Faculty Development Program

Title : Overview of Thermal Management Techniques for Electronic Equipment

Date : 2026-03-31 - 2026-03-31
Time : 10:00 - 11:30
Venue : KAMARAJ AUDITORIUM TT

Event Outcome

- Participants can able to get knowledge on how the Thermal Management Techniques will help in Electronic Equipment

Resource Person 1 - Details
Name : Tapano Kumar Hotta
Designation : Professor Grade 2, School of Mechanical Engineering
University/ Company : VIT, Vellore
Address : India, 632014.

Resource Person's Profile :

1. Profile of Tapano Kumar Hotta

Dr. Tapano Kumar Hotta is currently serving as a Professor in the School of Mechanical Engineering at VIT Vellore. He obtained his PhD in Mechanical Engineering from IIT Madras, specializing in the area of Electronic Cooling. His broad research interests include Thermal Energy Storage, Thermal Management, Optimization of Thermal Systems, and Climatic Mitigation. Dr. Hotta has over 17 years of teaching and research experience and has authored approximately 75 publications in reputed internationa

Miniaturization of electronic components continues to pose greater challenges in the field of thermal management. This has led to increased research focus and advancements in the field of phase change material (PCM)-based heat sinks for use in high-heat-flux environments. These heat sinks are not operated continuously over long periods and are invariably used in intermittent cycles. Under these conditions, the time taken for the PCM to solidify back plays a key role in the thermal performance. The heat transfer community has been trying hard to mimic real-time scenarios of electronic cooling and is currently working on various techniques to maintain the device within safe operational temperature limits. Most of the PCMs usually have a very low thermal conductivity, because of which, when the heat is dissipated from the electronic components into the PCM, even before a significant quantity of the PCM melts, the components may reach unsafe temperatures. By using a high thermal conductivity base material, known as a thermal conductivity enhancer (TCE), in conjunction with a PCM, this challenge can be addressed. Moreover, the geometric parameters of a heat sink have a considerable effect on the melting and solidification cycle and hence affect the thermal performance of the heat sink. Additionally, it was found that the thermal performance of the heat sink is also a strong function of orientation and volume fraction of PCM. This motivates us to perform a multi-objective optimisation using candidate multi-objective algorithms to lead us to the best design that satisfies thermal management objectives.

NA

Coordinator's: **Prof. PERI KAMESWARA KAMESWARAN 14454 - Associate Professor Grade 2 - SAS**
Prof. THUNDIL KARUPPA RAJ R 12449 - Professor Higher Academic Grade - SMEC