SYNOPSYS®
Predictable Success

Synopsys and Skyviia
Skyviia Reduces Risk and Speeds Multimedia SoC Development Time with Synopsys' HAPS FPGA-Based Prototyping System

"
With Synopsys' HAPS system we had a comprehensive prototyping solution, complete with pre-tested IP, from a single vendor. This allowed us to focus on developing our core design, saving us three months of schedule and helping us achieve high-quality results."

Skyviia

Yiyung Jeng
Senior Director of R&D, Skyviia

Business

Skyviia Corporation, a multimedia IC design company, develops System-on-Chip (SoC) solutions for innovative digital multimedia products. Skyviia develops integrated product solutions that enable its customers to create high quality audio, video and internet multimedia electronics products.

Challenges

▸ Speed time to market by accelerating development and validation of hardware IP

▸ Reduce hardware-software integration risk

▸ Meet tight timing constraints required to operate DDR3 at speed

Synopsys Solution

▸ HAPS®-62 Prototyping System

▸ DDR3 high-speed HAPS daughter board

▸ DesignWare® HDMI Receiver IP

Benefits

▸ Accelerated time to silicon by three months with easy-to-use high-speed interfaces for real-world testing

▸ Reduced integration risk with available DesignWare IP

▸ Met DDR3 timing constraints utilizing HAPS DDR3 reference design and high-speed DDR3 daughter board running at 400 MHz (DDR3-800 rates)

Overview

Skyviia's multimedia SoCs are highly integrated, high-performance solutions supporting a wide range of applications at very low system cost, including set top boxes, media players and digital photo frames. The chips support a wide range of audio, video and image formats for real-time decoding and deliver superior resolution and sound quality.

Skyviia recently developed a single-chip SoC solution for set top boxes. This comprehensive solution includes a dual-core ARM® Cortex™-A9 processor, audio DSP, image/video decoders, a video encoder and a security processor/subsystem, as well as all the necessary audio and video interfaces and peripherals to enable internet connectivity (e.g., GMAC and USB 2.0). With a goal of reducing both schedule and integration risk in the development of their SoC, Skyviia's key criteria in selecting a prototyping solution was configuration flexibility and support for multiple industry-standard high-speed interfaces. Having used Synopsys' HAPS prototypes as well as DesignWare IP in previous projects, the design team was confident that the high-performance HAPS-62 prototyping system would meet their project requirements.

Leading Hardware Prototyping Solution

The level of complexity in Skyviia's multimedia SoC increased both design and schedule risks because of the potential for more bugs and the subsequent respins that would be required. To validate their multimedia SoC design was functioning according to specifications early in the development cycle, Skyviia selected Synopsys' HAPS-62 system, which enabled them to run the design at near real-time operating speeds using real-world interfaces. The HAPS FPGA-based prototyping solution includes an extensive library of modular daughter boards supporting a broad range of standard interfaces. The HAPS daughter cards can be connected in a variety of ways to accommodate a number of design requirements, giving the design team a great deal of configuration flexibility. "The ability to access real-world, high-speed interfaces, which enabled us to validate our system in real time, is HAPS most valuable feature," said Yiyung Jeng, senior director of R&D at Skyviia. "The HAPS system is a flexible and complete prototyping solution that helped us reduce risk and accelerated our development time." Having recently integrated DDR3 into their overall design, Skyviia chose Synopsys' DDR3 HAPS daughter board because it performed to their required 800 Mbps spec without slowing the system down. Additionally, by using the DDR3 controller reference design provided with the daughter board, the Skyviia design team was able to bring up their design quickly.

High-Quality DesignWare IP

With a large portion of their SoC consisting of IP blocks, the design team benefited from utilizing the available DesignWare IP. By using a proven solution for system-level hardware and software prototyping using the same SoC production RTL, Skyviia's design team was able to focus its effort on their unique design components and validating the system, instead of verifying the IP.

Their project was further simplified with the easy-to-use HAPS GUI and the Synopsys System Configuration Software, which gave the Skyviia engineers control over all aspects of the HAPS-62 boards including voltages, frequencies and clock routing, as well as the ability to configure the FPGAs.

With an integrated prototyping environment consisting of the HAPS-62 system, high-speed DDR3 daughter board and reference design and available DesignWare IP, the Skyviia team had a complete solution that enabled them to accelerate their time to silicon while reducing overall project risk. With this success, Skyviia looks forward to using Synopsys' solutions in future projects.

"The ability to access real-world, high-speed interfaces, which enabled us to validate our system in real time, is HAPS most valuable feature. The HAPS system is a flexible and complete prototyping solution that helped us reduce risk and accelerated our development time.

Yiyung Jeng
Senior Director of R&D, Skyviia