

ABSTRACT

Synthetic Aperture Radar is popular remote sensing technology. SAR use radio wave and aperture technology to sense the object. L-Band SAR operates in 1.27 GHz frequency is chosen for earth surface sensing because its attenuation characteristics that endure to water.

PALSAR (Phased Array L-Band SAR) combine SAR technology with phased array. Application of phased array on SAR allow movement of antenna's beam without move the antenna mechanically. Antennas are controlled by its phase for every element. PALSAR research is proposed by JAXA and JAROS.

Phase shifter is used to electronically shift the phase. Digital phase shifter gives phase response by bit that controlled by bit is chosen as phase control solution, especially for array antenna. PALSAR and SAR need this device to control antenna's beam.

In this Final Project research, a 5 bit digital phase shifter is designed and realized for L-Band SAR. Delay line topology is used on microstrip line to produce phase shifting and PIN diode is used as switch. Phase shifter has 2.35 dB maximum insertion loss and 19.11 dB minimum return loss. RMS phase error at 1.27 GHz is 1.54° or 1,21% compared to phase shifting step.

Keywords: *L-Band SAR, digital phase shifter, delay line, PIN diode, beamforming*