ABSTRACT

The development of technology communication system is increasing every

year triggers the increasing high demand of speed internet access. The technology

that can provide internet services at high speed and cover all the areas, namely 5G

technology(fifth generation). 5G technology has the advantages such as high data

rate, wide bandwidth, reducing latency, increasing channel capacity and more

energy efficient. The antenna used in 5G technology using the MIMO

system(Multiple Input Multiple Output). A MIMO system that serves to reduce

reflection and scattering of the wave as well as useful to raise the channel capacity

by using more than one antenna at the receiver and the transmitter.

In this thes the research done by designing the antenna massive MIMO at

the transmitter side with the arrangement of the 2×8 16 elements using a frequency

of 3.5 GHz. The shape of the patch that is selected is the shape circular. The

material chosen for the substrate layer that is FR-4 with dielectric permittivity 4.3

and thickness of 1.6 mm and the material for the layer groundplane, the patch and

the feedline, i.e. copper (copper). Feeding techniques used ration microstrip

line. The methods used in the design of the antenna between the other multi-

substrate 3 of the layer to improve the bandwidth and the reflector to increase the

gain.

Based on the simulation of the MIMO transmitter antenna design using

the software, it obtain a bandwidth value from 143.2 MHz (3,4253-3,5685 GHz) to

154.2 MHz (3,4264-3,5806 GHz), with a minimum gain value of 6,519 dBi. and

maximum gain of 7,148 dBi, unidirectional radiation pattern of each antenna

element and mutual coupling value of -20.29 dB and smallest -67.11 dB.

Keyword: Antenna, MIMO, 5G, Gain, Bandwidth, Mutual Coupling

iν