ABSTRACT

Satellite technology is being developed by Telkom University on independent satellite program. It is being created by student team and lecturer from Telkom University. Then, is called Tel-USAT, collaboration with INSPIRE, LAPAN, ORARI, and AMSAT Indonesia. In the first generation, called Tel-USAT1 is a nano-satellite which has less than 10 Kg of mass with RSPL (Remote Sensing Payload) mission that uses optical system. In the Second generation, called Tel-USAT2 is a micro-satellite with RSPL (Remote Sensing Payload) mission that uses SAR (Syntetic Aperture Radar). SAR is radar remote sensing imaging. Micro-satellite has mass about 50 Kg. One of the subsystem in satellite communication system is antenna. S-band Transmitter antenna of SAR has working frequency 2.35 GHz. In previous research, two elements array microstrip antenna for s-band transmitter SAR has been made. In there, to produce circularly polarized antenna is used perturbation tecnique, and to increase gain is used front-end parasitic method. The dimension of these antenna is (103×104×47) mm. It has 60° of beamwidth, less than specification that is needed. From the spesification need 70° of beamwidth to cover Indonesia area.

In these research, has been made single patch microstrip antenna using dual-feed feeding technique. Using these technique can produce circularly polarized antenna. Then use rectangular slot to reduce dimension of patch antenna and increase the bandwidth, so it will be easier to produce circularly polarized antenna. To increase antenna gain, is added front-end parasitic elements. Distance between front parasitic and main patch is optimized to maximize electro-magnetic coupling and maximize main lobe antenna, While distance between groundplane and end parasitic is optimized to minimize back lobe antenna.

The antenna is produced in these research has circularly polarization which unidirectional radiation pattern that has working frequency on 2.325 GHz to 2.375 GHz. Obtained value of VSWR is less than 1.5 and Gain is more than 6 dBic. It has beamwidth about 70° to 80°, and the dimension is (61×67×50) mm. Bandwidth of VSWR is 165.9 MHz, and axial ratio banwidth is 54.8 MHz. So the effective bandwidth antenna that working on VSWR less than 1.5 with axial ratio less than 3dB is 54.8 MHz.

Keywords : microstrip antenna, S-band Transmitter, SAR (Syntetic Aperture Radar)