SYNOPSYS®
Silicon to Software™

Synopsys and MegaChips

MegaChips Meets Aggressive Performance and Time-to-Market Targets for
SSD Flash Controllers With DesignWare SATA IP

DesignWare SATA IP met all of our high performance and time-to-market requirements without compromise. As the IP is successfully shipping in hundreds of designs, we had no doubt about its reliability and quality."

MegaChips

Seiji Takenobu
Department Manager, MegaChips

Business

MegaChips is a global fabless company specializing in ASICs and system integration. MegaChips develops products and technologies for mobile, wearable and Internet of Things (IoT) applications.

Challenges

▸ Acquire a scalable, high-quality SATA IP solution that supports requirement to move from 3 Gbps to 6 Gbps

▸ Meet aggressive time-to-market requirements

▸ Reduce integration risk with proven and reliable SATA IP

▸ Implement production testing without expensive test equipment

Synopsys Solutions

▸ DesignWare® SATA Device Controller and PHY IP

Benefits

▸ Obtained a SATA IP solution that supported speeds of up to 6 Gbps, ensuring scalability and reuse in current and future SoCs

▸ Greatly accelerated time-to-market

▸ Quickly integrated quality, silicon-proven SATA controller and PHY IP solutions

▸ Acquired SATA PHY IP solution that provided early test coverage with built-in diagnostics and sample Automatic Test Equipment (ATE)

Overview

MegaChips, Japan's first fabless Large Scale Integration (LSI) company, focuses on building a superior level of expertise from development and design technology to manufacturing processes and supplies.

With continuous investments in research and development and accumulation of countless patents for digital and analog technologies, MegaChips adds value with creative products and technologies that meet their customers' needs in a timely manner.

MegaChips has installed a stringent quality control and assurance system which requires the company to select the very best technologies from leading suppliers around the globe. "Our customer's mandate was to develop a fully functioning chip for mass production while maintaining an aggressive production schedule," said Seiji Takenobu, Department Manager, MegaChips. "For this reason, we selected DesignWare SATA IP from Synopsys, the leading interface IP solutions provider. Synopsys' silicon-proven DesignWare IP for SATA met all of our performance and time-to-market requirements without compromise. As the IP is successfully shipping in hundreds of designs, we had no doubt about its reliability and quality."

> *We did not evaluate other IP. As far as we know, DesignWare SATA IP in 55-nm process technology is the only solution that allowed us to design a flash memory controller per our customer's specification for industrial SSD applications."*

Seiji Takenobu
Department Manager, MegaChips

High-Quality DesignWare IP Solutions

A customer tasked MegaChips with delivering a SSD flash controller chip for mass production with an aggressive production schedule, which required MegaChips to select an IP solution that was reliable, high quality, high performance and offered broad test coverage capabilities for production testing. MegaChips chose Synopsys' DesignWare SATA Device Controller and PHY IP, which met all of their requirements.

MegaChips needed an easy-to-integrate SATA IP solution that ensured that all functions work together seamlessly. They integrated the DesignWare SATA IP quickly and leveraged its built-in diagnostics and sample ATE test vectors to implement at-speed production testing. The test vectors enabled MegaChips to quickly identify signal integrity issues. "DesignWare SATA IP test vectors were very helpful for production testing and its architecture offered a stable Process, Voltage and Temperature (PVT) range," said Takenobu.

DesignWare SATA IP supports speeds up to 6 Gbps, which allowed MegaChips to meet their customer's specification for bandwidth and performance. "We wanted to give our customer the benefit of supporting the latest speeds in their current and future projects. For that reason, the SATA interface had to be scalable and reusable. We went from 3 Gbps to 6 Gbps, which DesignWare SATA IP easily supported," said Takenobu.

Expert and Responsive Services and Support

MegaChip's customer successfully launched their NAND flash memory controller technology. "Our customer's success is directly tied to our success with Synopsys's DesignWare SATA IP. Not only we were satisfied with the IP, but we especially benefited from Synopsys' worldwide online and technical support teams for their timely response and level of expert knowledge," said Takenobu.

Building Future Products

"We are continuing to offer value to our customers as they deliver differentiated and innovative products in markets like Internet of Things and mobile systems. We will continue to work with Synopsys and incorporate high-quality and silicon-proven DesignWare IP into our SoCs," said Takenobu.

> *"The successful launch of our customer's product is directly tied to our success with Synopsys' DesignWare SATA IP. We have already started discussing our next project's requirements with Synopsys.*

Seiji Takenobu
Department Manager, MegaChips

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