XMOS Redefines Hardware Programmability with a Generative System-on-Chip (GenSoc)

XMOS is a trusted leader in semiconductors, shipping over 35 million units of its XCORE® chips to date. Thousands of customers trust us to deliver high precision and low latency processing across Control, I/O, AI and DSP to build solutions for the unique needs of their application.

Software development has changed completely since we launched, but the XCORE architecture is now more suited to emerging applications than ever before, including those requiring more contemporary classes of computation, like AI. Its unique homogeneous parallel processing architecture delivers the flexibility and deterministic execution properties that make it a game-changer for modern generative system design – enabling users to build and verify entire differentiated systems more quickly and economically than on any other platform.

What is a Generative System-on-Chip

Whilst we are now entering our fourth generation, XCORE is fundamentally the same trusted architecture and platform it always has been. However, processors are not sold on architecture alone – the programming model is equally important. It is the combination of the unique properties of XCORE with recent advances in generative AI for coding that open the door on a new category of hardware that reflects the unique advantages of our platform: Generative System-on-Chip (GenSoC).

XMOS enables you to generate your own SoC, from the I/O used to interface to the rest of the system, to the DSP, AI and control processing, in a single chip. Its architecture consists of parallel processing elements, meaning it can perform multiple tasks at the same time without interference, and complete them reliably, quickly and predictably, every time. This provides key advantages over processors that are fixed and sequential, with unpredictable timing.

How will customers benefit?

1. **From months to minutes**: dramatically reducing the time, effort and cost of creating custom SoCs.
2. **One chip, many functions**: replacing multiple single-function chips on a board with a single, flexible XCORE-based device.
3. **Future-proof investment**: enabling products to evolve through reprogramming in situ, long after deployment.

Endless real-time reconfiguration

Software and AI are accelerating rapidly, and hardware innovation has not kept pace. XCORE is the only platform that offers whole-system flexibility whilst guaranteeing functional and timing performance from the highest levels of programming abstraction. Our new category celebrates this uniqueness.

XCORE is an SoC that is able to match the flexibility and reconfigurability of modern system design tools, such as those driven by generative AI. While the category name is new, XMOS has long been the industry leader in GenSoCs – it is only now that the tools are emerging that reveal and enhance the vision.

Custom hardware requires an immense amount of forward planning, compromise, expertise, and cost. Fixed hardware, high development costs and long lead times mean that creative projects get stalled, compromised, or never built at all. But in the modern era of generative system design, XCORE GenSoC chips enable bespoke systems to be constructed from natural language in real-time, enabling the broadest design community and the fastest time to market – letting developers shape behaviour, sound, motion, sensing, and intelligence with ease and precision

Mark Lippett, CEO of XMOS, said:

"Generative design enables a major leap forward in making embedded system design more accessible, productive, and fast. However, it is nothing without a platform that offers the flexibility to match the creativity of the designer, and the robustness to match the requirements of mass-market deployment. That platform is XCORE GenSoC. In the near future, designs will move seamlessly from an application description to a fully realised production-ready GenSoC solution, built on the trusted strength of our XCORE platform"

Contact XMOS to explore how GenSoCs can solve your design challenges."

sales@xmos.com

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