

# YANKEE BUSH SOFTWARE LLC



Digital IIR Low-Pass  
Filter Design Using the  
Chebyshev-I Prototype

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Design  
specific

## Problem Description

Design a digital IIR lowpass filter using the Chebyshev-I prototype to meet the following specifications:

$$\begin{aligned}\omega_p &= 0.22\pi, & R_p &= 0.5dB \\ \omega_s &= 0.32\pi, & A_s &= 20 dB\end{aligned}$$

Plot the magnitude response, the phase response, the magnitude in dB and the group delay.



## Matlab Source Code

```
%Design of digital IIR low pass filter using chebyshev-I prototype

clc;

clear all;

wp=0.22 ;% normalised frequency

ws=0.32;

Rp=0.5;% in db

As=20;% in db

[n wn]=cheb1ord(wp,ws,Rp,As);

[b a]=cheby1(n,Rp,wn);

fvtool(b,a);

h=fvtool(b,a,'analysis','phase');

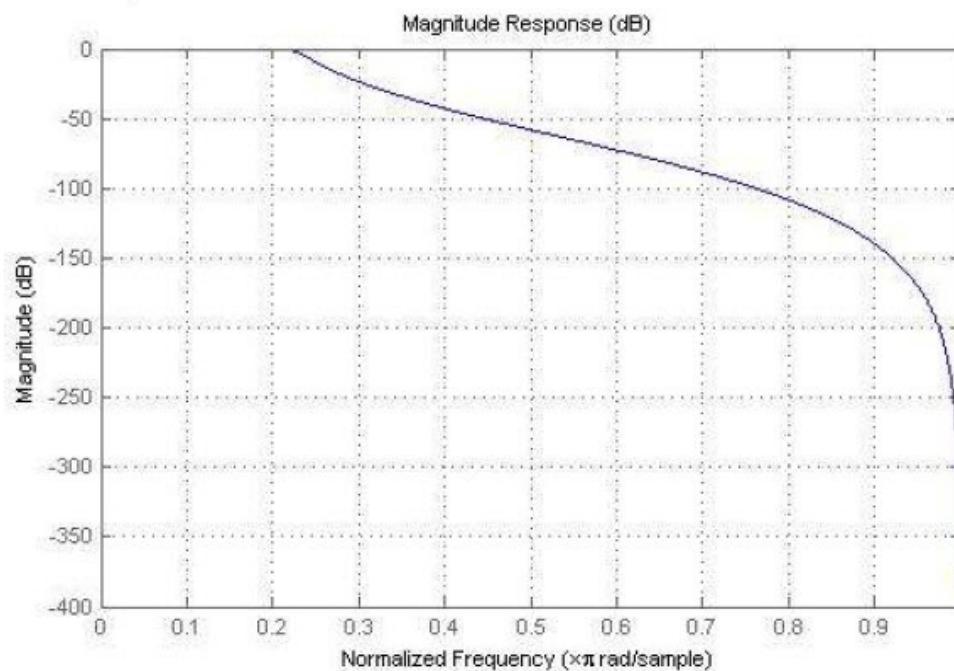
hFVT = fvtool(b,a,'Analysis','grpdelay');

set(hFVT,'NumberofPoints',128);
```

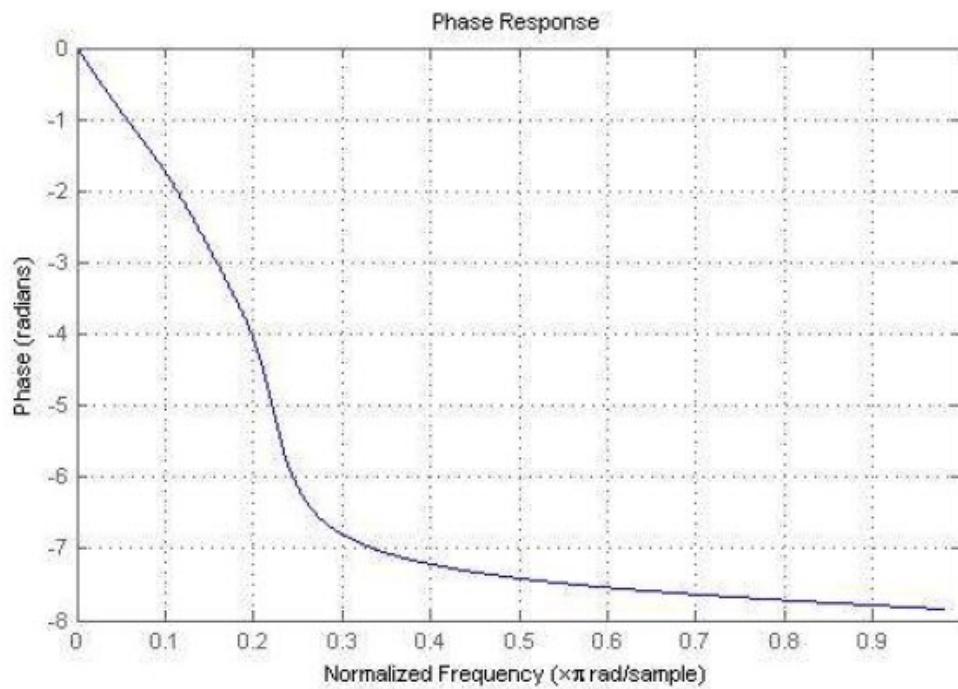
M  
IN

## Simulations

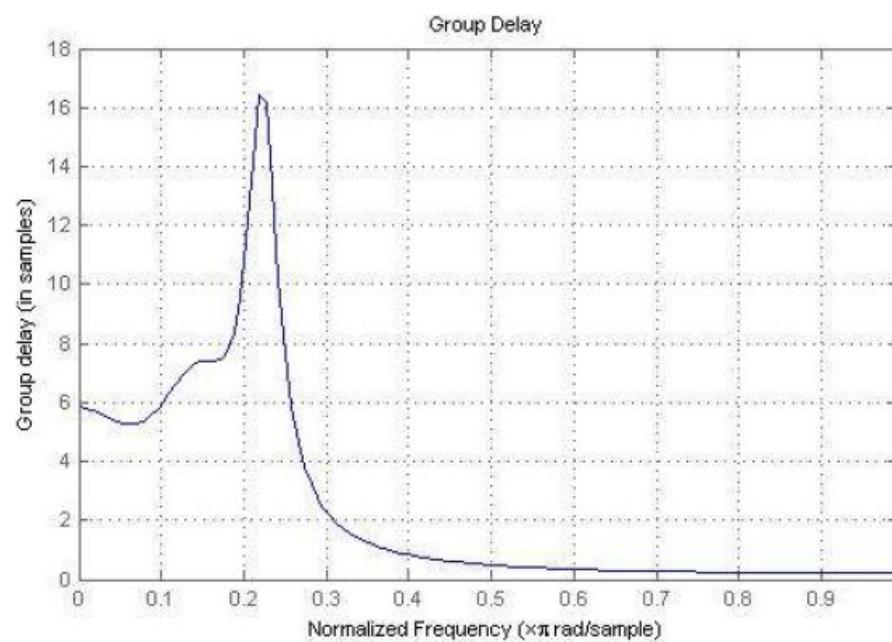
### MAGNITUDE RESPONSE(MAGNITUDE IN DB)



# PHASE RESPONSE(MAGNITUDE IN DB)



# GROUP DELAY





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