

## ABSTRACT

The current development of 5G telecommunications technology requires support from the device side, one of which is the antenna. The antenna technology currently being developed is the Multiple Input Multiple Output (MIMO) technique. Using more than one antenna element is one of the challenges in designing MIMO antennas. One of the important parameters of the MIMO antenna system is mutual coupling

In this research a microstrip antenna with a frequency of 2.3 GHz has been designed by adding the proximity method for feeding and DGS to reduce mutual coupling. The microstrip antenna used has a frequency range of 2.1 GHz – 2.5 GHz. This microstrip antenna will be designed using a circular patch and using elliptical polarization with the proximity supply method, namely the method of having 2 substrates with the supply being between the substrates and also adding the Defected method. Ground Structure (DGS) dumbbells that function to reduce mutual coupling values. The design and simulation will use application software before finally fabricating it.

The results of this study indicate that by adjusting the polarization of the MIMO antenna, each antenna element has the same polarization as the RHEP configuration. In software simulation, the S32 value has a value of -37.36 dB after using the DGS method, it can reduce the mutual coupling value, which is -48.63 dB in mutual coupling. between elements 2 and 3 and vice versa. With a comparison of the values of the measurements and simulations on the MIMO antenna using DGS with a decrease in value of -12.92 dB on elements 2 and 3 and vice versa.

**Keywords: 5G, Mutual Coupling, Microstrip Antenna, MIMO**