

ABSTRACT

The need for wireless communication is increasing every year, so that the development of wireless communication continues. Multi antenna selection by applying MIMO it is used to provide greater benefits and capacity as well as to serve multiple users simultaneously. The frequency used in the fifth generation (5G) based on the approval is the 3.5 GHz frequency.

In this final project, a MIMO transmitter antenna system, will be designed in the form of a 2x4 with array 2 elements. MIMO transmitter antenna system, 2x4 with two elements grouped into 3 step. The first step is a single microstrip antenna design element. At this stage, selection of substrate materials, identification of antenna dimensions, and specifying those in the line of sight. The results of step 1 will be continued in phase 2, which is that the single element is linear in size 2x1. In step 3, the antenna array will be organized mimo, 2x4. The material used on the substrate is FR-4. While the material used in the groundplane and patch is copper. The patch used is circular patch and using a microstrip line feed.

An antenna designed to match the specifications needed for 5G technology. Antenna design in this final project uses software. The designed antenna gets the result of $VSWR \leq 1.348$ with unidirectional radiation pattern, *mutual coupling* ≤ -21.25 dB, gain ≥ 7.06 dB and bandwidth ≥ 142.9 MHz at frequency 3,32 GHz-3,36 GHz.

Keywords: Antenna, MIMO, Fifth Generation, 5G, Array, Microstrip.