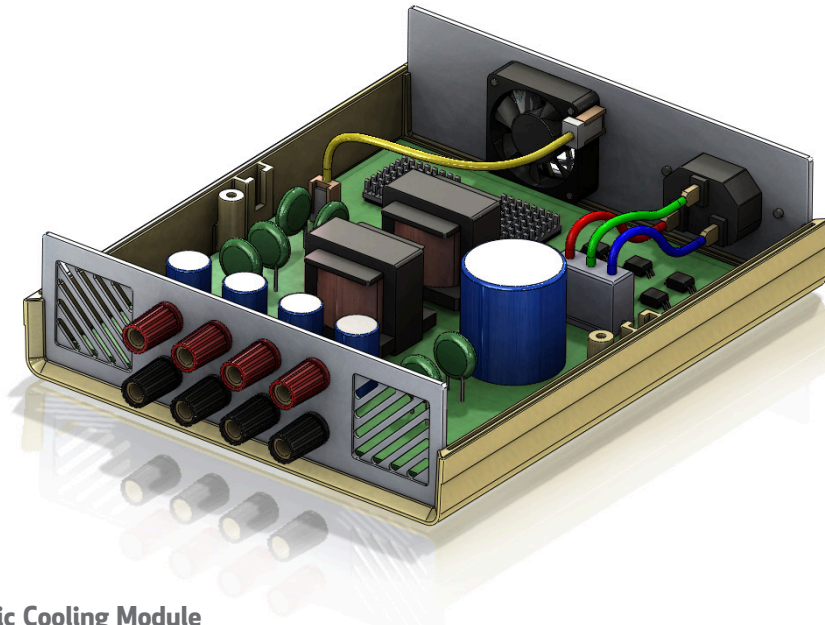


SOLIDWORKS FLOW SIMULATION: ELECTRONIC COOLING MODULE

The complete electronic cooling simulation tool



The Electronic Cooling module helps designers test and optimize the thermal performance of their PCB and electronic components.

Electronic Cooling Module

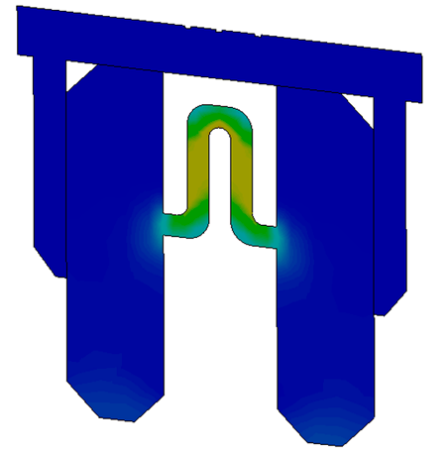
The Electronic Cooling Module for SolidWorks Flow Simulation evaluates thermal properties and cooling requirements for standard components. The module includes both analysis productivity capability and enhanced simulation functionality, giving designers and engineers a great toolset to tackle the tough challenges of electronic packaging:

- **Airflow Optimization** - Ensuring the correct volume of cooling flow to all components is a key engineering challenge. Optimizing the airflow can require moving components and/or creating air baffles and ducts.
- **Product Thermal Design** - Overall thermal behavior must be understood to ensure correct product performance, including heat-up/cool-down cycles and maximum temperature under load.
- **Heatsink Selection/Design** - Selecting the correct heatsink can be crucial in the operational life of the component to be cooled. The correct heatsink can only be determined with knowledge of the overall airflow and the thermal impacts of the components on the PCB.
- **PCB Thermal Simulation** - Studying the PCB in isolation allows the designer to evaluate component placement, use of heat pipes, thermal pads and interface materials.
- **Fan Selection** - Optimizing fan selection and placement can have a dramatic impact on the overall thermal performance of a design.

Flow Simulation For Every Engineer
SolidWorks® Flow Simulation software is a powerful tool that takes the complexity out of computational fluid dynamics (CFD) for designers and engineers. You can quickly and easily simulate fluid flow, heat transfer, and fluid forces that are critical to the success of your design. The Electronic Cooling Module provides industry-specific tools and methodologies that deliver unrivaled ease of use, power, and productivity.

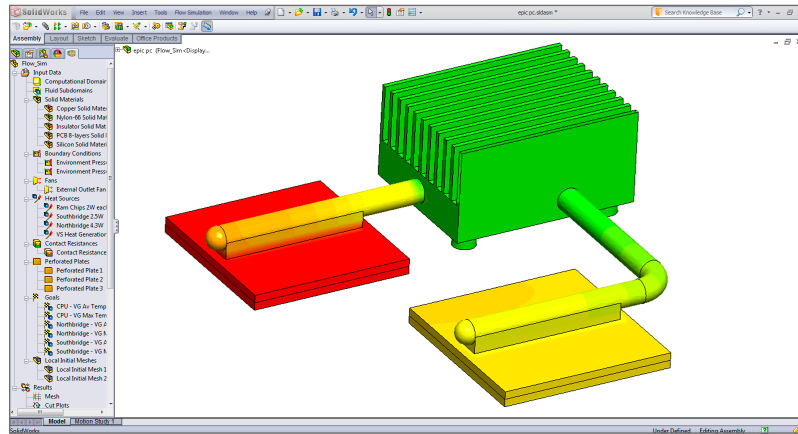
Industry Specific Tools in the Electronic Cooling Module are aimed directly for the mechanical engineer designing enclosures for electronic components. The tools are easy to use while providing exceptional simulation power:

- **Joule Heating** - Joule heating calculates the steady-state direct electric current in electro-conductive solids and is automatically included in heat transfer calculations.
- **Two Resistor Components** - The two resistor compact model is a test that is based on an approved JEDEC standard. It represents a significant increase in accuracy for predicting absolute results, compared to the traditional single-resistor metrics of mono-chip electronic packages.
- **Heat Pipes** - A simple and pragmatic method for modeling a predominant cooling approach in laptops and other space constrained or conduction cooled designs.



Specific Volume Joule Heat [W/m^3]

You can get an understanding of resistive component behavior with Joule heating.



The Electronic Cooling Module enables you to model heat pipes simply and effectively.

- **PCB Generators** - Allows you to obtain the bi-axial thermal conductivity values automatically derived from the PCB structure and the properties of the specified conductor and dielectric materials. A simple and standard approach for determining the physical properties of multi-layer PCB's.
- **Engineering Database** - An enhanced engineering data base includes a wide range of new solids, fans, thermoelectric coolers, and two-resistor components. A library of interface materials and solids representing typical IC packages has also been added.

The Electronic Cooling Module enables designers and engineers to quickly and accurately model complex electronic systems for thermal analysis. With its combination of ease of use and industry specific tools, the Electronic Cooling Module ensures maximum analysis productivity with enhanced simulation fidelity.

Visit www.solidworks.com/simulation or contact your local authorized SolidWorks reseller to learn more.

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