ABSTRACT

Filter is a device used to filter the operating frequency with the desired frequency pass (pass band) and damp out unwanted frequencies (stop band). Based on the frequency region passed, filters can be divided into several types, namely: LPF (Low Pass Filter), BPF (Band Pass Filter), HPF (High Pass Filter), and BSF (Band Stop Filter).

This Final Project was aimed for designing and realizing a BPF (band pass filter) for Coastal Surveillance Radar transmitter. The filter made was combined bandpass filters microstripe. Microstripe channel is a transmission channel that consists of conductor stripe (patch) and ground plane that is separated by substrate with certain material characteristic. Patch and ground plane used was made from copper with 0.035 mm thick, with Duroid Rogers 4003 substrate that has $\varepsilon_r = 3.38$ *and 1.575 mm height. The shape of DGS Hairpin BPF frequency response was designed based on selective filters with single pair of transmission zeros.*

To get information about the activity and characteristic of the prototype that has been made, this filter was tested using Network Analyzer. The parameter tested from this BPF prototype are Frequency response, Bandwidth, Insertion Loss,the change of phase, Return Loss, Standing Wave Ratio, and terminal impedance. The measurement results from BPF characteristic are: center frequency 9400 MHz with bandwidth 292 MHz (at 10.731 dB), insertion loss 7.579 dB, VSWR $\leq$ *1.5 at input and* $\geq$ *1.5 at output, the change of phase with frequency is constant, and terminal impedance 44.494 + j3.109 (input) dan 62.234 – j51.093 (output). From the measurement results it can be seen that the BPF is made is too sloped, so the performance of the filter is still not as expected.*

Keywords: *Band Pass Filter DGS Hairpin, Mikrostrip, Standing Wave Ratio, Insertion Loss, Return Loss, Network Analyzer.*