

Devoir 2 Électronique

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1 Filtre passe-bas

1.1

On a pour section 1:

$$R_2 = \frac{1}{2\pi f_0 C} \approx 2M\Omega$$

$$R_4 = R_2 - 5k\Omega \approx 1.995M\Omega$$

$$R_3 \approx 522.6k\Omega$$

$$R_1 = \frac{R_3}{K} \approx 400k\Omega$$

On a pour section 2:

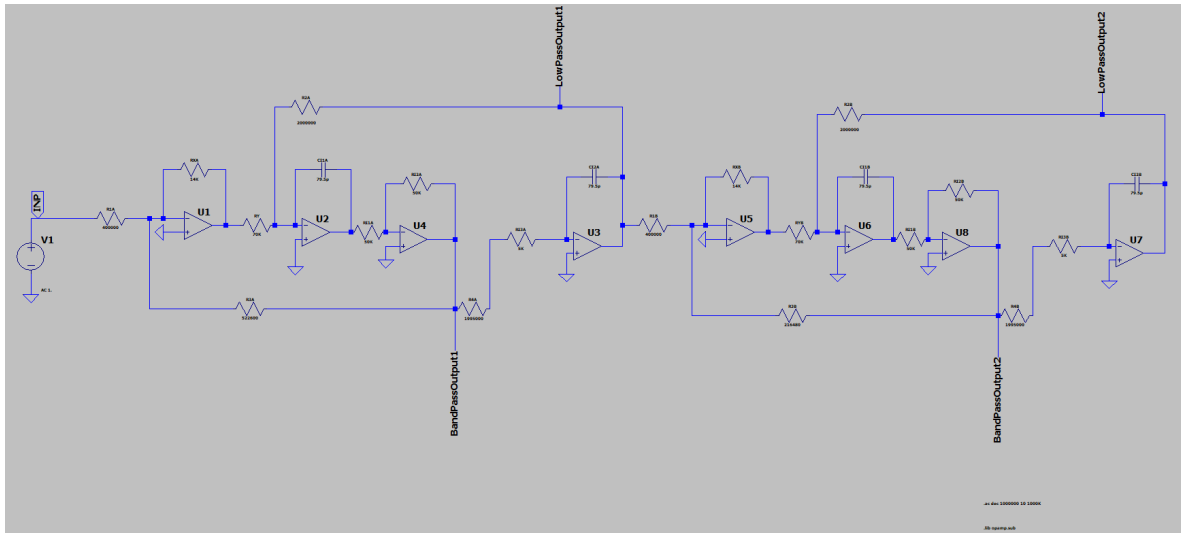
$$R_2 \approx 2M\Omega$$

$$R_4 = 1.995M\Omega$$

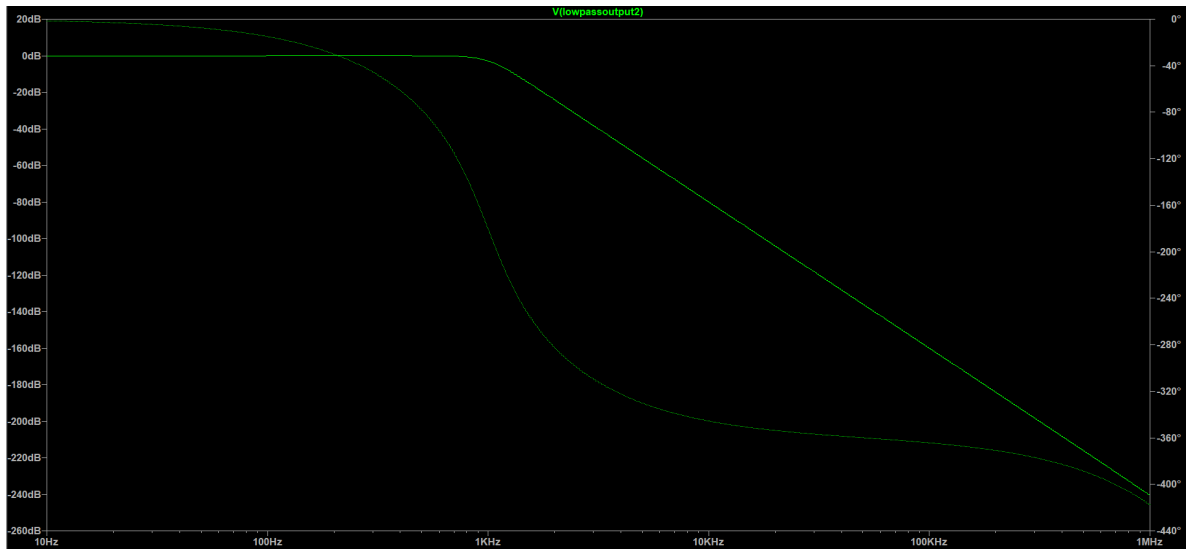
$$R_3 \approx 216.48k\Omega$$

$$R_1 \approx 400k\Omega$$

après avoir placé les chiffres, on a:



ensuite on vérifie les cahiers des charges:



C'est un filtre passe-bas.

MAX274_2.asc

Cursor 1

V(lowpassoutput2)

Freq: Mag:

Phase:

Group Delay:

Cursor 2

Freq: Mag:

Phase:

Group Delay:

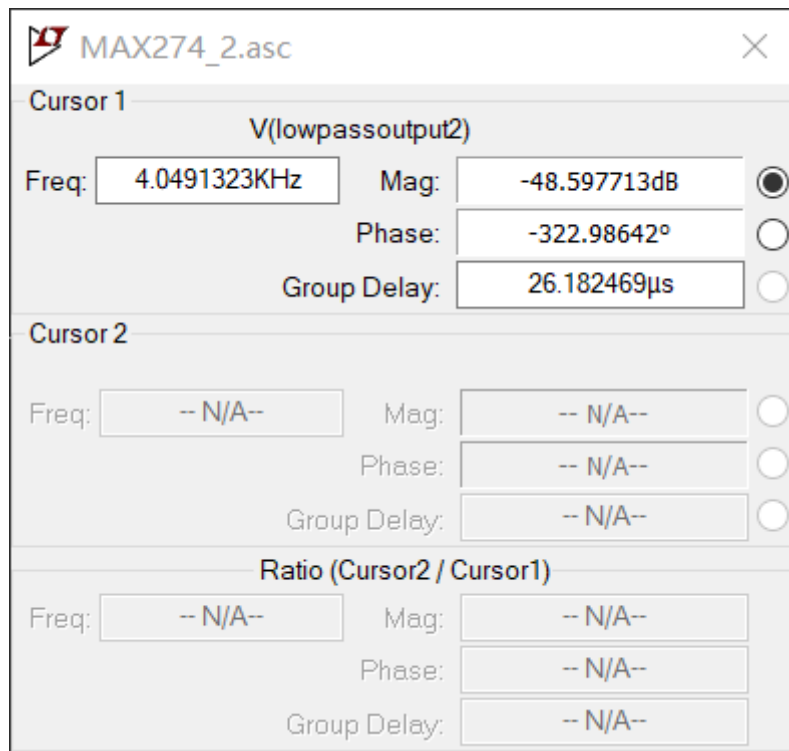
Ratio (Cursor2 / Cursor1)

Freq: Mag:

Phase:

Group Delay:

1kHz de Fréquence de coupure.



l'atténuation minimale dans la BA est 45dB, maintenant -48.6dB.

3 Structure Biquad

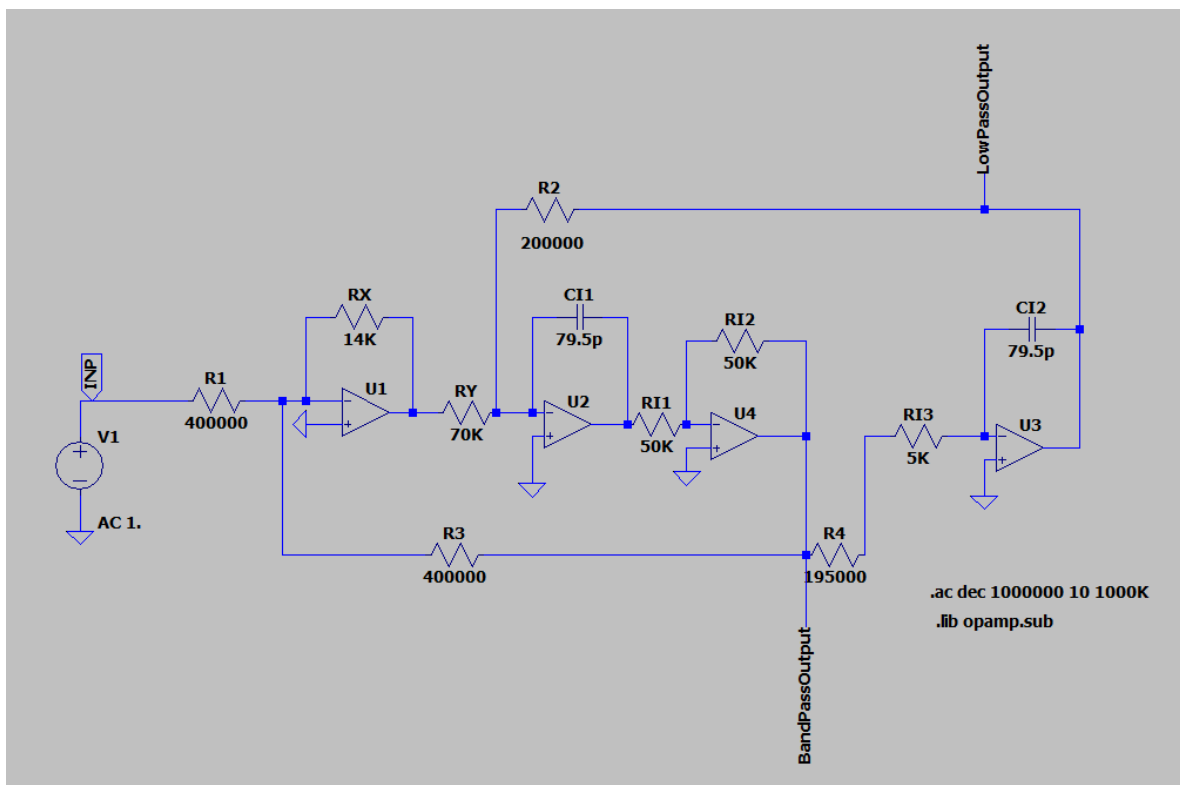
2

$$R_2 \approx 200k\Omega$$

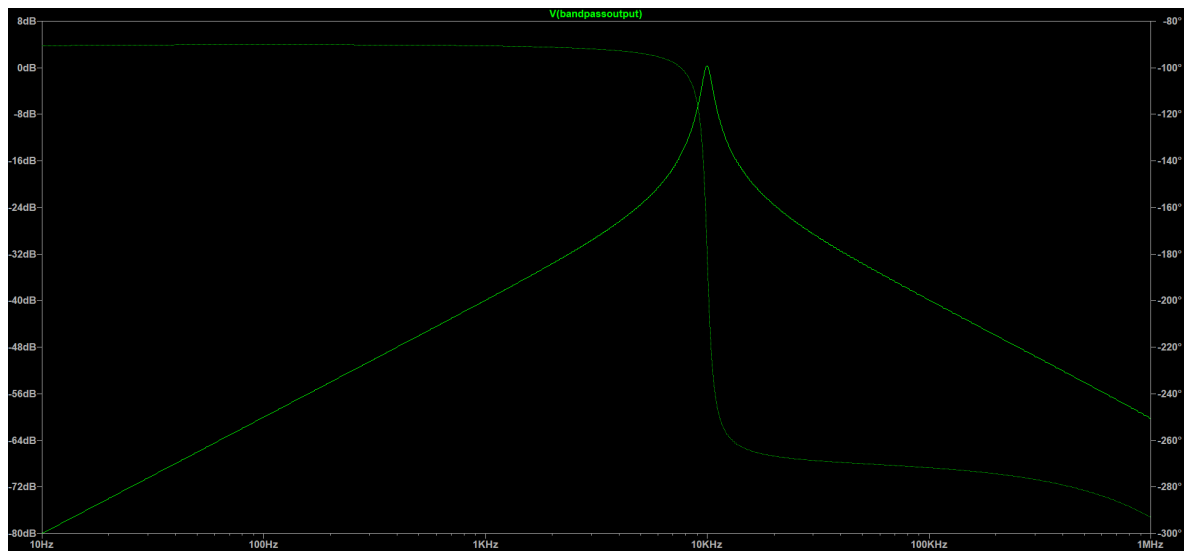
$$R_4 \approx 195k\Omega$$

$$R_3 \approx 400k\Omega$$

$$R_1 \approx 400k\Omega$$



on a :



C'est bien passe-bande.

MAX274-devoir2.asc

Cursor 1
 V(bandpassoutput)

Freq:	9.4837487KHz	Mag:	-3.0030589dB	<input checked="" type="radio"/>
		Phase:	-133.04666°	<input type="radio"/>
		Group Delay:	161.94714µs	<input type="radio"/>

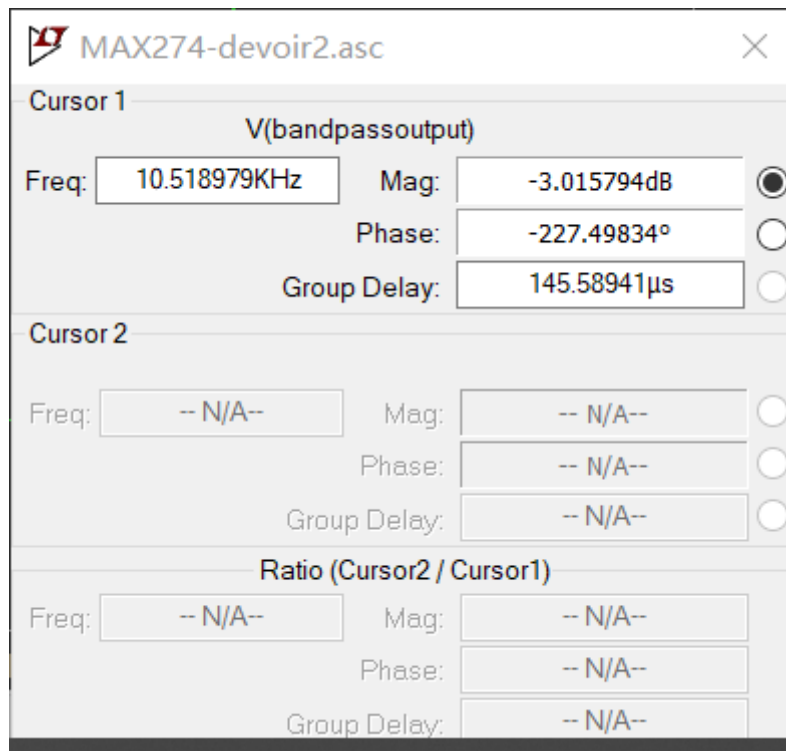
Cursor 2

Freq:	-- N/A--	Mag:	-- N/A--	<input type="radio"/>
		Phase:	-- N/A--	<input type="radio"/>
		Group Delay:	-- N/A--	<input type="radio"/>

Ratio (Cursor2 / Cursor1)

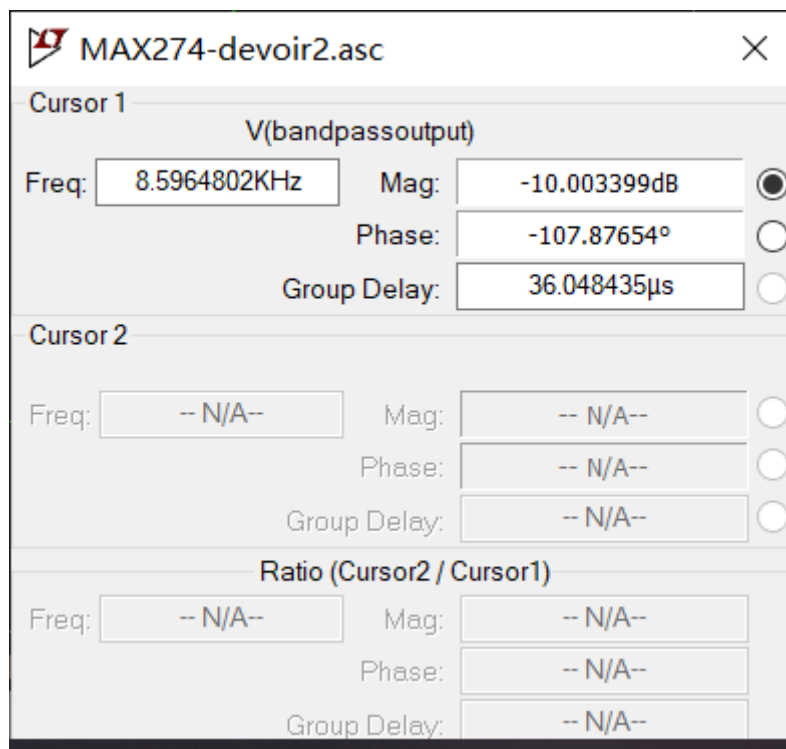
Freq:	-- N/A--	Mag:	-- N/A--	
		Phase:	-- N/A--	
		Group Delay:	-- N/A--	

et

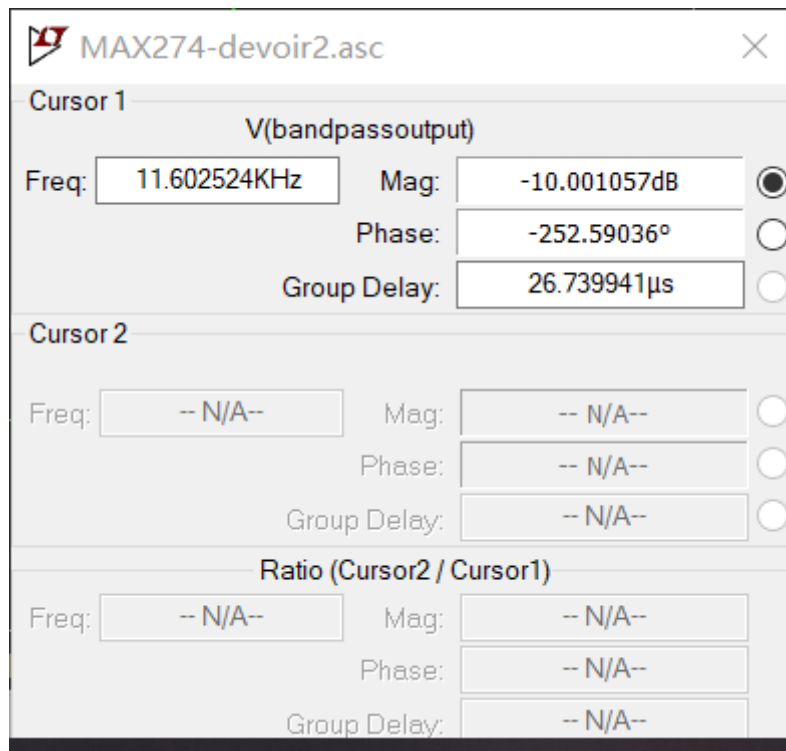


$$10.52\text{kHz} - 9.48\text{kHz} = 1.04\text{kHz}$$

C'est presque 1kHz pour la bande passante.



et

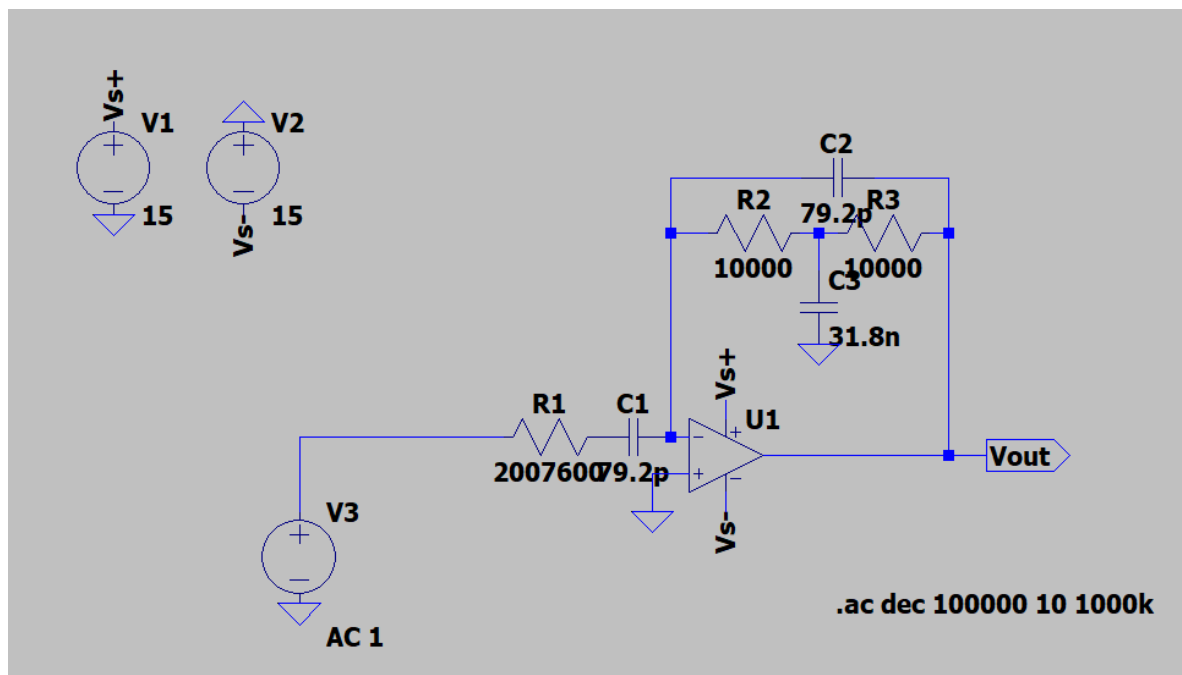


$$11.60kHz - 8.60kHz = 3kHz$$

on a 3kHz de la bande d'atténuation.

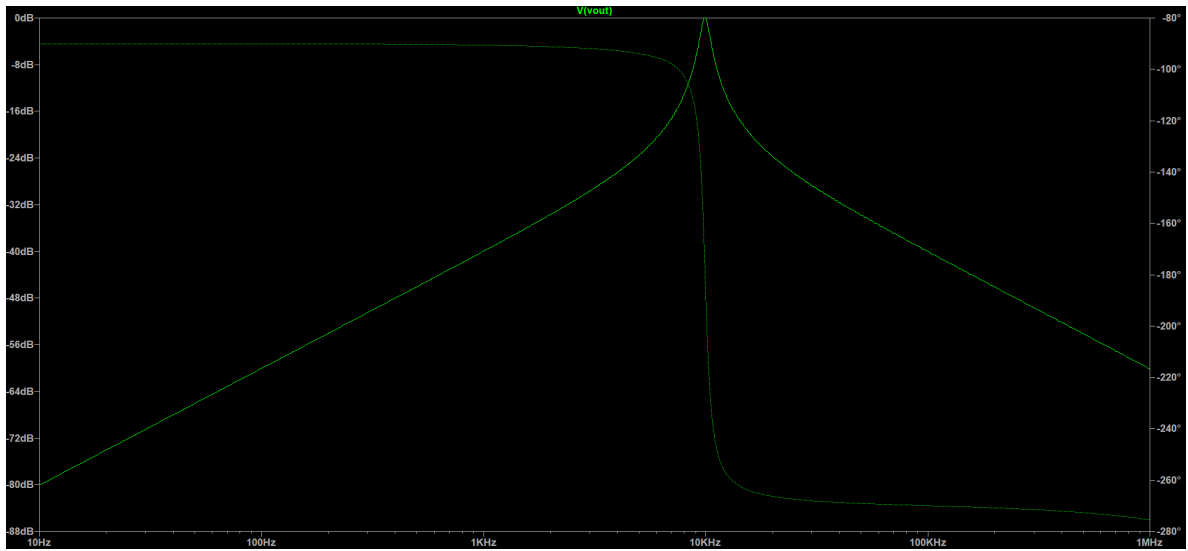
4 Structure à 1 amplificateur opérationnel

3



On prend le schéma comme cela.

On fait les même chose comme avant pour vérifier les cahiers des charges ,



pour la bande passante,

devoir2-4.raw
✕

Cursor 1

V(vout)

Freq:	9.4511108KHz	Mag:	-3.0040553dB	<input checked="" type="radio"/>
		Phase:	-135.11752°	<input type="radio"/>
		Group Delay:	170.95522μs	<input type="radio"/>

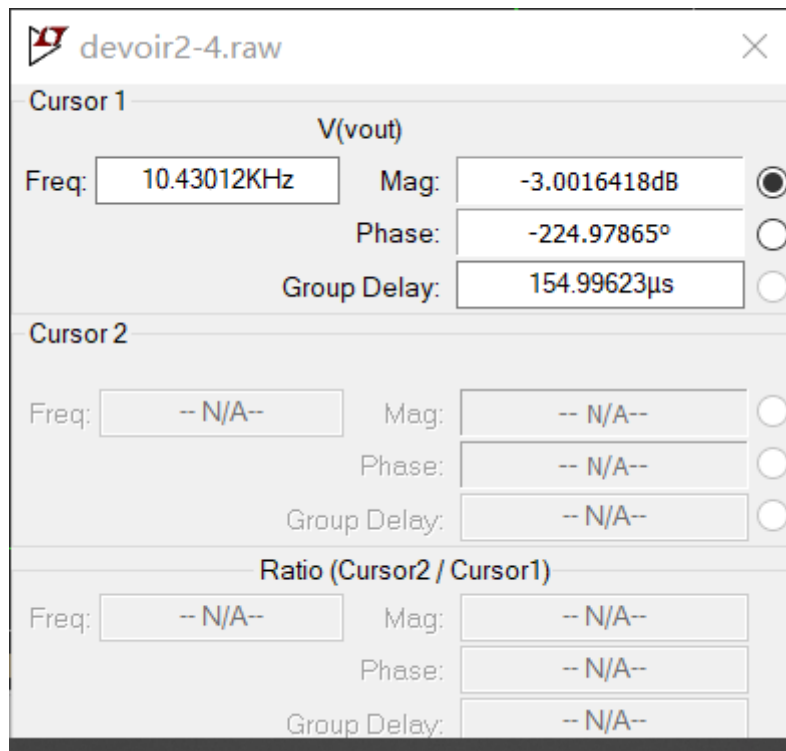
Cursor 2

Freq:	-- N/A--	Mag:	-- N/A--	<input type="radio"/>
		Phase:	-- N/A--	<input type="radio"/>
		Group Delay:	-- N/A--	<input type="radio"/>

Ratio (Cursor2 / Cursor1)

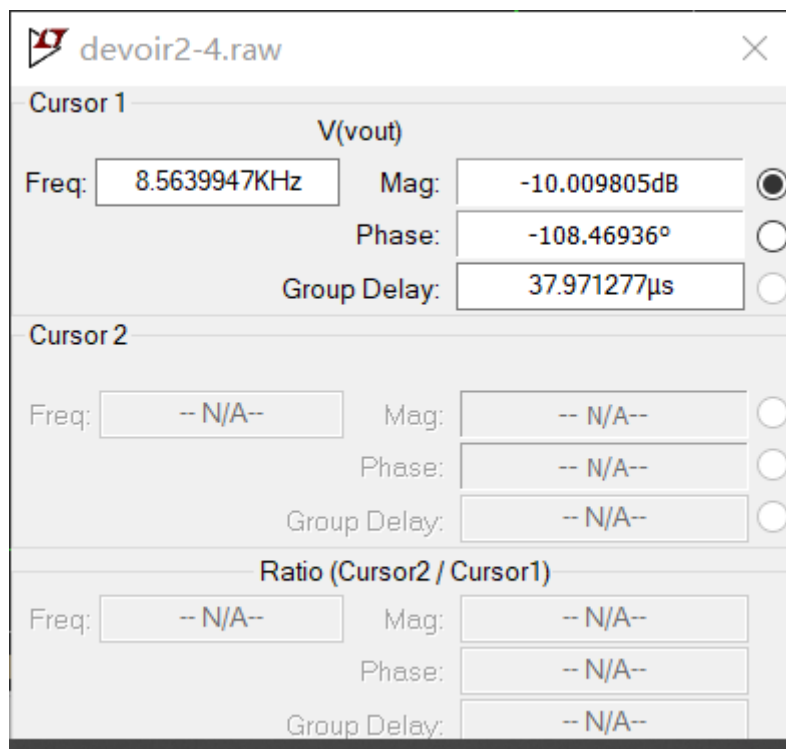
Freq:	-- N/A--	Mag:	-- N/A--	
		Phase:	-- N/A--	
		Group Delay:	-- N/A--	

et

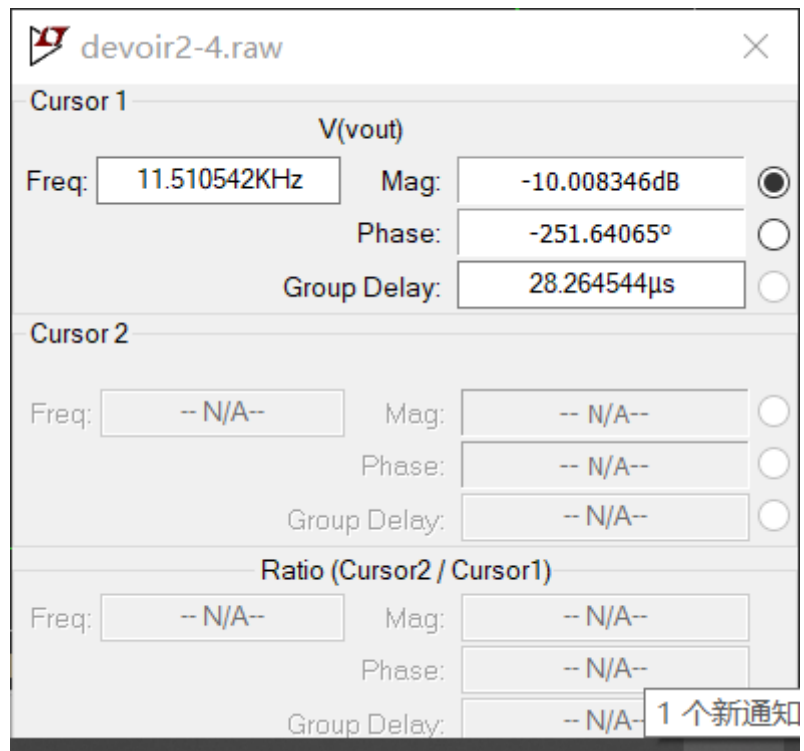


$$10.43\text{kHz} - 9.45\text{kHz} = 0.98\text{kHz} \approx 1\text{kHz}$$

On a



et



$$11.51kHz - 8.56kHz = 2.95kHz \approx 3kHz$$

C'est correspond bien aux cahiers des charges.