

## ABSTRACT

*Filter is a device that can perform signal transmission with a certain frequency and other frequency damping. Based on the frequency regions that are passed, the filter is divided into four types: LPF (Low Pass Filter), BPF (Band Pass Filter), HPF (High Pass Filter), and BSF (Band Stop Filter). Filters are a very important block in a radio communication system, every system of radio transmitter or receiver, from the baseband to the RF would always found the filter.*

*This final project was aimed to realized Band Pass Filter (BPF) at frequency 2.6 – 2.7 GHz for LTE (Long Term Evolution). That frequency used as LTE downlink frequency of BTS to the mobile station. BPF is made using the method of hairpin with  $\lambda g / 2$  length of resonators and have resonators topology as 'U' shape. BPF is realized with a microstrip line, that is a channel which consists of groundplane, substrate with certain characteristics, and strip conductor. Type of substrate used is FR4 Epoxy with dielectric constant ( $\epsilon_r$ ) 4,4, substrate thickness ( $t$ ) 0,035 mm and loss tangent 0,024.*

*Measuring of filter with Network Analyzer intended on getting information about performance and prototype characteristic that made. Parameters that have been tested from the BPF include frequency response, bandwidth, insertion loss, return loss, VSWR (Voltage Standing Wave Ratio) and terminal impedance. The result of BPF characteristic are: center frequency at 2650 MHz with bandwidth of 85 MHz, insertion loss 11.216 dB, return loss 18 dB (input) and 22.066 dB (output), VSWR 1.288 (input) and 1.171 (output) and impedance terminal  $38.981 + j2.034 \Omega$  (input) and  $42.853 + j14.86 \Omega$  (output).*

**Key words :** *band pass filter hairpin, downlink, LTE, microstrip*