

# Synopsys and Rockchip

Rockchip Achieves First-Pass Silicon Success for Mobile Application Processor SoC with DesignWare USB, HDMI & MIPI IP



*Success in the fast-moving mobile market requires every advantage available. We gained a competitive edge by integrating DesignWare USB, HDMI, and MIPI IP into our mobile application processor SoC.”*

**Cottice Lee**

Chip Design Director, Rockchip

## Business

Fuzhou Rockchip Electronics Co., Ltd. (Rockchip) is a leading Chinese fabless semiconductor company and mobile SoC solution provider. Rockchip focuses on chip design and providing total system-on-chip (SoC) solutions for Android tablets, Android smart TVs, e-books, and WiFi/Bluetooth audio solutions. Rockchip-designed SoCs have won the prestigious “China chip” award for five consecutive years.

## Challenges

- ▶ Meet aggressive performance and low power targets for mobile application SoC
- ▶ Meet challenging time-to-market schedule
- ▶ Reduce integration risk with proven and reliable IP

## Synopsys Solution

- ▶ DesignWare® USB, HDMI and MIPI PHY and Controller IP

## Benefits

- ▶ Reduced integration and interoperability risk with high-performance, silicon-proven DesignWare IP
- ▶ Met aggressive performance and power targets
- ▶ Accelerated time-to-market by months
- ▶ Received excellent technical support that helped accelerate tapeout

## Overview

Rockchip's top-tier customers develop and deploy mobile application products such as smartphones, tablets and smart TVs. For Rockchip to gain a competitive advantage in the fast-moving market that provides application processor SoCs for these consumer products, they needed to launch their product as quickly as possible, and with minimal risk. In addition, Rockchip's SoCs had to offer low power and high performance to gain a competitive edge.

“Our customer's next-generation mobile devices required low-power, high-bandwidth connectivity, so we needed a reliable IP solution that is compliant to our required IP standards, including USB, HDMI, and MIPI. In addition, we needed the IP in our selected process technology,” said Cottice Lee, Chip Design Director at Rockchip. “Only Synopsys DesignWare IP could meet all of our stringent criteria for power, performance, and compliance.”



*For high-performance, low-power, small-footprint SoCs, DesignWare IP is the clear choice. Using Synopsys gave us not only the ability to focus our engineering resources on our proprietary technology, but also confidence that the IP would work as expected.”*

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Chip Design Director, Rockchip

### High-Quality DesignWare IP

To offer a differentiating product, Rockchip needed to focus its engineering resources on its core competencies, including the SoC multicore architecture. While Rockchip has the capability to develop complex IP internally, they chose to use third-party IP so that they could focus on their product's core value. With this decision, Rockchip knew that they required a complete range of reliable, high-quality IP that was silicon-proven so they could reduce integration and interoperability risk.

Rockchip turned to Synopsys, their trusted IP supplier, to deliver the interface IP needed for their design. Using Synopsys DesignWare USB, HDMI, and MIPI IP enabled Rockchip's SoC to meet their aggressive performance and power targets, ensured that the interfaces would function per the specifications, and gave Rockchip additional confidence in their product.

Using Synopsys DesignWare IP allowed Rockchip to focus its resource allocation and reduce their overall product development timeline by months. Integrating DesignWare USB, HDMI, and MIPI IP allowed Rockchip to deliver an efficient, low-power, and cost-effective solution for their demanding mobile device application SoC.

### Expert and Responsive Support

Rockchip worked closely with Synopsys technical support engineers throughout their development and integration process. As the HDMI standard specification was being finalized in parallel with the SoC design, clear and consistent communication between Synopsys and Rockchip was required for successful product development.

“We were pleased with Synopsys' responsive and expert technical support,” said Lee. “We plan to integrate DesignWare IP into future projects as we have every confidence that Synopsys will continue to meet our design and support requirements.”

*“Synopsys' technical support was excellent. The team was available and responsive in every phase of our development cycle, from architecture to production.”*



**Cottice Lee**

Chip Design Director, Rockchip