Data sheet for 2-Dimentional DCT Core

Functional Description

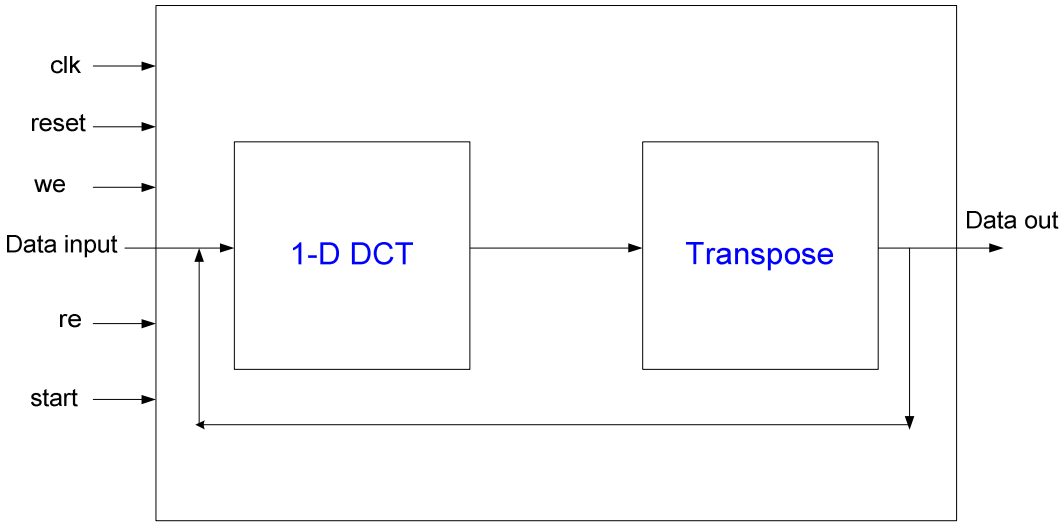
Discrete Cosine Transform (DCT) helps to separate the image into parts (or spectral sub-hands) of differing importance (with respect to image's visual quality). The DCT is similar to the Discrete Fourier Transform. It transfers a signal or image from the spectral domain to the frequency domain. But the difference is DCT uses cosine terms only but DFT uses both cosine and sine terms.

DCT is used to compress the image which needed large memory for storing and process it otherwise. Input to the DCT is image pixel intensity information in the form of matrix (usually 8 X 8) and the output is transformed data with the same dimension as input. For most images, much of the energy lies at low frequencies. These appear in the upper left corner of DCT matrix. Compression is archived since the lower right values represent higher frequencies and are often small – small enough to be neglected with little visible distortion. The DCT input is an 8 by 8 array of integers. This array contains each pixel's gray scale level. 8 bit pixels have levels from 0 to 255.

Features:

- Core can be configured for n x n matrix.
- Can be easily integrated with other modules.
- Area optimized implementation.

Block Diagram:



Performance:

Device	Slice Count	Frequency
Spartan-3A (xc3s700a-4fg484)		
Virtex-4 (xc4vlx25-ff668)		

Verification:

The DCT core has been verified with exhaustive Functional and Timing simulation

Deliverables:

- Verilog RTL source code & Test benches
- Synthesis and Simulation scripts
- Detailed user documentation, including RTL source code documentation

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