OKAWA Electric Design

RC Low-pass Filter Design Tool - Result -

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

Vin(s)→ R C →Vout(s)
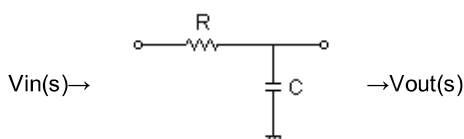
Transfer Function:

$$G(s)=\frac{45454.5454545}{s+45454.5454545}$$

Cut-off frequency
fc = 7234.31559509[Hz]

CR Filter

Rise/Fall time of step response

R = 2200 Ω C = 1.0E-8 F

Stead-state value: 0 %→ 90 %

Calculate

tr = 5.06568720459E-5 [sec]

Pole(s)
$p = -7234.31559509$[Hz]
$|p|= 7234.31559509$[Hz]

Phase margin
$pm=$ NAN[deg] (f=0[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)
$g(\infty) = 1$

R= 2.2k Ω C= .01u F

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

Frequency analysis

Bode diagram
Nyquist diagram(f=0→∞)
Pole, zero
Phase margin
Oscillation analysis
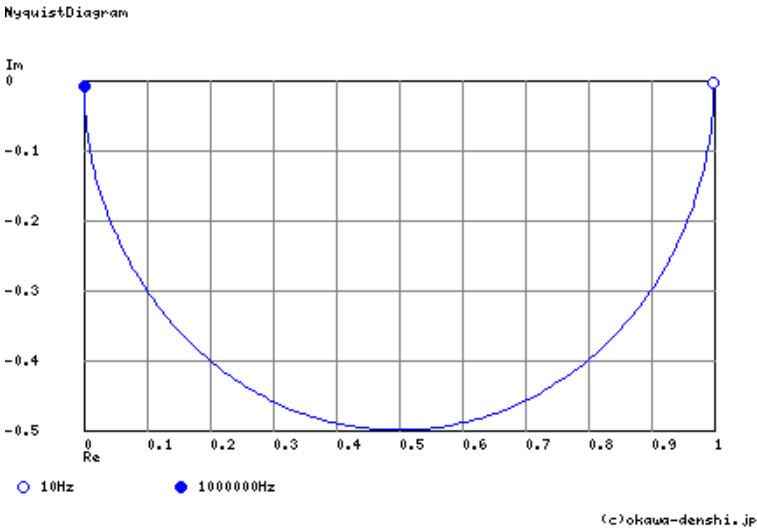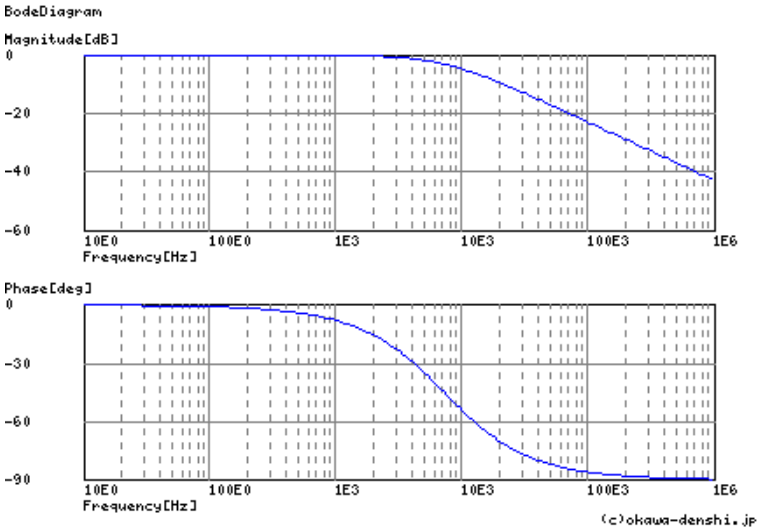
Transient analysis

Step response   Impulse response

Overshoot
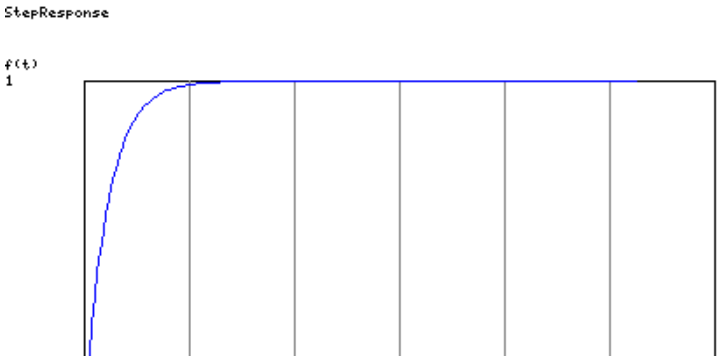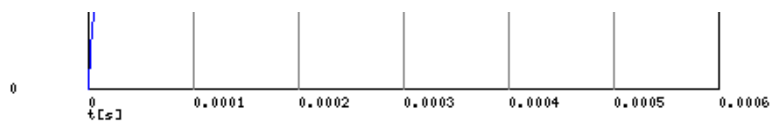Final value of the step response

Calculate

Frequency analysis

BodeDiagram

Magnitude[dB]

Phase[deg]

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NyquistDiagram

Im

○ 10Hz   ● 1000000Hz

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Transient analysis

StepResponse

f(t)

0

0   0.0001   0.0002   0.0003   0.0004   0.0005   0.0006
t[s]

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ImpulseResponse

f(t)
49000

42000

35000

28000

21000

14000

7000

0

0   0.0001   0.0002   0.0003   0.0004   0.0005   0.0006
t[s]
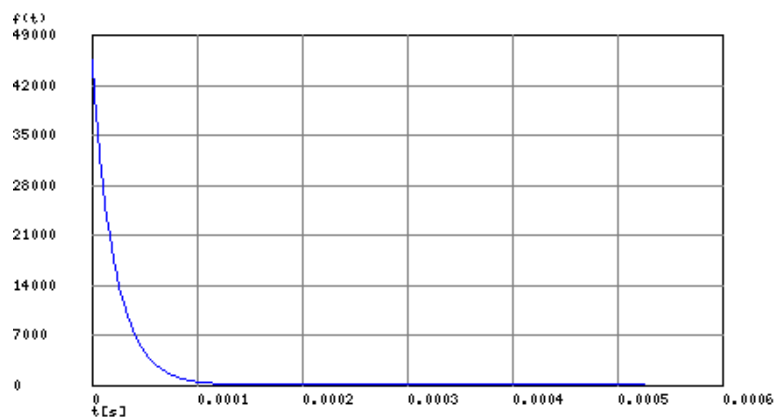
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