

ABSTRACT

The development of information and communication technology specifically in the telecommunications sector requires equipment to support the development of these technologies. Now wireless technologies of the fifth generation (5G) is currently being reviewed by ITU. Wireless technologies of 5G requires an antenna using the MIMO system because it is expected to increase data speed, reduce latency and connect to various devices. One of candidate for the Frequency 5G technology is 15 GHz.

In this study we will discuss antenna for 5G communication that works at a frequency of 15 GHz. The design use triangular patch, and when single patches will analyzed with rectangular patch, and circular patch. Analysis at the time of the single patch aims to prove that the antenna with triangular patches can produce greater bandwidth compared to rectangular patches, and circle patches. Analysis in the form of arrays and MIMO only focus on patch triangles. The material used is Duroid Roger 5880 with $\epsilon_r = 2,2$ and a material thickness of 1,575 mm.

Based simulation in this study the results obtained are that triangular single patch antenna obtained bandwidth 4,063 GHz with gain of 6,323 dBi, while the circular patch obtained bandwidth 1,003 GHz with gain 5,056 dBi, and the rectangular patch obtained bandwidth 1,172 GHz with gain of 6,605 dBi. In addition, the addition of a 1×2 array technique can increase the gain of the triangular patch antenna to 9,128 dBi. For 8×8 MIMO antennas, the highest mutual coupling value obtained is -39,685 dB. The triangular patch arranged in an array of 1×2 and MIMO 8×8 produces a unidirectional radiation pattern.

Keywords: MIMO, Microstrip Antenna, Triangular patch, Single Patch, Array.