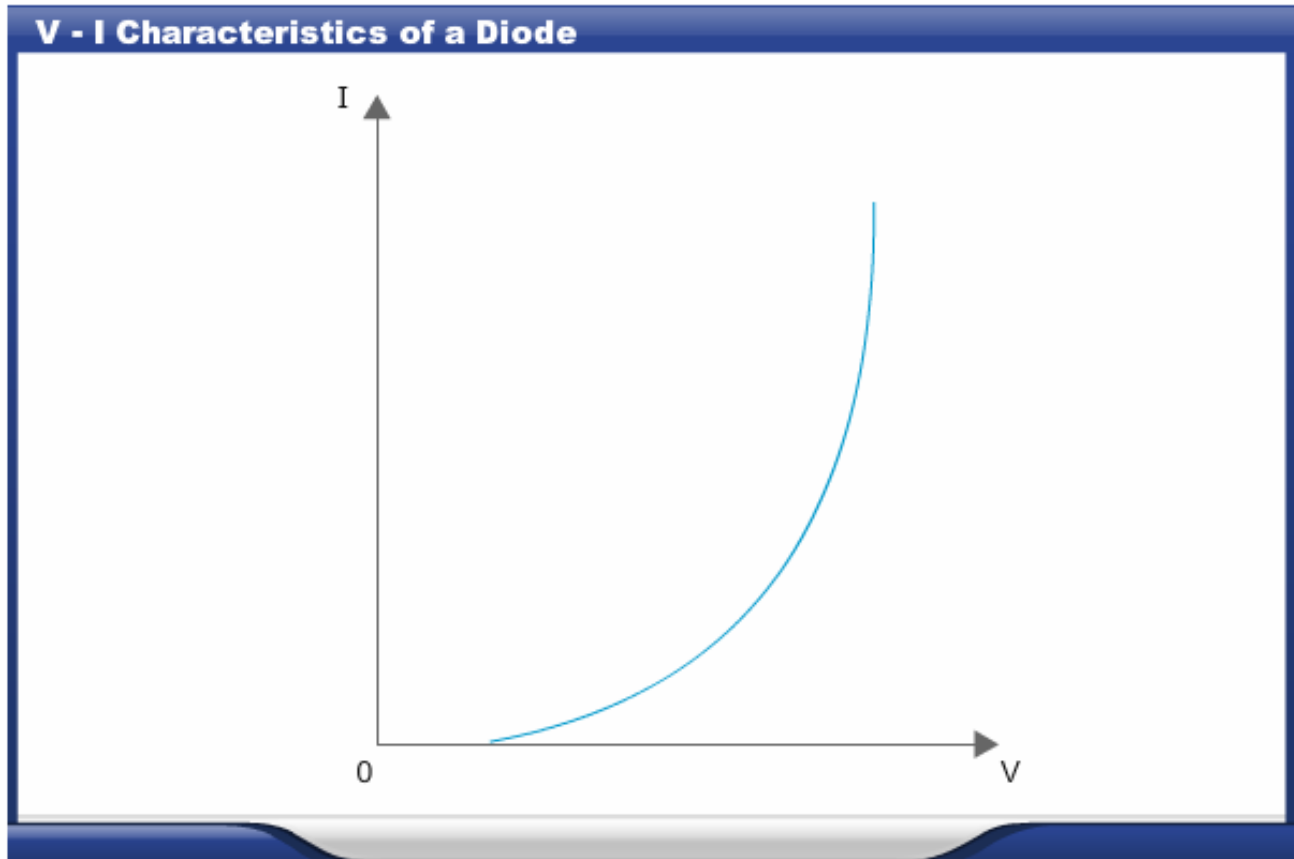


Non-linear resistors

Linear resistors obey Ohm's Law. The current through the linear resistor is inversely proportional to its resistance value, provided the temperature is constant. Its V-I curves are straight lines. There are some elements which do not obey Ohm's Law. Their V-I curves are not straight lines i.e., the V-I curves are non-linear. Such resistors are called non linear elements. Filaments of incandescent lamps are typical examples of non-linear elements.

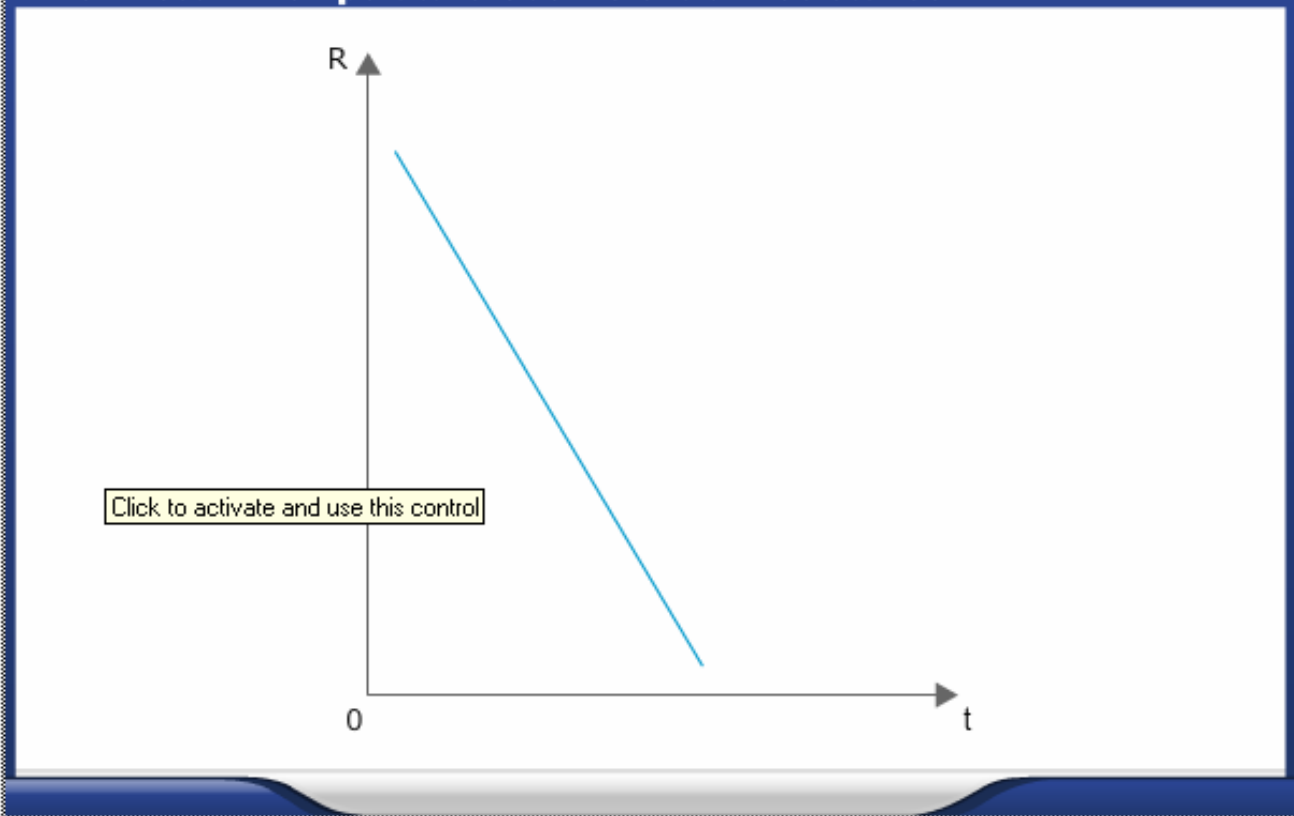
Diodes, thermistors and varistors also have non linear V-I curves. Diode is an artificially made junction of semi conductor materials. The V-I characteristic of diode is shown in the image given below:



Thermistor

A thermistor is made of metallic oxides in a binder. It has a large negative temperature coefficient of resistance. Its resistance decreases with increase in temperature as shown in image given below:

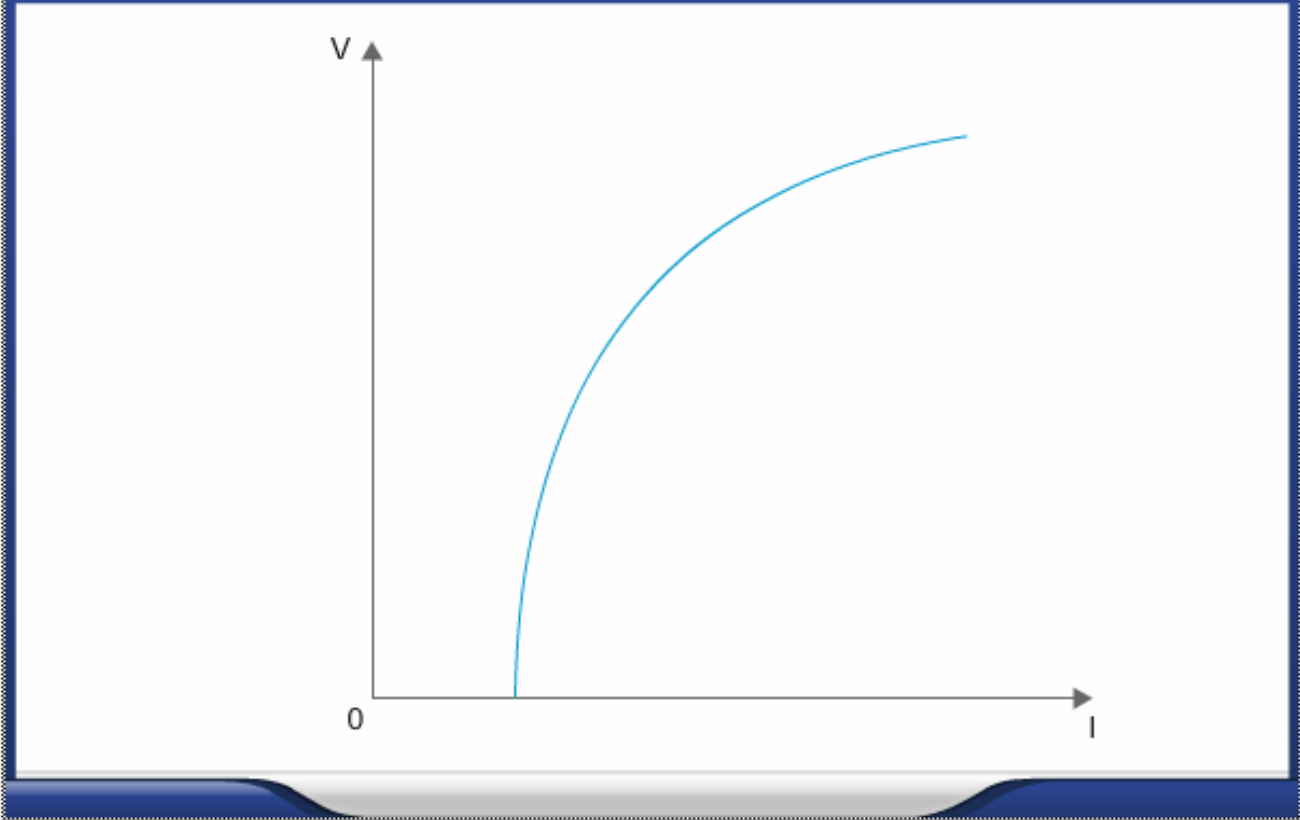
Thermistor - Temperature Coefficient of Resistance



Varistor

An artificially made non linear resistor is called varistor. It is made of carborundum crystals bound together. The image given below shows the V-I curve of a varistor. It may be seen that the current through a varistor increases rapidly when the applied voltage increases beyond a certain amount. This means that there is a corresponding rapid decrease in resistance when the current increases.

V - I Characteristics of a Varistor



Varistors made of metal oxides are mostly used to provide protection against high voltage surges caused in the transmission and distribution systems by lightning where the voltage surge appears in micro seconds. The lightning current could be discharged in micro seconds if resistance in the discharge path is reduced in time. Varistors are capable of giving this reduced resistance value when voltage increases. By discharging the surges thus, the interruption in the electricity system is averted.