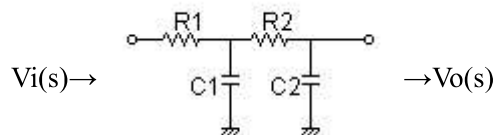


## 2nd order CR Low-pass Filter Design Tool - Result -

Calculated the transfer function for 2nd order CR Low-pass filter, displayed on graphs, showing Bode diagram, Nyquist diagram, Impulse response and Step response

### 2nd order CR filter



Transfer Function:

$$G(s) = \frac{4444444444.4444}{s^2 + 200000s + 4444444444.4444}$$



### Center frequency

$$f_c = 10610.32953946[\text{Hz}]$$

### Q factor

$$Q = 0.33333333333333$$

### Damping ratio $\zeta$

$$\zeta = 1.5$$

### Pole(s)

$$R1 = 150 \, \Omega \quad C1 = .0000001 \, \text{F}$$

$$R2 = 150 \, \Omega \quad C2 = .0000001 \, \text{F}$$

p:pico, n:nano, u:micro, k:kilo, M:mega

### Frequency analysis

- Bode diagram
  - Phase  Group delay
- Nyquist diagram
- Pole, zero
- Phase margin
- Oscillation analysis

Analysis on frequency range:

$$f1 = 300 \quad \sim f2 = 10000 \quad [\text{Hz}] \text{ (optional)}$$

$p = -4052.7852522366[\text{Hz}]$   
 $|p| = 4052.7852522366[\text{Hz}]$   
 $p = -27778.203366142[\text{Hz}]$   
 $|p| = 27778.203366142[\text{Hz}]$

### Phase margin

$pm = \text{INF}[\text{deg}] (f=0[\text{Hz}])$

**The system does not oscillate.**

### Overshoot (in absolute value)

The peak of transient waveform is not detected.

**Final value of the step response (on the condition that the system converged when t goes to infinity)**

$g(\infty) = 1$

### Transient analysis

- Step response
  - Impulse response
  - Overshoot
  - Final value of the step response
- Analysis on time range:  
0~  [sec] (optional)

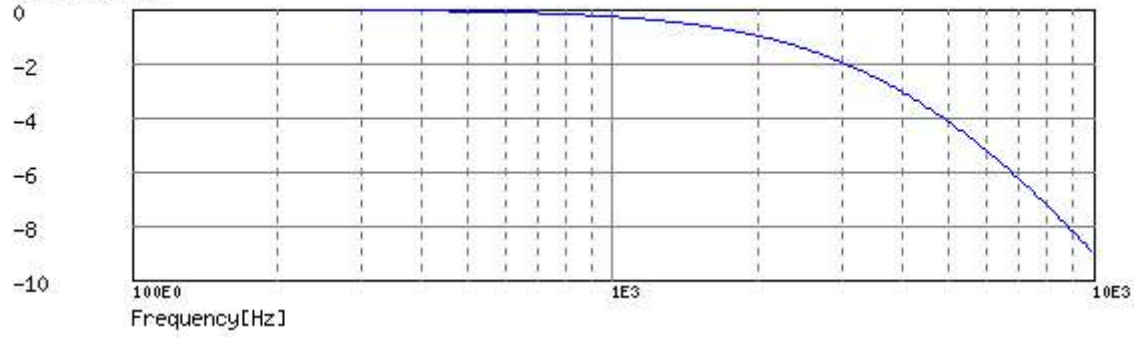
**Calculate**

## Frequency analysis

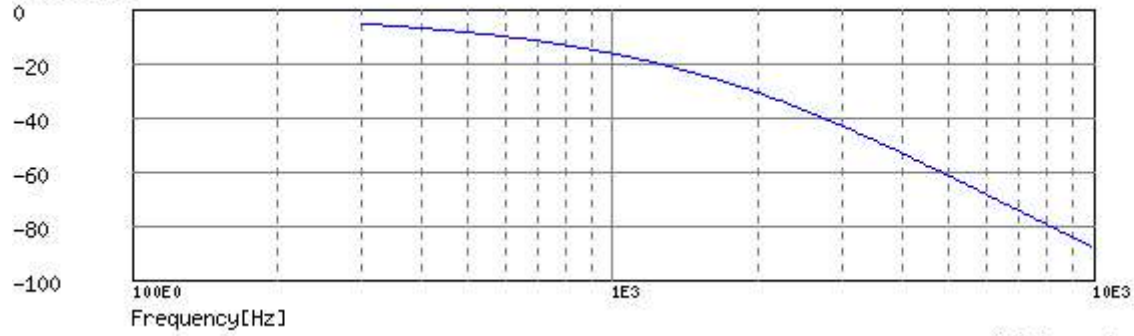
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### BodeDiagram

Magnitude[dB]



Phase[deg]



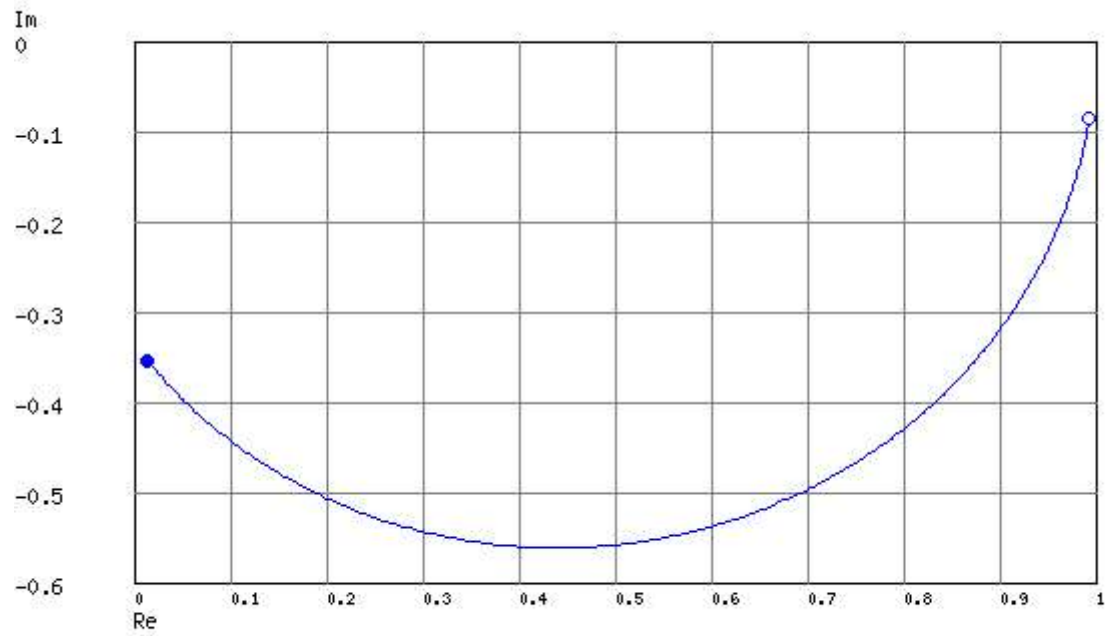
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[Gain characteristics at the Bode Diagram](#) (provides up to 1 minute)

[Phase characteristics at the Bode Diagram](#) (provides up to 1 minute)

[Bode Diagram text data](#) (provides up to 1 minute)

## NyquistDiagram



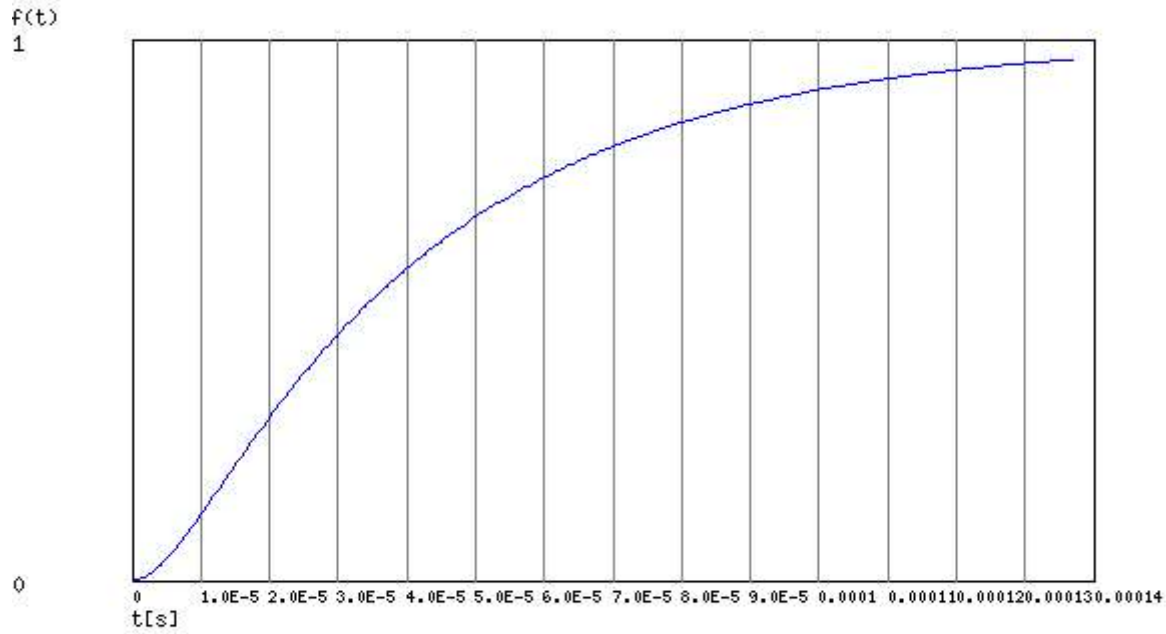
○ 300Hz      ● 10000Hz

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## Transient analysis

[Nyquist Diagram text data](#) (provides up to 1 minute)

## StepResponse



[Step Response text data](#) (provides up to 1 minute)

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## Suggestion box

We'll use your suggestion to improve site quality in future.

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