QF4A512-DK

Development Kit

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Features

- Includes all the Hardware and Software necessary to design, implement, and test a complete filter design

- Circuit board features: 4 BNC signal input connectors, USB to SPI bridge for control and data, and prototyping area

- Development Kit evaluation and testing capabilities:
  - A filter design may be evaluated by introducing an analog input to the Development Kit board, either from a PC generated white noise source or from a user supplied source (signal generator or the actual signal of interest)
  - Once the analog input has been introduced, the filtered digital output data is routed back to the PC via USB and an FFT of the data is displayed, showing the results of the filter as designed

- Runs under Windows$^{®}$ 2000, XP or later

- No separate power supply or controller board is required
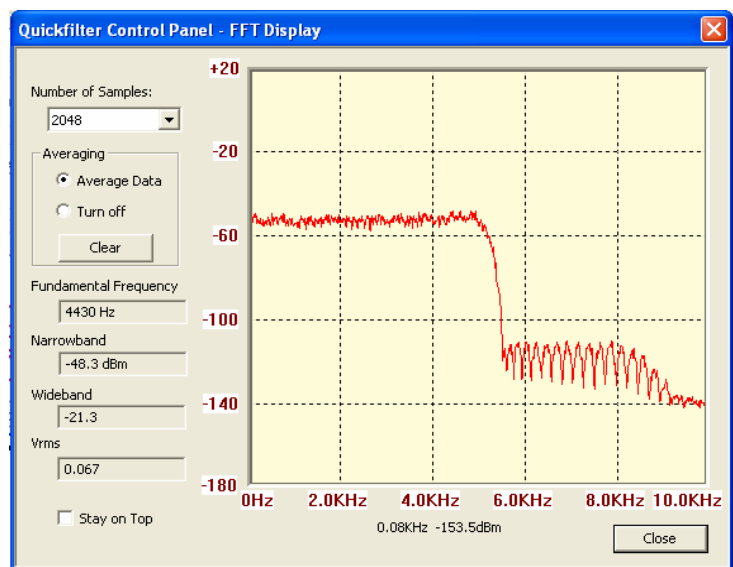
Description

The QF4A512-DK Development Kit is a complete hardware and software solution for the QF4A512, 4-Channel Programmable Signal Converter. The kit allows the user to easily set up the configuration parameters of the QF4A512 for his specific application and evaluate the resulting device performance.

The Quickfilter software design tool allows all the necessary parameters to be generated in a quick and user-friendly manner. The user enters the desired characteristics (e.g. sampling rates, type of filter, cut-off frequencies etc.) for each channel and the software generates a configuration file for the device. The configuration file can be immediately downloaded into the QF4A512 device on the development board, and the *actual hardware performance* can be monitored - either in response to a PC-generated noise source or to a user-applied signal. Device configuration parameters can be further adjusted, if necessary, until the optimum system performance is reached.

Once satisfied with the performance, a configuration file can be saved for future use, for example to program devices in bulk prior to volume board manufacturing.
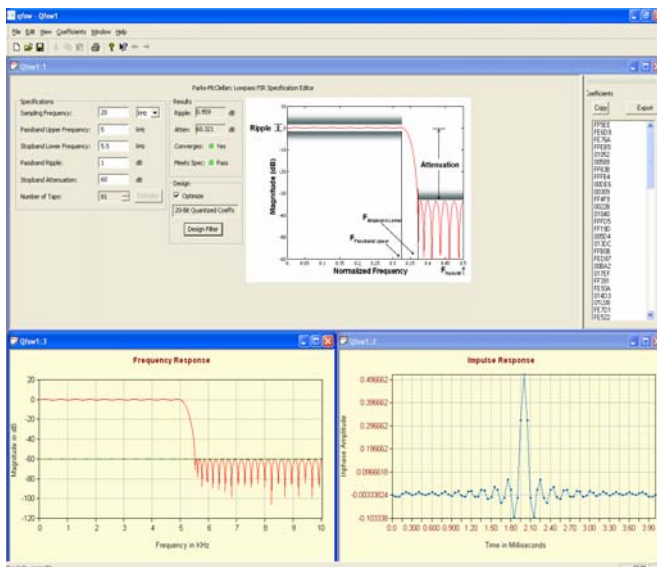
| Filter Design Screen	Actual filter output from QF4A512

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Hardware

The development board interfaces to a host PC via a USB connection. This connection supplies power to the board, although there is also provision to supply power from an external 5 – 9V source. A bridge circuit on the board converts from the native SPI interface of the QF4A512 to USB. A header is provided to allow connection to the QF4A512 via SPI from a host CPU.

BNC connectors on the board allow connection of analog input signals to all 4 channels. The board is preconfigured for single-ended, ac coupled operation with signals of approximately 1V peak-to-peak. This configuration can be easily modified for any combination of single-ended, differential, ac- or dc-coupled, and varying input signal levels (see schematics). An adjacent prototyping area allows for further input configuration modifications, for example for providing bias voltages for sensors such as accelerometers.
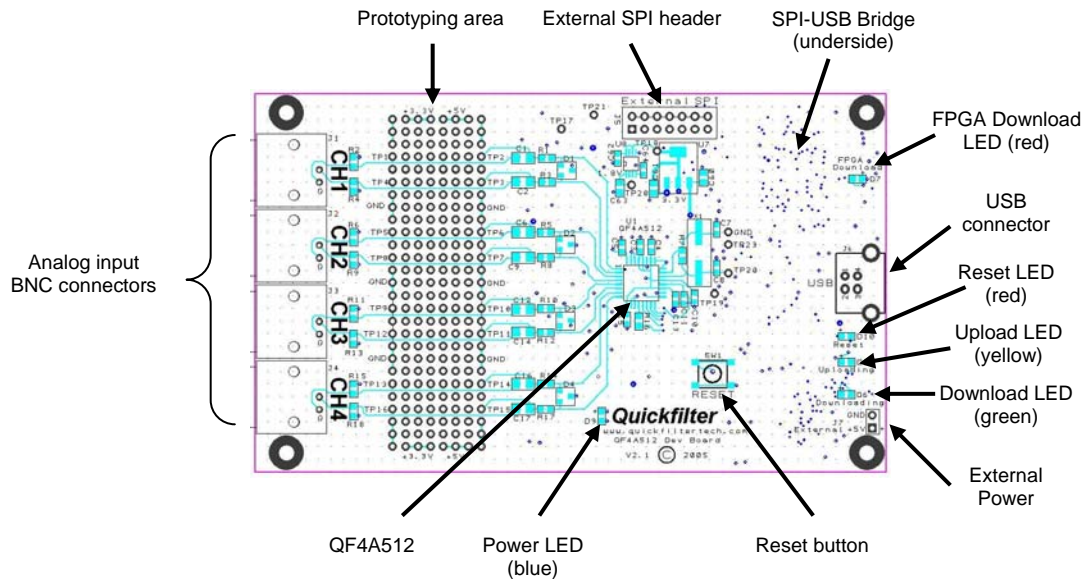
Software

There are three main software functions provided by the included Quickfilter software:

1. Filter design. A variety of different filter types can be designed and simulated, including lowpass, notched lowpass, highpass, bandpass, dual bandpass, bandstop, and dual bandstop. Currently available filter algorithms include Parks-McLellan and Windows Sinc. Desired frequencies, slope and attenuation can be input and the theoretical results observed. Completed designs can be saved as filter files for future use.

2. Chip configuration. Various filter types can be assigned to the 4 channels available in the QF4A512, along with key device configuration parameters. When complete, the configuration is downloaded to the device on the development board. It is also possible to interrogate the various on-chip control registers and save configurations for future use.

3. Evaluation. Once the QF4A512 has been configured, analog signals can be introduced to the device inputs and the software will produce and display an FFT of the filter response. A white noise source file is provided as a convenient method to drive the input from a PC and observe the filter characteristics.

Development Kit Contents

- Development Board
- CD containing Quickfilter software, documentation and install files.
- USB cable (board to PC)
- Signal cable (BNC to 3.5mm phone plug)
- Quickstart Guide