

VLSI IMPLEMENTATION OF PIPELINED FFT/IFFT IP CORE

ABSTRACT

The FFT is one of the most widely used algorithms for calculating the Discrete Fourier Transform (DFT) owing to its efficiency in reducing computation time. Fast Fourier Transform (FFT) has been used in a wide range of applications, such as wide-band mobile digital communication system based on Orthogonal Frequency Division Multiplexing (OFDM) principle, where the system implementation is only feasible when the equipment complexity and power consumption are greatly reduced by utilizing a real-time FFT transformer to replace the bank of (de)modulators for each individual sub-carriers. FFT, as an efficient algorithm to compute the Discrete Fourier Transform (DFT), is one of the most important operations in modern digital signal Processing and communication systems.

The discrete Fourier transform (DFT), of length N , calculates the sampled Fourier transform of a discrete-time sequence at N evenly distributed points $\omega_k = 2\pi k/N$ on the unit circle.