

## 5.VI CHARACTERISTICS OF PN JUNCTION DIODE

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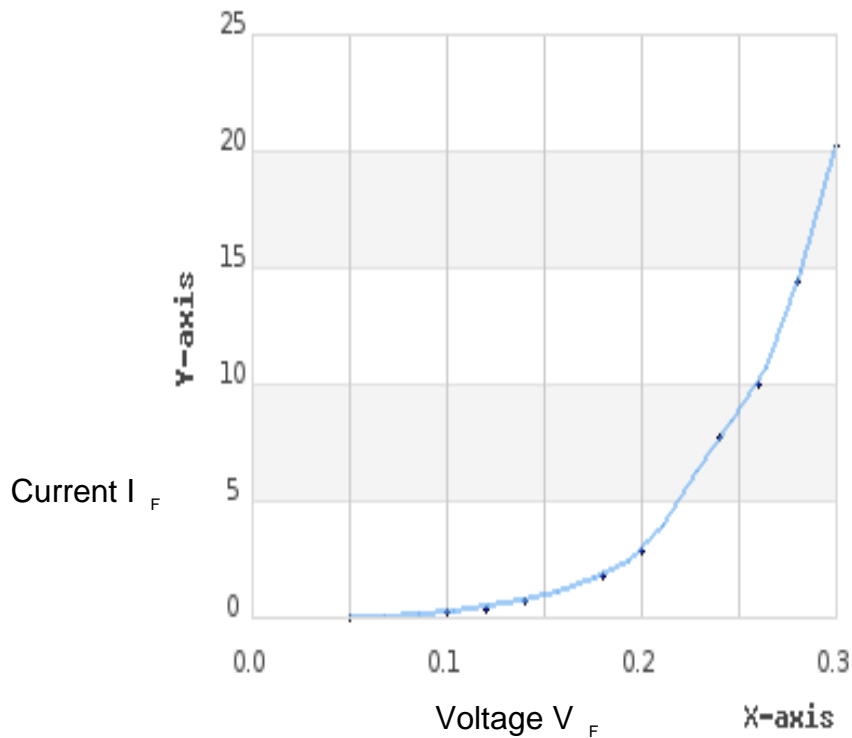
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Enter the Number of Observations : 10

SI No.	$V_F$	$I_F$	$R_F = V_F / I_F$
	FORWORD VOLTAGE (in V)	FORWORD CURRENT (in mA)	FORWORD RESISTANCE ( in $\Omega$ )
1	0.05	0.02	2500
2	0.1	0.18	555.55556
3	0.12	0.4	300
4	0.14	0.73	191.78082
5	0.18	1.8	100
6	0.2	2.84	70.42254
7	0.24	7.77	30.88803
8	0.26	10.03	25.92223
9	0.28	14.35	19.5122
10	0.3	20.2	14.85149

**5.VI CHARACTERISTICS OF PN JUNCTION DIODE**

**Graph :**



$$\text{Slope} = 1/r_d$$

$$r_d = 1/\text{Slope}$$

$$\text{Slope} = AB/BC = I_{f2} - I_{f1} / V_{f2} - V_{f1}$$

**Cut in Voltage  $V_c$  : 0.14 V**

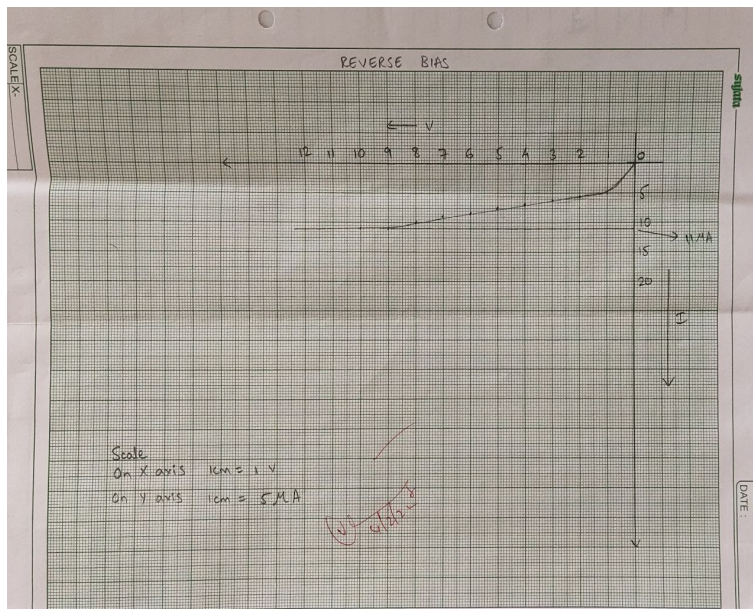
**Dyanamic resistance  $r_d$  : 81.17  $\Omega$**

**Static resistance  $r_s$  : 26  $\Omega$**

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SI No.	$V_R$ (In V)	$I_R$ (In $\mu A$ )	$R_R$ (In $\Omega$ )
1	1	5.1	196.07843
2	2	5.5	363.63636
3	3	6.2	483.87097
4	4	6.8	588.23529
5	5	7.6	657.89474
6	6	8.5	705.88235
7	7	9.2	760.86957
8	8	10.2	784.31373
9	9	11.1	810.81081
10	10	12.1	826.44628



Consider The loop equation  $E = I_f R + V_f$

GIVEN  $R = 100 \Omega$ ,  $E = 1 V$

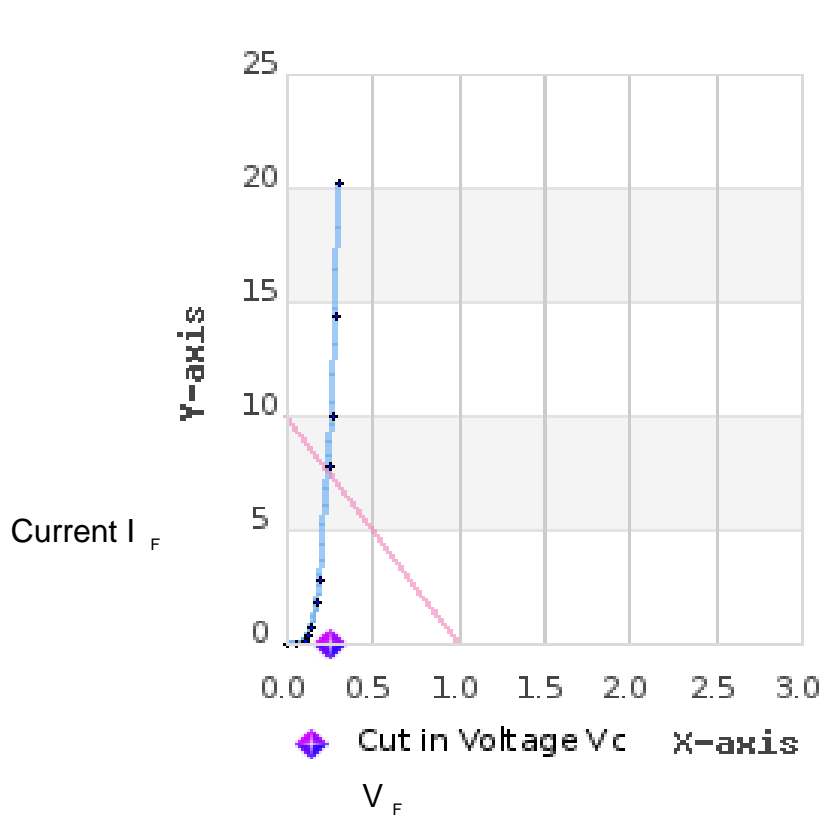
If  $I_f = 0$ , in the loop equation

Then  $V_f = E = 1 V$

If  $V_f = 0$

Then  $I_f = E/R = 10 mA$

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$$\text{Slope} = 1/r_d$$

$$r_d = 1/\text{Slope}$$

$$\text{Slope} = AB/BC = I_{f2} - I_{f1} / V_{f2} - V_{f1}$$

### Results

Sl No	At Q Point	Values
1	Maximum forward voltage $V_{fmax}$	0.225 V
2	Maximum forward Current $I_{fmax}$	7.8 mA
3	$R = \text{Load resistance} = 1/\text{slope}$	100 $\Omega$

### Conclusion

The given diode is Germanium diode.