

Experiment 4: DC Circuits BACKGROUND AND THEORY The resistance  $R$  of a metallic conductor is defined by  $R = \text{Voltage} / \text{Current} = V / I$  (4.1) where  $V$  is the potential difference applied between the endpoints of the conductor and  $I$  is the current flowing through the conductor. For a metallic conductor, such as a copper wire, the resistance  $R$  is a constant provided that the temperature of the wire stays essentially constant, that is  $R$  does not depend on  $I$  or  $V$ . Units:  $V$  is measured in volts (V),  $I$  in Amperes (A) or milli-amperes (mA), and  $R$  in Ohms ( $\Omega$ ). PROCEDURE [www.lib-go.com](http://www.lib-go.com) Uploaded by Rasha Daoud to Lib-Go.com 49 Part A: DC Circuit with One Resistor 1. We can test if a material is ohmic or not by measuring the potential difference  $V$  across the material against [www.lib-go.com](http://www.lib-go.com) Uploaded by Rasha Daoud to Lib-Go.com 48 a current  $I$  that pass through it while keeping the temperature of the material constant. 1: Example of Ohmic and Non-Ohmic Materials Conductors obey Ohm's law and are called ohmic materials. Figure 4.