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[摘要]

近年來，由於高速電腦用之電子晶片的快速發展，導致尋求新的、可靠度高的電子散熱方法日趨重要。本研究的目件之散熱增強特性。

研究方法爲以數值模擬分析於強迫脈衝流下，兩平行管道內具多孔質熱沉之片狀形發熱元件的熱流場分佈及其熱傳質區內則因考慮多孔質微結構造成之邊界不滑移與慣性效應，故採用Forchheimer-Brinkman-Darcy模式模擬多孔質合層熱流場系統系統分方程式組成爲電腦可解的差分方程式。對於介面不連續處之物性則以調和平均公式處理，以期性穩態時之瞬間與平均之熱傳特性被求出，用以探討熱流場變化及其對熱傳增強效益。經計算結果顯示，於多孔流場朝熱源後緣靠近，造成熱邊界層變薄，對發熱元件之散熱冷卻有增強效益，且此增強效益隨著達西數 減少、加，但所引起之壓降因子振幅會隨 、A、 和 等增加而增大，但對參數 、St、 等之增加，則無明顯的改變。總結，散熱效益，但應用時仍須考慮所產生的壓損，方有最佳的增強效益。

[英文摘要]

Recently, the rapid development in the design of electronic packages for modern high-speed computers has led cooling. The purpose of this study is to explore the cooling enhancement from heat sources by using fiber-porou In this work, a numerical study has been carried out for forced pulsating flow in a parallel-plate channel with two wall. The flow over the fluid region is governed by the Navier-Stokes equation, and the flow through the porous n equation that account for the effects of the impermeable boundary and inertia. Through the use of a stream funct governing equations for the porous/fluid composite system is obtained using the control-volume method and hyb handle the discontinuous thermophysical properties across the interface. Comprehensive time-dependent flow a pulsation cycle in a periodic steady state. The dependence of streamline, isotherm, and enhanced heat transfer such as Reynolds number, Darcy number, pulsation frequency and amplitude, geometric parameters and is docu periodic change of shape of recirculation flows caused by porous blocks, which will push the core flow approach enhanced effect on the cooling of heat sources. This enhanced effect is found to increase with the increase of R St, geometric parameters and , and conductivity ratio , but decrease with the increase of Darcy number. In additi caused by these two methods is increases with Re, A, and , but slightly increases with Da, St, and . In summary, heat sink can be used as an augment heat transfer tool cooling high-speed electronic devices. However, it shoul pressure lose will be an efficient thermal device in employing the present proposed enhanced method.

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