

- 1) We connected one of the DMM as Ohmmeter and the other DMM as Voltmeter that shown in figure 7. Then reset the ohmmeter to the 2k range and voltmeter 2v range, measure the voltage across the diode and the resistance.

Forward Biased		Reverse Biased	
V_{diode}	Resistance	V_{diode}	Resistance
619mV	6443 Ω	3.30	-

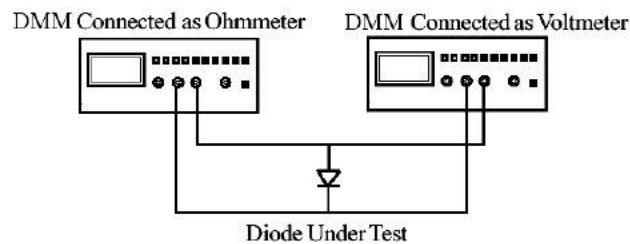


figure_7

- 2) Values of the circuit in 6 a with $R=220\ \Omega$ are shown in table 2:

Diode Volts	Current in mA
.35	3,50 microA
.40	8,34 microA
.45	19,23 microA
.50	41,63 microA
.55	72,15 microA
.60	153,34 microA
.65	1.1334 mA
.70	4,942 mA
.75	11,43 mA
.80	24,38 mA
.85	48,93 mA
.90	95,29 mA

Table 2

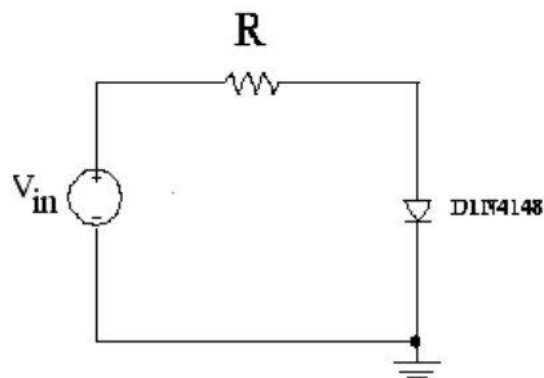
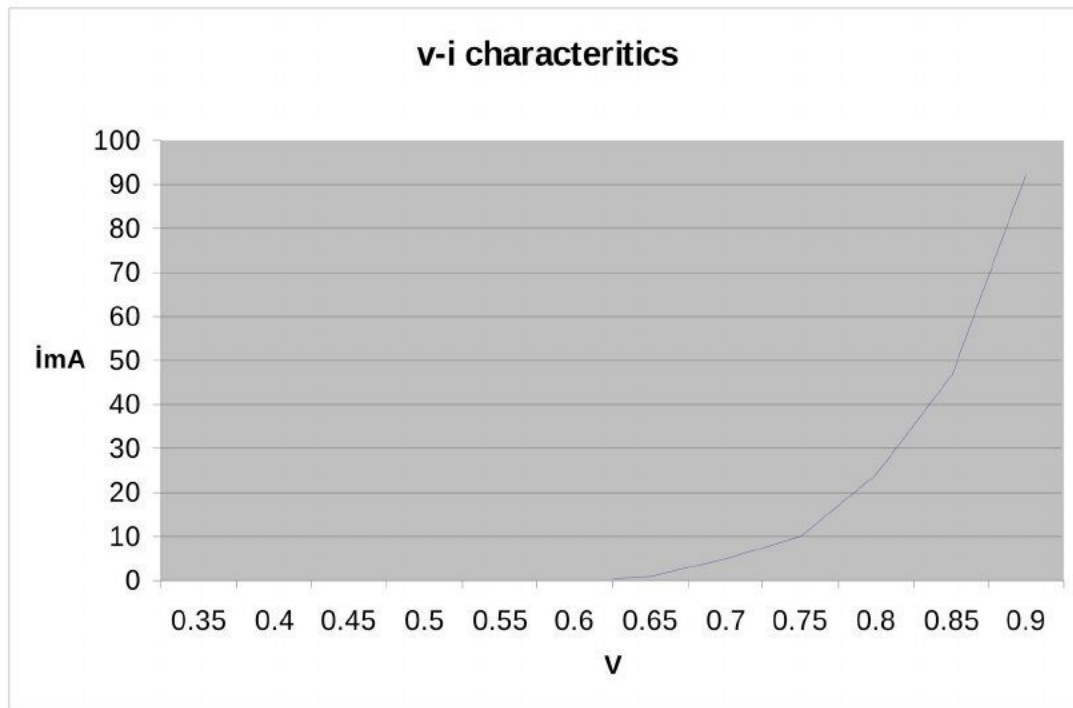


figure_6-a



3)

Table 3

Silicon Diode		
I _f	V _f	r _f
40mA	0.86	7 Ω
50mA	0.90	

$$r_{\text{bulk}} = \frac{\Delta V}{\Delta I}$$

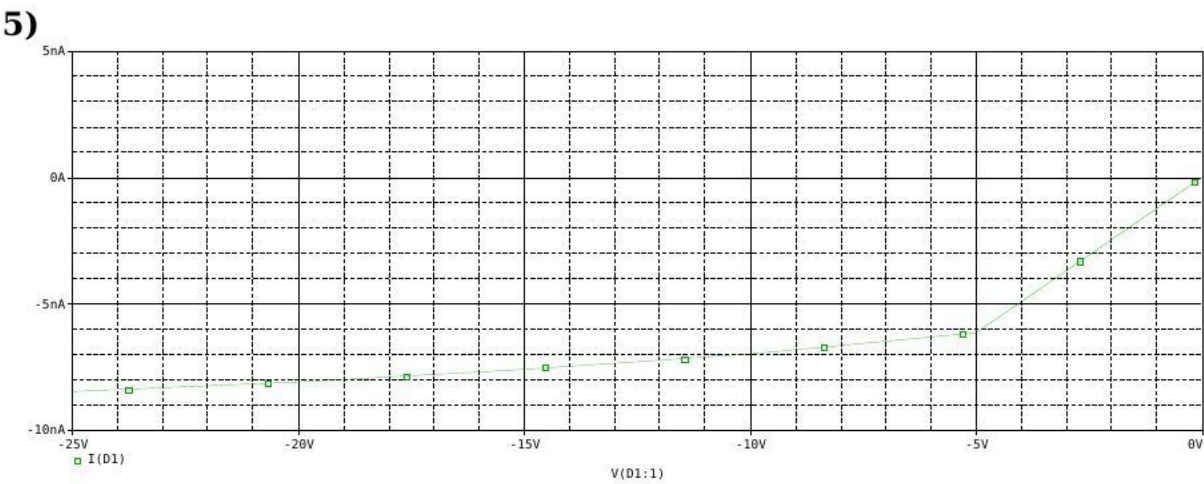
Calculation of the ΔV and ΔI then r_{bulk} :

$$\begin{aligned} \Delta V &= 0.905 - 0.869 = 0.036\text{V} \\ \Delta I &= 50 - 40 = 10 \text{ mA} \\ R_{\text{bulk}} &= 0.036 / 10\text{mA} = 3,6 \Omega \end{aligned}$$

4) Values of the circuit in 6 a with $R=1\text{ M}\Omega$ are shown in table 4:

Source Voltage	Silicon Diode 1N4148	
	V_{resistor} (measured)	I_{diode} (calculated)
0	1.40mV	1.40 mA
-1	1.93 mV	1.93 mA
-2	2.24 mV	2.24 mA
-3	2.52 mV	2.52 mA
-4	2.55 mV	2.55 mA
-5	2.64 mV	2.64 mA
-10	3.16 mV	3.16 mA
-15	3.63 mV	3.63 mA
-20	3.77 mV	3.77 mA
-25	3.89 mV	3.89 mA

Table 4



I-V characteristics



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ELECTRIC & ELECTRONICS ENGINEERING

EEM 214 ~ ELECTRONICS–I
LABORATORY
REPORT

Experiment Name : Diode Characteristics
Experiment Number : 2

Student Name : [REDACTED]	
Student Number [REDACTED]	
Section Number :	Experiment Day:

