

Feng Chia University

Electrical Engineering Fundamentals II Lab

Laboratory 5

AC RLC Circuits and Phasor

Instructor: Prof. Shyan-Lung Lin

Student Name: 周嘉禾

Student ID: D1166506

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I. Introduction

- To observe the RLC Circuits and Phasor under Alternative Current

II. Materials

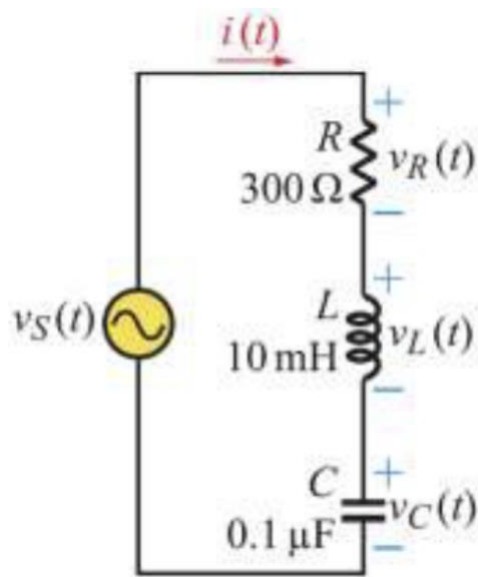
- Waveform Generator
- Digital Oscilloscope
- Digital Multimeter
- Devices

Resistors: $R = 1\ \Omega, 10\ \Omega, 100\ \Omega, 1\text{k}\Omega$

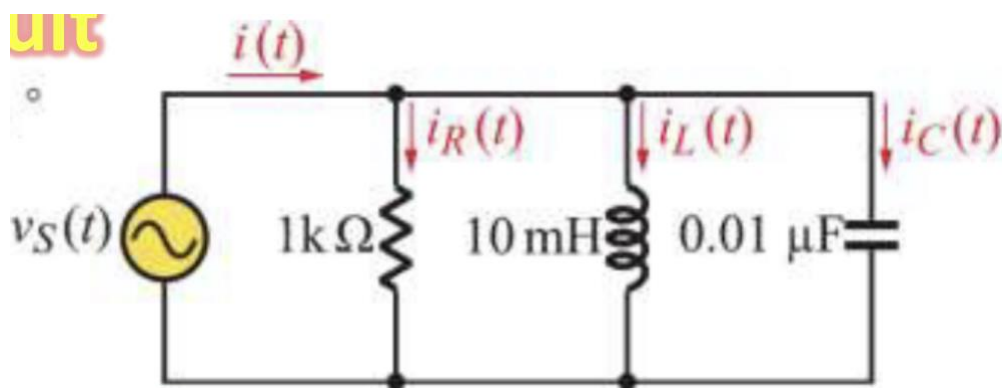
Capacitor: $C = 0.1\ \mu\text{F}, 0.01\ \mu\text{F}$

Inductor: $L = 1\ \text{mH}$

III. Circuit diagram



▲ Figure 1. Circuit of Experiment 5.a RLC Series Circuit



▲ Figure 2. Circuit of Experiment 5.b RLC Parallel Circuit

IV. Methods

Using Digital Multimeter to observe current and voltage and Oscilloscope to observe the wave.

V. Experiments data

a. Experiment 5.a RLC Series Circuit

Table 1: Measurement of RLC Series Circuit

	V_S	V_R	V_L	V_C
Theoretical	2 V	1.8639 V	0.3568 V	1.0819 V
Measurement	1.7683 V	1.5128 V	0.3146 V	0.9057 V

	I	X_L	X_C	Z
Theoretical	6.2131 mA	57.4283 Ω	174.1301 Ω	321.8995 Ω
Measurement	4.7835 mA	65.7657 Ω	189.3279 Ω	369.6666 Ω

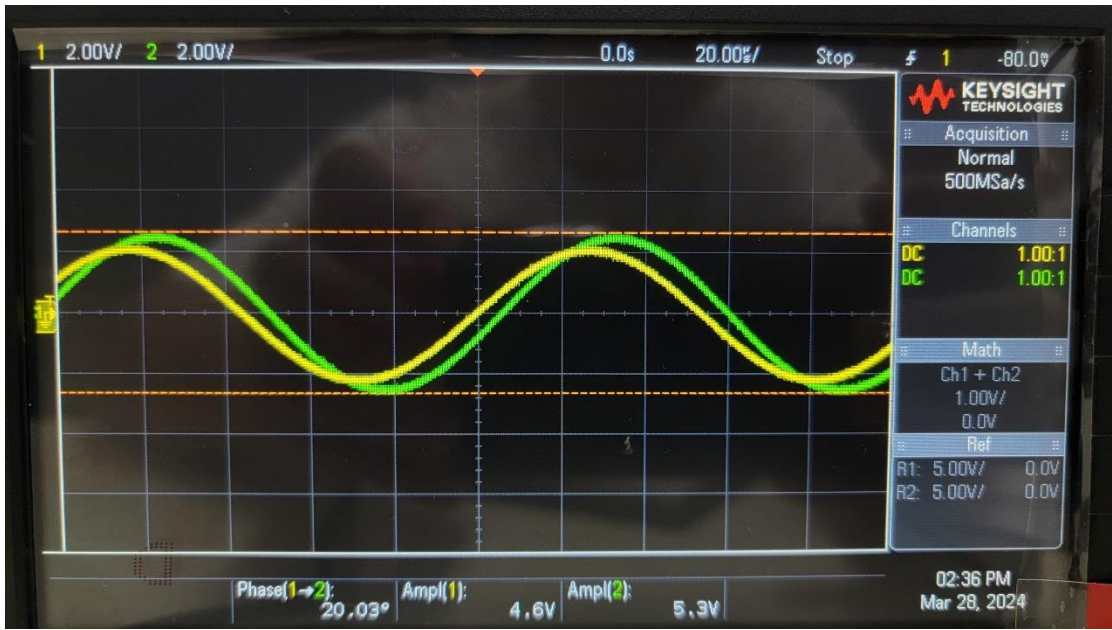
b. Experiment 5.b RLC Parallel Circuit

Table 3: Measurement of RLC Parallel Circuit

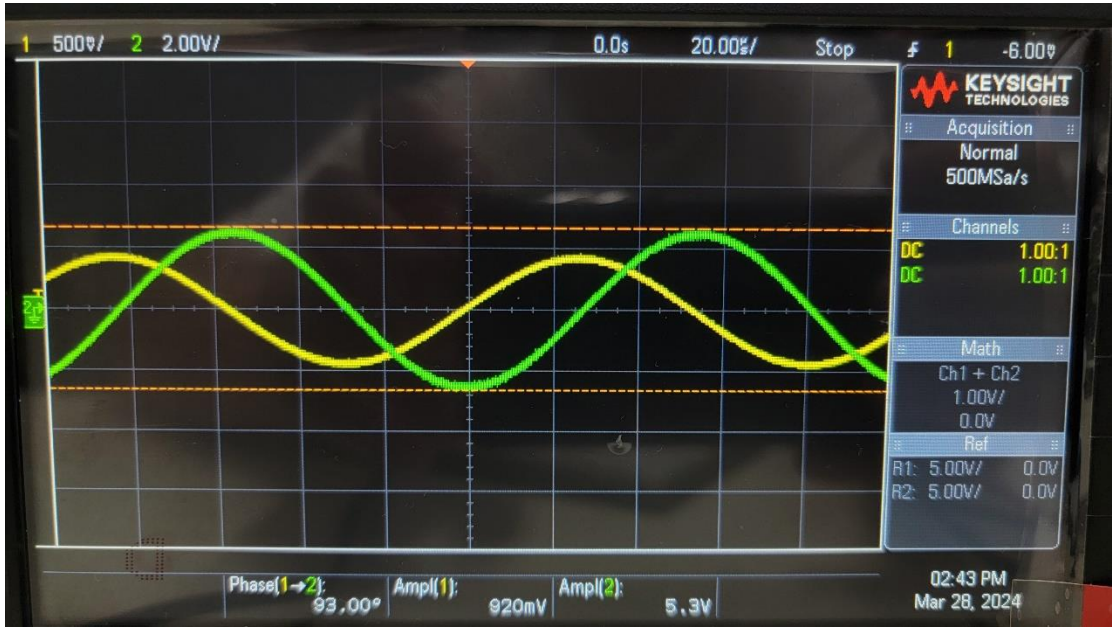
	V_S	I_R	I_L	I_C	I
Theoretical	4 V	4 mA	57.87 mA	2.7646 mA	55.255 mA
Measurement	2.8176 V	2.7271 mA	49.63 mA	0.8661 mA	48.674 mA

	B_L	B_C	Y	Z
Theoretical	14.469 S	0.691 S	13.814 S	72.3918 Ω
Measurement	17.614 S	0.307 S	17.275 S	57.8872 Ω

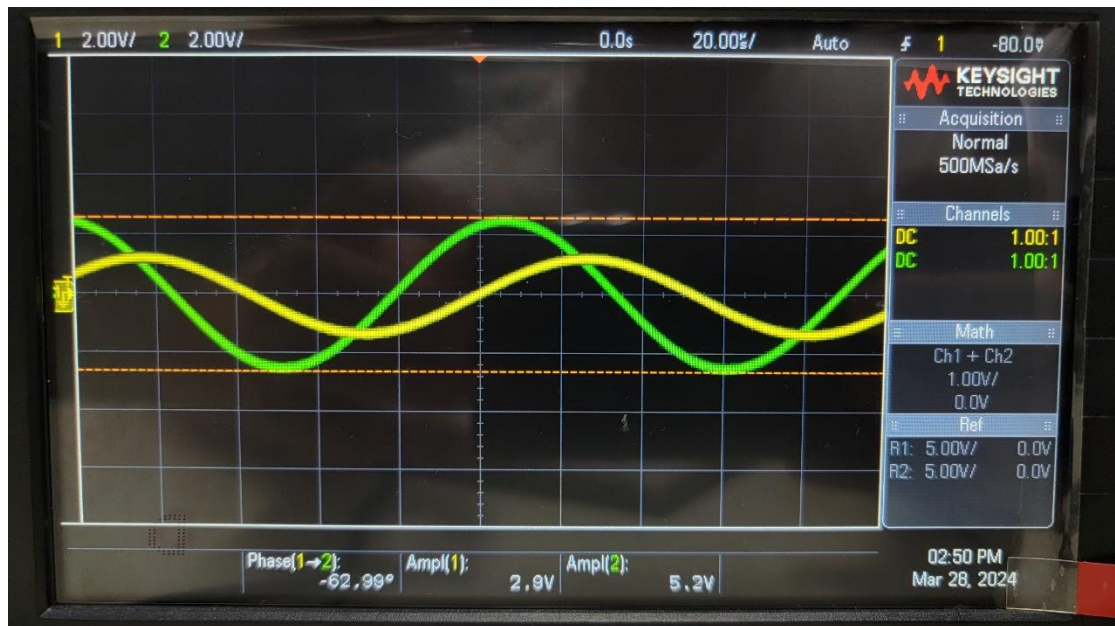
VI. Results



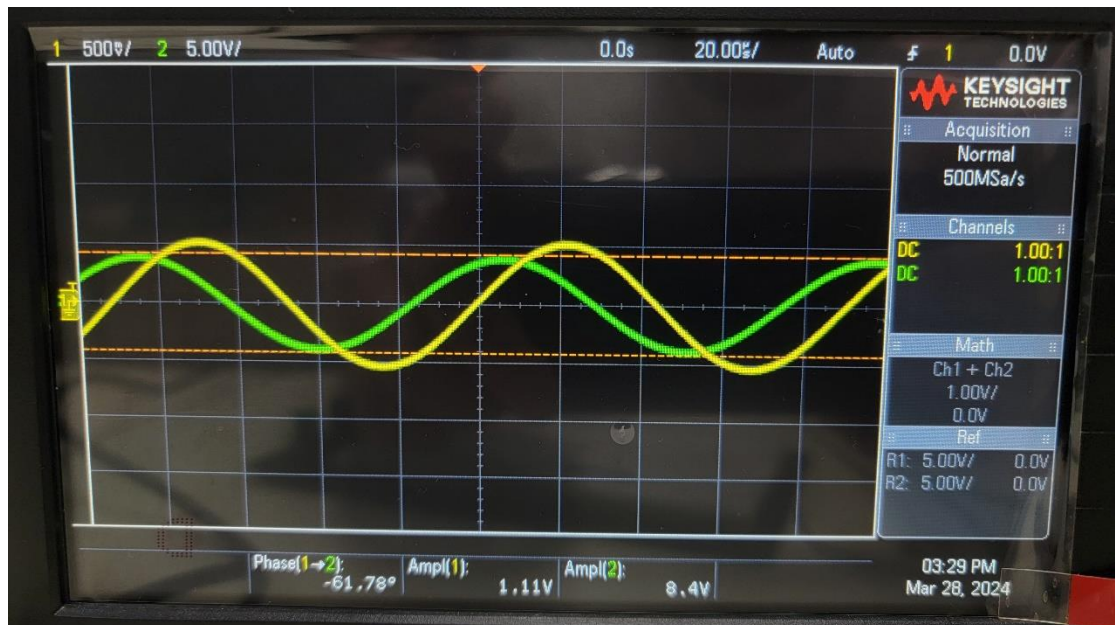
▲ Figure 3. Results of Experiment 5.b.2



▲ Figure 4. Results of Experiment 5.b.3



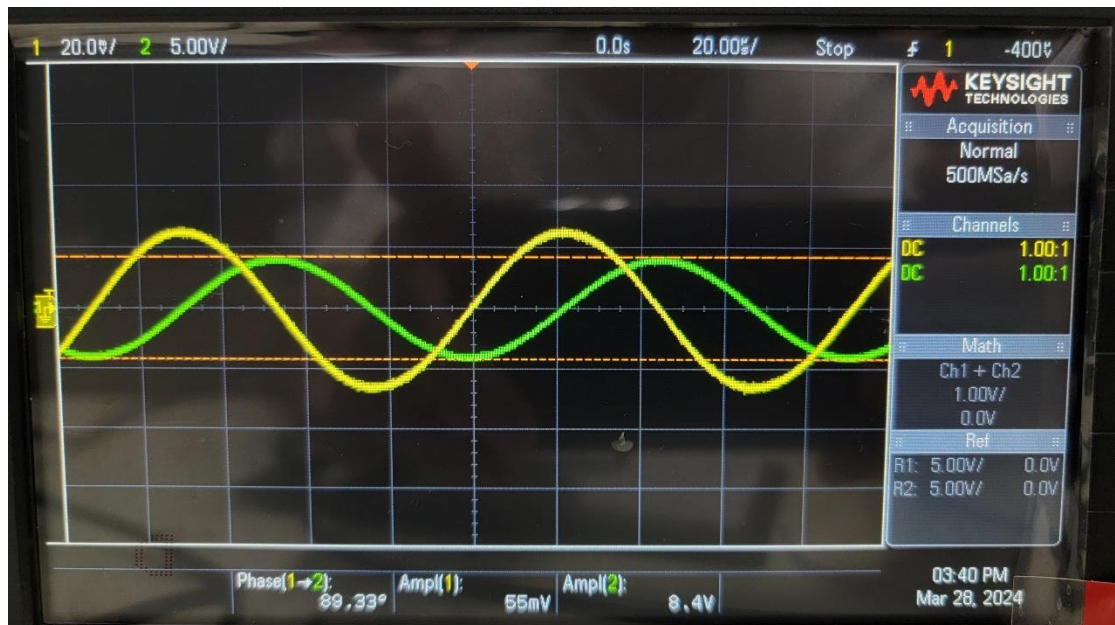
▲ Figure 5. Results of Experiment 5.b.4



▲ Figure 6. Results of Experiment 5.c.2



▲ Figure 7. Results of Experiment 5.c.3



▲ Figure 8. Results of Experiment 5.c.4

VII. Discussion

None

VIII. Conclusion

From the graphs and experimental datas above, voltage, current, and impedance behalf as the experiments before.