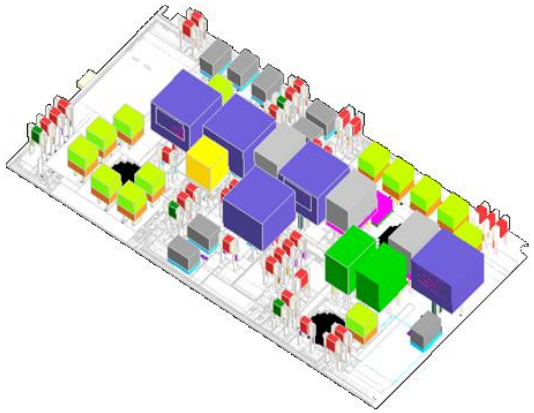
ElectroFlo® Electronics Cooling Software

ElectroFlo® is designed exclusively for challenging electronics cooling and design issues. It is a CFD based package capable of solving problems involving conduction, natural and forced convection, radiation and conjugate heat transfer, yet it is easy enough to use for a non-CFD expert.



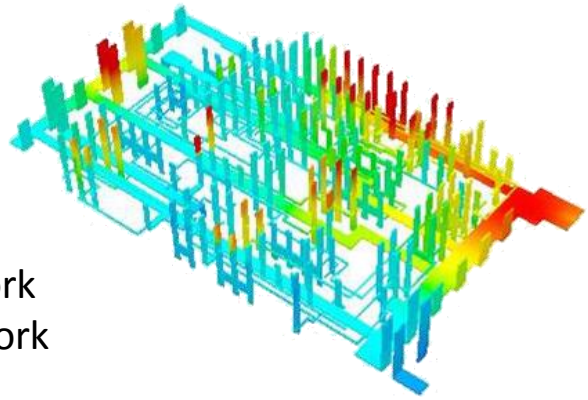
Powerful and Accurate Core Solver

- As the level of model complexity increases the power and efficiency of ElectroFlo becomes more apparent.
- Perform thermal/CFD/electrical analysis of extremely complex models of electronic boxes involving millions of elements with ease.
- Relieves the analyst of very tedious and time-consuming task of model clean-up and simplification.
- Makes it possible to provide customized “Turn-Key” Solutions for Complex Problems.

Differentiating Capabilities:

… so much more than a CFD package

- Coupled Electrical Analysis
- Embedded Flow Network
- Patented Radiation Solver
- Multi-System Analysis
- Embedded Thermal RC Network
- Embedded Electrical RC Network



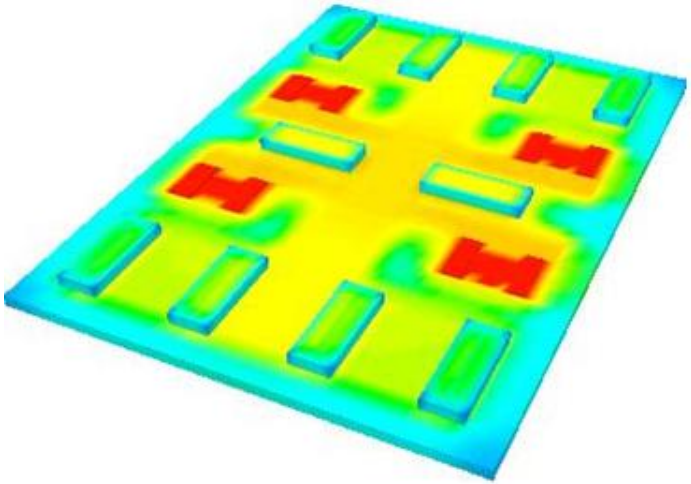
Coupled Electrical Analysis

Traditionally, trace heating is modeled by approximating the Joulian heat dissipation in the board and applying it in desired regions. This approach is inherently inaccurate as it ignores:

- Uneven distribution heat and bottlenecks.
- Dependency of electrical resistivity on local trace temperature.

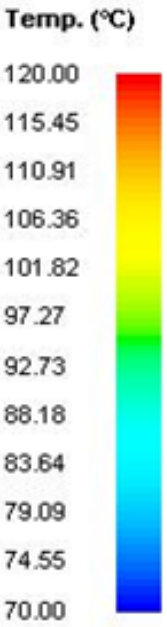
ElectroFlo Approach

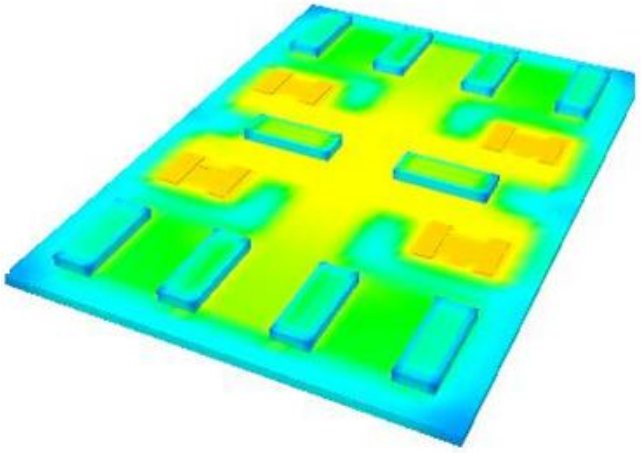
- The voltage field is solved in parallel but coupled with temperature, pressure and flow fields with the updated electrical properties.
- Joulian power dissipation distribution in all electrical conductors is calculated.
- This results in accurate accounting of self-heating of traces; resolves thermal bottle-necks and avoids overdesigns.



Results

Coupled Electrical Analysis



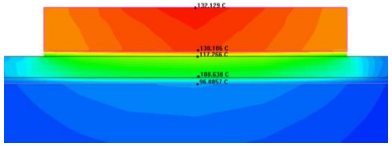


Results

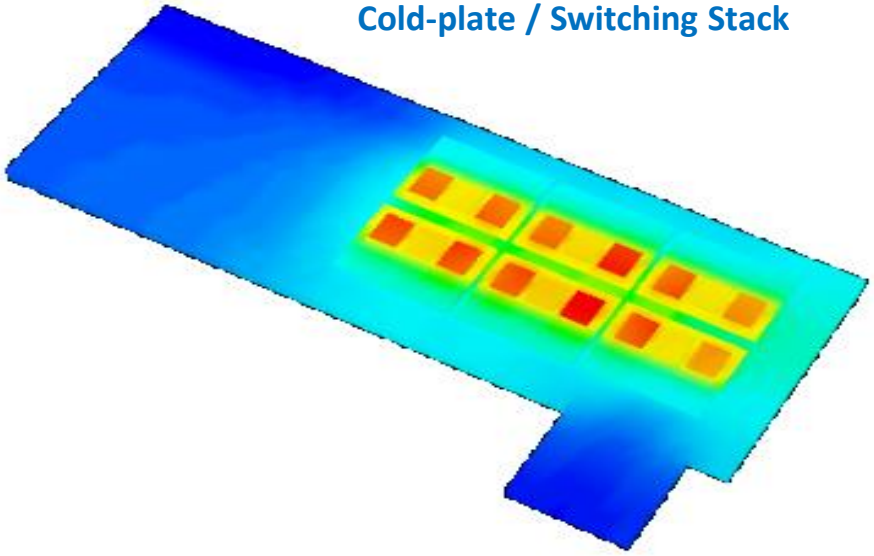
Un-Coupled Analysis

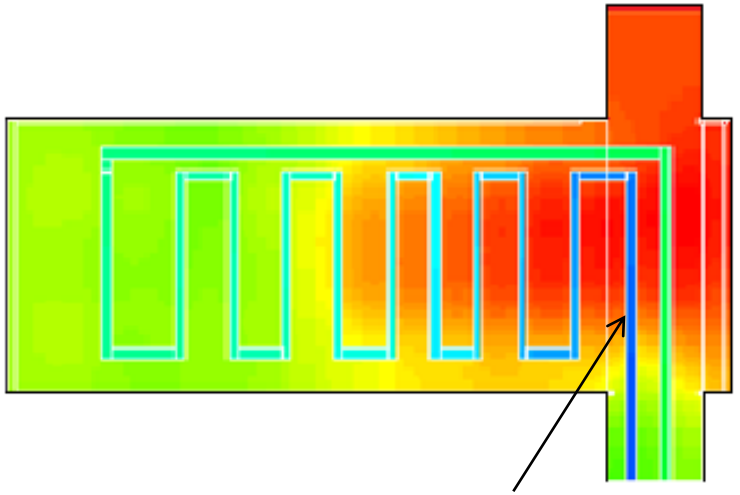
Embedded Flow Network

- Allows integration of complex ”Flow Systems” into the model by Combining flow-network modeling approaches within an overall system.
- The analyst can calculate pressure loss and flow distribution throughout the system.
- Provides capability to model liquid cooling channels with little impact on computer resources.
- Ideal for modeling of cold-plates, heat exchangers, micro channels and many other embedded liquid cooling options.



Cold-plate / Switching Stack





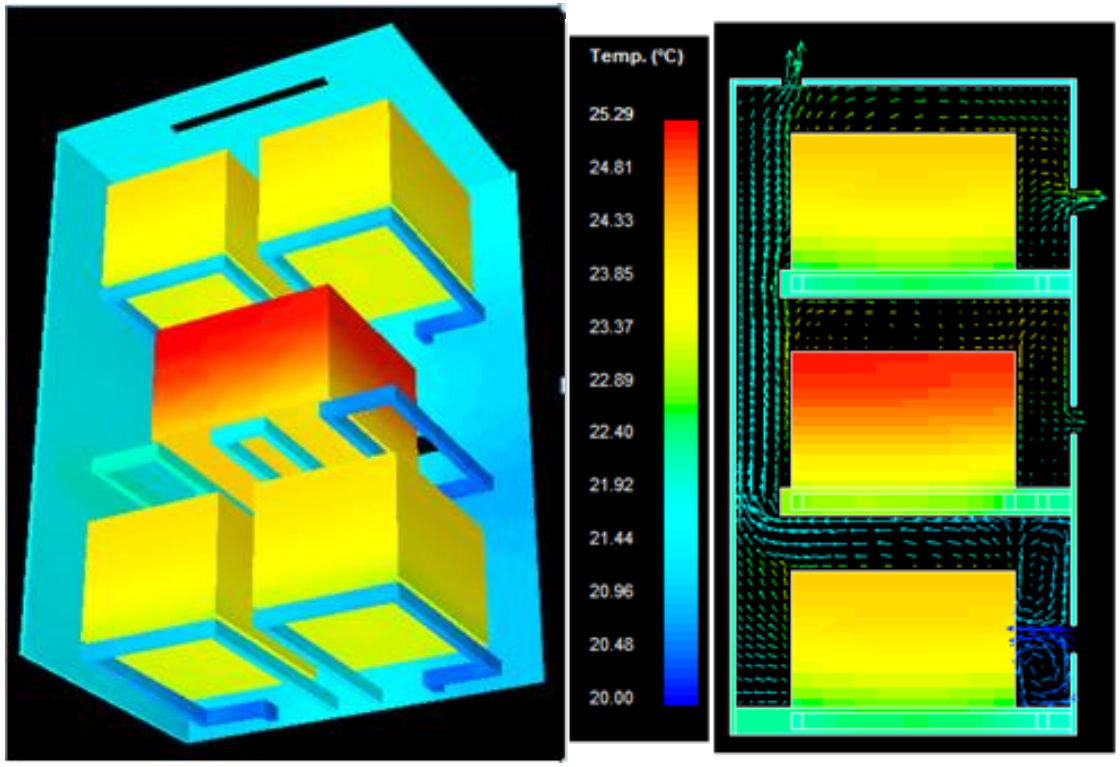
Liquid Cooling Channels

Multi-System Analysis

- Allows subdividing complex thermal systems into manageable subsystems.
- Parallel, coupled and synchronized numerical simulation of all models.

Benefits:

- Combine existing models of components, boards and electronic boxes and racks.
- Never need to build the same model more than once.



Electronic Rack with Coldplate Trays