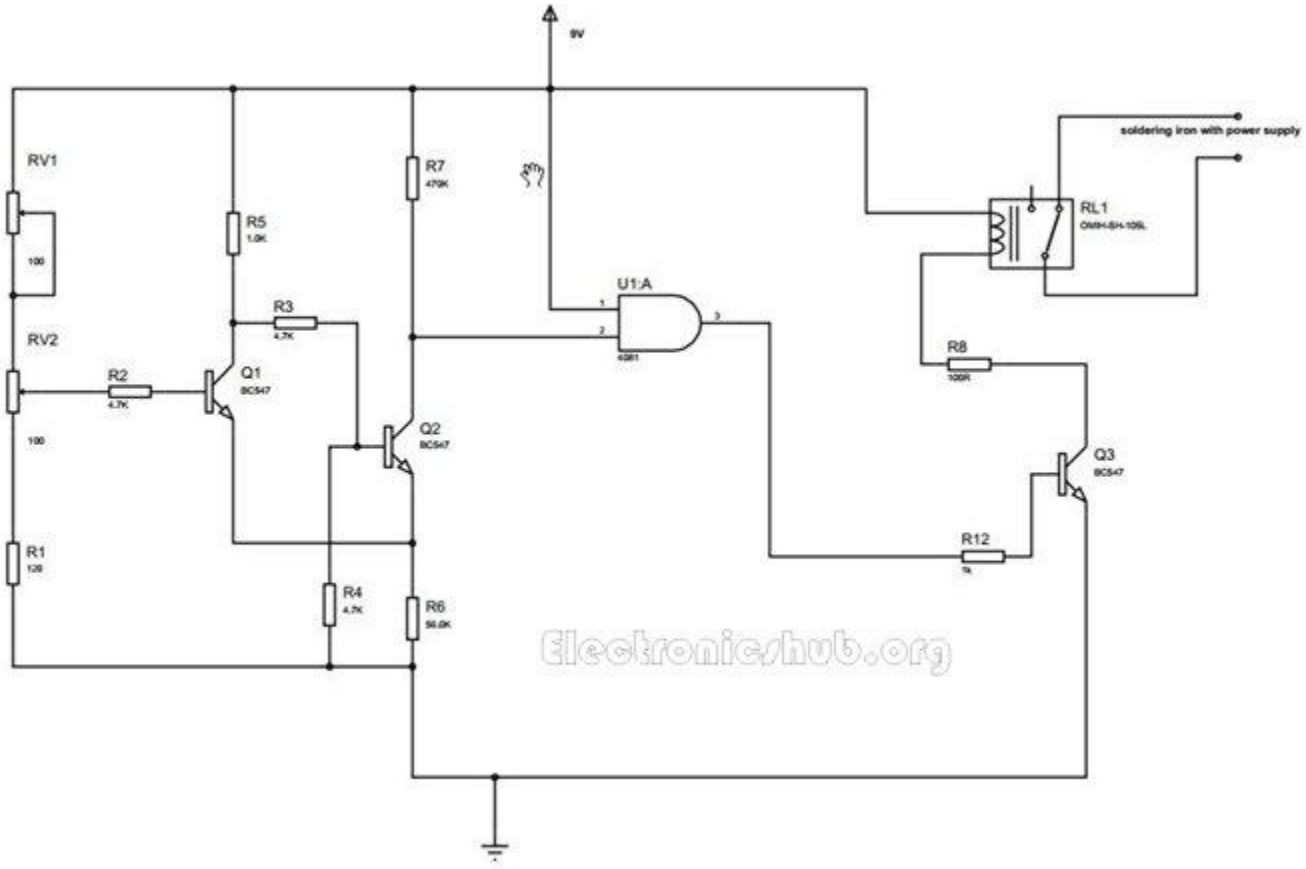
Auto Turnoff Soldering Iron Circuit

We all use soldering iron to solder our components on a printed circuit board. We sometimes use the soldering iron continuously for a long time or we sometimes forget to turn it off. In both the cases, if the soldering iron is left on for a longer time, then it may get over heated and it may result to its damage. This circuit helps the soldering iron to turn off automatically when it detects overheating and thereby avoids it from getting damaged.

Circuit Diagram of Auto Turnoff Soldering Iron:



The circuit uses a thermistor for detecting the temperature of the circuit. The resistance of the thermistor is inversely proportional to the temperature thereby the temperature of the thermistor decreases with increase of temperature and its resistance increases with decrease of temperature. This means that the thermistor is a temperature sensitive device with negative coefficient of temperature. Negative coefficient of temperature

implies that the resistance of the device is inversely proportional to the temperature like the thermistor.

An NPN transistor is used as a switch to turn on or off the circuit depending on the temperature sensed. If the temperature reaches a threshold value, then the transistor operates in saturation mode and thereby provides low voltage at the output. The transistor circuit is arranged in common emitter mode. In this mode, if the input is high, then the output is low and if the input is low, the output turns high. Accordingly we get a low output when the input is high. In order to get high output for high input, we have used another transistor in common emitter mode so that inverting twice will make it non inverted. This non inverted output is given to AND gate and further it is made to operate a relay.

The relay is an electrically controlled mechanical switch which mechanically turns on or off our soldering iron when required depending on the electrical signal given to it. The relay has a coil in it which activates or deactivates the circuit depending on the DC voltage given to it. It has two modes of connection. One is the normally open and the other is normally closed. In this circuit, we are arranging the circuit in normally closed mode which means that the circuit is in ON mode by default and when the temperature rises above a specific value, then the circuit turns OFF the soldering iron by breaking its loop. When the soldering iron cools down, the circuit turns it back again so that the soldering iron will run normally again after getting cooled down.

This is how it protects our soldering iron from getting damaged.

Source: www.electronicshub.org/auto-turnoff-soldering-iron-circuit/