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# ODROID-H2 Intel Ubuntu Linux Benchmarks

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

## 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

## Raspberry Pi 4 Model B

Processor: ARMv7 rev 3 @ 1.50GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.1, Memory: 4096MB, Disk: 32GB 00000, Graphics: V3D 4.2 4GB, Monitor: SAMSUNG

OS: Raspbian 10, Kernel: 4.19.57-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:

# ODROID-H2 Intel Ubuntu Linux Benchmarks

1920x1080

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

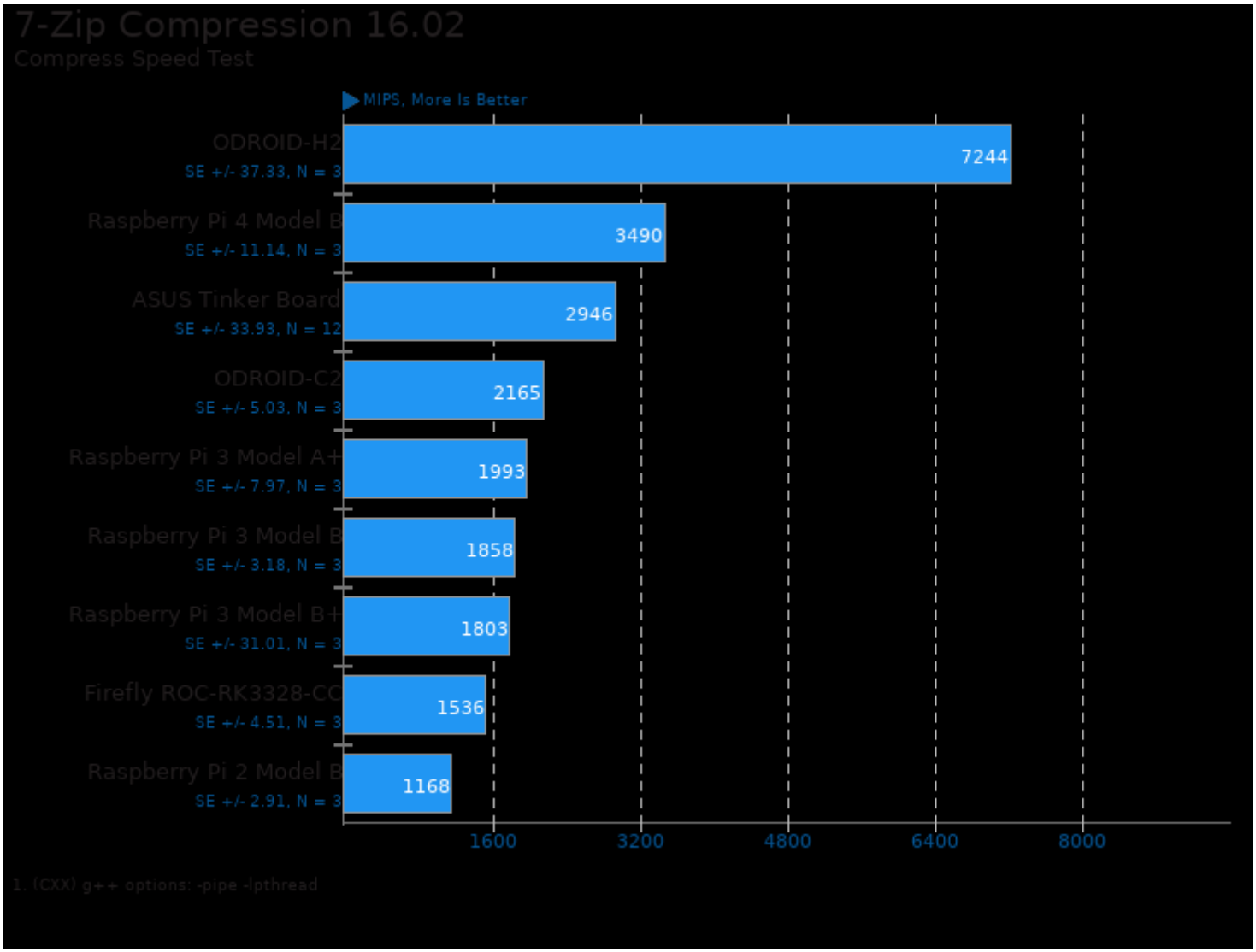
| | Raspberry Pi 2 Model B | Raspberry Pi 3 Model B | Raspberry Pi 3 Model B+ | Raspberry Pi 3 Model A+ | ASUS Tinker Board | Firefly ROC-RK3328-CC | ODROID-C2 | ODROID-H2 | Raspberry Pi 4 Model B |
|---|---|---|---|---|---|---|---|---|---|
| **7-Zip Compression - C.S.T (MIPS)** | 1168 | 1858 | 1803 | 1993 | 2946 | 1536 | 2165 | 7244 | 3490 |
| **Normalized** | 16.12% | 25.65% | 24.89% | 27.51% | 40.67% | 21.2% | 29.89% | 100% | 48.18% |
| **Standard Deviation** | 0.4% | 0.3% | 3% | 0.7% | 4% | 0.5% | 0.4% | 0.9% | 0.6% |
| **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% | |
| **AOBench - 2048 x 2048 - Total Time (sec)** | 668 | 334 | 298 | 286 | 214 | 298 | 262 | 88.80 | 124.43 |
| **Normalized** | 13.29% | 26.59% | 29.8% | 31.05% | 41.5% | 29.8% | 33.89% | 100% | 71.37% |
| **Standard Deviation** | 0.4% | 0.1% | 4.7% | 0.4% | 3.4% | 0.4% | 0.9% | 0.5% | 0.2% |
| **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% | |
| **C-Ray - Total Time - 4.1.R.P.P (sec)** | 4364 | 2317 | 2111 | 2068 | 1579 | 2604 | 1559 | 454 | 729 |
| **Normalized** | 10.4% | 19.59% | 21.51% | 21.95% | 28.75% | 17.43% | 29.12% | 100% | 62.28% |
| **Standard Deviation** | 1.6% | 0.9% | 0.2% | 0.4% | 0.3% | 0.8% | 1.9% | 0% | 9.5% |
| **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% | |
| **Git - T.T.C.C.G.C (sec)** | 96.99 | 59.52 | 49.17 | 58.67 | 25.72 | 41.47 | 42.08 | 12.99 | 28.46 |
| **Normalized** | 13.39% | 21.82% | 26.42% | 22.14% | 50.51% | 31.32% | 30.87% | 100% | 45.64% |
| **Standard Deviation** | 5.5% | 10.2% | 10.4% | 1.7% | 3.5% | 2.5% | 13.9% | 2% | 4% |
| **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% | |

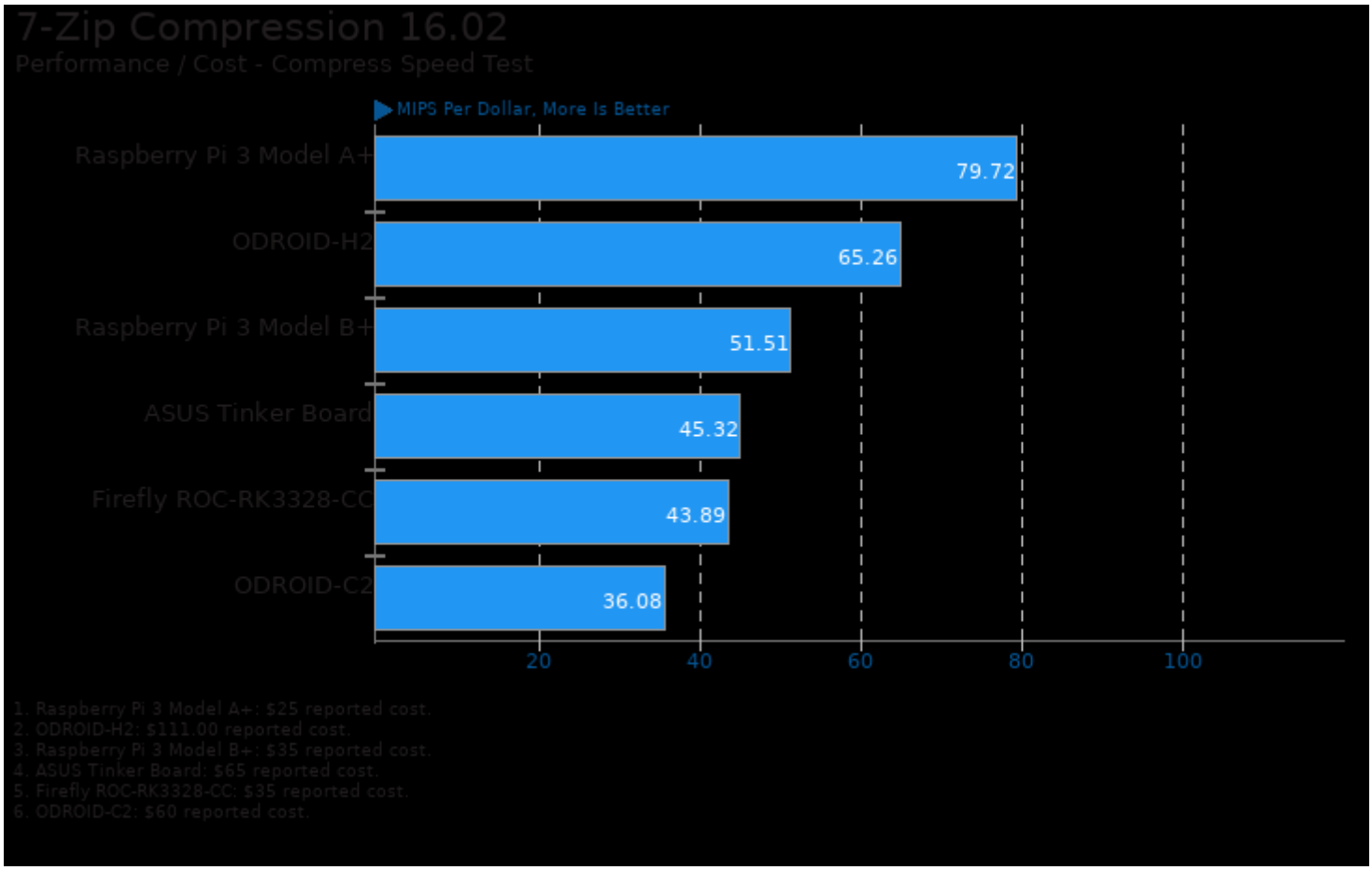
# ODROID-H2 Intel Ubuntu Linux Benchmarks

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|---|---|---|---|---|---|---|---|---|---|
| **LAME MP3 Encoding - WAV To MP3 (sec)** | 515 | 352 | 302 | 304 | 158 | 315 | 265 | 73.22 | 125.74 |
| **Normalized** | 14.22% | 20.8% | 24.25% | 24.09% | 46.34% | 23.24% | 27.63% | 100% | 58.23% |
| **Standard Deviation** | 0.3% | 0.2% | 0.3% | 0.6% | 0.6% | 0.2% | 0.1% | 0% | 0.4% |
| **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% | |
| **Perl Benchmarks - Pod2html (sec)** | 2.391983 71 | 1.299323 92 | 1.210610 75 | 1.159524 01 | 0.743728 82 | 1.703258 77 | 1.088939 65 | 0.328906 68 | 0.634120 85 |
| **Normalized** | 13.75% | 25.31% | 27.17% | 28.37% | 44.22% | 19.31% | 30.2% | 100% | 51.87% |
| **Standard Deviation** | 1.9% | 1.7% | 0.8% | 0.1% | 1.1% | 2.3% | 4.7% | 0.1% | 0.3% |
| **Perl Benchmarks - Interpreter (sec)** | 0.014098 89 | 0.008430 41 | 0.008079 74 | 0.009716 87 | 0.004274 66 | 0.005988 28 | 0.005480 34 | 0.003332 89 | 0.009300 15 |
| **Normalized** | 23.64% | 39.53% | 41.25% | 34.3% | 77.97% | 55.66% | 60.82% | 100% | 35.84% |
| **Standard Deviation** | 5.7% | 3.3% | 7% | 14.5% | 7.2% | 0.2% | 0.9% | 0.6% | 32.2% |
| **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% | |
| **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% | |
| **PHPBench - P.B.S (Score)** | 20920 | 34426 | 38087 | 40338 | 61415 | 52852 | 59664 | 257186 | 101484 |
| **Normalized** | 8.13% | 13.39% | 14.81% | 15.68% | 23.88% | 20.55% | 23.2% | 100% | 39.46% |
| **Standard Deviation** | 0.5% | 0.2% | 0.7% | 0.2% | 0.7% | 0.5% | 0.2% | 0.1% | 0.5% |
| **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% | |
| **PyBench - T.F.A.T.T (Milliseconds)** | 38087 | 24328 | 21206 | 20874 | 9318 | 14242 | 12619 | 3031 | 5263 |
| **Normalized** | 7.96% | 12.46% | 14.29% | 14.52% | 32.53% | 21.28% | 24.02% | 100% | 57.59% |
| **Standard Deviation** | 0.4% | 0.4% | 0.4% | 0.2% | 0.8% | 0.4% | 0.1% | 0.1% | 0.4% |
| **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% | |
| **Tinymembench - Standard Memcpy (MB/s)** | 1000 | 1302 | 1285 | 1300 | 1532 | 1240 | 1718 | 5577 | 2484 |
| **Normalized** | 17.93% | 23.35% | 23.04% | 23.31% | 27.47% | 22.23% | 30.81% | 100% | 44.54% |
| **Standard Deviation** | 2.5% | 0.3% | 1.2% | 1.3% | 0.3% | 3.4% | 0.4% | 0.3% | 0.7% |

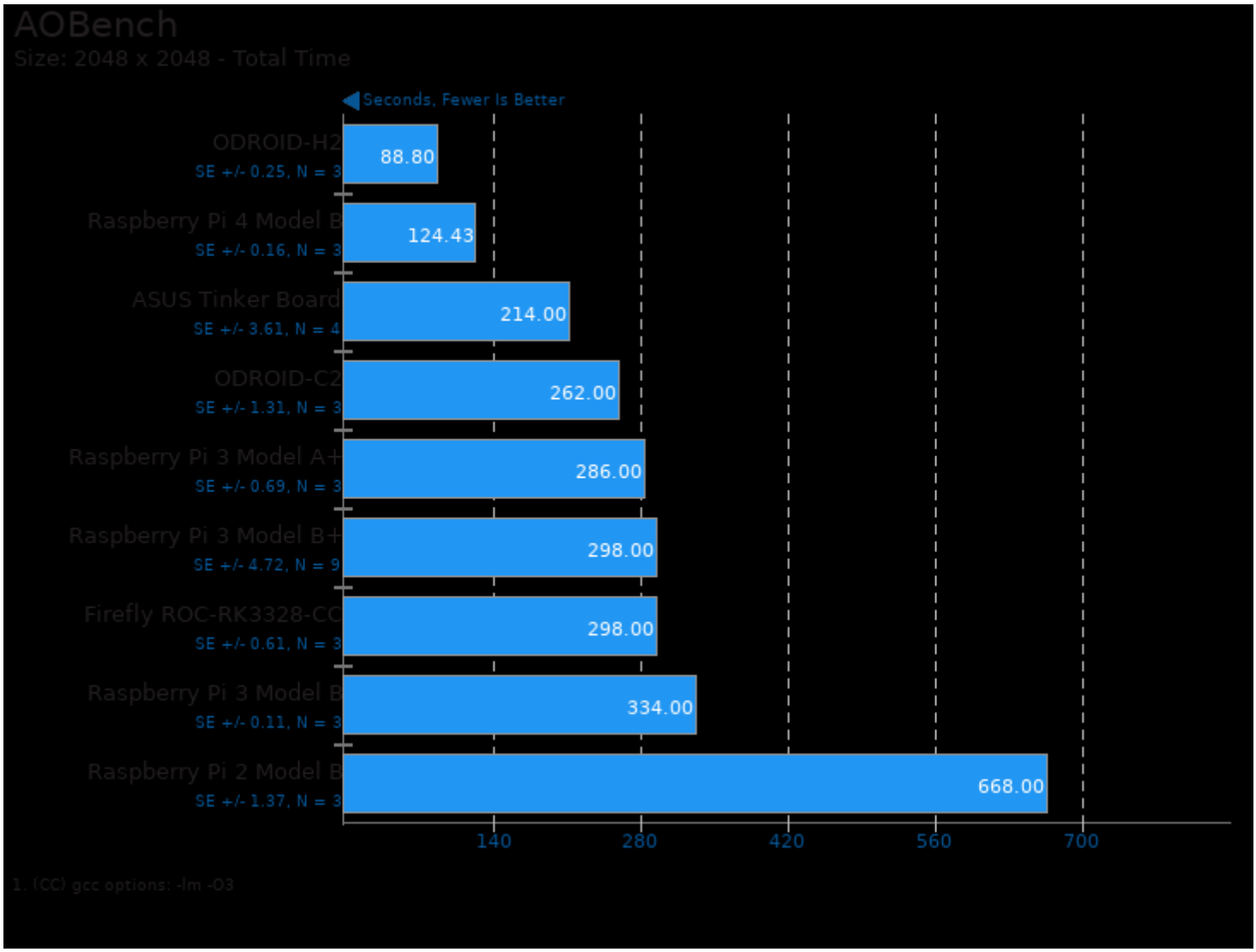
# ODROID-H2 Intel Ubuntu Linux Benchmarks

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|---|---|---|---|---|---|---|---|---|---|
| **Tinymembench - Standard Memset (MB/s)** | **1188** | 1773 | 1826 | 1833 | 4199 | 5628 | 3737 | **7590** | 3183 |
| **Normalized** | 15.65% | 23.36% | 24.06% | 24.15% | 55.32% | 74.15% | 49.24% | 100% | 41.94% |
| **Standard Deviation** | 0.5% | 1.6% | 2.4% | 3.4% | 0% | 5.3% | 0.1% | 0.1% | 0.2% |
| **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% | | |
| **Tinymembench - Performance / Cost - Standard Memset (MB/s/Dollar)** | | | | | | | | 68.38 | |
| **TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)** | **11.20** | 15.99 | 16.51 | 17.25 | 22.38 | | 22.51 | **77.58** | 25.46 |
| **Normalized** | 14.44% | 20.61% | 21.28% | 22.24% | 28.85% | | 29.02% | 100% | 32.82% |
| **Standard Deviation** | 0.4% | 3.3% | 0.3% | 1.6% | 2.6% | | 2.2% | 0.3% | 0.6% |
| **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% | |
| **x264 - H.2.V.E (FPS)** | **1.13** | 2.03 | 2.08 | | 3.36 | 1.65 | 2.88 | **12.03** | 5.24 |
| **Normalized** | 9.39% | 16.87% | 17.29% | | 27.93% | 13.72% | 23.94% | 100% | 43.56% |
| **Standard Deviation** | 0.5% | 0% | 0.6% | | 0.5% | 0.6% | 0.2% | 0.3% | 3% |
| **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% | |

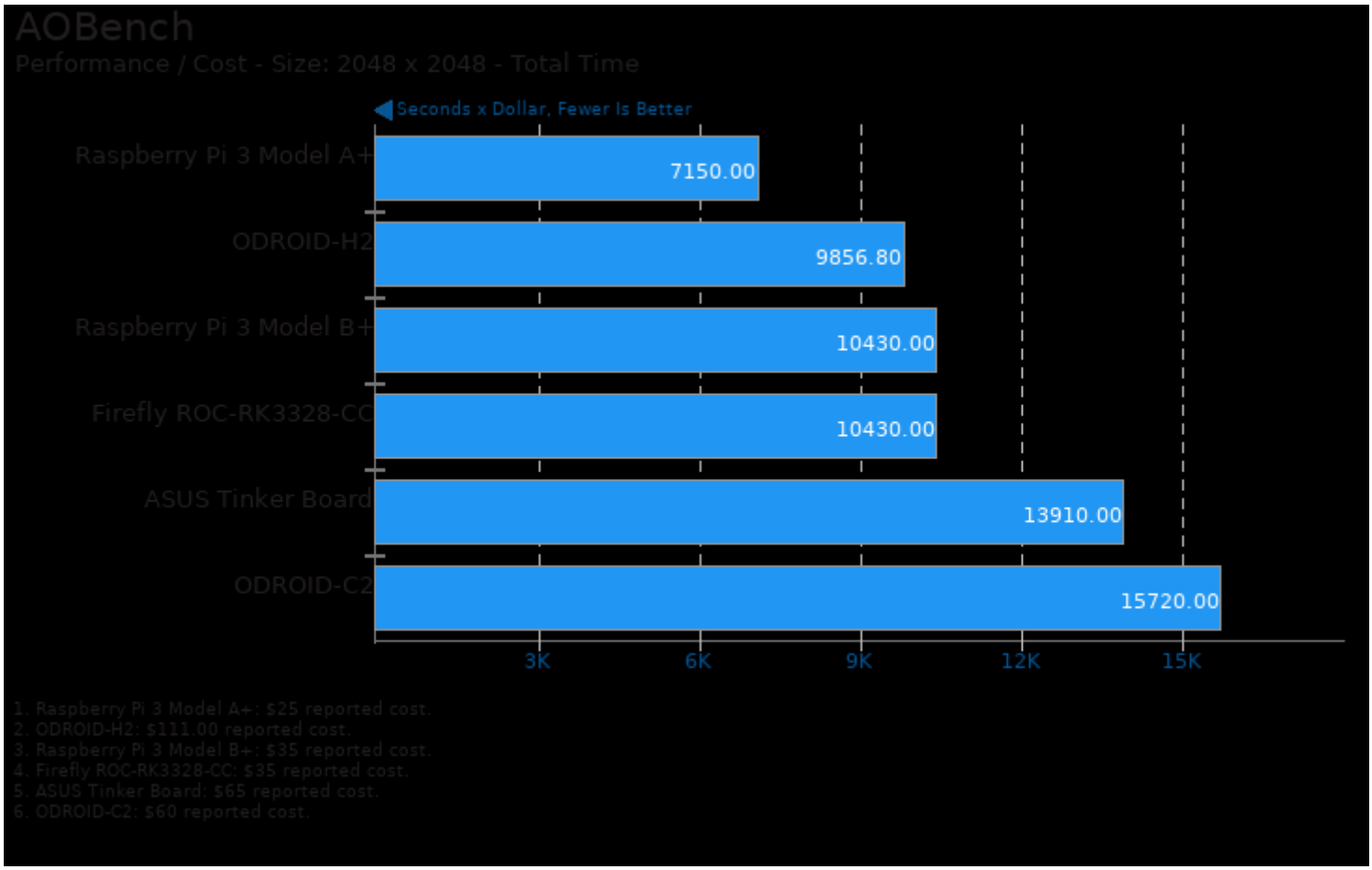

7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
ODROID-H2
SE +/- 37.33, N = 3
7244
Raspberry Pi 4 Model B
SE +/- 11.14, N = 3
3490
ASUS Tinker Board
SE +/- 33.93, N = 12
2946
ODROID-C2
SE +/- 5.03, N = 3
2165
Raspberry Pi 3 Model A+
SE +/- 7.97, N = 3
1993
Raspberry Pi 3 Model B
SE +/- 3.18, N = 3
1858
Raspberry Pi 3 Model B+
SE +/- 31.01, N = 3
1803
Firefly ROC-RK3328-CC
SE +/- 4.51, N = 3
1536
Raspberry Pi 2 Model B
SE +/- 2.91, N = 3
1168
1600
3200
4800
6400
8000
1. (CXX) g++ options: -pipe -lpthread


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

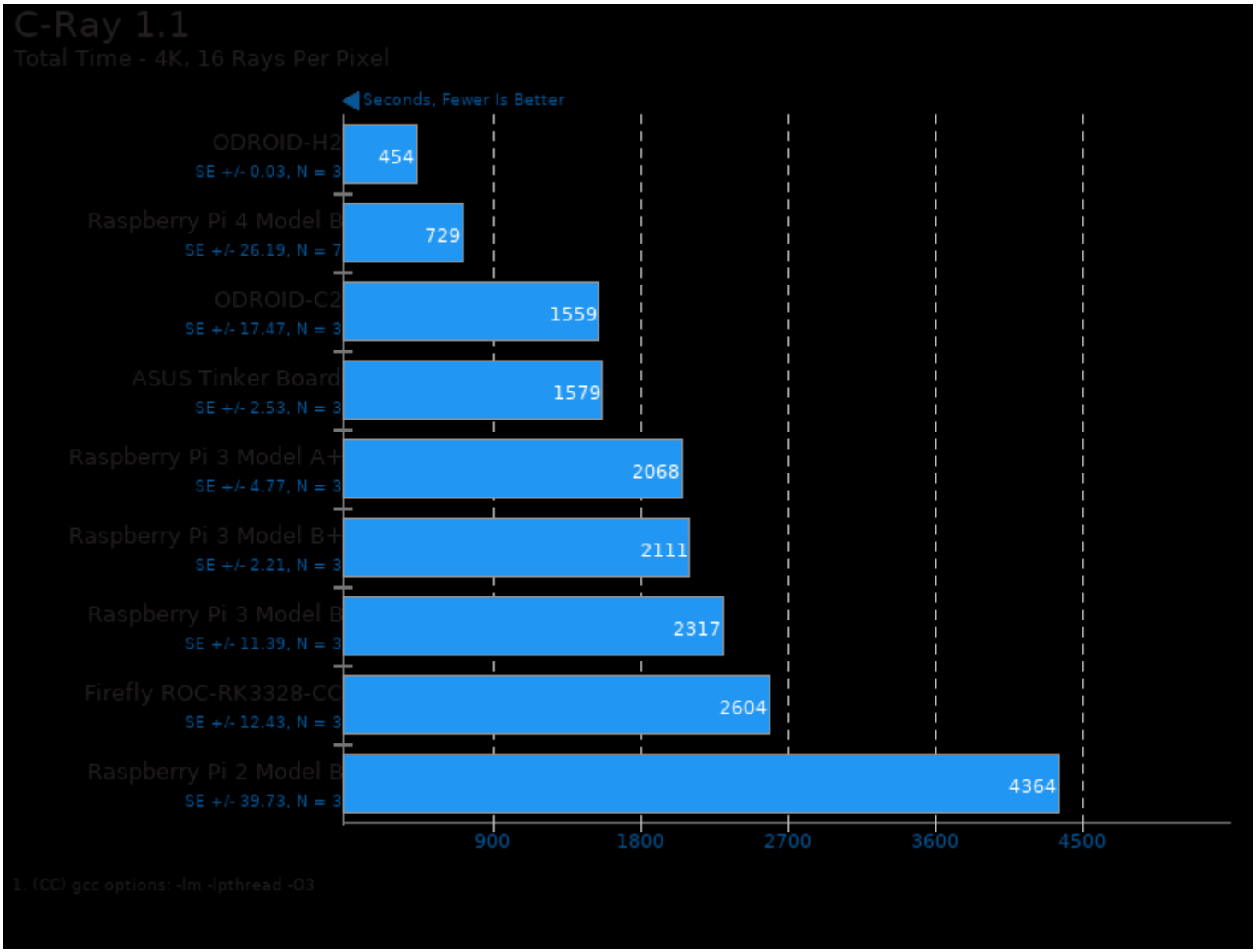
# ODROID-H2 Intel Ubuntu Linux Benchmarks



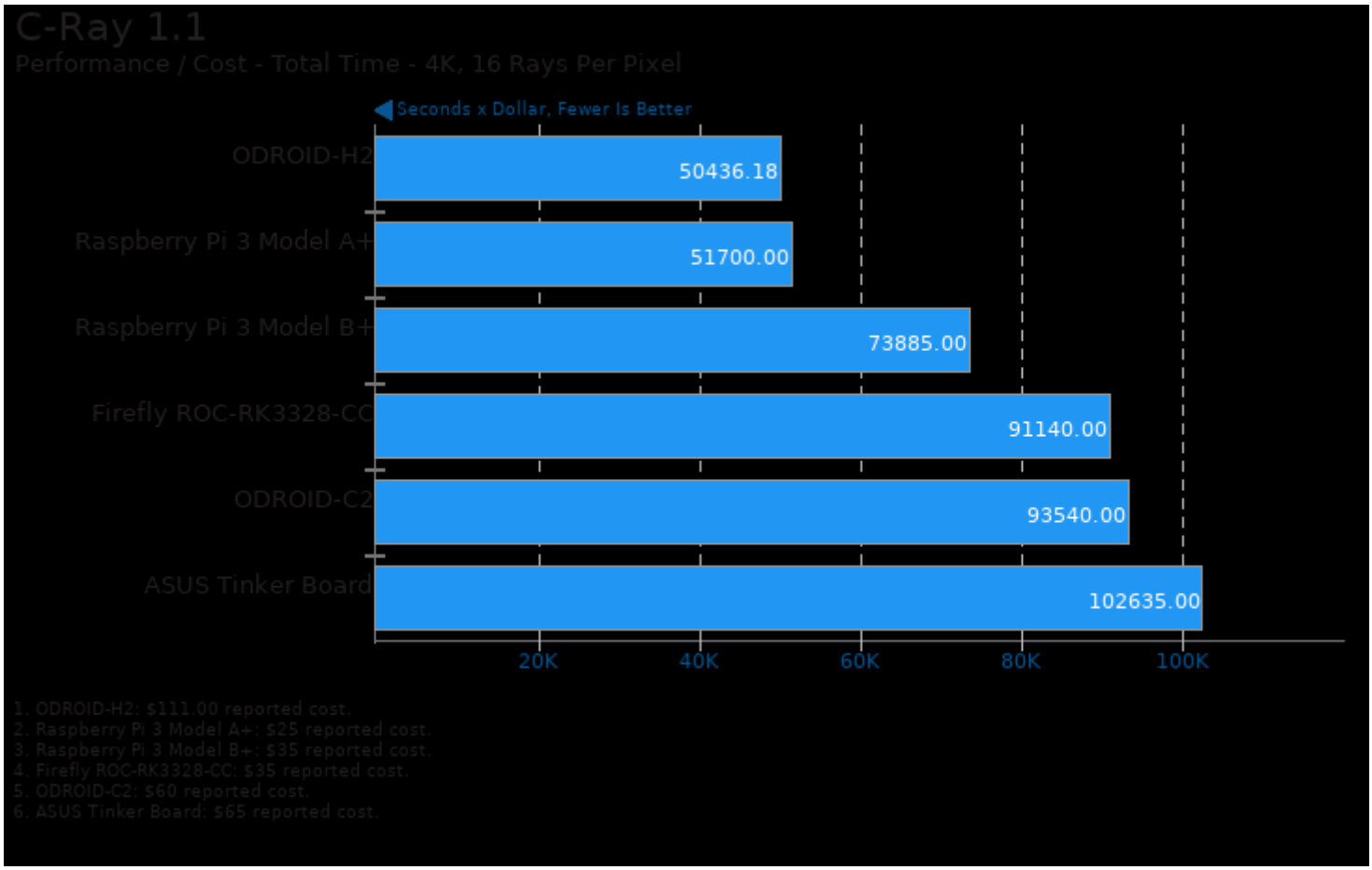
# ODROID-H2 Intel Ubuntu Linux Benchmarks



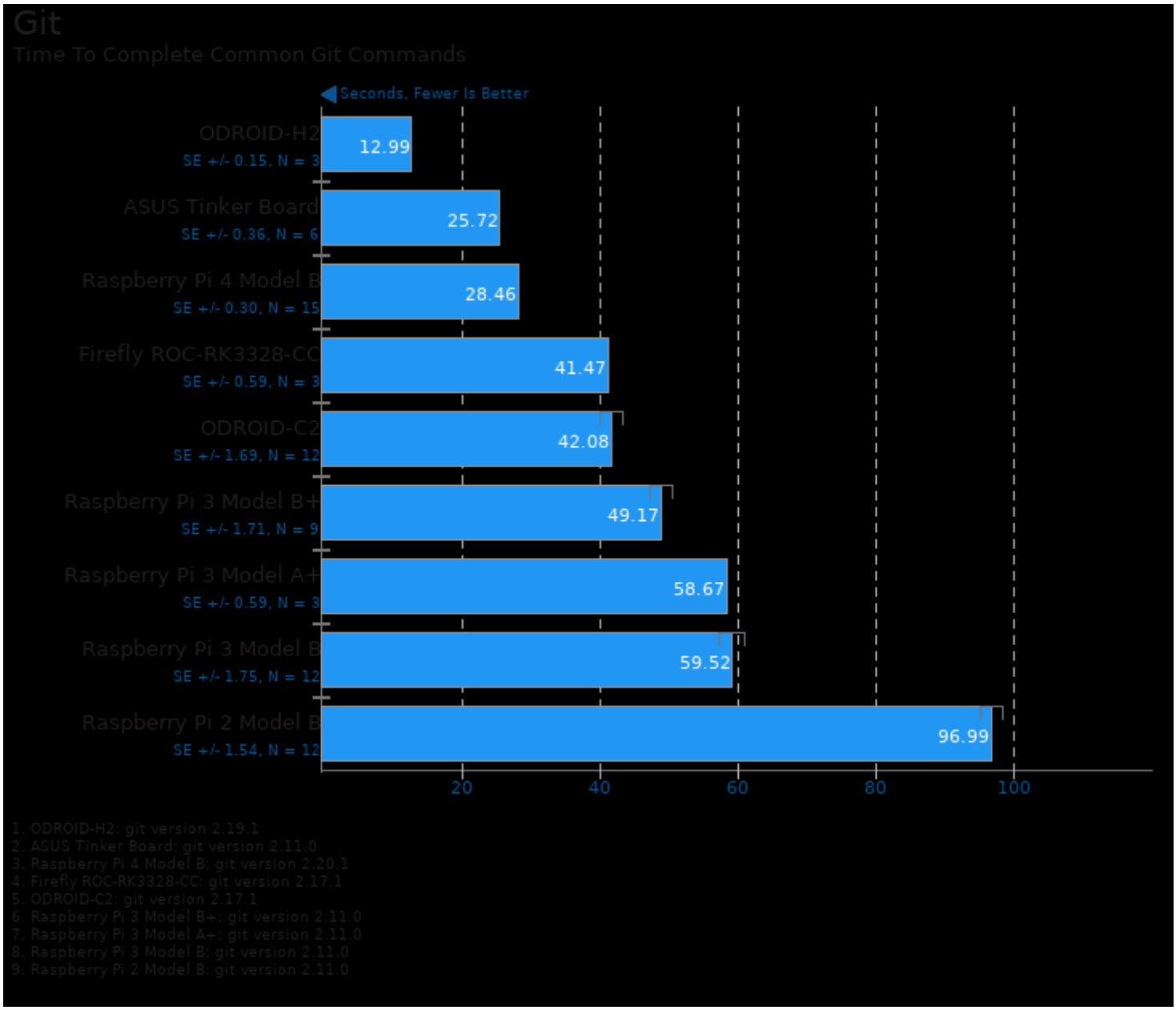
# ODROID-H2 Intel Ubuntu Linux Benchmarks



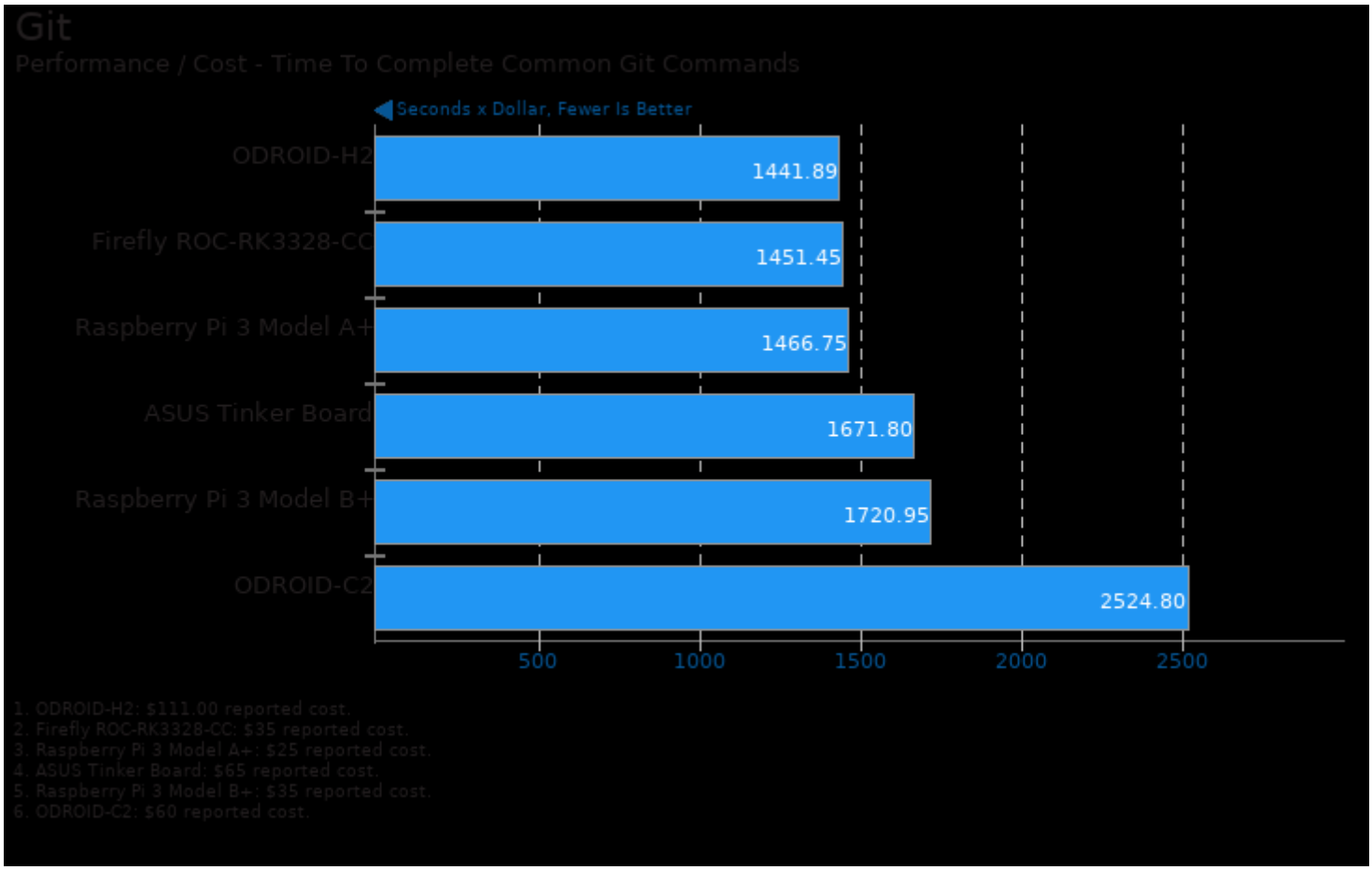
# ODROID-H2 Intel Ubuntu Linux Benchmarks

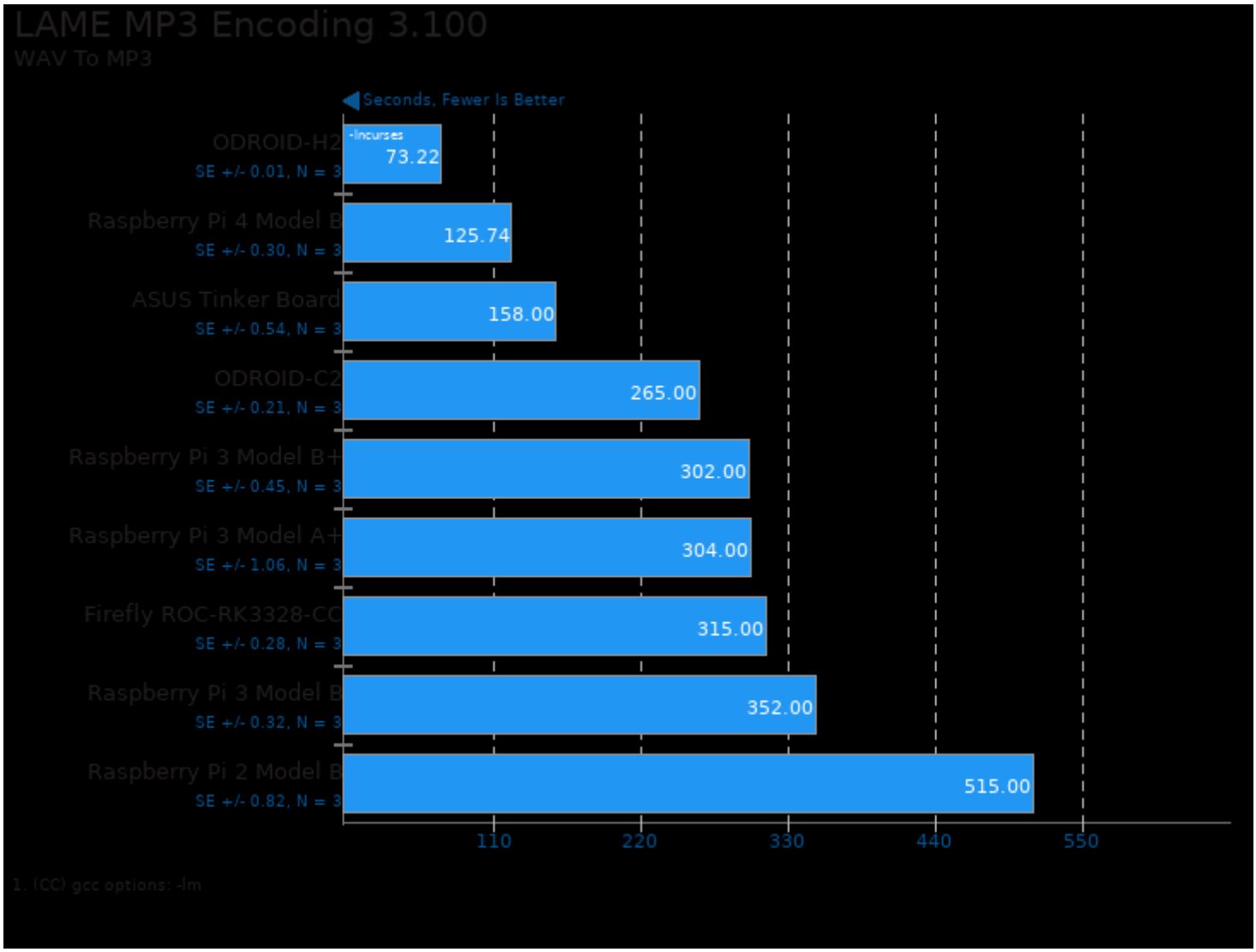


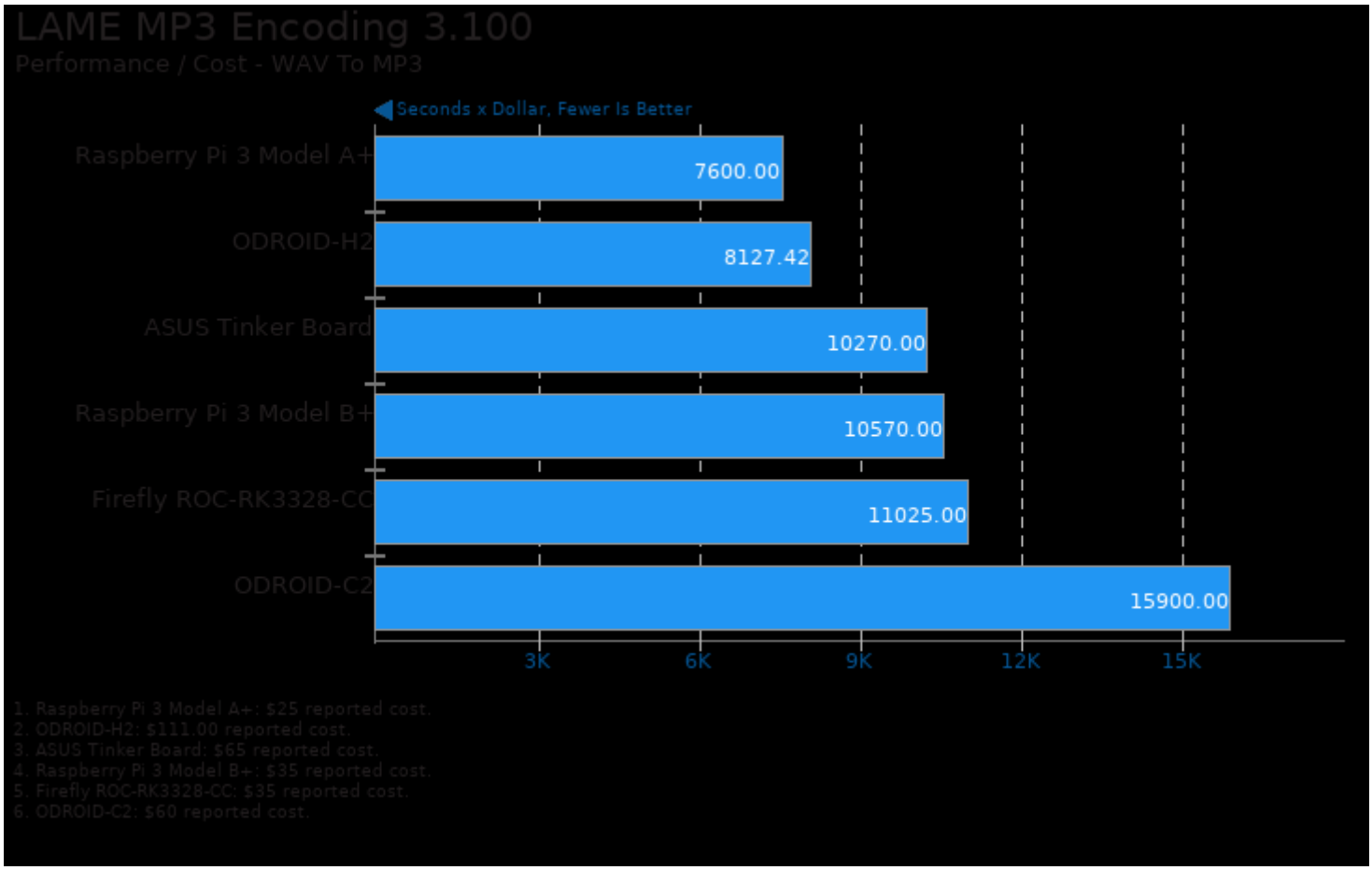
# ODROID-H2 Intel Ubuntu Linux Benchmarks



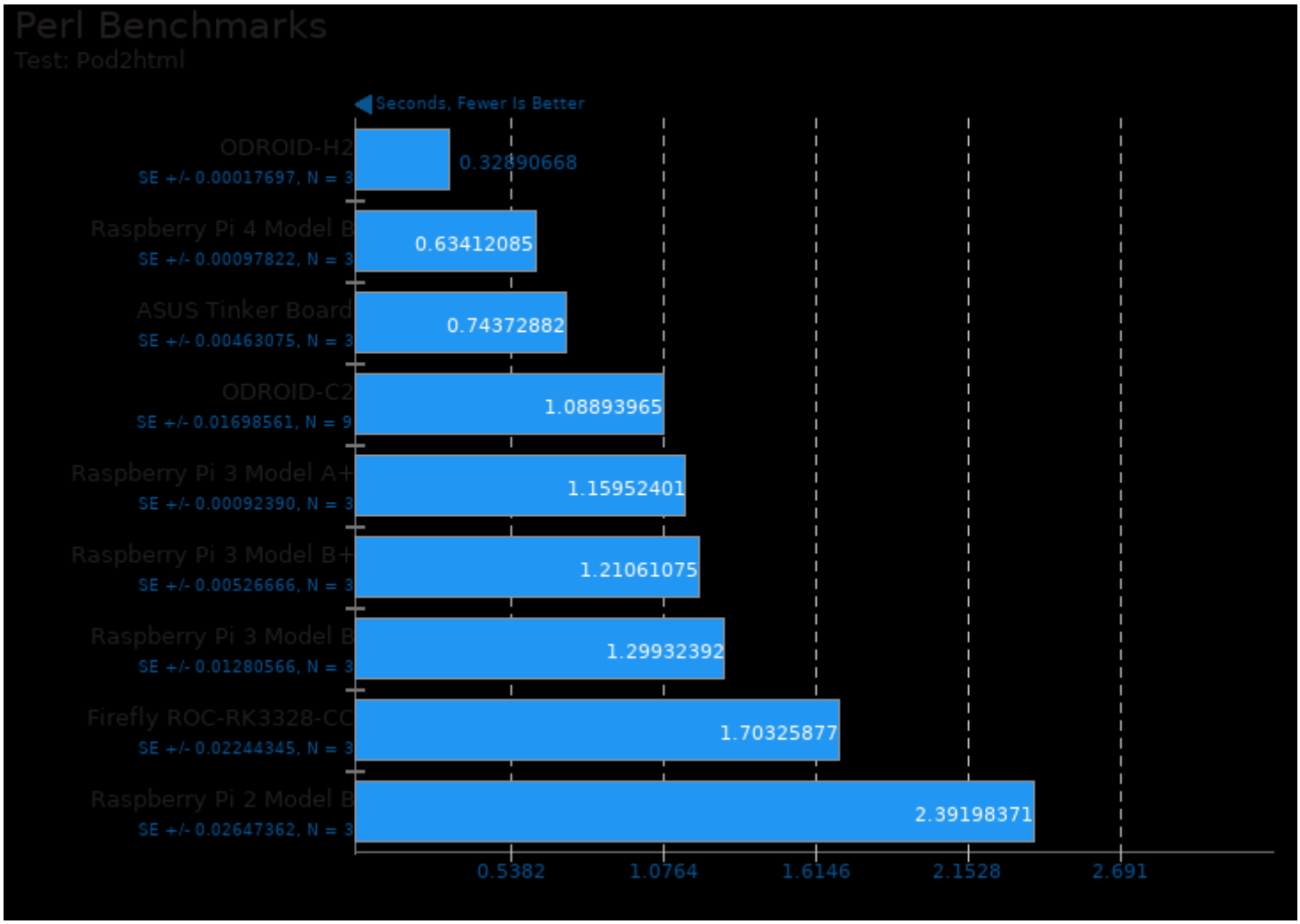
# ODROID-H2 Intel Ubuntu Linux Benchmarks

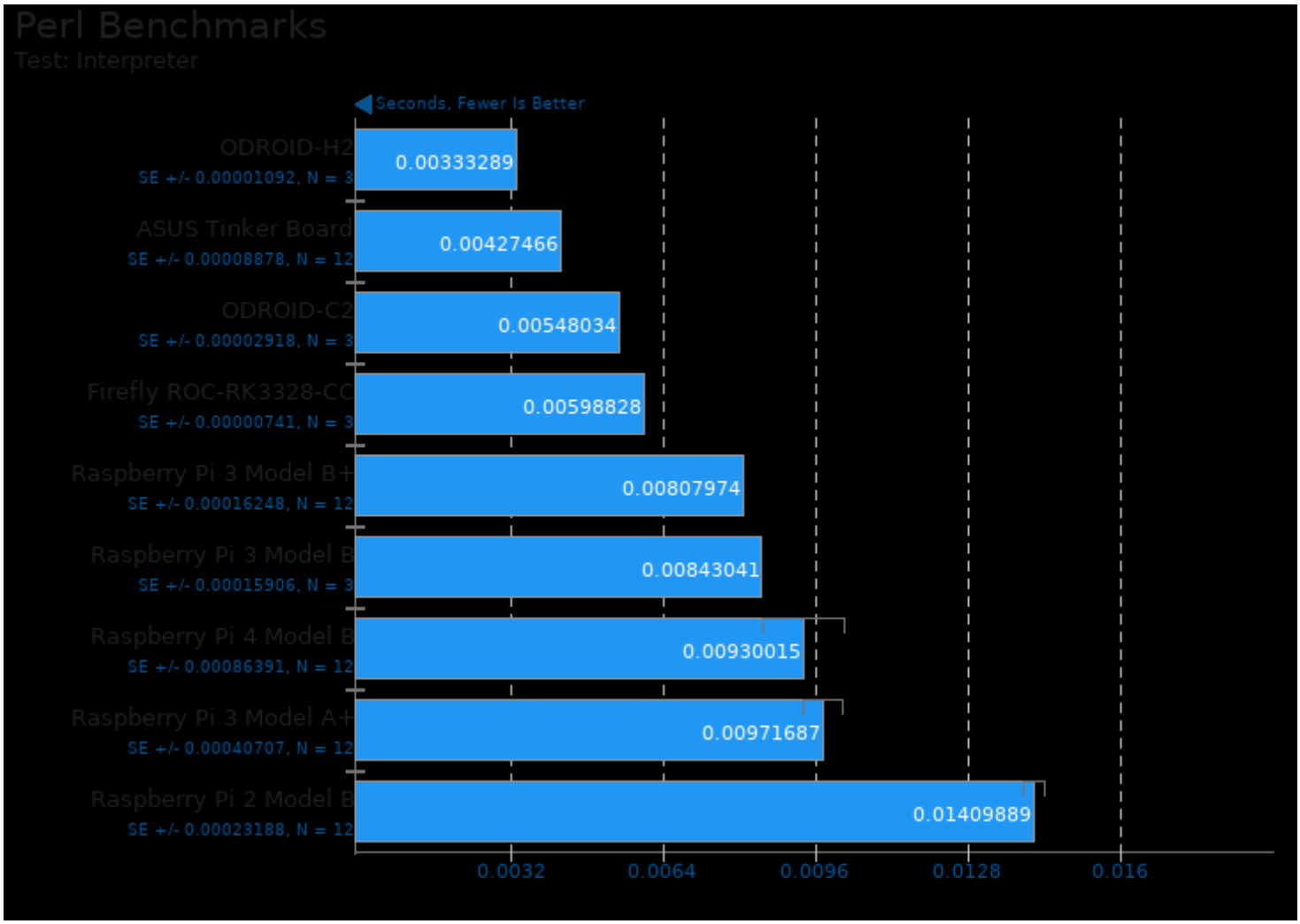


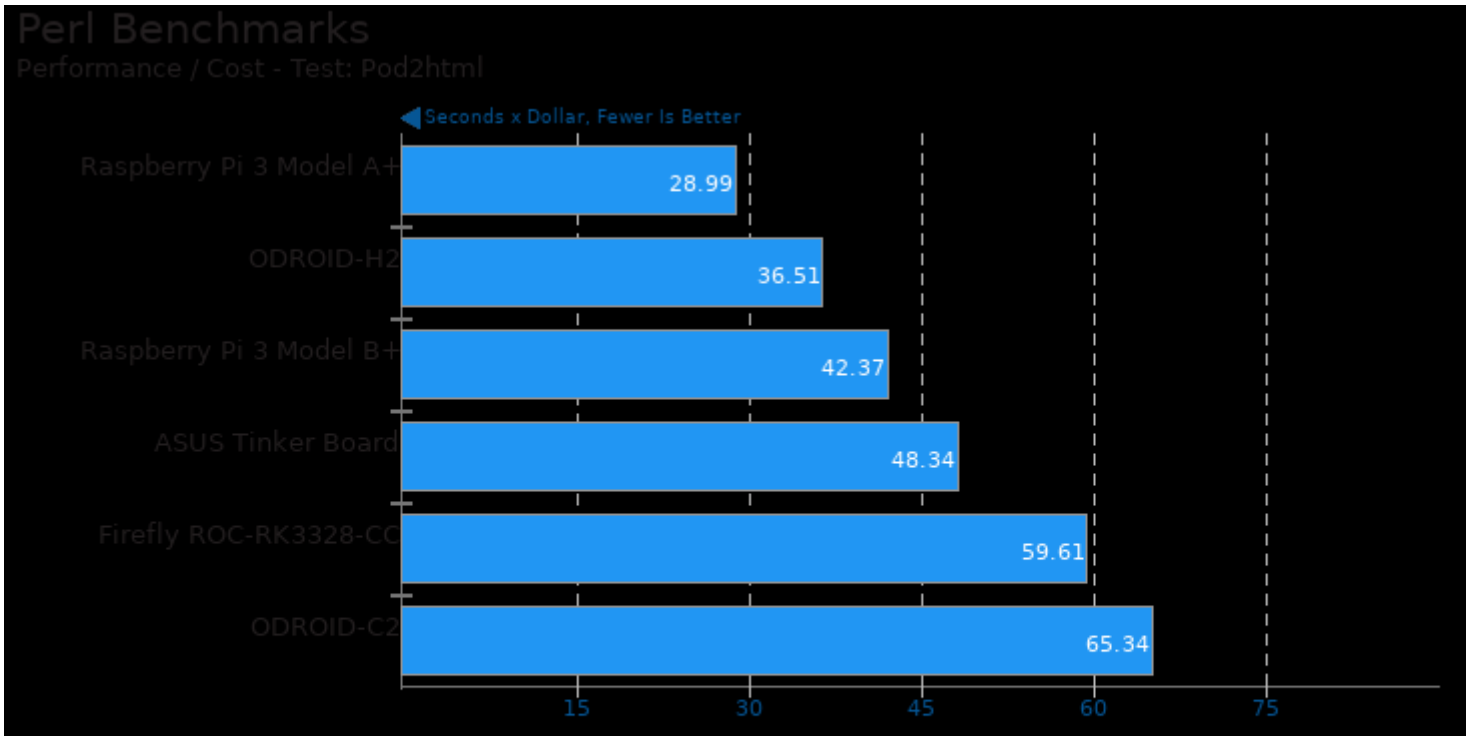

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
ODROID-H2
-lncurses
73.22
SE +/- 0.01, N = 3
Raspberry Pi 4 Model B
125.74
SE +/- 0.30, N = 3
ASUS Tinker Board
158.00
SE +/- 0.54, N = 3
ODROID-C2
265.00
SE +/- 0.21, N = 3
Raspberry Pi 3 Model B+
302.00
SE +/- 0.45, N = 3
Raspberry Pi 3 Model A+
304.00
SE +/- 1.06, N = 3
Firefly ROC-RK3328-CC
315.00
SE +/- 0.28, N = 3
Raspberry Pi 3 Model B
352.00
SE +/- 0.32, N = 3
Raspberry Pi 2 Model B
515.00
SE +/- 0.82, N = 3
110
220
330
440
550
1. (CC) gcc options: -lm


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

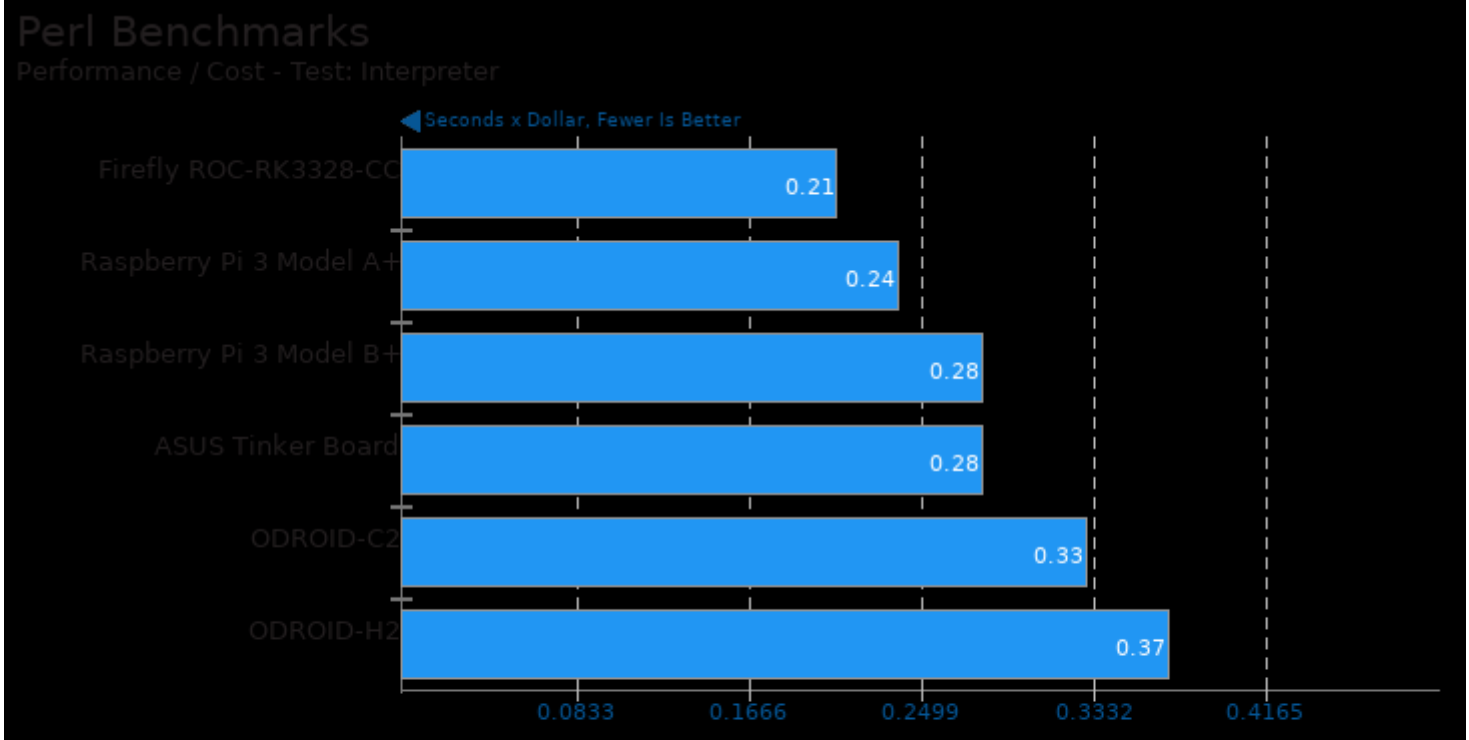
# ODROID-H2 Intel Ubuntu Linux Benchmarks



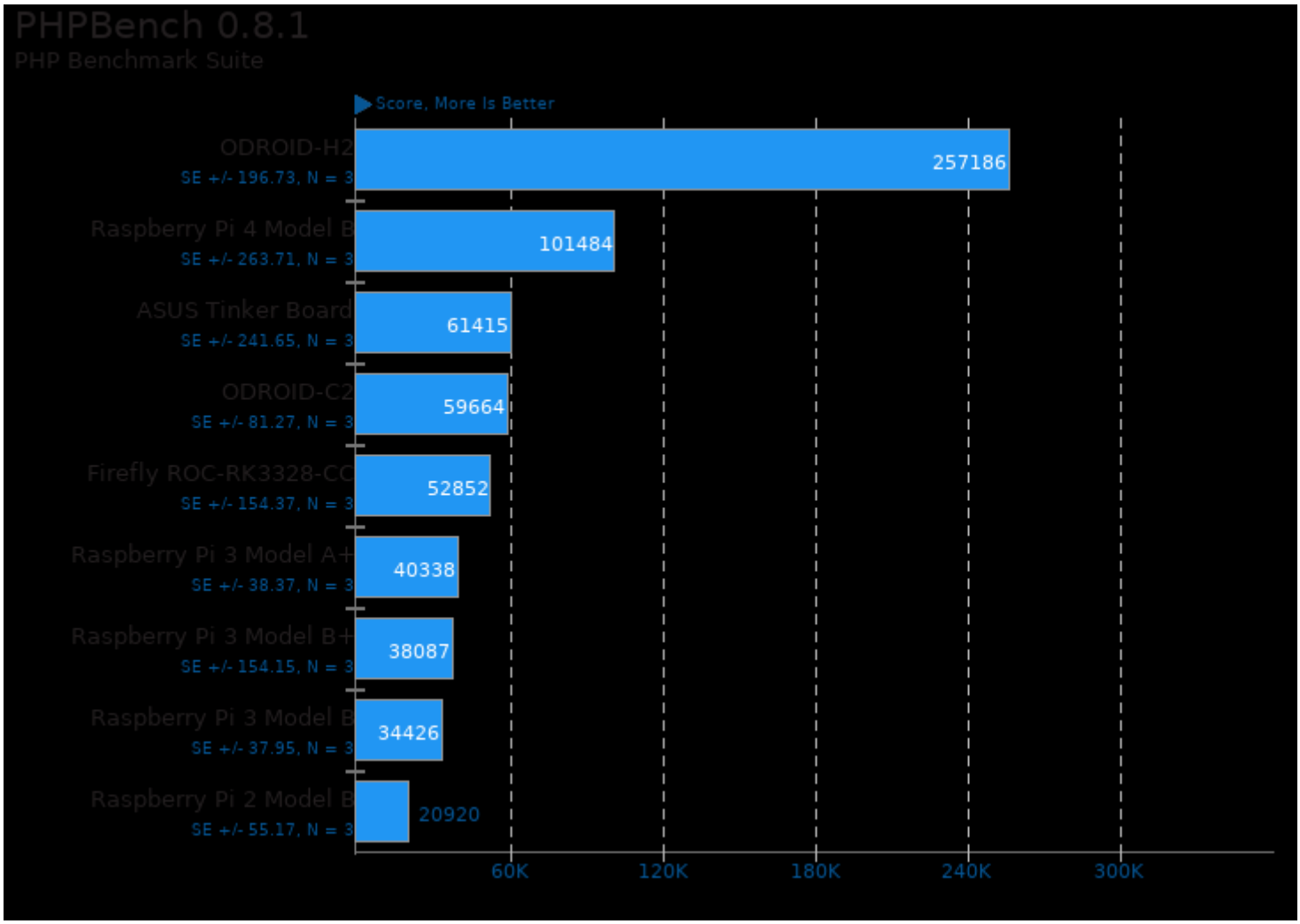

Perl Benchmarks
Test: Interpreter
Seconds, Fewer Is Better
ODROID-H2
SE +/- 0.00001092, N = 3
0.00333289
ASUS Tinker Board
SE +/- 0.00008878, N = 12
0.00427466
ODROID-C2
SE +/- 0.00002918, N = 3
0.00548034
Firefly ROC-RK3328-CC
SE +/- 0.00000741, N = 3
0.00598828
Raspberry Pi 3 Model B+
SE +/- 0.00016248, N = 12
0.00807974
Raspberry Pi 3 Model B
SE +/- 0.00015906, N = 3
0.00843041
Raspberry Pi 4 Model B
SE +/- 0.00086391, N = 12
0.00930015
Raspberry Pi 3 Model A+
SE +/- 0.00040707, N = 12
0.00971687
Raspberry Pi 2 Model B
SE +/- 0.00023188, N = 12
0.01409889
0.0032
0.0064
0.0096
0.0128
0.016



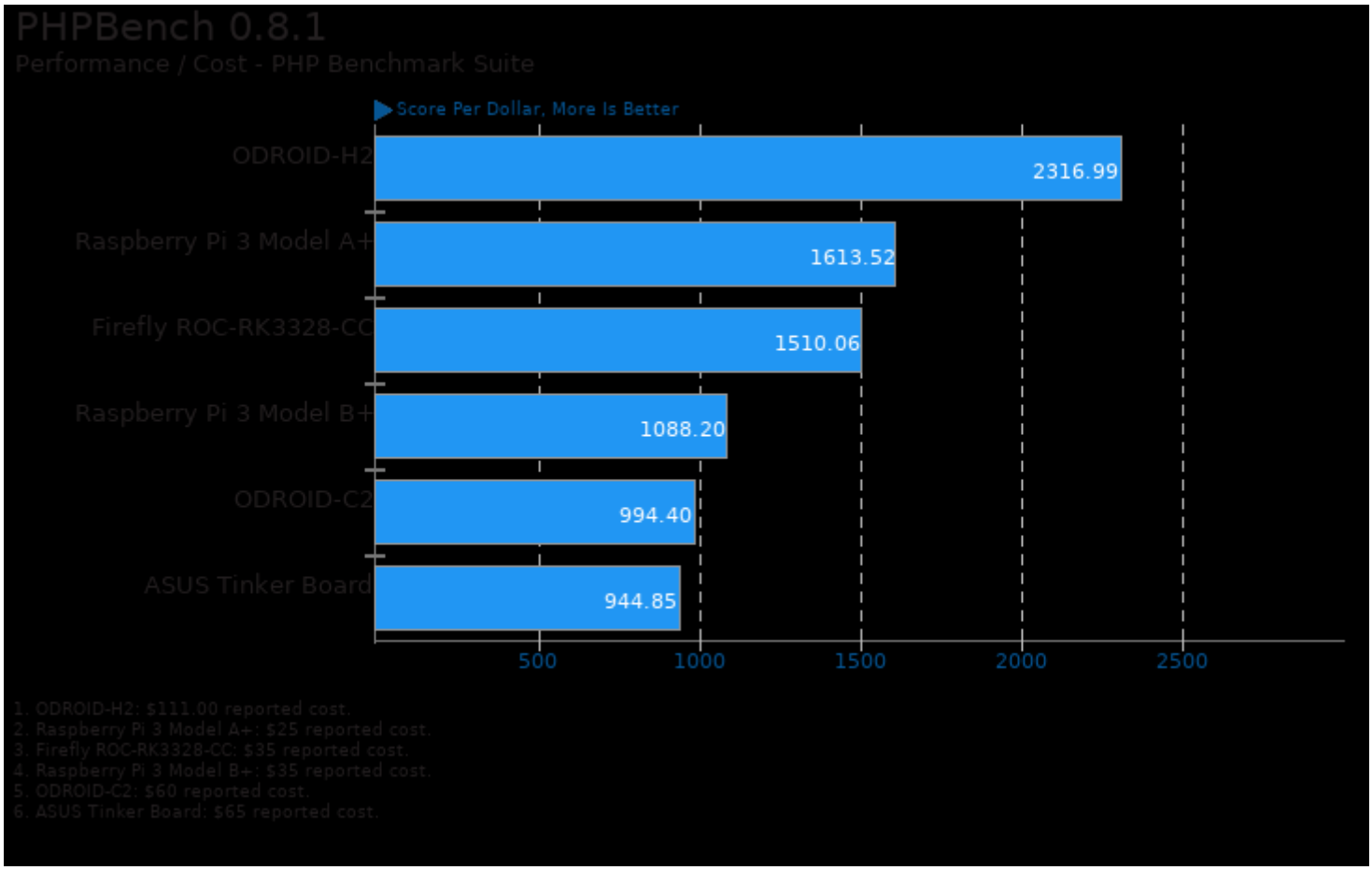

1. Raspberry Pi 3 Model A+: $25 reported cost.
2. ODROID-H2: $111.00 reported cost.
3. Raspberry Pi 3 Model B+: $35 reported cost.
4. ASUS Tinker Board: $65 reported cost.
5. Firefly ROC-RK3328-CC: $35 reported cost.
6. ODROID-C2: $60 reported cost.

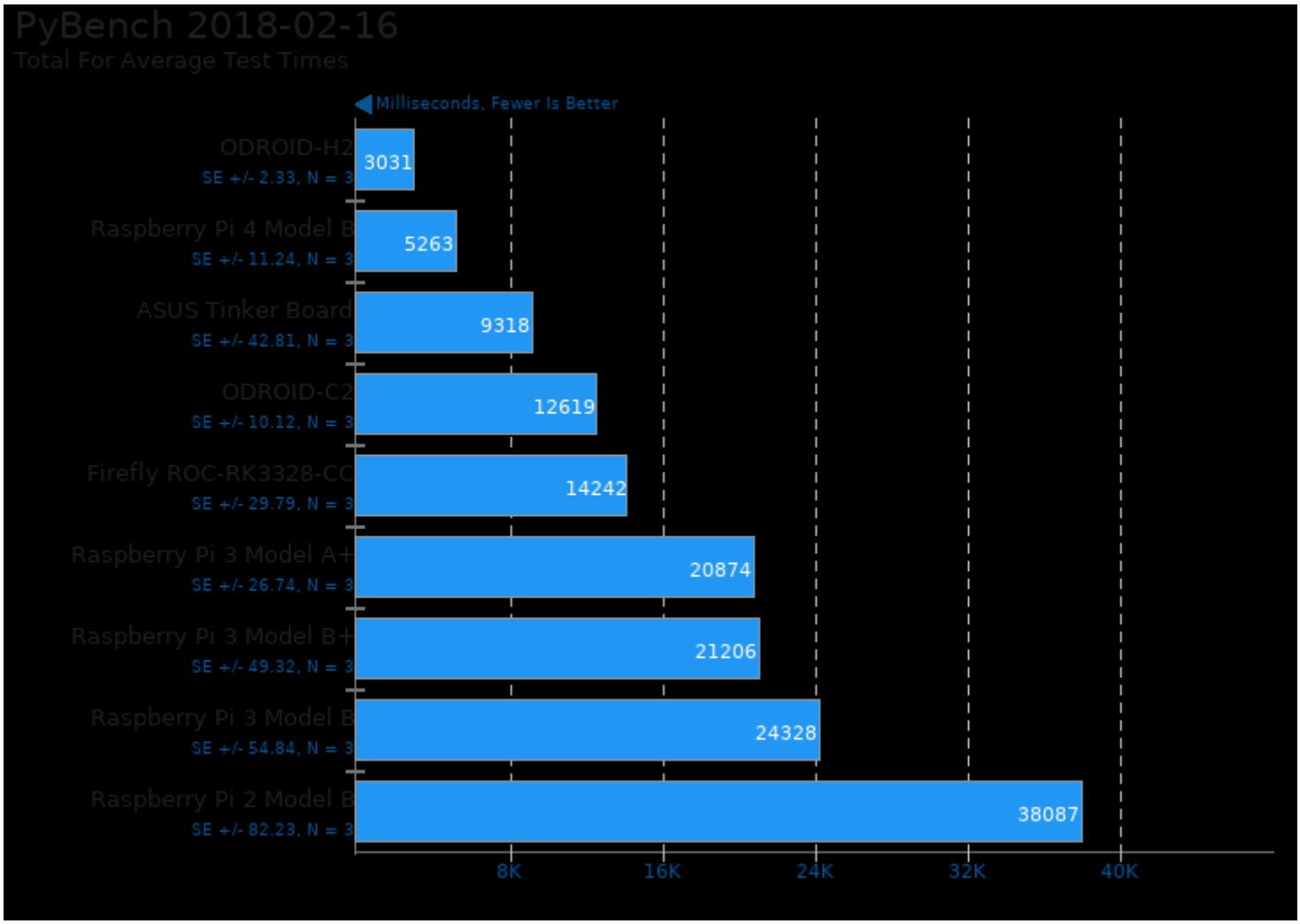


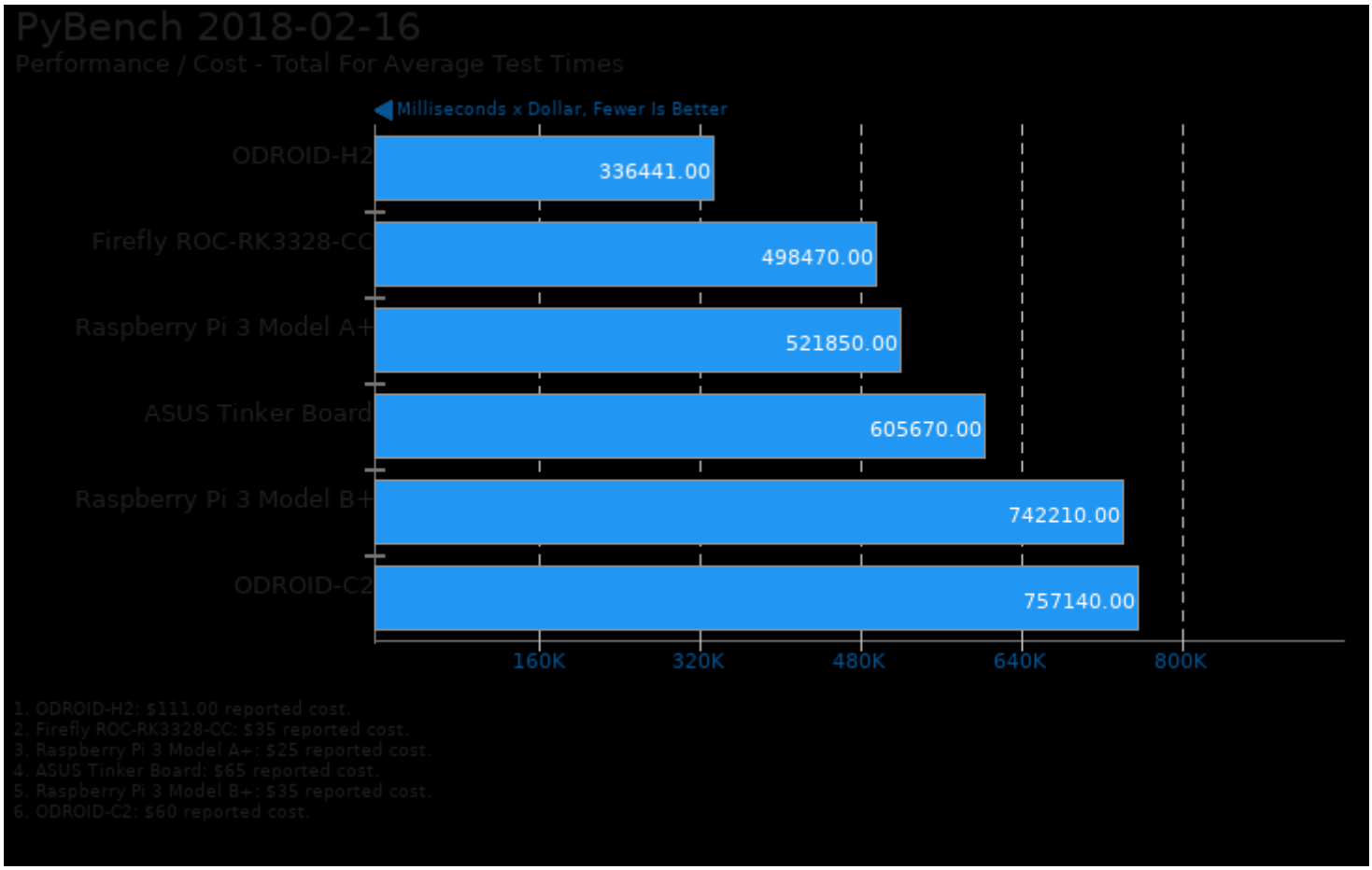

1. Firefly ROC-RK3328-CC: $35 reported cost.
2. Raspberry Pi 3 Model A+: $25 reported cost.
3. Raspberry Pi 3 Model B+: $35 reported cost.
4. ASUS Tinker Board: $65 reported cost.
5. ODROID-C2: $60 reported cost.
6. ODROID-H2: $111.00 reported cost.


PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
ODROID-H2
SE +/- 196.73, N = 3
257186
Raspberry Pi 4 Model B
SE +/- 263.71, N = 3
101484
ASUS Tinker Board
SE +/- 241.65, N = 3
61415
ODROID-C2
SE +/- 81.27, N = 3
59664
Firefly ROC-RK3328-CC
SE +/- 154.37, N = 3
52852
Raspberry Pi 3 Model A+
SE +/- 38.37, N = 3
40338
Raspberry Pi 3 Model B+
SE +/- 154.15, N = 3
38087
Raspberry Pi 3 Model B
SE +/- 37.95, N = 3
34426
Raspberry Pi 2 Model B
SE +/- 55.17, N = 3
20920
60K
120K
180K
240K
300K

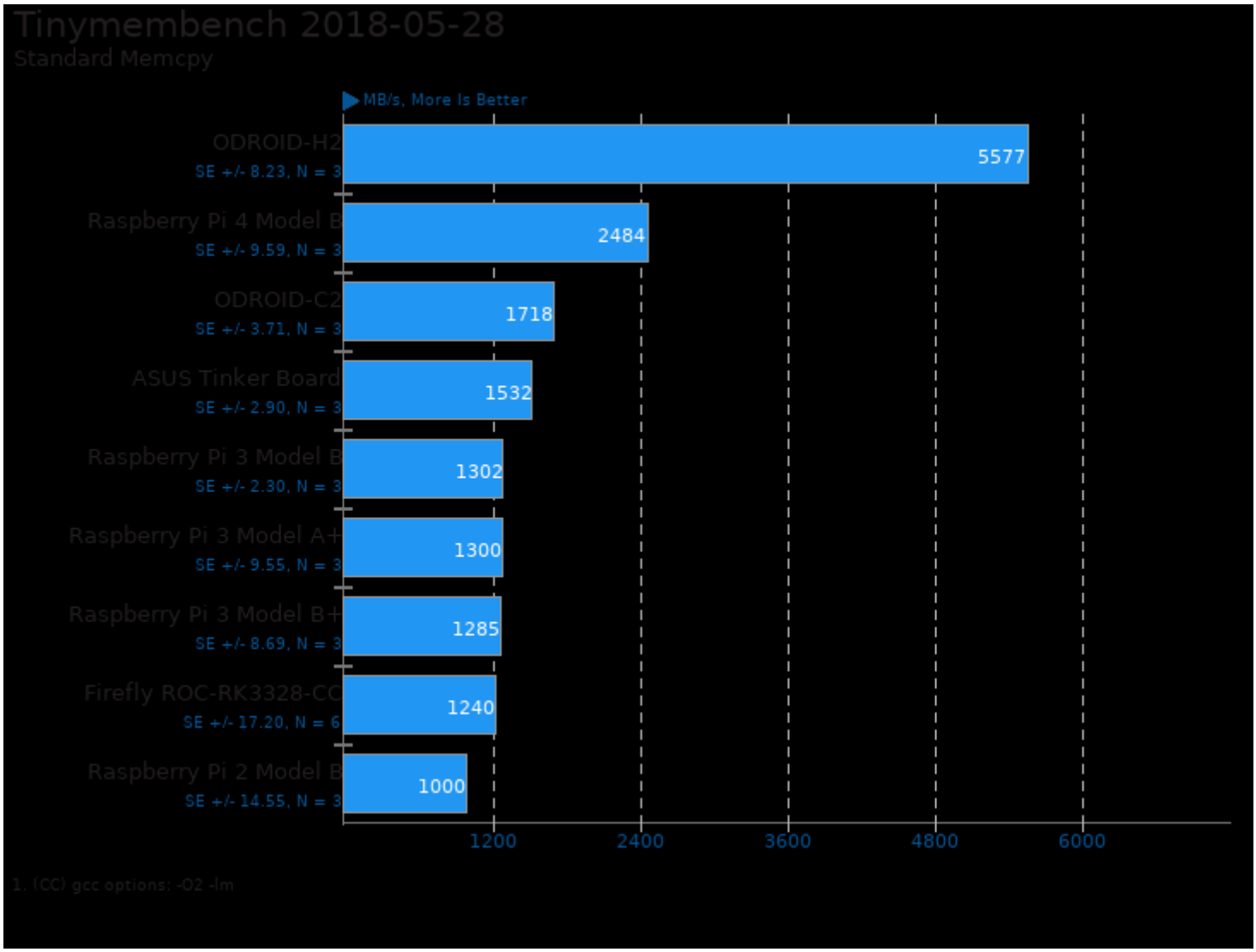
# ODROID-H2 Intel Ubuntu Linux Benchmarks

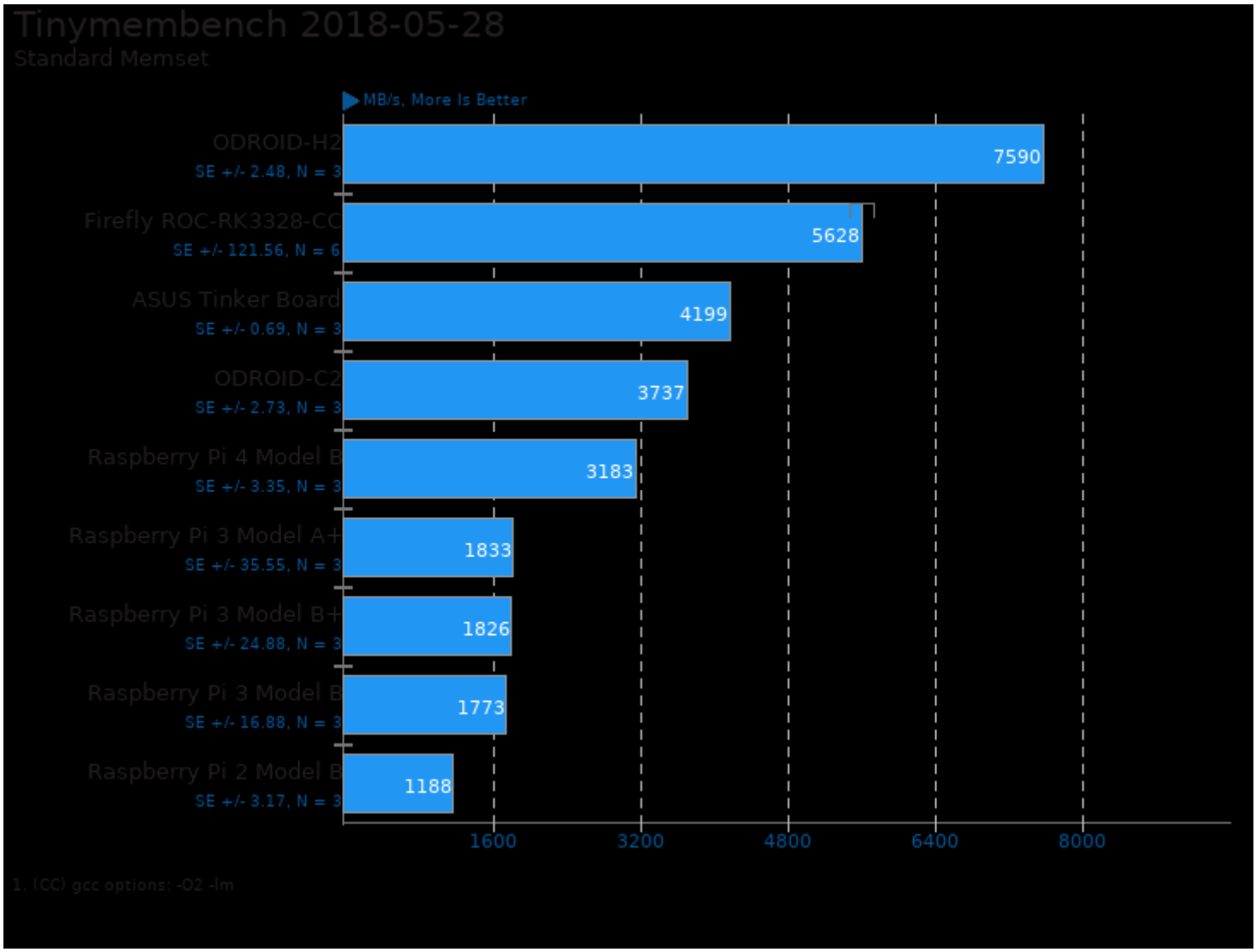


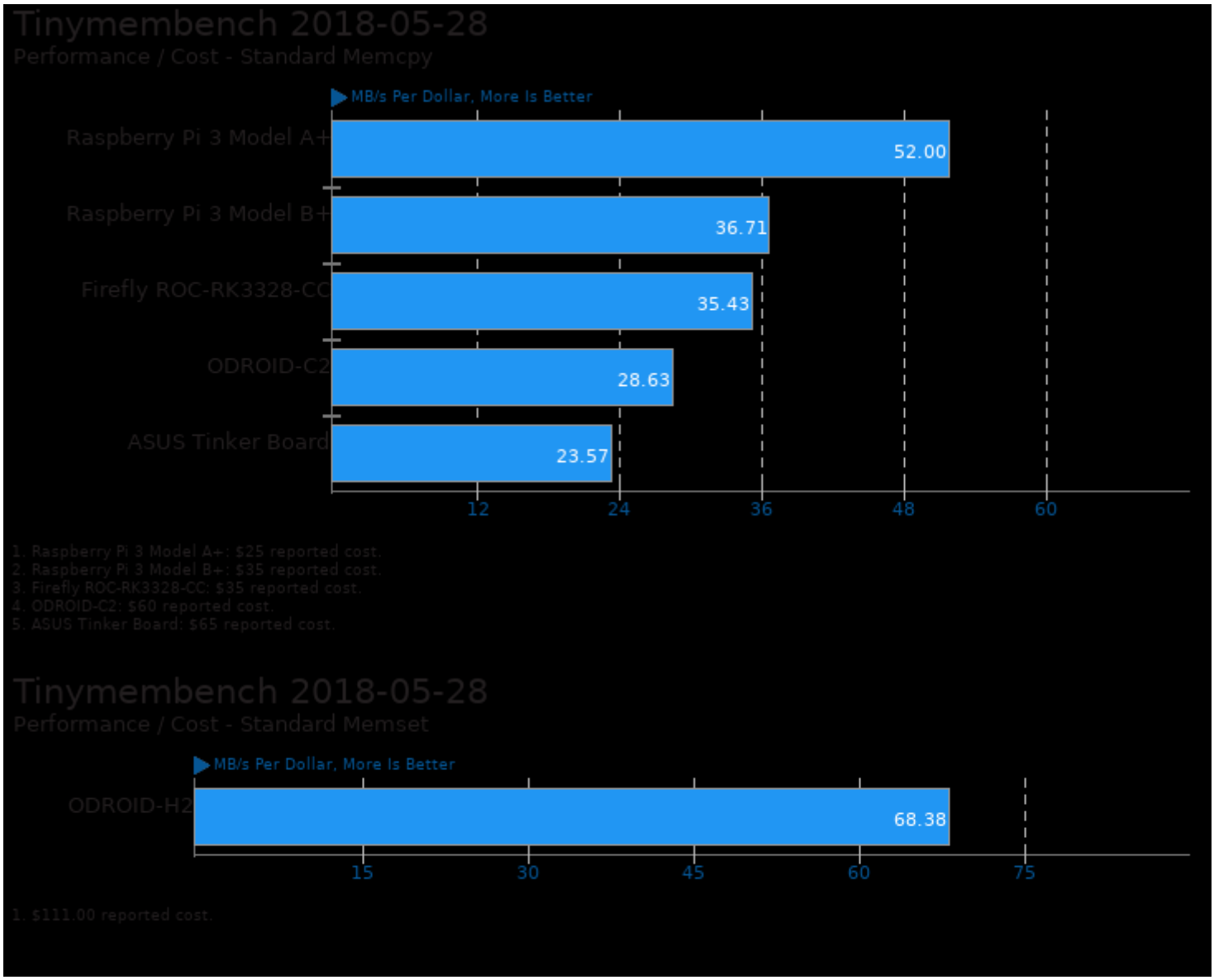

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
ODROID-H2
SE +/- 2.33, N = 3
3031
Raspberry Pi 4 Model B
SE +/- 11.24, N = 3
5263
ASUS Tinker Board
SE +/- 42.81, N = 3
9318
ODROID-C2
SE +/- 10.12, N = 3
12619
Firefly ROC-RK3328-CC
SE +/- 29.79, N = 3
14242
Raspberry Pi 3 Model A+
SE +/- 26.74, N = 3
20874
Raspberry Pi 3 Model B+
SE +/- 49.32, N = 3
21206
Raspberry Pi 3 Model B
SE +/- 54.84, N = 3
24328
Raspberry Pi 2 Model B
SE +/- 82.23, N = 3
38087
8K
16K
24K
32K
40K


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

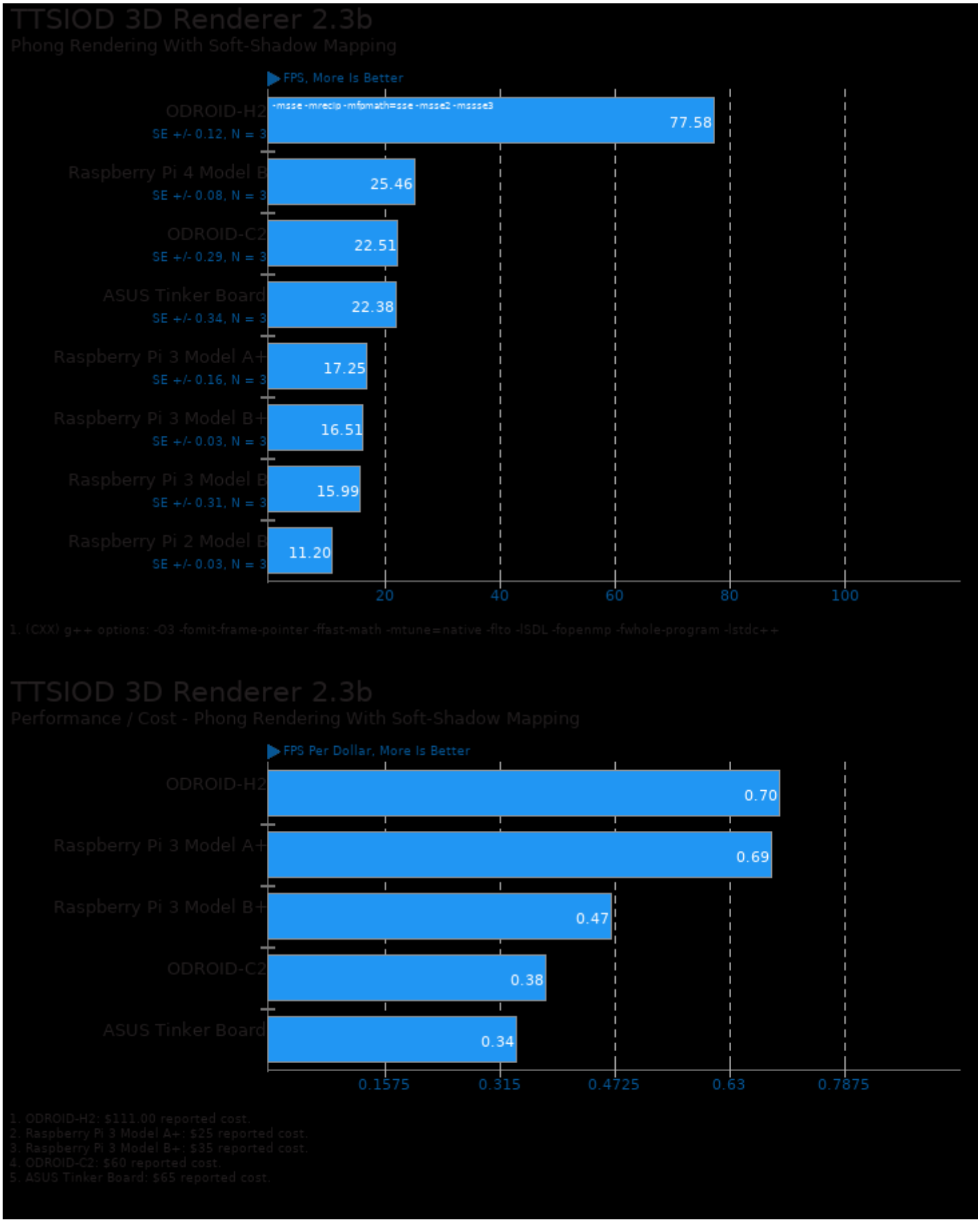
# ODROID-H2 Intel Ubuntu Linux Benchmarks




Tinymembench 2018-05-28
Standard Memset
MB/s, More Is Better
ODROID-H2
SE +/- 2.48, N = 3
7590
Firefly ROC-RK3328-CC
SE +/- 121.56, N = 6
5628
ASUS Tinker Board
SE +/- 0.69, N = 3
4199
ODROID-C2
SE +/- 2.73, N = 3
3737
Raspberry Pi 4 Model B
SE +/- 3.35, N = 3
3183
Raspberry Pi 3 Model A+
SE +/- 35.55, N = 3
1833
Raspberry Pi 3 Model B+
SE +/- 24.88, N = 3
1826
Raspberry Pi 3 Model B
SE +/- 16.88, N = 3
1773
Raspberry Pi 2 Model B
SE +/- 3.17, N = 3
1188
1600
3200
4800
6400
8000
1. (CC) gcc options: -O2 -lm

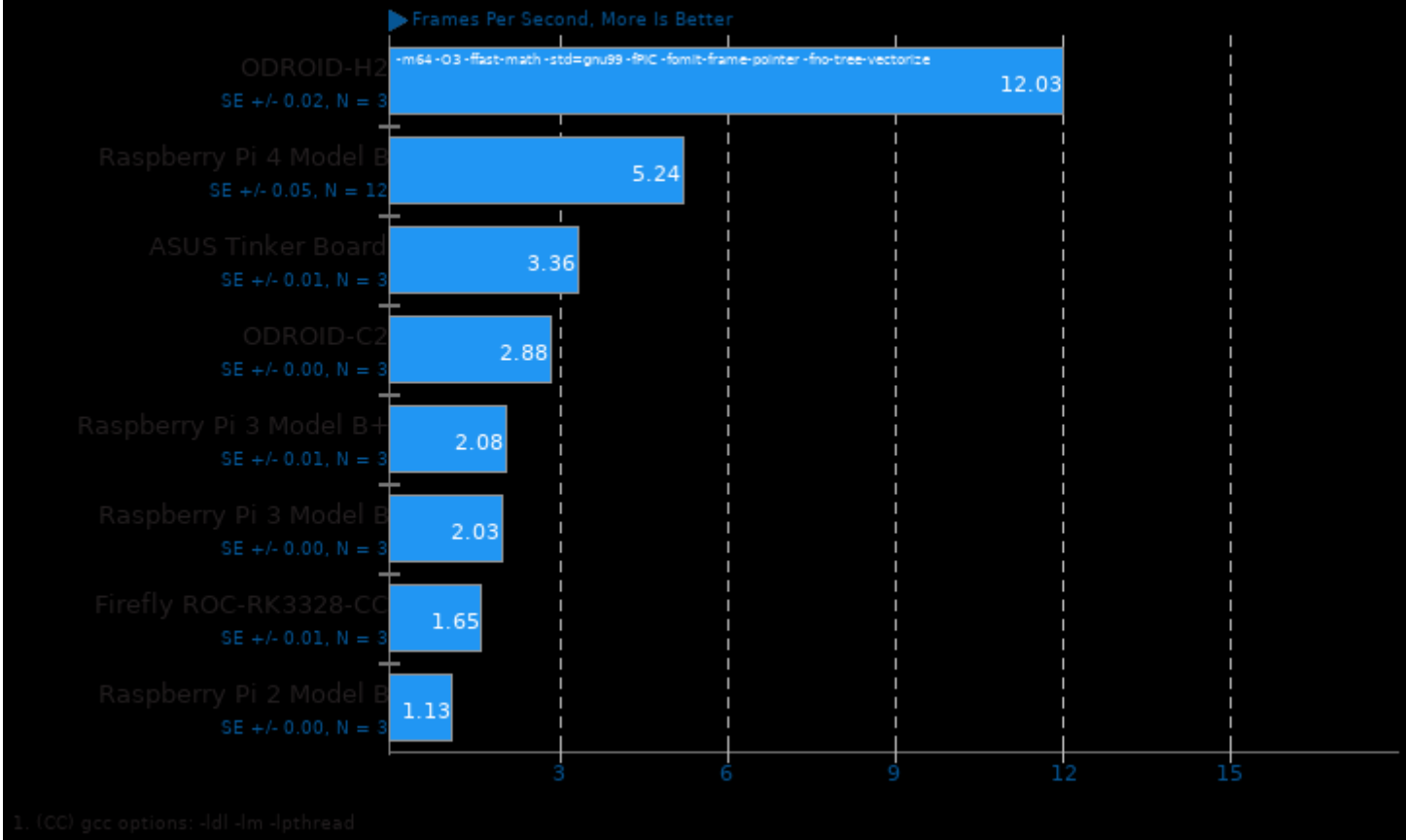

Tinymembench 2018-05-28
Performance / Cost - Standard Memcpy
MB/s Per Dollar, More Is Better
Raspberry Pi 3 Model A+
Raspberry Pi 3 Model B+
Firefly ROC-RK3328-CC
ODROID-C2
ASUS Tinker Board
52.00
36.71
35.43
28.63
23.57
12
24
36
48
60
1. Raspberry Pi 3 Model A+: $25 reported cost.
2. Raspberry Pi 3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

# ODROID-H2 Intel Ubuntu Linux Benchmarks



## x264 2018-09-25

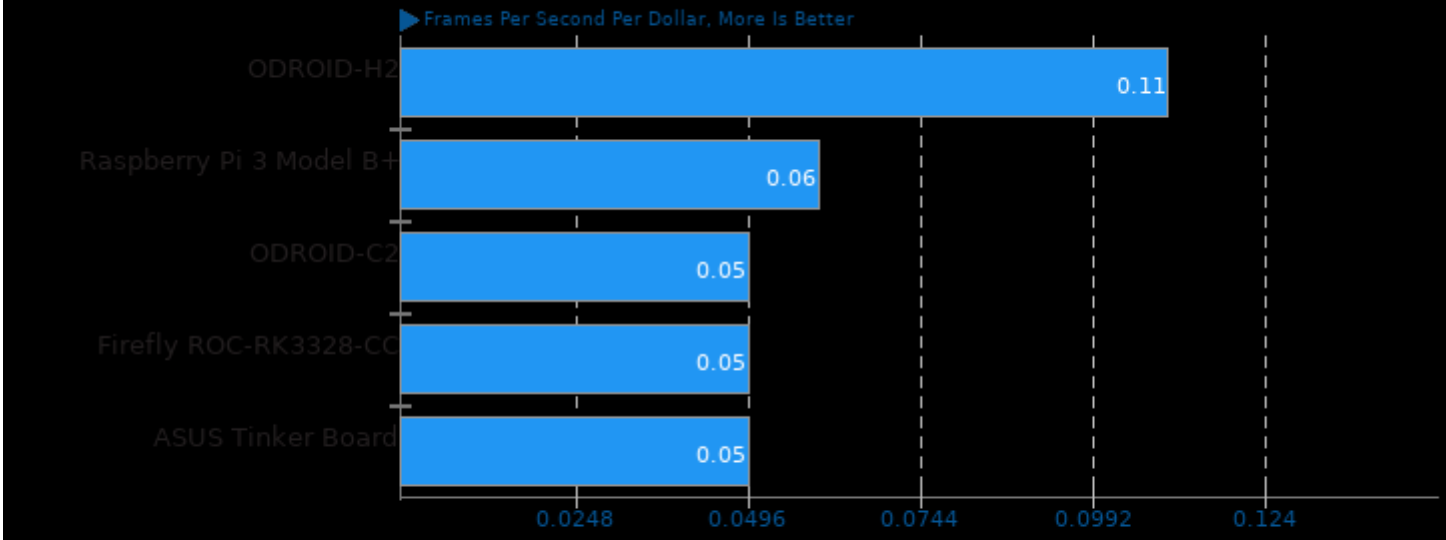
H.264 Video Encoding




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

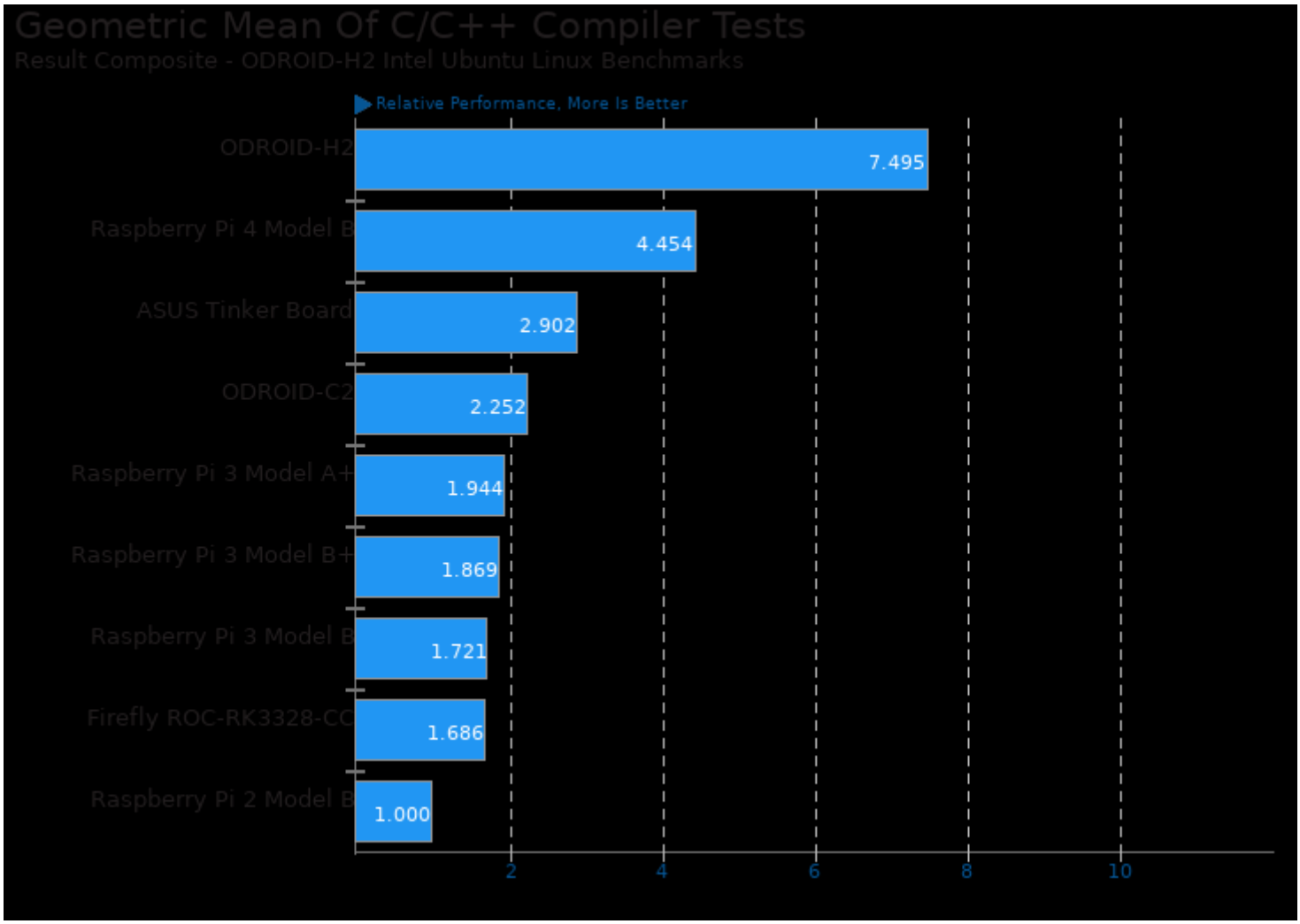
## x264 2018-09-25

Performance / Cost - H.264 Video Encoding

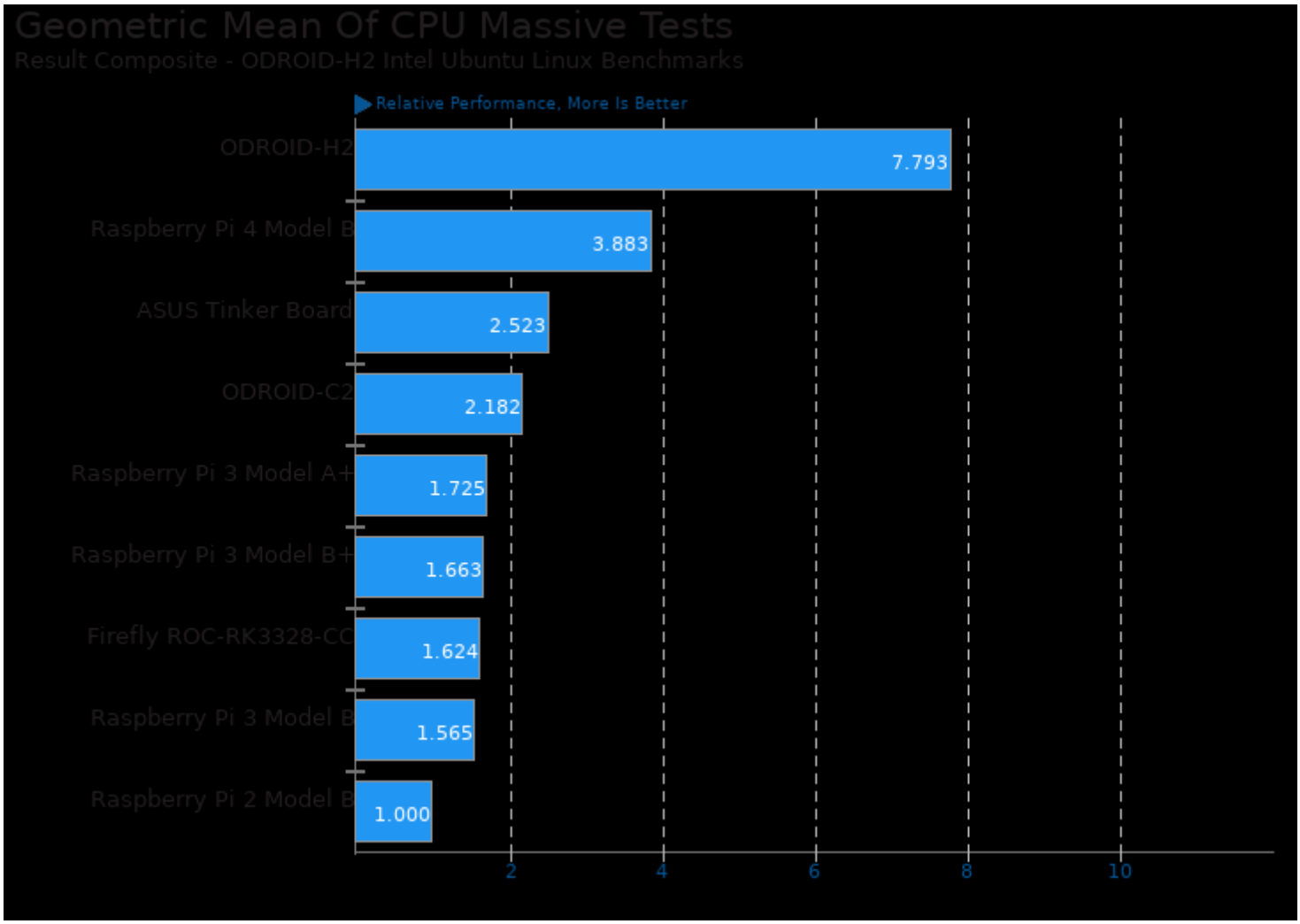



1. ODROID-H2: $111.00 reported cost.
2. Raspberry Pi 3 Model B+: $35 reported cost.
3. ODROID-C2: $60 reported cost.
4. Firefly ROC-RK3328-CC: $35 reported cost.
5. ASUS Tinker Board: $65 reported cost.

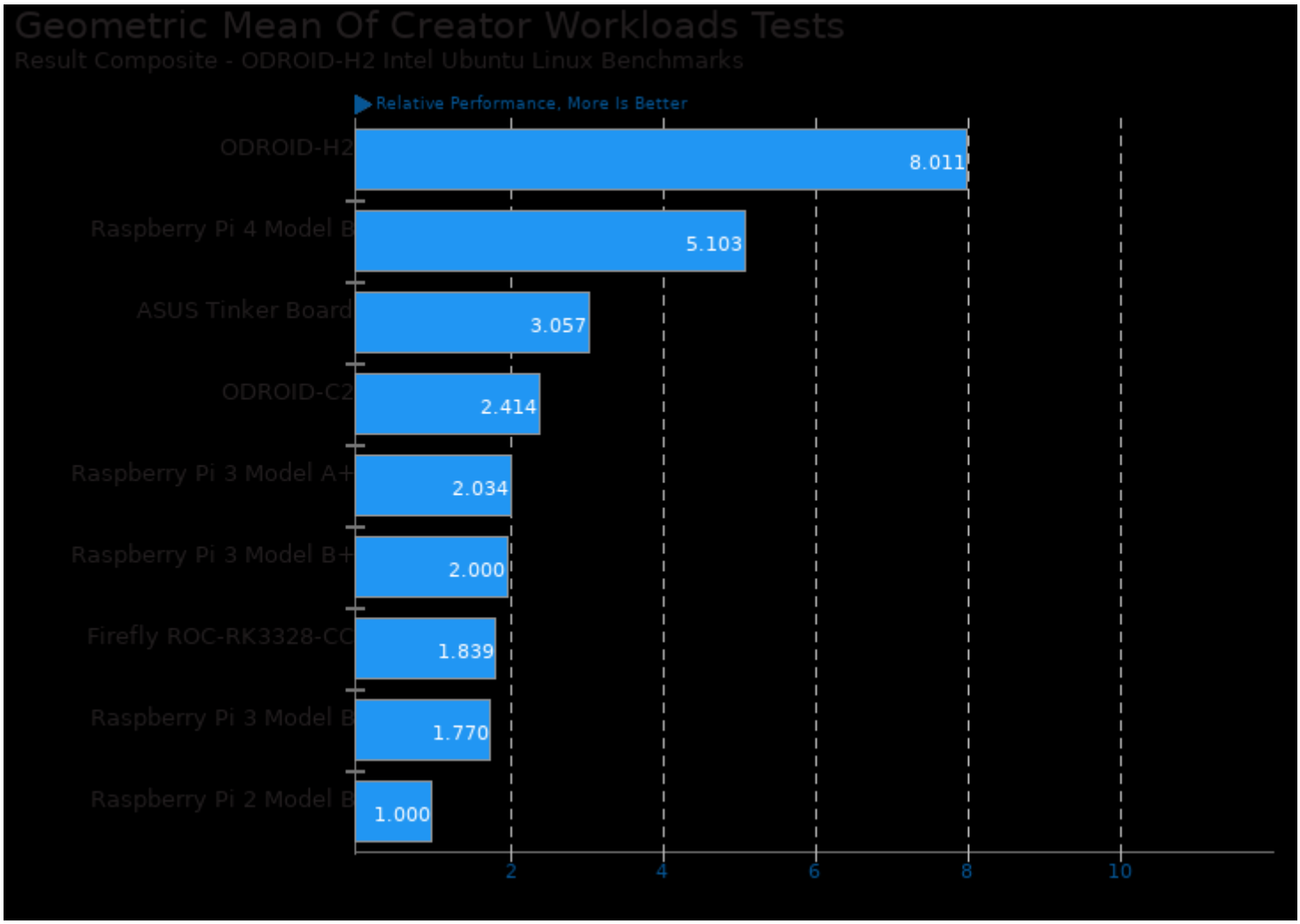
These geometric means are based upon test groupings / test suites for this result file.



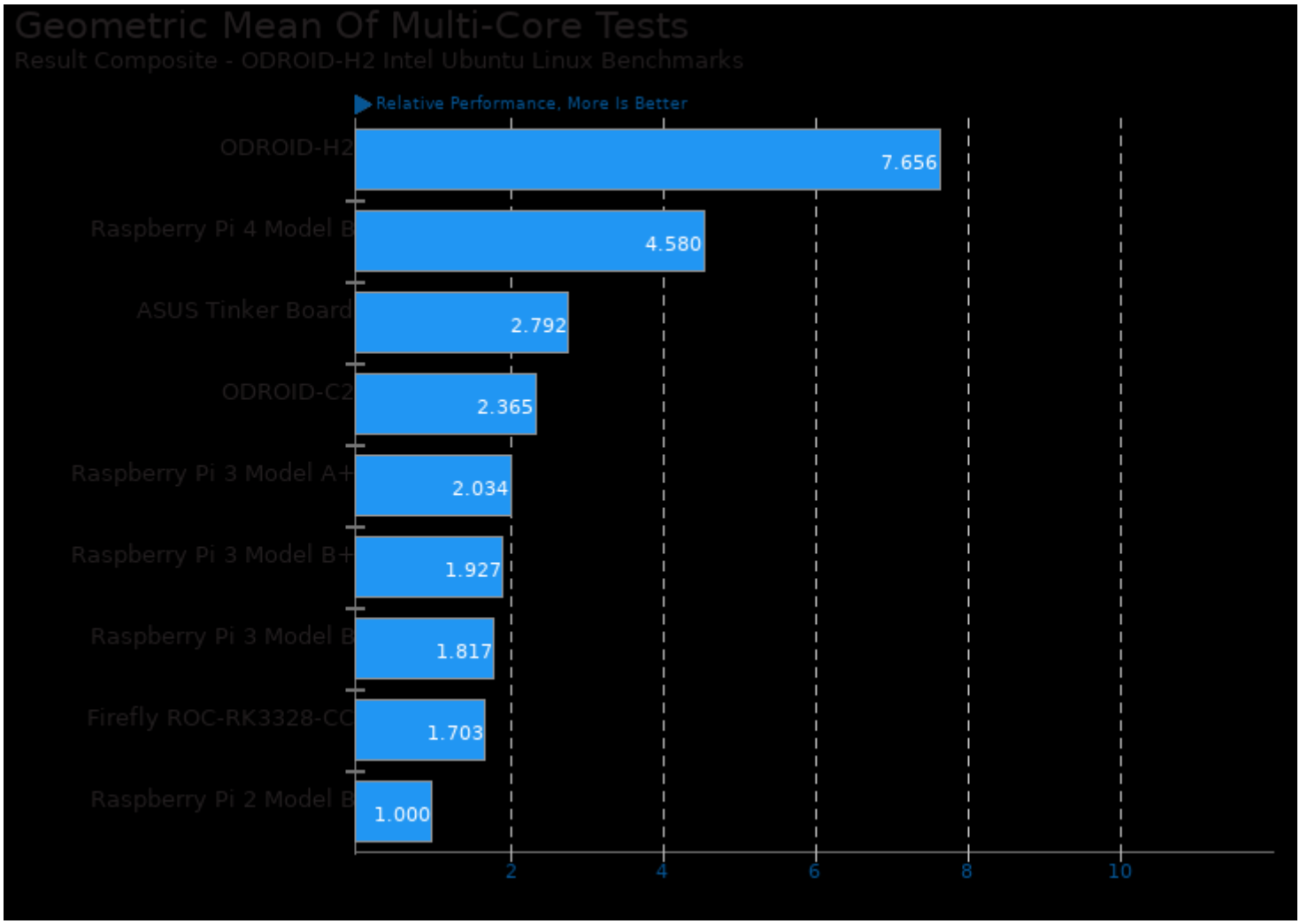

Geometric mean based upon tests: pts/aobench, pts/c-ray, pts/compress-7zip, pts/encode-mp3 and pts/x264



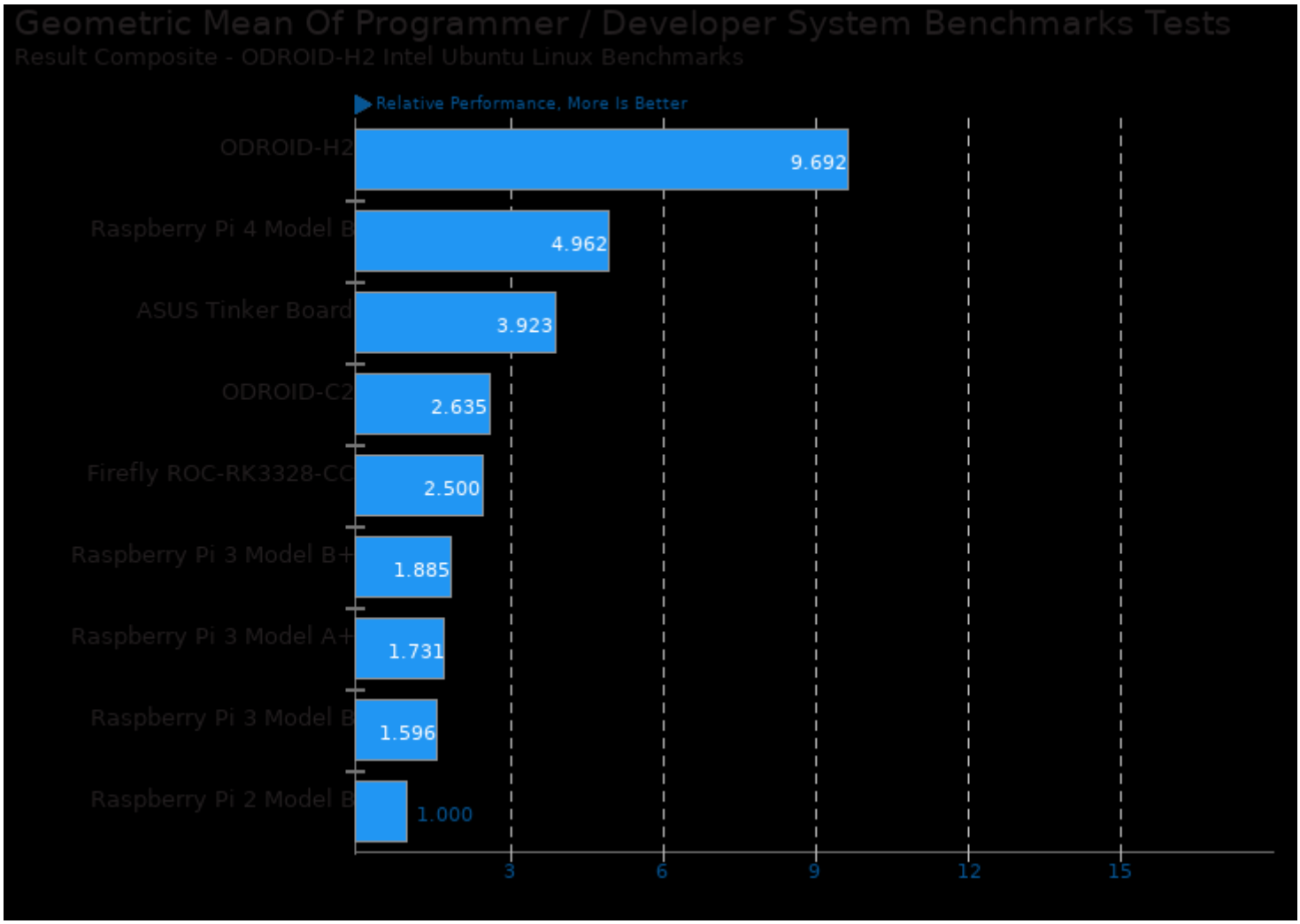

Geometric mean based upon tests: pts/c-ray, pts/compress-7zip, pts/x264, pts/encode-mp3, pts/phpbench, pts/tinymembench and pts/ttsiod-renderer



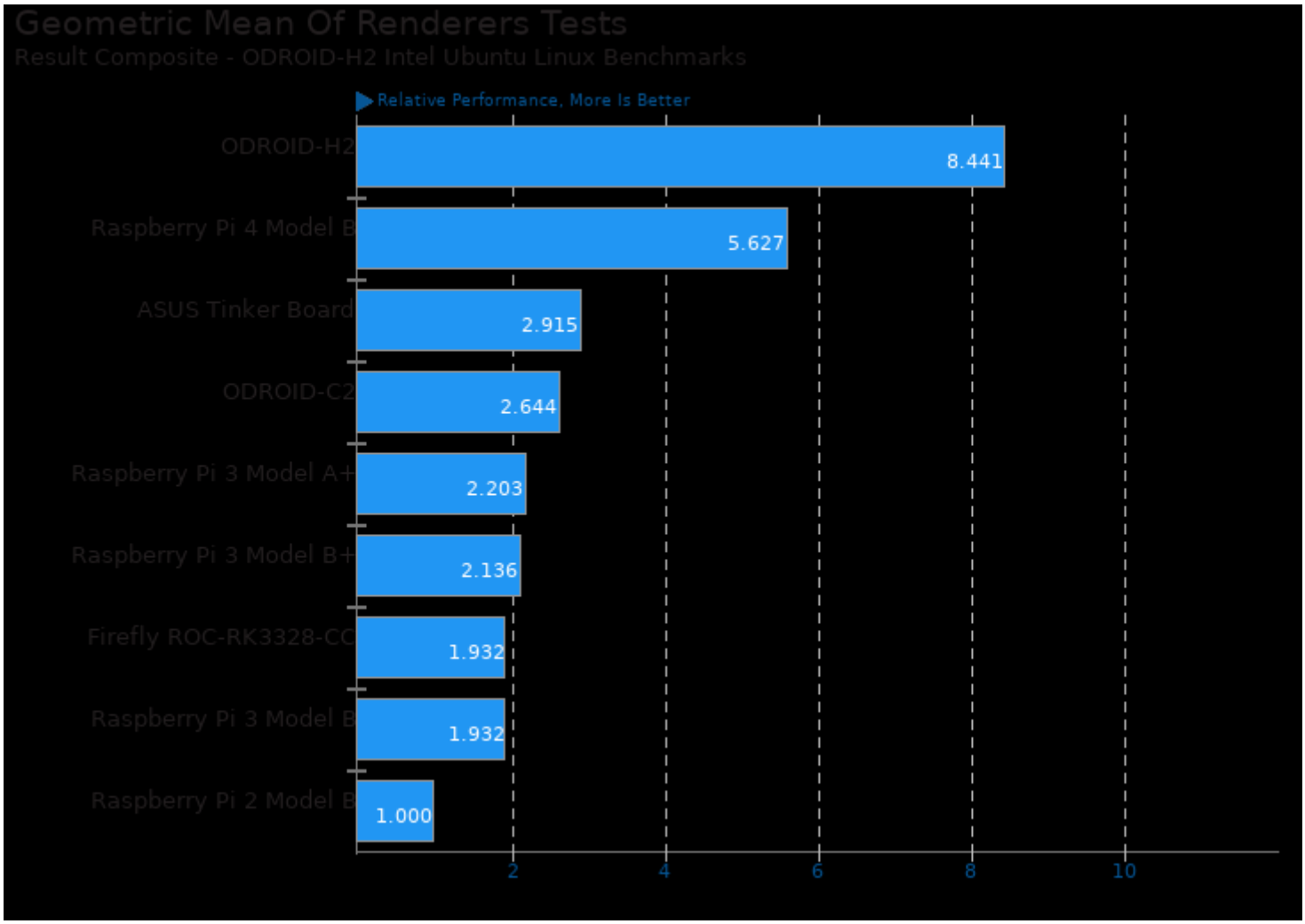

Geometric mean based upon tests: pts/c-ray, pts/aobench, pts/ttsiod-renderer, pts/x264 and pts/encode-mp3



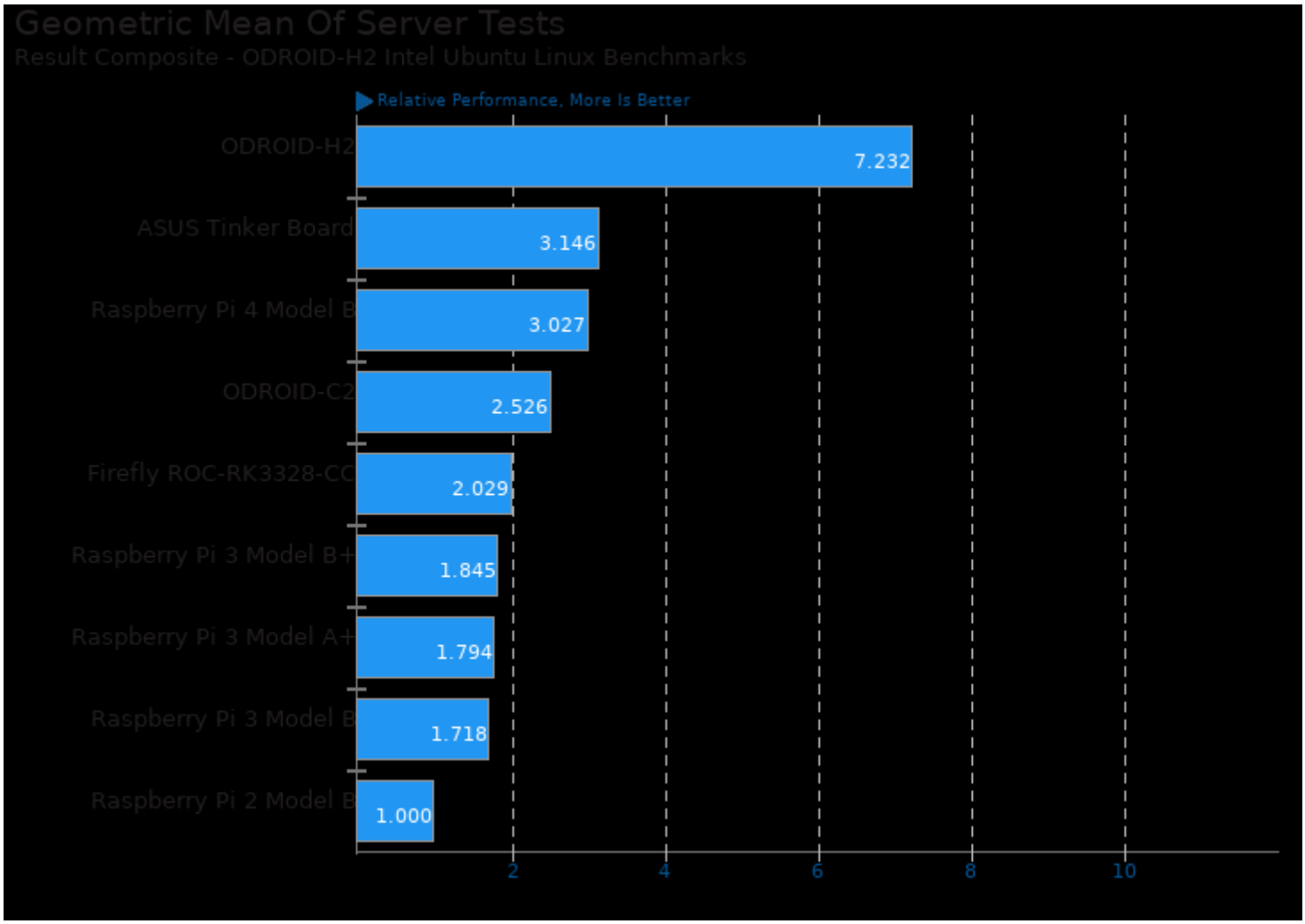

Geometric mean based upon tests: pts/c-ray, pts/x264, pts/compress-7zip, pts/aobench and pts/ttsiod-renderer



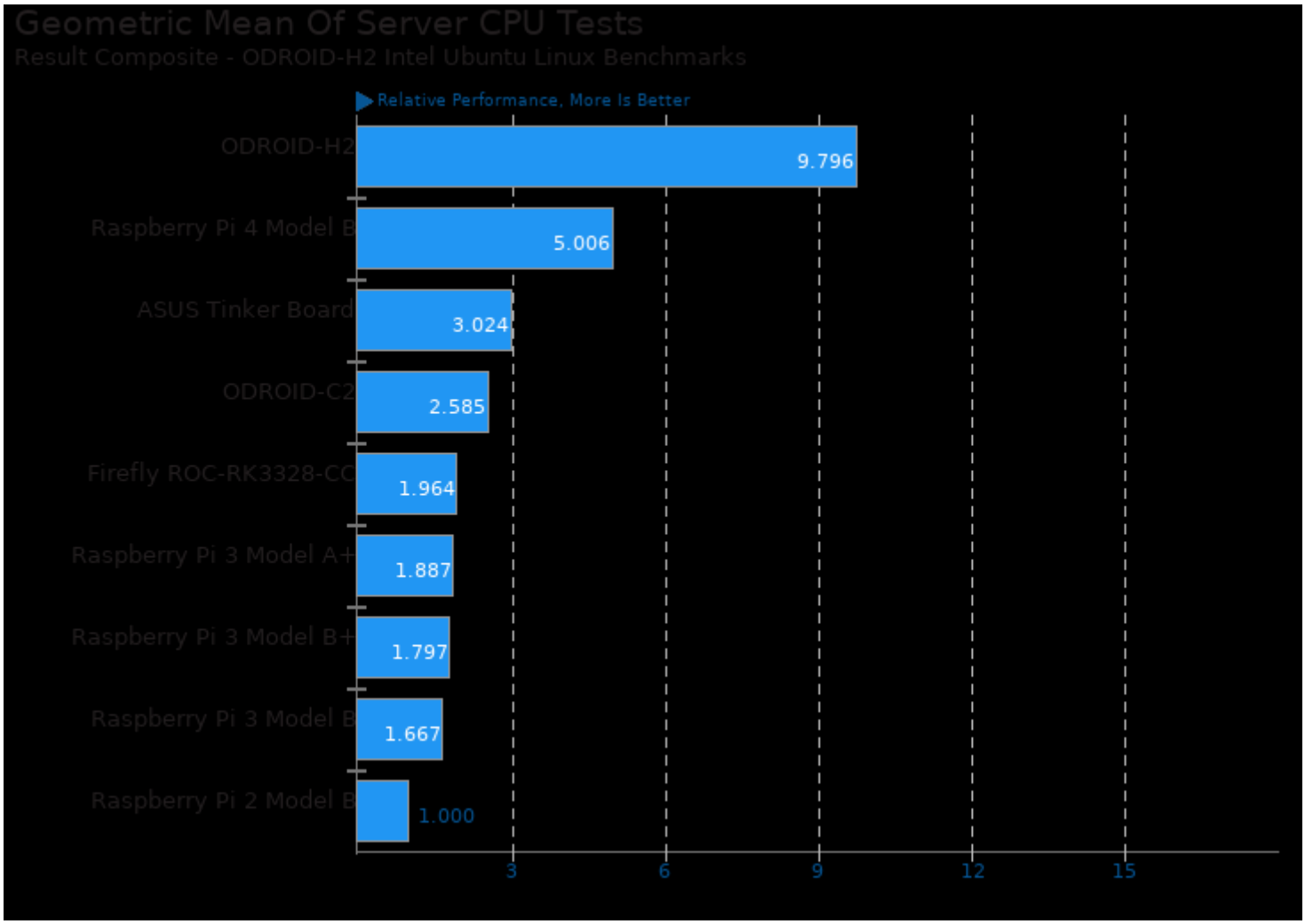

Geometric mean based upon tests: pts/git and pts/pybench




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

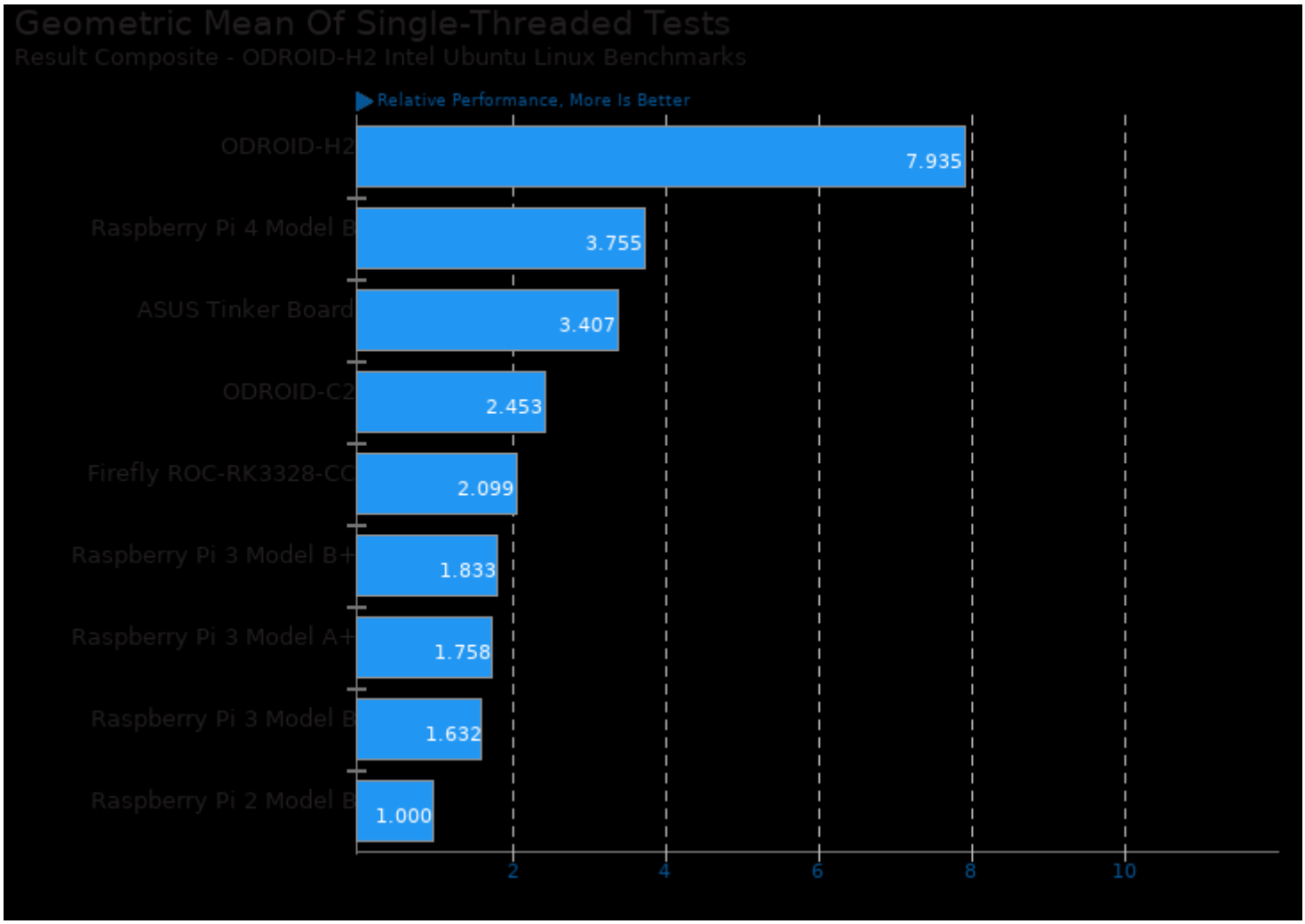



Geometric mean based upon tests: pts/phpbench and pts/perl-benchmark




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 Friday, 29 March 2024 10:22.*