

## **ABSTRACT**

*The development of cellular networks in modern times is growing very rapidly to give birth to the 5th generation technology at the cellular network stage in the world. 5G offers a network that is up to 10x faster than its predecessor, namely 4G with a lower latency of below 0.1 ms. One of the important components in the implementation of the 5G network is the antenna which has the function of receiving and transmitting signals for devices using the 5G network.*

*In this study, a microstrip antenna with a metasurface layer will be proposed and connected to a Low Noise Amplifier (LNA) for 5G. The working frequency of the proposed antenna is 3.5 GHz, the polarization shape will be changed using a 4×4 Split Ring Resonator (SRR) metasurface. Meanwhile, the LNA is required to have a large gain value and the smallest possible noise level. Furthermore, with the addition of the PGA-102+ amplifier which was made based on the data-sheet on the microstrip antenna, a metasurface layer was added to measure the received power, gain, and radiation pattern.*

*In the research that the author has done, the results of the antenna bandwidth are 122 MHz at a VSWR ratio of 2. As for the polarization, it has been successfully changed from originally linear to elliptical thanks to the presence of a metasurface. The author design antenna radiation pattern is bi-directional. And the antenna gain designed by the author is 4.78 dBi before the LNA is attached, and 16.81 dBi after it is connected to the LNA.*

*Keywords : 5G, Antenna, Microstrip, Metasurface, LNA*