

Public Abstract

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Department:Mechanical & Aerospace Engineering

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Title:Liquid Metal Heat Sink For Laptop Computers

With the rapid improvement of the computer development, tremendous heat generation in the chip becomes a major serious problem for thermal management. At the same time, the CPU chips are becoming smaller and smaller with almost no room for heat to dissipate. The high density of heat generation make it extremely hard to attain the higher performance and reliability of computer. Because the conventional cooling methods such as finned heat sink are incapable in providing adequate cooling for sophisticated electronic systems, new systems like heat pipes or liquid cooling systems are being studied. Recently, it was realized that using a liquid metal or its alloy with low melting point can significantly lower the chip temperature which solved many important fundamental and practical issues. To accommodate to the coming endeavor in this area, this work focused on the novel design of liquid metal heat sink for laptop. In order to better understand the design process, theoretical analysis for fluid flow and heat transfer performance of liquid metal and heat sink are conducted. Furthermore, in order to demonstrate the feasibility of this new concept, a series of experiments on the fabricated module under different heater powers and pump power are performed.