

ABSTRACT

The faster development of 5G technology requires components that can support implementing 5G technology. Microstrip antennas are components that can support 5G technology because microstrip antennas have small dimensions, are light and easy to fabricate, but have several drawbacks, such as narrow bandwidth and low gain. So, in this final project, the focus is on increasing the bandwidth of the microstrip antenna using the Left-Handed Metamaterial (LHM) method.

In this final project, a triangular patch microstrip antenna is designed which in the ground plane uses Left-Handed Metamaterial (LHM), which is a combination of Capacitively Loaded Strips (CLS) and Split Ring Resonant (SRR) at a frequency of 3.5 GHz. The substrate used is FR-4 with a relative dielectric constant of 4.4, a loss tangent of 0.02 and a substrate thickness of 1.6 mm.

The results of antenna design with LHM are proven to increase the bandwidth of antennas without LHM, the increase in bandwidth reaches 58.79%. The gain generated by the antenna with LHM reaches 3.146 dBi with a bidirectional radiation pattern and linear polarization.

Keywords: 5G technology, microstrip antenna, metamaterial, Left-Handed Metamaterial (LHM)