ABSTRACT

3D Radar technology is used to detect, measure distances and mapping an object in three-dimensional coverage. In 3D radar, antennas are usually arranged in array to increase the gain and beamforming. In this study, antennas that used is Phased Array Antenna which consist of several pieces of antenna elements with phase variation between elements so that the radiation pattern of antenna can be changed according to the phase change. To perform phase shift in antenna, needed a device that called Phase shifter. Phase shifter allows the antenna beam settings to desired direction without changing the physical position of antenna. In the application, phase shifter is integrated with a controller so-called Antenna control unit. With antenna control unit, phase shift of antenna can be performed automatically without moving the physical antenna. Antenna control unit that used in this study is an Arduino microcontroller and 6-bit digital Phase shifter MAPS-010164. Phase shifters is placed on several antenna elements in S-Band frequency (2.9 to 3.1 GHz). Performance parameters that tested is accuracy of phase shift, return loss, insertion loss, VSWR, impedance, gain and radiation pattern. Design phase shifter is used can minimize the various attenuation over the phase shift and suitable for high phase accuracy. With this specification and design, phase shifter can work to phase shift the phased array antenna well.

Keyword : Antenna Control Unit, Phase Shifter, Phased Array Antenna