

Freescale / Vivante



Vivante got into the news with OpenCL, when winning in the [automotive-industry](#) from NVIDIA. Reason: the car-industry wanted an open standard. They have support for:

- OpenCL
- OpenGL
- Google RenderScript

OpenCL

See Vivante's [GPGPU-page](#) for more info, where below table is taken from.

GC800 Series
GC1000 Series
GC2000 Series
GC4000 Series
GC5000 Series
GC6000 Series

Clock Speed MHz

600 ? 800
600 ? 800
600 ? 800
600 ? 800
600 ? 800
600 ? 800

Compute Cores

1
1
1
2
4
Up to 8

Shader Cores

1 (Vec-4)
4 (Vec-1)
2 / 4 (Vec-4)
8 / 16 (Vec-1)
4 (Vec-4)
16 (Vec-1)
8 (Vec-4)
32 (Vec-1)
8 (Vec-4)
32 (Vec-1)
16 (Vec-4)
64 (Vec-1)

Shader GFLOPS

6?8 (High)
12?16 (Medium)
11?30 (High)
22?60 (Medium)
22?30 (High)
44?60 (Medium)
44?60 (High)
88?120 (Medium)
44?60 (High)
88?120 (Medium)
88?118 (High)
176?236 (Medium)

GPGPU Options

Embedded Profile
Embedded Profile
Embedded / Full Profile
Embedded / Full Profile
Embedded / Full Profile
Embedded / Full Profile

Cache Coherent

Yes
Yes
Yes
Yes
Yes
Yes

One big advantage Vivante [claims](#) to have over the competition, is the GFLOPS/mm2. This could be of advantage to win the 1TFLOPS-war over their competition (which they've [entered](#)). The upcoming GC4000 series can push around 48GFLOPS, leaving the 1TFLOPS to the GC6000 series.

Their GPUs are sold as IP to CPU-makers, so they don't sell their own chips. Vivante has created the GPU-drivers, but you have to contact the chip-maker to obtain them.

Freescale i.MX6



The [i.MX6 Quad](#) (4 ARM Cortex-A9 cores) and [i.MX6 Dual](#) (2 ARM Cortex-A9 cores) have support for OpenCL 1.1 EP (Embedded Profile). ([source](#))

Both have a Vivante GC2000 GPU, which has [16 GFLOPS](#) to 24 GFLOPS depending on the source. The GPU cores can be used to run OpenGL 2.0 ES shaders and OpenCL EP kernels.

Board: SABRE



There are several boards available. Freescale suggests to use the [SABRE Board for Smart Devices](#) (\$399).

This Linux board support package including OpenCL drivers and general BSP documentation is available for free download on the product page under *Software & Tools* tab.

Other Boards

Alternative evaluation boards from 3rd parties can be found by searching on internet for "i.MX6Q board" as there are many! For instance the [Wandboard](#) (i.MX6Q, \$139, shown at the left - was tipped that the Dual is actually a Duallite and thus not have support!!).

OpenCL-driver found on the Wandboard Ubuntu-image - download clinfo-output here (`gcc clinfo.c -lOpenCL -lGAL`).

Drivers & SDK

Under the *Software & Tools* tab of the SABRE-board there are drivers - they have not been tested with other boards, so no guarantees are given.

Most information is given in [Get started with OpenCL on Qualcomm i.MX6](#).

IMX6_GPU_SDK: a collection of GPU code samples, for OpenCL the work is still in progress. You can find it under "Software Development Tools" -> "Snippets, Boot Code, Headers, Monitors, etc."

IMX_6D_Q_VIVANTE_VDK_<version>_TOOLS: GPU profiling tools, offline compiler and an emulator with CL support which runs on Windows platforms. Be sure you pick the latest version! You can find it under "Software Development Tools" -> "IDE - Debug, Compile and Build Tools".

More info



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Check out the [i.MX-community](#). You can also [contact us](#) for more info.

To see a great application with 4 i.MX6 Quad boards using OpenCL, see this ["Using i.MX6Q to Build a Palm-Sized Heterogeneous Mini-HPC" project](#).