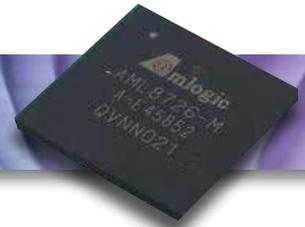


Synopsys and Amlogic

Amlogic Achieves First-Pass Silicon Success and Accelerates Time-to-Market by Six Months With Synopsys DesignWare HDMI RX IP and ARC Processors



Working with Synopsys is much easier than working with other vendors that provide similar IP. Synopsys tools and IP work together seamlessly, ultimately speeding up our time-to-market. We plan to use Synopsys for our future digital TV SoCs.”



Michael Mo

Senior Director of Business Development and Product Marketing, Amlogic

Business

Amlogic is a leading fabless system-on-chip (SoC) company that provides open platform solutions for high-definition (HD) multimedia, 3D gaming, and Internet connected consumer applications, including tablets, digital TVs, and set-top boxes. Amlogic combines its proprietary HD multimedia processing engine and systems IP with industry-leading CPU and graphics processor technology to produce semiconductor (IC) solutions for leading OEM/ODM customers. By providing solutions with a high level of system integration, Amlogic enables its customers to quickly manufacture products with an optimal balance between advanced features, performance, power consumption, and cost. The company is headquartered in Santa Clara, California, with offices in Shanghai, Shenzhen, Beijing, and Hong Kong.

Challenges

- ▶ Expedite time-to-market for high-performance, low-power HDTV SoC on an advanced process node
- ▶ Minimize design integration risk by ensuring that IP works well in the entire design environment
- ▶ Acquire flexible and future-proof solution that allows upgrades through software

Synopsys Solution

- ▶ DesignWare® HDMI 1.4 RX PHY and controller IP
- ▶ DesignWare ARC® EM embedded processors
- ▶ DesignWare ARC AS211BD audio processor and ARC Multimedia Audio Framework

Benefits

- ▶ Achieved first-pass silicon success and accelerated time-to-market by at least six months
- ▶ Reduced integration risk with silicon-proven DesignWare IP in Synopsys design environments
- ▶ Integrated a separate audio DSP and framework to allow for easy integration of codecs that support changing audio requirements
- ▶ Added advanced HDMI features like 4K x 2K video format with YCbCr 4:2:0 after tape out through software upgrade

Overview

Amlogic's latest generation of SoCs, the 4K HDTV 76 and 87 Series, incorporates multi-core CPUs and GPUs for high-performance, low-power digital smart TVs and set-top boxes. With support for Linux (Android) software development and advanced graphics and video capabilities, the 76 and 87 Series SoCs help ensure first-time-right product development for leading consumer electronics manufacturers.



Design after design, we've found that Synopsys ARC processors deliver the performance, power, and area that we require."

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The 76 and 87 Series SoCs offer media processors for audio decoding and video management and support camera ports, i2s digital audio inputs, and all standard audio/video interfaces, including four ports for HDMI 1.4 RX with audio return channel.

To support the development of this high-performance SoC, Amlogic required IP that would minimize integration effort and function as expected the first time.

High-Quality DesignWare IP

Amlogic needed to incorporate high-quality IP that would help give them an edge in the fast moving, competitive world of multimedia consumer SoCs. Amlogic selected Synopsys HDMI 1.4 RX IP due to its support for advanced features, including audio return channel, fast switching between four ports, 4K x 2K resolution with YCbCr 4:2:0, and 3D modes. The DesignWare HDMI 1.4 RX IP includes a robust analog front end that supports adaptive equalization for excellent signal integrity across 100+ foot cable lengths, a key feature for Amlogic's OEMs.

In addition to the HDMI 1.4 RX IP, Amlogic selected the ARC AS221 BD for audio decoding and the ARC EM for WiFi control. As one of the earliest ARC licensees, Amlogic has had excellent experiences using the ARC processors for over 10 years, and they knew that the processors' small size and low power consumption would be ideal for their 87 and 76 Series SoCs. "High performance with minimum power

consumption is essential for our SoCs," said Michael Mo, Senior Director of Business Development and Product Marketing, Amlogic. "Design after design, we've found that Synopsys ARC processors deliver the performance, power, and area that we require."

"In our industry, time-to-market and cost competitiveness are very important," said Mo. "Our engineering team needed to keep an eye on both of these areas as they developed the latest SoCs. Our excellent experiences with Synopsys tools, including those for synthesis and timing analysis, gave us confidence that the IP would work well in the entire design environment, including the riskier environment that advanced nodes bring."

Expert and Responsive Support

Amlogic integrated the DesignWare IP into their design with no major issues, saving an estimated six months in development time compared to their other IP options. Despite the complexity of designing in the advanced processes node, the integration process moved smoothly and quickly. The accuracy and completeness of Synopsys' product documentation helped Amlogic efficiently integrate the DesignWare IP into their ASIC design.

When assistance was needed, Synopsys' responsive technical support team was ready to provide timely and knowledgeable help, further easing the integration process on their path to first-pass silicon success.

"We needed a reliable IP vendor who could help us minimize our risk and speed our time-to-market as we moved to more advanced process nodes. Only Synopsys could provide the total IP solution we required, including the IP, design tools, and excellent support."



Michael Mo

Senior Director of Business Development and Product Marketing, Amlogic