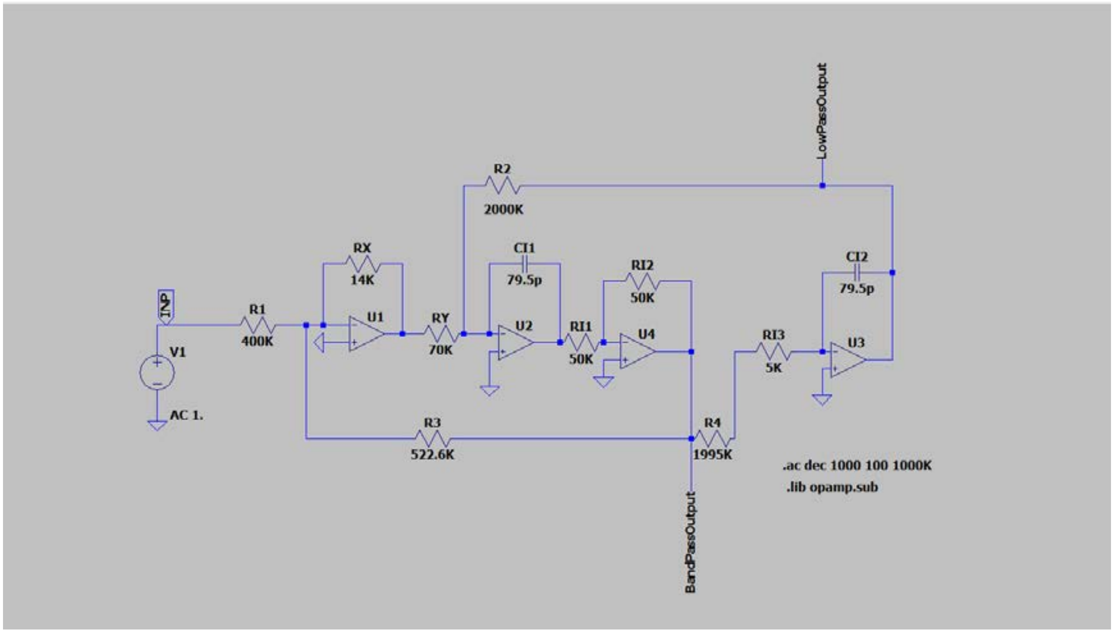
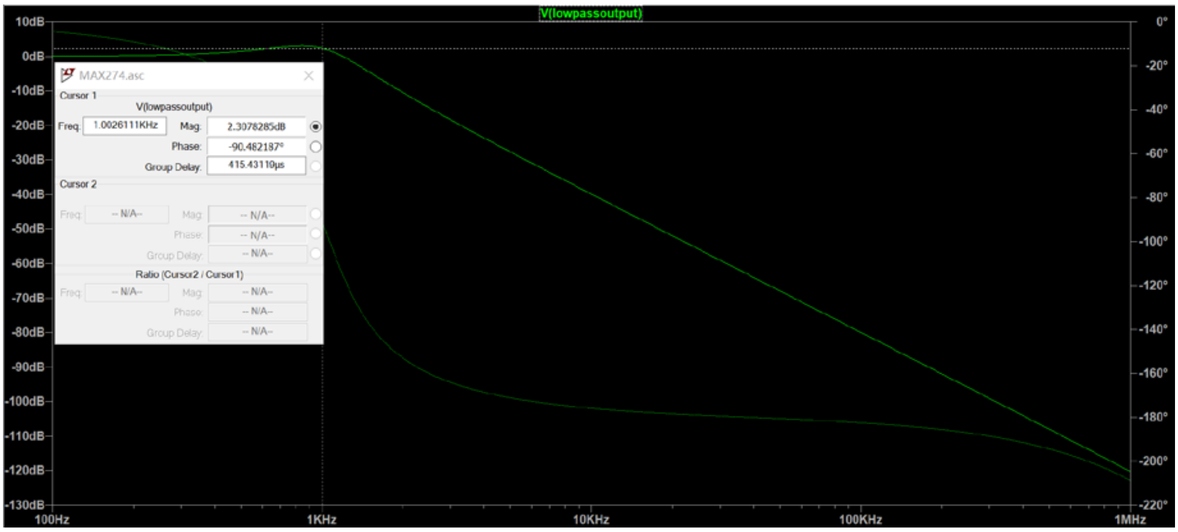
Synthèse de filtre

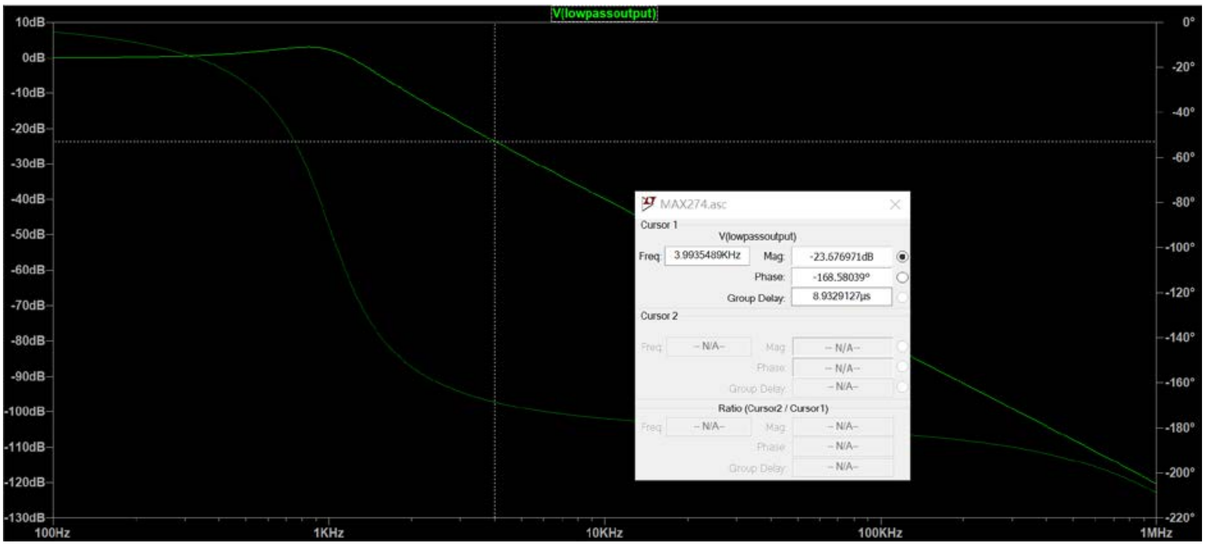
1. Quand on choisit R1=400KΩ, R2=2MΩ, R3=522.6KΩ, R4=1.995MΩ



On le simule et on obtient :

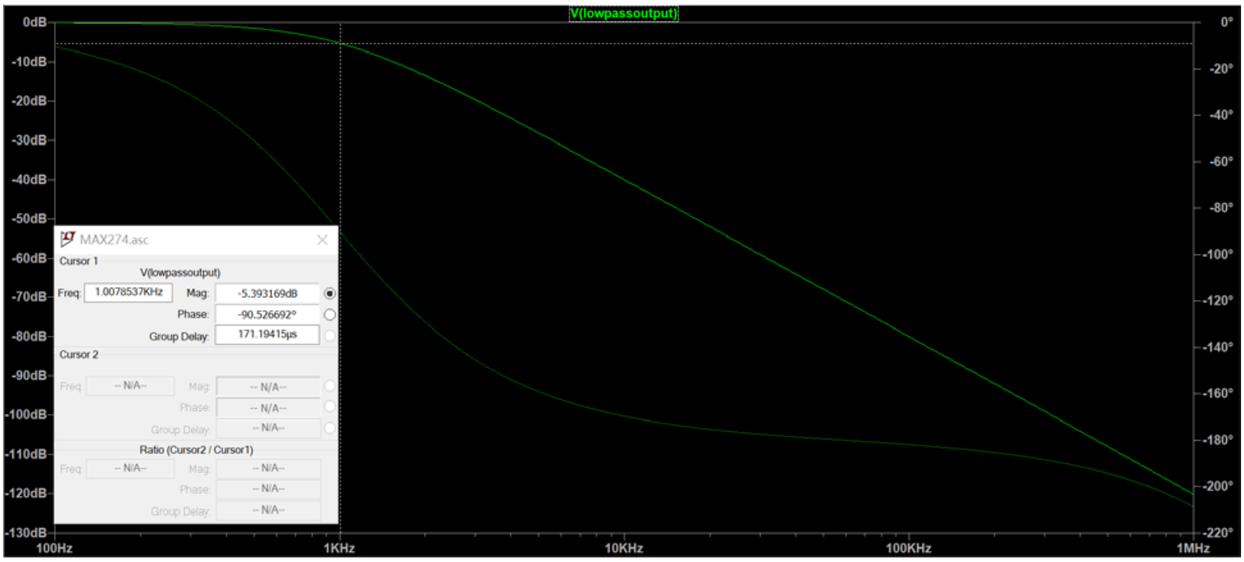


À f=1KHz, le gain est 2.3078285dB

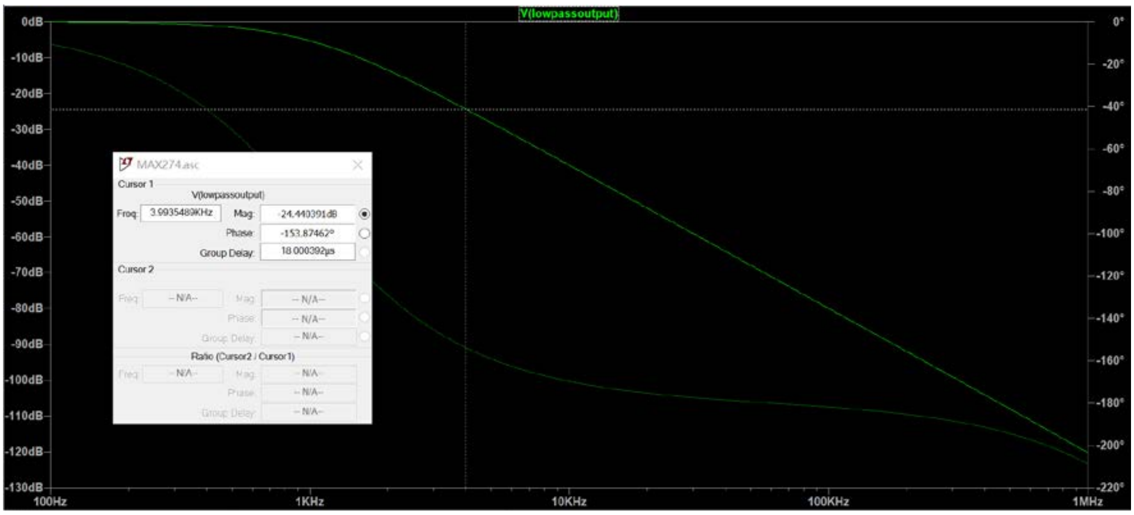


À f=4KHz, le gain est -23.676971dB

Quand on choisit R1=400KΩ, R2=2MΩ, R3=216.48KΩ, R4=1.995MΩ



À f=1KHz, le gain est -5.393169dB



À f=4KHz, le gain est -24.440391dB

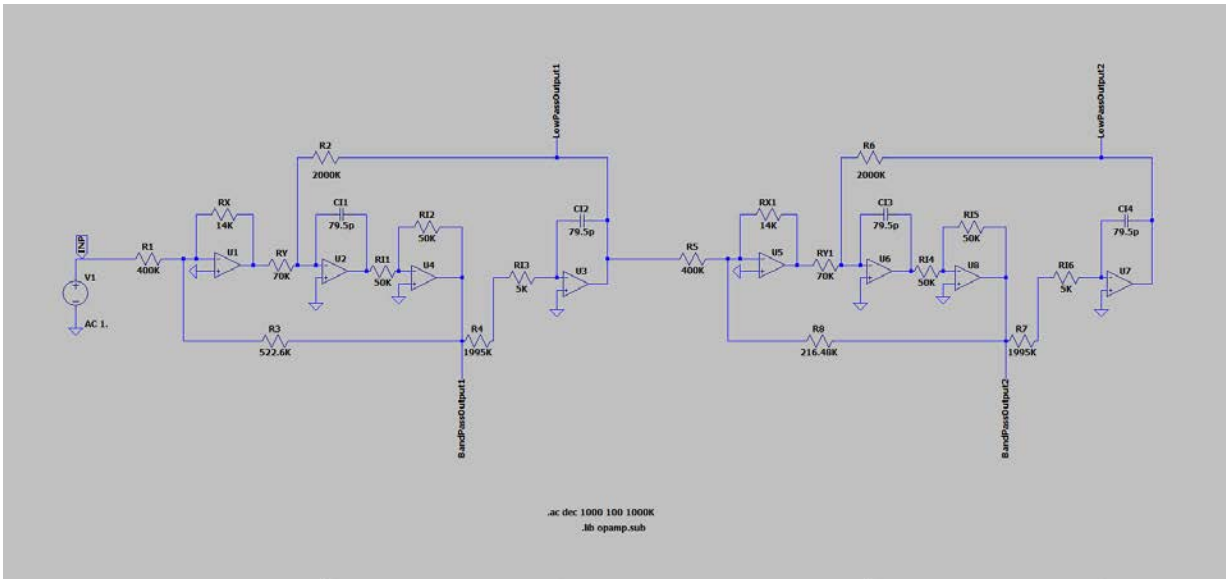
Si on les calcule ensemble, on obtient :

À f=1KHz, le gain est : 2.3078-5.3932≈-3.1dB

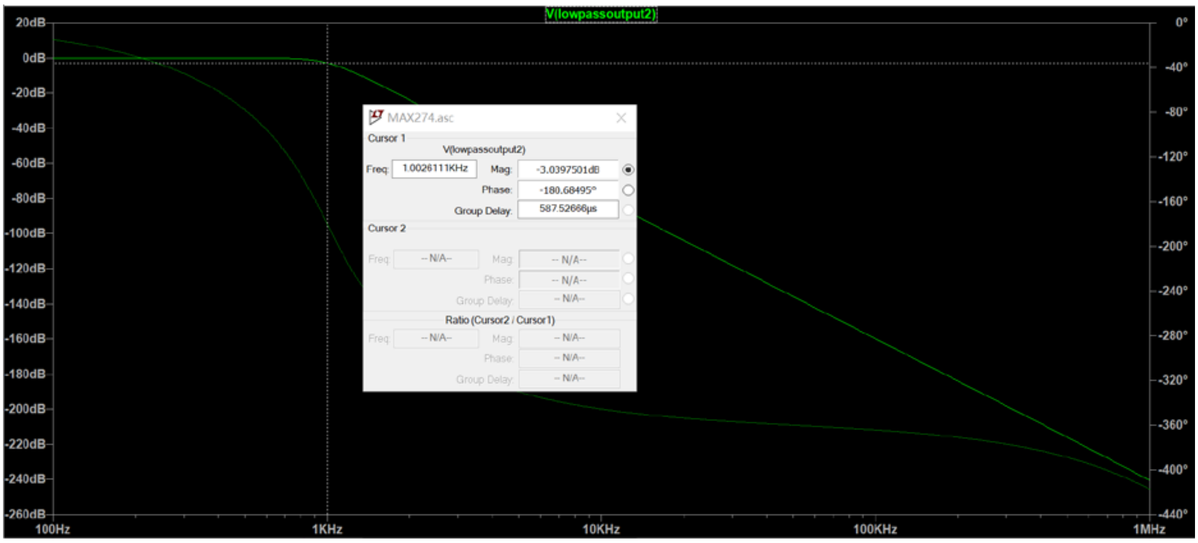
À f=4KHz, le gain est : -23.6770-24.4404≈-48.1dB

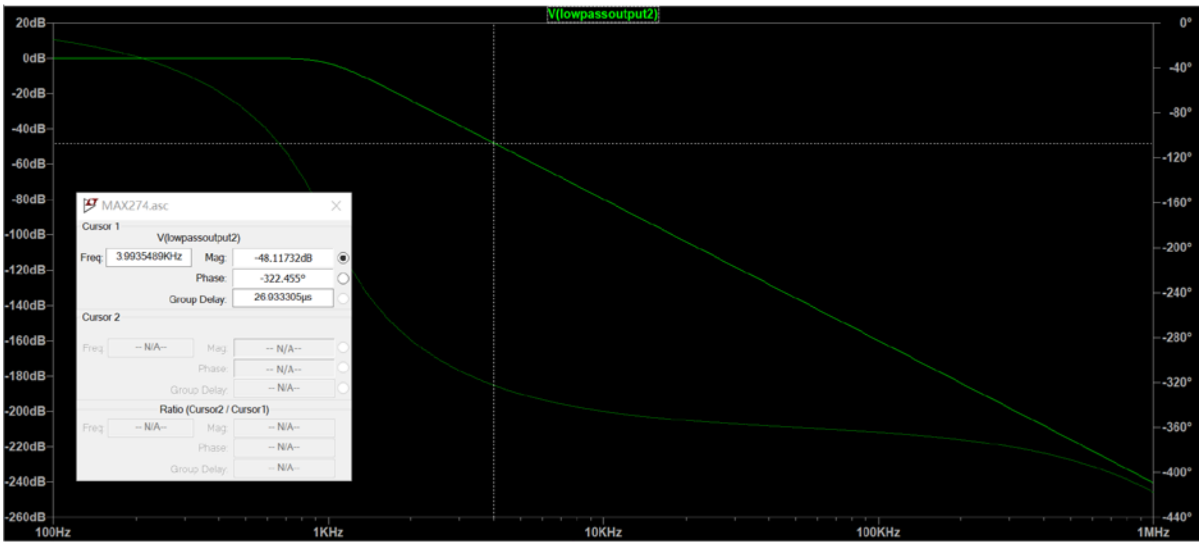
L'atténuation dans la BA est : -3.1-(-48.1)=45dB

Et puis, on va le vérifier:



On obtient :



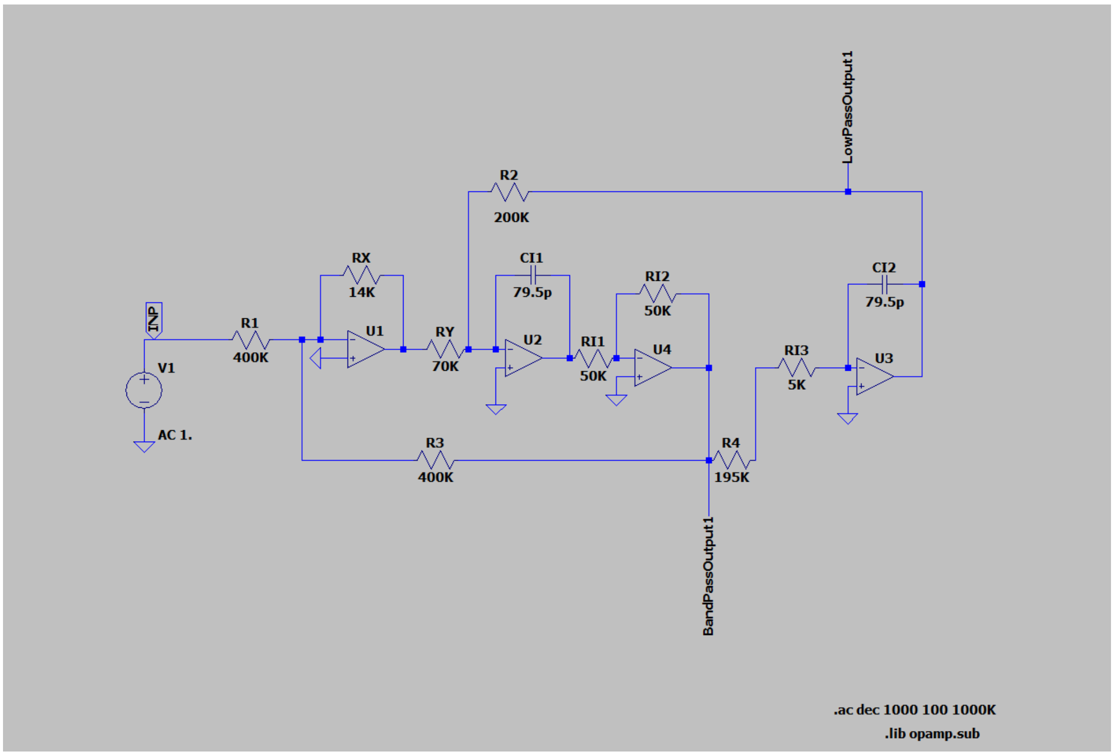


À f=1KHz, le gain est : -3.0dB

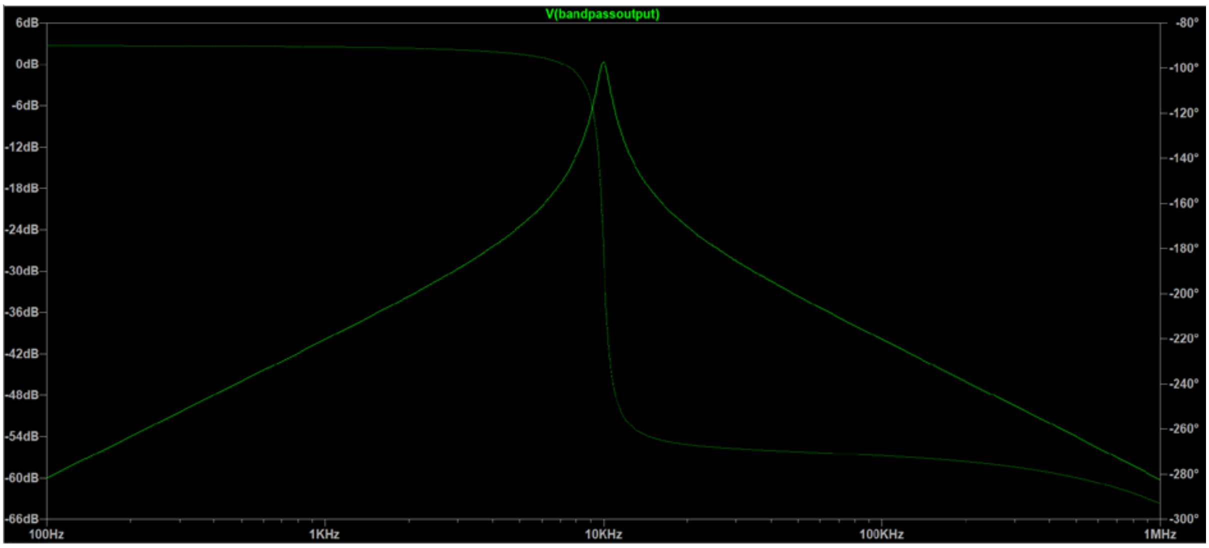
À f=4KHz, le gain est : -48.1dB

L'atténuation dans la BA est prèsque 45dB.

2. D'après le TD, on choisit : R1=400KΩ, R2=200KΩ, R3=400KΩ, R4=195KΩ



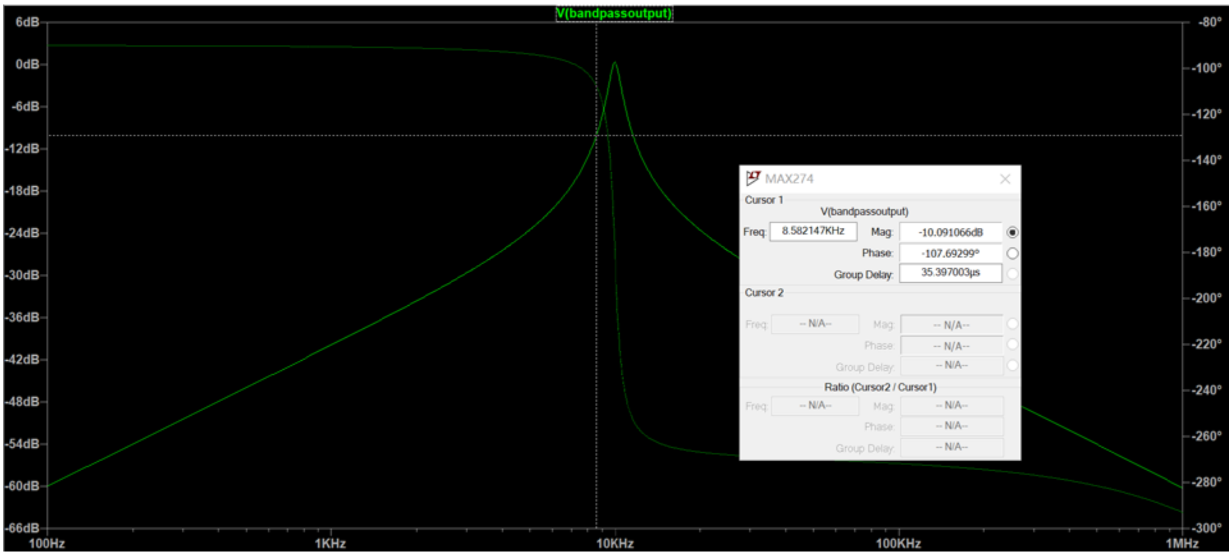
On obtient :



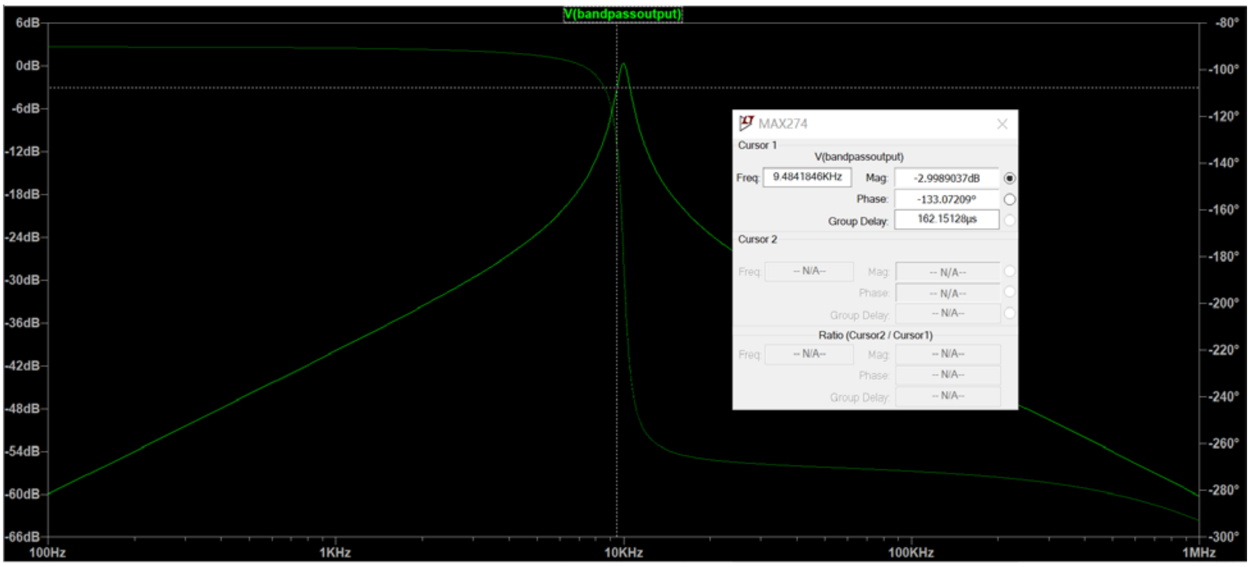
D’après le TD , les fréquences sont :

$$f_1' = 8611.6Hz, f_1 = 9512.5Hz, f_2 = 10512.5Hz, f_2' = 11612.9Hz$$

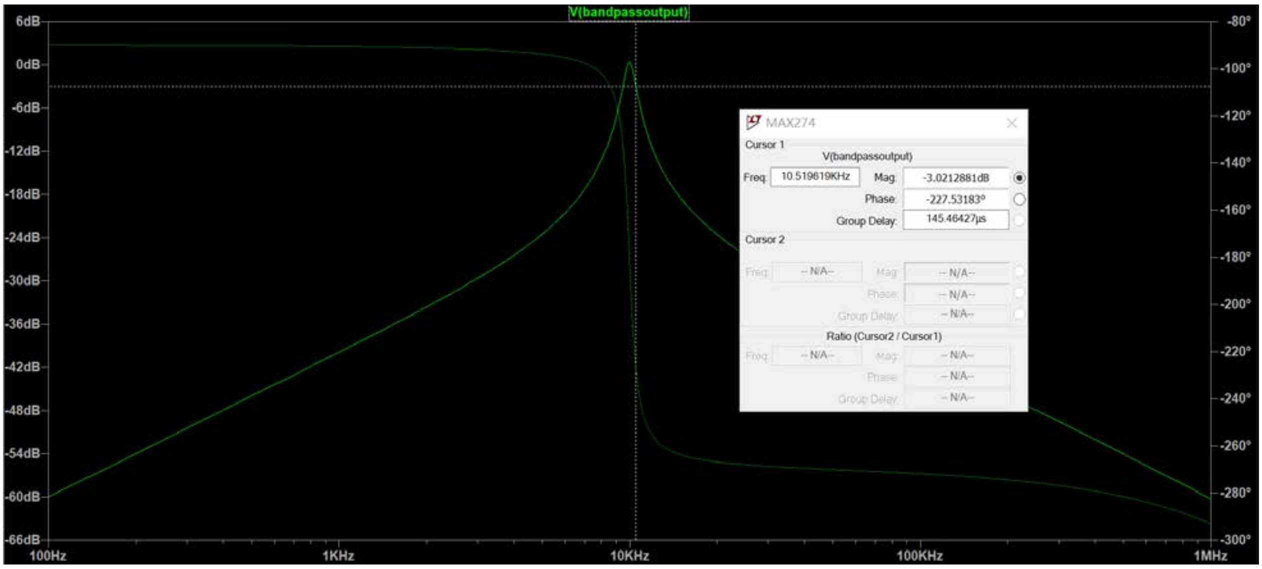
D’après le résultat qu’on obtient :



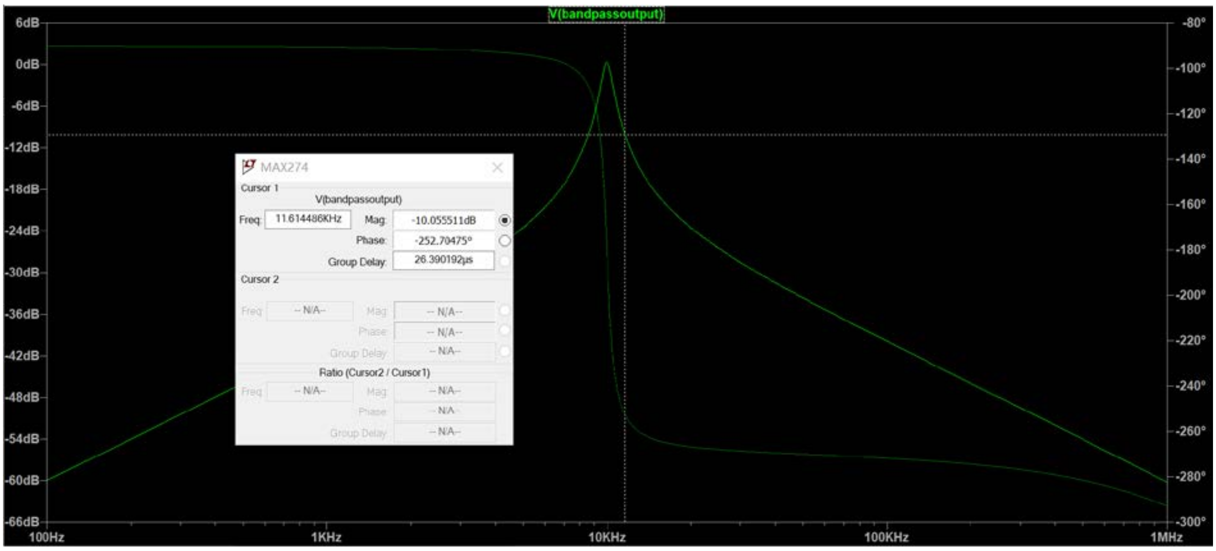
$f_1{}' = 8582.1Hz$, le gain est : -10.09dB



$f_1 = 9484.2Hz$, le gain est :-3.00dB



$f_2 = 10519.6Hz$, le gain est : -3.02dB

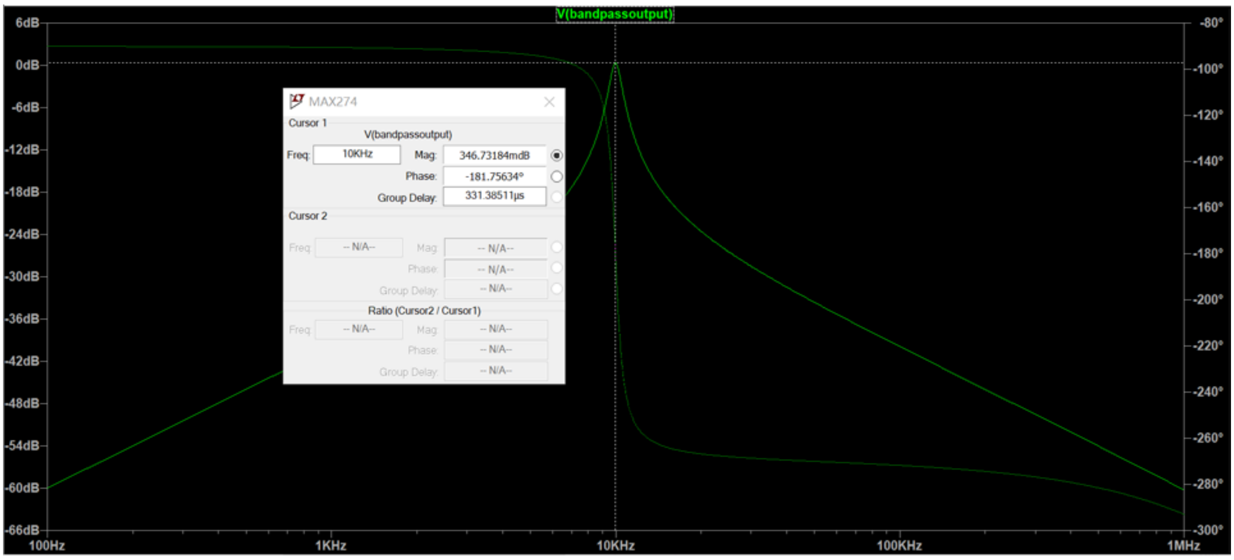


$f_2' = 11614.5Hz$, le gain est : -10.06dB

$f_2 - f_1 = 10519.6 - 9484.2 = 1035.4Hz \approx 1KHz$

$f_2' - f_1' = 11614.5 - 8582.1 = 3032.4Hz \approx 3KHz$

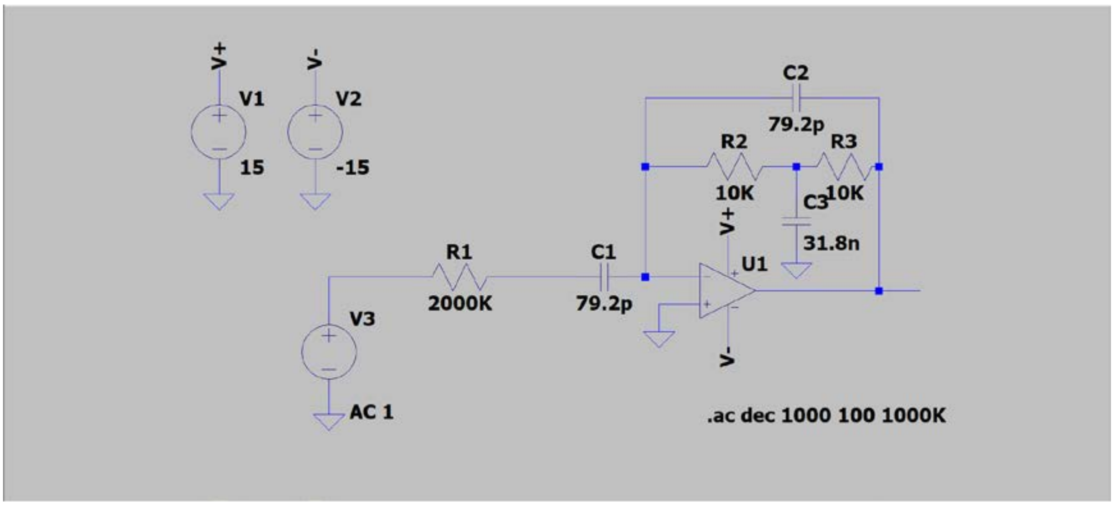
Quand f=10KHz,



Le gain est : 346.73mdB, donc, c'est 0.3dB

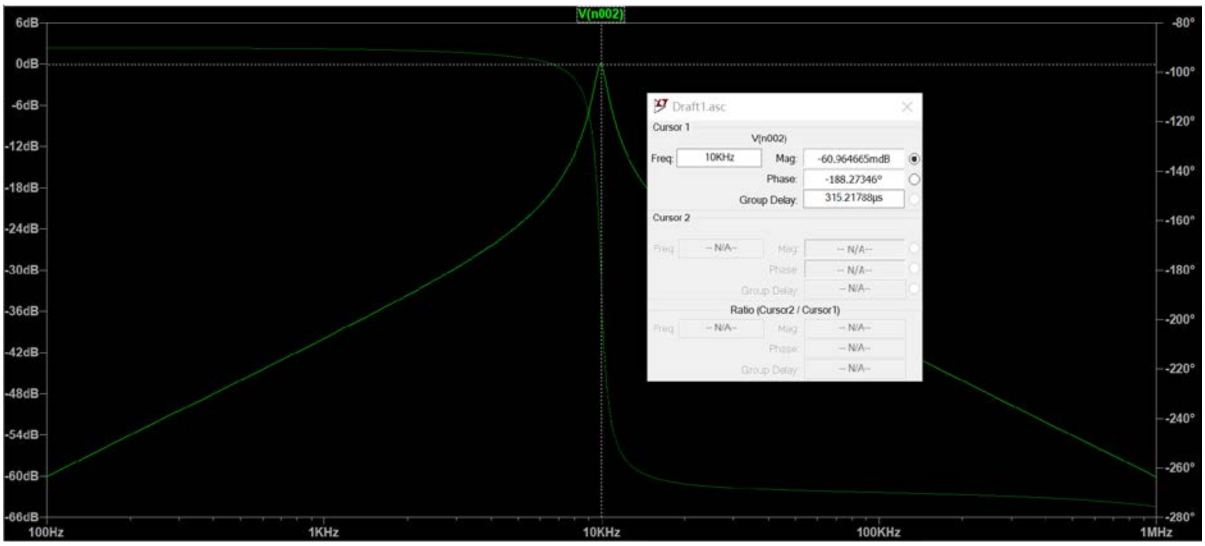
L'atténuation est 0.3-(-10)=10.3≈10dB

3.

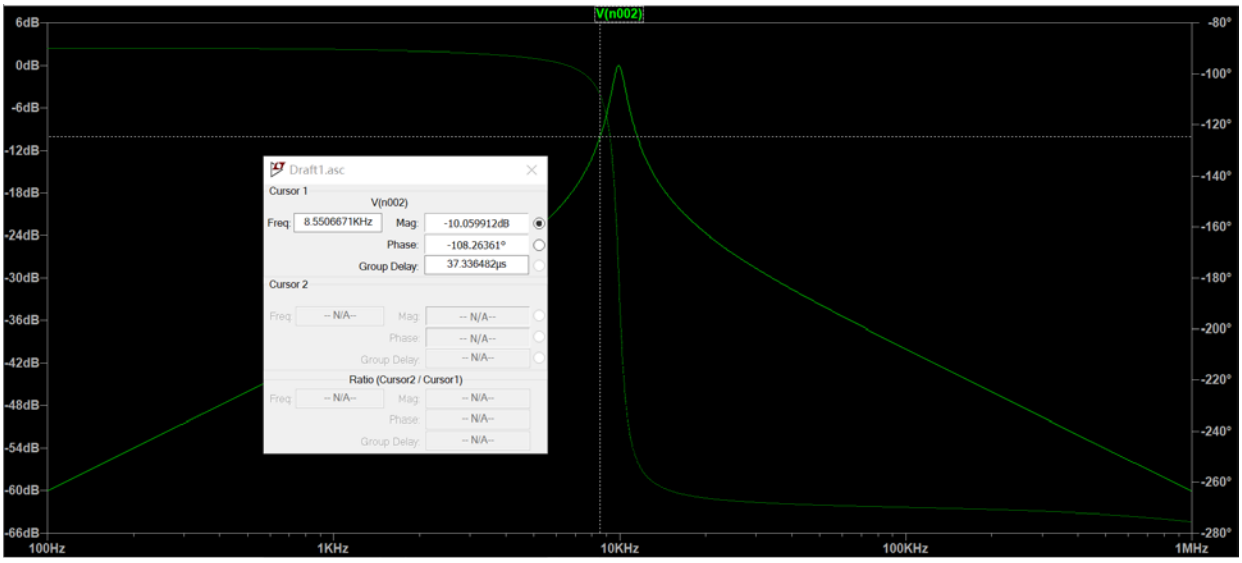


D'après le TD, C1=C2=79.2pF, C3=31.8nF, R2=R3=R=10KΩ, $R_1 = \frac{RC_2}{2C_1} \approx 2000K\Omega$

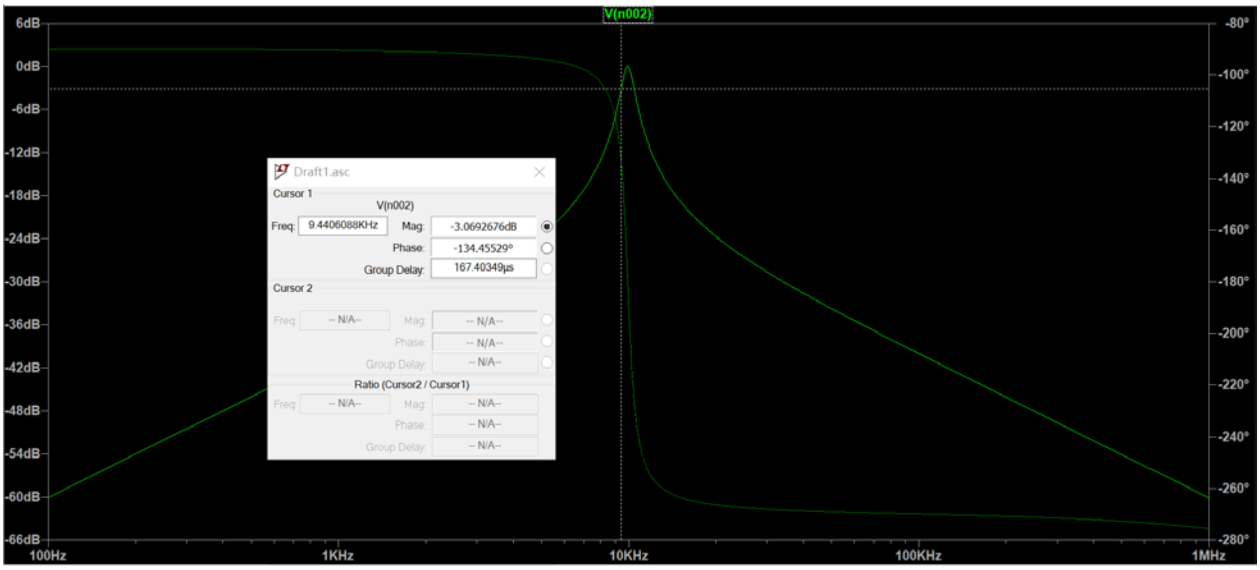
On le simule et on obtient :



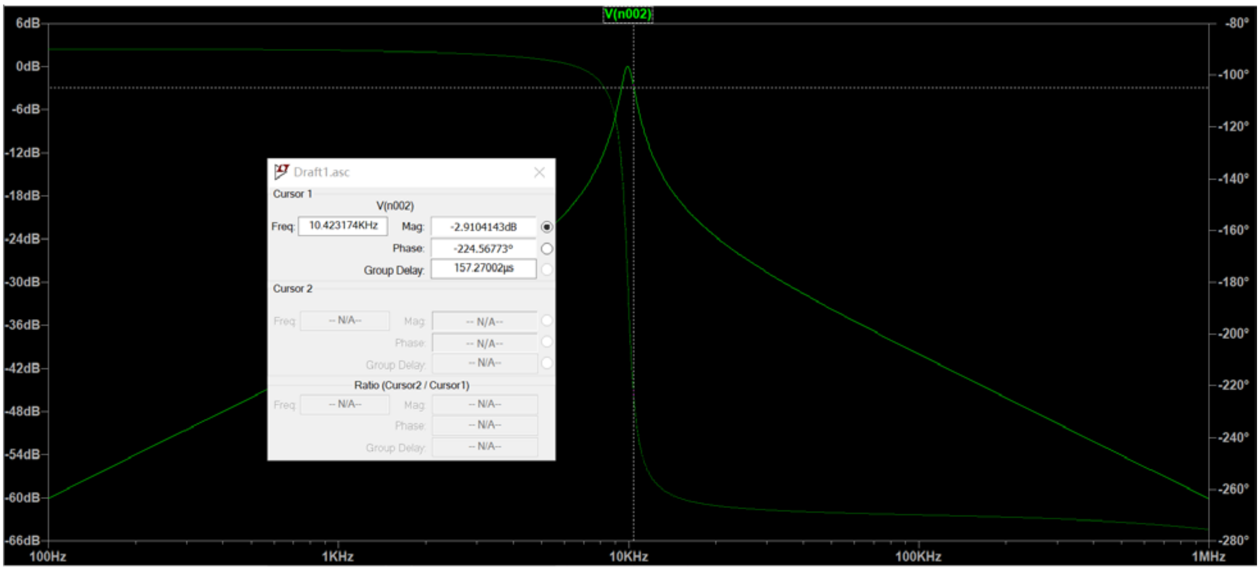
Quand f=10KHz, le gain est : -60.965mdB environs -0.06dB



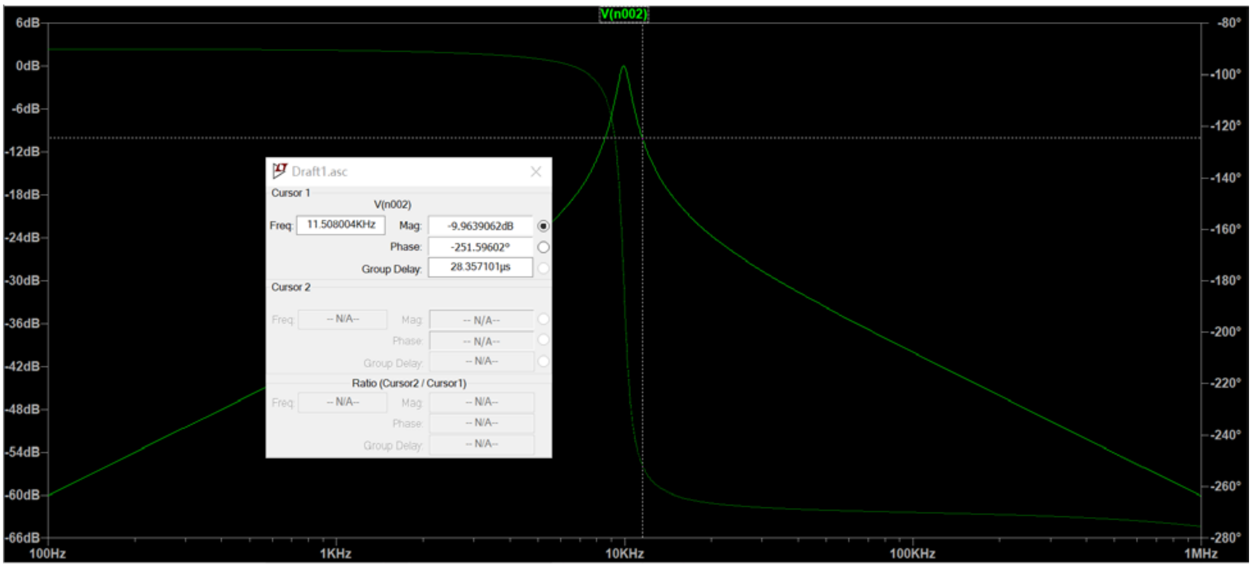
$f_1{}' = 8550.7Hz$, le gain est : -10.06dB



$f_1 = 9440.6Hz$, le gain est : -3.07dB



$f_2 = 10423.2Hz$, le gain est : -2.91dB



${f_2}' = 11508.0Hz$, le gain est : -9.96dB

$f_2 - f_1 = 10423.2 - 9440.6 = 982.6Hz \approx 1KHz$

${f_2}' - {f_1}' = 11508.0 - 8550.7 = 2957.3Hz \approx 3KHz$

L’atténuation est -0.06-(-10)=9.94≈10dB