

ABSTRACT

Seeing the potential nature of Indonesia is located in the state of the equator, where the area of Indonesia always has get a fairly high solar radiation throughout the year is approximately 12 hours per day. It is very easy to develop the solar power. Solar power is one the example of alternative energy by utilizing the sun's light energy, which if its hit the solar panels will generate electricity accordance to nature. By developing the solar power is expected to reduce problems such as reducing use of fossil fuels, gas, solid thinning and global warming issues.

The final project has been discussed about 39.9 Watt laptop battery charging from a 50 Watt solar panel. Voltage of the solar panel is stored in advance through a battery 12 V_{DC} /7.2 A, DC voltage is converted to AC voltage through an inverter. Relationship a solar panel with battery 12 V_{DC} connected via relay 1 as well as between the battery 12 V_{DC} to the inverter using relay 2, two relays are used as battery charging controller and turn on or turn off an inverter. All of which are controlled by a microcontroller ATMEGA8535.

System has been implemented and tested until the result are quite good. Of the 50 Watt solar panel testing greatest power in obtained when the hot sun conditions during the day 41.416 Watt. Testing the charging battery 12 V_{DC} /7.2 AH using 50 Watt solar panels for about 420 minutes. Testing of inverters generate a square wave AC voltage 192.2 V_{AC} /55 Hz. Test of charging laptop battery 39.9 Watt inverter design obtained using 75.027% efficiency. While testing using other expenses such as solder 30 Watt with 80.034% efficiency, nokia mobile phone battery charging 3.7 V/1.15 A and phillips fluorescent light 5 Watt. The smaller the load inverter efficiency obtained higher quality.

Keywords: Solar Energy, Solar Panels, Inverters, Batteries, Relay and Microcontroller ATMEGA8535.