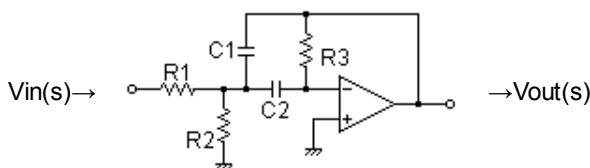


[Home](#) > [Tools](#) > [Filters](#) > [Multiple Feedback Band-pass Filter Design Tool](#) > Result**Multiple Feedback Band-pass Filter Design Tool - Result -**

Calculated the Transfer Function for the multiple feedback Band-pass filter, displayed on graphs, showing Bode diagram, Nyquist diagram, Impulse response and Step response.



Transfer Function

$$G(s) = \frac{-769.230769231s}{s^2 + 625s + 208573717.949}$$

Center frequency

$$f_0 = 2298.52865869[\text{Hz}]$$

Gain at f_0

$$G_{pk} = -1.23076923077[\text{times}] (1.80353260698)[\text{dB}]$$

Quality factor

$$Q = 23.1073303942$$

Multiple Feedback Filter

Damping ratio

$$\zeta = 0.0216381551425$$

Pole(s)

$$p = -49.7359197162 + 2297.99049891i[\text{Hz}]$$

$$|p| = 2298.52865869[\text{Hz}]$$

$$p = -49.7359197162 - 2297.99049891i[\text{Hz}]$$

$$|p| = 2298.52865869[\text{Hz}]$$

Zero(s)

$$z = 0[\text{Hz}]$$

$$|z| = 0[\text{Hz}]$$

Phase margin

$$pm = -26.4[\text{deg}] (f = 2334.5[\text{Hz}])$$

Oscillation frequency

$$f = 2297.99049891[\text{Hz}]$$

Overshoot (in absolute value)

$$\text{The 1st peak } g_{pk} = -0.052 (t = 0.00011[\text{sec}])$$

$$\text{The 2nd peak } g_{pk} = 0.048 (t = 0.00032[\text{sec}])$$

$$\text{The 3rd peak } g_{pk} = -0.045 (t = 0.00054[\text{sec}])$$

R1= 130k	Ω	C1= 10n	F
R2= 150	Ω	C2= 10n	F
R3= 320k	Ω		

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

Frequency analysis

- Bode diagram
- Nyquist diagram($f = 0 \rightarrow \infty$)
- Pole, zero
- Phase margin
- Oscillation analysis

Transient analysis

- Step response Impulse response
- Overshoot
- Final value of the step response

Calculate

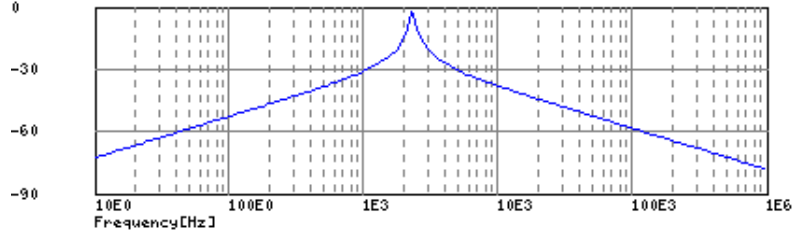
Final value of the step response (on the condition that the system converged when t goes to infinity)

$$g(\infty) = 0$$

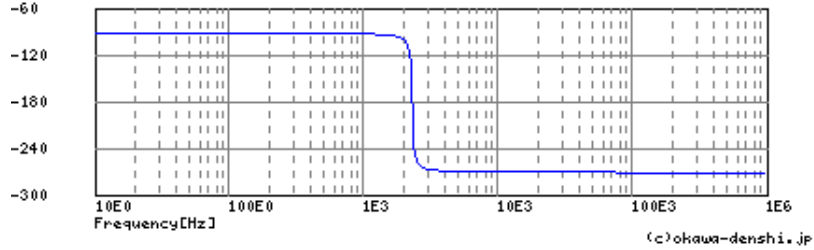
Frequency analysis

BodeDiagram

Magnitude[dB]

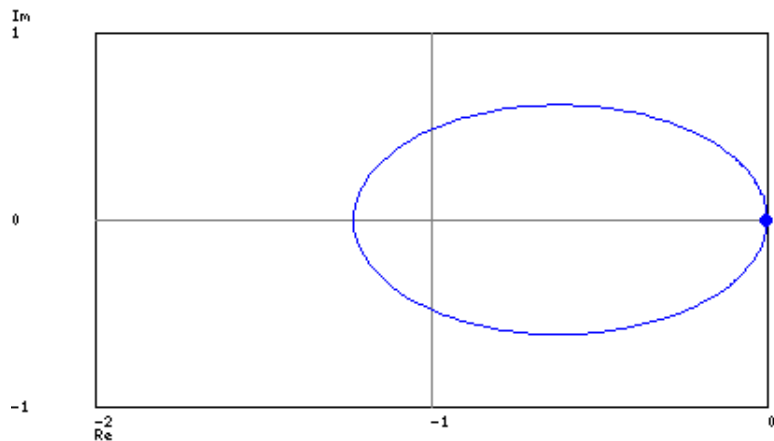


Phase[deg]



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NyquistDiagram

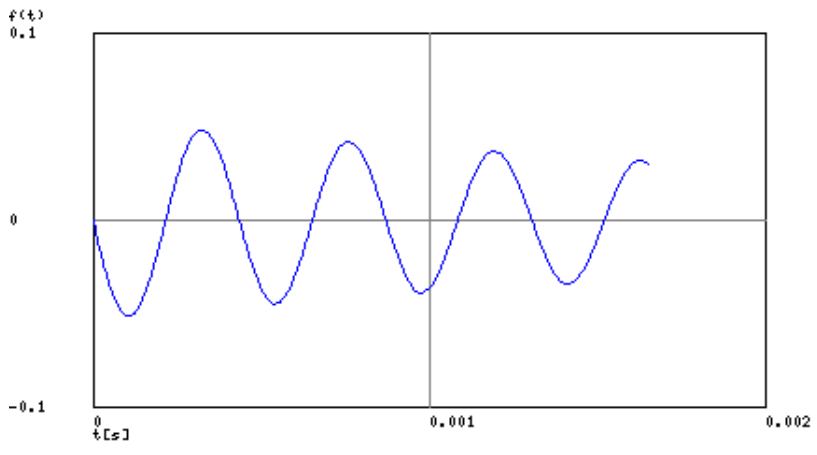


○ 10Hz ● 1000000Hz

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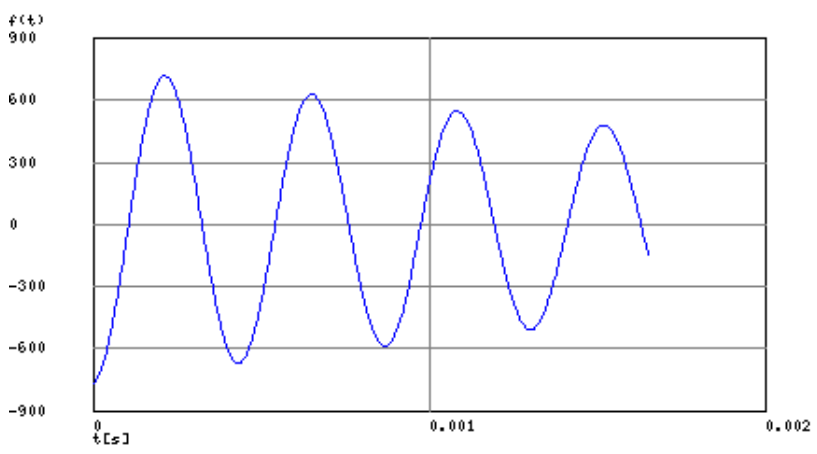
Transient analysis

StepResponse



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ImpulseResponse



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◆Suggestion box

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