

ABSTRACT

The rapid development of space technology affects the development of satellite communication technology. As learning mission, Telkom University developed technology research satellite microsatellite which used for payload Synthetic Aperture Radar (SAR). SAR is an active microwave instrument which has radar (radio detection and ranging) working principle to produce high resolution images of the surface of the earth in all conditions. The image data sent over by the S-Band transmitter to the ground station.

Microstrip antenna is a lightweight antenna types with small volumes that match the needs of the microsatellite's S-Band transmitter in terms of limited space availability. Simple configuration simplify the assembly process and the adjustment to the conditions of microsatellite itself. In addition, the microstrip antenna also supports the type of circular polarization that would be useful in overcoming the effects of Faraday rotation due to the rotation of ions present in the atmosphere as well as unidirectional radiation pattern for both point to point communications with the ground station. To cope with the low gain and bandwidth that is theoretically owned, in this thesis is designed as a microstrip antenna array using the proximity technique coupled supply. In order to achieve circular polarization of this study also proposes the design of a feed ration with sub-orthogonal. The results of the design is simulated with the help of assistive software-based Method of Moment (MoM) using epoxy substrate material FR-4 with a value of $\mu r = 4.3$.

The measurement results show the performance of the antenna with the center frequency of 2:35 GHz gain bandwidth of 230 MHz for the target impedance return loss ≤ -10 dB axial ratio bandwidth up to 32 MHz in order to fulfill the prerequisites of circular polarization, and the average gain dBic 5:27. While unidirectional radiation pattern with a value of 63.8° azimuth HPBW and HPBW elevation 89°

Keywords: *microsatellite, S-Band transmitter, microstrip antenna, array antenna, proximity coupled*