ABSTRACT

One of the international communications standards, particularly communications Broadband Wireless Access (BWA), which is considered adequate and in accordance with the demands of users today is the Worldwide Interoperability for Microwave Access (WiMAX) issued by the Institute of Electrical and Electronics Engineering (IEEE). WiMAX itself has also experienced growth with the variants that are designated as a service to certain conditions such as 802.16a standard, 802.16a rev.d-2004, and 802.16e for mobile WiMAX. This system uses the technique of Orthogonal Frequency Division Multiplexing (OFDM), a multicarrier modulation technique in which each bit of data is modulated using a different carrier frequency.

OFDM is a technology that can be used to overcome problems of various kinds of propagation (multipath), including NLOS conditions between the base station with the user and can overcome the problems of delay spread and inter-symbol interference (ISI). OFDM signal is formed by a narrow signal that is sent in parallel to any information that will be transmitted. Some development and modification of this system, eventually producing a technology that can meet the need for BWA communication.

This final project discussed regarding the design and implementation of OFDM using IFFT / FFT 256 points on the Field Programmable Gate Array (FPGA)-based on coding VHDL. The design process is focused on making the system block IFFT / FFT 256 points in the OFDM system will be able to process the input data bits to produce performance standards IEEE 802.16d-2004 WiMAX . In its implementationon FPGA Virtex-4 FPGA XC4VLX25, the system can produce 256 points output of subcarrier and use 22% resource of FPGA.

Keywords: OFDM, IFFT / FFT, FPGA, VHDL