Aayush Arya

(Submitted: October 4, 2021)

PHY350 Lab Report
Practical: 5 Registration No.: 11912610 Section: G2903

Aim

To study the power characteristics of a photoresistor.

Methods

The simulation was performed at http://www.falstad.com/circuit/. A photoresistor's light exposure was varied at constant battery supply voltage of $5V$

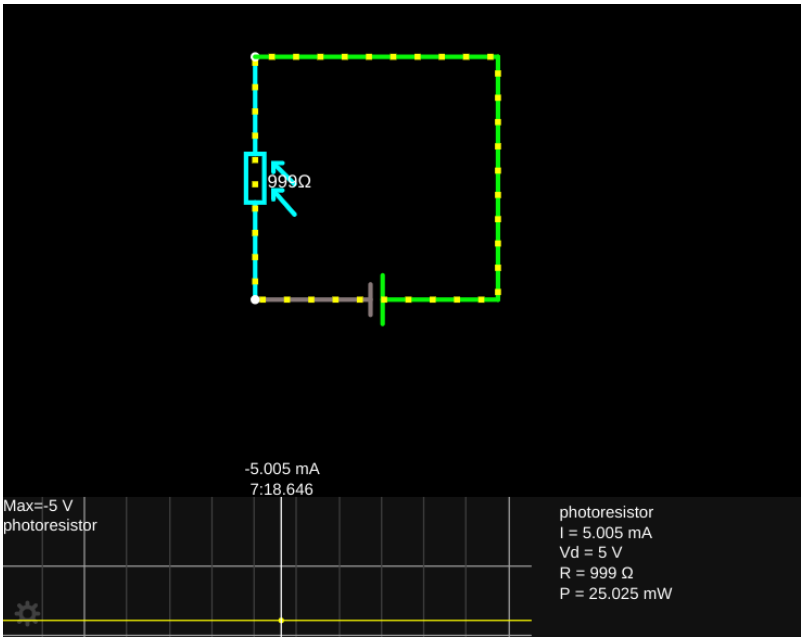


Figure 1: A photoresistor circuit using Falstad's online simulator

Since at constant voltage, power

$$P = VI$$

we expect a straight line between P and I. Also, since resistance R affects the current as $I = V/R$,

$$P = \frac{V^2}{R}$$

Therefore, a plot of P vs R should look like a rectangular hyperbola.

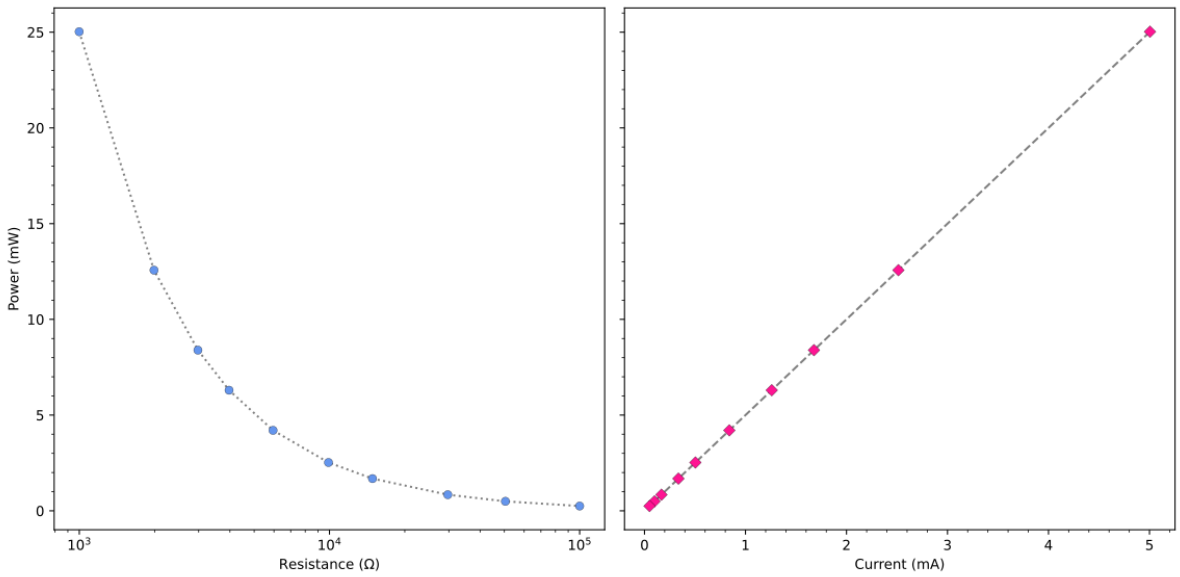
Resistance	Current (mA)	Power (mW)
999	5.005	25.025
1989	2.514	12.569
2979	1.678	8.392
3969	1.26	6.299
5949	0.84	4.202
9909	0.504	2.523
14859	0.336	1.682
29709	0.168	0.842
50499	0.099	0.495
99999	0.05	0.25

Table 1: Measurements at constant $V_d = 5$ V

Results & Discussion

We verify the expectations described in the preceding section. Our observations have been summarized in Table 1.

The data is plotted in the figure below



From the plot above, it is evident that $P = VI$ is being strictly followed in a wide range of resistances. Photoresistors thus show the behavior of ohmic resistors and can be considered to be *linear* circuit elements.