

## Design of FIR Filter using Kaiser Window

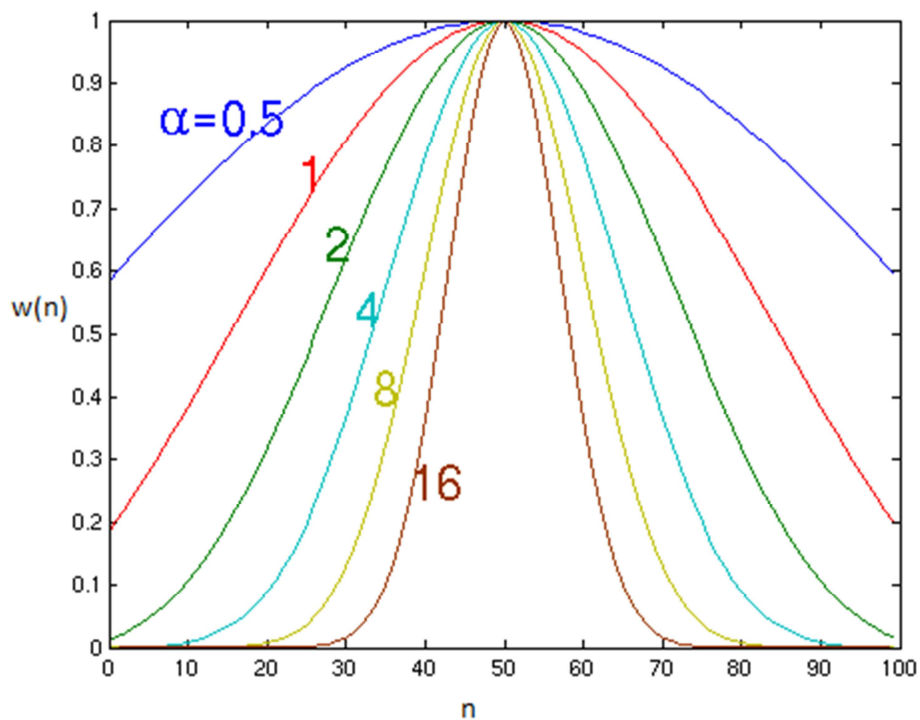
### Kaiser window:

It is a parametric window function that facilitates the designer to select the value of the ripple parameter  $\pi\alpha$ . The  $\pi\alpha$  parameter enables to tradeoff between the ripple and the transition bandwidth. It is a generalized window function, which gives a particular kind of window function depending on the value of  $\pi\alpha$  chosen. The coefficients of the Kaiser window, which uses the modified zero<sup>th</sup> order Bessel function  $I_0(x)$ , are usually calculated using some software package.

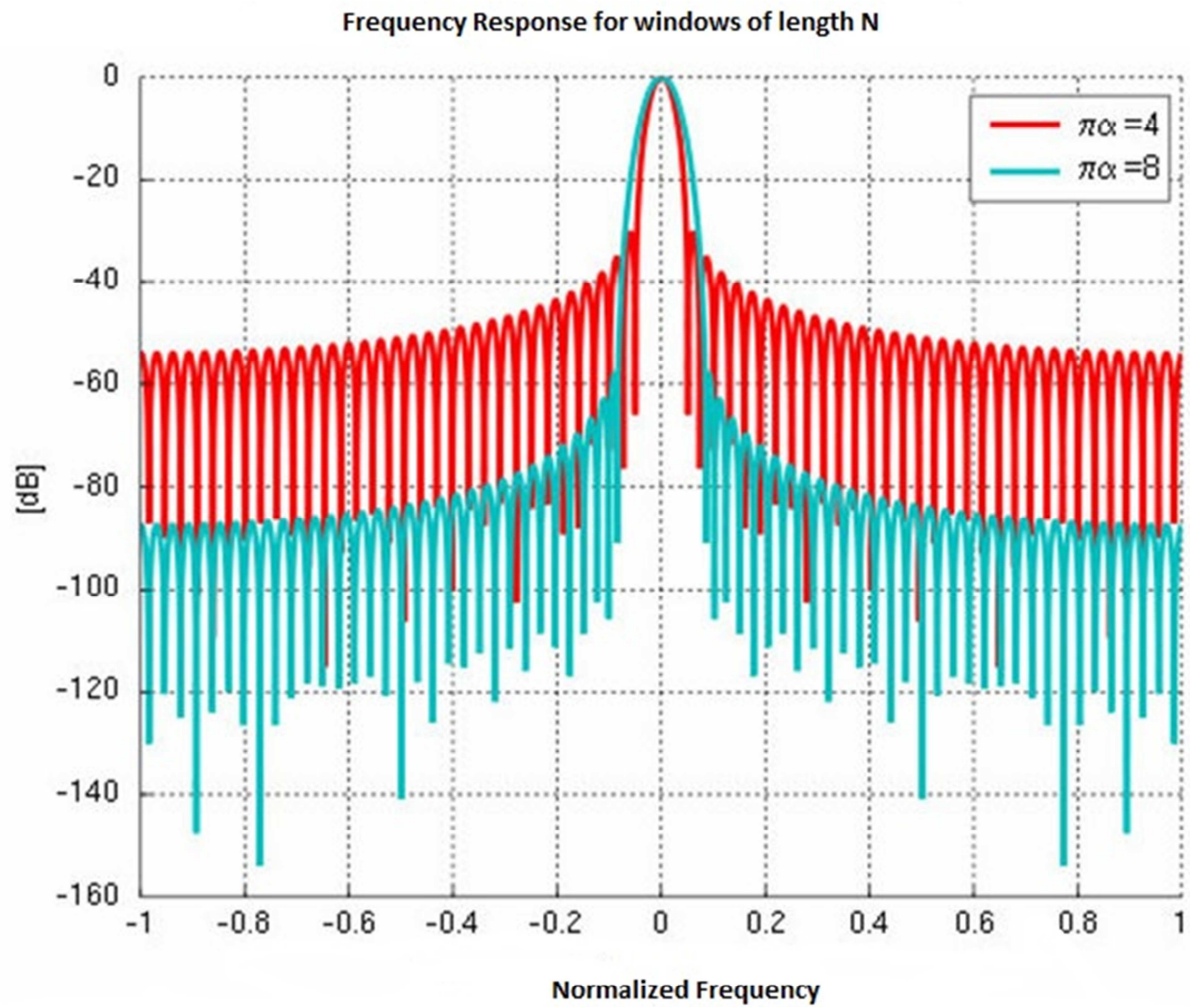
$$w[n] = \begin{cases} \frac{I_0\left(\pi\alpha\left(1 - \left(\frac{2n}{N}\right)^2\right)^{1/2}\right)}{I_0(\pi\alpha)}, & 0 \leq n \leq N \\ 0, & \text{otherwise} \end{cases}$$

N= Length of window.

$I_0$  = Modified Bessel's Function of first order



Kaiser window of length N=100



**References:**

- CC Studio examples.
- TMS320C6713 Datasheet, User Manual (and supporting documents).
- [http://en.wikipedia.org/wiki/Finite\\_impulse\\_response](http://en.wikipedia.org/wiki/Finite_impulse_response).
- [http://en.wikipedia.org/wiki/Kaiser\\_window](http://en.wikipedia.org/wiki/Kaiser_window).
- <http://www.labbookpages.co.uk/audio/firWindowing.html>.