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mini computers

ARMv6-compatible rev 7 testing on Debian Linux 7.0 via the Phoronix Test Suite.

Automated Executive Summary

intel sandy i5 had the most wins, coming in first place for 96% of the tests.

Based on the geometric mean of all complete results, the fastest (intel sandy i5) was 43.293x the speed of the slowest (raspberry). odroid-x2 was 0.185x the speed of intel sandy i5 and raspberry was 0.125x the speed of odroid-x2.

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

x11perf (Test: Fill 300 x 300px AA Trapezoid) at 777.778x
x11perf (Test: Char in 80-char aa line) at 512.093x
RAMspeed SMP (Type: Triad - Benchmark: Floating Point) at 66.551x
RAMspeed SMP (Type: Add - Benchmark: Floating Point) at 65.574x
RAMspeed SMP (Type: Add - Benchmark: Integer) at 59.261x
RAMspeed SMP (Type: Triad - Benchmark: Integer) at 58.651x
RAMspeed SMP (Type: Average - Benchmark: Floating Point) at 56.754x
RAMspeed SMP (Type: Average - Benchmark: Integer) at 56.447x
C-Ray (Total Time) at 55.612x
RAMspeed SMP (Type: Copy - Benchmark: Integer) at 54.416x.

Test Systems:

raspberry

Processor: ARMv6-compatible rev 7 @ 0.70GHz (1 Core), Motherboard: BCM2708, Memory: 438MB, Disk: 16GB SU16G

OS: Debian Linux 7.0, Kernel: 3.6.11+ (armv6l), Desktop: LXDE 0.5.10, Display Server: X Server 1.12.4, Compiler: GCC 4.6, File-System: ext4, Screen Resolution: 1366x768

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: powersave
System Notes: Python 2.7.3.

intel sandy i5

Processor: Intel Core i5-2410M @ 2.30GHz (4 Cores), Motherboard: ASUS N53SV v1.0, Chipset: Intel 2nd Generation Core Family DRAM, Memory: 8192MB, Disk: 500GB Seagate ST9500325AS, Graphics: Intel 2nd Generation Core Family IGP, Audio: Realtek ALC269VB, Monitor: IPS224, Network: Realtek RTL8111/8168 + Atheros AR9285 Wireless

OS: Ubuntu 13.04, Kernel: 3.9.0-030900rc8-generic (x86_64), Desktop: Xfce 4.10, Display Server: X Server 1.13.3, Display Driver: intel 2.21.6, OpenGL: 3.0 Mesa 9.2.0 (git-3900a0e quantal-oibaf-ppa), Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-cloog-version-check --disable-ppl-version-check --disable-werror --enable-checking=release --enable-clocale=gnu --enable-cloog-backend=ppl --enable-gnu-unique-object --enable-languages=c,c++,go,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-cloog --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Processor Notes: Scaling Governor: ondemand
Graphics Notes: SNA
System Notes: Python 2.7.4.

odroid-x2

Processor: ARMv7 rev 0 @ 1.60GHz (1 Core), Motherboard: ODROIDX2, Memory: 2048MB, Disk: 16GB SU16G

OS: Ubuntu 12.11, Kernel: 3.0.60-odroidx2 (armv7l), Desktop: Unity 2D, Display Server: X Server 1.11.3, OpenGL: 2.1 Mesa 8.0.4, Compiler: GCC 4.6, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=arm-linux-gnueabihf --disable-sjlj-exceptions --disable-werror --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-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch=armv7-a --with-float=hard --with-fpu=vfpv3-d16 --with-mode=thumb -v
Processor Notes: Scaling Governor: ondemand
System Notes: Python 2.7.3.

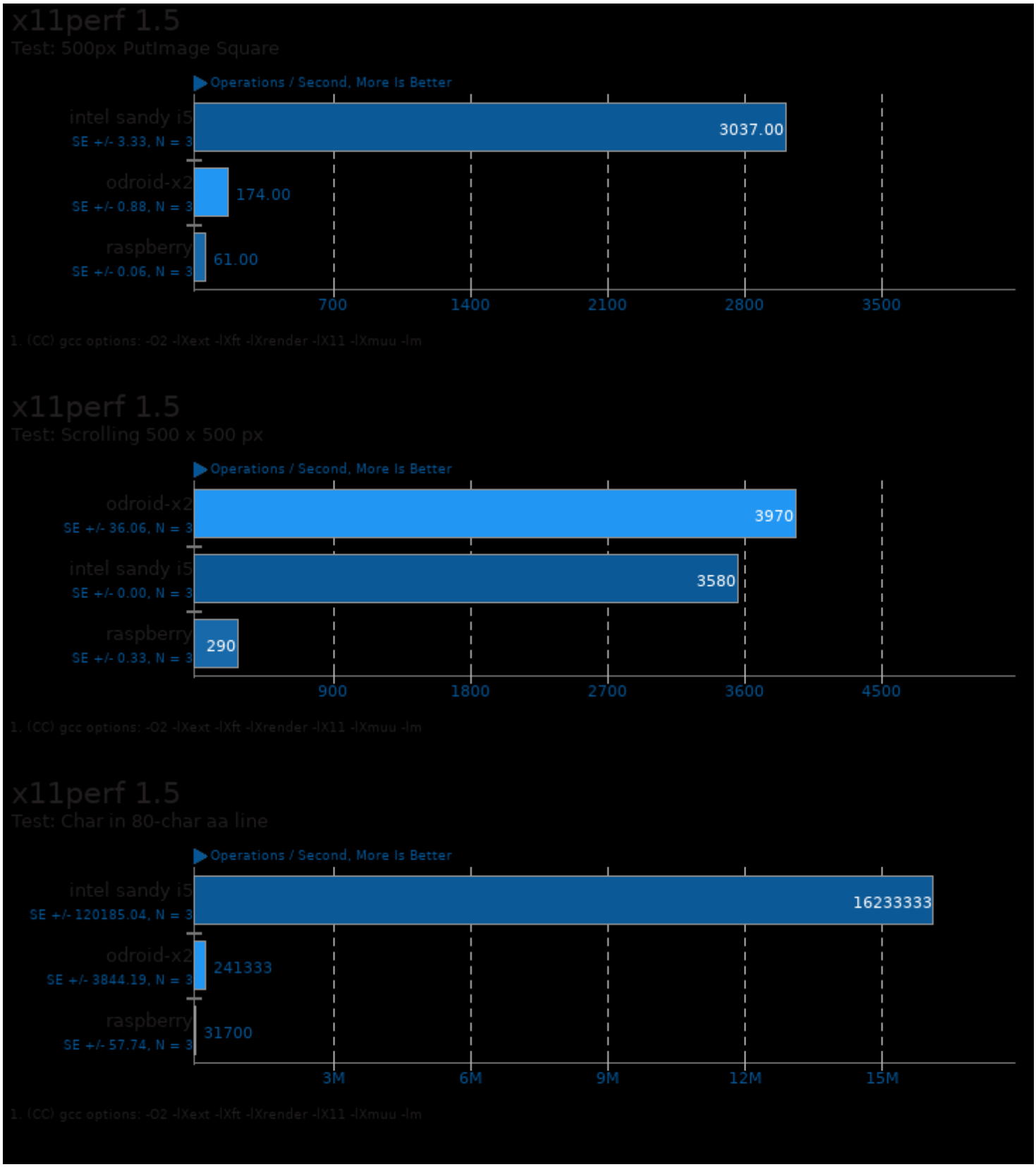
	raspberry	intel sandy i5	odroid-x2
x11perf - 5.P.S (Operations / Second)	**61.00**	**3037**	174
Normalized	100%	4978.69%	285.25%
Standard Deviation	0.2%	0.2%	0.9%

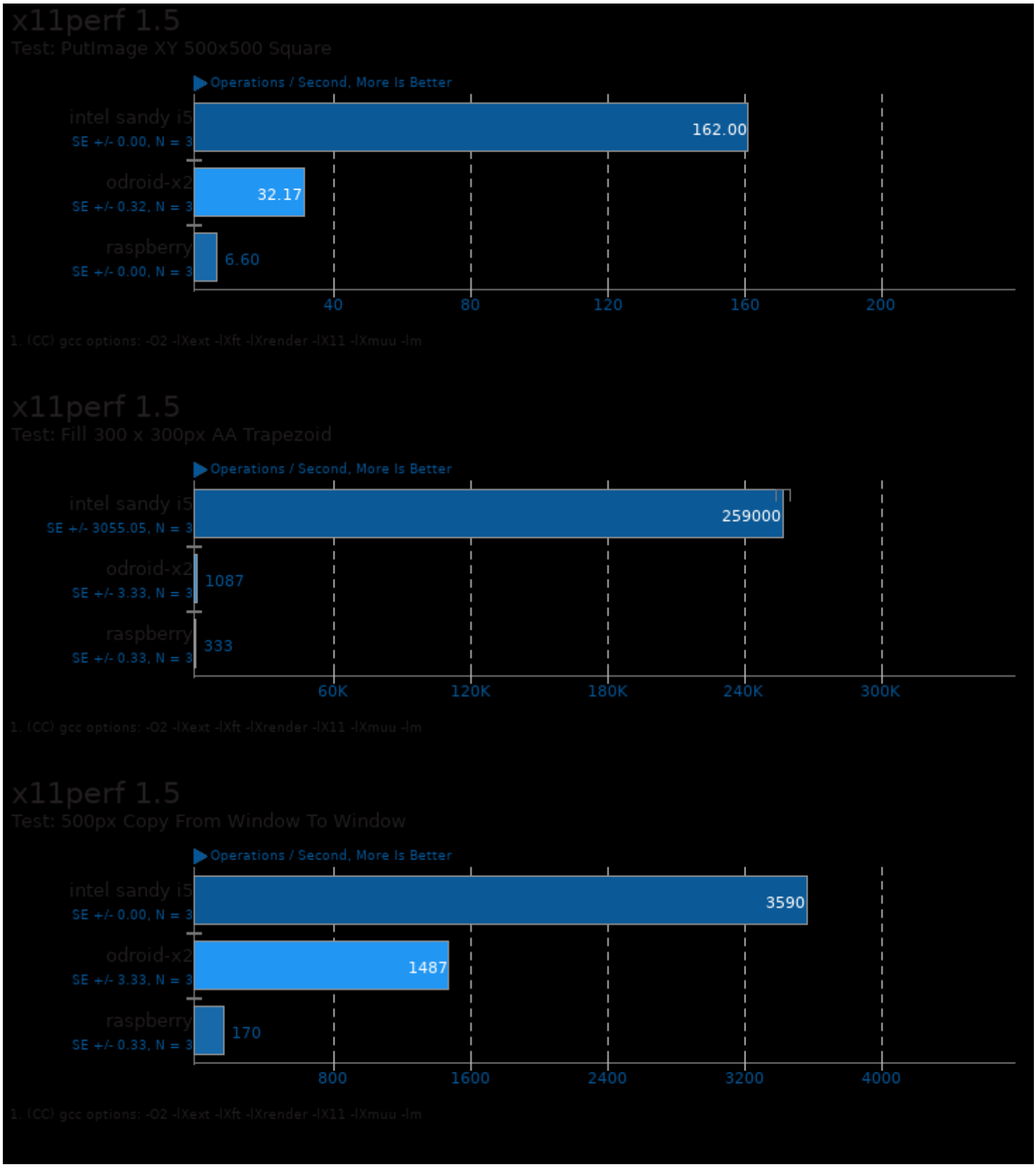
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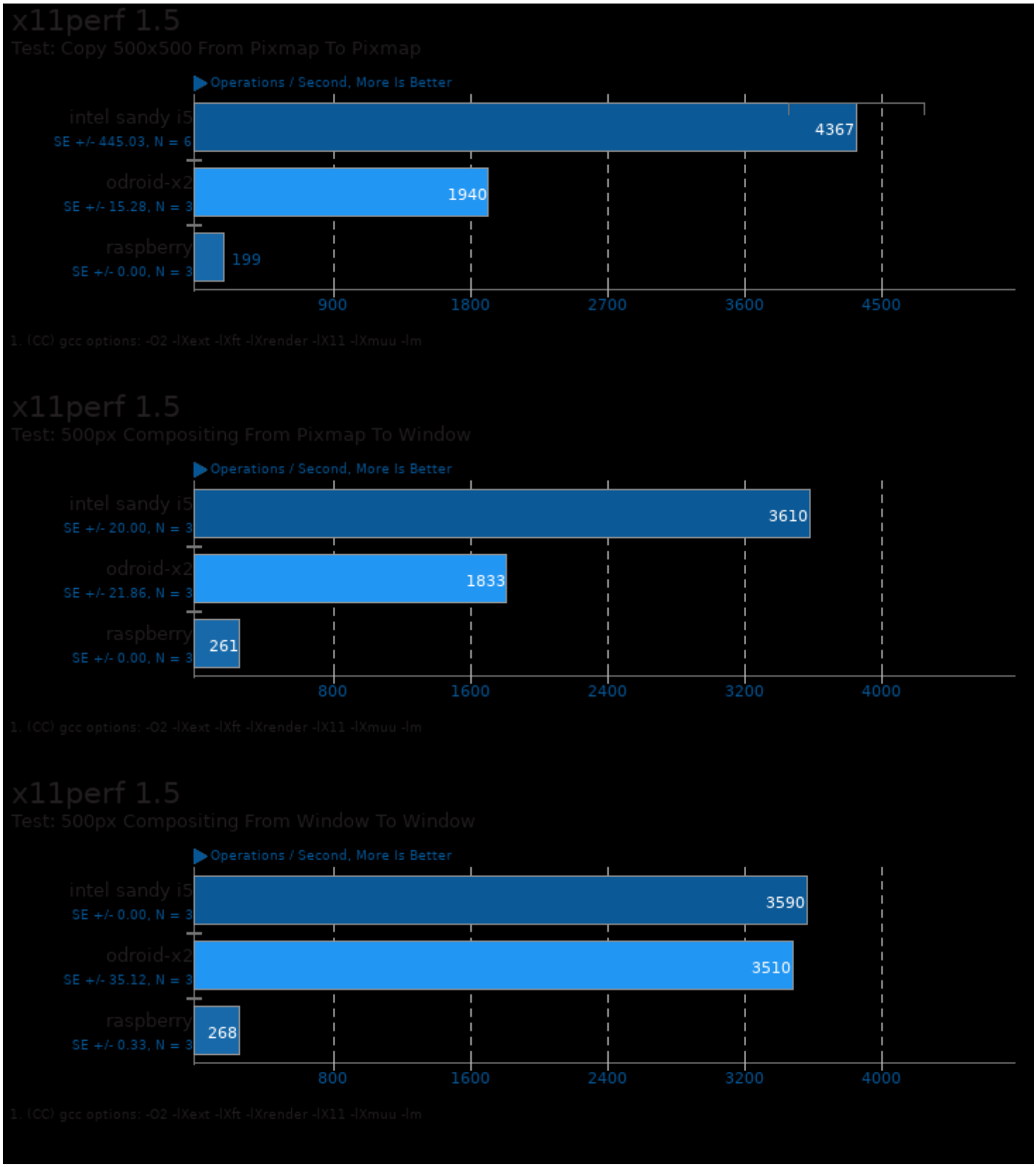
x11perf - S.5.x.5.p (Operations / Second)	**290**	3580	**3970**
Normalized	100%	1234.48%	1368.97%
Standard Deviation	0.2%	0%	1.6%
x11perf - C.i.8.c.a.l (Operations / Second)	**31700**	**16233333**	241333
Normalized	100%	51209.25%	761.3%
Standard Deviation	0.3%	1.3%	2.8%
x11perf - P.X.5.S (Operations / Second)	**6.60**	**162**	32.17
Normalized	100%	2454.55%	487.42%
Standard Deviation	0%	0%	1.7%
x11perf - F.3.x.3.A.T (Operations / Second)	**333**	**259000**	1087
Normalized	100%	77777.78%	326.43%
Standard Deviation	0.2%	2%	0.5%
x11perf - 5.C.F.W.T.W (Operations / Second)	**170**	**3590**	1487
Normalized	100%	2111.76%	874.71%
Standard Deviation	0.3%	0%	0.4%
x11perf - C.5.F.P.T.P (Operations / Second)	**199**	**4367**	1940
Normalized	100%	2194.47%	974.87%
Standard Deviation	0%	25%	1.4%
x11perf - 5.C.F.P.T.W (Operations / Second)	**261**	**3610**	1833
Normalized	100%	1383.14%	702.3%
Standard Deviation	0%	1%	2.1%
x11perf - 5.C.F.W.T.W (Operations / Second)	**268**	**3590**	3510
Normalized	100%	1339.55%	1309.7%
Standard Deviation	0.2%	0%	1.7%
RAMspeed SMP - Add - Integer (MB/s)	**187.92**	**11136**	1576
Normalized	100%	5926.12%	838.5%
RAMspeed SMP - Copy - Integer (MB/s)	**206.23**	**11222**	2733
Normalized	100%	5441.63%	1325.46%
RAMspeed SMP - Scale - Integer (MB/s)	**207.46**	**11223**	2662
Normalized	100%	5409.65%	1283.33%
RAMspeed SMP - Triad - Integer (MB/s)	**189.40**	**11108**	1593
Normalized	100%	5865.09%	841.31%
RAMspeed SMP - Average - Integer (MB/s)	**197.73**	**11161**	2149
Normalized	100%	5644.75%	1086.79%
RAMspeed SMP - Add - Floating Point (MB/s)	**191.38**	**12550**	1796
Normalized	100%	6557.44%	938.55%
RAMspeed SMP - Copy - Floating Point	**241.79**	**11032**	2216
Normalized	100%	4562.54%	916.7%
RAMspeed SMP - Scale - Floating Point	**214**	**11236**	2687
Normalized	100%	5250.3%	1255.82%
RAMspeed SMP - Triad - Floating Point	**191.27**	**12729**	1848
Normalized	100%	6655.08%	965.98%
RAMspeed SMP - Average - Floating Point (MB/s)	**209.55**	**11893**	2150
Normalized	100%	5675.4%	1026.15%
C-Ray - Total Time (sec)	**5394**	**97.00**	390.48
Normalized	100%	5561.22%	1381.47%
Standard Deviation	0.3%	0%	0.5%
dcraw - R.T.P.I.C (sec)	**1713**	**80.47**	438.81
Normalized	100%	2129.3%	390.48%
Standard Deviation	0.3%	0.9%	0.1%
LAME MP3 Encoding - WAV To MP3 (sec)	**389.13**	**18.40**	79.11
Normalized	100%	2114.84%	491.88%
Standard Deviation	2.3%	0.8%	0.1%

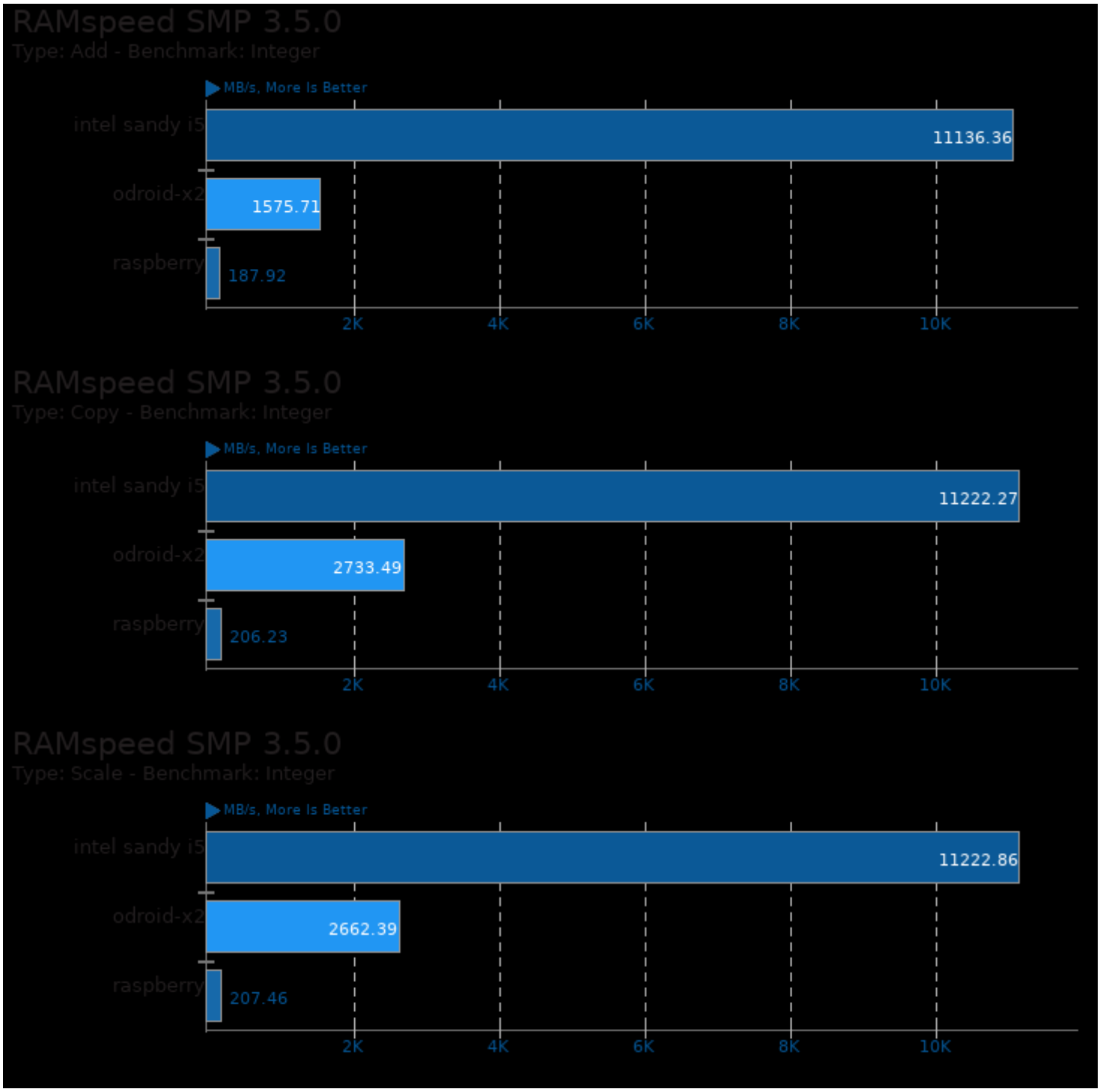
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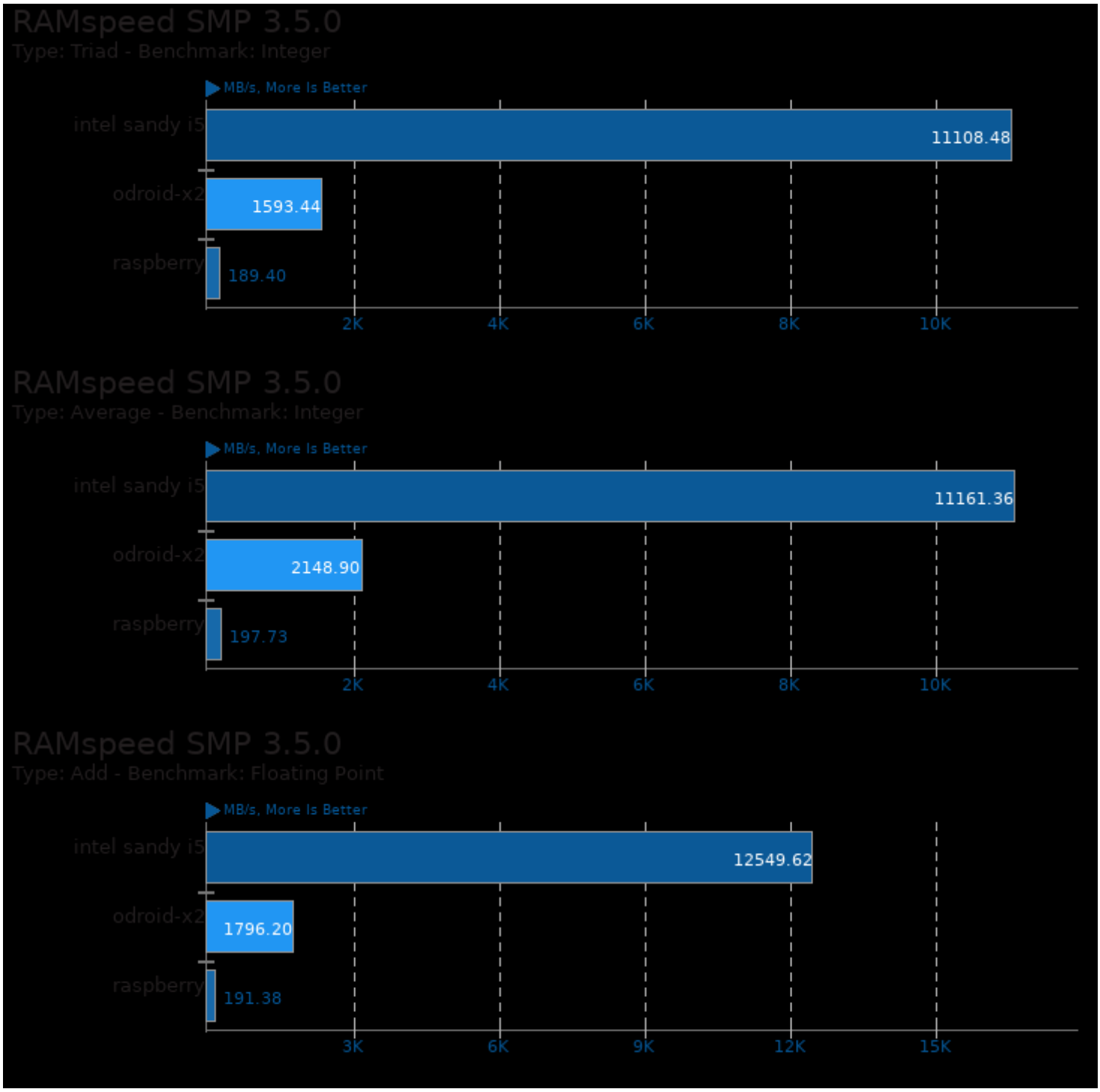
Sample Pi Program - P.T.S.v.4.1 (sec)	**91.76**	**4.80**	21.21
Normalized	100%	1911.67%	432.63%
Standard Deviation	0.2%	0.1%	0%
PyBench - T.F.A.T.T (Milliseconds)	**79878**	**2645**	12200
Normalized	100%	3019.96%	654.74%
Standard Deviation	4.1%	0.3%	0.1%
NGINX Benchmark - S.W.P.S (Reqs/sec)	**377.34**	**18183**	6206
Normalized	100%	4818.86%	1644.65%
Standard Deviation	0.1%	3.3%	0.3%
PHPBench - P.B.S (Score)	**3103**	**88727**	15480
Normalized	100%	2859.39%	498.87%
Standard Deviation	1.9%	0.3%	0%

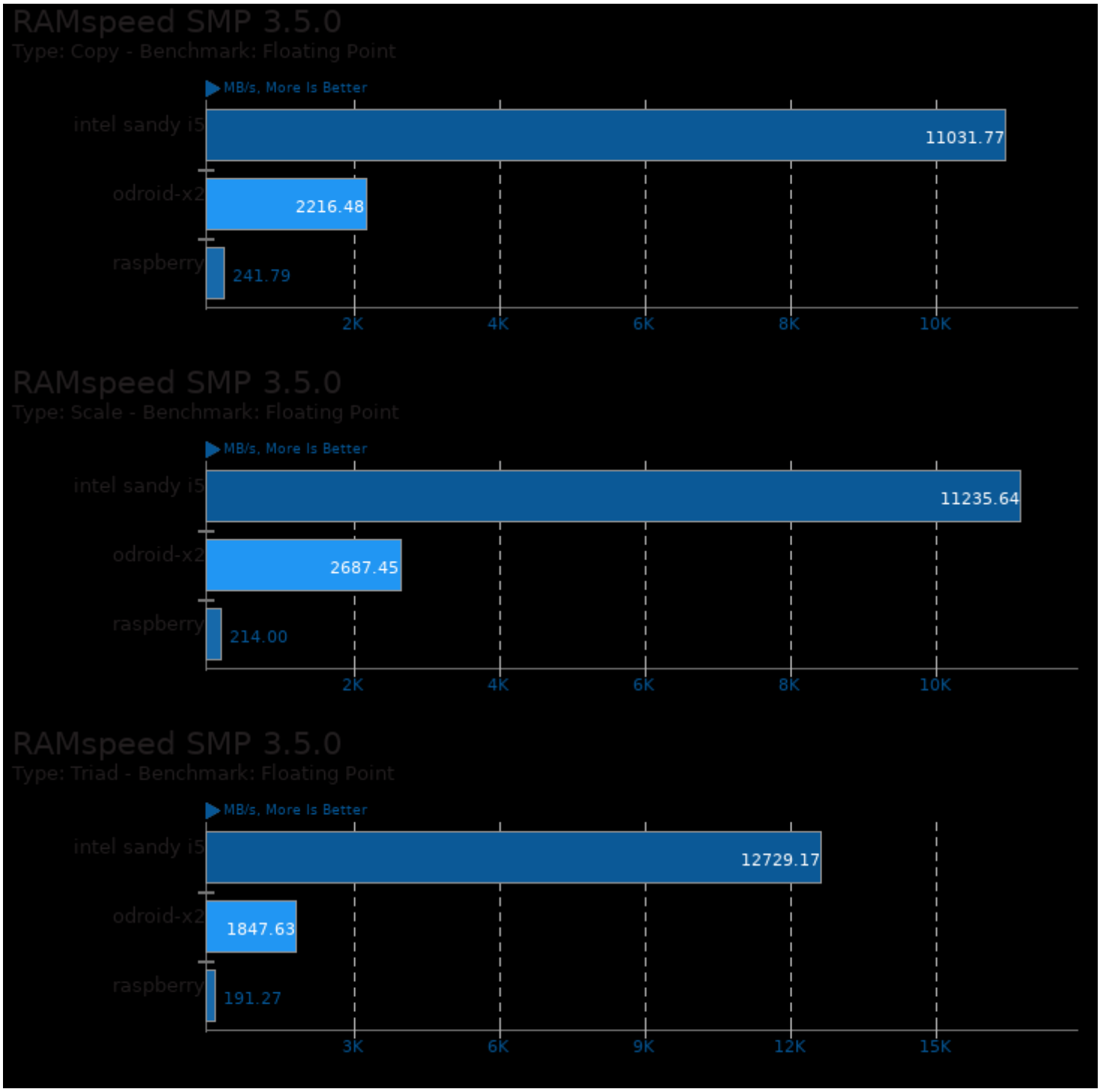

x11perf 1.5
Test: 500px PutImage Square
Operations / Second, More Is Better
intel sandy i5
SE +/- 3.33, N = 3
3037.00
odroid-x2
SE +/- 0.88, N = 3
174.00
raspberry
SE +/- 0.06, N = 3
61.00
700
1400
2100
2800
3500
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm
x11perf 1.5
Test: Scrolling 500 x 500 px
Operations / Second, More Is Better
odroid-x2
SE +/- 36.06, N = 3
3970
intel sandy i5
SE +/- 0.00, N = 3
3580
raspberry
SE +/- 0.33, N = 3
290
900
1800
2700
3600
4500
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm
x11perf 1.5
Test: Char in 80-char aa line
Operations / Second, More Is Better
intel sandy i5
SE +/- 120185.04, N = 3
16233333
odroid-x2
SE +/- 3844.19, N = 3
241333
raspberry
SE +/- 57.74, N = 3
31700
3M
6M
9M
12M
15M
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm

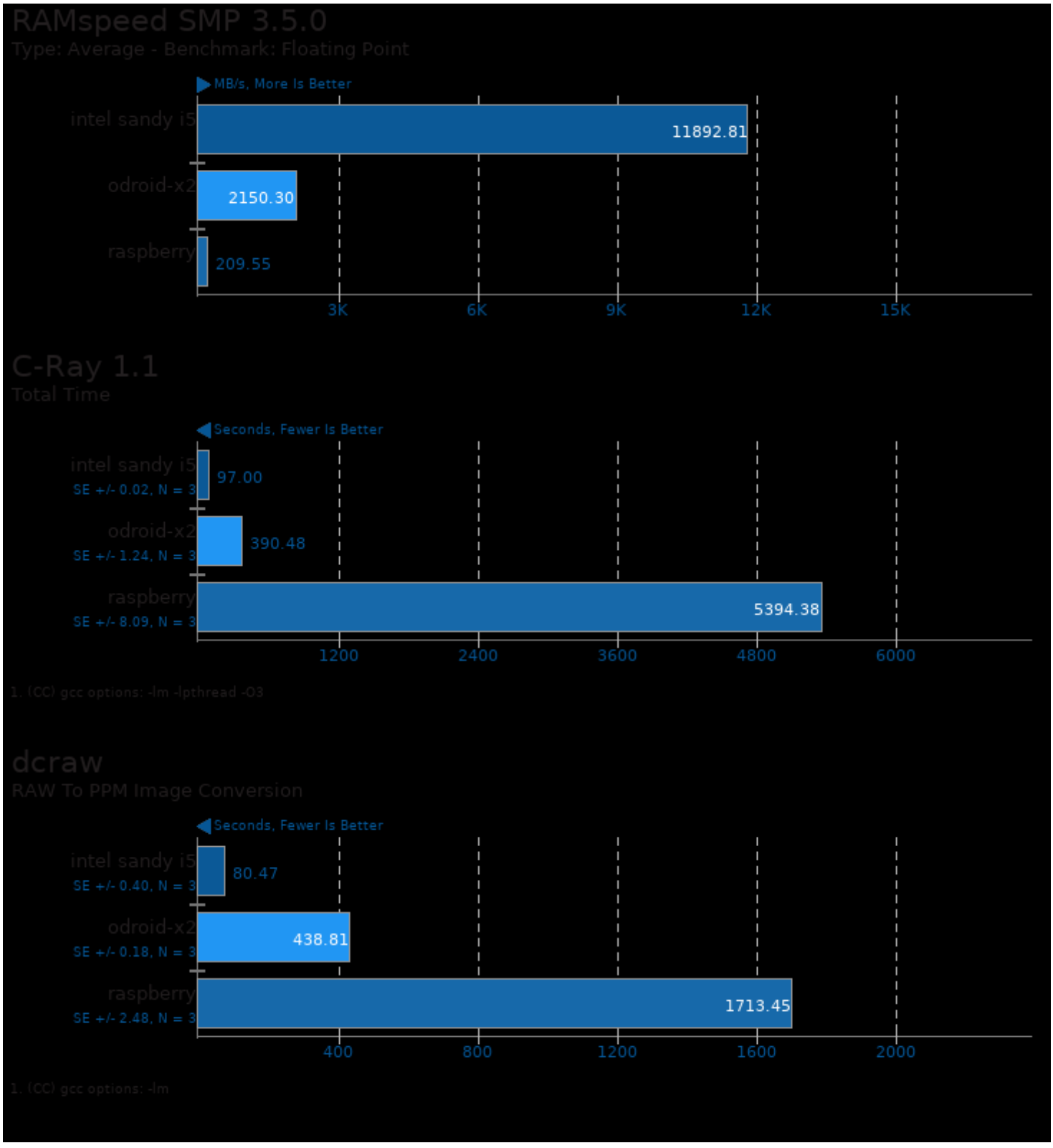

x11perf 1.5
Test: PutImage XY 500x500 Square
Operations / Second, More Is Better
intel sandy i5
SE +/- 0.00, N = 3
162.00
odroid-x2
SE +/- 0.32, N = 3
32.17
raspberry
SE +/- 0.00, N = 3
6.60
40
80
120
160
200
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm
x11perf 1.5
Test: Fill 300 x 300px AA Trapezoid
Operations / Second, More Is Better
intel sandy i5
SE +/- 3055.05, N = 3
259000
odroid-x2
SE +/- 3.33, N = 3
1087
raspberry
SE +/- 0.33, N = 3
333
60K
120K
180K
240K
300K
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm
x11perf 1.5
Test: 500px Copy From Window To Window
Operations / Second, More Is Better
intel sandy i5
SE +/- 0.00, N = 3
3590
odroid-x2
SE +/- 3.33, N = 3
1487
raspberry
SE +/- 0.33, N = 3
170
800
1600
2400
3200
4000
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm

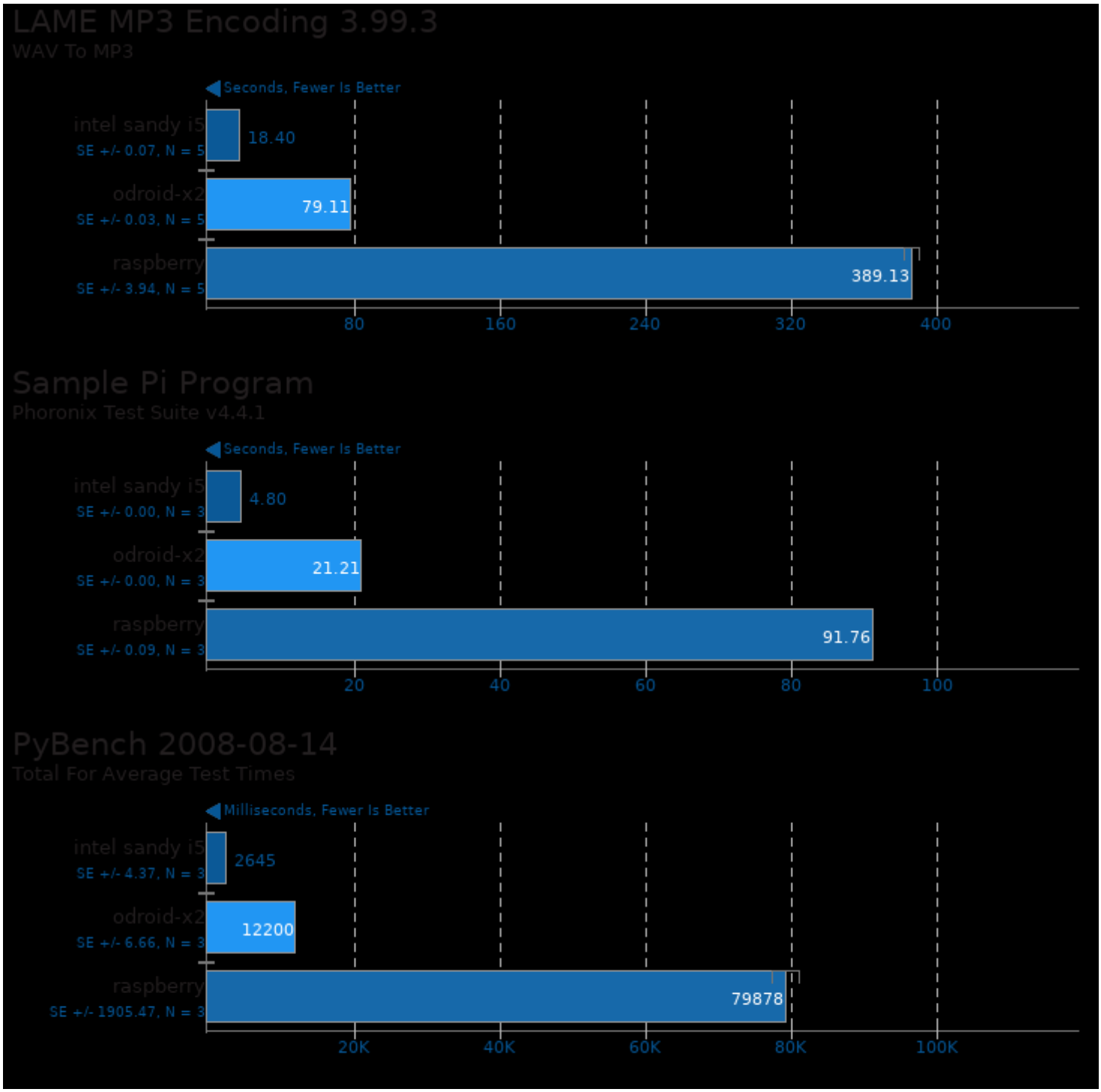

x11perf 1.5
Test: Copy 500x500 From Pixmap To Pixmap
Operations / Second, More Is Better
intel sandy i5
SE +/- 445.03, N = 6
4367
odroid-x2
SE +/- 15.28, N = 3
1940
raspberry
SE +/- 0.00, N = 3
199
900
1800
2700
3600
4500
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm
x11perf 1.5
Test: 500px Compositing From Pixmap To Window
Operations / Second, More Is Better
intel sandy i5
SE +/- 20.00, N = 3
3610
odroid-x2
SE +/- 21.86, N = 3
1833
raspberry
SE +/- 0.00, N = 3
261
800
1600
2400
3200
4000
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm
x11perf 1.5
Test: 500px Compositing From Window To Window
Operations / Second, More Is Better
intel sandy i5
SE +/- 0.00, N = 3
3590
odroid-x2
SE +/- 35.12, N = 3
3510
raspberry
SE +/- 0.33, N = 3
268
800
1600
2400
3200
4000
1. (CC) gcc options: -O2 -lXext -lXft -lXrender -lX11 -lXmuu -lm

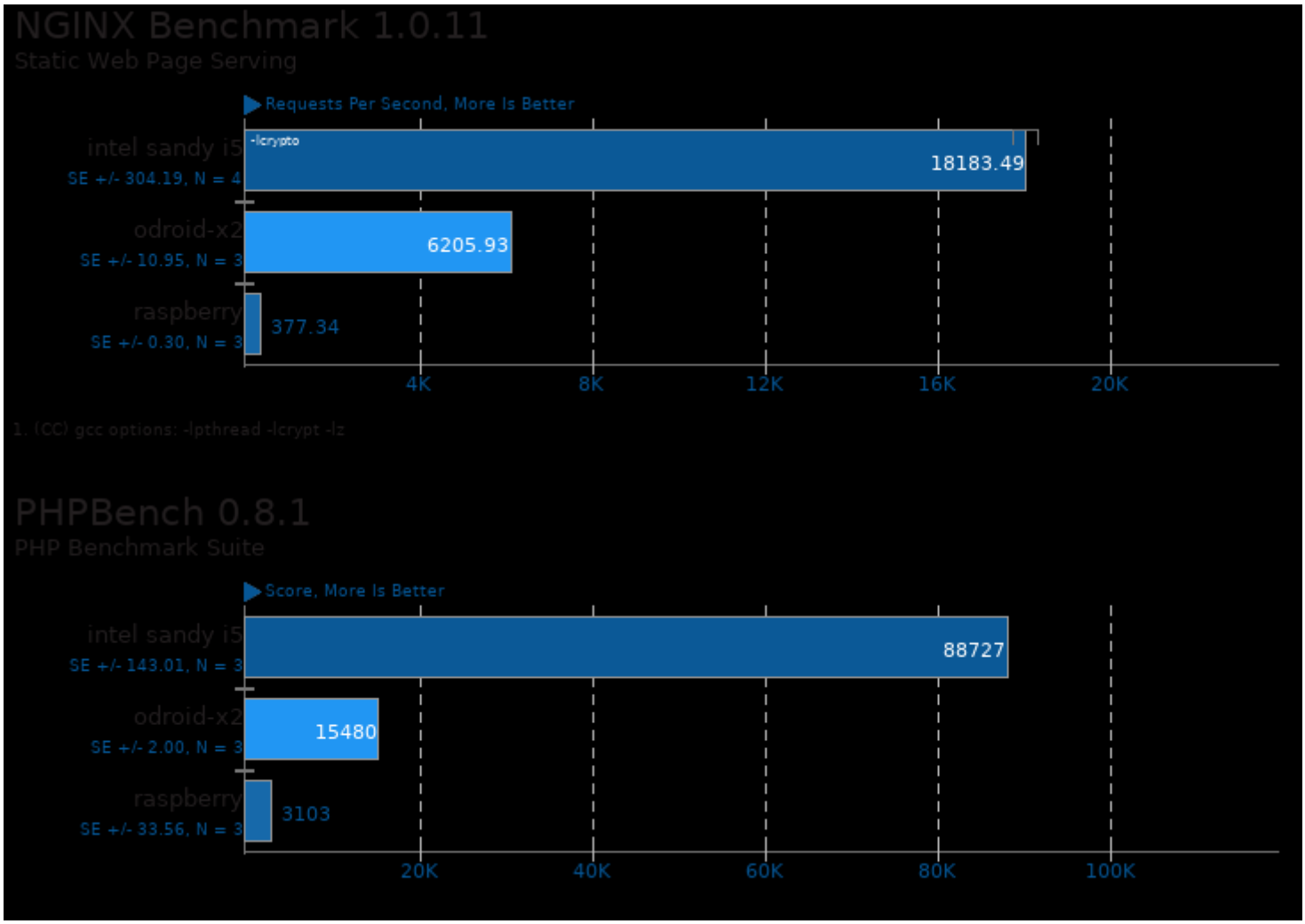

RAMspeed SMP 3.5.0
Type: Add - Benchmark: Integer
MB/s, More Is Better
intel sandy i5
11136.36
odroid-x2
1575.71
raspberry
187.92
2K
4K
6K
8K
10K
RAMspeed SMP 3.5.0
Type: Copy - Benchmark: Integer
MB/s, More Is Better
intel sandy i5
11222.27
odroid-x2
2733.49
raspberry
206.23
2K
4K
6K
8K
10K
RAMspeed SMP 3.5.0
Type: Scale - Benchmark: Integer
MB/s, More Is Better
intel sandy i5
11222.86
odroid-x2
2662.39
raspberry
207.46
2K
4K
6K
8K
10K


RAMspeed SMP 3.5.0
Type: Triad - Benchmark: Integer
MB/s, More Is Better
intel sandy i5
11108.48
odroid-x2
1593.44
raspberry
189.40
2K
4K
6K
8K
10K
RAMspeed SMP 3.5.0
Type: Average - Benchmark: Integer
MB/s, More Is Better
intel sandy i5
11161.36
odroid-x2
2148.90
raspberry
197.73
2K
4K
6K
8K
10K
RAMspeed SMP 3.5.0
Type: Add - Benchmark: Floating Point
MB/s, More Is Better
intel sandy i5
12549.62
odroid-x2
1796.20
raspberry
191.38
3K
6K
9K
12K
15K


RAMspeed SMP 3.5.0
Type: Copy - Benchmark: Floating Point
MB/s, More Is Better
intel sandy i5
11031.77
odroid-x2
2216.48
raspberry
241.79
2K
4K
6K
8K
10K
RAMspeed SMP 3.5.0
Type: Scale - Benchmark: Floating Point
MB/s, More Is Better
intel sandy i5
11235.64
odroid-x2
2687.45
raspberry
214.00
2K
4K
6K
8K
10K
RAMspeed SMP 3.5.0
Type: Triad - Benchmark: Floating Point
MB/s, More Is Better
intel sandy i5
12729.17
odroid-x2
1847.63
raspberry
191.27
3K
6K
9K
12K
15K

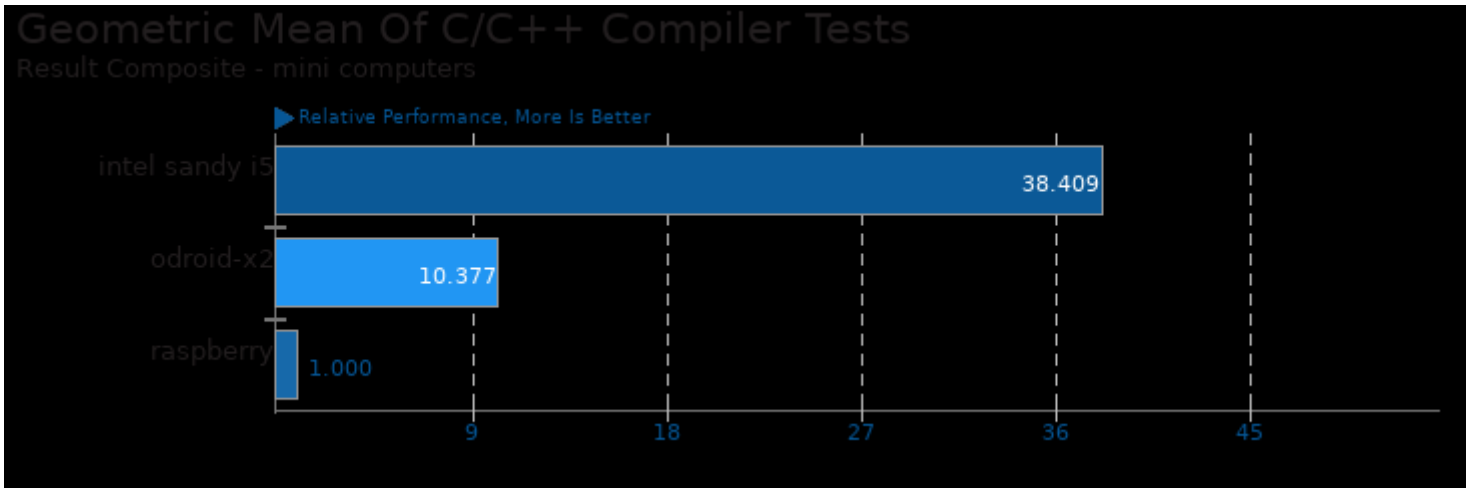

RAMspeed SMP 3.5.0
Type: Average - Benchmark: Floating Point
MB/s, More Is Better
intel sandy i5
11892.81
odroid-x2
2150.30
raspberry
209.55
3K
6K
9K
12K
15K
C-Ray 1.1
Total Time
Seconds, Fewer Is Better
intel sandy i5
SE +/- 0.02, N = 3
97.00
odroid-x2
SE +/- 1.24, N = 3
390.48
raspberry
SE +/- 8.09, N = 3
5394.38
1200
2400
3600
4800
6000
1. (CC) gcc options: -lm -lpthread -O3
dcraw
RAW To PPM Image Conversion
Seconds, Fewer Is Better
intel sandy i5
SE +/- 0.40, N = 3
80.47
odroid-x2
SE +/- 0.18, N = 3
438.81
raspberry
SE +/- 2.48, N = 3
1713.45
400
800
1200
1600
2000
1. (CC) gcc options: -lm


LAME MP3 Encoding 3.99.3
WAV To MP3
Seconds, Fewer Is Better
intel sandy i5
SE +/- 0.07, N = 5
18.40
odroid-x2
SE +/- 0.03, N = 5
79.11
raspberry
SE +/- 3.94, N = 5
389.13
80
160
240
320
400
Sample Pi Program
Phoronix Test Suite v4.4.1
Seconds, Fewer Is Better
intel sandy i5
SE +/- 0.00, N = 3
4.80
odroid-x2
SE +/- 0.00, N = 3
21.21
raspberry
SE +/- 0.09, N = 3
91.76
20
40
60
80
100
PyBench 2008-08-14
Total For Average Test Times
Milliseconds, Fewer Is Better
intel sandy i5
SE +/- 4.37, N = 3
2645
odroid-x2
SE +/- 6.66, N = 3
12200
raspberry
SE +/- 1905.47, N = 3
79878
20K
40K
60K
80K
100K

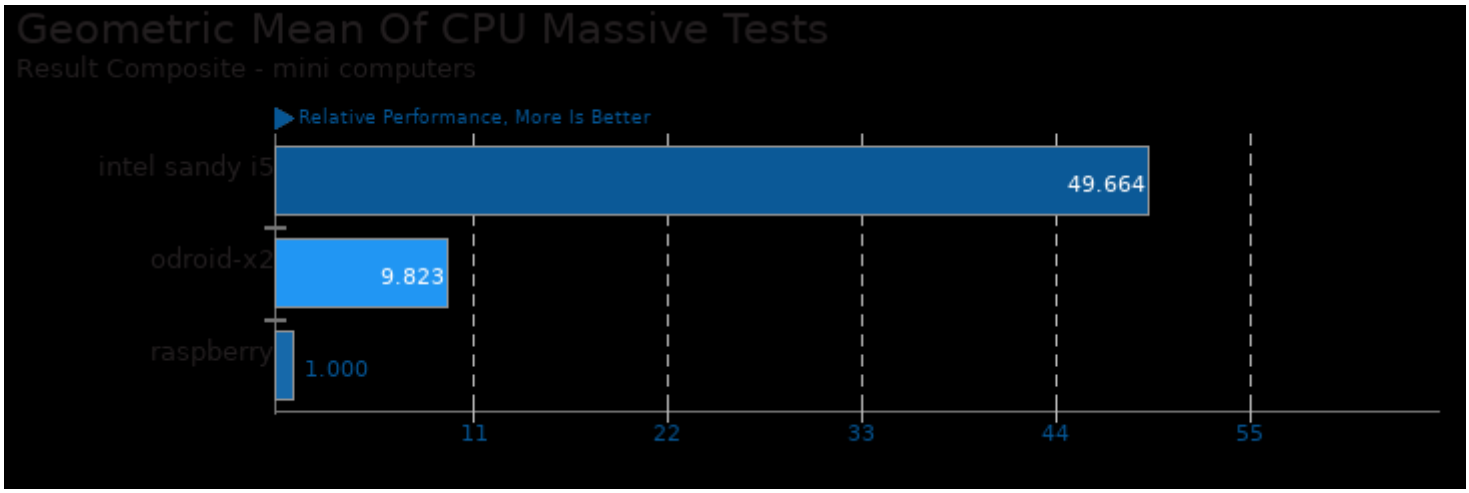

NGINX Benchmark 1.0.11
Static Web Page Serving
Requests Per Second, More Is Better
intel sandy i5
SE +/- 304.19, N = 4
-lcrypto
18183.49
odroid-x2
SE +/- 10.95, N = 3
6205.93
raspberry
SE +/- 0.30, N = 3
377.34
4K
8K
12K
16K
20K
1. (CC) gcc options: -lpthread -lcrypt -lz
PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
intel sandy i5
SE +/- 143.01, N = 3
88727
odroid-x2
SE +/- 2.00, N = 3
15480
raspberry
SE +/- 33.56, N = 3
3103
20K
40K
60K
80K
100K

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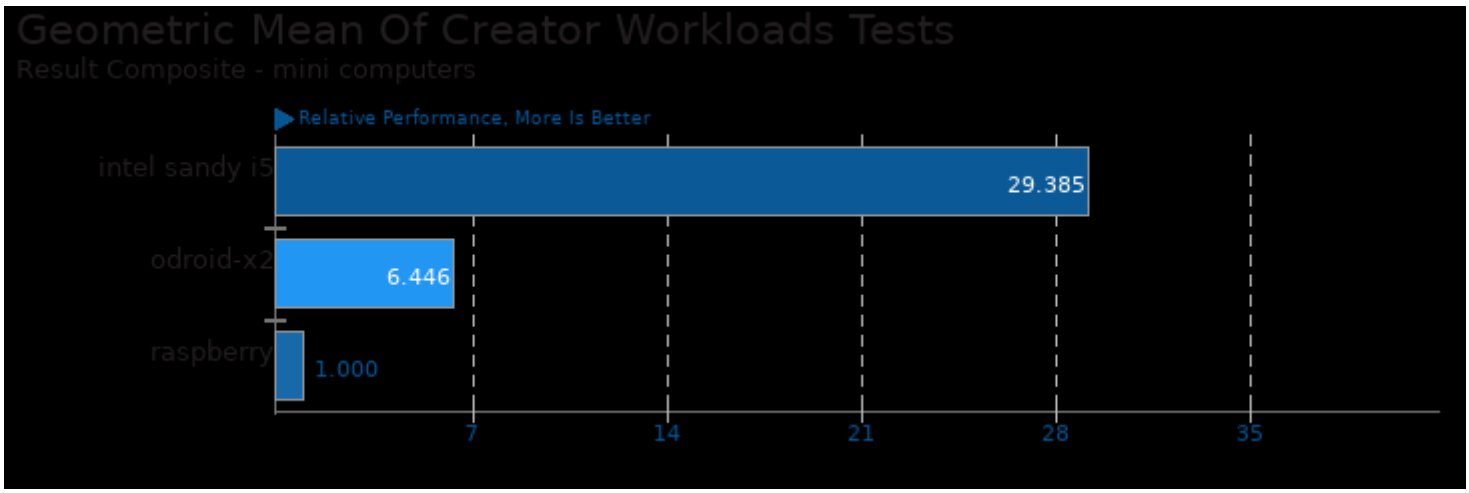
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/c-ray, pts/encode-mp3 and pts/nginx

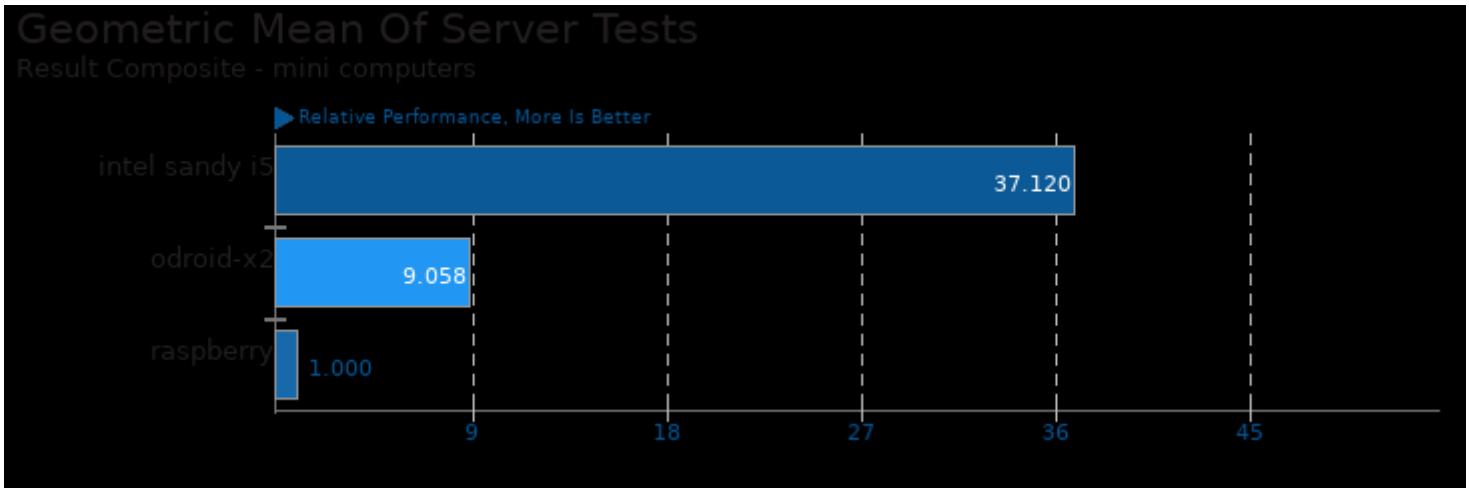


Geometric mean based upon tests: pts/c-ray, pts/encode-mp3, pts/nginx, pts/phpbench and pts/ramspeed

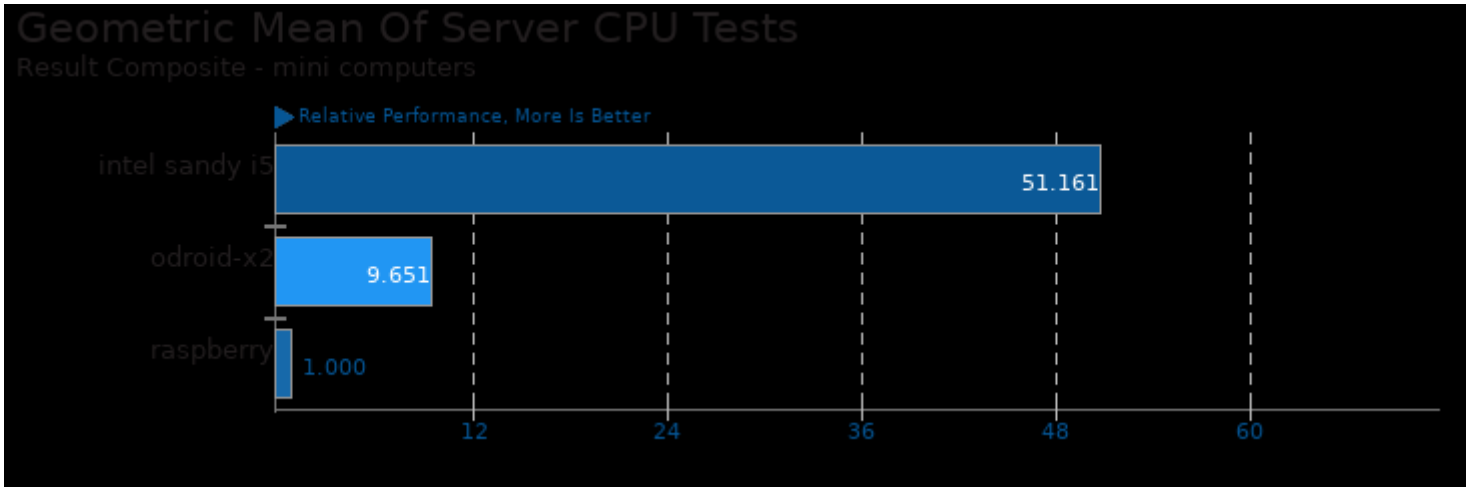


Geometric mean based upon tests: pts/c-ray, pts/encode-mp3 and pts/dcraw

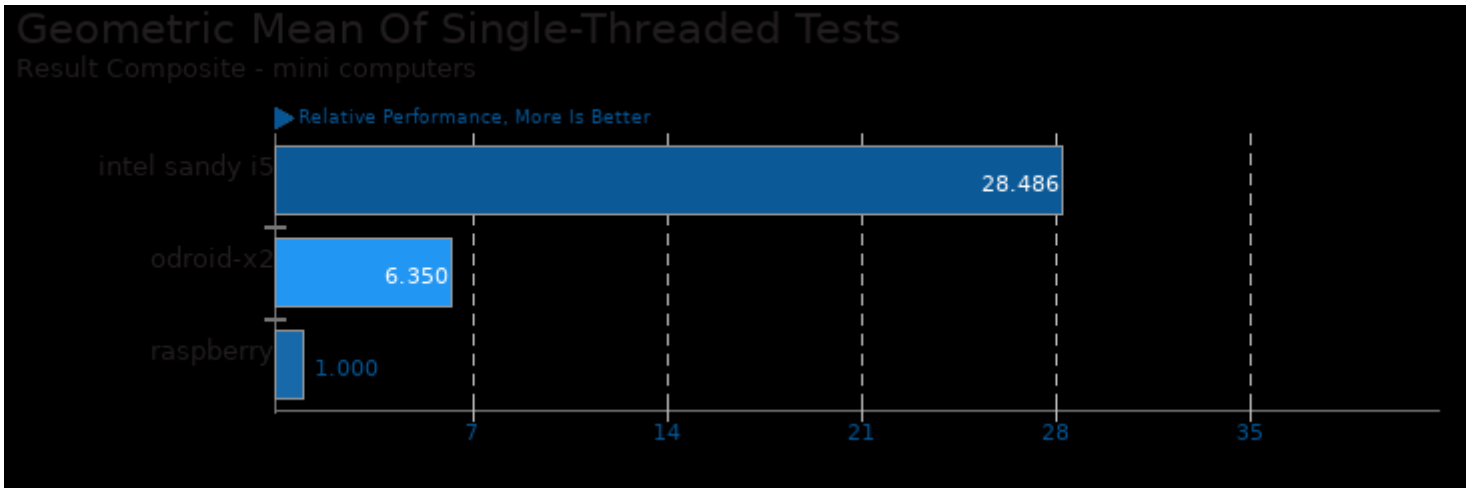
mini computers



Geometric mean based upon tests: pts/nginx and pts/phpbench



Geometric mean based upon tests: pts/c-ray, pts/pybench, pts/phpbench and pts/ramspeed



Geometric mean based upon tests: pts/dcraw, pts/encode-mp3, pts/pybench, pts/phpbench and pts/nginx

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