

ABSTRACT

Radio Detecting and Ranging (RADAR) is a system for the detection of radio waves that are useful for detecting, measuring distances and map objects such as airplanes, military, weather information. One type of radar is a three-dimensional radar, This radar has the technology with the capability to determine the distance, azimuth and height of the target in a single scan.

In a radar system, we needed a transmission medium in the form of the antenna as a transmitter and receiver. To perform the scanning area as a whole, needed rotator 360 ° in azimuth so that the object can be detected in all directions. But the scanning area using this rotator requires a high cost. Array antenna application allows electric scanning in the radar antenna, which is not change the mechanic position of antenna but the radiation pattern can be directed with controlling as needed. One method is control the supply current phase in antenna.

Antenna was realized using epoxy substrate material FR-4 with values ($\epsilon_r = 4,35$ and $h = 1,6$ mm). Antenna works at the frequency of the S-Band (2.9 to 3.1 GHz) which produces VSWR = 1.08, Gain 17.108 dBi and unidirectional radiation pattern. The dimensions of realized antenna is 359 mm × 436,4 mm × 91 mm that has effective bandwidth ≈ 453 MHz. Phase shift of 25° and 80° produce unidirectional radiation pattern in 10° and 20° direction. With these specifications, the phased array antenna is work well for the performance of three-dimensional radar

Keywords : Antena Phased Array, Phased Shifter, S-Band, Vivaldi,