ABSTRACT

In 5G communication one of the frequencies that become candidates to be radio access is 15 GHz. Radio access is a connection technology that physically uses radio waves on communication networks. Radio access 5G uses MIMO antenna system (Multiple Input, Multiple Output) in order to increase data rate. In addition, MIMO antennas can also be used as solutions to deal with possible reflection and wave scattering, which is often the case for high frequency communications. High frequency usage also causes the dimensions of the antenna to be small, so 5G technology requires an easy to integrate antenna. Thus, microstrip antennas are suitable candidates for this technology.

Analyzed antenna is MIMO 8×8 microstrip antenna which uses two patches, rectangular and patch circular which each element added T-shaped slotted-patch and arranged array 1×2. The purpose of adding slotted-patch to increase bandwidth, while arranged in array to increase the gain of the antenna. The material used as the substrate is Duroid 5880 with a relative permittivity of 2.2 thickness of 1.575 mm and cooper as a patch with a thickness of 0.035 mm.

The results of this study found that the addition of slotted-patch antennas in the patch rectangular for 1 T-Slot and 3 T-Slot generated bandwidth of 2.25 GHz and 2.20 GHz with minimum return loss of -23.95 dB and -22, 16 dB, while patch circulares of 2.88 GHz and 2.78 with a minimum return loss of -19.99 dB and -19.23 dB. The maximum gain value for the patch rectangular on the addition of 1 T-Slot and 3 T-Slot of 10.40 dB and 10.43 dB, while for the patch circular of 9.92 dB and 9.93 dB. The highest mutual coupling value on the patch rectangular for 1 T-Slot and 3 T-Slot is -22.84 dB and -22.65 dB, while for patch circular is -26,03 dB and -26,31 dB. Both patches produce the same radiation pattern that is, unidireksially and linearly polarized for the patch circular, while the patch rectangular polarized ellips.

Key words: 5G, Antena MIMO, 15 GHz, *slotted-patch*, *patch rectangular, patch circular*