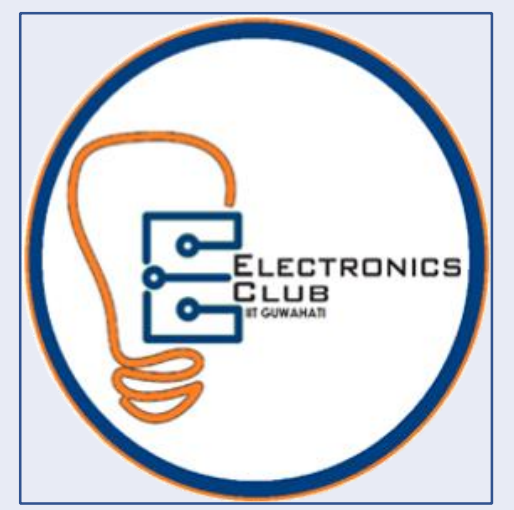# Electronic Thermometer

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Abstract/Introduction

This project works on the principle that the threshold voltage of diode decreases with temperature.

IN4148 is the type of diode which will be using in this project.

Two IN 741 integrated circuits are used as operational amplifiers.

Various kinds of resistances are used in the circuit of this project as those are helpful for
voltage division and feedback.

Capacitors are also used for maintaining constant inputs and outputs.

The output of the final opamp will be calibrated in such a way that the output current is the temperature or a factor of temperature.

It can be used for large range of temperatures.

Results

When an external input voltage is applied to the non-inverting end the of opamp and a temperature change is recognised by the diode it gets amplified and the output of first opamp is further amplified by connecting it to the inverting end of second opamp and with a finite voltage given to the non inverting end of it. The output current from second opamp is calibrated to measure the temperature .
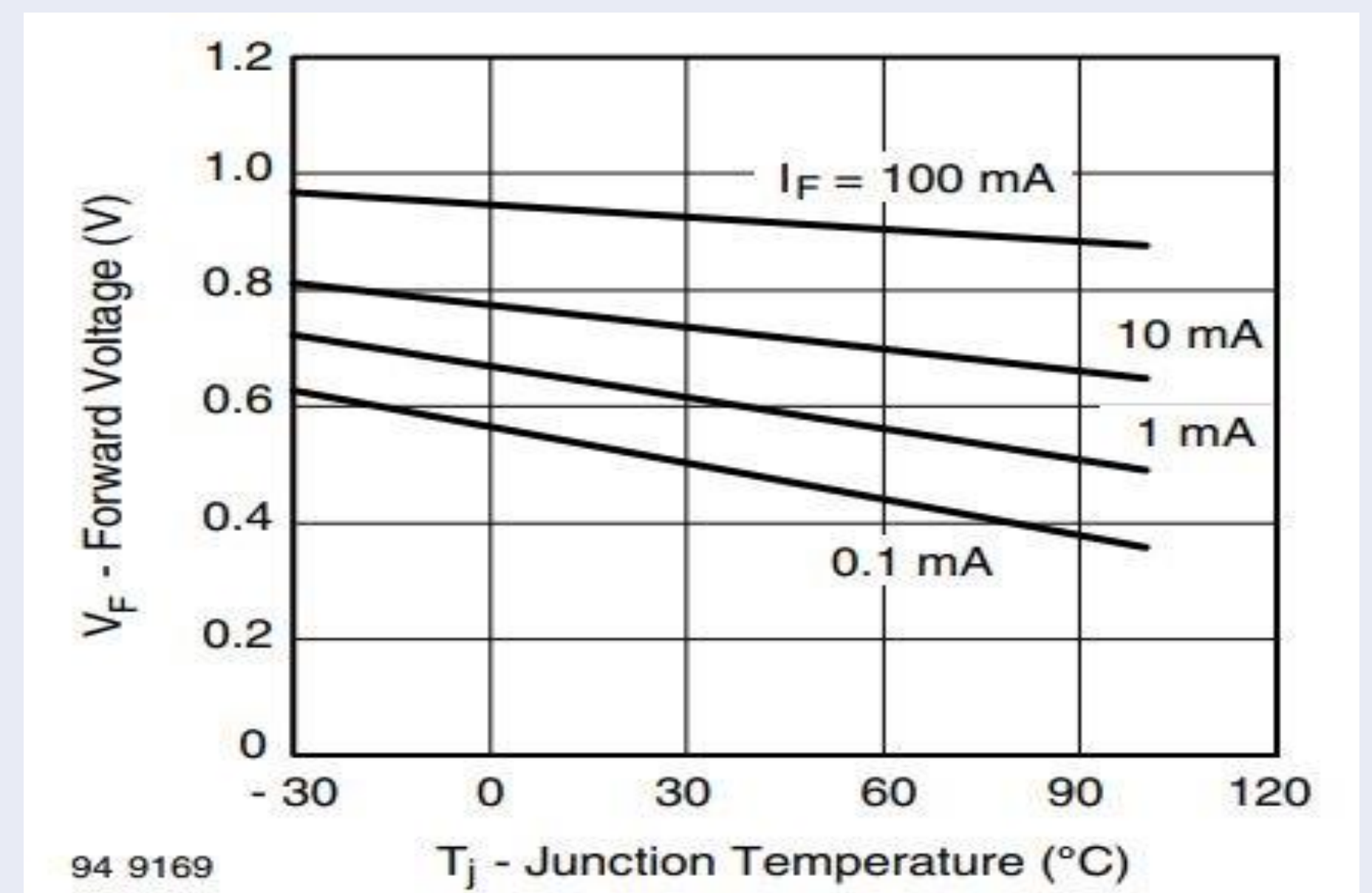
Methodology
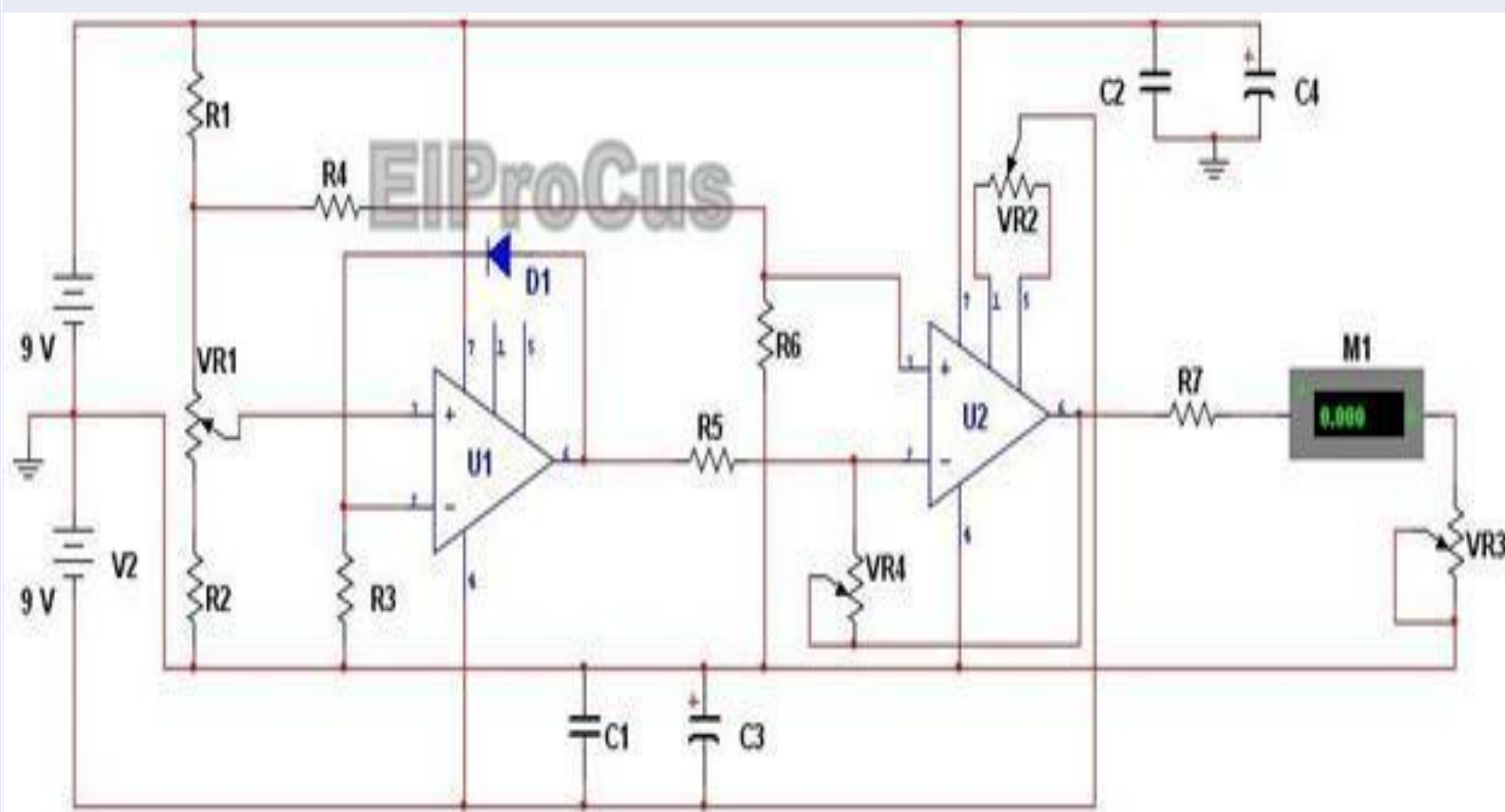
First Opamp acts a s Non-inverting amplifier and the output of 1st opamp acts as Non-inverting input of second opamp.

Second opamp acts as differential amplifier with both inverting and Non-inverting inputs.

Potentiometers(VR1 and VR2) are used in the circuit to maintain constant inputs.

Diode is used in the feedback path of 1st opamp and the voltage drop across the diode will change accordingly to the temperature and that change will be sensed by opamp and produces change in output.

The Changed outputs will be calibrated to produce temperature.

Conclusion

We made a electronic thermometer using diode and opamp which verified the temperature voltage dependence property of diode.

Here we found that when the current through a diode is kept constant, it shows linear dependence of forward voltage of diode and temperature.

References

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