

## ABSTRACT

The 15 GHz frequency used in the 5G technology experiments, which use higher frequencies than the radio waves that conventional frequency mobile phones used today. However, because it operates at a very high frequency, the signal can't easily travel through obstacles and scattering. For this reason, 5G networks using technology Antenna with massive MIMO system which is applied to small cells technology. Massive MIMO was intended for single array or beamforming on Small cell.

In this final project designed a MIMO rectangular patch antenna at 15 GHz frequency, used on massive MIMO technology. Design of MIMO antenna, using 8 elements. Substrate material of Microstrip antenna using Duroid 5880. This research is a continuation of Previous studies in which previous studies used antennas MIMO with 4 elements.

In this final project realized an MIMO  $8 \times 8$  array rectangular patch at 15 GHz with has return loss -23.62 db and simulation -17.67 db. Gain of the antenna is 9.37 dB, polaradiation is unidirectional and polaritation is elliptic.

Keywords: Antenna, MIMO, Microstrip, Rectangular