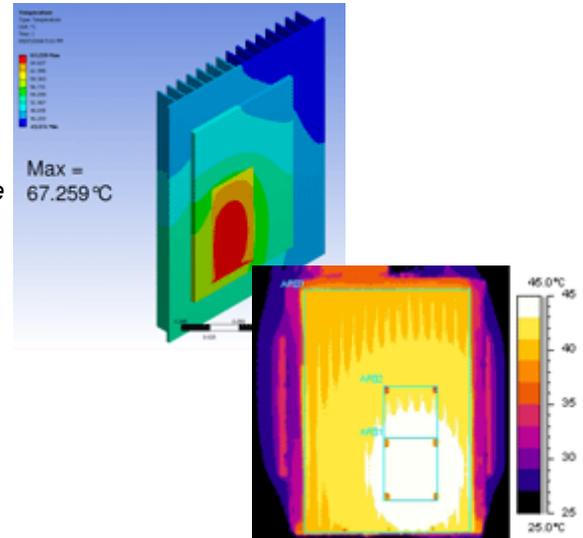


Thermal Analysis Project

February 2010, SmallPC.com, a manufacturer of specialized computer solutions, has completed its' research partnership with the Ontario Centres of Excellence and McMaster University. The project leader, Dr. Chan Ching, is an expert in two-phase flow and heat transfer. Dr. Ching established the Thermal Management Research Laboratory at McMaster University. He has extensive experience in thermal management of electronic packaging systems. The results and data of this two year collaborative project have lead to several improvements to the design of the thermal management solution used in Small PC's line of rugged sealed computers.

Various material combinations and cooling methods were analyzed and tested including copper, bi-porus wicks, peltier elements, aluminum and a unique graphite carbon foam. Blake Allen, Small PC's president said *"The heat signature images provided by the Flir Thermal Imaging Camera were significant in pointing us in the right direction for improvements to our passive cooling solution."* These design improvements have been implemented in Small PC's complete series of waterproof computers. The systems are sealed with no fans or vents requiring only natural external air flow for cooling.



Modified versions of Small PC's computer models SDC170HB and SC240ML were used in the thermal testing. Specialized testing software was run on the systems as part of the thermal experiments to exercise and stress the limits of all the components of a typical configuration including the CPU, chipset, memory and hard drive. The combination of the infrared camera and thermocouple feedback provided the data used to characterize the thermal management system performance. This data was used to identify weak links in the design of the passive cooling solution and define changes required to improve performance.

SmallPC.com a division of ICI Controls, Inc., was formed in 1993. Small PC designs and manufactures computers with a focus on solutions for specialized, rugged, and industrial applications.

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