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ODROID-H2 Intel Ubuntu Linux Benchmarks

ODROID H2 Intel Linux benchmarks by Michael Larabel for a future article.

Automated Executive Summary

ODROID-H2 had the most wins, coming in first place for 91% of the tests.

Based on the geometric mean of all complete results, the fastest (ODROID-H2) was 7.578x the speed of the slowest (Raspberry Pi 2 Model B). A9 T7100 was 0.597x the speed of ODROID-H2, ASUS Tinker Board was 0.655x the speed of A9 T7100, ODROID-C2 was 0.79x the speed of ASUS Tinker Board, Firefly ROC-RK3328-CC was 0.799x the speed of ODROID-C2, Raspberry Pi 3 Model B+ was 0.96x the speed of Firefly ROC-RK3328-CC, Raspberry Pi 3 Model A+ was 0.992x the speed of Raspberry Pi 3 Model B+, Raspberry Pi 3 Model B was 0.925x the speed of Raspberry Pi 3 Model A+, Raspberry Pi 2 Model B was 0.607x the speed of Raspberry Pi 3 Model B.

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

PyBench (Total For Average Test Times) at 12.566x
PHPBench (PHP Benchmark Suite) at 12.294x
x264 (H.264 Video Encoding) at 10.646x
C-Ray (Total Time - 4K, 16 Rays Per Pixel) at 9.612x
AOBench (Size: 2048 x 2048 - Total Time) at 7.523x
Perl Benchmarks (Test: Pod2html) at 7.273x

LAME MP3 Encoding (WAV To MP3) at 7.034x
TTSIOD 3D Renderer (Phong Rendering With Soft-Shadow Mapping) at 6.927x
Tinymembench (Standard Memset) at 6.389x
7-Zip Compression (Compress Speed Test) at 6.202x.

Test Systems:

Raspberry Pi 2 Model B

Processor: ARMv7 rev 5 @ 0.90GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 2 Model B Rev 1.1, Memory: 927MB, Disk: 32GB GB2MW, Graphics: BCM2708

OS: Raspbian 9.6, Kernel: 4.14.79-v7+ (armv7l), Desktop: LXDE, Display Server: X Server 1.19.2, Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 656x416

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
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.13 + Python 3.5.3

Raspberry Pi 3 Model B

Processor: ARMv7 rev 4 @ 1.20GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 3 Model B Rev 1.2, Memory: 927MB, Disk: 32GB GB1QT, Graphics: BCM2708

OS: Raspbian 9.6, Kernel: 4.14.79-v7+ (armv7l), Desktop: LXDE, Display Server: X Server 1.19.2, Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 656x416

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
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.13 + Python 3.5.3

Raspberry Pi 3 Model B+

Processor: ARMv7 rev 4 @ 1.40GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 3 Model B Plus Rev 1.3, Memory: 927MB, Disk: 32GB GB2MW, Graphics: BCM2708

OS: Raspbian 9.6, Kernel: 4.14.79-v7+ (armv7l), Desktop: LXDE, Display Server: X Server 1.19.2, Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 1824x984

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
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.13 + Python 3.5.3

Raspberry Pi 3 Model A+

Processor: ARMv7 rev 4 @ 1.40GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 3 Model A Plus Rev 1.0, Memory: 431MB, Disk: 32GB SC32G, Graphics: BCM2708

OS: Raspbian 9.6, Kernel: 4.14.79-v7+ (armv7l), Desktop: LXDE, Display Server: X Server 1.19.2, Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 1824x984

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
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Python Notes: Python 2.7.13 + Python 3.5.3

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

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 7.3.0, 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-as=/usr/bin/aarch64-linux-gnu-as --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-ld=/usr/bin/aarch64-linux-gnu-ld -v
Processor Notes: Scaling Governor: cpufreq-dt performance
Python Notes: Python 2.7.15rc1 + Python 3.6.5

ODROID-C2

Processor: Amlogic ARMv8 Cortex-A53 @ 1.54GHz (4 Cores), Motherboard: ODROID-C2, Memory: 2048MB, Disk: 32GB GB1QT, Graphics: OSD

OS: Ubuntu 18.04, Kernel: 3.16.57-20 (aarch64), Display Server: X Server 1.19.6, Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 1920x1080

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-as=/usr/bin/aarch64-linux-gnu-as --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-ld=/usr/bin/aarch64-linux-gnu-ld -v
Processor Notes: Scaling Governor: meson_cpufreq performance

Python Notes: Python 2.7.15rc1 + Python 3.6.5

ODROID-H2

Processor: Intel Celeron J4105 @ 2.50GHz (4 Cores), Motherboard: HARDKERNEL ODROID-H2 v1.0 (5.13 BIOS), Chipset: Intel Device 31f0, Memory: 32768MB, Disk: 500GB Western Digital WDS500G2X0C-00L350, Graphics: inteldrmfb (750MHz), Audio: Realtek ALC662 rev1, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 18.10, Kernel: 4.15.0-38-generic (x86_64), Display Server: X Server, Compiler: GCC 8.2.0, File-System: overlayfs, Screen Resolution: 1920x1080, System Layer: docker

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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_pstate powersave
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW + SSB disabled via prctl and seccomp

A9 T7100

Processor: Intel Core 2 Duo T7100 @ 1.80GHz (2 Cores), Motherboard: TOSHIBA Portable PC (Version 1.40 BIOS), Chipset: Intel Mobile PM965/GM965/GL960 + ICH8M, Memory: 2048MB, Disk: 120GB FUJITSU MHW2120B, Graphics: Intel 965GM 384MB, Audio: Realtek ALC262, Network: Intel 82566MC Gigabit Connection + Intel PRO/Wireless

OS: Ubuntu 18.04, Kernel: 4.15.0-39-generic (x86_64), Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.19.6, Display Driver: modesetting 1.19.6, OpenGL: 2.1 Mesa 18.0.5, Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 1280x800

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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: acpi-cpufreq ondemand
Python Notes: Python 2.7.15rc1 + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline + PTE Inversion; VMX: EPT disabled

	Raspberry Pi 2 Model B	Raspberry Pi 3 Model B	Raspberry Pi 3 Model B+	Raspberry Pi 3 Model A+	ASUS Tinker Board	Firefly ROC-RK3328-CC	ODROID-C2	ODROID-H2	A9 T7100
C-Ray - Total Time - 4.1.R.P.P (sec)	4364	2317	2111	2068	1579	2604	1559	454	1472
Normalized	10.4%	19.59%	21.51%	21.95%	28.75%	17.43%	29.12%	100%	30.84%
Standard Deviation	1.6%	0.9%	0.2%	0.4%	0.3%	0.8%	1.9%	0%	0.2%
AOBench - 2048 x 2048 - Total Time (sec)	668	334	298	286	214	298	262	88.80	145.46
Normalized	13.29%	26.59%	29.8%	31.05%	41.5%	29.8%	33.89%	100%	61.05%
Standard Deviation	0.4%	0.1%	4.7%	0.4%	3.4%	0.4%	0.9%	0.5%	0.1%

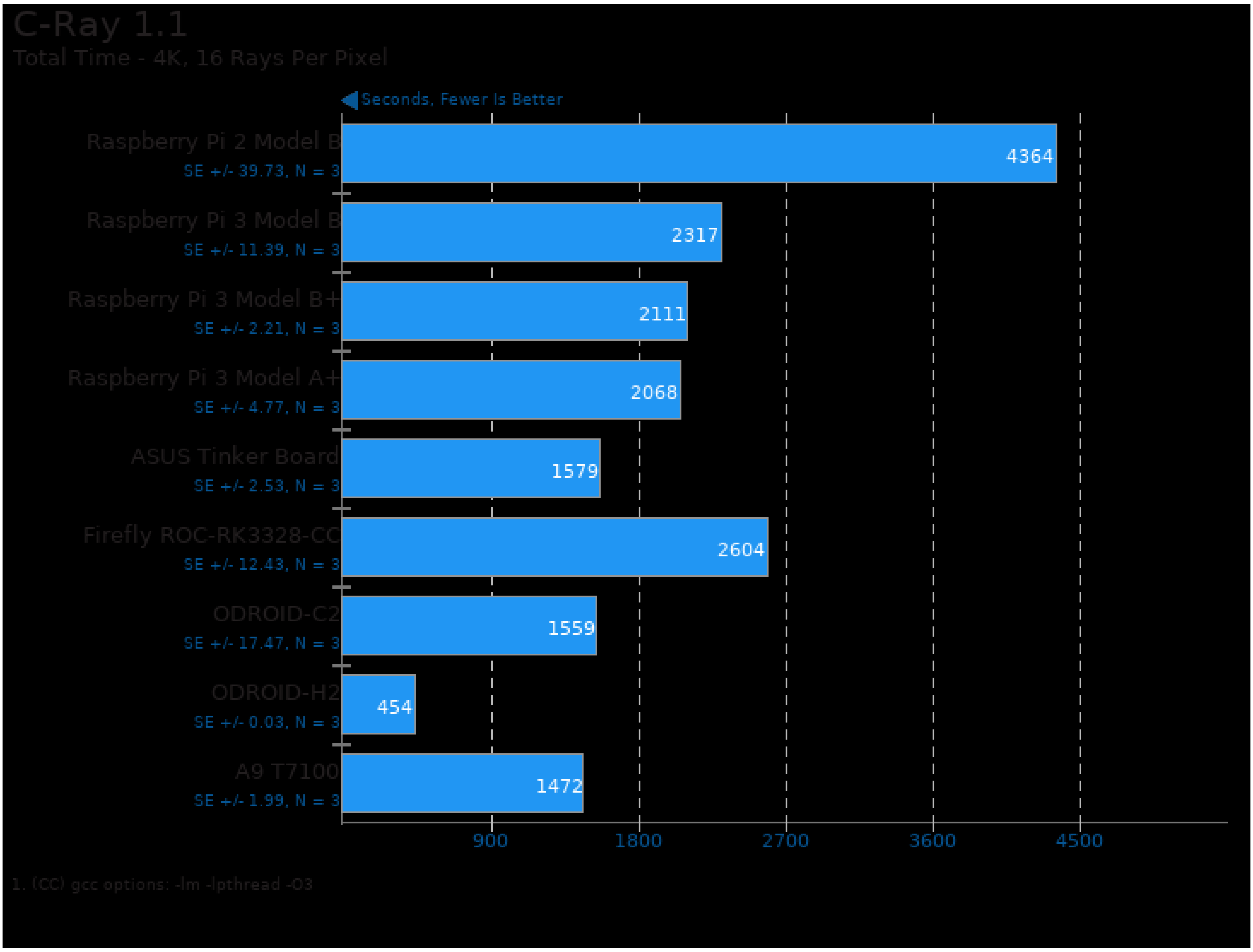
ODROID-H2 Intel Ubuntu Linux Benchmarks

Perl Benchmarks - Pod2html (sec)	**2.39198371**	1.29932392	1.21061075	1.15952401	0.74372882	1.70325877	1.08893965	**0.32890668**	0.40308935
Normalized	13.75%	25.31%	27.17%	28.37%	44.22%	19.31%	30.2%	100%	81.6%
Standard Deviation	1.9%	1.7%	0.8%	0.1%	1.1%	2.3%	4.7%	0.1%	0.5%
LAME MP3 Encoding - WAV To MP3 (sec)	**515**	352	302	304	158	315	265	**73.22**	90.85
Normalized	14.22%	20.8%	24.25%	24.09%	46.34%	23.24%	27.63%	100%	80.59%
Standard Deviation	0.3%	0.2%	0.3%	0.6%	0.6%	0.2%	0.1%	0%	0.1%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	**11.20**	15.99	16.51	17.25	22.38		22.51	**77.58**	28.75
Normalized	14.44%	20.61%	21.28%	22.24%	28.85%		29.02%	100%	37.06%
Standard Deviation	0.4%	3.3%	0.3%	1.6%	2.6%		2.2%	0.3%	0.4%
Tinymembench - Standard Memset (MB/s)	**1188**	1773	1826	1833	4199	5628	3737	**7590**	2086
Normalized	15.65%	23.36%	24.06%	24.15%	55.32%	74.15%	49.24%	100%	27.48%
Standard Deviation	0.5%	1.6%	2.4%	3.4%	0%	5.3%	0.1%	0.1%	0.1%
7-Zip Compression - C.S.T (MIPS)	**1168**	1858	1803	1993	2946	1536	2165	**7244**	3023
Normalized	16.12%	25.65%	24.89%	27.51%	40.67%	21.2%	29.89%	100%	41.73%
Standard Deviation	0.4%	0.3%	3%	0.7%	4%	0.5%	0.4%	0.9%	0.6%
Tinymembench - Standard Memcpy (MB/s)	**1000**	1302	1285	1300	1532	1240	1718	**5577**	1949
Normalized	17.93%	23.35%	23.04%	23.31%	27.47%	22.23%	30.81%	100%	34.95%
Standard Deviation	2.5%	0.3%	1.2%	1.3%	0.3%	3.4%	0.4%	0.3%	0.4%
PHPBench - Performance / Cost - P.B.S (Score/Dollar)			1088	1614	**944.85**	1510	994.40	**2317**	
Normalized			46.97%	69.64%	40.78%	65.17%	42.92%	100%	
Perl Benchmarks - Performance / Cost - Pod2html (sec x Dollar)			42.37	**28.99**	48.34	59.61	**65.34**	36.51	
Normalized			68.42%	100%	59.97%	48.63%	44.37%	79.4%	
PyBench - Performance / Cost - T.F.A.T.T (Milliseconds x			742210	521850	605670	498470	**757140**	**336441**	
Normalized			45.33%	64.47%	55.55%	67.49%	44.44%	100%	
7-Zip Compression - Performance / Cost - C.S.T (MIPS/Dollar)			51.51	**79.72**	45.32	43.89	**36.08**	65.26	
Normalized			64.61%	100%	56.85%	55.06%	45.26%	81.86%	
Tinymembench - Performance / Cost - Standard Memcpy (MB/s/Dollar)			36.71	**52.00**	**23.57**	35.43	28.63		
Normalized			70.6%	100%	45.33%	68.13%	55.06%		

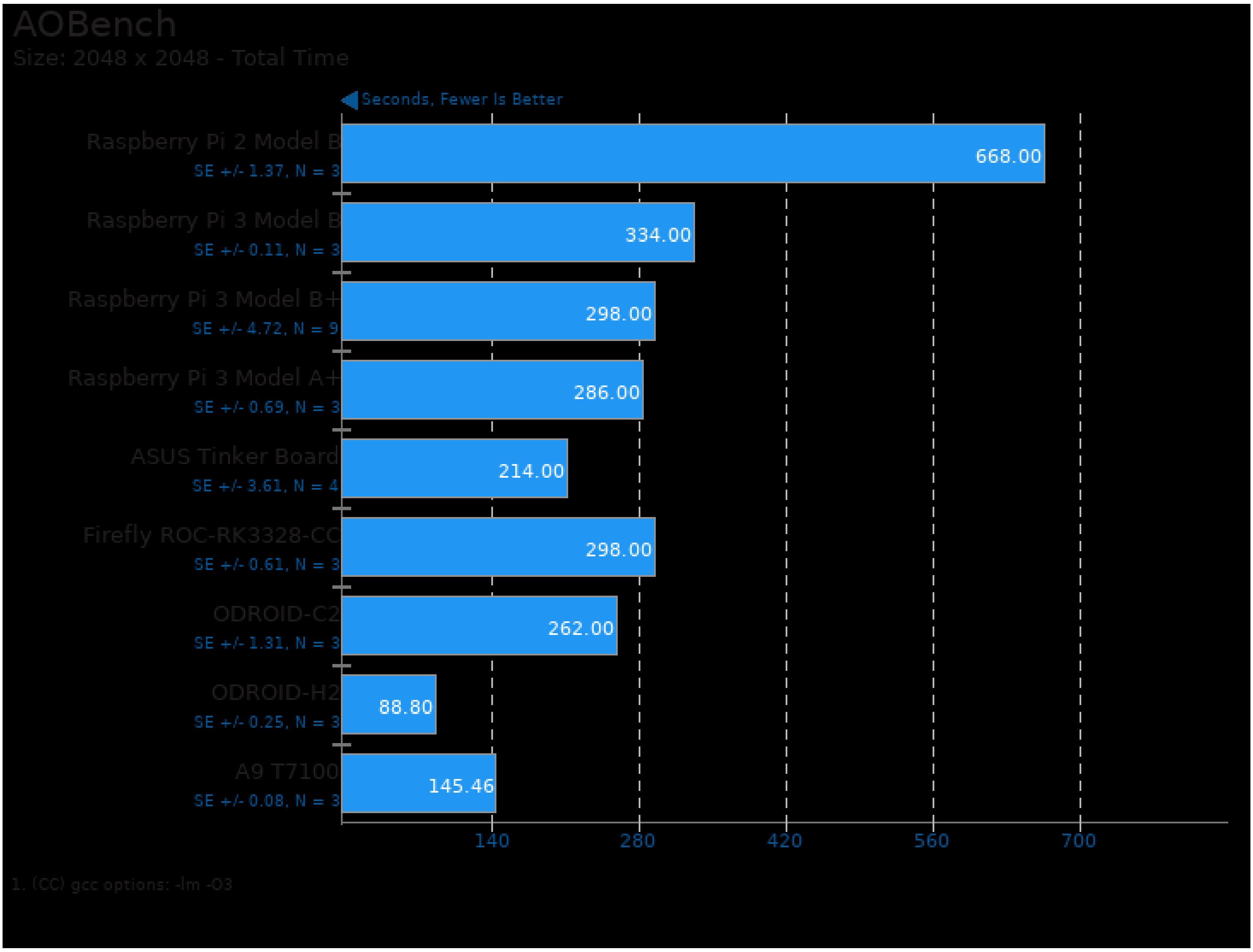
ODROID-H2 Intel Ubuntu Linux Benchmarks

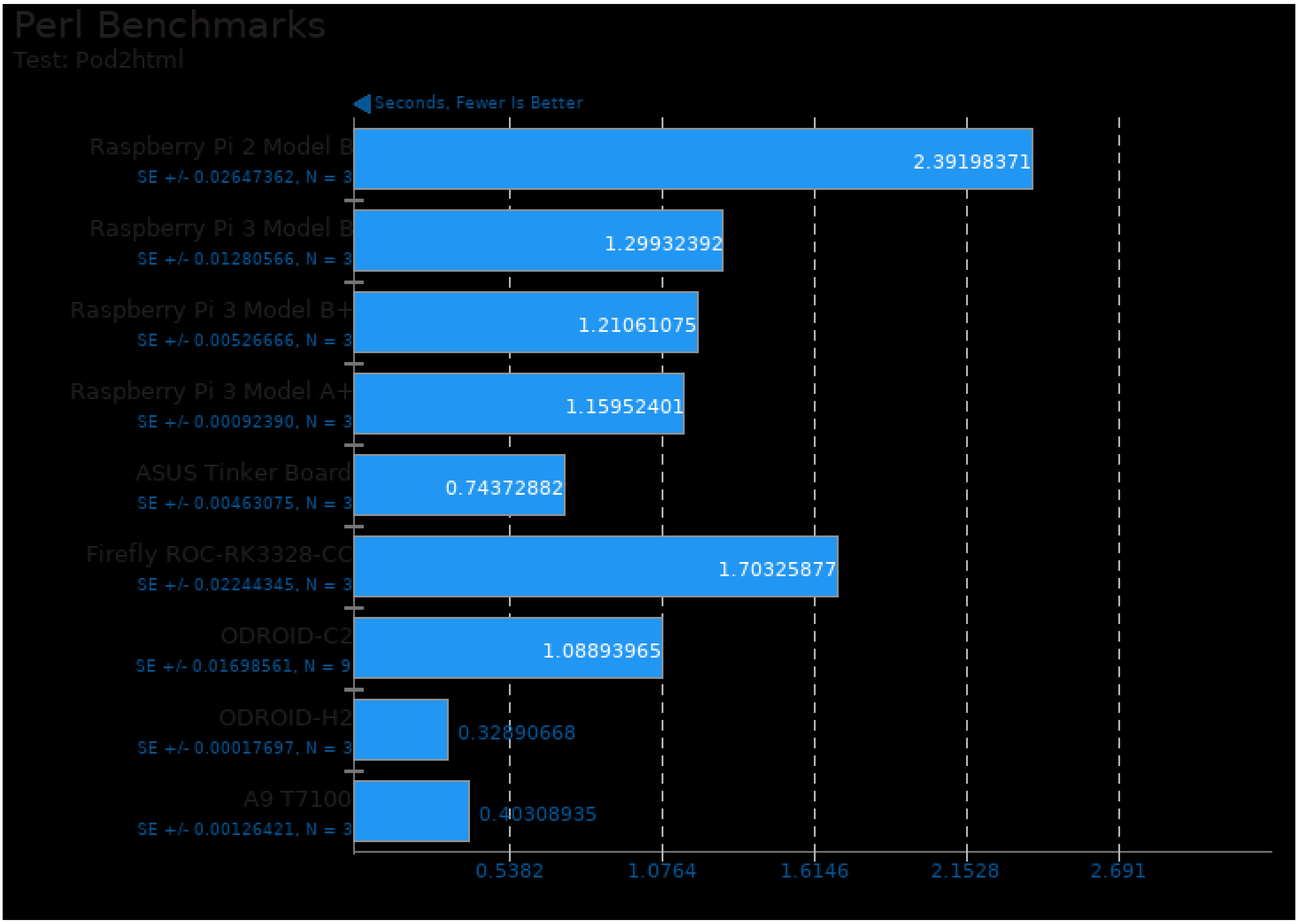
x264 - Performance / Cost - H.2.V.E (FPS/Dollar)			0.06		**0.05**	**0.05**	**0.05**	**0.11**	
Normalized			54.55%		45.45%	45.45%	45.45%	100%	
AOBench - Performance / Cost - 2048 x 2048 - Total Time (sec x Dollar)			10430	**7150**	13910	10430	**15720**	9857	
Normalized			68.55%	100%	51.4%	68.55%	45.48%	72.54%	
LAME MP3 Encoding - Performance / Cost - WAV To MP3 (sec x Dollar)			10570	**7600**	10270	11025	**15900**	8127	
Normalized			71.9%	100%	74%	68.93%	47.8%	93.51%	
TTSIOD 3D Renderer - Performance / Cost - P.R.W.S.S.M (FPS/Dollar)			0.47	0.69	**0.34**		0.38	**0.70**	
Normalized			67.14%	98.57%	48.57%		54.29%	100%	
C-Ray - Performance / Cost - Total Time - 4.1.R.P.P (sec x Dollar)			73885	51700	**102635**	91140	93540	**50436**	
Normalized			68.26%	97.56%	49.14%	55.34%	53.92%	100%	
PyBench - T.F.A.T.T (Milliseconds)	**38087**	24328	21206	20874	9318	14242	12619	**3031**	3542
Normalized	7.96%	12.46%	14.29%	14.52%	32.53%	21.28%	24.02%	100%	85.57%
Standard Deviation	0.4%	0.4%	0.4%	0.2%	0.8%	0.4%	0.1%	0.1%	0.5%
PHPBench - P.B.S (Score)	**20920**	34426	38087	40338	61415	52852	59664	**257186**	190928
Normalized	8.13%	13.39%	14.81%	15.68%	23.88%	20.55%	23.2%	100%	74.24%
Standard Deviation	0.5%	0.2%	0.7%	0.2%	0.7%	0.5%	0.2%	0.1%	1.4%
x264 - H.2.V.E (FPS)	**1.13**	2.03	2.08		3.36	1.65	2.88	**12.03**	4.03
Normalized	9.39%	16.87%	17.29%		27.93%	13.72%	23.94%	100%	33.5%
Standard Deviation	0.5%	0%	0.6%		0.5%	0.6%	0.2%	0.3%	0.5%
Perl Benchmarks - Performance / Cost - Interpreter (sec x Dollar)			0.28	0.24	0.28	**0.21**	0.33	**0.37**	
Normalized			75%	87.5%	75%	100%	63.64%	56.76%	
Git - Performance / Cost - T.T.C.C.G.C (sec x Dollar)			1721	1467	1672	1451	**2525**	**1442**	
Normalized			83.78%	98.31%	86.25%	99.34%	57.11%	100%	

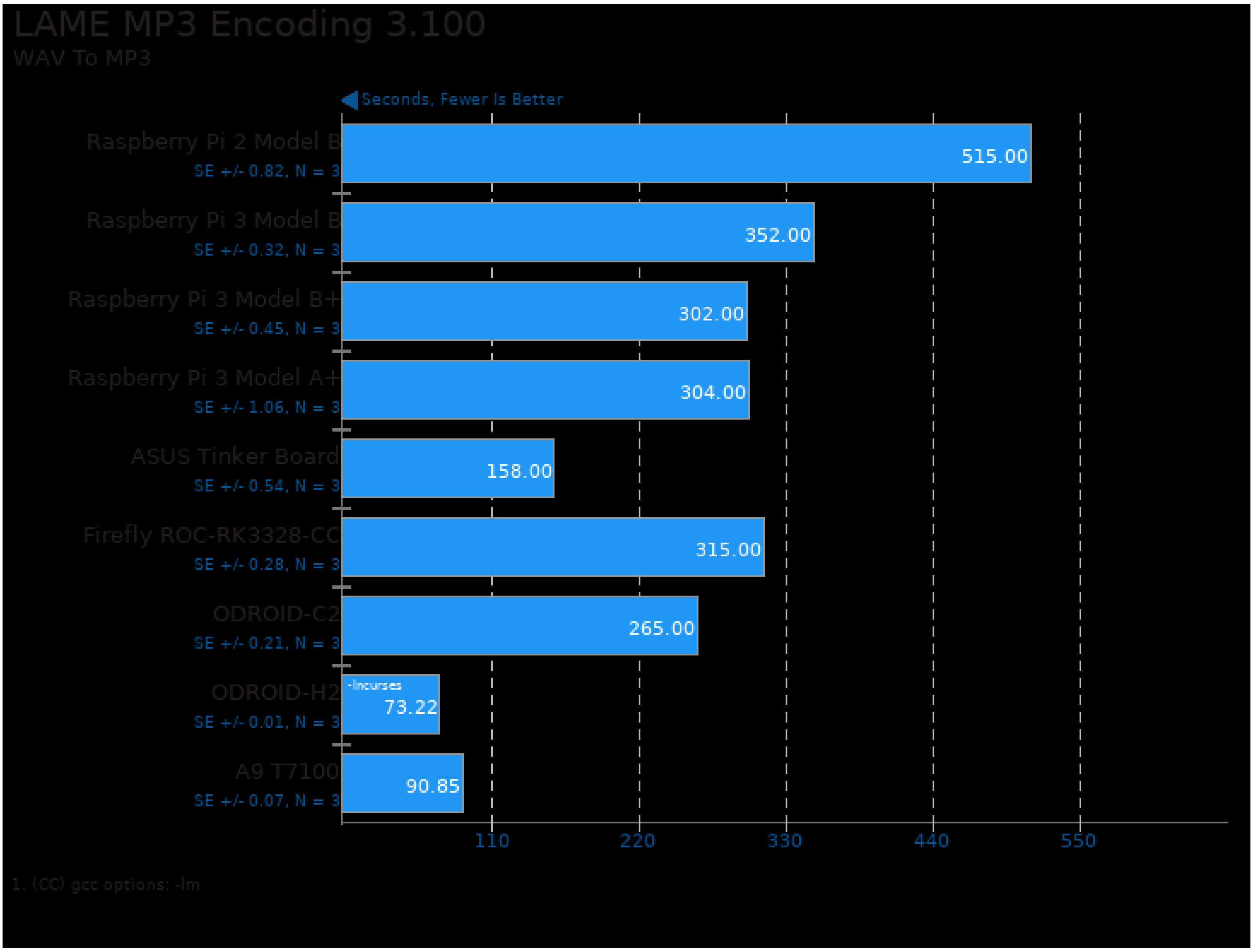
Tinymembench - Performance / Cost - Standard Memset (MB/s/Dollar)								68.38	
Git - T.T.C.C.G.C (sec)	**96.99**	59.52	49.17	58.67	25.72	41.47	42.08	**12.99**	27.95
Normalized	13.39%	21.82%	26.42%	22.14%	50.51%	31.32%	30.87%	100%	46.48%
Standard Deviation	5.5%	10.2%	10.4%	1.7%	3.5%	2.5%	13.9%	2%	0.3%
Perl Benchmarks - Interpreter (sec)	**0.01409889**	0.00843041	0.00807974	0.00971687	0.00427466	0.00598828	0.00548034	0.00333289	**0.00309349**
Normalized	21.94%	36.69%	38.29%	31.84%	72.37%	51.66%	56.45%	92.82%	100%
Standard Deviation	5.7%	3.3%	7%	14.5%	7.2%	0.2%	0.9%	0.6%	0.2%


C-Ray 1.1
Total Time - 4K, 16 Rays Per Pixel
Seconds, Fewer Is Better
Raspberry Pi 2 Model B
SE +/- 39.73, N = 3
4364
Raspberry Pi 3 Model B
SE +/- 11.39, N = 3
2317
Raspberry Pi 3 Model B+
SE +/- 2.21, N = 3
2111
Raspberry Pi 3 Model A+
SE +/- 4.77, N = 3
2068
ASUS Tinker Board
SE +/- 2.53, N = 3
1579
Firefly ROC-RK3328-CC
SE +/- 12.43, N = 3
2604
ODROID-C2
SE +/- 17.47, N = 3
1559
ODROID-H2
SE +/- 0.03, N = 3
454
A9 T7100
SE +/- 1.99, N = 3
1472
900
1800
2700
3600
4500
1. (CC) gcc options: -lm -lpthread -O3

ODROID-H2 Intel Ubuntu Linux Benchmarks




Perl Benchmarks
Test: Pod2html
Seconds, Fewer Is Better
Raspberry Pi 2 Model B
SE +/- 0.02647362, N = 3
2.39198371
Raspberry Pi 3 Model B
SE +/- 0.01280566, N = 3
1.29932392
Raspberry Pi 3 Model B+
SE +/- 0.00526666, N = 3
1.21061075
Raspberry Pi 3 Model A+
SE +/- 0.00092390, N = 3
1.15952401
ASUS Tinker Board
SE +/- 0.00463075, N = 3
0.74372882
Firefly ROC-RK3328-CC
SE +/- 0.02244345, N = 3
1.70325877
ODROID-C2
SE +/- 0.01698561, N = 9
1.08893965
ODROID-H2
SE +/- 0.00017697, N = 3
0.32890668
A9 T7100
SE +/- 0.00126421, N = 3
0.40308935
0.5382
1.0764
1.6146
2.1528
2.691


LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
Raspberry Pi 2 Model B
SE +/- 0.82, N = 3
515.00
Raspberry Pi 3 Model B
SE +/- 0.32, N = 3
352.00
Raspberry Pi 3 Model B+
SE +/- 0.45, N = 3
302.00
Raspberry Pi 3 Model A+
SE +/- 1.06, N = 3
304.00
ASUS Tinker Board
SE +/- 0.54, N = 3
158.00
Firefly ROC-RK3328-CC
SE +/- 0.28, N = 3
315.00
ODROID-C2
SE +/- 0.21, N = 3
265.00
ODROID-H2
SE +/- 0.01, N = 3
-lncurses
73.22
A9 T7100
SE +/- 0.07, N = 3
90.85
110
220
330
440
550
1. (CC) gcc options: -lm

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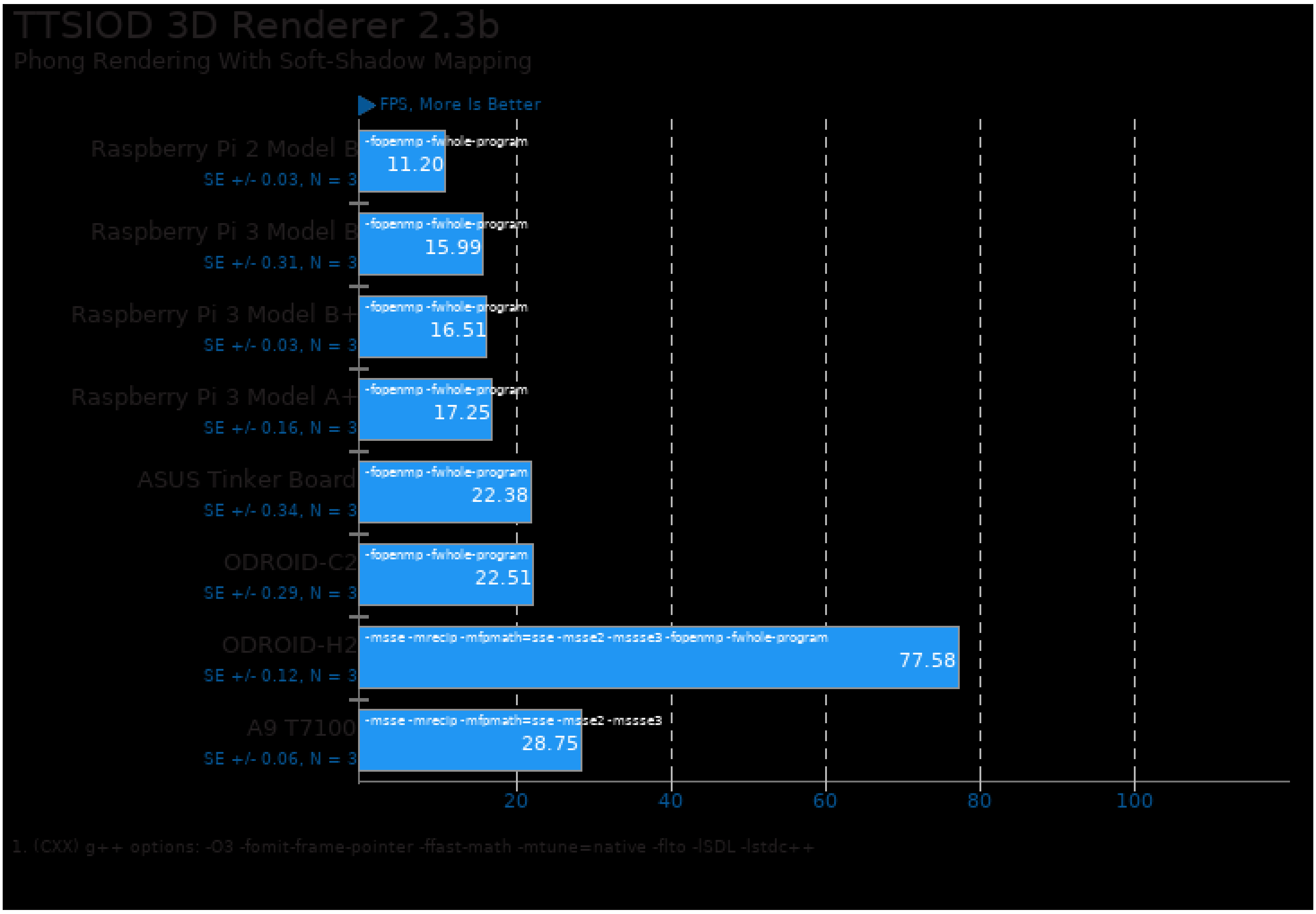
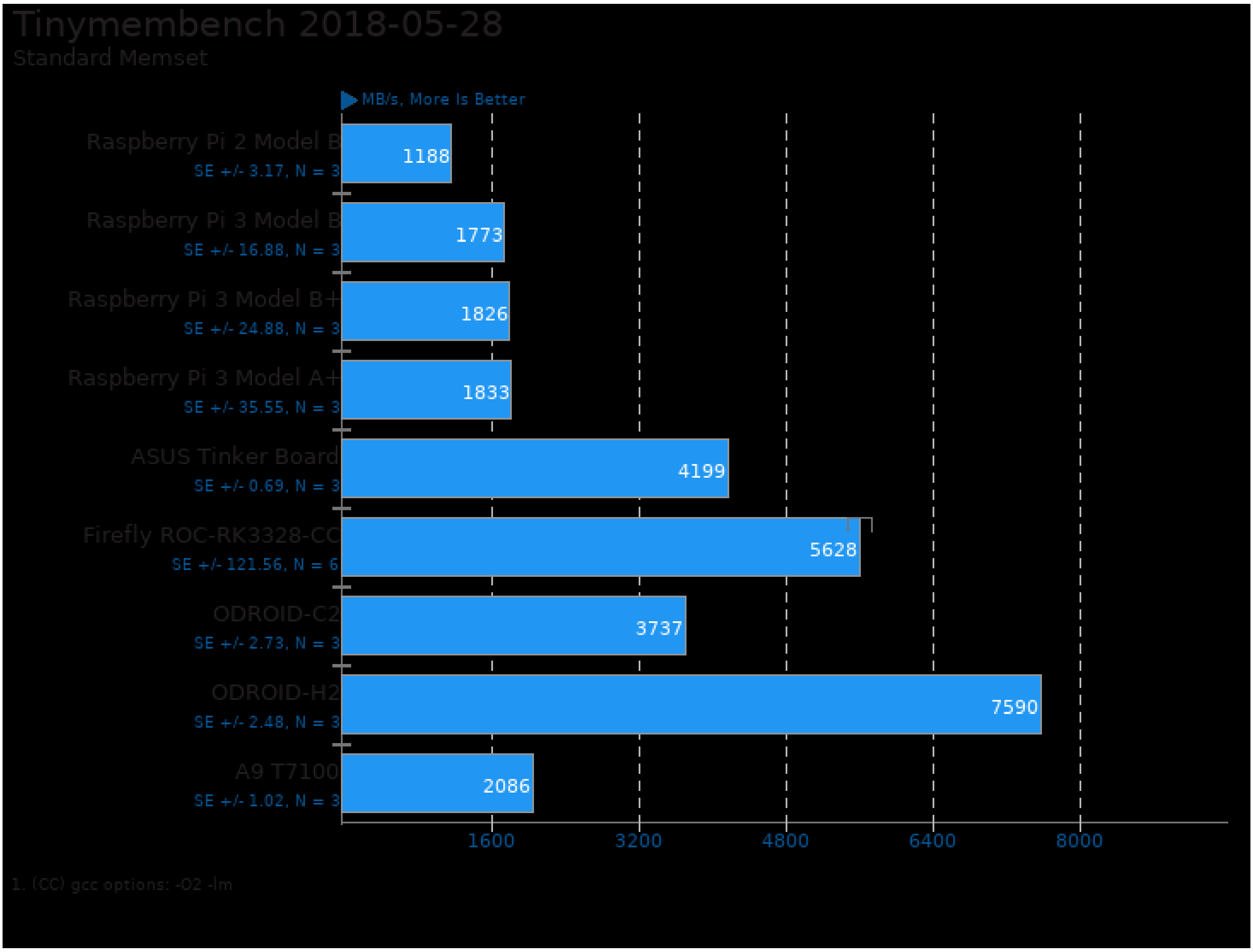
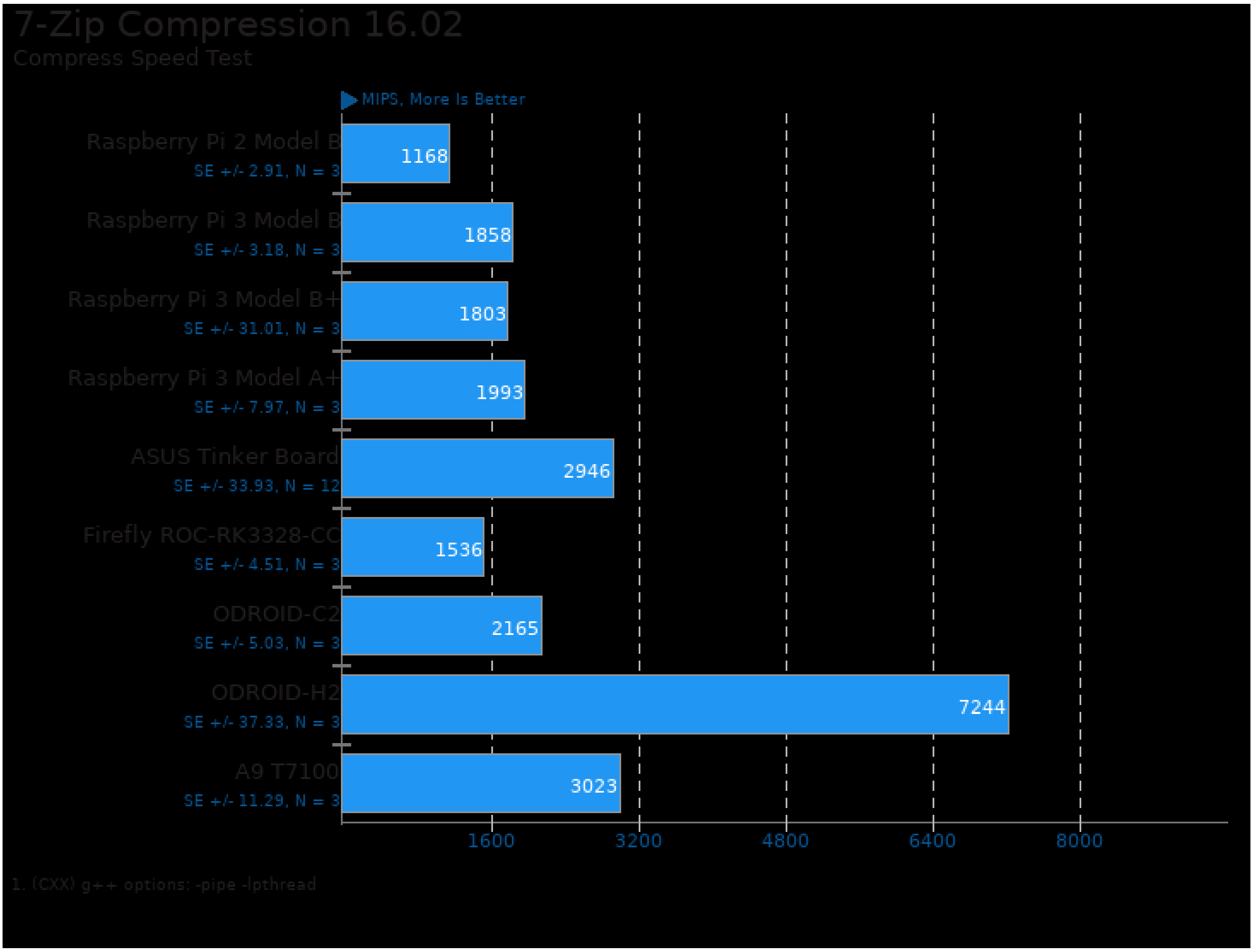
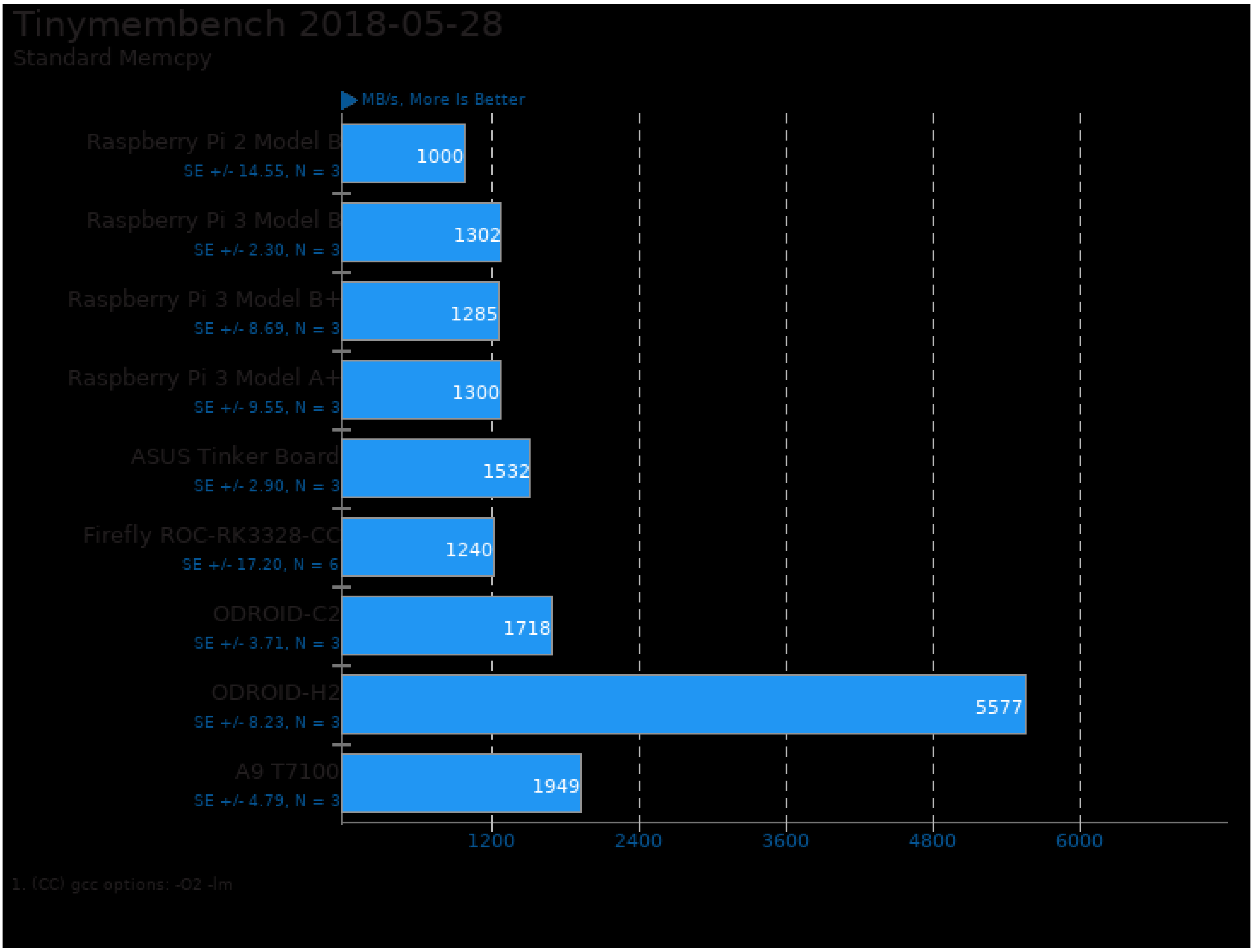


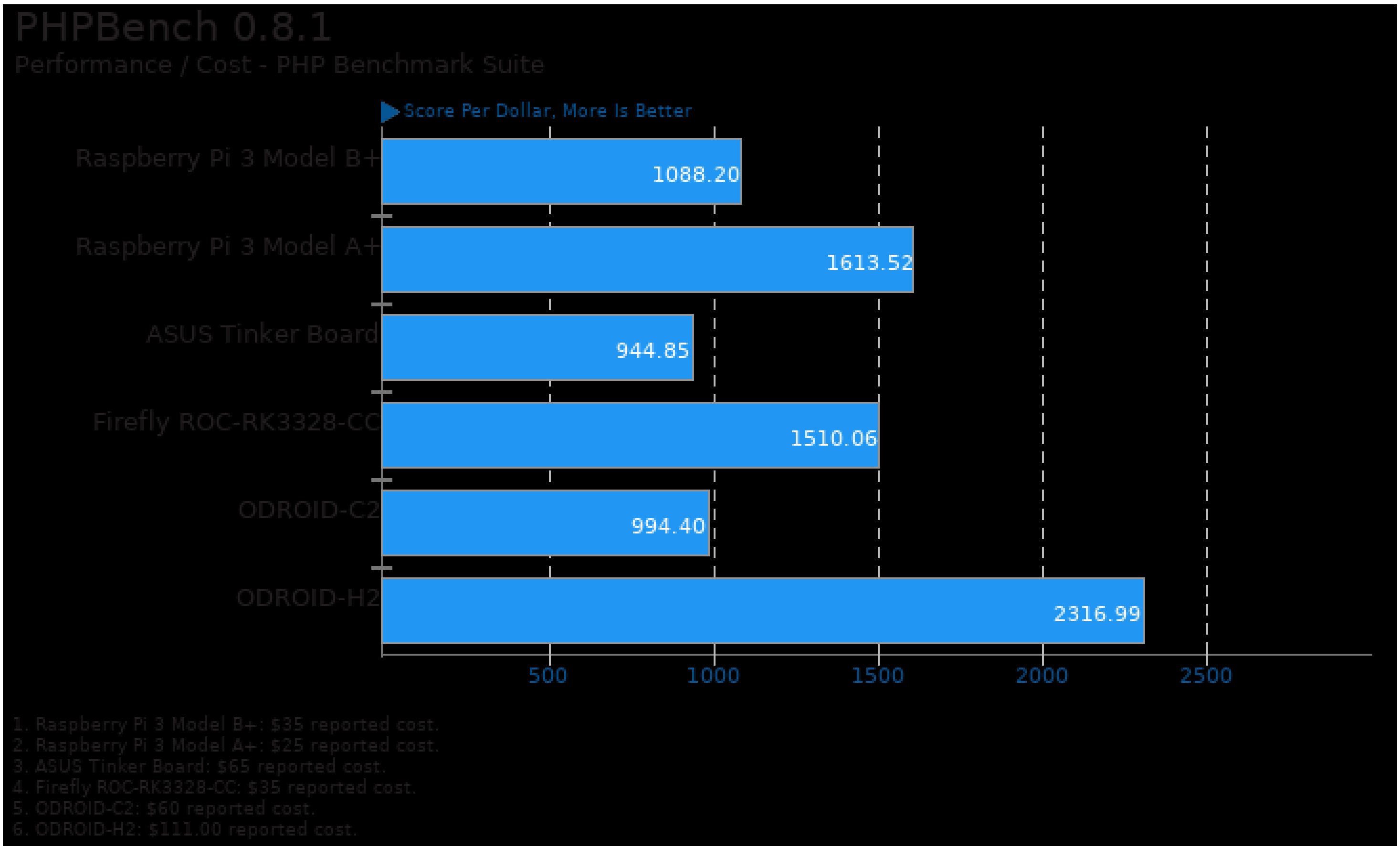
ODROID-H2 Intel Ubuntu Linux Benchmarks

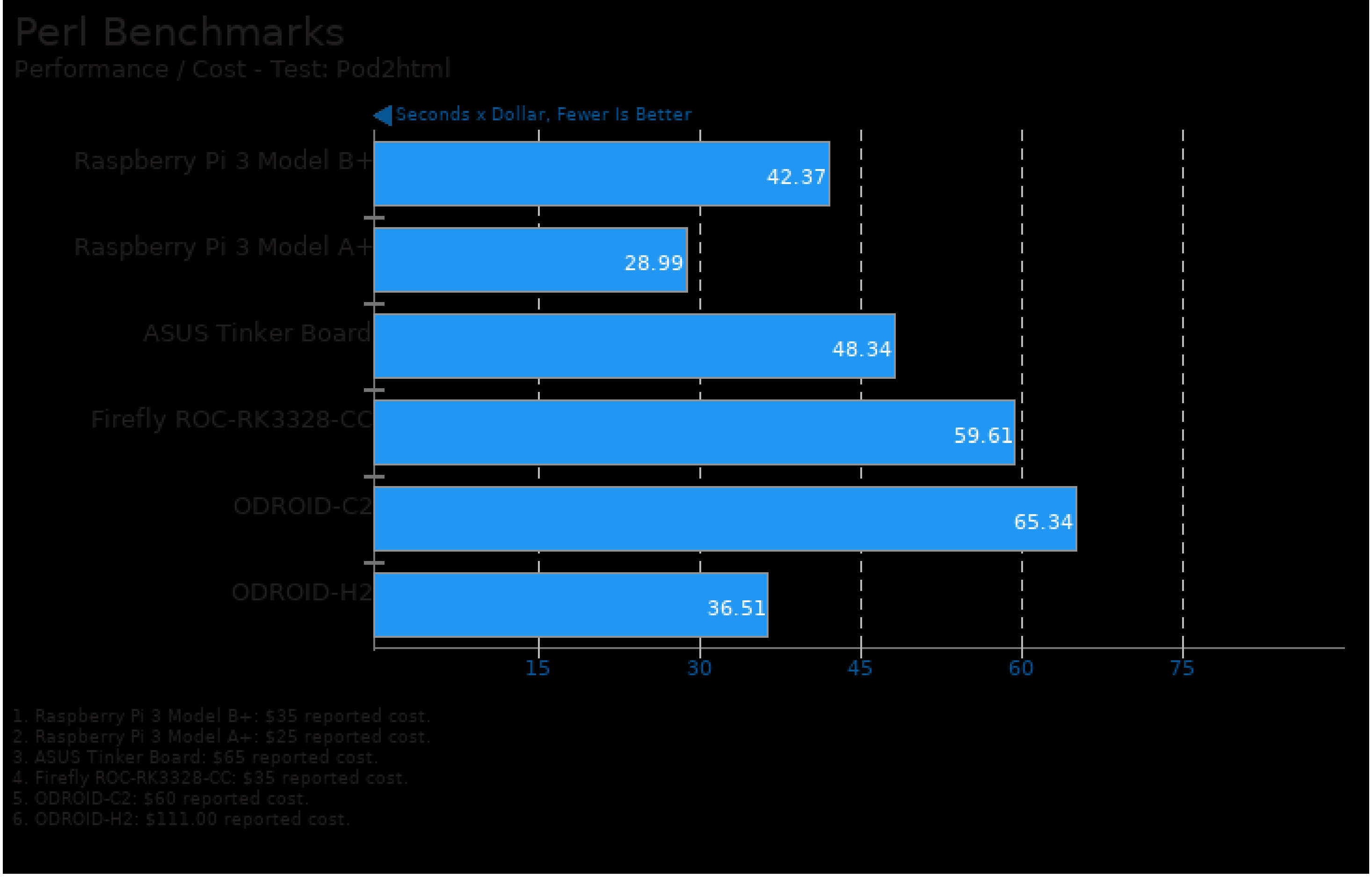


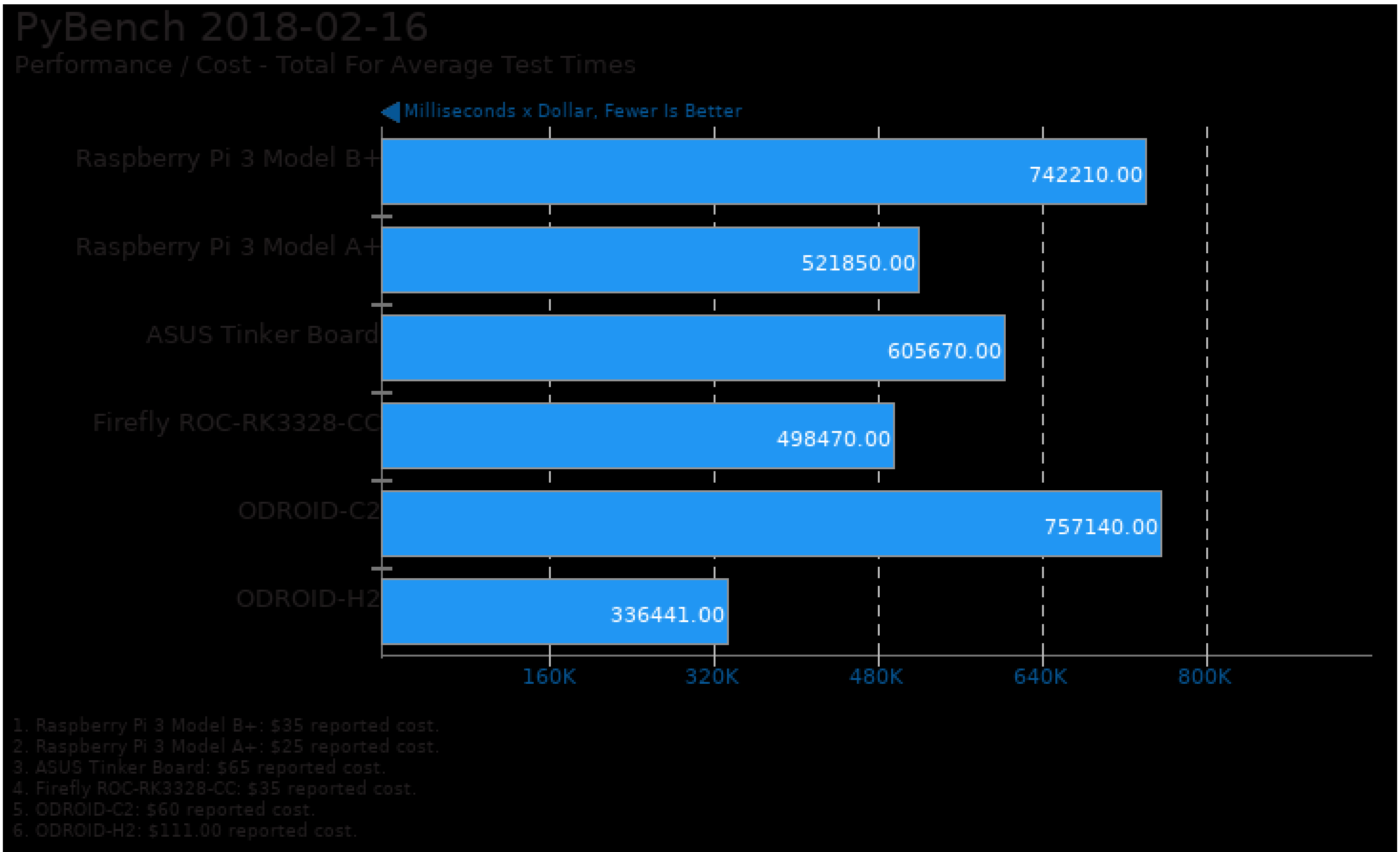

7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
Raspberry Pi 2 Model B
SE +/- 2.91, N = 3
1168
Raspberry Pi 3 Model B
SE +/- 3.18, N = 3
1858
Raspberry Pi 3 Model B+
SE +/- 31.01, N = 3
1803
Raspberry Pi 3 Model A+
SE +/- 7.97, N = 3
1993
ASUS Tinker Board
SE +/- 33.93, N = 12
2946
Firefly ROC-RK3328-CC
SE +/- 4.51, N = 3
1536
ODROID-C2
SE +/- 5.03, N = 3
2165
ODROID-H2
SE +/- 37.33, N = 3
7244
A9 T7100
SE +/- 11.29, N = 3
3023
1600
3200
4800
6400
8000
1. (CXX) g++ options: -pipe -lpthread

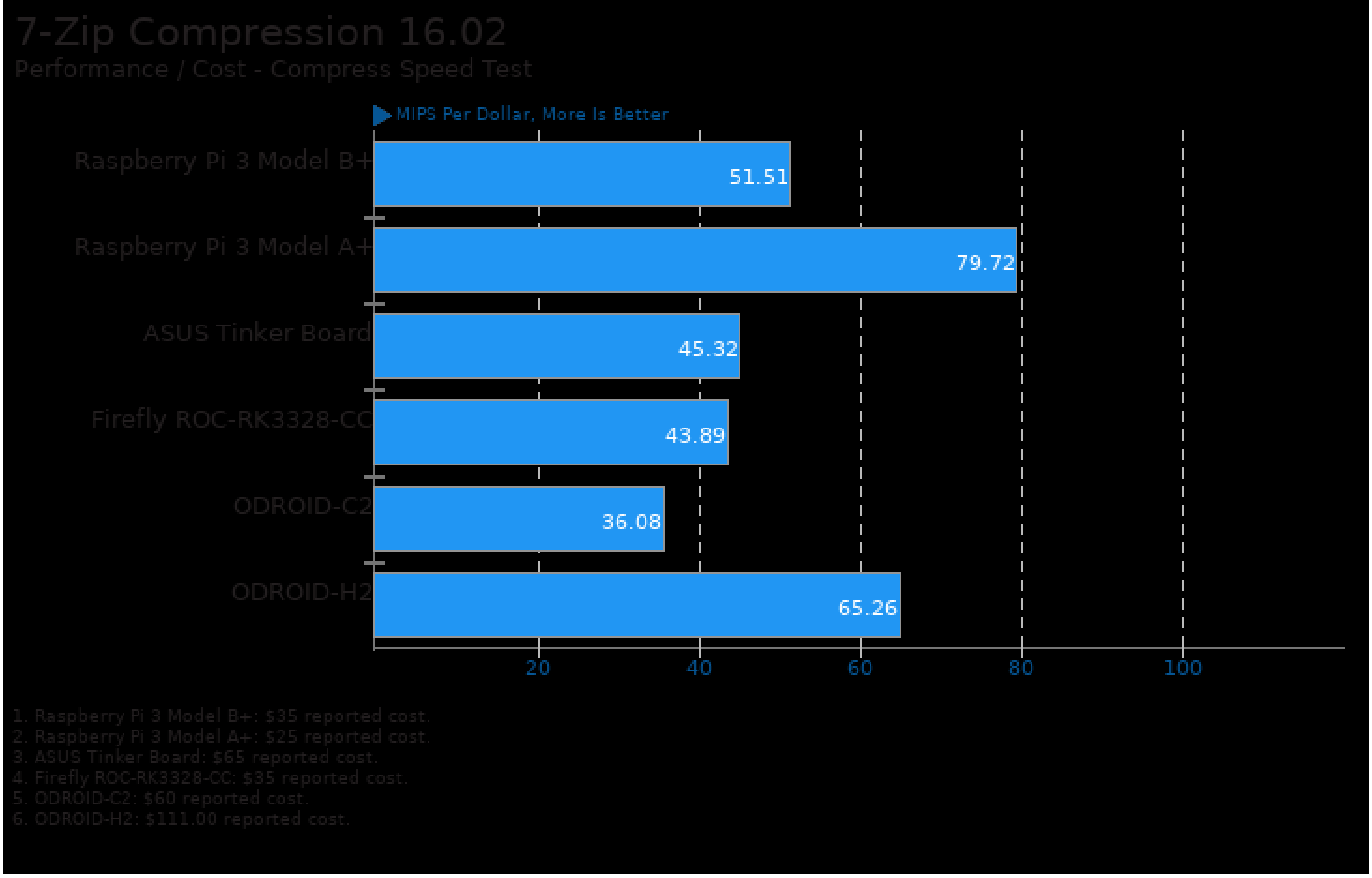

Tinymembench 2018-05-28
Standard Memcpy
MB/s, More Is Better
Raspberry Pi 2 Model B
SE +/- 14.55, N = 3
1000
Raspberry Pi 3 Model B
SE +/- 2.30, N = 3
1302
Raspberry Pi 3 Model B+
SE +/- 8.69, N = 3
1285
Raspberry Pi 3 Model A+
SE +/- 9.55, N = 3
1300
ASUS Tinker Board
SE +/- 2.90, N = 3
1532
Firefly ROC-RK3328-CC
SE +/- 17.20, N = 6
1240
ODROID-C2
SE +/- 3.71, N = 3
1718
ODROID-H2
SE +/- 8.23, N = 3
5577
A9 T7100
SE +/- 4.79, N = 3
1949
1200
2400
3600
4800
6000
1. (CC) gcc options: -O2 -lm

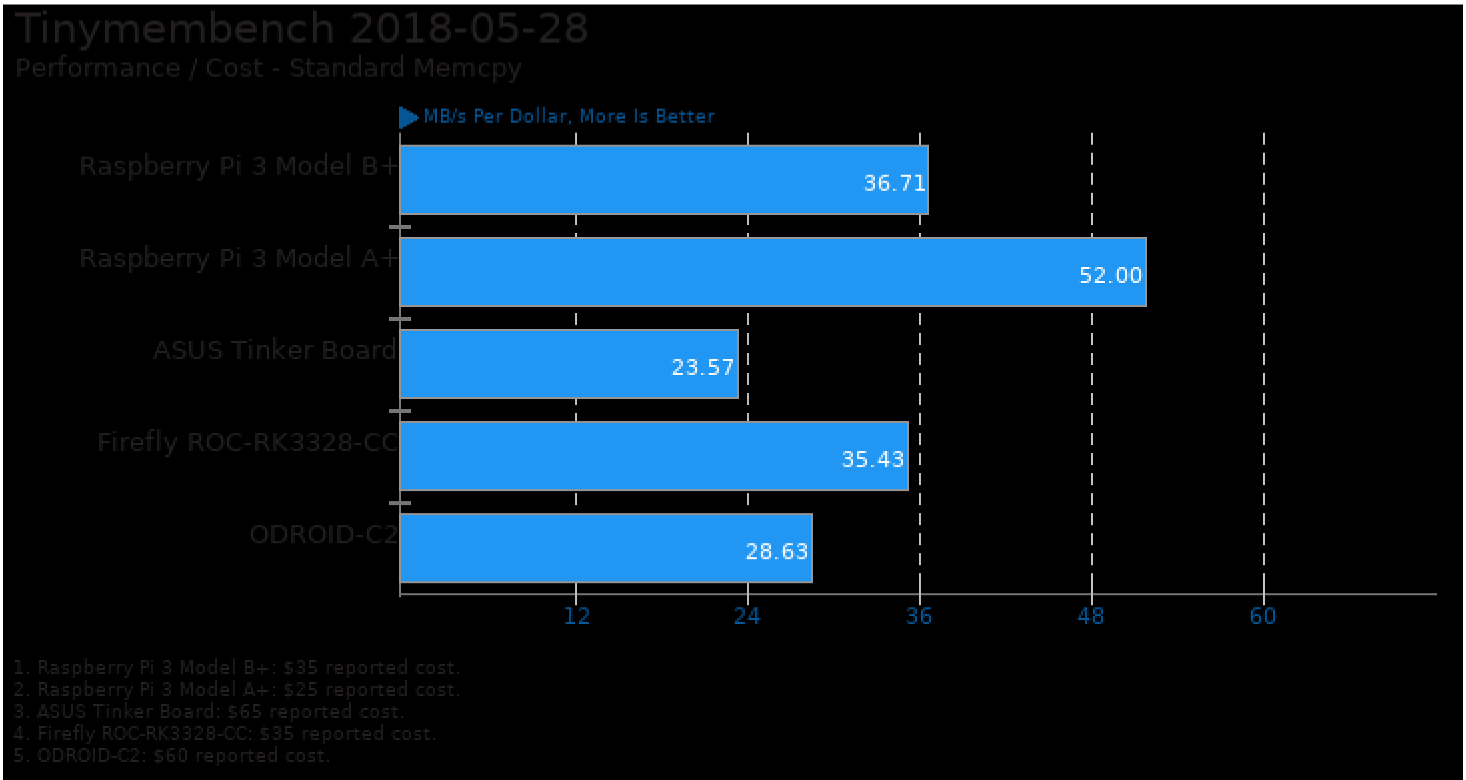
ODROID-H2 Intel Ubuntu Linux Benchmarks

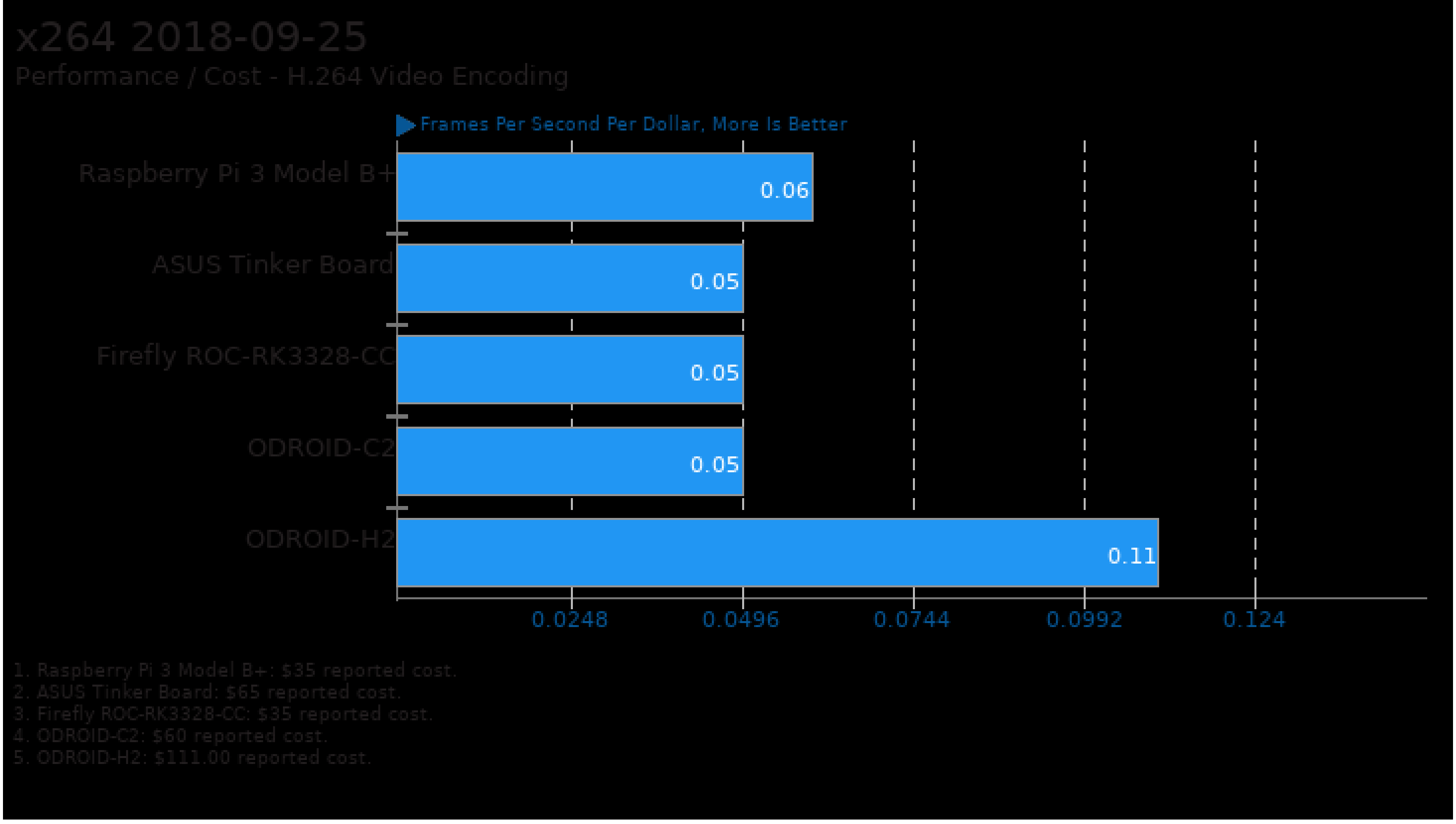


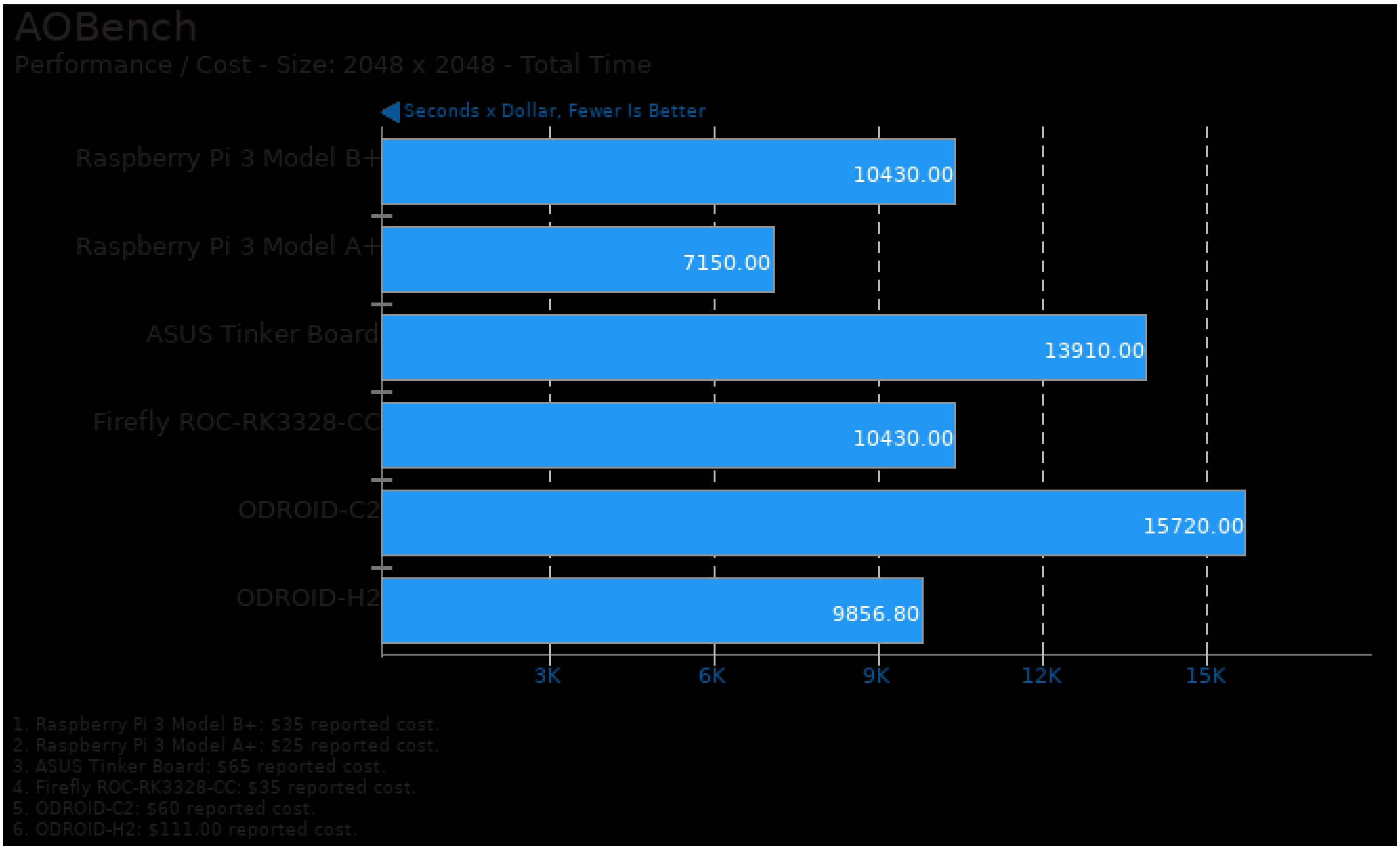


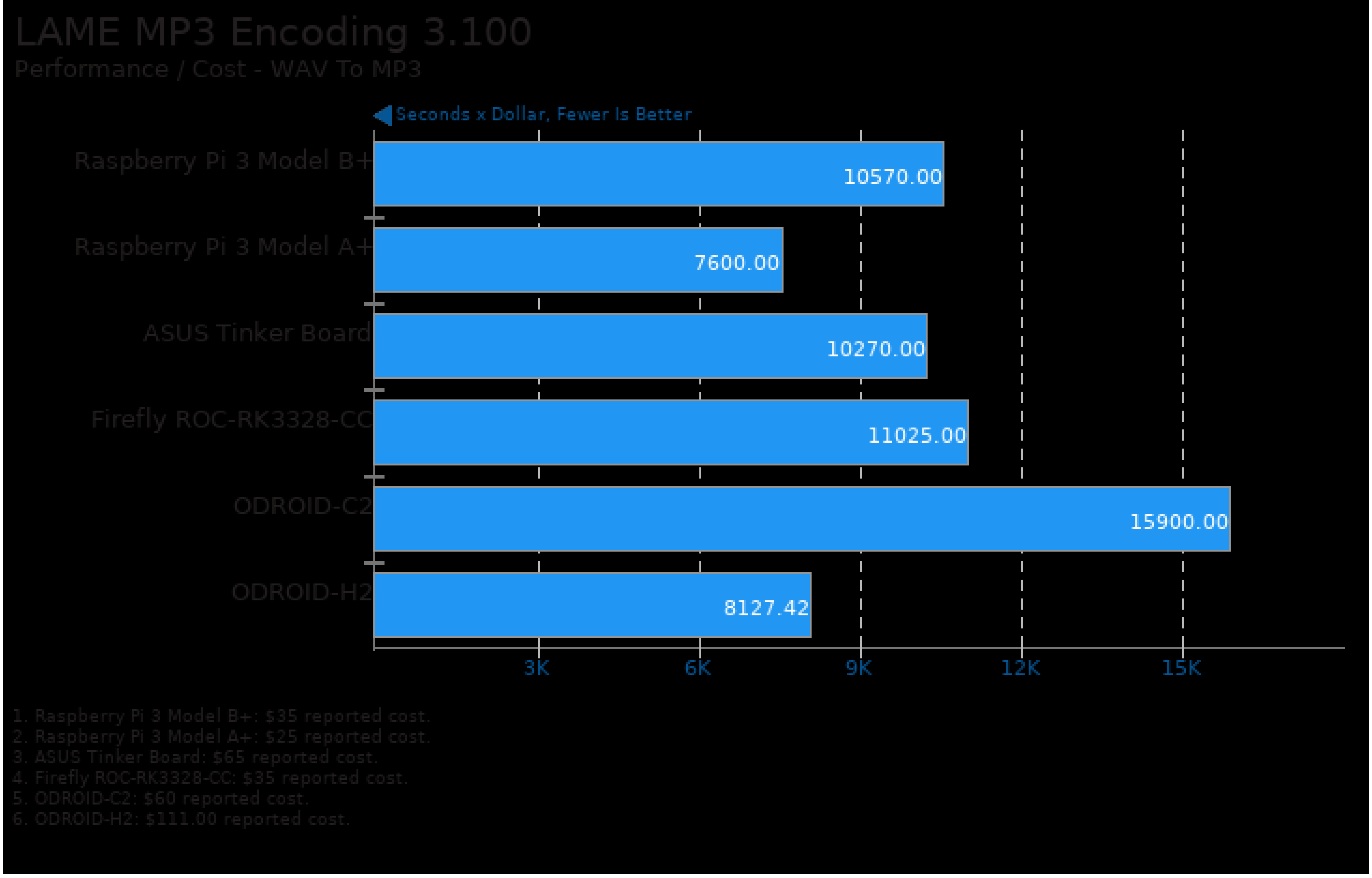

PyBench 2018-02-16
Performance / Cost - Total For Average Test Times
Milliseconds x Dollar, Fewer Is Better
Raspberry Pi 3 Model B+
742210.00
Raspberry Pi 3 Model A+
521850.00
ASUS Tinker Board
605670.00
Firefly ROC-RK3328-CC
498470.00
ODROID-C2
757140.00
ODROID-H2
336441.00
160K
320K
480K
640K
800K
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ODROID-C2: $60 reported cost.
6. ODROID-H2: $111.00 reported cost.

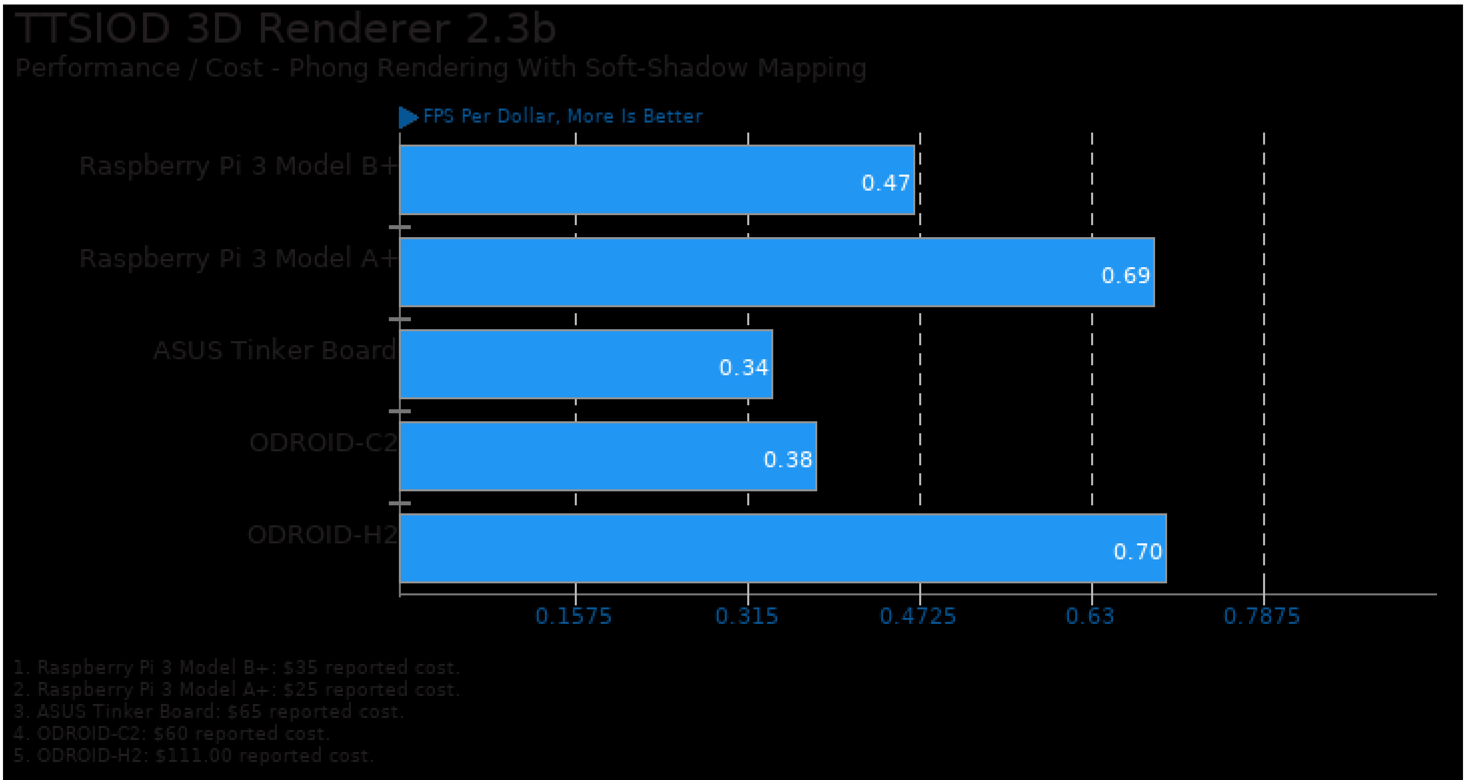

7-Zip Compression 16.02
Performance / Cost - Compress Speed Test
MIPS Per Dollar, More Is Better
Raspberry Pi 3 Model B+
51.51
Raspberry Pi 3 Model A+
79.72
ASUS Tinker Board
45.32
Firefly ROC-RK3328-CC
43.89
ODROID-C2
36.08
ODROID-H2
65.26
20
40
60
80
100
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ODROID-C2: $60 reported cost.
6. ODROID-H2: $111.00 reported cost.

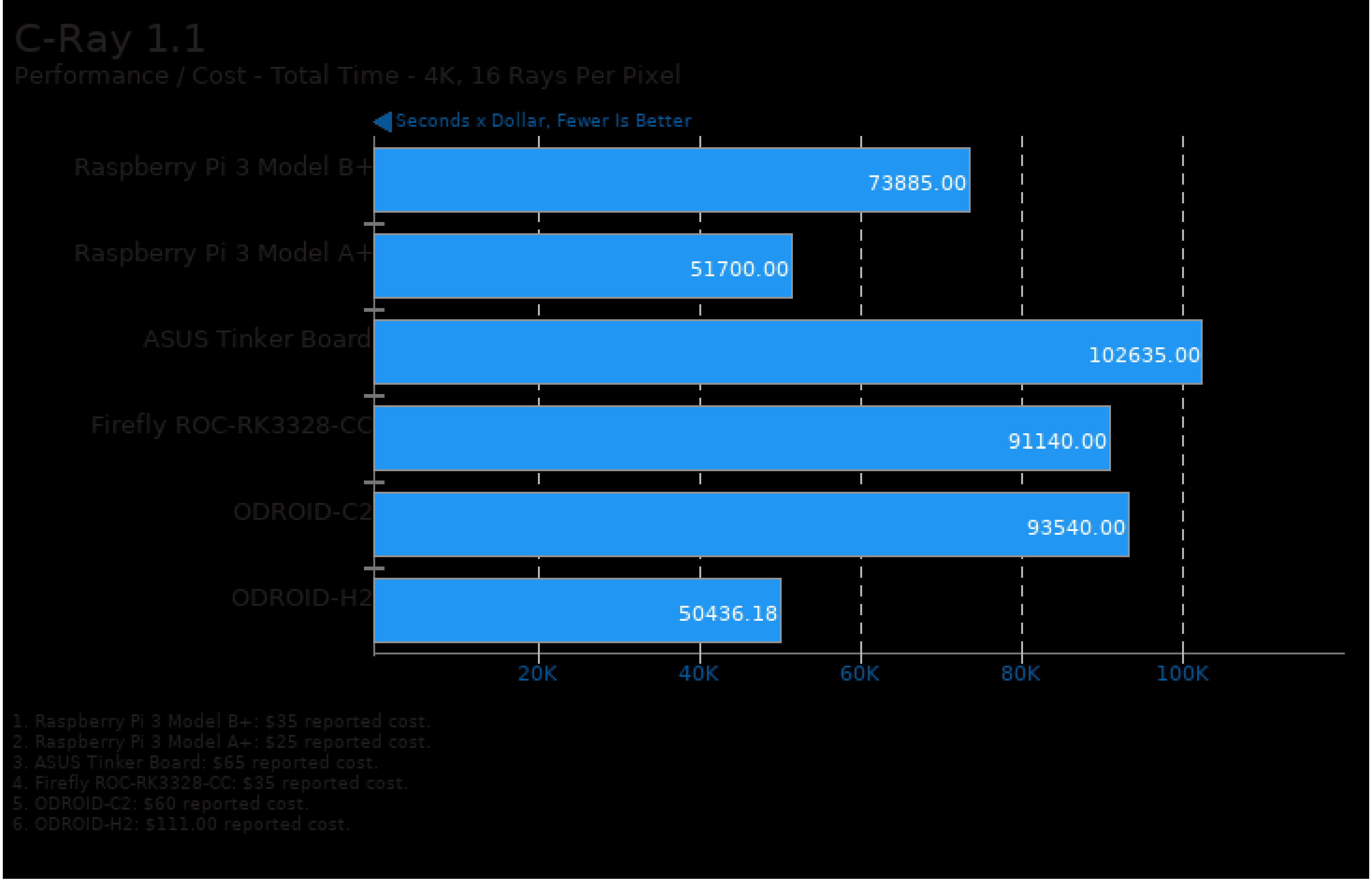

Tinymembench 2018-05-28
Performance / Cost - Standard Memcpy
MB/s Per Dollar, More Is Better
Raspberry Pi 3 Model B+
36.71
Raspberry Pi 3 Model A+
52.00
ASUS Tinker Board
23.57
Firefly ROC-RK3328-CC
35.43
ODROID-C2
28.63
12
24
36
48
60
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ODROID-C2: $60 reported cost.

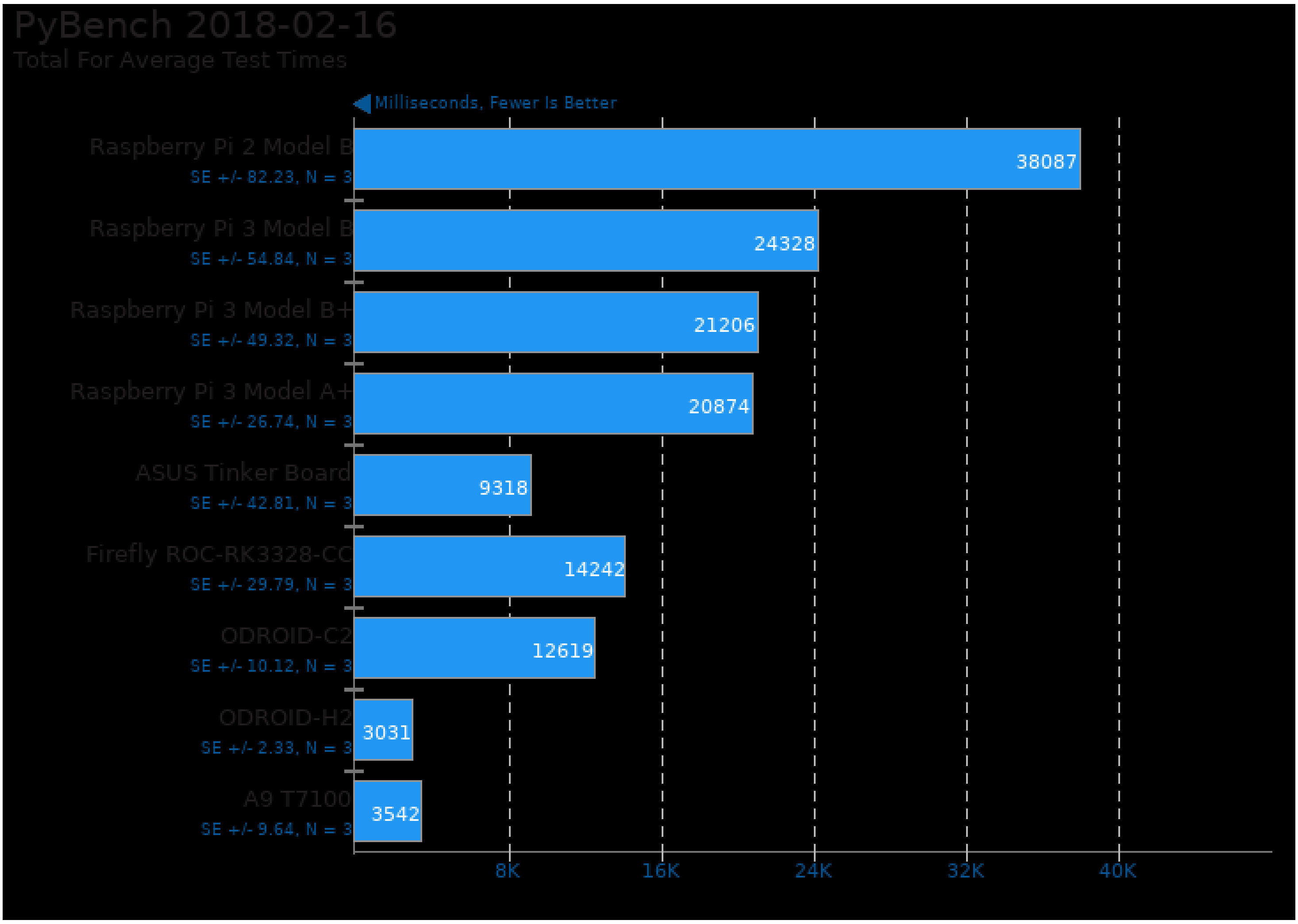

x264 2018-09-25
Performance / Cost - H.264 Video Encoding
Frames Per Second Per Dollar, More Is Better
Raspberry Pi 3 Model B+
0.06
ASUS Tinker Board
0.05
Firefly ROC-RK3328-CC
0.05
ODROID-C2
0.05
ODROID-H2
0.11
0.0248
0.0496
0.0744
0.0992
0.124
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. ASUS Tinker Board: $65 reported cost.
3. Firefly ROC-RK3328-CC: $35 reported cost.
4. ODROID-C2: $60 reported cost.
5. ODROID-H2: $111.00 reported cost.


AOBench
Performance / Cost - Size: 2048 x 2048 - Total Time
Seconds x Dollar, Fewer Is Better
Raspberry Pi 3 Model B+
10430.00
Raspberry Pi 3 Model A+
7150.00
ASUS Tinker Board
13910.00
Firefly ROC-RK3328-CC
10430.00
ODROID-C2
15720.00
ODROID-H2
9856.80
3K
6K
9K
12K
15K
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ODROID-C2: $60 reported cost.
6. ODROID-H2: $111.00 reported cost.

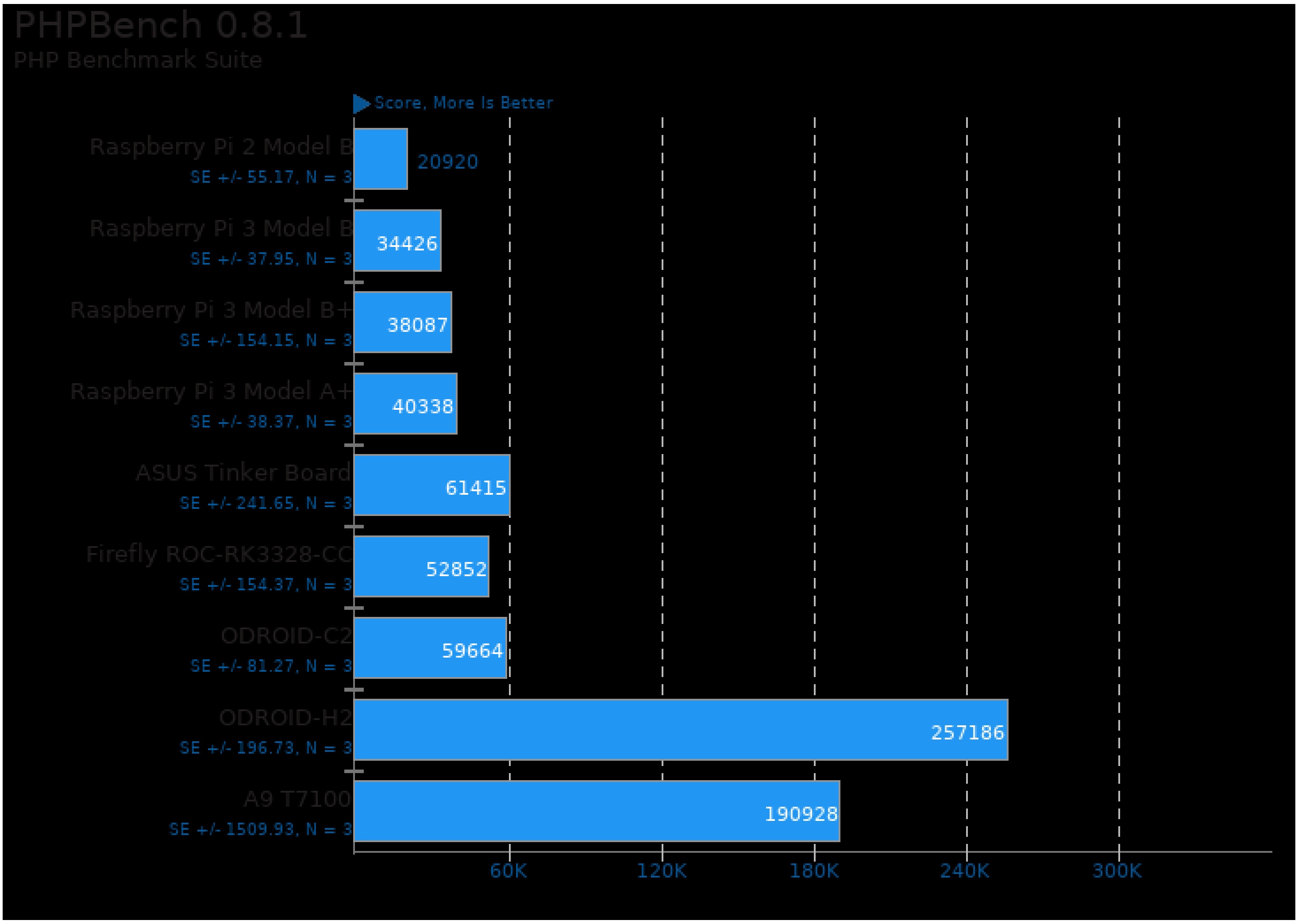

LAME MP3 Encoding 3.100
Performance / Cost - WAV To MP3
Seconds x Dollar, Fewer Is Better
Raspberry Pi 3 Model B+
10570.00
Raspberry Pi 3 Model A+
7600.00
ASUS Tinker Board
10270.00
Firefly ROC-RK3328-CC
11025.00
ODROID-C2
15900.00
ODROID-H2
8127.42
3K
6K
9K
12K
15K
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ODROID-C2: $60 reported cost.
6. ODROID-H2: $111.00 reported cost.

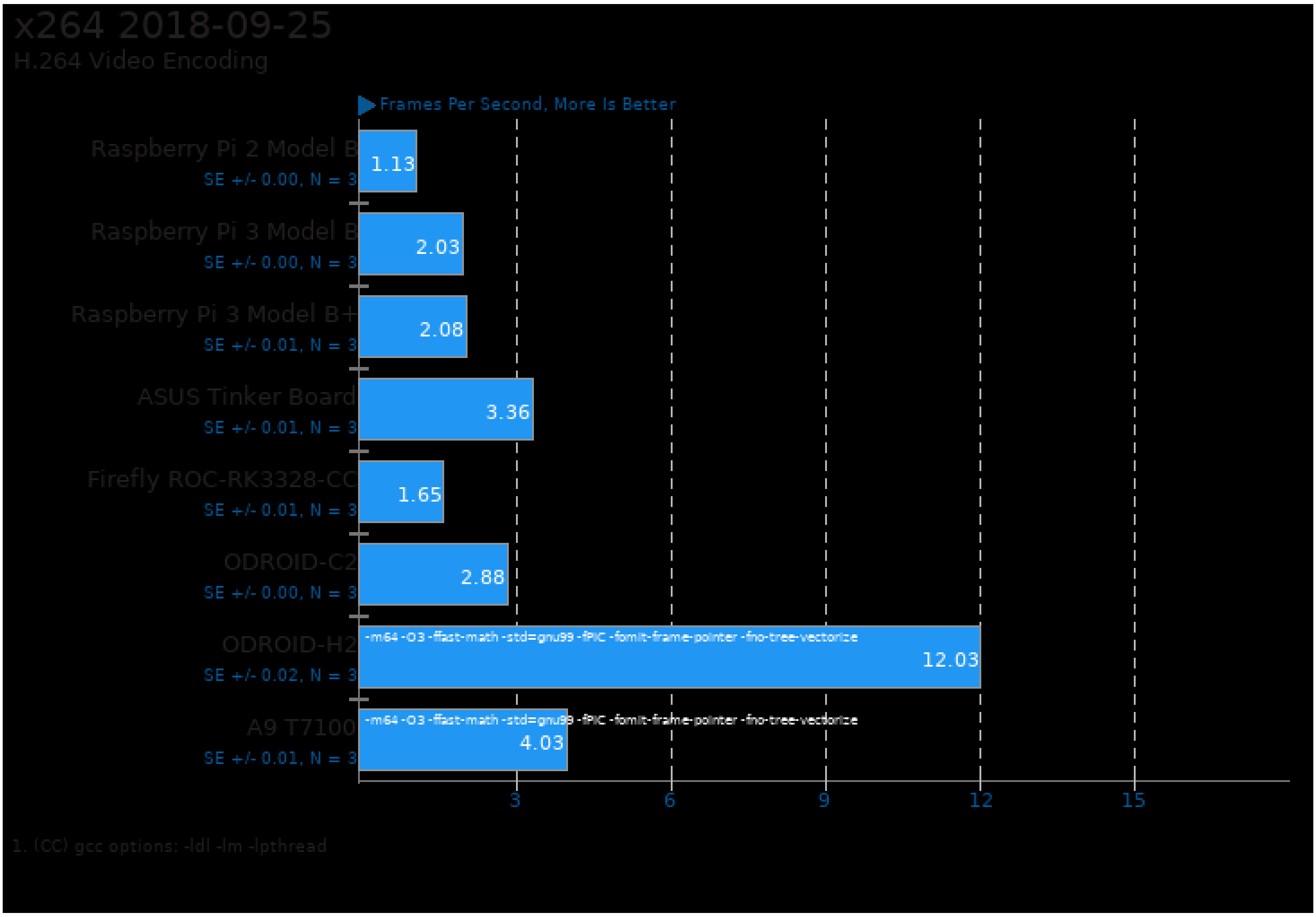

TTSIOD 3D Renderer 2.3b
Performance / Cost - Phong Rendering With Soft-Shadow Mapping
FPS Per Dollar, More Is Better
Raspberry Pi 3 Model B+
0.47
Raspberry Pi 3 Model A+
0.69
ASUS Tinker Board
0.34
ODROID-C2
0.38
ODROID-H2
0.70
0.1575
0.315
0.4725
0.63
0.7875
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. ODROID-C2: $60 reported cost.
5. ODROID-H2: $111.00 reported cost.


C-Ray 1.1
Performance / Cost - Total Time - 4K, 16 Rays Per Pixel
Seconds x Dollar, Fewer Is Better
Raspberry Pi 3 Model B+
73885.00
Raspberry Pi 3 Model A+
51700.00
ASUS Tinker Board
102635.00
Firefly ROC-RK3328-CC
91140.00
ODROID-C2
93540.00
ODROID-H2
50436.18
20K
40K
60K
80K
100K
1. Raspberry Pi 3 Model B+: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. ASUS Tinker Board: $65 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ODROID-C2: $60 reported cost.
6. ODROID-H2: $111.00 reported cost.

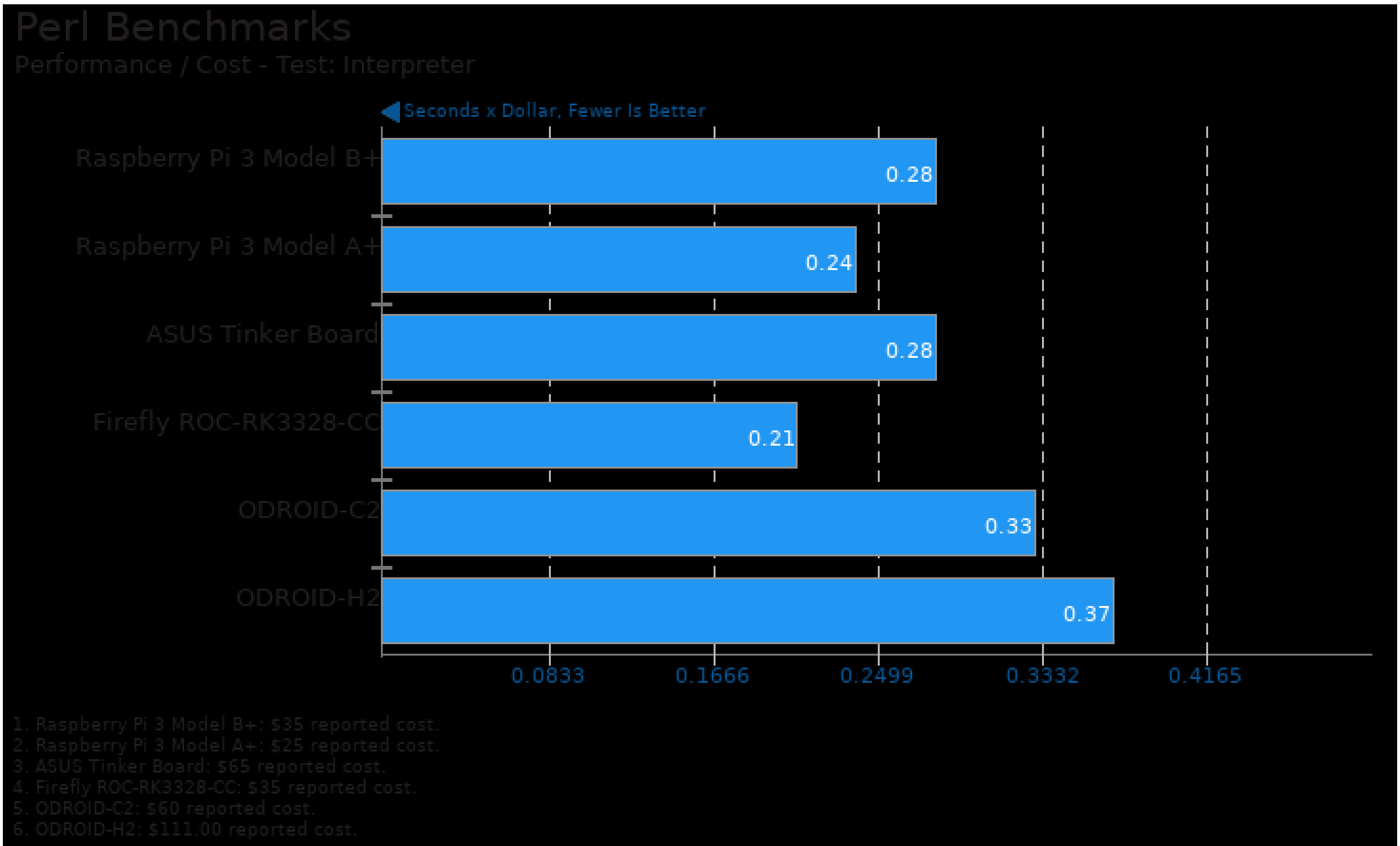

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Raspberry Pi 2 Model B
SE +/- 82.23, N = 3
38087
Raspberry Pi 3 Model B
SE +/- 54.84, N = 3
24328
Raspberry Pi 3 Model B+
SE +/- 49.32, N = 3
21206
Raspberry Pi 3 Model A+
SE +/- 26.74, N = 3
20874
ASUS Tinker Board
SE +/- 42.81, N = 3
9318
Firefly ROC-RK3328-CC
SE +/- 29.79, N = 3
14242
ODROID-C2
SE +/- 10.12, N = 3
12619
ODROID-H2
SE +/- 2.33, N = 3
3031
A9 T7100
SE +/- 9.64, N = 3
3542
8K
16K
24K
32K
40K

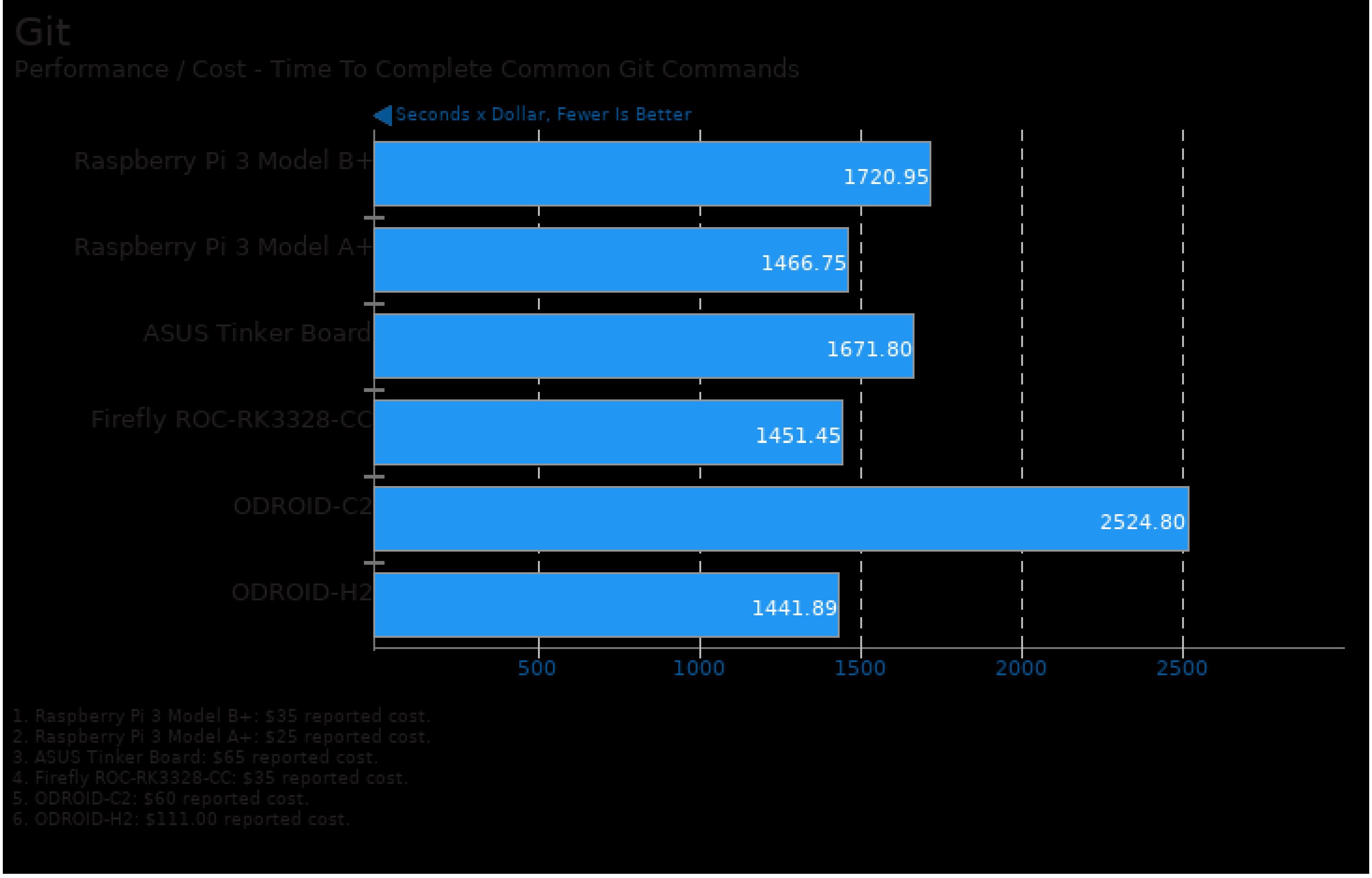
ODROID-H2 Intel Ubuntu Linux Benchmarks

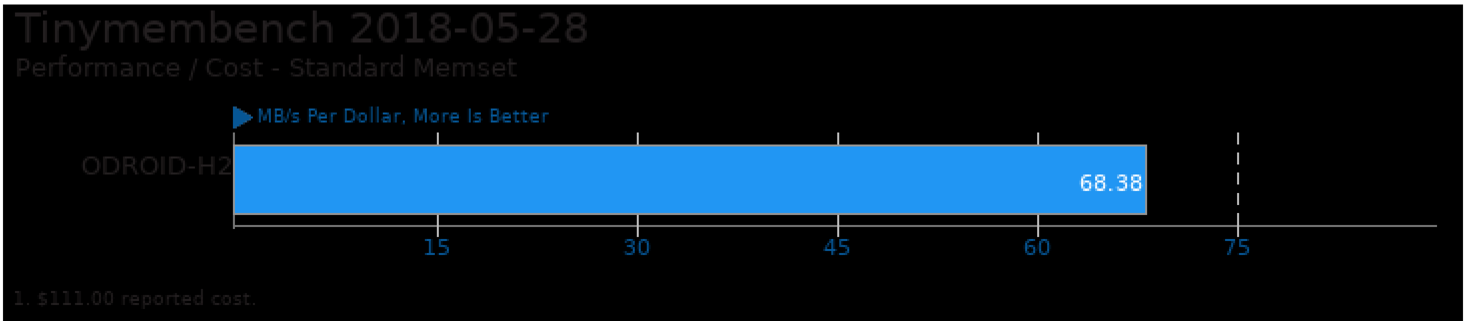


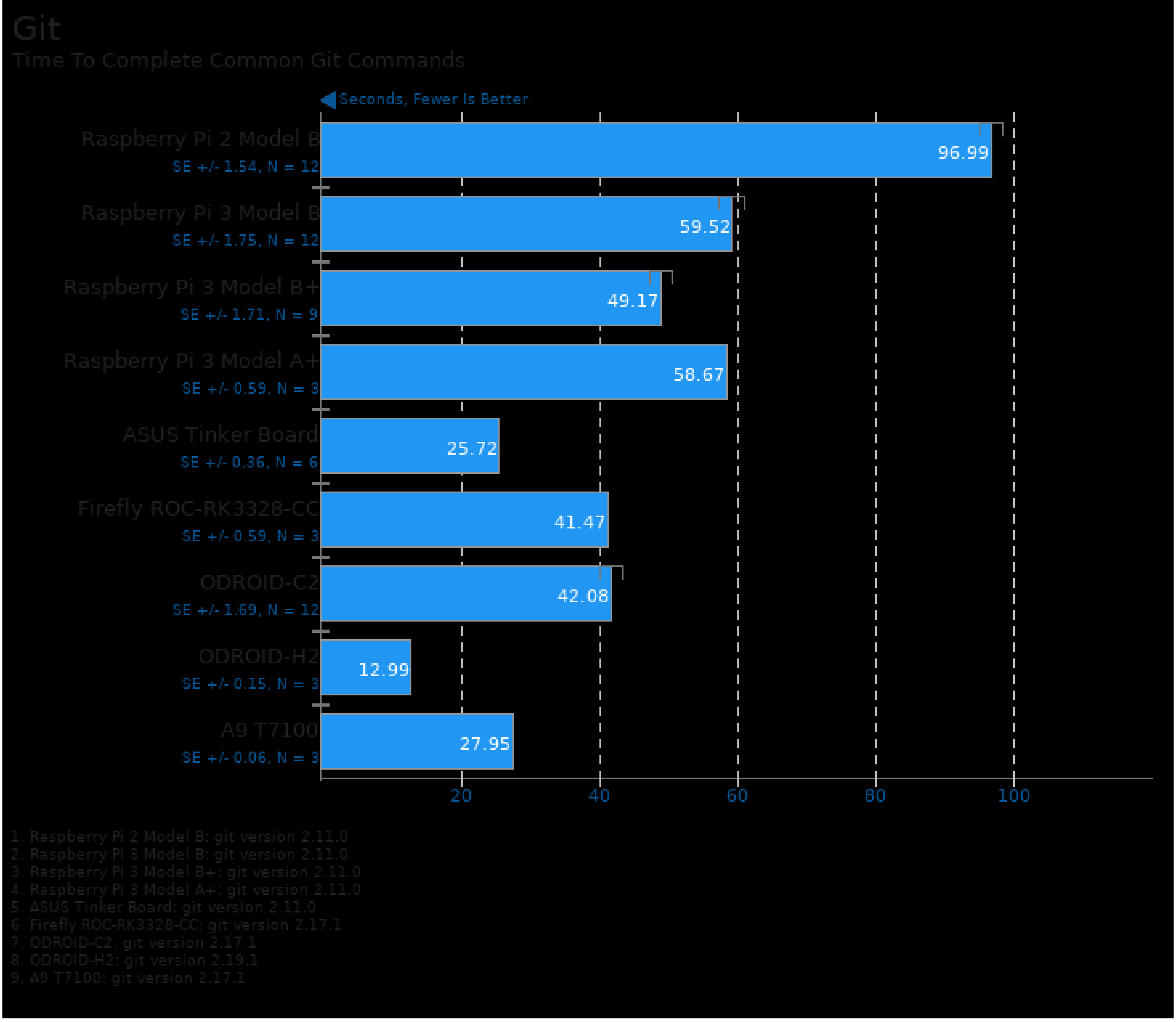

x264 2018-09-25
H.264 Video Encoding
Frames Per Second, More Is Better
Raspberry Pi 2 Model B
SE +/- 0.00, N = 3
1.13
Raspberry Pi 3 Model B
SE +/- 0.00, N = 3
2.03
Raspberry Pi 3 Model B+
SE +/- 0.01, N = 3
2.08
ASUS Tinker Board
SE +/- 0.01, N = 3
3.36
Firefly ROC-RK3328-CC
SE +/- 0.01, N = 3
1.65
ODROID-C2
SE +/- 0.00, N = 3
2.88
ODROID-H2
SE +/- 0.02, N = 3
-m64 -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize
12.03
A9 T7100
SE +/- 0.01, N = 3
-m64 -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize
4.03
3
6
9
12
15
1. (CC) gcc options: -ldl -lm -lpthread

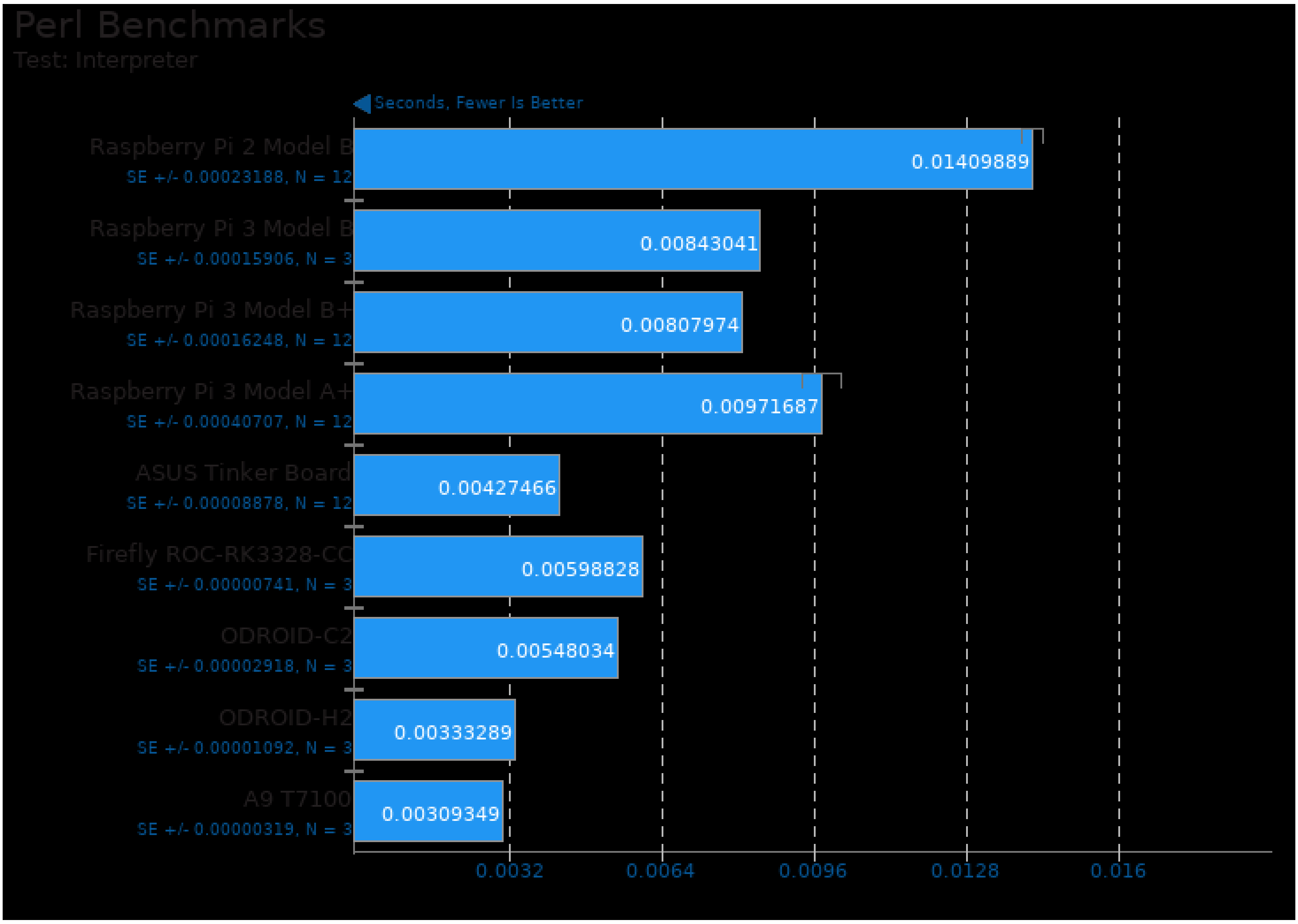
ODROID-H2 Intel Ubuntu Linux Benchmarks



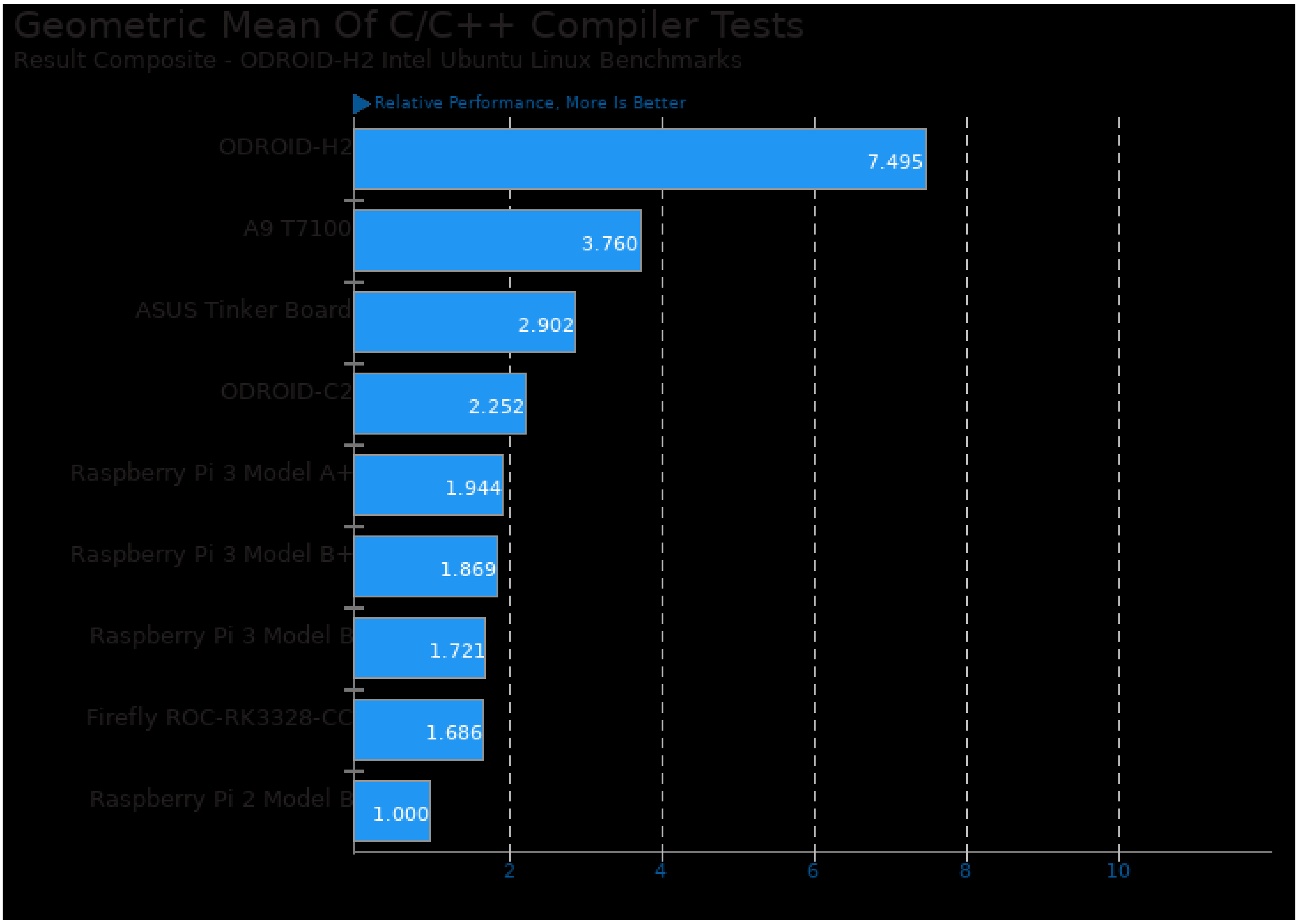



Tinymembench 2018-05-28
Performance / Cost - Standard Memset
MB/s Per Dollar, More Is Better
ODROID-H2
68.38
15
30
45
60
75
1. $111.00 reported cost.

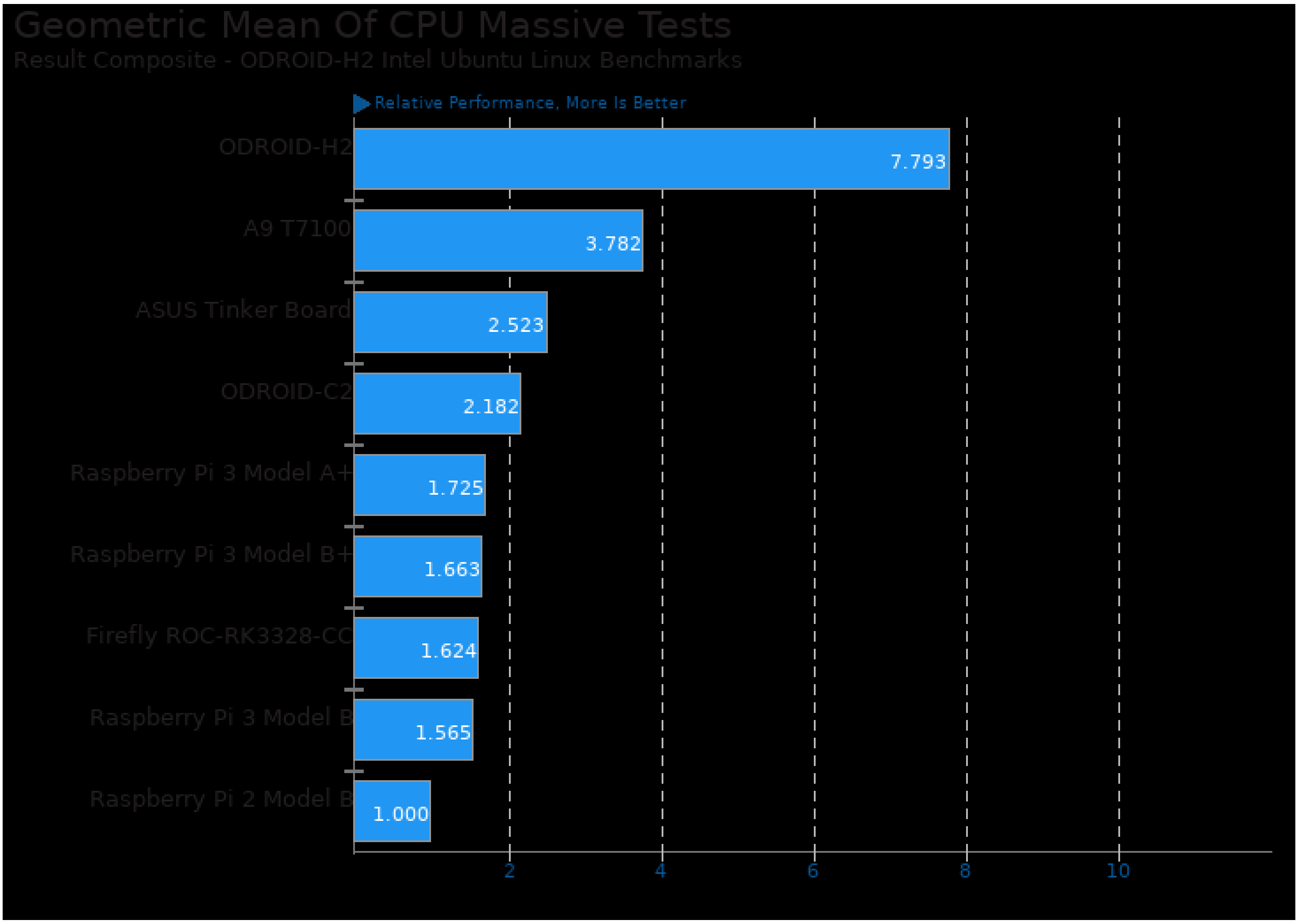

Git
Time To Complete Common Git Commands
Seconds, Fewer Is Better
Raspberry Pi 2 Model B
SE +/- 1.54, N = 12
96.99
Raspberry Pi 3 Model B
SE +/- 1.75, N = 12
59.52
Raspberry Pi 3 Model B+
SE +/- 1.71, N = 9
49.17
Raspberry Pi 3 Model A+
SE +/- 0.59, N = 3
58.67
ASUS Tinker Board
SE +/- 0.36, N = 6
25.72
Firefly ROC-RK3328-CC
SE +/- 0.59, N = 3
41.47
ODROID-C2
SE +/- 1.69, N = 12
42.08
ODROID-H2
SE +/- 0.15, N = 3
12.99
A9 T7100
SE +/- 0.06, N = 3
27.95
20
40
60
80
100
1. Raspberry Pi 2 Model B: git version 2.11.0
2. Raspberry Pi 3 Model B: git version 2.11.0
3. Raspberry Pi 3 Model B+: git version 2.11.0
4. Raspberry Pi 3 Model A+: git version 2.11.0
5. ASUS Tinker Board: git version 2.11.0
6. Firefly ROC-RK3328-CC: git version 2.17.1
7. ODROID-C2: git version 2.17.1
8. ODROID-H2: git version 2.19.1
9. A9 T7100: git version 2.17.1


Perl Benchmarks
Test: Interpreter
Seconds, Fewer Is Better
Raspberry Pi 2 Model B
SE +/- 0.00023188, N = 12
0.01409889
Raspberry Pi 3 Model B
SE +/- 0.00015906, N = 3
0.00843041
Raspberry Pi 3 Model B+
SE +/- 0.00016248, N = 12
0.00807974
Raspberry Pi 3 Model A+
SE +/- 0.00040707, N = 12
0.00971687
ASUS Tinker Board
SE +/- 0.00008878, N = 12
0.00427466
Firefly ROC-RK3328-CC
SE +/- 0.00000741, N = 3
0.00598828
ODROID-C2
SE +/- 0.00002918, N = 3
0.00548034
ODROID-H2
SE +/- 0.00001092, N = 3
0.00333289
A9 T7100
SE +/- 0.00000319, N = 3
0.00309349
0.0032
0.0064
0.0096
0.0128
0.016

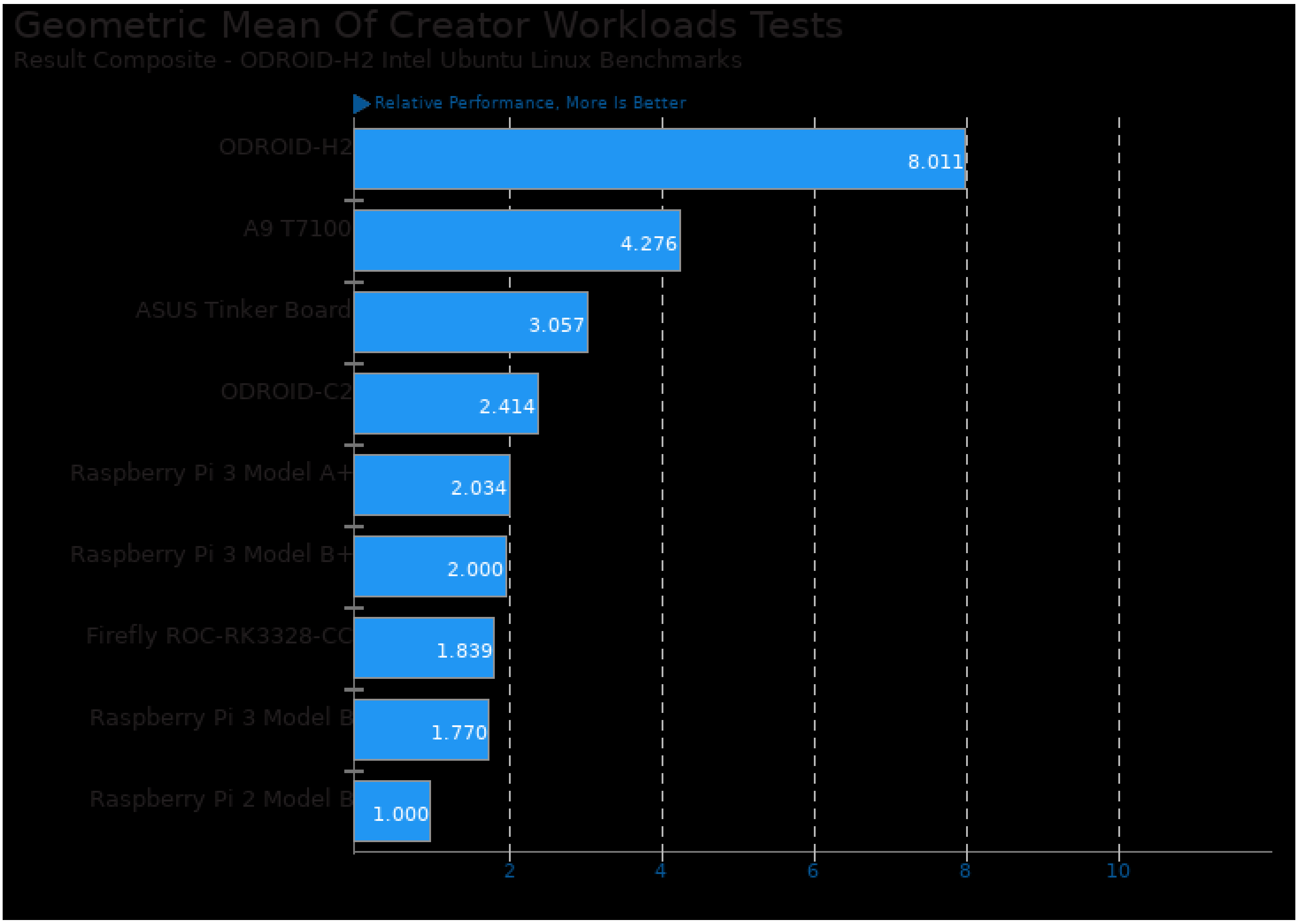
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/aobench, pts/c-ray, pts/compress-7zip, pts/encode-mp3 and pts/x264

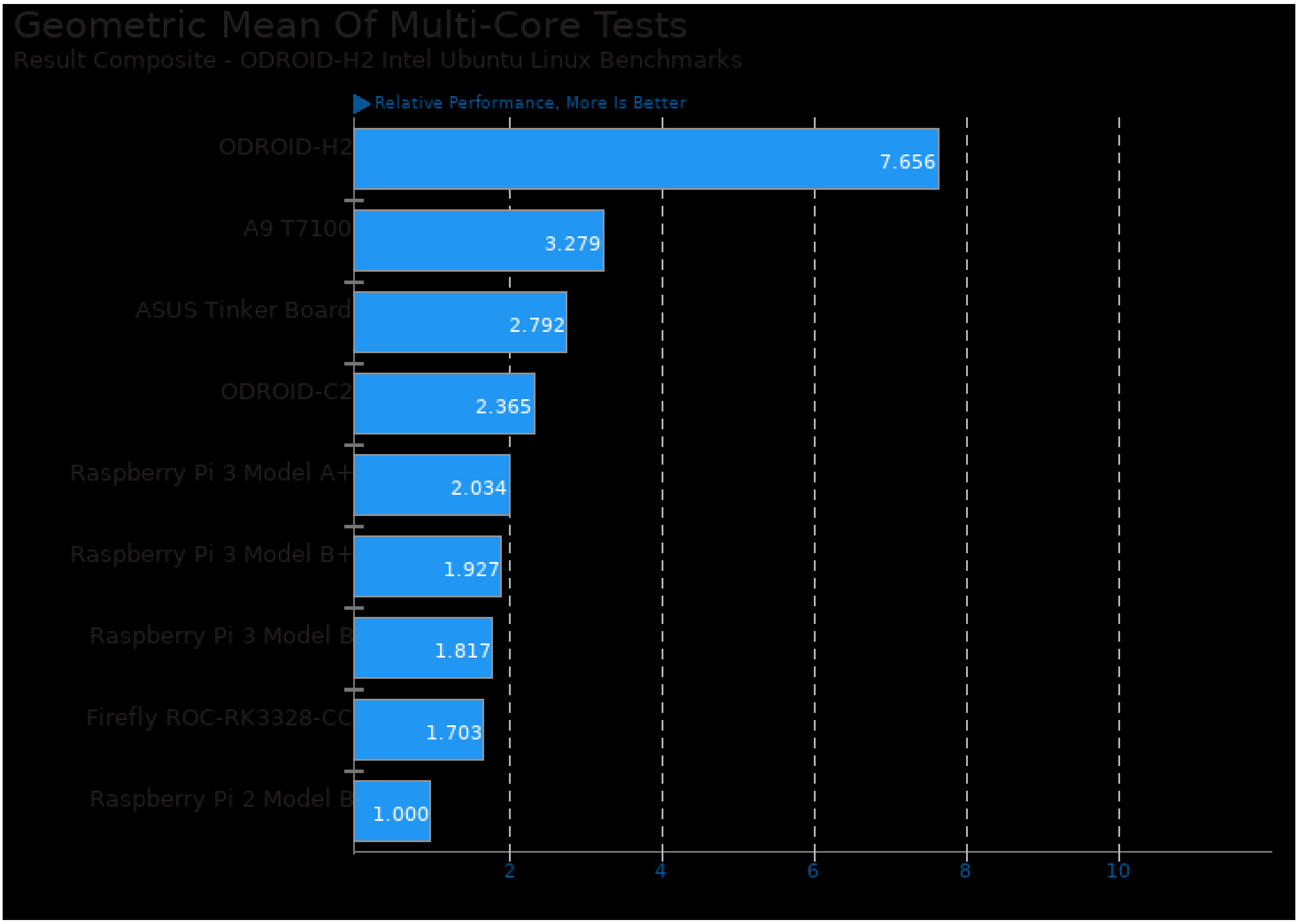


Geometric mean based upon tests: pts/c-ray, pts/compress-7zip, pts/x264, pts/encode-mp3, pts/phpbench, pts/tinymembench and pts/ttsiod-renderer

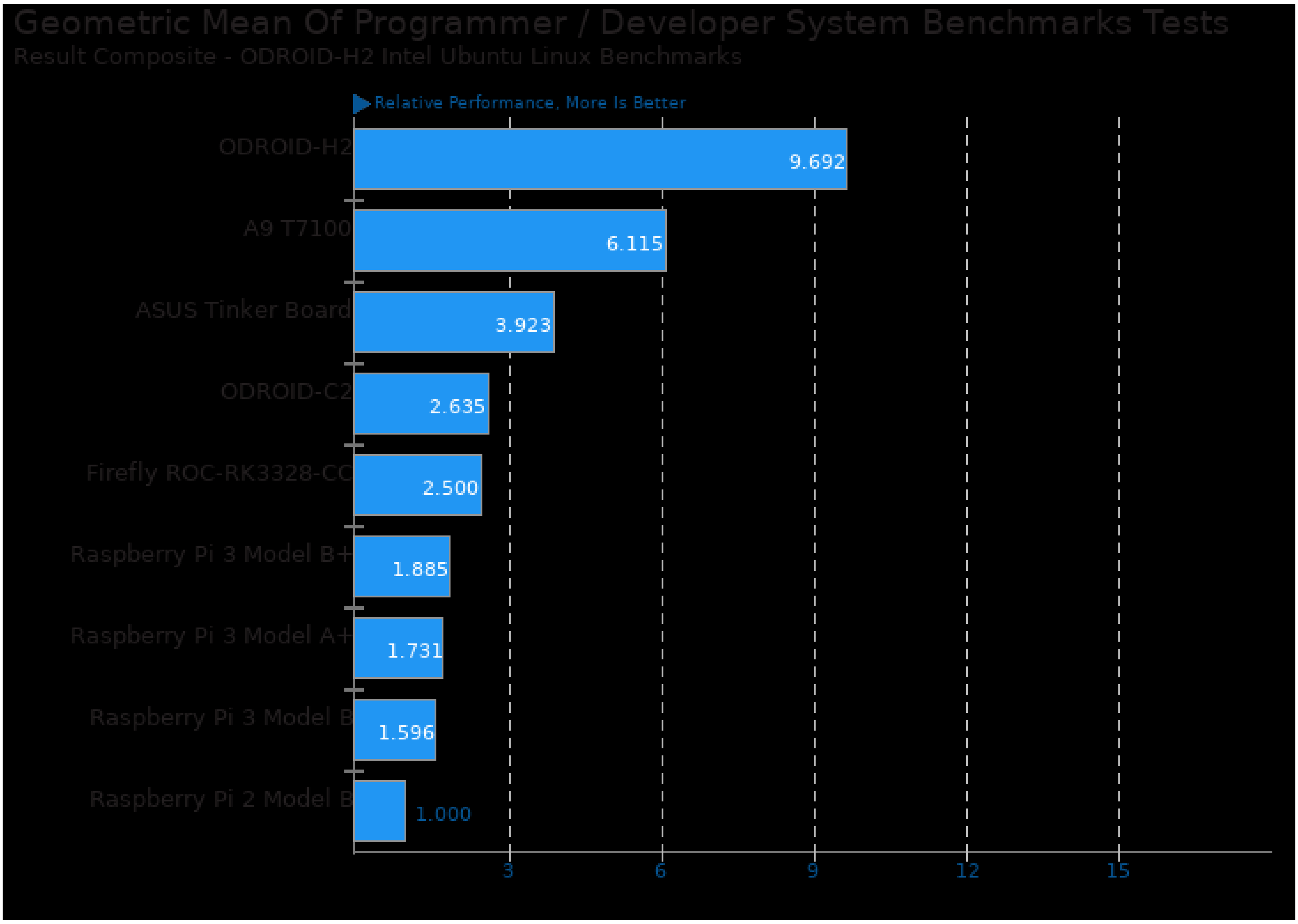


Geometric mean based upon tests: pts/c-ray, pts/aobench, pts/ttsiod-renderer, pts/x264 and pts/encode-mp3

ODROID-H2 Intel Ubuntu Linux Benchmarks

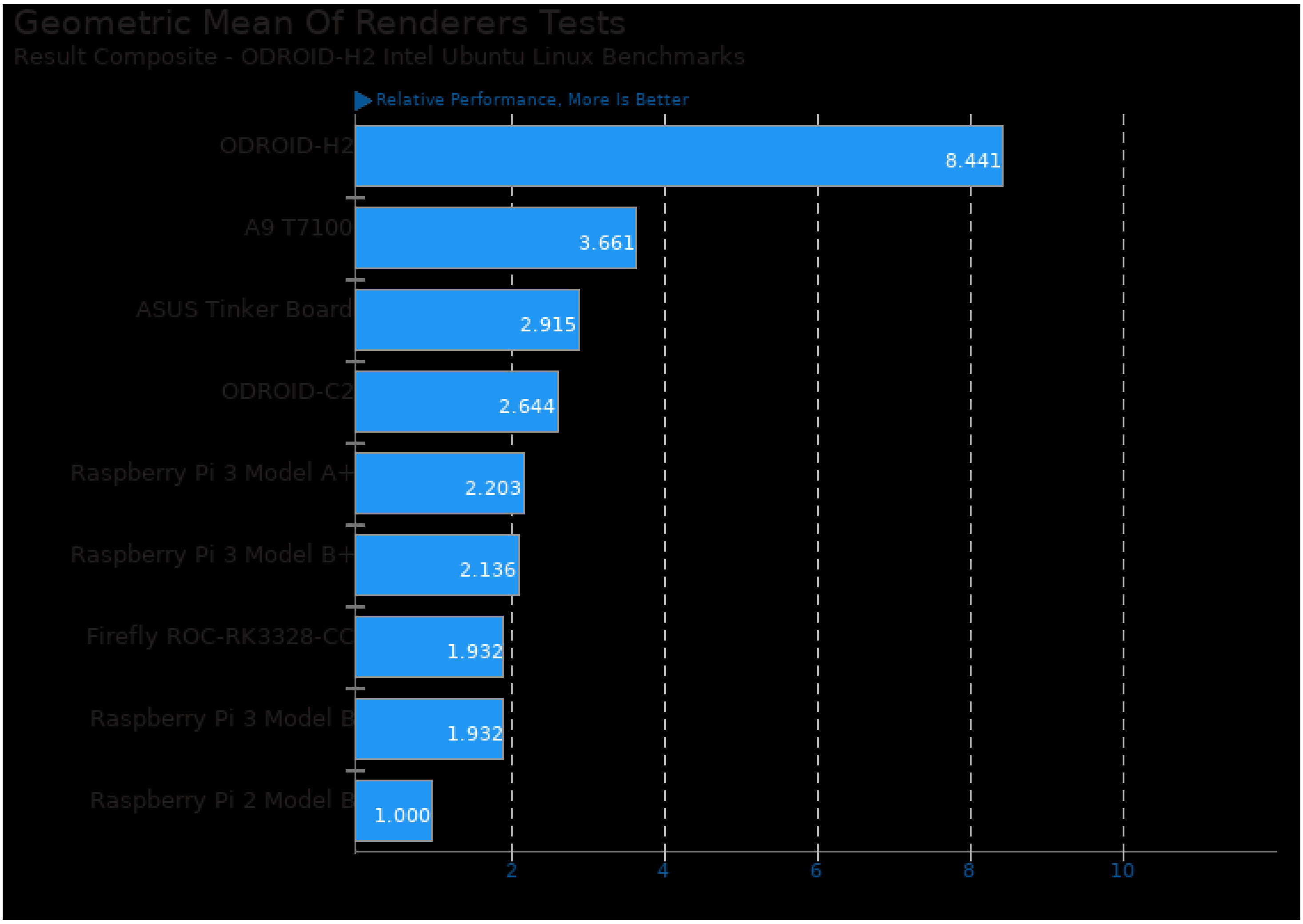


Geometric mean based upon tests: pts/c-ray, pts/x264, pts/compress-7zip, pts/aobench and pts/ttsiod-renderer

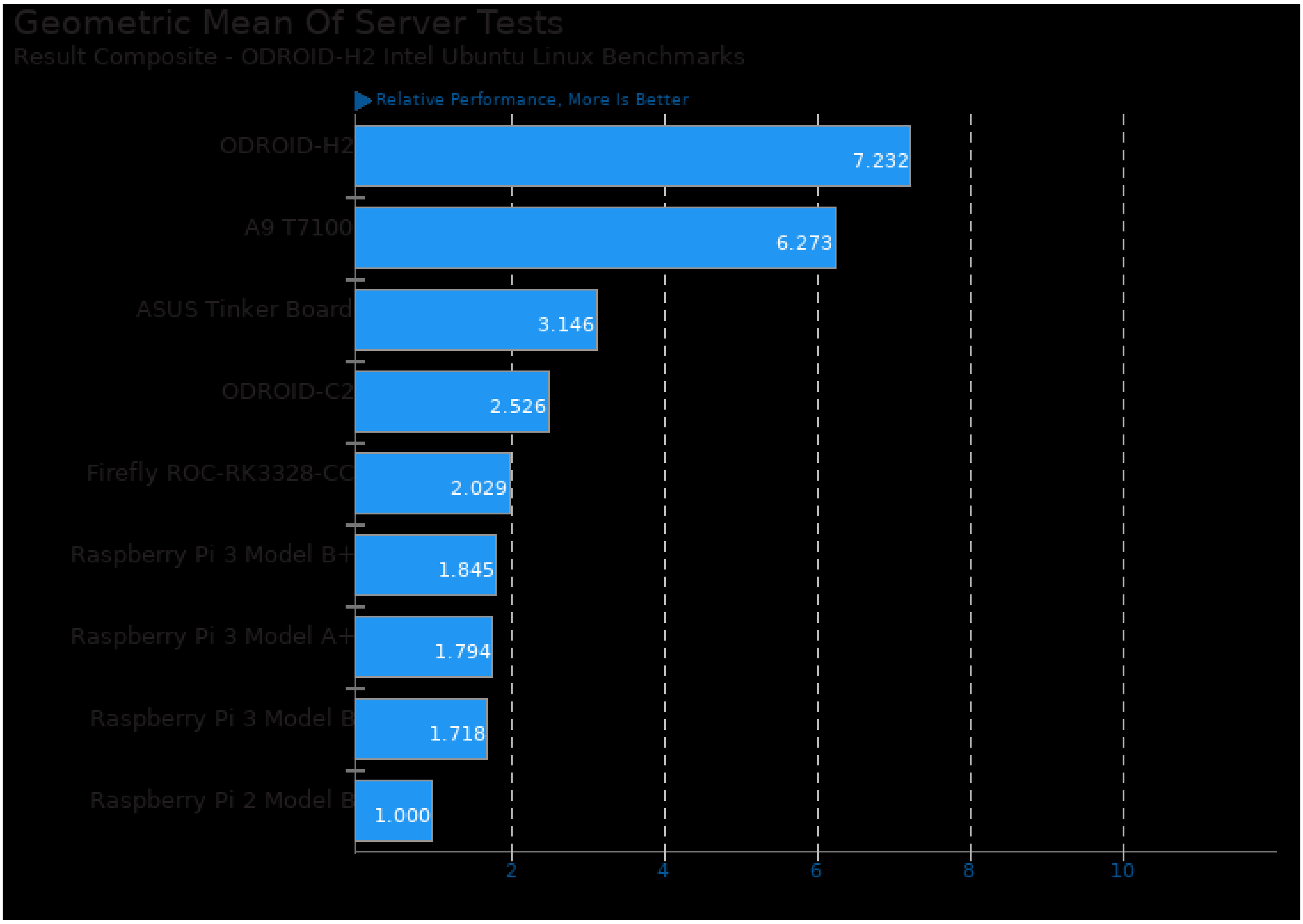


Geometric mean based upon tests: pts/git and pts/pybench

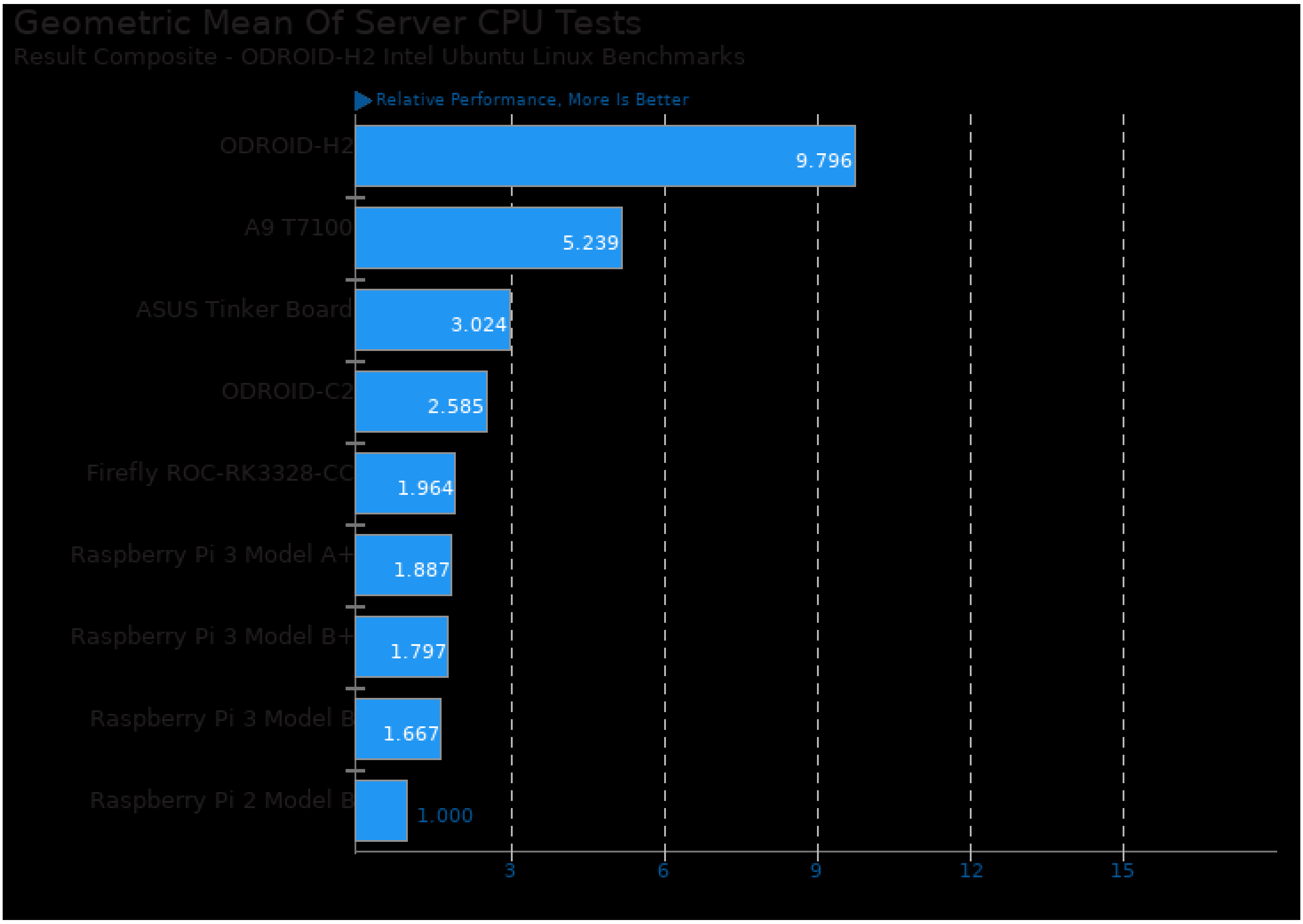
ODROID-H2 Intel Ubuntu Linux Benchmarks



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

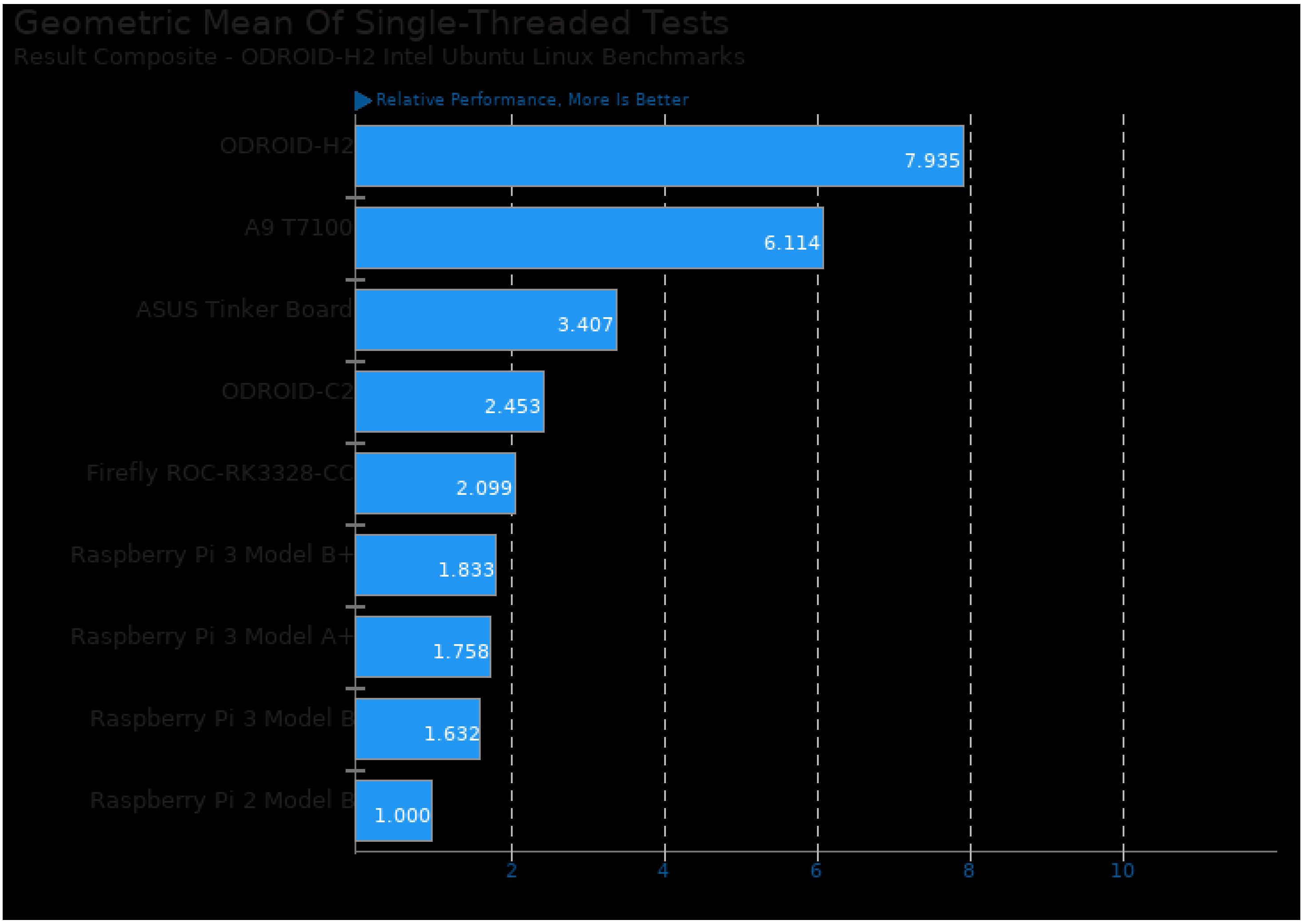


Geometric mean based upon tests: pts/phpbench and pts/perl-benchmark



Geometric mean based upon tests: pts/x264, pts/compress-7zip, pts/c-ray, pts/pybench and pts/phpbench

ODROID-H2 Intel Ubuntu Linux Benchmarks



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

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 07:55.