

Imagination



Imagination is best known for their GPUs in Apples iDevices. They have support for:

- OpenCL
- Apple Metal
- Vulkan
- OpenGL
- Google RenderScript

Imagination is a strong supporter of Khronos APIs OpenCL and Vulkan.

OpenCL

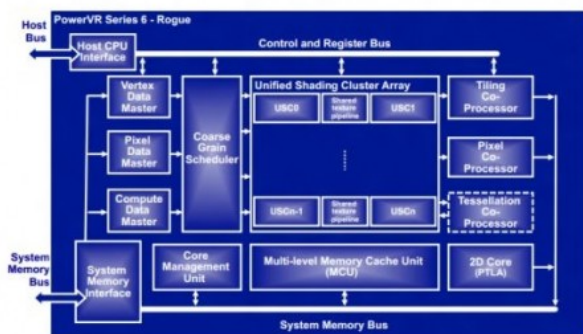
Currently there are two PowerVR GPU architectures with OpenCL support: the 5 series (scroll down) and the 6 series (introduced in 2014).

PowerVR 6

In 2013 companies will launch processors using IP from Imagination Technologies, the PowerVR G6230 and G6430. Named licensees are:

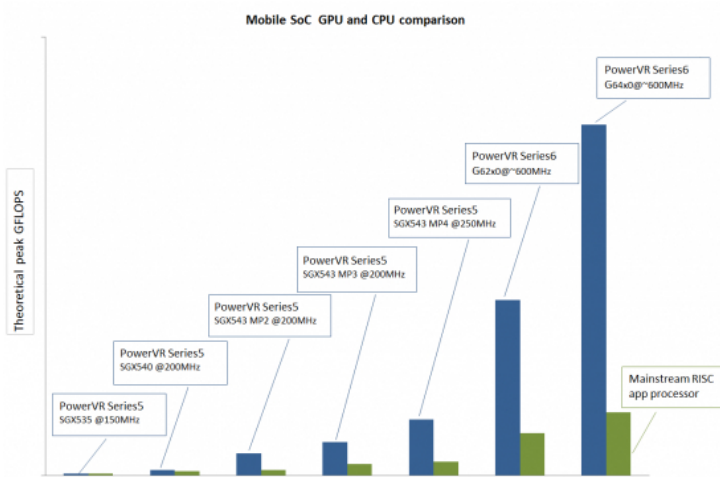
- ST-Ericsson: NovaThor A9600 - not available yet or even mentioned on their own webpage.
- Texas Instruments: no products announced, latest OMAP5-series are PowerVR 5 based.
- Renesas Electronics: no products announced, latest are based on Series5 (SGX54x and 53x).
- MediaTek: no products announced, latest MT6577 is based on Series5.
- HiSilicon: [licensed](#), but no products announced.]

While a lot of news was around this platform, it has been delayed several times. Their latest designs in the series are running on an FPGA and more details will be given at CES 2013 ([source](#)).



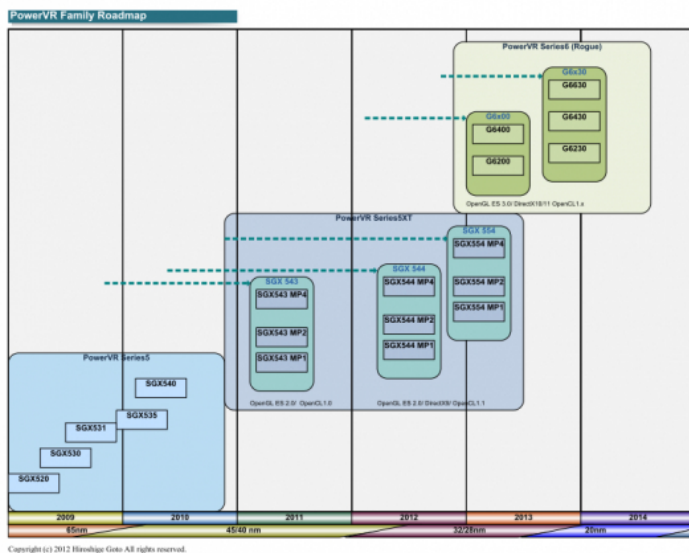
Performance

Below you see where the PowerVR6 stands. It is clocked much higher (from 250MHz to 600MHz), which suggests it will be baked sub-sub 45 nm. The PowerVR 5 is used in for example the iPad2 and delivers around 70GFlops. The PowerVR6 G62x0 is promised to deliver 200GFlops and up. The TFLOPS barrier is [promised](#) to be broken with the series.



Comparison between PowerVR 5 and 6 series.

The below image shows the 6-series are baked on 32nm and below. It shows different series-identifiers though. The "3" in G6x30 is the addition of "frame buffer compression logic" ([source](#)).



PowerVR 5

The chipset that currently dominates mobile devices, from the PSP to tablets to phones to Apple iPad.

Drivers

Imagination only sells IP and refers to their licensees for driver-support. If you have ideas what to do with OpenCL -on-PowerVR, you can [request for an NDA here](#).

Texas Instruments has the drivers available, but [only under an SLA](#). Contact your TI-representative for the most recent information.

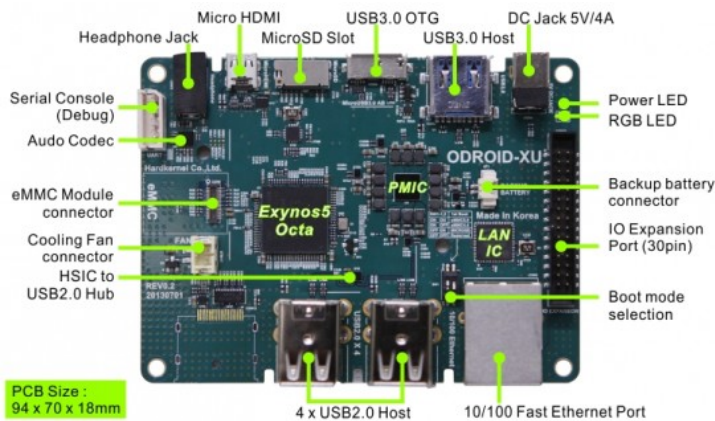
Samsung delivers drivers with their Exynos 5 Octa development board (Odroid XU).

Boards

Let me know if you know a TI-board and can give me a description of the business-requirements to get hands on drivers.

Exynos 5410: ODROID-XU

- ARM Cortex-A15 Quad 1.6GHz + Cortex-A7 Quad 1.2GHz
- PowerVR 5 SGX544 MP3 GPU
- 2GB LPDDR3 (12.8GB/s memory bandwidth)
- Lots of IO-ports (see image below). No wifi without dongle.
- CCI-400 bug seems to be fixed ([source](#)). Not clear how.]



OpenCL info from the FAQ:

Which OpenGL and OpenCL are included in Android?

OpenGL ES 1.1 and OpenGL ES 2.0

OpenCL 1.1 Embedded Profile

Will It run Ubuntu or other Linux distros?

Currently we supports only Ubuntu 13.04 server version with only serial console.

We need to develop HDMI/LCD driver for Xorg display.

We are trying to release Linux BSP with OpenGL/OpenCL in Q4 of 2013.

[Buy here.](#) [Forum here.](#)

Drivers







[Firmware\]](#)

[BSP\]](#)

[Other\]](#)

See [this page](#) for explanation how to write the images. The links don't get updated, so check the above links for the latest versions.

Minimum price for board+eMMC+shipping is \$273,-. Price including some needed (eMMC, shipping), possibly needed (HDMI, USB-UART) and convenience add-on's (SD, wifi) is:

Description	Quantity	Item price	Discount	Amount	Remove
 ODROID-XU+E Country of Origin: South Korea	<input type="text" value="1"/>	\$199.00	-	\$199.00	Cancel
 8GB eMMC Module XU Country of Origin: South Korea	<input type="text" value="1"/>	\$25.00	-	\$25.00	Cancel
 8GB MicroSD Card XU Country of Origin: South Korea	<input type="text" value="1"/>	\$13.00	-	\$13.00	Cancel
 WiFi Module 3 Country of Origin: South Korea	<input type="text" value="1"/>	\$0.00	-	\$0.00	Cancel
 HDMI Cable (Micro, Type D) Country of Origin: South Korea	<input type="text" value="1"/>	\$9.00	-	\$9.00	Cancel
 USB-UART Module Kit Country of Origin: South Korea	<input type="text" value="1"/>	\$15.00	-	\$15.00	Cancel
				Item total: \$209.00 Shipping and handling: \$40.00 Total: \$309.00	

Board includes adaptor and case. An eMMC is needed for a fast OS, but a micro-SD also works - although slower.

Without the integrated power analysis tool, it's \$30,- less. Ordering only the board is \$10 less shipping.

Devices

Once I get more (public) info on OpenCL-drivers, this section will be extended.

Kindle Fire HD

As seen on [Engadget](#), Imagination Technologies is working with Amazon and Texas Instruments to deliver OpenCL-enabled Kindle Fire HDs.

YouTube Video: [YouTube.com/watch?v=-twOwM4LP9o](https://www.youtube.com/watch?v=-twOwM4LP9o)

The chipset is a OMAP 4470 by Texas Instruments, which contains a PowerVR SGX544 GPU running at 384MHz. It only delivers 24.5GFLOPS.