Imagination Technologies is a global leader in multimedia, processor and communication technologies, creating and licensing market-leading processor solutions for graphics, video and vision processing, multi-standard communications and connectivity, and cross-platform V.VoIP and VoLTE.

These silicon and software intellectual property (IP) solutions for systems-on-chip (SoC) are complemented by an extensive portfolio of software drivers, developer tools and extensive market and technology-focused ecosystems.

Imagination was established in 1985 in Britain and has a long history as an IP provider, with partners amongst the world’s top-20 semiconductor and OEM companies.

We license fundamental multimedia, communications and processor technologies and receive a royalty when products using those technologies ship into the market.

Imagination is more than a semiconductor IP company. Our focus is on solutions, including a growing portfolio of software and infrastructure technologies required for enabling system-level cloud-connected solutions.

We work closely with many of the biggest semiconductor companies in the world. Our business model puts partnership first focused on our mutual goal of successful and timely volume shipments and long term strategic innovation.

Our partners include many of the leading companies in the semiconductor and consumer electronics spheres. They have created some of the most iconic and culturally important products of the 21st century.

Our extensive software capabilities are a key part of our offering and a major differentiator, from drivers and reference code through to application software such as our HelloSoft V.VoIP software platforms, and system software, such as FlowCloud, which enables next generation cloud-based solutions.

We are intensely relationship focused, working closely with our partners to help them get successfully to market, shipping high volumes of advanced semiconductors containing our technologies. As a royalty based business, our partners’ success is our success.

Why choose Imagination?

1. **Performance**
   - Our unique and innovative IP does the job better than anything else on the market.

2. **Proven**
   - Our IP is proven in hundreds of millions of devices and hundreds of successful products from world-class brands.

3. **Low Power**
   - Our power-efficient architectures enable eco-friendly products and longer battery life.

4. **Roadmaps**
   - Our customers use our scalable IP in multiple products and markets for maximum return on investment.

5. **Solutions**
   - Our solution-based approach and strong ecosystem programmes make our IP easy to integrate.
The quality of support we offer our licensees both before and after licensing is crucial to our business.

As well as our core IP technologies we have an extensive range of complementary technology offerings that support our customers’ designs and help them succeed.

IMGworks is our SoC integration support team. It is available to help our customers deliver their SoC designs, and is skilled at solving the most difficult problems in specific and challenging areas of silicon design. IMGworks offers a complete range of SoC integration, physical design, and custom development services.

By working closely with EDA companies and leading foundries, IMGworks ensures our IP is ready to be used in any design flow and at all process nodes.

Our Platform Services team is dedicated to helping customers accelerate time to market for their products using Imagination's IP by providing software integration, customization and optimization services. Together with IMGworks they enable our licensees to exploit the full capabilities of our IP.

Codescape is our comprehensive suite of development tools, which supports the advanced and unique features of Imagination’s IP cores.

Codescape already supports heterogeneous multi-processor SoCs making it a unique debug environment that supports all processors in the SoC, not just the CPU.

Ecosystems

Our ecosystems and strategic partnership programmes are an integral part of our IP and vital to Imagination’s success.

These ecosystems comprise companies large and small that create software or other products using chips containing our IP. We work with thousands of developers who support imagination-based platforms with the most innovative and exciting content as well as with comprehensive tools, middleware and support.

Because our technologies are used in the most iconic products, and shipped in very high volume, key applications are developed first for our technology. Ports to other platforms come much later, if at all.

We have continued to expand our ecosystem programmes, to help Imagination’s licensees and key partners meet and engage with a broad community of developers, middleware providers, foundries, EDA and tool vendors, and third party support teams and provide extensive co-marketing opportunities for product manufacturers, content developers and semiconductor companies.
International reach

We are a British company with a world outlook.

Imagination has over 1,500 employees across more than a dozen countries.

Our sales and support teams are located in all our key regional markets to ensure that customers always have access to someone who speaks their language in their time zone. Our R&D centres are in strong technology regions, which offer highly-developed skills and academic excellence.

We hold The Queen’s Award for Enterprise in the International Trade category, the fifth Queen’s Award we have won.

Each year we run successful events with our partners around the world, including Korea, Japan, Taiwan, the USA, India, Poland, China, the UAE and of course the UK.

Markets

Partners using our products target a wide array of markets including mobile and tablet computing, multimedia, connected home consumer, in-car electronics, networking, telecoms, health, smart energy and connected sensors and controllers.

We aim to deliver highly efficient, low power processing to tackle all forms of multimedia and embedded applications, enabling the widest range of price/performance points to be addressed in these dynamic markets.

Imagination is focused on systems and solutions and takes the initiative to get inside how consumers think about and experience new technology. We understand market trends and use this knowledge to help our partners navigate the increasing convergence between traditionally separate markets.

We focus on the ‘four screens’, which define the primary gateways for consumers to interact with their connected world: mobile phones, mobile computers, home consumer electronics and in-car.

We are very strong in multimedia and connectivity: technology domains where Imagination excels. To enable that connectivity, and to enable emerging, but more fragmented markets like healthcare and home automation, we have developed an approach that combines our hardware processors with our software offerings, such as V.VoIP and FlowCloud, to enable flexible and highly extendable solutions which will help our partners create both connected devices and enabling services. Our multi-threaded MIPS processors deliver market-leading low power and high performance and are the leading CPU in several key markets, with a growing presence in mobile.

Increasingly, consumers expect to be able to access the broad range of media and features they use every day no matter what device they are using. This ‘convergence’ means that markets increasingly share common requirements. Our common IP across all markets enables us to drive and ride the convergence trend.
Mobile Phone

Mobile Computing

Home Electronics

Handheld Multimedia

Automotive

Networking

Emerging Markets
Technologies

Each of our core technologies is built on innovation, whether it be architecture, algorithms, programmability or simply great implementation. We’re known for our ‘smart’ solutions to difficult challenges.

These include the tile-based deferred rendering (TBDR) of PowerVR graphics; the efficient combination of fixed and reconfigurable elements in PowerVR video; the fully programmable heart of our Ensigma connectivity and communications core; the multi-threading of our MIPS processors; the interoperability of our VoIP technology; and the disruptive approach of our PowerVR ray tracing IP.

While our partners all use very similar IP cores from us, all of our IP core families are designed to maximize opportunities for our customers to differentiate their products, for example by using some of our extensions to APIs, selecting from our wide range of IP cores optimized for different power, performance and cost metrics, or designing in to customers’ unique SoC architectures. With Imagination, every customer can be unique.

Our business is fundamentally driven by our capability to create a roadmap of future technologies that accurately anticipates the requirements of tomorrow’s consumers. Our compelling IP roadmaps are the cornerstone of Imagination’s on-going leadership.

System on Chip IP

The SoCs that power everything in the consumer and embedded electronics space can be constructed from combinations of our unique portfolio of IP cores.

With our software and solutions we enable those SoCs to deliver the key multimedia, communications, connectivity and telecoms features customers require.

We deliver the highest performance at lowest power consumption and silicon area by making full use of our advanced, patented low-level design features alongside system-level philosophies such as hardware multi-threading, system latency tolerance and reconfigurable multi-standard solutions.

At the heart of our approach we have a simple design philosophy: deliver the maximum performance per mm² of silicon and per mW of power.

We enable heterogeneous SoCs where multiple processors, each with domain-optimized architectures, can each perform highly optimized tasks in a complementary, efficient and flexible way. Imagination is a founder member of the HSA Foundation which is creating new APIs and tools for the SoCs of the future.
PowerVR graphics

PowerVR is a range of visual IP processors for graphics, video, and display.

Central to the PowerVR family is our GPU: a graphics processing unit to run graphics and complex parallel compute tasks.

At the heart of this technology is a unique tile-based, deferred rendering shader-based architecture which allows our GPUs to deliver higher performance and image quality at lower power consumption and silicon area than our competitors.

Driven by demands for next generation UIs with stunning visual impact and high frame rate, designers now appreciate that many key applications rely on using low power, highly efficient graphics processors.

The PowerVR Graphics programmable GPU IP core families have been designed to offer the best performance in their respective class, with no compromise in feature set and with full backwards compatibility to earlier generations.

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 DirectX.

PowerVR is the industry’s leading solution for graphics acceleration in the mobile and embedded multimedia market.

Tens of thousands of developers rely on PowerVR’s 3D graphics capabilities for games, UIs, navigation apps and much more.

PowerVR graphics technologies are complemented by the PowerVR Insider ecosystem, which has more than 38,000 members and provides comprehensive support for developers, publishers and middleware developers.

PowerVR GPUs are also capable of doing more than just graphics. By using compute-based APIs (application programming interfaces) such as OpenCL, the PowerVR architecture delivers vast parallel processing power, increasingly referred to as GPU compute. Using this technology GPUs will increasingly come to dominate SoC “heavy lifting” processor-intensive computing as part of heterogeneous SoCs.
PowerVR video and vision

The other major PowerVR family is our VPU (video and vision processing units).

Our video and vision technologies are an exceptional balance of hardcoded and programmable elements, which combine to deliver the most efficient multi-standard and multi-stream video decoders and encoders and image signal processors.

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 video content as popular as audio.

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 up to 4K Ultra HD resolutions with exceptionally low power consumption and CPU overhead.

With features such as simultaneous multi-sensor support, 16-bit capability, and a path to 4K, PowerVR ‘Raptor’ ISP is ideal for ideal for low-power products such as mobile and wearables, and can seamlessly scale to provide the performance needed for UltraHD video, multi-megapixel photography, higher pixel depth sensors and provides the basis for context-aware applications such as facial and gesture recognition, augmented reality and more.

We provide extensive support for integrating our PowerVR graphics, video and vision technologies to enable unrivalled total visual processing solutions for TV and mobile devices.

1,000,000 units shipped per day
11 products per second
**PowerVR ray tracing**

Ray tracing is a technique for rendering cinema quality 3D at a level of near photographic realism that is impractical with traditional 3D graphics techniques.

Imagination has developed unique and patented technologies to radically lower the cost and dramatically increase the efficiency and performance of ray tracing.

Building on fundamental Imagination IP, such as OpenRL, an open API for ray tracing, we are today creating technologies for tomorrow’s creative graphics professionals.

We are aiming for the holy grail: embedded, mass market ray tracing.

Imagination will use tightly coupled PowerVR GPU and RTU technology to drive major innovations in the 3D graphics market. Our PowerVR ray tracing unit (RTU) technology is being fully integrated with Imagination’s future generation of PowerVR GPUs.

**Ensigma communications**

Ensigma RPUs (radio-processing unit) run communications and connectivity tasks.

Ensigma solves the problem of proliferating broadcast and connectivity standards by supporting them all on a single device.

The Ensigma RPU one core can handle all radio, TV and connectivity standards. It uses a unique combination of hardware and software to create an ideally flexible architecture with programmability and fixed hardware blocks in sophisticated balance.

At the heart of this technology is a uniquely optimized balance of programmability and hardware configurability, yet it occupies equivalent or less silicon area than comparable hard-wired, single-standard hardware solutions.

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.

Ensigma RPUs 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 Wi-Fi capabilities include 802.11a/b/g/n and ac with excellent scalable MIMO support and Bluetooth v3.0, with more being added.

By incorporating the advanced algorithms and completely production-ready implementations of all supported standards we are able to deliver better data throughput, sensitivity, and other key performance metrics, while minimizing bandwidth and power requirements.

<table>
<thead>
<tr>
<th>Connectivity</th>
<th>802.11abgn, MIMO 902.11n to 4x4, MIMO 802.11ac – with simultaneous Bluetooth</th>
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<tbody>
<tr>
<td>World TV Reception</td>
<td>DVB-T/T2/S/S2/C/C2, ISDB-T/S/C, ATSC, SBTVD, CTBB, J.83B</td>
</tr>
<tr>
<td>Analogue TV</td>
<td>DVB-H, T-DMB, 1-Seg</td>
</tr>
<tr>
<td>Radio</td>
<td>DAB/DAB+, HD Radio, ISDB-T sb/mm, DRM, FM, AM</td>
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<tr>
<td>Universal</td>
<td>Simultaneous combinations of the above</td>
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MIPS processors

Based on a heritage built and continuously innovated over more than three decades, Imagination’s MIPS architecture is the industry’s most efficient RISC architecture, delivering the best performance and lowest power consumption in a given silicon area. SoC designers can use this efficiency advantage for significant cost and power savings, or to implement additional cores to deliver a performance advantage in the same power, thermal and area budget.

Imagination’s family of MIPS processor cores are ideal for products where ultra low-power, compact silicon area and a high level of integration are required.

Our powerful, yet flexible CPU IP scales seamlessly from entry-level to high-end, and features advanced technologies such as hardware multi-threading, compatible 32-bit and 64-bit instruction set architectures (ISAs), and ISA consistency from entry-level to high-end.

MIPS is one of only three CPU architectures officially supported by Google’s Android, making it ideal for Android-based devices, as well as a wide range of other operating systems (OS) including Linux, and a range of RTOS (real-time OS). With billions of MIPS-based products already shipped, and many universities and schools around the world teaching CPU architecture using MIPS as their preferred platform, MIPS is truly the ideal CPU for tomorrow’s SoCs, from the highest-performance mobile applications processors to the lowest power connected sensor processors.

The market-leading MIPS architecture was created in the early 1980s as a 32-bit RISC processor focused on providing the highest levels of performance together with new levels of silicon efficiency thanks to its clean, elegant design.

MIPS CPUs deliver lower power consumption and smaller silicon area than other CPUs thanks to an extremely well-defined, clean RISC architecture coupled with many years’ experience in the most demanding environments from networking to TVs and set-top boxes.

Hardware multi-threading is a key technology for Imagination – most of our IP cores use this approach to extract the maximum possible processor performance from every clock cycle. For many applications, the multi-threading features in some MIPS cores enable SoCs to make far better use of every memory cycle, getting more done in fewer cycles than other CPUs.

Imagination is now one of the top three CPU companies in the world, and the only CPU IP company committed to providing the best possible choice for its customers. Imagination’s CPU, GPU, VPU and RPU technologies are each class leaders in their fields: each works independently of the other and integrate just as well with each other or with other third party IP.

Our IP is proven in hundreds of millions of devices and hundreds of successful products from world class brands.
FlowCloud & MIPS connected processors

Imagination’s FlowCloud technology is a comprehensive and unique end-to-end connectivity solution, optimized for MIPS processors and featuring the sophisticated and highly configurable FlowWorld portal. It establishes a new benchmark for connecting devices to the cloud.

Our MIPS Connected Processor IP platforms bring together a high performance 32-bit hardware multi-threaded CPU and FlowCloud and portal technologies, all in an unequalled total IP solution.

FlowCloud technology enables an end-to-end solution for delivery of services and content between service providers and users through the cloud. This highly streamlined IP platform will become a key enabler of future “always-on” internet connectivity.

Using the platform’s advanced FlowCloud APIs it is possible for a wide range of developers, large and small, to prototype and deploy truly connected products and solutions without requiring the broad range of engineering and commercial know-how and resources usually only found in the biggest industry players.

FlowCloud technology will enable the growth and acceleration of markets for products featuring connectivity across an increasingly diverse range of applications such as home automation, security, entertainment, toys, and healthcare.

New categories will be created and old ones revitalized by this ubiquitous connectivity technology, which enables embedded devices to deliver their functionality using an optimal mix of local and internet resources. Just as we helped to revolutionize the use of graphics across the mobile and embedded markets we intend to do the same for connected embedded devices with FlowCloud technology.

Diagram:

- End User Websites
- OEM Products
- FlowCloud User Portals
- FlowCloud Services
- FlowCloud Administration
- Developer Admin
- OEM Admin
- Services Admin
- FlowCloud Web Service API Backplane
- FlowCloud Directory
- FlowCloud User Database
- FlowCloud Key Value Store
- OEM Product
- Music Website
- Pure Connect
- OEM Website
- Internet
- 3rd Party FlowCloud-Based Services
**V.VoIP & VoLTE: HelloSoft**

HelloSoft is a technology solution for V.VoIP (Video and Voice over IP) and VoLTE (Voice over LTE) networks.

The key requirement for network operators in the 4G age is to make sure devices can access all different networks, with varied connecting technologies such as 4G, LTE, 3G, Wi-Fi and other IP-based channels.

HelloSoft is the only truly cross-platform carrier-class software V.VoIP solution in the market today.

HelloSoft V.VoIP 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, together with efficient call switching.

With the only cross-platform carrier grade VoLTE and with the world’s best degraded channel performance HelloSoft solutions are set to be at the heart of 4G.
Find your Imagination

Our headquarters and primary R&D base is in Kings Langley, near London, UK, with other R&D centres in Chepstow, Bristol and Leeds in the UK, as well as centres in the USA, India, New Zealand, Australia and Poland.

We keep close to our technology customers and partners worldwide, with sales and support offices across the USA, Europe, Japan, China, Korea and Taiwan.

Imagination has delivered on a strategy of innovation and diversification that has created a globally recognized technology company.

Thanks to the long and deep relationships we have with our licensees, strategic partners and our shareholders, we believe the lives of hundreds of millions of consumers around the world are being enriched by Imagination.

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.

Explore a partnership with Imagination.