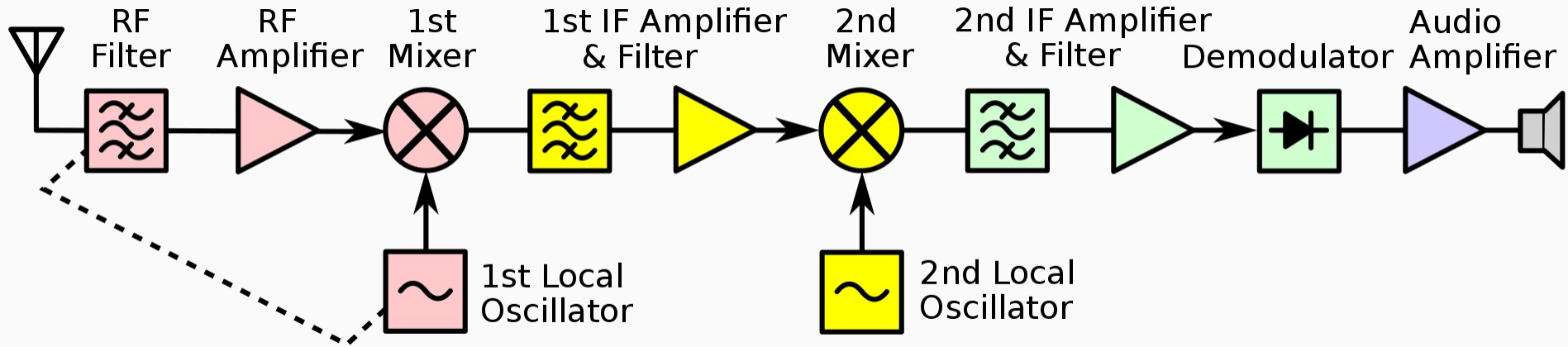


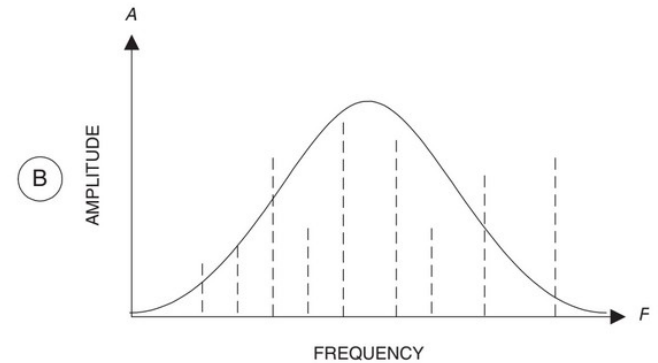
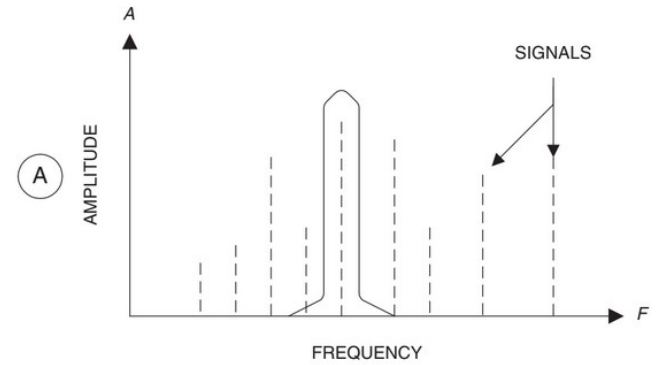
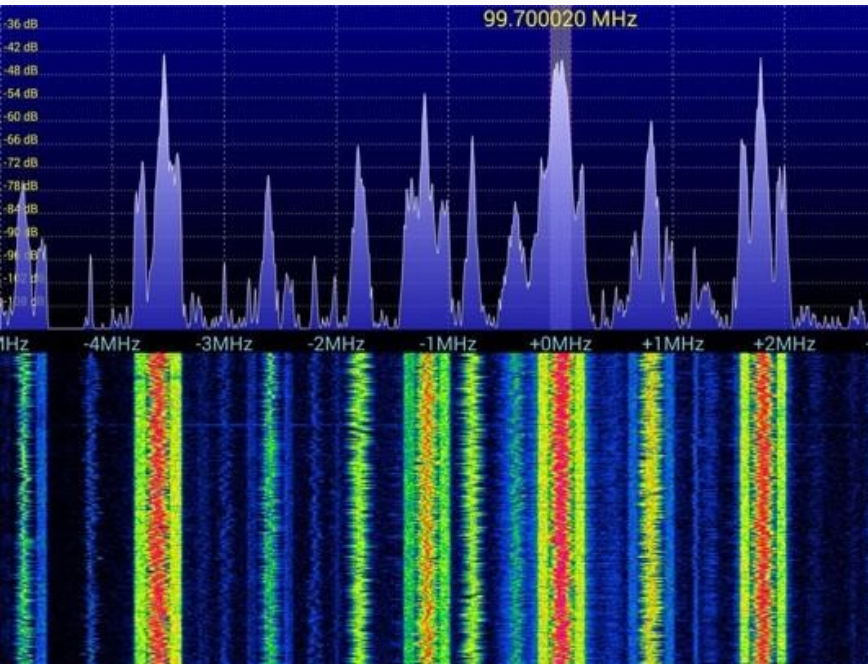
Szűrők



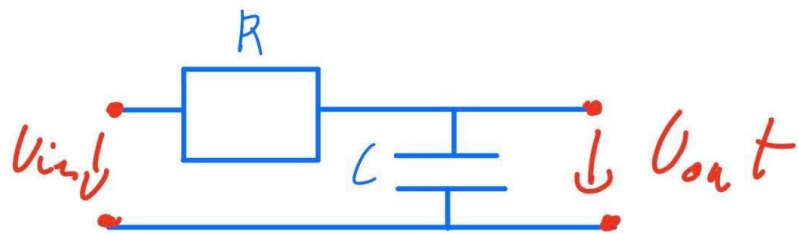
Szűrés és érzékenység



Szűrés és érzékenység 2.



Aluláteresztő szűrő



$$H(\omega) = \frac{V_{out}}{V_{in}}$$

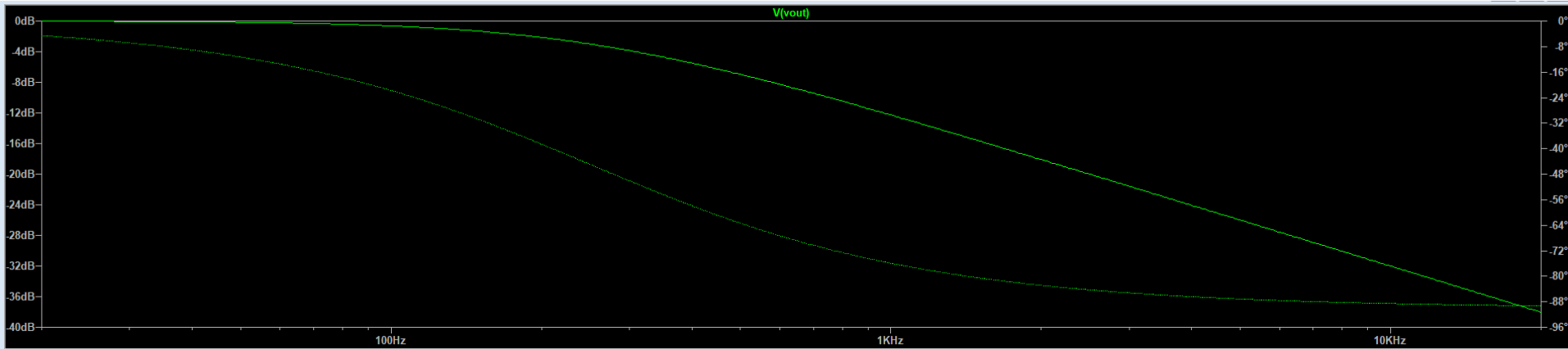
$$H(j\omega) = \frac{1}{RCs + 1}$$

$$(s = j\omega)$$

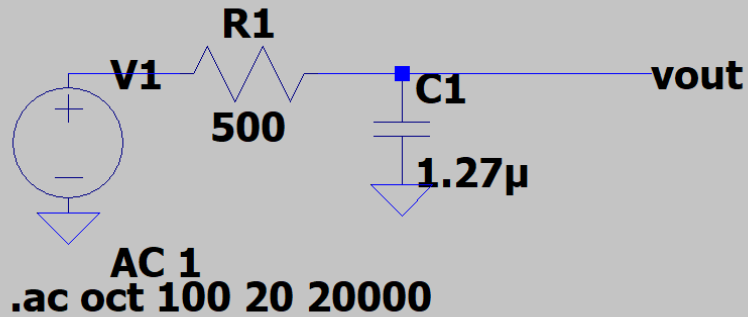
$$V_{out} = V_{in} \cdot \frac{\frac{1}{j\omega C}}{R + \frac{1}{j\omega C}} =$$

$$= V_{in} \frac{\frac{1}{j\omega C}}{R + \frac{1}{j\omega C}} = \frac{1}{RCs + 1}$$

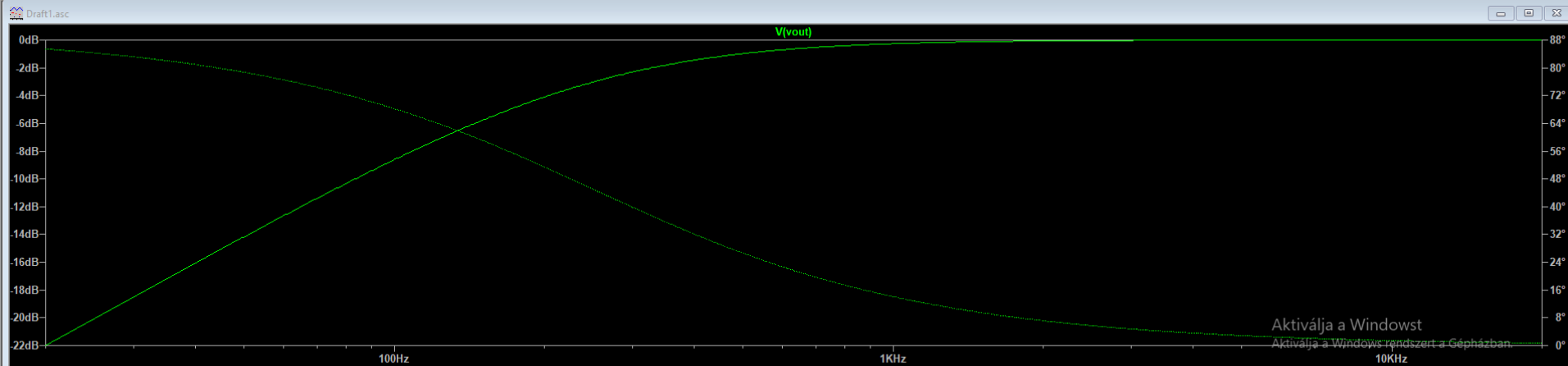
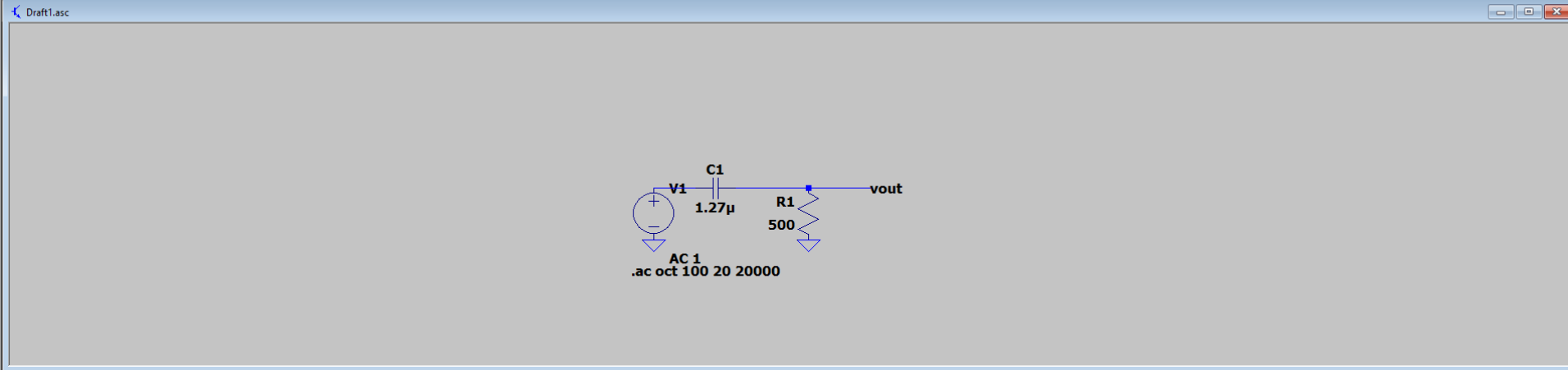
Analóg Szűrők



Draft1.asc

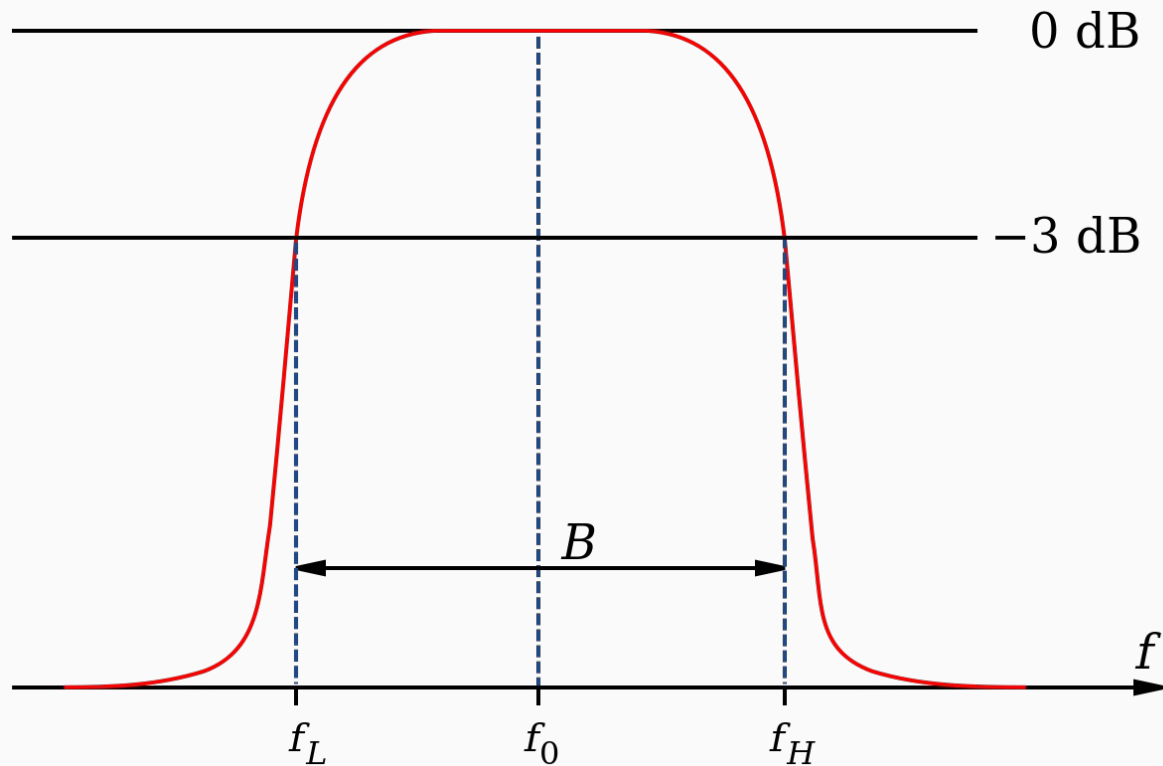


HPF

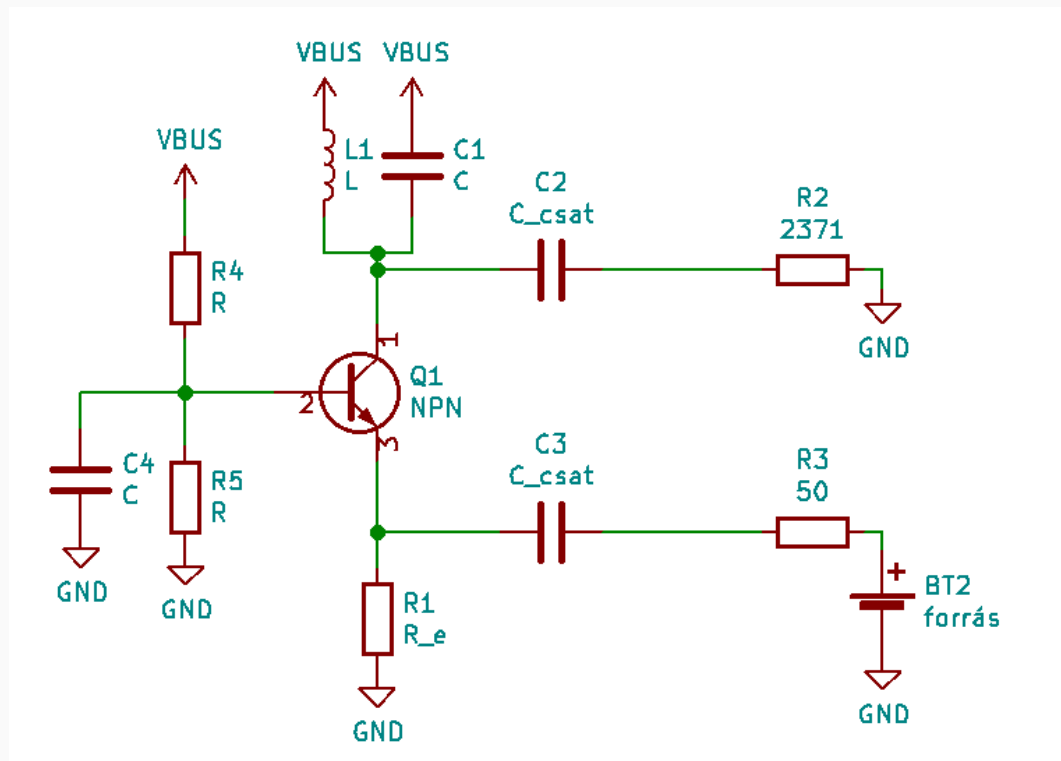


Sáváteresztő szűrő

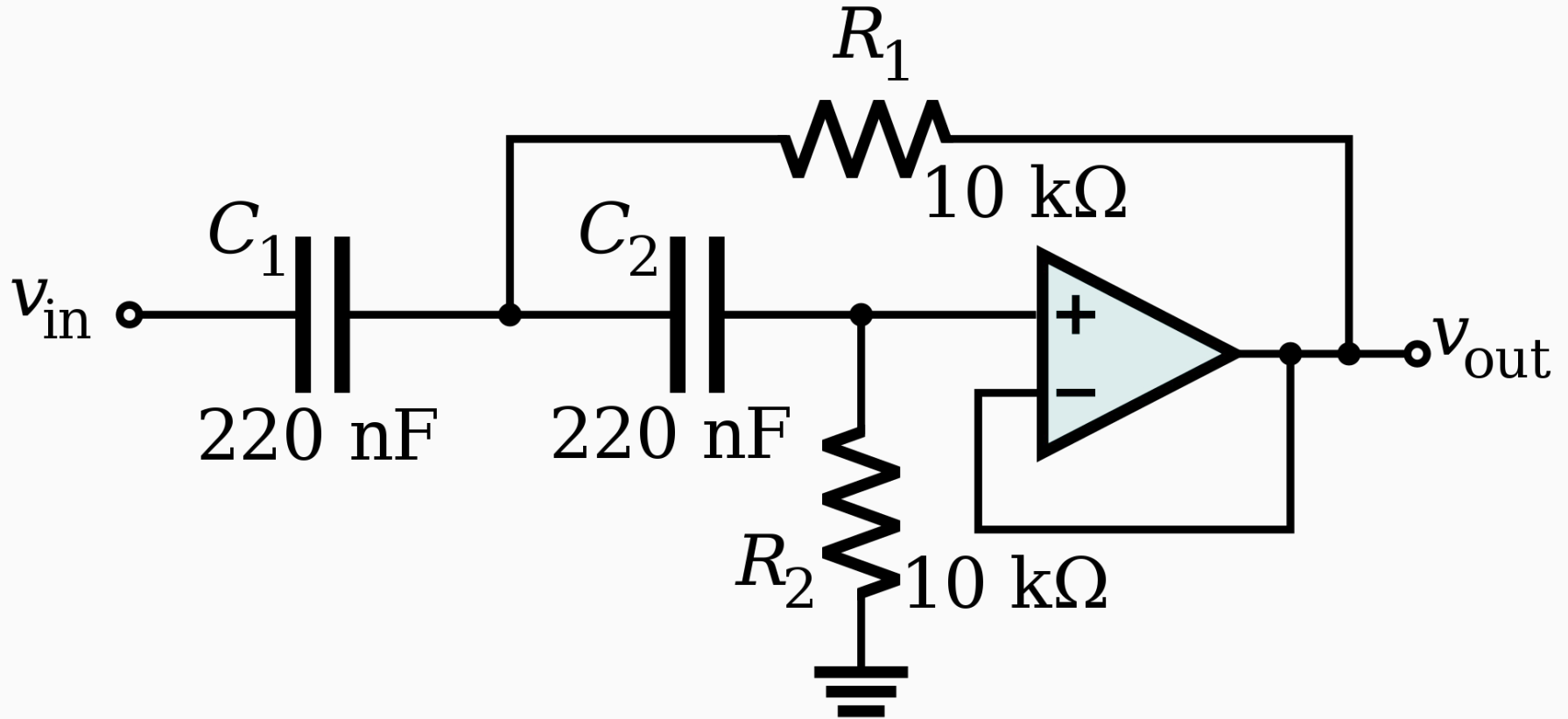
$$Q = \frac{2^{\frac{BW}{2}}}{2^{BW} - 1}$$



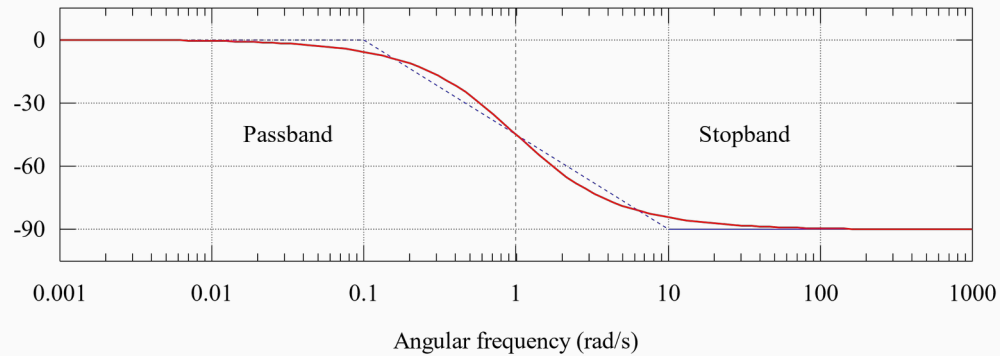
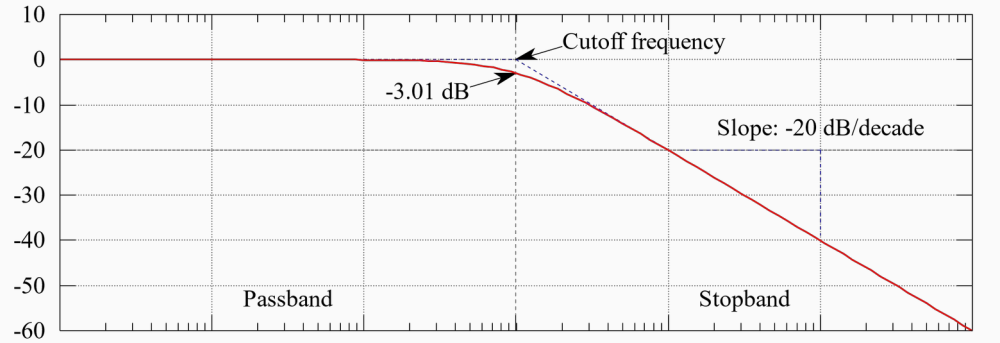
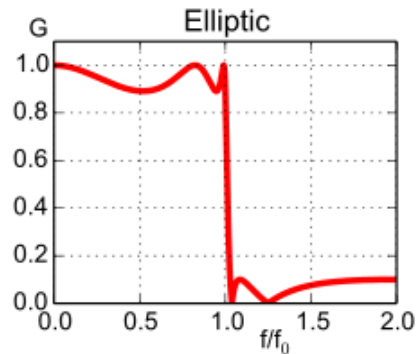
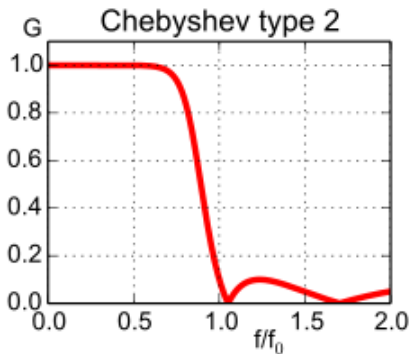
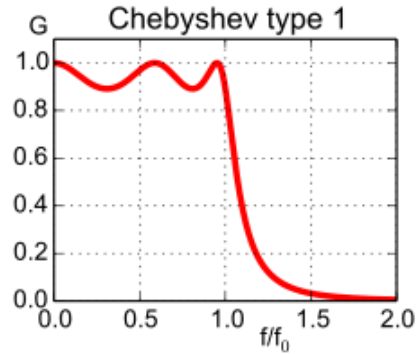
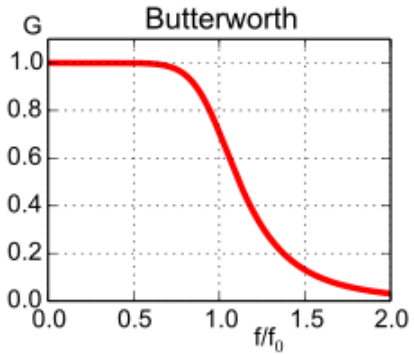
Hangolt kollektorkör



Sallen-Key

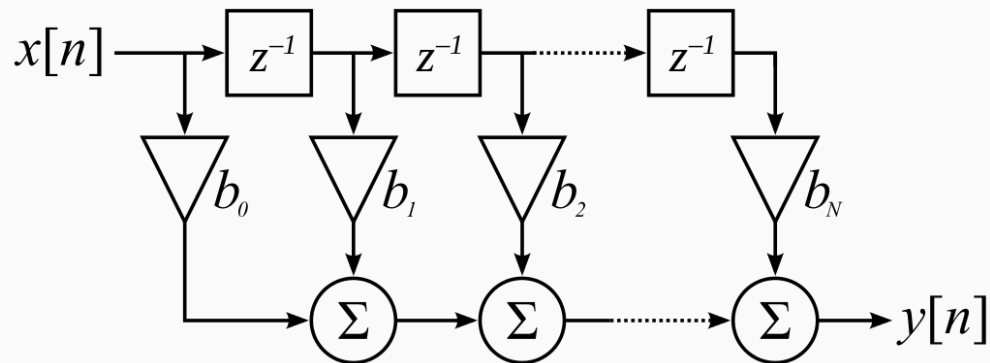


Butterworth és barátai



$$y[n] = b_0 x[n] + b_1 x[n - 1] + \dots + b_N x[n - N]$$

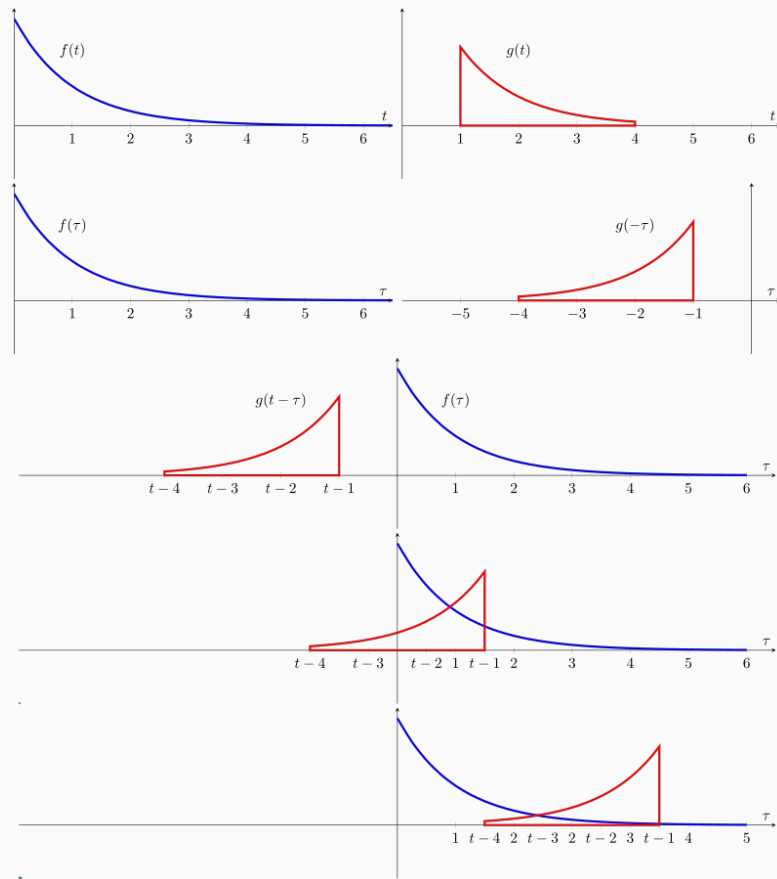
$$= \sum_{i=0}^N b_i \cdot x[n - i],$$



$$H(z) = \frac{P(z)}{Q(z)} = \frac{\sum_{m=0}^M b_m z^{-m}}{1 + \sum_{n=1}^N a_n z^{-n}} = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2} \dots + b_M z^{-M}}{1 + a_1 z^{-1} + a_2 z^{-2} \dots + a_N z^{-N}}$$

Konvolúció

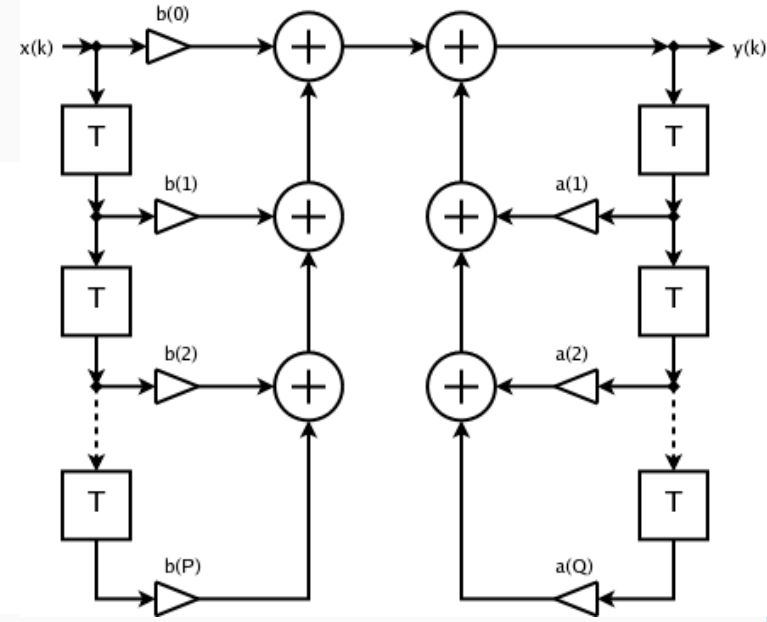
$$(f * g)(n) = \sum_{k \in D} f(k)g(n - k)$$



$$y[n] = \frac{1}{a_0} (b_0 x[n] + b_1 x[n-1] + \dots + b_P x[n-P] - a_1 y[n-1] - a_2 y[n-2] - \dots - a_Q y[n-Q])$$

$$H(z) = H\left(\frac{z}{T}, \frac{z-1}{z+1}\right) = \frac{1}{1+K} \left(\frac{z}{T}, \frac{z-1}{z+1}\right) =$$

$$= \frac{1+z}{\frac{1-2Kz}{T} + \frac{1+2Kz}{T} \cdot z} = \frac{1+z^{-1}}{\frac{1+2Kz}{T} + \frac{1-2Kz}{T} z^{-1}}$$



Vége

Kérdések?

