

PowerVR Series6XT

GPU IP Family



The PowerVR® Series6XT GPU (Graphics Processing Unit) IP family pushes the PowerVR Rogue architecture to new extremes of performance and efficiency, targeting markets that require the very highest levels of graphical and compute processing capability, while consuming the lowest levels of memory bandwidth, energy and silicon area.

Thanks to exclusive patented technologies such as PowerGearing™ G6XT power management and PVR3C™ compression the PowerVR Series6XT family delivers the best performance per mW and per mm² in the industry. Series6XT GPUs provide up to 50% higher performance than the equivalent Series6 parts on industry standard benchmarks.

The Series6XT range features market-leading scalability, supporting implementations with up to six clusters and beyond. With OpenGL ES 3.x* support, strong GPU compute capabilities and a comprehensive feature set, the Series6XT range enables the very latest cutting-edge content to run on devices ranging from smartphones and tablets to automotive infotainment systems and games consoles.

PowerVR Series6XT Family (announced GPUs)

GX6240, GX6250, GX6450, GX6650

Multi-standard API and OS Support

Embedded APIs	Khronos OpenGL ES 1.1/2.0/3.x* Khronos OpenCL 1.x EP* Android Renderscript/Filterscript
Desktop APIs	Khronos OpenGL3.2* Microsoft DirectX 10_0
OS Support	Linux, Android and Windows

Applications

- Smart phones
- Mobile internet devices (MIDs)
- Personal media players
- Games consoles
- UltraHD/4K Smart TV and set-top boxes
- Personal navigation devices
- In-car navigation and information
- Electronic dashboards
- UMPCs, laptops and netbooks
- Connected home

Features

- Most comprehensive graphics IP family and roadmap in the industry
- Series6XT tile-based deferred rendering (TBDR) architecture featuring unified shaders
- Fully programmable GPU using unique scalar-based USC architecture
- Support for all industry standard mobile and desktop graphics and compute APIs and OSs
- Fully backward compatible with PowerVR MBX™, SGX™ and Series6/Series6XE GPUs
- PVR3C Triple Compression for significant bandwidth savings
- PowerGearing G6XT technology for ultimate power efficiency
- UltraHD Deep Colour to enable support for the most demanding high resolution, high colour-depth displays
- The next generation of Imagination's Hierarchical Scheduling Technology (HST) for high resource utilization

Benefits

- Performance increase of up to 50% compared with Series6 GPUs
- Extensive product line that supports all area/power/performance points
- Proven technology that provides a low risk solution for all embedded graphics applications
- Industry-leading ecosystem and developer community
- Fully compliant, proven implementations of all APIs*
- Class leading performance per mm² and per mW
- Low host CPU and memory system bandwidth load

Low Power, High Performance, Ultimate Efficiency with PowerGearing G6XT

All PowerVR GPUs are designed from the outset to be architecturally efficient and PowerGearing technology builds on this inherent advantage. PowerVR PowerGearing G6XT has a number of features that ensure that Series6XT GPUs are the most power-efficient GPUs in the market:

- Highly flexible power management schemes
- Microkernel-based power management that can interact directly with system-level power management logic to give intelligent, responsive control and reduce CPU load
- Multi-level clock gating
- Built-in utilization counters to inform DVFS decisions
- Support for power-islands and fine-grained compute cluster power control – shader clusters can be powered on/off to match workload demands

Triple Compression Technology for Lowest Bandwidth

The PowerVR Series6XT family features PVR3C Triple Compression technology to ensure the most efficient use of memory bandwidth, reduce power consumption and system-level memory costs and increase system efficiency.

PVR3C consists of three distinct technologies:

1. PVRGC lossless geometry compression (to manage the increasing geometry complexity of scenes)
2. Support for the market-leading PVRTC texture compression (lossy), including the latest iteration of the format, PVRTC2, as well as optional support for ASTC LDR/HDR.
3. PVRIC2 – the latest version of the PowerVR lossless image compression scheme (to reduce system-level bandwidth; a critical consideration due to the ever increasing size of render targets, both on-screen and off-screen, in modern applications).

Up to 50% Extra Performance

Architectural enhancements including instruction set optimizations and next-generation Hierarchical Scheduling Technology have unlocked significant extra performance when compared with Series6 GPUs (at same clock speed and number of clusters).

Series6XT Shader-Based TBDR Architecture

From the outset the PowerVR Series6 GPUs were designed with high performance and low-power consumption in mind. Precision, feature set and performance are balanced carefully with the practical requirements of the embedded market. The patented PowerVR technologies such as Hidden Surface Removal (HSR) mean that the GPUs are inherently efficient at an architectural level and this is complemented by PowerGearing™ features such as multi-level clock gating, support for power islands and advanced power management schemes.

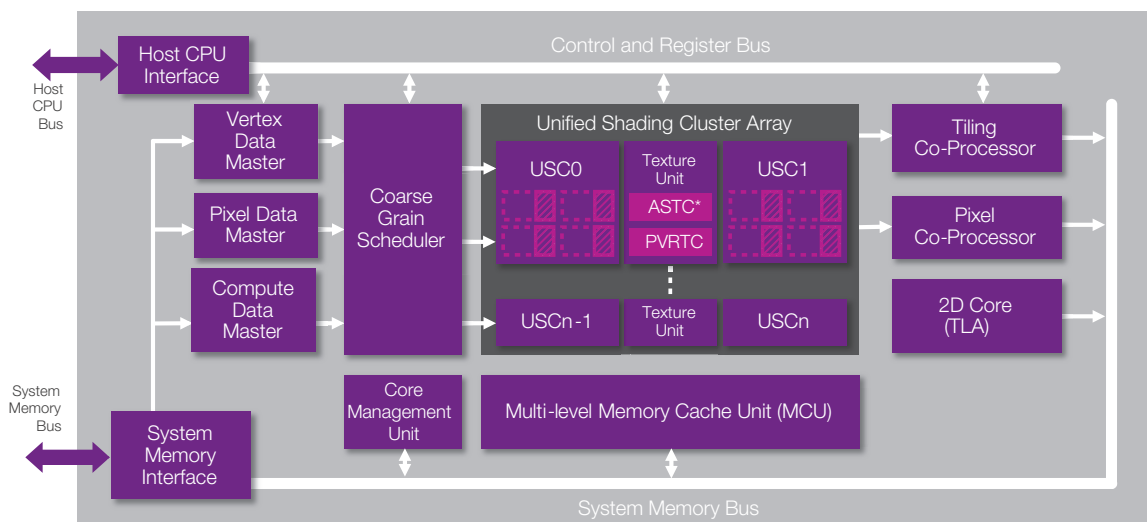
Highly Scalable, Programmable Processing Clusters

Series6XT features the latest evolution of our Universal Shading Cluster (USC) engines – multi-threaded processing units optimized for the operations used in vertex and pixel shaders and also practical GPU compute tasks like video and image processing. The USC architecture is highly scalable, meaning that multiple clusters can be implemented with very little overhead (performance scales almost linearly with additional clusters).

The unified architecture combined with improved intelligent task scheduling and hardware load balancing means that processing resources achieve maximum utilization and latency tolerance.

Optimized data paths and local caching enable further increases in performance efficiency whilst reducing power consumption.

Alongside the PowerVR Series5 (SGX), Series6 and Series6XE family, the Series6XT GPUs allow Imagination Technologies to offer the widest range of power, performance, area and feature options in the industry and provide an optimal GPU solution for every application across every market segment.



 Extra low power GFLOPS * Supports both LDR and HDR ASTC formats

* PowerVR Series6XT Rogue GPUs are based on a published Khronos specification, and are expected to pass the Khronos Conformance Testing Process. Previous generation Rogue GPUs have already achieved conformance. Current conformance status can be found at www.khronos.org/conformance.

UK t: +44 1923 260511 enquiries@imgtec.com
USA t: +1 408 530 5000 www.imgtec.com

TM/® Denotes a trademark or registered trademark of Imagination Technologies Limited and/or its affiliated group companies in the United Kingdom and/or other countries. All other logos, products, trademarks and registered trademarks are the property of their respective manufacturers. Copyright © 2014 Imagination Technologies Limited, an Imagination Technologies Group plc company. June 2014.

