

ABSTRACT

1U Cubesat is one type of nano satellite that forms a cube of very small size (10 x 10 x 10) cm³. This small size makes 1U Cubesat severely limits its mass, volume, and power in each subsystem, now nano satellite missions are increasingly complex and diverse which makes their power needs increase. Therefore, there will need an electric power system (EPS) for nano satellites that is able to increase the power generated from solar cells and control the distribution of power as efficiently as possible to all subsystems in a single board that is integrated directly with the microcontroller.

This final project will design an EPS engineering model that can be provided and regulate the power as effectively as possible for 1U Cubesat by observing the IC battery charger and load switch components. In the IC battery charger component, the main feature that can increase EPS efficiency is the feature of a power path that acts as a determinant of power from solar panels or batteries for cubesat when conditions require sunlight (solar time) or when there is no sunlight (eclipse time) While the load switch component is used as a power management system to the subsystem which can be activated or deactivated according to the battery voltage.

8 power output pins with 2 different voltages were given by EPS to meet the needs of the cubesat subsystem, with four pins that can be programmed as a load switch to disconnect the path into subsystems so it is able to save the battery power. The 8-hour EM EPS battery charging process is 9.91% of the battery capacity. While for emptying the battery with a load of 0.764 Watt EM EPS can last for 25 hours so that if using a load based on the budgetary power used by cubesat is 4.47 Watts, then EPS can last for 4.27 hours when used in earth conditions

Keywords : Cubesat, EPS, Power path, , Load Switch, microcontroller