

Aim:

The aim of this experiment is to investigate the pn-junction diodes. To learn more about their i-v characteristics

Experimental Work:

- 1) A good diode will produce a voltage between 0,500 to 0,900 for silicon diode, if forward current flow is established.

In reversed bias, if the diode is good, "1" will be displayed. "1" means overrange.

	Forward Biased	Reversed Biased
Vdiode	0,6775 V	Overranged

From this table we can see that our diode is good.

- 2) At this part we set up the circuit, and increased the voltage on the power supply until the voltage across the diode is wanted value. Then we investigated the v-i characteristics of diode.

Diode Volts	Current in mA
.35	0,0026 mA
.40	0,0079 mA
.45	0,0259 mA
.50	0,0690 mA
.55	0,1956 mA
.60	0,5710 mA
.65	1,663 mA
.70	4,498 mA
.75	10,954 mA
.80	24,31 mA
.85	48,11 mA
.90	79,60 mA

- 3)** In this part we calculated the bulk resistance of diode. First we measured the V_f value at 40 mA and 50 mA. Then use the formula to find r

Silicon Diode 1N4148		
I	V	r
40mA	0,835V	1,8 ohm
50mA	0,853V	

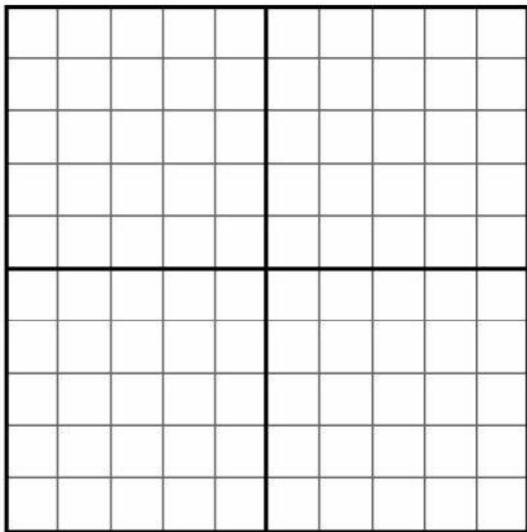
- 4)** In this part we set up the circuit in part 2, but changed the R value. New R value was 1Mohm. We measured the resistor voltages and calculated the diode current.

Source Voltage	Silicon Diode 1N4148	
	V resistor(measured)	Idiode(calculated)
0	-0,0025 V	0.100×10^{-15} A
-1	2,59 mV	-10^{-15} A
-2	2,87 mV	-10^{-15} A
-3	2,94 mV	-10^{-15} A
-4	3,15 mV	-10^{-15} A
-5	3,29 mV	-10^{-15} A
-10	3,68 mV	-10^{-15} A
-15	4,03 mV	-10^{-15} A
-20	4,34 mV	-10^{-15} A
-25	4,52 mV	-10^{-15} A

Calculation:

6)

v_{in}



v_{out}

