Laboratory Application Assignment

In this lab application assignment you will examine the four-band resistor color code. You will also use a digital multimeter (DMM) to measure the resistance values of both fixed and variable resistors.

Equipment: Obtain the following items from your instructor.

- An assortment of carbon-film resistors
- 1-MΩ carbon-film resistor (any wattage rating)
- 10-kΩ potentiometer (any wattage rating)
- DMM

Resistor Color Code

Obtain five different carbon-film resistors from your instructor. In the space provided below, indicate the color of each band and its corresponding color coded value. The coded value should include both the resistance value and tolerance. Finally, measure and record the value of each of the five resistors.

	First Band	Second Band	Third Band	Fourth Band	Coded Value	Measured Value
R_1						
R_2						
R_3						
R_4						
R_5						

Is the measured value of each resistor within its specified tolerance? _____ If not, indentify which resistors are out of tolerance._____

Resistance Measurement Precautions

Now let's use a DMM to measure the value of a 1-MΩ resistor.

Measure the value of the 1-MΩ resistor without allowing your fingers to touch its leads. Record your measured value. R = _____

Remeasure the value of the 1-MΩ resistor with both of your fingers firmly grasping the resistor leads. Record your measured value. R = _____

Are the measured values different? _____ If so, which measurement is incorrect and why? _____

_____

_____

Potentiometer

Locate the 10-kΩ potentiometer and position it, as shown in Fig. 2–26.

Measure and record the resistance across terminals 1 and 3. R = _____ Rotate the shaft of the potentiometer back and forth. Does the resistance vary? _____

Connect the DMM to terminals 1 and 2 of the potentiometer. Does the resistance increase or decrease with clockwise shaft rotation? _____

Connect the DMM to terminals 2 and 3 of the potentiometer. Does the resistance increase or decrease with clockwise shaft rotation? _____

Rotate the shaft of the potentiometer to its midway position. Measure and record the resistance across terminals 1 and 2. R = _____ Measure and record the resistance across terminals 2 and 3. R = _____ Do the sum of these resistance values add to equal the resistance across terminals 1 and 3? _____

Rheostat

In this step, you will convert a potentiometer into a rheostat.

Connect a jumper across terminals 1 and 2. Connect your DMM to terminals 1 and 3. Explain how the resistance varies with clockwise shaft rotation. _____

_____

Remove the jumper across terminals 1 and 2, and place it across terminals 2 and 3. With your DMM connected across terminals 1 and 3, explain how the resistance varies with clockwise shaft rotation. _____

_____

Figure 2–26 Potentiometer. (*a*) Component body. (*b*) Schematic symbol.