



## Heat transfer and flow characteristics of microscale flow networks in a disk-shaped heat sink

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### *Abstract*

A numerical simulation for determining the heat transfer and flow characteristics of fractal-like flow networks in disk-shaped heat sink is presented. The numerical results are validated by comparing them with the experimental results obtained from the open literature. The comparison results illustrate that the current model provides reasonable agreement with the experimental results. Therefore, the present model can be used to investigate the heat transfer and flow characteristics of the disk-shaped heat sink with fractal-like flow network. It is found that the average heat transfer coefficient and pressure drop of the fractal-like flow networks in disk-shaped heat sink increases with an increase of total volume flow rate. The surface temperature and pressure distributions of a heat sink, and flow behavior at each bifurcation are discussed.

**Keywords:** Bifurcation, Flow network, Fractal-like, Heat sink