

Zadání

Typ filtru:

Pásmová propust

Tolerancní schéma:

$$\begin{aligned} f_{-s} &= 411.268\text{Hz} & f_m &= 1.43\text{kHz} \\ f_{-p} &= 730\text{Hz} & \Delta f_p &= 2.07\text{kHz} \\ f_p &= 2.8\text{kHz} & \Delta f_s &= 4.559\text{kHz} \\ f_s &= 4.97\text{kHz} \\ a_p &= 2\text{dB} \\ a_s &= 18\text{dB} \end{aligned}$$

Typ aproximace:

Chebyshev

Rád filtru:

3

Výsledky aproximací úlohy

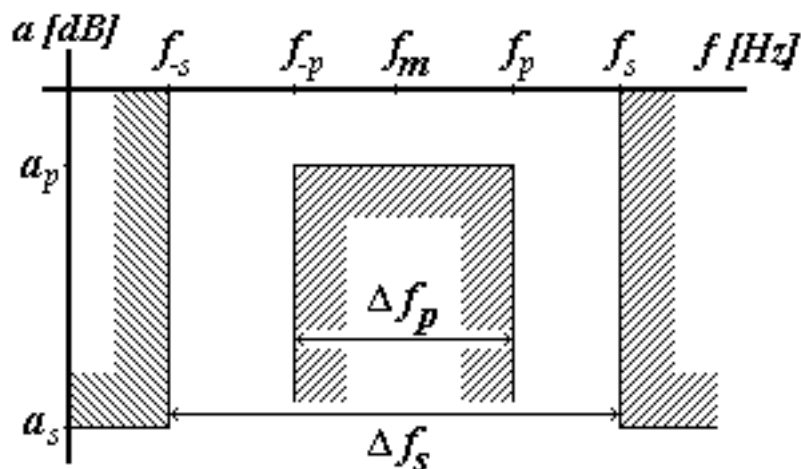
Prenosová funkce

$$H(p) = \frac{.7192045e12p^3}{(p^2 + 1060.425p + .2289370e8)(p^2 + 3737.700p + .2844233e9)}$$

$$\frac{1}{(p^2 + 4798.125p + .8069389e8)}$$

Tabulka s koeficienty prenosové funkce

| itatel | Jmenovatel |
|----------------------|-----------------------------|
| $b_0 = 0$ | $a_0 = 5.254384\text{E}+23$ |
| $b_1 = 0$ | $a_1 = 6.248601\text{E}+19$ |
| $b_2 = 0$ | $a_2 = 3.348768\text{E}+16$ |
| $b_3 = 719204500000$ | $a_3 = 2267922000000$ |
| | $a_4 = 414996400$ |
| | $a_5 = 9596.25$ |
| | $a_6 = 1$ |



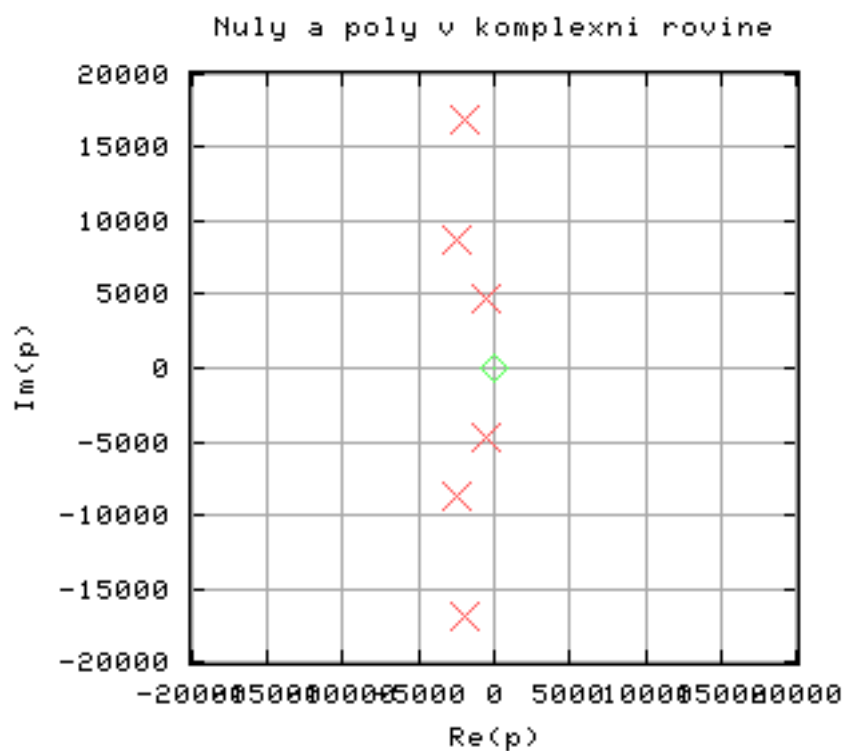
Nuly a póly prenosové funkce

| Nuly | Póly |
|--------------------------|----------------------------------|
| 0.000000000+0.000000000j | -2399.062566085-8656.695927854j |
| 0.000000000+0.000000000j | -2399.062566085+8656.695927854j |
| 0.000000000+0.000000000j | -1868.850146972-16760.988202022j |
| | -1868.850146972+16760.988202022j |
| | -530.212419113-4755.268428404j |
| | -530.212419113+4755.268428404j |

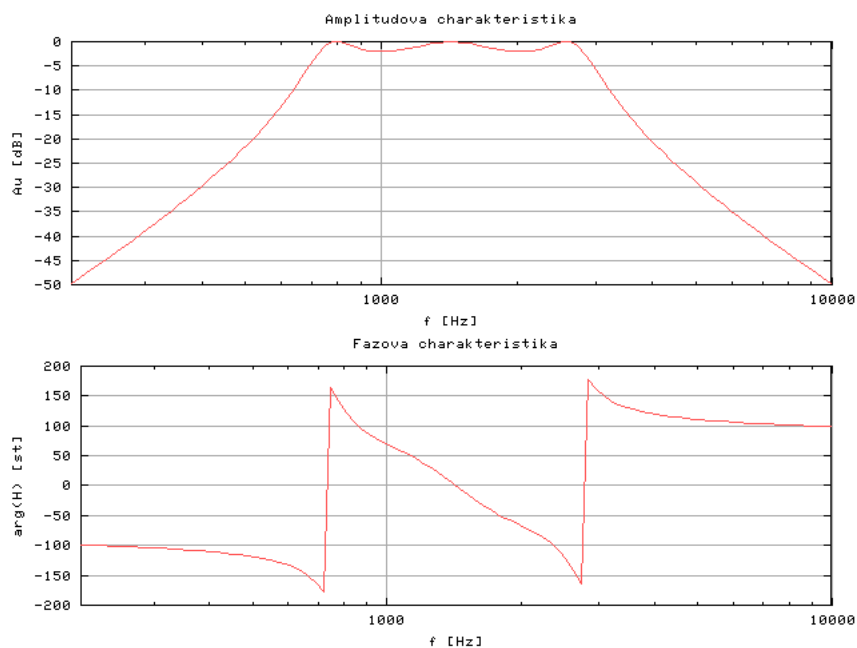
Q pól prenosové funkce

| Blok | k | Q | ω_0 | ω_n |
|------|-----------------|-----------------|-----------------|------------|
| 1 | 3.3565939710831 | 4.5120939194468 | 4784.7364645875 | |
| 2 | 3.3565939710831 | 4.5120939194468 | 16864.854769021 | |
| 3 | 3.3565939710831 | 1.872184926002 | 8982.9775455194 | |

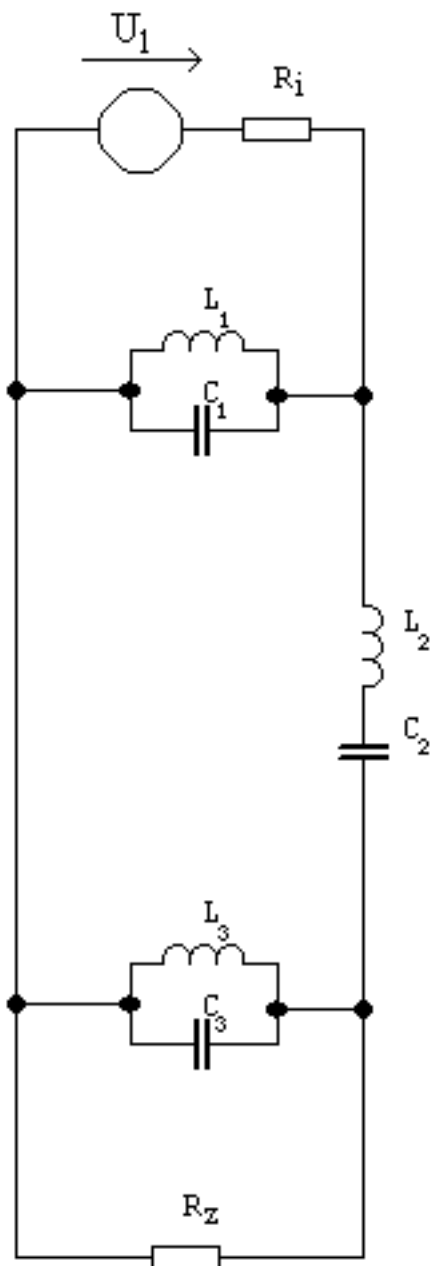
Nuly a póly prenosové funkce v komplexní rovine



Frekvenční charakteristiky prenosové funkce



LC prücková struktura



$$R_i = 50 \Omega$$

$$L_1 = 2.973 \text{mH}$$

$$C_1 = 4.168 \mu\text{F}$$

$$R_1 = 0 \Omega$$

$$Q_1 = \infty$$

$$L_2 = 3.201 \text{mH}$$

$$C_2 = 3.871 \mu\text{F}$$

$$R_2 = 0 \Omega$$

$$Q_2 = \infty$$

$$L_3 = 2.973 \text{mH}$$

$$C_3 = 4.168 \mu\text{F}$$

$$R_3 = 0 \Omega$$

$$Q_3 = \infty$$

$$R_z = 50 \Omega$$