

# DIODES

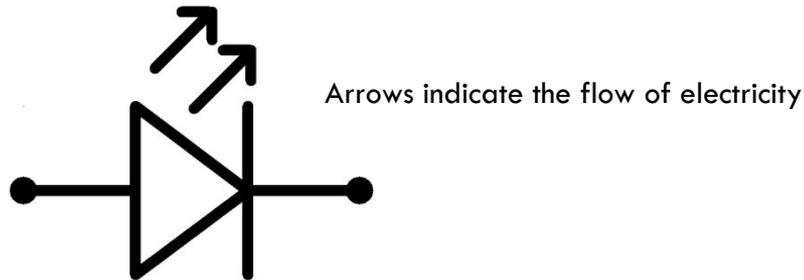
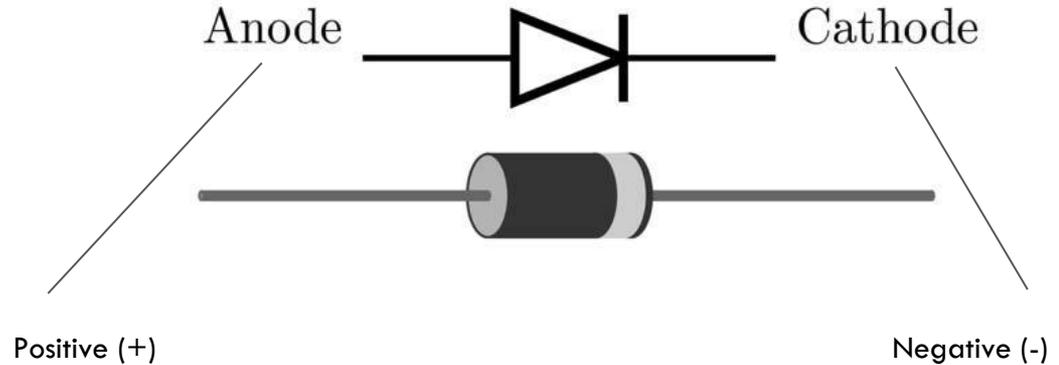
What is a diode?

An electronic component that allows that current flow in one direction only.

It contains two electrodes, (1) anode (electricity flows into) (2) cathode (electricity flows out of).

An important application of a diode is rectification: changing AC (alternating current) to DC (direct current)

Most diodes are made from a semiconducting material, i.e., silicon



# Types of Diodes

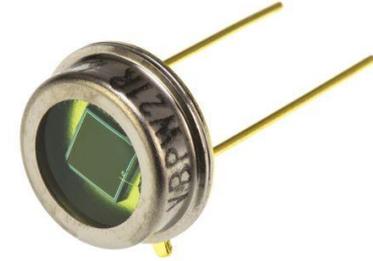
Some common types of diodes are:

Light Emitting diode (LED)

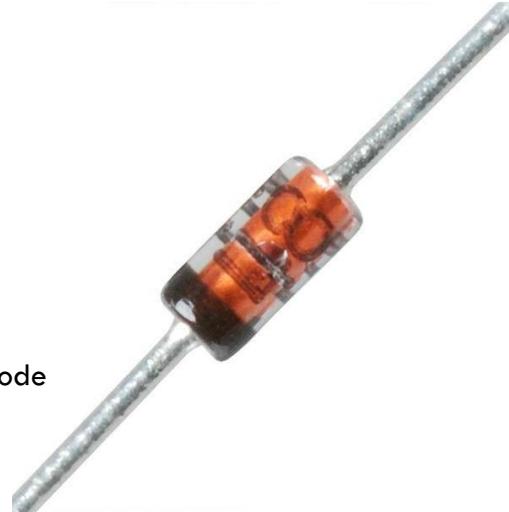
Photodiode - detects light

Laser diode - emits a coherent light beam (laser)

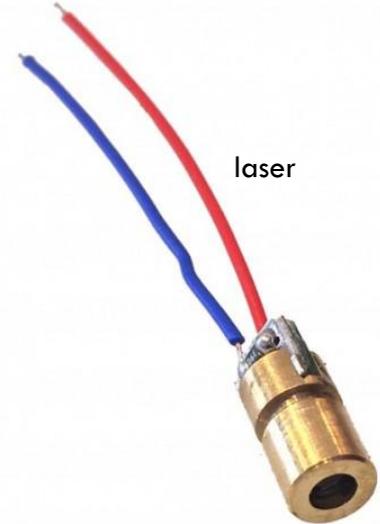
Zener diode - prevents current flow up to a voltage threshold.



Photodiode



Zener diode



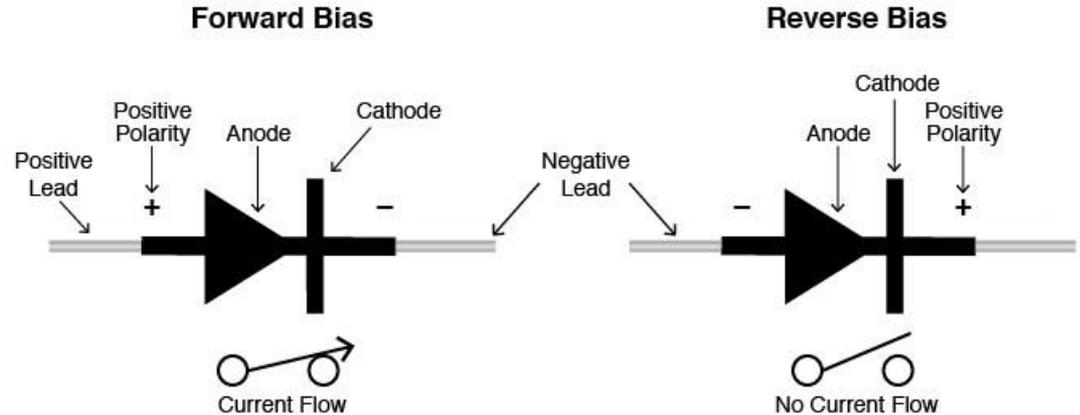
laser

# How Diodes Work

**Forward Operation:** In this case the anode is connected to the positive electrode of the source, and the cathode is connected to the negative electrode of the source. This allows the current to flow.

**Reverse Operation:** In this case the polarity is reversed, preventing very little to no electricity to flow.

Often a diode is used to isolate the effect of one component from another, such as preventing excess electricity from a circuitry component to affect other parts or even the microcontroller.



# Light Emitting Diode (LED):

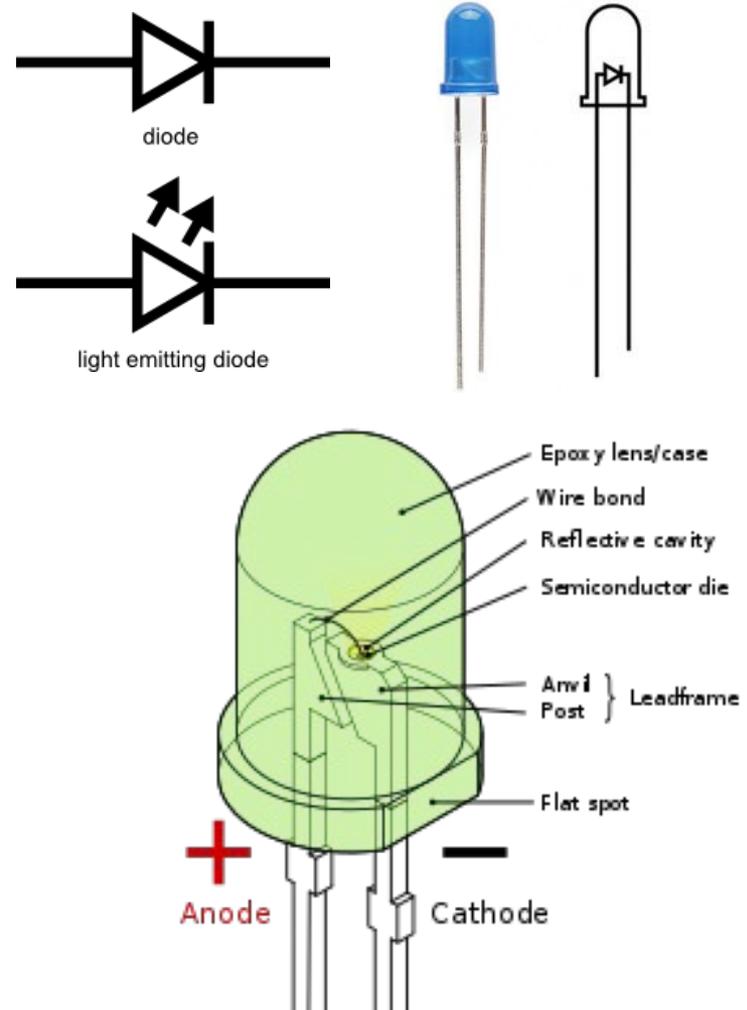
Light emitting diodes (LED) are a very common type of diode that converts electrical energy into light.

The arrows discharging from the diode represents light → .

How it works: When a current flows into the semi-conductor, it jumps from one side of this boundary to the other, releasing energy in the process. In most diodes that energy leaves as heat, but in LEDs that energy is dissipated as light!

Like all diodes, electricity only flows in one direction. Orient the legs correctly as it can block the entire flow of electricity.

A LED will always want to draw as much power as it can take, the more power the brighter it will be. Though it cannot control its craving and too much electricity will end up burning it out.



# Zener Diodes:

Zener diodes are an interesting diode that conducts a reverse current. Their unique ability has granted them their own symbol.

The zener diode or “Breakdown Diode” are specially designed to have a low and specified Reverse Breakdown Voltage which takes advantage of any reverse voltage applied to it.

Due to Zener diode’s ability to withstand reverse voltage and produce a consistent (Zener) voltage they are often used to create a known reference voltage which is handy in regulating for small loads. but they’re not really made to regulate voltage to circuits that will pull significant amounts of current.

The science behind zener diodes are complex, feel free to check this source out for more information: [Zener Diodes](#)



Zener diode symbol

