

Product Features

ECAD interfaces

- ▶ Cadence APD
- ▶ Sigrity UPD

Package Types

- ▶ Ball grid array
- ▶ Package-on-package
- ▶ System-in-package
- ▶ Leaded
- ▶ Stacked die
- ▶ Multi-chip modules
- ▶ Flip chip
- ▶ Wire bond
- ▶ Practically any package type

ECAD Data Imported

- ▶ Complete ball grid array substrate
 - All traces
 - All types of vias
 - Dielectric and metal layers
 - Solderballs
 - Bond wires
 - Chips
 - Encapsulant

MCAD Interface through DXF/DWG Files

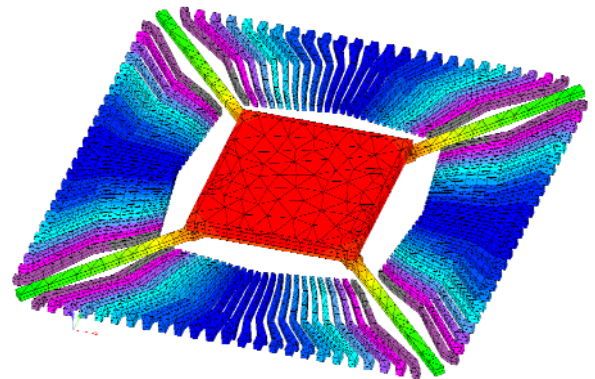
Thermal Environment

- ▶ Natural or forced convection; define a heat transfer coefficient or have ANSYS Icechip calculate
- ▶ Radiation
- ▶ Fixed-temperature boundary conditions
- ▶ Simulate standard JEDEC thermal, tests

ANSYS® Icechip® software allows you to accurately characterize package during design — saving time, money and headaches that result from discovering thermal problems late in the design cycle.

ANSYS Icechip provides far more than temperature predictions typical of other thermal analysis tools. It actually helps build thermal optimization into the design, no matter what package style you are designing.

Developed for use by both non-thermal and thermal analysts, the ANSYS Icechip direct interface with industry-recognized package design tools delivers fast, accurate results, ensuring the best possible thermal design.



Complex geometry, such as a lead frame, is exactly represented in the ANSYS Icechip 3-D model.

- ▶ Improves accuracy: Launch ANSYS Icechip from within Cadence® APD or Sigrity® UPD to capture real device geometry automatically.

- ▶ Reduces time to market: ANSYS Icechip integrates thermal simulation into the system design and verification process.

- ▶ Solid long-term investment: ANSYS Icechip handles today's package styles as well as the high heat-generating designs of tomorrow.

- ▶ Customer confidence: The ANSYS Icechip library of standard JEDEC boards and multiple case studies capability means packages can be characterized based on customers' real world conditions.

Who Can Use ANSYS Icechip

- ▶ Electrical and packaging engineers: designed so you don't need a strong thermal background
- ▶ Thermal engineers: generates accurate thermal models and provides the flexibility to solve thermal problems

Export the model to ANSYS® or ANSYS® Workbench™ for stress analysis

Export the geometry to Icepak® for systems-level simulation

Define non-uniform power to predict chip hot spots; power can be temperature dependent

Accurate 3-D models automatically generated

Fast solve times, usually in minutes

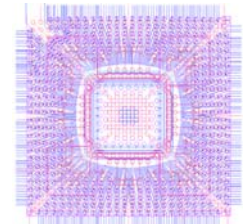
Includes a library of standard JEDEC boards

Automatic 3-D Models

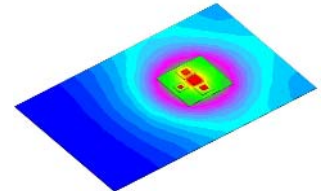
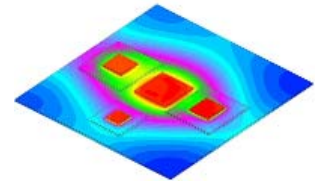
ANSYS Icechip software automatically generates fully detailed three-dimensional models. An unstructured triangular mesher is used to capture complex geometries such as component lead frames. The substrate of a ball grid array is three-dimensionally simulated accounting for every trace, plane and via as a local heat transfer path. Complex algorithms process the exact geometry imported from the ECAD tool and locally represent it at the meshed element level. This methodology results in an accurate simulation that can still be solved in minutes. An imported JEDEC board library file is similarly three-dimensionally represented. This results in accuracies of better than 10 percent of standard JEDEC Theta-JA simulations when compared with test data.

Benefits

- ▶ Thermally design components quickly and accurately
- ▶ Work easily and intuitively
- ▶ Automatically produce detailed 3-D models
- ▶ Flexibility to simulate today's complex packages — as well as tomorrow's



BGA substrate data imported from Cadence Allegro Package Designer



Package-on-package simulating a standard JEDEC Theta-JA thermal test



Package-on-package cross section showing temperatures

