

The Creonic Fast Fourier Transform IP Core implements the Decimation in Frequency - Fast Fourier Transform based on the Cooley-Tukey algorithm. The FFT core expects complex samples as input and provides transformed complex samples as output. It performs the transform using  $\log_2(\text{transform length})$  stages in pipeline.

## Benefits

- Run-time configuration of the transform mode (Forward or Inverse FFT) and transform length.
- Continuously stream input and output data. The core starts processing immediately after receiving the first sample and does not wait until it receives the entire frame.
- Twiddle factors can be stored in ECC ROMs.
- Low-power and low-complexity design.
- AXI4-Stream handshaking interfaces for seamless integration.
- Works with the Creonic DVB-S2X Multi-Carrier Demodulator and Creonic DVB-RCS2 Multi-Carrier Receiver.
- Available for ASIC and FPGAs (AMD Xilinx, Intel and Microchip on request).

## Features

- Supports forward and inverse complex FFT
- Supports transform length ( $N$ ) from  $2^3$  to  $2^{16}$
- Supports scaled or unscaled IFFT output.
- Implemented as pipelined streaming IO architecture.

## Applications

- Multi-Carrier Transmitter and Receiver Systems
- Spectrum Analysis
- Signal Filtering
- Data Compression

## Deliverables

- VHDL source code or synthesized netlist
- HDL simulation models e.g. for Aldec's Riviera-PRO
- VHDL testbench
- Bit-accurate Matlab, C or C++ simulation model
- Comprehensive documentation

The following figure gives an overview of all components that are part of the Creonic Fast Fourier Transform IP core.



## Related Products

[DVB-S2X Multi-Carrier Demodulator](#)

[DVB-RCS2 Multi-Carrier Receiver](#)

## About Creonic

Creonic is an ISO 9001:2015 certified provider of ready-for-use IP cores for wired, wireless, fiber, and free-space optical communications. All relevant digital signal processing algorithms are covered, including, but not limited to, forward error correction, modulation, equalization, and demodulation. The company offers the richest product portfolio in this field, covering standards like 3GPP 5G, DVB-S2X, DVB-RCS2, CCSDS, and WiFi. The products are applicable for ASIC and FPGA technologies and comply with the highest requirements with respect to quality and performance. For more information please visit our website at [www.creonic.com](http://www.creonic.com).

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