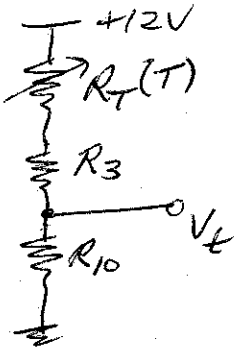
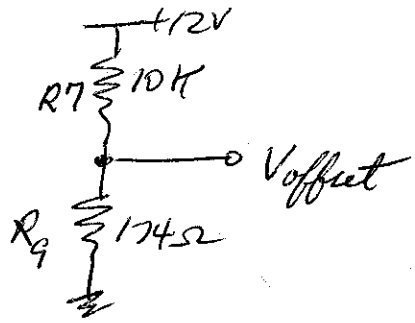
Thermistor Circuit Resistor - Fixing $R_9 = 1745\Omega$





$$V_{offset} = 12\,\frac{R_9}{10^4 + R_9}$$

TC = MOSFET temperature coefficient

Match at temperatures T_1 and T_2 (e.g. $T_1 = 20°C$, $T_2 = 60°C$):

at T_1: $$V_t = \frac{12R_{10}}{R_{10}+R_3+R_T(T_1)} = 12\,\frac{R_9}{10^4+R_9};$$

$$(10^4+R_9)R_{10} = R_9R_{10} + R_9\left(R_3 + R_T(T_1)\right);$$

$$\boxed{10^4 R_{10} - R_9 R_3 = R_9 R_T(T_1)} \quad \text{eq. 1}$$

at T_2: $$V_t = \frac{12\,R_{10}}{R_{10}+R_3+R_T(T_2)} = 12\frac{R_9}{10^4+R_9} + (T_2-T_1)*TC;$$

$$12R_{10}(10^4+R_9) = 12R_9\left(R_{10}+R_3+R_T(T_2)\right) + \left(R_{10}+R_3+R_T(T_2)\right)(10^4+R_9)(T_2-T_1)*TC;$$

$$12\times10^4 R_{10} = 12R_9R_3 + 12R_9R_T(T_2) + (R_{10}+R_3)(10^4+R_9)(T_2-T_1)TC + R_T(T_2)(10^4+R_9)(T_2-T_1)TC;$$

$$\boxed{\left[12*10^4 - (10^4+R_9)(T_2-T_1)TC\right]R_{10} - \left[12R_9 + (10^4+R_9)(T_2-T_1)TC\right]R_3 = 12R_9R_T(T_2) + R_T(T_2)(10^4+R_9)(T_2-T_1)TC;} \quad \text{eq. 2}$$

~~$\left[R_9(T_2-T_1)TC\right]R_{10} - \left[10^4+2R_9\right]$~~

$$10^4\left[12*10^4 - (10^4+R_9)(T_2-T_1)TC\right]R_{10} - R_9\left[12*10^4 - (10^4+R_9)(T_2-T_1)TC\right]R_3 = R_9R_T(T_1)\left[12*10^4 - (10^4+R_9)(T_2-T_1)TC\right]; \quad \text{eq. 1'}$$

$$10^4\left[12*10^4 - (10^4+R_9)(T_2-T_1)TC\right]R_{10} - 10^4\left[12R_9 + (10^4+R_9)(T_2-T_1)TC\right]R_3 = 10^4\left[12*R_9R_T(T_2) + R_T(T_2)(10^4+R_9)(T_2-T_1)TC\right]; \quad \text{eq. 2'}$$

Thermistor Circuit Resistors - Fixing $R_9 = 17452$

Subtracting:

$$R_3\left[\cancel{12*10^4 R_9} + 10^4(10^4+R_9)(T_2-T_1)TC - \cancel{12*10^4 R_9} + R_9(10^4+R_9)(T_2-T_1)TC\right]$$

$$= R_9 R_T(T_1)\left[\cancel{12*10^4} - (10^4+R_9)(T_2-T_1)TC\right] - 10^4\left[\cancel{12*R_9 R_T(T_2)} + R_T(T_2)\times (10^4+R_9)(T_2-T_1)TC\right];$$

$$R_3\left[(10^4+R_9)^2(T_2-T_1)TC\right] = 12*10^4 R_9\left[R_T(T_1)-R_T(T_2)\right] - \left[(10^4+R_9)(T_2-T_1)TC\right]\left[R_9 R_T(T_1)+10^4 R_T(T_2)\right];$$

$$\cancel{R_3(10^4+R_9)^2(T_2-T_1)TC = 10^4 R_9 R_T(T_1) + 10^4 R_9 R_T(T_2)}$$

$$R_3 = \frac{12*10^4 R_9\left[R_T(T_1)-R_T(T_2)\right] - \left[(10^4+R_9)(T_2-T_1)TC\right]\left[R_9 R_T(T_1)+10^4 R_T(T_2)\right]}{(10^4+R_9)^2(T_2-T_1)TC}$$

$$R_{10} = \frac{R_9(R_3+R_T(T_1))}{10^4}$$