

Semiconductors

Spoken Tutorial Project

<https://spoken-tutorial.org>

National Mission on Education through ICT

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Learning Objectives



Learning Objectives

We will learn,



Learning Objectives

We will learn,

- ▶ **How a battery acts as a driving force in a circuit**



Learning Objectives

We will learn,

- ▶ How a battery acts as a driving force in a circuit
- ▶ To add dopants to move the electrons in the circuit

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We will learn,

- ▶ How a battery acts as a driving force in a circuit
- ▶ To add dopants to move the electrons in the circuit
- ▶ How the dopants change energy levels in a semiconductor



Learning Objectives



Learning Objectives

- ▶ Why a pn junction acts as a diode



Learning Objectives

- ▶ **Why a pn junction acts as a diode**
- ▶ **Why a depletion region does not allow current to flow**



System Requirement



System Requirement

Here I am using,



System Requirement

Here I am using,

► Windows 11 (64 bit)



System Requirement

Here I am using,

- ▶ Windows 11 (64 bit)
- ▶ Java version 1.8



Prerequisites



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- ▶ Learner should be familiar with topics in high school science



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- ▶ Learner should be familiar with topics in high school science
- ▶ Please use the link below to access the tutorials on PhET Simulations
<https://spoken-tutorial.org>



PhET Simulations



PhET Simulations

- Please use the given link to download the PhET simulation
<https://phet.colorado.edu/en/simulations/semiconductor/about>



Summary

We have learnt,

- ▶ How a battery acts as a driving force in a circuit
- ▶ To add dopants to move the electrons in the circuit
- ▶ How the dopants change energy levels in a semiconductor



Summary

- ▶ **Why a pn junction acts as a diode**
- ▶ **Why a depletion region does not allow current to flow**



Assignment

As an assignment,

- ▶ **Make various combinations of dopants at different voltages and record the observations**



About the Spoken Tutorial Project

- ▶ Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- ▶ It summarises the Spoken Tutorial project



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Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to contact@spoken-tutorial.org



Answers for THIS Spoken Tutorial

- ▶ Questions in THIS Spoken Tutorial?
- ▶ Visit <https://forums.spoken-tutorial.org>
- ▶ Choose the minute and second where you have the question
- ▶ Explain your question briefly
- ▶ The Spoken Tutorial project will ensure an answer



Acknowledgements

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funded by the Ministry of Education,
Govt. of India**



Thank you

- ▶ **This is Vidhi Thakur, a FOSSEE summer fellow 2022, IIT Bombay signing off**

