

ABSTRACT

The electric car is a car that uses electrical energy stored in the battery as a source of energy. Electric car will be one of solution to the problem of fuel oil that had been decreased at the moment. In addition, the electric car is also very friendly to the environment. This car does not produce harmful gases such as CO₂ and also does not cause noise pollution. The electric car is driven by an electric motor or commonly known as traction motor. One of the traction motors which are often used in electric cars is a DC motor.

In this final project, designed DC chopper is used to drive and control speed of dc motor in electric car. DC chopper is a device that converts the fixed DC voltage to a variable DC voltage and its value can be changed as needed. DC chopper designed using buck method which is a variable DC voltage is obtained by reducing the input voltage through the switching process. ± 48 Vdc input voltage was reduced to a variable voltage 0 to 36 Vdc with setting the duty cycle value of the PWM signal. ± 48 Vdc input voltage coming from the dry accumulator 12V/10AH drawn series as much as 4 pieces. Topology which is used in the circuit is a synchronous buck converter. The main components used in the design of synchronous buck DC chopper is MOSFET IRF3710, MOSFET driver IR2103, inductor 1.4 uh, 220 uF capacitors, and a microcontroller ATmega8535.

The results of the testing and analysis of this DC chopper design is obtained peak power efficiency is 97.71% with a 10 ohm load resistif and maximum voltage regulation is 1,5%. While the value of the power efficiency inductive load testing using dc motor 36 volt 250 watt is 89.32% with a maximum voltage regulation is 1,55%. Rotation speed 36 volt DC motor at highest point is 344.6 RPM. From the results of testing and analysis concluded that DC chopper is designed to work very well in moving and control the speed of the motor 36 volt 250 watt DC to be used in electric cars.

Keywords : DC Chopper, Buck Converter, Synchronous Buck, DC Motor, Electric Car