

## ABSTRACT

Synthetic Aperture Radar, as known as SAR, is a remote- sensing technology toward earth surface. In order to get a good sensing results, then it needs a filter. The required filter is a Band-pass filter in order to skip to the desired frequency and frequency cut is not expected. The electromagnetic spectrum that is limited and should be divided, and used filters to limit and select the signal micro wave RF with limited spectral. The filter has many types and one of them is a band pass filter who passes frequencies cut off top and bottom cut off.

In this Final project aims to design and realize a filter type of BPF (Band Pass Filter) to be placed on SAR. Techniques that can be used, such as the input/output ports directly connected to the filter, and the method used is the Hairpin microstrip line added with Defected Ground Structure. Mikrostrip line is a transmission line that consists of a strip conductor (patch) and ground plane separated by substrate with certain material characteristics.

This research make improvements to performance of filter by modifying shapes of Hairpin line with the addition of Defected Ground Structure in order to have a value of insertion loss approaching a value of 0 in the Middle frequencies 1.27 GHz. Materials used in this filter is FR-4 Epoxy dielectric constants that have amounted to 4.3. The results of the measurement of filter frequency is realized on 1231 MHz with good selectivity. The value of return loss of -17.619 dB insertion loss of value -5.499 with filter bandwidth of value 65 MHz. The value of the stopband lower frequency filter lies at a frequency of 1120 MHz at -22.678 dB, and the upper stopband frequency lies at a frequency of 1360 MHz at -49.904 MHz.

**Keyword:** *Band Pass Filter DGS Hairpin, Insertion Los, Synthetic Aperture Radar*