

ABSTRACT

Research on reflector antennas has undergone rapid development in recent years. Reflectors have a role in increasing the value of the reflection coefficient on the antenna. In principle, this technique uses an artificial magnetic conductor (AMC) layer with high surface impedance characteristics. By simulating on a simulation device and using a flexible dielectric material from Rogers Corporation's RO3003® with a relative permittivity of 3.0 and a thickness of 0.5 mm it is used as a dielectric substrate for reflector deployment and also a printed dipole antenna as a wearable experimental antenna. The antenna used is the ISM-Band (Industrial, Scientific, and Medical-band) frequencies. Where the ISM-Band frequency works at 2.45 GHz and 3.35 GHz for Worldwide Interoperability for Microwave Access (WiMAX). Since the wearable antenna will be positioned close to the human body, the absorption of electromagnetic energy by the body creates a potential health risk, especially if there is long-term radiation to the human body. Therefore, in order for a usable antenna to comply with health and safety requirements, the radiation from the integrated antenna must provide the least amount of power absorbed per unit mass. To overcome this problem, an AMC antenna design was created to help minimize electromagnetic coupling to the human body compared to conventional antennas [5]. This final project investigates the shape of a rectangular patch with a reflector which aims to amplify the resonating waves, which are printed on a Rogers RO3003® dielectric substrate with a thickness of 0.5 mm. Furthermore, to make a comparison, added a reflector and the effect of the distance between the reflector and the printed dipole antenna, the simulation results were obtained at a frequency of 2.45 GHz and 3.35 GHz with a reflection coefficient value of -12 dB and 10.4 dB and the results with measurements namely at a frequency of 2.66 GHz and 3.80 GHz with a reflection coefficient of -29.4 dB and -21.8 dB. The distance values used in measurements using the AMC 3x3 reflector are 5 mm, 10 mm, 15 mm, and 20 mm. In the measurement, there is a frequency shift and two frequencies are obtained, namely 2.66 GHz and 3.80 GHz. With the best reflection coefficient values obtained at a distance of 5 mm -37 dB and -20 dB.

Keywords: *Dipole, Reflector, Dual-band, ISM-Band, Return-Loss, Wearable*