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Raspberry Pi Model 4 Benchmarks

OdroidN2+2208

Automated Executive Summary

Odroid-H2Plus had the most wins, coming in first place for 71% of the tests.

Based on the geometric mean of all complete results, the fastest (Odroid-H2Plus) was 11.104x the speed of the slowest (RPi Model 3 B+). OdroidN2+ was 0.778x the speed of Odroid-H2Plus, OdroidN2+2208 was 0.927x the speed of OdroidN2+, Odroid-N2 4Gb was 0.812x the speed of OdroidN2+2208, RPi Model 4 B 2GB was 0.725x the speed of Odroid-N2 4Gb, RPi Model 4 B 4GB was 0.939x the speed of RPi Model 4 B 2GB, ASUS Tinker Board was 0.748x the speed of RPi Model 4 B 4GB, Firefly ROC-RK3328-CC was 0.744x the speed of ASUS Tinker Board, Libre Board ALL-H3-CC H5 was 0.482x the speed of Firefly ROC-RK3328-CC, RPi Model 3 B+ was 0.84x 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 84.571x
Rust Prime Benchmark (Prime Number Test To 200,000,000) at 52.145x
FLAC Audio Encoding (WAV To FLAC) at 27.275x
Rust Prime Benchmark (Performance / Cost - Prime Number Test To 200,000,000) at 22.155x
PyBench (Total For Average Test Times) at 16.811x

Perl Benchmarks (Test: Interpreter) at 14.089x
PHPBench (PHP Benchmark Suite) at 12.905x
Smallpt (Global Illumination Renderer; 128 Samples) at 11.23x
LAME MP3 Encoding (WAV To MP3) at 10.203x
SciMark (Computational Test: Composite) at 8.031x.

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

Odroid-N2 4Gb

Processor: ARMv8 Cortex-A73 @ 1.99GHz (6 Cores), Motherboard: Hardkernel ODROID-N2, Memory: 4096MB, Disk: 128GB Type-C + 31GB BJTD4R, Graphics: llvmpipe 4GB

OS: Ubuntu 18.04, Kernel: 4.9.184-37 (aarch64), Desktop: MATE 1.20.1, Display Server: X Server 1.19.6, Display Driver: modesetting 1.19.6, OpenGL: 3.3 Mesa 19.0.2 (LLVM 8.0 128 bits), Compiler: GCC 7.4.0, File-System: ext4, Screen Resolution: 1360x768

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: arm-big-little interactive
Python Notes: Python 2.7.15+ + Python 3.6.8

Odroid-H2Plus

Processor: Intel Celeron J4115 @ 2.50GHz (4 Cores), Motherboard: HARDKERNEL ODROID-H2 v1.0 (5.13 BIOS), Chipset: Intel Device 31f0, Memory: 8GB, Disk: 16GB AJTD4R, Graphics: i915drmfb (750MHz), Audio: Realtek ALC662 rev3, Monitor: C34J79x, Network: 2 x Realtek Device 8125

OS: Debian 10, Kernel: 5.8.0-0.bpo.2-amd64 (x86_64), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 3440x1440

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_cpufreq performance - CPU Microcode: 0x32
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

OdroidN2+

OdroidN2+2208

Processor: ARMv8 Cortex-A73 @ 2.02GHz (6 Cores), Motherboard: Hardkernel ODROID-N2Plus, Memory: 4096MB, Disk: 16GB AJTD4R

OS: Debian 10, Kernel: 5.8.16-meson64 (aarch64), Compiler: GCC 8.3.0, File-System: ext4

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 performance
Python Notes: 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	Odroid-N2 4Gb	Odroid-H2Plus	OdroidN2+	OdroidN2+2208
SciMark - Composite (Mflops)	48.80	141.72	**28.76**	51.13	142.17	143.02	193.95	**230.97**	229.94	213.24
Normalized	21.13%	61.36%	12.45%	22.14%	61.55%	61.92%	83.97%	100%	99.55%	92.32%
Standard Deviation	0.4%	0.1%	0.1%	0%	1.6%	1.1%	0.1%	0.4%	0.1%	0%
x264 - H.2.V.E (FPS)	**0.14**	3.32		2.31	3.10	4.91	**11.84**			
Normalized	1.18%	28.04%		19.51%	26.18%	41.47%	100%			

Raspberry Pi Model 4 Benchmarks

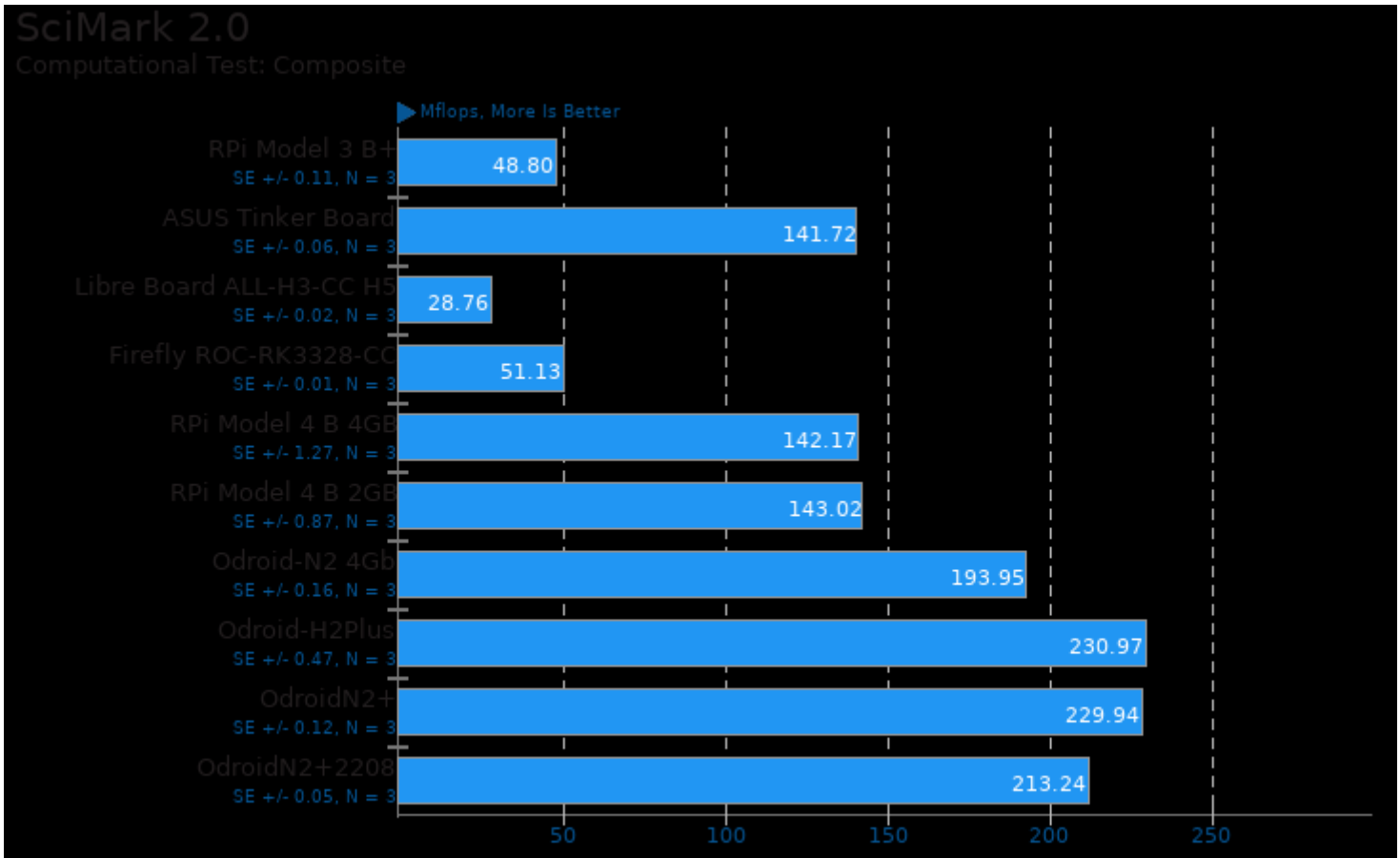
Standard Deviation	0%	6.3%		0.2%	8.5%	2.1%	3.3%			
GraphicsMagick - Rotate (Iterations/min)	16	66	24	44	63	64	109	127		
Normalized	12.6%	51.97%	18.9%	34.65%	49.61%	50.39%	85.83%	100%		
Standard Deviation		3.4%			1.8%		1.4%			
GraphicsMagick - Resizing (Iterations/min)	15	53	22	36	45	53	93	109		
Normalized	13.76%	48.62%	20.18%	33.03%	41.28%	48.62%	85.32%	100%		
Standard Deviation		3.4%			2.9%					
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	3106	1052		140.20	1104	657.76	65.73	117.029		59.567
Normalized	1.92%	5.66%		42.49%	5.39%	9.06%	90.62%	50.9%		100%
Standard Deviation	1.1%	1%		0.3%	0.6%	0%	0%	0%		0%
Smallpt - G.I.R.1.S (sec)	744.55	273.30	424.02	251.36	260.72	145.50	83.26	75.513	66.302	70.842
Normalized	8.9%	24.26%	15.64%	26.38%	25.43%	45.57%	79.63%	87.8%	100%	93.59%
Standard Deviation	0.1%	0.9%	0.3%	1.1%	2.3%	2.9%	0.5%	0.1%	0.1%	0.1%
Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)	787	240	402	343	291	292	155		123.938	123.359
Normalized	15.67%	51.4%	30.69%	35.96%	42.39%	42.25%	79.59%		99.53%	100%
Standard Deviation	0.4%	0.3%	3.4%	0.1%	1.5%	1%	3.4%		2.3%	1.6%
FLAC Audio Encoding - WAV To FLAC (sec)	777.65	135.25	566.40	288.92	111.09	111.48	88.39	28.511	64.599	70.212
Normalized	3.67%	21.08%	5.03%	9.87%	25.66%	25.57%	32.26%	100%	44.14%	40.61%
Standard Deviation	0.9%	3.4%	0.3%	0.7%	3.1%	0.7%	1.2%	1.6%	1.6%	1.2%
LAME MP3 Encoding - WAV To MP3 (sec)	659	162	518	295	125	125	102	64.589	85.653	93.100
Normalized	9.8%	39.87%	12.47%	21.89%	51.67%	51.67%	63.32%	100%	75.41%	69.38%
Standard Deviation	2.4%	0.6%	0%	0.2%	0.1%	0.1%	0.2%	0%	0.1%	0.1%
Perl Benchmarks - Pod2html (sec)	2.565112 78	0.782542 68	2.572732 50	1.316597 61	0.612074 02	0.621362 99	0.431880 60	0.320726 32	0.349866 70	0.378046 94
Normalized	12.5%	40.99%	12.47%	24.36%	52.4%	51.62%	74.26%	100%	91.67%	84.84%
Standard Deviation	5.2%	2%	0.6%	2%	0.8%	1.3%	0.6%	0.2%	0.1%	0.4%
Perl Benchmarks - Interpreter (sec)	0.031736 53	0.012298 04	0.010916 88	0.004914 47	0.007784 05	0.008260 85	0.005326 60	0.002252 65	0.002504 65	0.002651 88
Normalized	7.1%	18.32%	20.63%	45.84%	28.94%	27.27%	42.29%	100%	89.94%	84.95%
Standard Deviation	3.5%	0.4%	0.3%	0.5%	5.6%	6.9%	0.7%	0.3%	2.9%	1.3%
PyBench - T.F.A.T.T (Milliseconds)	29609	9312	40683	13542	5249	5233	4716	2420	3819	4153
Normalized	8.17%	25.99%	5.95%	17.87%	46.1%	46.24%	51.31%	100%	63.37%	58.27%
Standard Deviation	0.5%	0.5%	0.8%	0.2%	0.2%	0.3%	0.2%	0.2%	0.1%	0.4%
NGINX Benchmark - S.W.P.S	2012	3880			4746	5105		9898		
Normalized	20.33%	39.2%			47.95%	51.58%		100%		
Standard Deviation	0.7%	1.6%			3.1%	0.1%		0.2%		

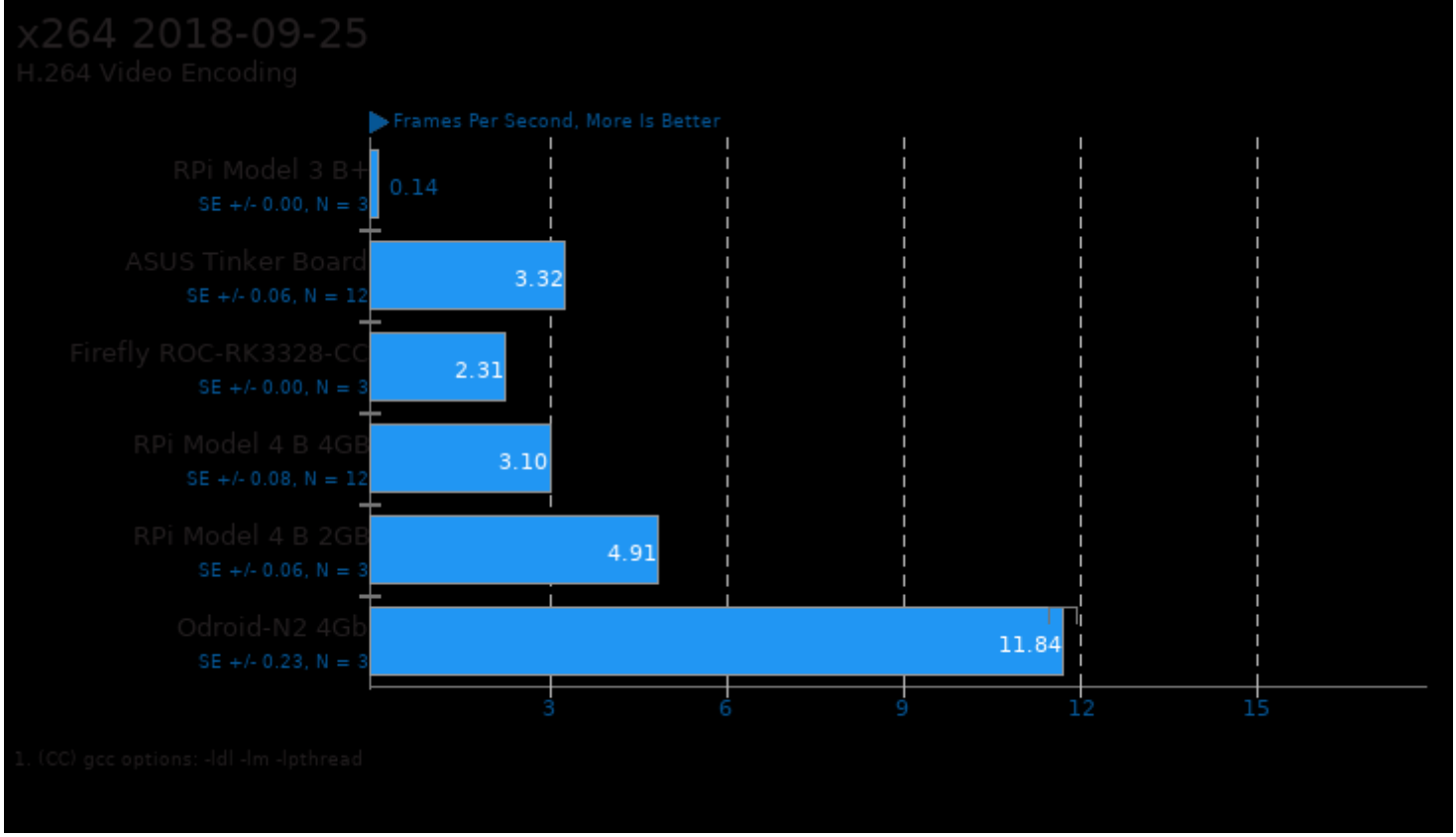
Raspberry Pi Model 4 Benchmarks

PHPBench - P.B.S (Score)	20275	59450	21345	54131	101564	100678	145691	261649	178875	165181
Normalized	7.75%	22.72%	8.16%	20.69%	38.82%	38.48%	55.68%	100%	68.36%	63.13%
Standard Deviation	0.5%	3.3%	0.1%	0.2%	0.4%	0.9%	0.2%	0.2%	0.5%	1.3%
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%				
GraphicsMagick - Performance / Cost - Rotate (Iterations/min/Dollar)	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%				
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%				
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%				

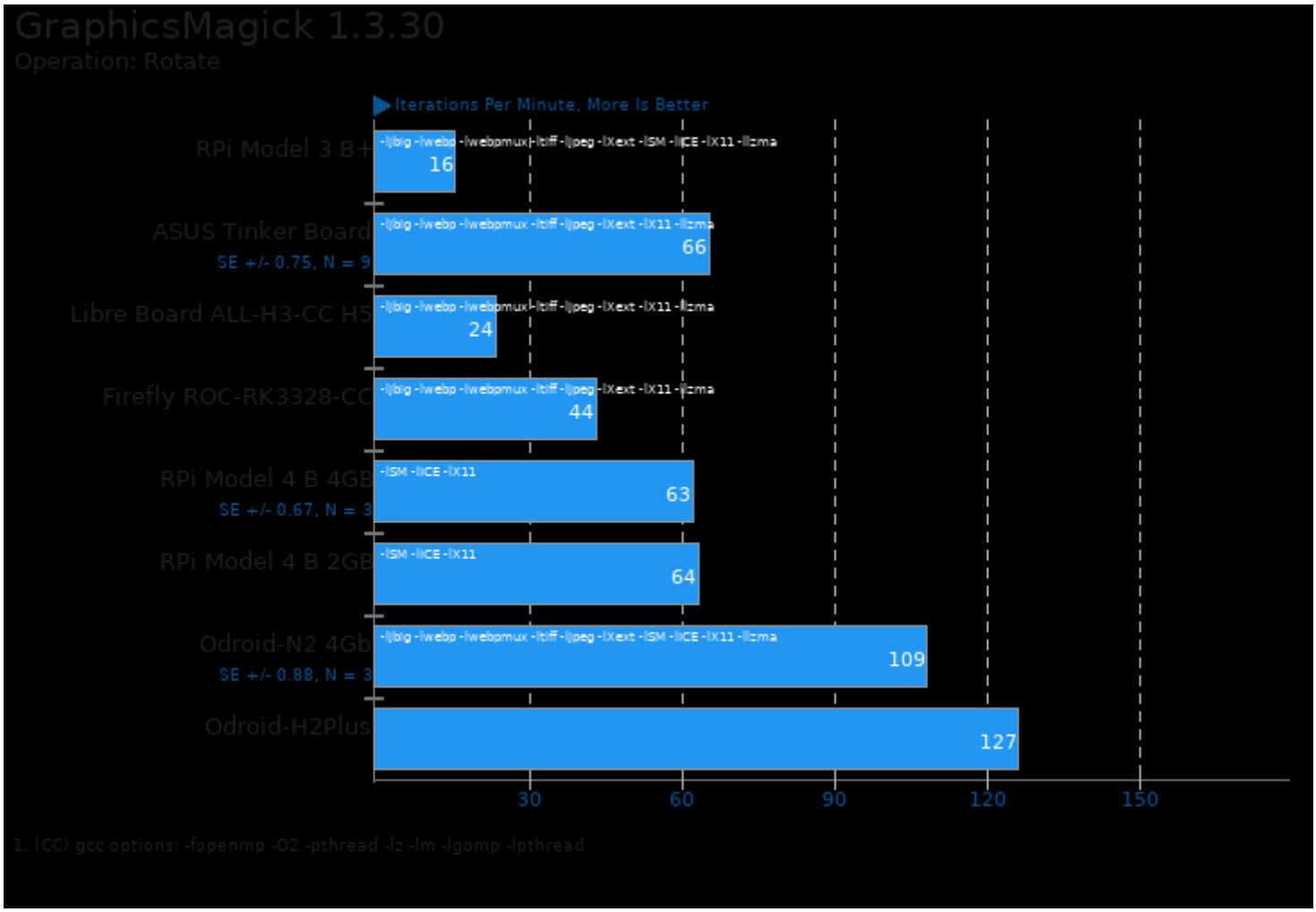
Raspberry Pi Model 4 Benchmarks

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%
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%
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 - 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%
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%

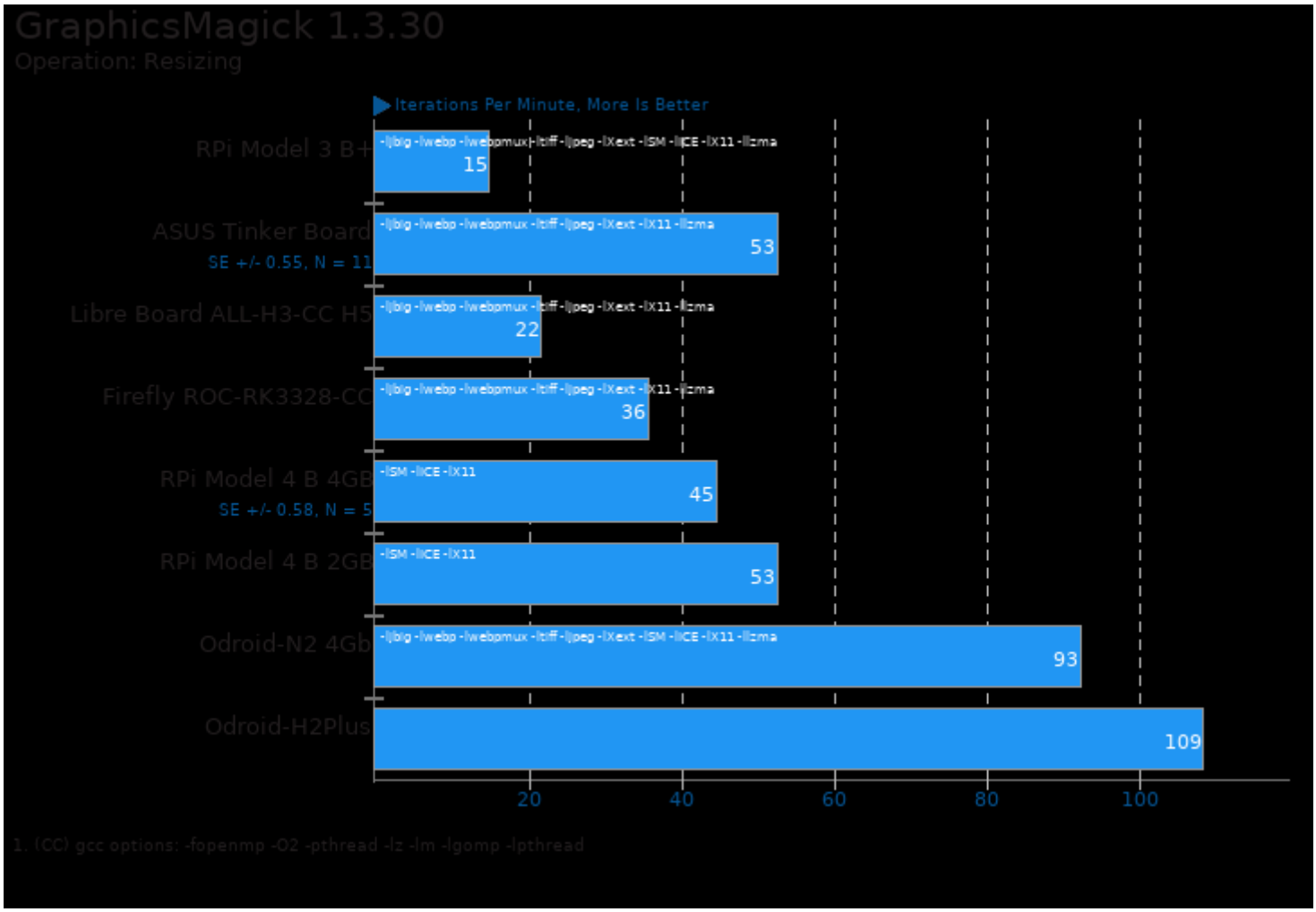

SciMark 2.0
Computational Test: Composite
Mflops, More Is Better
RPi Model 3 B+
SE +/- 0.11, N = 3
48.80
ASUS Tinker Board
SE +/- 0.06, N = 3
141.72
Libre Board ALL-H3-CC H5
SE +/- 0.02, N = 3
28.76
Firefly ROC-RK3328-CC
SE +/- 0.01, N = 3
51.13
RPi Model 4 B 4GB
SE +/- 1.27, N = 3
142.17
RPi Model 4 B 2GB
SE +/- 0.87, N = 3
143.02
Odroid-N2 4Gb
SE +/- 0.16, N = 3
193.95
Odroid-H2Plus
SE +/- 0.47, N = 3
230.97
OdroidN2+
SE +/- 0.12, N = 3
229.94
OdroidN2+2208
SE +/- 0.05, N = 3
213.24
50
100
150
200
250
1. (CC) gcc options: -lm


x264 2018-09-25
H.264 Video Encoding
Frames Per Second, More Is Better
RPi Model 3 B+
SE +/- 0.00, N = 3
0.14
ASUS Tinker Board
SE +/- 0.06, N = 12
3.32
Firefly ROC-RK3328-CC
SE +/- 0.00, N = 3
2.31
RPi Model 4 B 4GB
SE +/- 0.08, N = 12
3.10
RPi Model 4 B 2GB
SE +/- 0.06, N = 3
4.91
Odroid-N2 4Gb
SE +/- 0.23, N = 3
11.84
3
6
9
12
15
1. (CC) gcc options: -ldl -lm -lpthread

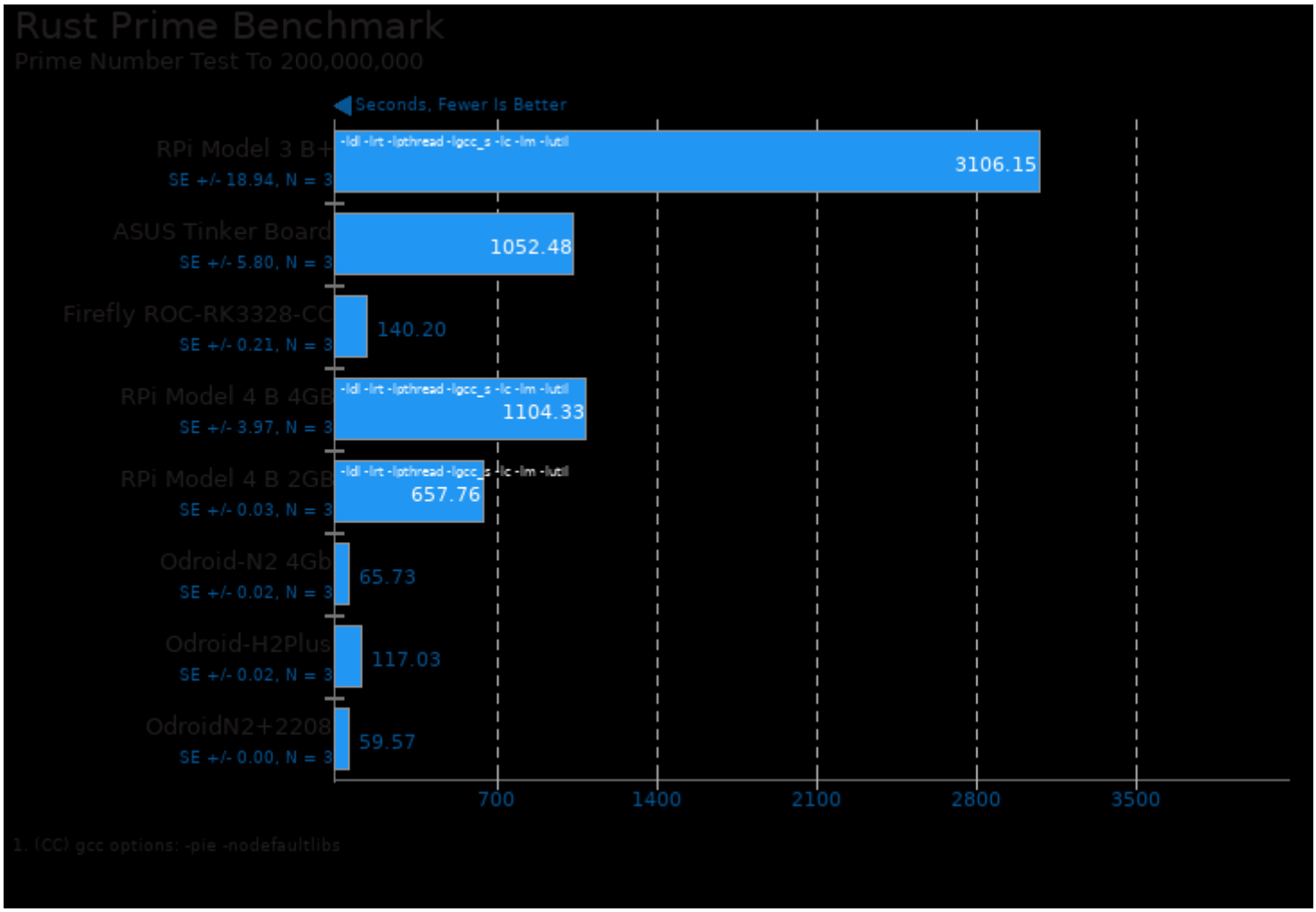
Raspberry Pi Model 4 Benchmarks



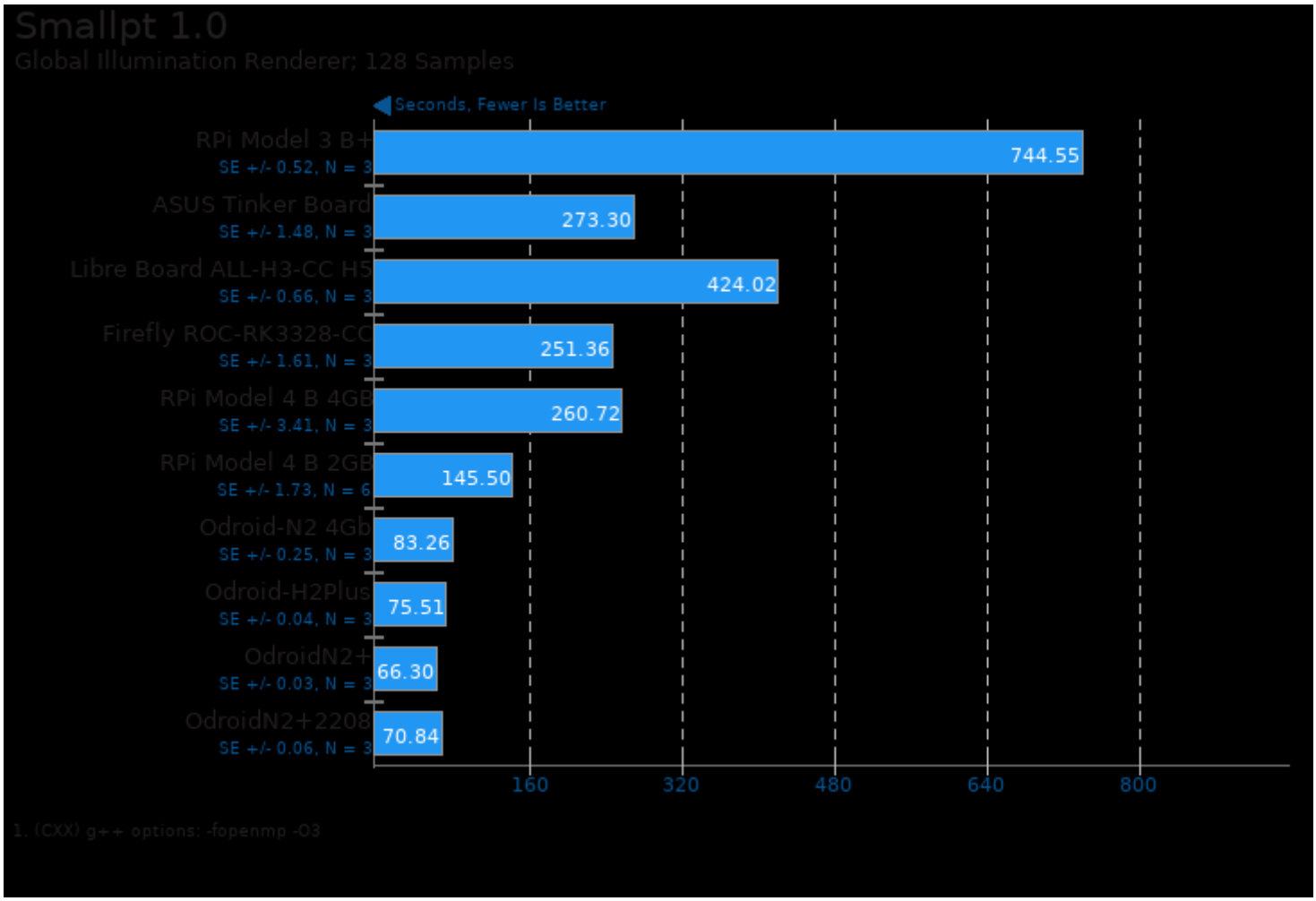
Raspberry Pi Model 4 Benchmarks

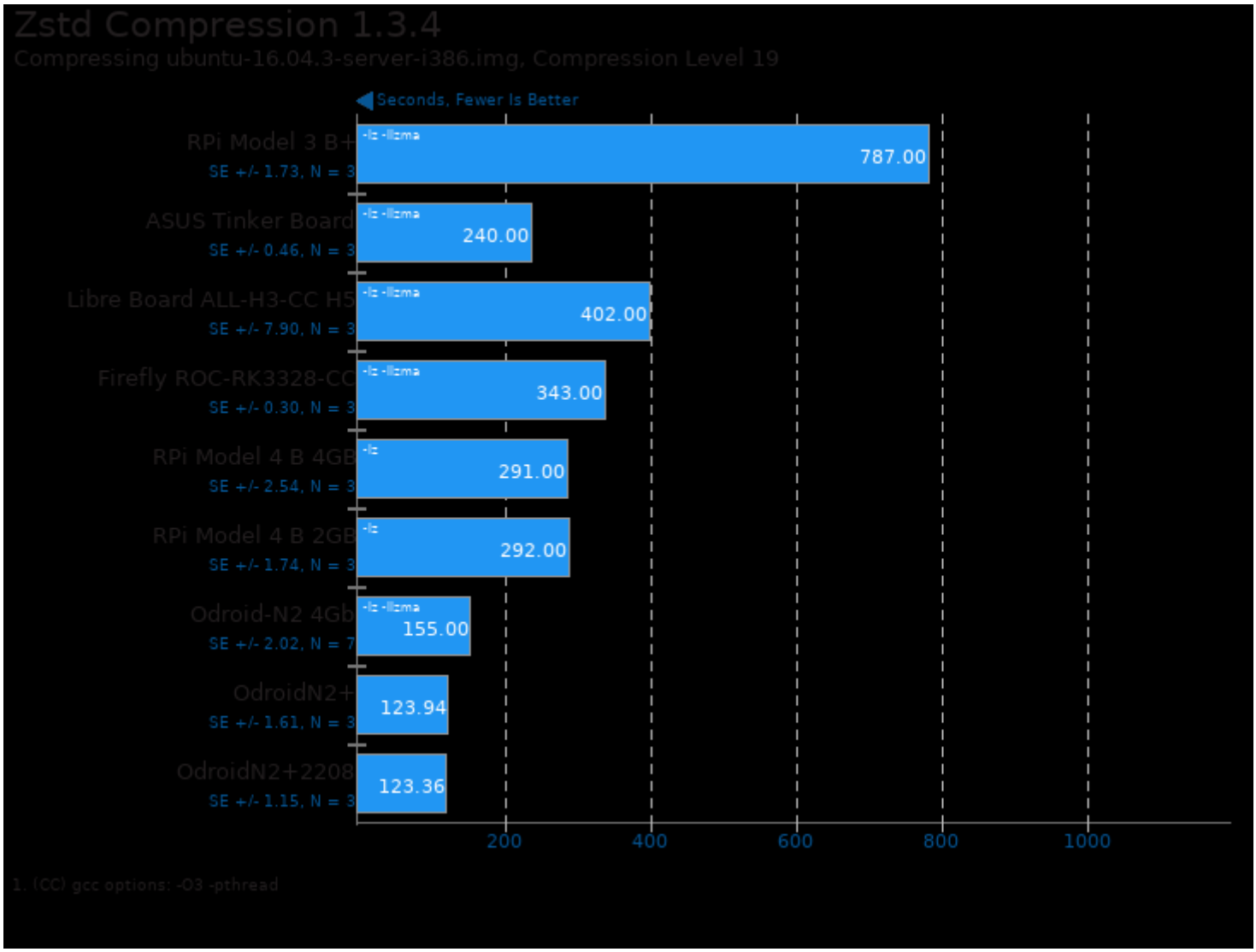


Raspberry Pi Model 4 Benchmarks

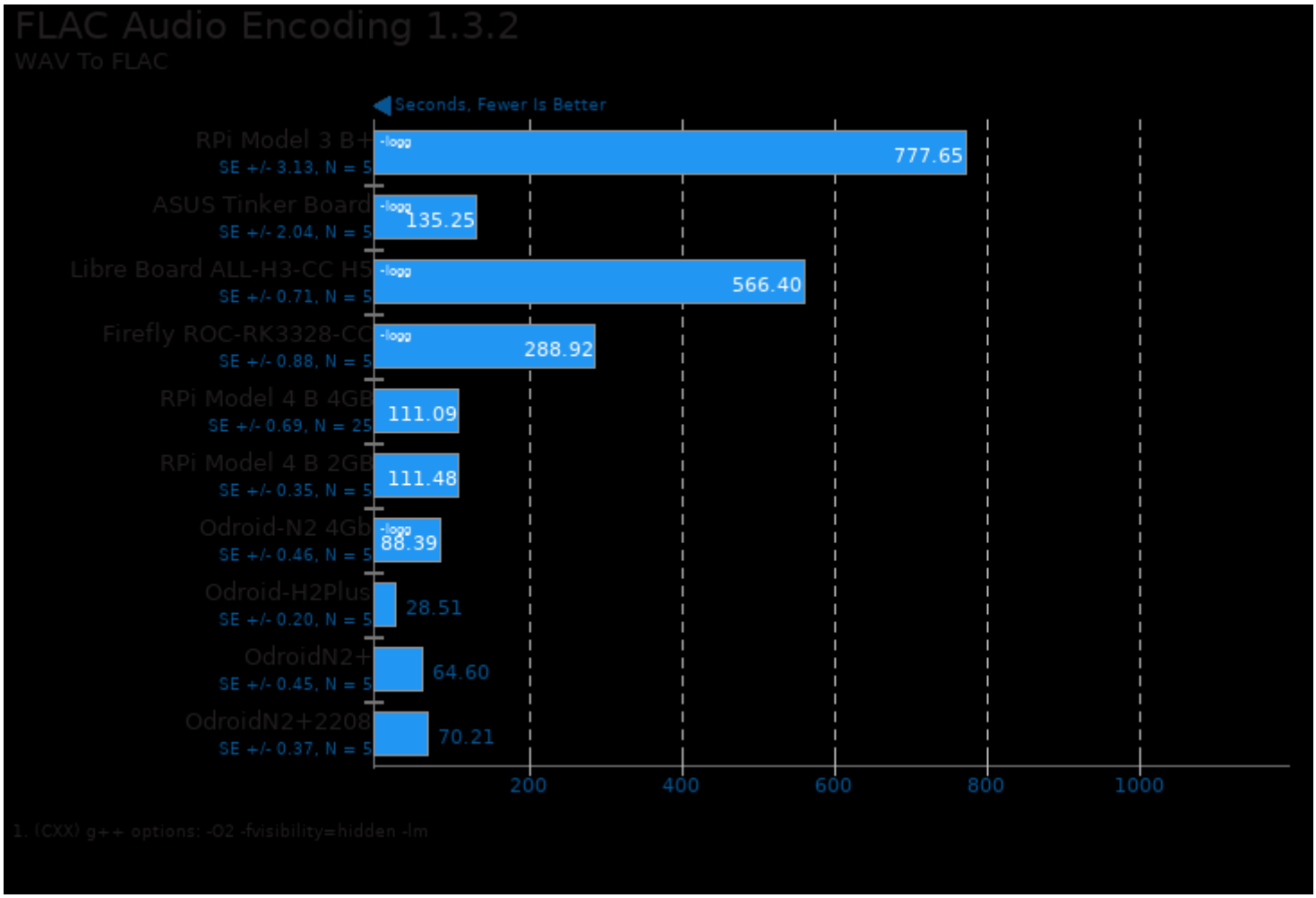


Raspberry Pi Model 4 Benchmarks

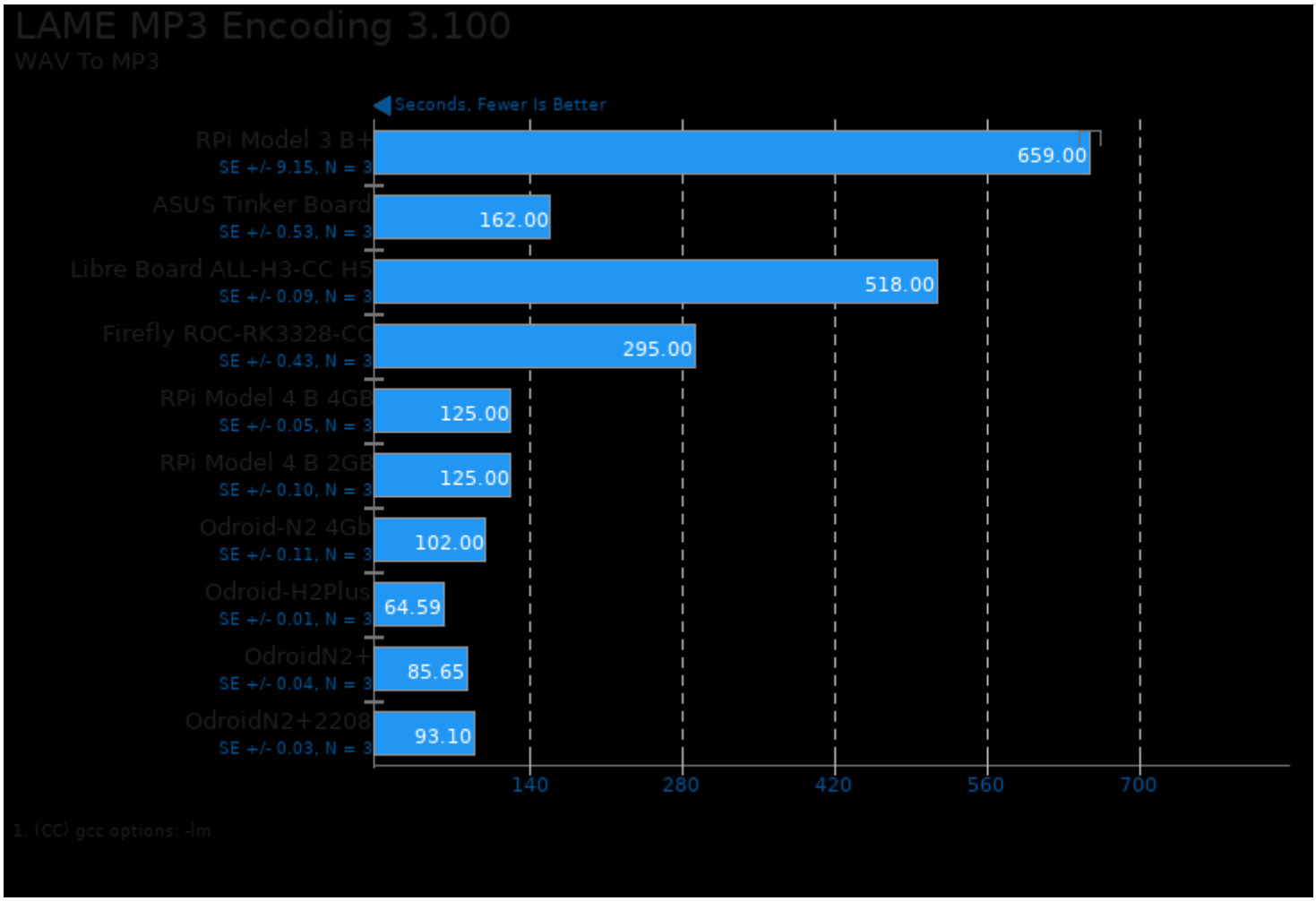



Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
RPi Model 3 B+
SE +/- 1.73, N = 3
787.00
ASUS Tinker Board
SE +/- 0.46, N = 3
240.00
Libre Board ALL-H3-CC H5
SE +/- 7.90, N = 3
402.00
Firefly ROC-RK3328-CC
SE +/- 0.30, N = 3
343.00
RPi Model 4 B 4GB
SE +/- 2.54, N = 3
291.00
RPi Model 4 B 2GB
SE +/- 1.74, N = 3
292.00
Odroid-N2 4Gb
SE +/- 2.02, N = 7
155.00
OdroidN2+
SE +/- 1.61, N = 3
123.94
OdroidN2+2208
SE +/- 1.15, N = 3
123.36
200
400
600
800
1000
1. (CC) gcc options: -O3 -pthread

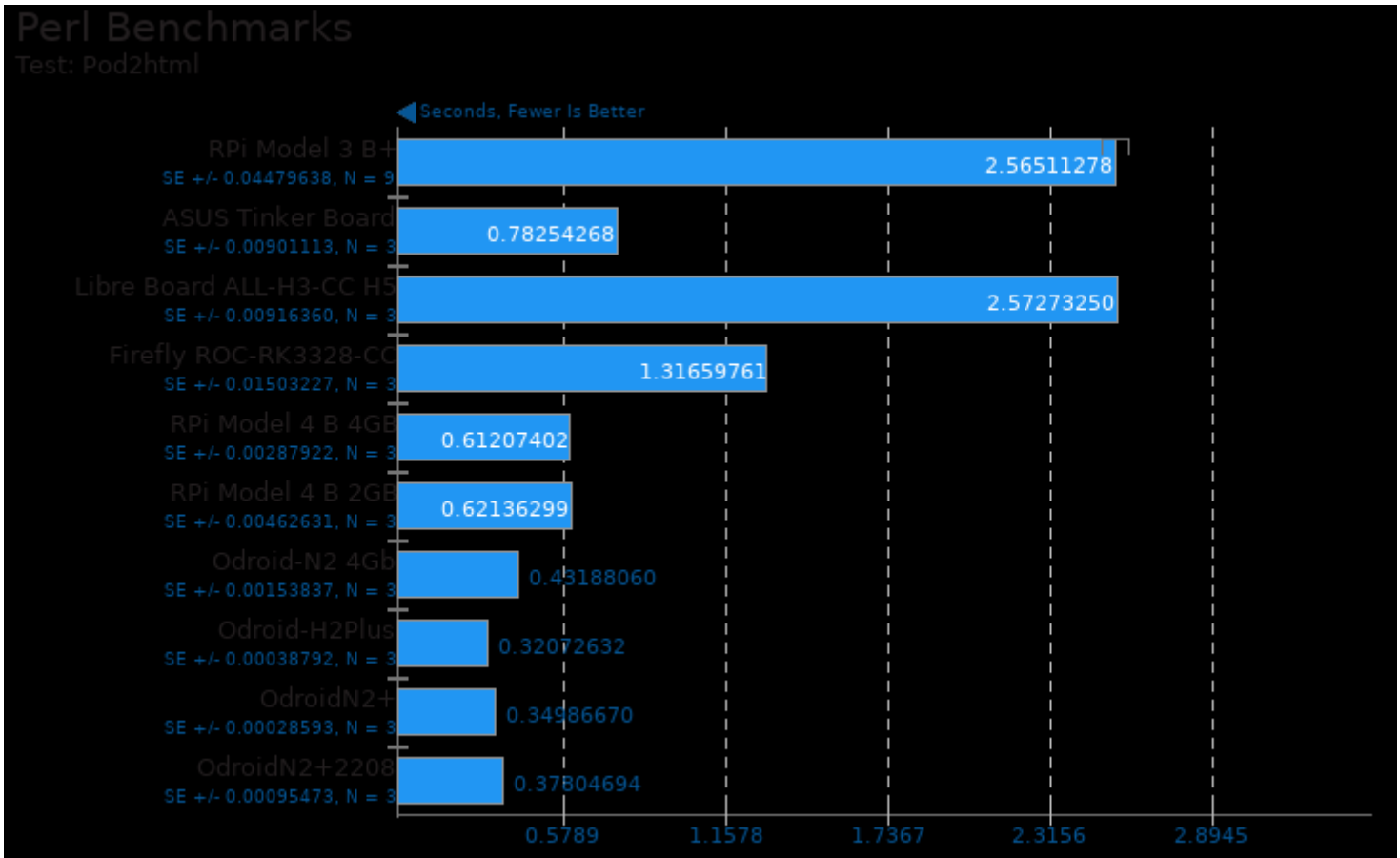
Raspberry Pi Model 4 Benchmarks

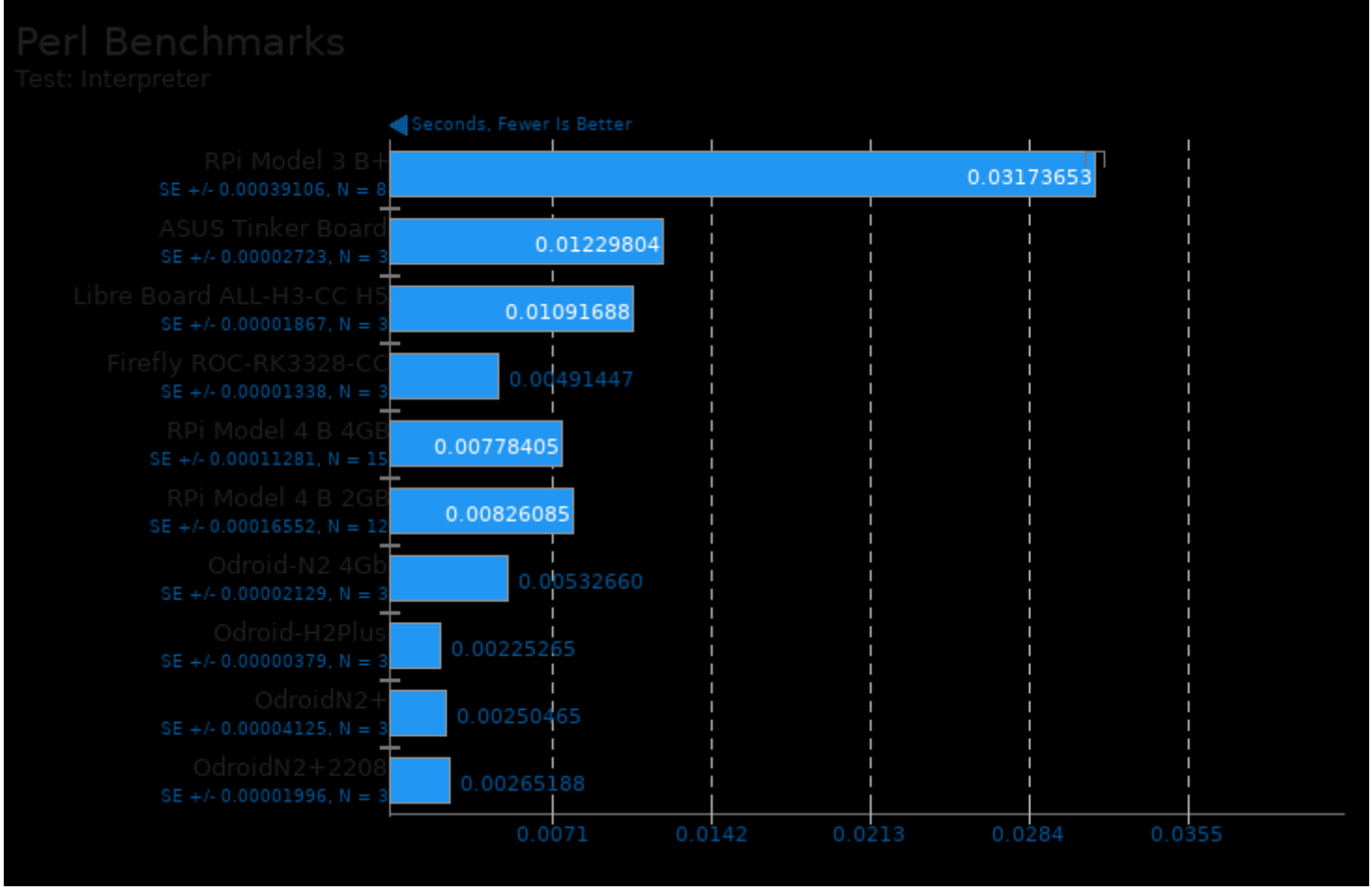


Raspberry Pi Model 4 Benchmarks

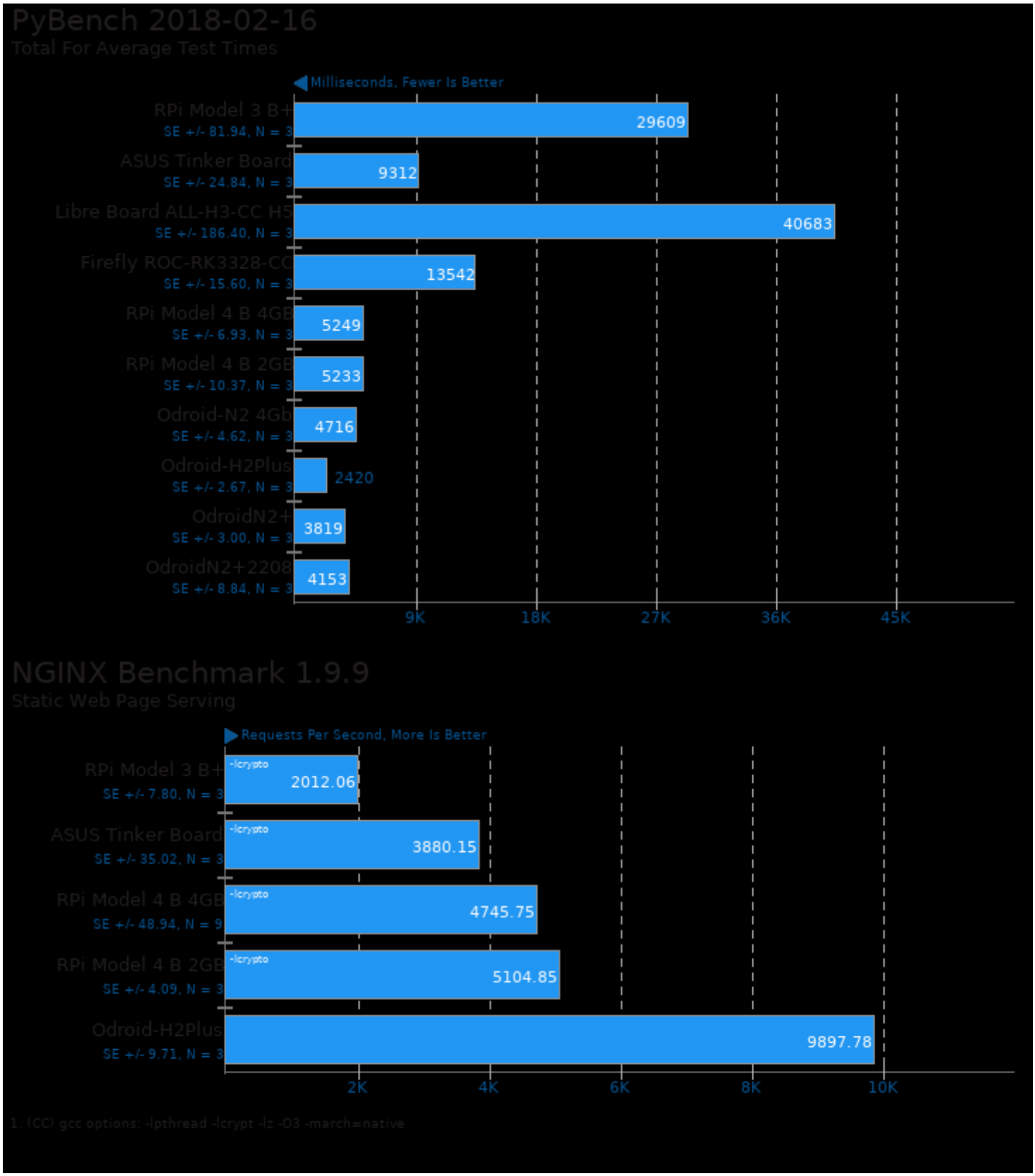


Raspberry Pi Model 4 Benchmarks

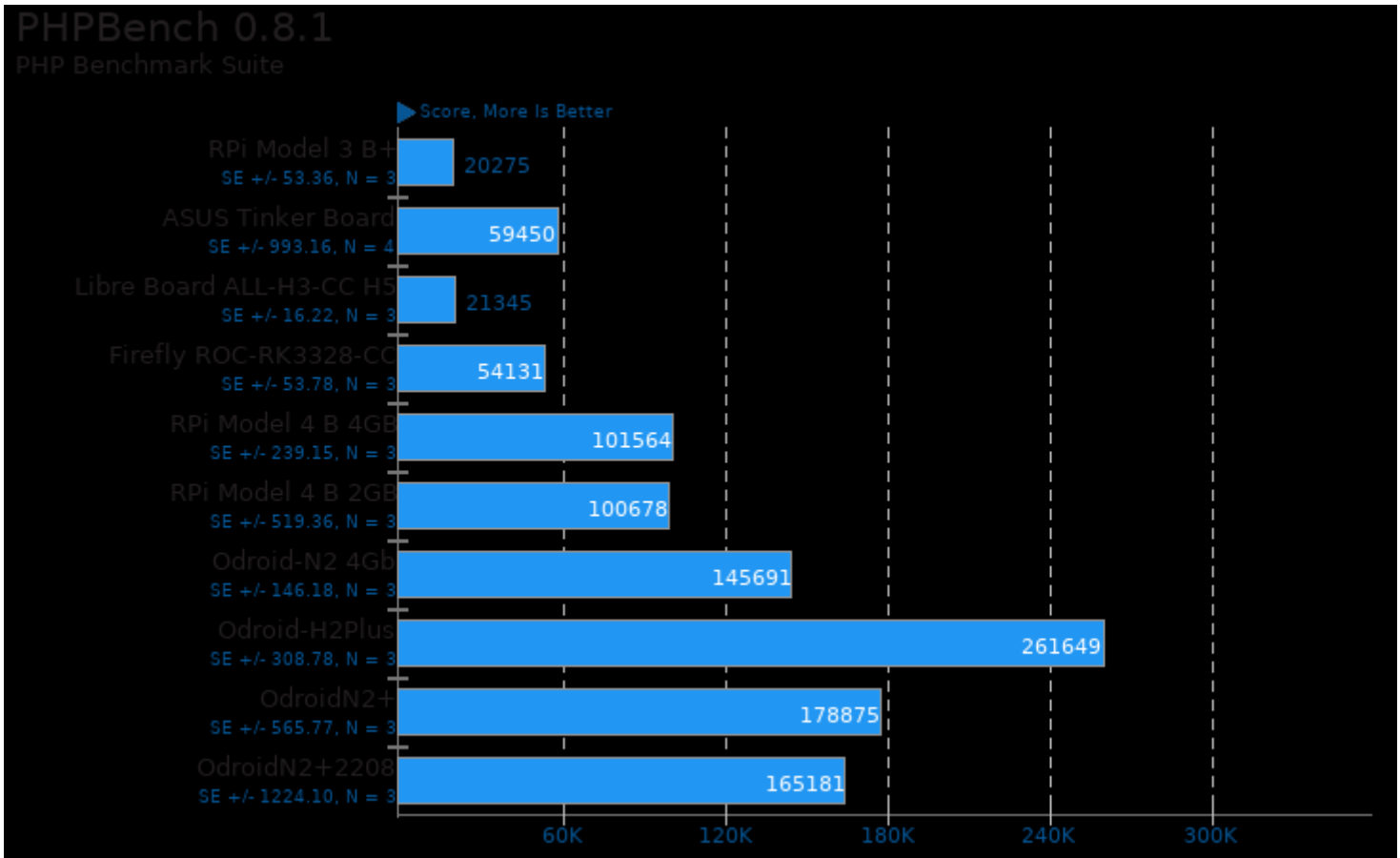


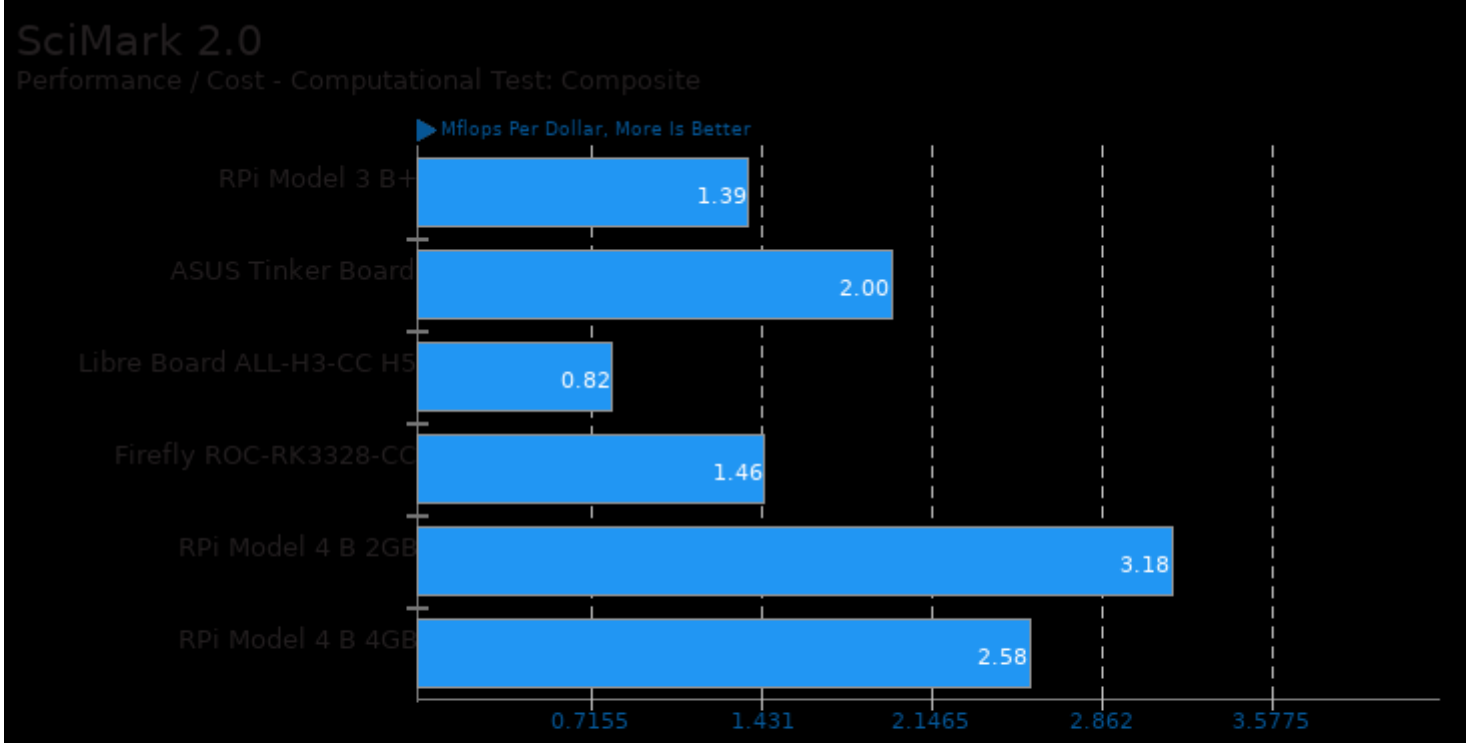


Raspberry Pi Model 4 Benchmarks

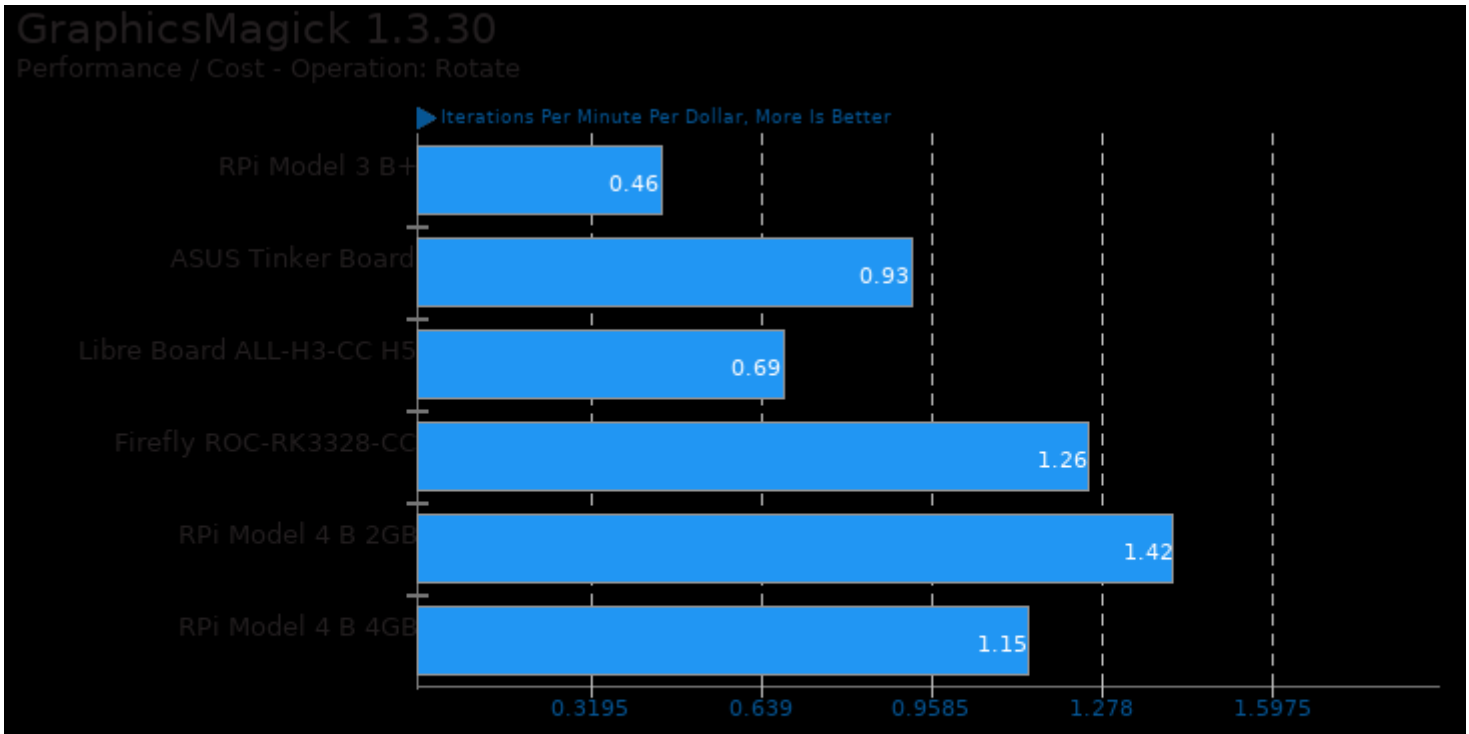


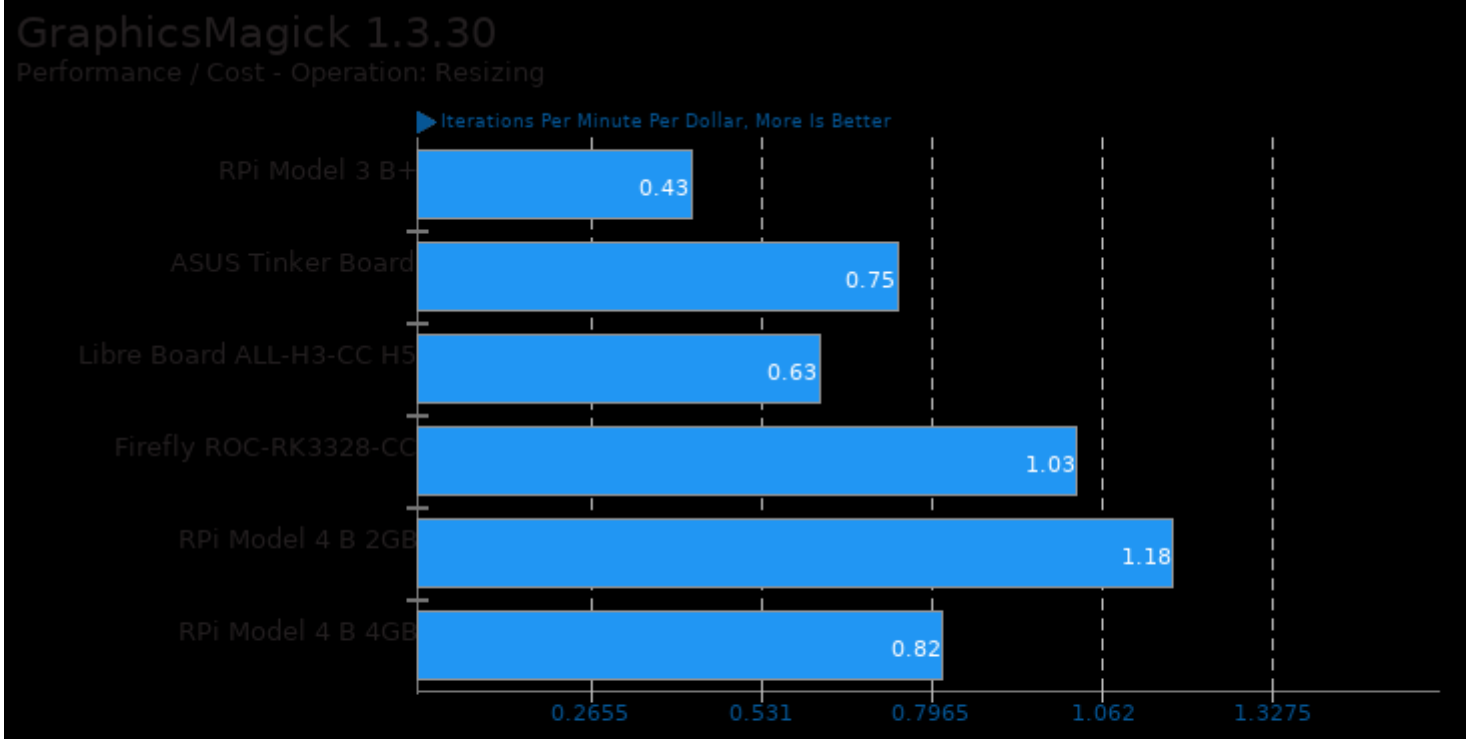
Raspberry Pi Model 4 Benchmarks





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

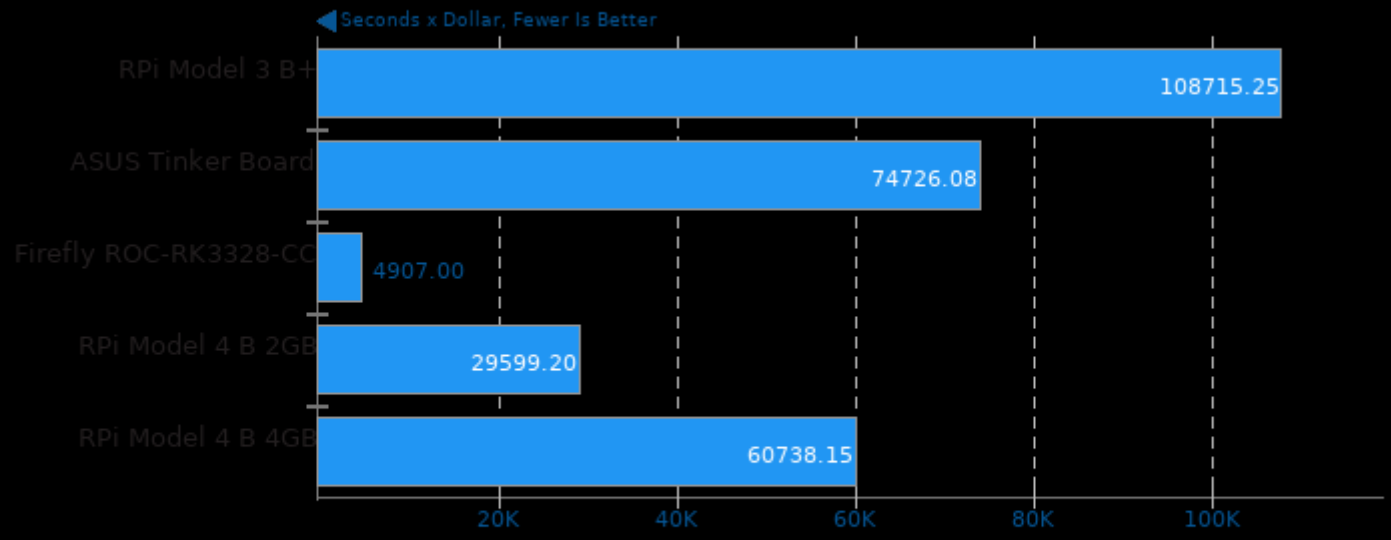

GraphicsMagick 1.3.30
Performance / Cost - Operation: Rotate
Iterations Per Minute Per Dollar, More Is Better
RPi Model 3 B+
0.46
ASUS Tinker Board
0.93
Libre Board ALL-H3-CC H5
0.69
Firefly ROC-RK3328-CC
1.26
RPi Model 4 B 2GB
1.42
RPi Model 4 B 4GB
1.15
0.3195
0.639
0.9585
1.278
1.5975
1. RPi Model 3 B+: $35 reported cost.
2. ASUS Tinker Board: $71 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. Firefly ROC-RK3328-CC: $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
Iterations Per Minute Per Dollar, More Is Better
RPi Model 3 B+
0.43
ASUS Tinker Board
0.75
Libre Board ALL-H3-CC H5
0.63
Firefly ROC-RK3328-CC
1.03
RPi Model 4 B 2GB
1.18
RPi Model 4 B 4GB
0.82
0.2655
0.531
0.7965
1.062
1.3275
1. RPi Model 3 B+: $35 reported cost.
2. ASUS Tinker Board: $71 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. Firefly ROC-RK3328-CC: $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

Rust Prime Benchmark

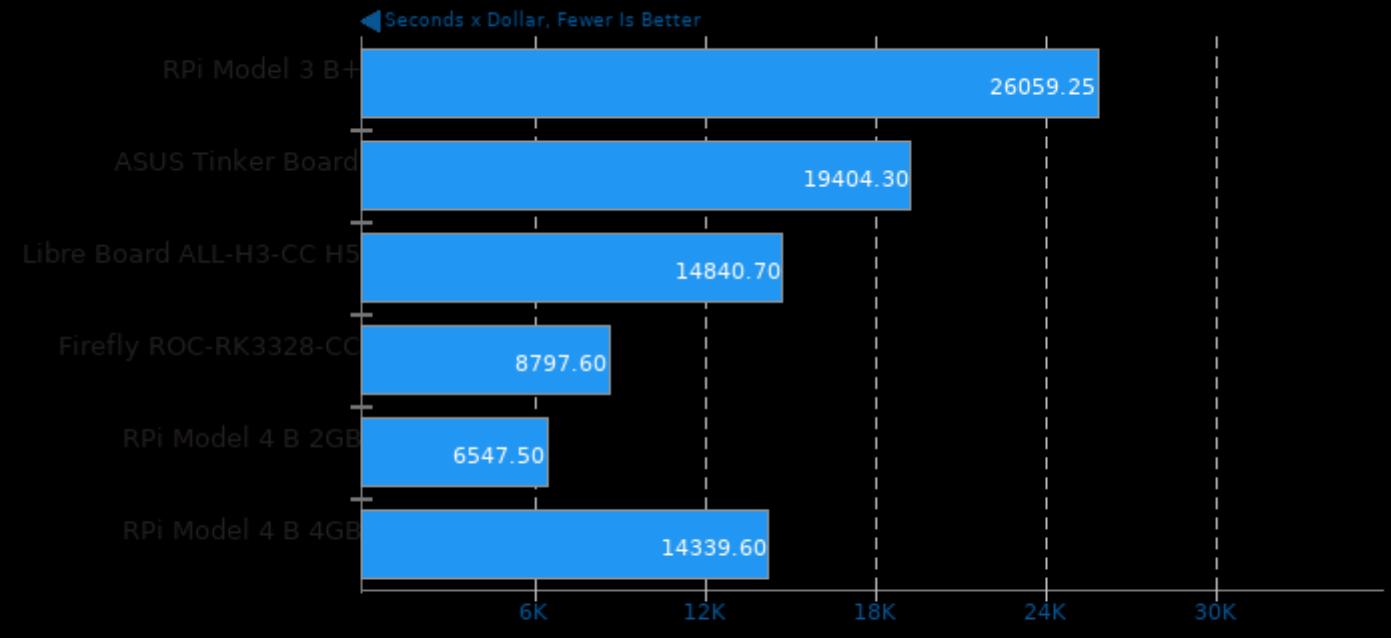
Performance / Cost - Prime Number Test To 200,000,000



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

Smallpt 1.0

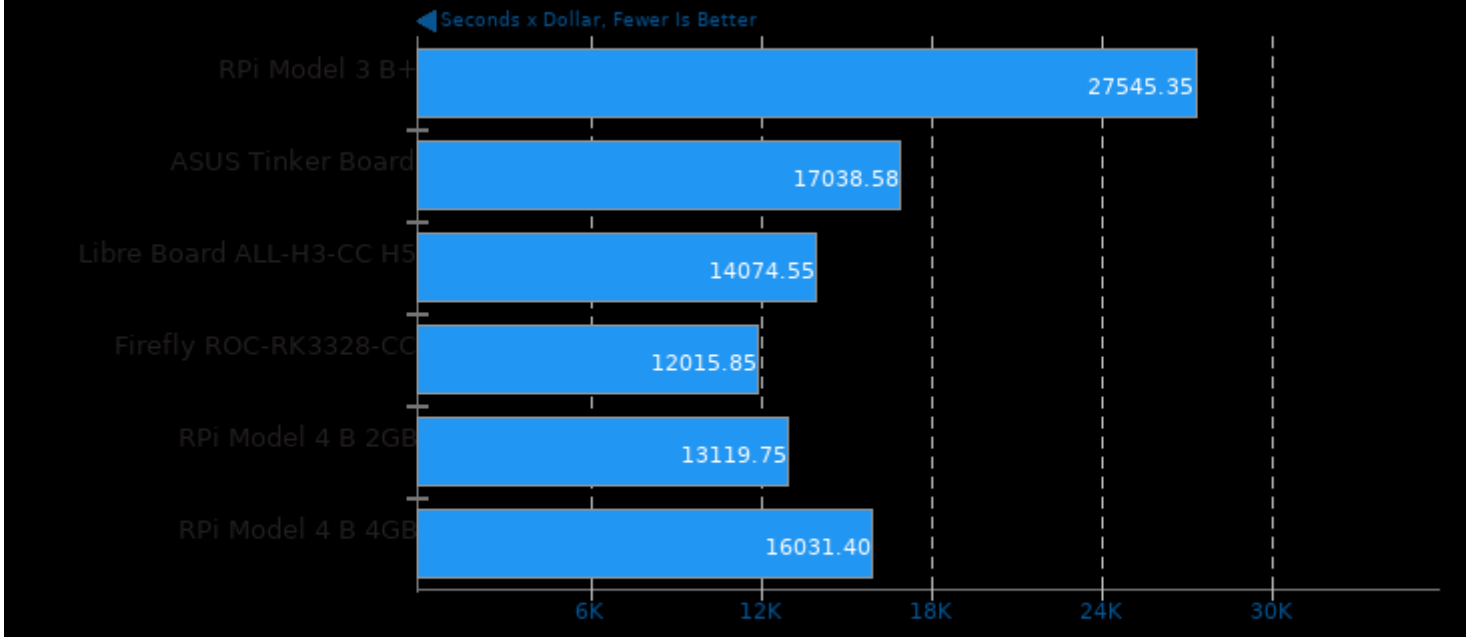
Performance / Cost - Global Illumination Renderer; 128 Samples



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

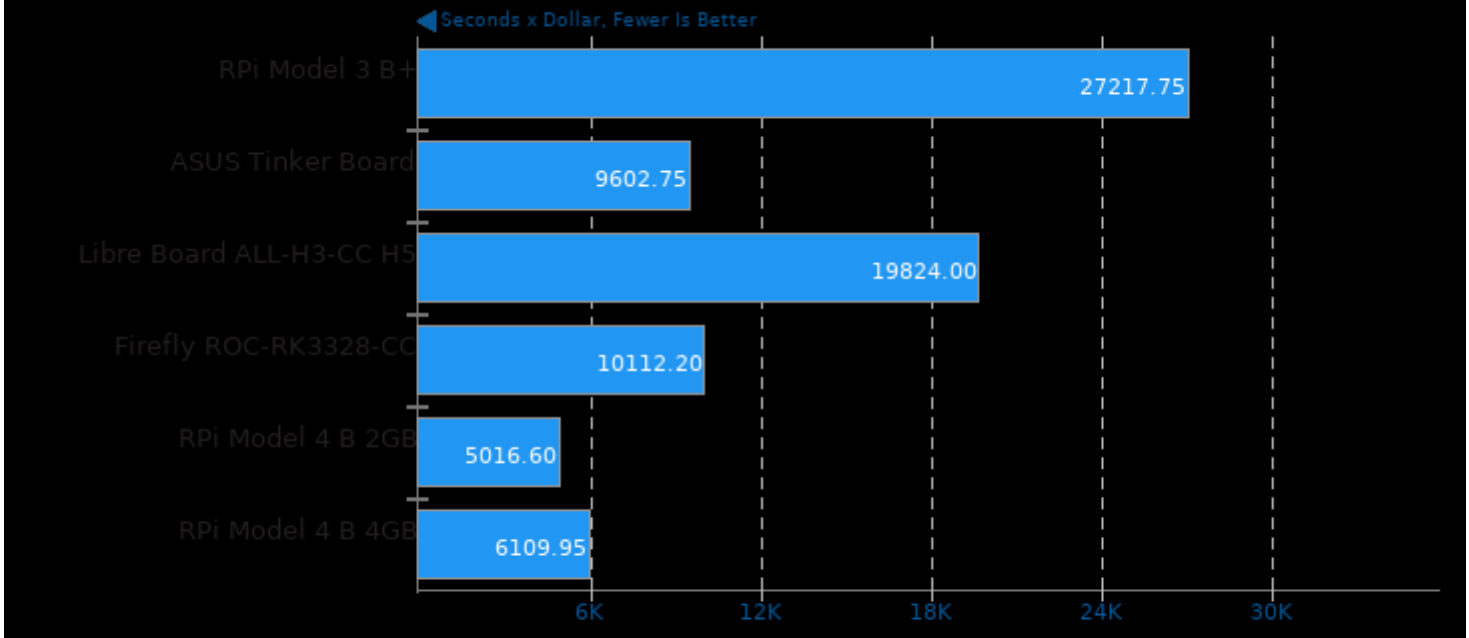
Performance / Cost - Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19



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

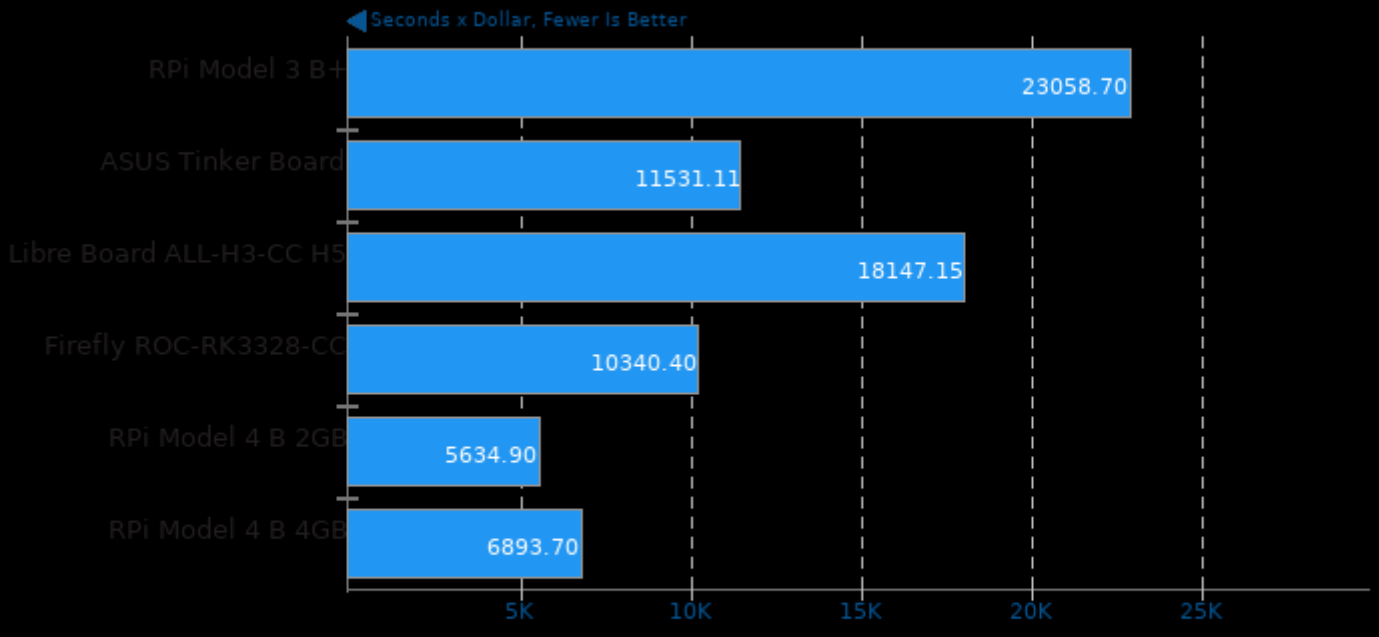
Performance / Cost - WAV To FLAC



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

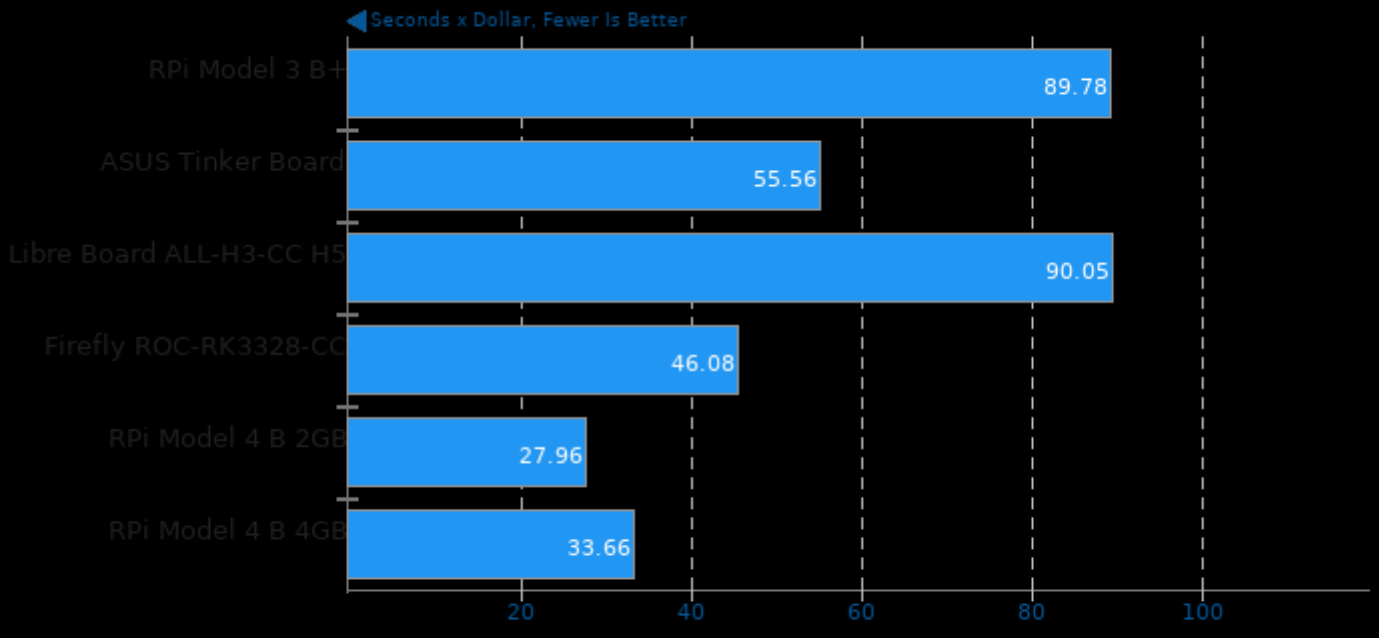
Performance / Cost - WAV To MP3



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

Perl Benchmarks

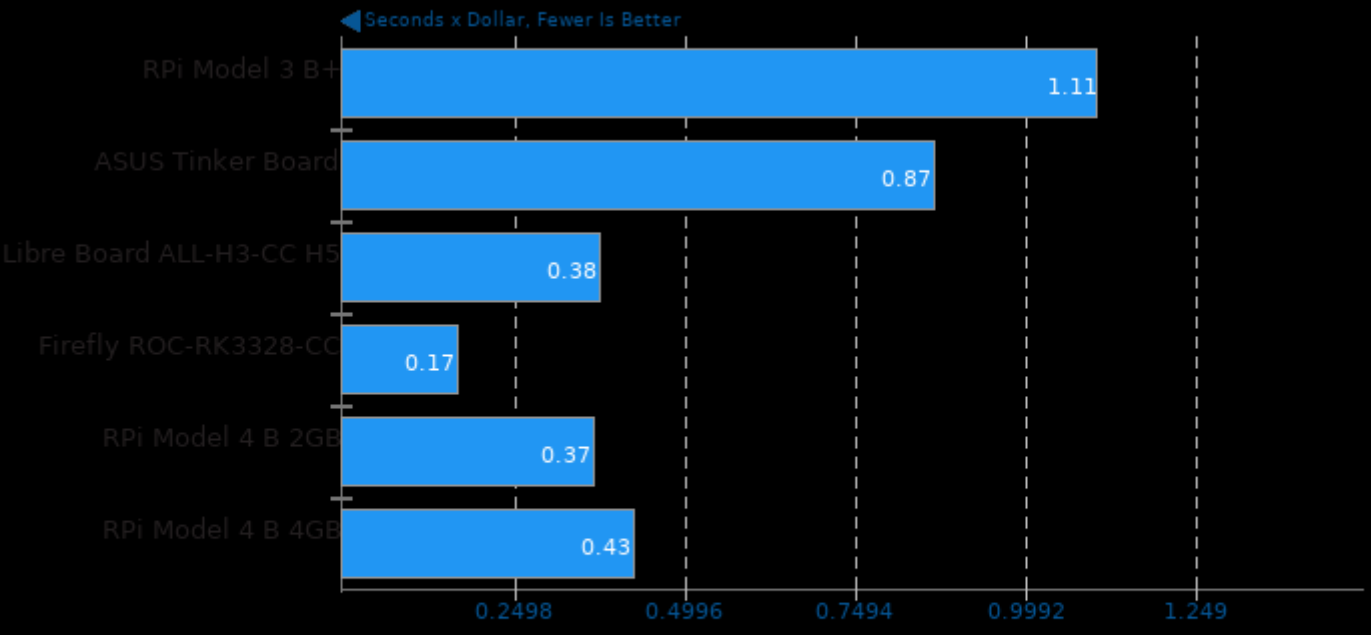
Performance / Cost - Test: Pod2html



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

Perl Benchmarks

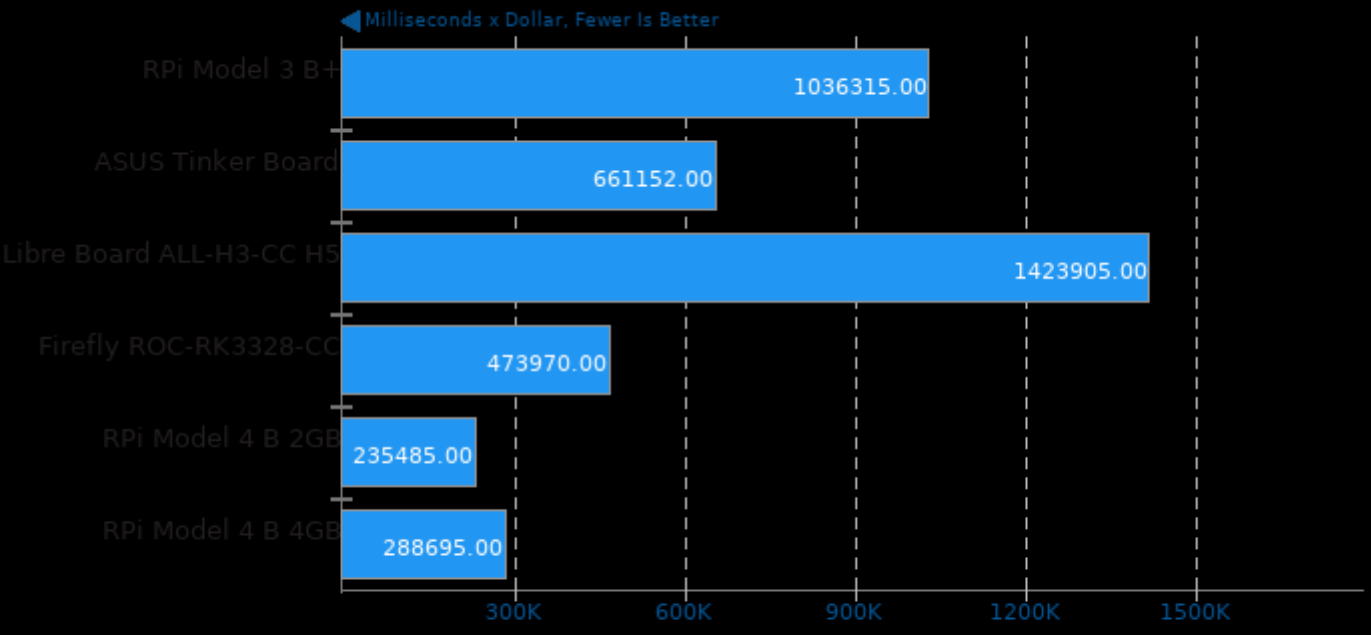
Performance / Cost - Test: Interpreter



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

PyBench 2018-02-16

Performance / Cost - Total For Average Test Times

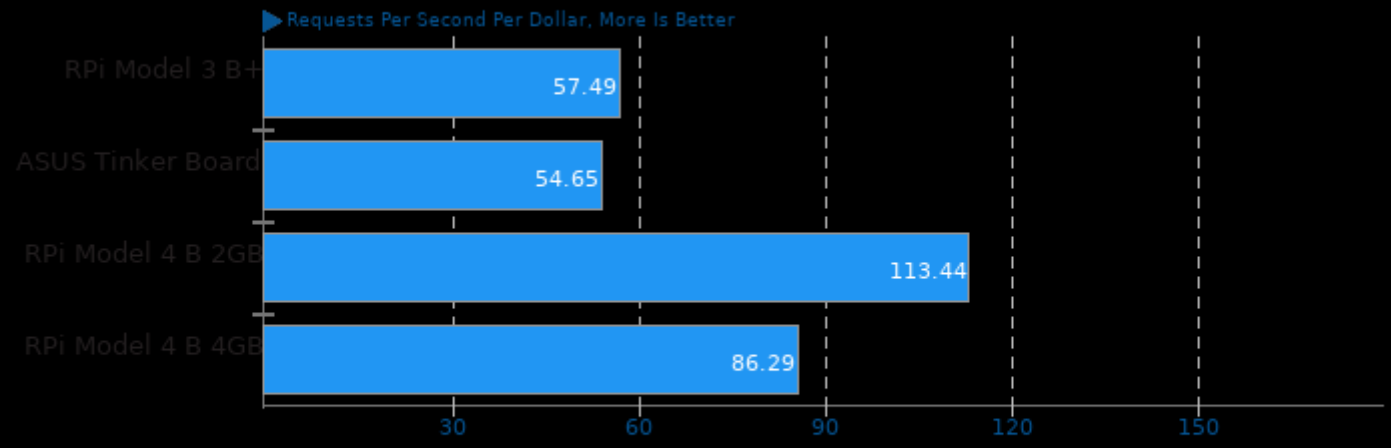


1. RPi Model 3 B+: $35 reported cost.
2. ASUS Tinker Board: $71 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Raspberry Pi Model 4 Benchmarks

NGINX Benchmark 1.9.9

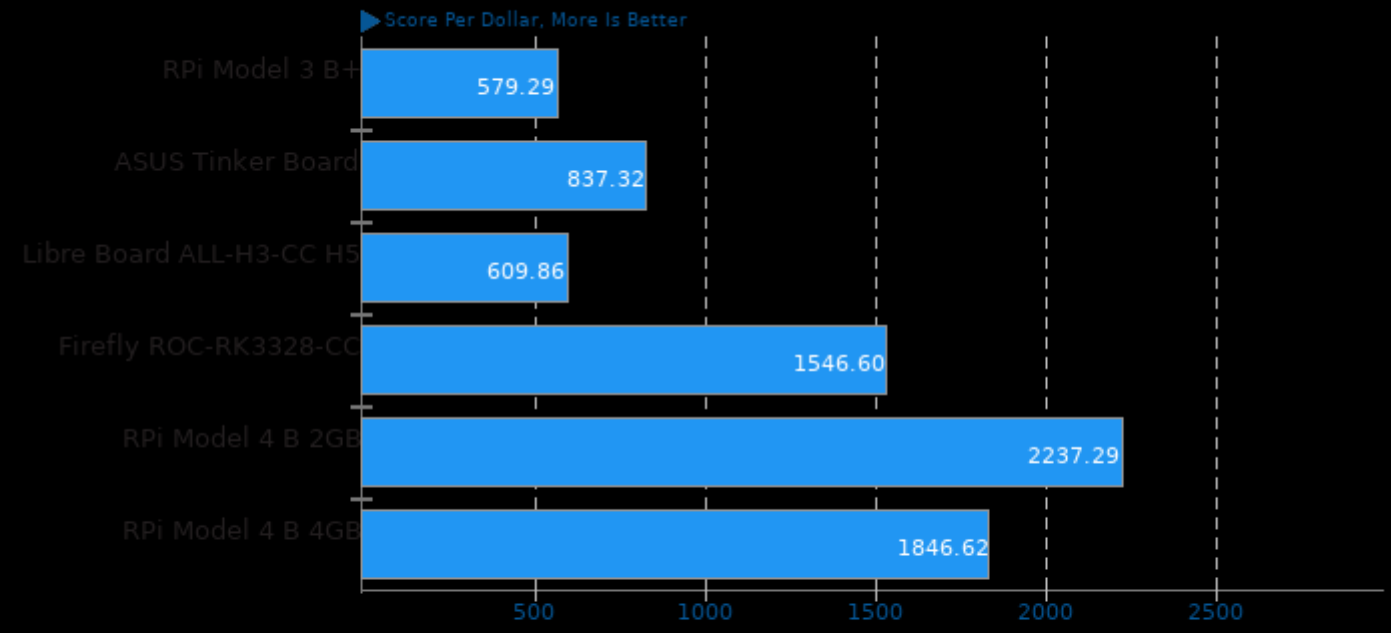
Performance / Cost - Static Web Page Serving



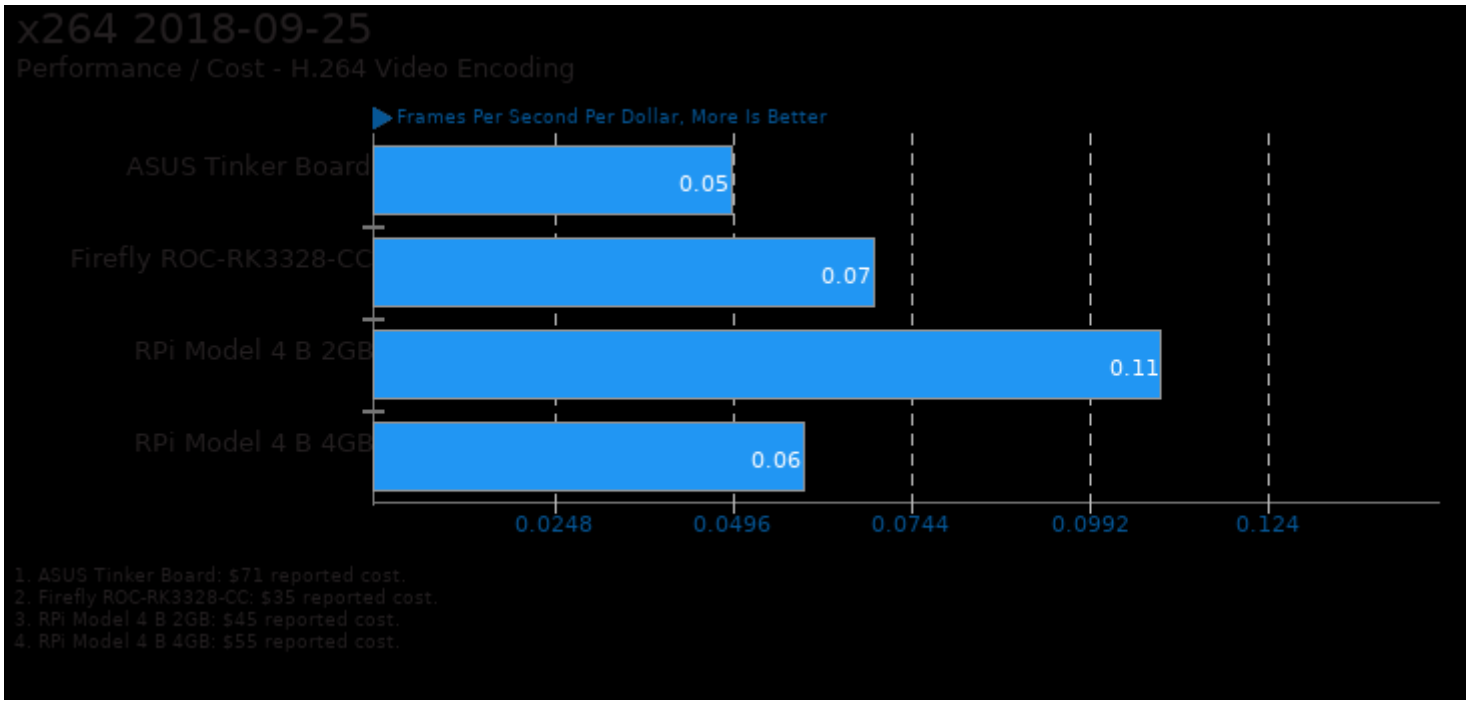
1. RPi Model 3 B+: $35 reported cost.
2. ASUS Tinker Board: $71 reported cost.
3. RPi Model 4 B 2GB: $45 reported cost.
4. RPi Model 4 B 4GB: $55 reported cost.

PHPBench 0.8.1

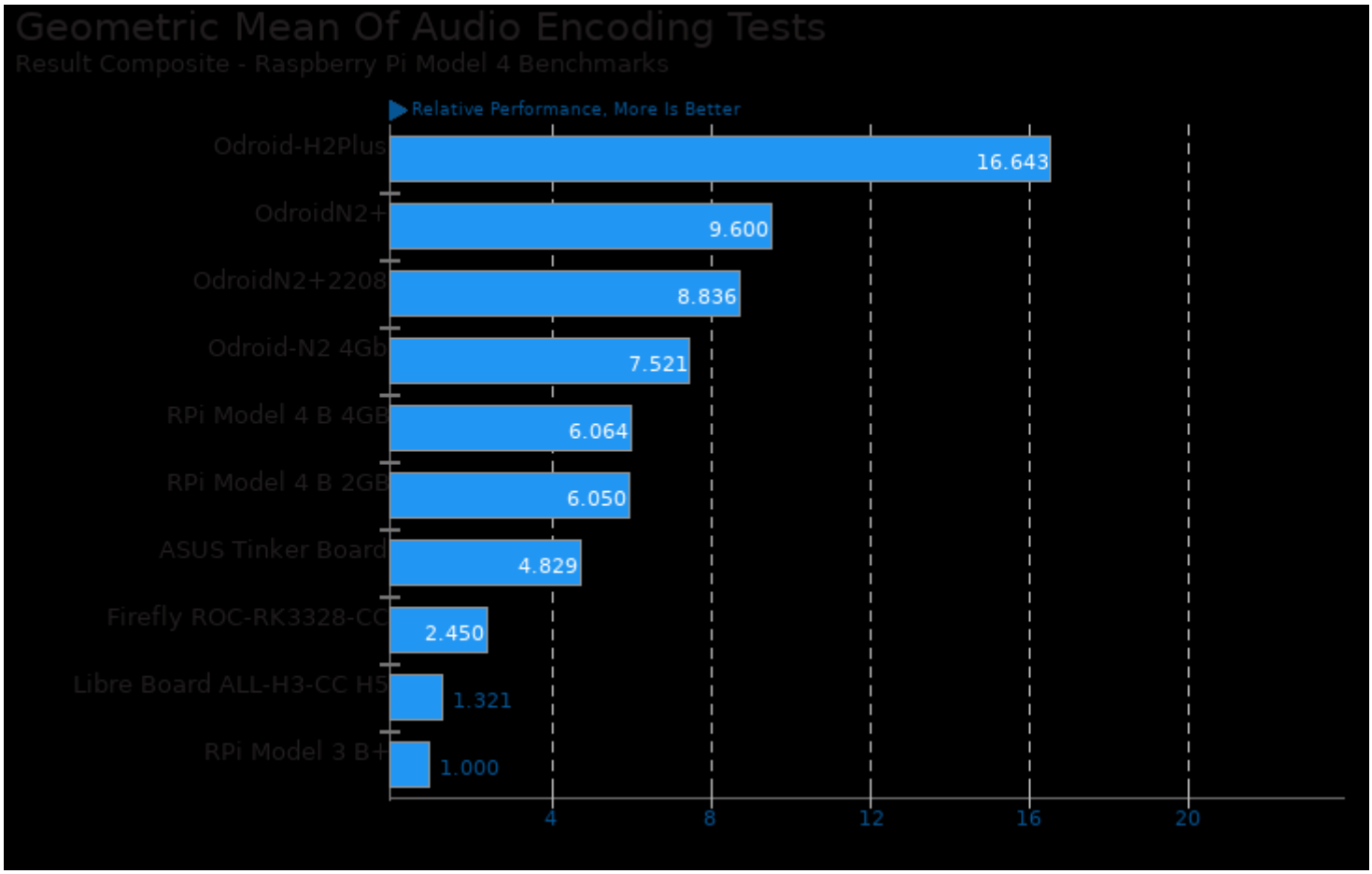
Performance / Cost - PHP Benchmark Suite



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

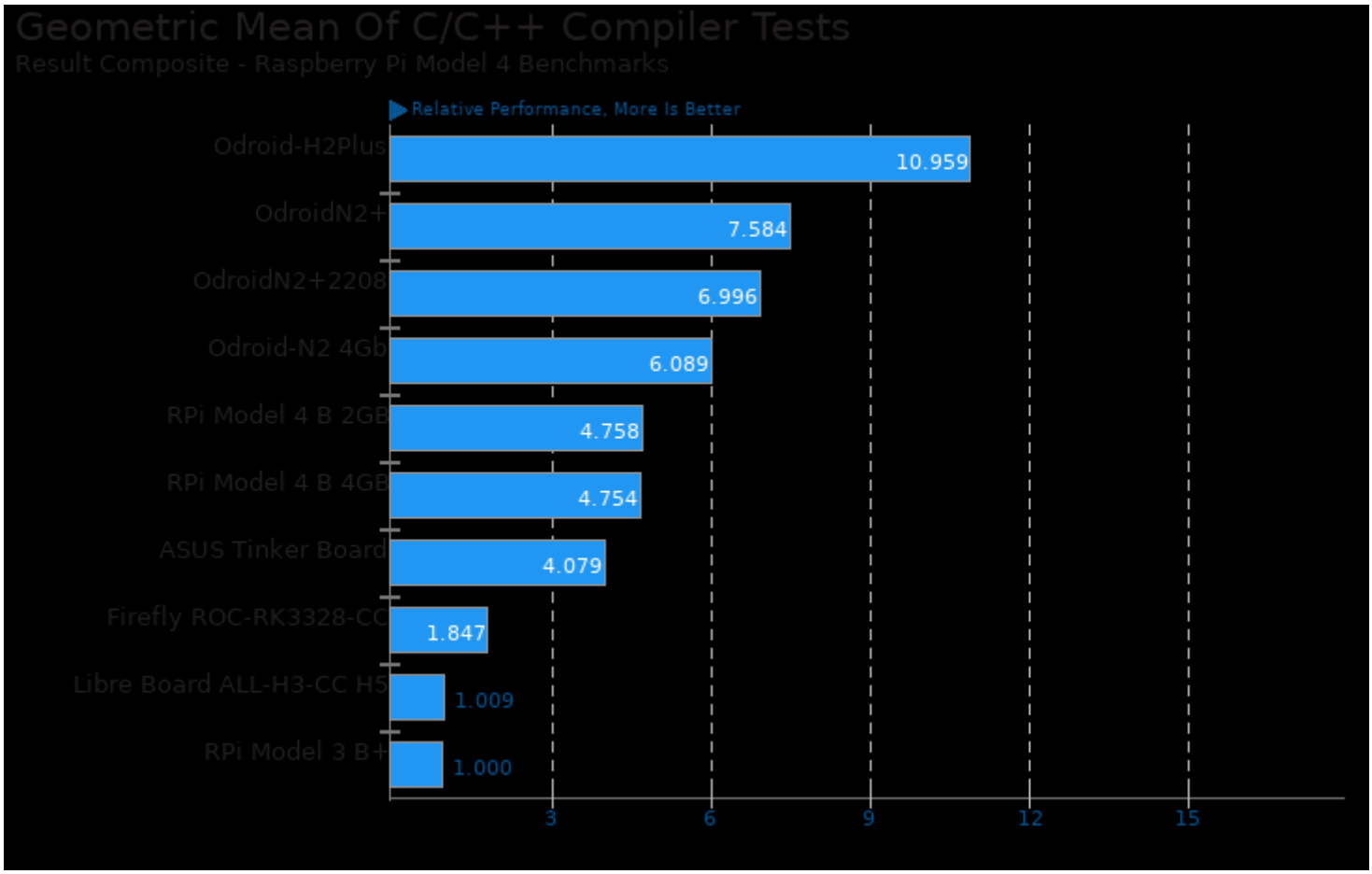

x264 2018-09-25
Performance / Cost - H.264 Video Encoding
Frames Per Second Per Dollar, More Is Better
ASUS Tinker Board
Firefly ROC-RK3328-CC
RPi Model 4 B 2GB
RPi Model 4 B 4GB
0.05
0.07
0.11
0.06
0.0248
0.0496
0.0744
0.0992
0.124
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. RPi Model 4 B 2GB: $45 reported cost.
4. RPi Model 4 B 4GB: $55 reported cost.

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

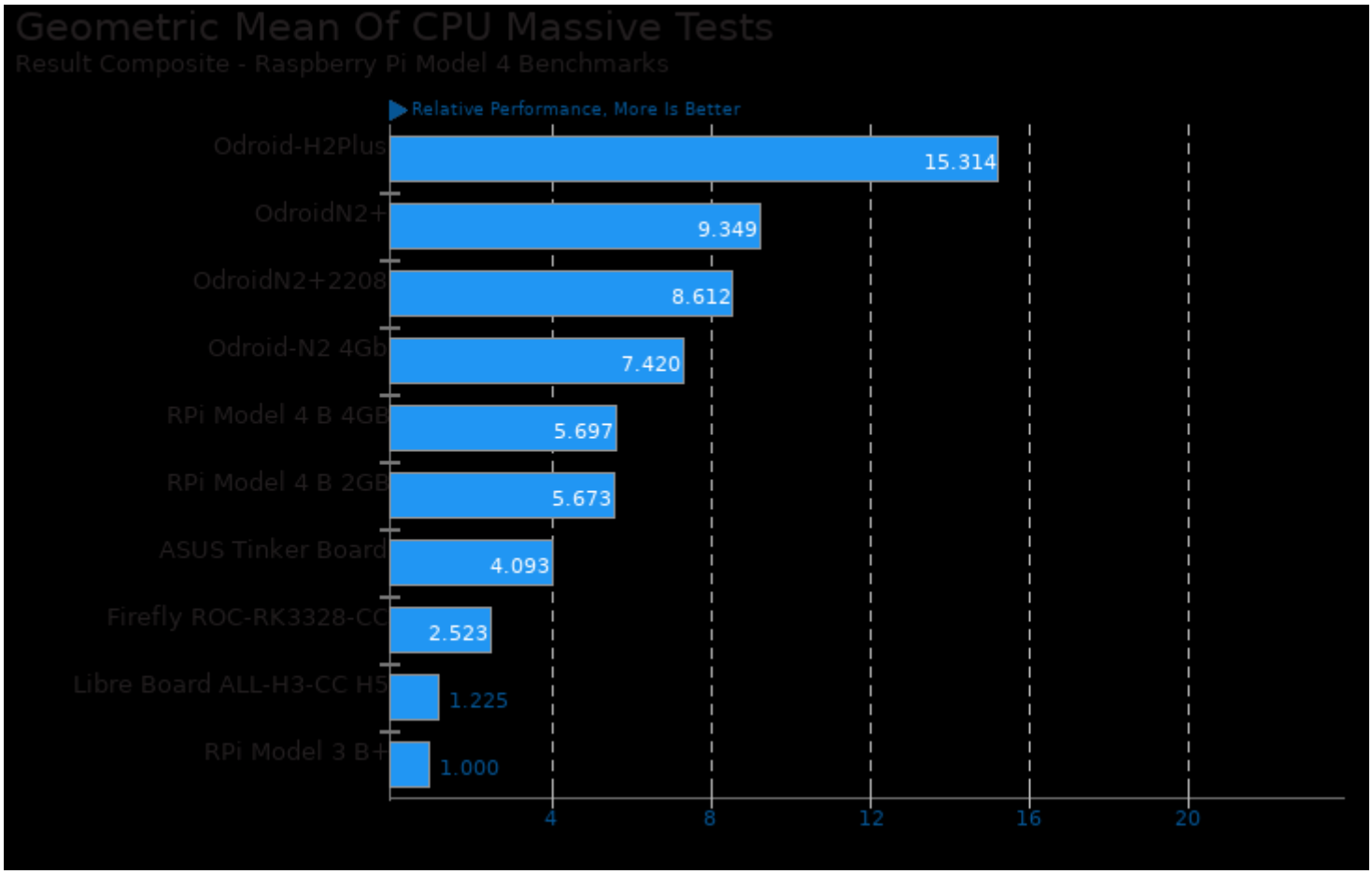


Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac

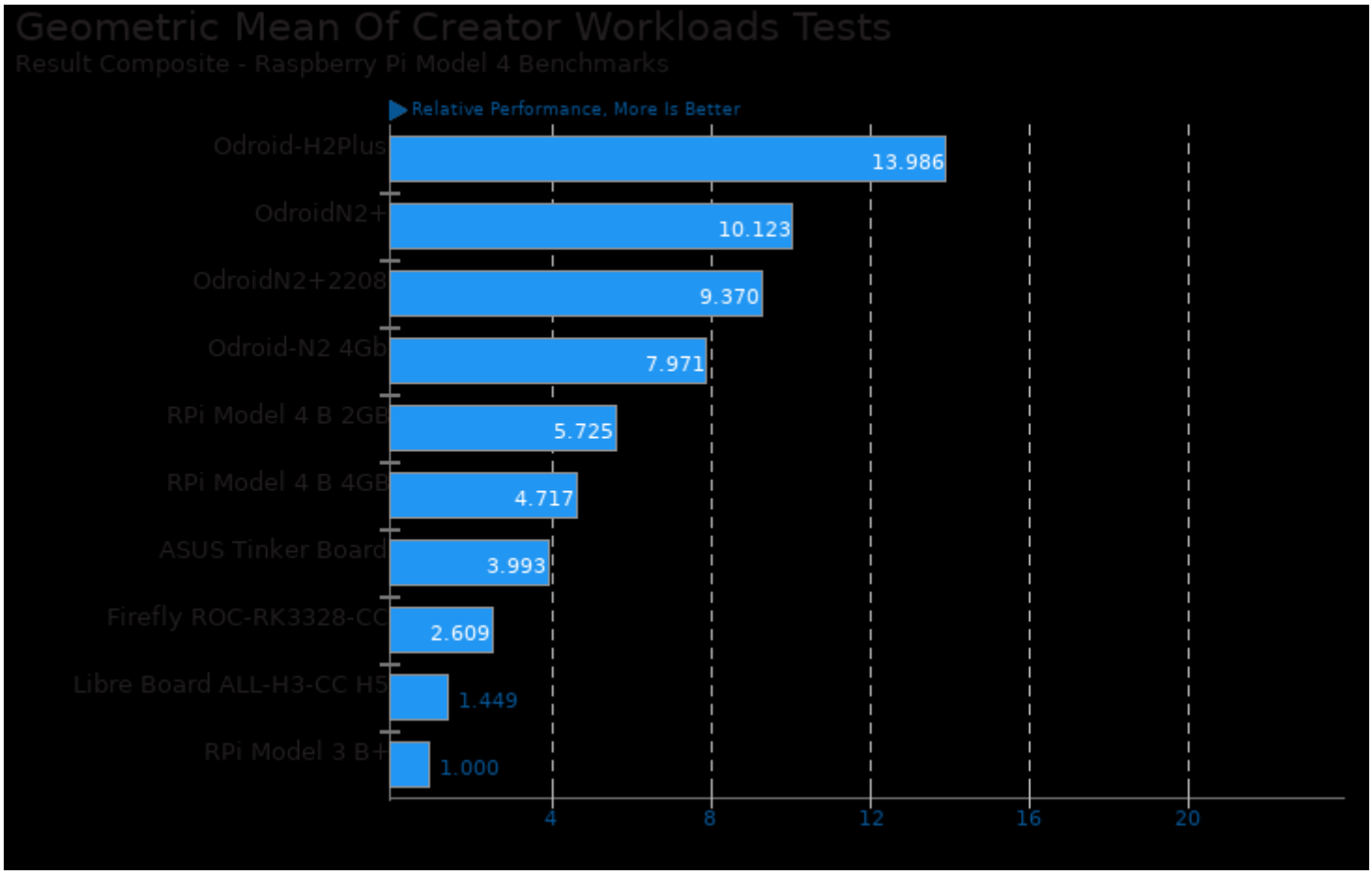
Raspberry Pi Model 4 Benchmarks



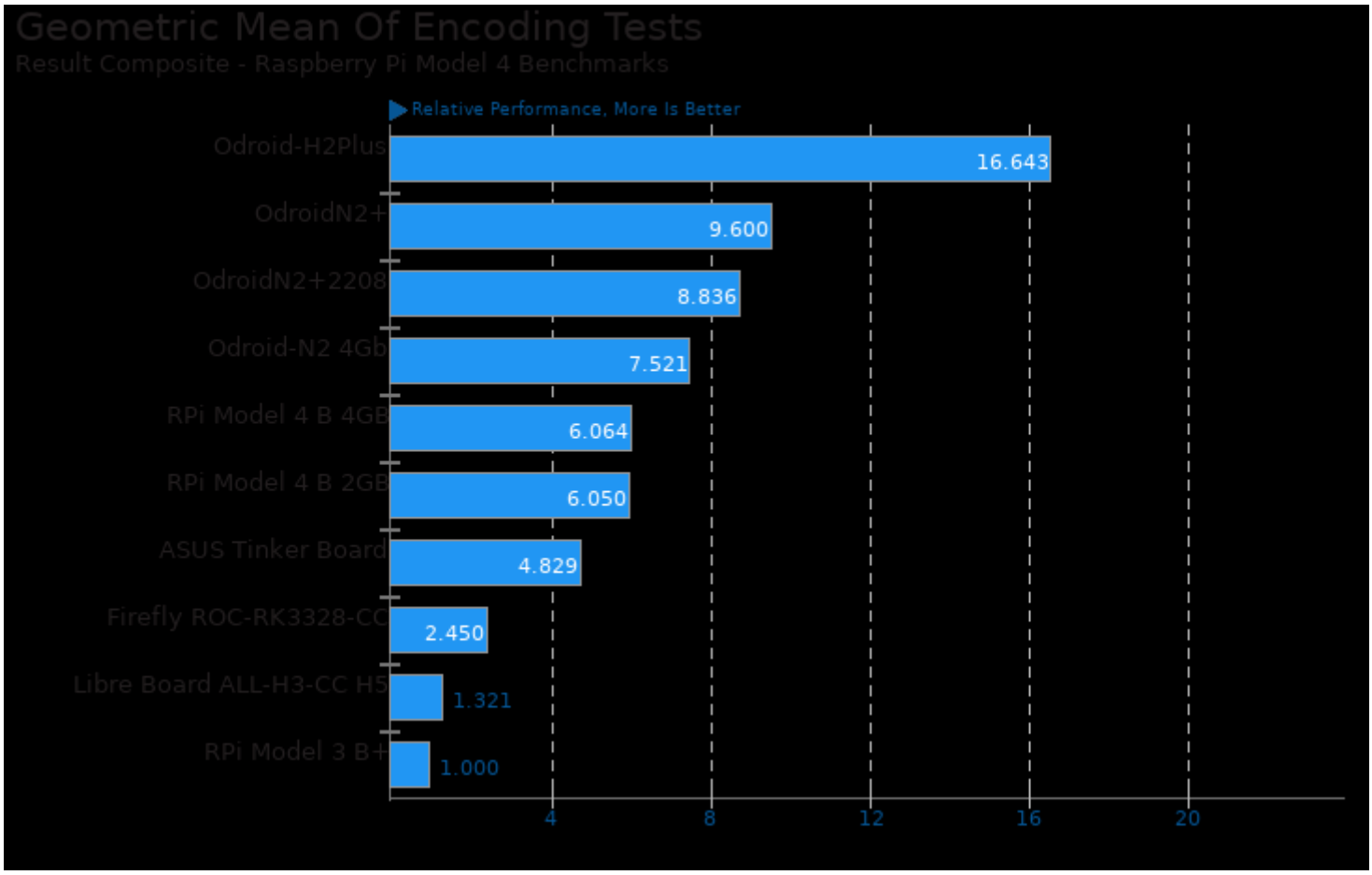
Geometric mean based upon tests: pts/scimark2, pts/graphics-magick, pts/encode-mp3, pts/encode-flac, pts/x264, pts/compress-zstd and pts/nginx



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

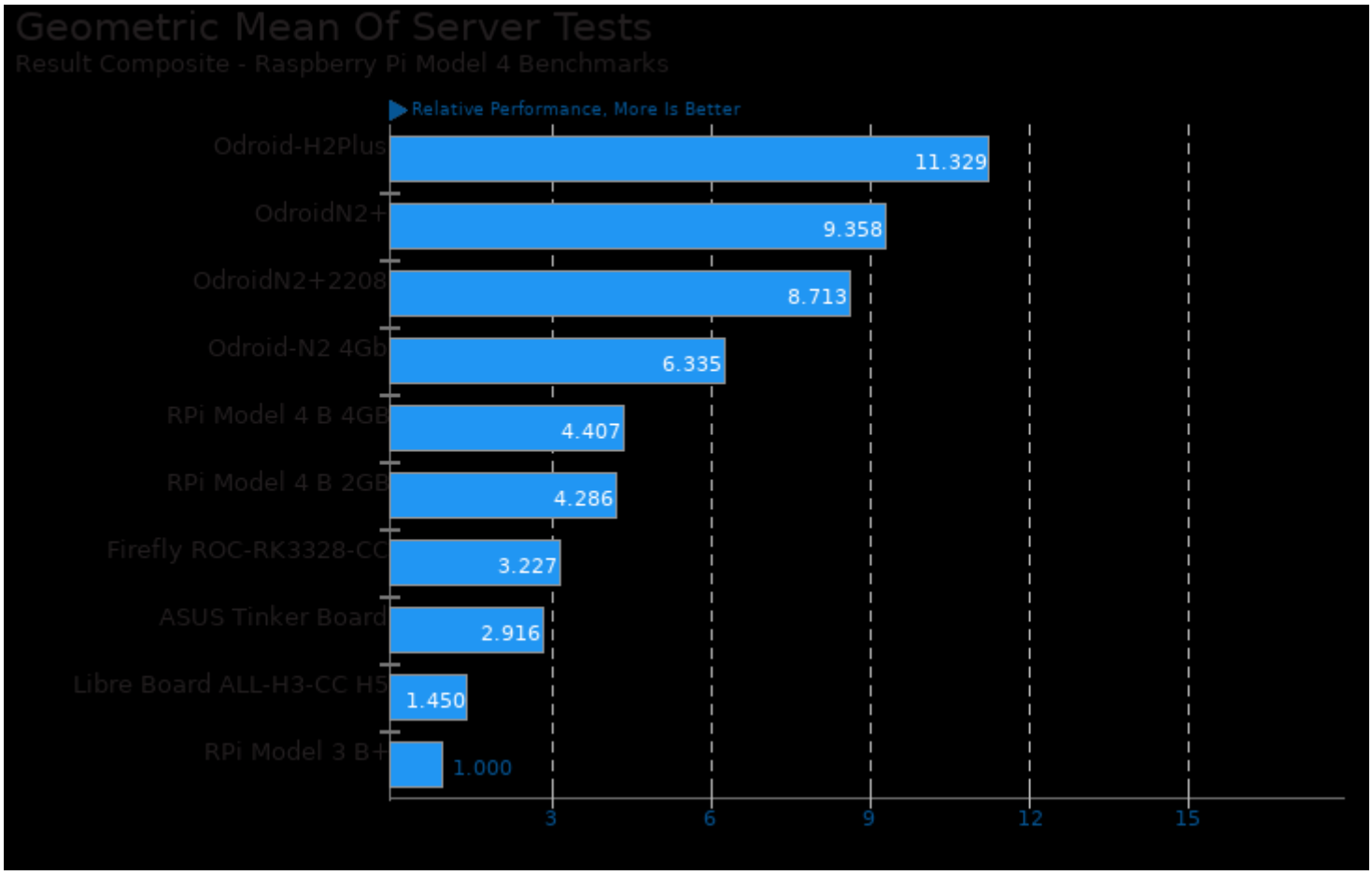


Geometric mean based upon tests: pts/smallpt, pts/x264, pts/encode-mp3, pts/encode-flac and pts/graphics-magick



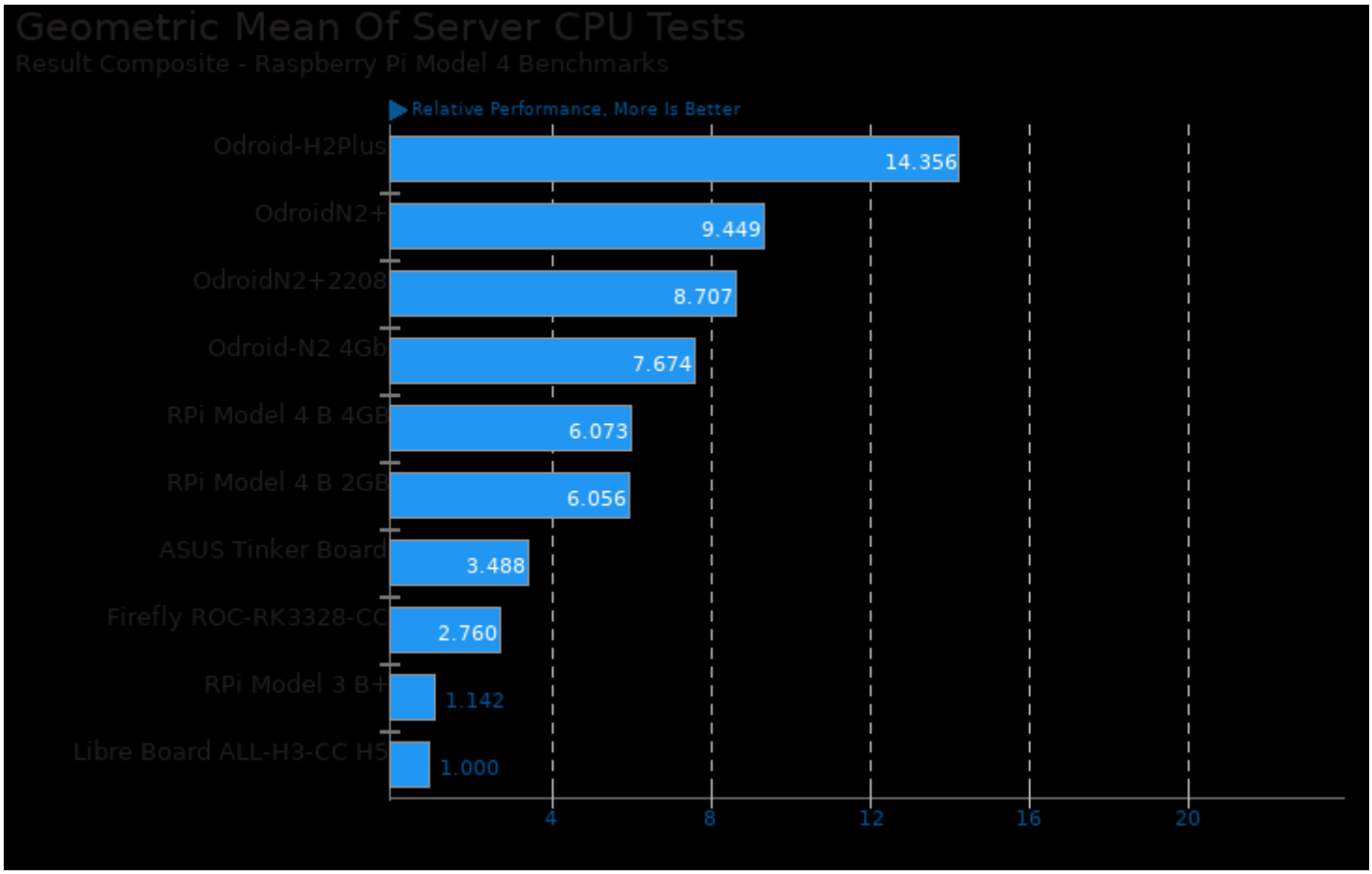
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac and pts/x264

Raspberry Pi Model 4 Benchmarks



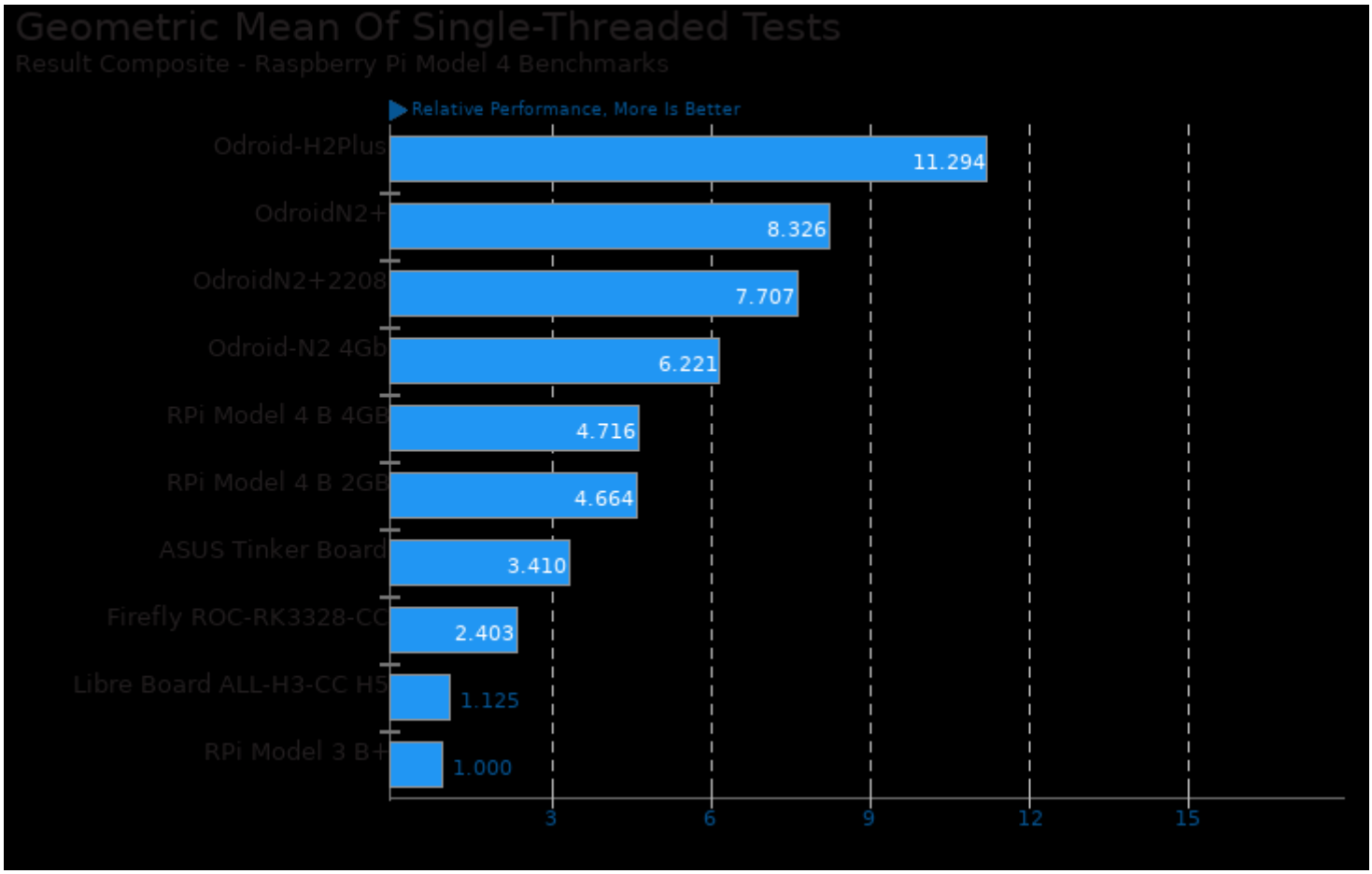
Geometric mean based upon tests: pts/nginx, pts/phpbench and pts/perl-benchmark

Raspberry Pi Model 4 Benchmarks



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 Friday, 29 March 2024 02:47.