

EXPERIMENT-2

NAME – SANCHIT JAIN

BATCH – B-7

ENROLL – 21103192

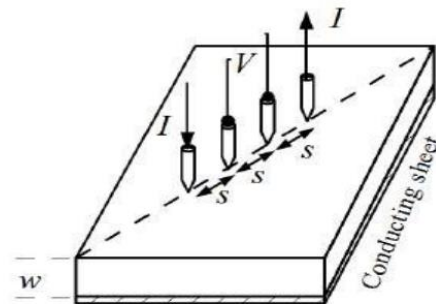
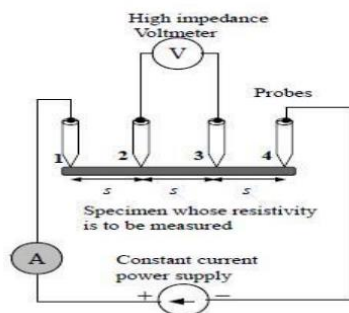
Aim:

To determine the resistivity of semiconductors by Four probe Method.

Formula Used:

The function, $f(w/S)$ is a divisor for computing resistivity which depends on the value of w and S . We assume that the size of the metal tip is infinitesimal and sample thickness is greater than the distance between the probes.

$$\rho_0 = \frac{V}{I} \times 2\pi S$$



OBSERVATION TABLE:

Current-11mA

Voltage range – 1V

Current range – 200mA

Temperature	Voltage	Resistivity
30	0.31	6.01
35	0.30	5.84
40	0.29	5.68
45	0.28	5.52
50	0.27	5.38
55	0.27	5.24
60	0.26	5.11
65	0.25	4.99
70	0.25	4.88
75	0.24	4.77
80	0.24	4.66
85	0.23	4.56
90	0.23	4.47
95	0.22	4.38

Current – 9mA

Voltage range – 1V

Current range – 200mA

Temperature	Voltage	Resistivity
30	0.25	6.01
35	0.24	5.84
40	0.23	5.68
45	0.23	5.52
50	0.22	5.38
55	0.22	5.24
60	0.21	5.11

65	0.21	4.99
70	0.20	4.88
75	0.20	4.77
80	0.19	4.66
85	0.19	4.56
90	0.18	4.47
95	0.18	4.38

Current – 23mA

Voltage Range – 1v

Current Range – 200mA

Temperature	Voltage	Resistivity
30	0.64	6.01
35	0.63	5.84
40	0.61	5.68
45	0.59	5.52
50	0.58	5.38
55	0.56	5.24
60	0.55	5.11
65	0.53	4.99
70	0.52	4.88
75	0.51	4.77
80	0.50	4.66
85	0.49	4.56
90	0.48	4.47
95	0.47	4.38

CALCULATION:

Case 1: ($I = 1\text{mA}$) \Rightarrow Mean Resistivity= 5.106 ohm cm

Case 2: ($I = 2\text{mA}$) \Rightarrow Mean Resistivity= 5.098 ohm cm

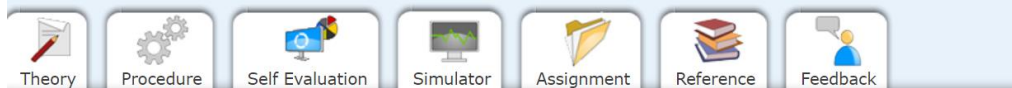
Case 3: ($I = 3\text{mA}$) \Rightarrow Mean Resistivity= 5.113 ohm cm

Therefore, Mean resistivity of all cases = **5.1063 ohm cm**

RESULT:

The resistivity of Germanium = 5.1063 ohm cm.

Resistivity by Four Probe Method



≡ Resistivity by Four Probe Method

