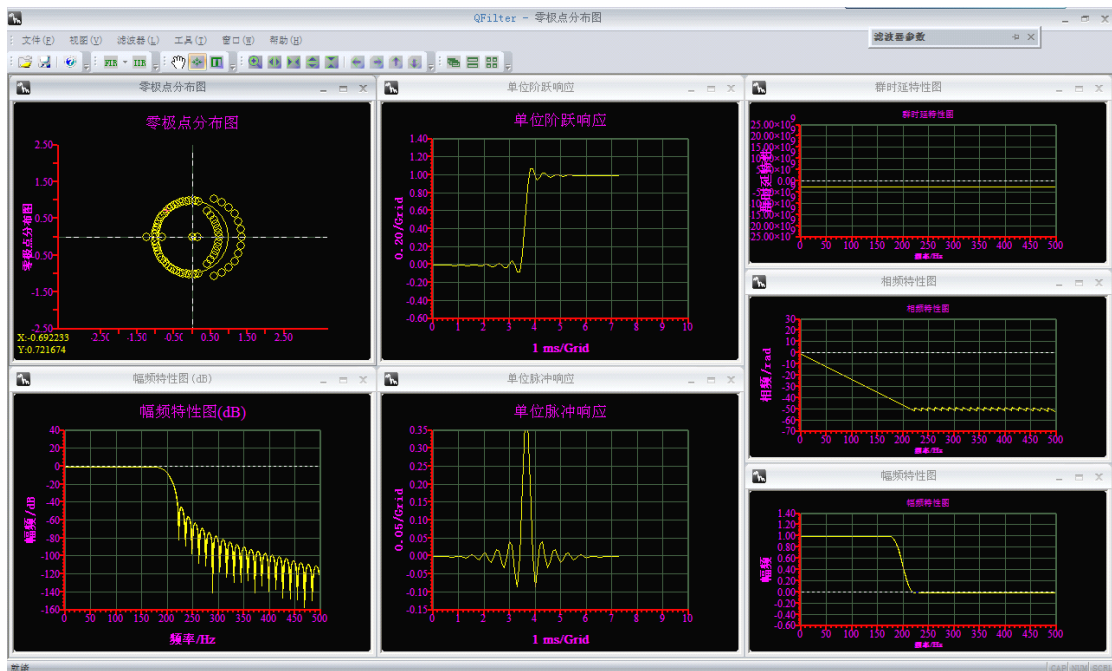


QFilter User Guide



InstruStart Electronic Technology

2011-5-29

contents

1.Introduction.....	1
2.filter design.....	2
2.1 FIR filter design - window method.....	2
2.2 FIR filter design - frequency sampling method.....	3
2.3 IIR filter design.....	4
2.4 data and bmp save.....	4

1. Introduction

QFilter support design IIR and FIR filter , and design of the filter can be used to collect data filtering and presentation of the theoretical simulation model; IIR filter which support the "Butterworth", "Chebyshev I ", " Chebyshev II ", "oval "type of filter design; FIR filter supports arbitrary amplitude and frequency of sampling ,Rectangle, bartlett, triangular, cosine, hanning, bartlett_hanning, hamming, blackman, blackman_Harris, tukey, Nuttall, FlatTop, Bohman, Parzen, Lanczos, kaiser, gauss and dolph_chebyshev window function method of design; supportd esigned to save the image; the design of $H(z)$ pole-zero coefficients and save as txt file, for other design system; the design parameters are saved into a fdd format, easy to open and for subsequent waveform processing and simulation.

2. filter design

2.1 FIR filter design - window method

Click the toolbar "FIR" button in the pop-up menu, select "Window method", will pop up a dialog box in the dialog box, fill in the desired design of the filter types and their parameters. When choosing and click "design" will appear corresponding to the filter "amplitude(dB)", "amplitude", "phase", "log Amplitude", "step response", "zero-pole" and "group delay" seven images. Figure 2.2 for the FIR hanning window length of 74 design results map.

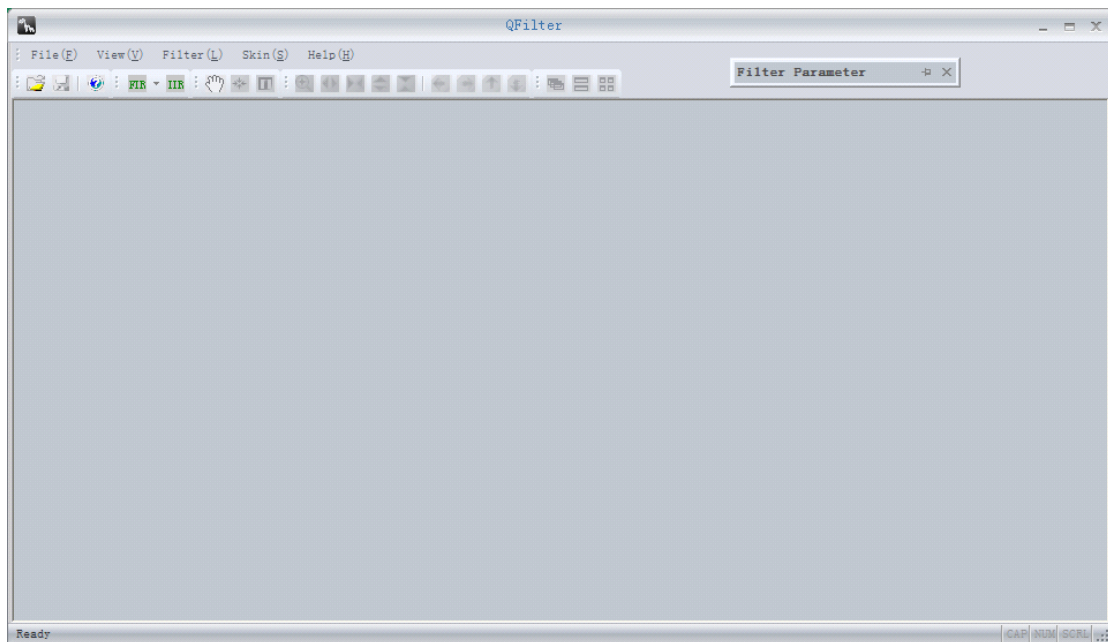


Figure 2.1 QFilter interface

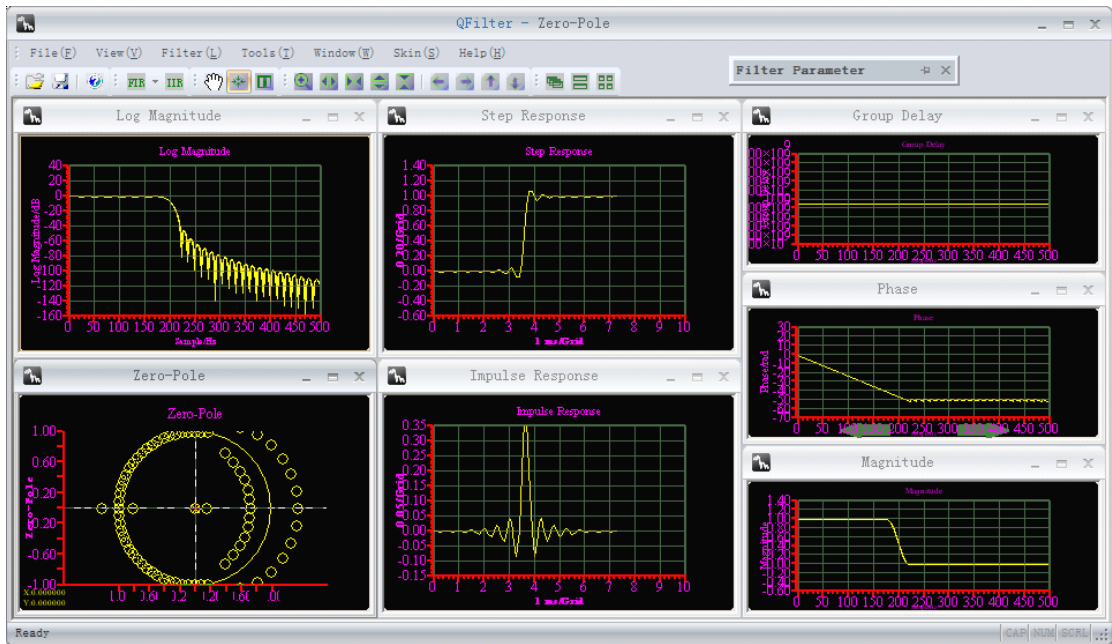


Figure 2.2 FIR hanning window length 74

2.2 FIR filter design - frequency sampling method

Click the toolbar "FIR" button, in the pop-up menu select "frequency sampling", will pop up a dialog box, shown in Figure 2.3.

Respectively, according to need to fill the order, the normalized frequency and the corresponding point of the range, plus choosing the type of window, and then click Design. Design was completed and results will appear curve. Design is complete, click OK, there will be corresponding to the filter "amplitude(dB)", "amplitude", "phase", "log Amplitude", "step response", "zero-pole" and "group delay" seven images. Figure 2.4 is the design of FIR frequency sampling results of Fig.

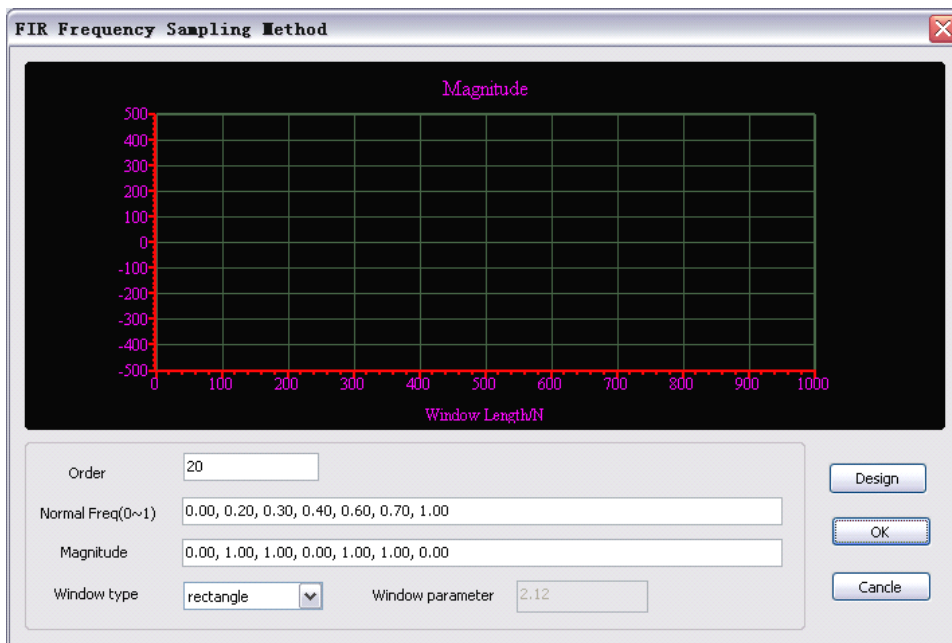


Figure 2.3 frequency sample design interface

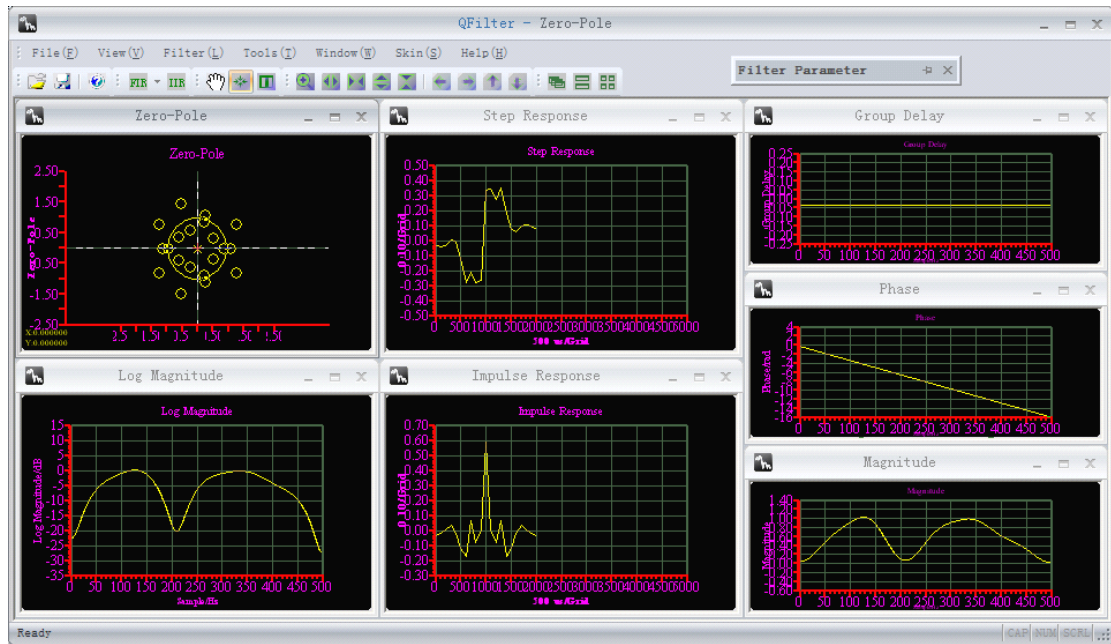


Figure 2.4 FIR frequency sample

2.3 IIR filter design

Click on the toolbar "IIR" button will pop up a dialog box in the dialog box, fill in the desired design of the filter types and their parameters. And FIR as fill parameters each time, and move the mouse, the software will be completed to determine the parameters are correct, if there is an error, the bottom of the dialog box will display, where the parameter is incorrect; when all parameters are right after the "order of the budget" will be given in the design of indicators to meet the kind of order of the filter.

Of course, you can also to choose the filter type, can be "Butterworth", "Chebyshev I", "Chebyshev II" and "ellip" and its order number. When choosing and click "design" will appear corresponding to the filter "amplitude(dB)", "amplitude", "phase", "log Amplitude", "step response", "zero-pole" and "group delay" seven images. Figure 2.5 is 7 order IIR elliptical design result.

2.4 data and bmp save

When designing a good filter, you can save the data and images. Click on the toolbar or menu item "Save" dialog box will pop up to save, in the "Save as type" drop-down combo box, select the corresponding txt, fdd would be able to filter $H(z)$ coefficients stored, select the bmp they can save the images (Figure 2.6).

For txt format, in the dialog box below, "the output coefficient formatting", you can specify to save $H(z)$ or pole-zero; can specify the output of $H(z)$ pole-zero coefficients and in what kind of format, you can also choose whether the parameters and then multiplied by a factor of the output. For example: Select% 0.0f, and multiplied by the factor given is 4096, then the output will be multiplied by the coefficient will be designed after the integer part of 4096, there is no fractional part.

For fdd format, the filter can be designed for each parameter are preserved for future to open or for a given waveform filtering.

For the bmp format, you can "bmp save" and select "Save all images" check box, so one will

be able to save seven images.

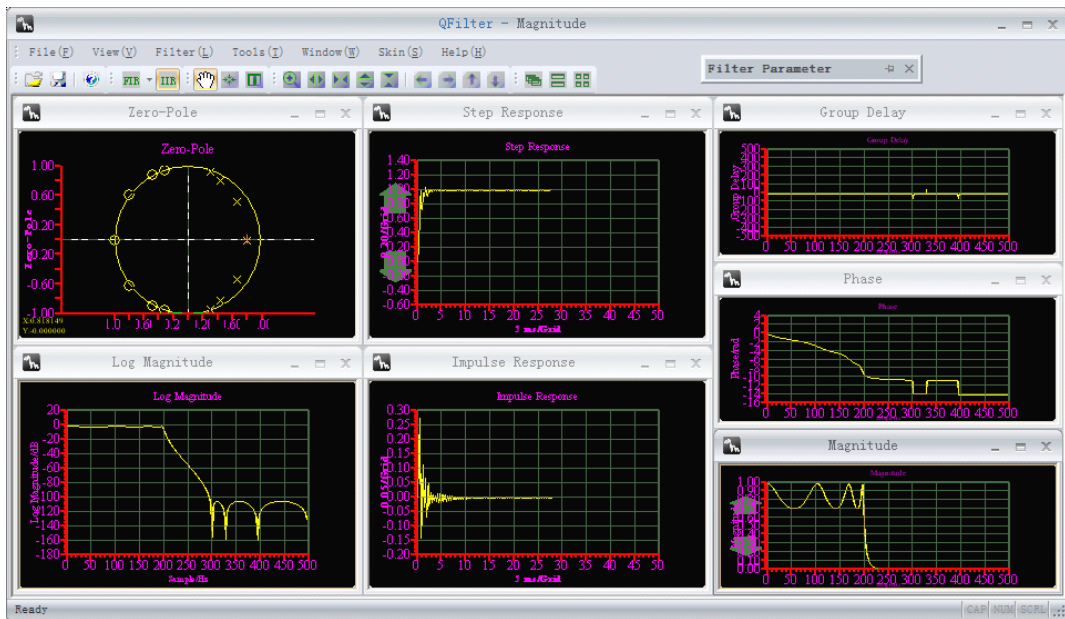


Figure 2.5 IIR 7 order elliptical

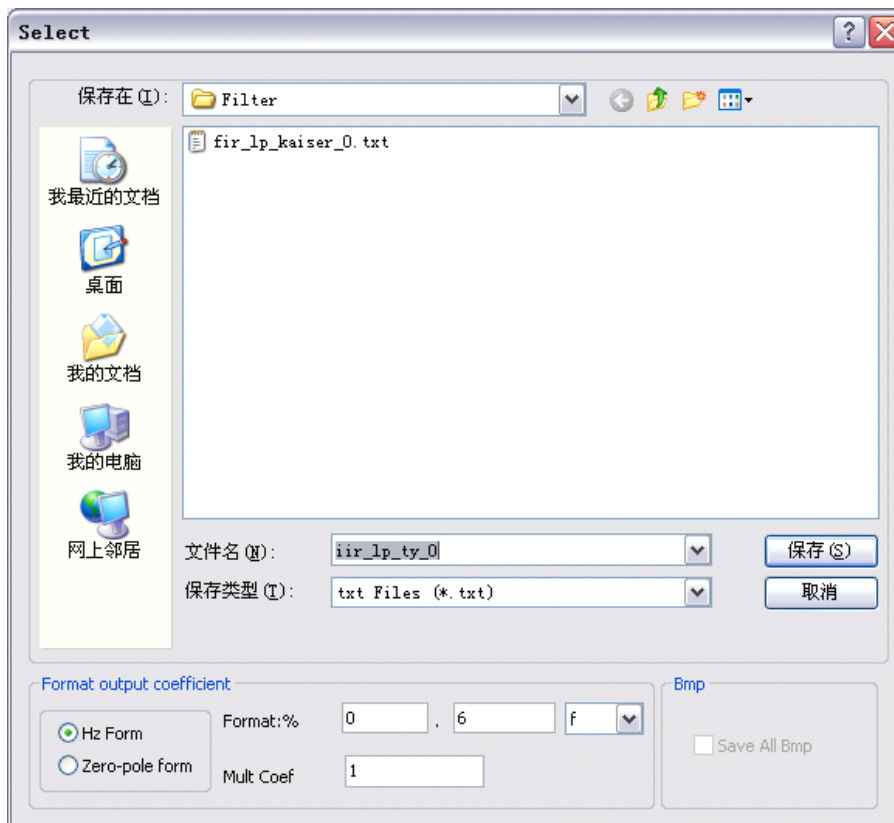


Figure 2.6 save dialog