

Synopsys Introduces 3DIC Compiler, Industry's First Unified Platform to Accelerate Multi-die System Design and Integration

Unique platform delivers automation and visualization for 2.5D/3D package design and implementation, with power, thermal, and noise-aware optimization

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Highlights:

- Built on Synopsys' Fusion Design Platform, world-class engines and data model, 3DIC Compiler offers a consolidated end-to-end solution with a full array of capabilities for advanced multi-die system design – all under a single user environment
- Offers powerful 3D viewing capabilities which provide an intuitive environment for 2.5D/3D package visualization and significantly reduces design to analysis iterations and minimizes the overall integration time
- Provides tight integration with Ansys' silicon-package-PCB technology for system-level signal, power, and thermal analysis

Synopsys, Inc. (Nasdaq: SNPS) today introduced its 3DIC Compiler platform to transform the design and integration of complex 2.5 and 3D multi-die system in a package. It provides an unprecedented fully integrated, high-performance, and easy-to-use environment, offering architectural exploration, design, implementation, and signoff with signal, power, and thermal integrity optimizations, all in one solution. With 3DIC Compiler, IC design and packaging teams are enabled to achieve unparalleled levels of multi-die integration, co-design and faster time to convergence.

"Through our collaboration with Synopsys, we can now serve our mutual customers with advanced multi-die package solutions for high-end networking and high-performance computing applications," said Jaehong Park, executive vice president of Design Platform Development at Samsung Electronics. "Synopsys' 3DIC Compiler with its unified platform is an industry disruptor in how advanced multi-die packages are designed, as it has redefined the conventional tool boundaries across the full design workflow for 2.5D/3D multi-die solutions."

A New Era in IC Packaging

With insatiable demand for increasing silicon scalability and new system architectures, 2.5 and 3D multi-die integration have become paramount to meet system-level performance, power, area, and cost requirements. An increasing number of factors are driving system design teams to leverage multi-die integration to address new applications such as artificial intelligence and high-performance computing. These applications are driving new packaging architectures like chiplets and stacked-die, in combination with high-bandwidth or low-latency memory to be integrated in a package solution.

Disruption in Traditional IC Packaging Tools

With the advent of 2.5D and 3D IC, the IC packaging requirements are much more like IC design requirements such as SoC-like scale, with hundreds of thousands of inter-die interconnects. Traditional IC packaging tools have been integrated, often loosely, with existing IC Design tools. However, they are fundamentally limited in scalability by their data models and begin to break with the more complex design requirements of recent complex 3DIC architectures. In addition, given the disjoint tools and loosely integrated flows, the 3DIC design schedules are unpredictable, long, and frequently non-convergent.

Introducing 3DIC Compiler

Synopsys' 3DIC Compiler is built on an IC design data model – enabling scalability in capacity and performance with more modern 3DIC structures. It provides a single environment with planning, architectural exploration, design, implementation, analysis, and sign off – all in one. In addition, 3DIC Compiler sets a new standard in IC packaging usability with its unique and user-friendly visualization capabilities such as 360° 3D view, cross probing, etc. for all views (architecture, planning, design, implementation, analysis, and signoff).

Synopsys has partnered with Ansys, the global leader in multi-physics simulation, to integrate Ansys' RedHawk™ family of silicon-proven analysis capabilities with 3DIC Compiler. RedHawk generates highly accurate signal, thermal, and power data which are tightly integrated into 3DIC Compiler for package design. The automatic back-annotation between RedHawk and Synopsys' 3DIC Compiler enables much faster convergence with fewer iterations than disjoint solutions.

"Power and thermal analysis of an individual die in isolation is no longer sufficient in a multi-die environment. The full system needs to be analyzed together," said John Lee, vice president and general manager at Ansys. "Through our integration with Synopsys' 3DIC Compiler with its multi-die design environment, designers can better optimize their overall system solution for signal integrity, power integrity as well as thermal integrity, while achieving faster convergence during signoff."

"Synopsys' 3DIC Compiler, developed in close collaboration with key customers and foundries, is poised to enable a new era of 3DIC design," said Charles Matar, senior vice president of System Solutions and Ecosystem Enablement for the Design Group at Synopsys. "It offers a fully integrated set of technologies, with SoC-scale capacity, for an unparalleled, system-level and holistic approach to multi-die integration, required for today's extremely complex leading-edge designs. This will also enable our customers to innovate in package design and provide solutions for heterogeneous system architectures."

For more information visit www.synopsys.com/3DIC.

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 www.synopsys.com.

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