

ABSTRACT

An important consideration in designing a wireless energy harvesting system is how to achieve high efficiency. One effort that can be done to achieve high efficiency is by suppressing the harmonic signals generated by the diode contained in the rectifier.

This final project discusses the design and realization of antennas that have multiple functions, namely capturing signals and suppressing harmonic signals. The antenna used is a microstrip circular patch antenna designed on a FR4 substrate with $\epsilon_r = 4.7$ with a thickness of 1.6 mm. The technique used to suppress harmonic signals is to choke the ground plane with a regular arrangement of 9 pieces of circle each with a radius of 5 mm.

Antenna performance in holding harmonic signals will be expressed with the antenna return loss parameter. The antenna designed is able to withstand the second harmonic frequency and the third harmonic. The second harmonic signal at a frequency of 4.9 GHz can be suppressed at $-0.567 - (-11.541) = 10.974$ dB and the third harmonic signal at a frequency of 7.35 GHz can be suppressed at $-4.736 - (-10.765) = 6.029$ dB.

Keywords: Wireless energy harvesting, microstrip patch antenna, harmonic suppression