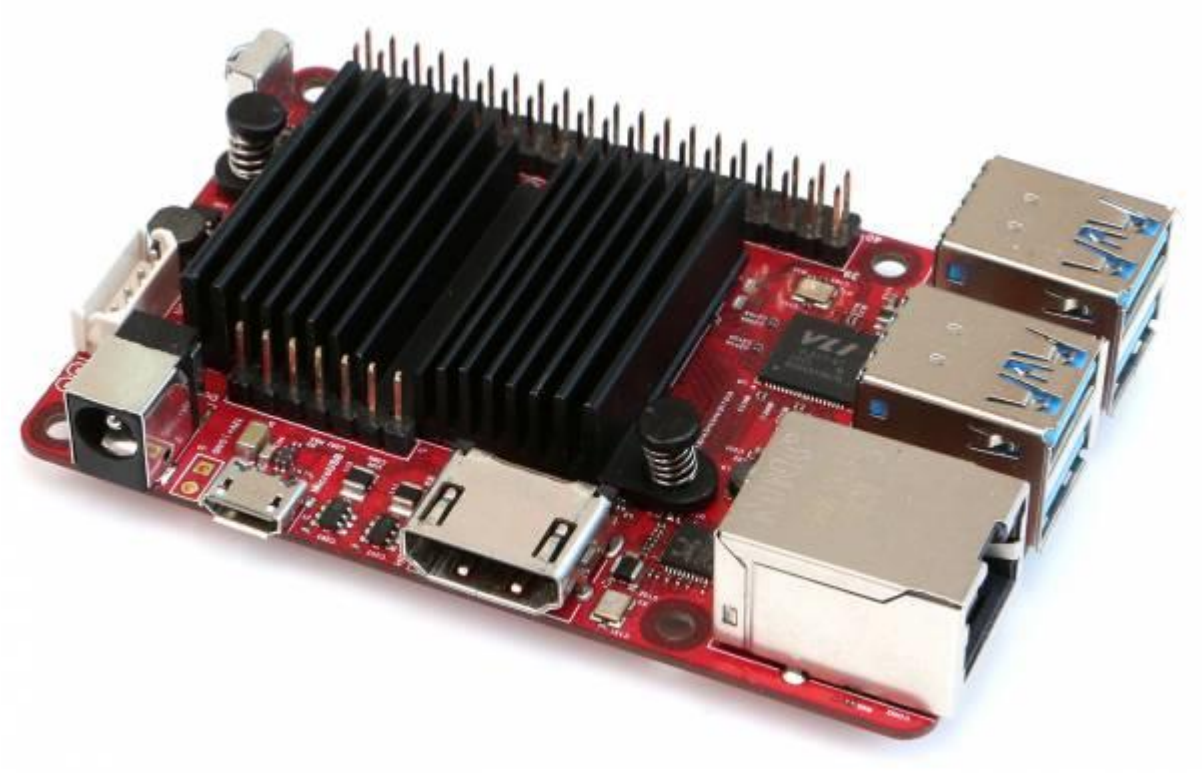
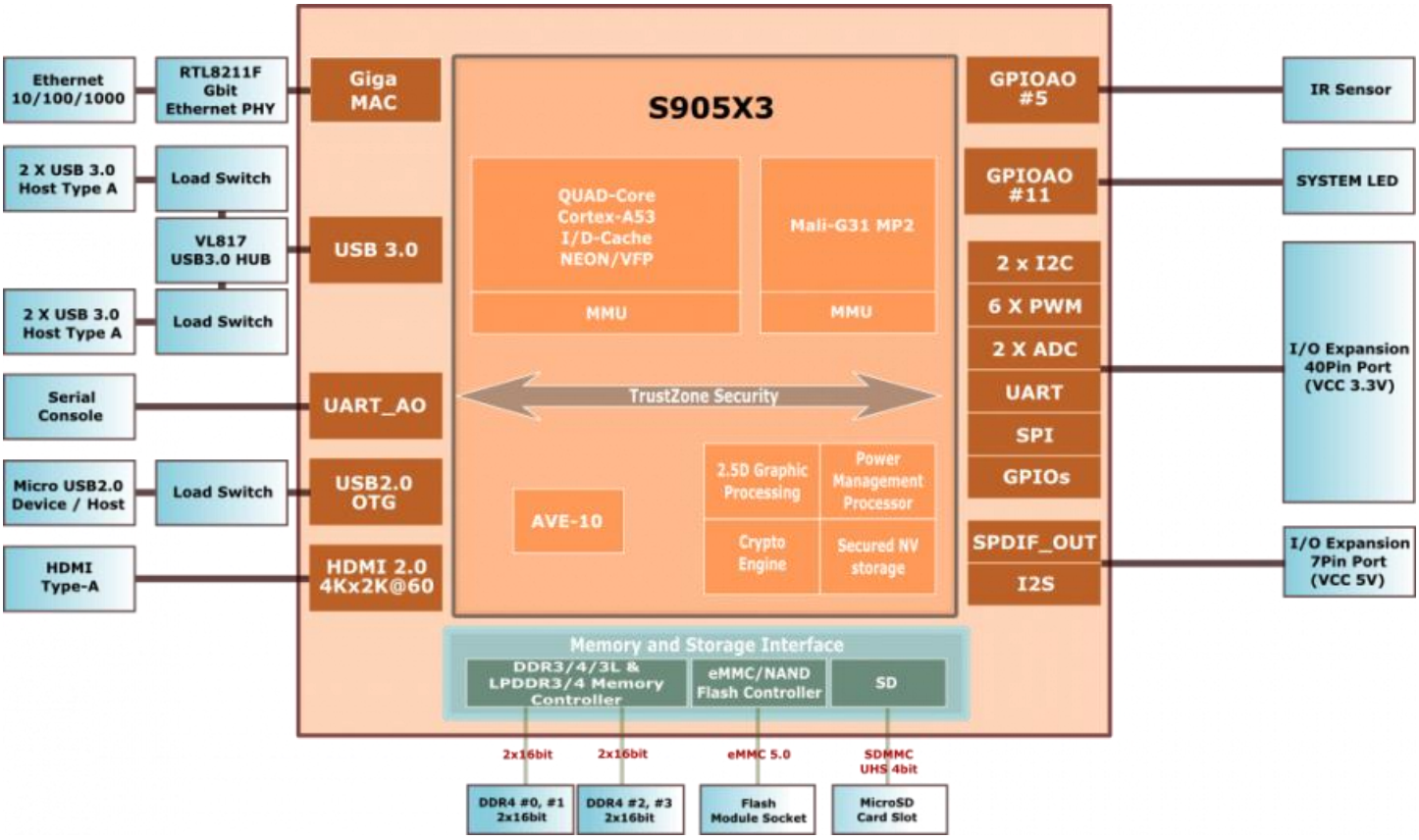
ODROID-C4

ODROID-C4 is a new generation single board computer that is more energy efficient and faster performing than ODROID-C2 which was introduced over four years ago as the world's first affordable ARM 64bit computer. The main CPU of the ODROID-C4 is built with a quad-core Cortex-A55 cluster with a new generation Mali-G31 GPU. The A55 cores run at 2.0Ghz without thermal throttling using the stock heat sink allowing a robust and quiet computer. The CPU multi-core performance is around 40% faster, and the system DRAM performance is 50% faster than the ODROID-C2.





Beginner's Guide

- Install the OS, Google Play and etc.... and **Getting Started!**

Application Note

Application Note

Hardware and Peripherals

Hardware Information

Software Platform

Information

- Boot sequence
- Partition Table

Build

- U-boot
- Linux
- Android
- Buildroot

Software(OS) Release

Please read **THIS** once before you start to download and flashing S/W release on your ODROID device.

- Android
- Ubuntu
- Third Party OS Images

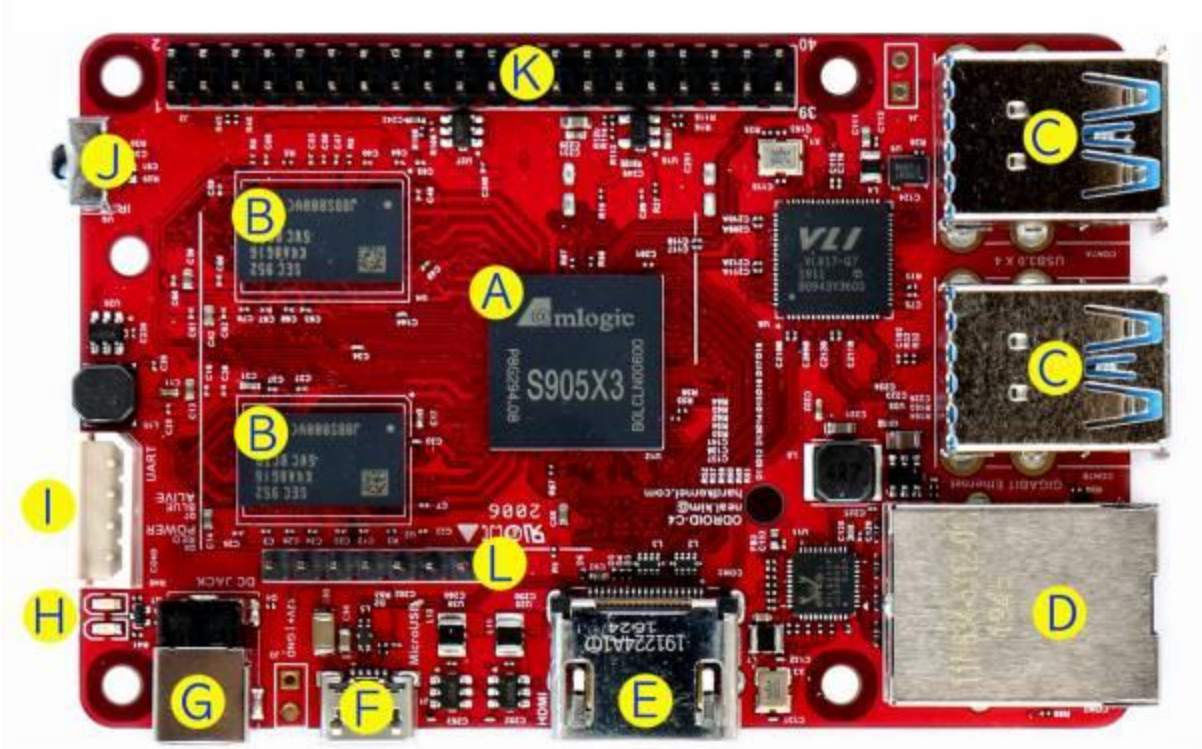
Trouble Shooting

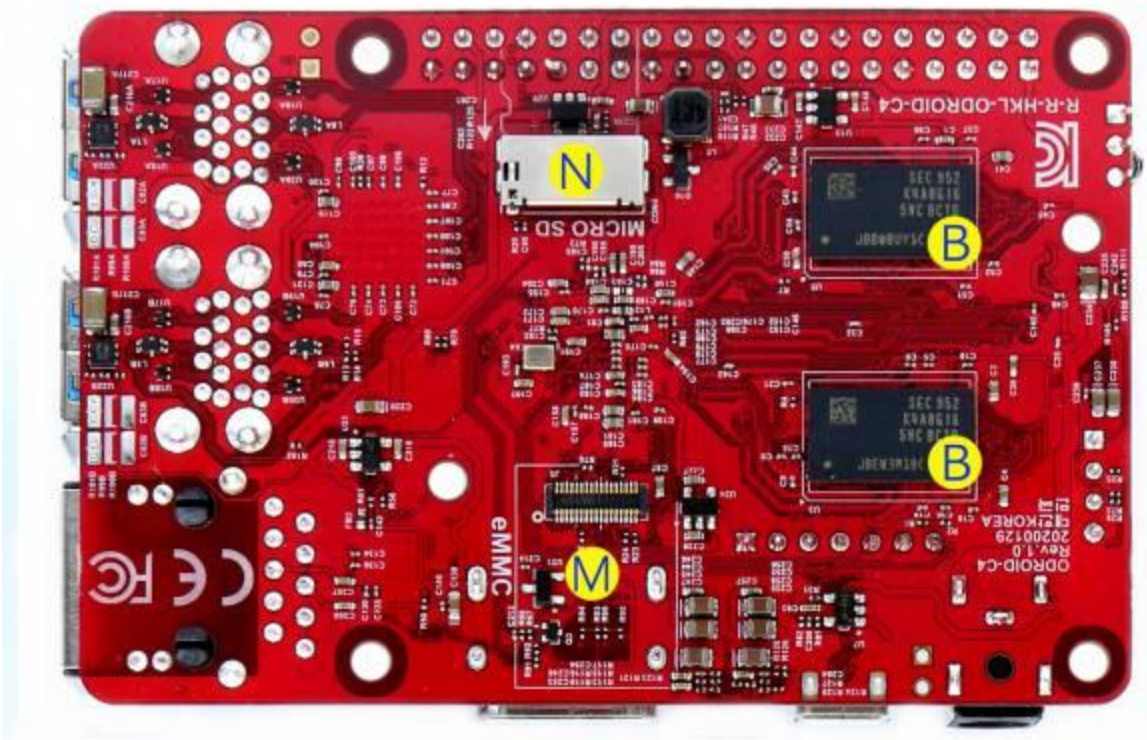
- boot.ini
- USB hub reset

Schematics, Drawings and S905X3 datasheet

* * C4 Schematics
  * PCB Mechanical drawings (DXF CAD format)
  * PCB Mechanical drawings (PDF format)
  * Amlogic S905X3 Data Sheet
  * ODROID-C4 Fritzing part

Board Layout





A	CPU (Amlogic S905X3)	***H***	2 x System LED indicators
B	DDR4 memory (2GiB or 4GiB)	***I***	1 x UART for system console
C	4 x USB 3.0 host ports	***J***	1 x IR receiver
D	1 x RJ45 Ethernet port (10/100/1000)	***K***	40 x GPIO pins
E	1 x HDMI 2.0	***L***	7 x GPIO pins
F	1 x Micro USB 2.0 port (OTG)	***M***	1 x eMMC module socket
G	1 x DC power jack (Outer diameter : 5.5mm, inner diameter : 2.1mm)	***N***	1 x Micro SD slot

. Specifications

Form Factor	Board Dimensions: 85mm x 56mm x 1.0mm Heatsink Dimensions: 40mm x 32mm x 10mm Weight: 59g including heatsink
Processor	Amlogic S905X3 Processor L1 instruction cache: 32 KB, 4-way set associative (128 sets), 64 byte lines, shared by 1 processor L1 data cache: 32 KB, 4-way set associative (128 sets), 64 byte lines, shared by 1 processor L3 data cache: 512KB , 16-way set associative (512 sets), 64 byte lines, shared by 4 processors Quad-Core Cortex-A55 (2.0xxGHz) ARMv8-A architecture with Neon and Crypto extensions Mali-G31 MP2 GPU with 4 x Execution Engines (650Mhz)
Memory	DDR4 4GiB with 32-bit bus width Data rate: 2640 MT/s (PC4-21333 grade) 1.2Volt low power design
Storage	1x eMMC connector (8/16/32/64 are available) 1x Micro SD slot (DS/HS mode up to UHS-I SDR104)
Networking	1 x GbE LAN ports (RJ45, supports 10/100/1000 Mbps) - Realtek RTL8211F (Ethernet transceiver) - LED indicators * Green LED: Flashing by data traffics at 100Mbps connection * Amber LED: Flashing by data traffics at 1000Mbps connection Optional WiFi USB adapters
Video	1 x HDMI 2.0 (up to 4K@60Hz with HDR, CEC, EDID)
Audio	1 x HDMI digital output 1 x Optional SPDIF optical output
External I/O	4 x USB 3.0 Host ports (shares one single root hub) 1 x USB 2.0 OTG port for Host or Device mode. (No power input) 1 x Debug serial console (UART) 1 x Peripheral Expansion Header (40-pin, 2.54mm pitch) 2x DC 5V, 2x DC 3.3V, 1x DC 1.8V, 8x GND 1x SPI 1x UART 2x I2C

	6x PWM 2x ADC input (12bit, 1.8V Max) 25x GPIO (Max) 1x Audio Expansion Header (7-pin, 2.54mm pitch) 1x DC 5V 1x SPDIF out 1x I2S - All 3.3V I/O signal level except for ADC input at max 1.8Volt.
Other features	IR receiver for remote controller System LEDS Indicators: - Red (PWR) – Solid light when DC power is connected - Blue (ALIVE) – Flashing like heartbeat while Kernel is running.
Power	1 x DC jack : outer (negative) diameter 5.5mm, inner (positive) diameter 2.1mm DC input : 5.5V ~ 15.5V - DC 12V/2A power adaptor is recommended Power consumption: - IDLE : ≃ 1.8W - CPU Stress : ≃ 3.64W (Performance governor) - Power-off : ≃ 0.14W

- We suggest only powering the ODROID-N2/C4 with a good quality 12V/2A PSU

Connectors

Expansion Connectors (J2)

- Expansion Connector Description

UART Console Connector

```
_____UART____
|Pin 4 - GND|
|Pin 3 - RXD|
|Pin 2 - TXD|
|Pin 1 - VCC|
\___________|

CON5
3.3V LVTTL
```

Regulatory Compliance Documents

* ODROID-C4 KC Certification
* ODROID-C4 CE Certification
* ODROID-C4 FCC Certification

Software Platform Build Information

Partition Table

- Android Platform
- Ubuntu Platform

Build Information

- U-boot
- Kernel
- Android
- Buildroot

1. After install the self-install image by etcher, can I see a boot.ini file on eMMC or SD card that is connected to the host PC?

- No, you have to do normal booting the android at least one time. At first booting, self-install image make partitions, boot.ini files and etc.

2. Else, after normal self install procedure, can I see the boot.ini file on the host PC?

- Yes. you can see the boot.ini file after the self-install procedure.

3. Or, After running the ODROID-UTILITY / ODROID-Settings (N2/C4 only) App and modify some configurations, the boot.ini file is generated?

- Sometimes, partition has the boot.ini and env.ini (N2/C4 only) file can be corrupted. So you can check by running the ODROID-Utility or ODROID-Settings App. when the partition is corrupted, please format the partition by using the settings's storage feature or by PC. and the boot.ini and env.ini (N2/C4 only) file will be made automatically.

USB Hub IC reset command

- If you need to do power-cycle to the USB devices on the USB host ports, run below commands. It will reset all the USB devices connected to the USB host ports.

```
echo reset > /sys/devices/platform/gpio-reset/reset-usb_hub/control
```

- If you want to check or adjust the reset cycle, use the file /sys/devices/platform/gpio-reset/reset-usb_hub/duration_ms.