

Implementation of FFT IP Core on FPGA Hardware Platform

Abstract

Fast Fourier Transform (FFT) is a fundamental signal processing technique widely used in communication systems, instrumentation, radar, biomedical applications, and real-time spectral analysis. This project focuses on the implementation and evaluation of an FFT Intellectual Property (IP) core on an FPGA hardware platform. The primary objective is to understand FPGA-based digital signal processing and to achieve efficient frequency-domain transformation of sampled signals using FFT IP cores.

The work includes design entry, parameter configuration of the FFT IP core, hardware description integration, simulation, synthesis, and deployment on the FPGA platform. Input test signals are applied to the FFT module, and the resulting frequency spectra are analyzed to verify functionality and performance. FPGA-based FFT processing, provides parallelism, high speed, and re-configurability compared to conventional software-based approaches. The project provides practical exposure to FPGA design flow, IP integration, and hardware validation, while building fundamental skills in digital signal processing and embedded hardware development.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 3

2) Name of course with branch/discipline: B.E./B.Tech. Electronics and Instrumentation Engineering

3) Academic Project duration:

(a) Total academic project duration: 6 Weeks

(b) Student's presence at IPR for academic project work: 5 Full working Days per week

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