ABSTRACT

5G technology is a wireless technology that is the result of the development of 4G which can send data faster, this is components that can support the implementation of 5G technology are needed. Microstrip antenna is an antenna that has dimensions that are small, thin, light, and can be carried anywhere that it can meet the needs of implementing 5G technology. In addition, microstrip antennas have some disadvantages such as gain and bandwidth narrower, in this final project, the focus is on enhancement the bandwidth of the microstrip antenna using the Left-Handed Metamaterial (LHM) method on the ground plane.

microstrip antenna is a triangular patch modified on the ground plane by adding a Left-Handed Metamaterial (LHM) structure, that is Triangular Split Ring Resonator (TSRR) which can work at a frequency of 3.5 GHz. The characteristics of the substrate used are FR-4 with a dielectric constant of 4.4, a thickness of 1.6 mm, and a loss tangent of 0.02.

Based on the results of the realization of the antenna shows a significant increase in bandwidth of 528 MHz. The bandwidth microstrip patch is 91 MHz, while the metamaterial antenna with the LHM structure is 619 MHz. The return loss value is -12.99 dB, VSWR 1.57, with an omnidirectional radiation pattern obtained by adding a frame square to the ground plane and a gain of 3.335 dBi. It can be concluded that the design of the metamaterial antenna with the LHM structure in this Final Project has met the specifications and can work at frequency of 3.5 GHz for 5G technology.

Keywords: *5G, Microstrip Antenna, Microstrip Antenna Parameters, Triangular Patch Microstrip Antenna, Metamaterial, Left-Handed Metamaterial (LHM).*