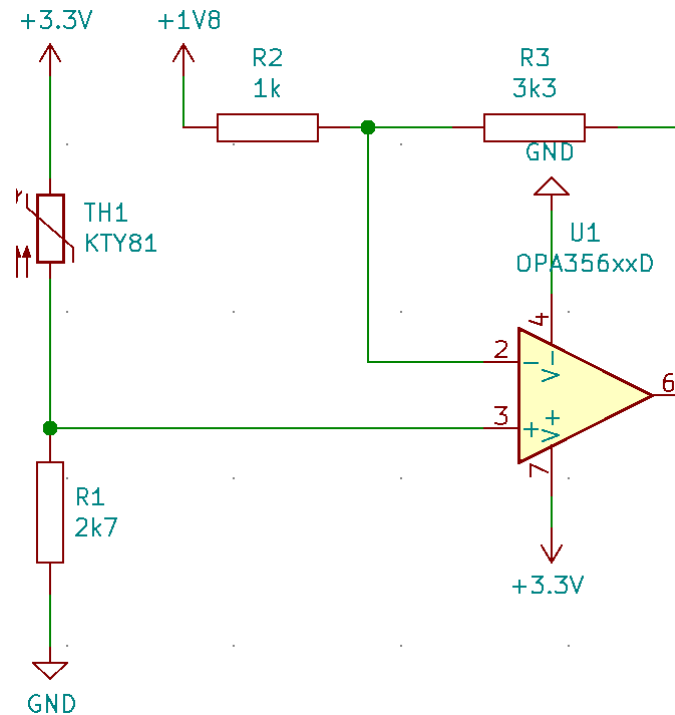


Dimensionamento de circuito para termistor KTY81/210 para medição da temperatura do motor:



$$R_{Thermistor_{MAX}} = R_{150^{\circ}C} = 4k\Omega$$

$$V_{out_{MAX}} = 3.25V$$

$$R_1 = \sqrt{R_{150^{\circ}C} * R_{0^{\circ}C}} = 2530 \Rightarrow 2,7k\Omega$$

$$V_{in_{MIN}} = V_{dd} * \frac{R_1}{R_1 + R_{150^{\circ}C}} = 1,33V$$

$$G = \frac{V_{out_{MAX}} - V_{out_{MIN}}}{V_{in_{MAX}} - V_{in_{MIN}}} = 4,3$$

$$R_2 = 1k\Omega$$

$$\Delta V_{out} = G * (V_{in_{MAX}} - V_{in_{MIN}}) = 3,2V$$

$$V_{ref} = (V_{out_{MAX}} - V_{in_{MAX}} * G) * \frac{-R_2}{R_3} = 1,7V \Rightarrow 1,8V$$

$$R_{Thermistor_{MIN}} = R_{0^{\circ}C} = 1,6k\Omega$$

$$V_{out_{MIN}} = 0.05V$$

$$V_{in_{MAX}} = V_{dd} * \frac{R_1}{R_1 + R_{0^{\circ}C}} = 2,07V$$

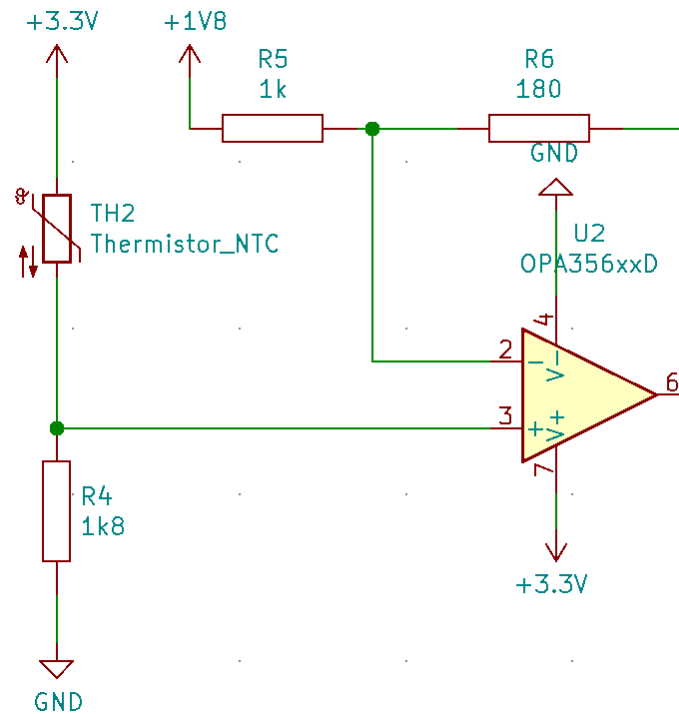
$$G = \frac{R_2 + R_3}{R_2}$$

$$R_3 = G * R_2 - R_2 = 3,3k\Omega$$

$$V_{out_{MAX}} = \frac{V_{dd}}{2} - \frac{\Delta V_{out}}{2} = 3,25V$$

REF: <http://www.ti.com/lit/an/sboa323/sboa323.pdf>

Dimensionamento de circuito para termistor NTC para medição da temperatura de ponte de transístores IGBT:



$$R_{Thermistor_{MAX}} = R_{0^{\circ}C} = 16,1k\Omega$$

$$R_{Thermistor_{MIN}} = R_{150^{\circ}C} = 160\Omega$$

$$V_{out_{MAX}} = 3,25V$$

$$V_{out_{MIN}} = 0,05V$$

$$R_4 = \sqrt{R_{150^{\circ}C} * R_{0^{\circ}C}} = 1610 \Rightarrow 1,8k\Omega$$

$$V_{in_{MIN}} = V_{dd} * \frac{R_4}{R_4 + R_{0^{\circ}C}} = 0,33V$$

$$V_{in_{MAX}} = V_{dd} * \frac{R_4}{R_4 + R_{150^{\circ}C}} = 3,03V$$

$$G = \frac{V_{out_{MAX}} - V_{out_{MIN}}}{V_{in_{MAX}} - V_{in_{MIN}}} = 1,18$$

$$G = \frac{R_5 + R_6}{R_5}$$

$$R_4 = 1k\Omega$$

$$R_5 = G * R_4 - R_4 = 180\Omega$$

$$\Delta V_{out} = G * (V_{in_{MAX}} - V_{in_{MIN}}) = 3,2V$$

$$V_{out_{MAX}} = \frac{V_{dd}}{2} - \frac{\Delta V_{out}}{2} = 3,25V$$

$$V_{ref} = (V_{out_{MAX}} - V_{in_{MAX}} * G) * \frac{-R_5}{R_6} = 1,84V \Rightarrow 1,8V$$

REF: <http://www.ti.com/lit/an/sboa323/sboa323.pdf>