ABSTRACT

LTE (Long Term Evolution) is the Universal Mobile Telecommunications System that is a next step towards the 4th generation (4G). LTE technology was created to improve the previous, LTE capabilities and advantages of the previous technology of data transfer speed, coverage and greater service capacity. LTE frequencies in each country is different, to pass different frequencies would require a filter device is a device that can pass the desired frequencies (pass band) and reduce unwanted frequencies (stop band). Therefore, in this final project aims to design and realize a filter that works in the frequency range of that LTE, is 3400MHz - 3600MHz.

The type of filter that has been designed and realized is a microstrip bandpass filter using mathematical approaches and methods of Chebyshev Interdigital, and it was manufactured through photoetching process. Before the photoetching process, the filter design was initiated by a calculation process to obtain ideal dimensions of the filter. After performing the simulation using the software AWR 2008, then the filter was designed in the form of hardware. The next step, it is measured using a Network Analyzer to test the filter so that is able to pass the desired frequencies, and the last, it is performed an analysis to compare the results of the measurements with the initial specifications.

The measurement results of the characteristics of the BPF is the center frequency that is obtained is 3500 MHz with a bandwidth of 200 MHz. The insertion loss at the center frequency is 13.763, VSWR > 1.196 at the range of operating frequency. return loss amounted to 14 292 dB, terminal impedance 59 242 + j30.387 (input) 52 386 - j21.372 (output) as a result, the results obtained as VSWR, bandwidth, center frequency and return loss meets the specifications, while the insertion loss, impedance terminal do not meet specifications.

Key words: *Bandpass Filter, Microstrip, Interdigital, Standing Wave Ratio, Network Analyzer*