Polyphase Filterbank

Description
The 4DSP Polyphase Filterbank Intellectual Property (IP) core algorithm was designed to process data in real-time up to rates of 1GSPS. 4DSP's core is the fastest and most efficient IP core known to be commercially available for FPGA based signal processing. The 4DSP Polyphase Filterbank Algorithm is an efficient way to implement and uniformly distributed multi-channel filterbank data using a Fast Fourier Transform.

The 4DSP Polyphase Filterbank core is designed for 16 up to 4096 channels. Slower processing rates to better suit various requirements can be implemented. The data resolution ranges from 8-bit up to 24-bit. A floating-point version of the core is available upon request. Fully functional VHDL testbench and Matlab functions are delivered with 4DSP Polyphase Filterbank IP core for simulation customer specified performance characterization, generate data and check results.

Features
• IP core targeted for many FPGA devices:
  - Xilinx: Virtex-II™, Virtex-II Pro™, Virtex-4™, Virtex-6™, Stratix-IV™
• Number of channels:
  - M=2^m with m = 3 to 12 (8 to 4096 channels)
• Arithmetic type and data formats:
  - 8 to 24-bit integer fixed point
  - Any resolution upon request
• Configurable on the fly filter taps for each channel
• Fully functional VHDL testbench Matlab functions
  - FFT/IFFT core simulation
  - Customer defined performance characterization
• Algorithms
  - Fast Fourier Transform (FFT)
  - Discrete Fourier Transform (DFT)
  - Finite Impulse Response Filter (FIR)

Applications
• RADAR / SONAR Signal Processing
• Digital Filtering
• Spectral Analysis

Other IP Products
• Fixed Point FFT
• Wideband Digital Down Converter
• Real time JPEG Compression
• Serial front panel data port (sFPDP)

Testbench and Matlab
Fully functional VHDL testbench and Matlab functions are delivered with Polyphase Filterbank IP core, used for simulation purposes and specific performance characterization and generate data and check results.

Filterbank_TB.vhd
Filterbank_In.m
Filterbank_Out.m

Performance guarantee
4DSP has developed hardware specifically optimized to provide maximum performance of 4DSP's IP Cores. Visit our website or call for our offices for help in selecting the optimum hardware platform for your applications. 4DSP has many I/O options for its FPGA platforms which use Xilinx and Altera FPGA products. Additionally, 4DSP provides engineering services for customization of IP Cores. 4DSP can also provide support to customers for porting 4DSP's IP cores to third-party hardware or can even provide "turn-key" porting and performance validation services. 4DSP has many other IP Cores, i.e. IEEE-754 Floating Point FFT, Serial-FPDP, Wideband Digital Down-Converters, 16-Bit Mantissa and more. 4DSP has many other IP Cores not listed; please contact us about your requirements.

rev-1.2