Modeling of Ladder Heat Sink Design using Artificial Neural Network

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Abstract: This work investigates improving thermal characteristics of heat sink. Conventional heat sinks consist of parallel plates or pin fins. Recently, the design of heat sinks has been a main challenge for researchers to improve its performance. Ladder heat sink design is one of the effective recent designs formed by inserting a link between two parallel plates. In this work, the performance of ladder heat sink design is studied and compared with two designs, namely; elliptical and parallel plate heat sink designs. The simulation environment is carried out over COMSOL Multiphysics. Artificial Neural Network is used to predict the pressure drop value with changing the dimensions of the heat sink fins and comparing the results with COMSOL values. Preliminary results show that ladder heat sink design has better performance in comparison with the other heat sink designs according to many parameters used to characterize the performance of the heat sink design.

Keywords: Heat Sinks, Ladder Heat Sink Design, Artificial Neural Network