Operational Amplifier Circuits Report

梁程捷(B11901136),吴奕娃(B11901080)

Inverting OP-Amp Circuit

f (kHz)	V_i (V)	V_o (V)	f (Hz)	V_i (V)	V_o (V)
1	3.92	7.84	46	4.00	5.84
5	3.92	7.84	47	4.00	5.68
10	4.00	7.84	48	4.00	5.56
15	4.00	7.92	50	4.08	5.36
20	4.00	7.76	60	4.00	4.56
25	3.92	7.68	80	4.08	3.44
30	4.00	7.68	100	4.00	2.80
40	4.08	6.56			

Table 1: inverting op-amp raw experimental data

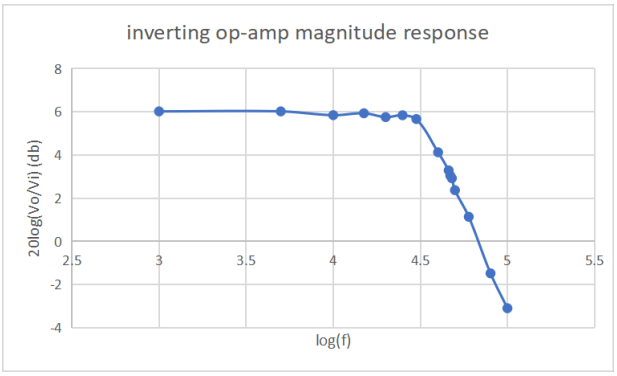


Figure 1: inverting op-amp magnitude response

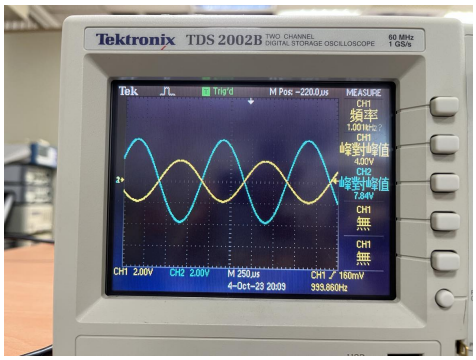


Figure 2: inverting op-amp input and output waveforms

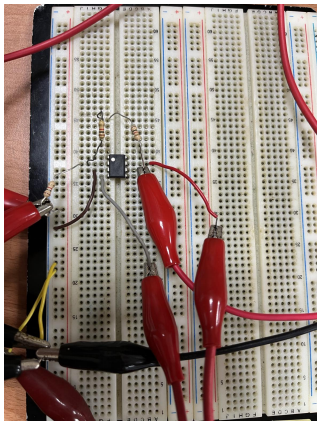
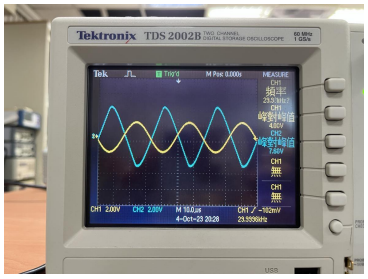
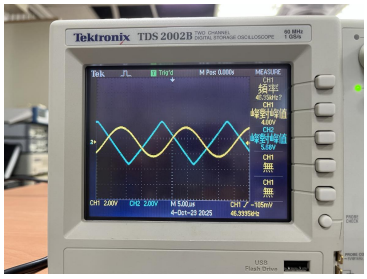


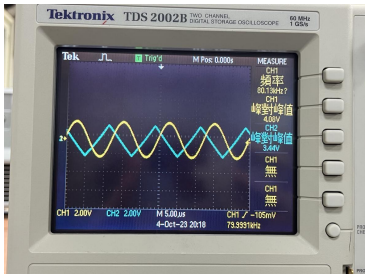
Figure 3: inverting op-amp circuit



(a) $f = 30$ kHz



(b) $f = 47$ kHz



(c) $f = 80$ kHz

As shown in the figure, there is a phase shift occured in this circuit.

Measured $f_{3dB} = 47$ kHz

Non-Inverting OP-Amp Circuit

f (kHz)	V_i (V)	V_o (V)	f (kHz)	V_i (V)	V_o (V)
0.5	4.08	12.4	32	4.08	8.00
1	4.20	12.4	35	4.08	7.44
20	4.16	12.0	40	4.16	6.88
21	4.08	11.6	100	4.16	2.84
22	4.08	11.2	200	4.08	1.40
25	4.08	10.4	300	4.08	1.00
27	4.08	9.60	400	4.08	0.74
28	4.08	9.28	500	4.08	0.62
30	4.08	8.64			

Table 2: non-inverting op-amp raw experimental data

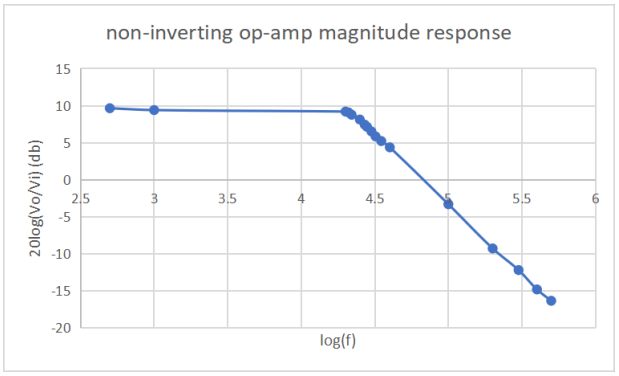


Figure 5: non-inverting op-amp magnitude response

Figure 6: non-inverting op-amp input and output waveforms

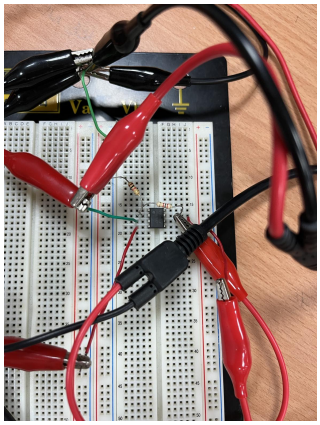
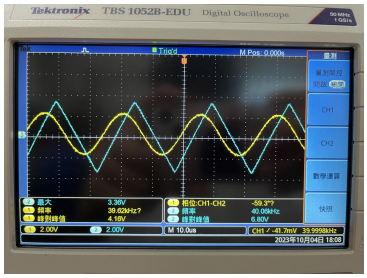
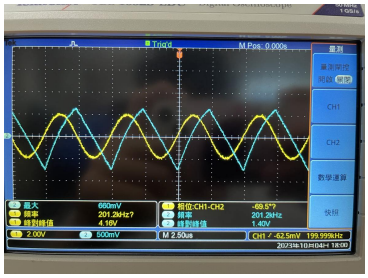


Figure 7: non-inverting op-amp circuit

(a) $f = 20$ kHz



(b) $f = 40$ kHz



(c) $f = 200$ kHz

As shown in the figure, there is a phase shift occured in this circuit.

Measured $f_{3dB} = 30$ kHz