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# Raspberry Pi vs Orange Pi vs Banana Pi 2016-03 Showdown by LoveRPi

Ubuntu 16.04.2 with Linux 4.10 on NanoPi NEO 2

**Automated Executive Summary**

*MeUbuntu 14.04.3 had the most wins, coming in first place for 57% of the tests.*

# Test Systems:

## Orange Pi One on Armbian

Processor: ARMv7 rev 5 @ 1.20GHz (4 Cores), Motherboard: sun8i, Memory: 494MB, Disk: 32GB 00000

OS: Debian 8.3, Kernel: 3.4.110-sun8i (armv7l), Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1280x1440

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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## Orange Pi PC on Armbian

Processor: ARMv7 rev 5 @ 1.30GHz (4 Cores), Motherboard: sun8i, Memory: 1024MB, Disk: 32GB 00000

OS: Debian 8.3, Kernel: 3.4.110-sun8i (armv7l), Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1280x1440

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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## Orange Pi Plus on Armbian

Processor: ARMv7 rev 5 @ 1.30GHz (4 Cores), Motherboard: sun8i, Memory: 1024MB, Disk: 32GB 00000 + 8GB M8G1GC

OS: Debian 8.3, Kernel: 3.4.110-sun8i (armv7l), Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1280x1440

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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## Raspberry Pi 2 on Raspbian

Processor: ARMv7 rev 5 @ 0.90GHz (4 Cores), Motherboard: BCM2709 Raspberry Pi 2 Model B Rev 1.1, Memory: 925MB, Disk: 8GB SD

OS: Raspbian 8.0, Kernel: 4.1.13-v7+ (armv7l), Desktop: LXDE 0.7.2, Display Server: X Server 1.16.4, Compiler: GCC 4.9.2, 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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv6 --with-float=hard --with-fpu=vfp -v
Processor Notes: Scaling Governor: BCM2835 Freq ondemand

## Raspberry Pi 3 on Raspbian

Processor: ARMv7 rev 4 @ 1.20GHz (4 Cores), Motherboard: BCM2709 Raspberry Pi 3 Model B Rev 1.2, Memory: 925MB, Disk: 63GB 00000

OS: Raspbian GNU/Linux 8, Kernel: 4.1.20-v7+ (armv7l), Compiler: GCC 4.9.2, 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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv6 --with-float=hard --with-fpu=vfp -v
Processor Notes: Scaling Governor: BCM2835 Freq ondemand

## Banana Pi M2 by LoveRPi

Processor: ARMv7 rev 3 @ 1.01GHz (4 Cores), Motherboard: Allwinner sun6i (A31) Family Sinovoip BPI-M2, Memory: 1024MB, Disk: 129GB 00000

OS: Ubuntu 14.04, Kernel: 4.4.1-sunxi (armv7l), Compiler: GCC 4.8.4, File-System: ext4

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libmudflap --disable-libquadmath --disable-sjlj-exceptions --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand

## Banana Pi M3 by LoveRPi

Processor: ARMv7 rev 5 @ 1.80GHz (8 Cores), Motherboard: sun8i, Memory: 2048MB, Disk: 8GB M8G1GC + 129GB TO

OS: Ubuntu 15.10, Kernel: 3.4.39-BPI-M3-aufs (armv7l), Compiler: GCC 5.2.1 20151010, File-System: aufs, Screen Resolution: 1920x2160

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libquadmath --disable-sjlj-exceptions --disable-werror --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-multilib --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=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 -v
Processor Notes: Scaling Governor: sunxi-iks interactive

## Banana Pi M2+ SinoVoip

Processor: ARMv7 rev 5 @ 1.20GHz (1 Core), Motherboard: sun8i, Memory: 745MB, Disk: 64GB 00000 + 8GB 8WMB3R

OS: Debian 8.4, Kernel: 3.4.111-sun8i (armv7l), Desktop: Xfce, Display Driver: modesetting 0.9.0, Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1280x720

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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## Banana Pi M2+ on Armbian

Processor: ARMv7 rev 5 @ 1.20GHz (4 Cores), Motherboard: sun8i, Memory: 745MB, Disk: 64GB 00000 + 8GB 8WMB3R

OS: Debian 8.4, Kernel: 3.4.111-sun8i (armv7l), Desktop: Xfce, Display Driver: modesetting 0.9.0, Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1920x1080

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,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## Banana Pi M2+ Raspbian 8.0

Processor: ARMv7 rev 5 @ 1.20GHz (3 Cores), Motherboard: sun8i, Memory: 1024MB, Disk: 8GB SU08G + 8GB 8WMB3R

OS: Raspbian 8.0, Kernel: 3.4.39-02-lobo (armv7l), Desktop: LXDE, Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1280x720

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,c++,java,go,d,fortran,objc,obj-c++

--enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv6 --with-float=hard --with-fpu=vfp -v
Processor Notes: Scaling Governor: cpufreq-sunxi ondemand

## MiQi on Lubuntu 14.04

Processor: ARMv7 rev 1 @ 1.80GHz (4 Cores), Motherboard: Rockchip RK3288 (Flattened Device Tree), Memory: 2048MB, Disk: 31GB BIWIN

OS: Ubuntu 14.04, Kernel: 3.10.0 (armv7l), Desktop: LXDE, Compiler: GCC 4.8.4, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libmudflap --disable-libquadmath --disable-sjlj-exceptions --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: rockchip interactive

## DragonBoard 410c on Debian RPB 16.03

Processor: Unknown @ 1.21GHz (4 Cores), Memory: 833MB, Disk: 8GB DS2008, Monitor: TX-NR636

OS: Debian 8.3, Kernel: 4.4.0-104-arm64 (aarch64), Desktop: LXDE, Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-libsanitizer --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,c++,java,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 --target=aarch64-linux-gnu --with-arch-directory=arm64 -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand

## MeUbuntu 14.04.3

Processor: Intel Atom Z3735F @ 1.83GHz (4 Cores), Motherboard: Mini PC v2.80, Chipset: Intel ValleyView SSA-CUnit, Memory: 2048MB, Disk: 31GB NCard, Graphics: Intel ValleyView Gen7 (646MHz), Monitor: TX-NR636

OS: Ubuntu 14.04, Kernel: 3.16.0-45-generic (x86_64), Desktop: Unity 7.2.6, Display Driver: intel 2.99.914, Compiler: GCC 4.8.4, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-libmudflap --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Processor Notes: Scaling Governor: intel_pstate powersave

## NanoPi NEO 512MB No Heatsink

Processor: ARMv7 rev 5 @ 0.82GHz (4 Cores), Motherboard: sun8i, Memory: 495MB, Disk: 8GB SL08G

OS: Ubuntu 15.10, Kernel: 3.4.39-h3 (armv7l), Compiler: GCC 5.2.1 20151010, File-System: ext4, Screen Resolution: 1280x1440

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libquadmath --disable-sjlj-exceptions --disable-werror --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-multilib --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=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 -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## NanoPi NEO 512MB Heatsink

## NanoPi NEO 512MB Heatsink 2

## NanoPi NEO 512MB Heatsink2

Processor: ARMv7 rev 5 @ 1.20GHz (4 Cores), Motherboard: sun8i, Memory: 495MB, Disk: 8GB SL08G

OS: Ubuntu 15.10, Kernel: 3.4.39-h3 (armv7l), Compiler: GCC 5.2.1 20151010, File-System: ext4, Screen Resolution: 1280x1440

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libquadmath --disable-sjlj-exceptions --disable-werror --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-multilib --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=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 -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## NanoPi NEO 2 FA Ubuntu 16.04.2

Processor: AArch64 rev 4 @ 0.82GHz (4 Cores), Motherboard: sun50iw2, Memory: 468MB, Disk: 8GB SL08G

OS: Ubuntu 16.04, Kernel: 3.10.65 (aarch64), Compiler: GCC 5.4.0 20160609, File-System: ext4, Screen Resolution: 1280x1440

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-werror --enable-checking=release --enable-clocale=gnu --enable-fix-cortex-a53-843419 --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-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --target=aarch64-linux-gnu --with-arch-directory=aarch64 --with-default-libstdcxx-abi=new -v
Processor Notes: Scaling Governor: cpufreq-sunxi interactive

## NanoPi NEO 2 Armbian Ubuntu 16.04.2

Processor: AArch64 rev 4 (4 Cores), Motherboard: Xunlong Orange Pi PC 2, Memory: 483MB, Disk: 8GB SL08G

OS: Ubuntu 16.04, Kernel: 4.10.0-sun50iw2 (aarch64), Compiler: GCC 5.4.0 20160609, File-System: ext4

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-werror --enable-checking=release --enable-clocale=gnu --enable-fix-cortex-a53-843419 --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-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --target=aarch64-linux-gnu --with-arch-directory=aarch64 --with-default-libstdcxx-abi=new -v

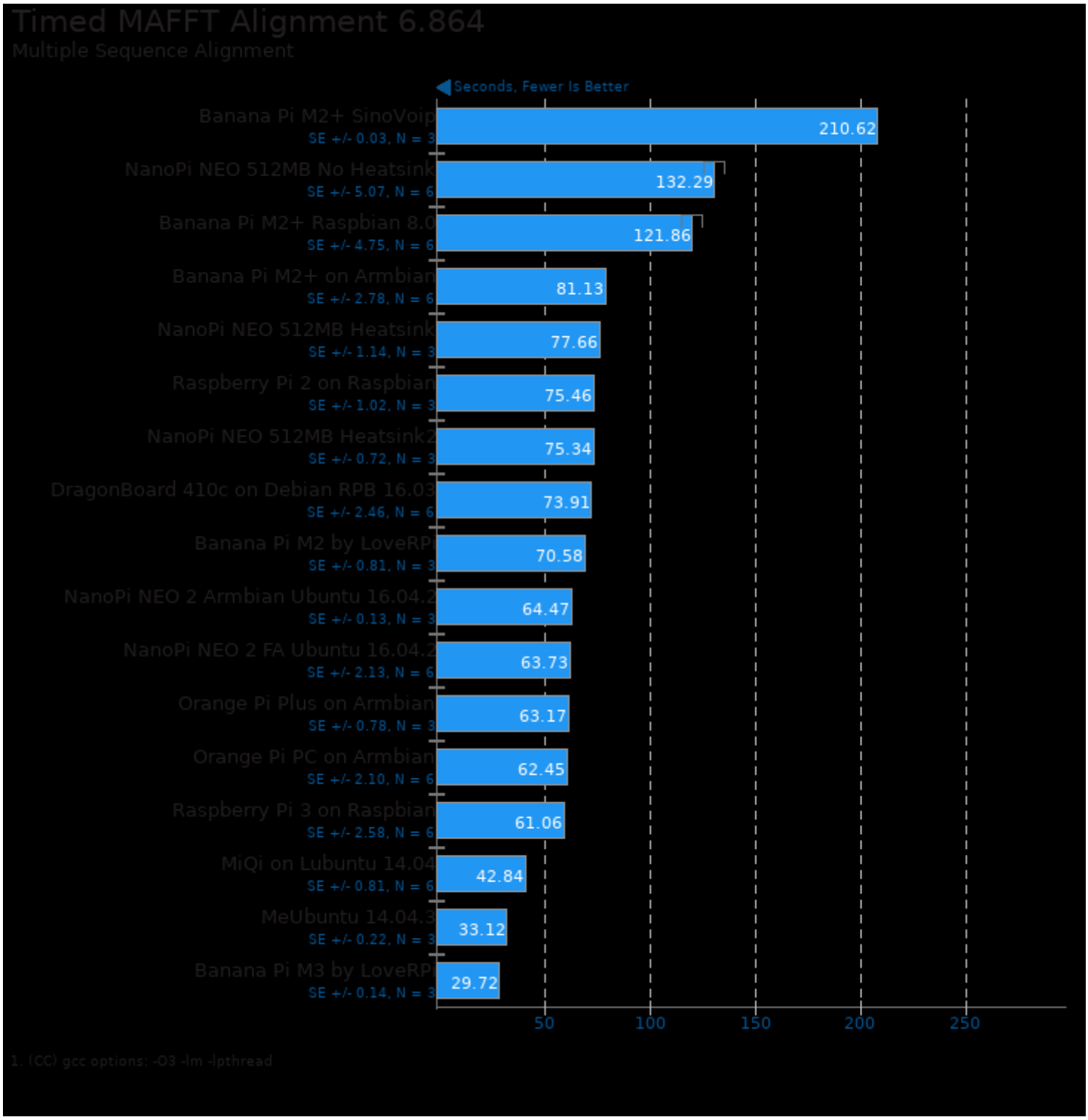
# Raspberry Pi vs Orange Pi vs Banana Pi 2016-03 Showdown by LoveRPi

| | Orange Pi One on Armbian | Orange Pi PC on Armbian | Orange Pi Plus on Armbian | Raspberry Pi 2 on Raspbian | Raspberry Pi 3 on Raspbian | Banana Pi M2 by LoveRPi | Banana Pi M3 by LoveRPi | Banana Pi M2+ Sino Voip | Banana Pi M2+ on Armbian | Banana Pi M2+ Raspbian 8.0 | MiQi on Lubuntu 14.04 | Dragon Board 410c on Debian RPB 16.0 | MeUbuntu 14.04.3 | NanoPi NEO 512MB No Heatsink | NanoPi NEO 512MB Heatsink | NanoPi NEO 512MB Heatsink 2 | NanoPi NEO 512MB Heatsink 2 | NanoPi NEO2 FA Ubuntu 16.04.2 | NanoPi NEO2 Armbian Ubuntu 16.04.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Timed MAFFT Alignment - M.S.A (sec)** | | 62.45 | 63.17 | 75.46 | 61.06 | 70.58 | **29.72** | **210.62** | 81.13 | 121.86 | 42.84 | 73.91 | 33.12 | 132.29 | 77.66 | | 75.34 | 63.73 | 64.47 |
| **Normalized** | | 47.59% | 47.05% | 39.39% | 48.67% | 42.11% | 100% | 14.11% | 36.63% | 24.39% | 69.37% | 40.21% | 89.73% | 22.47% | 38.27% | | 39.45% | 46.63% | 46.1% |
| **Standard Deviation** | | 8.2% | 2.1% | 2.3% | 10.4% | 2% | 0.8% | 0% | 8.4% | 9.5% | 4.6% | 8.1% | 1.2% | 9.4% | 2.5% | | 1.6% | 8.2% | 0.4% |
| **Meta Performance Per Dollar - P.P.D (Performance/Dollar** | **19.65** | 14.12 | 5.34 | | 6.48 | **3.80** | 6.18 | | | | | | | | | | | | |
| **Normalized** | 100% | 71.86% | 27.18% | | 32.98% | 19.34% | 31.45% | | | | | | | | | | | | |
| **OpenSSL - Performance / Cost - R.4.b.P (Signs/sec** | **1.60** | 1.15 | 0.44 | | 0.59 | **0.30** | 0.54 | | | | | | | | | | | | |
| **Normalized** | 100% | 71.88% | 27.5% | | 36.88% | 18.75% | 33.75% | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Himeno Benchmark - Performance / Cost - P.P.S (MFLOPS/Dollar)** | **6.44** | 4.55 | 1.74 | | 1.72 | 1.36 | **0.40** | | | | | | | | | | | |
| **Normalized** | 100% | 70.65% | 27.02% | | 26.71% | 21.12% | 6.21% | | | | | | | | | | | |
| **John The Ripper - Performance / Cost - Blowfish (Real C/S/Dollar** | **50.90** | 36.67 | 13.85 | | 17.11 | **9.73** | 17.60 | | | | | | | | | | | |
| **Normalized** | 100% | 72.04% | 27.21% | | 33.61% | 19.12% | 34.58% | | | | | | | | | | | |
| **FLAC Audio Encoding - WAV To FLAC (sec)** | 229.54 | 228.09 | 231.38 | 314.58 | 237.30 | 288.16 | | 279.95 | 230.20 | 282.60 | 81.96 | 198.14 | **36.43** | **325.72** | 231.39 | | 230.99 | 236.51 | 290.91 |
| **Normalized** | 15.87% | 15.97% | 15.74% | 11.58% | 15.35% | 12.64% | | 13.01% | 15.83% | 12.89% | 44.45% | 18.39% | 100% | 11.18% | 15.74% | | 15.77% | 15.4% | 12.52% |
| **Standard Deviation** | 0.2% | 1% | 1.4% | 0.9% | 1.6% | 0.1% | | 0.2% | 0.3% | 0.3% | 0.9% | 3.3% | 7.7% | 1.8% | 0.3% | | 0.1% | 0.2% | 0% |
| **OpenSSL - R.4.b.P (Signs/sec** | 16 | 17.20 | 17.13 | 11.93 | 20.60 | 13.40 | 43.30 | **3.30** | 10.48 | 6.67 | 29.70 | 10.90 | **66.53** | 7.68 | 12.35 | | 12.40 | | |
| **Normalized** | 24.05% | 25.85% | 25.75% | 17.93% | 30.96% | 20.14% | 65.08% | 4.96% | 15.75% | 10.03% | 44.64% | 16.38% | 100% | 11.54% | 18.56% | | 18.64% | | |
| **Standard Deviation** | 0% | 0% | 0.3% | 0.5% | 8.9% | 0% | 2% | 0% | 14.2% | 0.9% | 0% | 9% | 1.4% | 18.6% | 3.4% | | 4.4% | | |
| **Himeno Benchmark - P.P.S (MFLOPS)** | 64.38 | 68.23 | 68.01 | 33.29 | 60.28 | 61.26 | 31.80 | 56.83 | 64.35 | 63.04 | 89.84 | 66.91 | **443.65** | 41.32 | 15.34 | | **15.31** | 52.67 | 49.18 |
| **Normalized** | 14.51% | 15.38% | 15.33% | 7.5% | 13.59% | 13.81% | 7.17% | 12.81% | 14.5% | 14.21% | 20.25% | 15.08% | 100% | 9.31% | 3.46 | | 3.45% | 11.87% | 11.09% |
| **Standard Deviation** | 0.4% | 0.8% | 0.1% | 2.4% | 1.1% | 0.2% | 2.7% | 1.4% | 1% | 1.5% | 3% | 1.2% | 0.9% | 0.2% | 0.5% | | 1.8% | 8.2% | 0.7% |
| **Smallpt - G.I.R.1.S (sec)** | 166 | 154 | 154 | 217 | 139 | 195 | 621 | **812** | 248 | 390 | 866 | 234 | **620** | 282 | 213 | | 210 | 130 | 128 |
| | 5 | 7 | 9 | 5 | 0 | 4 | | 7 | 3 | 6 | | 1 | | 9 | 4 | | 1 | 8 | 5 |
| **Normalized** | 37.24% | 40.08% | 40.03% | 28.51% | 44.6% | 31.73% | 99.84% | 7.63% | 24.97% | 15.87% | 71.59% | 26.48% | 100% | 21.92% | 29.05% | | 29.51% | 47.4% | 48.25% |
| **Standard Deviation** | 0% | 0.4% | 0.1% | 0.5% | 0.2% | 0.1% | 0.4% | 0.5% | 0% | 0.3% | 0.5% | 11% | 0.2% | 4% | 0.2% | | 0.1% | 0% | 0.1% |

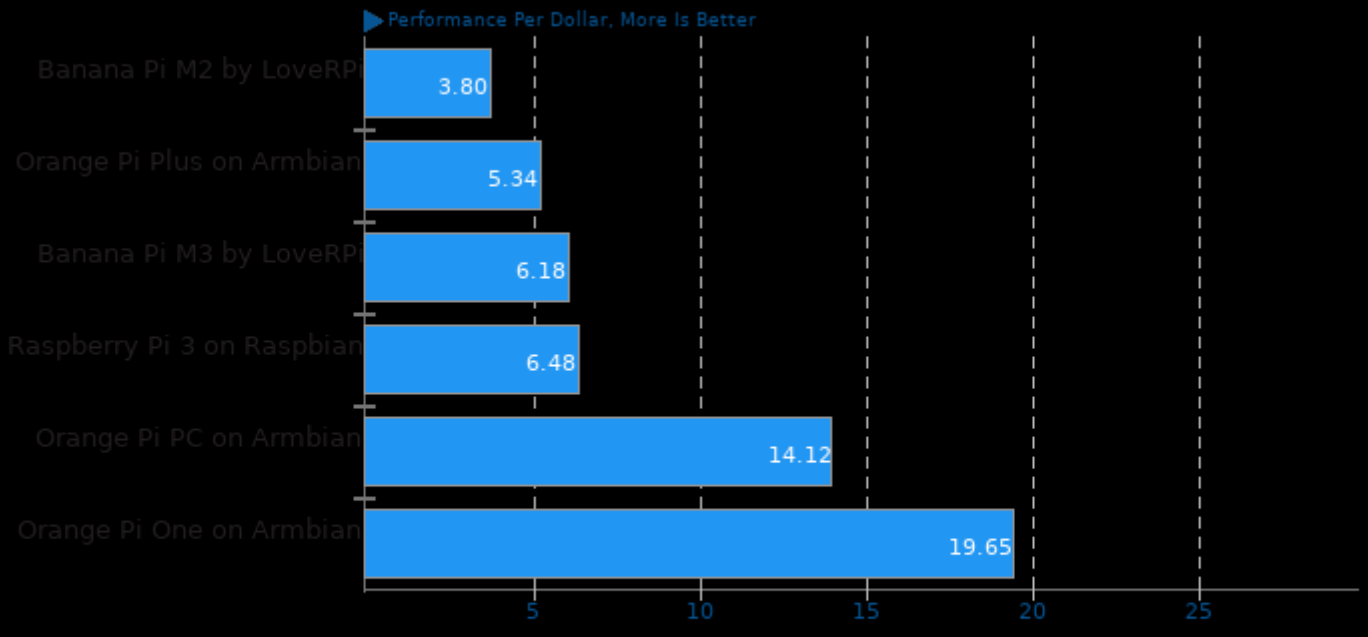
# Raspberry Pi vs Orange Pi vs Banana Pi 2016-03 Showdown by LoveRPi

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C-Ray - Total Time (sec)** | 365.94 | 344.52 | 350.07 | 505.44 | 250.79 | 431.10 | **136.14** | **1778** | 581.37 | 893.24 | 136.96 | 341.80 | 200.29 | 848.52 | 461.70 | 466.89 | 350.48 | 344.91 |
| **Normalized** | 37.2% | 39.52% | 38.89% | 26.93% | 54.28% | 31.58% | 100% | 7.66% | 23.42% | 15.24% | 99.4% | 39.83% | 67.97% | 16.04% | 29.49% | 29.16% | 38.84% | 39.47% |
| **Standard Deviation** | 0.2% | 1.5% | 0.5% | 0.3% | 0.1% | 0% | 0.3% | 0.4% | 3.6% | 2.3% | 4.3% | 3.8% | 0% | 7.8% | 3% | 1.8% | 0% | 0.1% |
| **John The Ripper - Blowfish (Real C/S)** | 509 | 550 | 540 | 387 | 599 | 438 | **1408** | **104** | 390 | 323 | 1055 | 535 | 1003 | 313 | 462 | 452 | 456 | 478 |
| **Normalized** | 36.15% | 39.06% | 38.35% | 27.49% | 42.54% | 31.11% | 100% | 7.39% | 27.7% | 22.94% | 74.93% | 38% | 71.24% | 22.23% | 32.81% | 32.1% | 32.39% | 33.95% |
| **Standard Deviation** | 0.1% | 0% | 0% | 0.3% | 0.6% | 0.1% | 0.6% | 3% | 14.2% | 0.8% | 0.2% | 11.2% | 20.4% | 9.1% | 2.7% | 2.7% | 0.6% | |


Timed MAFFT Alignment 6.864
Multiple Sequence Alignment
Seconds, Fewer Is Better
Banana Pi M2+ SinoVoip
SE +/- 0.03, N = 3
210.62
NanoPi NEO 512MB No Heatsink
SE +/- 5.07, N = 6
132.29
Banana Pi M2+ Raspbian 8.0
SE +/- 4.75, N = 6
121.86
Banana Pi M2+ on Armbian
SE +/- 2.78, N = 6
81.13
NanoPi NEO 512MB Heatsink
SE +/- 1.14, N = 3
77.66
Raspberry Pi 2 on Raspbian
SE +/- 1.02, N = 3
75.46
NanoPi NEO 512MB Heatsink2
SE +/- 0.72, N = 3
75.34
DragonBoard 410c on Debian RPB 16.03
SE +/- 2.46, N = 6
73.91
Banana Pi M2 by LoveRPi
SE +/- 0.81, N = 3
70.58
NanoPi NEO 2 Armbian Ubuntu 16.04.2
SE +/- 0.13, N = 3
64.47
NanoPi NEO 2 FA Ubuntu 16.04.2
SE +/- 2.13, N = 6
63.73
Orange Pi Plus on Armbian
SE +/- 0.78, N = 3
63.17
Orange Pi PC on Armbian
SE +/- 2.10, N = 6
62.45
Raspberry Pi 3 on Raspbian
SE +/- 2.58, N = 6
61.06
MiQi on Lubuntu 14.04
SE +/- 0.81, N = 6
42.84
MeUbuntu 14.04.3
SE +/- 0.22, N = 3
33.12
Banana Pi M3 by LoveRPi
SE +/- 0.14, N = 3
29.72
50
100
150
200
250
1. (CC) gcc options: -O3 -lm -lpthread

## Meta Performance Per Dollar

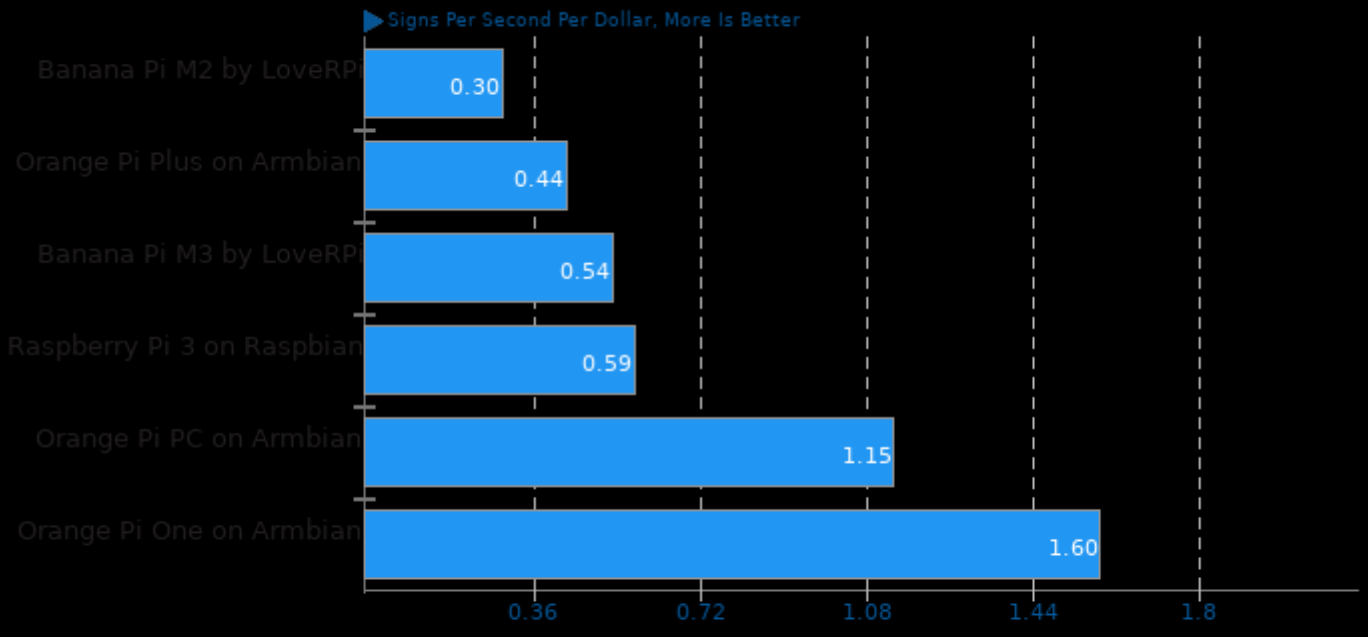
Performance Per Dollar




1. Banana Pi M2 by LoveRPi: $45 reported cost. Average result: 170.89.
2. Orange Pi Plus on Armbian: $39 reported cost. Average result: 208.38.
3. Banana Pi M3 by LoveRPi: $80 reported cost. Average result: 494.37.
4. Raspberry Pi 3 on Raspbian: $35 reported cost. Average result: 226.63.
5. Orange Pi PC on Armbian: $15 reported cost. Average result: 211.81.
6. Orange Pi One on Armbian: $10 reported cost. Average result: 196.46.

## OpenSSL 1.0.1g

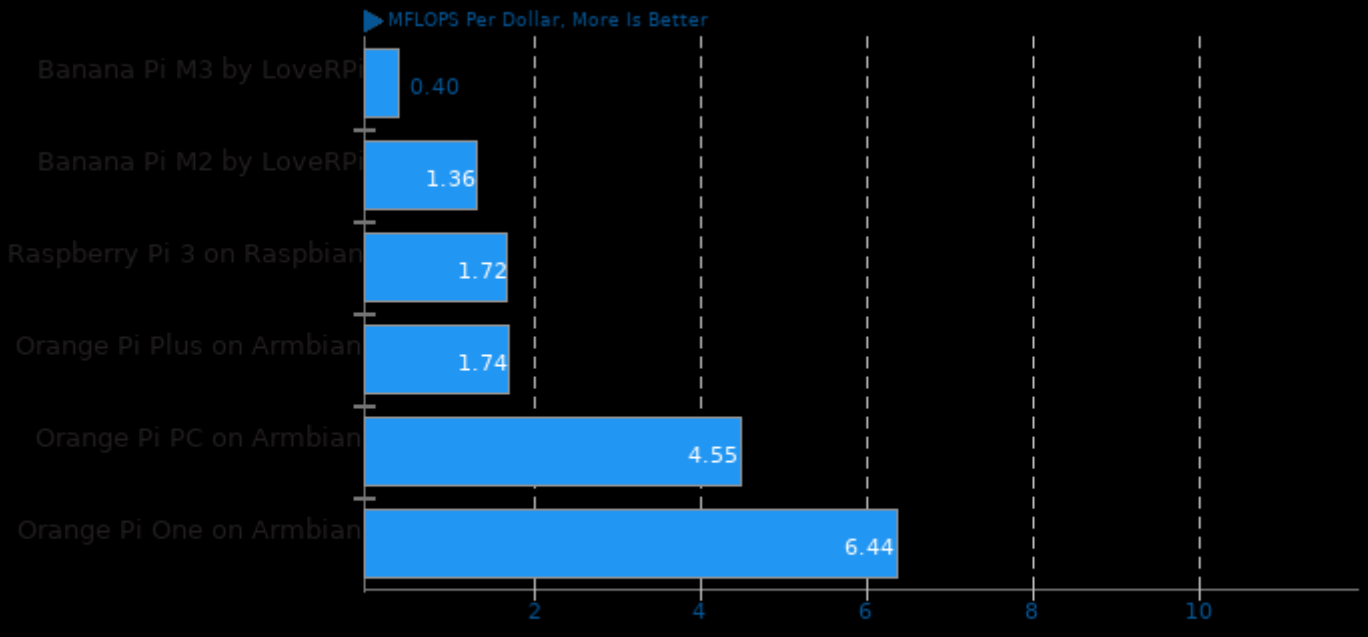
Performance / Cost - RSA 4096-bit Performance




1. Banana Pi M2 by LoveRPi: $45 reported cost.
2. Orange Pi Plus on Armbian: $39 reported cost.
3. Banana Pi M3 by LoveRPi: $80 reported cost.
4. Raspberry Pi 3 on Raspbian: $35 reported cost.
5. Orange Pi PC on Armbian: $15 reported cost.
6. Orange Pi One on Armbian: $10 reported cost.

## Himeno Benchmark 3.0

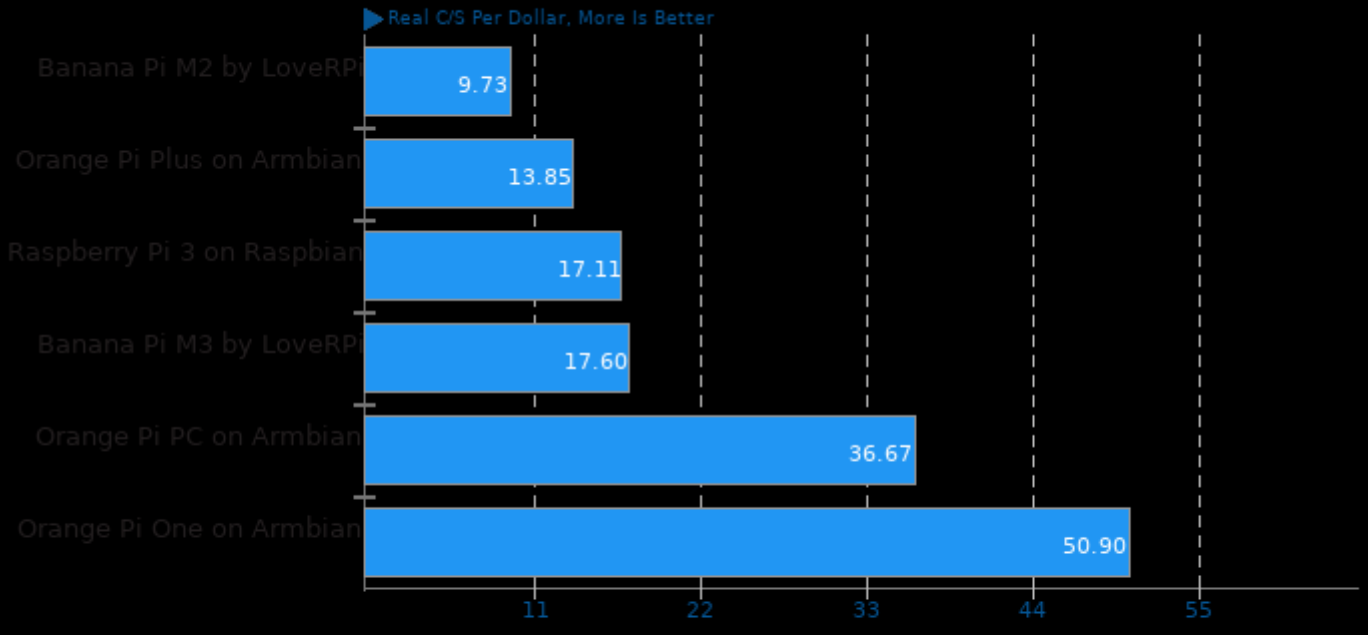
Performance / Cost - Poisson Pressure Solver



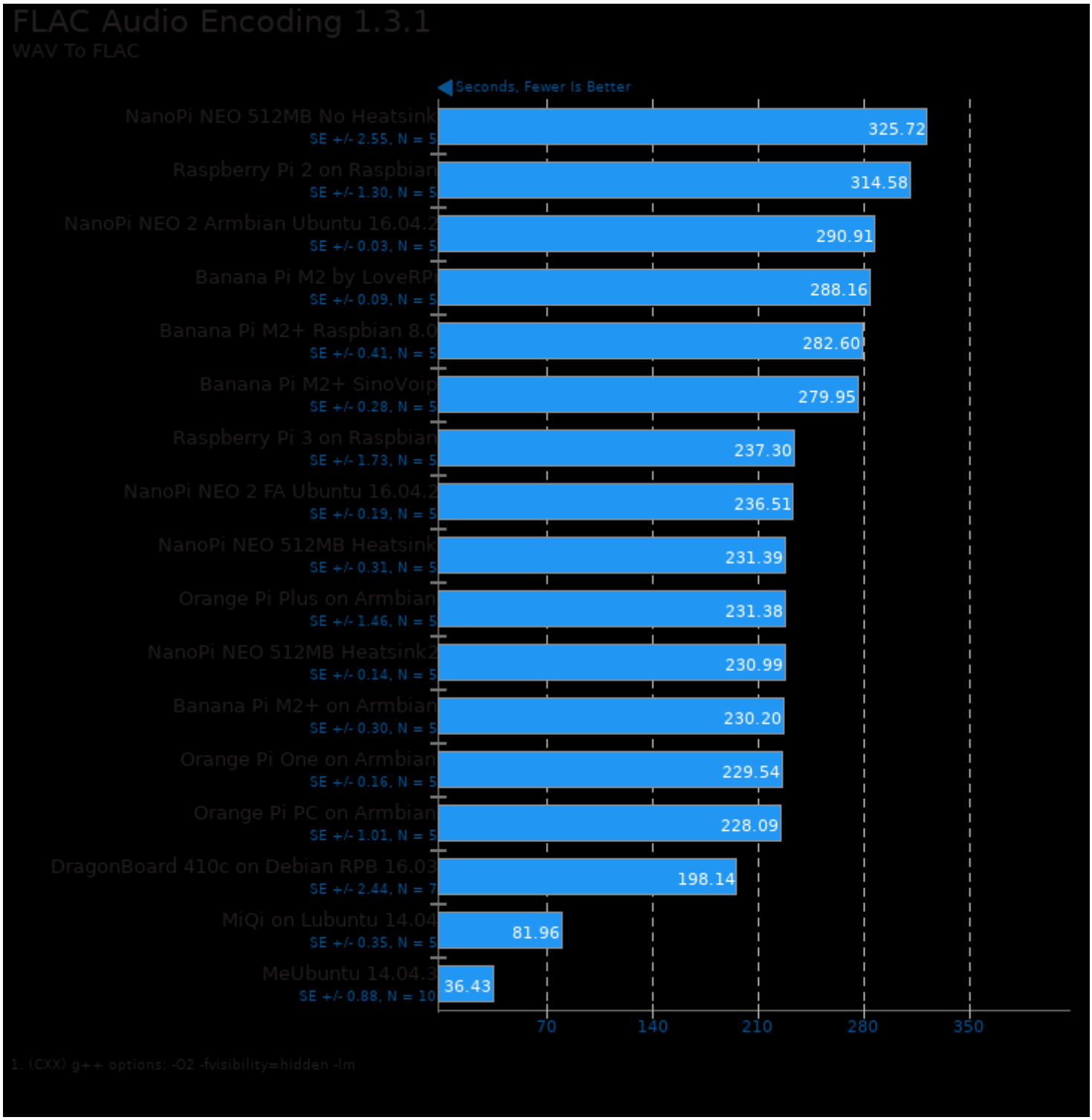

1. Banana Pi M3 by LoveRPi: $80 reported cost.
2. Banana Pi M2 by LoveRPi: $45 reported cost.
3. Raspberry Pi 3 on Raspbian: $35 reported cost.
4. Orange Pi Plus on Armbian: $39 reported cost.
5. Orange Pi PC on Armbian: $15 reported cost.
6. Orange Pi One on Armbian: $10 reported cost.

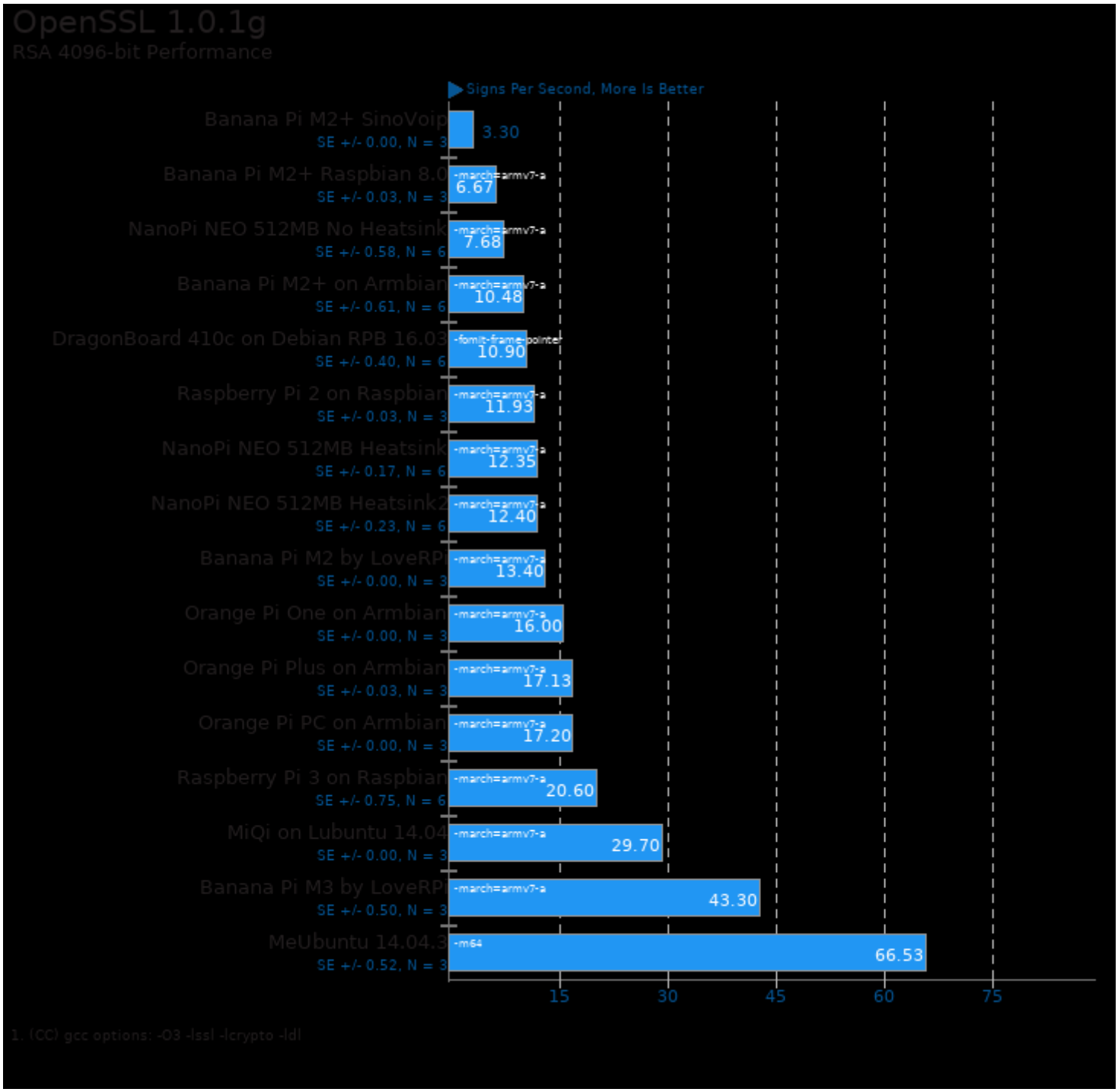
## John The Ripper 1.8.0

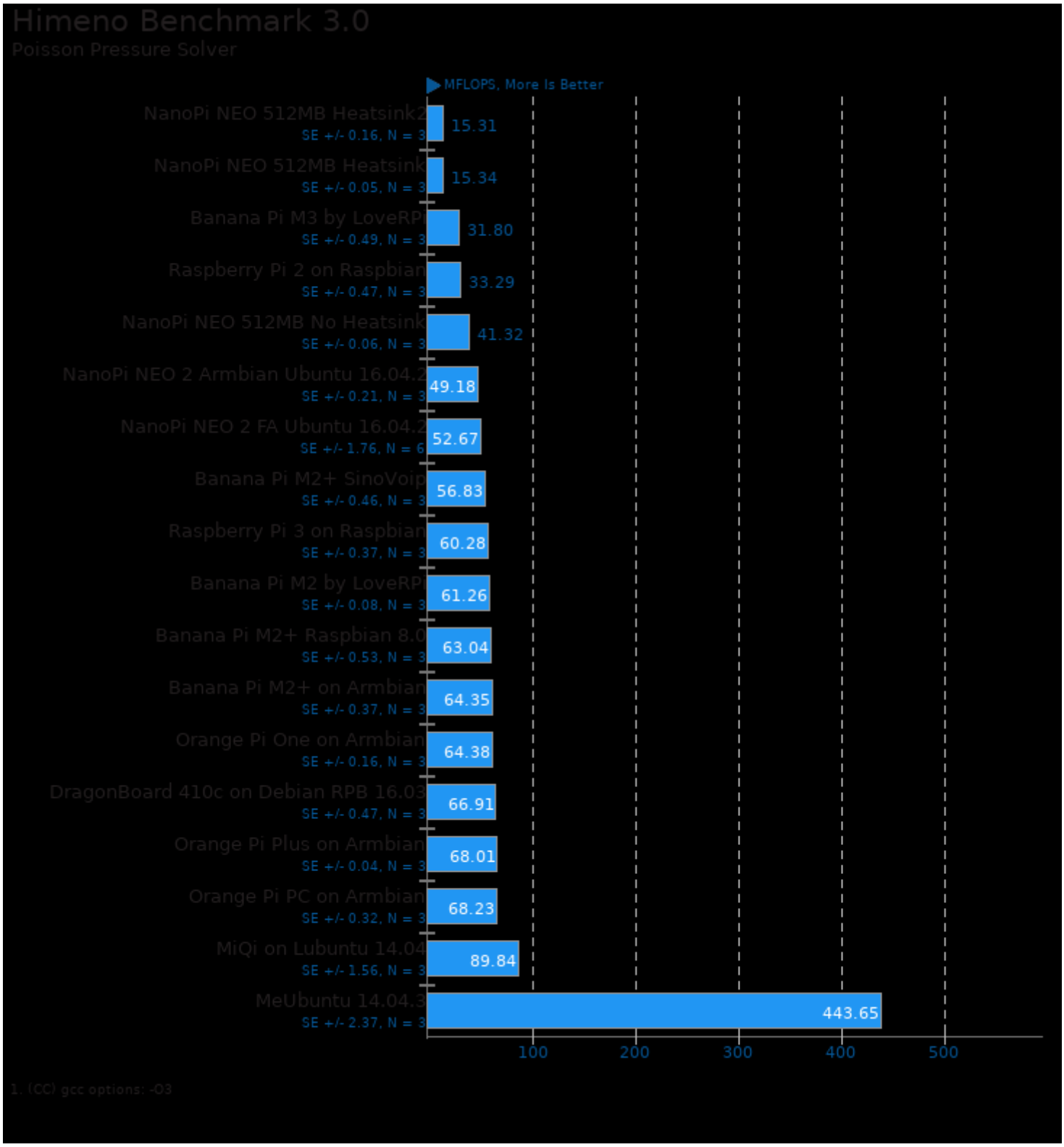
Performance / Cost - Test: Blowfish

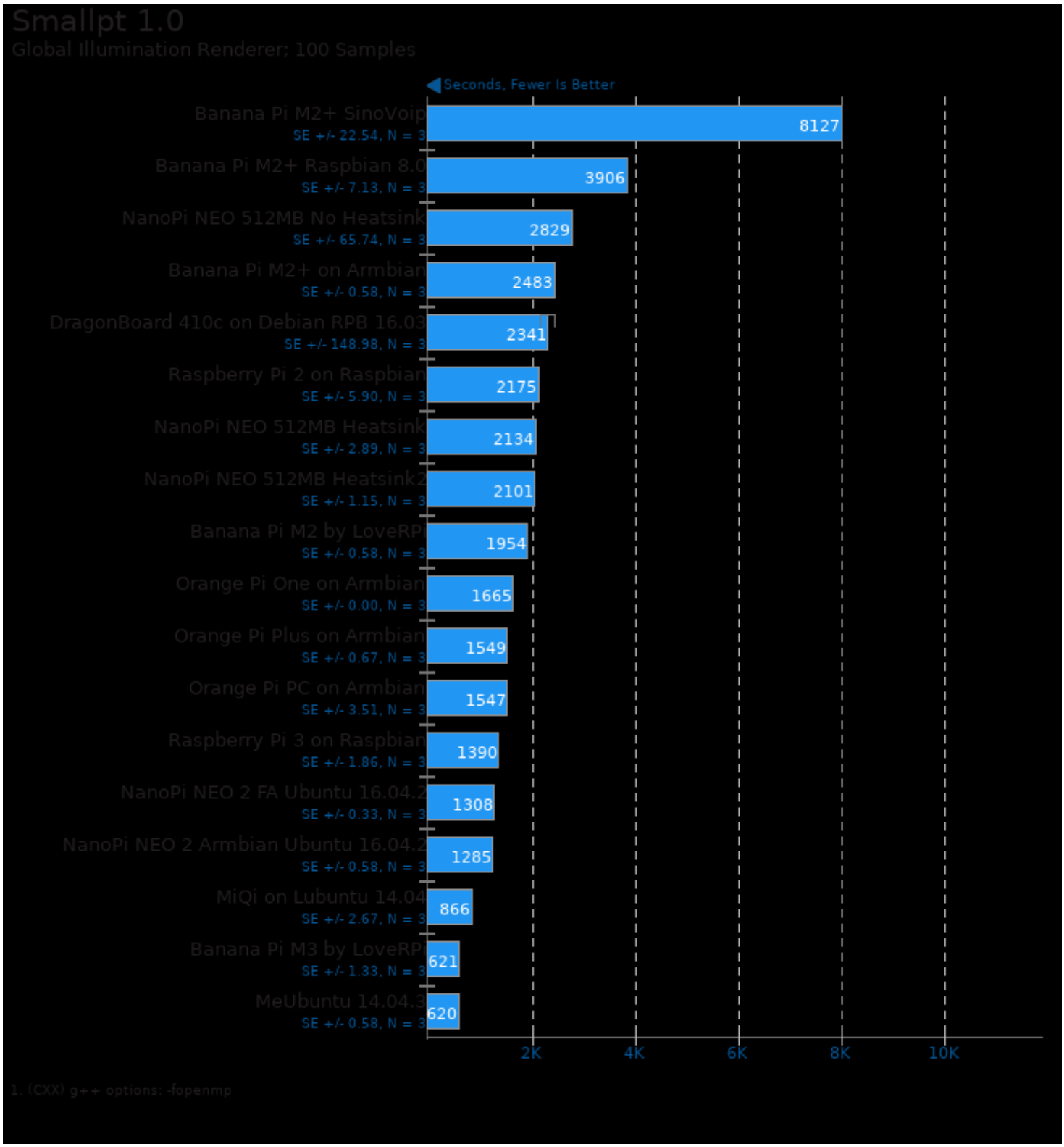


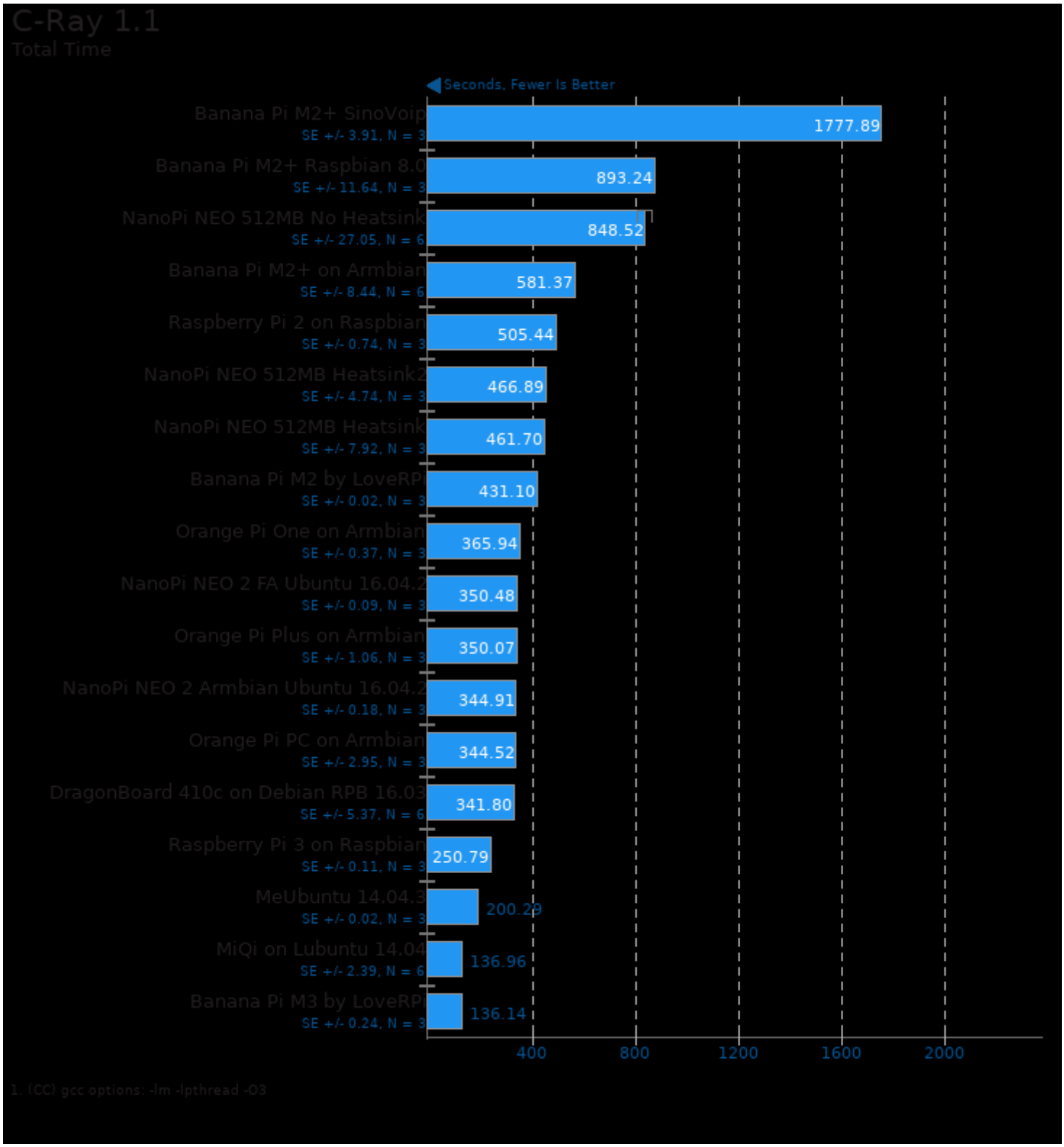

1. Banana Pi M2 by LoveRPi: $45 reported cost.
2. Orange Pi Plus on Armbian: $39 reported cost.
3. Raspberry Pi 3 on Raspbian: $35 reported cost.
4. Banana Pi M3 by LoveRPi: $80 reported cost.
5. Orange Pi PC on Armbian: $15 reported cost.
6. Orange Pi One on Armbian: $10 reported cost.

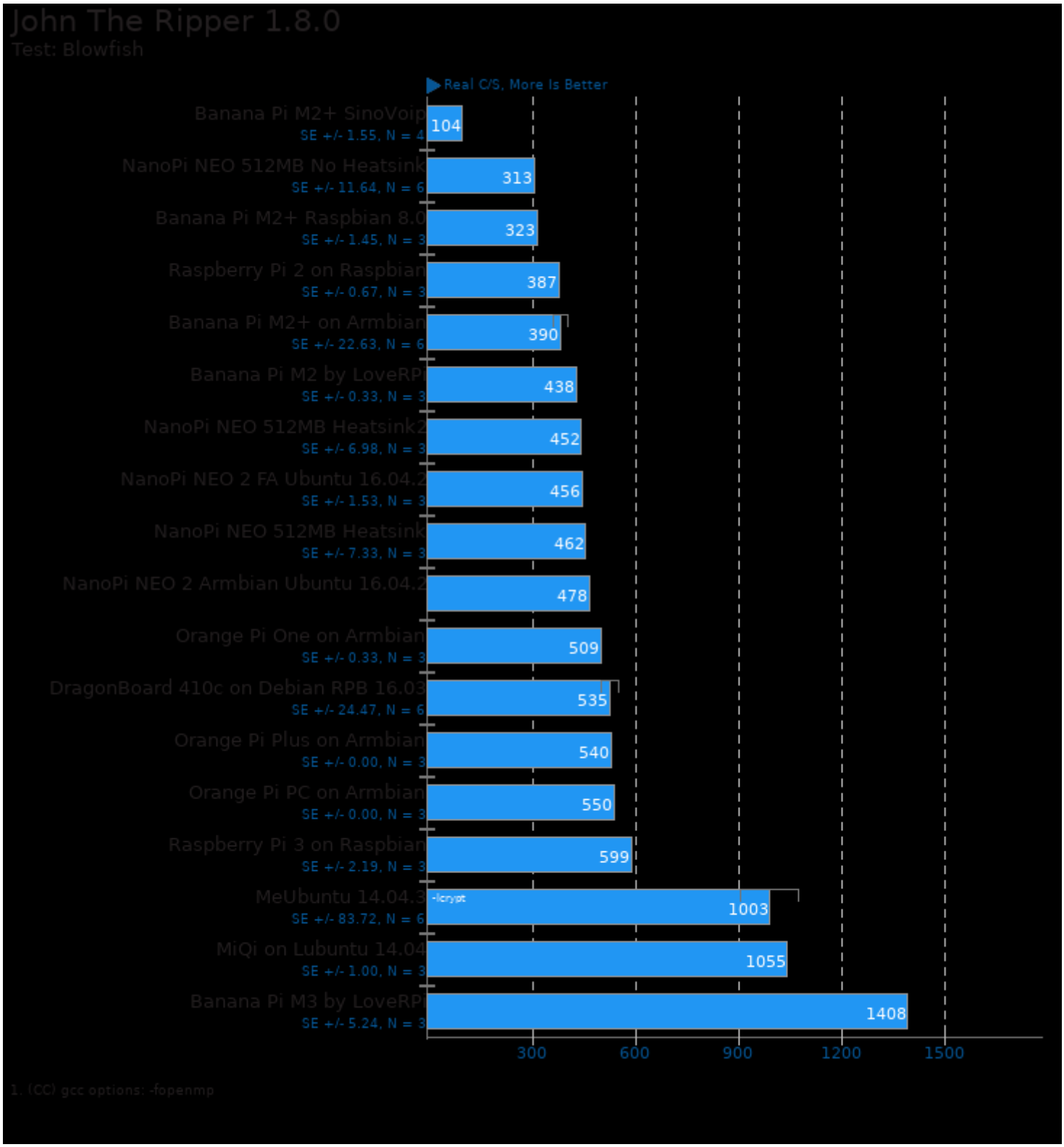

FLAC Audio Encoding 1.3.1
WAV To FLAC
Seconds, Fewer Is Better
NanoPi NEO 512MB No Heatsink
SE +/- 2.55, N = 5
325.72
Raspberry Pi 2 on Raspbian
SE +/- 1.30, N = 5
314.58
NanoPi NEO 2 Armbian Ubuntu 16.04.2
SE +/- 0.03, N = 5
290.91
Banana Pi M2 by LoveRPi
SE +/- 0.09, N = 5
288.16
Banana Pi M2+ Raspbian 8.0
SE +/- 0.41, N = 5
282.60
Banana Pi M2+ SinoVoip
SE +/- 0.28, N = 5
279.95
Raspberry Pi 3 on Raspbian
SE +/- 1.73, N = 5
237.30
NanoPi NEO 2 FA Ubuntu 16.04.2
SE +/- 0.19, N = 5
236.51
NanoPi NEO 512MB Heatsink
SE +/- 0.31, N = 5
231.39
Orange Pi Plus on Armbian
SE +/- 1.46, N = 5
231.38
NanoPi NEO 512MB Heatsink2
SE +/- 0.14, N = 5
230.99
Banana Pi M2+ on Armbian
SE +/- 0.30, N = 5
230.20
Orange Pi One on Armbian
SE +/- 0.16, N = 5
229.54
Orange Pi PC on Armbian
SE +/- 1.01, N = 5
228.09
DragonBoard 410c on Debian RPB 16.03
SE +/- 2.44, N = 7
198.14
MiQi on Lubuntu 14.04
SE +/- 0.35, N = 5
81.96
MeUbuntu 14.04.3
SE +/- 0.88, N = 10
36.43
70
140
210
280
350
1. (CXX) g++ options: -O2 -fvisibility=hidden -lm


OpenSSL 1.0.1g
RSA 4096-bit Performance
Signs Per Second, More Is Better
Banana Pi M2+ SinoVoip
SE +/- 0.00, N = 3
3.30
Banana Pi M2+ Raspbian 8.0
SE +/- 0.03, N = 3
-march=armv7-a
6.67
NanoPi NEO 512MB No Heatsink
SE +/- 0.58, N = 6
-march=armv7-a
7.68
Banana Pi M2+ on Armbian
SE +/- 0.61, N = 6
-march=armv7-a
10.48
DragonBoard 410c on Debian RPB 16.03
SE +/- 0.40, N = 6
-fomit-frame-pointer
10.90
Raspberry Pi 2 on Raspbian
SE +/- 0.03, N = 3
-march=armv7-a
11.93
NanoPi NEO 512MB Heatsink
SE +/- 0.17, N = 6
-march=armv7-a
12.35
NanoPi NEO 512MB Heatsink2
SE +/- 0.23, N = 6
-march=armv7-a
12.40
Banana Pi M2 by LoveRPi
SE +/- 0.00, N = 3
-march=armv7-a
13.40
Orange Pi One on Armbian
SE +/- 0.00, N = 3
-march=armv7-a
16.00
Orange Pi Plus on Armbian
SE +/- 0.03, N = 3
-march=armv7-a
17.13
Orange Pi PC on Armbian
SE +/- 0.00, N = 3
-march=armv7-a
17.20
Raspberry Pi 3 on Raspbian
SE +/- 0.75, N = 6
-march=armv7-a
20.60
MiQi on Lubuntu 14.04
SE +/- 0.00, N = 3
-march=armv7-a
29.70
Banana Pi M3 by LoveRPi
SE +/- 0.50, N = 3
-march=armv7-a
43.30
MeUbuntu 14.04.3
SE +/- 0.52, N = 3
-m64
66.53
15
30
45
60
75
1. (CC) gcc options: -O3 -lssl -lcrypto -ldl


Himeno Benchmark 3.0
Poisson Pressure Solver
MFLOPS, More Is Better
NanoPi NEO 512MB Heatsink2
SE +/- 0.16, N = 3
15.31
NanoPi NEO 512MB Heatsink
SE +/- 0.05, N = 3
15.34
Banana Pi M3 by LoveRPi
SE +/- 0.49, N = 3
31.80
Raspberry Pi 2 on Raspbian
SE +/- 0.47, N = 3
33.29
NanoPi NEO 512MB No Heatsink
SE +/- 0.06, N = 3
41.32
NanoPi NEO 2 Armbian Ubuntu 16.04.2
SE +/- 0.21, N = 3
49.18
NanoPi NEO 2 FA Ubuntu 16.04.2
SE +/- 1.76, N = 6
52.67
Banana Pi M2+ SinoVoip
SE +/- 0.46, N = 3
56.83
Raspberry Pi 3 on Raspbian
SE +/- 0.37, N = 3
60.28
Banana Pi M2 by LoveRPi
SE +/- 0.08, N = 3
61.26
Banana Pi M2+ Raspbian 8.0
SE +/- 0.53, N = 3
63.04
Banana Pi M2+ on Armbian
SE +/- 0.37, N = 3
64.35
Orange Pi One on Armbian
SE +/- 0.16, N = 3
64.38
DragonBoard 410c on Debian RPB 16.03
SE +/- 0.47, N = 3
66.91
Orange Pi Plus on Armbian
SE +/- 0.04, N = 3
68.01
Orange Pi PC on Armbian
SE +/- 0.32, N = 3
68.23
MiQi on Lubuntu 14.04
SE +/- 1.56, N = 3
89.84
MeUbuntu 14.04.3
SE +/- 2.37, N = 3
443.65
100
200
300
400
500
1. (CC) gcc options: -O3


Smallpt 1.0
Global Illumination Renderer; 100 Samples
Seconds, Fewer Is Better
Banana Pi M2+ SinoVoip
SE +/- 22.54, N = 3
8127
Banana Pi M2+ Raspbian 8.0
SE +/- 7.13, N = 3
3906
NanoPi NEO 512MB No Heatsink
SE +/- 65.74, N = 3
2829
Banana Pi M2+ on Armbian
SE +/- 0.58, N = 3
2483
DragonBoard 410c on Debian RPB 16.03
SE +/- 148.98, N = 3
2341
Raspberry Pi 2 on Raspbian
SE +/- 5.90, N = 3
2175
NanoPi NEO 512MB Heatsink
SE +/- 2.89, N = 3
2134
NanoPi NEO 512MB Heatsink2
SE +/- 1.15, N = 3
2101
Banana Pi M2 by LoveRPi
SE +/- 0.58, N = 3
1954
Orange Pi One on Armbian
SE +/- 0.00, N = 3
1665
Orange Pi Plus on Armbian
SE +/- 0.67, N = 3
1549
Orange Pi PC on Armbian
SE +/- 3.51, N = 3
1547
Raspberry Pi 3 on Raspbian
SE +/- 1.86, N = 3
1390
NanoPi NEO 2 FA Ubuntu 16.04.2
SE +/- 0.33, N = 3
1308
NanoPi NEO 2 Armbian Ubuntu 16.04.2
SE +/- 0.58, N = 3
1285
MiQi on Lubuntu 14.04
SE +/- 2.67, N = 3
866
Banana Pi M3 by LoveRPi
SE +/- 1.33, N = 3
621
MeUbuntu 14.04.3
SE +/- 0.58, N = 3
620
2K
4K
6K
8K
10K
1. (CXX) g++ options: -fopenmp


C-Ray 1.1
Total Time
Seconds, Fewer Is Better
Banana Pi M2+ SinoVoip
SE +/- 3.91, N = 3
1777.89
Banana Pi M2+ Raspbian 8.0
SE +/- 11.64, N = 3
893.24
NanoPi NEO 512MB No Heatsink
SE +/- 27.05, N = 6
848.52
Banana Pi M2+ on Armbian
SE +/- 8.44, N = 6
581.37
Raspberry Pi 2 on Raspbian
SE +/- 0.74, N = 3
505.44
NanoPi NEO 512MB Heatsink2
SE +/- 4.74, N = 3
466.89
NanoPi NEO 512MB Heatsink
SE +/- 7.92, N = 3
461.70
Banana Pi M2 by LoveRPi
SE +/- 0.02, N = 3
431.10
Orange Pi One on Armbian
SE +/- 0.37, N = 3
365.94
NanoPi NEO 2 FA Ubuntu 16.04.2
SE +/- 0.09, N = 3
350.48
Orange Pi Plus on Armbian
SE +/- 1.06, N = 3
350.07
NanoPi NEO 2 Armbian Ubuntu 16.04.2
SE +/- 0.18, N = 3
344.91
Orange Pi PC on Armbian
SE +/- 2.95, N = 3
344.52
DragonBoard 410c on Debian RPB 16.03
SE +/- 5.37, N = 6
341.80
Raspberry Pi 3 on Raspbian
SE +/- 0.11, N = 3
250.79
MeUbuntu 14.04.3
SE +/- 0.02, N = 3
200.29
MiQi on Lubuntu 14.04
SE +/- 2.39, N = 6
136.96
Banana Pi M3 by LoveRPi
SE +/- 0.24, N = 3
136.14
400
800
1200
1600
2000
1. (CC) gcc options: -lm -lpthread -O3




*This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 09:24.*