Instrumentação Electrónica
Sensor de temperatura
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30 anos
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Develop a system to measure the temperature based on a diode.
The current through a diode is given by (Ebers-Moll)

$$I_D = I_S(T) \, [\, \exp(qV_D/nkT) - 1]$$

Suggestion: Connect the diode in series with a current source (or resistor) to guarantee a constant current.

- Determine the relation between T and V_D theoretically and experimentally.
- Determine the linearity of the system (defined as the range of temperatures where the deviation from linearity is less than 5%).
- Determine the sensitivity of the system (V/^{o}C)
- Determine the ideality factor n.

A warning LED has to light up when the temperatures is larger than 40 ^{o}C.

===> SYSTEM ===>