



ABSTRACT

ARJUNA UGM is an electric vehicle racing team consisting of students who compete in FSAE (Formula Student Automotive Engineering) Japan. In this competition, a high-performance vehicle is required. Therefore, a high efficiency and reliable BLDC motor controller is needed.

FOC (Field oriented control) method is used to meet the need for high efficiency and reliable BLDC (Brushless Direct Current) motor controller. The hardware that built has 3 parts, the first is the microcontroller board that contains microcontroller and logic circuit, gate driver board which contains the isolated power supply and isolated gate driver, and the high voltage system part that contains IGBT and bulk capacitor. For processing the complex algorithm, XMC4500-F100K1024 is used.

This BLDC motor controller can operate ME1302 motor with 120VDC maximum input voltage and torque control FOC. A few features like sine/cosine encoder sensor compatibility and protections are installed in this motor controller to protect it and to satisfy the user needs.

Keywords: *ARJUNA UGM Team, BLDC Motor Controller, Field Oriented Control, ME1302 Motor, XMC4500-F100K1024.*