ABSTRACT

Today, SAR sensor is operated with linear polarization (HH, VV, or its combination) and has limited retrieved information [7, 8, 10, 24]. The conventional SAR is sensitive to the Faraday rotation effects, has large dimensions, and requires high power, etc. To overcome these problems, a Circularly Polarized Synthetic Aperture Radar (CP-SAR) is developed to obtain information signals transmitted near to the earth surface. This CP-SAR sensor is applied to the microsatellite and called Circularly Polarized Synthetic Aperture Radar Onboard Microsatellite (μSAT CP-SAR). It is operated at a frequency of 1.27 GHz (L band) and the satellite will be launched in 2014 with the altitude of 500-700 km above the Earth's surface [27].

This thesis discusses the design of antenna that may be suitable for μSAT CP-SAR sensor with the acceptable axial ratio of the Right Handed Circular Polarization (RHCP) at the transmit mode and Left Handed Circular Polarization (LHCP) + RHCP at the receive mode [27]. The proposed antenna is a truncated edges circular patch microstrip antenna.

This study resulted in a blue print of truncated edges circular patch microstrip antenna with dual-polarized in a single stack. The results of the simulation using a finite integration technique based computing [33] showed that the axial ratio for LHCP and RHCP patch was 1.26 dB with the isolation factor of -26.78 dB. On the value of VSWR $\leq$ 1.5, the obtained bandwidth

was ≈ 28 MHz and the achieved gain for fabricated antenna was ≈ 8.59 dBic.

Keywords: circularly polarized antenna, RHCP, LHCP, μSAT CP-SAR