



Introduction

A major contract electronics manufacturer (CEM) chose Aavid, Thermal division of Boyd Corporation, to evaluate the thermal performance of a ruggedized tablet PC in order to reduce the skin temperature of the product.

The Challenge

- Reduce the skin temperature and still maintain the component temperatures within operating limits
- The system had to be isolated from outside air and dust.
- Due to the small product form factor, it had to be cooled using natural convection.

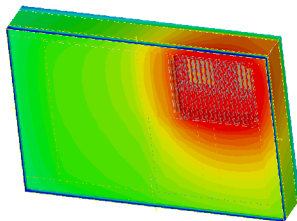
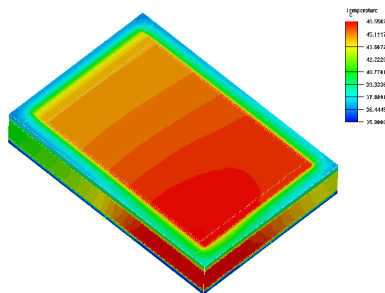


The Solution

Aavid characterized the air flow and temperature profile of the enclosure using CFD. The resulting model was used to identify critical components and product zones that needed improvement. The size of the heat sinks for the hottest components was reduced to decrease radiant heat transfer from the heat sinks to the external enclosure.

The hotspot regions were isolated from the external enclosure using insulation at several locations:

- A plastic cover was added over the hotspots to separate the heat sources from the side wall of the enclosure.
- Polycarbonate sheet was added for thermal insulation between the PCB and a magnesium plate that houses the processor.
- Silicone sealant was added between the heat sink base and the magnesium plate.
- An RF gasket was added around the interface between the heat sink and the processor to act both as thermal insulation and EMI shielding.



The Deliverables/Results

Aavid's solution solved the customer's tablet temperature problem. The solution included a counterintuitive reduction of heat sink size. Aavid's expertise provided a cost-effective alternative to a customer that had no need for full time thermal engineering.

