# Filter Wizard

Filter Wizard Design

Created on 11/02/2025

ANALOG DEVICES

# Filter Wizard Design Report

## Filter Requirements for Low-Pass, 4th order Chebyshev

Specifications: Optimize: Specific Parts; +Vs: 5; -Vs: -5

Gain: 0 dB

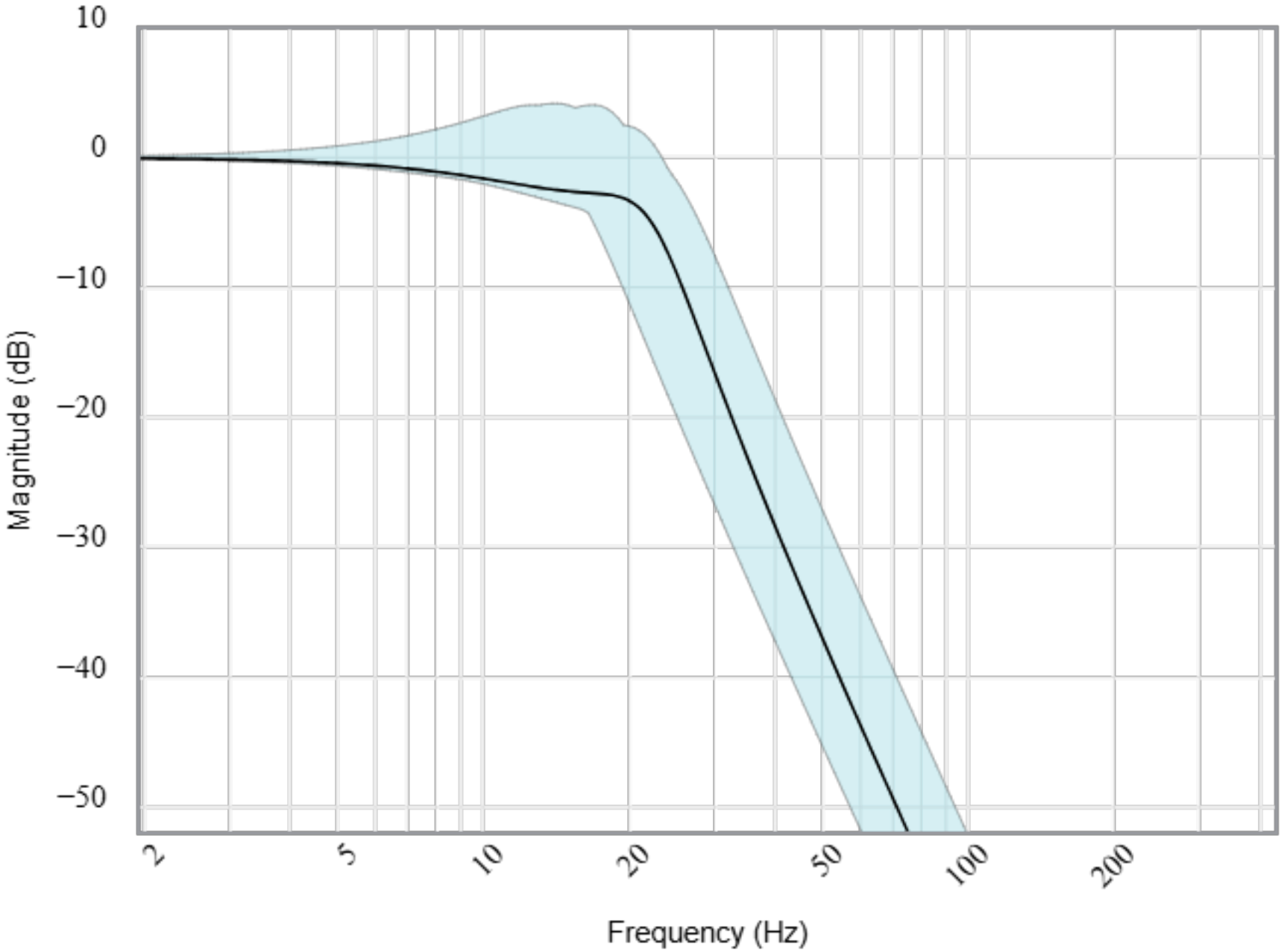
Passband: -3dB at 20Hz

Stopband: -32dB at 42.5Hz

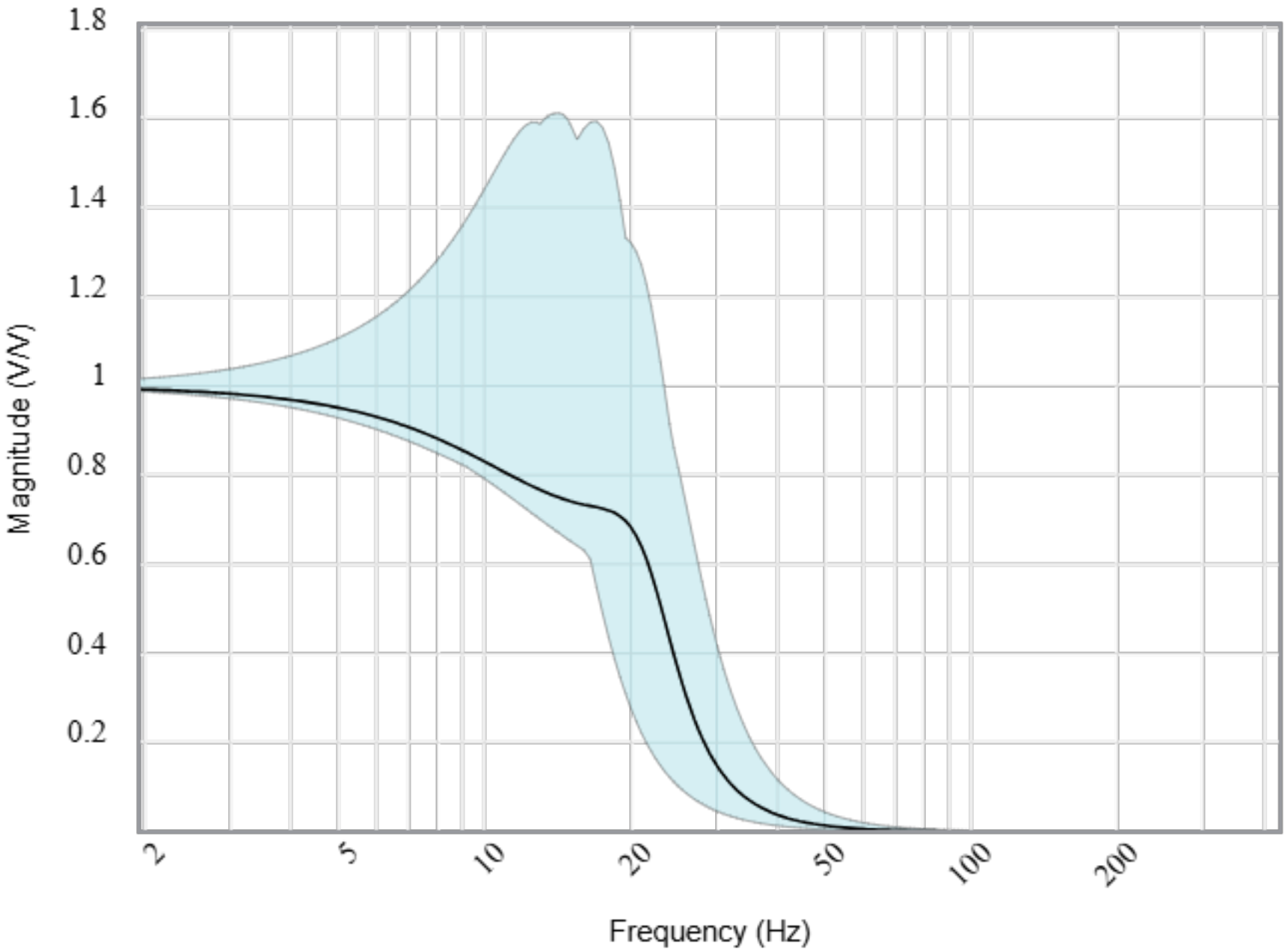
Component Tolerances: Capacitor = 20%; Resistor = 5%; Inductor = 5%; Op Amp GBW = 20%

BOM: refer to BOM.csv file

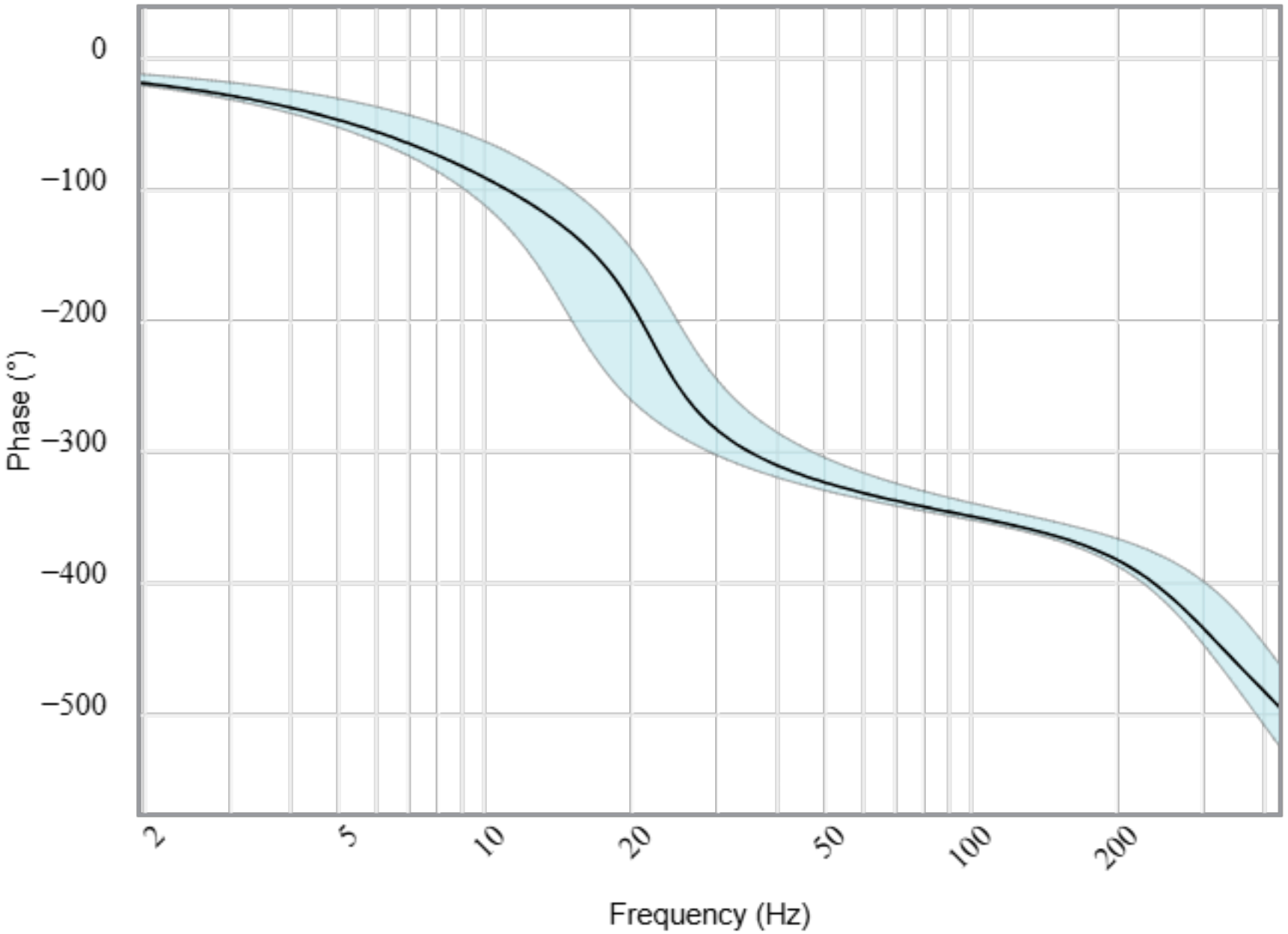
Magnitude(dB)



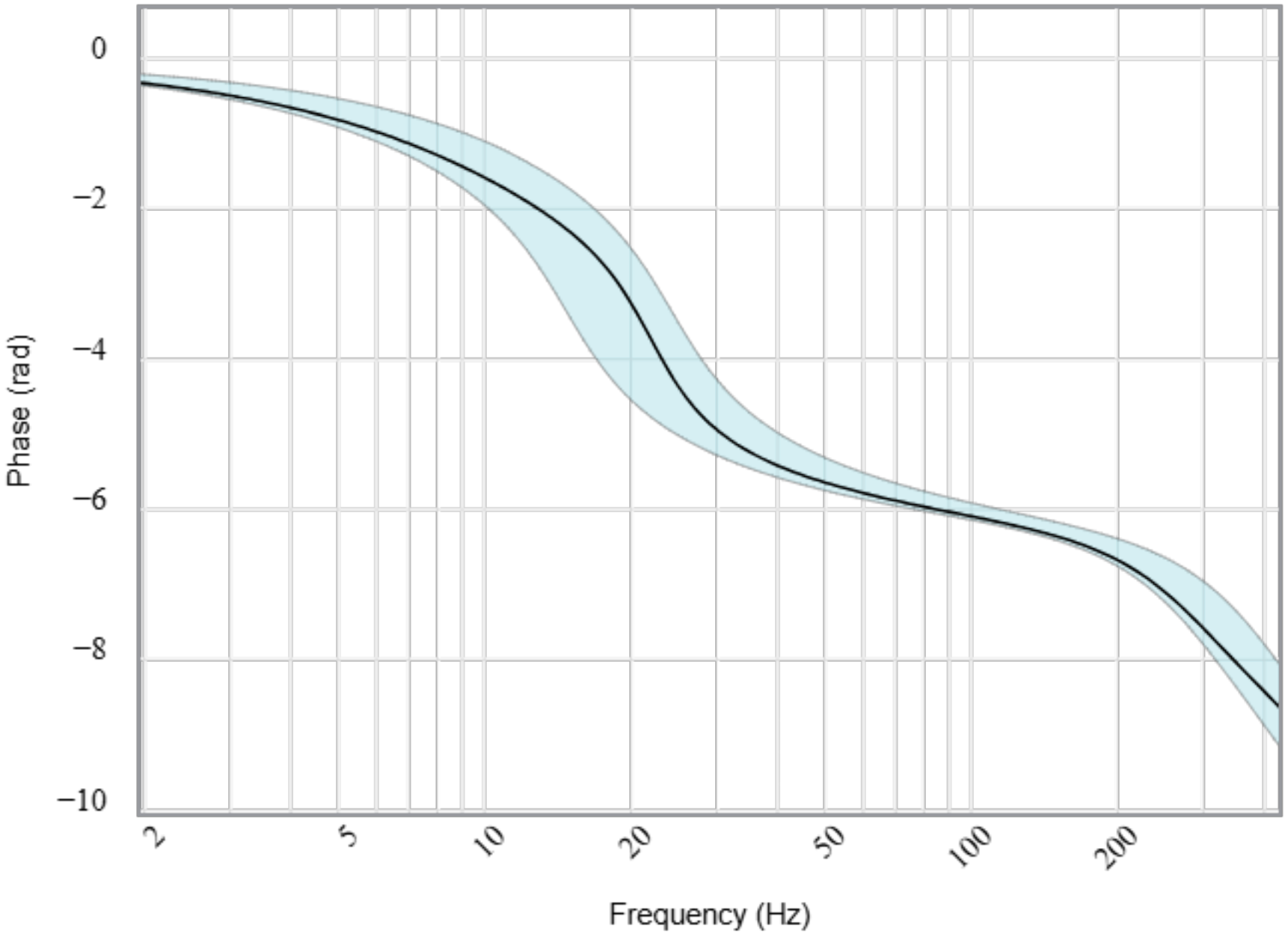
Magnitude(Volts per Volt)



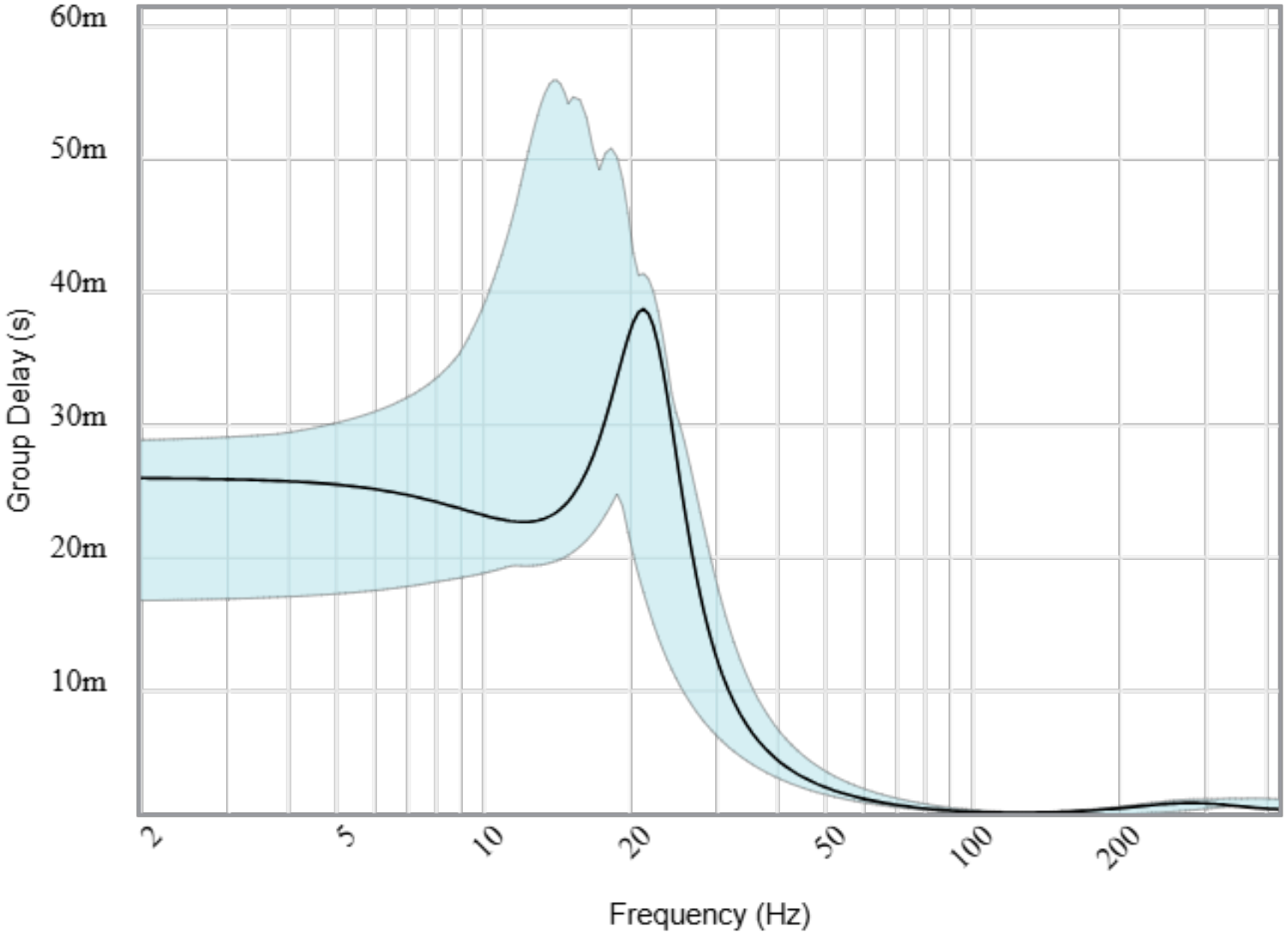
Phase(degrees)



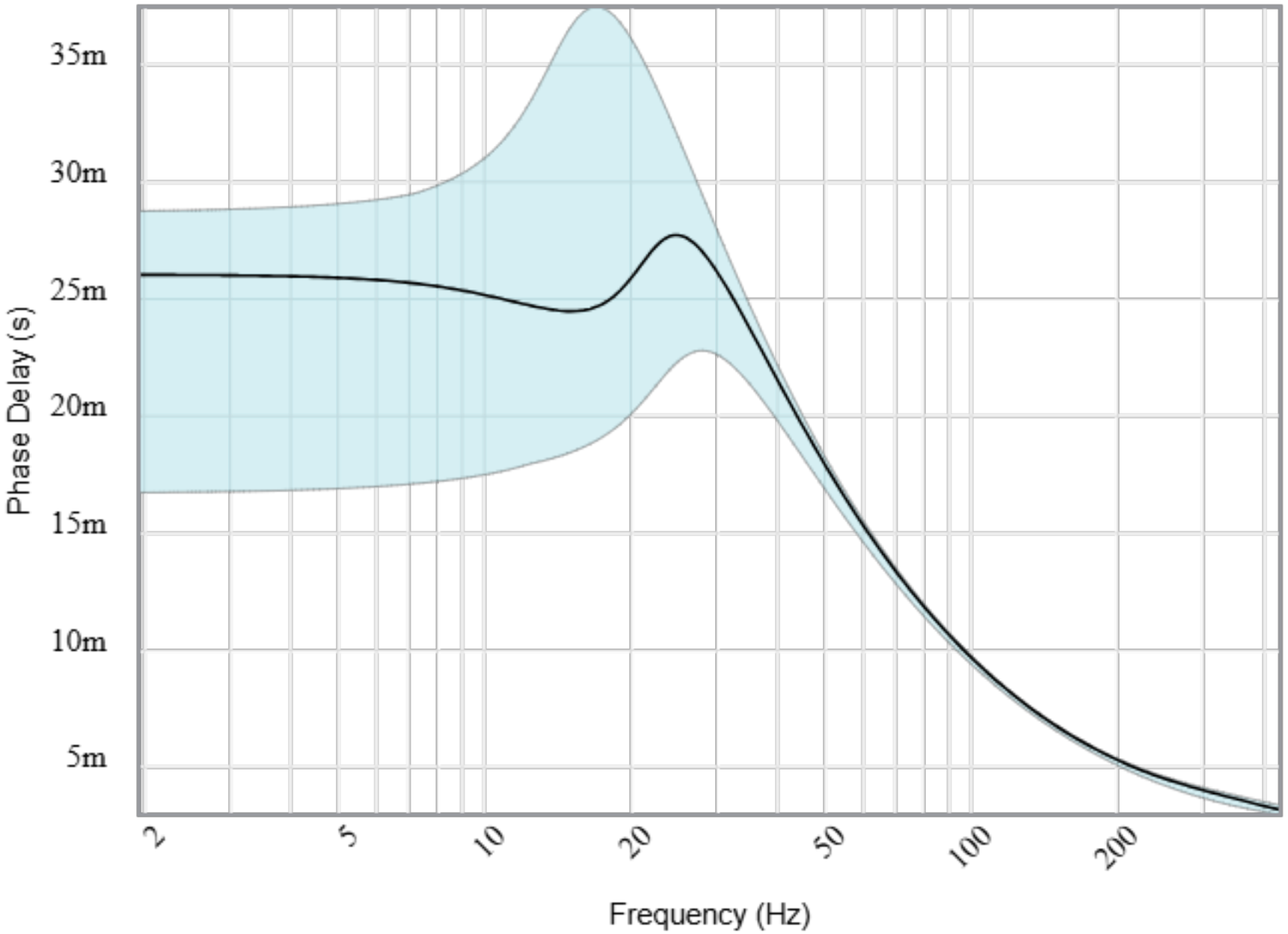
Phase(radians)



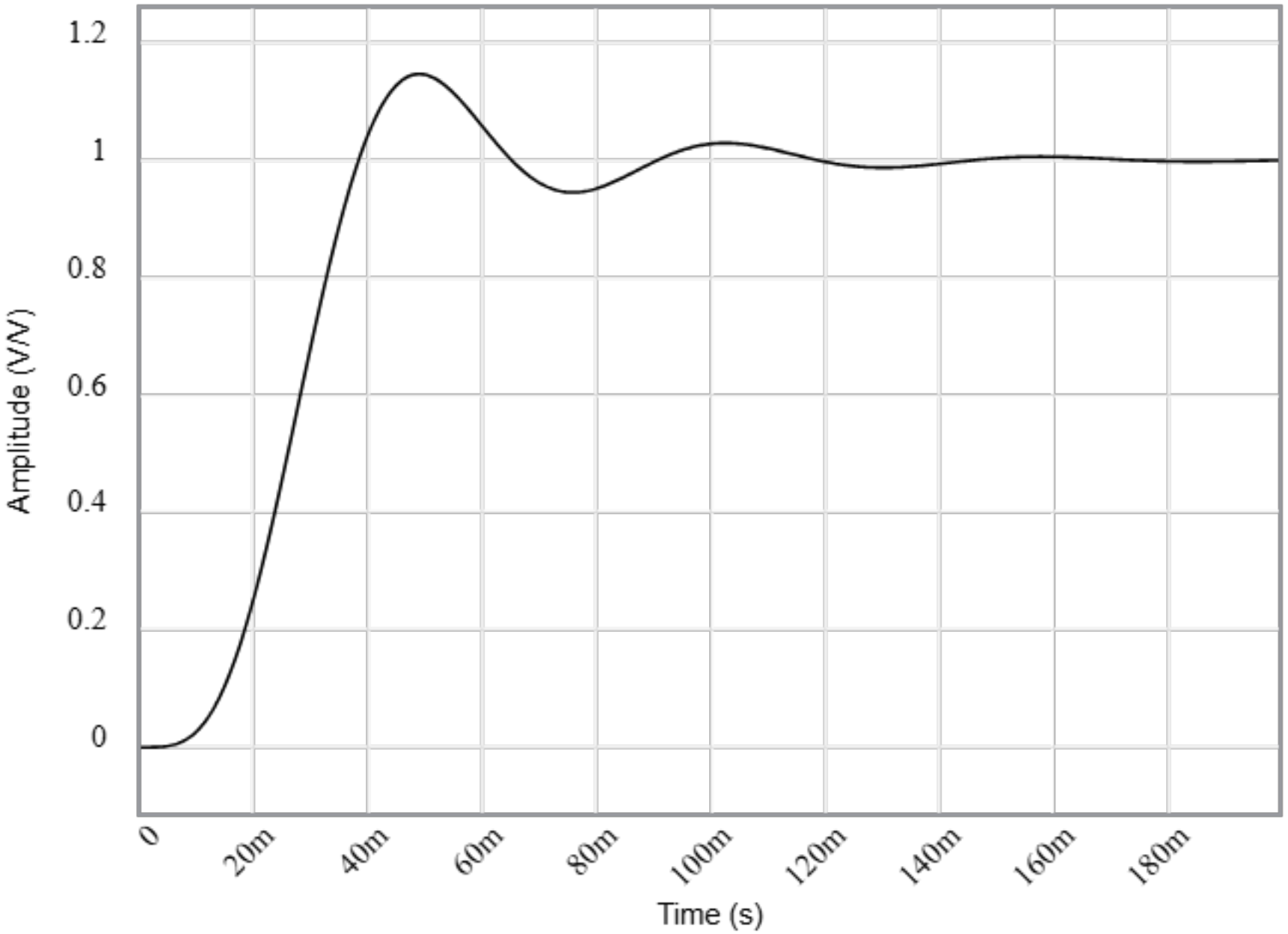
# Group Delay


60m
50m
40m
30m
20m
10m
Group Delay (s)
2
5
10
20
50
100
200
Frequency (Hz)

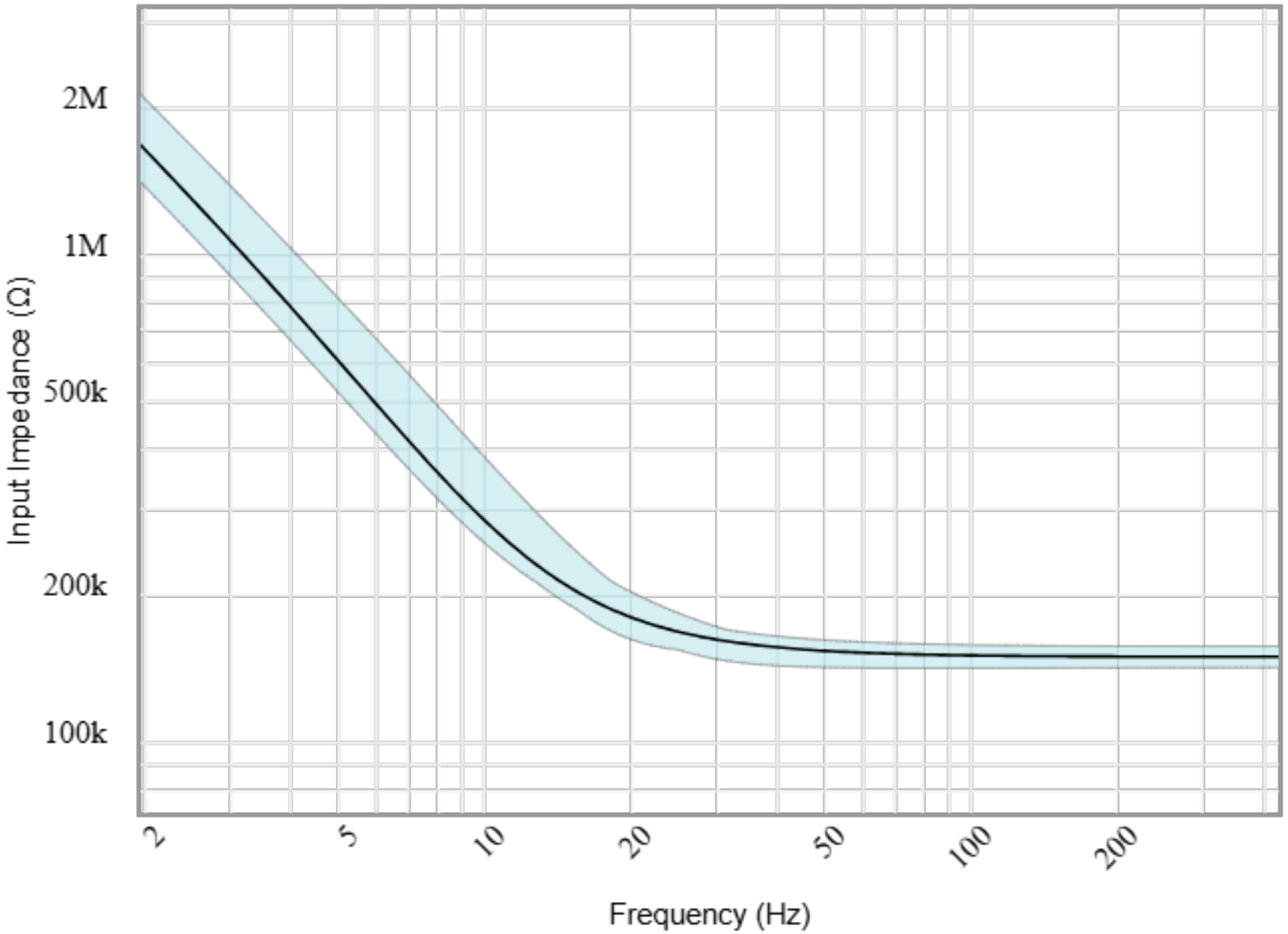
# Phase Delay


35m
30m
25m
20m
15m
10m
5m
Phase Delay (s)
2
5
10
20
50
100
200
Frequency (Hz)

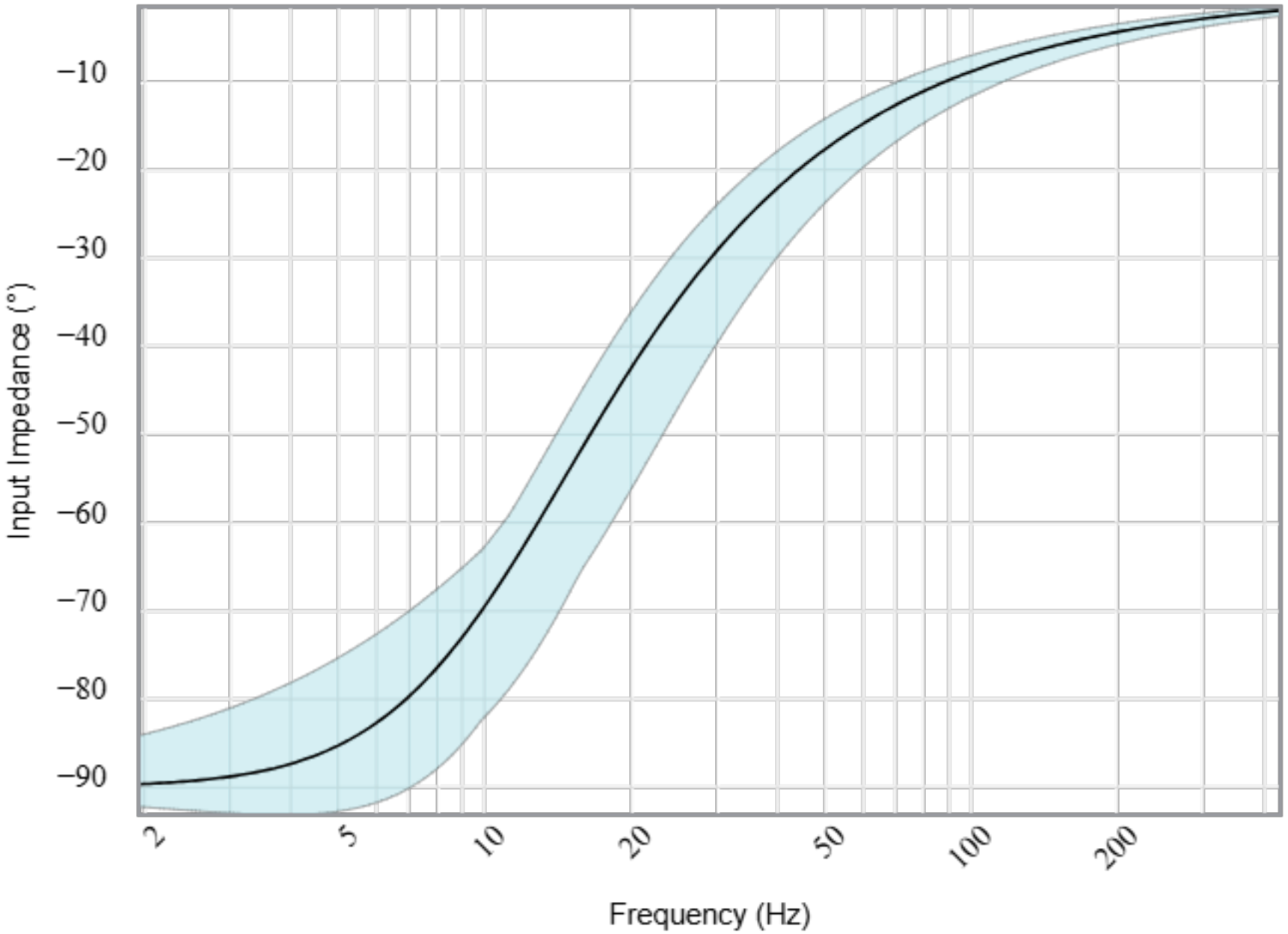
Step Response



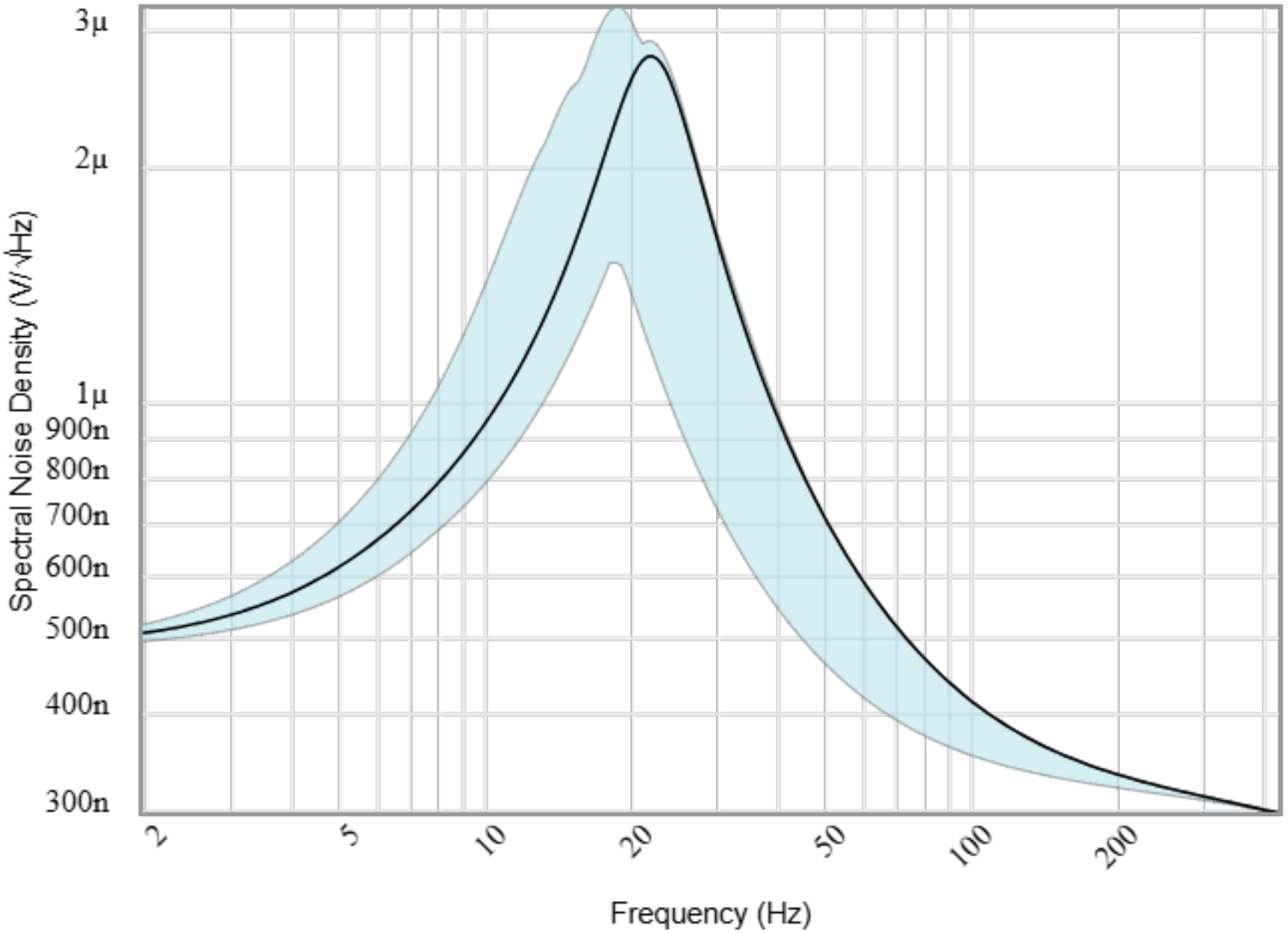
Input Impedance Magnitude



Input Impedance Phase



Noise


3µ
2µ
1µ
900n
800n
700n
600n
500n
400n
300n
Spectral Noise Density (V/√Hz)
2
5
10
20
50
100
200
Frequency (Hz)

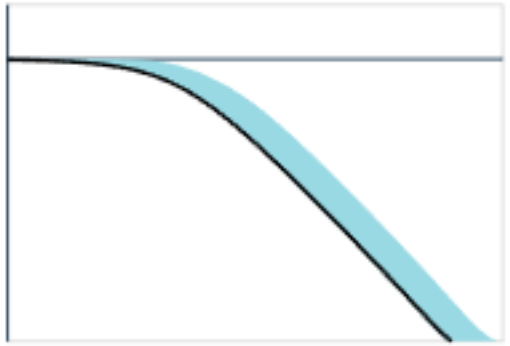
# Stages

Your filter requires 2 op amp stage(s) with the following characteristics

## A

2nd order
Low-Pass
Sallen Key

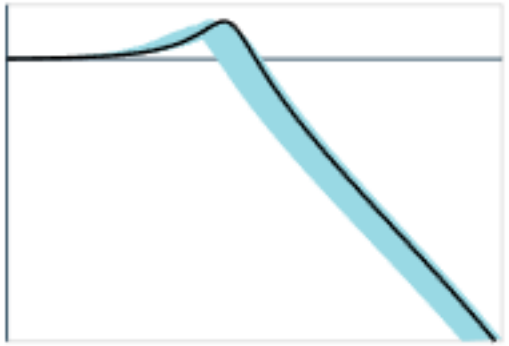
| | Target | Simulated |
|---|---|---|
| Gain (V/V): | 1 | 1 to 1 |
| $f_p$ (Hz): | 13.8 | 12.3 to 20.2 |
| Q: | 600m | 479m to 733m |



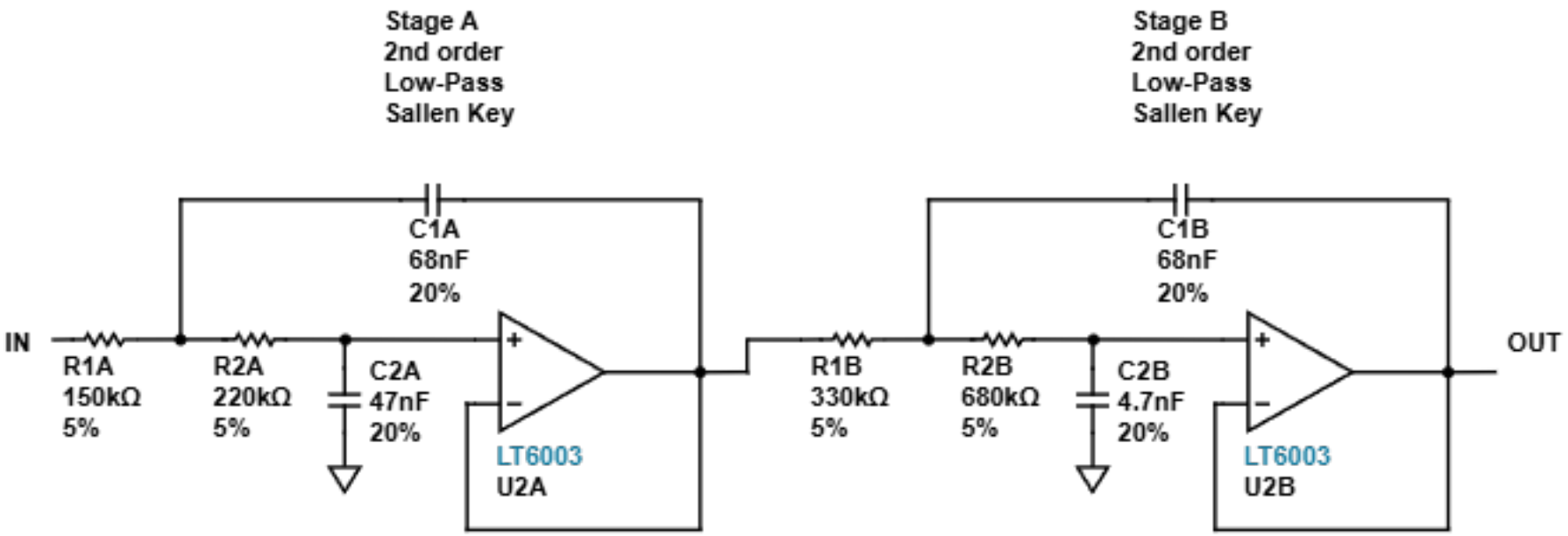
## B

2nd order
Low-Pass
Sallen Key

| Target | Simulated |
|---|---|
| 1 | 1 to 1 |
| 19.1 | 14.8 to 24.3 |
| 2 | 1.46 to 2.25 |



# Circuit




BYPASS CAPACITORS