Synopsys Introduces Industry's First Complete USB4 IP Solution

Successful Tapeout of the DesignWare USB4 PHY Test Chip on 5nm Process Reduces Risk and Accelerates Time-to-Market for SoCs Supporting the 40 Gbps USB Specification

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Highlights

- DesignWare USB4 IP solution, including controllers, routers, PHYs, and verification IP, supports all features in the USB4 specification
- Support for USB4, DisplayPort with HDCP 2.3 security, PCI Express, and Thunderbolt 3 connectivity protocols through USB Type-C connectors and cables
- New USB4 router IP tunnels USB, PCIe and DisplayPort protocol traffic while optimizing bandwidth
- Throughput of up to 20 or 40 Gbps delivers required bandwidth for high-performance edge AI, storage, PC, and tablet SoC designs

Synopsys, Inc. (Nasdaq: SNPS) today introduced the industry's first complete DesignWare® USB4™ IP solution consisting of controllers, routers, PHYs, and verification IP. The DesignWare USB4 IP operates at up to 40 Gbps, which is twice the maximum data rate of USB 3.2 and is backwards compatible with USB 3.x and USB 2.0 systems. The DesignWare USB4 IP supports multiple high-speed interface protocols, including USB4, DisplayPort 1.4a TX, PCI Express, and Thunderbolt 3 for efficient data transfer and simultaneous delivery of data, power, and high-resolution video through a single USB Type-C® cable.

Synopsys has already achieved successful test chip tapeout of its USB4 IP in an advanced 5nm FinFET process, demonstrating the robustness of the IP across process, voltage, and temperature variations. The new DesignWare USB4 IP is designed to meet the functionality, power, performance, and area requirements of a broad range of storage, PC, and tablet SoC designs as well as software development debug and easy deployment of artificial intelligence (AI) applications at the edge. As the leading provider of USB IP for nearly two decades, Synopsys is enabling designers to lower the risk and adoption barrier of integrating USB4 functionality into their SoCs.

The DesignWare USB4 Router IP enables efficient connectivity between all supported protocols and are pre-verified with the USB4 Controller IP for millions of simulated CPU hours to help ensure long-term performance and interoperability. The DesignWare USB4 PHY IP offers a highly efficient power profile while supporting all required protocols in approximately one-third the area of independent PHYs. The Synopsys USB4 Verification IP Solution includes built-in coverage, protocol checkers, Verdi® protocol-aware debug technology for Host and Device router topologies, and a comprehensive source code test suite for USB, PCI Express, and DisplayPort tunneled protocols to accelerate verification closure.

"As an active member of the USB Implementers Forum (USB-IF) for more than 20 years, Synopsys has helped to advance USB specifications while developing IP products that ease the integration and adoption of the latest USB technologies," said Jeff Ravencraft, president and COO of USB-IF. "Initial USB4 products are expected to appear in late 2020 and the early availability of integration-ready USB4 IP is critical to helping designers incorporate the USB4 interface into their SoCs. Synopsys continues to support the industry by helping designers ensure interoperability and connectivity with billions of USB-enabled devices worldwide."

"Synopsys has been at the forefront of providing high-quality, complete IP solutions through every generation of widely used interface standards such as USB," said John Koeter, senior vice president of marketing and strategy for IP at Synopsys. "By providing a complete USB4 IP solution, backed by billions of SoCs shipped with DesignWare USB IP and our long track record of technical expertise, Synopsys enables designers to accelerate the integration of high-performance USB4 functionality into their SoCs with significantly less risk."

Availability & Resources

DesignWare USB4 PHYs, Device Router, Controllers, and Synopsys Verification IP are available for lead customers now.

- Visit the Synopsys DesignWare USB4 IP website
- Download the white paper, "USB4: User Expectations Drive Design Complexity"
- View the video, "What is USB4? USB, PCIe, DisplayPort with a Single Type-C Connector"

About Synopsys DesignWare IP

Synopsys is a leading provider of high-quality, silicon-proven IP solutions for SoC designs. The broad Synopsys DesignWare

IP portfolio includes logic libraries, embedded memories, embedded test, analog IP, wired and wireless interface IP, security IP, embedded processors, and subsystems. To accelerate prototyping, software development and integration of IP into SoCs, Synopsys' IP Accelerated initiative offers IP prototyping kits, IP software development kits and IP subsystems. Synopsys' extensive investment in IP quality, comprehensive technical support and robust IP development methodology enables designers to reduce integration risk and accelerate time-to-market. For more information on Synopsys DesignWare IP, visit https://www.synopsys.com/designware.

About Synopsys

Synopsys, Inc. (Nasdaq: SNPS) is the Silicon to Software™ partner for innovative companies developing the electronic products and software applications we rely on every day. As the world's 15th largest software company, Synopsys has a long history of being a global leader in electronic design automation (EDA) and semiconductor IP and is also growing its leadership in software security and quality solutions. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing applications that require the highest security and quality, Synopsys has the solutions needed to deliver innovative, high-quality, secure products. Learn more at https://www.synopsys.com/.

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