

## **ABSTRACT**

Currently, the Machine to Machine (M2M) communication system on the Internet of Things continues to increase. With the existence of the Internet of Things, modern technology can be used as sensors to communicate with machines. Regional telecommunications networks will require satellites to capture information from sensors. Module on satellite is necessary for the satellite to receive sensor information, and the module used is LoRa. LoRa has low power and can communicate in nano-satellite system, namely Cubesat. The mission of cubesat in final project is to use the LoRa module to capture information from the sensor. Therefore, a suitable antenna is required in the cubesat to capture information from the sensor using the LoRa module.

This final project proposes a microstrip antenna that uses a miniaturization method and slot patch technology so that the size of the antenna can match the size of a 1U cubesat. The manufactured antenna is a receiving antenna that operates in LoRa frequency. The antenna has omnidirectional radiation because cubesat has no attitude control. Due to the Faraday effect between the earth and outer space, the antenna has a circular polarization.

The antenna is realized using the slotted patch method on the patch part. The VSWR result of the antenna realization measurement is 1,23 with a bandwidth of 21 Mhz. The beam is at an angle of  $0^\circ$  and  $180^\circ$  on azimuth and  $0^\circ$  on elevation with a gain value of 1,804 dB. The results of the polarization obtained an axial ratio value of 1,2 dBi with circular polarization.

**Keywords:** *Cubesat, LoRa, Antenna, slotted patch.*