

www.phoronix-test-suite.com

Raspberry Pi Model 3 B+ Benchmarks vs. ARM SBCs vs. x86

Raspberry Pi 3 Model B Plus benchmarks by Michael Larabel for a future article on Phoronix.

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: 926MB, Disk: 32GB GB2MW, Graphics: VC4 V3D 2.1 1024MB, Monitor: VE228

OS: Raspbian 9.4, Kernel: 4.9.80-v7+ (armv7l), Desktop: LXDE 0.9.3, Display Server: X Server 1.19.2, Display Driver: modesetting 1.19.2, OpenGL: 2.1 Mesa 13.0.6 Gallium 0.4, Compiler: GCC 6.3.0 20170516, 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,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: 926MB, Disk: 32GB GB2MW, Graphics: VC4 V3D 2.1 1024MB, Monitor: VE228

OS: Raspbian 9.4, Kernel: 4.9.80-v7+ (armv7l), Desktop: LXDE 0.9.3, Display Server: X Server 1.19.2, Display Driver: modesetting 1.19.2, OpenGL: 2.1 Mesa 13.0.6 Gallium 0.4, Compiler: GCC 6.3.0 20170516, 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,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 Plus

Processor: ARMv7 rev 4 @ 1.40GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 3 Model B Plus Rev 1.3, Memory: 926MB, Disk: 32GB GB2MW, Graphics: VC4 V3D 2.1 1024MB, Monitor: VE228

OS: Raspbian 9.4, Kernel: 4.9.80-v7+ (armv7l), Desktop: LXDE 0.9.3, Display Server: X Server 1.19.2, Display Driver: modesetting 1.19.2, OpenGL: 2.1 Mesa 13.0.6 Gallium 0.4, Compiler: GCC 6.3.0 20170516, 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,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 TinkerBoard

Processor: ARMv7 rev 1 @ 1.80GHz (4 Cores), Motherboard: Rockchip (Device Tree), Memory: 2048MB, Disk: 8GB SD, Graphics: LLVMpipe, Monitor: VE228

OS: Debian 9.4, Kernel: 4.4.16-00006-g4431f98-dirty (armv7l), Desktop: LXDE 0.9.3, Display Server: X Server 1.19.2, Display Driver: modesetting 1.19.2, OpenGL: 3.3 Mesa 13.0.6 Gallium 0.4 (LLVM 3.9 128 bits), Compiler: GCC 6.3.0 20170516, 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-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

ODROID-C2

Processor: Unknown @ 1.54GHz (4 Cores), Motherboard: ODROID-C2, Memory: 2048MB, Disk: 16GB SD16G, Graphics: LLVMpipe

OS: Ubuntu 16.04, Kernel: 3.14.79-108 (aarch64), Desktop: MATE 1.12.1, Display Server: X Server 1.18.4, OpenGL: 3.3 Mesa 12.0.6 Gallium 0.4 (LLVM 3.8 128 bits), Compiler: GCC 5.4.0 20160609, File-System: ext4, Screen Resolution: 1920x1080

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: meson_cpufreq interactive
Python Notes: Python 2.7.12 + Python 3.5.2

Pine A64

Processor: AArch64 rev 4 @ 1.15GHz (4 Cores), Motherboard: sun50iw1p1, Memory: 1024MB, Disk: 8GB SL08G, Graphics: LLVMpipe

OS: Ubuntu 16.04, Kernel: 3.10.104 (aarch64), Desktop: MATE 1.12.1, Display Server: X Server 1.18.4, OpenGL: 3.3 Mesa 11.2.0 Gallium 0.4 (LLVM 3.8 128 bits), Compiler: GCC 5.4.0 20160609, File-System: ext4, Screen Resolution: 1920x1080

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
Python Notes: Python 2.7.12 + Python 3.5.2

Jetson TX1

Processor: ARMv8 rev 1 @ 1.73GHz (4 Cores), Motherboard: jetson_tx1, Memory: 4096MB, Disk: 16GB 016G32, Graphics: NVIDIA Tegra X1, Monitor: DELL P2415Q

OS: Ubuntu 16.04, Kernel: 3.10.96-tegra (aarch64), Desktop: Unity 7.4.0, Display Server: X Server 1.18.3, Display Driver: NVIDIA 24.2.1, OpenGL: 4.5.0, Vulkan: 1.0.8, Compiler: GCC 5.4.0 20160609 + CUDA 8.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: __GL_PERFMON_MODE=1
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: tegra interactive
Python Notes: Python 2.7.12 + Python 3.5.2

Jetson TX2

Processor: ARMv8 rev 3 @ 2.00GHz (6 Cores), Motherboard: quill, Memory: 8192MB, Disk: 31GB 032G34, Graphics: GP10B, Monitor: DELL P2415Q

OS: Ubuntu 16.04, Kernel: 4.4.15-tegra (aarch64), Desktop: Unity 7.4.0, Display Server: X Server 1.18.3, Display Driver: NVIDIA 27.1.0, OpenGL: 4.5.0, Vulkan: 1.0.8, Compiler: GCC 5.4.0 20160609 + CUDA 8.0, File-System: ext4, Screen Resolution: 1920x1080

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: tegra_cpufreq schedutil
Python Notes: Python 2.7.12 + Python 3.5.2

Orange Pi PC v1.2

Processor: ARMv7 rev 5 @ 1.20GHz (3 Cores), Motherboard: sun8i, Memory: 1024MB, Disk: 32GB GB2MW

OS: Raspbian GNU/Linux 7, Kernel: 3.4.39 (armv7l), Desktop: LXDE 0.7.1, Display Server: X Server 1.12.4, Compiler: GCC 4.6.3, File-System: ext4, Screen Resolution: 1280x720

Compiler Notes: --build=arm-linux-gnueabihf --disable-sjlj-exceptions --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch=armv6 --with-float=hard --with-fpu=vfp -v
Processor Notes: Scaling Governor: cpufreq-sunxi ondemand
Python Notes: Python 2.7.3 + Python 3.2.3

Celeron N2820

Processor: Intel Celeron N2820 @ 2.40GHz (2 Cores), Motherboard: Intel DN2820FYK (FYBYT10H.86A.0050.2015.0326.1731 BIOS), Chipset: Intel Atom Z36xxx/Z37xxx, Memory: 8192MB, Disk: 60GB OCZ VERTEX2, Graphics: Intel Bay Trail 1536MB (756MHz), Audio: Realtek ALC283, Monitor: DELL P2415Q, Network: Realtek RTL8111/8168/8411 + Intel Wireless 7260

OS: Ubuntu 18.04, Kernel: 4.15.0-10-generic (x86_64), Desktop: GNOME Shell 3.27.91, Display Driver: modesetting 1.19.6, OpenGL: 4.2 Mesa 18.0.0-rc4, Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 2048x1280

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 2.7.14+ + Python 3.6.4+
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Celeron J3455

Processor: Intel Celeron J3455 @ 2.30GHz (4 Cores), Motherboard: Compulab fitlet2 v1.1 (FLT2.0.38.01.00 BIOS), Chipset: Intel Celeron N3350/Pentium, Memory: 8192MB, Disk: 127GB NT-128, Graphics: Intel HD 500 3072MB (750MHz), Audio: Realtek ALC1150, Monitor: DELL P2415Q, Network: Intel I211 Gigabit Connection + Intel Wireless 8260

OS: Ubuntu 18.04, Kernel: 4.15.0-10-generic (x86_64), Desktop: GNOME Shell 3.27.91, Display Driver: modesetting 1.19.6, OpenGL: 4.5 Mesa 18.0.0-rc4, Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 1920x1080

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 2.7.14+ + Python 3.6.4+
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i3 8100

Processor: Intel Core i3-8100 @ 3.60GHz (4 Cores), Motherboard: ASRock Z370M-ITX/ac (P1.20 BIOS), Chipset: Intel Device 3e1f, Memory: 8192MB, Disk: 60GB DREVO X1 SSD, Graphics: (1100MHz), Audio: Realtek ALC892, Network: Intel Connection + Intel Device 24fb

OS: Ubuntu 17.10, Kernel: 4.15.0-999-generic (x86_64) 20171231, Desktop: GNOME Shell 3.26.1, Compiler: GCC 8.0.1 20180319, File-System: ext4

Compiler Notes: --disable-multilib --enable-checking=release --enable-languages=c,c++,fortran
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14 + Python 3.6.3

Orange pi zero 2

Processor: Unknown @ 1.51GHz (4 Cores), Memory: 1024MB, Disk: 16GB SC16G, Graphics: llvmpipe (LLVM 7.0 128 bits)

OS: Debian 10, Kernel: 4.9.170-sun50iw9 (aarch64), Desktop: Xfce 4.12, Display Server: X Server disp_reserve=3686400 0x7bf51cc0, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 18.3.6, Compiler: Clang 7.0.1-8+deb10u2, File-System: ext4, Screen Resolution: 1280x720

Compiler Notes: --build=aarch64-linux-gnu --disable-libphobos --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
System Notes: Python 2.7.16.

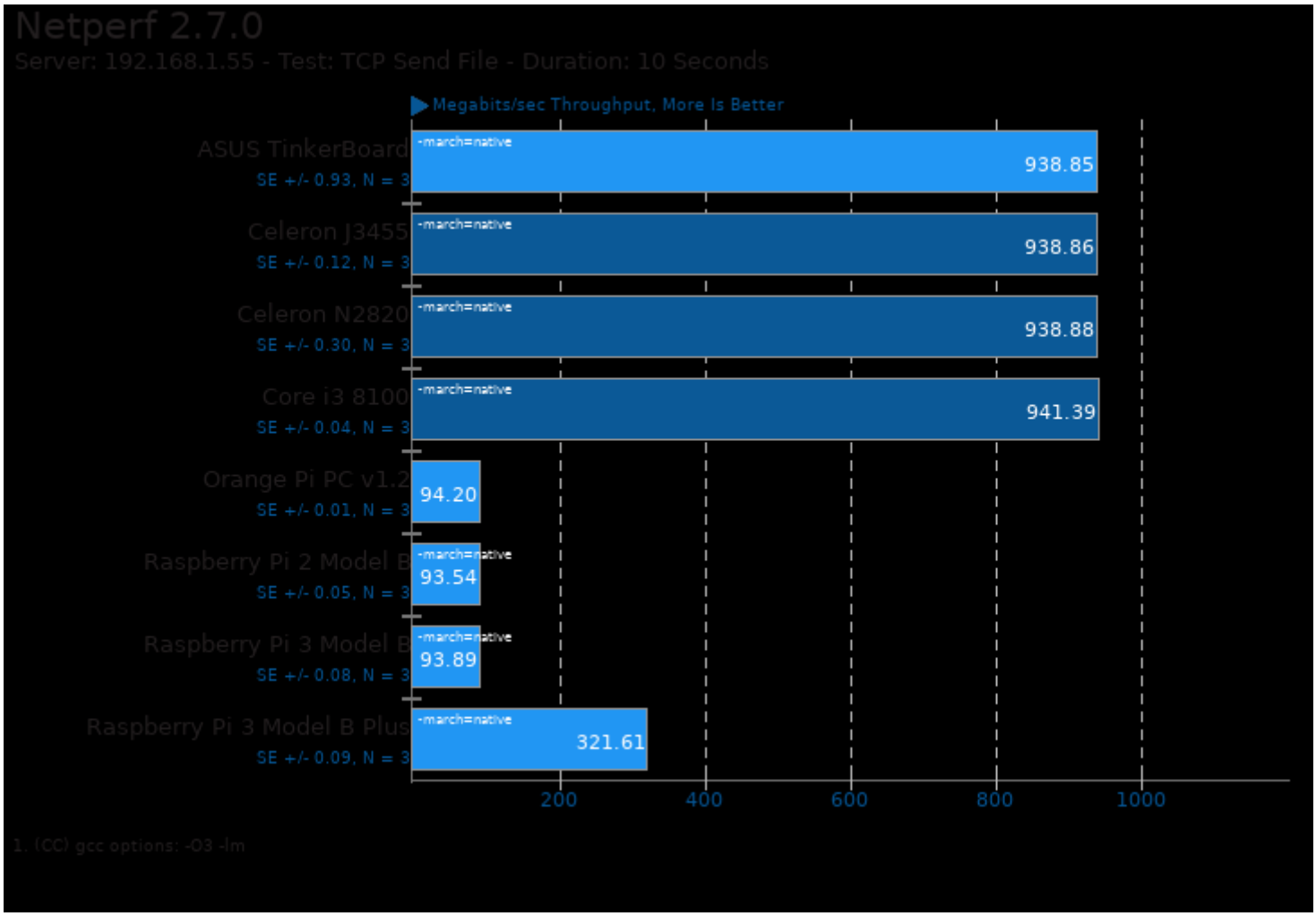
	Raspberry Pi 2 Model	Raspberry Pi 3 Model	Raspberry Pi 3 Model	ASUS Tinker Board	ODROID-C2	Pine A64	Jetson TX1	Jetson TX2	Orange Pi PC v1.2	Celeron N2820	Celeron J3455	Core i3 8100	Orange pi zero 2
Netperf - 192.168.1.55 - TCP Send File - 10 Seconds (Megabits/sec Throughput)	**93.54**	93.89	321.61	938.85					94.20	938.88	938.86	**941.39**	
Normalized	9.94%	9.97%	34.16%	99.73%					10.01%	99.73%	99.73%	100%	
Standard Deviation	0.1%	0.1%	0%	0.2%					0%	0.1%	0%	0%	
Netperf - 192.168.1.55 - TCP Stream - Client To Server - 10 Seconds (Megabits/sec	**94.05**	**94.05**	226.59	783.73					94.14	787.16	786.12	**787.50**	
Normalized	11.94%	11.94%	28.77%	99.52%					11.95%	99.96%	99.82%	100%	
Standard Deviation	0.1%	0.1%	0.2%	0.2%					0%	0.1%	0.2%	0%	

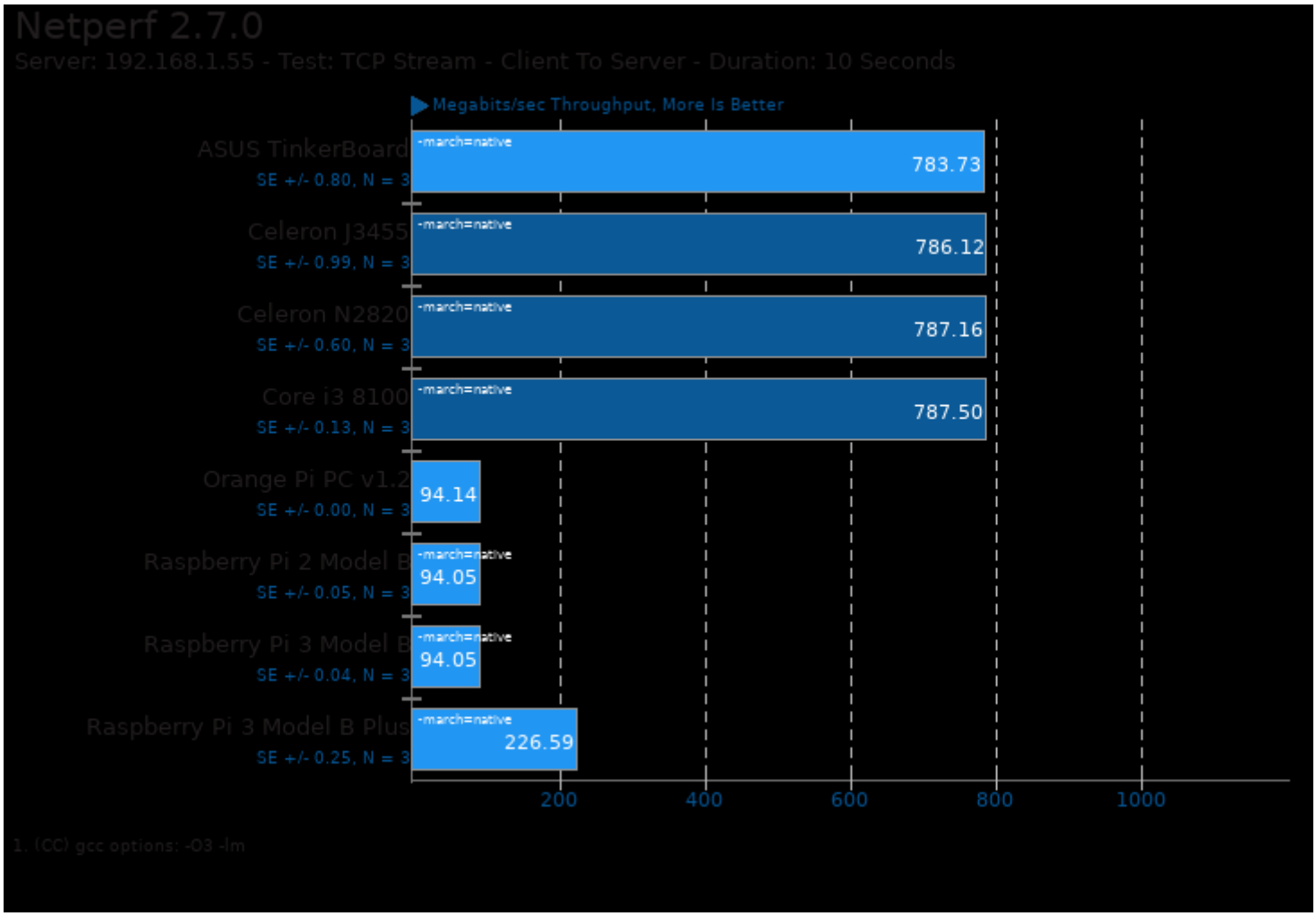
Netperf - 192.168.1.55 - TCP Stream - Server To Client - 10 Seconds (Megabits/sec	**93.58**	94.00	322.32	939.90					94.19	938.88	938.86	**941.30**	
Normalized	9.94%	9.99%	34.24%	99.85%					10.01%	99.74%	99.74%	100%	
Standard Deviation	0.4%	0.1%	0.1%	0.2%					0%	0%	0%	0%	
Netperf - 192.168.1.55 - UDP Stream - Server To Client - 10G - 10 Seconds (Megabits/sec Throughput)	96.02	**96.00**	272.78	634.19					96.16	959.55	959.56	**961.58**	
Normalized	9.99%	9.98%	28.37%	65.95%					10%	99.79%	99.79%	100%	
Standard Deviation	0%	0.3%	1%	62.6%					0%	0.1%	0%	0%	
CacheBench - Read (MB/s)	**1657**	1795	2102	2735	2308	1696	2638	2803	2196	1959	1935	**3048**	2493
Normalized	54.38%	58.88%	68.97%	89.73%	75.74%	55.65%	86.56%	91.97%	72.07%	64.27%	63.5%	100%	81.79%
Standard Deviation	0.7%	0.2%	0.3%	0.5%	0.2%	1.4%	0.2%	3.2%	1.6%	3.4%	0%	0.2%	0.8%
CacheBench - Write (MB/s)	**2238**	3013	3495	8814	3847	2830	6439	6956	2983	8770	10270	**25256**	4507
Normalized	8.86%	11.93%	13.84%	34.9%	15.23%	11.2%	25.49%	27.54%	11.81%	34.72%	40.66%	100%	17.84%
Standard Deviation	0%	0%	0.6%	0.6%	0%	2%	0%	0.2%	0.3%	0.1%	0.1%	0%	0.6%
SciMark - Composite (Mflops)	**25.66**	41.74	48.45	139.66	50.61	39.45	155.37	167.38	31.90	125.93	195.32	**562.39**	
Normalized	4.56%	7.42%	8.62%	24.83%	9%	7.01%	27.63%	29.76%	5.67%	22.39%	34.73%	100%	
Standard Deviation	0%	0.1%	0.9%	2.1%	2.9%	0.5%	0.5%	0.3%	0.1%	0%	0%	0%	
SciMark - Monte Carlo	**13.99**	21.28	24.81	40.93	28.12	21.59	46.56	50.83	18.34	52.44	50.93	**121.61**	
Normalized	11.5%	17.5%	20.4%	33.66%	23.12%	17.75%	38.29%	41.8%	15.08%	43.12%	41.88%	100%	
Standard Deviation	0%	0%	0.6%	2.1%	2.4%	0.7%	0.6%	0.2%	0%	0%	0%	0.1%	
SciMark - F.F.T (Mflops)	**9.26**	13.80	15.56	21.26	15.46	12.75	36.92	37.09	11.36	25.79	44.83	**201.86**	
Normalized	4.59%	6.84%	7.71%	10.53%	7.66%	6.32%	18.29%	18.37%	5.63%	12.78%	22.21%	100%	
Standard Deviation	0.1%	1.7%	0.8%	0.4%	2.2%	2.3%	0%	0.2%	0.3%	0.6%	0.1%	0.1%	
SciMark - S.M.M (Mflops)	**19.55**	35.72	41.02	112.89	39.56	31.67	139.14	144.77	22.94	141.07	220.67	**653.78**	
Normalized	2.99%	5.46%	6.27%	17.27%	6.05%	4.84%	21.28%	22.14%	3.51%	21.58%	33.75%	100%	
Standard Deviation	0.1%	0.2%	0.9%	4.7%	3.1%	1.7%	1%	0.1%	0%	0%	0.1%	0%	
SciMark - D.L.M.F	**31.47**	53.38	62.10	168.10	65.43	50.12	205.74	228.98	39.70	158.34	191.92	**813.80**	
Normalized	3.87%	6.56%	7.63%	20.66%	8.04%	6.16%	25.28%	28.14%	4.88%	19.46%	23.58%	100%	
Standard Deviation	0%	0.1%	1%	2.7%	3.3%	3.4%	1.7%	0.6%	0%	0%	0.1%	0.1%	
SciMark - J.S.O.R	**54.04**	84.52	98.79	355.13	104.49	81.09	348.49	375.19	67.15	252.01	468.25	**1021**	
Normalized	5.29%	8.28%	9.68%	34.79%	10.24%	7.94%	34.14%	36.75%	6.58%	24.69%	45.87%	100%	
Standard Deviation	0%	0.1%	1%	1.1%	3%	1.6%	0.2%	0.3%	0.2%	0%	0%	0%	

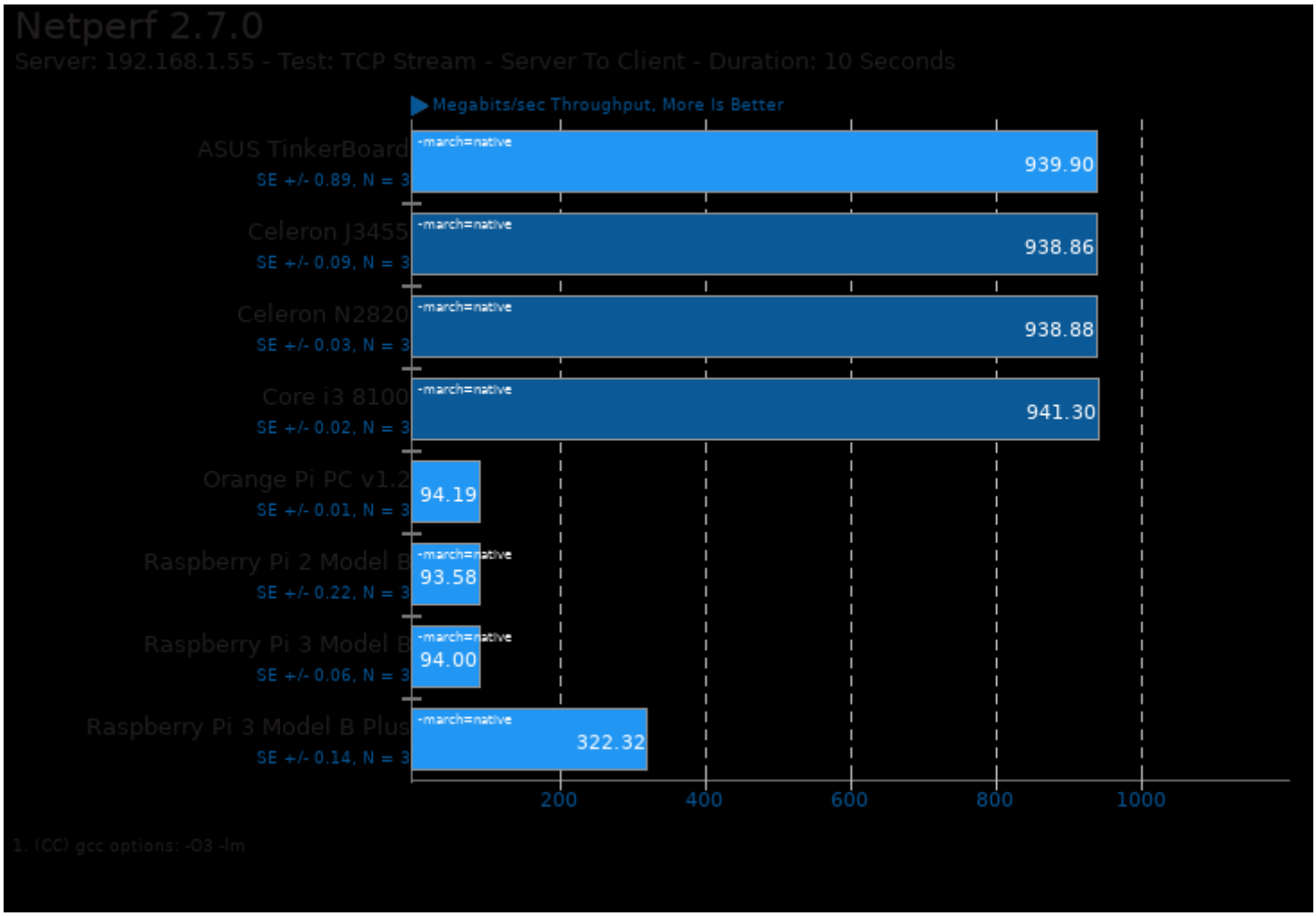
GraphicsMagick - Resizing (Iterations/min)	19	29	33	55			62	72	15	52	86	187	
Normalized	10.16%	15.51%	17.65%	29.41%			33.16%	38.5%	8.02%	27.81%	45.99%	100%	
Standard Deviation			1.8%	2.1%								0.3%	
ebizzy (Records/s)	4500	7622	8102	19200	4914	4556	22977	31865	3918	5127	9197	211417	
Normalized	2.13%	3.61%	3.83%	9.08%	2.32%	2.15%	10.87%	15.07%	1.85%	2.43%	4.35%	100%	
Standard Deviation	0.3%	1.1%	1%	2%	0.2%	10.5%	13.5%	6.9%	7%	0.4%	0.5%	0.2%	
C-Ray - Total Time (sec)	490.45	239.99	222.75	155.40	187.54	277.19	102.57	88.38	1422	252.32	71.83	21.61	181.77
Normalized	4.41%	9%	9.7%	13.91%	11.52%	7.8%	21.07%	24.45%	1.52%	8.56%	30.08%	100%	11.89%
Standard Deviation	0.3%	1.1%	1.2%	1.4%	0.8%	1%	18.6%	29.9%	0.8%	0%	0%	0.2%	3.3%
Stockfish - Total Time (ms)	68581	36549	31658	19893	22868	31725	13136	11581	52564	12859	8852	3387	23074
Normalized	4.94%	9.27%	10.7%	17.03%	14.81%	10.68%	25.78%	29.25%	6.44%	26.34%	38.26%	100%	14.68%
Standard Deviation	2.1%	0.4%	0.3%	4.6%	3.4%	1.6%	0.6%	0.7%	0.8%	0.1%	0.3%	0.1%	0.1%
AOBench - 2048 x 2048 - Total Time	668.60	333.75	285.71	192.12	271.76	353.89	165.58	144.90	654.65	190.10	109.23	44.87	241.10
Normalized	6.71%	13.44%	15.7%	23.36%	16.51%	12.68%	27.1%	30.97%	6.85%	23.6%	41.08%	100%	18.61%
Standard Deviation	0.3%	0.3%	0.3%	0.1%	2.4%	0.2%	0.2%	0.1%	0%	0.1%	0%	0%	0.1%
LAME MP3 Encoding - WAV To MP3	513.43	351.98	301.79	145.61	271.78	350.38	112.70	104.13	400.22	124.38	85.63	33.59	274.23
Normalized	6.54%	9.54%	11.13%	23.07%	12.36%	9.59%	29.8%	32.26%	8.39%	27.01%	39.23%	100%	12.25%
Standard Deviation	0%	0.1%	0.3%	0.1%	2.9%	0.1%	0.1%	0.4%	0.1%	0%	0.1%	0%	0.2%
Perl Benchmarks - Pod2html (sec)	2.4578 0646	1.3402 7781	1.1644 0876	0.7131 0443	1.1302 5050	1.4203 6821	0.5934 2906	0.5395 0171	2.1398 4966	0.6702 2559	0.4520 4529	0.1320 2331	1.3640 2462
Normalized	5.37%	9.85%	11.34%	18.51%	11.68%	9.3%	22.25%	24.47%	6.17%	19.7%	29.21%	100%	9.68%
Standard Deviation	0.5%	0.3%	0.7%	6.5%	5.6%	0.4%	0.9%	0.9%	4.5%	0.1%	0.2%	0.8%	0.2%
Perl Benchmarks - Interpreter	0.0126 5626	0.0070 1593	0.0061 9301	0.0041 0594	0.0053 3560	0.0106 3092	0.0118 1083	0.0082 4671	0.0094 1563	0.0033 2811	0.0040 2343	0.0009 5108	0.0067 3521
Normalized	7.51%	13.56%	15.36%	23.16%	17.83%	8.95%	8.05%	11.53%	10.1%	28.58%	23.64%	100%	14.12%
Standard Deviation	0.3%	2%	3%	5.4%	0.1%	0.2%	2%	0.4%	1.3%	2.5%	0.8%	14.2%	0.4%
OpenSSL - R.4.b.P (Signs/sec)	25.77	52.87	29.77	85.42	81.50	60.43	109.33		16.87	56.57	215.57	1057	
Normalized	2.44%	5%	2.82%	8.08%	7.71%	5.72%	10.34%		1.6%	5.35%	20.4%	100%	
Standard Deviation	0.2%	8.6%	0.2%	9.2%	0.1%	1.8%	0.4%		0.3%	0.3%	0.2%	0%	
Redis - GET (Reqs/sec)	112559	178669	245707	315326	256306	258185	511506	644759	107875	426838	733499	3264426	265800
Normalized	3.45%	5.47%	7.53%	9.66%	7.85%	7.91%	15.67%	19.75%	3.3%	13.08%	22.47%	100%	8.14%
Standard Deviation	0.9%	2.1%	0.7%	1.3%	0.6%	1.8%	1.6%	0.6%	2.2%	1.8%	0.2%	0.2%	0.6%
Redis - SET (Reqs/sec)	66149	131098	154508	216013	172012	161472	342886	413681	64242	335119	601593	2158316	188368
Normalized	3.06%	6.07%	7.16%	10.01%	7.97%	7.48%	15.89%	19.17%	2.98%	15.53%	27.87%	100%	8.73%
Standard Deviation	1.3%	1.9%	1.1%	2.1%	2.8%	3.1%	1.1%	0.3%	2.8%	1.3%	1.9%	0.5%	2.1%

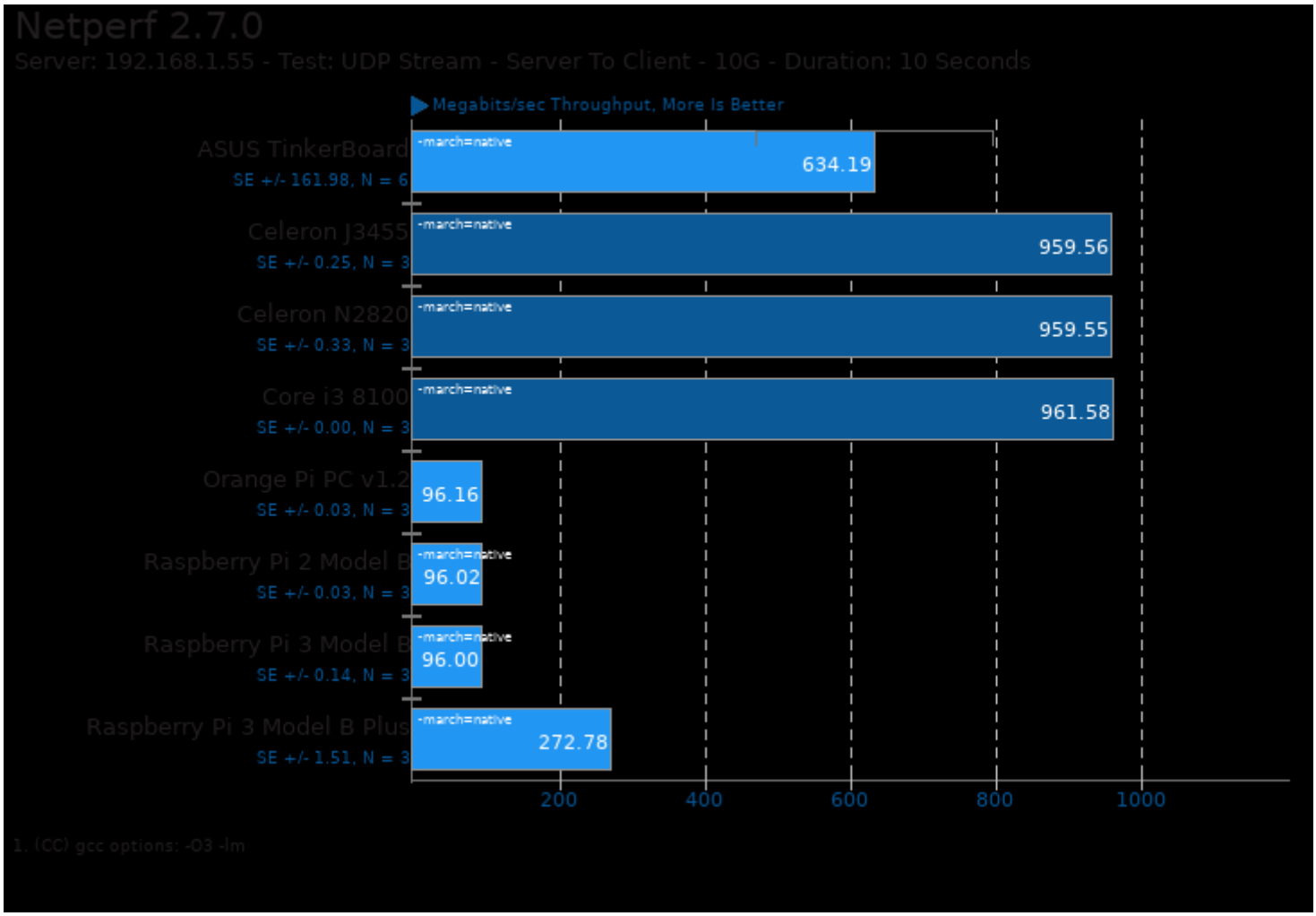
Raspberry Pi Model 3 B+ Benchmarks vs. ARM SBCs vs. x86

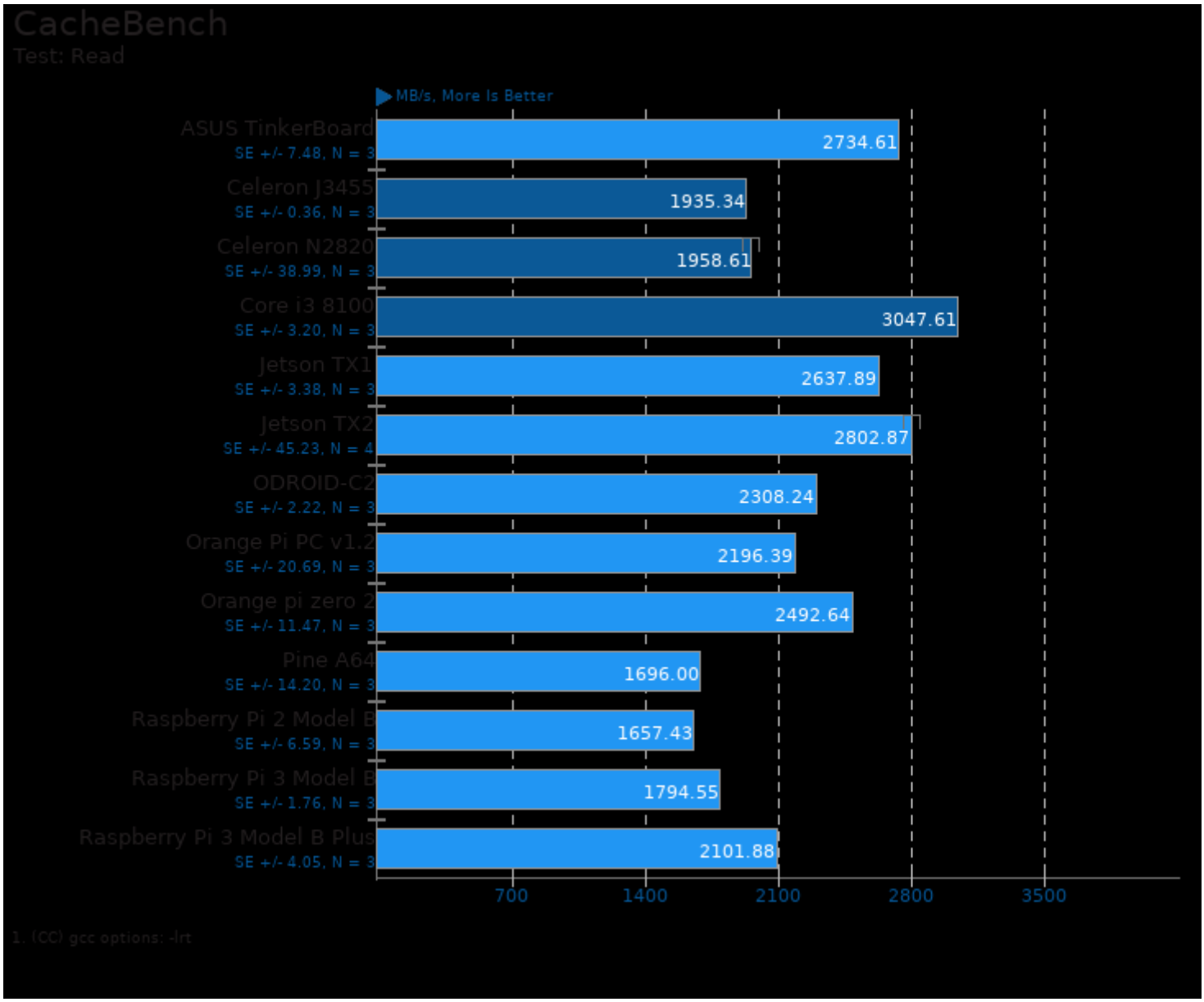
PyBench - T.F.A.T.T (Milliseconds)	**38200**	24380	20841	9273	15124	20338	6375	5808	24555	5912	4215	**1445**	12170
Normalized	3.78%	5.93%	6.93%	15.58%	9.55%	7.1%	22.67%	24.88%	5.88%	24.44%	34.28%	100%	11.87%
Standard Deviation	0.5%	0.4%	0.1%	0.3%	0.3%	0.2%	0.1%	0.2%	0.4%	0.1%	0.6%	0.7%	0.2%
PHPBench - P.B.S (Score)	20952	34682	40392	65900	47423	36986	110745	120469	**13383**	141192	208375	**537078**	76644
Normalized	3.9%	6.46%	7.52%	12.27%	8.83%	6.89%	20.62%	22.43%	2.49%	26.29%	38.8%	100%	14.27%
Standard Deviation	0.9%	0.2%	0.2%	0.1%	2.3%	0%	1.1%	0.4%	0.2%	0.1%	0.3%	0.1%	0%
Git - T.T.C.C.G.C (sec)	106.88	69.85	65.78	29.57	80.45	**162.15**	24.89	19.36	75.05	21.52	15.87	**5.73**	46.43
Normalized	5.36%	8.2%	8.71%	19.38%	7.12%	3.53%	23.02%	29.6%	7.63%	26.63%	36.11%	100%	12.34%
Standard Deviation	12.7%	7.8%	15.5%	26%	26.2%	3.4%	8.7%	8.8%	6.8%	4.1%	3.4%	0.5%	2.9%
ebizzy - P.T.S.v.8.1 (Records/s)													3994
Standard Deviation													8.5%

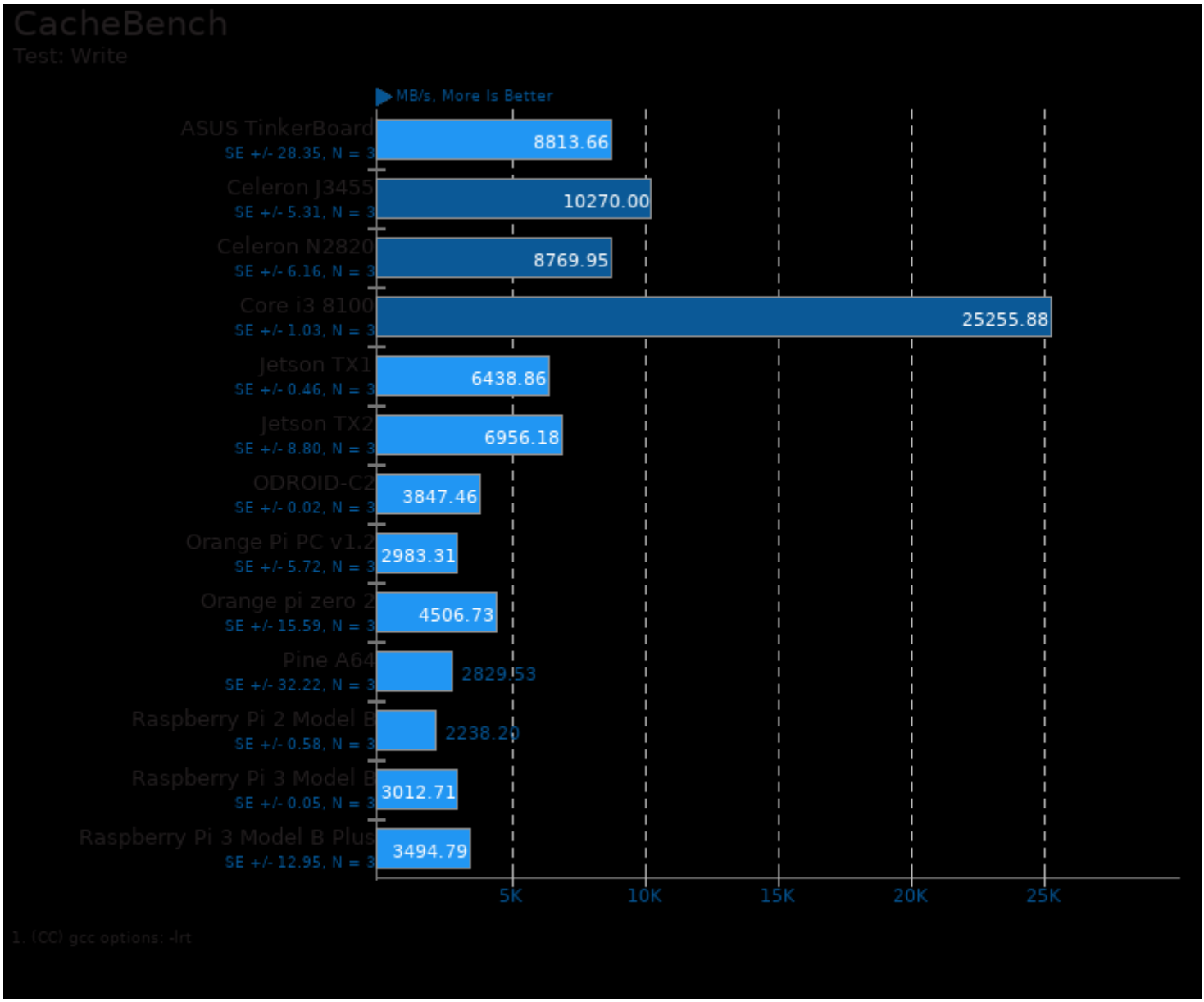

Netperf 2.7.0
Server: 192.168.1.55 - Test: TCP Send File - Duration: 10 Seconds
Megabits/sec Throughput, More Is Better
ASUS TinkerBoard
SE +/- 0.93, N = 3
-march=native
938.85
Celeron J3455
SE +/- 0.12, N = 3
-march=native
938.86
Celeron N2820
SE +/- 0.30, N = 3
-march=native
938.88
Core i3 8100
SE +/- 0.04, N = 3
-march=native
941.39
Orange Pi PC v1.2
SE +/- 0.01, N = 3
94.20
Raspberry Pi 2 Model B
SE +/- 0.05, N = 3
-march=native
93.54
Raspberry Pi 3 Model B
SE +/- 0.08, N = 3
-march=native
93.89
Raspberry Pi 3 Model B Plus
SE +/- 0.09, N = 3
-march=native
321.61
200
400
600
800
1000
1. (CC) gcc options: -O3 -lm

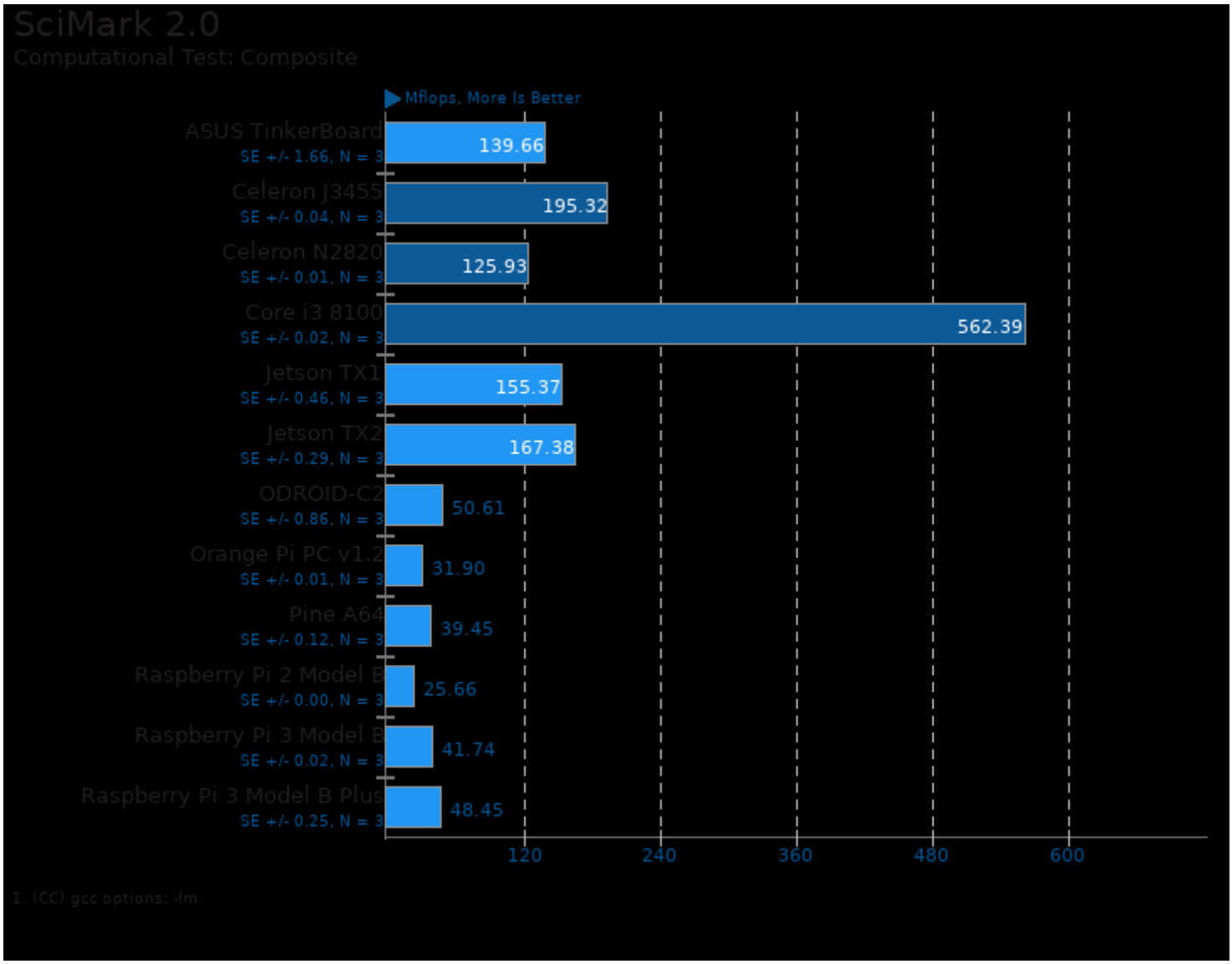

Netperf 2.7.0
Server: 192.168.1.55 - Test: TCP Stream - Client To Server - Duration: 10 Seconds
Megabits/sec Throughput, More Is Better
ASUS TinkerBoard
SE +/- 0.80, N = 3
-march=native
783.73
Celeron J3455
SE +/- 0.99, N = 3
-march=native
786.12
Celeron N2820
SE +/- 0.60, N = 3
-march=native
787.16
Core i3 8100
SE +/- 0.13, N = 3
-march=native
787.50
Orange Pi PC v1.2
SE +/- 0.00, N = 3
94.14
Raspberry Pi 2 Model B
SE +/- 0.05, N = 3
-march=native
94.05
Raspberry Pi 3 Model B
SE +/- 0.04, N = 3
-march=native
94.05
Raspberry Pi 3 Model B Plus
SE +/- 0.25, N = 3
-march=native
226.59
200
400
600
800
1000
1. (CC) gcc options: -O3 -lm

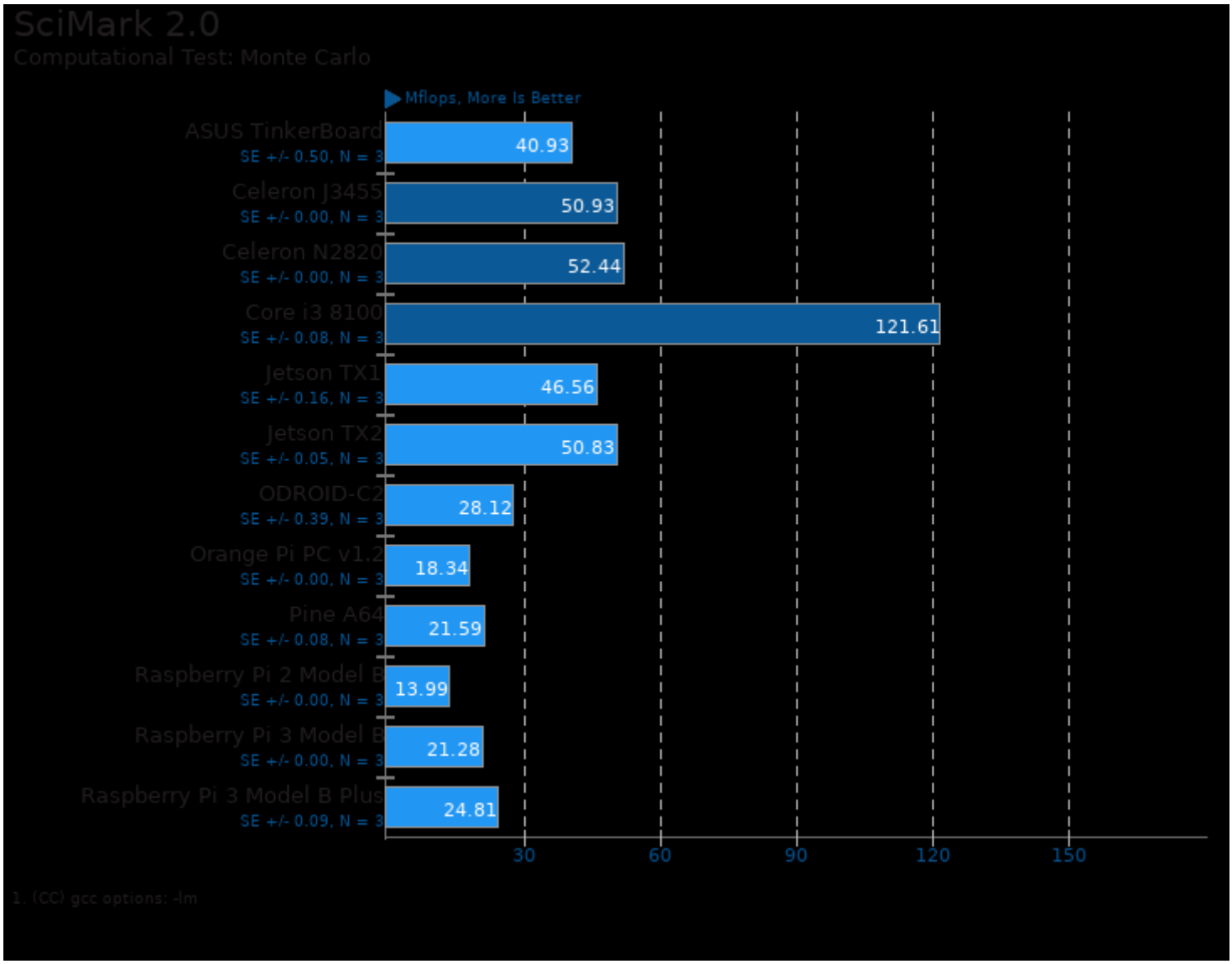

Netperf 2.7.0
Server: 192.168.1.55 - Test: TCP Stream - Server To Client - Duration: 10 Seconds
Megabits/sec Throughput, More Is Better
ASUS TinkerBoard
SE +/- 0.89, N = 3
-march=native
939.90
Celeron J3455
SE +/- 0.09, N = 3
-march=native
938.86
Celeron N2820
SE +/- 0.03, N = 3
-march=native
938.88
Core i3 8100
SE +/- 0.02, N = 3
-march=native
941.30
Orange Pi PC v1.2
SE +/- 0.01, N = 3
94.19
Raspberry Pi 2 Model B
SE +/- 0.22, N = 3
-march=native
93.58
Raspberry Pi 3 Model B
SE +/- 0.06, N = 3
-march=native
94.00
Raspberry Pi 3 Model B Plus
SE +/- 0.14, N = 3
-march=native
322.32
200
400
600
800
1000
1. (CC) gcc options: -O3 -lm

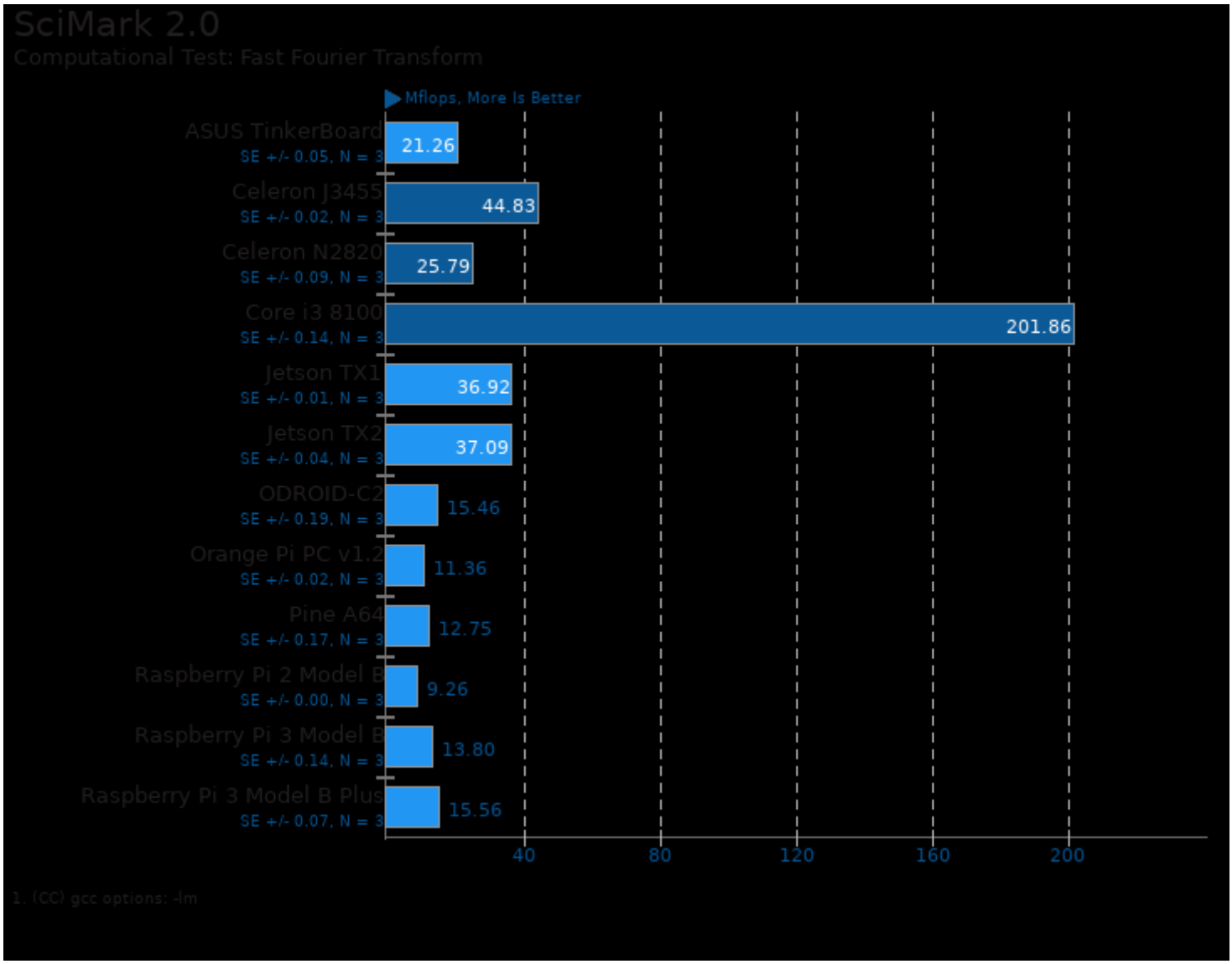

Netperf 2.7.0
Server: 192.168.1.55 - Test: UDP Stream - Server To Client - 10G - Duration: 10 Seconds
Megabits/sec Throughput, More Is Better
ASUS TinkerBoard
SE +/- 161.98, N = 6
-march=native
634.19
Celeron J3455
SE +/- 0.25, N = 3
-march=native
959.56
Celeron N2820
SE +/- 0.33, N = 3
-march=native
959.55
Core i3 8100
SE +/- 0.00, N = 3
-march=native
961.58
Orange Pi PC v1.2
SE +/- 0.03, N = 3
96.16
Raspberry Pi 2 Model B
SE +/- 0.03, N = 3
-march=native
96.02
Raspberry Pi 3 Model B
SE +/- 0.14, N = 3
-march=native
96.00
Raspberry Pi 3 Model B Plus
SE +/- 1.51, N = 3
-march=native
272.78
200
400
600
800
1000
1. (CC) gcc options: -O3 -lm

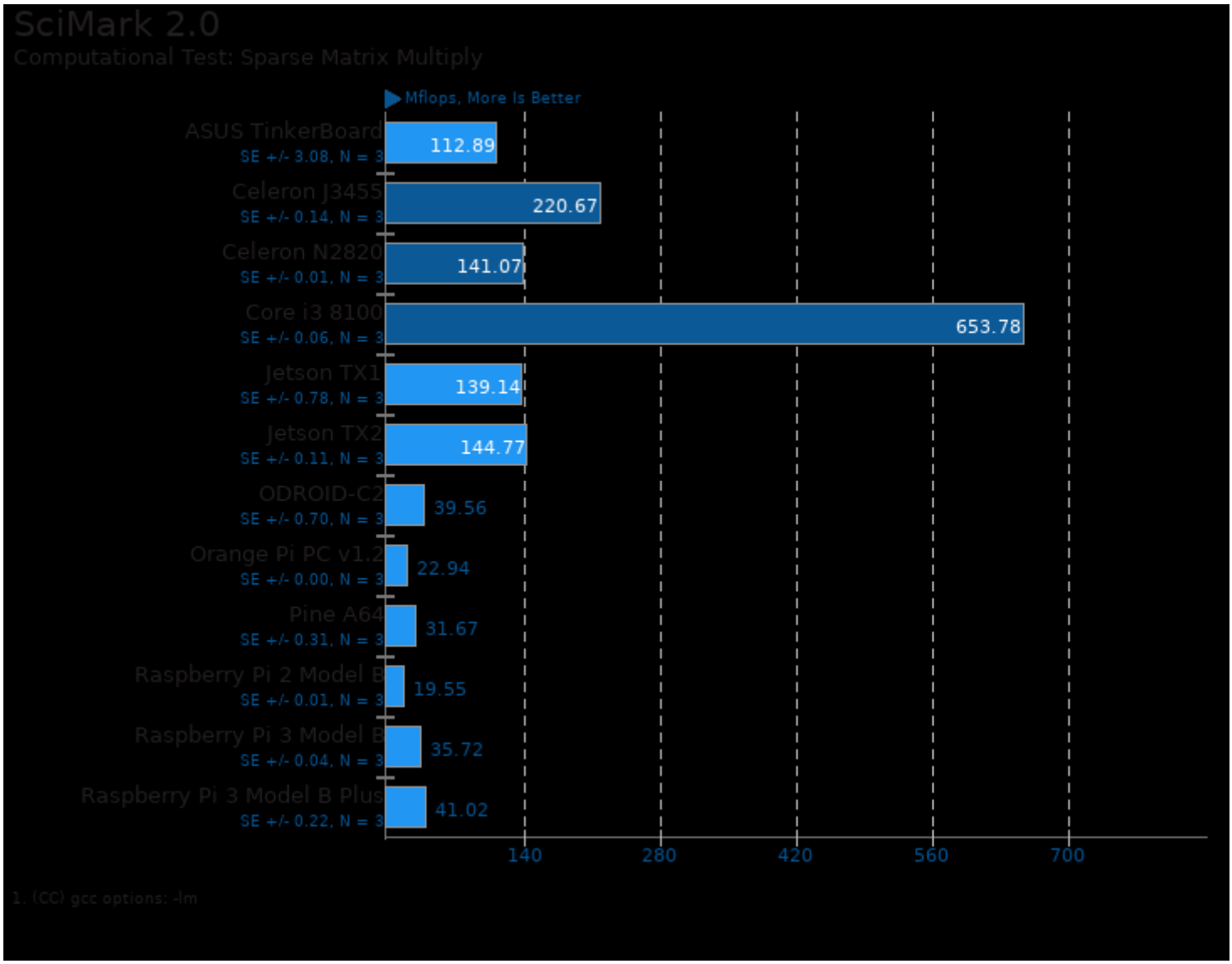

CacheBench
Test: Read
MB/s, More Is Better
ASUS TinkerBoard
SE +/- 7.48, N = 3
2734.61
Celeron J3455
SE +/- 0.36, N = 3
1935.34
Celeron N2820
SE +/- 38.99, N = 3
1958.61
Core i3 8100
SE +/- 3.20, N = 3
3047.61
Jetson TX1
SE +/- 3.38, N = 3
2637.89
Jetson TX2
SE +/- 45.23, N = 4
2802.87
ODROID-C2
SE +/- 2.22, N = 3
2308.24
Orange Pi PC v1.2
SE +/- 20.69, N = 3
2196.39
Orange pi zero 2
SE +/- 11.47, N = 3
2492.64
Pine A64
SE +/- 14.20, N = 3
1696.00
Raspberry Pi 2 Model B
SE +/- 6.59, N = 3
1657.43
Raspberry Pi 3 Model B
SE +/- 1.76, N = 3
1794.55
Raspberry Pi 3 Model B Plus
SE +/- 4.05, N = 3
2101.88
700
1400
2100
2800
3500
1. (CC) gcc options: -lrt

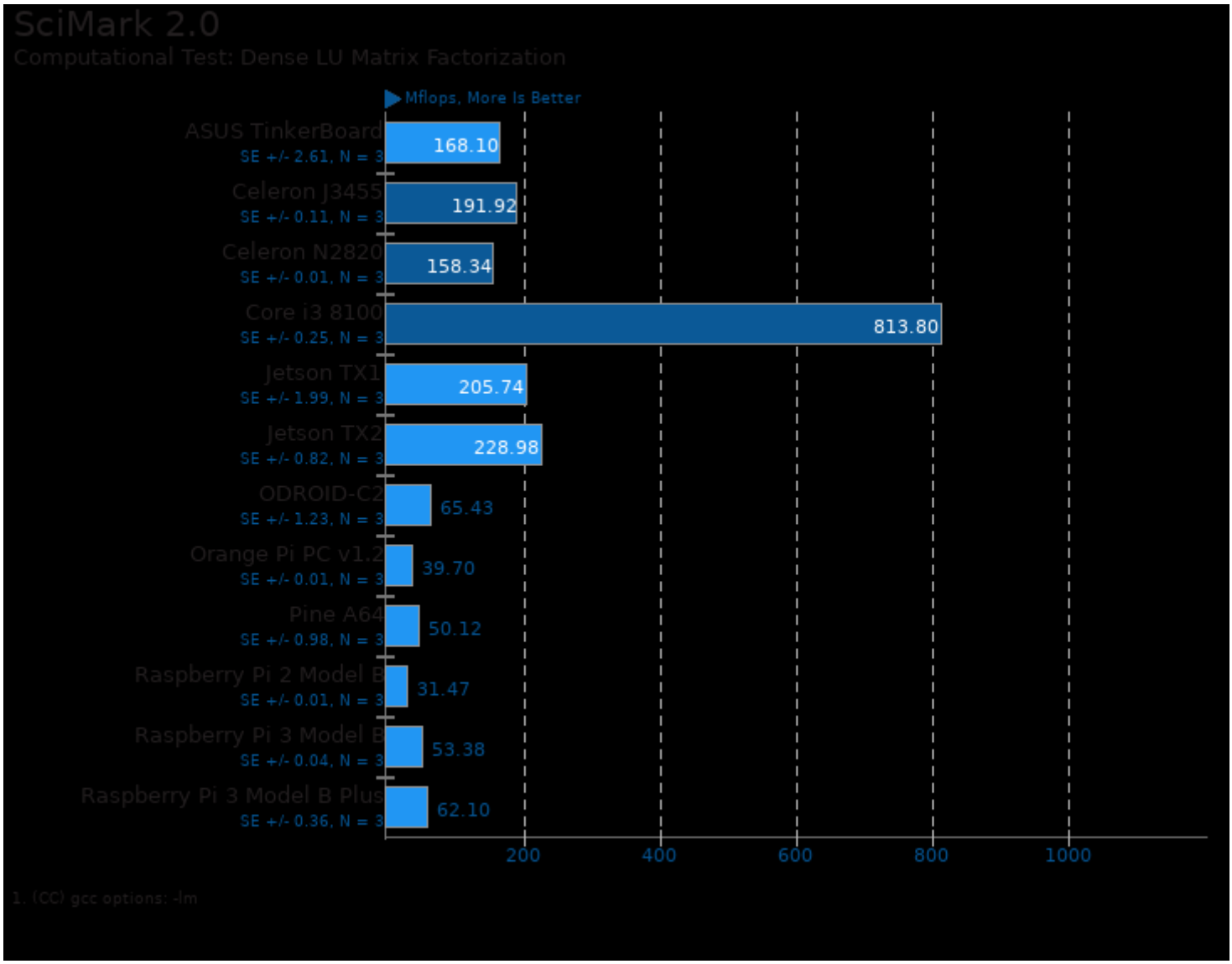

CacheBench
Test: Write
MB/s, More Is Better
ASUS TinkerBoard
SE +/- 28.35, N = 3
8813.66
Celeron J3455
SE +/- 5.31, N = 3
10270.00
Celeron N2820
SE +/- 6.16, N = 3
8769.95
Core i3 8100
SE +/- 1.03, N = 3
25255.88
Jetson TX1
SE +/- 0.46, N = 3
6438.86
Jetson TX2
SE +/- 8.80, N = 3
6956.18
ODROID-C2
SE +/- 0.02, N = 3
3847.46
Orange Pi PC v1.2
SE +/- 5.72, N = 3
2983.31
Orange pi zero 2
SE +/- 15.59, N = 3
4506.73
Pine A64
SE +/- 32.22, N = 3
2829.53
Raspberry Pi 2 Model B
SE +/- 0.58, N = 3
2238.20
Raspberry Pi 3 Model B
SE +/- 0.05, N = 3
3012.71
Raspberry Pi 3 Model B Plus
SE +/- 12.95, N = 3
3494.79
5K
10K
15K
20K
25K
1. (CC) gcc options: -lrt

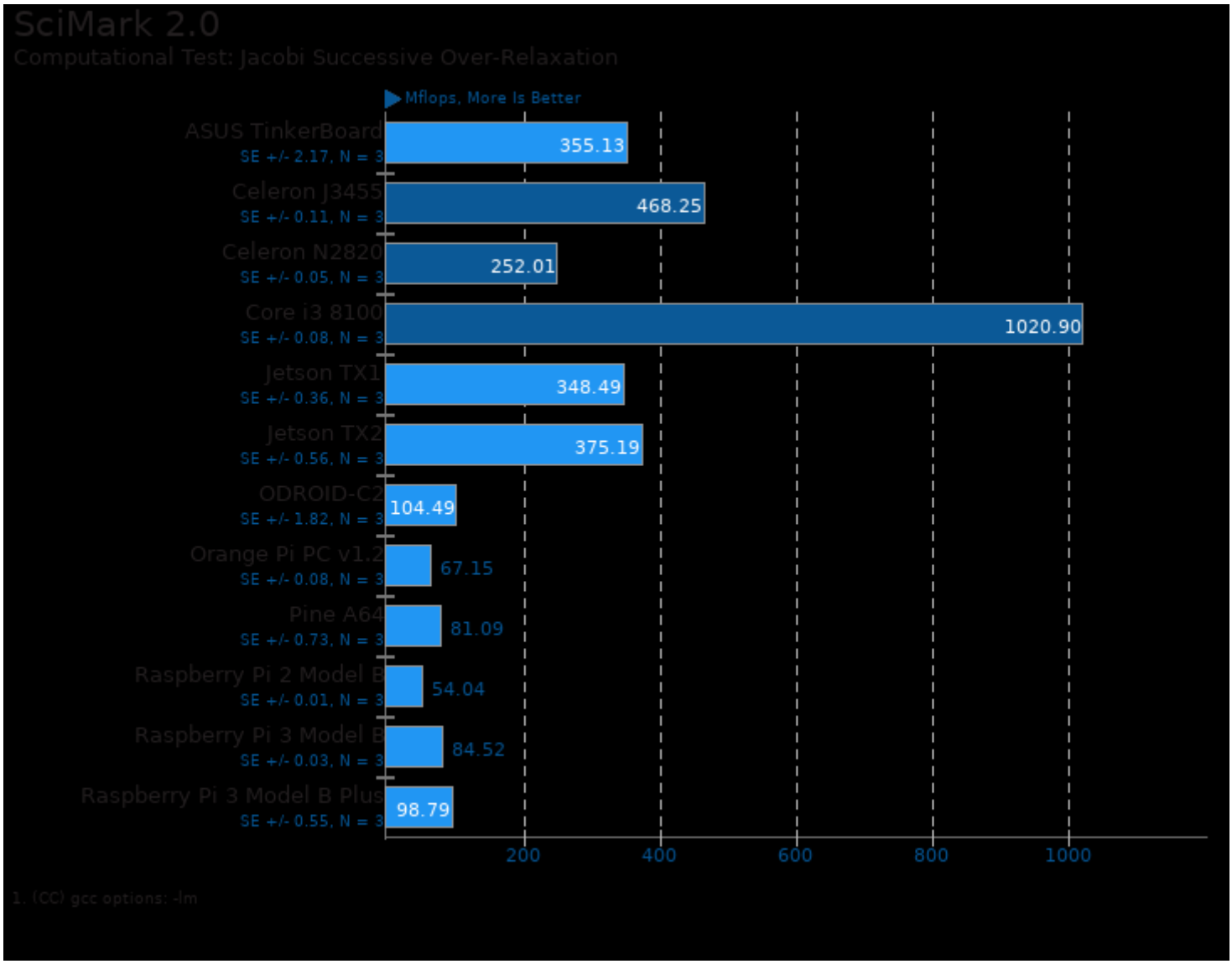

SciMark 2.0
Computational Test: Composite
Mflops, More Is Better
ASUS TinkerBoard
SE +/- 1.66, N = 3
139.66
Celeron J3455
SE +/- 0.04, N = 3
195.32
Celeron N2820
SE +/- 0.01, N = 3
125.93
Core i3 8100
SE +/- 0.02, N = 3
562.39
Jetson TX1
SE +/- 0.46, N = 3
155.37
Jetson TX2
SE +/- 0.29, N = 3
167.38
ODROID-C2
SE +/- 0.86, N = 3
50.61
Orange Pi PC v1.2
SE +/- 0.01, N = 3
31.90
Pine A64
SE +/- 0.12, N = 3
39.45
Raspberry Pi 2 Model B
SE +/- 0.00, N = 3
25.66
Raspberry Pi 3 Model B
SE +/- 0.02, N = 3
41.74
Raspberry Pi 3 Model B Plus
SE +/- 0.25, N = 3
48.45
120
240
360
480
600
1. (CC) gcc options: -lm

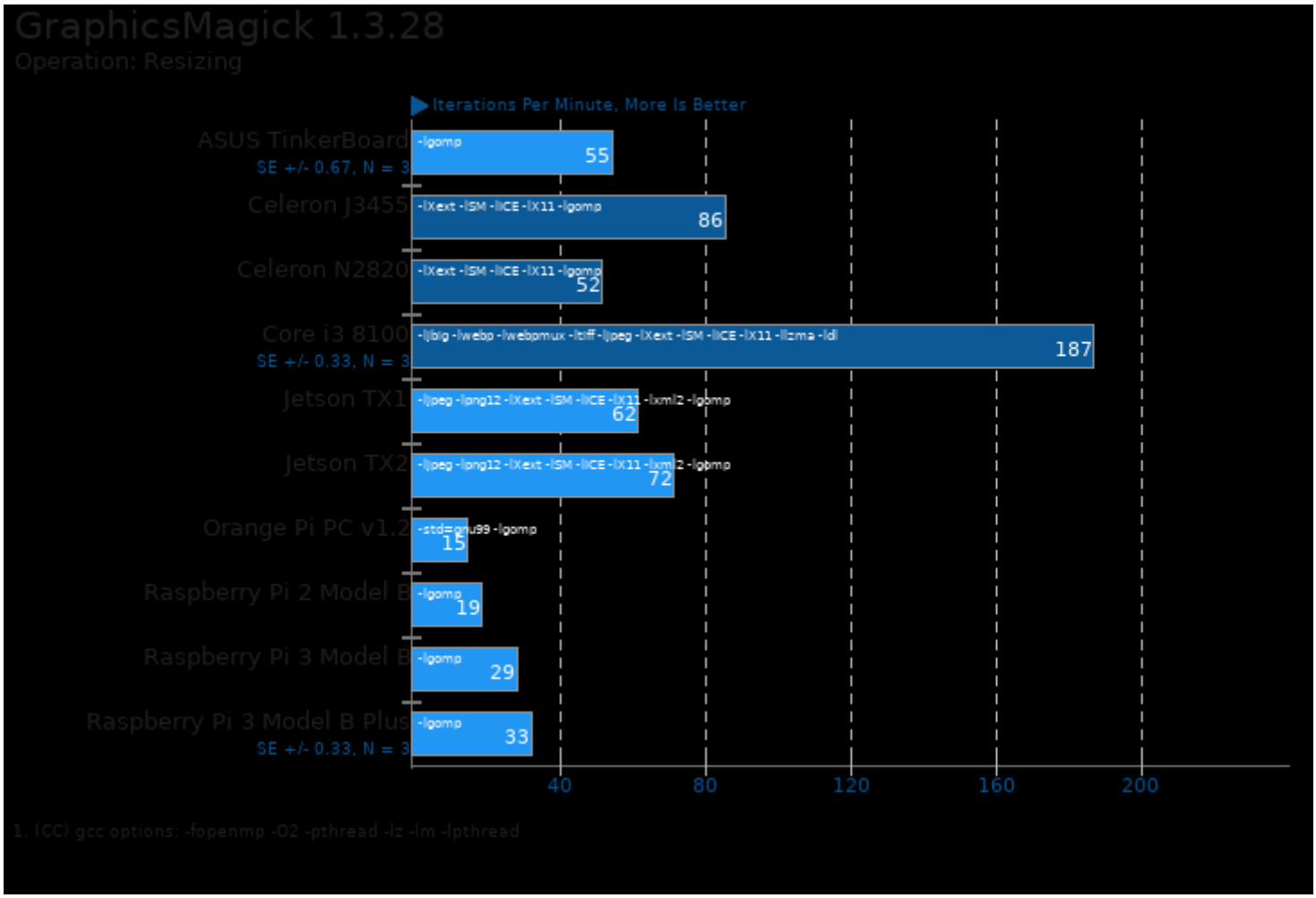

SciMark 2.0
Computational Test: Monte Carlo
Mflops, More Is Better
ASUS TinkerBoard
SE +/- 0.50, N = 3
40.93
Celeron J3455
SE +/- 0.00, N = 3
50.93
Celeron N2820
SE +/- 0.00, N = 3
52.44
Core i3 8100
SE +/- 0.08, N = 3
121.61
Jetson TX1
SE +/- 0.16, N = 3
46.56
Jetson TX2
SE +/- 0.05, N = 3
50.83
ODROID-C2
SE +/- 0.39, N = 3
28.12
Orange Pi PC v1.2
SE +/- 0.00, N = 3
18.34
Pine A64
SE +/- 0.08, N = 3
21.59
Raspberry Pi 2 Model B
SE +/- 0.00, N = 3
13.99
Raspberry Pi 3 Model B
SE +/- 0.00, N = 3
21.28
Raspberry Pi 3 Model B Plus
SE +/- 0.09, N = 3
24.81
30
60
90
120
150
1. (CC) gcc options: -lm

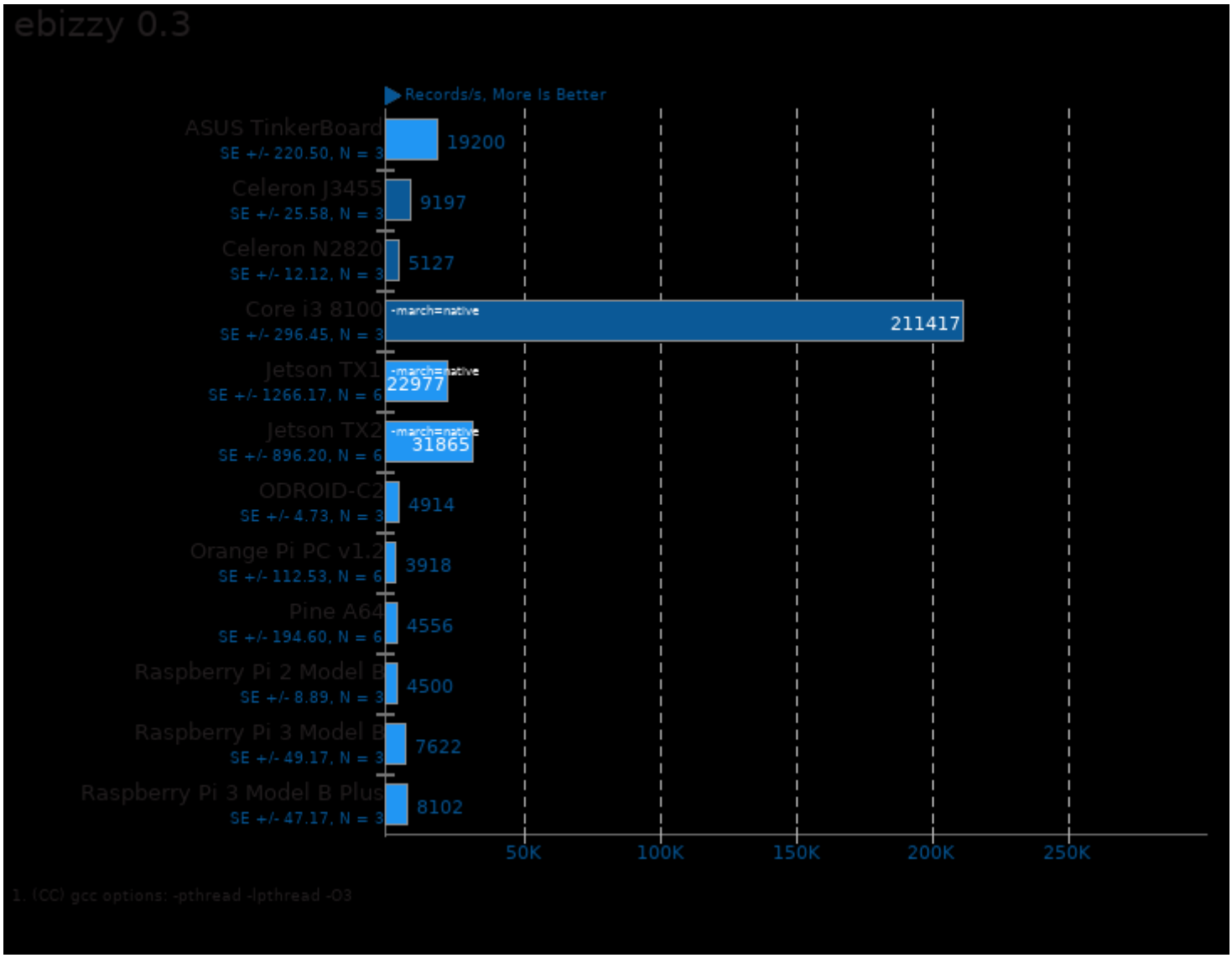

SciMark 2.0
Computational Test: Fast Fourier Transform
Mflops, More Is Better
ASUS TinkerBoard
SE +/- 0.05, N = 3
21.26
Celeron J3455
SE +/- 0.02, N = 3
44.83
Celeron N2820
SE +/- 0.09, N = 3
25.79
Core i3 8100
SE +/- 0.14, N = 3
201.86
Jetson TX1
SE +/- 0.01, N = 3
36.92
Jetson TX2
SE +/- 0.04, N = 3
37.09
ODROID-C2
SE +/- 0.19, N = 3
15.46
Orange Pi PC v1.2
SE +/- 0.02, N = 3
11.36
Pine A64
SE +/- 0.17, N = 3
12.75
Raspberry Pi 2 Model B
SE +/- 0.00, N = 3
9.26
Raspberry Pi 3 Model B
SE +/- 0.14, N = 3
13.80
Raspberry Pi 3 Model B Plus
SE +/- 0.07, N = 3
15.56
40
80
120
160
200
1. (CC) gcc options: -lm

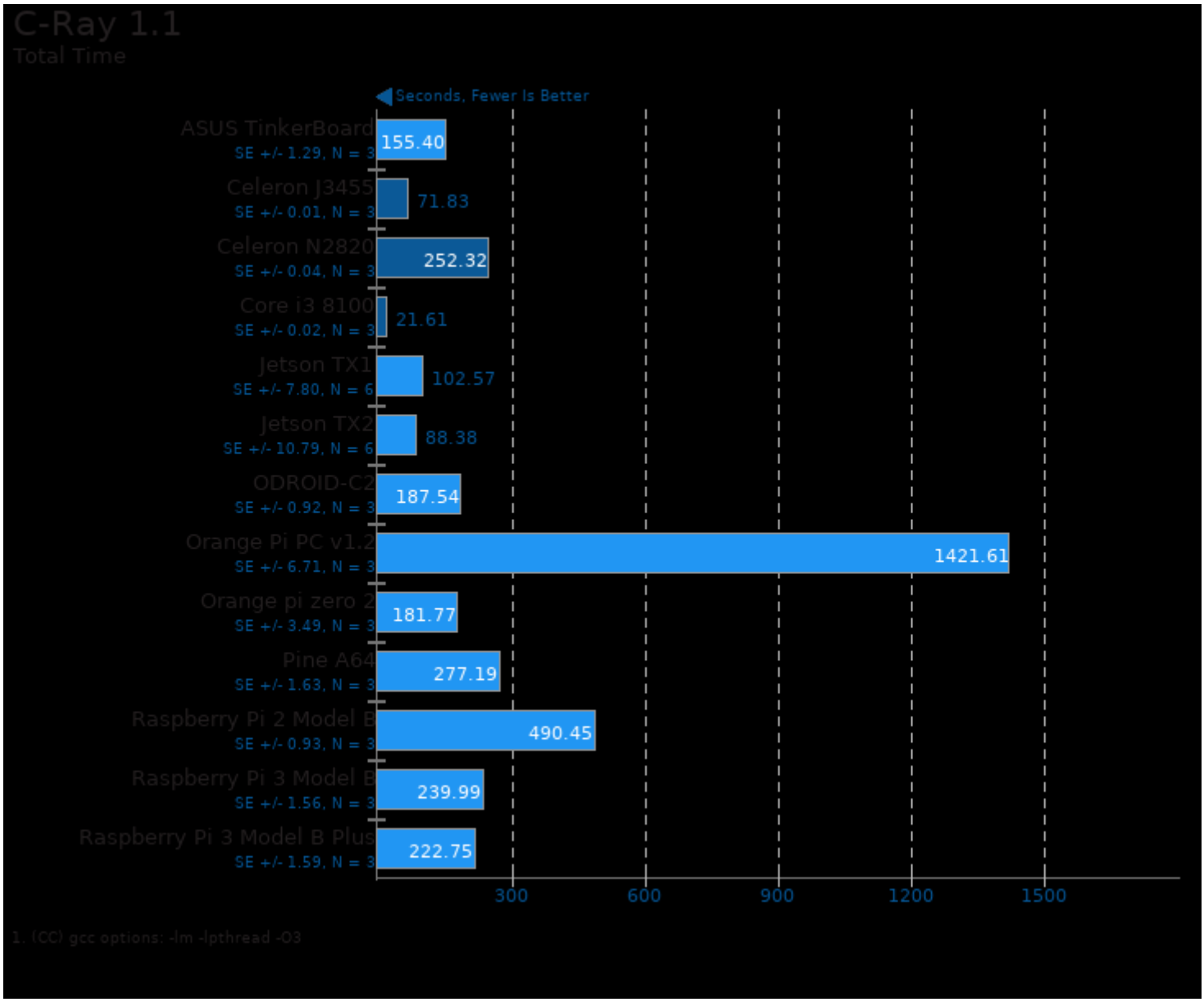

SciMark 2.0
Computational Test: Sparse Matrix Multiply
Mflops, More Is Better
ASUS TinkerBoard
SE +/- 3.08, N = 3
112.89
Celeron J3455
SE +/- 0.14, N = 3
220.67
Celeron N2820
SE +/- 0.01, N = 3
141.07
Core i3 8100
SE +/- 0.06, N = 3
653.78
Jetson TX1
SE +/- 0.78, N = 3
139.14
Jetson TX2
SE +/- 0.11, N = 3
144.77
ODROID-C2
SE +/- 0.70, N = 3
39.56
Orange Pi PC v1.2
SE +/- 0.00, N = 3
22.94
Pine A64
SE +/- 0.31, N = 3
31.67
Raspberry Pi 2 Model B
SE +/- 0.01, N = 3
19.55
Raspberry Pi 3 Model B
SE +/- 0.04, N = 3
35.72
Raspberry Pi 3 Model B Plus
SE +/- 0.22, N = 3
41.02
140
280
420
560
700
1. (CC) gcc options: -lm

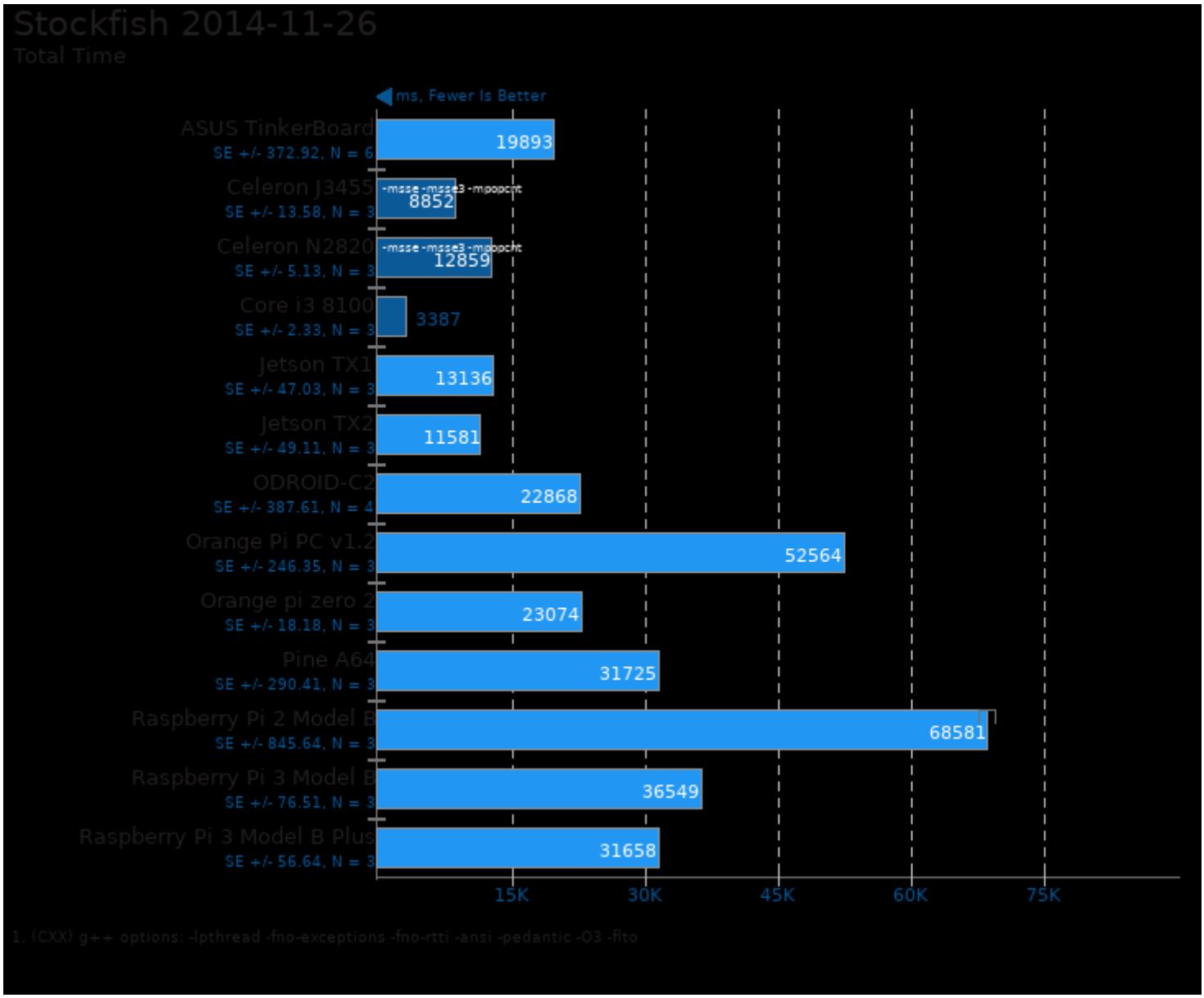

SciMark 2.0
Computational Test: Dense LU Matrix Factorization
Mflops, More Is Better
ASUS TinkerBoard
SE +/- 2.61, N = 3
168.10
Celeron J3455
SE +/- 0.11, N = 3
191.92
Celeron N2820
SE +/- 0.01, N = 3
158.34
Core i3 8100
SE +/- 0.25, N = 3
813.80
Jetson TX1
SE +/- 1.99, N = 3
205.74
Jetson TX2
SE +/- 0.82, N = 3
228.98
ODROID-C2
SE +/- 1.23, N = 3
65.43
Orange Pi PC v1.2
SE +/- 0.01, N = 3
39.70
Pine A64
SE +/- 0.98, N = 3
50.12
Raspberry Pi 2 Model B
SE +/- 0.01, N = 3
31.47
Raspberry Pi 3 Model B
SE +/- 0.04, N = 3
53.38
Raspberry Pi 3 Model B Plus
SE +/- 0.36, N = 3
62.10
200
400
600
800
1000
1. (CC) gcc options: -lm

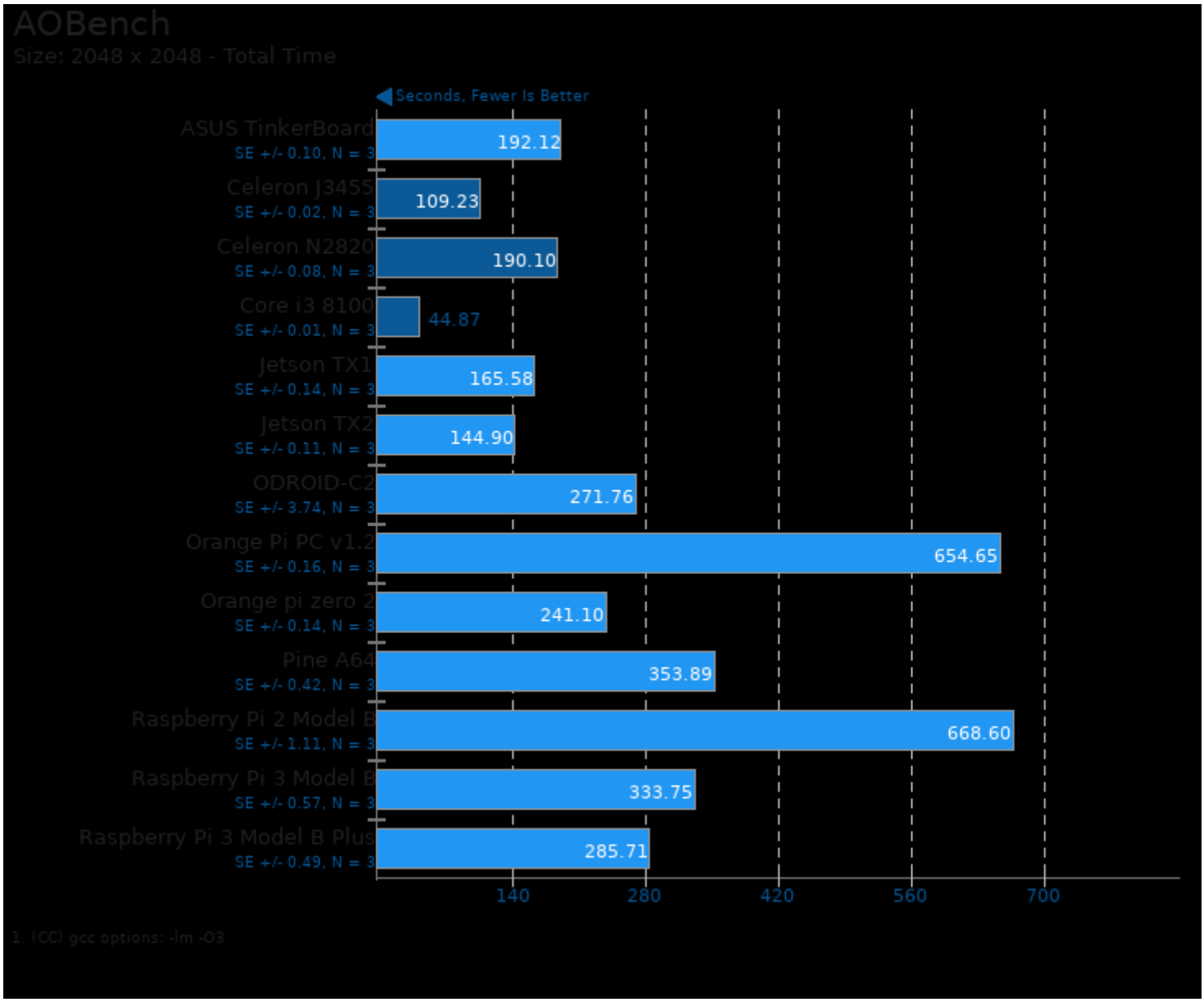

SciMark 2.0
Computational Test: Jacobi Successive Over-Relaxation
Mflops, More Is Better
ASUS TinkerBoard
SE +/- 2.17, N = 3
355.13
Celeron J3455
SE +/- 0.11, N = 3
468.25
Celeron N2820
SE +/- 0.05, N = 3
252.01
Core i3 8100
SE +/- 0.08, N = 3
1020.90
Jetson TX1
SE +/- 0.36, N = 3
348.49
Jetson TX2
SE +/- 0.56, N = 3
375.19
ODROID-C2
SE +/- 1.82, N = 3
104.49
Orange Pi PC v1.2
SE +/- 0.08, N = 3
67.15
Pine A64
SE +/- 0.73, N = 3
81.09
Raspberry Pi 2 Model B
SE +/- 0.01, N = 3
54.04
Raspberry Pi 3 Model B
SE +/- 0.03, N = 3
84.52
Raspberry Pi 3 Model B Plus
SE +/- 0.55, N = 3
98.79
200
400
600
800
1000
1. (CC) gcc options: -lm

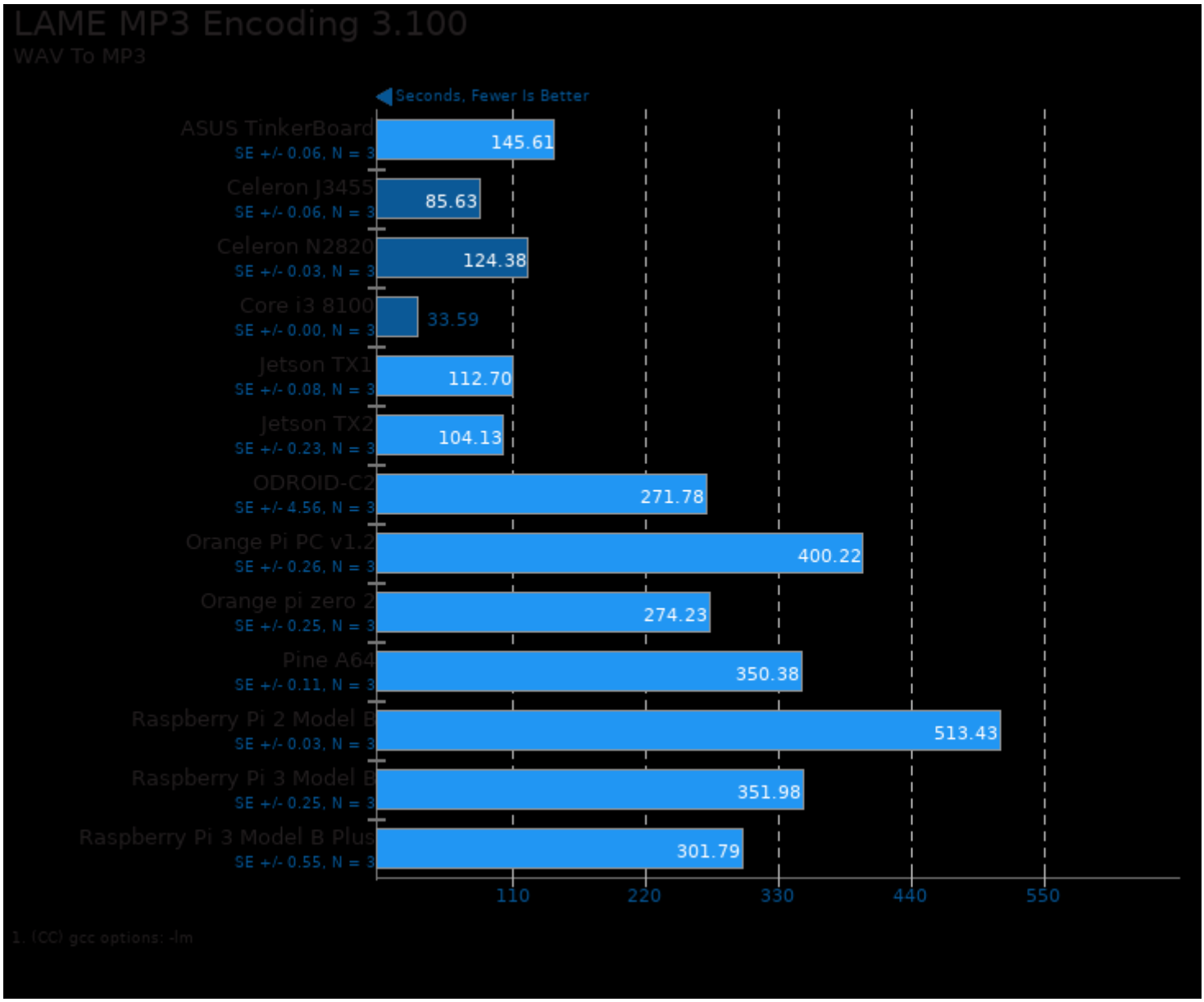

GraphicsMagick 1.3.28
Operation: Resizing
Iterations Per Minute, More Is Better
ASUS TinkerBoard
SE +/- 0.67, N = 3
-lgomp
55
Celeron J3455
-lXext -lSM -lICE -lX11 -lgomp
86
Celeron N2820
-lXext -lSM -lICE -lX11 -lgomp
52
Core i3 8100
SE +/- 0.33, N = 3
-ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lSM -lICE -lX11 -llzma -ldl
187
Jetson TX1
-ljpeg -lpng12 -lXext -lSM -lICE -lX11 -lxml2 -lgomp
62
Jetson TX2
-ljpeg -lpng12 -lXext -lSM -lICE -lX11 -lxml2 -lgomp
72
Orange Pi PC v1.2
-std=gnu99 -lgomp
15
Raspberry Pi 2 Model B
-lgomp
19
Raspberry Pi 3 Model B
-lgomp
29
Raspberry Pi 3 Model B Plus
SE +/- 0.33, N = 3
-lgomp
33
40
80
120
160
200
1. (CC) gcc options: -fopenmp -O2 -pthread -lz -lm -lpthread

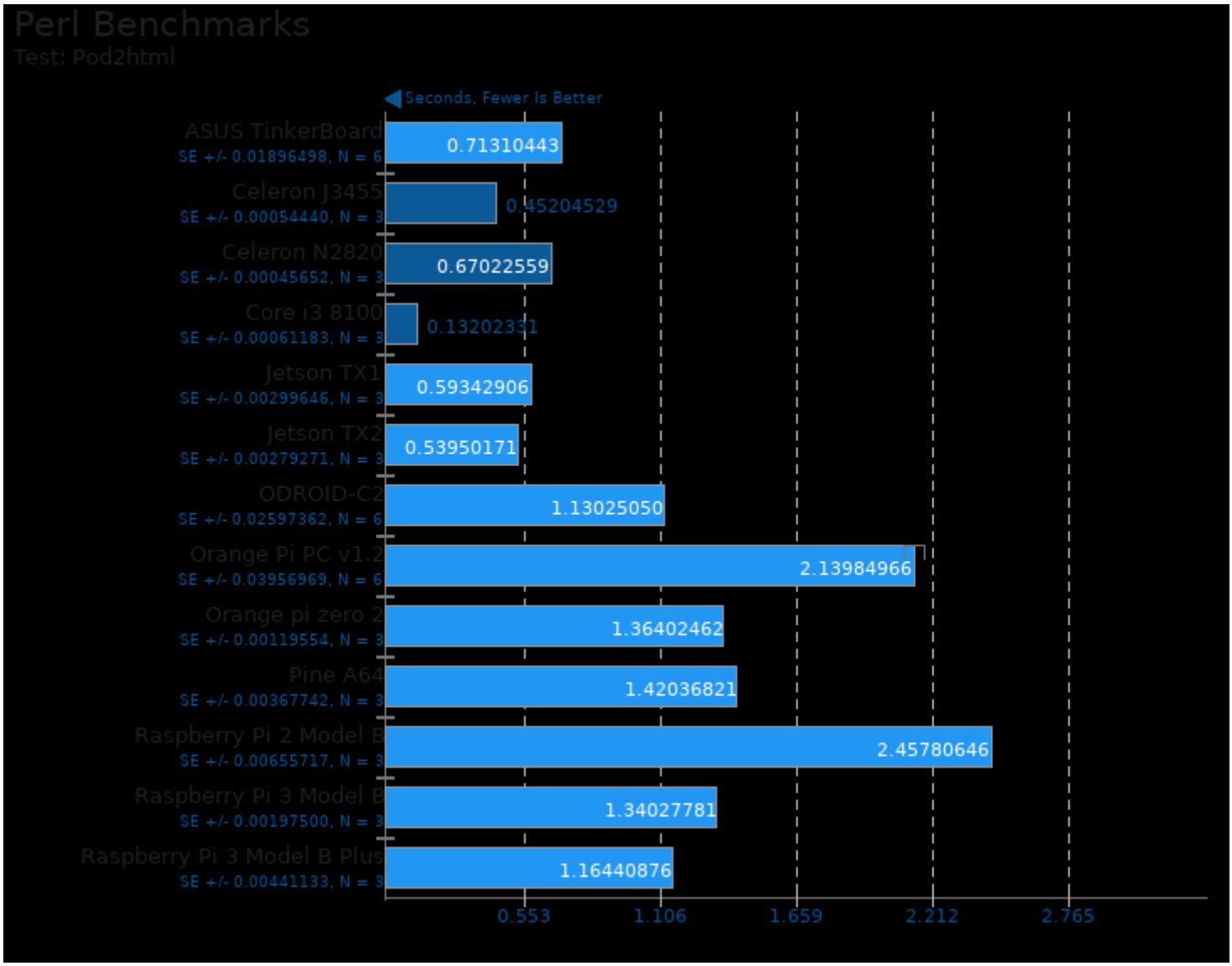

ebizzy 0.3
Records/s, More Is Better
ASUS TinkerBoard
SE +/- 220.50, N = 3
19200
Celeron J3455
SE +/- 25.58, N = 3
9197
Celeron N2820
SE +/- 12.12, N = 3
5127
Core i3 8100
SE +/- 296.45, N = 3
-march=native
211417
Jetson TX1
SE +/- 1266.17, N = 6
-march=native
22977
Jetson TX2
SE +/- 896.20, N = 6
-march=native
31865
ODROID-C2
SE +/- 4.73, N = 3
4914
Orange Pi PC v1.2
SE +/- 112.53, N = 6
3918
Pine A64
SE +/- 194.60, N = 6
4556
Raspberry Pi 2 Model B
SE +/- 8.89, N = 3
4500
Raspberry Pi 3 Model B
SE +/- 49.17, N = 3
7622
Raspberry Pi 3 Model B Plus
SE +/- 47.17, N = 3
8102
50K
100K
150K
200K
250K
1. (CC) gcc options: -pthread -lpthread -O3

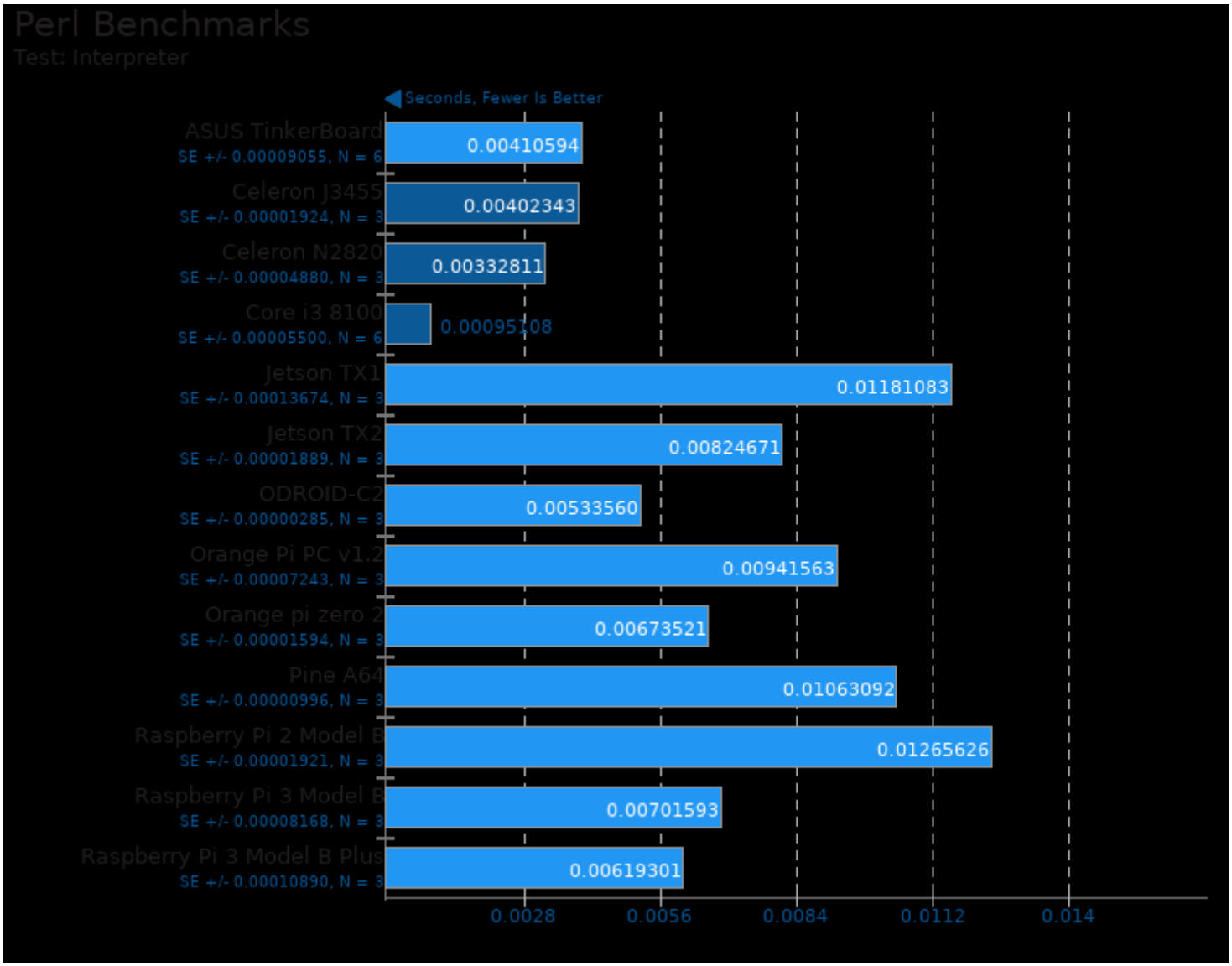

C-Ray 1.1
Total Time
Seconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 1.29, N = 3
155.40
Celeron J3455
SE +/- 0.01, N = 3
71.83
Celeron N2820
SE +/- 0.04, N = 3
252.32
Core i3 8100
SE +/- 0.02, N = 3
21.61
Jetson TX1
SE +/- 7.80, N = 6
102.57
Jetson TX2
SE +/- 10.79, N = 6
88.38
ODROID-C2
SE +/- 0.92, N = 3
187.54
Orange Pi PC v1.2
SE +/- 6.71, N = 3
1421.61
Orange pi zero 2
SE +/- 3.49, N = 3
181.77
Pine A64
SE +/- 1.63, N = 3
277.19
Raspberry Pi 2 Model B
SE +/- 0.93, N = 3
490.45
Raspberry Pi 3 Model B
SE +/- 1.56, N = 3
239.99
Raspberry Pi 3 Model B Plus
SE +/- 1.59, N = 3
222.75
300
600
900
1200
1500
1. (CC) gcc options: -lm -lpthread -O3

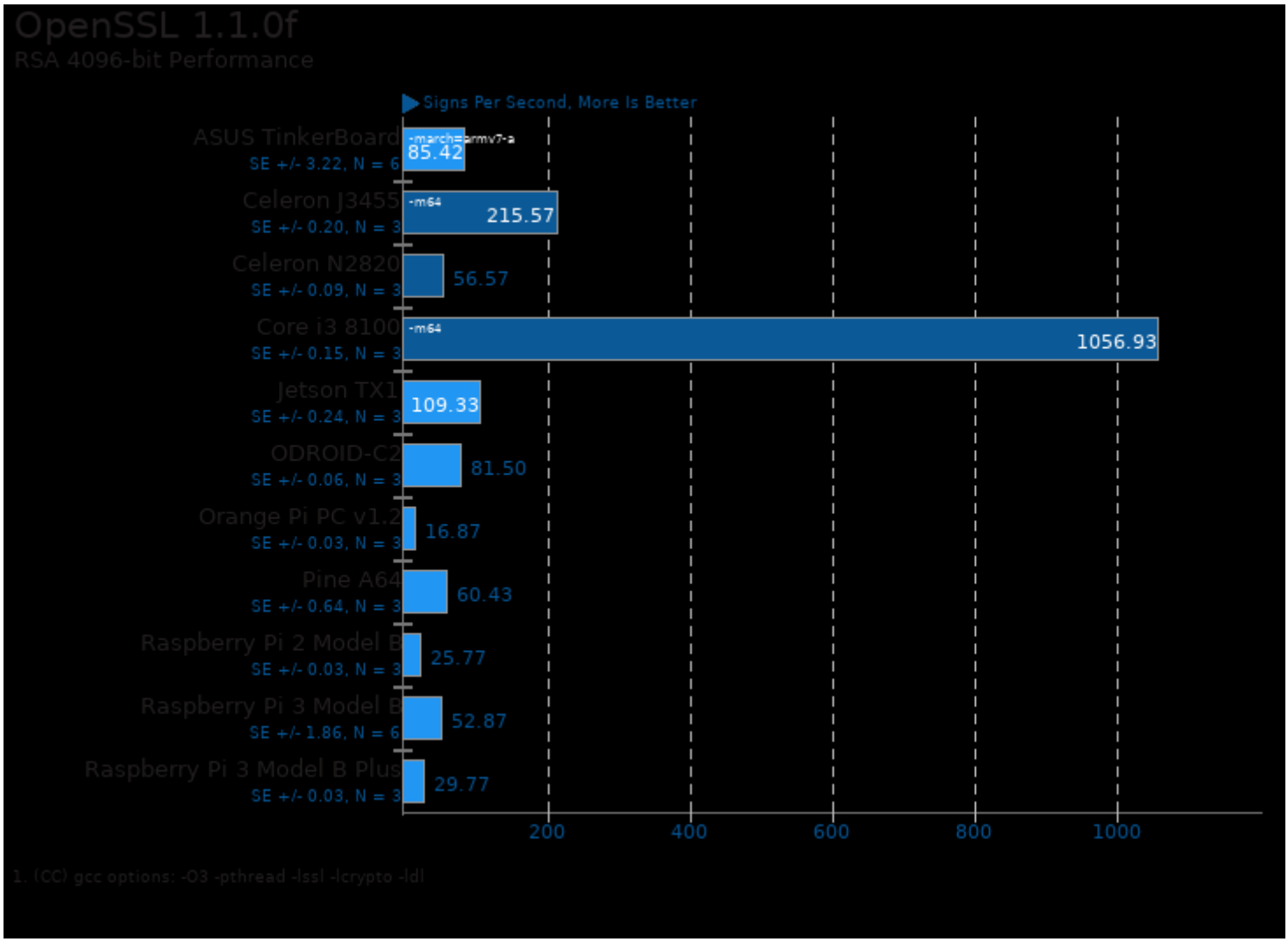

Stockfish 2014-11-26
Total Time
ms, Fewer Is Better
ASUS TinkerBoard
SE +/- 372.92, N = 6
19893
Celeron J3455
SE +/- 13.58, N = 3
-msse -msse3 -mpopcnt
8852
Celeron N2820
SE +/- 5.13, N = 3
-msse -msse3 -mpopcnt
12859
Core i3 8100
SE +/- 2.33, N = 3
3387
Jetson TX1
SE +/- 47.03, N = 3
13136
Jetson TX2
SE +/- 49.11, N = 3
11581
ODROID-C2
SE +/- 387.61, N = 4
22868
Orange Pi PC v1.2
SE +/- 246.35, N = 3
52564
Orange pi zero 2
SE +/- 18.18, N = 3
23074
Pine A64
SE +/- 290.41, N = 3
31725
Raspberry Pi 2 Model B
SE +/- 845.64, N = 3
68581
Raspberry Pi 3 Model B
SE +/- 76.51, N = 3
36549
Raspberry Pi 3 Model B Plus
SE +/- 56.64, N = 3
31658
15K
30K
45K
60K
75K
1. (CXX) g++ options: -lpthread -fno-exceptions -fno-rtti -ansi -pedantic -O3 -flto

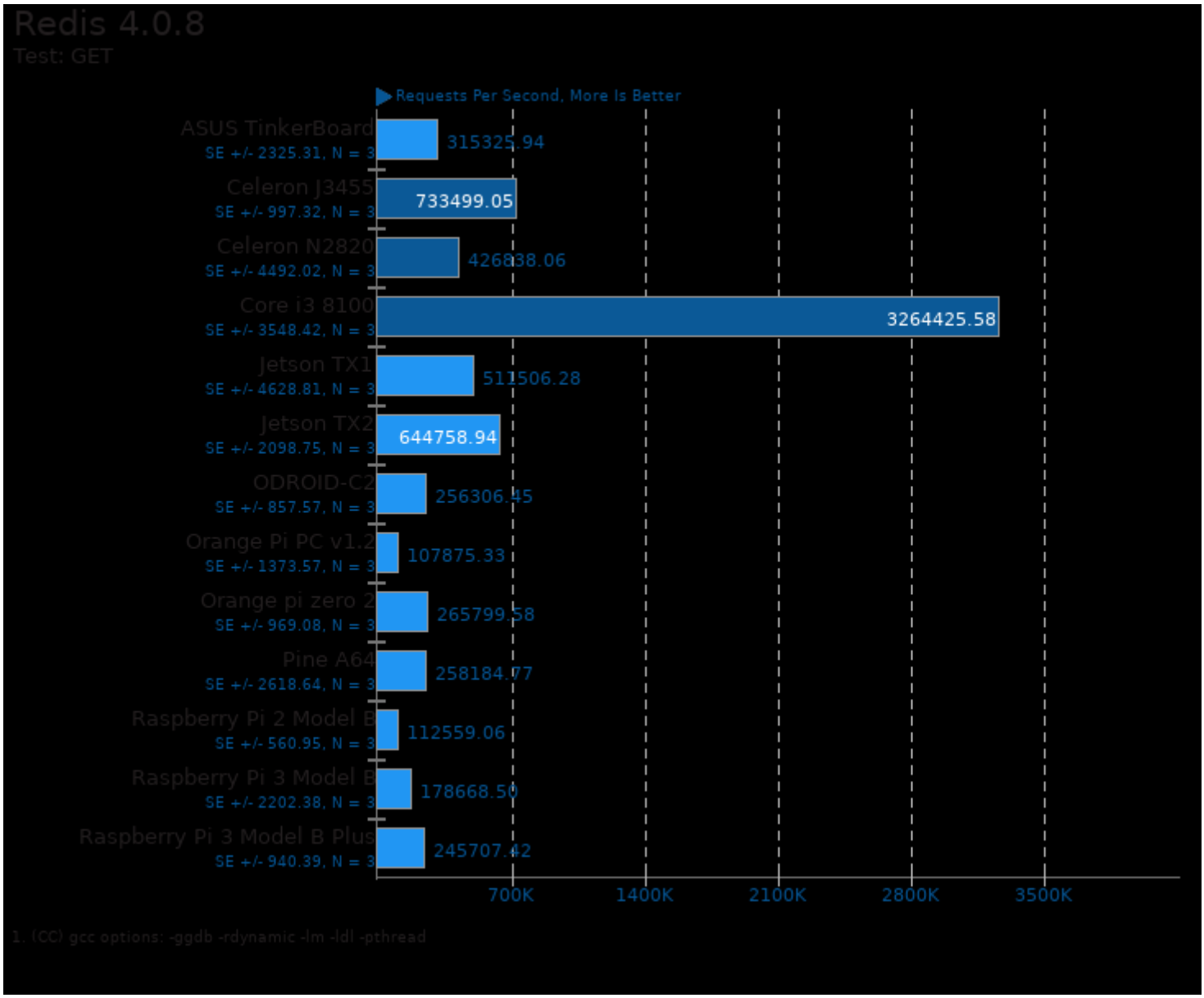

AOBench
Size: 2048 x 2048 - Total Time
Seconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 0.10, N = 3
192.12
Celeron J3455
SE +/- 0.02, N = 3
109.23
Celeron N2820
SE +/- 0.08, N = 3
190.10
Core i3 8100
SE +/- 0.01, N = 3
44.87
Jetson TX1
SE +/- 0.14, N = 3
165.58
Jetson TX2
SE +/- 0.11, N = 3
144.90
ODROID-C2
SE +/- 3.74, N = 3
271.76
Orange Pi PC v1.2
SE +/- 0.16, N = 3
654.65
Orange pi zero 2
SE +/- 0.14, N = 3
241.10
Pine A64
SE +/- 0.42, N = 3
353.89
Raspberry Pi 2 Model B
SE +/- 1.11, N = 3
668.60
Raspberry Pi 3 Model B
SE +/- 0.57, N = 3
333.75
Raspberry Pi 3 Model B Plus
SE +/- 0.49, N = 3
285.71
140
280
420
560
700
1. (CC) gcc options: -lm -O3

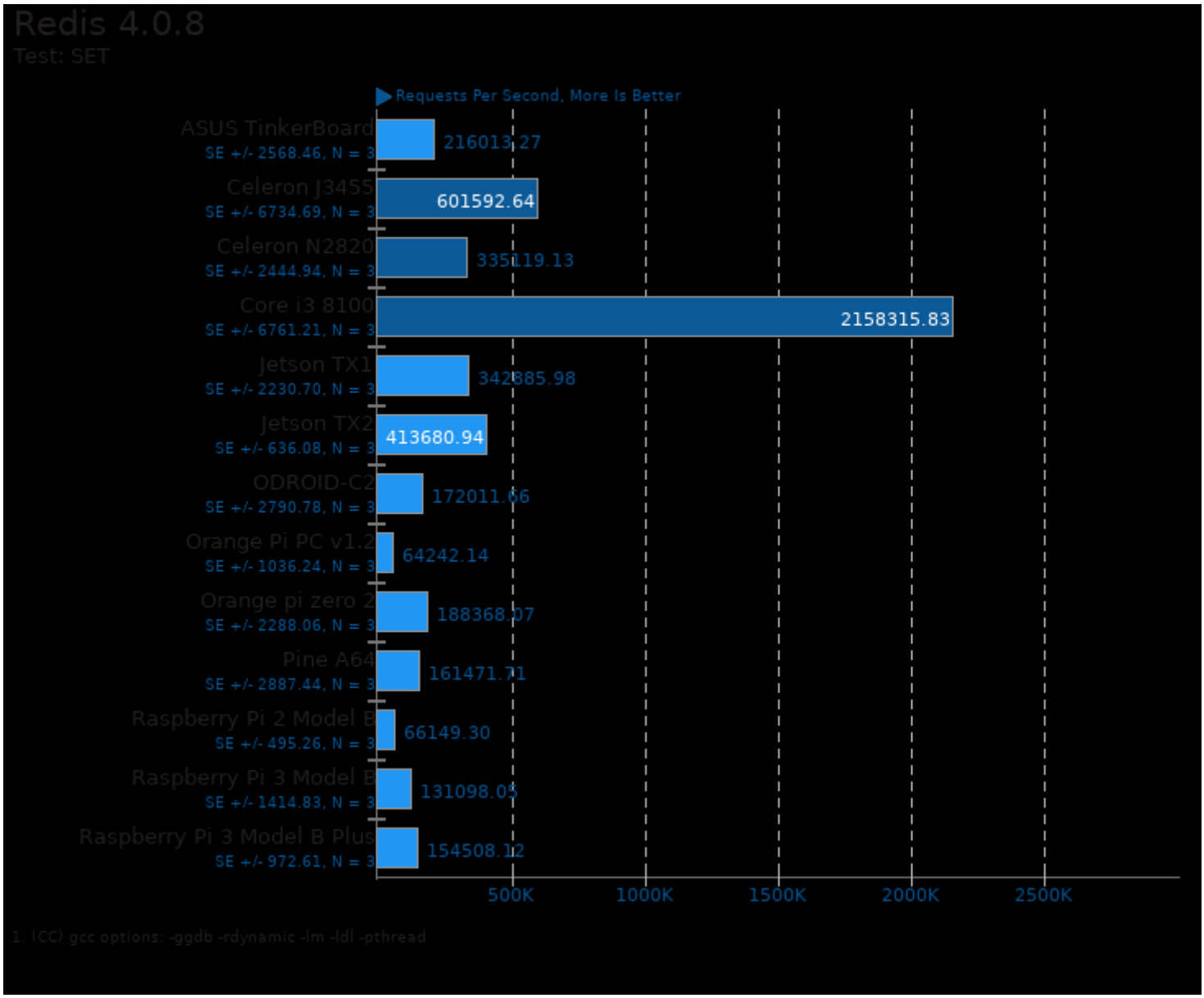

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 0.06, N = 3
145.61
Celeron J3455
SE +/- 0.06, N = 3
85.63
Celeron N2820
SE +/- 0.03, N = 3
124.38
Core i3 8100
SE +/- 0.00, N = 3
33.59
Jetson TX1
SE +/- 0.08, N = 3
112.70
Jetson TX2
SE +/- 0.23, N = 3
104.13
ODROID-C2
SE +/- 4.56, N = 3
271.78
Orange Pi PC v1.2
SE +/- 0.26, N = 3
400.22
Orange pi zero 2
SE +/- 0.25, N = 3
274.23
Pine A64
SE +/- 0.11, N = 3
350.38
Raspberry Pi 2 Model B
SE +/- 0.03, N = 3
513.43
Raspberry Pi 3 Model B
SE +/- 0.25, N = 3
351.98
Raspberry Pi 3 Model B Plus
SE +/- 0.55, N = 3
301.79
110
220
330
440
550
1. (CC) gcc options: -lm

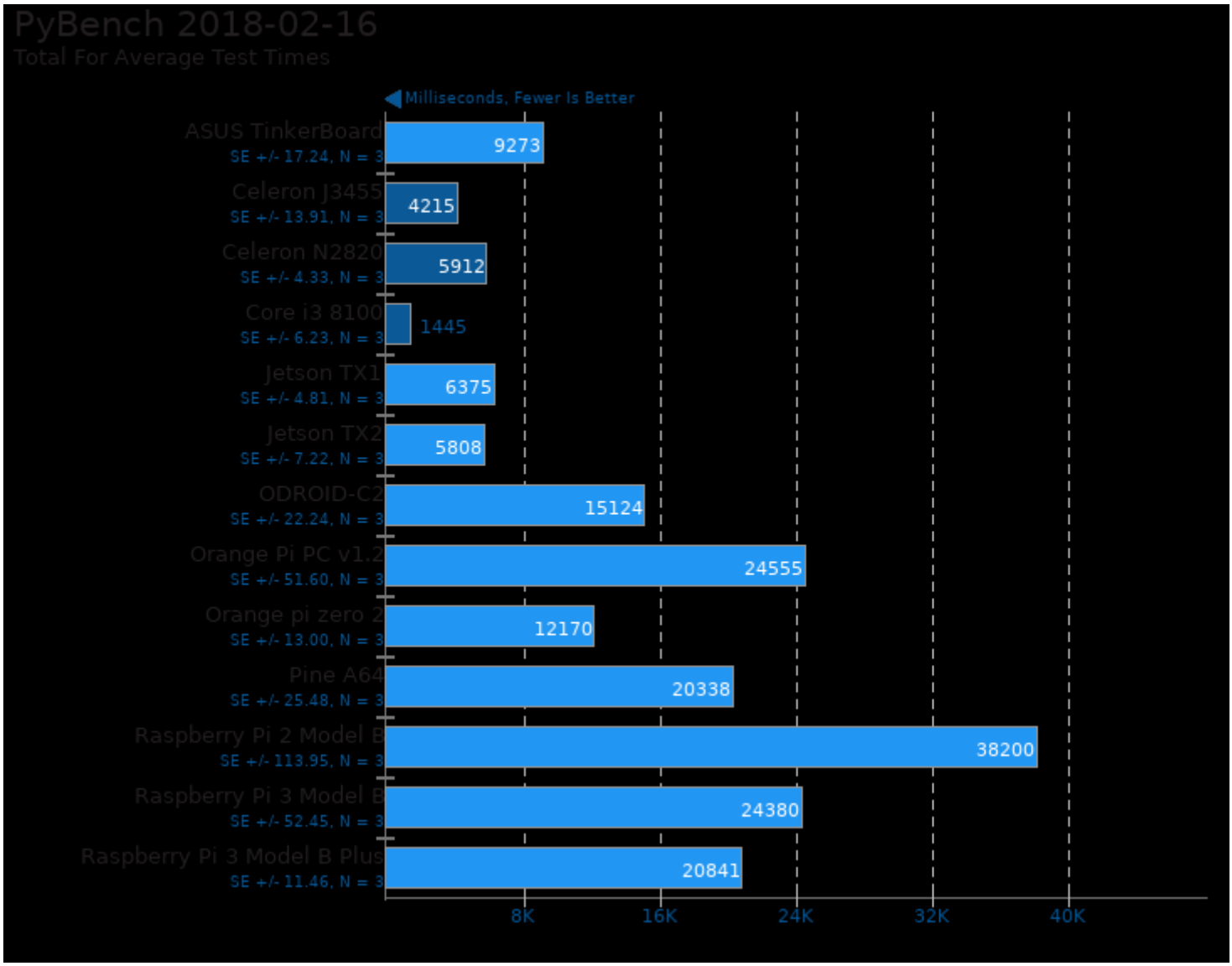

Perl Benchmarks
Test: Pod2html
Seconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 0.01896498, N = 6
0.71310443
Celeron J3455
SE +/- 0.00054440, N = 3
0.45204529
Celeron N2820
SE +/- 0.00045652, N = 3
0.67022559
Core i3 8100
SE +/- 0.00061183, N = 3
0.13202351
Jetson TX1
SE +/- 0.00299646, N = 3
0.59342906
Jetson TX2
SE +/- 0.00279271, N = 3
0.53950171
ODROID-C2
SE +/- 0.02597362, N = 6
1.13025050
Orange Pi PC v1.2
SE +/- 0.03956969, N = 6
2.13984966
Orange pi zero 2
SE +/- 0.00119554, N = 3
1.36402462
Pine A64
SE +/- 0.00367742, N = 3
1.42036821
Raspberry Pi 2 Model B
SE +/- 0.00655717, N = 3
2.45780646
Raspberry Pi 3 Model B
SE +/- 0.00197500, N = 3
1.34027781
Raspberry Pi 3 Model B Plus
SE +/- 0.00441133, N = 3
1.16440876
0.553
1.106
1.659
2.212
2.765

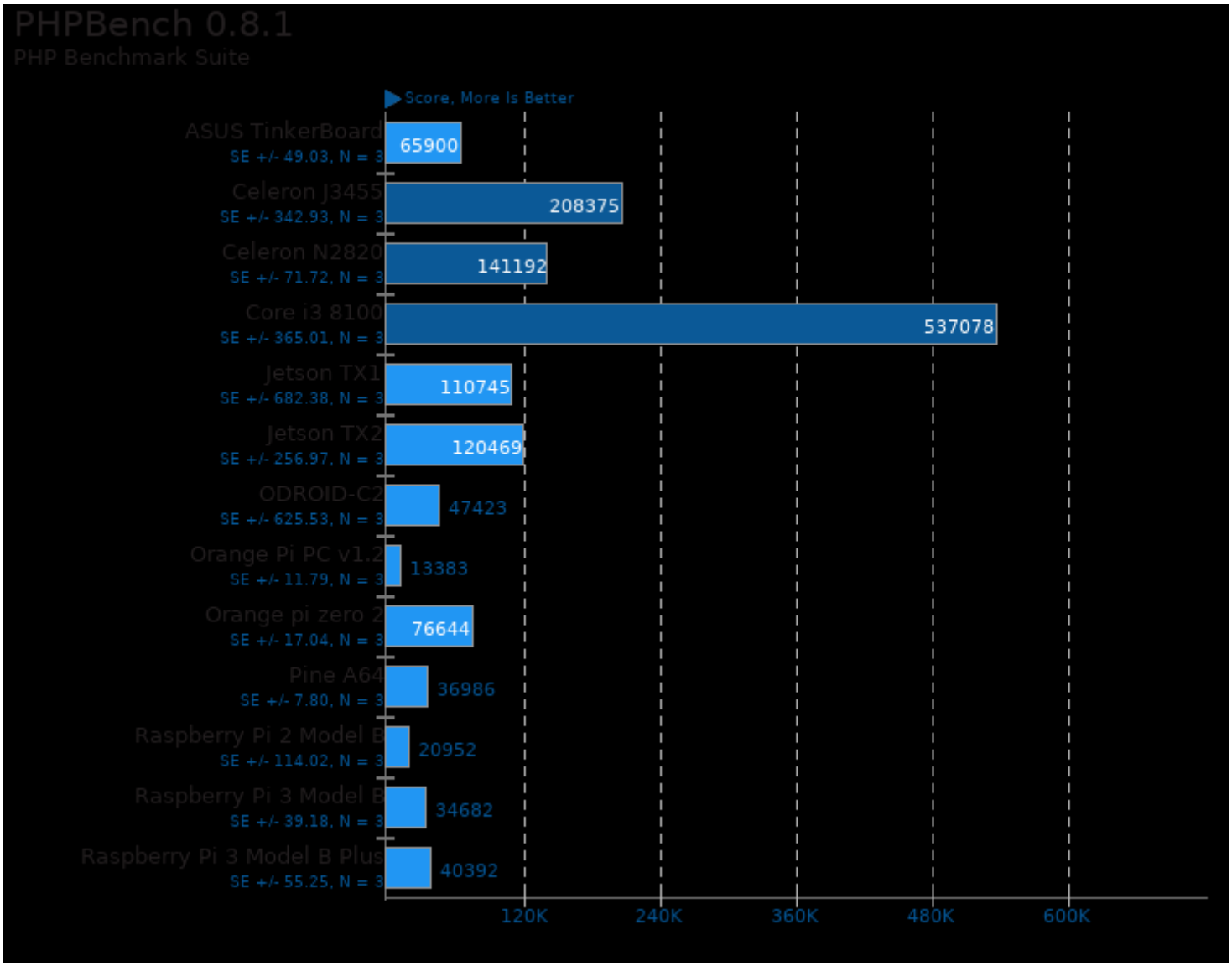

Perl Benchmarks
Test: Interpreter
Seconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 0.00009055, N = 6
0.00410594
Celeron J3455
SE +/- 0.00001924, N = 3
0.00402343
Celeron N2820
SE +/- 0.00004880, N = 3
0.00332811
Core i3 8100
SE +/- 0.00005500, N = 6
0.00095108
Jetson TX1
SE +/- 0.00013674, N = 3
0.01181083
Jetson TX2
SE +/- 0.00001889, N = 3
0.00824671
ODROID-C2
SE +/- 0.00000285, N = 3
0.00533560
Orange Pi PC v1.2
SE +/- 0.00007243, N = 3
0.00941563
Orange pi zero 2
SE +/- 0.00001594, N = 3
0.00673521
Pine A64
SE +/- 0.00000996, N = 3
0.01063092
Raspberry Pi 2 Model B
SE +/- 0.00001921, N = 3
0.01265626
Raspberry Pi 3 Model B
SE +/- 0.00008168, N = 3
0.00701593
Raspberry Pi 3 Model B Plus
SE +/- 0.00010890, N = 3
0.00619301
0.0028
0.0056
0.0084
0.0112
0.014

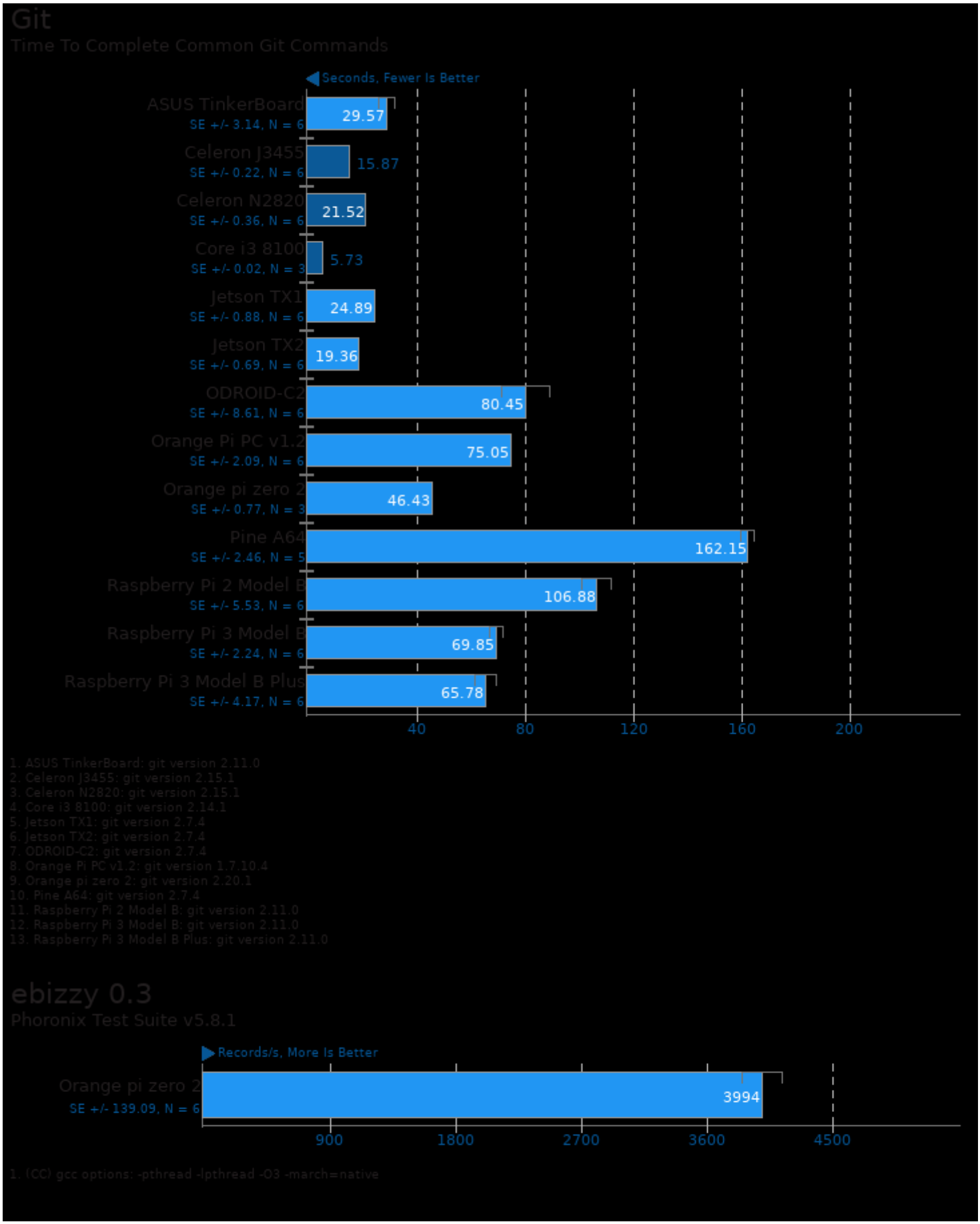

OpenSSL 1.1.0f
RSA 4096-bit Performance
Signs Per Second, More Is Better
ASUS TinkerBoard
SE +/- 3.22, N = 6
-march=armv7-a
85.42
Celeron J3455
SE +/- 0.20, N = 3
-m64
215.57
Celeron N2820
SE +/- 0.09, N = 3
56.57
Core i3 8100
SE +/- 0.15, N = 3
-m64
1056.93
Jetson TX1
SE +/- 0.24, N = 3
109.33
ODROID-C2
SE +/- 0.06, N = 3
81.50
Orange Pi PC v1.2
SE +/- 0.03, N = 3
16.87
Pine A64
SE +/- 0.64, N = 3
60.43
Raspberry Pi 2 Model B
SE +/- 0.03, N = 3
25.77
Raspberry Pi 3 Model B
SE +/- 1.86, N = 6
52.87
Raspberry Pi 3 Model B Plus
SE +/- 0.03, N = 3
29.77
200
400
600
800
1000
1. (CC) gcc options: -O3 -pthread -lssl -lcrypto -ldl


Redis 4.0.8
Test: GET
Requests Per Second, More Is Better
ASUS TinkerBoard
SE +/- 2325.31, N = 3
315325.94
Celeron J3455
SE +/- 997.32, N = 3
733499.05
Celeron N2820
SE +/- 4492.02, N = 3
426838.06
Core i3 8100
SE +/- 3548.42, N = 3
3264425.58
Jetson TX1
SE +/- 4628.81, N = 3
511506.28
Jetson TX2
SE +/- 2098.75, N = 3
644758.94
ODROID-C2
SE +/- 857.57, N = 3
256306.45
Orange Pi PC v1.2
SE +/- 1373.57, N = 3
107875.33
Orange pi zero 2
SE +/- 969.08, N = 3
265799.58
Pine A64
SE +/- 2618.64, N = 3
258184.77
Raspberry Pi 2 Model B
SE +/- 560.95, N = 3
112559.06
Raspberry Pi 3 Model B
SE +/- 2202.38, N = 3
178668.50
Raspberry Pi 3 Model B Plus
SE +/- 940.39, N = 3
245707.42
700K
1400K
2100K
2800K
3500K
1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread

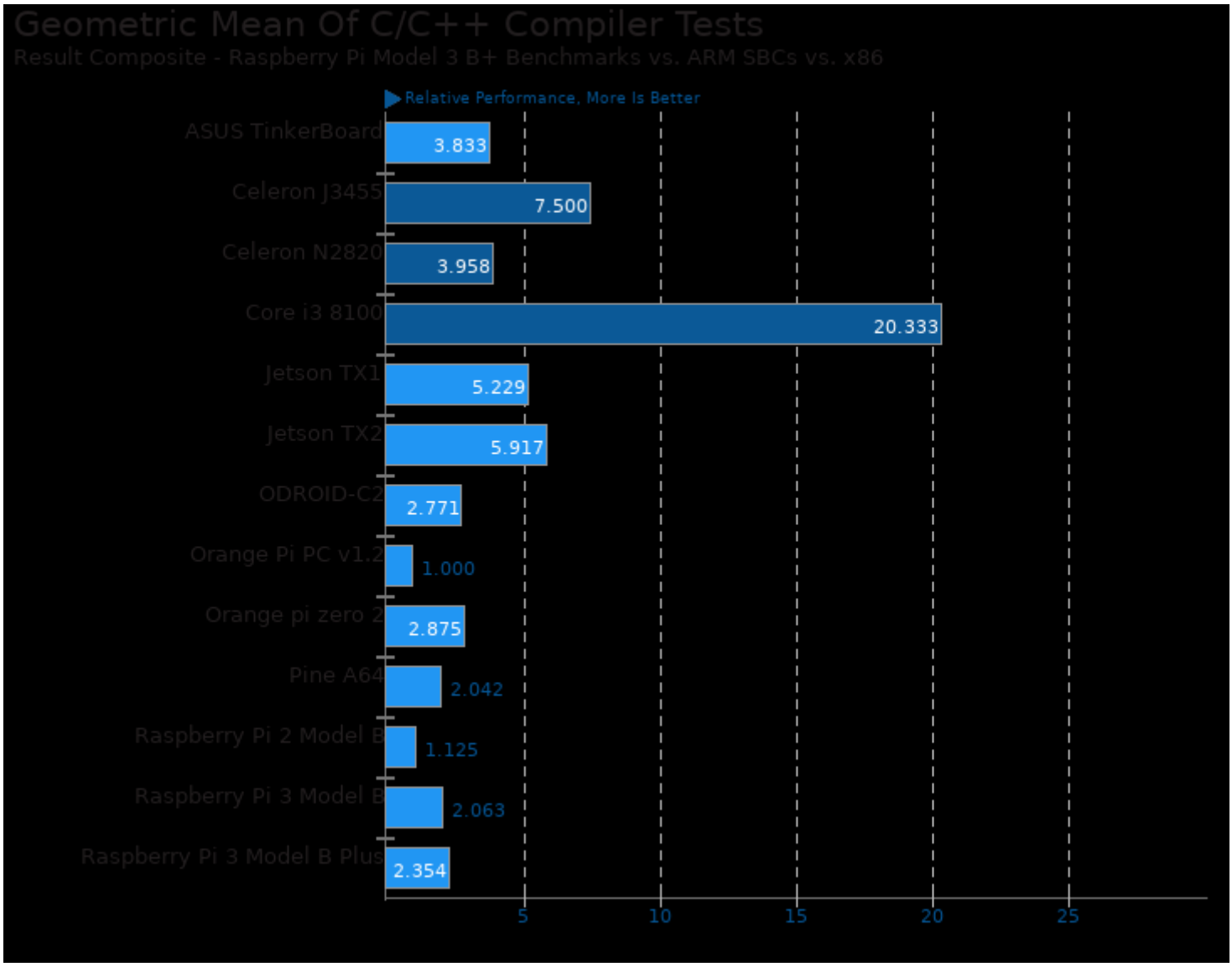

Redis 4.0.8
Test: SET
Requests Per Second, More Is Better
ASUS TinkerBoard
SE +/- 2568.46, N = 3
216013.27
Celeron J3455
SE +/- 6734.69, N = 3
601592.64
Celeron N2820
SE +/- 2444.94, N = 3
335119.13
Core i3 8100
SE +/- 6761.21, N = 3
2158315.83
Jetson TX1
SE +/- 2230.70, N = 3
342885.98
Jetson TX2
SE +/- 636.08, N = 3
413680.94
ODROID-C2
SE +/- 2790.78, N = 3
172011.66
Orange Pi PC v1.2
SE +/- 1036.24, N = 3
64242.14
Orange pi zero 2
SE +/- 2288.06, N = 3
188368.07
Pine A64
SE +/- 2887.44, N = 3
161471.71
Raspberry Pi 2 Model B
SE +/- 495.26, N = 3
66149.30
Raspberry Pi 3 Model B
SE +/- 1414.83, N = 3
131098.05
Raspberry Pi 3 Model B Plus
SE +/- 972.61, N = 3
154508.12
500K
1000K
1500K
2000K
2500K
1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread


PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 17.24, N = 3
9273
Celeron J3455
SE +/- 13.91, N = 3
4215
Celeron N2820
SE +/- 4.33, N = 3
5912
Core i3 8100
SE +/- 6.23, N = 3
1445
Jetson TX1
SE +/- 4.81, N = 3
6375
Jetson TX2
SE +/- 7.22, N = 3
5808
ODROID-C2
SE +/- 22.24, N = 3
15124
Orange Pi PC v1.2
SE +/- 51.60, N = 3
24555
Orange pi zero 2
SE +/- 13.00, N = 3
12170
Pine A64
SE +/- 25.48, N = 3
20338
Raspberry Pi 2 Model B
SE +/- 113.95, N = 3
38200
Raspberry Pi 3 Model B
SE +/- 52.45, N = 3
24380
Raspberry Pi 3 Model B Plus
SE +/- 11.46, N = 3
20841
8K
16K
24K
32K
40K

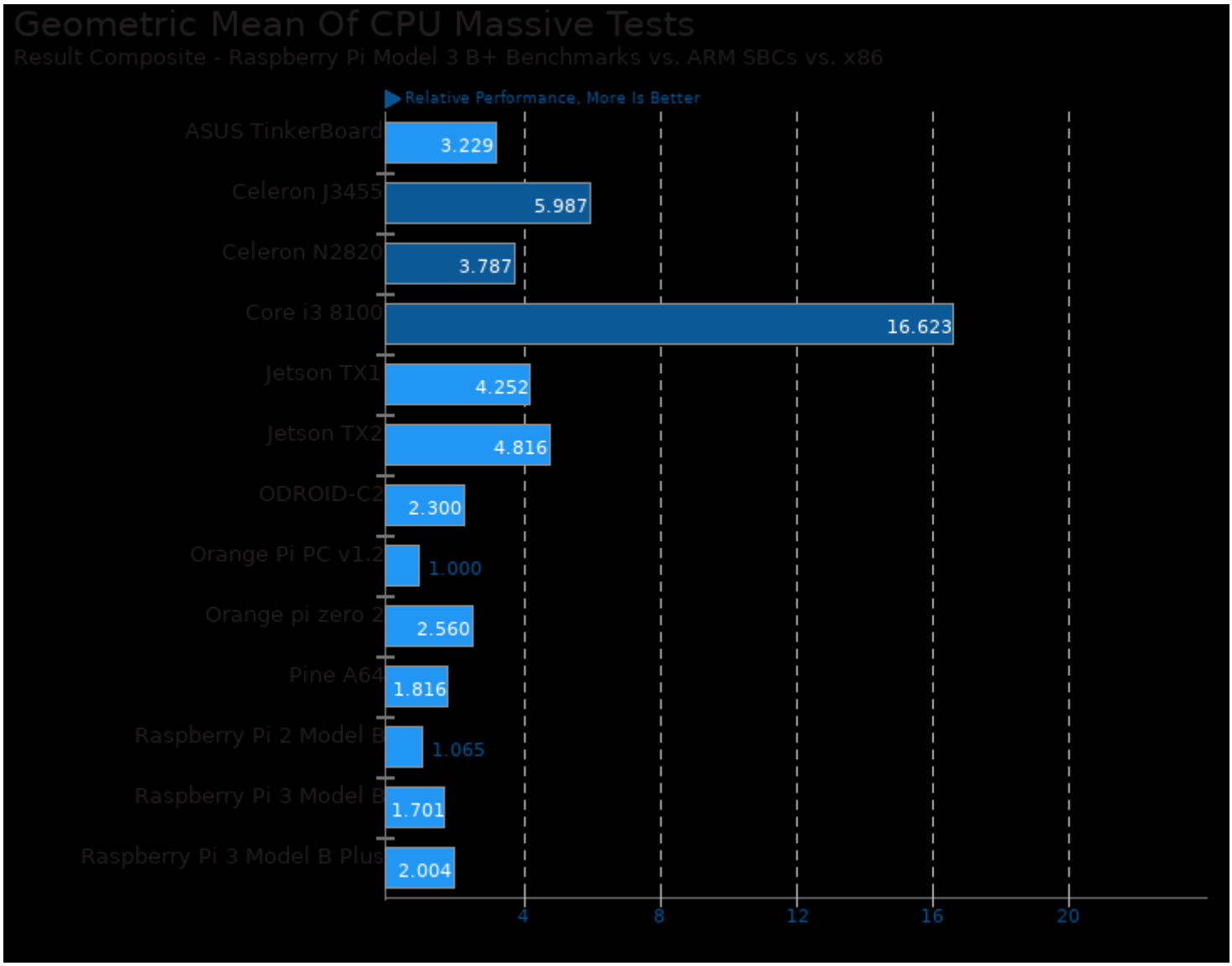

PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
ASUS TinkerBoard
SE +/- 49.03, N = 3
65900
Celeron J3455
SE +/- 342.93, N = 3
208375
Celeron N2820
SE +/- 71.72, N = 3
141192
Core i3 8100
SE +/- 365.01, N = 3
537078
Jetson TX1
SE +/- 682.38, N = 3
110745
Jetson TX2
SE +/- 256.97, N = 3
120469
ODROID-C2
SE +/- 625.53, N = 3
47423
Orange Pi PC v1.2
SE +/- 11.79, N = 3
13383
Orange pi zero 2
SE +/- 17.04, N = 3
76644
Pine A64
SE +/- 7.80, N = 3
36986
Raspberry Pi 2 Model B
SE +/- 114.02, N = 3
20952
Raspberry Pi 3 Model B
SE +/- 39.18, N = 3
34682
Raspberry Pi 3 Model B Plus
SE +/- 55.25, N = 3
40392
120K
240K
360K
480K
600K


Git
Time To Complete Common Git Commands
Seconds, Fewer Is Better
ASUS TinkerBoard
SE +/- 3.14, N = 6
29.57
Celeron J3455
SE +/- 0.22, N = 6
15.87
Celeron N2820
SE +/- 0.36, N = 6
21.52
Core i3 8100
SE +/- 0.02, N = 3
5.73
Jetson TX1
SE +/- 0.88, N = 6
24.89
Jetson TX2
SE +/- 0.69, N = 6
19.36
ODROID-C2
SE +/- 8.61, N = 6
80.45
Orange Pi PC v1.2
SE +/- 2.09, N = 6
75.05
Orange pi zero 2
SE +/- 0.77, N = 3
46.43
Pine A64
SE +/- 2.46, N = 5
162.15
Raspberry Pi 2 Model B
SE +/- 5.53, N = 6
106.88
Raspberry Pi 3 Model B
SE +/- 2.24, N = 6
69.85
Raspberry Pi 3 Model B Plus
SE +/- 4.17, N = 6
65.78
40
80
120
160
200
1. ASUS TinkerBoard: git version 2.11.0
2. Celeron J3455: git version 2.15.1
3. Celeron N2820: git version 2.15.1
4. Core i3 8100: git version 2.14.1
5. Jetson TX1: git version 2.7.4
6. Jetson TX2: git version 2.7.4
7. ODROID-C2: git version 2.7.4
8. Orange Pi PC v1.2: git version 1.7.10.4
9. Orange pi zero 2: git version 2.20.1
10. Pine A64: git version 2.7.4
11. Raspberry Pi 2 Model B: git version 2.11.0
12. Raspberry Pi 3 Model B: git version 2.11.0
13. Raspberry Pi 3 Model B Plus: git version 2.11.0
ebizzy 0.3
Phoronix Test Suite v5.8.1
Records/s, More Is Better
Orange pi zero 2
SE +/- 139.09, N = 6
3994
900
1800
2700
3600
4500
1. (CC) gcc options: -pthread -lpthread -O3 -march=native

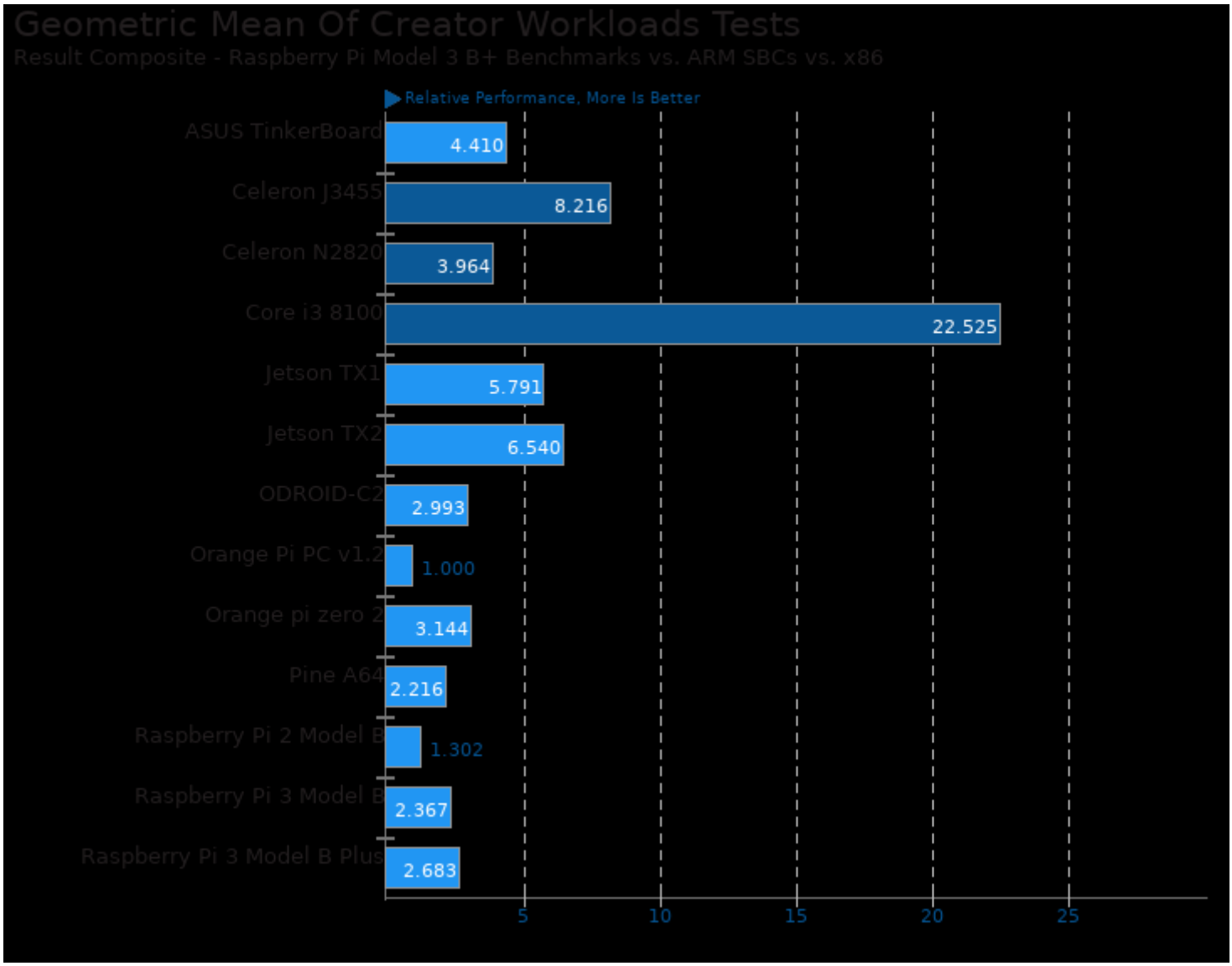
These geometric means are based upon test groupings / test suites for this result file.



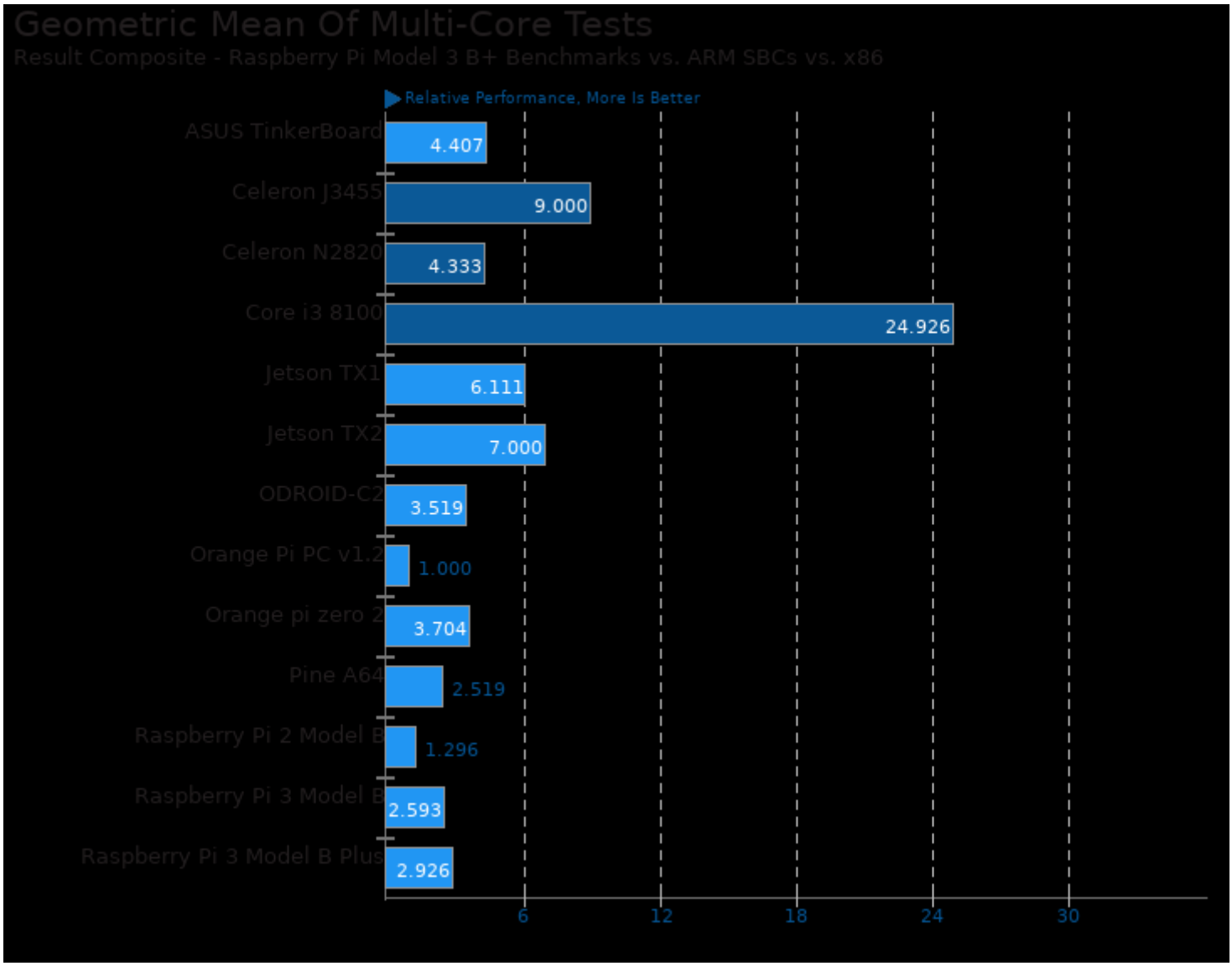
Geometric mean based upon tests: pts/scimark2, pts/aobench, pts/graphics-magick, pts/stockfish, pts/c-ray, pts/encode-mp3 and pts/openssl



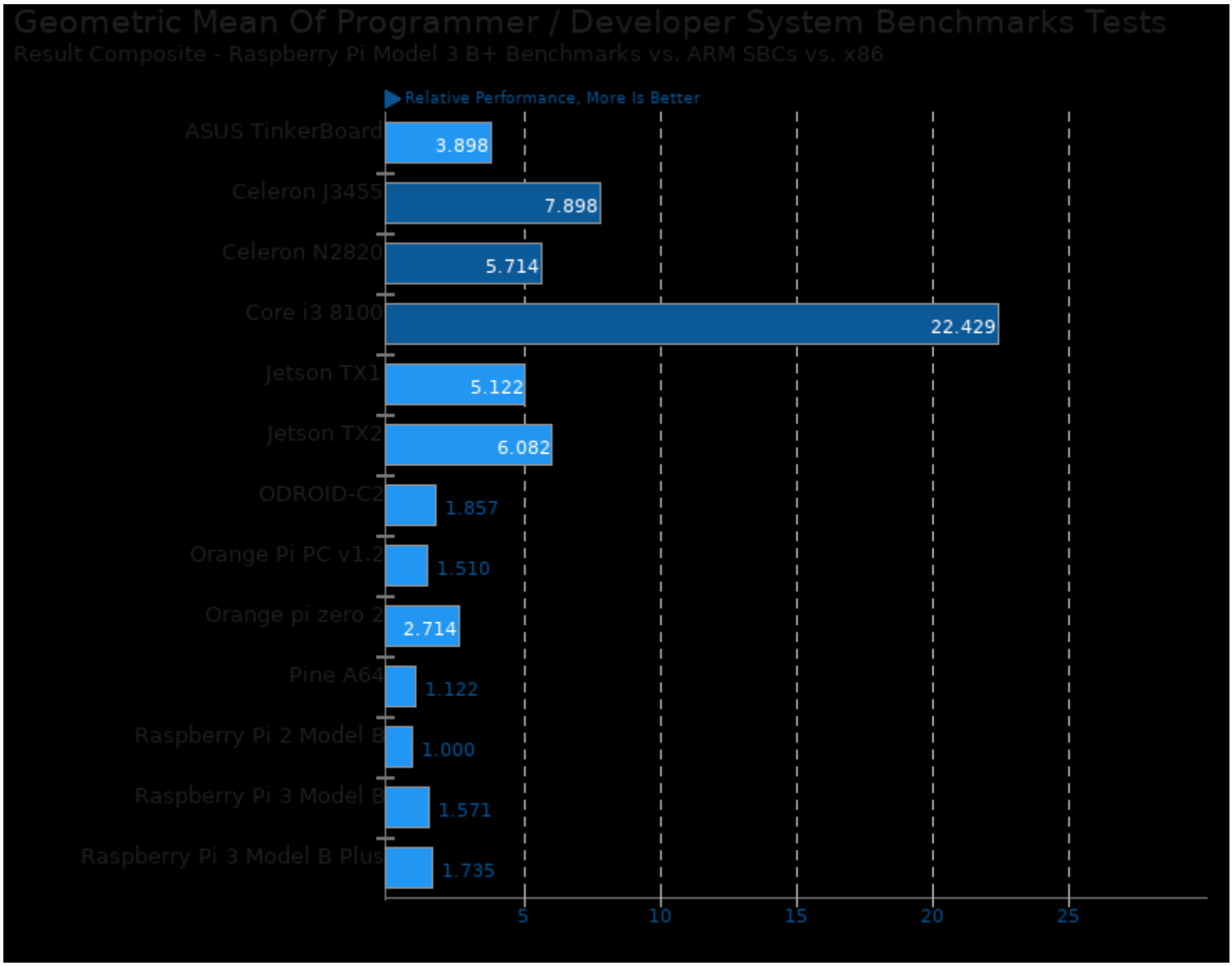
Geometric mean based upon tests: pts/c-ray, pts/cachebench, pts/ebizzy, pts/encode-mp3, pts/graphics-magick, pts/openssl, pts/phpbench, pts/redis and pts/stockfish



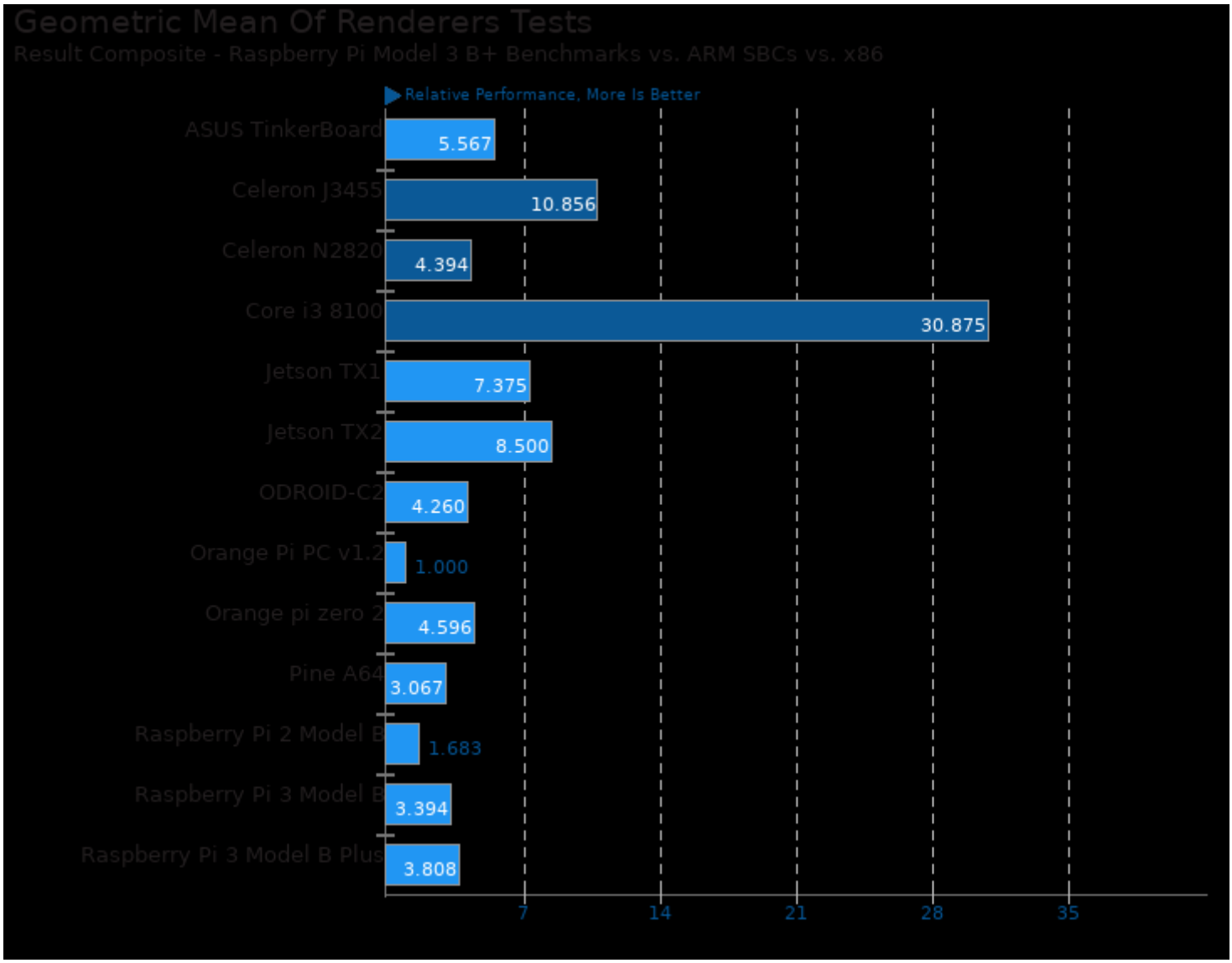
Geometric mean based upon tests: pts/c-ray, pts/aobench, pts/encode-mp3 and pts/graphics-magick



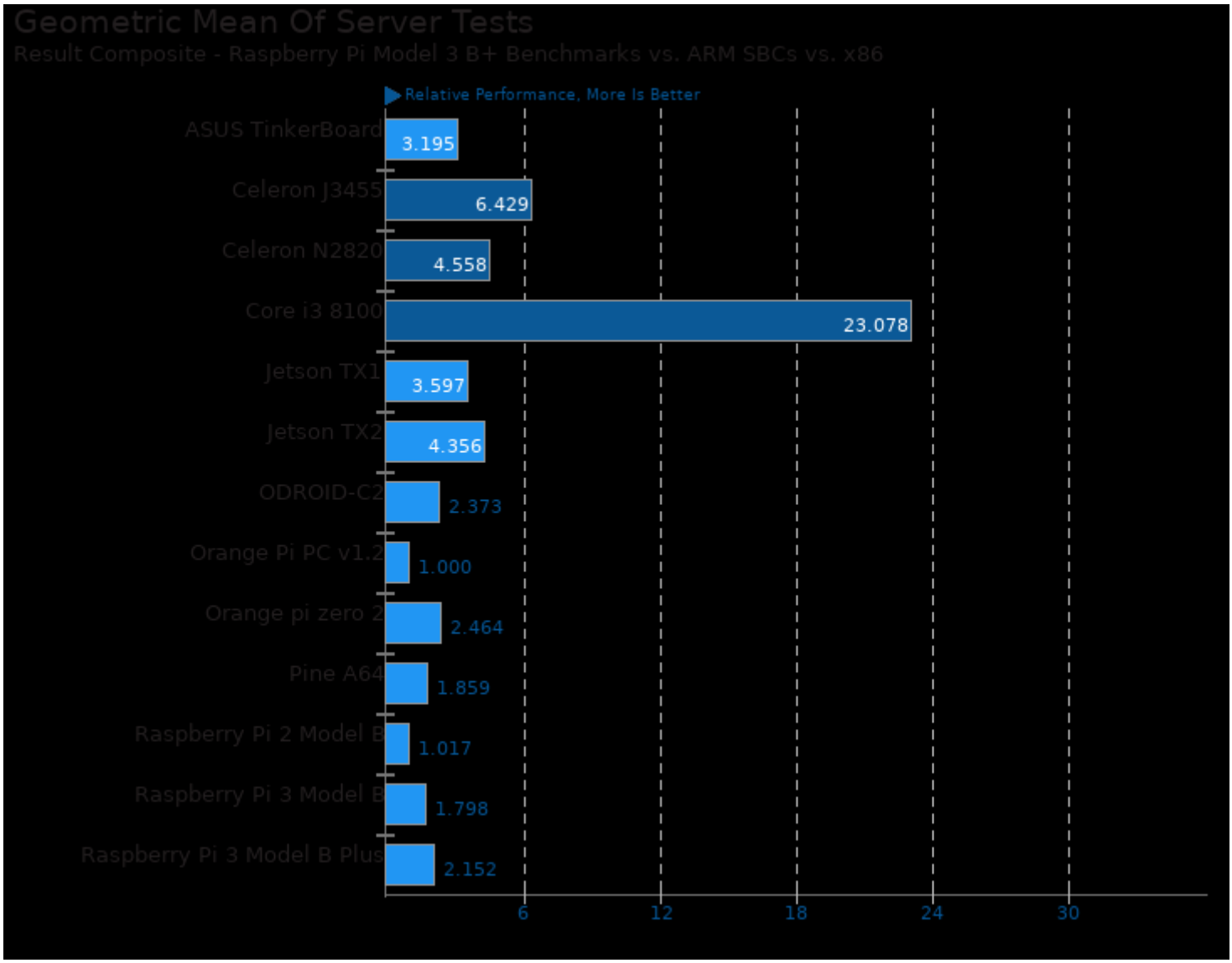
Geometric mean based upon tests: pts/c-ray, pts/stockfish, pts/ebizzy, pts/graphics-magick and pts/aobench



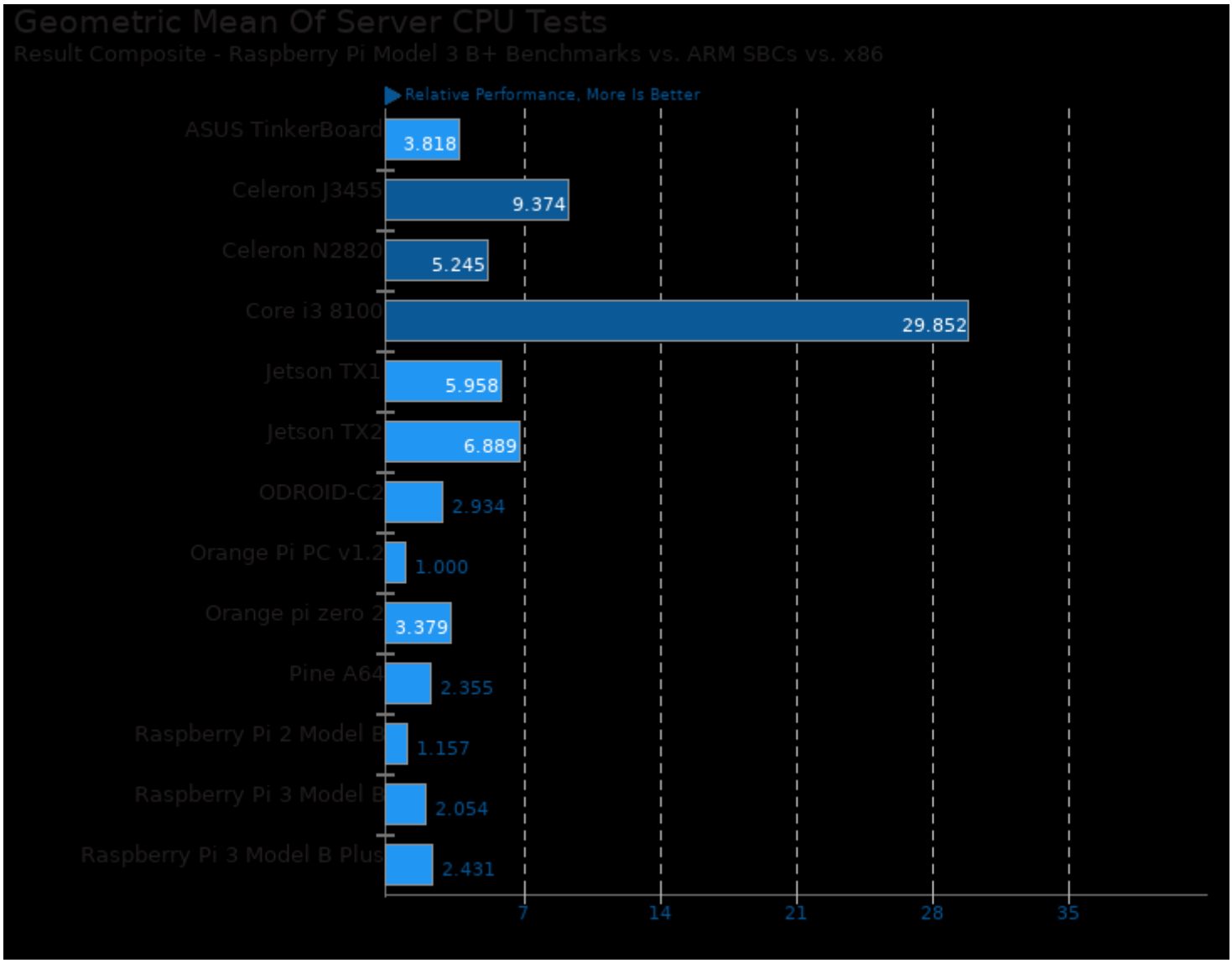
Geometric mean based upon tests: pts/git and pts/pybench



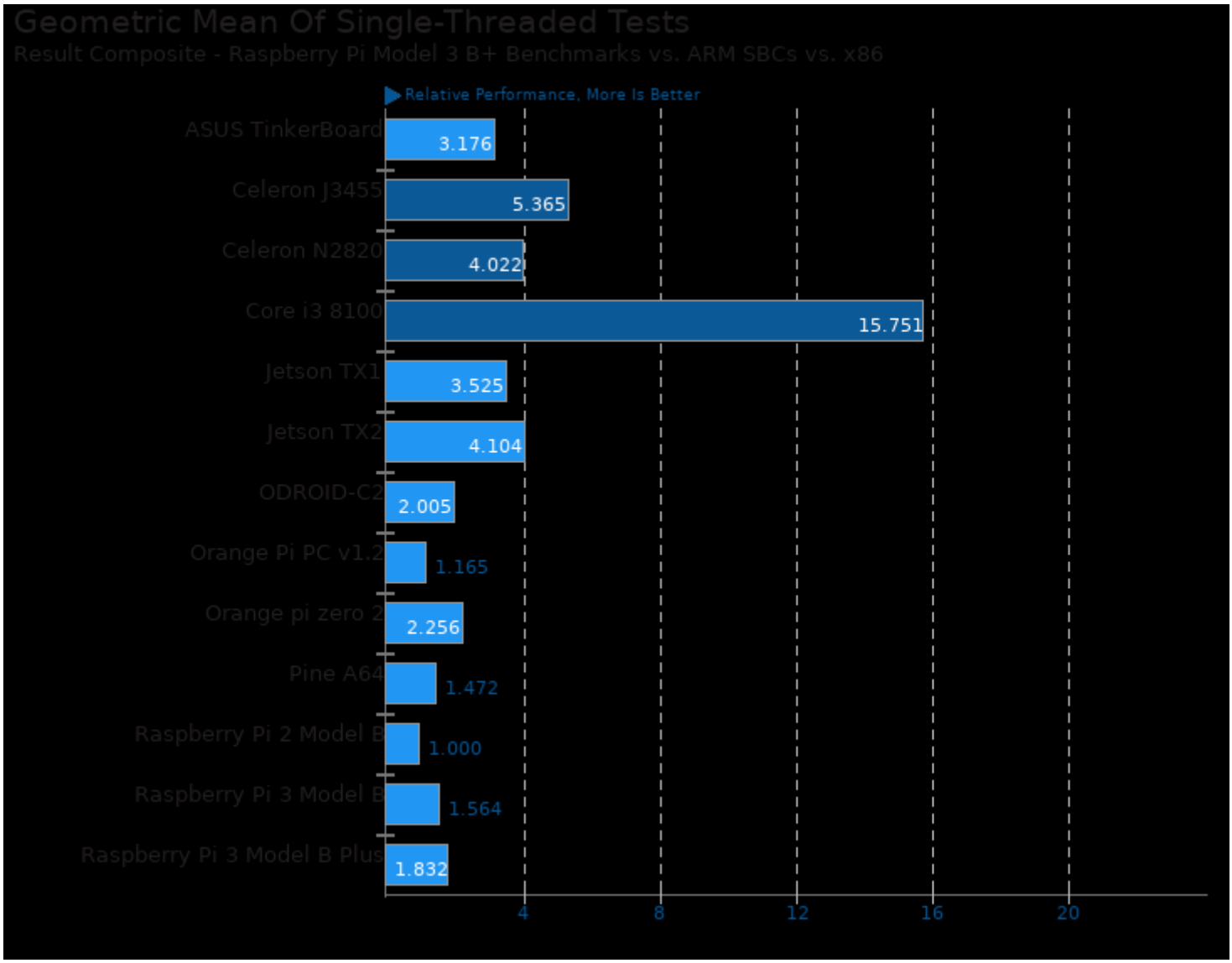
Geometric mean based upon tests: pts/c-ray and pts/aobench



Geometric mean based upon tests: pts/ebizzy, pts/redis, pts/phpbench, pts/openssl and pts/perl-benchmark



Geometric mean based upon tests: pts/stockfish, pts/c-ray, pts/openssl, pts/redis, pts/pybench and pts/phpbench



Geometric mean based upon tests: pts/cachebench, pts/scimark2, pts/encode-mp3, pts/perl-benchmark, pts/redis, pts/pybench, pts/phpbench and pts/git

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 05:42.