

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). The frequency that is passed through this device is matched with the filter that is used with different characteristic. 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) with frequency range 2300 MHz – 2390 MHz or WiMAX frequency (standart IEEE 802.16). Shape of damping characteristics filter was designed based on respon selective filters with single pair of transmission zeros using Dissimilar Resonator Methods. It was using two resonator, UIR (Uniform Impedance Resonator) and SIR (Stepped Impedance Resonator). 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 $\epsilon_r = 3.38$ and 0.813 mm height.

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 2345 MHz with bandwidth 169 MHz (at 8.067 dB), insertion loss 9.092 dB, VSWR ≤ 1.5 . The change of phase with frequency is did not constant, and terminal impedance $43.164 - j4.214 \Omega$ (input) dan $54.253 + j2.295 \Omega$ (output).

Key words: *Band Pass Filter, Microstrip, Dissimilar Resonator, Uniform Impedance Resonator, Stepped Impedance Resonator, Bandwidth, Standing Wave Ratio, Insertion Loss, Return Loss.*