Using Simulation at the Conceptual Design Stage

Samsung Electronics

Semiconductor/System LSI

Korea

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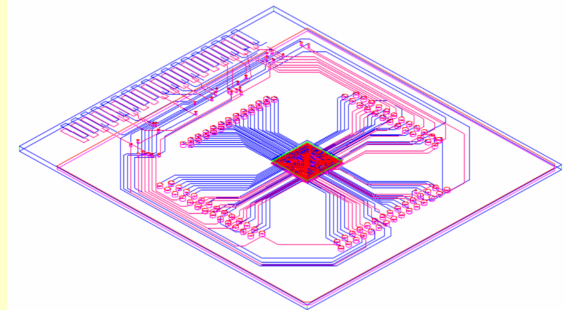
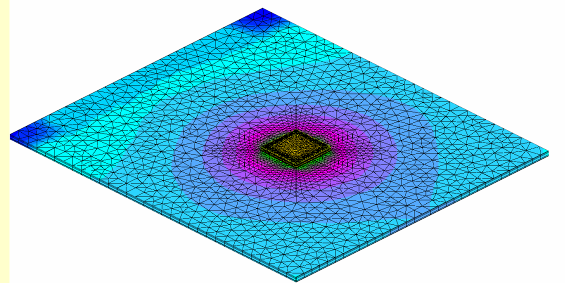
ANSYS® Icechip™

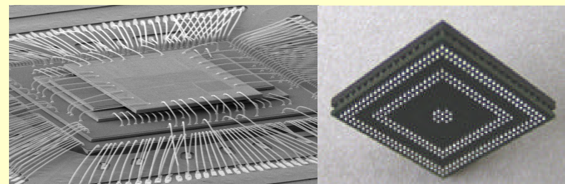
Overview

Samsung Electronics Inc.'s IPT group specializes in the thermal design and analysis of semiconductor packages through simulation and measurement in order to guarantee product thermal reliability. The company's main product group encompasses microprocessors for mobile products, display drive ICs, smart cards and display panel processors. The IPT group is responsible for the analysis of leadframe, ball grid array (BGA) and tape automated bonding (TAB) packages as well as the development of new package designs through its refined package thermal analysis.

As the demand for the more complex modules of system-in-package (SIP) and package-on-package (POP) design increases, more accurate and easier-to-use simulation solutions are needed to account for the structure complexity. For this problem, ANSYS Icechip software is emerging as Samsung Electronics' most appropriate and reliable solution.







Testimonial

"ANSYS Icechip software leads the package thermal analysis market due to its easy-to-use interface and intuitive model generation. With the interface to the ECAD tools we use to electrically design packages and the adaptive meshing, ANSYS Icechip creates a compact yet accurate model with extremely fast solve times.

Our engineers are successfully adopting ANSYS Icechip beginning with the conceptual design stage. This software allows us to confidently determine the feasibility of a new design concept. It provides us with feedback on how to design chips and how to plan product design efficiently with its compact and accurate models. The highly accurate predictions during design verification plays a revolutionary role in improving our package thermal analysis skills."

Jaewook Yoo
Samsung Electronics

Challenge

Detail modeling: determine how entities of a package affect thermal design, including traces, vias, ground and power planes, bondwires, and solder balls

Type diversity: determine the structure complexity in the new products, such as SIP and POP; for example, how a POP made of different kinds of chips can affect thermal analysis

Highly integrated performing device: determine how device integrity and its electrical performance affect thermal results

Easy access: use of thermal software by non-thermal engineers

Solution

ANSYS Icechip software can handle various types and kinds of packages by importing the ECAD design file as a prototype.

ANSYS Icechip has a built-in solver that adapts to any new package supporting on-chip distributed power and thermally induced power generation. This leads to a thermally optimal distribution and provides a one-step process from modeling to solving and reporting — so non-thermal engineers can perform simulations easily.

Benefits

Thermal analysis efficiency has significantly increased due to:

- Prototype-intuitive modeling that directly imports ECAD drawing file

- Fast, accurate solution speed

- One-step handling process from modeling to reporting

- Application to various types of packages

As a result, the company stands to considerably reduce measurement time and expense.

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