

ABSTRACT

As technologies improves and evolve, one of the most important elements in powering up technology is current. Current are divided into two parts that is the alternating current (AC) and direct current (DC). Electricity generated from power plants and hydro dams are transferred to substation power plant and to houses using AC current to generate power supply. Besides that, AC current has a bigger advantage over the DC current due to that AC current is easier to change the voltage of the power to be higher by using a transformer. Furthermore, the consideration of using AC current is not only affected by the current and voltage of the power but also affecting the physical transmission line of the current. As in theory, as the current in power is higher, then thicker the wire will be rather than having high voltage in power.

AC current can be divided into phases that are called the single phase, two phase and three phase current signal.

Regarding this project, an integrated thyristor electronic circuit is designed to control the rotation speed of a three phase motor and light bulb intensity applications. The controller will be able to generate a single phase and three phase current signal whereby the single phase current signal will be supplying to the light bulb while the three phase current signal will be supplying to the motor.

The integrated thyristor controller is also known as the integrated gate – commutated thyristor (IGCT) is a power semiconductor electronic device which could withstand high power usage for the purpose of switching and rectifying currents. This semiconductor device is able to be turned on and off by applying current at its input gate terminal that will trigger the device to behave as a switch. Besides that, the usage of IGCT have been commercialize due to the factor of having lower conduction loss compared to other semiconductor device. Moreover, the IGCT is one of the latest and advanced devices create based in the group of semiconductor devices.