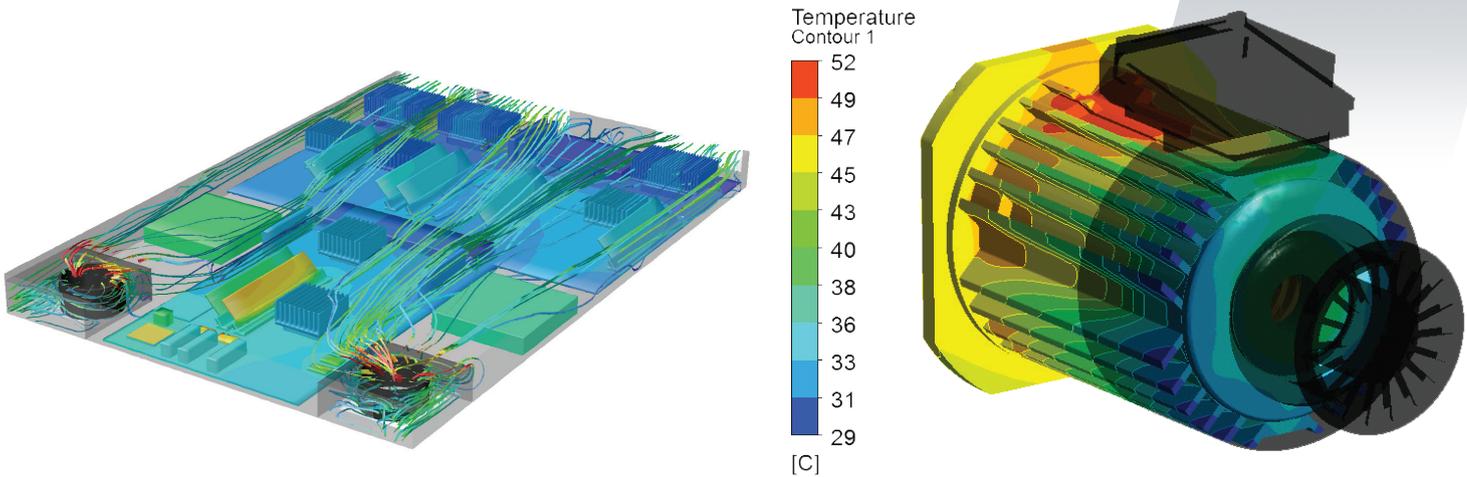




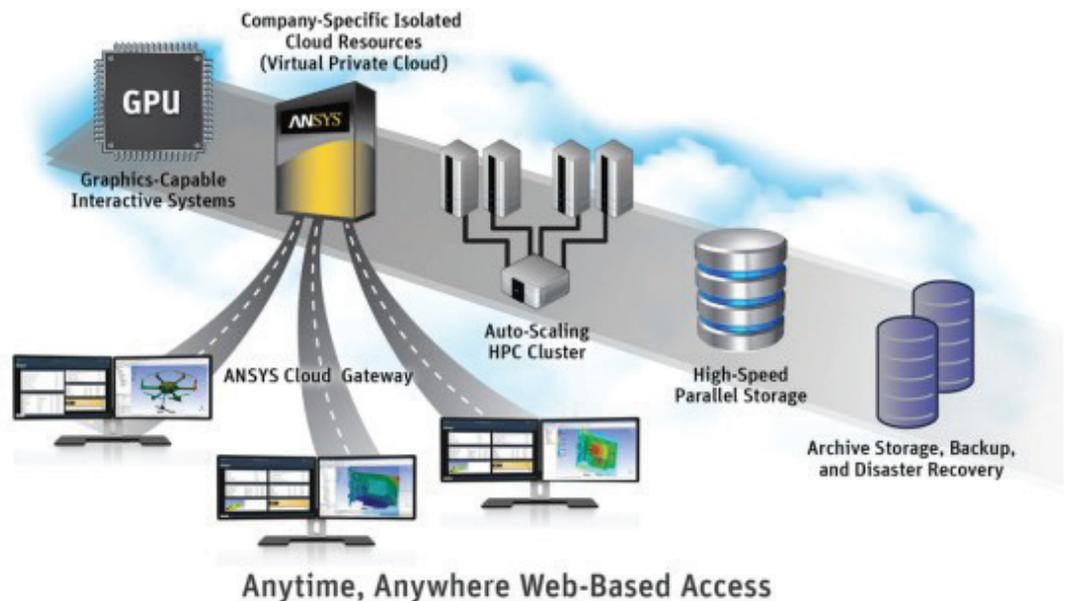
ANSYS ICEPAK

Electronics Cooling Solution

ANSYS Icepak accurately predicts airflow, temperature and heat transfer for electronic and power electronic components and printed circuit boards. It can also perform thermal analysis of system-level applications, such as data centers, computers and telecommunications equipment, and leverages the powerful computational fluid dynamics (CFD) solver, ANSYS Fluent, for evaluating conceptual designs and accessing data that would be either impractical or impossible with physical testing.



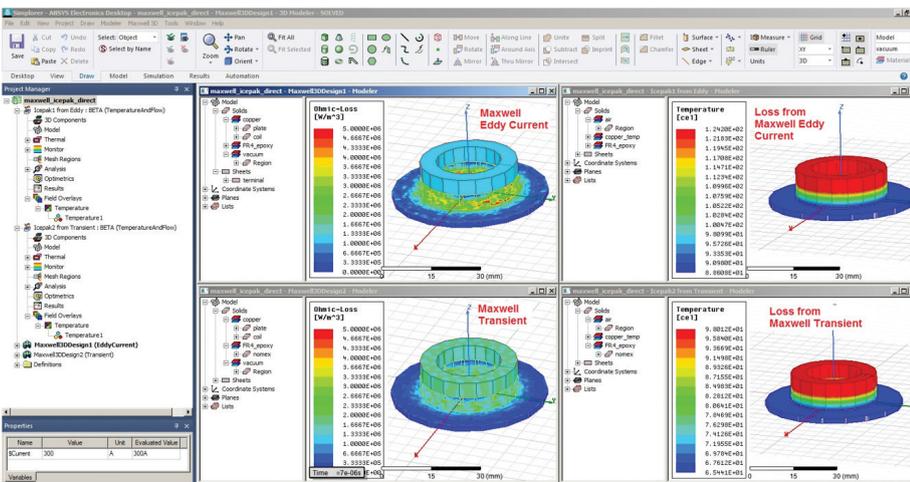
With CAD-centric (mechanical and electrical CAD) and multiphysics user interfaces, Icepak facilitates the solving of today's most challenging thermal management problems in electronics products. It uses sophisticated CAD healing, simplification and metal fraction algorithms that reduce simulation times, while providing highly accurate solutions that have been validated against real-world products. The solution's high degree of accuracy results from the highly automated, advanced meshing and solver schemes, which ensure a true representation of the electronics application. The hex-dominant, unstructured meshing algorithms generate body-fitted meshes of complex geometries with minimal intervention. The state-of-the-art ANSYS Fluent CFD solver calculates thermal and fluid flows. Icepak includes all modes of heat transfer — conduction, convection and radiation — for steady-state and transient electronics cooling applications. Icepack also offers support for comprehensive electro-thermo-mechanical multiphysics analyses, thus enabling a true, 360-degree analysis of electronics products. Its software platform deployment ranges from laptops, workstations and internal compute farms to the cloud.



ANSYS Icepak Capabilities	ANSYS Workbench User Interface	Electronics Desktop User Interface
Easy-to-Use Slider Bar Meshing		●
Mechanical and Electrical Cad-Centric		●
User-friendly Ribbons and Tabs Interface		●
Automated MCAD Healing and Simplification		●
IronPython and VBS Scripting with Recording		●
Integrated Dynamic Links for Electro-thermal Interaction		●
User Experience Comparable to ANSYS HFSS, ANSYS Maxwell, ANSYS SIwave and ANSYS Q3D Extractor		●
Integrated Material Library for Electrical, Thermal and Mechanical Properties		●
ECAD Metal Fraction Analysis	●	●
Thermal-Mechanical Coupling	●	●*
AC and DC Electro-Thermal Coupling	●	●
Solver with Four Cores	●	●
HPC, Cloud and Scheduler Support	●	●
Parametric Variations and DoE Support for “What-if” Analyses	●	●
Transient Thermal Analyses for Conduction, Convection and Radiation HT	●	●*
Commercial Library for Fans, Heatsinks, Blowers*, TECs* and Thermostats*	●	●*
Steady-state Thermal Analyses for Conduction, Convection and Radiation HT	●	●

*Denotes planned future capability.

The ANSYS Electronics Desktop complements Icepak with its intuitive, streamlined interface that lowers the learning curve for product simulation success. Additionally, existing ANSYS customers can build upon their existing electromagnetic solutions by adding an Icepak solver-only license to HFSS, Maxwell, Q3D Extractor or SIwave for a complete electro-thermal design flow.



Electro-thermal results from Maxwell 3D and Icepak within the Electronics Desktop user interface. The eddy current losses solved by Maxwell 3D are automatically pushed into the Icepak steady-state thermal solver, to account for nonlinear electromagnetic thermal losses.



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