

ABSTRACT

LTE (Long Term Evolution) is a new name from telecommunication service that have high performance in mobile communication system. This technology is a step to 4th generation of cellular technology that developed from GSM and designed to improve the capacity and speed from cellular's network. LTE give downlink capacity from 100 Mbps and uplink capacity from 50 Mbps. Operator's bandwidth from LTE have downgrade from 20 MHz to 1,4 GHz and support either frequency division duplexing (FDD) and time division duplexing (TDD). For that, LTE need high performance devices in that realization. One of that is a duplexer that have function to divide received signal and transmitted signal. With duplexer, an antenna can have a function as transmitter and receiver in the same time.

In this final project, a duplexer have been designed with branch-line hybrid directional coupler bandstop filter method. The used frequency is one of LTE's frequency that will be implemented in Indonesia, uplink frequency at 2500 – 2570 MHz and downlink frequency at 2620-2690 MHz.

This final project produce a duplexer with operation frequency filter at 2500 – 2540 MHz and 2640 – 2690 MHz with 19.6 dB rejection loss, operation frequency coupler at 2500 – 2700 MHz with 3.48 dB coupling and 87.3° phase different, and Tx – Rx Isolation is lower than -30 dB. This final project can become a reference to the realization of LTE transceiver device and learning about transmission in the microwave.

Keywords : duplexer, band stop filter, hybrid directional coupler, LTE