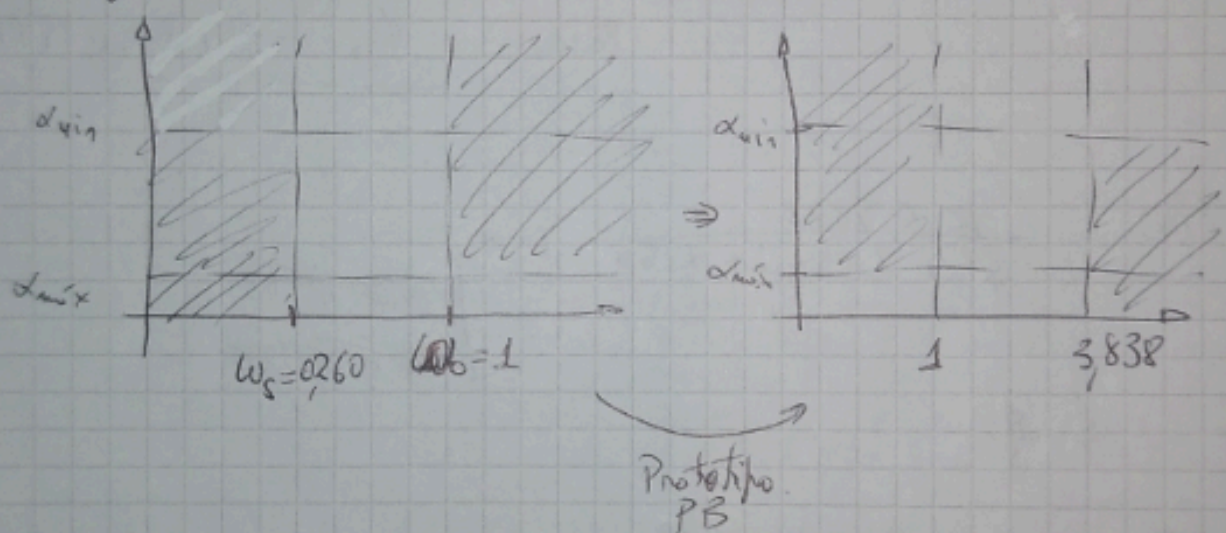


$$\alpha_{max} = 1 \text{ dB}$$

$$\alpha_{min} = 20 \text{ dB}$$

normalizados



Ahora trabajamos el E y n

$$\epsilon^2 = 10^{\frac{\alpha_{min}}{10}} - 1 \Rightarrow \epsilon^2 = 0,2589$$

$$n=2 \quad C_n = (2\omega_s^2 - 1) \Rightarrow \omega_s = 3,838 \Rightarrow$$

$$\alpha_{min} = 10 \log(1 + \epsilon^2 C_n^2)$$

$$\alpha_{min} = 10 \log(1 + 0,2589 (2(3,838)^2 - 1)^2)$$

$$\boxed{\alpha_{min} = 23,236 \text{ dB}}$$

el orden es 2:



luego:  $|T(s)| = \frac{1}{1 + \varepsilon^2 (2\Omega_s^2 - 1)^2}$

$$T(s) T(-s) = \frac{1}{1 + \varepsilon^2 (2(\frac{s}{j})^2 - 1)^2} = \frac{1}{\varepsilon^2 4s^4 + \varepsilon^2 4s^2 + \varepsilon^2 + 1}$$

$$T(s) T(s) = \frac{1 A \varepsilon^2}{s^4 + s^2 + \frac{(\varepsilon^2 + 1)}{4\varepsilon^2}} = K \frac{0,9826}{s^2 + 1,097s + 1,102} \frac{0,9826}{s^2 + 1,097s + 1,102}$$

Polos:  $s_{1,2} = -0,5488 \pm 0,8951j$

$$T(s) = \frac{K \cdot 0,9826}{s^2 + 1,097s + 1,102}$$

~~$\omega_n = 1,049$~~   
 ~~$\zeta = 0,5286$~~

luego:  $s = \frac{s}{s}$

$$T(s) = \frac{K \cdot 0,9826}{\left(\frac{1}{s}\right)^2 + 1,097\left(\frac{1}{s}\right) + 1,102}$$

$$T(s) = \frac{K \cdot 0,9826 s^2 / 1,102}{(1 + 1,097s + 1,102s^2) / 1,102} \Rightarrow T(s) = \frac{K \cdot 0,9826 s^2}{s^2 + 0,995s + 0,907}$$

0,8916