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Raspberry Pi Model 4 Benchmarks

ARMv7 rev 3 testing with a BCM2835 Raspberry Pi 4 Model B Rev 1.1 and V3D 4.2 2GB by Michael Larabel.

Automated Executive Summary

2ghz had the most wins, coming in first place for 85% of the tests.

Based on the geometric mean of all complete results, the fastest (2ghz) was 6.277x the speed of the slowest (RPi Model 3 B+). RPi Model 4 B 2GB was 0.685x the speed of 2ghz, RPi Model 4 B 4GB was 0.94x the speed of RPi Model 4 B 2GB, ASUS Tinker Board was 0.84x the speed of RPi Model 4 B 4GB, Firefly ROC-RK3328-CC was 0.727x the speed of ASUS Tinker Board, Libre Board ALL-H3-CC H5 was 0.525x the speed of Firefly ROC-RK3328-CC, RPi Model 3 B+ was 0.772x the speed of Libre Board ALL-H3-CC H5.

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

x264 (H.264 Video Encoding) at 50.714x
Rust Prime Benchmark (Prime Number Test To 200,000,000) at 41.776x
Rust Prime Benchmark (Performance / Cost - Prime Number Test To 200,000,000) at 22.155x
FLAC Audio Encoding (WAV To FLAC) at 12.754x
PyBench (Total For Average Test Times) at 9.488x
Perl Benchmarks (Test: Interpreter) at 8.588x
Smallpt (Global Illumination Renderer; 128 Samples) at 8.155x

PHPBench (PHP Benchmark Suite) at 8.105x
LAME MP3 Encoding (WAV To MP3) at 7.11x
Perl Benchmarks (Performance / Cost - Test: Interpreter) at 6.529x.

Test Systems:

RPi Model 3 B+

Processor: ARMv7 rev 4 @ 1.40GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 3 Model B Plus Rev 1.3, Memory: 926MB, Disk: 32GB GB2MW, Graphics: BCM2708

OS: Raspbian 10, Kernel: 4.19.42-v7+ (armv7l), Display Server: X Server 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 656x416

Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --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-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.16 + Python 3.7.3

ASUS Tinker Board

Processor: ARMv7 rev 1 @ 1.80GHz (4 Cores), Motherboard: Rockchip (Device Tree), Memory: 2048MB, Disk: 32GB GB1QT

OS: Debian 9.0, Kernel: 4.4.16-00006-g4431f98-dirty (armv7l), Desktop: LXDE, Display Server: X Server 1.18.4, Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libquadmath --disable-sjlj-exceptions --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb --with-target-system-zlib -v
Processor Notes: Scaling Governor: cpufreq-dt interactive
Python Notes: Python 2.7.13 + Python 3.5.3

Libre Board ALL-H3-CC H5

Processor: ARMv8 Cortex-A53 (4 Cores), Motherboard: Libre Board ALL-H3-CC H5, Memory: 2048MB, Disk: 32GB GB1QT

OS: Raspbian 9.6, Kernel: 4.18.0-rc3-gfc36def997cf-dirty (aarch64), Display Server: X Server 1.19.2, Compiler: GCC 6.3.0 20170516, File-System: ext4

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libquadmath --disable-sjlj-exceptions --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-target-system-zlib -v
Python Notes: Python 2.7.13 + Python 3.5.3

Firefly ROC-RK3328-CC

Processor: Rockchip ARMv8 Cortex-A53 @ 1.39GHz (4 Cores), Motherboard: Firefly ROC-RK3328-CC, Memory: 2048MB, Disk: 32GB GB1QT

OS: Ubuntu 18.04, Kernel: 4.4.114 (aarch64), Display Server: X Server 1.18.4, Compiler: GCC 7.4.0, File-System: ext4, Screen Resolution: 1024x768

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++ --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 performance
Python Notes: Python 2.7.15rc1 + Python 3.6.7

RPi Model 4 B 4GB

Processor: ARMv7 rev 3 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Memory: 4096MB, Disk: 16GB SC16G, Graphics: V3D 4.2 4GB, Monitor: DELL P2415Q

OS: Raspbian 10, Kernel: 4.19.50-v7l+ (armv7l), Desktop: LXDE 0.10.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 2.1 Mesa 19.1.0-devel, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --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-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.16 + Python 3.7.3

RPi Model 4 B 2GB

Processor: ARMv7 rev 3 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Memory: 2048MB, Disk: 16GB SC16G, Graphics: V3D 4.2 2GB, Monitor: DELL P2415Q

OS: Raspbian 10, Kernel: 4.19.50-v7l+ (armv7l), Desktop: LXDE 0.10.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 2.1 Mesa 19.1.0-devel, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --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-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.16 + Python 3.7.3

2ghz

Processor: ARMv8 Cortex-A72 @ 2.00GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.4, Memory: 8GB, Disk: EMTEC X200 256GB

OS: Debian 10, Kernel: 5.10.17-v8+ (aarch64), Desktop: LXDE, Display Server: X Server 1.20.4, Compiler: GCC 8.3.0, File-System: ext4

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=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

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--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
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

	RPi Model 3 B+	ASUS Tinker Board	Libre Board ALL-H3-CC H5	Firefly ROC-RK3328-CC	RPi Model 4 B 4GB	RPi Model 4 B 2GB	2ghz
x264 - H.2.V.E (FPS)	**0.14**	3.32		2.31	3.10	4.91	**7.10**
Normalized	1.97%	46.76%		32.54%	43.66%	69.15%	100%
Standard Deviation	0%	6.3%		0.2%	8.5%	2.1%	0.7%
x264 - Performance / Cost - H.2.V.E (FPS/Dollar)		**0.05**		0.07	0.06	**0.11**	
Normalized		45.45%		63.64%	54.55%	100%	
GraphicsMagick - Performance / Cost - Rotate	**0.46**	0.93	0.69	1.26	1.15	**1.42**	
Normalized	32.39%	65.49%	48.59%	88.73%	80.99%	100%	
GraphicsMagick - Performance / Cost - Resizing (Iterations/min/Dollar)	**0.43**	0.75	0.63	1.03	0.82	**1.18**	
Normalized	36.44%	63.56%	53.39%	87.29%	69.49%	100%	
GraphicsMagick - Rotate (Iterations/min)	**16**	66	24	44	63	64	**91**
Normalized	17.58%	72.53%	26.37%	48.35%	69.23%	70.33%	100%
Standard Deviation		3.4%			1.8%		
GraphicsMagick - Resizing (Iterations/min)	**15**	53	22	36	45	53	**71**
Normalized	21.13%	74.65%	30.99%	50.7%	63.38%	74.65%	100%
Standard Deviation		3.4%			2.9%		
SciMark - Performance / Cost - Composite (Mflops/Dollar)	1.39	2.00	**0.82**	1.46	2.58	**3.18**	
Normalized	43.71%	62.89%	25.79%	45.91%	81.13%	100%	
SciMark - Composite (Mflops)	48.80	141.72	**28.76**	51.13	142.17	143.02	**182.82**
Normalized	26.69%	77.52%	15.73%	27.97%	77.77%	78.23%	100%
Standard Deviation	0.4%	0.1%	0.1%	0%	1.6%	1.1%	1.1%
NGINX Benchmark - S.W.P.S (Reqs/sec)	**2012**	3880			4746	**5105**	
Normalized	39.41%	76.01%			92.97%	100%	
Standard Deviation	0.7%	1.6%			3.1%	0.1%	

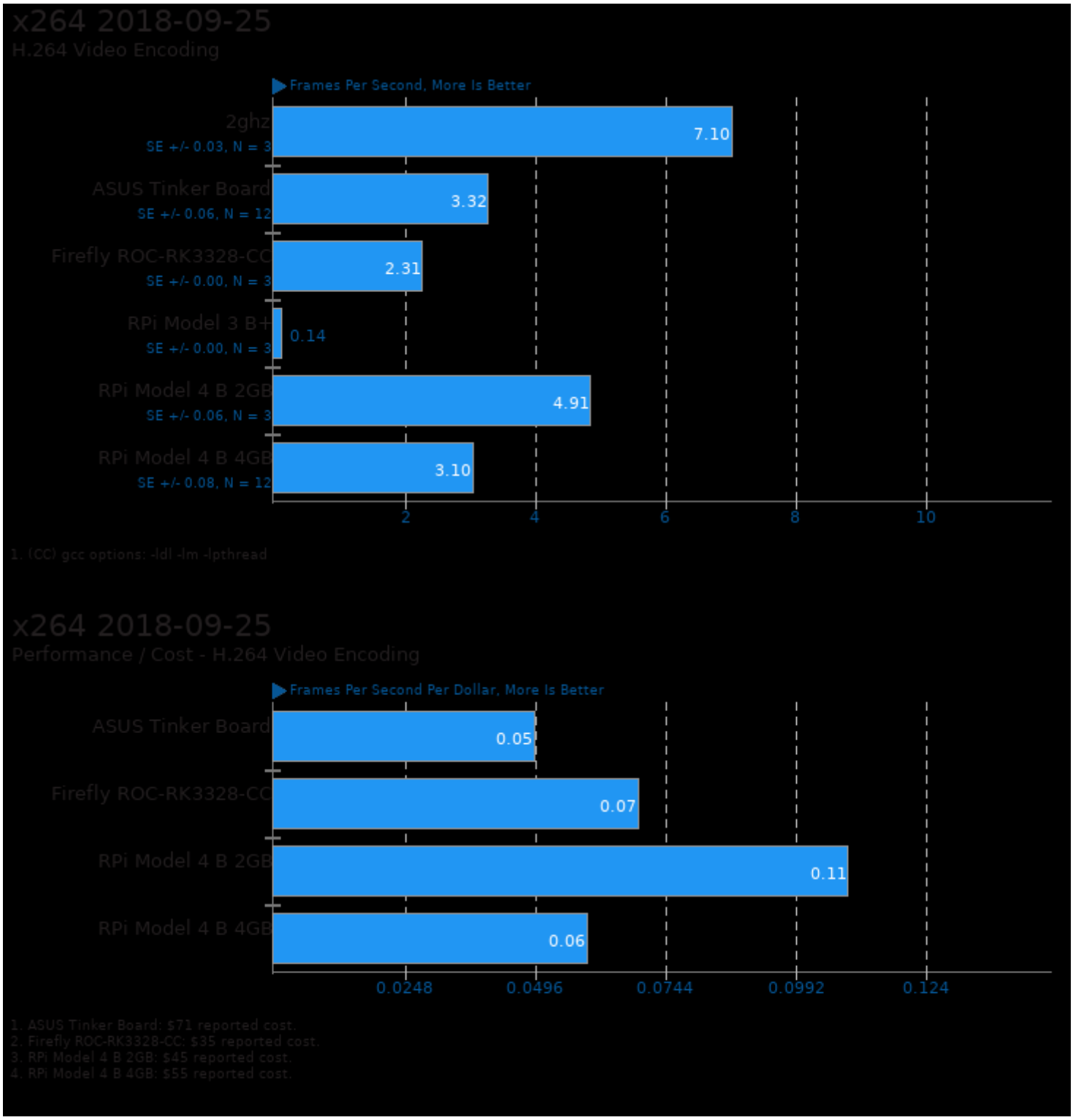
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NGINX Benchmark - Performance / Cost - S.W.P.S (Reqs/sec/Dollar)	57.49	**54.65**			86.29	**113.44**	
Normalized	50.68%	48.18%			76.07%	100%	
PHPBench - P.B.S (Score)	**20275**	59450	21345	54131	101564	100678	**164326**
Normalized	12.34%	36.18%	12.99%	32.94%	61.81%	61.27%	100%
Standard Deviation	0.5%	3.3%	0.1%	0.2%	0.4%	0.9%	1.5%
PHPBench - Performance / Cost - P.B.S	**579.29**	837.32	609.86	1547	1847	**2237**	
Normalized	25.89%	37.43%	27.26%	69.13%	82.54%	100%	
PyBench - T.F.A.T.T (Milliseconds)	29609	9312	**40683**	13542	5249	5233	**4288**
Normalized	14.48%	46.05%	10.54%	31.66%	81.69%	81.94%	100%
Standard Deviation	0.5%	0.5%	0.8%	0.2%	0.2%	0.3%	0.4%
PyBench - Performance / Cost - T.F.A.T.T (Milliseconds x Dollar)	1036315	661152	**1423905**	473970	288695	**235485**	
Normalized	22.72%	35.62%	16.54%	49.68%	81.57%	100%	
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	**3106**	1052		140.20	1104	657.76	**74.353**
Normalized	2.39%	7.06%		53.03%	6.73%	11.3%	100%
Standard Deviation	1.1%	1%		0.3%	0.6%	0%	0.2%
Smallpt - G.I.R.1.S (sec)	**744.55**	273.30	424.02	251.36	260.72	145.50	**91.305**
Normalized	12.26%	33.41%	21.53%	36.32%	35.02%	62.75%	100%
Standard Deviation	0.1%	0.9%	0.3%	1.1%	2.3%	2.9%	0.2%
Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)	**787.01**	**239.98**	402.13	343.31	291.48	291.55	281.262
Normalized	30.49%	100%	59.68%	69.9%	82.33%	82.31%	85.32%
Standard Deviation	0.4%	0.3%	3.4%	0.1%	1.5%	1%	0.9%
FLAC Audio Encoding - WAV To FLAC (sec)	**777.65**	135.25	566.40	288.92	111.09	111.48	**60.972**
Normalized	7.84%	45.08%	10.76%	21.1%	54.89%	54.69%	100%
Standard Deviation	0.9%	3.4%	0.3%	0.7%	3.1%	0.7%	0.1%
LAME MP3 Encoding - WAV To MP3 (sec)	**658.82**	162.41	518.49	295.44	125.34	125.22	**92.655**
Normalized	14.06%	57.05%	17.87%	31.36%	73.92%	73.99%	100%
Standard Deviation	2.4%	0.6%	0%	0.2%	0.1%	0.1%	0.1%
Perl Benchmarks - Pod2html (sec)	2.56511278	0.78254268	**2.57273250**	1.31659761	0.61207402	0.62136299	**0.43097273**
Normalized	16.8%	55.07%	16.75%	32.73%	70.41%	69.36%	100%
Standard Deviation	5.2%	2%	0.6%	2%	0.8%	1.3%	1.1%
Perl Benchmarks - Interpreter (sec)	**0.03173653**	0.01229804	0.01091688	0.00491447	0.00778405	0.00826085	**0.00369550**
Normalized	11.64%	30.05%	33.85%	75.2%	47.48%	44.74%	100%
Standard Deviation	3.5%	0.4%	0.3%	0.5%	5.6%	6.9%	0.1%
Rust Prime Benchmark - Performance / Cost - P.N.T.T.2.0.0 (sec x Dollar)	**108715**	74726		**4907**	60738	29599	
Normalized	4.51%	6.57%		100%	8.08%	16.58%	

Raspberry Pi Model 4 Benchmarks

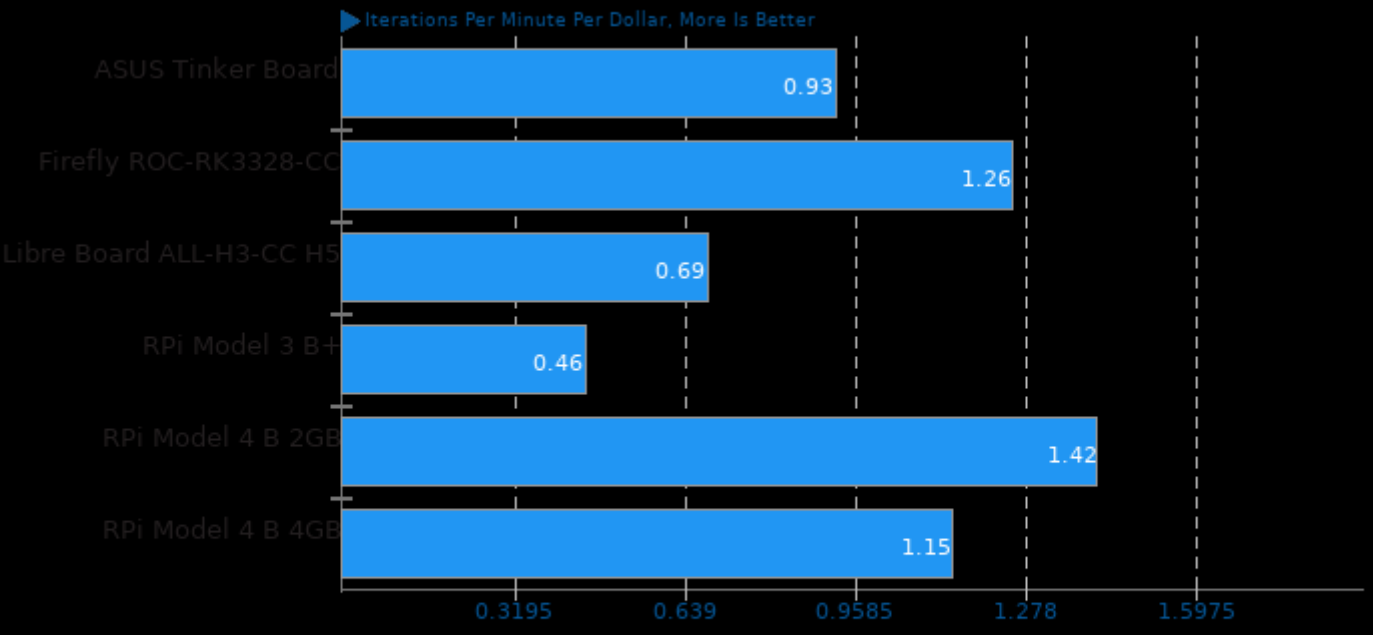
Smallpt - Performance / Cost - G.I.R.1.S (sec x Dollar)	**26059**	19404	14841	8798	14340	**6548**
Normalized	25.13%	33.74%	44.12%	74.42%	45.66%	100%
Zstd Compression - Performance / Cost - C.u.1.0.3.s.i.i.C.L.1 (sec x Dollar)	**27545**	17039	14075	**12016**	16031	13120
Normalized	43.62%	70.52%	85.37%	100%	74.95%	91.59%
FLAC Audio Encoding - Performance / Cost - WAV To FLAC (sec x Dollar)	**27218**	9603	19824	10112	6110	**5017**
Normalized	18.43%	52.24%	25.31%	49.61%	82.11%	100%
LAME MP3 Encoding - Performance / Cost - WAV To MP3 (sec x Dollar)	**23059**	11531	18147	10340	6894	**5635**
Normalized	24.44%	48.87%	31.05%	54.49%	81.74%	100%
Perl Benchmarks - Performance / Cost - Pod2html (sec x Dollar)	89.78	55.56	**90.05**	46.08	33.66	**27.96**
Normalized	31.14%	50.32%	31.05%	60.68%	83.07%	100%
Perl Benchmarks - Performance / Cost - Interpreter (sec x Dollar)	**1.11**	0.87	0.38	**0.17**	0.43	0.37
Normalized	15.32%	19.54%	44.74%	100%	39.53%	45.95%

Raspberry Pi Model 4 Benchmarks



GraphicsMagick 1.3.30

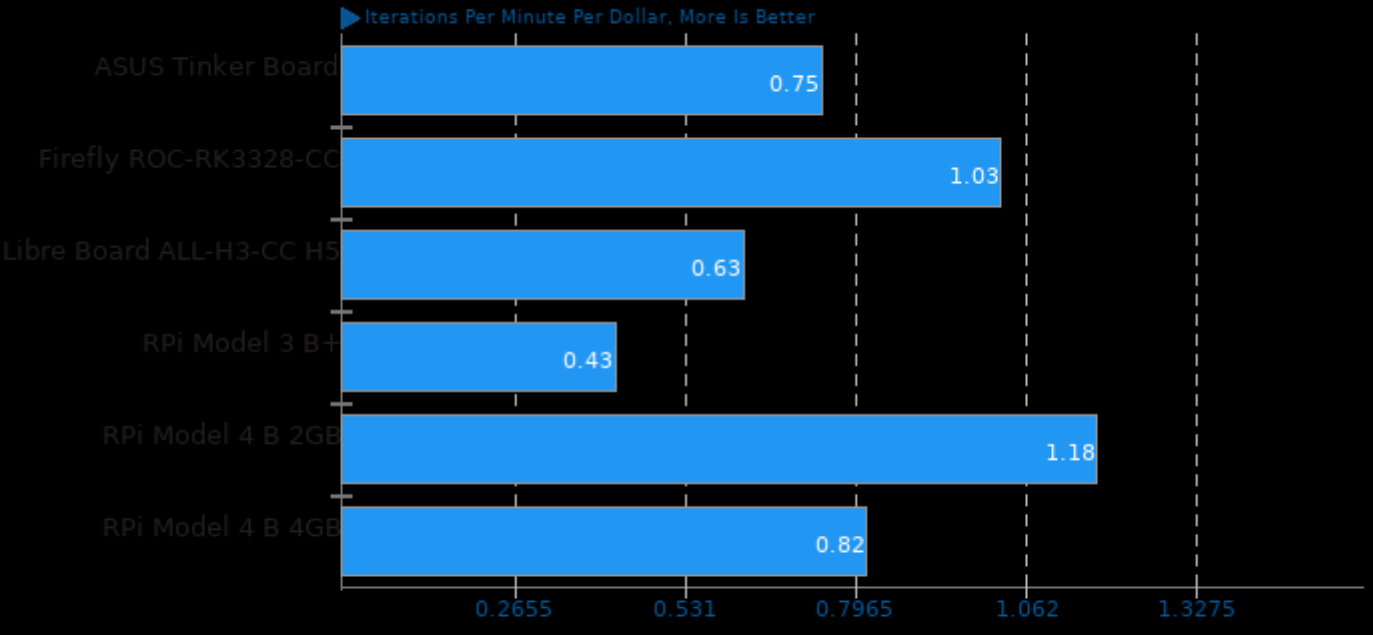
Performance / Cost - Operation: Rotate



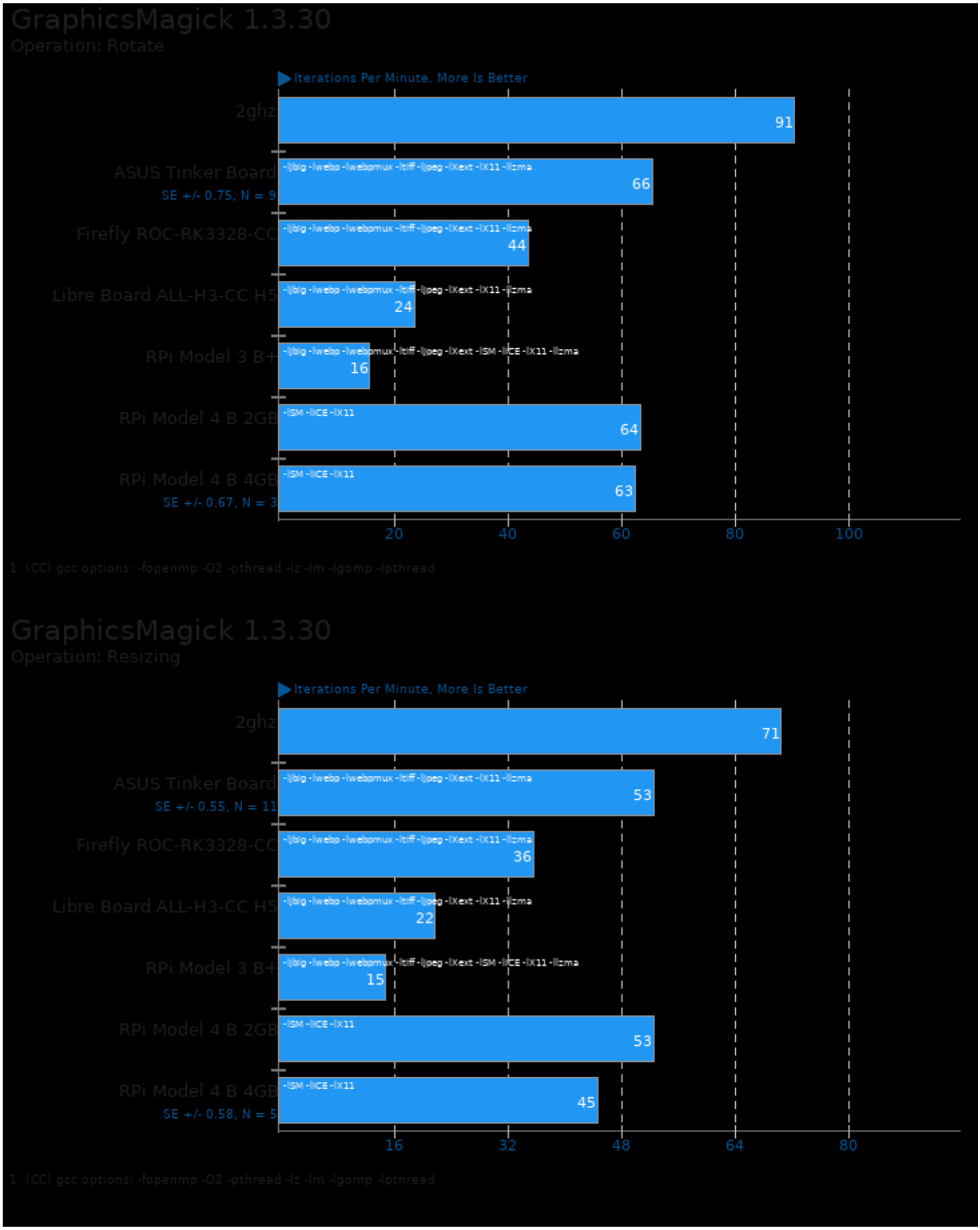
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

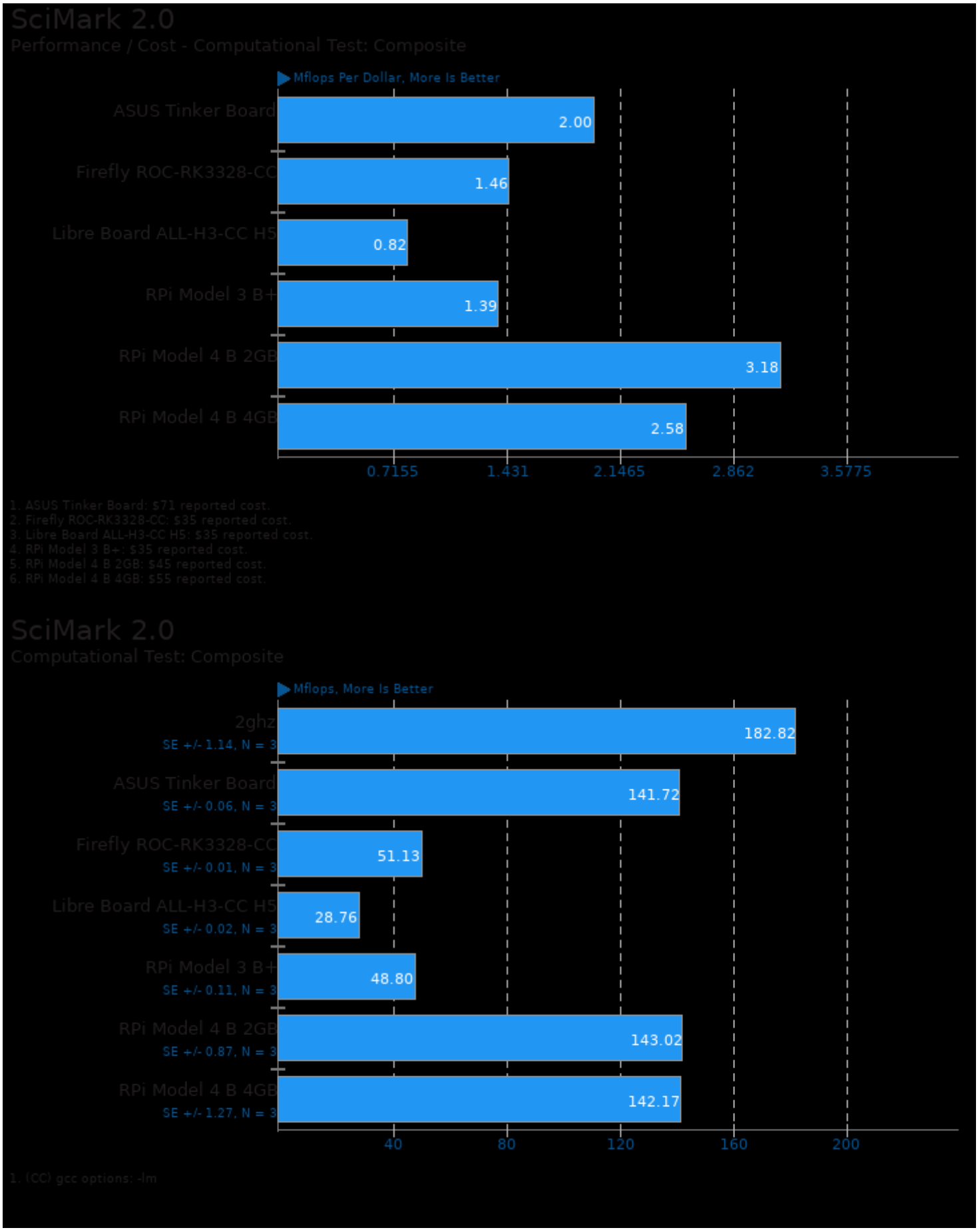
GraphicsMagick 1.3.30

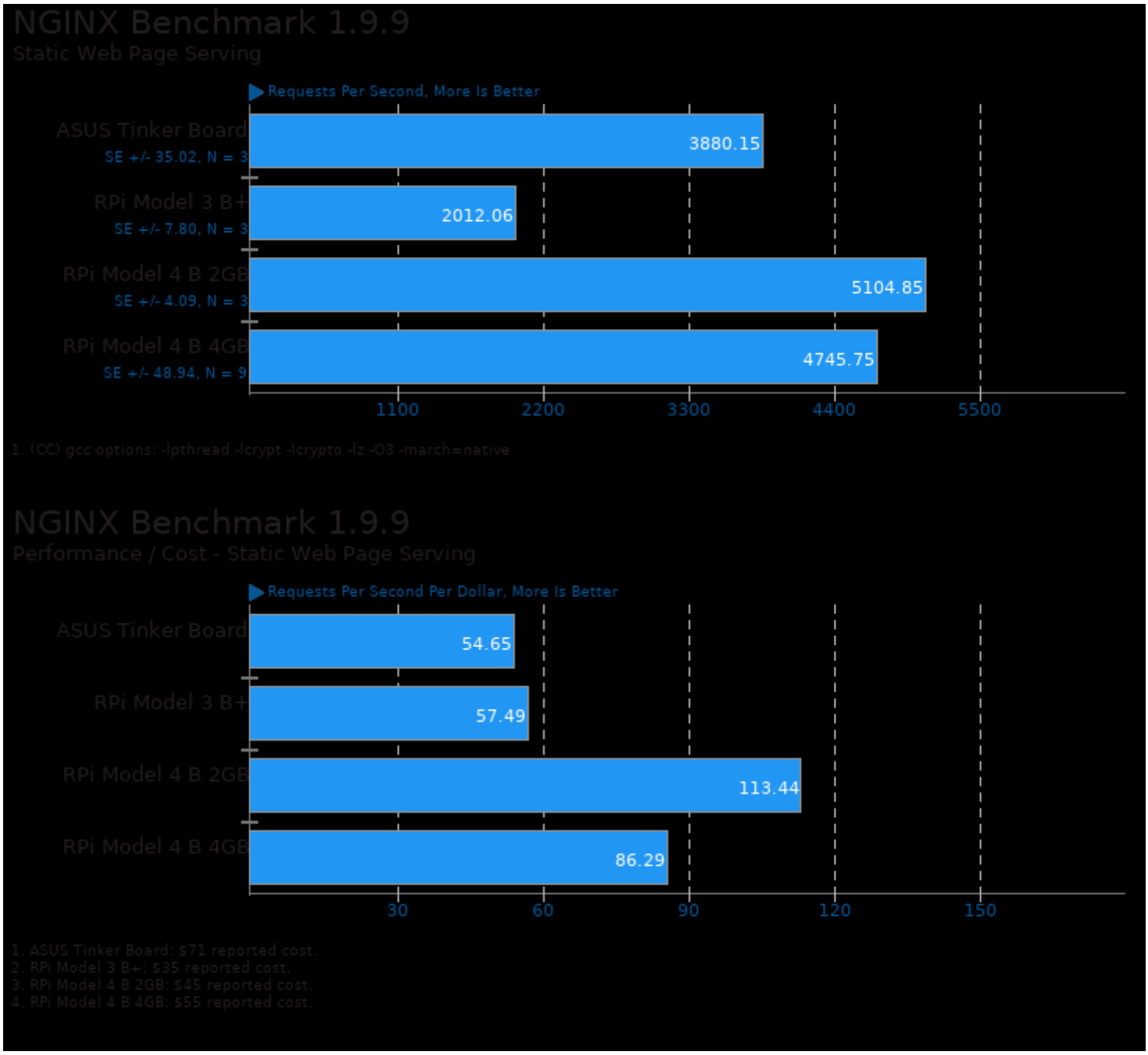
Performance / Cost - Operation: Resizing



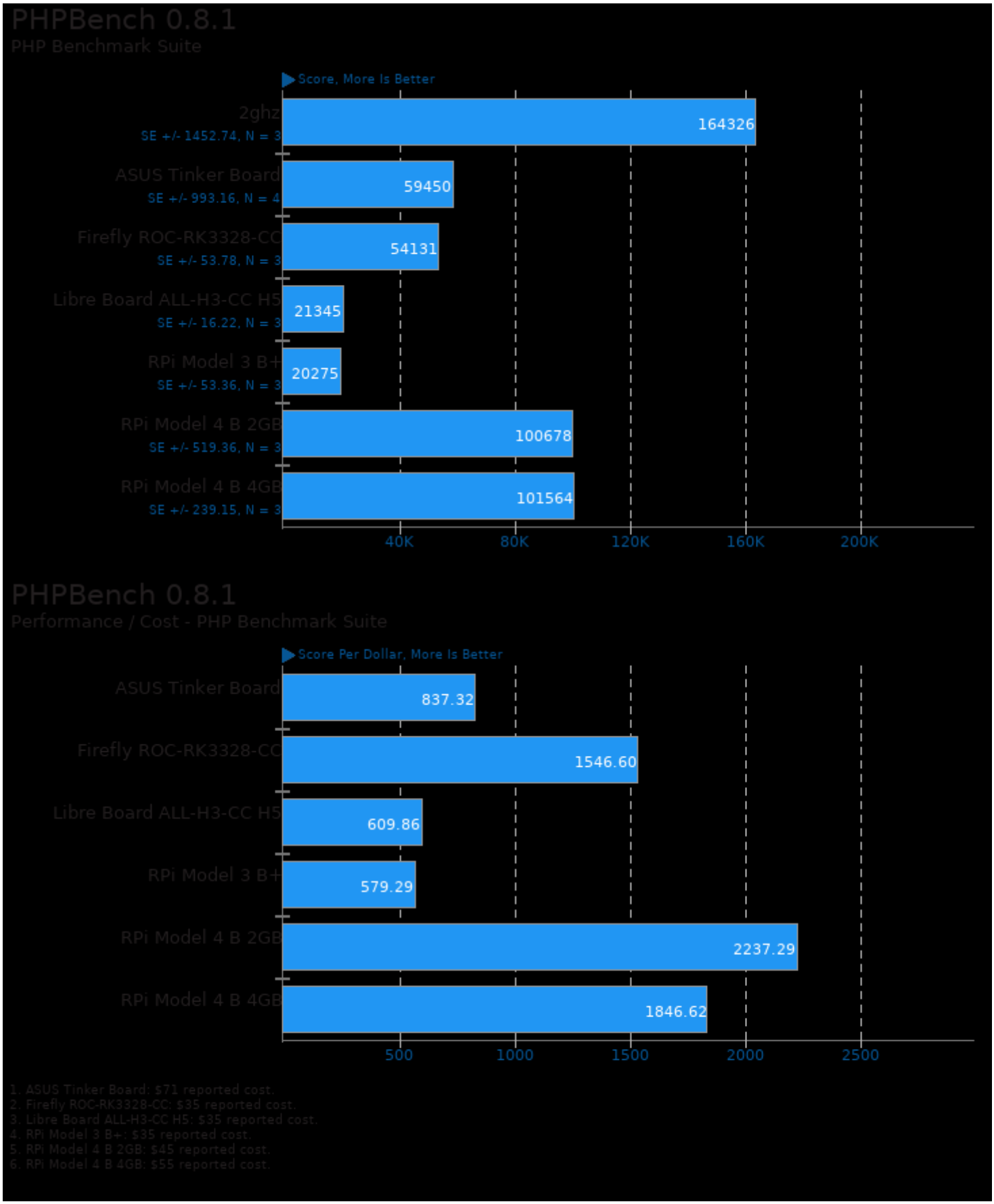
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.


GraphicsMagick 1.3.30
Operation: Rotate
Iterations Per Minute, More Is Better
2ghz
ASUS Tinker Board
SE +/- 0.75, N = 9
Firefly ROC-RK3328-CC
Libre Board ALL-H3-CC H5
RPi Model 3 B+
RPi Model 4 B 2GB
RPi Model 4 B 4GB
SE +/- 0.67, N = 3
91
66
44
24
16
64
63
-ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma
-lSM -lICE -lX11
20
40
60
80
100
1. (CC) gcc options: -fopenmp -O2 -pthread -lz -lm -lgomp -lpthread
GraphicsMagick 1.3.30
Operation: Resizing
Iterations Per Minute, More Is Better
2ghz
ASUS Tinker Board
SE +/- 0.55, N = 11
Firefly ROC-RK3328-CC
Libre Board ALL-H3-CC H5
RPi Model 3 B+
RPi Model 4 B 2GB
RPi Model 4 B 4GB
SE +/- 0.58, N = 5
71
53
36
22
15
53
45
16
32
48
64
80
1. (CC) gcc options: -fopenmp -O2 -pthread -lz -lm -lgomp -lpthread

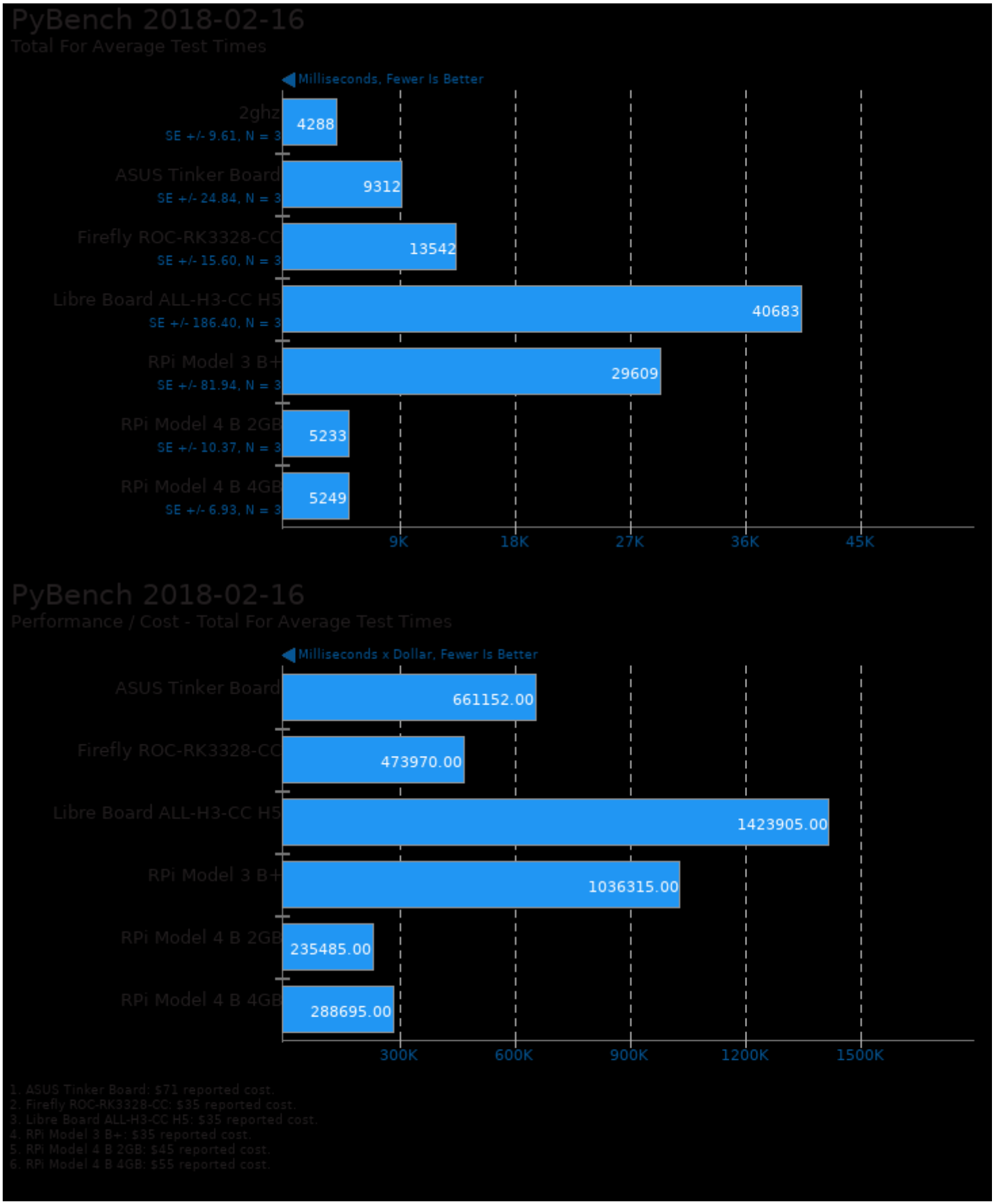

SciMark 2.0
Performance / Cost - Computational Test: Composite
Mflops Per Dollar, More Is Better
ASUS Tinker Board
2.00
Firefly ROC-RK3328-CC
1.46
Libre Board ALL-H3-CC H5
0.82
RPi Model 3 B+
1.39
RPi Model 4 B 2GB
3.18
RPi Model 4 B 4GB
2.58
0.7155
1.431
2.1465
2.862
3.5775
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.
SciMark 2.0
Computational Test: Composite
Mflops, More Is Better
2ghz
SE +/- 1.14, N = 3
182.82
ASUS Tinker Board
SE +/- 0.06, N = 3
141.72
Firefly ROC-RK3328-CC
SE +/- 0.01, N = 3
51.13
Libre Board ALL-H3-CC H5
SE +/- 0.02, N = 3
28.76
RPi Model 3 B+
SE +/- 0.11, N = 3
48.80
RPi Model 4 B 2GB
SE +/- 0.87, N = 3
143.02
RPi Model 4 B 4GB
SE +/- 1.27, N = 3
142.17
40
80
120
160
200
1. (CC) gcc options: -lm

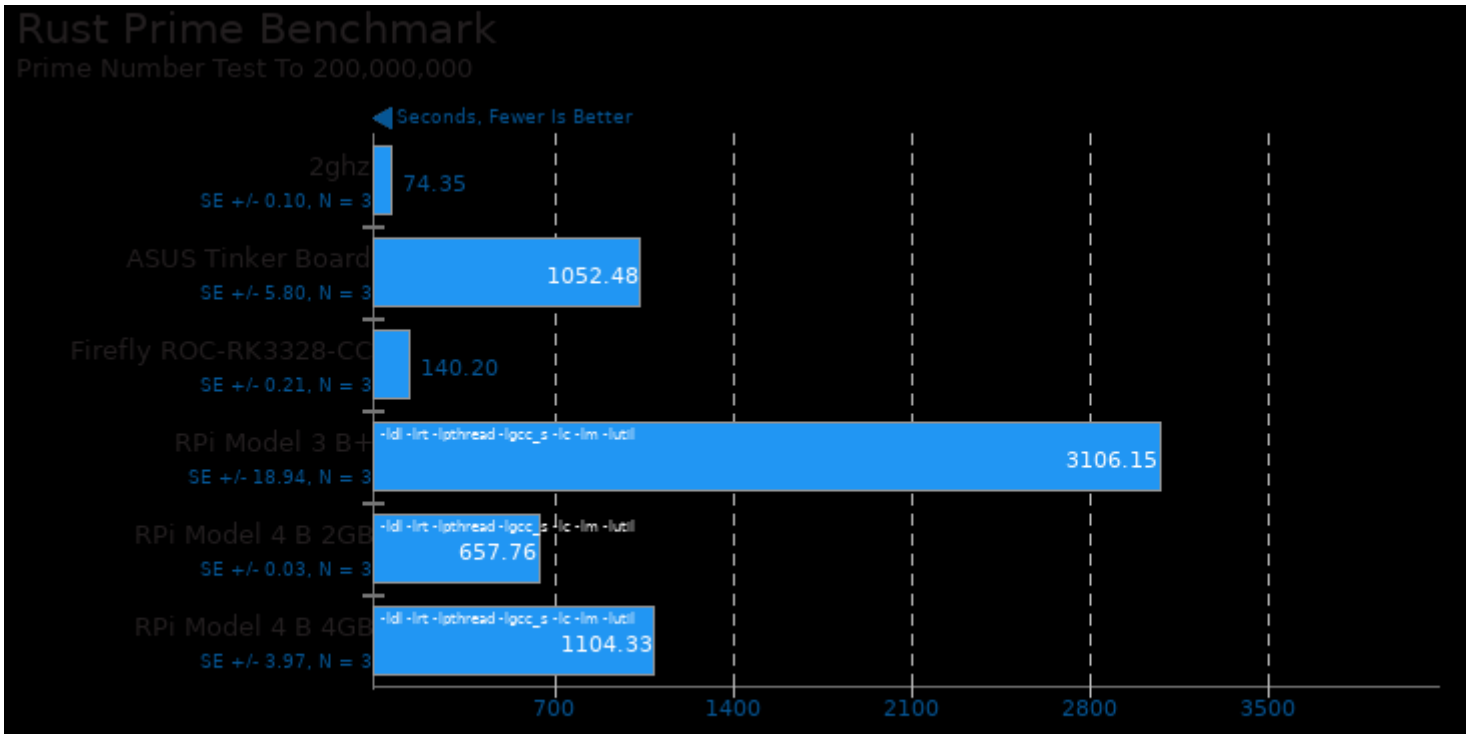

NGINX Benchmark 1.9.9
Static Web Page Serving
Requests Per Second, More Is Better
ASUS Tinker Board
SE +/- 35.02, N = 3
3880.15
RPi Model 3 B+
SE +/- 7.80, N = 3
2012.06
RPi Model 4 B 2GB
SE +/- 4.09, N = 3
5104.85
RPi Model 4 B 4GB
SE +/- 48.94, N = 9
4745.75
1100
2200
3300
4400
5500
1. (CC) gcc options: -lpthread -lcrypt -lcrypto -lz -O3 -march=native
NGINX Benchmark 1.9.9
Performance / Cost - Static Web Page Serving
Requests Per Second Per Dollar, More Is Better
ASUS Tinker Board
54.65
RPi Model 3 B+
57.49
RPi Model 4 B 2GB
113.44
RPi Model 4 B 4GB
86.29
30
60
90
120
150
1. ASUS Tinker Board: $71 reported cost.
2. RPi Model 3 B+: $35 reported cost.
3. RPi Model 4 B 2GB: $45 reported cost.
4. RPi Model 4 B 4GB: $55 reported cost.

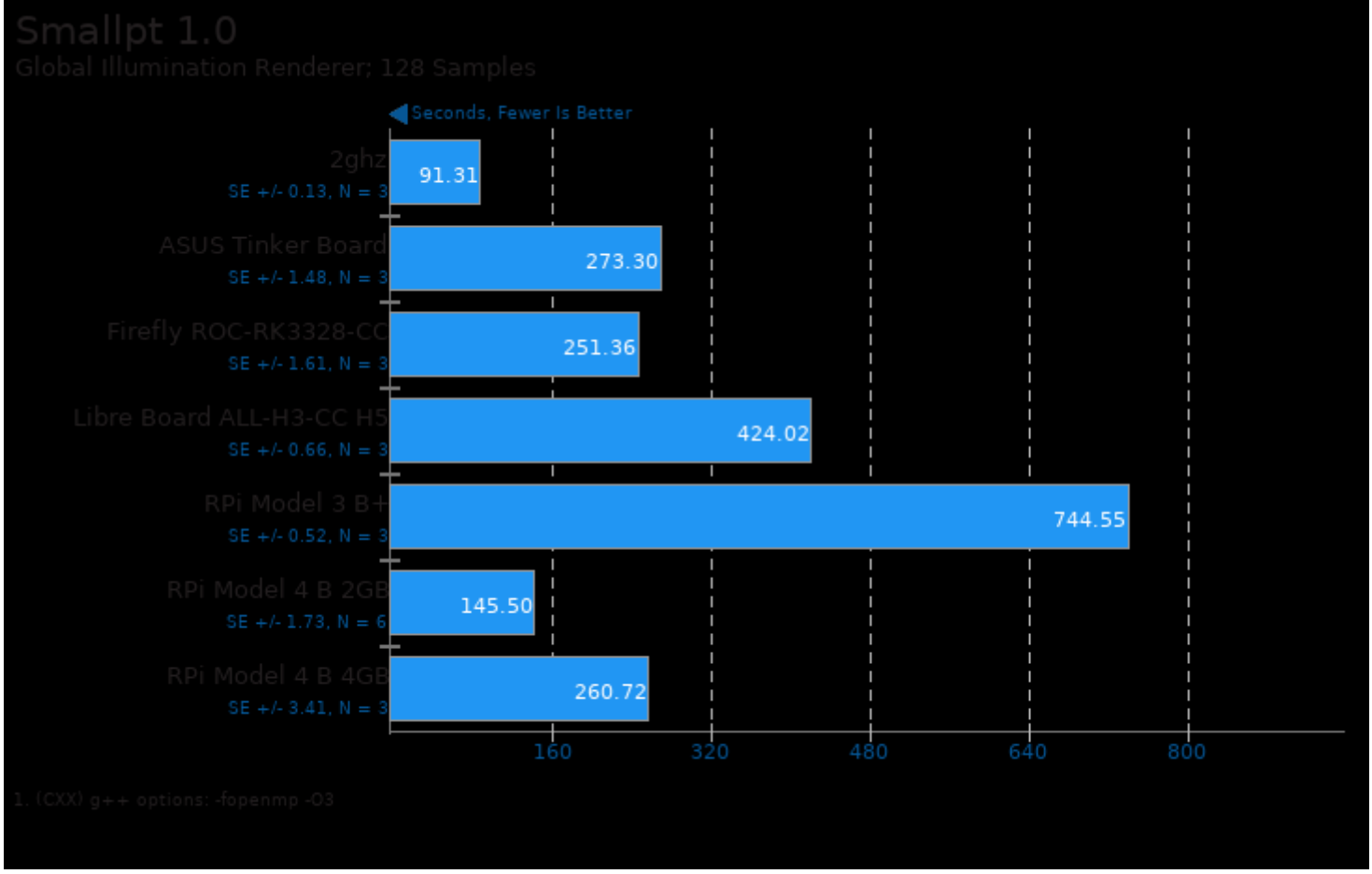
Raspberry Pi Model 4 Benchmarks

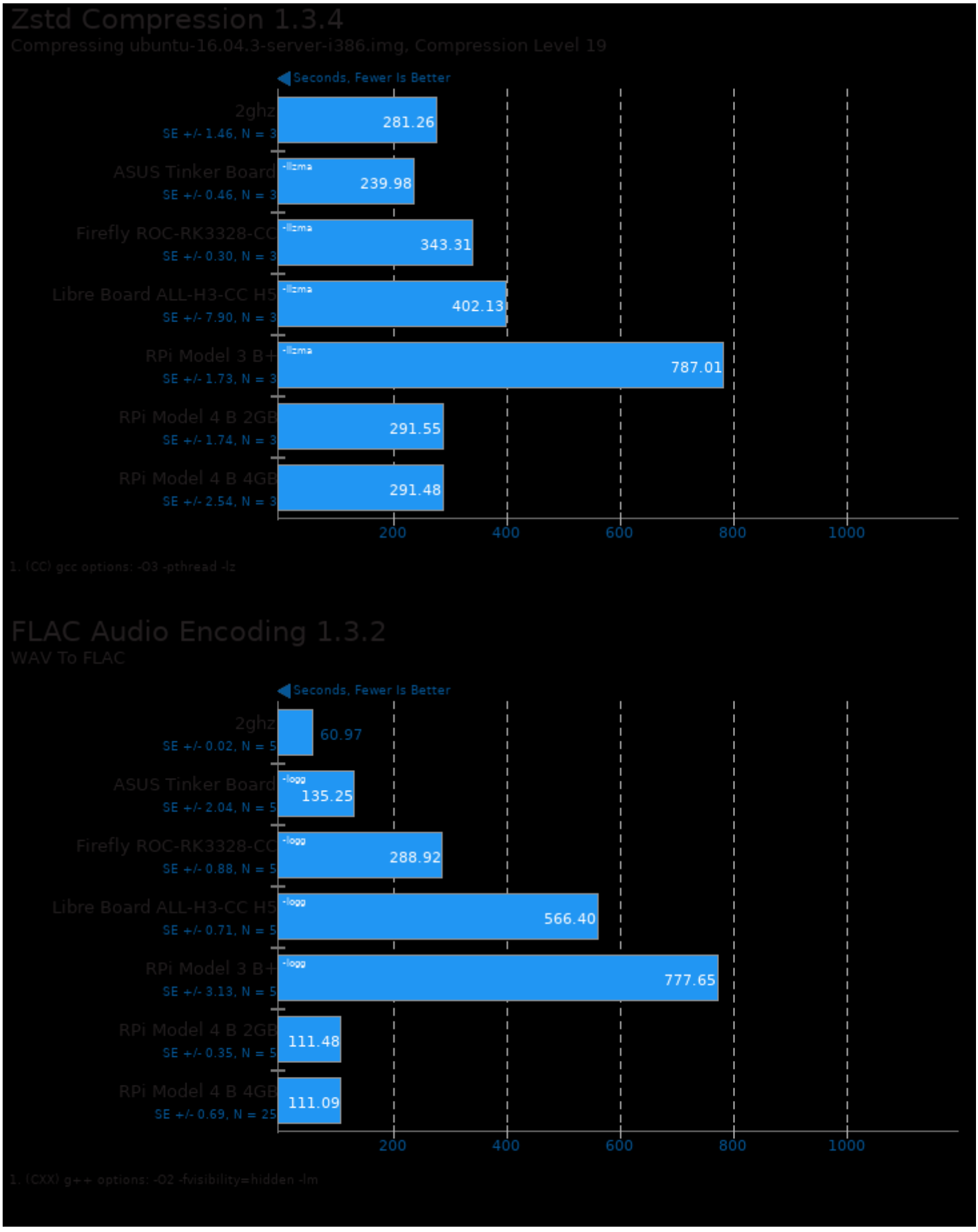


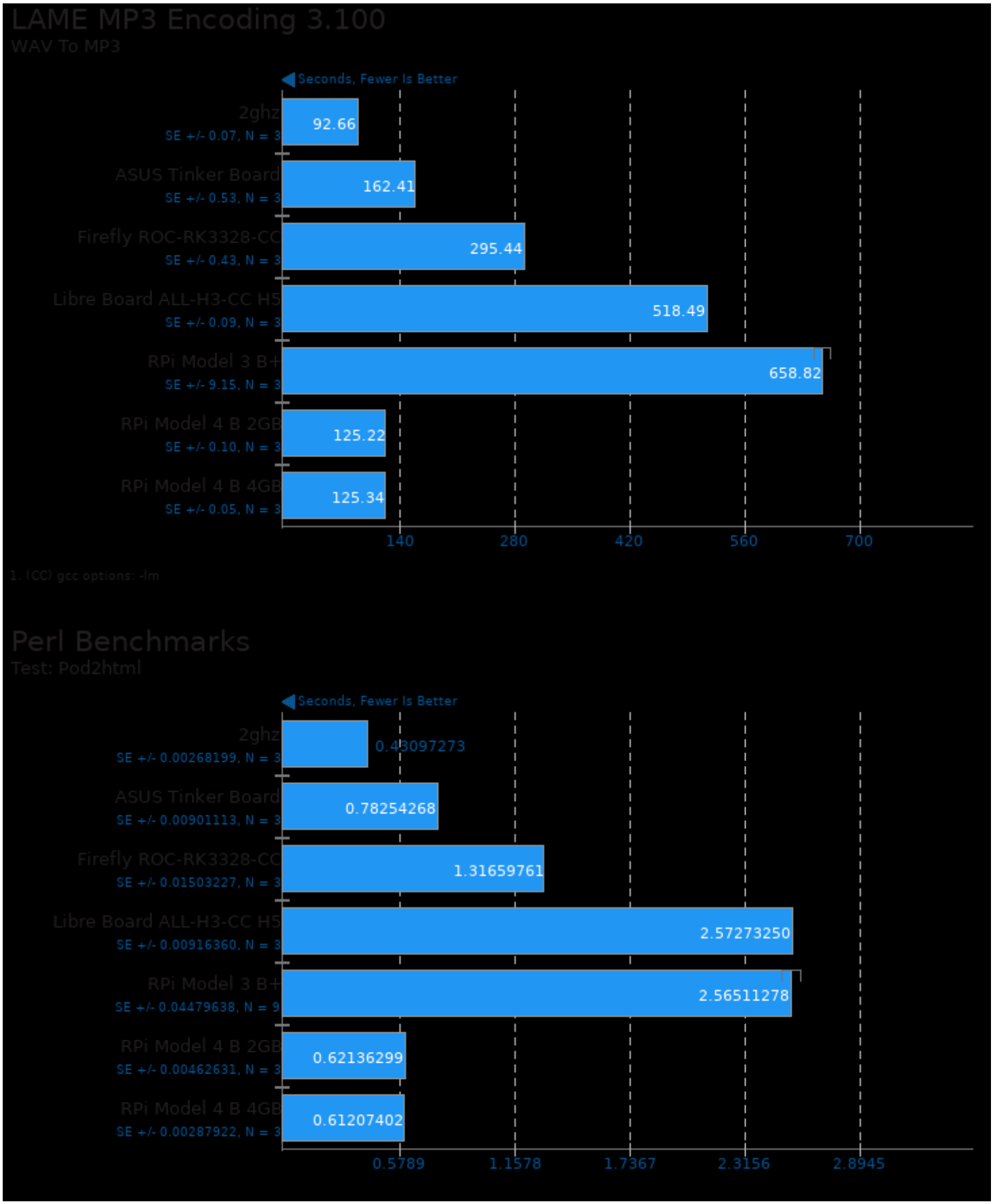
Raspberry Pi Model 4 Benchmarks



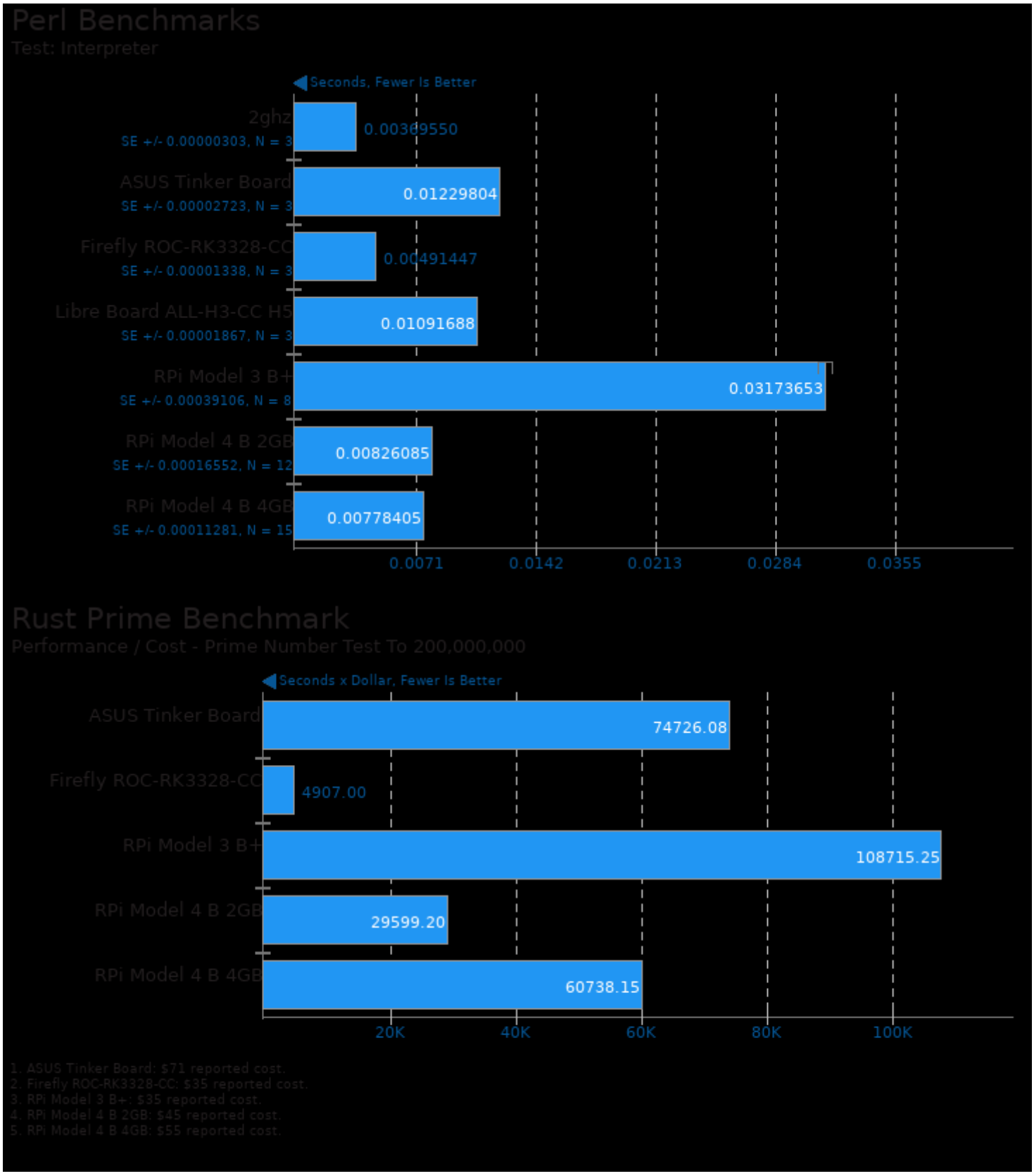

Rust Prime Benchmark
Prime Number Test To 200,000,000
Seconds, Fewer Is Better
2ghz
SE +/- 0.10, N = 3
74.35
ASUS Tinker Board
SE +/- 5.80, N = 3
1052.48
Firefly ROC-RK3328-CC
SE +/- 0.21, N = 3
140.20
RPi Model 3 B+
SE +/- 18.94, N = 3
-ldl -lrt -lpthread -lgcc_s -lc -lm -lutil
3106.15
RPi Model 4 B 2GB
SE +/- 0.03, N = 3
-ldl -lrt -lpthread -lgcc_s -lc -lm -lutil
657.76
RPi Model 4 B 4GB
SE +/- 3.97, N = 3
-ldl -lrt -lpthread -lgcc_s -lc -lm -lutil
1104.33
700
1400
2100
2800
3500
1. (CC) gcc options: -pie -nodefaultlibs


Smallpt 1.0
Global Illumination Renderer; 128 Samples
Seconds, Fewer Is Better
2ghz
SE +/- 0.13, N = 3
91.31
ASUS Tinker Board
SE +/- 1.48, N = 3
273.30
Firefly ROC-RK3328-CC
SE +/- 1.61, N = 3
251.36
Libre Board ALL-H3-CC H5
SE +/- 0.66, N = 3
424.02
RPi Model 3 B+
SE +/- 0.52, N = 3
744.55
RPi Model 4 B 2GB
SE +/- 1.73, N = 6
145.50
RPi Model 4 B 4GB
SE +/- 3.41, N = 3
260.72
160
320
480
640
800
1. (CXX) g++ options: -fopenmp -O3


Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
2ghz
SE +/- 1.46, N = 3
281.26
ASUS Tinker Board
SE +/- 0.46, N = 3
-llzma
239.98
Firefly ROC-RK3328-CC
SE +/- 0.30, N = 3
-llzma
343.31
Libre Board ALL-H3-CC H5
SE +/- 7.90, N = 3
-llzma
402.13
RPi Model 3 B+
SE +/- 1.73, N = 3
-llzma
787.01
RPi Model 4 B 2GB
SE +/- 1.74, N = 3
291.55
RPi Model 4 B 4GB
SE +/- 2.54, N = 3
291.48
200
400
600
800
1000
1. (CC) gcc options: -O3 -pthread -lz
FLAC Audio Encoding 1.3.2
WAV To FLAC
Seconds, Fewer Is Better
2ghz
SE +/- 0.02, N = 5
60.97
ASUS Tinker Board
SE +/- 2.04, N = 5
-logg
135.25
Firefly ROC-RK3328-CC
SE +/- 0.88, N = 5
-logg
288.92
Libre Board ALL-H3-CC H5
SE +/- 0.71, N = 5
-logg
566.40
RPi Model 3 B+
SE +/- 3.13, N = 5
-logg
777.65
RPi Model 4 B 2GB
SE +/- 0.35, N = 5
111.48
RPi Model 4 B 4GB
SE +/- 0.69, N = 25
111.09
200
400
600
800
1000
1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

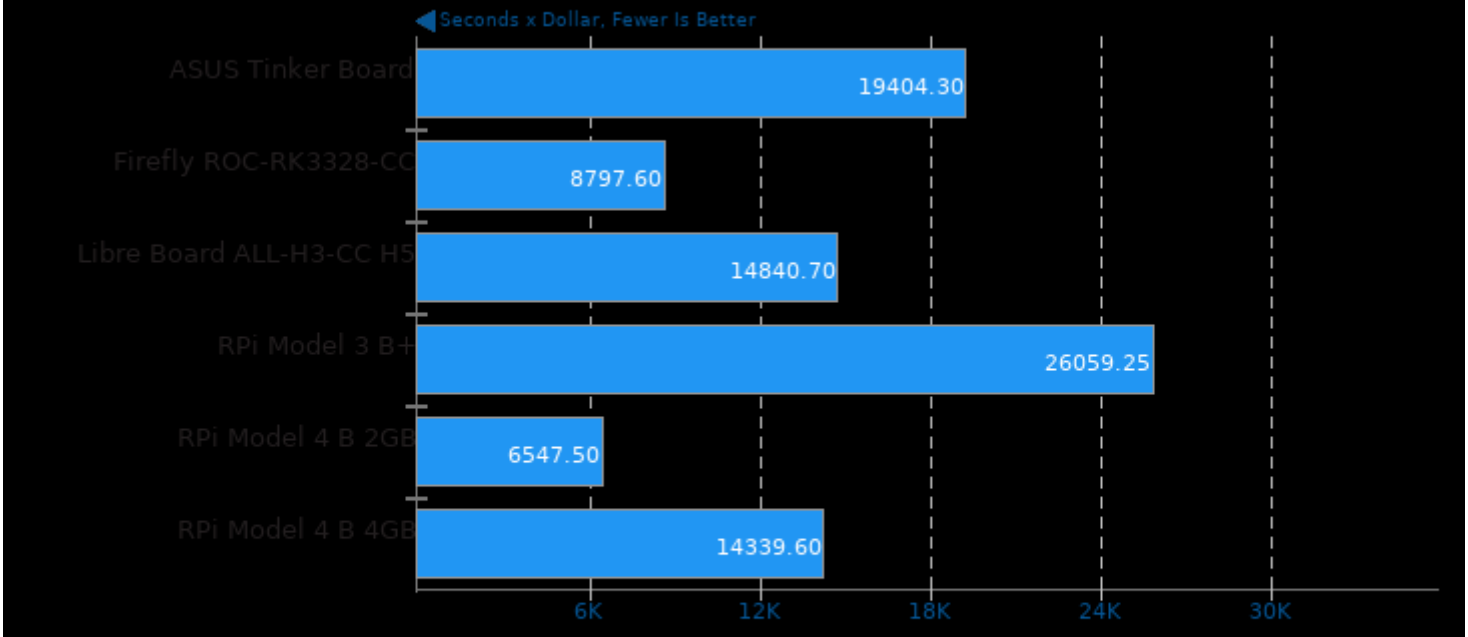

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
2ghz
SE +/- 0.07, N = 3
92.66
ASUS Tinker Board
SE +/- 0.53, N = 3
162.41
Firefly ROC-RK3328-CC
SE +/- 0.43, N = 3
295.44
Libre Board ALL-H3-CC H5
SE +/- 0.09, N = 3
518.49
RPi Model 3 B+
SE +/- 9.15, N = 3
658.82
RPi Model 4 B 2GB
SE +/- 0.10, N = 3
125.22
RPi Model 4 B 4GB
SE +/- 0.05, N = 3
125.34
140
280
420
560
700
1. (CC) gcc options: -lm
Perl Benchmarks
Test: Pod2html
Seconds, Fewer Is Better
2ghz
SE +/- 0.00268199, N = 3
0.43097273
ASUS Tinker Board
SE +/- 0.00901113, N = 3
0.78254268
Firefly ROC-RK3328-CC
SE +/- 0.01503227, N = 3
1.31659761
Libre Board ALL-H3-CC H5
SE +/- 0.00916360, N = 3
2.57273250
RPi Model 3 B+
SE +/- 0.04479638, N = 9
2.56511278
RPi Model 4 B 2GB
SE +/- 0.00462631, N = 3
0.62136299
RPi Model 4 B 4GB
SE +/- 0.00287922, N = 3
0.61207402
0.5789
1.1578
1.7367
2.3156
2.8945

Raspberry Pi Model 4 Benchmarks



Smallpt 1.0

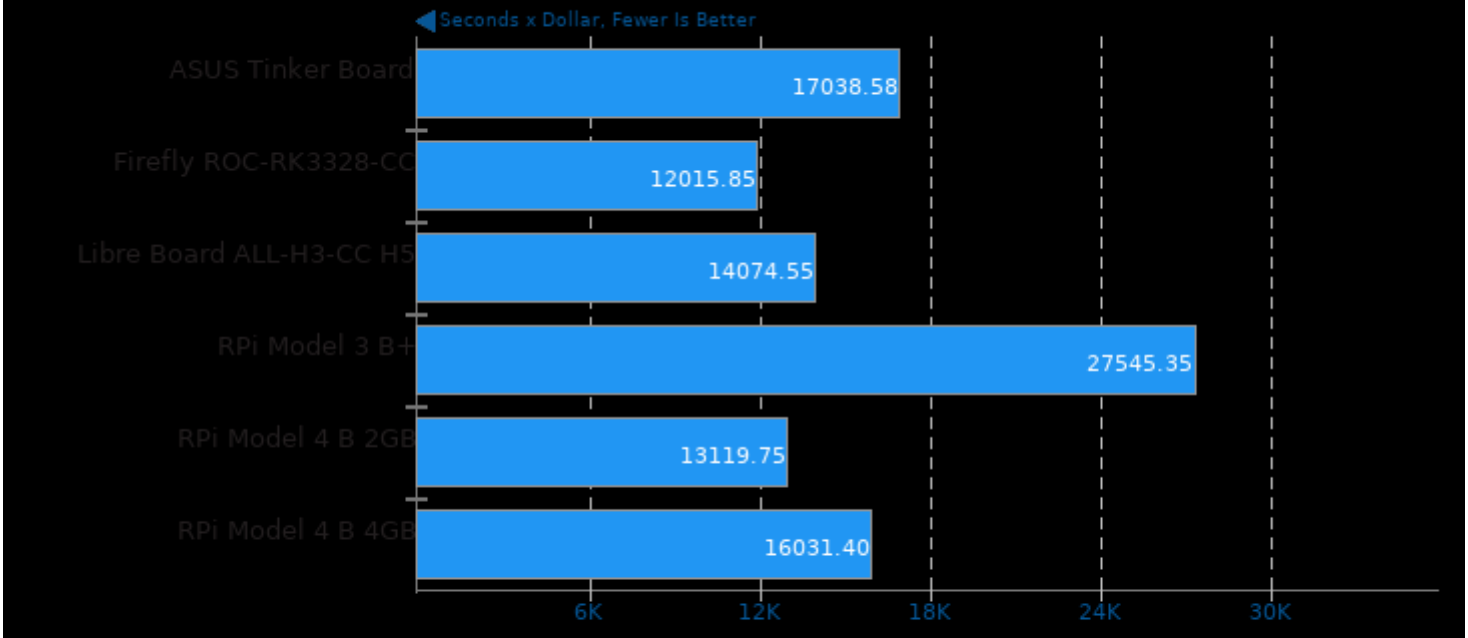
Performance / Cost - Global Illumination Renderer; 128 Samples



1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Zstd Compression 1.3.4

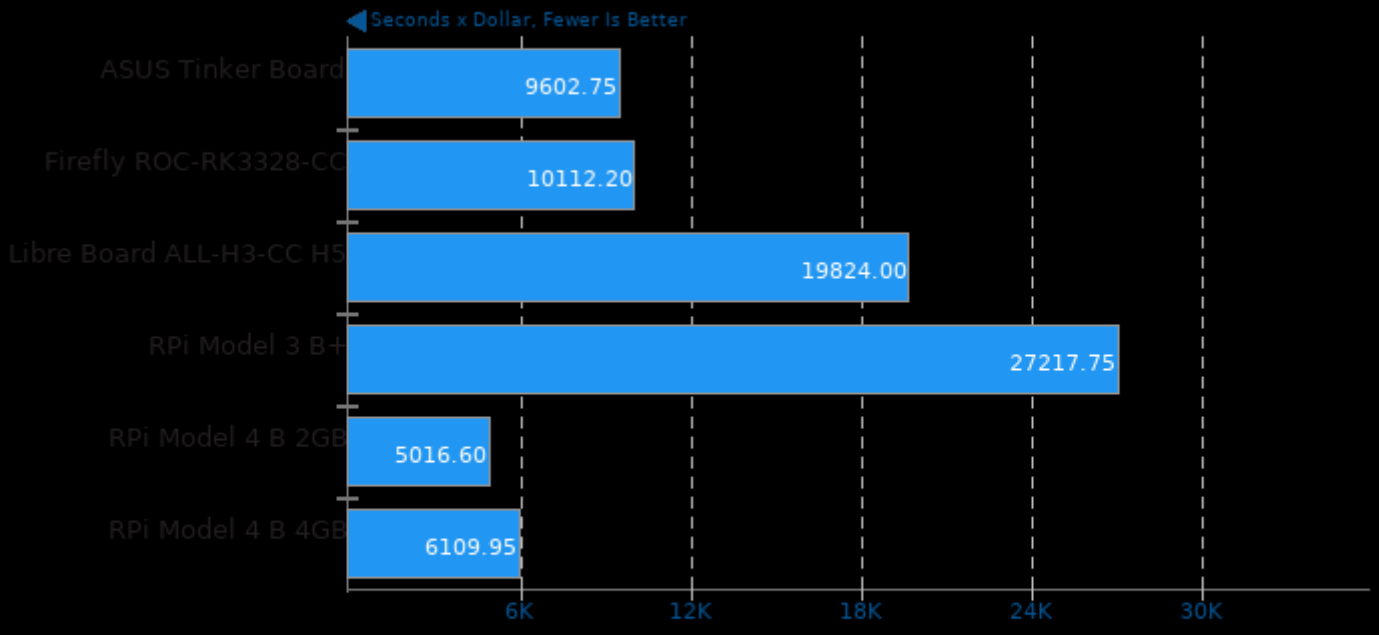
Performance / Cost - Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19



1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

FLAC Audio Encoding 1.3.2

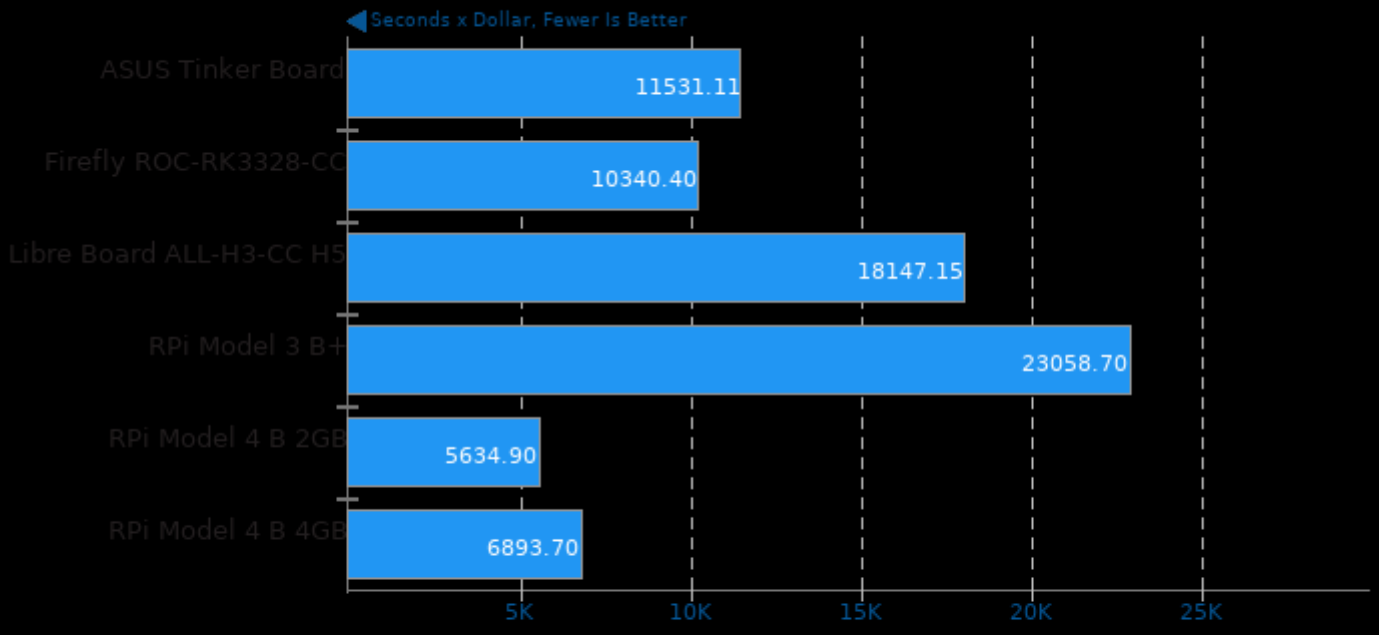
Performance / Cost - WAV To FLAC



1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

LAME MP3 Encoding 3.100

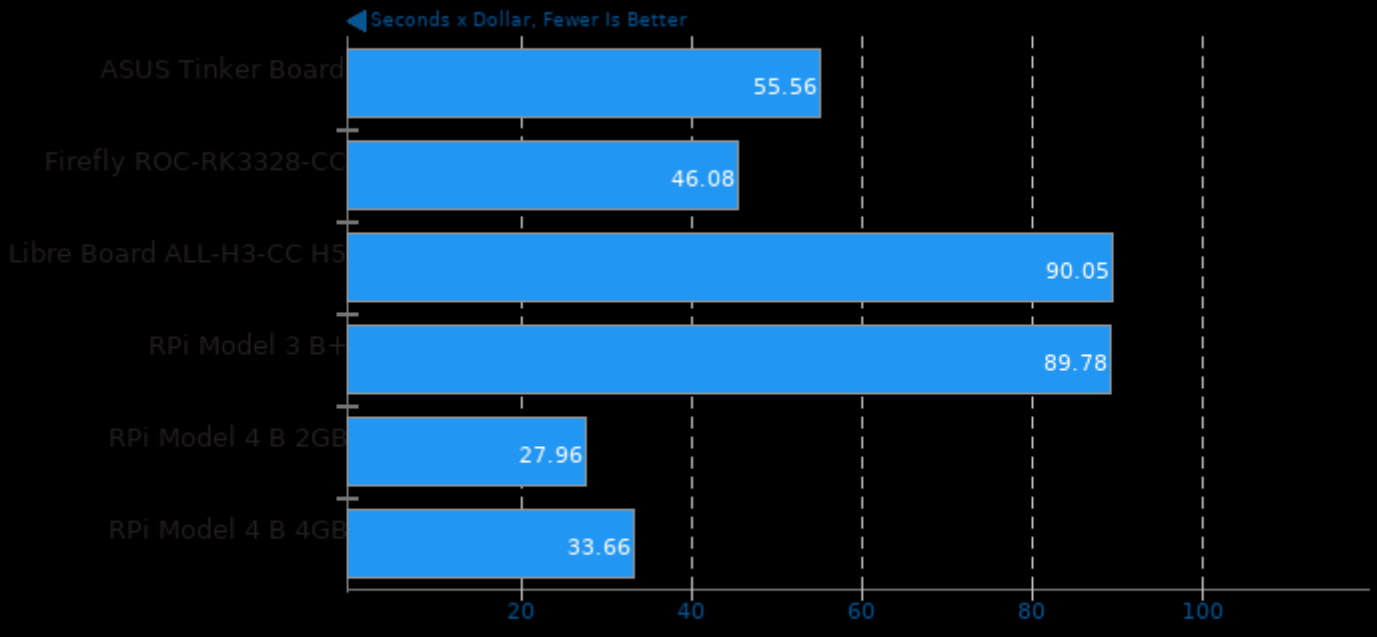
Performance / Cost - WAV To MP3



1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Perl Benchmarks

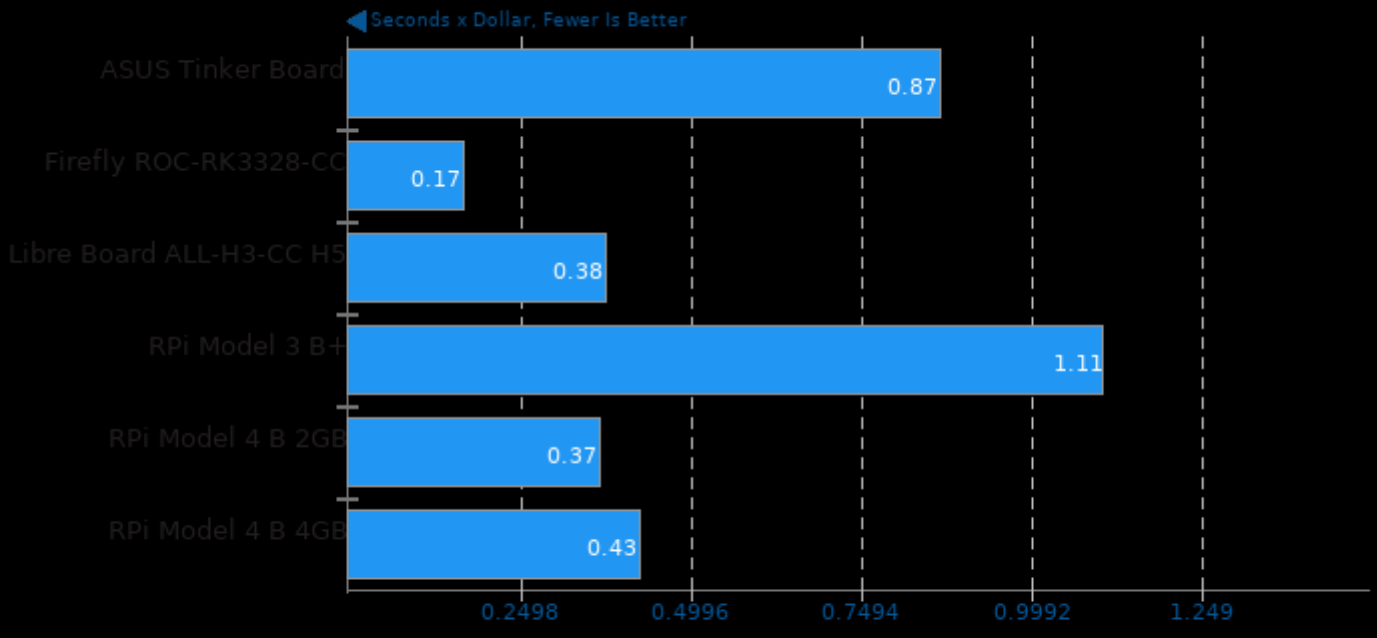
Performance / Cost - Test: Pod2html



1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Perl Benchmarks

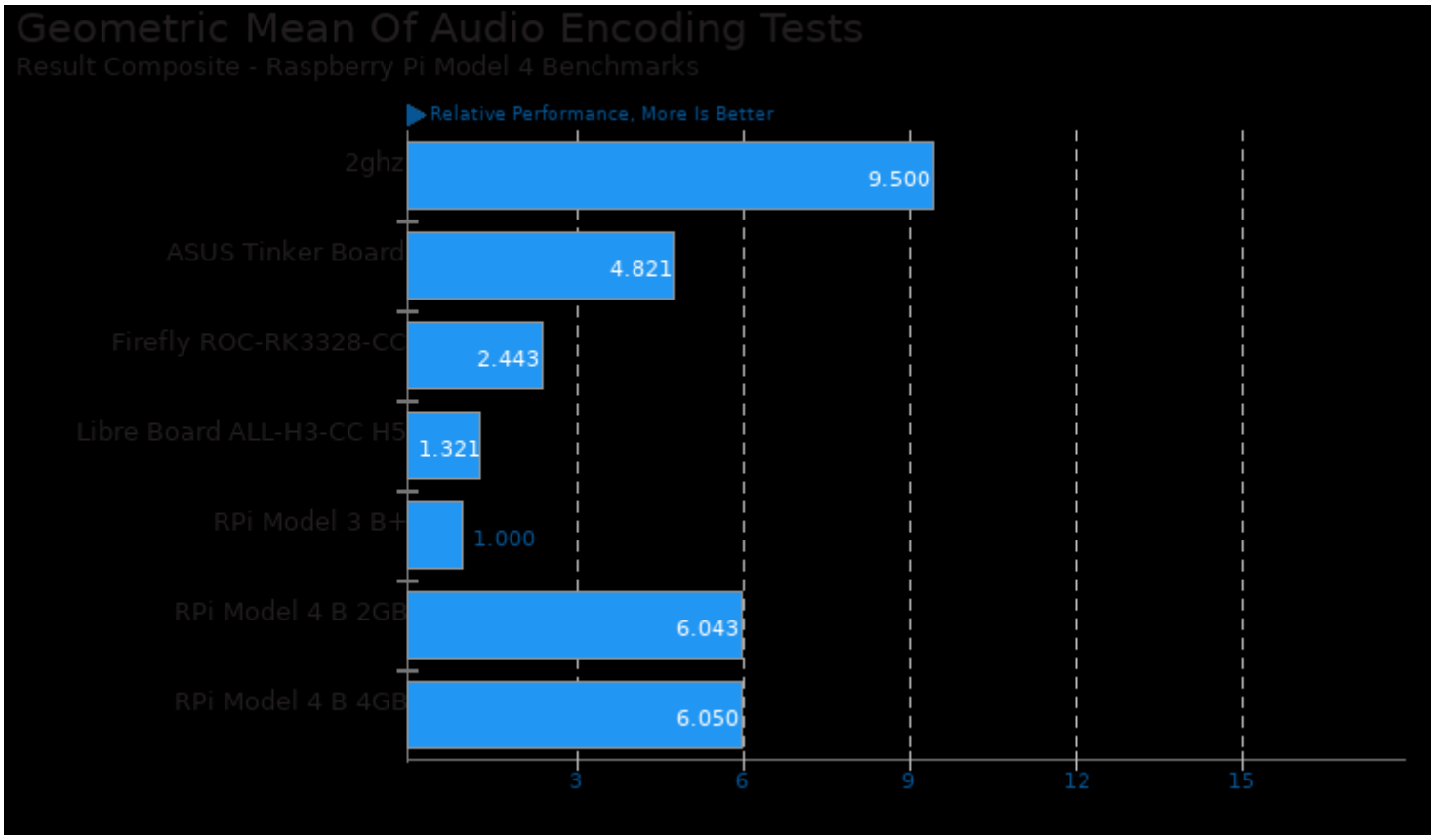
Performance / Cost - Test: Interpreter



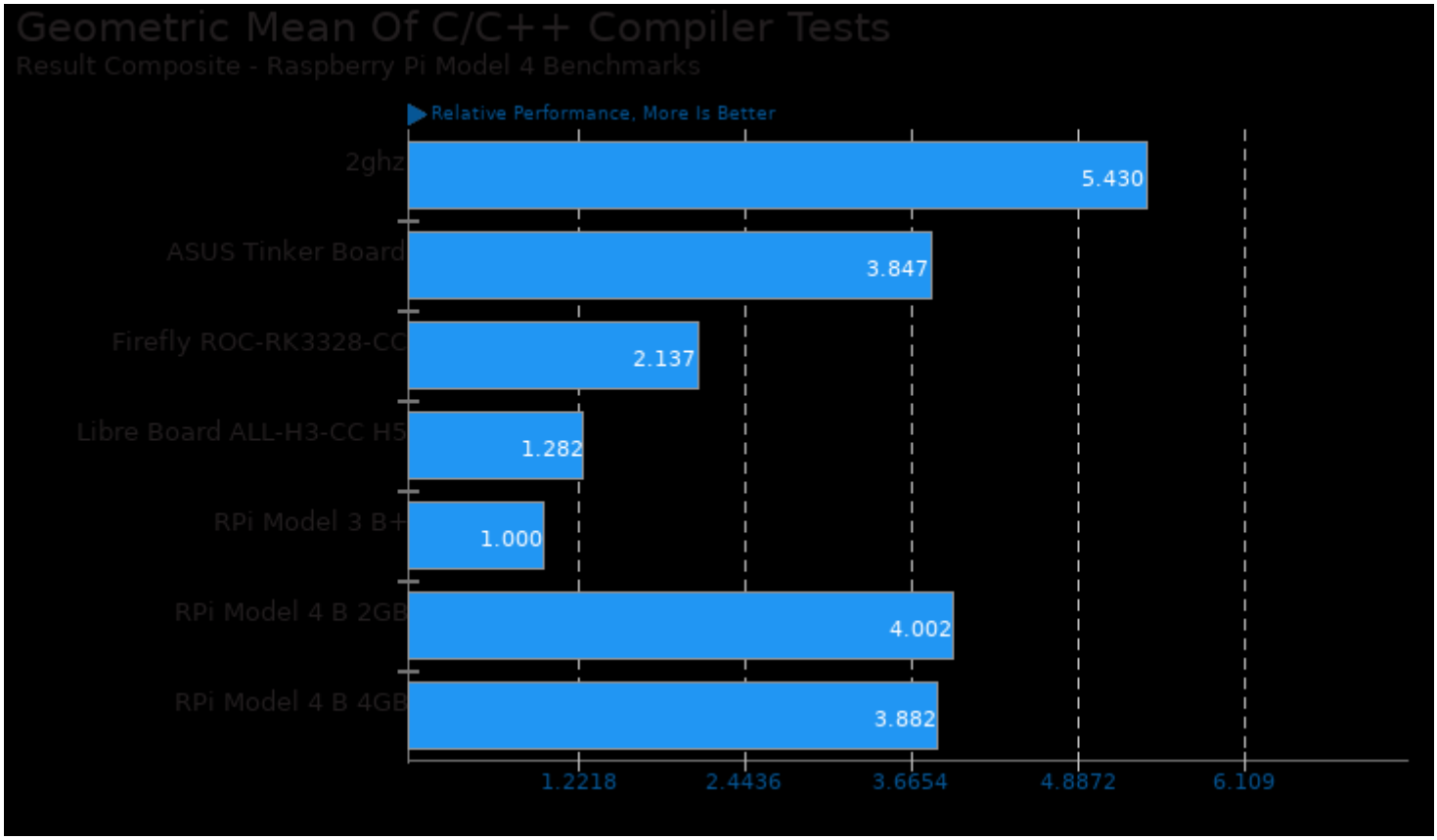
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Raspberry Pi Model 4 Benchmarks

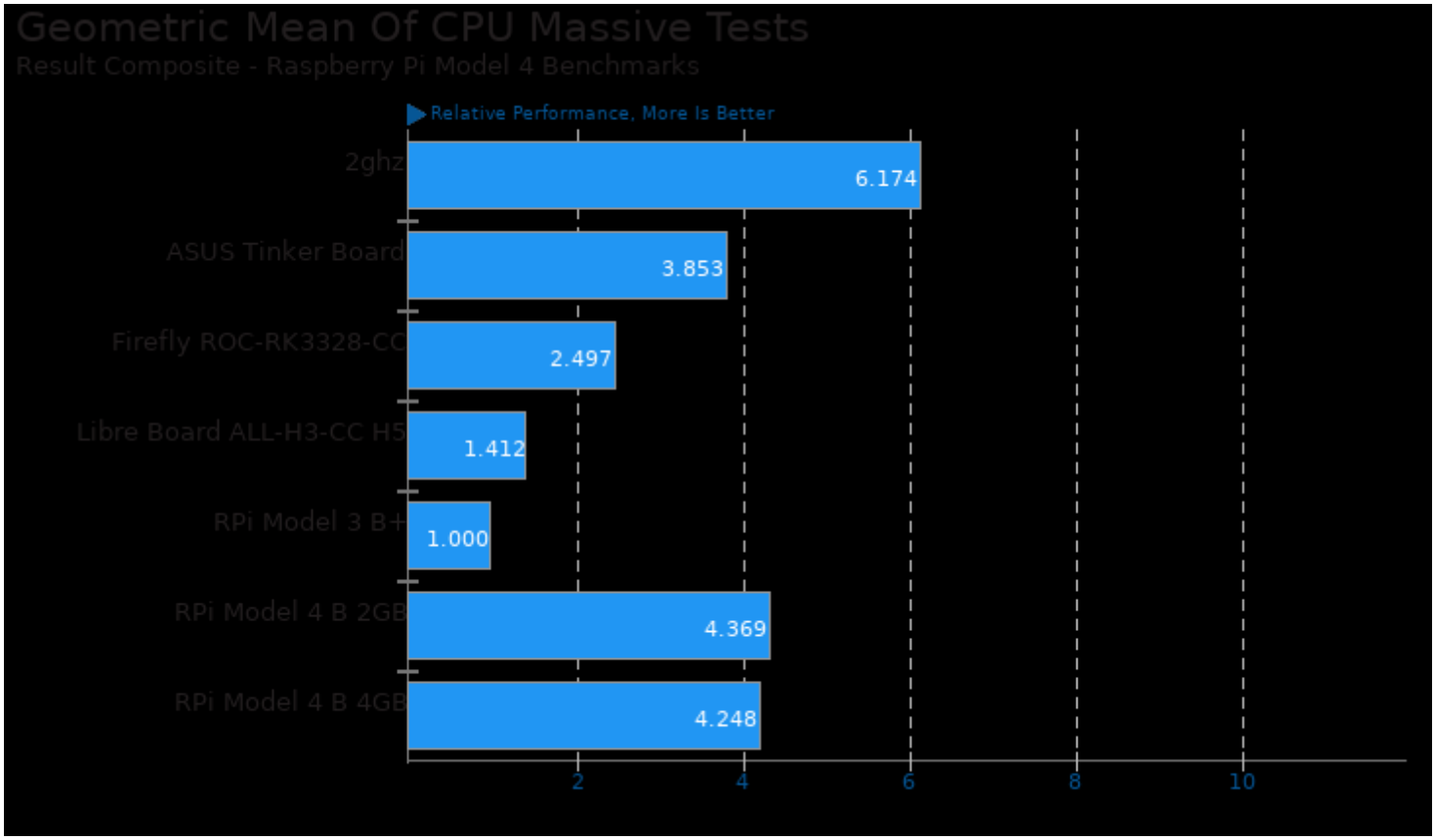
These geometric means are based upon test groupings / test suites for this result file.



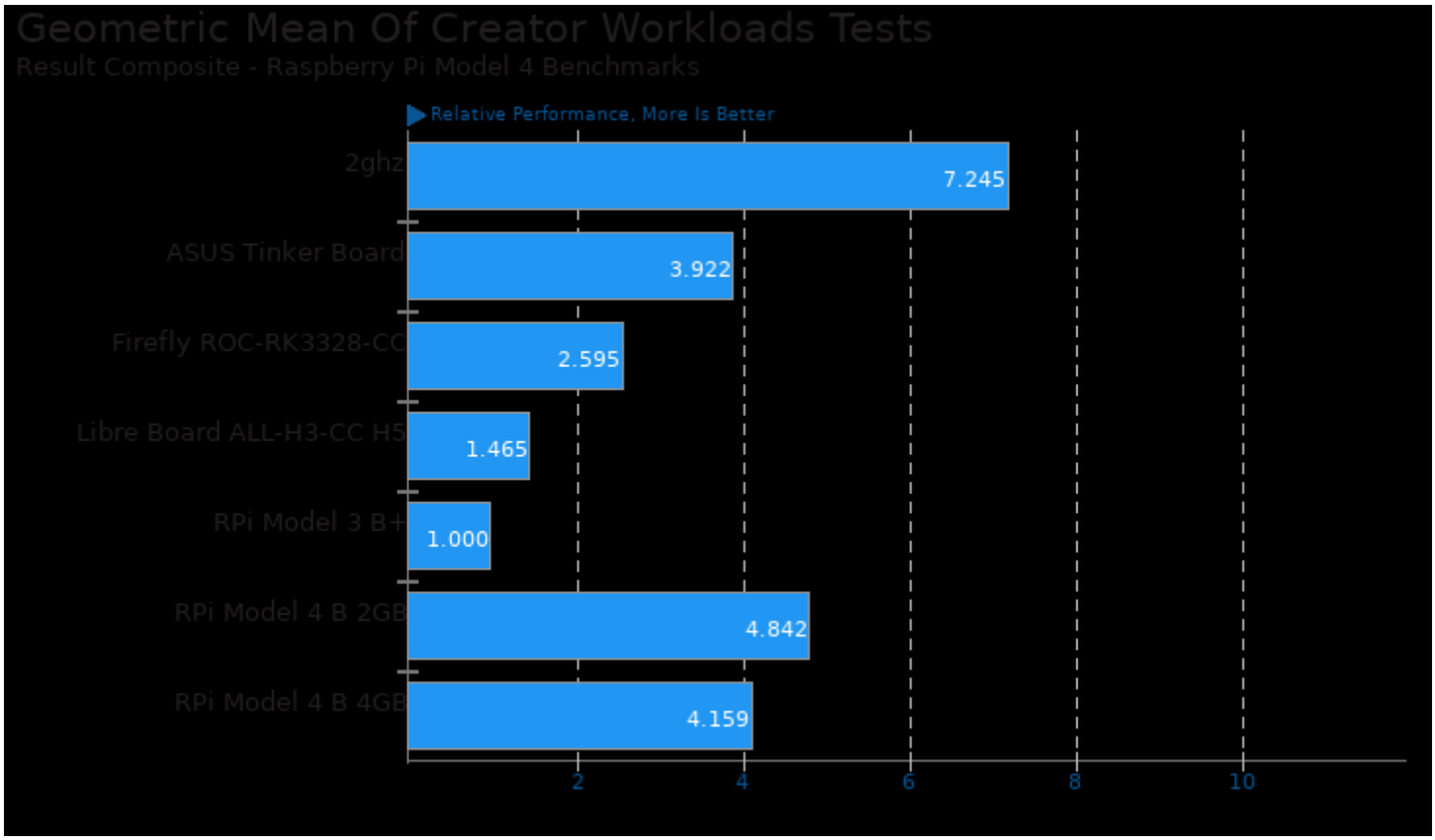
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



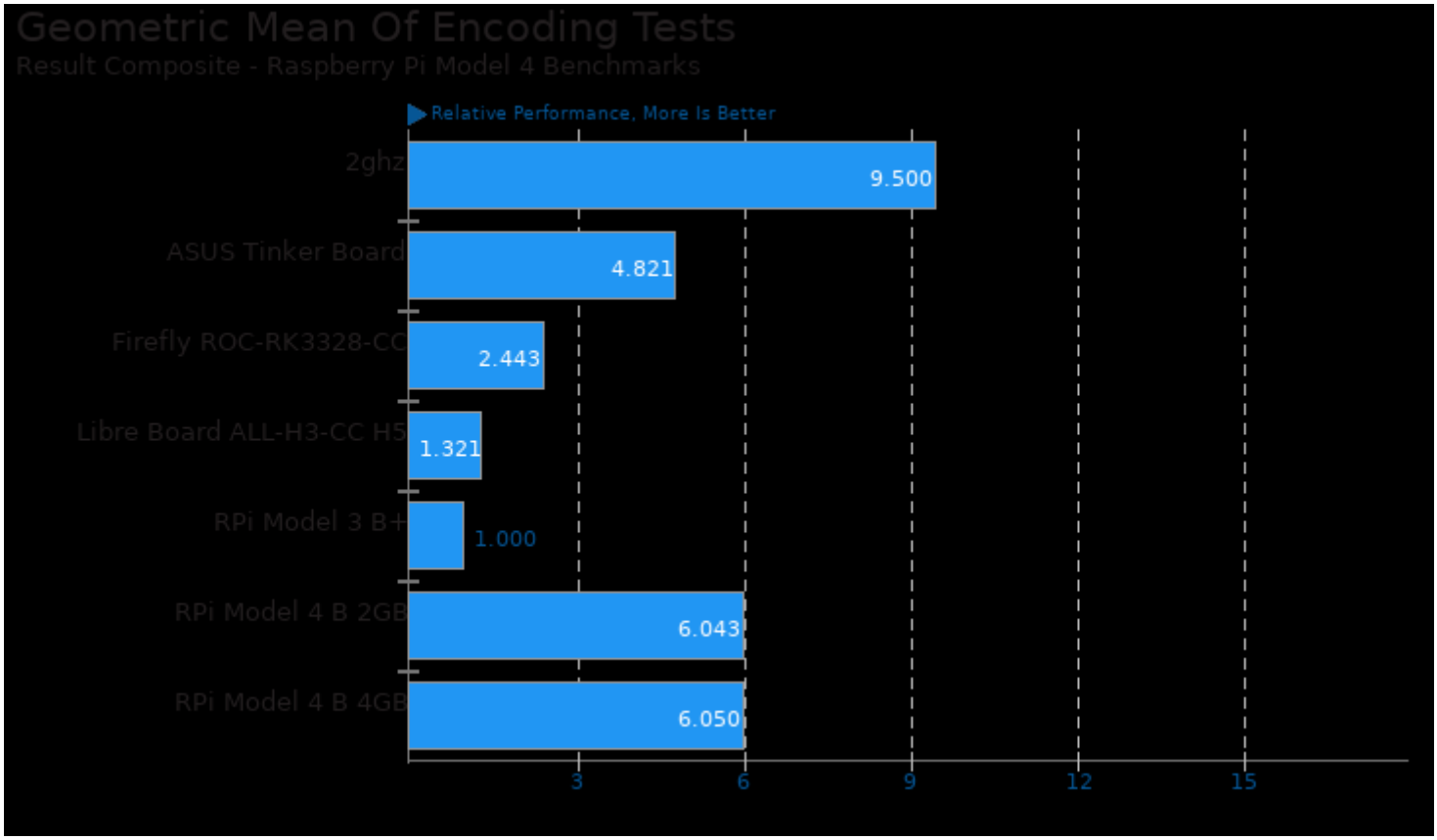
Geometric mean based upon tests: pts/scimark2, pts/graphics-magick, pts/encode-mp3, pts/encode-flac, pts/x264, pts/compress-zstd and pts/nginx



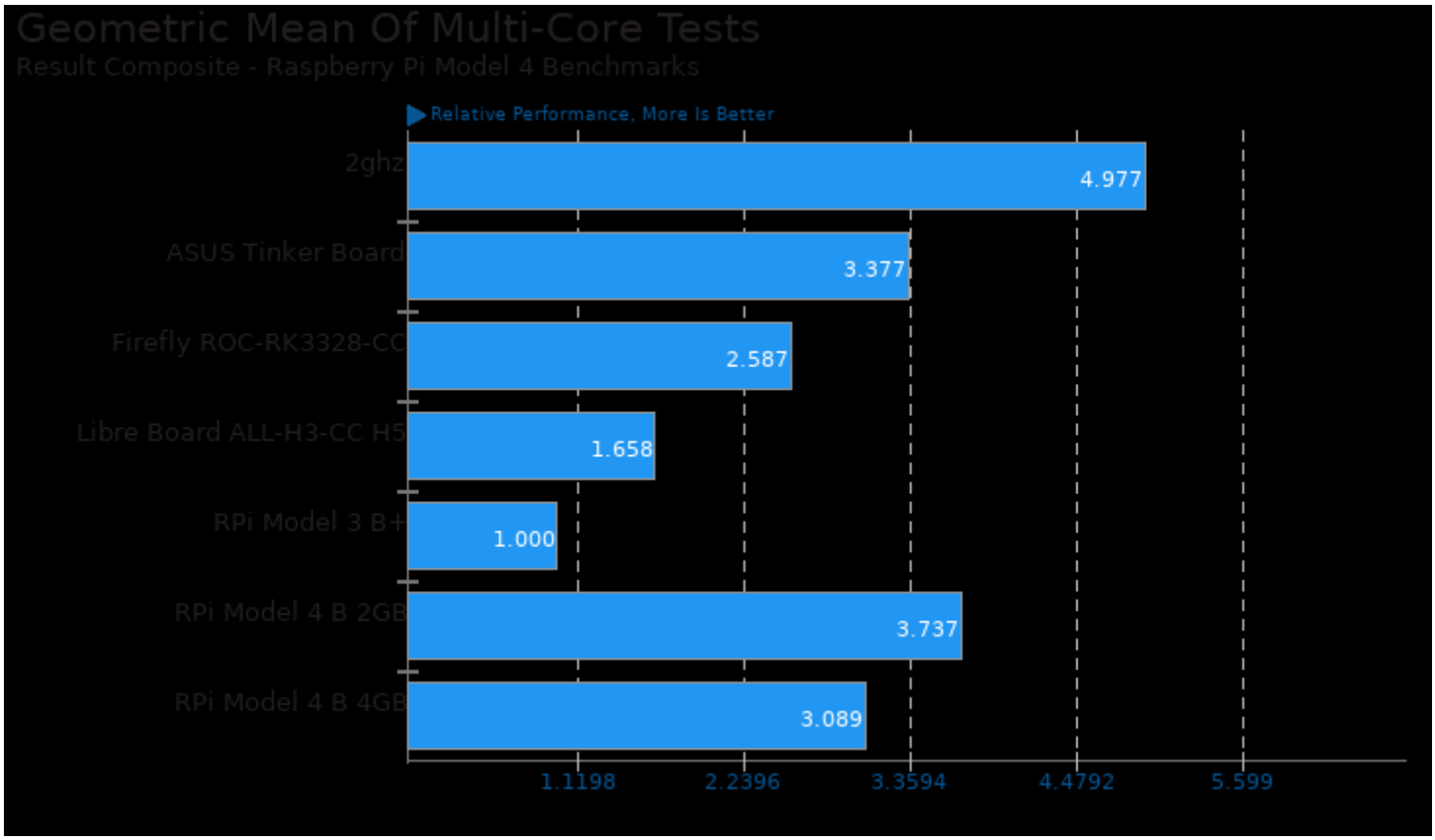
Geometric mean based upon tests: pts/compress-zstd, pts/x264, pts/encode-flac, pts/encode-mp3, pts/graphics-magick, pts/nginx, pts/phpbench and pts/rust-prime



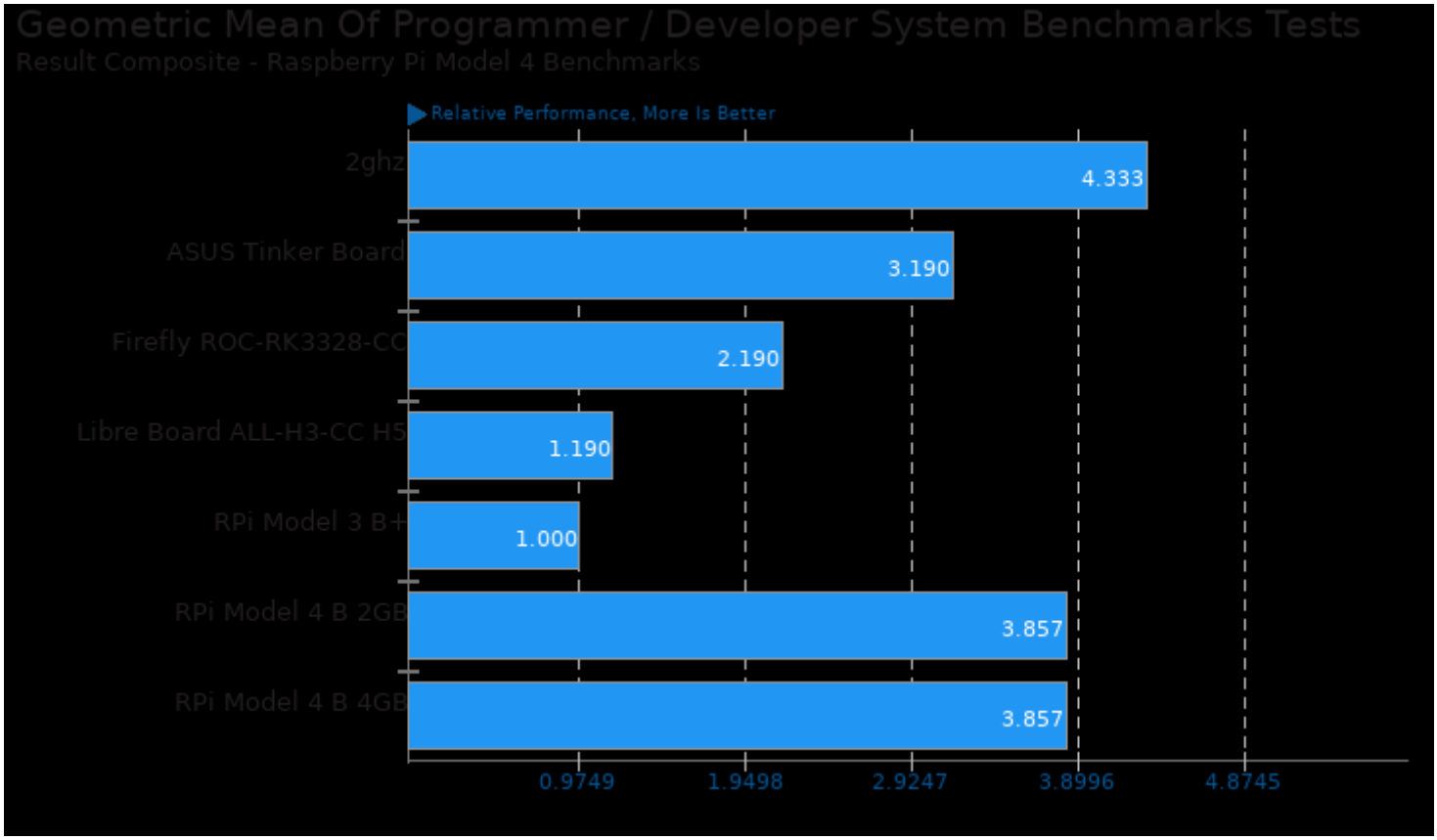
Geometric mean based upon tests: pts/smallpt, pts/x264, pts/encode-mp3, pts/encode-flac and pts/graphics-magick



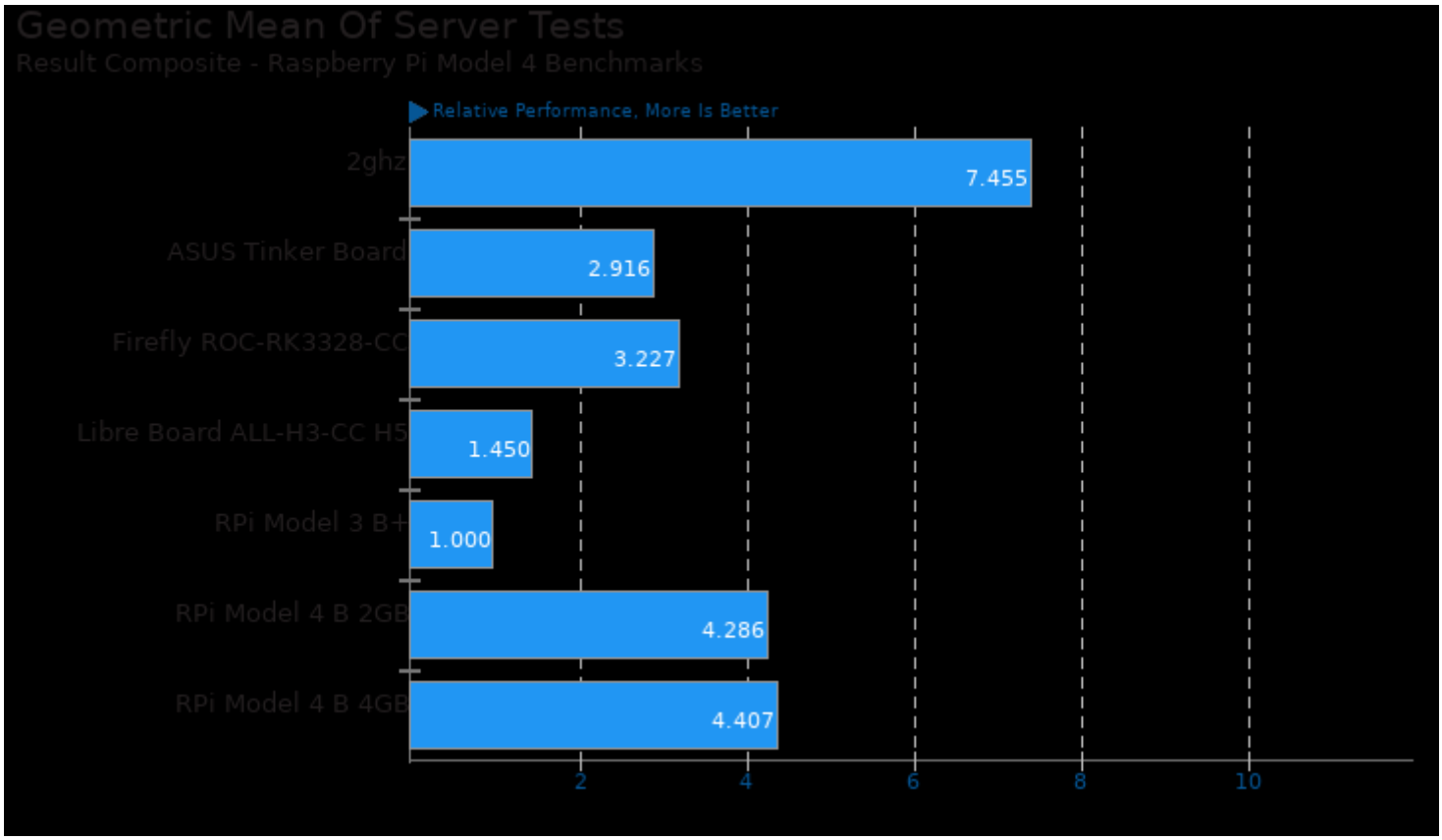
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac and pts/x264



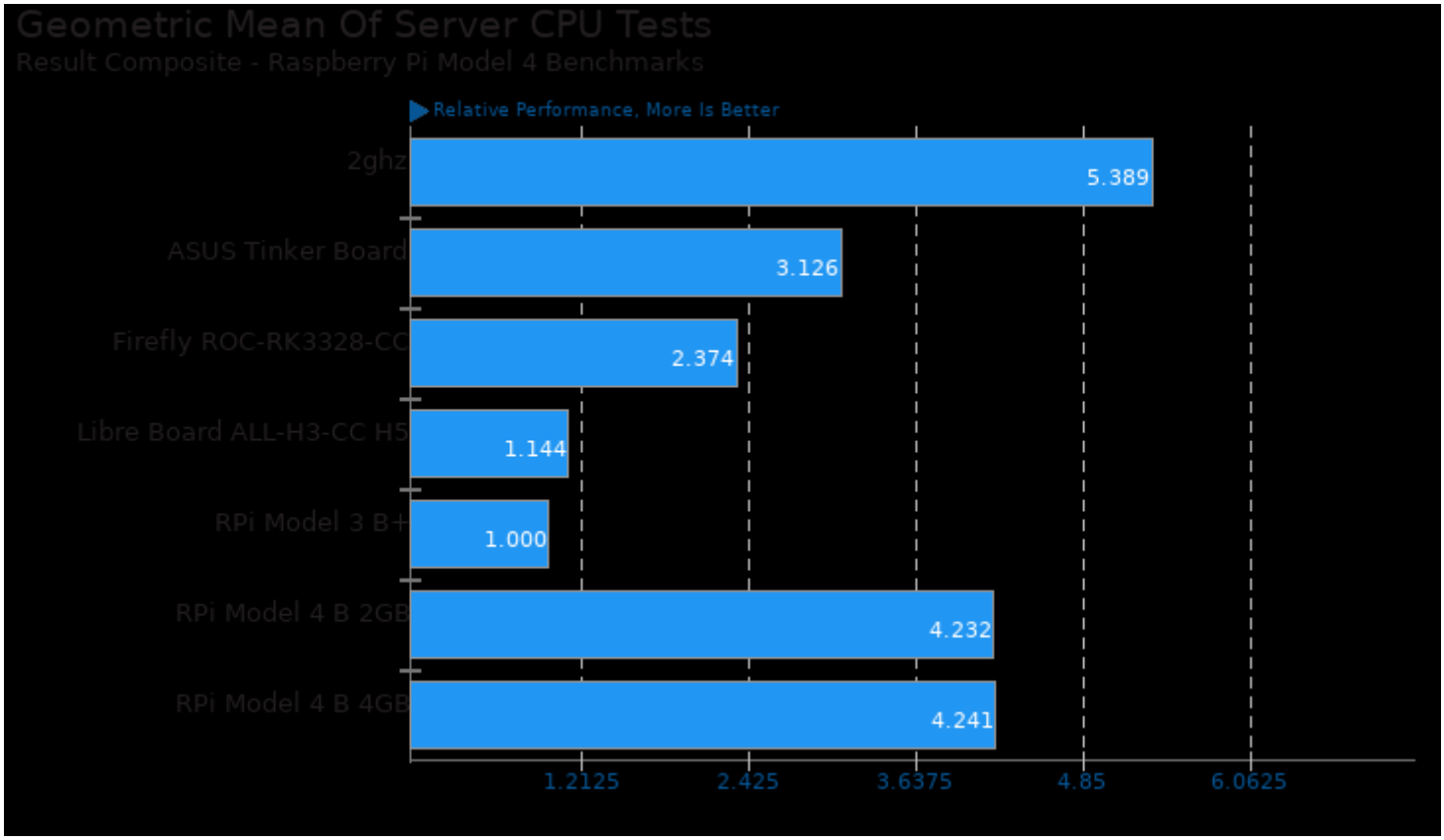
Geometric mean based upon tests: pts/x264, pts/smallpt, pts/graphics-magick, pts/compress-zstd and pts/rust-prime



Geometric mean based upon tests: pts/compress-zstd and pts/pybench

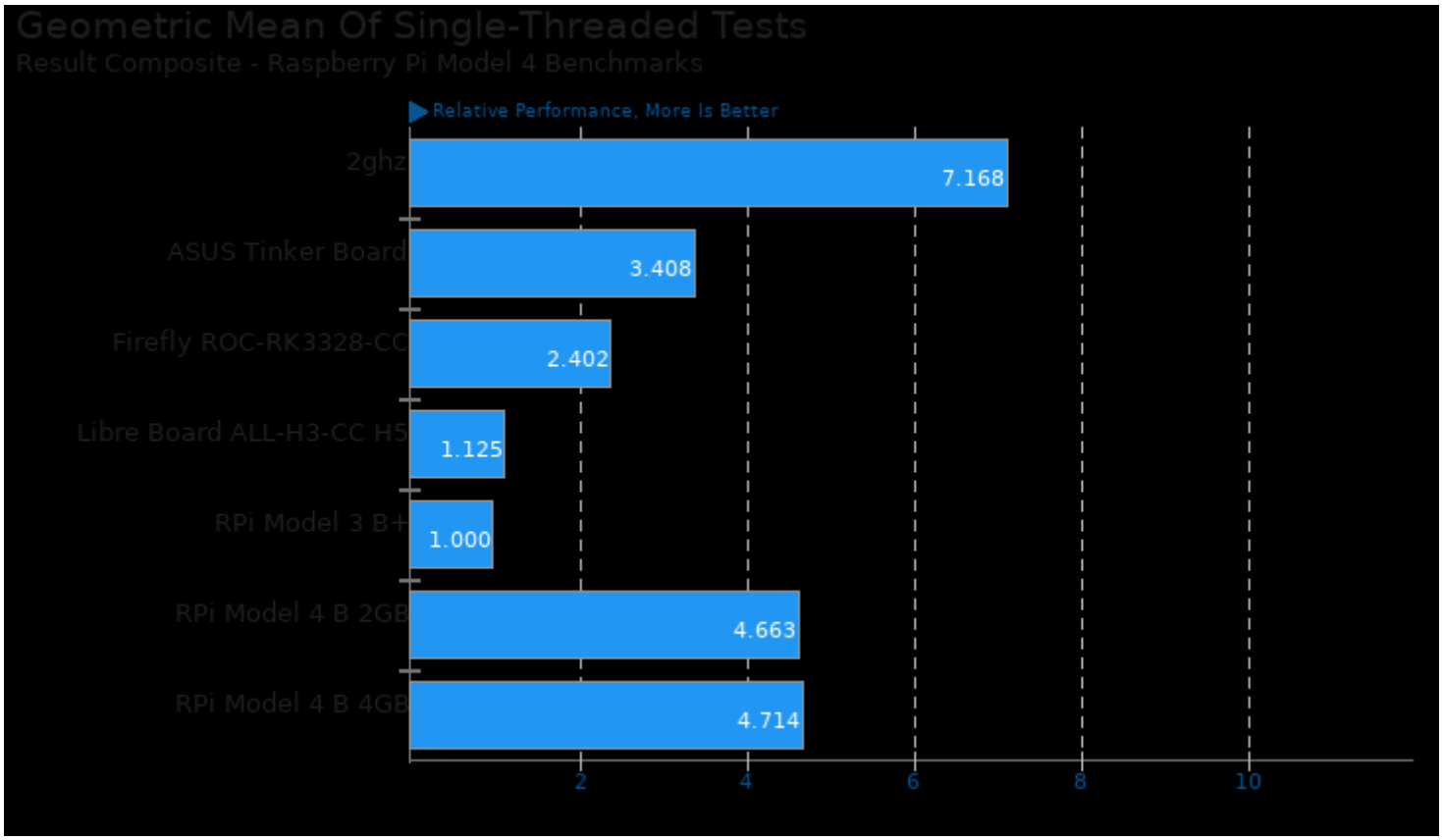


Geometric mean based upon tests: pts/nginx, pts/phpbench and pts/perl-benchmark



Geometric mean based upon tests: pts/x264, pts/compress-zstd, pts/pybench and pts/phpbench

Raspberry Pi Model 4 Benchmarks



Geometric mean based upon tests: pts/scimark2, pts/encode-flac, pts/encode-mp3, pts/perl-benchmark, pts/pybench, pts/phpbench and pts/nginx

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 14:51.