



Vivante Graphics Cores

World's *fastest* and *coolest* 3D GPUs

Vivante Embedded GPU Cores



The amazing range of Vivante licensable GPU cores addresses the critical needs of the consumer marketplace. From smartphones and tablet PCs to HDTV and automotive - in all product categories, graphics and compute performance are key differentiators.

From the world's fastest embedded 3D GPU core to the world's coolest OpenGL ES 2.0 GPU core, our licensees are mass producing winning products using Vivante GPUs to achieve class leading high performance and graphics quality at the lowest power consumption and silicon cost.

Faster, Smaller, Cooler

The Vivante GPU architecture is the most efficient available today. Compared with other solutions, the equivalent performance can be achieved in only half the silicon area, or with the same silicon area performance can be doubled. This same efficiency delivers very low power consumption, making Vivante GPUs ideal for mobile products as well as wired consumer and professional systems. Specifically designed for embedded systems, Vivante GPUs consistently deliver stunning performance and realism.

Software Development Freedom

Vivante GPUs give the most freedom possible to the application software developer. Supporting the widest range of graphics and compute APIs, and with drivers ported to all common platforms, the developer can immediately target standard application environments without compromising quality or functionality. The drivers and API software can also easily be ported to proprietary platforms. Thousands of existing applications work seamlessly on Vivante enabled devices.

Adobe Flash/AIR, HTML5 and WebGL

The embedded Web experience is accelerated by support for browser plug-ins Flash 10, WebGL and HTML5 using high performance OpenGL ES 2.0, DirectFB and OpenVG acceleration.

OpenCL Parallel Computing

Support for OpenCL parallel computing unleashes the incredible power of the shader cores for almost any parallel-style computation task. No longer limited to graphics, Vivante cores also enable entirely new functionality.

Features and performance of selected GPU cores in TSMC 40LP

Graphics Core	GC300	GC350	GC400	GC800	GC1000	GC2000	GC4000
Core Type	Composition Engine	OpenVG engine	3D GPU, GP-GPU				
Common Applications	WinCE, X11, Google TV	Adobe Flash Lite, Vector Graphics	Adobe Flash/AIR, Web, User Interface, Gaming				
Unified Shader (32-bit SIMD Vec4)			Single Core	Single Core	Dual Core	Quad Core	Octal Core
Geometry Rate			15 M Tri/s	35 M Tri/s	50 M Tri/s	100 M Tri/s	200 M Tri/s
Textured Pixel Rate	300 M Pix/s	375 M Pix/s	150 M Pix/s	325 M Pix/s	650 M Pix/s	1.25 G Pix/s	2.5 G Pix/s
Core Processing			3 GFLOPS	6 GFLOPS	12 GFLOPS	24 GFLOPS	48 GFLOPS
Synthesis Area	0.3 mm ²	0.8 mm ²	1.2 mm ²	1.9 mm ²	2.9 mm ²	5.4 mm ²	9.6 mm ²
Silicon Area	0.4 mm ²	1.0 mm ²	1.6 mm ²	2.5 mm ²	3.5 mm ²	6.9 mm ²	12.4 mm ²

Area data includes all internal memories. Performance data represents final implementation silicon. This table only shows a selection of our graphics cores - other GPU cores are also available.

API support

- OpenGL ES 1.1/2.0/Halti
- OpenCL 1.1 EP
- OpenVG 1.1
- DirectFB 1.4
- GDI/Direct2D
- X11/EXA
- DirectX 11 9.3

Operating System support

- Android
- Linux
- Windows
- QNX

Hardware features

- Ultra-threaded unified shader maximizes performance and latency tolerance
- Highly efficient ScalarMorphic™ architecture minimizes silicon area and bandwidth
- Highest graphics performance per square mm - smallest die area in every GPU class
- Very low power with battery-saving innovations
- Superior image quality with high-definition detail, MSAA, and high dynamic range
- Depth texturing to enable dynamic shadow generation
- High-definition screen resolutions - all cores support larger than HD 1080P
- Comprehensive fire-and-forget hardware API support minimizes host CPU load

- Simple integration using standard AHB and AXI buses

Unified Shader

- Fully supports SM3.0, OpenGL ES 2.0 Shading Language and Halti extensions for unrestricted programmability
- Fully backward compatible with OpenGL ES 1.1 applications
- Unified vertex and fragment shader avoids wasted cycles
- IEEE 32-bit high-precision floating point computation for more detail, higher quality with no performance penalty
- Massively parallel multi-threading gives excellent bus latency tolerance, virtually eliminating stalls

Texture Mapping

- Texture support includes 2D, Cubic environment, Projective, YUY2, and High Dynamic Range (HDR)
- Point sample, bi-linear, and tri-linear texture filters
- Bump mapping support
- Depth map up to 24-bit
- Compressed texture standards ETC1 and DXT1-DXT5
- Dependent texture operation with high performance
- Up to 16 vertex textures and 16 pixel textures simultaneously
- Texture sizes up to 8K x 8K

OpenCL Support

- Incredible performance for parallel computing tasks
- Full support for OpenCL 1.1 EP

Composition Engine

- Full support for DirectFB, GDI, X11
- High-quality filter for image and HD video scaling
- YUV-RGB color space conversion
- Camera preview

AHB Slave Interface

- Used for control from host CPU
- 256K addressable register space
- 32 bit data bus
- Handles error response for illegal accesses
- Bus speed up to 400MHz
- Fully asynchronous interface for ease of integration

AXI Master interface

- AMBA AXI protocol compliant
- 32 bit address bus
- 64 or 128 bit data bus
- Burst lengths up to 64 bytes
- High performance support for multiple outstanding transactions
- Supports out-of-order return data from multiple slaves
- Bus speed up to 600MHz
- Fully asynchronous interface for ease of integration



www.vivantecorp.com

General Inquiries:
info@vivantecorp.com
Customer Inquiries:
sales@vivantecorp.com

CORPORATE HEADQUARTERS
268 Santa Ana Court
Sunnyvale, CA 94085 USA
(Main) +1 408-738-0186
(Fax) +1 408-738-0118
(Toll Free) +1 888-0ES20GPU
(888-637-2047 from US & Canada)

VIVANTE CHINA
1st Floor, District C
HuaHong Science & Technology Park
No. 177, Bibo Road, Shanghai, China
上海市碧波路177号华虹科技园C区1楼
(Zip Code) 201203
(Main) +86-21-5080-9802
(Fax) +86-21-5080-7203

VIVANTE TAIWAN
2F, No.15, Alley 6, Jin-Shan 6th St.
Hsinchu 300
Taiwan, R.O.C.
新竹市金山六街六巷15號2F
(Main) +886-2-5579-3732
(Fax) +886-2-2656-2604