

Diode, Rectifier & Transistor

Spoken Tutorial Project

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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Learning Objectives

Learning Objectives

- Working of PN Junction diode



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- Working of PN Junction diode
- Diode as rectifier



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- Working of PN Junction diode
- Diode as rectifier
- Diode IV characteristics



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- LED IV characteristics



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- Working of PN Junction diode
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- Out of Phase inverting amplifier



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- Working of PN Junction diode
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- Diode IV characteristics
- LED IV characteristics
- Out of Phase inverting amplifier
- Transistor CE



System Requirement

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- **ExpEYES v 3.1.0**



System Requirement

- **ExpEYES v 3.1.0**
- **Ubuntu Linux OS v 14.04**



Pre-requisites

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- **ExpEYES Junior interface**



Pre-requisites

- **ExpEYES Junior** interface
- For relevant tutorials, visit our website
www.spoken-tutorial.org



PN junction Diode

PN junction Diode

PN junction Diode,

- is a semiconductor device which allows current to pass through in one direction

PN junction Diode

PN junction Diode,

- is a semiconductor device which allows current to pass through in one direction
- converts alternating current to direct current



PN junction Diode

PN junction Diode

- **Demonstrate working of PN junction diode as a half wave rectifier**

Half wave Rectifier

Half wave Rectifier

- **Convert AC signal into a DC signal in forward bias**



Half wave Rectifier

- Convert AC signal into a DC signal in forward bias
- Convert AC signal into a DC signal in reverse bias

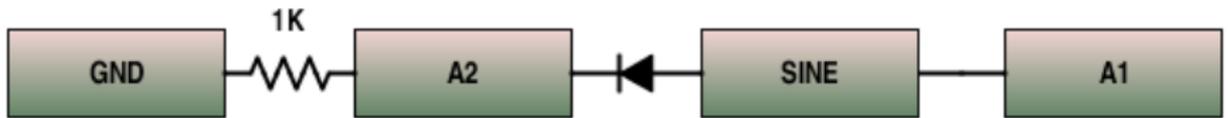


Half wave Rectifier

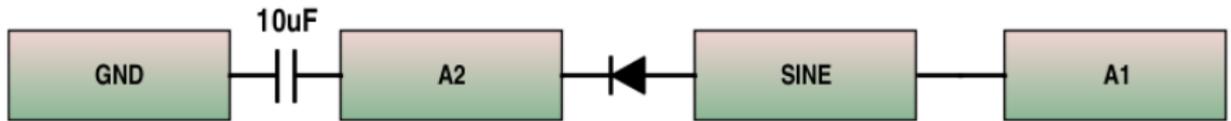
- Convert AC signal into a DC signal in forward bias
- Convert AC signal into a DC signal in reverse bias
- Filter the AC component using a capacitor



Half wave Rectifier



Half wave Rectifier and Filter



Diode IV

Diode IV

- **Diode IV characteristics of:
PN junction diode and LEDs**



Diode IV



LED

- **Replace diode with red, green & white LEDs one by one in the circuit**



Note

Note

- Please note LED glows in only one direction



Note

- Please note LED glows in only one direction
- If it does not glow, turn to opposite direction and connect again



LED



Inverting Amplifier

Inverting Amplifier

- Demonstrate 180 degree out of Phase sine waves



Inverting Amplifier

- Demonstrate 180 degree out of Phase sine waves
- Inverting the output of SINE using an amplifier

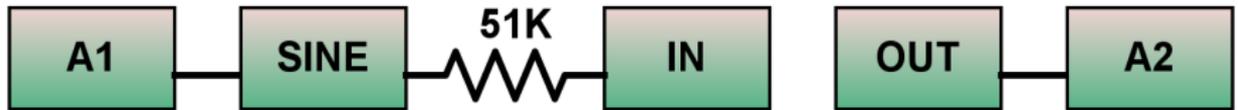


Inverting Amplifier

- Demonstrate 180 degree out of Phase sine waves
- Inverting the output of SINE using an amplifier
- 51K Ohm resistor for the amplification



Inverting amplifier



Transistor CE

Transistor CE

- Plot transistor CE (collector emitter) characteristic curves



NPN Transistor

NPN Transistor

- Use 2N2222, NPN transistor

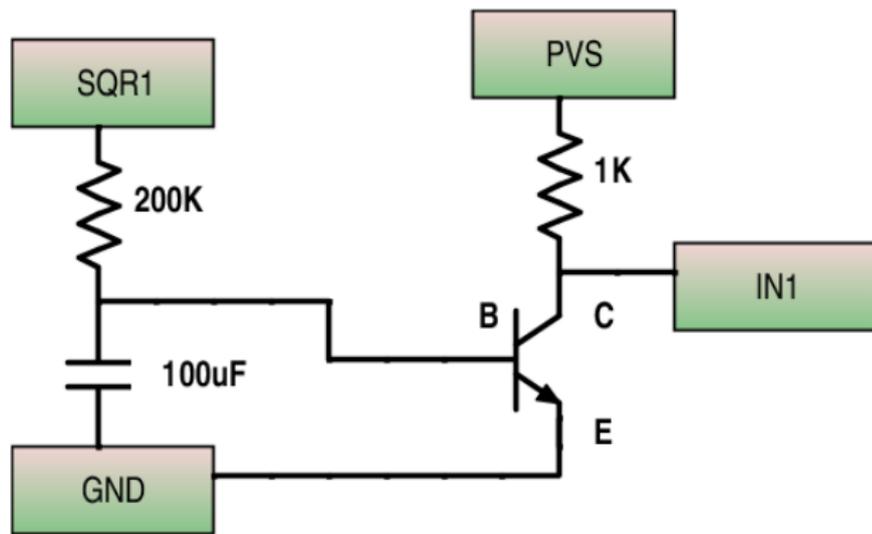


NPN Transistor

- Use 2N2222, NPN transistor
- Solder the wires of the transistor



Transistor CE



Summary

- Working of PN Junction diode
- Diode as rectifier
- Diode IV characteristics
- LED IV characteristics
- Out of Phase inverting amplifier
- Transistor CE

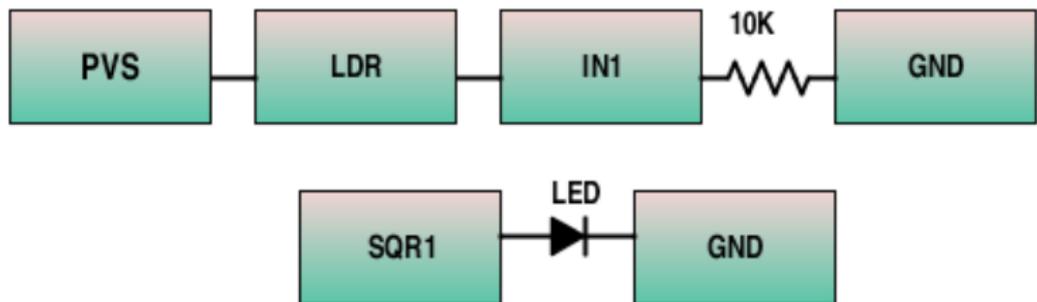


Assignment

- 1 **Measure the intensity of light and its variation from the source**



Assignment



About the Spoken Tutorial Project

- Watch the video available at http://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



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- More information on this Mission is available at <http://spoken-tutorial.org/NMEICT-Intro>

