Ansys Collaborates with TSMC and Microsoft to Accelerate Mechanical Stress Simulation for 3D-IC Reliability in the Cloud

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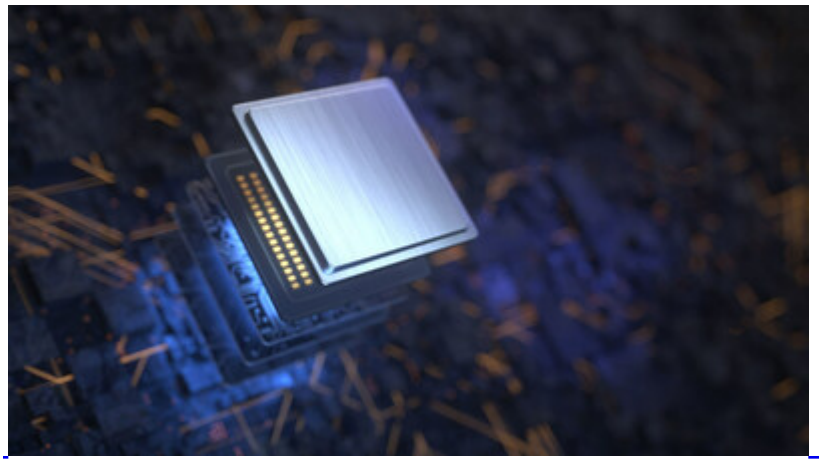
The joint solution provides a high-speed and high-capacity cloud solution for analyzing the mechanical stresses in 2.5D/3D-IC multi-die systems, which extends product reliability

/ Key Highlights

- Managing thermal mechanical stress is crucial for 3D-IC reliability and robustness
- Ansys collaborated with TSMC and Microsoft to enable a fast, and high-capacity solution for analyzing mechanical stresses in multi-die designs using TSMC's 3DFabric technologies
- Ansys Mechanical simulates the stresses in large, 3D integrated circuits with predictive accuracy to enable robust and reliable products

PITTSBURGH, Nov. 16, 2023 /PRNewswire/ -- Ansys (NASDAQ: ANSS) has collaborated with TSMC and Microsoft to validate a joint solution for analyzing mechanical stresses in multi-die 3D-IC systems manufactured with TSMC's 3DFabric™ advanced packaging technologies. This collaborative solution gives customers added confidence to address novel multiphysics requirements that improve the functional reliability of advanced designs using TSMC's 3DFabric, a comprehensive family of 3D silicon stacking and advanced packaging technologies.



Ansys Mechanical is the industry-leading finite element analysis software used to simulate mechanical stresses caused by thermal gradients in 3D-ICs. The solution flow has been proven to run efficiently on Microsoft Azure, helping to ensure fast turn-around times with today's very large and complex 2.5D/3D-IC systems.

3D-IC systems often have large temperature gradients that lead to intense mechanical stresses between components due to differential thermal expansion. These stresses can lead to cracking or shearing of the connections between various elements and reduce the reliable lifespan of a 3D-IC assembly. As the size and complexity of semiconductor systems grow it becomes more difficult to analyze them efficiently. Ansys Mechanical, running on Azure's purpose-built HPC infrastructure, is instrumental in scaling up computationally demanding stress simulations while maintaining predictive accuracy. By automating highly complex thermo-mechanical stress simulations, Ansys Mechanical can simulate massive models due to a highly efficient hybrid parallel solver that supports cost-effective computing by using on-demand cloud computing resources like Azure.

"In face of the design challenges brought by the growing size and complexity of semiconductor systems, the accurate analysis results become critical for the 3D IC design using TSMC's latest 3DFabric technologies," said James Chen, director of 3D IC integration division, TSMC. "Our latest collaboration with Ansys and Microsoft will benefit designer with Ansys Mechanical on Microsoft Azure, performing simulations faster without sacrificing accuracy to ensure high-quality 3D IC designs for the next generation AI, HPC, mobile and networking applications."

"With this valuable collaboration between Ansys, Microsoft, and TSMC, our innovative solutions address novel multiphysics challenges and accelerate time-to-market, while mitigating the risk of costly field failures in 3D-ICs due to thermo-mechanical stresses," said John Lee, vice president and general manager of the semiconductor, electronics, and optics business unit at Ansys. "Our joint customers and partners see increased value in Ansys' open ecosystem approach, ensuring they can choose the best-in-class solutions and take advantage of our cloud-ready solvers with ease."

"Microsoft and Ansys have collaborated to provide optimized cloud solutions for some of the biggest semiconductor design challenges with Microsoft Azure's cloud resources and on-demand elastic compute capabilities," said Merrie Williamson, corporate vice president, Azure infrastructure and digital & application innovation, Microsoft. "And with this close collaboration with TSMC, we have been able to create a leading-edge solution flow that is made possible by cloud technology."

/ About Ansys

Our Mission: Powering Innovation that Drives Human Advancement™

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

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