

Description

The QF1D512 is a programmable digital filter designed for seamless insertion in the serial data path of a digital signal or used as an FIR coprocessor. The device can interface with almost all microcontrollers, ADCs and DACs. It is easily configured with NO PROGRAMMING REQUIRED using our QuickPro™ design software. Virtually any FIR filter type can be implemented. The user is provided a free form editor for complex, non-standard filters. The device can realize “brick wall” filters such as a low pass filter with a 1 kHz cutoff frequency, 140dB of rejection, and a total transition band of only 10 Hz. The filter can operate over a broad range of ADC data rates – up to 500ksps and can support ADC’s with resolutions up to 24 bits.

Applications

- Audio
- Automotive
- Industrial control and monitoring
- Digital & Wireless Sensor Networks
- Medical patient monitoring & diagnostic equipment
- Security

Features

Digital Filter

- Maximum 512-tap symmetric or 256-tap non-symmetric digital FIR filter
- 12 - 24 bit data words, up to 32 bit coefficients
- Programmable Box-car Averager and Down-sampler pre-FIR, including bypass mode
- Reprogrammable in circuit

Data Rates

- up to 500ksps

Interface

- Configuration Interface: SPI 4-wire (all 4 modes supported)
- Data Interface: Fully programmable SPI and synchronous serial modes (I2S, SPDIF) – operates with a wide variety of ADC’s
- 3.3V I/O, all 5-V tolerant
- Operates off serial data clock (20MHz max.)
- Can daisy chain multiple devices
- Programmable Bypass mode (e.g. process raw data, or to configure ADC)

Power

- Scales with input data rate, and
- Scales with filter length, e.g. for 512 taps:
 - <1mW @ 1ksps
 - ~ 2mW @ 10ksps
 - ~ 5mW @ 100ksps

Design Software & Filter Types

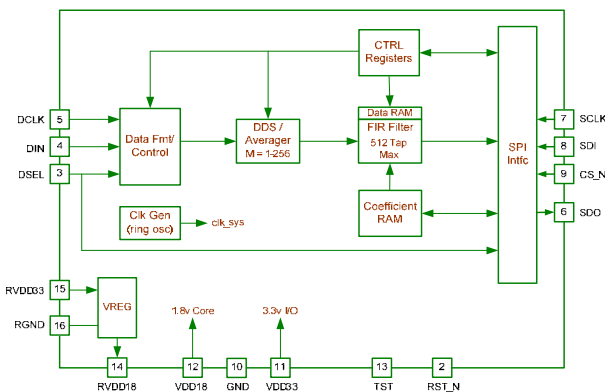
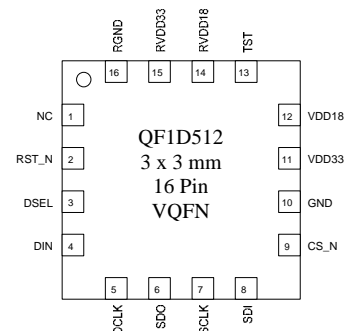
- Complete filter design using QuickPro Design Software (supplied at no charge)
- Supports filters such as Lowpass, Notched Lowpass, Highpass, Bandpass, Dual Bandpass, Bandstop, and Dual Bandstop, Parks-McClellan & Windows Sinc filter algorithms
- Free form filter editor allows complex filters to be implemented

Development Kit

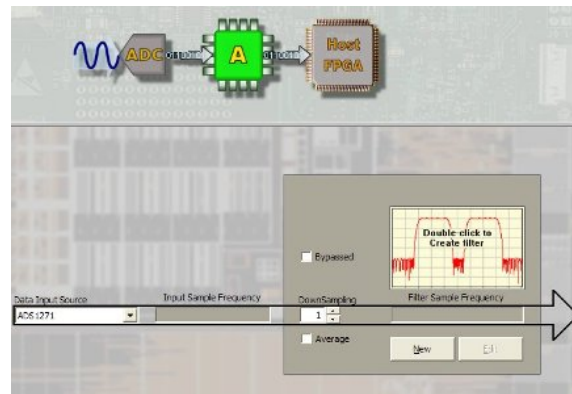
- \$199: Includes all of the hardware and software necessary to design, implement, and test a complete filter design
- USB for both data and power

Other

- Package: 16- pin QFN (3 X 3 mm)
- Temperature range: -40 to +85°C
- 3.3V and 1.8V supplies
- Internal linear voltage regulator may be used for single rail operation

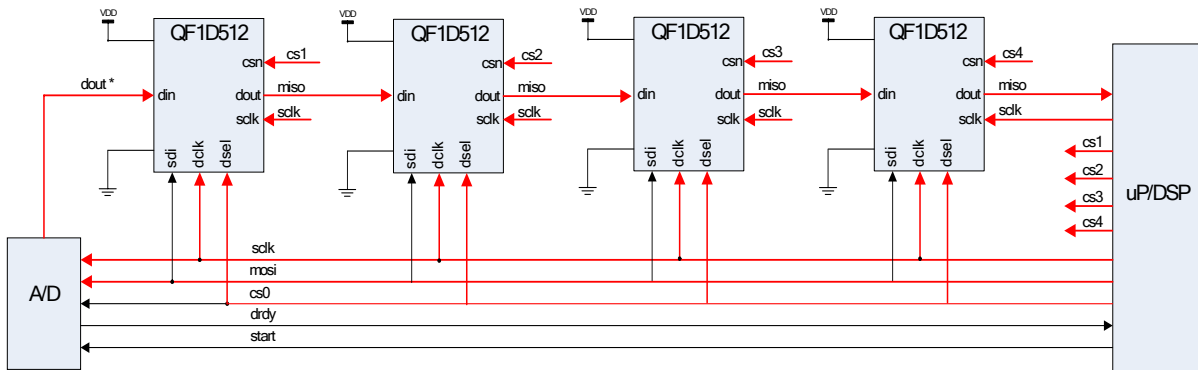
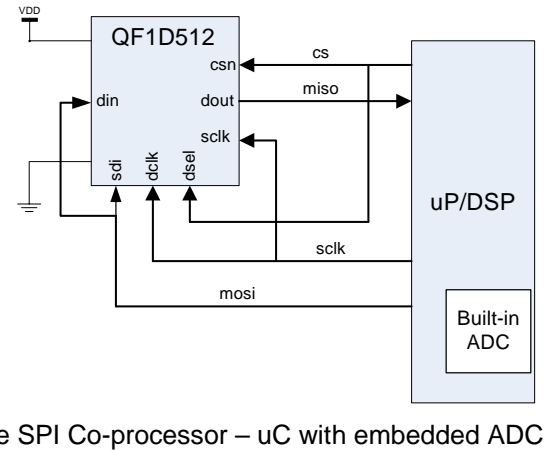
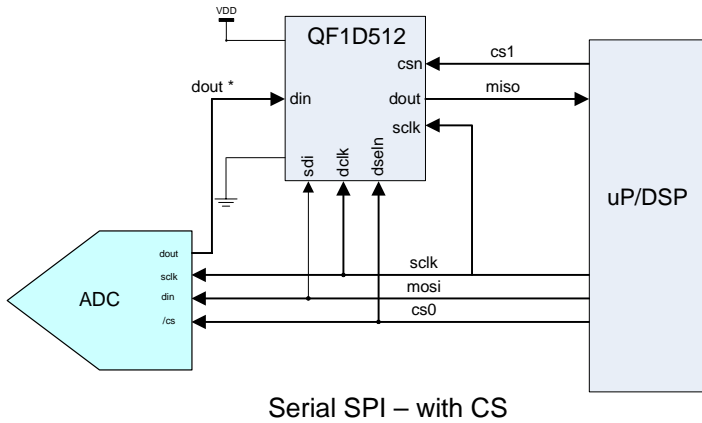


Functional Block Diagram

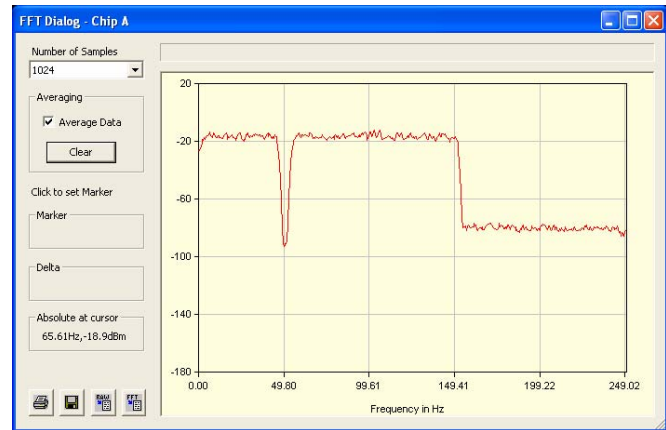


Design Software

Application Examples



Quickfilter Development Kit



Example of Actual Filter Output FFT

Features

- Includes all the Hardware and Software necessary to design, implement, and test a complete filter design
- All inclusive Development Kit for \$199
- QF1D512-DK is shipped with CD, circuit board, USB cable, analog input cable, and Startup Guide
- No separate power supply or controller board is required

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