

BE1M13VES

Manufacturing of Electrical Components

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Overview

1 Semiconductor Components

2 Light Dependent Resistor

3 Diodes

TOPIC

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Semiconductor Components

Basic properties

- Nonlinear characteristics - used for rectifying, sensing, saturation etc.
- VA characteristics are quite dependent on ambient factors - temperature, light.
- Some components are able to amplify the input signal - transistors

Doping

Intrinsic semiconductors (semiconductors without impurities):

- The free charge is excited via temperature or light.
- Quite small conductivity dependent on ambient factors.

Extrinsic semiconductors (semiconductors with doped material):

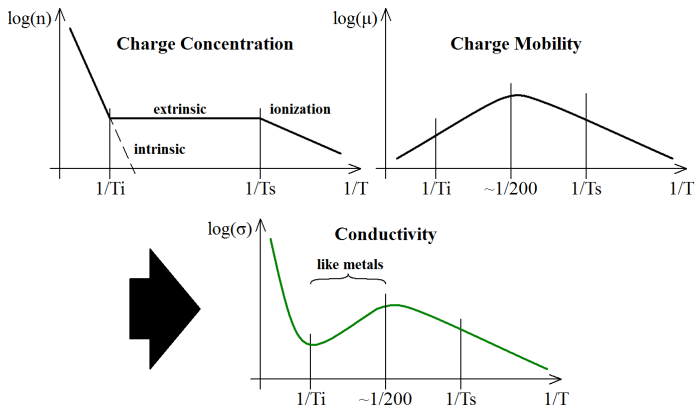
- Most of the free charge is excited at room temperature from impurities.
- Similar behavior as metal conductors (rising resistance with temperature).
- Two types of doped materials (dopants): **donors & acceptors**

Doping

Degenerate semiconductors

- High level of dopant.
- Almost the same behaviour as metal conductors.
- They are used to create contact layer between metal wire and semiconductor.

Temperature dependency



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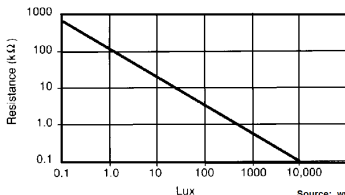
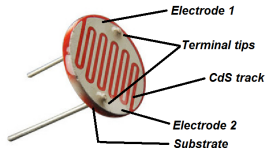
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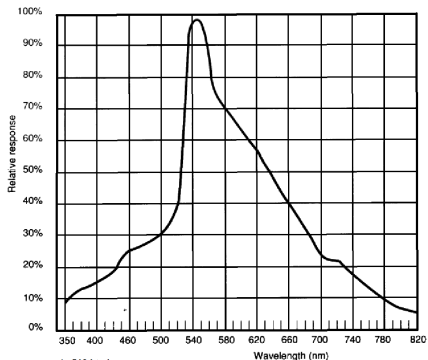
3 Diodes

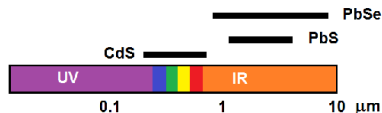
LDR, Photoresistor - Basic properties

- The resistance decreases with illumination.
- The spectral light sensitivity depends on semiconductor material.



Source: www.sunrom.com/p-510.html





- Materials: CdS, CdSe, PbS, PbSe, and others;
- **No PN junction** - one type of conductivity:
 - intrinsic - high resistance, sensitive to short wavelengths of light
 - extrinsic - smaller resistance, sensitive to longer wavelengths of light (IR)
- Dynamic response is exponential: **milliseconds**

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Diode

The construction contain one junction between different types of semiconductor conductivity.