

The Influence of Using Aluminium Heatsink as Passive Cooler on the Power Output of Solar Panels

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ABSTRACT

The utilization of solar energy can be done by converting sunlight into electrical energy using solar cells. The performance of solar panels in generating output power can be influenced by several factors, one of which is temperature. Increasing temperature can cause a decrease in the performance of the solar panel. Cooling is one alternative to inhibit temperature rise. Cooling using an aluminum heatsink is one example of a passive cooling system. The purpose of this research is to determine the effect of an aluminum heatsink as a passive cooler on the performance of solar panels and to identify the differences in the efficiency of the output power produced. The research includes the design, fabrication, and testing of the device, data collection, and data analysis. The research method used is quantitative. The solar panel with an aluminum heatsink with a fin distance variation of 10 mm has a lower temperature compared to the solar panel with an aluminum heatsink with a fin distance variation of 5 mm and without cooling. The voltage and current produced by the cooled solar panel are better than those of the panel without cooling. The test results show that the daily average power of the solar panel using an aluminum heatsink with a fin distance of 10 mm increased by 10.3%, while the increase in efficiency was 11.4%. The daily average power of the solar panel using an aluminum heatsink with a fin distance of 5 mm increased by 3.58%, while the increase in efficiency was 3.27%.

Keywords : Solar Panel, Cooling, Aluminium Heatsink.