

Synopsys and MegaChips

MegaChips Enables Highest Security Levels for DisplayPort/HDMI Converters with DesignWare Security IP

“ We successfully pioneered implementation of the new HDCP 2.3 security protocol for high grade protection of digital content thanks to the extraordinary cooperation we experienced with Synopsys. Choosing DesignWare Security IP gave us an advantage in the highly competitive image processing market. ”

~Maurizio Paganini, Executive VP at MegaChips

MegaChips

Business

Enabling everyday life through innovation, MegaChips is a semiconductor leader whose technology transforms the world we live in by helping each one of us achieve healthier, safer and more fulfilling lives. Leveraging decades of technology excellence, partnerships and acquisitions, MegaChips is shaping the next wave of the digital revolution, adding significant value for businesses and consumers in the areas of Internet of Things, displays, enterprise, and mobile computing all around the world.

Challenges

- Collaborate with an IP vendor who can provide expertise on security protocols, flexible solutions to accommodate quickly changing industry standards, and unique features
- Acquire complete, standards-compliant multi-port Repeater/Transmitter/Receiver HDCP solution that can enforce stringent security requirements over HDMI and DisplayPort/USB Type-C wired connections
- Meet data rate requirements in streaming mode within a strict power envelope

DesignWare IP Solution

- HDCP 2.3 Embedded Security Modules (ESMs) on HDMI and DisplayPort
- True Random Number Generators (TRNGs)

Benefits

- Achieved silicon success for HDMI and DisplayPort/USB Type-C Smart Converters that support the new HDCP 2.3 content protection specification
- Integrated complete, self-contained security modules with a tight security boundary to meet strict Digital Content Protection (DCP) robustness rules
- Acquired flexible solutions with advanced security features to support secure boot, secure communication, and firmware upgrades
- Received gate count efficient solutions with integrated support for multiple port interface types in one security module
- Delivered highly secure system-on-chips (SoCs) supporting high dynamic range (HDR) imaging and 4k2k@60Hz video resolution within a small power budget to end customers

Overview

MegaChips Smart Connectivity products lead the industry with the variety of inventive and advanced features to support the latest DisplayPort, HDMI, USB and other interface standards. MegaChips' chipsets power industry-leading smart mobile devices, notebooks, TVs, USB Type-C dongles, large format displays, gaming consoles, and accessory products reaching hundreds of millions of users.

When MegaChips began development of HDMI/DisplayPort converters for USB Type-C dongles, streaming boxes, and phone docks, they focused on providing high-performance, feature-rich ICs with rich color management and advanced audio. Their end customers also required robust security to meet the latest content protection standards. "We had system-level expertise in-house," said Maurizio Paganini, Executive VP at MegaChips, "and we knew that security domain expertise from an experienced third-party IP provider would be critical to our products' success in our competitive market."

High-Quality DesignWare IP

To meet their security requirements, MegaChips turned to Synopsys DesignWare® IP. "After evaluating four potential security IP providers, only Synopsys demonstrated sufficient technological expertise, product performance, and culture of flexibility to accommodate our specific functions and policies," said Paganini. "During the course of the project, Synopsys worked with us to develop a solution that overcame technological challenges in a variety of ways. For example, the original project was meant to support the High-bandwidth Digital Content Protection (HDCP) 2.2 content protection specification and we were able to deploy HDCP 2.3 without a silicon re-spin. This speaks to the robustness and flexibility of the Synopsys Security IP solution."

Expert and Responsive Technical Support

MegaChips utilized Synopsys' responsive, worldwide support team to meet the requirements for their high-performance SoC. "Synopsys' design engineers were extremely open to understanding the system-level implications of design decisions and shared our passion in implementing policies as we needed, which we rarely see with other IP providers," said Paganini. "Synopsys engineers and technical support were very solution-oriented."

"Our collaboration with Synopsys does not stop here. We are already integrating DesignWare Security IP into our next projects and are engaged for future product development and future standard adoption," said Paganini.



MegaChips MCDP2800 and MCDP2900 DisplayPort to HDMI Converters integrate DesignWare Security IP

“While other IP providers wanted a ‘cookie cutter’ approach, Synopsys offered the flexibility to accommodate different use cases and policies.”

~Maurizio Paganini, Executive VP at MegaChips