

ABSTRACT

Radio detection and ranging or RADAR is the result of optical camera development as remote sensing device. RADAR can resolve the obstacles that cannot do by optical camera, such as cloud and night day. RADAR make use of electromagnetic wave to get the distance and position of target. One of RADAR is synthetic aperture radar (SAR) which can process reflection wave from target (echo) be an image. Unmanned aerial Vehicle (UAV) is the one of airborne which support SAR to trasmit electromagnetic wave from the sky. The using of UAV is relatively cheap, low risk, and can be operate whenever leading UAV be the first choice from another airborne for supporting SAR operation.

In this research has designed and realized microstrip antenna array for dual-band SAR on C-band and X-band frequency with E-shaped patch method. Using both of frequency at the same time, SAR will be obtained more data and more specific. Design and simulation microstrip antenna will be using antenna design software. Antenna realization will be using FR-4 Epoxy as substrate and copper as ground plane also patch.

Antenna has realized with dual operation frequency at 5,8 Ghz (C-band) and 9,65 (X-band). The result of measurement gives the value of return loss at -11,9 dB, VSWR 1,67, gain 6,39 dBi, and bandwidth 87 MHz at 5,8 GHz. While at 9,65 GHz, antenna provides the result of return loss -11,34 dB, VSWR 1,73, gain 3,285 dBi, and Bandwidht 102 MHz. The dimension of antenna is 22 cm × 4,6 cm × 0,167 cm.

Key words: SAR, UAV, dual-band antenna, array antenna, gain, E-shaped patch