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Raspberry Pi 400

Test to compare Ubuntu 21.10b and THP settings to Phoronix results.

Automated Executive Summary

Raspberry Pi 400 had the most wins, coming in first place for 82% of the tests.

Based on the geometric mean of all complete results, the fastest (Raspberry Pi 400) was 2.574x the speed of the slowest (Raspberry Pi 3 Model B). Raspberry Pi 4 Model B THP madvise was 0.899x the speed of Raspberry Pi 400, Raspberry Pi 4 Model B was 0.976x the speed of Raspberry Pi 4 Model B THP madvise, Raspberry Pi 4 Model B GUI was 0.93x the speed of Raspberry Pi 4 Model B, Raspberry Pi 4 Model B THP+defrag always was 0.99x the speed of Raspberry Pi 4 Model B GUI, Raspberry Pi 3 Model B was 0.481x the speed of Raspberry Pi 4 Model B THP+defrag always.

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

Zstd Compression (Compression Level: 3) at 75.922x
Himeno Benchmark (Poisson Pressure Solver) at 5.077x
IOR (Read Test) at 4.775x
DaCapo Benchmark (Java Test: H2) at 4.526x
GraphicsMagick (Operation: Rotate) at 3.821x
GraphicsMagick (Operation: Enhanced) at 3.5x

TNN (Target: CPU - Model: MobileNet v2) at 3.421x
TNN (Target: CPU - Model: SqueezeNet v1.1) at 3.361x
GraphicsMagick (Operation: HWB Color Space) at 3.058x
GraphicsMagick (Operation: Noise-Gaussian) at 3x.

Test Systems:

Raspberry Pi 3 Model B

Processor: ARMv8 Cortex-A53 @ 1.40GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 3 Model B Plus Rev 1.3, Memory: 913MB, Disk: 32GB GB1QT, Graphics: vc4drmfb, Monitor: VA2431

OS: Debian 10, Kernel: 5.4.51-v8+ (aarch64), Desktop: LXDE 0.10.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 snd_bcm2835.enable_headphones=1
Compiler Notes: --build=aarch64-linux-gnu --disable-libphobos --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Disk Mount Options Notes: noatime,rw
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Debian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Not affected + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Not affected + srbds: Not affected + tsx_async_abort: Not affected

Raspberry Pi 4 Model B

Processor: ARMv8 Cortex-A72 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Memory: 2048MB, Disk: 32GB GB1QT, Graphics: vc4drmfb, Monitor: VA2431

OS: Debian 10, Kernel: 5.4.51-v8+ (aarch64), Desktop: LXDE 0.10.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 snd_bcm2835.enable_headphones=1
Compiler Notes: --build=aarch64-linux-gnu --disable-libphobos --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Disk Mount Options Notes: noatime,rw
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Debian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

Raspberry Pi 400

Processor: ARMv8 Cortex-A72 @ 1.80GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 400 Rev 1.0, Memory: 4096MB, Disk: 32GB GB1QT, Graphics: vc4drmfb, Monitor: VA2431

OS: Debian 10, Kernel: 5.4.51-v8+ (aarch64), Desktop: LXDE 0.10.0, Display Server: X Server 1.20.4, Display Driver:

modesetting 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 snd_bcm2835.enable_headphones=1
Compiler Notes: --build=aarch64-linux-gnu --disable-libphobos --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Disk Mount Options Notes: noatime,rw
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Debian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

Raspberry Pi 4 Model B GUI

Processor: ARMv8 Cortex-A72 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Memory: 4096MB, Disk: 124GB USB DISK 3.0 + 32GB 00000, Graphics: V3D 4.2 4GB, Monitor: SyncMaster

OS: Ubuntu 20.10, Kernel: 5.8.0-1008-raspi (aarch64), Desktop: GNOME Shell 3.38.1, Display Server: X Server 1.20.9, Display Driver: modesetting 1.20.9, OpenGL: 2.1 Mesa 21.0.0-devel (git-7c075ba 2020-12-07 groovy-oibaf-ppa), Vulkan: 1.0.155, Compiler: GCC 10.2.0, File-System: btrfs, Screen Resolution: 1600x1200

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 snd_bcm2835.enable_headphones=1
Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v
Disk Notes: MQ-DEADLINE / relatime,rw,space_cache,subvol=/pts,subvolid=257
Processor Notes: Scaling Governor: cpufreq-dt ondemand
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: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

Raspberry Pi 4 Model B THP+defrag always

Processor: ARMv8 Cortex-A72 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Chipset: Broadcom BCM2711, Memory: 4096MB, Disk: 124GB USB DISK 3.0 + 32GB 00000, Graphics: V3D 4.2 4GB, Monitor: SyncMaster

OS: Ubuntu 21.10, Kernel: 5.11.0-1009-raspi (aarch64), Desktop: GNOME Shell 40.2, Display Server: X Server 1.20.11, OpenGL: 2.1 Mesa 21.3.0-devel (git-513fb54 2021-08-12 impish-oibaf-ppa), Vulkan: 1.0.185, Compiler: GCC 11.2.0, File-System: btrfs, Screen Resolution: 1920x1200

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 - Transparent Huge Pages: always
Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v
Disk Notes: MQ-DEADLINE / relatime,rw,space_cache,subvol=/pts,subvolid=257 / Block Size: 4096
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Java Notes: OpenJDK Runtime Environment (build 16.0.1+9-Ubuntu-1)
Python Notes: Python 3.9.6
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

Raspberry Pi 4 Model B THP madvise

Processor: ARMv8 Cortex-A72 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Chipset: Broadcom BCM2711, Memory: 4096MB, Disk: 124GB USB DISK 3.0 + 32GB 00000, Graphics: V3D 4.2 4GB,

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Monitor: SyncMaster

OS: Ubuntu 21.10, Kernel: 5.11.0-1009-raspi (aarch64), Desktop: GNOME Shell 40.2, Display Server: X Server 1.20.11, OpenGL: 2.1 Mesa 21.3.0-devel (git-4d9acfa 2021-08-15 impish-oibaf-ppa), Vulkan: 1.0.185, Compiler: GCC 11.2.0, File-System: btrfs, Screen Resolution: 1920x1200

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 - Transparent Huge Pages: madvise
Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v
Disk Notes: MQ-DEADLINE / relatime,rw,space_cache,subvol=/pts,subvolid=257 / Block Size: 4096
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Java Notes: OpenJDK Runtime Environment (build 16.0.1+9-Ubuntu-1)
Python Notes: Python 3.9.6
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

	Raspberry Pi 3 Model B	Raspberry Pi 4 Model B	Raspberry Pi 400	Raspberry Pi 4 Model B GUI	Raspberry Pi 4 Model B THP+defrag always	Raspberry Pi 4 Model B THP madvise
IOR - Write Test (MB/s)	7.44	9.90	10.72	28.68	16.26	19.35
Normalized	25.94%	34.52%	37.38%	100%	56.69%	67.47%
Standard Deviation	2%	1.7%	17.4%	11.3%	7.9%	4.8%
IOR - Read Test (MB/s)	19.19	37.77	40.47	91.64	59.33	60.64
Normalized	20.94%	41.22%	44.16%	100%	64.74%	66.17%
Standard Deviation	1.3%	2.3%	0.7%	7%	1.1%	1.4%
CloverLeaf - L.E.H (sec)	88.07	46.04	45.05	46.79	47.44	48.91
Normalized	51.15%	97.85%	100%	96.28%	94.96%	92.11%
Standard Deviation	1.3%	0.2%	0.3%	0.3%	0.8%	0.7%
Dolfyn - C.F.D (sec)	344.278	106.986	95.521	109.931	117.659	133.647
Normalized	27.75%	89.28%	100%	86.89%	81.18%	71.47%
Standard Deviation	6.1%	1%	0.7%	2.1%	7.4%	6.8%
FFTE - N.2.3.C.F.R (MFLOPS)	978.40	1932	1972	1857	1509	1833
Normalized	49.62%	98.01%	100%	94.18%	76.51%	92.96%
Standard Deviation	0.6%	0.8%	0.9%	1.4%	5.3%	0.7%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	0.203	0.509	0.574	0.495	0.497	0.490
Normalized	35.37%	88.68%	100%	86.24%	86.59%	85.37%
Standard Deviation	0.6%	0.5%	1.1%	1.1%	0.3%	0.6%
WebP Image Encode - Default (Encode Time - sec)	16.036	8.937	7.464	8.466	8.321	8.294
Normalized	46.55%	83.52%	100%	88.16%	89.7%	89.99%
Standard Deviation	0.2%	0.4%	0.3%	0.3%	0.2%	0.6%
WebP Image Encode - Quality 100 (Encode Time -	19.877	12.212	10.259	11.849	11.588	11.681
Normalized	51.61%	84.01%	100%	86.58%	88.53%	87.83%
Standard Deviation	4.3%	0.2%	0.4%	0.3%	0.5%	0.1%

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WebP Image Encode - Q.1.L (Encode Time - sec)	**153.353**	92.951	**84.688**	95.741	91.936	96.743
Normalized	55.22%	91.11%	100%	88.46%	92.12%	87.54%
Standard Deviation	0.1%	0.8%	3.5%	0.8%	0.9%	0.8%
WebP Image Encode - Q.1.H.C (Encode Time - sec)	**46.048**	27.795	**23.155**	27.620	27.030	27.264
Normalized	50.28%	83.31%	100%	83.83%	85.66%	84.93%
Standard Deviation	0.4%	0.3%	0.5%	0.3%	0.1%	0.1%
WebP Image Encode - Q.1.L.H.C (Encode Time -		216.139	**195.378**	219.615	211.255	**223.064**
Normalized		90.39%	100%	88.96%	92.48%	87.59%
Standard Deviation		0.3%	0.4%	0.3%	0.3%	0.1%
DaCapo Benchmark - H2 (msec)	**63605**	15200	**14053**	15814	14643	15779
Normalized	22.09%	92.45%	100%	88.86%	95.97%	89.06%
Standard Deviation	0.6%	4.6%	3%	3%	1.3%	10.4%
DaCapo Benchmark - Jython (msec)	**55388**	29475	**28481**	28697	32585	29838
Normalized	51.42%	96.63%	100%	99.25%	87.41%	95.45%
Standard Deviation	2.7%	5.4%	10.2%	1.3%	42.4%	4.3%
DaCapo Benchmark - Tradebeans (msec)	**51166**	31281	**28292**	29694		
Normalized	55.29%	90.44%	100%	95.28%		
Standard Deviation	5.9%	10.1%	12%	5.1%		
Zstd Compression - 3 (MB/s)	121	194.7	**214.1**	**2.82**	7.64	205.7
Normalized	56.52%	90.94%	100%	1.32%	3.57%	96.08%
Standard Deviation		0.3%	3.5%	13.3%	23.5%	3.7%
Zstd Compression - 19		2.50	**2.75**	**1.12**		1.81
Normalized		90.91%	100%	40.73%		65.82%
Standard Deviation		1.2%	2%	4.4%		6.2%
LibRaw - P.P.B (Mpix/sec)	**2.40**	5.66	**6.57**	5.60	5.58	5.52
Normalized	36.53%	86.15%	100%	85.24%	84.93%	84.02%
Standard Deviation	0.6%	0.1%	0.4%	1.4%	0.4%	0.2%
TSCP - A.C.P (Nodes/s)	**184288**	344454	**412801**	363070	354154	354519
Normalized	44.64%	83.44%	100%	87.95%	85.79%	85.88%
Standard Deviation	3.9%	0.3%	0.2%	0%	0.3%	0.3%
GraphicsMagick - Rotate (Iterations/min)	**28**	98	**107**	98	104	83
Normalized	26.17%	91.59%	100%	91.59%	97.2%	77.57%
Standard Deviation		3.8%	4.8%	2.7%	4.5%	1.2%
GraphicsMagick - Sharpen (Iterations/min)	**7**	15	17	**18**	17	**18**
Normalized	38.89%	83.33%	94.44%	100%	94.44%	100%
Standard Deviation					0%	0%
GraphicsMagick - Enhanced (Iterations/min)	**6**	18	**21**	18	18	18
Normalized	28.57%	85.71%	100%	85.71%	85.71%	85.71%
Standard Deviation					0%	2.5%
GraphicsMagick - Resizing (Iterations/min)	**21**	50	55	51	**56**	50
Normalized	37.5%	89.29%	98.21%	91.07%	100%	89.29%
Standard Deviation					1%	1.2%

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GraphicsMagick - Noise-Gaussian (Iterations/min)	**9**	23	**27**	**27**	26	25
Normalized	33.33%	85.19%	100%	100%	96.3%	92.59%
Standard Deviation	5.5%				0%	0%
GraphicsMagick - HWB Color Space (Iterations/min)	**52**	137	**159**	135	145	113
Normalized	32.7%	86.16%	100%	84.91%	91.19%	71.07%
Standard Deviation			0.4%		0.8%	0.5%
Kvazaar - Bosphorus 1080p - Very Fast (FPS)	**0.53**	1.27	**1.53**	1.46	1.50	1.51
Normalized	34.64%	83.01%	100%	95.42%	98.04%	98.69%
Standard Deviation	0%	0%	0.4%	0%	5.1%	0.8%
Kvazaar - Bosphorus 1080p - Ultra Fast (FPS)	**1.07**	2.53	**3.02**	2.69	2.85	2.86
Normalized	35.43%	83.77%	100%	89.07%	94.37%	94.7%
Standard Deviation	0%	0.2%	0%	0.9%	0.7%	0.2%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**15603**	33044	**39684**	32807	33212	33261
Normalized	39.32%	83.27%	100%	82.67%	83.69%	83.81%
Standard Deviation	0.1%	0.3%	0.1%	0.3%	0.2%	0.3%
Himeno Benchmark - P.P.S (MFLOPS)	**143.553754**	580.679620	**728.803695**	539.428464	525.997113	530.391118
Normalized	19.7%	79.68%	100%	74.02%	72.17%	72.78%
Standard Deviation	3%	1.3%	1.2%	1.4%	0.5%	1%
asmFish - 1.H.M.2.D		2428892	**2779745**	**2337247**	2635220	2357424
Normalized		87.38%	100%	84.08%	94.8%	84.81%
Standard Deviation		2.2%	1.6%	1.2%	3.6%	1.8%
Timed Apache Compilation - Time To Compile (sec)	**349.969**	197.374	**155.907**	226.879	248.16	220.299
Normalized	44.55%	78.99%	100%	68.72%	62.83%	70.77%
Standard Deviation	0.4%	1.1%	1.1%	0.6%	0.5%	1.5%
Timed GDB GNU Debugger Compilation - Time To Compile (sec)		1019	**924.107**	1298	**1364**	1290
Normalized		90.7%	100%	71.21%	67.73%	71.64%
Standard Deviation		2.8%	1.1%	1.5%	4.8%	2.4%
Timed ImageMagick Compilation - Time To Compile (sec)		570.425	**513.651**	**584.696**	562.015	561.706
Normalized		90.05%	100%	87.85%	91.39%	91.44%
Standard Deviation		1.6%	0.7%	0.1%	0.4%	0.5%
Timed PHP Compilation - Time To Compile (sec)		801.272	**731.514**	**935.327**	906.640	905.324
Normalized		91.29%	100%	78.21%	80.68%	80.8%
Standard Deviation		0.5%	0.9%	0.4%	0.3%	0.1%
Build2 - Time To Compile		**1714**	**1569**			
Normalized		91.51%	100%			
Standard Deviation		1%	1.8%			
C-Ray - Total Time - 4.1.R.P.P (sec)	**1979**	607.312	**539.718**	599.126	678.675	696.562
Normalized	27.27%	88.87%	100%	90.08%	79.53%	77.48%
Standard Deviation	0.1%	1.1%	9.6%	1.5%	11.6%	12.5%

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Smallpt - G.I.R.1.S (sec)	**269.788**	121.564	**101.358**	129.684	130.024	128.451
Normalized	37.57%	83.38%	100%	78.16%	77.95%	78.91%
Standard Deviation	0.2%	0.4%	0.6%	1.6%	0.3%	1.6%
Numpy Benchmark (Score)	**25.77**	46.88	**54.69**		46.65	45.84
Normalized	47.12%	85.72%	100%		85.3%	83.82%
Standard Deviation	1%	0.4%	0.2%		0.4%	0.1%
AOBench - 2048 x 2048 - Total Time (sec)	**262.532**	124.471	**103.725**		119.198	120.049
Normalized	39.51%	83.33%	100%		87.02%	86.4%
Standard Deviation	0%	0%	0.1%		0%	0.8%
FLAC Audio Encoding - WAV To FLAC (sec)	**300.952**	94.648	**82.552**		101.824	108.372
Normalized	27.43%	87.22%	100%		81.07%	76.17%
Standard Deviation	1.4%	2.3%	2.9%		8.9%	5.8%
LAME MP3 Encoding - WAV To MP3 (sec)	**54.957**	29.235	**24.405**		28.830	28.749
Normalized	44.41%	83.48%	100%		84.65%	84.89%
Standard Deviation	0.1%	0.1%	0.3%		2.5%	1%
eSpeak-NG Speech Engine - T.T.S.S (sec)	**297.746**	161.560	154.696		125.807	**125.475**
Normalized	42.14%	77.66%	81.11%		99.74%	100%
Standard Deviation	2.2%	6.1%	1.7%		3.8%	6.5%
Perl Benchmarks - Pod2html (sec)	**1.12228333**	0.56889272	**0.47305417**		0.67002612	0.67100913
Normalized	42.15%	83.15%	100%		70.6%	70.5%
Standard Deviation	0.8%	1%	0.2%		0.4%	0.7%
Perl Benchmarks - Interpreter (sec)	0.00661400	0.00417488	**0.00370104**		**0.01030860**	0.00893839
Normalized	55.96%	88.65%	100%		35.9%	41.41%
Standard Deviation	0.7%	0.5%	0.4%		0.3%	0.6%
RNNoise (sec)	**175.305**	71.126	**61.961**		65.265	64.585
Normalized	35.34%	87.11%	100%		94.94%	95.94%
Standard Deviation	1.5%	3.2%	3.9%		12.9%	5.2%
OpenSSL - R.4.b.P	**63.9**	95.5	**114.3**		95.6	95.5
Normalized	55.91%	83.55%	100%		83.64%	83.55%
Standard Deviation	2.7%	0.3%	0.2%		0.3%	0.2%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**987.198**	537.637	**466.329**		786.098	808.306
Normalized	47.24%	86.74%	100%		59.32%	57.69%
Standard Deviation	2.2%	3%	2.6%		1.3%	1.3%
GEGL - Crop (sec)	79.574	47.762	**40.613**		**111.450**	101.937
Normalized	51.04%	85.03%	100%		36.44%	39.84%
Standard Deviation	2.1%	1.8%	2.3%		19.4%	13.8%
GEGL - Reflect (sec)	27.231	13.441	**11.589**		**241.496**	221.293
Normalized	42.56%	86.22%	100%		4.8%	5.24%
Standard Deviation	0.8%	0.3%	0.3%		5.3%	6.5%
GEGL - Color Enhance (sec)	**522.034**	297.290	**257.795**		391.590	380.401
Normalized	49.38%	86.71%	100%		65.83%	67.77%
Standard Deviation	0.9%	2.6%	0.3%		5.1%	1.8%
GEGL - Rotate 90 Degrees (sec)	**382.494**	216.108	**192.390**		320.495	305.062
Normalized	50.3%	89.02%	100%		60.03%	63.07%
Standard Deviation	0.3%	0.9%	0.3%		6.5%	0.9%
GIMP - rotate (sec)	**8.544**	3.643	**3.111**			

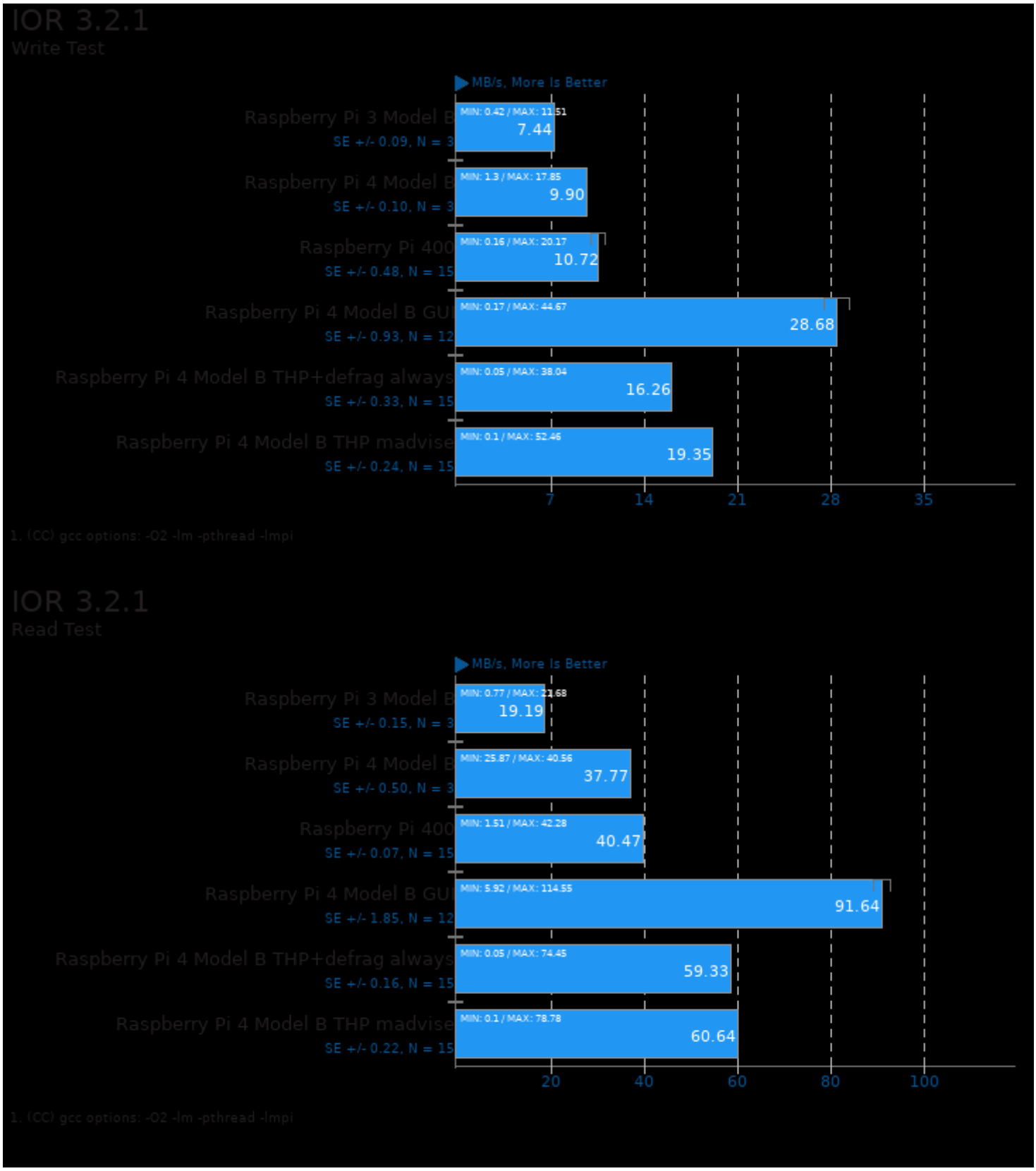
Normalized	36.41%	85.4%	100%		
Standard Deviation	29.7%	1.4%	1.1%		
GIMP - auto-levels (sec)	8.134	4.976	3.100		
Normalized	38.11%	62.3%	100%		
Standard Deviation	29.9%	44.6%	1.2%		
GIMP - unsharp-mask (sec)	9.702	4.298	3.116		
Normalized	32.12%	72.5%	100%		
Standard Deviation	33.1%	26.6%	1.8%		
Inkscape - SVG Files To PNG (sec)	209.427	117.213	100.848		
Normalized	48.15%	86.04%	100%		
Standard Deviation	0.7%	0.6%	1.3%		
OCRMyPDF - P.6.P.P.D (sec)	849.612	339.025	294.326		
Normalized	34.64%	86.82%	100%		
Standard Deviation	2.2%	1.1%	3.3%		
GNU Octave Benchmark	86.950	40.614	36.662		
Normalized	42.16%	90.27%	100%		
Standard Deviation	7.5%	1.5%	1.2%		
librsvg - SVG Files To PNG (sec)	125.042	71.543	62.183	254.158	261.529
Normalized	49.73%	86.92%	100%	24.47%	23.78%
Standard Deviation	4.2%	0.9%	2%	6%	3.7%
Mobile Neural Network - SqueezeNetV1.0 (ms)	124.589	67.211	57.236	64.914	66.341
Normalized	45.94%	85.16%	100%	88.17%	86.28%
Standard Deviation	0.3%	1%	0.8%	0.4%	1%
Mobile Neural Network - resnet-v2-50 (ms)	599.905	325.661	283.985	327.725	325.998
Normalized	47.34%	87.2%	100%	86.65%	87.11%
Standard Deviation	0%	0.4%	1.1%	1.4%	0.2%
Mobile Neural Network - MobileNetV2_224 (ms)	68.440	37.700	32.784	38.023	37.777
Normalized	47.9%	86.96%	100%	86.22%	86.78%
Standard Deviation	0.4%	0.3%	0.3%	3.7%	0.5%
Mobile Neural Network - mobilenet-v1-1.0 (ms)	112.955	65.299	56.044	64.681	63.822
Normalized	49.62%	85.83%	100%	86.65%	87.81%
Standard Deviation	0.1%	0.3%	0.1%	1.6%	0.3%
Mobile Neural Network - inception-v3 (ms)	854.295	427.886	366.491	423.471	424.602
Normalized	42.9%	85.65%	100%	86.54%	86.31%
Standard Deviation	0.2%	0.1%	1.2%	0.5%	0.4%
TNN - CPU - MobileNet v2 (ms)	3985	1640	1356	1226	1165
Normalized	29.23%	71.01%	85.92%	94.97%	100%
Standard Deviation	2.9%	1%	0.6%	2.2%	0.3%
TNN - CPU - SqueezeNet v1.1 (ms)	3284	1329	1148	977.256	1001
Normalized	29.75%	73.53%	85.1%	100%	97.67%
Standard Deviation	1.2%	1%	0.7%	1.3%	0.7%
PyBench - T.F.A.T.T (Milliseconds)	13254	5758	4784	4443	4459
Normalized	33.52%	77.16%	92.87%	100%	99.64%
Standard Deviation	0.1%	0.9%	0.4%	0.7%	1.3%

Raspberry Pi 400

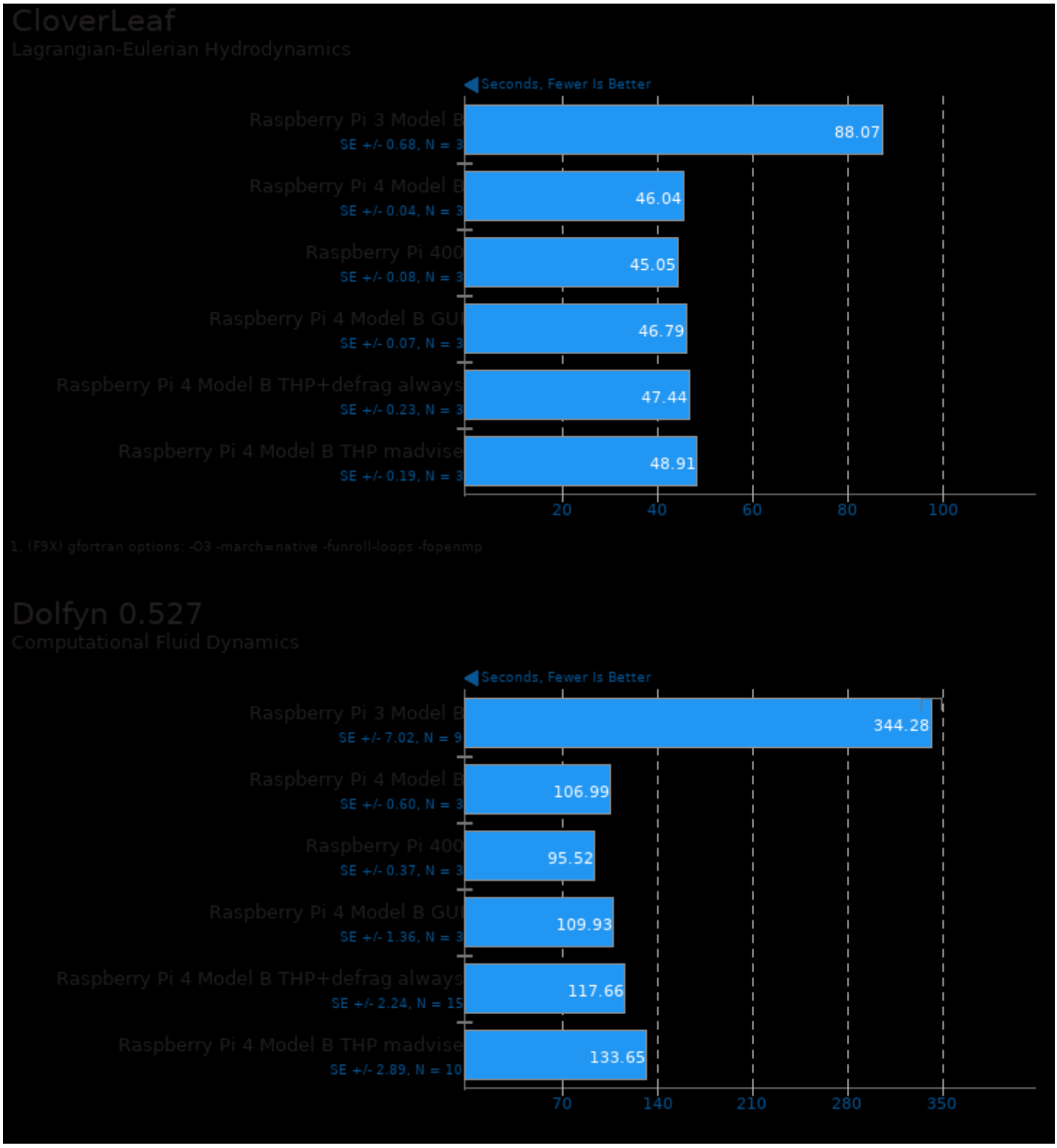
PyPerformance - go (Milliseconds)	**3.23**	1.68	1.4	**1.29**	**1.29**
Normalized	39.94%	76.79%	92.14%	100%	100%
Standard Deviation	0%	0%	0%	0.4%	0%
PyPerformance - 2to3 (Milliseconds)	**4**	2.21	**1.87**	**1.87**	1.88
Normalized	46.75%	84.62%	100%	100%	99.47%
Standard Deviation		0%	0%	0%	0.3%
PyPerformance - pathlib (Milliseconds)	**262**	162	**136**	239	239
Normalized	51.91%	83.95%	100%	56.9%	56.9%
Standard Deviation				0%	0.2%
PyPerformance - raytrace (Milliseconds)	**6.78**	3.41	2.84	**2.47**	2.49
Normalized	36.43%	72.43%	86.97%	100%	99.2%
Standard Deviation	0.2%	0%	0%	0.4%	0.5%
PyPerformance - json_loads (Milliseconds)	**290**	153	127	**106**	108
Normalized	36.55%	69.28%	83.46%	100%	98.15%
Standard Deviation	0.3%			0%	0%
PyPerformance - python_startup	**76.3**	43.6	**38.1**	55.2	55.2
Normalized	49.93%	87.39%	100%	69.02%	69.02%
Standard Deviation	0.1%	0%	0.2%	0%	0.1%
PyPerformance - django_template	**841**	466	390	**312**	313
Normalized	37.1%	66.95%	80%	100%	99.68%
Standard Deviation		0.2%	0.3%	0.2%	0.2%
PyPerformance - pickle_pure_python (Milliseconds)	**6.64**	3.58	3.00	**2.58**	**2.58**
Normalized	38.86%	72.07%	86%	100%	100%
Standard Deviation	0.1%	0.3%	0.4%	0.2%	0.2%
Hierarchical INTegration - FLOAT (QUIPs)	**62697907**	105866488	**126728793**	110467110	110437281
Normalized	49.47%	83.54%	100%	87.17%	87.14%
Standard Deviation	0%	0%	0.3%	0.1%	0.1%
PHPBench - P.B.S (Score)	**56935**	124303	**149237**		
Normalized	38.15%	83.29%	100%		
Standard Deviation	0.2%	1.1%	0.7%		
Tesseract OCR - T.T.O.7.I (sec)	**269.375**	121.650	**102.837**		
Normalized	38.18%	84.54%	100%		
Standard Deviation	1.6%	0%	0.5%		
GIMP - rotate (sec)				**161.560**	**124.700**
Normalized				77.18%	100%
Standard Deviation				9.7%	6%
GIMP - auto-levels (sec)				**172.460**	**131.127**
Normalized				76.03%	100%
Standard Deviation				13%	11.8%
GIMP - unsharp-mask (sec)				**202.259**	**172.284**
Normalized				85.18%	100%
Standard Deviation				1%	8.7%

Raspberry Pi 400

OCRMyPDF - P.6.P.P.D (sec)	**304.801**	**307.419**
Normalized	100%	99.15%
Standard Deviation	0.5%	0.3%
GNU Octave Benchmark	**35.090**	**41.548**
Normalized	100%	84.46%
Standard Deviation	2.5%	1.9%
Tesseract OCR - T.T.O.7.I (sec)	**124.276**	**127.004**
Normalized	100%	97.85%
Standard Deviation	1.8%	2.4%

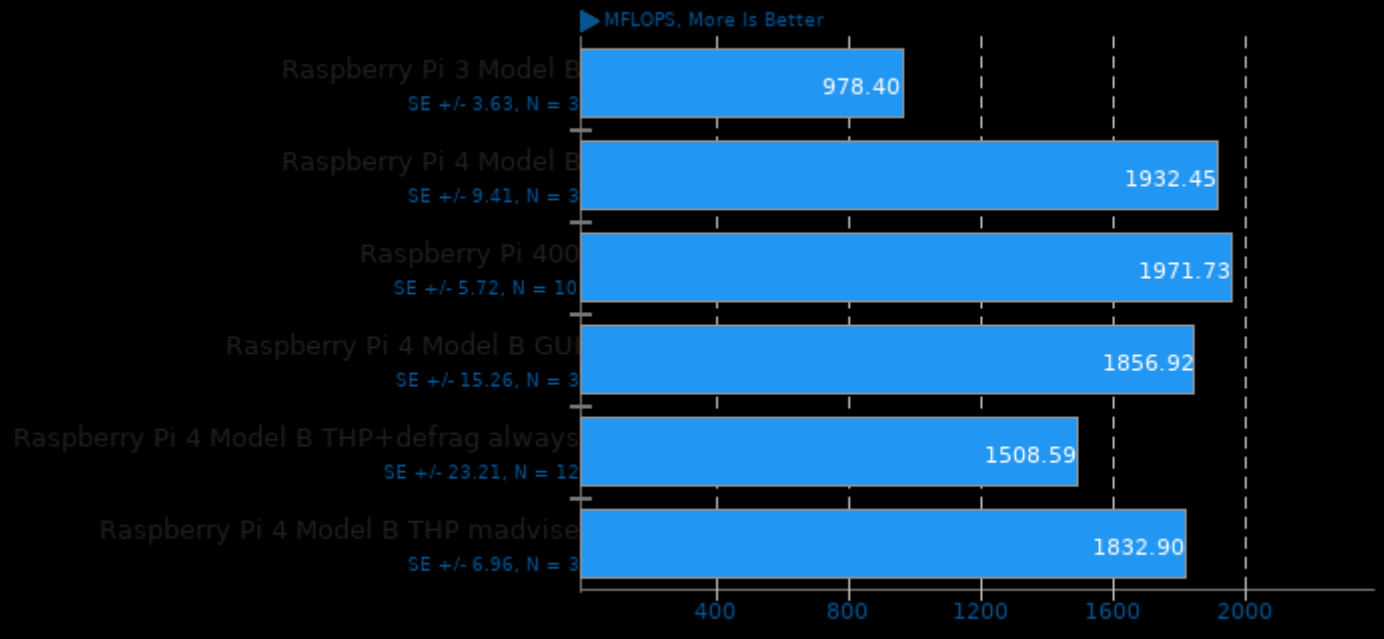

IOR 3.2.1
Write Test
MB/s, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.09, N = 3
MIN: 0.42 / MAX: 11.51
7.44
Raspberry Pi 4 Model B
SE +/- 0.10, N = 3
MIN: 1.3 / MAX: 17.85
9.90
Raspberry Pi 400
SE +/- 0.48, N = 15
MIN: 0.16 / MAX: 20.17
10.72
Raspberry Pi 4 Model B GUI
SE +/- 0.93, N = 12
MIN: 0.17 / MAX: 44.67
28.68
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.33, N = 15
MIN: 0.05 / MAX: 38.04
16.26
Raspberry Pi 4 Model B THP madvise
SE +/- 0.24, N = 15
MIN: 0.1 / MAX: 52.46
19.35
7
14
21
28
35
1. (CC) gcc options: -O2 -lm -pthread -lmpi
IOR 3.2.1
Read Test
MB/s, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.15, N = 3
MIN: 0.77 / MAX: 21.68
19.19
Raspberry Pi 4 Model B
SE +/- 0.50, N = 3
MIN: 25.87 / MAX: 40.56
37.77
Raspberry Pi 400
SE +/- 0.07, N = 15
MIN: 1.51 / MAX: 42.28
40.47
Raspberry Pi 4 Model B GUI
SE +/- 1.85, N = 12
MIN: 5.92 / MAX: 114.55
91.64
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.16, N = 15
MIN: 0.05 / MAX: 74.45
59.33
Raspberry Pi 4 Model B THP madvise
SE +/- 0.22, N = 15
MIN: 0.1 / MAX: 78.78
60.64
20
40
60
80
100
1. (CC) gcc options: -O2 -lm -pthread -lmpi

Raspberry Pi 400



FFTE 7.0

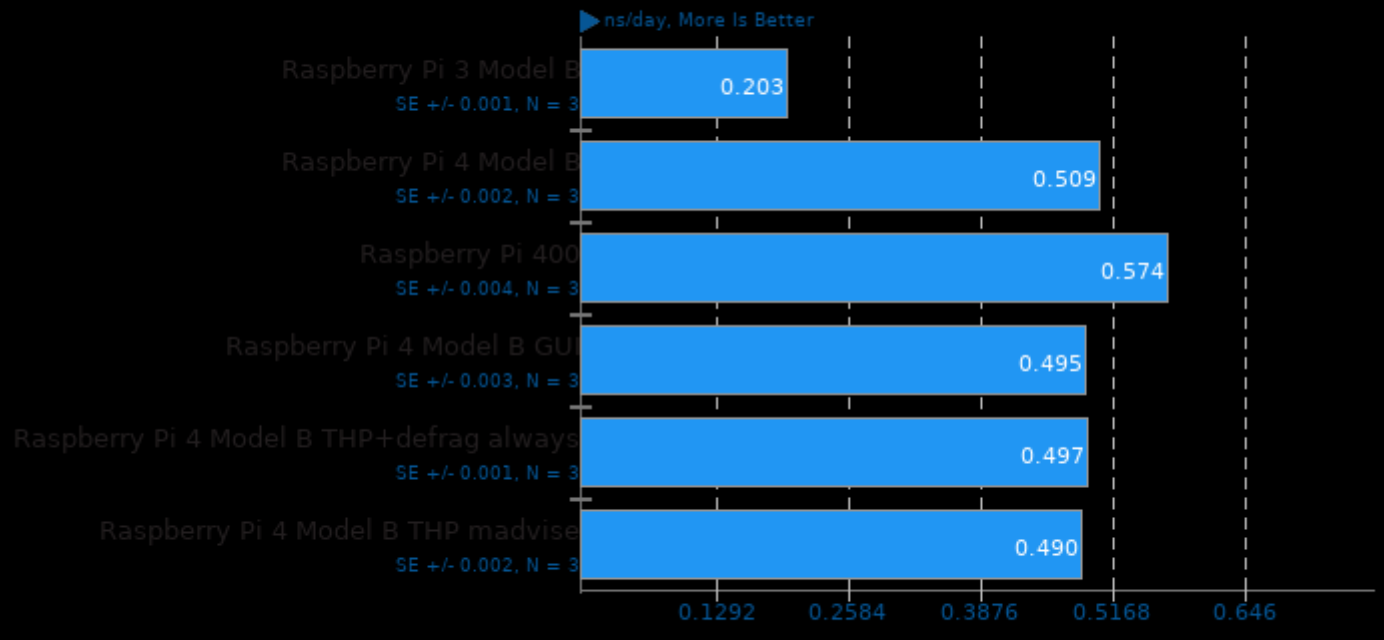
N=256, 3D Complex FFT Routine



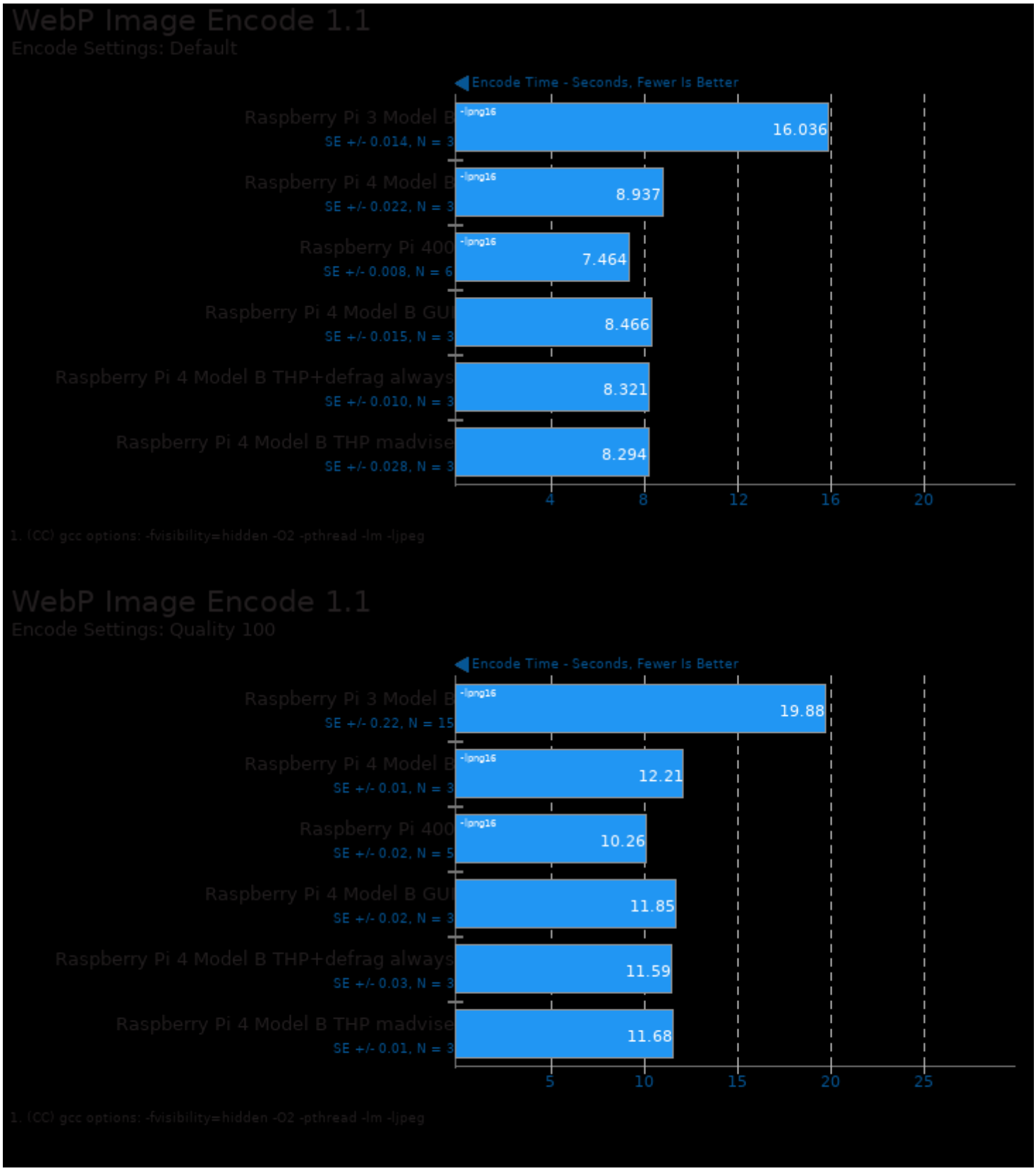
1. (F9X) gfortran options: -O3 -fomit-frame-pointer -fopenmp

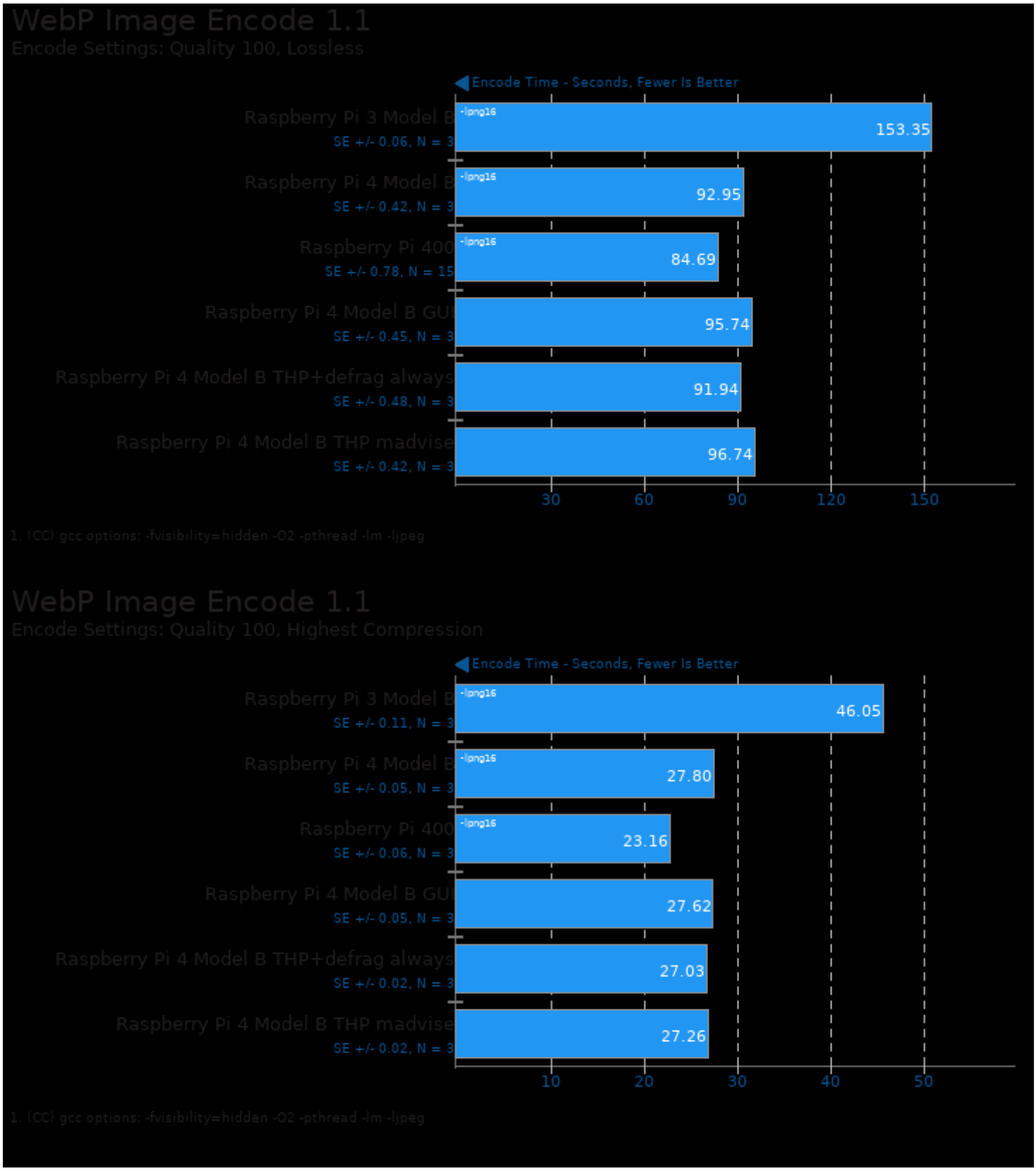
LAMMPS Molecular Dynamics Simulator 24Aug2020

Model: Rhodopsin Protein

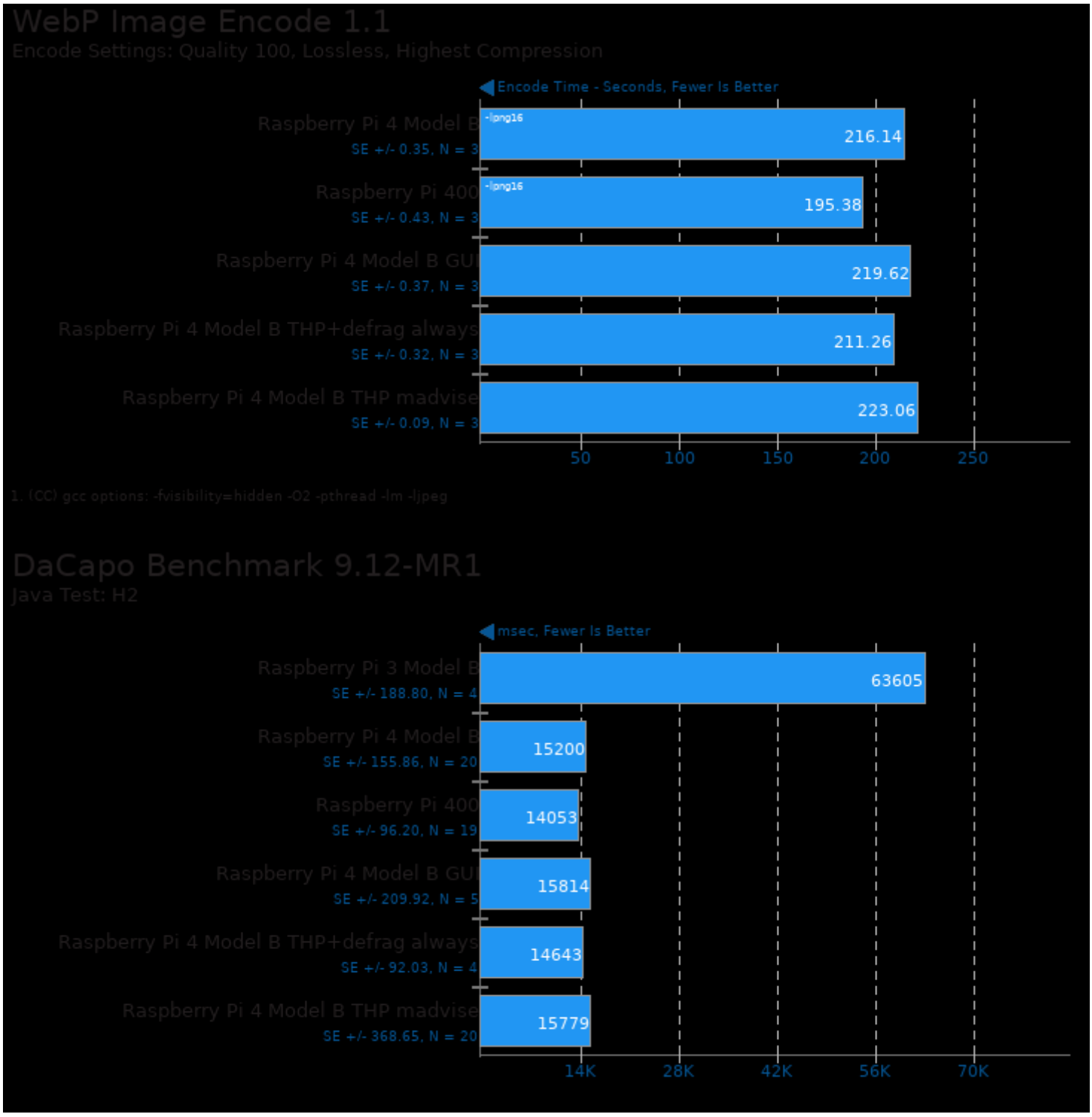


1. (CXX) g++ options: -O3 -pthread -lm

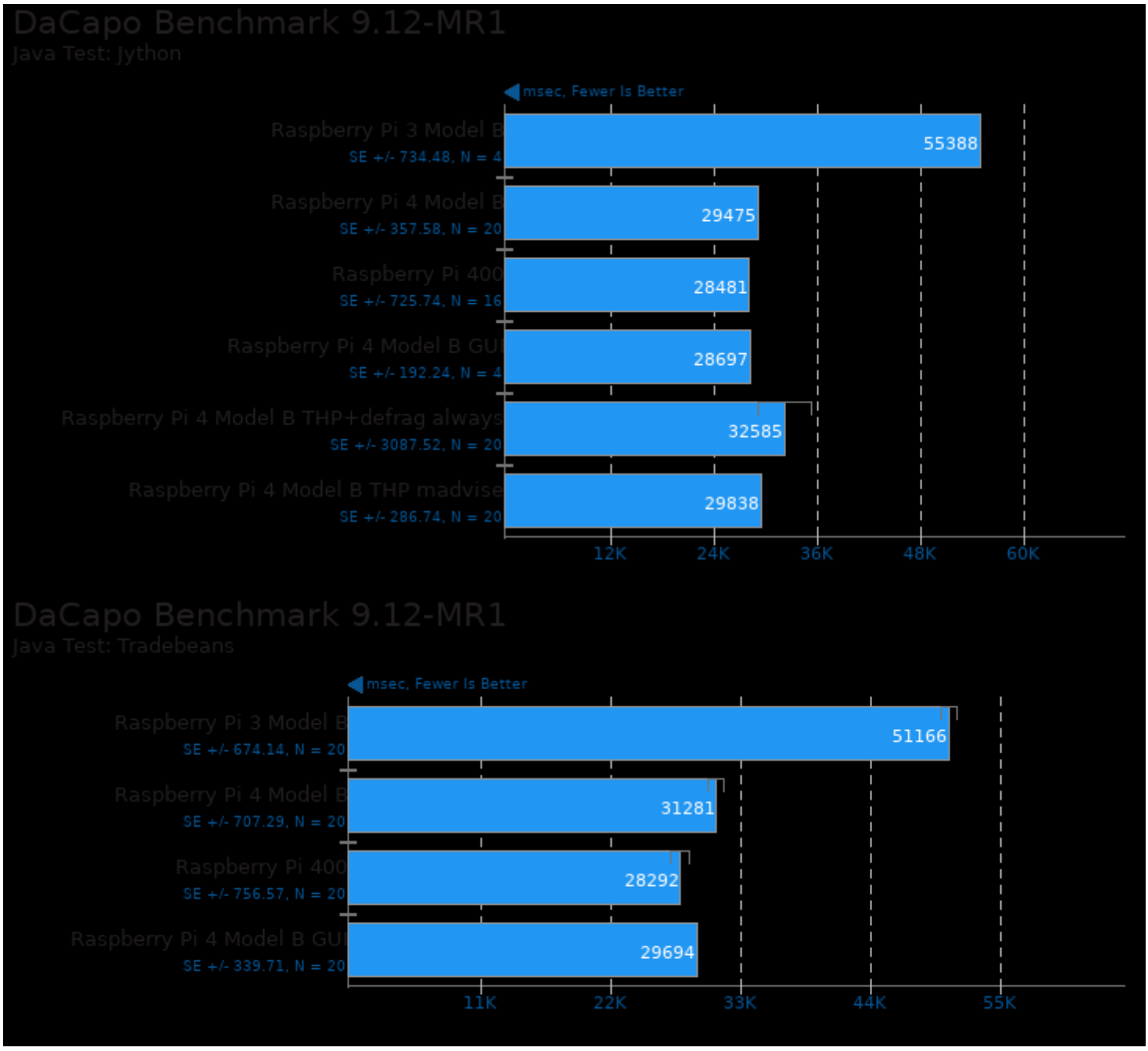

WebP Image Encode 1.1
Encode Settings: Default
Encode Time - Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.014, N = 3
16.036
Raspberry Pi 4 Model B
SE +/- 0.022, N = 3
8.937
Raspberry Pi 400
SE +/- 0.008, N = 6
7.464
Raspberry Pi 4 Model B GUI
SE +/- 0.015, N = 3
8.466
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.010, N = 3
8.321
Raspberry Pi 4 Model B THP madvise
SE +/- 0.028, N = 3
8.294
-lpng16
4
8
12
16
20
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg
WebP Image Encode 1.1
Encode Settings: Quality 100
Encode Time - Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.22, N = 15
19.88
Raspberry Pi 4 Model B
SE +/- 0.01, N = 3
12.21
Raspberry Pi 400
SE +/- 0.02, N = 5
10.26
Raspberry Pi 4 Model B GUI
SE +/- 0.02, N = 3
11.85
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.03, N = 3
11.59
Raspberry Pi 4 Model B THP madvise
SE +/- 0.01, N = 3
11.68
-lpng16
5
10
15
20
25
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg

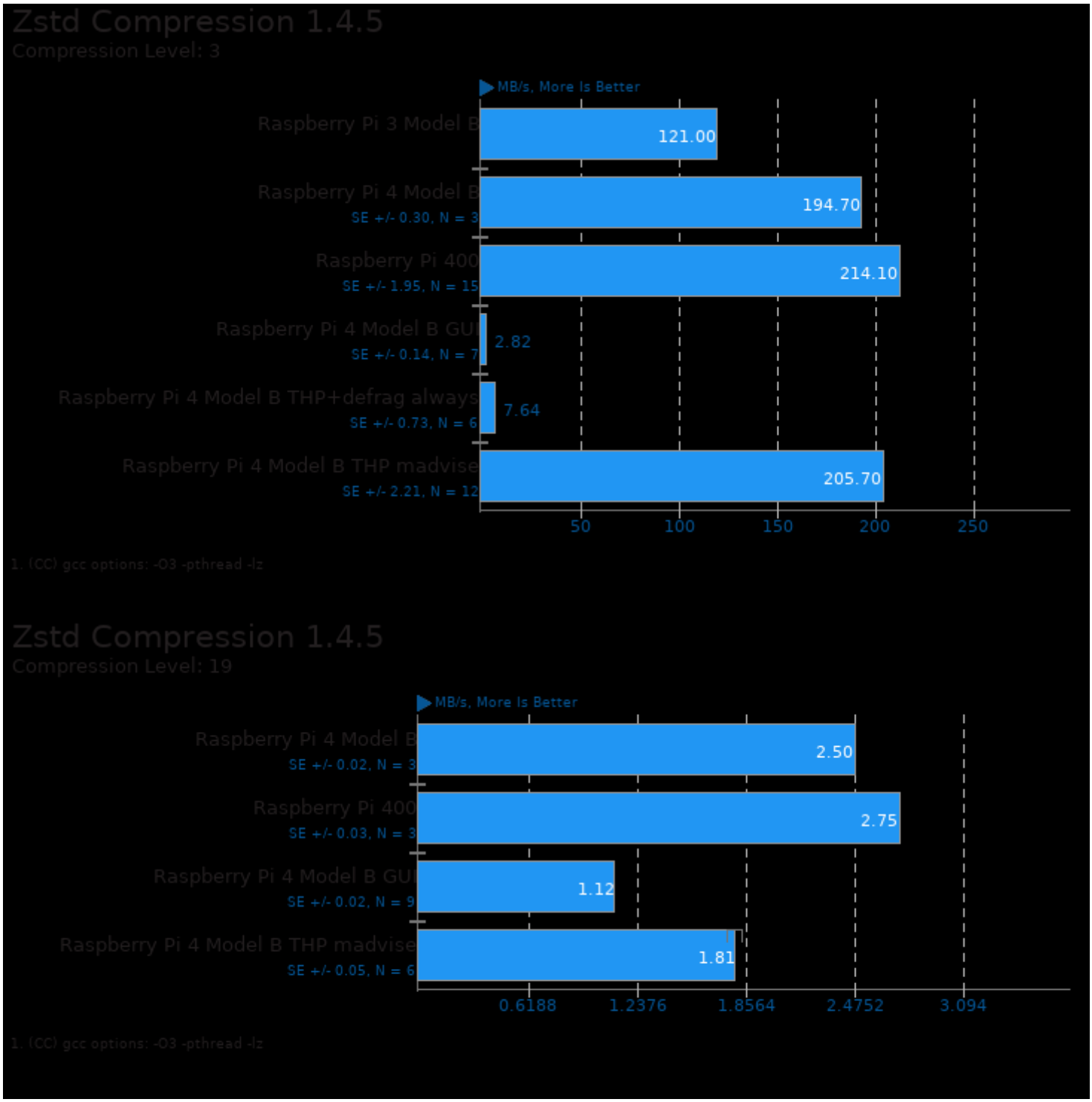

WebP Image Encode 1.1
Encode Settings: Quality 100, Lossless
Encode Time - Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.06, N = 3
153.35
Raspberry Pi 4 Model B
SE +/- 0.42, N = 3
92.95
Raspberry Pi 400
SE +/- 0.78, N = 15
84.69
Raspberry Pi 4 Model B GUI
SE +/- 0.45, N = 3
95.74
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.48, N = 3
91.94
Raspberry Pi 4 Model B THP madvise
SE +/- 0.42, N = 3
96.74
-lpng16
30
60
90
120
150
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg
WebP Image Encode 1.1
Encode Settings: Quality 100, Highest Compression
Encode Time - Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.11, N = 3
46.05
Raspberry Pi 4 Model B
SE +/- 0.05, N = 3
27.80
Raspberry Pi 400
SE +/- 0.06, N = 3
23.16
Raspberry Pi 4 Model B GUI
SE +/- 0.05, N = 3
27.62
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.02, N = 3
27.03
Raspberry Pi 4 Model B THP madvise
SE +/- 0.02, N = 3
27.26
-lpng16
10
20
30
40
50
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg

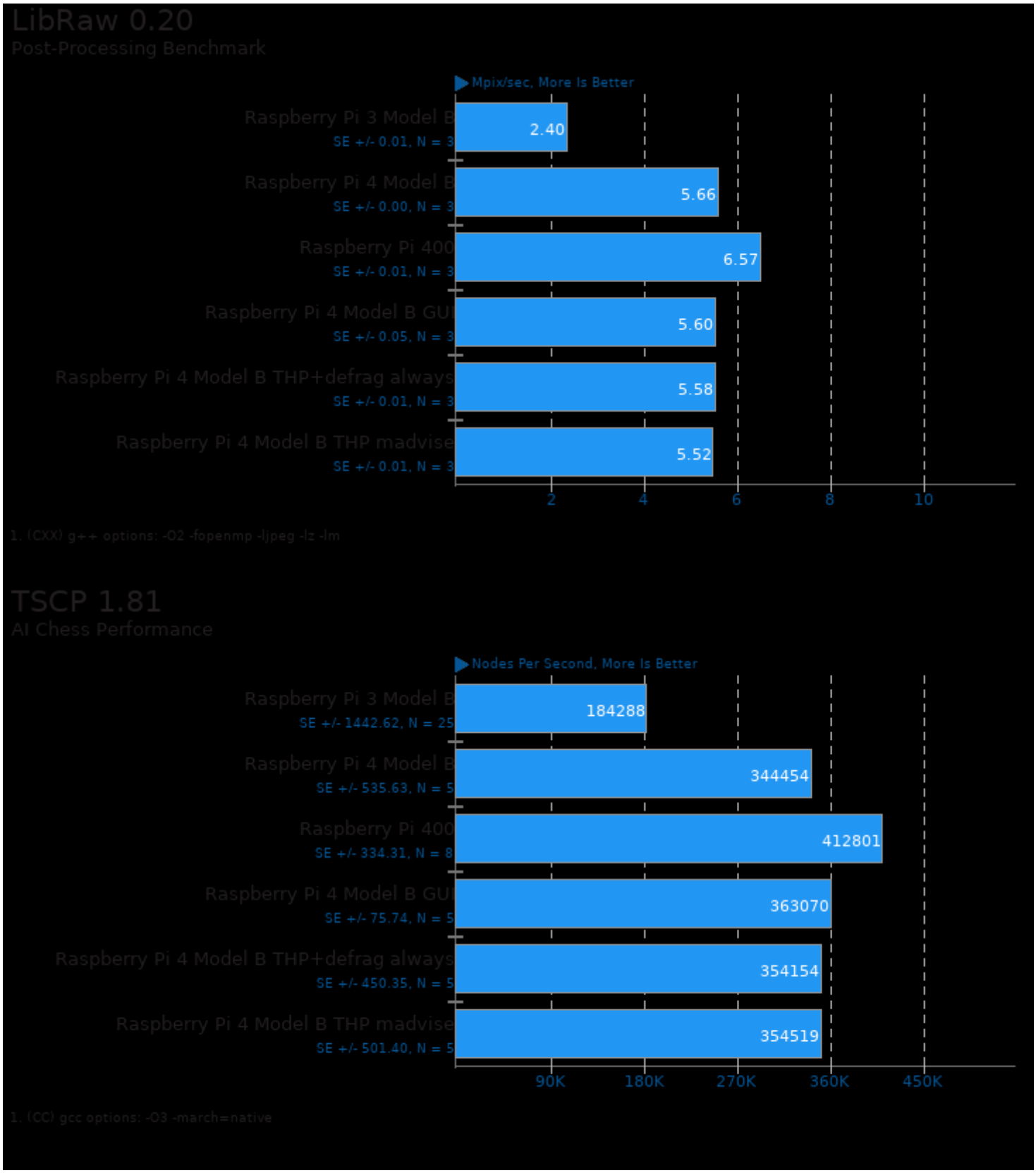
Raspberry Pi 400

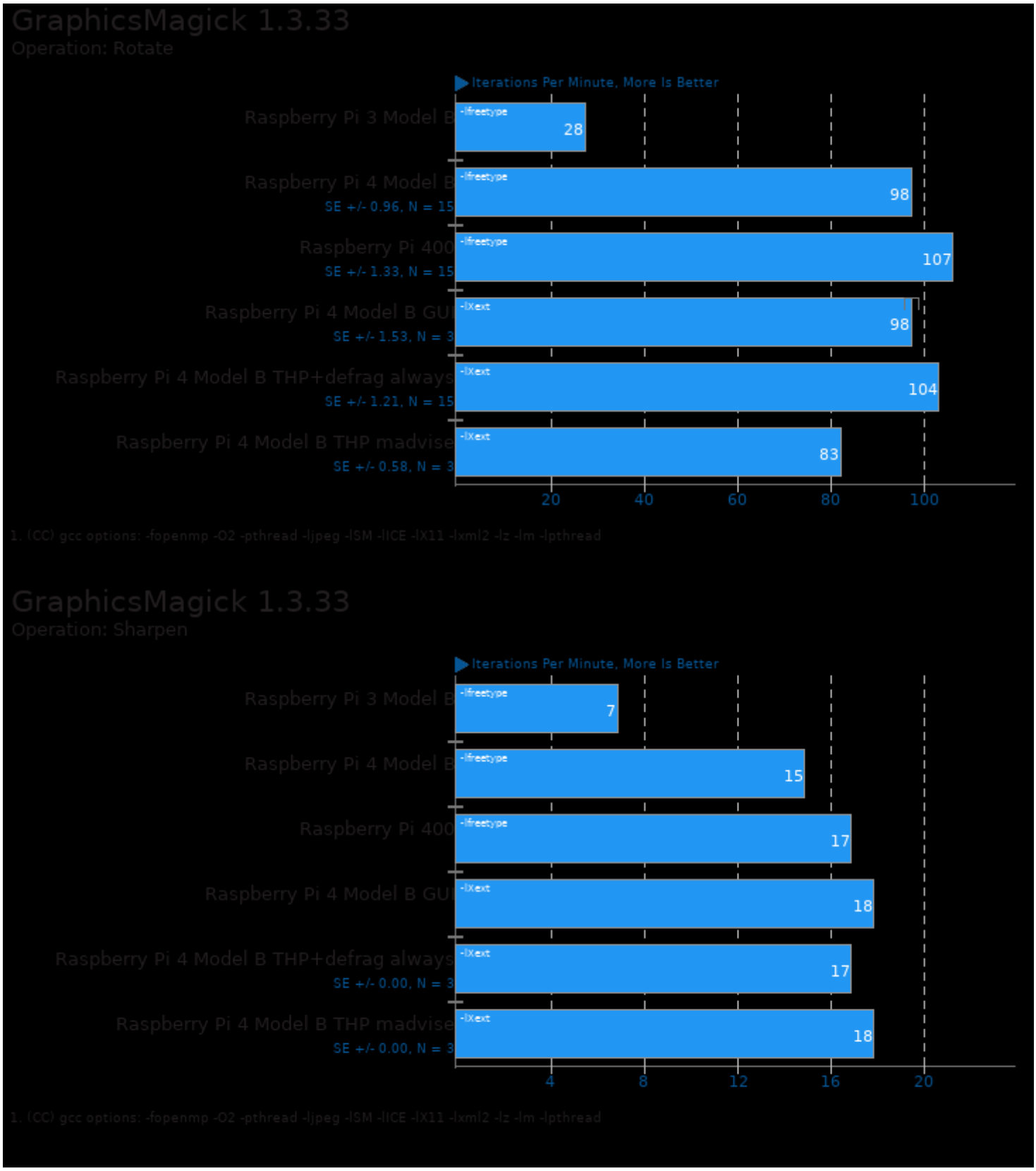


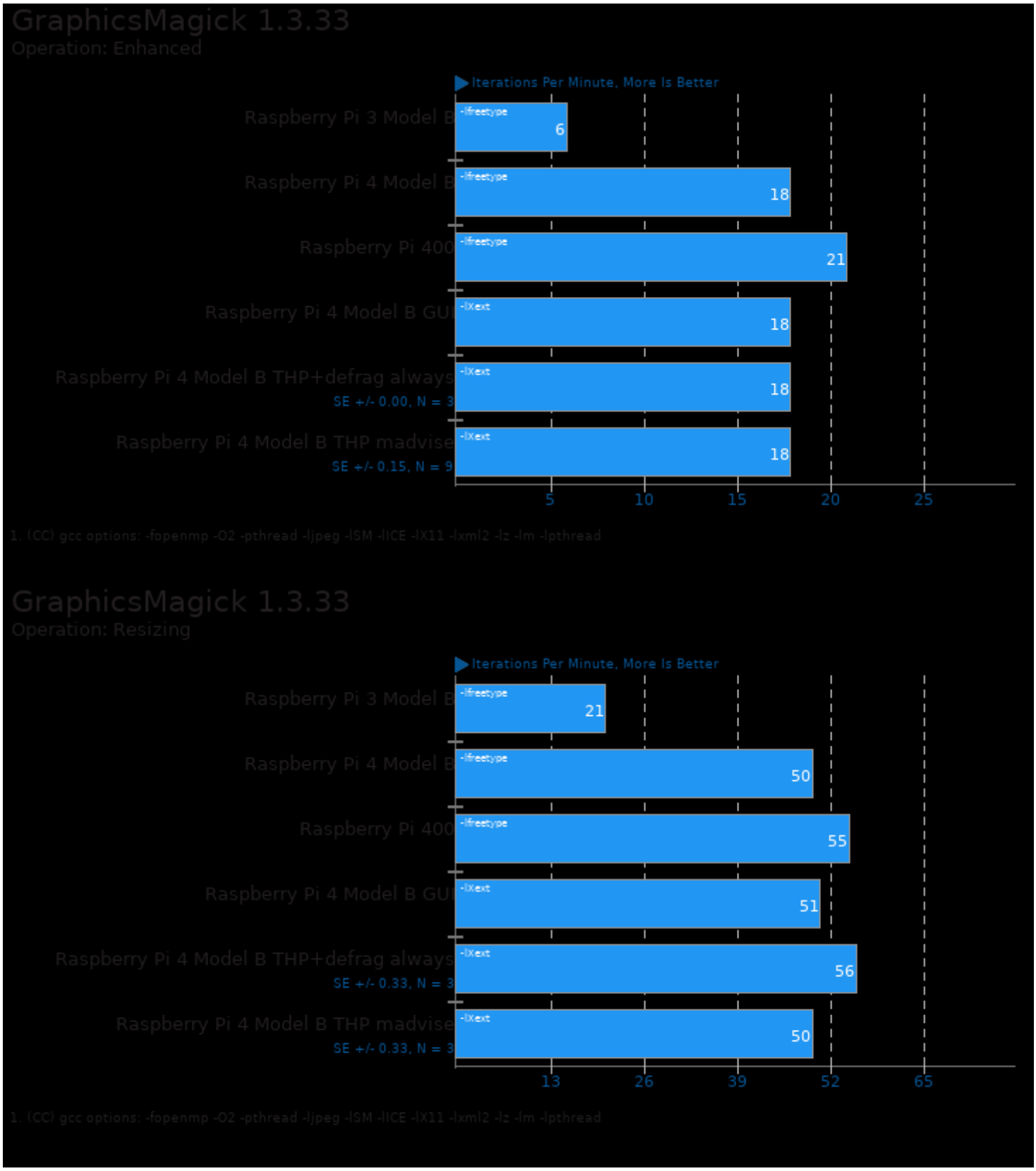
Raspberry Pi 400

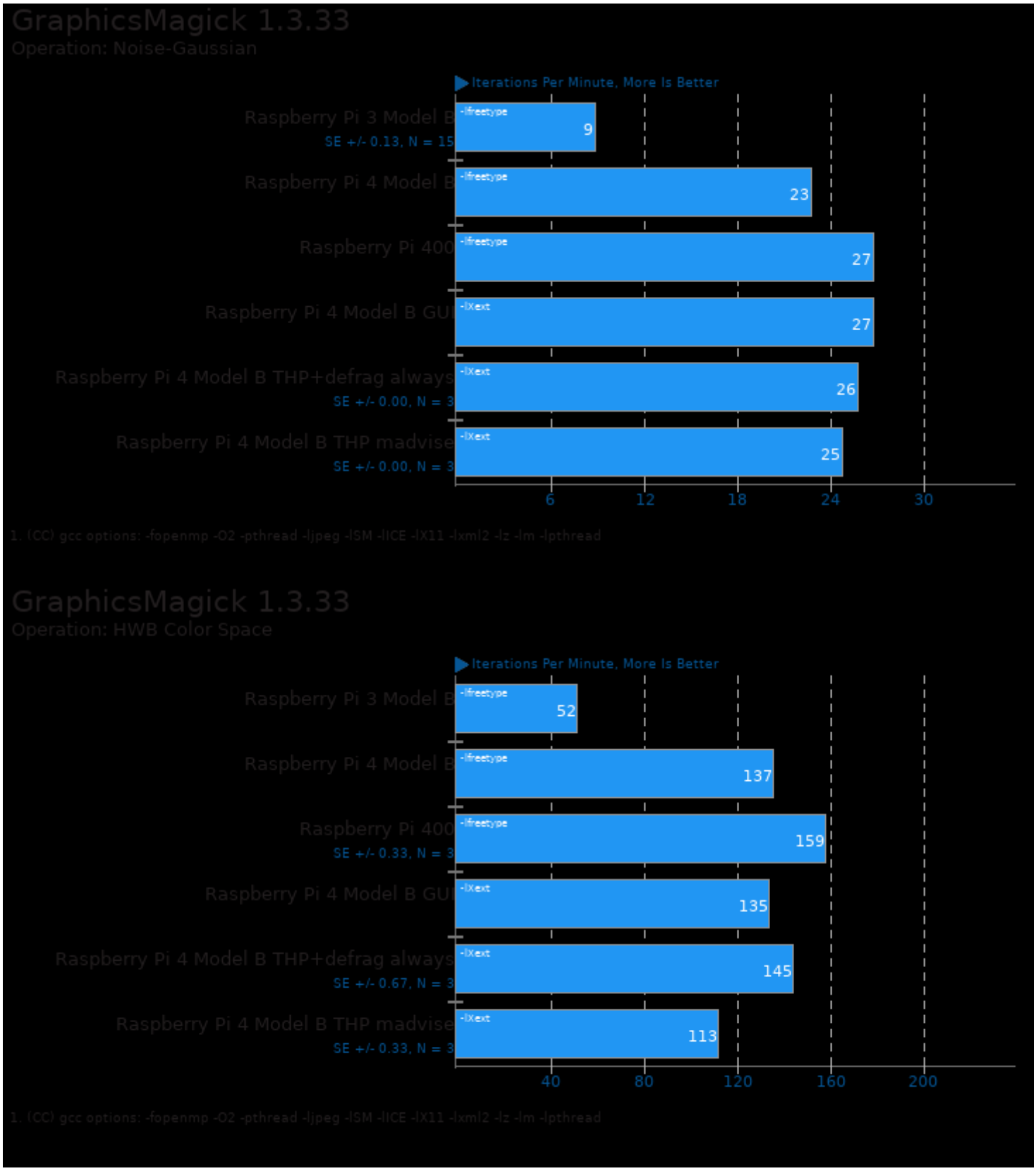


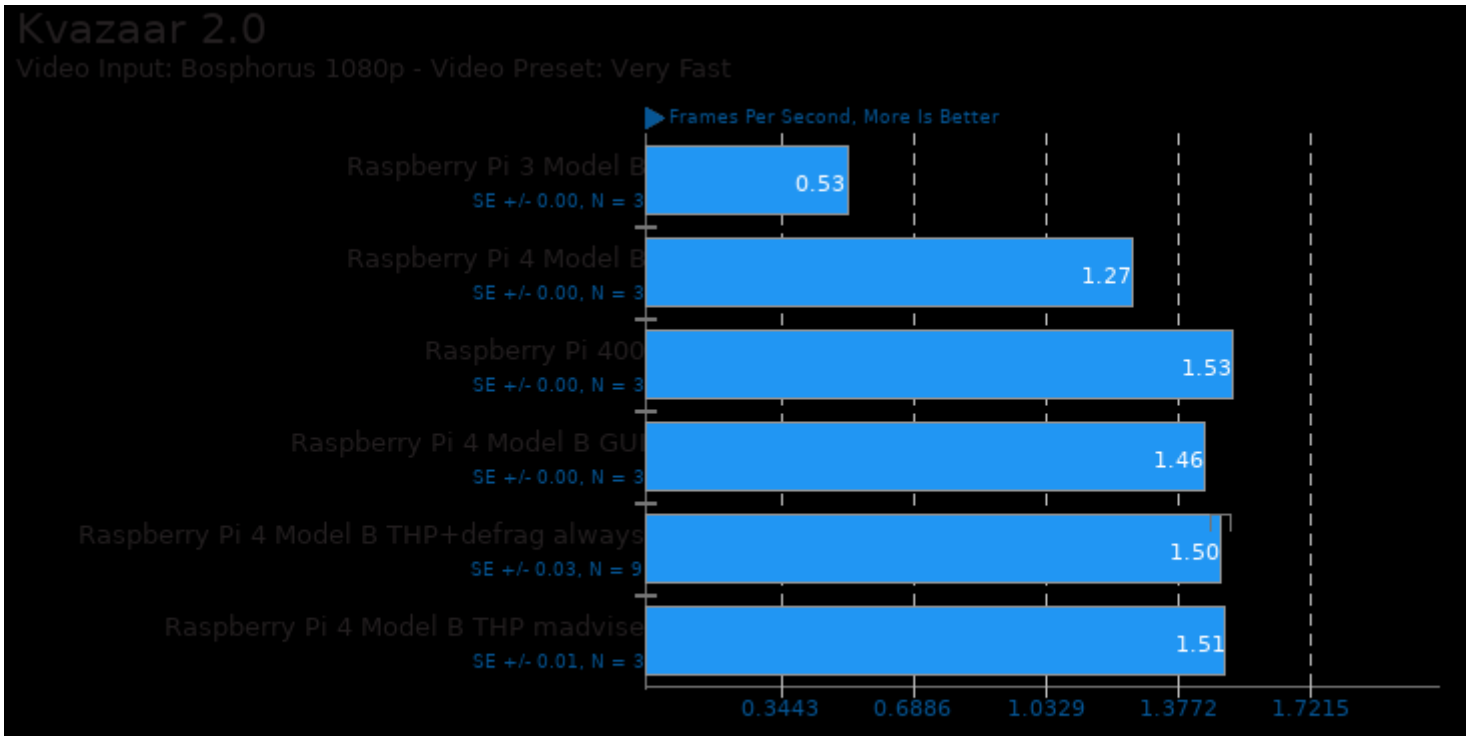

Zstd Compression 1.4.5
Compression Level: 3
MB/s, More Is Better
Raspberry Pi 3 Model B
121.00
Raspberry Pi 4 Model B
SE +/- 0.30, N = 3
194.70
Raspberry Pi 400
SE +/- 1.95, N = 15
214.10
Raspberry Pi 4 Model B GUI
SE +/- 0.14, N = 7
2.82
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.73, N = 6
7.64
Raspberry Pi 4 Model B THP madvise
SE +/- 2.21, N = 12
205.70
50
100
150
200
250
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.5
Compression Level: 19
MB/s, More Is Better
Raspberry Pi 4 Model B
SE +/- 0.02, N = 3
2.50
Raspberry Pi 400
SE +/- 0.03, N = 3
2.75
Raspberry Pi 4 Model B GUI
SE +/- 0.02, N = 9
1.12
Raspberry Pi 4 Model B THP madvise
SE +/- 0.05, N = 6
1.81
0.6188
1.2376
1.8564
2.4752
3.094
1. (CC) gcc options: -O3 -pthread -lz

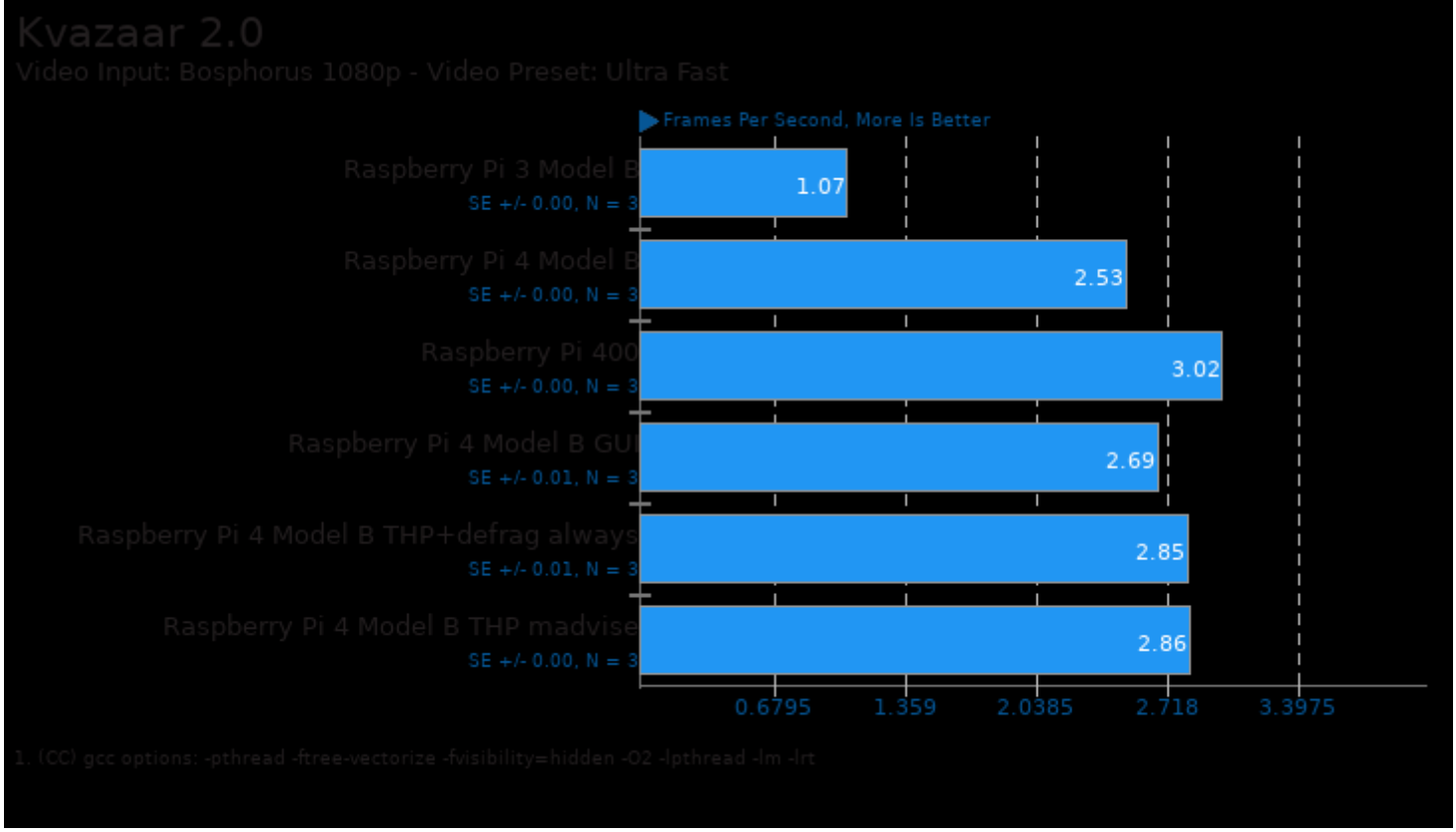

LibRaw 0.20
Post-Processing Benchmark
Mpix/sec, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.01, N = 3
2.40
Raspberry Pi 4 Model B
SE +/- 0.00, N = 3
5.66
Raspberry Pi 400
SE +/- 0.01, N = 3
6.57
Raspberry Pi 4 Model B GUI
SE +/- 0.05, N = 3
5.60
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.01, N = 3
5.58
Raspberry Pi 4 Model B THP madvise
SE +/- 0.01, N = 3
5.52
2
4
6
8
10
1. (CXX) g++ options: -O2 -fopenmp -ljpeg -lz -lm
TSCP 1.81
AI Chess Performance
Nodes Per Second, More Is Better
Raspberry Pi 3 Model B
SE +/- 1442.62, N = 25
184288
Raspberry Pi 4 Model B
SE +/- 535.63, N = 5
344454
Raspberry Pi 400
SE +/- 334.31, N = 8
412801
Raspberry Pi 4 Model B GUI
SE +/- 75.74, N = 5
363070
Raspberry Pi 4 Model B THP+defrag always
SE +/- 450.35, N = 5
354154
Raspberry Pi 4 Model B THP madvise
SE +/- 501.40, N = 5
354519
90K
180K
270K
360K
450K
1. (CC) gcc options: -O3 -march=native


GraphicsMagick 1.3.33
Operation: Rotate
Iterations Per Minute, More Is Better
Raspberry Pi 3 Model B
-lfreetype
28
Raspberry Pi 4 Model B
SE +/- 0.96, N = 15
-lfreetype
98
Raspberry Pi 400
SE +/- 1.33, N = 15
-lfreetype
107
Raspberry Pi 4 Model B GUI
SE +/- 1.53, N = 3
-lXext
98
Raspberry Pi 4 Model B THP+defrag always
SE +/- 1.21, N = 15
-lXext
104
Raspberry Pi 4 Model B THP madvise
SE +/- 0.58, N = 3
-lXext
83
20
40
60
80
100
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lSM -lICE -lX11 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Raspberry Pi 3 Model B
-lfreetype
7
Raspberry Pi 4 Model B
-lfreetype
15
Raspberry Pi 400
-lfreetype
17
Raspberry Pi 4 Model B GUI
-lXext
18
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.00, N = 3
-lXext
17
Raspberry Pi 4 Model B THP madvise
SE +/- 0.00, N = 3
-lXext
18
4
8
12
16
20
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lSM -lICE -lX11 -lxml2 -lz -lm -lpthread


GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute, More Is Better
Raspberry Pi 3 Model B
Raspberry Pi 4 Model B
Raspberry Pi 400
Raspberry Pi 4 Model B GUI
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.00, N = 3
Raspberry Pi 4 Model B THP madvise
SE +/- 0.15, N = 9
-lfreetype
-lXext
6
18
21
18
18
18
5
10
15
20
25
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lSM -lICE -lX11 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Raspberry Pi 3 Model B
Raspberry Pi 4 Model B
Raspberry Pi 400
Raspberry Pi 4 Model B GUI
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.33, N = 3
Raspberry Pi 4 Model B THP madvise
SE +/- 0.33, N = 3
-lfreetype
-lXext
21
50
55
51
56
50
13
26
39
52
65
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lSM -lICE -lX11 -lxml2 -lz -lm -lpthread


GraphicsMagick 1.3.33
Operation: Noise-Gaussian
Iterations Per Minute, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.13, N = 15
-lfreetype
9
Raspberry Pi 4 Model B
-lfreetype
23
Raspberry Pi 400
-lfreetype
27
Raspberry Pi 4 Model B GUI
-lXext
27
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.00, N = 3
-lXext
26
Raspberry Pi 4 Model B THP madvise
SE +/- 0.00, N = 3
-lXext
25
6
12
18
24
30
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lSM -lICE -lX11 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: HWB Color Space
Iterations Per Minute, More Is Better
Raspberry Pi 3 Model B
-lfreetype
52
Raspberry Pi 4 Model B
-lfreetype
137
Raspberry Pi 400
SE +/- 0.33, N = 3
-lfreetype
159
Raspberry Pi 4 Model B GUI
-lXext
135
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.67, N = 3
-lXext
145
Raspberry Pi 4 Model B THP madvise
SE +/- 0.33, N = 3
-lXext
113
40
80
120
160
200
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lSM -lICE -lX11 -lxml2 -lz -lm -lpthread

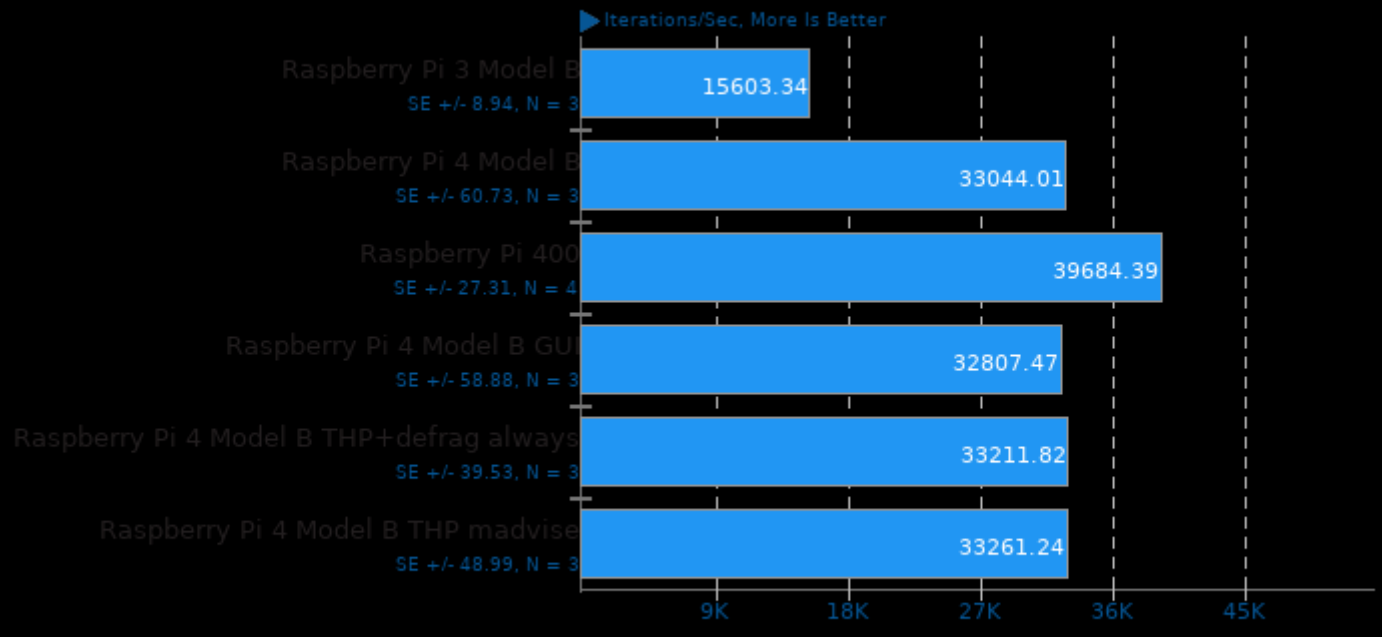

Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Very Fast
Frames Per Second, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.00, N = 3
0.53
Raspberry Pi 4 Model B
SE +/- 0.00, N = 3
1.27
Raspberry Pi 400
SE +/- 0.00, N = 3
1.53
Raspberry Pi 4 Model B GUI
SE +/- 0.00, N = 3
1.46
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.03, N = 9
1.50
Raspberry Pi 4 Model B THP madvise
SE +/- 0.01, N = 3
1.51
0.3443
0.6886
1.0329
1.3772
1.7215
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt


Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Ultra Fast
Frames Per Second, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.00, N = 3
1.07
Raspberry Pi 4 Model B
SE +/- 0.00, N = 3
2.53
Raspberry Pi 400
SE +/- 0.00, N = 3
3.02
Raspberry Pi 4 Model B GUI
SE +/- 0.01, N = 3
2.69
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.01, N = 3
2.85
Raspberry Pi 4 Model B THP madvise
SE +/- 0.00, N = 3
2.86
0.6795
1.359
2.0385
2.718
3.3975
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt

Raspberry Pi 400

Coremark 1.0

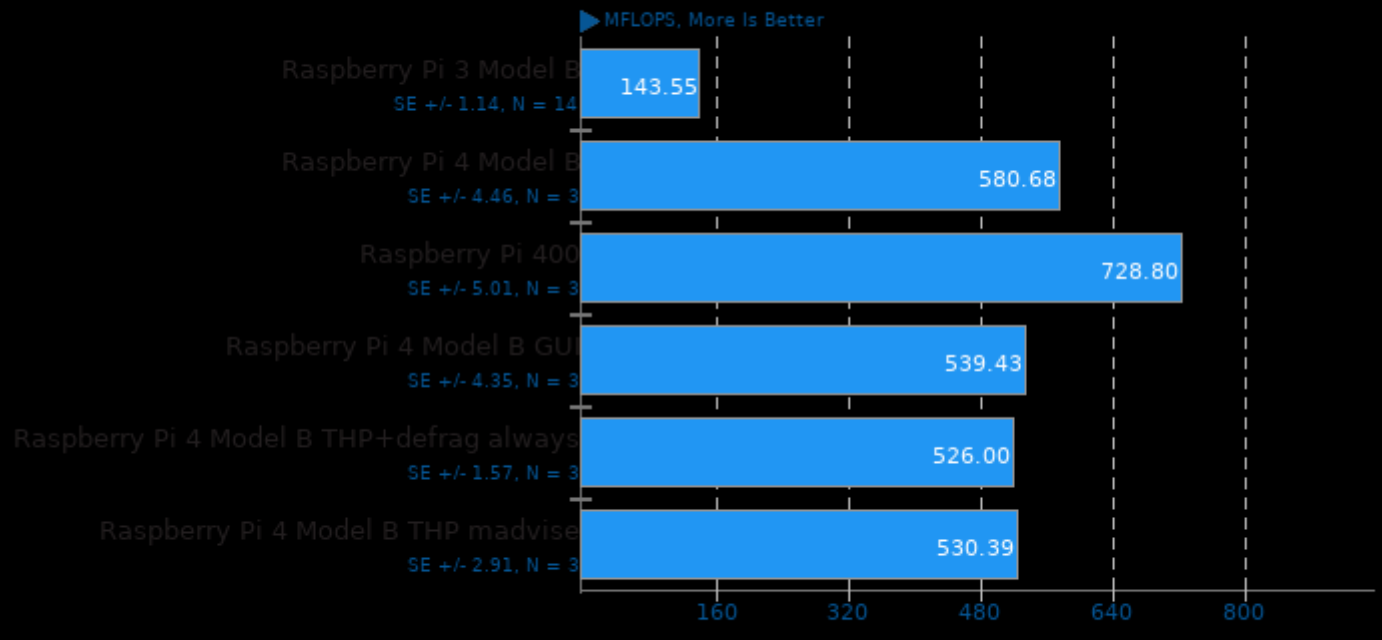
CoreMark Size 666 - Iterations Per Second



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

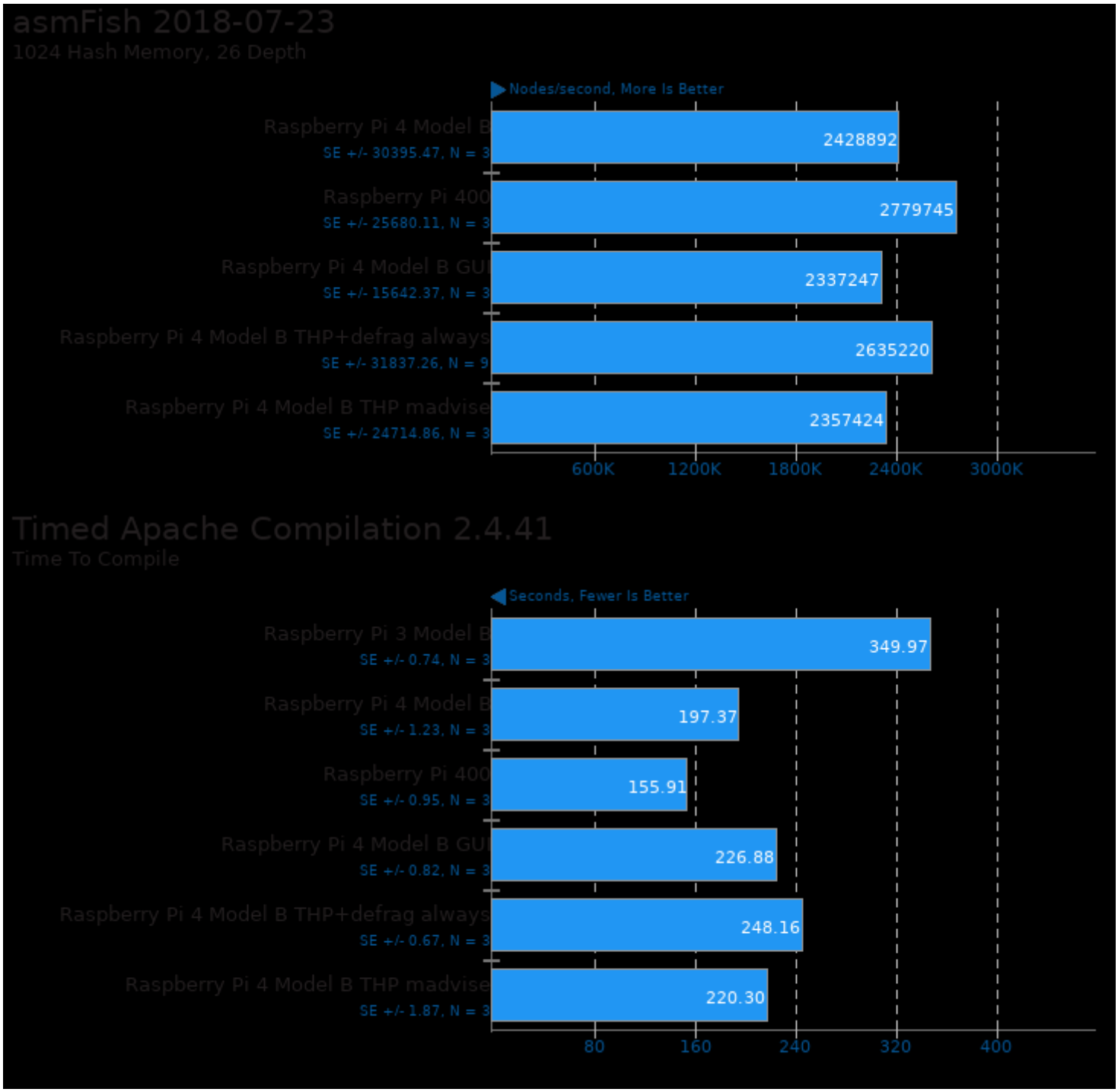
Himeno Benchmark 3.0

Poisson Pressure Solver

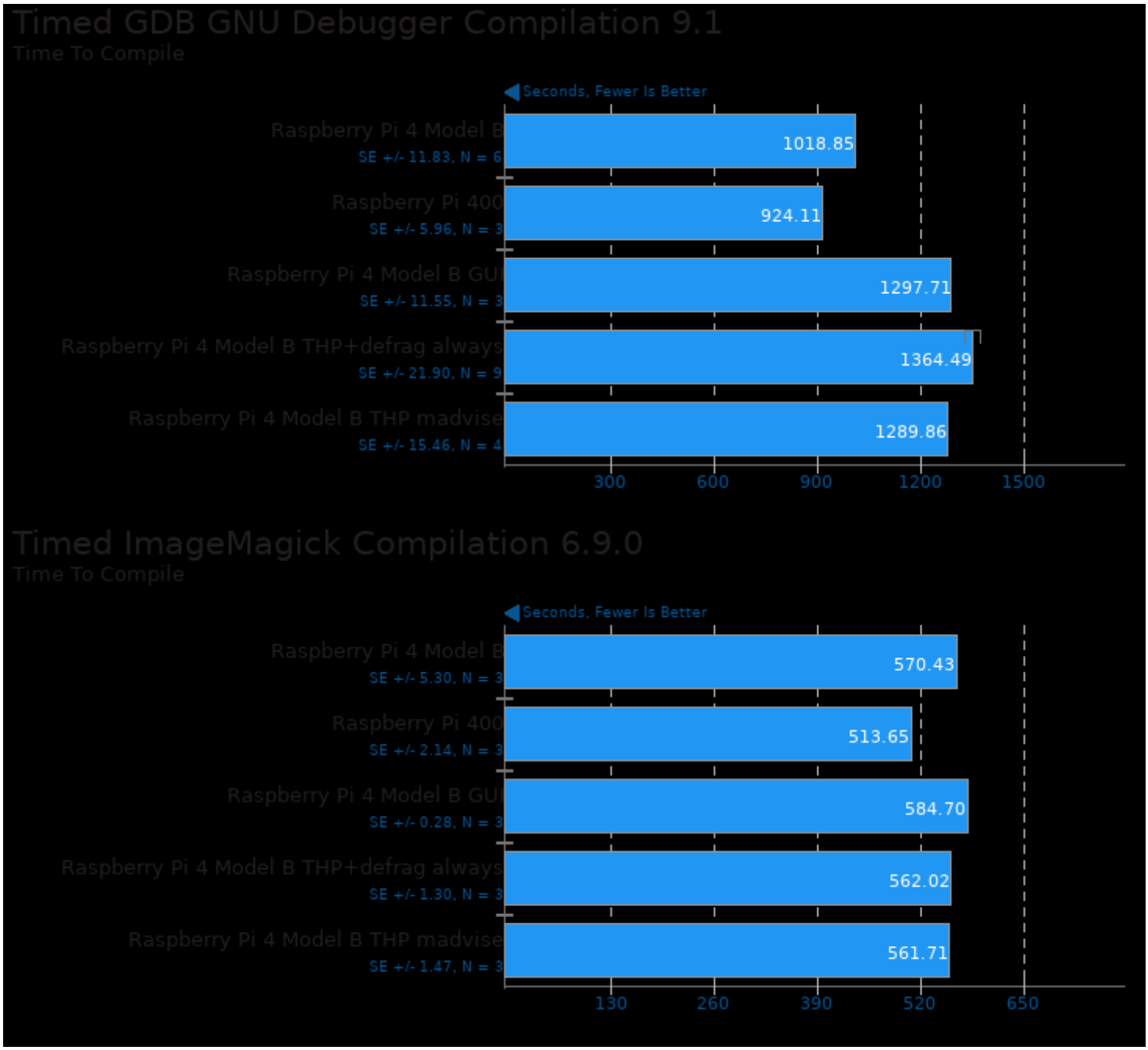


1. (CC) gcc options: -O3

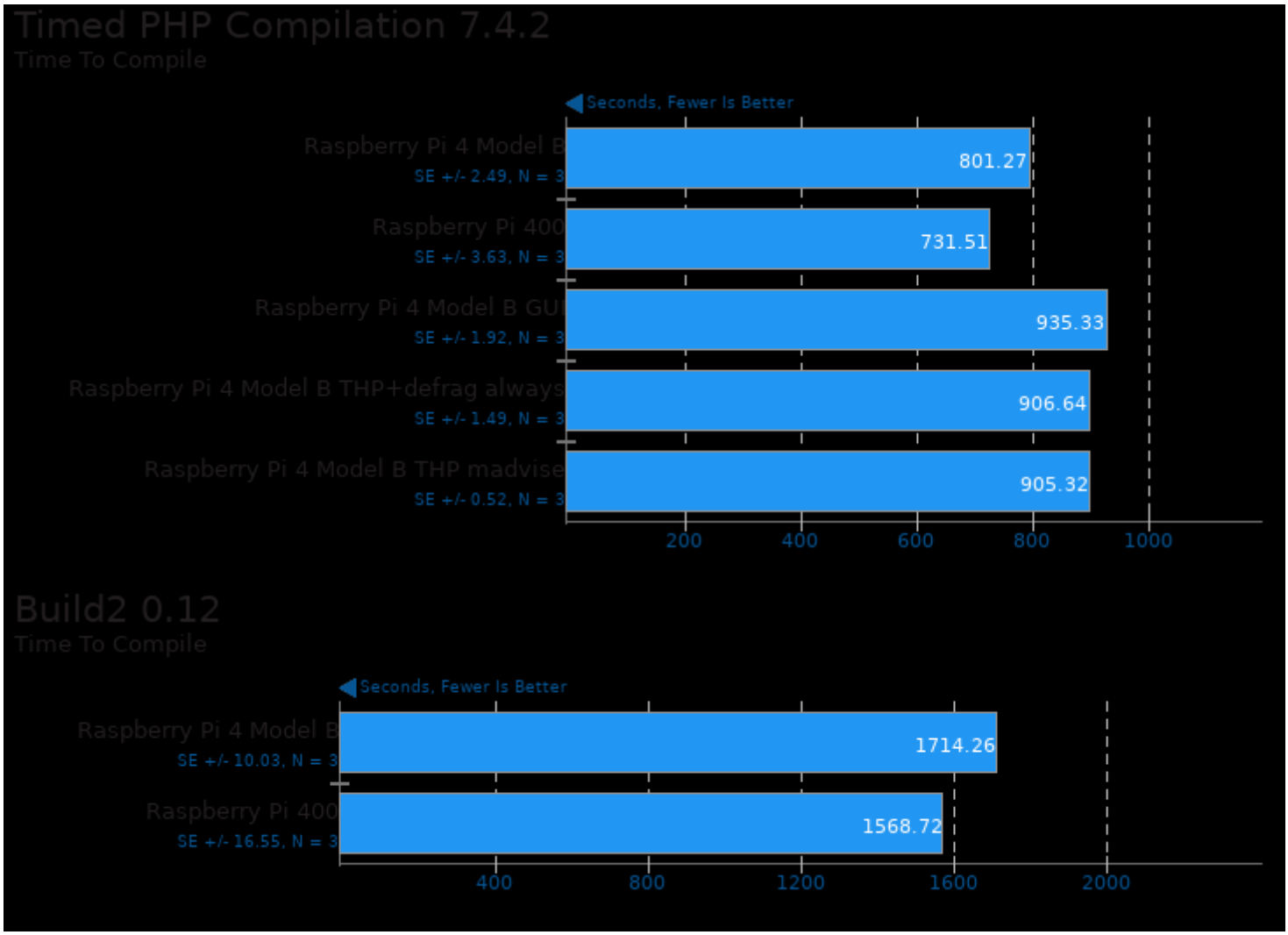
Raspberry Pi 400



Raspberry Pi 400

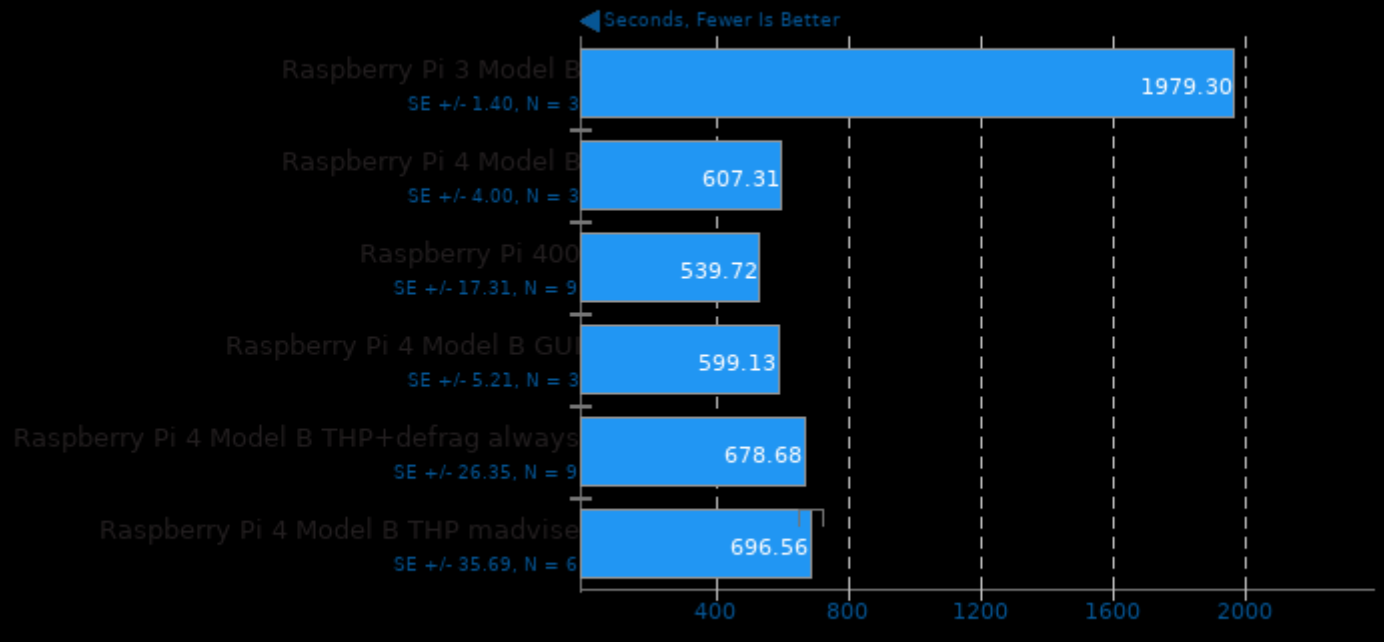


Raspberry Pi 400



C-Ray 1.1

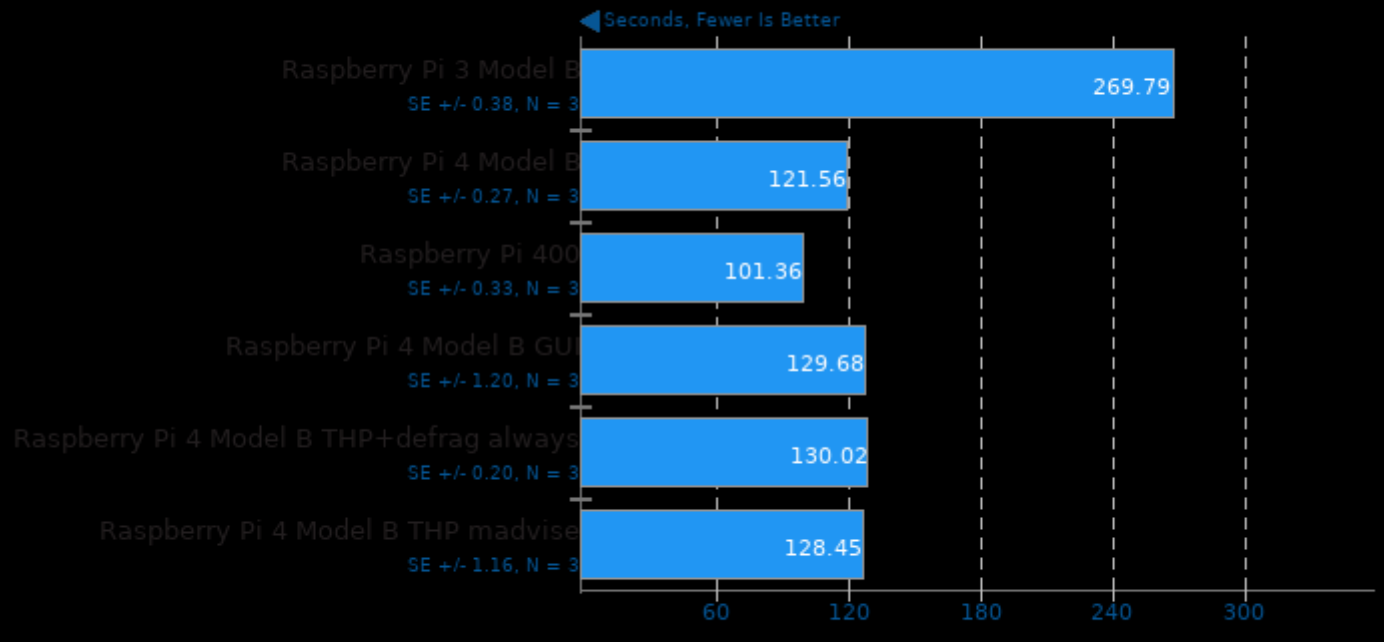
Total Time - 4K, 16 Rays Per Pixel



1. (CC) gcc options: -lm -lpthread -O3

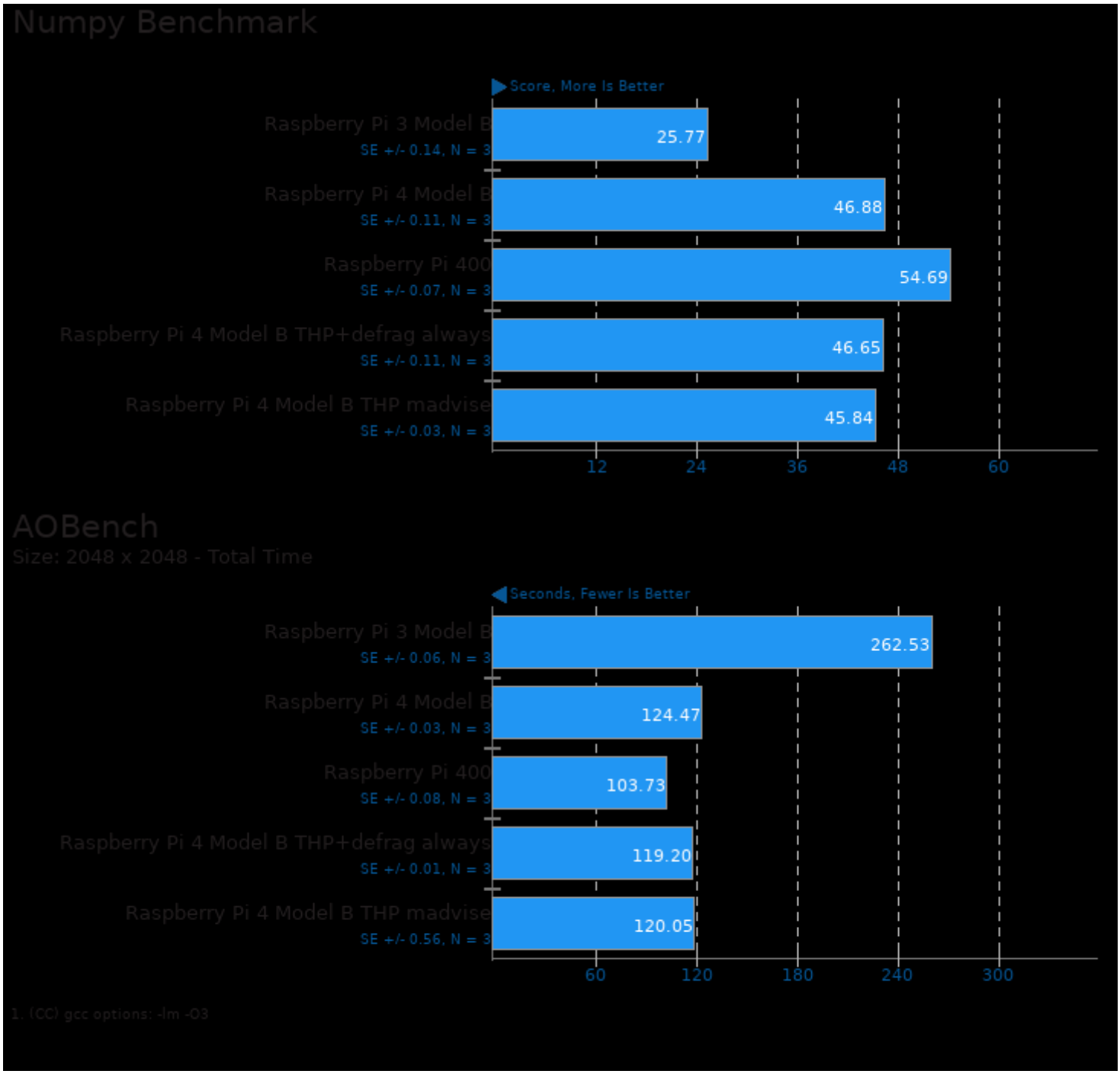
Smallpt 1.0

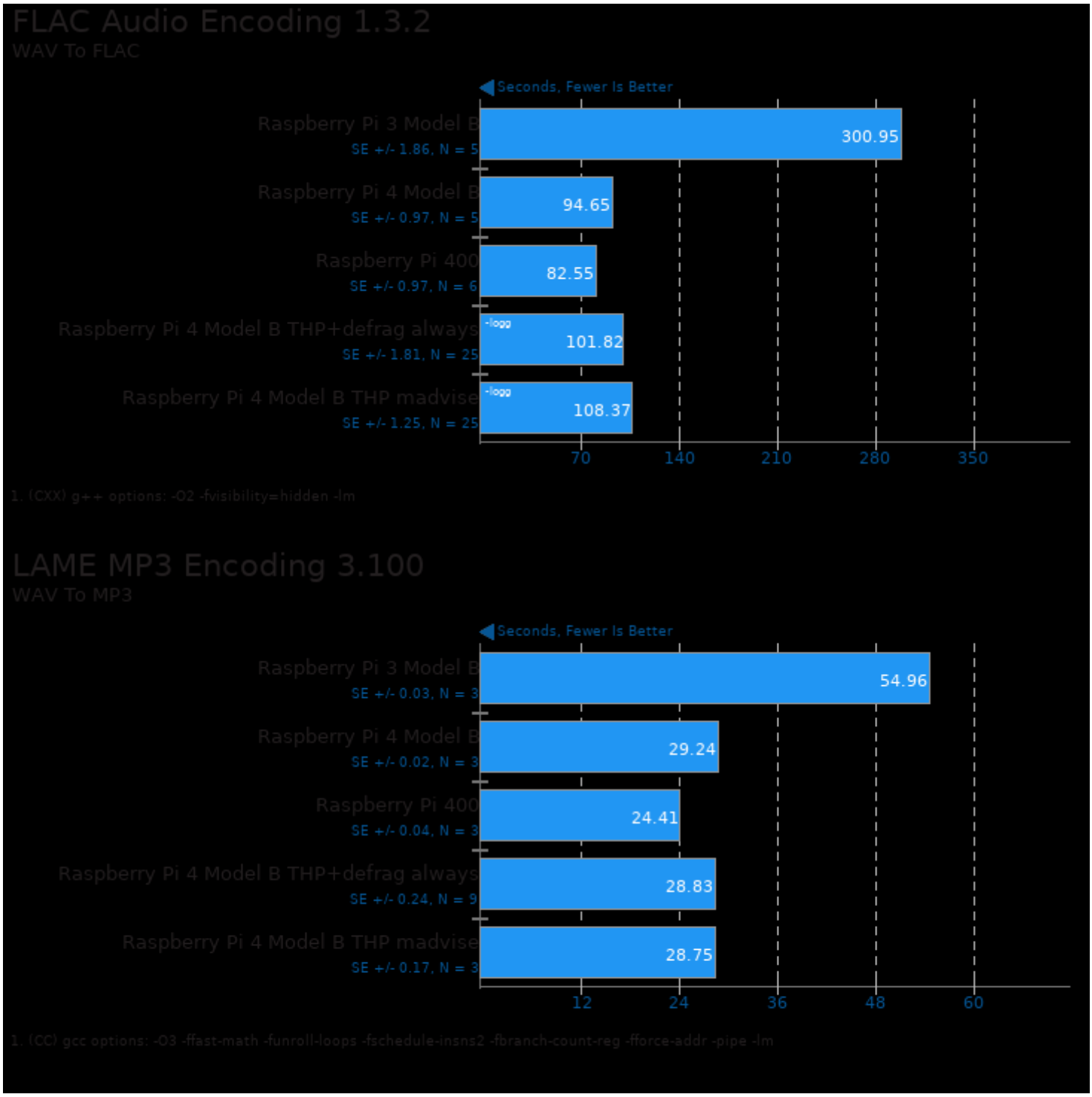
Global Illumination Renderer; 128 Samples



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

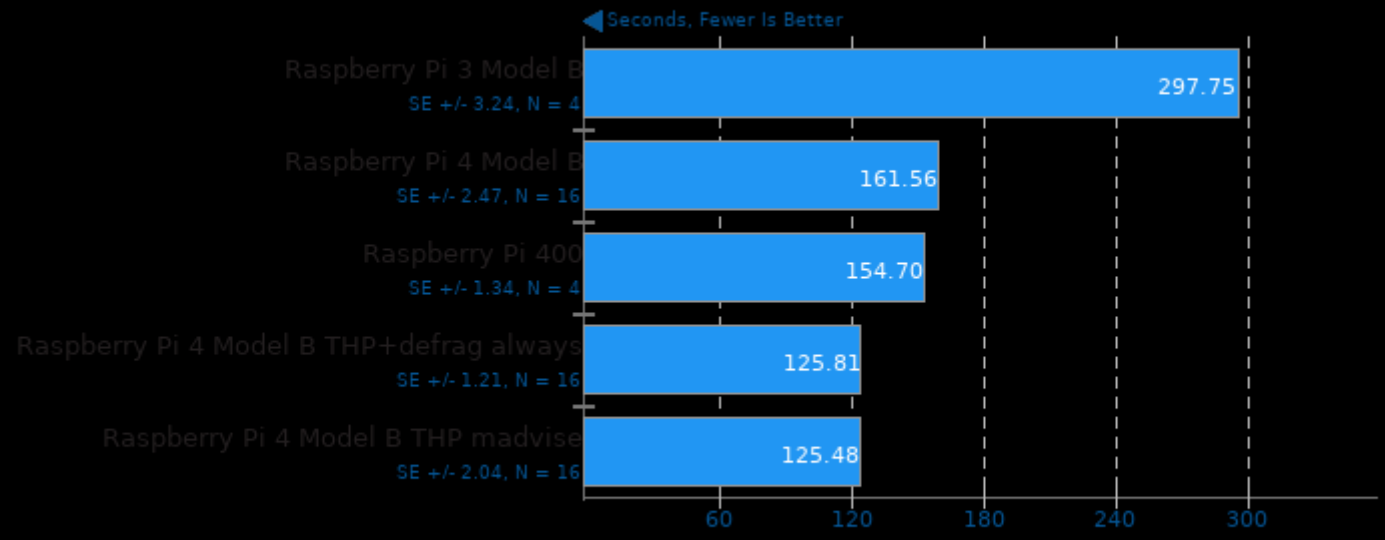
Raspberry Pi 400




FLAC Audio Encoding 1.3.2
WAV To FLAC
Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 1.86, N = 5
300.95
Raspberry Pi 4 Model B
SE +/- 0.97, N = 5
94.65
Raspberry Pi 400
SE +/- 0.97, N = 6
82.55
Raspberry Pi 4 Model B THP+defrag always
SE +/- 1.81, N = 25
-logg
101.82
Raspberry Pi 4 Model B THP madvise
SE +/- 1.25, N = 25
-logg
108.37
70
140
210
280
350
1. (CXX) g++ options: -O2 -fvisibility=hidden -lm
LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.03, N = 3
54.96
Raspberry Pi 4 Model B
SE +/- 0.02, N = 3
29.24
Raspberry Pi 400
SE +/- 0.04, N = 3
24.41
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.24, N = 9
28.83
Raspberry Pi 4 Model B THP madvise
SE +/- 0.17, N = 3
28.75
12
24
36
48
60
1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lm

eSpeak-NG Speech Engine 20200907

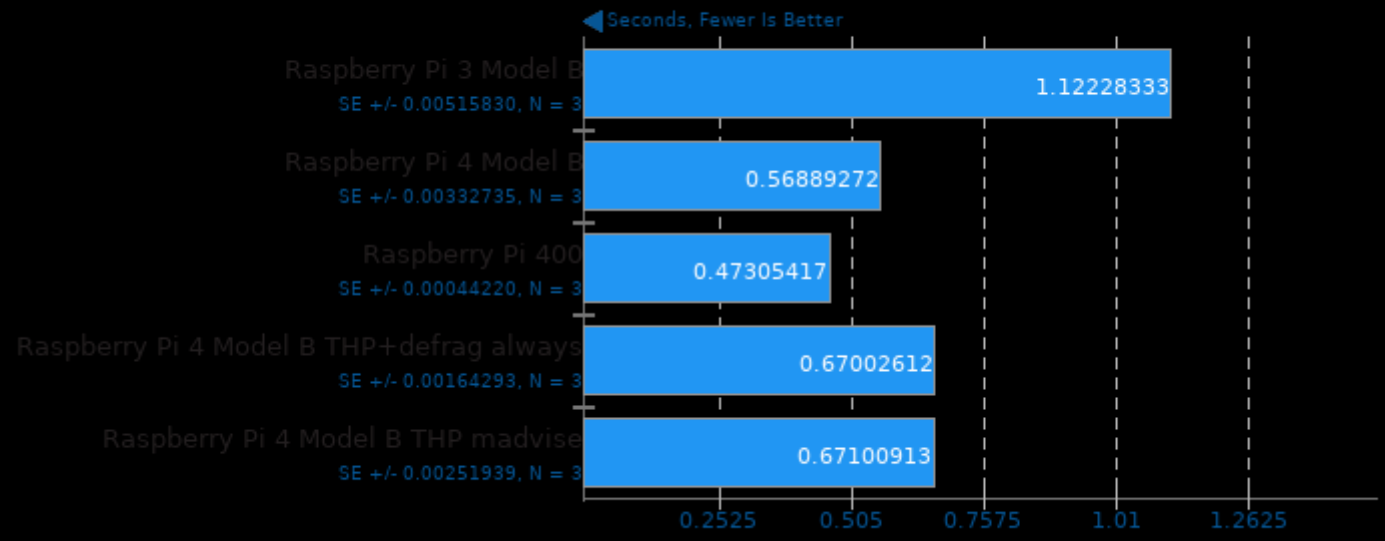
Text-To-Speech Synthesis



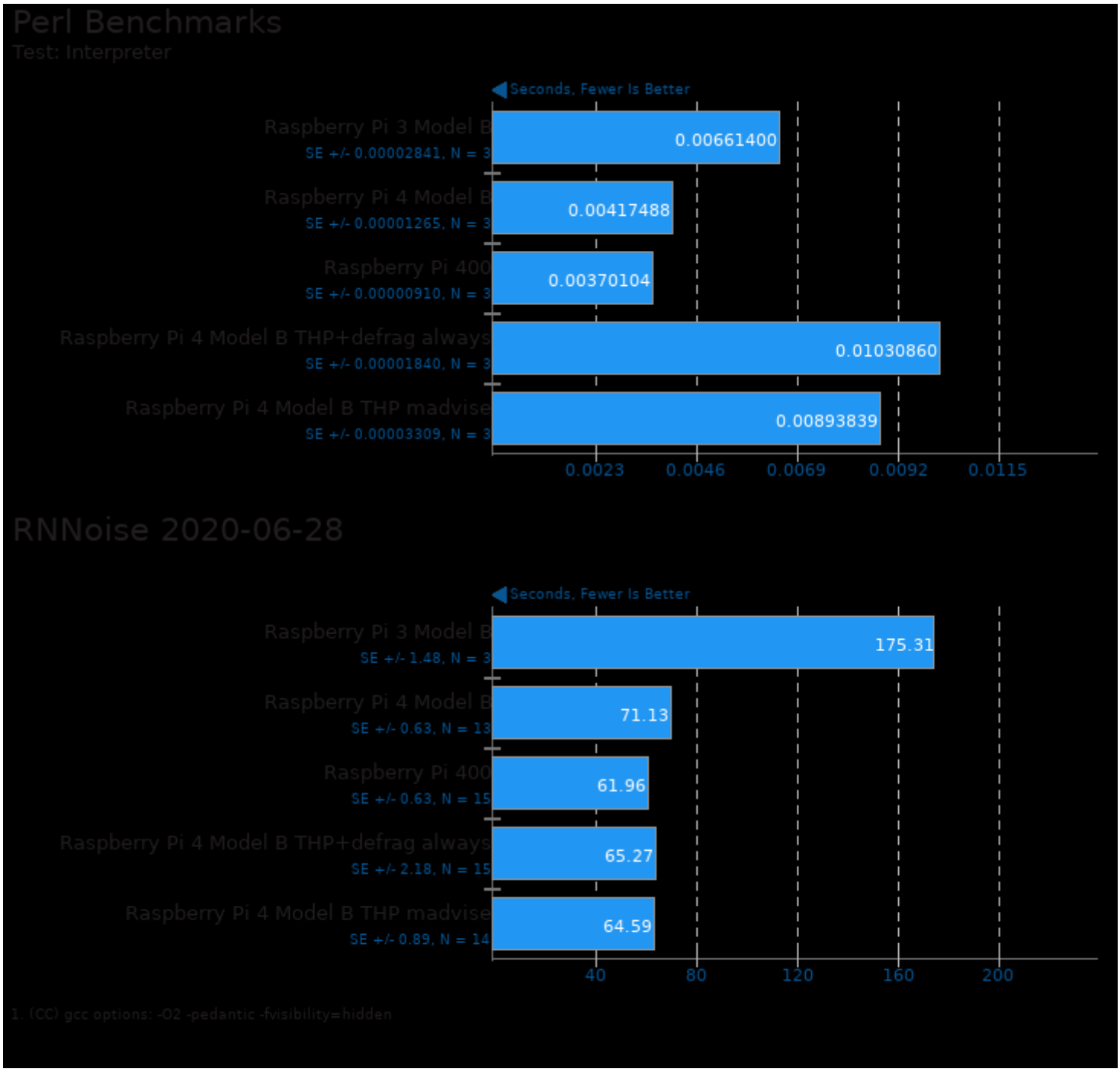
1. (CC) gcc options: -O2 -std=c99

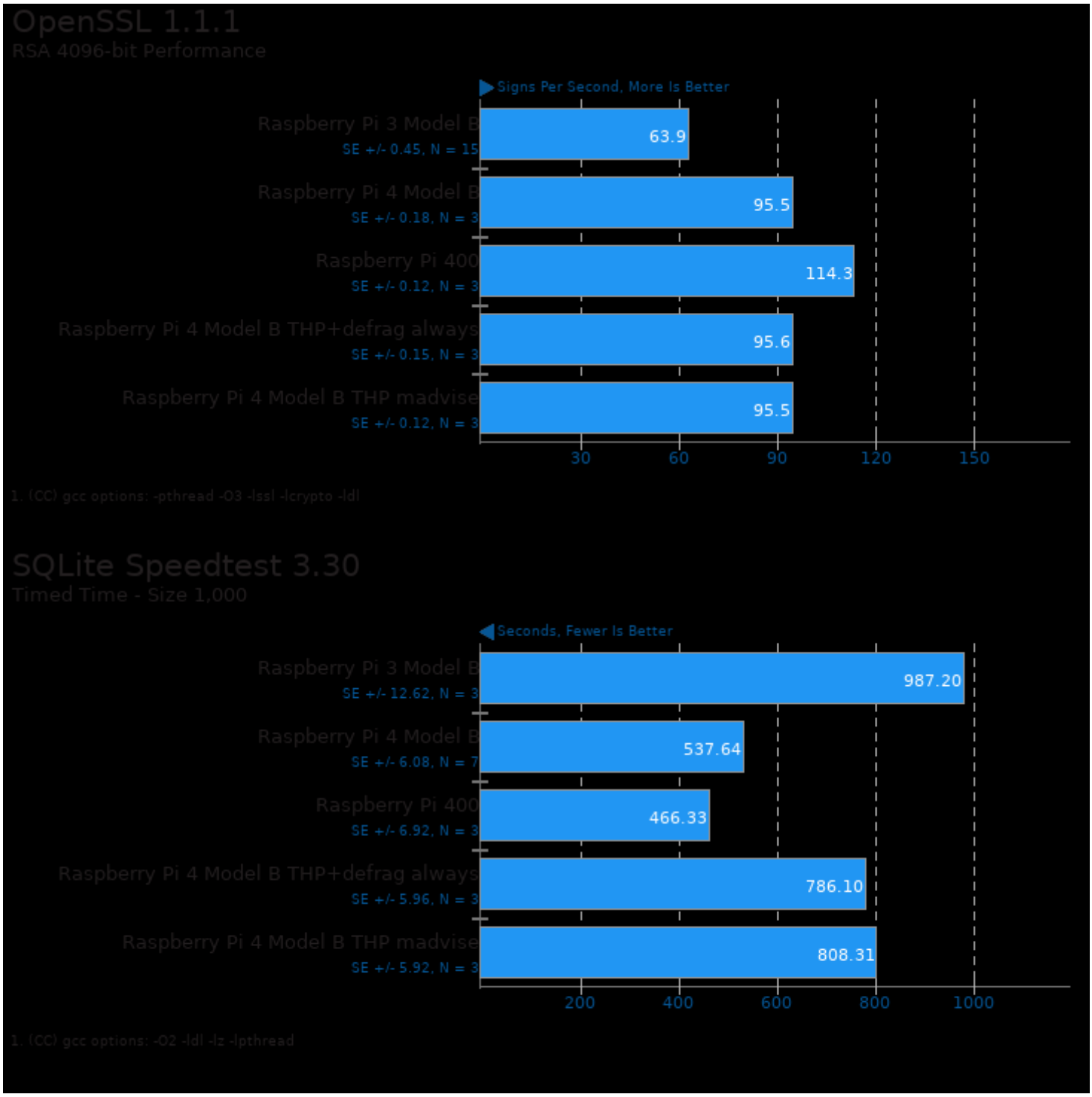
Perl Benchmarks

Test: Pod2html

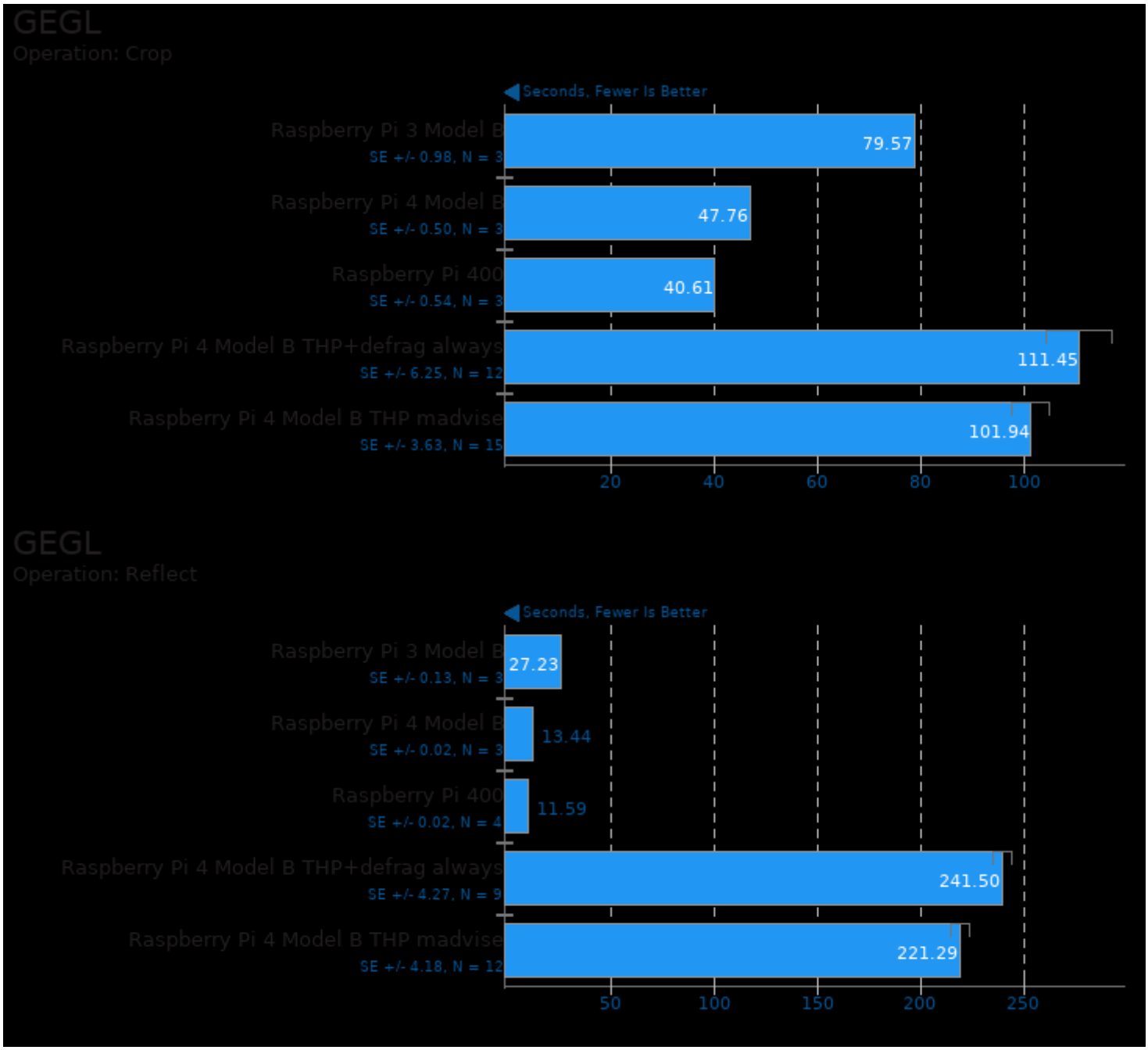


Raspberry Pi 400



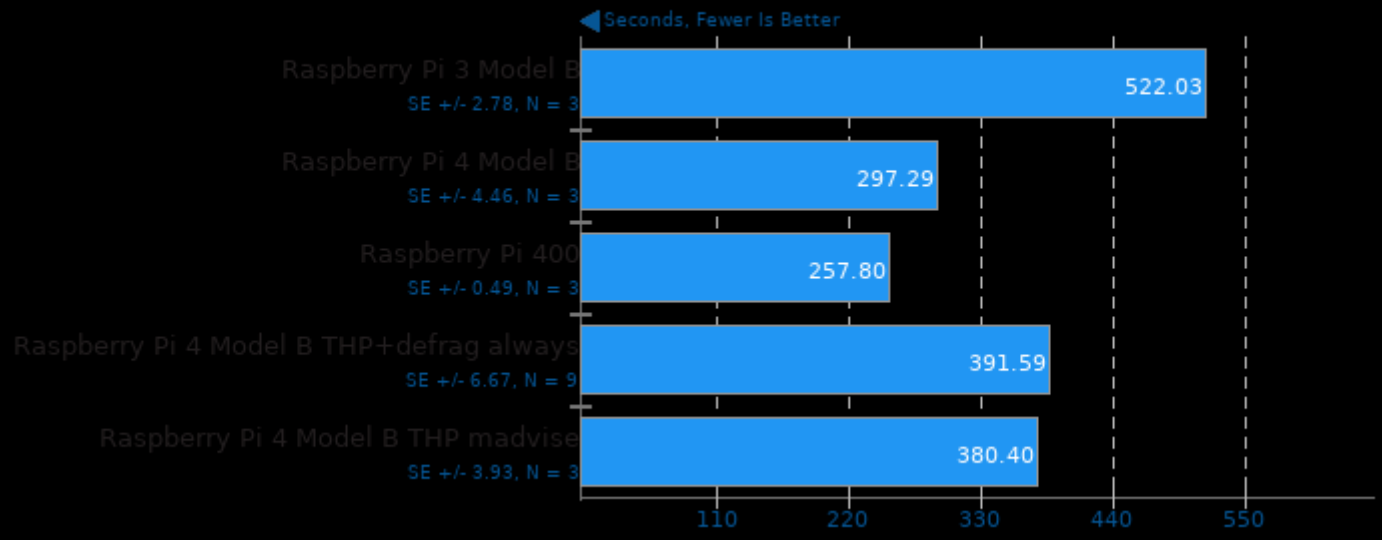

OpenSSL 1.1.1
RSA 4096-bit Performance
Signs Per Second, More Is Better
Raspberry Pi 3 Model B
SE +/- 0.45, N = 15
63.9
Raspberry Pi 4 Model B
SE +/- 0.18, N = 3
95.5
Raspberry Pi 400
SE +/- 0.12, N = 3
114.3
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.15, N = 3
95.6
Raspberry Pi 4 Model B THP madvise
SE +/- 0.12, N = 3
95.5
30
60
90
120
150
1. (CC) gcc options: -pthread -O3 -lssl -lcrypto -ldl
SQLite Speedtest 3.30
Timed Time - Size 1,000
Seconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 12.62, N = 3
987.20
Raspberry Pi 4 Model B
SE +/- 6.08, N = 7
537.64
Raspberry Pi 400
SE +/- 6.92, N = 3
466.33
Raspberry Pi 4 Model B THP+defrag always
SE +/- 5.96, N = 3
786.10
Raspberry Pi 4 Model B THP madvise
SE +/- 5.92, N = 3
808.31
200
400
600
800
1000
1. (CC) gcc options: -O2 -ldl -lz -lpthread

Raspberry Pi 400

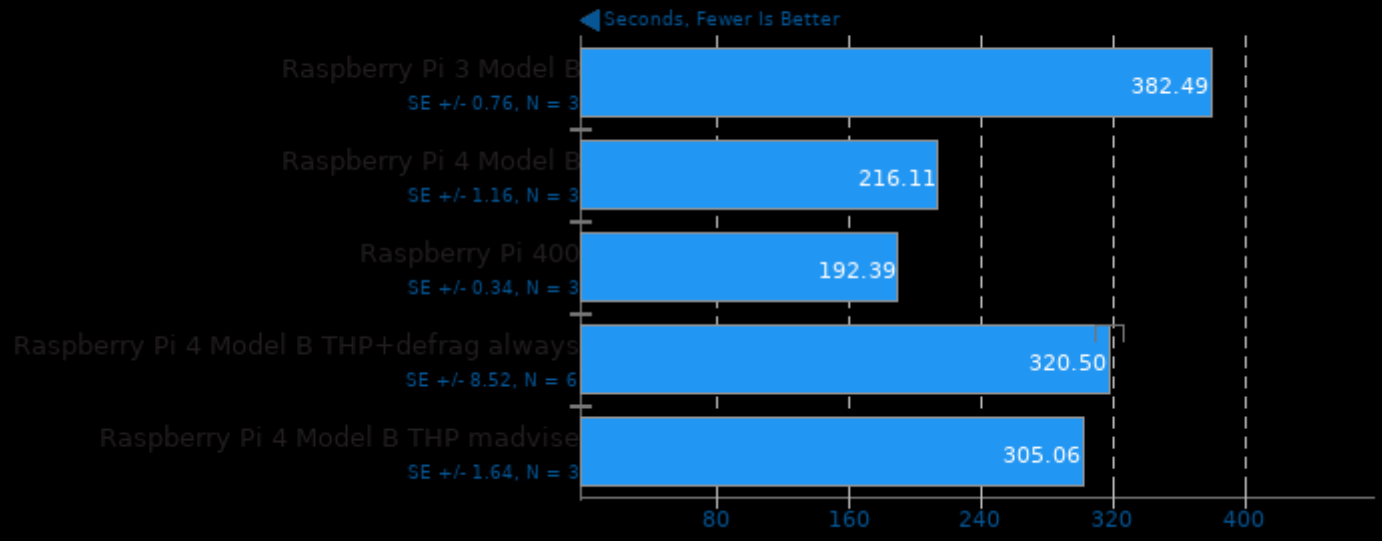


Raspberry Pi 400

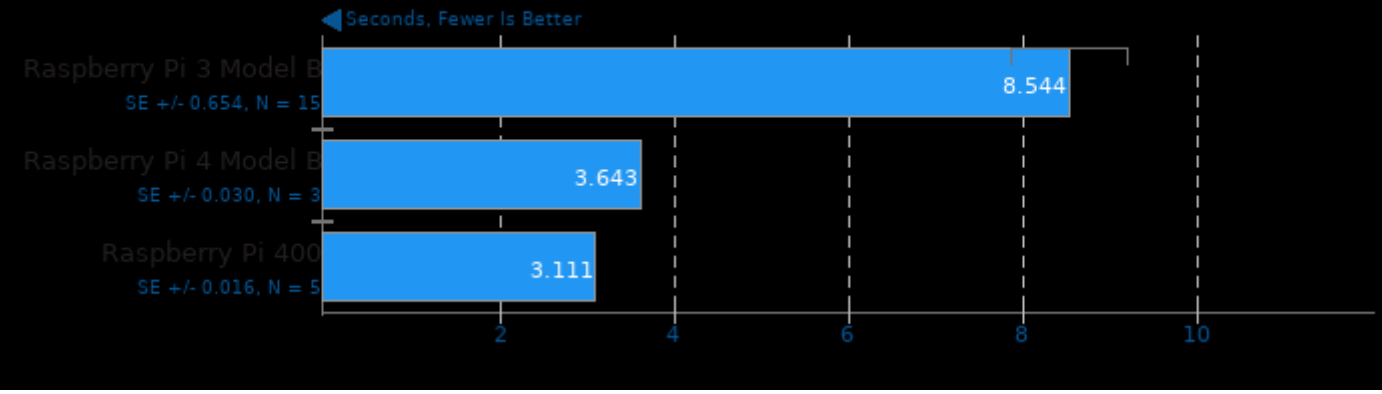
GEGL
Operation: Color Enhance



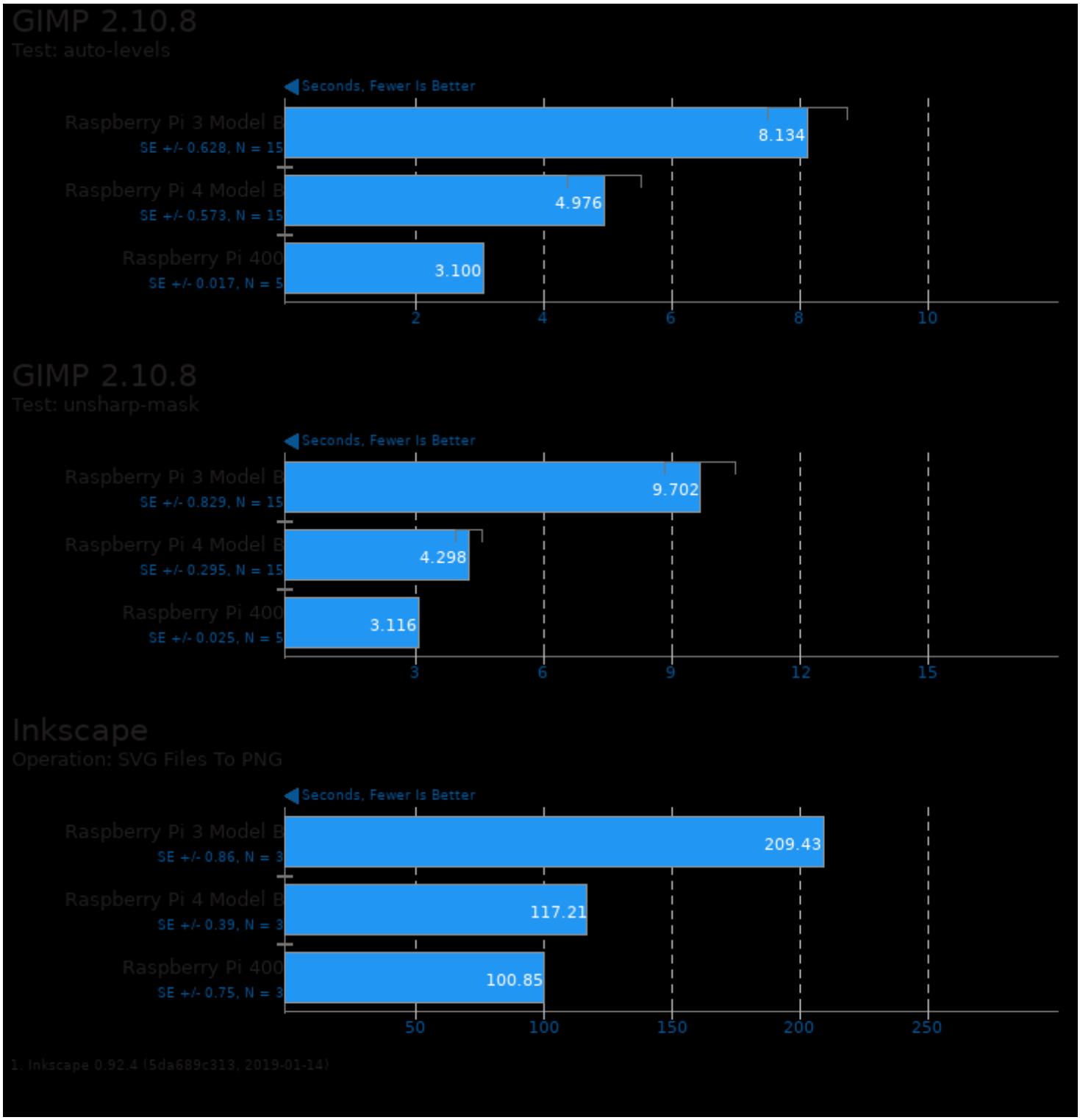
GEGL
Operation: Rotate 90 Degrees



GIMP 2.10.8
Test: rotate

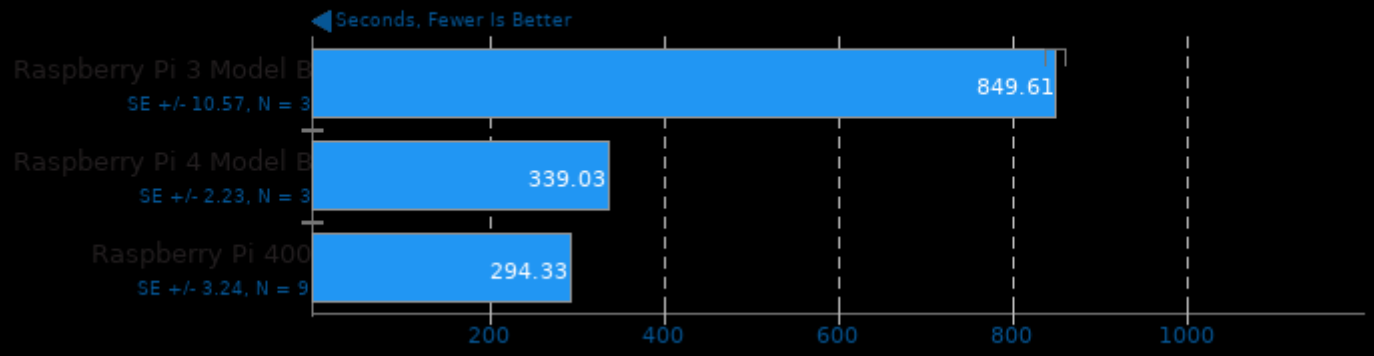


Raspberry Pi 400

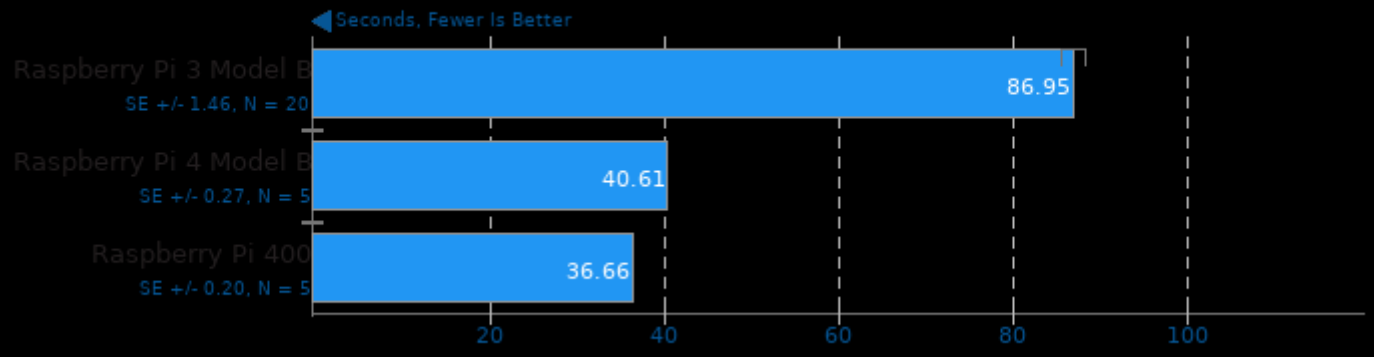


OCRMyPDF 8.0.1+dfsg

Processing 60 Page PDF Document

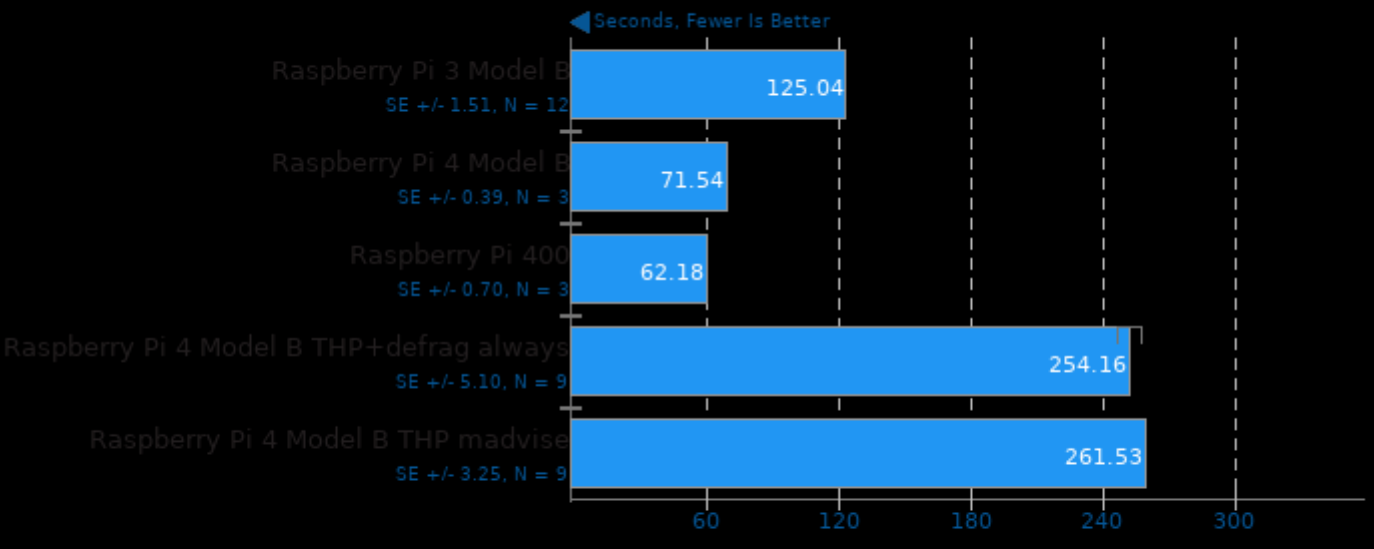


GNU Octave Benchmark 4.4.1

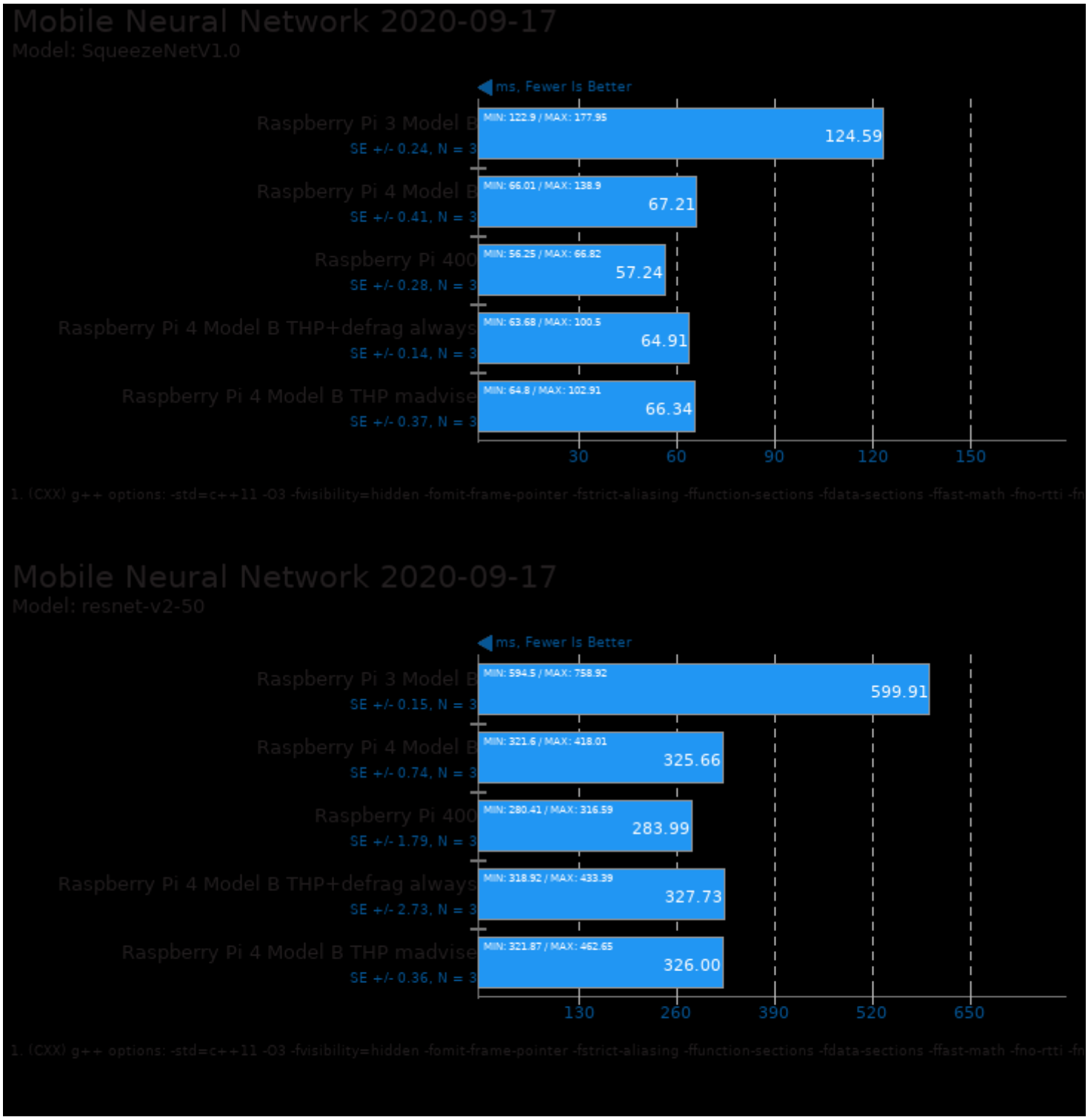


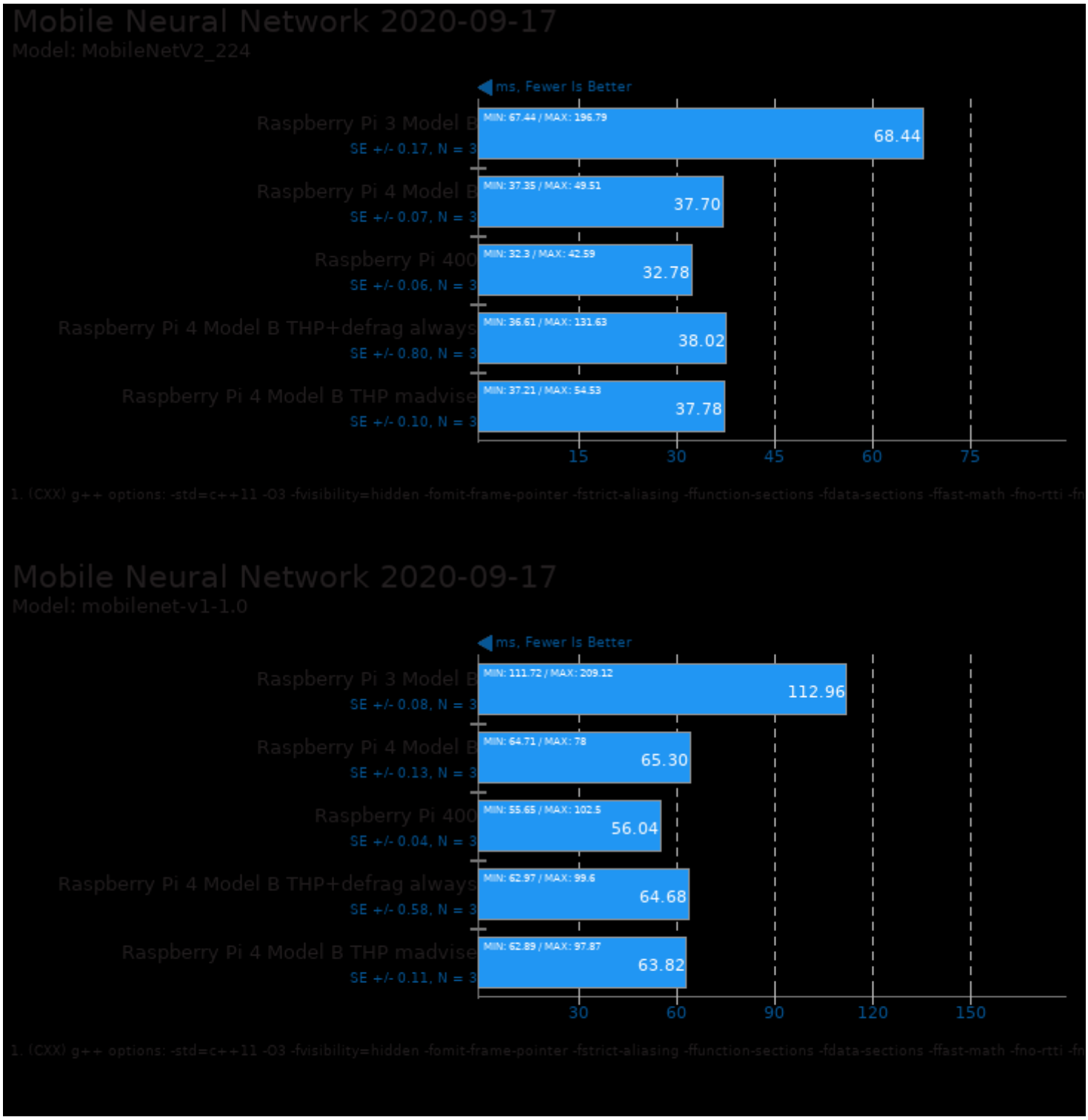
librsvg

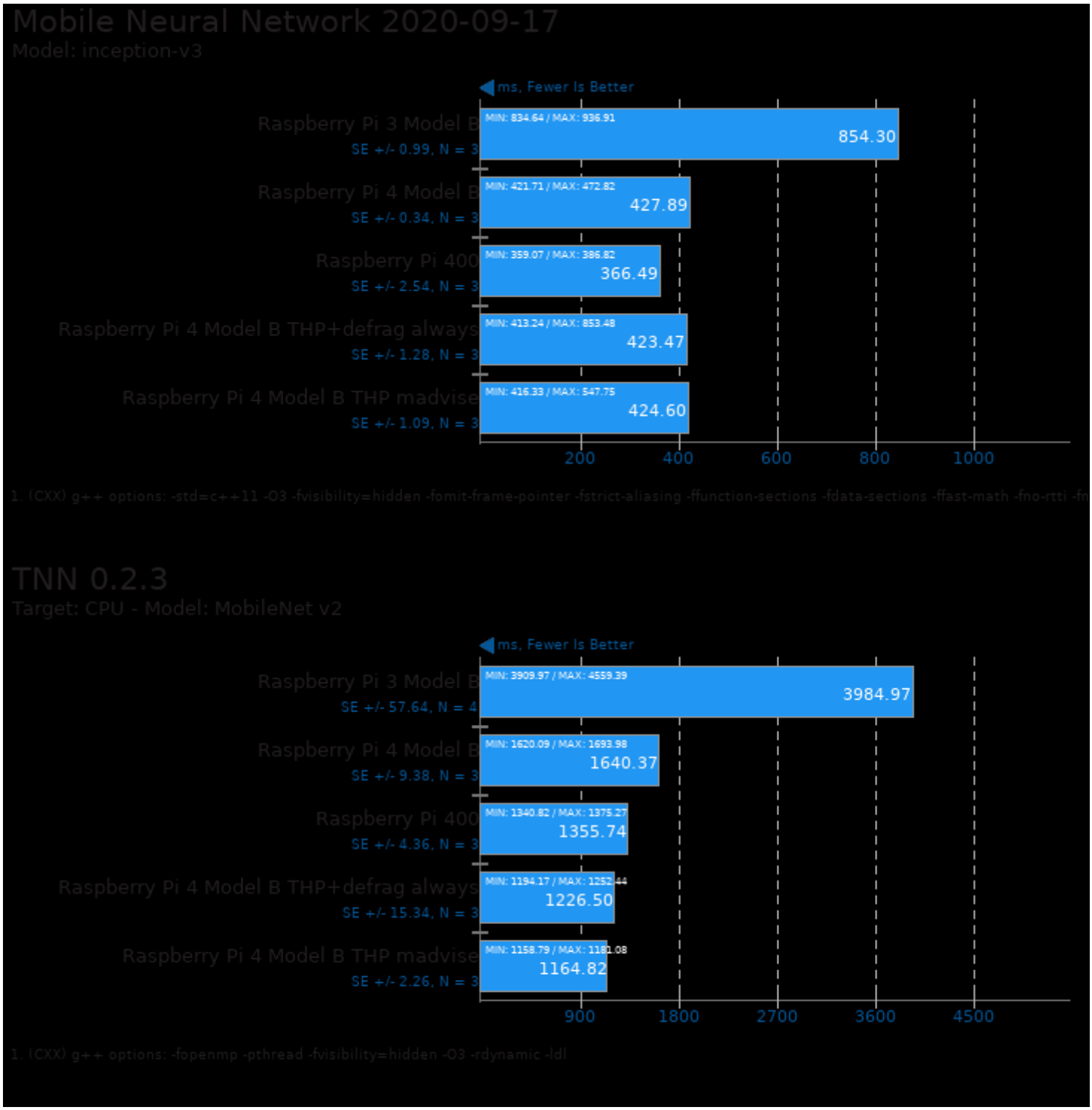
Operation: SVG Files To PNG

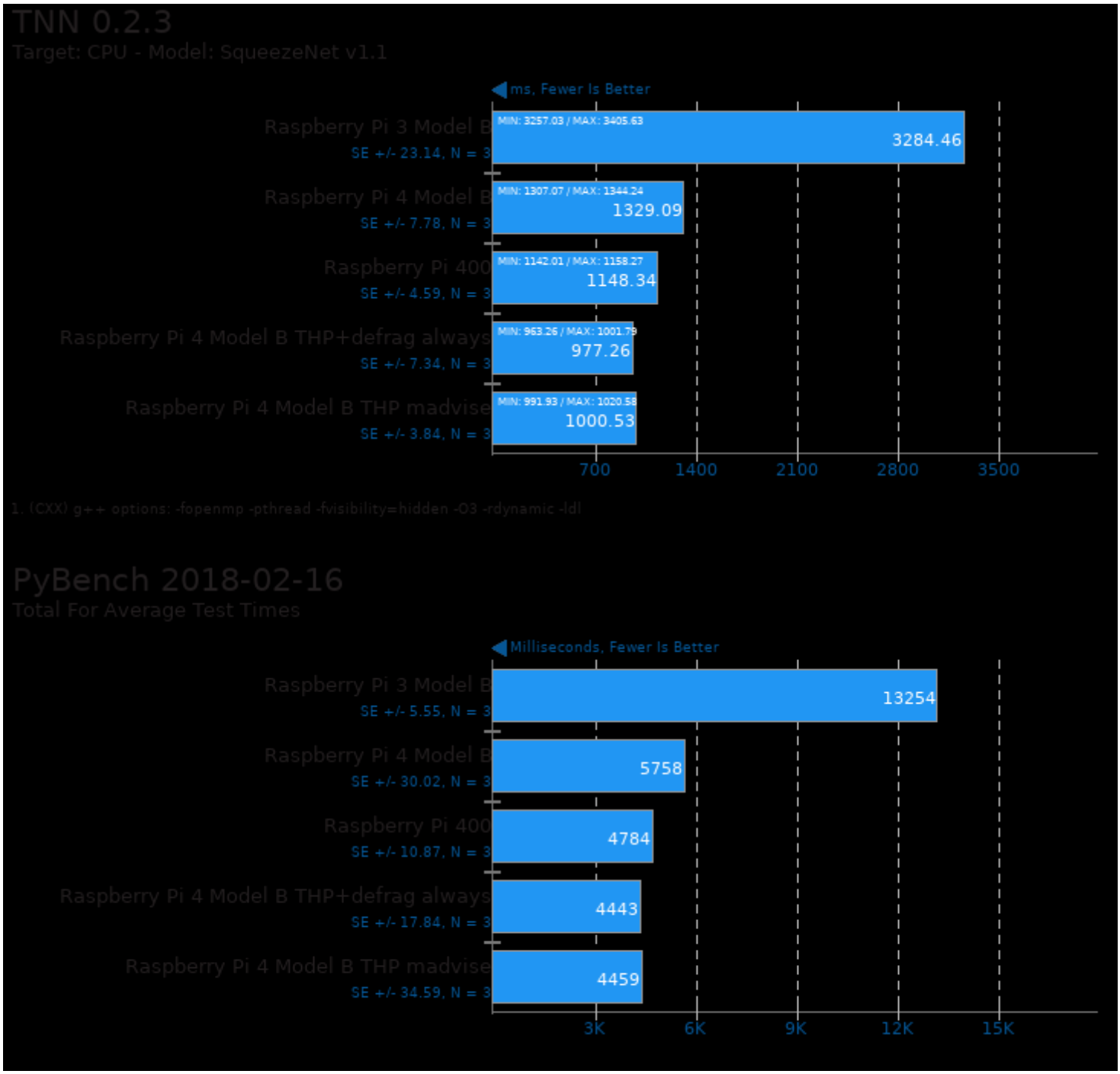


1. Raspberry Pi 3 Model B: rsvg-convert version 2.44.10
2. Raspberry Pi 4 Model B: rsvg-convert version 2.44.10
3. Raspberry Pi 400: rsvg-convert version 2.44.10
4. Raspberry Pi 4 Model B THP+defrag always: rsvg-convert version 2.50.7
5. Raspberry Pi 4 Model B THP madvise: rsvg-convert version 2.50.7

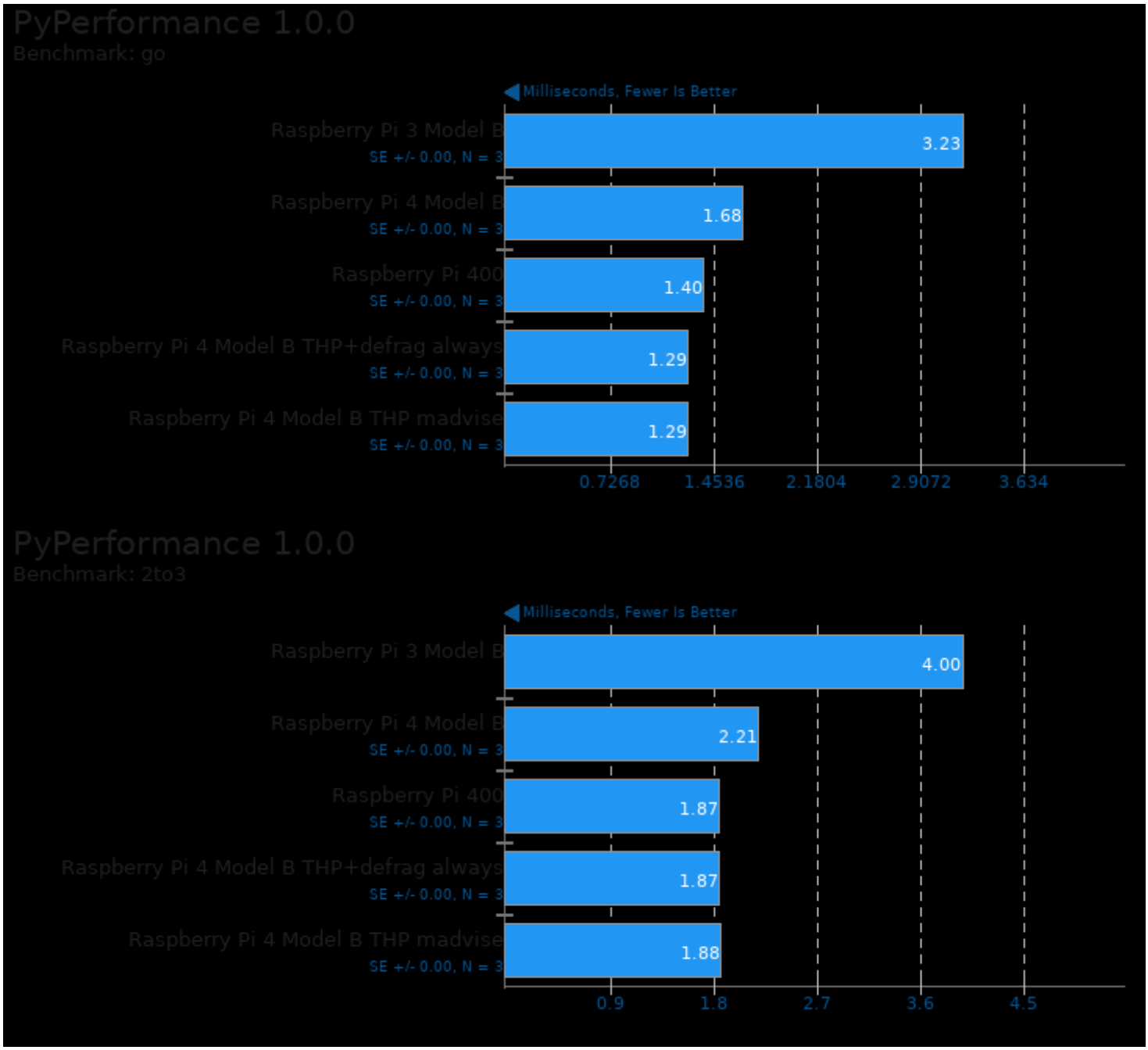

Mobile Neural Network 2020-09-17
Model: SqueezeNetV1.0
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.24, N = 3
MIN: 122.9 / MAX: 177.95
124.59
Raspberry Pi 4 Model B
SE +/- 0.41, N = 3
MIN: 66.01 / MAX: 138.9
67.21
Raspberry Pi 400
SE +/- 0.28, N = 3
MIN: 56.25 / MAX: 66.82
57.24
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.14, N = 3
MIN: 63.68 / MAX: 100.5
64.91
Raspberry Pi 4 Model B THP madvise
SE +/- 0.37, N = 3
MIN: 64.8 / MAX: 102.91
66.34
30
60
90
120
150
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn
Mobile Neural Network 2020-09-17
Model: resnet-v2-50
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.15, N = 3
MIN: 594.5 / MAX: 758.92
599.91
Raspberry Pi 4 Model B
SE +/- 0.74, N = 3
MIN: 321.6 / MAX: 418.01
325.66
Raspberry Pi 400
SE +/- 1.79, N = 3
MIN: 280.41 / MAX: 316.59
283.99
Raspberry Pi 4 Model B THP+defrag always
SE +/- 2.73, N = 3
MIN: 318.92 / MAX: 433.39
327.73
Raspberry Pi 4 Model B THP madvise
SE +/- 0.36, N = 3
MIN: 321.87 / MAX: 462.65
326.00
130
260
390
520
650
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn

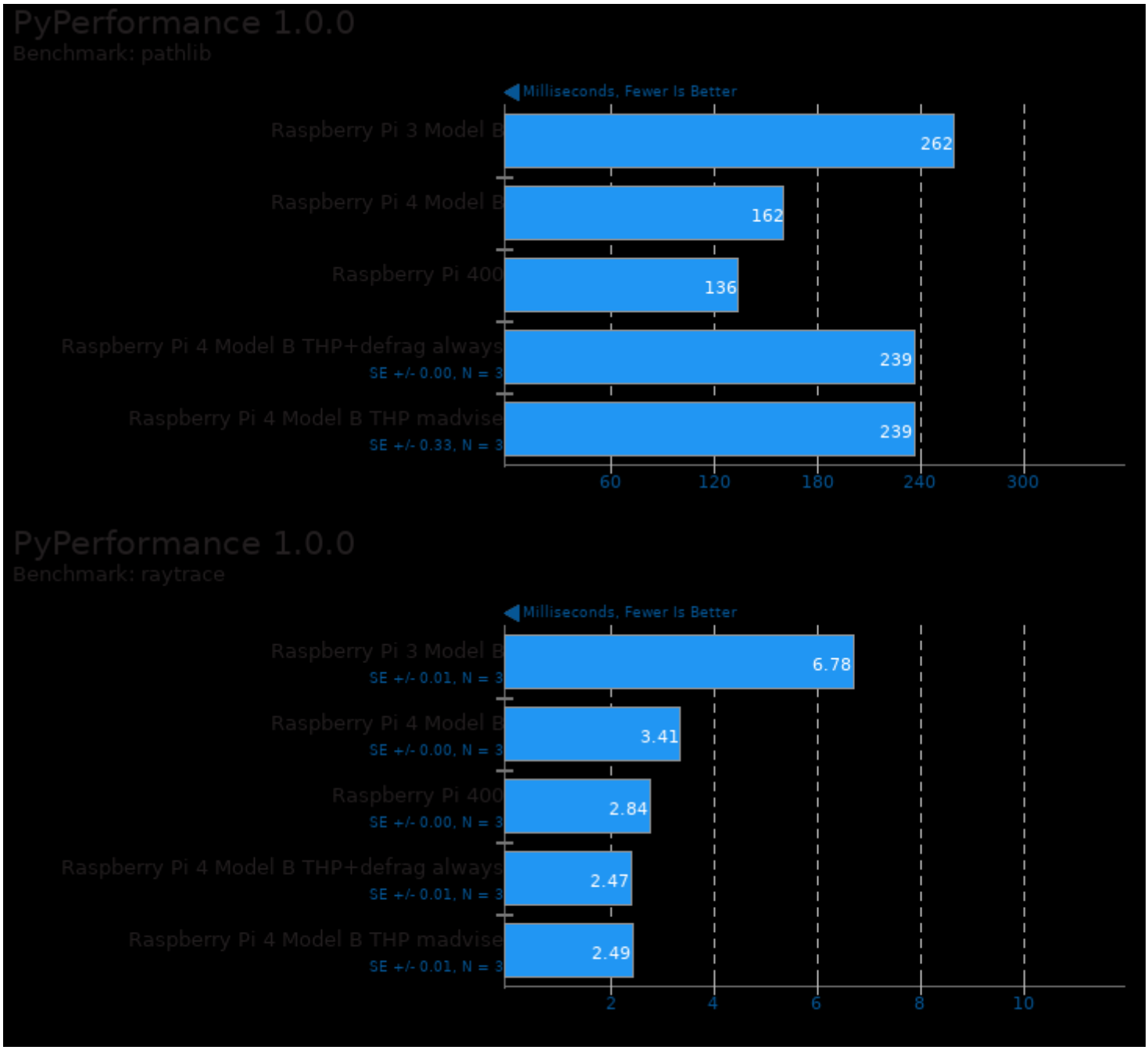

Mobile Neural Network 2020-09-17
Model: MobileNetV2_224
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.17, N = 3
MIN: 67.44 / MAX: 196.79
68.44
Raspberry Pi 4 Model B
SE +/- 0.07, N = 3
MIN: 37.35 / MAX: 49.51
37.70
Raspberry Pi 400
SE +/- 0.06, N = 3
MIN: 32.3 / MAX: 42.59
32.78
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.80, N = 3
MIN: 36.61 / MAX: 131.63
38.02
Raspberry Pi 4 Model B THP madvise
SE +/- 0.10, N = 3
MIN: 37.21 / MAX: 54.53
37.78
15
30
45
60
75
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn
Mobile Neural Network 2020-09-17
Model: mobilenet-v1-1.0
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.08, N = 3
MIN: 111.72 / MAX: 209.12
112.96
Raspberry Pi 4 Model B
SE +/- 0.13, N = 3
MIN: 64.71 / MAX: 78
65.30
Raspberry Pi 400
SE +/- 0.04, N = 3
MIN: 55.65 / MAX: 102.5
56.04
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.58, N = 3
MIN: 62.97 / MAX: 99.6
64.68
Raspberry Pi 4 Model B THP madvise
SE +/- 0.11, N = 3
MIN: 62.89 / MAX: 97.87
63.82
30
60
90
120
150
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn

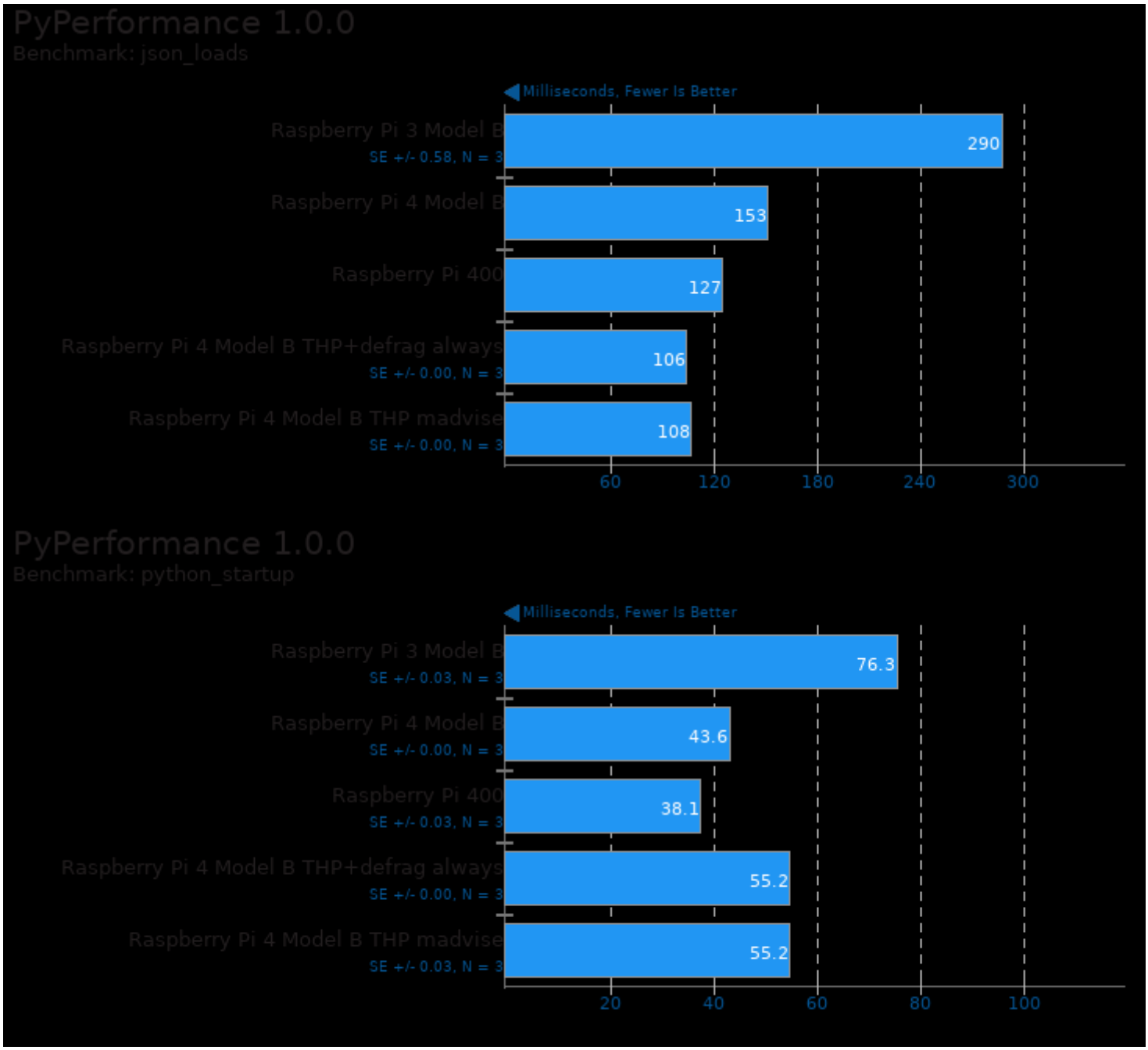

Mobile Neural Network 2020-09-17
Model: inception-v3
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.99, N = 3
MIN: 834.64 / MAX: 936.91
854.30
Raspberry Pi 4 Model B
SE +/- 0.34, N = 3
MIN: 421.71 / MAX: 472.82
427.89
Raspberry Pi 400
SE +/- 2.54, N = 3
MIN: 359.07 / MAX: 386.82
366.49
Raspberry Pi 4 Model B THP+defrag always
SE +/- 1.28, N = 3
MIN: 413.24 / MAX: 853.48
423.47
Raspberry Pi 4 Model B THP madvise
SE +/- 1.09, N = 3
MIN: 416.33 / MAX: 547.75
424.60
200
400
600
800
1000
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn
TNN 0.2.3
Target: CPU - Model: MobileNet v2
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 57.64, N = 4
MIN: 3909.97 / MAX: 4559.39
3984.97
Raspberry Pi 4 Model B
SE +/- 9.38, N = 3
MIN: 1620.09 / MAX: 1693.98
1640.37
Raspberry Pi 400
SE +/- 4.36, N = 3
MIN: 1340.82 / MAX: 1375.27
1355.74
Raspberry Pi 4 Model B THP+defrag always
SE +/- 15.34, N = 3
MIN: 1194.17 / MAX: 1252.44
1226.50
Raspberry Pi 4 Model B THP madvise
SE +/- 2.26, N = 3
MIN: 1158.79 / MAX: 1181.08
1164.82
900
1800
2700
3600
4500
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl


TNN 0.2.3
Target: CPU - Model: SqueezeNet v1.1
ms, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 23.14, N = 3
MIN: 3257.03 / MAX: 3405.63
3284.46
Raspberry Pi 4 Model B
SE +/- 7.78, N = 3
MIN: 1307.07 / MAX: 1344.24
1329.09
Raspberry Pi 400
SE +/- 4.59, N = 3
MIN: 1142.01 / MAX: 1158.27
1148.34
Raspberry Pi 4 Model B THP+defrag always
SE +/- 7.34, N = 3
MIN: 963.26 / MAX: 1001.79
977.26
Raspberry Pi 4 Model B THP madvise
SE +/- 3.84, N = 3
MIN: 991.93 / MAX: 1020.58
1000.53
700
1400
2100
2800
3500
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl
PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 5.55, N = 3
13254
Raspberry Pi 4 Model B
SE +/- 30.02, N = 3
5758
Raspberry Pi 400
SE +/- 10.87, N = 3
4784
Raspberry Pi 4 Model B THP+defrag always
SE +/- 17.84, N = 3
4443
Raspberry Pi 4 Model B THP madvise
SE +/- 34.59, N = 3
4459
3K
6K
9K
12K
15K

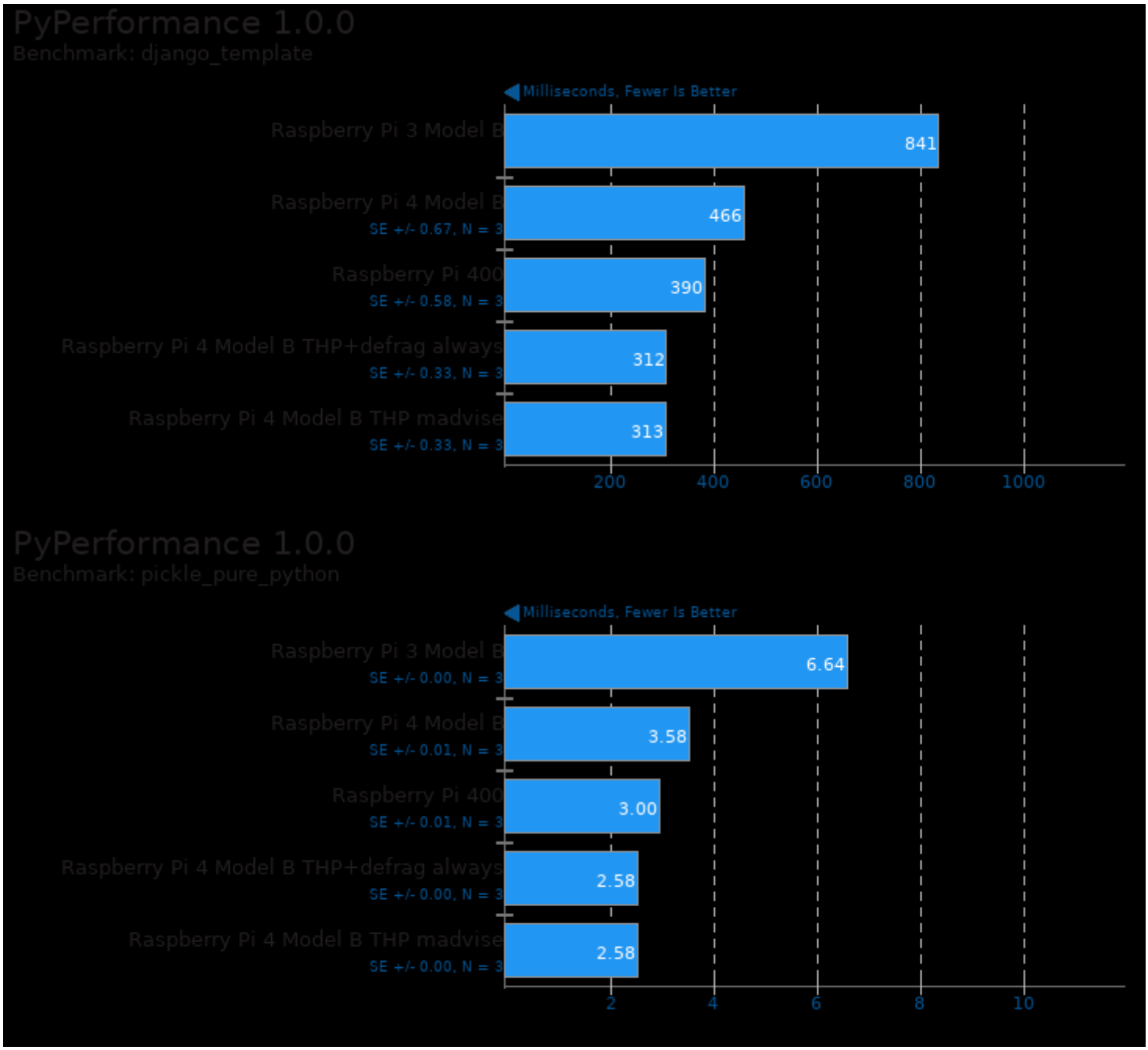
Raspberry Pi 400




PyPerformance 1.0.0
Benchmark: pathlib
Milliseconds, Fewer Is Better
Raspberry Pi 3 Model B
262
Raspberry Pi 4 Model B
162
Raspberry Pi 400
136
Raspberry Pi 4 Model B THP+defrag always
239
SE +/- 0.00, N = 3
Raspberry Pi 4 Model B THP madvise
239
SE +/- 0.33, N = 3
60
120
180
240
300
PyPerformance 1.0.0
Benchmark: raytrace
Milliseconds, Fewer Is Better
Raspberry Pi 3 Model B
6.78
SE +/- 0.01, N = 3
Raspberry Pi 4 Model B
3.41
SE +/- 0.00, N = 3
Raspberry Pi 400
2.84
SE +/- 0.00, N = 3
Raspberry Pi 4 Model B THP+defrag always
2.47
SE +/- 0.01, N = 3
Raspberry Pi 4 Model B THP madvise
2.49
SE +/- 0.01, N = 3
2
4
6
8
10


PyPerformance 1.0.0
Benchmark: json_loads
Milliseconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.58, N = 3
290
Raspberry Pi 4 Model B
153
Raspberry Pi 400
127
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.00, N = 3
106
Raspberry Pi 4 Model B THP madvise
SE +/- 0.00, N = 3
108
60
120
180
240
300
PyPerformance 1.0.0
Benchmark: python_startup
Milliseconds, Fewer Is Better
Raspberry Pi 3 Model B
SE +/- 0.03, N = 3
76.3
Raspberry Pi 4 Model B
SE +/- 0.00, N = 3
43.6
Raspberry Pi 400
SE +/- 0.03, N = 3
38.1
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.00, N = 3
55.2
Raspberry Pi 4 Model B THP madvise
SE +/- 0.03, N = 3
55.2
20
40
60
80
100

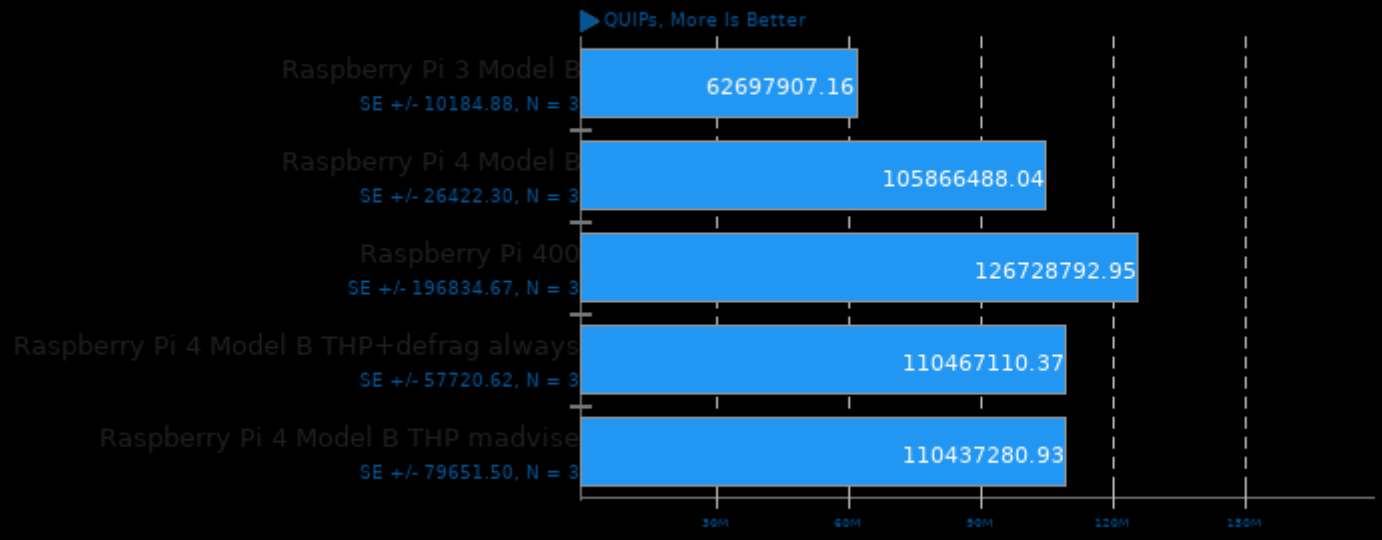
Raspberry Pi 400



Raspberry Pi 400

Hierarchical INTegration 1.0

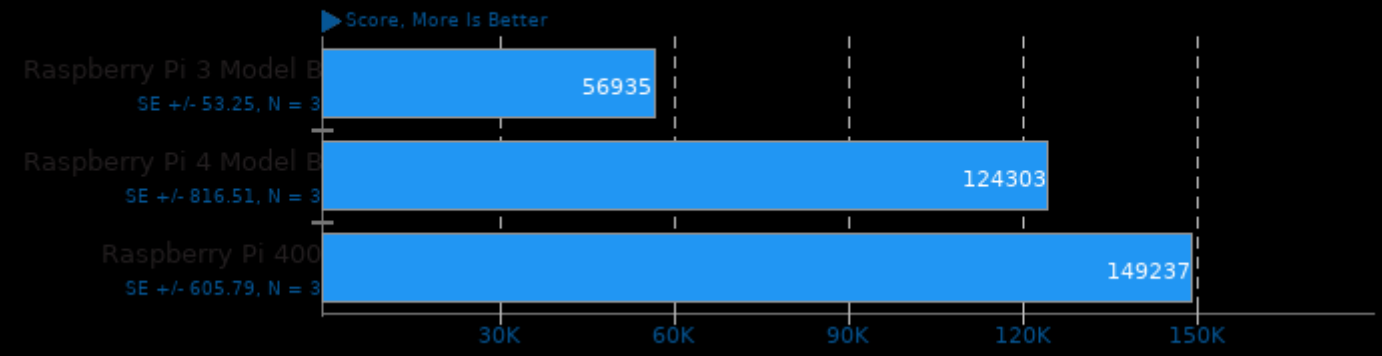
Test: FLOAT



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

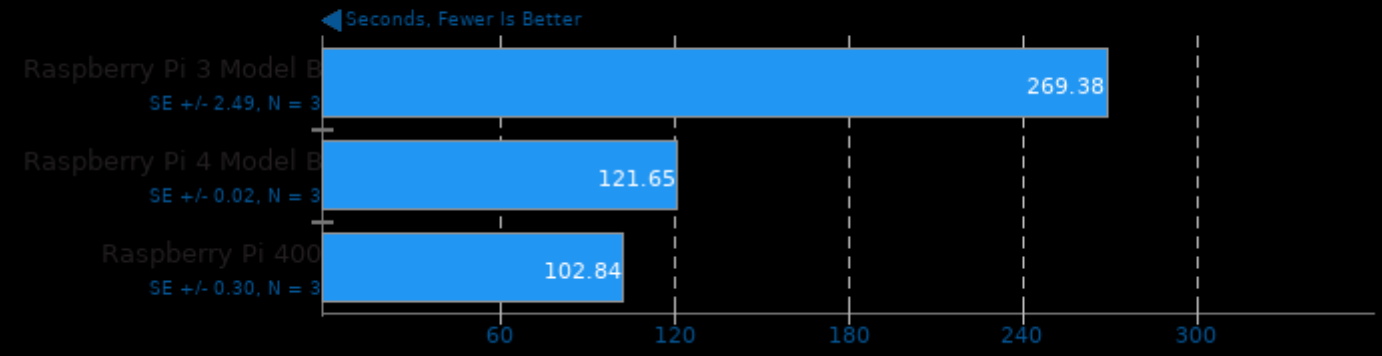
PHPBench 0.8.1

PHP Benchmark Suite

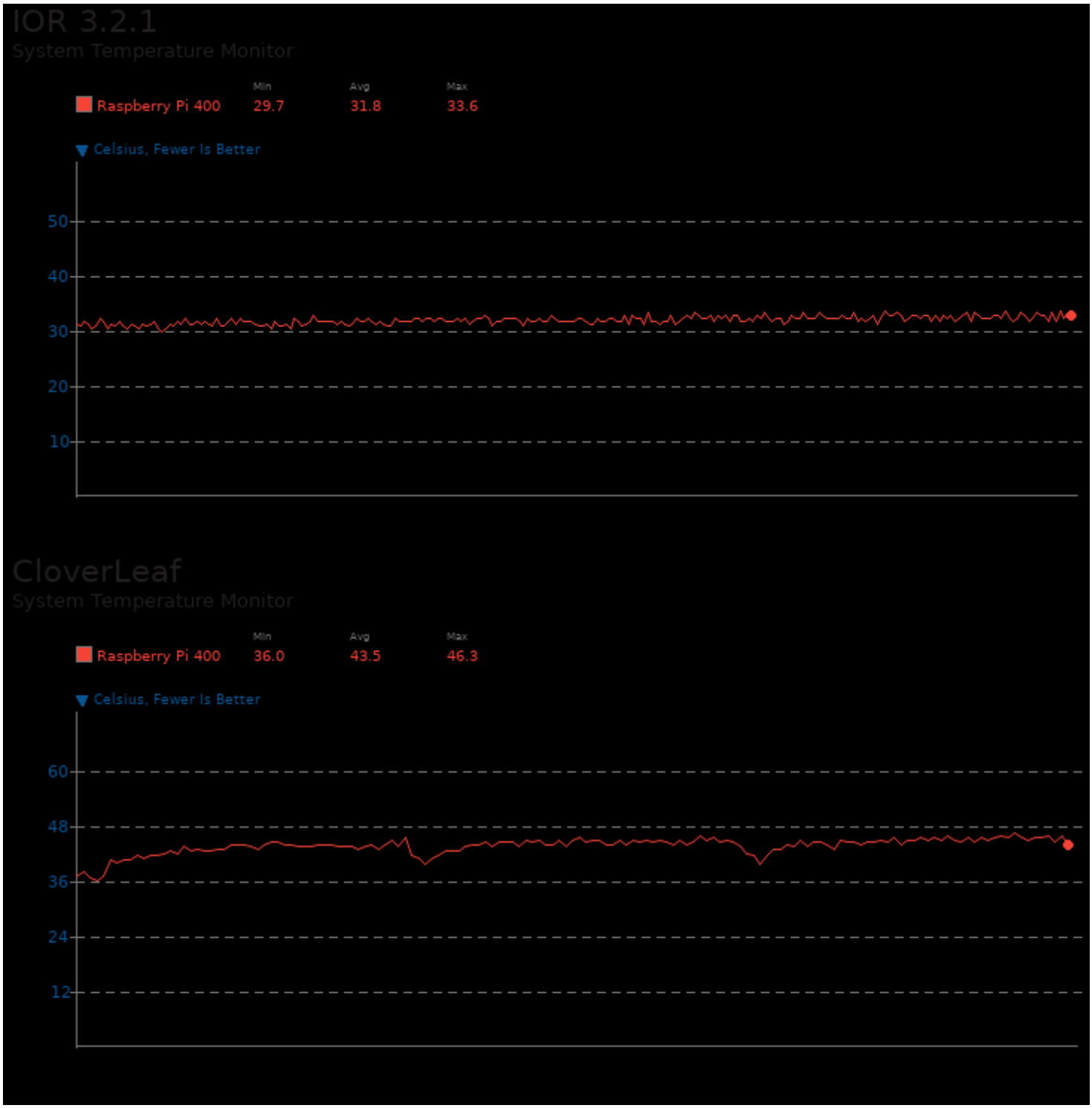


Tesseract OCR 4.0.0

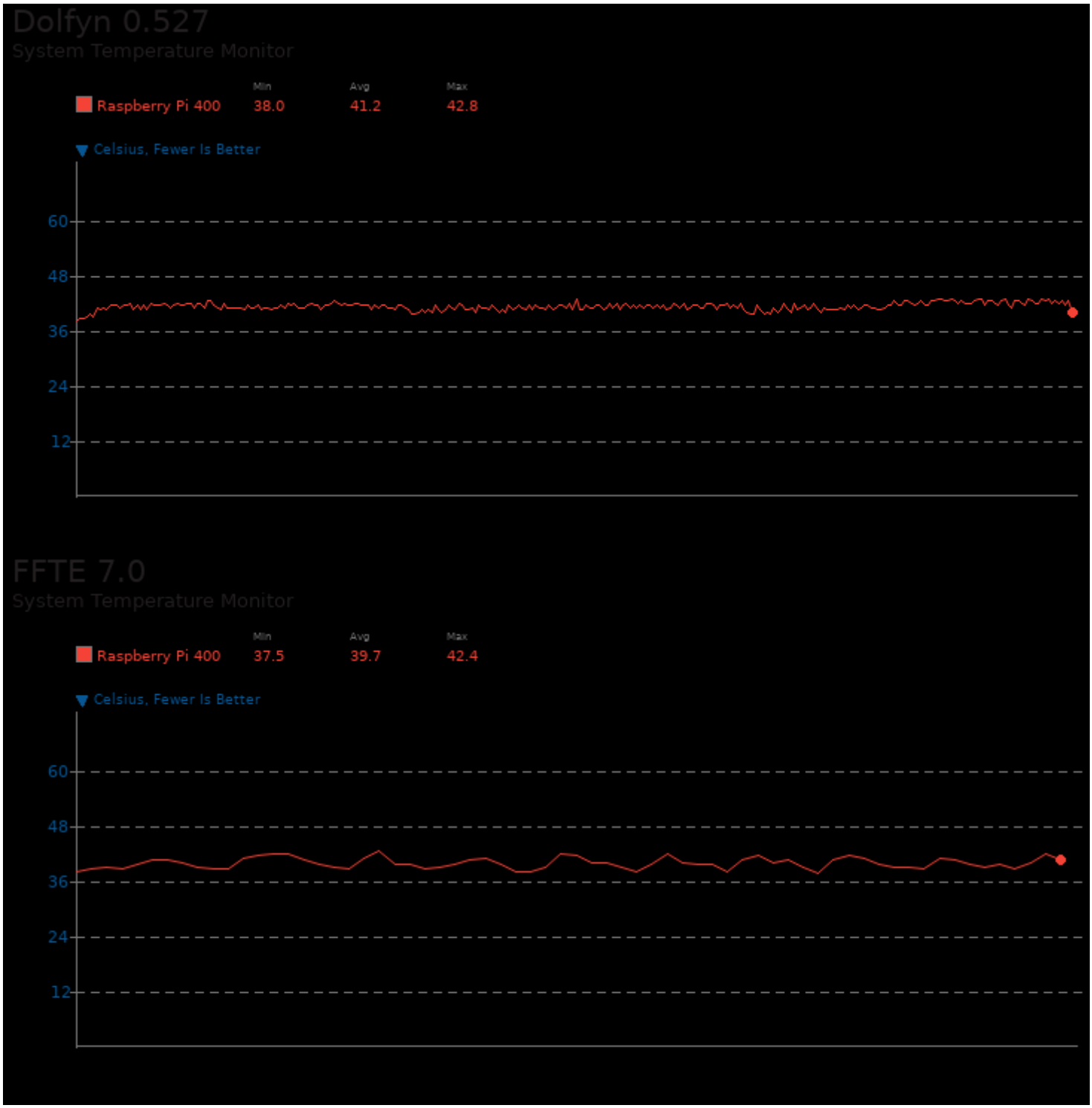
Time To OCR 7 Images

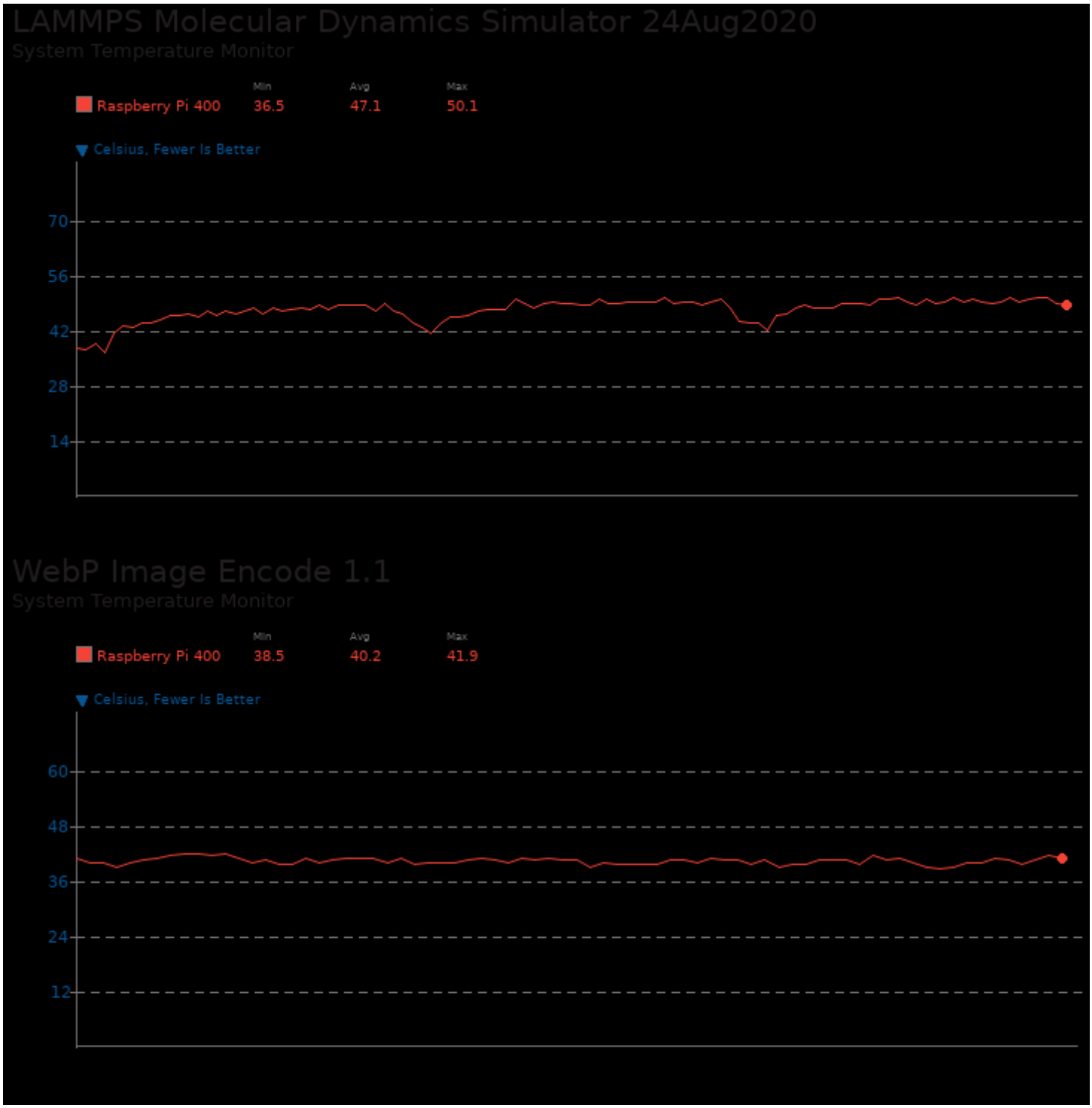


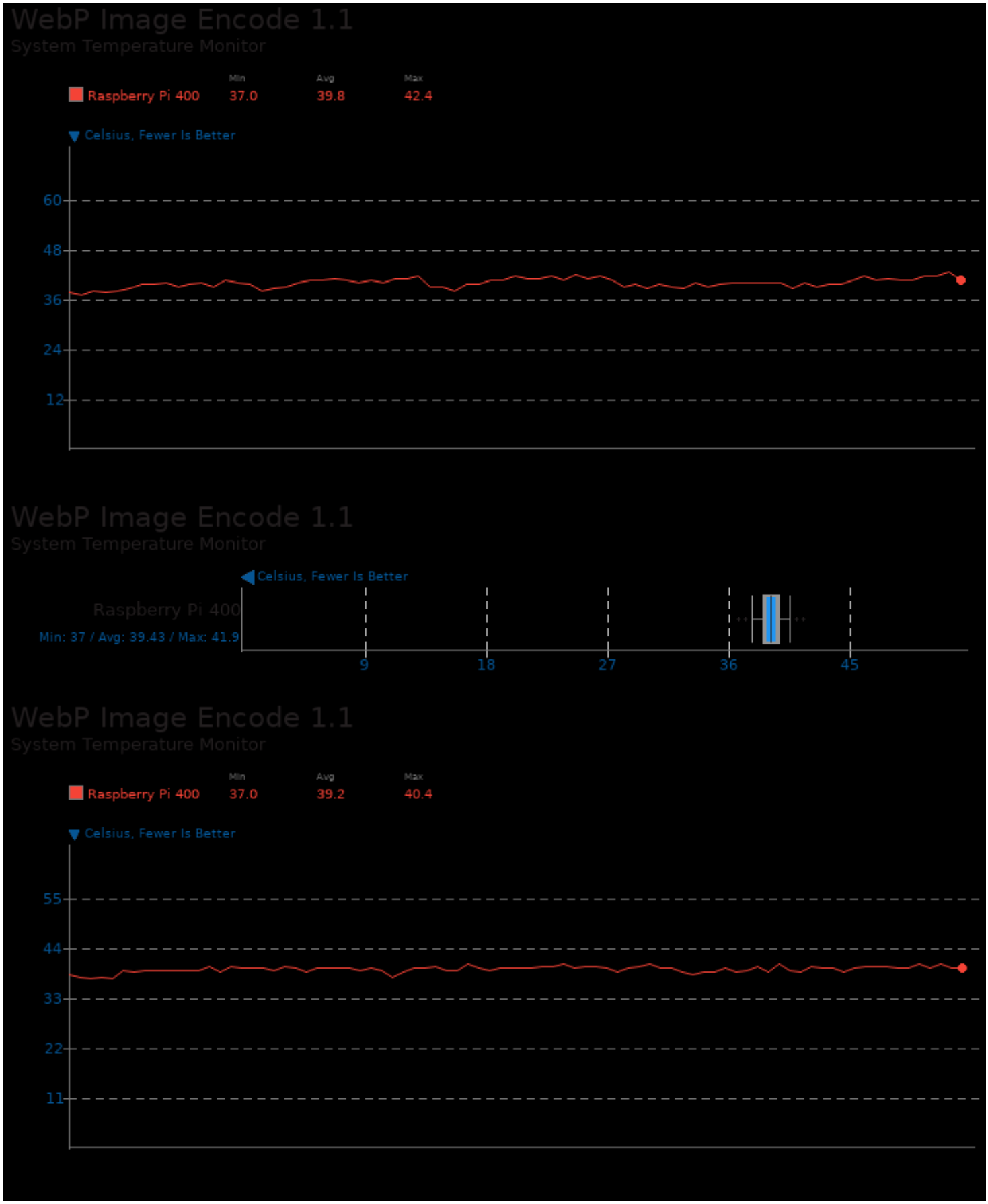
Raspberry Pi 400



Raspberry Pi 400



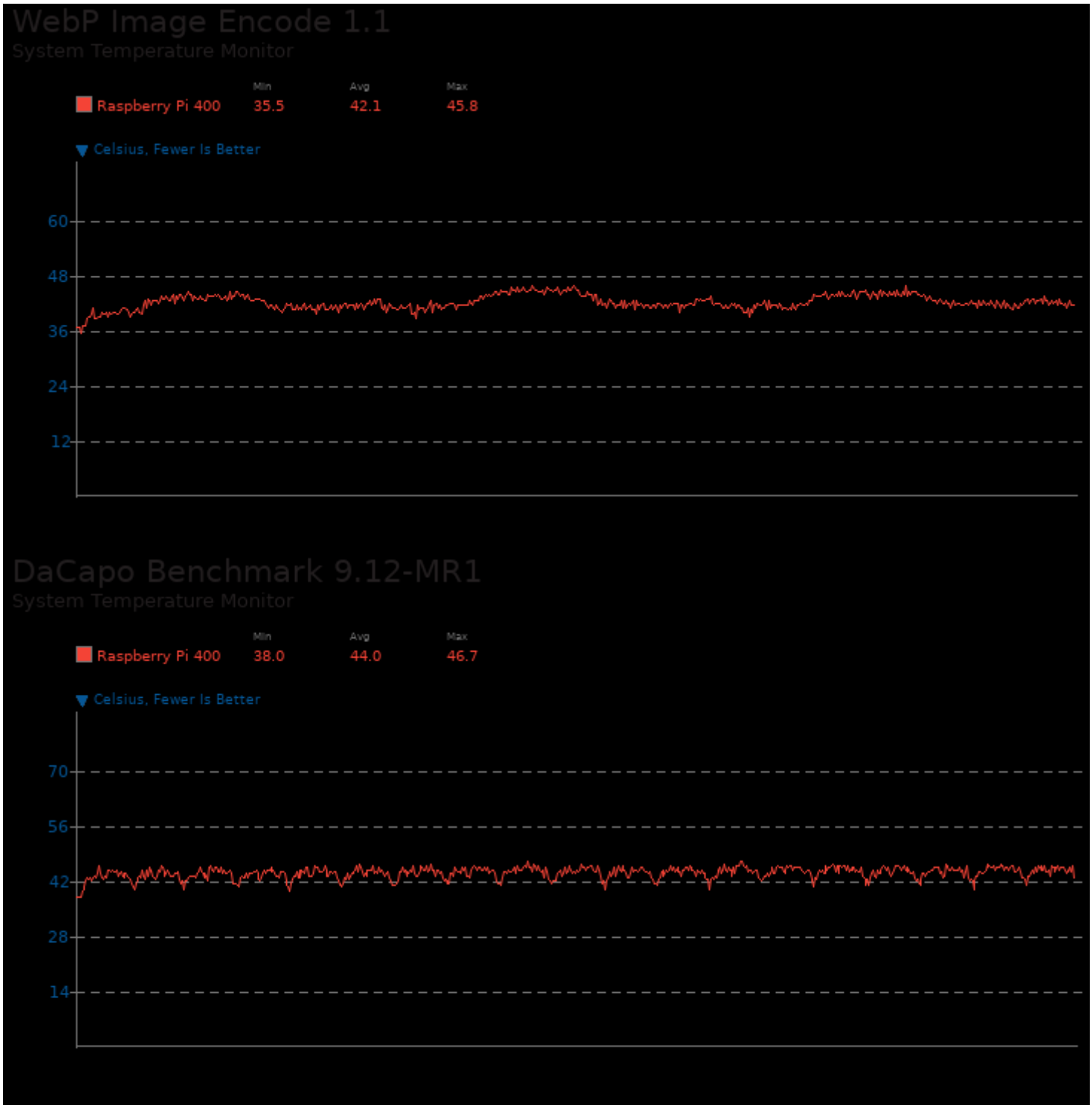

LAMMPS Molecular Dynamics Simulator 24Aug2020
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
36.5
47.1
50.1
Celsius, Fewer Is Better
70
56
42
28
14
WebP Image Encode 1.1
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
38.5
40.2
41.9
Celsius, Fewer Is Better
60
48
36
24
12


WebP Image Encode 1.1
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
37.0
39.8
42.4
Celsius, Fewer Is Better
60
48
36
24
12

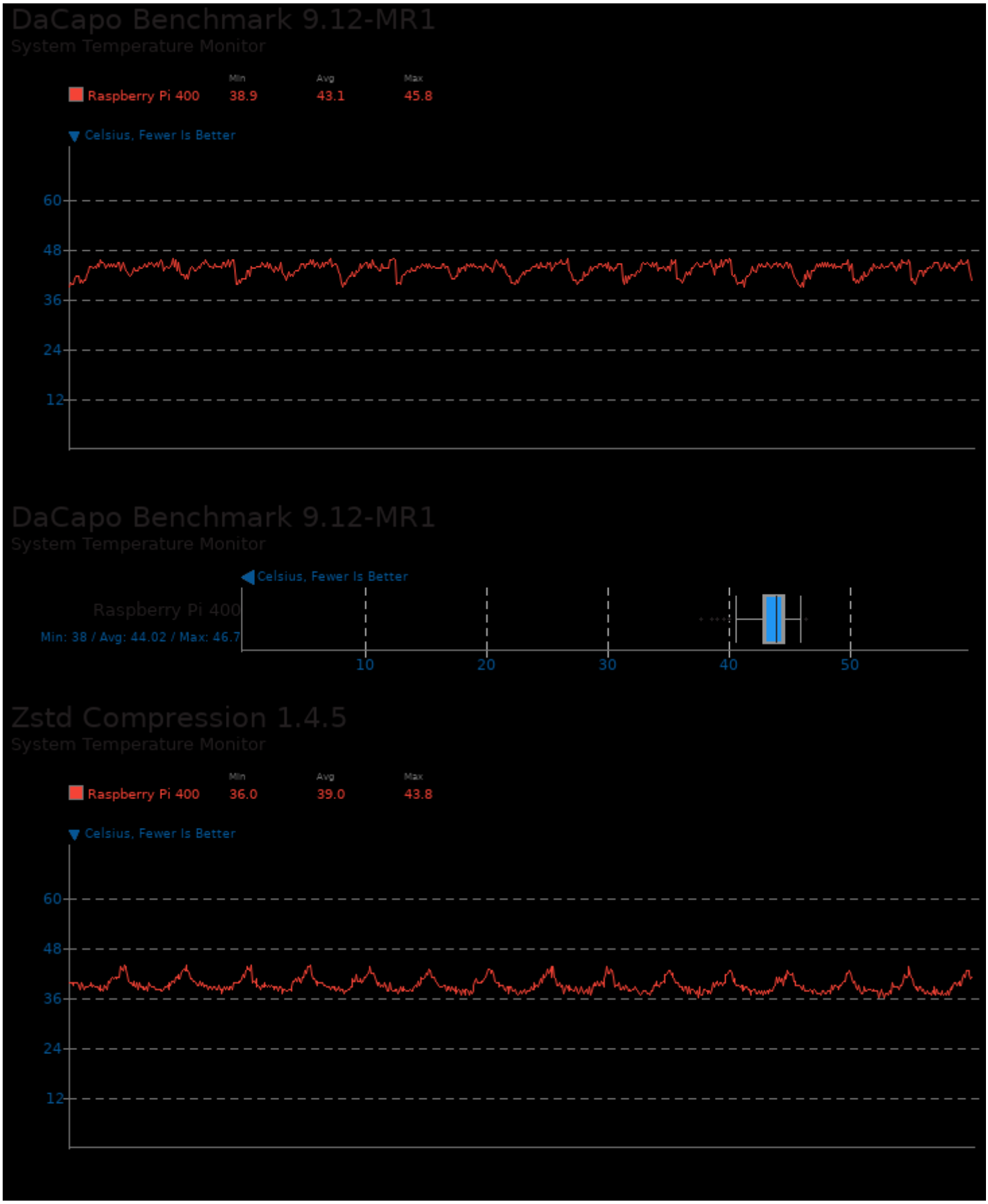
WebP Image Encode 1.1
System Temperature Monitor
Celsius, Fewer Is Better
Raspberry Pi 400
Min: 37 / Avg: 39.43 / Max: 41.9
9
18
27
36
45

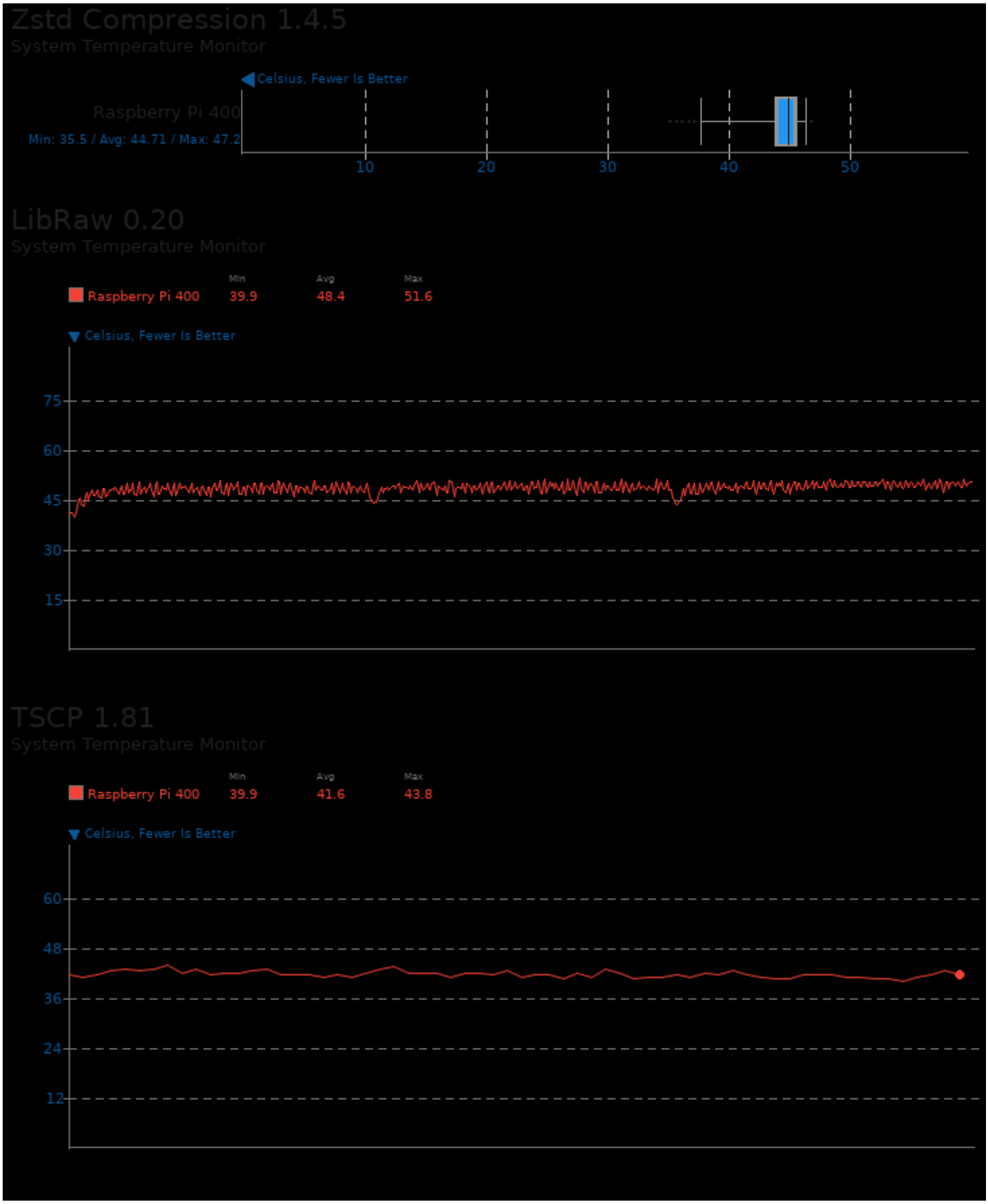
WebP Image Encode 1.1
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
37.0
39.2
40.4
Celsius, Fewer Is Better
55
44
33
22
11

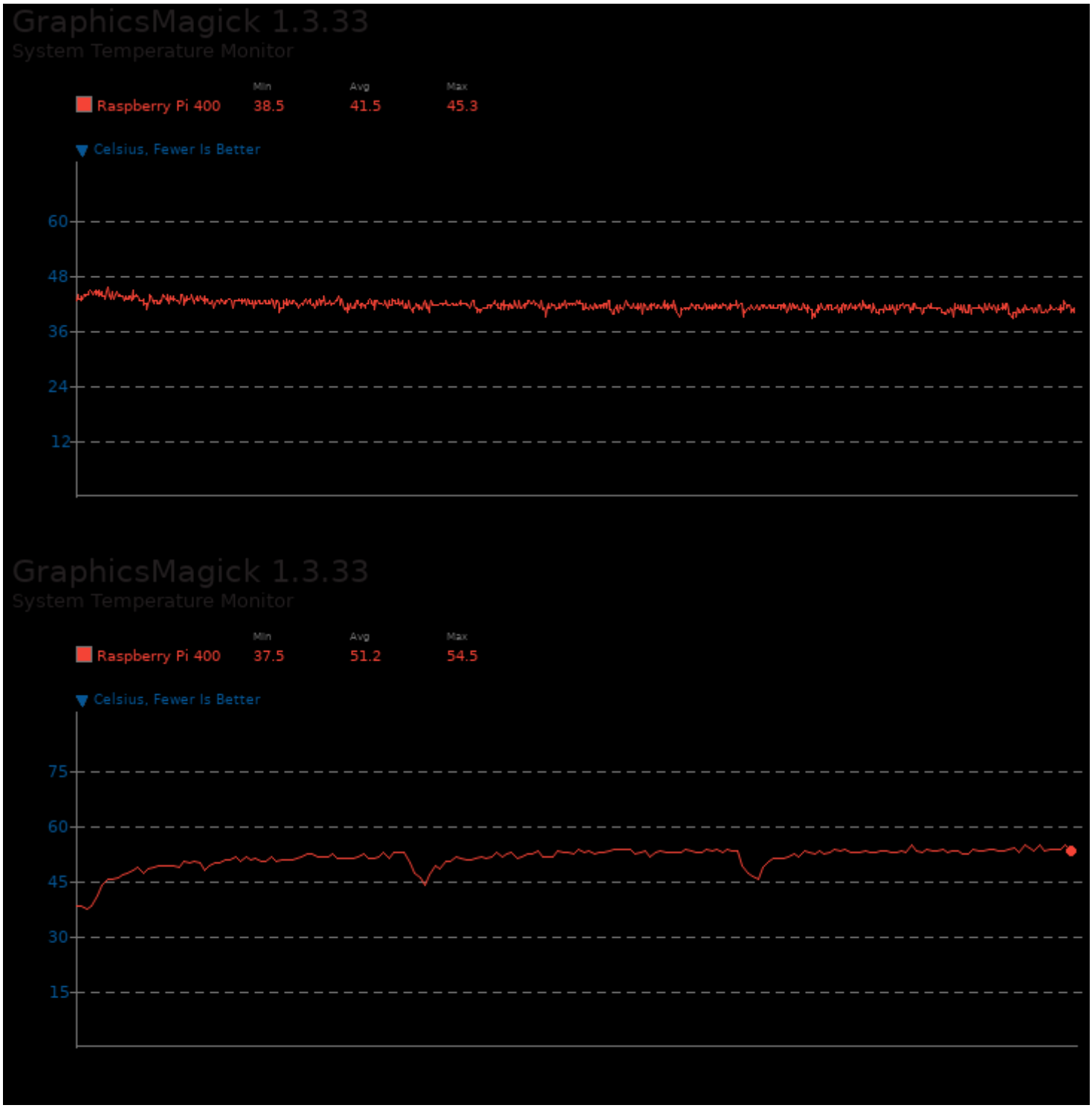
Raspberry Pi 400

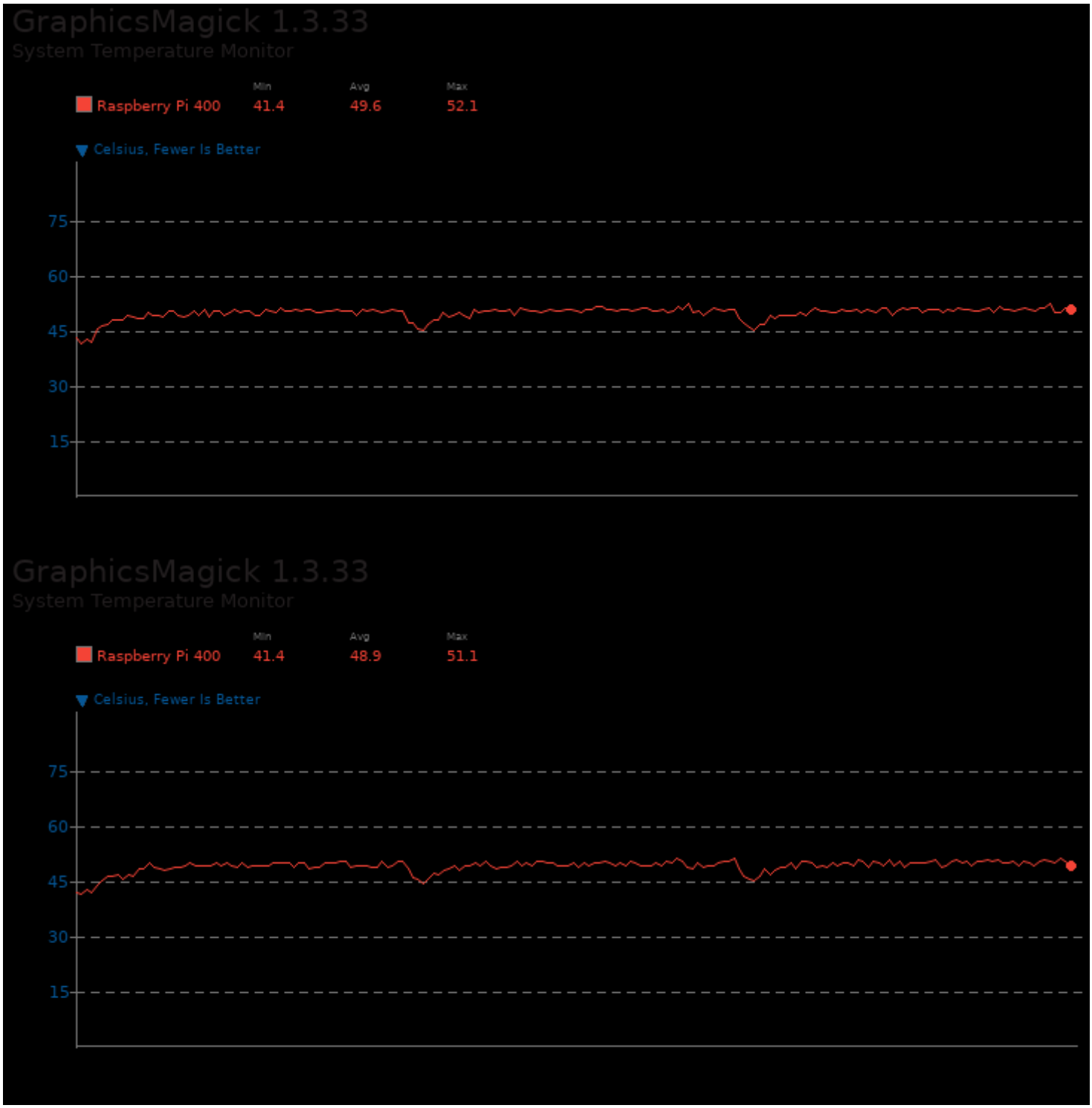


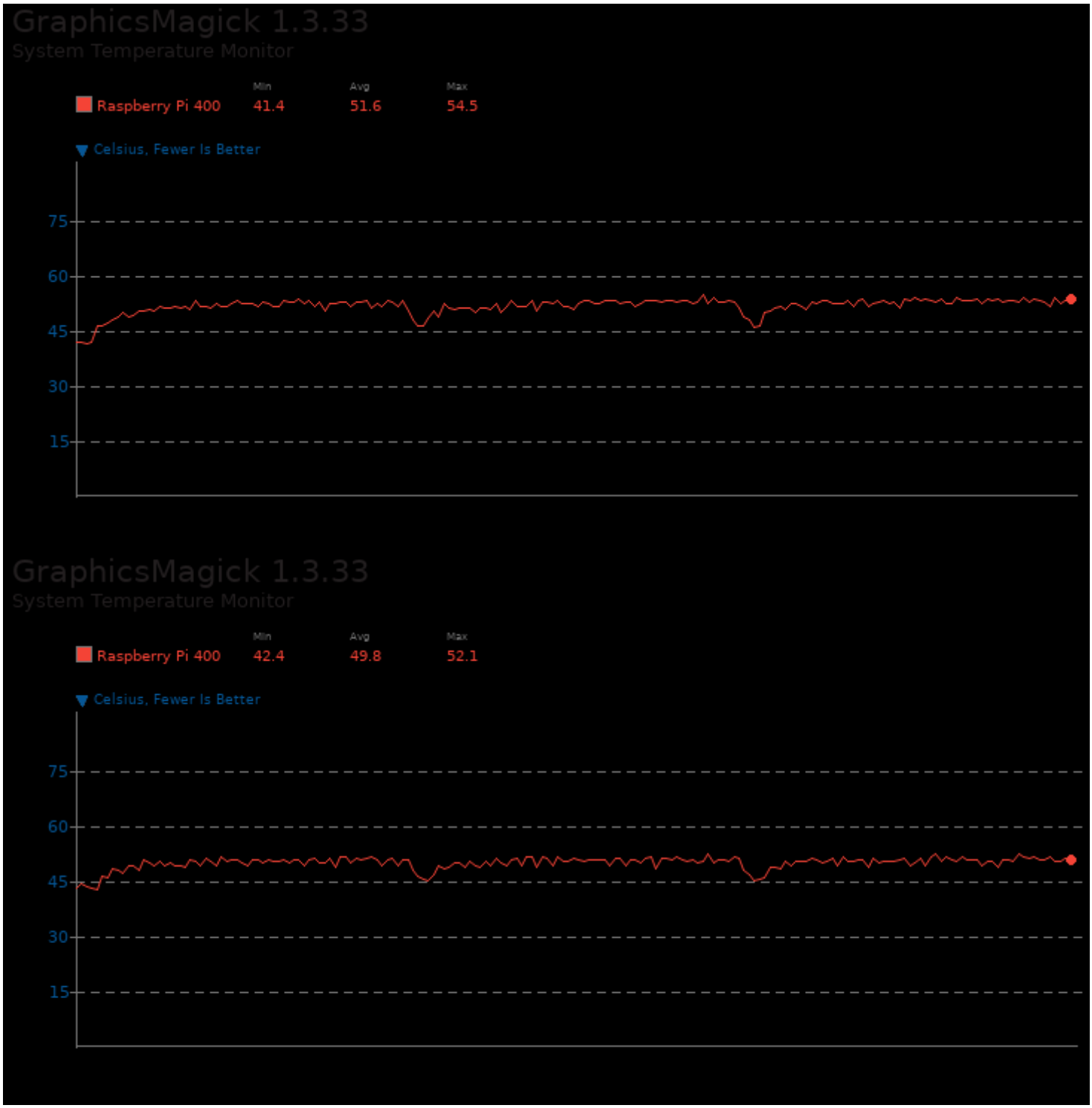
Raspberry Pi 400

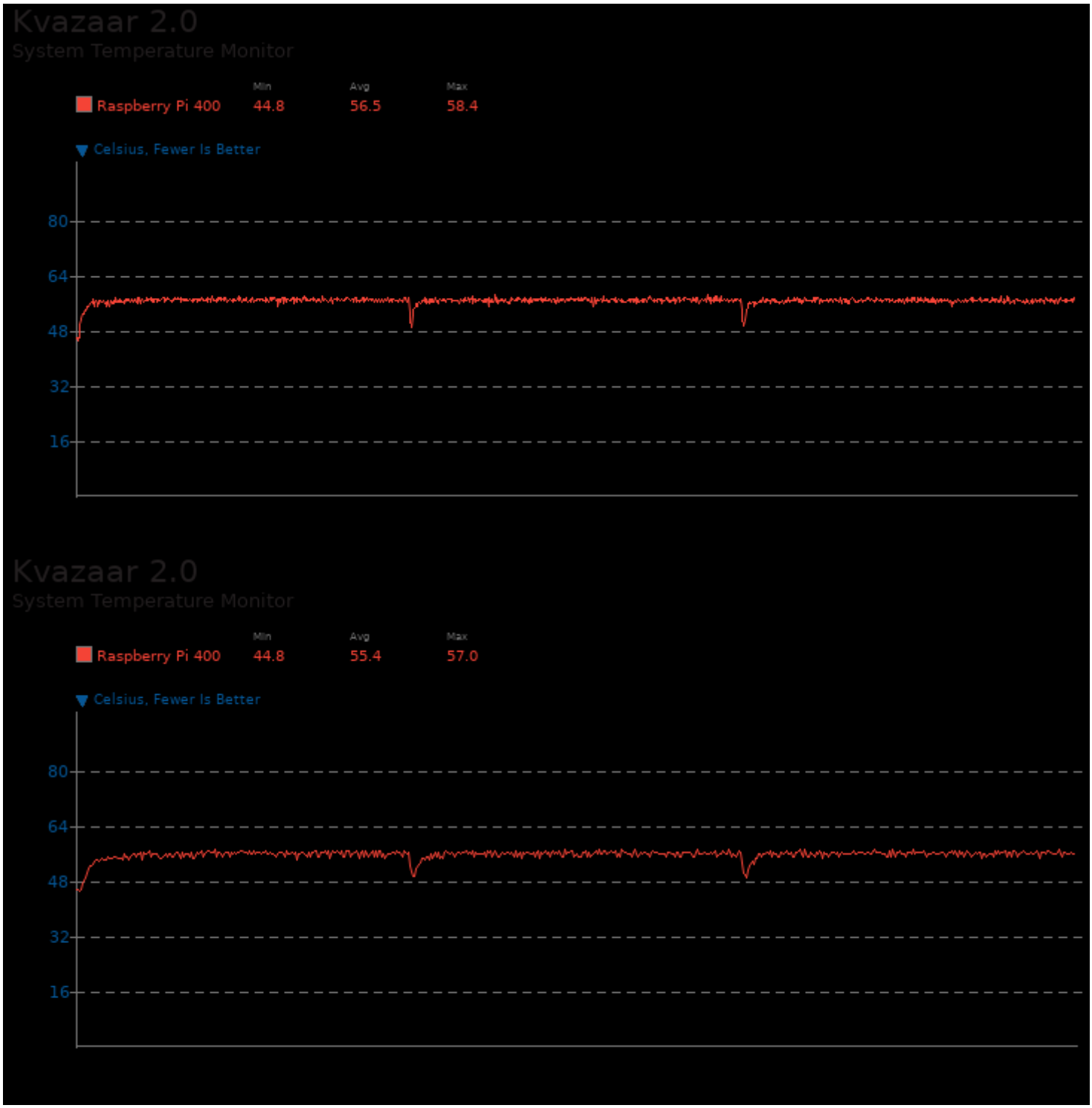



Zstd Compression 1.4.5
System Temperature Monitor
Celsius, Fewer Is Better
Raspberry Pi 400
Min: 35.5 / Avg: 44.71 / Max: 47.2
10
20
30
40
50
LibRaw 0.20
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
39.9
48.4
51.6
Celsius, Fewer Is Better
75
60
45
30
15
TSCP 1.81
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
39.9
41.6
43.8
Celsius, Fewer Is Better
60
48
36
24
12

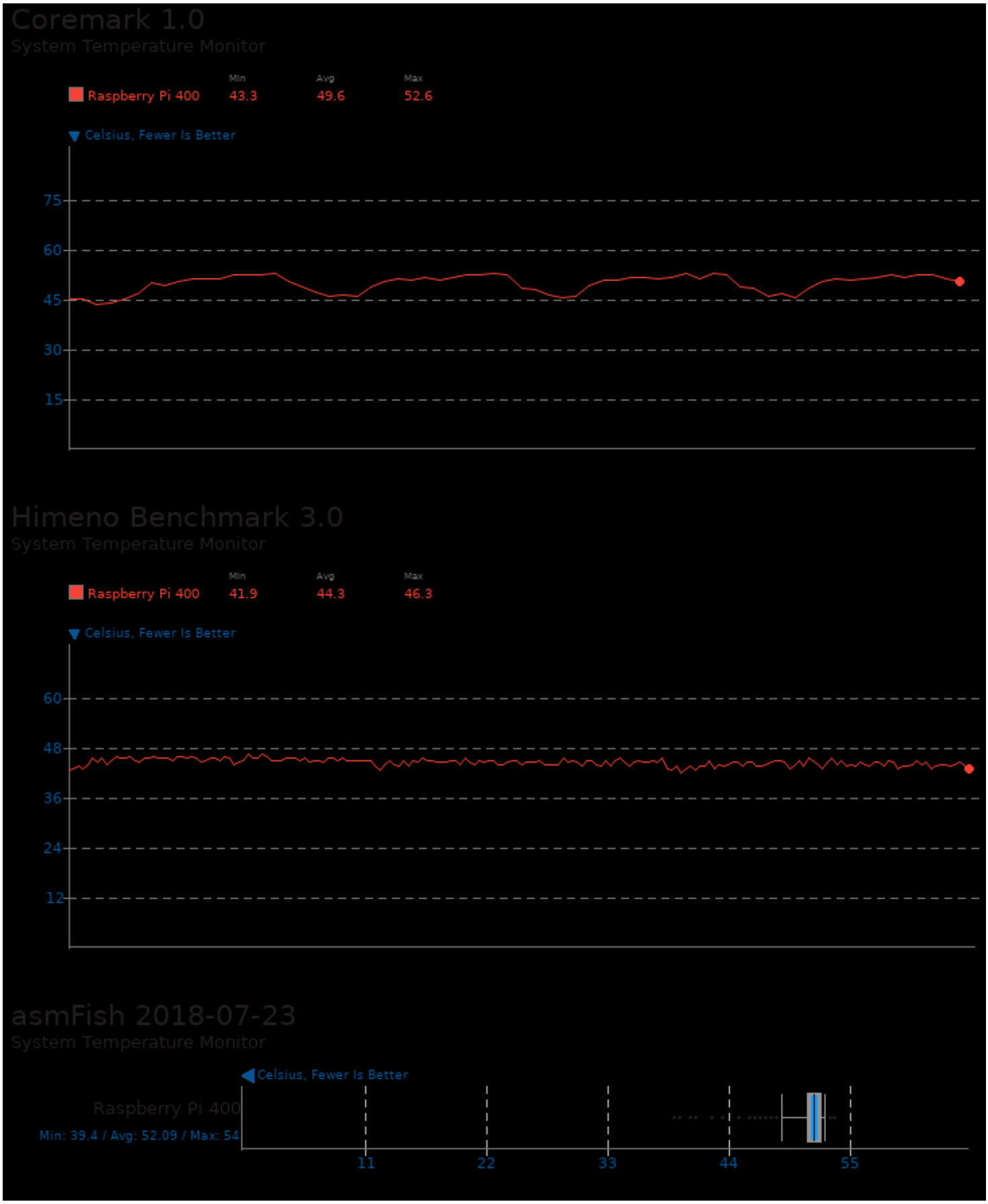

GraphicsMagick 1.3.33
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
38.5
41.5
45.3
Celsius, Fewer Is Better
60
48
36
24
12
GraphicsMagick 1.3.33
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
37.5
51.2
54.5
Celsius, Fewer Is Better
75
60
45
30
15


GraphicsMagick 1.3.33
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
41.4
49.6
52.1
Celsius, Fewer Is Better
75
60
45
30
15
GraphicsMagick 1.3.33
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
41.4
48.9
51.1
Celsius, Fewer Is Better
75
60
45
30
15

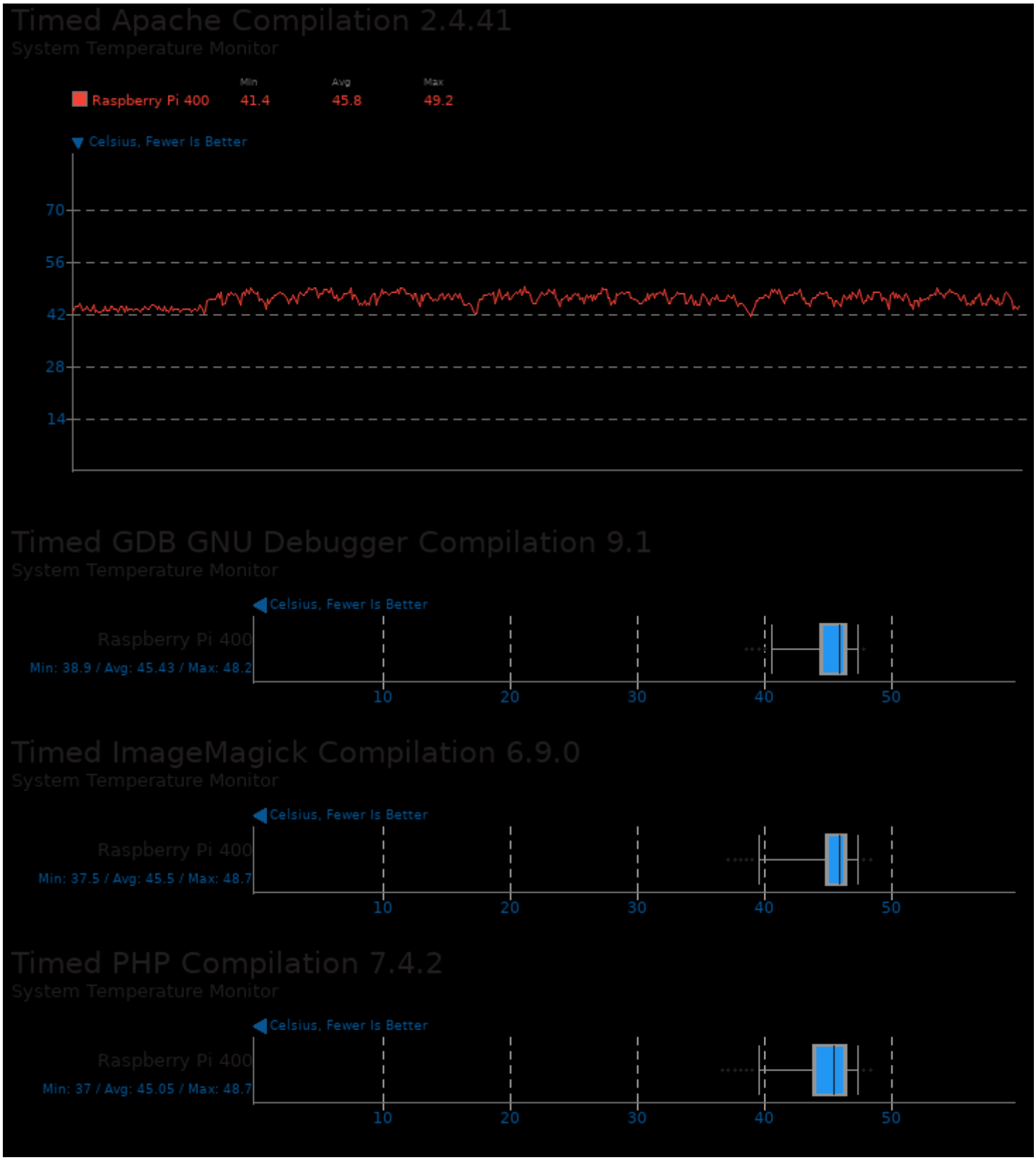

GraphicsMagick 1.3.33
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
41.4
51.6
54.5
Celsius, Fewer Is Better
75
60
45
30
15
GraphicsMagick 1.3.33
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
42.4
49.8
52.1
Celsius, Fewer Is Better
75
60
45
30
15


Kvazaar 2.0
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
44.8
56.5
58.4
Celsius, Fewer Is Better
80
64
48
32
16
Kvazaar 2.0
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
44.8
55.4
57.0
Celsius, Fewer Is Better
80
64
48
32
16

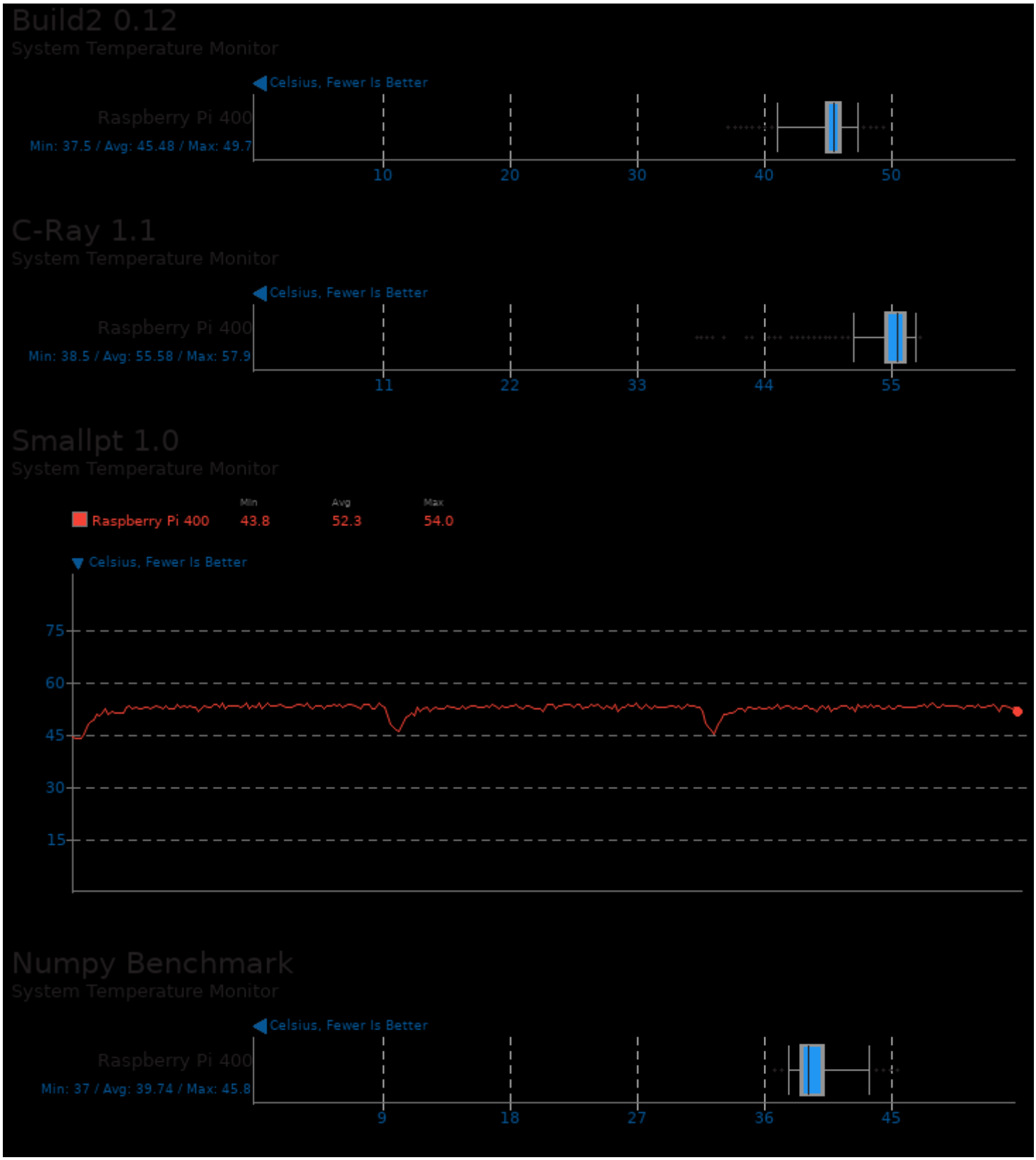
Raspberry Pi 400



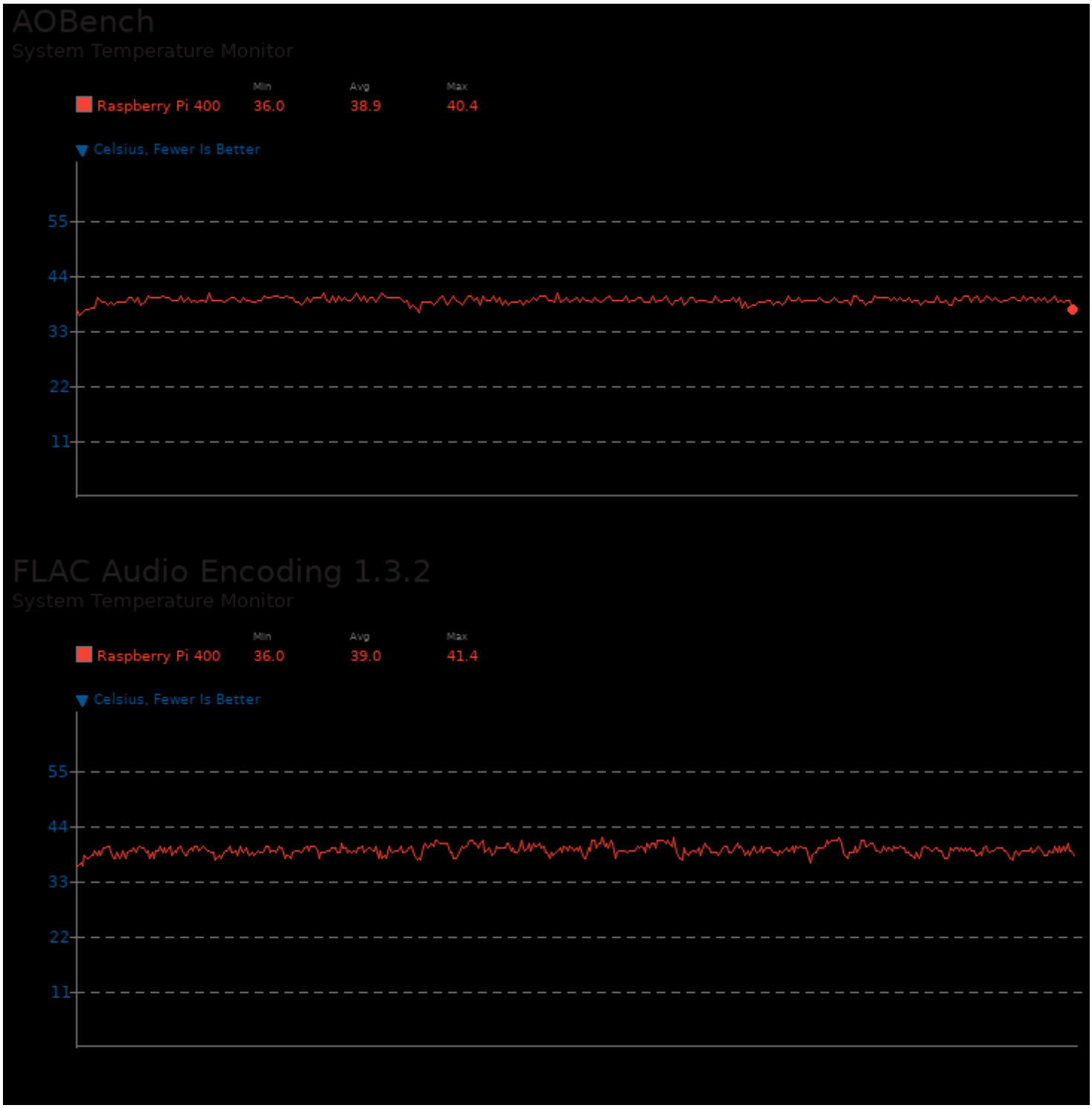
Raspberry Pi 400



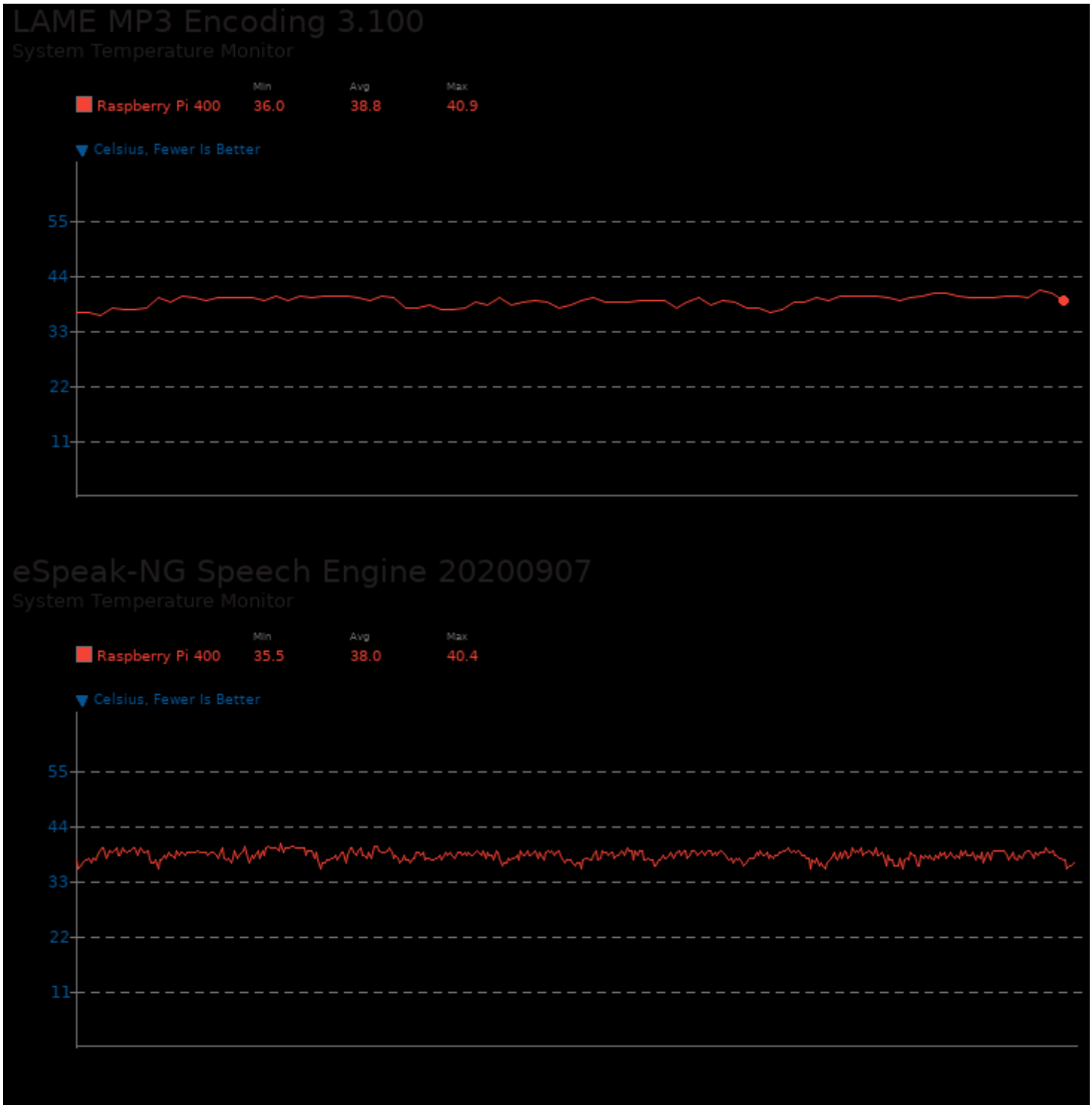
Raspberry Pi 400



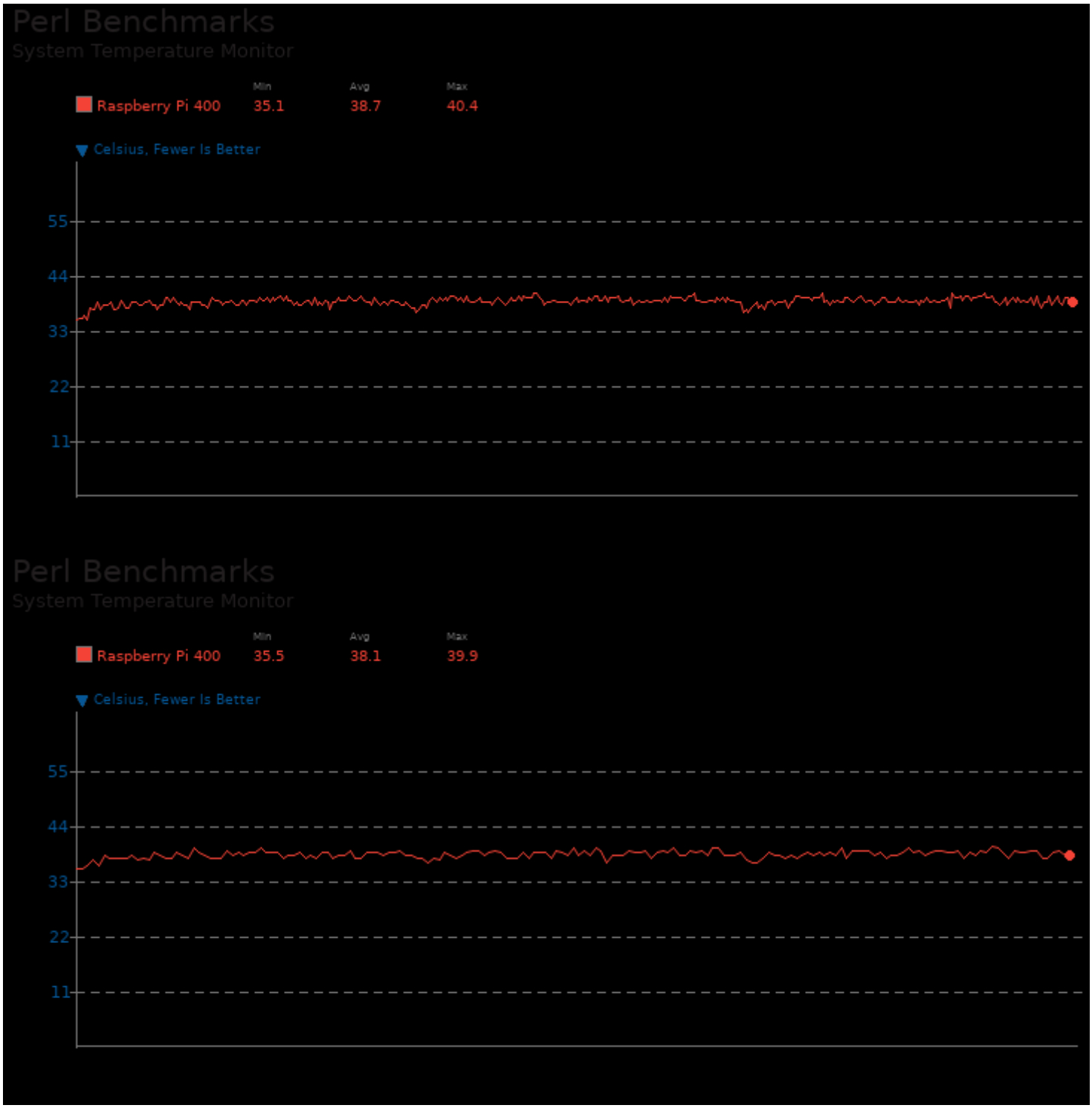
Raspberry Pi 400



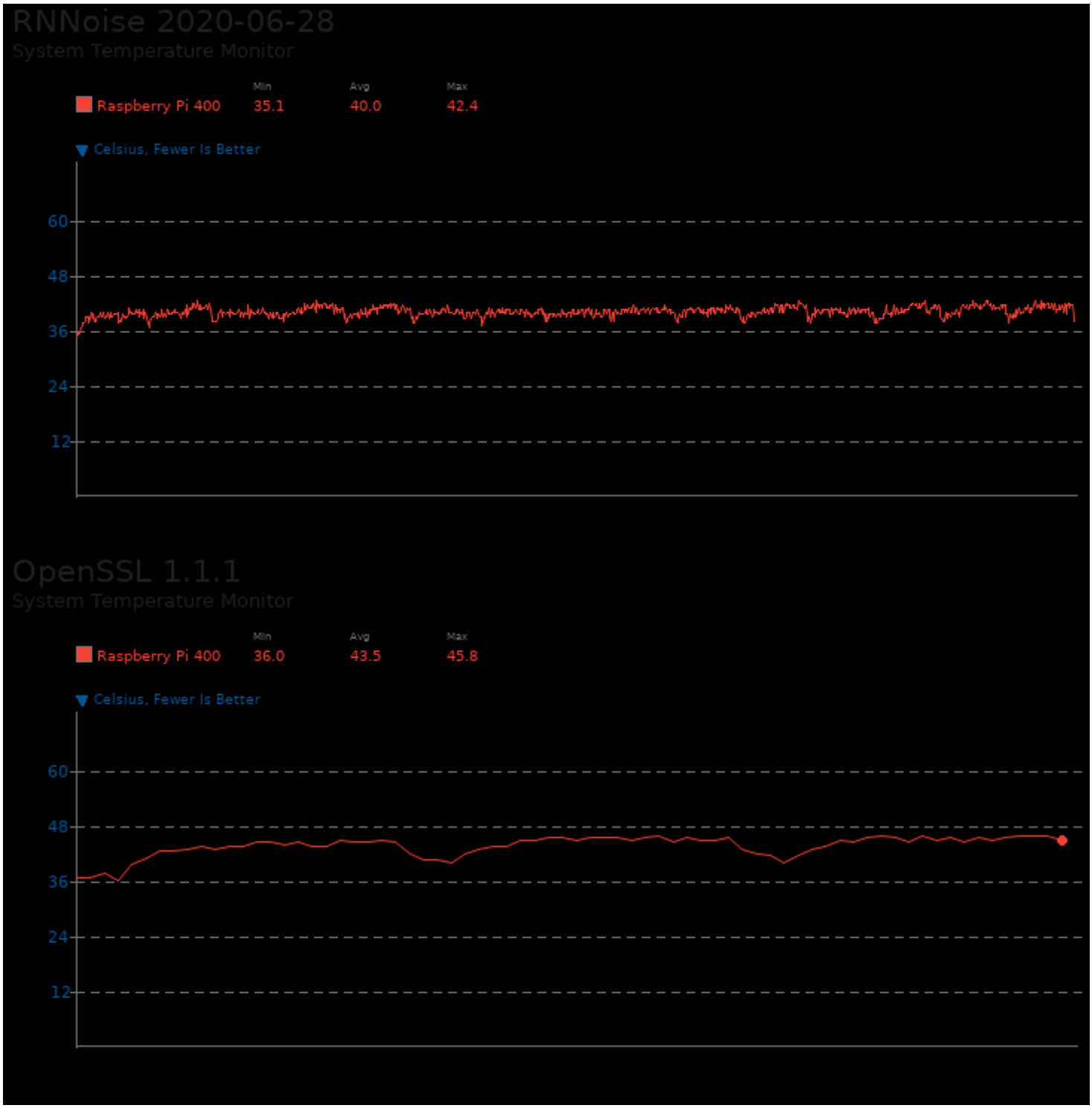
Raspberry Pi 400

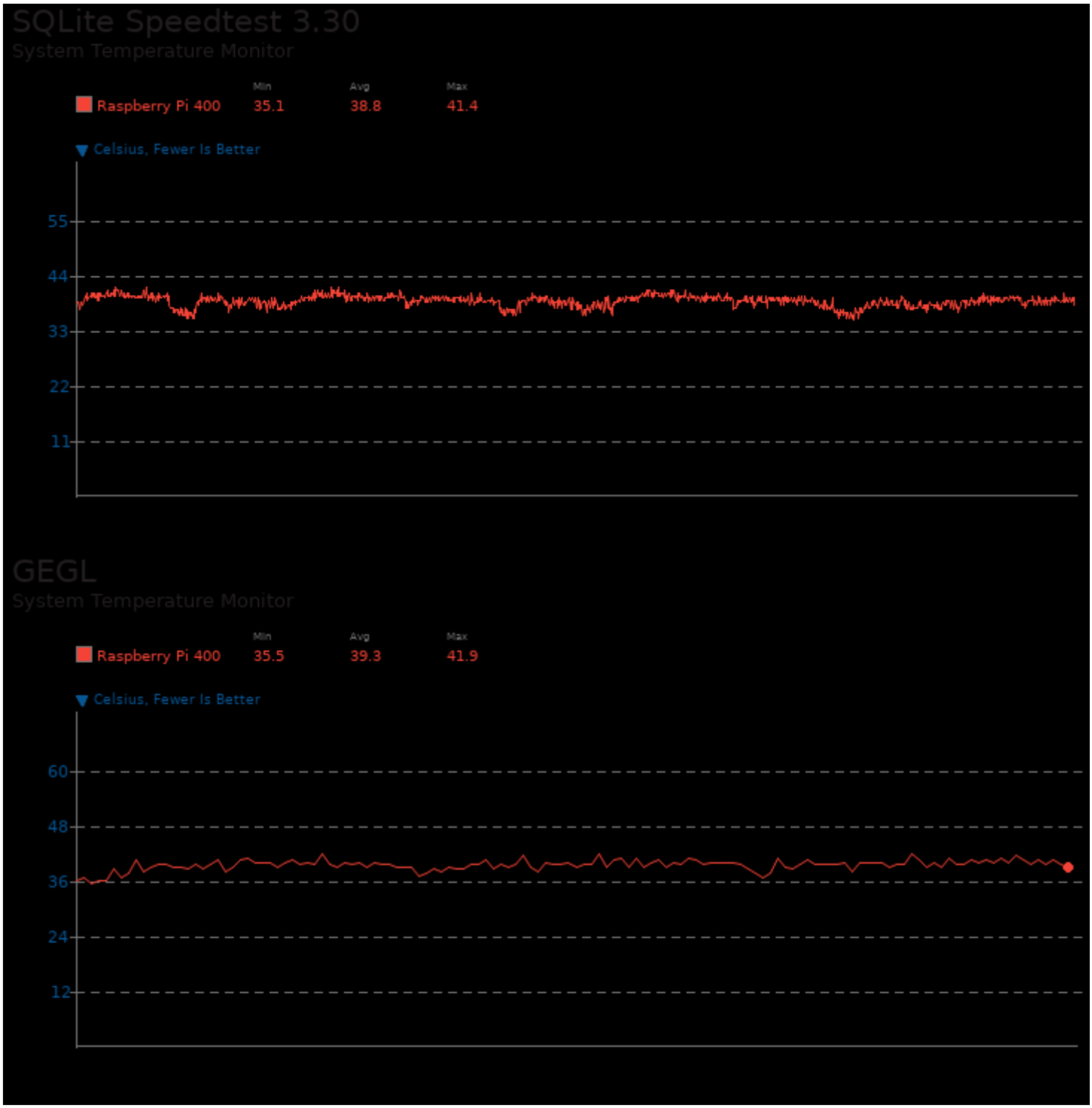


Raspberry Pi 400



Raspberry Pi 400

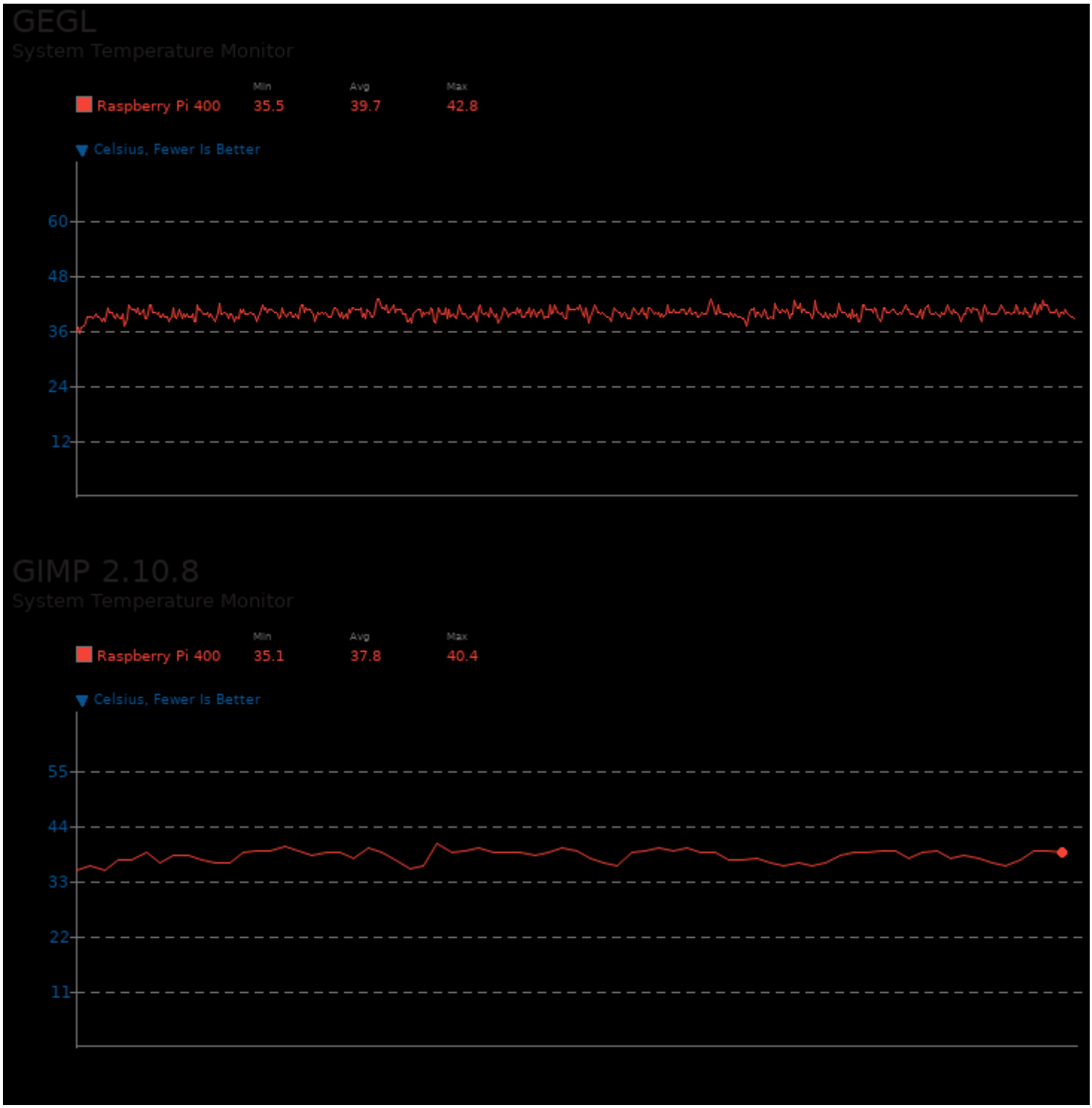



SQLite Speedtest 3.30
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
35.1
38.8
41.4
Celsius, Fewer Is Better
55
44
33
22
11
GEGL
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
35.5
39.3
41.9
Celsius, Fewer Is Better
60
48
36
24
12

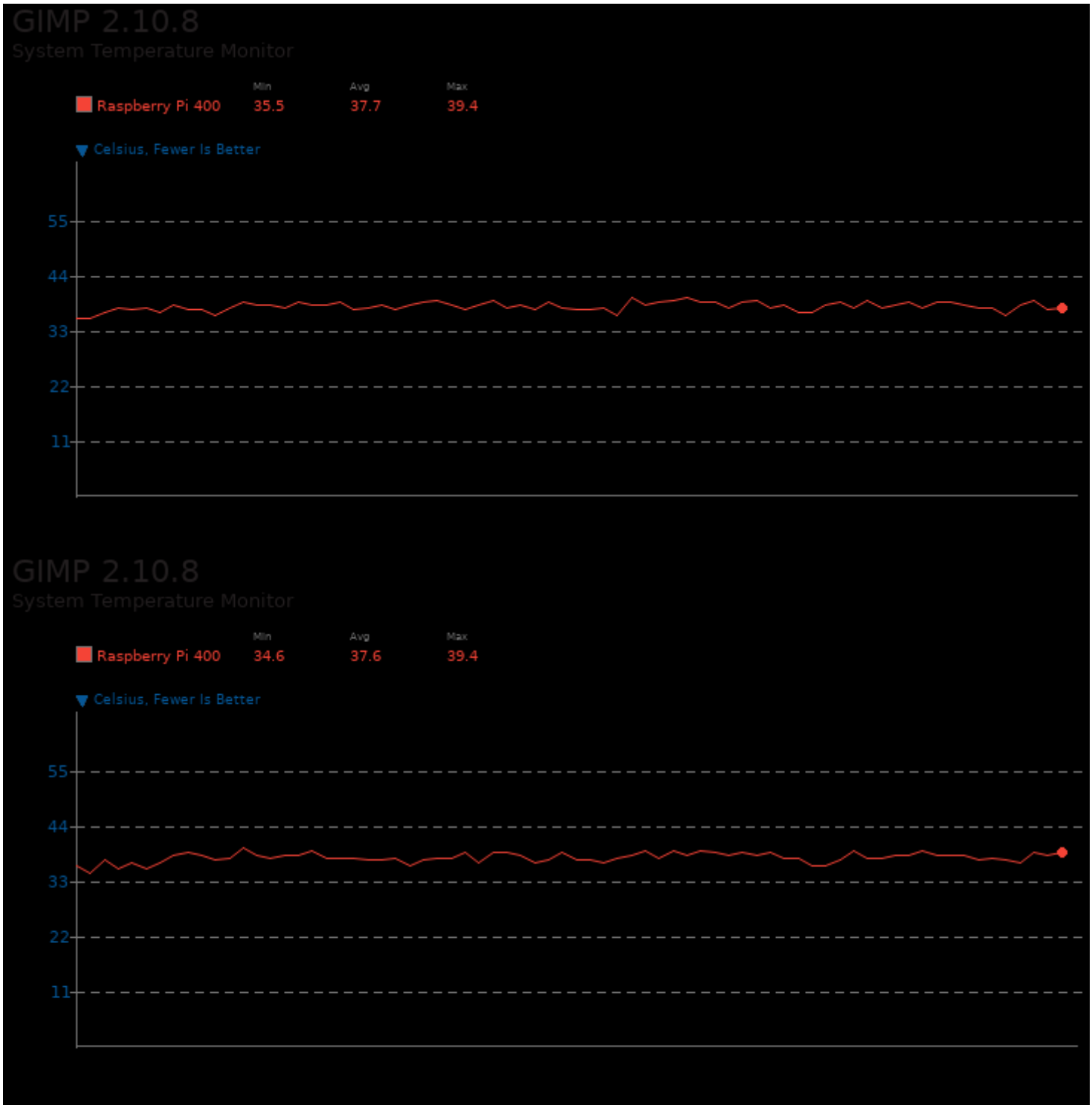
Raspberry Pi 400

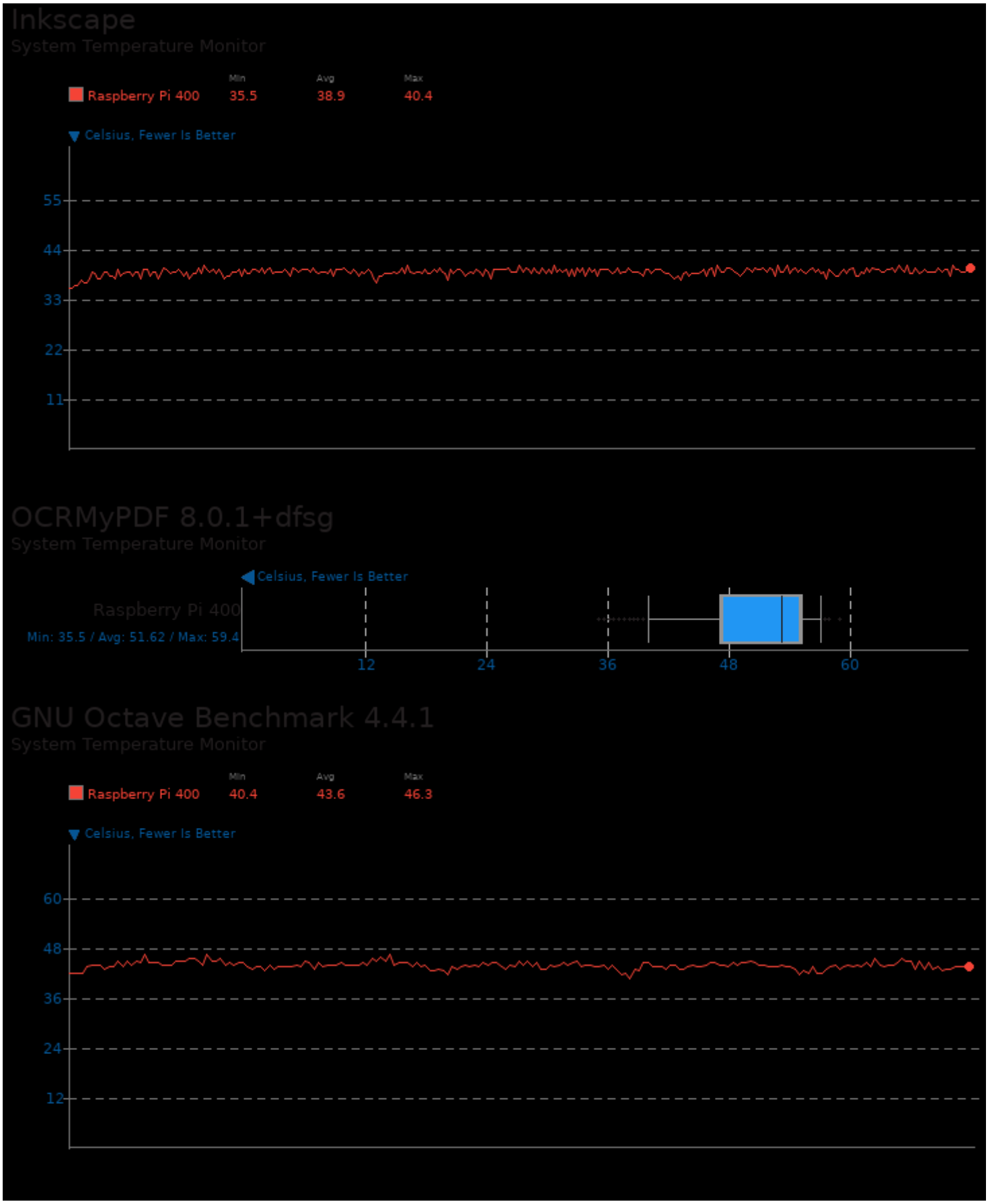


Raspberry Pi 400

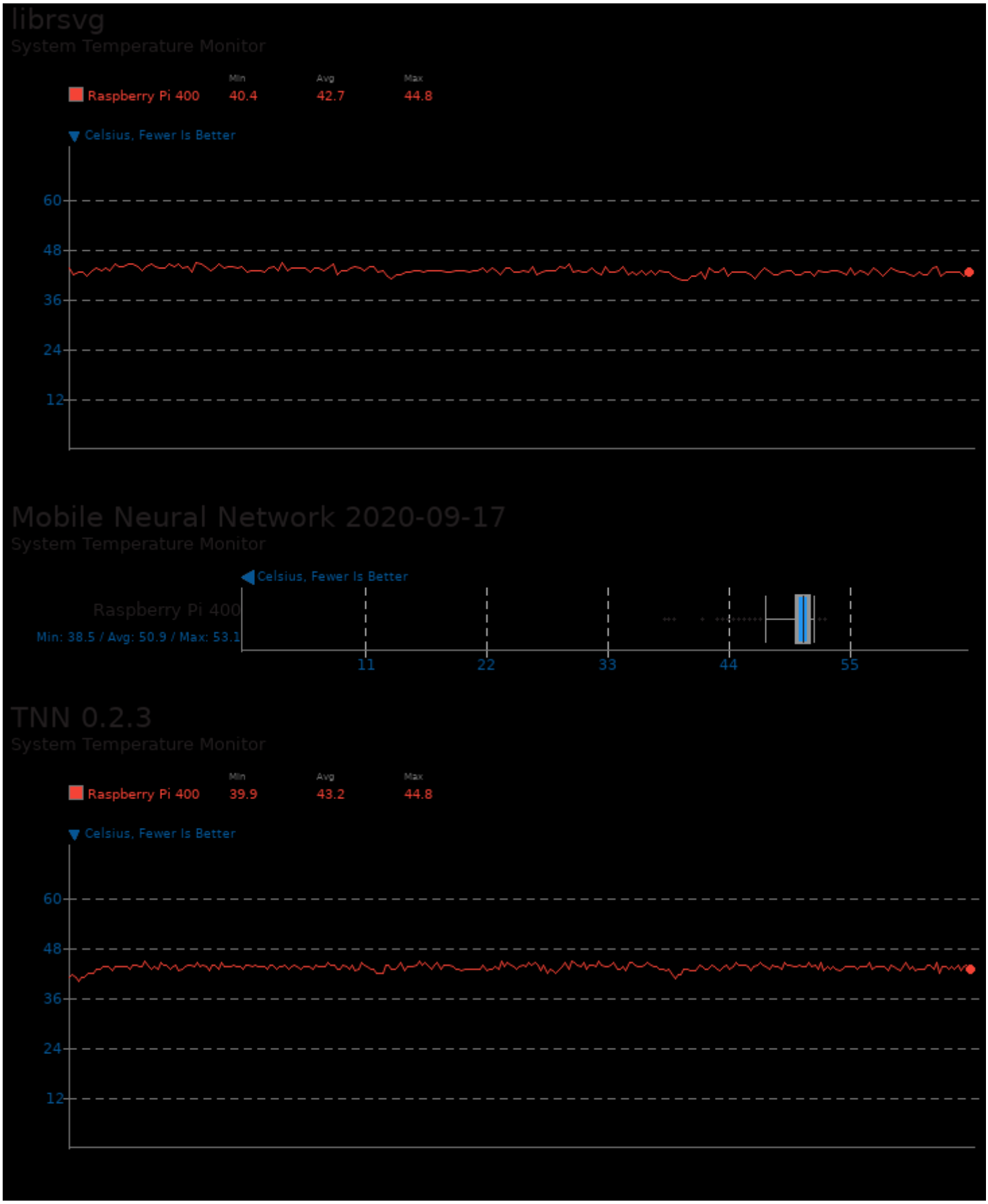


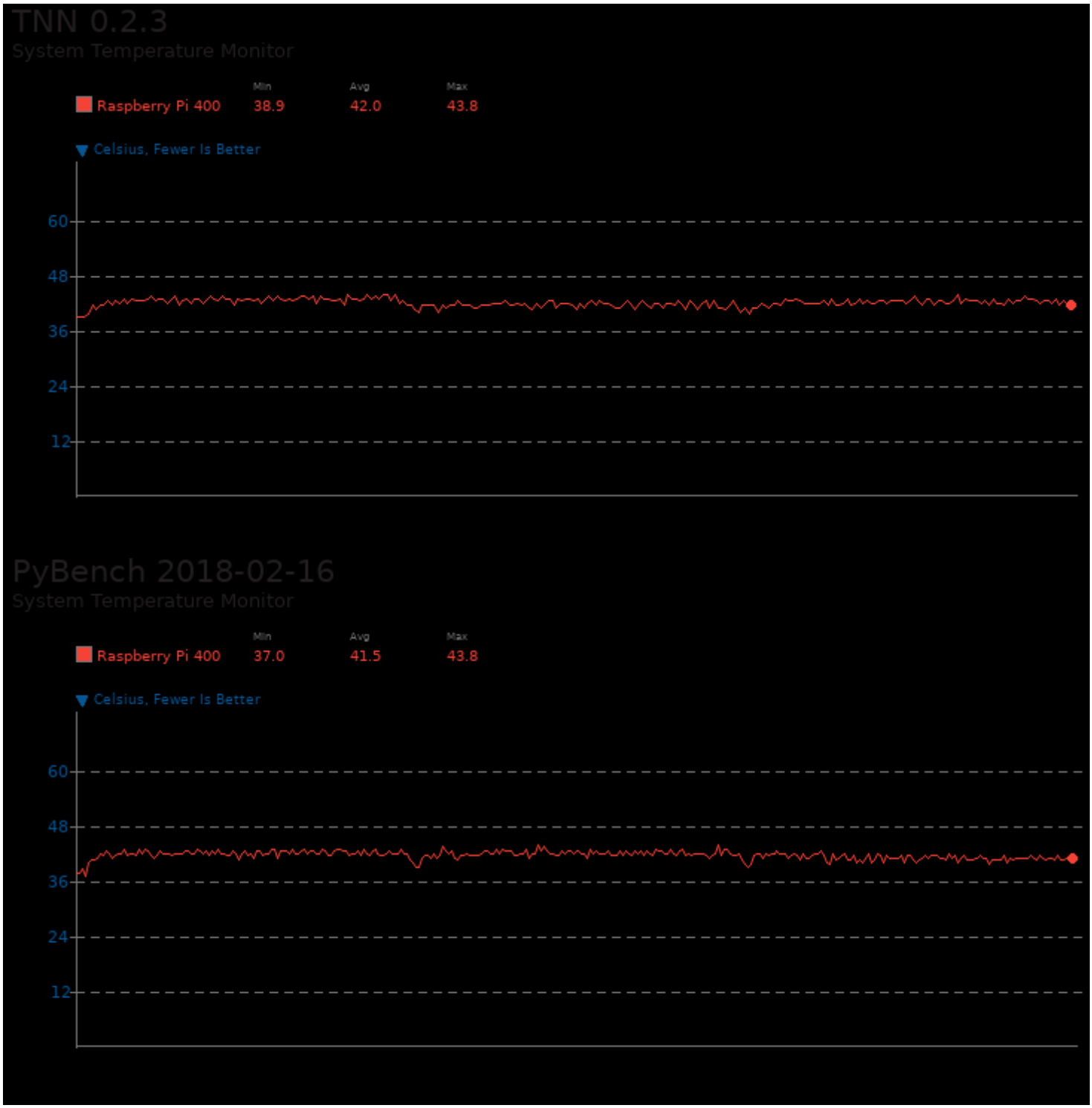
Raspberry Pi 400



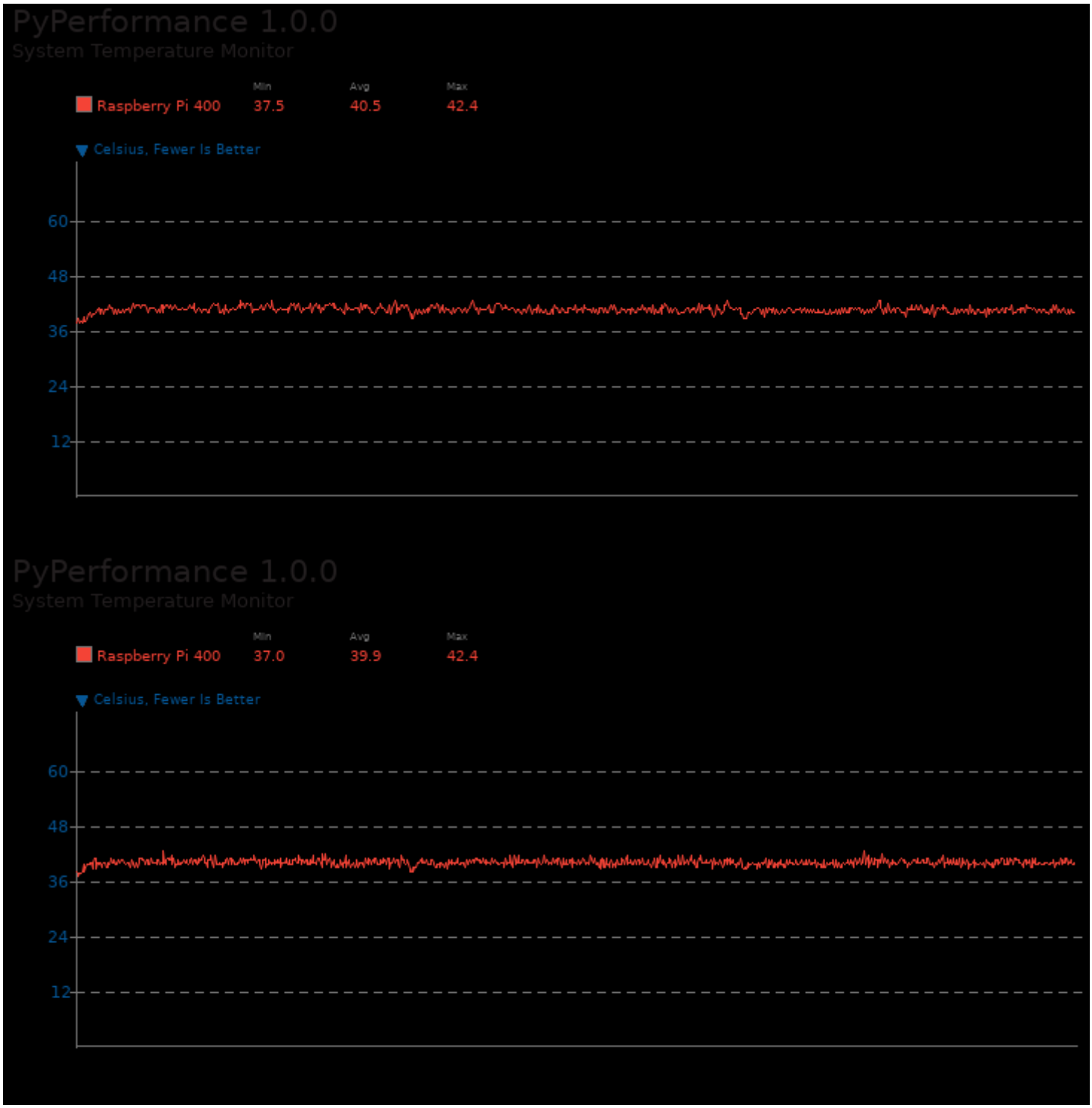

Inkscape
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
35.5
38.9
40.4
Celsius, Fewer Is Better
55
44
33
22
11
OCRMyPDF 8.0.1+dfsg
System Temperature Monitor
Celsius, Fewer Is Better
Raspberry Pi 400
Min: 35.5 / Avg: 51.62 / Max: 59.4
12
24
36
48
60
GNU Octave Benchmark 4.4.1
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
40.4
43.6
46.3
Celsius, Fewer Is Better
60
48
36
24
12

Raspberry Pi 400

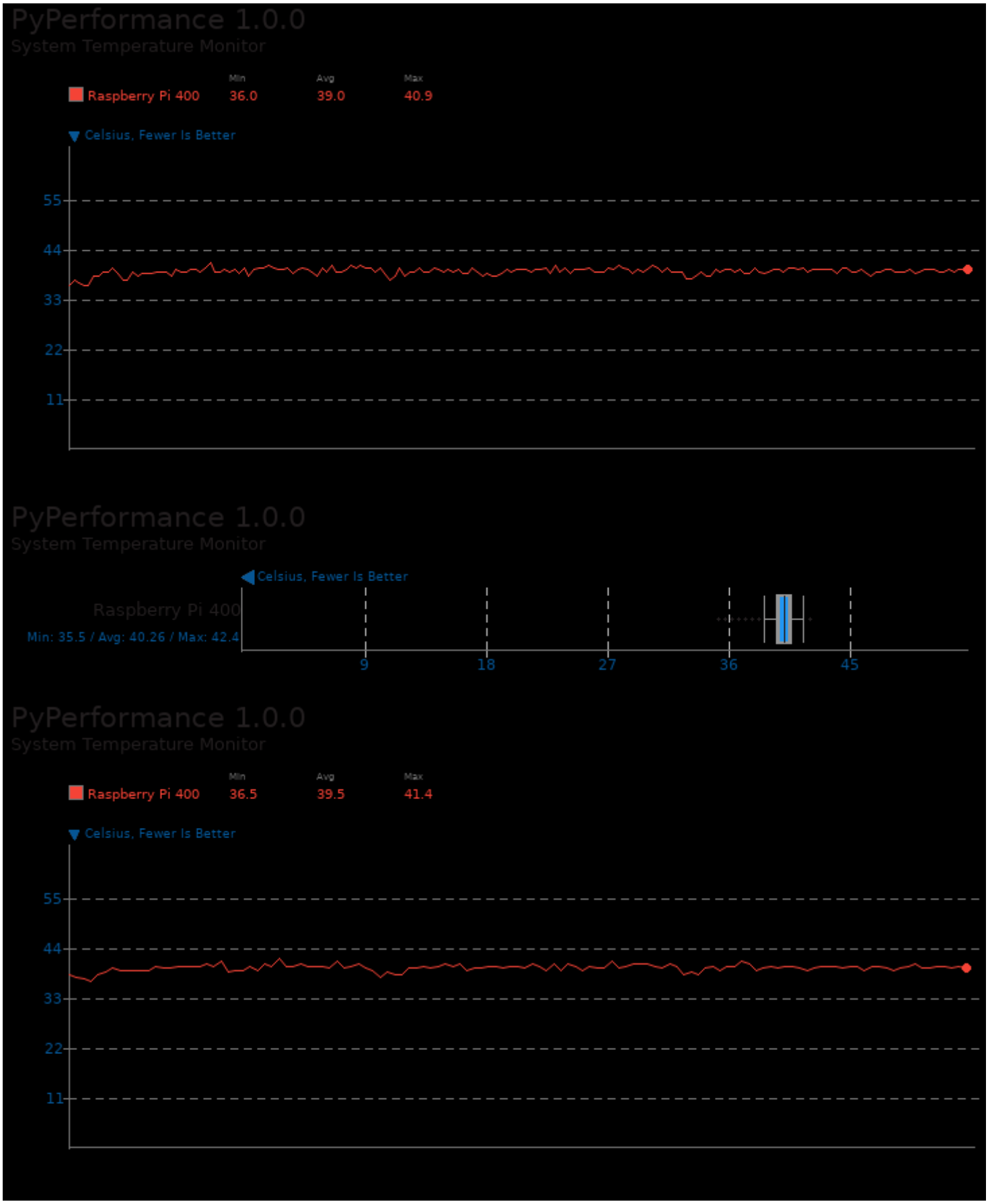



TNN 0.2.3
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
38.9
42.0
43.8
Celsius, Fewer Is Better
60
48
36
24
12
PyBench 2018-02-16
System Temperature Monitor
Min
Avg
Max
Raspberry Pi 400
37.0
41.5
43.8
Celsius, Fewer Is Better
60
48
36
24
12

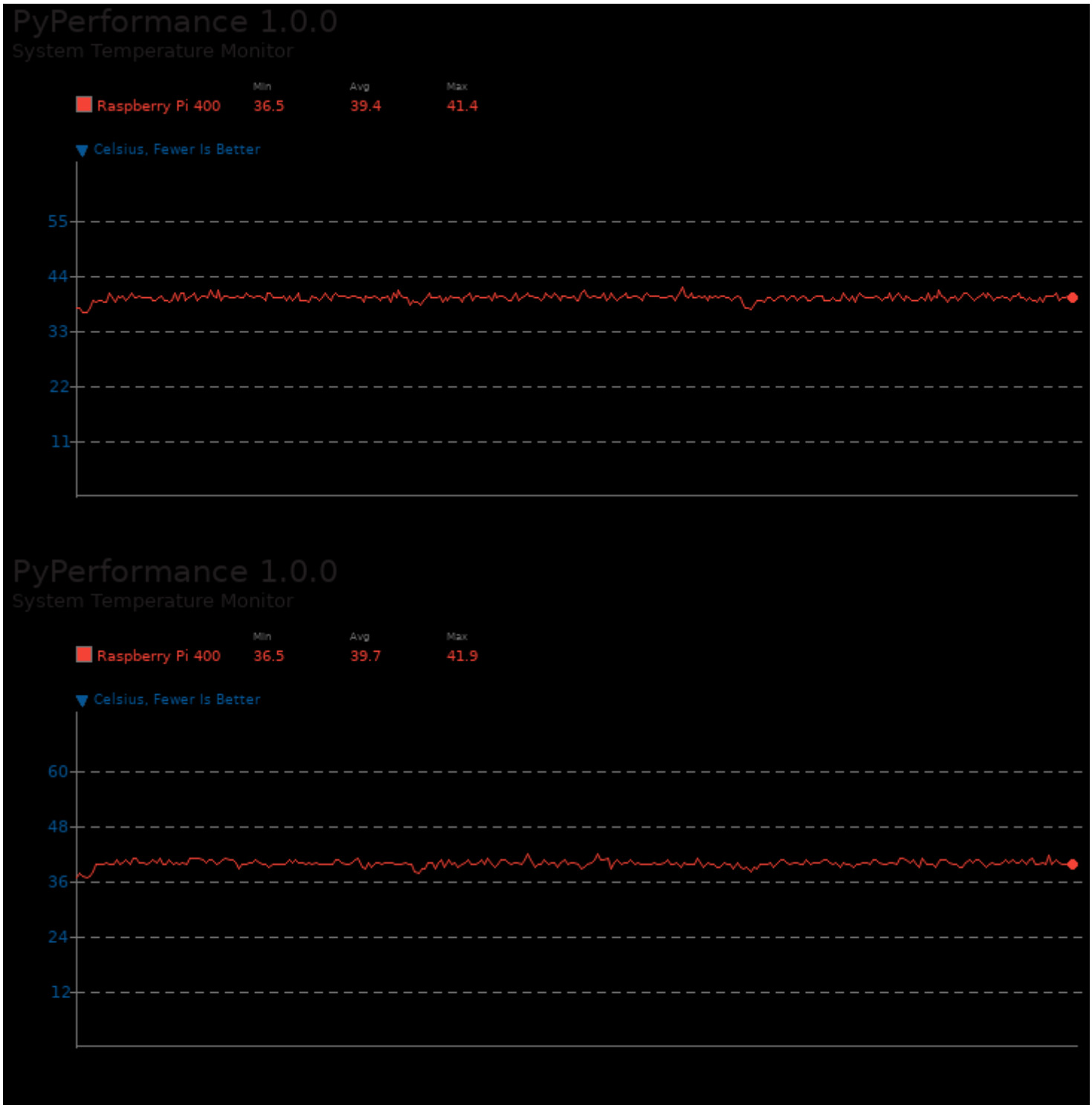
Raspberry Pi 400



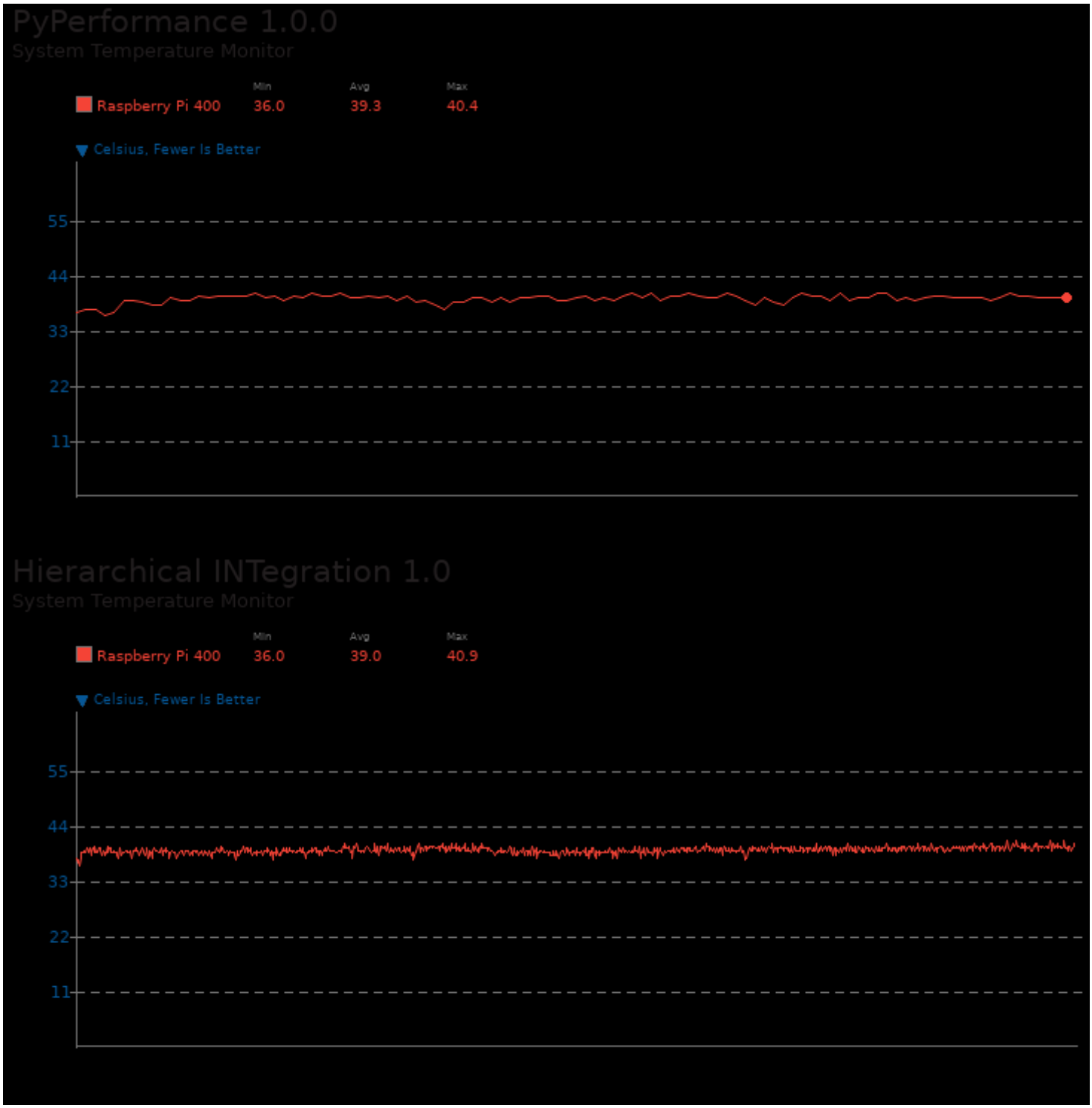
Raspberry Pi 400



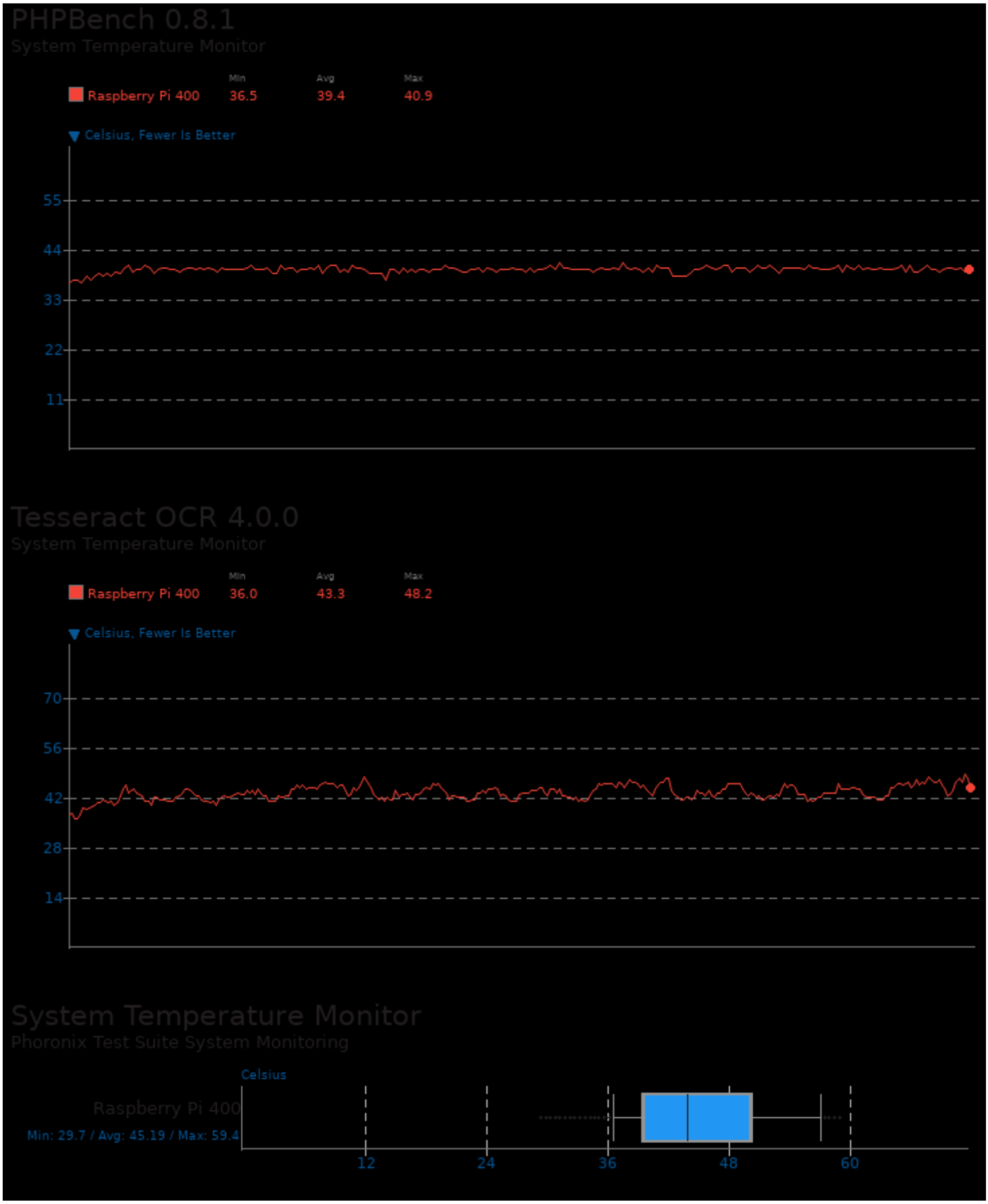
Raspberry Pi 400



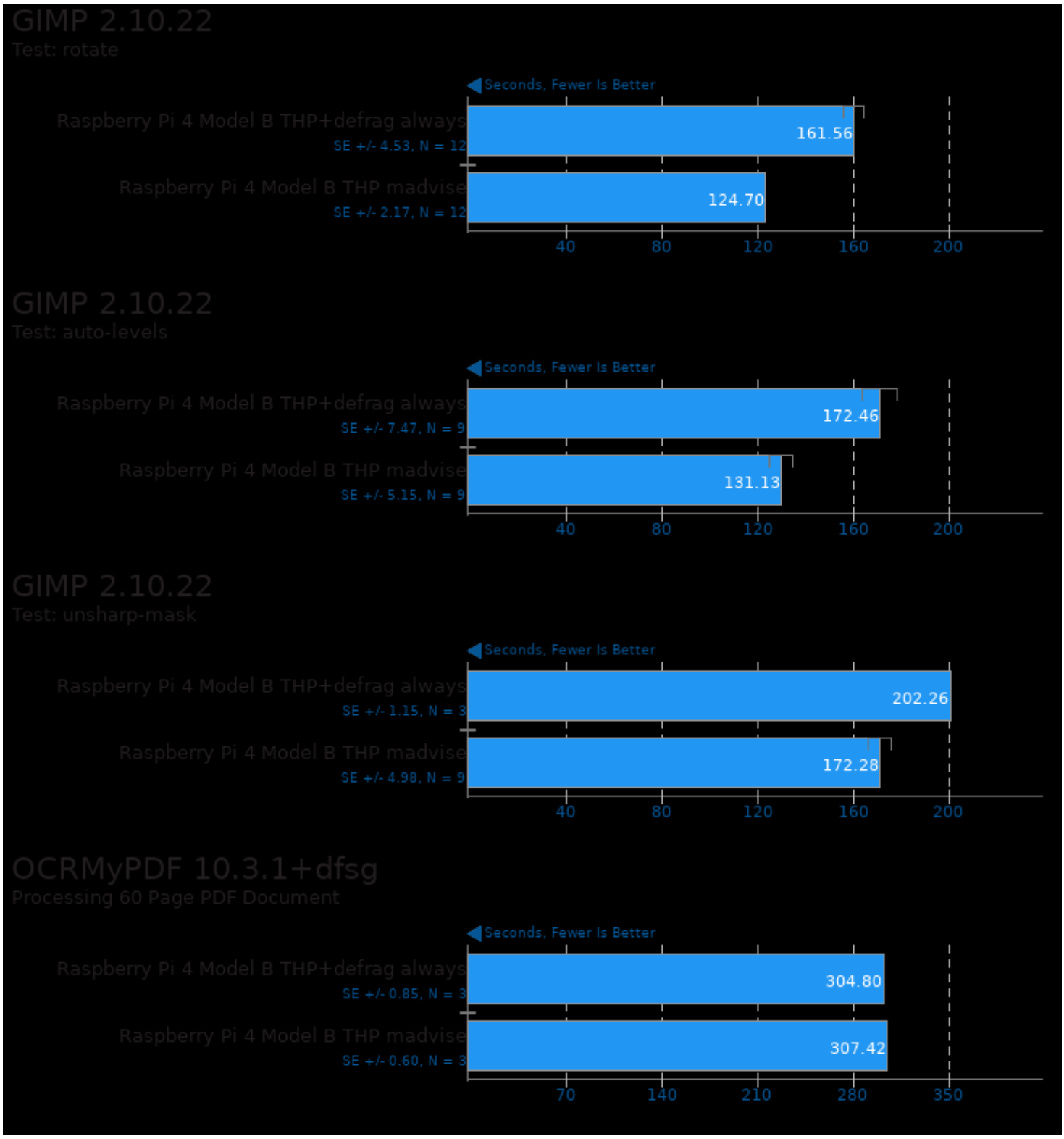
Raspberry Pi 400

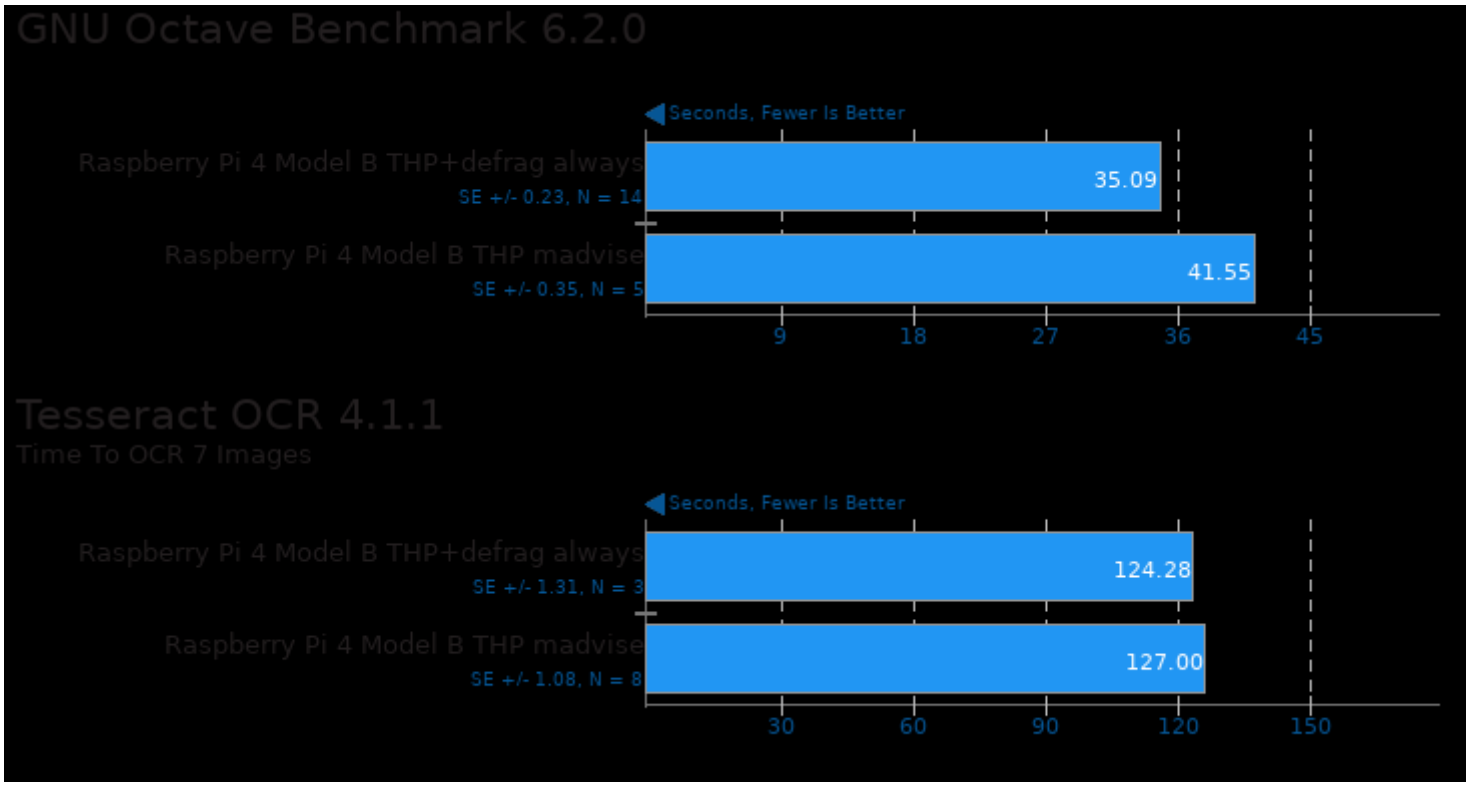


Raspberry Pi 400



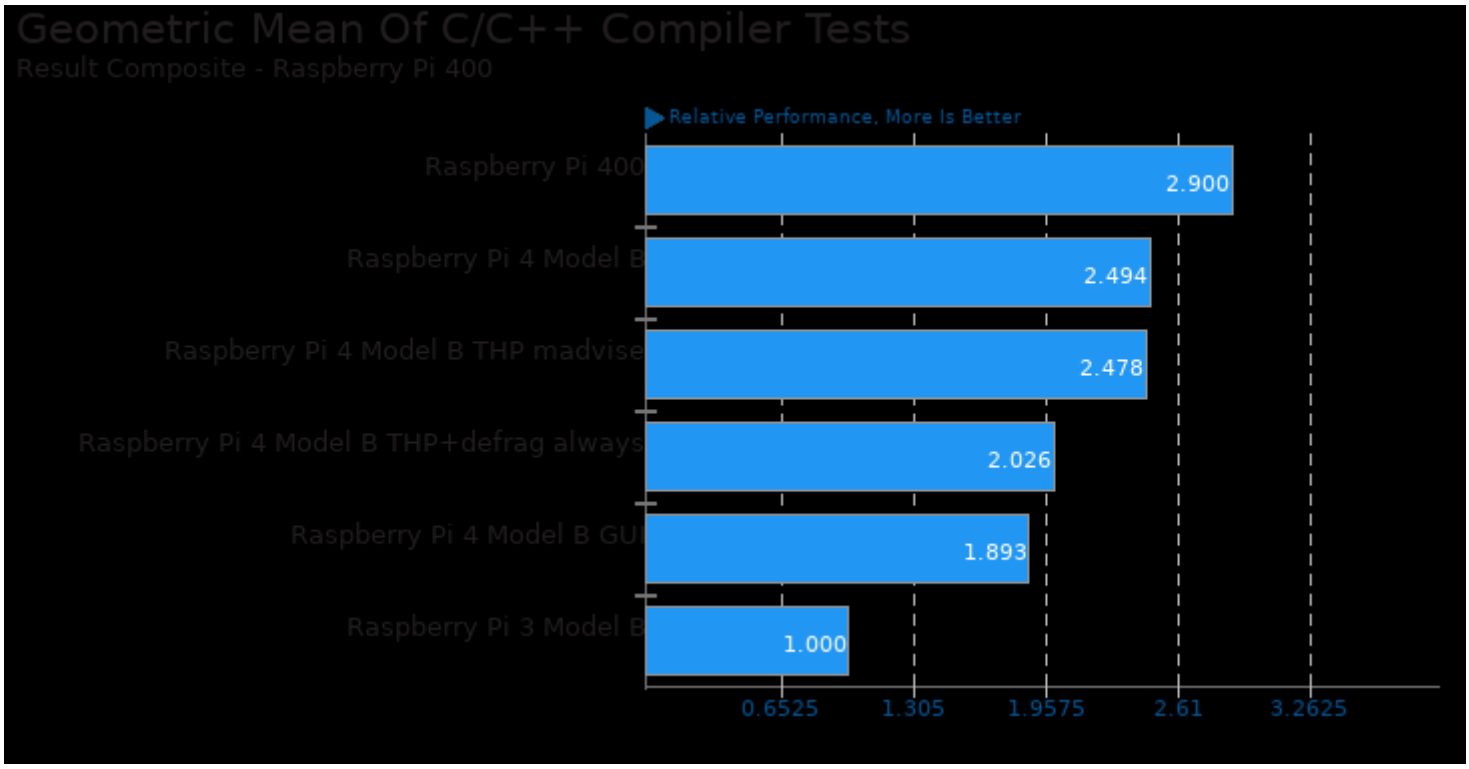
Raspberry Pi 400



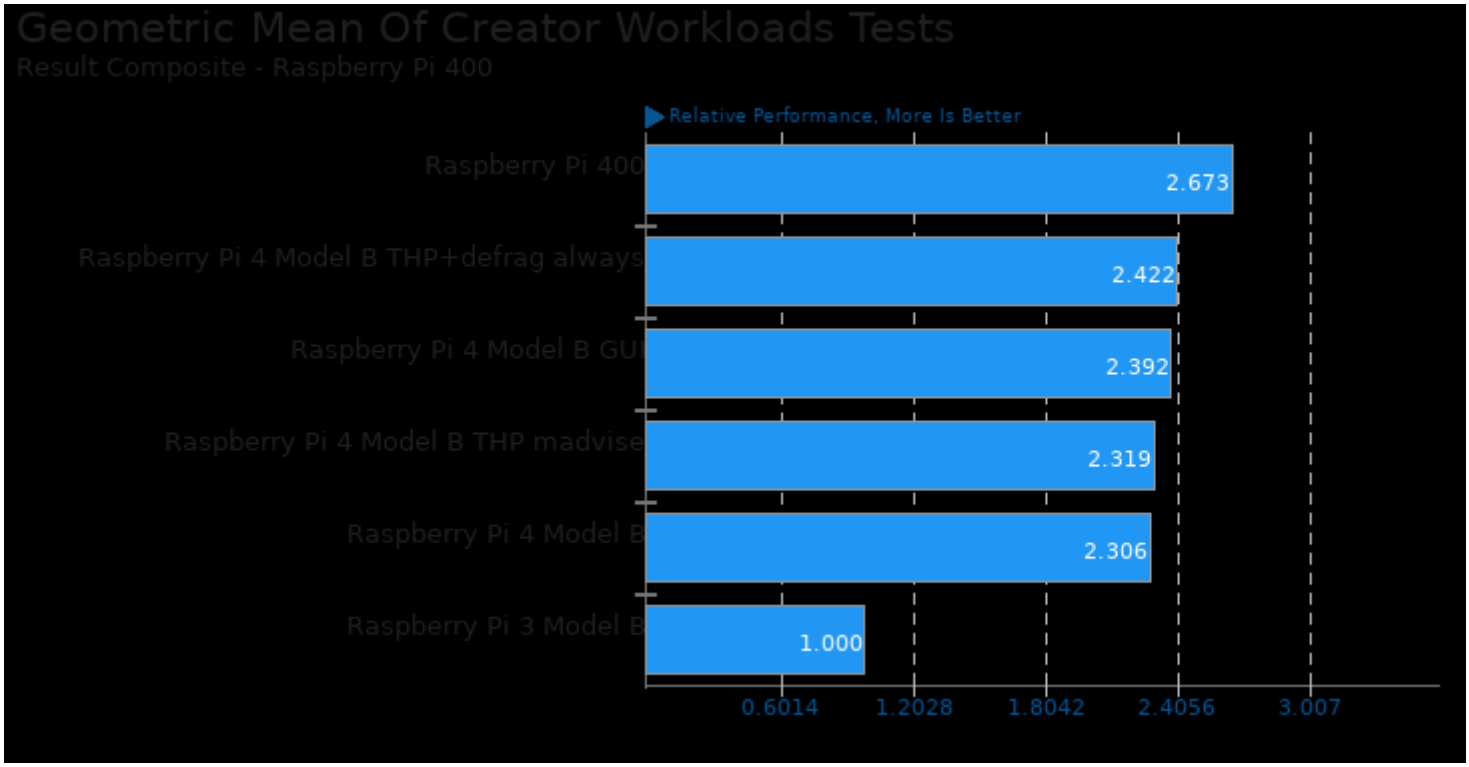

GNU Octave Benchmark 6.2.0
Seconds, Fewer Is Better
Raspberry Pi 4 Model B THP+defrag always
SE +/- 0.23, N = 14
35.09
Raspberry Pi 4 Model B THP madvise
SE +/- 0.35, N = 5
41.55
9
18
27
36
45
Tesseract OCR 4.1.1
Time To OCR 7 Images
Seconds, Fewer Is Better
Raspberry Pi 4 Model B THP+defrag always
SE +/- 1.31, N = 3
124.28
Raspberry Pi 4 Model B THP madvise
SE +/- 1.08, N = 8
127.00
30
60
90
120
150

Raspberry Pi 400

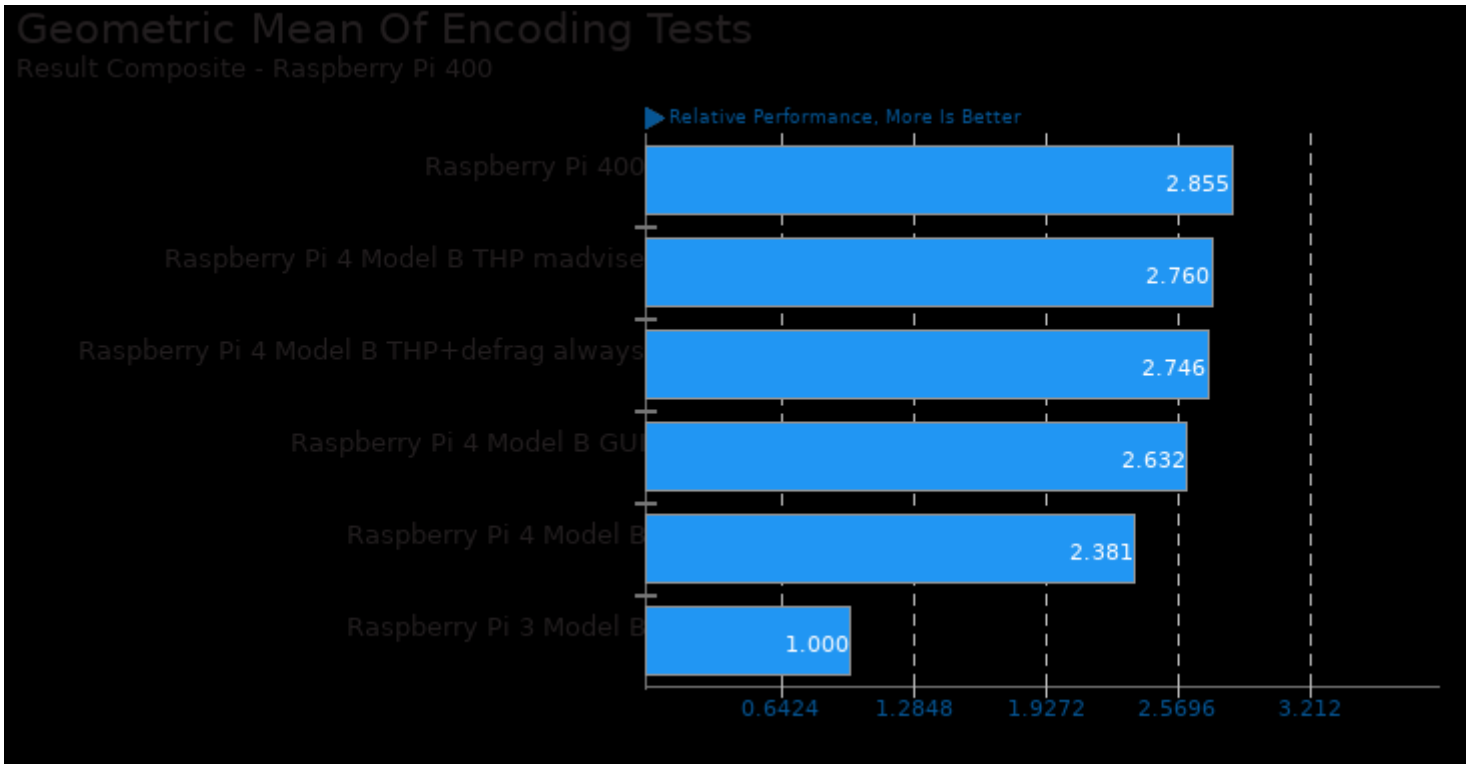
These geometric means are based upon test groupings / test suites for this result file.



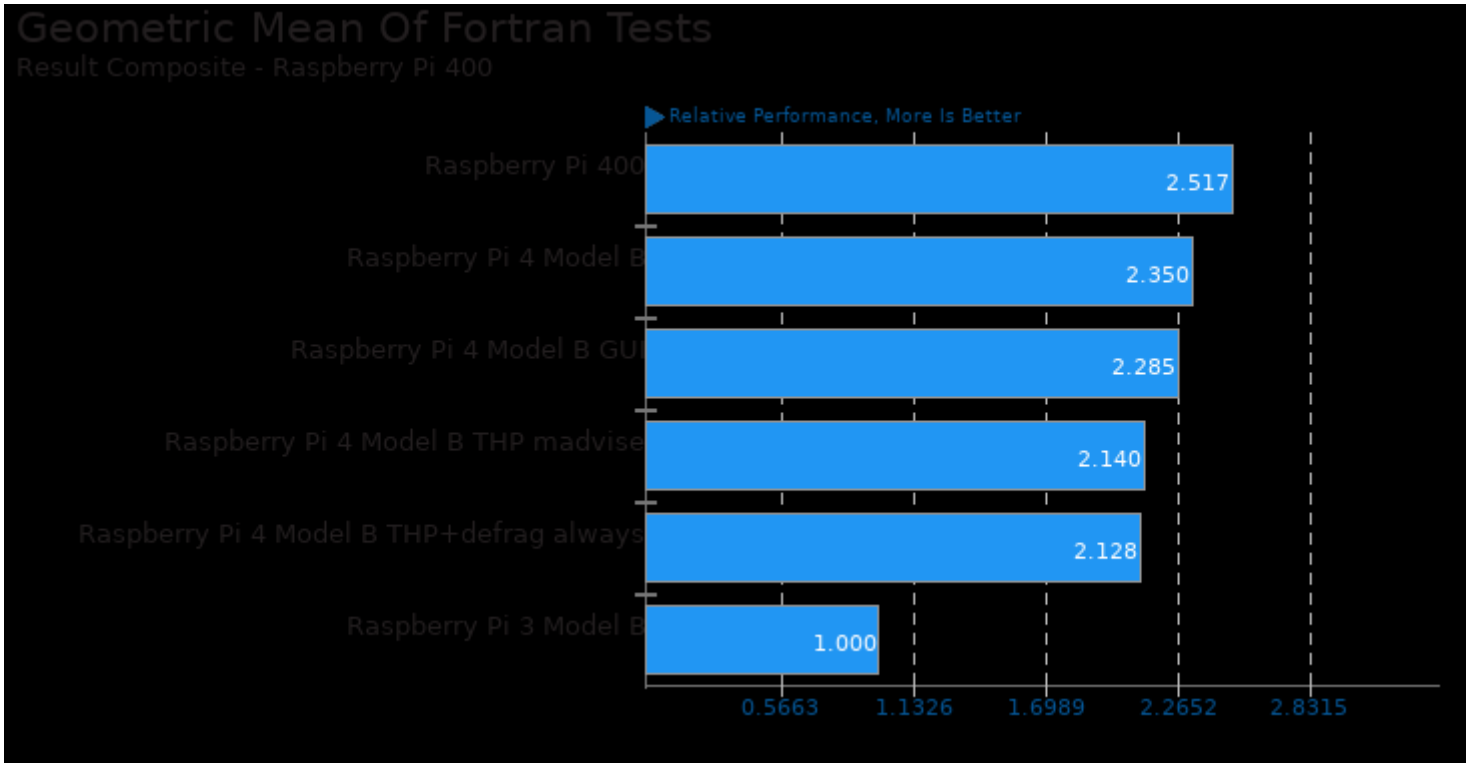
Geometric mean based upon tests: pts/aobench, pts/tscp, pts/graphics-magick, pts/himeno, pts/build-php, pts/build-imagemagick, pts/c-ray, pts/encode-mp3, pts/encode-flac, pts/sqlite-speedtest, pts/kvazaar, pts/compress-zstd, pts/openssl, pts/lammps, pts/build-gdb and pts/build-apache



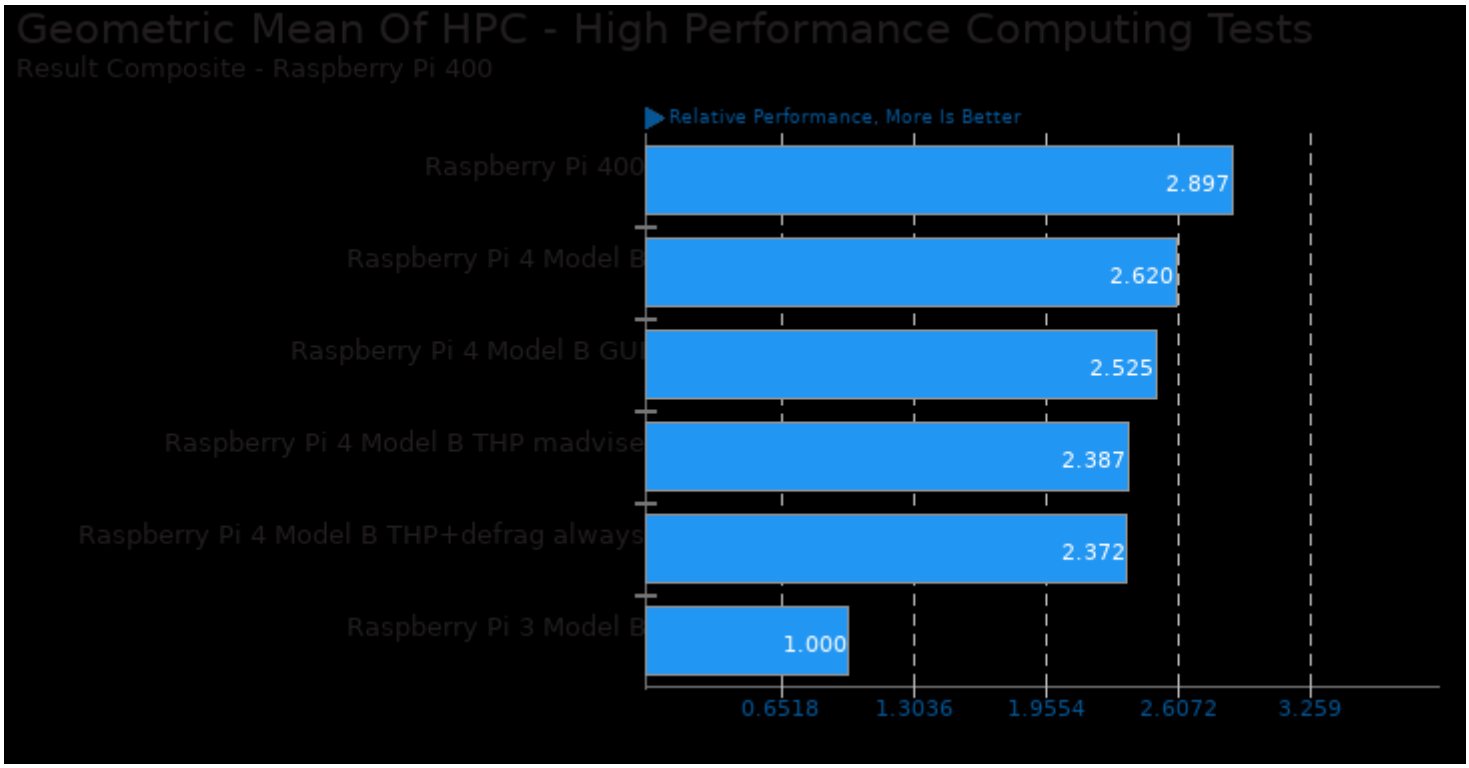
Geometric mean based upon tests: pts/c-ray, pts/aobench, pts/smallpt, system/tesseract-ocr, system/ocrmypdf, pts/kvazaar, pts/encode-mp3, pts/encode-flac, pts/graphics-magick, system/inkscape, pts/libraw, pts/webp, system/gimp, system/rsvg, system/gegl, pts/espeak and pts/rnnoise



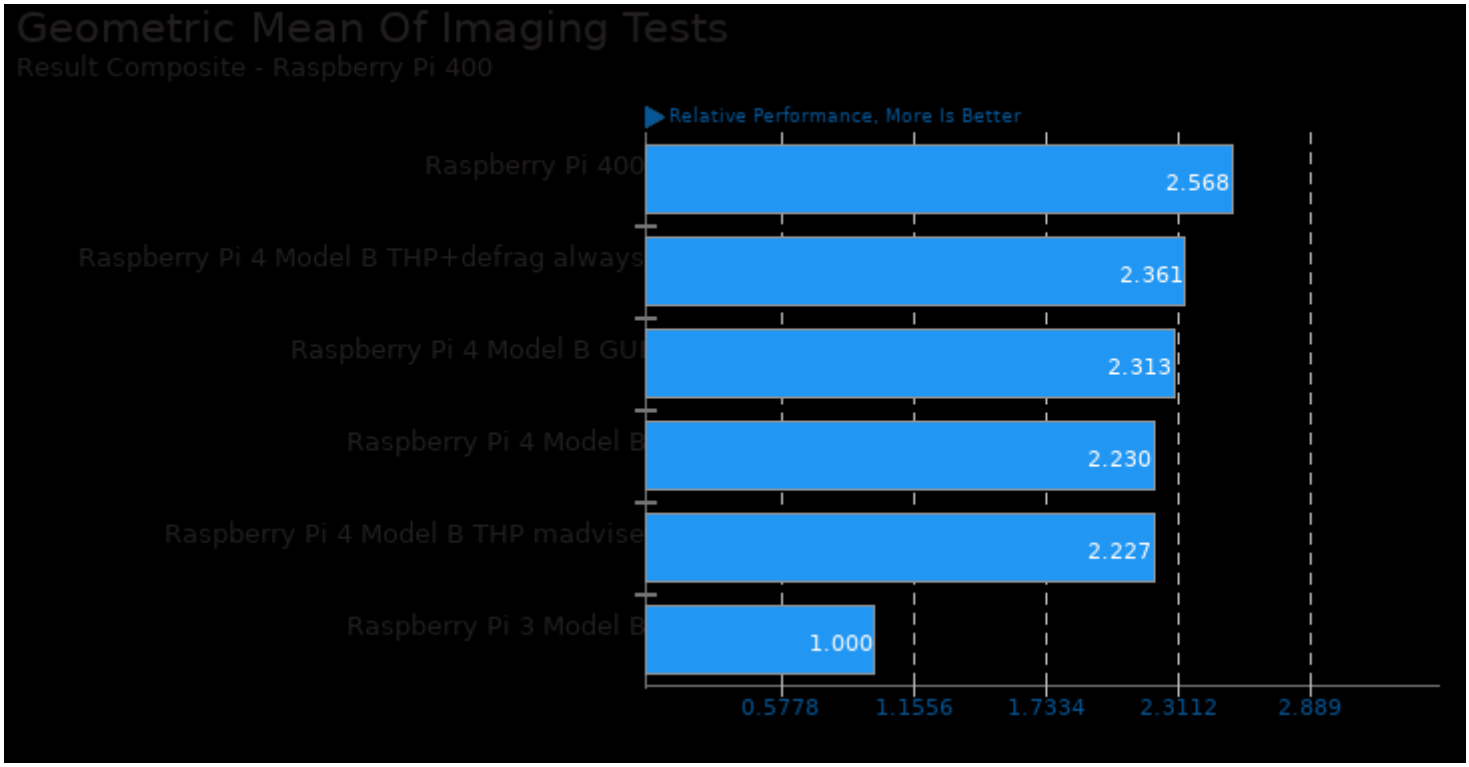
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac and pts/kvazaar



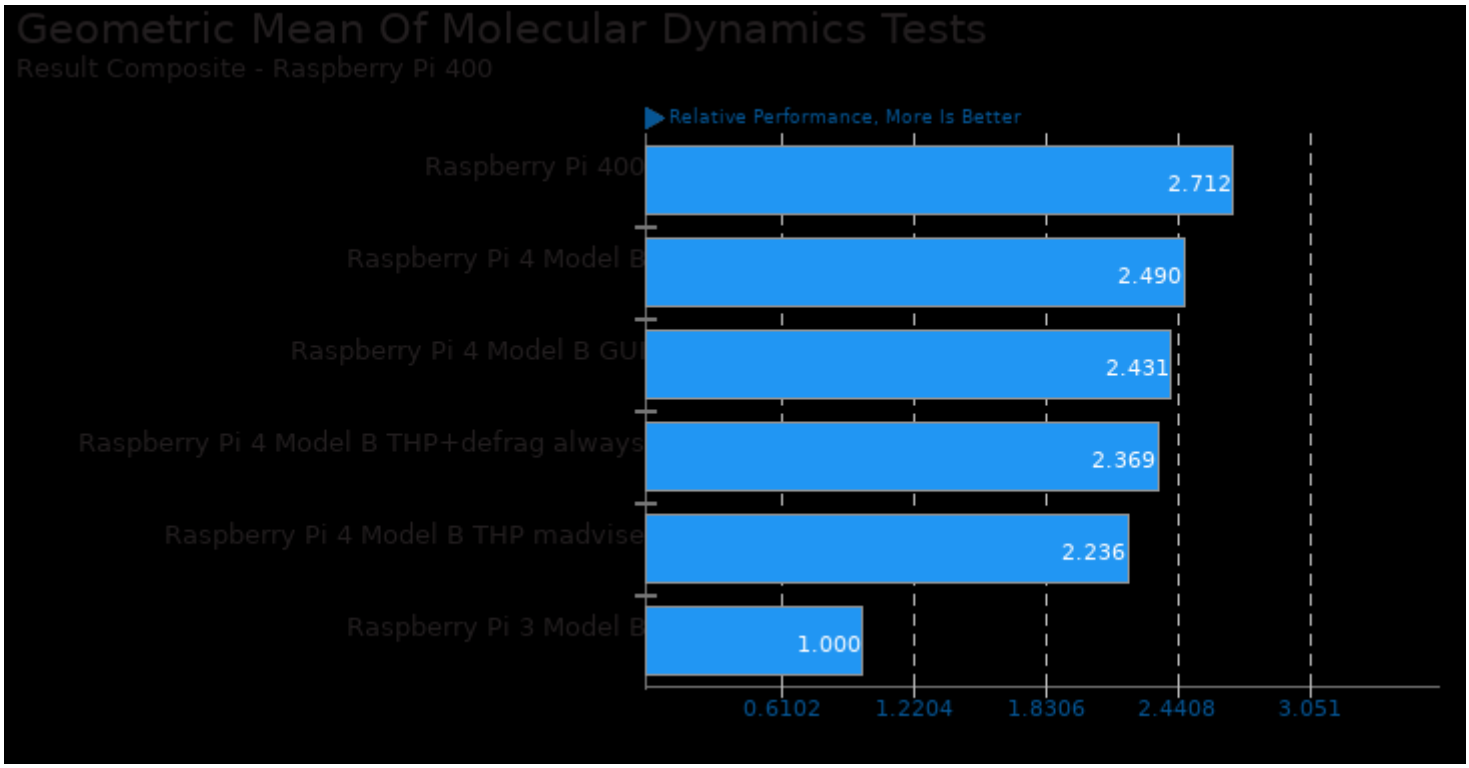
Geometric mean based upon tests: pts/cloverleaf, pts/dolfyn, pts/ffte and pts/lammps



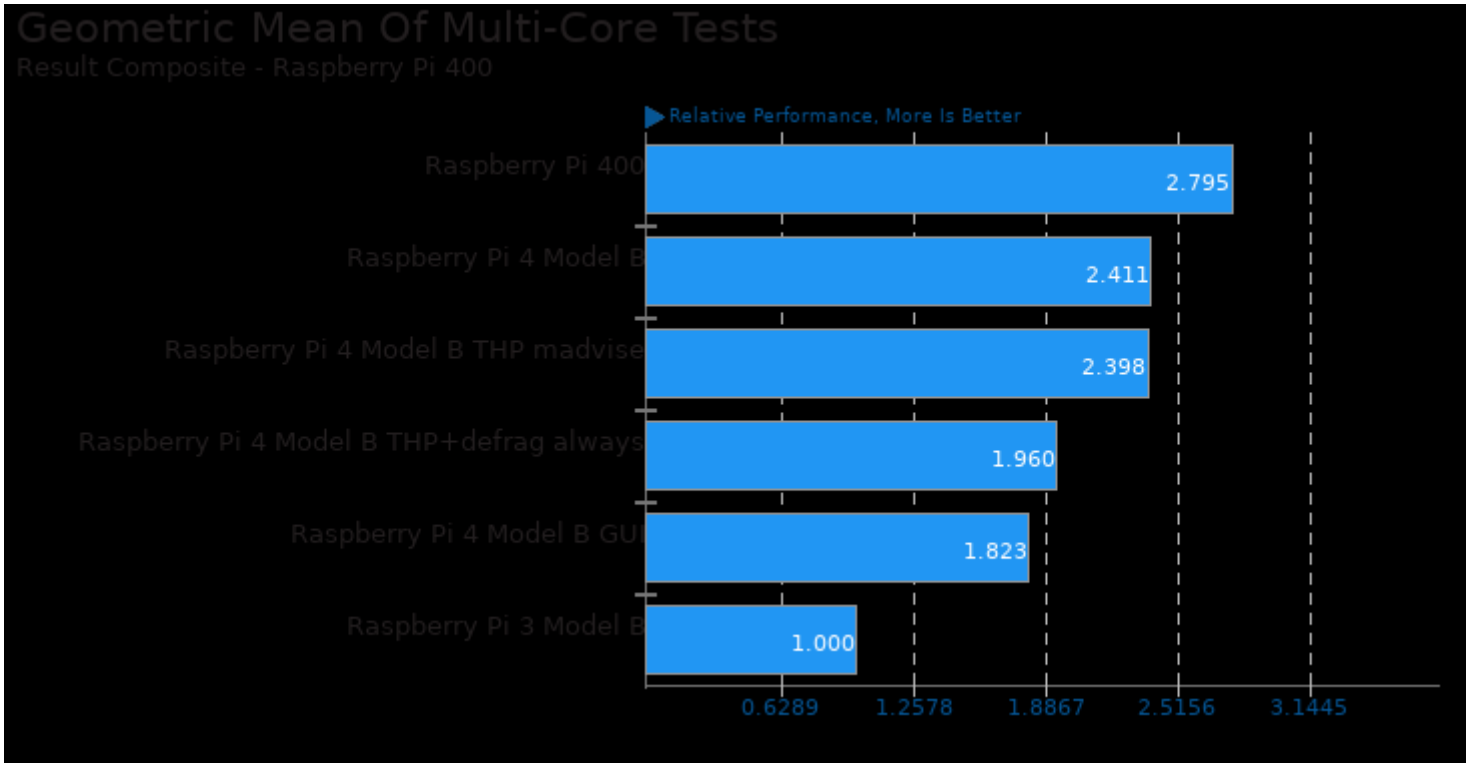
Geometric mean based upon tests: pts/ffte, system/octave-benchmark, pts/dolfyn, pts/cloverleaf, pts/lammps, pts/himeno, pts/mnn, pts/tnn, pts/numpy and pts/rnnoise



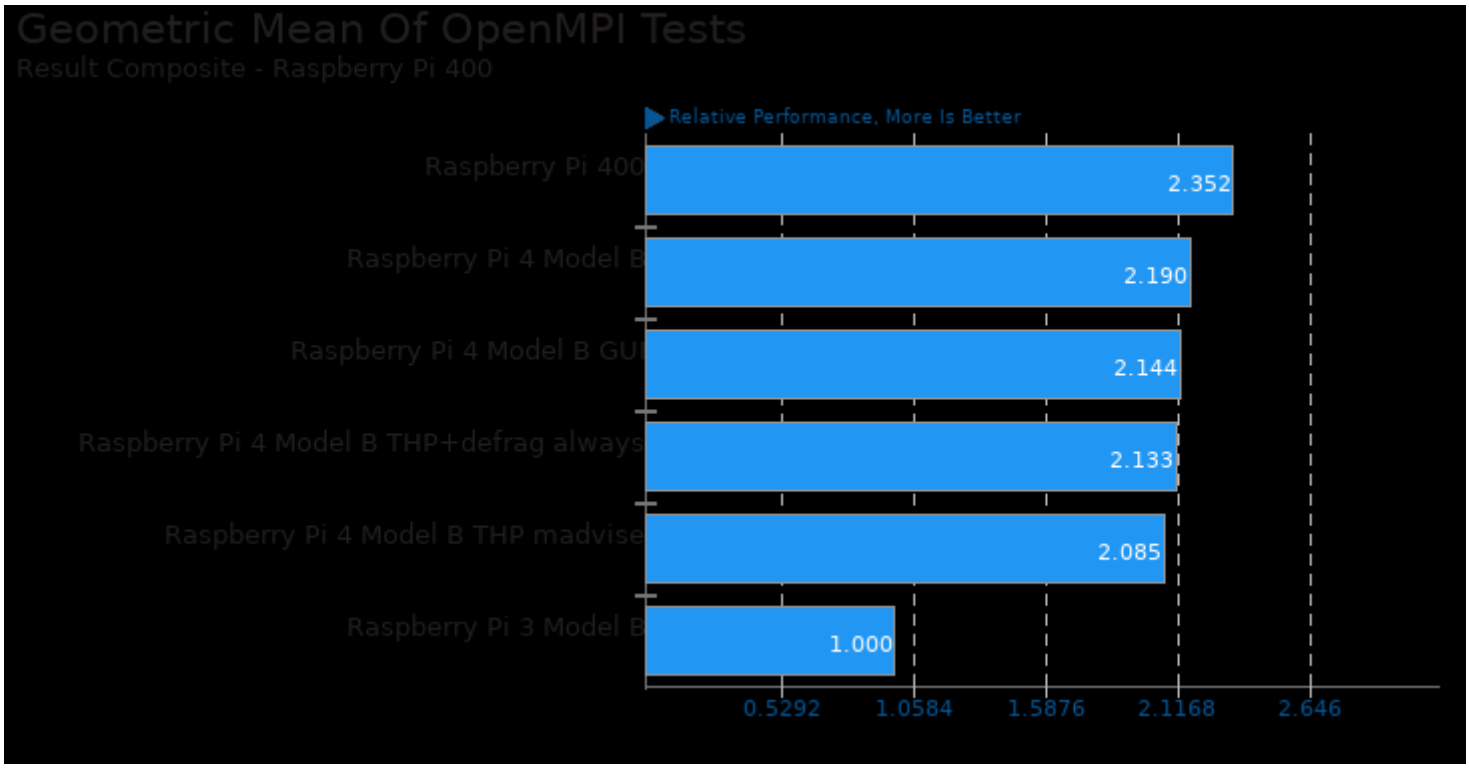
Geometric mean based upon tests: pts/graphics-magick, system/inkscape, pts/libraw, pts/webp, system/gimp, system/rsvg and system/gegl



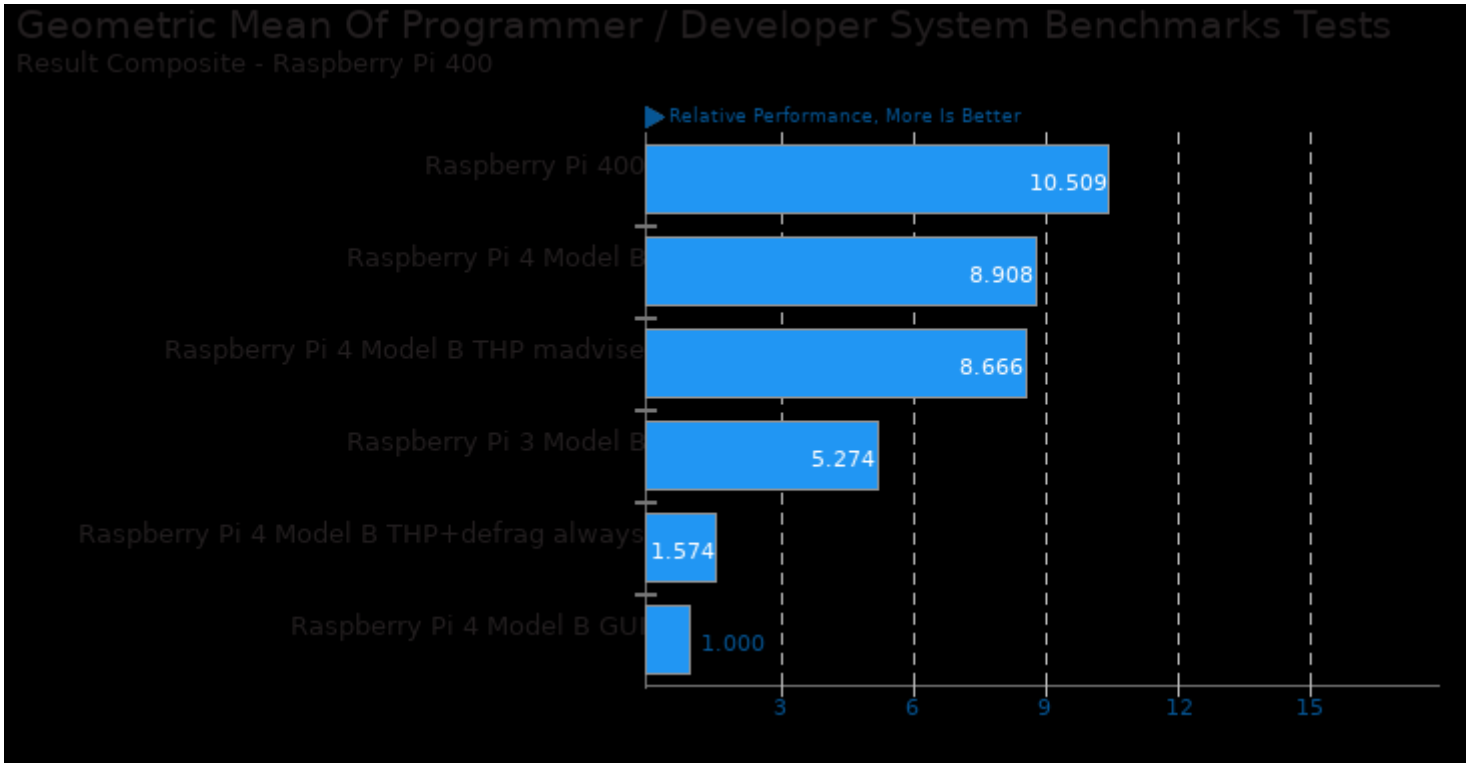
Geometric mean based upon tests: pts/dolfyn, pts/cloverleaf and pts/lammps



Geometric mean based upon tests: pts/c-ray, pts/coremark, pts/kvazaar, pts/smallpt, pts/asmfish, pts/graphics-magick, pts/lammps, pts/compress-zstd, pts/build-apache, pts/build-php, pts/build-imagemagick, pts/build-gdb, pts/build2 and pts/aobench

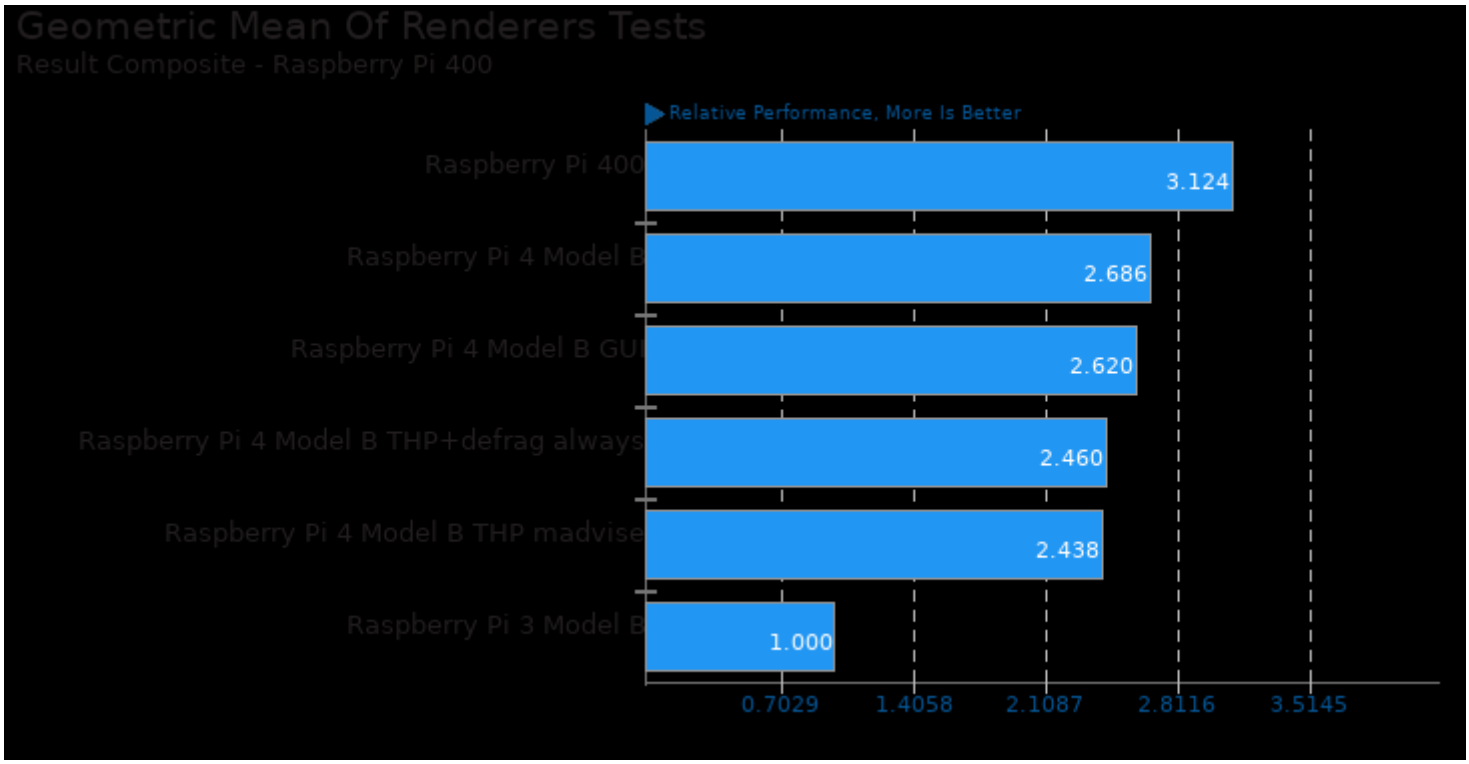


Geometric mean based upon tests: pts/cloverleaf and pts/lammps

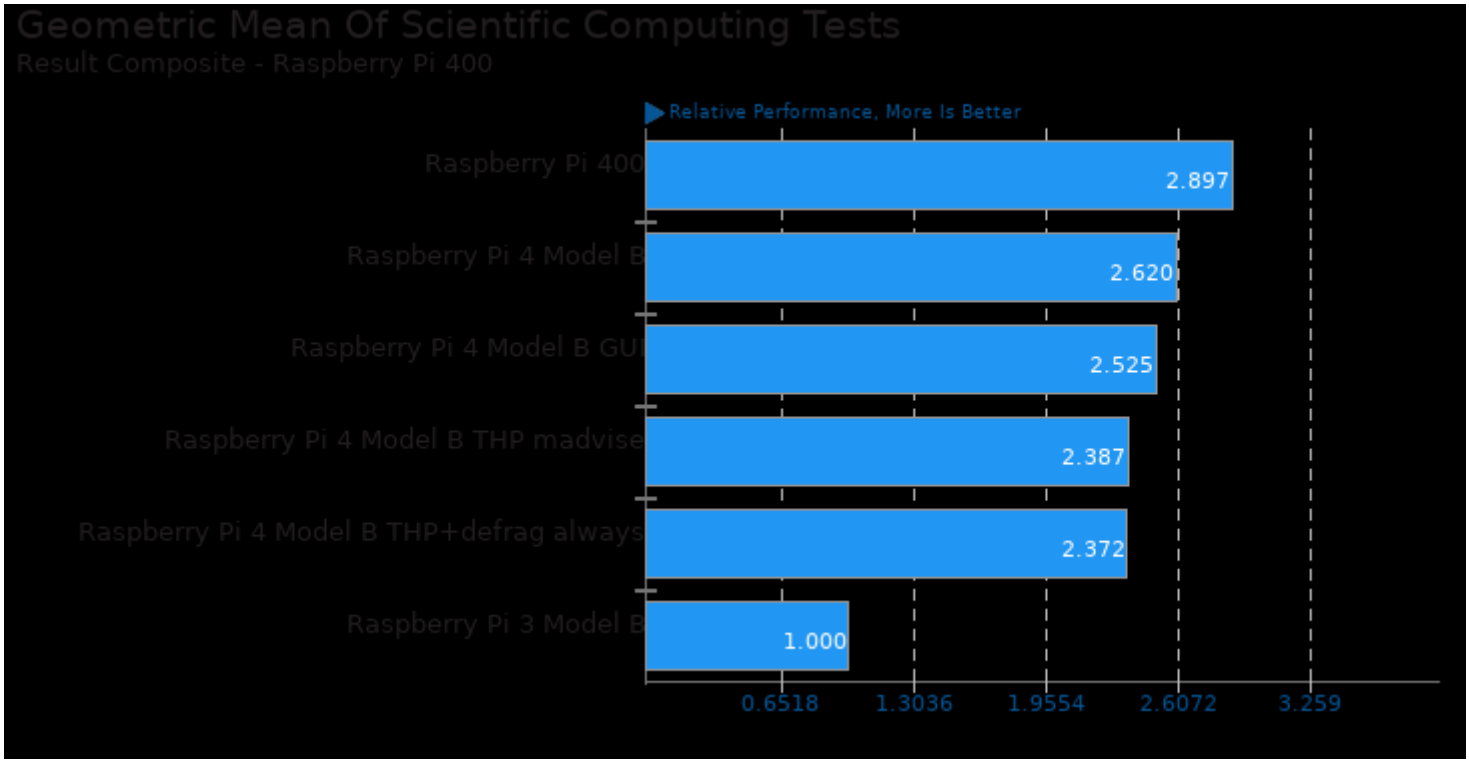


Geometric mean based upon tests: pts/sqlite-speedtest, pts/compress-zstd, pts/pyperformance, pts/pybench, pts/build-apache, pts/build-php, pts/build-imagemagick, pts/build-gdb and pts/build2

Raspberry Pi 400

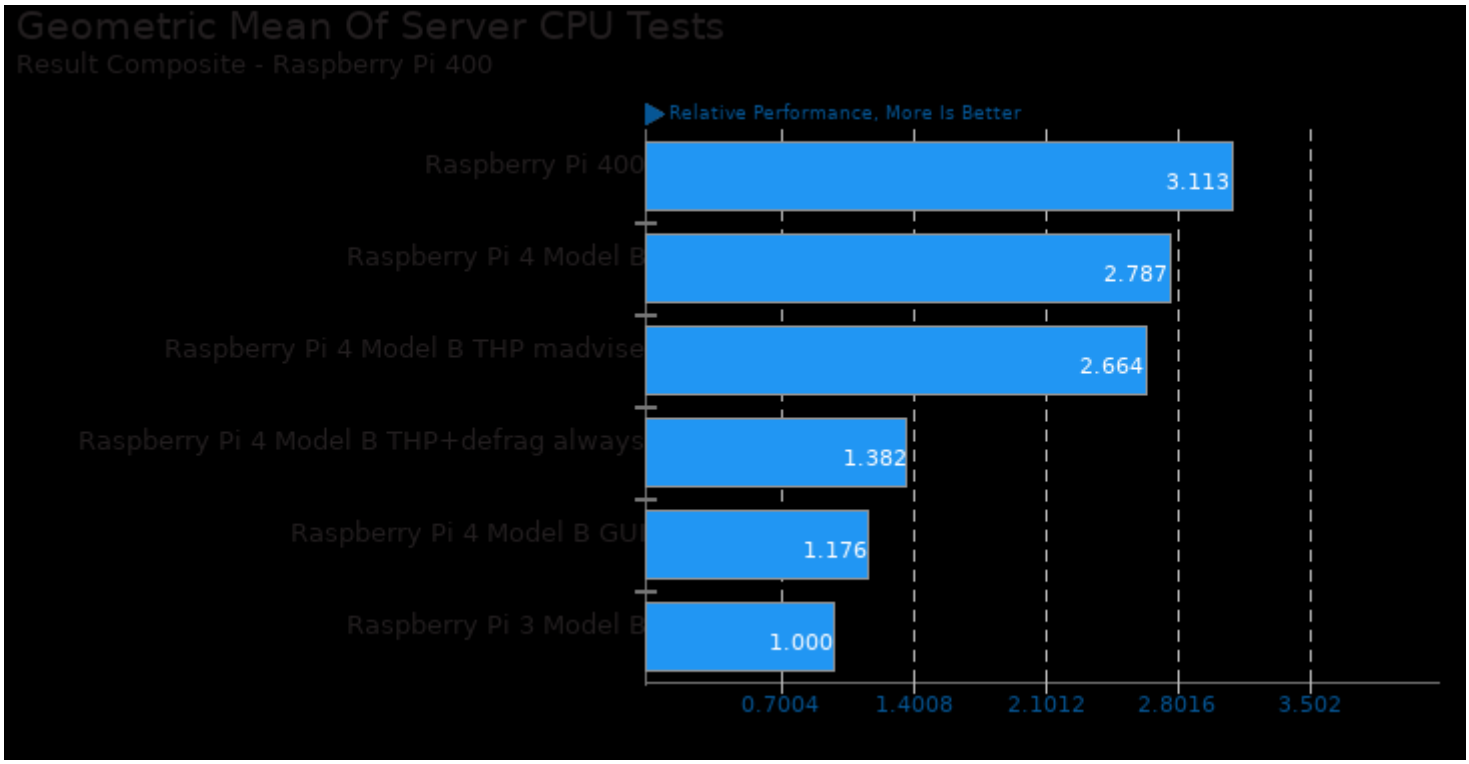


Geometric mean based upon tests: pts/c-ray, pts/aobench and pts/smallpt



Geometric mean based upon tests: pts/ffte, system/octave-benchmark, pts/dolfyn, pts/cloverleaf, pts/lammps and pts/himeno

Raspberry Pi 400



Geometric mean based upon tests: pts/dacapobench, pts/himeno, pts/asmfish, pts/build-php, pts/c-ray, pts/compress-zstd, pts/openssl, system/gimp, pts/pybench, pts/numpy, pts/phpbench and system/tesseract-ocr

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 07:54.