

Synopsys and Achronix

Achronix Achieves First-Pass Silicon Success for High-Performance Computing FPGAs with DesignWare Foundation and Interface IP

“Selecting Synopsys DesignWare IP saved us two to three months in overall time to market. In addition, developing the IP in-house would have cost us more than twice what we spent with Synopsys.”

~Namit Varma, Senior Director, India Technology Center, Achronix



Business

Achronix Semiconductor Corporation is a fabless semiconductor corporation based in Santa Clara, California, offering high-end FPGA-based data acceleration solutions, designed to address high-performance, compute-intensive and real-time processing applications. Achronix is the only supplier to offer both high-performance, high-density standalone FPGAs and licensed eFPGA IP solutions. Achronix [Speedster®7t FPGAs](#) and [Speedcore™ eFPGA IP](#) offerings are further enhanced by the ready-to-use [VectorPath™ accelerator cards](#) targeting AI, machine learning, networking and data center applications. All Achronix products are fully supported by the [Achronix Tool Suite](#) which enables customers to quickly develop their own custom applications.

Challenges

- Design and deliver high-performance FPGAs on a 7nm process that addresses the fast-moving AI/ML, telecom and data center markets
- Reduce design risk and optimize FPGAs for power, performance, and area
- Meet critical time-to-market objectives while under the pressures of bringing up a new team, using a new process node, and integrating leading-edge interfaces

DesignWare IP Solution

- Foundation IP: Embedded Memories, Logic Libraries, and Temperature Sensors
- PCIe 5.0 IP
- DDR4 PHY and controller IP

Benefits

- Accelerated time-to-market by two to three months with high-quality DesignWare IP portfolio
- High-quality PCI Express and DDR IP enabled low latency and high bandwidth
- Rich set of logic library cells improved PPA over competitive offerings
- Broad portfolio of memory compilers, including dual-port, reduced power consumption
- Received excellent support from a knowledgeable and responsive local technical support team

“Benchmarked against a leading competitor, the DesignWare Logic Libraries offered considerably better area and an 8% improvement in timing, which is significant for high-speed designs like ours.”

~Namit Varma, Senior Director, India Technology Center, Achronix

“The quality of the PCIe 5.0 and DDR4 IP was very good – we found no issues during integration and verification, and the IP is robust overall. For this reason, we are discussing our next project requiring faster interfaces including DDR5.”

~Namit Varma, Senior Director, India Technology Center, Achronix

Overview

Achronix and Synopsys have collaborated closely for more than a decade as their businesses grew and their markets expanded. When Achronix was ready to enhance their high-performance FPGAs with the industry's most advanced interface IP while meeting their customers' performance, power, and area requirements, they turned to Synopsys DesignWare IP.

High-Quality DesignWare IP Solutions

To achieve their PPA targets, Achronix started with DesignWare Foundation IP. “The DesignWare Logic Libraries offer a lot of variants in cell sizing and offered significant PPA advantages over competitive offerings,” said Namit Varma, Achronix. “In addition, the Synopsys memory compilers are easy to use through the GUI and offer lots of options on which collateral and files to generate.

We had more than 90 unique macros/configurations to create in our design which could have been tough with our lean team. The fact that the memories can be scripted and auto-generated in a ‘one-time effort’ is a huge benefit for us.” Finally, Achronix customers requested temperature sensors so they can manage frequency and data transfers, and the DesignWare Temperature Sensors met their requirements for accuracy and ease-of-use.

In addition to Foundation IP, Achronix integrated a range of DesignWare Interface IP. “The DesignWare DDR4 Controller and PHY IP solution was easy to integrate, offered more comprehensive and extensive RAS capabilities than competitive offerings. We are looking forward to using Synopsys' DesignWare IP including DDR5 IP in our future designs,” said Varma. “The low-latency PCI Express 5.0 IP with 512-bit datapath width supporting x16 links offered maximum bandwidth and power efficiency, all of which are required for Achronix's FPGAs. In addition, the PCIe ‘design for debug’ capability is strong and well thought out for the users.”

“Of all of the valuable contributions that the DesignWare IP brought to the Speedster7t FPGA family, the time-to-market acceleration was paramount,” said Varma. “By selecting Synopsys DesignWare IP over competitive IP vendors, we knew that we were getting the most robust, mature IP possible.”

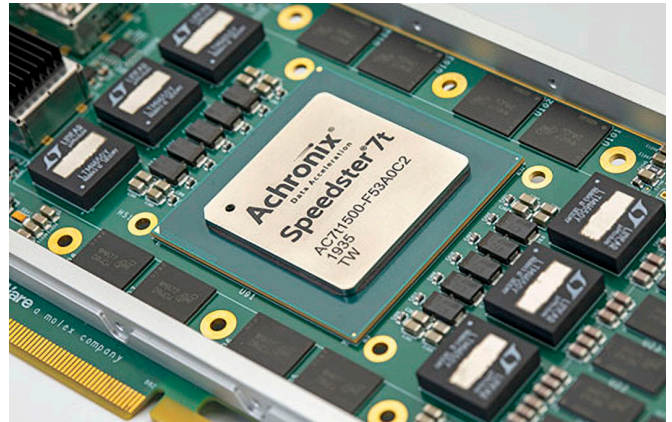
Expert and Responsive Technical Support

Achronix utilized Synopsys' responsive, worldwide support team to meet the requirements for their high-performance Speedster7t FPGAs. “One of our challenges from the start was bringing new team members up to speed as Achronix grows,” said Varma. “The Synopsys sales, technical support, and R&D teams worked together to help accelerate our project schedules while getting the most out of the design.”

“With another successful project completed, thanks to working closely with Synopsys, we are looking forward to our next generation and collaboration with Synopsys,” said Varma.

“Synopsys support is consistently responsive. They are ready to roll up their sleeves to get any issues resolved quickly.”

~Namit Varma, Senior Director, India Technology Center, Achronix



Achronix's Speedster7t FPGAs integrate a portfolio of DesignWare IP for high-performance AI/ML applications in data centers.