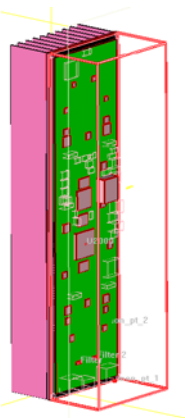
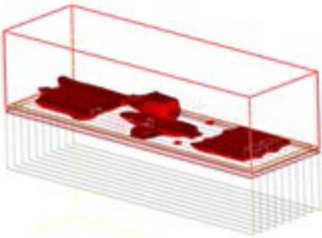
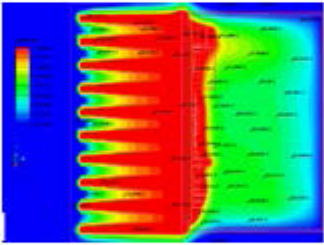


Industry:
Telecommunications
Application:
Outdoor Radio



Introduction

- A manufacturer of outdoor equipment sought Aavid, Thermal division of Boyd Corporation, for help. This client designs and manufactures disruptive technology platforms for emerging markets that drive profitable business models and enable ubiquitous connectivity. The client reached out to Aavid on a new outdoor point-to-point radio design challenge.

The Challenge

- The client is developing a new point to point radio product. This is an outdoor product that is mounted high on a pole.
- Within the current design it houses a six layer PCB with all components on one side of the board. The components will face to the inside of the product, into a five sided plastic housing with the sixth side of the enclosure being the heat sink.
- The back side of the board will interface with the heat sink using a compressible thermal pad.
- Aavid's objective is to verify the potential success of its thermal solution and to optimize the heat sink design.

The Solution

- Aavid was tasked with the following:
 - To create a thermal CFD model of the existing product and implement PCB thermal properties.
 - Create package level model for all critical components, apply thermal resistances and power.
 - Compute internal and external thermal radiation paths. Simulate the baseline case and analyze temperature data, identify hot spots, and explore opportunities for improvements.
 - Design heat sink for total power of 45W, to limit the internal enclosure temperature to 85° C with an external ambient of 55°C. (max 30°C rise).
 - Optimize the heat sink design including: fin height, spacing, materials, base thickness, manufacturing process, size etc.

The Deliverables/Results

- Aavid discovered:
 - For the total of 45W power, at 55°C ambient, with the addition of Cu layer and Al-Spreader all components are under maximum junction temperature limit.
 - The ambient temperature inside the enclosure is well below 85°C with the proposed heat sink design at 55°C ambient.
 - The shape of the enclosure is thermally close to the shape shown in drawings.
- Aavid was able to manufacture the proposed heat sink and helped launch a successful project to market.