

ABSTRACT

The development of telecommunications technology every year has developed very rapidly. At this time, the fastest technology and already in Indonesia is the 5th generation Fifth Generation (5G) technology. Research and development of 5G technology has begun to be implemented in Indonesia. This 5G technology has been regulated based on the approval of the Government of Communication and Information (KEMKOMINFO) with a frequency allocation of 3.5 GHz with a bandwidth of 100 MHz. To meet the requirements that have been determined in the use of 5G technology. It takes the selection of a suitable antenna, one of which is by using the antenna method with the MIMO (Multiple Input Multiple Output) system.

In this study, the suitable antenna for the MIMO system is a microstrip antenna because of its small size and capable of working at a working frequency of 3.5 GHz. With a rectangular microstrip patch antenna design, the substrate material used is FR-4 to get a good impedance with a thickness of 1.5 mm and the dielectric constant used is $\epsilon_r=4.08$. The antenna design for this 2×2 MIMO system is designed and simulated using a software application. Taking into account the parameters to be analyzed are, return loss, bandwidth, gain and mutual coupling, with parameter values that have been specified.

Based on the simulation results carried out with the polarization configuration using the MIMO method, the maximum gain value is 4.658 dBi, with a return loss value of -10 dB, a bandwidth value of 156 MHz, and also the mutual coupling value obtained is -20 dB from overall polarization configuration. From the results that have been simulated, it can be concluded that the MIMO antenna with a polarization configuration has met the desired specifications for 5G technology applications.

Keywords: 5G, Microstrip Antenna, MIMO, Diversity