

## ABSTRACT

Radio frequency (RF) emitted from sources emitting technology GSM, UMTS, LTE, Wifi, analog and digital television. Transmitter RF wave source that is widely used on 900-2400 MHz frequency bands, as many Base Transceiver Station (BTS) mobile operators spread across large or small cities, as well as access points of wifi technology. The RF waves can be harvested to the maximum as alternative energy sources by RF Energy Harvesting system. RF Energy Harvesting system use antenna and rectifier are integrated is called Rectenna. The antenna used to capture radio waves in the air, and rectifier as rectifier RF wave into DC voltage.

In this final project has been done the design and realization of rectenna (Rectifier Antenna) by comparing two types of antennas used are singleband and multiband antennas, then analyze the difference of power and output voltage generated by both types of antenna. Antenna realized for multiband type is PIFA L-slot antenna and for singleband type is rectangular patch microstrip antenna.

Singleband microstrip antennas have a bandwidth of 32 MHz working in the frequency range 1777-1809 MHz with a gain of 0.3479 dB. The multiband PIFA antenna has a bandwidth of 14 MHz working in the 940-954 MHz frequency range with gain of -0.3498 dB, bandwidth of 25 MHz working in the 1796-1821 MHz frequency range with gain of 0.1716 dB, and bandwidth of 26 MHz working in the frequency range 2344-2370 MHz with gain of 1.8941 dB. The rectifiers used in this study, using a BAT17 type Schottky Diode that works in the UHF frequency range (300-3000 MHz). The result of rectenna singleband measurement shows the highest output power reaches -32.43 dBm and the highest output voltage reaches 9.2 mVolt at a distance of 50 cm. Multiband rectenna measurement results show the highest output power reaches -25.17 dBm and the highest output voltage reaches 19.7 mVolt at a distance of 50 cm.

**Keyword :** Radio Frequency, *Rectenna*, *Rectifier*, Antena, Energy Harvesting, *Schottky Diode*.