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OnLogic Helix 500 Linux benchmarks

OnLogic Helix 500 benchmarks by Michael Larabel.

Automated Executive Summary

OnLogic Helix 500 had the most wins, coming in first place for 76% of the tests.

Based on the geometric mean of all complete results, the fastest (OnLogic Helix 500) was 1.171x the speed of the slowest (OnLogic Karbon 700).

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

CLOMP (Static OMP Speedup) at 2.034x
oneDNN (Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU) at 1.885x
ASKAP (Test: tConvolve OpenMP - Gridding) at 1.87x
oneDNN (Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU) at 1.815x
oneDNN (Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU) at 1.807x
HPC Challenge (Test / Class: Random Ring Bandwidth) at 1.799x
OpenFOAM (Input: Motorbike 30M) at 1.762x
ASKAP (Test: Hogbom Clean OpenMP) at 1.76x
Algebraic Multi-Grid Benchmark at 1.748x
NAS Parallel Benchmarks (Test / Class: MG.C) at 1.717x.

Test Systems:

OnLogic Helix 500

Processor: Intel Core i7-10700T @ 4.50GHz (8 Cores / 16 Threads), Motherboard: Logic Supply RXM-181 (Z01-0002A026 BIOS), Chipset: Intel Comet Lake PCH, Memory: 32GB, Disk: 256GB TS256GMTS800, Graphics: Intel UHD 630 3GB (1200MHz), Audio: Realtek ALC233, Monitor: DELL P2415Q, Network: Intel I219-LM + Intel I210

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: modesetting 1.20.9, OpenGL: 4.6 Mesa 20.2.6, Vulkan: 1.2.145, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: MQ-DEADLINE / errors=remount-ro,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xe0 - Thermald 2.3
Java Notes: OpenJDK Runtime Environment (build 11.0.9.1+1-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 3.8.6
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

OnLogic Karbon 700

Processor: Intel Xeon E-2278GEL @ 3.90GHz (8 Cores / 16 Threads), Motherboard: Logic Supply RXM-181 (Z01-0001A027 BIOS), Chipset: Intel Cannon Lake PCH, Memory: 16GB, Disk: 512GB TS512GMTE510T, Graphics: Intel UHD P630 3GB (1150MHz), Audio: Realtek ALC233, Monitor: DELL P2415Q, Network: Intel I219-LM + 2 x Intel I210

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.9, Display Driver: intel, OpenGL: 4.6 Mesa 20.2.6, Vulkan: 1.2.145, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xde - Thermald 2.3
Java Notes: OpenJDK Runtime Environment (build 11.0.9.1+1-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 3.8.6
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Mitigation of TSX disabled + tsx_async_abort: Mitigation of TSX disabled

	OnLogic Helix 500	OnLogic Karbon 700

OnLogic Helix 500 Linux benchmarks

WebP2 Image Encode - Q.1.C.E.5 (sec)	**20.392**	**21.395**
Normalized	100%	95.31%
Standard Deviation	4%	3%
ASKAP - tConvolve MPI - Degridding (Mpix/sec)	**1679**	**1288**
Normalized	100%	76.72%
Standard Deviation	2.4%	0.3%
ASKAP - tConvolve MPI - Gridding (Mpix/sec)	**1834**	**1168**
Normalized	100%	63.69%
Standard Deviation	2.6%	0.3%
ASKAP - tConvolve OpenMP - Gridding (Million Grid Points/sec)	**1272**	**680.389**
Normalized	100%	53.47%
Standard Deviation	0.5%	0.4%
ASKAP - H.C.O (Iterations/sec)	**184.389**	**104.786**
Normalized	100%	56.83%
Standard Deviation	0.1%	0.4%
NAS Parallel Benchmarks - FT.C (Mop/s)	**11017**	**7383**
Normalized	100%	67.02%
Standard Deviation	1.6%	0.2%
NAS Parallel Benchmarks - LU.C (Mop/s)	**21135**	**15484**
Normalized	100%	73.26%
Standard Deviation	2.1%	0.2%
NAS Parallel Benchmarks - MG.C (Mop/s)	**9748**	**5678**
Normalized	100%	58.25%
Standard Deviation	0.7%	0.4%
NAS Parallel Benchmarks - CG.C (Mop/s)	**4511**	**2903**
Normalized	100%	64.36%
Standard Deviation	1%	0.1%
lzbench - Zstd 1 - Compression (MB/s)	**459**	**453**
Normalized	100%	98.69%
lzbench - Zstd 1 - Decompression (MB/s)	**1563**	**1611**
Normalized	97.02%	100%
Standard Deviation		0.1%
lzbench - Zstd 8 - Compression (MB/s)	**80**	**81**
Normalized	98.77%	100%
lzbench - Zstd 8 - Decompression (MB/s)	**1683**	**1738**
Normalized	96.84%	100%
Standard Deviation	0.5%	0.5%
lzbench - Brotli 0 - Compression (MB/s)	**421**	**420**
Normalized	100%	99.76%
Standard Deviation		0.2%
lzbench - Brotli 0 - Decompression (MB/s)	**576**	**562**
Normalized	100%	97.57%
Standard Deviation	0.1%	
lzbench - Crush 0 - Decompression (MB/s)	**456**	**450**
Normalized	100%	98.68%
FinanceBench - Bonds OpenMP (ms)	**78160**	**70482**
Normalized	90.18%	100%
Standard Deviation	1.7%	2.1%
FinanceBench - Repo OpenMP (ms)	**55140**	**49773**
Normalized	90.27%	100%
Standard Deviation	1.9%	0.6%
GnuPG - 2.7.S.F.E (sec)	**73.925**	**72.714**
Normalized	98.36%	100%
Standard Deviation	2.2%	1.6%

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Cpuminer-Opt - T.S.2.O (kH/s)	**63503**	**61289**
Normalized	100%	96.51%
Standard Deviation	0.8%	10.4%
QuantLib (MFLOPS)	**2089**	**2182**
Normalized	95.76%	100%
Standard Deviation	2.4%	1.4%
Etcpak - ETC1 (Mpx/s)	**285.568**	**298.346**
Normalized	95.72%	100%
Standard Deviation	0.3%	0.4%
Etcpak - ETC1 + Dithering (Mpx/s)	**266.700**	**280.579**
Normalized	95.05%	100%
Standard Deviation	0.7%	0.1%
Etcpak - ETC2 (Mpx/s)	**158.318**	**165.029**
Normalized	95.93%	100%
Standard Deviation	0.2%	0.2%
Etcpak - DXT1 (Mpx/s)	**1146**	**1211**
Normalized	94.6%	100%
Standard Deviation	0.3%	0.1%
ONNX Runtime - yolov4 - OpenMP CPU	**272**	**263**
Normalized	100%	96.69%
Standard Deviation	0.7%	0.7%
ONNX Runtime - fcn-resnet101-11 - OpenMP CPU (Inferences/min)	**43**	**45**
Normalized	95.56%	100%
Standard Deviation	1.3%	0.6%
ONNX Runtime - shufflenet-v2-10 - OpenMP CPU (Inferences/min)	**12412**	**14173**
Normalized	87.57%	100%
Standard Deviation	1.1%	0.6%
ONNX Runtime - super-resolution-10 - OpenMP CPU (Inferences/min)	**2839**	**3293**
Normalized	86.21%	100%
Standard Deviation	1.6%	0.3%
ONNX Runtime - bertsquad-10 - OpenMP CPU (Inferences/min)	**382**	**400**
Normalized	95.5%	100%
Standard Deviation	1.1%	0.5%
Google SynthMark - VoiceMark_100 (Voices)	**590.243**	**616.100**
Normalized	95.8%	100%
Standard Deviation	0%	0.2%
rav1e - 10 (FPS)	**3.189**	**3.164**
Normalized	100%	99.22%
Standard Deviation	0.8%	0.4%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	**5.421**	**4.896**
Normalized	100%	90.32%
Standard Deviation	3.3%	4.4%
Algebraic Multi-Grid Benchmark (Figure Of Merit)	**213962927**	**122416800**
Normalized	100%	57.21%
Standard Deviation	2.4%	0%
OpenFOAM - Motorbike 30M (sec)	**263.49**	**464.34**
Normalized	100%	56.75%
Standard Deviation	0.5%	0.2%
dav1d - S.N.1 (FPS)	**496.82**	**438.06**

Normalized	100%	88.17%
Standard Deviation	0.9%	0.1%
dav1d - Summer Nature 4K (FPS)	**128.88**	**102.30**
Normalized	100%	79.38%
Standard Deviation	2.4%	0.4%
dav1d - Chimera 1080p (FPS)	**553.32**	**456.52**
Normalized	100%	82.51%
Standard Deviation	2.4%	0.2%
VKMark - 1920 x 1080 (VKMark Score)	**833**	**513**
Normalized	100%	61.58%
Standard Deviation	0.4%	0.4%
GLmark2 - 1920 x 1080 (Score)	**849**	**525**
Normalized	100%	61.84%
oneDNN - C.B.S.A - f32 - CPU (ms)	**17.6683**	**31.9318**
Normalized	100%	55.33%
Standard Deviation	0.3%	0.2%
oneDNN - IP Shapes 3D - f32 - CPU (ms)	**8.81906**	**16.6276**
Normalized	100%	53.04%
Standard Deviation	1.5%	0.6%
oneDNN - M.M.B.S.T - f32 - CPU (ms)	**3.79616**	**6.88996**
Normalized	100%	55.1%
Standard Deviation	1%	0.7%
CLOMP - Static OMP Speedup (Speedup)	**5.9**	**2.9**
Normalized	100%	49.15%
Standard Deviation	4%	3%
NCNN - CPU - mobilenet (ms)	**25.95**	**27.52**
Normalized	100%	94.3%
Standard Deviation	1.2%	0.1%
NCNN - CPU-v2-v2 - mobilenet-v2 (ms)	**6.47**	**7.79**
Normalized	100%	83.06%
Standard Deviation	2.5%	0.9%
NCNN - CPU - efficientnet-b0 (ms)	**9.41**	**10.06**
Normalized	100%	93.54%
Standard Deviation	3.1%	0.6%
NCNN - CPU - googlenet (ms)	**19.18**	**22.06**
Normalized	100%	86.94%
Standard Deviation	0.1%	2.5%
NCNN - CPU - vgg16 (ms)	**68.42**	**116.92**
Normalized	100%	58.52%
Standard Deviation	0.1%	0.2%
NCNN - CPU - resnet18 (ms)	**18.17**	**24.18**
Normalized	100%	75.14%
Standard Deviation	0.2%	0.2%
NCNN - CPU - alexnet (ms)	**15.31**	**21.08**
Normalized	100%	72.63%
Standard Deviation	0.8%	0.4%
NCNN - CPU - resnet50 (ms)	**36.39**	**43.37**
Normalized	100%	83.91%
Standard Deviation	0.9%	0.3%
NCNN - CPU - yolov4-tiny (ms)	**35.02**	**40.74**
Normalized	100%	85.96%
Standard Deviation	1.9%	0.2%
NCNN - CPU - squeezenet_ssd (ms)	**26.80**	**28.56**
Normalized	100%	93.84%
Standard Deviation	0.7%	0.1%

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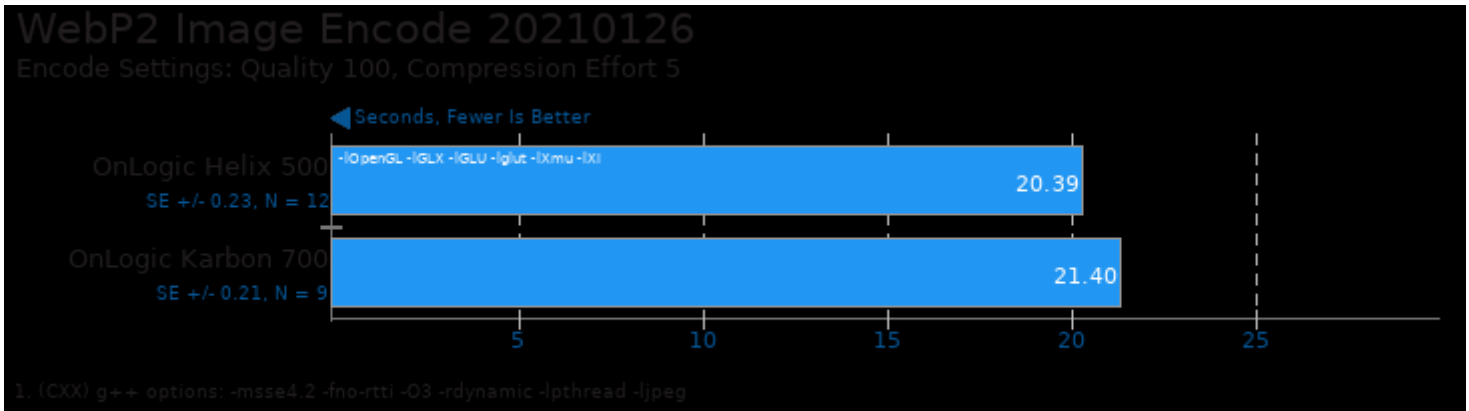
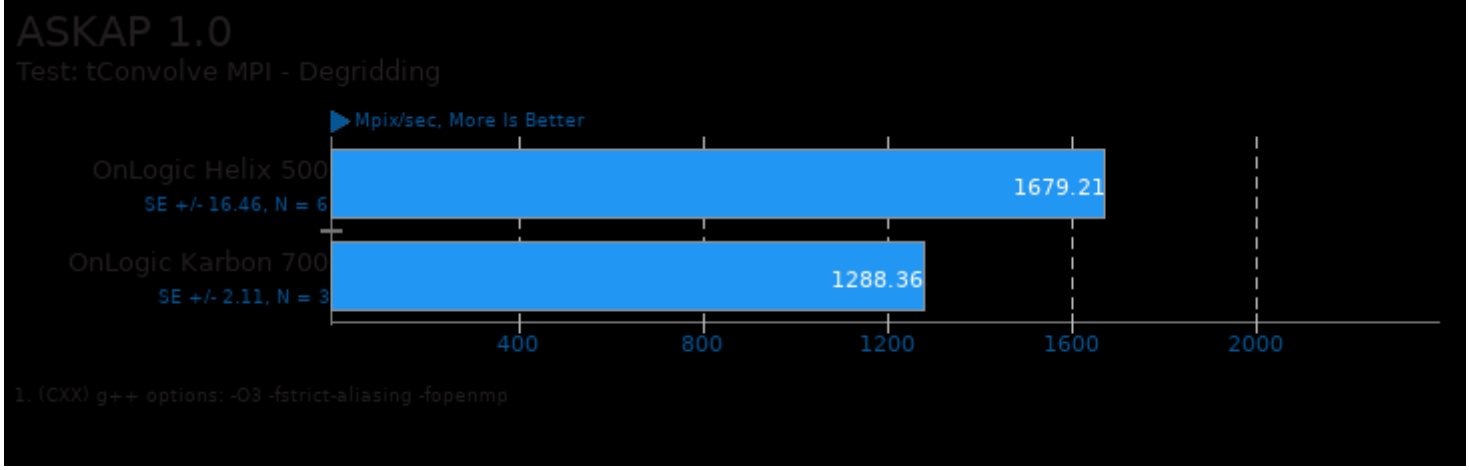
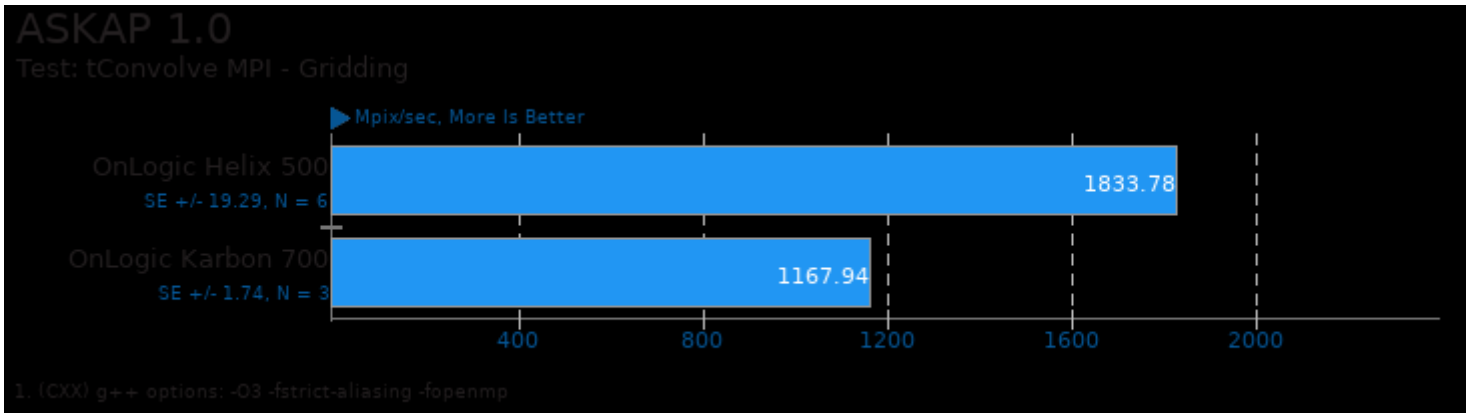
TNN - CPU - MobileNet v2 (ms)	**366.518**	**368.053**
Normalized	100%	99.58%
Standard Deviation	0.2%	0.2%
simdjson - PartialTweets (GB/s)	**0.65**	**0.6**
Normalized	100%	92.31%
Standard Deviation	0%	0%
simdjson - LargeRand (GB/s)	**0.38**	**0.37**
Normalized	100%	97.37%
Standard Deviation	0%	0%
simdjson - Kostya (GB/s)	**0.59**	**0.48**
Normalized	100%	81.36%
Standard Deviation	0%	0%
simdjson - DistinctUserID (GB/s)	**0.67**	**0.61**
Normalized	100%	91.04%
Standard Deviation	0%	0%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**63.361**	**61.284**
Normalized	96.72%	100%
Standard Deviation	0.2%	0.2%
Timed HMMer Search - P.D.S (sec)	**123.573**	**131.315**
Normalized	100%	94.1%
Standard Deviation	0.1%	0%
HPC Challenge - R.R.B (GB/s)	**1.70442**	**0.94729**
Normalized	100%	55.58%
Standard Deviation	1.7%	0.6%
GROMACS - Water Benchmark (Ns/Day)	**0.640**	**0.518**
Normalized	100%	80.94%
Standard Deviation	0.5%	0.8%
Embree - Pathtracer ISPC - Asian Dragon (FPS)	**9.4193**	**8.9213**
Normalized	100%	94.71%
Standard Deviation	2.4%	0.9%
Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)	**8.4878**	**7.9607**
Normalized	100%	93.79%
Standard Deviation	1.8%	0.4%
ASTC Encoder - Fast (sec)	**6.83**	**7.12**
Normalized	100%	95.93%
Standard Deviation	1.6%	0.2%
WebP Image Encode - Q.1.L (Encode Time - sec)	**19.703**	**20.246**
Normalized	100%	97.32%
Standard Deviation	0.1%	0%
WebP Image Encode - Q.1.L.H.C (Encode Time - sec)	**41.117**	**43.409**
Normalized	100%	94.72%
Standard Deviation	0.1%	0.1%
AI Benchmark Alpha - D.I.S (Score)	**751**	**740**
Normalized	100%	98.54%
AI Benchmark Alpha - D.T.S (Score)	**857**	**684**
Normalized	100%	79.81%
AI Benchmark Alpha - Device AI Score (Score)	**1608**	**1424**
Normalized	100%	88.56%
Waifu2x-NCNN Vulkan - 2x - 3 - Yes (sec)	**70.533**	**79.264**
Normalized	100%	88.98%
Standard Deviation	1%	0.3%
Waifu2x-NCNN Vulkan - 2x - 3 - No (sec)	**9.693**	**10.765**
Normalized	100%	90.04%
Standard Deviation	0.1%	0.1%
RealSR-NCNN - 4x - Yes (sec)	**1442**	**1762**

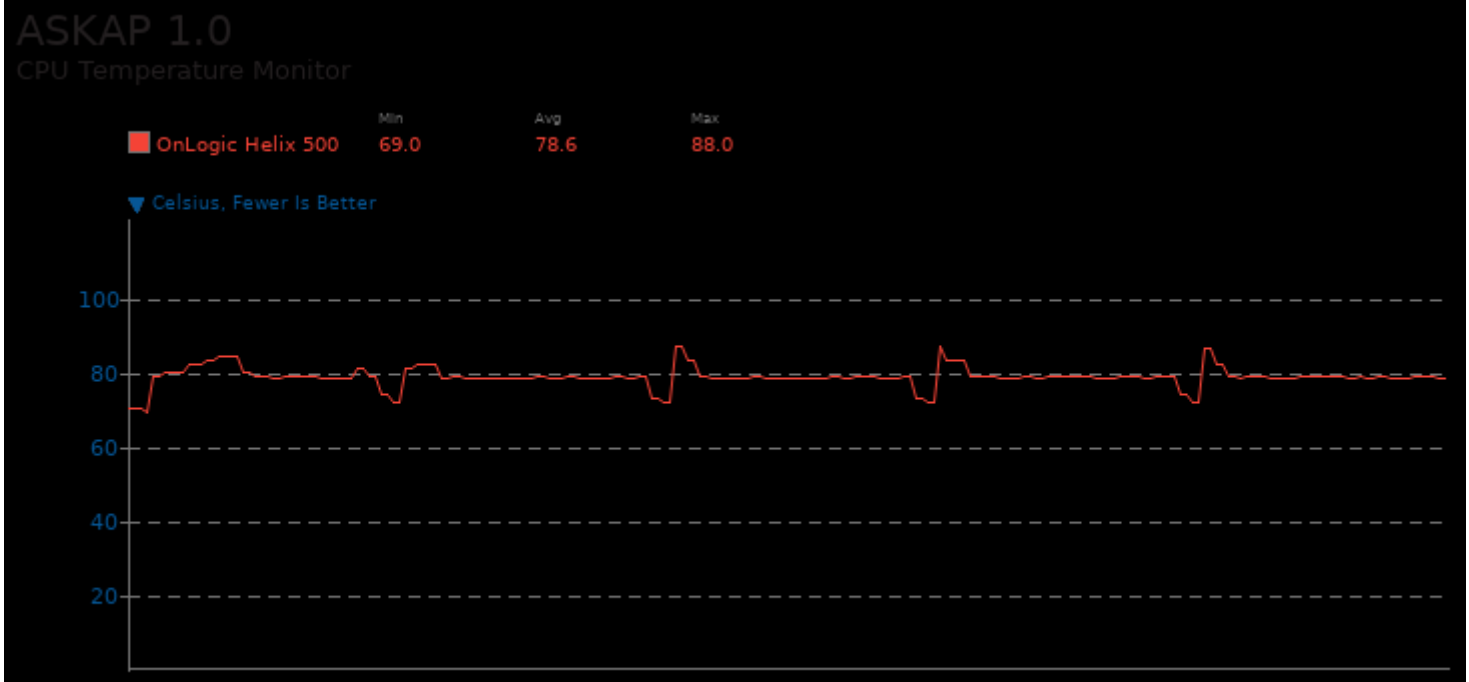
Normalized	100%	81.82%
Standard Deviation	0%	0%
RealSR-NCNN - 4x - No (sec)	**182.998**	**223.166**
Normalized	100%	82%
Standard Deviation	0%	0%
DeepSpeech - CPU (sec)	**78.40240**	**115.72795**
Normalized	100%	67.75%
Standard Deviation	0.9%	0.8%
InfluxDB - 4 - 10000 - 2,5000,1 - 10000 (val/sec)	**1118525**	**1061688**
Normalized	100%	94.92%
Standard Deviation	0.8%	3%
LibRaw - P.P.B (Mpix/sec)	**28.35**	**26.91**
Normalized	100%	94.92%
Standard Deviation	1.8%	0.4%
Unpacking Firefox - firefox-84.0.source.tar.xz (sec)	**20.722**	**21.947**
Normalized	100%	94.42%
Standard Deviation	0.4%	5.1%
LevelDB - Seq Fill (MB/s)	**32.9**	**33.2**
Normalized	99.1%	100%
Standard Deviation	2.2%	6%
LevelDB - Seq Fill (us/Op)	**53.895**	**53.437**
Normalized	99.15%	100%
Standard Deviation	2.2%	6.3%
LevelDB - Rand Fill (MB/s)	**33.6**	**27.6**
Normalized	100%	82.14%
Standard Deviation	2.5%	18.5%
LevelDB - Rand Delete (us/Op)	**53.394**	**48.851**
Normalized	91.49%	100%
Standard Deviation	1.3%	0.9%
LevelDB - Hot Read (us/Op)	**9.381**	**10.365**
Normalized	100%	90.51%
Standard Deviation	5%	4.8%
LevelDB - Seek Rand (us/Op)	**12.591**	**14.420**
Normalized	100%	87.32%
Standard Deviation	4.2%	2.9%

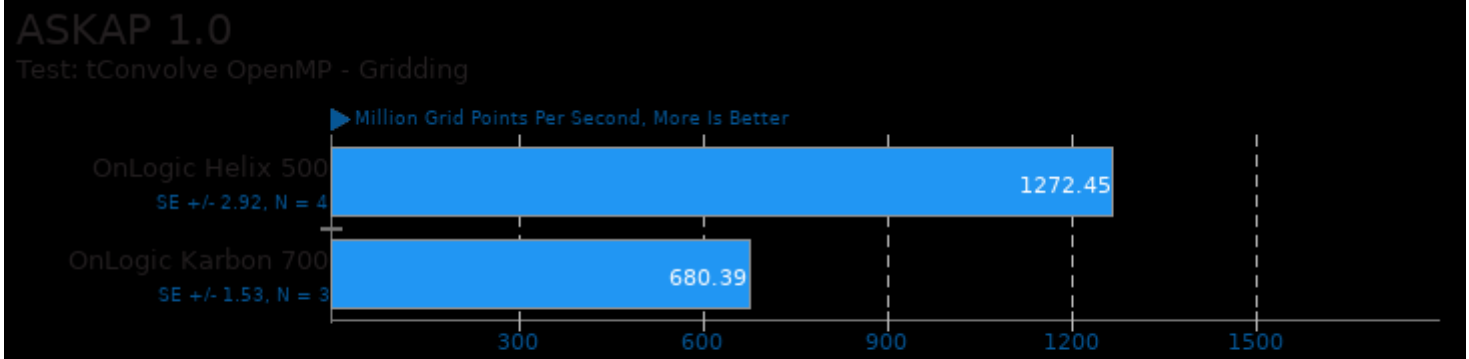
OnLogic Helix 500 Linux benchmarks






ASKAP 1.0
Test: tConvolve MPI - Gridding
Mpix/sec, More Is Better
OnLogic Helix 500
SE +/- 19.29, N = 6
1833.78
OnLogic Karbon 700
SE +/- 1.74, N = 3
1167.94
400
800
1200
1600
2000
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

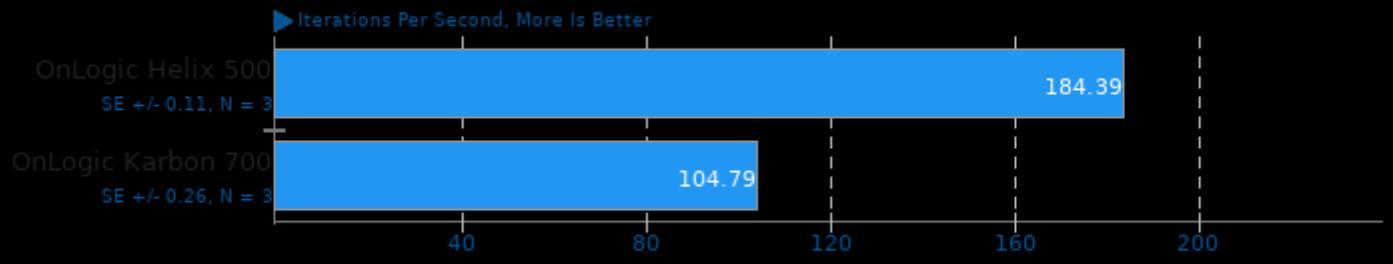

ASKAP 1.0
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
69.0
78.6
88.0
Celsius, Fewer Is Better
100
80
60
40
20


ASKAP 1.0
Test: tConvolve OpenMP - Gridding
Million Grid Points Per Second, More Is Better
OnLogic Helix 500
SE +/- 2.92, N = 4
1272.45
OnLogic Karbon 700
SE +/- 1.53, N = 3
680.39
300
600
900
1200
1500
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

OnLogic Helix 500 Linux benchmarks

ASKAP 1.0

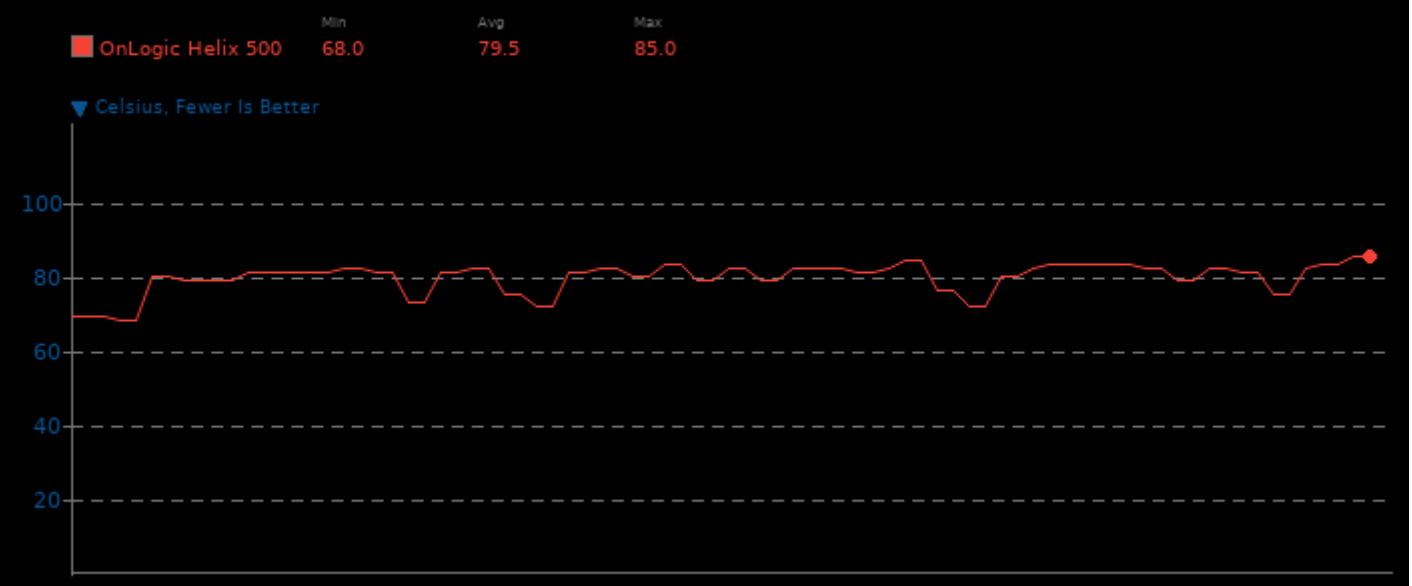
Test: Hogbom Clean OpenMP



1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

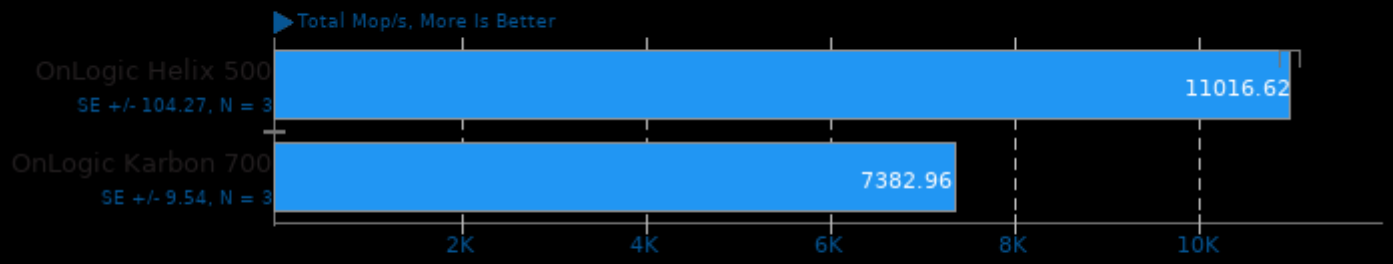
ASKAP 1.0

CPU Temperature Monitor



NAS Parallel Benchmarks 3.4

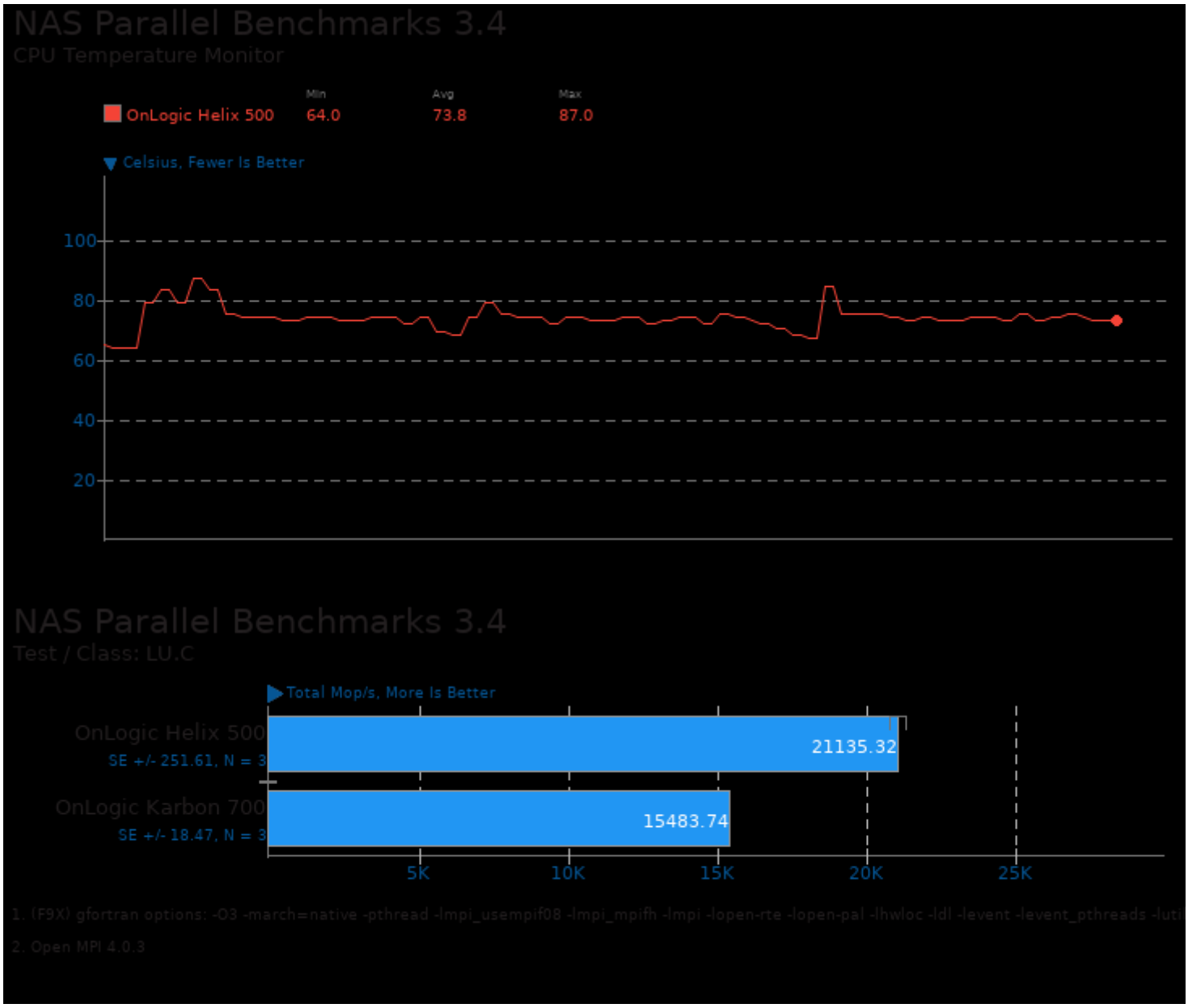
Test / Class: FT.C



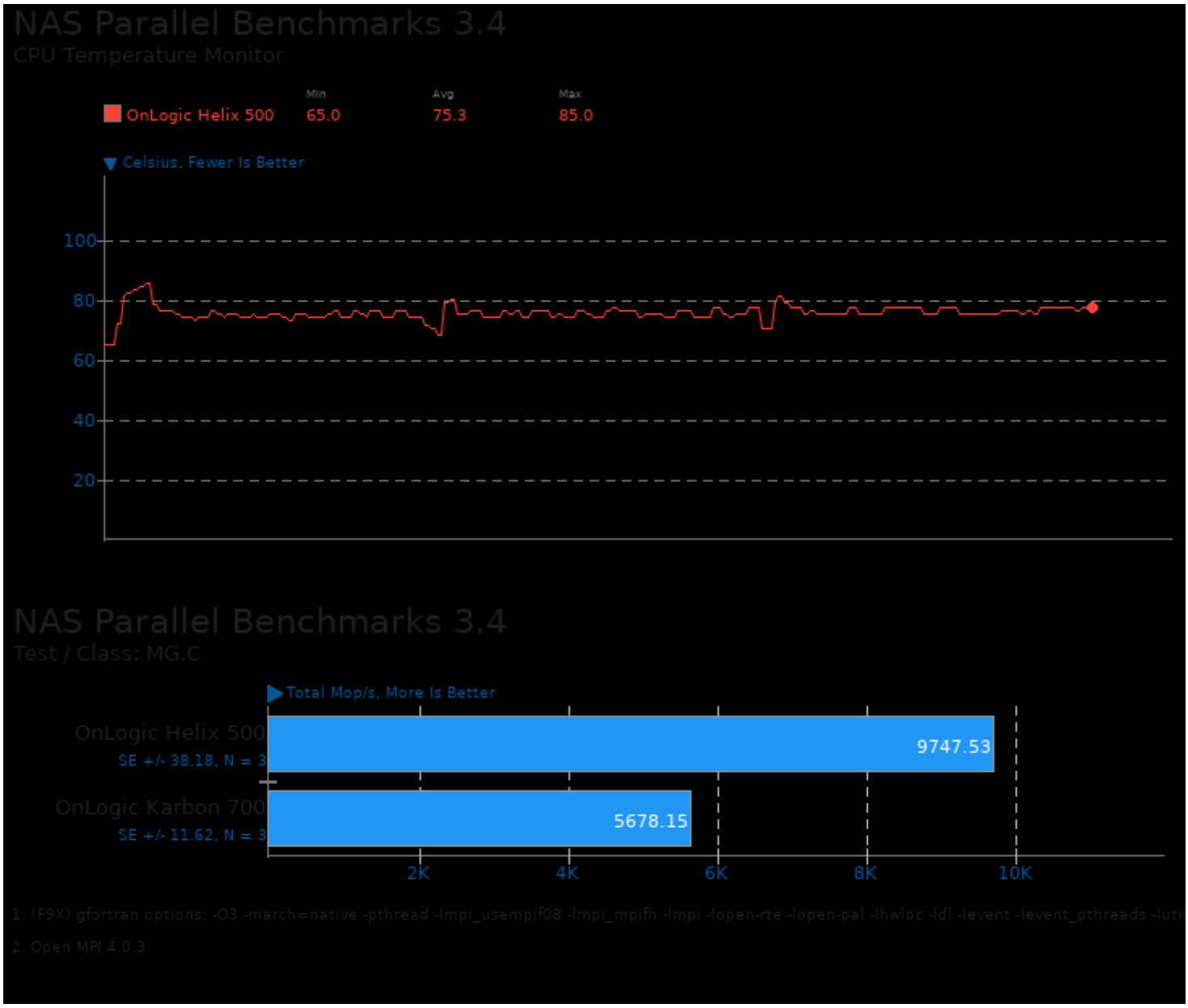
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi -lopen-rte -lopen-pal -lhwloc -ldl -levent -levent_pthreads -lut

2. Open MPI 4.0.3

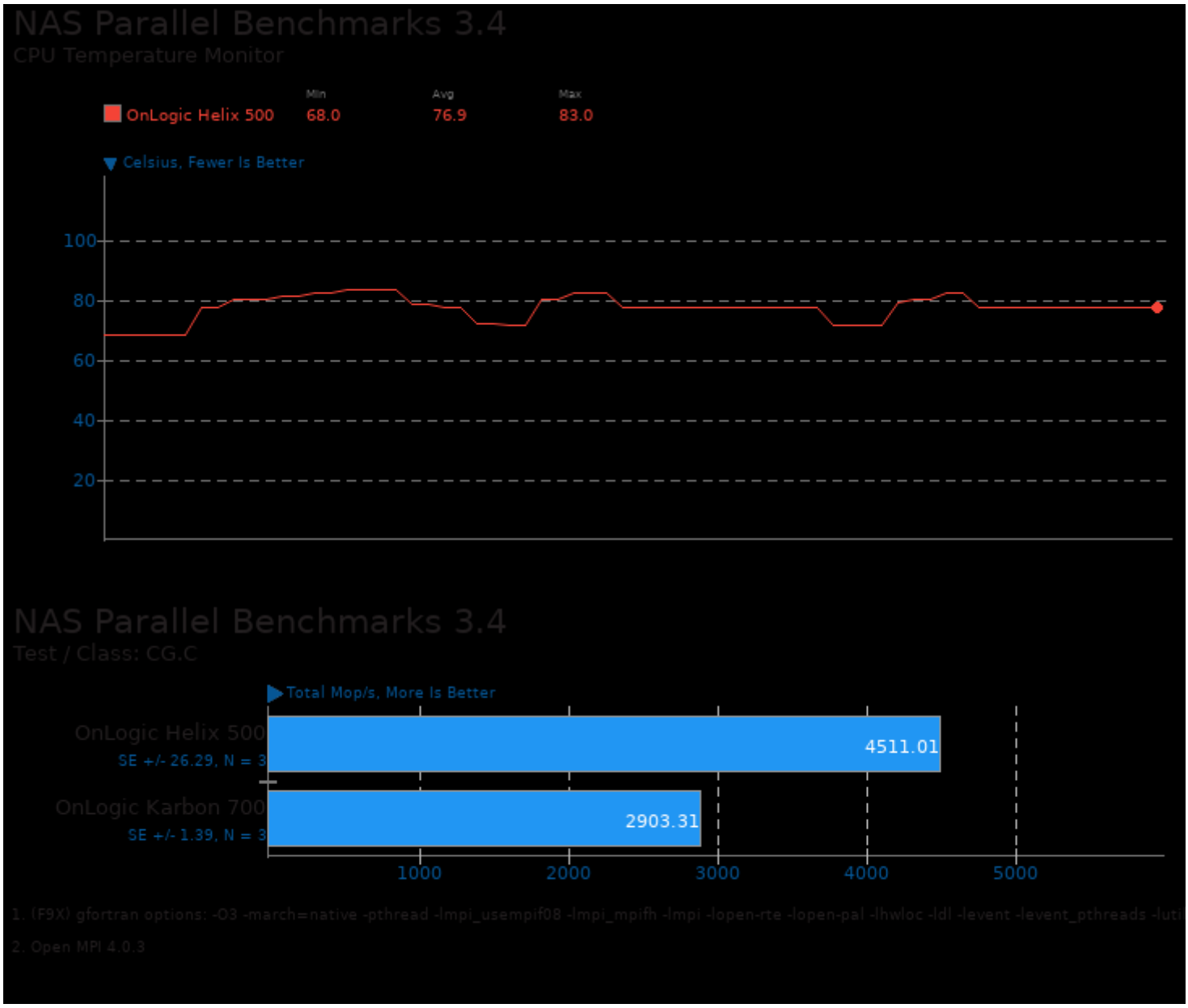
OnLogic Helix 500 Linux benchmarks



OnLogic Helix 500 Linux benchmarks

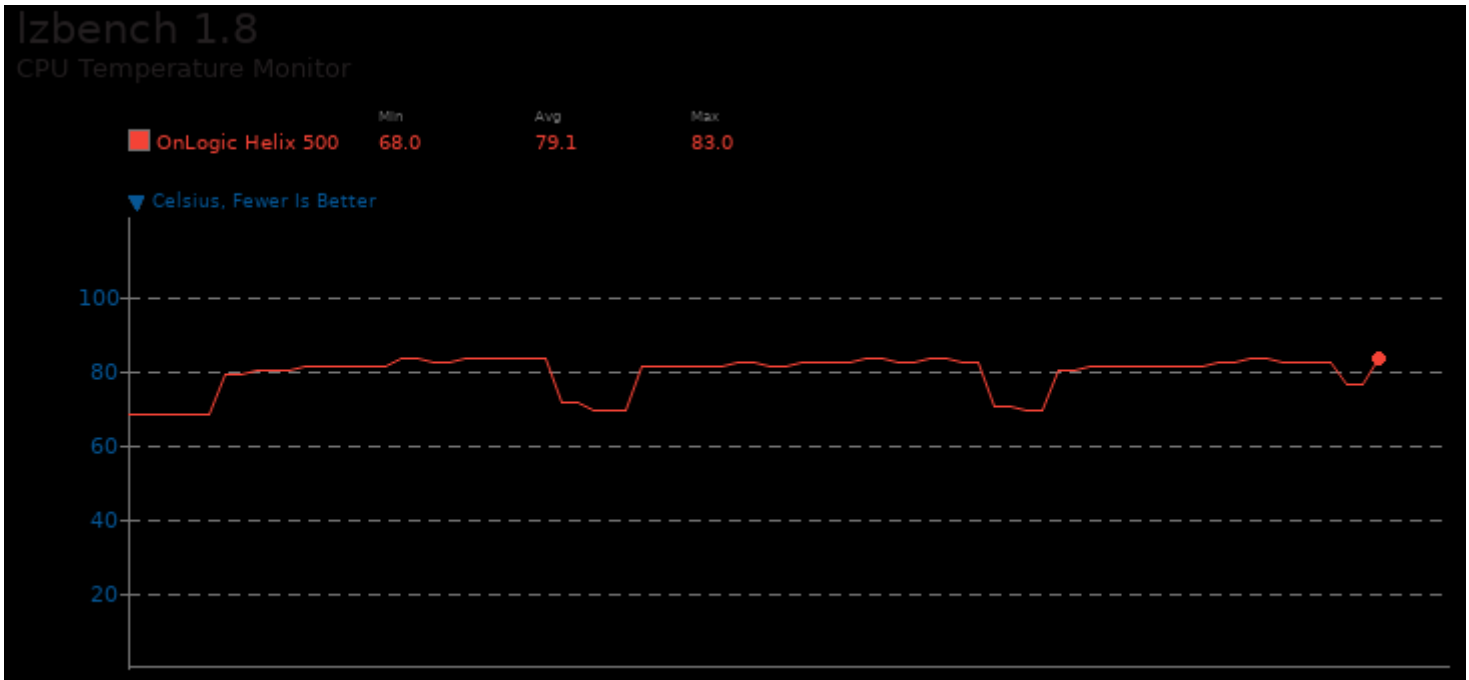


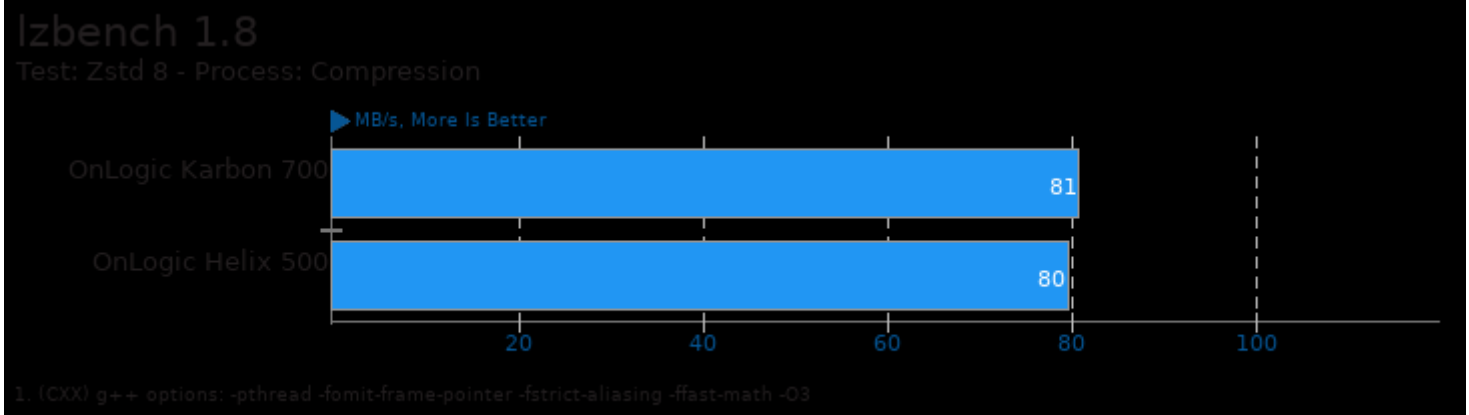
OnLogic Helix 500 Linux benchmarks

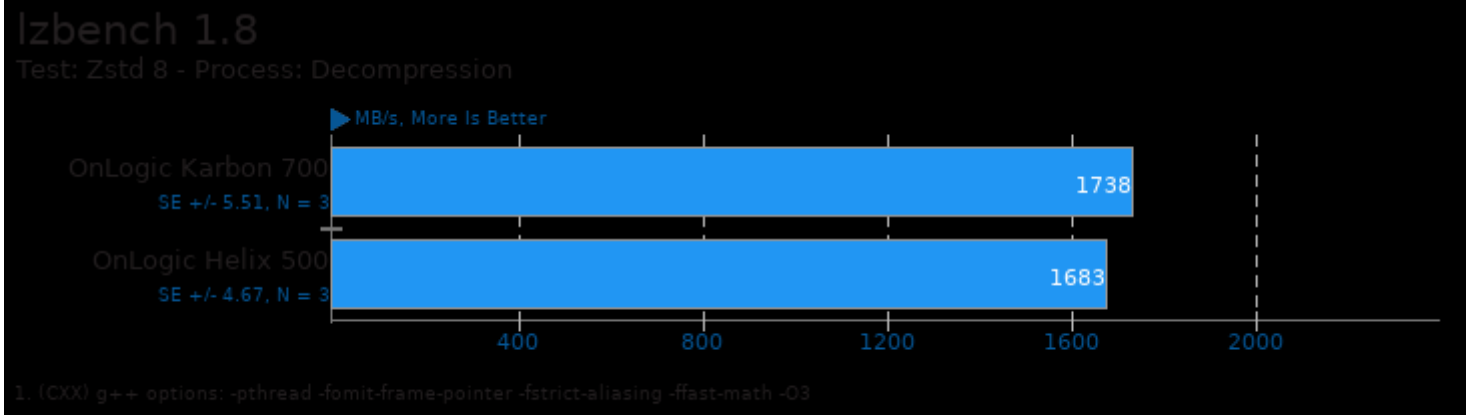


OnLogic Helix 500 Linux benchmarks

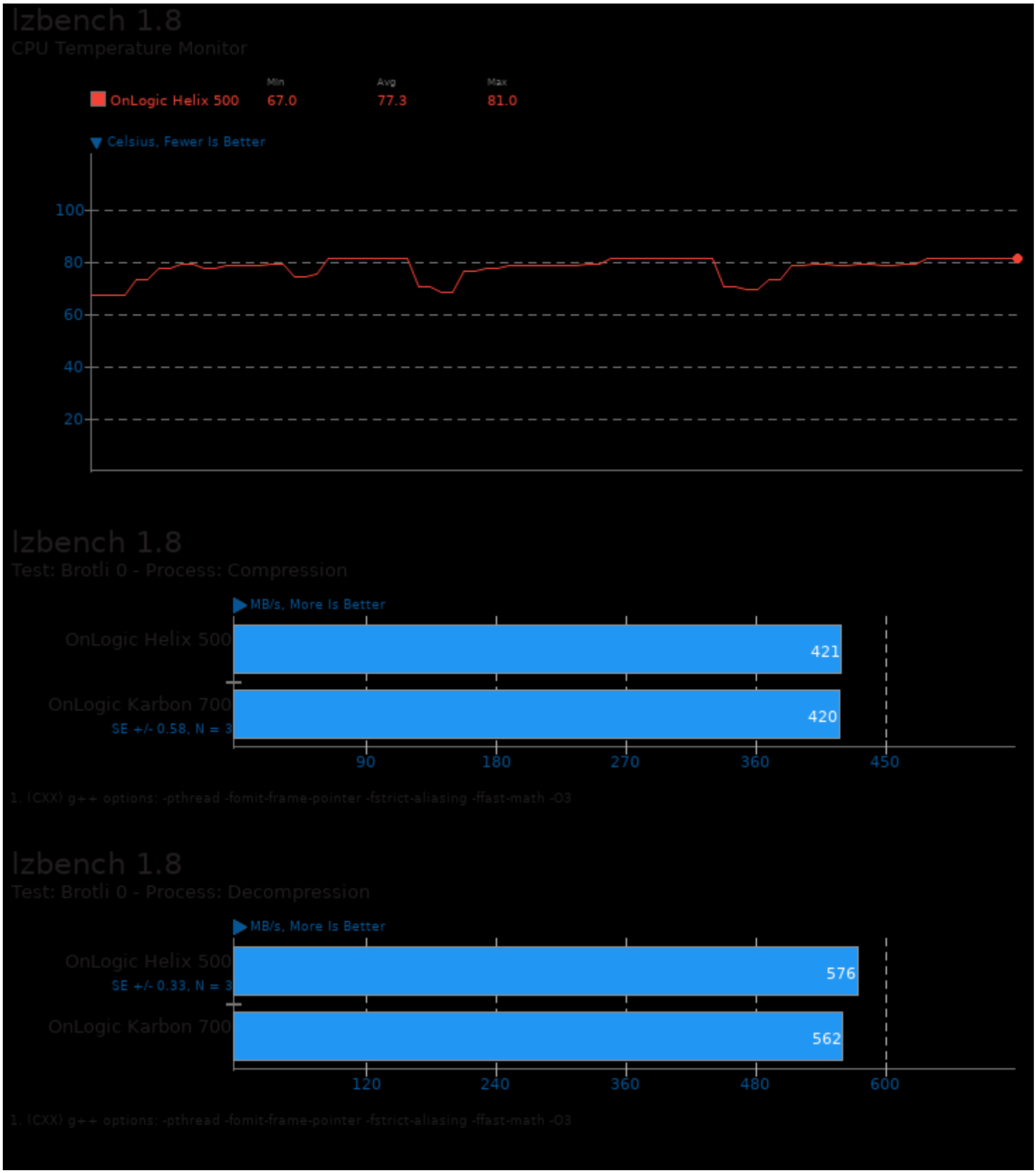
OnLogic Helix 500 Linux benchmarks



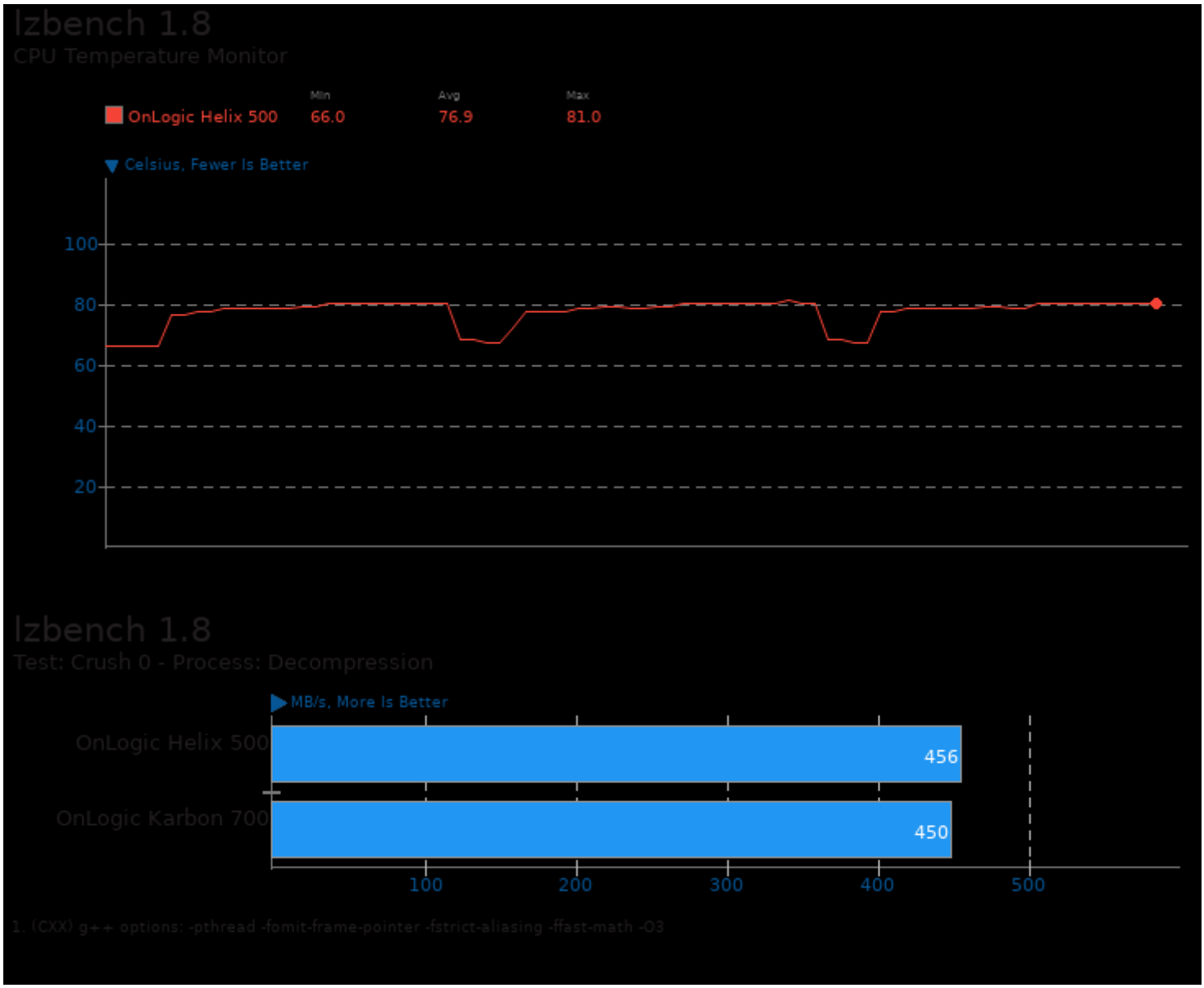




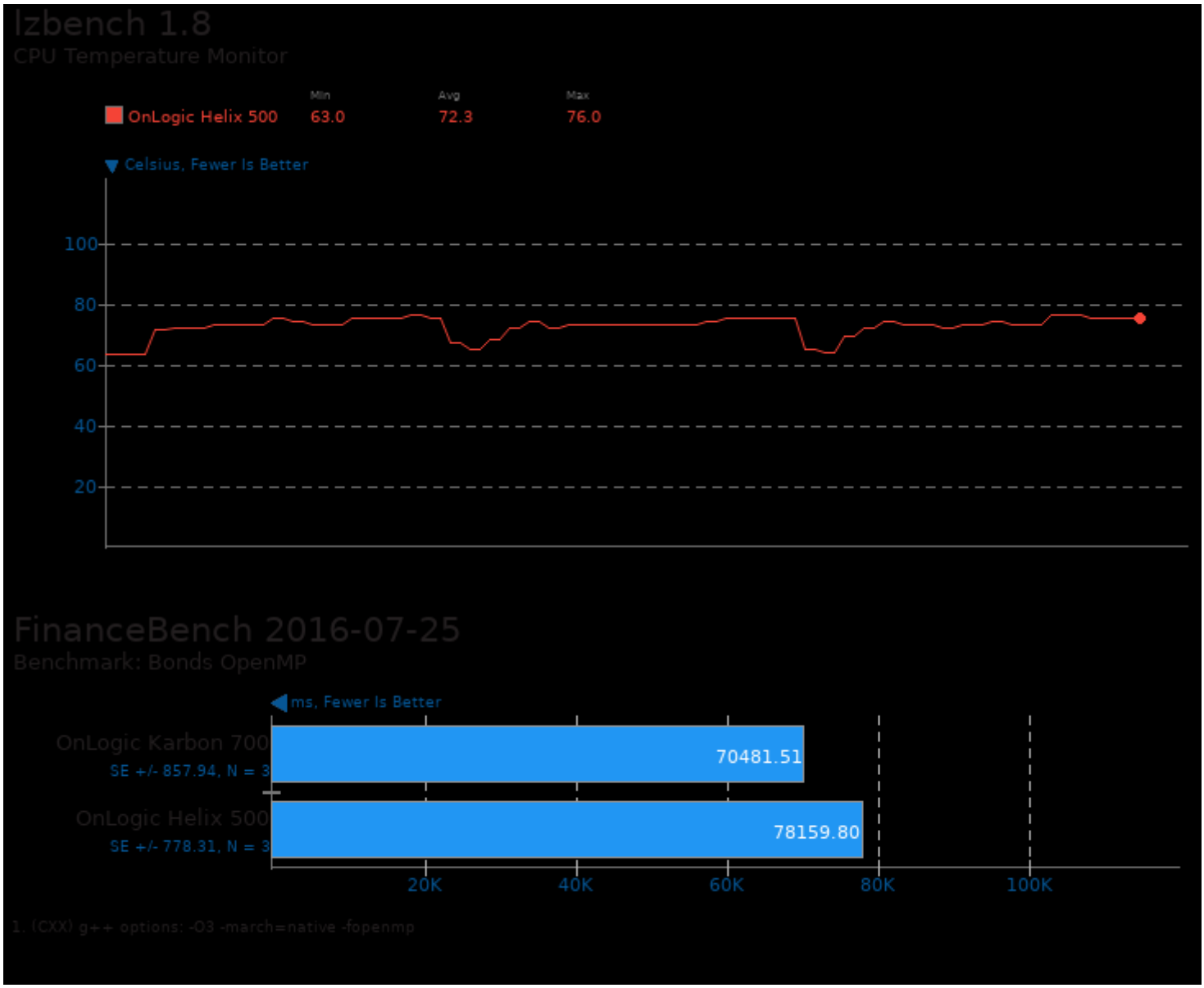
OnLogic Helix 500 Linux benchmarks



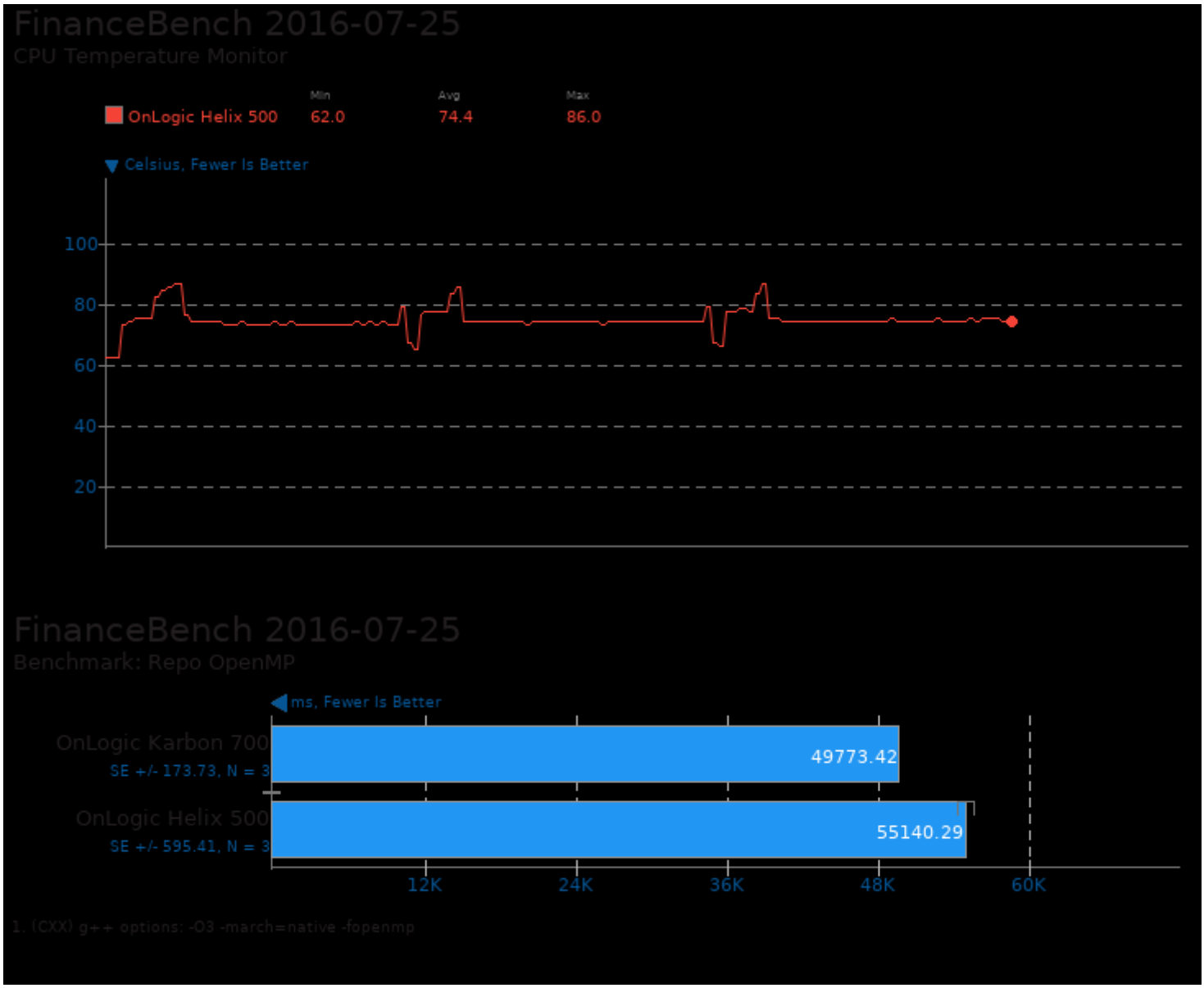
OnLogic Helix 500 Linux benchmarks



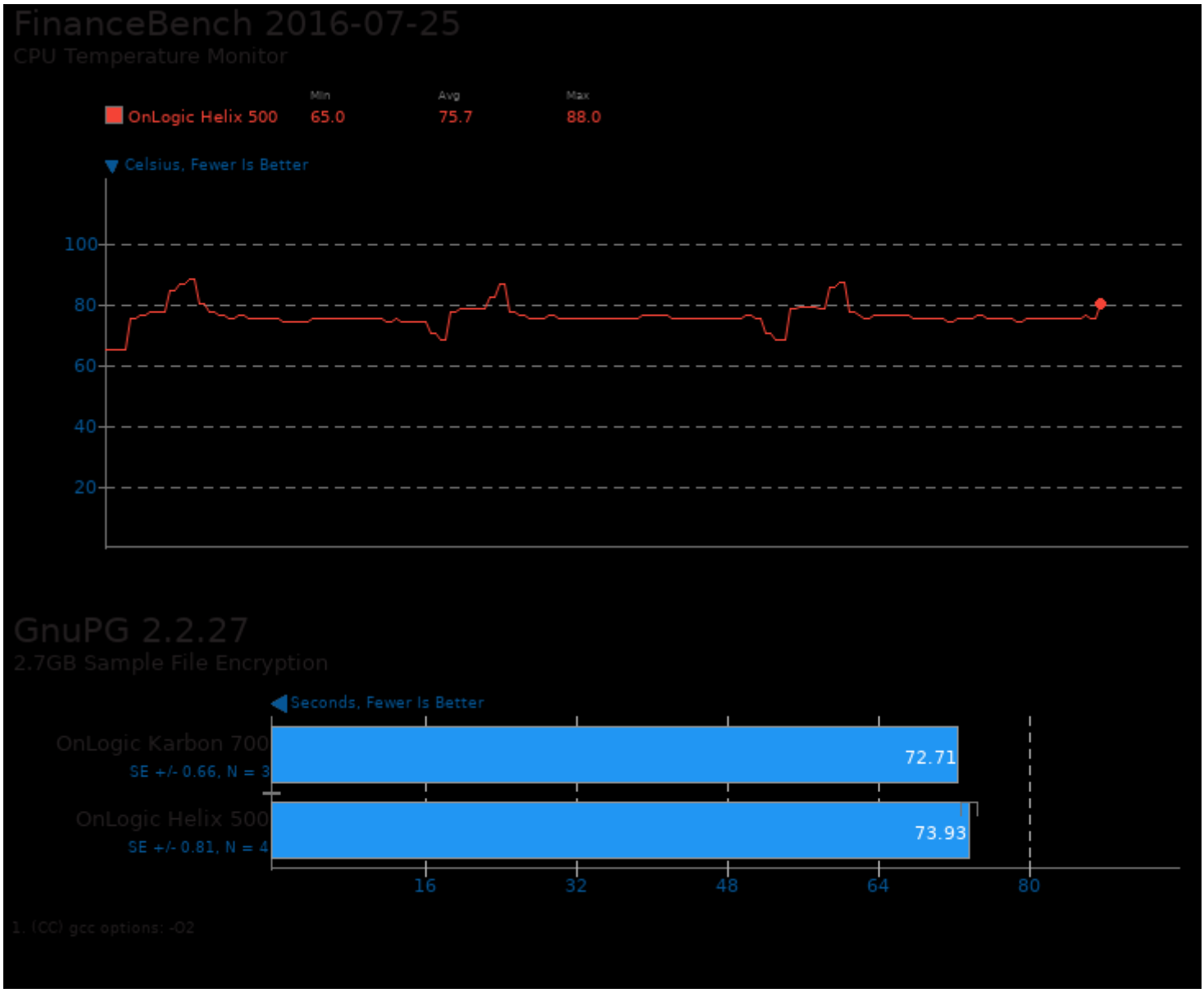
OnLogic Helix 500 Linux benchmarks

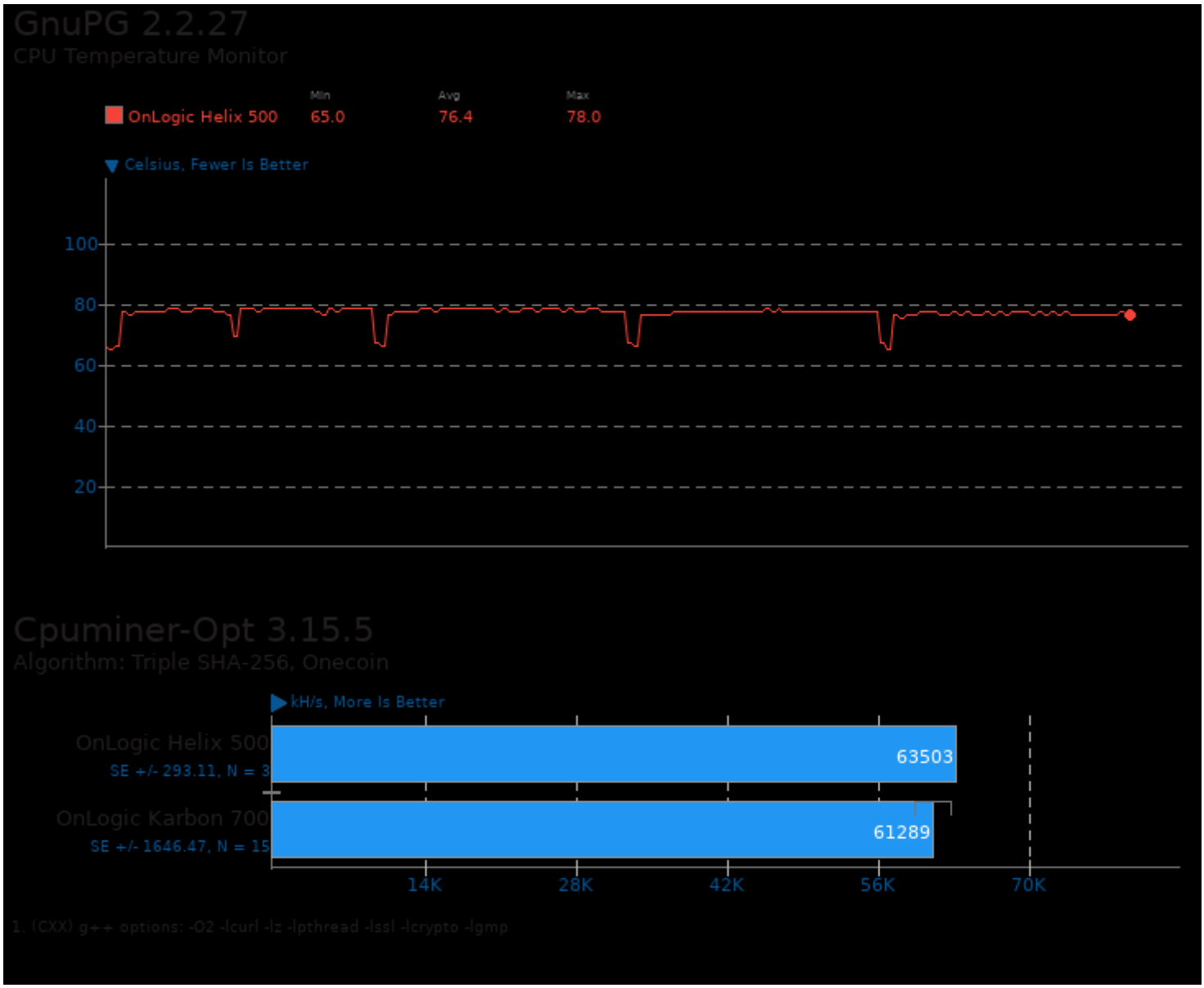


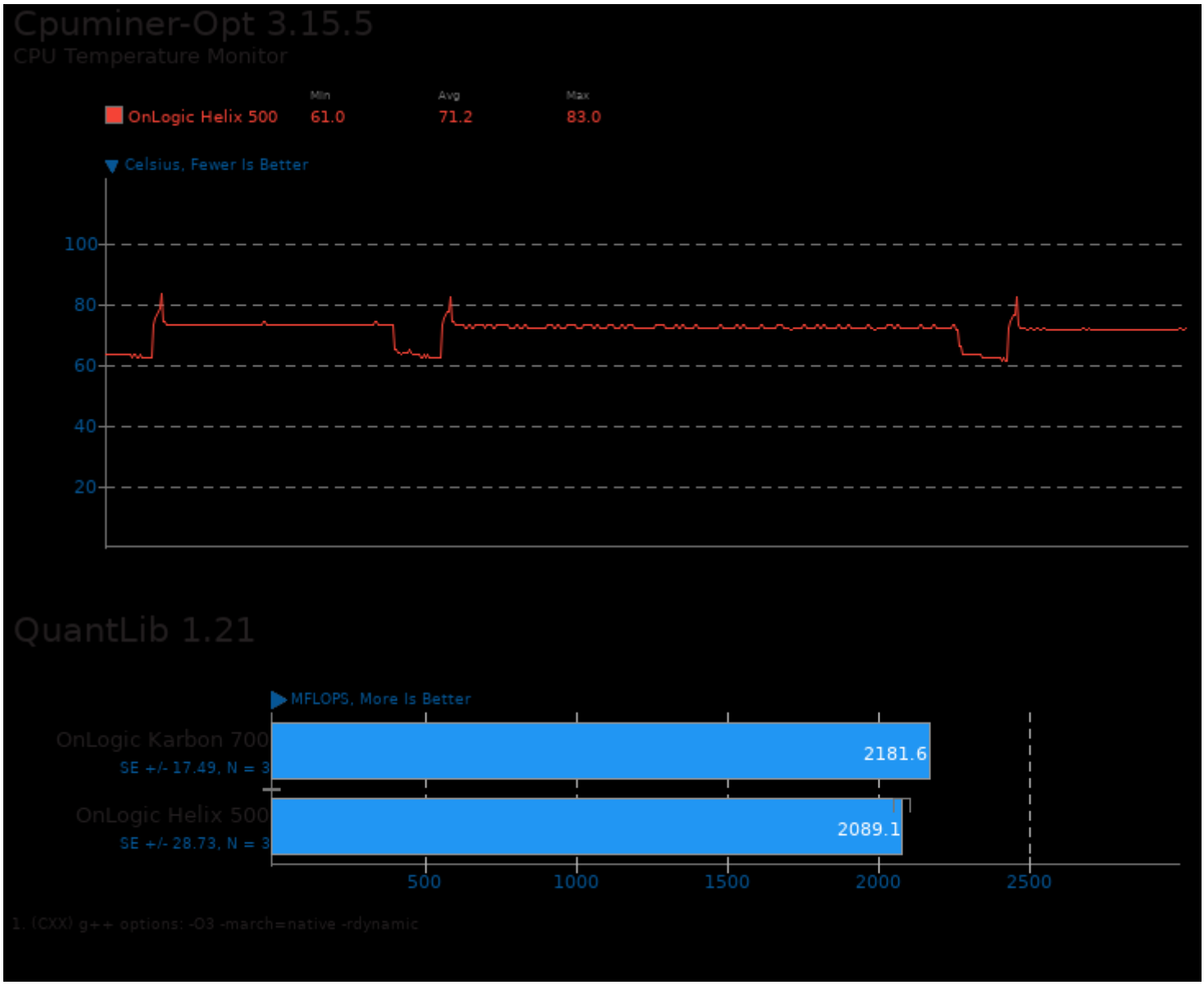
OnLogic Helix 500 Linux benchmarks



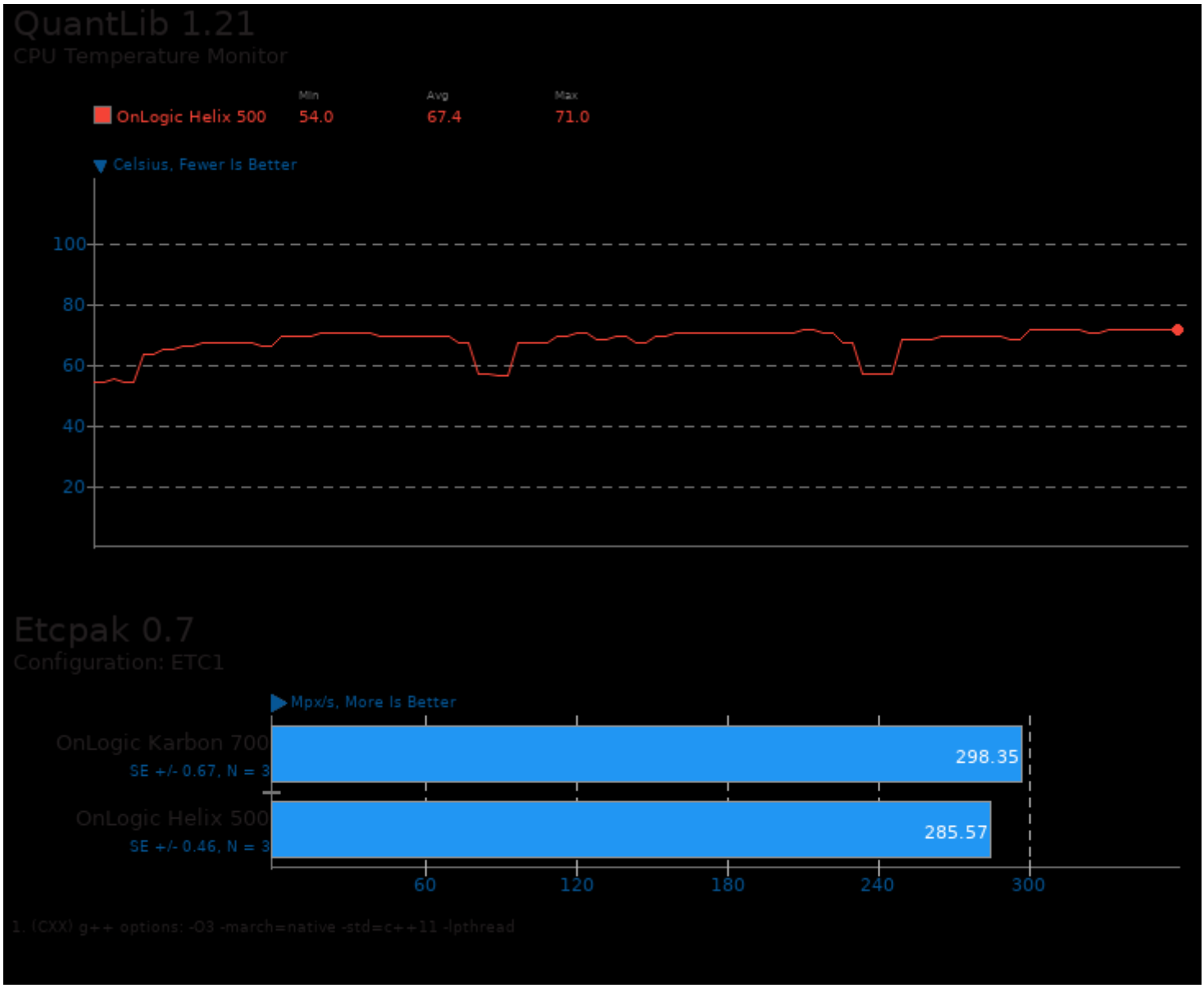
OnLogic Helix 500 Linux benchmarks



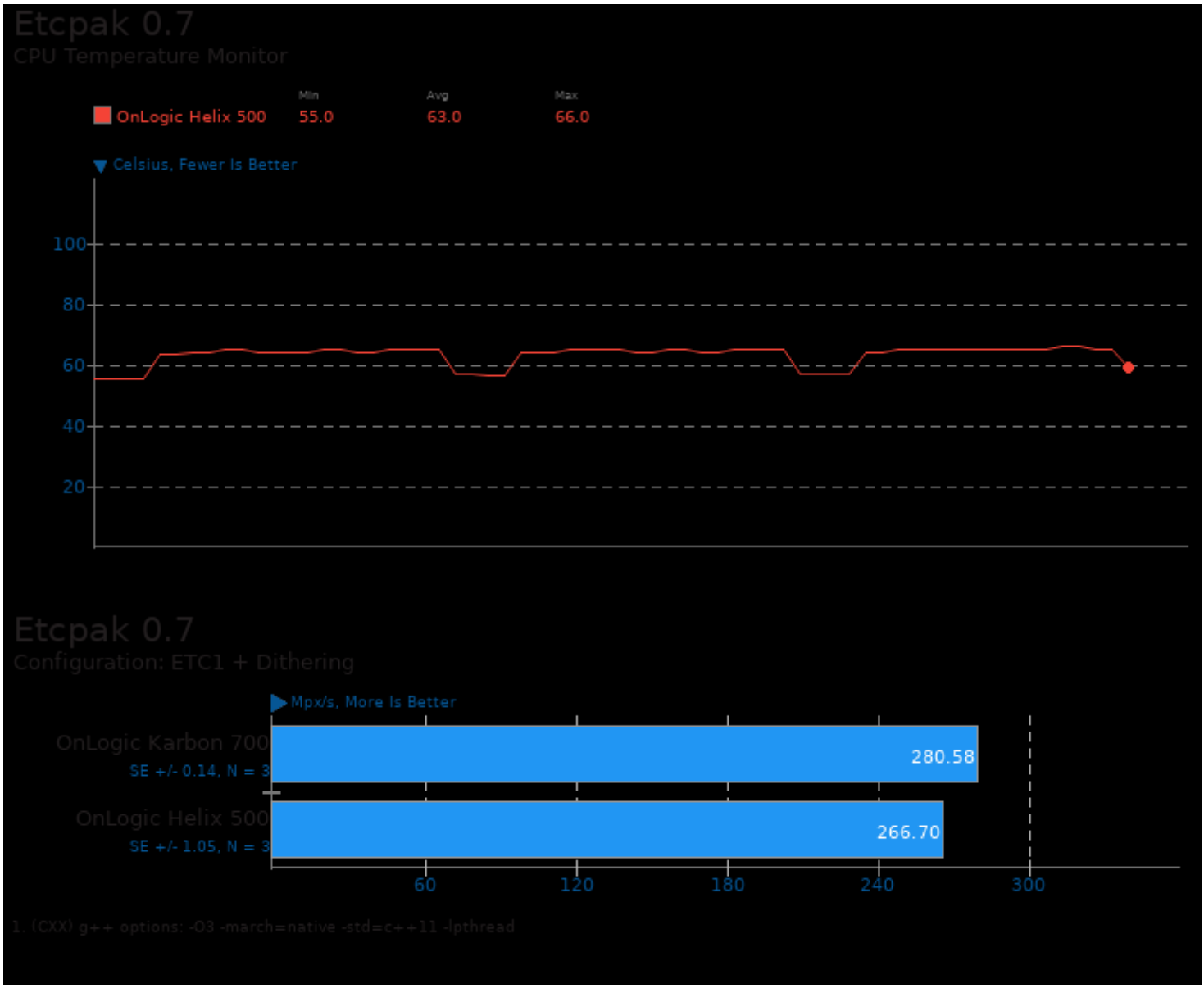

GnuPG 2.2.27
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
65.0
76.4
78.0
Celsius, Fewer Is Better
100
80
60
40
20
Cpuminer-Opt 3.15.5
Algorithm: Triple SHA-256, Onecoin
kH/s, More Is Better
OnLogic Helix 500
SE +/- 293.11, N = 3
63503
OnLogic Karbon 700
SE +/- 1646.47, N = 15
61289
14K
28K
42K
56K
70K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

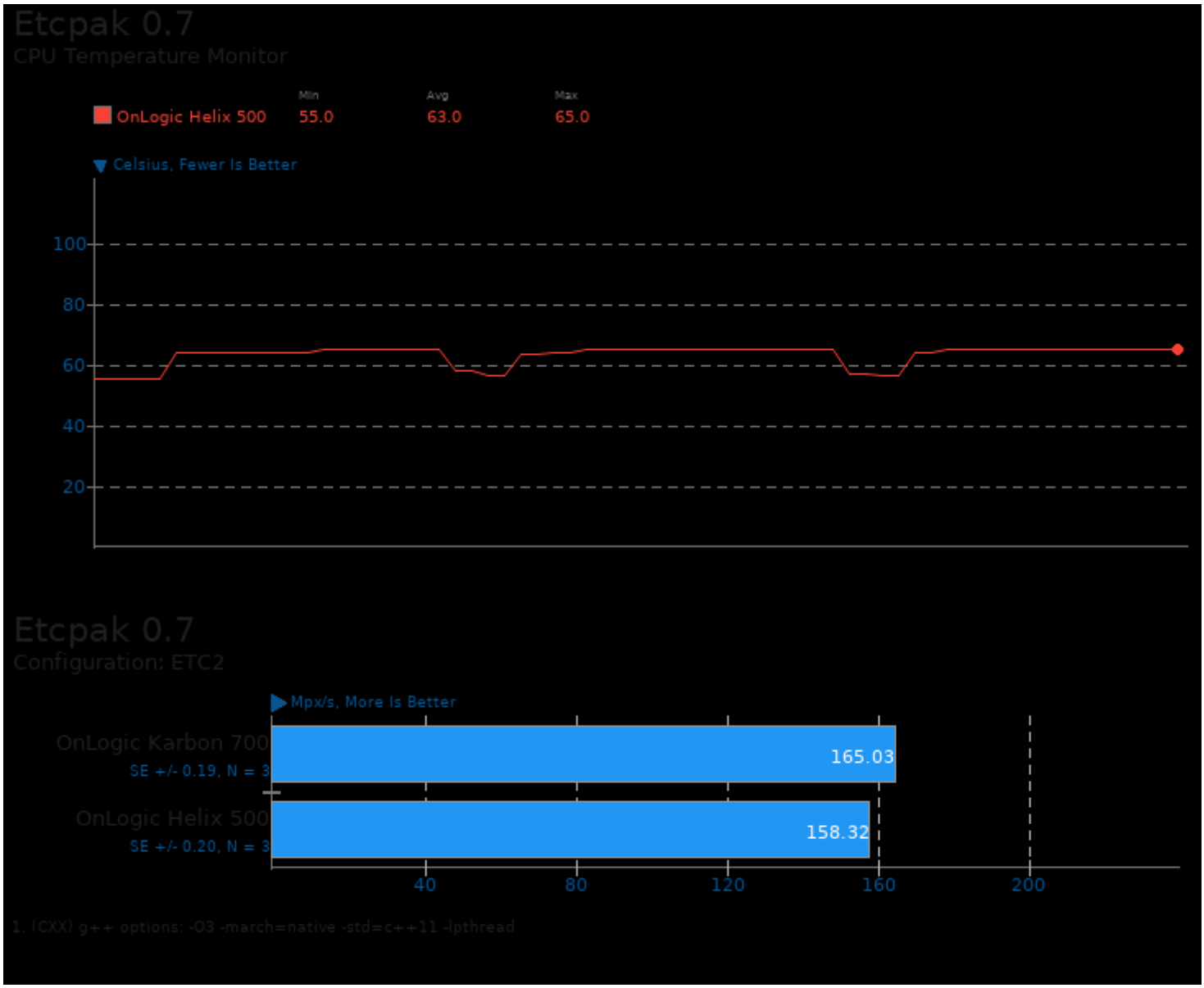

Cpuminer-Opt 3.15.5
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
61.0
71.2
83.0
Celsius, Fewer Is Better
100
80
60
40
20
QuantLib 1.21
MFLOPS, More Is Better
OnLogic Karbon 700
SE +/- 17.49, N = 3
2181.6
OnLogic Helix 500
SE +/- 28.73, N = 3
2089.1
500
1000
1500
2000
2500
1. (CXX) g++ options: -O3 -march=native -rdynamic

OnLogic Helix 500 Linux benchmarks

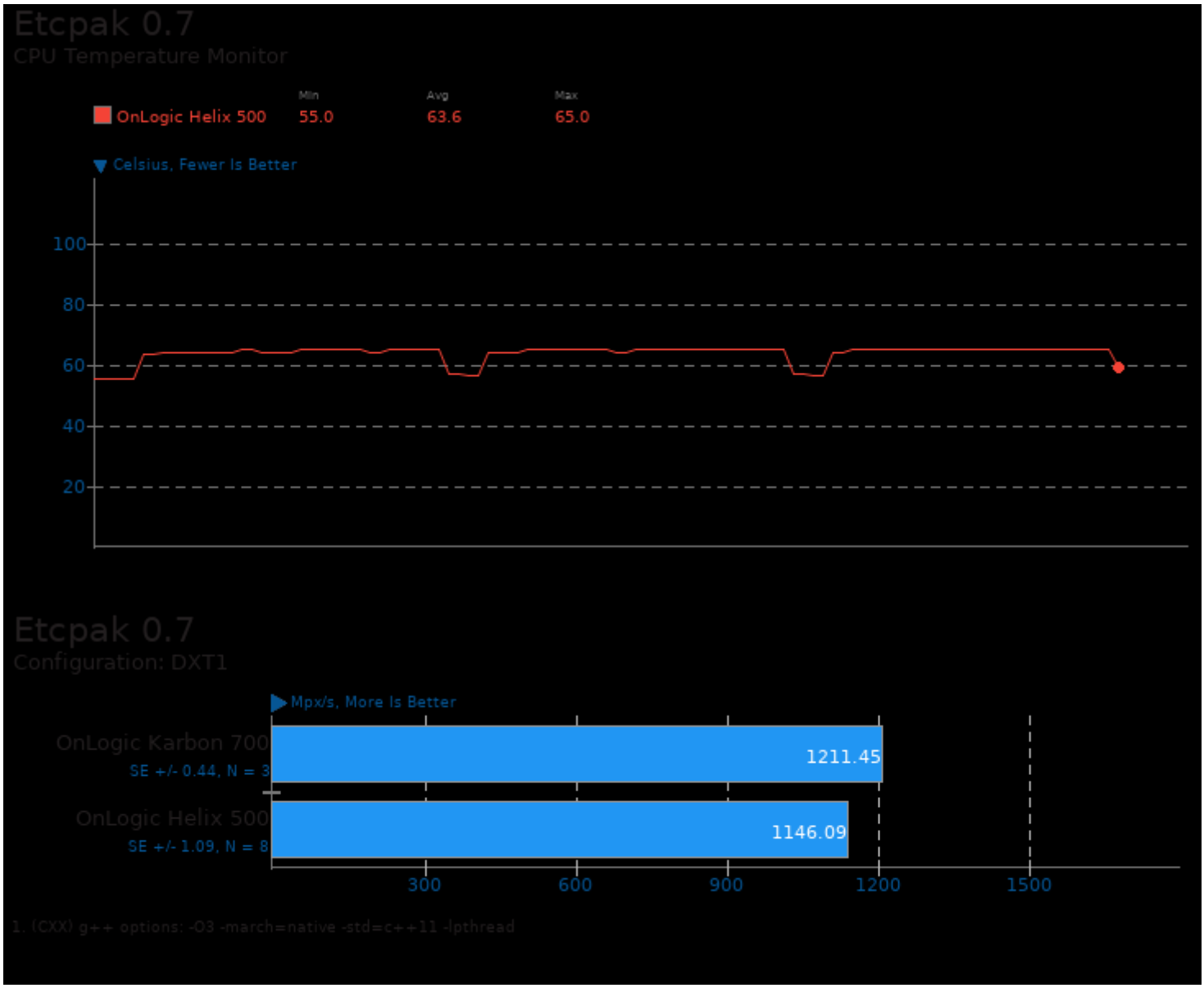


OnLogic Helix 500 Linux benchmarks

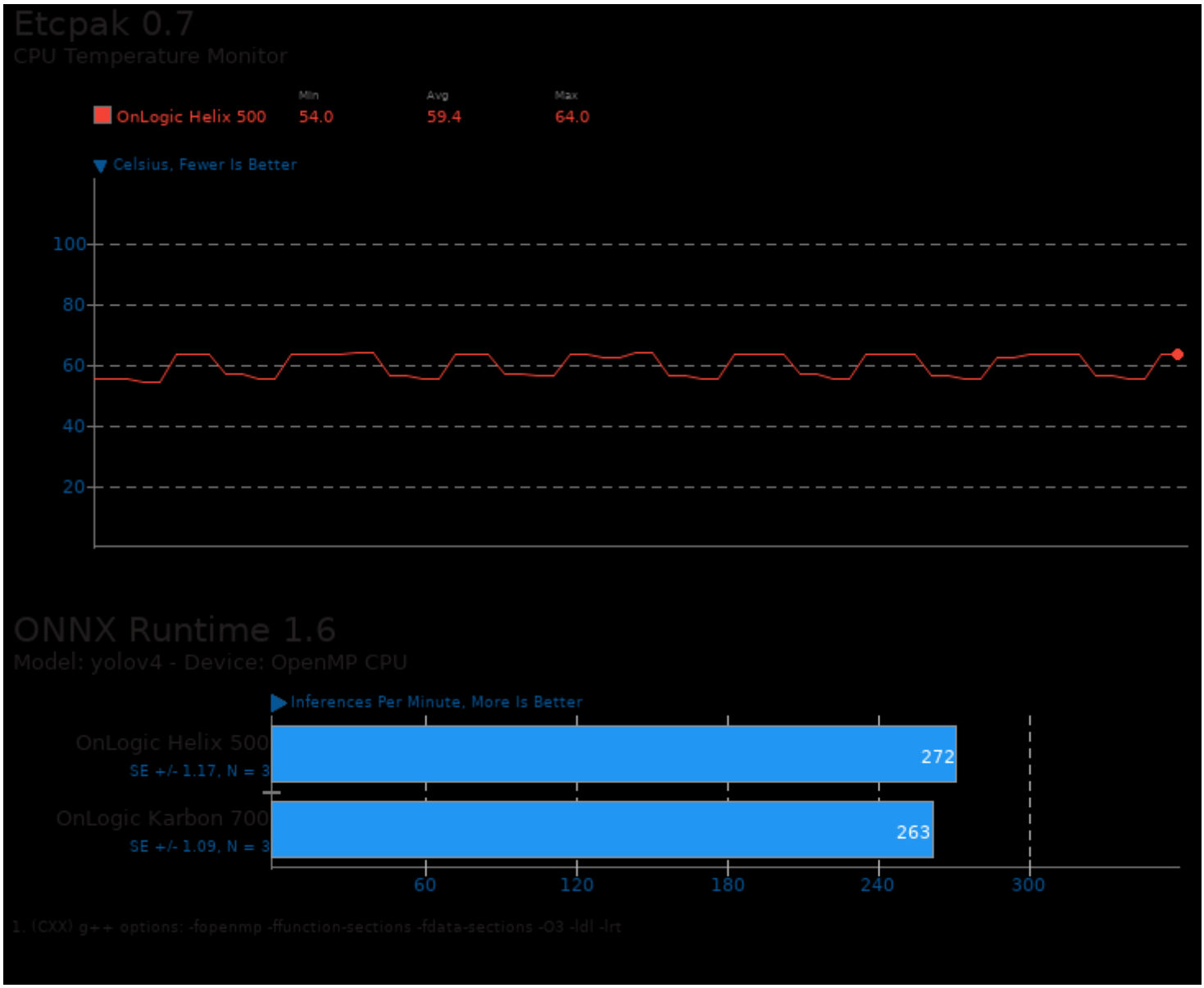


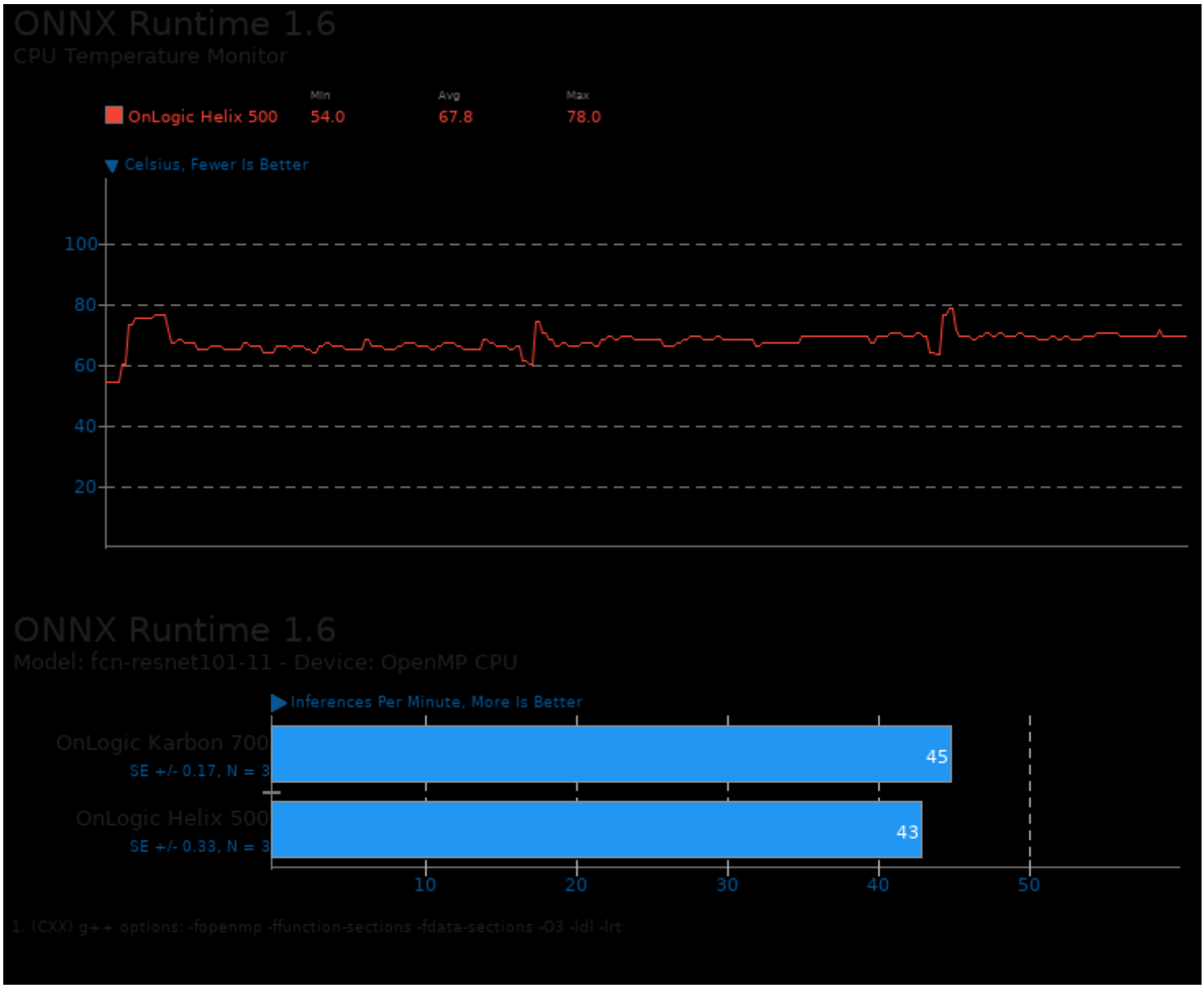

Etcpak 0.7
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
55.0
63.0
65.0
Celsius, Fewer Is Better
100
80
60
40
20
Etcpak 0.7
Configuration: ETC2
Mpx/s, More Is Better
OnLogic Karbon 700
SE +/- 0.19, N = 3
165.03
OnLogic Helix 500
SE +/- 0.20, N = 3
158.32
40
80
120
160
200
1. (CXX) g++ options: -O3 -march=native -std=c++11 -lpthread

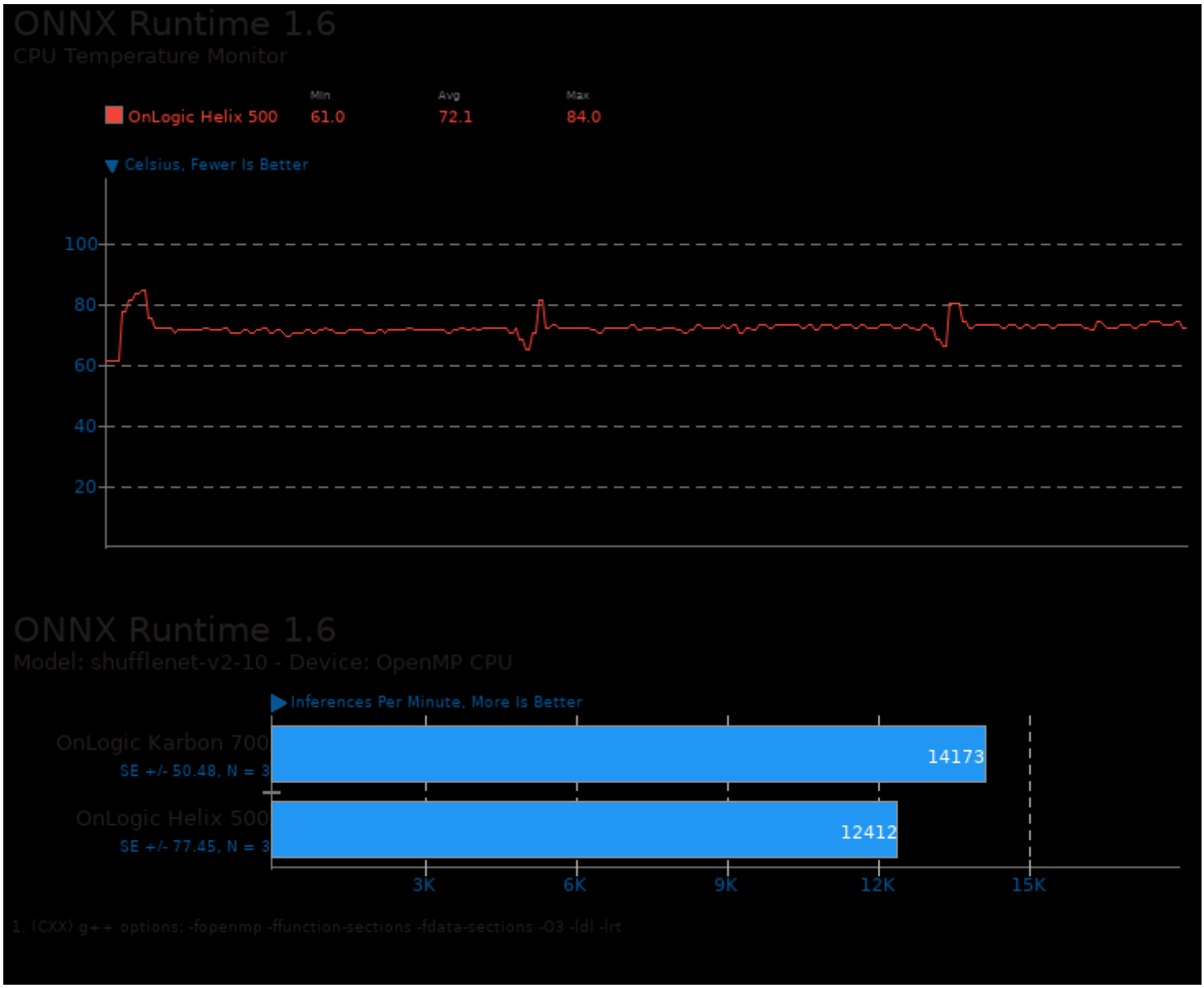
OnLogic Helix 500 Linux benchmarks

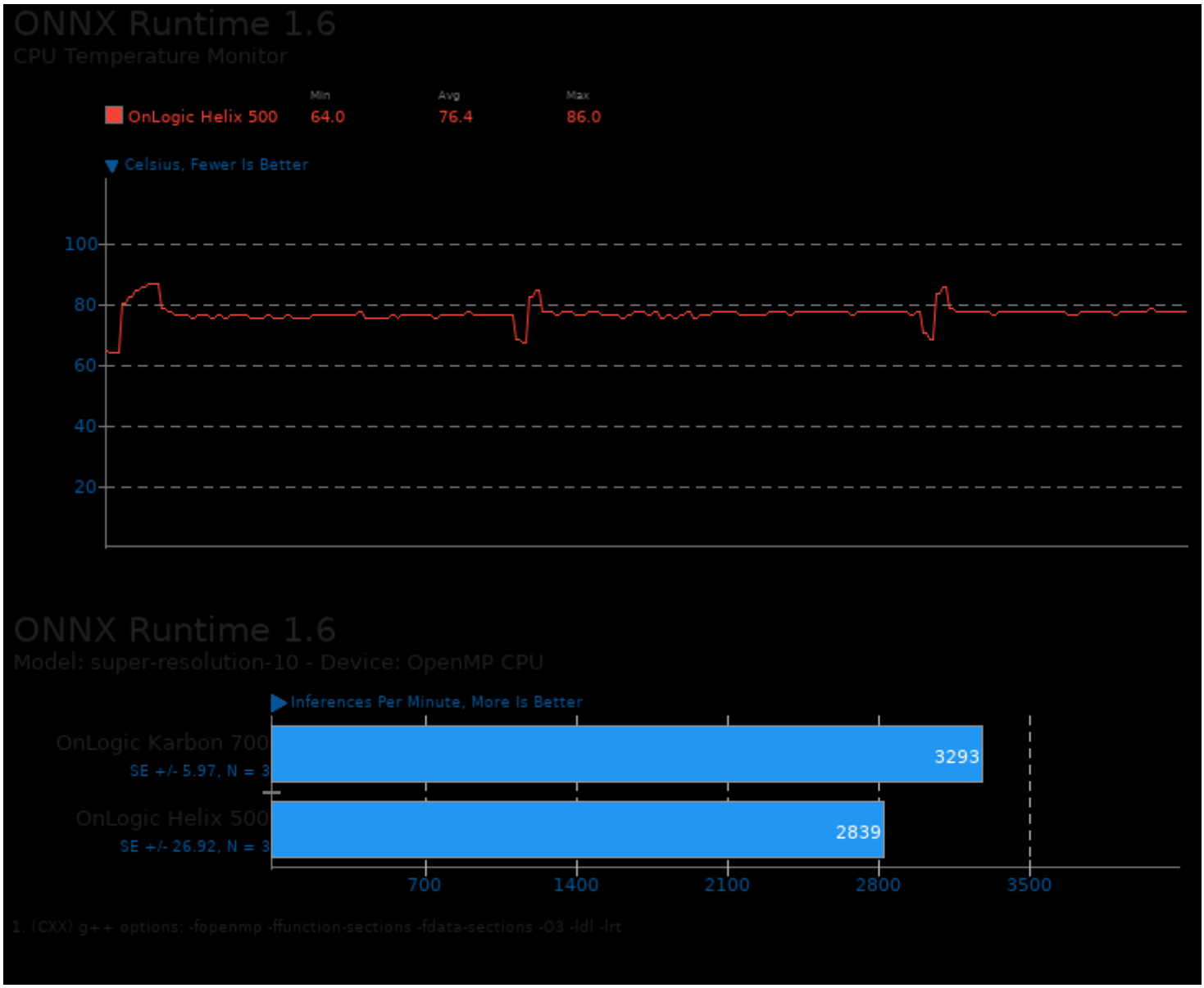


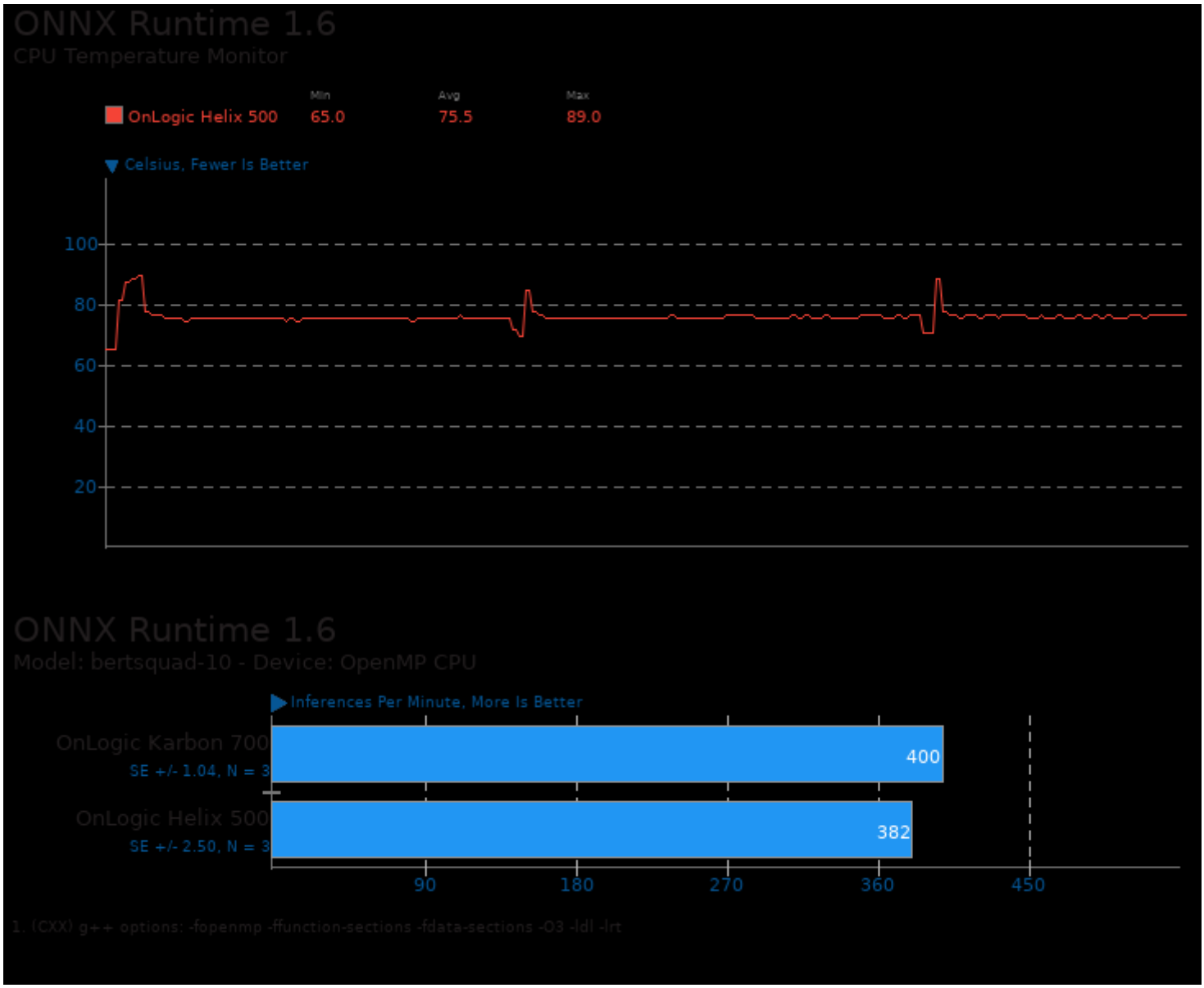
OnLogic Helix 500 Linux benchmarks

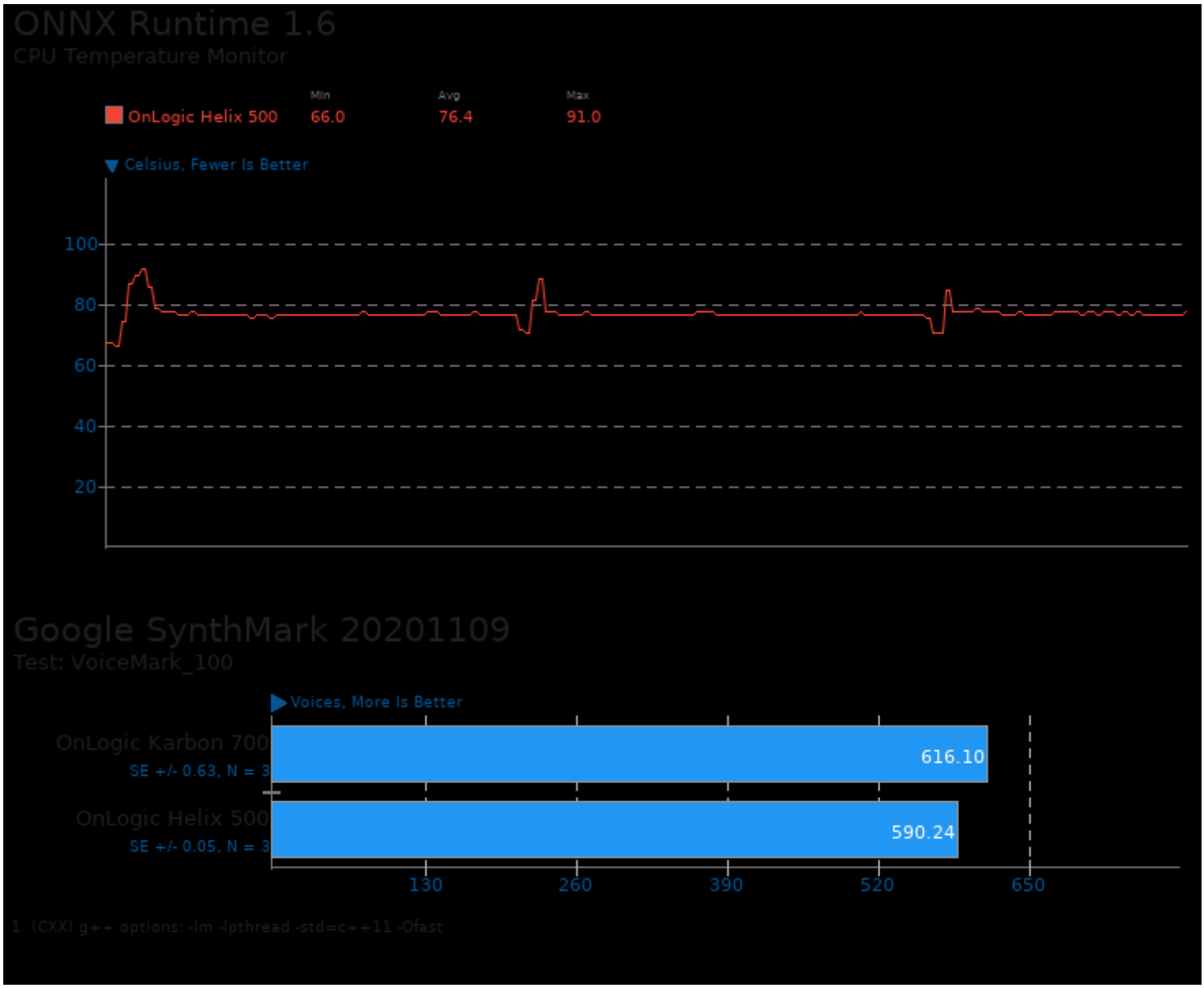



ONNX Runtime 1.6
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
54.0
67.8
78.0
Celsius, Fewer Is Better
100
80
60
40
20
ONNX Runtime 1.6
Model: fcn-resnet101-11 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
OnLogic Karbon 700
SE +/- 0.17, N = 3
45
OnLogic Helix 500
SE +/- 0.33, N = 3
43
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

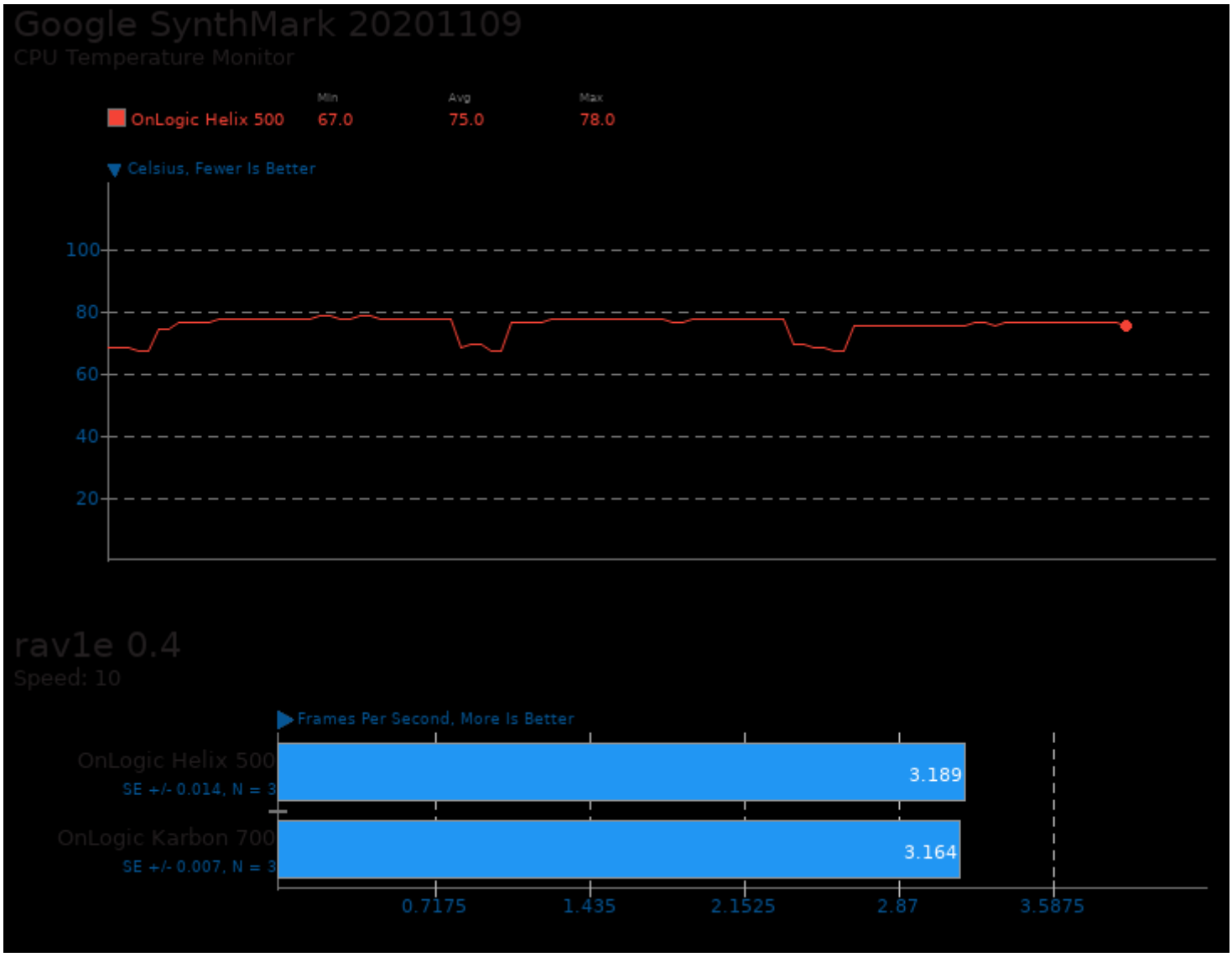

ONNX Runtime 1.6
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
61.0
72.1
84.0
Celsius, Fewer Is Better
100
80
60
40
20
ONNX Runtime 1.6
Model: shufflenet-v2-10 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
OnLogic Karbon 700
SE +/- 50.48, N = 3
14173
OnLogic Helix 500
SE +/- 77.45, N = 3
12412
3K
6K
9K
12K
15K
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt


ONNX Runtime 1.6
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
64.0
76.4
86.0
Celsius, Fewer Is Better
100
80
60
40
20
ONNX Runtime 1.6
Model: super-resolution-10 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
OnLogic Karbon 700
SE +/- 5.97, N = 3
3293
OnLogic Helix 500
SE +/- 26.92, N = 3
2839
700
1400
2100
2800
3500
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

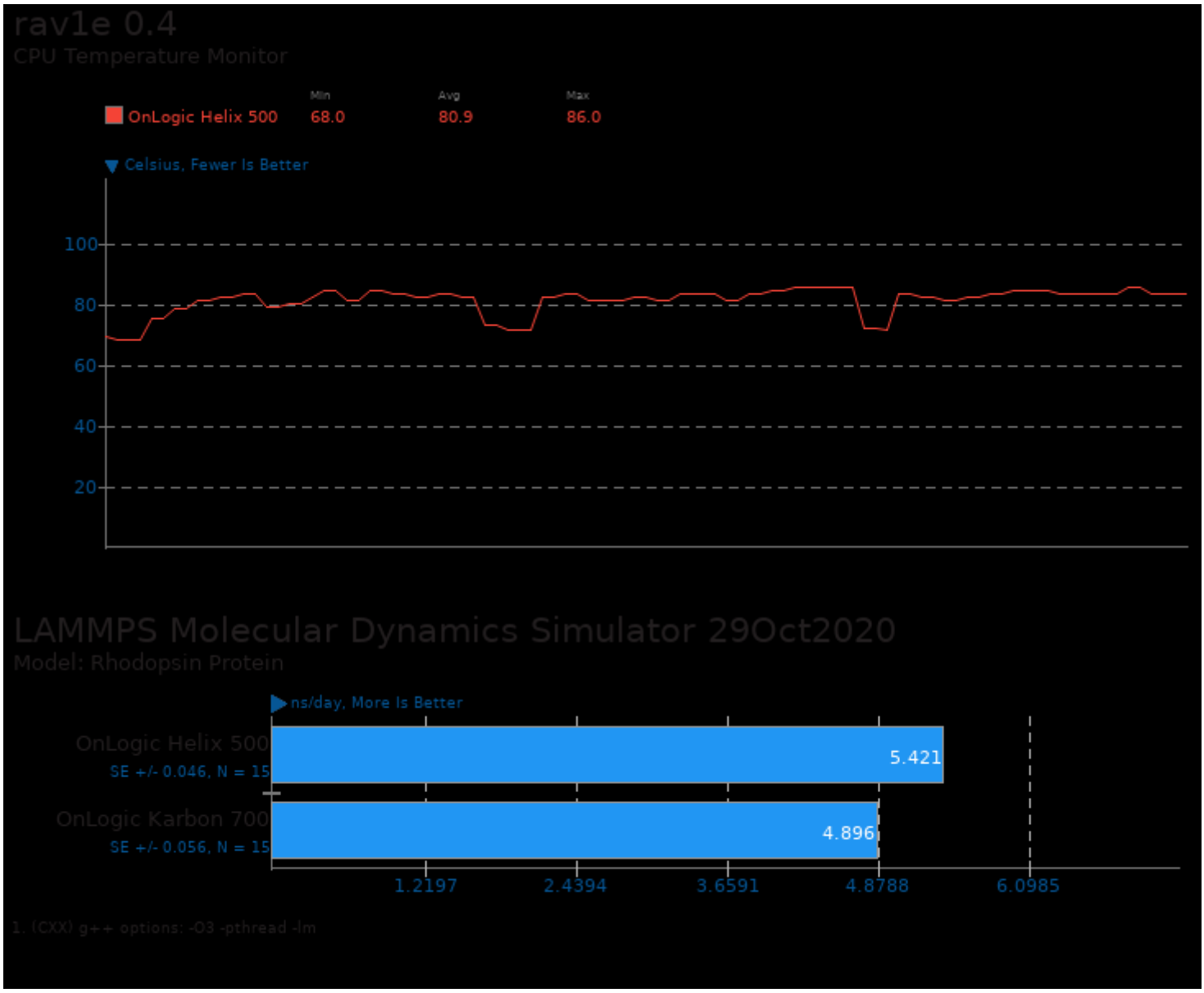

ONNX Runtime 1.6
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
65.0
75.5
89.0
Celsius, Fewer Is Better
100
80
60
40
20
ONNX Runtime 1.6
Model: bertsquad-10 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
OnLogic Karbon 700
SE +/- 1.04, N = 3
400
OnLogic Helix 500
SE +/- 2.50, N = 3
382
90
180
270
360
450
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

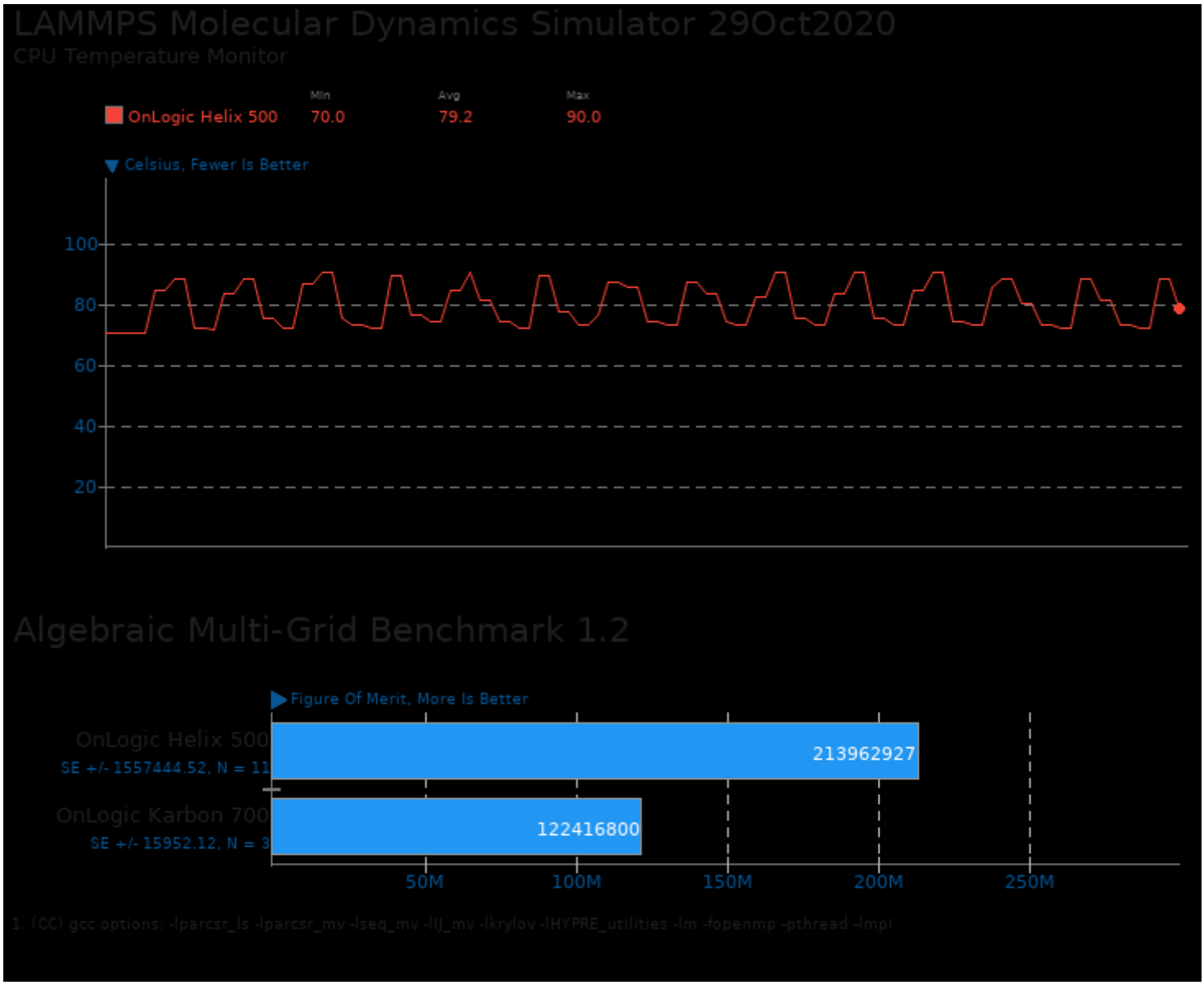

ONNX Runtime 1.6
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
66.0
76.4
91.0
Celsius, Fewer Is Better
100
80
60
40
20
Google SynthMark 20201109
Test: VoiceMark_100
Voices, More Is Better
OnLogic Karbon 700
SE +/- 0.63, N = 3
616.10
OnLogic Helix 500
SE +/- 0.05, N = 3
590.24
130
260
390
520
650
1. (CXX) g++ options: -lm -lpthread -std=c++11 -Ofast

OnLogic Helix 500 Linux benchmarks

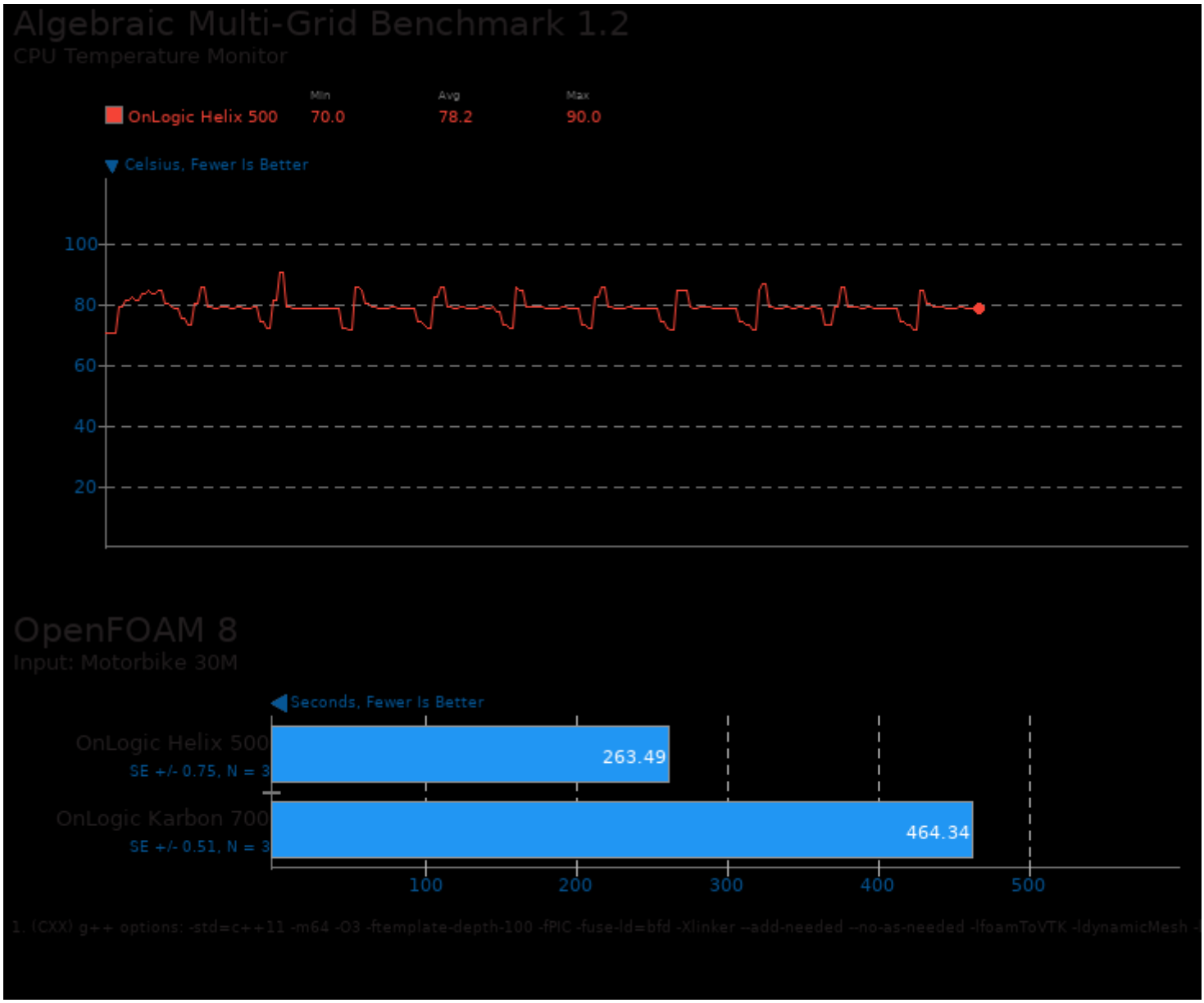


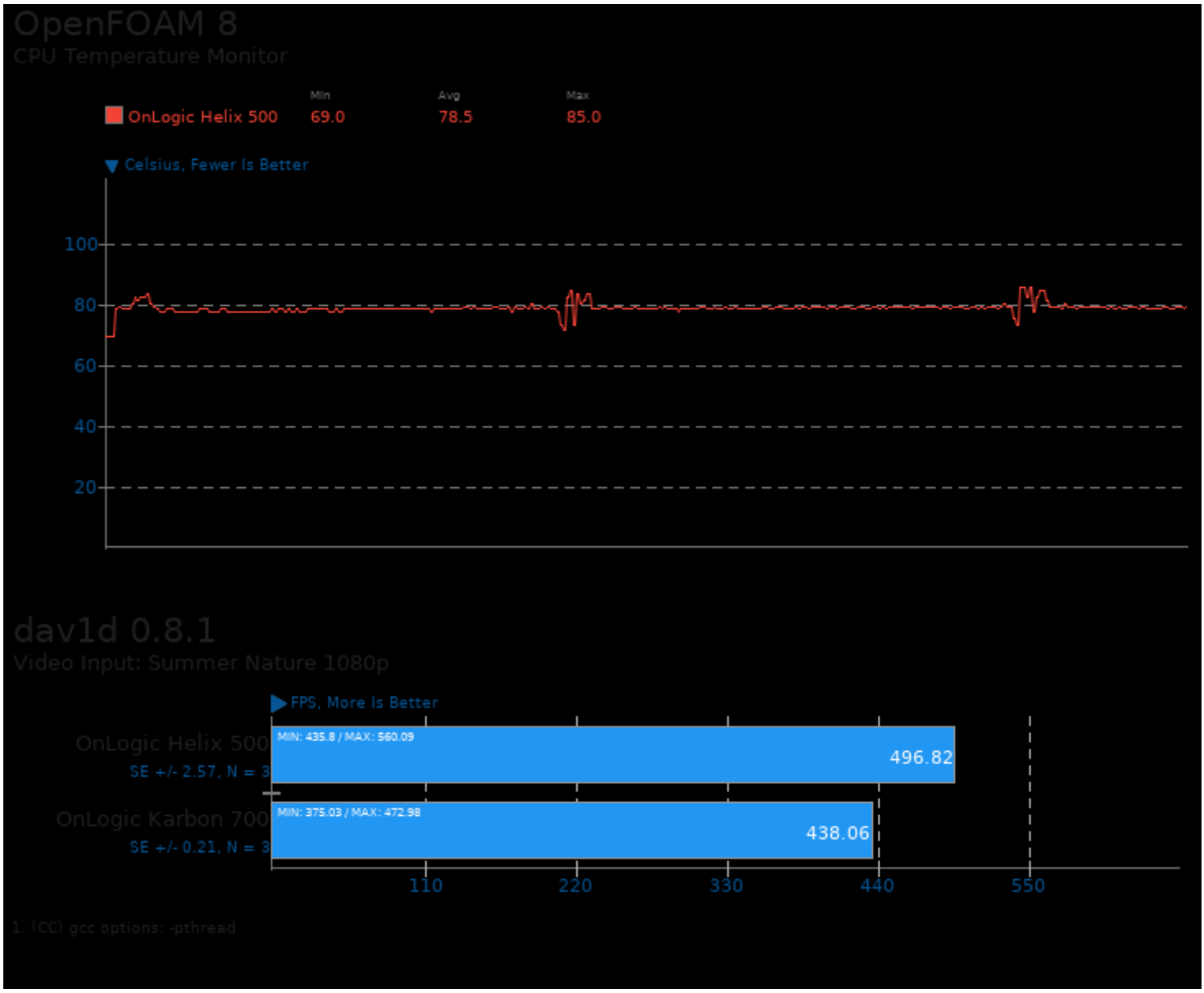
OnLogic Helix 500 Linux benchmarks

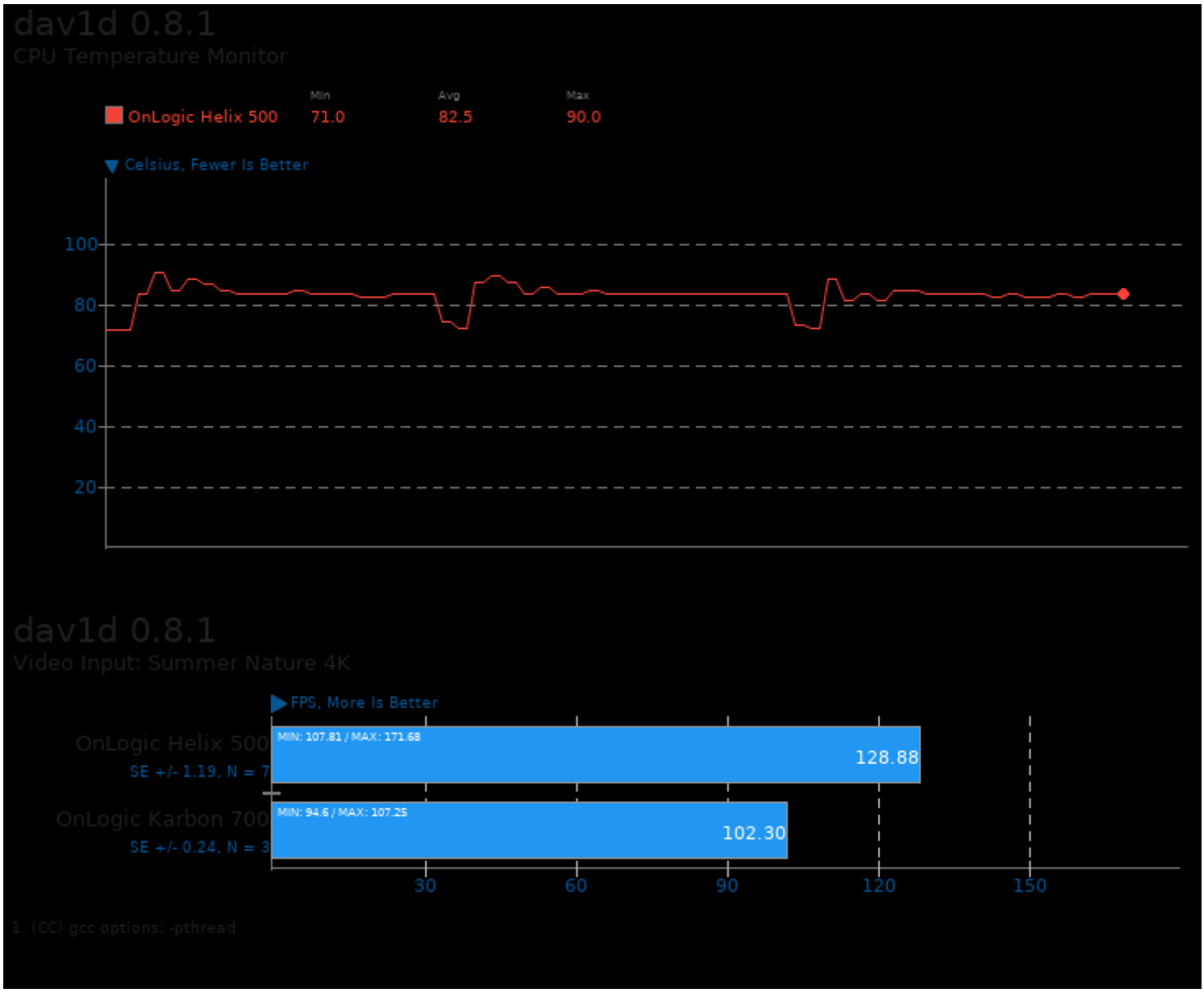



LAMMPS Molecular Dynamics Simulator 29Oct2020
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
70.0
79.2
90.0
Celsius, Fewer Is Better
100
80
60
40
20
Algebraic Multi-Grid Benchmark 1.2
Figure Of Merit, More Is Better
OnLogic Helix 500
SE +/- 1557444.52, N = 11
213962927
OnLogic Karbon 700
SE +/- 15952.12, N = 3
122416800
50M
100M
150M
200M
250M
1. (CC) gcc options: -lparcsr_ls -lparcsr_mv -lseq_mv -lIJ_mv -lkrylov -lHYPRE_utilities -lm -fopenmp -pthread -lmpi

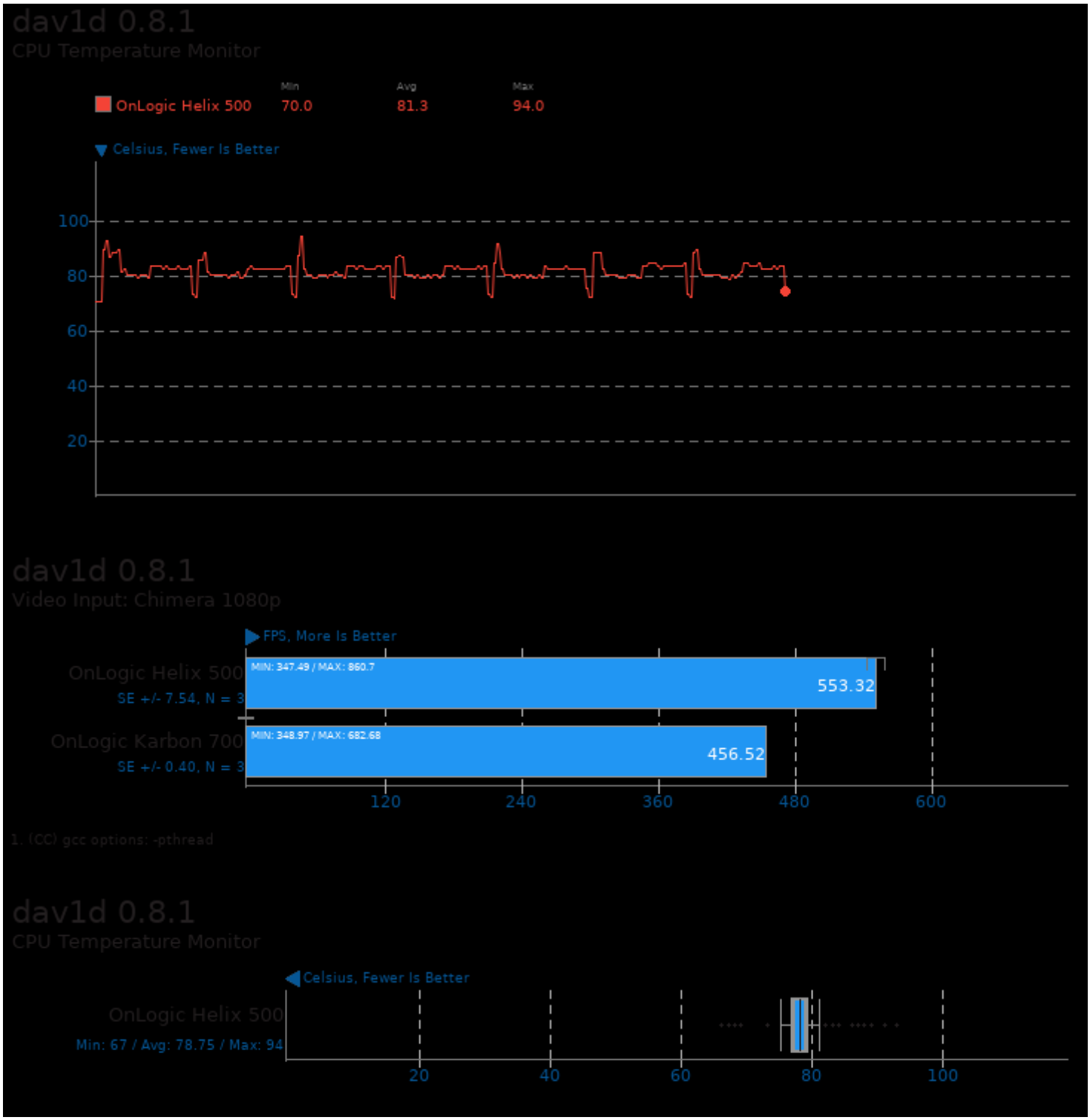
OnLogic Helix 500 Linux benchmarks



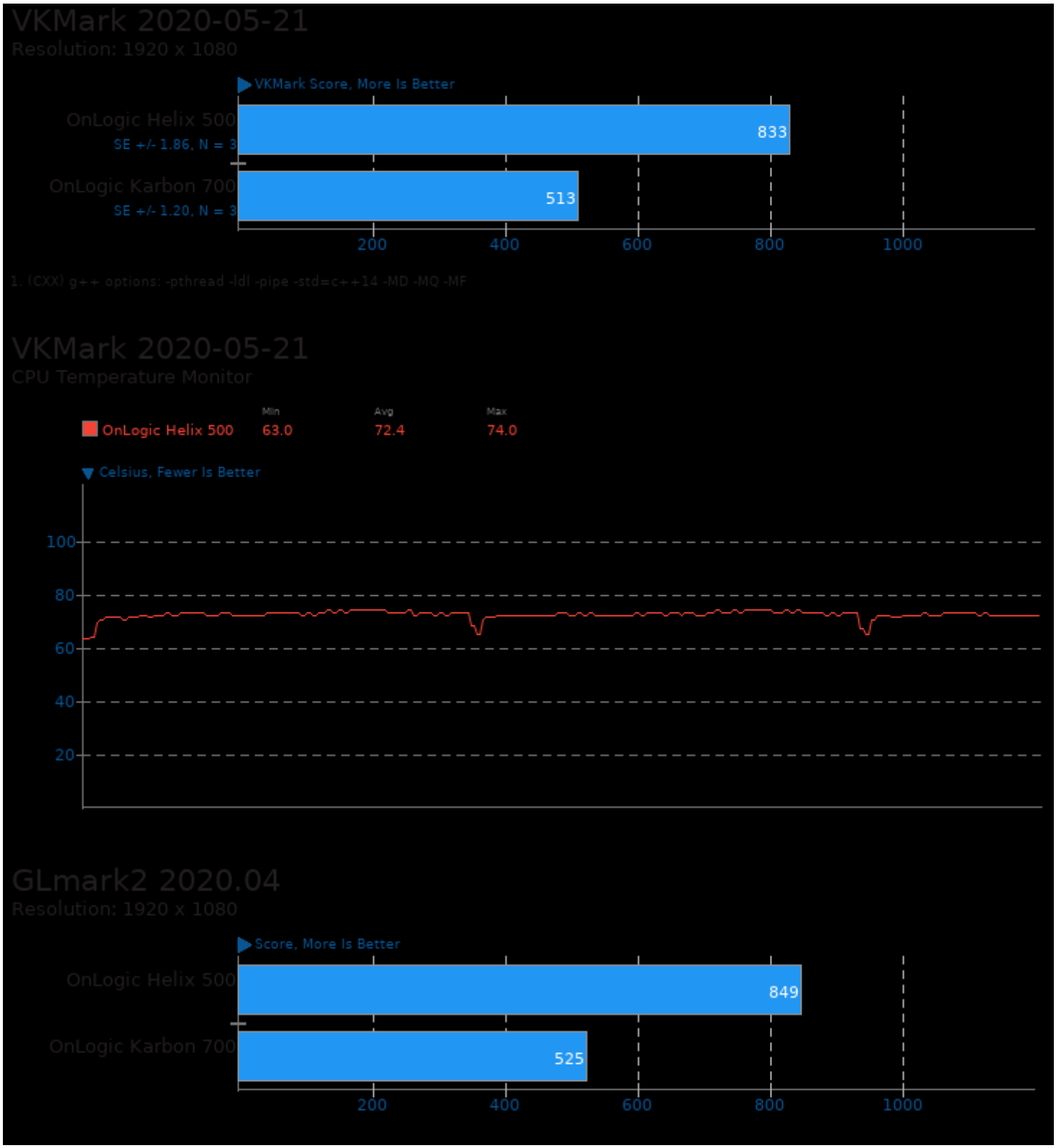

OpenFOAM 8
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
69.0
78.5
85.0
Celsius, Fewer Is Better
100
80
60
40
20
dav1d 0.8.1
Video Input: Summer Nature 1080p
FPS, More Is Better
OnLogic Helix 500
SE +/- 2.57, N = 3
MIN: 435.8 / MAX: 560.09
496.82
OnLogic Karbon 700
SE +/- 0.21, N = 3
MIN: 375.03 / MAX: 472.98
438.06
110
220
330
440
550
1. (CC) gcc options: -pthread


dav1d 0.8.1
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
71.0
82.5
90.0
Celsius, Fewer Is Better
100
80
60
40
20
dav1d 0.8.1
Video Input: Summer Nature 4K
FPS, More Is Better
OnLogic Helix 500
SE +/- 1.19, N = 7
MIN: 107.81 / MAX: 171.68
128.88
OnLogic Karbon 700
SE +/- 0.24, N = 3
MIN: 94.6 / MAX: 107.25
102.30
30
60
90
120
150
1. (CC) gcc options: -pthread

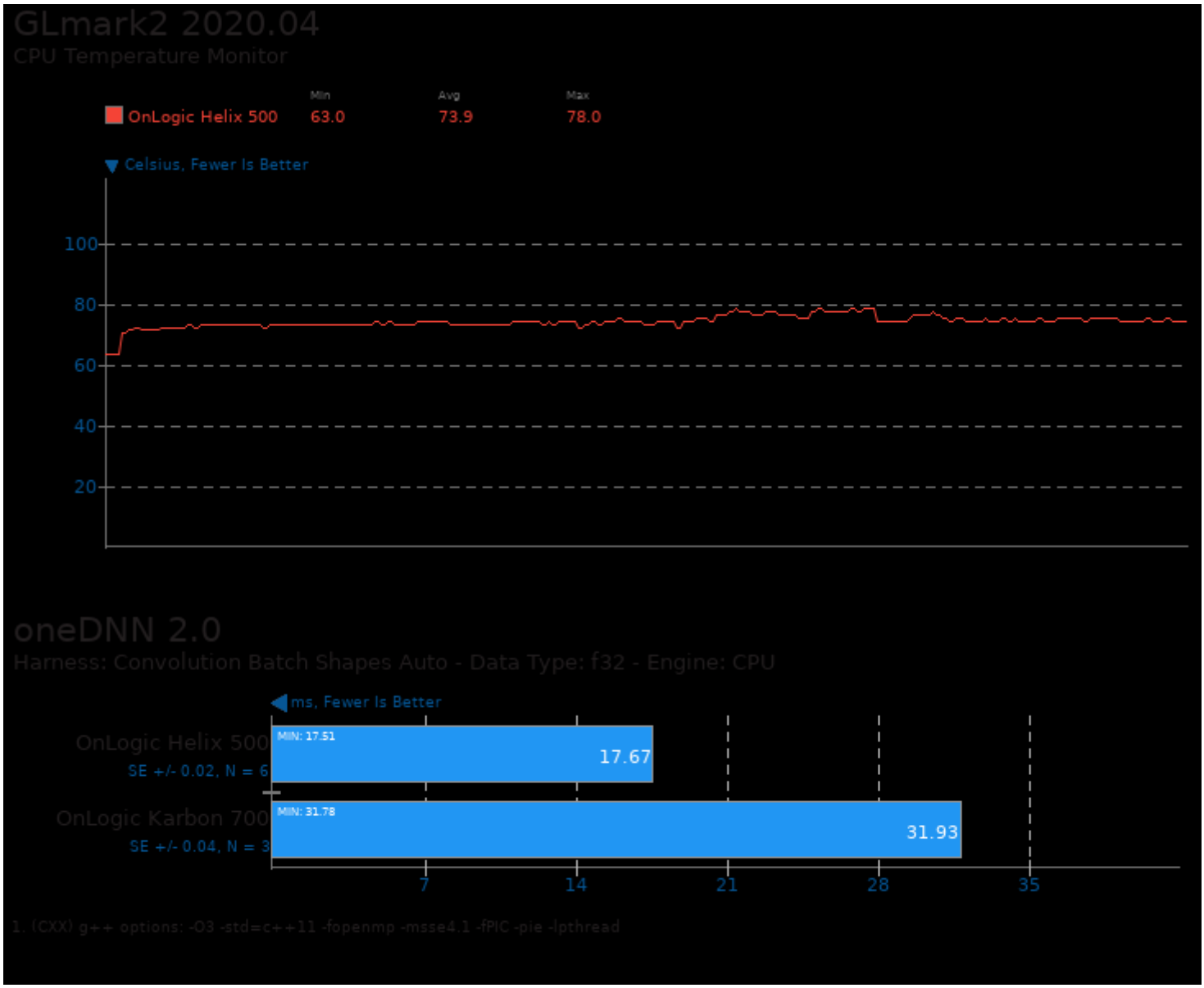
OnLogic Helix 500 Linux benchmarks

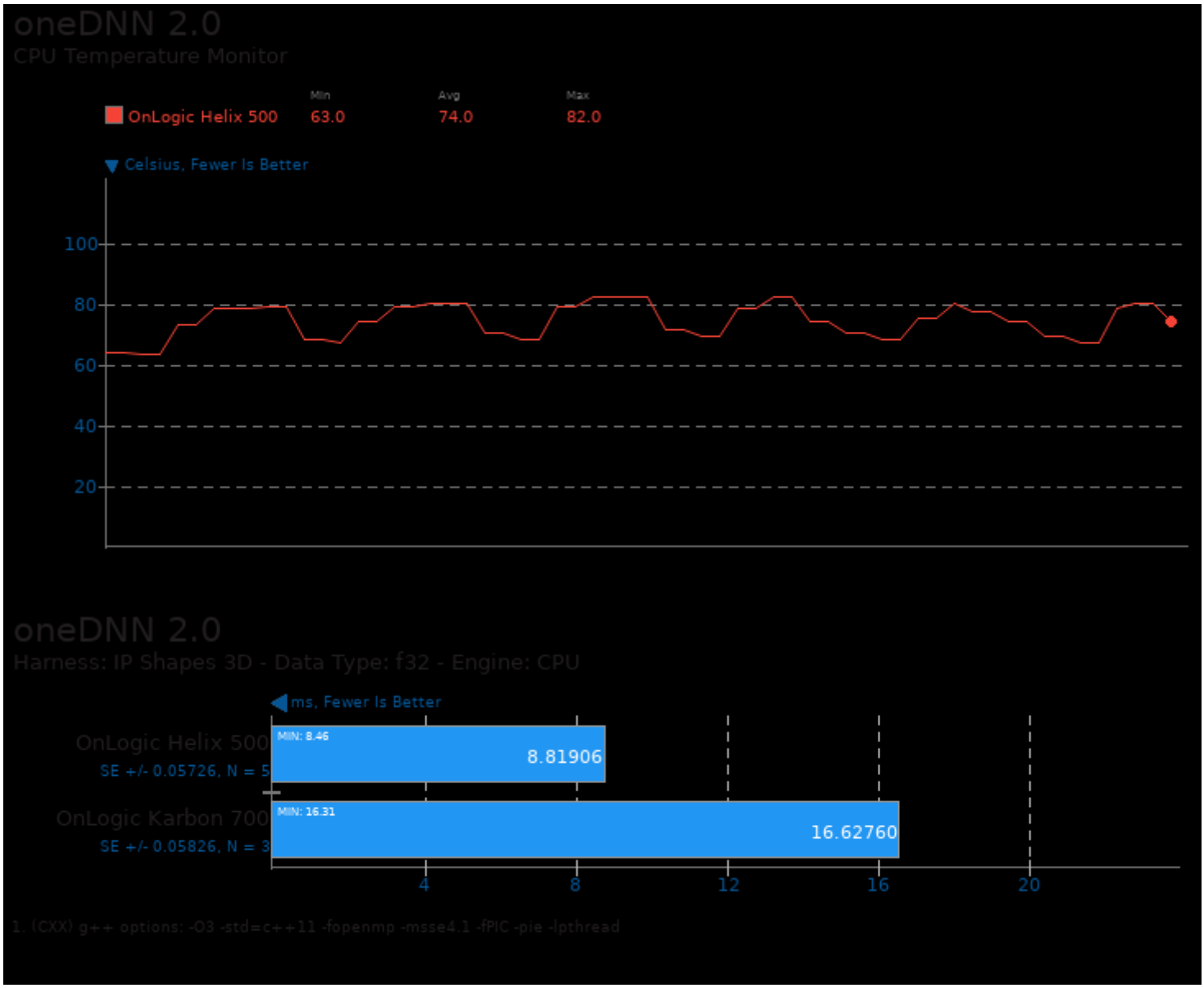


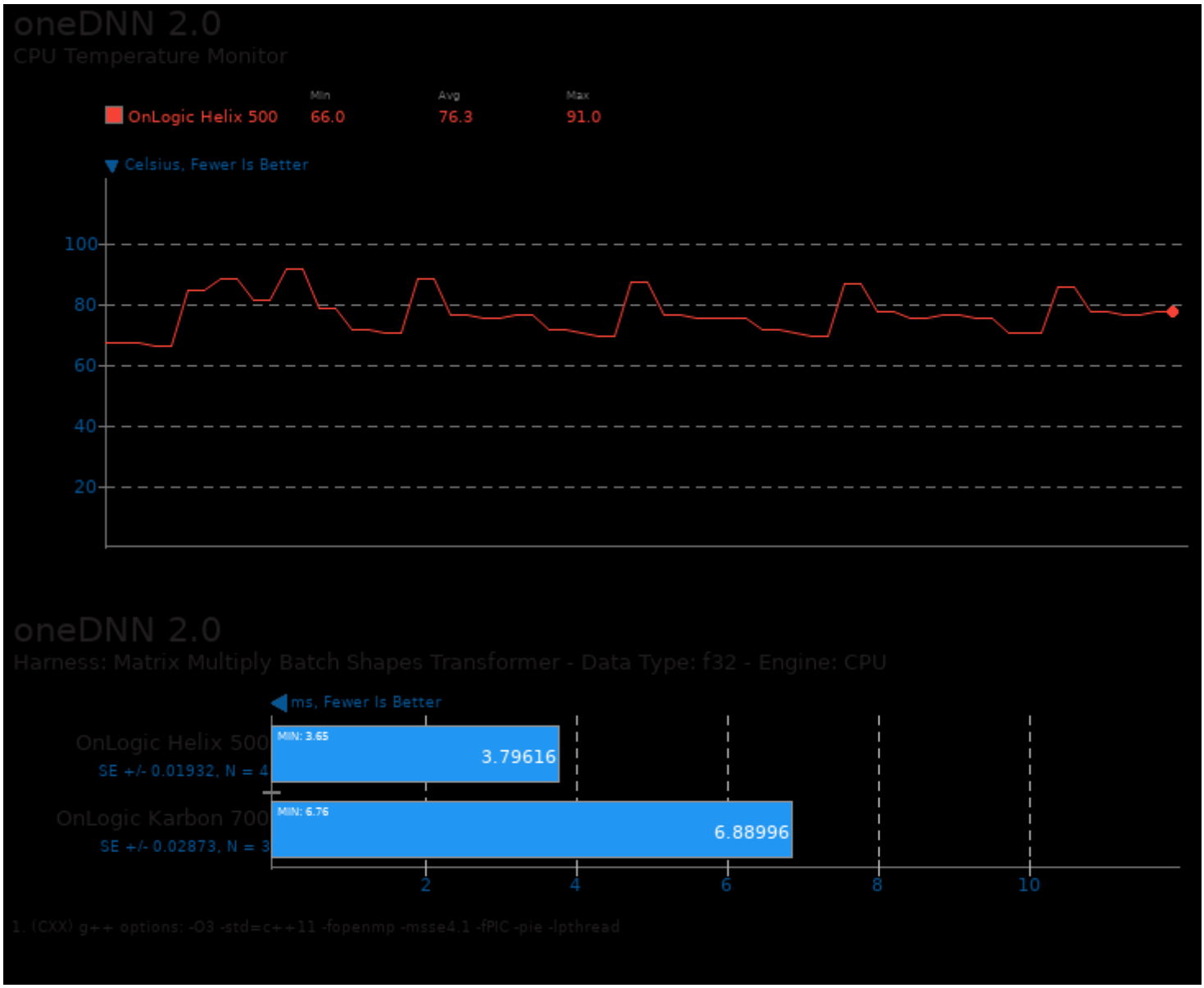
OnLogic Helix 500 Linux benchmarks



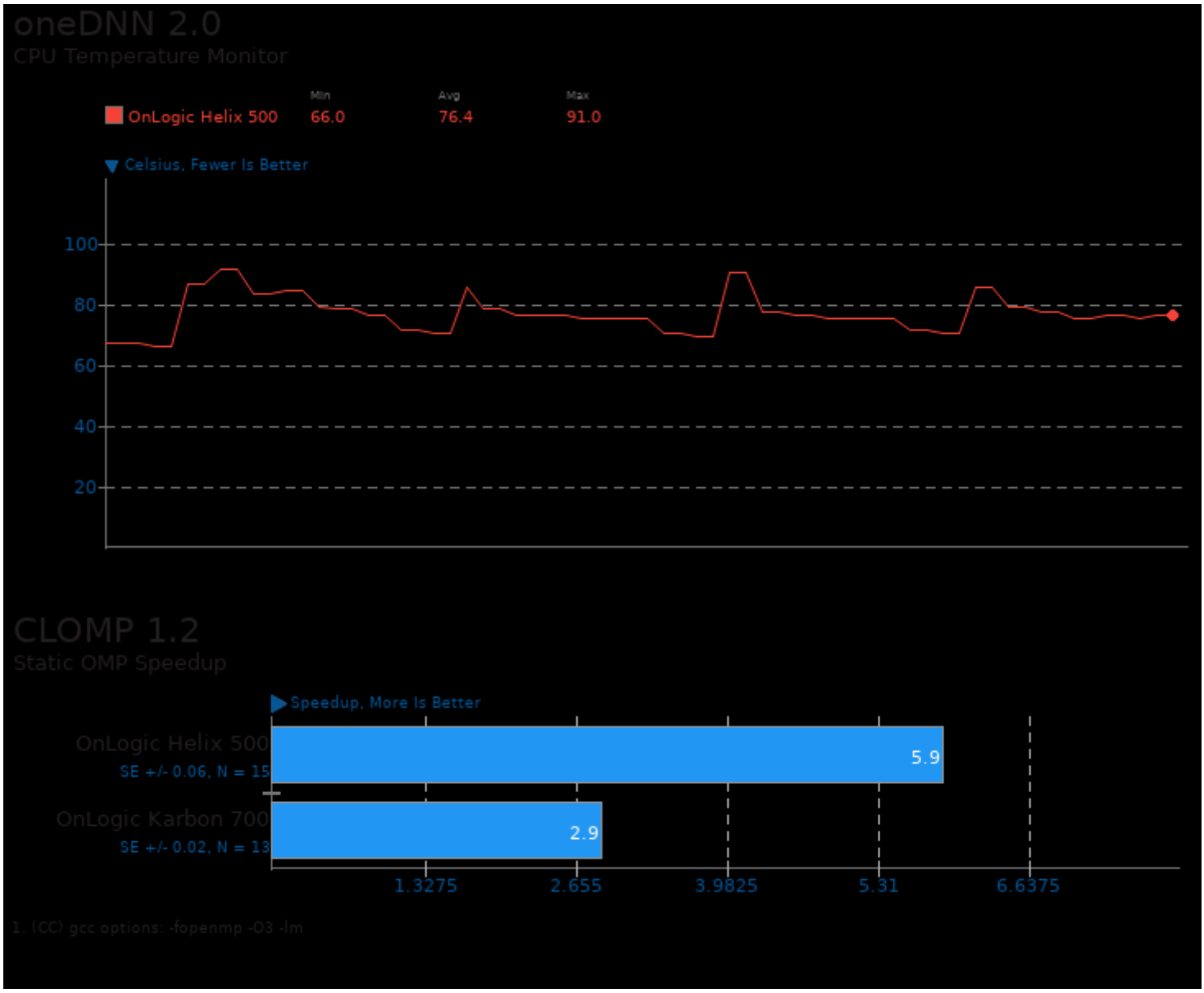
OnLogic Helix 500 Linux benchmarks



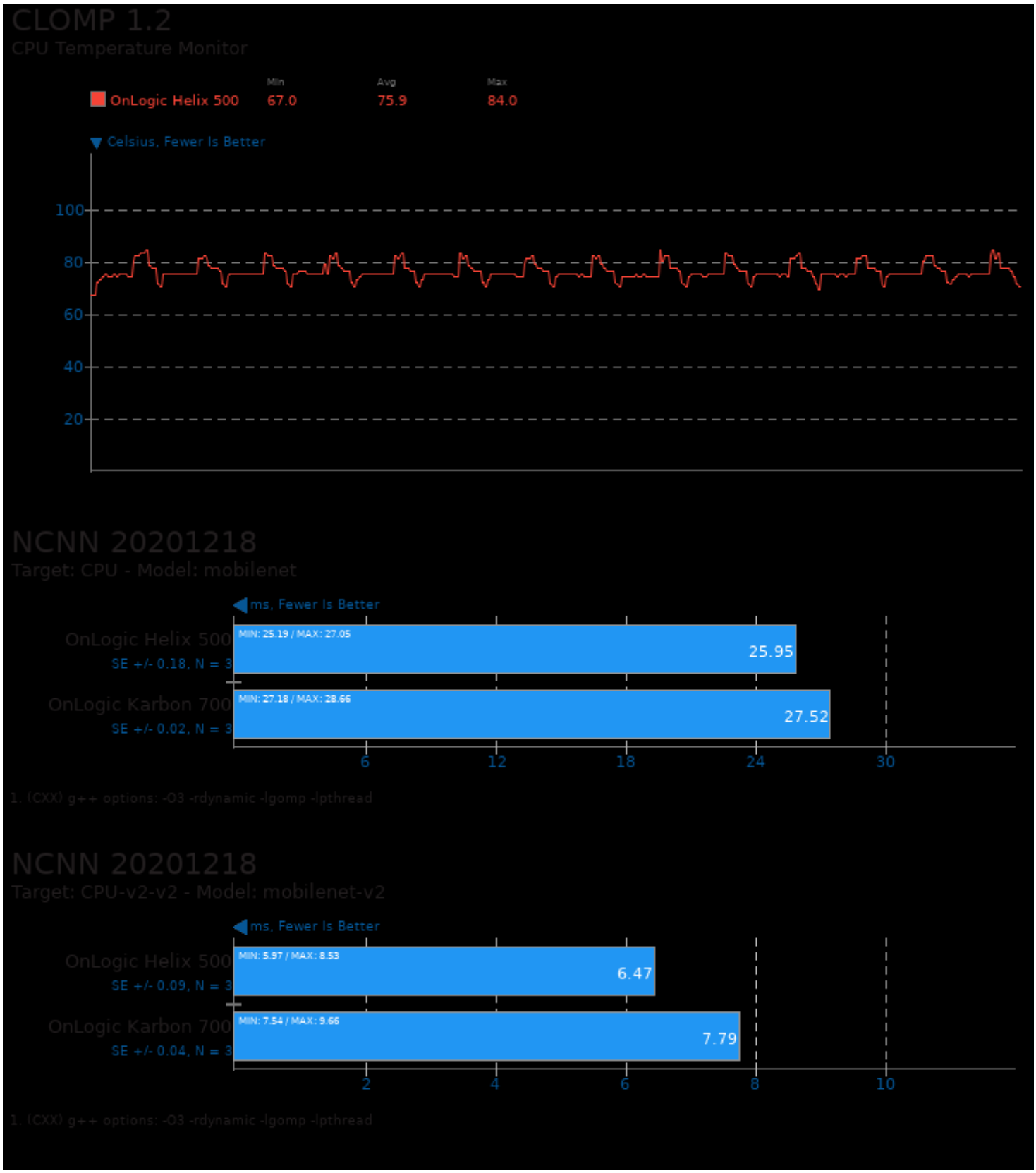

oneDNN 2.0
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
63.0
74.0
82.0
Celsius, Fewer Is Better
100
80
60
40
20
oneDNN 2.0
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.05726, N = 5
MIN: 8.46
8.81906
OnLogic Karbon 700
SE +/- 0.05826, N = 3
MIN: 16.31
16.62760
4
8
12
16
20
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread

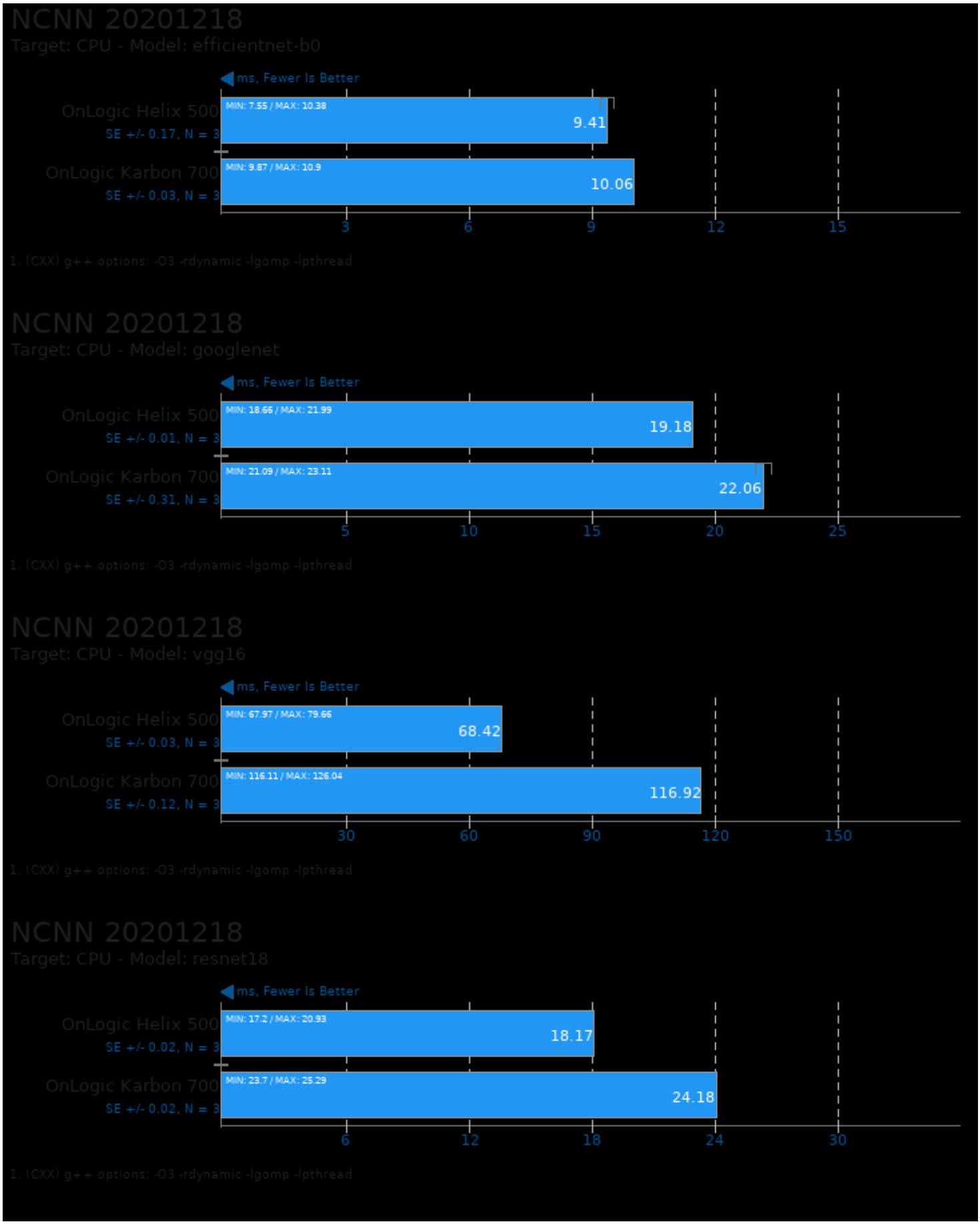

oneDNN 2.0
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
66.0
76.3
91.0
Celsius, Fewer Is Better
100
80
60
40
20
oneDNN 2.0
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.01932, N = 4
MIN: 3.65
3.79616
OnLogic Karbon 700
SE +/- 0.02873, N = 3
MIN: 6.76
6.88996
2
4
6
8
10
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread

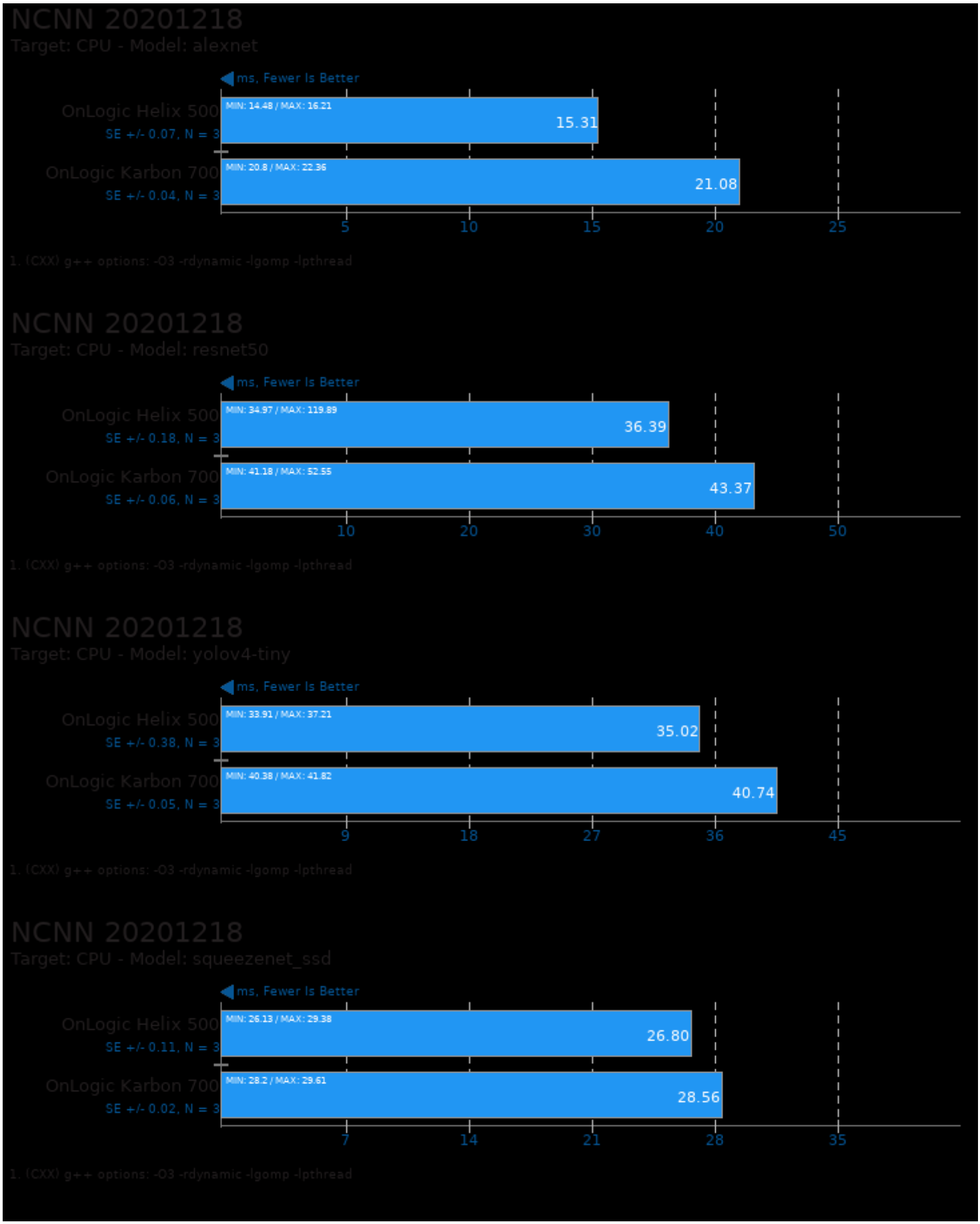
OnLogic Helix 500 Linux benchmarks

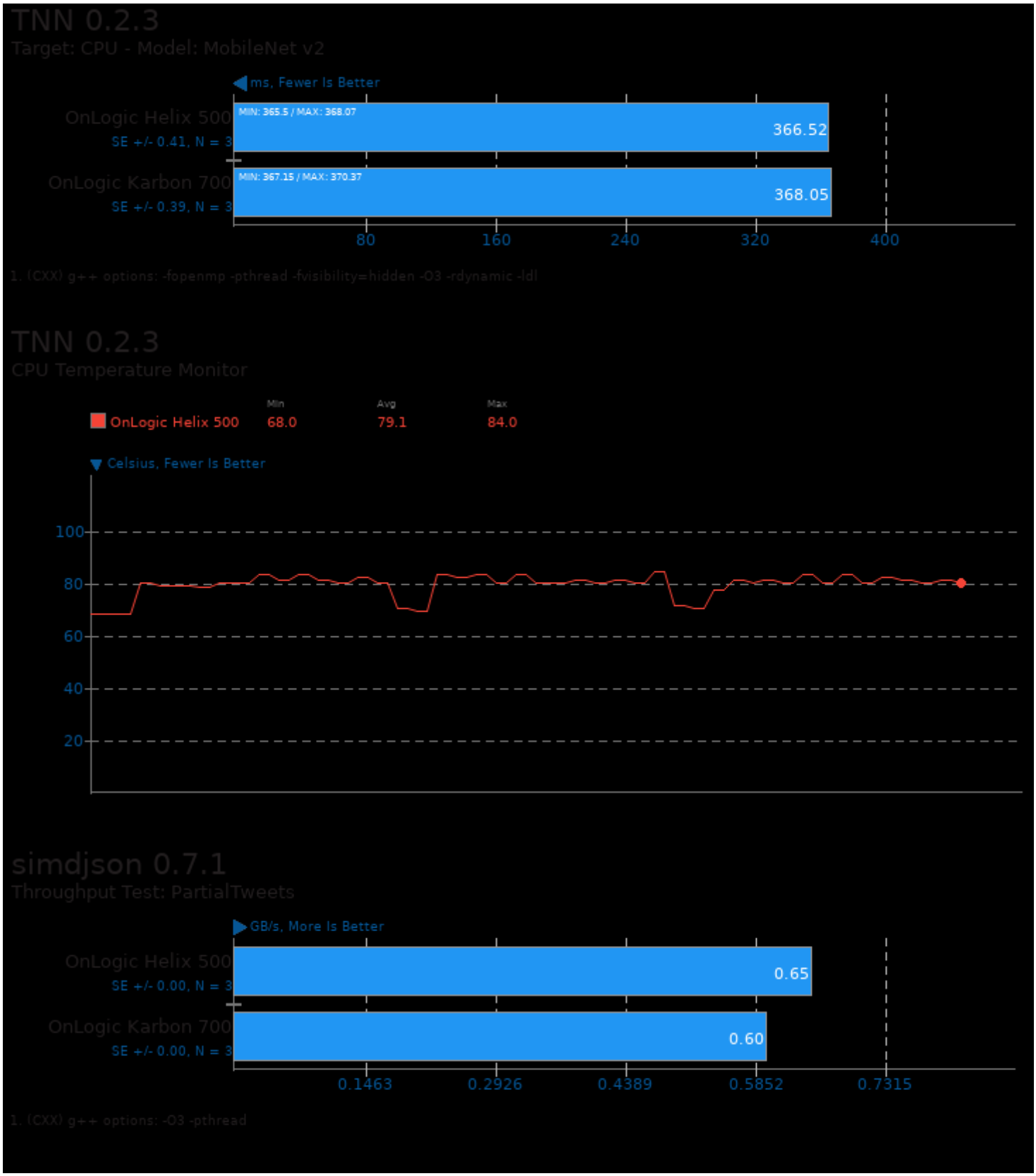


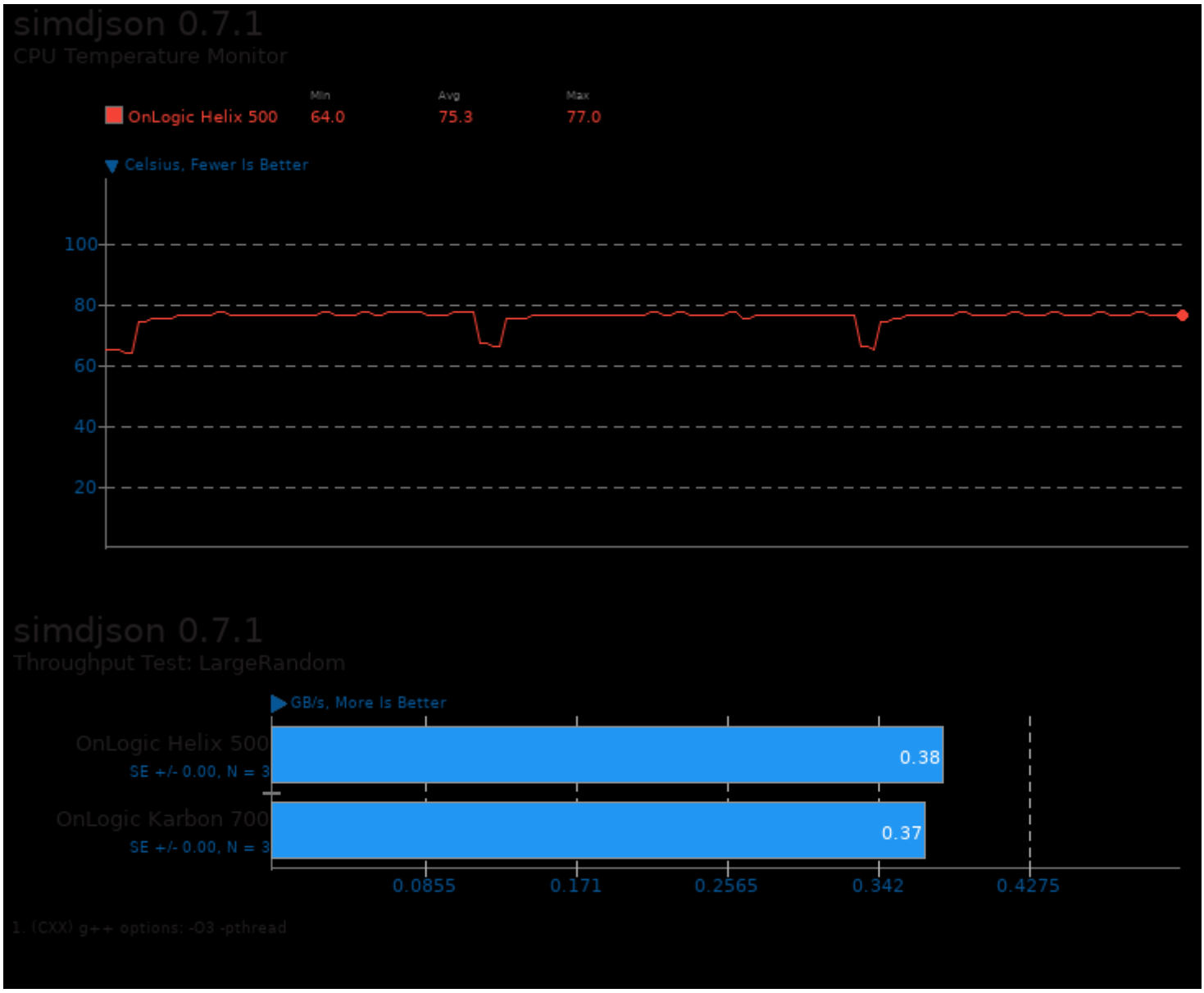
OnLogic Helix 500 Linux benchmarks

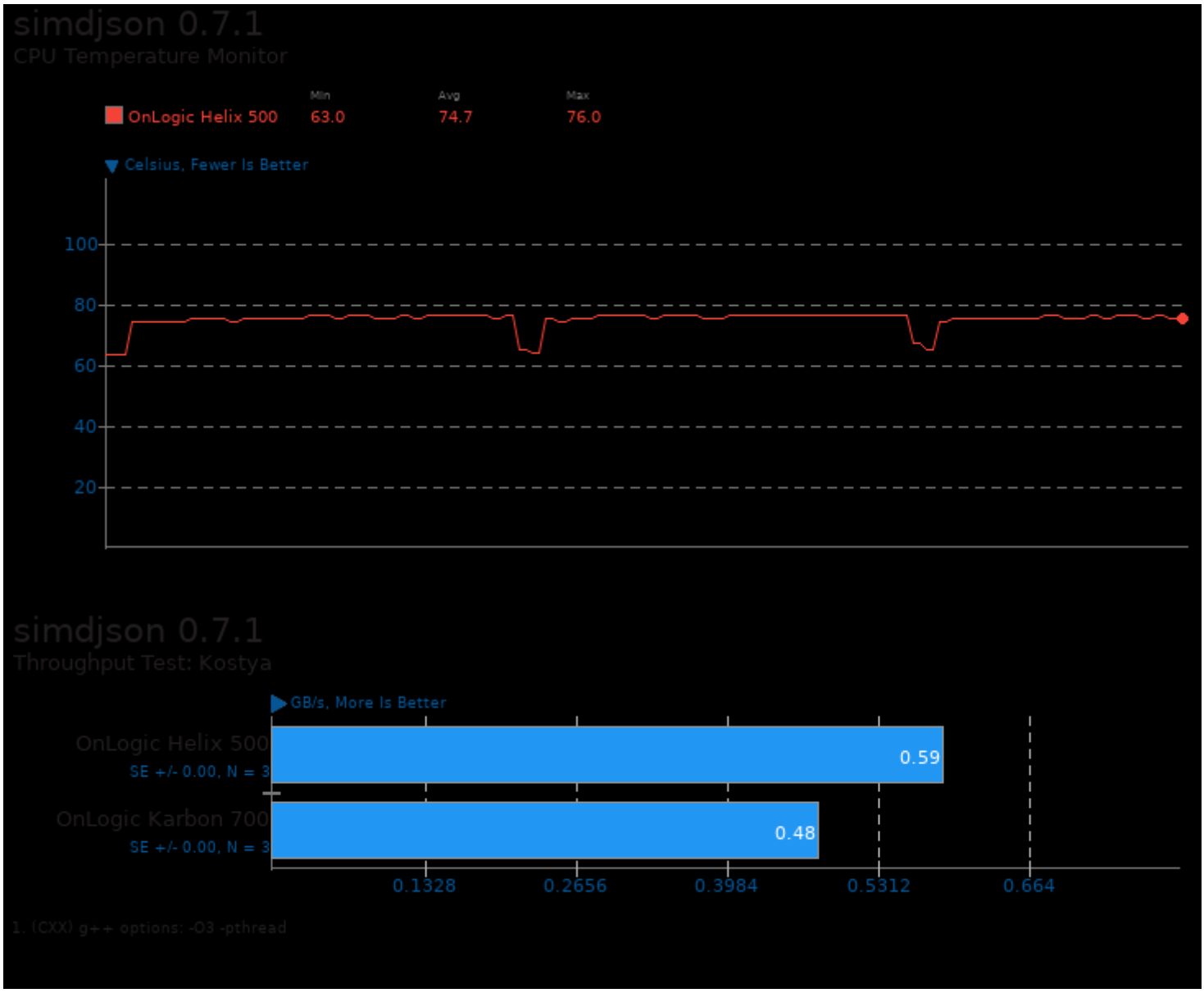


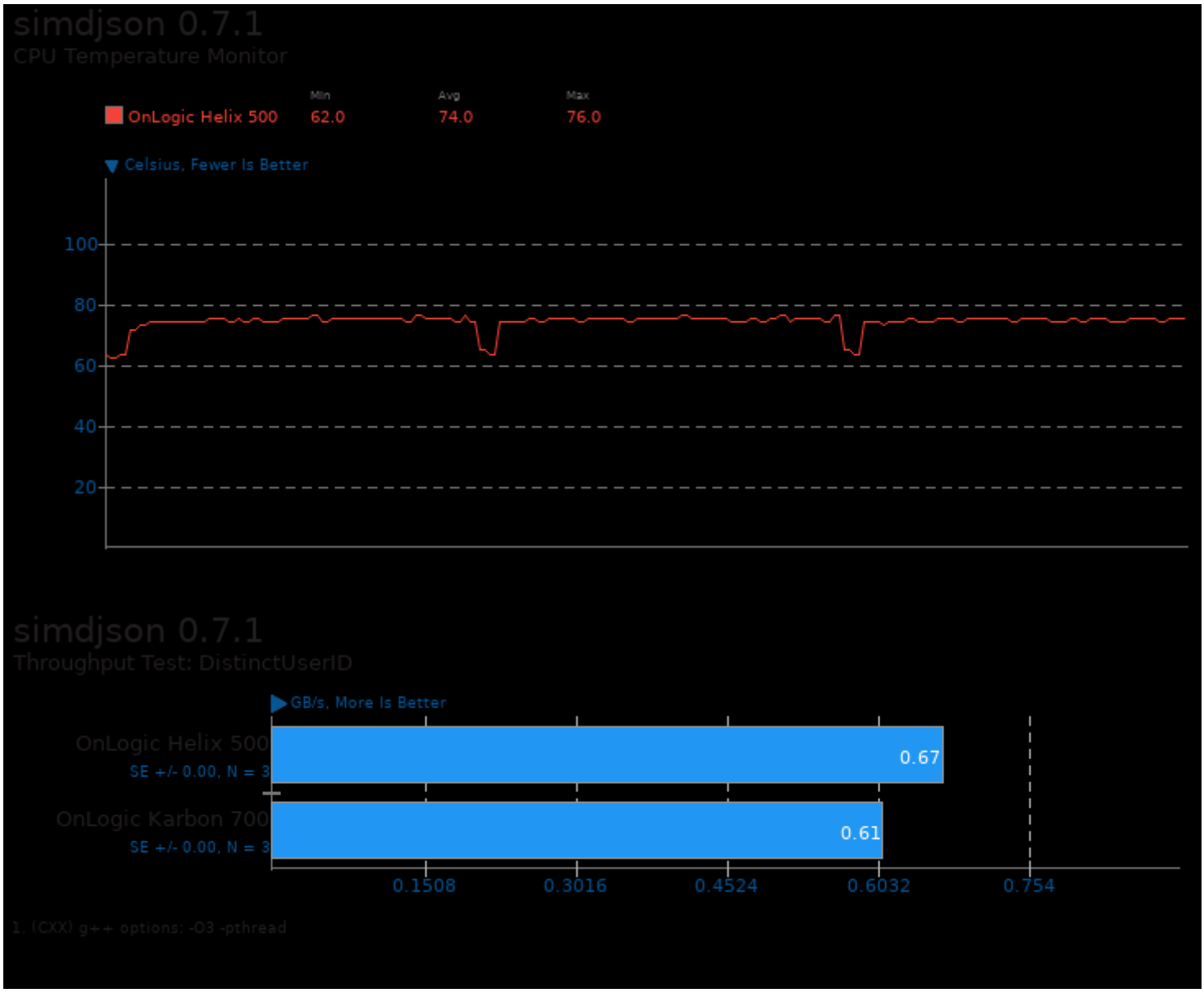

NCNN 20201218
Target: CPU - Model: efficientnet-b0
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.17, N = 3
MIN: 7.55 / MAX: 10.38
9.41
OnLogic Karbon 700
SE +/- 0.03, N = 3
MIN: 9.87 / MAX: 10.9
10.06
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: googlenet
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.01, N = 3
MIN: 18.66 / MAX: 21.99
19.18
OnLogic Karbon 700
SE +/- 0.31, N = 3
MIN: 21.09 / MAX: 23.11
22.06
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: vgg16
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.03, N = 3
MIN: 67.97 / MAX: 79.66
68.42
OnLogic Karbon 700
SE +/- 0.12, N = 3
MIN: 116.11 / MAX: 126.04
116.92
30
60
90
120
150
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: resnet18
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.02, N = 3
MIN: 17.2 / MAX: 20.93
18.17
OnLogic Karbon 700
SE +/- 0.02, N = 3
MIN: 23.7 / MAX: 25.29
24.18
6
12
18
24
30
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

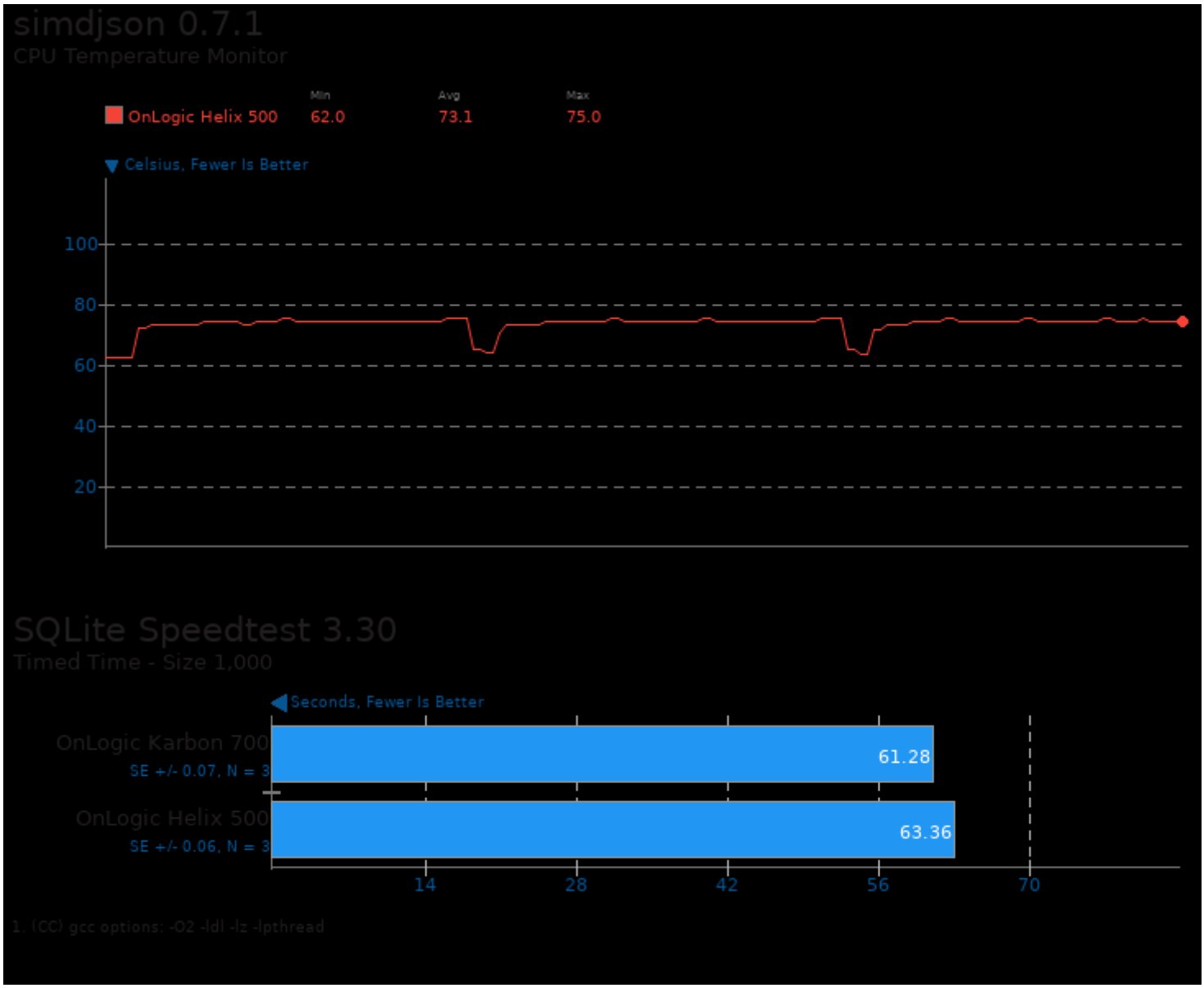

NCNN 20201218
Target: CPU - Model: alexnet
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.07, N = 3
MIN: 14.48 / MAX: 16.21
15.31
OnLogic Karbon 700
SE +/- 0.04, N = 3
MIN: 20.8 / MAX: 22.36
21.08
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: resnet50
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.18, N = 3
MIN: 34.97 / MAX: 119.89
36.39
OnLogic Karbon 700
SE +/- 0.06, N = 3
MIN: 41.18 / MAX: 52.55
43.37
10
20
30
40
50
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: yolov4-tiny
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.38, N = 3
MIN: 33.91 / MAX: 37.21
35.02
OnLogic Karbon 700
SE +/- 0.05, N = 3
MIN: 40.38 / MAX: 41.82
40.74
9
18
27
36
45
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: squeezenet_ssd
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.11, N = 3
MIN: 26.13 / MAX: 29.38
26.80
OnLogic Karbon 700
SE +/- 0.02, N = 3
MIN: 28.2 / MAX: 29.61
28.56
7
14
21
28
35
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


TNN 0.2.3
Target: CPU - Model: MobileNet v2
ms, Fewer Is Better
OnLogic Helix 500
SE +/- 0.41, N = 3
MIN: 365.5 / MAX: 368.07
366.52
OnLogic Karbon 700
SE +/- 0.39, N = 3
MIN: 367.15 / MAX: 370.37
368.05
80
160
240
320
400
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl
TNN 0.2.3
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
68.0
79.1
84.0
Celsius, Fewer Is Better
100
80
60
40
20
simdjson 0.7.1
Throughput Test: PartialTweets
GB/s, More Is Better
OnLogic Helix 500
SE +/- 0.00, N = 3
0.65
OnLogic Karbon 700
SE +/- 0.00, N = 3
0.60
0.1463
0.2926
0.4389
0.5852
0.7315
1. (CXX) g++ options: -O3 -pthread

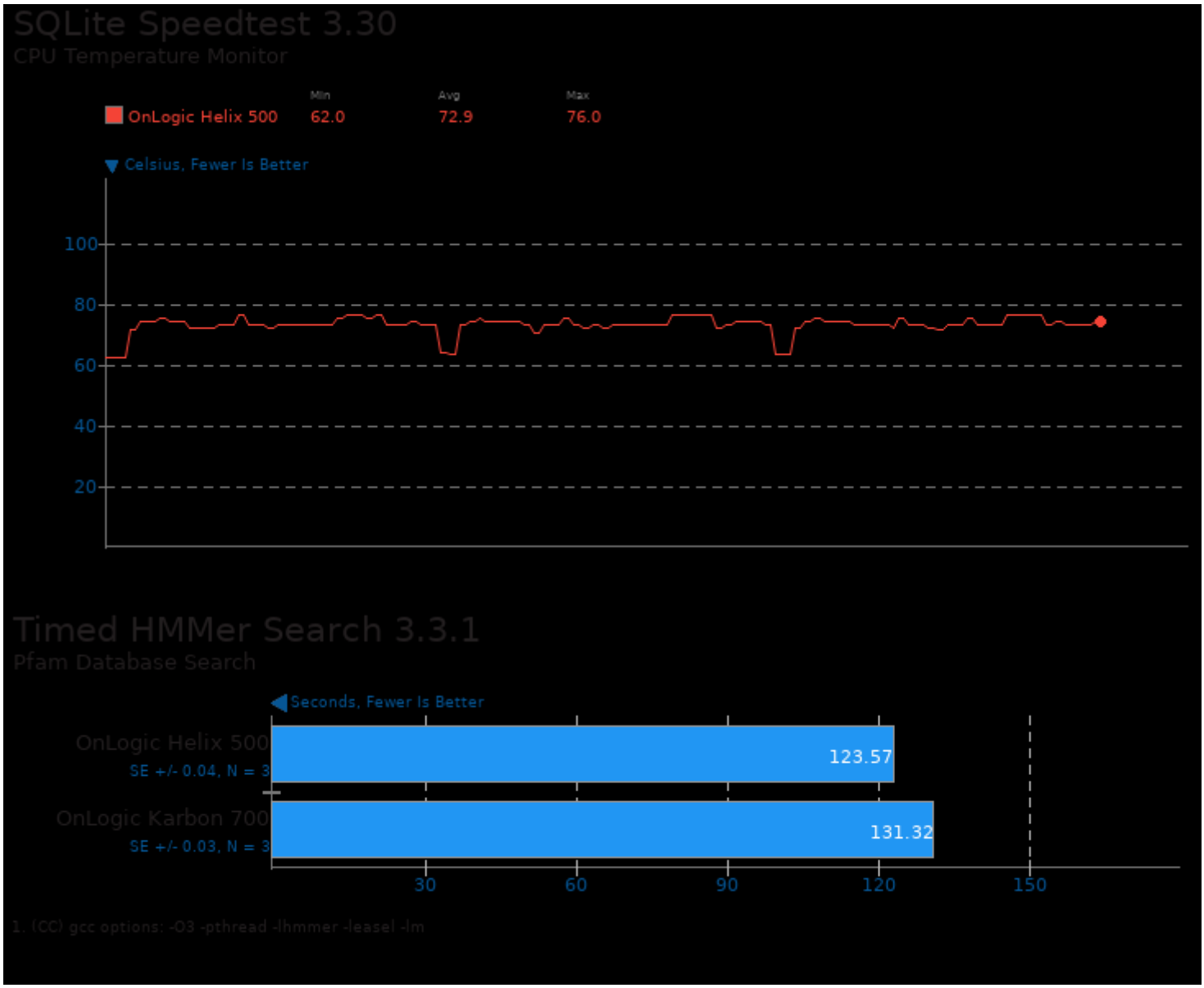

simdjson 0.7.1
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
64.0
75.3
77.0
Celsius, Fewer Is Better
100
80
60
40
20
simdjson 0.7.1
Throughput Test: LargeRandom
GB/s, More Is Better
OnLogic Helix 500
SE +/- 0.00, N = 3
0.38
OnLogic Karbon 700
SE +/- 0.00, N = 3
0.37
0.0855
0.171
0.2565
0.342
0.4275
1. (CXX) g++ options: -O3 -pthread


simdjson 0.7.1
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
63.0
74.7
76.0
Celsius, Fewer Is Better
100
80
60
40
20
simdjson 0.7.1
Throughput Test: Kostya
GB/s, More Is Better
OnLogic Helix 500
SE +/- 0.00, N = 3
0.59
OnLogic Karbon 700
SE +/- 0.00, N = 3
0.48
0.1328
0.2656
0.3984
0.5312
0.664
1. (CXX) g++ options: -O3 -pthread

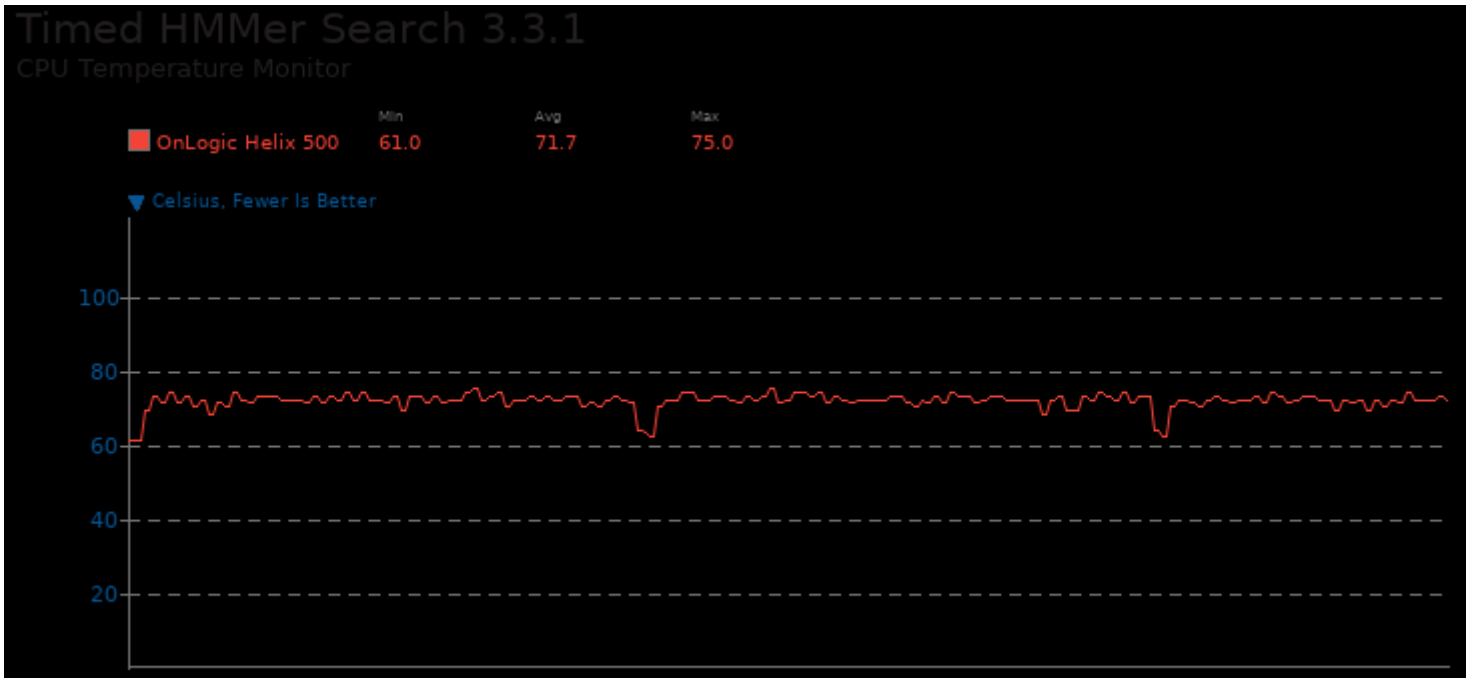

simdjson 0.7.1
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
62.0
74.0
76.0
Celsius, Fewer Is Better
100
80
60
40
20
simdjson 0.7.1
Throughput Test: DistinctUserID
GB/s, More Is Better
OnLogic Helix 500
SE +/- 0.00, N = 3
0.67
OnLogic Karbon 700
SE +/- 0.00, N = 3
0.61
0.1508
0.3016
0.4524
0.6032
0.754
1. (CXX) g++ options: -O3 -pthread

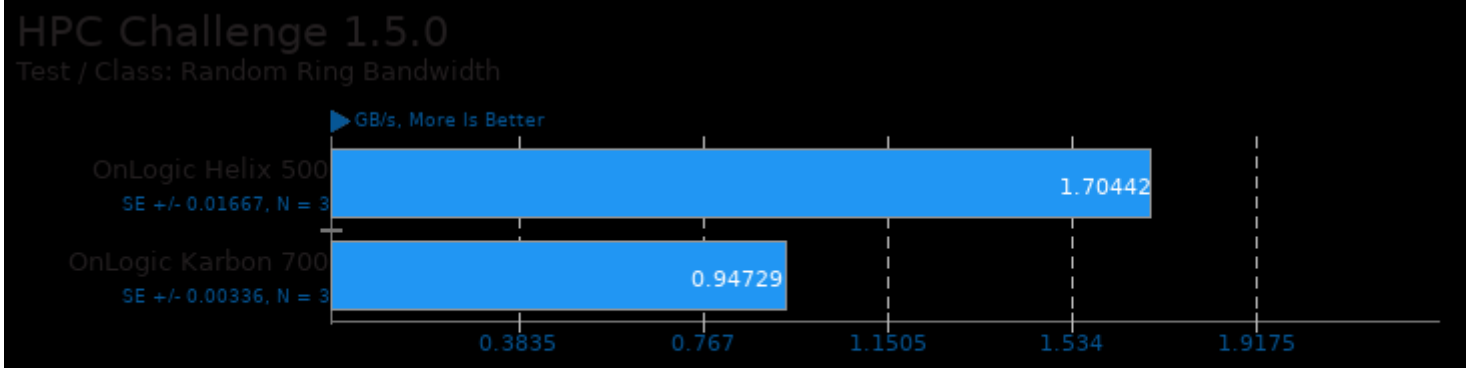

simdjson 0.7.1
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
62.0
73.1
75.0
Celsius, Fewer Is Better
100
80
60
40
20
SQLite Speedtest 3.30
Timed Time - Size 1,000
Seconds, Fewer Is Better
OnLogic Karbon 700
SE +/- 0.07, N = 3
61.28
OnLogic Helix 500
SE +/- 0.06, N = 3
63.36
14
28
42
56
70
1. (CC) gcc options: -O2 -ldl -lz -lpthread

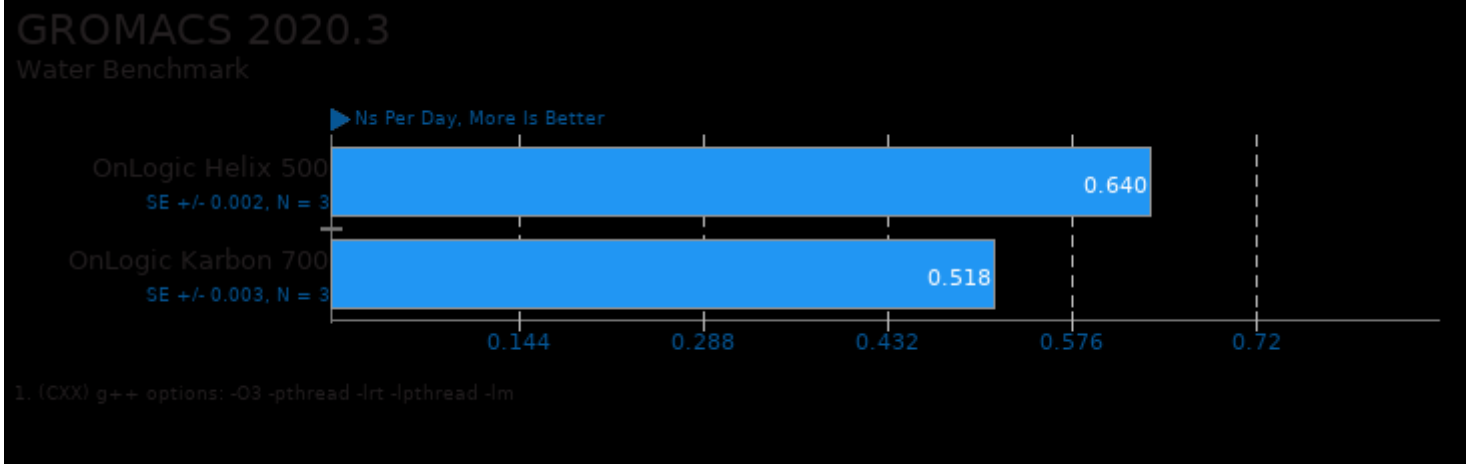
OnLogic Helix 500 Linux benchmarks

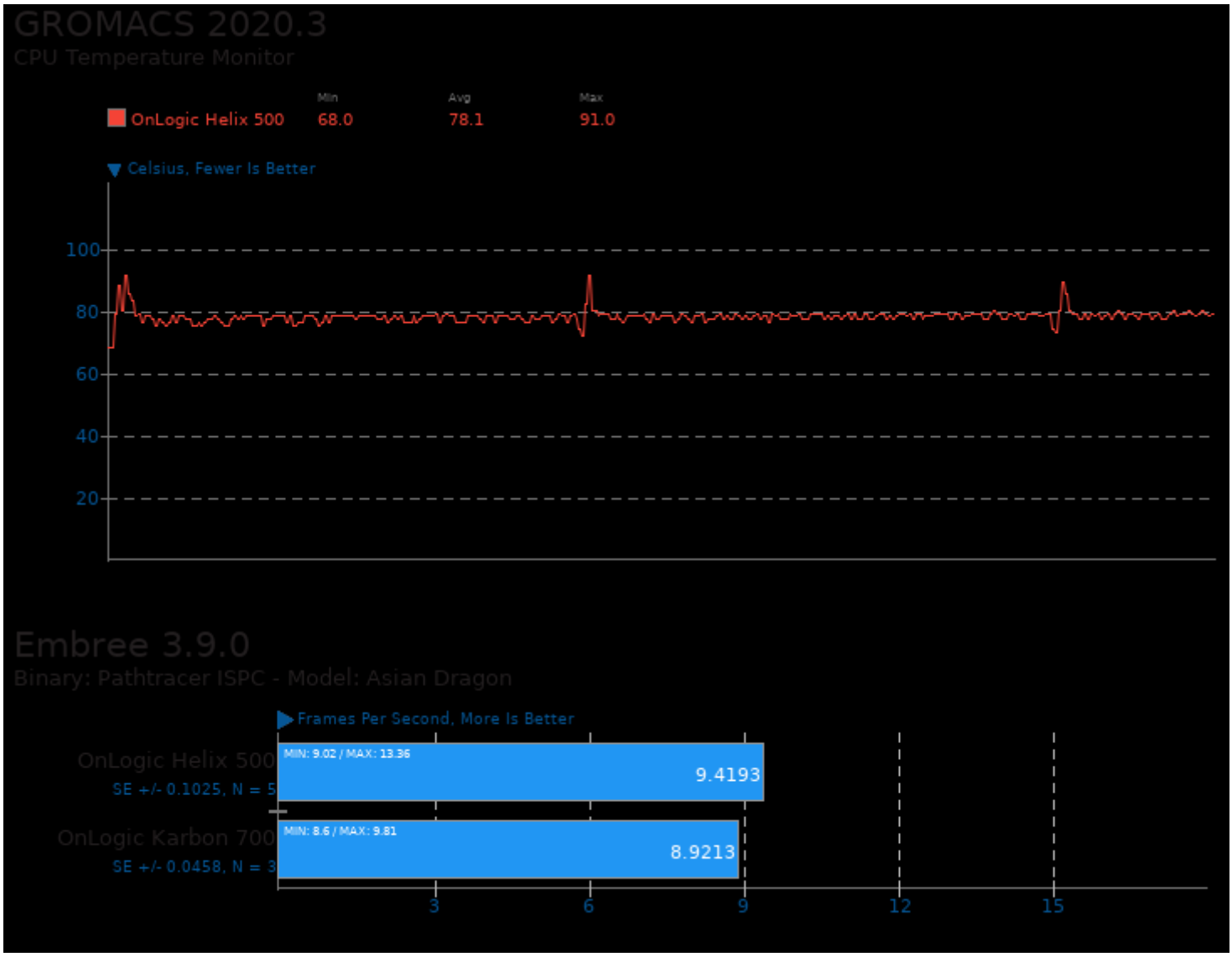


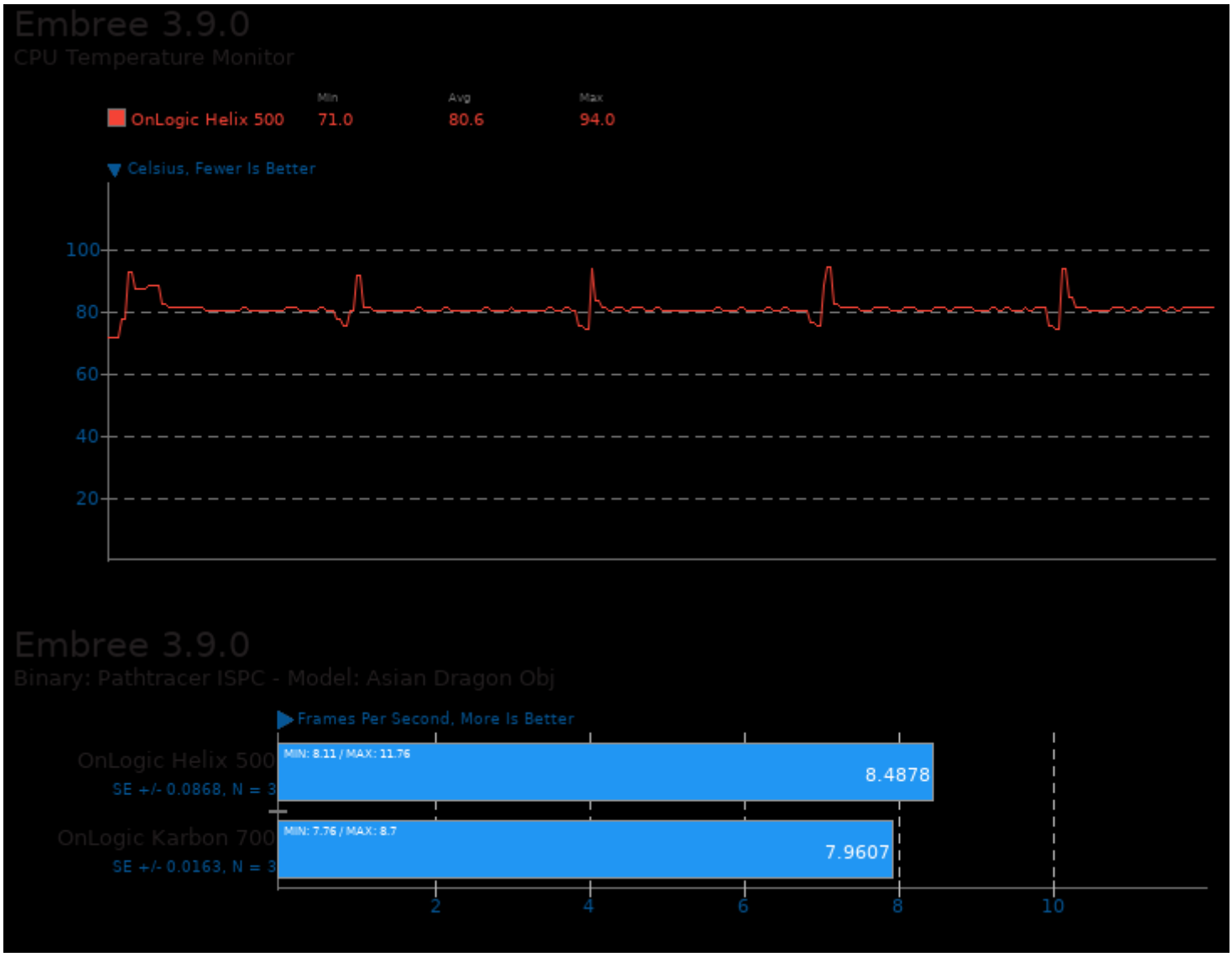
OnLogic Helix 500 Linux benchmarks

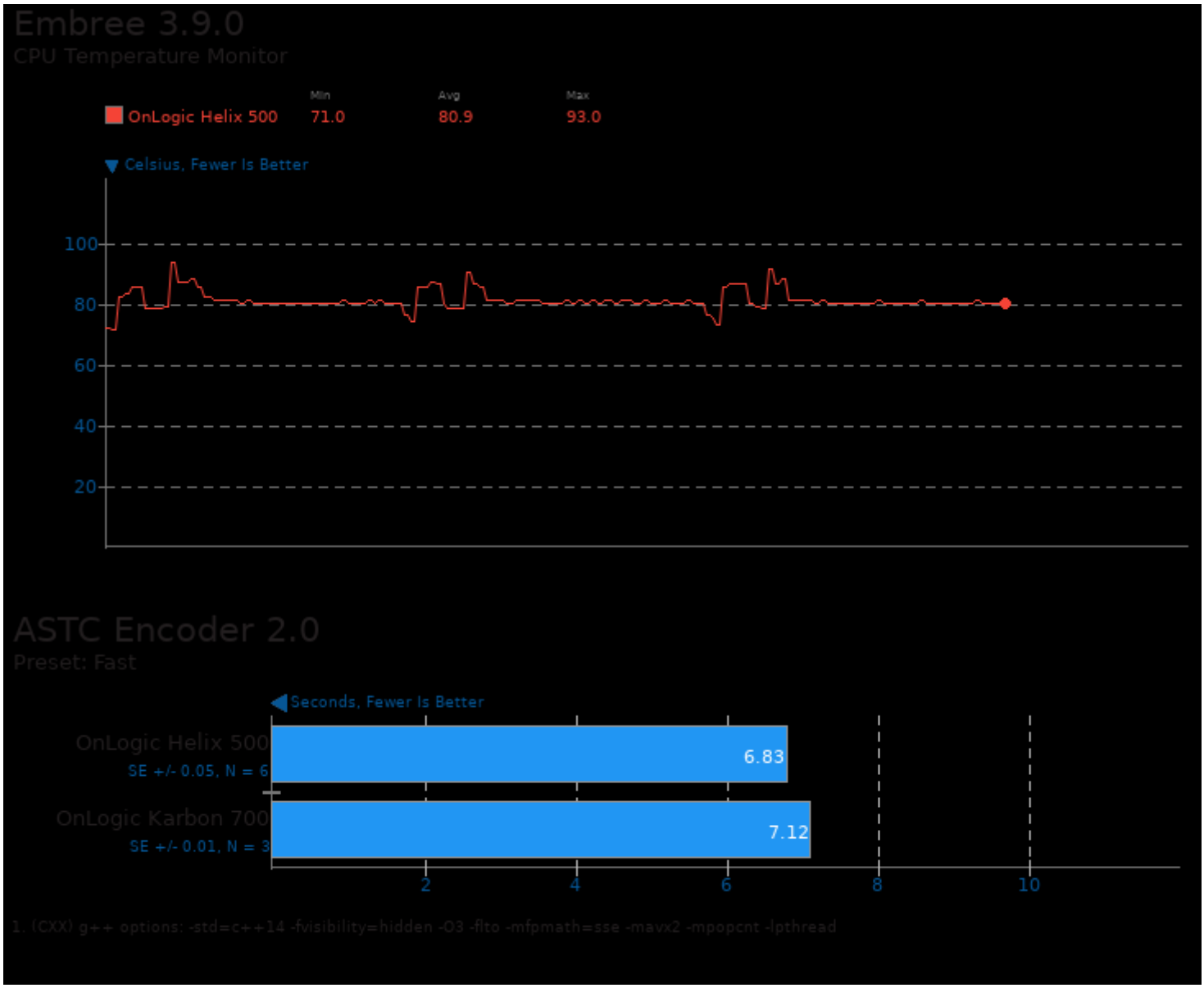




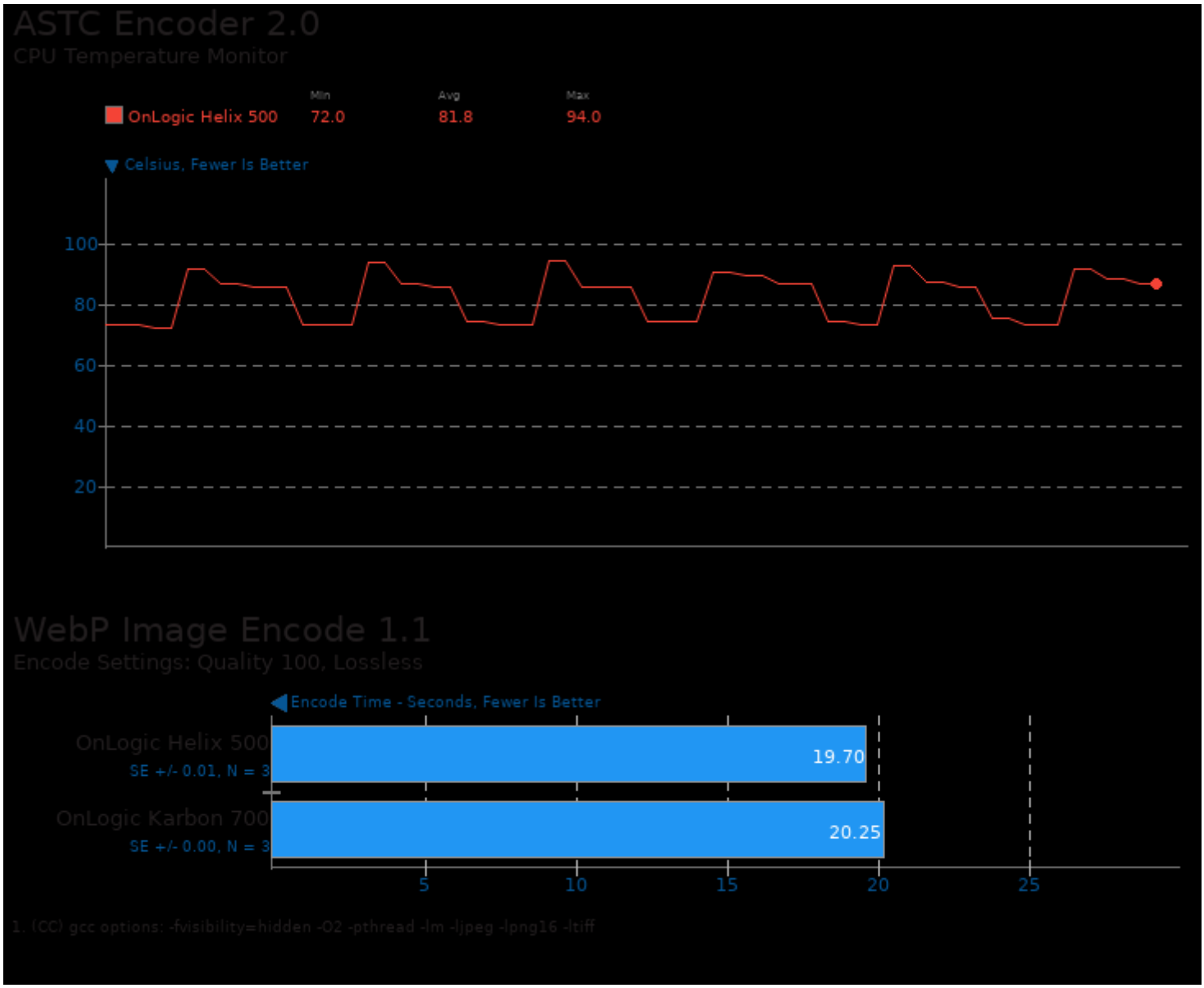


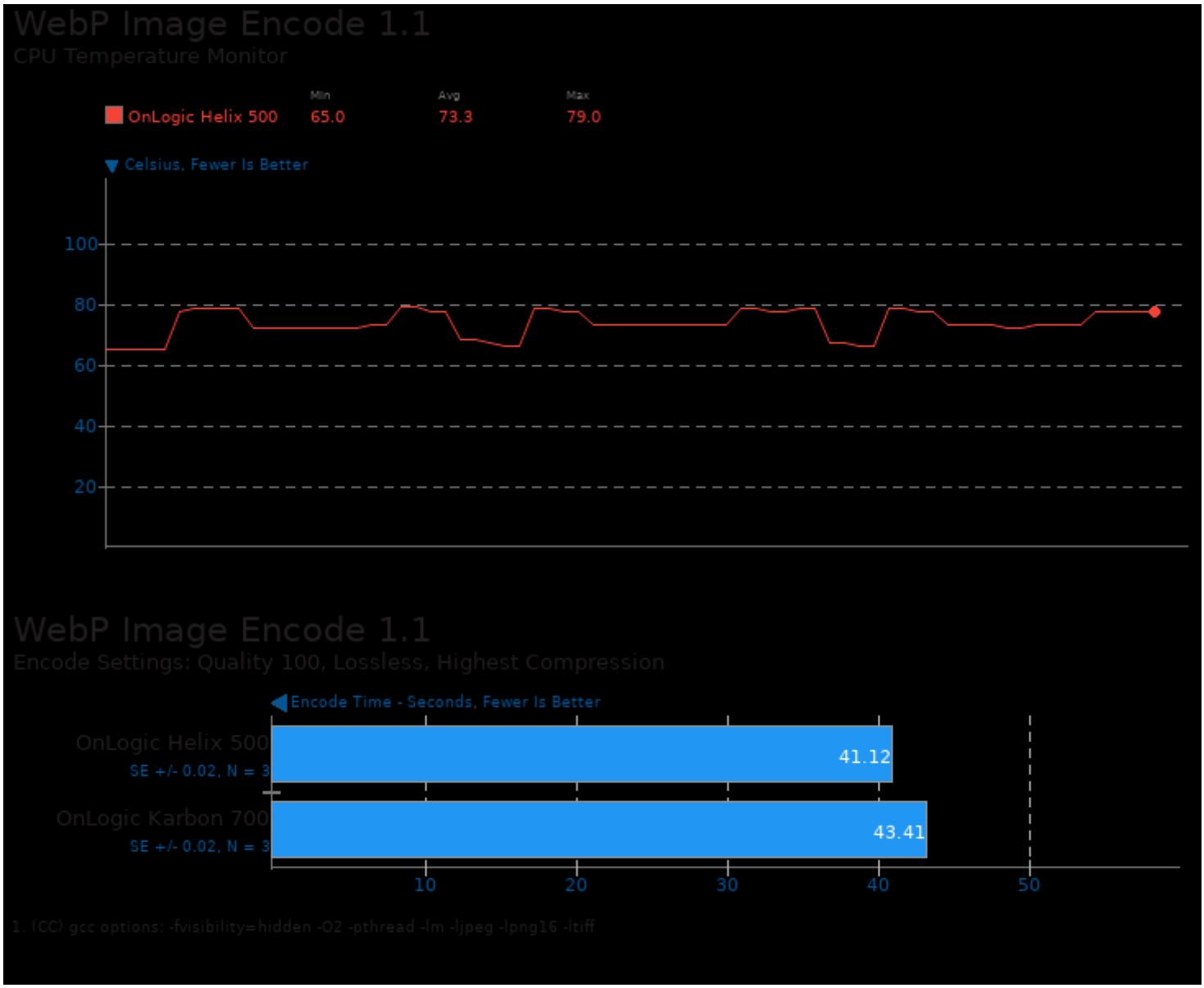

GROMACS 2020.3
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
68.0
78.1
91.0
Celsius, Fewer Is Better
100
80
60
40
20
Embree 3.9.0
Binary: Pathtracer ISPC - Model: Asian Dragon
Frames Per Second, More Is Better
OnLogic Helix 500
SE +/- 0.1025, N = 5
MIN: 9.02 / MAX: 13.36
9.4193
OnLogic Karbon 700
SE +/- 0.0458, N = 3
MIN: 8.6 / MAX: 9.81
8.9213
3
6
9
12
15


Embree 3.9.0
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
71.0
80.6
94.0
Celsius, Fewer Is Better
100
80
60
40
20
Embree 3.9.0
Binary: Pathtracer ISPC - Model: Asian Dragon Obj
Frames Per Second, More Is Better
OnLogic Helix 500
SE +/- 0.0868, N = 3
MIN: 8.11 / MAX: 11.76
8.4878
OnLogic Karbon 700
SE +/- 0.0163, N = 3
MIN: 7.76 / MAX: 8.7
7.9607
2
4
6
8
10

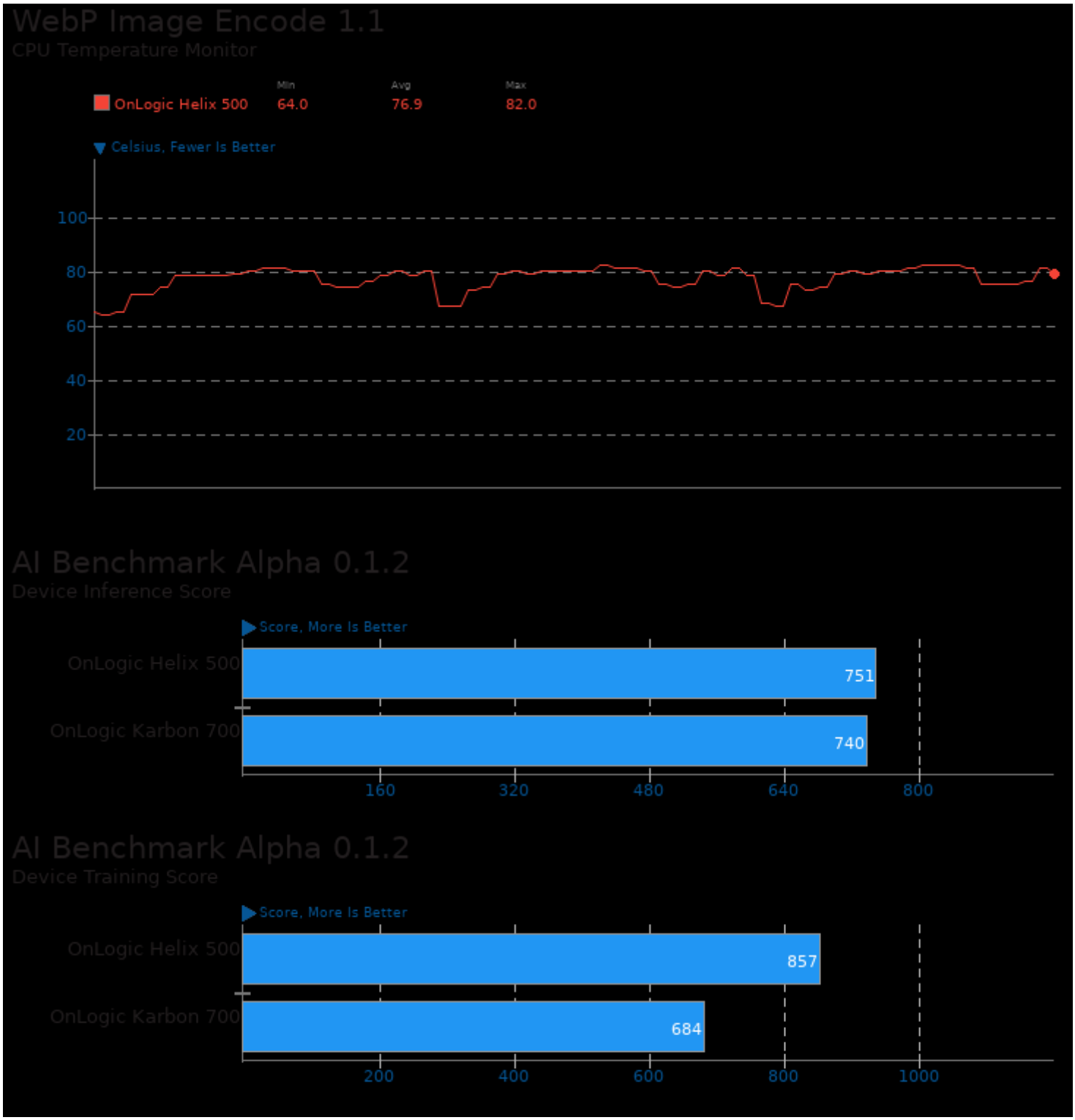

Embree 3.9.0
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
71.0
80.9
93.0
Celsius, Fewer Is Better
100
80
60
40
20
ASTC Encoder 2.0
Preset: Fast
Seconds, Fewer Is Better
OnLogic Helix 500
SE +/- 0.05, N = 6
6.83
OnLogic Karbon 700
SE +/- 0.01, N = 3
7.12
2
4
6
8
10
1. (CXX) g++ options: -std=c++14 -fvisibility=hidden -O3 -flto -mfpmath=sse -mavx2 -mpopcnt -lpthread

OnLogic Helix 500 Linux benchmarks

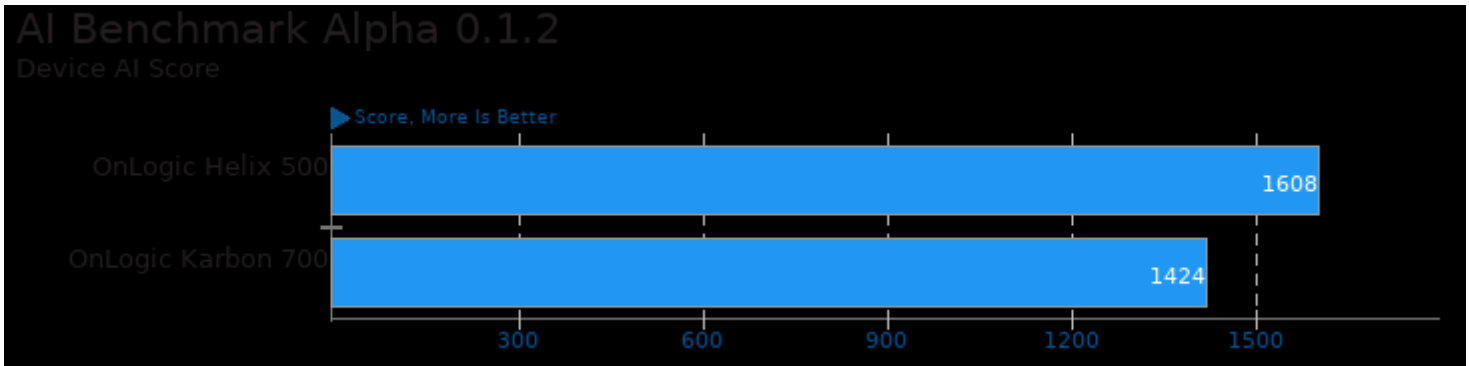


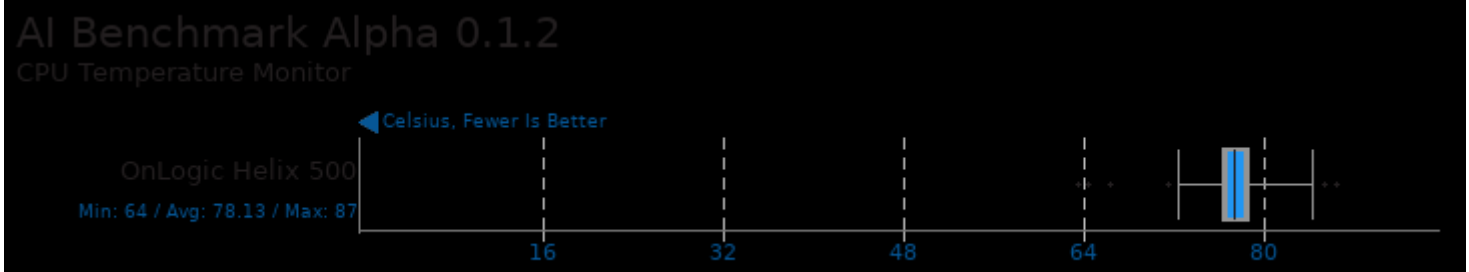

WebP Image Encode 1.1
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
65.0
73.3
79.0
Celsius, Fewer Is Better
100
80
60
40
20
WebP Image Encode 1.1
Encode Settings: Quality 100, Lossless, Highest Compression
Encode Time - Seconds, Fewer Is Better
OnLogic Helix 500
SE +/- 0.02, N = 3
41.12
OnLogic Karbon 700
SE +/- 0.02, N = 3
43.41
10
20
30
40
50
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg -lpng16 -ltiff

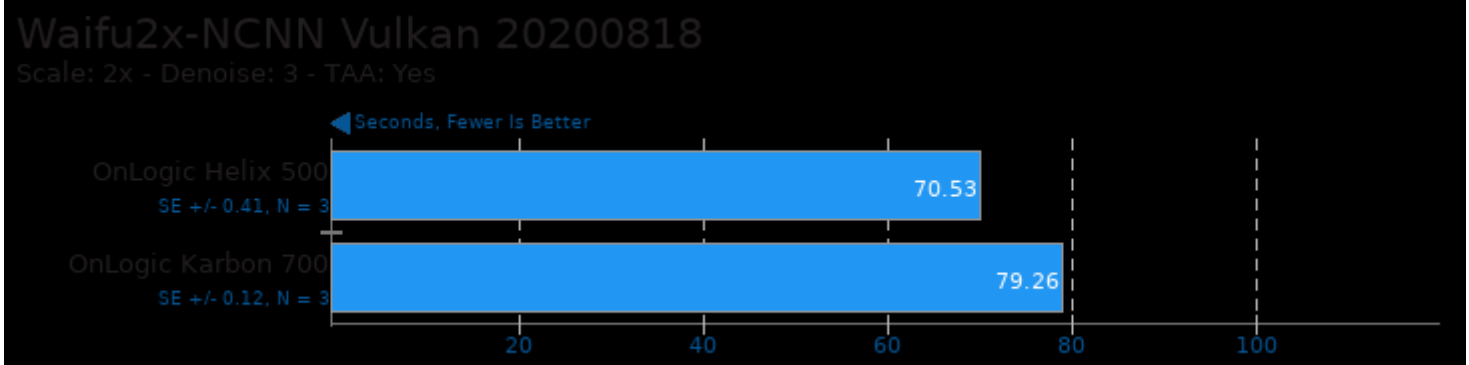
OnLogic Helix 500 Linux benchmarks

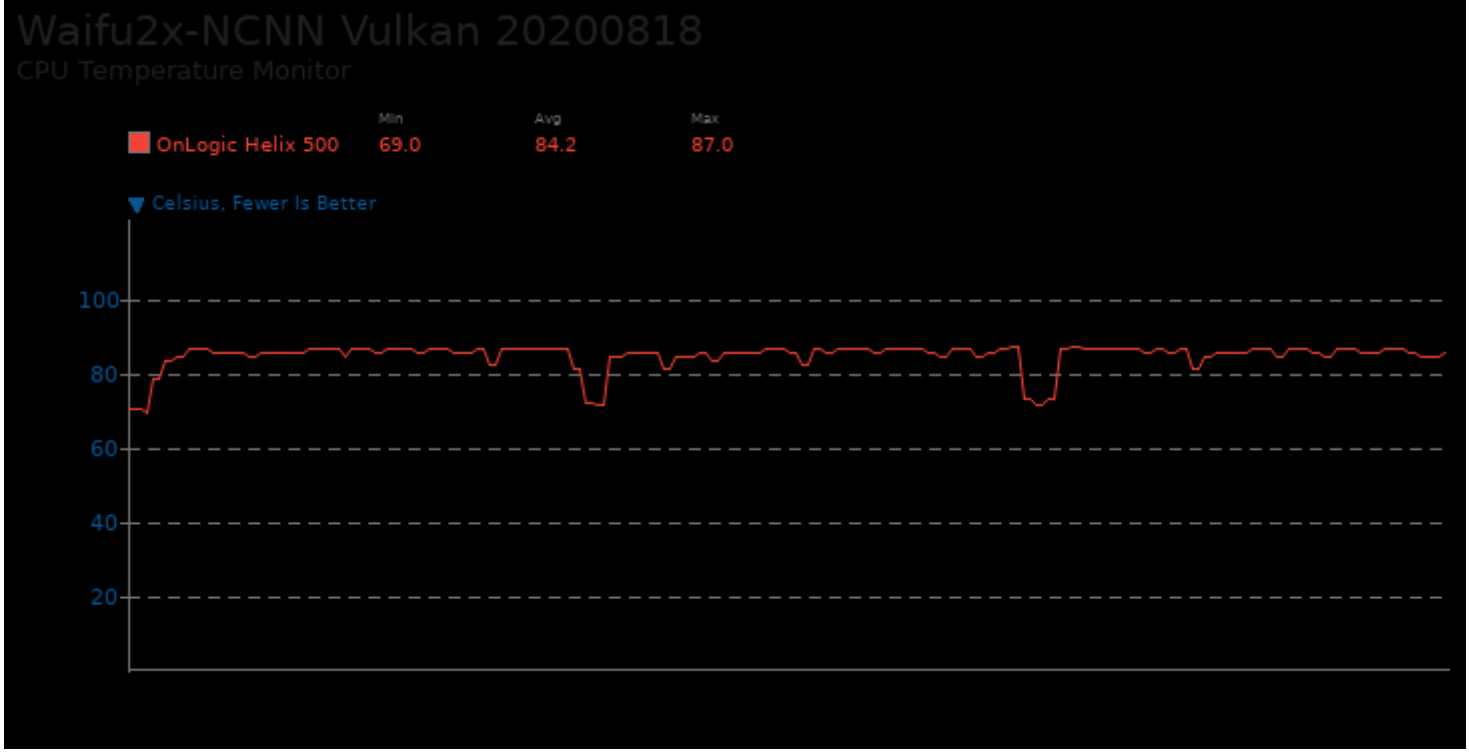


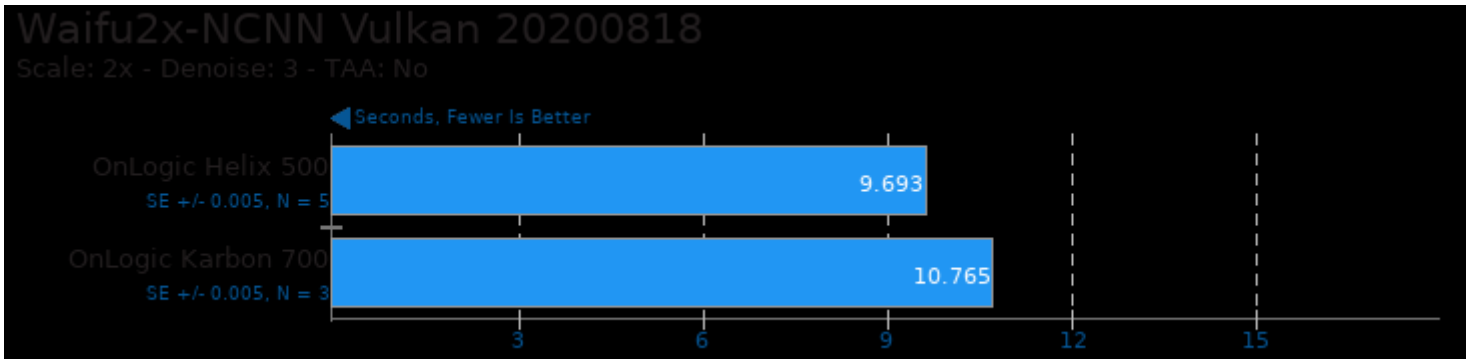
OnLogic Helix 500 Linux benchmarks

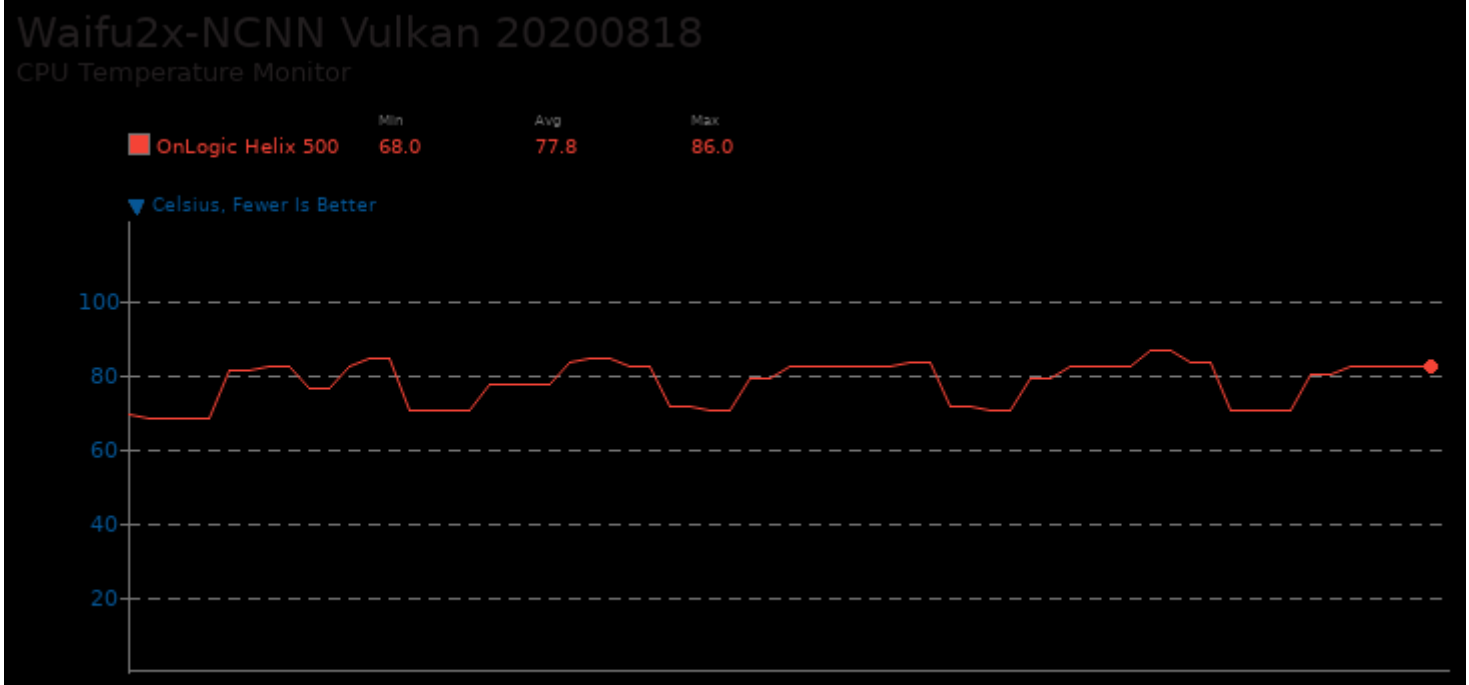


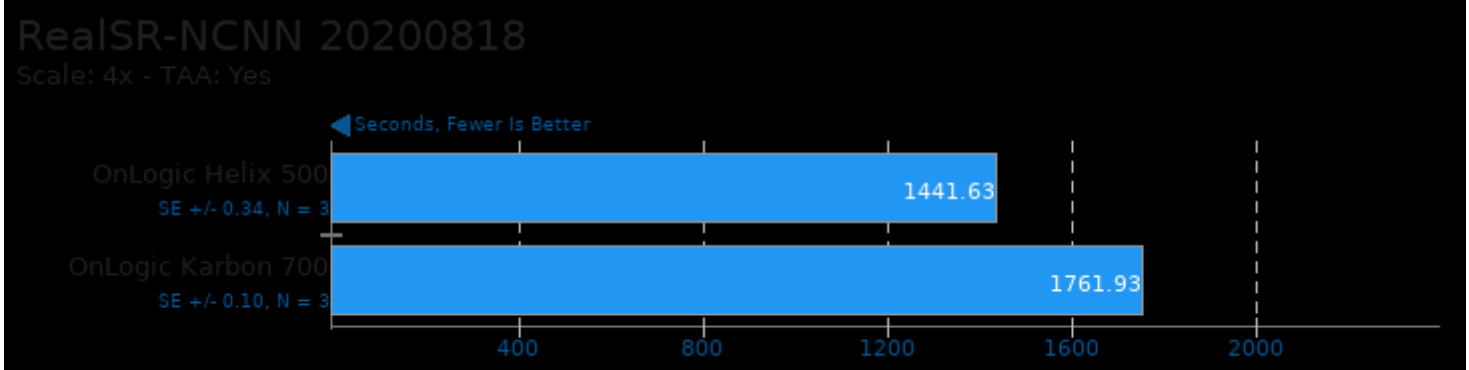


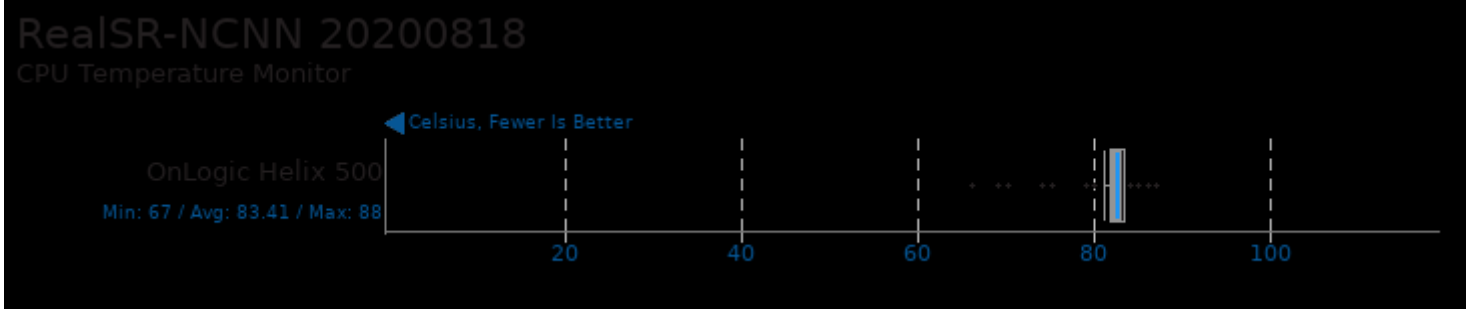


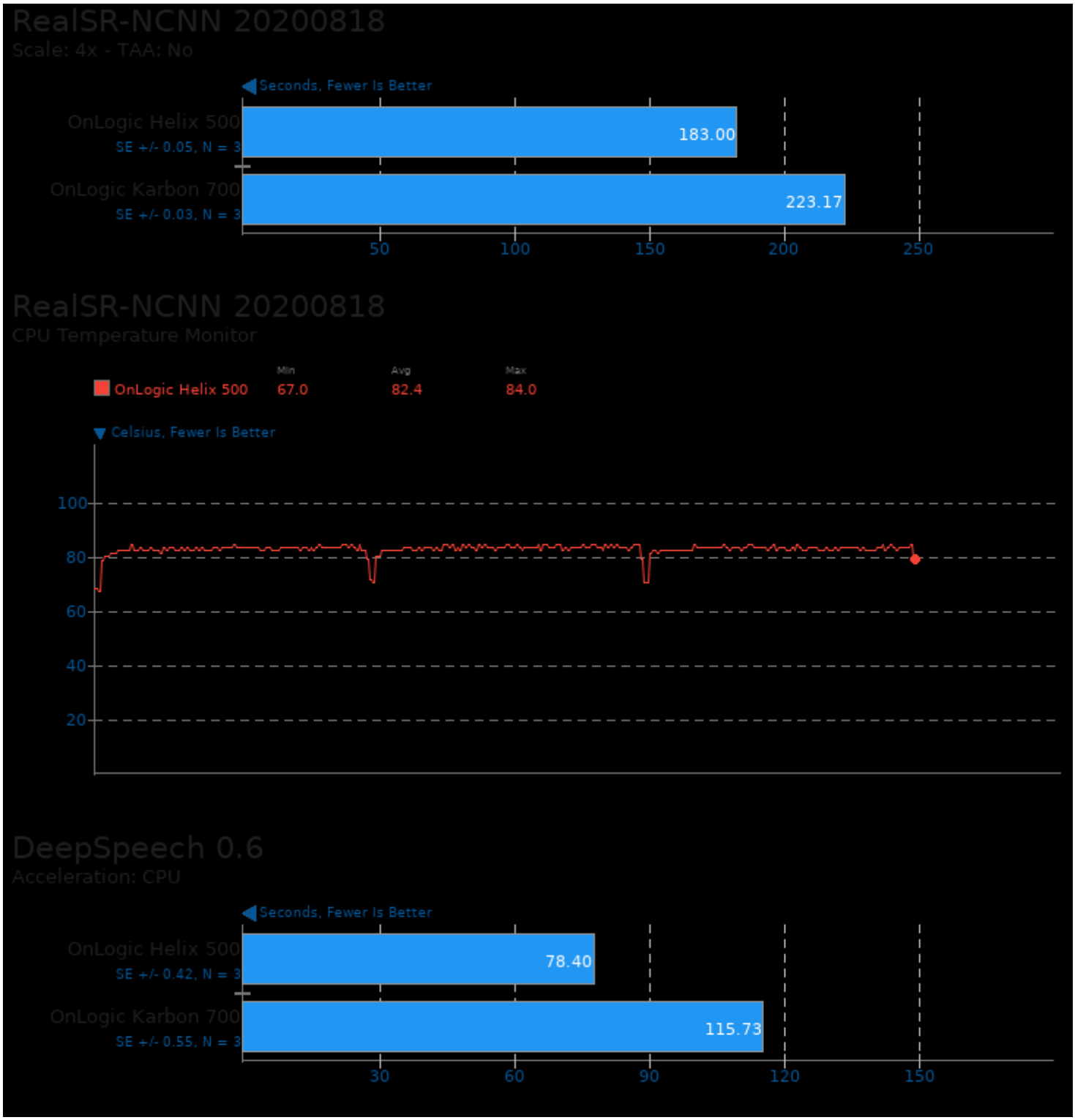


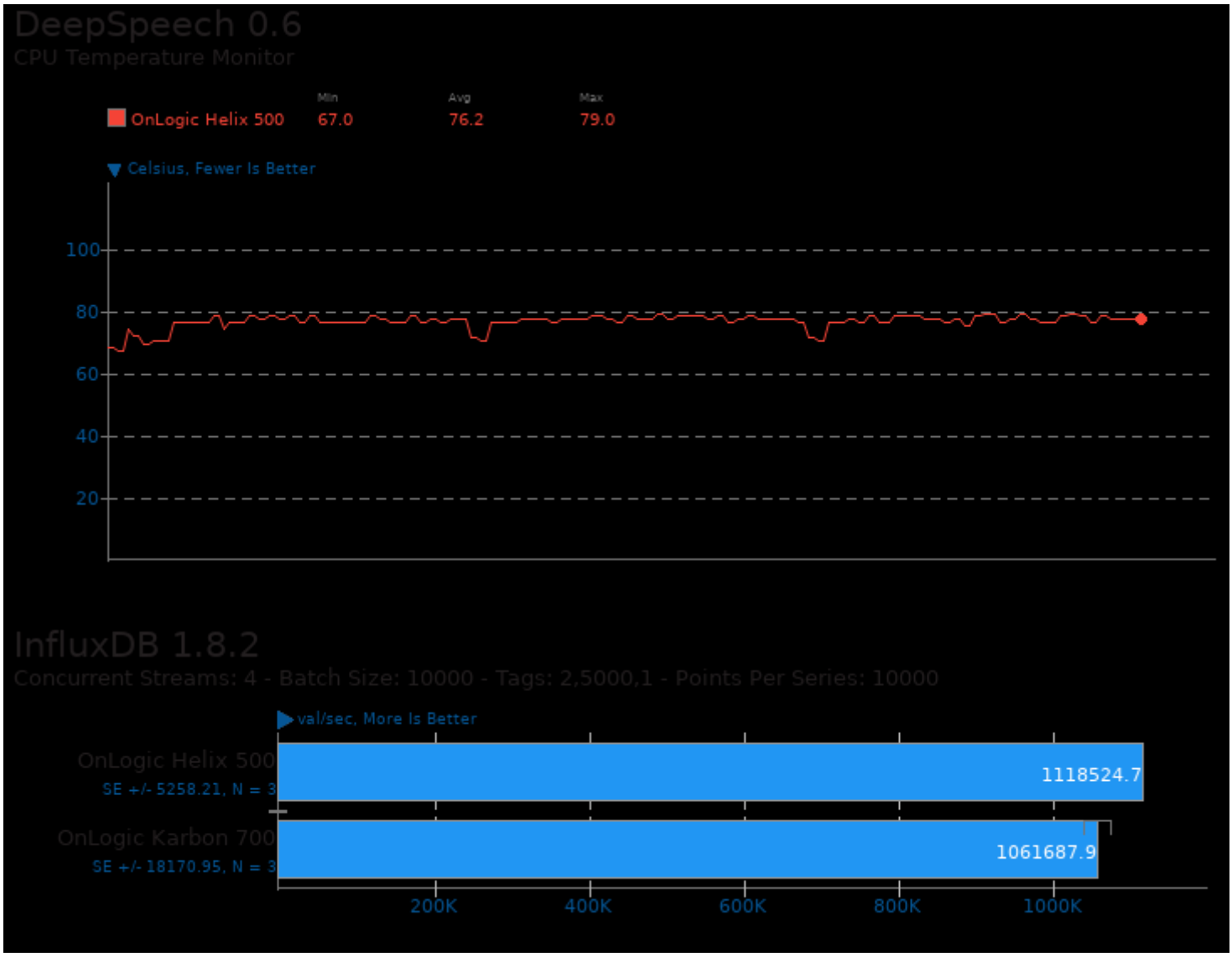

Waifu2x-NCNN Vulkan 20200818
Scale: 2x - Denoise: 3 - TAA: No
Seconds, Fewer Is Better
OnLogic Helix 500
SE +/- 0.005, N = 5
9.693
OnLogic Karbon 700
SE +/- 0.005, N = 3
10.765
3
6
9
12
15


Waifu2x-NCNN Vulkan 20200818
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
68.0
77.8
86.0
Celsius, Fewer Is Better
100
80
60
40
20

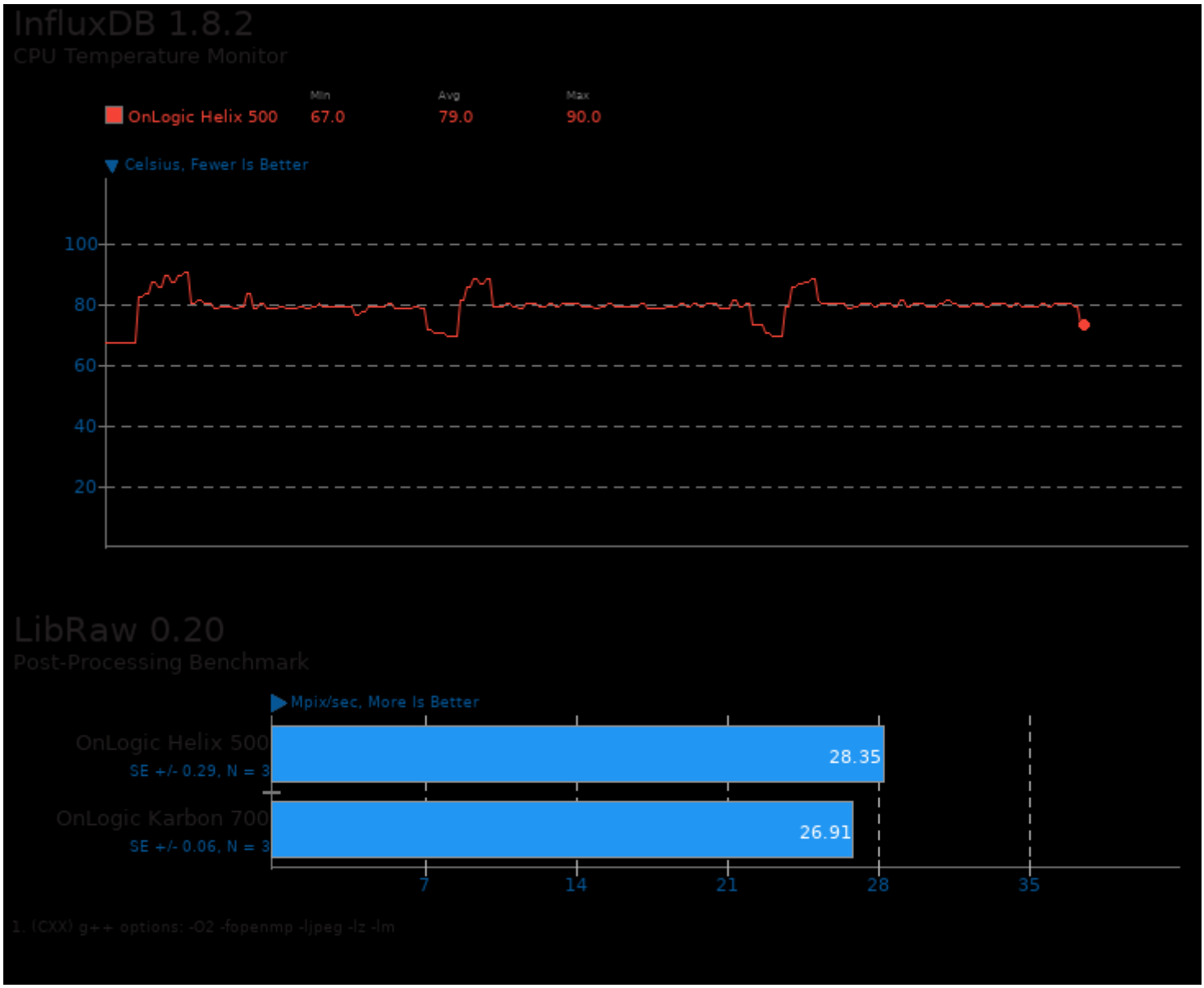

RealSR-NCNN 20200818
Scale: 4x - TAA: Yes
Seconds, Fewer Is Better
OnLogic Helix 500
SE +/- 0.34, N = 3
1441.63
OnLogic Karbon 700
SE +/- 0.10, N = 3
1761.93
400
800
1200
1600
2000


RealSR-NCNN 20200818
CPU Temperature Monitor
Celsius, Fewer Is Better
OnLogic Helix 500
Min: 67 / Avg: 83.41 / Max: 88
20
40
60
80
100

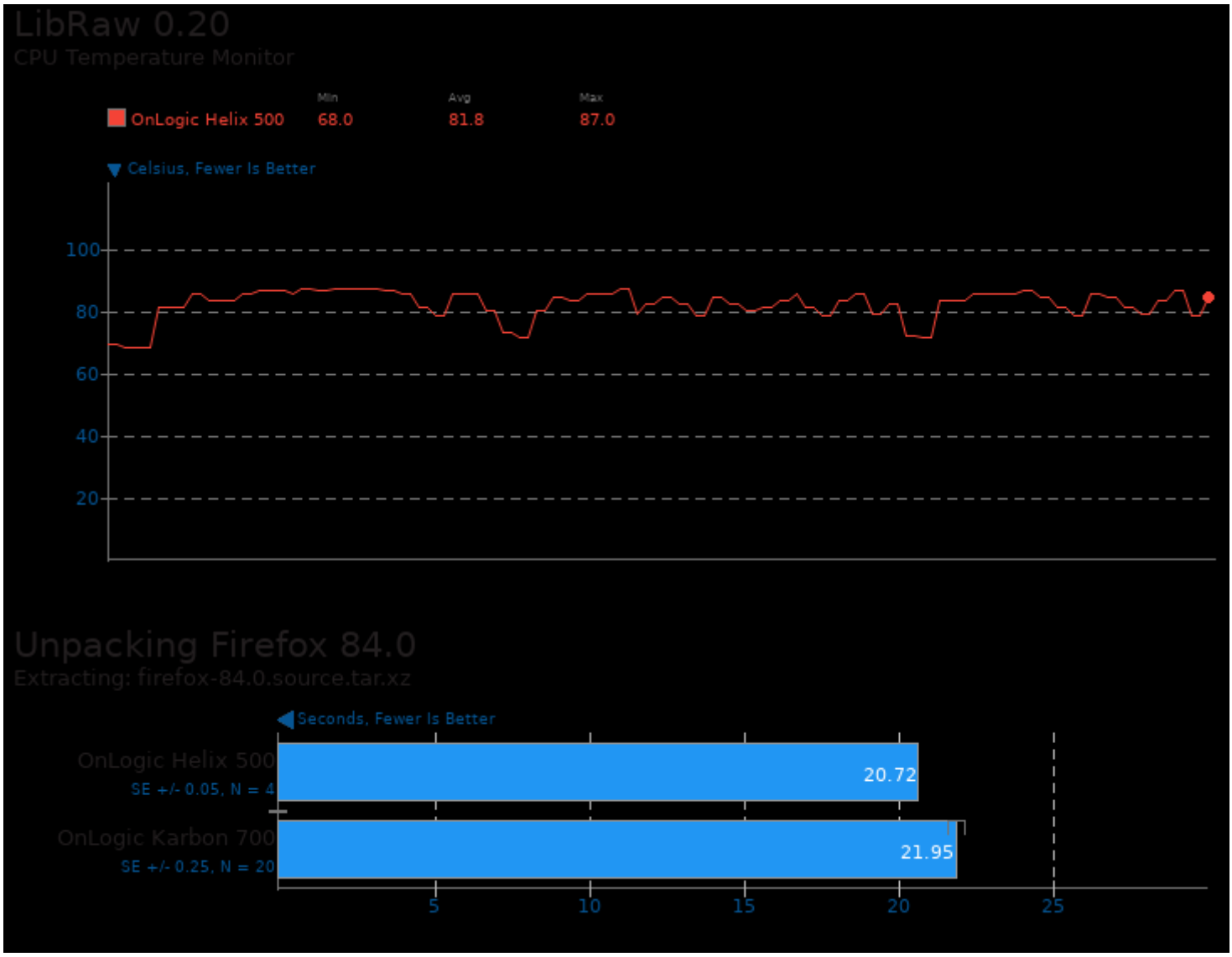

RealSR-NCNN 20200818
Scale: 4x - TAA: No
Seconds, Fewer Is Better
OnLogic Helix 500
SE +/- 0.05, N = 3
183.00
OnLogic Karbon 700
SE +/- 0.03, N = 3
223.17
50
100
150
200
250
RealSR-NCNN 20200818
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
67.0
82.4
84.0
Celsius, Fewer Is Better
100
80
60
40
20
DeepSpeech 0.6
Acceleration: CPU
Seconds, Fewer Is Better
OnLogic Helix 500
SE +/- 0.42, N = 3
78.40
OnLogic Karbon 700
SE +/- 0.55, N = 3
115.73
30
60
90
120
150


DeepSpeech 0.6
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
67.0
76.2
79.0
Celsius, Fewer Is Better
100
80
60
40
20
InfluxDB 1.8.2
Concurrent Streams: 4 - Batch Size: 10000 - Tags: 2,5000,1 - Points Per Series: 10000
val/sec, More Is Better
OnLogic Helix 500
SE +/- 5258.21, N = 3
1118524.7
OnLogic Karbon 700
SE +/- 18170.95, N = 3
1061687.9
200K
400K
600K
800K
1000K

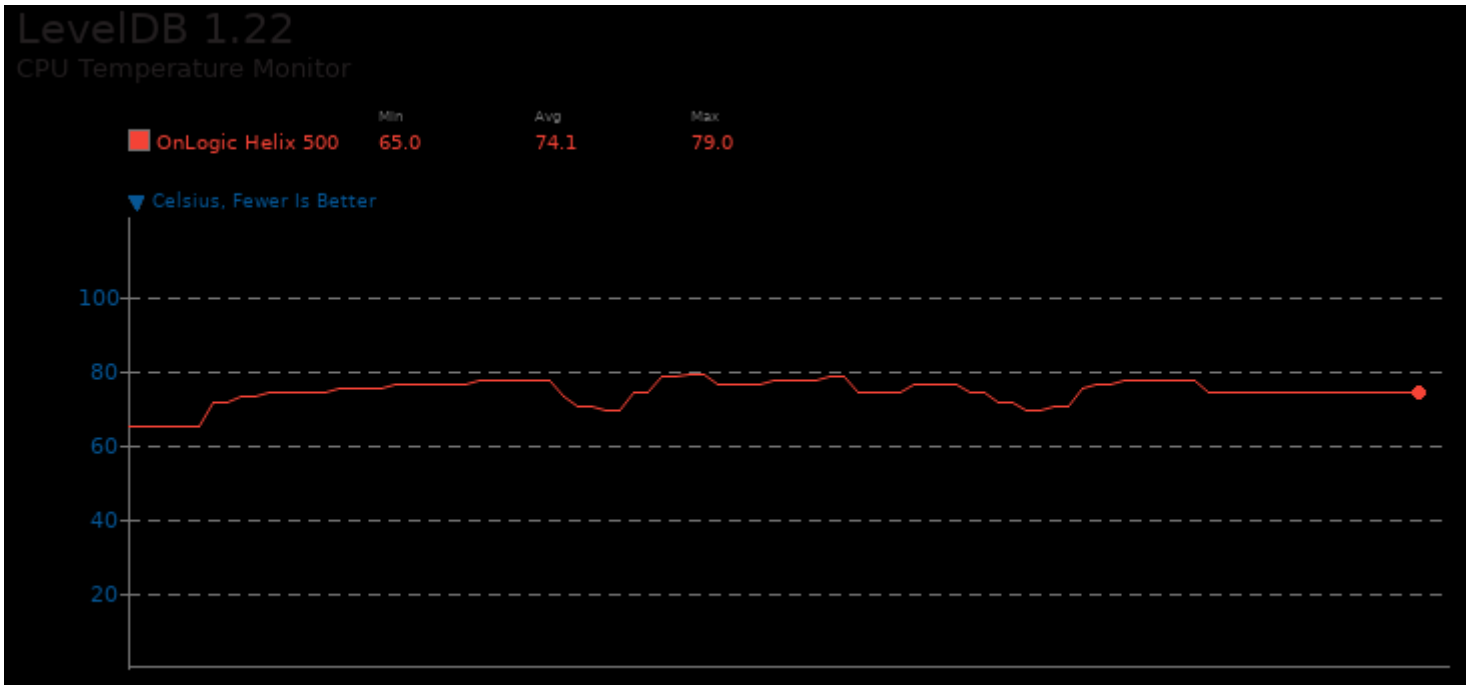
OnLogic Helix 500 Linux benchmarks

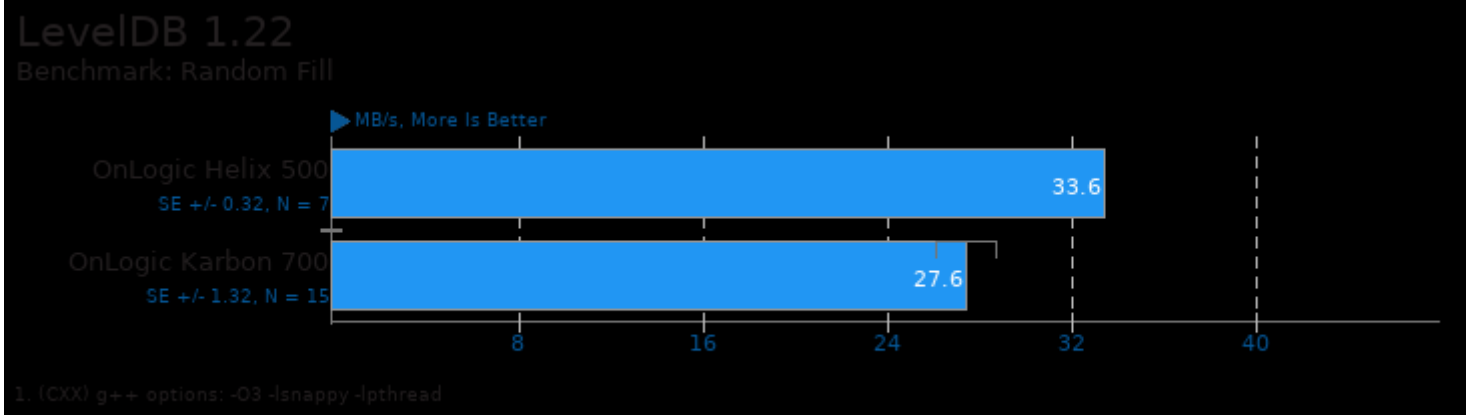


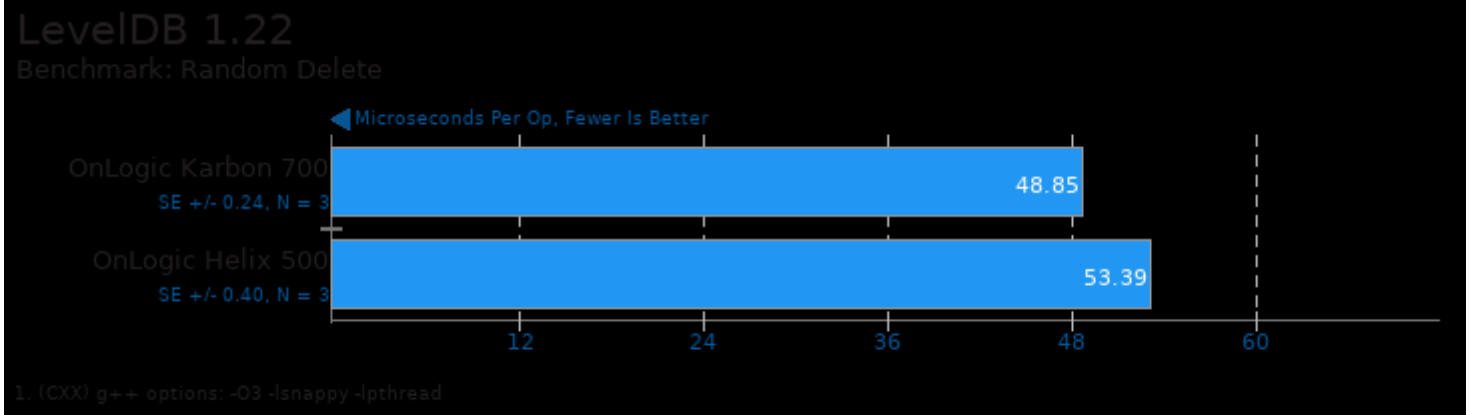
OnLogic Helix 500 Linux benchmarks

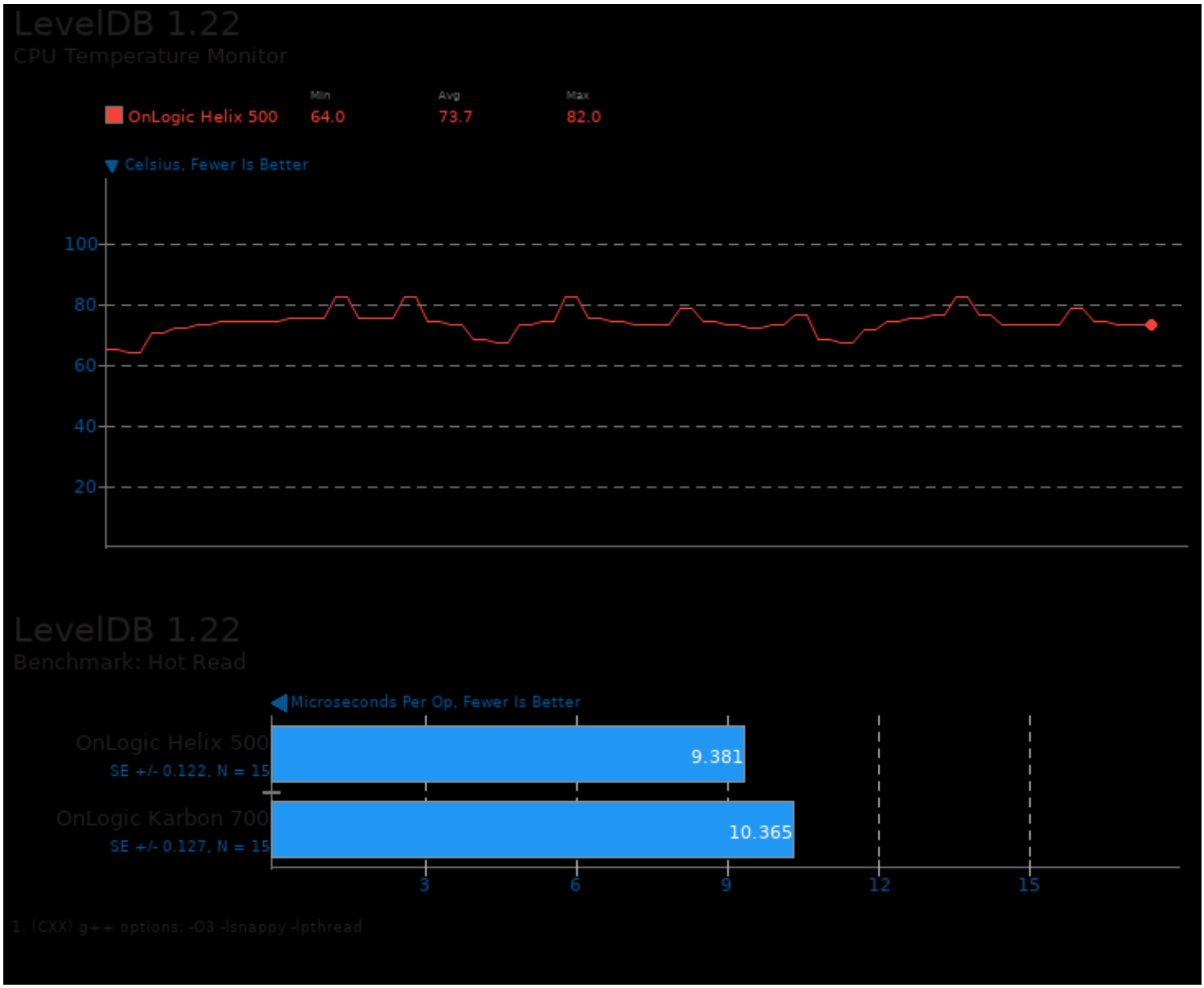


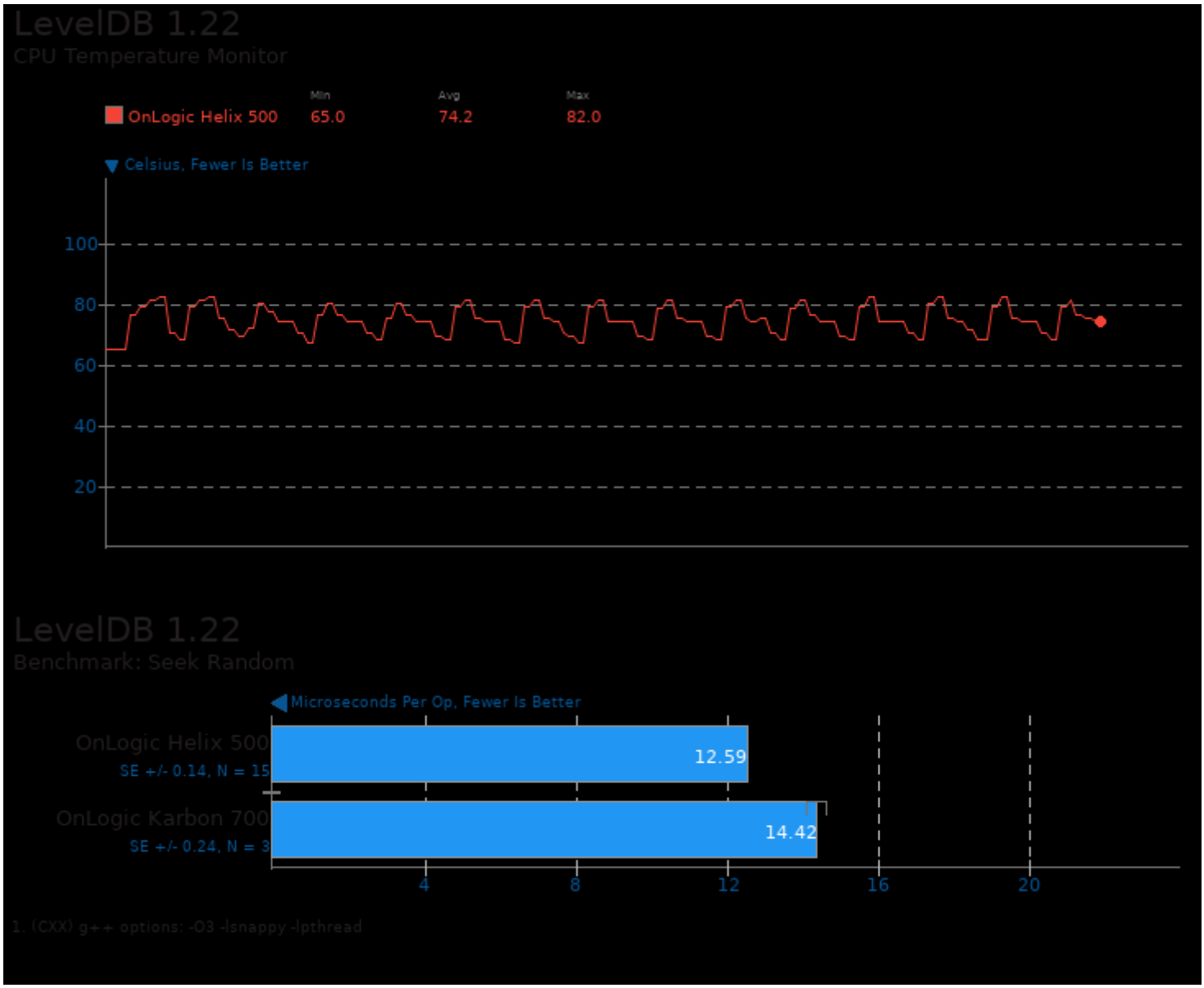
OnLogic Helix 500 Linux benchmarks

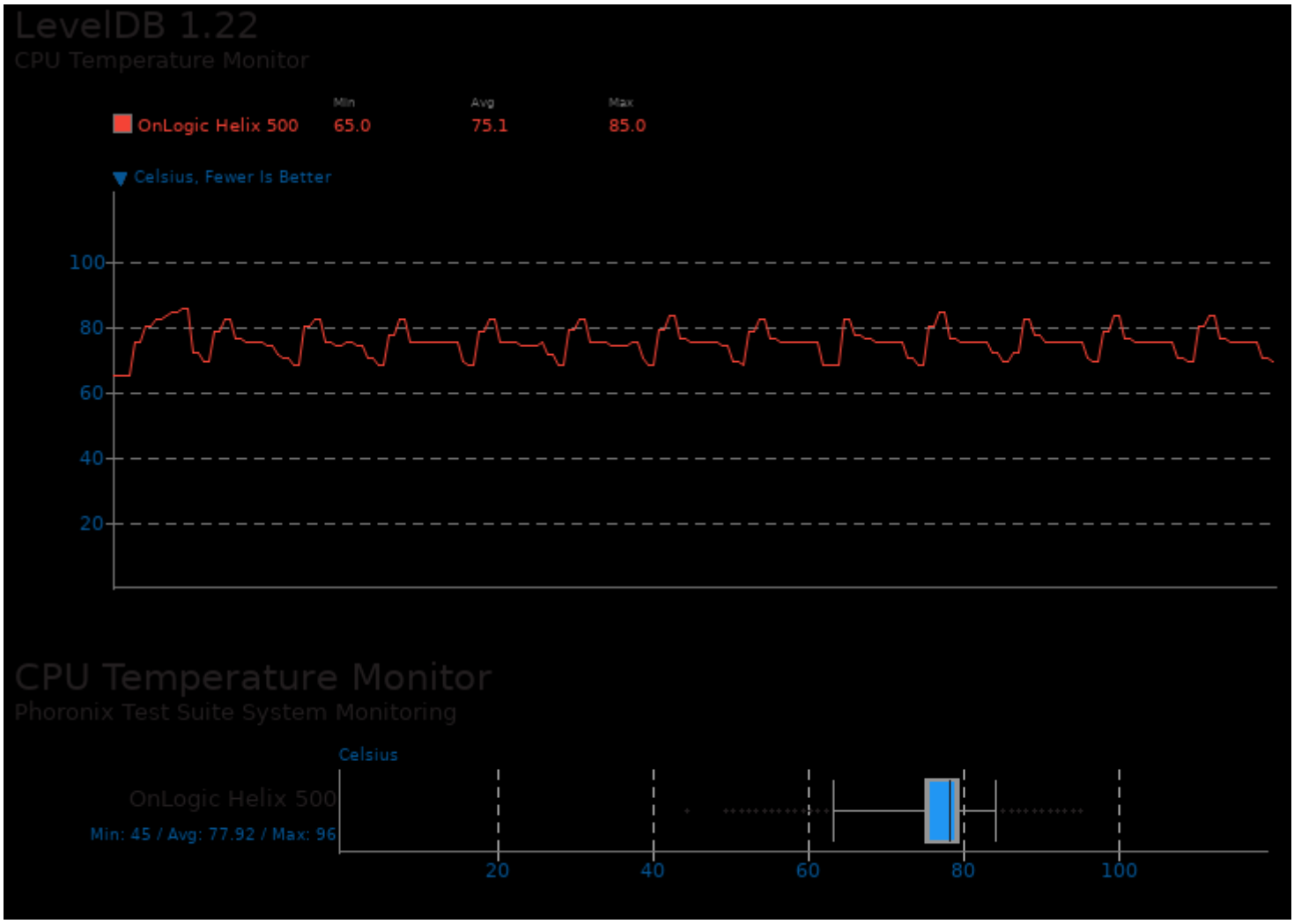

LevelDB 1.22
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
65.0
74.1
79.0
Celsius, Fewer Is Better
100
80
60
40
20


LevelDB 1.22
Benchmark: Random Fill
MB/s, More Is Better
OnLogic Helix 500
SE +/- 0.32, N = 7
33.6
OnLogic Karbon 700
SE +/- 1.32, N = 15
27.6
8
16
24
32
40
1. (CXX) g++ options: -O3 -lsnappy -lpthread


LevelDB 1.22
Benchmark: Random Delete
Microseconds Per Op, Fewer Is Better
OnLogic Karbon 700
SE +/- 0.24, N = 3
48.85
OnLogic Helix 500
SE +/- 0.40, N = 3
53.39
12
24
36
48
60
1. (CXX) g++ options: -O3 -lsnappy -lpthread

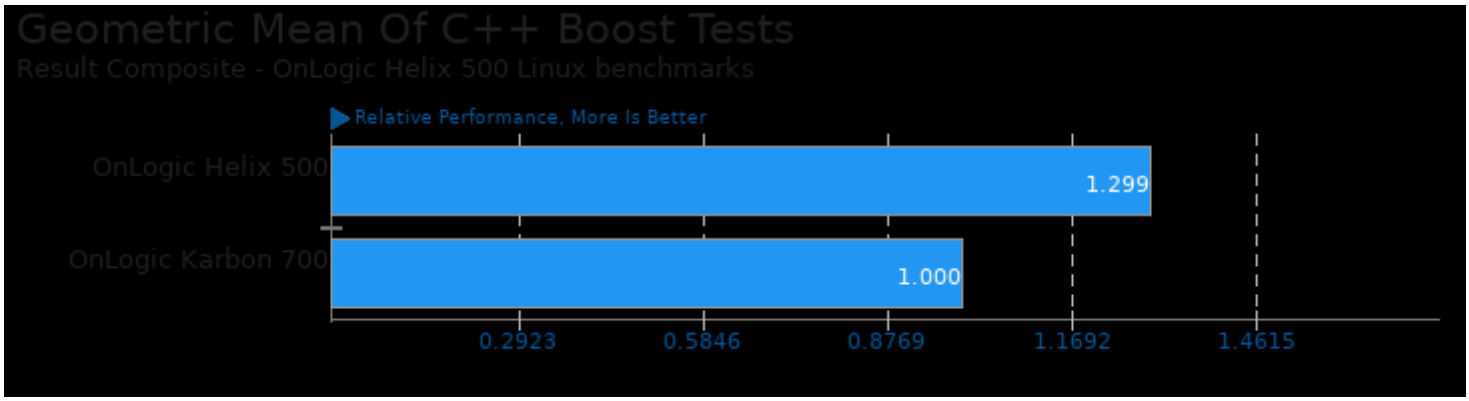

LevelDB 1.22
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
64.0
73.7
82.0
Celsius, Fewer Is Better
100
80
60
40
20
LevelDB 1.22
Benchmark: Hot Read
Microseconds Per Op, Fewer Is Better
OnLogic Helix 500
SE +/- 0.122, N = 15
9.381
OnLogic Karbon 700
SE +/- 0.127, N = 15
10.365
3
6
9
12
15
1. (CXX) g++ options: -O3 -lsnappy -lpthread


LevelDB 1.22
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
65.0
74.2
82.0
Celsius, Fewer Is Better
100
80
60
40
20
LevelDB 1.22
Benchmark: Seek Random
Microseconds Per Op, Fewer Is Better
OnLogic Helix 500
SE +/- 0.14, N = 15
12.59
OnLogic Karbon 700
SE +/- 0.24, N = 3
14.42
4
8
12
16
20
1. (CXX) g++ options: -O3 -lsnappy -lpthread

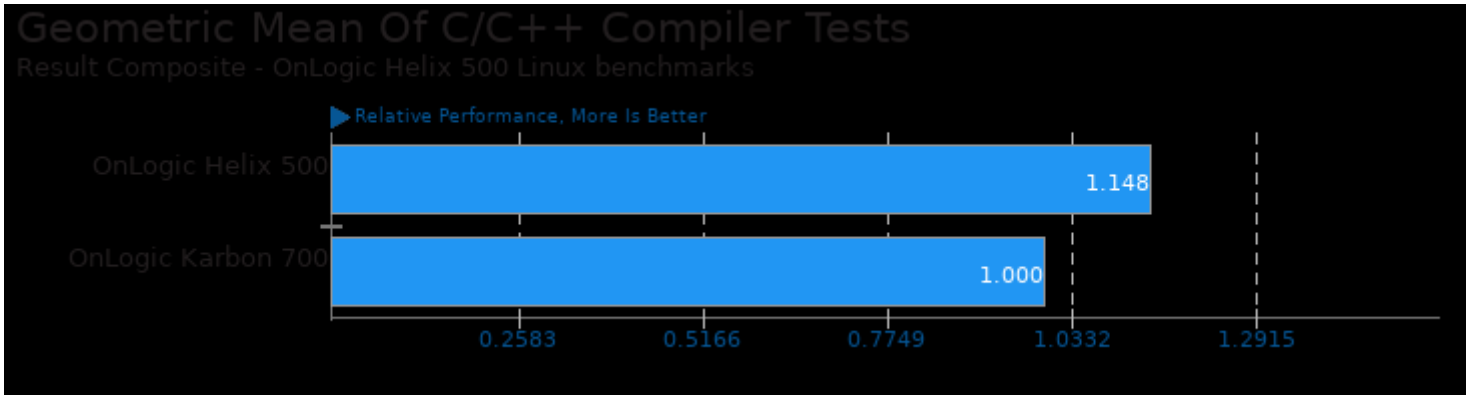

LevelDB 1.22
CPU Temperature Monitor
Min
Avg
Max
OnLogic Helix 500
65.0
75.1
85.0
Celsius, Fewer Is Better
100
80
60
40
20
CPU Temperature Monitor
Phoronix Test Suite System Monitoring
Celsius
OnLogic Helix 500
Min: 45 / Avg: 77.92 / Max: 96
20
40
60
80
100

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

Geometric mean based upon tests: pts/dav1d and pts/rav1e

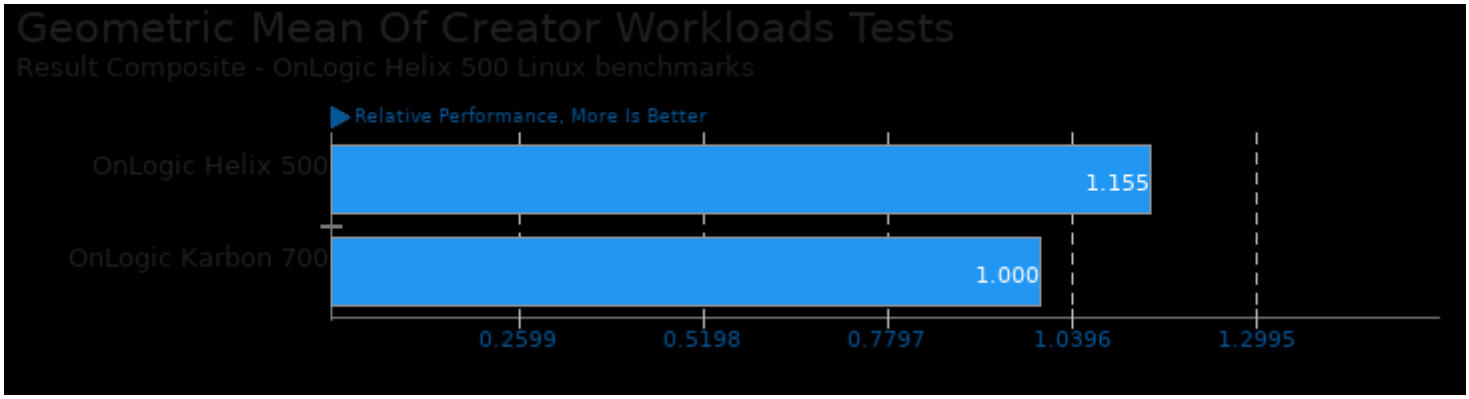


Geometric mean based upon tests: pts/quantlib and pts/openfoam



Geometric mean based upon tests: pts/hmmer, pts/sqlite-speedtest, pts/dav1d, pts/clomp, pts/lammps, pts/gromacs and pts/leveldb

Geometric mean based upon tests: pts/dav1d, pts/hmmer, pts/hpcc, pts/lammps, pts/lzbench, pts/onednn, pts/npb, pts/clomp and pts/cpuminer-opt



Geometric mean based upon tests: pts/dav1d, pts/rav1e, pts/libraw, pts/webp, pts/webp2, pts/embree, pts/onednn, pts/astcenc, pts/etcpak, pts/deepspeech and pts/synthmark

Geometric mean based upon tests: pts/gnupg and pts/cpuminer-opt

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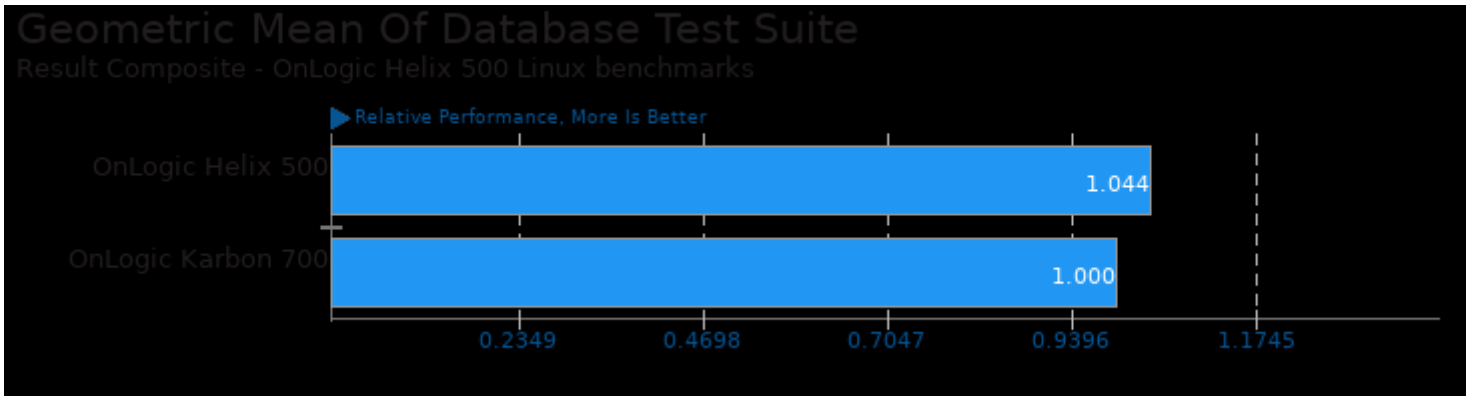
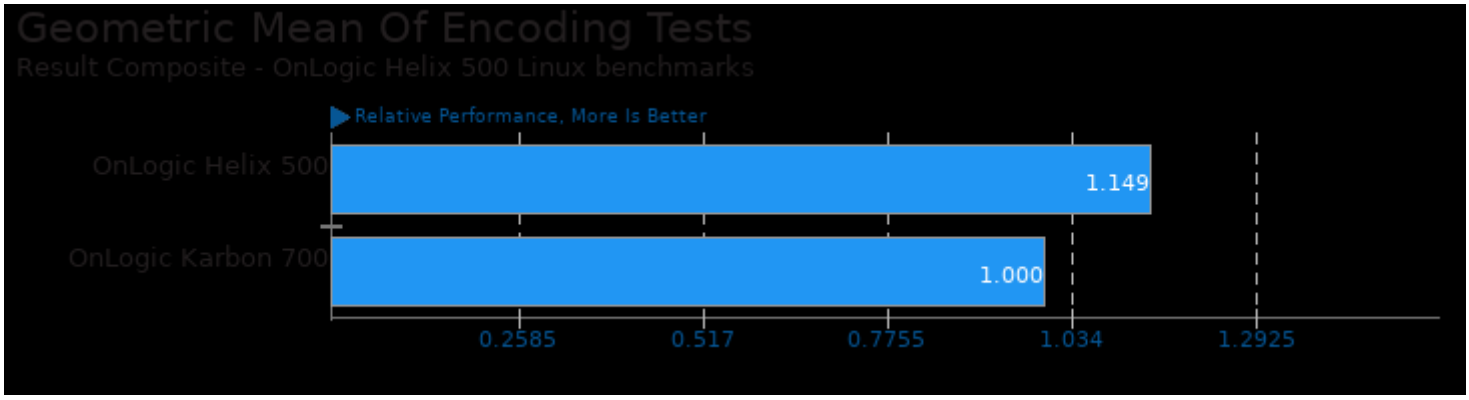
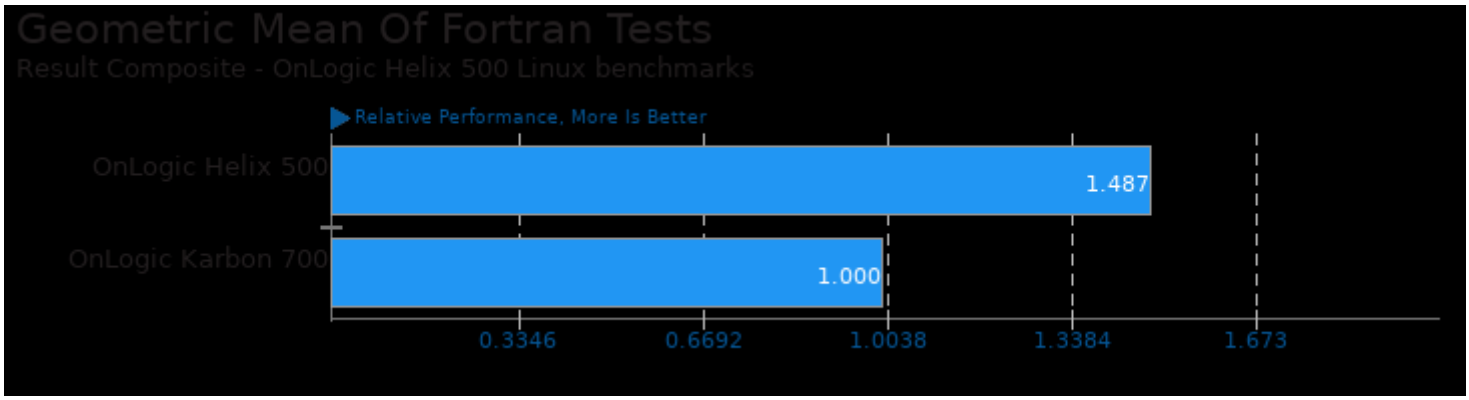


Geometric mean based upon tests: pts/sqlite-speedtest, pts/leveldb and pts/influxdb

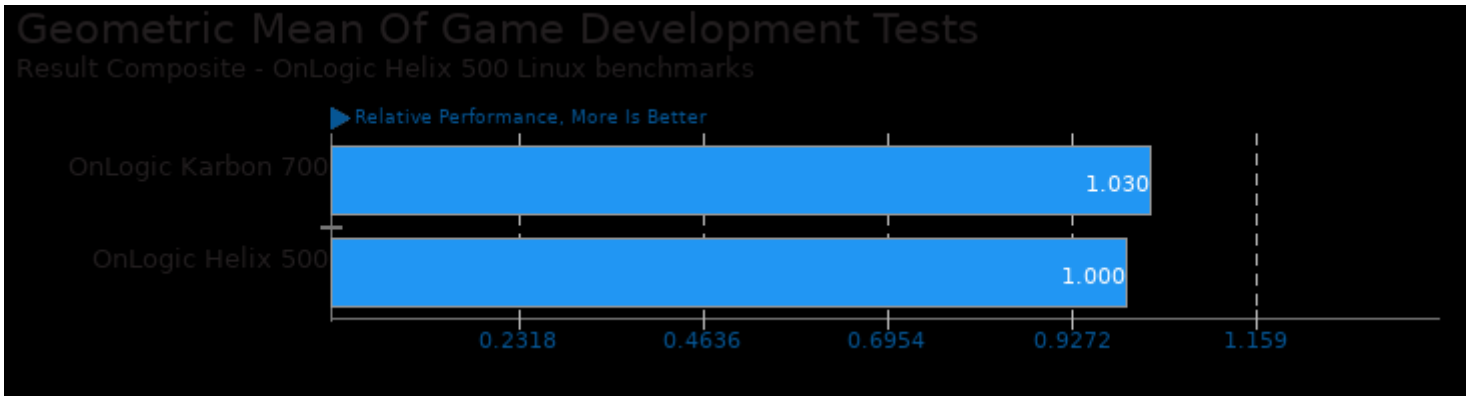


Geometric mean based upon tests: pts/dav1d and pts/rav1e

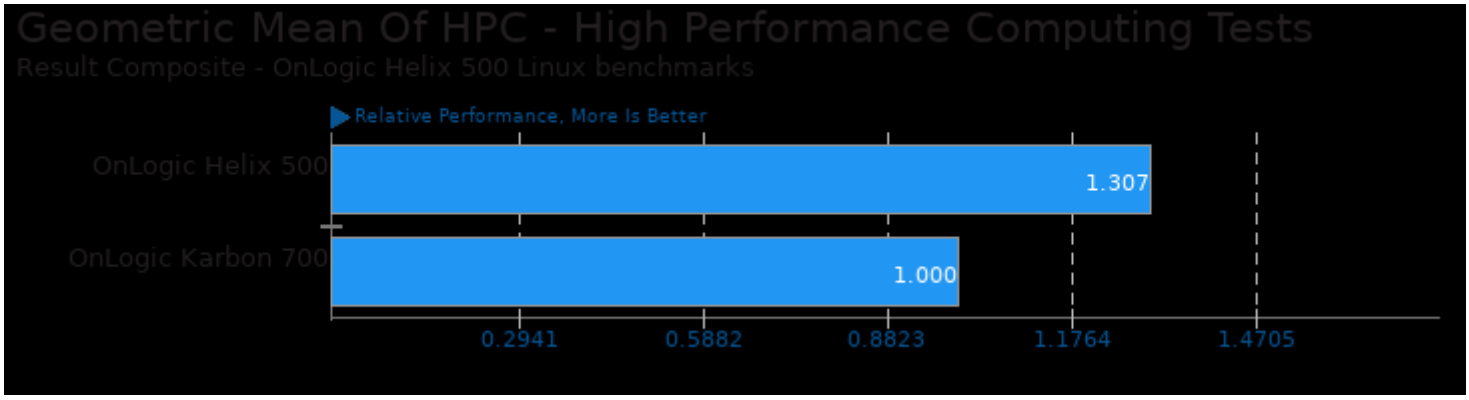
Geometric mean based upon tests: pts/financebench and pts/quantlib



Geometric mean based upon tests: pts/npb, pts/lammps and pts/hpcc

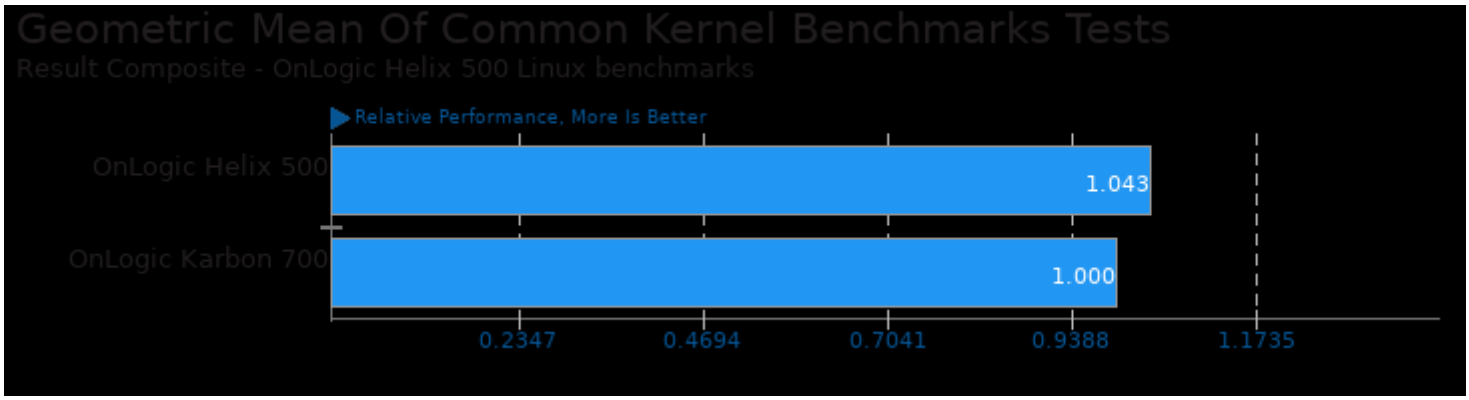


Geometric mean based upon tests: pts/astcenc and pts/etcpak

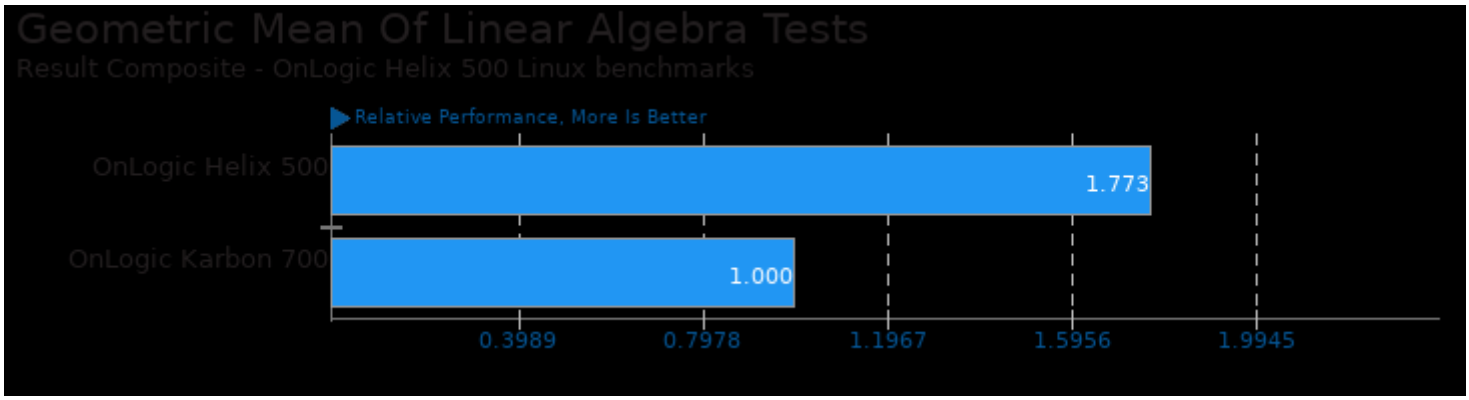


Geometric mean based upon tests: pts/npb, pts/hpcc, pts/askap, pts/amg, pts/gromacs, pts/lammps, pts/openfoam, pts/hmmer, pts/ncnn, pts/tnn, pts/ai-benchmark, pts/deepspeech, pts/onednn and pts/onnx

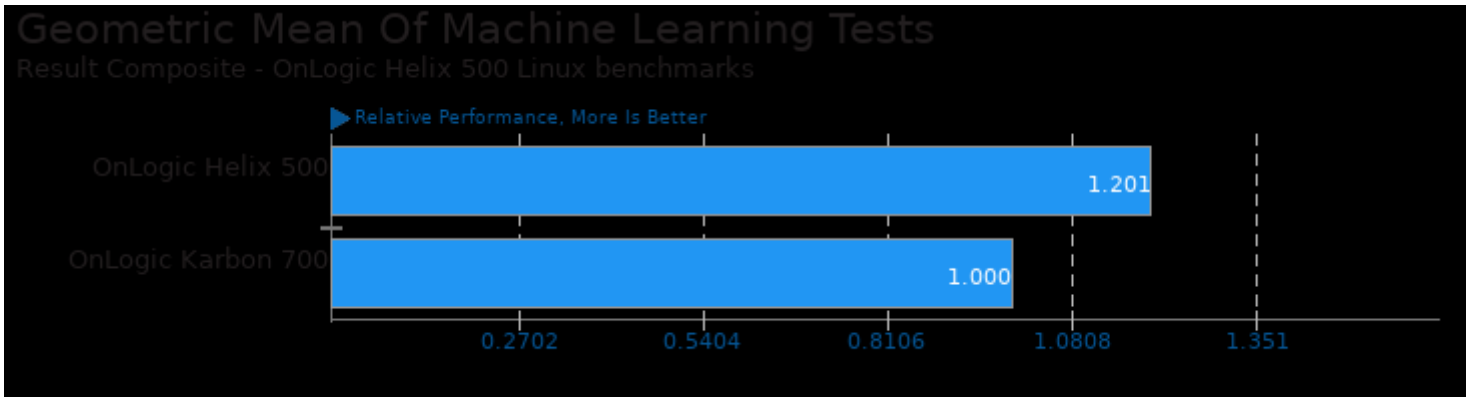
Geometric mean based upon tests: pts/libraw, pts/webp and pts/webp2



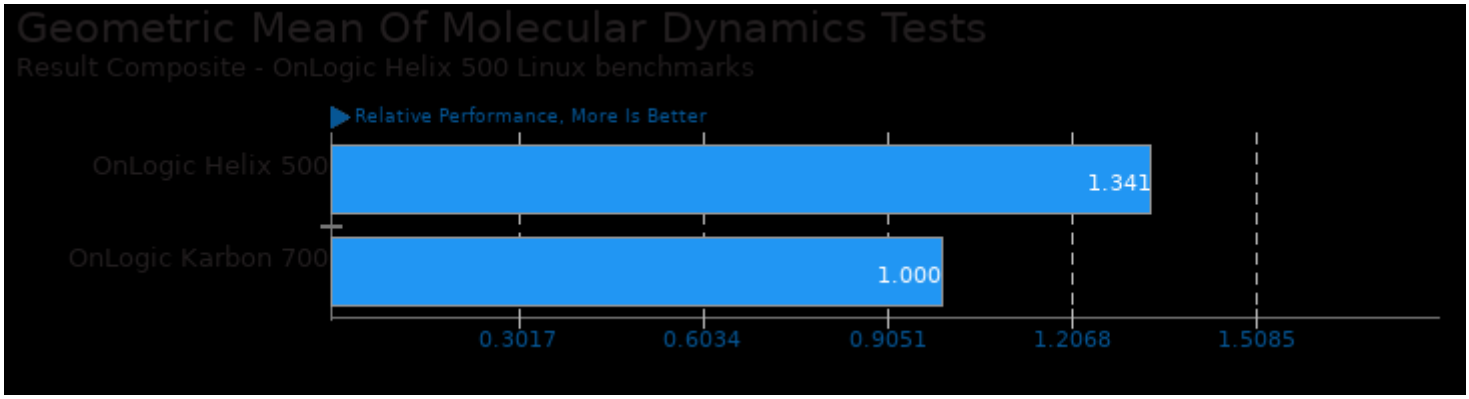
Geometric mean based upon tests: pts/sqlite-speedtest and pts/leveldb



Geometric mean based upon tests: pts/amg and pts/hpcc



Geometric mean based upon tests: pts/ncnn, pts/tnn, pts/ai-benchmark, pts/deepspeech, pts/onednn and pts/onnx



Geometric mean based upon tests: pts/gromacs, pts/lammps and pts/openfoam

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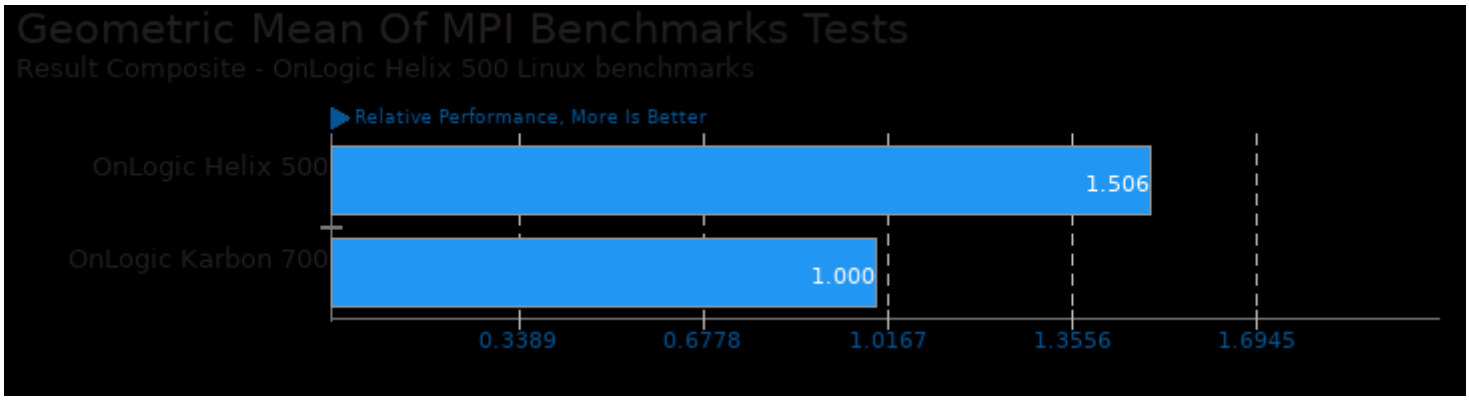
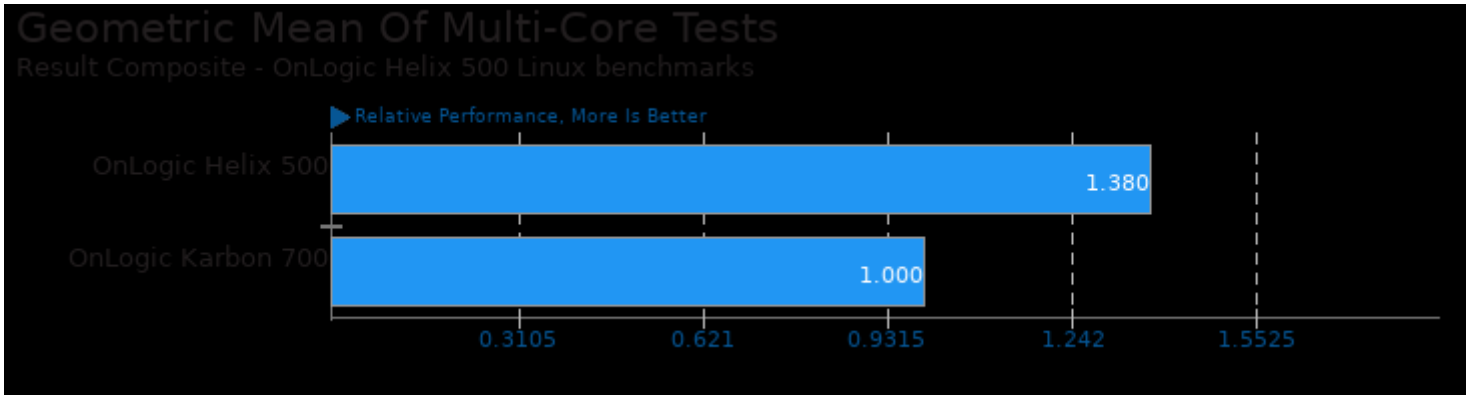
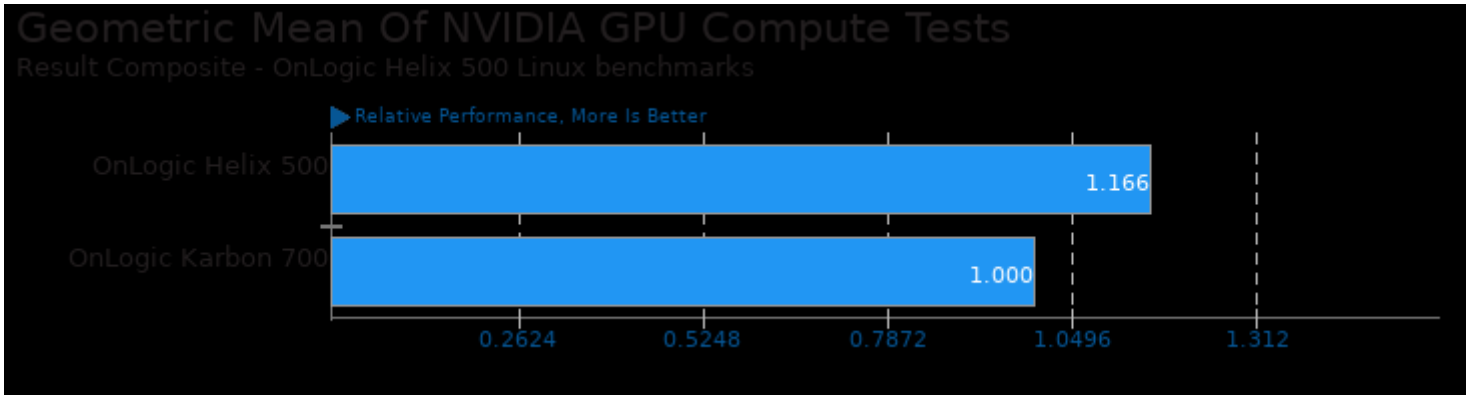


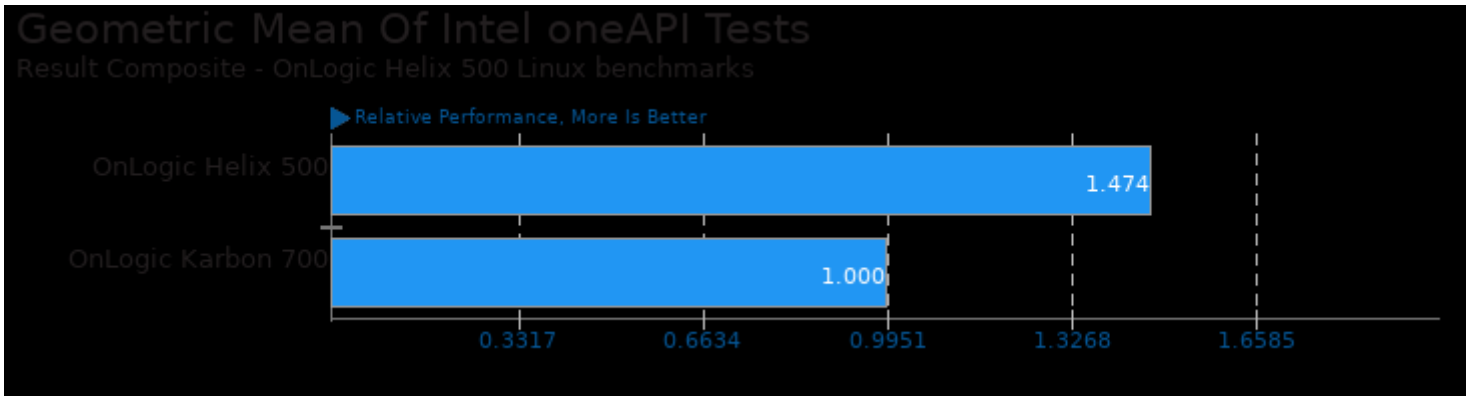
Geometric mean based upon tests: pts/askap, pts/lammps, pts/hpcc, pts/gromacs and pts/npb



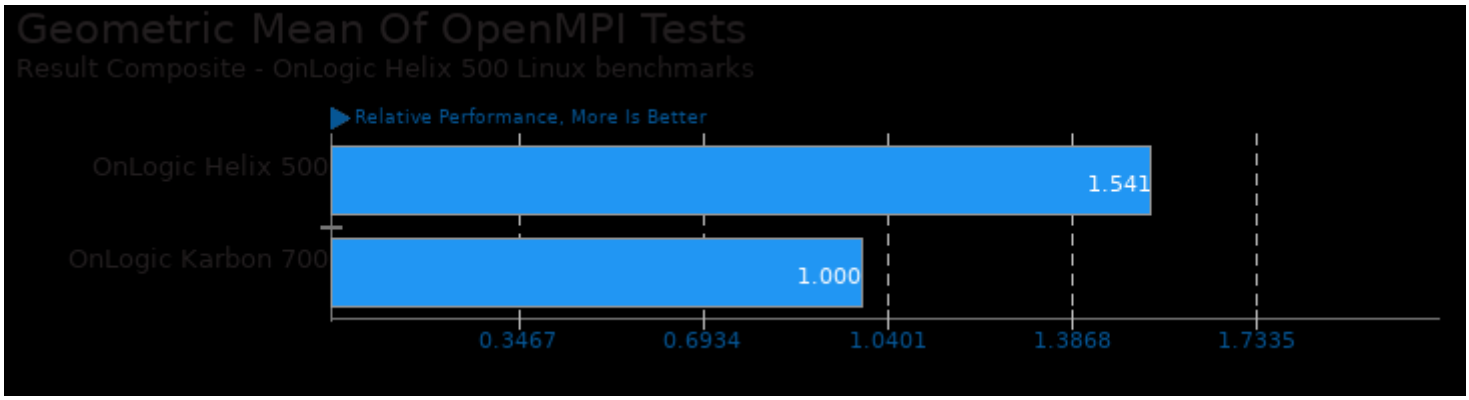
Geometric mean based upon tests: pts/cpuminer-opt, pts/askap, pts/dav1d, pts/rav1e, pts/npb, pts/onednn, pts/lammps, pts/gromacs and pts/embree



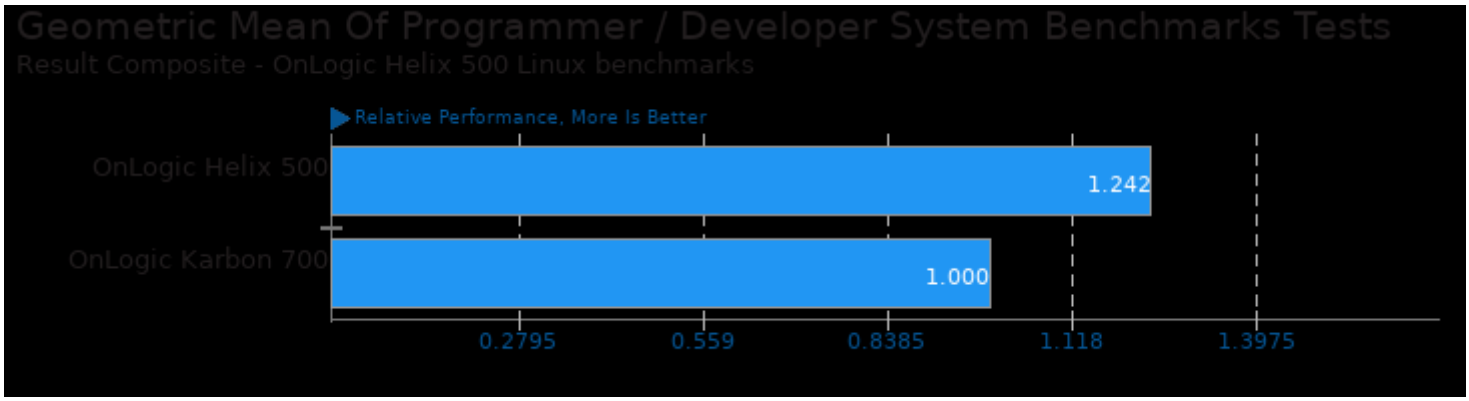
Geometric mean based upon tests: pts/gromacs, pts/financebench, pts/ncnn, pts/realsr-ncnn and pts/waifu2x-ncnn



Geometric mean based upon tests: pts/embree and pts/onednn

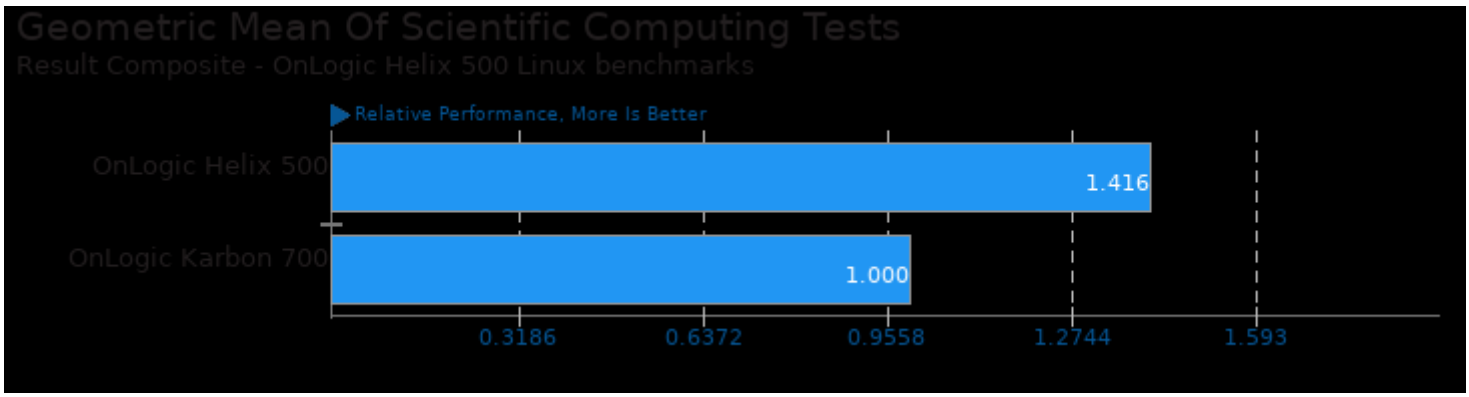


Geometric mean based upon tests: pts/askap, pts/npb, pts/lammps, pts/amg, pts/openfoam, pts/hpcc and pts/gromacs



Geometric mean based upon tests: pts/simdjson, pts/sqlite-speedtest, pts/amg and pts/hpcc

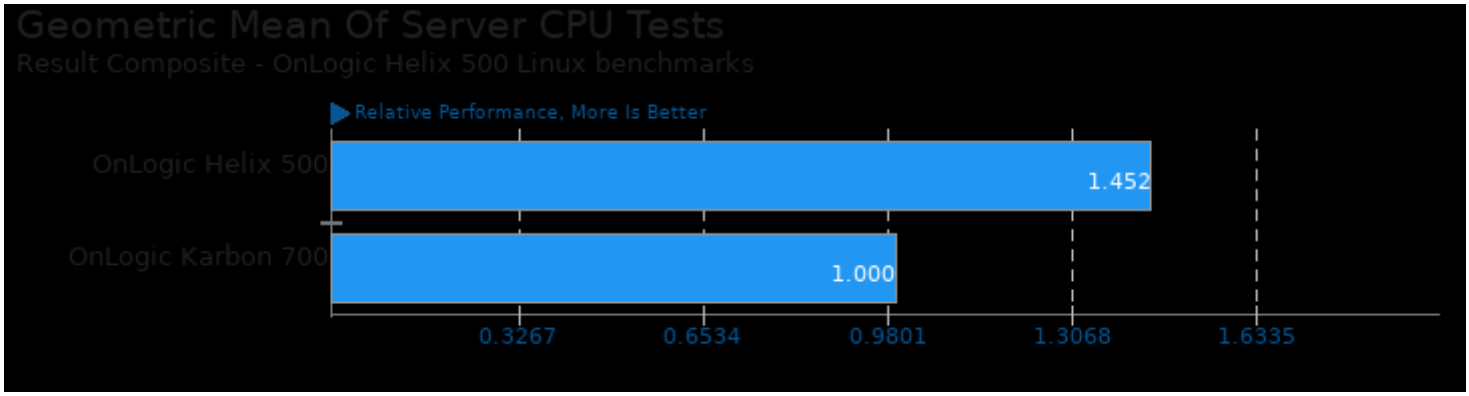
Geometric mean based upon tests: pts/onnx, pts/glmark2 and pts/ai-benchmark



OnLogic Helix 500 Linux benchmarks

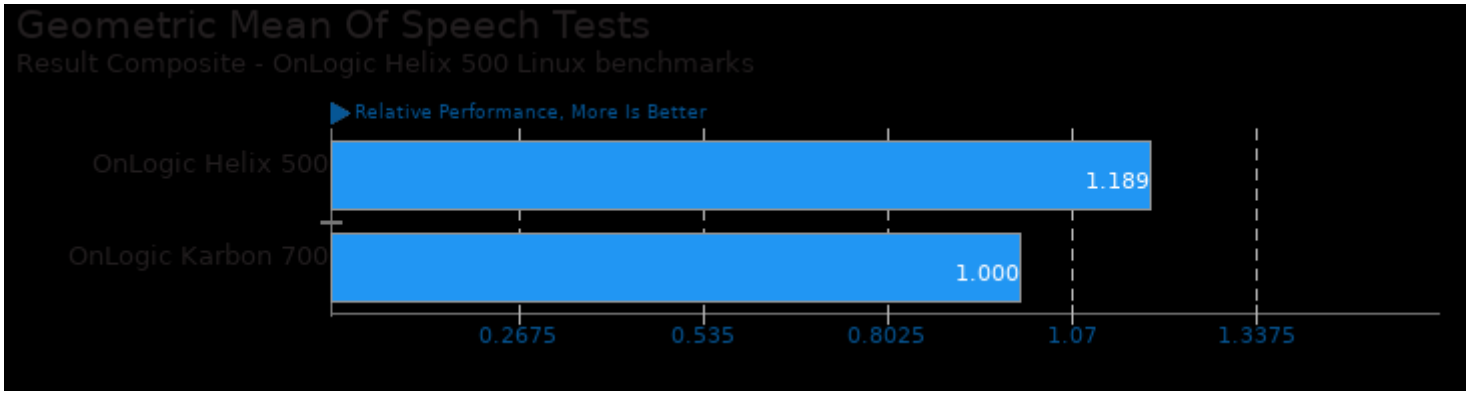
Geometric mean based upon tests: pts/amg, pts/hpcc, pts/gromacs, pts/lammps, pts/openfoam and pts/hmmer

Geometric mean based upon tests: pts/simdjson, pts/sqlite-speedtest, pts/leveldb and pts/influxdb



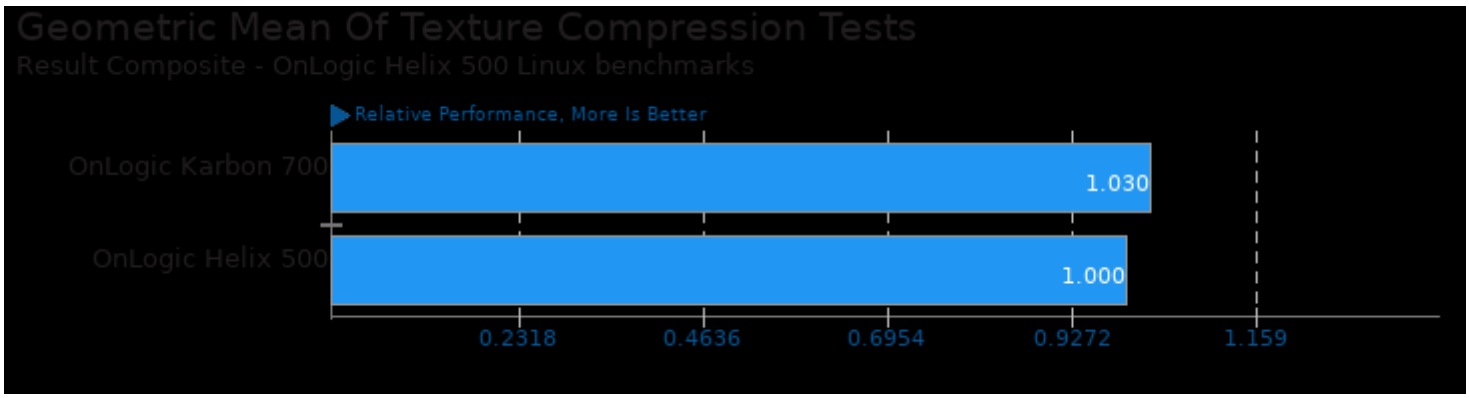
Geometric mean based upon tests: pts/npb, pts/onednn, pts/dav1d and pts/cpuminer-opt

Geometric mean based upon tests: pts/lzbench, pts/deepspeech and pts/gnupg

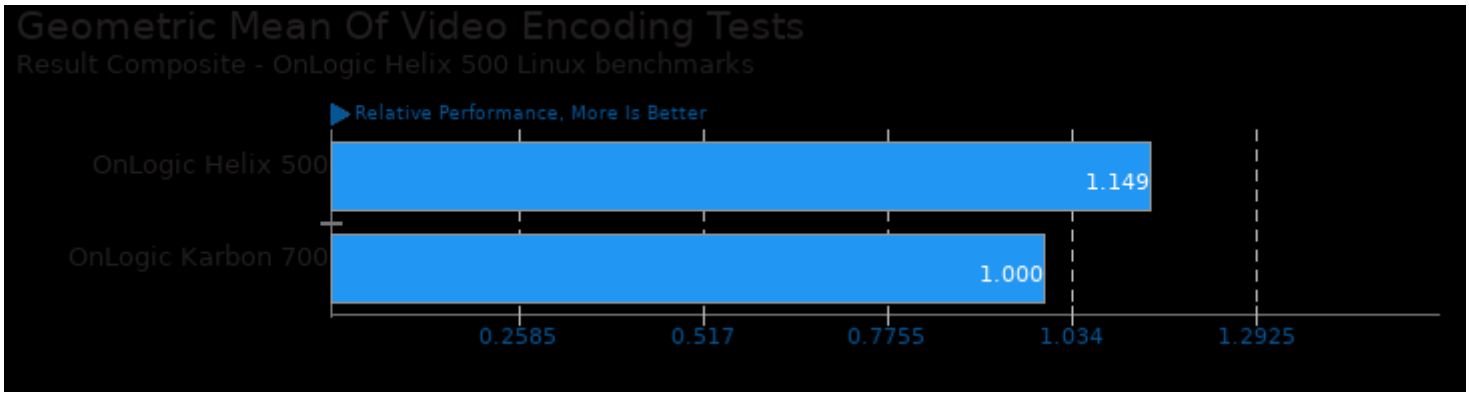


Geometric mean based upon tests: pts/deepspeech and pts/synthmark

Geometric mean based upon tests: pts/deepspeech and pts/synthmark



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



Geometric mean based upon tests: pts/dav1d and pts/rav1e

OnLogic Helix 500 Linux benchmarks

Geometric mean based upon tests: pts/ncnn, pts/realsr-ncnn and pts/waifu2x-ncnn

This file was automatically generated via the Phoronix Test Suite benchmarking software on Sunday, 19 January 2025 11:12.