ABSTRACT

Remote sensing technology is known as a technology that has wide benefits. In the development of remote sensing technology using satellite platforms, many of the developers adopted camera technology, both spectral and push-broom cameras to get the Earth's image periodically. But the camera technology has several disadvantages, such as not being able to map areas covered by clouds and areas at night conditions. Therefore it is necessary to develop a technology that does not utilize the spectrum of light. This challenge is answered by the technology of Circularly Polarized Synthetic Aperture Radar (CP-SAR) which is included in the category of remote sensing microwave is a remote sensing technology that utilizes radio waves as a means of data retrieval. In the CP-SAR system antenas are required with circular polarization characteristics.

In this study designed microstrip antena using asymmetric square patch with addition of circular asymmetric patch at each corner. To get RHCP polarization the radius of each circular patch must be eligible r1> r2> r3> r4 from left to right. Painting techniques used with proximity coupled with upper and lower layers are made equal. The design process using Finite Integration Technique (FIT) antena simulator with FR-4 Epoxy substrate material has dielectric constant of 4,6 at 1,27 GHz frequency. Once a single antena is obtained, the antena is arrayed with a 4x8 array to obtain the required gain.

The result of this research shows that the addition of asymmetric patch circular in each corner of the patch patch can modify the polarization of microstrip antenna into RHCP circular polarization with dimension parameters affecting circular patch circus radius (r1, r2, r3, and r4). To form a circular polarization must satisfy conditions r1> r2> r3> r4 for RHCP, and vice versa for LHCP. From the verification results, both regular microstrip antennas (without parasitic elements) and parasitic microstrips show a circulation with axial ratio bandwidth of 30 MHz each in the measurement of the frequency range 1,25 GHz to 1,29 Ghz. The technique of adding parasitic elements in front and behind the main antenna has been verified to increase the gain, bandwidth, and antenna dimension respectively by 1,84 dBic, 38,29% and 39,93% of antennas without parasitics. 4x8 element microstrip array antenna successfully designed working frequency at 1,27 GHz with value of VSWR equal to 1,24 and axial ratio value equal to 0,627 dB. The effective bandwidth and impedance are 11,12 MHz and 44,8 MHz respectively. Gain achievement of 15,246 dB. Designed antennas can be applied to CP-SAR sensors on board UAVs as they are in accordance with system specifications, but not yet met for CP-SAR on board μ-Satellites.

Keywords: *Array Antenna Microstrip, Proximity Coupled, Circular Polarazation, μ-SAT CP-SAR*