

## **ABSTRACT**

*In the fifth generation cellular communication system (5G) there are 3 sub-frequencies there are low band, midband and high band. Midband frequencies have characteristics suitable for urban areas. Where Indonesia is dominated by user to user communication in urban areas. To support area expansion with 5G technology, an antenna device that complies with 5G specifications is needed. The microstrip antenna was chosen due to its lightweight characteristics, easy to fabricate and affordable cost. However, due to limited bandwidth, Multiple Input Multiple Output (MIMO) modeling and the double U-slot method are needed to increase data rates and bandwidth. Antenna design was carried out using Ansoft HFSS software version 13.0. The results of the design and simulation of the 2X2 MIMO antenna using the DGS and double u-slot methods are antenna can work at frequency of 3.5 GHz, the value of return loss -17.8 dB, VSWR 1.29, the bandwidth reaches 161 MHz, the gain value is 3.65 dB and mutual coupling value is -45.817 dB. So it can be concluded that the design of the 2X2 MIMO antenna using Defected Ground Structure (DGS) and double u-slot method meets the specifications and can work on 5G technology at a frequency of 3.5 GHz.*

**Keywords:** 5G, antenna, double U-slot, midband and MIMO.