ABSTRACT

With the rapid development of telecommunications technology, the need for the internet is increasing. Good internet coverage is wide and fast. High-speed communication has a large capacity and a higher data rate. Over time, a new generation will emerge, namely the fifth generation (5G). In 5G, this involves several sub-bands to be used, namely the low frequency band below 6GHz, and the high frequency band above 6GHz, according to the World Radiocommunication Conference (WRC-19) held in 2019, frequency 3, 5 GHz has become a strong candidate for the Asian region.

The focus of this final project is to design a 4×2 MIMO antenna which is composed of 2 elements, each of which has a square patch operating at 3.5 GHz. The purpose of the arrangement of these 2 elements is to increase the range of the antenna without increasing the size of the antenna. The substrate used is FR-4, which has a dielectric constant of 4.3, and a thickness of 1.6mm.

The antennas are designed according to the specifications needed to optimize 5G work. Antenna design in this final project is done using software, then simulated and analyzed to get an antenna that meets the specified specifications. Based on the simulation in this final project, the simulation results of a 4×2 MIMO antenna with an arrangement of 2 square patch elements at an operating frequency of 3.5 GHz, with the lowest VSWR value of 1.4, the narrowest frequency range of 3.303-3,867 GHz, and The measured Bandwidth is 564 MHz. Meanwhile, the highest value of mutual coupling obtained by a 4x2 MIMO antenna with 2 square patch elements is -36.37 dB. And obtained the largest gain value of 7.23 dB, and Unidirectional radiation with a value of Beamwidth 90°, which can be applied to BTS Indoor in the corner of the room.

Keywords: Rectangular Patch Microstrip Antenna, Multiple Input Multiple Output (MIMO) 4×2, Array, BTS Indoor, 5G