Synopsys Announces Industry's First USB Type-C IP Solutions

DesignWare USB-C IP Supports Reversible USB Type-C Connectors and USB 3.1, 3.0 and 2.0 Specifications

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Highlights:

- USB Type-C standard enables reversible connectors and 10 Gbps data transfer speeds with support for new bi-directional USB power delivery
- DesignWare USB-C IP supports USB 3.1, 3.0 and 2.0 specifications for a range of application needs
- Optimized DesignWare USB-C PHY IP uses up to 40 percent fewer pins, enabling smaller PHY area and lower overall silicon cost
- Complete DesignWare USB solutions for USB Type-C, 3.1, 3.0 and 2.0 consist of controllers, PHYs, verification IP, IP Prototyping Kits and IP software development kits

Synopsys, Inc. (Nasdaq:SNPS) today introduced the industry's first USB IP solutions that support the USB Type-C™ (USB-C™) connectivity specification as well as the USB 3.1, 3.0 and 2.0 specifications. The new Type-C specification simplifies mechanical USB connectors with reversible cables, rotational symmetry, up to 10 Gbps data rate, bi-directional power delivery, audio multiplexing and alternate modes such as DisplayPort and MHL. The Synopsys DesignWare® USB-C PHYs integrate Type-C functionality, reducing BOM costs by eliminating discrete multiplexers and crossbar switch components, which were previously required to support the small, reversible Type-C connector.

Supporting the USB Type-C connector requires two SuperSpeed or Enhanced SuperSpeed datapaths, so designers could either implement two non-Type-C USB PHYs in a dual PHY solution or choose a single PHY that is optimized for Type-C. The DesignWare USB-C PHYs supporting USB 3.1, 3.0 and 2.0 offer an optimized solution with small area and use up to 40 percent fewer pins than a dual PHY solution for Type-C. In addition, the DesignWare USB-C PHYs are based on the established DesignWare USB PHY architectures that are shipping in volume in 28-nanometer (nm) and 14/16-nm FinFET silicon, enabling designers to reduce system-on-chip (SoC) design risk when implementing the IP in advanced process technologies. The DesignWare USB-C PHYs are optimized for low power, meeting the stringent requirements of mobile devices such as smartphones and tablets, high-volume consumer applications such as digital TVs, storage and networking applications.

The DesignWare USB-C 3.1 PHY offers 10 Gbps and 5 Gbps data transfer rates and consumes less than 55mW power at 10 Gbps speeds. The DesignWare USB-C 3.0 PHY supports all USB 3.0 and 2.0 speed modes (SuperSpeed, High-Speed, Full Speed and Low Speed) in a single easy-to-integrate GDSII design.

"Teledyne-LeCroy and Synopsys have worked together for more than 15 years to perform early interoperability testing of new USB generations between our respective solutions," said Mike Micheletti, product marketing manager at Teledyne-LeCroy. "Interoperability testing is critical to developing the USB 3.1 ecosystem, and the successful interoperability testing between DesignWare USB-C 3.1 and USB-C 3.0 IP and Teledyne-LeCroy's Voyager M310C gives designers confidence that the IP will work as expected and reduce their design risk."

The DesignWare USB-C PHYs are part of Synopsys' complete USB solution, which also includes controllers, verification IP, IP Prototyping Kits and IP software development kits. Together, they reduce IP integration risk and speed time-to-market for consumer and mobile SoCs. The DesignWare USB 3.1 Controller IP, based on the DesignWare USB 3.0 Controller IP architecture which has shipped in more than 100 million SoCs, supports 10 Gbps data transfer rates, power saving capabilities and backward compatibility with existing USB 3.0 software stacks and device drivers. The DesignWare USB 3.1/3.0 IP Prototyping Kits and IP software development kits provide the essential hardware and software elements needed to reduce IP prototyping and integration effort, enabling designers to start implementing USB IP in an SoC in minutes. Synopsys USB Verification IP is based on a 100 percent SystemVerilog, UVM-based architecture with test suites delivered as source code to enable quick development of a verification environment to verify the proper integration and connection of the USB interface within the SoC.

"Products such as Synopsys' DesignWare IP that support the combination of the USB 3.1 and Type-C specifications offer high throughput with new, user-friendly capabilities for the demanding mobile and consumer markets," said Terry Moore, CEO of MCCI. "As interest in these specifications gains momentum, Synopsys IP and MCCI software are enabling the ecosystem to quickly adopt the new standards. Seamless software execution is easiest on best-in-class hardware implementations. Synopsys' high-quality DesignWare IP gives us a proven platform and enables our customers to delight their end users."

"As the demand for Type-C connectivity and 10 Gbps data transfers increases, system architects must quickly introduce

products that provide these features," said John Koeter, vice president of marketing for IP and prototyping at Synopsys. "As the leading provider of USB IP for more than a decade, Synopsys understands what is needed to help designers adopt the latest standards, such as USB Type-C, and provides IP products early so companies can be competitive in their fast-moving markets."

Availability

The DesignWare USB-C 3.1 PHY, DesignWare USB-C 3.0 PHY and DesignWare USB 3.1 PHY are available now. The complete DesignWare USB IP solutions, including Host and Device Controllers, Verification IP, IP Prototyping Kits and IP Virtualizer™ Development Kits are available now.

About DesignWare IP

Synopsys is a leading provider of high-quality, silicon-proven IP solutions for SoC designs. The broad 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 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 a leader in software quality and security testing with its Coverity® solutions. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing applications that require the highest quality and security, Synopsys has the solutions needed to deliver innovative, high-quality, secure products. Learn more at www.synopsys.com.

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