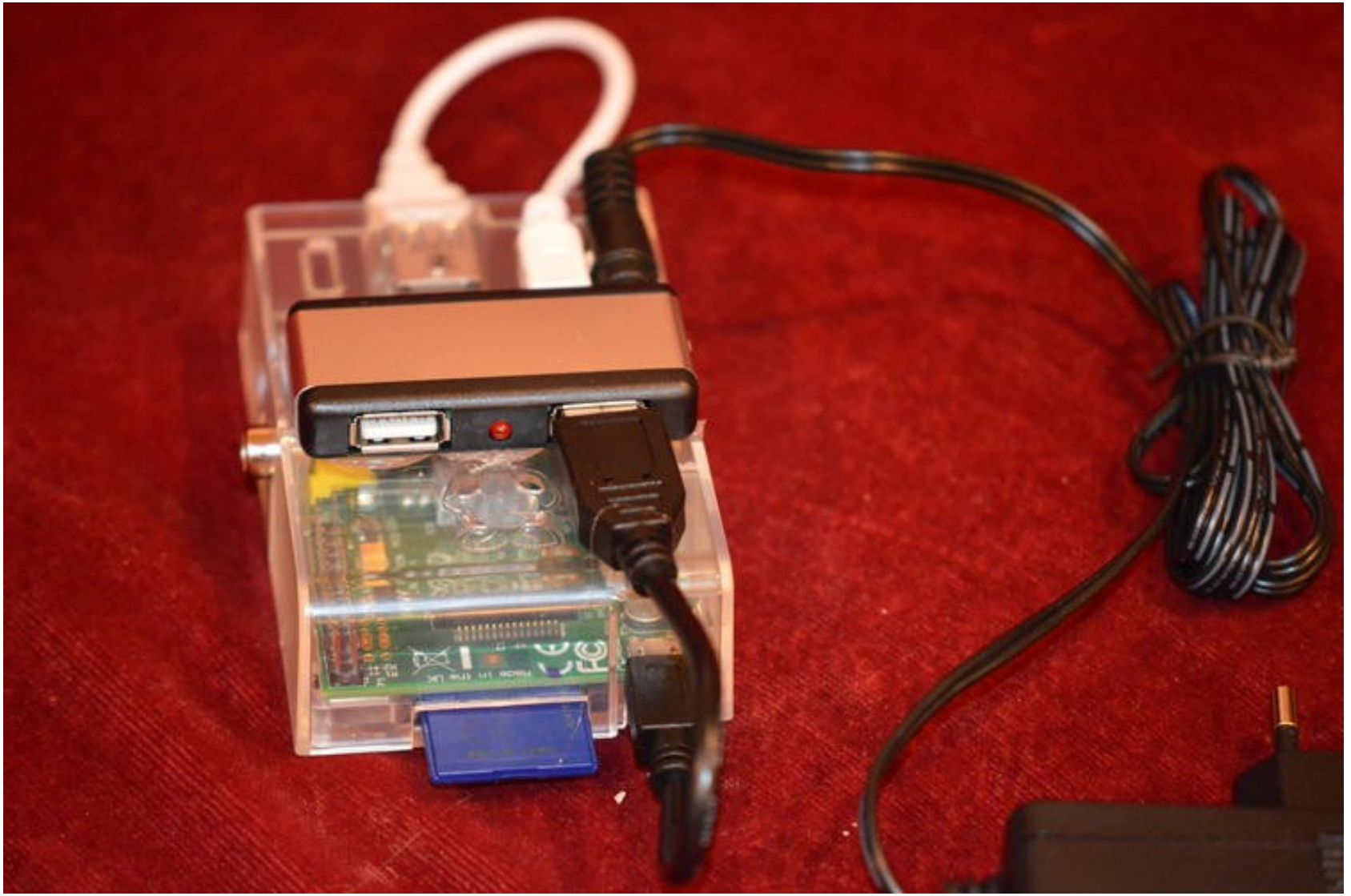
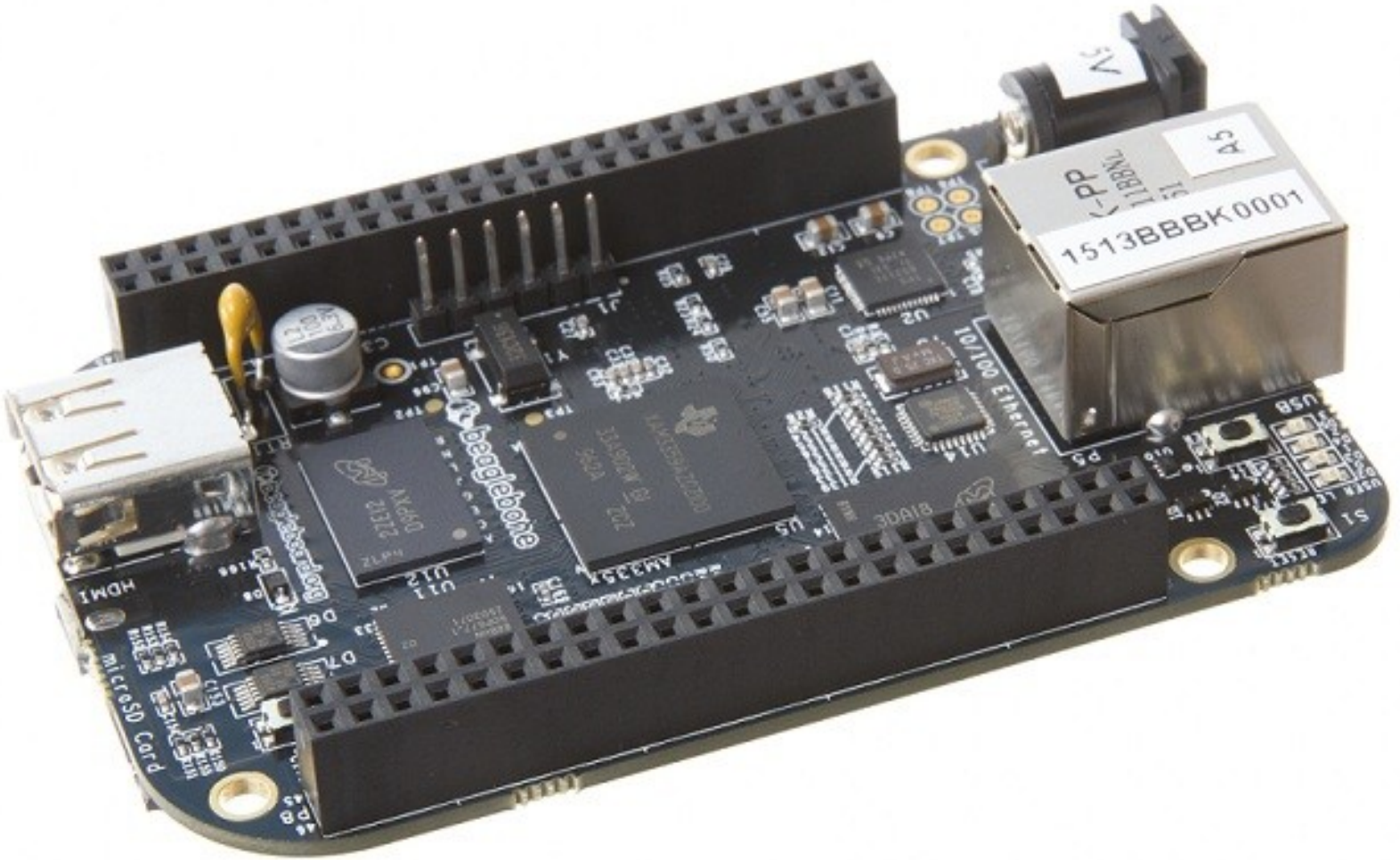
ODROID-XU3

Bifrost Workshop 2014-11-26
KTH/IRT
Robert Olsson

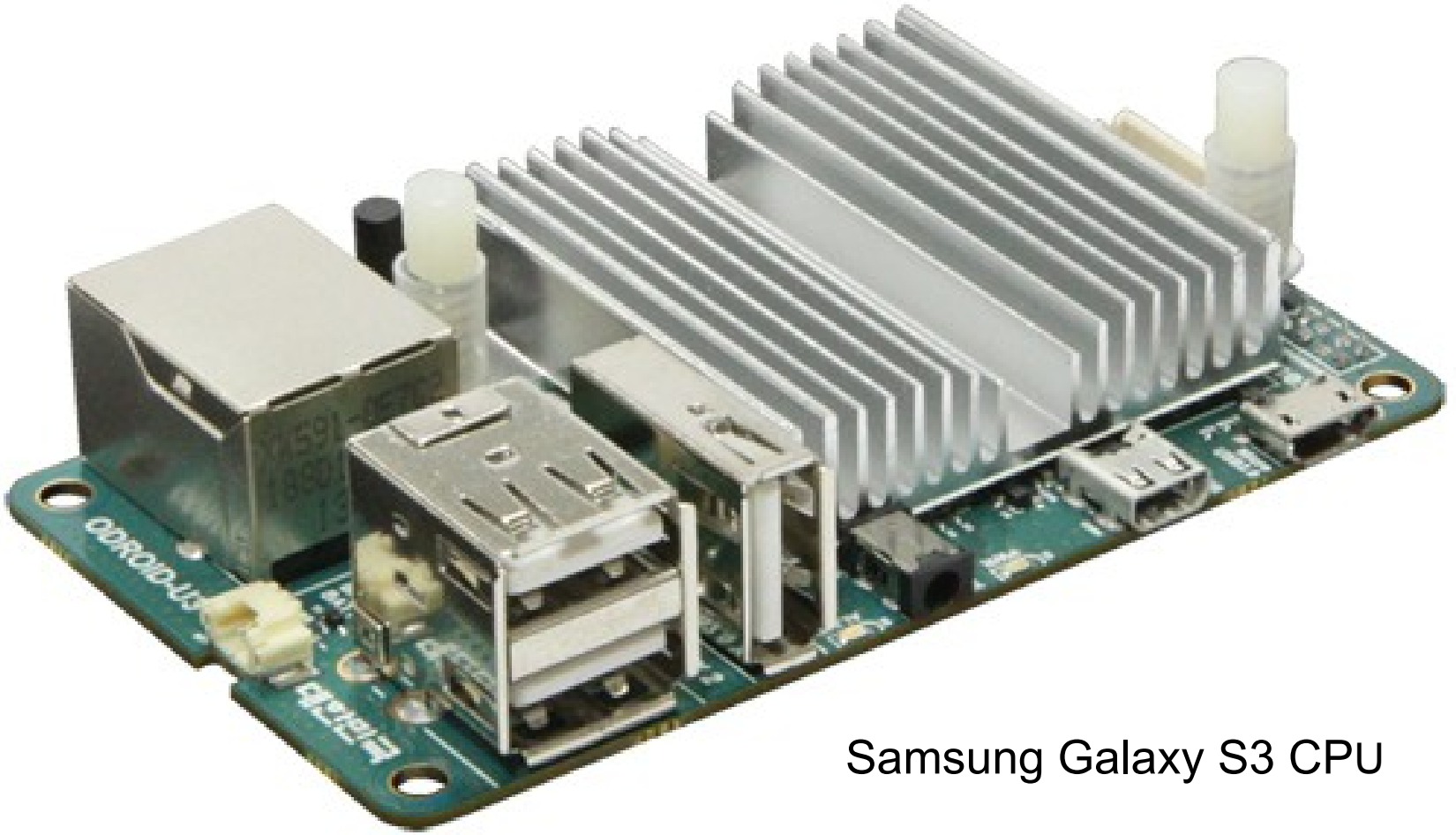
RPI & USB hub unit



Beaglebone Black, TI SoC

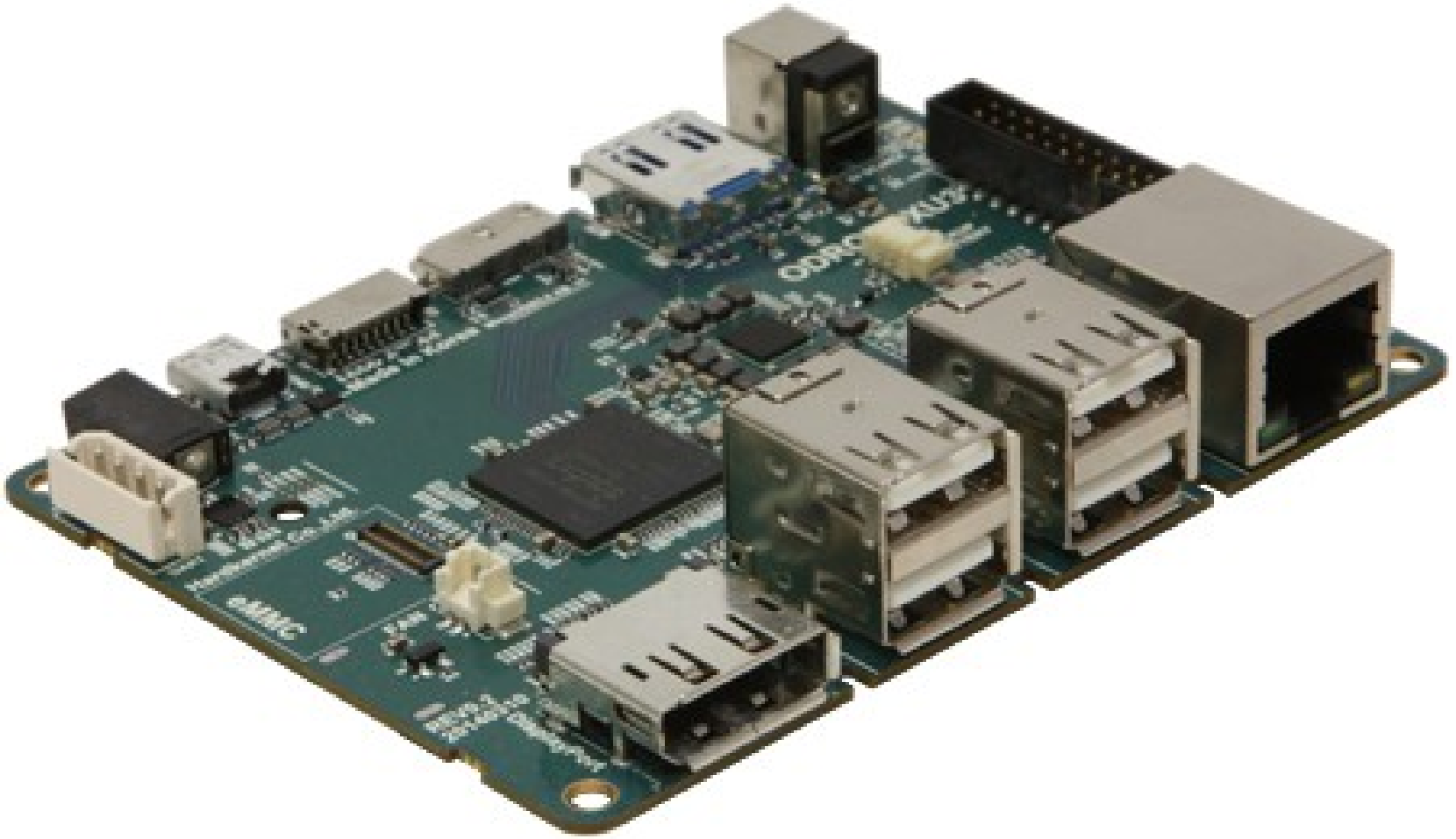


Odroid 1.7 GHz 4 cores

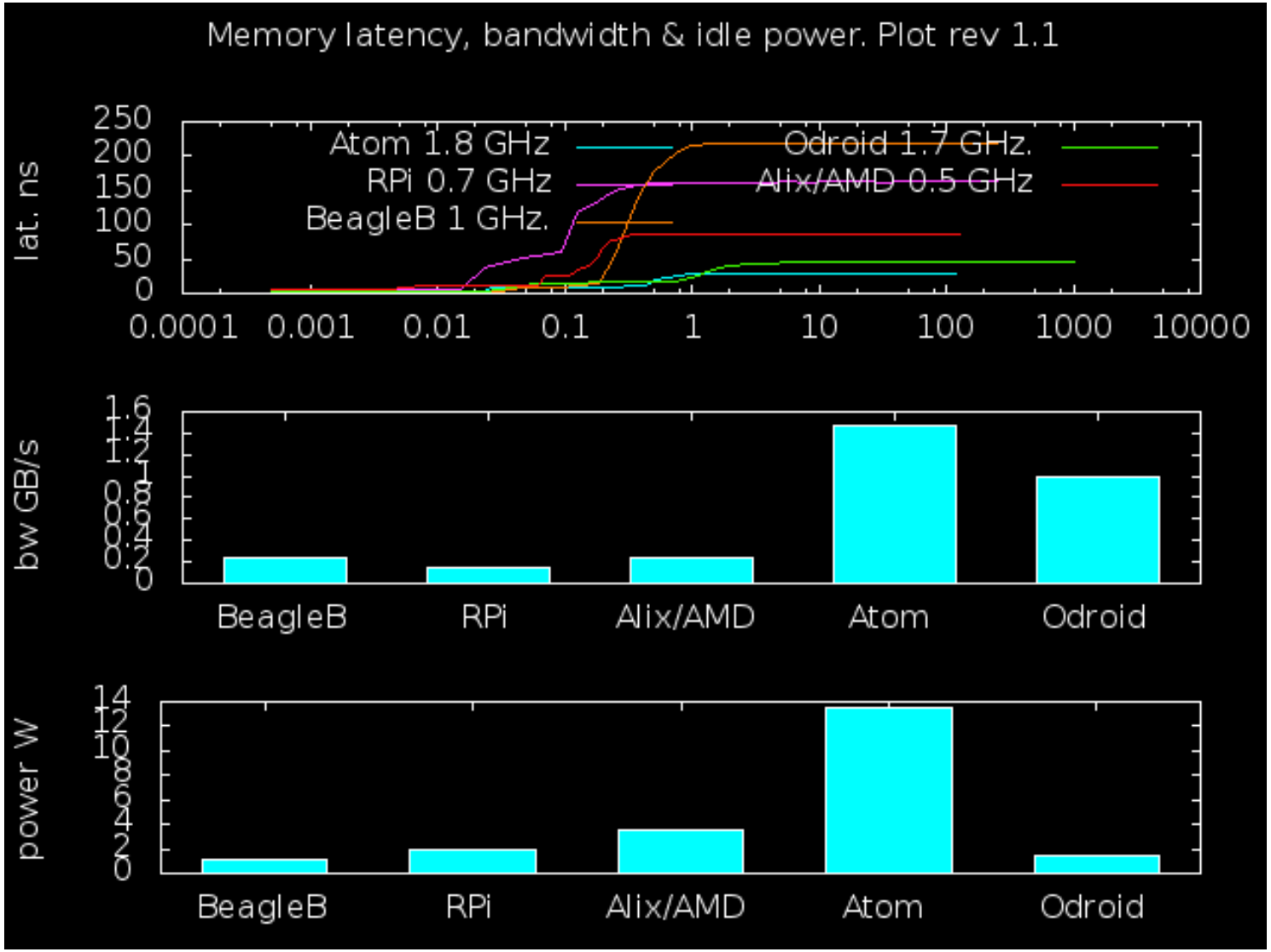


Samsung Galaxy S3 CPU

Odroid XU3: 4 cores @ 2.0 GHz
4 cores @ 1.4 GHz



System performance comparison



Odroid-XU3, HW Summary

Samsung Exynos5422 Cortex™-A15 2.0Ghz quad core and Cortex™-A7 quad core CPUs*

Mali-T628 MP6(OpenGL ES 3.0/2.0/1.1 and OpenCL 1.1 Full profile)

2 Gbyte LPDDR3 RAM at 933MHz (14.9GB/s memory bandwidth) PoP stacked

eMMC module socket : eMMC 5.0 Flash Storage (up to 64GByte)

MicroSD Card Slot (up to 64GByte)

USB 3.0 Host x 1, USB 3.0 OTG x 1, USB 2.0 Host x 4

HDMI 1.4a and DisplayPort1.1 for display

Integrated power consumption monitoring tool

10/100Mbps Ethernet with RJ-45 Jack (Auto-MDIX support)

Price $179

Odroid-XU3
iperf3 loopback TCP

iperf3 -c localhost -A 4

6.25 Gbit/s

0-3	2.25 Gbit/s
4-7	6.25 Gbit/s

Odroid-XU3
iperf3 loopback TCP

iperf3 -c localhost -A 4 -P 4

6.25 Gbit/s

0-3	2.28 Gbit/s
4-7	9.27 Gbit/s

Odroid-XU3 Ethernet's

Built'in 10/100 Mbps

Gigabit Ethernet via dongle:

Via USB
2.0
3.0

No HW classifier. Only 1 IRQ USB...

Odroid-XU3
USB SuperSpeed

USB 3.0 SuperSpeed" (SS),	5 Gbit/s
USB 2.0	480 Mbit/s

Devices not correctly probed.... hard fight

Finally:

```
lsusb -t
/:  Bus 04.Port 1: Dev 1, Class=root_hub, Driver=xhci-hcd/1p, 5000M
    |__ Port 1: Dev 2, If 0, Class=Vendor Specific Class, Driver=ax88179_178a, 5000M

/:  Bus 03.Port 1: Dev 1, Class=root_hub, Driver=xhci-hcd/1p, 480M
/:  Bus 02.Port 1: Dev 1, Class=root_hub, Driver=exynos-ohci/3p, 12M
```

Odroid-XU3
iperf3 TCP baseline

iperf3 -c 192.168.2.1	232 Mbits/sec
iperf3 -c 192.168.2.1 -R	420 Mbits/sec
iperf3 -c 192.168.2.1 -A 0	135 Mbits/sec
iperf3 -c 192.168.2.1 -A 1	280 Mbits/sec
iperf3 -c 192.168.2.1 -A 4	160 Mbits/sec
iperf3 -c 192.168.2.1 -A 1 -R	490 Mbits/sec

Odroid-XU3
iperf3 TCP rps affinity

RPS = Receive Packet Steering.Distribute packet load.

echo F0 > /sys/class/net/eth2/queues/rx-0/rps_cpus

iperf3 -c 192.168.2.1 -A 6	194 Mbits/sec
iperf3 -c 192.168.2.1 -A 6 -R	795 Mbits/sec

Etc etc

power efficiency benchmarking proposal

Sever performance. The general clause:

Mb(Class,TCPX) / Watt

Number of Mbit/s per Watt for fixed number of TCP flows, 1 , 10, 100, 1000 etc

Example:
MB(100, TCP10) = 20

Iperf is a usable tool. Server side runs on DUT.

XU3 Idle power

5V@ Approx. 4W
FAN mostly quiet

Intel Quark @ 2.2W

Quark™ SoC X1021

(16K Cache, 400 MHz)

512MB DDR3 ECC

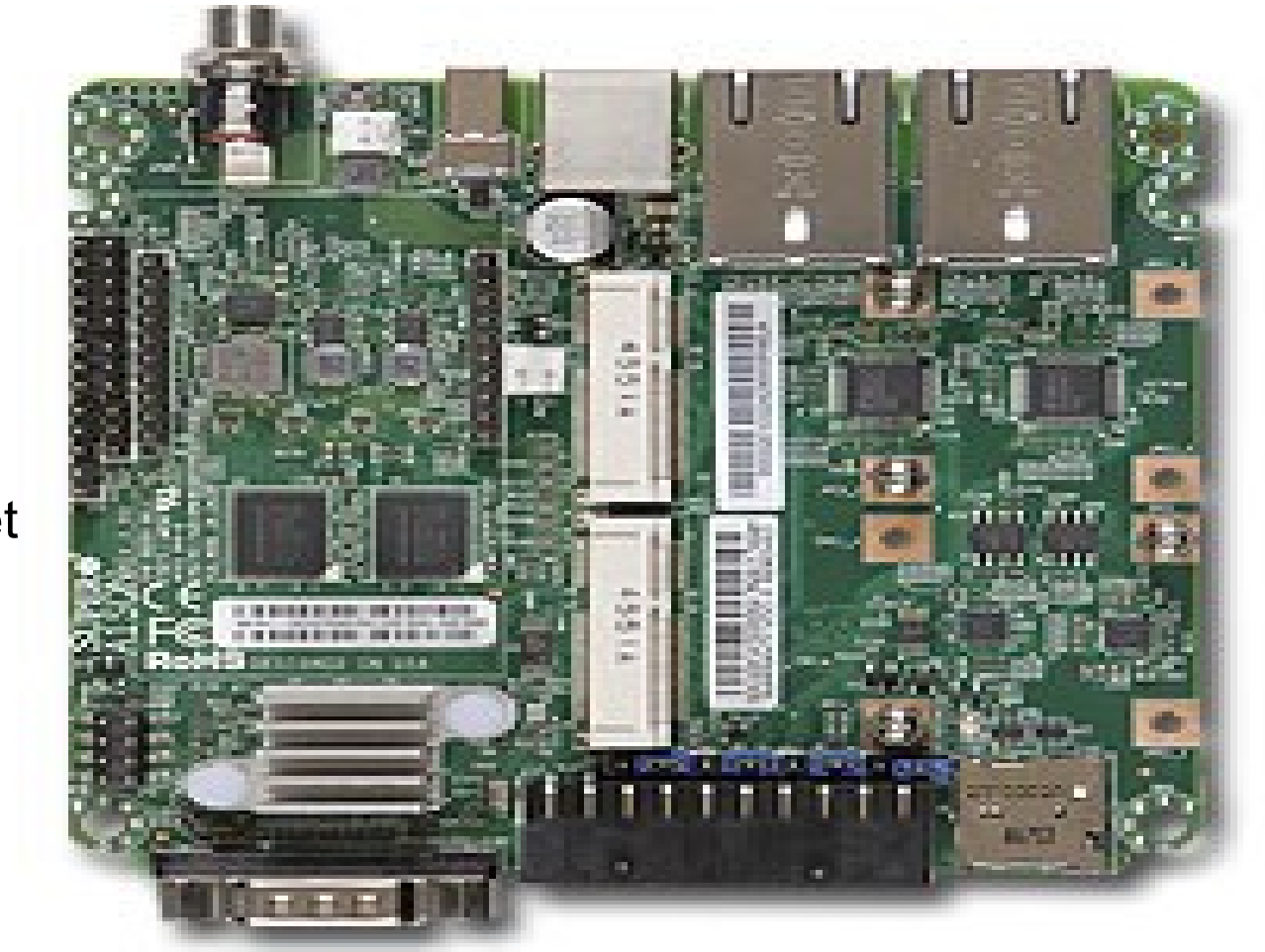
2x Mini-PCI-E slots;

1x ZigBee module socket

2x 10/100Mbps LAN

32 bit

1 Core



Mini PCI-E Dual Ethernet

Intel I350
Multi-queue 8 RX + 8 TX
PCI-E GEN1(2.5GT/s) GEN2(5GT/s