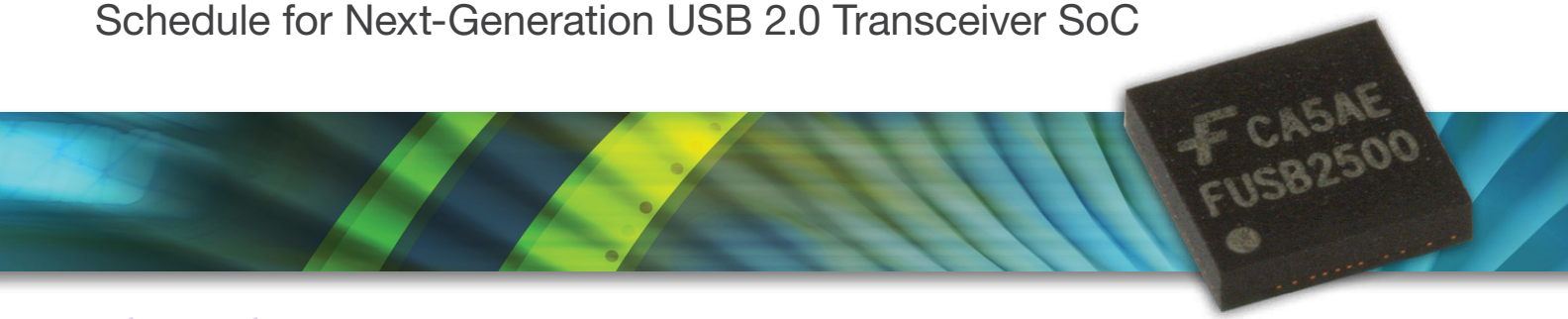
SYNOPSYS®
Predictable Success

Synopsys and Fairchild Semiconductor

Fairchild Achieves First-Pass Silicon Success and Meets Project Schedule for Next-Generation USB 2.0 Transceiver SoC



To meet our critical time-to-market window, we selected Synopsys, an established IP vendor with known expertise and who would give us the best opportunity of achieving first-pass silicon success."

Jerry Johnston,
Sr. Director of Switch and Interface, Fairchild Semiconductor

Business

Fairchild Semiconductor – Global Presence, Local Support, Smart Ideas – delivering energy efficient, easy-to-use and value-added semiconductor solutions for power and mobile designs.

Challenges

- Achieve first-pass silicon success for a complex product that was designed into a major mobile device manufacturer
- Meet critical 14 month project schedule to establish position in the high-end handset market
- Seamlessly integrate 3rd party USB 2.0 IP with existing Fairchild IP

DesignWare IP Solution

- USB 2.0 nanoPHY IP in 130-nm process technology

Benefits

- Achieved first-pass silicon success with high-quality DesignWare® USB 2.0 nanoPHY IP
- Met time-to-market window and successfully entered into a new technology space
- Acquired a USB 2.0 PHY IP that helped achieved lower power requirements

Overview

Fairchild's expertise in power and signal path products helps customers differentiate their designs and solve difficult technical challenges. They work closely with leading electronic manufacturers to understand their power and mobile challenges, and provide customized silicon solutions to help their customers maintain a competitive advantage. An application-driven, solution-based semiconductor supplier, Fairchild provides online design tools and design centers worldwide as part of its comprehensive Global Power Resource℠.

Fairchild's USB transceiver chips provide a USB 2.0 interface for Low-Speed (1.5 Mbps) and High-Speed (12 Mbps) portable and consumer electronic applications. These transceivers provide designers "off-the-shelf" USB 2.0 electrical compliance with features such as on-board voltage regulation, voltage level translation and 15kV ESD protection. Fairchild's USB transceivers are offered in thin-shrink small outline package (TSSOP) and ultra-small micro leadframe packages (MLPs) with common industry footprints. These features and package options offer designers flexibility while minimizing time-to-market, board space and total implementation cost.

The quality of the DesignWare USB 2.0 nanoPHY is excellent and the support we received is clearly the best we have experienced in recent years."

Jerry Johnston,
Sr. Director of Switch and Interface, Fairchild Semiconductor

Leading DesignWare IP Solution

Fairchild's FUSB2500 is a UTMI+ Low-Pin Interface (ULPI) USB 2.0 On-The-Go (OTG) transceiver chip targeting the high-end handset market. Compliant with the USB 2.0, ULPI Rev. 1.1 and OTG specifications, the FUSB2500 transceiver chip is optimized to connect the USB 2.0 host, peripheral or OTG-controller to the USB connector via the ULPI link. The charger-detection functional block enables automatic recognition for USB 2.0 host charging ports or dedicated chargers. The FUSB2500 chip is also compliant with Battery Charging Specification Rev. 1.0 and provides 25% lower power consumption in active mode compared to other available solutions.

The FUSB2500 transceiver was an extremely complex design and Fairchild's first 130-nm chip that would be integrated by a major mobile handset manufacturer. To help them focus on their product differentiation, Fairchild set out to acquire a 3rd party USB 2.0 IP. With much at stake, Fairchild wanted to engage with an established IP provider that had a known track record for delivering high-quality IP solutions. Fairchild selected Synopsys' DesignWare USB 2.0 nanoPHY IP because it was low in power and area. In addition, Fairchild was also impressed with the technical features of the PHY IP including the auto-detect functionality, ULPI interface and unique PHY tunability, which enabled Fairchild to easily conduct post-silicon adjustments without incurring the cost of a metal re-spin.

High-Quality IP and Excellent Support

The FUSB2500 is Fairchild's most complex chip to-date and integrating 3rd party USB 2.0 IP with Fairchild's IP added to the complexity. "With Synopsys' reputation for high-quality IP and known expertise, we had a greater level of confidence in achieving first-pass silicon success," said Jerry Johnston, Senior Director of Switch and Interface at Fairchild. "The quality of the DesignWare USB 2.0 nanoPHY IP is excellent. We did not have to compromise on any aspect of the design and were able to meet our critical time-to-market window."

With Synopsys' comprehensive product documentation and a knowledgeable and responsive technical support team at their side when they needed assistance, Fairchild was able to easily integrate the DesignWare USB 2.0 nanoPHY IP within a matter of weeks with no major issues and achieve a right-first-time design.

Fairchild successfully launched their leading FUSB2500 transceiver chip into the market and expects to produce millions of units per year. Johnston commented, "I don't think we would be here today without the DesignWare USB nanoPHY IP. We entered into a new technology space and attempting to develop the IP internally would have taken more than twice the time to complete the project. Synopsys' DesignWare IP will continue to be a core element of our family of products going forward."

"The unique tunability feature of the DesignWare USB nanoPHY was critical. It enabled us to easily make post-silicon adjustments and get a clean eye diagram without any issues.

Jerry Johnston,
Sr. Director of Switch and Interface, Fairchild Semiconductor

SYNOPSYS®
Predictable Success

Synopsys, Inc. • 700 East Middlefield Road • Mountain View, CA 94043 • www.synopsys.com