

ABSTRACT

Cellular communication technology is experiencing rapid development with the presence of 5G (fifth generation). The fifth generation of wireless communications targets higher data rates and greater capacity than the previous generation. One of the techniques that can be used to improve the performance of the 5G communication system is to use the MIMO (Multiple Input Multiple Output) antenna technique. One of the frequencies used is the middle frequency because it is considered more likely to be used as a 5G service frequency in Indonesia and has a larger coverage so as to save network development costs.

In this final project, the design and realization of a four-element MIMO antenna for 5G communication at a frequency of 3.5 GHz will be carried out. The antenna used this time is a four-element MIMO antenna which has a monopole-based patch form which is then miniaturized, so that the antenna has a smaller size. This time, the MIMO antenna design simulation was carried out using the CST Studio Suite 2019 software by taking into account the parameter values of Return Loss, VSWR, Bandwidth and Mutual Coupling.

This 4-element MIMO antenna design produces parameter values, such as the Return Loss on element one of -10,513 dB, for element two of -10,215 dB, for element three of -17,229 dB, and for element four of -14 dB. The value of element one is 1.84, element two is 1.31, element three is 1.31, and element four is 1.49. Bandwidth value \geq 1500 MHz, and Mutual Coupling value \leq -19.254 dB. This antenna is used for 5G communication with a working frequency of 3.5 GHz.

Keywords: Microstrip, Miniaturization, MIMO, 5G.