ABSTRACT

CP-SAR (Circularly Polarized Synthetic Aperture Radar) is a remote sensing sensor that can be used to get high resolution of earth imagery without being affected by light and weather. With the circular polarization, the losses of propagation of the CP-SAR is smaller than the conventional SAR, so the size of CP-SAR can be smaller as well. CP-SAR is placed on an object that move relatively to the Earth's surface such as UAV (Unmanned Aerial Vehicle) and low earth orbit (LEO) microsatellites, so it needs a transmitter to transmit the remote sensing result to the Earth. This system will use S-Band Transmitter with a circularly polarized antenna to avoid the Faraday Rotation Effect.

In this study, the performance of a circularly polarized microstrip antenna with truncated edge and slotted patch perturbation techniques will be compared. From the simulation result, can be concluded that slotted patch technique has a better performance. Then the parasitic element will be added to increase the gain of the antenna. Proximity coupled feed is used to decrease the radiation that emitted from the feed so it is easier to design circularly polarized antenna.

The realized antenna has LHCP (Left Handed Circularly Polarized) polarization in the 2.34 – 2.4075 GHz frequency range with 67.5 MHz bandwidth where the VSWR ≤ 1.5, return loss ≤ -14 dB, and axial ratio ≤ 3 dB. The gain of the antenna is 6.074 dBic with azimuth HPBW 65.63° and elevation HPBW 66.2°.

Keywords: CP-SAR, S-Band Transmitter, microstrip antenna, parasitic element.