

# Interface Adapter Cooling Review

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## Objective

Products for avionics applications have demanding reliability requirements and cooling plays a significant role. A newly developed interface adapter was suspected of having cooling problems during its final verification tests - diagnostic tests pointed to failures associated with processor overheating. ECS was asked to assess cooling of the processor and the overall adapter thermal design, and to evaluate proposed cooling enhancements.

## Methodology

A strategy involving both tests and simulation was developed to meet the objectives. Thermal tests were conducted at lab ambient conditions and elevated temperatures to establish a comprehensive baseline. Further tests were run to determine how well alternate air moving devices would cool the processor. Simulations were run to evaluate proposed changes that could not easily be tested due to cost or schedule, such as adding cooling fins to the enclosure.

## Results and Conclusions

The test results showed the processor and memory modules were overheating. A high performance fan, placed slightly above the processor heat sink instead of directly on it, solved both cooling problems. Further simulations determined that the recommended fan was the optimum fan – higher performing fans would not provide any more benefit. The simulations also showed that other proposed changes would not improve cooling and should not be pursued.

