

---

## Table of Contents

.....	1
Single Stage Filter .....	1
Multi Rate Filter .....	2
Polyphase Filter .....	4

```
clear all;close all;clc
[snd,fs] = audioread('Wagner.wav');
newfs = 24000;
```

## Single Stage Filter

```
% Test the Impulse Response
figure
fprintf('Impulse ')
ySS = srconvertSingleStage([1 zeros(1,3000)]');
verify(ySS);

% Test the File
fprintf('Wagner ')
wSS=srconvertSingleStage(snd);
% Listen to before and after filtered sound
soundsc(snd,fs)
waitforbuttonpress
soundsc(wSS,newfs)

% Write out file
audiowrite('WagnerSingleStage.wav',wSS,newfs);

Impulse srconvertSingleStage time: Elapsed time is 0.124072 seconds.

ans =

    'Passband Ripple:      0.053 dB'
    '

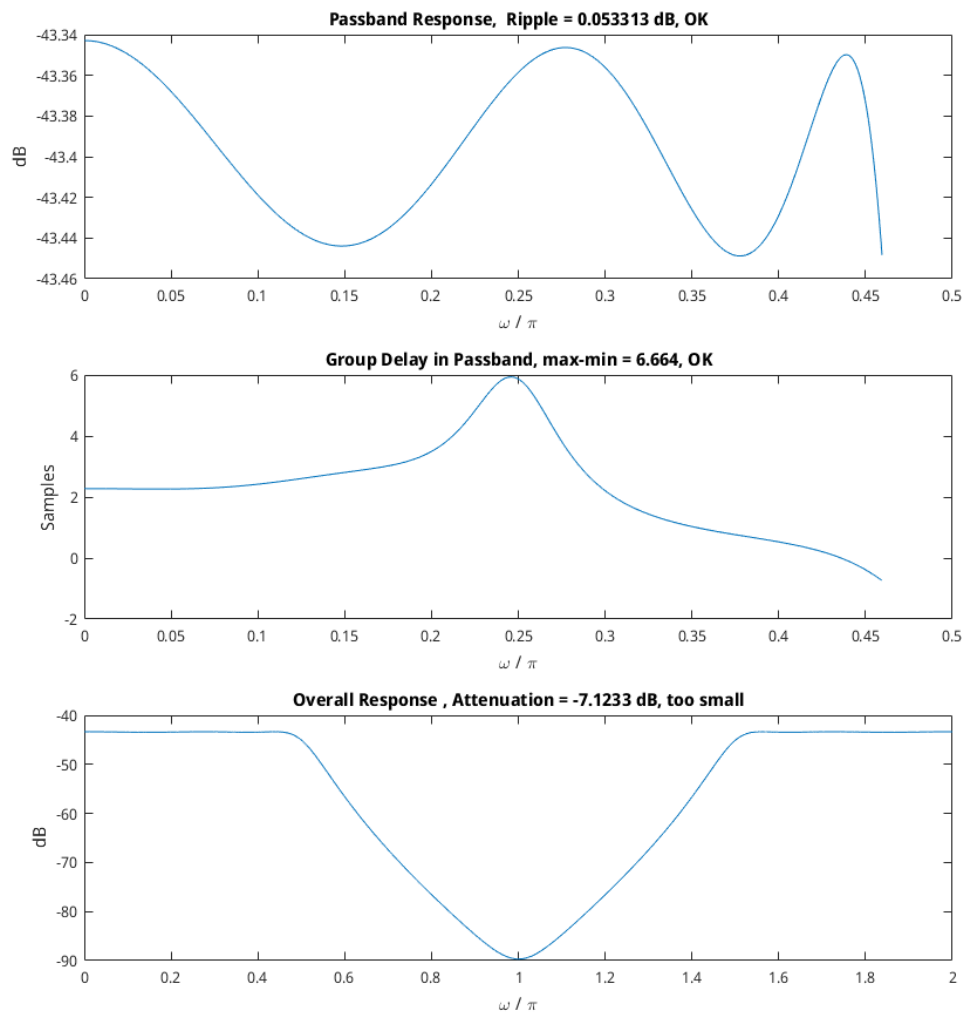
ans =

    'Groupdelay Variation:  6.663977e+00  samples'
    '

ans =

    'Stopband Attenuation:  -7.123 dB'
    '

Wagner srconvertSingleStage time: Elapsed time is 0.345671 seconds.
```



## Multi Rate Filter

```
waitforbuttonpress
close all

% Test the Impulse Response
figure
fprintf('Impulse ')
yMR = srconvertMultiRate([1 zeros(1,3000)]');
verify(yMR);

% Test the File
fprintf('Wagner ')
wMR=srconvertMultiRate(snd);
% Listen to before and after filtered sound
soundsc(snd,fs)
```

---

```
waitforbuttonpress
soundsc(wMR,newfs)

% Write out file
audiowrite('WagnerMultiRate.wav',wMR,newfs);

Impulse srconvertMultiRate time: Elapsed time is 0.018120 seconds.

ans =

    'Passband Ripple:      0.079 dB'
    '

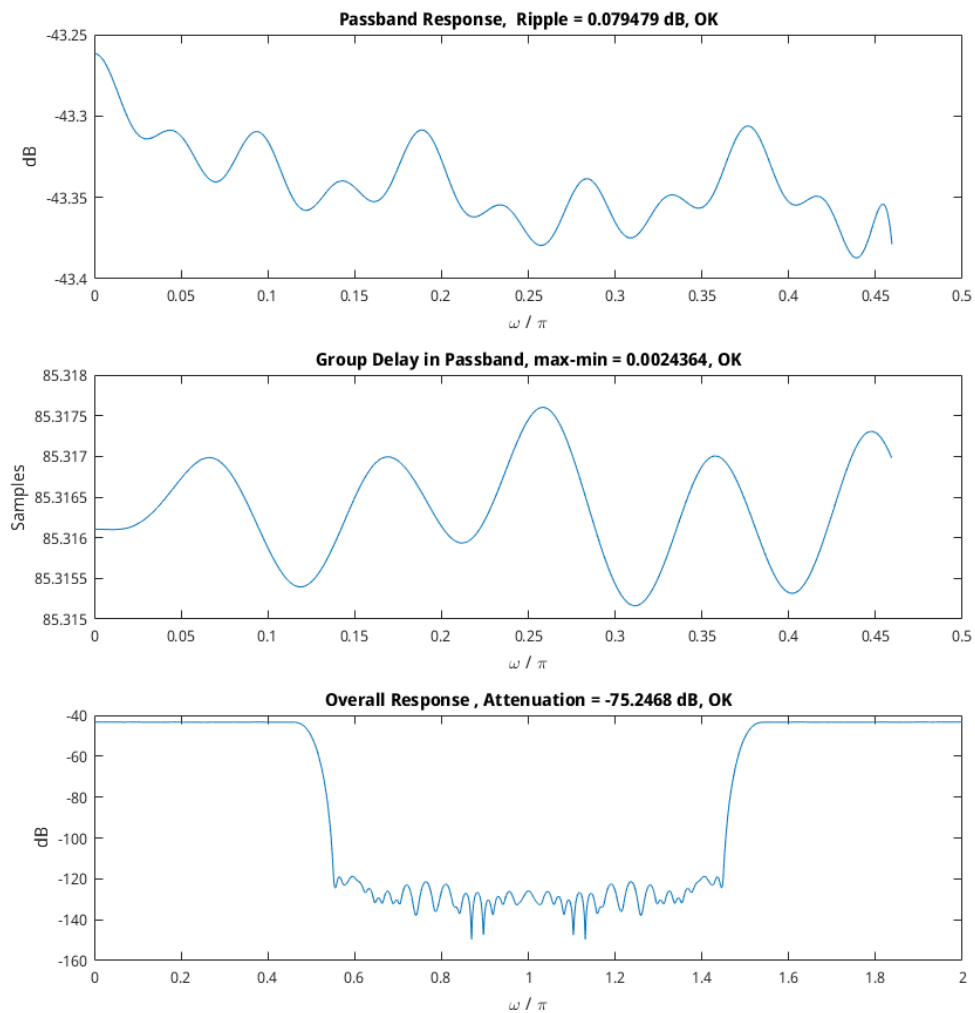
ans =

    'Groupdelay Variation: 2.436439e-03 samples'
    '

ans =

    'Stopband Attenuation: -75.247 dB'
    '

Wagner srconvertMultiRate time: Elapsed time is 0.333003 seconds.
```



## Polyphase Filter

```
waitforbuttonpress
close all

% Test the Impulse Response
figure
fprintf('Impulse ')
yPP = srconvertPolyPhase([1 zeros(1,3000)]');
verify(yPP);

% Test the File
fprintf('Wagner ')
wPP=srconvertPolyPhase(snd);
% Listen to before and after filtered sound
soundsc(snd,fs)
```

---

```
waitforbuttonpress
soundsc(wPP,newfs)

% Write out file
audiowrite('WagnerPolyPhase.wav',wPP,newfs);

Impulse srconvertPolyPhase time: Elapsed time is 0.052162 seconds.

ans =

    'Passband Ripple:      0.079 dB'
    '

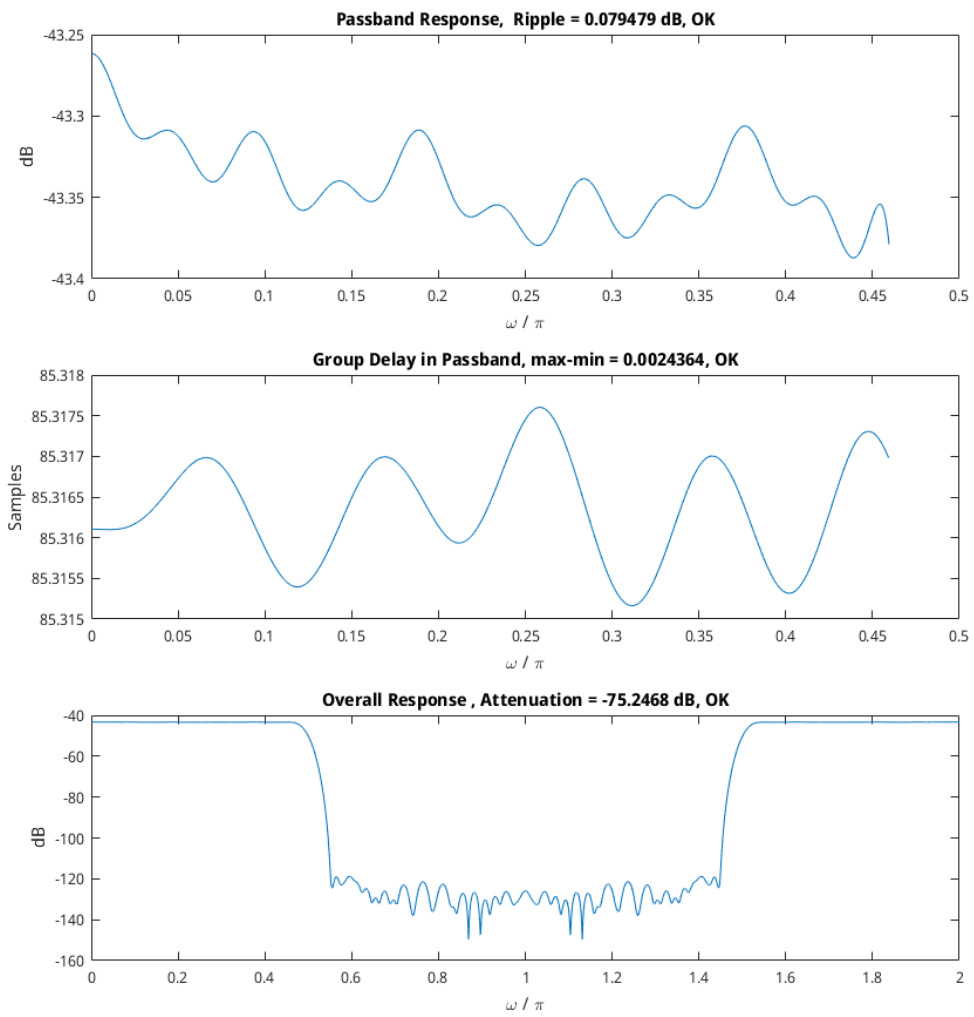
ans =

    'Groupdelay Variation: 2.436439e-03 samples'
    '

ans =

    'Stopband Attenuation: -75.247 dB'
    '

Wagner srconvertPolyPhase time: Elapsed time is 1.436319 seconds.
```



*Published with MATLAB® R2017a*