Filter Wizard

Created on 3/18/2018

ANALOG DEVICES

Filter Wizard Design Report

Filter Requirements for Low-Pass, 8th order Chebyshev 0.65 dB

Specifications: Optimize for Specific Components, +Vs= 5, -Vs= -5

Gain: 0 dB

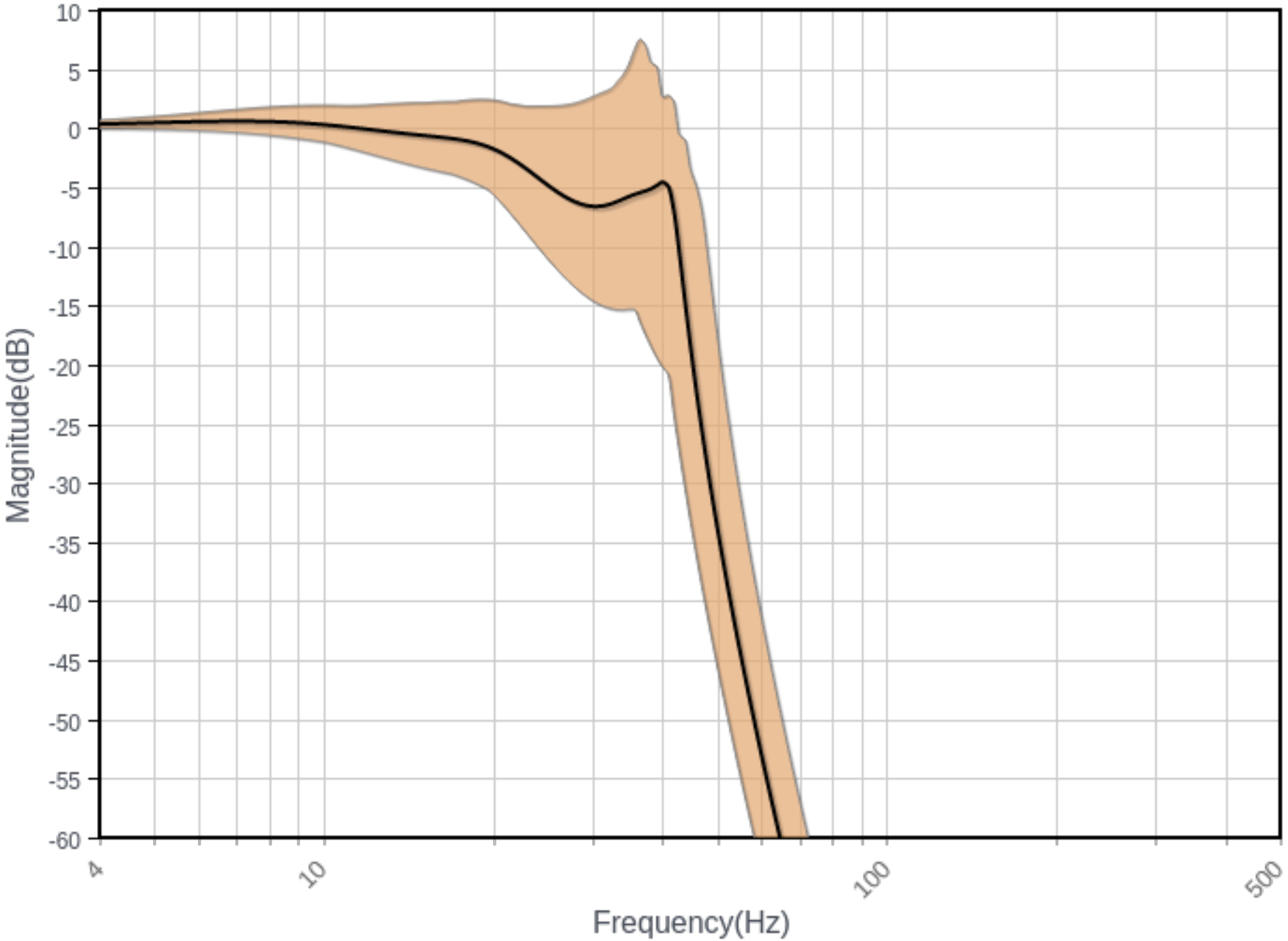
Passband: -3dB at 40Hz

Stopband: -36dB at 50Hz

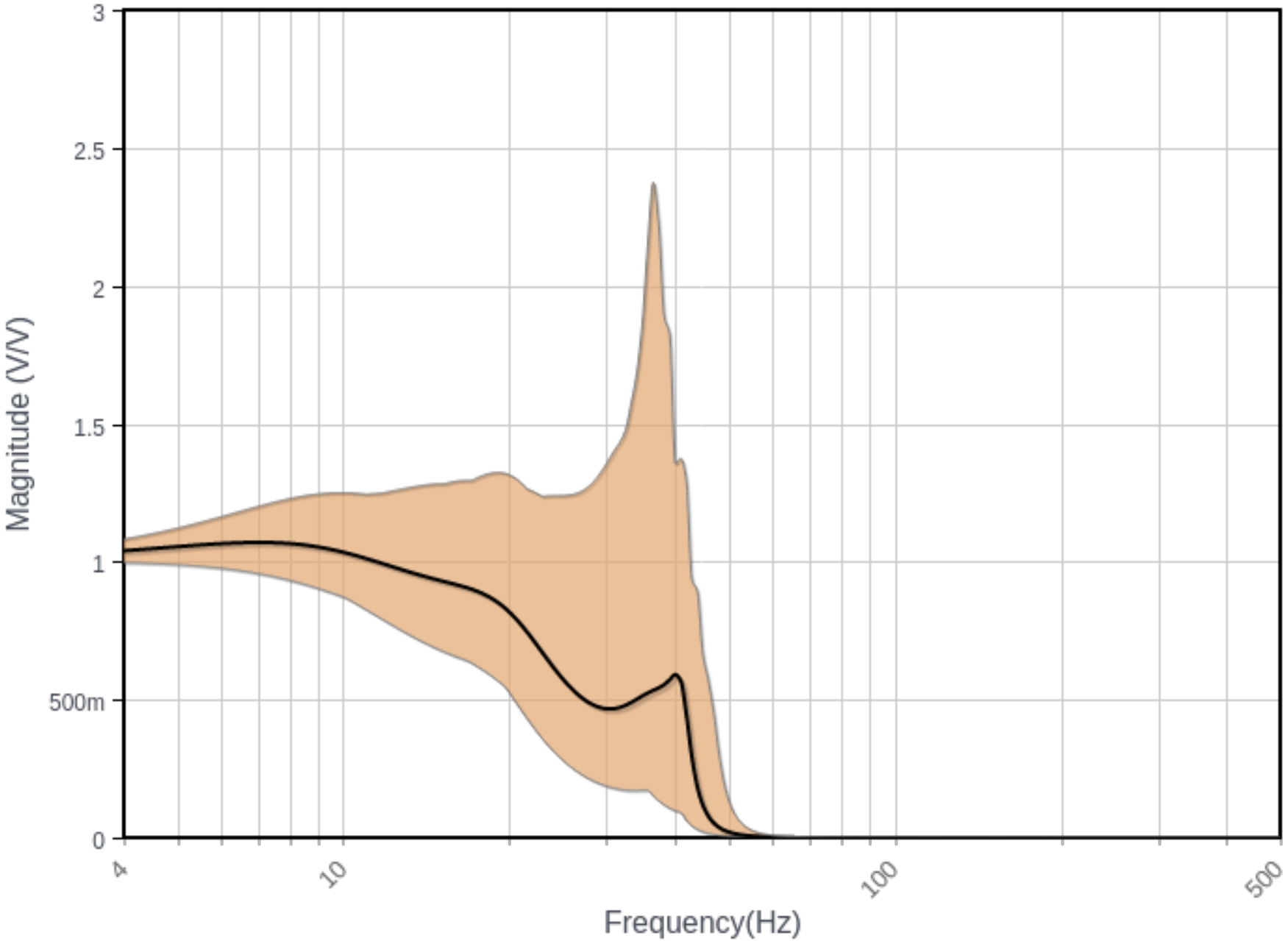
Component Tolerances: Capacitor = 10%; Resistor = 1%; Inductor = 5%; Op Amp GBW = 20%

BOM: refer to BOM.csv file

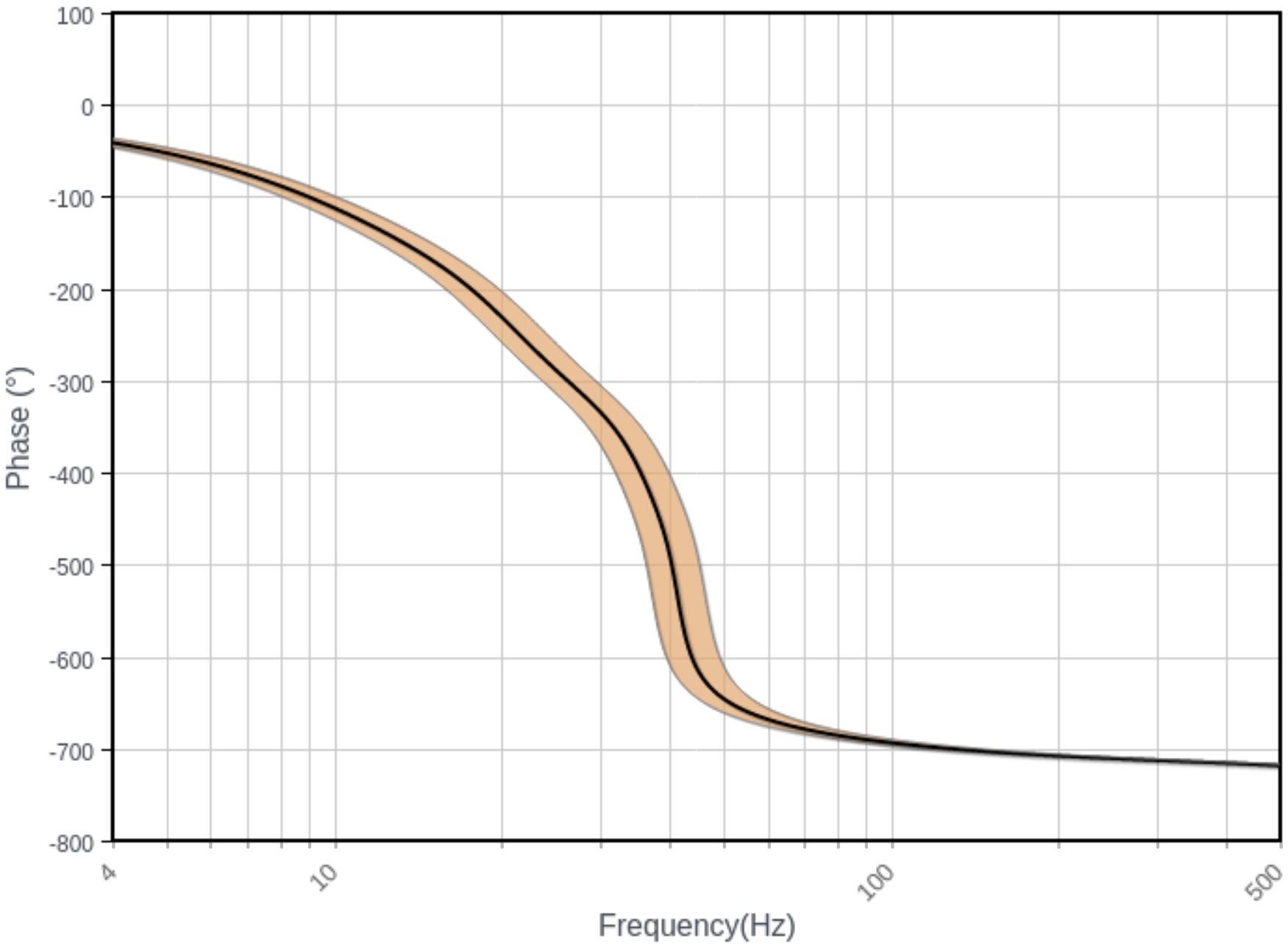
Magnitude(dB)



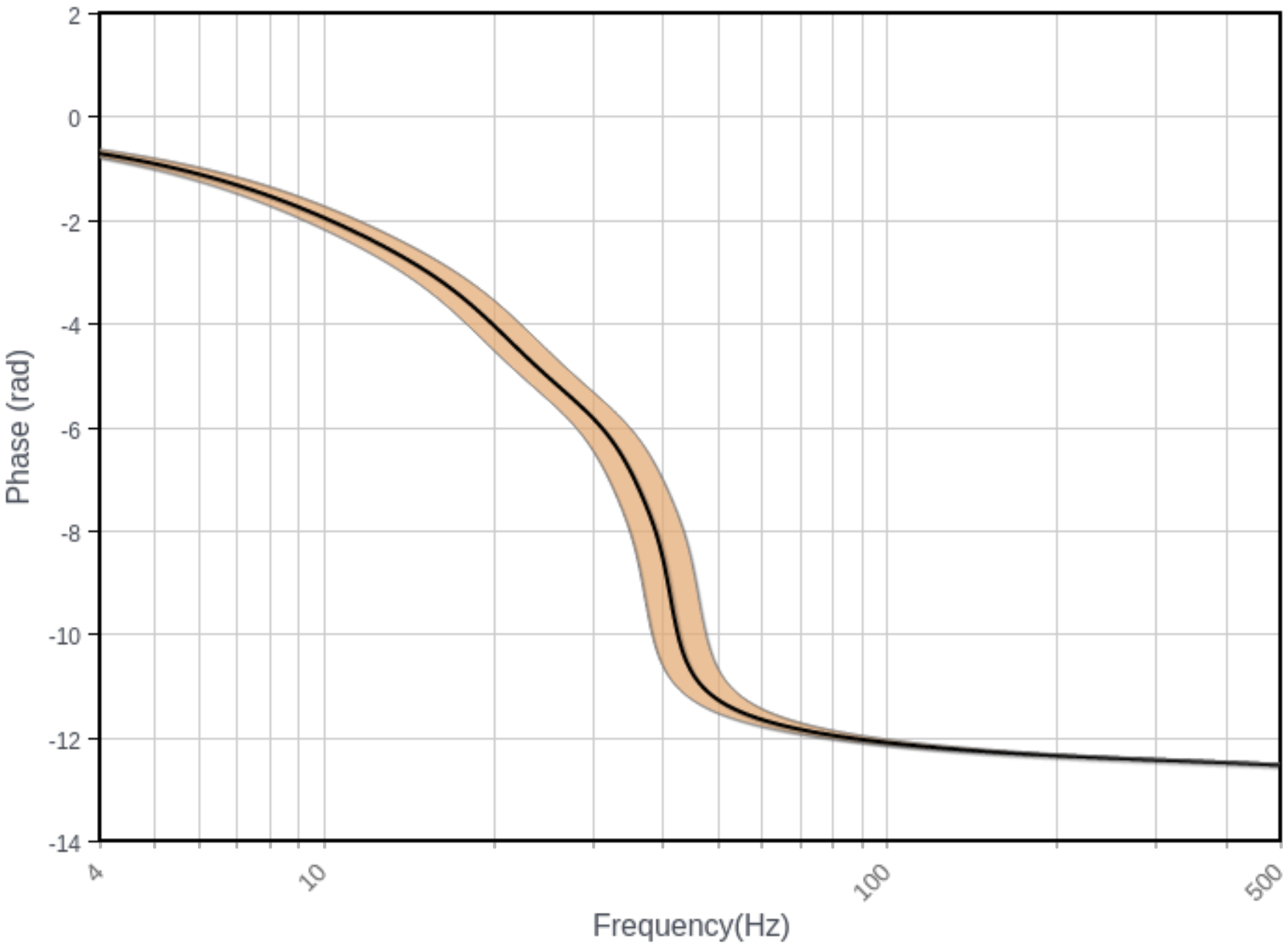
Magnitude(Volts per Volt)



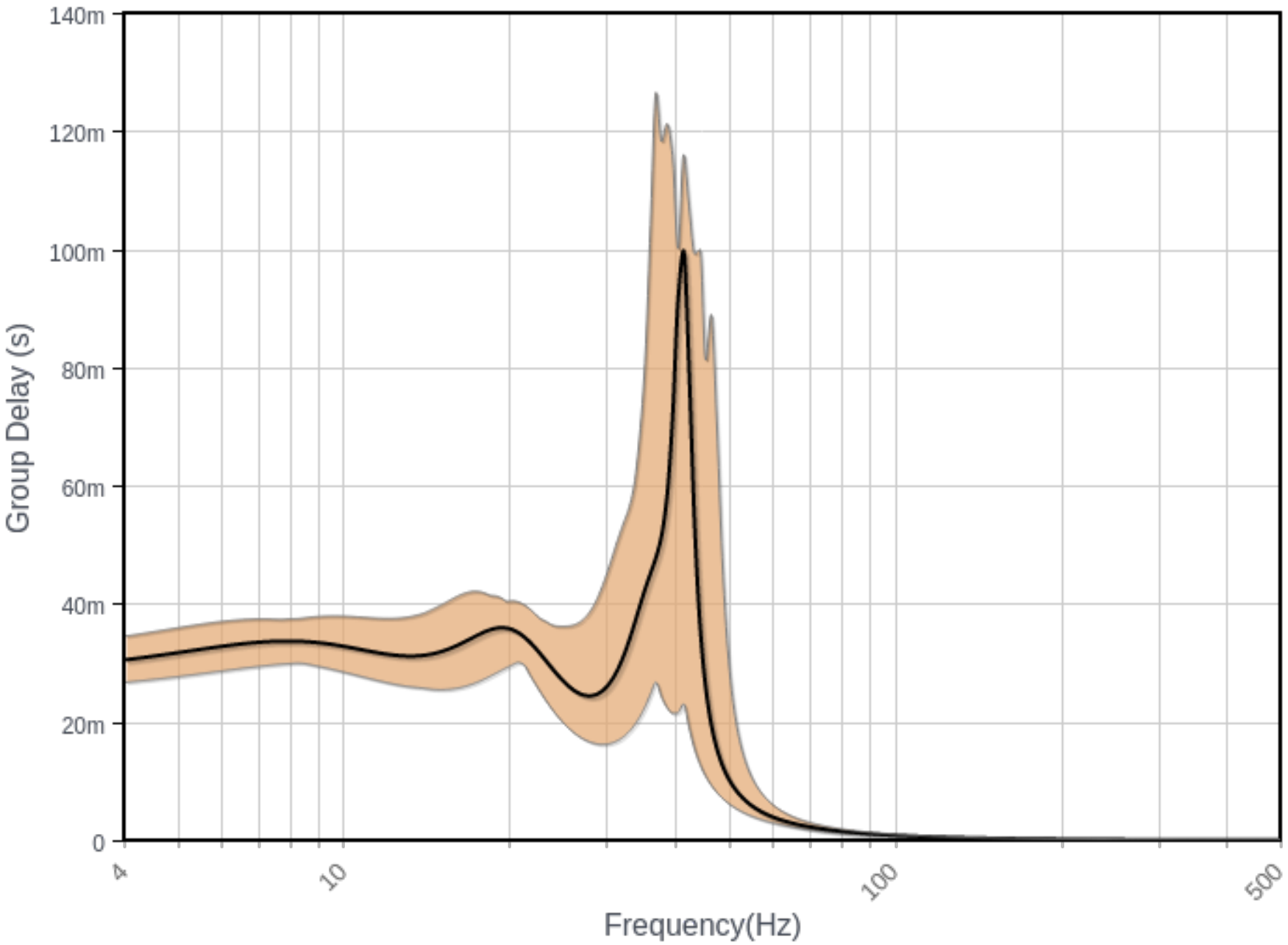
Phase(degrees)



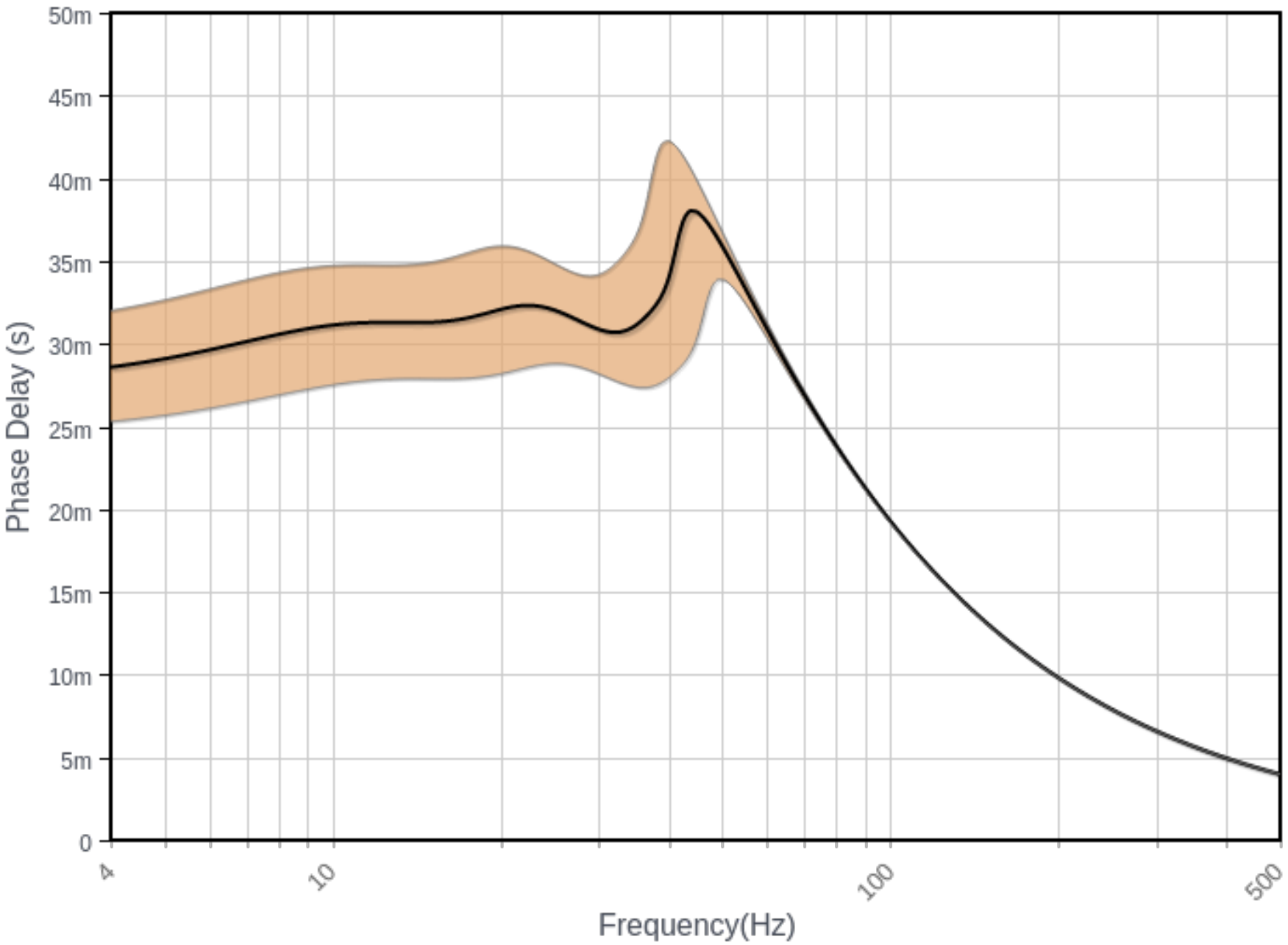
Phase(radians)

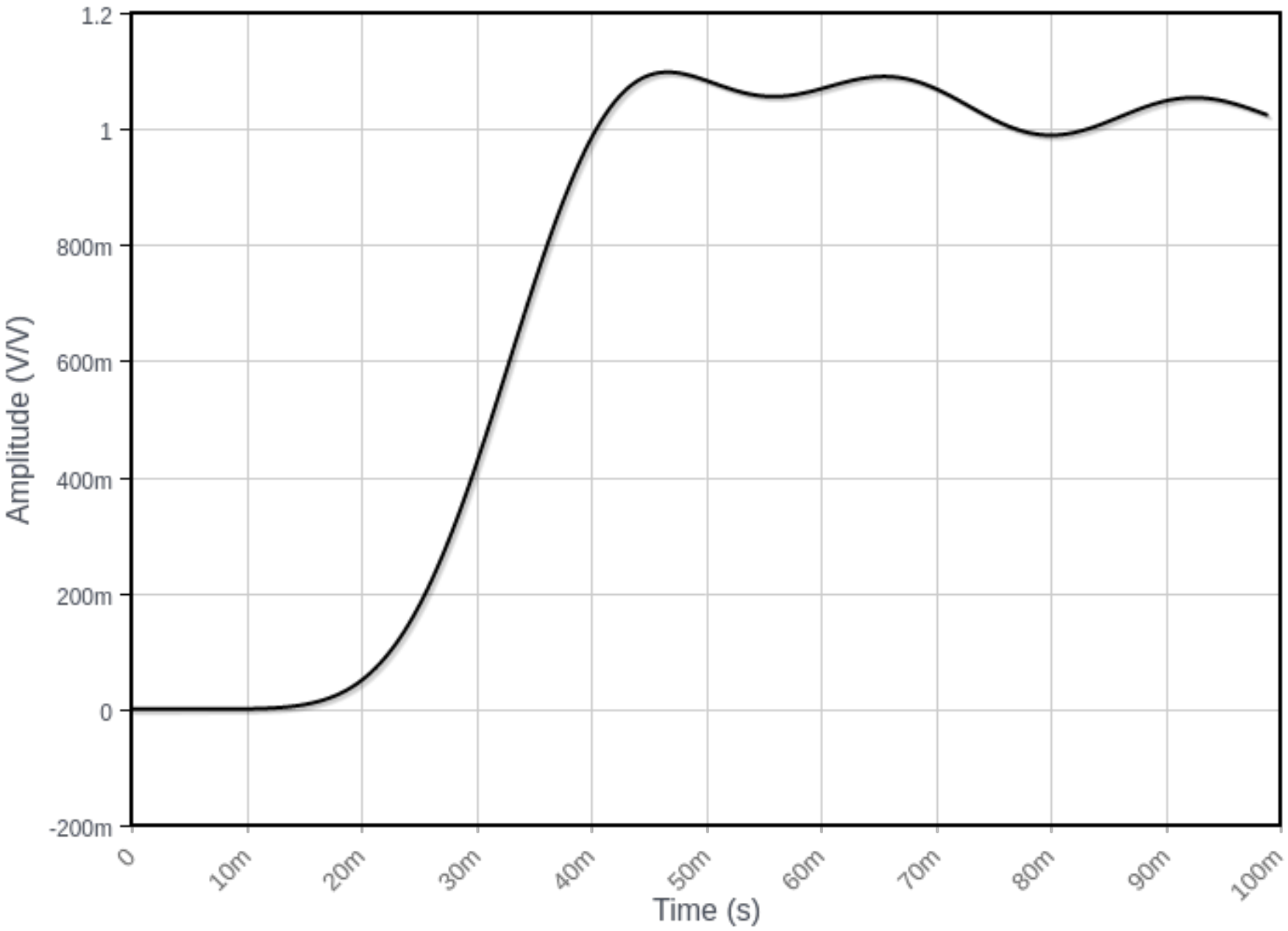


Group Delay

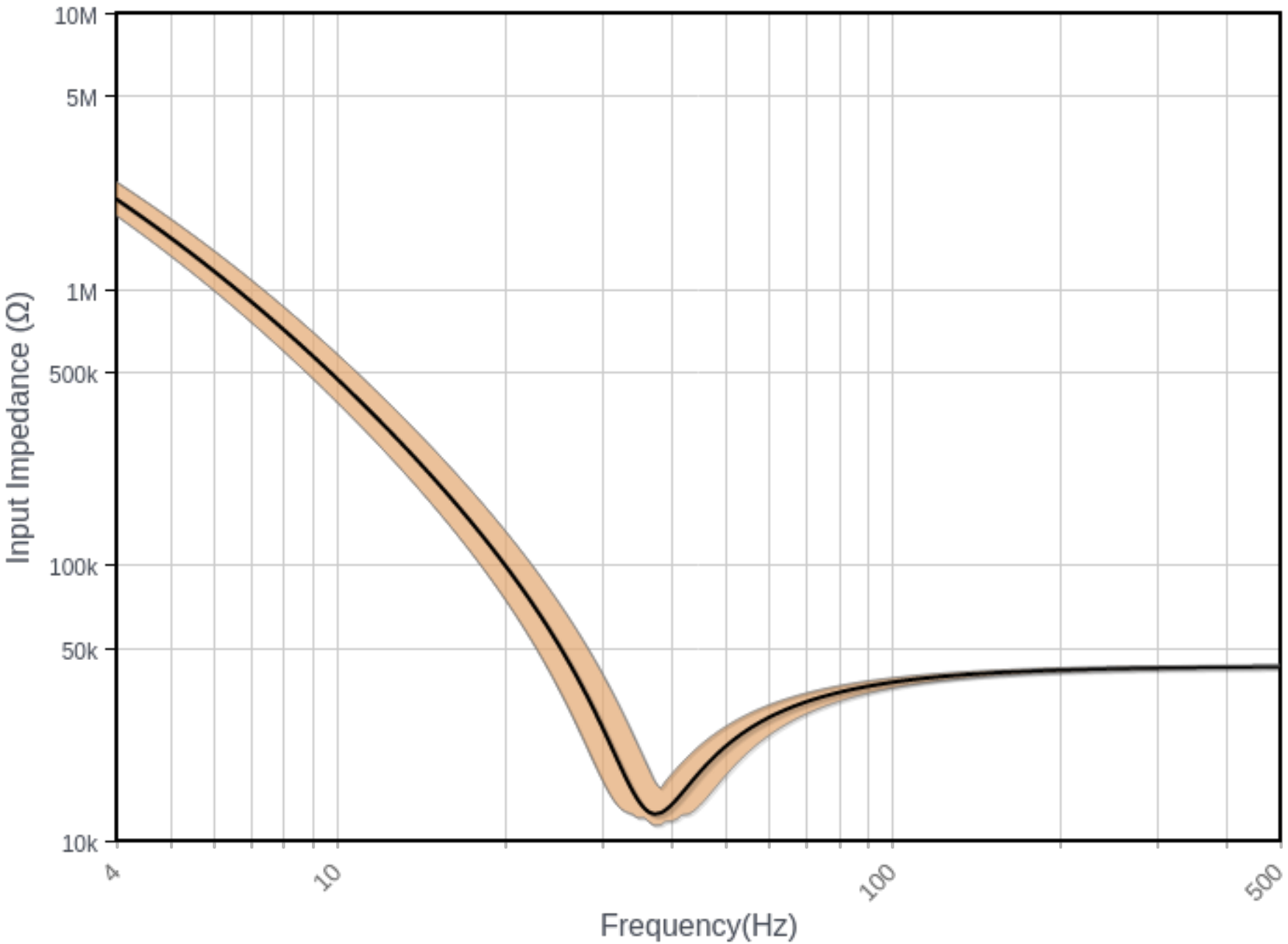

140m
120m
100m
80m
60m
40m
20m
0
Group Delay (s)
4
10
100
500
Frequency(Hz)

Phase Delay

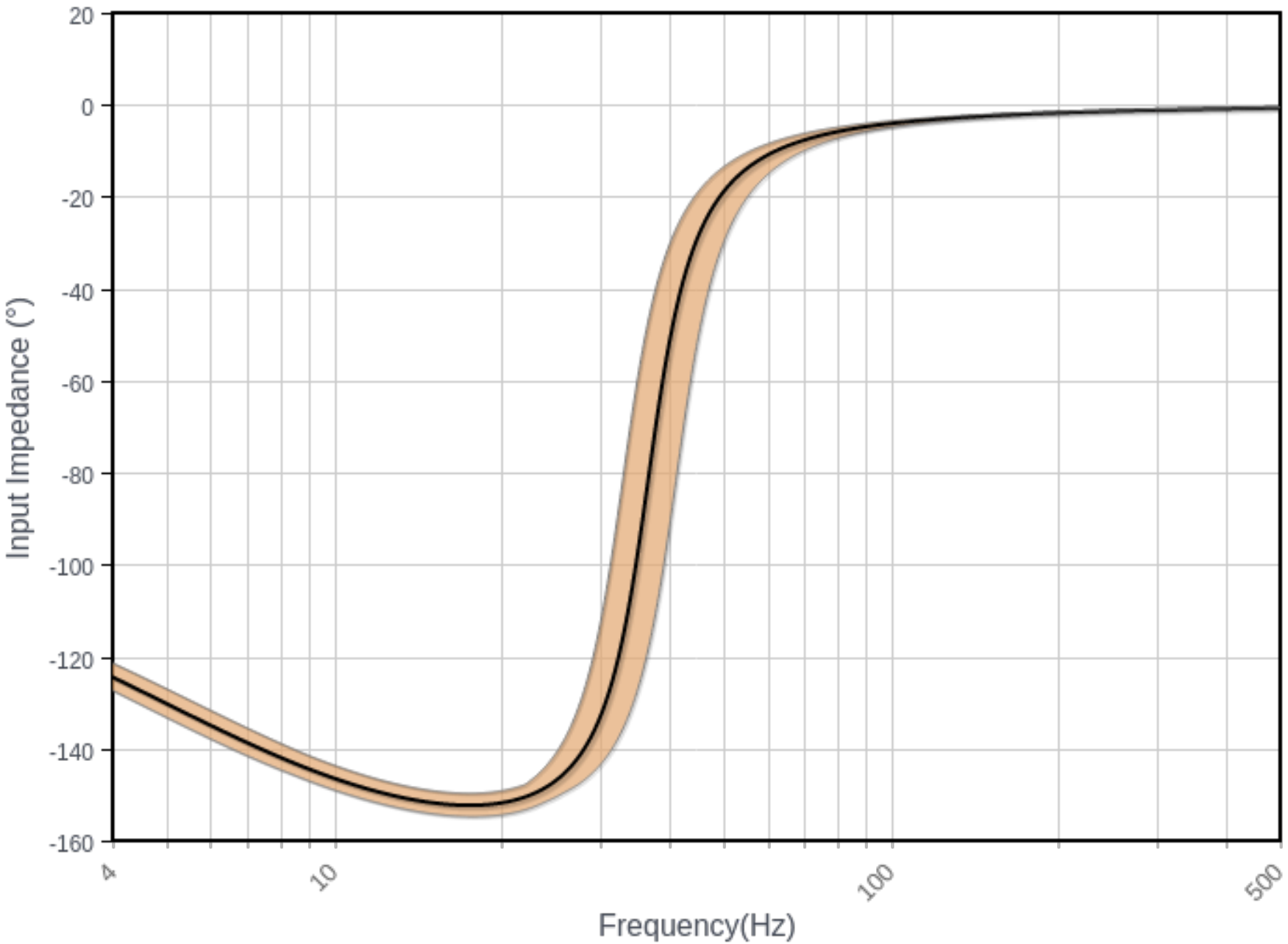

50m
45m
40m
35m
30m
25m
20m
15m
10m
5m
0
Phase Delay (s)
4
10
100
500
Frequency(Hz)


Step Response
1.2
1
800m
600m
400m
200m
0
-200m
Amplitude (V/V)
0
10m
20m
30m
40m
50m
60m
70m
80m
90m
100m
Time (s)

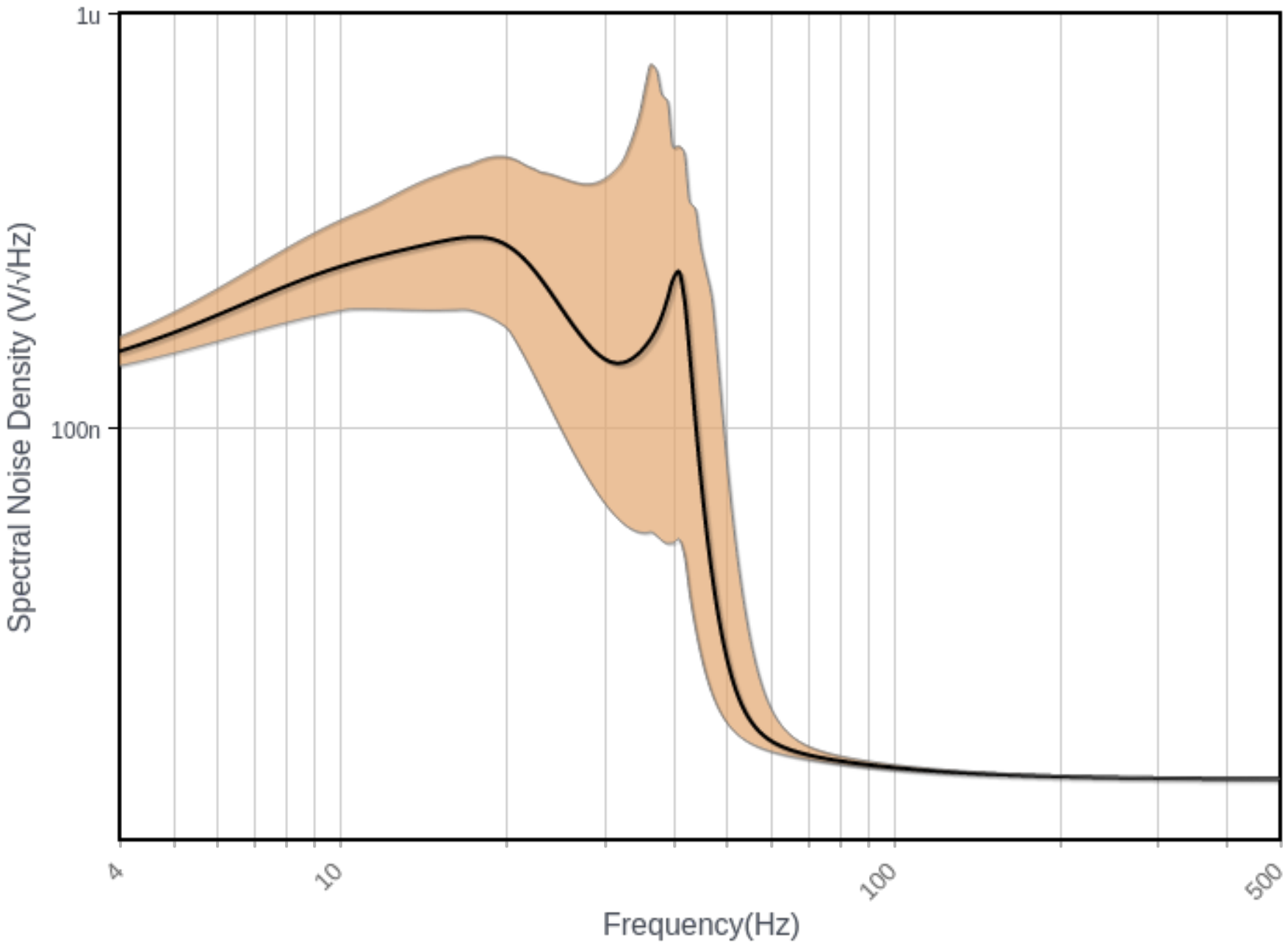
Input Impedance Magnitude



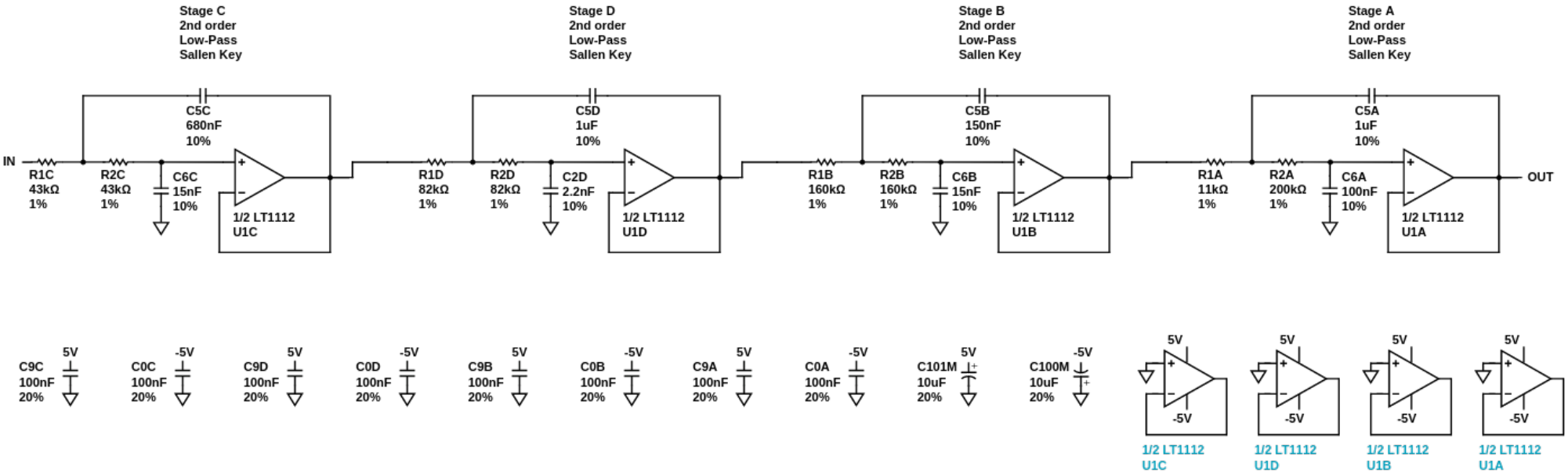
Input Impedance Phase



Noise



Circuit


Stage C
2nd order
Low-Pass
Sallen Key
Stage D
2nd order
Low-Pass
Sallen Key
Stage B
2nd order
Low-Pass
Sallen Key
Stage A
2nd order
Low-Pass
Sallen Key
IN
OUT
R1C
43kΩ
1%
R2C
43kΩ
1%
C6C
15nF
10%
C5C
680nF
10%
1/2 LT1112
U1C
R1D
82kΩ
1%
R2D
82kΩ
1%
C2D
2.2nF
10%
C5D
1uF
10%
1/2 LT1112
U1D
R1B
160kΩ
1%
R2B
160kΩ
1%
C6B
15nF
10%
C5B
150nF
10%
1/2 LT1112
U1B
R1A
11kΩ
1%
R2A
200kΩ
1%
C6A
100nF
10%
C5A
1uF
10%
1/2 LT1112
U1A

C9C
100nF
20%
5V
C0C
100nF
20%
-5V
C9D
100nF
20%
5V
C0D
100nF
20%
-5V
C9B
100nF
20%
5V
C0B
100nF
20%
-5V
C9A
100nF
20%
5V
C0A
100nF
20%
-5V
C101M
10uF
20%
5V
C100M
10uF
20%
-5V
5V
-5V
1/2 LT1112
U1C
5V
-5V
1/2 LT1112
U1D
5V
-5V
1/2 LT1112
U1B
5V
-5V
1/2 LT1112
U1A