

Lab 3: Capacitors in Series and Parallel

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1 Purpose

The purpose of this lab is to gain a working understanding of the real-world behavior of capacitors, and experimentally finding the equivalent capacitance of various combinations of series and parallel capacitors.

2 Theory

3 Experiment Analysis

4 Procedure

4.1 Measurement of Capacitance Using a Multi-Meter

4.2 Measurement of Equivalent Capacitance in Series

4.3 Measurement of Equivalent Capacitance in Parallel

4.4 Measurement of Equivalent Capacitance for Both Series and Parallel

5 Data and Graphs

5.1 Part 1

5.2 Part 2

5.3 Part 3

6 Calculations and Results

6.1 Part 1

6.2 Part 2

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6.3 Part 3

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6.4 Part 4

6.5 Part 5

6.6 Part 6

7 Questions

7.1 Circuit 1

7.2 Circuit 2

$$\left(\frac{1}{0.75\mu F + 15\mu F} + \frac{1}{1.5\mu F} \right)^{-1} + \left(\frac{1}{3.5\mu F} + \frac{1}{5\mu F} \right)^{-1} + 8\mu F = 11.4\mu F$$

8 Conclusion