PowerVR has established itself as the developer’s de facto standard across smartphones, tablets, mobile computing and games consoles, attracting an extensive community of adopters and powering iconic and much-loved products. Our partners are now delivering the most comprehensive range of solutions, from low end to high end, that truly can enable any phone or tablet device to have PowerVR, the leading GPU technology. Imagination is driving mobile and embedded graphics performance to reach across the full range of smart mobile consumer devices, from mass market to high end in an era of ubiquitous mobile multimedia. Coupled with our Ensigma communications and Meta general purpose processing IP (intellectual property), we can offer a complete range of solutions to extensively address the needs of an ever growing electronics market.

**Graphics**

High quality 3D and 2D graphics acceleration has rapidly become a ‘must-have’ technology for any mobile product. Driven by demands for next generation UIs with stunning visual impact and high frame rate, designers now appreciate that many key applications can benefit from using low power, highly efficient graphics processors (GPUs).

PowerVR’s revolutionary tile-based, deferred shading architecture allows a very small area of a die to deliver higher performance and image quality at lower power consumption compared to other competing technologies. It uniquely supports all major APIs, including the latest versions of OpenGL ES, OpenGL, DirectX and OpenCL.
The PowerVR Series5/5XT and Series6 programmable GPU IP core families have been designed to offer the best performance per mm² and mW from low end to high end mobile and embedded applications. With no compromise in feature set and with full backwards compatibility between them. A smooth migration path is ensured for developers upgrading and migrating applications.

Imagination’s latest PowerVR Series6 ‘Rogue’ family of GPUs delivers the advanced capabilities of OpenGL ES 3.0* as well as OpenGL ES 2.0 and 1.1, and other key graphics APIs such as DirectX10 and 11.

PowerVR is recognized as the industry’s leading GPU for graphics acceleration in the mobile and embedded multimedia market, from handsets to tablets, and multimedia players. Shipped in more than 700 million devices worldwide, tens of thousands of developers rely on PowerVR’s OpenGL ES 3D graphics capabilities for the best possible user experience in games, UIs, navigation apps and much more.

PowerVR graphics technologies are complemented by the PowerVR Insider ecosystem, which has more than 33,000 members (as at September 2012) and provides comprehensive support for developers, publishers and middleware developers. The programme also provides extensive co-marketing opportunities for OEMs, ODMs, content developers and our IP core licensees.

**Video**

The ubiquity of digital cameras for still and video photography, together with the growth in social networking sites like YouTube™ and Facebook™, the emergence of downloadable media, and the popularity of PVRs, has made digital video content as popular as audio. However, since video is often viewed on large, high quality screens, mobile players need to deliver exceptional performance while processing the latest video formats.

The PowerVR Series3 decode and encode IP core families provide a range of solutions, handling all major standards including H.264, H.263, MPEG-4, MPEG-2, WMV9/VC-1, WebM, VP8 and Real (RMVB) with more being added all the time. These IP solutions deliver UHD (Ultra HD) resolutions with exceptionally low power consumption.

The PowerVR Series4 video decoder and encoder families are multi-pipe video IPs which deliver features including 10-bit colour and 4:4:4 chroma subsampling support designed to enhance modern applications such as wireless display and video capture with previously unseen levels of colour fidelity, as well as HD and Ultra HD displays and surfaces (H.264 L5.2 4Kx2K @ 60fps).

PowerVR’s multi-stream decode capabilities make it ideal for browsing your video collection, or prevewing video while also watching a broadcast. Capable of handling multiple streams simultaneously, each of a different standard, our decoder IP has built a reputation as an industry leader. The PowerVR encoder offers highly efficient H.264 high profile compression, at beyond 4K resolutions, allowing the user to record and transmit the highest quality video, whilst minimizing bandwidth and storage requirements. The high frame rate capability also allows users creative flexibility for slow motion capture.

In addition, Imagination’s long history in games consoles and digital TV technologies provides the ideal path for achieving class-leading display quality. We are thus able to offer a range of complimentary display IP to enhance the visual quality of the video output and also provide extensive support for integrating our graphics, video and display technologies together to enable advanced acceleration of pre- and post-processing effects on the video stream.

**Connectivity**

Traditionally, radio, TV, Wi-Fi and Bluetooth used to have their own chipsets but, as the number of standards to be supported continues to increase, this approach becomes less cost-effective and more power hungry.

The Ensigma Radio Programmable Unit (RPU) communications IP cores solve these problems by providing an advanced solution that combines programmability and configurable hardware to deliver a single, universal solution which can accommodate current and future standards. Ensigma Series3 Wi-Fi capabilities include 802.11a/b/g/n with MIMO smart antenna technology and Bluetooth v3.0. By incorporating the latest wireless communication technology on its Ensigma Series3 and Series4 platforms, Imagination is able to offer significantly increased data...
throughput, sensitivity, and other key performance metrics, while limiting bandwidth requirements and lowering transmit power. The Ensigma Series4 IP architecture features a highly scalable multicore approach for maximum configurability, combined with an ultra-high bandwidth programmable bus fabric and an extremely efficient VLIW-based 4th generation modulation processor with multi-context capabilities. This enables Series4 RPU to be configured to 4x4 MIMO, 802.11ac and beyond, as well as more than 30 standards including every major 802.11 profile, TV and radio broadcast, Bluetooth and many other broadcast and connectivity communications standards.

Imagination’s HelloSoft V.VolP and VoLTE technology includes a portfolio of highly-portable software for wireless and wireline devices. The highly optimized client offers superior voice and video quality, efficient call switching and enables mass deployment of low-cost, power-efficient, fully-featured multi-mode wireless and wireline devices for next generation endpoints. Target devices for HelloSoft SDKs include PCs, netbooks, smartphones, tablets and consumer premises equipment including set-top boxes, cable modems, PON, DSL modems, ATA, residential gateways and other embedded devices.

Imagination is also unique in having developed in house the underlying technologies needed to make connected smart systems happen. Imagination’s Flow technology is a comprehensive and unique enabling platform that establishes a new benchmark for connecting devices to the cloud across both internet and broadcast channels. The MetaFlow Connected Processor IP platforms bring together a high performance 32-bit hardware multi-threaded CPU architecture (with optional 32-bit DSP capability), full 802.11a/b/g/n Wi-Fi capability (extendable to Bluetooth and over 20 other TV and radio communications standards) and Imagination’s Flow cloud and portal technologies all in an ultra-low power, highly cost-engineered IP package.

General purpose CPU Processing

Imagination’s Meta family of 32-bit general purpose multi-threaded processor/DSP IP cores are the ideal CPU solution. Meta is Imagination’s synthesizable applications processor based on a common instruction-set architecture (ISA) that delivers high performance via multi-threading combined with low power consumption and reduced system cost. The unique multi-threading features of the Meta architecture enable SoCs (systems-on-chip) to make far better use of every cycle of the Meta processor, getting more done in fewer cycles than conventional embedded CPUs. Meta runs the latest Linux operating system, but can also run low level RTOS, Android or even native DSP code simultaneously—all highly efficiently sharing SoC resources, which keeps clock speeds down, optimizes memory utilization, and gets the most performance out of an SoC.

System designers can take advantage of Meta’s unified core architecture to replace multiple CPU and DSP cores in a standard SoC configuration, as each virtual processor can run an independent OS as well as signal processing tasks. Delivering up to more than 3 DMIPS/MHz, it features a combination of simultaneous multi-threading (SMT), automatic MIPS allocation (AMA) and scalability (2 to 4 hardware threads) to outperform multi-processor solutions both in terms of performance and cost. Our licensees have shipped in excess of three hundred million Meta processors since launch, and it is a key block in many of our other IP cores.

One example of the benefits of the unique real time capabilities of Meta is audio processing, which is taking more processing power than ever before as audio codecs continue to increase in complexity, and demands for multi-channel and multistream blended audio increase.
Bringing it all together

Imagination Technologies is a global leader in multimedia and communication technologies creating and licensing market-leading processor solutions for graphics, video and display, embedded processing, multi-standard communications and connectivity, and cross-platform V.VoIP & VoLTE. These silicon and software IP solutions for SoC are complemented by an extensive portfolio of software drivers, developer tools and extensive market and technology-focused ecosystems.

Imagination’s licensees include many of the world’s leading semiconductor, network operator and electronics OEM/ODM companies. Partners using our products can target a wide array of markets including mobile and tablet computing, multimedia, connected home consumer, in-car electronics, telecoms, health, smart energy and connected sensors and controllers. We aim to deliver highly efficient, low power processing to tackle all forms of multimedia applications, enabling the widest range of price/performance points to be addressed in these dynamic markets.

We are proud to contribute technologies which satisfy the creativity, attention to detail, and aspirations of some of the brightest stars of engineering, software development and innovative business.

If you are an innovative developer of applications or systems, you should be talking to us.

To find our more about our technologies visit
www.imgtec.com/technology

For sales enquiries contact enquiries@imgtec.com

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For more information
For an in-depth view of Imagination’s IP, please refer to our individual factsheets describing our Meta processor, Ensigma communications cores, PowerVR graphics, PowerVR video, PowerVR display, Hellossoft V.VoIP and Caustic ray tracing technologies, available online at www.imgtec.com.