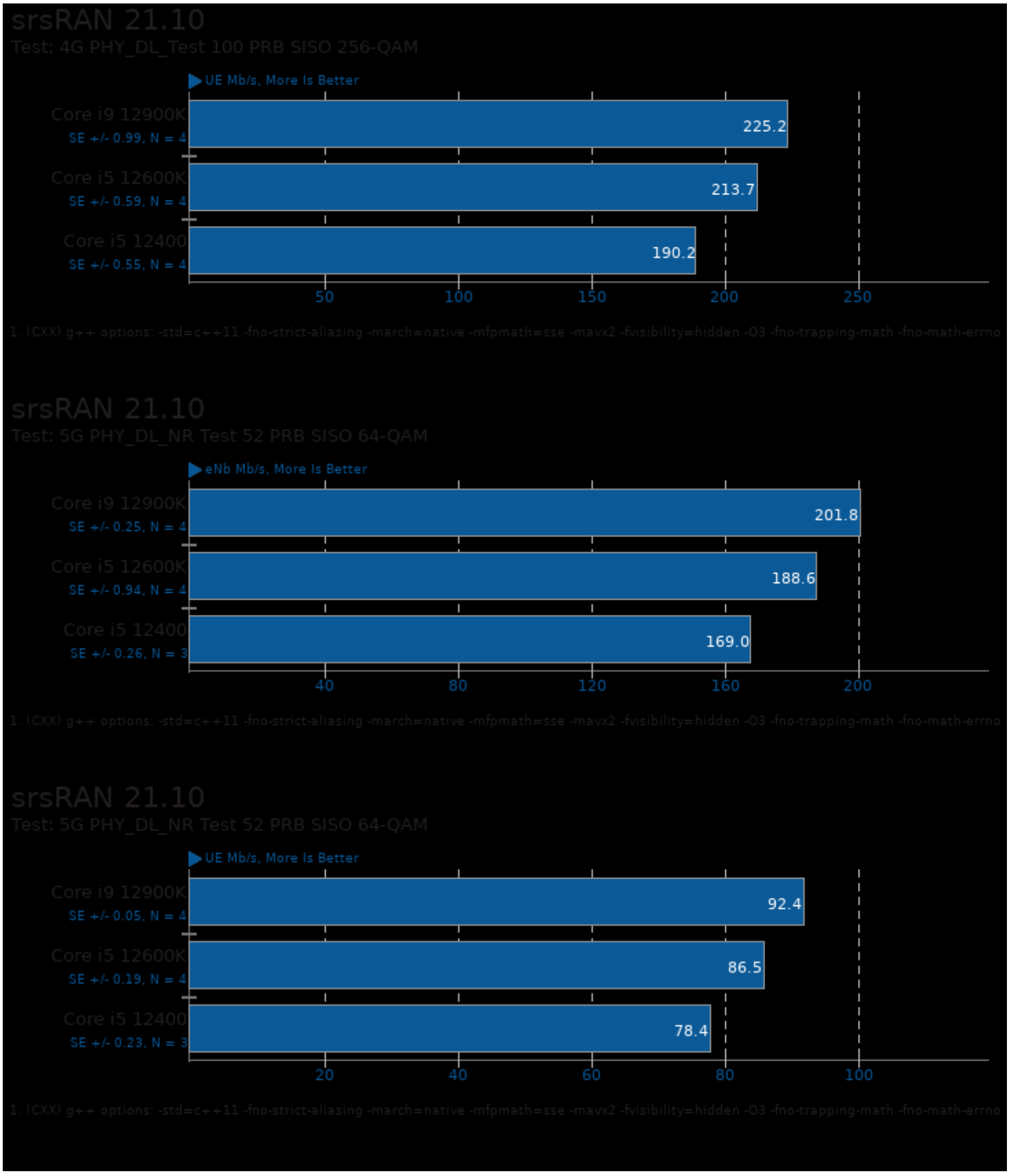

LZ4 Compression 1.9.3
Compression Level: 9 - Decompression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 259.08, N = 3
11991.2
Core i5 12600K
SE +/- 18.97, N = 3
13475.5
Core i5 12400
SE +/- 22.86, N = 3
12982.9
3K
6K
9K
12K
15K
1. (CC) gcc options: -O3
Zstd Compression 1.5.0
Compression Level: 19 - Compression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 0.52, N = 4
43.7
Core i5 12600K
SE +/- 0.12, N = 3
35.9
Core i5 12400
SE +/- 0.17, N = 3
35.8
10
20
30
40
50
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.5.0
Compression Level: 19 - Decompression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 2.83, N = 4
4550.2
Core i5 12600K
SE +/- 3.82, N = 3
4483.2
Core i5 12400
SE +/- 3.32, N = 3
4096.0
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz -llzma


Zstd Compression 1.5.0
Compression Level: 19, Long Mode - Compression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 0.31, N = 3
39.0
Core i5 12600K
SE +/- 0.07, N = 3
32.9
Core i5 12400
SE +/- 0.03, N = 3
27.0
9
18
27
36
45
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.5.0
Compression Level: 19, Long Mode - Decompression Speed
MB/s, More Is Better
Core i9 12900K
SE +/- 2.88, N = 3
4679.8
Core i5 12600K
SE +/- 3.15, N = 3
4604.2
Core i5 12400
SE +/- 1.52, N = 3
4218.0
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz -llzma
JPEG XL libjxl 0.6.1
Input: PNG - Encode Speed: 8
MP/s, More Is Better
Core i9 12900K
SE +/- 0.01, N = 3
1.09
Core i5 12600K
SE +/- 0.01, N = 3
1.06
Core i5 12400
SE +/- 0.00, N = 3
0.95
0.2453
0.4906
0.7359
0.9812
1.2265
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie

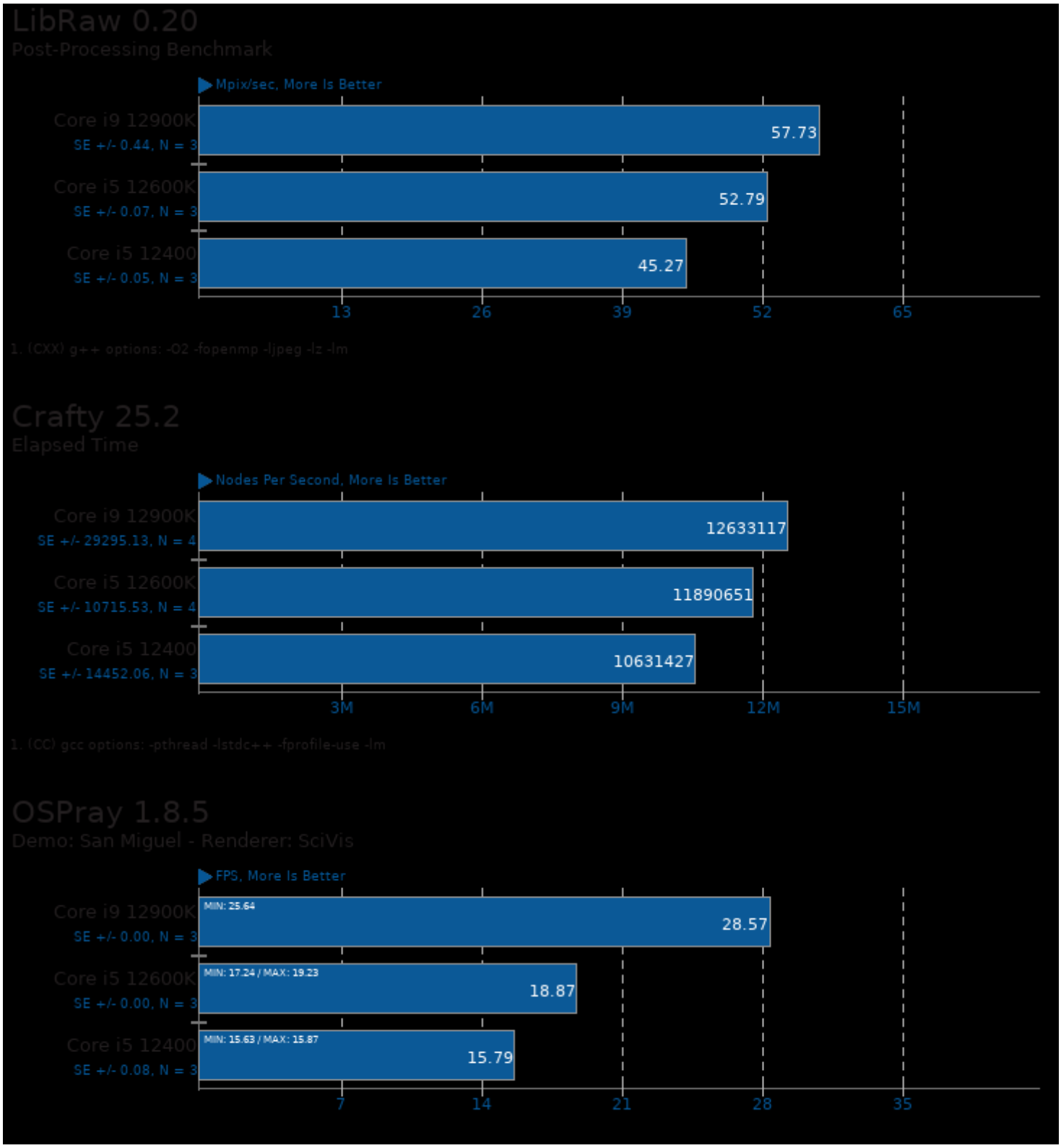

JPEG XL libjxl 0.6.1
Input: JPEG - Encode Speed: 8
MP/s, More Is Better
Core i9 12900K
SE +/- 0.27, N = 6
42.66
Core i5 12600K
SE +/- 0.23, N = 6
41.15
Core i5 12400
SE +/- 0.11, N = 6
35.77
10
20
30
40
50
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie
srsRAN 21.10
Test: OFDM_Test
Samples / Second, More Is Better
Core i9 12900K
SE +/- 907377.17, N = 3
195700000
Core i5 12600K
SE +/- 1201388.09, N = 3
184100000
Core i5 12400
SE +/- 2061386.50, N = 15
152760000
40M
80M
120M
160M
200M
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB MIMO 64-QAM
eNb Mb/s, More Is Better
Core i9 12900K
SE +/- 1.36, N = 3
551.0
Core i5 12600K
SE +/- 5.75, N = 4
523.5
Core i5 12400
SE +/- 1.07, N = 3
470.9
120
240
360
480
600
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

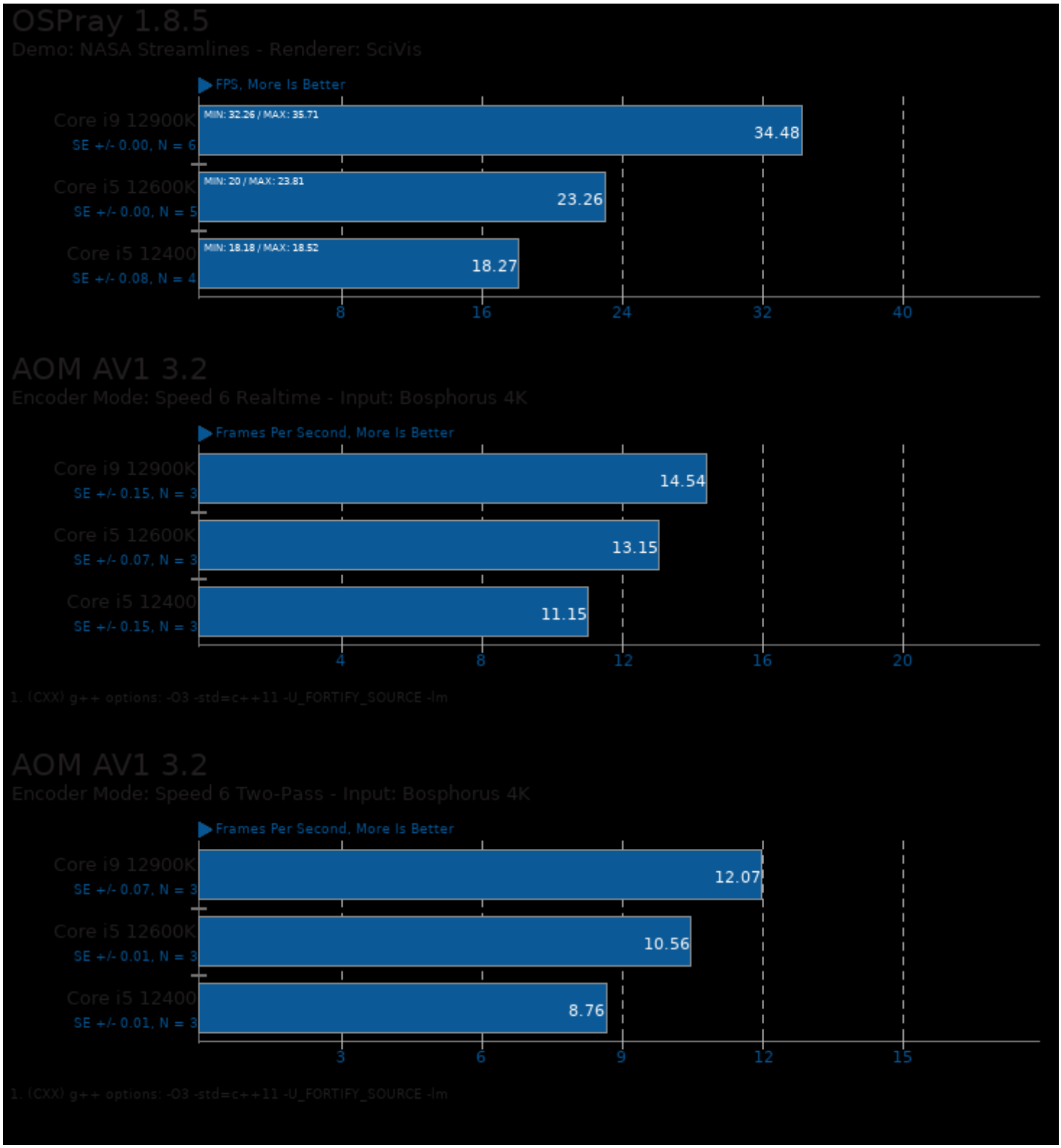

srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB MIMO 64-QAM
UE Mb/s, More Is Better
Core i9 12900K
SE +/- 0.18, N = 3
161.9
Core i5 12600K
SE +/- 0.48, N = 4
152.3
Core i5 12400
SE +/- 0.17, N = 3
136.5
40
80
120
160
200
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB SISO 64-QAM
eNb Mb/s, More Is Better
Core i9 12900K
SE +/- 4.35, N = 5
568.1
Core i5 12600K
SE +/- 2.08, N = 4
538.4
Core i5 12400
SE +/- 3.21, N = 4
478.8
120
240
360
480
600
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB SISO 64-QAM
UE Mb/s, More Is Better
Core i9 12900K
SE +/- 0.97, N = 5
206.3
Core i5 12600K
SE +/- 0.21, N = 4
194.5
Core i5 12400
SE +/- 0.73, N = 4
172.4
50
100
150
200
250
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

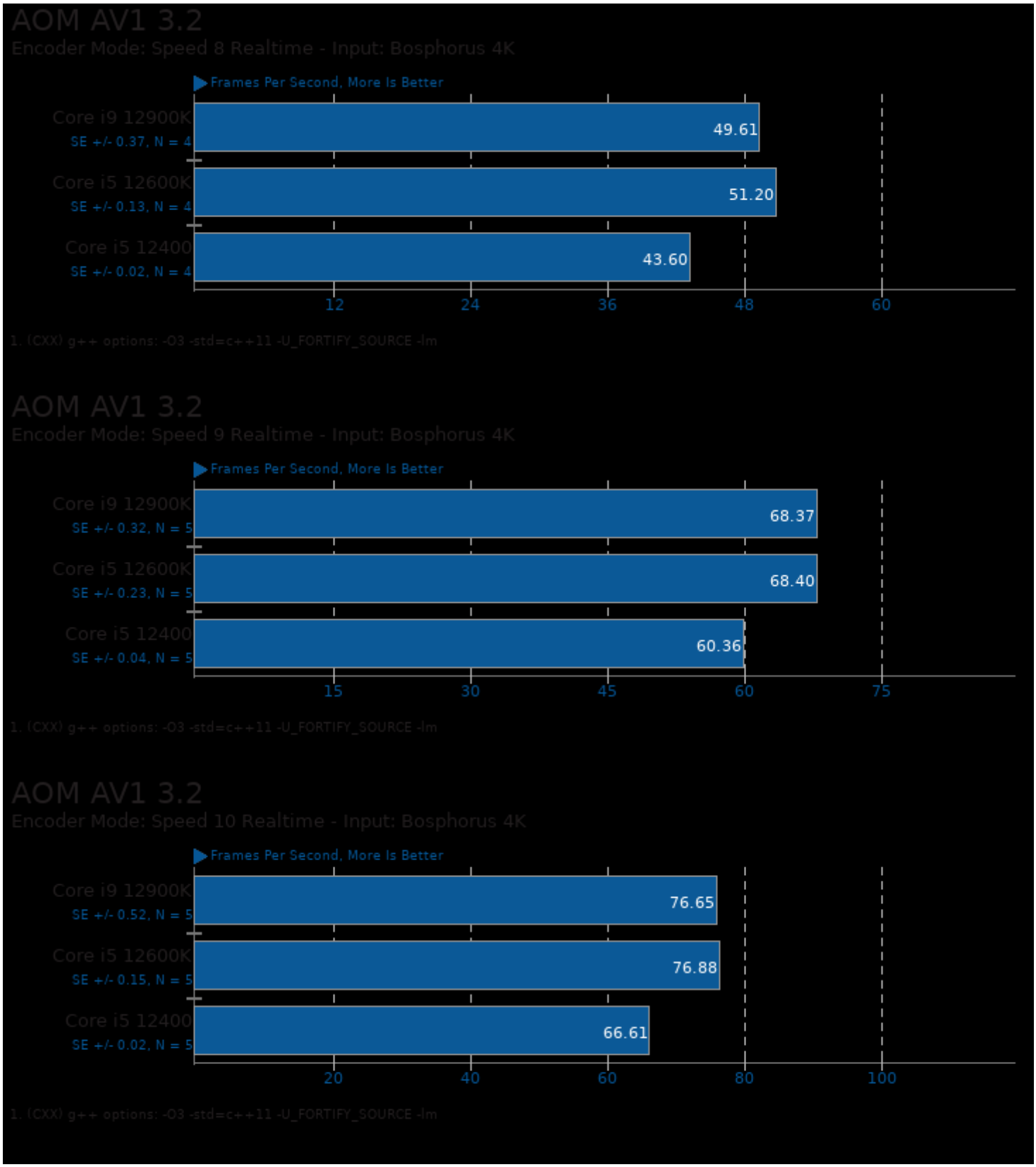

srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB MIMO 256-QAM
eNb Mb/s, More Is Better
Core i9 12900K
SE +/- 3.11, N = 3
621.1
Core i5 12600K
SE +/- 3.85, N = 3
587.8
Core i5 12400
SE +/- 0.78, N = 3
522.5
130
260
390
520
650
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB MIMO 256-QAM
UE Mb/s, More Is Better
Core i9 12900K
SE +/- 0.71, N = 3
182.3
Core i5 12600K
SE +/- 0.45, N = 3
173.5
Core i5 12400
SE +/- 0.50, N = 3
154.7
40
80
120
160
200
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB SISO 256-QAM
eNb Mb/s, More Is Better
Core i9 12900K
SE +/- 3.84, N = 4
623.1
Core i5 12600K
SE +/- 1.62, N = 4
593.2
Core i5 12400
SE +/- 1.06, N = 4
534.0
130
260
390
520
650
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno


srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB SISO 256-QAM
UE Mb/s, More Is Better
Core i9 12900K
SE +/- 0.99, N = 4
225.2
Core i5 12600K
SE +/- 0.59, N = 4
213.7
Core i5 12400
SE +/- 0.55, N = 4
190.2
50
100
150
200
250
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 5G PHY_DL_NR Test 52 PRB SISO 64-QAM
eNb Mb/s, More Is Better
Core i9 12900K
SE +/- 0.25, N = 4
201.8
Core i5 12600K
SE +/- 0.94, N = 4
188.6
Core i5 12400
SE +/- 0.26, N = 3
169.0
40
80
120
160
200
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
srsRAN 21.10
Test: 5G PHY_DL_NR Test 52 PRB SISO 64-QAM
UE Mb/s, More Is Better
Core i9 12900K
SE +/- 0.05, N = 4
92.4
Core i5 12600K
SE +/- 0.19, N = 4
86.5
Core i5 12400
SE +/- 0.23, N = 3
78.4
20
40
60
80
100
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

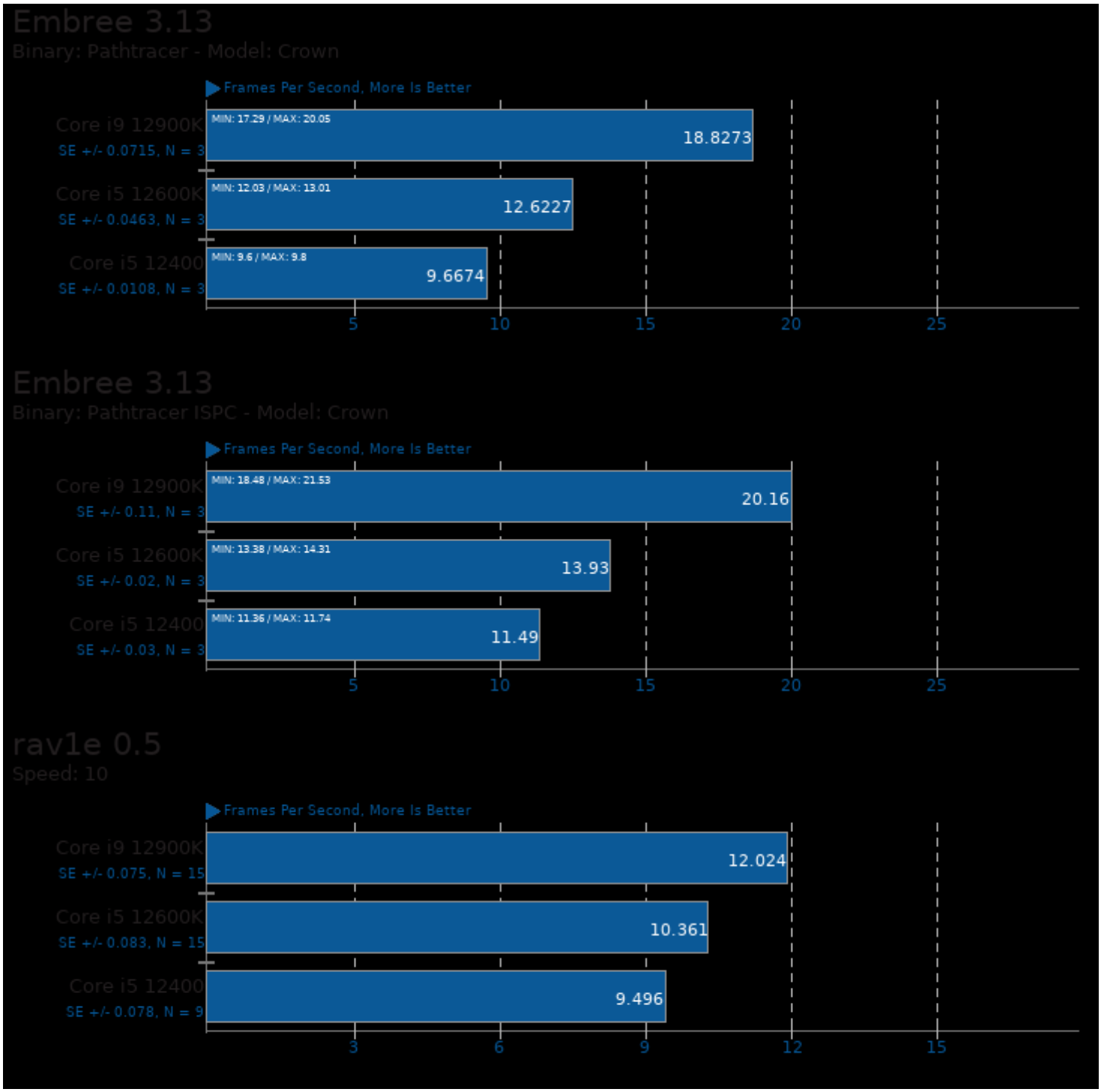
Alder Lake Intel Linux Tests

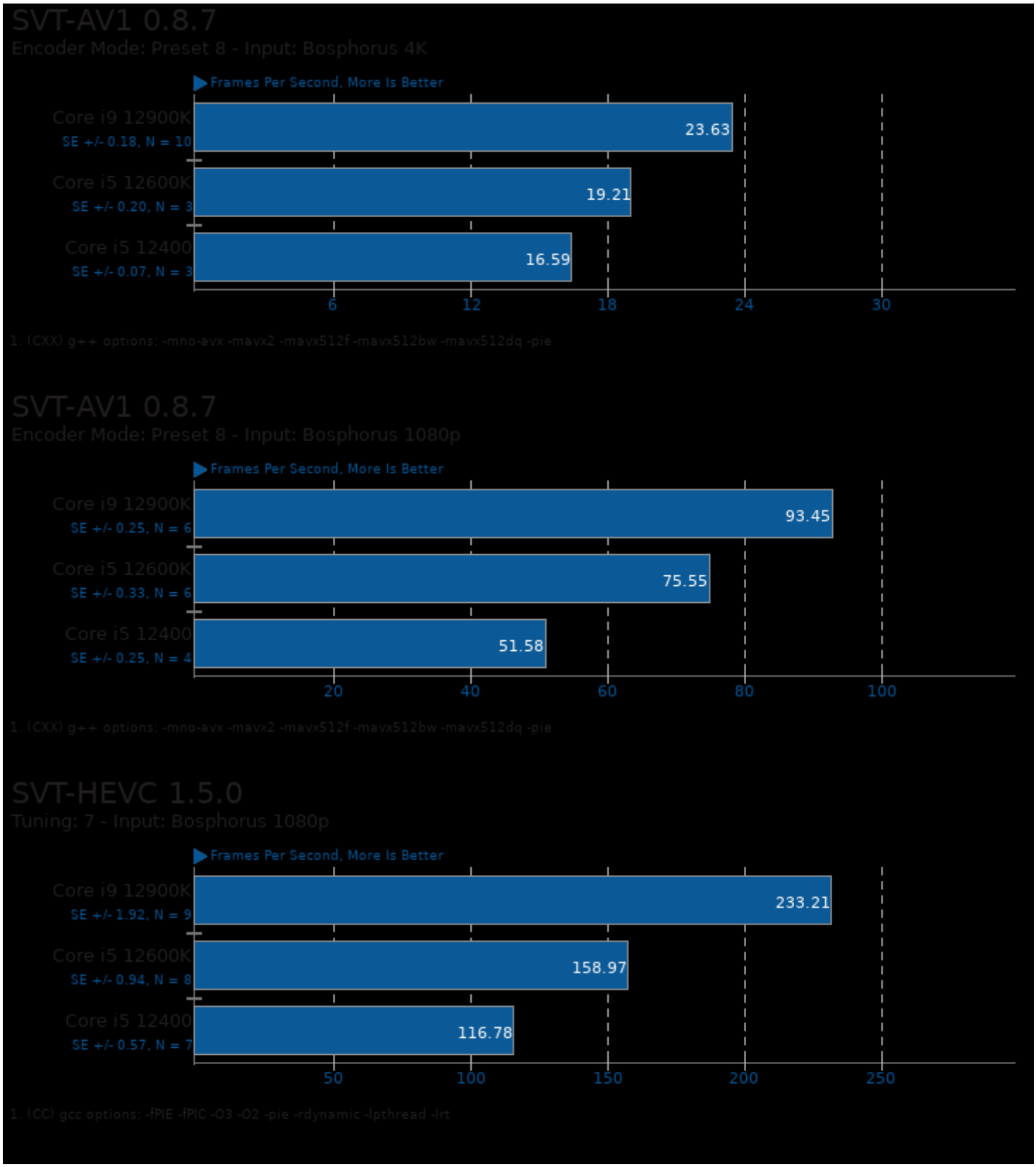



OSPray 1.8.5
Demo: NASA Streamlines - Renderer: SciVis
FPS, More Is Better
Core i9 12900K
SE +/- 0.00, N = 6
MIN: 32.26 / MAX: 35.71
34.48
Core i5 12600K
SE +/- 0.00, N = 5
MIN: 20 / MAX: 23.81
23.26
Core i5 12400
SE +/- 0.08, N = 4
MIN: 18.18 / MAX: 18.52
18.27
8
16
24
32
40
AOM AV1 3.2
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.15, N = 3
14.54
Core i5 12600K
SE +/- 0.07, N = 3
13.15
Core i5 12400
SE +/- 0.15, N = 3
11.15
4
8
12
16
20
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
AOM AV1 3.2
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.07, N = 3
12.07
Core i5 12600K
SE +/- 0.01, N = 3
10.56
Core i5 12400
SE +/- 0.01, N = 3
8.76
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm


AOM AV1 3.2
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.37, N = 4
49.61
Core i5 12600K
SE +/- 0.13, N = 4
51.20
Core i5 12400
SE +/- 0.02, N = 4
43.60
12
24
36
48
60
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
AOM AV1 3.2
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.32, N = 5
68.37
Core i5 12600K
SE +/- 0.23, N = 5
68.40
Core i5 12400
SE +/- 0.04, N = 5
60.36
15
30
45
60
75
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
AOM AV1 3.2
Encoder Mode: Speed 10 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.52, N = 5
76.65
Core i5 12600K
SE +/- 0.15, N = 5
76.88
Core i5 12400
SE +/- 0.02, N = 5
66.61
20
40
60
80
100
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm

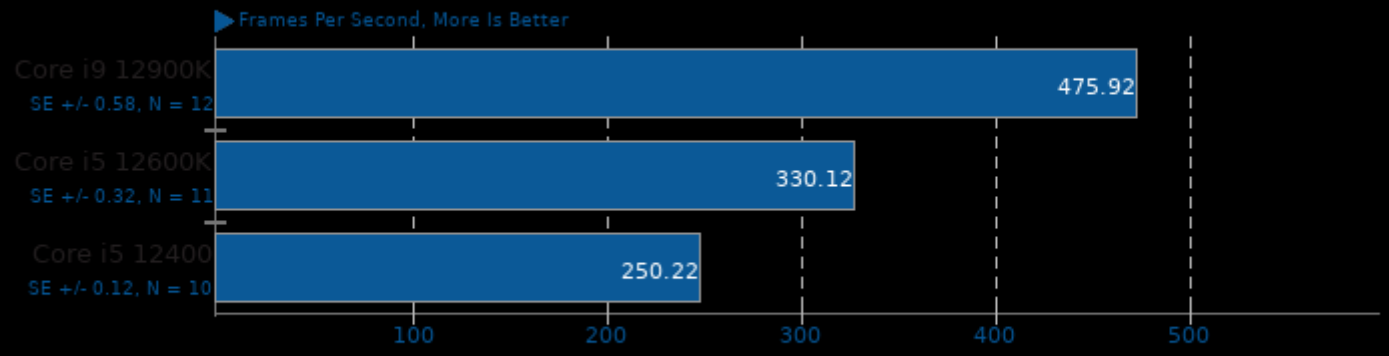
Alder Lake Intel Linux Tests




SVT-AV1 0.8.7
Encoder Mode: Preset 8 - Input: Bosphorus 4K
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.18, N = 10
23.63
Core i5 12600K
SE +/- 0.20, N = 3
19.21
Core i5 12400
SE +/- 0.07, N = 3
16.59
6
12
18
24
30
1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie
SVT-AV1 0.8.7
Encoder Mode: Preset 8 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 0.25, N = 6
93.45
Core i5 12600K
SE +/- 0.33, N = 6
75.55
Core i5 12400
SE +/- 0.25, N = 4
51.58
20
40
60
80
100
1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie
SVT-HEVC 1.5.0
Tuning: 7 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Core i9 12900K
SE +/- 1.92, N = 9
233.21
Core i5 12600K
SE +/- 0.94, N = 8
158.97
Core i5 12400
SE +/- 0.57, N = 7
116.78
50
100
150
200
250
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt

SVT-HEVC 1.5.0

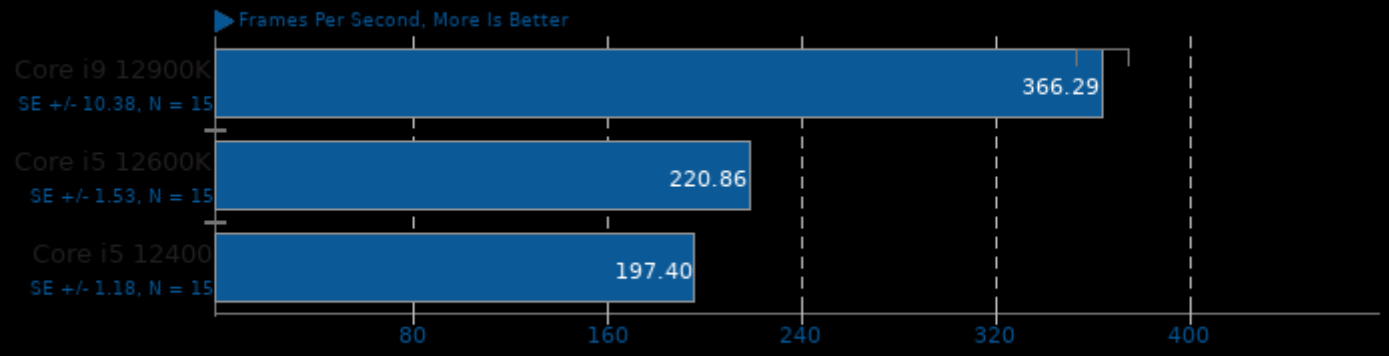
Tuning: 10 - Input: Bosphorus 1080p



1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt

SVT-VP9 0.3

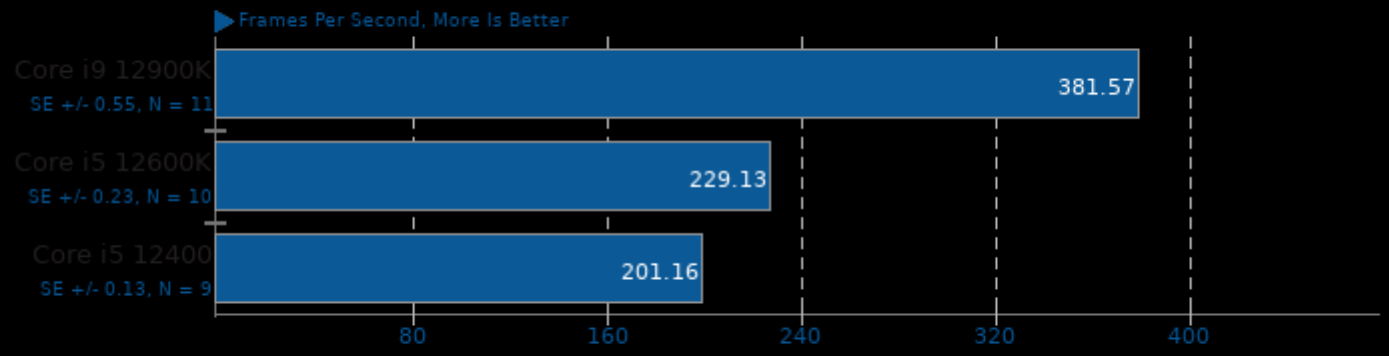
Tuning: VMAF Optimized - Input: Bosphorus 1080p



1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

SVT-VP9 0.3

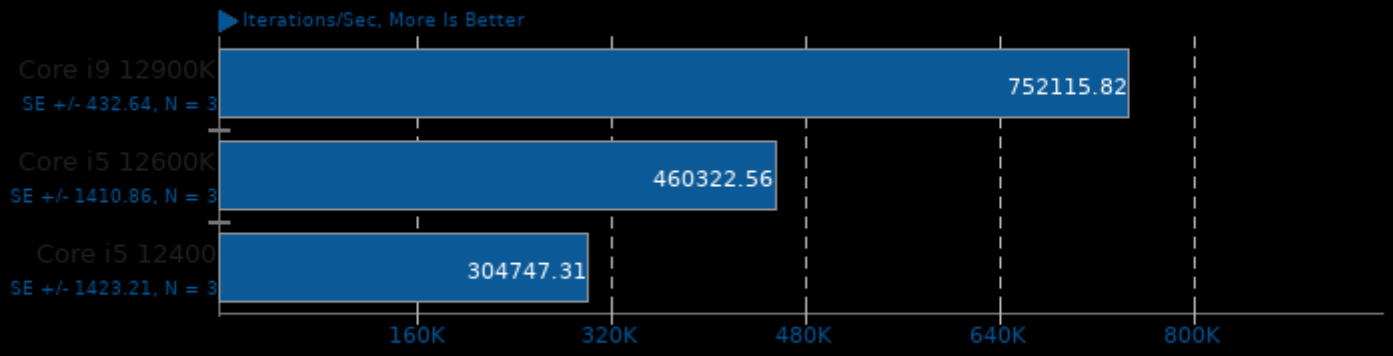
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

Coremark 1.0

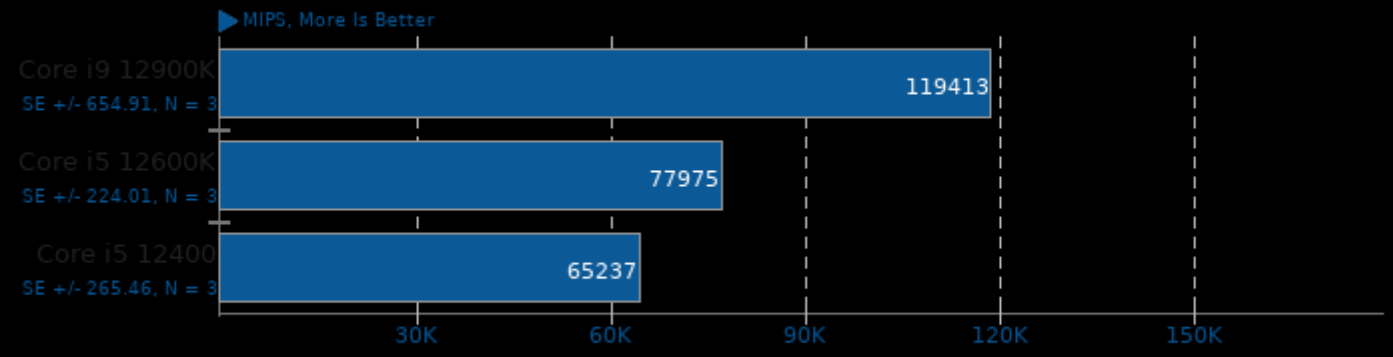
CoreMark Size 666 - Iterations Per Second



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

7-Zip Compression 21.06

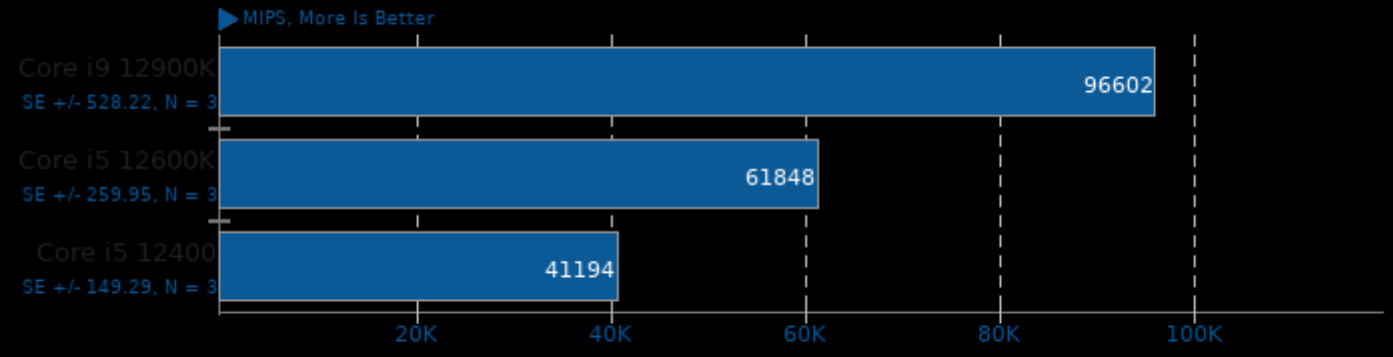
Test: Compression Rating



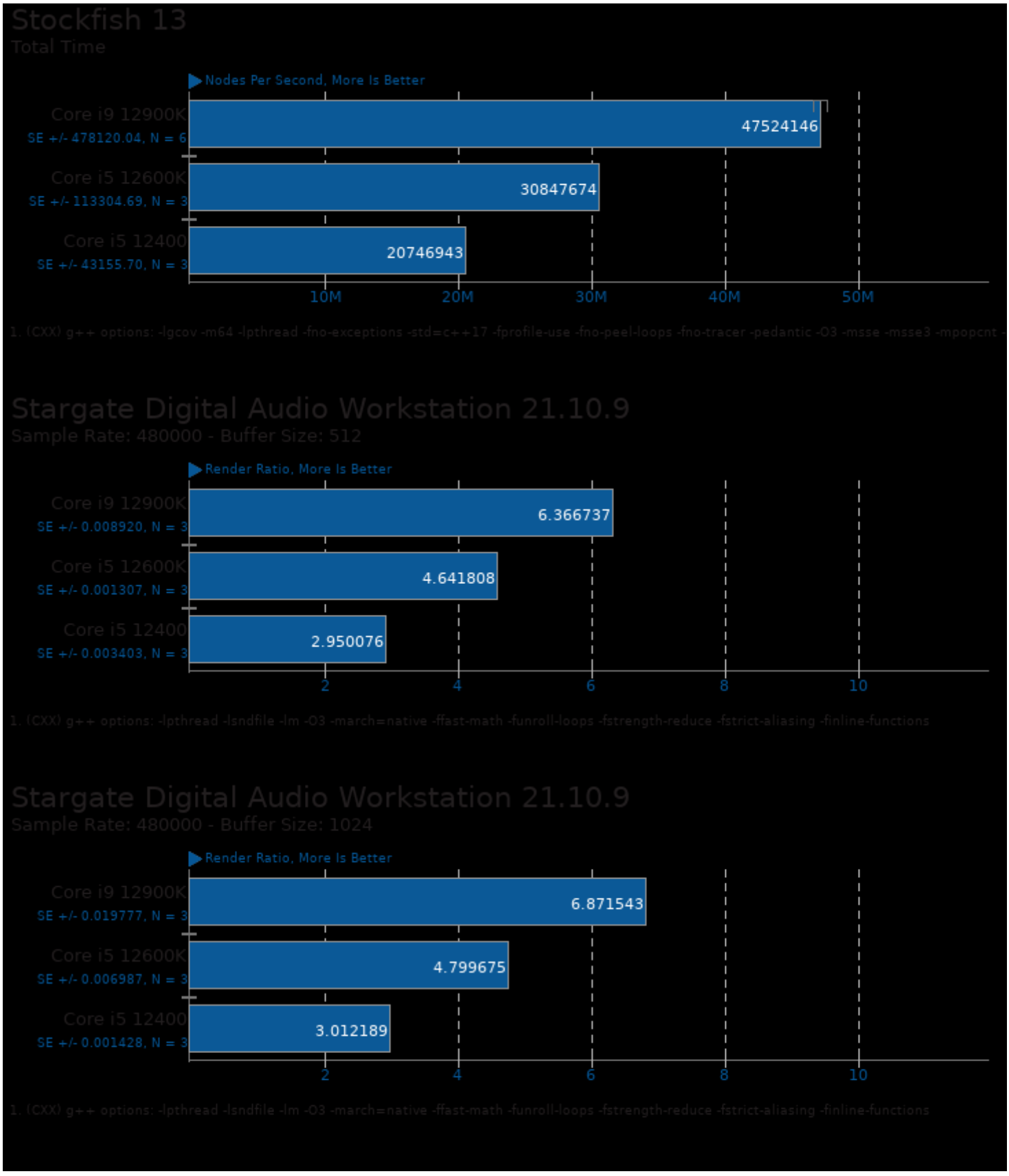
1. (CXX) g++ options: -lpthread -ldl -O2 -fPIC

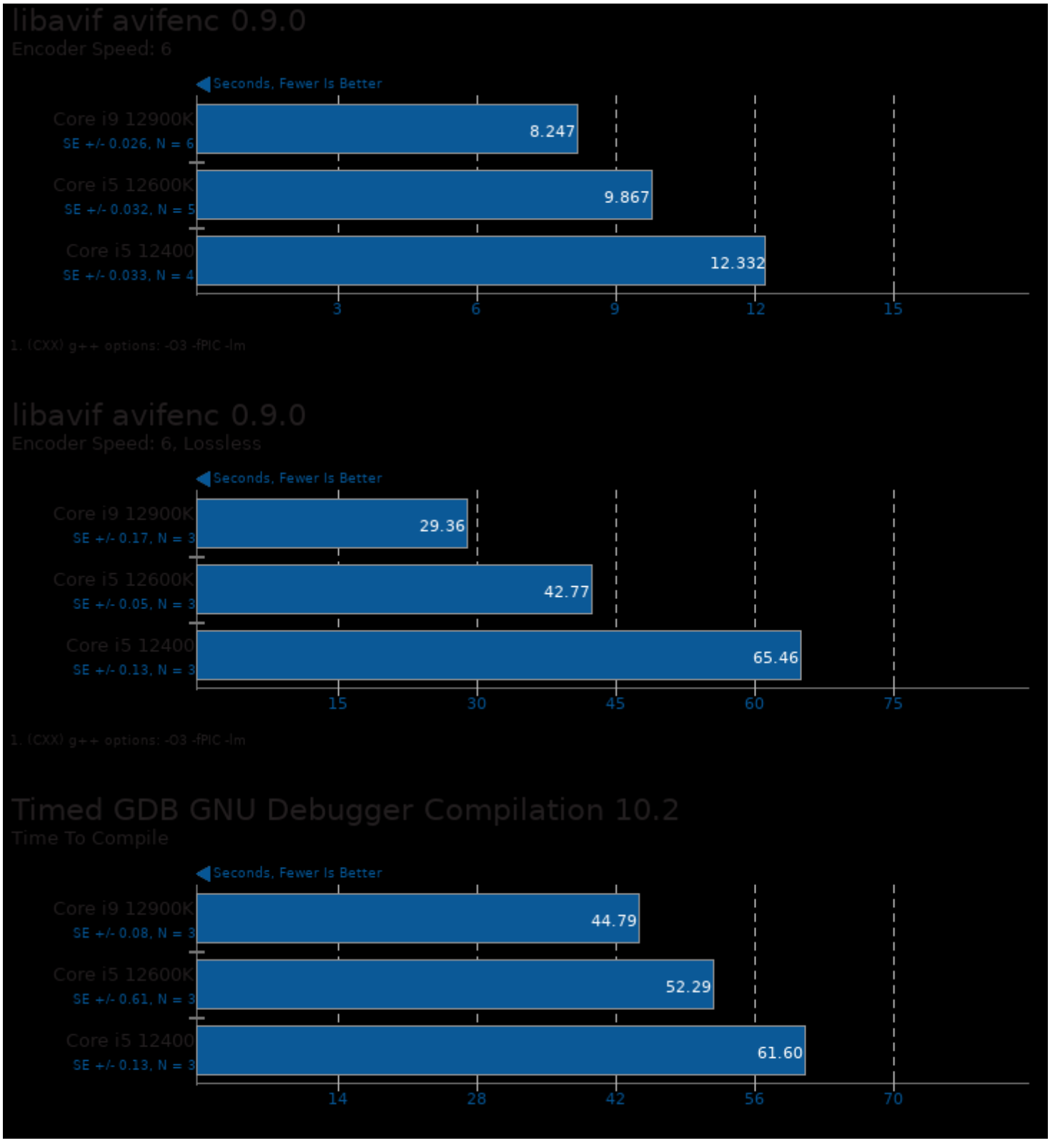
7-Zip Compression 21.06

Test: Decompression Rating

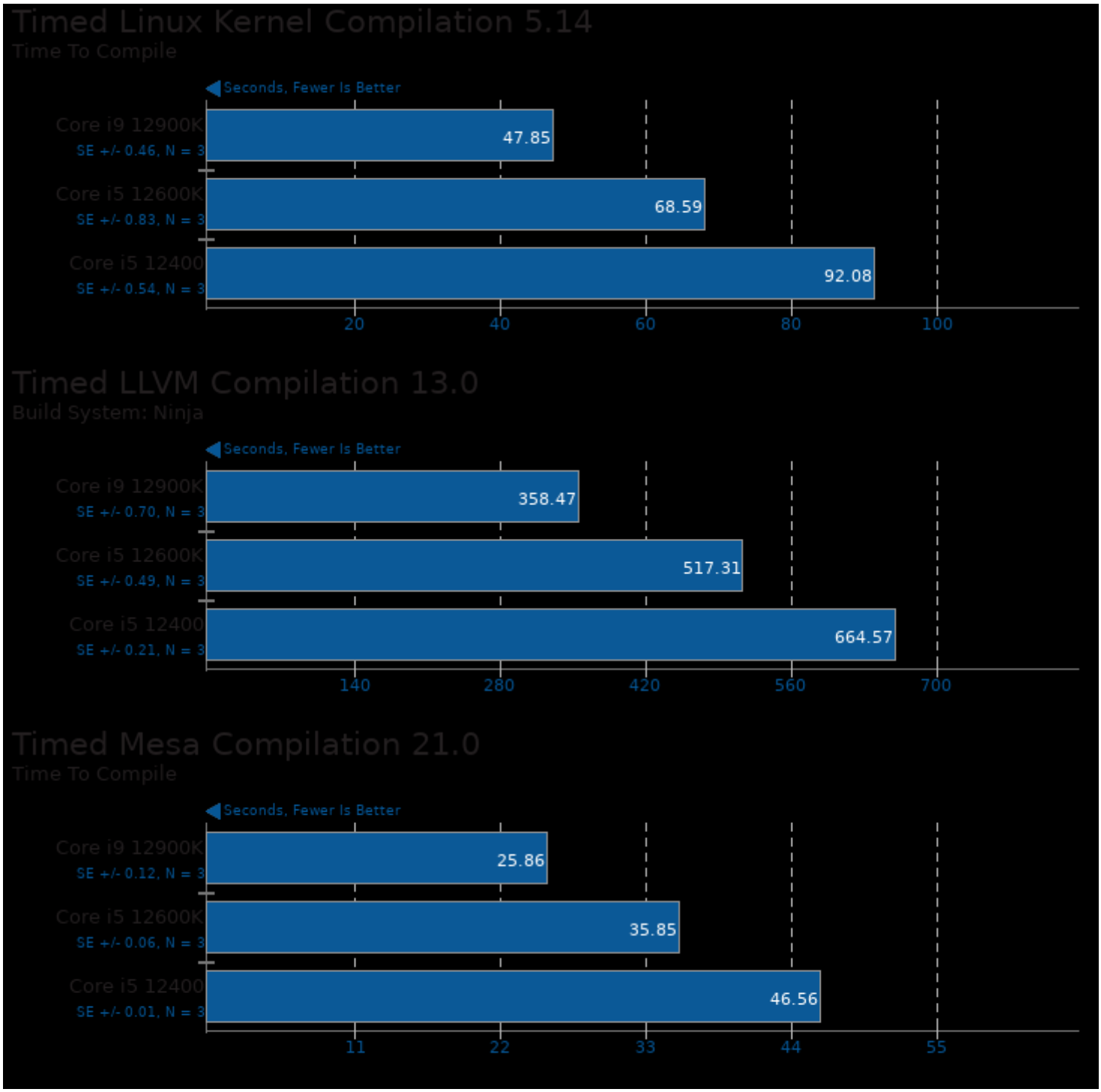


1. (CXX) g++ options: -lpthread -ldl -O2 -fPIC

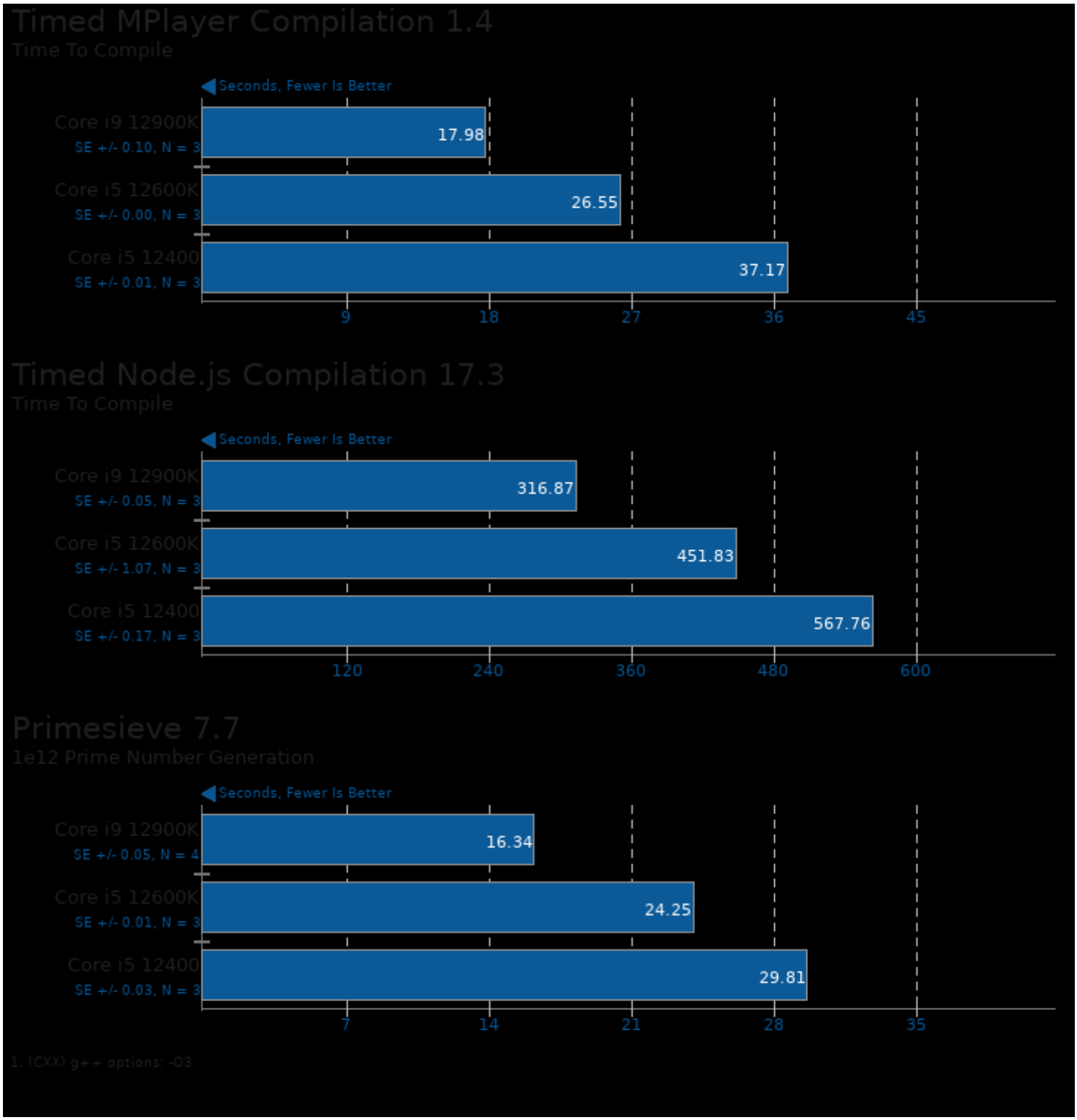

Stockfish 13
Total Time
Nodes Per Second, More Is Better
Core i9 12900K
SE +/- 478120.04, N = 6
47524146
Core i5 12600K
SE +/- 113304.69, N = 3
30847674
Core i5 12400
SE +/- 43155.70, N = 3
20746943
10M
20M
30M
40M
50M
1. (CXX) g++ options: -lgcov -m64 -lpthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -msse -msse3 -mpopcnt
Stargate Digital Audio Workstation 21.10.9
Sample Rate: 480000 - Buffer Size: 512
Render Ratio, More Is Better
Core i9 12900K
SE +/- 0.008920, N = 3
6.366737
Core i5 12600K
SE +/- 0.001307, N = 3
4.641808
Core i5 12400
SE +/- 0.003403, N = 3
2.950076
2
4
6
8
10
1. (CXX) g++ options: -lpthread -lsndfile -lm -O3 -march=native -ffast-math -funroll-loops -fstrength-reduce -fstrict-aliasing -finline-functions
Stargate Digital Audio Workstation 21.10.9
Sample Rate: 480000 - Buffer Size: 1024
Render Ratio, More Is Better
Core i9 12900K
SE +/- 0.019777, N = 3
6.871543
Core i5 12600K
SE +/- 0.006987, N = 3
4.799675
Core i5 12400
SE +/- 0.001428, N = 3
3.012189
2
4
6
8
10
1. (CXX) g++ options: -lpthread -lsndfile -lm -O3 -march=native -ffast-math -funroll-loops -fstrength-reduce -fstrict-aliasing -finline-functions

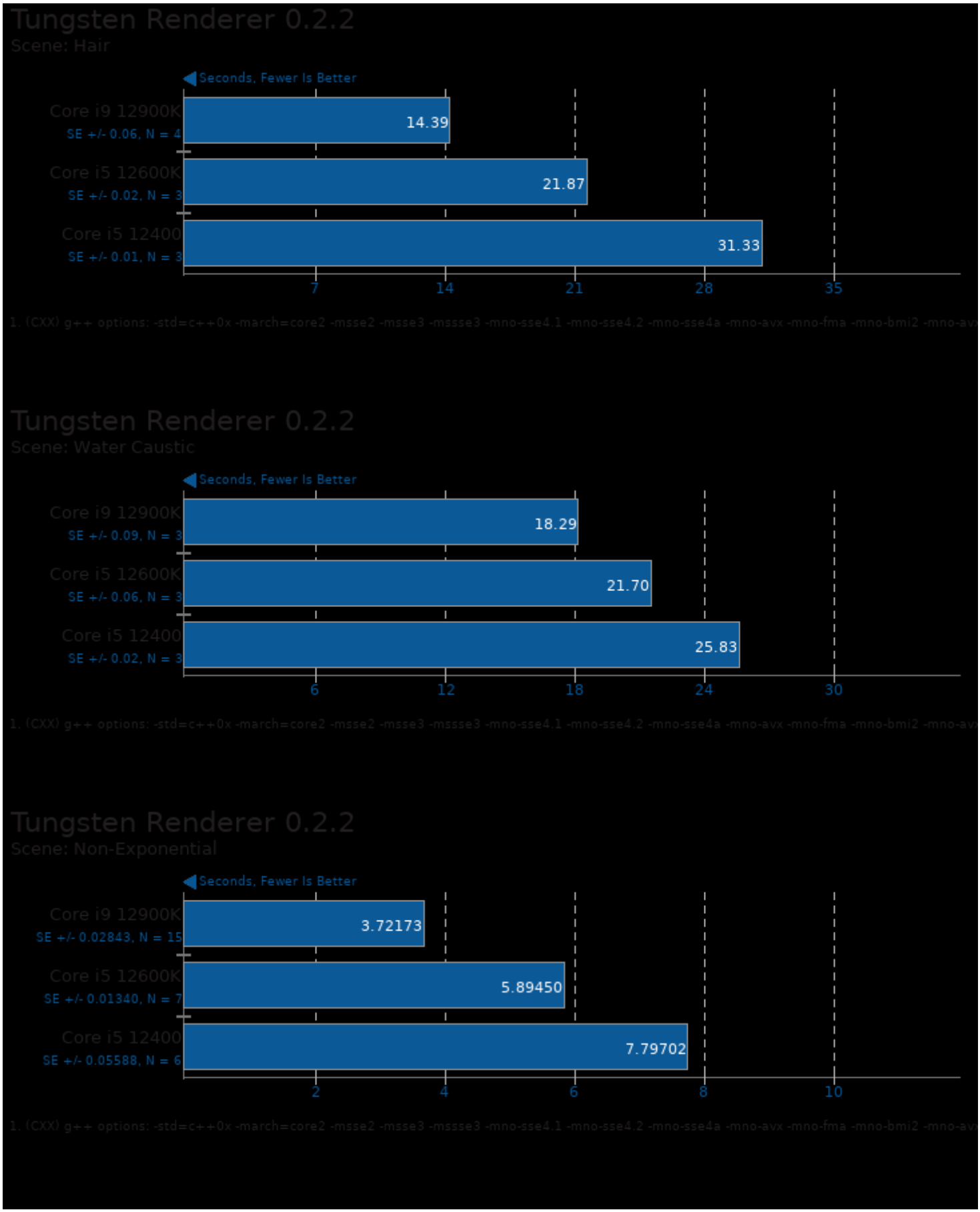

libavif avifenc 0.9.0
Encoder Speed: 6
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.026, N = 6
8.247
Core i5 12600K
SE +/- 0.032, N = 5
9.867
Core i5 12400
SE +/- 0.033, N = 4
12.332
3
6
9
12
15
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6, Lossless
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.17, N = 3
29.36
Core i5 12600K
SE +/- 0.05, N = 3
42.77
Core i5 12400
SE +/- 0.13, N = 3
65.46
15
30
45
60
75
1. (CXX) g++ options: -O3 -fPIC -lm
Timed GDB GNU Debugger Compilation 10.2
Time To Compile
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.08, N = 3
44.79
Core i5 12600K
SE +/- 0.61, N = 3
52.29
Core i5 12400
SE +/- 0.13, N = 3
61.60
14
28
42
56
70

Alder Lake Intel Linux Tests



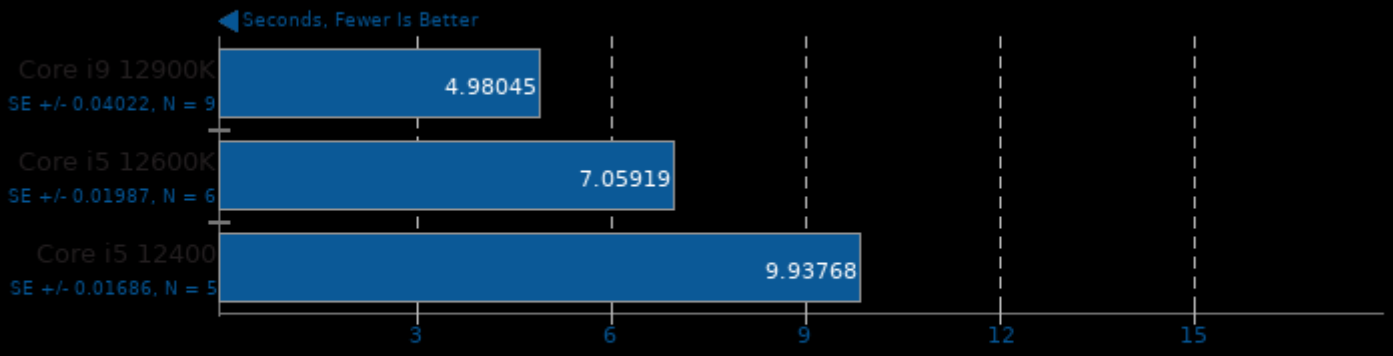
Alder Lake Intel Linux Tests




Tungsten Renderer 0.2.2
Scene: Hair
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.06, N = 4
14.39
Core i5 12600K
SE +/- 0.02, N = 3
21.87
Core i5 12400
SE +/- 0.01, N = 3
31.33
7
14
21
28
35
1. (CXX) g++ options: -std=c++0x -march=core2 -msse2 -msse3 -mssse3 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-avx -mno-fma -mno-bmi2 -mno-av
Tungsten Renderer 0.2.2
Scene: Water Caustic
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.09, N = 3
18.29
Core i5 12600K
SE +/- 0.06, N = 3
21.70
Core i5 12400
SE +/- 0.02, N = 3
25.83
6
12
18
24
30
1. (CXX) g++ options: -std=c++0x -march=core2 -msse2 -msse3 -mssse3 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-avx -mno-fma -mno-bmi2 -mno-av
Tungsten Renderer 0.2.2
Scene: Non-Exponential
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.02843, N = 15
3.72173
Core i5 12600K
SE +/- 0.01340, N = 7
5.89450
Core i5 12400
SE +/- 0.05588, N = 6
7.79702
2
4
6
8
10
1. (CXX) g++ options: -std=c++0x -march=core2 -msse2 -msse3 -mssse3 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-avx -mno-fma -mno-bmi2 -mno-av

Tungsten Renderer 0.2.2

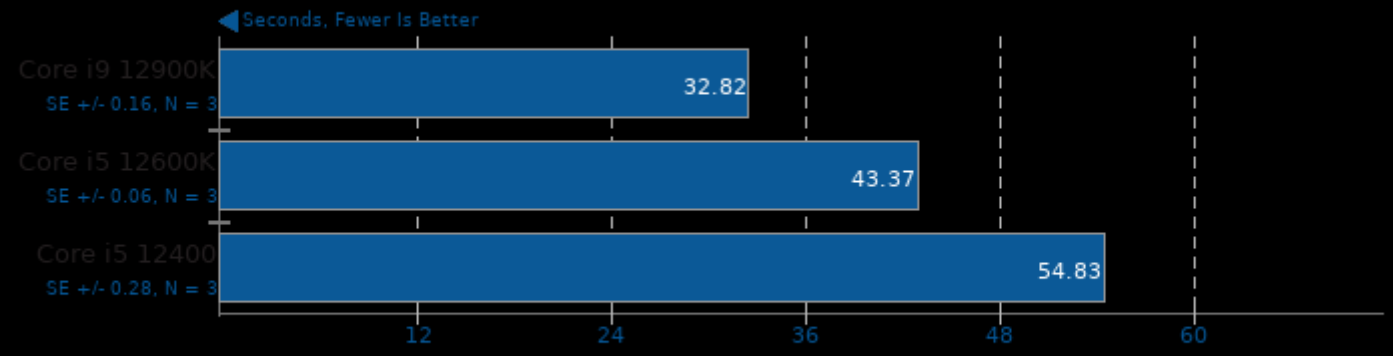
Scene: Volumetric Caustic



1. (CXX) g++ options: -std=c++0x -march=core2 -msse2 -msse3 -mssse3 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-avx -mno-fma -mno-bmi2 -mno-av

Timed Wasmer Compilation 1.0.2

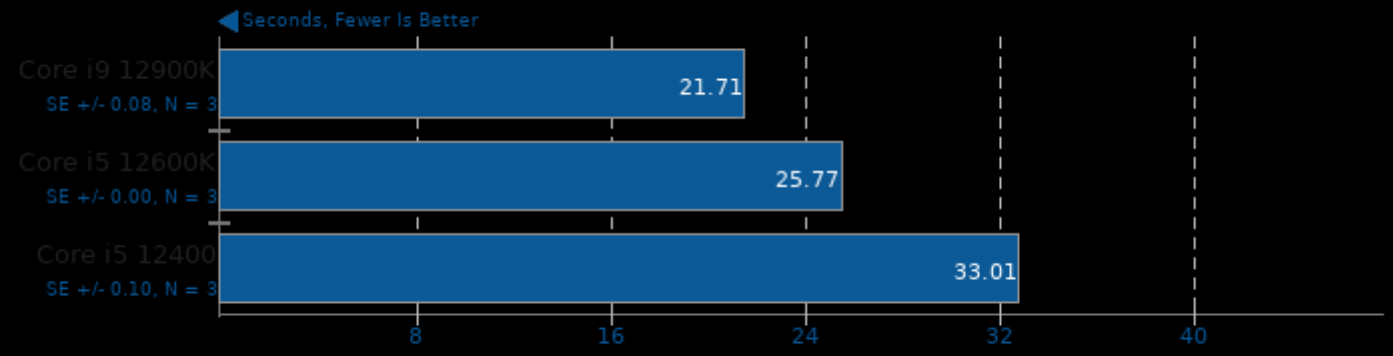
Time To Compile



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

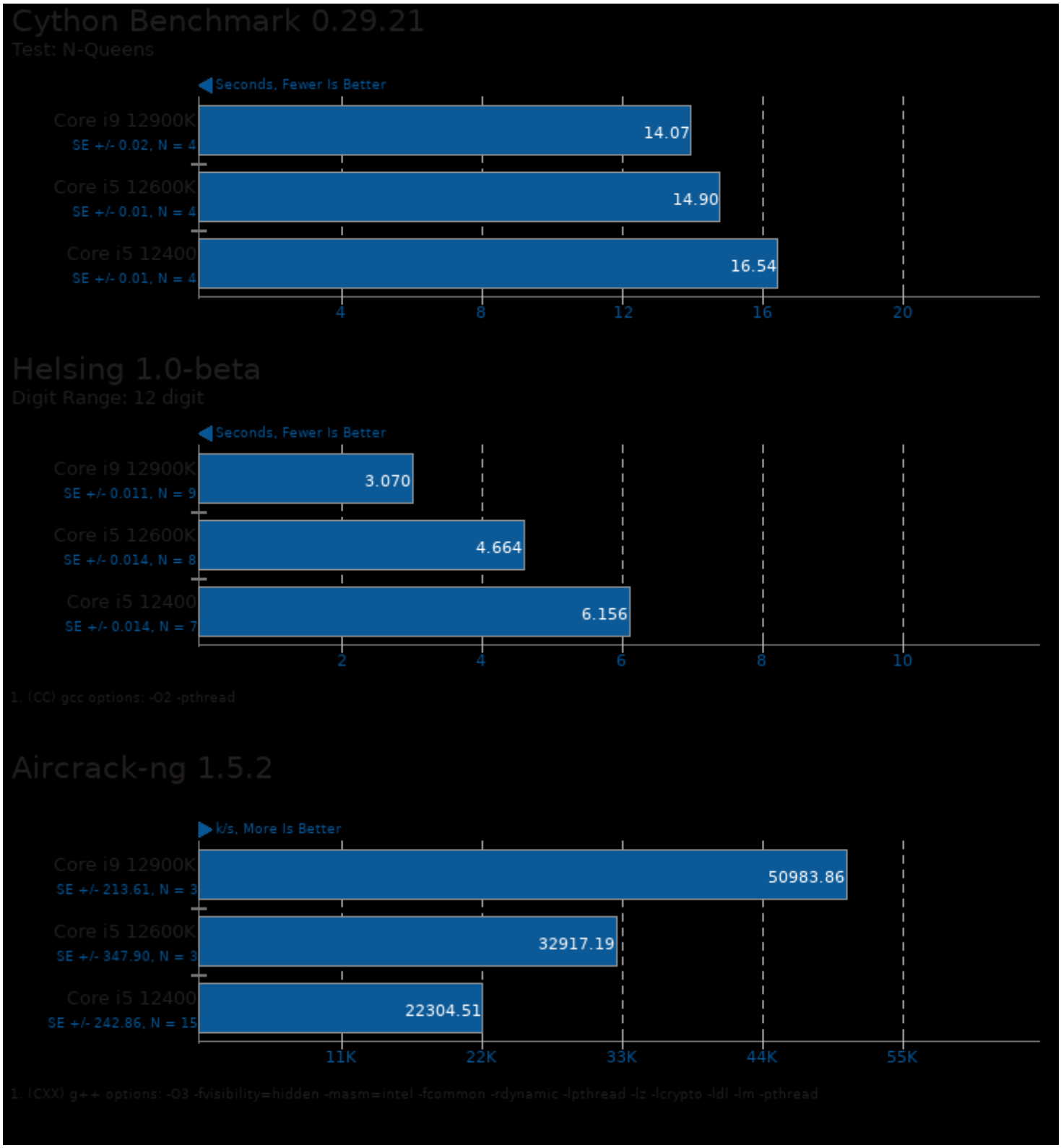
XZ Compression 5.2.4

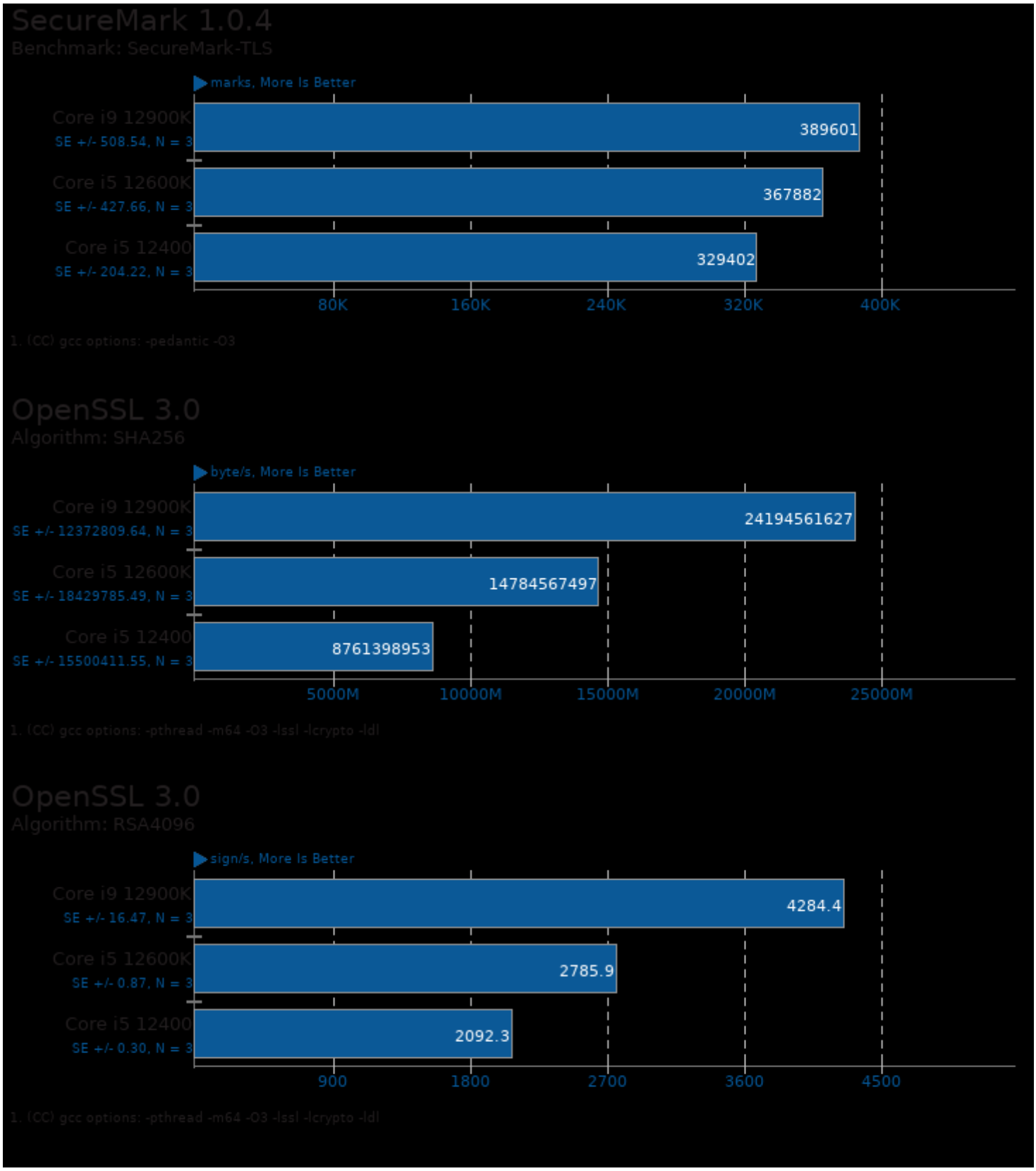
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9

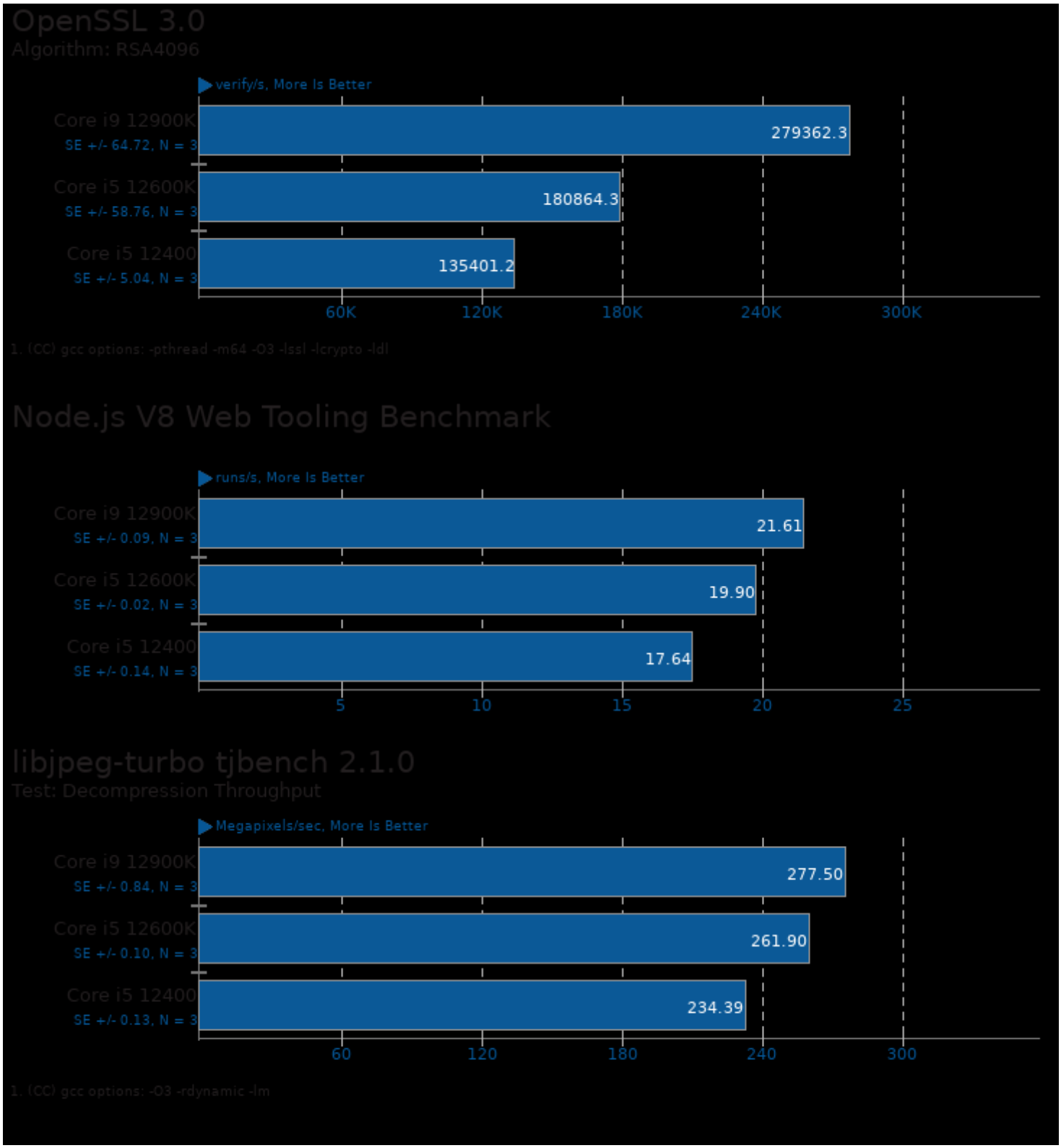


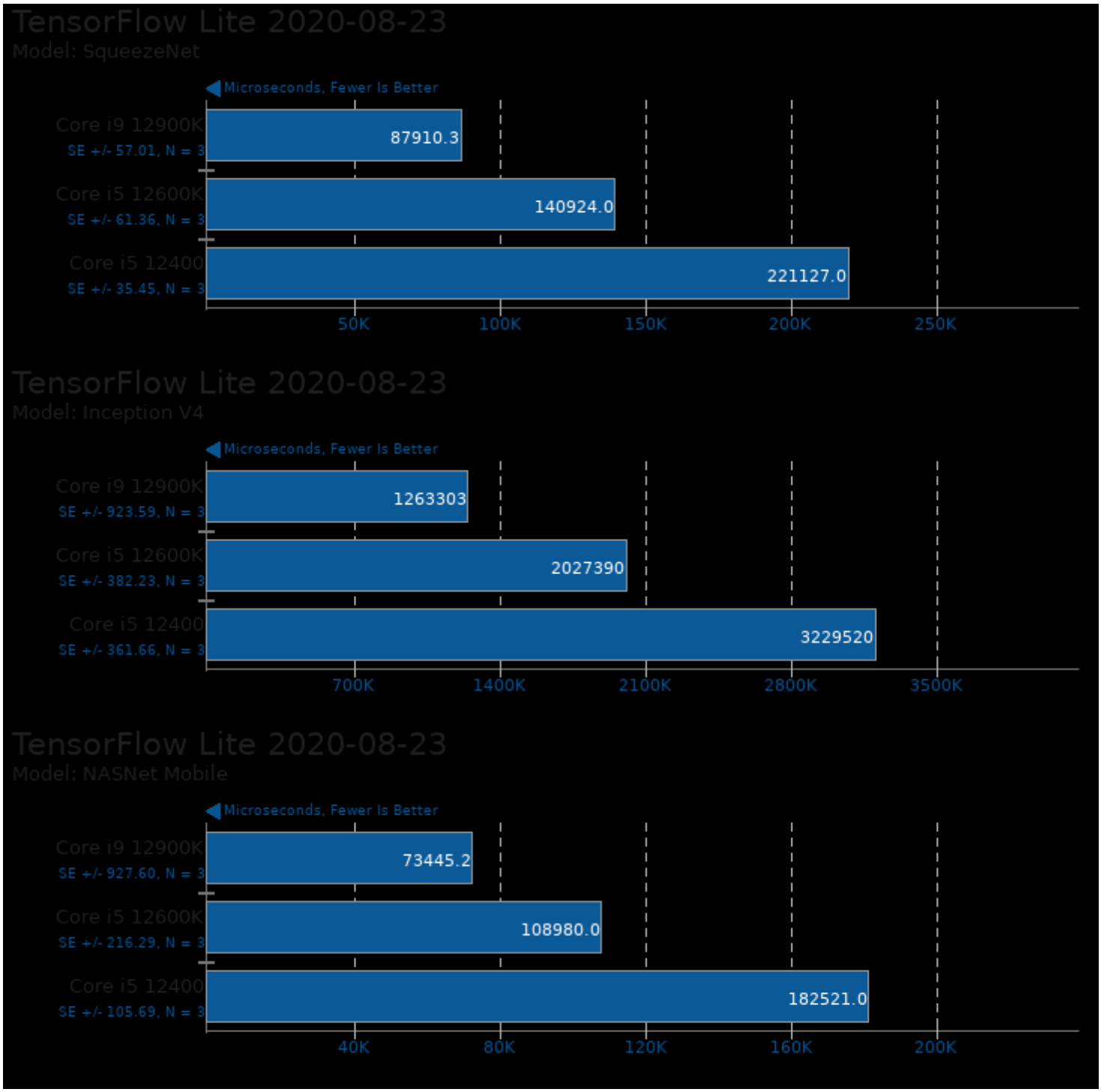
1. (CC) gcc options: -fvisibility=hidden -O2

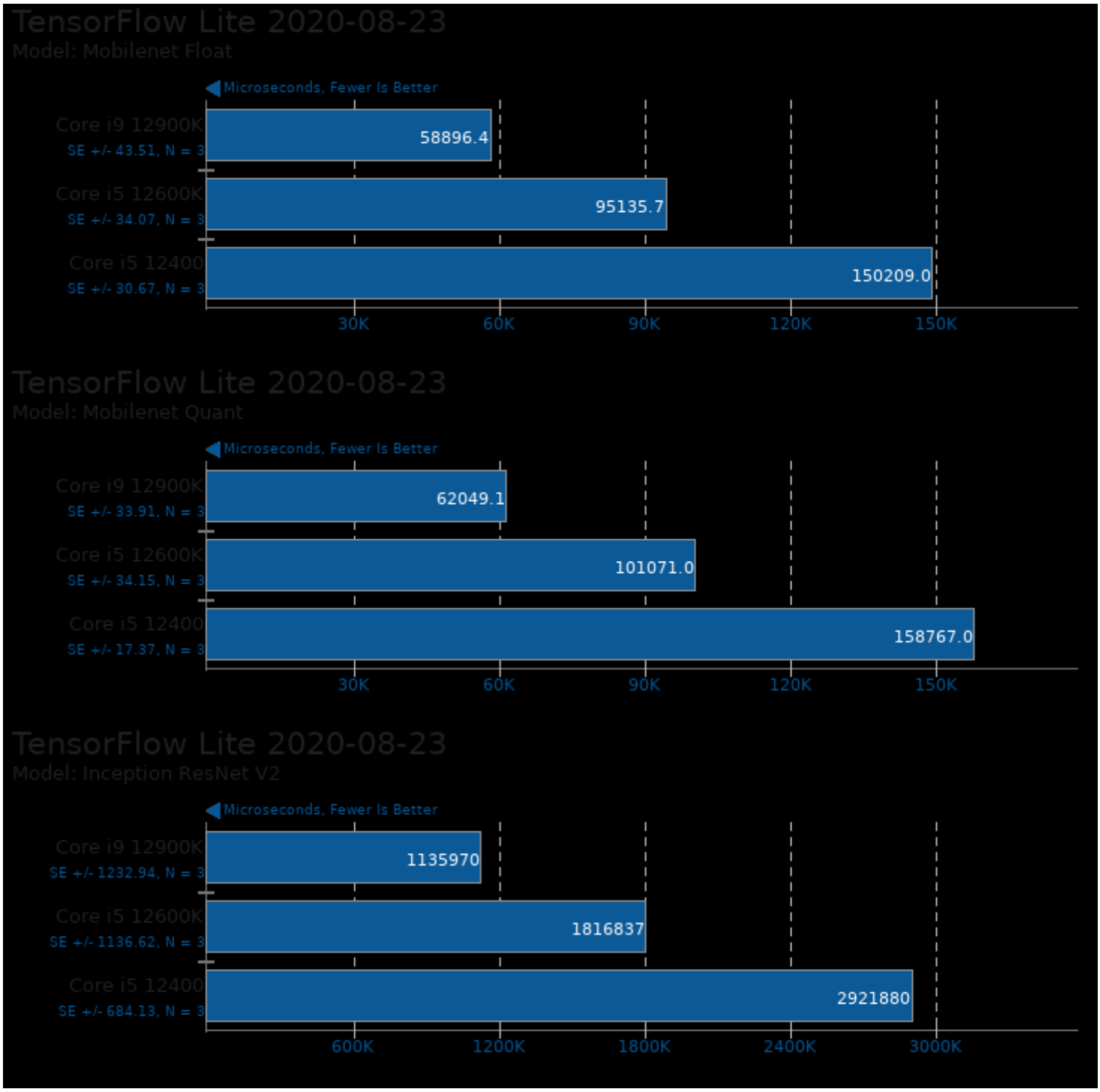
Alder Lake Intel Linux Tests



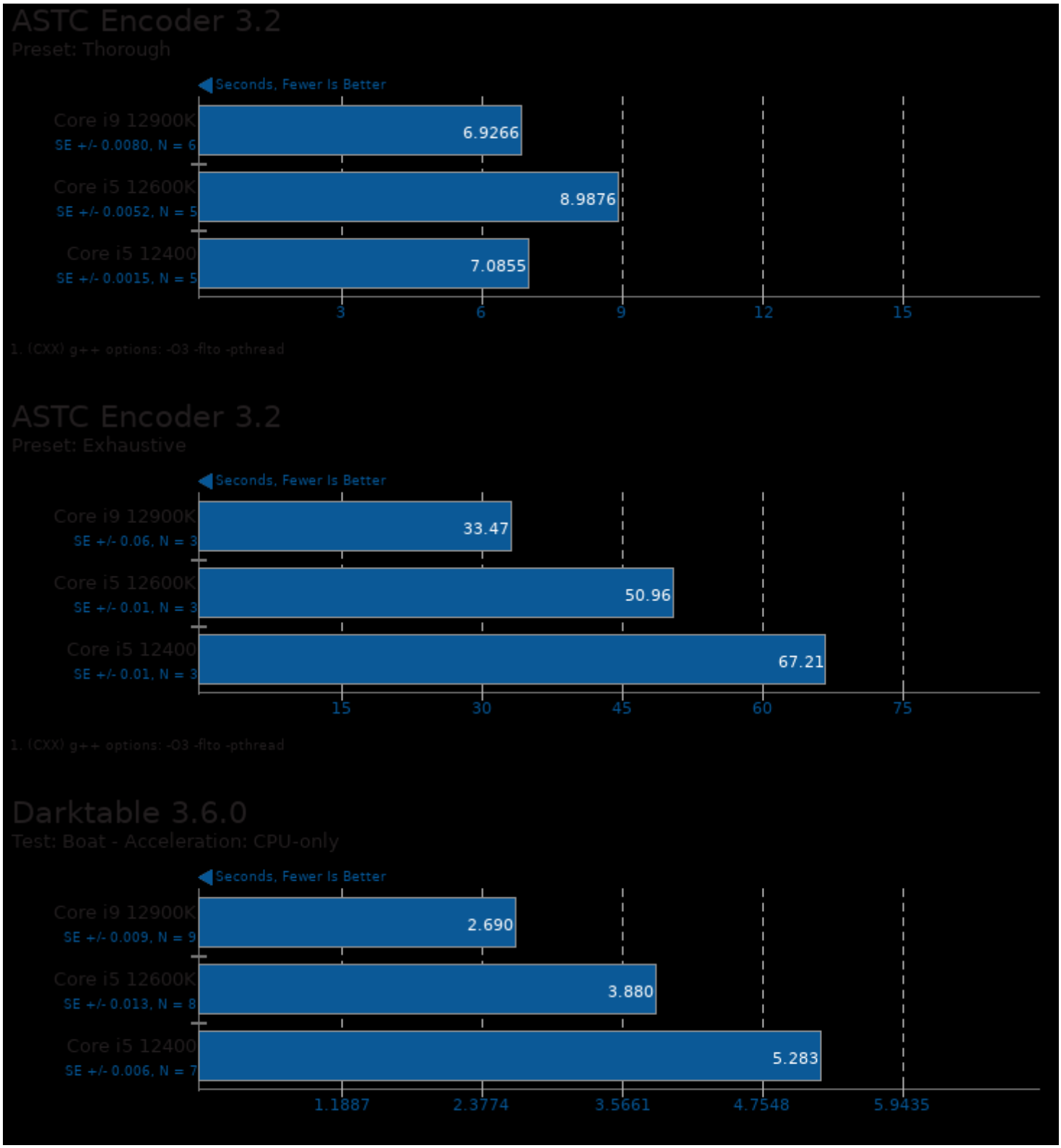

SecureMark 1.0.4
Benchmark: SecureMark-TLS
marks, More Is Better
Core i9 12900K
SE +/- 508.54, N = 3
389601
Core i5 12600K
SE +/- 427.66, N = 3
367882
Core i5 12400
SE +/- 204.22, N = 3
329402
80K
160K
240K
320K
400K
1. (CC) gcc options: -pedantic -O3
OpenSSL 3.0
Algorithm: SHA256
byte/s, More Is Better
Core i9 12900K
SE +/- 12372809.64, N = 3
24194561627
Core i5 12600K
SE +/- 18429785.49, N = 3
14784567497
Core i5 12400
SE +/- 15500411.55, N = 3
8761398953
5000M
10000M
15000M
20000M
25000M
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl
OpenSSL 3.0
Algorithm: RSA4096
sign/s, More Is Better
Core i9 12900K
SE +/- 16.47, N = 3
4284.4
Core i5 12600K
SE +/- 0.87, N = 3
2785.9
Core i5 12400
SE +/- 0.30, N = 3
2092.3
900
1800
2700
3600
4500
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl


OpenSSL 3.0
Algorithm: RSA4096
verify/s, More Is Better
Core i9 12900K
SE +/- 64.72, N = 3
279362.3
Core i5 12600K
SE +/- 58.76, N = 3
180864.3
Core i5 12400
SE +/- 5.04, N = 3
135401.2
60K
120K
180K
240K
300K
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl
Node.js V8 Web Tooling Benchmark
runs/s, More Is Better
Core i9 12900K
SE +/- 0.09, N = 3
21.61
Core i5 12600K
SE +/- 0.02, N = 3
19.90
Core i5 12400
SE +/- 0.14, N = 3
17.64
5
10
15
20
25
libjpeg-turbo tjbench 2.1.0
Test: Decompression Throughput
Megapixels/sec, More Is Better
Core i9 12900K
SE +/- 0.84, N = 3
277.50
Core i5 12600K
SE +/- 0.10, N = 3
261.90
Core i5 12400
SE +/- 0.13, N = 3
234.39
60
120
180
240
300
1. (CC) gcc options: -O3 -rdynamic -lm

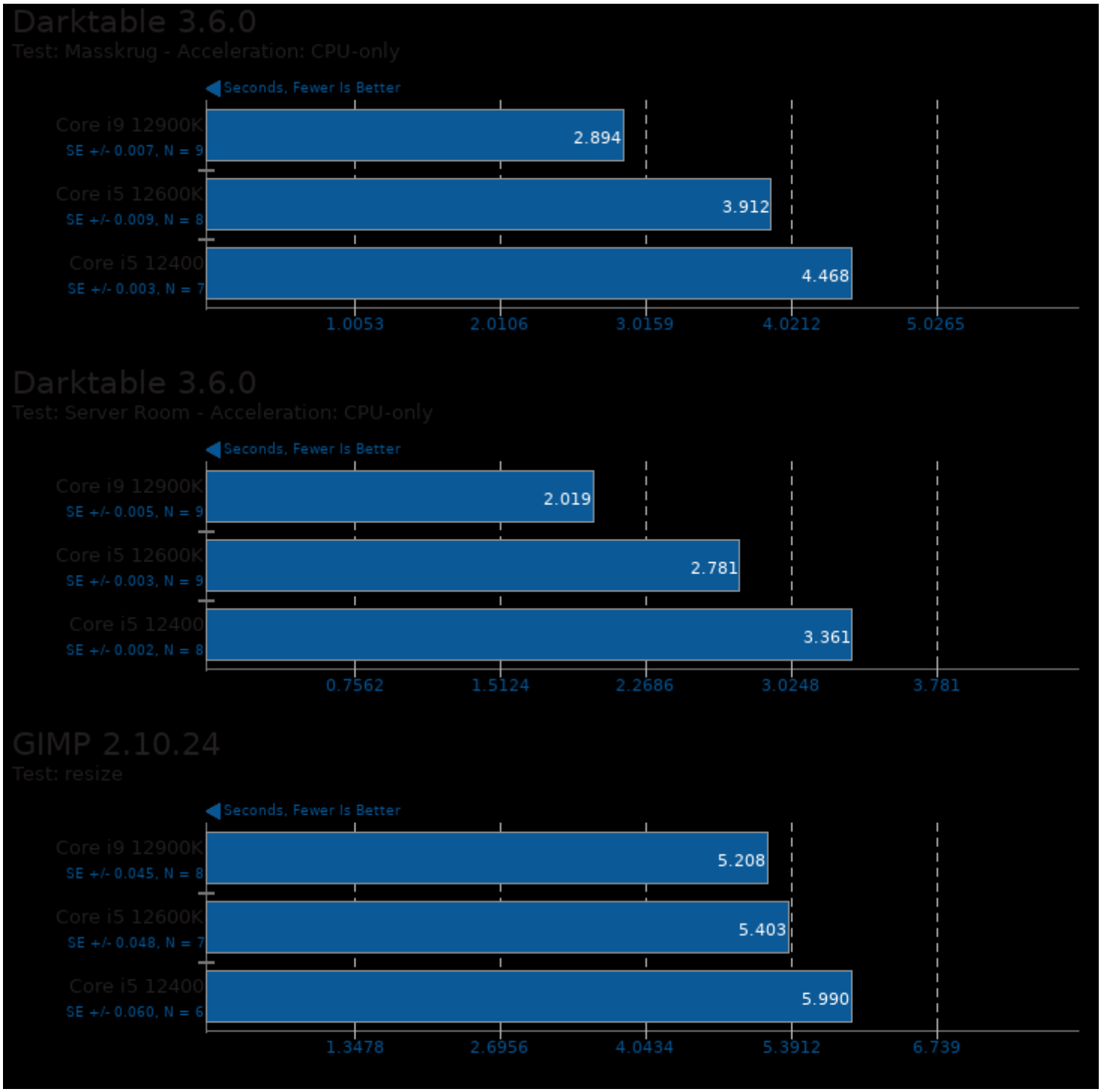

TensorFlow Lite 2020-08-23
Model: SqueezeNet
Microseconds, Fewer Is Better
Core i9 12900K
SE +/- 57.01, N = 3
87910.3
Core i5 12600K
SE +/- 61.36, N = 3
140924.0
Core i5 12400
SE +/- 35.45, N = 3
221127.0
50K
100K
150K
200K
250K
TensorFlow Lite 2020-08-23
Model: Inception V4
Microseconds, Fewer Is Better
Core i9 12900K
SE +/- 923.59, N = 3
1263303
Core i5 12600K
SE +/- 382.23, N = 3
2027390
Core i5 12400
SE +/- 361.66, N = 3
3229520
700K
1400K
2100K
2800K
3500K
TensorFlow Lite 2020-08-23
Model: NASNet Mobile
Microseconds, Fewer Is Better
Core i9 12900K
SE +/- 927.60, N = 3
73445.2
Core i5 12600K
SE +/- 216.29, N = 3
108980.0
Core i5 12400
SE +/- 105.69, N = 3
182521.0
40K
80K
120K
160K
200K

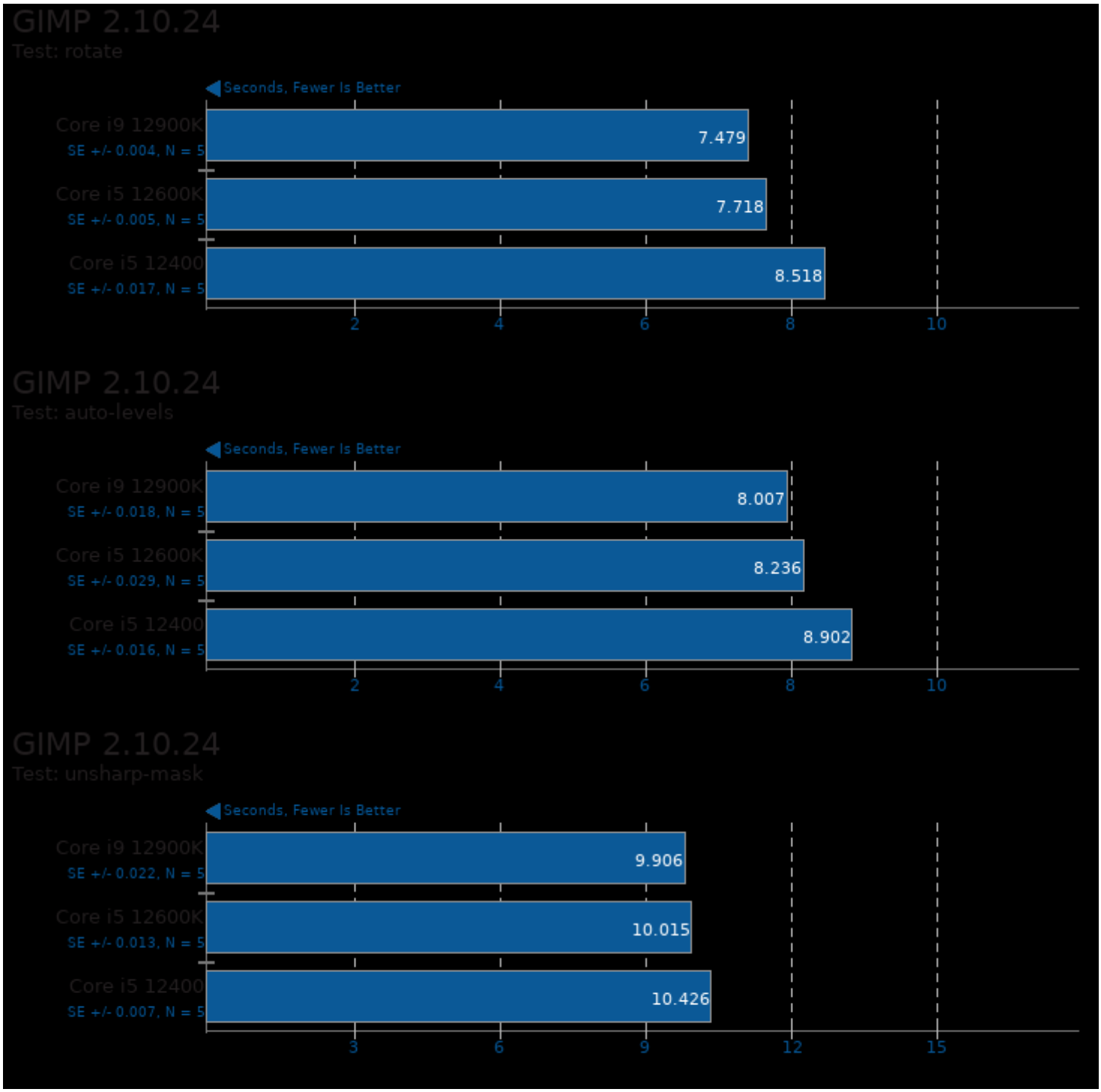

TensorFlow Lite 2020-08-23
Model: Mobilenet Float
Microseconds, Fewer Is Better
Core i9 12900K
SE +/- 43.51, N = 3
58896.4
Core i5 12600K
SE +/- 34.07, N = 3
95135.7
Core i5 12400
SE +/- 30.67, N = 3
150209.0
30K
60K
90K
120K
150K
TensorFlow Lite 2020-08-23
Model: Mobilenet Quant
Microseconds, Fewer Is Better
Core i9 12900K
SE +/- 33.91, N = 3
62049.1
Core i5 12600K
SE +/- 34.15, N = 3
101071.0
Core i5 12400
SE +/- 17.37, N = 3
158767.0
30K
60K
90K
120K
150K
TensorFlow Lite 2020-08-23
Model: Inception ResNet V2
Microseconds, Fewer Is Better
Core i9 12900K
SE +/- 1232.94, N = 3
1135970
Core i5 12600K
SE +/- 1136.62, N = 3
1816837
Core i5 12400
SE +/- 684.13, N = 3
2921880
600K
1200K
1800K
2400K
3000K

Alder Lake Intel Linux Tests

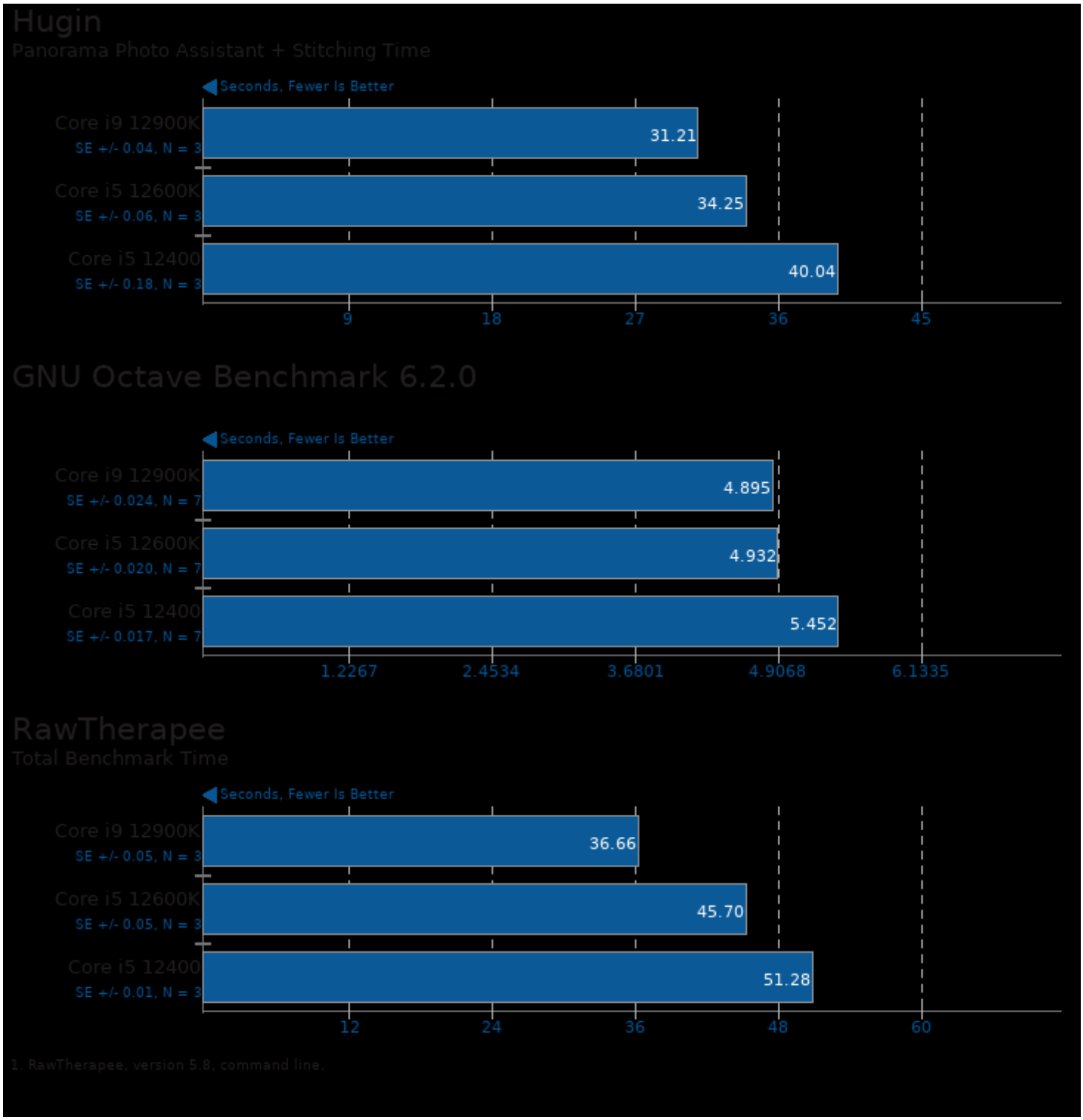


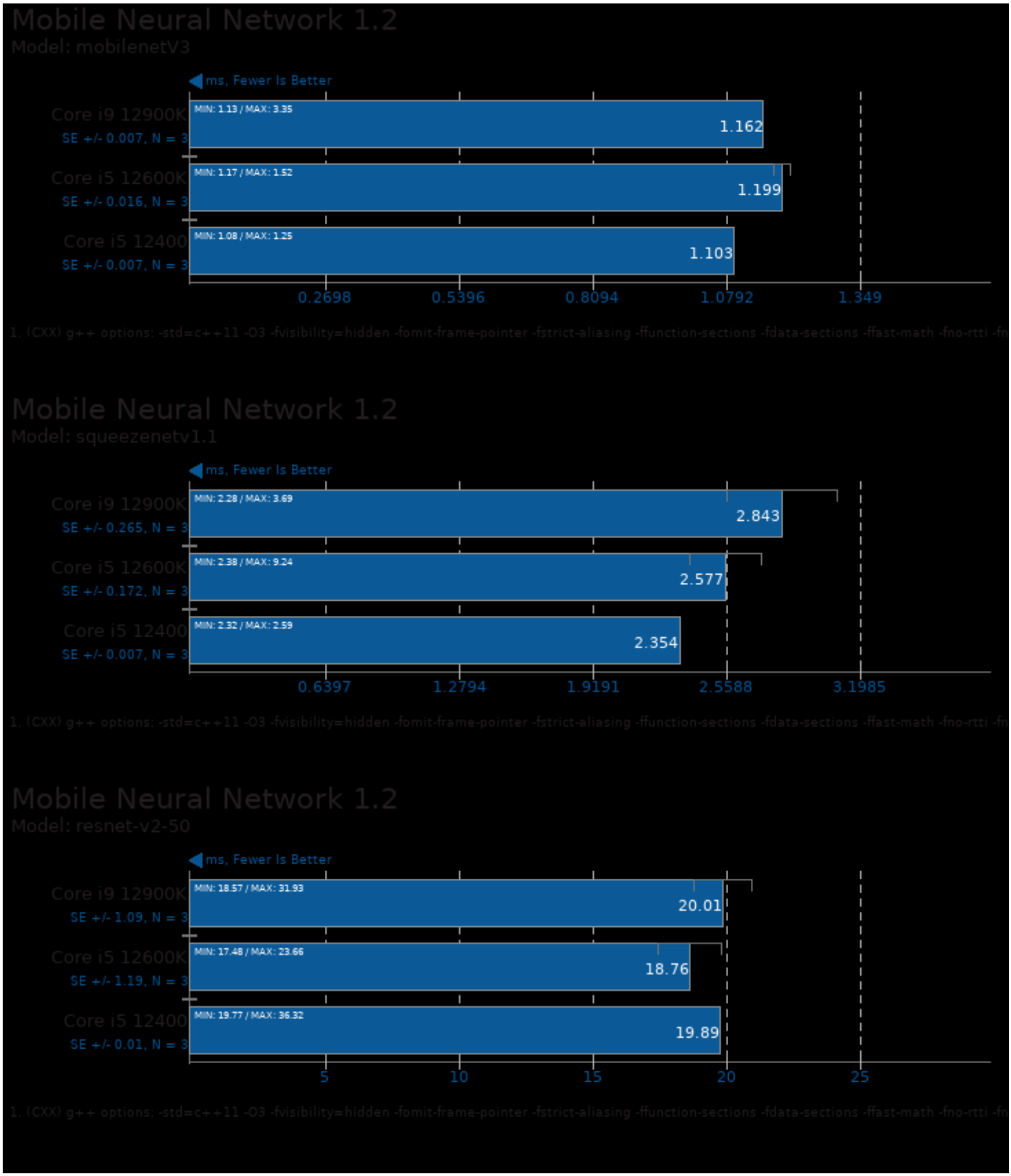
Alder Lake Intel Linux Tests

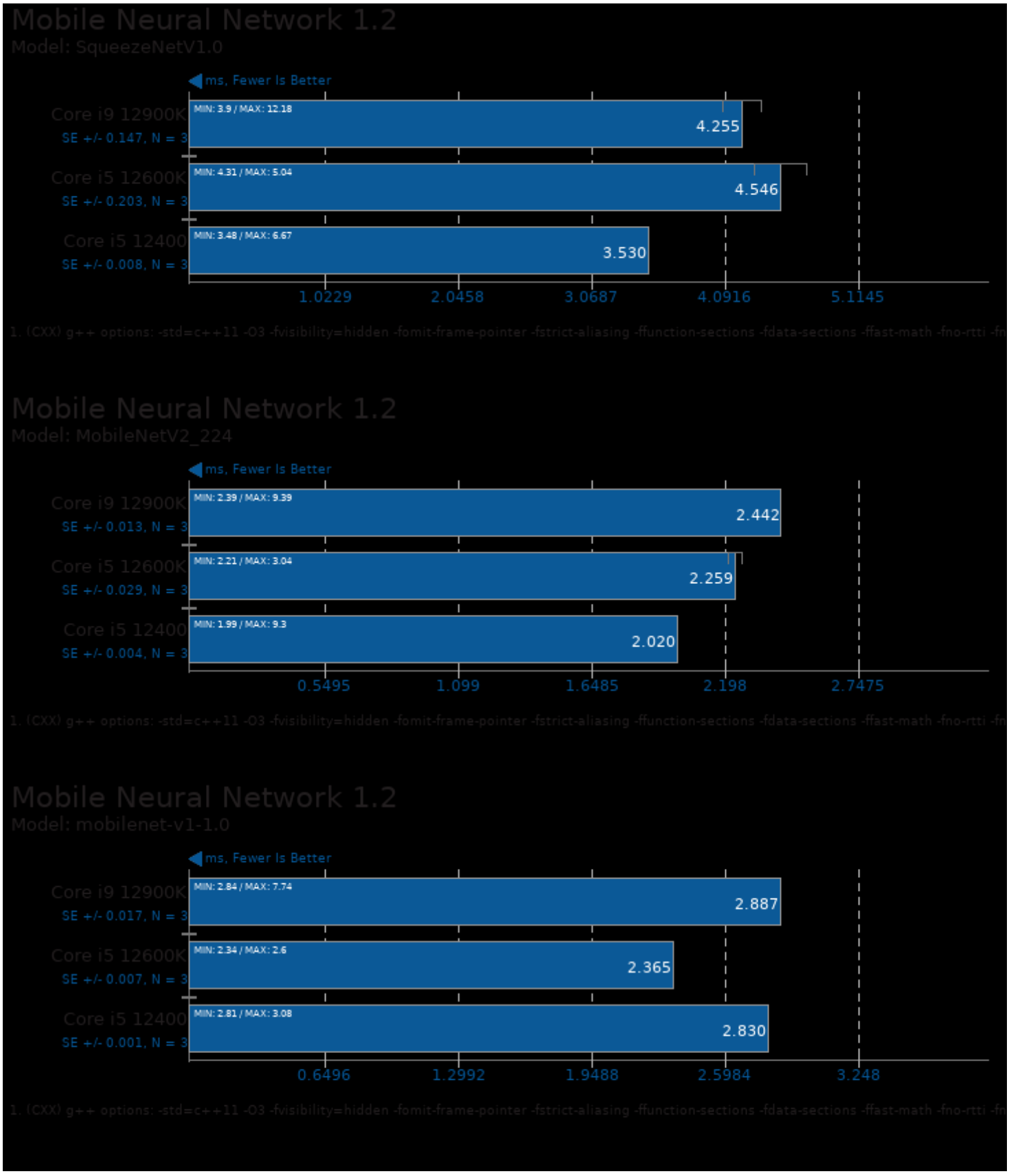


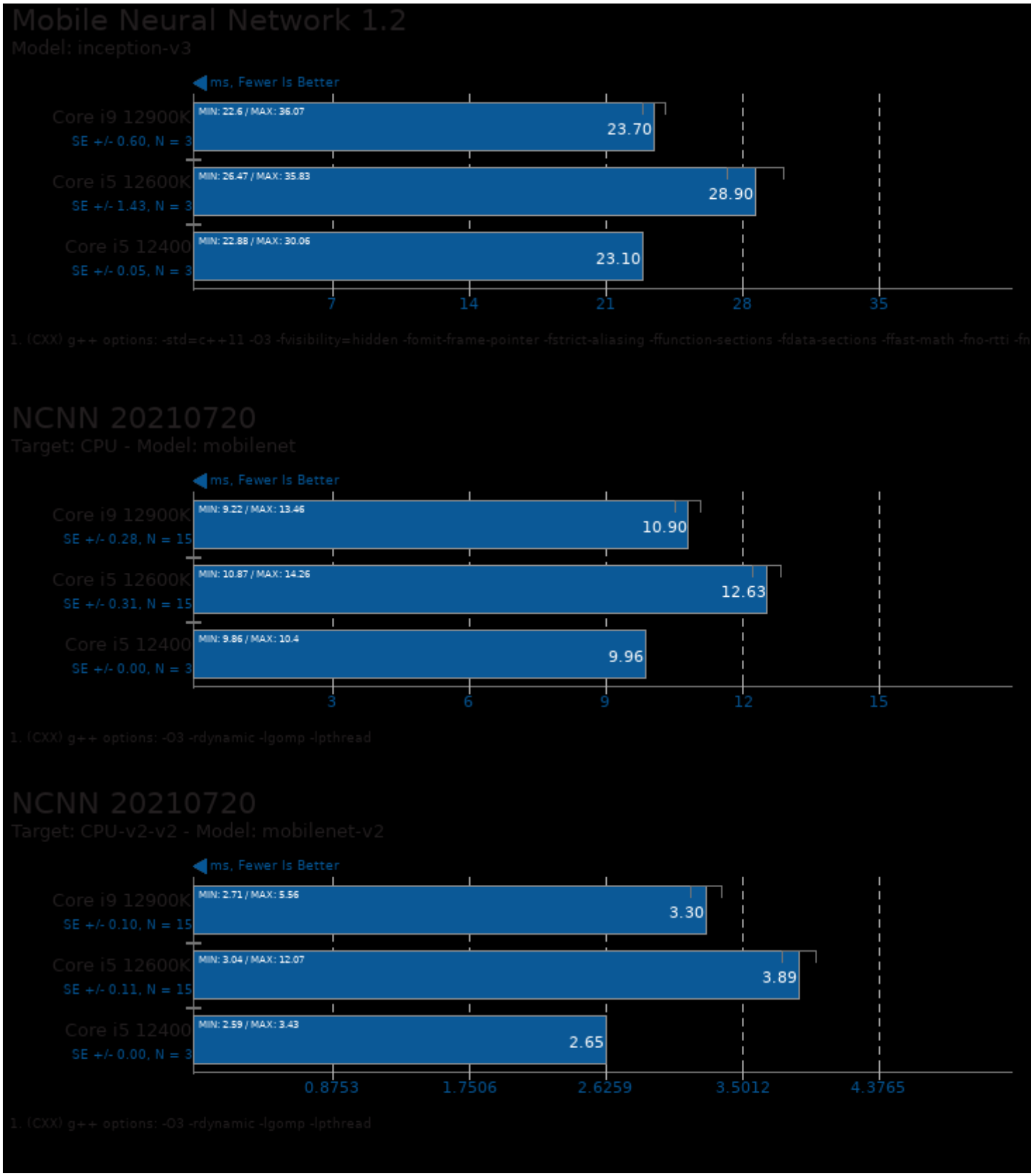

GIMP 2.10.24
Test: rotate
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.004, N = 5
7.479
Core i5 12600K
SE +/- 0.005, N = 5
7.718
Core i5 12400
SE +/- 0.017, N = 5
8.518
2
4
6
8
10
GIMP 2.10.24
Test: auto-levels
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.018, N = 5
8.007
Core i5 12600K
SE +/- 0.029, N = 5
8.236
Core i5 12400
SE +/- 0.016, N = 5
8.902
2
4
6
8
10
GIMP 2.10.24
Test: unsharp-mask
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.022, N = 5
9.906
Core i5 12600K
SE +/- 0.013, N = 5
10.015
Core i5 12400
SE +/- 0.007, N = 5
10.426
3
6
9
12
15

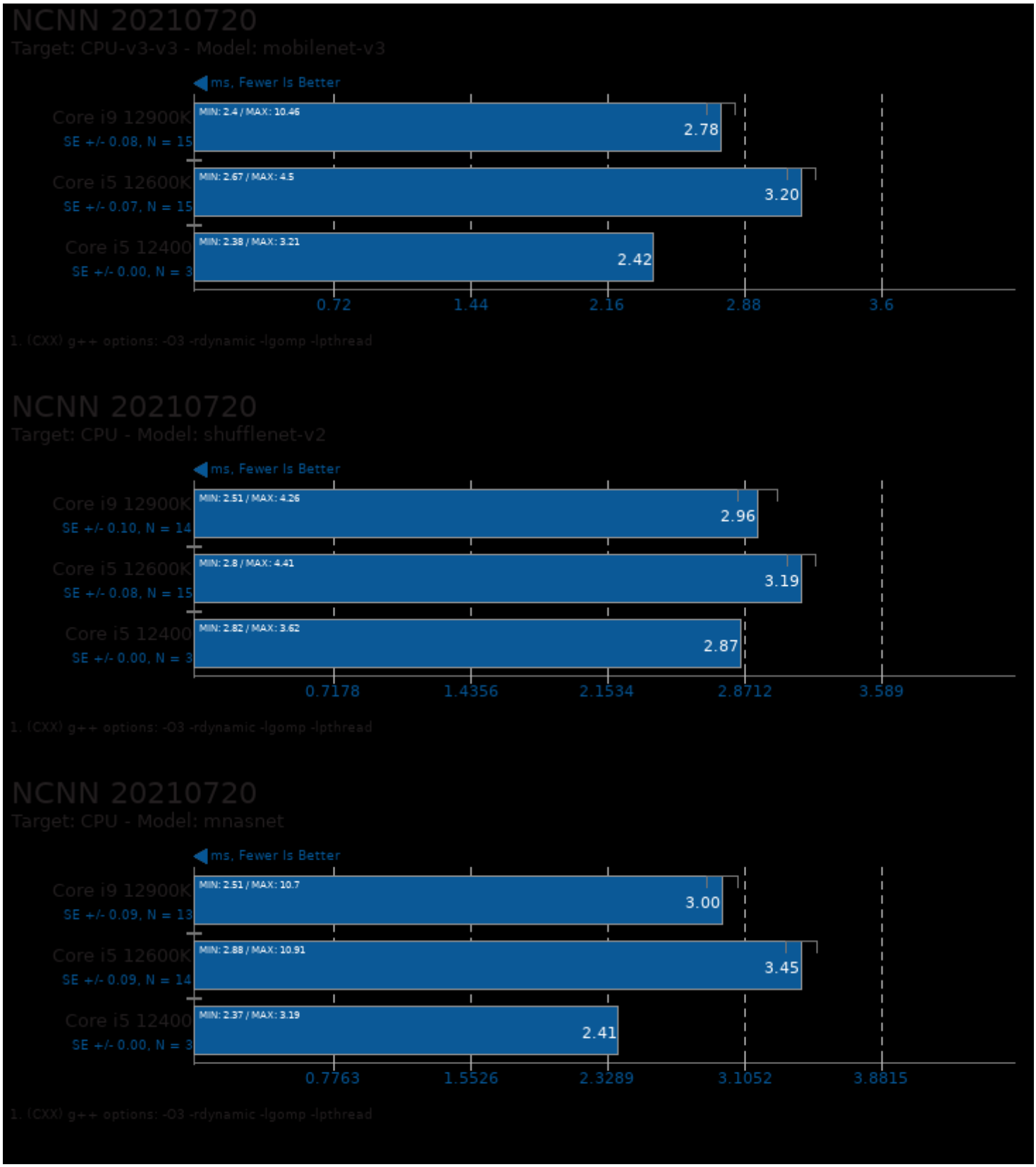
Alder Lake Intel Linux Tests

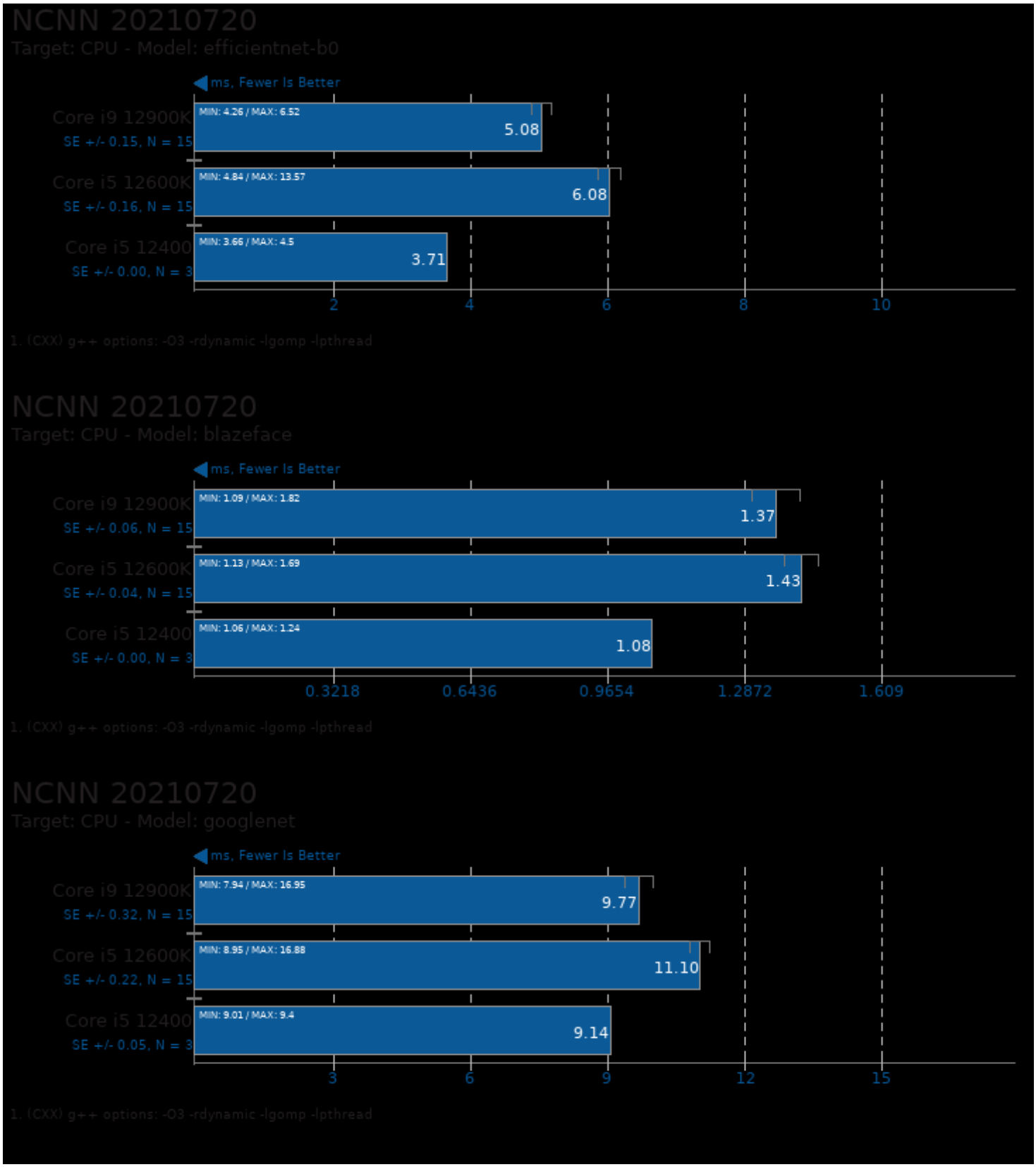


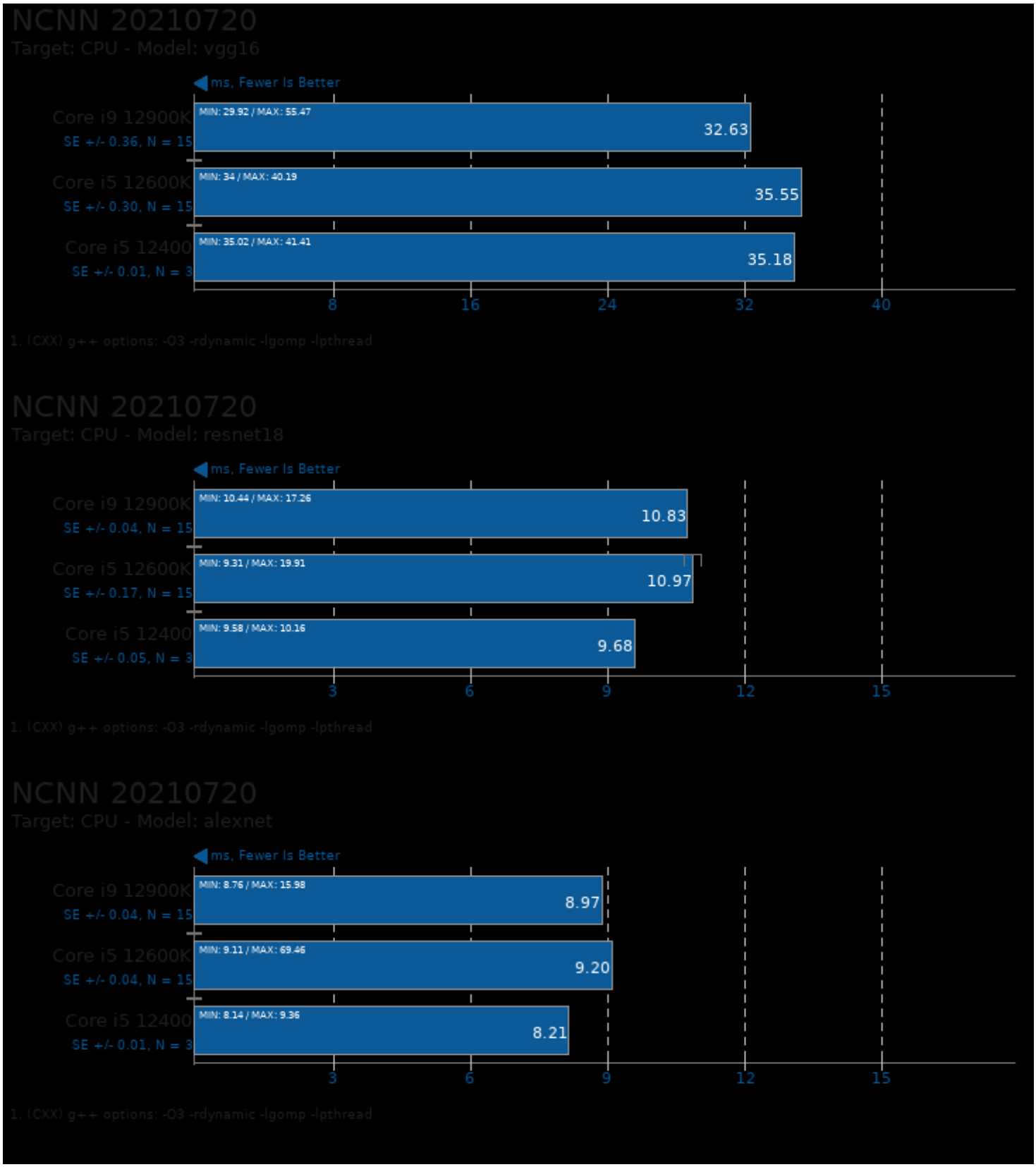

Mobile Neural Network 1.2
Model: mobilenetV3
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.007, N = 3
MIN: 1.13 / MAX: 3.35
1.162
Core i5 12600K
SE +/- 0.016, N = 3
MIN: 1.17 / MAX: 1.52
1.199
Core i5 12400
SE +/- 0.007, N = 3
MIN: 1.08 / MAX: 1.25
1.103
0.2698
0.5396
0.8094
1.0792
1.349
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.2
Model: squeezenetv1.1
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.265, N = 3
MIN: 2.28 / MAX: 3.69
2.843
Core i5 12600K
SE +/- 0.172, N = 3
MIN: 2.38 / MAX: 9.24
2.577
Core i5 12400
SE +/- 0.007, N = 3
MIN: 2.32 / MAX: 2.59
2.354
0.6397
1.2794
1.9191
2.5588
3.1985
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.2
Model: resnet-v2-50
ms, Fewer Is Better
Core i9 12900K
SE +/- 1.09, N = 3
MIN: 18.57 / MAX: 31.93
20.01
Core i5 12600K
SE +/- 1.19, N = 3
MIN: 17.48 / MAX: 23.66
18.76
Core i5 12400
SE +/- 0.01, N = 3
MIN: 19.77 / MAX: 36.32
19.89
5
10
15
20
25
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv

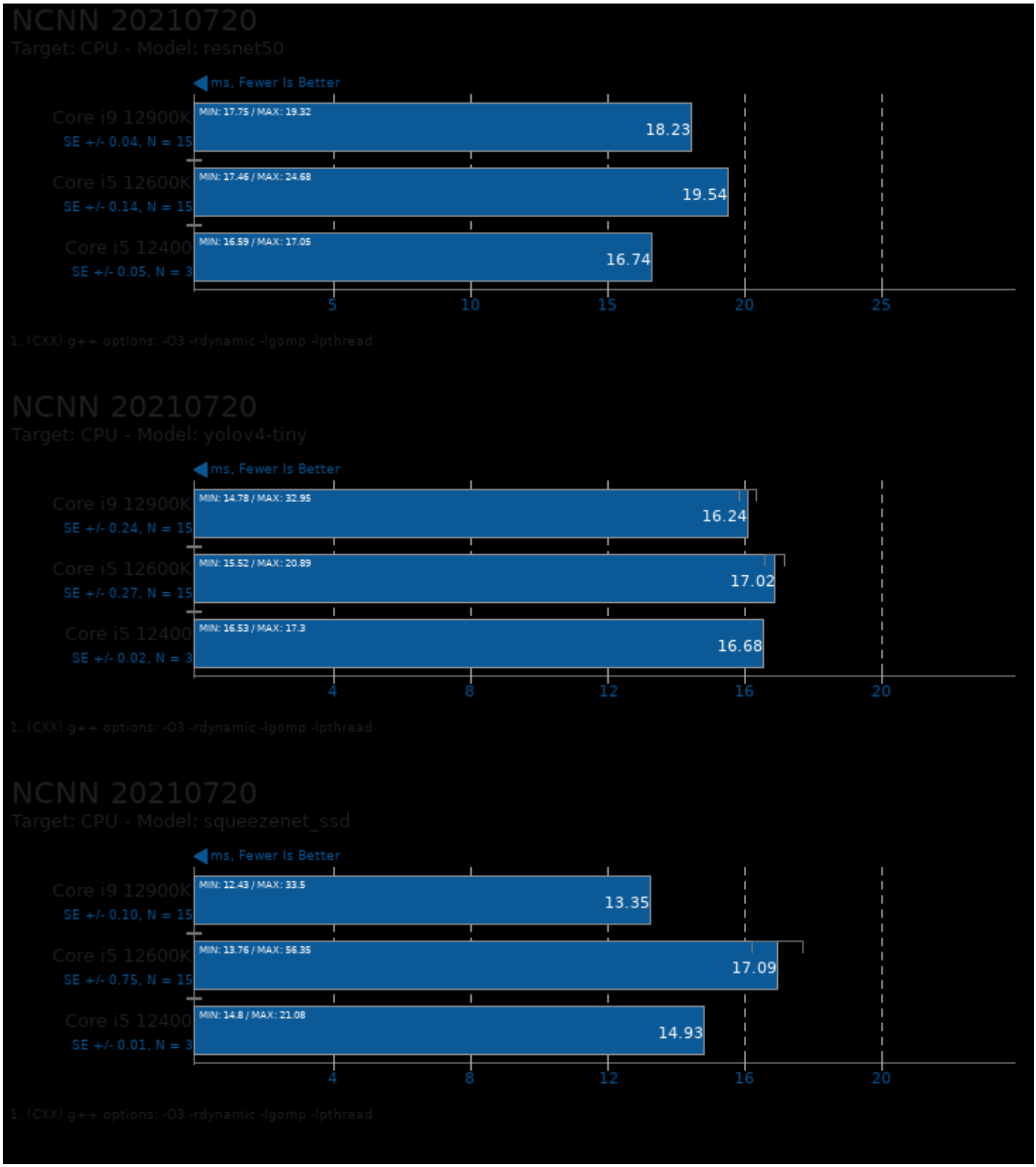

Mobile Neural Network 1.2
Model: SqueezeNetV1.0
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.147, N = 3
MIN: 3.9 / MAX: 12.18
4.255
Core i5 12600K
SE +/- 0.203, N = 3
MIN: 4.31 / MAX: 5.04
4.546
Core i5 12400
SE +/- 0.008, N = 3
MIN: 3.48 / MAX: 6.67
3.530
1.0229
2.0458
3.0687
4.0916
5.1145
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.2
Model: MobileNetV2_224
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.013, N = 3
MIN: 2.39 / MAX: 9.39
2.442
Core i5 12600K
SE +/- 0.029, N = 3
MIN: 2.21 / MAX: 3.04
2.259
Core i5 12400
SE +/- 0.004, N = 3
MIN: 1.99 / MAX: 9.3
2.020
0.5495
1.099
1.6485
2.198
2.7475
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.2
Model: mobilenet-v1-1.0
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.017, N = 3
MIN: 2.84 / MAX: 7.74
2.887
Core i5 12600K
SE +/- 0.007, N = 3
MIN: 2.34 / MAX: 2.6
2.365
Core i5 12400
SE +/- 0.001, N = 3
MIN: 2.81 / MAX: 3.08
2.830
0.6496
1.2992
1.9488
2.5984
3.248
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv

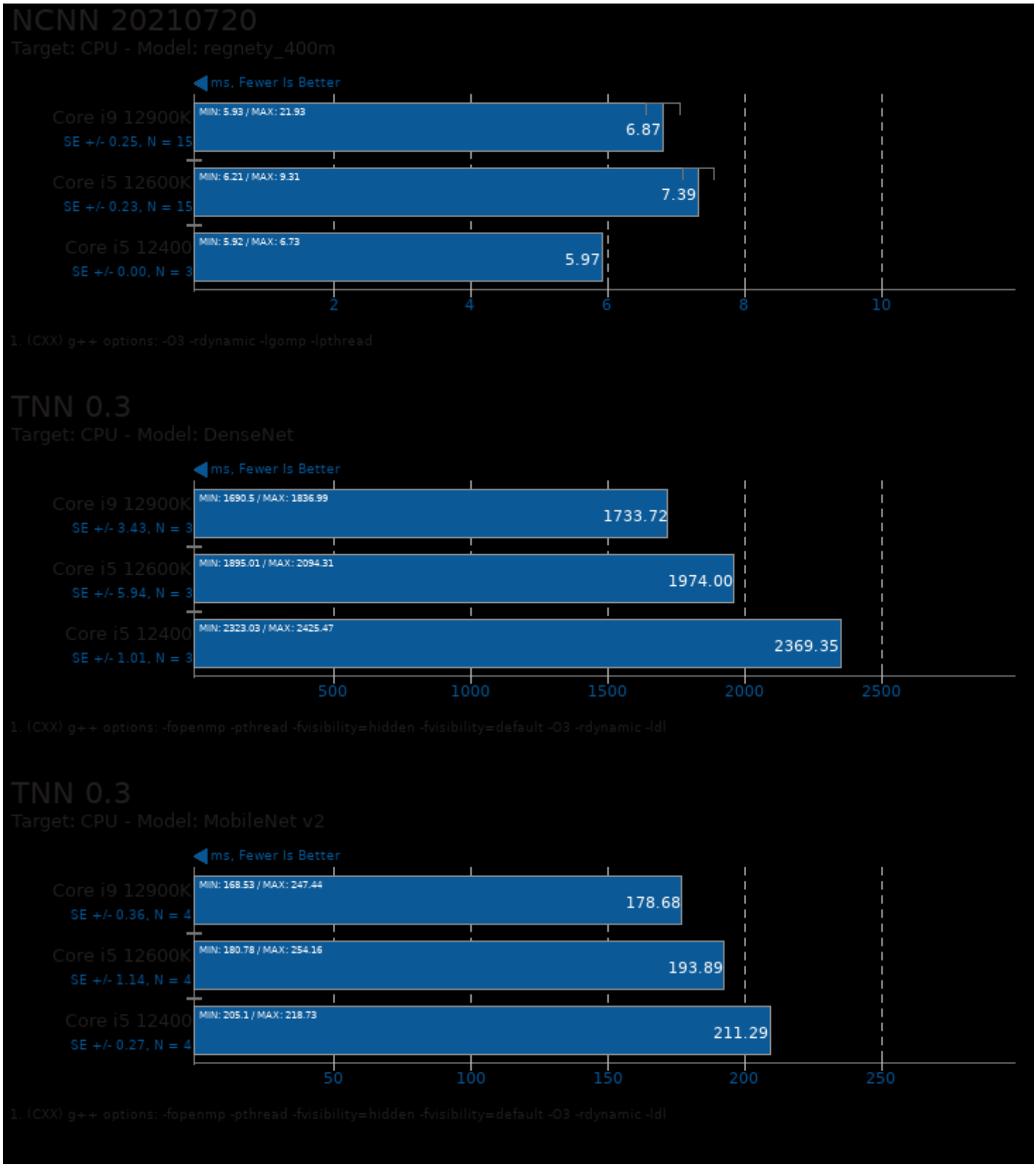

Mobile Neural Network 1.2
Model: inception-v3
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.60, N = 3
MIN: 22.6 / MAX: 36.07
23.70
Core i5 12600K
SE +/- 1.43, N = 3
MIN: 26.47 / MAX: 35.83
28.90
Core i5 12400
SE +/- 0.05, N = 3
MIN: 22.88 / MAX: 30.06
23.10
7
14
21
28
35
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
NCNN 20210720
Target: CPU - Model: mobilenet
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.28, N = 15
MIN: 9.22 / MAX: 13.46
10.90
Core i5 12600K
SE +/- 0.31, N = 15
MIN: 10.87 / MAX: 14.26
12.63
Core i5 12400
SE +/- 0.00, N = 3
MIN: 9.86 / MAX: 10.4
9.96
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU-v2-v2 - Model: mobilenet-v2
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.10, N = 15
MIN: 2.71 / MAX: 5.56
3.30
Core i5 12600K
SE +/- 0.11, N = 15
MIN: 3.04 / MAX: 12.07
3.89
Core i5 12400
SE +/- 0.00, N = 3
MIN: 2.59 / MAX: 3.43
2.65
0.8753
1.7506
2.6259
3.5012
4.3765
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

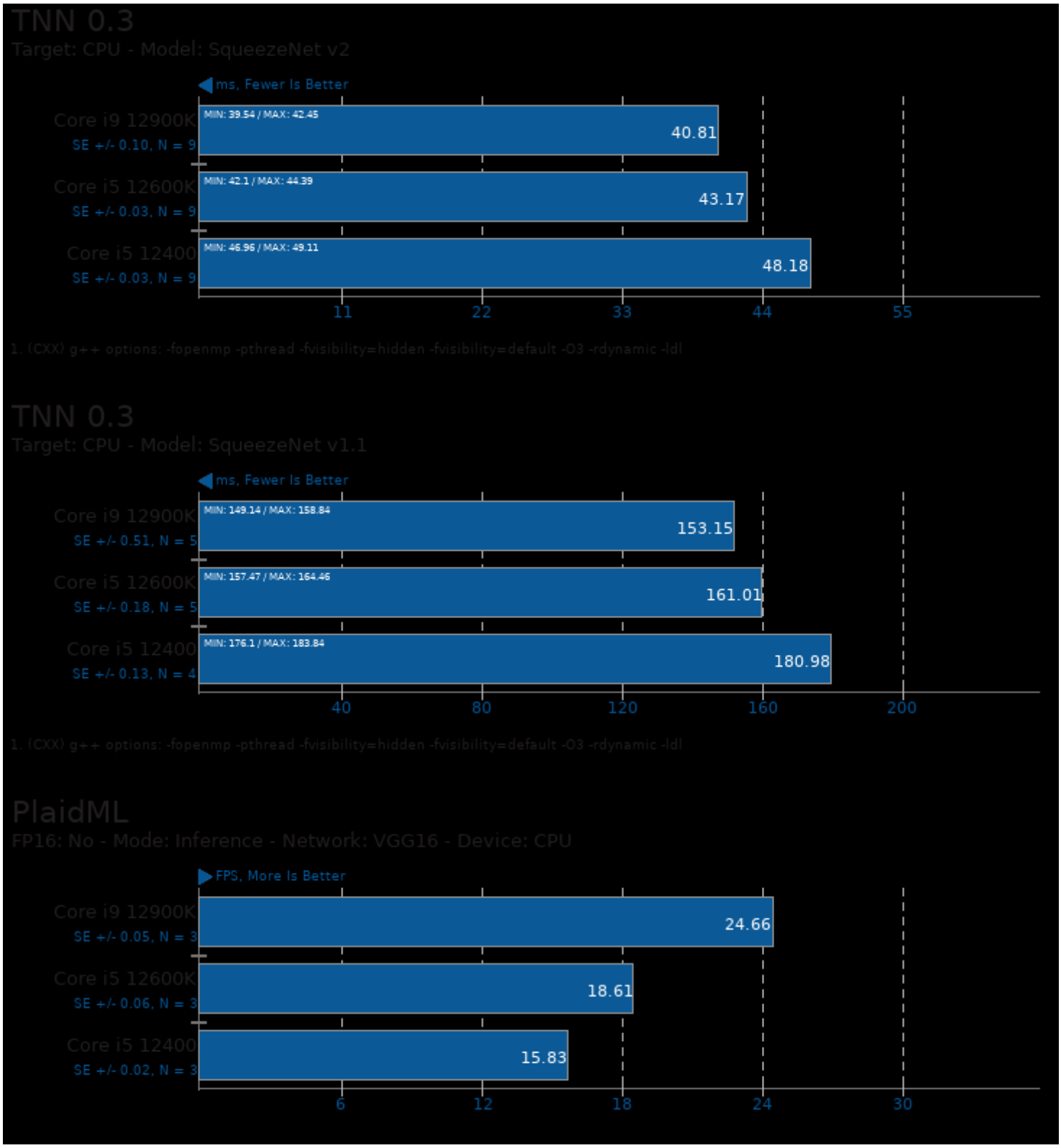

NCNN 20210720
Target: CPU-v3-v3 - Model: mobilenet-v3
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.08, N = 15
MIN: 2.4 / MAX: 10.46
2.78
Core i5 12600K
SE +/- 0.07, N = 15
MIN: 2.67 / MAX: 4.5
3.20
Core i5 12400
SE +/- 0.00, N = 3
MIN: 2.38 / MAX: 3.21
2.42
0.72
1.44
2.16
2.88
3.6
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: shufflenet-v2
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.10, N = 14
MIN: 2.51 / MAX: 4.26
2.96
Core i5 12600K
SE +/- 0.08, N = 15
MIN: 2.8 / MAX: 4.41
3.19
Core i5 12400
SE +/- 0.00, N = 3
MIN: 2.82 / MAX: 3.62
2.87
0.7178
1.4356
2.1534
2.8712
3.589
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: mnasnet
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.09, N = 13
MIN: 2.51 / MAX: 10.7
3.00
Core i5 12600K
SE +/- 0.09, N = 14
MIN: 2.88 / MAX: 10.91
3.45
Core i5 12400
SE +/- 0.00, N = 3
MIN: 2.37 / MAX: 3.19
2.41
0.7763
1.5526
2.3289
3.1052
3.8815
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: efficientnet-b0
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.15, N = 15
MIN: 4.26 / MAX: 6.52
5.08
Core i5 12600K
SE +/- 0.16, N = 15
MIN: 4.84 / MAX: 13.57
6.08
Core i5 12400
SE +/- 0.00, N = 3
MIN: 3.66 / MAX: 4.5
3.71
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: blazeface
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.06, N = 15
MIN: 1.09 / MAX: 1.82
1.37
Core i5 12600K
SE +/- 0.04, N = 15
MIN: 1.13 / MAX: 1.69
1.43
Core i5 12400
SE +/- 0.00, N = 3
MIN: 1.06 / MAX: 1.24
1.08
0.3218
0.6436
0.9654
1.2872
1.609
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: googlenet
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.32, N = 15
MIN: 7.94 / MAX: 16.95
9.77
Core i5 12600K
SE +/- 0.22, N = 15
MIN: 8.95 / MAX: 16.88
11.10
Core i5 12400
SE +/- 0.05, N = 3
MIN: 9.01 / MAX: 9.4
9.14
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

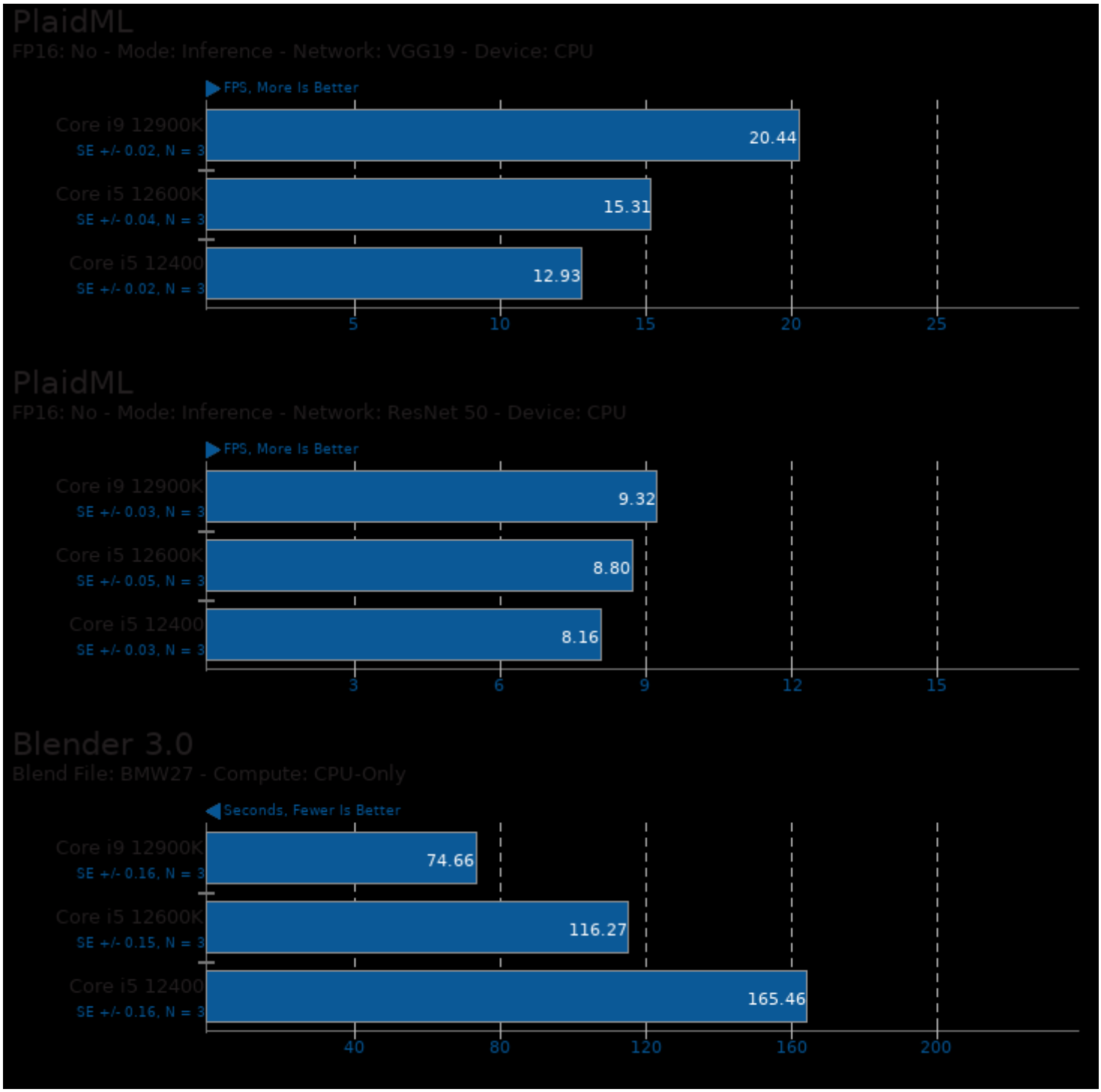

NCNN 20210720
Target: CPU - Model: vgg16
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.36, N = 15
MIN: 29.92 / MAX: 55.47
32.63
Core i5 12600K
SE +/- 0.30, N = 15
MIN: 34 / MAX: 40.19
35.55
Core i5 12400
SE +/- 0.01, N = 3
MIN: 35.02 / MAX: 41.41
35.18
8
16
24
32
40
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: resnet18
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.04, N = 15
MIN: 10.44 / MAX: 17.26
10.83
Core i5 12600K
SE +/- 0.17, N = 15
MIN: 9.31 / MAX: 19.91
10.97
Core i5 12400
SE +/- 0.05, N = 3
MIN: 9.58 / MAX: 10.16
9.68
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: alexnet
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.04, N = 15
MIN: 8.76 / MAX: 15.98
8.97
Core i5 12600K
SE +/- 0.04, N = 15
MIN: 9.11 / MAX: 69.46
9.20
Core i5 12400
SE +/- 0.01, N = 3
MIN: 8.14 / MAX: 9.36
8.21
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: resnet50
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.04, N = 15
MIN: 17.75 / MAX: 19.32
18.23
Core i5 12600K
SE +/- 0.14, N = 15
MIN: 17.46 / MAX: 24.68
19.54
Core i5 12400
SE +/- 0.05, N = 3
MIN: 16.59 / MAX: 17.05
16.74
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: yolov4-tiny
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.24, N = 15
MIN: 14.78 / MAX: 32.95
16.24
Core i5 12600K
SE +/- 0.27, N = 15
MIN: 15.52 / MAX: 20.89
17.02
Core i5 12400
SE +/- 0.02, N = 3
MIN: 16.53 / MAX: 17.3
16.68
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: squeezenet_ssd
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.10, N = 15
MIN: 12.43 / MAX: 33.5
13.35
Core i5 12600K
SE +/- 0.75, N = 15
MIN: 13.76 / MAX: 56.35
17.09
Core i5 12400
SE +/- 0.01, N = 3
MIN: 14.8 / MAX: 21.08
14.93
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

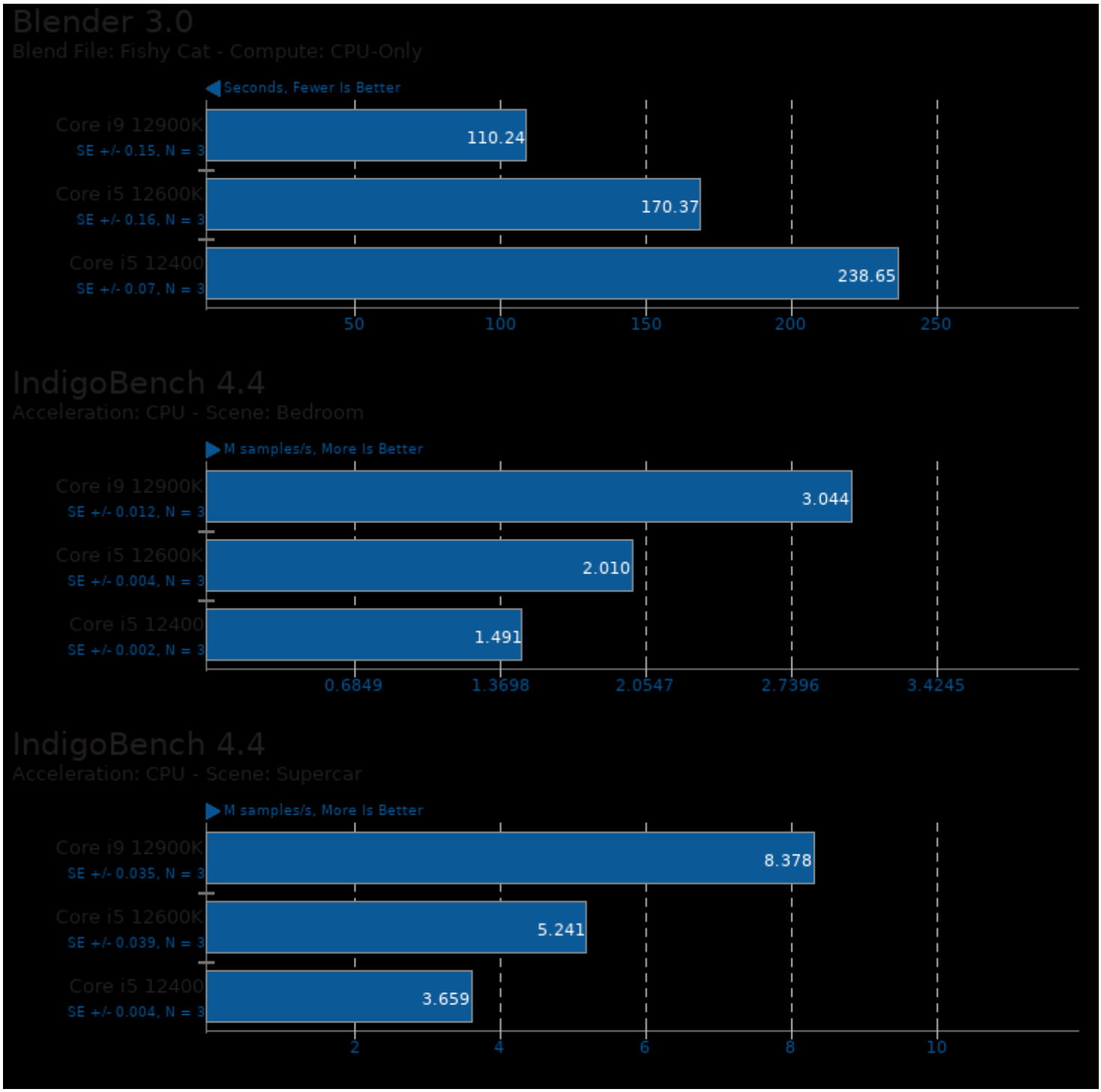

NCNN 20210720
Target: CPU - Model: regnety_400m
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.25, N = 15
MIN: 5.93 / MAX: 21.93
6.87
Core i5 12600K
SE +/- 0.23, N = 15
MIN: 6.21 / MAX: 9.31
7.39
Core i5 12400
SE +/- 0.00, N = 3
MIN: 5.92 / MAX: 6.73
5.97
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
TNN 0.3
Target: CPU - Model: DenseNet
ms, Fewer Is Better
Core i9 12900K
SE +/- 3.43, N = 3
MIN: 1690.5 / MAX: 1836.99
1733.72
Core i5 12600K
SE +/- 5.94, N = 3
MIN: 1895.01 / MAX: 2094.31
1974.00
Core i5 12400
SE +/- 1.01, N = 3
MIN: 2323.03 / MAX: 2425.47
2369.35
500
1000
1500
2000
2500
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl
TNN 0.3
Target: CPU - Model: MobileNet v2
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.36, N = 4
MIN: 168.53 / MAX: 247.44
178.68
Core i5 12600K
SE +/- 1.14, N = 4
MIN: 180.78 / MAX: 254.16
193.89
Core i5 12400
SE +/- 0.27, N = 4
MIN: 205.1 / MAX: 218.73
211.29
50
100
150
200
250
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl

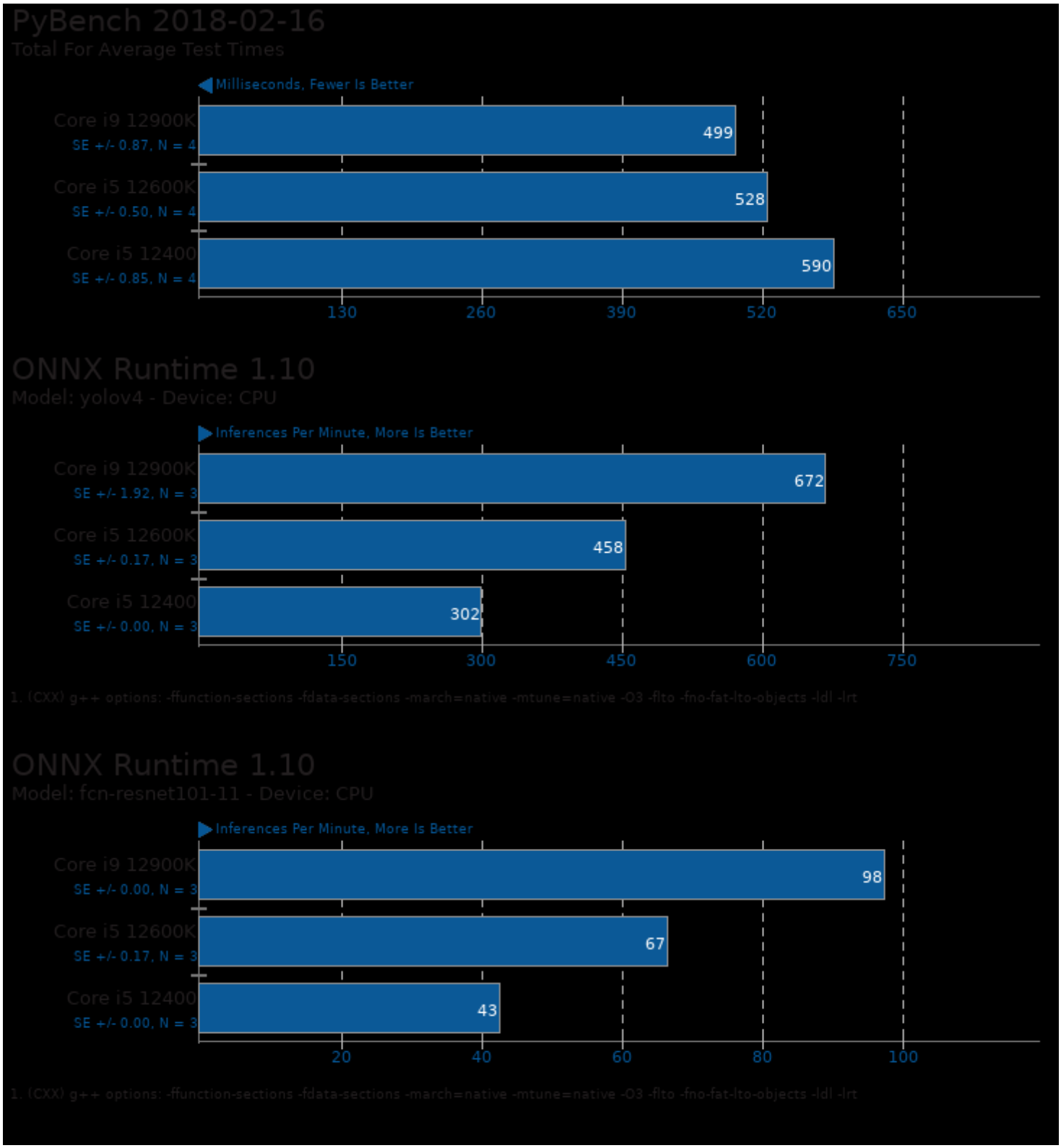

TNN 0.3
Target: CPU - Model: SqueezeNet v2
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.10, N = 9
MIN: 39.54 / MAX: 42.45
40.81
Core i5 12600K
SE +/- 0.03, N = 9
MIN: 42.1 / MAX: 44.39
43.17
Core i5 12400
SE +/- 0.03, N = 9
MIN: 46.96 / MAX: 49.11
48.18
11
22
33
44
55
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl
TNN 0.3
Target: CPU - Model: SqueezeNet v1.1
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.51, N = 5
MIN: 149.14 / MAX: 158.84
153.15
Core i5 12600K
SE +/- 0.18, N = 5
MIN: 157.47 / MAX: 164.46
161.01
Core i5 12400
SE +/- 0.13, N = 4
MIN: 176.1 / MAX: 183.84
180.98
40
80
120
160
200
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl
PlaidML
FP16: No - Mode: Inference - Network: VGG16 - Device: CPU
FPS, More Is Better
Core i9 12900K
SE +/- 0.05, N = 3
24.66
Core i5 12600K
SE +/- 0.06, N = 3
18.61
Core i5 12400
SE +/- 0.02, N = 3
15.83
6
12
18
24
30

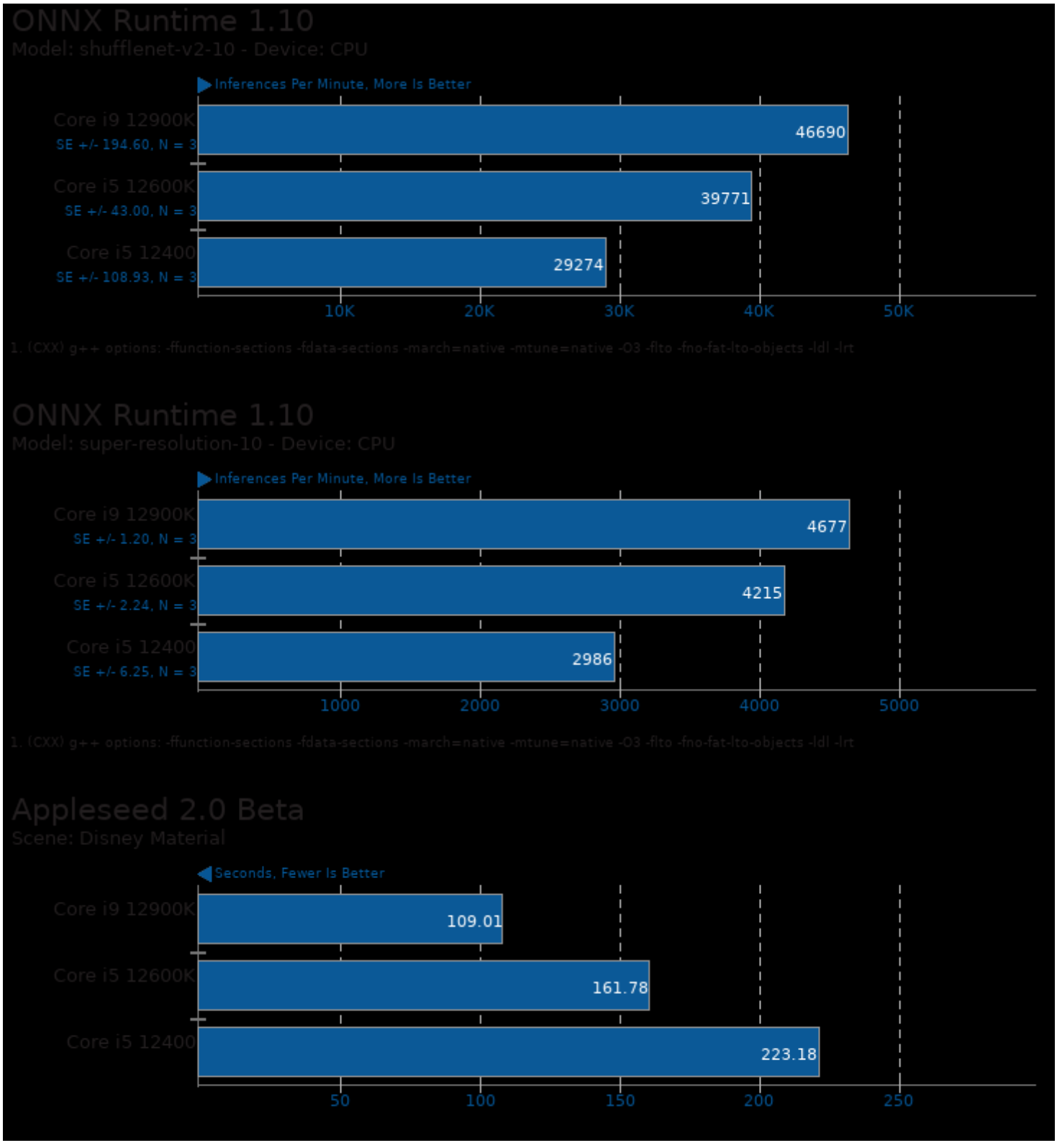
Alder Lake Intel Linux Tests



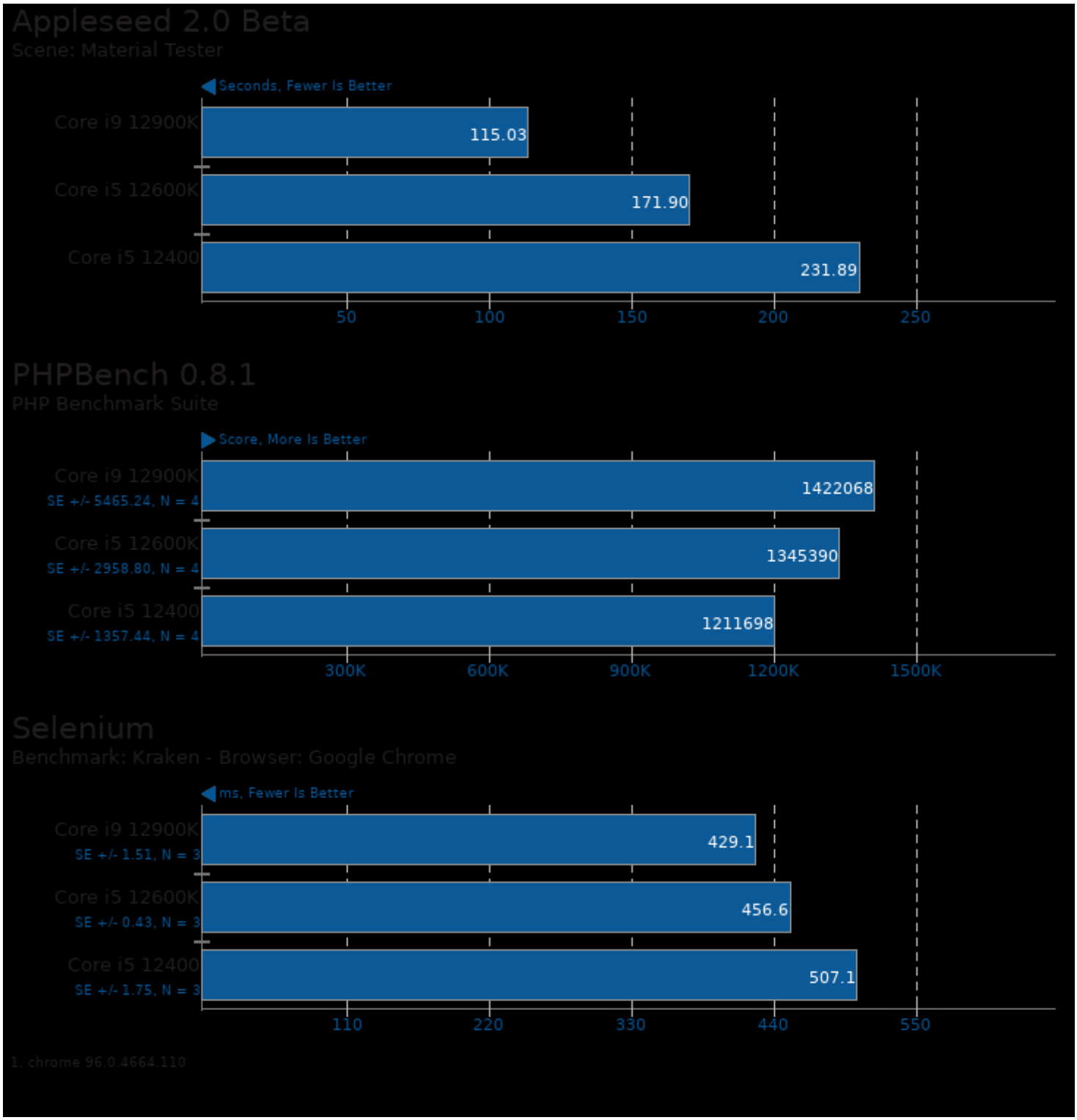
Alder Lake Intel Linux Tests



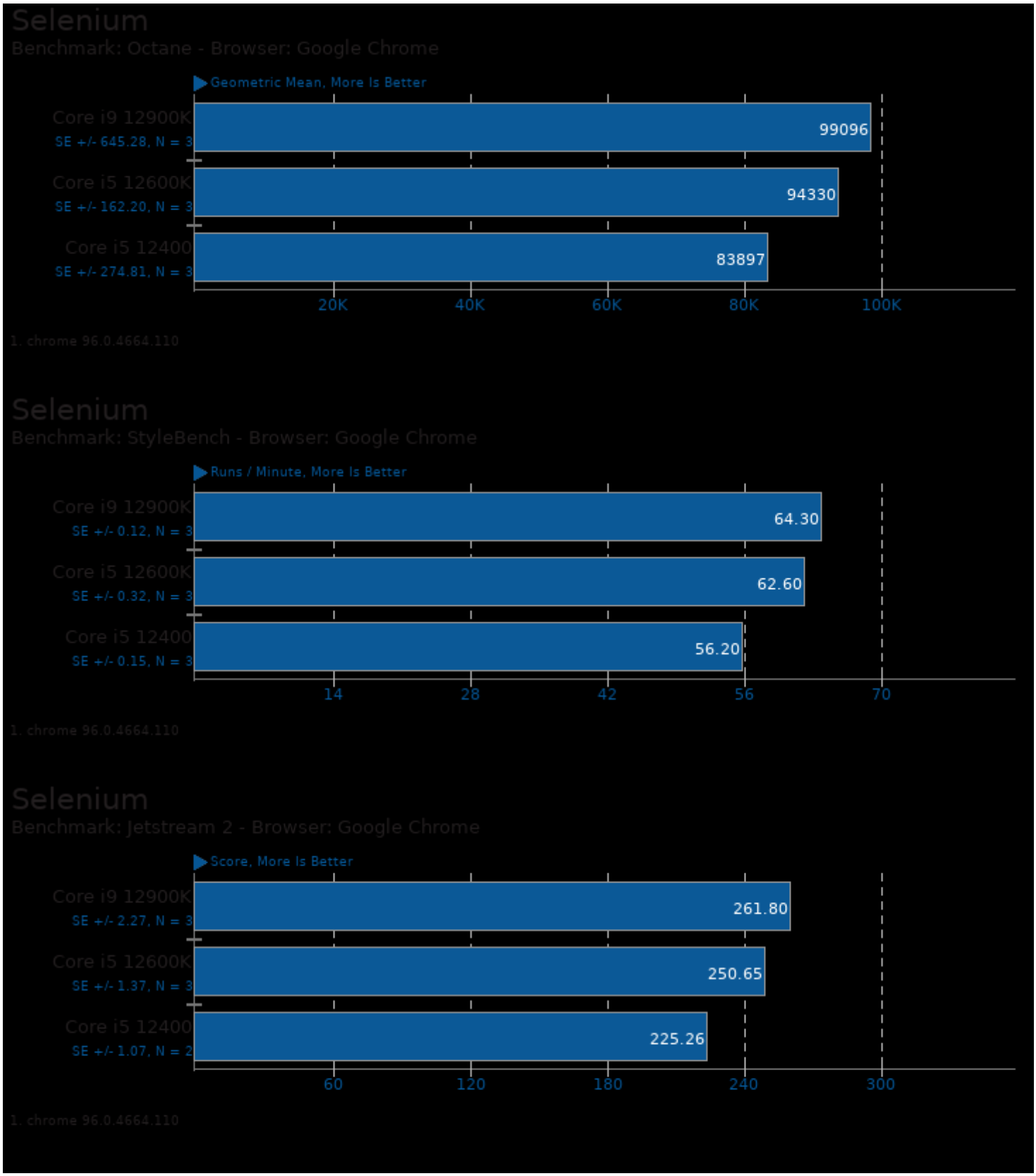

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Core i9 12900K
SE +/- 0.87, N = 4
499
Core i5 12600K
SE +/- 0.50, N = 4
528
Core i5 12400
SE +/- 0.85, N = 4
590
130
260
390
520
650
ONNX Runtime 1.10
Model: yolov4 - Device: CPU
Inferences Per Minute, More Is Better
Core i9 12900K
SE +/- 1.92, N = 3
672
Core i5 12600K
SE +/- 0.17, N = 3
458
Core i5 12400
SE +/- 0.00, N = 3
302
150
300
450
600
750
1. (CXX) g++ options: -ffunction-sections -fdata-sections -march=native -mtune=native -O3 -flto -fno-fat-lto-objects -ldl -lrt
ONNX Runtime 1.10
Model: fcn-resnet101-11 - Device: CPU
Inferences Per Minute, More Is Better
Core i9 12900K
SE +/- 0.00, N = 3
98
Core i5 12600K
SE +/- 0.17, N = 3
67
Core i5 12400
SE +/- 0.00, N = 3
43
20
40
60
80
100
1. (CXX) g++ options: -ffunction-sections -fdata-sections -march=native -mtune=native -O3 -flto -fno-fat-lto-objects -ldl -lrt

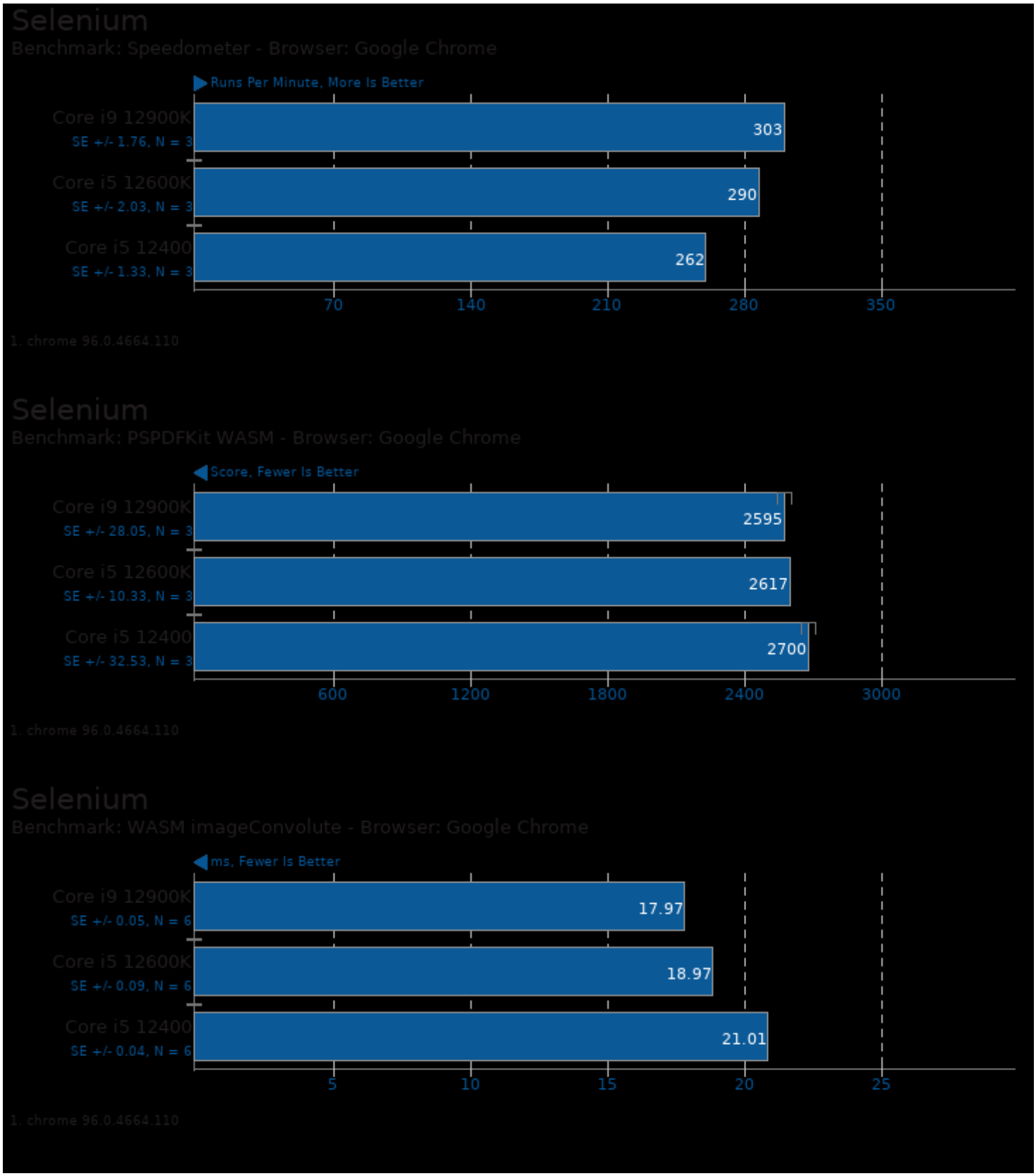

ONNX Runtime 1.10
Model: shufflenet-v2-10 - Device: CPU
Inferences Per Minute, More Is Better
Core i9 12900K
SE +/- 194.60, N = 3
46690
Core i5 12600K
SE +/- 43.00, N = 3
39771
Core i5 12400
SE +/- 108.93, N = 3
29274
10K
20K
30K
40K
50K
1. (CXX) g++ options: -ffunction-sections -fdata-sections -march=native -mtune=native -O3 -flto -fno-fat-lto-objects -ldl -lrt
ONNX Runtime 1.10
Model: super-resolution-10 - Device: CPU
Inferences Per Minute, More Is Better
Core i9 12900K
SE +/- 1.20, N = 3
4677
Core i5 12600K
SE +/- 2.24, N = 3
4215
Core i5 12400
SE +/- 6.25, N = 3
2986
1000
2000
3000
4000
5000
1. (CXX) g++ options: -ffunction-sections -fdata-sections -march=native -mtune=native -O3 -flto -fno-fat-lto-objects -ldl -lrt
Appleseed 2.0 Beta
Scene: Disney Material
Seconds, Fewer Is Better
Core i9 12900K
109.01
Core i5 12600K
161.78
Core i5 12400
223.18
50
100
150
200
250

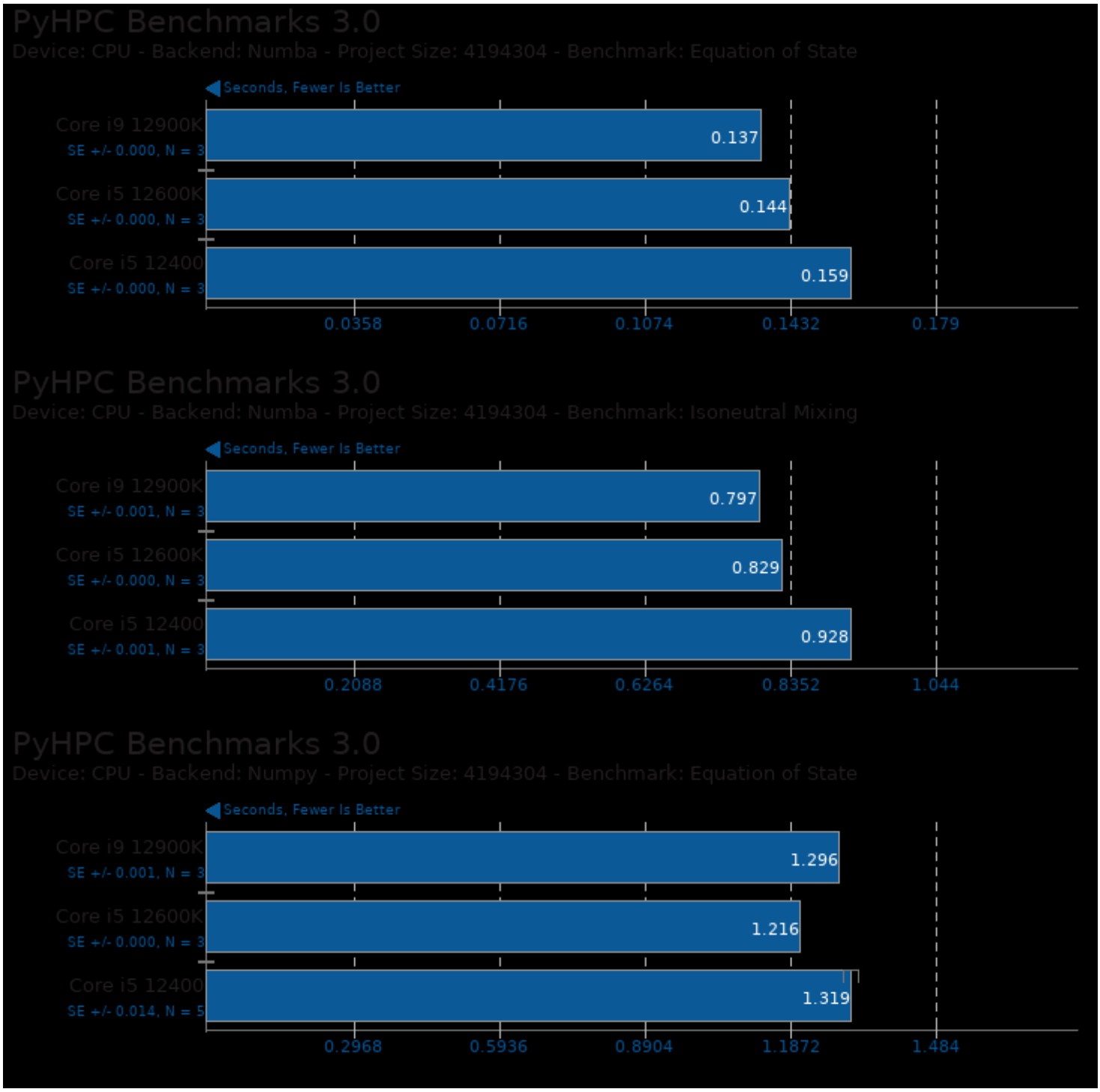
Alder Lake Intel Linux Tests

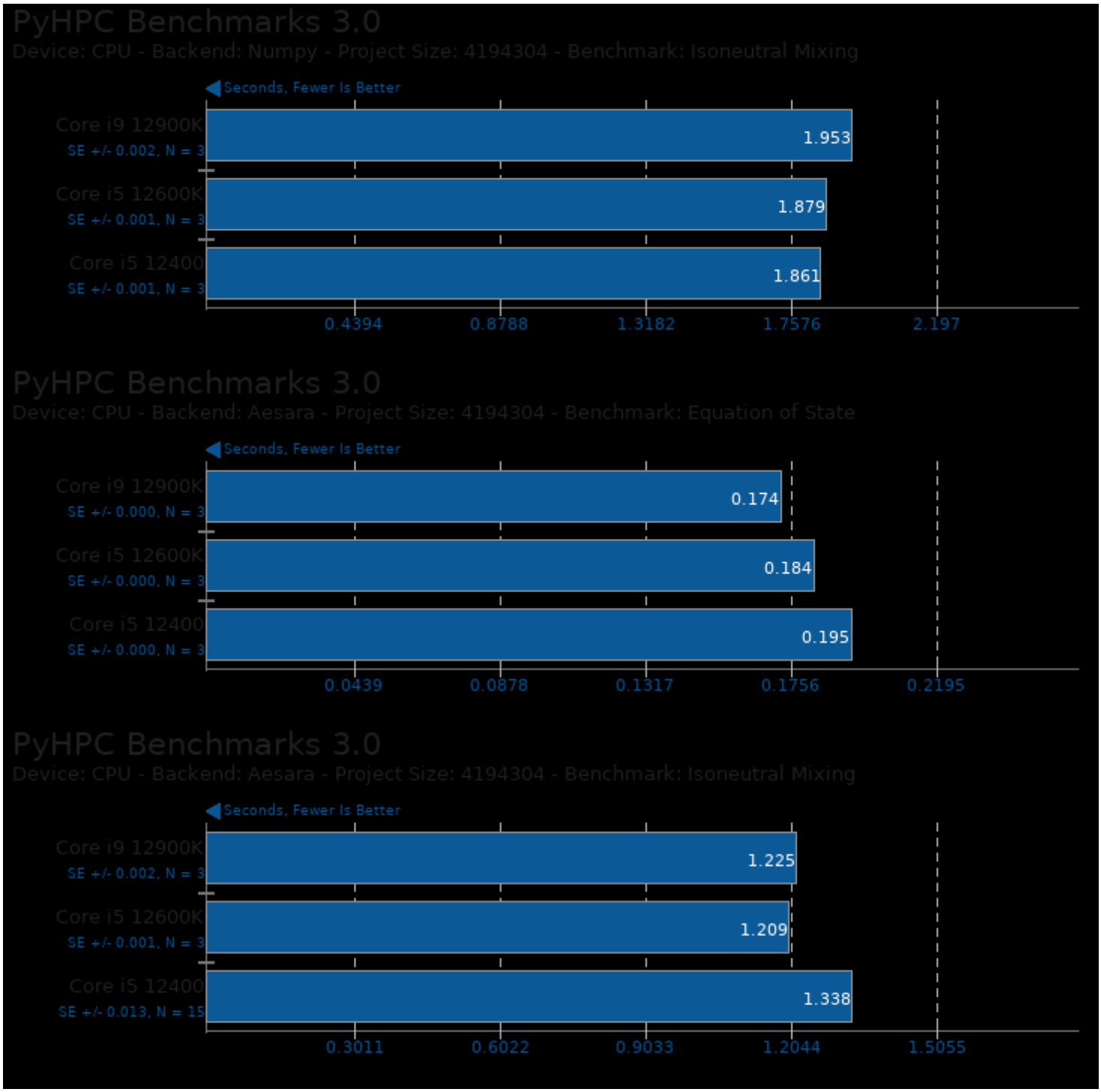


Alder Lake Intel Linux Tests

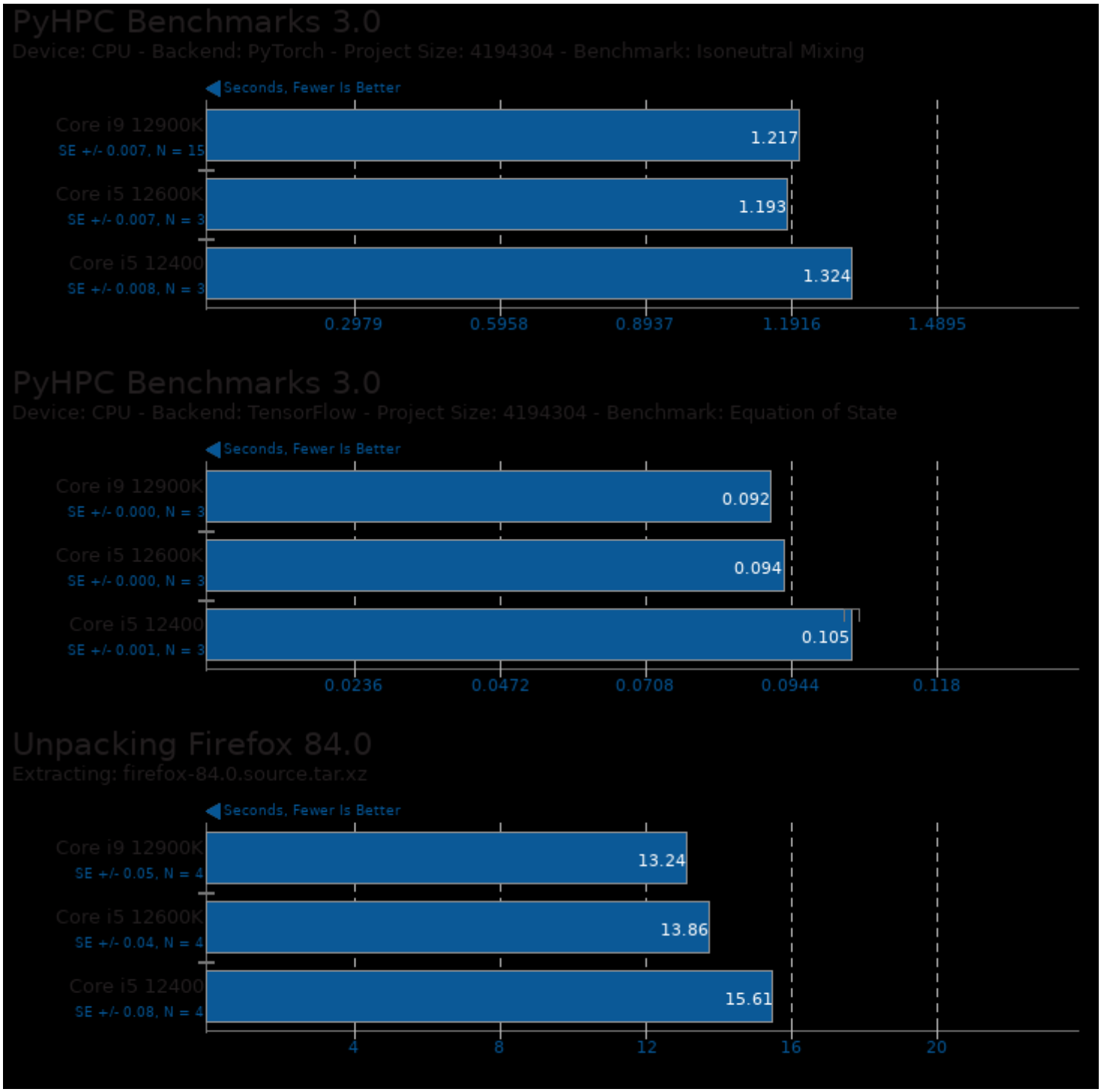


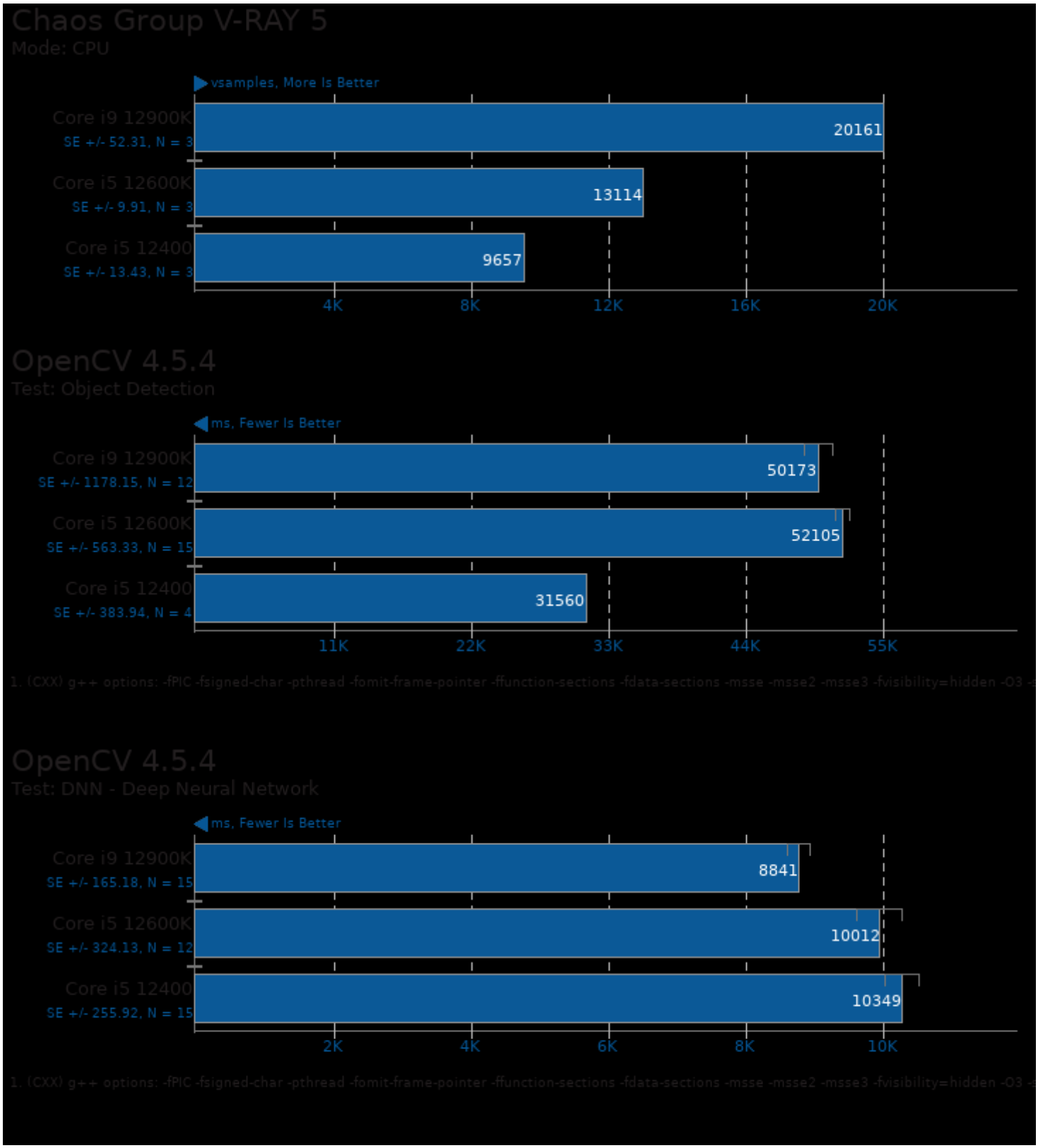

Selenium
Benchmark: Speedometer - Browser: Google Chrome
Runs Per Minute, More Is Better
Core i9 12900K
SE +/- 1.76, N = 3
303
Core i5 12600K
SE +/- 2.03, N = 3
290
Core i5 12400
SE +/- 1.33, N = 3
262
70
140
210
280
350
1. chrome 96.0.4664.110
Selenium
Benchmark: PSPDFKit WASM - Browser: Google Chrome
Score, Fewer Is Better
Core i9 12900K
SE +/- 28.05, N = 3
2595
Core i5 12600K
SE +/- 10.33, N = 3
2617
Core i5 12400
SE +/- 32.53, N = 3
2700
600
1200
1800
2400
3000
1. chrome 96.0.4664.110
Selenium
Benchmark: WASM imageConvolute - Browser: Google Chrome
ms, Fewer Is Better
Core i9 12900K
SE +/- 0.05, N = 6
17.97
Core i5 12600K
SE +/- 0.09, N = 6
18.97
Core i5 12400
SE +/- 0.04, N = 6
21.01
5
10
15
20
25
1. chrome 96.0.4664.110

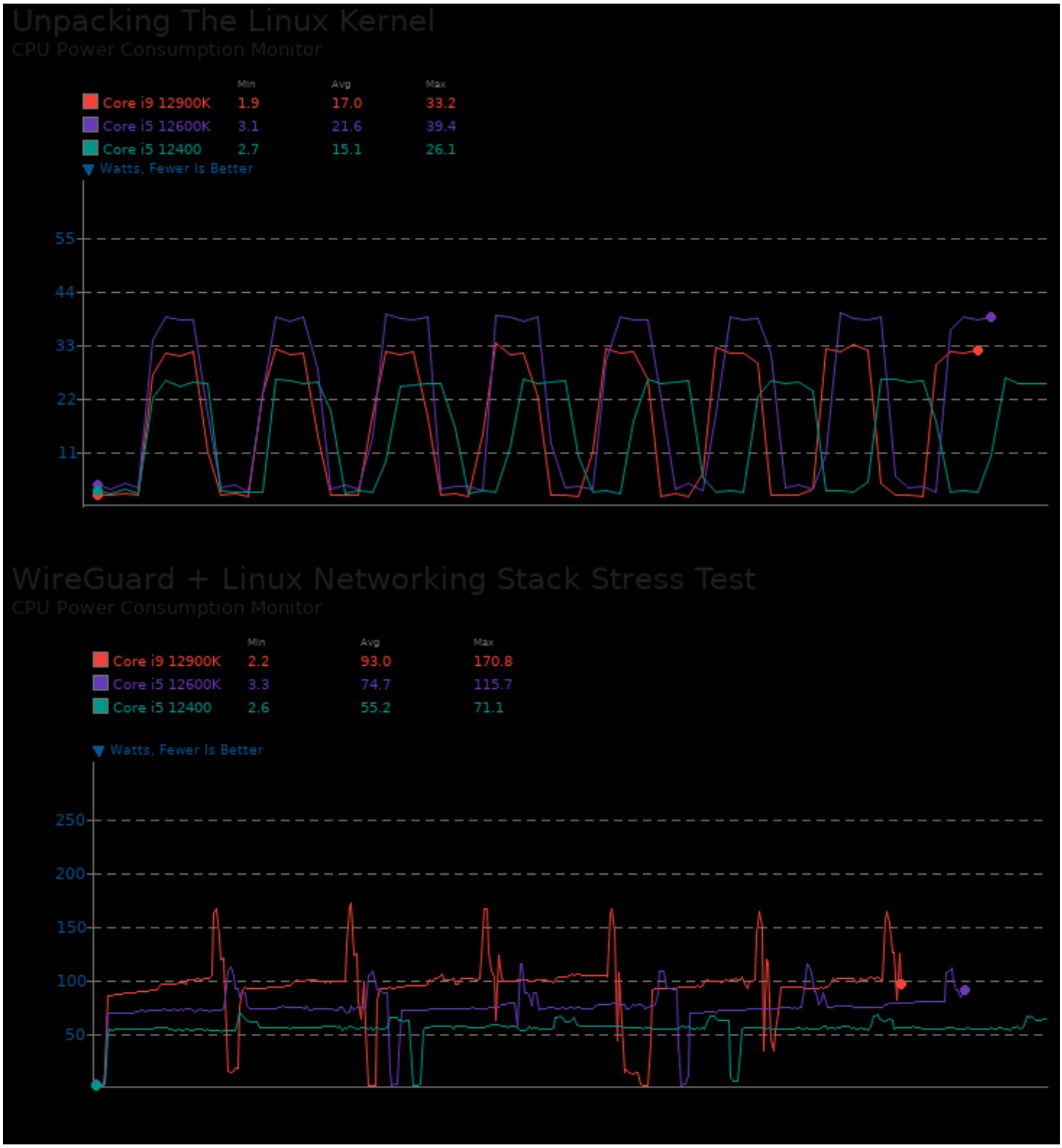

PyHPC Benchmarks 3.0
Device: CPU - Backend: Numba - Project Size: 4194304 - Benchmark: Equation of State
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.000, N = 3
0.137
Core i5 12600K
SE +/- 0.000, N = 3
0.144
Core i5 12400
SE +/- 0.000, N = 3
0.159
0.0358
0.0716
0.1074
0.1432
0.179
PyHPC Benchmarks 3.0
Device: CPU - Backend: Numba - Project Size: 4194304 - Benchmark: Isoneutral Mixing
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.001, N = 3
0.797
Core i5 12600K
SE +/- 0.000, N = 3
0.829
Core i5 12400
SE +/- 0.001, N = 3
0.928
0.2088
0.4176
0.6264
0.8352
1.044
PyHPC Benchmarks 3.0
Device: CPU - Backend: Numpy - Project Size: 4194304 - Benchmark: Equation of State
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.001, N = 3
1.296
Core i5 12600K
SE +/- 0.000, N = 3
1.216
Core i5 12400
SE +/- 0.014, N = 5
1.319
0.2968
0.5936
0.8904
1.1872
1.484

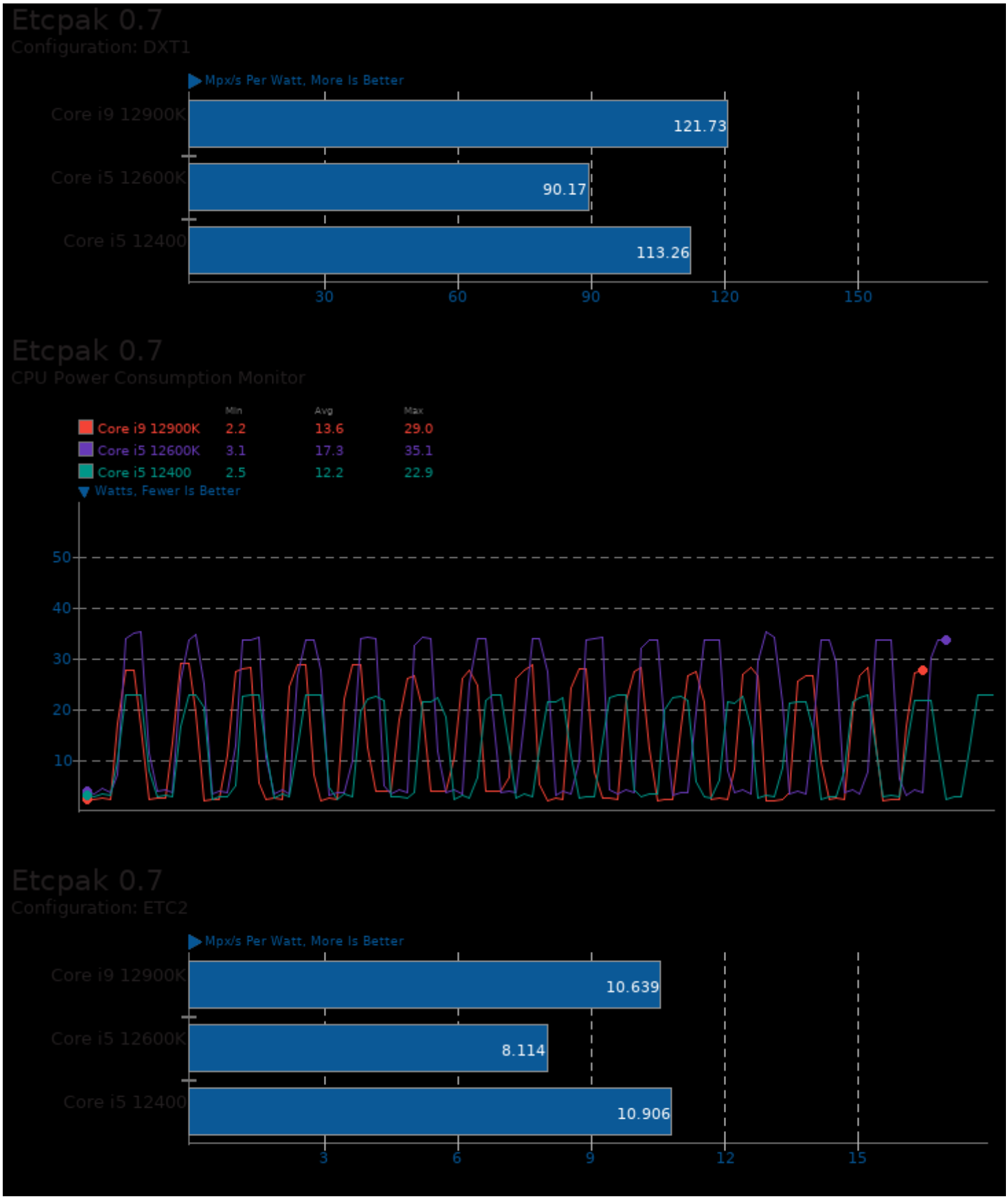

PyHPC Benchmarks 3.0
Device: CPU - Backend: Numpy - Project Size: 4194304 - Benchmark: Isoneutral Mixing
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.002, N = 3
1.953
Core i5 12600K
SE +/- 0.001, N = 3
1.879
Core i5 12400
SE +/- 0.001, N = 3
1.861
0.4394
0.8788
1.3182
1.7576
2.197
PyHPC Benchmarks 3.0
Device: CPU - Backend: Aesara - Project Size: 4194304 - Benchmark: Equation of State
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.000, N = 3
0.174
Core i5 12600K
SE +/- 0.000, N = 3
0.184
Core i5 12400
SE +/- 0.000, N = 3
0.195
0.0439
0.0878
0.1317
0.1756
0.2195
PyHPC Benchmarks 3.0
Device: CPU - Backend: Aesara - Project Size: 4194304 - Benchmark: Isoneutral Mixing
Seconds, Fewer Is Better
Core i9 12900K
SE +/- 0.002, N = 3
1.225
Core i5 12600K
SE +/- 0.001, N = 3
1.209
Core i5 12400
SE +/- 0.013, N = 15
1.338
0.3011
0.6022
0.9033
1.2044
1.5055

Alder Lake Intel Linux Tests



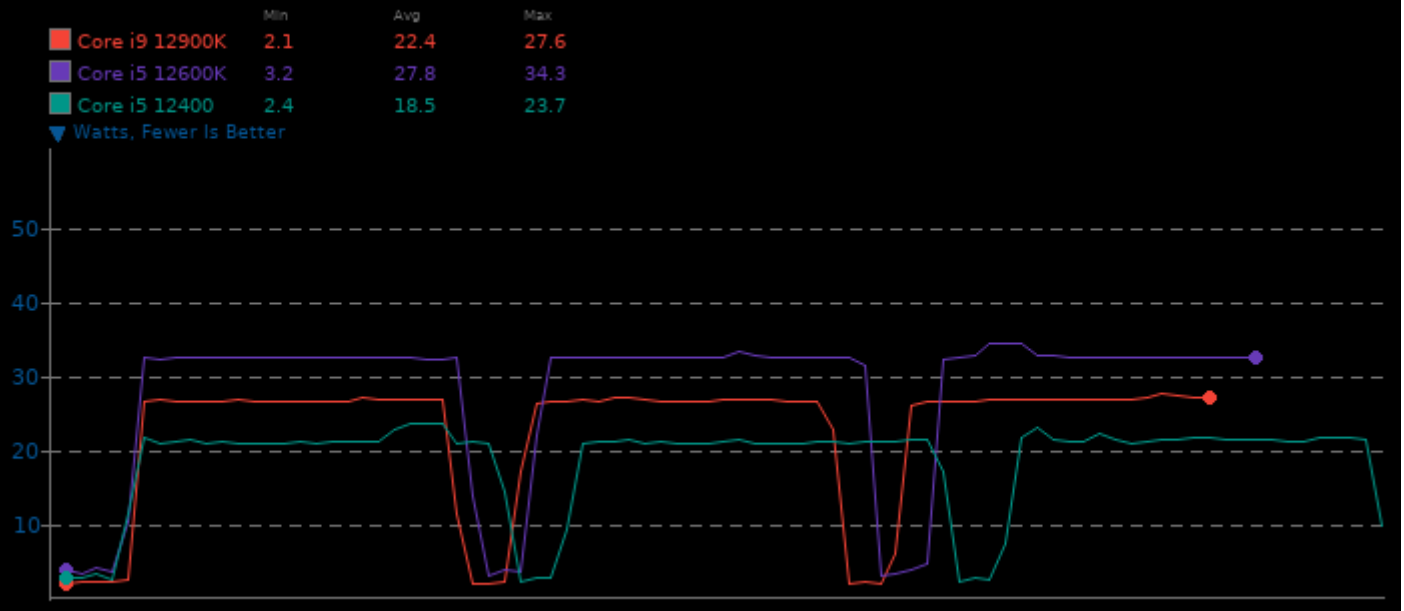

Chaos Group V-RAY 5
Mode: CPU
vsamples, More Is Better
Core i9 12900K
SE +/- 52.31, N = 3
20161
Core i5 12600K
SE +/- 9.91, N = 3
13114
Core i5 12400
SE +/- 13.43, N = 3
9657
4K
8K
12K
16K
20K
OpenCV 4.5.4
Test: Object Detection
ms, Fewer Is Better
Core i9 12900K
SE +/- 1178.15, N = 12
50173
Core i5 12600K
SE +/- 563.33, N = 15
52105
Core i5 12400
SE +/- 383.94, N = 4
31560
11K
22K
33K
44K
55K
1. (CXX) g++ options: -fPIC -fsigned-char -pthread -fomit-frame-pointer -ffunction-sections -fdata-sections -msse -msse2 -msse3 -fvisibility=hidden -O3
OpenCV 4.5.4
Test: DNN - Deep Neural Network
ms, Fewer Is Better
Core i9 12900K
SE +/- 165.18, N = 15
8841
Core i5 12600K
SE +/- 324.13, N = 12
10012
Core i5 12400
SE +/- 255.92, N = 15
10349
2K
4K
6K
8K
10K
1. (CXX) g++ options: -fPIC -fsigned-char -pthread -fomit-frame-pointer -ffunction-sections -fdata-sections -msse -msse2 -msse3 -fvisibility=hidden -O3


Unpacking The Linux Kernel
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 1.9 17.0 33.2
Core i5 12600K 3.1 21.6 39.4
Core i5 12400 2.7 15.1 26.1
Watts, Fewer Is Better
55
44
33
22
11
WireGuard + Linux Networking Stack Stress Test
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 93.0 170.8
Core i5 12600K 3.3 74.7 115.7
Core i5 12400 2.6 55.2 71.1
Watts, Fewer Is Better
250
200
150
100
50


Etcpak 0.7
Configuration: DXT1
Mpx/s Per Watt, More Is Better
Core i9 12900K
121.73
Core i5 12600K
90.17
Core i5 12400
113.26
30
60
90
120
150
Etcpak 0.7
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 13.6 29.0
Core i5 12600K 3.1 17.3 35.1
Core i5 12400 2.5 12.2 22.9
Watts, Fewer Is Better
50
40
30
20
10
Etcpak 0.7
Configuration: ETC2
Mpx/s Per Watt, More Is Better
Core i9 12900K
10.639
Core i5 12600K
8.114
Core i5 12400
10.906
3
6
9
12
15

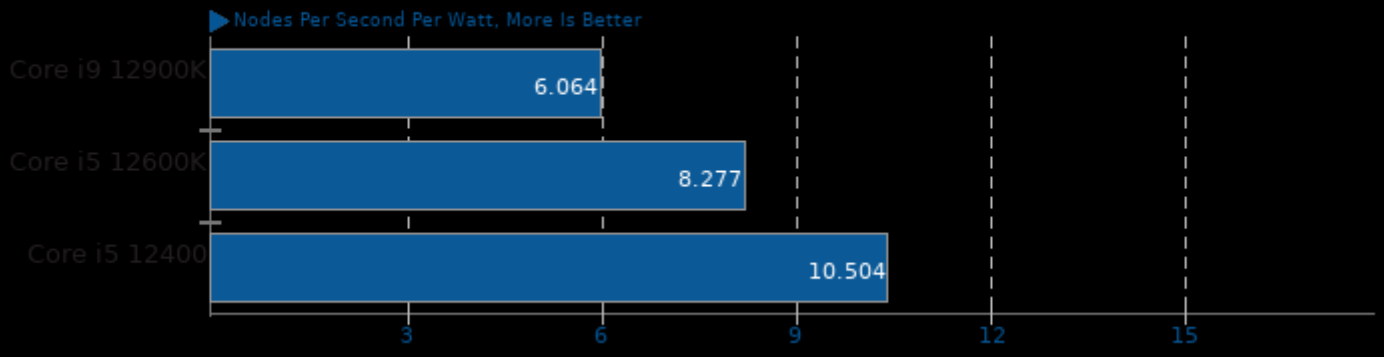
Etcpak 0.7

CPU Power Consumption Monitor



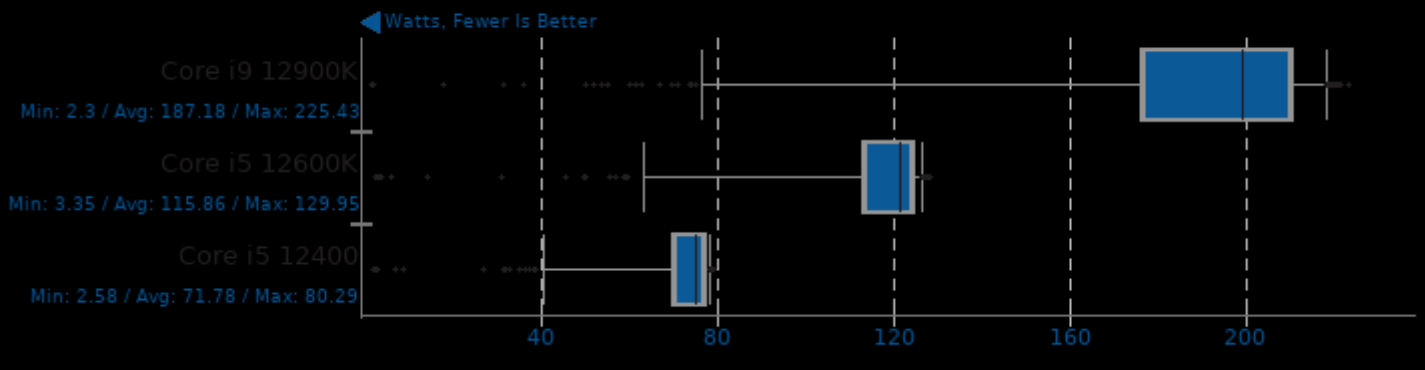
LeelaChessZero 0.28

Backend: BLAS



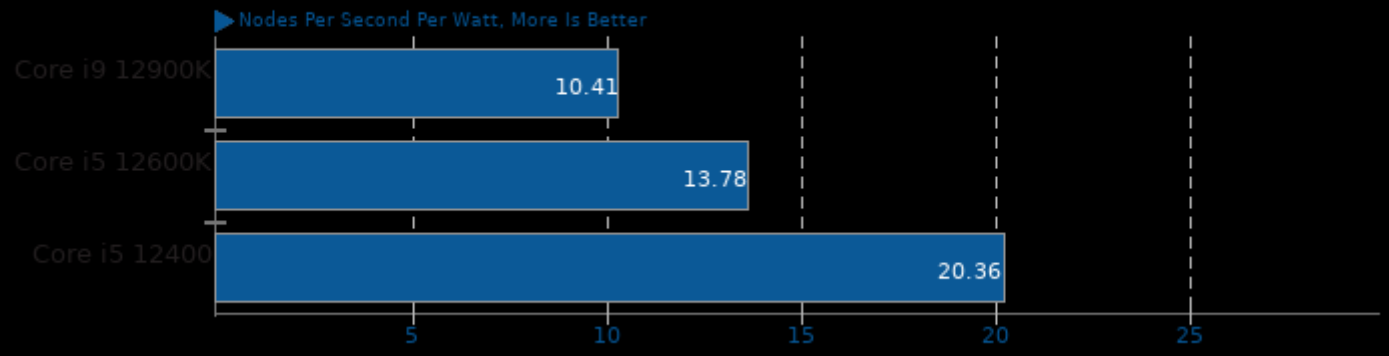
LeelaChessZero 0.28

CPU Power Consumption Monitor



LeelaChessZero 0.28

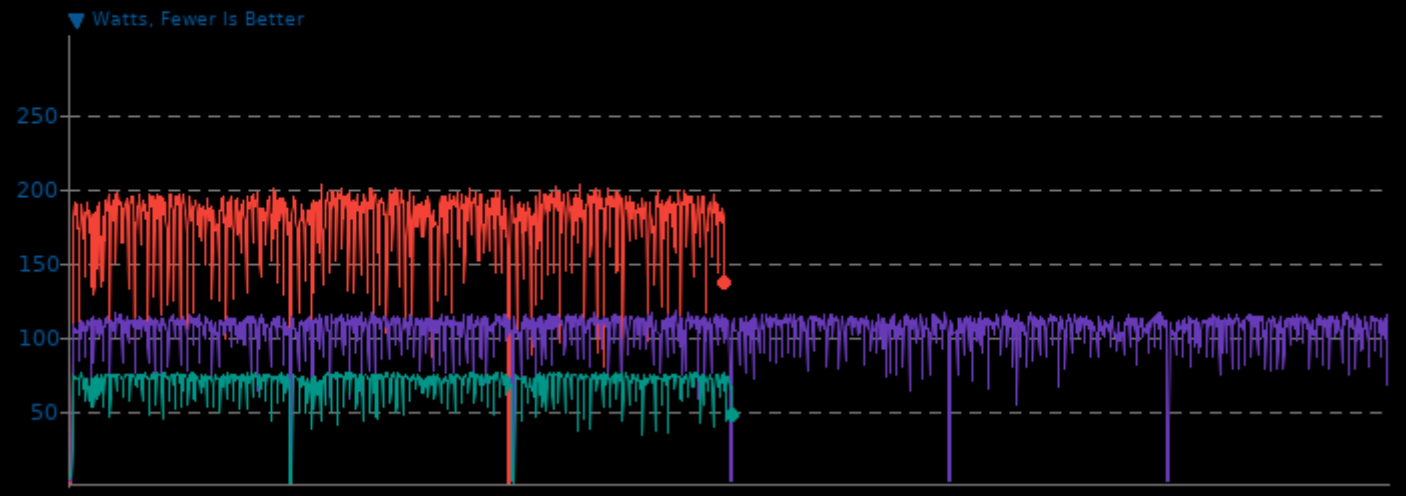
Backend: Eigen



LeelaChessZero 0.28

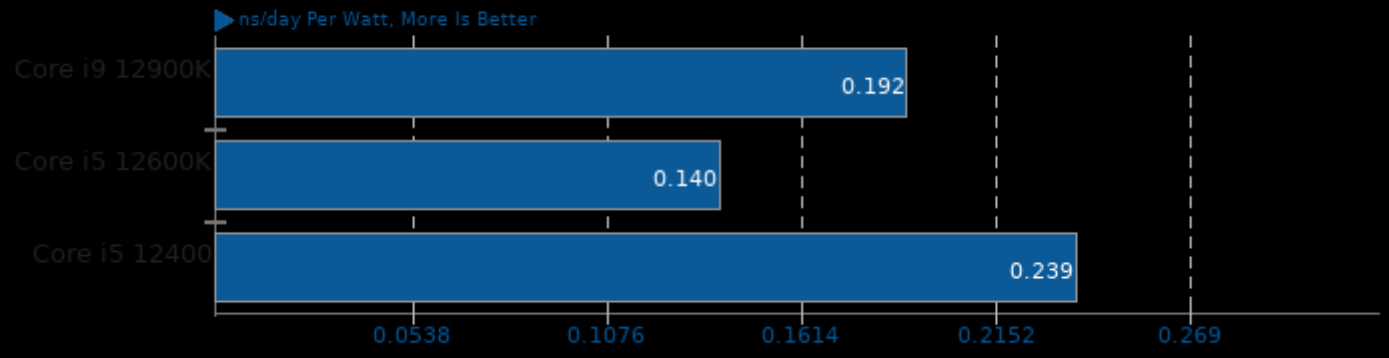
CPU Power Consumption Monitor

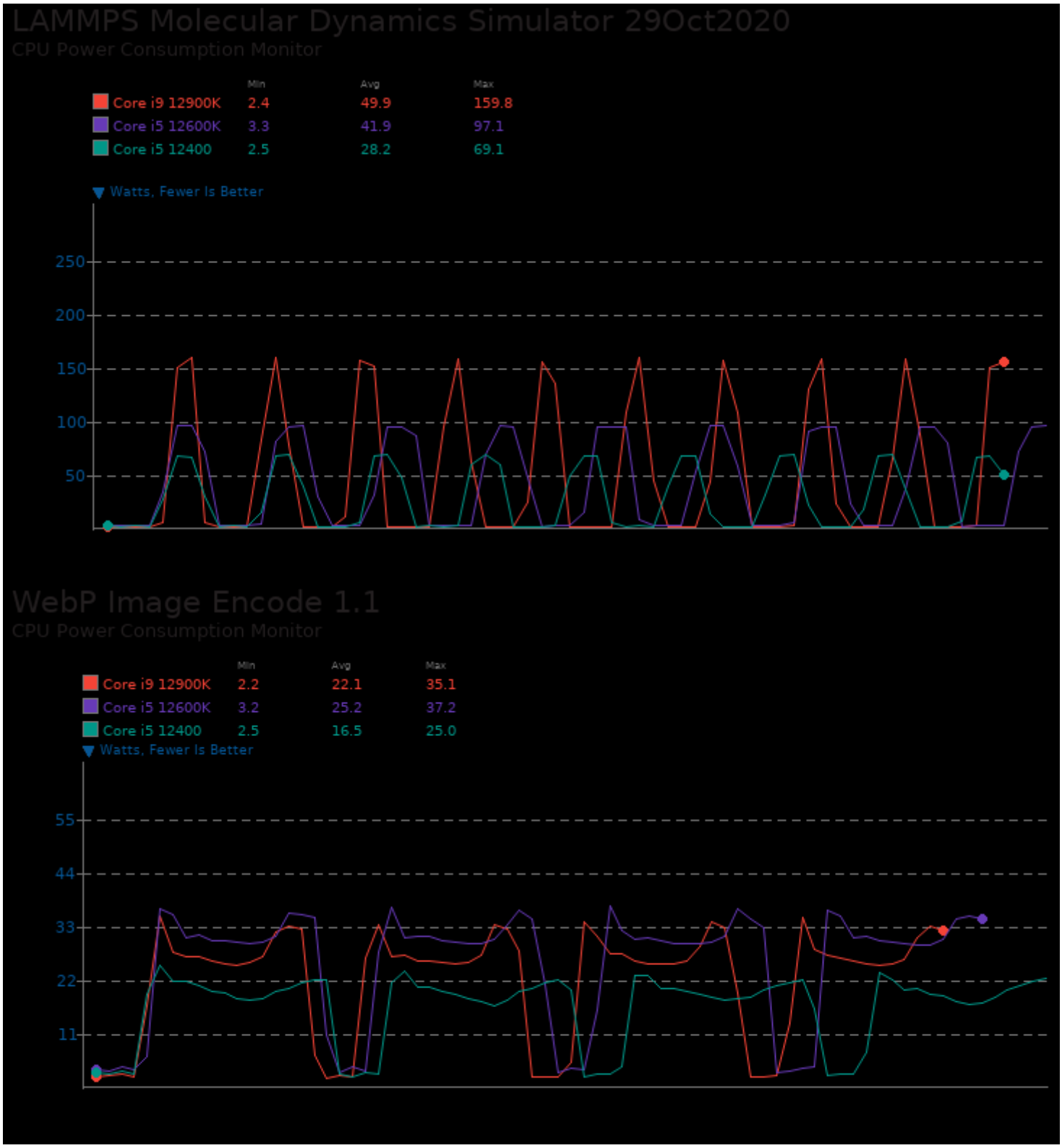
	Min	Avg	Max
Core i9 12900K	2.5	176.9	202.2
Core i5 12600K	3.5	105.1	117.2
Core i5 12400	2.6	69.5	76.8

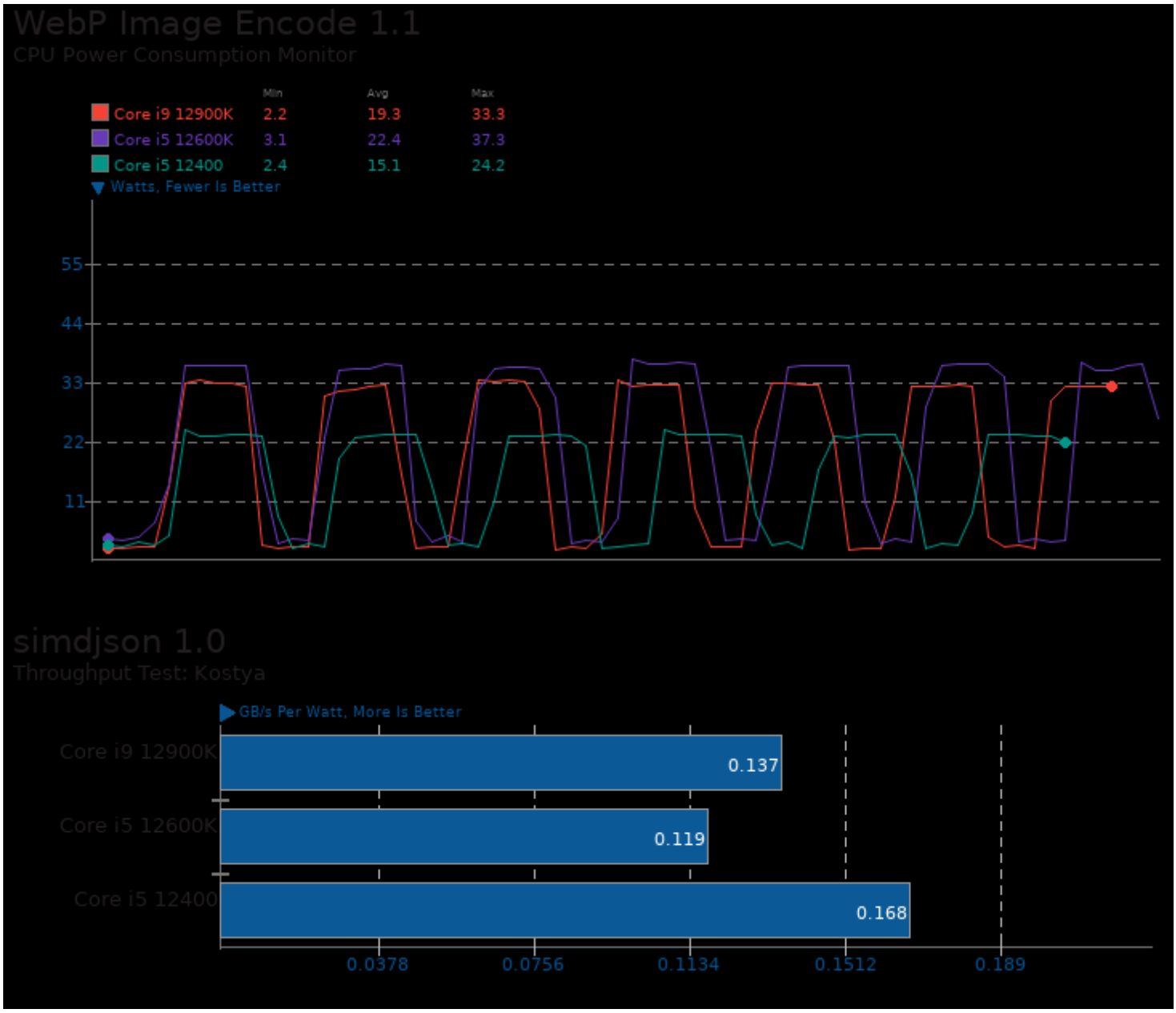


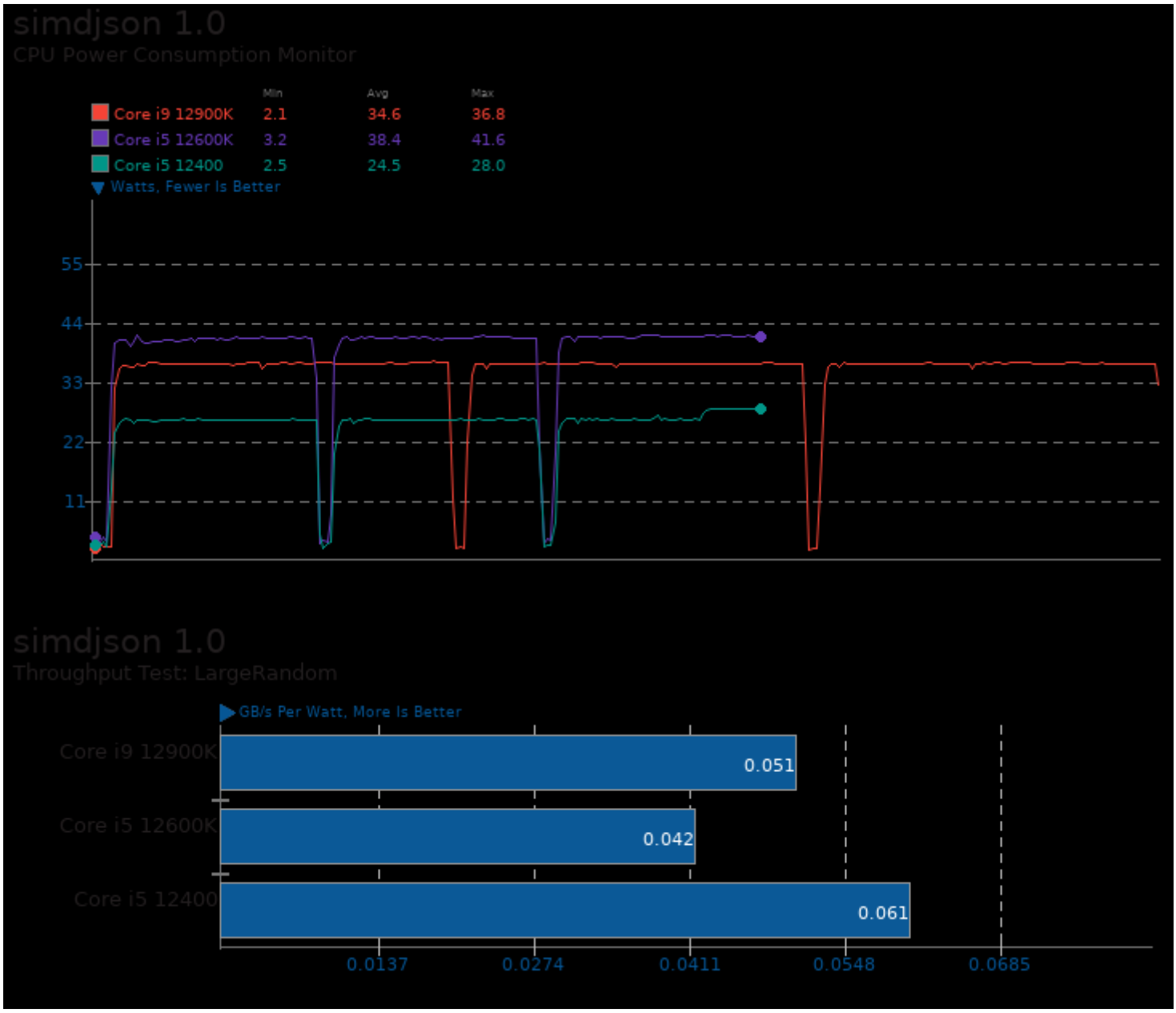
LAMMPS Molecular Dynamics Simulator 29Oct2020

Model: Rhodopsin Protein

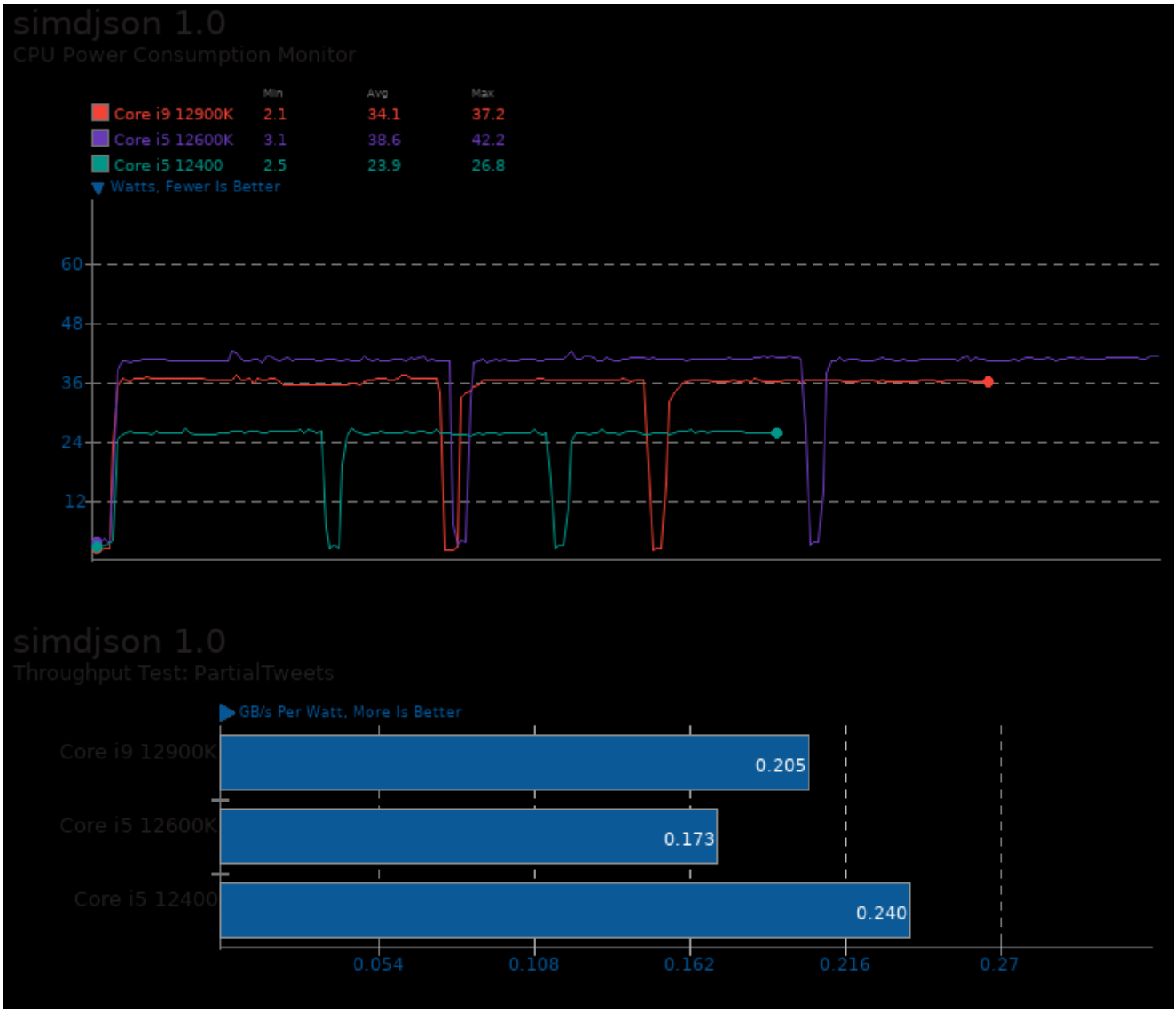


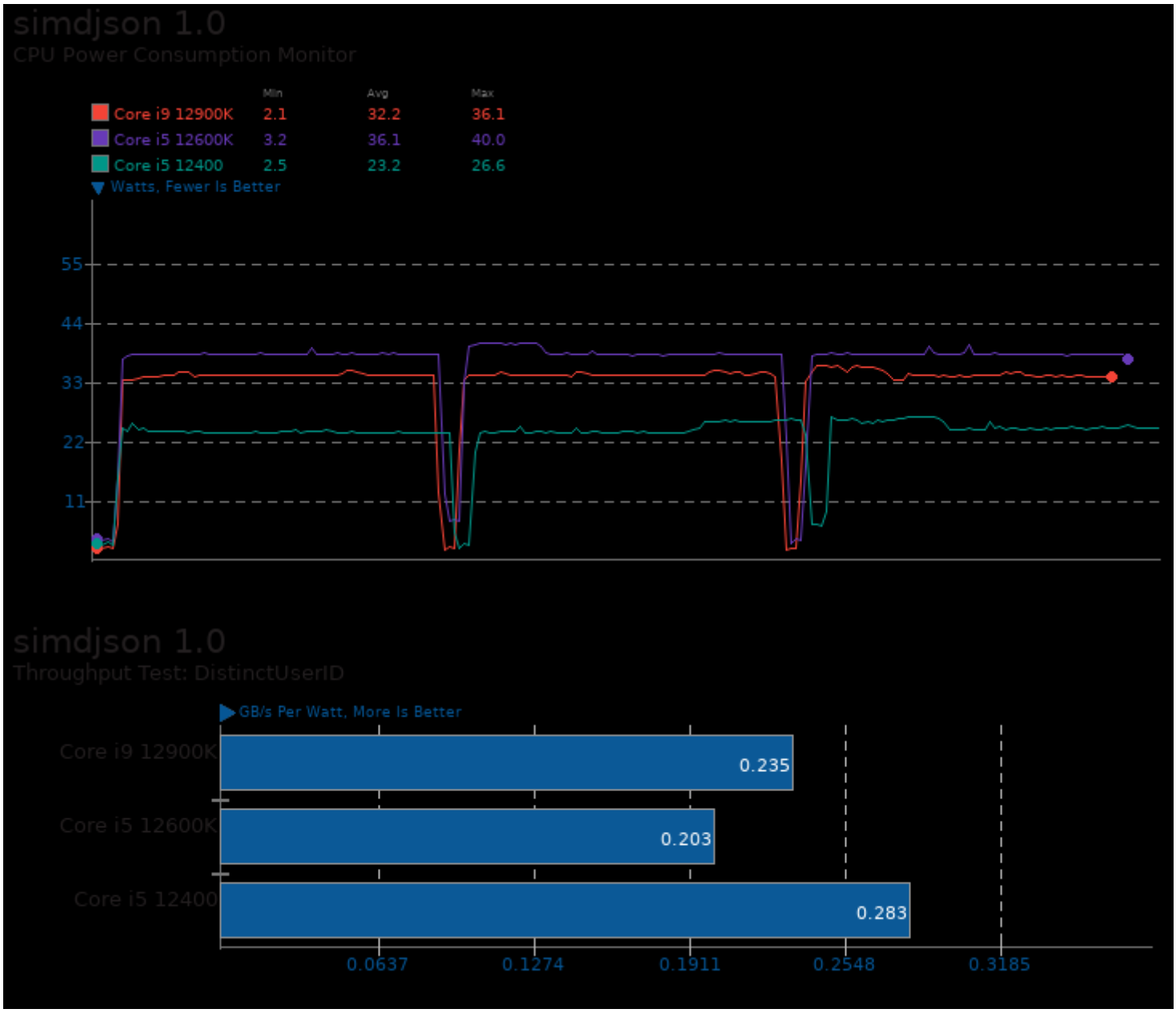

LAMMPS Molecular Dynamics Simulator 29Oct2020
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 49.9 159.8
Core i5 12600K 3.3 41.9 97.1
Core i5 12400 2.5 28.2 69.1
Watts, Fewer Is Better
250
200
150
100
50
WebP Image Encode 1.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 22.1 35.1
Core i5 12600K 3.2 25.2 37.2
Core i5 12400 2.5 16.5 25.0
Watts, Fewer Is Better
55
44
33
22
11


WebP Image Encode 1.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 19.3 33.3
Core i5 12600K 3.1 22.4 37.3
Core i5 12400 2.4 15.1 24.2
Watts, Fewer Is Better
55
44
33
22
11
simdjson 1.0
Throughput Test: Kostya
GB/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.137
0.119
0.168
0.0378
0.0756
0.1134
0.1512
0.189

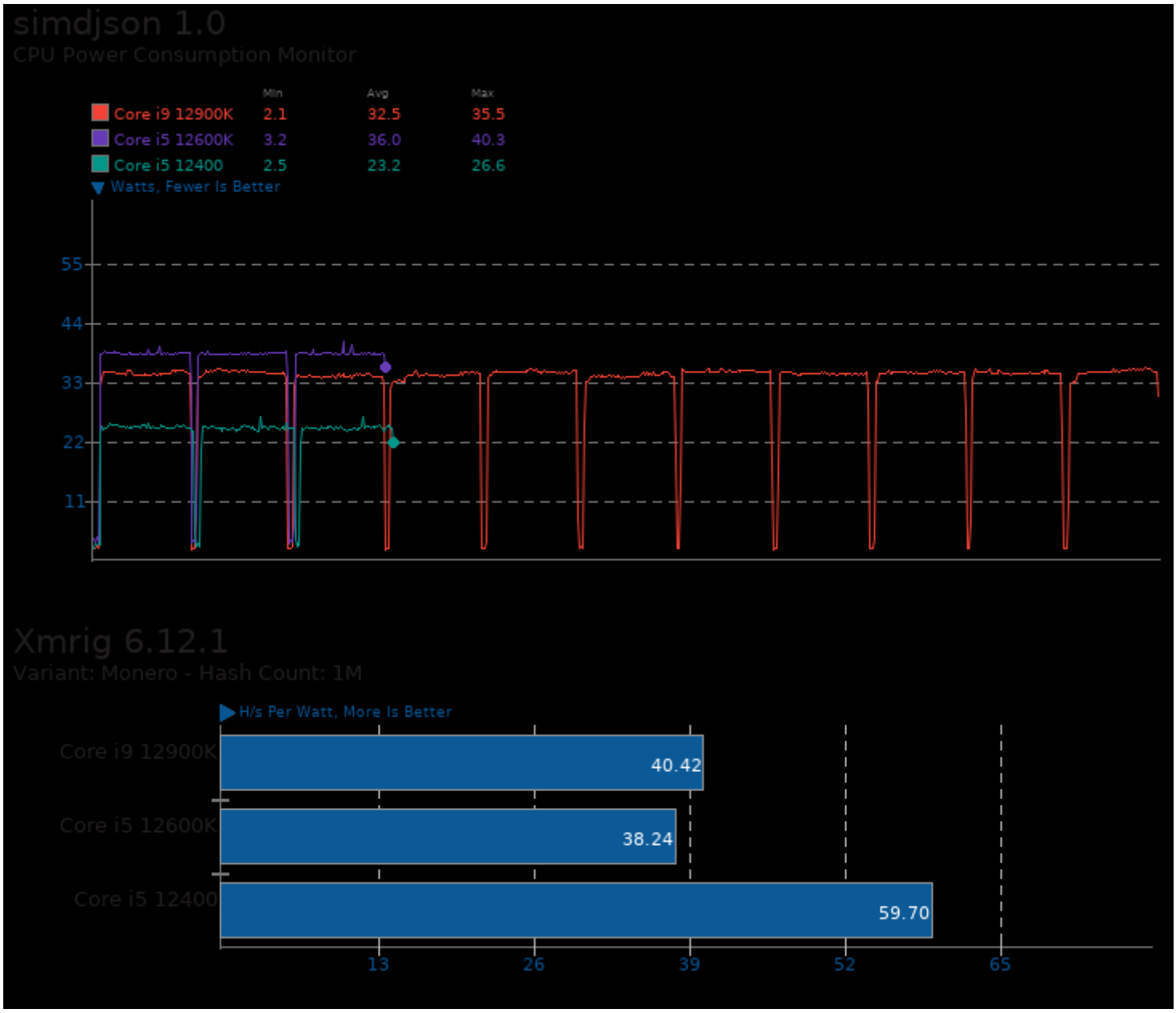

simdjson 1.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 34.6 36.8
Core i5 12600K 3.2 38.4 41.6
Core i5 12400 2.5 24.5 28.0
Watts, Fewer Is Better
55
44
33
22
11
simdjson 1.0
Throughput Test: LargeRandom
GB/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.051
0.042
0.061
0.0137
0.0274
0.0411
0.0548
0.0685

Alder Lake Intel Linux Tests

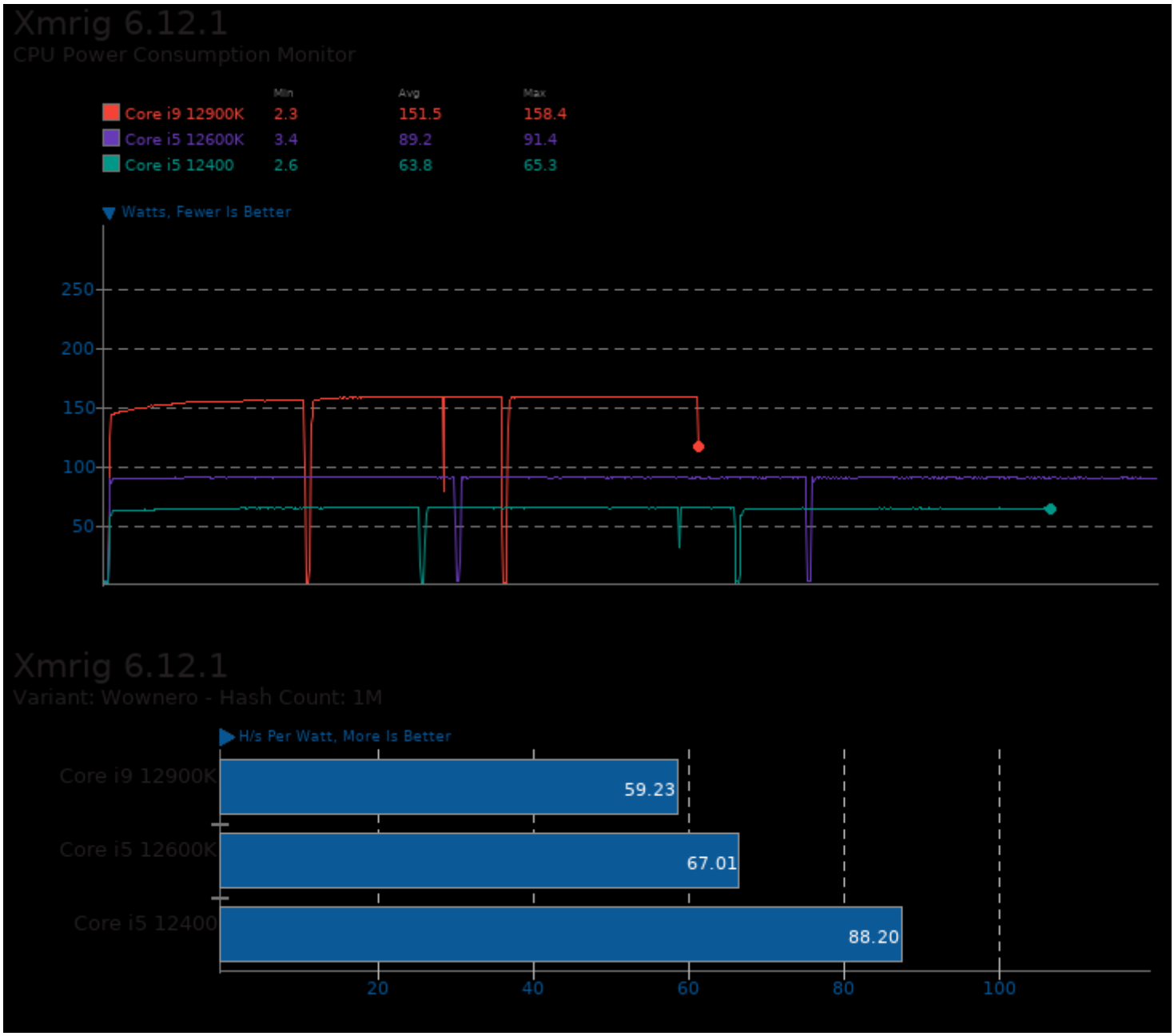


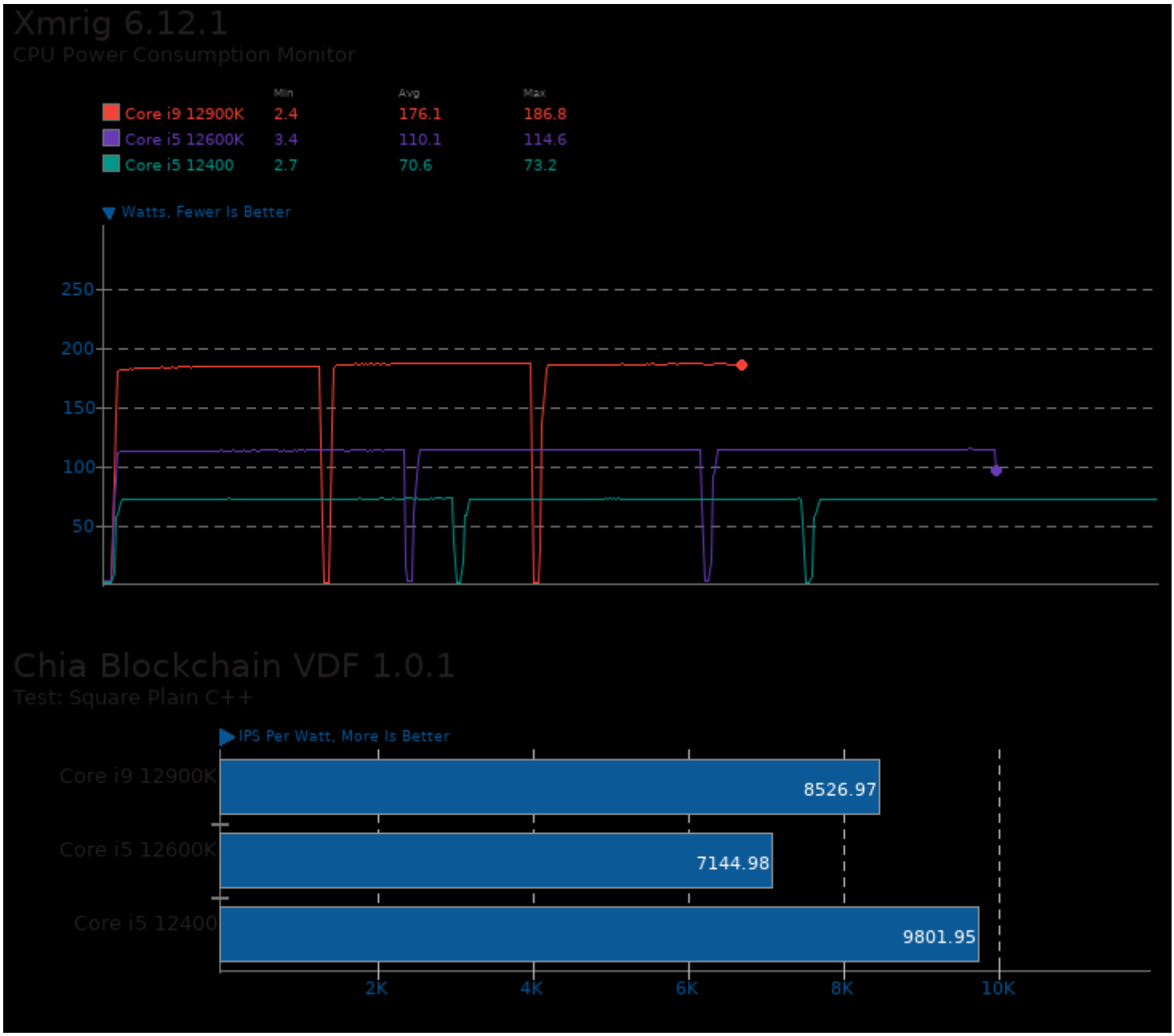

simdjson 1.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 32.2 36.1
Core i5 12600K 3.2 36.1 40.0
Core i5 12400 2.5 23.2 26.6
Watts, Fewer Is Better
55
44
33
22
11
simdjson 1.0
Throughput Test: DistinctUserID
GB/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.235
0.203
0.283
0.0637
0.1274
0.1911
0.2548
0.3185

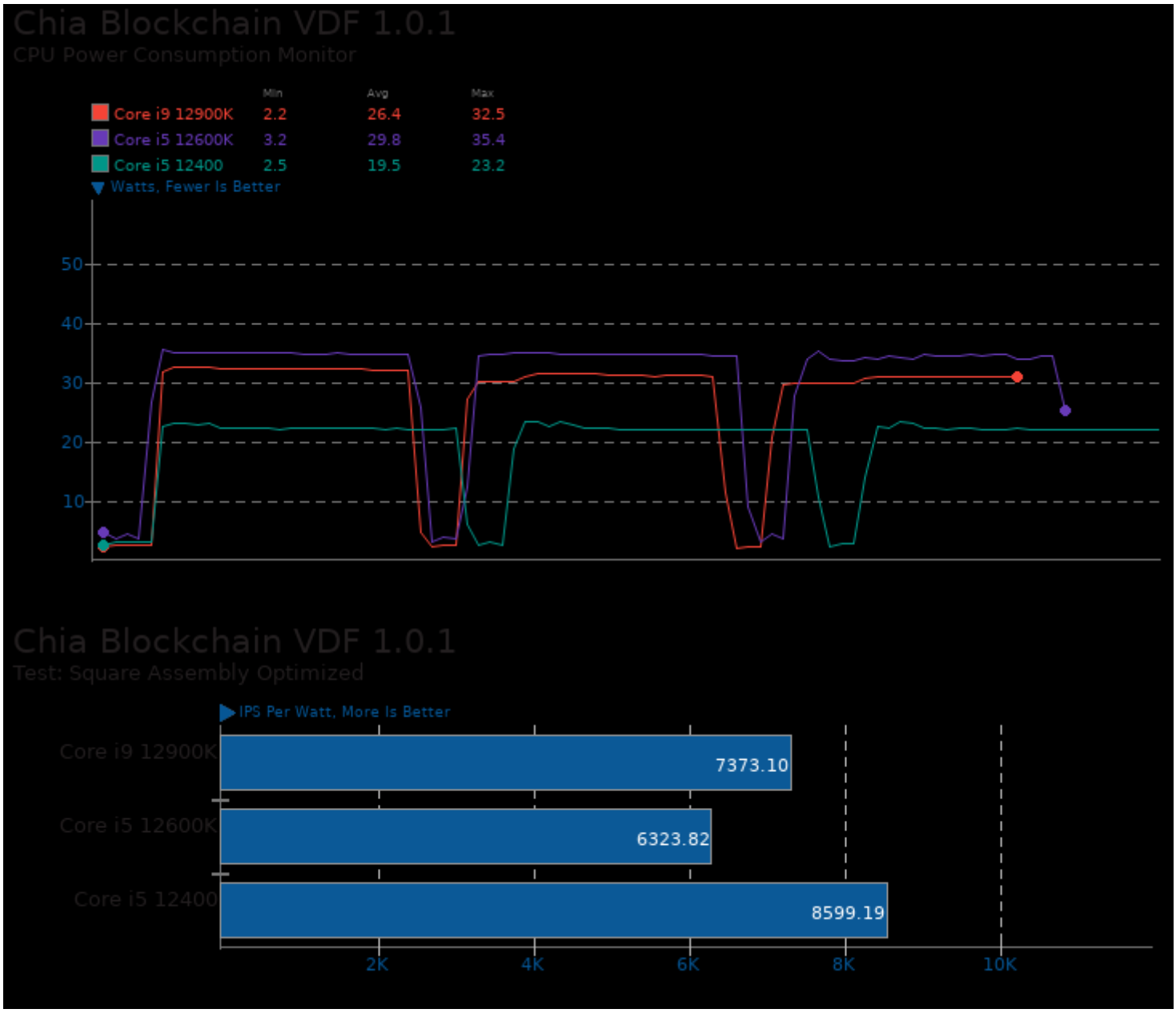
Alder Lake Intel Linux Tests

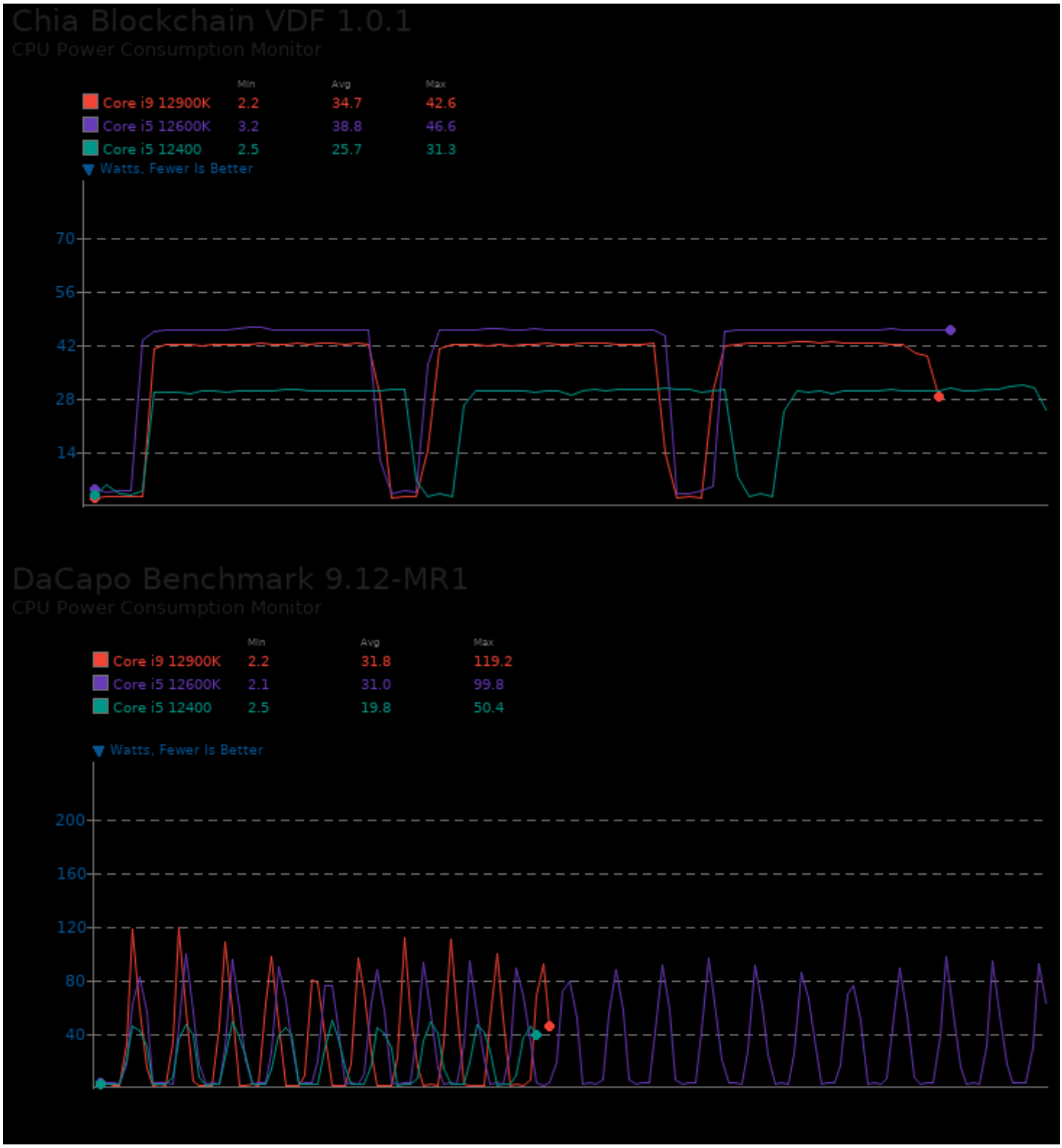


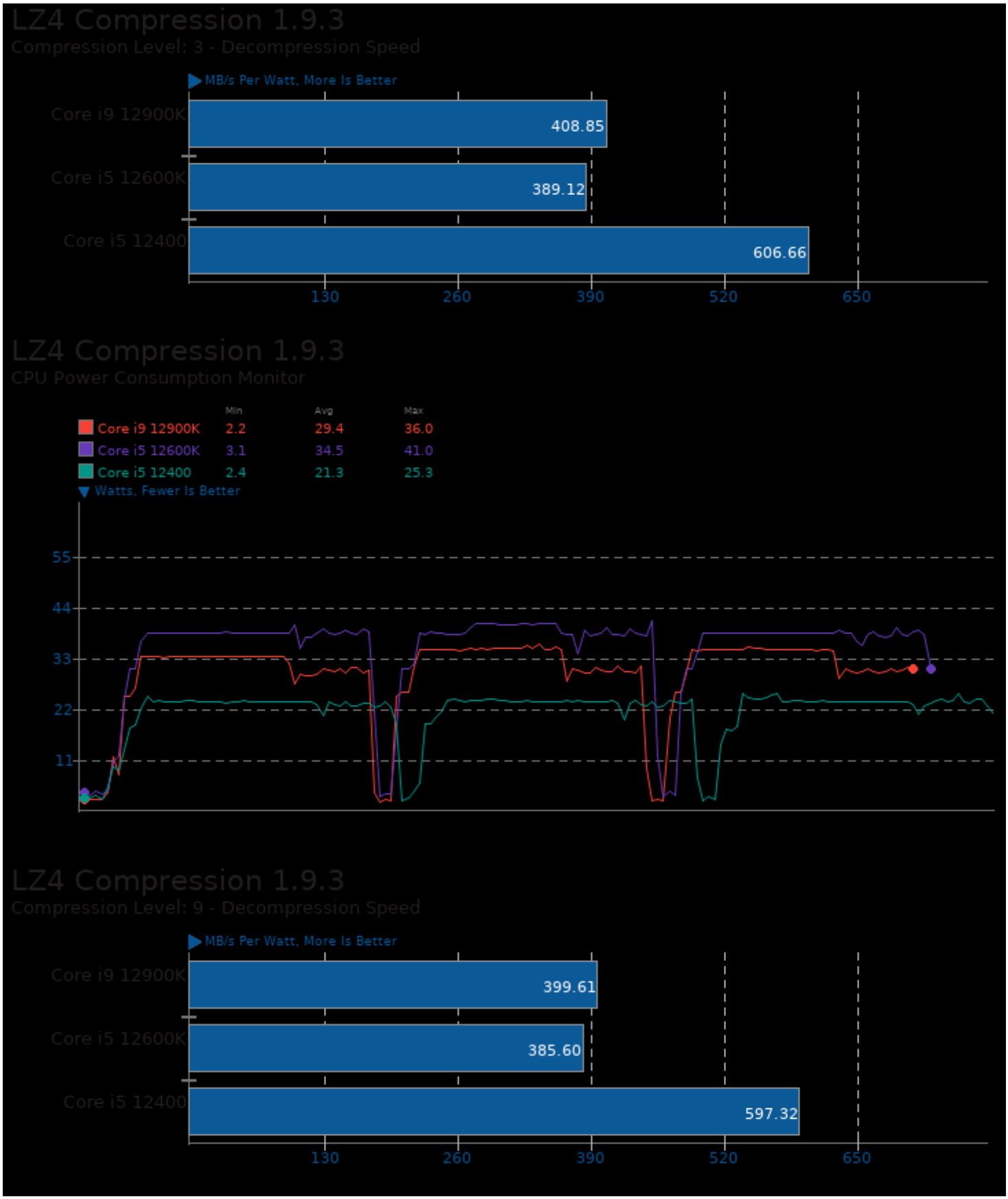
Alder Lake Intel Linux Tests

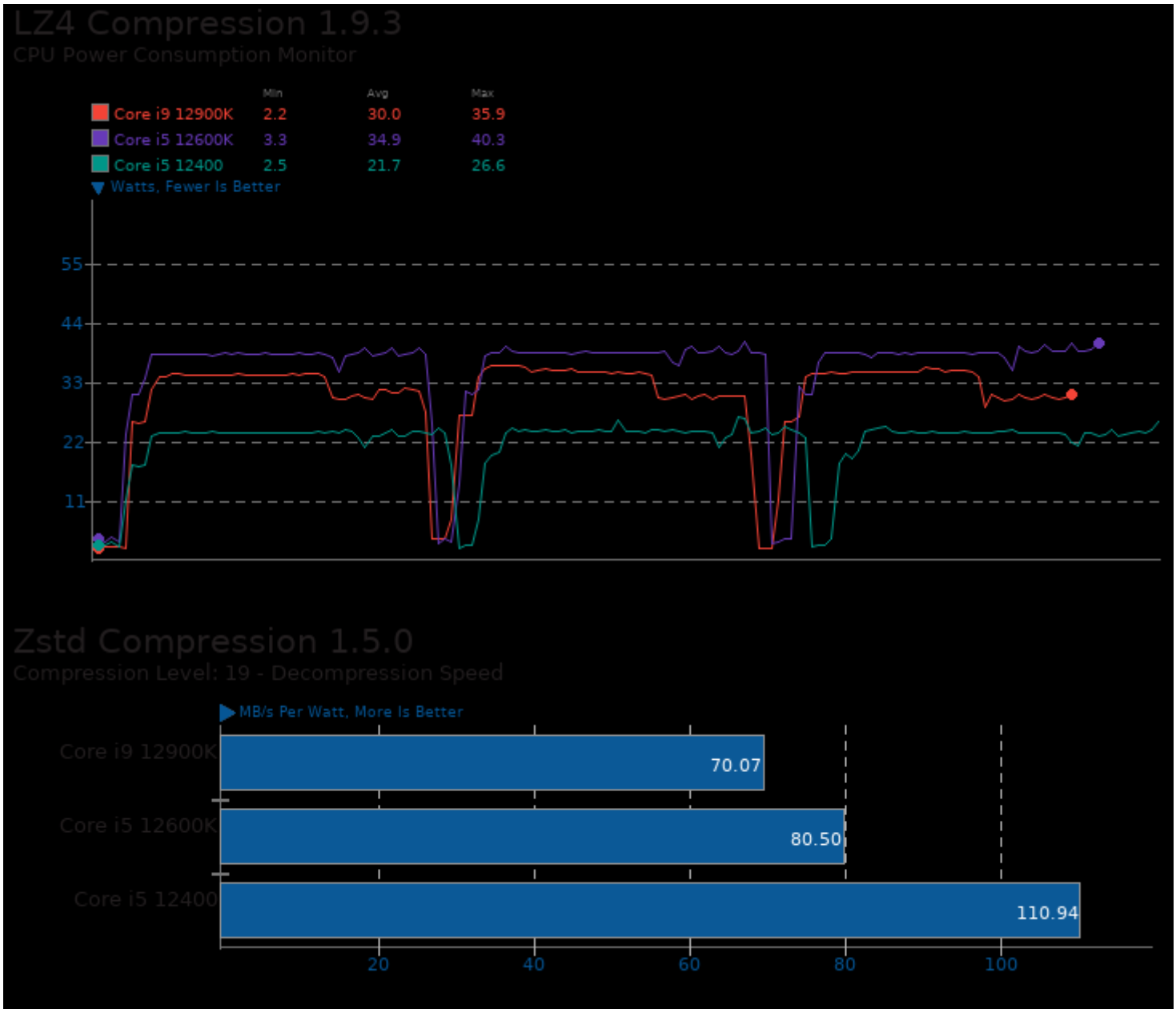


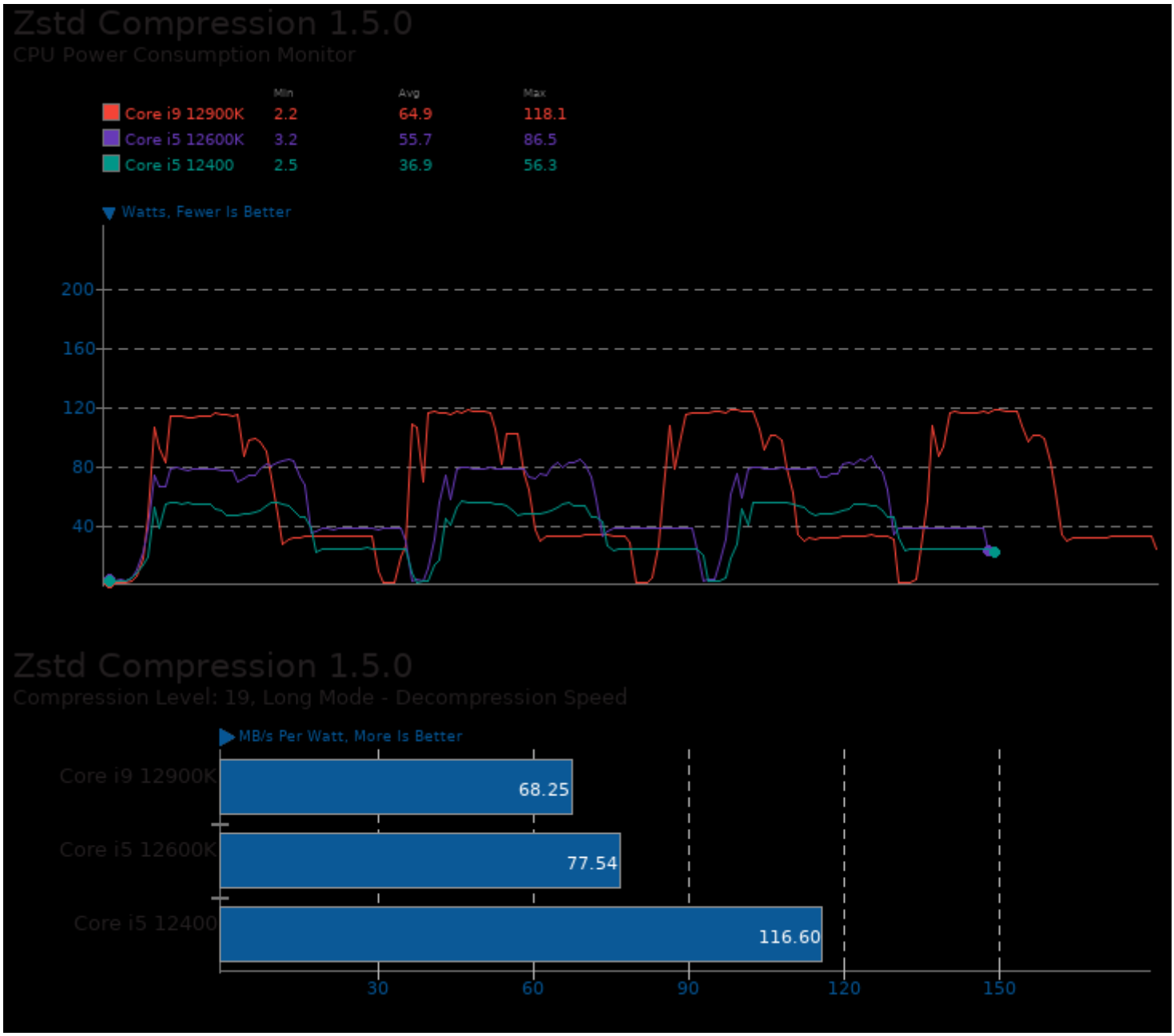

Xmrig 6.12.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 176.1 186.8
Core i5 12600K 3.4 110.1 114.6
Core i5 12400 2.7 70.6 73.2
Watts, Fewer Is Better
250
200
150
100
50
Chia Blockchain VDF 1.0.1
Test: Square Plain C++
IPS Per Watt, More Is Better
Core i9 12900K
8526.97
Core i5 12600K
7144.98
Core i5 12400
9801.95
2K
4K
6K
8K
10K

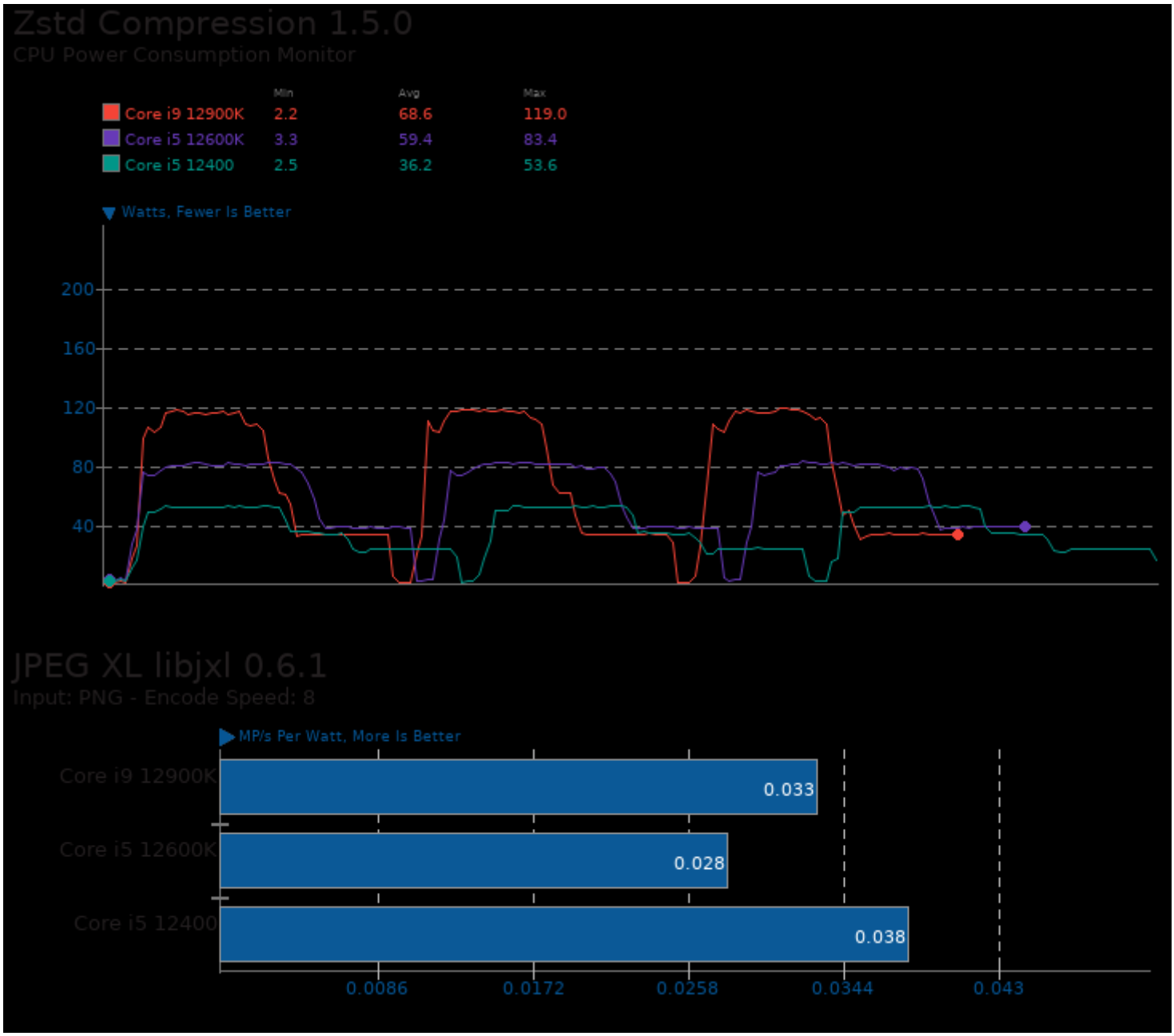

Chia Blockchain VDF 1.0.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 26.4 32.5
Core i5 12600K 3.2 29.8 35.4
Core i5 12400 2.5 19.5 23.2
Watts, Fewer Is Better
50
40
30
20
10
Chia Blockchain VDF 1.0.1
Test: Square Assembly Optimized
IPS Per Watt, More Is Better
Core i9 12900K
7373.10
Core i5 12600K
6323.82
Core i5 12400
8599.19
2K
4K
6K
8K
10K

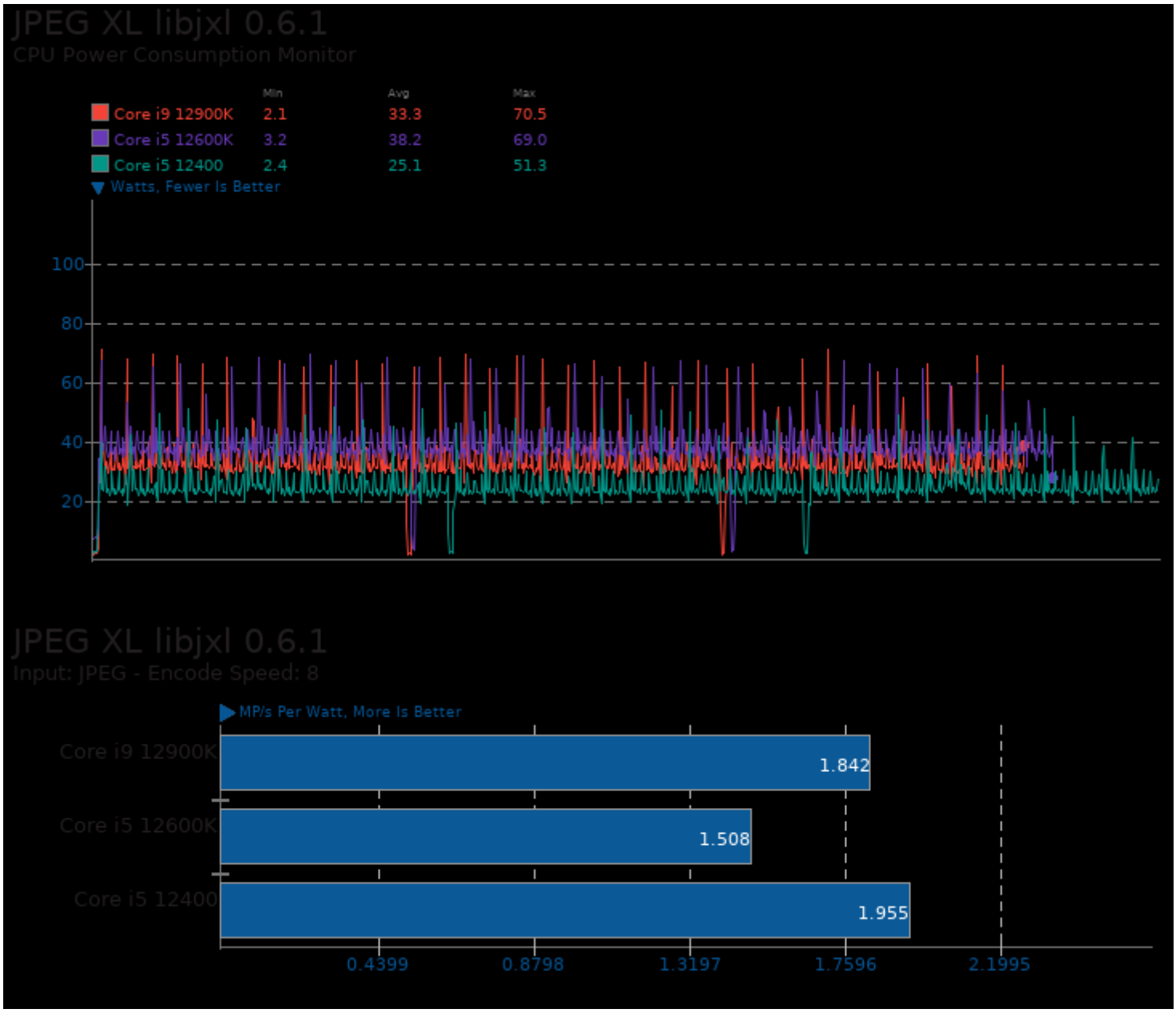

Chia Blockchain VDF 1.0.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 34.7 42.6
Core i5 12600K 3.2 38.8 46.6
Core i5 12400 2.5 25.7 31.3
Watts, Fewer Is Better
70
56
42
28
14
DaCapo Benchmark 9.12-MR1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 31.8 119.2
Core i5 12600K 2.1 31.0 99.8
Core i5 12400 2.5 19.8 50.4
Watts, Fewer Is Better
200
160
120
80
40

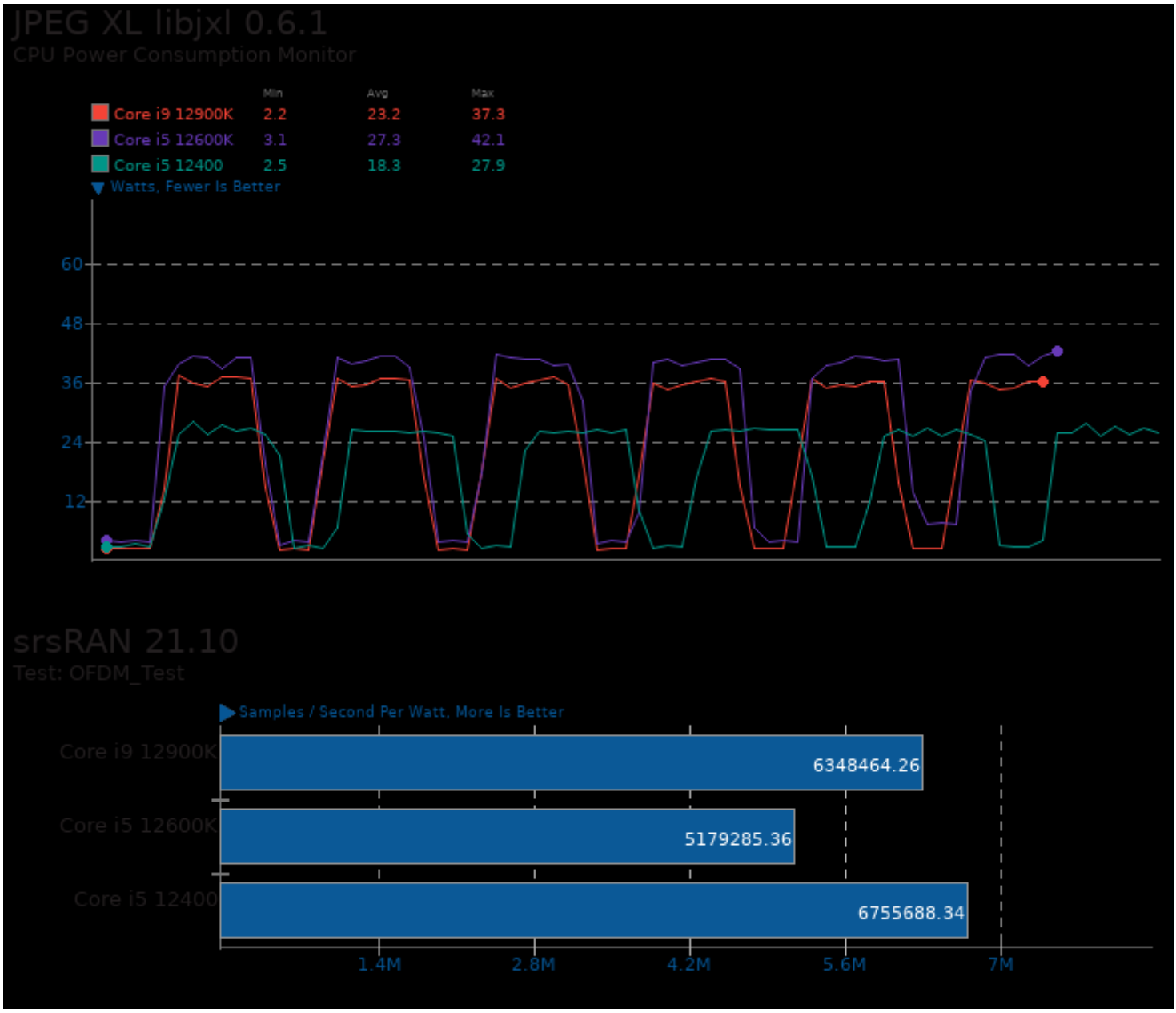

LZ4 Compression 1.9.3
Compression Level: 3 - Decompression Speed
MB/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
408.85
389.12
606.66
130
260
390
520
650
LZ4 Compression 1.9.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 29.4 36.0
Core i5 12600K 3.1 34.5 41.0
Core i5 12400 2.4 21.3 25.3
Watts, Fewer Is Better
55
44
33
22
11
LZ4 Compression 1.9.3
Compression Level: 9 - Decompression Speed
MB/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
399.61
385.60
597.32
130
260
390
520
650

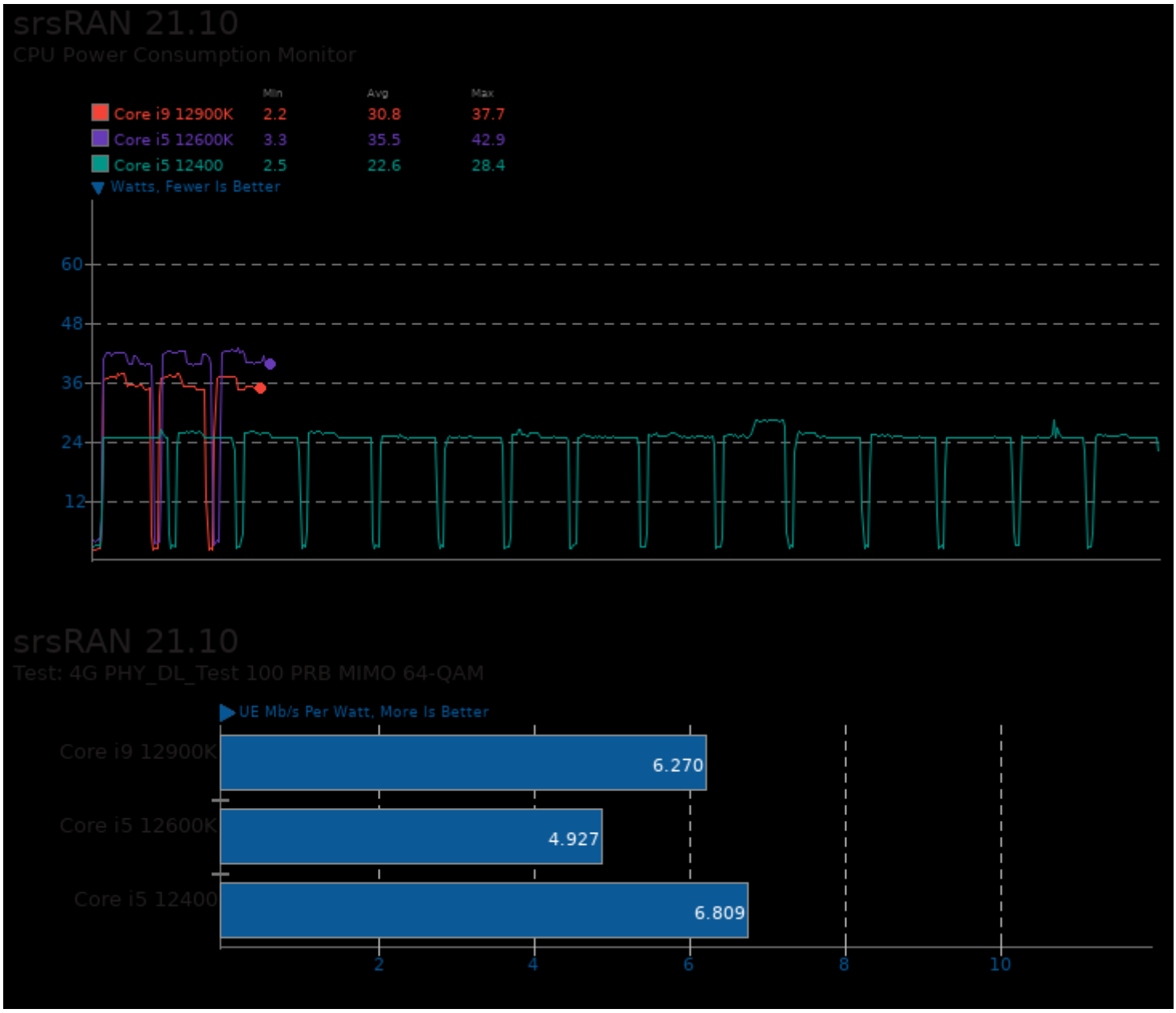

LZ4 Compression 1.9.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 30.0 35.9
Core i5 12600K 3.3 34.9 40.3
Core i5 12400 2.5 21.7 26.6
Watts, Fewer Is Better
55
44
33
22
11
Zstd Compression 1.5.0
Compression Level: 19 - Decompression Speed
MB/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
70.07
80.50
110.94
20
40
60
80
100

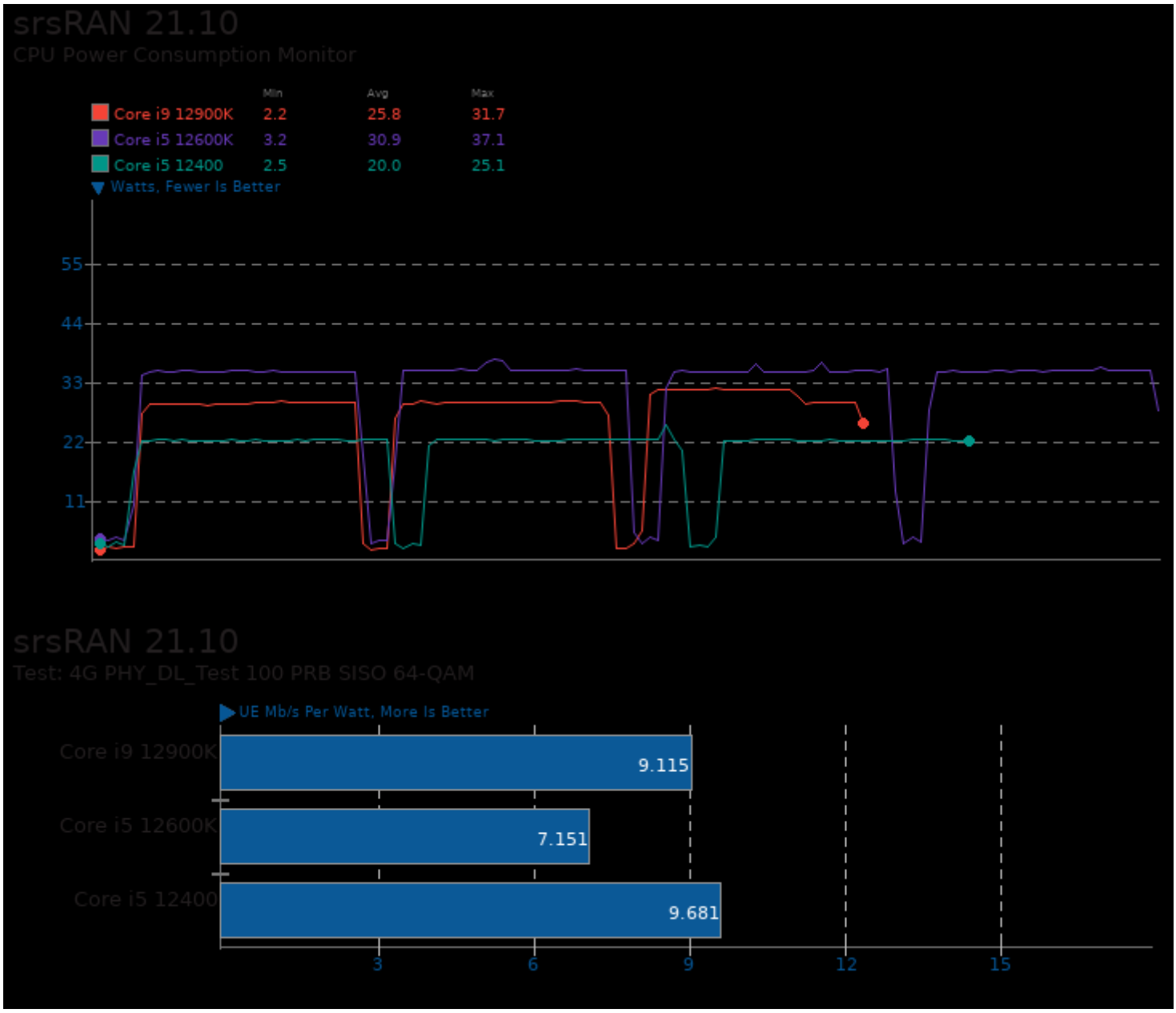

Zstd Compression 1.5.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 64.9 118.1
Core i5 12600K 3.2 55.7 86.5
Core i5 12400 2.5 36.9 56.3
Watts, Fewer Is Better
200
160
120
80
40
Zstd Compression 1.5.0
Compression Level: 19, Long Mode - Decompression Speed
MB/s Per Watt, More Is Better
Core i9 12900K
68.25
Core i5 12600K
77.54
Core i5 12400
116.60
30
60
90
120
150

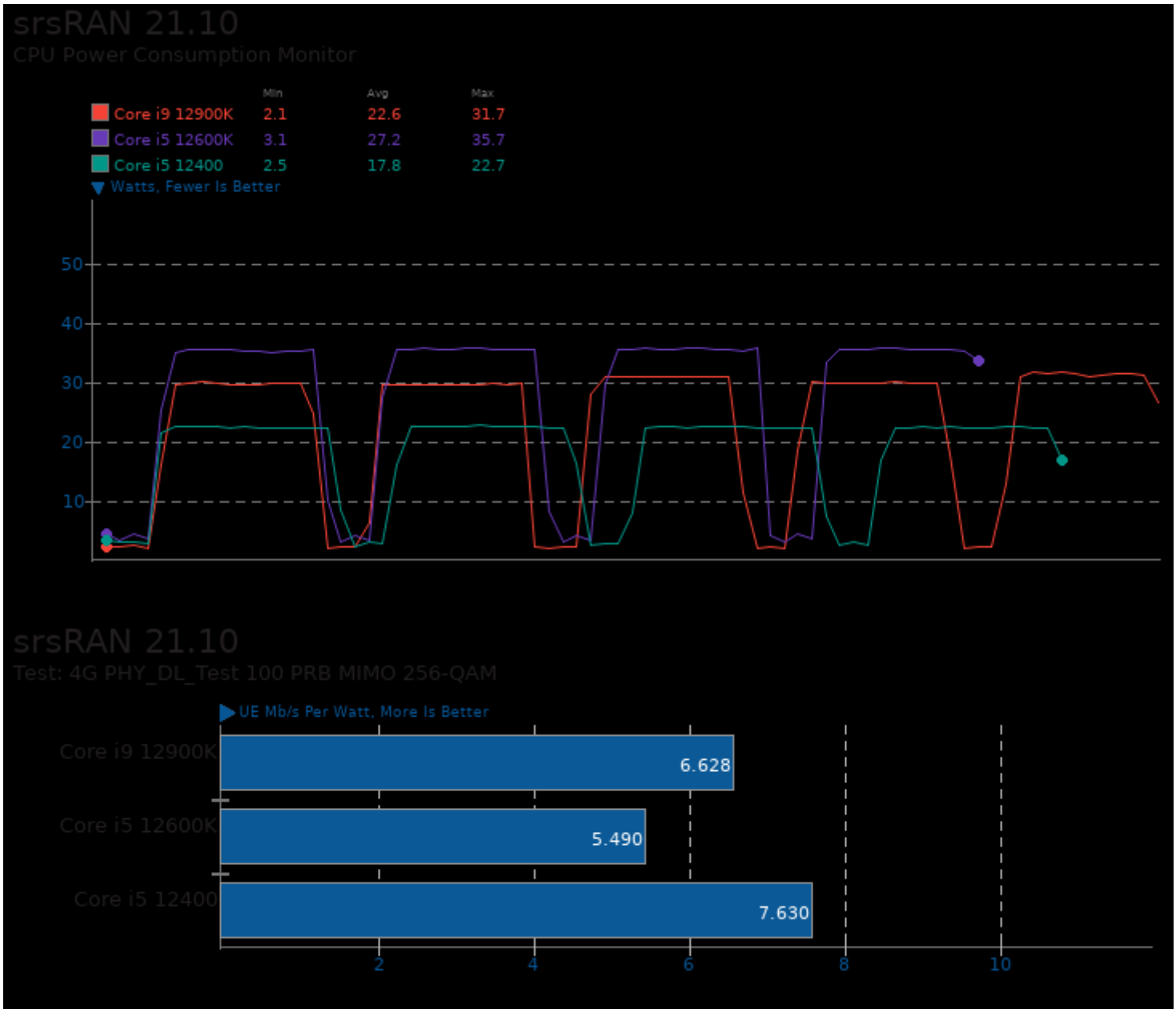

Zstd Compression 1.5.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 68.6 119.0
Core i5 12600K 3.3 59.4 83.4
Core i5 12400 2.5 36.2 53.6
Watts, Fewer Is Better
200
160
120
80
40
JPEG XL libjxl 0.6.1
Input: PNG - Encode Speed: 8
MP/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.033
0.028
0.038
0.0086
0.0172
0.0258
0.0344
0.043

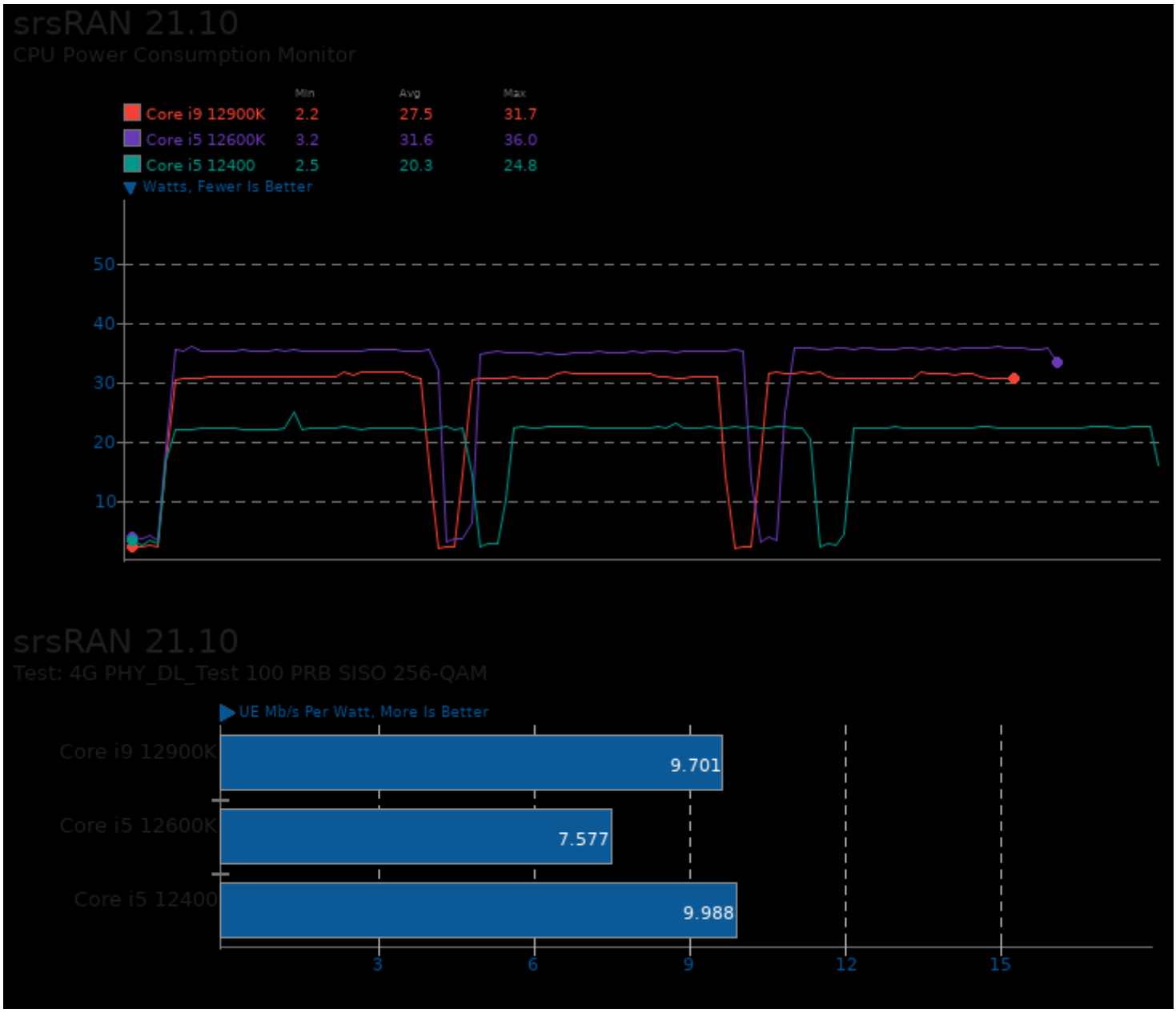

JPEG XL libjxl 0.6.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 33.3 70.5
Core i5 12600K 3.2 38.2 69.0
Core i5 12400 2.4 25.1 51.3
Watts, Fewer Is Better
100
80
60
40
20
JPEG XL libjxl 0.6.1
Input: JPEG - Encode Speed: 8
MP/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
1.842
1.508
1.955
0.4399
0.8798
1.3197
1.7596
2.1995

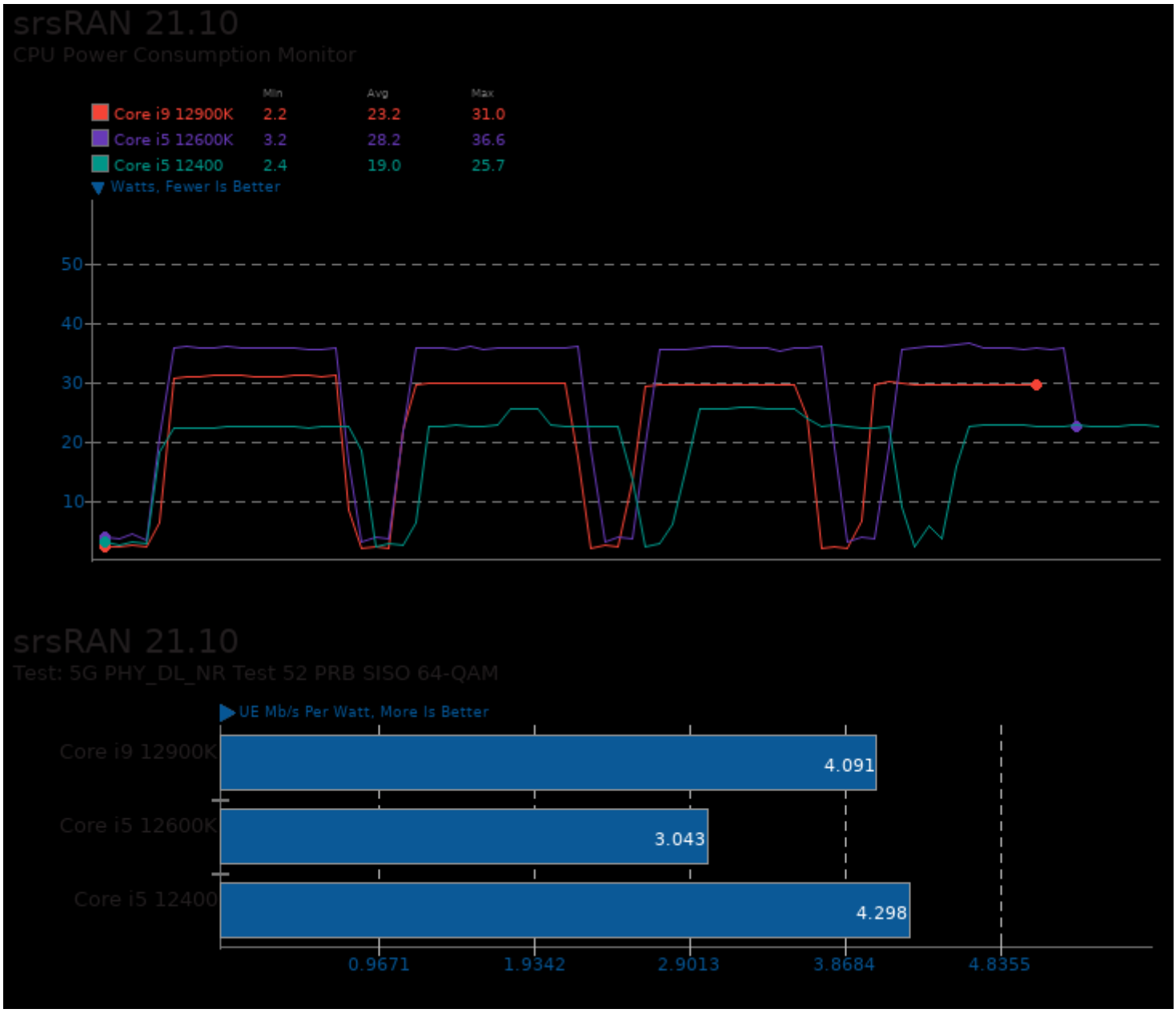

JPEG XL libjxl 0.6.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 23.2 37.3
Core i5 12600K 3.1 27.3 42.1
Core i5 12400 2.5 18.3 27.9
Watts, Fewer Is Better
60
48
36
24
12
srsRAN 21.10
Test: OFDM_Test
Samples / Second Per Watt, More Is Better
Core i9 12900K
6348464.26
Core i5 12600K
5179285.36
Core i5 12400
6755688.34
1.4M
2.8M
4.2M
5.6M
7M

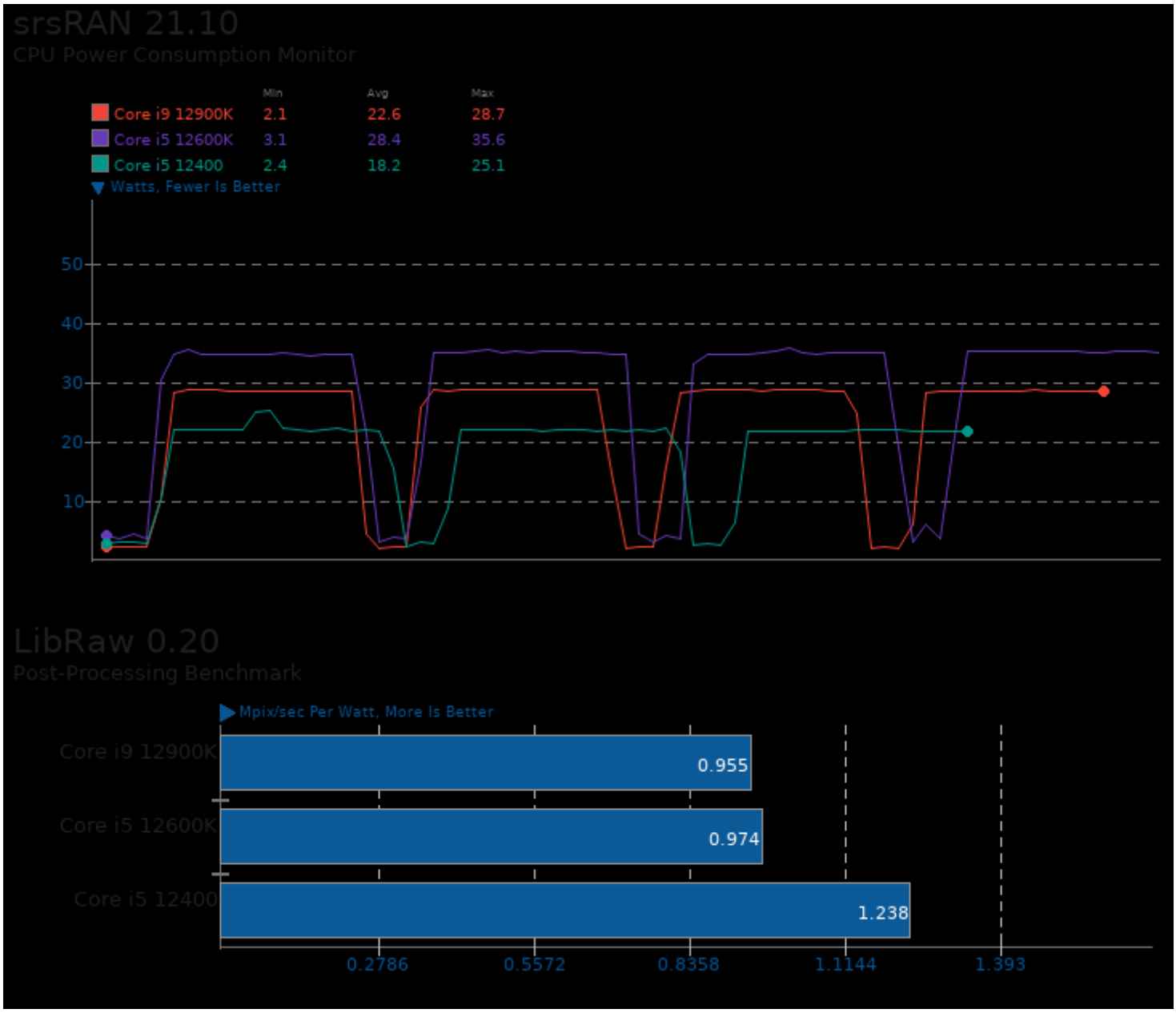

srsRAN 21.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 30.8 37.7
Core i5 12600K 3.3 35.5 42.9
Core i5 12400 2.5 22.6 28.4
Watts, Fewer Is Better
60
48
36
24
12
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB MIMO 64-QAM
UE Mb/s Per Watt, More Is Better
Core i9 12900K
6.270
Core i5 12600K
4.927
Core i5 12400
6.809
2
4
6
8
10


srsRAN 21.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 25.8 31.7
Core i5 12600K 3.2 30.9 37.1
Core i5 12400 2.5 20.0 25.1
Watts, Fewer Is Better
55
44
33
22
11
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB SISO 64-QAM
UE Mb/s Per Watt, More Is Better
Core i9 12900K
9.115
Core i5 12600K
7.151
Core i5 12400
9.681
3
6
9
12
15

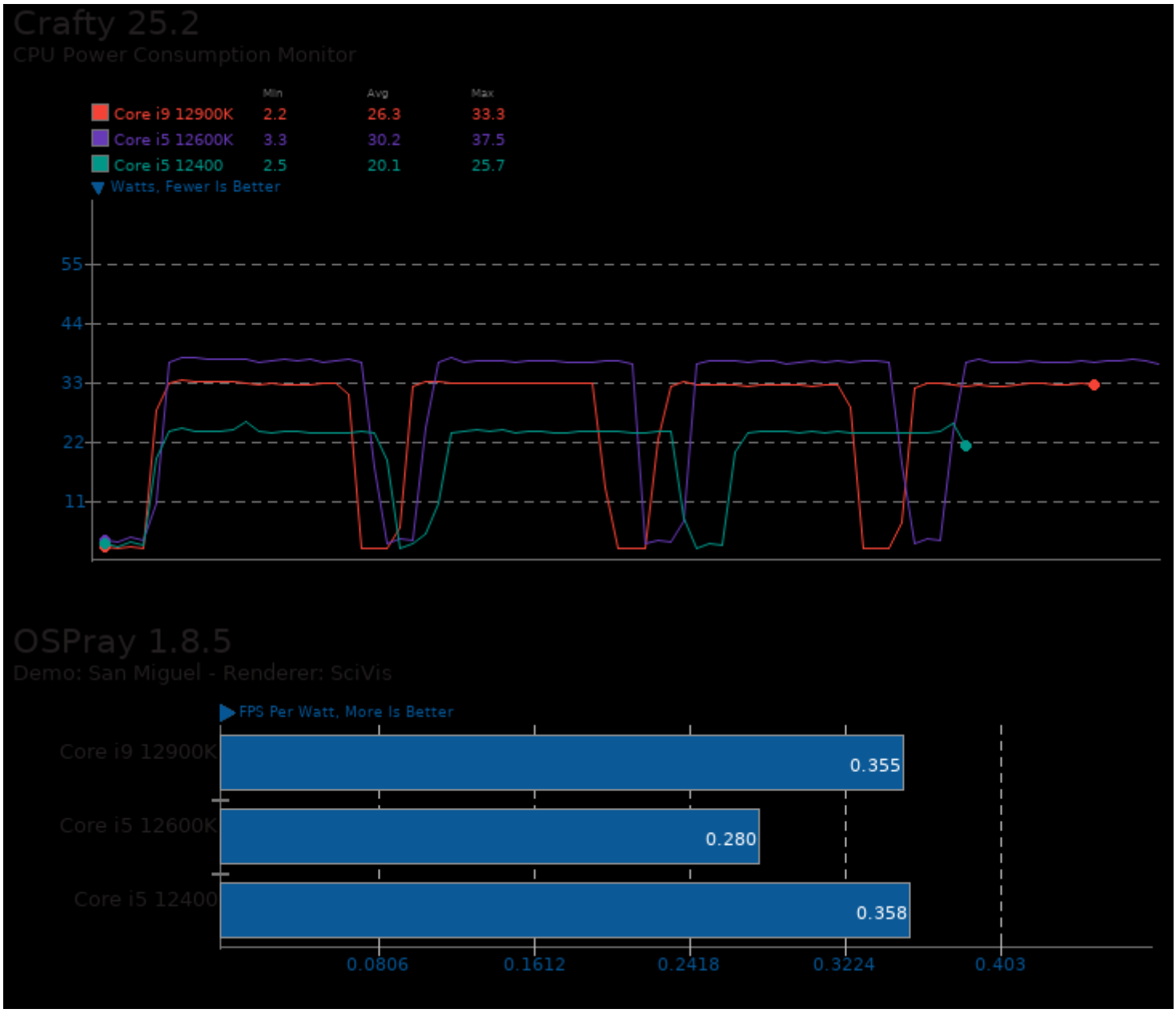

srsRAN 21.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 22.6 31.7
Core i5 12600K 3.1 27.2 35.7
Core i5 12400 2.5 17.8 22.7
Watts, Fewer Is Better
50
40
30
20
10
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB MIMO 256-QAM
UE Mb/s Per Watt, More Is Better
Core i9 12900K
6.628
Core i5 12600K
5.490
Core i5 12400
7.630
2
4
6
8
10

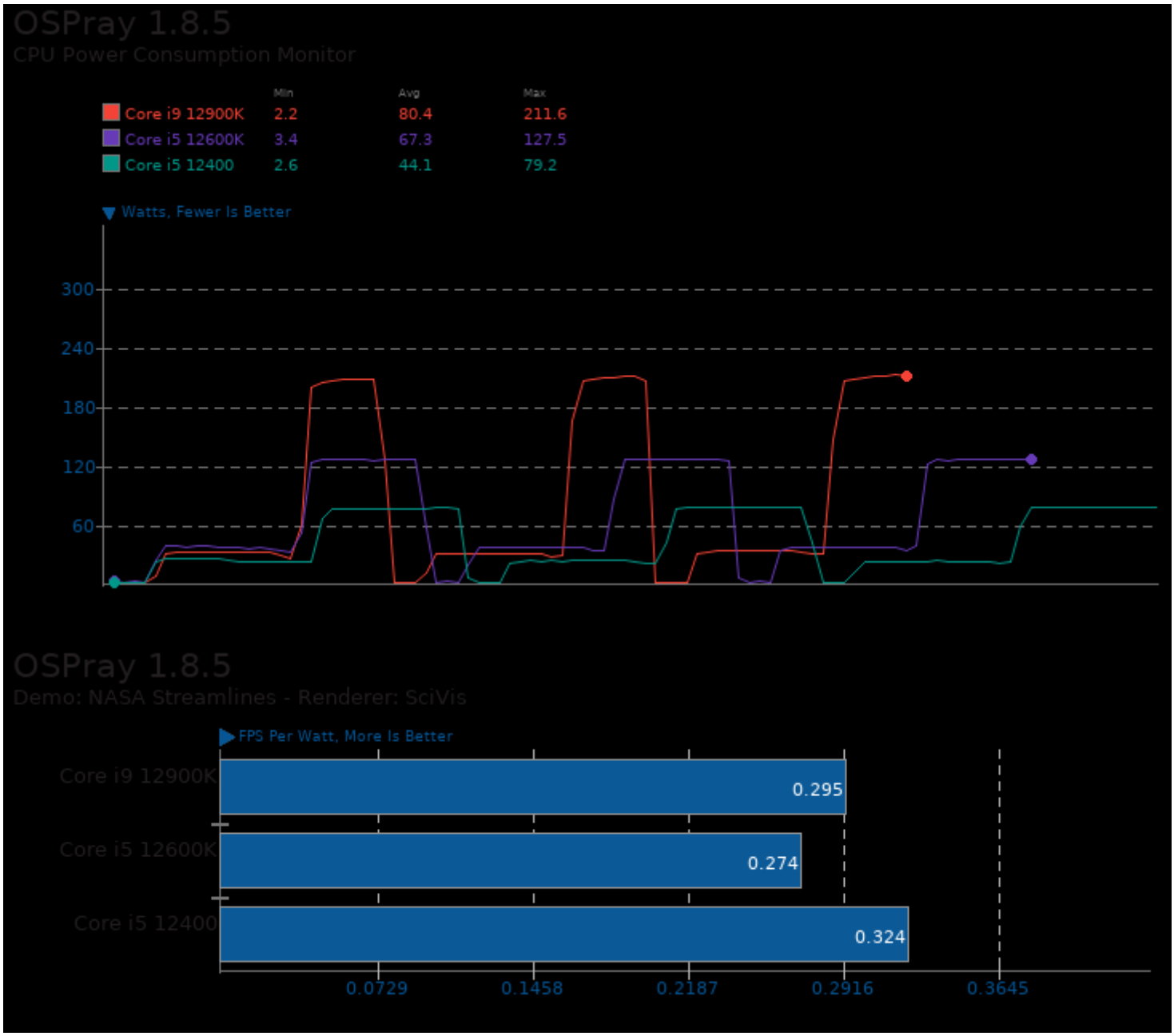

srsRAN 21.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 27.5 31.7
Core i5 12600K 3.2 31.6 36.0
Core i5 12400 2.5 20.3 24.8
Watts, Fewer Is Better
50
40
30
20
10
srsRAN 21.10
Test: 4G PHY_DL_Test 100 PRB SISO 256-QAM
UE Mb/s Per Watt, More Is Better
Core i9 12900K
9.701
Core i5 12600K
7.577
Core i5 12400
9.988
3
6
9
12
15

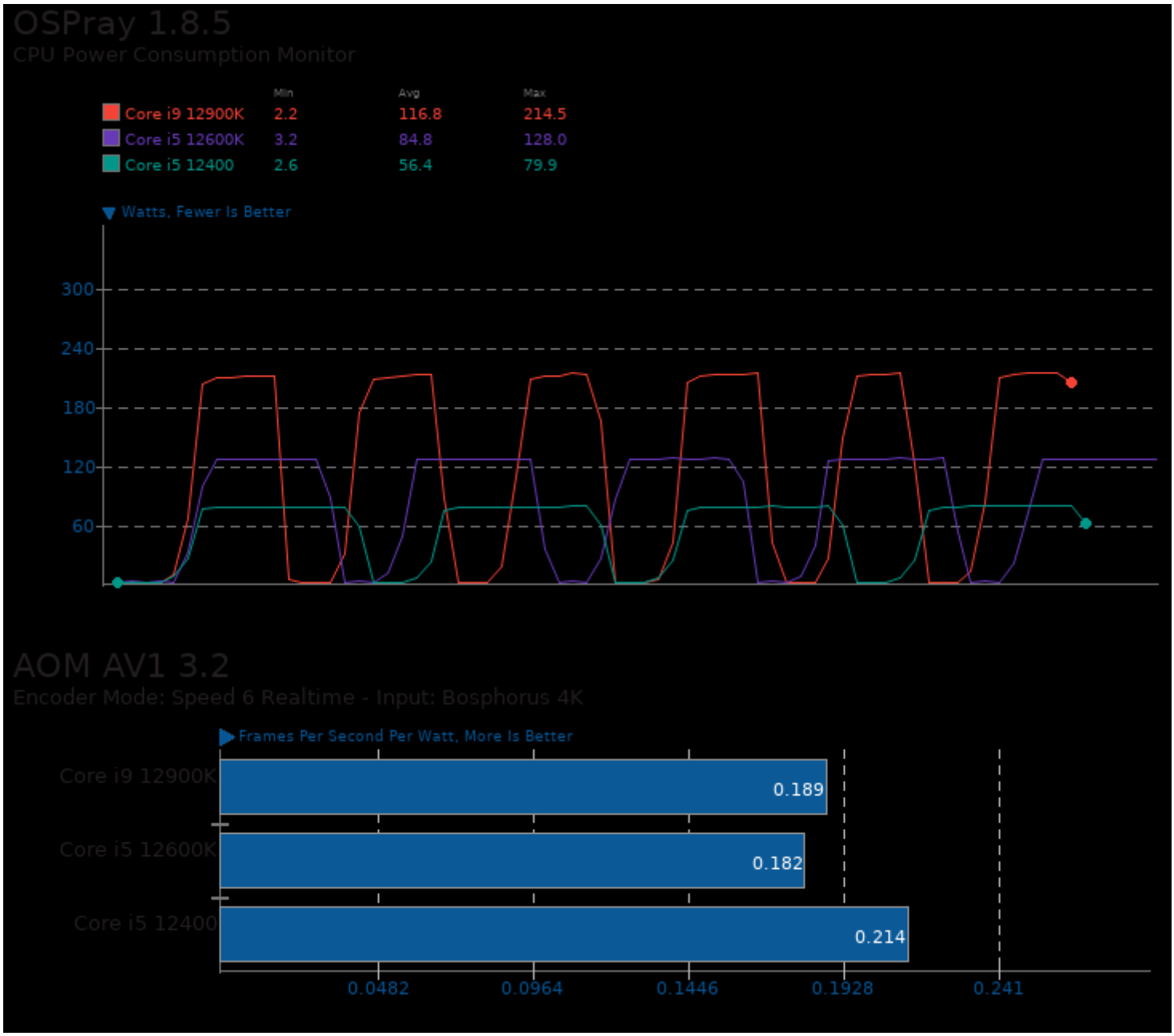

srsRAN 21.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 23.2 31.0
Core i5 12600K 3.2 28.2 36.6
Core i5 12400 2.4 19.0 25.7
Watts, Fewer Is Better
50
40
30
20
10
srsRAN 21.10
Test: 5G PHY_DL_NR Test 52 PRB SISO 64-QAM
UE Mb/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
4.091
3.043
4.298
0.9671
1.9342
2.9013
3.8684
4.8355


srsRAN 21.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 22.6 28.7
Core i5 12600K 3.1 28.4 35.6
Core i5 12400 2.4 18.2 25.1
Watts, Fewer Is Better
50
40
30
20
10
LibRaw 0.20
Post-Processing Benchmark
Mpix/sec Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.955
0.974
1.238
0.2786
0.5572
0.8358
1.1144
1.393

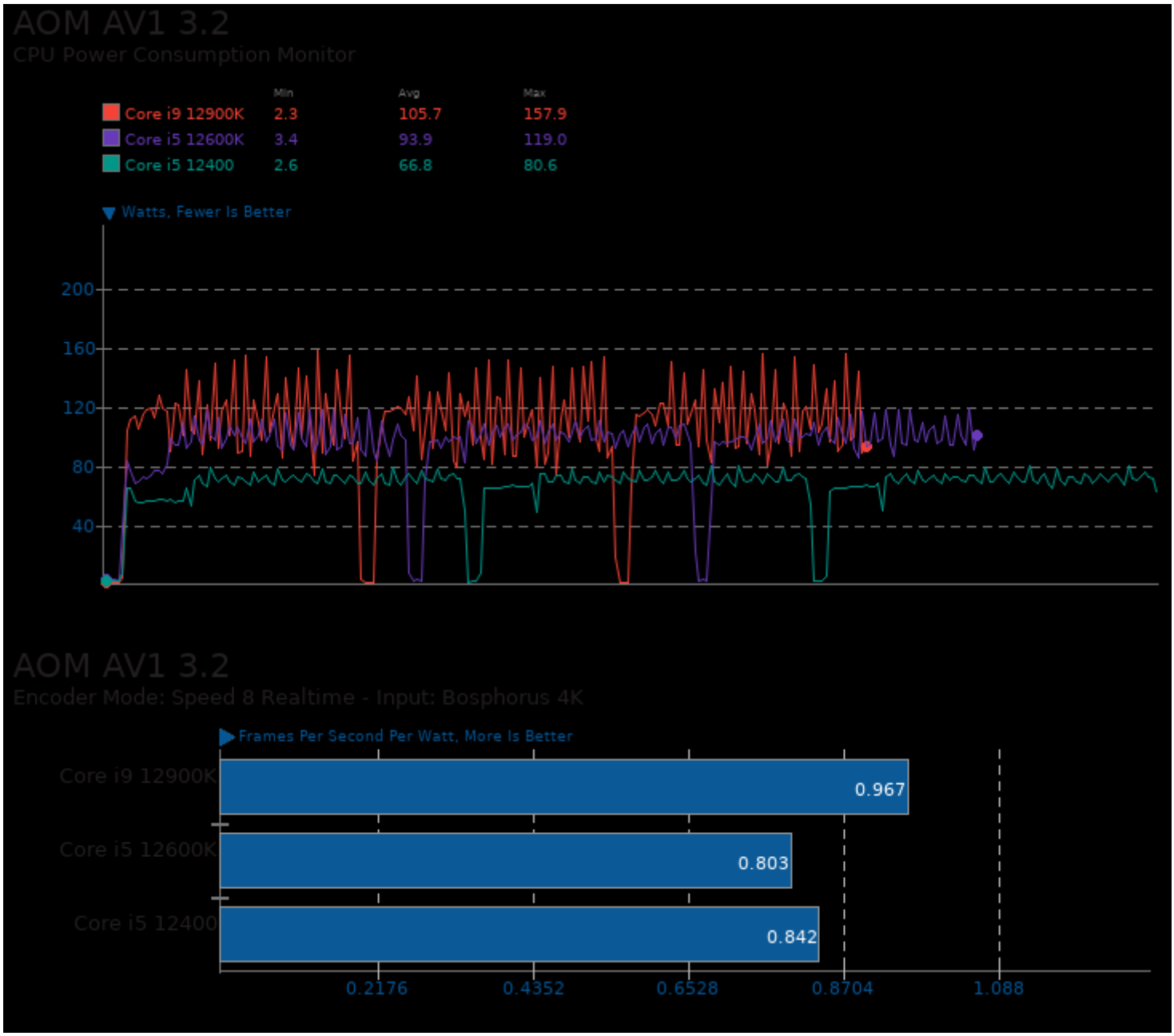

LibRaw 0.20
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 60.5 85.8
Core i5 12600K 3.2 54.2 67.7
Core i5 12400 2.6 36.6 43.6
Watts, Fewer Is Better
100
80
60
40
20
Crafty 25.2
Elapsed Time
Nodes Per Second Per Watt, More Is Better
Core i9 12900K
479442.18
Core i5 12600K
394162.60
Core i5 12400
528400.94
110K
220K
330K
440K
550K

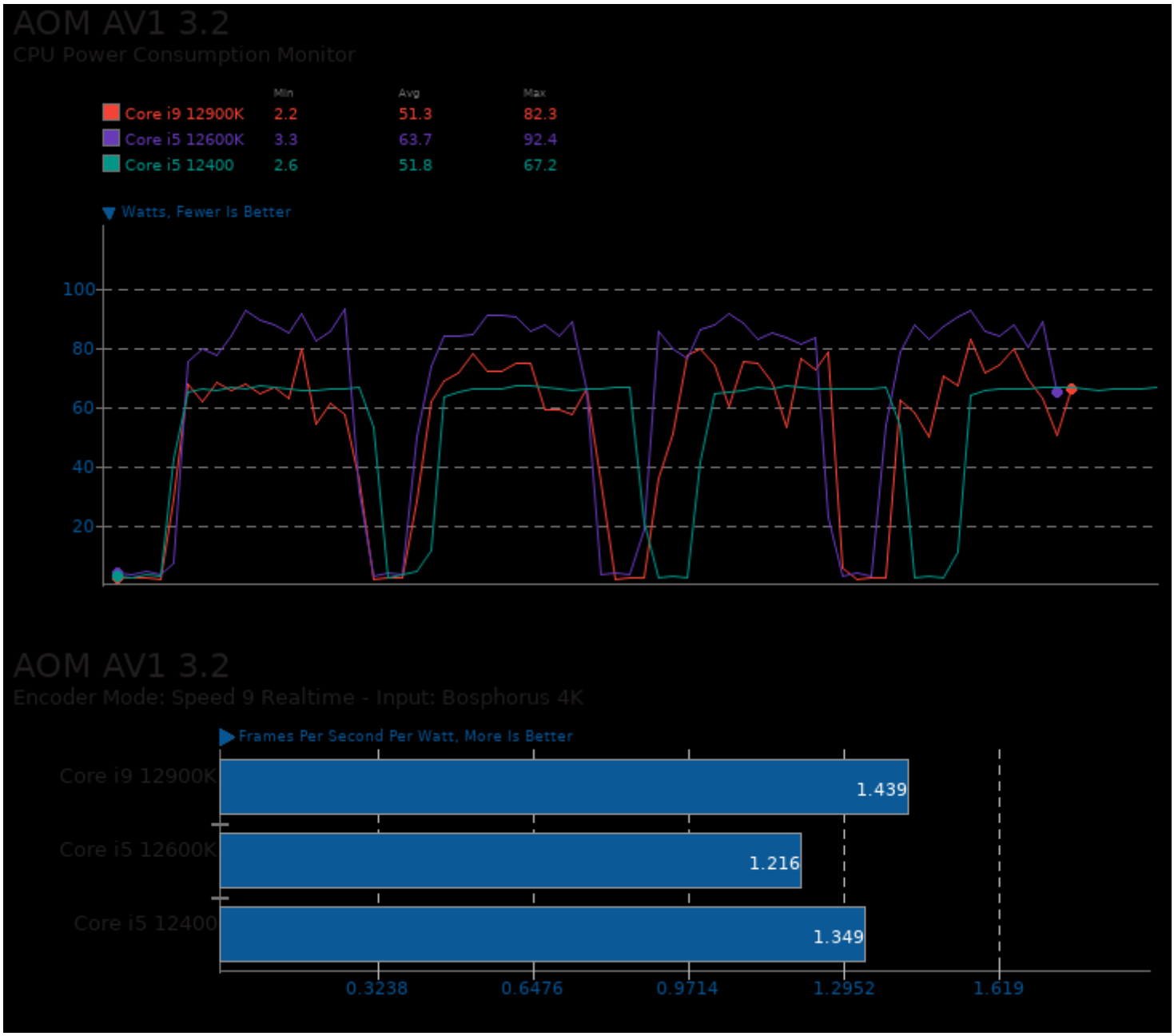

Crafty 25.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 26.3 33.3
Core i5 12600K 3.3 30.2 37.5
Core i5 12400 2.5 20.1 25.7
Watts, Fewer Is Better
55
44
33
22
11
OSPray 1.8.5
Demo: San Miguel - Renderer: SciVis
FPS Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.355
0.280
0.358
0.0806
0.1612
0.2418
0.3224
0.403

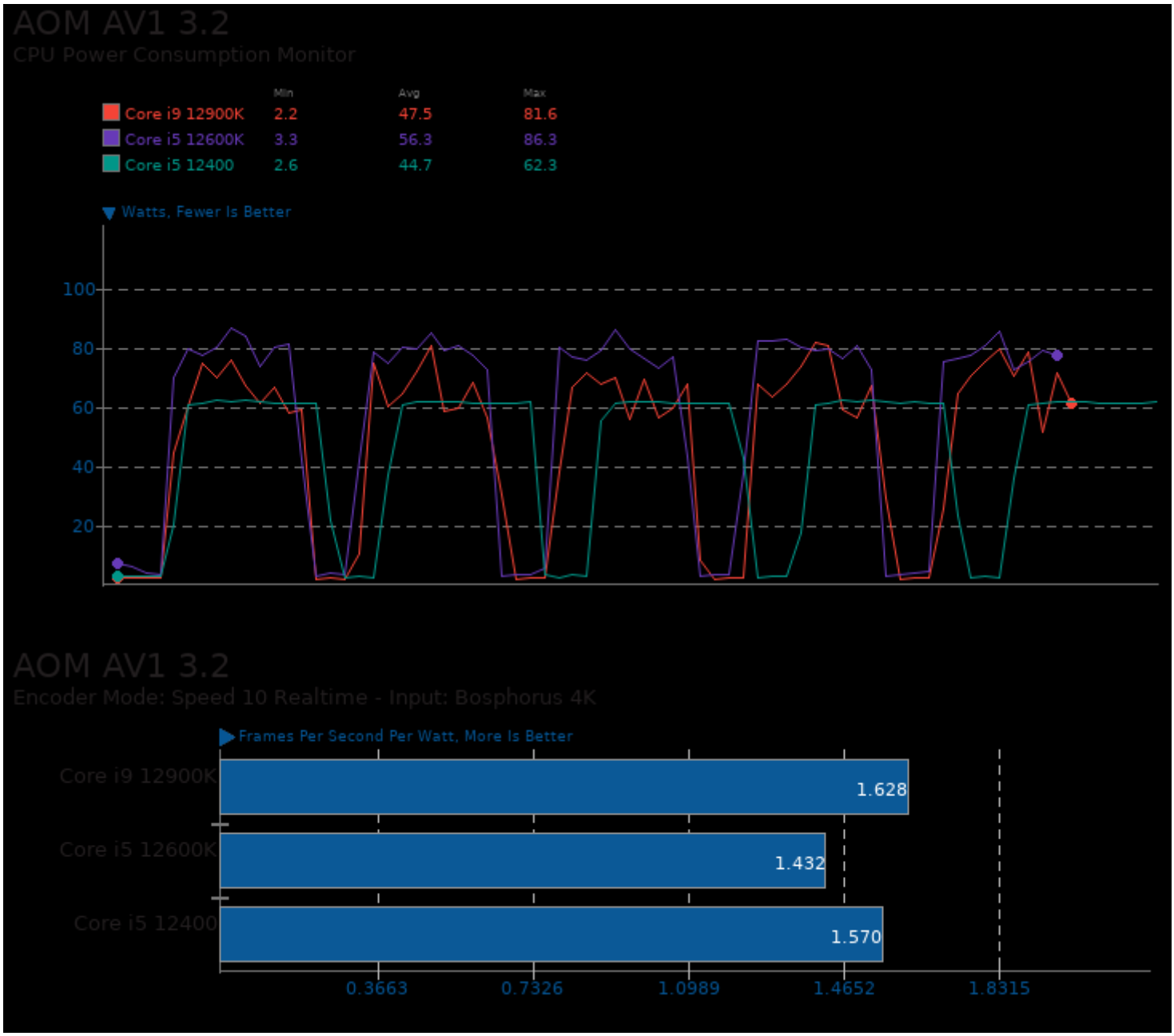

OSPray 1.8.5
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 80.4 211.6
Core i5 12600K 3.4 67.3 127.5
Core i5 12400 2.6 44.1 79.2
Watts, Fewer Is Better
300
240
180
120
60
OSPray 1.8.5
Demo: NASA Streamlines - Renderer: SciVis
FPS Per Watt, More Is Better
Core i9 12900K
0.295
Core i5 12600K
0.274
Core i5 12400
0.324
0.0729
0.1458
0.2187
0.2916
0.3645


OSPray 1.8.5
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 116.8 214.5
Core i5 12600K 3.2 84.8 128.0
Core i5 12400 2.6 56.4 79.9
Watts, Fewer Is Better
300
240
180
120
60
AOM AV1 3.2
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K
Frames Per Second Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.189
0.182
0.214
0.0482
0.0964
0.1446
0.1928
0.241

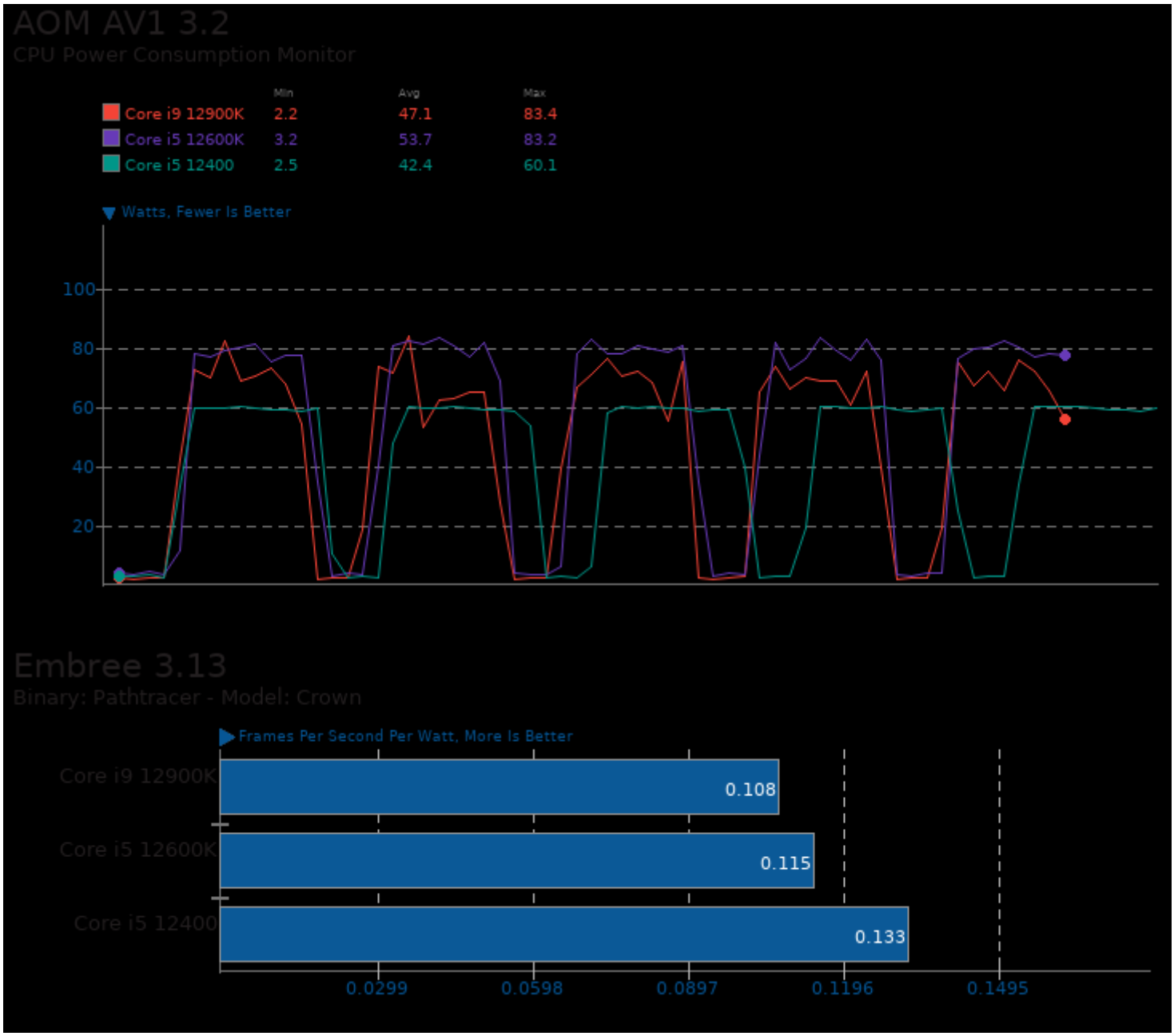

AOM AV1 3.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 77.1 97.4
Core i5 12600K 3.4 72.4 87.8
Core i5 12400 2.6 52.2 61.5
Watts, Fewer Is Better
100
80
60
40
20
AOM AV1 3.2
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K
Frames Per Second Per Watt, More Is Better
Core i9 12900K
0.114
Core i5 12600K
0.113
Core i5 12400
0.131
0.0295
0.059
0.0885
0.118
0.1475

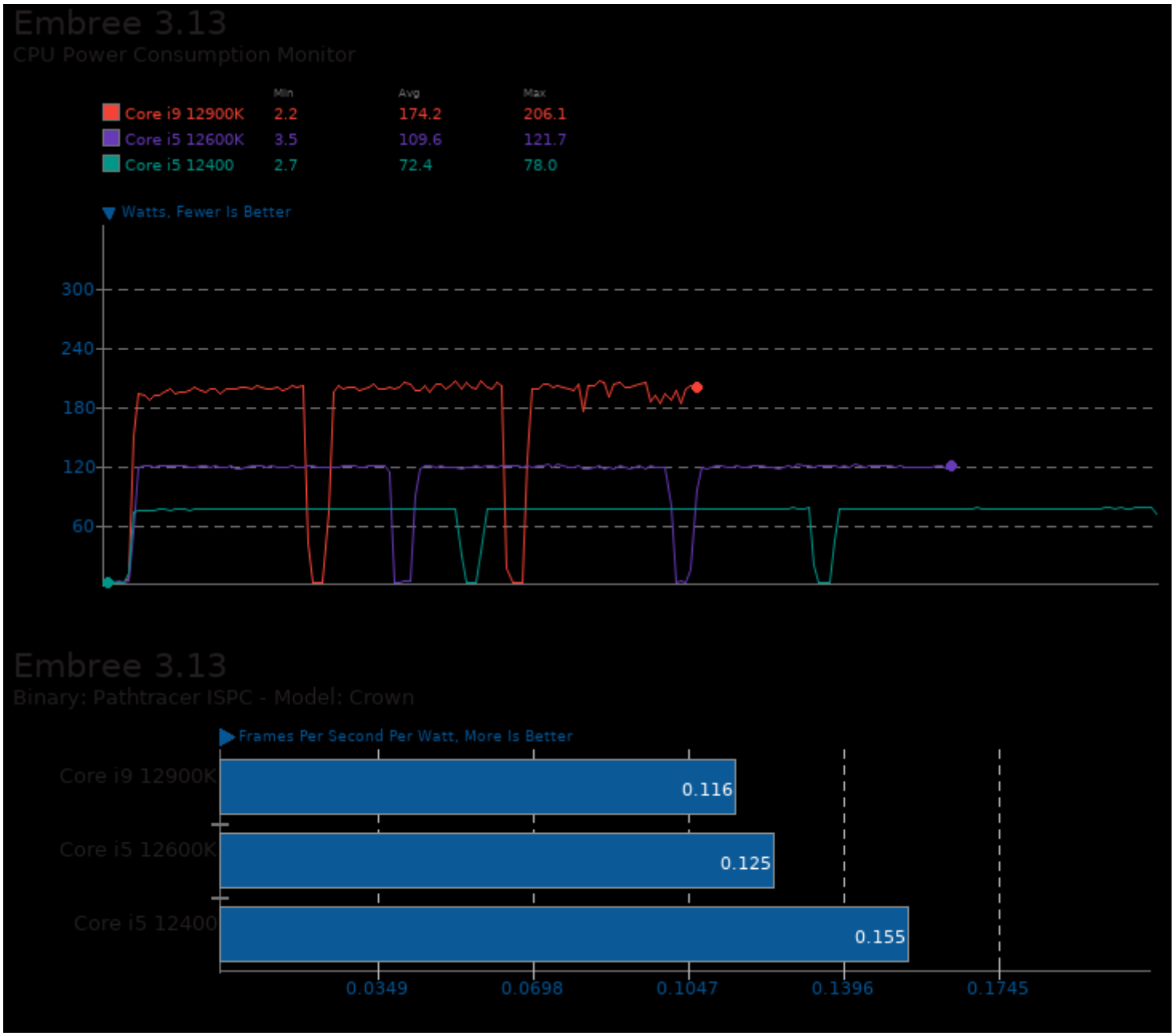

AOM AV1 3.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 105.7 157.9
Core i5 12600K 3.4 93.9 119.0
Core i5 12400 2.6 66.8 80.6
Watts, Fewer Is Better
200
160
120
80
40
AOM AV1 3.2
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K
Frames Per Second Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.967
0.803
0.842
0.2176
0.4352
0.6528
0.8704
1.088

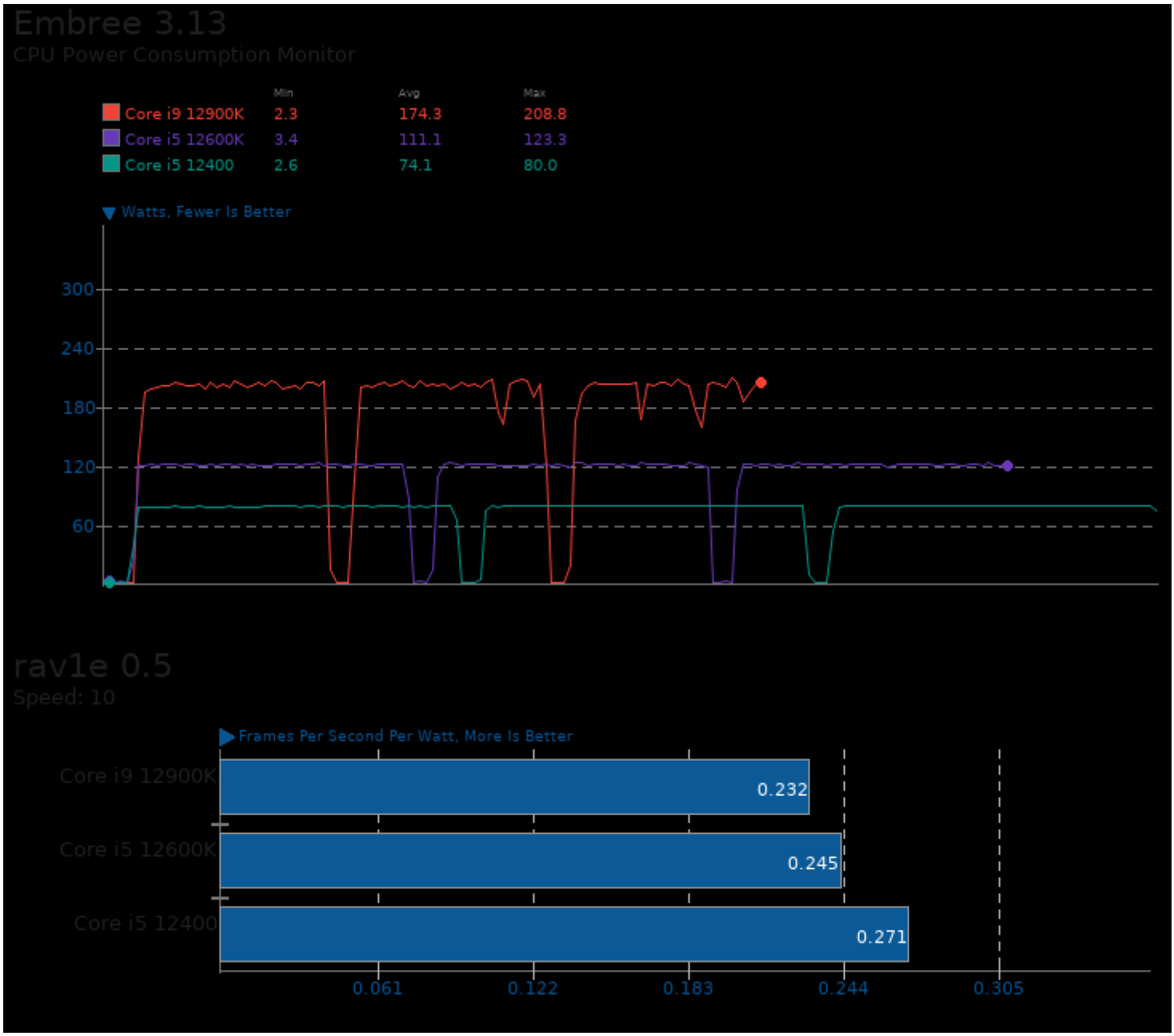

AOM AV1 3.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 51.3 82.3
Core i5 12600K 3.3 63.7 92.4
Core i5 12400 2.6 51.8 67.2
Watts, Fewer Is Better
100
80
60
40
20
AOM AV1 3.2
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K
Frames Per Second Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
1.439
1.216
1.349
0.3238
0.6476
0.9714
1.2952
1.619


AOM AV1 3.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 47.5 81.6
Core i5 12600K 3.3 56.3 86.3
Core i5 12400 2.6 44.7 62.3
Watts, Fewer Is Better
100
80
60
40
20
AOM AV1 3.2
Encoder Mode: Speed 10 Realtime - Input: Bosphorus 4K
Frames Per Second Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
1.628
1.432
1.570
0.3663
0.7326
1.0989
1.4652
1.8315

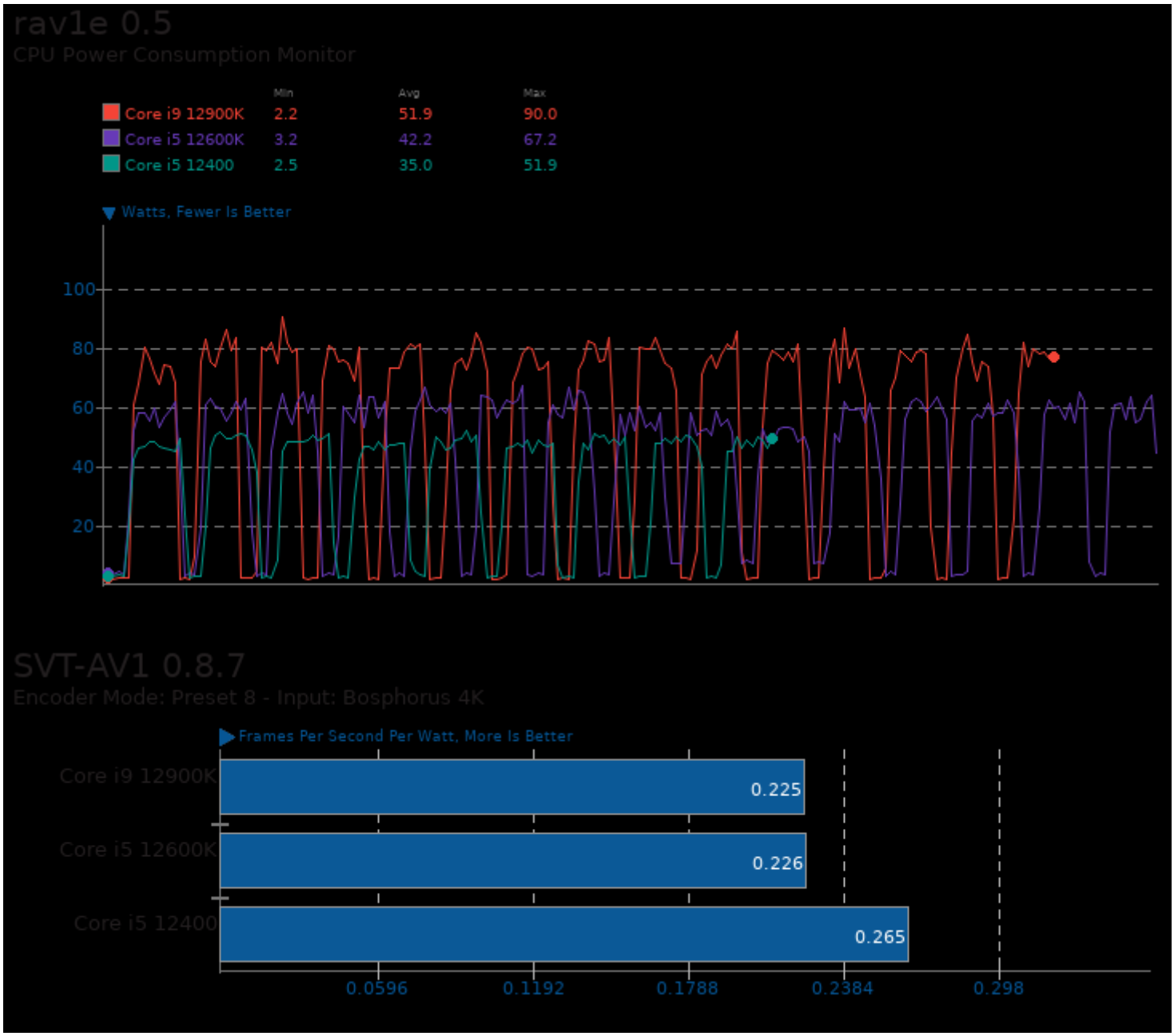
Alder Lake Intel Linux Tests

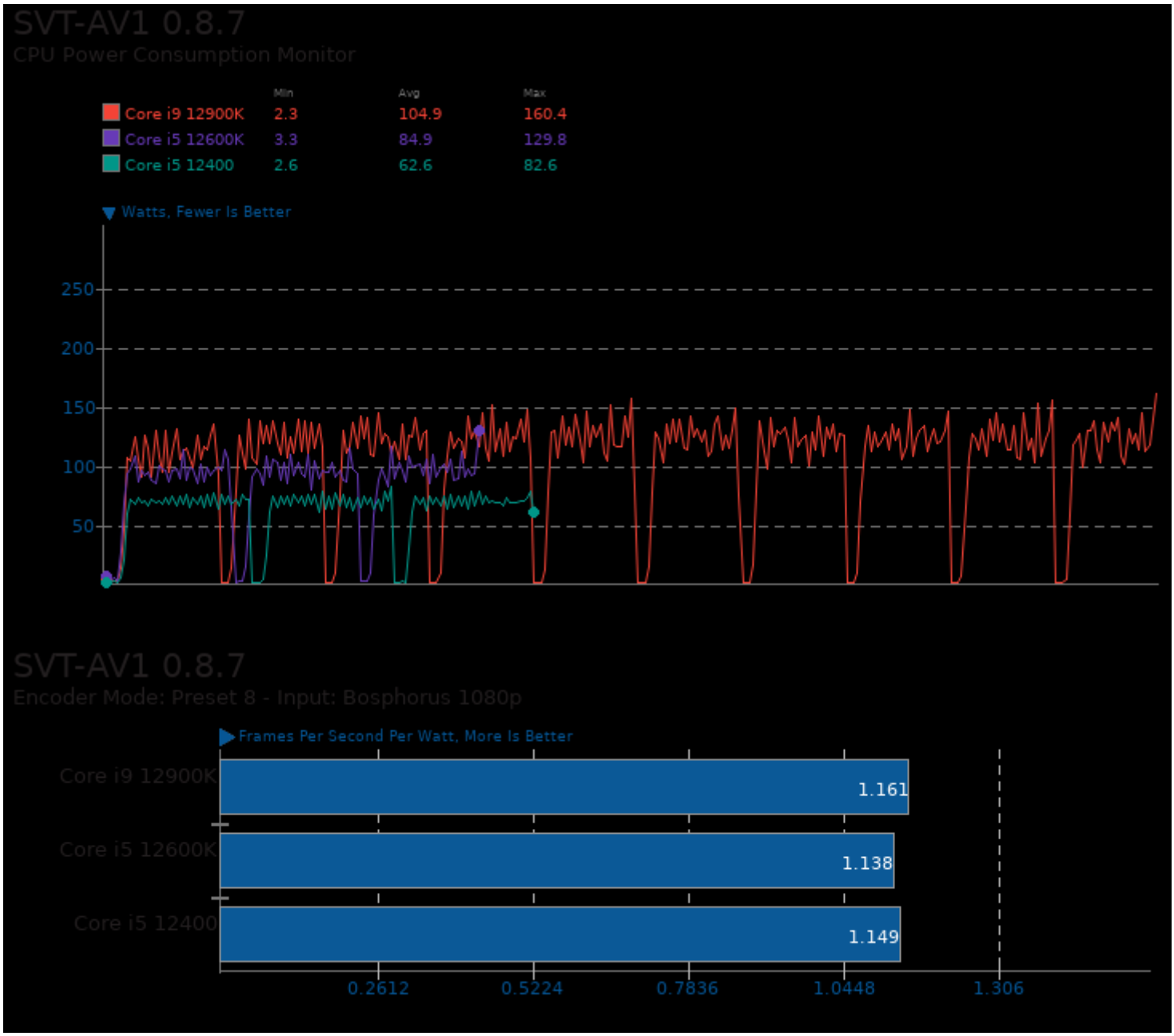



Embree 3.13
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 174.2 206.1
Core i5 12600K 3.5 109.6 121.7
Core i5 12400 2.7 72.4 78.0
Watts, Fewer Is Better
300
240
180
120
60
Embree 3.13
Binary: Pathtracer ISPC - Model: Crown
Frames Per Second Per Watt, More Is Better
Core i9 12900K
0.116
Core i5 12600K
0.125
Core i5 12400
0.155
0.0349
0.0698
0.1047
0.1396
0.1745

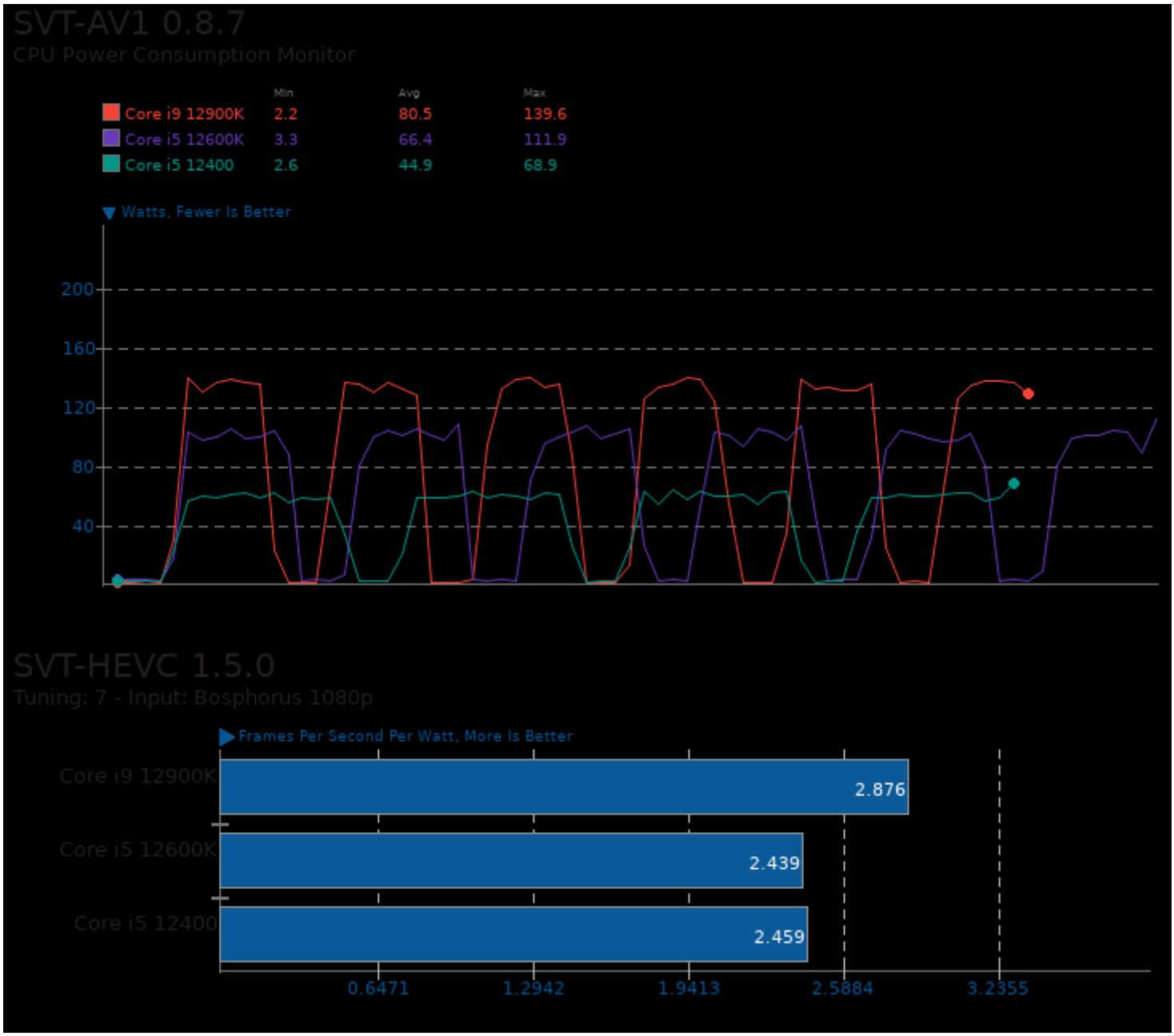

Embree 3.13
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 174.3 208.8
Core i5 12600K 3.4 111.1 123.3
Core i5 12400 2.6 74.1 80.0
Watts, Fewer Is Better
300
240
180
120
60
rav1e 0.5
Speed: 10
Frames Per Second Per Watt, More Is Better
Core i9 12900K
0.232
Core i5 12600K
0.245
Core i5 12400
0.271
0.061
0.122
0.183
0.244
0.305

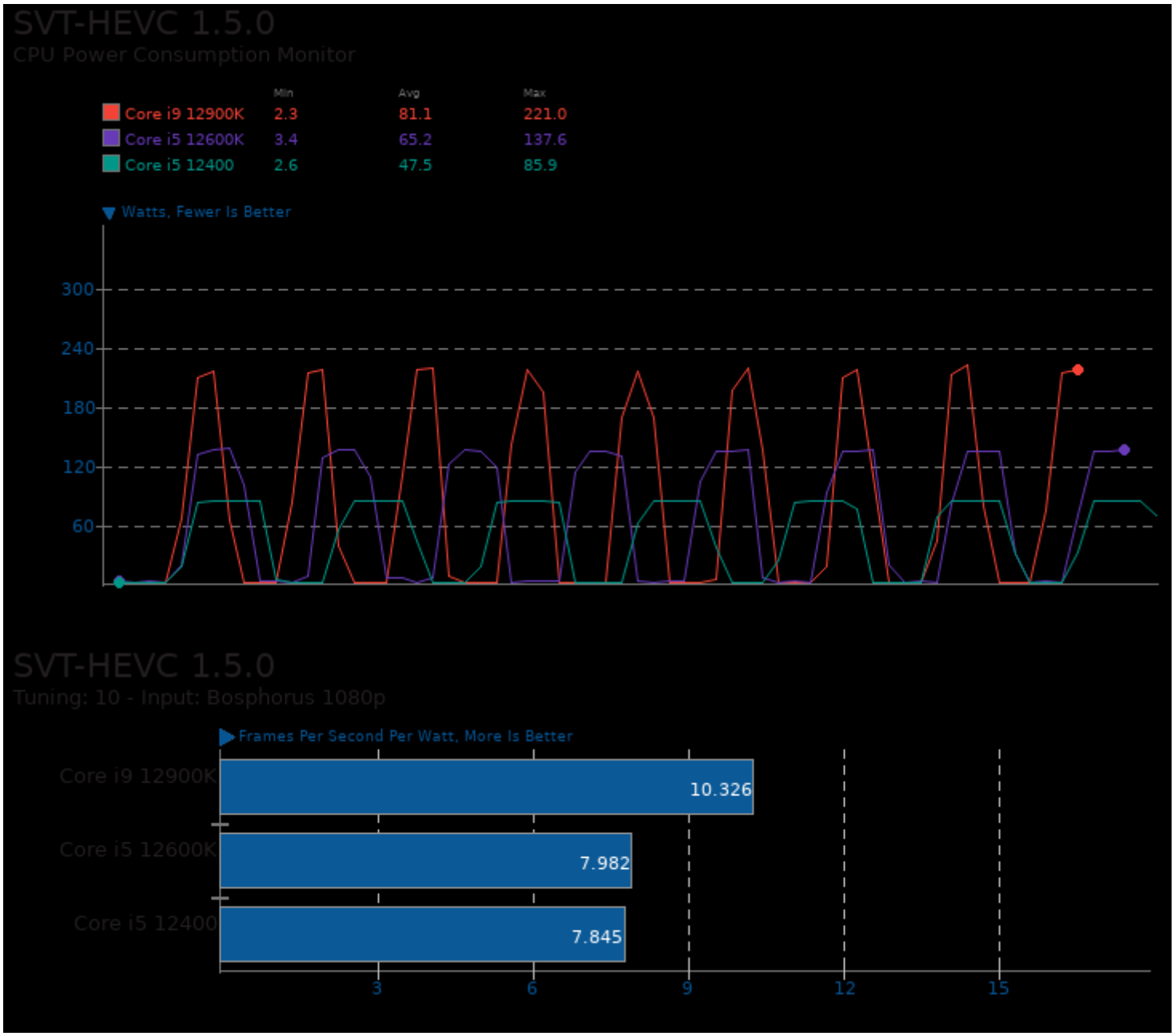
Alder Lake Intel Linux Tests

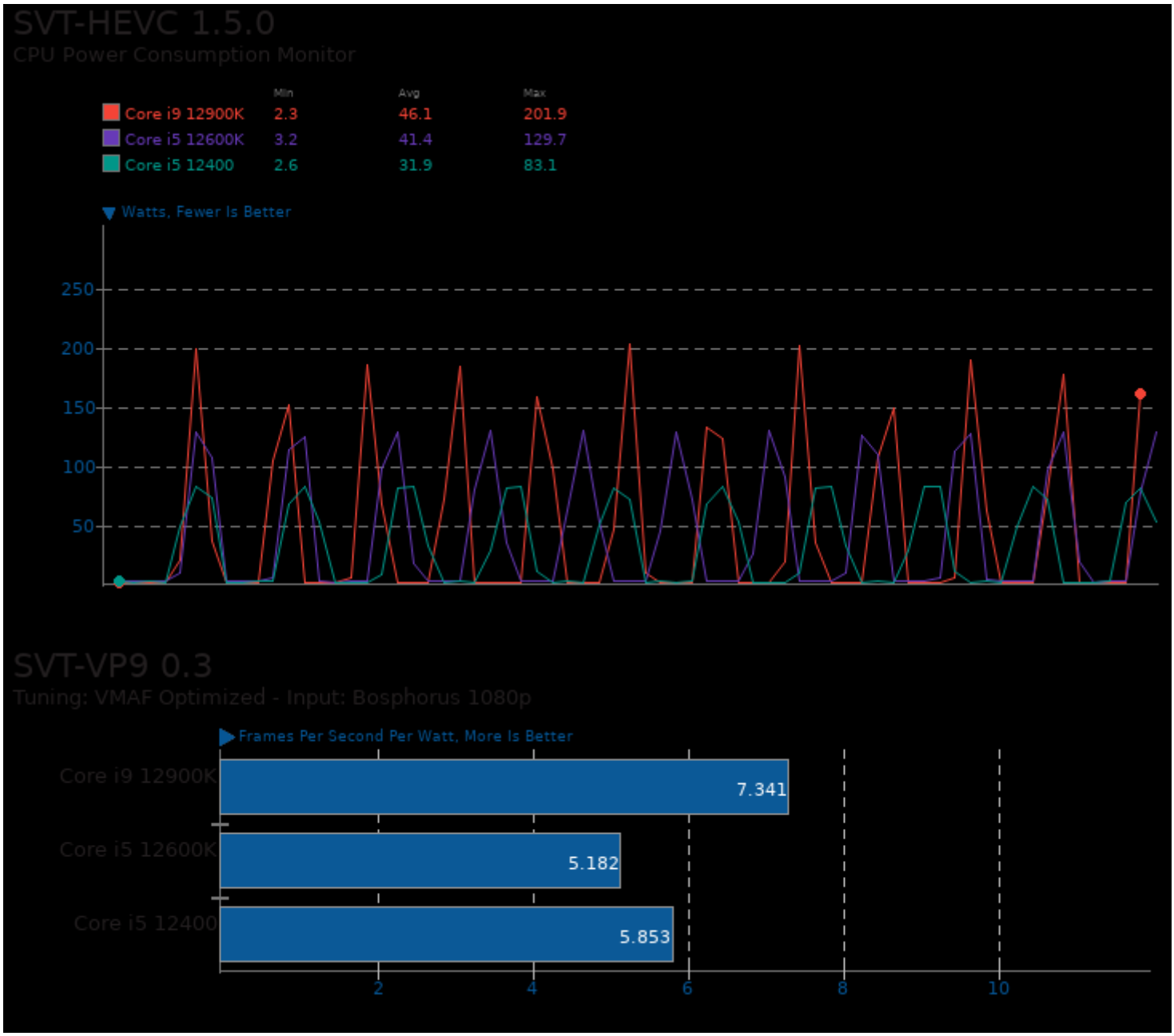


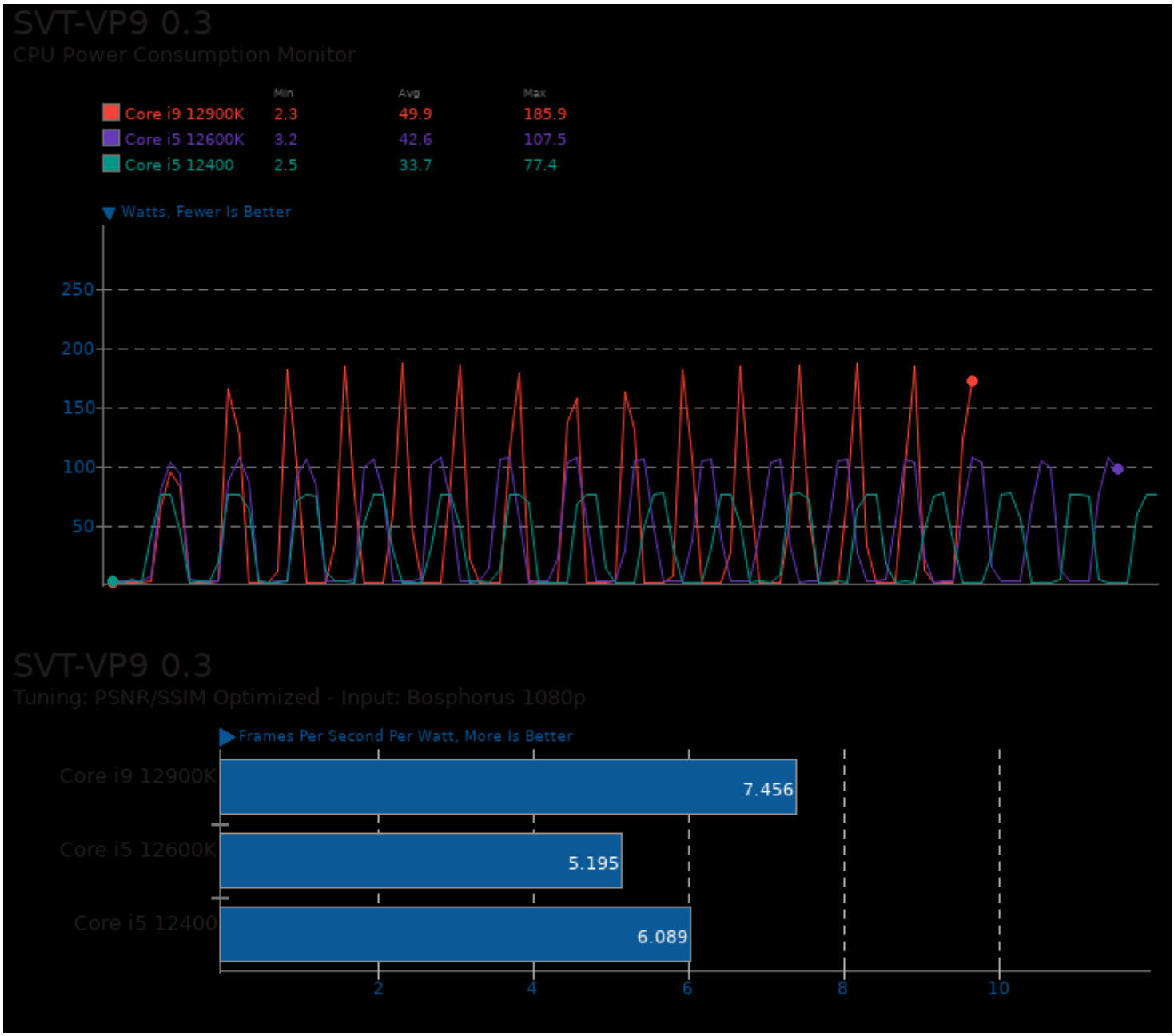

SVT-AV1 0.8.7
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 104.9 160.4
Core i5 12600K 3.3 84.9 129.8
Core i5 12400 2.6 62.6 82.6
Watts, Fewer Is Better
250
200
150
100
50
SVT-AV1 0.8.7
Encoder Mode: Preset 8 - Input: Bosphorus 1080p
Frames Per Second Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
1.161
1.138
1.149
0.2612
0.5224
0.7836
1.0448
1.306

Alder Lake Intel Linux Tests

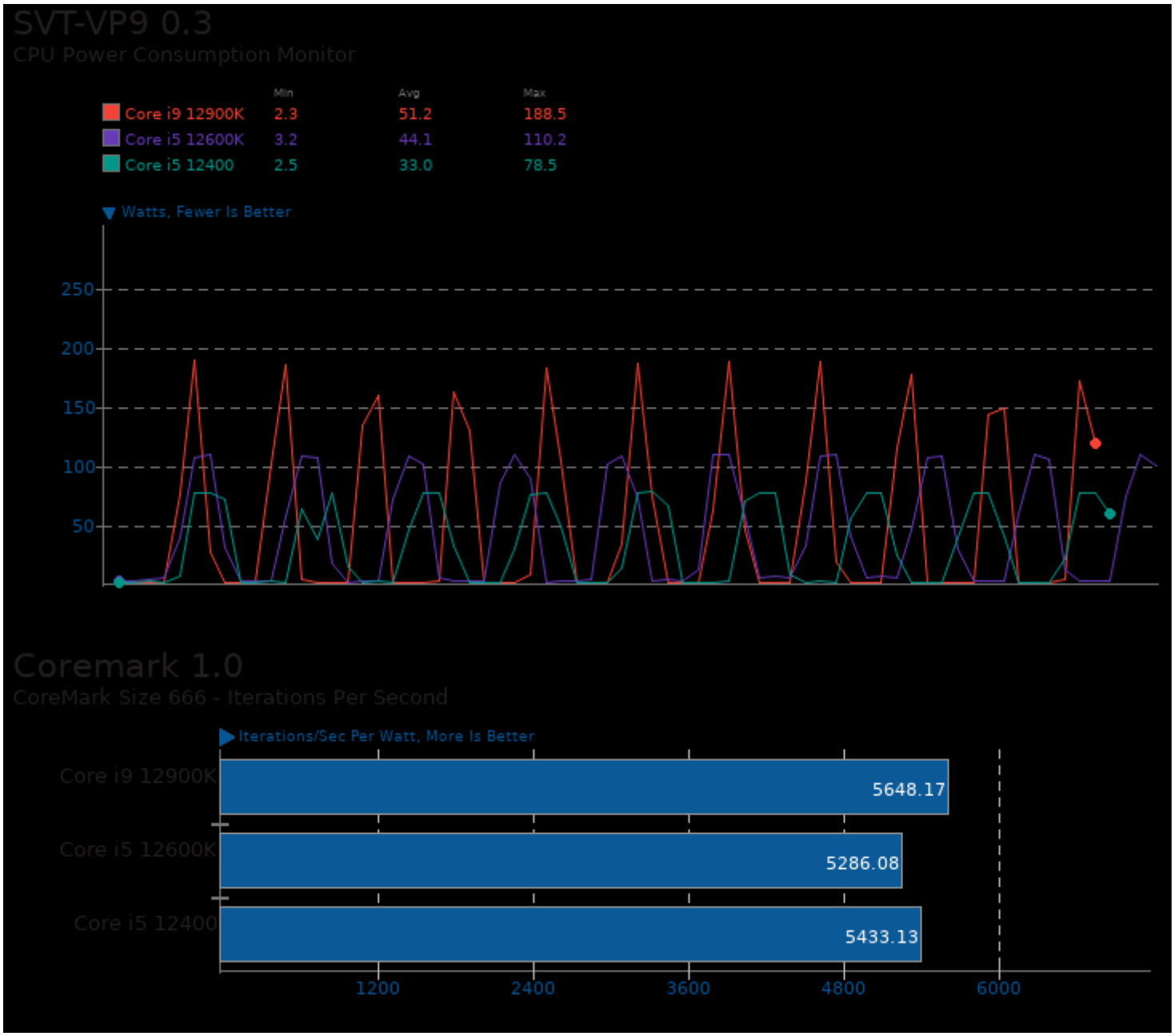


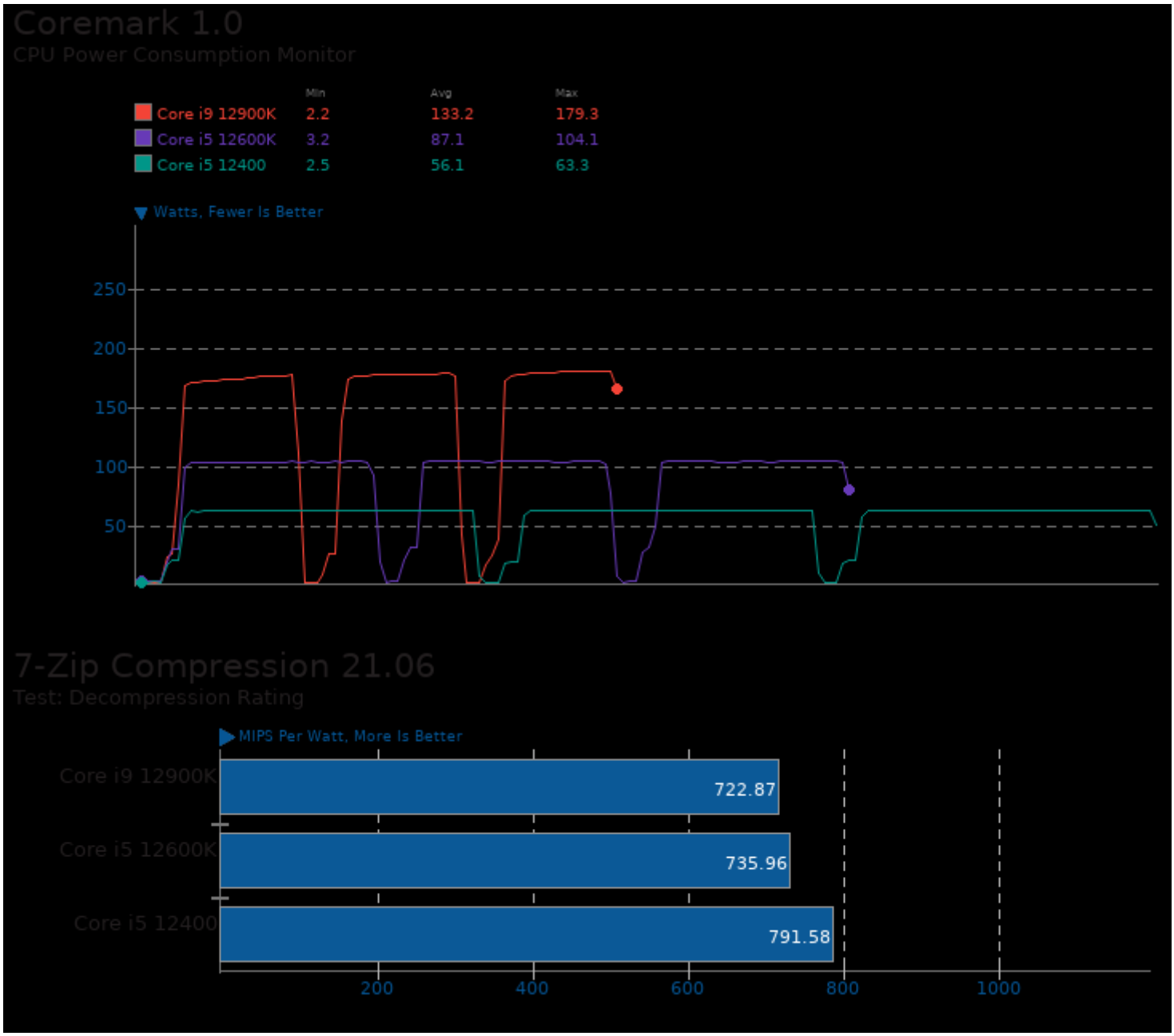

SVT-HEVC 1.5.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 81.1 221.0
Core i5 12600K 3.4 65.2 137.6
Core i5 12400 2.6 47.5 85.9
Watts, Fewer Is Better
300
240
180
120
60
SVT-HEVC 1.5.0
Tuning: 10 - Input: Bosphorus 1080p
Frames Per Second Per Watt, More Is Better
Core i9 12900K
10.326
Core i5 12600K
7.982
Core i5 12400
7.845
3
6
9
12
15

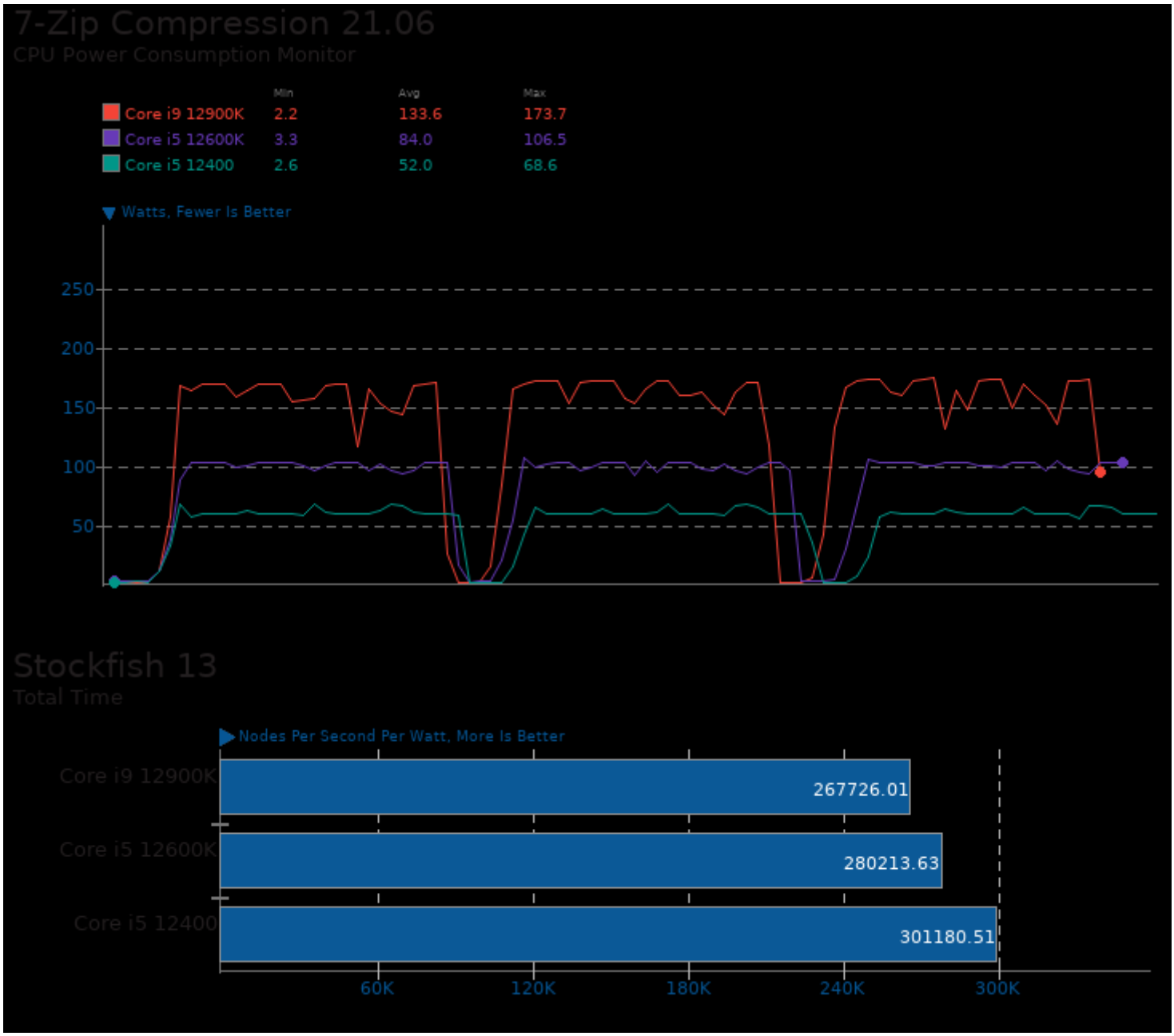

SVT-HEVC 1.5.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 46.1 201.9
Core i5 12600K 3.2 41.4 129.7
Core i5 12400 2.6 31.9 83.1
Watts, Fewer Is Better
250
200
150
100
50
SVT-VP9 0.3
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second Per Watt, More Is Better
Core i9 12900K
7.341
Core i5 12600K
5.182
Core i5 12400
5.853
2
4
6
8
10

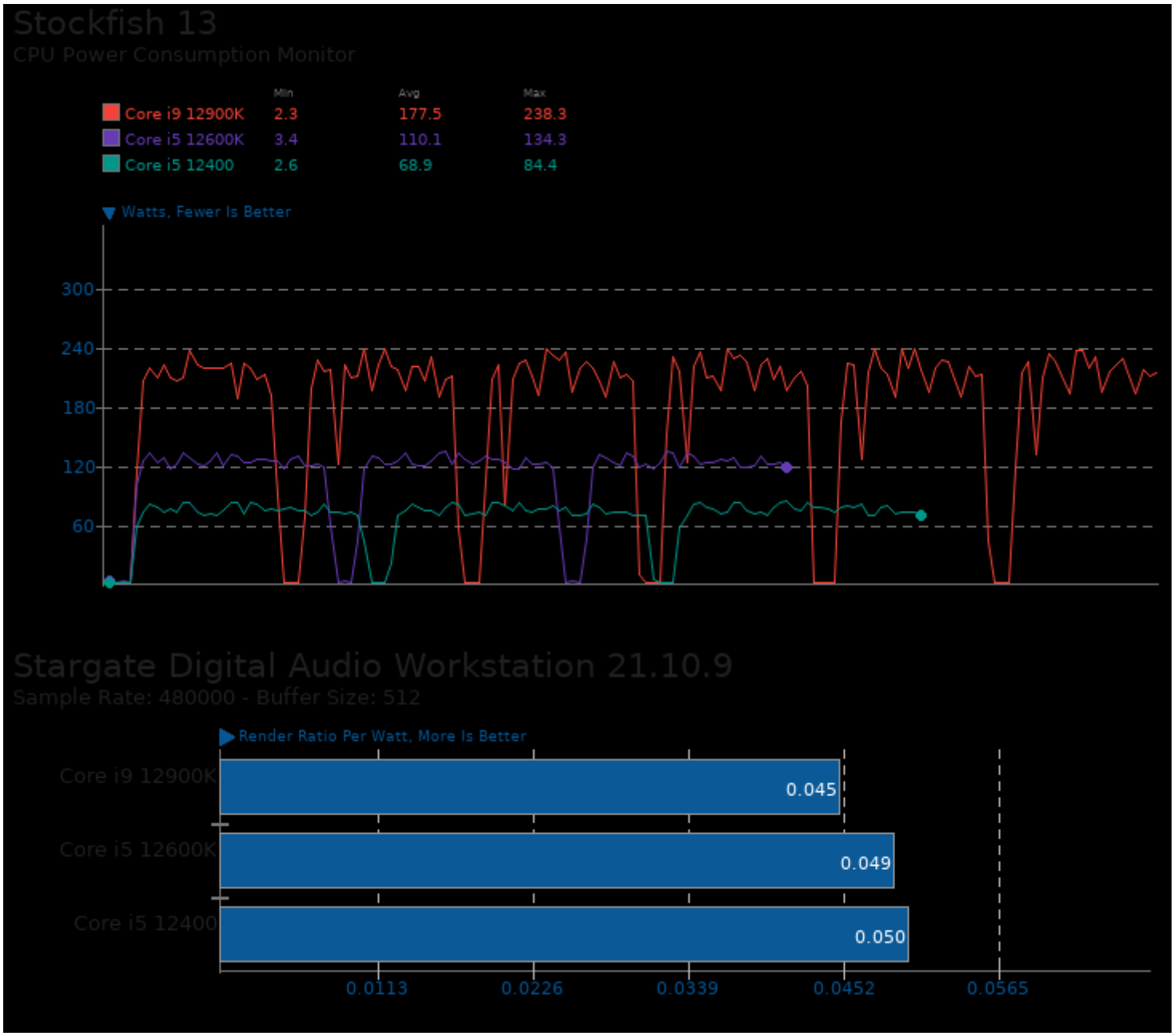

SVT-VP9 0.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 49.9 185.9
Core i5 12600K 3.2 42.6 107.5
Core i5 12400 2.5 33.7 77.4
Watts, Fewer Is Better
250
200
150
100
50
SVT-VP9 0.3
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second Per Watt, More Is Better
Core i9 12900K
7.456
Core i5 12600K
5.195
Core i5 12400
6.089
2
4
6
8
10

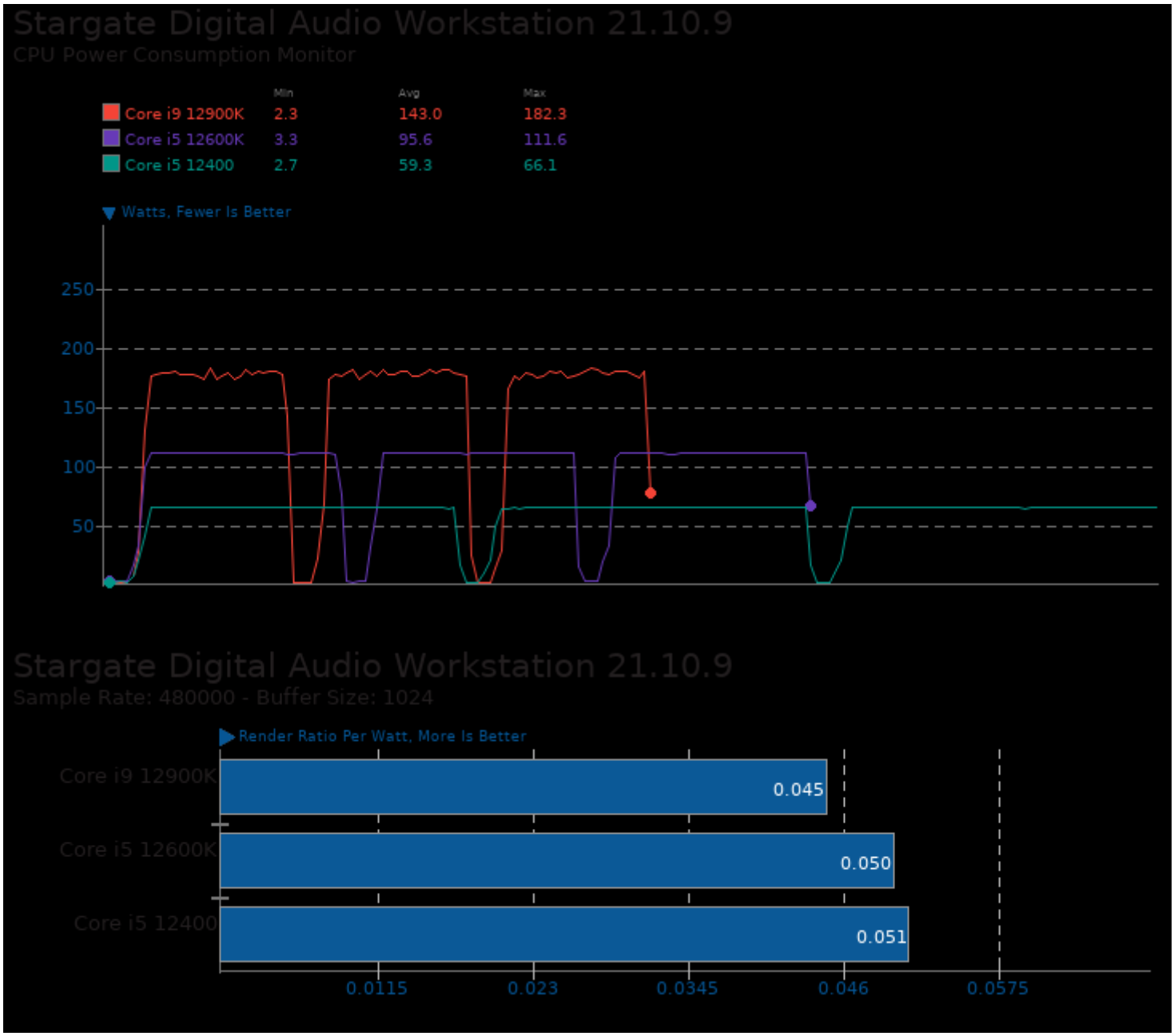
Alder Lake Intel Linux Tests

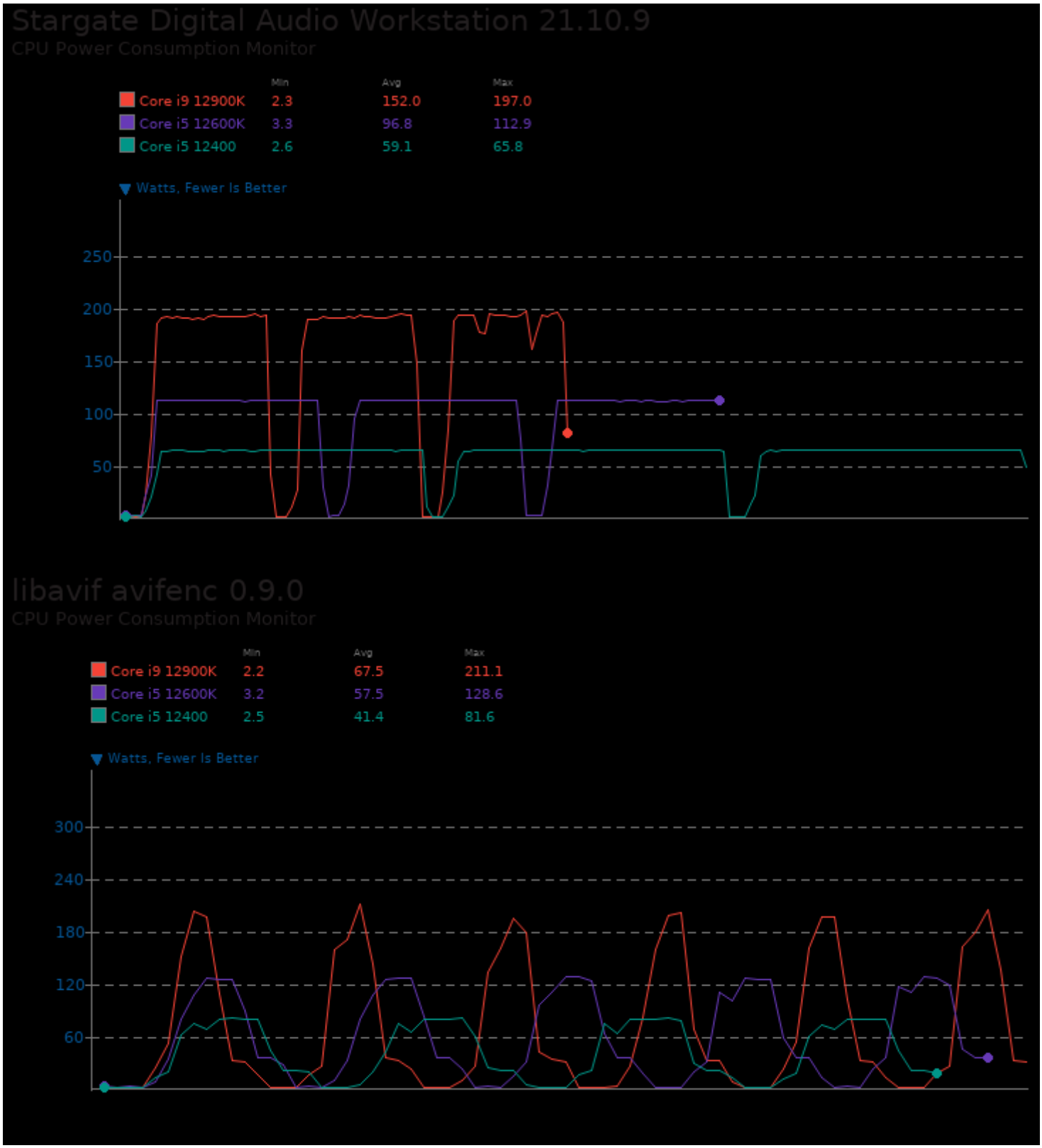


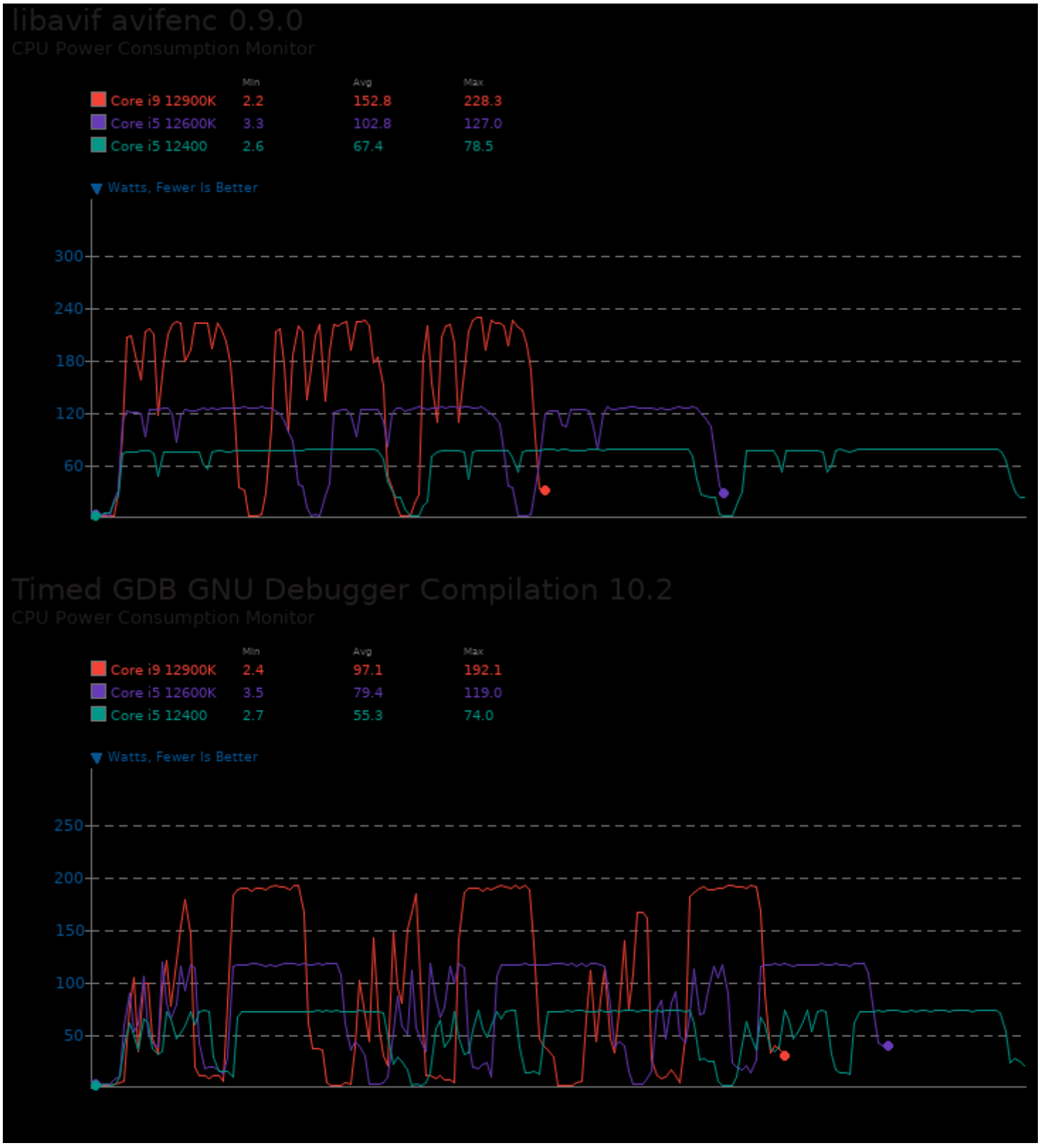

Coremark 1.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 133.2 179.3
Core i5 12600K 3.2 87.1 104.1
Core i5 12400 2.5 56.1 63.3
Watts, Fewer Is Better
250
200
150
100
50
7-Zip Compression 21.06
Test: Decompression Rating
MIPS Per Watt, More Is Better
Core i9 12900K
722.87
Core i5 12600K
735.96
Core i5 12400
791.58
200
400
600
800
1000

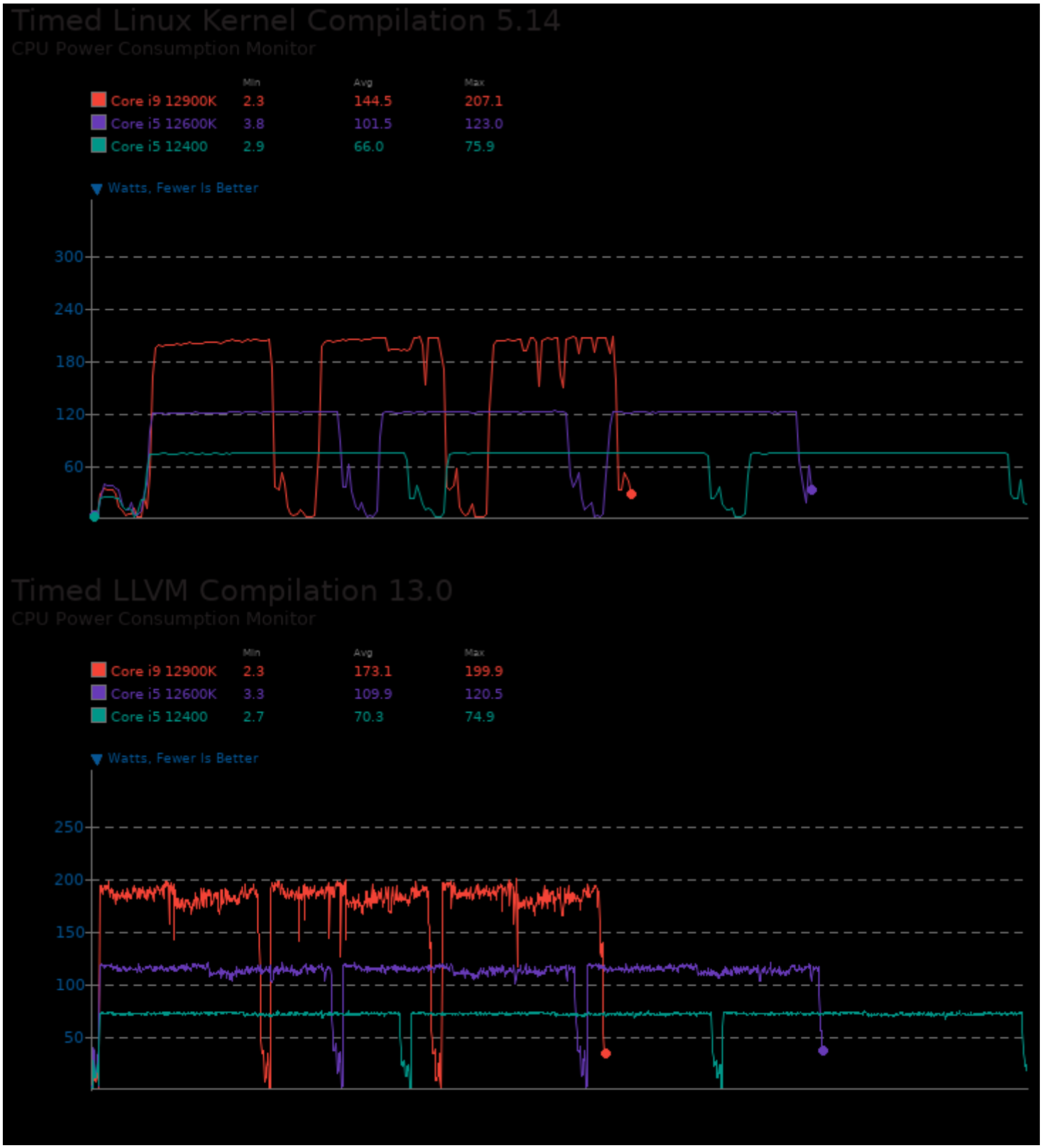

7-Zip Compression 21.06
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 133.6 173.7
Core i5 12600K 3.3 84.0 106.5
Core i5 12400 2.6 52.0 68.6
Watts, Fewer Is Better
250
200
150
100
50
Stockfish 13
Total Time
Nodes Per Second Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
267726.01
280213.63
301180.51
60K
120K
180K
240K
300K

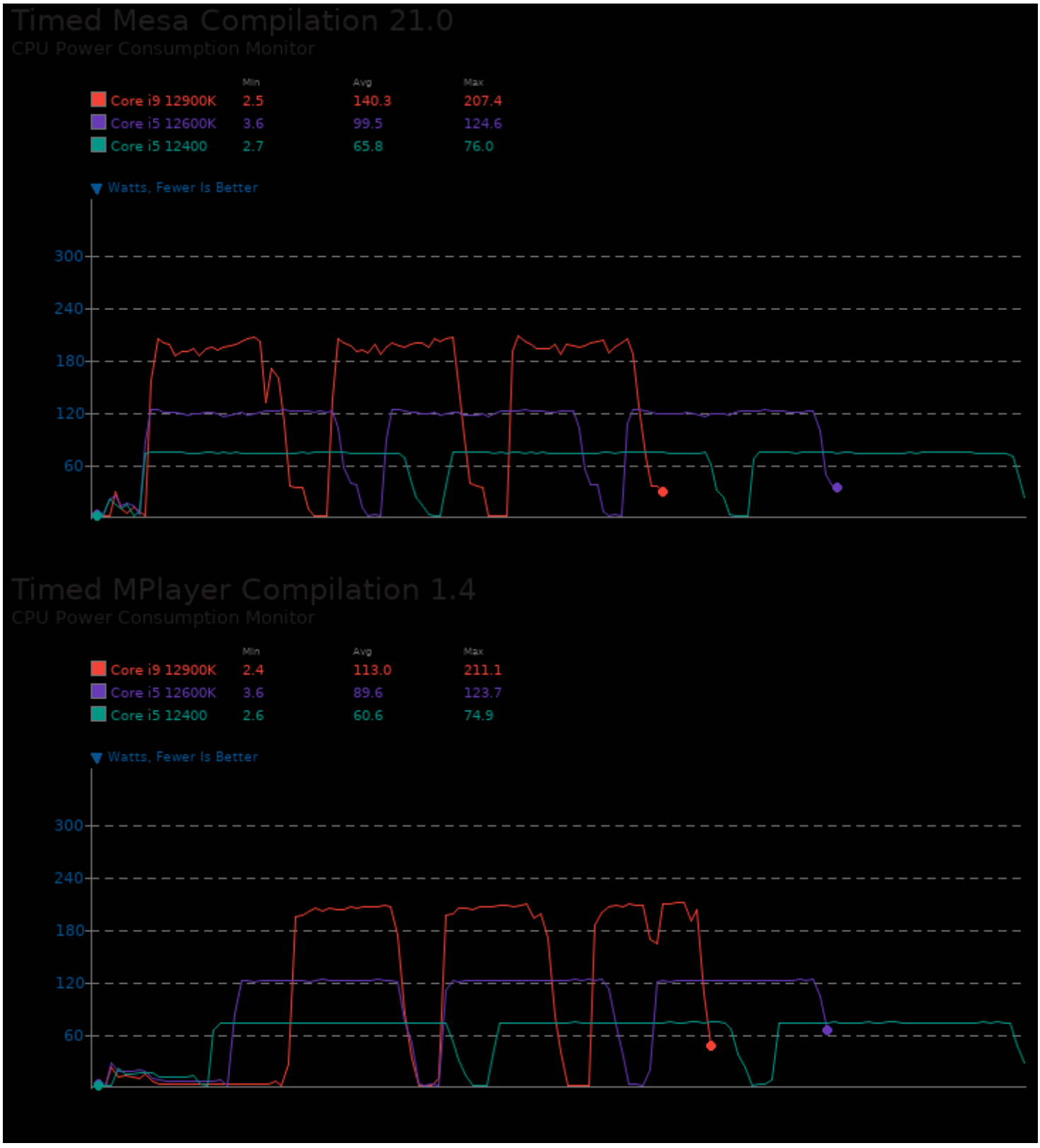

Stockfish 13
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 177.5 238.3
Core i5 12600K 3.4 110.1 134.3
Core i5 12400 2.6 68.9 84.4
Watts, Fewer Is Better
300
240
180
120
60
Stargate Digital Audio Workstation 21.10.9
Sample Rate: 480000 - Buffer Size: 512
Render Ratio Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.045
0.049
0.050
0.0113
0.0226
0.0339
0.0452
0.0565

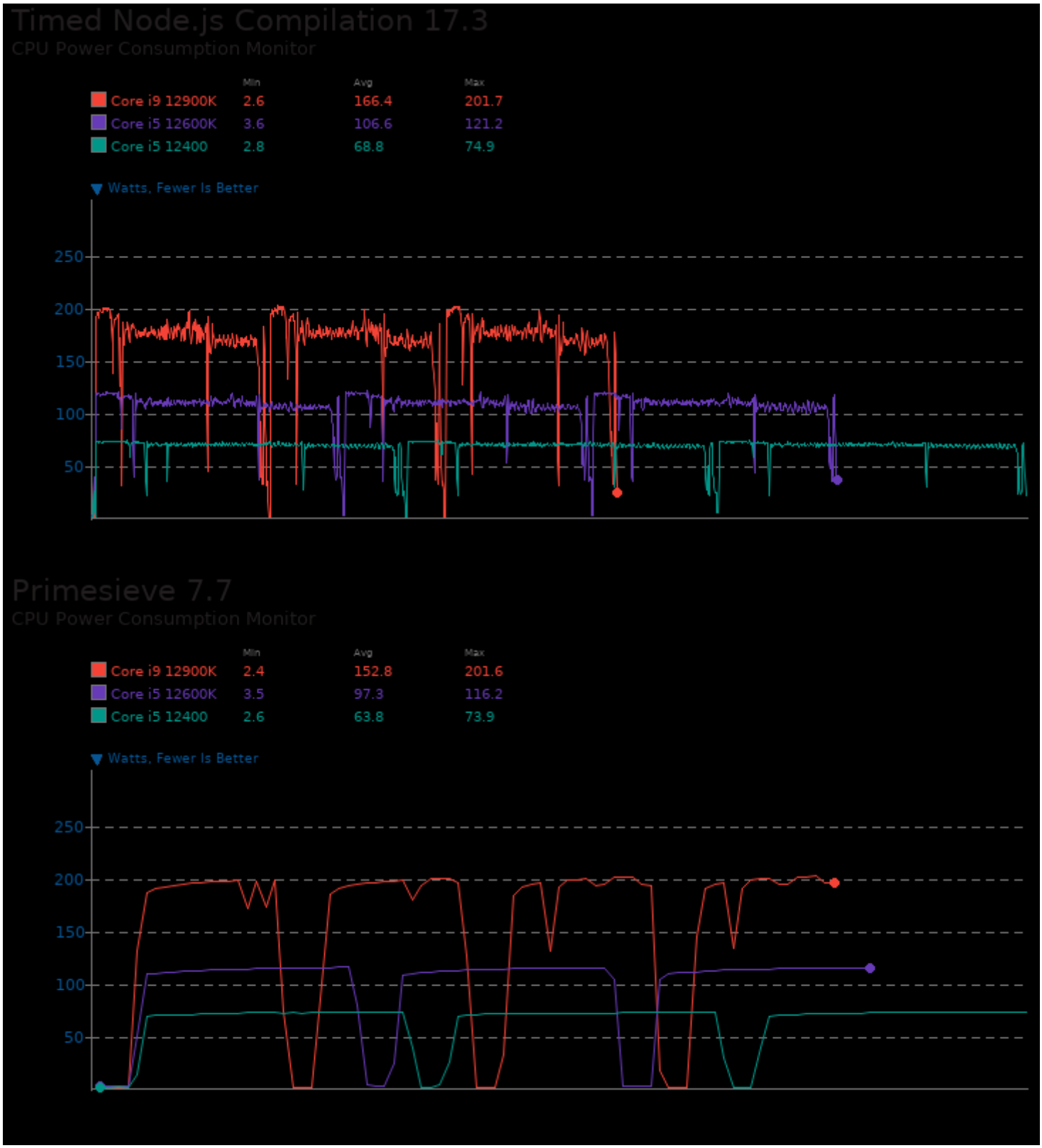

Stargate Digital Audio Workstation 21.10.9
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 143.0 182.3
Core i5 12600K 3.3 95.6 111.6
Core i5 12400 2.7 59.3 66.1
Watts, Fewer Is Better
250
200
150
100
50
Stargate Digital Audio Workstation 21.10.9
Sample Rate: 480000 - Buffer Size: 1024
Render Ratio Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.045
0.050
0.051
0.0115
0.023
0.0345
0.046
0.0575

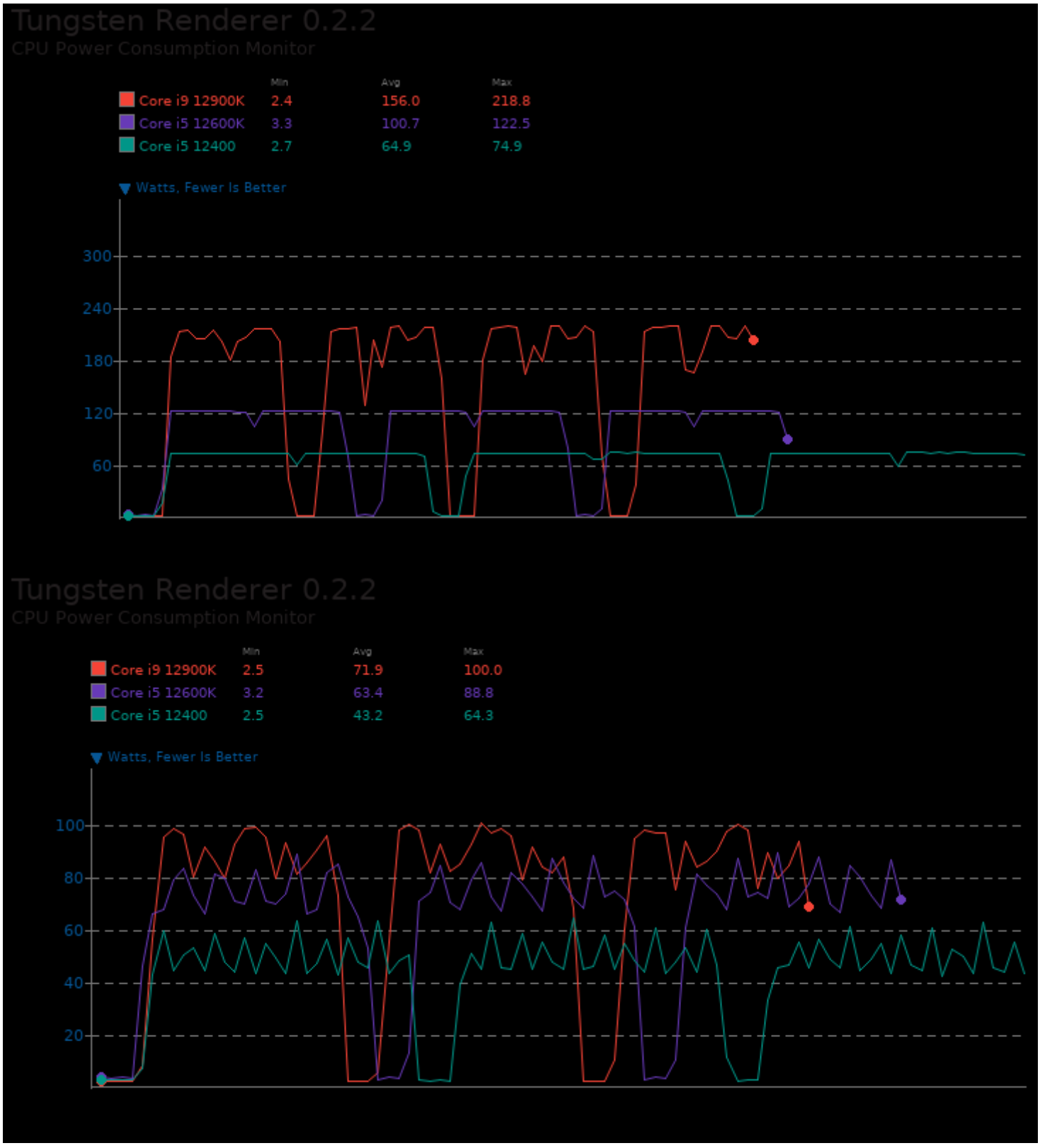

Stargate Digital Audio Workstation 21.10.9
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 152.0 197.0
Core i5 12600K 3.3 96.8 112.9
Core i5 12400 2.6 59.1 65.8
Watts, Fewer Is Better
250
200
150
100
50
libavif avifenc 0.9.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 67.5 211.1
Core i5 12600K 3.2 57.5 128.6
Core i5 12400 2.5 41.4 81.6
Watts, Fewer Is Better
300
240
180
120
60

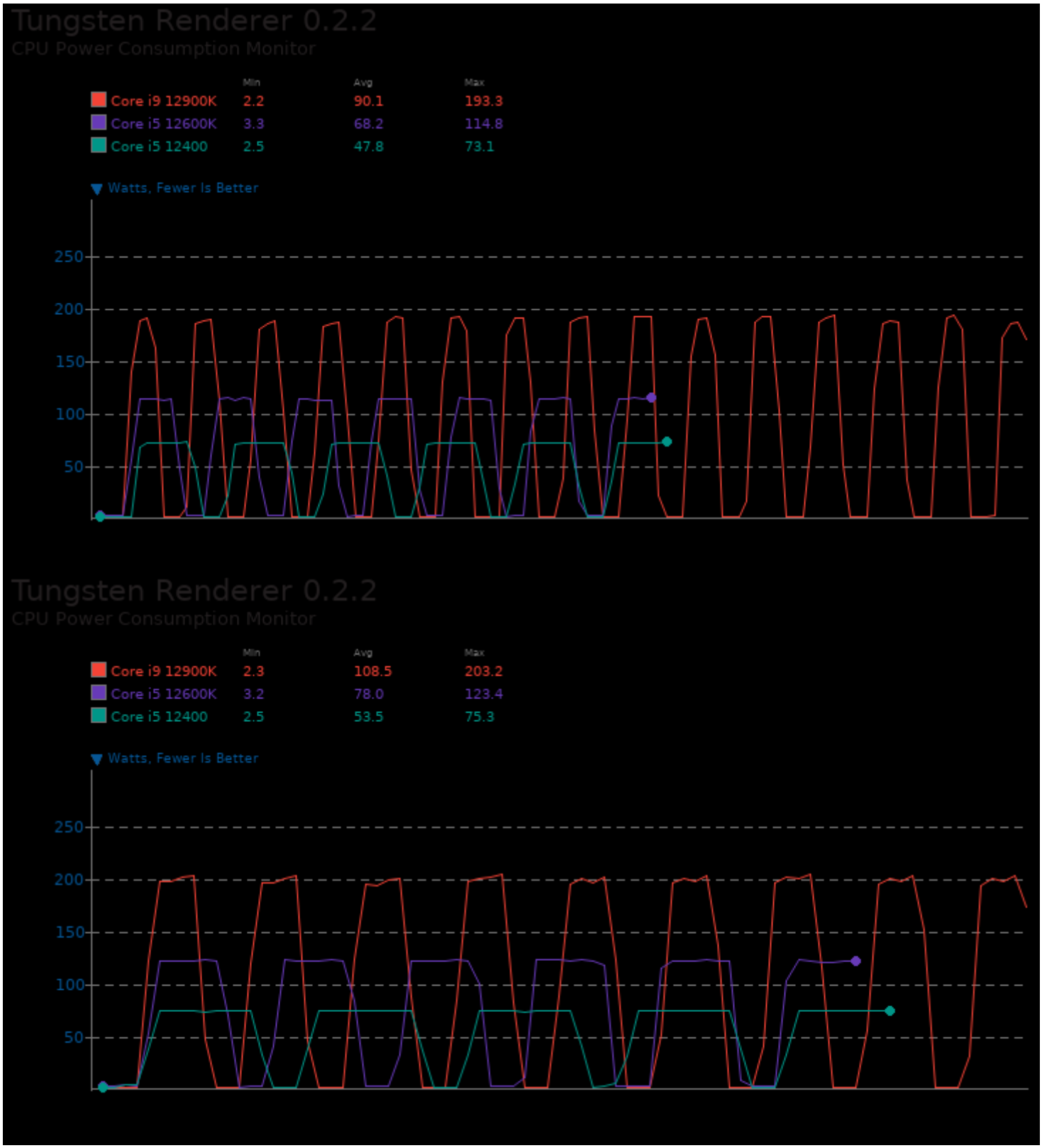

libavif avifenc 0.9.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 152.8 228.3
Core i5 12600K 3.3 102.8 127.0
Core i5 12400 2.6 67.4 78.5
Watts, Fewer Is Better
300
240
180
120
60
Timed GDB GNU Debugger Compilation 10.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 97.1 192.1
Core i5 12600K 3.5 79.4 119.0
Core i5 12400 2.7 55.3 74.0
Watts, Fewer Is Better
250
200
150
100
50

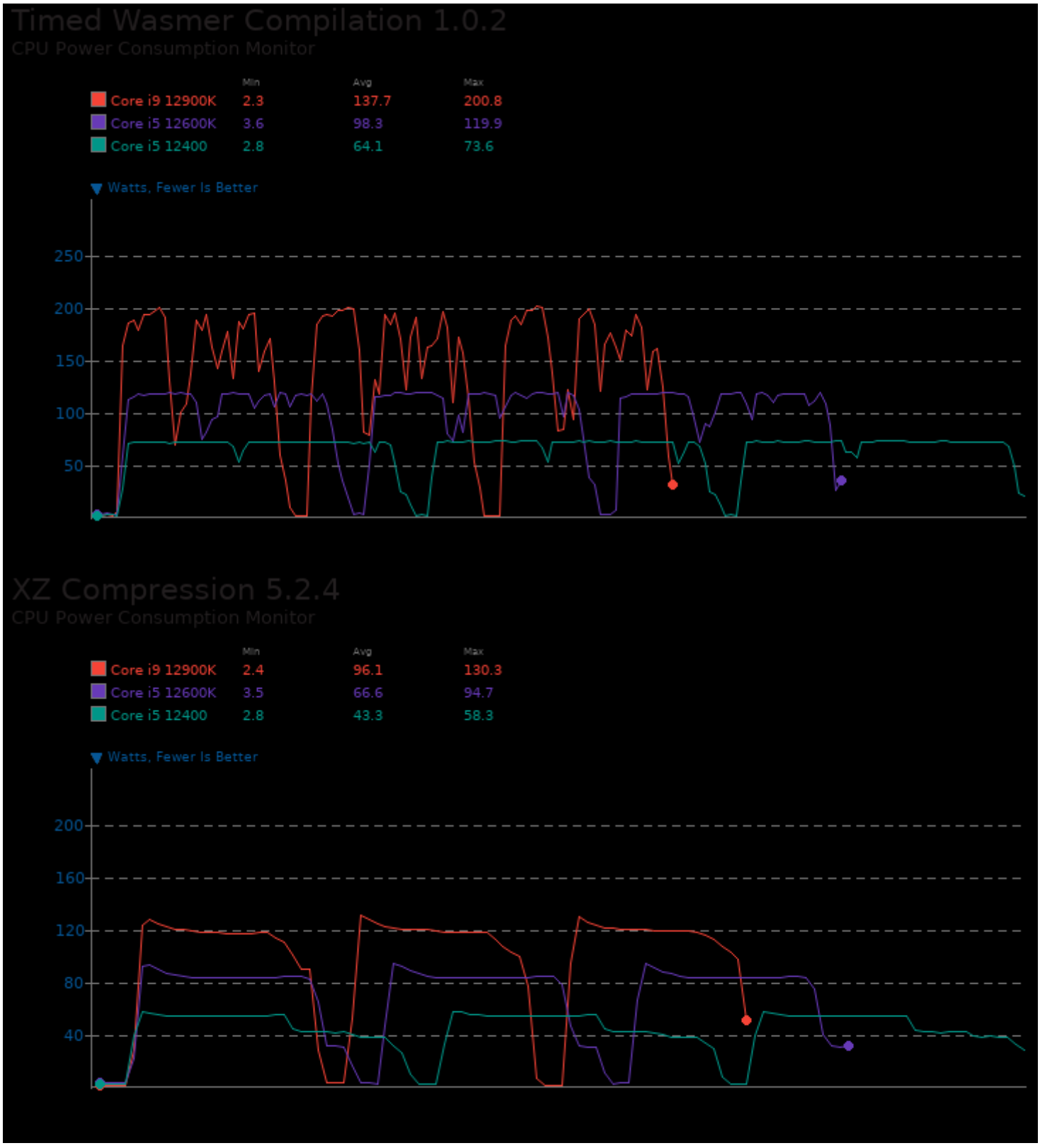

Timed Linux Kernel Compilation 5.14
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 144.5 207.1
Core i5 12600K 3.8 101.5 123.0
Core i5 12400 2.9 66.0 75.9
Watts, Fewer Is Better
300
240
180
120
60
Timed LLVM Compilation 13.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 173.1 199.9
Core i5 12600K 3.3 109.9 120.5
Core i5 12400 2.7 70.3 74.9
Watts, Fewer Is Better
250
200
150
100
50

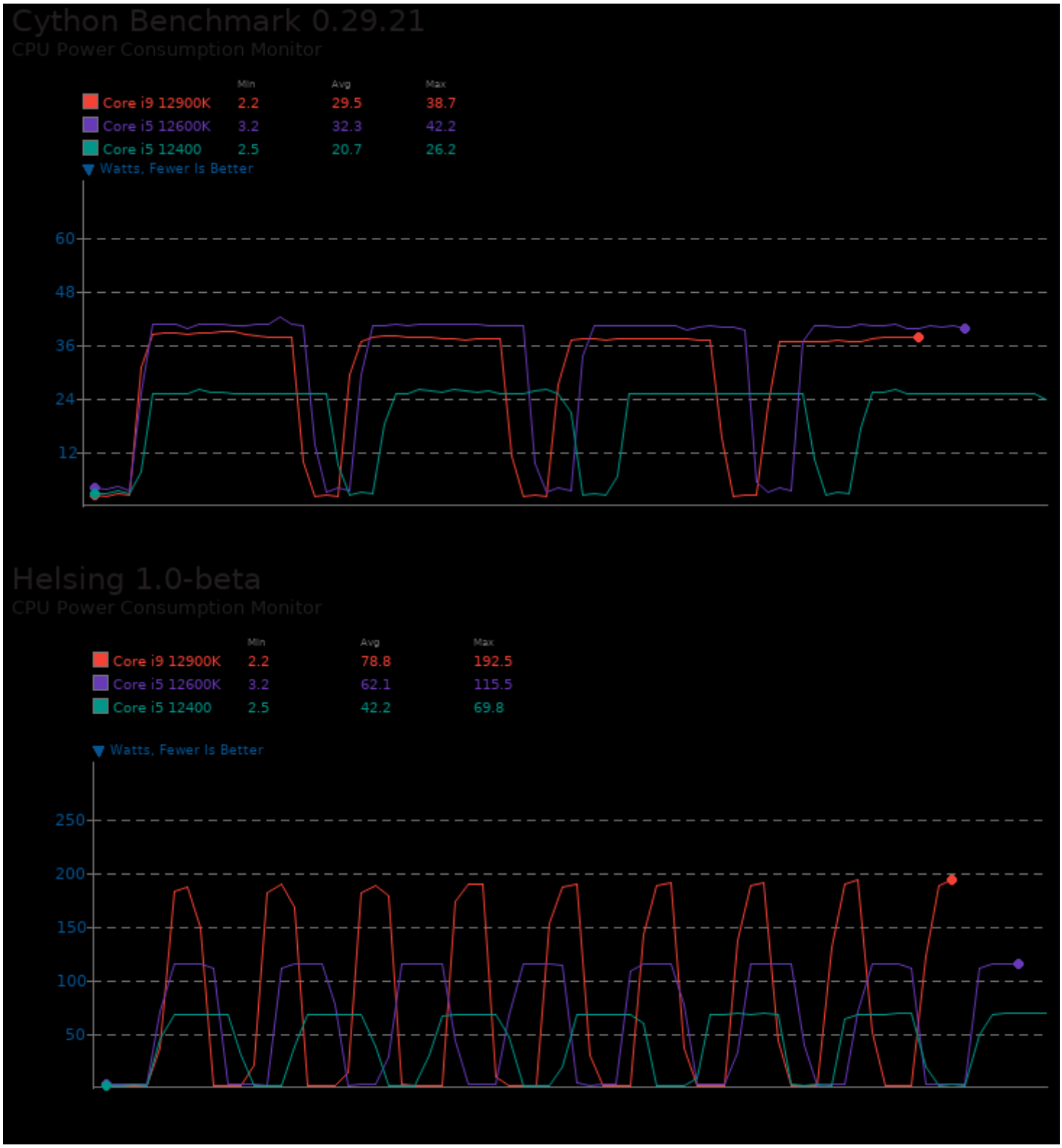

Timed Mesa Compilation 21.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.5 140.3 207.4
Core i5 12600K 3.6 99.5 124.6
Core i5 12400 2.7 65.8 76.0
Watts, Fewer Is Better
300
240
180
120
60
Timed MPlayer Compilation 1.4
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 113.0 211.1
Core i5 12600K 3.6 89.6 123.7
Core i5 12400 2.6 60.6 74.9
Watts, Fewer Is Better
300
240
180
120
60

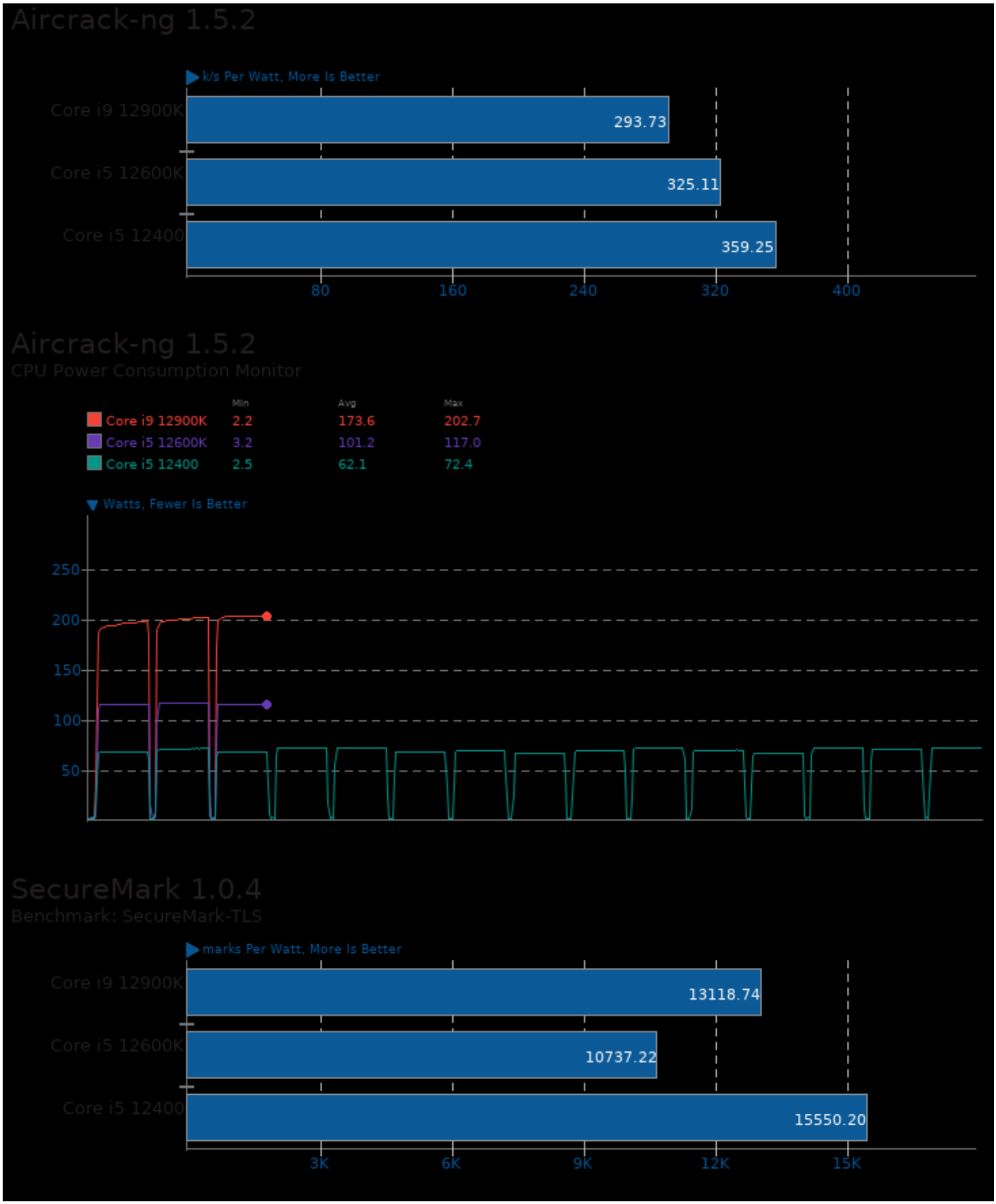

Timed Node.js Compilation 17.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.6 166.4 201.7
Core i5 12600K 3.6 106.6 121.2
Core i5 12400 2.8 68.8 74.9
Watts, Fewer Is Better
250
200
150
100
50
Primesieve 7.7
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 152.8 201.6
Core i5 12600K 3.5 97.3 116.2
Core i5 12400 2.6 63.8 73.9
Watts, Fewer Is Better
250
200
150
100
50


Tungsten Renderer 0.2.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 156.0 218.8
Core i5 12600K 3.3 100.7 122.5
Core i5 12400 2.7 64.9 74.9
Watts, Fewer Is Better
300
240
180
120
60
Tungsten Renderer 0.2.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.5 71.9 100.0
Core i5 12600K 3.2 63.4 88.8
Core i5 12400 2.5 43.2 64.3
Watts, Fewer Is Better
100
80
60
40
20

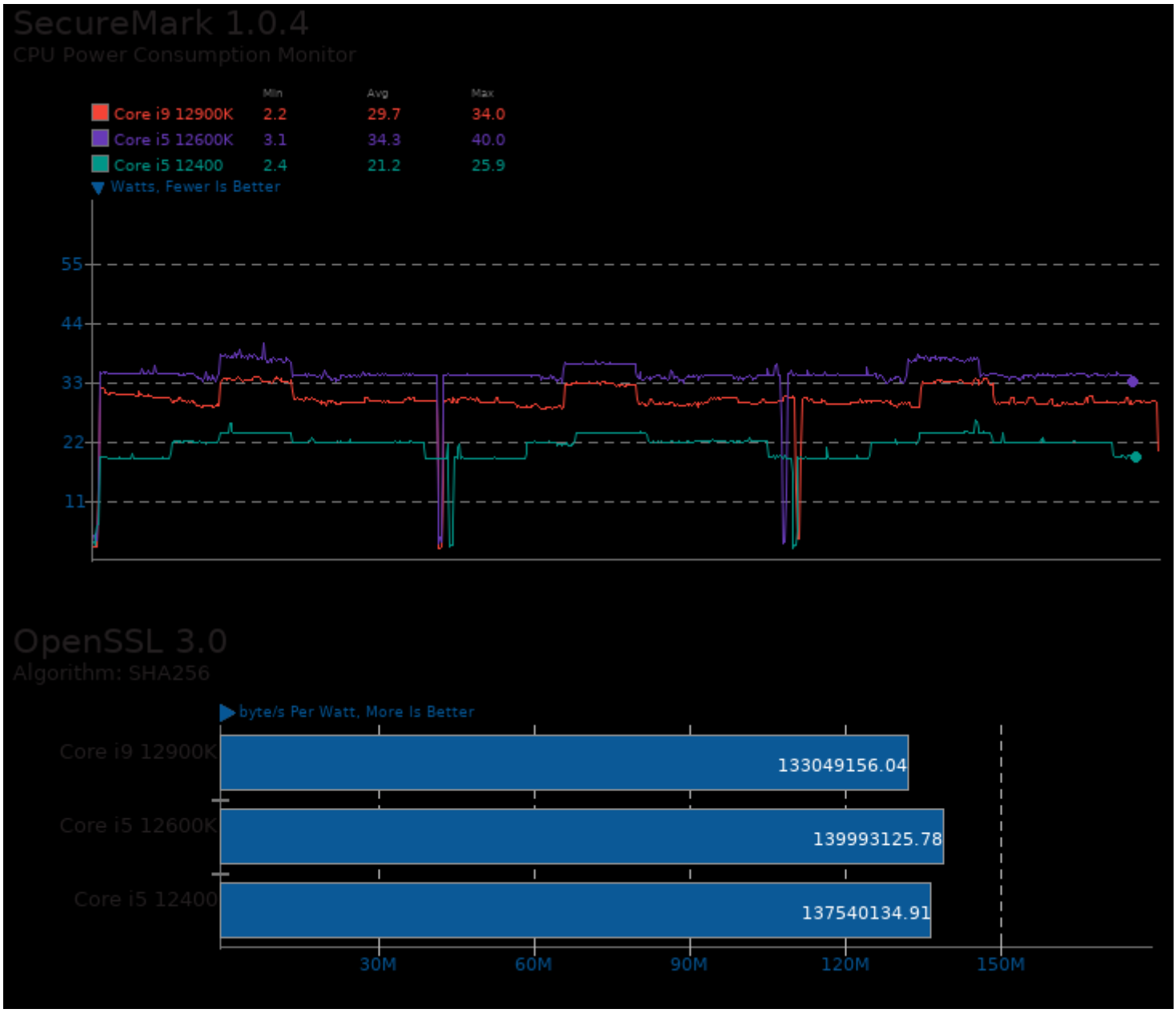

Tungsten Renderer 0.2.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 90.1 193.3
Core i5 12600K 3.3 68.2 114.8
Core i5 12400 2.5 47.8 73.1
Watts, Fewer Is Better
250
200
150
100
50
Tungsten Renderer 0.2.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 108.5 203.2
Core i5 12600K 3.2 78.0 123.4
Core i5 12400 2.5 53.5 75.3
Watts, Fewer Is Better
250
200
150
100
50

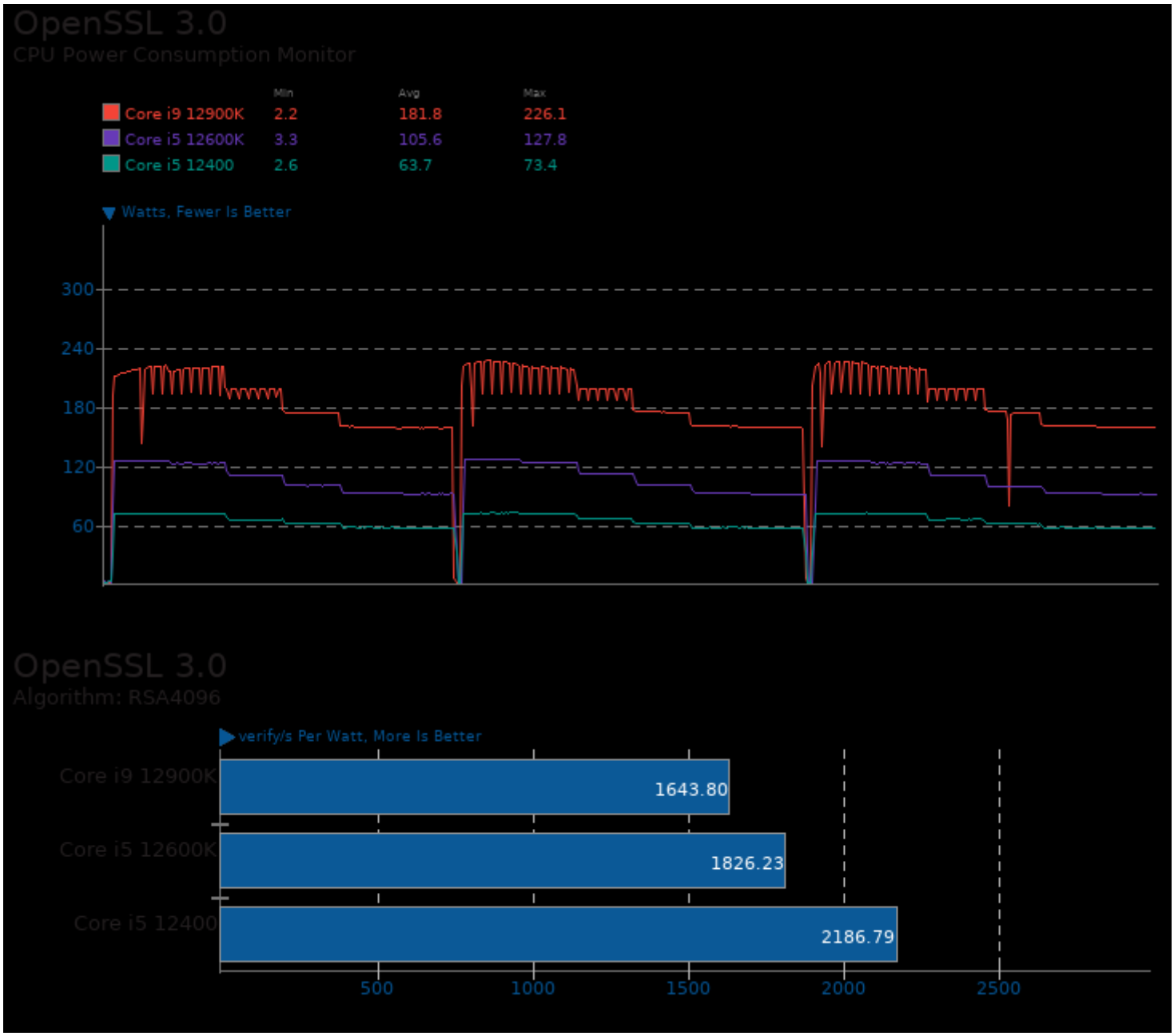

Timed Wasmer Compilation 1.0.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 137.7 200.8
Core i5 12600K 3.6 98.3 119.9
Core i5 12400 2.8 64.1 73.6
Watts, Fewer Is Better
250
200
150
100
50
XZ Compression 5.2.4
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 96.1 130.3
Core i5 12600K 3.5 66.6 94.7
Core i5 12400 2.8 43.3 58.3
Watts, Fewer Is Better
200
160
120
80
40

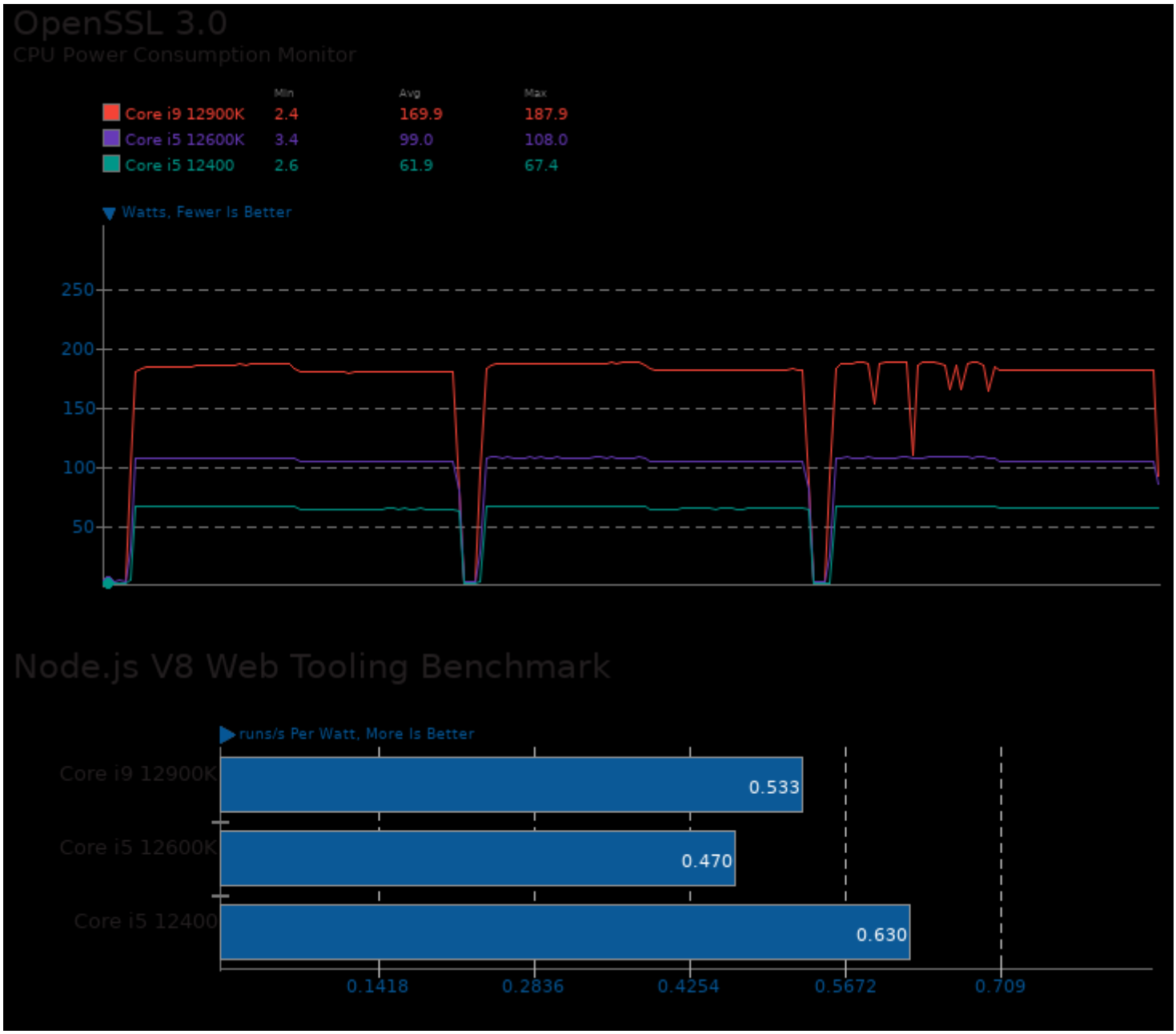

Cython Benchmark 0.29.21
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 29.5 38.7
Core i5 12600K 3.2 32.3 42.2
Core i5 12400 2.5 20.7 26.2
Watts, Fewer Is Better
60
48
36
24
12
Helsing 1.0-beta
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 78.8 192.5
Core i5 12600K 3.2 62.1 115.5
Core i5 12400 2.5 42.2 69.8
Watts, Fewer Is Better
250
200
150
100
50

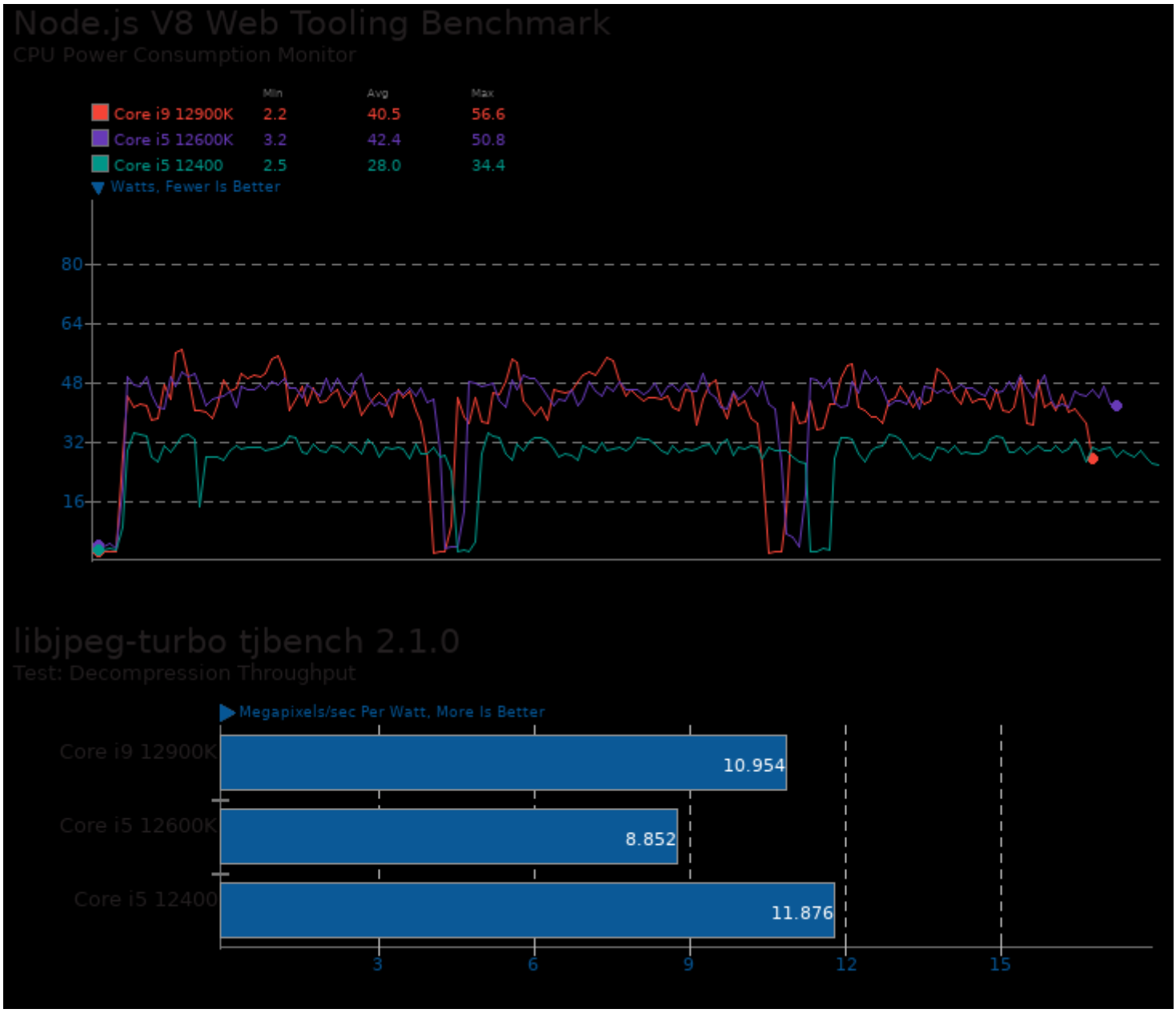

Aircrack-ng 1.5.2
k/s Per Watt, More Is Better
Core i9 12900K
293.73
Core i5 12600K
325.11
Core i5 12400
359.25
80
160
240
320
400
Aircrack-ng 1.5.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 173.6 202.7
Core i5 12600K 3.2 101.2 117.0
Core i5 12400 2.5 62.1 72.4
Watts, Fewer Is Better
250
200
150
100
50
SecureMark 1.0.4
Benchmark: SecureMark-TLS
marks Per Watt, More Is Better
Core i9 12900K
13118.74
Core i5 12600K
10737.22
Core i5 12400
15550.20
3K
6K
9K
12K
15K

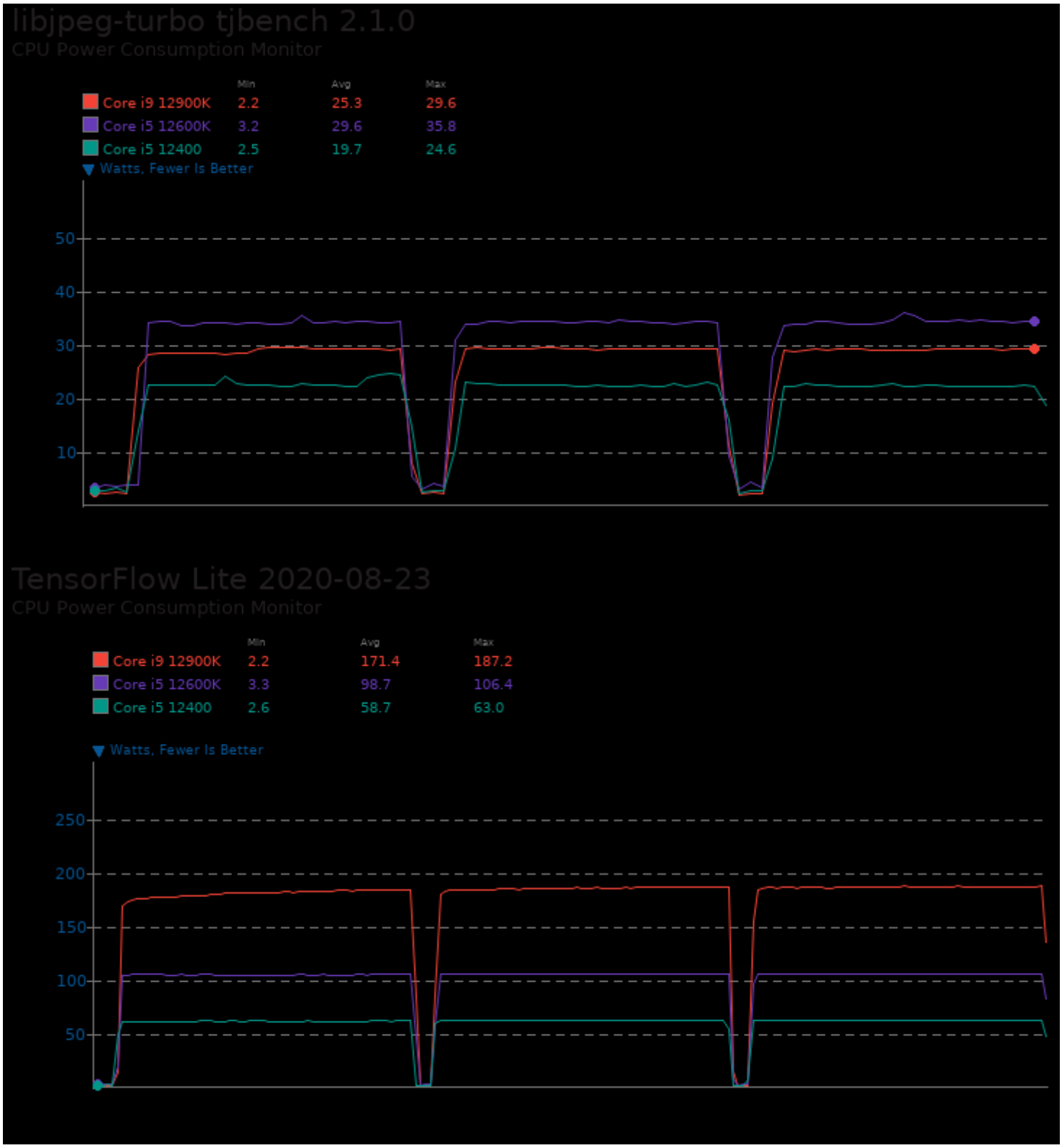
Alder Lake Intel Linux Tests

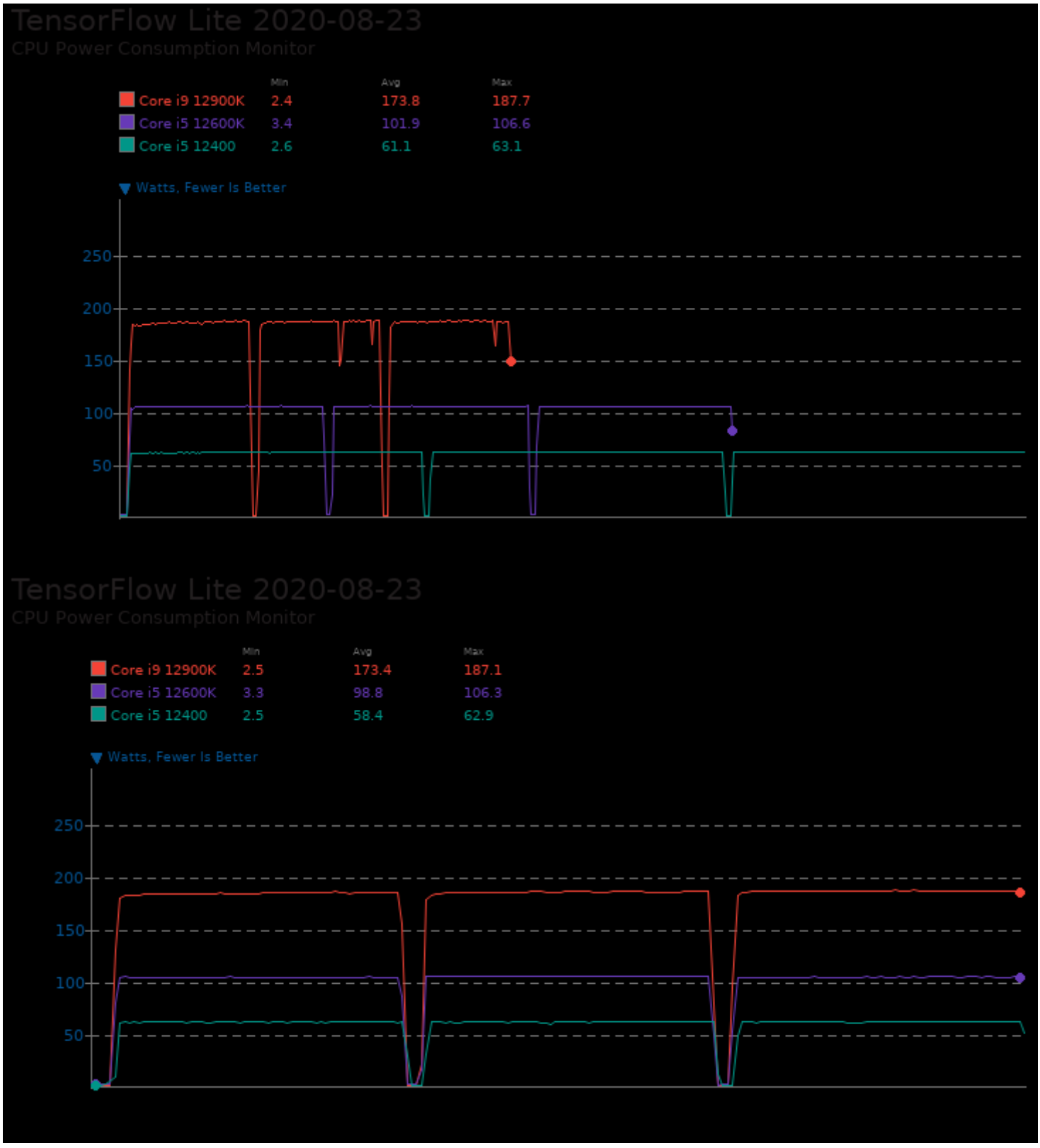


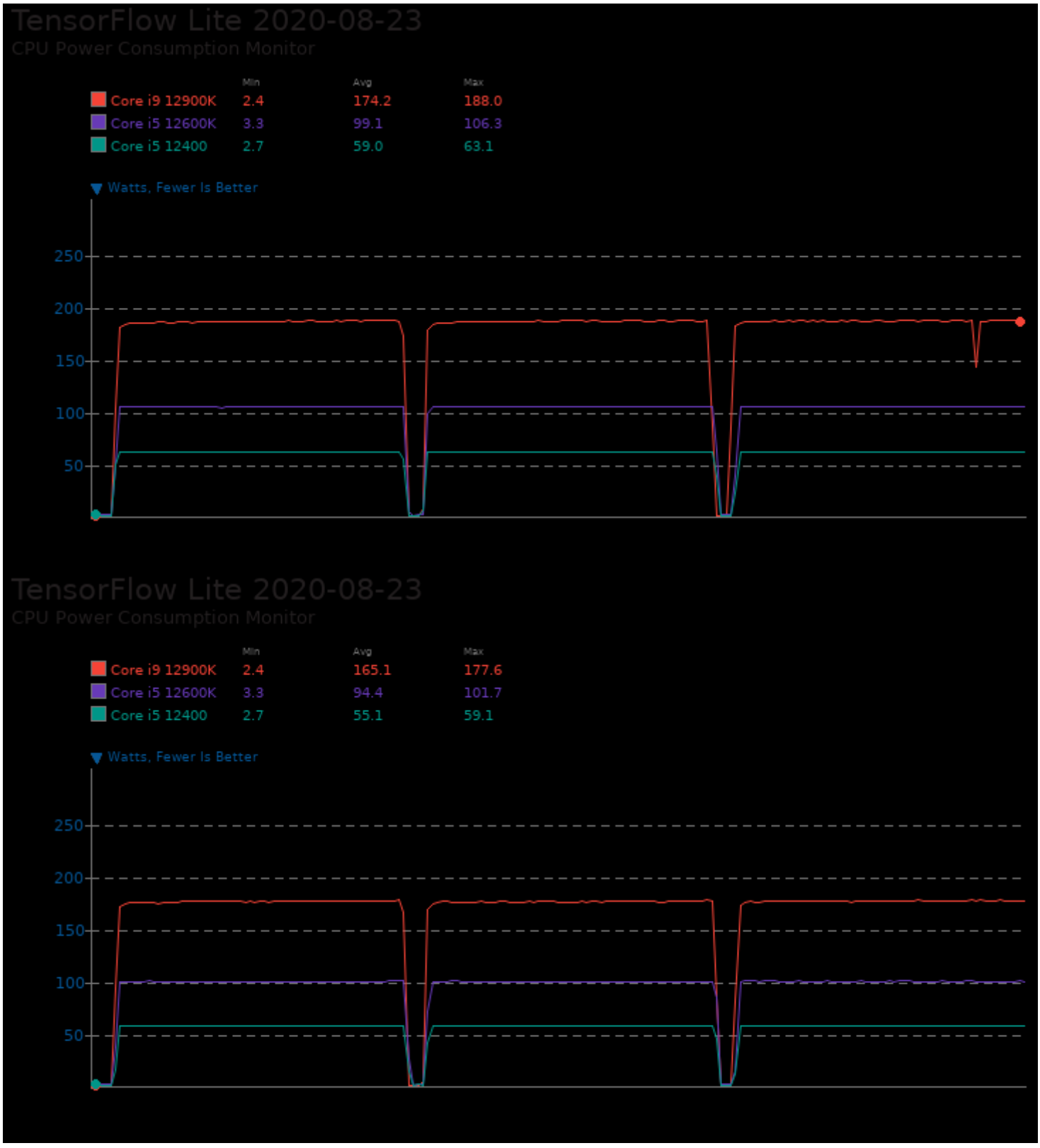

OpenSSL 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 181.8 226.1
Core i5 12600K 3.3 105.6 127.8
Core i5 12400 2.6 63.7 73.4
Watts, Fewer Is Better
300
240
180
120
60
OpenSSL 3.0
Algorithm: RSA4096
verify/s Per Watt, More Is Better
Core i9 12900K
1643.80
Core i5 12600K
1826.23
Core i5 12400
2186.79
500
1000
1500
2000
2500

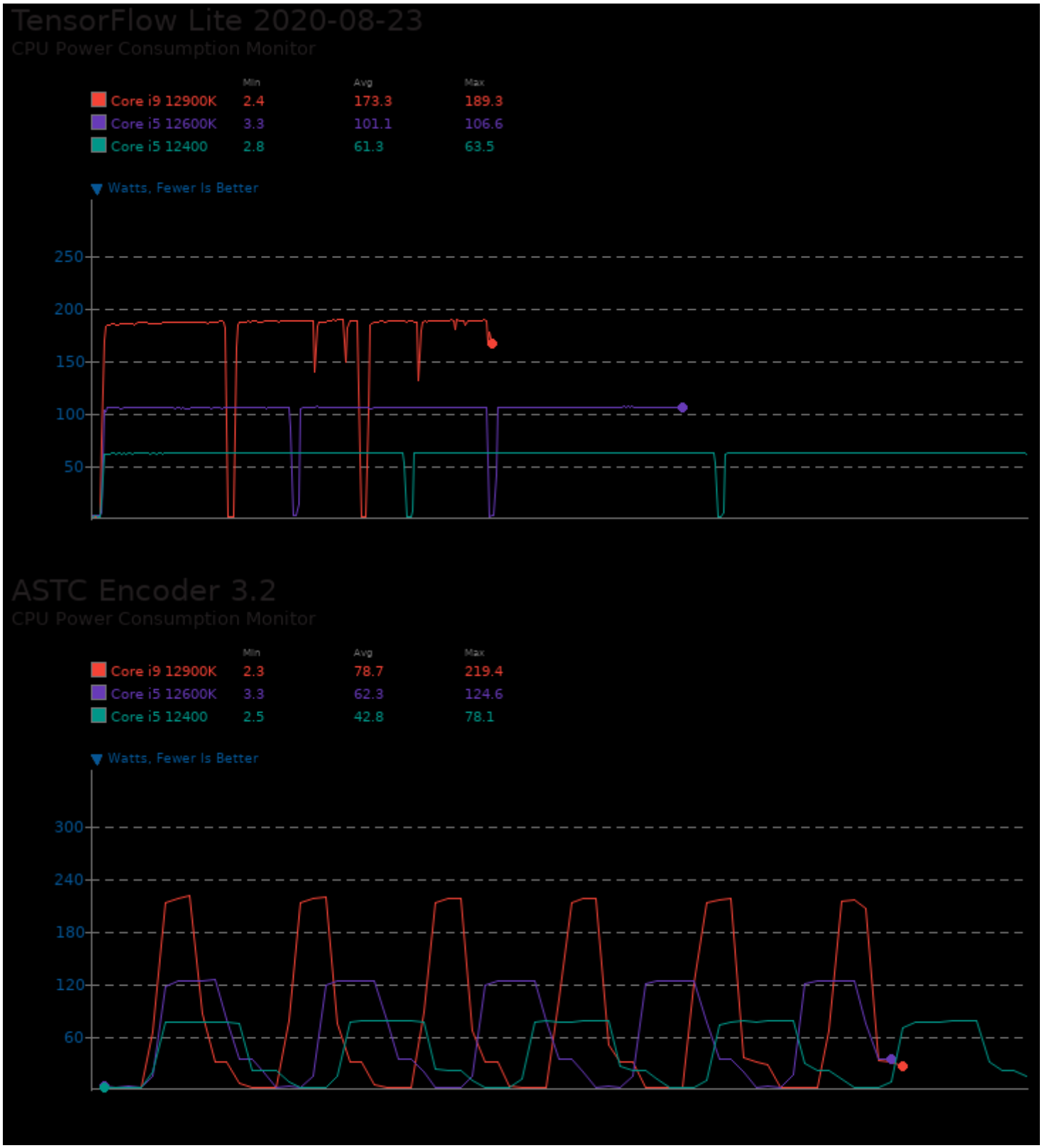

OpenSSL 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 169.9 187.9
Core i5 12600K 3.4 99.0 108.0
Core i5 12400 2.6 61.9 67.4
Watts, Fewer Is Better
250
200
150
100
50
Node.js V8 Web Tooling Benchmark
runs/s Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.533
0.470
0.630
0.1418
0.2836
0.4254
0.5672
0.709

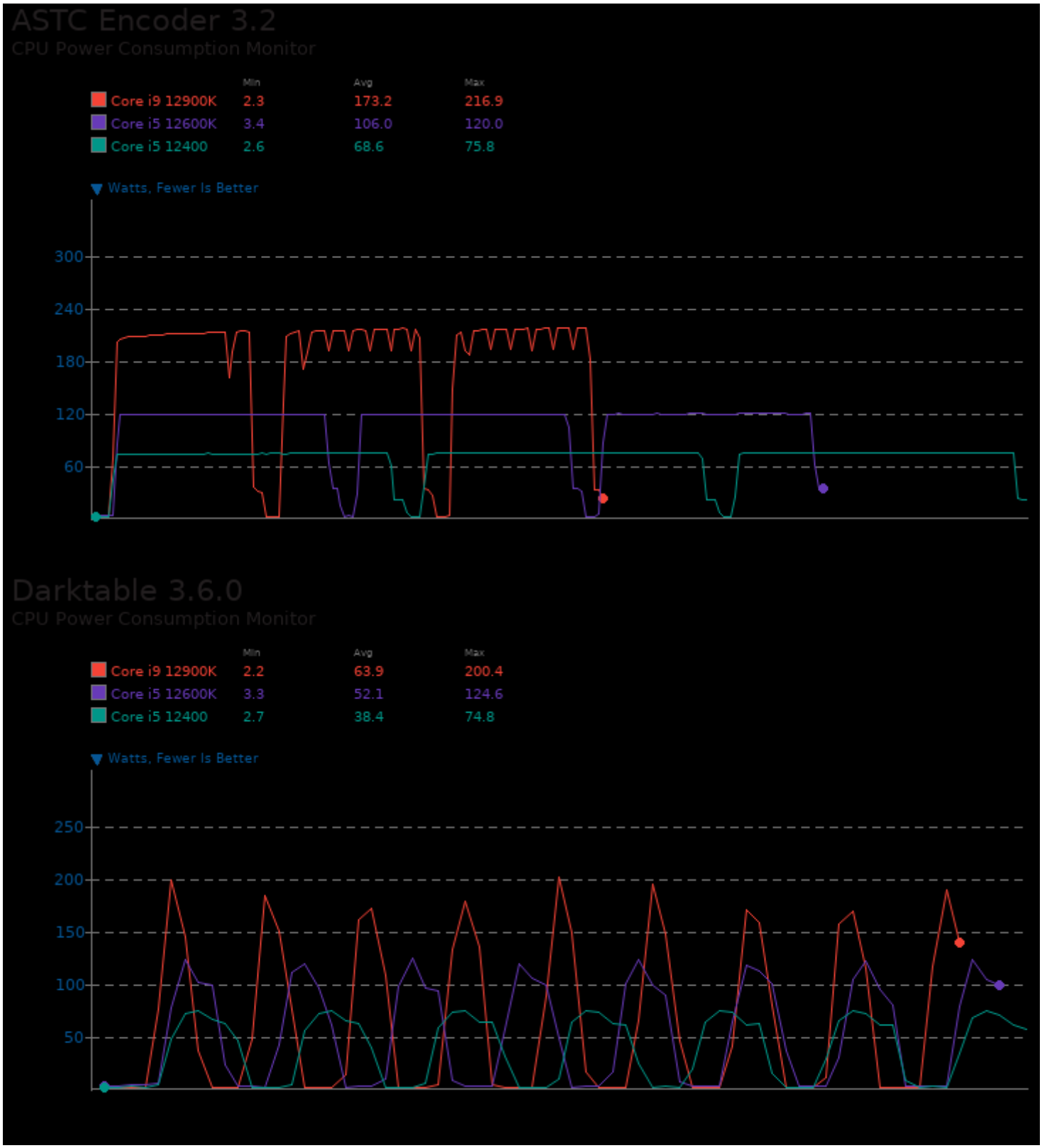

Node.js V8 Web Tooling Benchmark
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 40.5 56.6
Core i5 12600K 3.2 42.4 50.8
Core i5 12400 2.5 28.0 34.4
Watts, Fewer Is Better
80
64
48
32
16
libjpeg-turbo tjbench 2.1.0
Test: Decompression Throughput
Megapixels/sec Per Watt, More Is Better
Core i9 12900K
10.954
Core i5 12600K
8.852
Core i5 12400
11.876
3
6
9
12
15

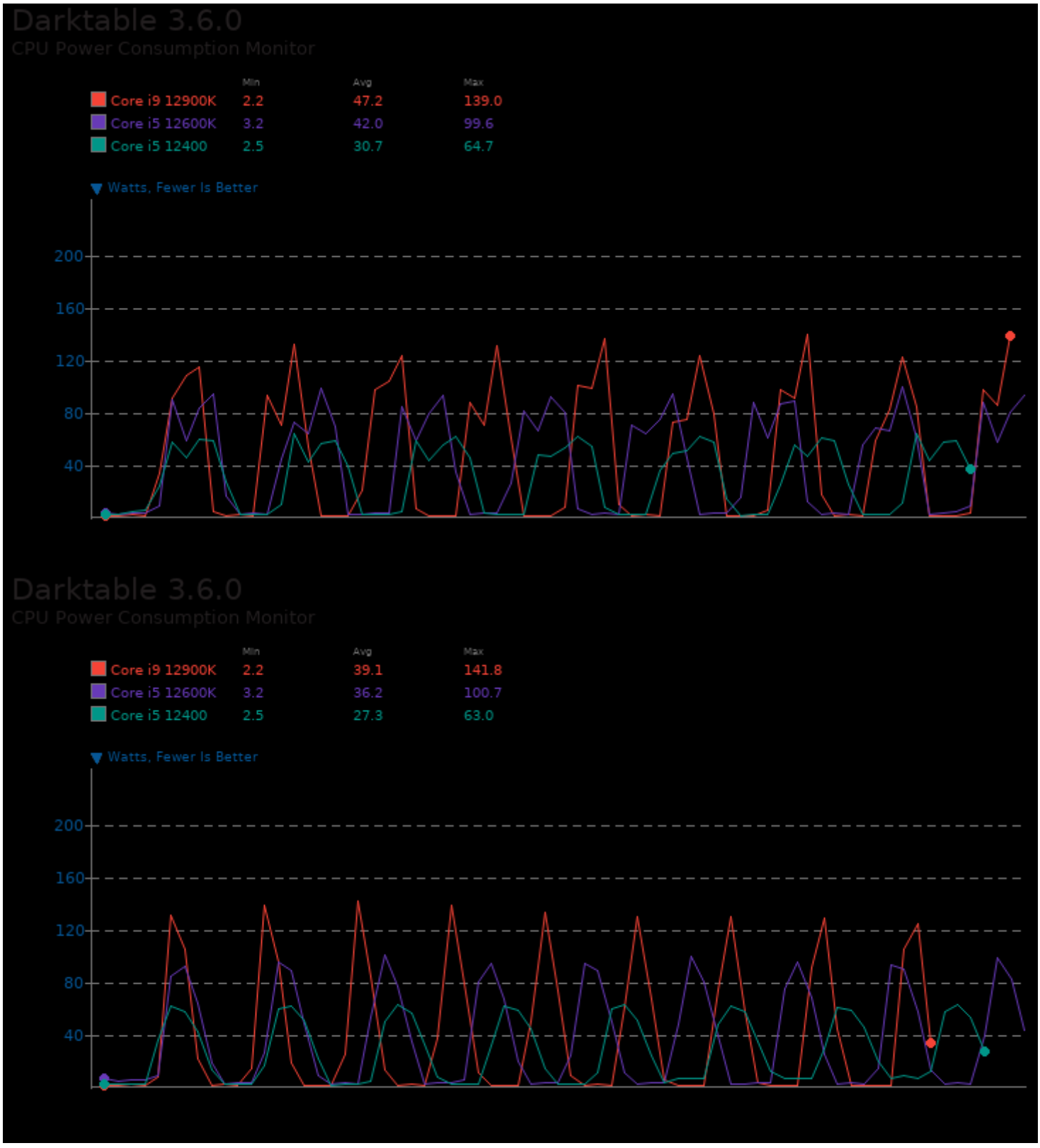

libjpeg-turbo tjbench 2.1.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 25.3 29.6
Core i5 12600K 3.2 29.6 35.8
Core i5 12400 2.5 19.7 24.6
Watts, Fewer Is Better
50
40
30
20
10
TensorFlow Lite 2020-08-23
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 171.4 187.2
Core i5 12600K 3.3 98.7 106.4
Core i5 12400 2.6 58.7 63.0
Watts, Fewer Is Better
250
200
150
100
50

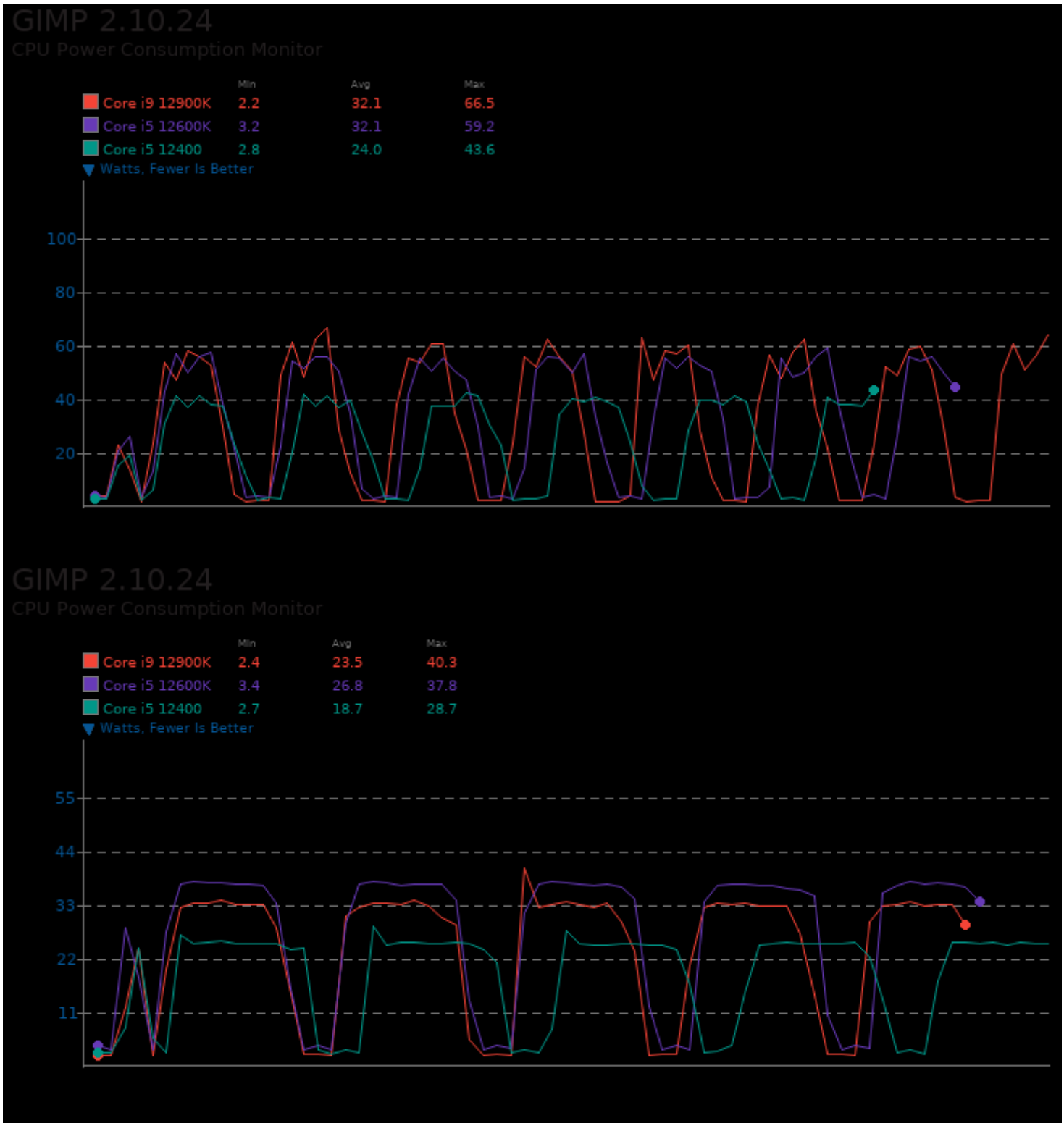

TensorFlow Lite 2020-08-23
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 173.8 187.7
Core i5 12600K 3.4 101.9 106.6
Core i5 12400 2.6 61.1 63.1
Watts, Fewer Is Better
250
200
150
100
50
TensorFlow Lite 2020-08-23
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.5 173.4 187.1
Core i5 12600K 3.3 98.8 106.3
Core i5 12400 2.5 58.4 62.9
Watts, Fewer Is Better
250
200
150
100
50

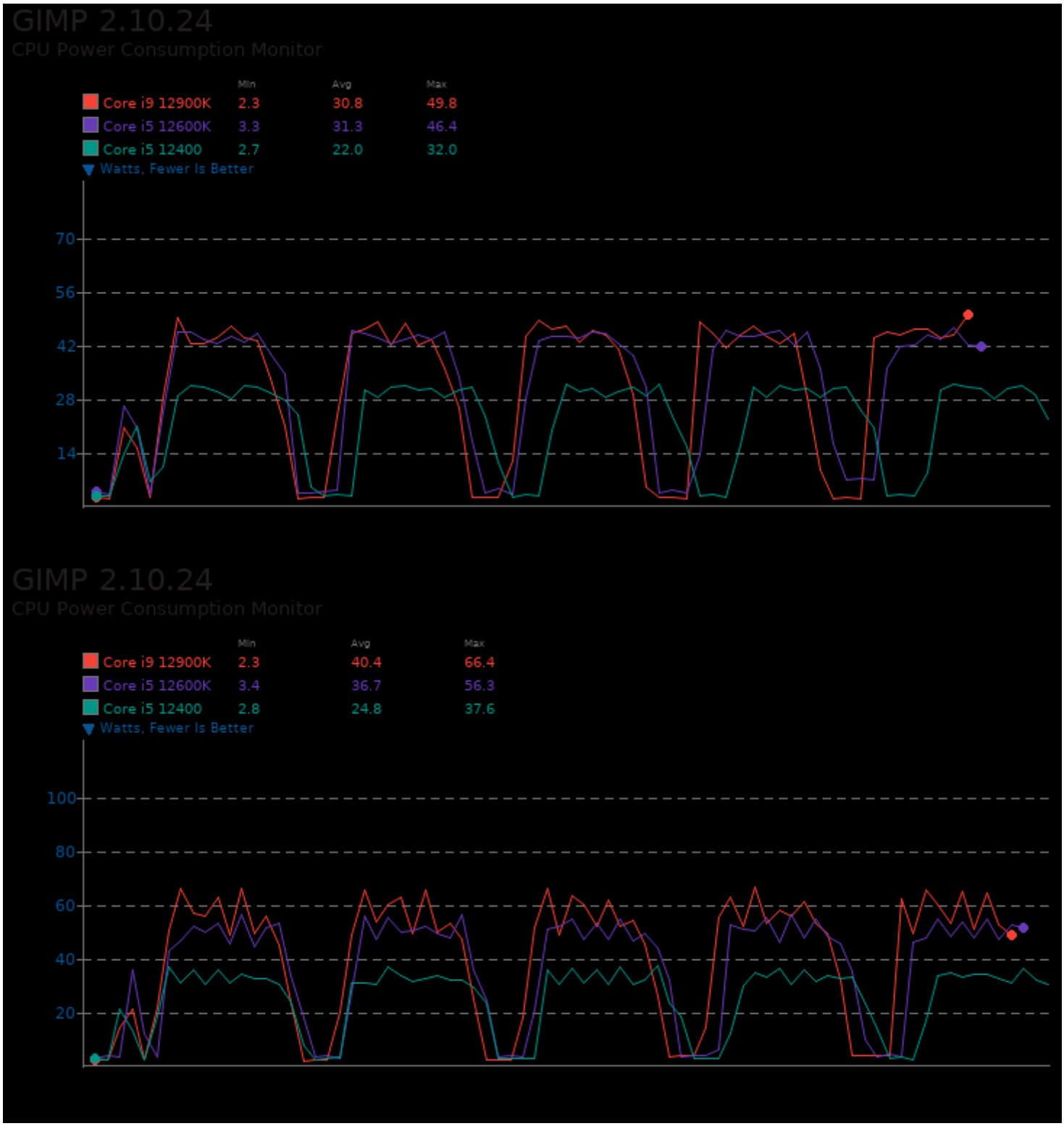

TensorFlow Lite 2020-08-23
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 174.2 188.0
Core i5 12600K 3.3 99.1 106.3
Core i5 12400 2.7 59.0 63.1
Watts, Fewer Is Better
250
200
150
100
50
TensorFlow Lite 2020-08-23
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 165.1 177.6
Core i5 12600K 3.3 94.4 101.7
Core i5 12400 2.7 55.1 59.1
Watts, Fewer Is Better
250
200
150
100
50

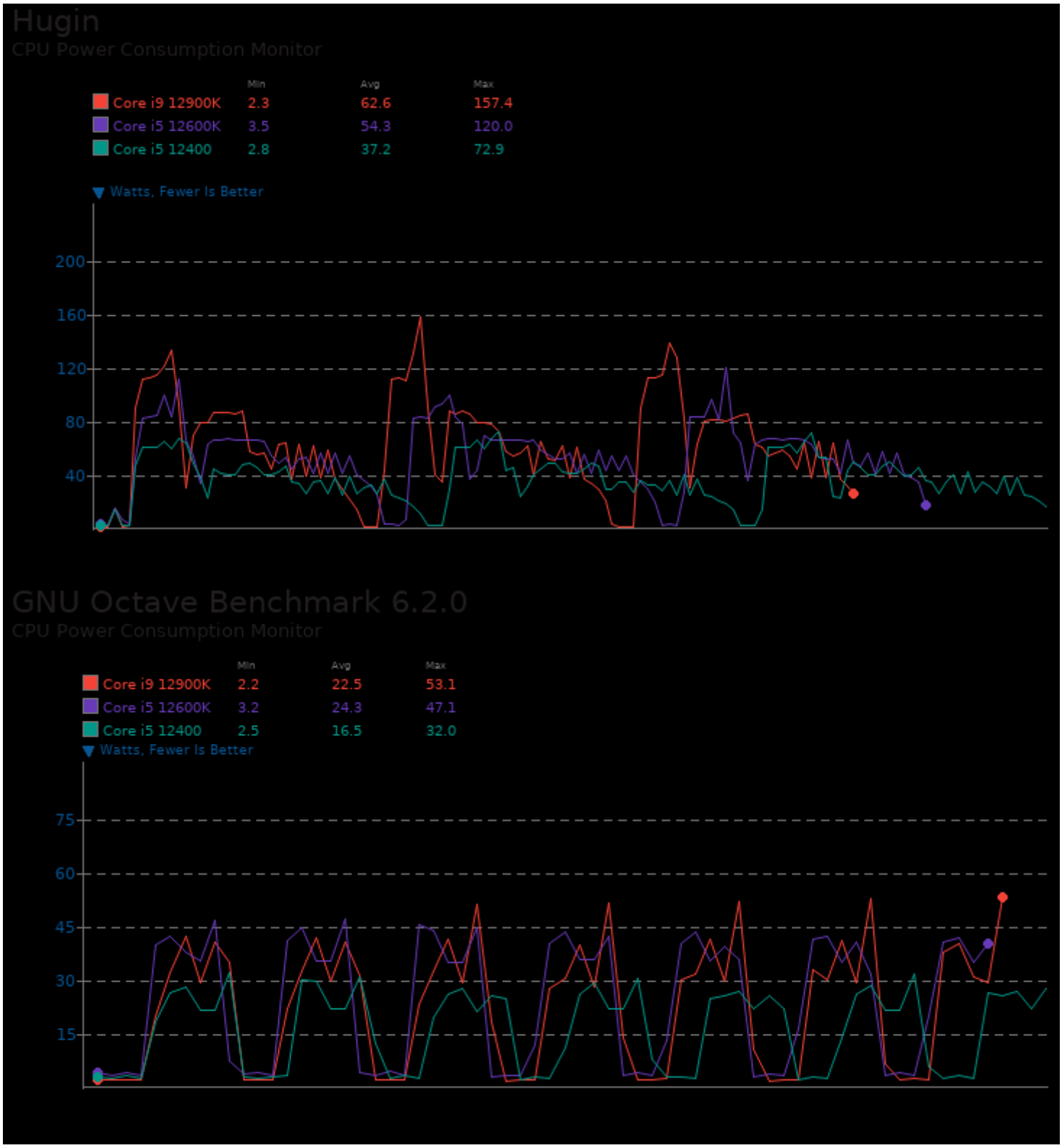

TensorFlow Lite 2020-08-23
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 173.3 189.3
Core i5 12600K 3.3 101.1 106.6
Core i5 12400 2.8 61.3 63.5
Watts, Fewer Is Better
250
200
150
100
50
ASTC Encoder 3.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 78.7 219.4
Core i5 12600K 3.3 62.3 124.6
Core i5 12400 2.5 42.8 78.1
Watts, Fewer Is Better
300
240
180
120
60

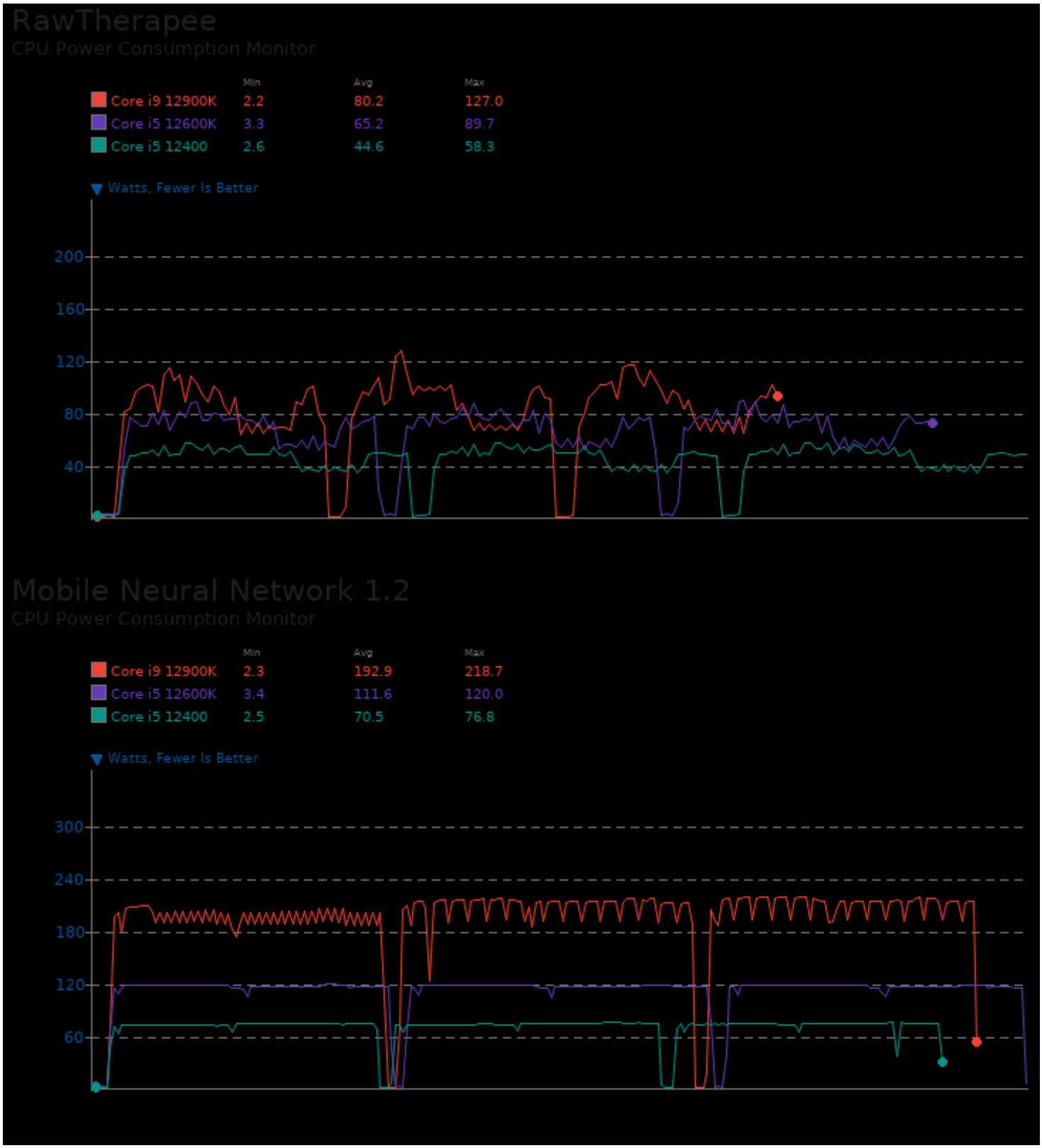

ASTC Encoder 3.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 173.2 216.9
Core i5 12600K 3.4 106.0 120.0
Core i5 12400 2.6 68.6 75.8
Watts, Fewer Is Better
300
240
180
120
60
Darktable 3.6.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 63.9 200.4
Core i5 12600K 3.3 52.1 124.6
Core i5 12400 2.7 38.4 74.8
Watts, Fewer Is Better
250
200
150
100
50

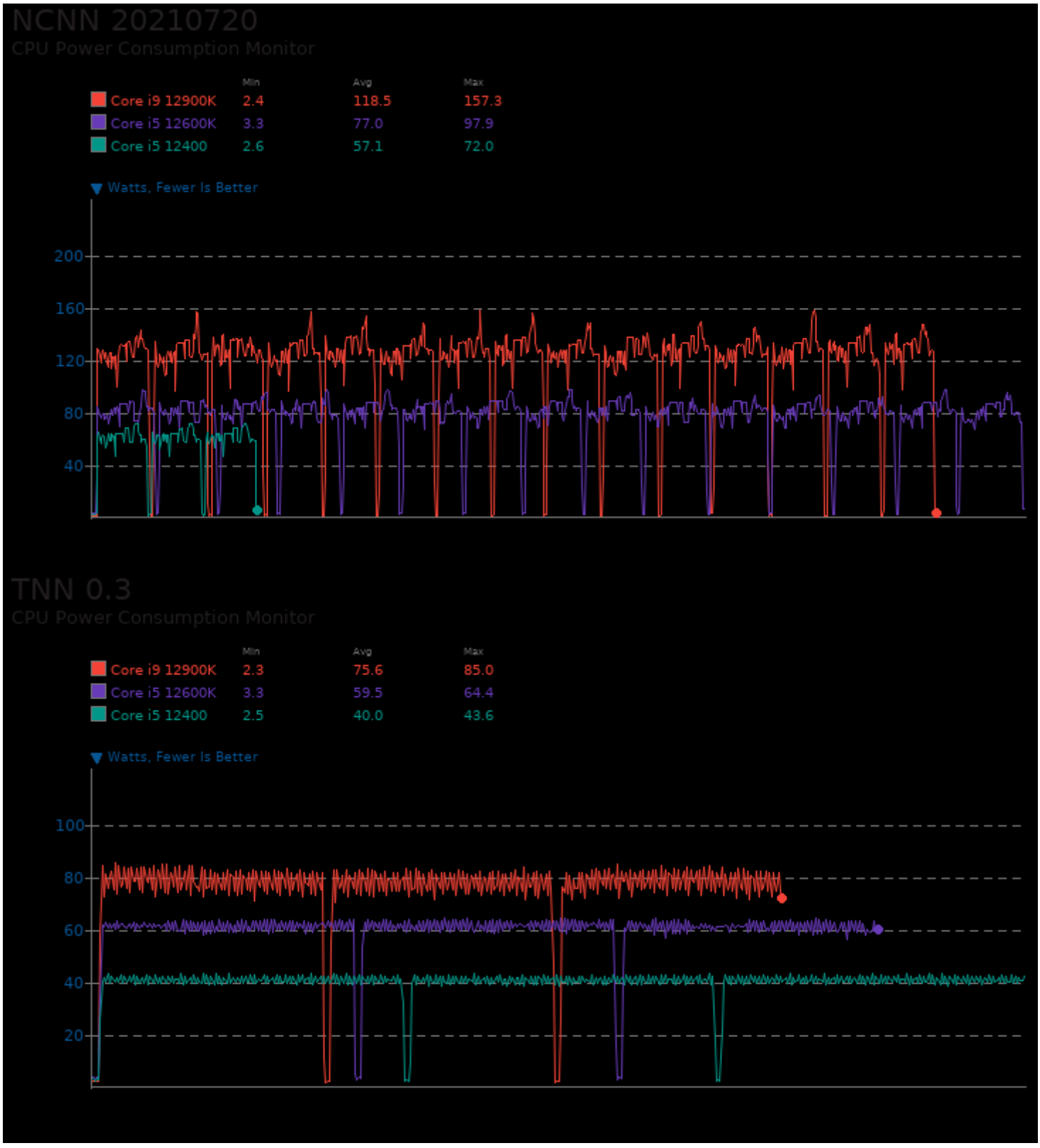

Darktable 3.6.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 47.2 139.0
Core i5 12600K 3.2 42.0 99.6
Core i5 12400 2.5 30.7 64.7
Watts, Fewer Is Better
200
160
120
80
40
Darktable 3.6.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 39.1 141.8
Core i5 12600K 3.2 36.2 100.7
Core i5 12400 2.5 27.3 63.0
Watts, Fewer Is Better
200
160
120
80
40

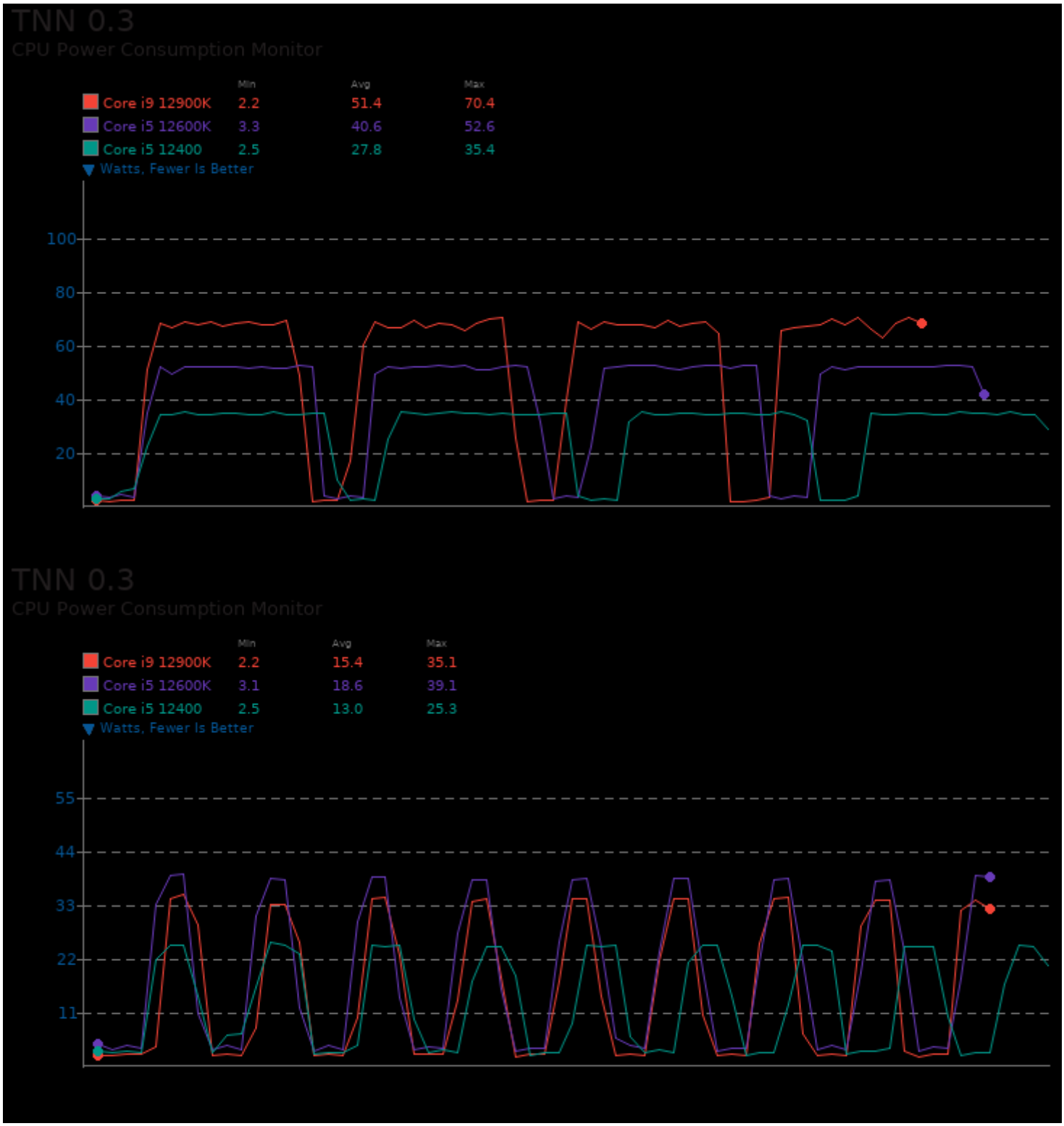

GIMP 2.10.24
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 32.1 66.5
Core i5 12600K 3.2 32.1 59.2
Core i5 12400 2.8 24.0 43.6
Watts, Fewer Is Better
100
80
60
40
20
GIMP 2.10.24
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 23.5 40.3
Core i5 12600K 3.4 26.8 37.8
Core i5 12400 2.7 18.7 28.7
Watts, Fewer Is Better
55
44
33
22
11

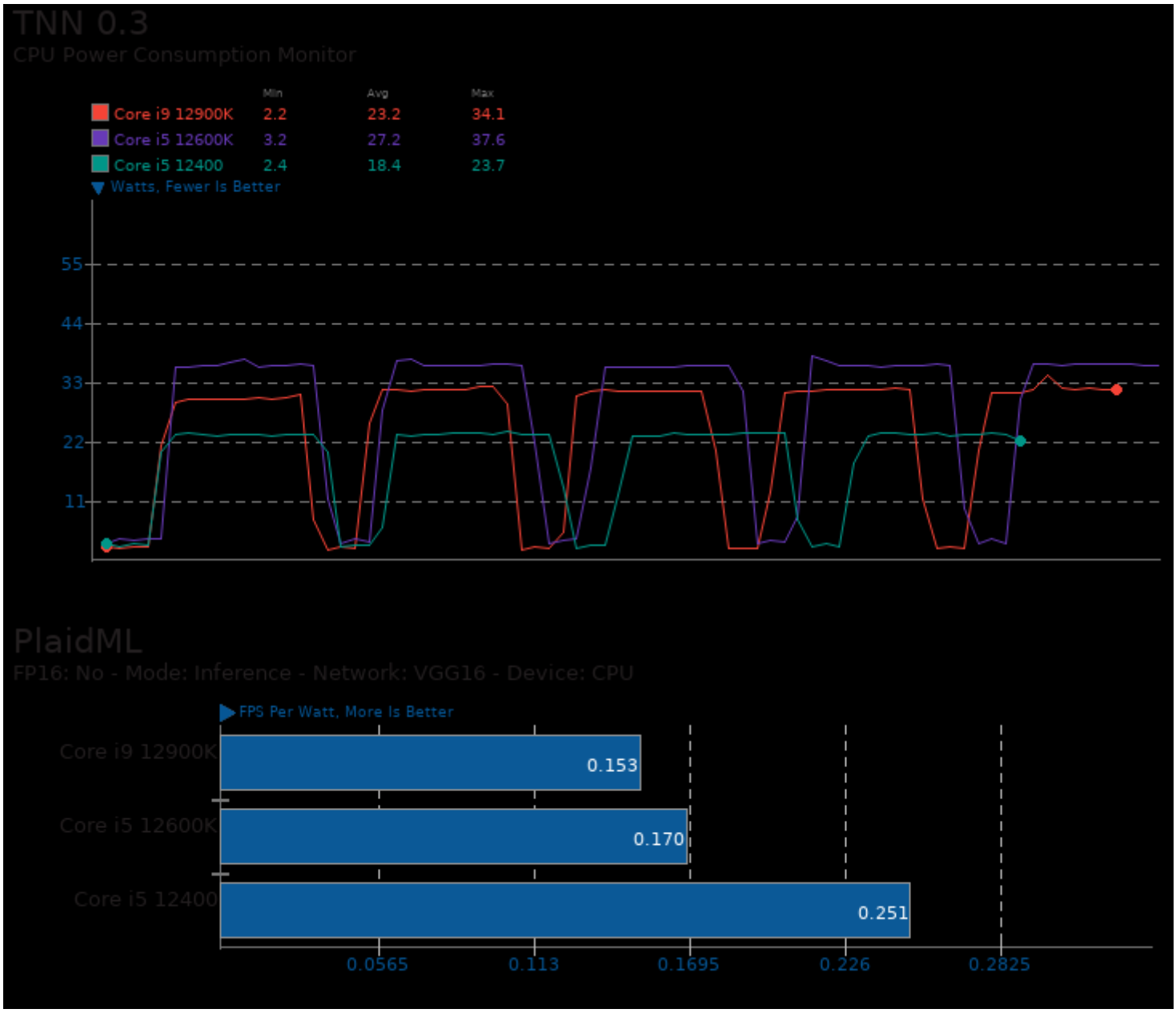

GIMP 2.10.24
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 30.8 49.8
Core i5 12600K 3.3 31.3 46.4
Core i5 12400 2.7 22.0 32.0
Watts, Fewer Is Better
70
56
42
28
14
GIMP 2.10.24
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 40.4 66.4
Core i5 12600K 3.4 36.7 56.3
Core i5 12400 2.8 24.8 37.6
Watts, Fewer Is Better
100
80
60
40
20

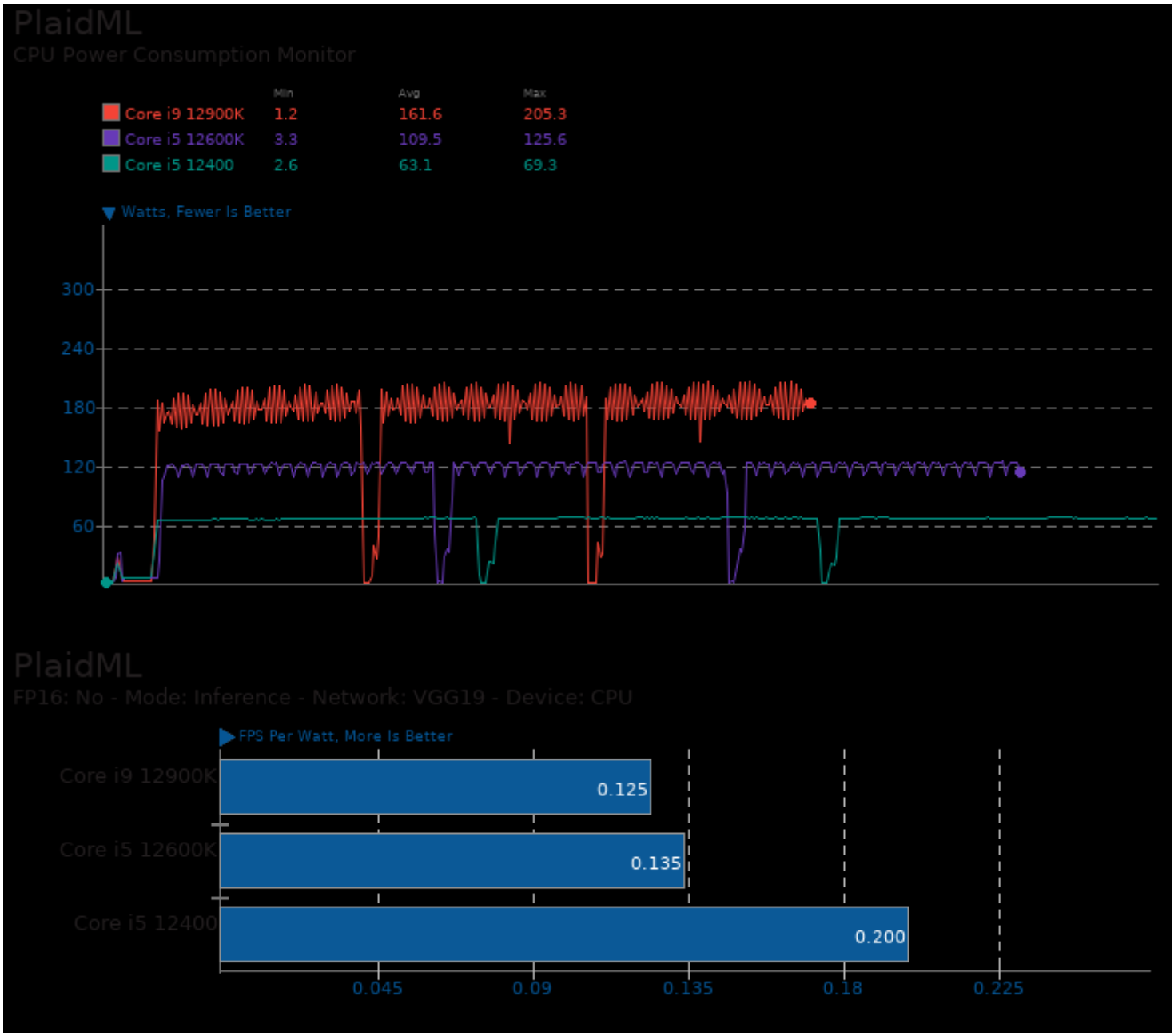

Hugin
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 62.6 157.4
Core i5 12600K 3.5 54.3 120.0
Core i5 12400 2.8 37.2 72.9
Watts, Fewer Is Better
200
160
120
80
40
GNU Octave Benchmark 6.2.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 22.5 53.1
Core i5 12600K 3.2 24.3 47.1
Core i5 12400 2.5 16.5 32.0
Watts, Fewer Is Better
75
60
45
30
15

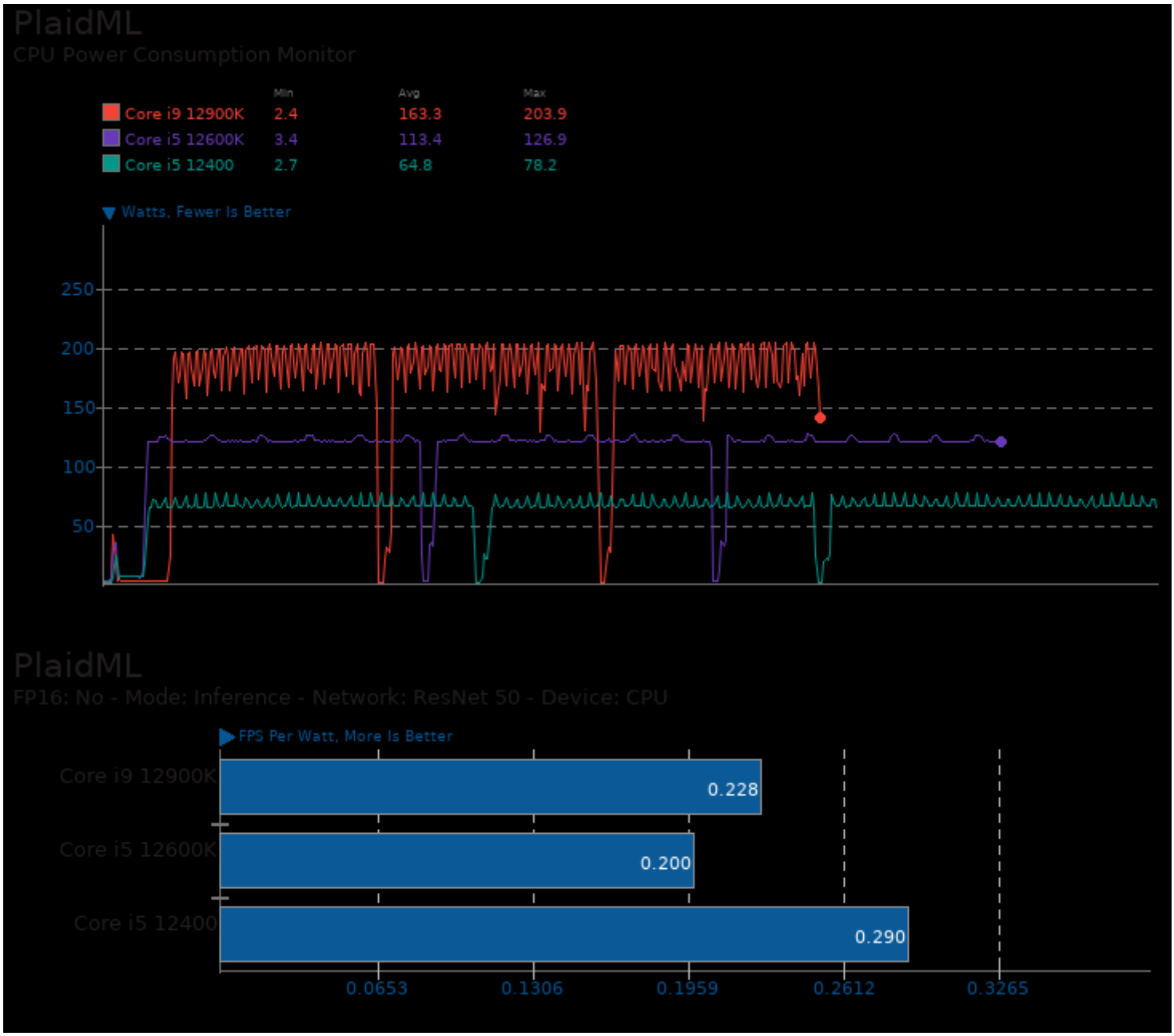

RawTherapee
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 80.2 127.0
Core i5 12600K 3.3 65.2 89.7
Core i5 12400 2.6 44.6 58.3
Watts, Fewer Is Better
200
160
120
80
40
Mobile Neural Network 1.2
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 192.9 218.7
Core i5 12600K 3.4 111.6 120.0
Core i5 12400 2.5 70.5 76.8
Watts, Fewer Is Better
300
240
180
120
60

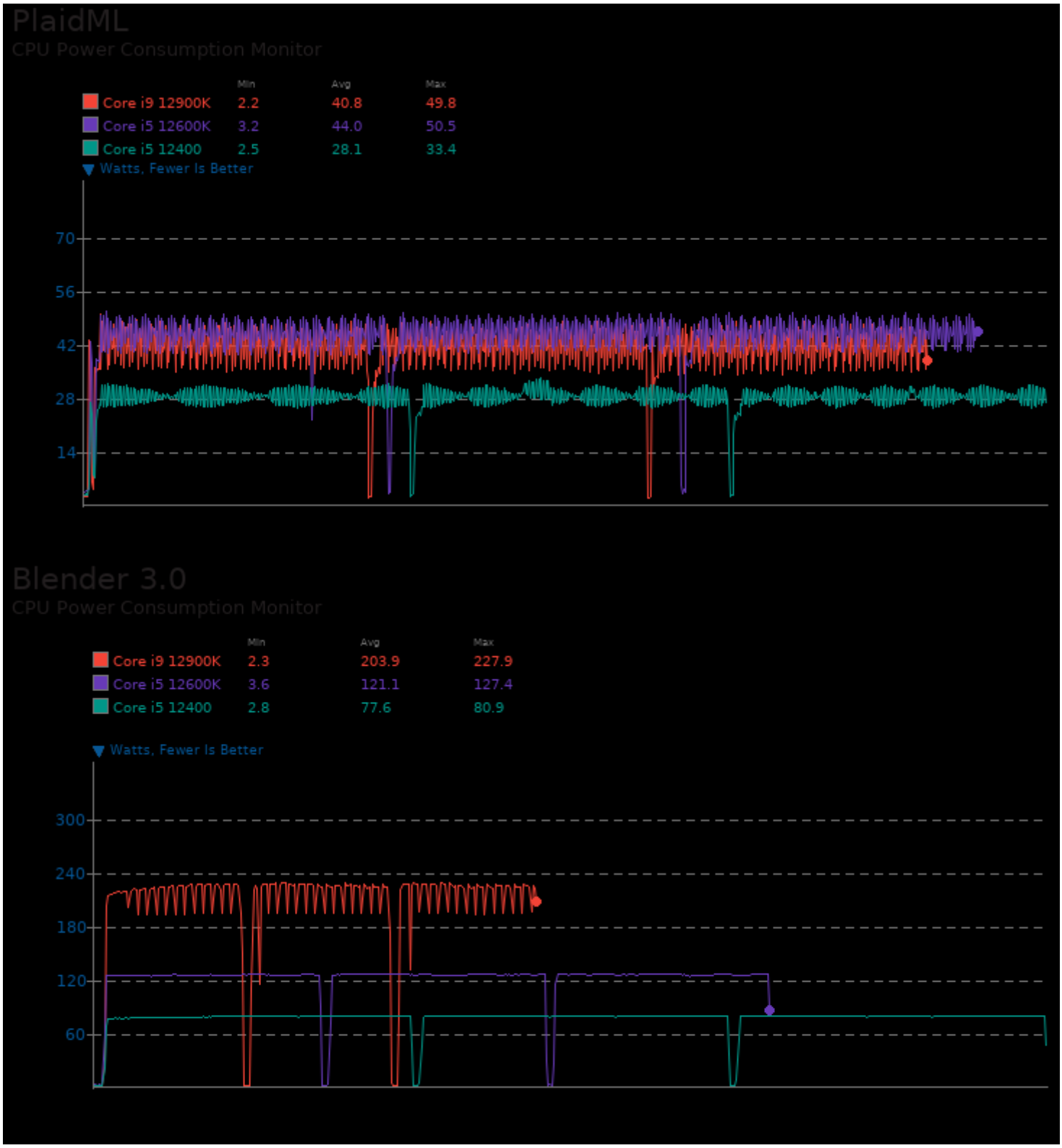

NCNN 20210720
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 118.5 157.3
Core i5 12600K 3.3 77.0 97.9
Core i5 12400 2.6 57.1 72.0
Watts, Fewer Is Better
200
160
120
80
40
TNN 0.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 75.6 85.0
Core i5 12600K 3.3 59.5 64.4
Core i5 12400 2.5 40.0 43.6
Watts, Fewer Is Better
100
80
60
40
20


TNN 0.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 51.4 70.4
Core i5 12600K 3.3 40.6 52.6
Core i5 12400 2.5 27.8 35.4
Watts, Fewer Is Better
100
80
60
40
20
TNN 0.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 15.4 35.1
Core i5 12600K 3.1 18.6 39.1
Core i5 12400 2.5 13.0 25.3
Watts, Fewer Is Better
55
44
33
22
11

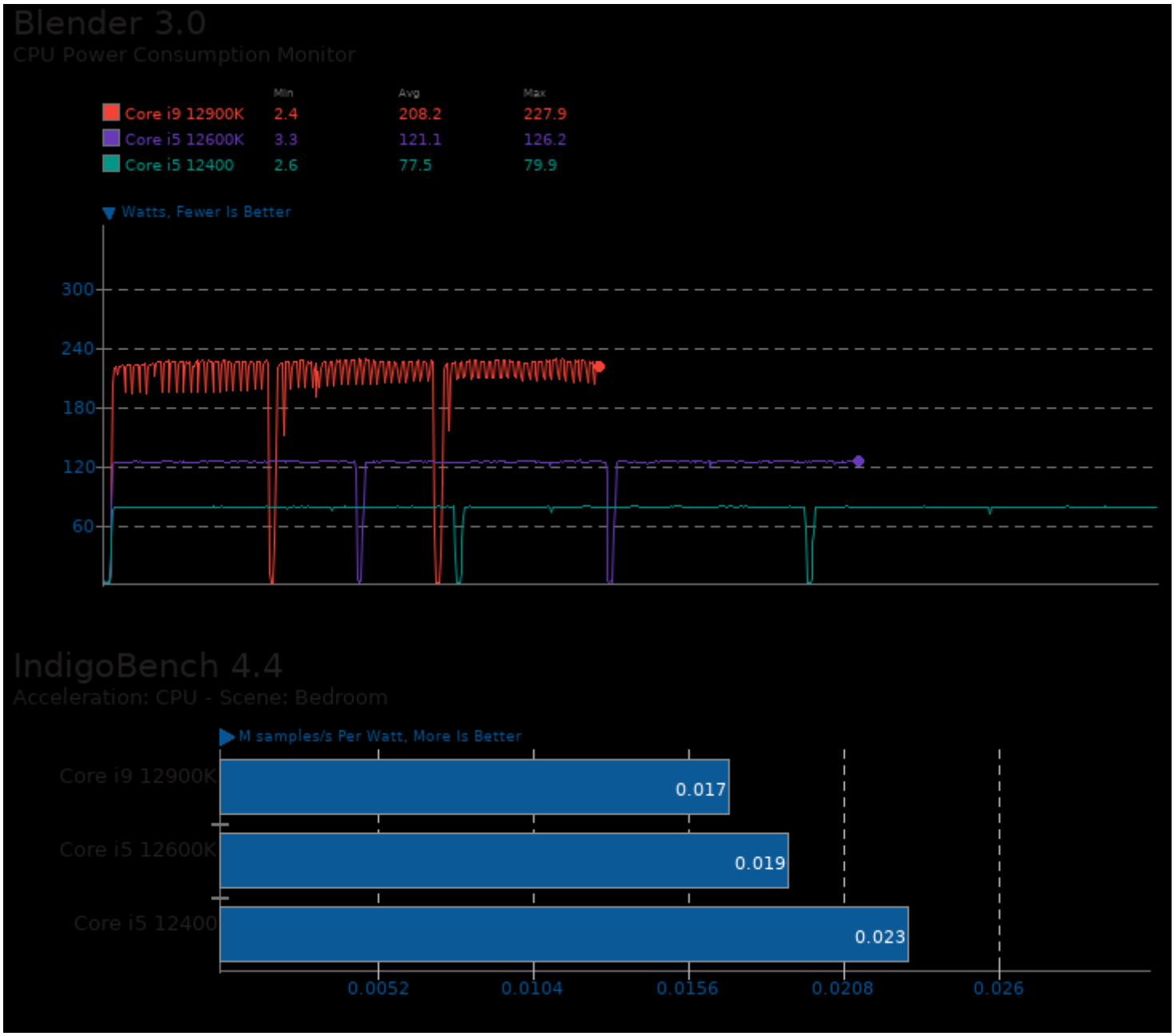

TNN 0.3
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 23.2 34.1
Core i5 12600K 3.2 27.2 37.6
Core i5 12400 2.4 18.4 23.7
Watts, Fewer Is Better
55
44
33
22
11
PlaidML
FP16: No - Mode: Inference - Network: VGG16 - Device: CPU
FPS Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.153
0.170
0.251
0.0565
0.113
0.1695
0.226
0.2825

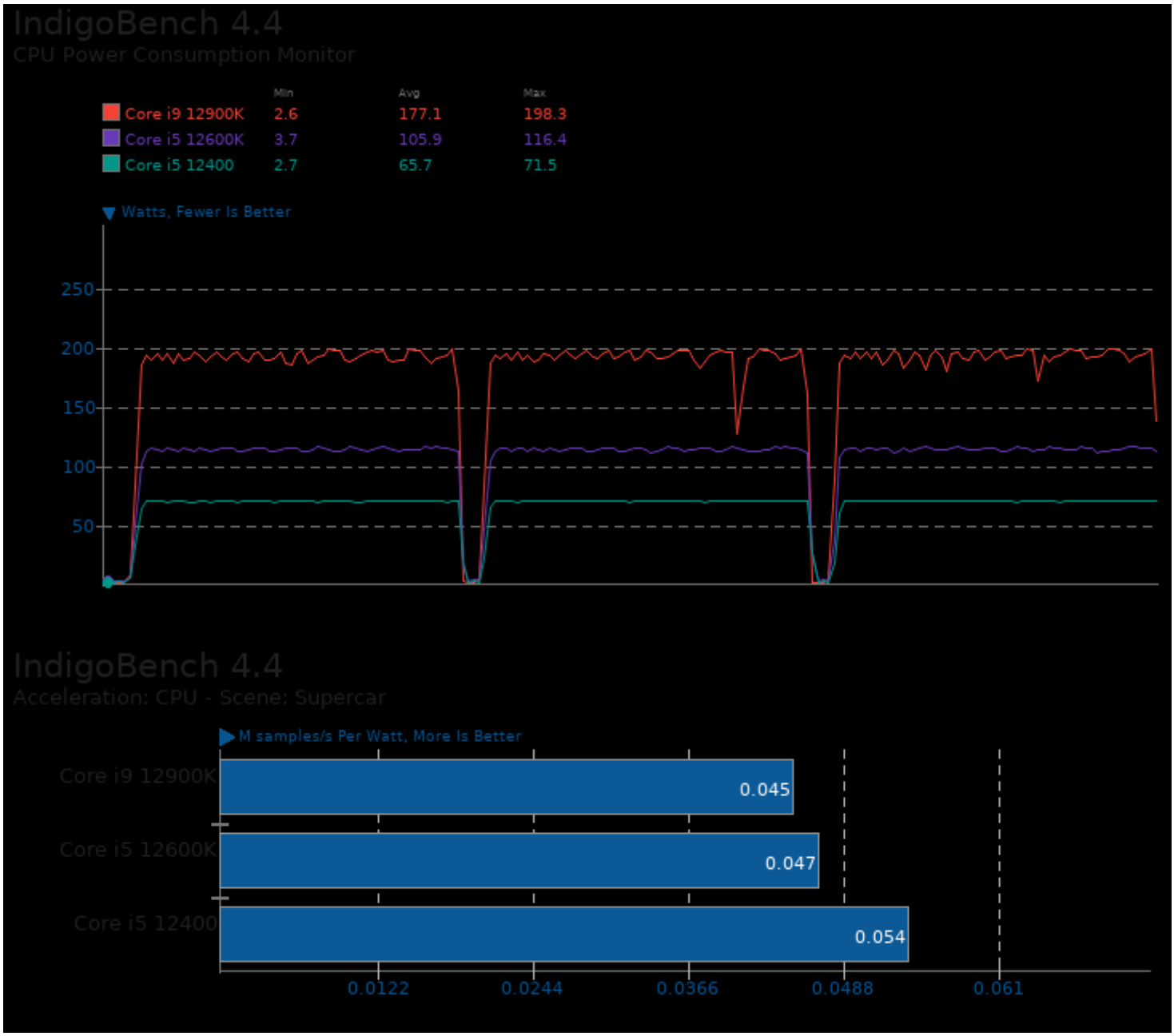

PlaidML
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 1.2 161.6 205.3
Core i5 12600K 3.3 109.5 125.6
Core i5 12400 2.6 63.1 69.3
Watts, Fewer Is Better
300
240
180
120
60
PlaidML
FP16: No - Mode: Inference - Network: VGG19 - Device: CPU
FPS Per Watt, More Is Better
Core i9 12900K
0.125
Core i5 12600K
0.135
Core i5 12400
0.200
0.045
0.09
0.135
0.18
0.225

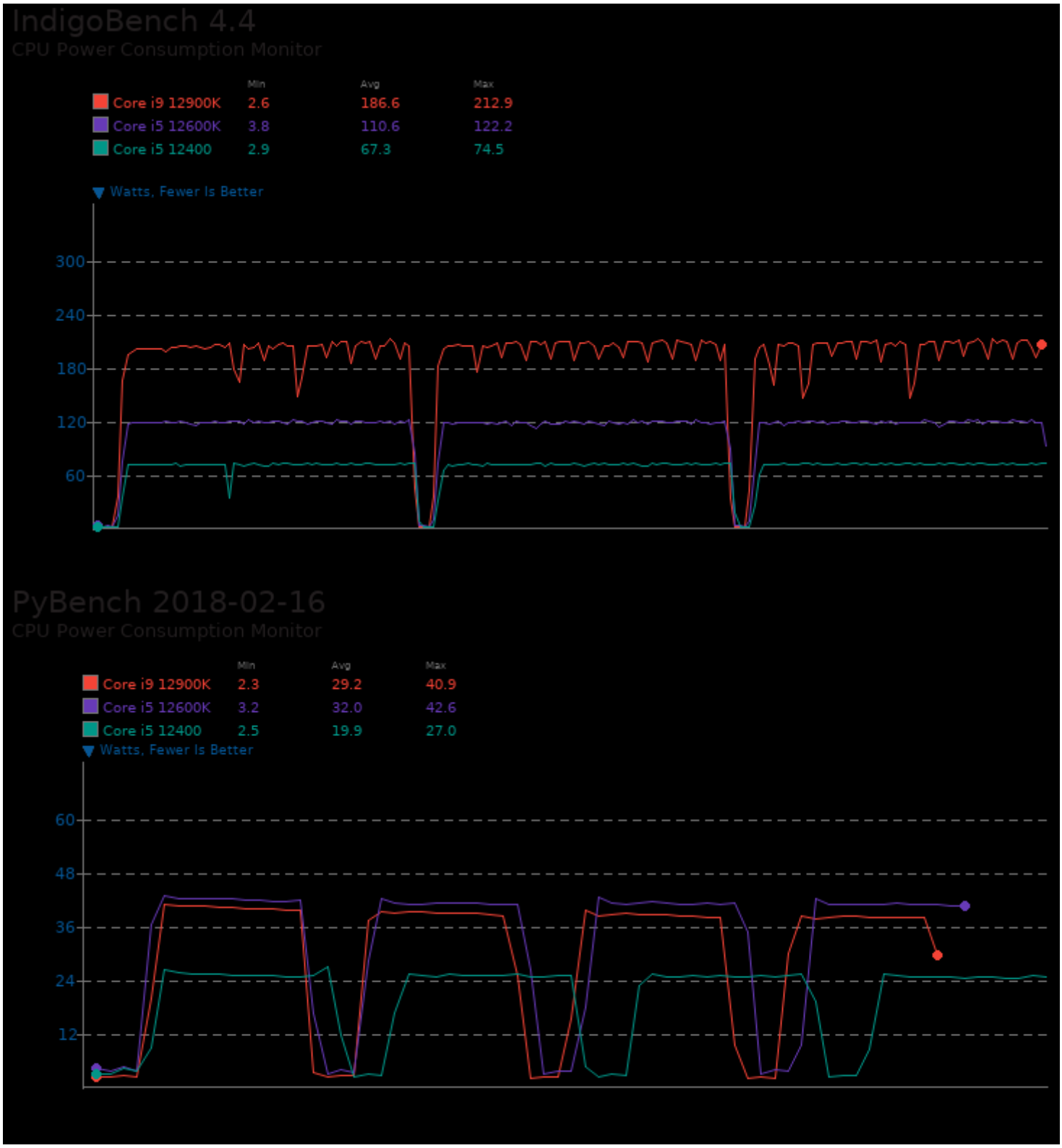

PlaidML
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 163.3 203.9
Core i5 12600K 3.4 113.4 126.9
Core i5 12400 2.7 64.8 78.2
Watts, Fewer Is Better
250
200
150
100
50
PlaidML
FP16: No - Mode: Inference - Network: ResNet 50 - Device: CPU
FPS Per Watt, More Is Better
Core i9 12900K
Core i5 12600K
Core i5 12400
0.228
0.200
0.290
0.0653
0.1306
0.1959
0.2612
0.3265

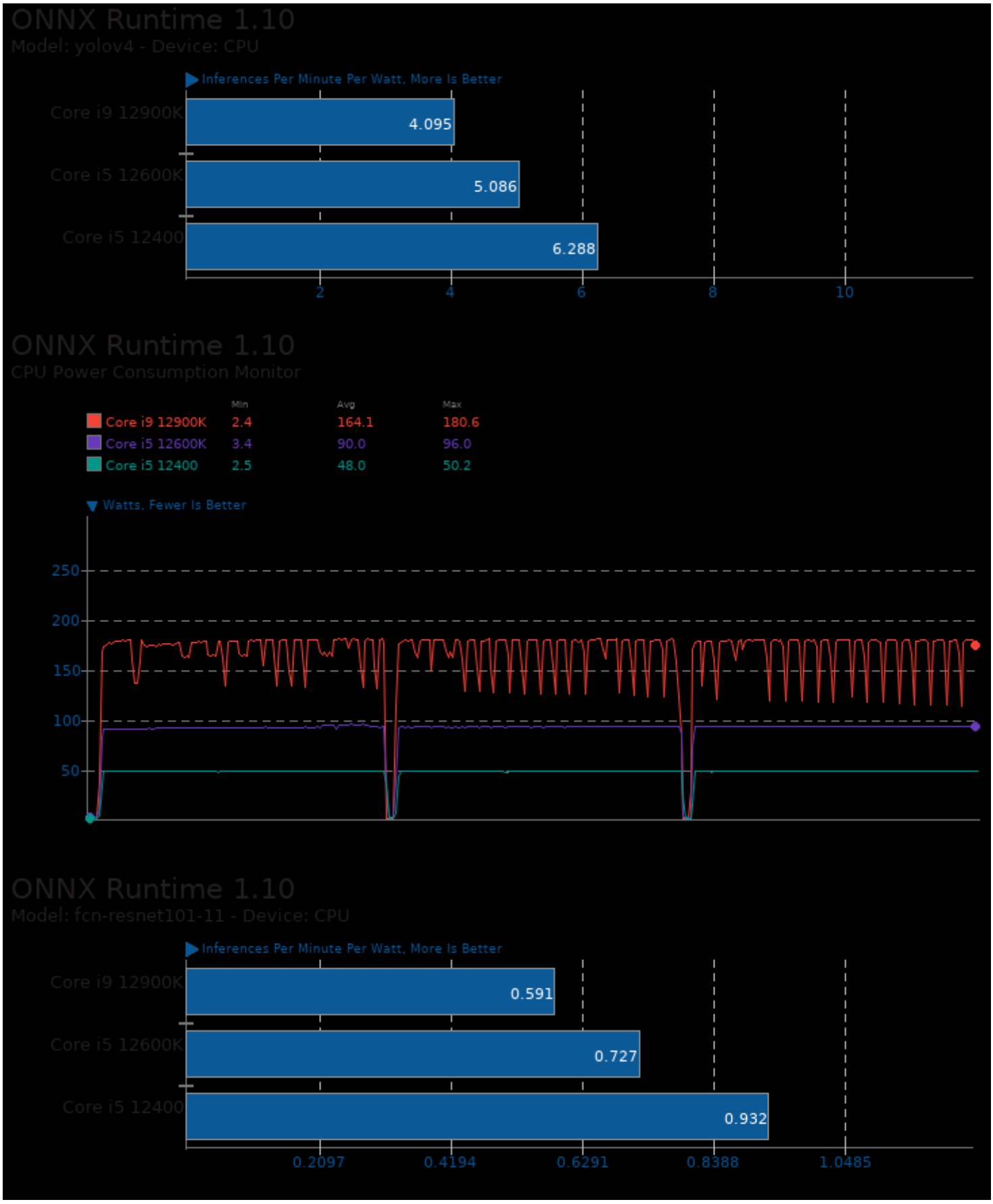

PlaidML
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 40.8 49.8
Core i5 12600K 3.2 44.0 50.5
Core i5 12400 2.5 28.1 33.4
Watts, Fewer Is Better
70
56
42
28
14
Blender 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 203.9 227.9
Core i5 12600K 3.6 121.1 127.4
Core i5 12400 2.8 77.6 80.9
Watts, Fewer Is Better
300
240
180
120
60

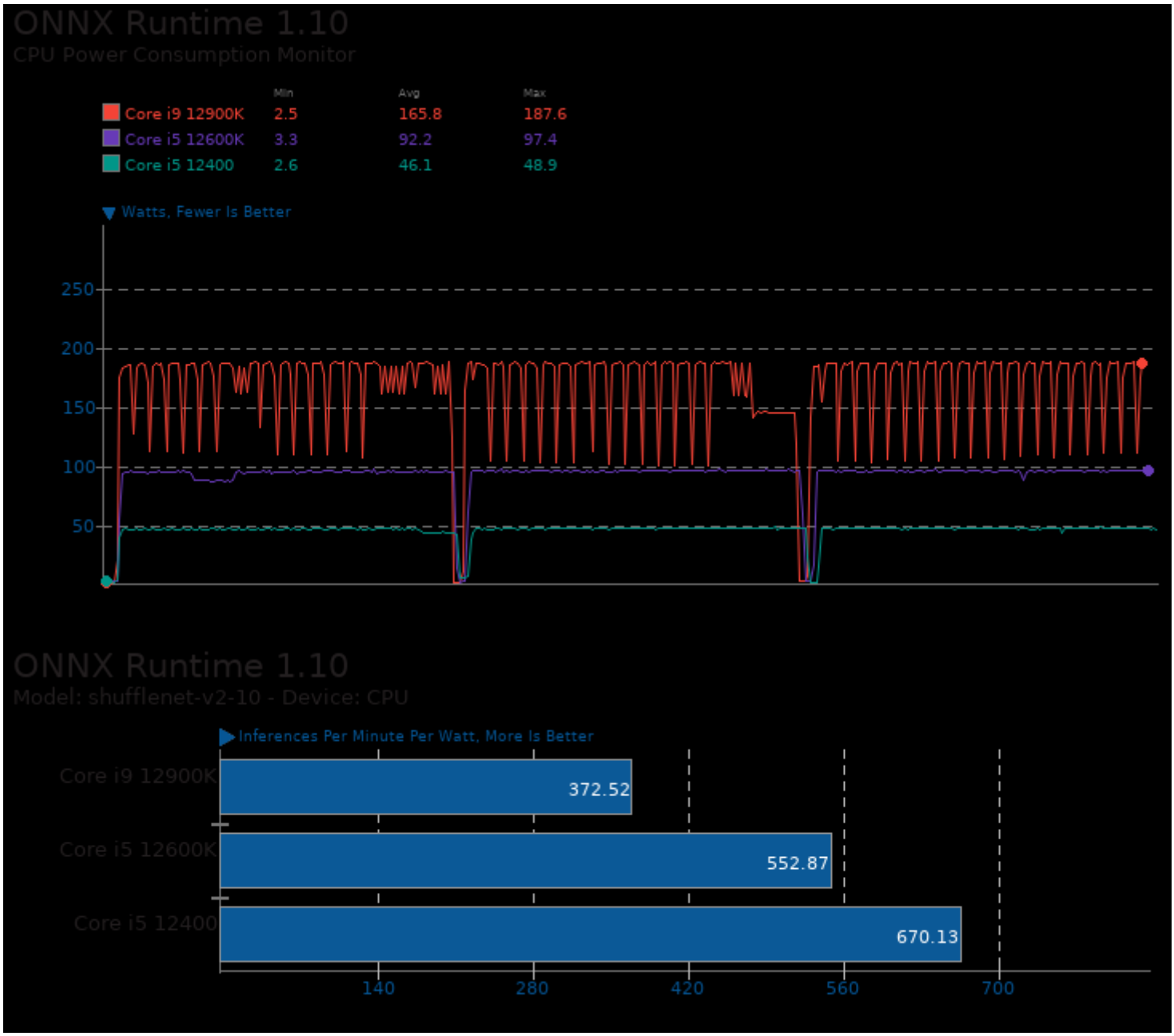
Alder Lake Intel Linux Tests

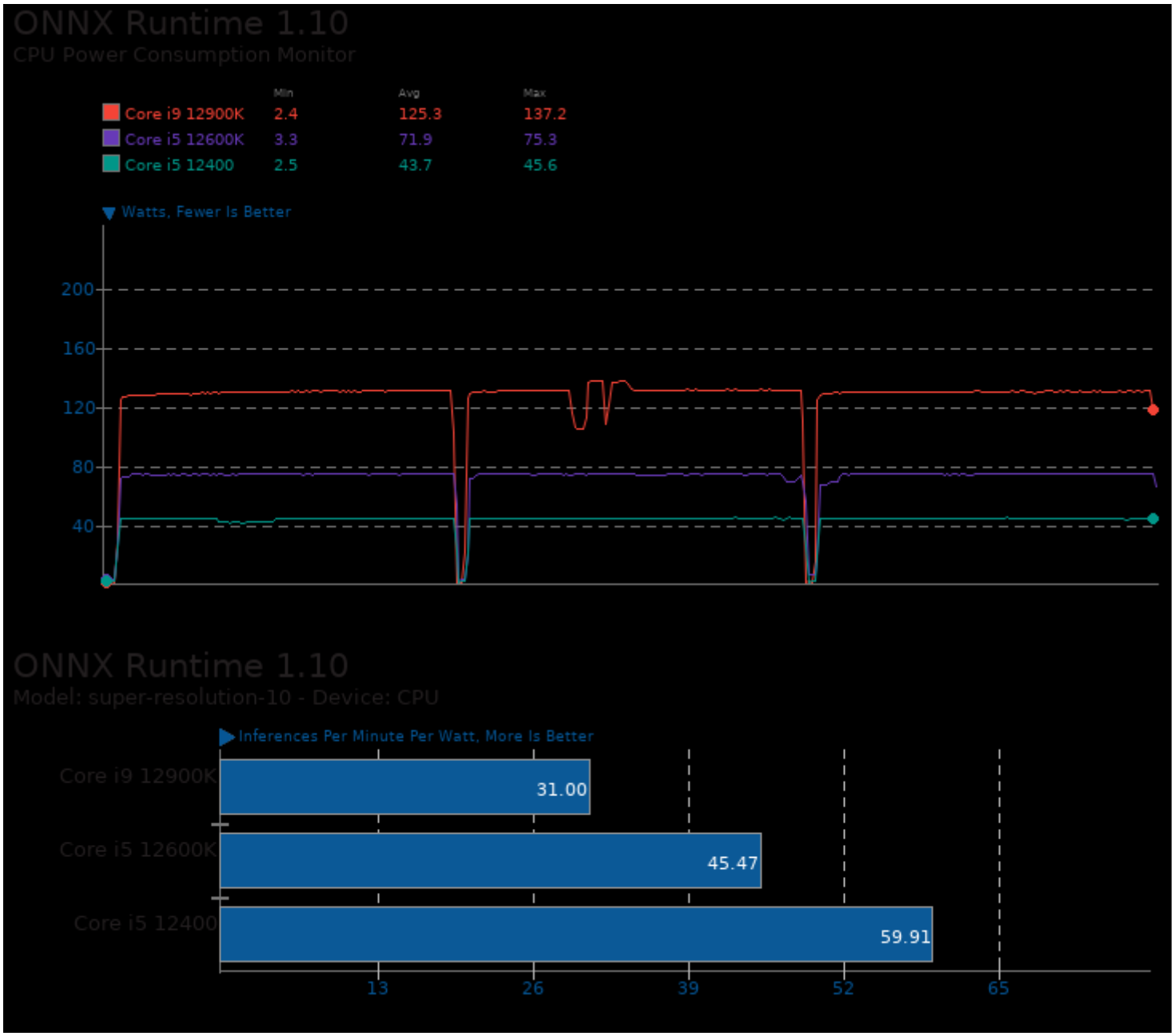


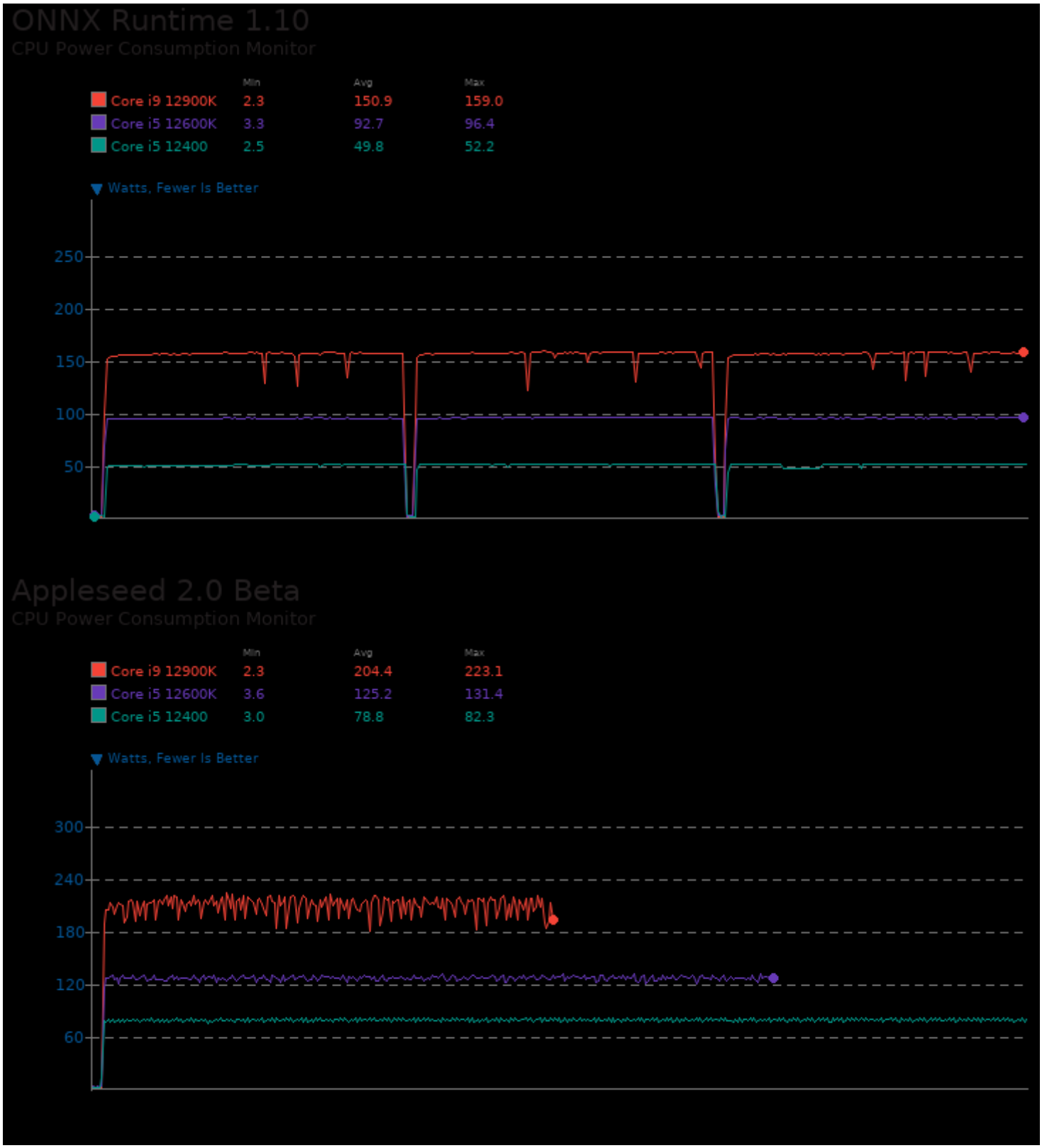

IndigoBench 4.4
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.6 177.1 198.3
Core i5 12600K 3.7 105.9 116.4
Core i5 12400 2.7 65.7 71.5
Watts, Fewer Is Better
250
200
150
100
50
IndigoBench 4.4
Acceleration: CPU - Scene: Supercar
M samples/s Per Watt, More Is Better
Core i9 12900K
0.045
Core i5 12600K
0.047
Core i5 12400
0.054
0.0122
0.0244
0.0366
0.0488
0.061

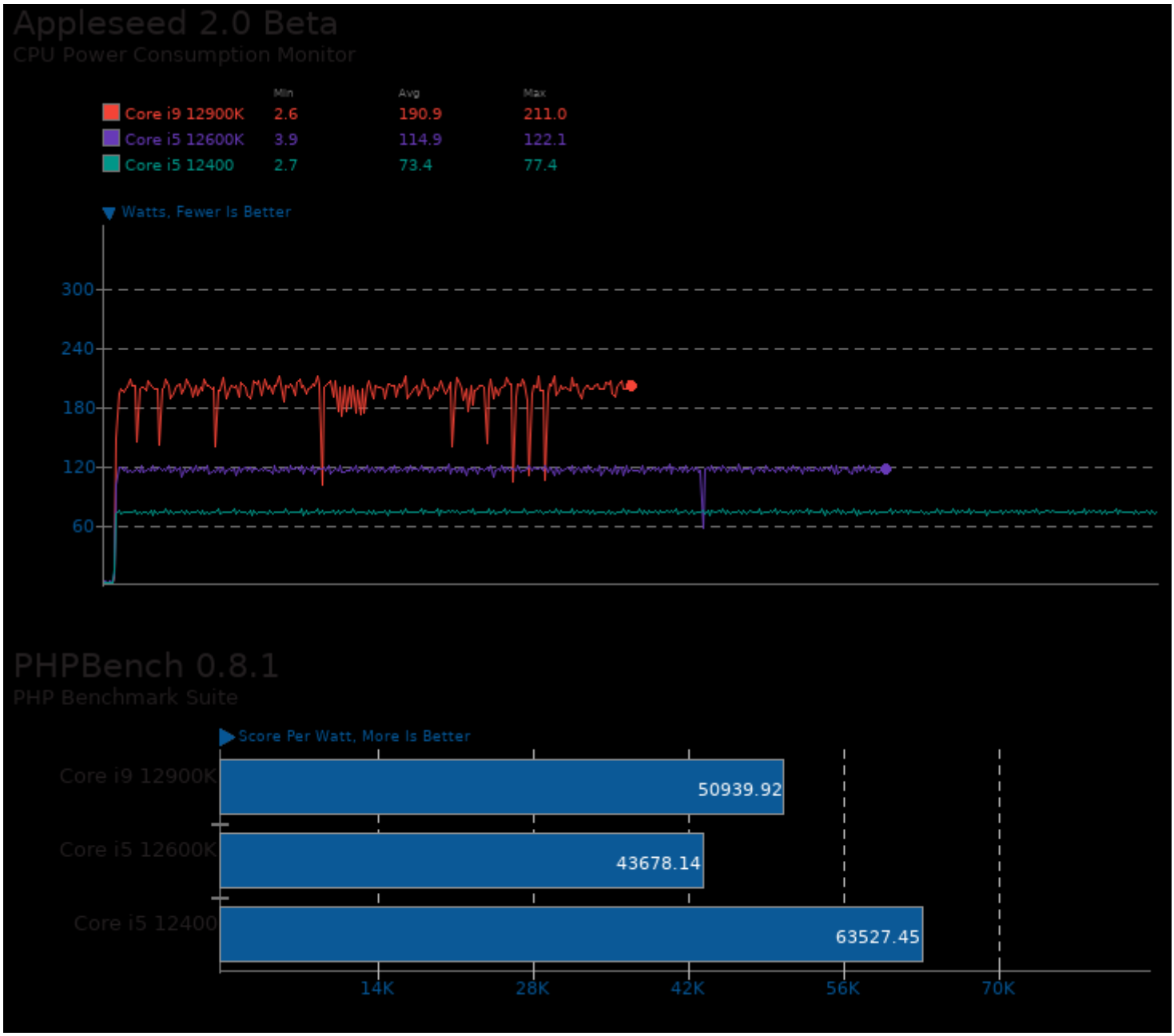

IndigoBench 4.4
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.6 186.6 212.9
Core i5 12600K 3.8 110.6 122.2
Core i5 12400 2.9 67.3 74.5
Watts, Fewer Is Better
300
240
180
120
60
PyBench 2018-02-16
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 29.2 40.9
Core i5 12600K 3.2 32.0 42.6
Core i5 12400 2.5 19.9 27.0
Watts, Fewer Is Better
60
48
36
24
12

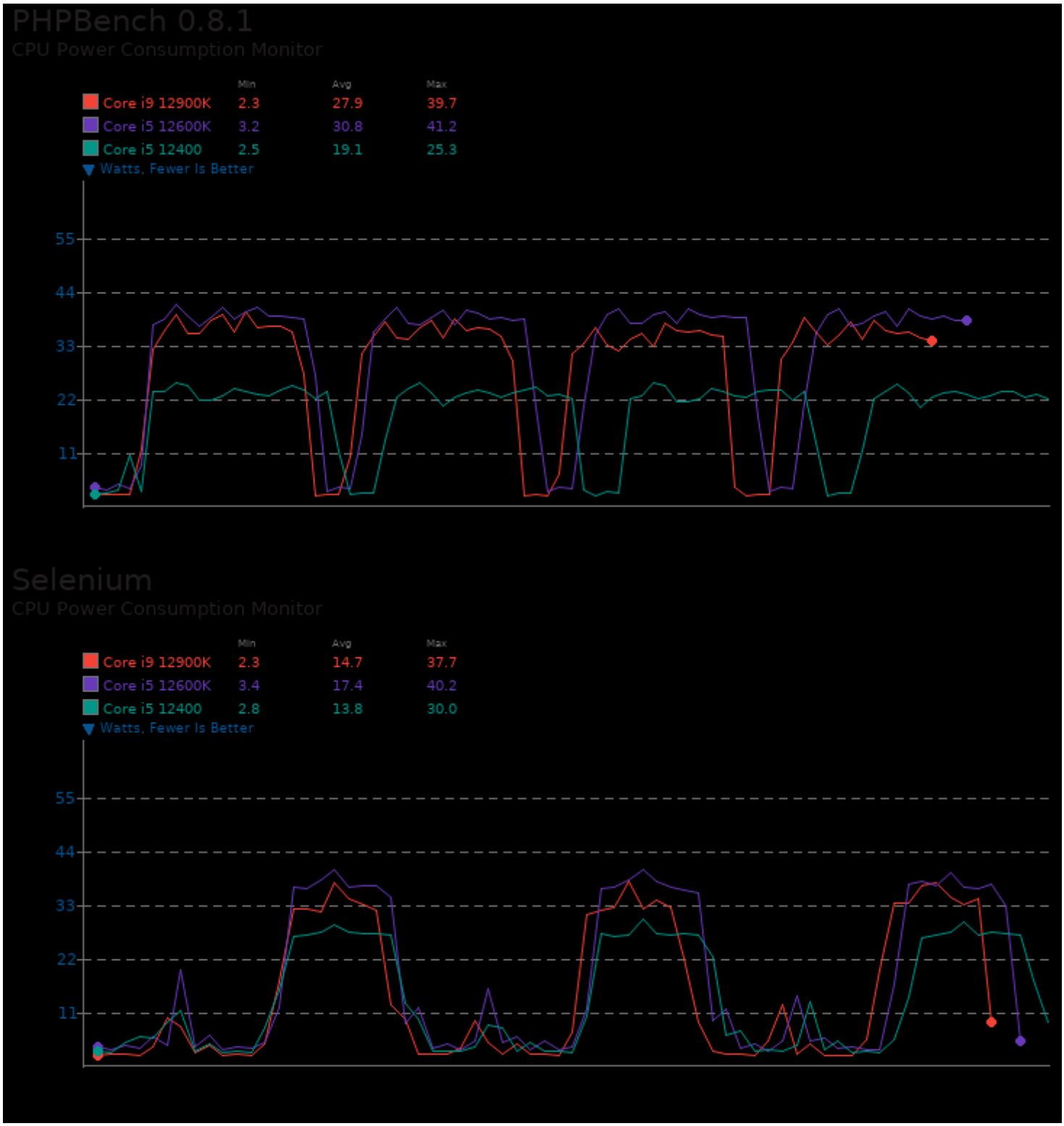

ONNX Runtime 1.10
Model: yolov4 - Device: CPU
Inferences Per Minute Per Watt, More Is Better
Core i9 12900K
4.095
Core i5 12600K
5.086
Core i5 12400
6.288
2
4
6
8
10
ONNX Runtime 1.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 164.1 180.6
Core i5 12600K 3.4 90.0 96.0
Core i5 12400 2.5 48.0 50.2
Watts, Fewer Is Better
250
200
150
100
50
ONNX Runtime 1.10
Model: fcn-resnet101-11 - Device: CPU
Inferences Per Minute Per Watt, More Is Better
Core i9 12900K
0.591
Core i5 12600K
0.727
Core i5 12400
0.932
0.2097
0.4194
0.6291
0.8388
1.0485


ONNX Runtime 1.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.5 165.8 187.6
Core i5 12600K 3.3 92.2 97.4
Core i5 12400 2.6 46.1 48.9
Watts, Fewer Is Better
250
200
150
100
50
ONNX Runtime 1.10
Model: shufflenet-v2-10 - Device: CPU
Inferences Per Minute Per Watt, More Is Better
Core i9 12900K
372.52
Core i5 12600K
552.87
Core i5 12400
670.13
140
280
420
560
700


ONNX Runtime 1.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.4 125.3 137.2
Core i5 12600K 3.3 71.9 75.3
Core i5 12400 2.5 43.7 45.6
Watts, Fewer Is Better
200
160
120
80
40
ONNX Runtime 1.10
Model: super-resolution-10 - Device: CPU
Inferences Per Minute Per Watt, More Is Better
Core i9 12900K
31.00
Core i5 12600K
45.47
Core i5 12400
59.91
13
26
39
52
65


ONNX Runtime 1.10
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 150.9 159.0
Core i5 12600K 3.3 92.7 96.4
Core i5 12400 2.5 49.8 52.2
Watts, Fewer Is Better
250
200
150
100
50
Appleseed 2.0 Beta
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 204.4 223.1
Core i5 12600K 3.6 125.2 131.4
Core i5 12400 3.0 78.8 82.3
Watts, Fewer Is Better
300
240
180
120
60

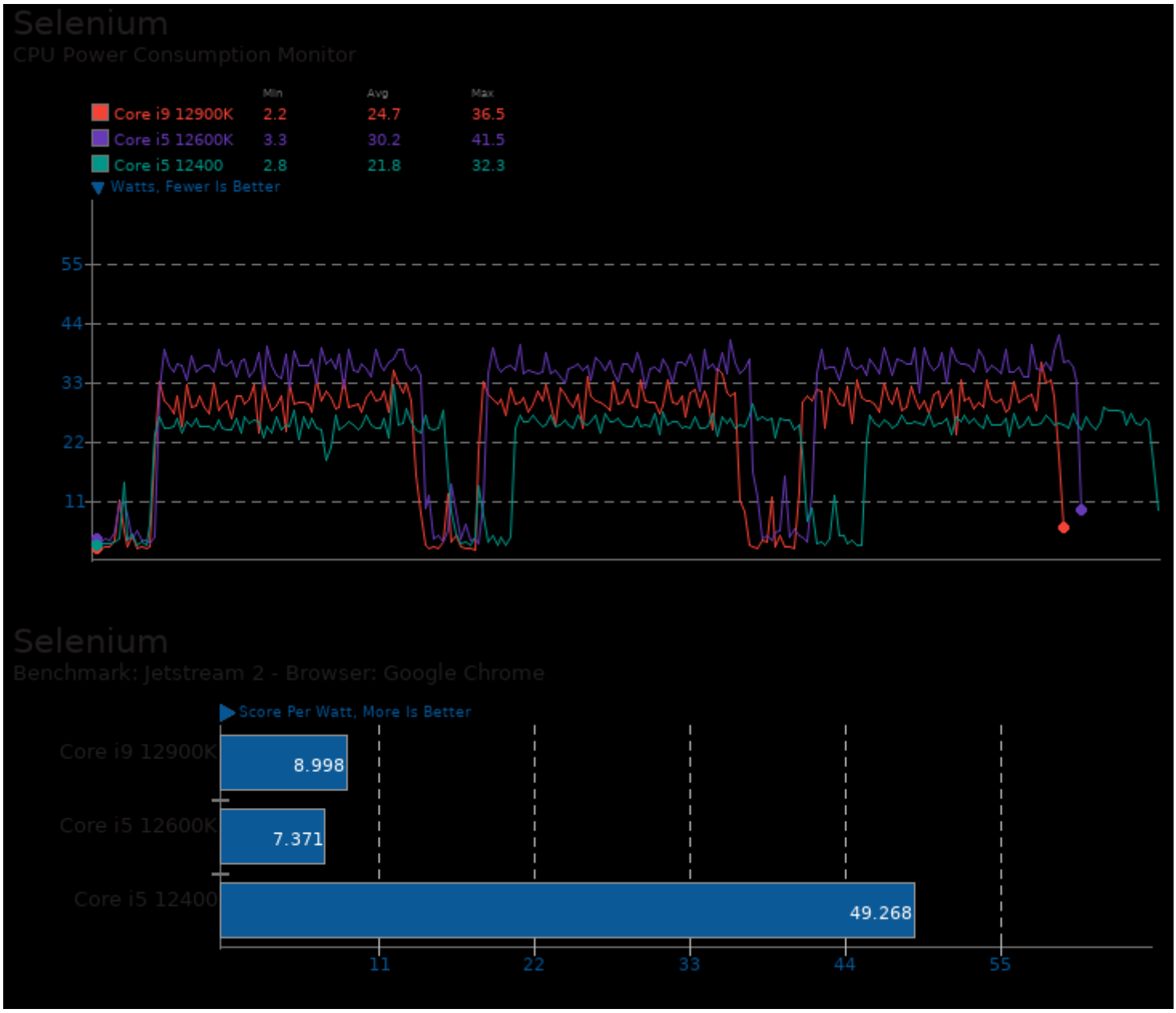

Appleseed 2.0 Beta
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.6 190.9 211.0
Core i5 12600K 3.9 114.9 122.1
Core i5 12400 2.7 73.4 77.4
Watts, Fewer Is Better
300
240
180
120
60
PHPBench 0.8.1
PHP Benchmark Suite
Score Per Watt, More Is Better
Core i9 12900K
50939.92
Core i5 12600K
43678.14
Core i5 12400
63527.45
14K
28K
42K
56K
70K


PHPBench 0.8.1
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 27.9 39.7
Core i5 12600K 3.2 30.8 41.2
Core i5 12400 2.5 19.1 25.3
Watts, Fewer Is Better
55
44
33
22
11
Selenium
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 14.7 37.7
Core i5 12600K 3.4 17.4 40.2
Core i5 12400 2.8 13.8 30.0
Watts, Fewer Is Better
55
44
33
22
11

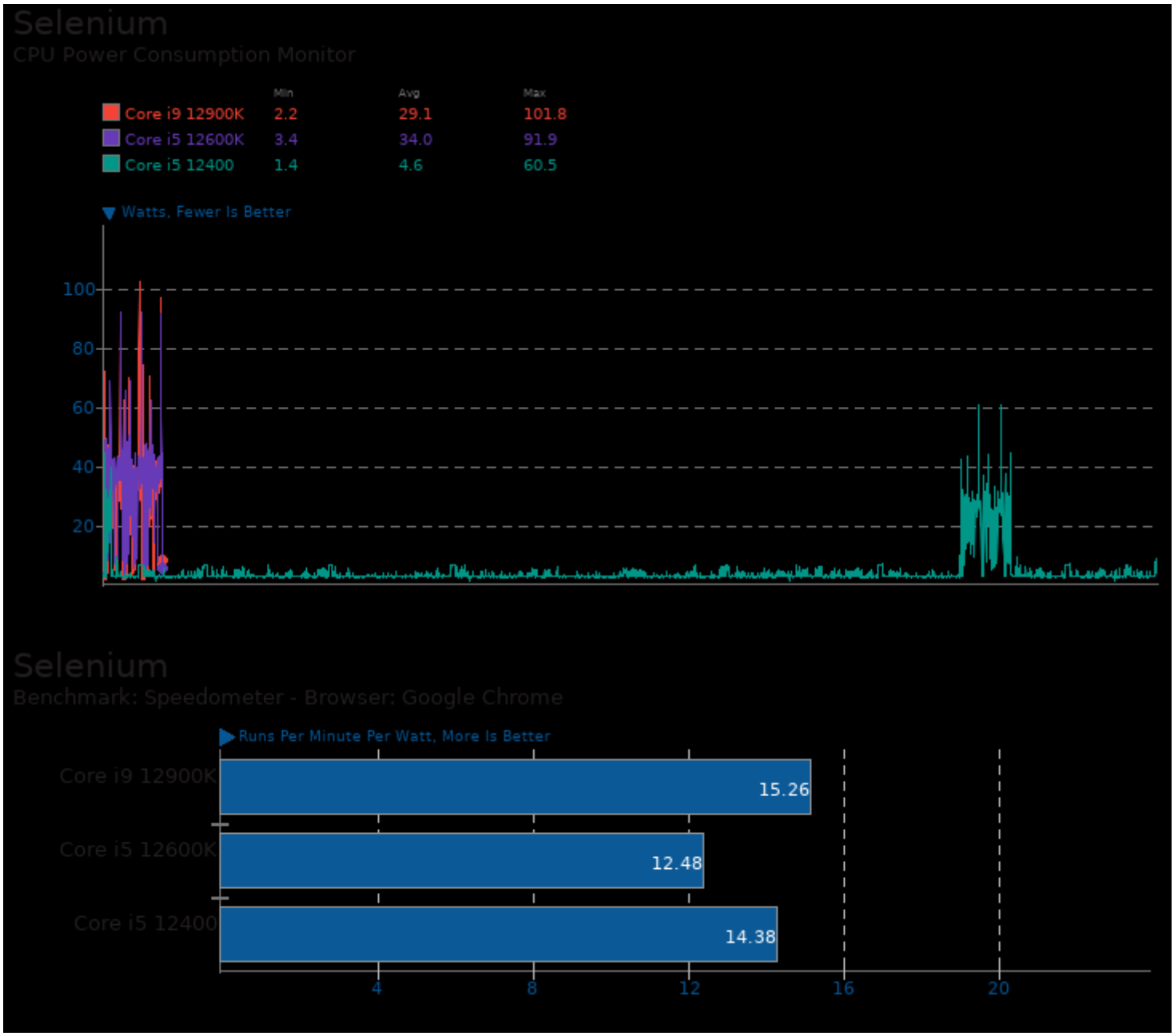
Alder Lake Intel Linux Tests

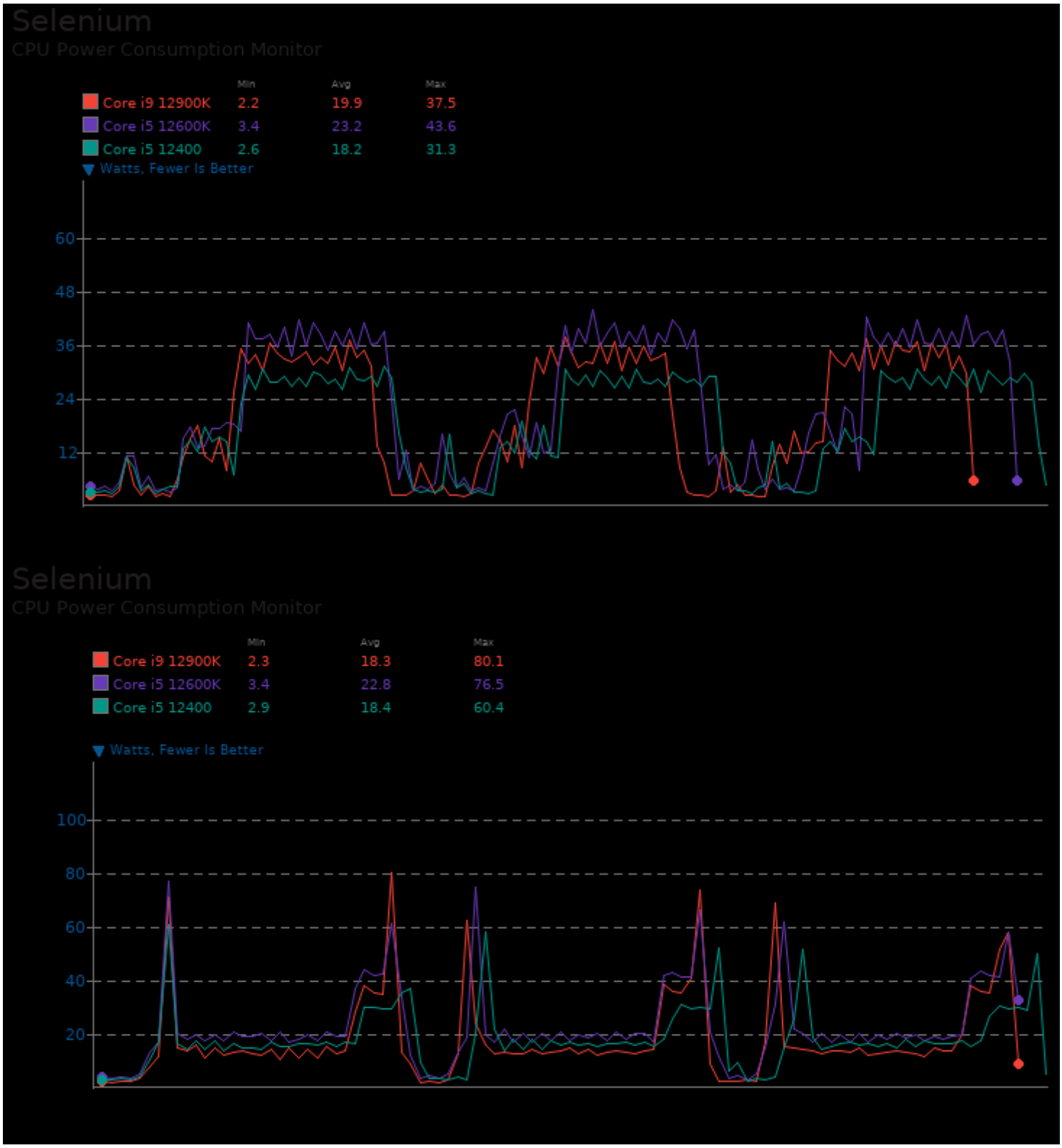


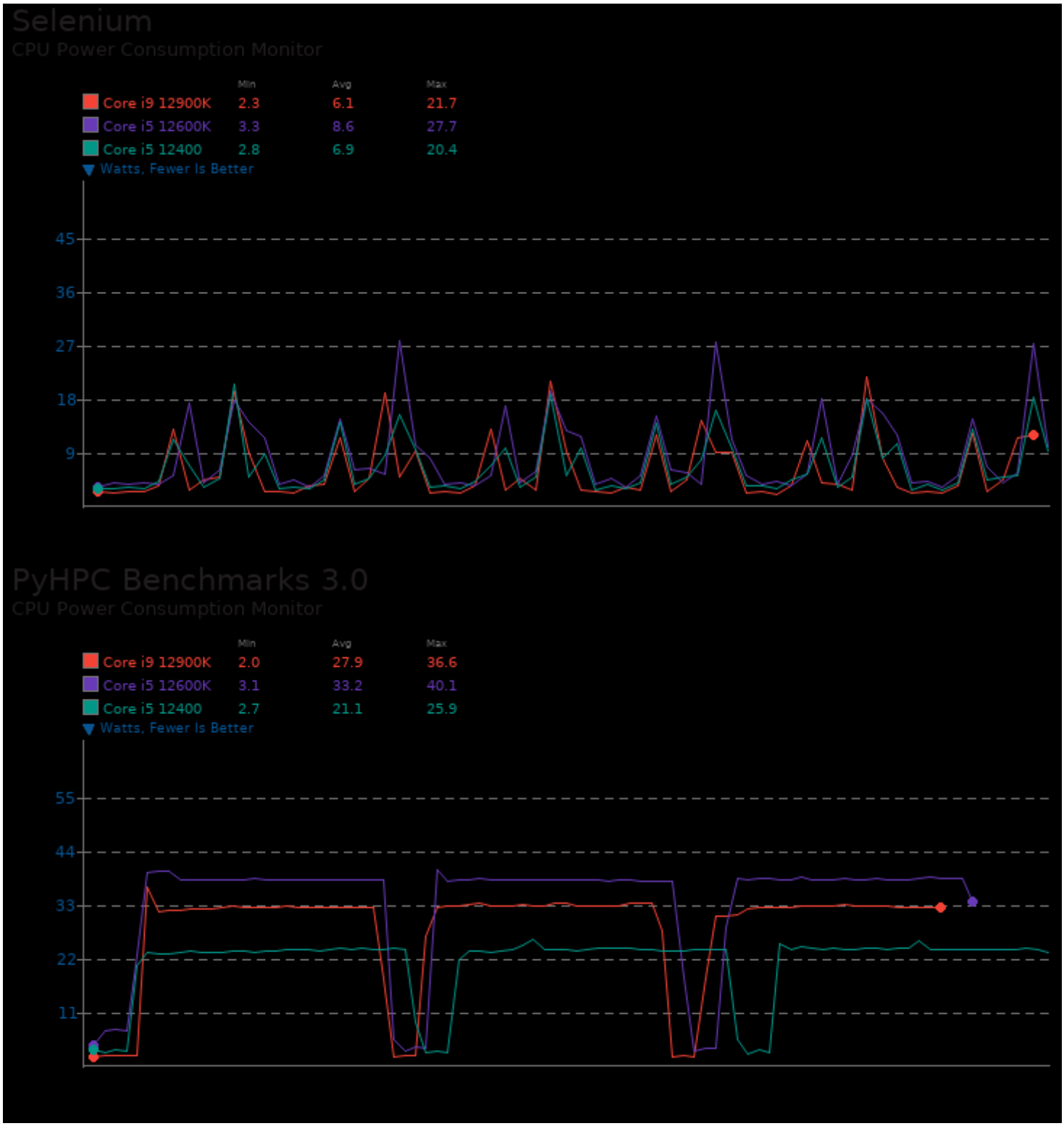
Alder Lake Intel Linux Tests

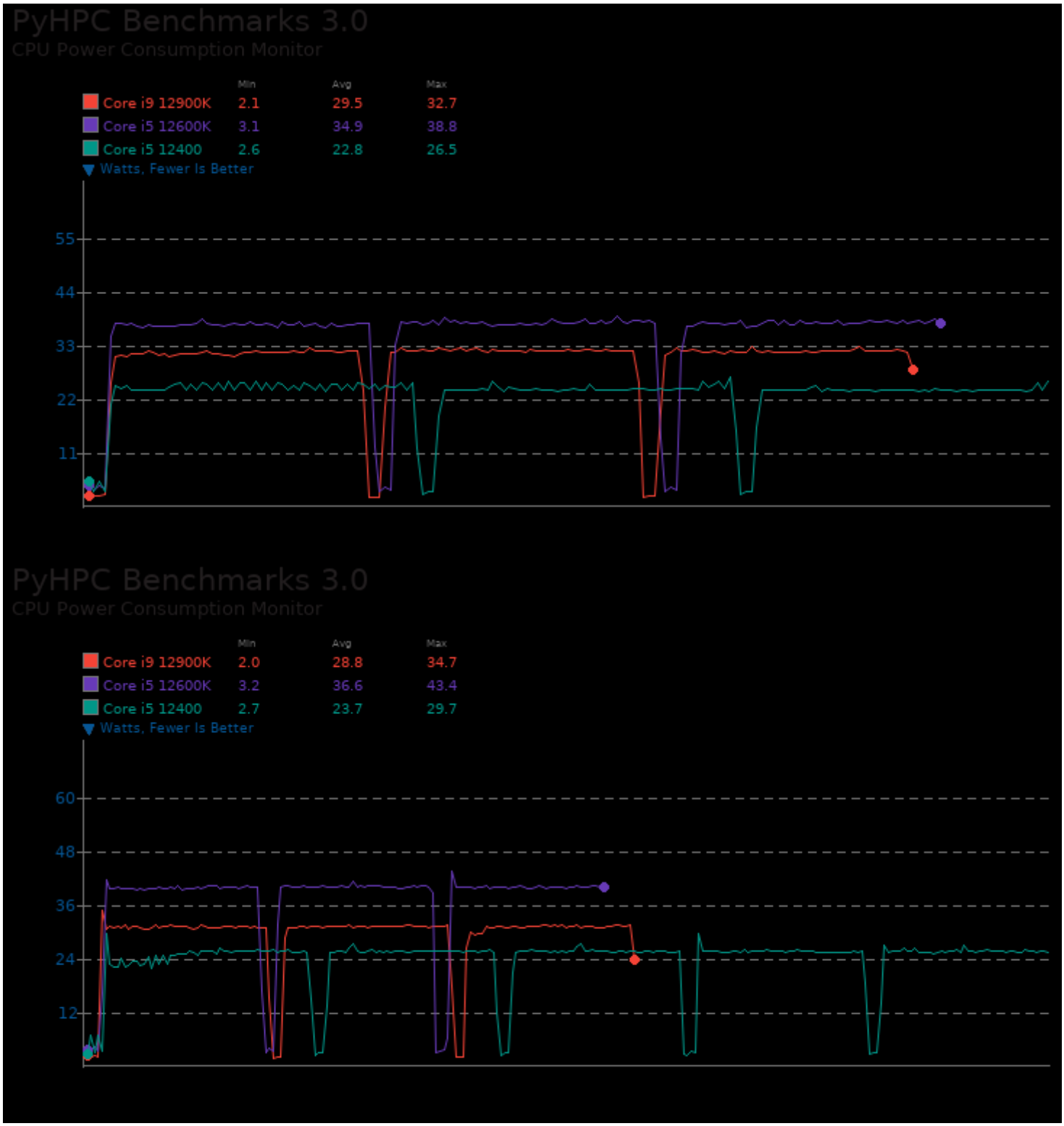


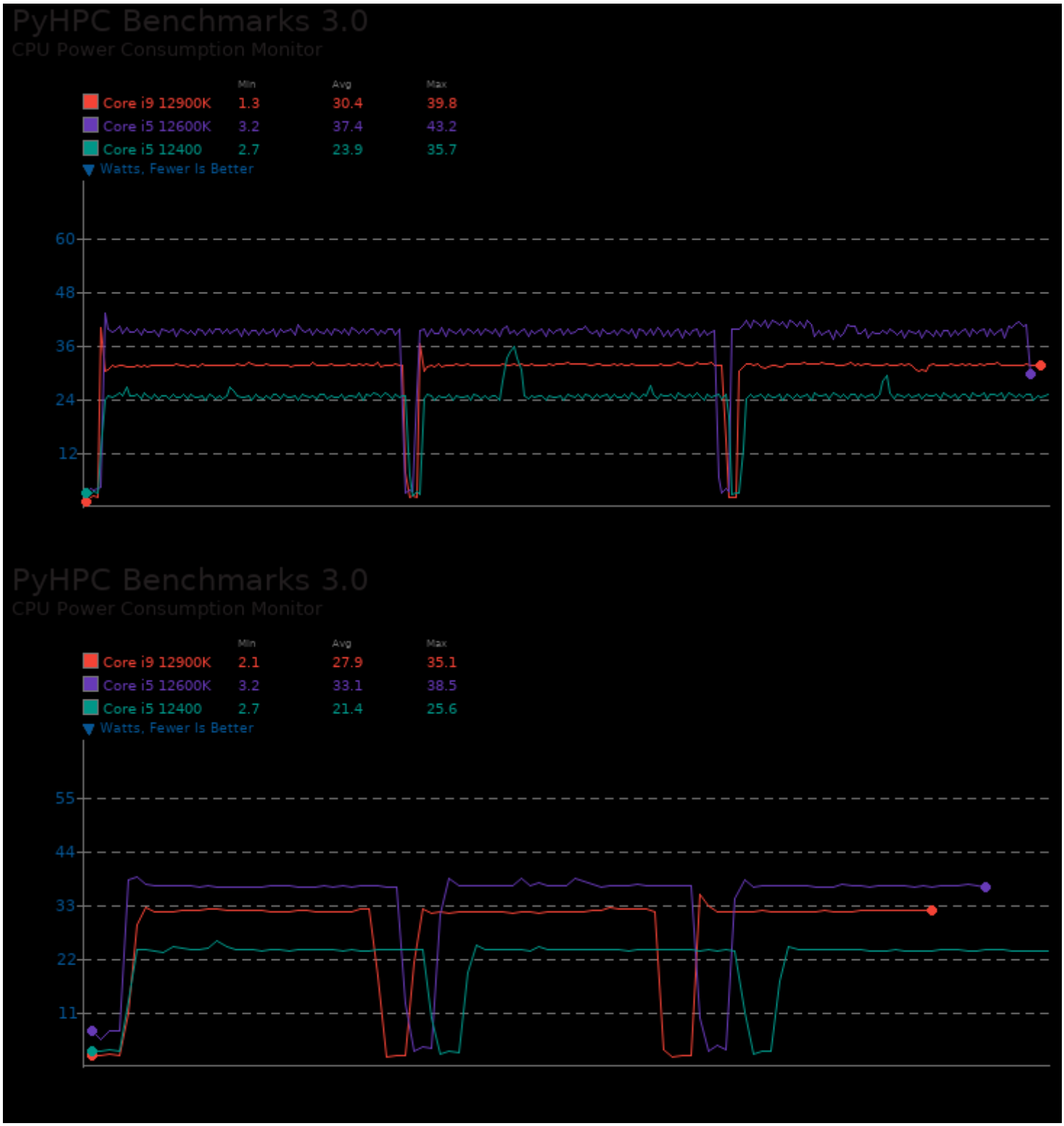
Alder Lake Intel Linux Tests

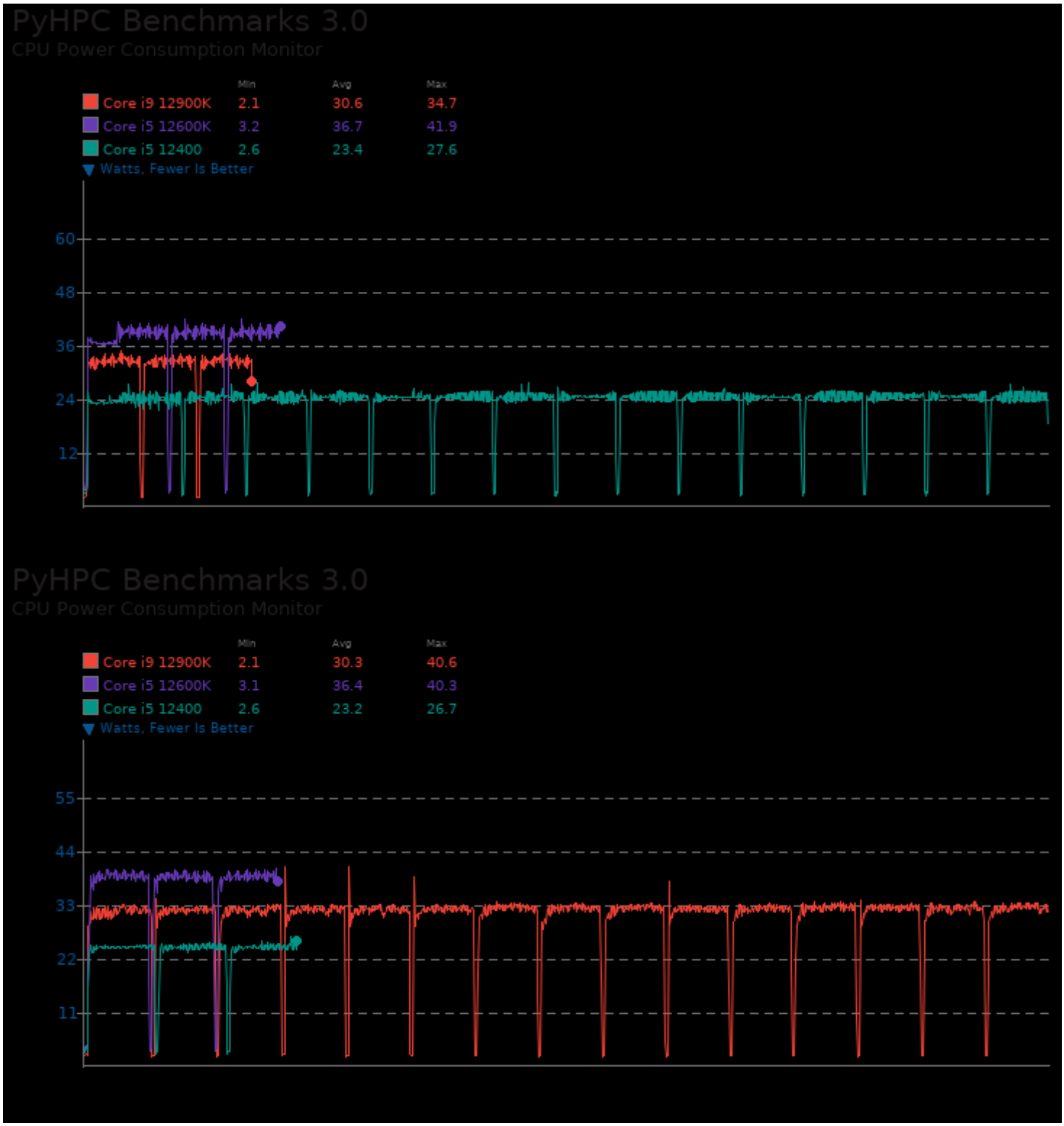


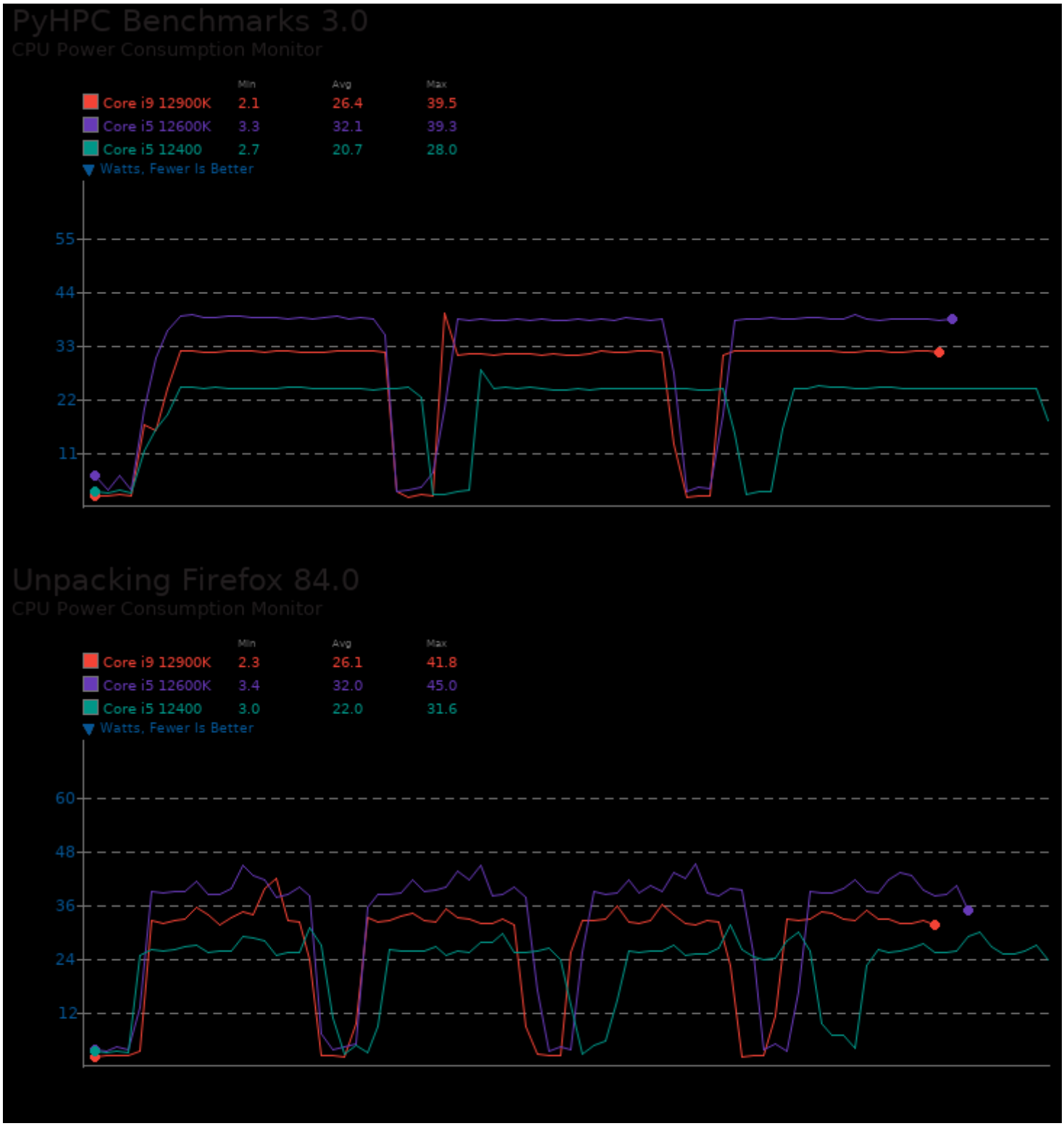

Selenium
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 19.9 37.5
Core i5 12600K 3.4 23.2 43.6
Core i5 12400 2.6 18.2 31.3
Watts, Fewer Is Better
60
48
36
24
12
Selenium
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 18.3 80.1
Core i5 12600K 3.4 22.8 76.5
Core i5 12400 2.9 18.4 60.4
Watts, Fewer Is Better
100
80
60
40
20

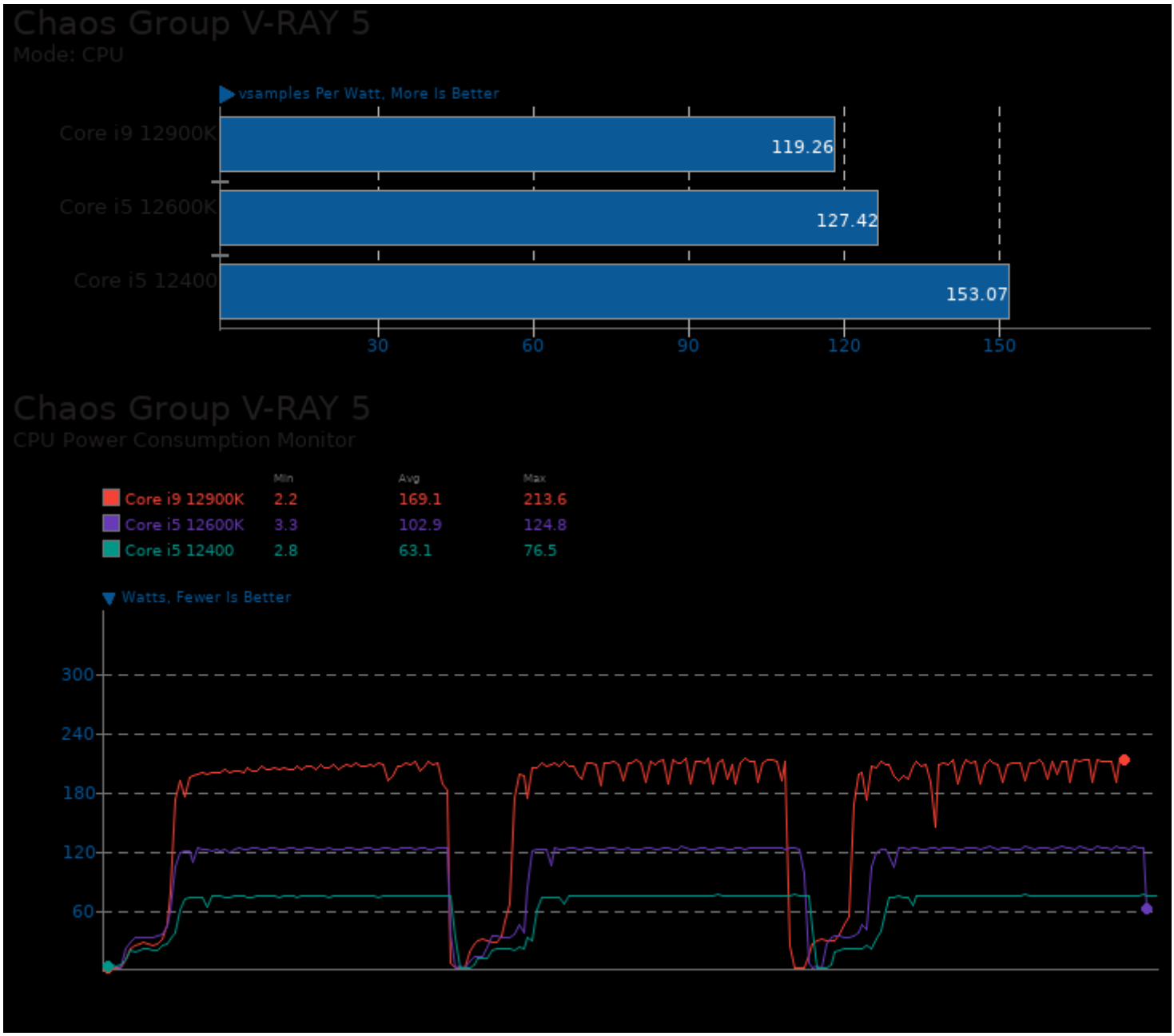

Selenium
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 6.1 21.7
Core i5 12600K 3.3 8.6 27.7
Core i5 12400 2.8 6.9 20.4
Watts, Fewer Is Better
45
36
27
18
9
PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.0 27.9 36.6
Core i5 12600K 3.1 33.2 40.1
Core i5 12400 2.7 21.1 25.9
Watts, Fewer Is Better
55
44
33
22
11

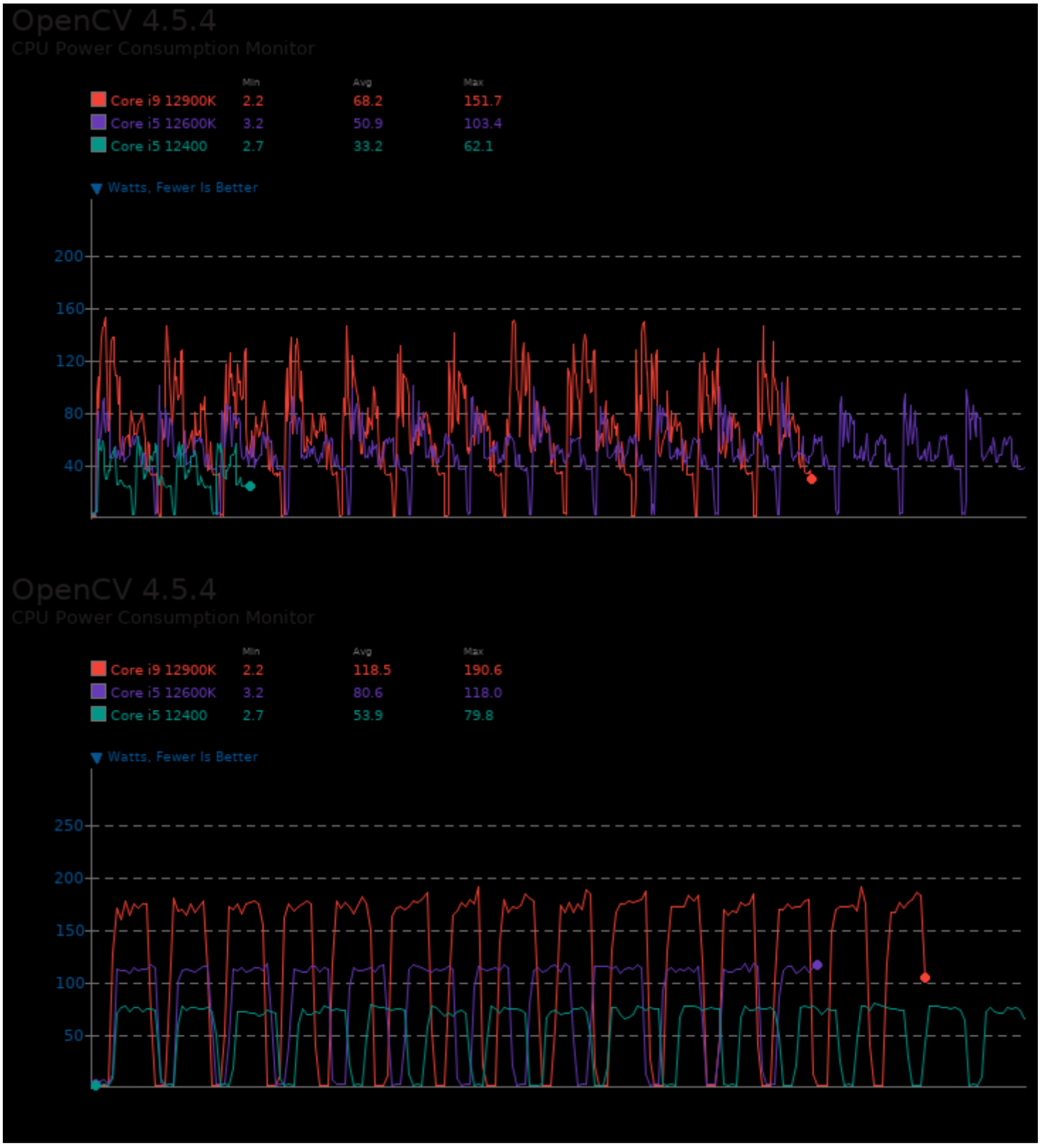

PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 29.5 32.7
Core i5 12600K 3.1 34.9 38.8
Core i5 12400 2.6 22.8 26.5
Watts, Fewer Is Better
55
44
33
22
11
PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.0 28.8 34.7
Core i5 12600K 3.2 36.6 43.4
Core i5 12400 2.7 23.7 29.7
Watts, Fewer Is Better
60
48
36
24
12

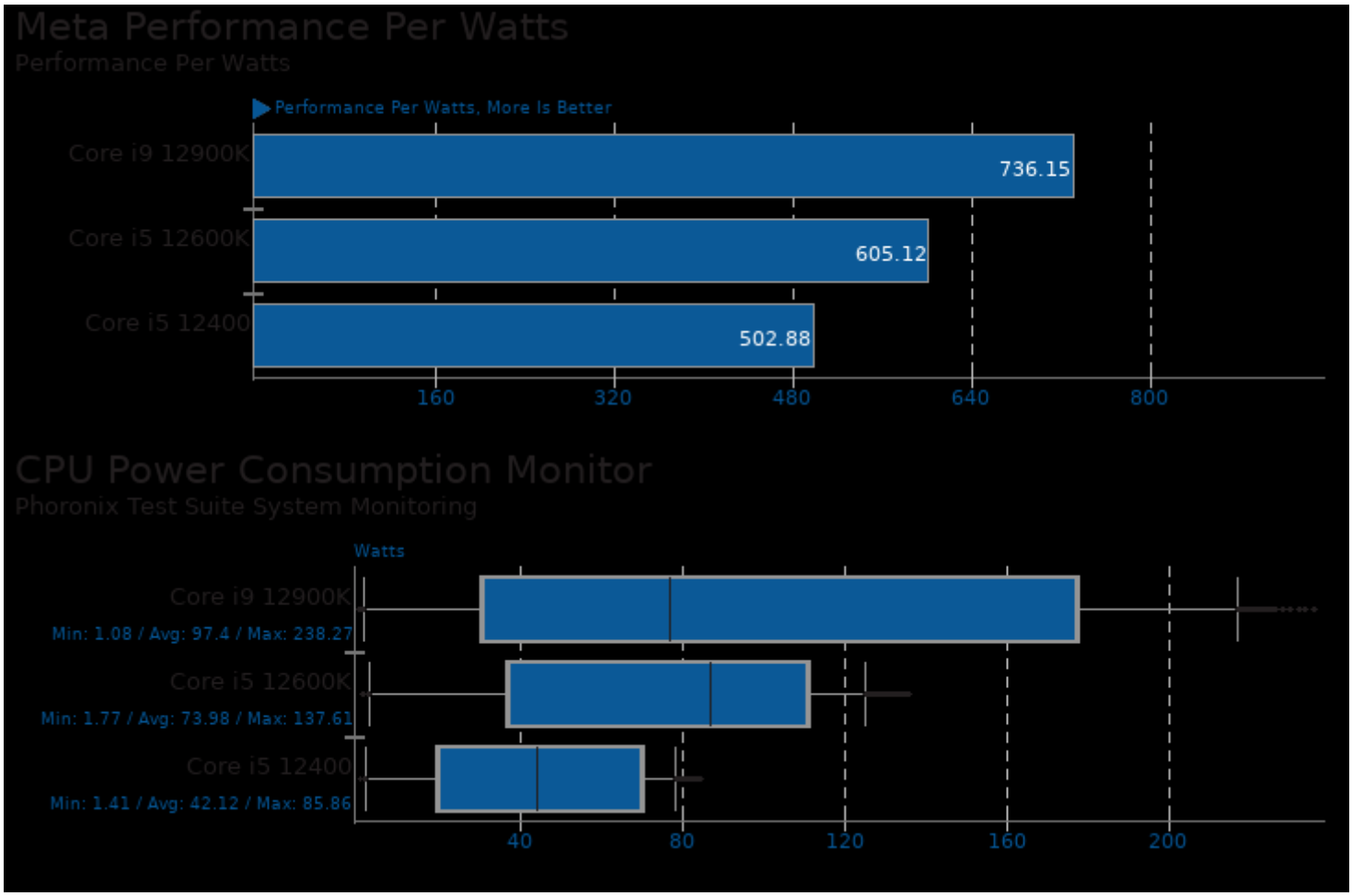

PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 1.3 30.4 39.8
Core i5 12600K 3.2 37.4 43.2
Core i5 12400 2.7 23.9 35.7
Watts, Fewer Is Better
60
48
36
24
12
PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 27.9 35.1
Core i5 12600K 3.2 33.1 38.5
Core i5 12400 2.7 21.4 25.6
Watts, Fewer Is Better
55
44
33
22
11


PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 30.6 34.7
Core i5 12600K 3.2 36.7 41.9
Core i5 12400 2.6 23.4 27.6
Watts, Fewer Is Better
60
48
36
24
12
PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 30.3 40.6
Core i5 12600K 3.1 36.4 40.3
Core i5 12400 2.6 23.2 26.7
Watts, Fewer Is Better
55
44
33
22
11


PyHPC Benchmarks 3.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.1 26.4 39.5
Core i5 12600K 3.3 32.1 39.3
Core i5 12400 2.7 20.7 28.0
Watts, Fewer Is Better
55
44
33
22
11
Unpacking Firefox 84.0
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.3 26.1 41.8
Core i5 12600K 3.4 32.0 45.0
Core i5 12400 3.0 22.0 31.6
Watts, Fewer Is Better
60
48
36
24
12

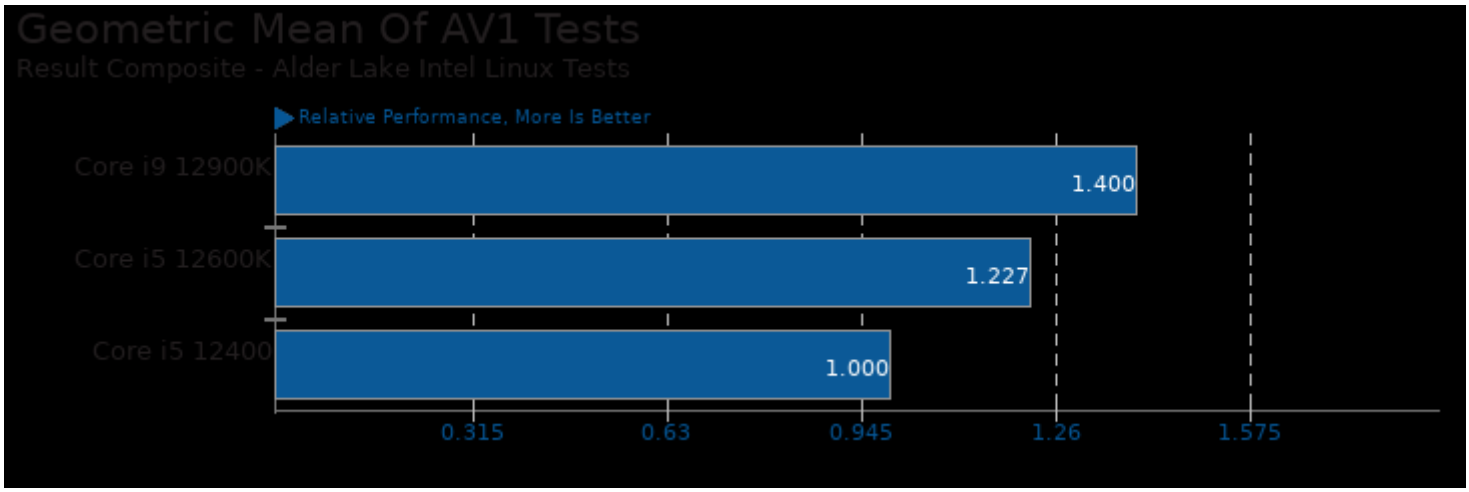

Chaos Group V-RAY 5
Mode: CPU
vsamples Per Watt, More Is Better
Core i9 12900K
119.26
Core i5 12600K
127.42
Core i5 12400
153.07
30
60
90
120
150
Chaos Group V-RAY 5
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 169.1 213.6
Core i5 12600K 3.3 102.9 124.8
Core i5 12400 2.8 63.1 76.5
Watts, Fewer Is Better
300
240
180
120
60


OpenCV 4.5.4
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 68.2 151.7
Core i5 12600K 3.2 50.9 103.4
Core i5 12400 2.7 33.2 62.1
Watts, Fewer Is Better
200
160
120
80
40
OpenCV 4.5.4
CPU Power Consumption Monitor
Min
Avg
Max
Core i9 12900K 2.2 118.5 190.6
Core i5 12600K 3.2 80.6 118.0
Core i5 12400 2.7 53.9 79.8
Watts, Fewer Is Better
250
200
150
100
50

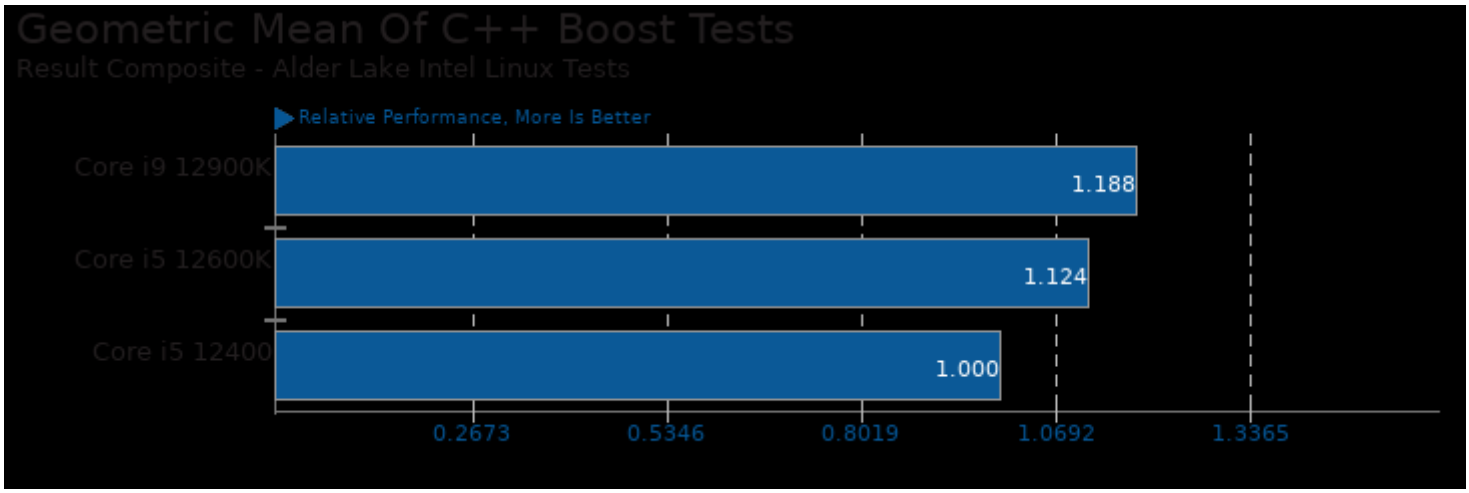

Meta Performance Per Watts
Performance Per Watts
Performance Per Watts, More Is Better
Core i9 12900K
736.15
Core i5 12600K
605.12
Core i5 12400
502.88
160
320
480
640
800
CPU Power Consumption Monitor
Phoronix Test Suite System Monitoring
Watts
Core i9 12900K
Min: 1.08 / Avg: 97.4 / Max: 238.27
Core i5 12600K
Min: 1.77 / Avg: 73.98 / Max: 137.61
Core i5 12400
Min: 1.41 / Avg: 42.12 / Max: 85.86
40
80
120
160
200

Alder Lake Intel Linux Tests

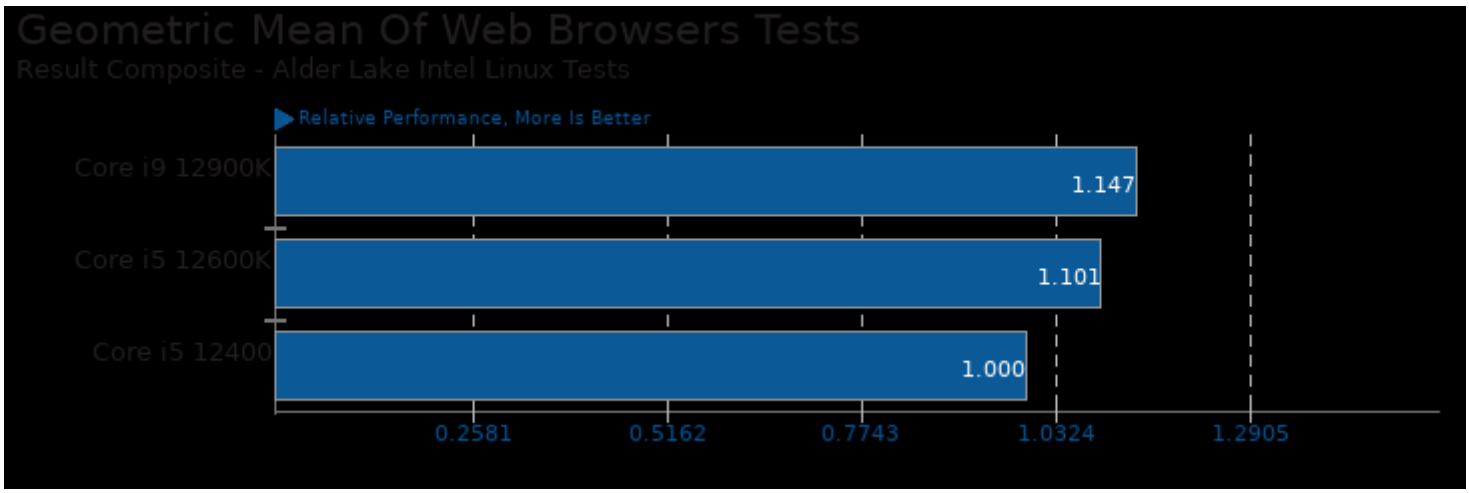
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/aom-av1, pts/svt-av1, pts/rav1e and pts/avifenc



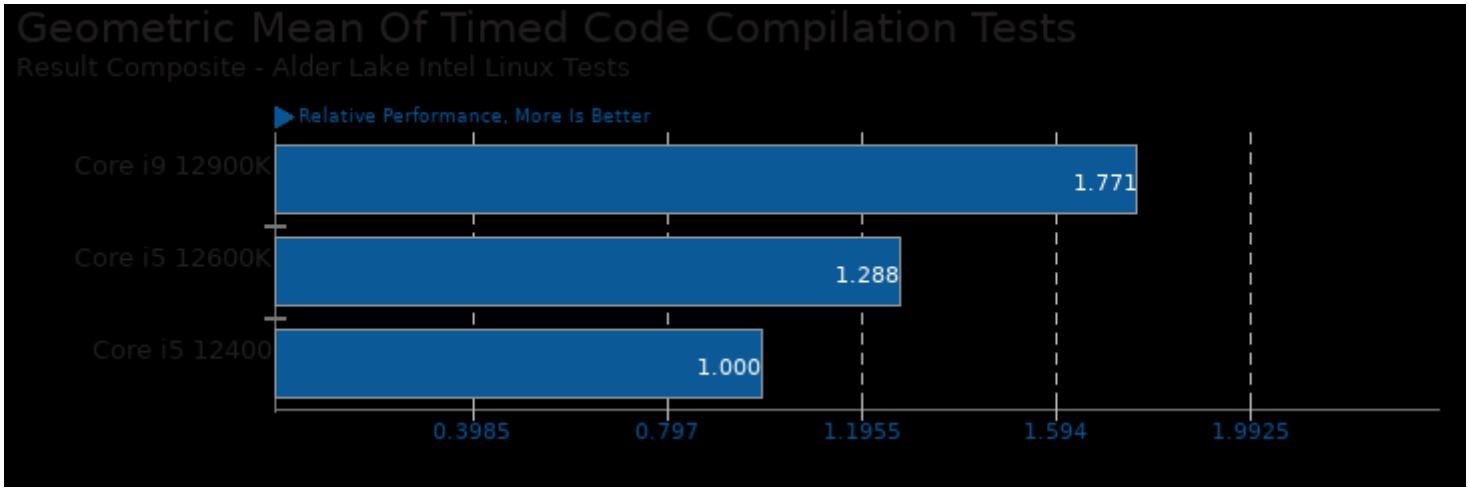
Geometric mean based upon tests: pts/chia-vdf and pts/srsran



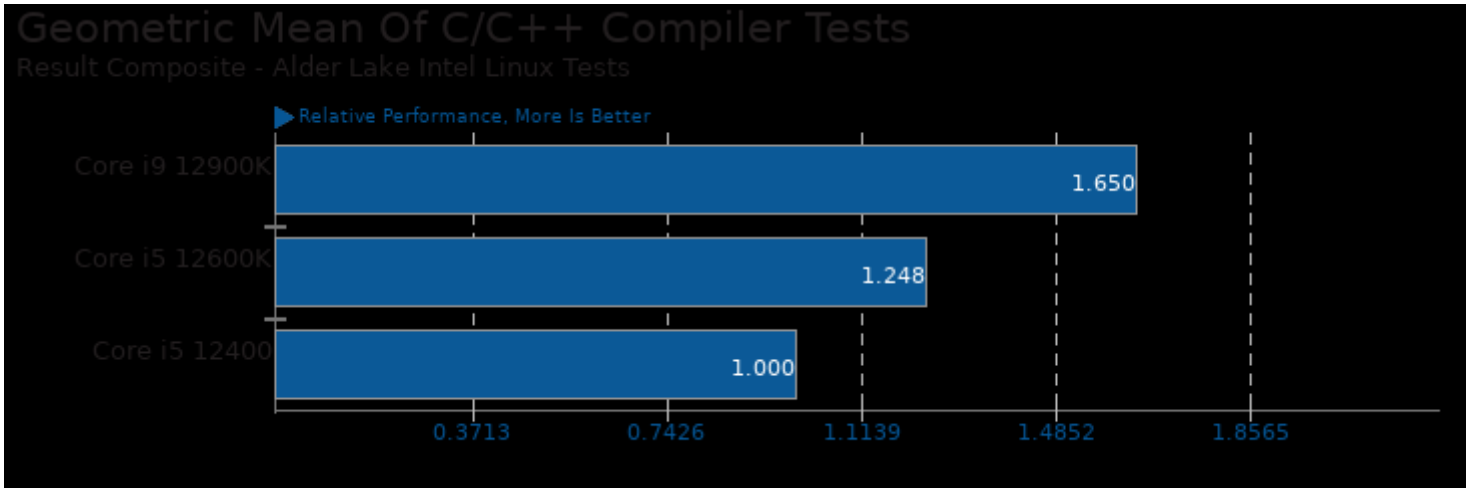
Geometric mean based upon tests: system/selenium



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



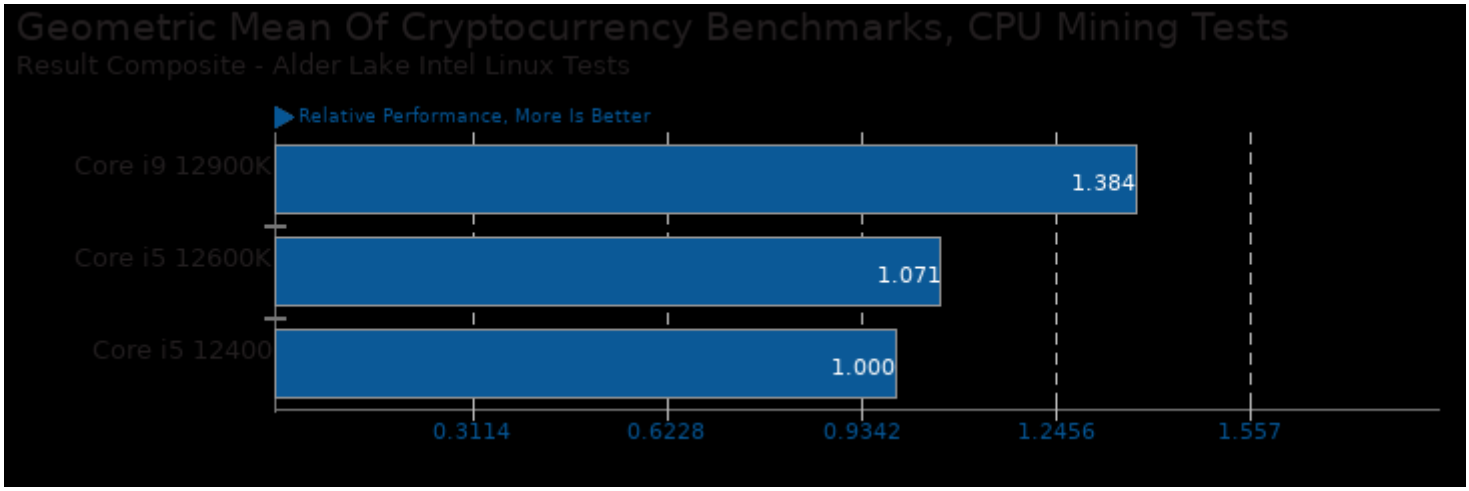
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-gdb, pts/build-llvm, pts/build-mplayer, pts/build-wasmer, pts/build-nodejs and pts/build-mesa



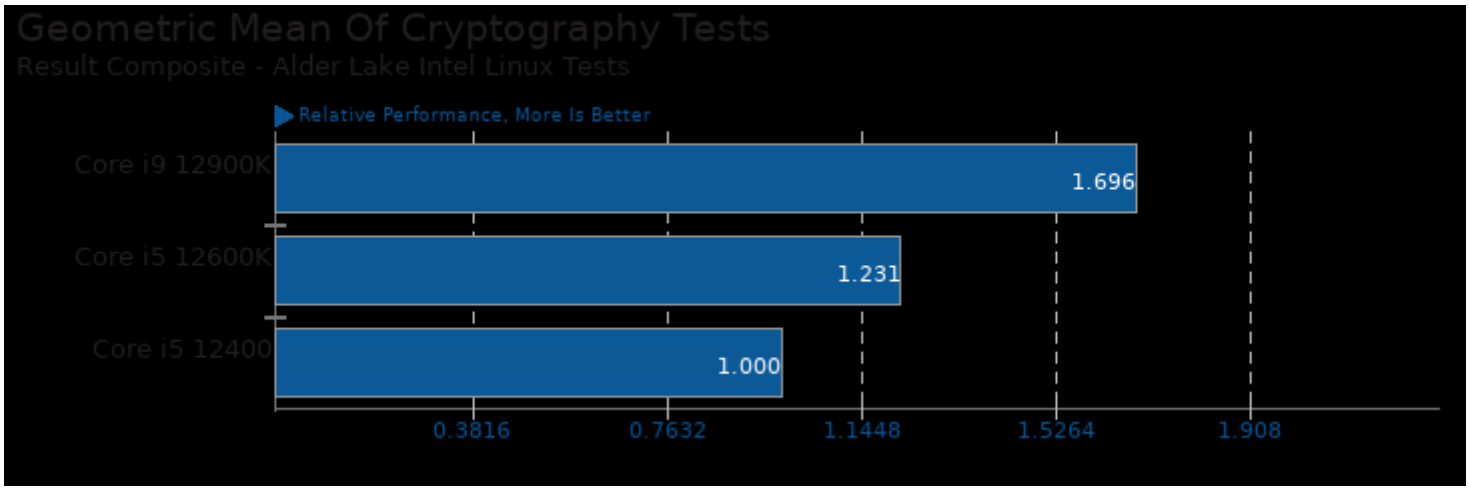
Geometric mean based upon tests: pts/stockfish, pts/build-llvm, pts/compress-7zip, pts/tungsten, pts/compress-xz, pts/compress-zstd, pts/openssl, pts/lammps, pts/aircrack-ng, pts/aom-av1, pts/svt-av1, pts/svt-vp9, pts/build-gdb and pts/build-mplayer



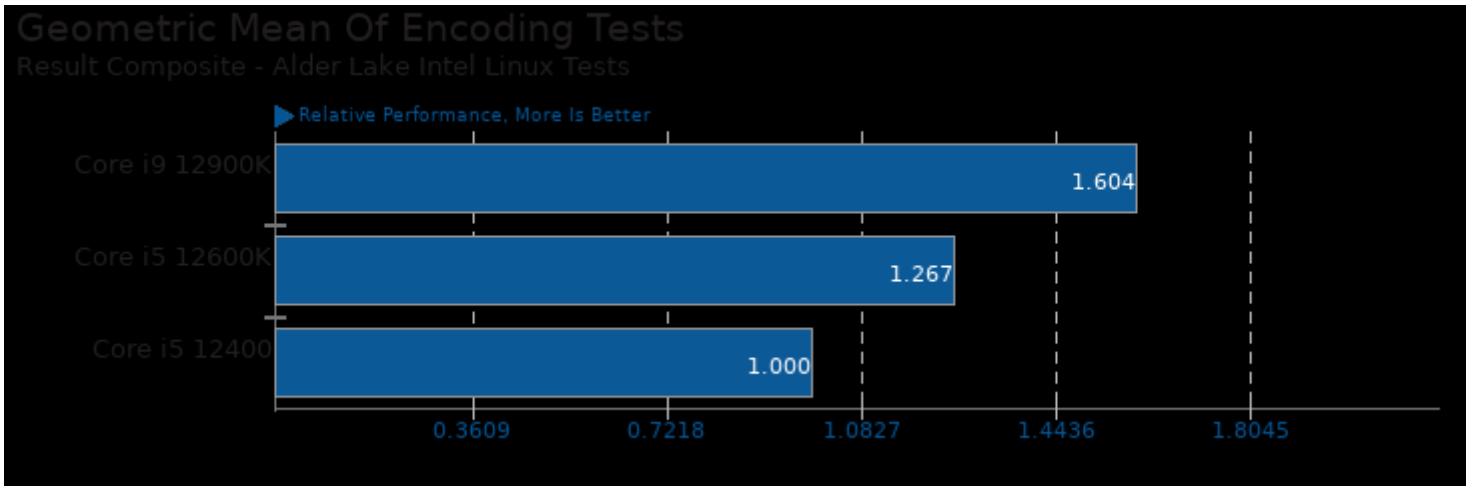
Geometric mean based upon tests: pts/compress-7zip, pts/compress-zstd, pts/compress-lz4 and pts/compress-xz



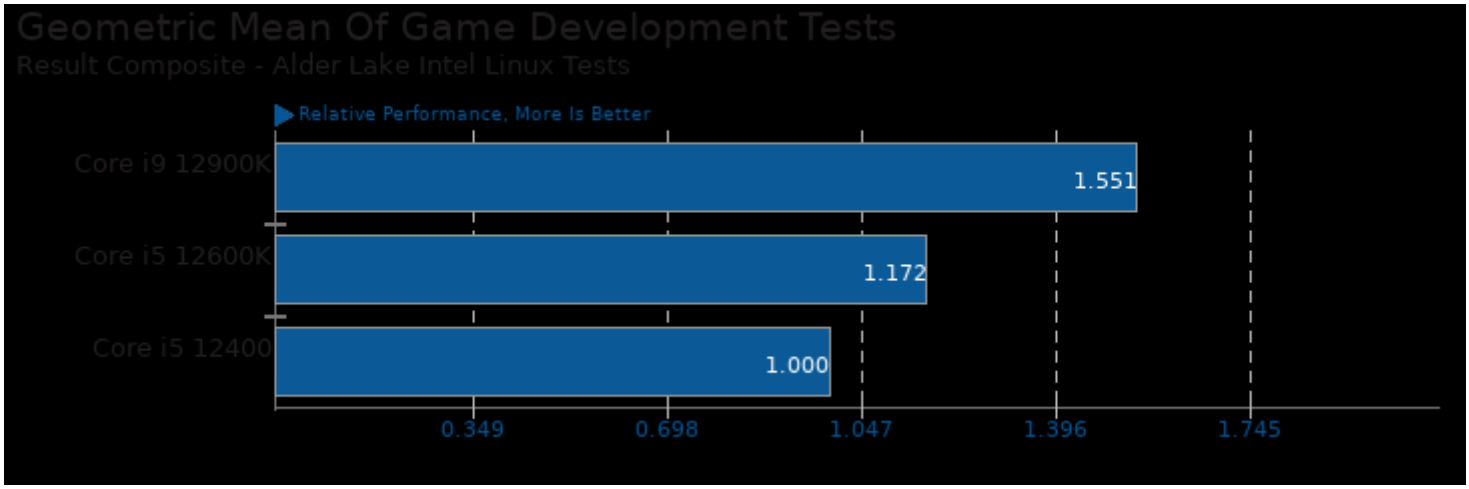
Geometric mean based upon tests: pts/xmrig and pts/chia-vdf



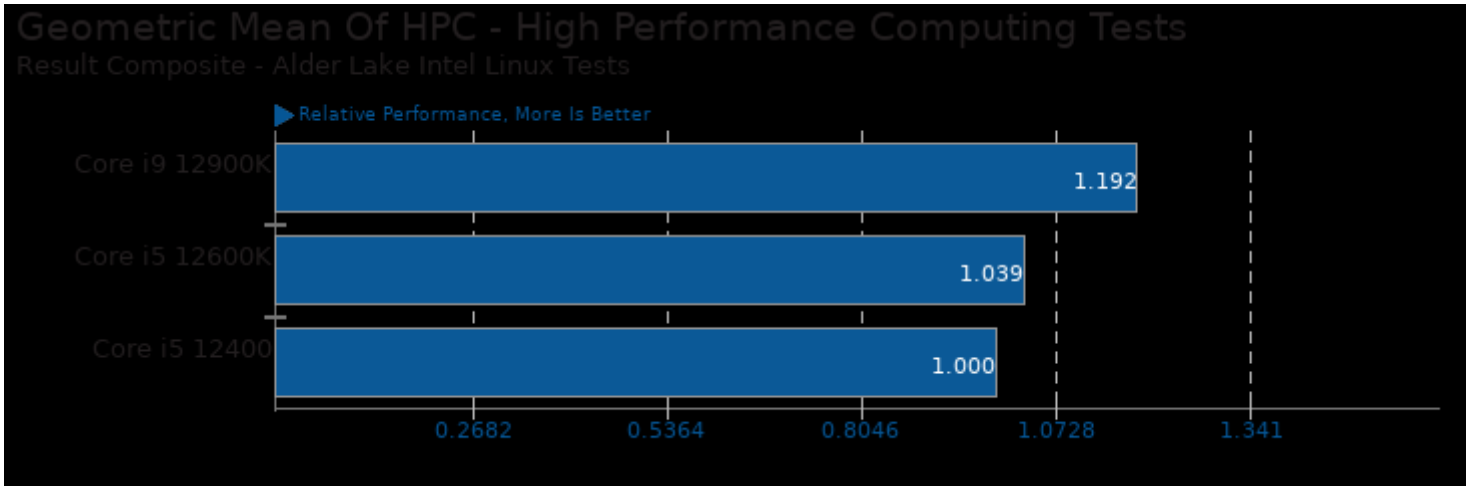
Geometric mean based upon tests: pts/openssl, pts/aircrack-ng, pts/securemark, pts/xmrig and pts/chia-vdf



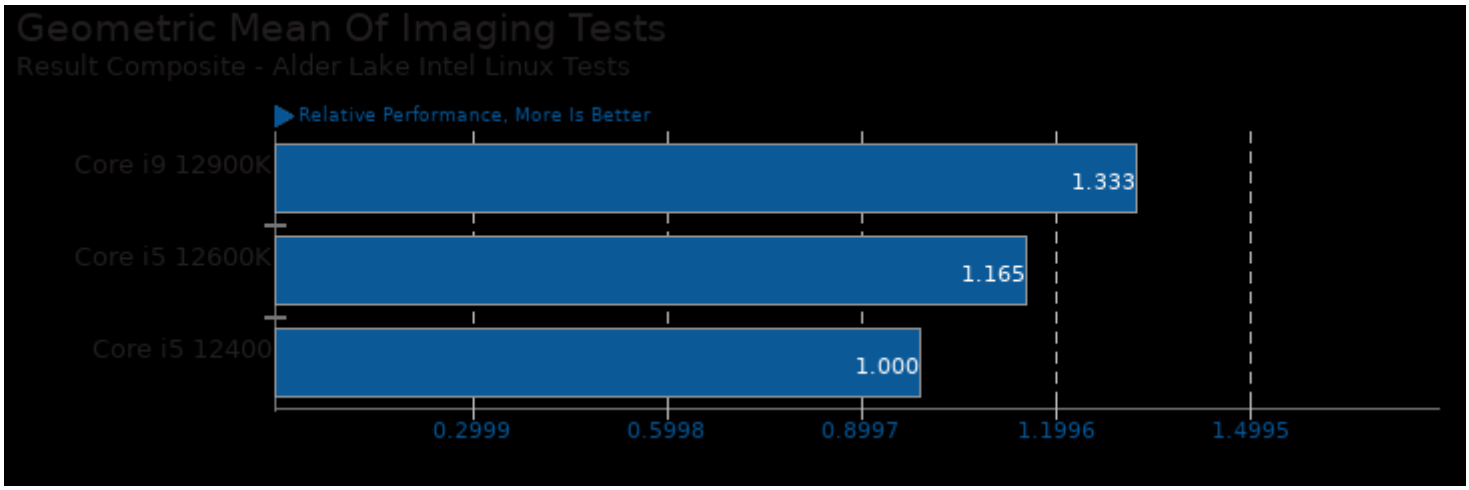
Geometric mean based upon tests: pts/stargate, pts/svt-vp9, pts/svt-hevc, pts/aom-av1, pts/svt-av1, pts/rav1e and pts/avifenc



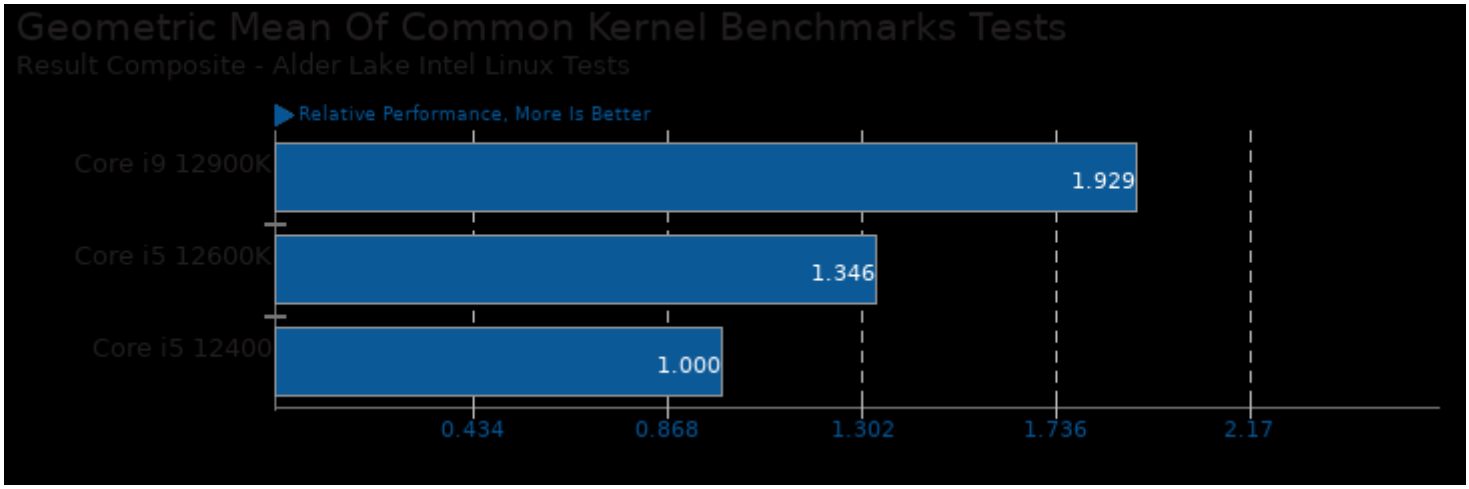
Geometric mean based upon tests: pts/astcenc, pts/etcpak and pts/blender



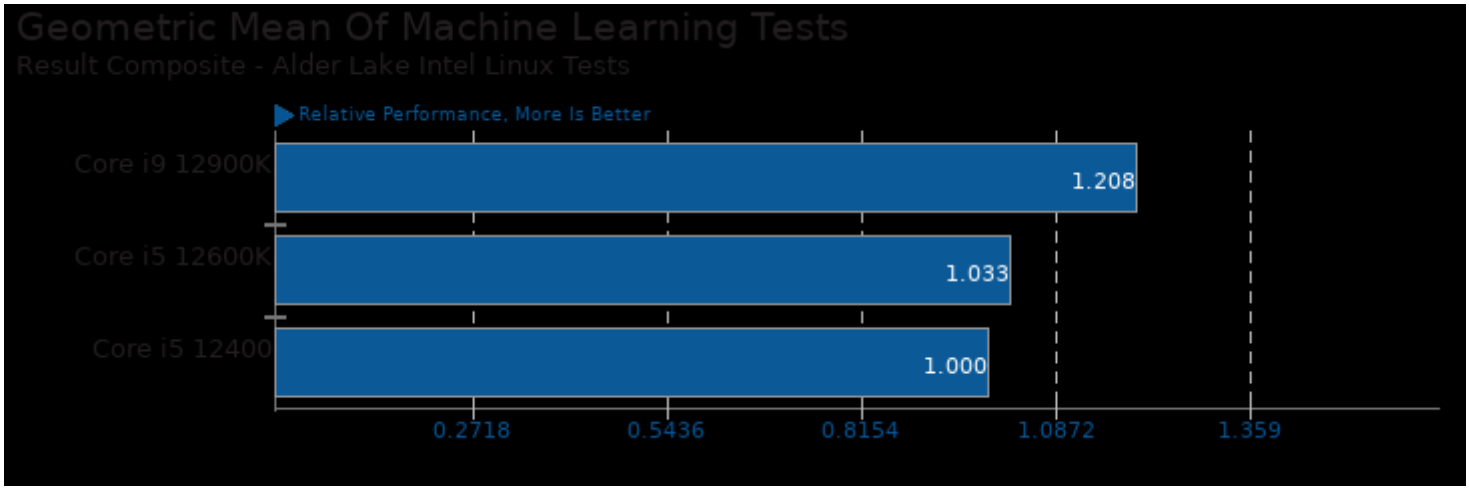
Geometric mean based upon tests: system/octave-benchmark, pts/lammps, pts/mnn, pts/ncnn, pts/tnn, pts/opencv, pts/tensorflow-lite, pts/onnx, pts/plaidml, pts/lczero and pts/pyhpc



Geometric mean based upon tests: pts/libraw, pts/webp, pts/jpegxl, system/rawtherapee, pts/tjbench, system/gimp, system/hugin, system/darktable and pts/avifenc

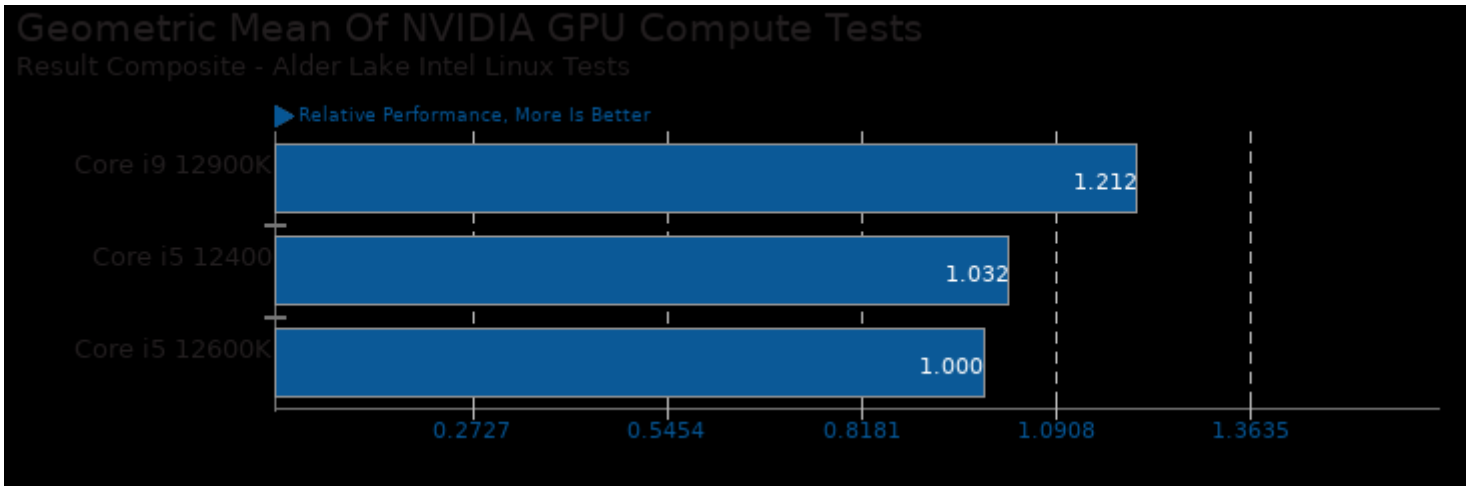


Geometric mean based upon tests: system/wireguard and pts/openssl

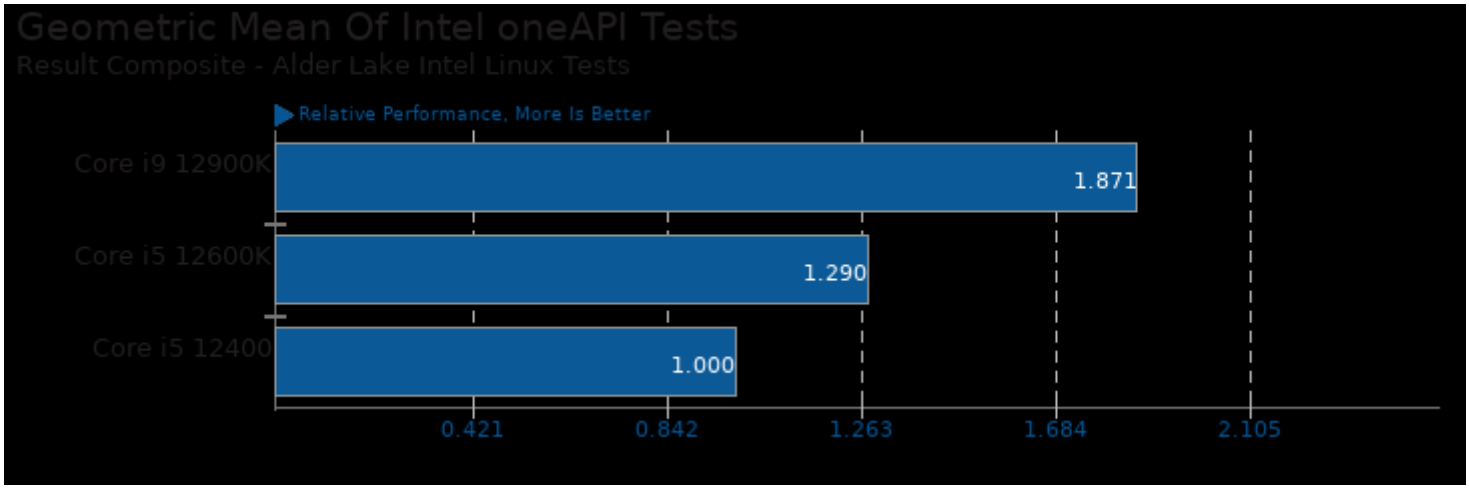


Geometric mean based upon tests: pts/mnn, pts/ncnn, pts/tnn, pts/opencv, pts/tensorflow-lite, pts/onnx, pts/plaidml and pts/lczero

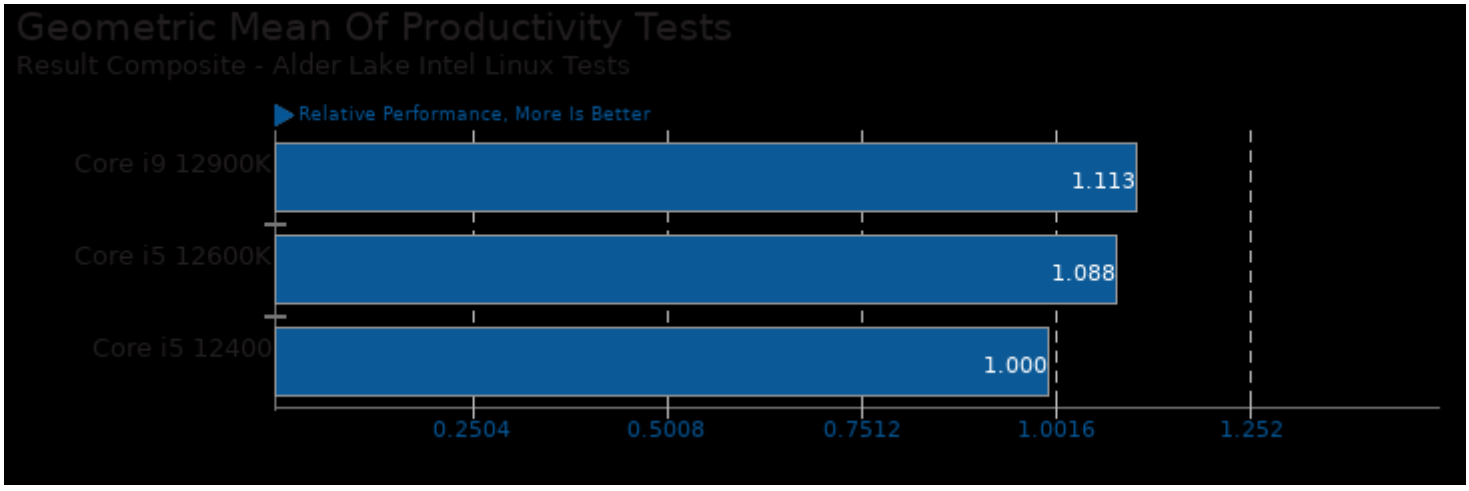
Alder Lake Intel Linux Tests



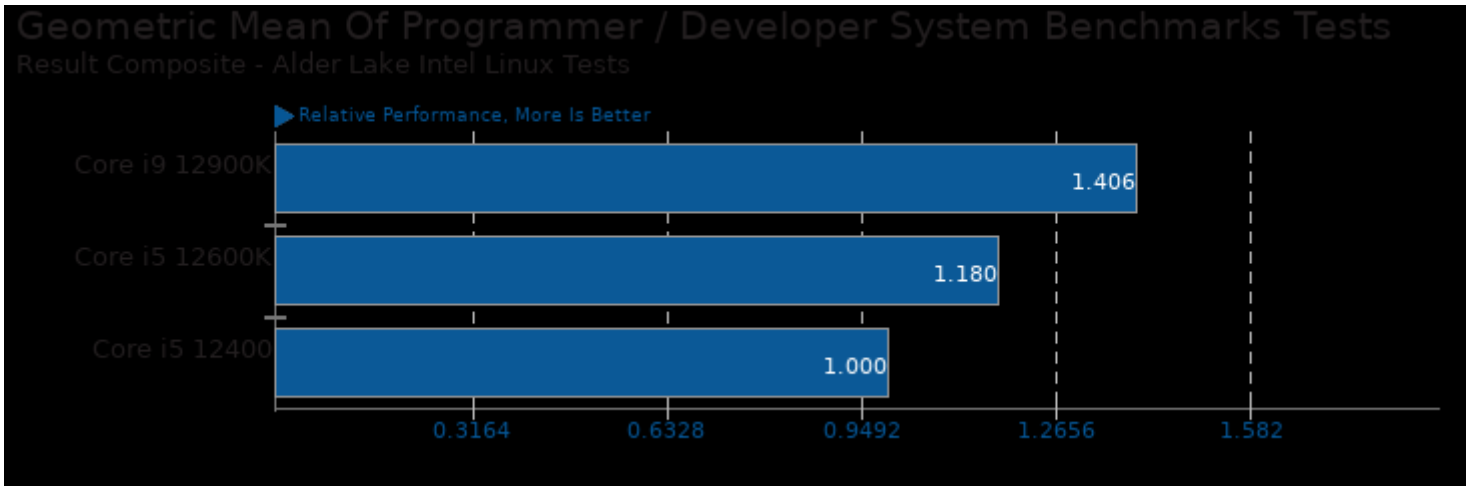
Geometric mean based upon tests: pts/plaidml, pts/lczero, pts/indigobench, pts/v-ray, pts/blender and pts/ncnn



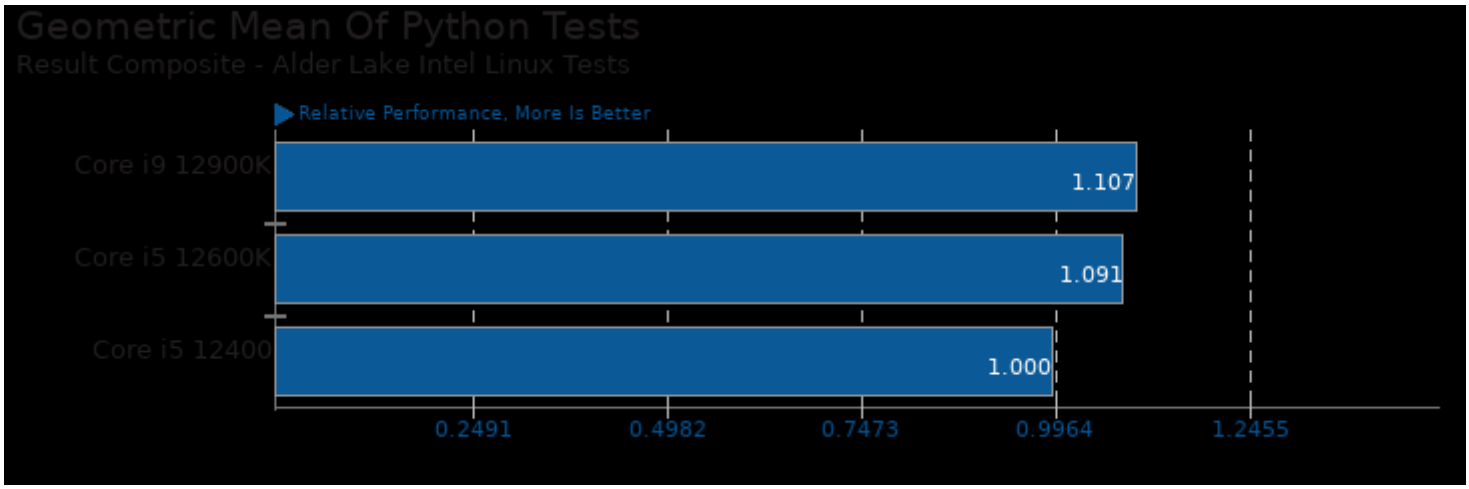
Geometric mean based upon tests: pts/embree, pts/ospray and pts/tungsten



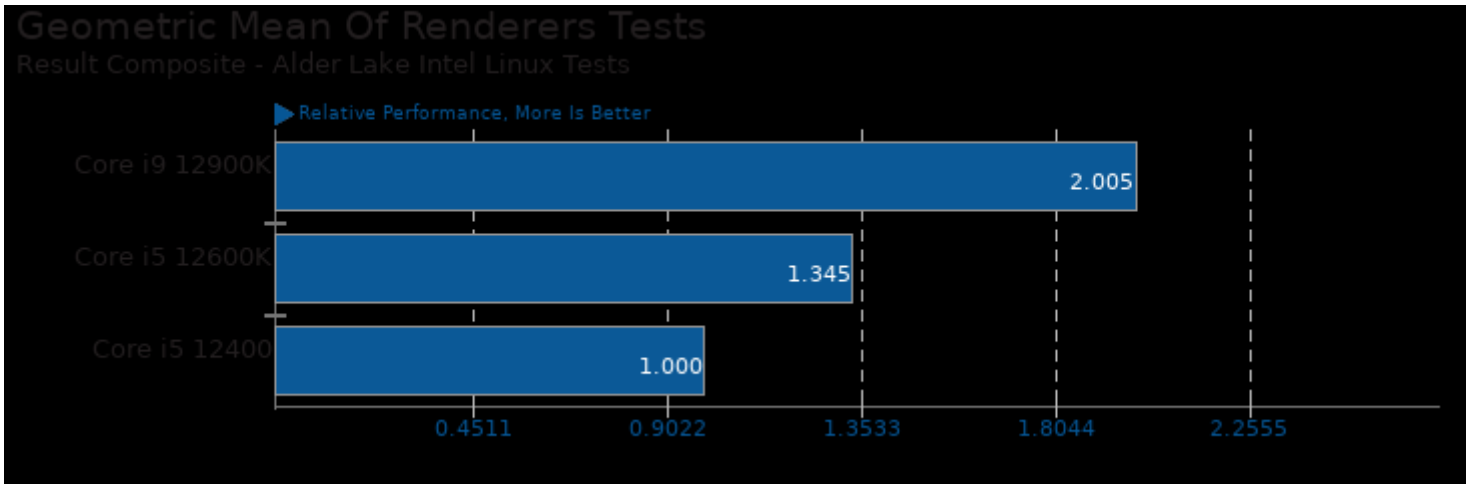
Geometric mean based upon tests: system/octave-benchmark and system/gimp



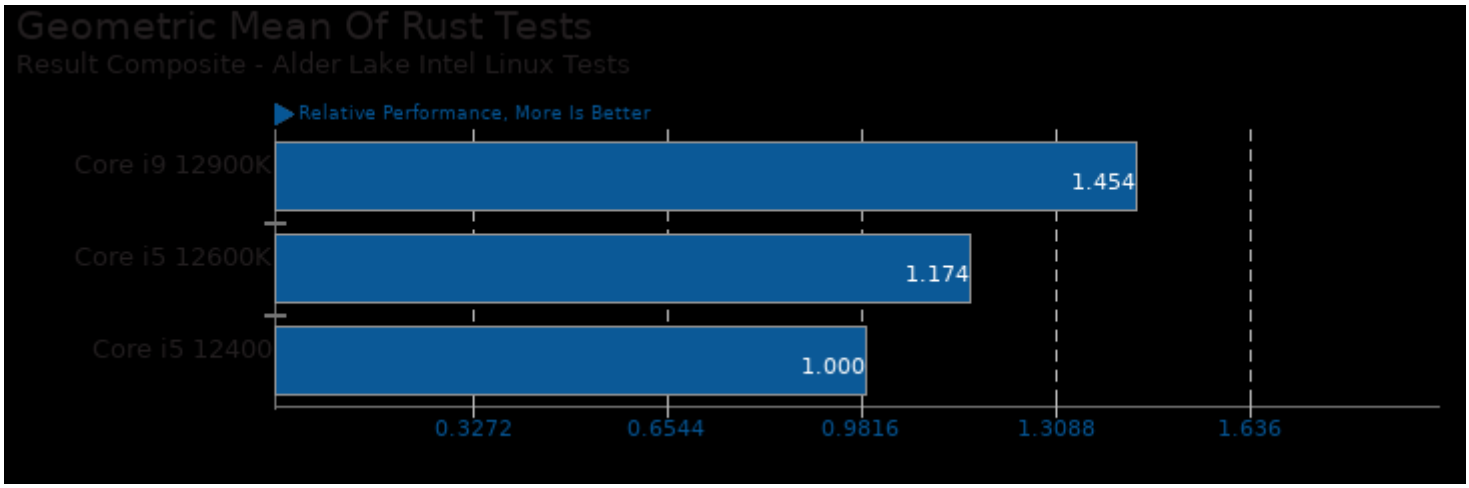
Geometric mean based upon tests: pts/simdjson, pts/node-web-tooling, pts/compress-zstd, pts/pybench, pts/build-linux-kernel, pts/build-gdb, pts/build-llvm, pts/build-mplayer, pts/build-wasmer, pts/build-nodejs and pts/build-mesa



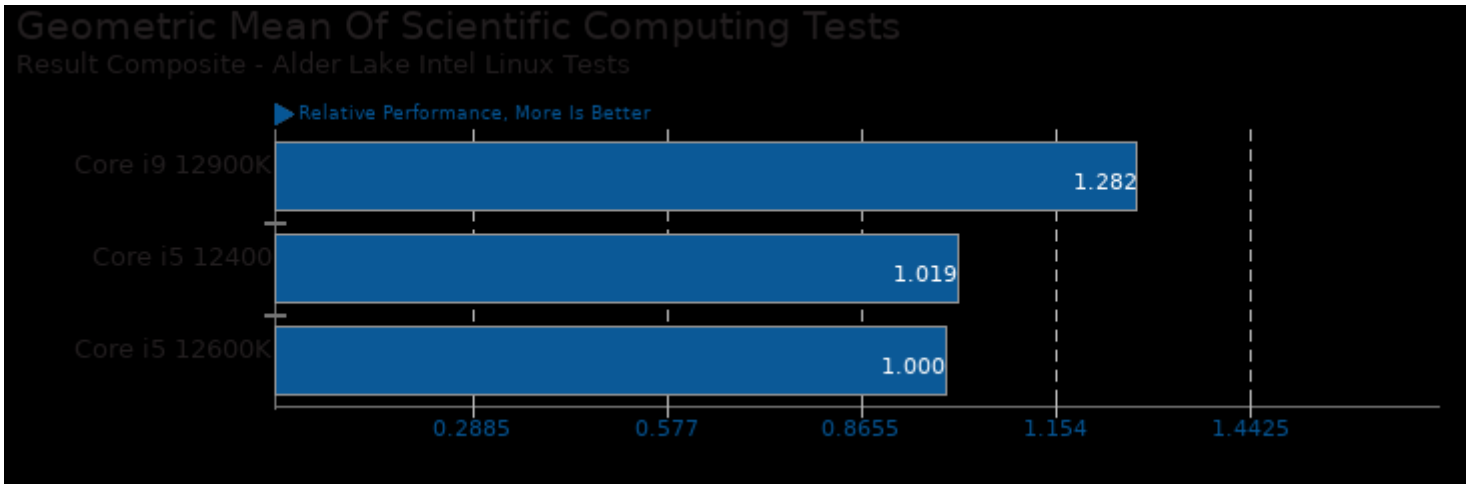
Geometric mean based upon tests: pts/pybench, pts/cython-bench and pts/pyhpc



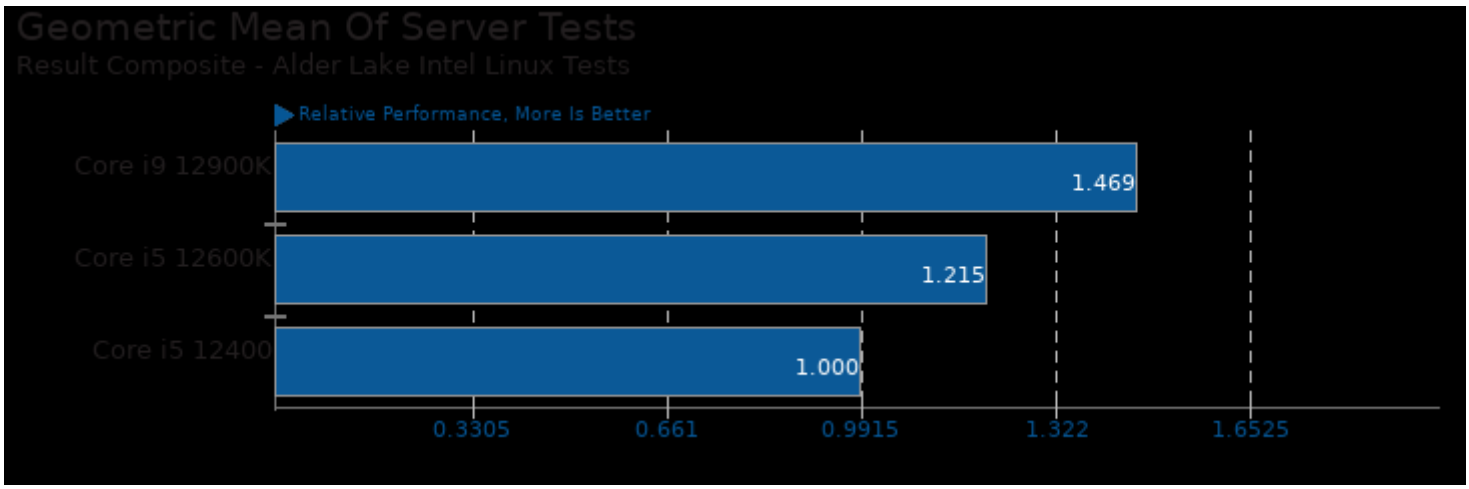
Geometric mean based upon tests: pts/ospray, pts/blender, pts/tungsten, pts/appleseed, pts/v-ray and pts/indigobench



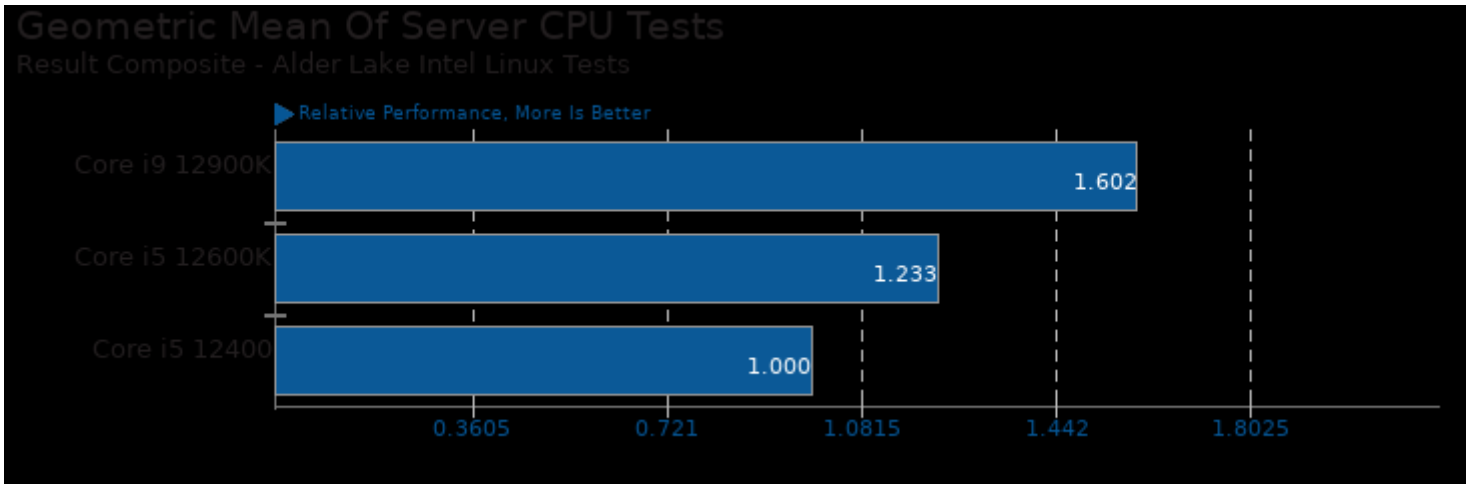
Geometric mean based upon tests: pts/rav1e and pts/build-wasmer



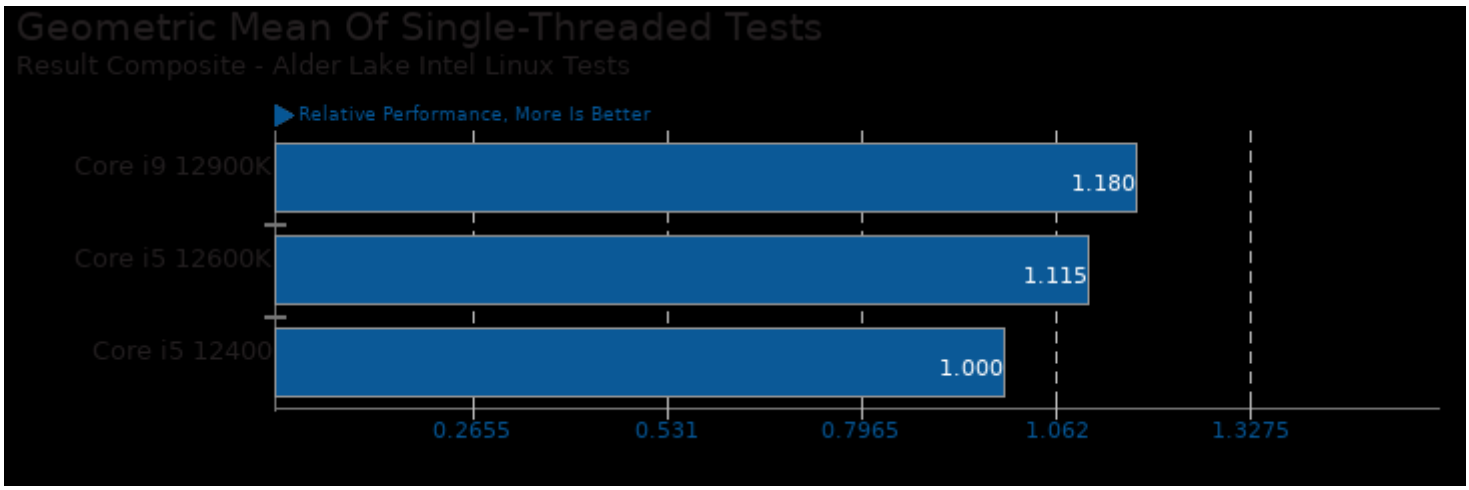
Geometric mean based upon tests: system/octave-benchmark and pts/lammps



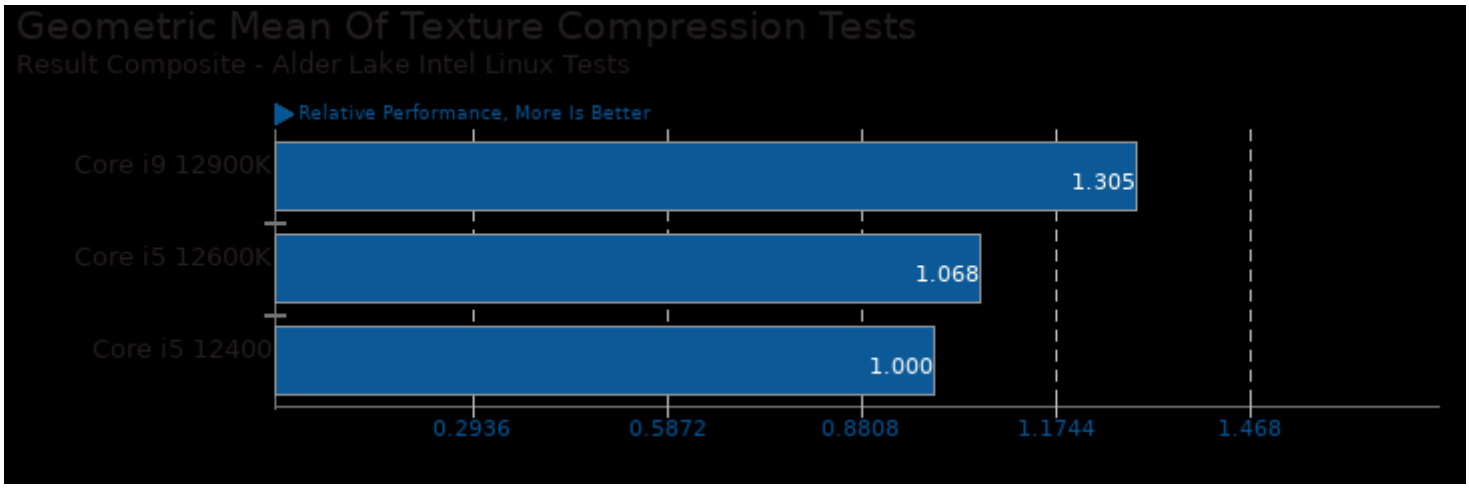
Geometric mean based upon tests: pts/phpbench, pts/openssl, pts/simdjson and pts/node-web-tooling



Geometric mean based upon tests: pts/dacapobench, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/compress-7zip, pts/stockfish, pts/build-linux-kernel, pts/build-llvm, pts/compress-zstd, pts/openssl, pts/tjbench, system/gimp, pts/blender, pts/appleseed, pts/pybench, pts/cython-bench and pts/phpbench

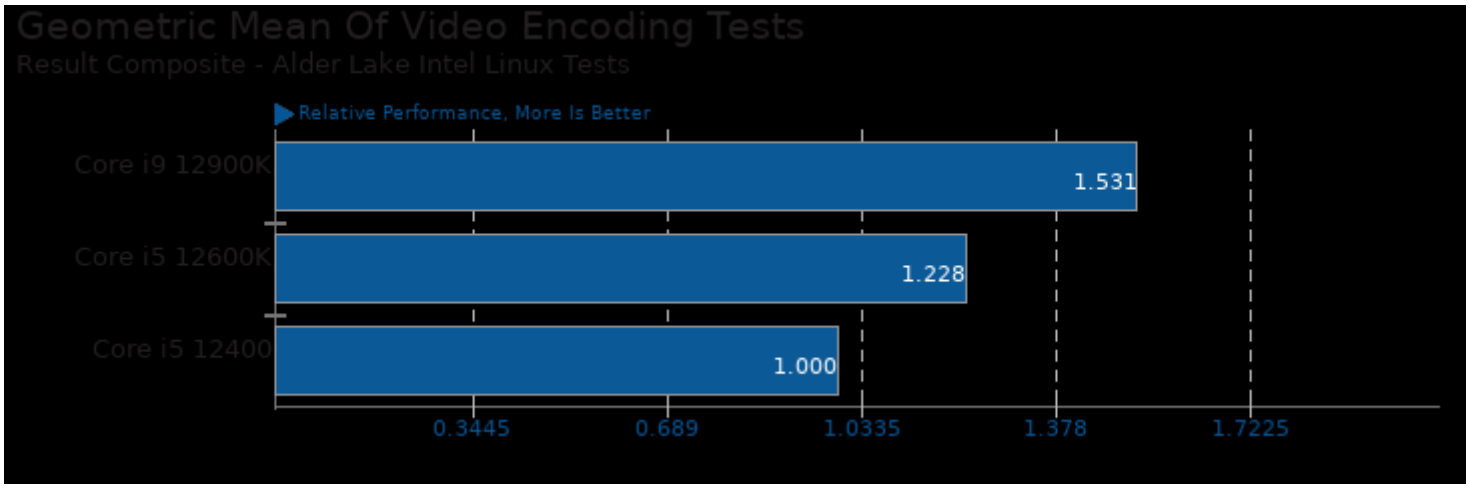


Geometric mean based upon tests: pts/tjbench, pts/pybench and pts/phpbench



Geometric mean based upon tests: pts/astcenc and pts/etcpak

Alder Lake Intel Linux Tests



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/aom-av1, pts/svt-av1, pts/rav1e and pts/avifenc

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 04:20.