

ABSTRACT

The method multicarrier being developed at this time, namely Orthogonal Frequency Division Multiplexing (OFDM). But in its development, OFDM has several shortcomings. Such as the high value of Peak to Average Power Ratio (PAPR) which causes the sub-carriers are not orthogonal so that the results obtained are less than the maximum. Therefore, an alternative method of multicarrier of OFDM is Orthogonal Wavelet Division Multiplexing (OWDM). If the OFDM is used Inverse Fast Fourier Transform (IFFT) while on OWDM used Inverse Discrete Wavelet Transform (IDWT). From our previous study [1], showed that the BER on OWDM value equivalent to OFDM, while the value of smaller PAPR than OFDM OWDM so as to provide maximum results.

This study uses VHDL language to encode each blocks on OWDM. To prove the performance of the corresponding OWDM simulation above, it needs to be implemented on a hardware device. One of the hardware devices that can be implemented with VHDL language one of which is a Field-Programmable Gate Array (FPGA). FPGA has many advantages, one of which has the ability to handle the computational load is so heavy. From the results of modeling and simulation will be implemented to the Field Programmable Gate Array (FPGA) board ATLYS Spartan-6 XC6SLX45 CSG324C.

Implementation of the results indicated that the design of prototype OWDM algorithm uses a technique Discrete Wavelet Transform (DWT) can be implemented on Spartan-6 board ATLYS XC6SLX45 CSG324C. The implementation results show resource usage by 13% on the FPGA board. This results of the Prototype in a system with a minimum period of 75.668 ns and the frequency of work under the working frequency Spartan-6 FPGA, which is 13.216 MHz.

Keywords: OWDM, DWT, FPGA