ABSTRACT

Low-power wireless devices such as sensors that record and monitor the physical condition of the environment is required to have high capacity and long lasting batteries. Moreover, if the sensor is placed in an area that is difficult to reach, battery replacement becomes not easy to conduct. The rapid technological development, especially in the telecommunications sector, as the development of telecommunication is growing rapidly, this causes the increase of the RF signal entity. By considering the availability which is offered, the RF signal has the potential to be a source of low-power electronic devices such as wireless sensors. The RF signal that will be used must be converted to a DC signal, this can be achieved using rectenna, which is a combination of antennas that is used to capture signal and rectifier that is used to rectify AC signal.

Although it has a continuous availability, on the other hand, the RF signal power density in each frequency spectrum is relatively small and has different power intensity, so it is very important to determine the operation frequency of the antenna that would be used in the rectenna design. Therefore, to maximize efficiency and be able to utilize the RF signal which is considered to have the greatest density, meandered slit method is applied on radiating patch to achieve dual-frequency antenna.

In this Final Project, rectenna dual-band frequency of 1800 MHz and 2450 MHz is integrated with rectifier 2 stage voltage multiplier. the antenna is fabricated on the RT duroid 5880 substrate to produce a greater gain. The experiment shows rectenna able to turn on the led lights with a 1.5 V forward voltage by using RF signal source from hotspot tethering and wifi router consecutively. Measurements show that rectenna is capable of producing an output voltage up to 3.5 V.

Keywords: textit*energy harvesting*, *rectenna*, *dual-band*, *Radio frequency signal*