

ABSTRACT

Energy is a basic human need. One thing that people cannot get away from it is the need for electrical energy. Electricity became a major factor in human activity. Most of the devices require AC power. Even more for an AC power source. Meanwhile, the power source is not just from the AC power generators or PLN electricity. The power source can be a source of DC power. For example: Solar Panels, Batteries, Accumulator, DC Generator and others. That requires a device that can change the DC electricity into AC electricity which is commonly called an inverter.

In general inverter, to generate AC power is made without regard to the form of the signal and the resulting voltage. But a good inverter is an inverter that has a sine wave signal and also able to stabilize the output voltage even if the load is varies. Meanwhile, inverter with constant voltage and sine wave signal also not damage electronic devices. The way that is used to make an inverter with a stable output voltage is by adding a DC to DC Converter on the inverter. The DC Converter is used Half-bridge converter topology consisting of Power Capacitors, switching MOSFET with PWM controlled using the ATmega8-16 microcontroller, High Frequency Transformers, Fast Switching Diode rectifier LC filter and a voltage sensor as a feedback.

From the research, gained the highest power efficiency at 89.56% with a load of 382.8 Ω resistive incandescent bulbs at 10 Watt. While the value of the highest power efficiency inductive load testing using 50 Watt parallel AC motor at 97.37% with a voltage error of 2.5 Vac. From the test results and analysis we can conclude that a series of half-bridge converter with full-bridge inverter that has been designed working well in regulating the output voltage of 220 volts with varying loads.

Keywords: AC, Inverter, Half-bridge converter, Switching, PWM, Rectifier, AtMega8-16