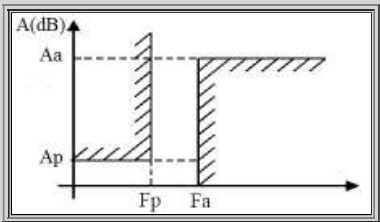# SUMMARY OF FILTER

by Analog Filter Pro
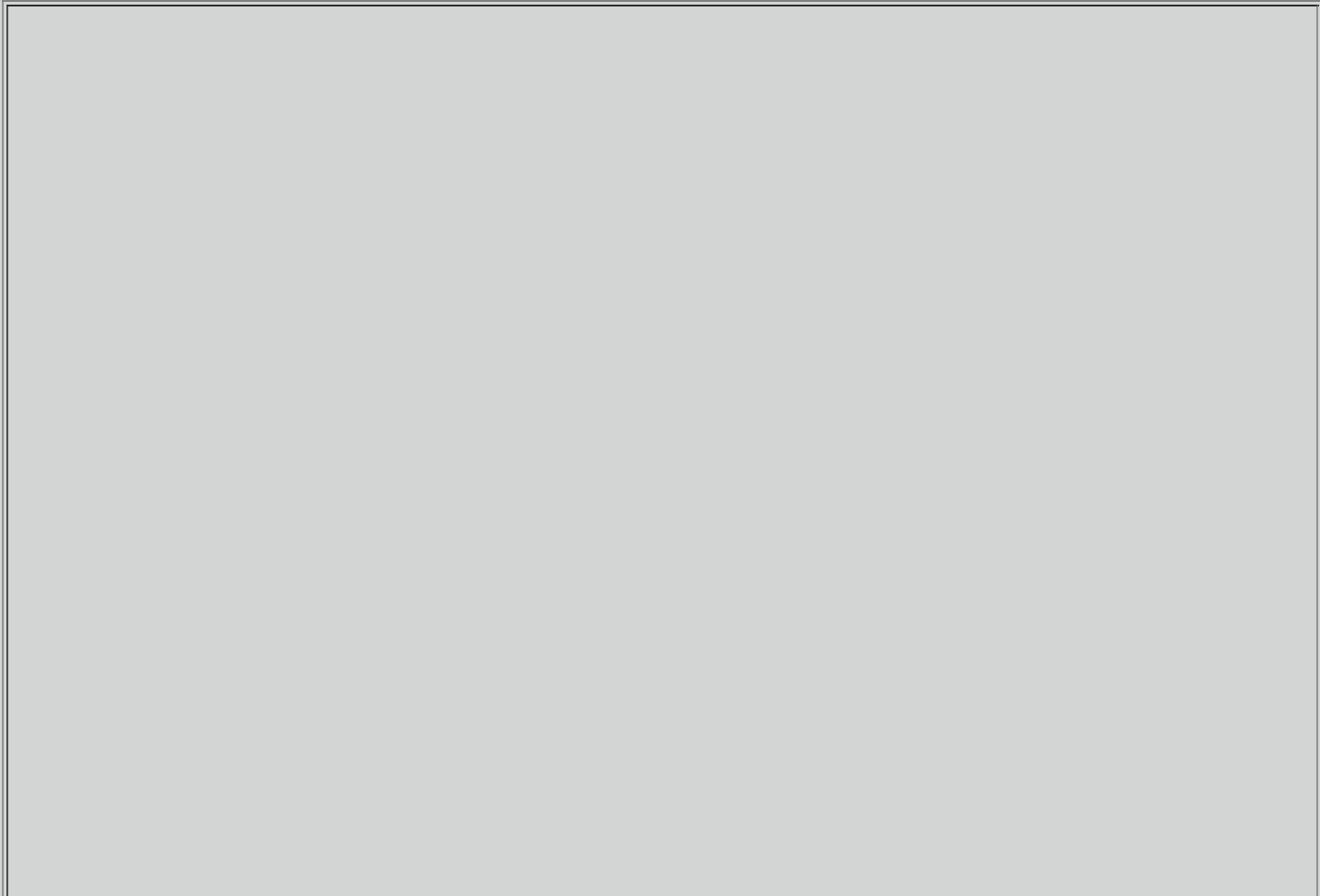
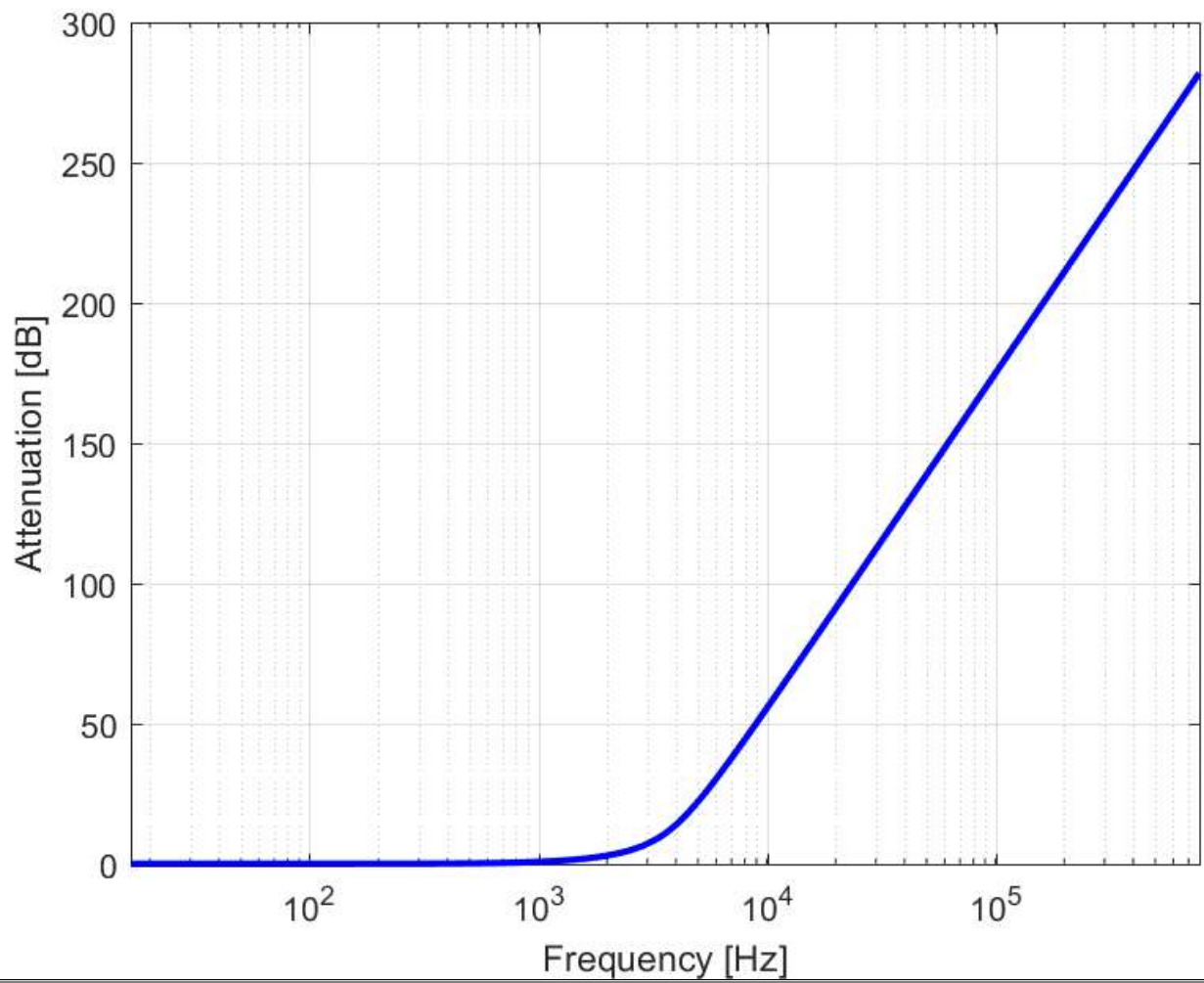## Lowpass Bessel

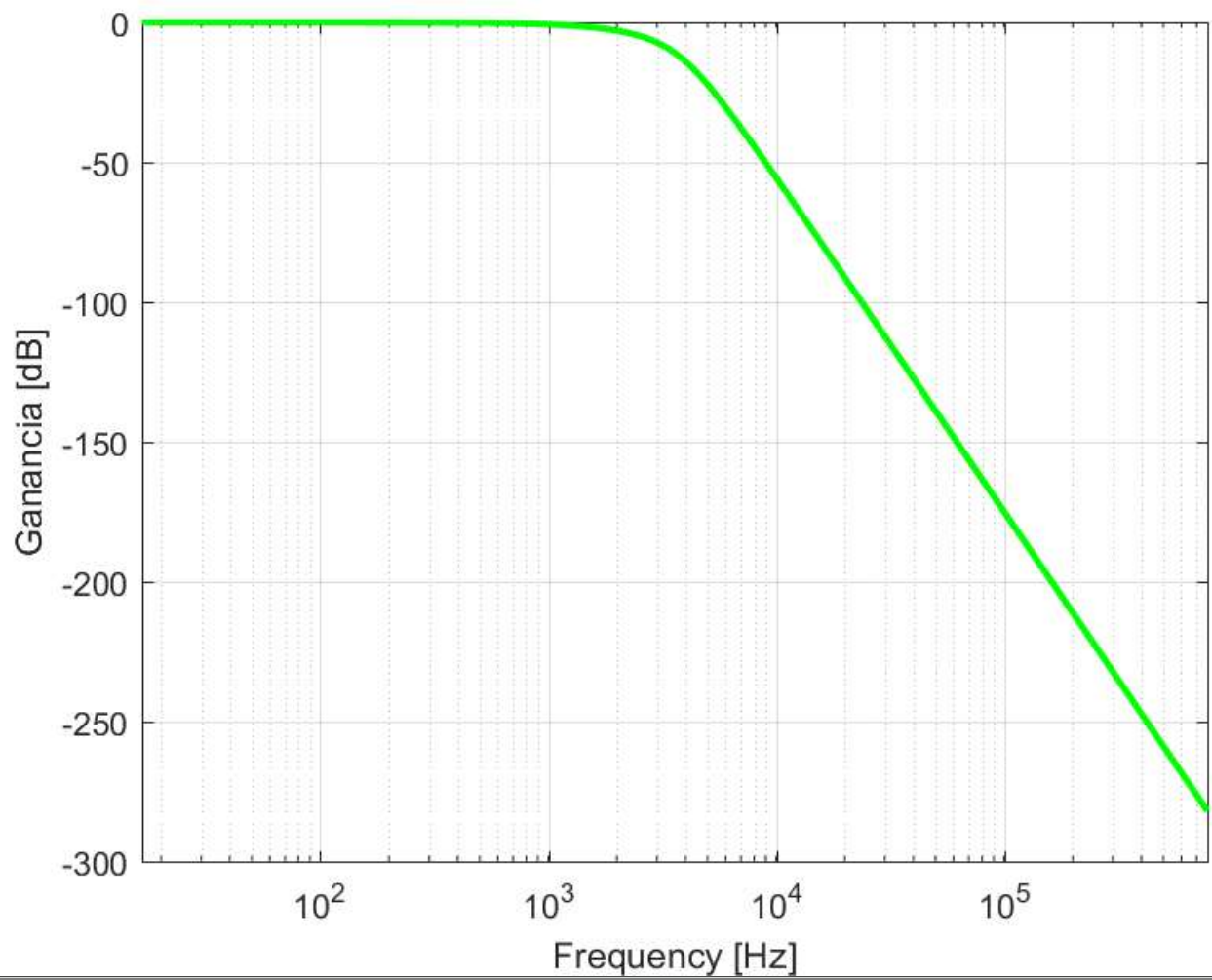### Filter Characteristics

Filter Properties					
Gain [dB]	Fp [Hz]	Fa [Hz]	Ap [dB]	Aa [dB]	Order
0	1.65k	7.8k	2	43	6

Attenuation Plot:

Gain Plot:

Phase Plot:
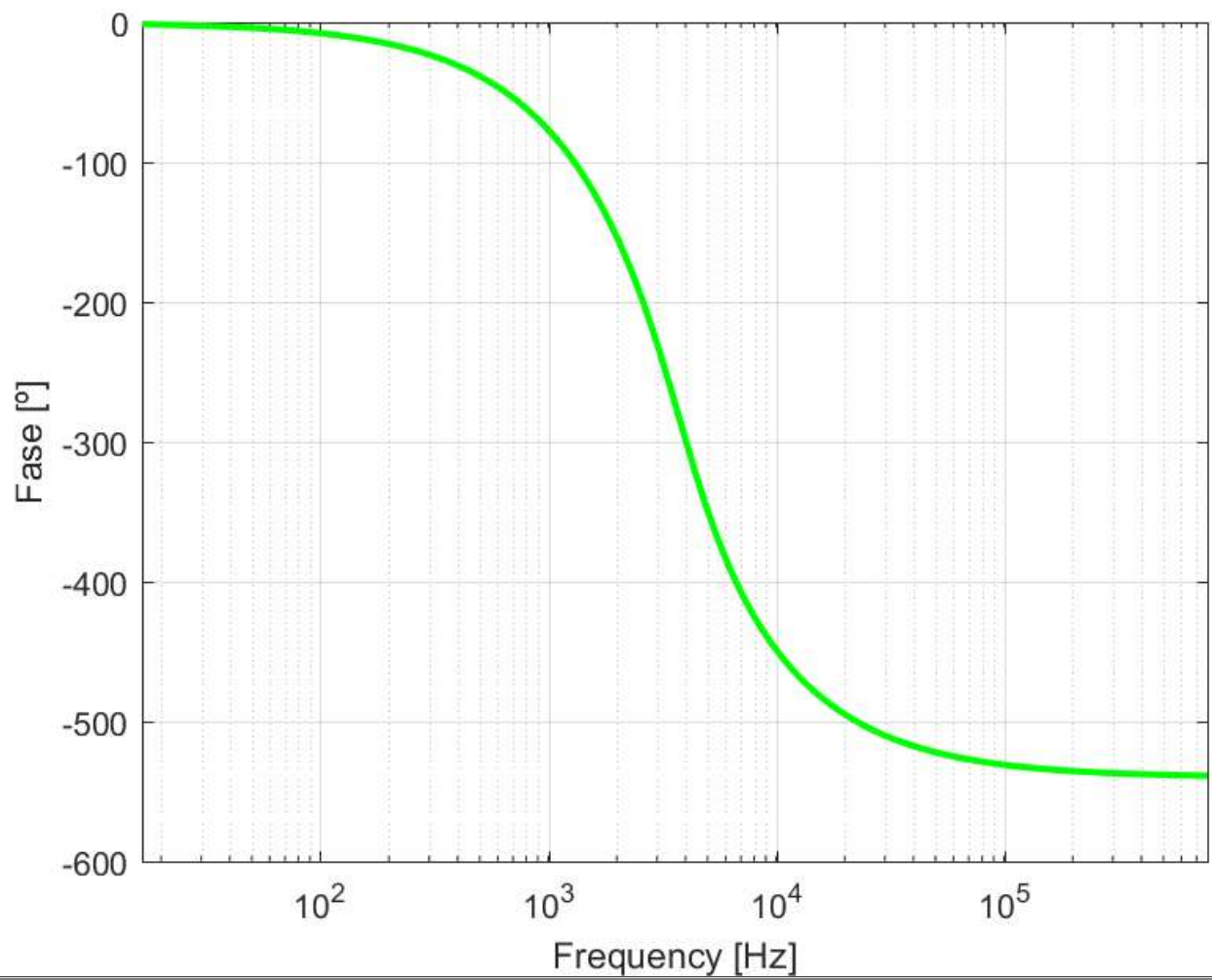
Group Delay:
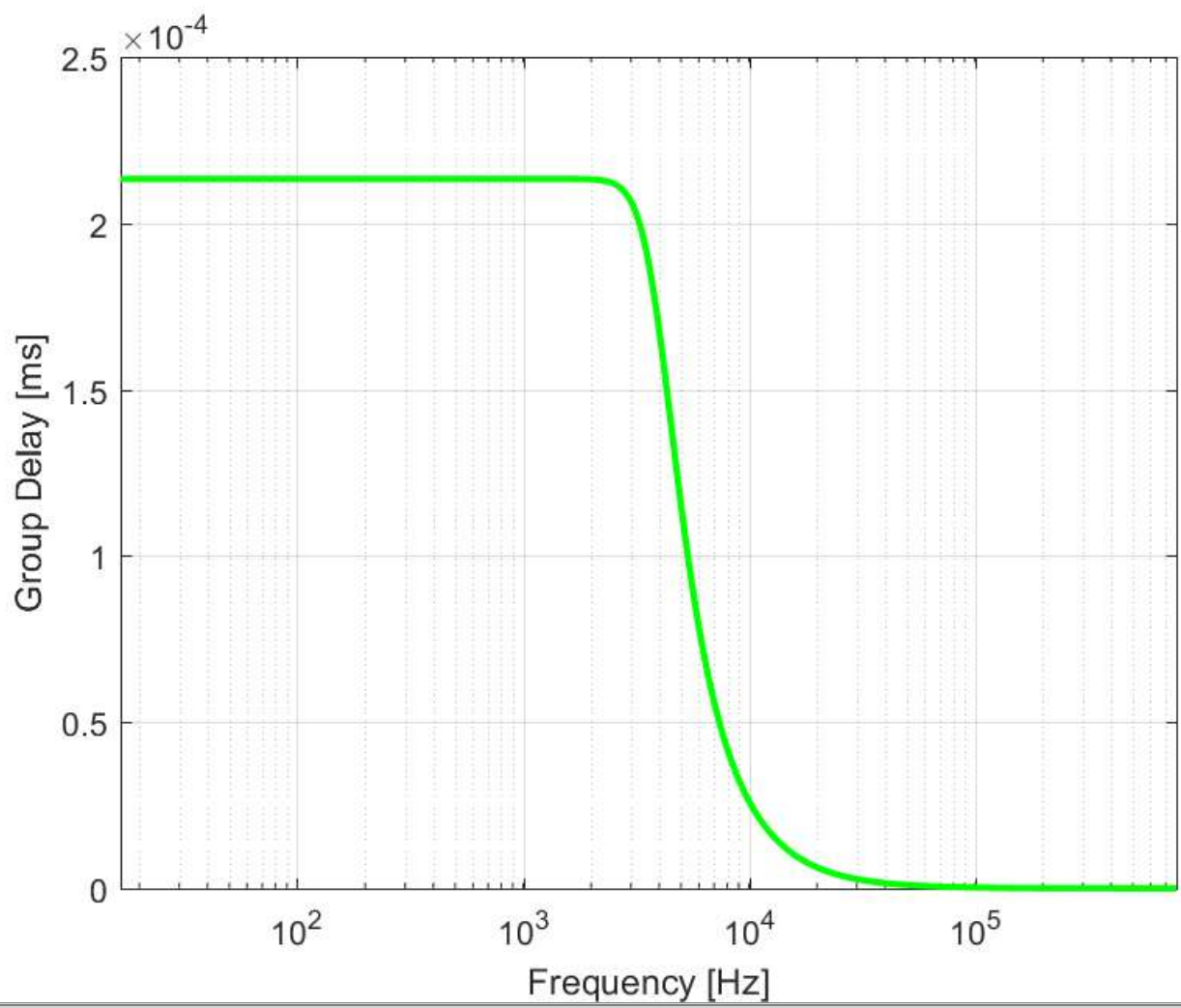
Step Response:
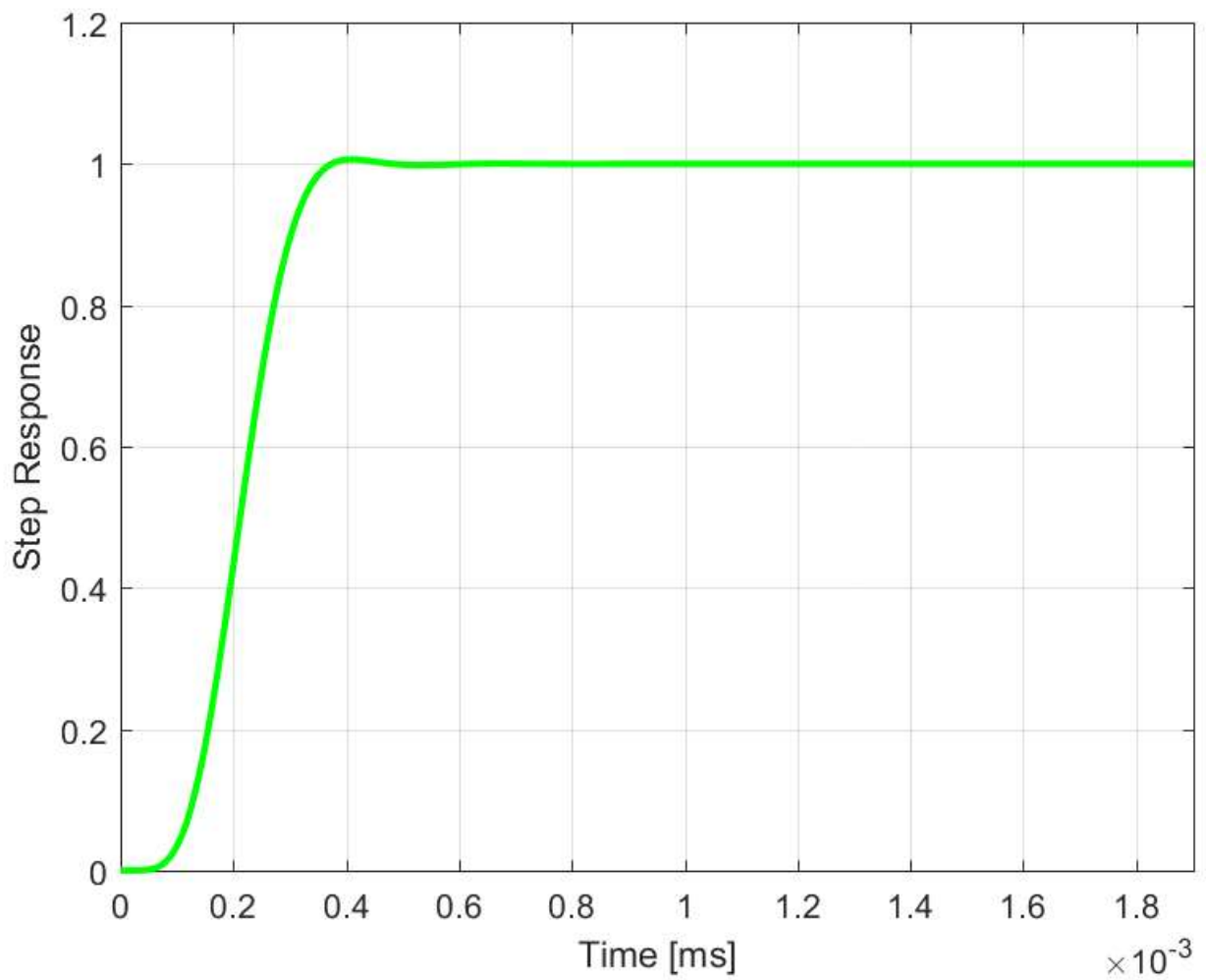
Impulse Response:
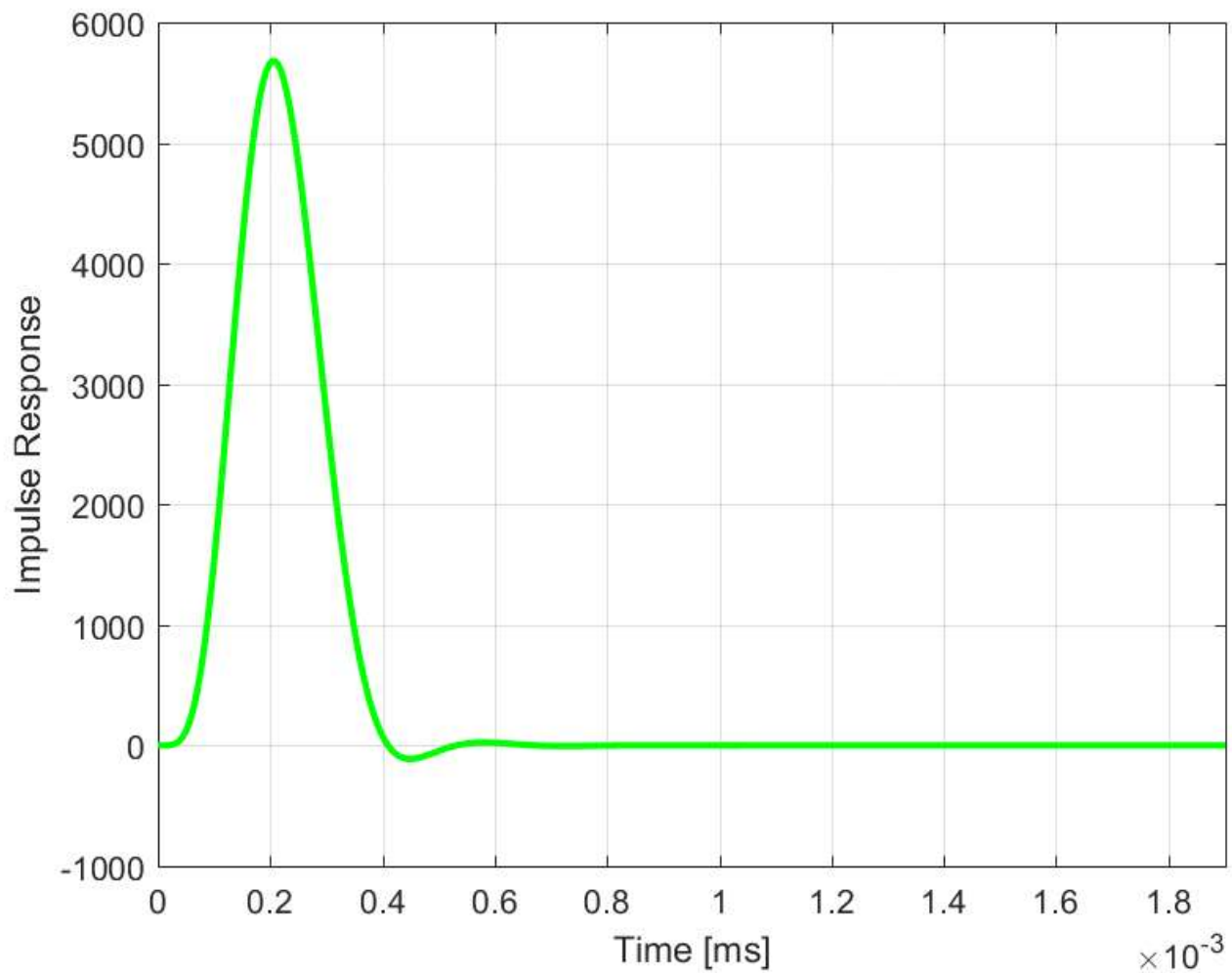
Stage Nº1: SK Low Pass
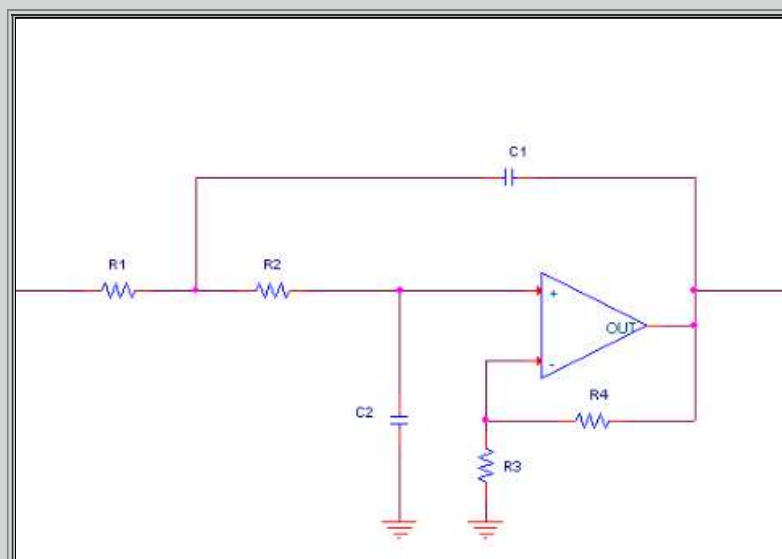
Stage Properties					
Type	Order	f_0 [Hz]	Gain [dB]	Q	Dinamic Range [dB]
LowPass	2	3.2k	2	0.51	38.1

Stage Attenuation:
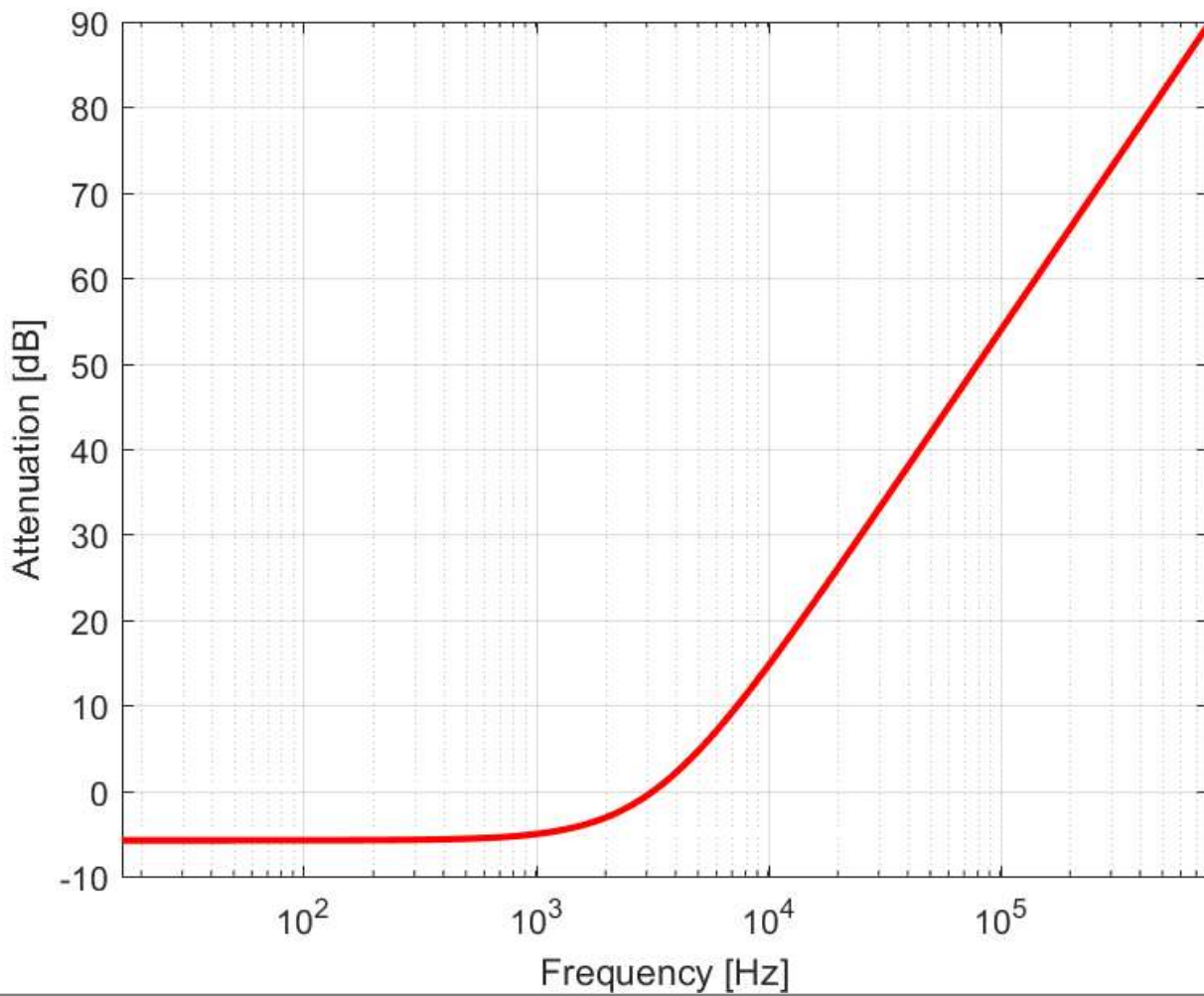
Calculated components for the specified filter:

Components					
Resistor [Ω]				**Capacitor [F]**	
R_1	R_2	R_3	R_4	C_1	C_2
50k	50k	603.9	470	766.98p	1.26n

Approximation of the components with commercial values:

Components with commercial values				
		Combination	**Result**	**Error**
Resistor	R_1	100kΩ // 100kΩ	50kΩ	0.0%
	R_2	100kΩ // 100kΩ	50kΩ	0.0%
	R_3	680Ω // 5.6kΩ	606.37Ω	0.4%
	R_4	470Ω	470Ω	0.0%
Capacitor	C_1	1000pF + 3.3nF	767.44pF	<0,1%
	C_2	68pF // 1.2nF	1.27nF	0.4%

Sensitivity of each component:

Sensitivities			
	S_X^G	S_X^Q	S_X^{Wp}
R_1	0.00	0.15	-0.50

R_2	0.00	-0.15	-0.50
R_3	-0.44	-0.31	0.00
R_4	0.44	0.31	0.00
C_1	0.00	0.81	-0.50
C_2	0.00	-0.81	-0.50

Stage Nº2: SK Low Pass
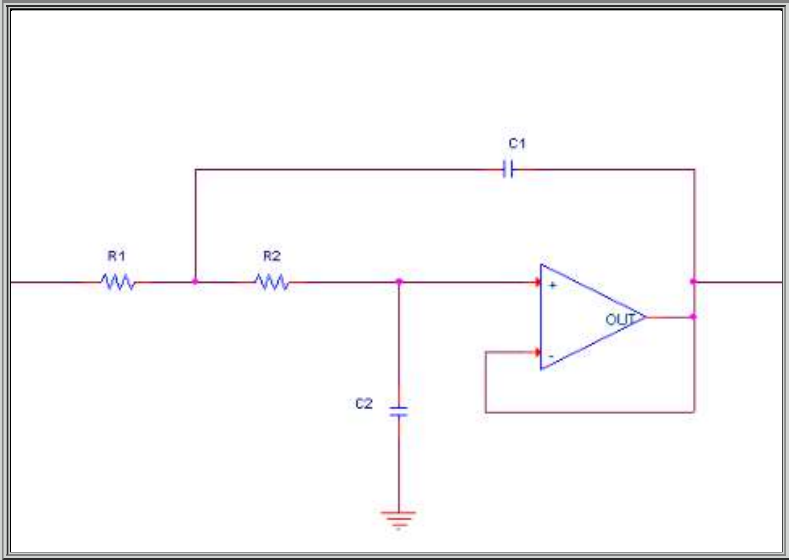
Stage Properties					
Type	Order	f_0 [Hz]	Gain [dB]	Q	Dinamic Range [dB]
LowPass	2	3.4k	1	0.61	39.2

Stage Attenuation:
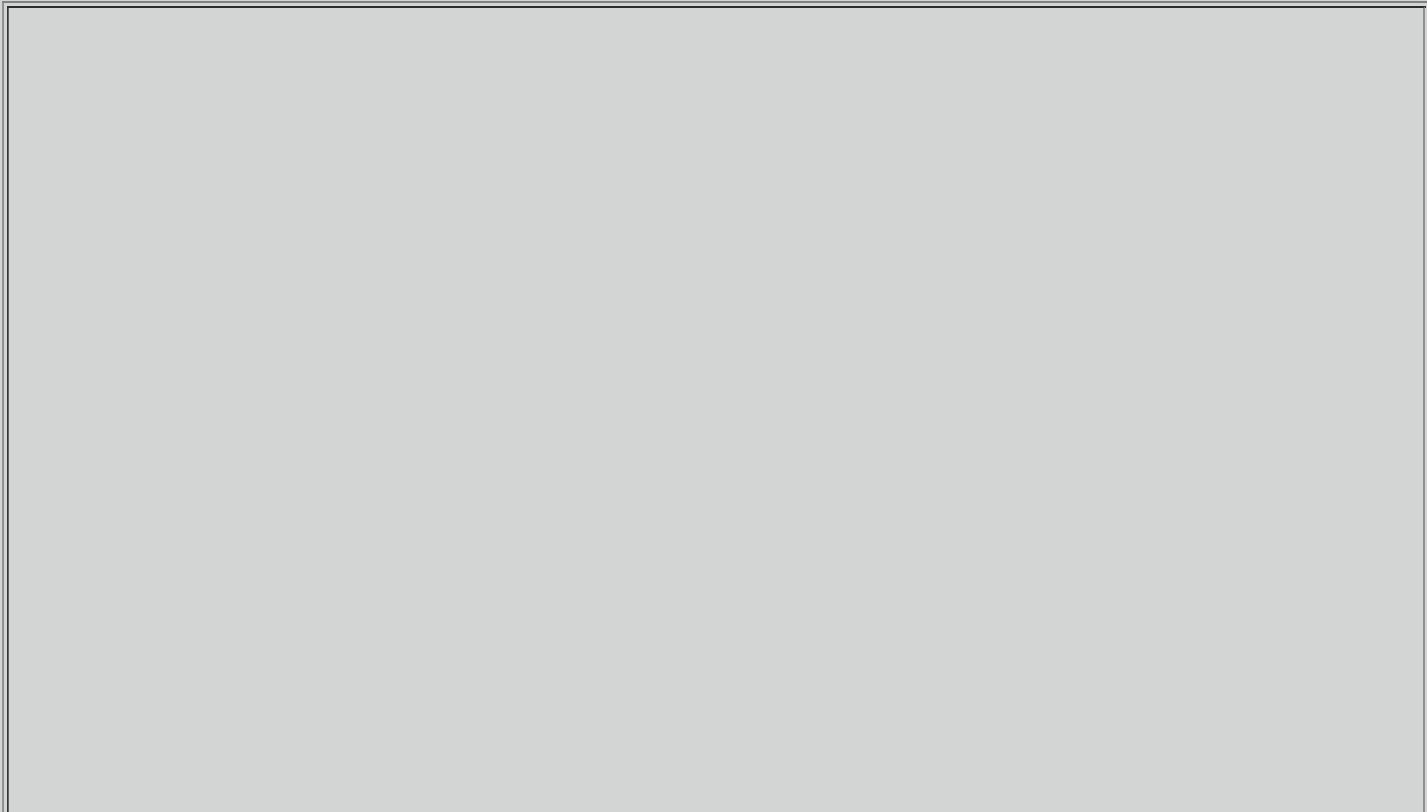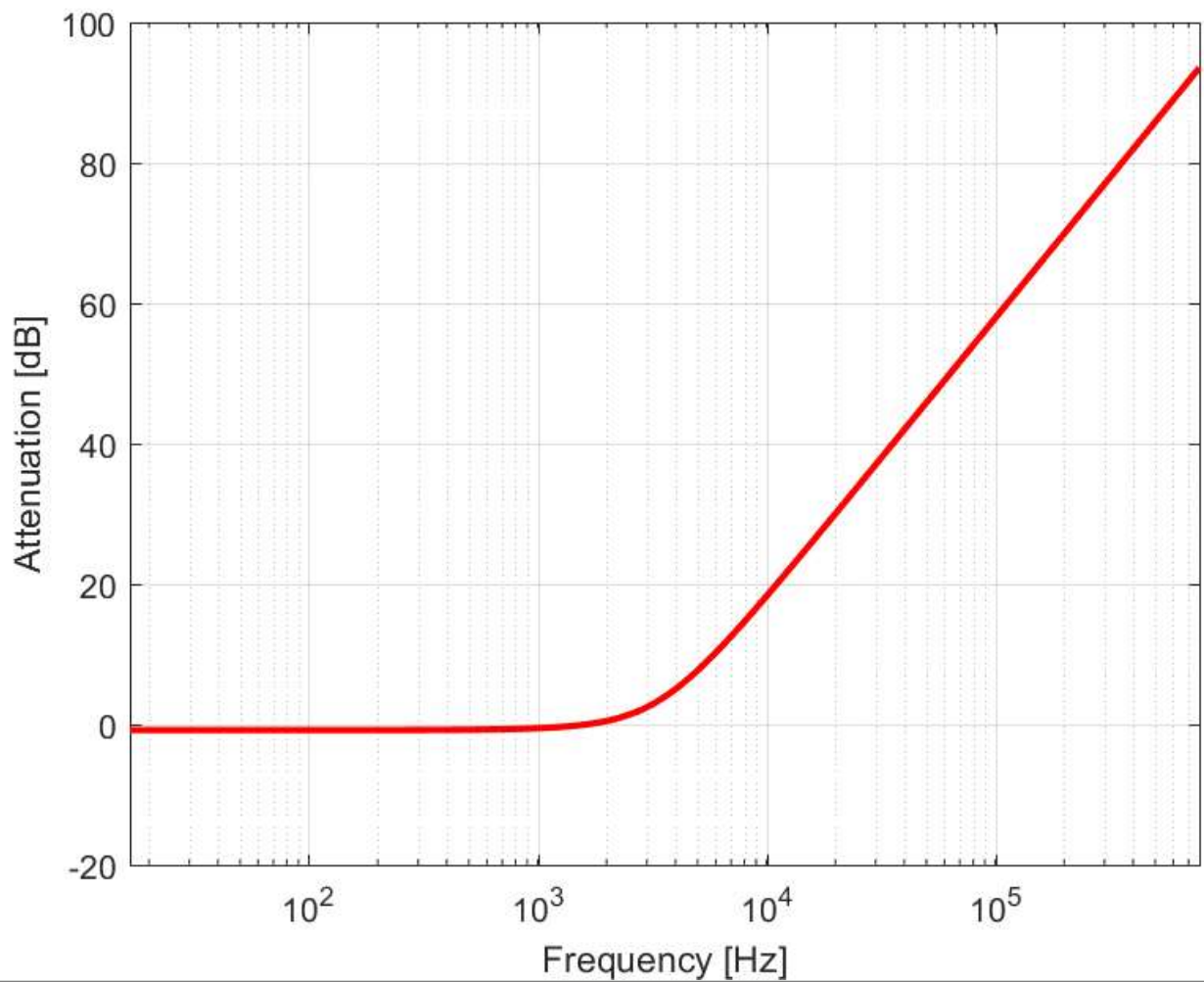
Calculated components for the specified filter:

Components			
Resistor [Ω]		Capacitor [F]	
R_1	R_2	C_1	C_2
4.7k	4.7k	12.15n	8.13n

Approximation of the components with commercial values:

Components with commercial values				
		Combination	Result	Error
Resistor	R_1	4.7kΩ	4.7kΩ	0.0%
	R_2	4.7kΩ	4.7kΩ	0.0%
Capacitor	C_1	150pF // 12nF	12.15nF	<0,1%
	C_2	8.2nF + 1uF	8.13nF	<0,1%

Sensitivity of each component:

Sensitivities			
	S_X^G	S_X^Q	S_X^{Wp}
R_1	0.00	0.00	-0.50
R_2	0.00	0.00	-0.50
C_1	0.00	0.50	-0.50

	C₂	0.00	-0.50	-0.50

Stage Nº3: SK Low Pass
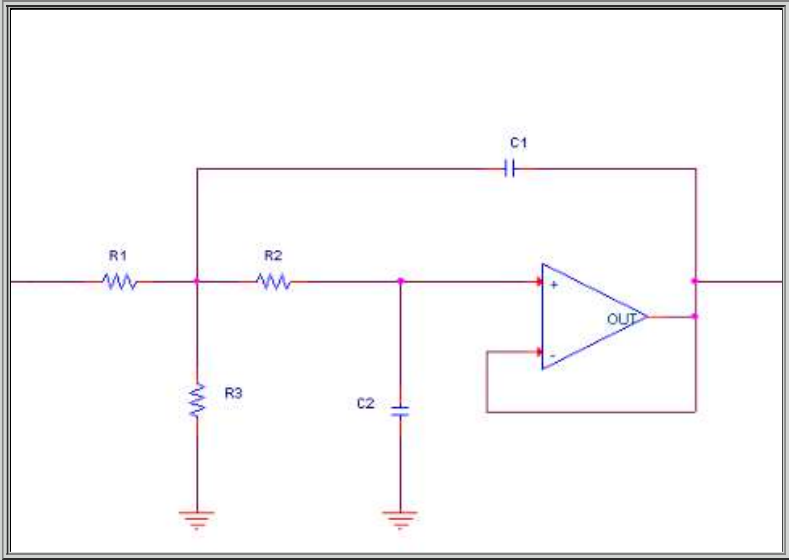
Stage Properties					
Type	Order	f_0 [Hz]	Gain [dB]	Q	Dinamic Range [dB]
LowPass	2	3.8k	0.6	1.02	39.2

Stage Attenuation:
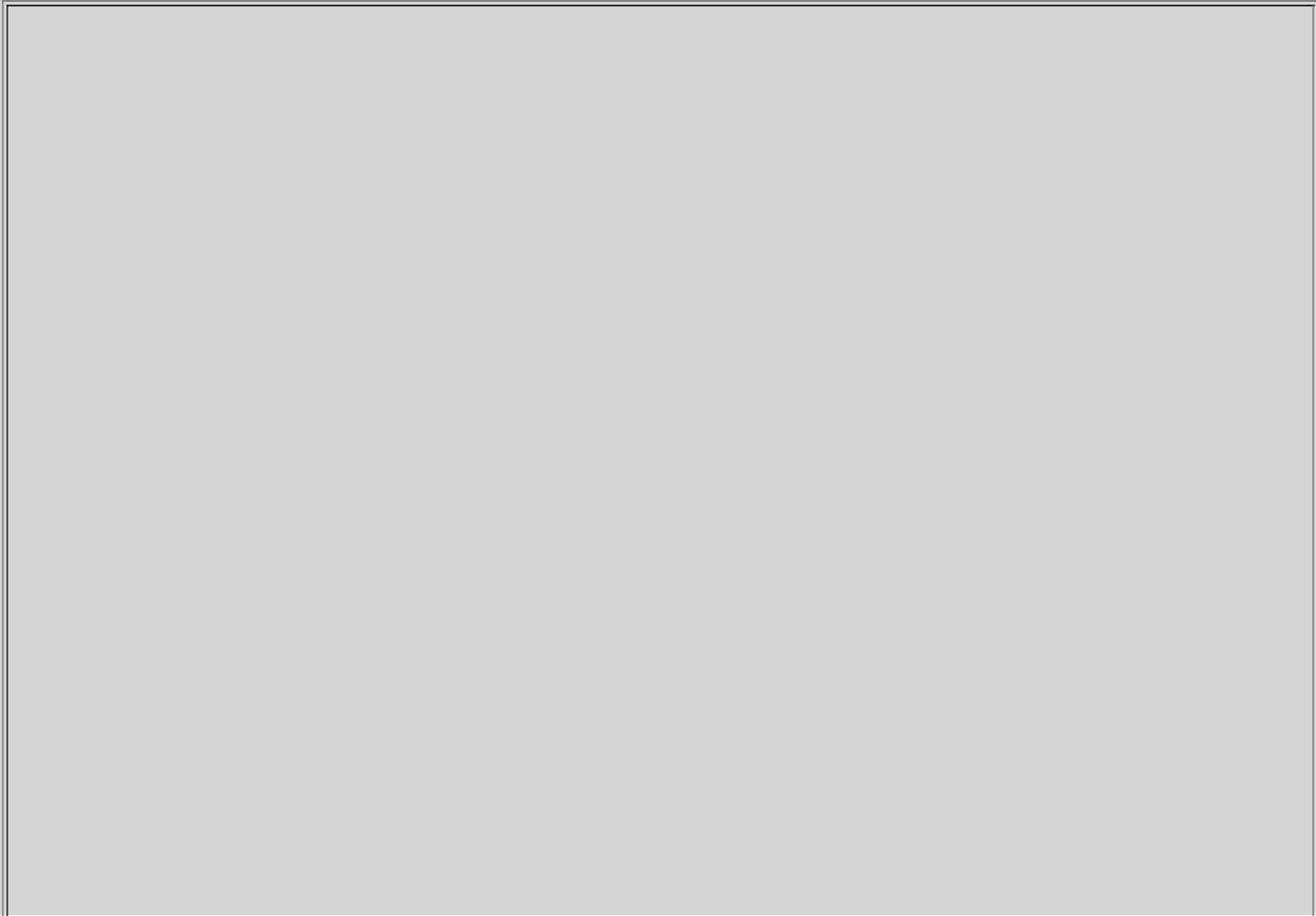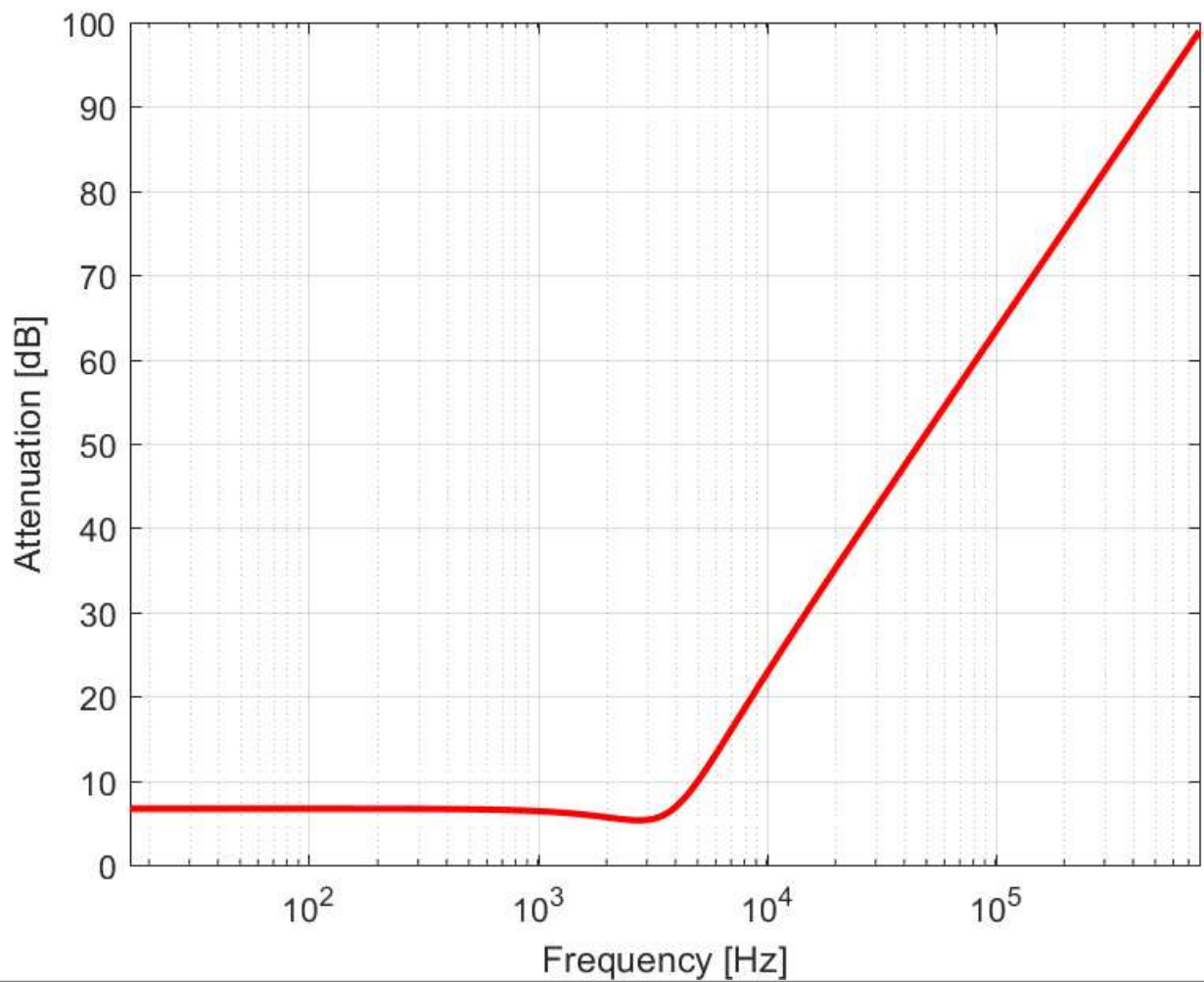
Calculated components for the specified filter:

Components				
Resistor [Ω]			Capacitor [F]	
R_1	R_2	R_3	C_1	C_2
2.13k	1.2k	2.74k	70.67n	16.87n

Approximation of the components with commercial values:

Components with commercial values				
		Combination	Result	Error
Resistor	R_1	3.9kΩ // 4.7kΩ	2.13kΩ	0.1%
	R_2	1.2kΩ	1.2kΩ	0.0%
	R_3	39Ω + 2.7kΩ	2.74kΩ	0.1%
Capacitor	C_1	2.7nF // 68nF	70.7nF	<0,1%
	C_2	18nF + 270nF	16.88nF	<0,1%

Sensitivity of each component:

Sensitivities			
	S_X^G	S_X^Q	S_X^{Wp}
R_1	-0.44	0.00	-0.28
R_2	0.00	0.00	-0.50

R_3	0.44	0.00	-0.22
C_1	0.00	0.50	-0.50
C_2	0.00	-0.50	-0.50