ABSTRACT

5G technology is the latest generation of communication technology that is being developed around the world, including Indonesia. The advantage of 5G over the previous generation is that it has minimal latency and high speed. The sub-6 GHz frequency is classified as a frequency that covers many of the bands of 5G. With a range of 2-6 GHz, it is a medium frequency that can cover a wide area and has a lot of layer capacity. The use of 6 GHz frequency in this simulation requires a microstrip antenna with a MIMO system arrangement in order to increase the working channel capacity and wide bandwidth.

In this Thesis, the design of a microstrip antenna with a 2×2 MIMO system with 4 elements is carried out. The patch to be used is in the form of an elliptical with Duroid 5880 material which has a thickness of 1.575 mm with a dielectric value of 2.2. The advantage of Duroid 5880 is that it is able to work more stable at high frequencies so that it can produce the best parameter values. Parameters to be analyzed in this final project include radiation pattern, polarization, gain, mutual coupling and correlation coefficient and bandwidth. The effect of patch cutter width and angle of inclination will also be investigated.

Based on the results of simulations and designs that have been carried out on a 2×2 MIMO antenna, the maximum gain is 10,943 dBic and the minimum gain is 10,781 dBic. Then the obtained polarization is circular with a bandwidth of 391 – 394 MHz (5,845-6,242 GHz). And the largest mutual coupling is -27,346 dB and the smallest -36,0124 dB. The largest ECC values and return loss are 1,1048 $\times 10^{-4}$ and -17.329 dB.

Keywords: 5G, antenna, MIMO, Microstrip