ABSTRACT

The fifth generation (5G) is expected to meet telecommunication technology needs in the future. The advantages of fifth generation technology (5G) is high data rates, reduce latency, increase the capacity of connected devices and more energy efficient. In accordance with the scenario of ITU-R, IMT-2020 or fifth generation (5G) will have 3 scenarios, one of them is Enhanced Mobile Broadband (eMBB). The selection of multi antennas by applying massive MIMO on eMBB is used to provide greater gain and capacity and to serve multiple users simultaneously.

Frequency candidates used in the fifth generation (5G) based on the aggrement are sub-6 GHz and sub-28 GHz frequencies. Based on previous research using a single patch antenna as a base model, in this study the single patch antenna is made into an array antenna so that it can increase the range of the antenna without increasing the size of the antenna. The use of substrate with a dielectric constant of 2.2 was chosen for high frequency use. The patch used is a rectangular shaped patch and uses a proximity coupled feed with a connector.

This study focused on designing massive MIMO mikrostrip antennas in the form of arrays and working at frequencies of 3.5 GHz and 26 GHz. Patches are used at 3.5 GHz frequencies of 12 patches and at 26 GHz frequencies of 96 patches, so the number of patches on the massive MIMO antenna is 108 patches. The designed antenna gets the result of s-parameter ≤ -10.8199 dB, gain ≥ 7.3 dB, and mutual coupling ≤ -32.6201 dB.

Keyword: antenna, massive MIMO, microstrip, fifth generation.