

ABSTRACT

DUAL BAND MICROSTRIP ANTENNA FOR SENSOR OF CIRCULARLY POLARIZED SYNTHETIC APERTURE RADAR (CP-SAR)

Synthetic Aperture Radar (SAR) is a remote sensing system using radar for high resolution image capture that works on microwave frequencies. SAR is operated using linear polarization where the polarization is very susceptible to Faraday rotation. This is overcome by the application of Circularly Polarization-Synthetic Aperture Radar (CP-SAR). Each frequency used produces different image result characteristics. The higher frequency, the resulting image detail will be higher accuracy. While the lower frequency, have a better image penetration capabilities. To unite the two advantages of the image characteristics, the CP-SAR is designed to work in two bands of frequency (dual band).

In this study designed dual circular polarized dual band microstrip antennas that work at two frequencies, 1.27 GHz (L-Band) and 3 GHz (S-Band) for the CP-SAR system. The use of two working frequencies will improve the data collection of the target in the CP-SAR system. Antenna has square patch shape with truncated edge technique and one of them was given a slot. Antenna also applied defected ground structure technique to decrease axial ratio and return loss. Dual bands are generated using multi resonant techniques by combining two patches into one. The feeding technique using proximity coupled, with substrate material FR-4 Epoxy.

The antenna generated in this study has two working frequency of 1.27 GHz and 3 GHz. At 1.27 GHz frequency the antenna has a return loss of -22.706 dB with bandwidth (return loss \leq -14 dB) 38.9 MHz, and gain 0.54 dBic. While at 3 GHz frequency the antenna has a return loss of -15.187 dB with bandwidth (return loss \leq -14 dB) 39 MHz, and gain 1.98 dBic. Both frequencies have a circular polarization with axial ratio 0.722 dB and 0.718 dB.

Keywords: Microstrip Antenna, Dual band, Circular Polarization, CP-SAR