

ABSTRACT

Spectral periodic signal can always be analyzed with the aid of Fourier Series. In fact many of the signals in communications systems that are non-periodic random. For the case of non-periodic signals used a formula that is Fourier Transform. Fourier transform is actually a development of Fourier Series that is by looking at non-periodic signal as a periodic signal with period approaches infinity. By using the FFT (Fast Fourier Transform) calculation of fourier transform will be more quickly and efficiently.

In this final project work, has designed a fourier transform by FFT block radix-8. The results modeled by designing a programming language VHDL (Very High Speed Integrated Circuit Description Language) and simulated using Modelsim SE 6.0a which is then synthesized and implemented using Xilinx ISE 8.1i. Target device used was Spartan-3 XC3S1000 FPGA with the display output through a GUI (Graphic User Interface) in Matlab R2009b.

From the results of modeling and simulation is performed on a hardware level synthesis with Xilinx FPGA Tools Shynthesize. From the results of synthesis of the fourier transform block with FFT radix-8 obtained amount of resource required is 3% the total number of slice register, the number of 4 input LUT 18 %, the number of IOB 9%, the number of MULT 18x18 33%, number BUFGMUX 37% and total memory used is 233048 kB. Overall, this study has shown that the Fourier Transform Block design results by using FFT radix-8 algorithm can be implemented on an FPGA. However for further development, the display outputs can be applied in real time.

Keywords : Fourier Transform, Radix-8, FFT, VHDL, FPGA.