

Uniquify and Cadence

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Sam Kim, Vice President and CTO, Uniquify

The Customer

Uniquify is a provider of leading-edge system-on-chip (SoC) design and manufacturing, and intellectual property (IP) solutions. The company offers a broad spectrum of SoC design, and places a special emphasis on adaptive variation-aware double data rate (DDR) IP—a patented, highly differentiated technology featuring self-calibrating logic (SCL) and dynamic SCL.

Founded in 2005, Uniquify is known for its “ideas2silicon™” approach, which spans from SoC planning, logic design, and design for test (DFT) to physical design and manufacturing services. Uniquify uses its own proprietary design management system, Perseus™, to drive a consistent, convergent SoC design methodology, reduce time to design, and provide advanced schedule tracking and resource management. The company supports several foundries, including TSMC, Samsung, GLOBALFOUNDRIES, and SMIC.

The Challenge

To maintain its reputation and high customer satisfaction levels, Uniquify has set a high bar to achieve 100% tapeout success. The company continues to meet this goal in multiple application domains, including image processing, networking, digital television (DTV), DSL, mobile phones, digital cameras and displays, multimedia processing, and audio processing. Uniquify’s impressive track record includes silicon-proven 28nm, 40nm, and 65nm processing technologies.

Being this good isn’t easy. To create a design layout that meets today’s aggressive performance, power, and cost goals, Uniquify engineers must perform comprehensive physical design space exploration and feasibility analysis early in the process. Given the complexity and size of today’s designs, they need systems with the capacity to handle 100M instances and more.

Business Challenge

- Remain competitive by achieving 100% tapeout success in increasingly short timeframes

Design Challenges

- Meet aggressive performance, power, and cost goals
- Perform comprehensive physical design space exploration and feasibility analysis early in the design process

Cadence Solutions

- Encounter Digital Implementation (EDI) System
- QRC Extraction

Results

- In combination with Uniquify’s design methodology, Perseus, Cadence has helped Uniquify achieve:
 - 25%-30% faster design closure
 - Faster time to design, leading to faster time to market
 - Greater efficiency, translating into lower costs
 - High levels of quality

“Our design experts have extensive experience in meeting stringent power, clocking, IP integration, and performance requirements for today’s most challenging application-specific integrated circuit (ASIC) and SoC designs,” says Sam Kim, Vice President and CTO, Uniquify. “To work most effectively and efficiently, we rely on electronic design automation (EDA) systems that keep pace with demanding quality, efficiency, and project timeline goals.”

The Solution

For several years, Uniquify has relied upon Cadence as one of its several preferred EDA partners. Kim had counted on Cadence at a previous company and felt confident its EDA solutions would be a good fit for Uniquify’s business.

Specifically, the company uses Cadence® Encounter® Digital Implementation (EDI) System to maximize performance and minimize area and power for its high-performance, leading-edge designs. The EDI System supports advanced process technologies and system-in-package (SiP)/3D-IC design.

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Based on design intent, abstraction, and convergence, Uniquify’s Perseus drives the EDI System to give Uniquify engineers an early, accurate view of design feasibility. The engineers are equipped to progress immediately to full-scale implementation and final signoff for large-scale, complex designs—without ever leaving the solution environment.

The EDI System combines early and rapid design exploration and accurate chip feasibility analysis using unique and patented abstraction technology; automated floorplan synthesis; clock tree and clock mesh synthesis; advanced nanometer routing; full-chip virtual prototyping; and full-chip digital implementation and signoff in a single environment.

The Benefits

“The Cadence solution works seamlessly with Perseus, which augments the portions of the process that the EDA solution can’t address,” Kim says. “Our system is set up to automatically analyze the design and summarize results, and it has a built-in, automated

monitoring capability. With the Cadence solution combined with Perseus, we eliminate nearly all of the manual work that needs to be done by engineers, so we can produce high-quality outcomes in the shortest timeframes possible.”

Uniquify relies on Cadence QRC Extraction for fast, accurate 3D full-chip parasitic extraction and analysis during design and at signoff. This solution integrates fully with EDI System, offering Uniquify ease of use, rapid analysis to accelerate design closure, and better and faster convergence because the design team can use the same engine during implementation and signoff.

“One of the most useful things about the Cadence EDA solution is that it’s highly integrated, from Encounter RTL Compiler and Encounter RTL Compiler Advanced Physical Option to Encounter Conformal®, and Encounter Timing System,” Kim says. “We gain the benefit of conducting all of our analysis and testing in one system. The Cadence Encounter solution, combined with Perseus, gives us a completely integrated environment.”

Another key benefit of working with Cadence, according to Kim, is the flexibility of licensing and the ability to use the toolset on an as-needed basis.

“Our relationship with Cadence is more like a partnership than a vendor/client relationship, and that’s what we want,” Kim explains. “Like many companies in the semiconductor space, we have fluctuations in our needs depending on the status of projects and customer activity. Sometimes we don’t need as many EDA tools and don’t want to needlessly spend money on them. Other times we may need additional licenses as the project load increases. Cadence was able to come up with a flexible way of working with us so that we can manage our licenses on an as-needed basis.”

Summary and Future Plans

“Cadence EDA solutions, in combination with our proprietary design management system, Perseus, gives our customers a highly competitive edge,” Kim says. “We’re able to offer 25%-30% faster design closure, and we gain the ability to run multiple projects in parallel. The end results are faster time to market, lower costs, more efficient use of resources, and consistently high-quality results.”

In the future, Uniquify is considering using Cadence Virtuoso® solutions for its mixed-signal layout needs. This aligns with the company’s goal to streamline its entire design system since the Virtuoso EDA platform integrates fully with the Virtuoso custom design environment, ensuring seamless data transfer and increasing productivity for mixed-signal designs.

“We look forward to continuing our relationship with Cadence,” Kim concludes. “Without superior EDA solutions we couldn’t do our jobs. Cadence is a key partner that contributes to our success as a company.”



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