SYNOPSYS®
Silicon to Software™

Synopsys and AMD

AMD Delivers Industry-Leading Ryzen and EPYC Processors with DesignWare
DDR4, USB 3.0, PCIe 3.1, Ethernet and Foundation IP on 14-nm Process

AMD

"To deliver our complex and high-performance Ryzen and EPYC SoCs on schedule, we relied on Synopsys' high-quality IP. Choosing DesignWare IP with custom features and capabilities enabled us to hit our schedule and supported our roadmap."—Rolands Ezers, Sr. Director, I/O & Circuit Technology, AMD

Business

Advanced Micro Devices (AMD) designs and integrates industry-leading technology that powers millions of intelligent devices, including personal computers, game consoles and cloud servers that define the new era of surround computing.

Challenges

▶ Meet aggressive schedule to design and deliver high-performance server systems-on-chips (SoCs)

▶ Work with a reliable supplier to customize IP to meet specific feature requirements

▶ Reduce integration risk with IP ported for 14-nm FinFET processes

Synopsys Solution

▶ DesignWare® Interface IP:
  – DDR4/3
  – USB 3.0 PHY
  – PCI Express® 3.0 PHY
  – SATA 6G PHY
  – Ethernet (1000BASE-KX/SGMII, 10GBASE-KR) PHY

▶ DesignWare Foundation IP:
  – Embedded Memories
  – Logic Libraries
  – STAR® Memory System
  – STAR Hierarchical System

Benefits

▶ Beat the competition to market with EPYC server processors and Ryzen PRO desktop processors

▶ Acquired standard and customized IP solutions that delivered the required features, performance, power and area

▶ Met tight deadlines with help from an experienced design team

Overview

The innovative AMD EPYC family of server processors, with up to 32 high-performance Zen cores and an unparalleled feature set, delivers greater performance than the competition across a full range of integer, floating point, memory bandwidth, and I/O benchmarks and workloads. Following the launch of its EPYC family of server processors, AMD added another tier to its enterprise CPU portfolio with the introduction of AMD Ryzen PRO desktop processors. Designed to meet the demands of today's compute-intensive workplace, Ryzen PRO desktop processors bring reliability, security, and performance to enterprise desktops worldwide.

High-Quality DesignWare IP

After determining their requirements for custom IP features and the aggressive time-to-market schedule, AMD selected a portfolio of Synopsys DesignWare IP due to their previous positive experiences with Synopsys' high-quality IP as well as AMD and Synopsys' history of collaboration. "We have partnered with Synopsys for tools and IP for more than a decade, and the rollout of Ryzen and EYPC are great examples of leveraging standard IP with custom features for cost-effective results," said Rolands Ezers, Sr. Director of I/O & Circuit Technology at AMD. "By licensing proven Foundation, DDR4, USB 3.0, PCIe 3.1, and Ethernet IP from Synopsys, we are able to focus our valuable engineering resources on ongoing product differentiation."

> *"The Synopsys DesignWare DDR4/3 PHY is a world-class product."* – Rolands Ezers, Sr. Director, I/O & Circuit Technology, AMD

Expert and Responsive Technical Support

AMD utilized Synopsys' responsive, worldwide support team to meet the requirements for their complex, high-performance SoC families. "Synopsys' experienced design engineers were extremely capable and solution-oriented," said Ezers. "Our products integrate a lot of Synopsys IP, and the engineer-to-engineer communication was critical to our success."

"We plan to use DesignWare IP in our next projects, and are engaged for future product development and future standard adoption," said Ezers.

> *"At the end of the day, the Synopsys engineering team augmented our own engineering teams, enabling us to focus on our differentiating features. Synopsys has a strong team of talented, technical people."* – Rolands Ezers, Sr. Director, I/O & Circuit Technology, AMD

AMD's Ryzen and EPYC SoCs integrate a portfolio of DesignWare Interface and Foundation IP