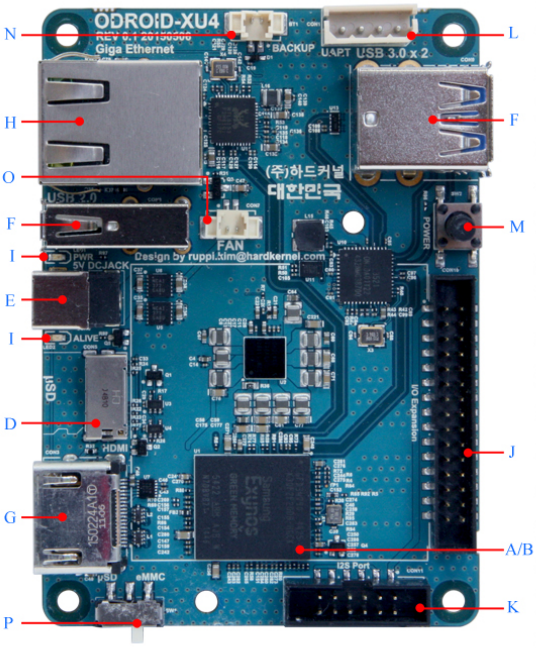
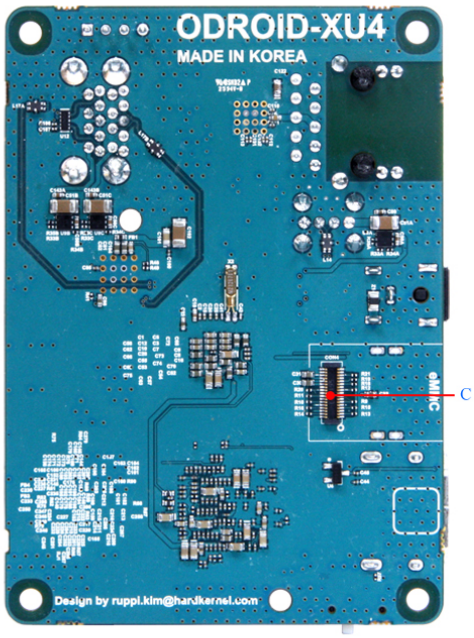
Tour of the Board

Let's start with a quick tour of the board. It's similar to a typical PC, but smaller and with different features.





A. Processor : At the heart of the ODROID-XU4 is a Samsung Exynos-5422 System on a Chip (SoC). The SoC contains the quad-core ARM Cortex-A15 and quad-core ARM Cortex-A7 CPUs plus the ARM Mali-T628 MP6 GPU.

B. Memory (RAM) : The 2GB LPDDR3 memory is stacked in a Package-on-Package (PoP) architecture on the SoC via a 32bit x 2 dual lane interface. The 750MHz clocking delivers 1500MHz of 64bit data transfer via DDR technology.

C. eMMC Module Socket : Using an eMMC module will increase speed and responsiveness, similar to how a Solid State Drive (SSD) speeds up a typical PC over a standard hard drive. The XU4 can boot from a microSD or eMMC. At location (P) in the image is the hardware switch to select the boot media. The eMMC 5.0 option is ~7 times faster than a standard Class-10 microSD card in read speeds. There are four size options: 8GB, 16GB, 32GB and 64GB.

D. Micro Secure Digital (MicroSD) Card Slot : At location (P) in the image is the hardware switch to select the boot media. The ODROID-XU4 supports the newer UHS-1 microSD standard which is about 2 times faster than a normal Class-10 microSD card. This is automatically available when using a UHS-1 enabled microSD card.

E. Power Jack : This is for 5VDC power input with an inner diameter of 2.1mm and an outer diameter of 5.5mm. The ODROID-XU4 consumes less than 1A in most cases, but it can climb to 3.5A if many passive USB peripherals are attached directly to the main board while processing heavy computing loads.

F. USB Host Port : There are two USB3.0 host ports and one USB2.0 host port. USB 3.0 adds the new transfer mode SuperSpeed that can transfer data around five times faster than the USB 2.0 standard.You can plug a keyboard, mouse, WiFi adapter, storage and many other devices into these ports. You can also charge your smartphone with it! If you need more than 3 ports, you can use a powered external USB hub to reduce the power load on the main device.

G. HDMI Connector : HDMI 1.4a, standard-sized Type-A connector.

H. Ethernet port : A standard RJ45 Ethernet port for LAN connectivity supports 10/100/1000Mbps speeds. Up/down streaming rates over Gigabit networks is around 880Mbps, or approximately 7 times faster in actual practice than a standard 100Mbps Ethernet connection.

I. Status LEDs : The ODROID-XU4 has four indicator LEDs that provide visual feedback:

PWR / Red /	Hooked up to 5Vpower
ALIVE / Blue /	Solid light : u-boot is running
	Flashing(heartbeat) : Kernel is running (heart beat)
ETHERNET / Green/	Flashes when there is 100Mbps connectivity
Yellow/	Flashes when there is 1000Mbps connectivity

J. 30pin General Purpose Input and Output (GPIO) Ports : These pins can be used for GPIO/I2C/SPI/UART/ADC for electronics and robotics. The connector has a 2mm pitch and all the IO ports are 1.8VDC.

K. 12pin General Purpose Input and Output(GPIO) Ports : These pins can be used for GPIO/I2C/I2S for audio applications. The connector has a 2mm pitch and all the IO ports are 1.8VDC.

L. Serial terminal Port : Connecting to a PC allows access to the Linux console. This allows viewing the boot log and changing the XU4's video and network settings.

NOTE: This serial UART uses a 1.8VDC interface. We recommend the USB-UART module kit available from Hardkernel and their distributors.

M. Power Button : Allows turning on the device.

N. RTC (Real Time Clock) Backup Battery Connector : Connecting an RTC backup battery to this terminal allows logging functions and keeping time when turned off. All the RTC circuits are included on the ODROID-XU4 by default.

O. Cooling Fan Connector : The active cooling fan is mounted by default. When the CPU temperature reaches a certain level, the fan starts spinning. Like most fans, a slight hum may be heard when the fan is spinning.

P. Boot Select Switch : Allows selecting either the eMMC module or microSD card as the boot device..