

ABSTRACT

Radar is a tool that uses a radio frequency (RF) system that functions as a detector of the movement of an object such as a ship, speed of distance, knowing the location of objects reached by the radar, and mapping moving or stationary objects. In this study, an antenna was designed and applied at the X-Band frequency with a rectangular patch shape using an FR-4 Epoxy substrate with a value of $h = 1.6$ mm, Loss tangent = 0.025, and $\epsilon_r = 4.3$ which will be used for maritime radar applications where the antenna used uses the multilayer parasitic method so that it can work effectively and efficiently. The antenna used for maritime radar requires two main parameters, namely high gain in order to receive electromagnetic wave sources from a distance and a Unidirectional radiation pattern so that the antenna made can focus on the source of the emitted electromagnetic waves. Based on the simulation results of the parasitic multilayer antenna at the X-Band frequency, the return loss value is -23.716 dB, the gain value is 7.144 dBi, the bandwidth reaches 946.7 MHz, the radiation pattern is unidirectional and has a total dimension of 50 x 50 x 1.6 mm. Based on the measurement results of the parasitic multilayer antenna at the X-Band frequency, the return loss value is -10.003 dB and the radiation pattern is unidirectional.

Keywords: *Maritime Radar, X-Band, Multilayer Parasitic, Unidirectional*