

Experiment 2

Resistance and Ohm's law

Name	Group	Grade
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Objectives:

1. Learn how to measure resistance using various ways.
2. Verify Ohm's law experimentally

Pre-Lab

1. A voltage of 110 V is across a 5 percent, 20-k Ω resistor. What range must the current be?
2. What is the greatest voltage that can be applied across a 1/8W, 2.7-M Ω resistor without causing it to overheat?

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Experiment

The opposite figure shows how to read the color codes to find the value of resistance.

1. You are given three resistors. Identify the different band colors in each resistor. What is the value of the resistance of each resistor. Record the data in table 1.
2. Using the multimeter, measure the resistance of each resistor and record the values in the last column of table 1.
3. Now you are given another resistor, find its resistance using the band colors and the multimeter measurement.
4. Connect the circuit shown. Adjust the controls to produce the voltages indicated in table 2 and measure the corresponding currents.

Color	Digit	Multiplier
BLACK	0	_____
BROWN	1	_____0
RED	2	_____00
ORANGE	3	_____000
YELLOW	4	___0,000
GREEN	5	_00,000
BLUE	6	000,000
VIOLET	7	
GRAY	8	
WHITE	9	

EXAMPLE
47,000 Ohms
or
47-K Ω

1st Digit — 4
2nd Digit — 7
Multiplier — 0000
Tolerance — 2% - Red

5% - Gold
10% - Silver

5. Make a graph of the data recorded (plot the voltages **versus** the currents in the next page). Draw the best **straight line** that passes through most of the points.
6. From the graph, find the resistance of the resistor using **the slope** of the line. Record your results in table 3

Table 1

Resistor	Color of Band 1	Color of band 2	Color of band 3	Color of band 4	Nominal value	Percent error	Multimeter measurment
1							
2							
3							

Table 2

Voltage (Volts)	Current (mA)
2	
4	
6	
8	
10	
12	
14	
16	

Table 3

Resistance using color code	Resistance using multimetrer	Resistance using the gragh

Write a conclusion on the different methods of finding resistance and Ohm's law.

Conclusion

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Voltage (V)

