

ABSTRACT

Nanosatellite is a small satellite weighing less than 10 g. One type of nanosatellite is a 1U cubesat with a size (10 x 10 x 10) cm³. When orbiting the earth, nanosatellites have two conditions, namely light time and eclipse time. Eclipse time is a condition where the satellite does not get enough sunlight, while main energy resource of nanosatellite is sunlight. It causes nanosatellite will not have enough power to do its missions. To solve this problem is using a battery that is able to store energy when it on light time and replace solar panels as the power source uring an eclipse time.

This final project will design a nanosatellite power supply with battery charging and discharging system using a Battery charger IC. IC Battery charger has a power path feature that determines the power source of satellite power during light and eclipse times. The battery charging system is equipped with a float Voltage feature to keep the battery at its maximum capacity, temperature monitoring to maintain battery temperature and a minimum input Voltage to avoid Voltage drops. The discharge system features under Voltage protection to keep the battery Voltage at a safe level by reducing the bias current to $< 0.1 \mu A$. by using float Voltage, temperature monitoring, minimum input Voltage and under Voltage protection this system expected to increase efficiency and keep lifetime of battery .

The result of this project are battery can be charged with 1,05 Watt on minimum, where only one solar panel's side exposed to sunlight, 2,52 Watt when two sides exposed, and 4,74 Watt when three sides exposed to sunlight. Nanosatellite must turn off on of its moduls when it's minimum power. While nanosatellite can save 1,37 Watt when two panels work and 3,59 Watt when three panels work.

Keywords: *nanosatellite, battery, power system, IC battery charger, solar panel*