

ABSTRACT

The development of aviation world is increasing as the raise of the mobility of people and trade traffic locally and internationally. The raise itself demands the development of radar technology within the navigation system of airplanes. One of the devices in the system itself is radar altimeter. The goal of this research is to produce radar altimeter's antenna that fulfills the standard specifications within the spectrum of 4,2 – 4,4 GHz, bandwidth is smaller than 196 MHz and radiates directionally. The main problem of microstrip antenna is low gain and one of the solutions to get rid of it is to modify its ground element with a method named slotted ground plane as known as defected ground structure. The method is to cut some plane of the ground in a specific dimension. The designing process is using software named High Frequency Structure Simulator version 15 (HFSS v15). As for the requirement of the parameter values are return loss ≤ -10 dB and VSWR ≤ 2 . The designing and simulation have been done for antenna designs with two different feeding method, that are microstrip line and coaxial probe. The substrate material used is FR4 Epoxy with a dielectric constant (ϵ_r) 4,4 and thickness of 1,6 mm. The simulation shows that the design of an equilateral triangle antenna with a side length (a) of 21 mm and 3 triangular slots with a base dimension of 8.3 mm and a height of 7.2 mm on the ground plane uses the coaxial probe feeding technique, which produces a return loss value of -32.46 dB , bandwidth of 178.5 MHz at center frequency of 4.3 GHz, VSWR 1.048, gain of 3.53 dB and with a beamwidth of 100.5°.

Keywords : *Microstrip antenna, triangular patch, slotted ground plane, radar altimeter*