

ABSTRACT

Filter is a device to pass a particular frequency by passing wanted frequency and reduce unwanted frequencies. The frequency that is used is depend on the applications used. Based on the frequency regions that are passed, the filter is divided into several types: LPF (Low Pass Filter), BPF (Band Pass Filter), HPF (High Pass Filter), and BSF (Band Stop Filter)

This final project was aimed to realized Band Pass Filter (BPF) at frequency 1930-1990 MHz for WCDMA application with Equal Ripple filter (Chebyshev). That frequency is the downlink frequency of BTS to the mobile station. The filter is a hairpin filter, which is one method of designing a distributed element filter with $\lambda_g / 2$ length of resonators that is parallel coupled and have resonators topology as 'U' shape. Realization of this filters was using microstrip with Rogers Duroid 4003c material as a transmission channel.

The information filter performance was measured by using Network Analyzer. In this BPF designing and realizing, some of the parameters measured are frequency response, bandwidth, insertion loss, return loss, VSWR (voltage standing wave ratio), and terminal impedance. The results of BPF characteristics measurements are : center frequency is 1926 MHz with 62 MHz bandwidth, insertion loss 9.471 dB, return loss 1.709 dB (input) and 9.567 dB (output), VSWR 1.5028 (input) and 1.4924 (output), terminal impedance $34.509 + j56.674$ (input) and $31.147 + j6.568$ (output).

Key words : *bandpass filter, microstrip, hairpin bandpass filters, chebyshev, wcdma*