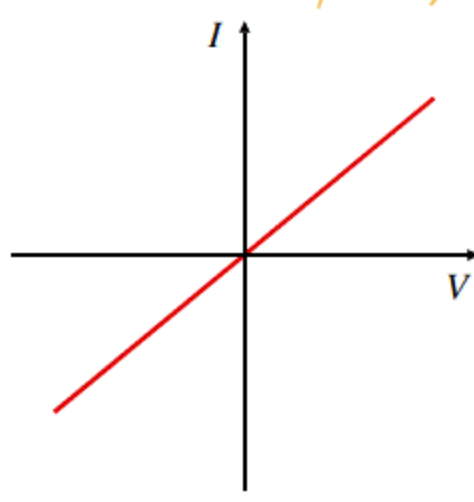


# Components and their characteristics

## Metallic conductor

An ohmic conductor

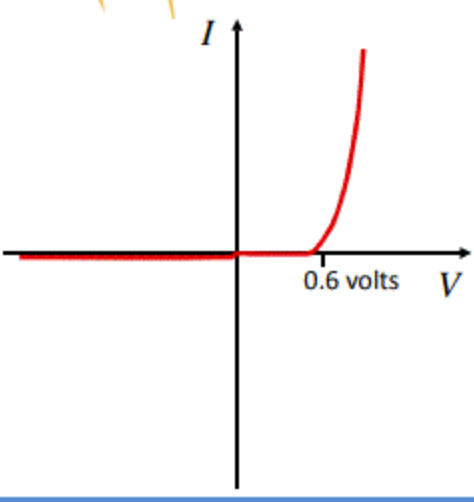
Assuming no temperature change the current is directly proportional to the potential difference. The resistance is constant (constant gradient)



## Semiconductor Diode

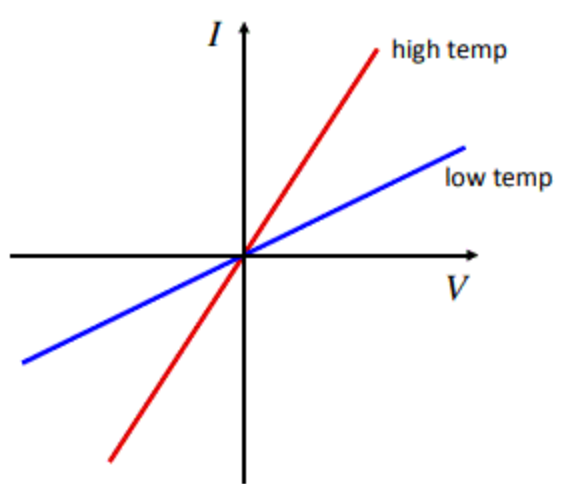
Virtually no current in the reverse bias direction. Extremely high resistance.

Current increases rapidly with potential difference after about 0.6 V in the forward bias direction. Resistance decreases with increasing p.d.



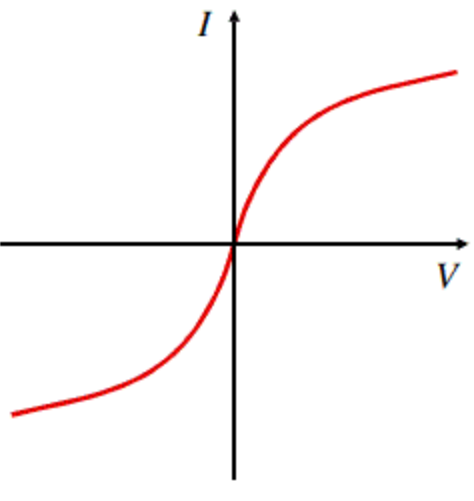
## Thermistor

Assuming no heating effect of the current, the current is directly proportional to the p.d. Higher constant temperature gives a lower resistance. Not a realistic characteristic for a thermistor, due to self heating effect of the current.

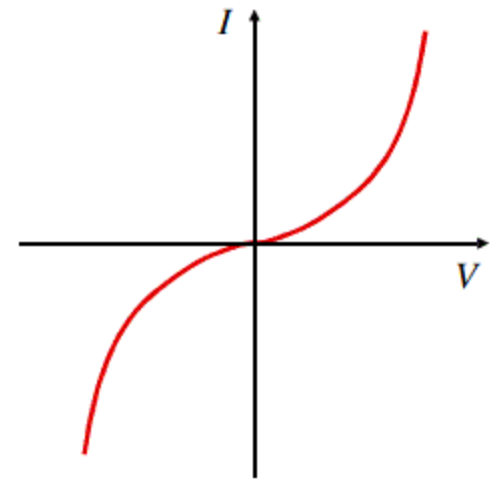


## Filament lamp

The resistance increases with increasing current. The filament becomes hotter, increasing the resistance



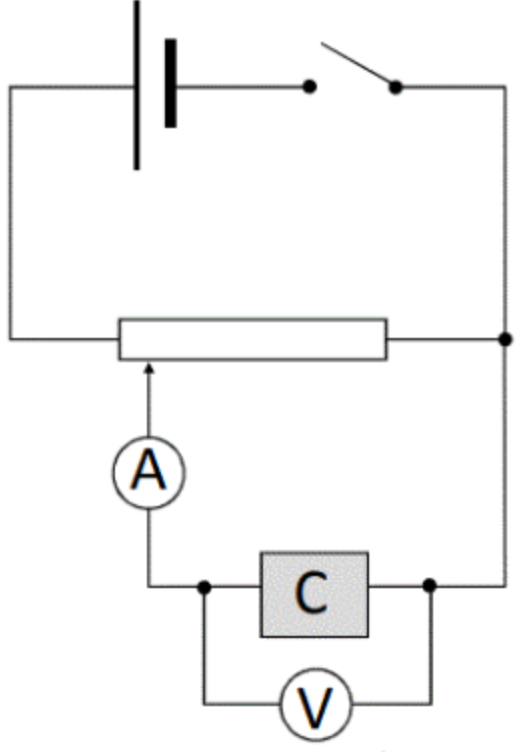
Increased thermal vibrations of the lattice of ions with a temperature increase will restrict the movement of the free electrons. Resistance increases.



As the current increases, the temperature of the thermistor increases, and the resistance decreases. This is a self-heating effect. A more realistic characteristic of a thermistor.

## Circuit used

A potential-divider circuit to investigate a component C



Allows a full range of potential difference to be applied, from 0 V to the full p.d of the supply.