

Benchmark of XU4 with Active Cooler and XU4Q with Passive Cooler

This wiki page shows benchmark test results to analysis and compare their system performance with ODROID-XU4 and ODROID-XU4Q that equips with a passive cooler.



- [1. Thermal and Frequency Performance Comparison](#)
- [2. AnTuTu Performance Comparison](#)
- [3. Kernel Build Time Performance Comparison](#)

We've tested three categories of benchmarking utilities and here is a brief result for each test cases.

sysbench

- to investigate and compare thermal/cpu frequency performance
- Sysbench running time increased by 16% and 6% for each cases of cpu max 2GHz and 1.8GHz

AnTuTu

- for examining a variety of categories performance
- The decreasing score value of XU4Q from XU4 is just 2%

Kernel build

- to check the hardest stress case

- About 5m 17s increase of the total execution time (20%)

Except the hardest case like kernel build, the differences are under just 10% or lower.

[Benchmark (1) - Thermal and Frequency Performance Comparison]

Environment and Instructions

- **sysbench** 100,000 iterations

```
$ sudo sysbench --test=cpu --cpu-max-prime=100000 --num-threads=8 run
```

- setting the max cpu frequency of CPU4-7

```
$ sudo echo 1800000 > /sys/devices/system/cpu/cpu4/cpufreq/scaling_max_freq  
$ sudo cat /sys/devices/system/cpu/cpu4/cpufreq/scaling_max_freq  
1800000
```

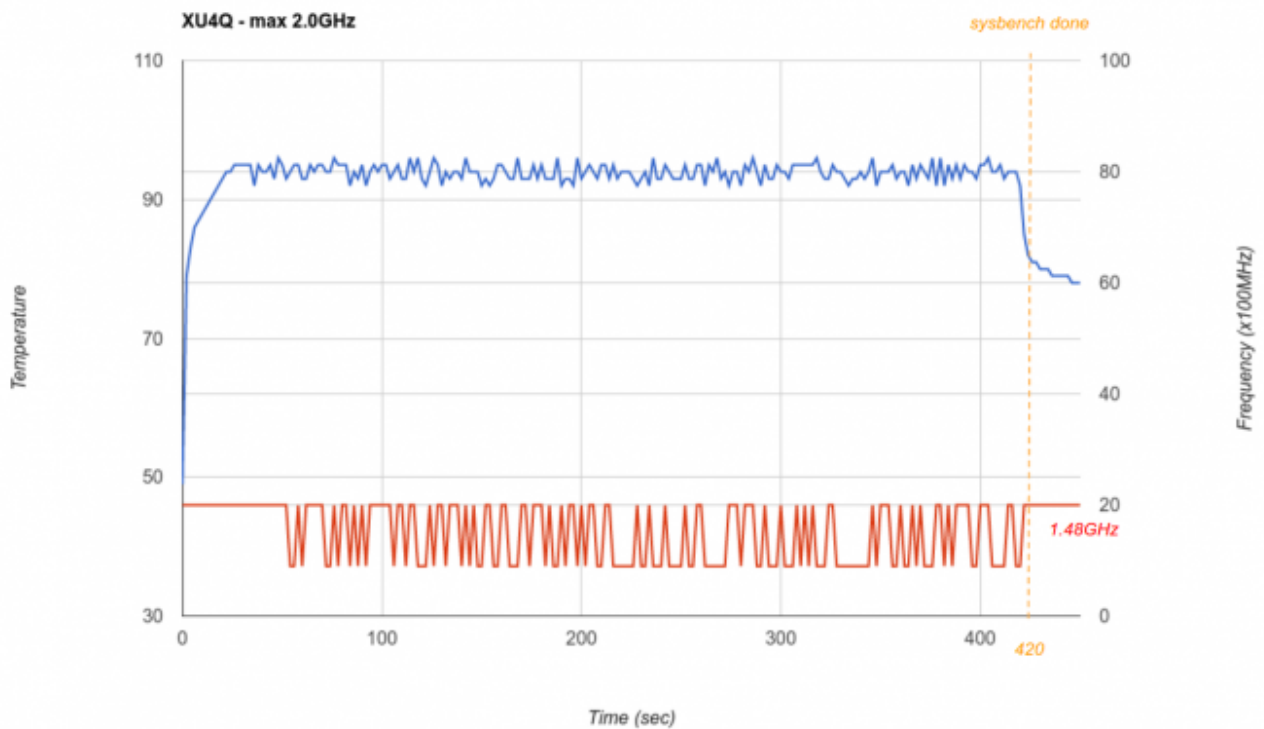
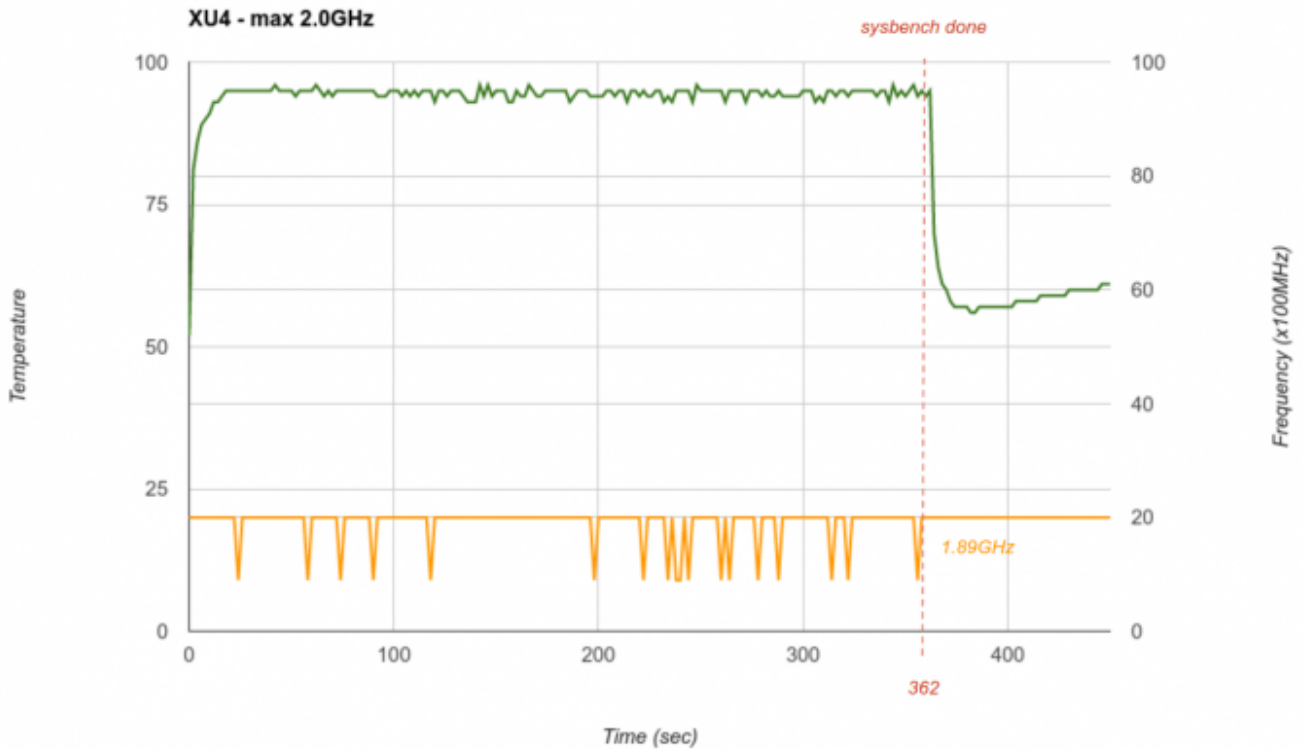
- All of 8 cores are ON
- Script

```
#!/bin/sh  
  
echo "Temp, FreqCPU0, FreqCPU4, FreqCPU5, Freq6CPU, FreqCPU7 "  
while true :  
do  
    t=`cat /sys/devices/virtual/thermal/thermal_zone0/temp`  
    t1=$(( $t/1000))  
  
    f0=`cat /sys/devices/system/cpu/cpu0/cpufreq/scaling_cur_freq`  
    f0_r=$(( $f0/100000))  
  
    f4=`cat /sys/devices/system/cpu/cpu4/cpufreq/scaling_cur_freq`  
    f4_r=$(( $f4/100000))  
  
    f5=`cat /sys/devices/system/cpu/cpu5/cpufreq/scaling_cur_freq`  
    f5_r=$(( $f5/100000))  
  
    f6=`cat /sys/devices/system/cpu/cpu6/cpufreq/scaling_cur_freq`  
    f6_r=$(( $f6/100000))  
  
    f7=`cat /sys/devices/system/cpu/cpu7/cpufreq/scaling_cur_freq`  
    f7_r=$(( $f7/100000))  
  
    echo $t1, $f0_r, $f4_r, $f5_r, $f6_r, $f7_r  
  
    sleep 2
```

Test Case 1 - Max CPU Frequency 2.0GHz case

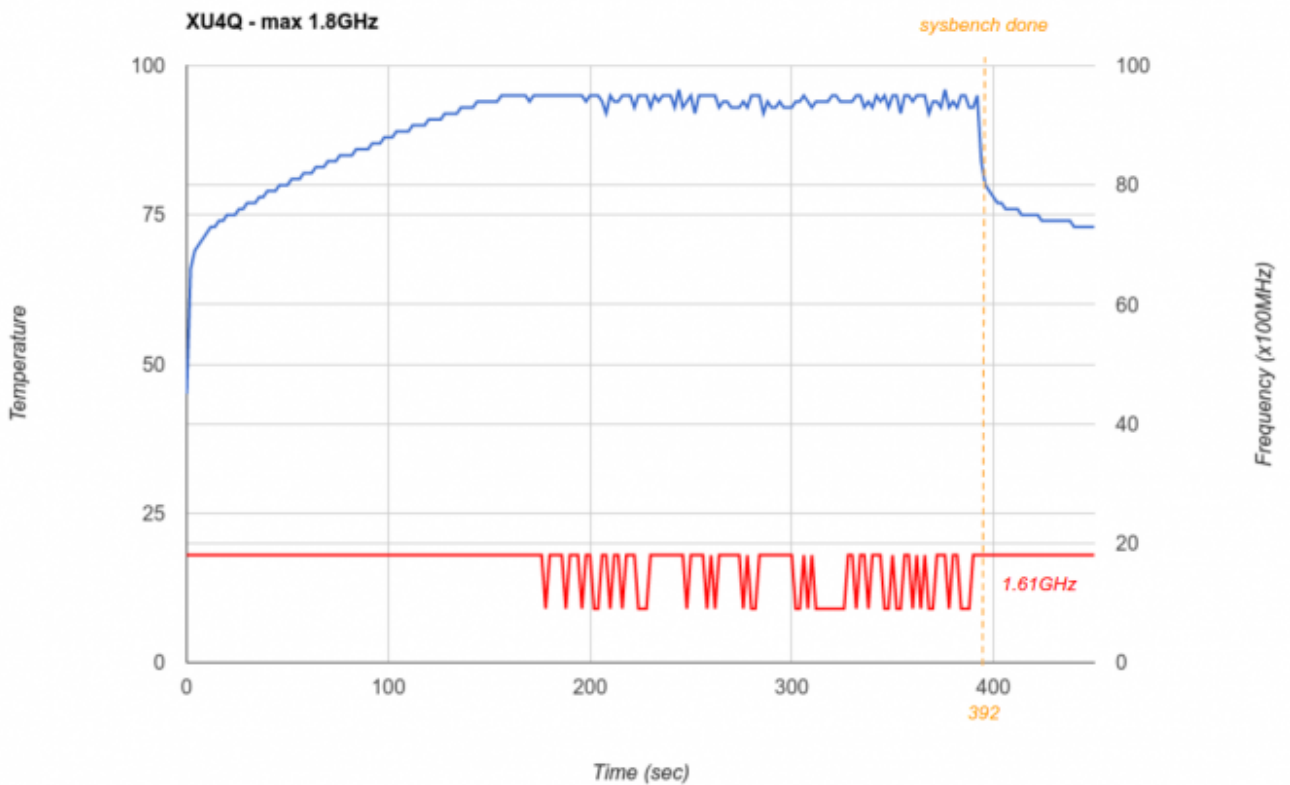
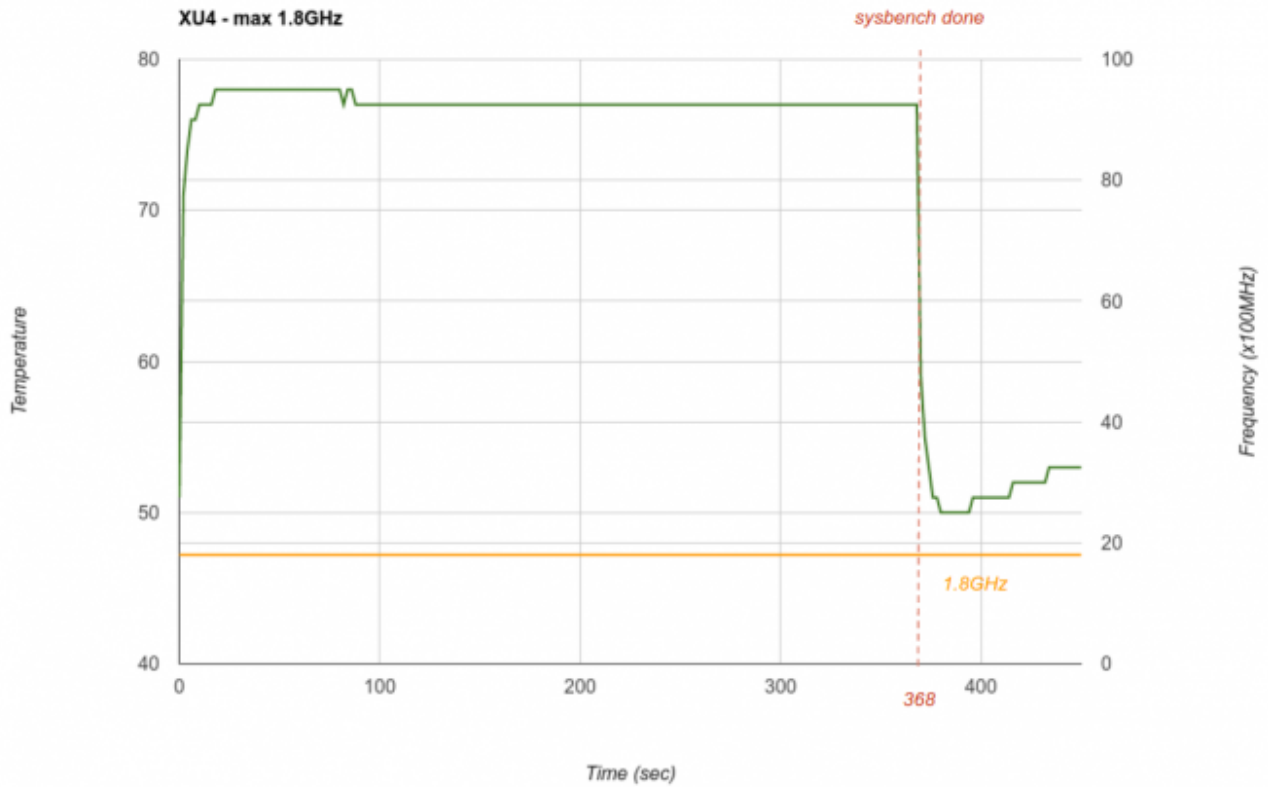
Here is sysbench test result in case of max cpu frequency 2.0GHz.

- Running Time : about 16% increase - XU4Q / XU4 = 420 / 362 = **116%**
- Average CPU Frequency : about 22% loss - XU4Q / XU4 = 1.48 / 1.89 = **78%**

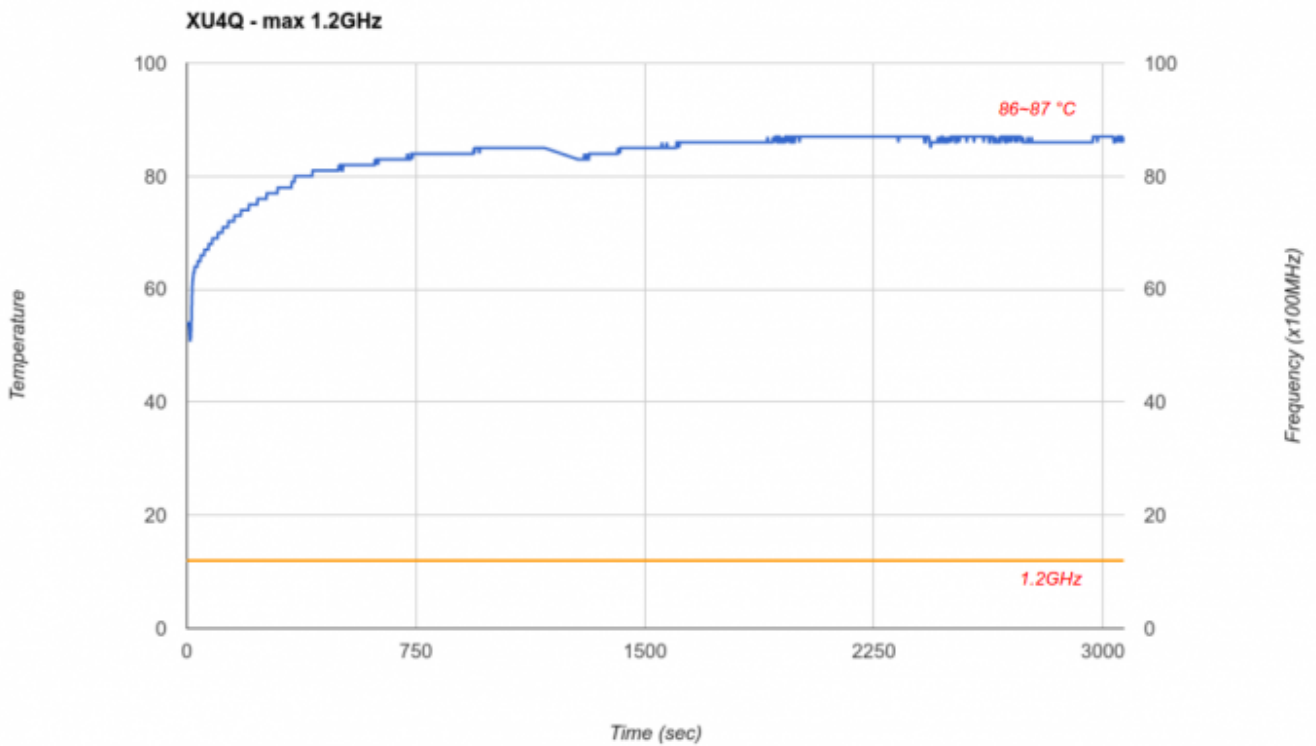


Test Case 2 - Max CPU Frequency 1.8GHz case

- Running Time : about 6% increase - XU4Q / XU4 = 392 / 368 = **106%**
- Average CPU Frequency : about 11% loss - XU4Q / XU4 = 1.61 / 1.8 = **89%**



Test Case 3 - Finding the threshold not to drop under max frequency



[Benchmark (2) - Android AnTuTu]

Here is Android [AnTuTu](#) benchmark result for examining common and a variety of categories' score.

Environment

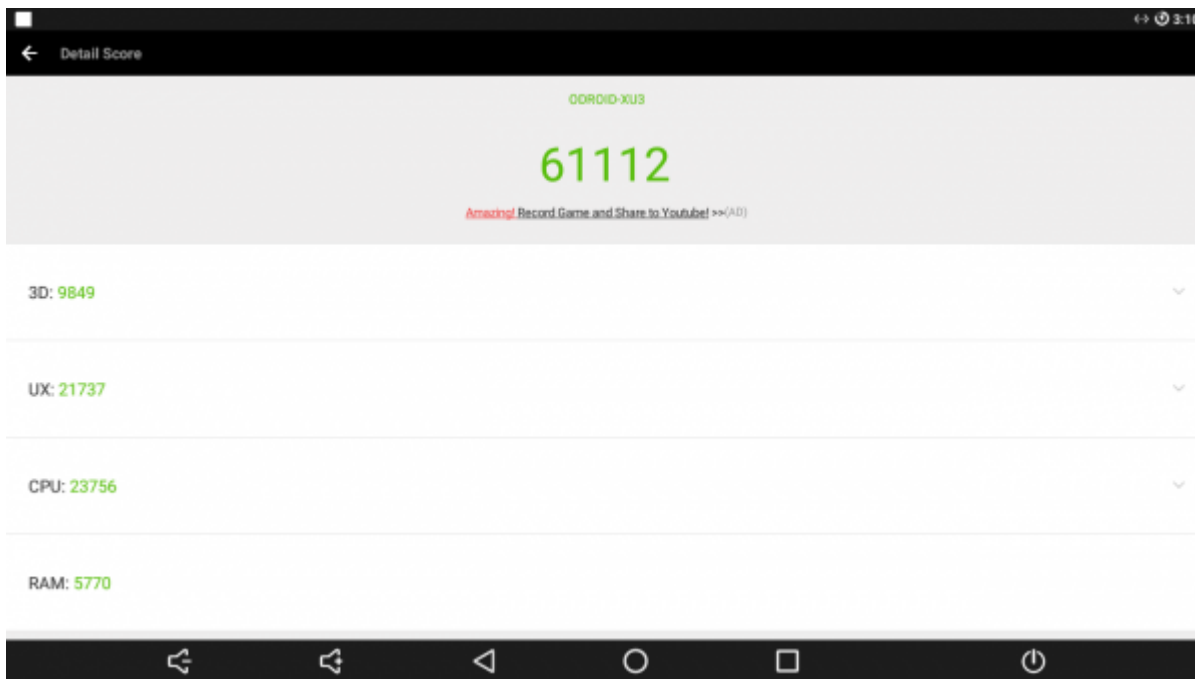
OS - [LineageOS-14.1](#) Android 7.1.1 Nougat

Resolution - 1280x720

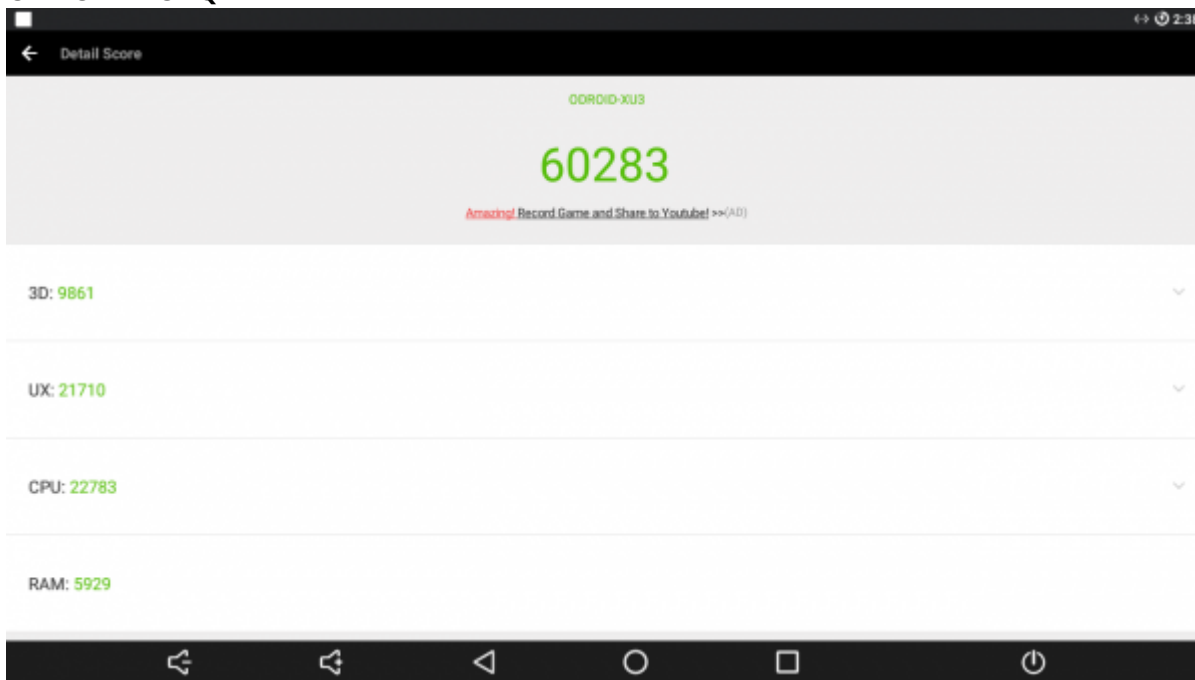
The benchmark has been tested at twice.

Result

ODROID-XU4



ODROID-XU4Q

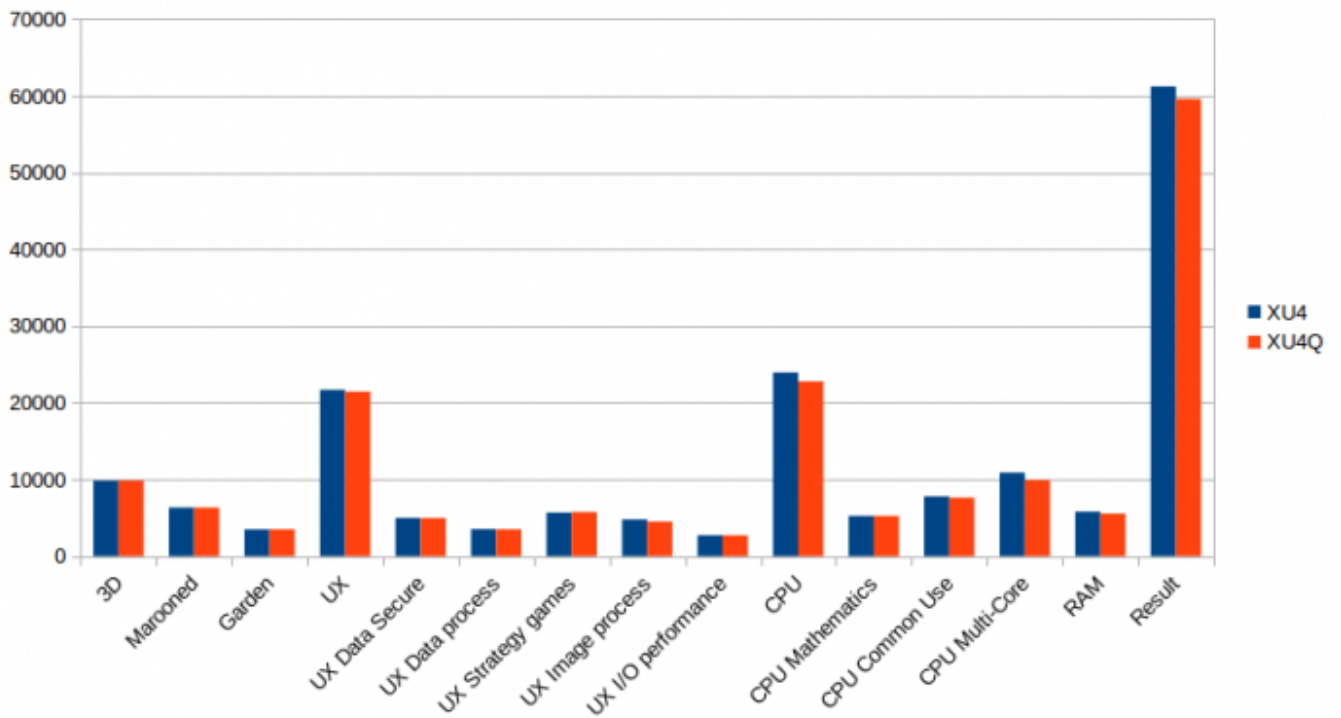


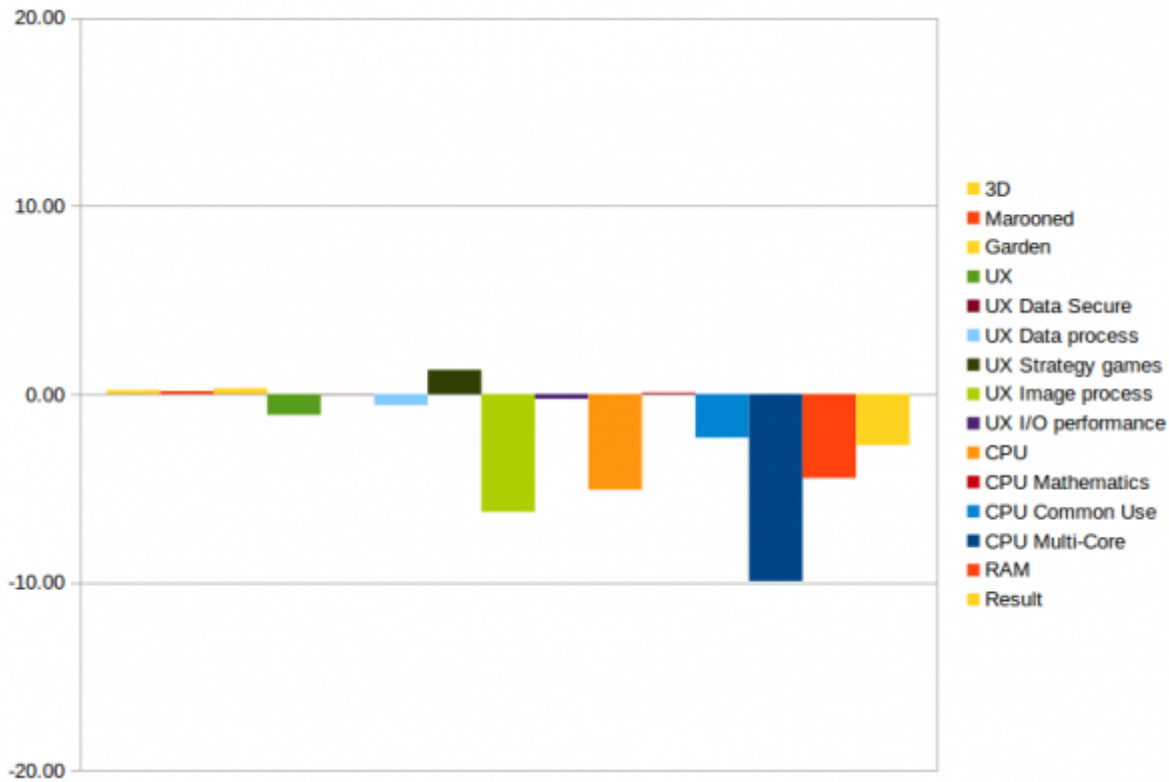
Detail score

Category	XU4	XU4Q	%
3D	9823	9843.5	0.21
Marooned	6337	6347	0.16
Garden	3486	3496.5	0.30
UX	21681	21443	-1.11
Data secure	4976.5	4975	-0.03
Data process	3517.5	3496.5	-0.60
Strategy games	5677.5	5751.5	1.29

Category	XU4	XU4Q	%
Image process	4787.5	4505	-6.27
I/O performance	2722	2715	-0.26
CPU	23933.5	22774	-5.09
Mathematics	5245	5248.5	0.07
Common use	7798	7621	-2.32
Multi-Core	10890.5	9904.5	-9.96
RAM	5791	5543	-4.47
Result	61228.5	59603.5	-2.73

AnTuTu





[Benchmark (3) - Kernel Build Time]

To check the hardest stress case, we did put kernel build test on XU4 and XU4Q. The test instruction is as following.

```
$ make odroidxu3_defconfig
$ time make -j8
```

Based on the result, in this case, the kernel build time on XU4Q gets **around 20%** increase from XU4's one.

time	XU4	XU4Q
real	25m 1.43s	30m 18.36s
user	149m 58.72s	184m 44.36s
sys	22m 54.96s	27m 21.55s

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