ABSTRACT

Microstrip patch technology has helped humans to reduce the size of the antenna, which involves reducing the size of the communication device. However, microstrip antennas have a number of disadvantages such as low gain and efficiency, narrow bandwidth and surface waves that damage the radiation pattern. The microstrip antenna carried out in this study is not only to overcome the shortcomings of the microstrip antenna, but also to further enhance the advantages of the microstrip antenna itself.

Based on the problems above, the authors propose the use of an AMC structure known as an Artificial Magnetic Conductor (AMC) to be used to obtain a high absorption rate that can work at the desired frequency. The AMC structure is implemented on a circular microstrip antenna which is realized on the reflector where this antenna functions to be used at the 5G frequency for use in the 3.4 to 3.6 GHz frequency range. In this final project, a circular microstrip antenna for 5G frequency with FR-4 substrate material has been made which has a dielectric constant of 4.3 and a thickness of 1.6 mm.

The simulation results of the antenna that have been integrated with AMC circular patch 6x8 working at a frequency of 3.5 GHZ get better results than the antenna that has not been integrated with AMC, the simulation results have a Return Loss of -18.1, a bandwidth of 220 MHz, a VSWR of 1.28, the gain is 6.1 dBi, and the radiation pattern is unidirectional. In the measurement, the Return Loss value is -15.49, the bandwidth is 158 MHz, the VSWR is 1.21, the gain is 5.4 dBi, and the radiation pattern is unidirectional. The results obtained from the simulation to the realization of the measurement get results that are in accordance with the expected antenna specifications.

Keywords: microstrip, reutrn loss, gain, bandwidth, Artificial Magnetic Conductor, 5G.