Abstract

Thermal management of electronics semiconductor technology is elixir to transform dream and imagination of the designers into reality. Motivation and need for research in development of novel cooling strategies for modern electronics is of paramount importance. Pulsating Heat Pipes, a novel research topic in heat pipe science, are new two-phase heat transfer devices that rely on the oscillatory flow of liquid slug and vapor plug in a long miniature tube bent into many
turns. The unique feature of PHPs, compared with conventional heat pipes, is that there is no wick structure to return the condensate to the heating section; thus, there is no countercurrent flow between the liquid and vapor. This paper highlights the thermo-hydrodynamic characteristics of these devices. State of art indicates that at least three thermo-mechanical boundary conditions have to be met for the device to function properly as pulsating heat pipe. This includes the internal tube diameter, the applied heat flux and amount of the working fluid in the system. Additionally the numbers of turns of the device and thermo-physical properties of the working fluid also play a vital role in determining the thermal behavior. Apart from this, paper is a literature review on pulsating heat pipe technology and work performed by researcher; it investigates experimental work performed on operating mechanisms of PHP, by using various working fluids. Finally, unresolved issues on the mechanism of PHP operation with different type of working fluids, and application are discussed.

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Index Terms

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Keywords
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