

## ABSTRACT

The fifth generation (5G) technology will be launched in 2020, is the development and improvement of telecommunications technology from the previous technology. This technology need the high data transfer speeds and handovers. To support all service uses and provide broad coverage, 5G technology requires spectrum in several frequency ranges. Many components are needed to implement 5G technology, one of them is antenna. This Final Project designs a metamaterial antenna to meet the 5G technology specifications.

This Final Project designs a microstrip antenna with the concept of metamaterial which has high gain, wide bandwidth, omnidirectional radiation pattern. The concept of metamaterial is used to reduce the dimensions of the microstrip antenna but still with good specifications.

This Final Project uses 3D electromagnetic software and realizes a metamaterial antenna for 5G technology. The metamaterial antenna for 5G technology is made with Rogers Duroid 6006 material with a dielectric constant of 6.15 and a thickness of 1.27 mm. Metamaterial antennas are designed to work at a frequency of 3.5 GHz. Antenna realization results show that antenna has a badhwidth 365 MHz, a return loss -20,289 dB, and a VSWR 1,21. The radiation pattern of the antenna is omnidirectional with gain 1,57 dB. It can be concluded that the design and realization of the antenna in this Final Project in accordance with the specification.

**Keywords:** *fifth generation, microstrip antenna, metamaterial, square patch, rogers duroid 6006*