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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

tm8372tg had the most wins, coming in first place for 85% of the tests.

Based on the geometric mean of all complete results, the fastest (tm8372tg) was 8.93x the speed of the slowest (RPi Model 3 B+). RPi Model 4 B 2GB was 0.482x the speed of tm8372tg, 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 35.071x
FLAC Audio Encoding (WAV To FLAC) at 34.118x
Rust Prime Benchmark (Performance / Cost - Prime Number Test To 200,000,000) at 22.155x
Rust Prime Benchmark (Prime Number Test To 200,000,000) at 22.155x
PyBench (Total For Average Test Times) at 17.491x
PHPBench (PHP Benchmark Suite) at 15.471x
Perl Benchmarks (Test: Interpreter) at 10.422x

LAME MP3 Encoding (WAV To MP3) at 9.801x
SciMark (Computational Test: Composite) at 8.953x
Perl Benchmarks (Test: Pod2html) at 7.889x.

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

tm8372tg

Processor: Intel Core i5 450M @ 2.40GHz (2 Cores / 4 Threads), Motherboard: Acer TravelMate 8372 (V1.10 BIOS), Chipset: Intel Core DRAM, Memory: 8GB, Disk: 250GB Western Digital WD2500BEVS-1, Graphics: Intel HD ILK 2GB, Audio: Conexant CX20585, Network: Broadcom NetXtreme BCM57760 PCIe + Broadcom BCM43225 802.11b/g/n

OS: Debian 11, Kernel: 6.0.0-4mx-amd64 (x86_64), Desktop: Xfce 4.18, Display Server: X Server 1.20.14, OpenGL: 2.1 Mesa 22.0.5, Compiler: GCC 10.2.1 20210110, File-System: ext4, Screen Resolution: 1366x768

Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie

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--enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-Km9U7s/gcc-10-10.2.1/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-Km9U7s/gcc-10-10.2.1/debian/tmp-gcn/usr, hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand (Boost: Enabled) - CPU Microcode: 0x7
Python Notes: Python 3.9.2
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Vulnerable: Clear buffers attempted no microcode; SMT vulnerable + meltdown: Mitigation of PTI + mmio_stale_data: Unknown: No mitigations + retbleed: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Retpolines IBPB: conditional IBRS_FW STIBP: conditional RSB filling PBRSB-eIBRS: Not affected + 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	tm8372tg
LAME MP3 Encoding - WAV To MP3 (sec)	**658.82**	162.41	518.49	295.44	125.34	125.22	**67.222**
Normalized	10.2%	41.39%	12.96%	22.75%	53.63%	53.68%	100%
Standard Deviation	2.4%	0.6%	0%	0.2%	0.1%	0.1%	0.1%
SciMark - Composite (Mflops)	48.80	141.72	**28.76**	51.13	142.17	143.02	**257.49**
Normalized	18.95%	55.04%	11.17%	19.86%	55.21%	55.54%	100%
Standard Deviation	0.4%	0.1%	0.1%	0%	1.6%	1.1%	2.4%
Perl Benchmarks - Pod2html (sec)	2.56511278	0.78254268	**2.57273250**	1.31659761	0.61207402	0.62136299	**0.32613134**
Normalized	12.71%	41.68%	12.68%	24.77%	53.28%	52.49%	100%
Standard Deviation	5.2%	2%	0.6%	2%	0.8%	1.3%	0.8%
GraphicsMagick - Rotate (Iterations/min)	**16**	66	24	44	63	64	**125**
Normalized	12.8%	52.8%	19.2%	35.2%	50.4%	51.2%	100%
Standard Deviation		3.4%			1.8%		0.8%
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%	
Smallpt - G.I.R.1.S (sec)	**744.55**	273.30	424.02	251.36	260.72	145.50	**119.625**
Normalized	16.07%	43.77%	28.21%	47.59%	45.88%	82.22%	100%
Standard Deviation	0.1%	0.9%	0.3%	1.1%	2.3%	2.9%	0.3%
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%	
GraphicsMagick - Resizing (Iterations/min)	**15**	53	22	36	45	53	**87**
Normalized	17.24%	60.92%	25.29%	41.38%	51.72%	60.92%	100%
Standard Deviation		3.4%			2.9%		
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

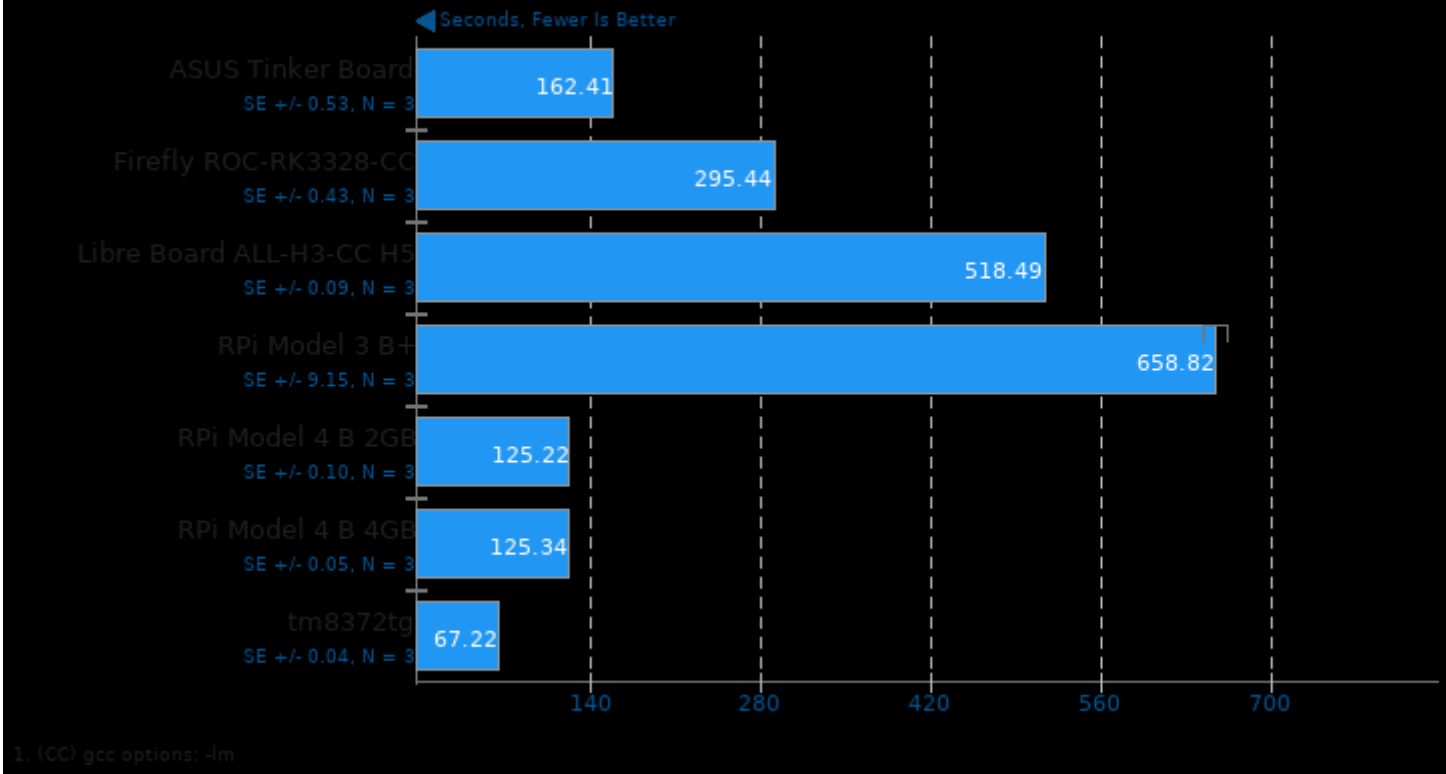
LAME MP3 Encoding - Performance / Cost - WAV To MP3 (sec x Dollar)	**23059**	11531	18147	10340	6894	**5635**	
Normalized	24.44%	48.87%	31.05%	54.49%	81.74%	100%	
NGINX Benchmark - S.W.P.S (Reqs/sec)	**2012**	3880			4746	5105	**8216**
Normalized	24.49%	47.23%			57.76%	62.13%	100%
Standard Deviation	0.7%	1.6%			3.1%	0.1%	0.4%
x264 - H.2.V.E (FPS)	**0.14**	3.32		2.31	3.10	**4.91**	
Normalized	2.85%	67.62%		47.05%	63.14%	100%	
Standard Deviation	0%	6.3%		0.2%	8.5%	2.1%	
FLAC Audio Encoding - WAV To FLAC (sec)	**777.65**	135.25	566.40	288.92	111.09	111.48	**22.793**
Normalized	2.93%	16.85%	4.02%	7.89%	20.52%	20.45%	100%
Standard Deviation	0.9%	3.4%	0.3%	0.7%	3.1%	0.7%	0.8%
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%	
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%	
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%	
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	**219.426**
Normalized	27.88%	91.44%	54.57%	63.91%	75.28%	75.26%	100%
Standard Deviation	0.4%	0.3%	3.4%	0.1%	1.5%	1%	0.5%
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%	
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%	
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%	
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	**3106**	1052		**140.20**	1104	657.76	
Normalized	4.51%	13.32%		100%	12.7%	21.31%	
Standard Deviation	1.1%	1%		0.3%	0.6%	0%	

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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%	
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%	
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%	
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%	
PyBench - T.F.A.T.T (Milliseconds)	29609	9312	**40683**	13542	5249	5233	**2326**
Normalized	7.86%	24.98%	5.72%	17.18%	44.31%	44.45%	100%
Standard Deviation	0.5%	0.5%	0.8%	0.2%	0.2%	0.3%	0.2%
PHPBench - P.B.S (Score)	**20275**	59450	21345	54131	101564	100678	**313675**
Normalized	6.46%	18.95%	6.8%	17.26%	32.38%	32.1%	100%
Standard Deviation	0.5%	3.3%	0.1%	0.2%	0.4%	0.9%	0.8%
Perl Benchmarks - Interpreter (sec)	**0.03173653**	0.01229804	0.01091688	0.00491447	0.00778405	0.00826085	**0.00304529**
Normalized	9.6%	24.76%	27.9%	61.97%	39.12%	36.86%	100%
Standard Deviation	3.5%	0.4%	0.3%	0.5%	5.6%	6.9%	1%

LAME MP3 Encoding 3.100

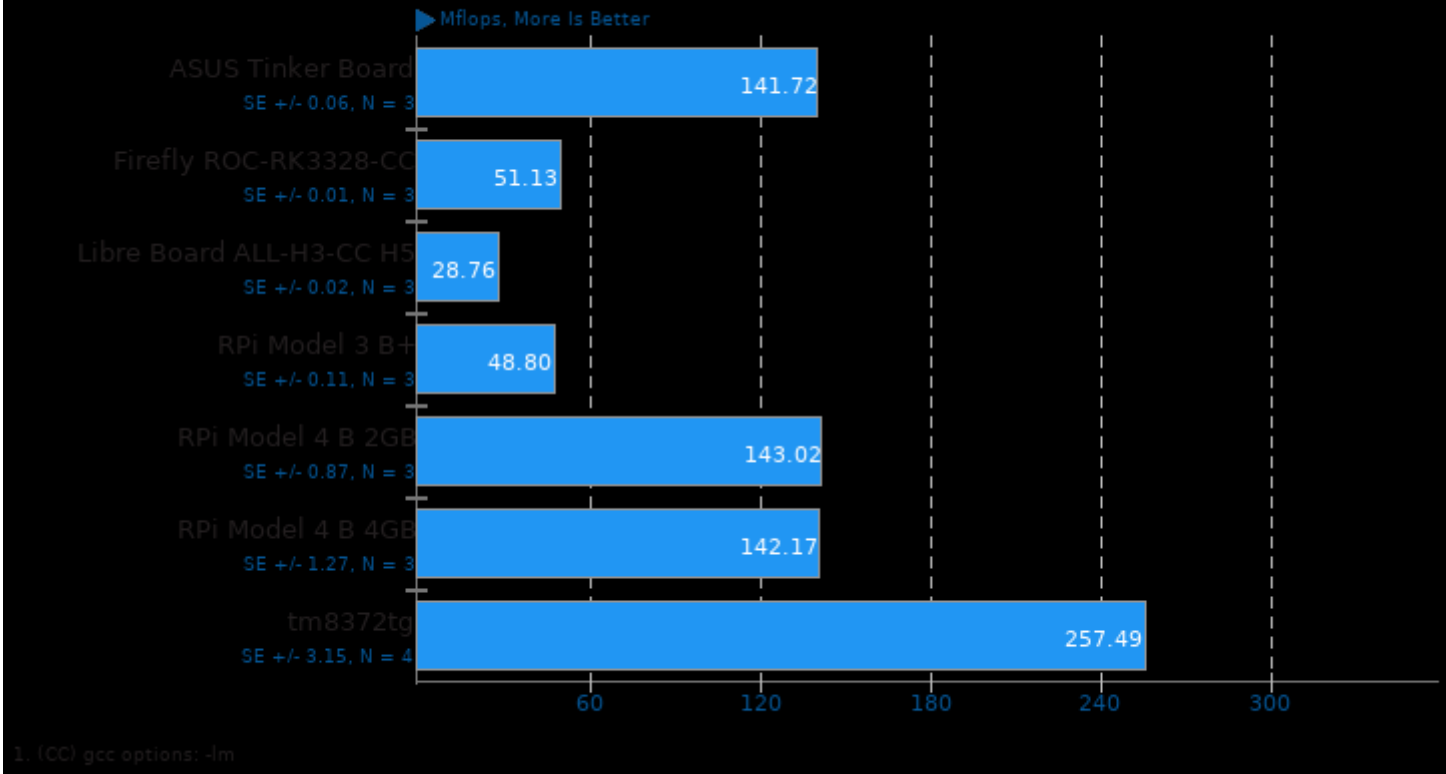
WAV To MP3



1. (CC) gcc options: -lm

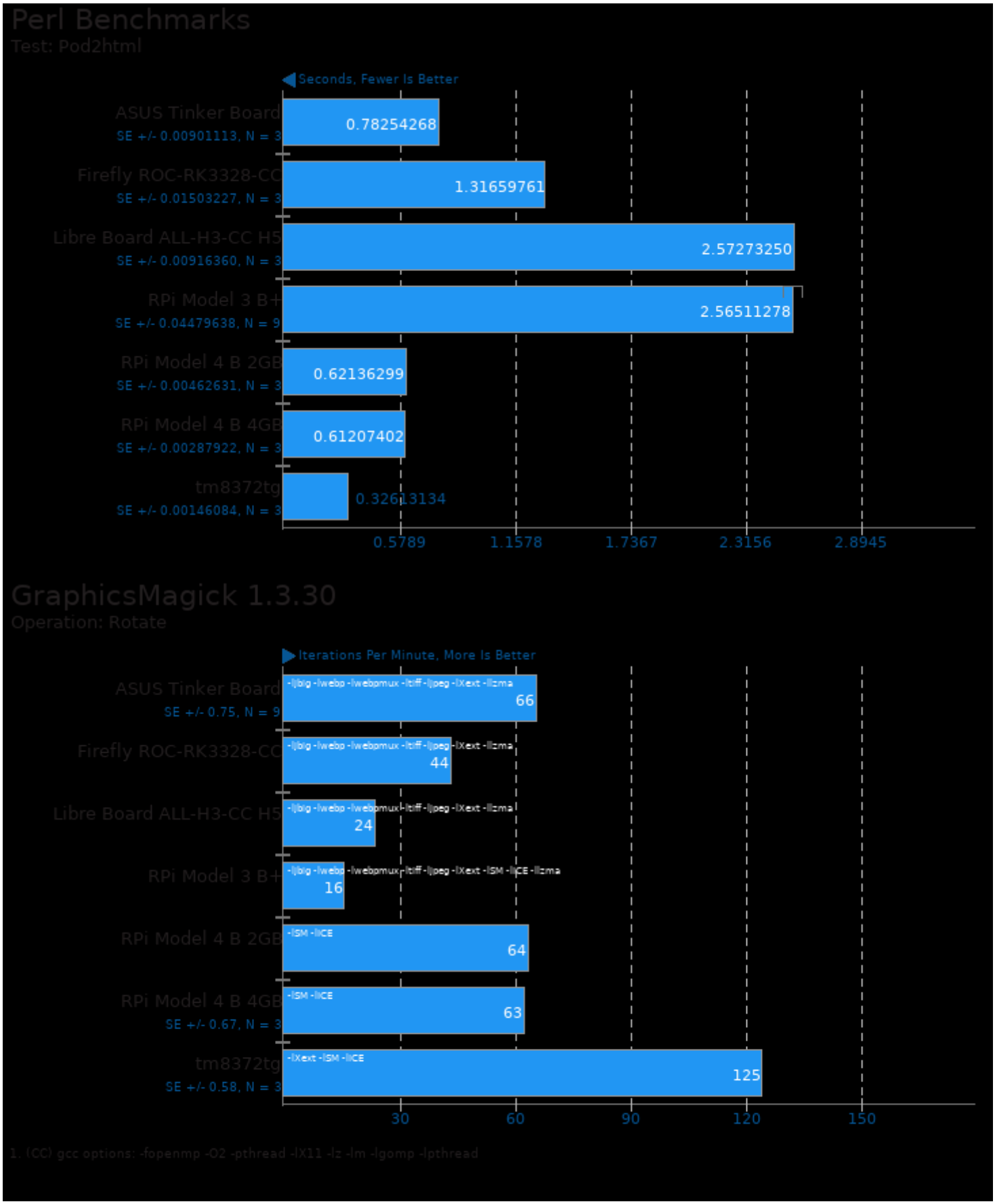
SciMark 2.0

Computational Test: Composite



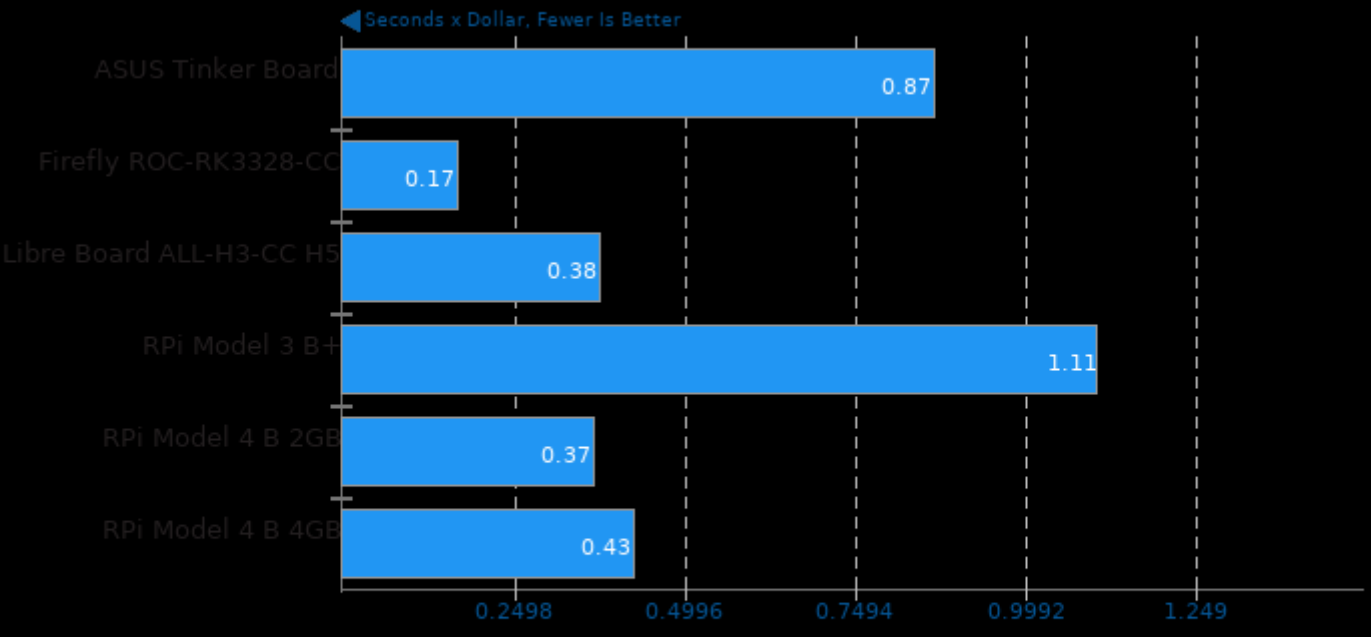
1. (CC) gcc options: -lm

Raspberry Pi Model 4 Benchmarks



Perl Benchmarks

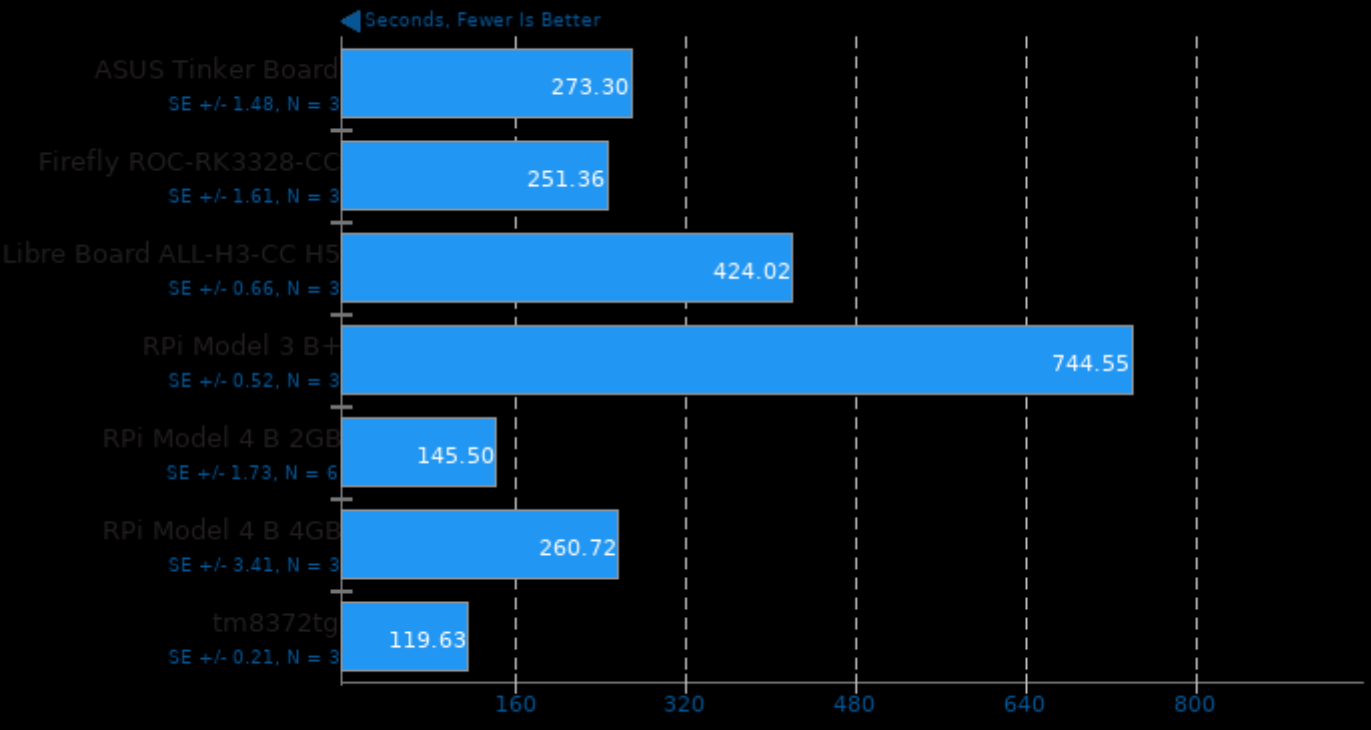
Performance / Cost - Test: Interpreter



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.

Smallpt 1.0

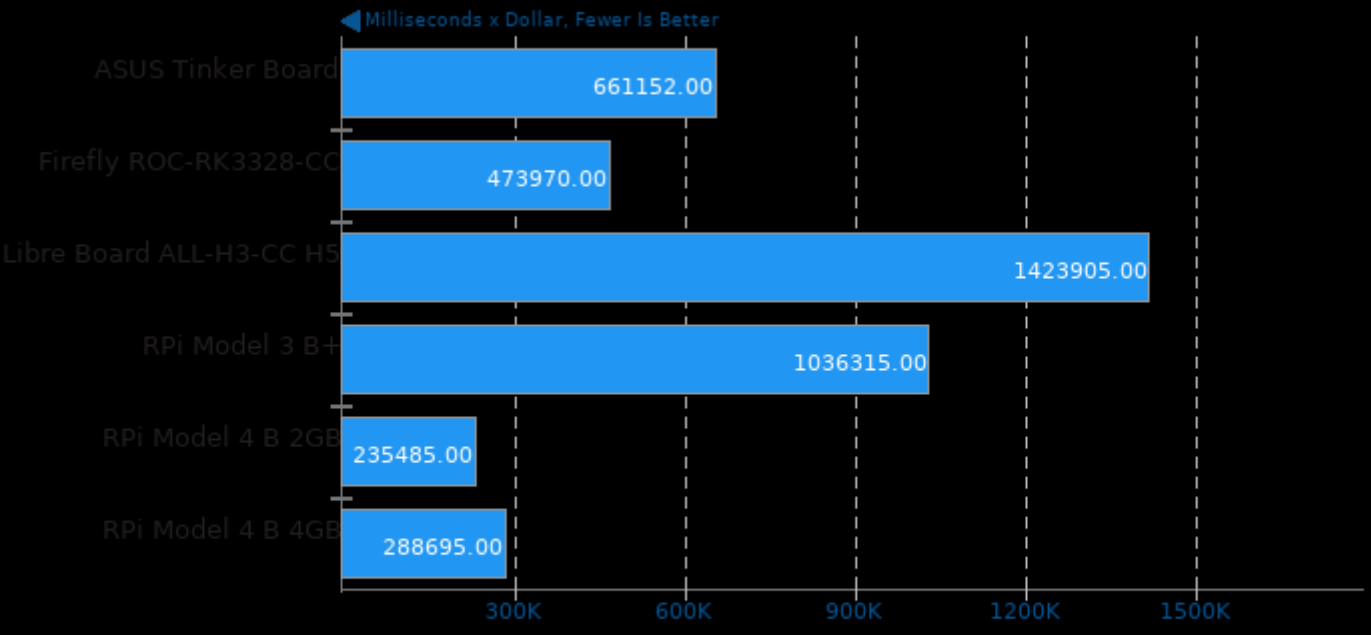
Global Illumination Renderer; 128 Samples



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

PyBench 2018-02-16

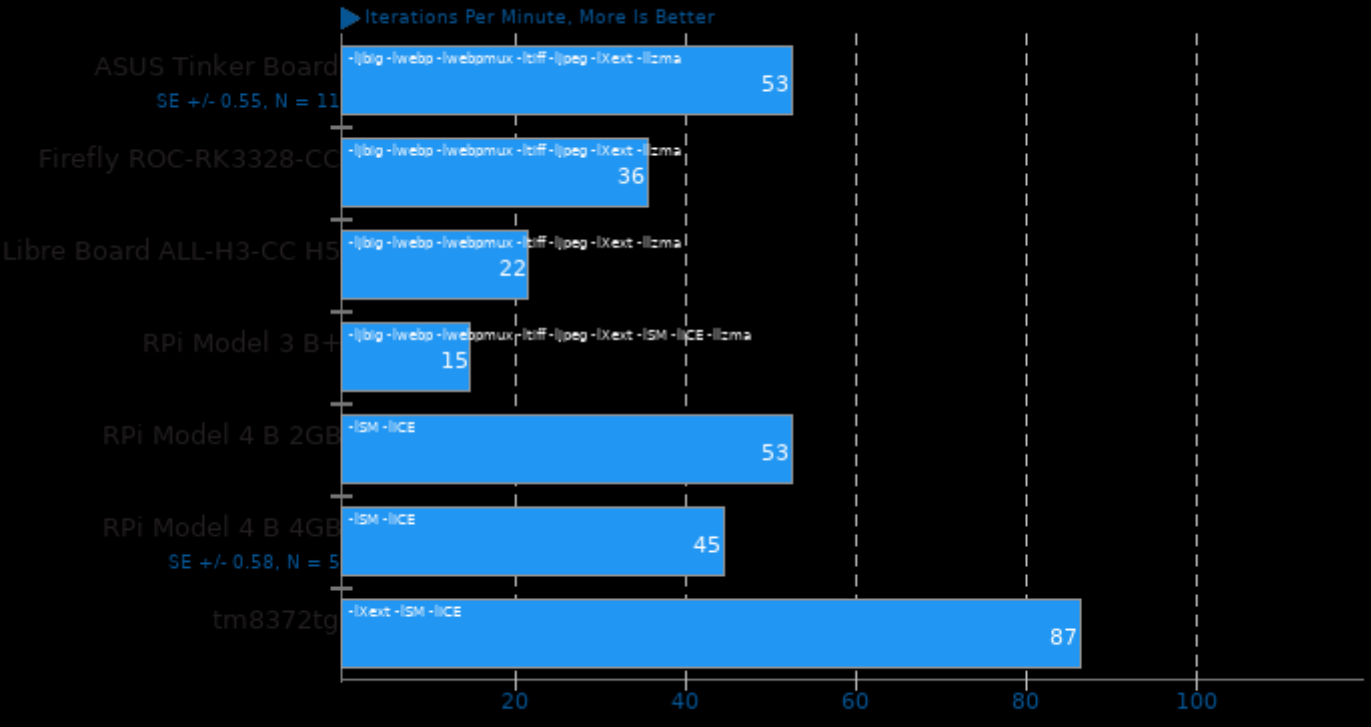
Performance / Cost - Total For Average Test Times



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

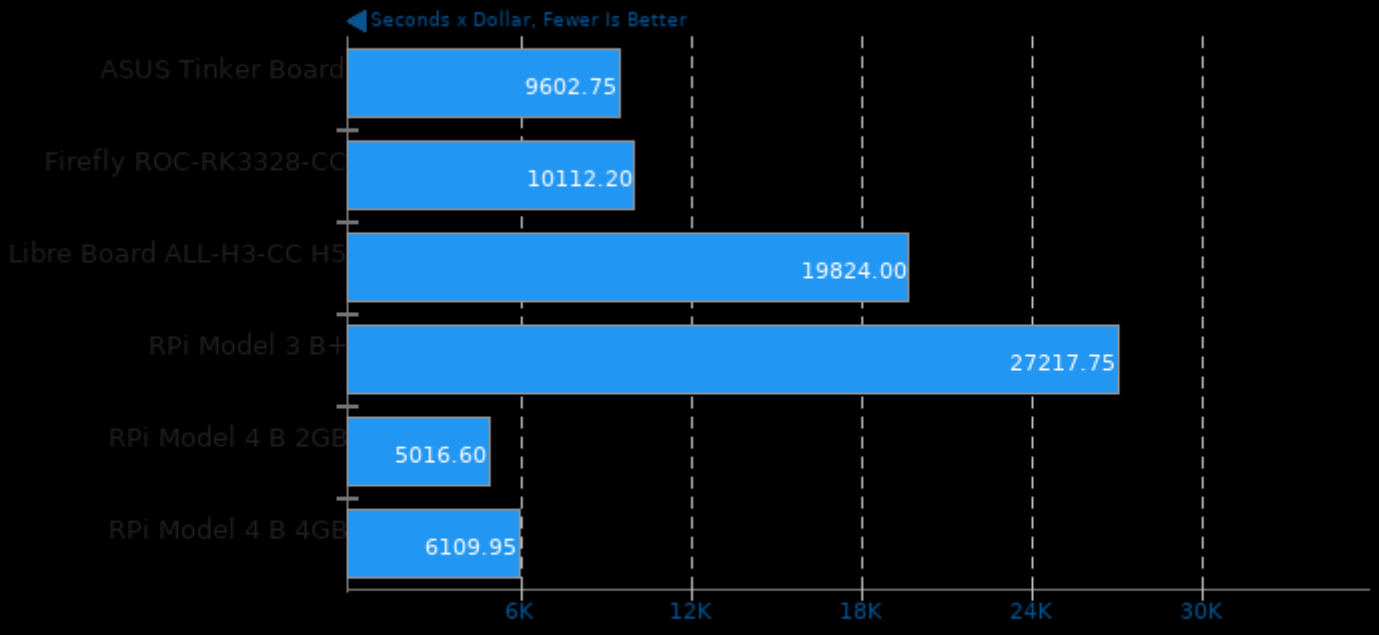
Operation: Resizing



1. (CC) gcc options: -fopenmp -O2 -pthread -lX11 -lz -lm -lgomp -lpthread

FLAC Audio Encoding 1.3.2

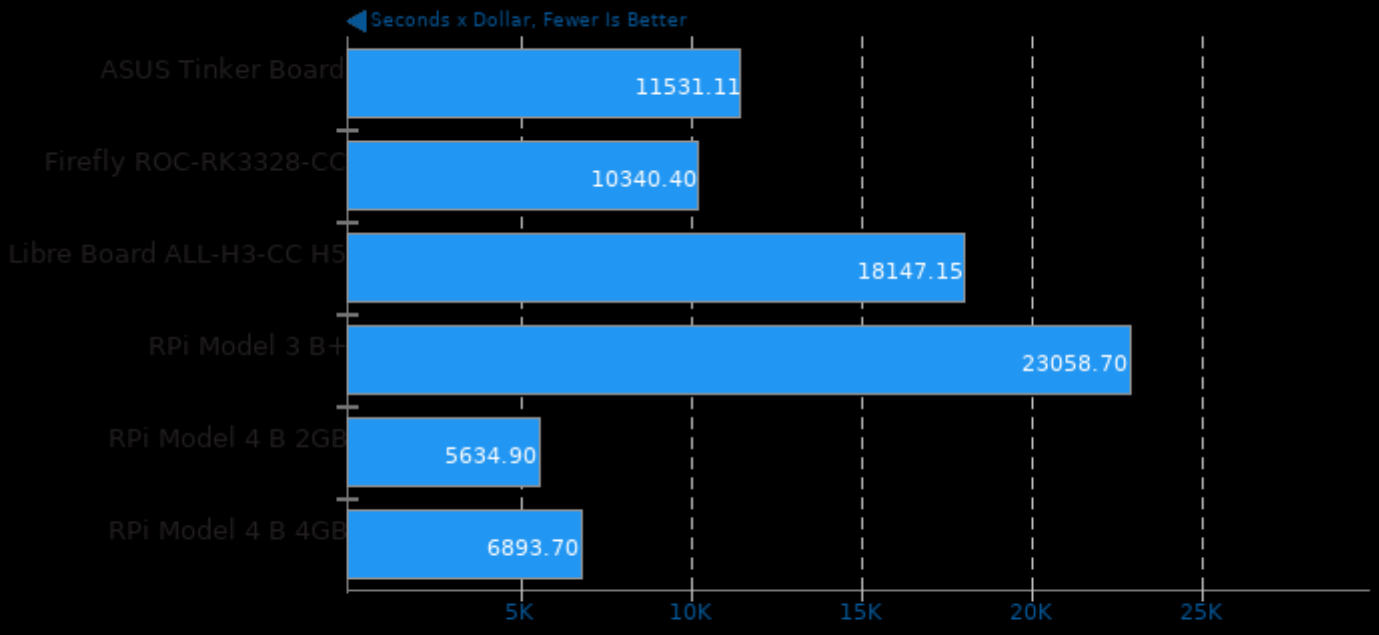
Performance / Cost - WAV To FLAC



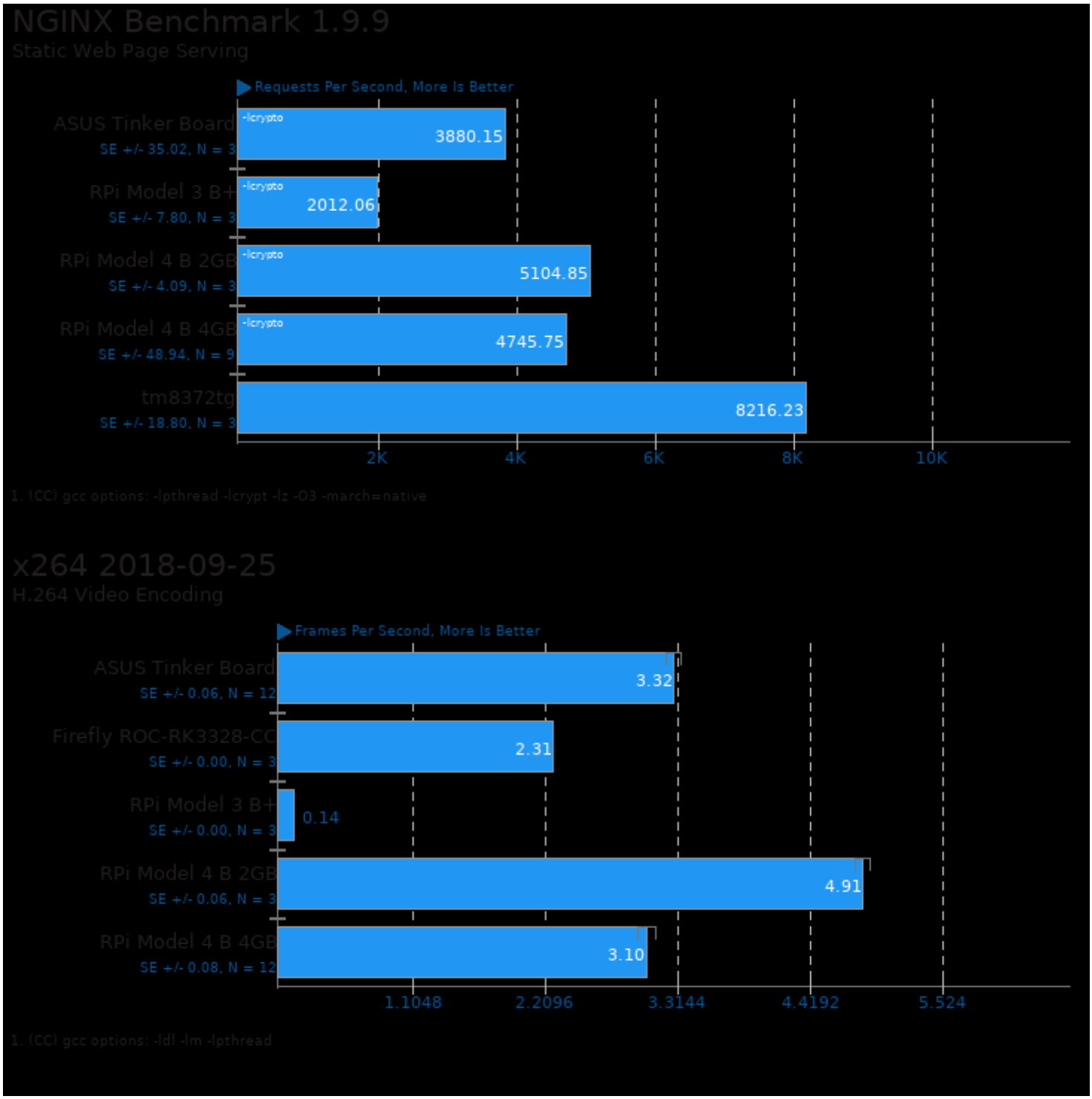
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

LAME MP3 Encoding 3.100

Performance / Cost - WAV To MP3

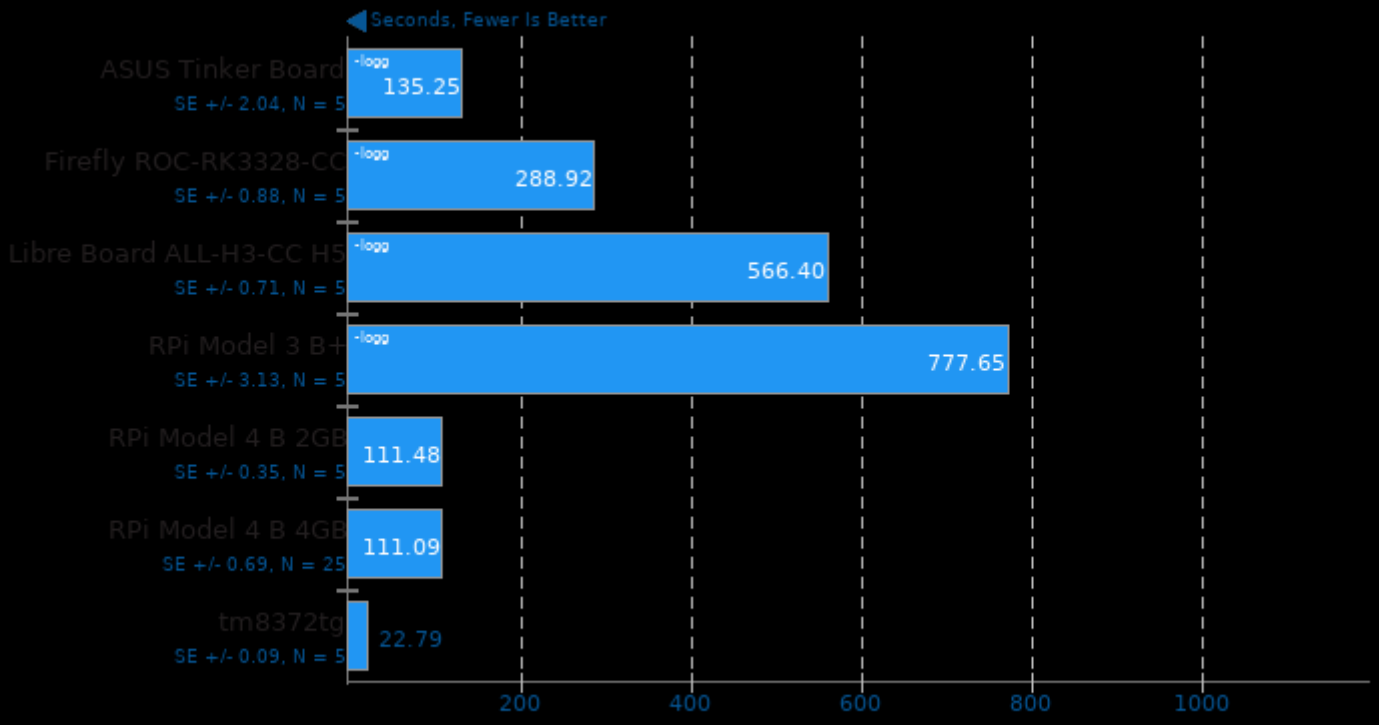


1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.


NGINX Benchmark 1.9.9
Static Web Page Serving
Requests Per Second, More Is Better
ASUS Tinker Board
SE +/- 35.02, N = 3
-lcrypto
3880.15
RPi Model 3 B+
SE +/- 7.80, N = 3
-lcrypto
2012.06
RPi Model 4 B 2GB
SE +/- 4.09, N = 3
-lcrypto
5104.85
RPi Model 4 B 4GB
SE +/- 48.94, N = 9
-lcrypto
4745.75
tm8372tg
SE +/- 18.80, N = 3
8216.23
2K
4K
6K
8K
10K
1. (CC) gcc options: -lpthread -lcrypt -lz -O3 -march=native
x264 2018-09-25
H.264 Video Encoding
Frames Per Second, More Is Better
ASUS Tinker Board
SE +/- 0.06, N = 12
3.32
Firefly ROC-RK3328-CC
SE +/- 0.00, N = 3
2.31
RPi Model 3 B+
SE +/- 0.00, N = 3
0.14
RPi Model 4 B 2GB
SE +/- 0.06, N = 3
4.91
RPi Model 4 B 4GB
SE +/- 0.08, N = 12
3.10
1.1048
2.2096
3.3144
4.4192
5.524
1. (CC) gcc options: -ldl -lm -lpthread

FLAC Audio Encoding 1.3.2

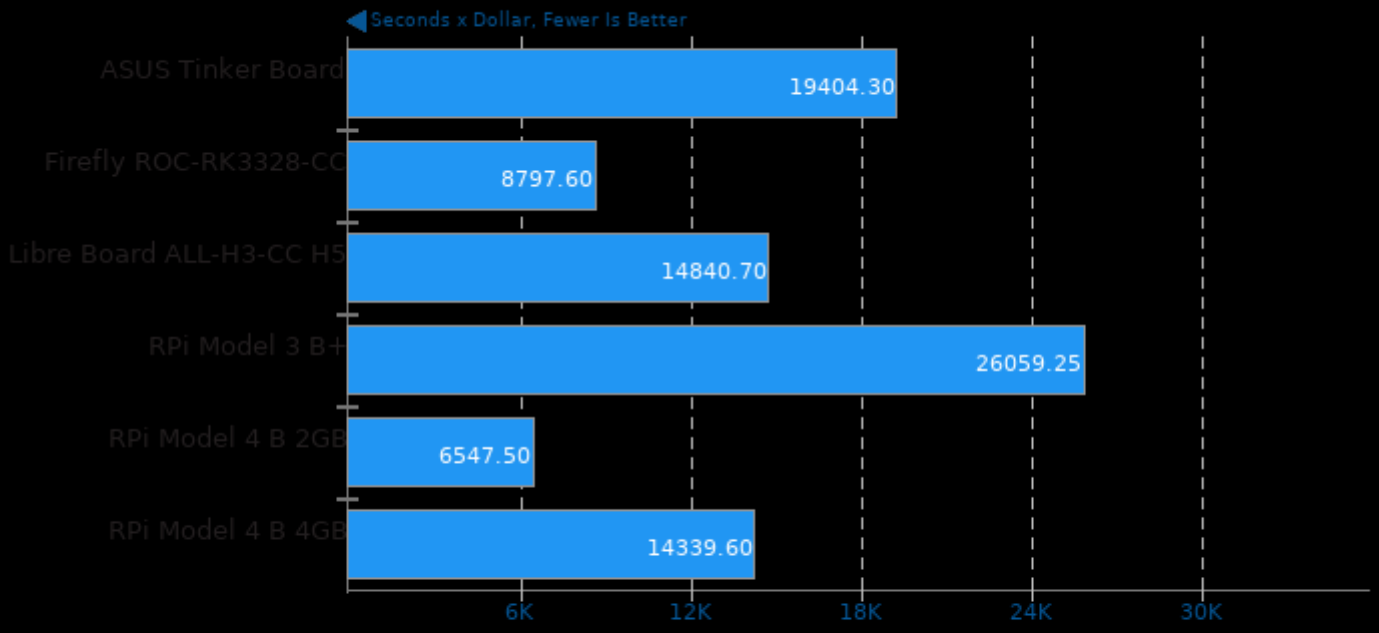
WAV To FLAC



1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

Smallpt 1.0

Performance / Cost - Global Illumination Renderer; 128 Samples

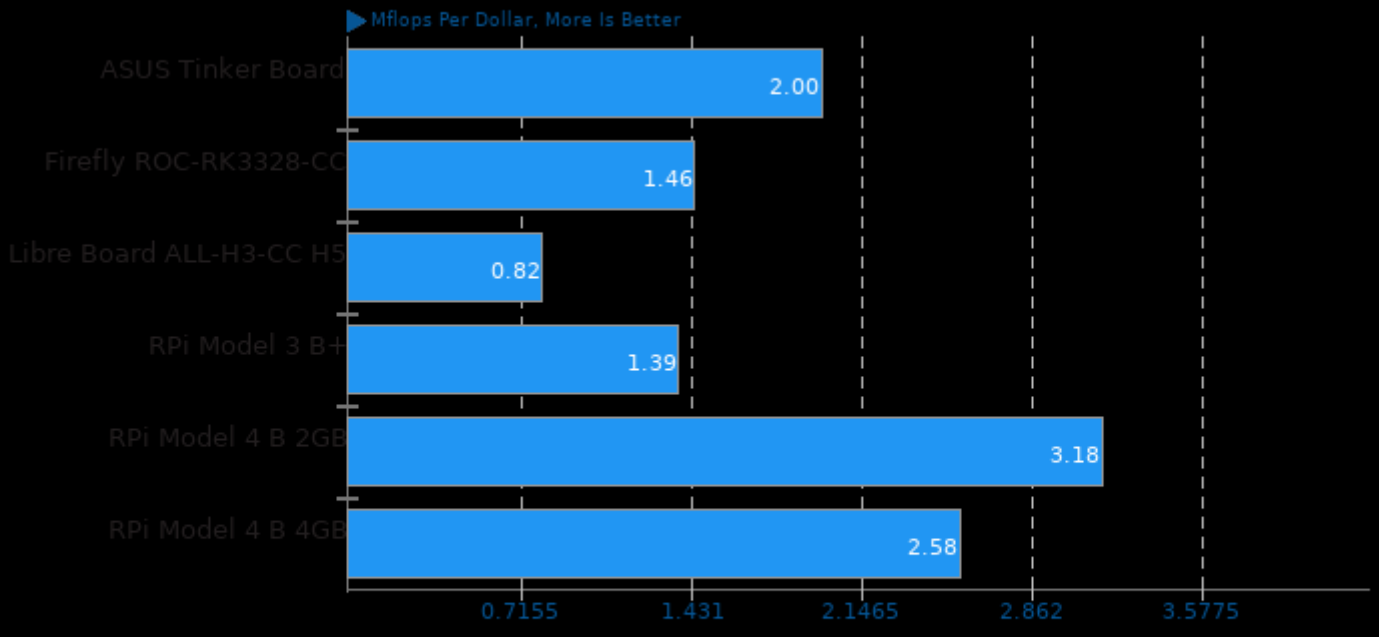


1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Raspberry Pi Model 4 Benchmarks

SciMark 2.0

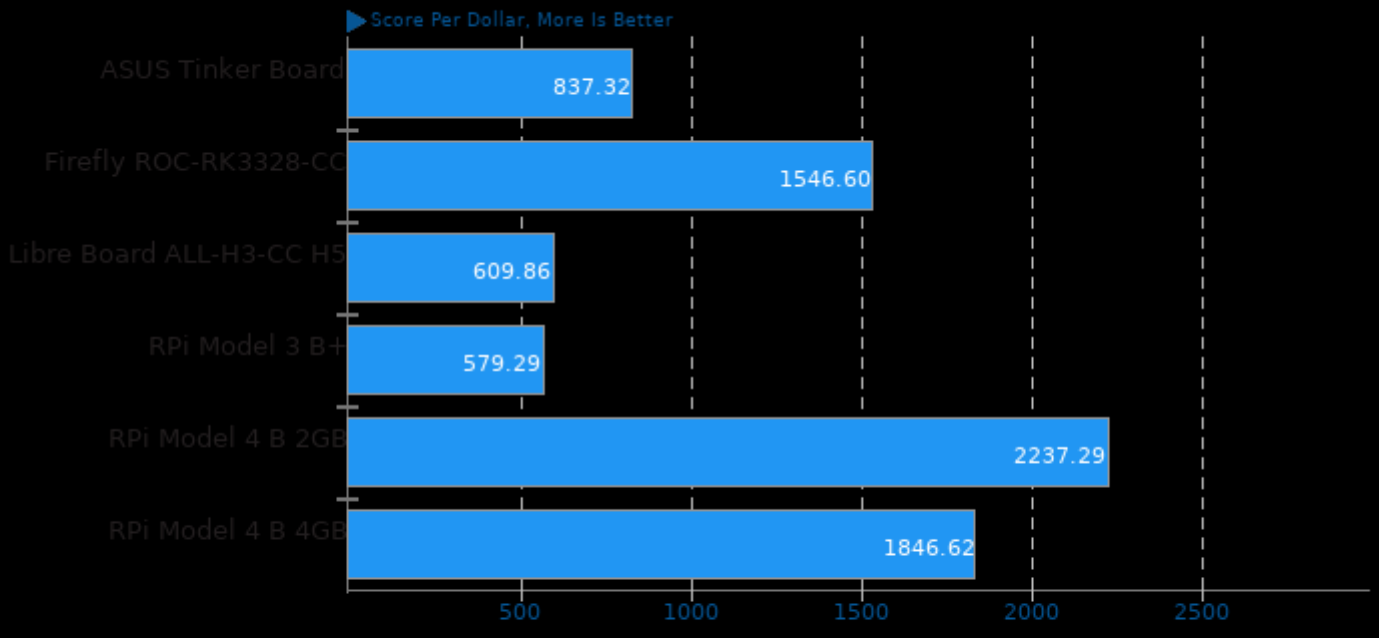
Performance / Cost - Computational Test: Composite



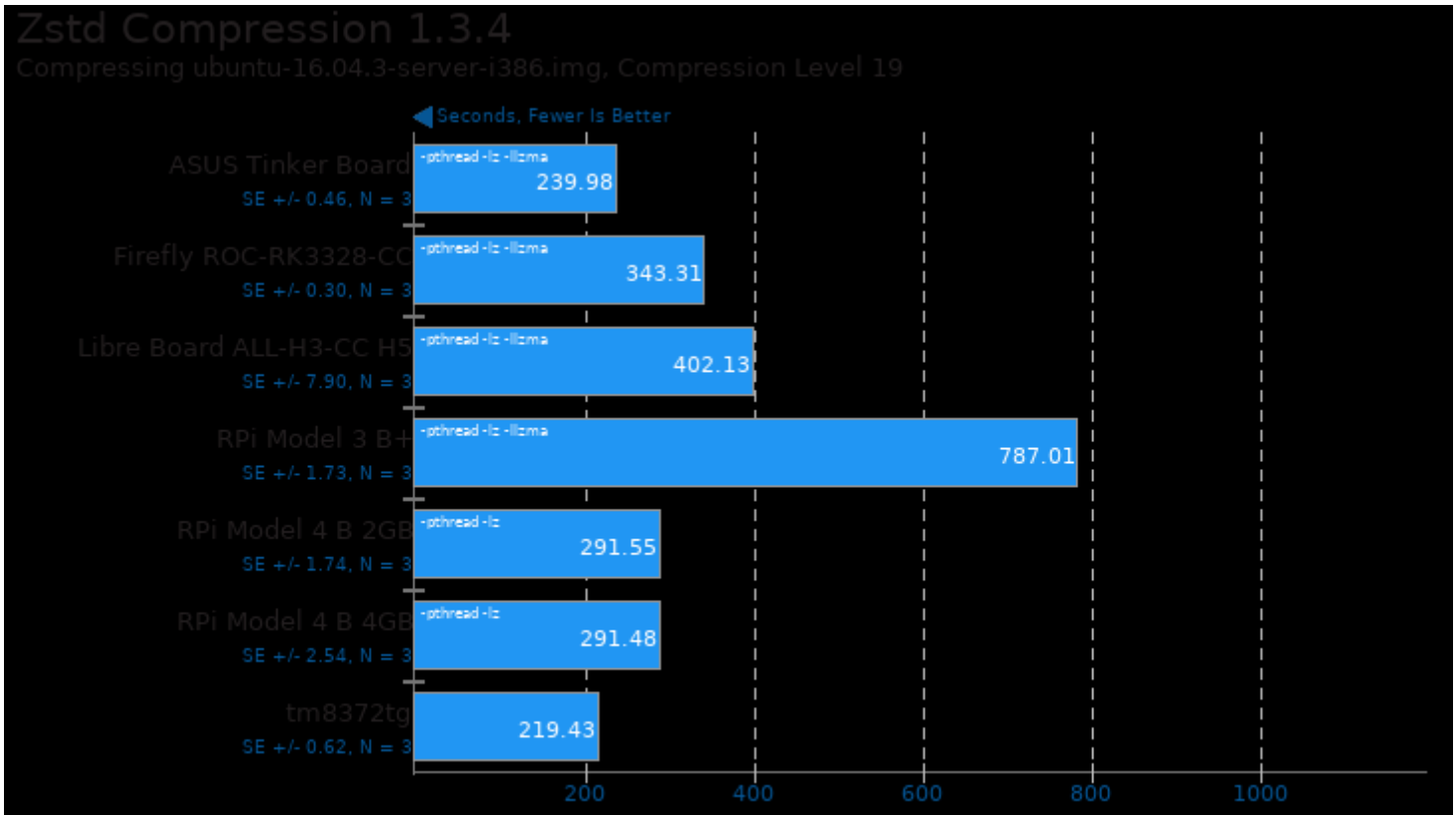
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

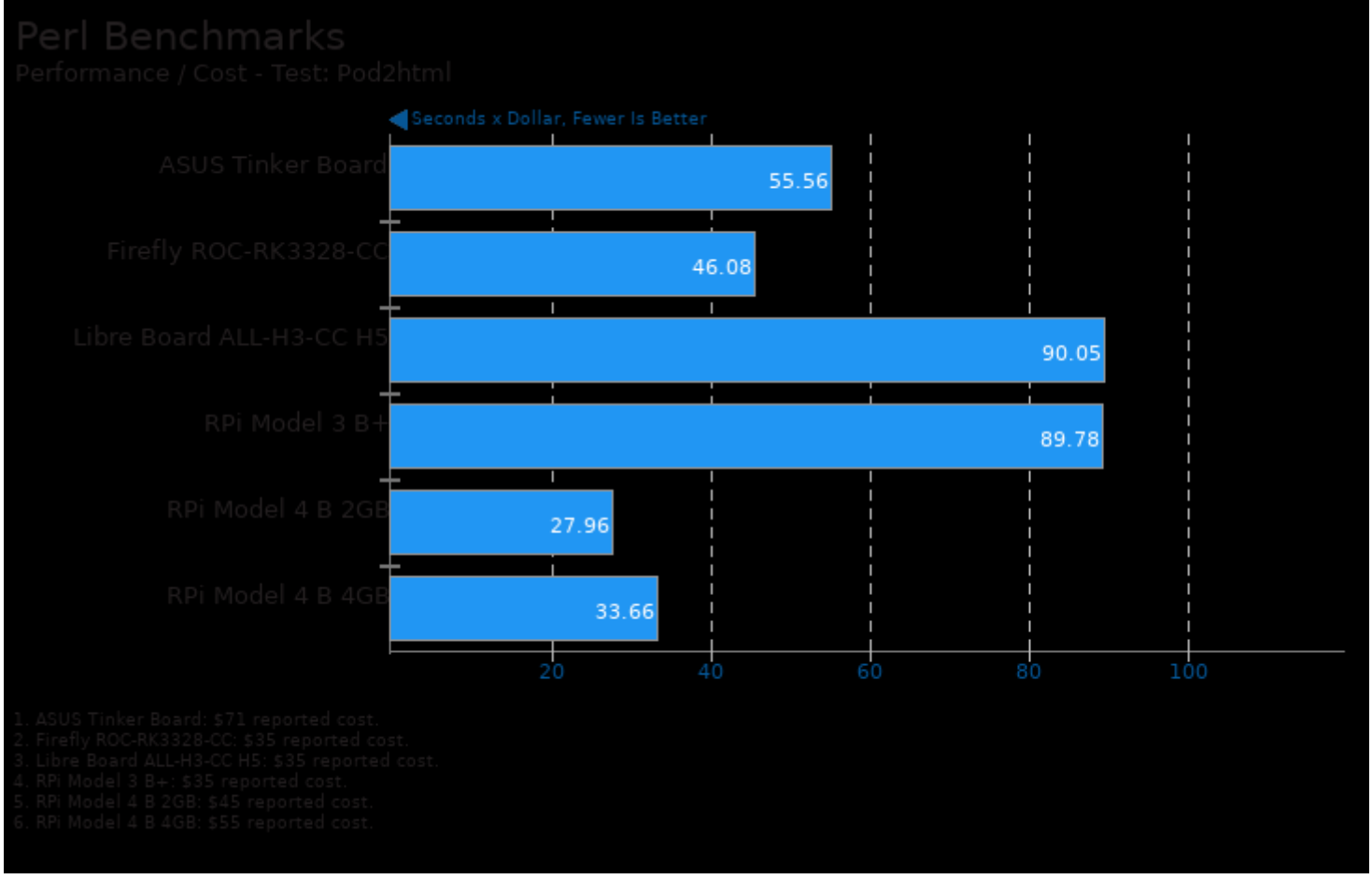
PHPBench 0.8.1

Performance / Cost - PHP Benchmark Suite



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.

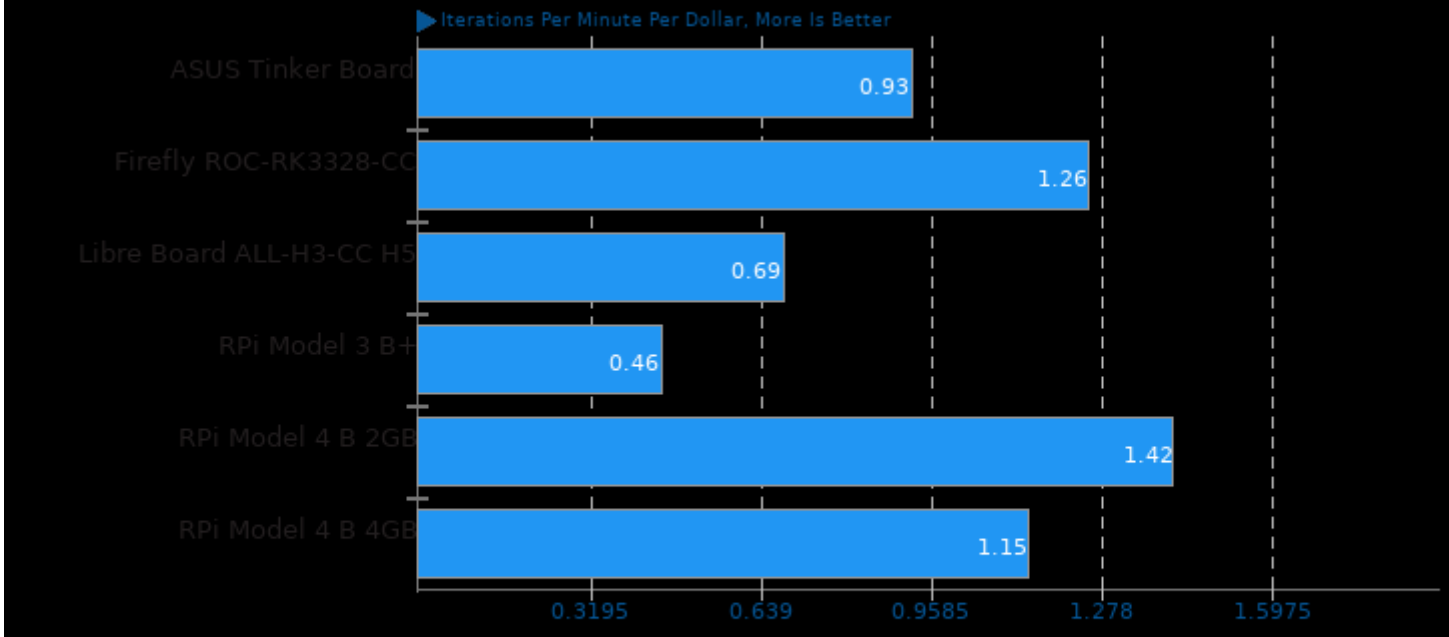

Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
ASUS Tinker Board
SE +/- 0.46, N = 3
-pthread -lz -llzma
239.98
Firefly ROC-RK3328-CC
SE +/- 0.30, N = 3
-pthread -lz -llzma
343.31
Libre Board ALL-H3-CC H5
SE +/- 7.90, N = 3
-pthread -lz -llzma
402.13
RPi Model 3 B+
SE +/- 1.73, N = 3
-pthread -lz -llzma
787.01
RPi Model 4 B 2GB
SE +/- 1.74, N = 3
-pthread -lz
291.55
RPi Model 4 B 4GB
SE +/- 2.54, N = 3
-pthread -lz
291.48
tm8372tg
SE +/- 0.62, N = 3
219.43
200
400
600
800
1000
1. (CC) gcc options: -O3


Perl Benchmarks
Performance / Cost - Test: Pod2html
Seconds x Dollar, Fewer Is Better
ASUS Tinker Board
55.56
Firefly ROC-RK3328-CC
46.08
Libre Board ALL-H3-CC H5
90.05
RPi Model 3 B+
89.78
RPi Model 4 B 2GB
27.96
RPi Model 4 B 4GB
33.66
20
40
60
80
100
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

GraphicsMagick 1.3.30

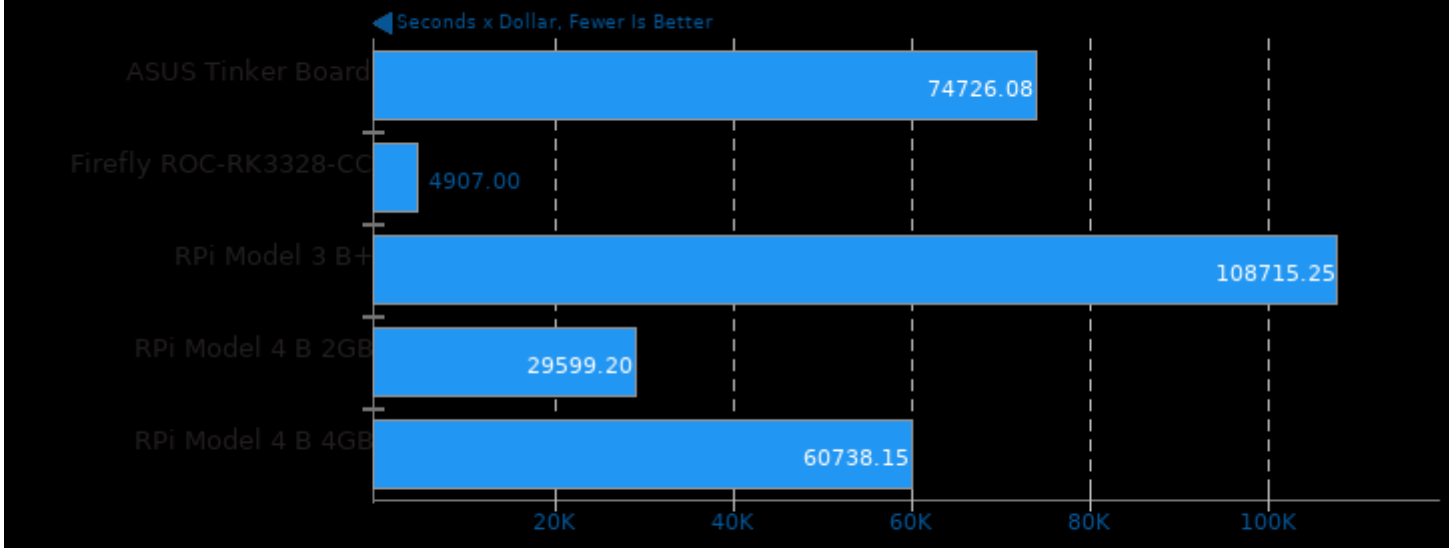
Performance / Cost - Operation: Rotate



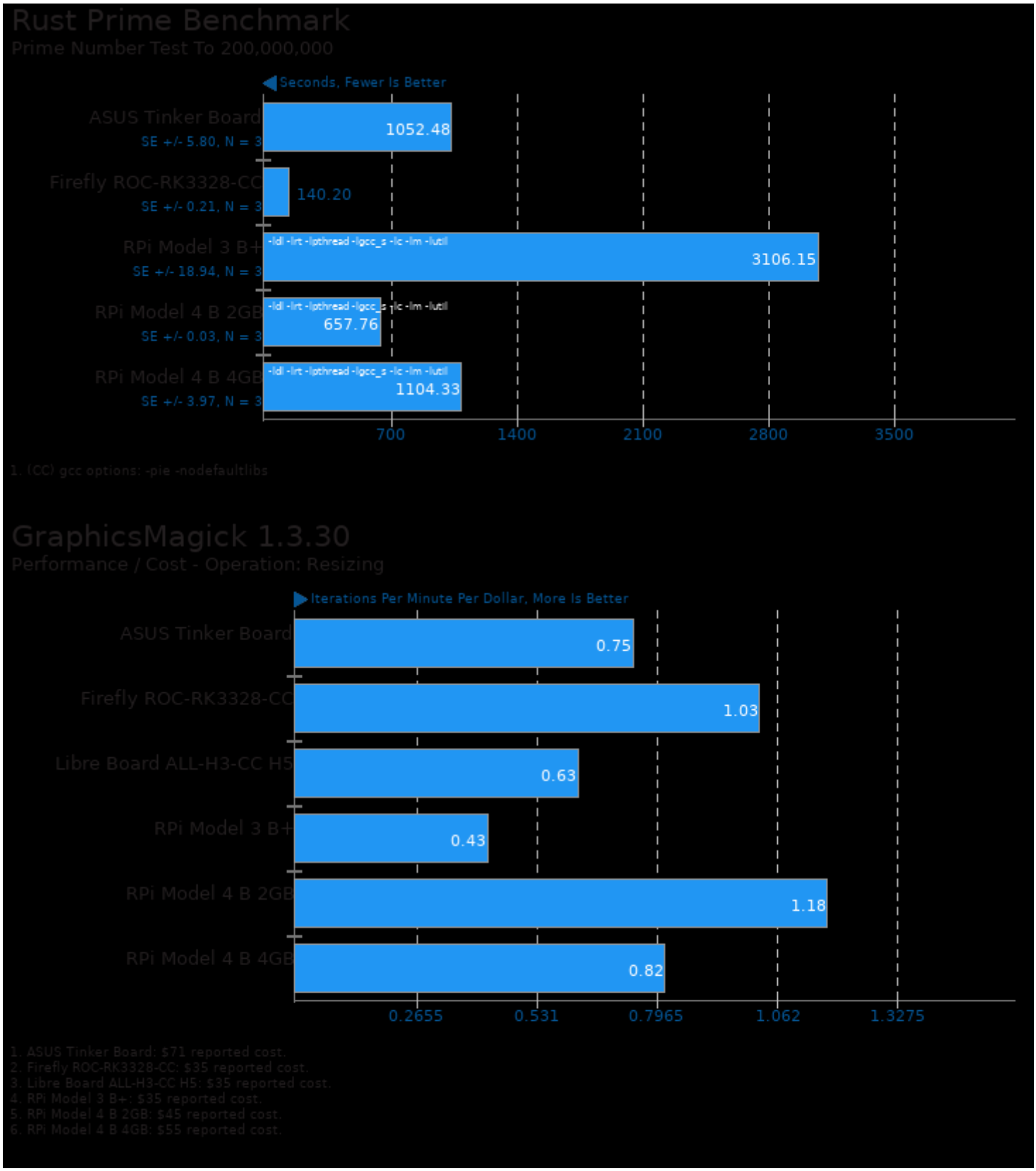
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. Libre Board ALL-H3-CC H5: $35 reported cost.
4. RPi Model 3 B+: $35 reported cost.
5. RPi Model 4 B 2GB: $45 reported cost.
6. RPi Model 4 B 4GB: $55 reported cost.

Rust Prime Benchmark

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



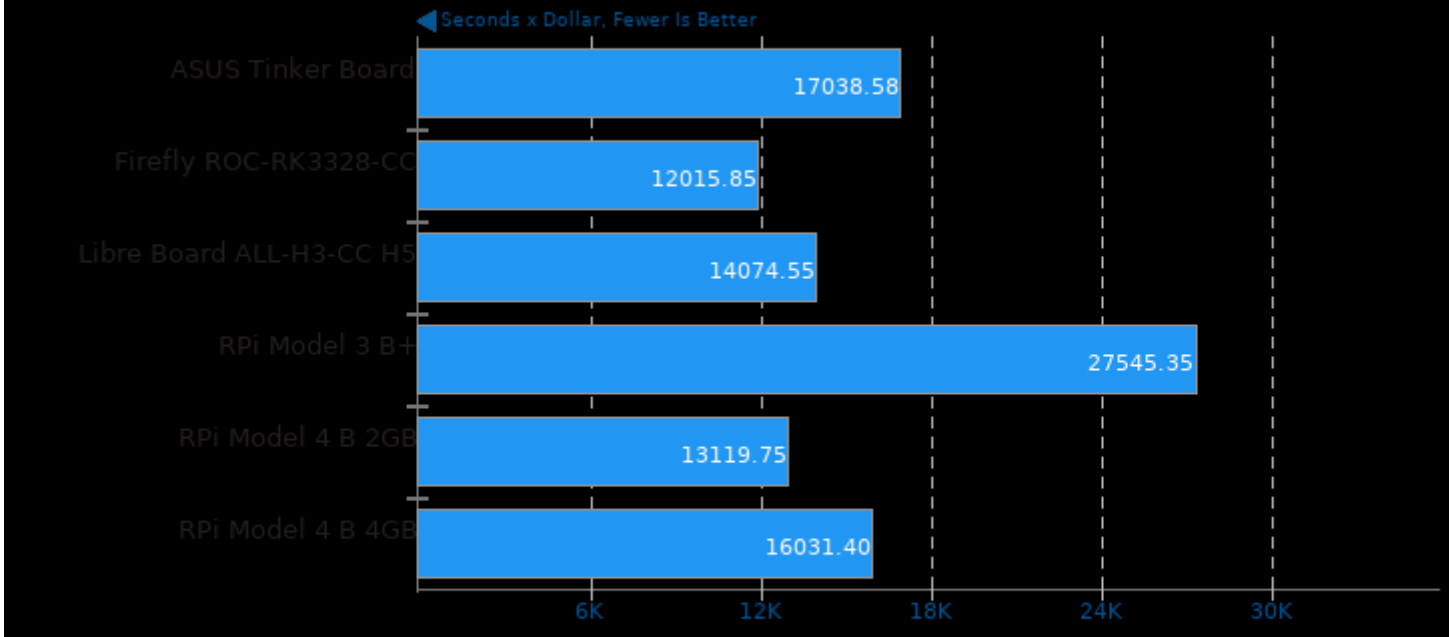
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. RPi Model 3 B+: $35 reported cost.
4. RPi Model 4 B 2GB: $45 reported cost.
5. RPi Model 4 B 4GB: $55 reported cost.


Rust Prime Benchmark
Prime Number Test To 200,000,000
Seconds, Fewer Is Better
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
GraphicsMagick 1.3.30
Performance / Cost - Operation: Resizing
Iterations Per Minute Per Dollar, More Is Better
ASUS Tinker Board
0.75
Firefly ROC-RK3328-CC
1.03
Libre Board ALL-H3-CC H5
0.63
RPi Model 3 B+
0.43
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. 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

Zstd Compression 1.3.4

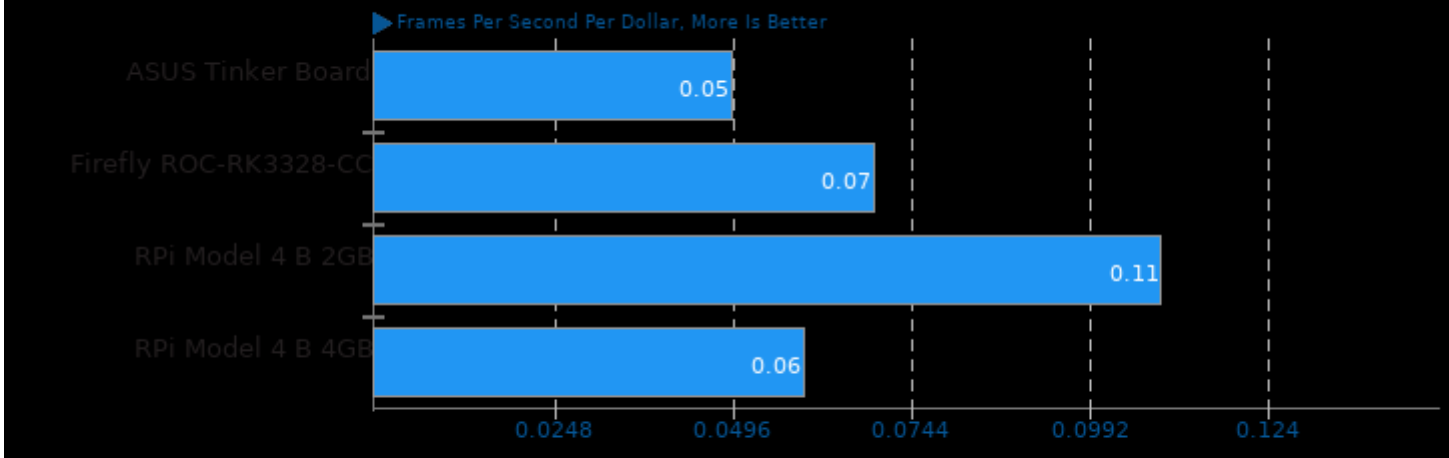
Performance / Cost - Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19



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.

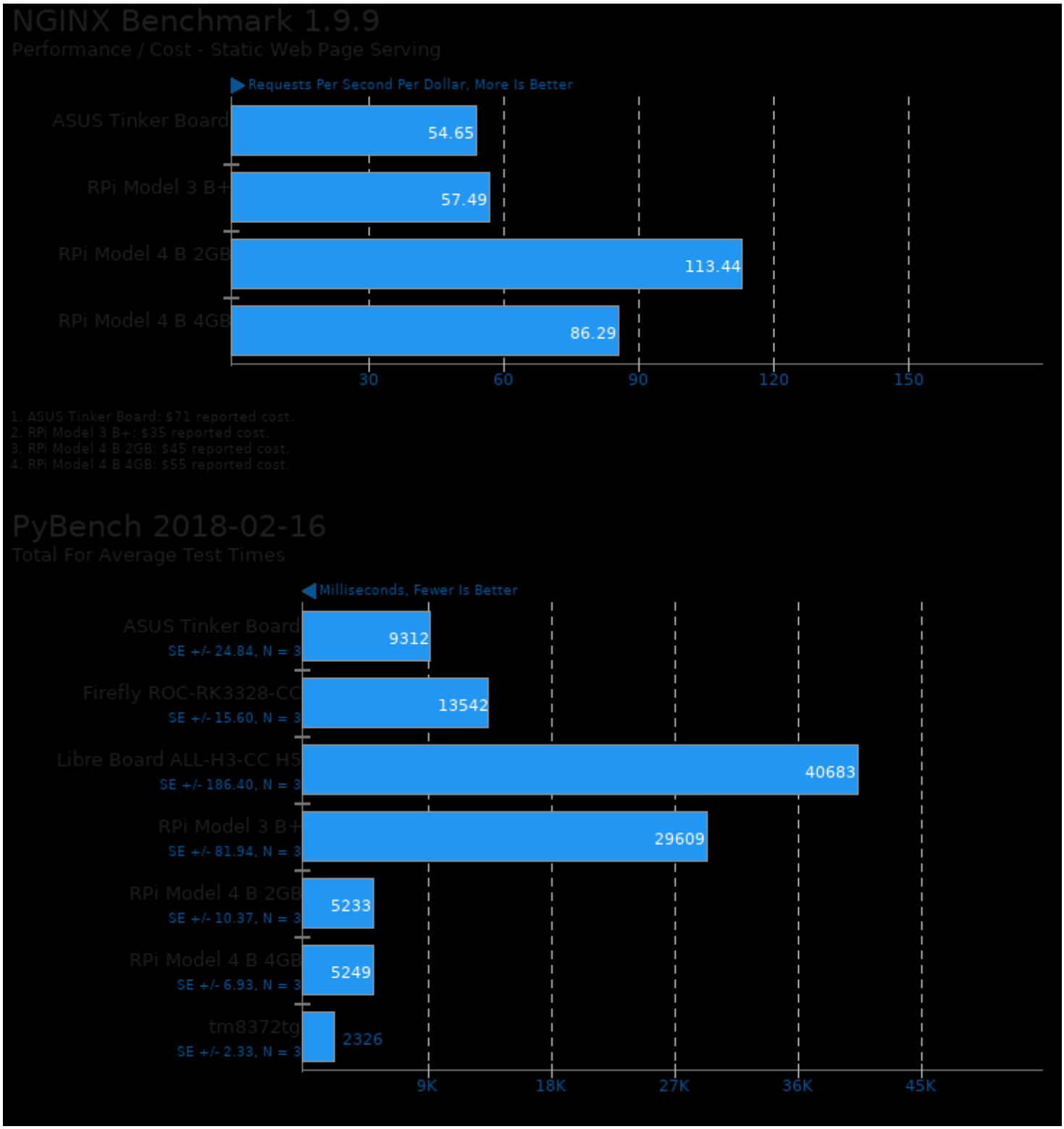
x264 2018-09-25

Performance / Cost - H.264 Video Encoding

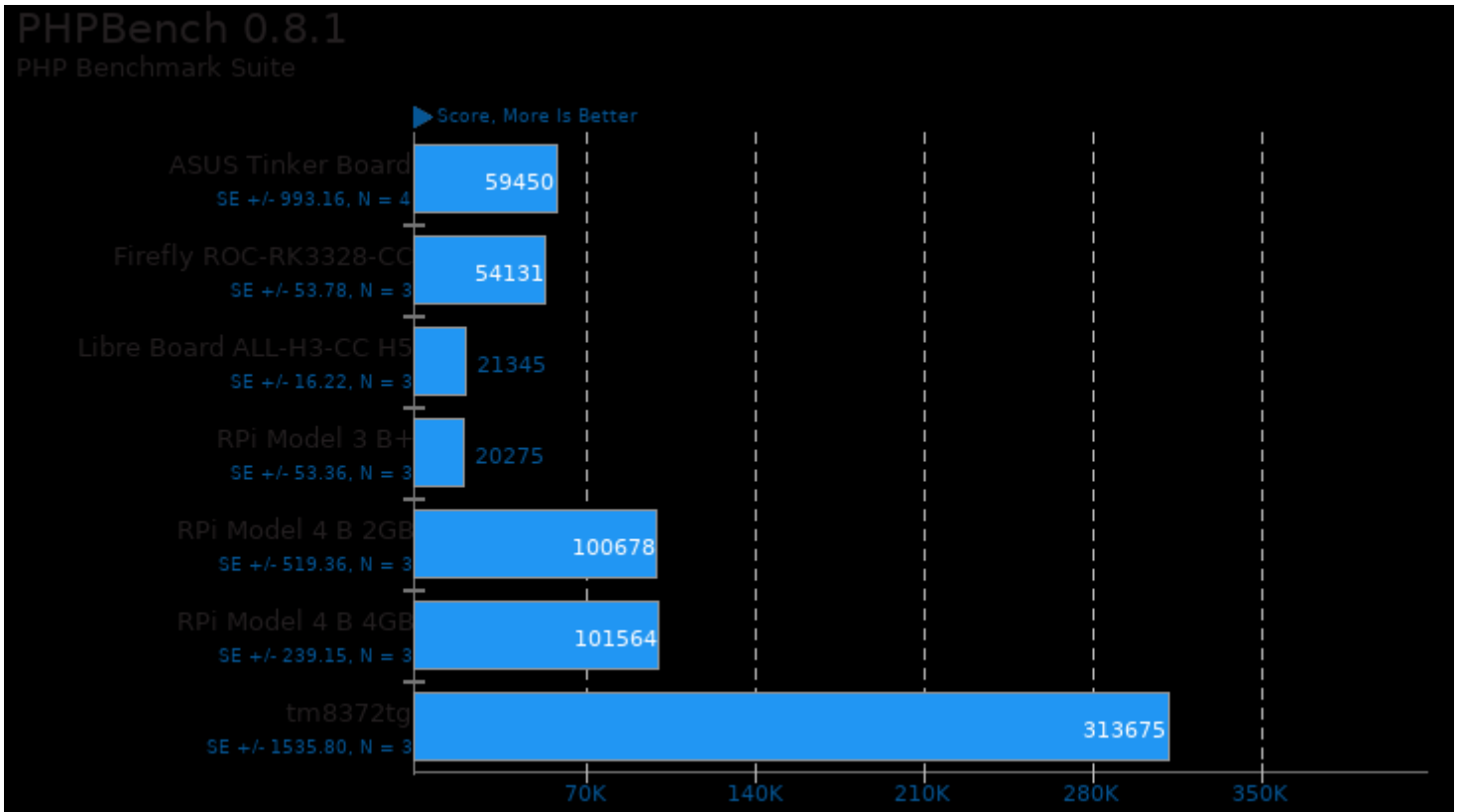


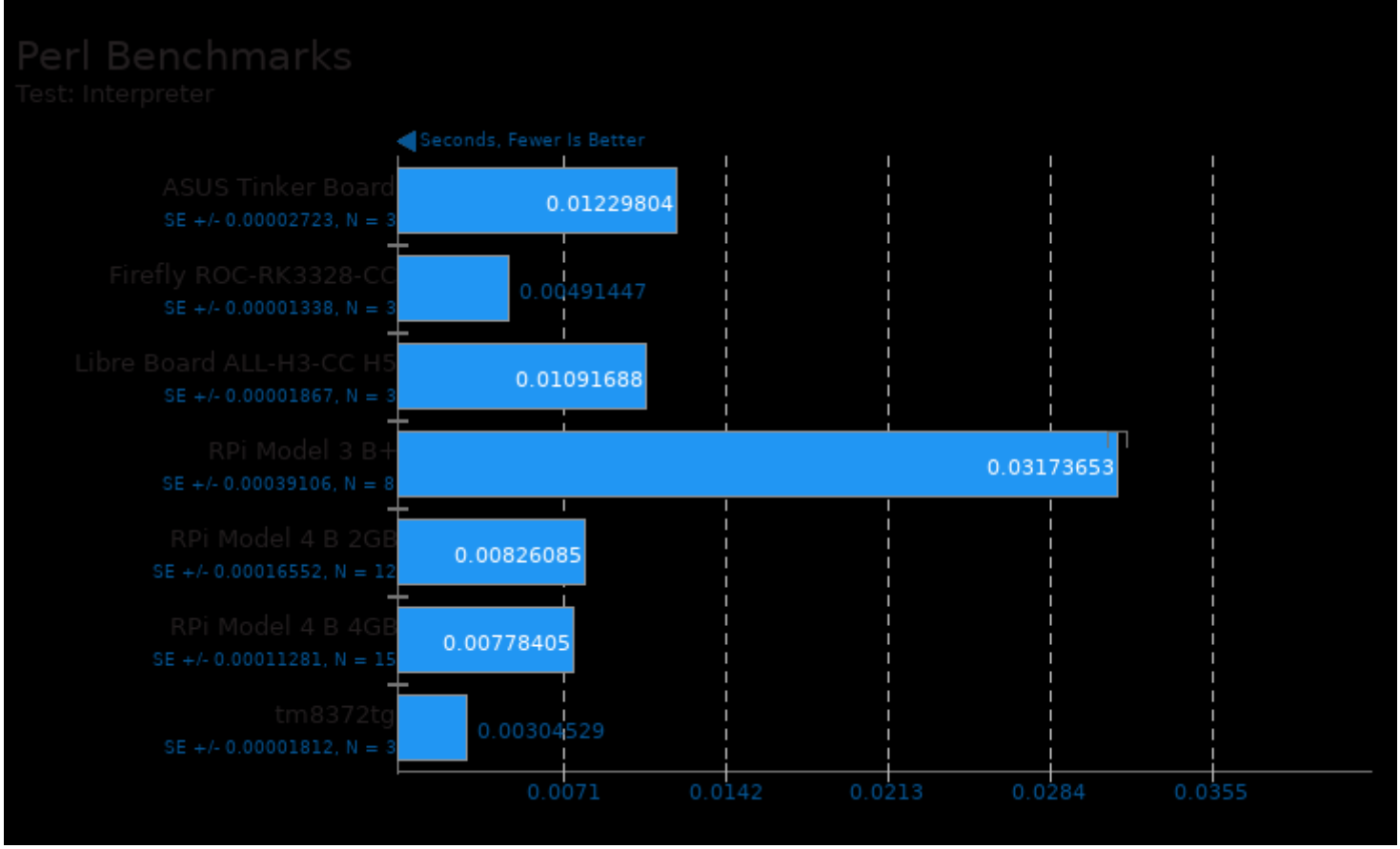
1. ASUS Tinker Board: $71 reported cost.
2. Firefly ROC-RK3328-CC: $35 reported cost.
3. RPi Model 4 B 2GB: $45 reported cost.
4. RPi Model 4 B 4GB: $55 reported cost.

Raspberry Pi Model 4 Benchmarks

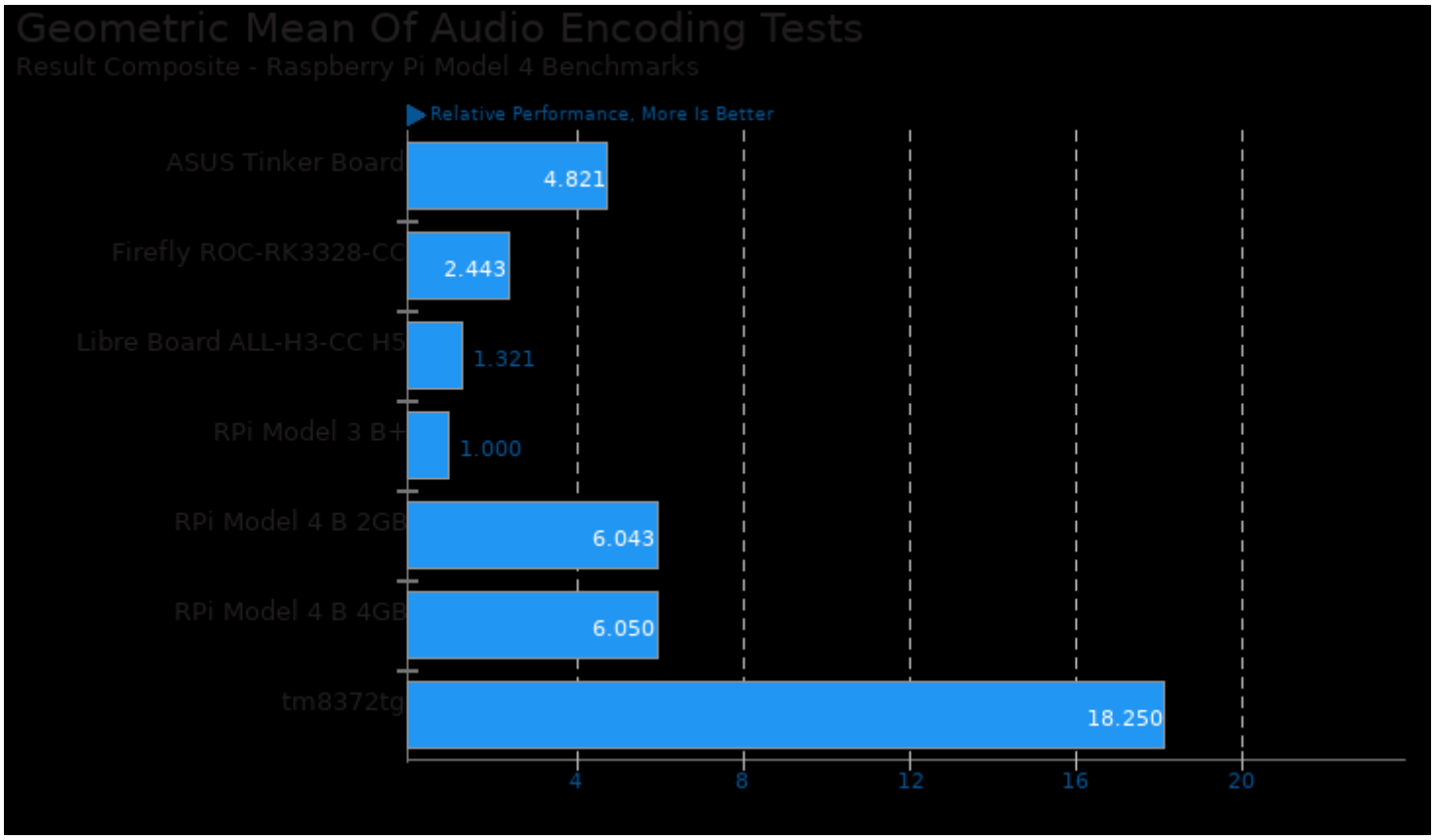


Raspberry Pi Model 4 Benchmarks

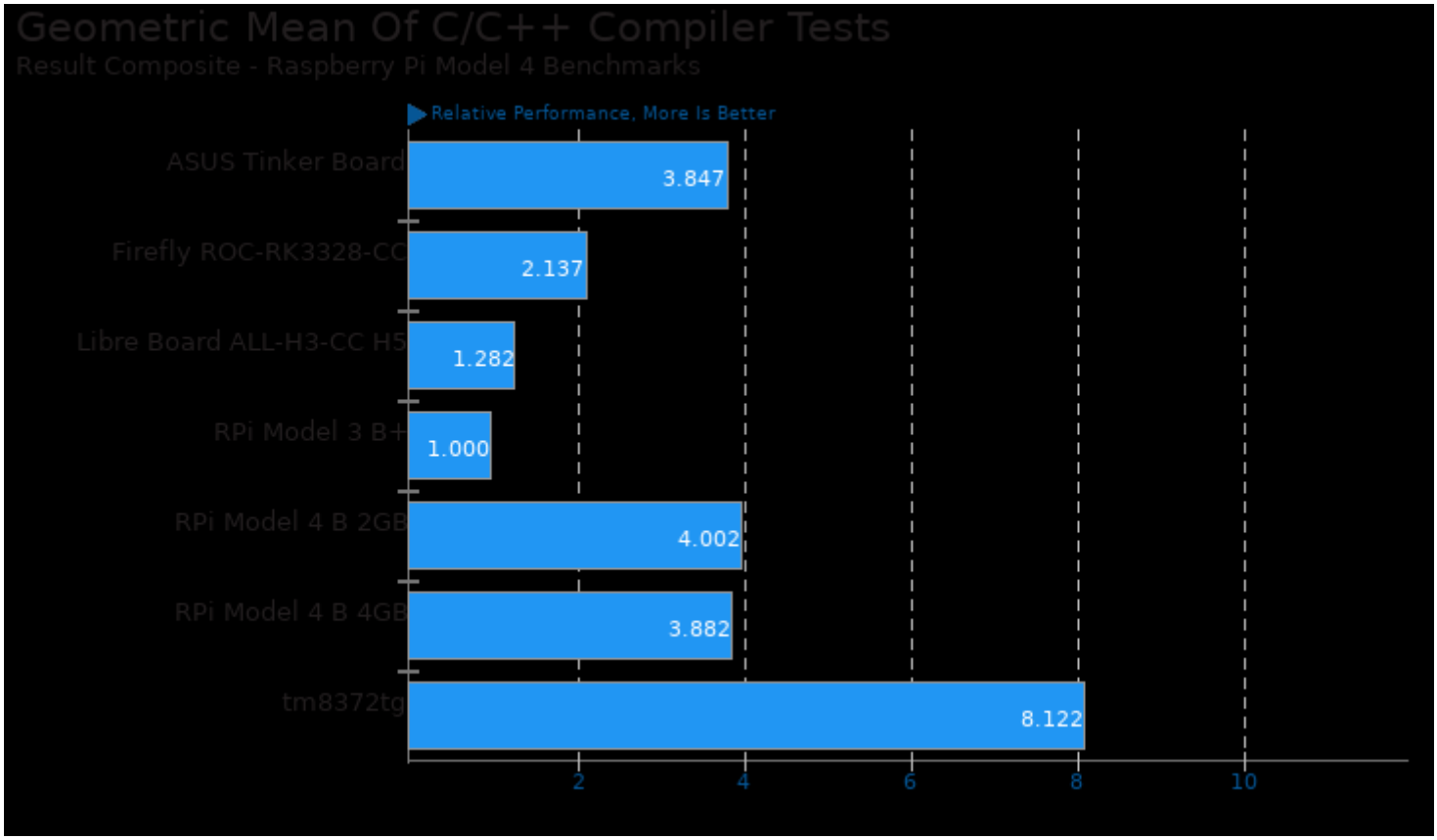




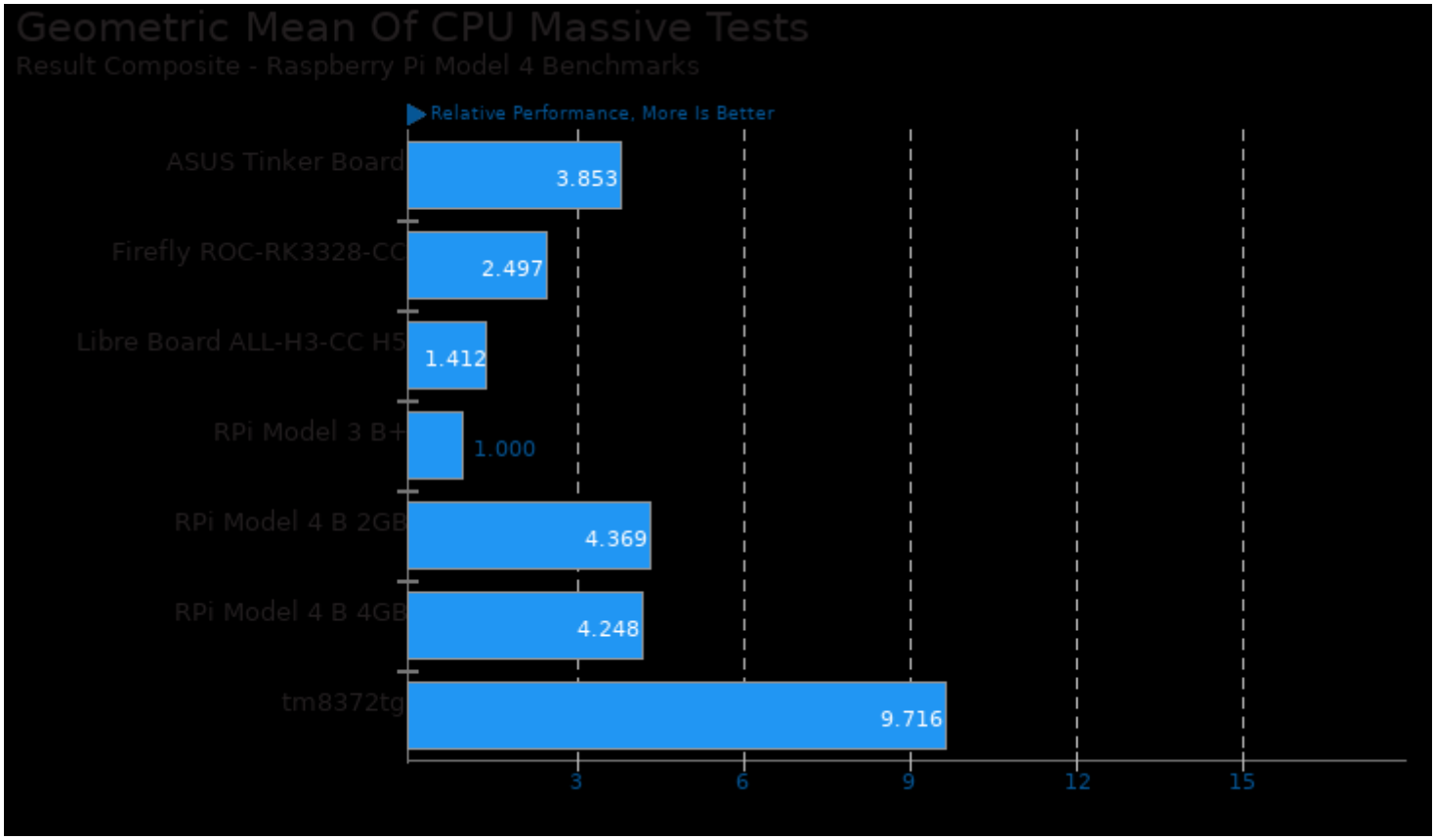
These geometric means are based upon test groupings / test suites for this result file.



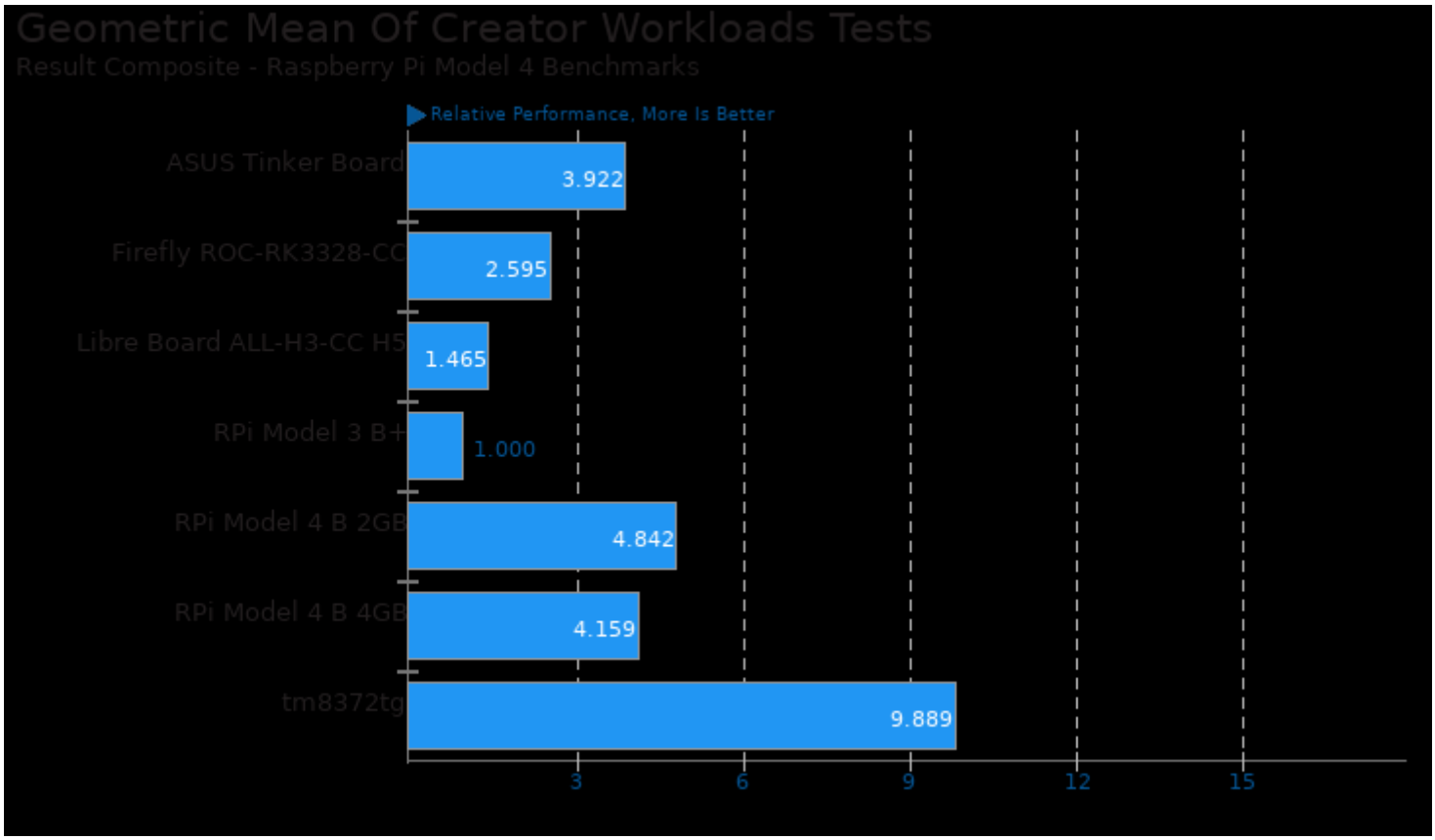
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



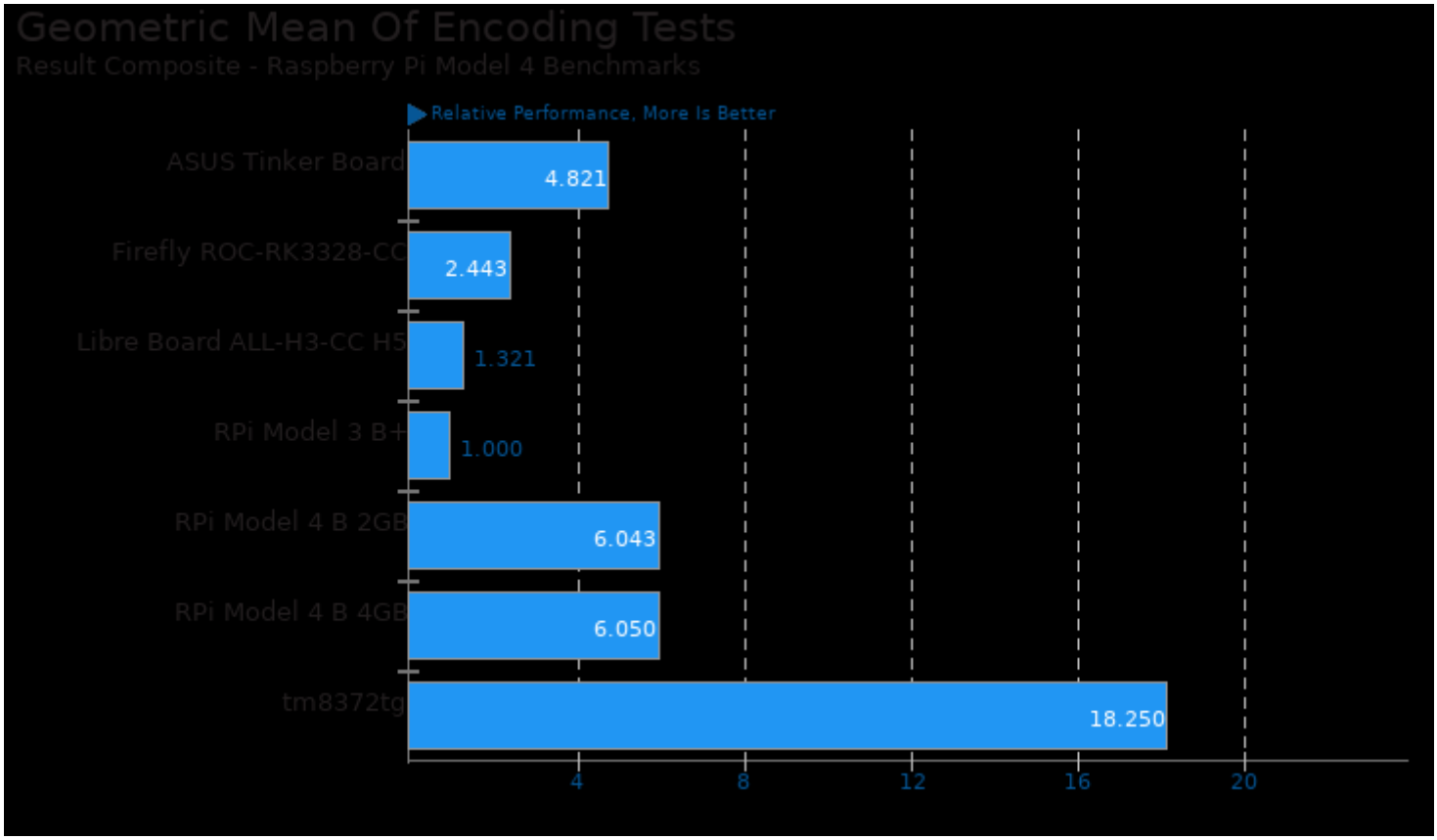
Geometric mean based upon tests: pts/scimark2, pts/graphics-magick, pts/encode-mp3, pts/encode-flac, pts/x264, pts/compress-zstd and pts/nginx



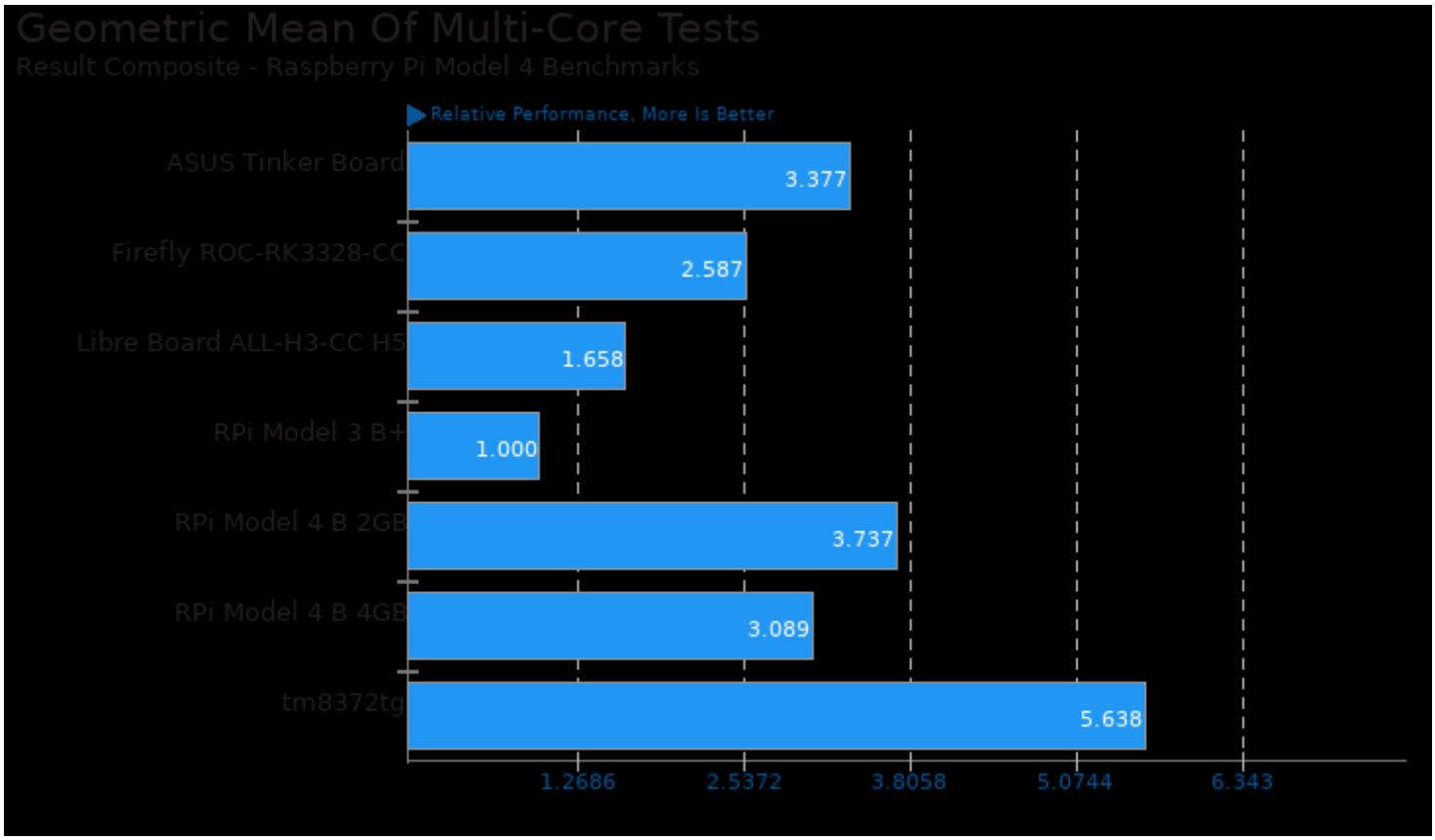
Geometric mean based upon tests: pts/compress-zstd, pts/x264, pts/encode-flac, pts/encode-mp3, pts/graphics-magick, pts/nginx, pts/phpbench and pts/rust-prime



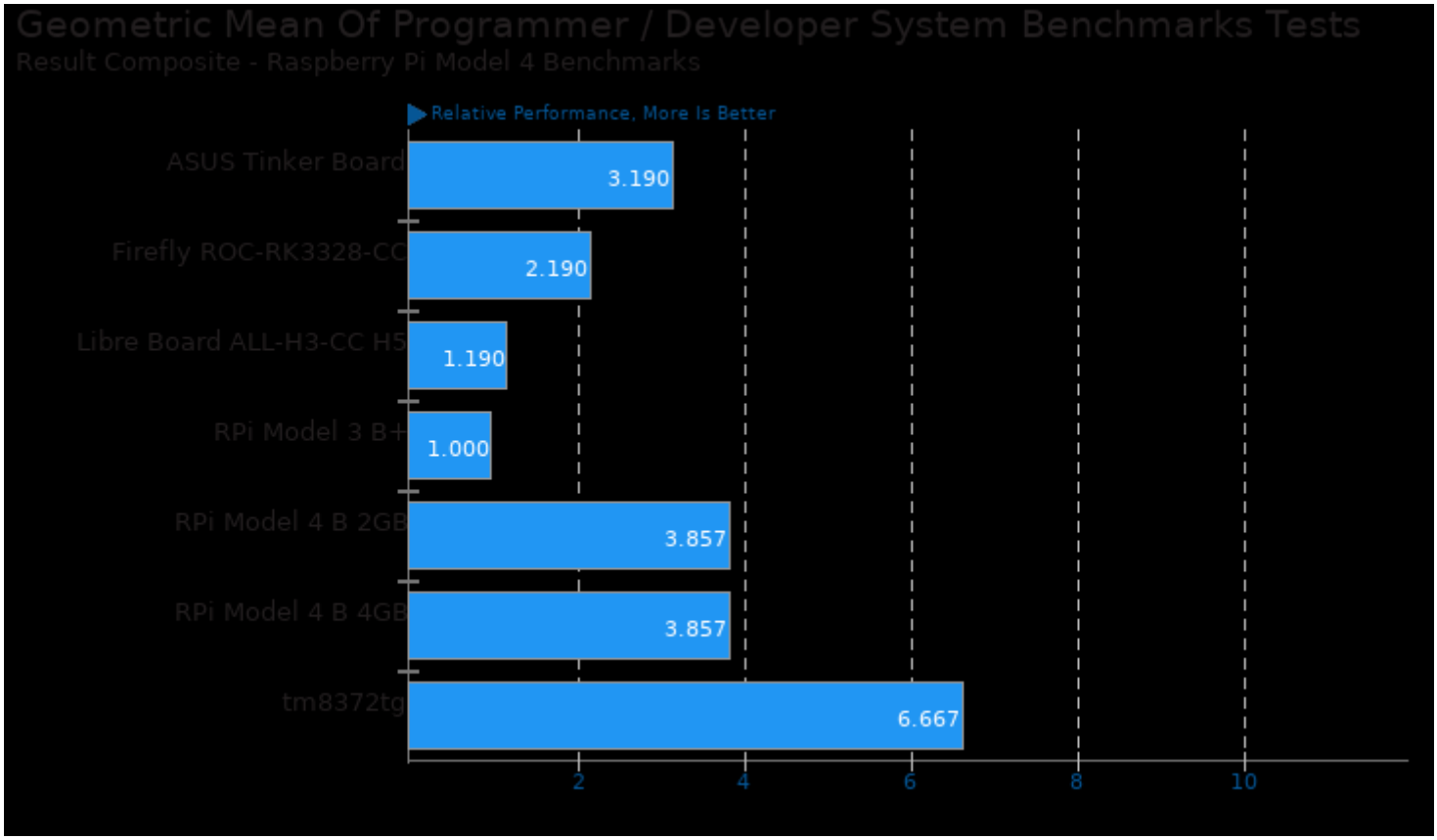
Geometric mean based upon tests: pts/smallpt, pts/x264, pts/encode-mp3, pts/encode-flac and pts/graphics-magick



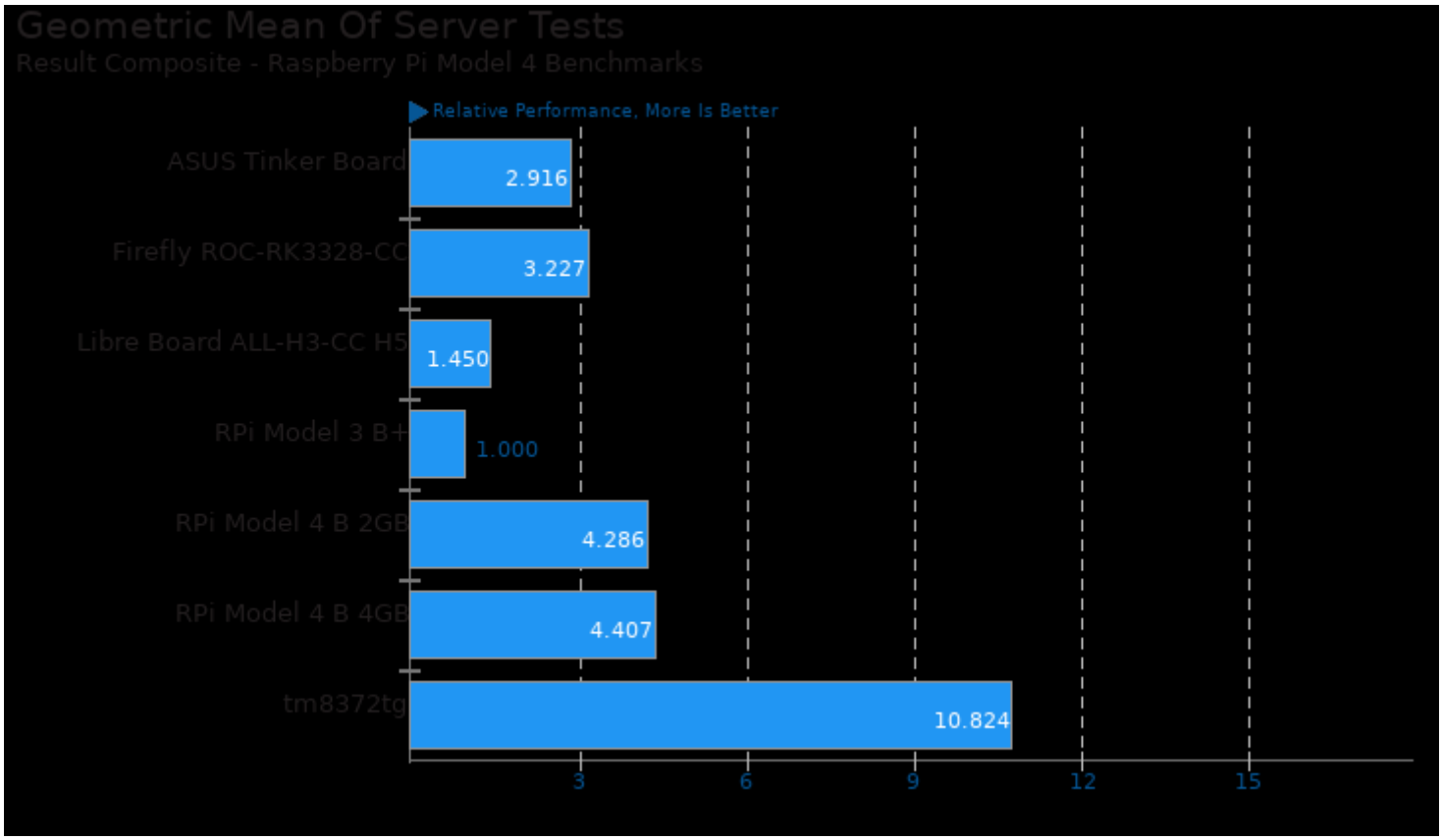
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac and pts/x264



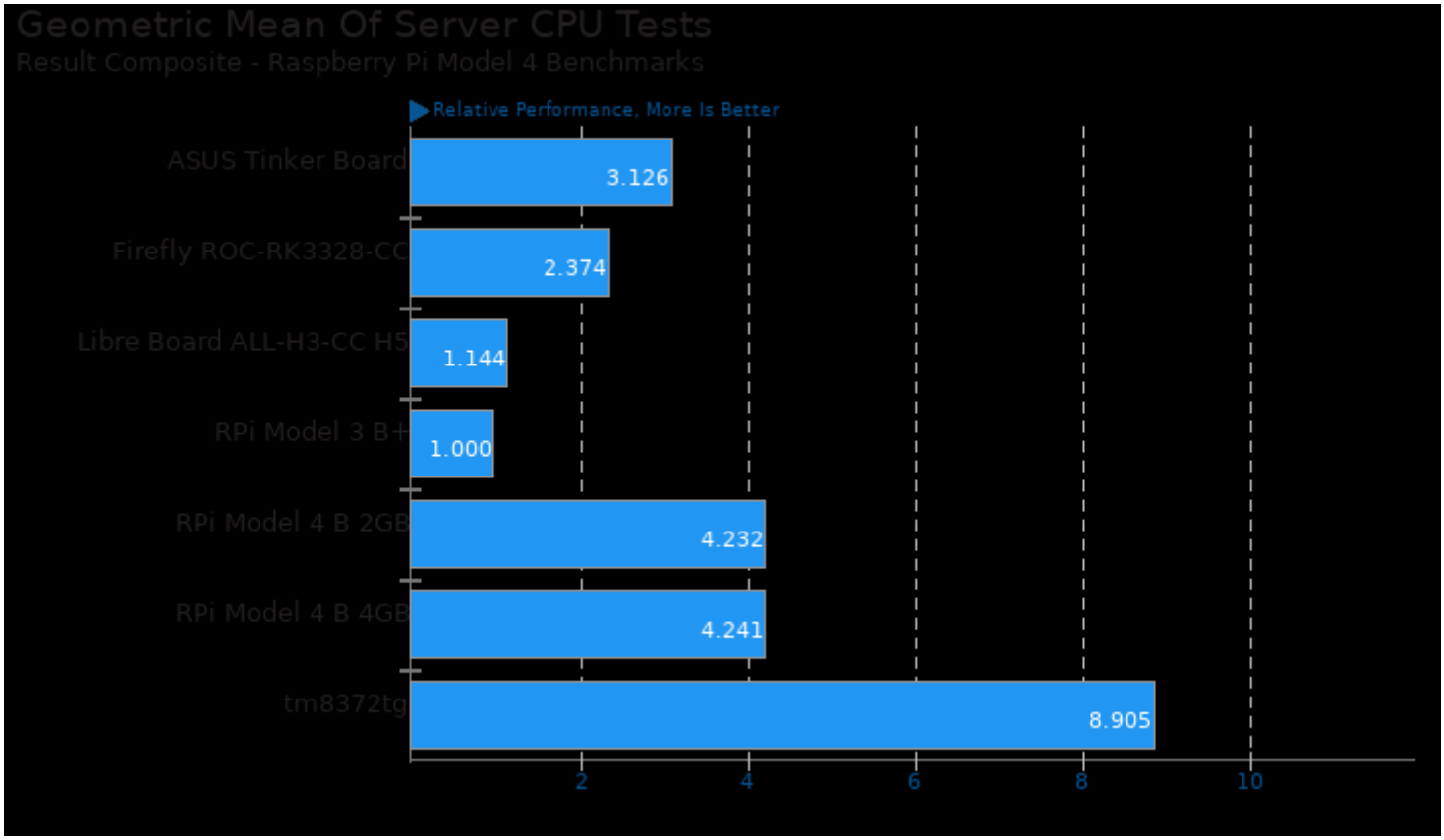
Geometric mean based upon tests: pts/x264, pts/smallpt, pts/graphics-magick, pts/compress-zstd and pts/rust-prime



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

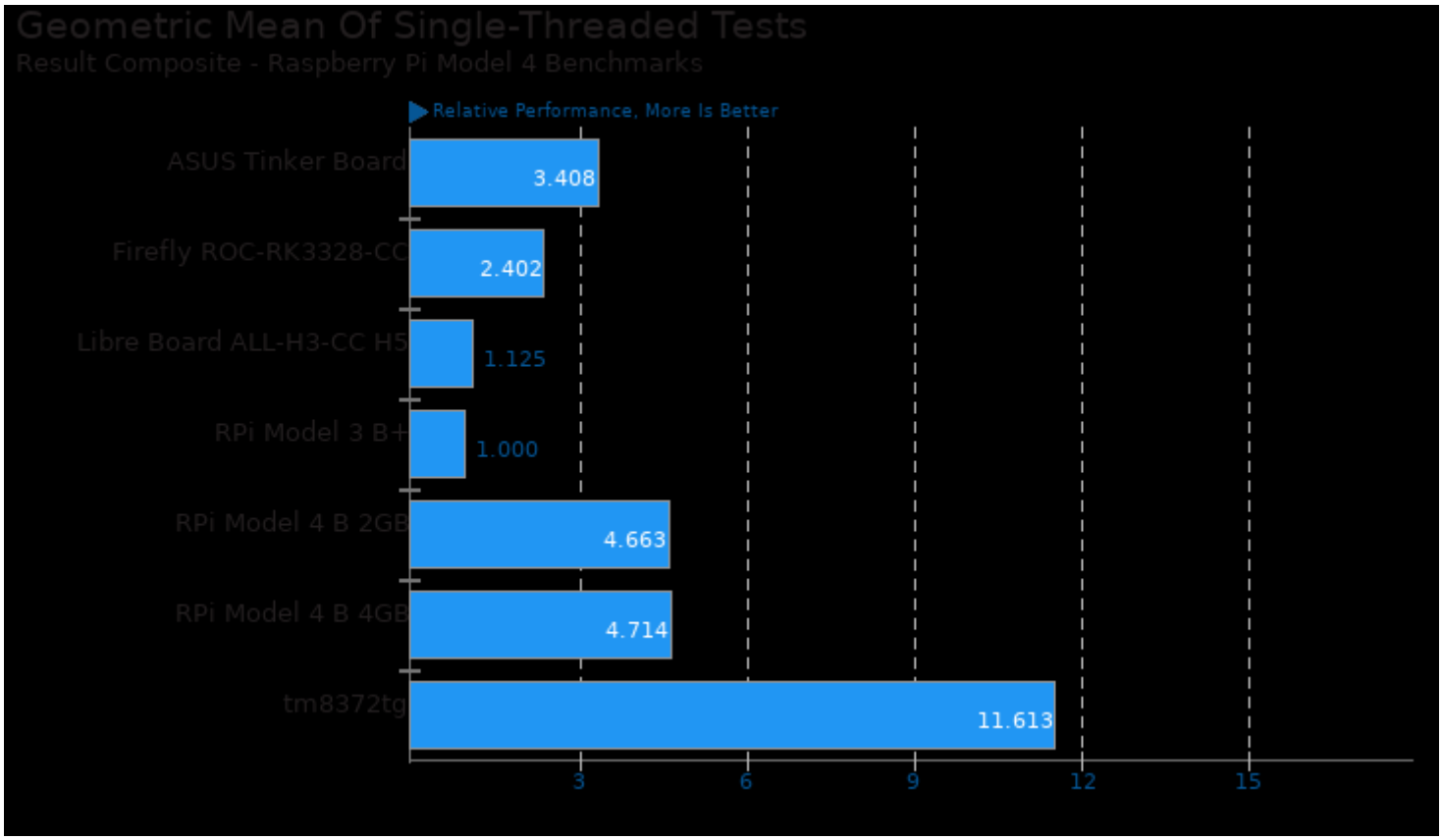


Geometric mean based upon tests: pts/nginx, pts/phpbench and pts/perl-benchmark



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 Friday, 29 March 2024 01:34.