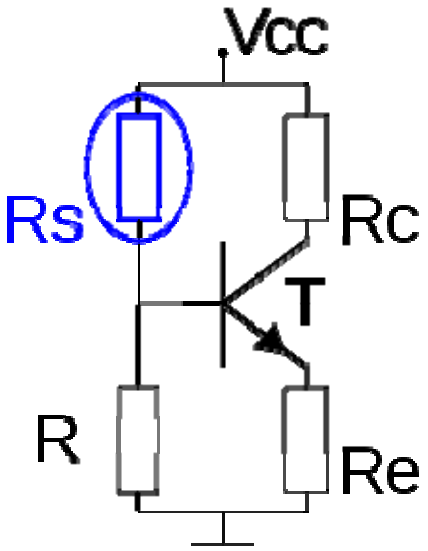
SENSISTOR,THERMISTOR &THERMAL RUNWAY

Sensistor is a resistor whose resistance changes with temperature. The resistance increases exponentially with temperature, that is the temperature coefficient is positive (eg. 0.7% per degree Celsius).Sensistors are used in electronic circuits for compensation of temperature influence or as sensors of temperature for other circuits.



Sensistors are made by using very heavily doped semiconductors so that their operation is similar to PTC-type thermistors. However, very heavily doped semiconductor behaves more like a metal[4] and the resistance change is more gradual than it is the case for other PTC thermistors.

A thermistor is a type of resistor whose resistance varies significantly with temperature, more so than in standard resistors. The word is a portmanteau of thermal and resistor. Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements.

thermistor

Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure metals. The temperature

response is also different; RTDs are useful over larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range [usually −90 °C to 130 °C].

Thermistor symbol

Assuming, as a first-order approximation, that the relationship between resistance and temperature is linear, then:

$$\Delta R = k\Delta T$$

where

ΔR = change in resistance
ΔT = change in temperature
k = first-order temperature coefficient of resistance

thermal runaway

Thermal runaway refers to a situation where an increase in temperature changes the conditions in a way that causes a further increase in temperature, often leading to a destructive result. It is a kind of uncontrolled positive feedback.

In other words, the term "thermal runaway" is used whenever a process is accelerated by increased temperature, in turn releasing energy that further increases temperature. In chemistry (and chemical engineering), this risk is associated with strongly exothermic reactions that are

accelerated by temperature rise. In electrical engineering, thermal runaway is typically associated with increased current flow and power dissipation, although exothermic chemical reactions can also occur under some conditions. Thermal runaway can occur in civil engineering, notably when the heat released by large amounts of curing concrete is not controlled. In the science of astrophysics, thermal runaway of thermonuclear fusion in the cores of massive stars can cause Type Ia supernova explosions.