

NTC Thermistor

NTC = Negative Temperature Coefficient

Temp $\uparrow$ Resistance $\downarrow$

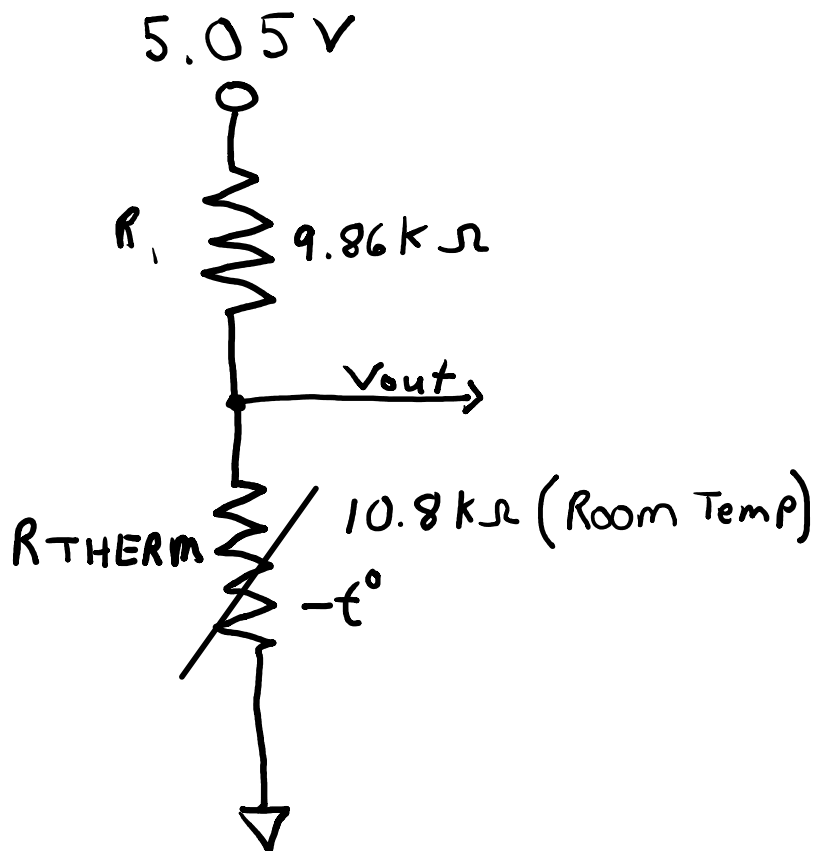
Temp $\downarrow$ Resistance $\uparrow$

our NTC Thermistor

Room temp: $R_{\text{therm}} \approx 10.8 \text{ k}\Omega$

Warm: $R_{\text{therm}} \approx 7.1 \text{ k}\Omega$

$T \uparrow R \downarrow$



$$T \uparrow \Rightarrow R_{THERM} \downarrow \Rightarrow V_{out} \downarrow$$

$$V_{OUT} = V_{CC} \left(\frac{R_{THERM}}{R_1 + R_{THERM}} \right)$$

$$V_{CC} = 5.05V$$

$$R_1 = 9.86k\Omega$$

$$R_{THERM} = 10.8k\Omega$$

Then:

$$\begin{aligned} V_{OUT} &= 5.05 \left(\frac{10.8k}{9.86k + 10.8k} \right) \\ &= 5.05 \left(\frac{10.8}{20.66} \right) \end{aligned}$$

Room Temperature

$$V_{OUT} \approx 2.64V$$

Warm Thermistor

$$R_{THERM} = 7.1k\Omega$$

$$V_{OUT} = 5.05 \left(\frac{7.1k}{9.86k + 7.1k} \right)$$

$$= 5.05 \left(\frac{7.1}{16.96} \right)$$

$$\boxed{V_{OUT} \approx 2.11V}$$

$$\boxed{T \uparrow \Rightarrow R_{THERM} \downarrow \Rightarrow V_{OUT} \downarrow}$$

ROOM

$$10.8k\Omega \rightarrow 2.64V$$

WARM

$$7.1k\Omega \rightarrow 2.11V$$