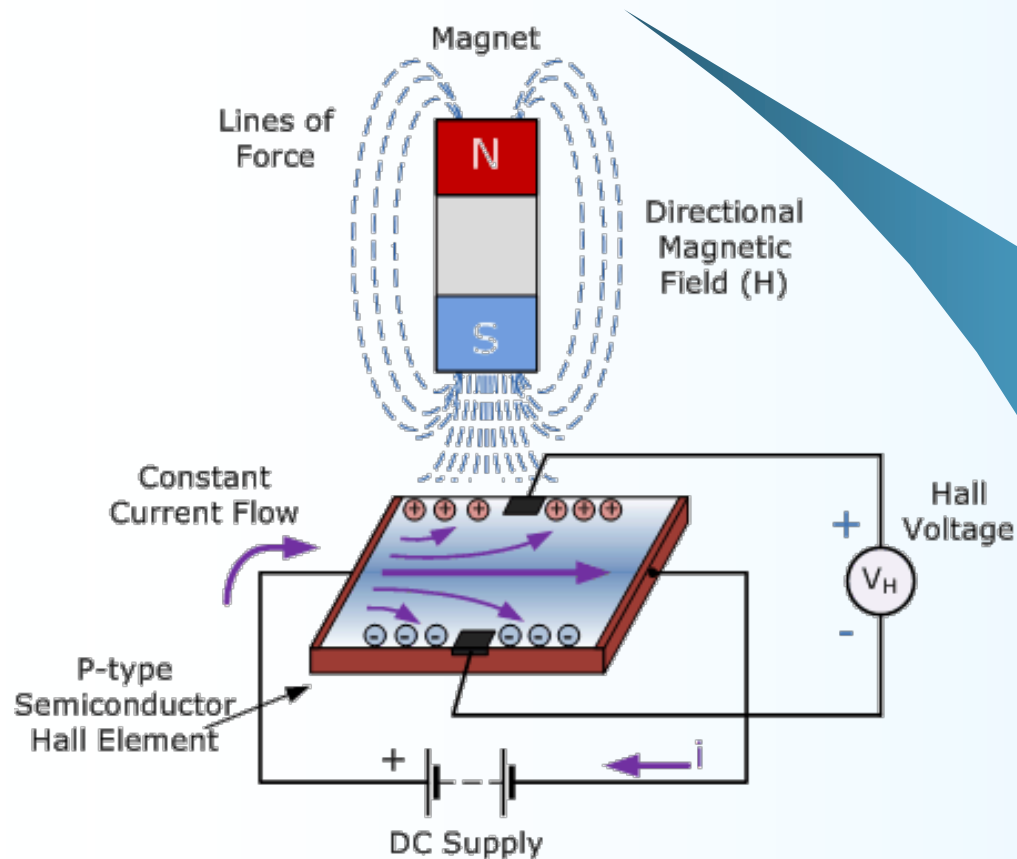


Solid State Transducers (Ch 8)

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AENG 262, Semiconductor Electronics

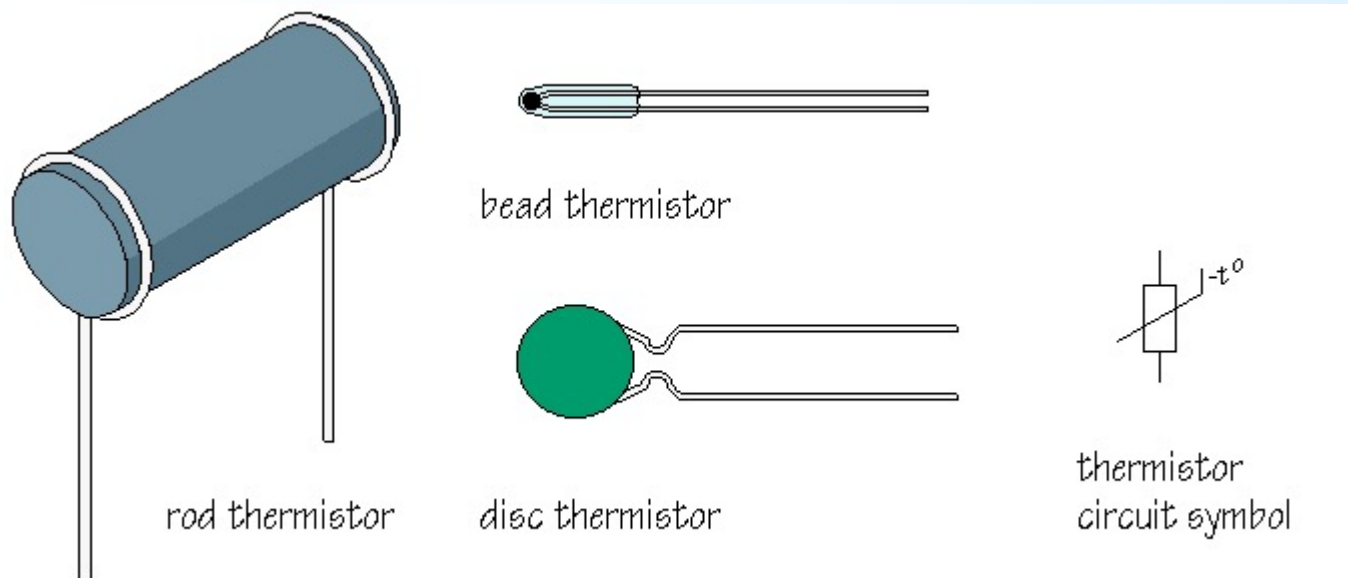


Semi-conductive Transducers

- A device made of semi-conductive material that changes one form of energy to another
- 6 Basic Technologies

1. Thermistors

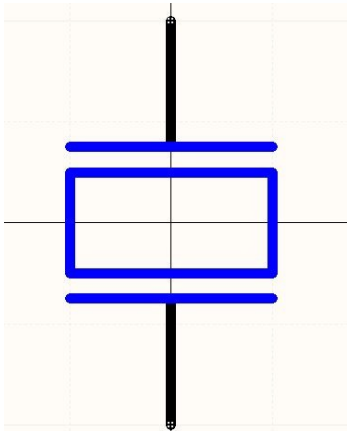
- A thermally sensitive resistor based on semi-conductive material
 - PTC vs. NTC
 - Linear vs. Nonlinear



2. Pressure Sensors

- A **piezoelectric sensor** is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, strain or force by converting them to an electric charge.

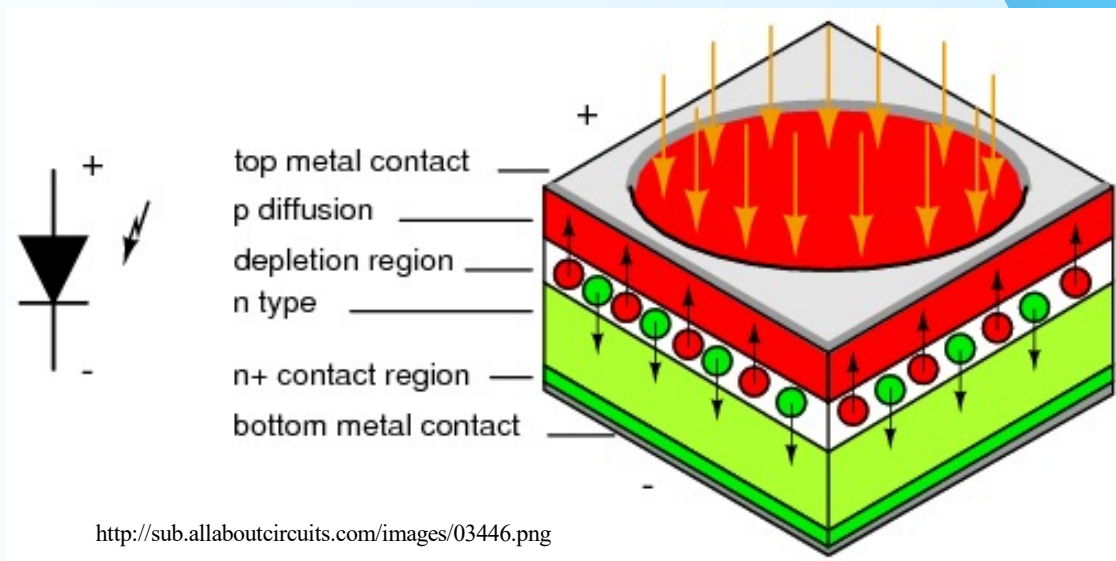
- Piezo is Greek for press
- <http://www.youtube.com/watch?v=Z3y5W5p7Ofg>



3. Photoelectric



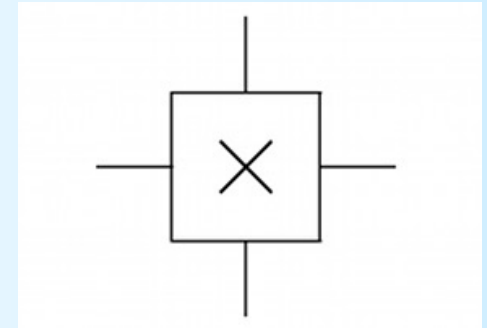
- Produce a change in either resistance or voltage when exposed to light
 - Photovoltaic (i.e. Photocell)
 - Photoconductive (i.e. Photodiode)



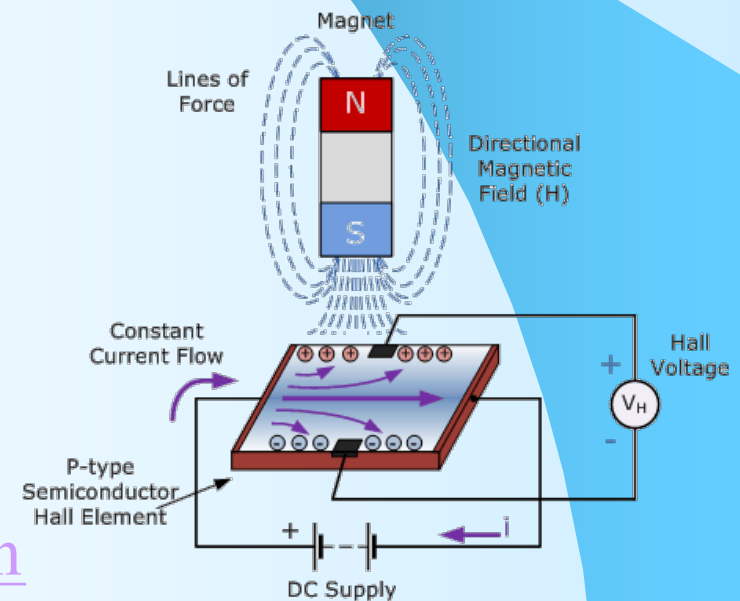
4. Hall Effect Sensors

- Strip of semi-conductive material connected to a constant current source
- A magnetic presence 90° to the constant current will produce a voltage at the perpendicular to the constant current

- <http://www.youtube.com/watch?v=AcRCgyComEw>



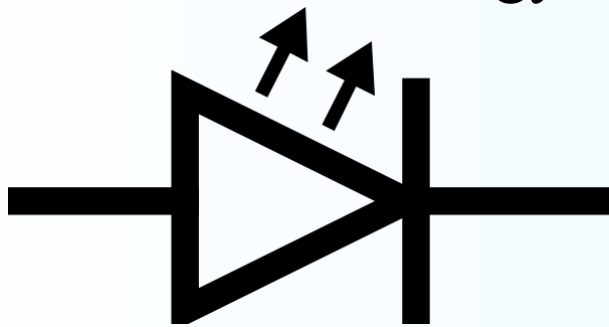
<http://upload.wikimedia.org/wikipedia/commons/1/1e/Commmbol.png>



<http://www.electronics-tutorials.ws/electromagnetism/hall-effect.html>

5. LED

- Light Emitting Diodes
- The PN Junction emits light or photons when a charge is applied
- Light color depends on the impurities present in the semi-conductive material
 - Older technology used plastic lenses



6. LCD

- Liquid Crystal Display
- Works by reflect or not reflect concept
 - Or pass, no pass
- Construction
 - Nematic Fluid
- Modern TVs are LCD or LED or should we say LED LCD!
 - <http://www.youtube.com/watch?v=TJsebZQCn74>