

ABSTRACT

Circular polarized type antennas are currently widely used in the telecommunications sector. Antennas that are often designed with circular polarization types are microstrip antennas. Several methods are often used by researchers to obtain circular polarized antennas including asymmetric circular patches, diagonal slots, truncated square patches, and dual-feeds. Previous researchers designed circularly polarized antennas using these methods in low frequencies such as 2.4 GHz and at 1.27 GHz. Whereas future technological developments will use a higher frequency so that it is necessary to design in advance the selection of the right circular polarization method.

In this final project, a circular polarized microstrip patch antenna has been designed that works on X-band (10 GHz) and Ku-band (14 GHz) frequencies. The method of forming circular polarization is by combining four methods, namely: 1) asymmetric circular 2) diagonal slot 3) truncated square 4) dual-feed. The addition of the circular polarization method results in a higher shifting frequency. Wide bandwidth values make it easy to maintain the desired frequency.

From several methods that have been designed, the antenna produced has circular polarization ($AR \leq 3$ dB) and $VSWR \leq 1.5$. However, the asymmetric method obtained an axial ratio of 5.45 dB at a frequency of 10 GHz and 4.27 dB at a frequency of 14 GHz. The asymmetric method will produce a more ideal axial ratio if combined with the diagonal slot, truncated, and dual-feed methods. Other parameters generated from all methods, such as gain parameters, are obtained between 5 dB - 7 dB. For beamwidth, the average is obtained between 65° - 90° . And bandwidth parameters are obtained on average between 230 MHz - 780 MHz.

Keywords: square patch microstrip antenna, circular polarization, asymmetric circular, diagonal slot, truncated square, dual-feed