

## **ABSTRACT**

*In 5G cellular communication, high frequency is needed to increase traffic capacity, review capacity and reach, one of the candidate frequencies is at 15 GHz. Because it works at high frequencies the signal is vulnerable to reflection because the smaller the wavelength results in the emergence of high fading. So than that MIMO (Multiple Input, Multiple Output) antenna system is used which can be a solution for reflecting problems and wave scattering, which often occurs for communication at high frequencies. This antenna also requires easy integration so microstrip is one of the technologies that is suitable for this.*

*The designed antenna is a MIMO antenna with 4 elements, in each element there is a hexagon patch and a square ring slot on the patch. The given slot aims to increase the bandwidth of the antenna, while array arrangement aims to increase antenna gain. The material used as a substrate is FR4-Epoxy with a thickness of 1.6 mm and cooper as a patch with a thickness of 0.035 mm.*

*The antennas produced in this study used a frequency of 15 GHz. at 15 GHz the antenna has a return loss of -19.0686 dB with a bandwidth of 750 MHz and a gain of 9.119 dB in the simulation, a return loss of -14,3348 dB and a gain of 9.89 dB in the measurement. At 15 GHz the antenna has a linear polarization with an axial value of 5.1356 dB in the simulation, 4.15 dB in the measurement.*

***Keywords: Antenna, MIMO, Microstrip, Square Ring Slot, 15 GHz***